Double Tie Knotter Handbook

OPERATOR'S MANUAL

Double Tie Knotter Handbook

OMFH317967 ISSUE C5 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

John Deere Ottumwa Works

Worldwide Edition

PRINTED IN U.S.A.

Foreword

W24533 —UN—21JAN14

Double Tie Knotter

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages (see your John Deere dealer to order).

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing the direction the implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Specification or Identification Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

BEFORE DELIVERING THIS MACHINE, ensure your dealer performed a predelivery inspection.

THIS BALER IS DESIGNED SOLELY for use in customary agricultural or similar operations ("INTENDED USE"). Use in any other way is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user. Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for the intended use.

THIS BALER SHOULD BE OPERATED, serviced and repaired only by persons familiar with all its particular characteristics and acquainted with the relevant safety rules (accident prevention). The accident prevention regulations, all other generally recognized regulations on safety and occupational medicine and the road traffic regulations must be observed at all times. Any arbitrary modifications carried out on this baler will relieve the manufacturer of all liability for any resulting damage or injury.

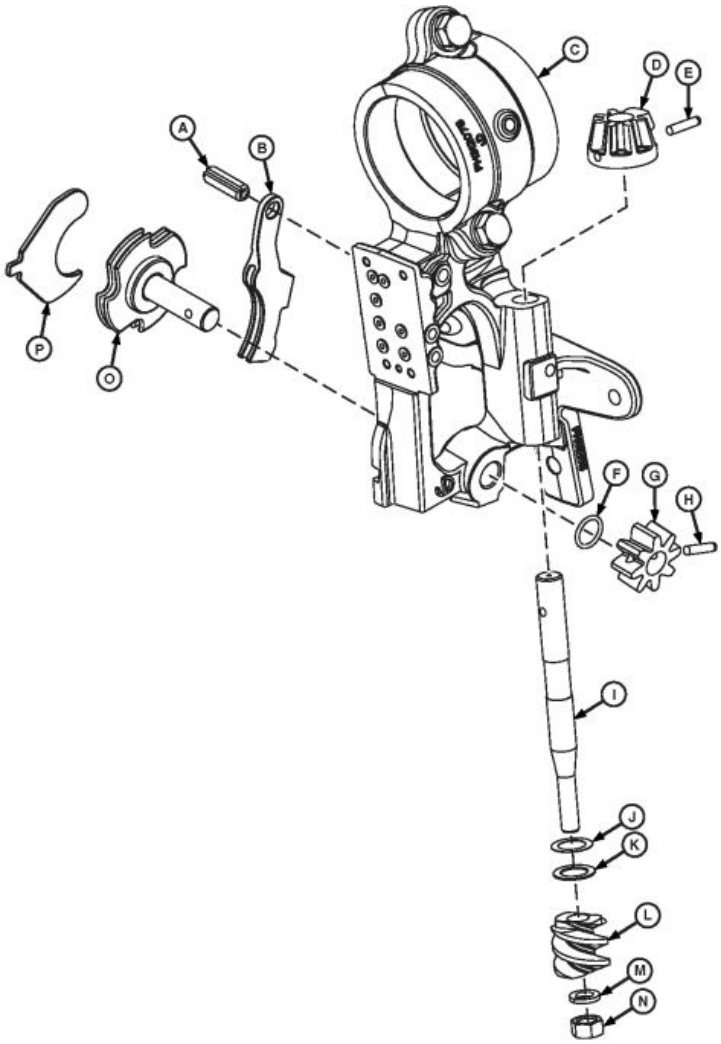
If you are not the original owner of this machine, it is in your interest to contact your local John Deere dealer to inform them of this unit's serial number. This will help John Deere notify you of any issues or product improvements.

SF04007,00005B6 -19-11JUN14-1/1

Contents

Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Knotter Component Identification and Location



W24478 —UN—17DEC13

A—Spring Pin
B—Twine Holder
C—Knotter Frame
D—Twine Disk Pinion
E—Spring Pin
F—Shim
G—Twine Disk Driven Gear
H—Pin
I— Twine Disk Drive Shaft
J— Shim
K—Washer
L—Worm Gear
M—Lock Washer
N—Nut
O—Twine Disk
P—Twine Cleaner

Knotter assembly components. Detail One.

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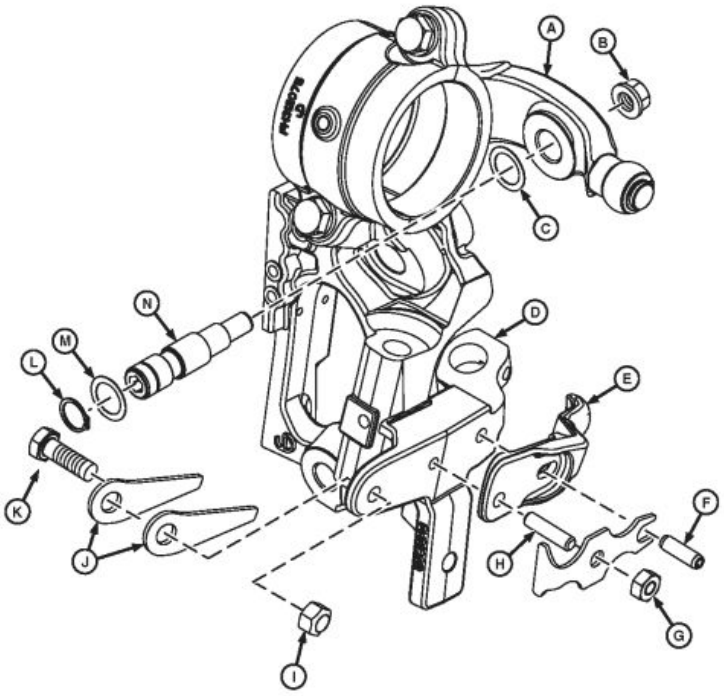

W24480 —UN—12DEC13

A—Wiper Arm
B—Nut
C—Washer (if necessary)
D—Knotter Frame
E—Billhook Pressure Arm
F—Spring Pin
G—Nut
H—Stud (Red Loctite)
I— Nut
J— Twine Holding Leaf Spring (2 used)
K—Cap Screw
L—Snap Ring
M—Washer
N—Wiper Arm Shaft

Knotter assembly components. Detail Two.

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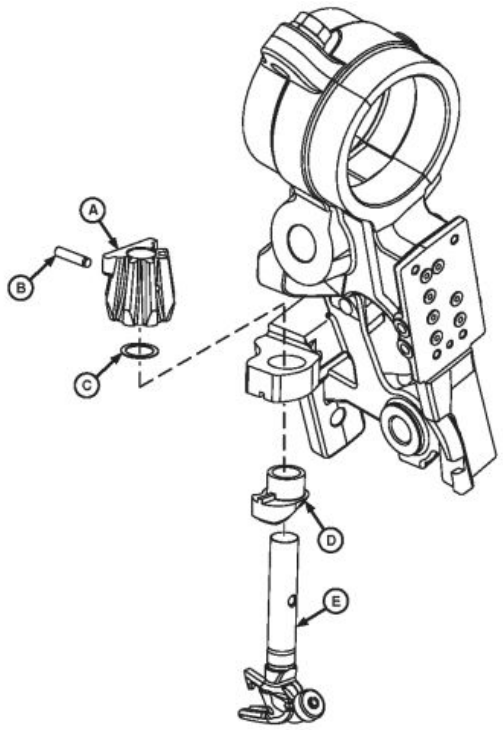

W24481 —UN—16DEC13

A—Billhook Pinion
B—Spring Pin
C—Shim
D—Billhook Cam
E—Billhook

Knotter assembly components. Detail Three.

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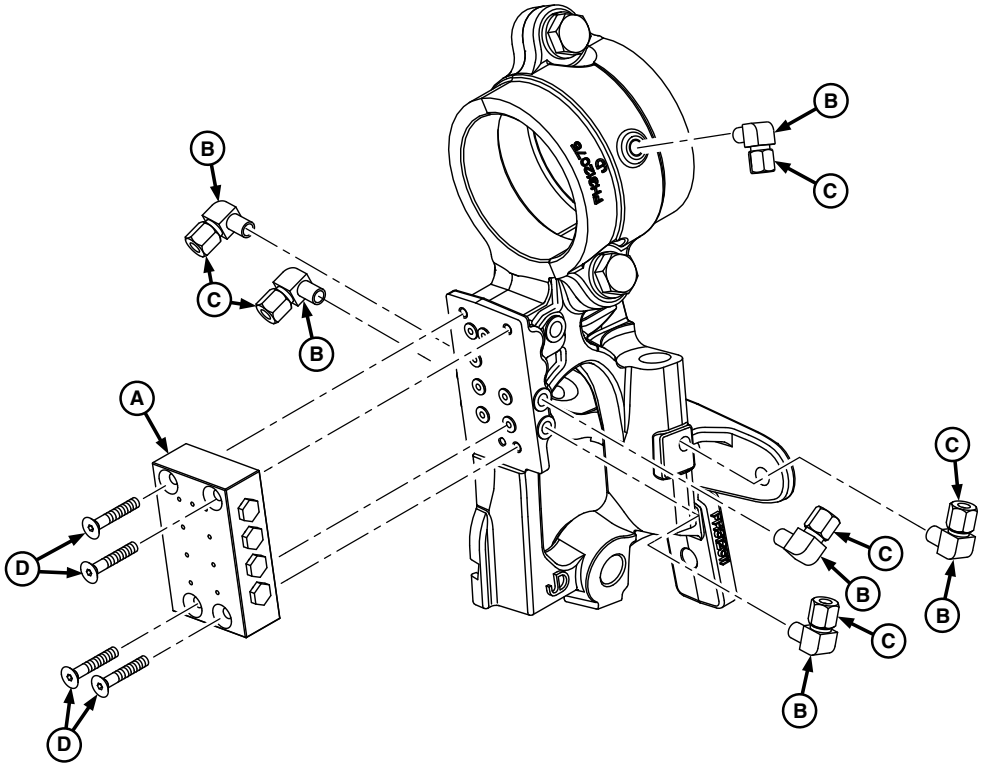

A—Grease Block
B—90 Degree Connector (6 used)
C—Compression Nut and Cone
D—Socket Head Cap Screw with Loctite 242 or Blue Loctite (4 used)

Knotter assembly components. Detail Four.

Continued on next page

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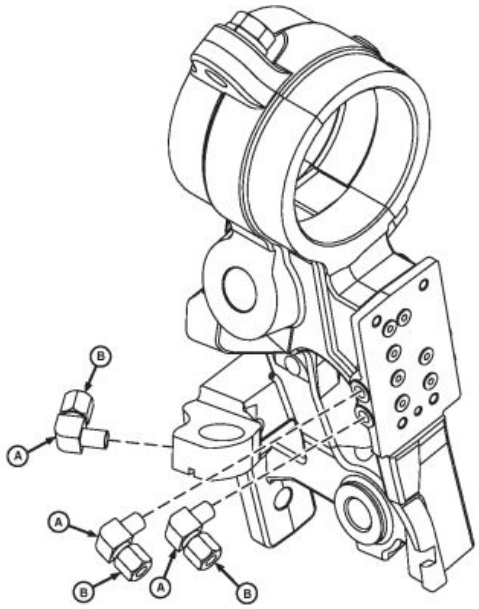

W24485 —UN—17DEC13

A—90 Degree Connector (3 used) B—Compression Nut and Cone (3 used)

Knotter assembly components. Detail Five.

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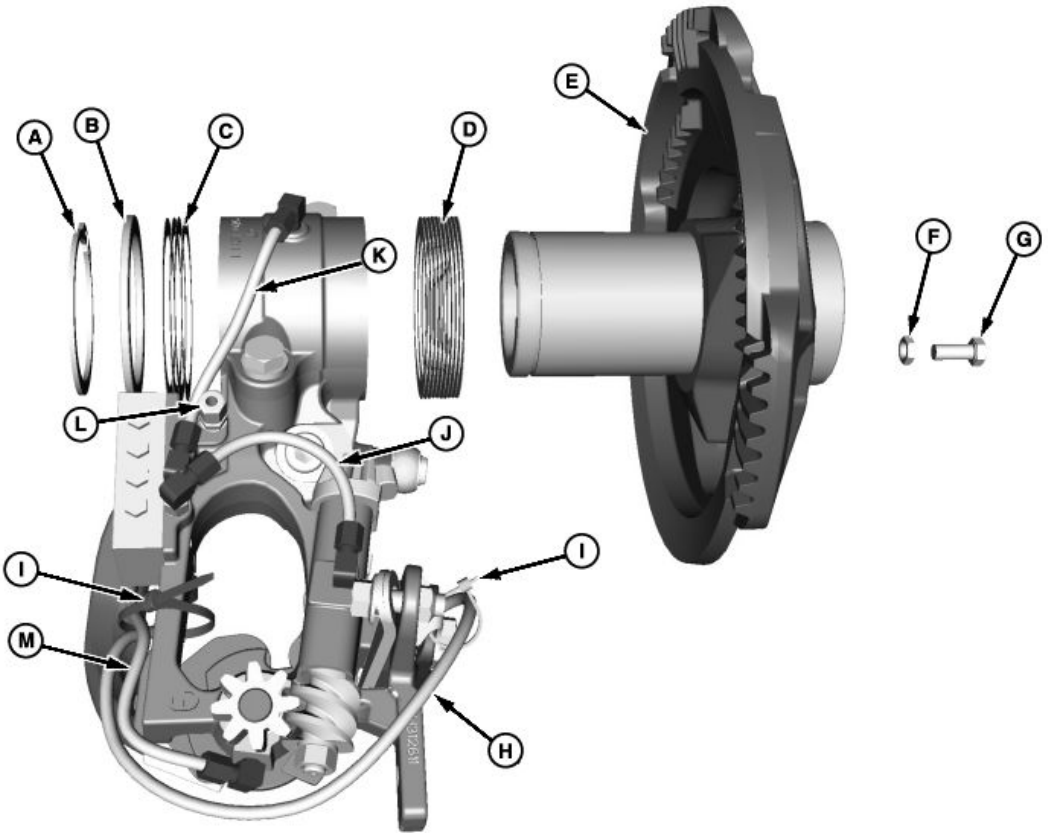

W24603 —UN—20MAR14

A—Snap Ring
B—Thick Washer
C—Thin Shim
D—Thin Shim (10 used)
E—Intermittent Gear
F—Hex Nut
G—Hex Head Cap Screw
H—Billhook Lower Lube Line (430 mm)
I—Tie Band (2 used)
J—Twine Disk Lube Line (140 mm)
K—Knotter Cap Lube Line (140 mm)
L—Straight Connector
M—Twine Disk Lube Line (165 mm)

Knotter assembly components. Detail Six.

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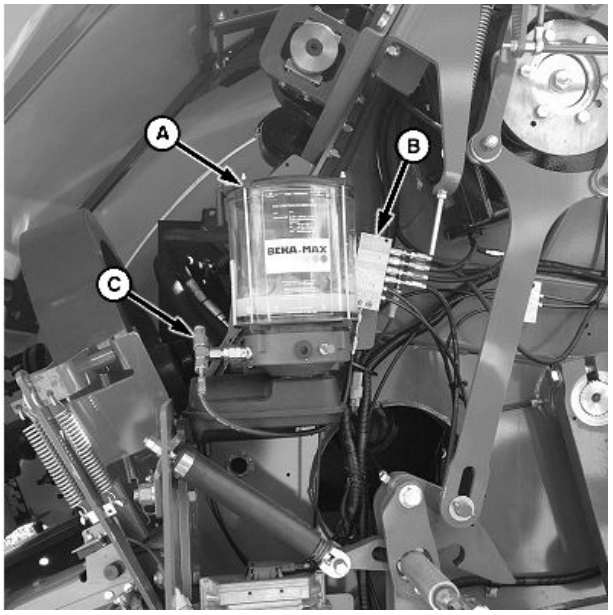
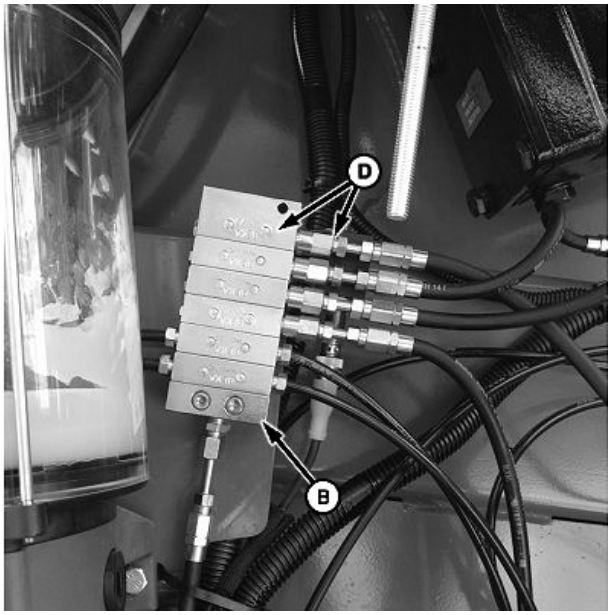
Lube System

Lubrication to knotter system is provided through the second block in the main distribution block (B). If a lube blockage occurs anywhere in the auto lubrication system, lubrication will be ejected out of pressure relief valve (C). The lubrication line (D) routed to all knotters is located in the first position on the main distribution block (B).

A—Auto Lubrication Pump
B—Main Distribution Block
C—Pressure Relief Valve
D—Knotter System Lubrication Block and Line



W26141 —UN—10JUN14



W26142 —UN—10JUN14

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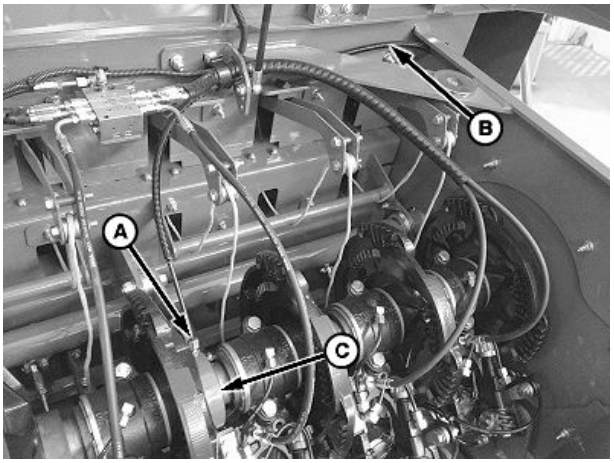
A center support (C) provides additional structure to the knotter shaft on all 3 x 4 balers. The support is positioned on the intermittent gear of Knotter 3. Grease is provided to the center support via the right-hand side distribution block (F). The right-hand side block is located below the hydraulic control valve (E).



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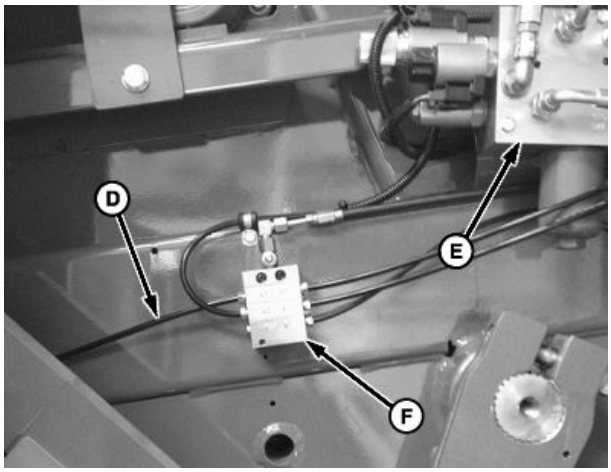

W26144 —UN—10JUN14

A—Center Support Lubrication Point
B—Lubrication Line Entry Point
C—Center Support
D—Lubrication Line To Center Support
E—Hydraulic Control Valve
F—Right-Hand Side Distribution Block

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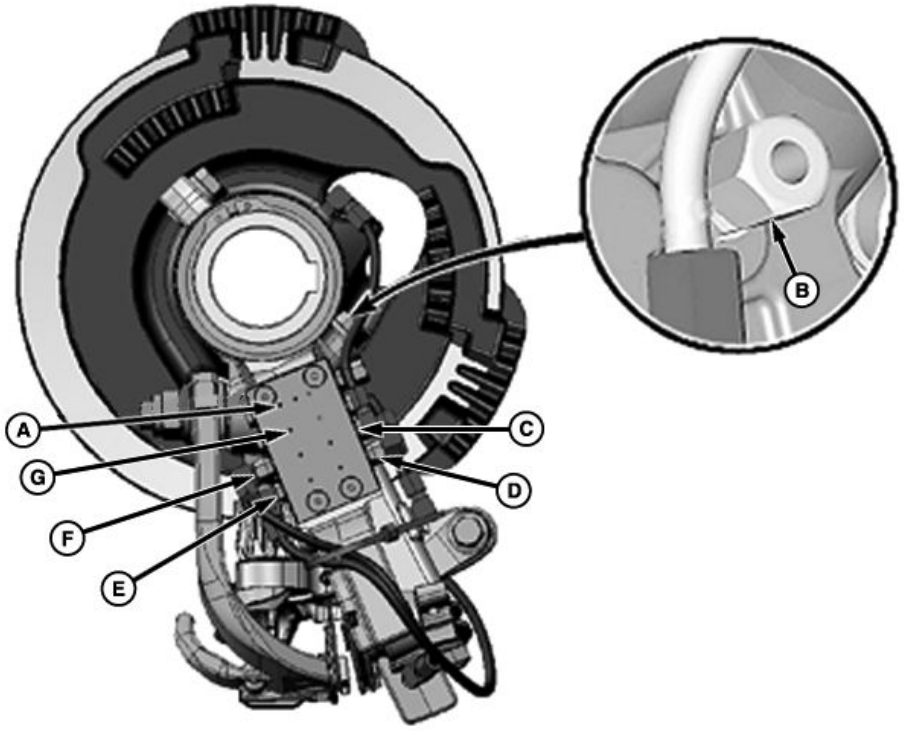


W24386 —UN—10JUN14

A—To Wiper Arm Shaft (Internal)
B—Line In
C—To Main Bearing Cap
D—To Twine Disk Spindle
E—To Lower Billhook Shaft
F—To Twine Disk Shaft
G—To Upper Billhook Shaft (Internal)

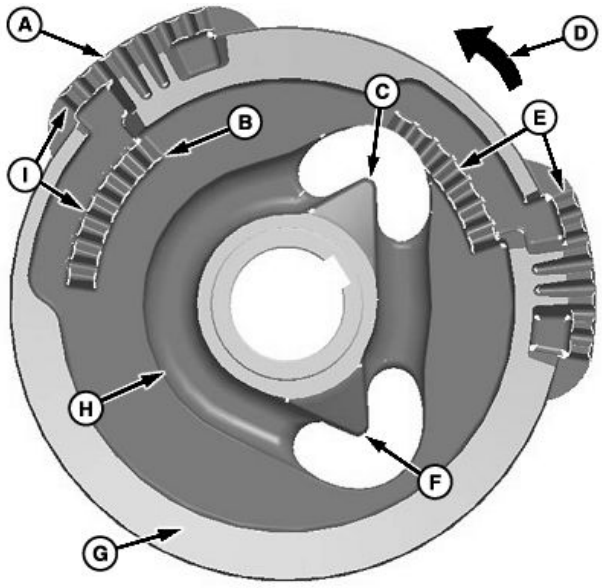
Use John Deere multi-purpose HD lithium complex grease. 14 oz., TY24416, P/N in Canada: CXTY24416 / 35 lb. tub, TY24417, P/N in Canada: CXTY24417

SF04007,0000578 -19-11JUN14-3/3

Intermittent Gear Stages and Component Identification and Location

Refer to drawing for intermittent gear components.

A—Billhook Gear Set
B—Twine Disk Gear Set
C—First Knot Wipe Off
D—Direction of Rotation
E—Second Knot Gear Set
F—Second Knot Wipe Off
G—Pinion Surface
H—Wiper Arm Cam Track
I— First Knot Gear Set



W24268 —UN—23OCT13

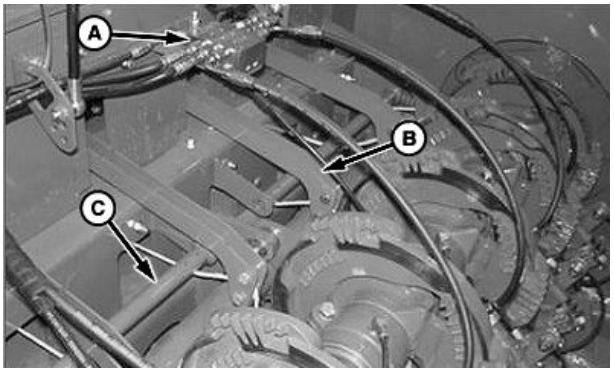
Intermittent Gear

SF04007,0000579 -19-05DEC13-1/1

Knotter System Component Identification

1. Upper knotter system components.

A—Knotter Main Grease Bank and Manual Override Grease Point
B—Upper Slack Arms
C—Slack Arm Stop Bars
D—Upper Slack Arm Sensor Wiring Harness
E—Tensioner Gears
F—Tensioner Adjustment Springs
G—Blower Fan Air Shield



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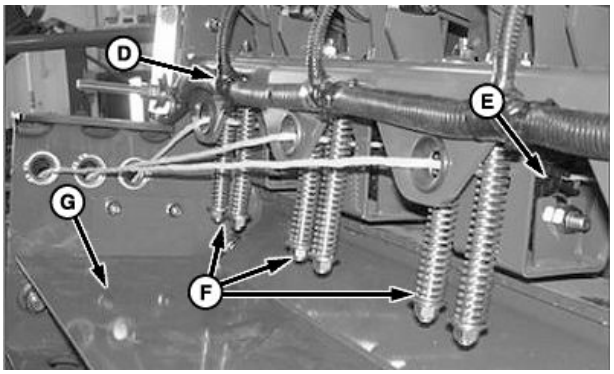

W24488 —UN—25MAR14

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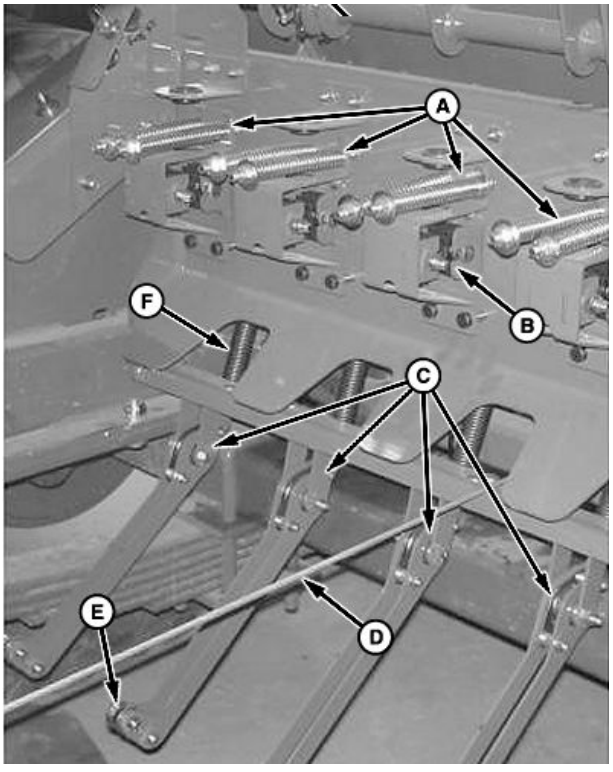
2. Lower knotter system components.

A—Tensioner Adjustment Springs
B—Tensioner Gears
C—Lower Slack Arms
D—Parking Brake Cable
E—Slack Arm Rollers
F—Slack Arm Springs



W24489 —UN—20MAR14

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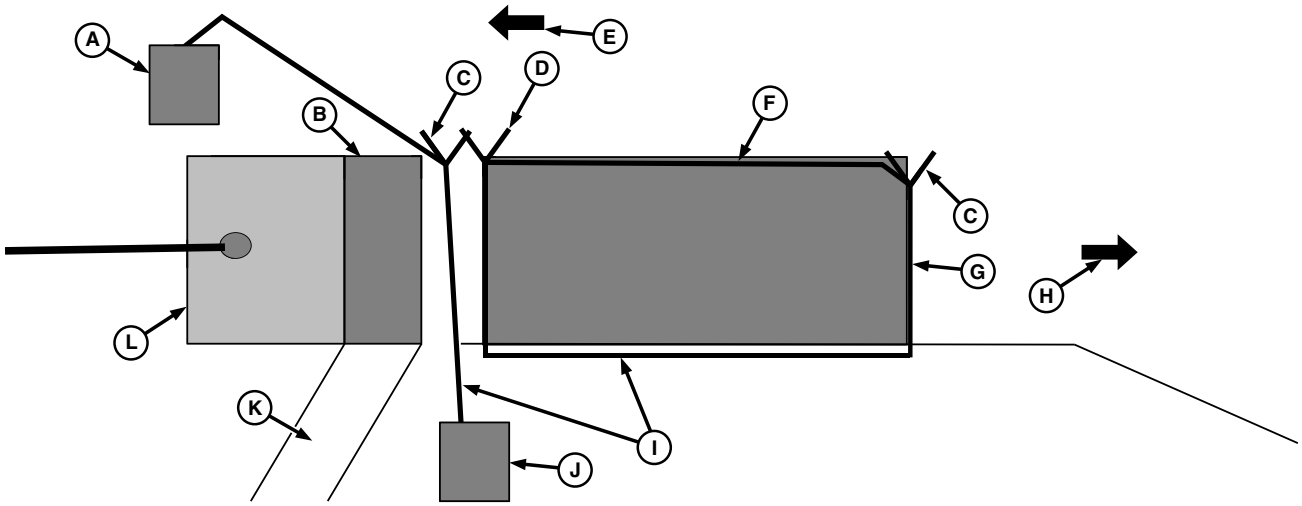
Knot Sequence



W24477 —UN—24MAR14

A—Top Twine Ball
B—Next Flake
C—Second Knot
D—First Knot
E—Direction of Travel
F—Top Twine
G—Completed Bale
H—Bale Chamber Exit
I— Lower Twine (Needle Twine)
J— Lower Twine Ball
K—Stuffer Chamber
L—Plunger

First Knot (D)	Second Knot (C)
• First knot tied by knotter	• Second knot tied by knotter
• Last knot on completed bale	• First knot on forming bale
• Last knot to exit bale chamber	• First knot to exit bale chamber

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Knotter Theory of Operation

Understanding the tying cycle is critical for performing baler adjustments. Twine tying cycle is as follows:

1. Knotter is in “home” position and is ready to receive twine from needle.

W26092 —UN—24APR14

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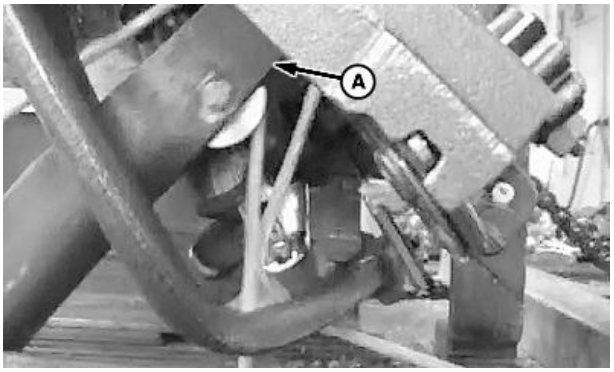
SF04007,00007C6 -19-03MAR15-1/10

2. Knotter has been engaged, driving needle (A) up through knotter frame to deliver both upper and lower twines to twine disk.

A—Needle



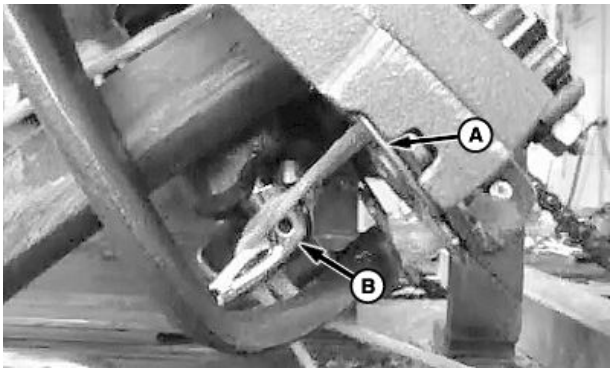
W26093 —UN—24APR14

SF04007,00007C6 -19-03MAR15-2/10

NOTE: Tucker finger positions twine for correct knot formation around billhook.

3. Twine disk (A) receives two strands of twine delivered by needles. As twine disk rotates it pinches twines between itself and twine holder. Holding force is determined by twine holding leaf spring settings. Timing of twine disk in relation to the remaining tying cycle is predetermined by intermittent gear.
4. Billhook (B) begins rotation to gather both upper and lower twines.

A—Twine Disk **B—Billhook**

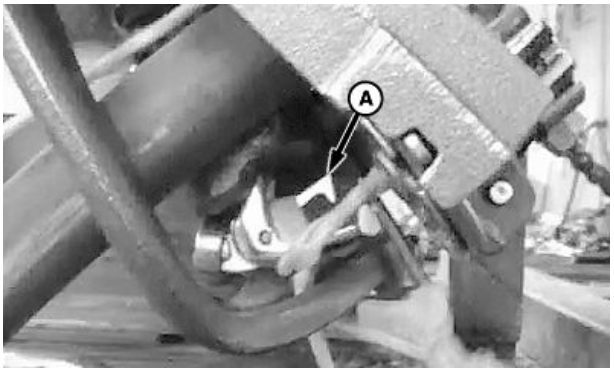


W26094 —UN—24APR14

SF04007,00007C6 -19-03MAR15-3/10

5. After about 2/3 of a revolution, billhook tongue (A) opens to grasp twine between billhook and twine disk.

A—Billhook Tongue



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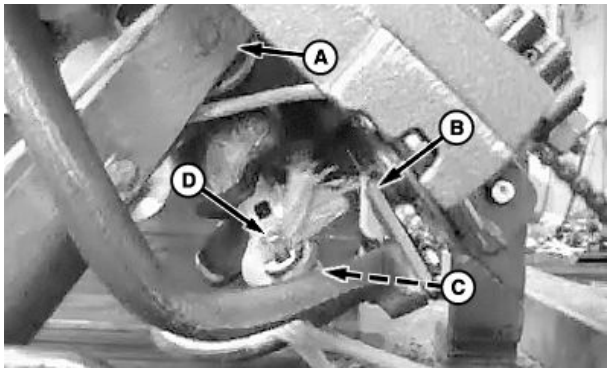
SF04007,00007C6 -19-03MAR15-4/10

6. Needle (A) begins to retract.
7. Billhook tongue (D) closes as first revolution is completed. Closing force of billhook tongue is determined by billhook spring settings.
8. Wiper arm begins movement cutting twine with knife (B) as wiper plate (C) slides across bottom of billhook. Knot is completed as wiper plate forces twine off end of billhook and draws tails through loop created by twine wrapped around outside of billhook.

A—Needle
B—Twine Knife
C—Wiper Plate
D—Billhook Tongue

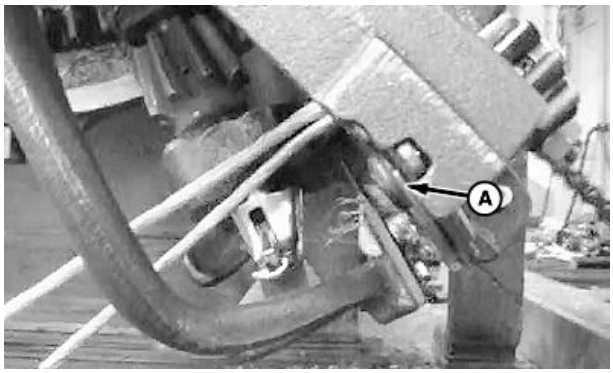


W26096 —UN—24APR14

SF04007,00007C6 -19-03MAR15-5/10

9. Twine disk (A) is now retaining twine in twine holder.
10. Knotter components are at “home” position and second knot is ready to be tied. Knotter shaft and needles are not yet back at home position.

A—Twine Disk



W26097 —UN—24APR14

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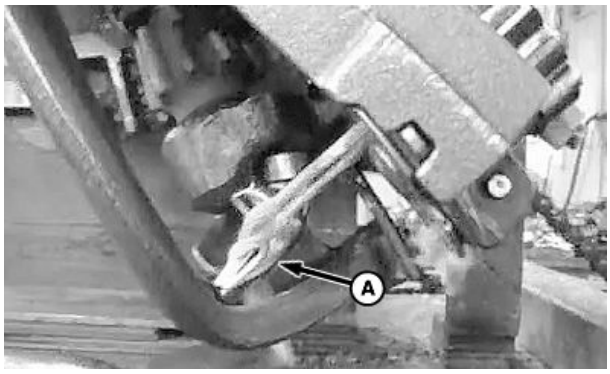
NOTE: Needles continue to retract.

11. Sequences starts over as second set of teeth on intermittent gear engage pinions on knotter frame. Second knot will be the rear knot on a new bale.
12. Billhook (A) begins second rotation to gather both upper and lower twines.

A—Billhook



W26098 —UN—24APR14

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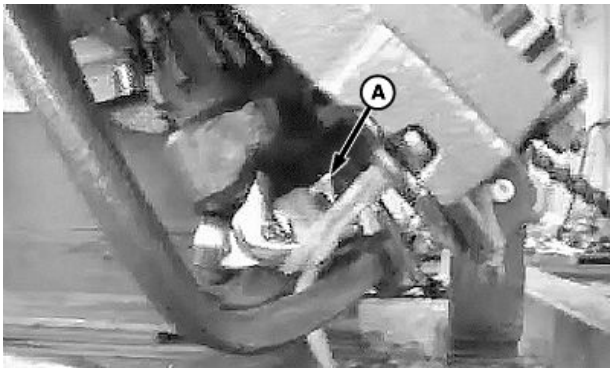
13. After about 2/3 of a revolution, the billhook tongue (A) opens to grasp the twine between the billhook and twine disk.

A—Billhook Tongue

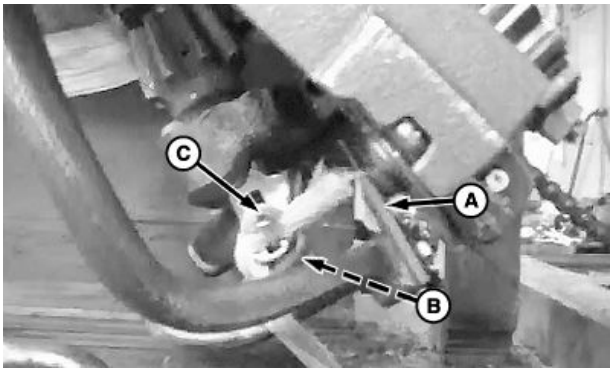


W26099 —UN—24APR14

SF04007,00007C6 -19-03MAR15-8/10

14. Billhook tongue (C) closes as second revolution is completed. Closing force of billhook tongue is determined by billhook spring settings.
15. Wiper arm begins movement cutting twine with knife (A) as wiper plate (B) slides across bottom of billhook. Knot and bale are completed as wiper plate forces twine off end of billhook and draws tails through loop created by twine wrapped around billhook.

A—Twine Knife
B—Wiper Plate
C—Billhook Tongue



W26100 —UN—24APR14

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16. All knotter components are now at “home” position including needle frame and intermittent gears. Clutch has been reset and is ready to start next tie cycle when triggered.

W26092 —UN—24APR14

SF04007,00007C6 -19-03MAR15-10/10

Common Tie Problems

Check List

CAUTION: The tie system can activate at any moment with the PTO engaged.

CAUTION: Before inspecting or making any adjustments, turn OFF the PTO, ensure that the PTO has stopped turning, and engage the flywheel brake.

CAUTION: Before inspecting or making any adjustments, set the needle lock pin to the rear position.

Incorrect twine tension accounts for 90% of all misties, check twine tension BEFORE performing more adjustments to knotter system.

Most of common knotter miss ties are resolved with a few quick checks and adjustments if necessary. Before proceeding to the complete listing of failure modes and solutions check the following areas:

Incorrect twine tension

1. Watch the upper slack arm indicators on the display:
   a. During bale formation the upper slack arms displays in the down position.
   b. If the upper slack arm is drifting up from the bottom, during bale formation, tighten the upper tensioner until bar remains down.
2. Inspect the twine box:
   a. Is the twine routed and tied between balls correctly?
   b. Is the twine wrapped around any objects?
3. Pull on the twine at different locations or at the knotter:
   a. The twine should never be completely slack or pull with no resistance.
   b. The twine should never be so tight that it cannot be pulled by hand.

Problems in the knotter area

1. Lift the knotter:
   a. Are all the components present and in good condition?
   b. Is the wiper plate contacting the billhook?
2. Inspect for debris:
   a. Is there debris within the knotter?
   b. Is there debris around the tucker finger or slack arms?

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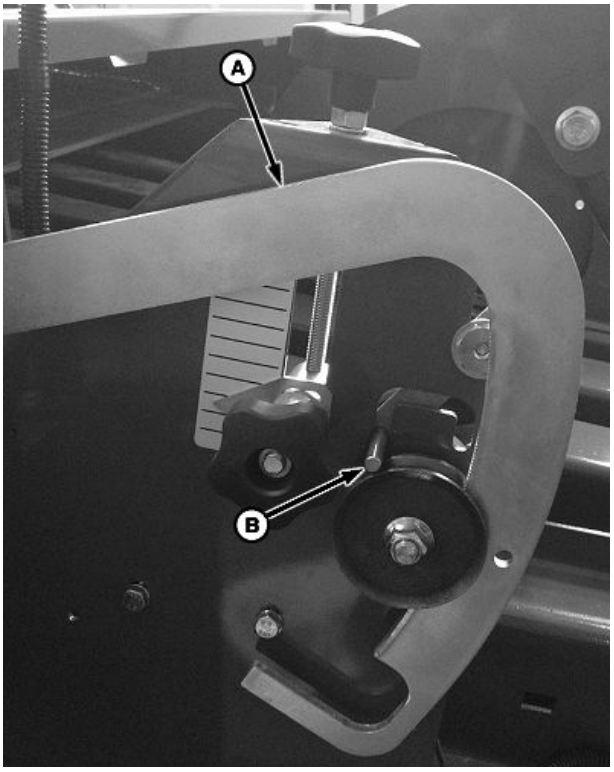
Needle Lock Out

Sector arm positions.

NOTE: Unlocked position is normal position during baling.

A—Sector Arm **B—Pin**



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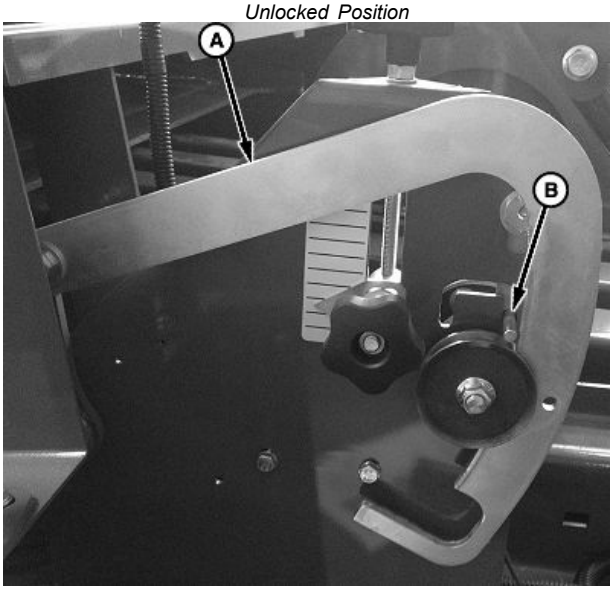
Unlocked Position



W26146 —UN—11JUN14

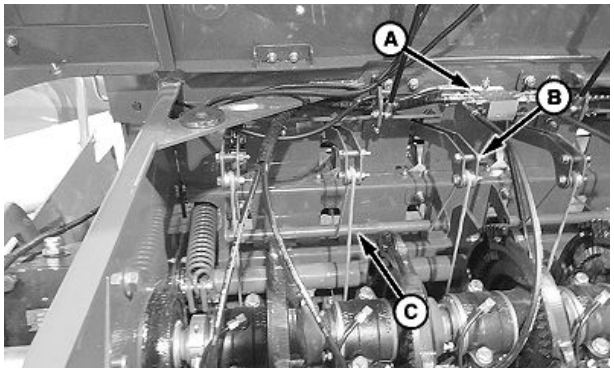
Locked Position

SF04007,0000694 -19-11JUL14-1/1

Component identification and location

1. Component identification (A—G).

A—Knotter Main Grease Bank and Manual Override Grease Point
B—Slack Arms
C—Slack Arm Stop Bar Tucker Finger Shaft
D—Upper Slack Arm Sensor Wiring Harness
E—Tensioner Gears
F—Tensioner Adjustment Springs
G—Blower Fan Air Shield



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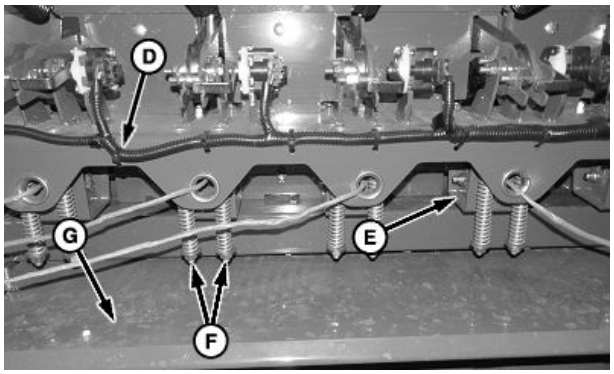

W24270 —UN—25MAR14

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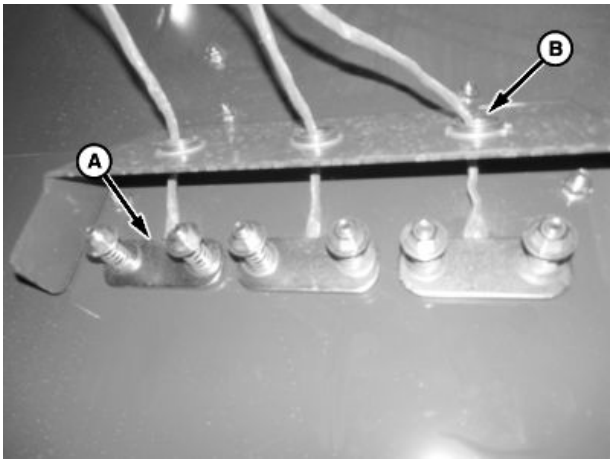
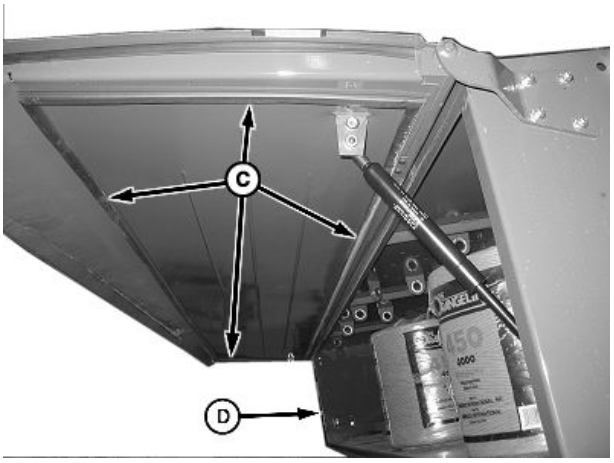
2. Component identification (A—D).

A—Eyelets
B—Tensioners
C—Twine Box Door Seal
D—Twine Box



W24363 —UN—18MAR14



W24523 —UN—21MAR14

SF04007,0000528 -19-13AUG14-2/2

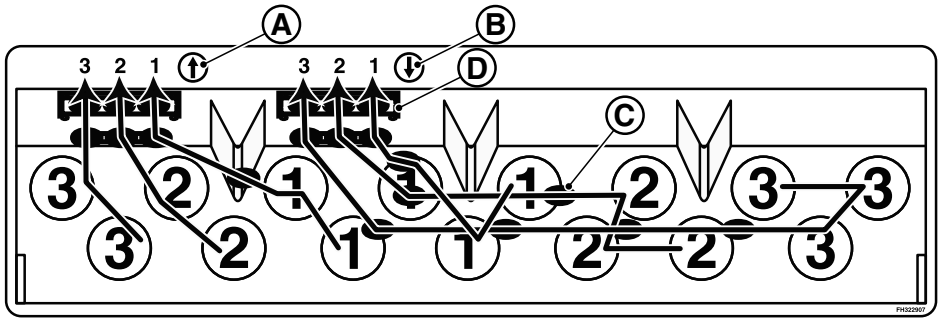
Twine Selection

Only use high quality twine designed for use on large square balers. Low quality or improper twine type can cause excessive knotter trouble and twine failures.

If a different knot strength twine is required, switch all twine balls on knotter at same time. Monitor knotter performance closely for first several bales and make minor adjustments to knotters as necessary.

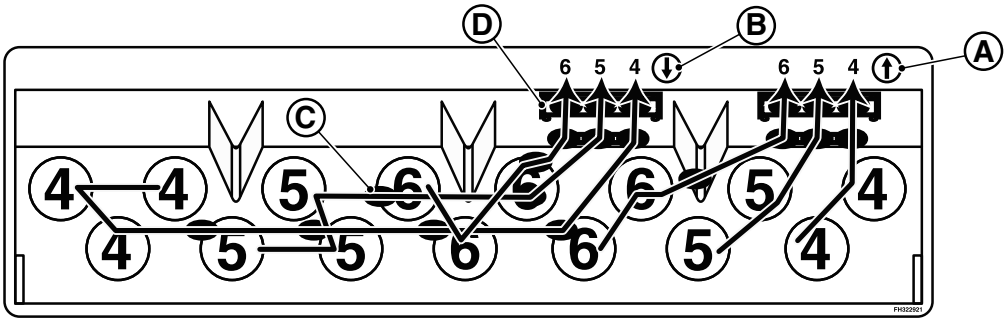
SF04007,00007CC -19-04MAR15-1/1

Twine Box Ball Placement



E73197 —UN—25NOV14

Left-Hand Side Shown



E73198 —UN—25NOV14

A—Up Arrow
B—Down Arrow
C—Twine Guide
D—Tension Plate

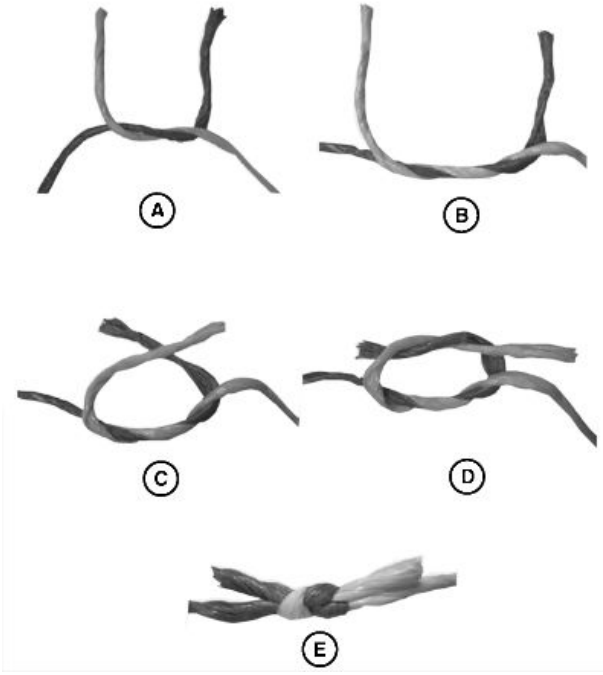
1— Twine Balls to Needle 1
2— Twine Balls to Needle 2
3— Twine Balls to Needle 3
4— Twine Balls to Needle 4
5— Twine Balls to Needle 5
6— Twine Balls to Needle 6

SF04007,000052A -19-14JUL14-1/1

Tying Between Twine Balls

1. Tie end of leading ball to center of trailing or next ball.
2. Tie a surgeon's knot with two twine strands (A—E).
3. Confirm knot ends are pointing in direction of strands.
4. Trim knot ends to approximately 25 mm (1 in.) in length.

A—Step 1
B—Step 2
C—Step 3
D—Step 4
E—Step 5



W26016 —UN—07APR14

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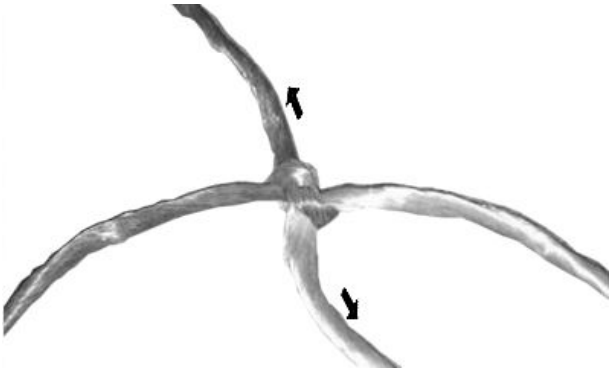
SF04007,000052B -19-13AUG14-1/2

5. Incorrect knot. (Ends are perpendicular to strand)



W24280 —UN—08APR14

Incorrect Knot

SF04007,000052B -19-13AUG14-2/2

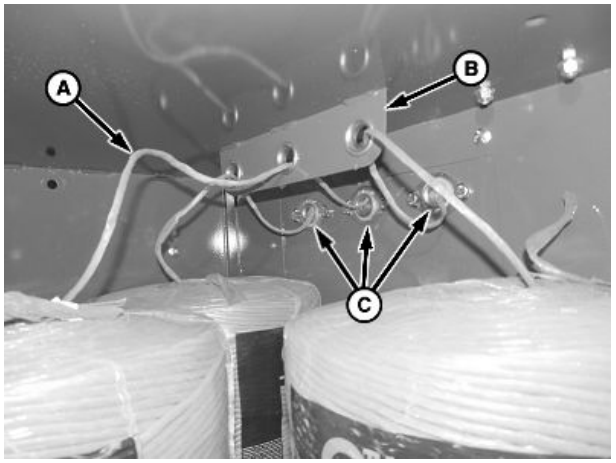
Twine Routing Through Box Eyelets

1. Pull twine (A) from center of leading ball.

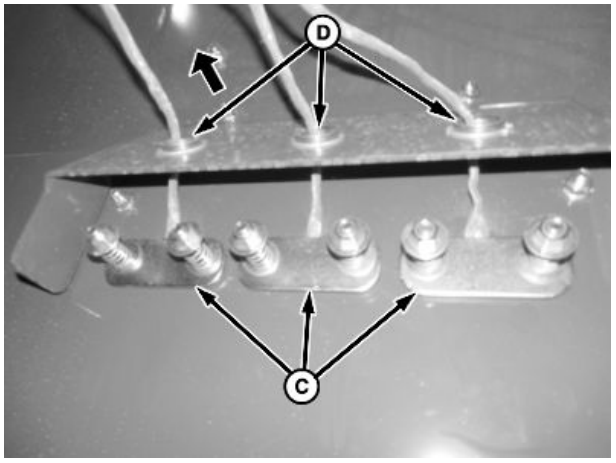
NOTE: Avoid crossing twine strands when routing through eyelets.

2. Route twine through twine box eyelets (B).
3. Push twine through twine box tensioner eyelets (C).
4. Push twine upwards on front eyelets (D) for top twine as shown.
5. Push twine downwards through eyelets for lower twine as shown.

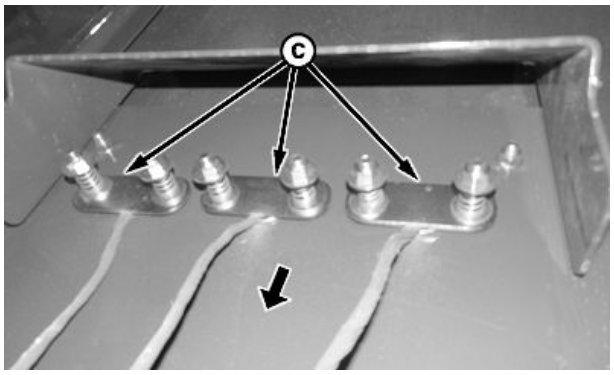
A—Twine
B—Twine Box Eyelets (Interior)
C—Twine Box Tensioner Eyelets
D—Twine Box Eyelets (Exterior)



W24364 —UN—21MAR14



W24692 —UN—21MAR14



W24693 —UN—21MAR14

SF04007,000052C -19-24MAR14-1/1

Twine Routing Sequence Through Eyelets, Tensioners, and Slack Arms

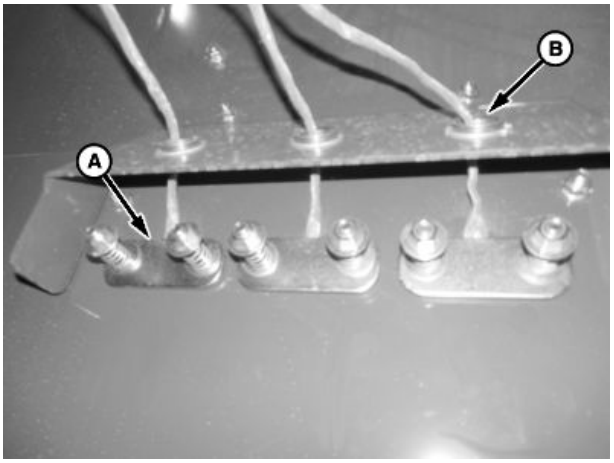
NOTE: **90% of misties are caused by incorrect or inconsistent twine tension. Make sure twine routing is correct BEFORE making adjustments to other parts of knotter system.**

1. Route twine from twine box through twine box tensioner (A).

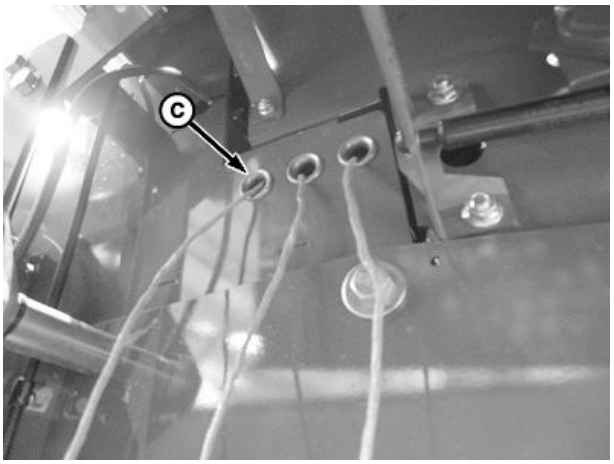
NOTE: Twine strands should not cross each other.

2. Feed up through twine box outside eyelets (B) across to machine upper eyelets (C).

A—Twine Box Tensioner
B—Twine Box Outside Eyelets
C—Machine Upper Eyelets



W24363 —UN—18MAR14



W24605 —UN—20JAN14

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SF04007,00007C7 -19-03MAR15-1/6

3. Check twine tension:
   - Tie loop in end of twine
   - Using a spring scale, pull twine in direction of travel
   - Adjust tensioner nut so that 8.9—17.8 N (2—4 lbs.) of force is required to pull twine.

NOTE: If twine tends to come off tensioner gears, check tension coming out of twine box.

4. On left-hand side, route twine under driveline before entering knotter table.
5. On right-hand side, route twine directly from twine box to knotter table.

W24697 —UN—26MAR14

Proper Tension

W24695 —UN—26MAR14

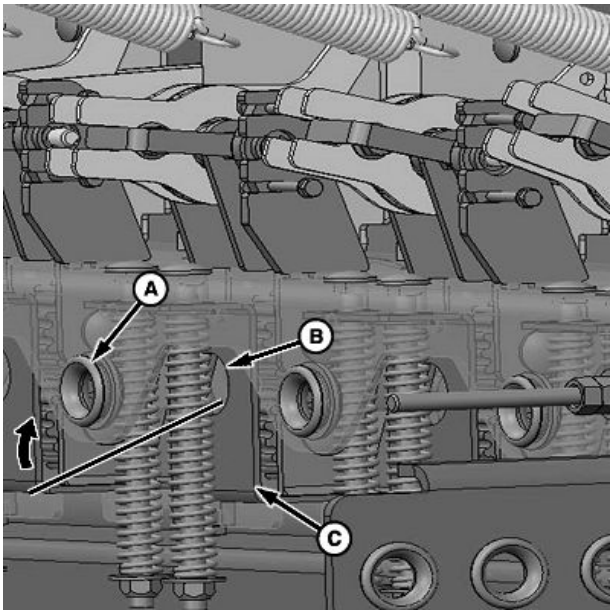
Improper Tension

Continued on next page

SF04007,00007C7 -19-03MAR15-2/6

6. To open upper tensioners, pry against frame just below eyelet (A) and on circular opening (B) of spring loaded tensioner bracket (C).

A—Eyelet
B—Opening
C—Bracket



W26101 —UN—25APR14

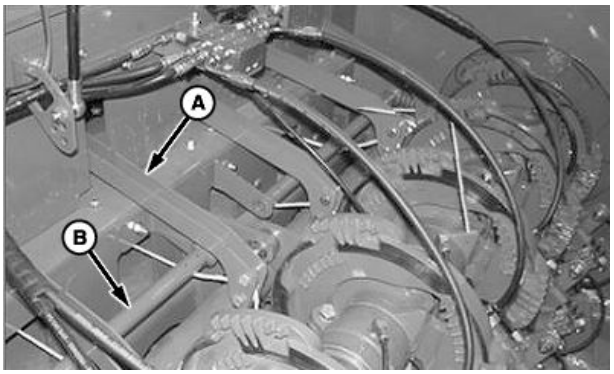
SF04007,00007C7 -19-03MAR15-3/6

7. Pull twine directly out of tensioner, under slack arm stop bar (B), through slack arm (A), and in front of twine placement arm roller (C).

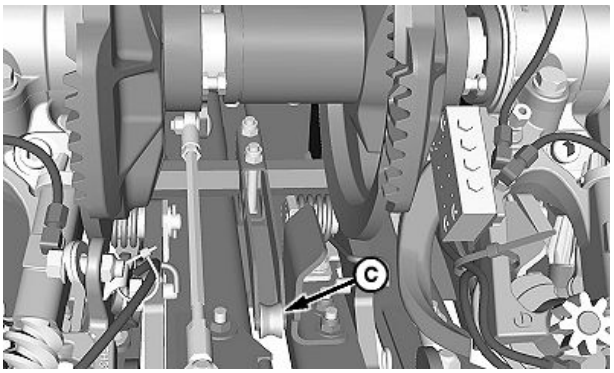
NOTE: While baling watch flag monitor to see that slack arms are staying down. If slack arms begin to float up, as flake count increases, tighten tensioner spring.

IMPORTANT: If tensioner is over tightened, twine pull out, billhook hang up, or other knotter failures can occur.

A—Slack Arm
B—Slack Arm Stop Bar
C—Twine Placement Arm Roller



W24365 —UN—21MAR14



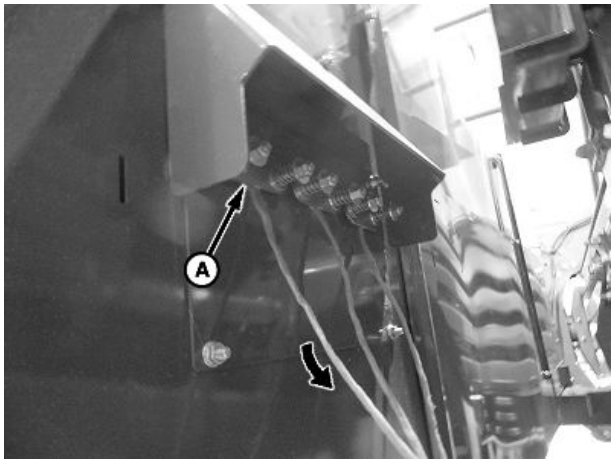
W24694 —UN—24MAR14

Continued on next page

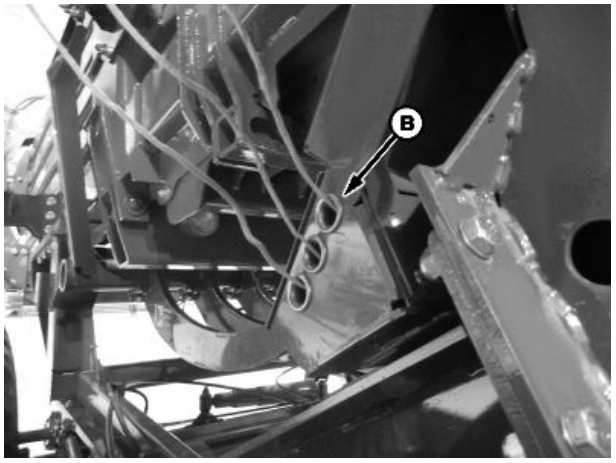
SF04007,00007C7 -19-03MAR15-4/6

8. Route twine through twine box tensioner (A) and downward to machine lower eyelets (B) as shown.

A—Twine Box Tensioner **B—Machine Lower Eyelets**



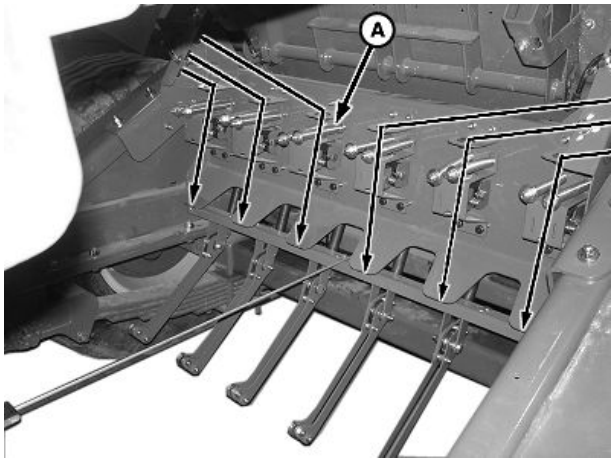
W24610 —UN—17MAR14



W24611 —UN—17MAR14

SF04007,00007C7 -19-03MAR15-5/6

9. Route twine through eyelets and into lower tensioners (A).
10. Pull twine downwards using a spring scale. Adjust tensioner between 27.12—32.5 N (20—24 lbs.).
11. Route twine under slack arm roller.
12. Pull twine towards needle tip and verify slack arm hits frame before releasing twine.
13. Route twine through needle.



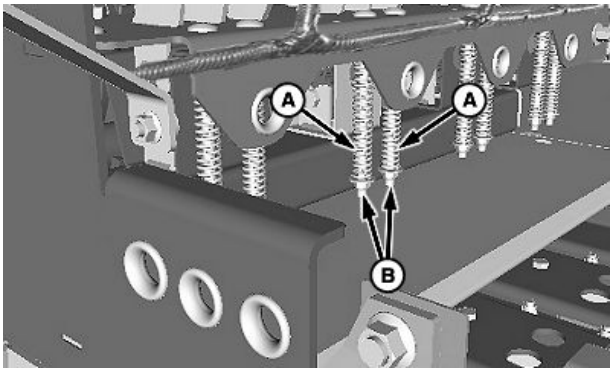
W26136 —UN—18JUN14

SF04007,00007C7 -19-03MAR15-6/6

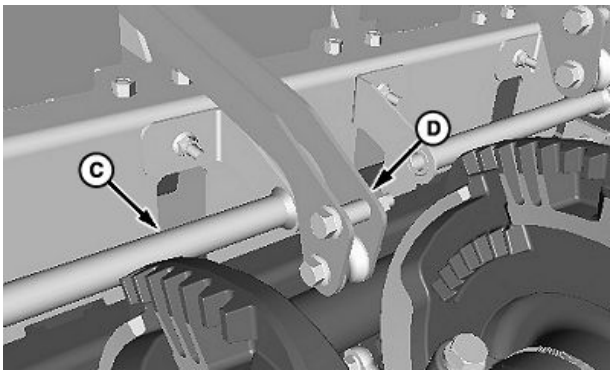
Check Specifications of Upper Tensioner

Pull twin directly out of tensioner (A) and adjust between 10—16 pounds by tightening lock nut (B) so top slack arm (D) bottoms out on slack arm stop bar (C) before releasing twine.

A—Tension Spring
B—Hex Lock Nut, 3/8-16
C—Slack Arm Stop Bar
D—Slack Arm



W24368 —UN—01OCT13



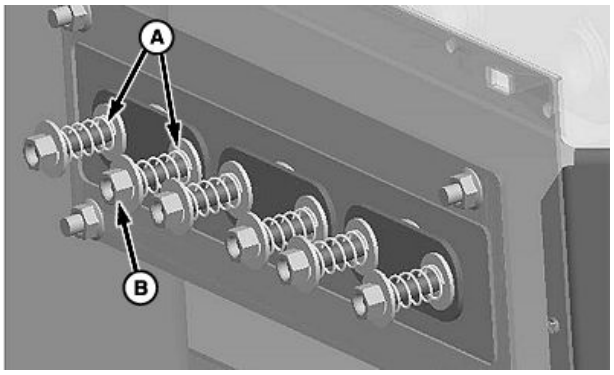
W24369 —UN—01OCT13

SF04007,0000692 -19-11JUL14-1/1

Check Specifications for Twine Box Tension Plates

Adjust spring (A) tension at 8.9—17.8 Newtons (2—4 lbs.) of pull in direction of twine travel by tightening hex nut (B).

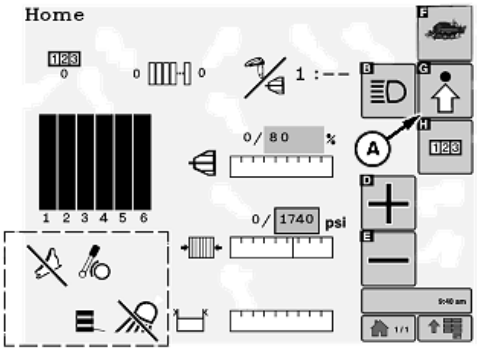
A—Tension Springs (6 used per bracket)
B—Hex Head Nut

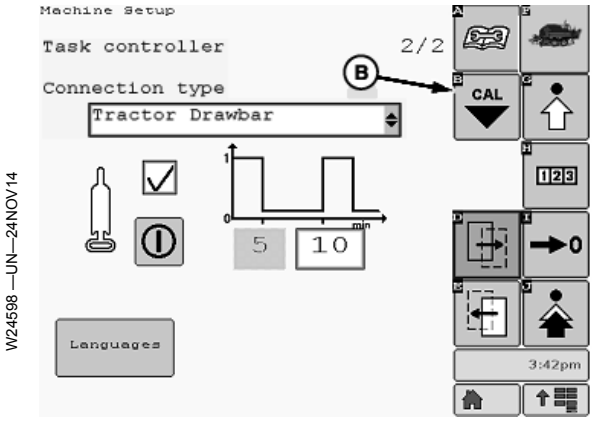


W24367 —UN—01OCT13

SF04007,000052E -19-27MAR14-1/1

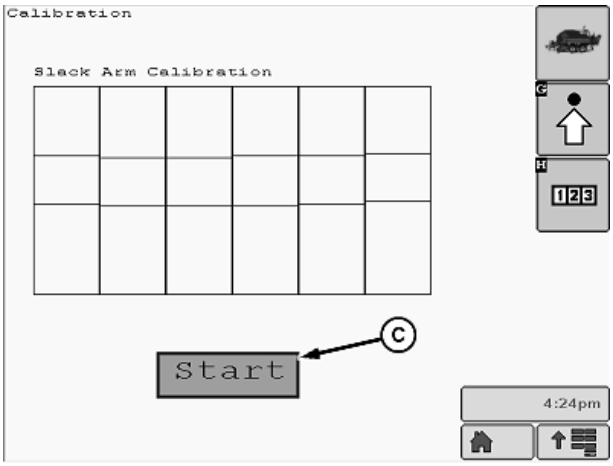
Calibrate Upper Slack Arms

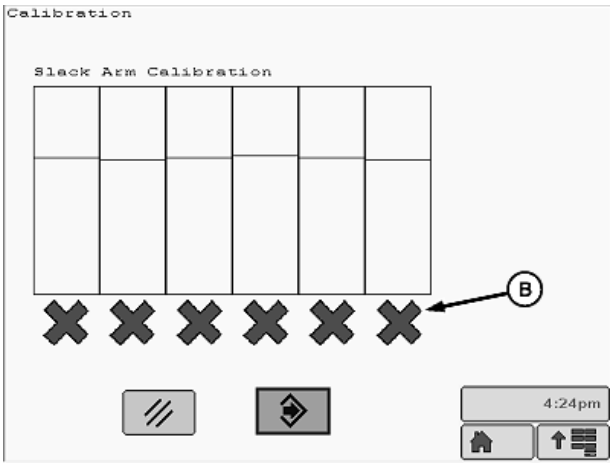




W24598 —UN—24NOV14

W24599 —UN—24NOV14





W24600 —UN—24NOV14

W24601 —UN—24NOV14

A—Baler Setting Button

B—Calibration (CAL) Button

C—Start Button

D—Slack Arm Status

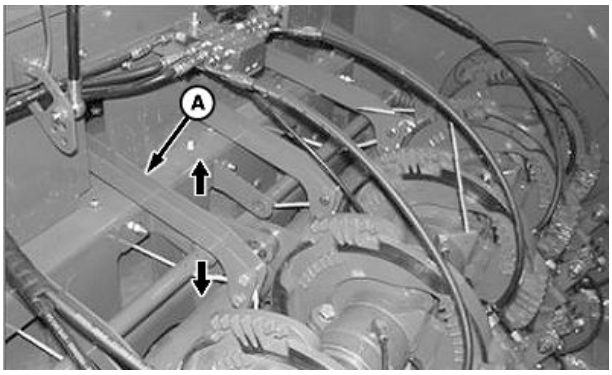
1. Navigate to calibration page in the following order:

NOTE: Display shows red colored "X" (D) for each slack arm before calibration.

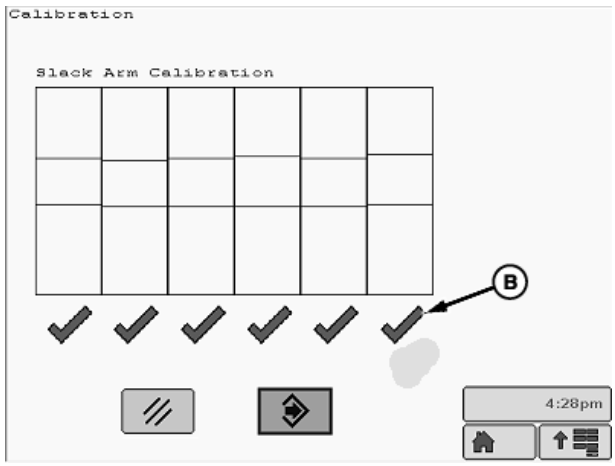
1. Press Baler Setting button (A).
2. Press CAL button (B).
3. Press Start button (C).

Continued on next page

SF04007,0000532 -19-24NOV14-1/2



W24596 —UN—14JAN14



W24602 —UN—24NOV14

A—Slack Arm **B—Slack Arm Status** **C—Accept Button**

2. Move slack arms (A) from furthest top position to furthest bottom position.
3. As each slack arm is calibrated, red “X” changes to green check mark (B).
4. Press Accept button (C) to save calibration and return to settings page.

SF04007,0000532 -19-24NOV14-2/2

Tying Off Twine For First Bale

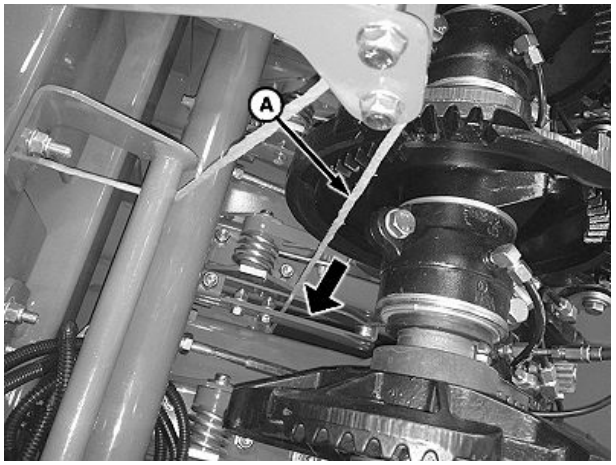
If there is no bale in chamber, upper and lower twines can be fed into chamber and tied together manually.

SF04007,0000533 -19-13AUG14-1/1

Loss of Top or Bottom Twine During Baling

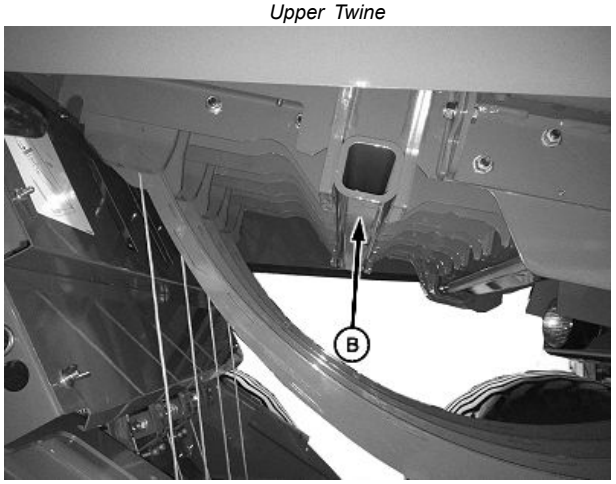
If you lose a bottom twine it must be threaded again through the needle and tied off to frame of baler (B). If you lose a top twine (A) it must be threaded again through slack arm and in front of twine placement arm. Then tie a knot or two at end and feed it down through needle slot onto face of bale.

A—Twine **B—Lower Cross Member**



W26137 —UN—10JUN14

Upper Twine

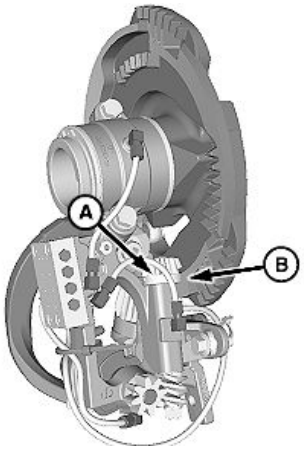


W26138 —UN—11JUN14

Lower Twine

SF04007,0000534 -19-13AUG14-1/1

Twine Disk Pinion to Intermittent Gear Setting



W26140 —UN—09JUN14

A—Intermittent Gear **B—Knotter Frame**

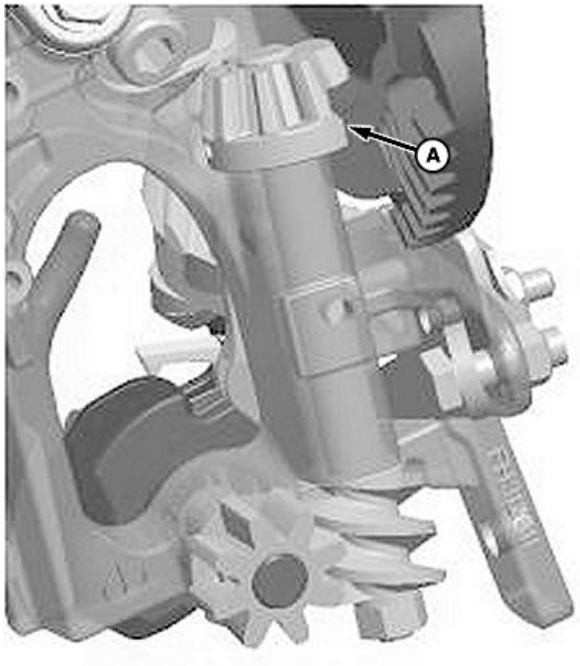
1. Before measuring insert large flat head screw driver between intermittent gear (A) and knotter frame (B). Tap screw driver in approximately 3 mm (.118 in.). This pushes knotter frame to the left and removes any slack between shims.

SF04007,0000515 -19-11JUL14-1/2

NOTE: Excessive gap may cause the pinion gears to skip teeth and become disoriented on the intermittent gear.

2. Adjust gap (A) between flat surfaces of intermittent gear and pinion gear at 0.15—0.5 mm (0.59—0.02 in.).

A—Twine Disk Pinion Gear to Intermittent Gear Gap



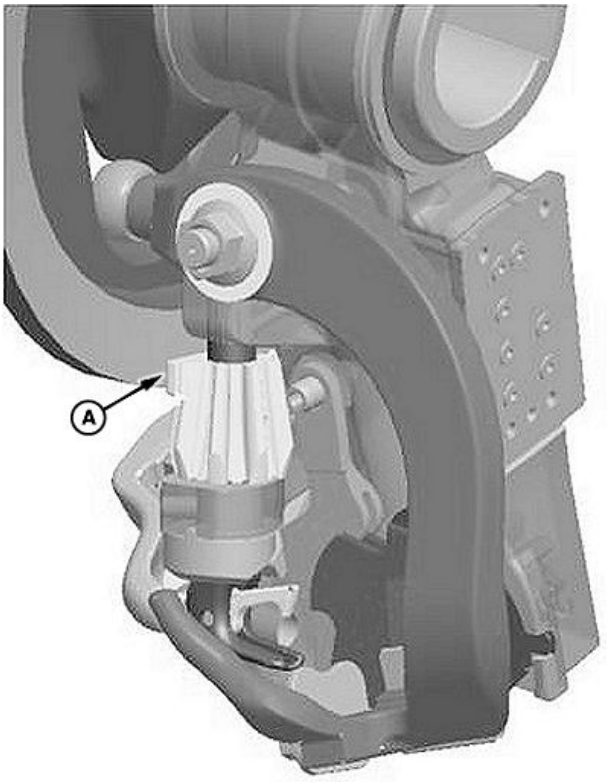
W24370 —UN—09JUN14

SF04007,0000515 -19-11JUL14-2/2

Billhook Pinion Gear to Intermittent Gear Setting

Adjust gap (A) between flat surfaces of intermittent gear and billhook pinion gear at 0.15—0.5 mm (0.0006—0.02 in.).

A—Billhook Pinion Gear to Intermittent Gear Gap



W26139 —UN—09JUN14

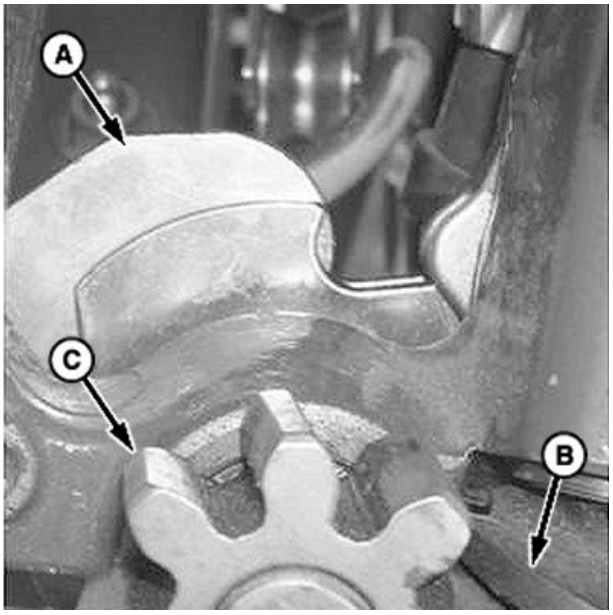
SF04007,0000693 -19-09JUN14-1/1

Twine Disk Timing

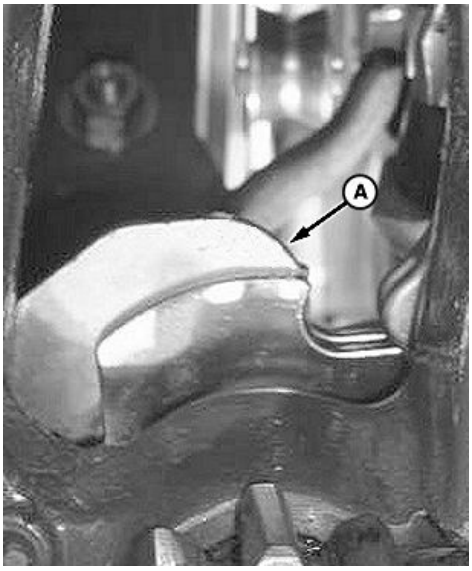
Push cleaner plate (A) to the left.

NOTE: When adjusting the worm gear (B), tighten nut and then tap pinion gear (C) to left to seat gears in the operating position. Otherwise hold the worm gear and pinion gear together (with pinion being held to the left) when tightening.

A—Cleaner Plate
B—Worm Gear
C—Pinion Gear



W24371 —UN—04OCT13



W24372 —UN—04OCT13

Preferred Setting

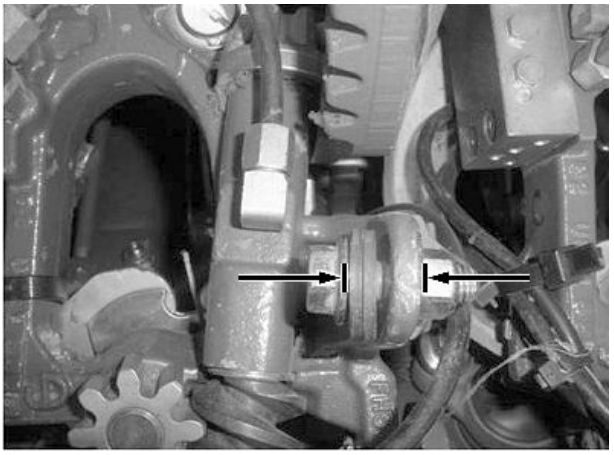
SF04007,0000516 -19-05DEC13-1/1

Twine Holder Pressure

Twine holder pressure is factory set at 15.75—16 mm (0.62—0.63 in.). Use calipers to measure distance.

NOTE: Setting controls the tightness of knot and length of knot tail. Optimal tail length is 19.05—25.4 mm (.750—1 in.).

NOTE: Twine holder pressure setting is balanced with twine tension. The higher the twine tension, the smaller the twine holder pressure distance.



W24375 —UN—07OCT13

Distance

SF04007,0000517 -19-05DEC13-1/1

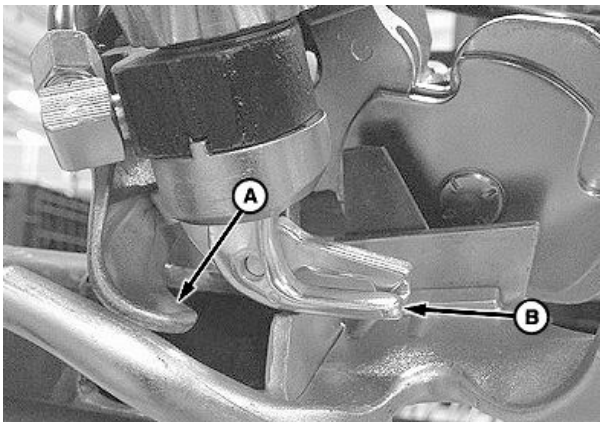
Billhook Pressure Arm

1. With billhook (B) in home position tongue is closed and tongue's roller is contacting pressure arm (A). In this position pressure arm must be pushed away from knotter frame.

NOTE: This is billhook's position during knot wipe off.

NOTE: Check for debris buildup between pressure arm and knotter frame. Clean this area periodically if debris is found after baling.

A—Pressure Arm **B—Billhook**

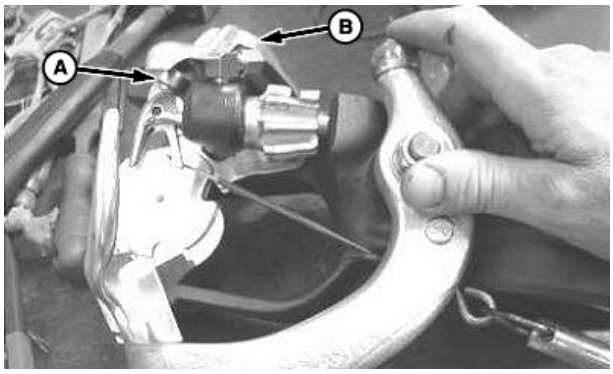


W26187 —UN—11JUL14

SF04007,0000518 -19-13AUG14-1/3

2. Ensure that roller billhook is in home position, tongue is closed, and roller is contacting pressure arm.

A—Roller **B—Pressure Arm Casting**



W24376 —UN—07APR14

Continued on next page

SF04007,0000518 -19-13AUG14-2/3

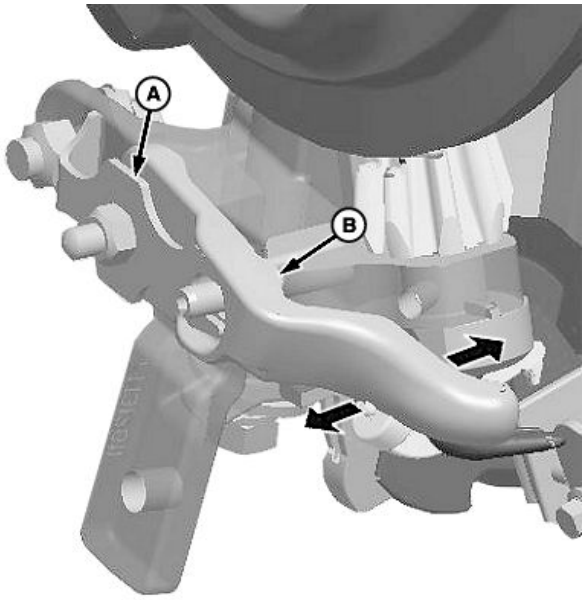
3. Pressure arm (B) is spring loaded through leaf spring (A) and moves in direction shown.
4. Adjust nut on leaf spring so it takes 40—89 N (9—20 lbs.) to open billhook tongue as shown on previous page. Make final adjustments with twine loaded in system.

NOTE: Increasing pressure increases tail length.

5. Spring plate tension determines how tightly billhook tongue closes on knot. Adjust this tension in 1/8 turn increments to avoid damage to billhook tongue and roller. Incorrect adjustment of spring plate can result in billhook hang up or damaged components.

NOTE: Do not allow billhook tongue to be loose to the touch. Check tongue pressure on adjacent knotters to confirm settings.

A—Leaf Spring **B—Pressure Arm**



W24387 —UN—07APR14

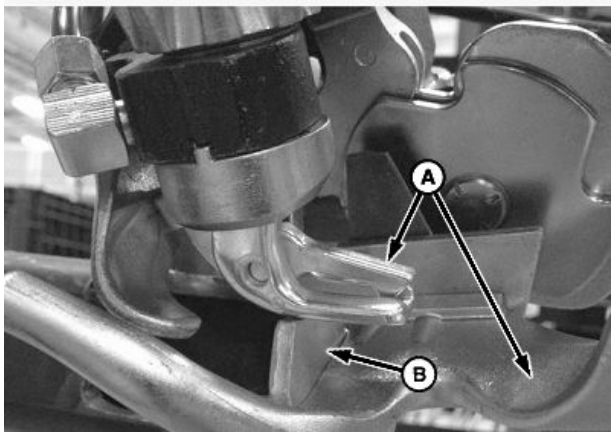
SF04007,0000518 -19-13AUG14-3/3

Set Wiper Plate

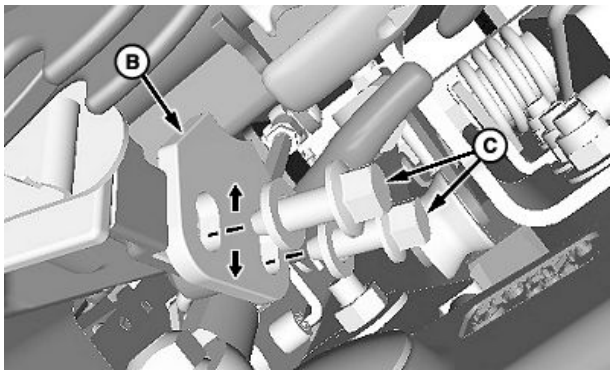
IMPORTANT: Remove pin from frame so knotter is free to rotate around knotter shaft. Cycle wiper plate back and forth across billhook. The resistance is the force it takes to wipe knot off billhook. Too large of a clearance (force low), knot does not clean off billhook which can result in a broken billhook and mis-ties. Too small of a clearance (force high), and wiper plate can break off causing premature wear to billhook and wiper plate. It also puts undue stress on knotter system because of higher torque required to rotate through the cycle.

1. Approximate location for setting wiper arm (B) to achieve 35.6—66.7 Newtons (8—15 lbs.) pressure for wipe off.
2. To adjust: Loosen self-tapping screws (C) to adjust wiper plate (A) to orientation shown.
3. Reposition wiper plate on billhook. Position plate towards heel to increase pressure and position plate towards tip to decrease pressure.
4. Ensure that plate is centered on billhook.
5. Tighten self-tapping screws to 10.17 N·m (90 lb.-in.) plus or minus 2 N·m (17.7 lb.-in.)

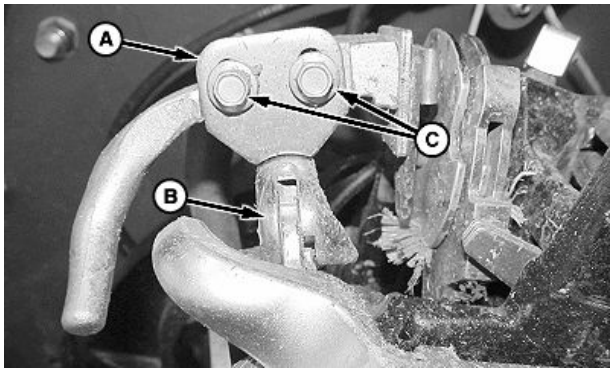
A—Wiper Plate
B—Billhook
C—Self-Tapping Screw



W24388 —UN—11JUL14



W24389 —UN—27NOV13



E78656 —UN—05MAR15

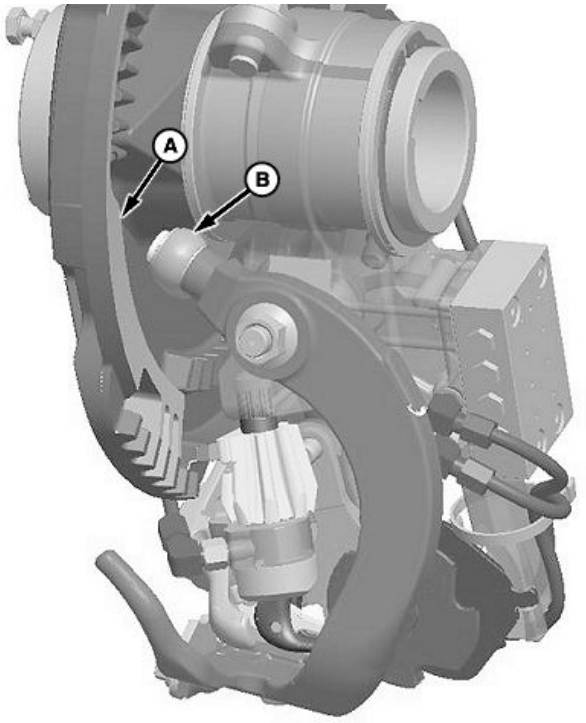
SF04007,00007C8 -19-05MAR15-1/1

Check Wiper Arm to Billhook Clearance

NOTE: Wiper arm is shown in home position.

1. Wiper arm roller (B) is riding on inner diameter of intermittent gear cam track (A).

A—Intermittent Gear Cam Track
B—Wiper Arm Roller



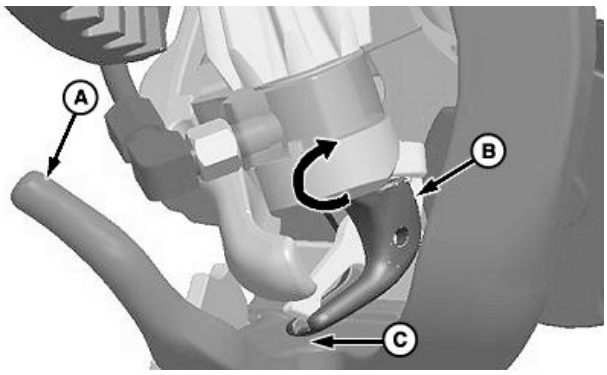
W24471 —UN—21OCT13

SF04007,000051A -19-13AUG14-1/3

IMPORTANT: Gap (C) must allow billhook to clear wiper arm casting through full rotation.

2. Billhook (B) rotates 360 degrees with wiper arm (A) in home position.

A—Wiper Arm
B—Billhook
C—Gap

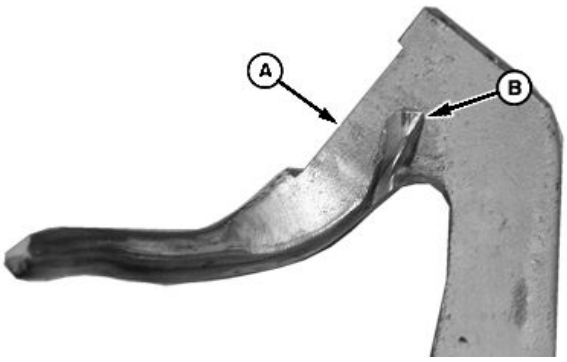


W24472 —UN—21OCT13

SF04007,000051A -19-13AUG14-2/3

3. Replace wiper arm (A) or billhook if there is wear (B) or interference.

A—Wiper Arm
B—Wear



W24493 —UN—27NOV13

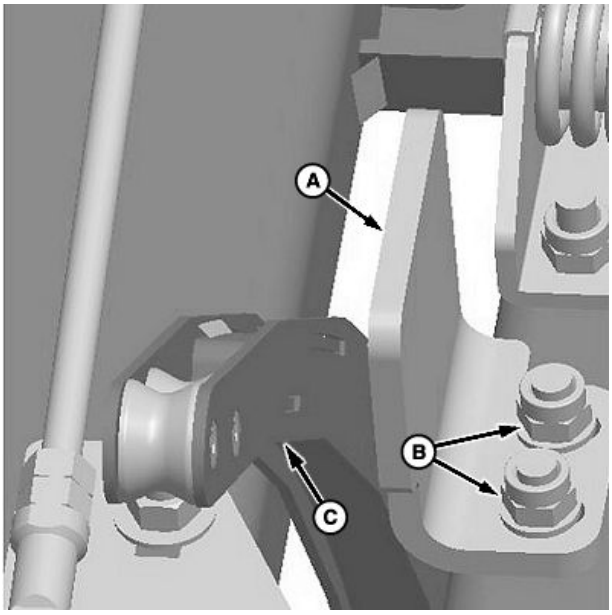
SF04007,000051A -19-13AUG14-3/3

Needle Settings

Needle to Stabilizer Contact

Loosen lock nuts (B) to adjust stabilizer (A). Set gap between needle (C) and stabilizer (A) at 0—(-)2 mm (0—(-)0.079 in.).

A—Stabilizer
B—Lock Nuts, M10
C—Needle Arm



W24380 —UN—15OCT13

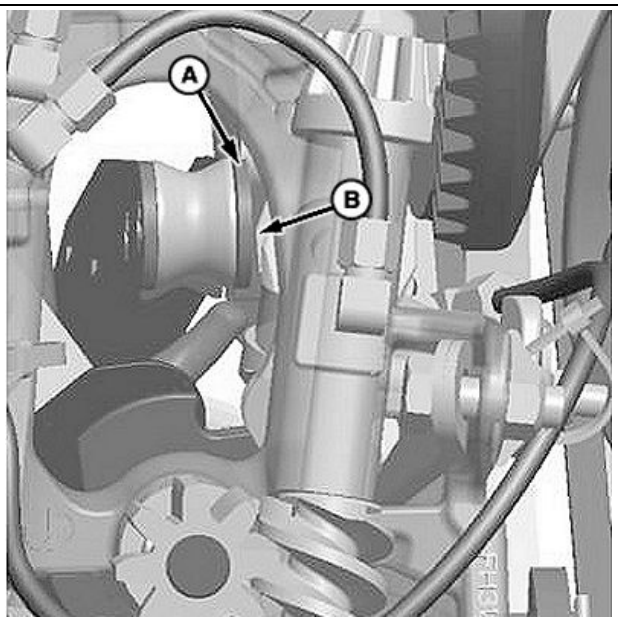
SF04007,0000537 -19-09JUN14-1/1

Needle to Knotter Frame Contact

NOTE: If needle to needle stabilizer setting is correct, adjust jack bolts between the knotters to perform this step.

Adjust gap between side of needle arm (A) and chamfer surface of billhook pinion gear (B) at 0.5—(-)1 mm (0.02—(-)0.039 in.).

A—Needle Roller
B—Billhook Pinion Gear



W24378 —UN—15OCT13

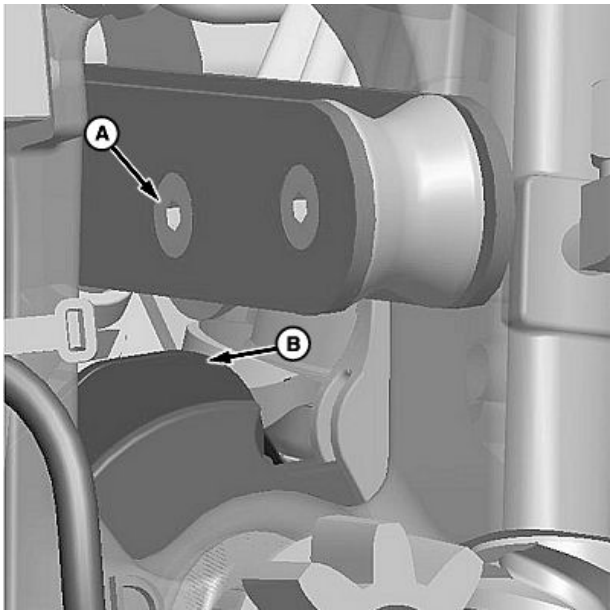
SF04007,0000535 -19-26MAR14-1/1

Needle to Twine Disk

NOTE: Adjustment is made by loosening and tightening upper and lower needle bolts.

Lower needle roller (A) to twine disk cleaner (B) clearance is between 2—3 mm (0.079—0.118 in.).

A—Needle Roller **B—Twine Disk Cleaner**



W24379 —UN—15OCT13

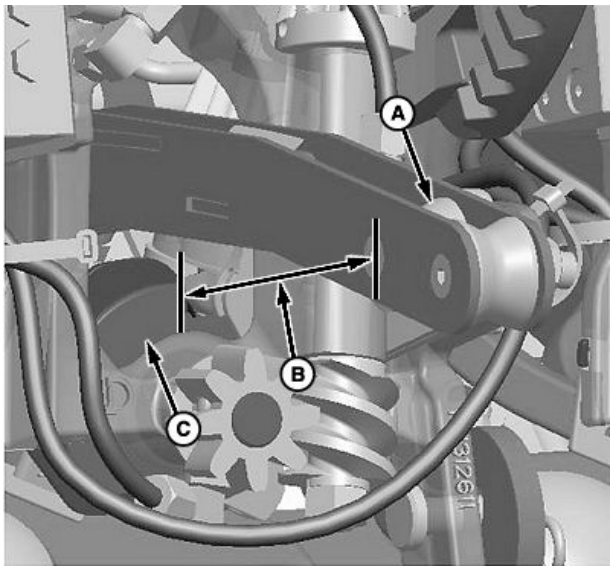
SF04007,0000536 -19-20MAR14-1/1

Needle Penetration

Measure from centerline of lower roller (A) perpendicular to top surface of twine disk (C) and set at 120—130 mm (4.7—5.1 in.) (B).

NOTE: Adjustment is made by lengthening or shortening needle lift rod.

A—Lower Roller
B—Distance
C—Twine Disk



W24381 —UN—20MAR14

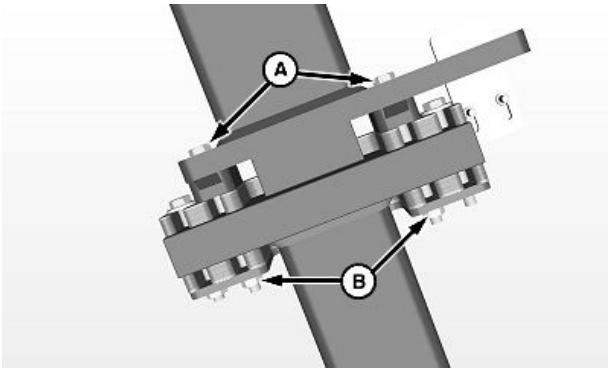
SF04007,0000538 -19-09JUN14-1/1

Needle Lift Shear Bolts

Tighten needle lift shear bolts (A) and nuts (B) to 4 ft.-lbs. plus 1/2 turn.

A—Shear Bolt, 1/4” x 28 (4 used)

B—Nut, 1/4” (4 used)

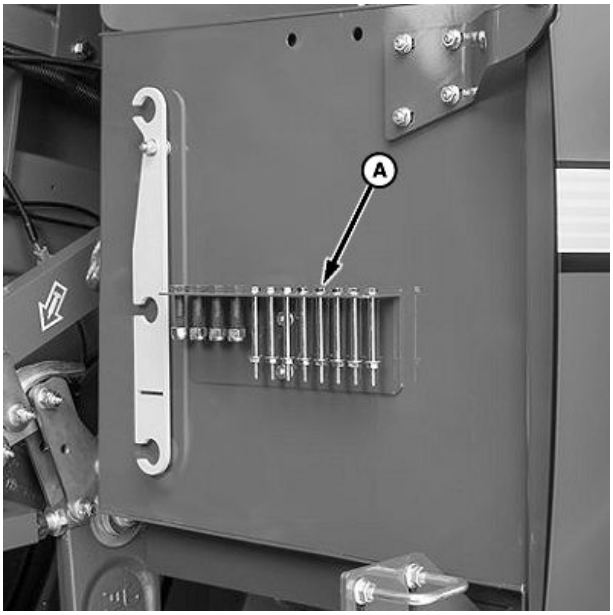


W26017 —UN—24NOV14

SF04007,00005CA -19-24NOV14-1/2

Spare needle lift shear bolts are stored on front of left-hand twine box.

A—Spare Needle Lift Shear Bolts



W26204 —UN—21JUL14

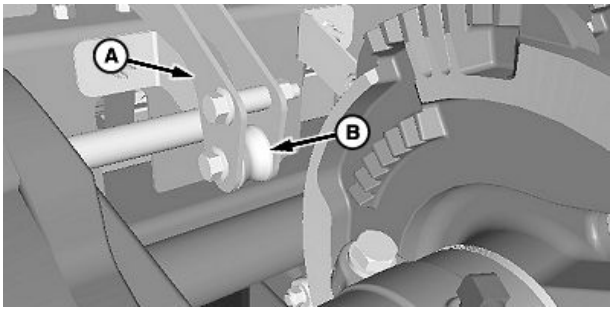
SF04007,00005CA -19-24NOV14-2/2

Check Roller

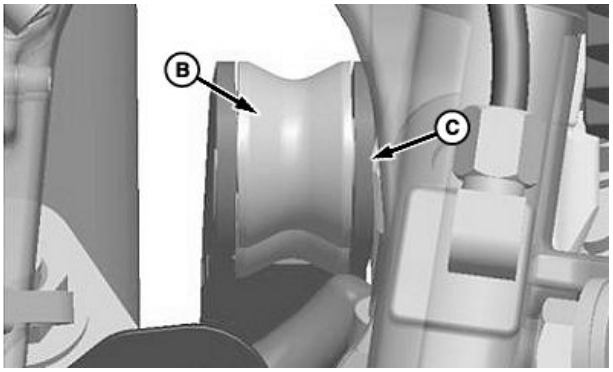
Inspect rollers (B) on all slack arms (A), twine placement arms, and needles (C) to confirm they spin freely and are not seized up.

NOTE: If disassembly is necessary, heat lock nut with a heat gun to soften the Loctite.

A—Slack Arm
B—Roller
C—Needle



W24491 —UN—28OCT13



W24492 —UN—31OCT13

SF04007,0000539 -19-24MAR14-1/1

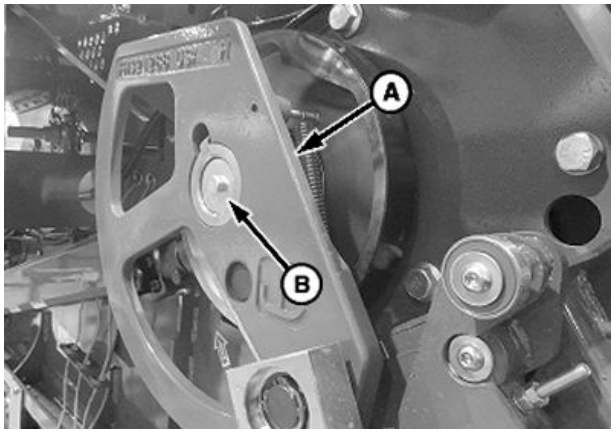
Tucker Finger Settings

Position Knotter Shaft

NOTE: Ensure knotter system is at home position as shown before starting below procedure.

Adjust needle lift crank (A) to set knotter shaft (B) as shown.

A—Needle Lift Crank
B—Knotter Shaft



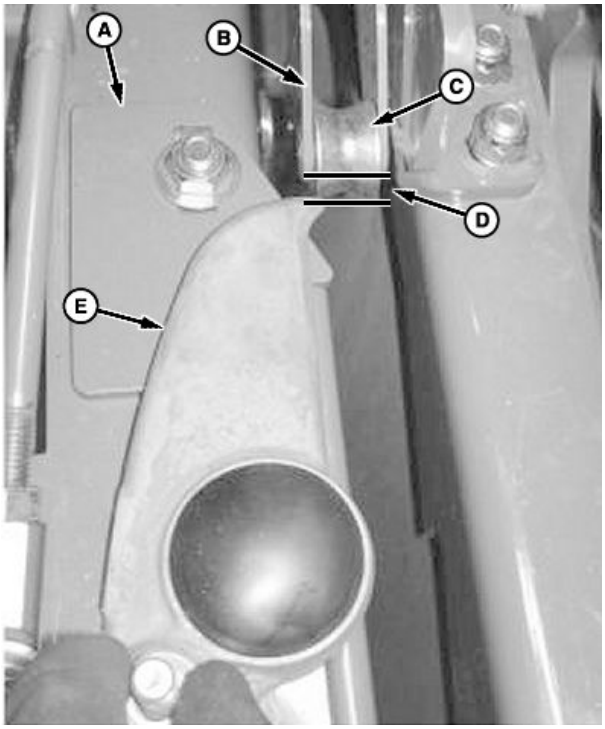
W24282 —UN—20MAR14

SF04007,000053A -19-07APR14-1/1

Set Base Plate

1. Activate tie system so tucker finger (E) is sweeping from home position to open position just after wipe off of first knot.
2. As twine placement arm (B) moves down, stop tie cycle when tucker finger gets to “full open” position and twine placement roller (C) is in path of tucker finger.
3. Adjust gap (D) to 3 mm (0.118 in.) by moving plate (A) forward or back.

A—Tucker Finger Plate
B—Twine Placement Arm
C—Roller
D—Gap
E—Tucker Finger



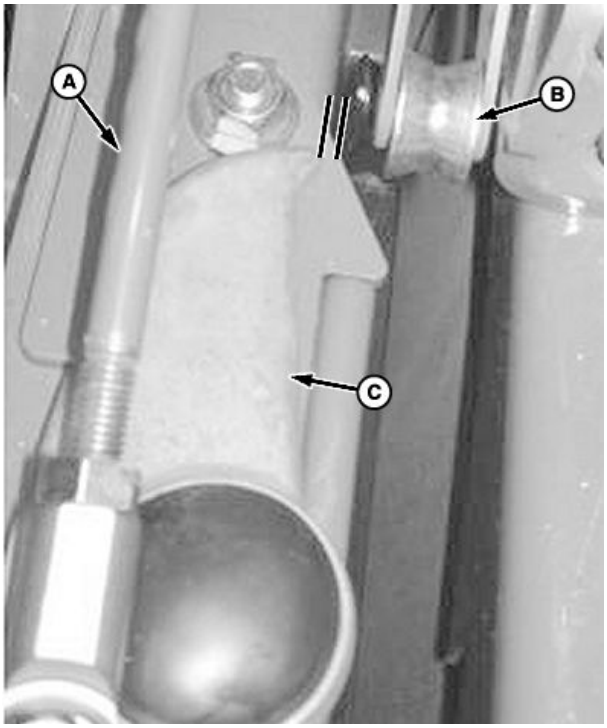
W24283 —UN—07APR14

SF04007,000053B -19-11JUL14-1/1

Tucker Finger Timing

1. Set tucker finger (C) timing by adjusting tucker finger rod (A).
2. In same position as setting base plate, set tucker finger tip in line with needle slot to 3 mm to left or away from slot.

A—Tucker Finger Rod
B—Tucker Finger Cam Roller
C—Tucker Finger



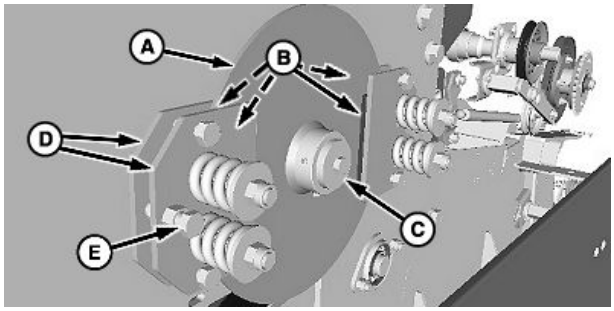
W24362 —UN—07APR14

SF04007,000053C -19-07APR14-1/1

Knotter and Needle Brake Settings

Check and Adjust Knotter Brake Shaft

1. Tie system brake is on right-hand side of baler. Brake disk (A) is keyed to knotter shaft (C) and rotates with tie system. Brake pads (B) are mounted to outer plates (D).
2. Knotter shaft brake is used to hold needles and knotters in home position while they are not tying a bale. Brake also provides for constant resistance during tie cycle so needles do not overrun during the tie cycle.



W24382 —UN—10JUN14

Right-Hand Side

A—Brake Disk
B—Brake Pads
C—Knotter Shaft
D—Outer Plates
E—Set Bolt

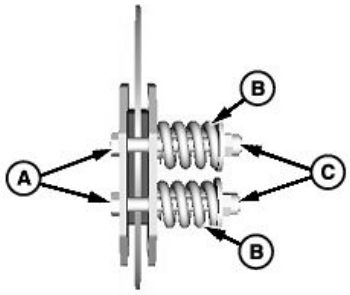
SF04007,000053D -19-13AUG14-1/2

IMPORTANT: Check spring tension regularly. Replace brake pads as soon as they are worn. Never grease brake disks.

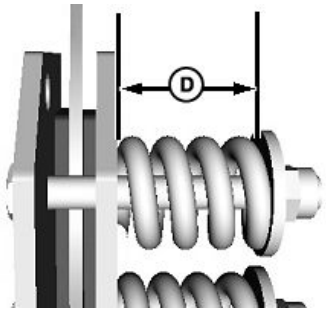
NOTE: When adjusting spring tension tighter, the gap does not improve, pads are ready for replacement.

NOTE: To adjust, use bolts (A) keeping springs (B) at an equal length.

3. Loosen or tighten nuts (C) to adjust tension of springs (B).
4. Optimal distance (D) is 43—45 mm (1.70—1.77 in.).
5. Use set bolts (E) to make sure that brake pads are in line.



W24384 —UN—17OCT13



W24385 —UN—10JUN14

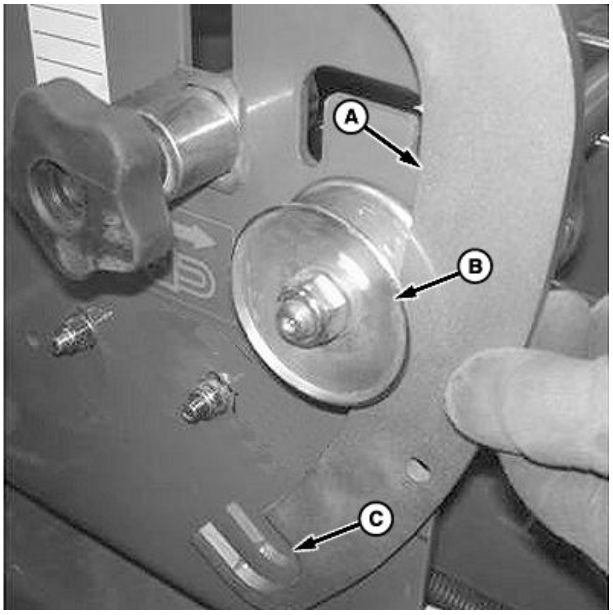
A—Hex Head Cap Screw
B—Springs
C—Lock Nuts
D—Distance, 43—45 mm (1.70—0.019 in.)

SF04007,000053D -19-13AUG14-2/2

Sector Arm Function and Settings

1. Sector arm (A) is driven up by sector wheel (B). Sector wheel is attached to gearwheel which engages bale as it is formed and driven out of bale chamber. When sector arm gets up to notch (C) it is able to spring forward which releases clutch arm into path of drive dog on upper knotter gearbox. Clutch arm is spring loaded so it can be tripped at any time but only is driven when gearbox dog reaches correct point, ensuring consistent timing.

A—Sector Arm
B—Sector Wheel
C—Notch

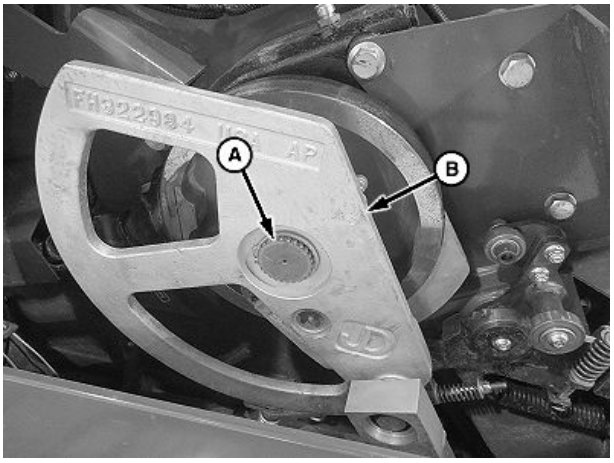


W24494 —UN—01NOV13

SF04007,0000540 -19-07NOV14-1/2

2. Sector arm is reset by a cam (B) on knotter shaft (A) allowing it to fall back down to the stop. Position of stop determines length of bale produced.

A—Knotter Shaft
B—Reset Cam



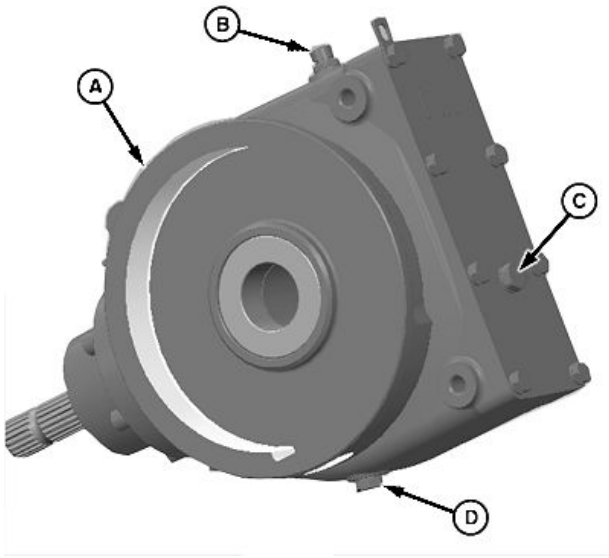
W24495 —UN—07NOV14

SF04007,0000540 -19-07NOV14-2/2

Check Upper Knotter Gearbox Oil and Change Interval

Change gearbox oil after first 50 hours and then every 500 hours. Recommended oil: ISO VG 150EP-SAE 90 EP, API GL5.

A—Upper Knotter Gearbox
B—Breather and Oil Fill
C—Check Level Plug
D—Drain Plug



W24609 —UN—22JAN14

SF04007,0000541 -19-11JUN14-1/1

Knotter Drive Components

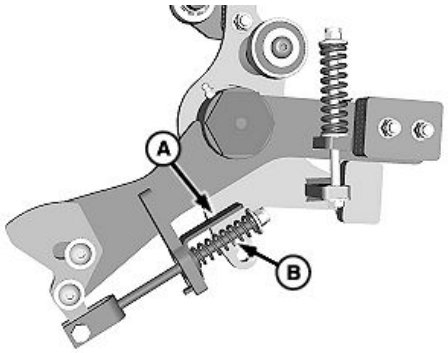
Adjust Knotter Clutch

IMPORTANT: Incorrect adjustment of trip mechanism leads to:

- **Variation in bale length**
- **Unintended tying cycles**

IMPORTANT: Check condition of teeth on sector arm and wheel, replace if necessary.

1. Adjust spring (B) coil length using spring tension gauge (A) to maintain trip finger plate tension.



E77610 —UN—14NOV14

A—Spring Tension Gauge
B—Spring

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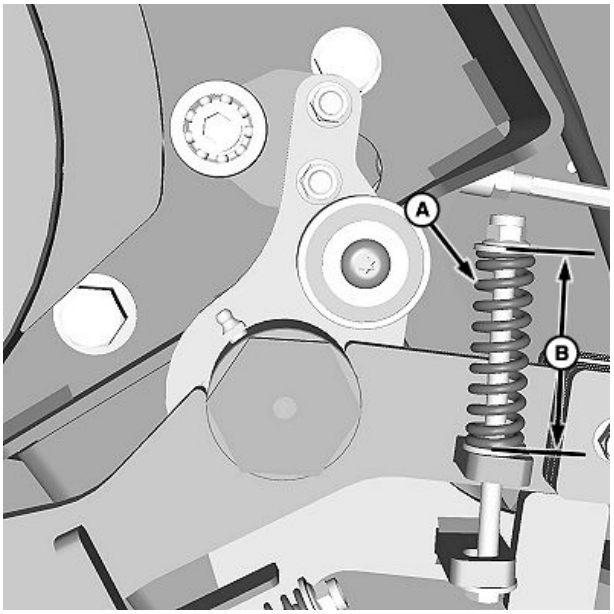
SF04007,00007C9 -19-04MAR15-1/3

2. Adjust spring (A) to specification (B).

Specification

Stop Roller Spring
Length——Distance..... 67 mm
(2.63 in.)

A—Spring **B—Specification**



E78635 —UN—27FEB15

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SF04007,00007C9 -19-04MAR15-2/3

Adjust Stop Roller Clearance

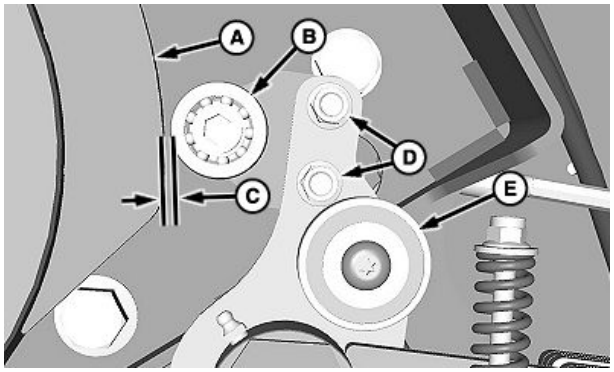
1. Check clearance with sector arm engaged normally on sector wheel (no tie cycle).
2. Turn flywheel by hand counterclockwise until stop roller (B) is aligned with stop arm cam (A) as shown.
3. Loosen locking nuts (F).
4. Turn linkage (G) until gap (C) is within specification.

Specification

Stop Roller-to-Stop Cam—Gap.....2—4 mm (0.079—0.157 in.)

5. Tighten lock nuts (F).
6. Move sector arm up until sector wheel is in notch and clutch is engaged.
7. Turn flywheel by hand counterclockwise until reset roller (E) is on crank (H) and sector arm drops to bale length setting stud.
8. If sector arm does not fall freely to the setting stud, loosen lock nuts (D), slide roller as far rearward as possible and repeat adjustment.
9. If sector arm falls freely to stud, adjustment is correct.

A—Stop Arm Cam
B—Stop Roller
C—Gap
D—Lock Nuts (2 used)
E—Reset Roller
F—Locking Nuts (2 used)
G—Linkage
H—Crank



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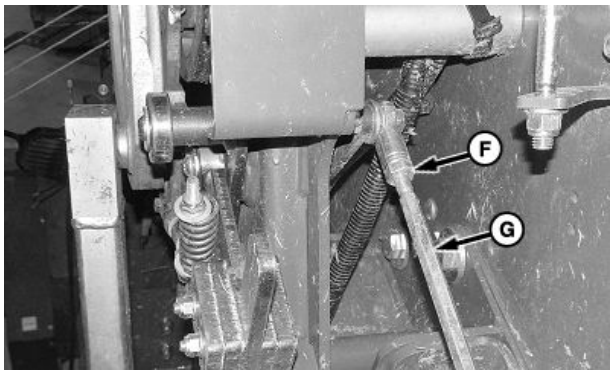
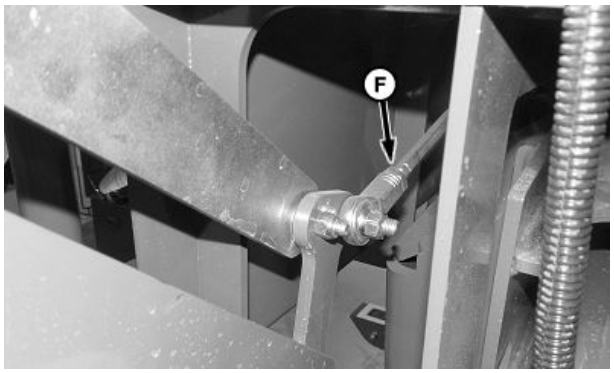


E78637 —UN—27FEB15



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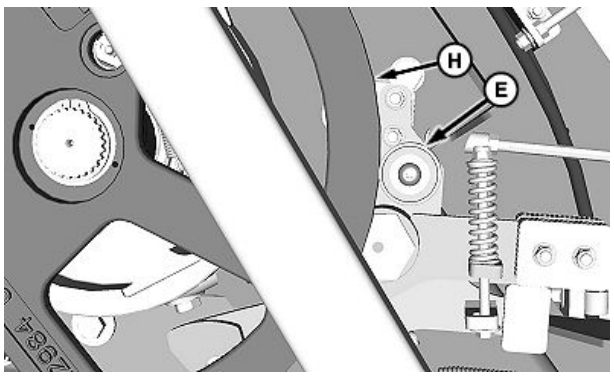


E78639 —UN—27FEB15

SF04007,00007C9 -19-04MAR15-3/3

Automatic Greasing System Difficulties

Automatic Greasing System		
Problem	**Cause**	**Solution**
Pump does not work.	Electric harness broken.	Repair or replace electric harness.
	Electric motor broken.	Replace motor.
	Fuse blown.	Find cause and replace fuse.
Pump works, but no grease output.	Air bubble in pump plunger.	Bleed pump.
	Grease level in reservoir below minimum.	Refill grease.
	Pump piston broken.	Replace pump piston.
	Motor runs in wrong direction (see arrow on reservoir).	Change polarity of wires to pump motor.
	Overflow tube is blocked.	If reservoir has been overfilled, a vacuum inside reservoir can be present and will hold grease in reservoir. Clean overflow tube.
All lubrication points are dry.	Pump not working.	Replace pump piston.
	Grease system setting too low.	Increase grease system setting using ISOBUS display.
	System is blocked.	Check for grease at pressure release valve.
Several lubrication points are dry.	Lines to divider blocks broken or leaking.	Repair lines as necessary.
	Compression couplings leaking.	Tighten or replace compression coupling.
Several points in one area of machine are dry.	Lines from primary divider block is leaking or broken.	Remove secondary supply line from divider block and cycle pump. If no grease is present, repair or replace line.
	Fitting is leaking at secondary divider block or inlet.	Check fittings for leakage. Repair or replace fitting as necessary.
One lubrication point is dry.	Line is broken or leaking.	Repair lines as necessary.
	Compression coupling leaking.	Tighten or replace compression coupling.
Grease at the output of pressure release valve.	System pressure too high.	Test the system.
	Divider blocked.	Repair or replace divider block.
	System blocked.	Repair blocked or failed bearings.
	Spring in pressure release valve is broken.	Replace pressure release valve.
Pump rotates slowly.	High pressure in system.	Check pressure relief valve for grease. If no grease is present, loosen each secondary divider block inlet fitting one at a time. If pressure relieves at fitting, check individual points for restrictions. Clear restriction from line.
	Extremely cold temperatures.	Clean out reservoir and fill with low temperature grease or grease of lower NLGI rating.

1. If grease alarm appears on monitor, first check following:
   - Presence of grease in reservoir/.
     - Fill reservoir with recommended grease..
     - Bleed system if necessary.
   - Visually check to see if pump is running. Grease agitator will constantly stir contents in reservoir while machine is in operation.
     - Check grease settings.
     - Check power connections.
     - Check for correct drive direction (arrow on container).

E73433 —UN—18MAR14

A—Main Grease Line

2. **Bleeding Automatic Grease System:**

   If grease reservoir is empty or pump piston was replaced, it is necessary to bleed pump system free of air. Proceed as follows:

   1. Disconnect main grease line (A) from pump.
   2. Engage grease system.
   3. Let grease flow until no air in pump system.

Continued on next page

SF04007,00007CA -19-03MAR15-1/6

4. Power down pump by pressing auto grease power button on settings screen or by leaving grease management settings screen.
5. Connect main grease line (A) to pump.
6. Cycle grease pump.

SF04007,00007CA -19-03MAR15-2/6

Automatic Grease System Blockage:

"Grease Alarm" appears on ISOBUS display when auto greasing system detects a higher than usual pressure in system.

Another indication is when grease is flowing from pump pressure release valve.

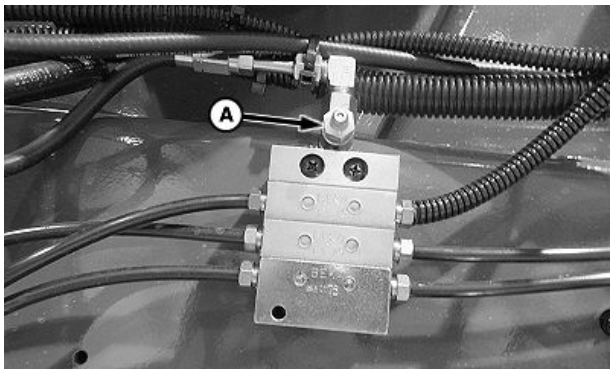
Several factors cause a system blockage. Isolate blockage by checking the following:

- Flattened or clogged grease line.
- Overfilled bearings or blocked fittings.
- Non-use of recommended grease.
- Clogged divider block.

To locate a blockage in divider blocks:

- Connect a manual grease gun to lubrication fitting (A) on each block.
- Slowly inject grease into lubrication fitting.
- If grease cannot be injected into divider block, it is clogged and must be replaced with a new divider block.
- If grease can be injected into divider block system, but with resistance, one of the outputs is clogged or output lines is clogged. Clean or replace the line, or replace divider block if necessary.

IMPORTANT: Tag each line to assure proper connection when installed.



E73434 —UN—18MAR14

If blockage continues, the main divider block must be checked:

- Mark and disconnect all lines on main divider block.
- Cycle grease system.
- Verify that grease is coming out of each output of main divider block.
- If grease is not coming out of outputs, main divider block must be replaced with new.
- If grease is dispensing from block, connect lines as recorded during removal.

Continued on next page

SF04007,00007CA -19-03MAR15-3/6

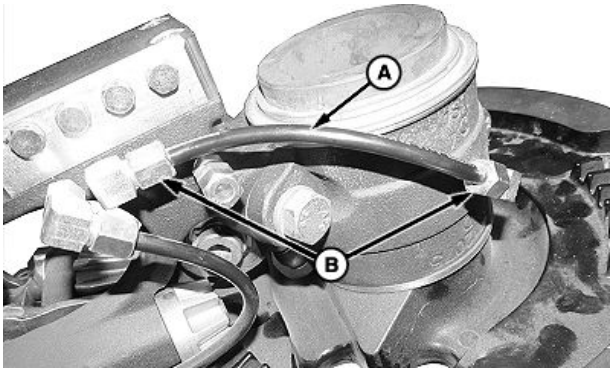
Remove and Install Knotter Grease Line

1. Record orientation of extension fitting (C) using a marker to aid in installation.
2. Loosen nuts (B) and remove grease line (A).
3. Replace line as necessary.
4. Remove extension fitting (C) from knotter frame (D) and replace as necessary.

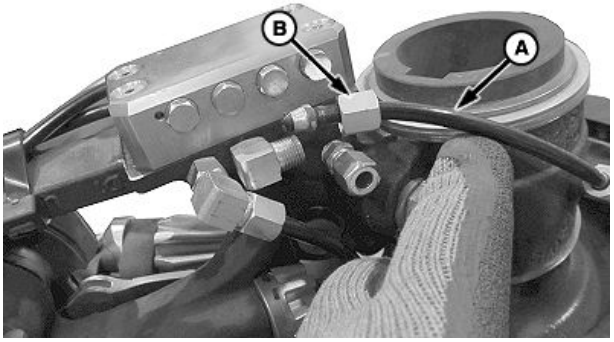
IMPORTANT: Apply lubrication to threads going into knotter casting. It is not necessary to lubricate threads for grease line.

5. Install and orient fitting (C) to knotter frame (D) as removed.
6. Install grease line (A) and tighten nuts (B) to fittings.
7. Prime system.
8. Check for leaks.

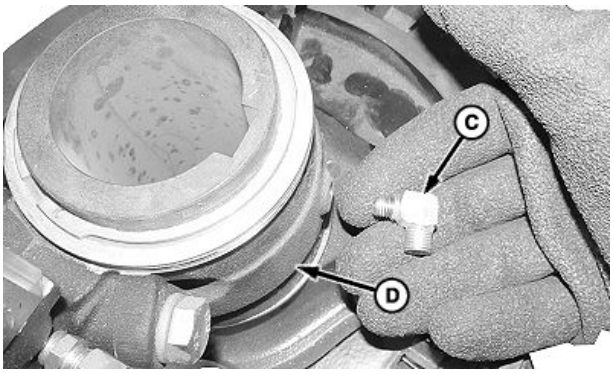
A—Grease Line
B—Nuts (2 used per line)
C—Extension Fitting
D—Knotter Frame



E72213 —UN—25NOV13



E72214 —UN—25NOV13



E72215 —UN—25NOV13

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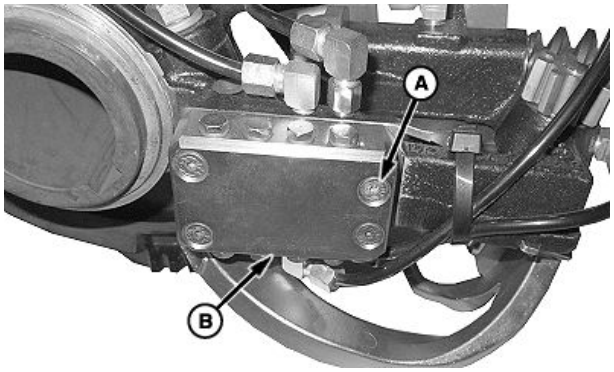
SF04007,00007CA -19-03MAR15-4/6

Remove and Install Knotter Divider Blocks

1. Remove socket head cap screws (A) and divider block (B) from knotter frame.
2. Clean, repair, or replace as necessary.
3. Install new O-rings between block and frame.
4. Apply a medium strength thread lock to threads of socket head cap screws (A) and install divider block (B) to knotter frame.
5. Prime system. (See Bleed Automatic Grease System in this section.)
6. Check for leaks.



E72216 —UN—25NOV13

A—Socket Head Cap Screw (4 used) **B—Divider Block**

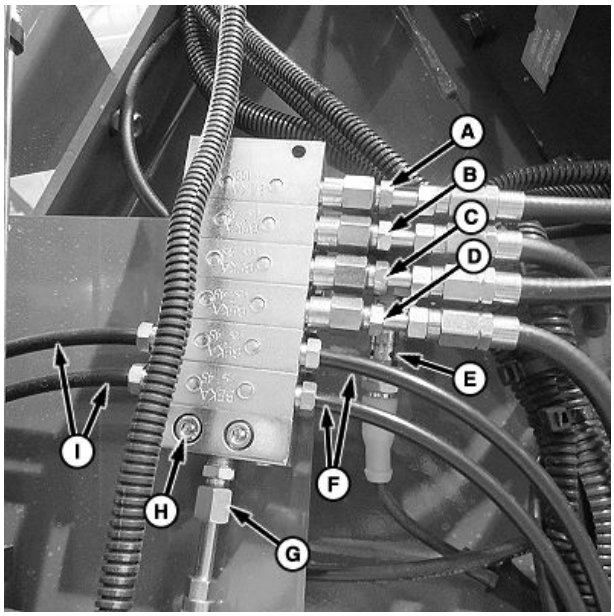
SF04007,00007CA -19-03MAR15-5/6

Remove and Install Divider Blocks

Main Divider Block

IMPORTANT: Tag each grease line to assure proper connection when installed.

1. Disconnect hoses (A—D, F, G, and I) from main divider block.
2. Disconnect sensor (E) and remove sensor from main divider block.
3. Remove nuts and screws (H).
4. Replace main divider block as necessary.
5. Install in reverse order of removal.
6. Prime system.
7. Check for leaks.



E75010 —UN—29APR14

A—Knotter Supply Hose
B—Left-Hand Side Supply Hose
C—Plunger Supply Hose
D—Right-Hand Side Supply Hose
E—Sensor
F—Right-Hand Side Pickup Hoses (2 used)
G—Main Supply Hose
H—Screw (2 used)
I— Left-Hand Side Pickup Hoses (2 used)

SF04007,00007CA -19-03MAR15-6/6

Hay Dogs

NOTE: Hay dogs are used to prevent crop from springing forward when pressure from plunger is released.

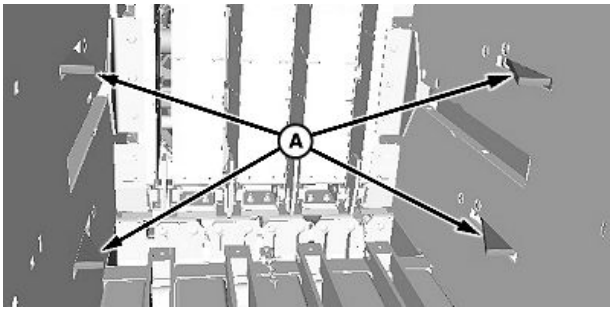
NOTE: Dynamic hay dogs are able to spring back in front of face of bale while stationary hay dogs provide constant resistance.

NOTE: Twine roller scrapers are also recommended in silage conditions to prevent buildup on twine rollers. See your John Deere Dealer.

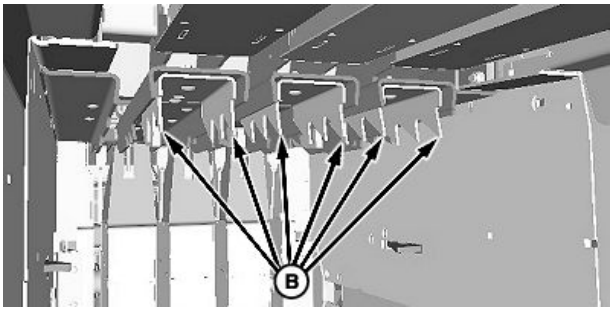
1. Stationary hay dogs, sometimes called retainers or razorbacks, are located in bottom (C) and top (B) of bale chamber behind knotters.
2. Dynamic hay dogs are located in sides (A) and top (B) of bale chamber just behind knotters.

NOTE: Because of the sticky nature of the crop, it is recommended removing top stationary hay dogs in silage conditions where there is poor bale shape, quality, or excessive buildup of material in knotter area.

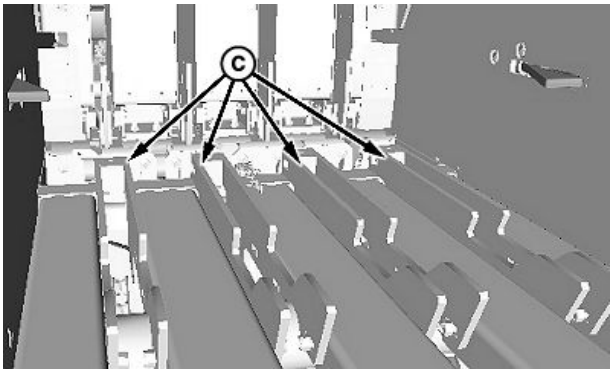
A—Side Hay Dogs
B—Top Hay Dogs
C—Bottom Hay Dogs



W24520 —UN—01NOV13



W24521 —UN—01NOV13



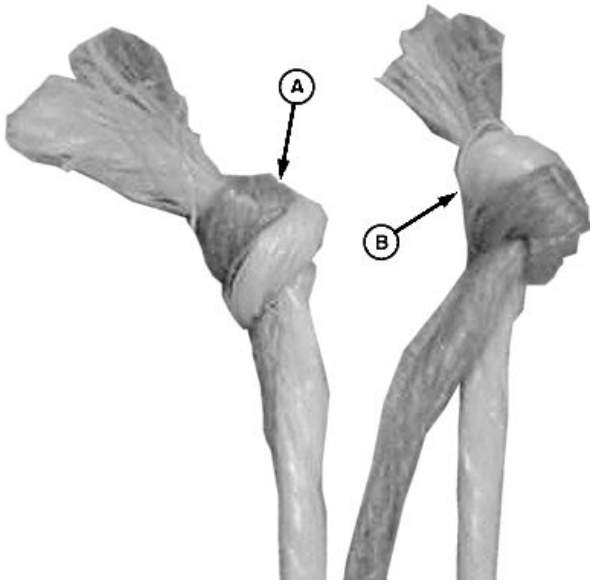
W24522 —UN—05NOV13

SF04007,000054E -19-11JUL14-1/1

Knots

1. First knot (A) typically has a longer tail (C) than second knot (B) due to systems overall twine tension being higher for first knot.
2. Knot 1 optimal knot tail length between 25—40 mm (.984—1.575 in.).
3. Knot 2 optimal knot tail length between 18—25 mm (.709—.984 in.).

A—Knot 1
B—Knot 2
C—Tail



W24531 —UN—05DEC13

W24532 —UN—19MAR14

Second Knot Field Example

SF04007,0000543 -19-20MAR14-1/1

Knotter Timing Charts

Description	Position—0 to 360 Degrees							
Plunger	Full Extension—115 degrees				Home—300 degrees			
Needle	Moving Upwards—0-180 degrees			Top Dead Center — 180 degrees		Moving Downwards—180-360 degrees		
Twine Disk				Rotation First Knot—155-205 degrees			Rotation Second Knot—270-320 degrees	
Billhook				Rotation First Knot—170-215 degrees			Rotation Second Knot—285-330 degrees	
Wiper Arm	Return—0-20 degrees				Wipe—205-235 degrees	Return—235-265 degrees	Home—265-320 degrees	Wipe—320-350 degrees
Tucker Finger	Moving to Open—15-65 degrees	Open Position—65-125 degrees	Moving to Closed—125-160 degrees	Closed—160-210 degrees	Open Position—230-265 degrees	Moving to Closed 265-305 degrees	Max—305-340 degrees	Closed—340-360 degrees
Twine Placement Arm	Home—0-20 degrees	Down—20-40 degrees	Down Position—40-70 degrees	Moving Upwards—70-115 degrees	Up Position—115-235 degrees	Moving Down—235-275 degrees	Down Position—280-340 degrees	Home—340-360 degrees

SF04007,0000545 -19-13MAR14-1/1

Troubleshooting

Problem	Possible Cause	Correction
Knotter will not engage.	Needle lock engaged.	Unlock needle lock lever.
	Knotter trip arm does not rotate freely on shaft.	Clean knotter trip arm and shaft. Lubricate trip arm. *NOTE: Lubricate knotter trip arm every 2000 bales.*
	Metering wheel and knotter trip arm out of adjustment.	Adjust metering wheel and knotter trip arm.

Problem	Possible Cause	Correction
No knotter indication when baler ties.	Faulty sensor at twine placement arm cam.	Check and adjust sensor clearance or replace sensor.
Knots staying on billhook too long.	Not enough twine holder spring tension.	Tighten twine holder spring adjustment bolt.
	Too much tension on billhook cam.	Check billhook cam adjustment.
	Twine disk rotated clockwise too far.	Check twine disk adjustment and rotate twine disk counterclockwise if necessary.
	Dull or damaged knife.	Adjust wiper arm to lightly rub billhook.
	Wiper arm not set close enough to billhook.	Adjust wiper arm to lightly rub billhook.
	Wiper arm does not travel far enough past end of billhook.	Check wiper arm adjustment.
	Wiper arm cam lobe on cam gear worn or damaged.	Repair or replace cam gear.
	Wiper arm roller worn or missing.	Replace wiper arm roller.
	Worn or rough billhook.	Replace billhook or remove rough edges with a file and emery cloth.
	Not enough bottom twine tension.	Increase bottom twine tension by tightening springs on bottom twine tensioners.
		Check wiper plate on wiper arm.
		Check billhook pressure arm is free of debris between billhook pressure arm and knotter frame.
Twine wrapped on top of billhook and first and second knot connected.	Needle and twine placement arm out of adjustment causing needle to not get top twine. (Twine right-hand side of needle)	Loosen bolts for twine placement arm and or needle, adjust until both parts are in alignment.
	Needle does not put both twines in disk correctly.	Adjust needle position and or twine disk timing.
	Twine running off right-hand side of twine placement arm roller.	Loosen bolts on top slack arm, adjust until aligned with twine placement arm. Use correct twine.
Knots in bottom twine only; top twine is not cut between bales. (Top twine is around two bales)	Needle and twine placement arm out of alignment causing needle to not get top twine. (Normally twine left-hand side of needle)	Loosen bolts and adjust twine placement arm and or needle until both parts are in alignment.
Knot in top twine only on first knot.	Tucker finger did not pick up twine from needles and move twine into tying position correctly.	Adjust tucker finger.
	Hay dogs are not entering bale chamber.	Clear hay and dirt from between hay dogs and bale chamber. Check for broken springs and hay dogs. Replace broken parts.
	Tucker fingers do not rotate freely.	Make sure that tucker finger pivot bearing rotates freely and does not have rough spots. Replace bearing if necessary.
		Check adjustment of tucker finger. Make sure that tucker finger rod is not bottoming out on base plate stops.
	Tucker finger shaft does not rotate freely.	Check tucker finger shaft bearing rotates freely. Replace bearing if necessary.
	Tucker finger spring broken or weak.	Replace tucker finger spring.

Continued on next page

Knots in top twine only on second knot.	Bottom twine slack arm not rotating freely on shaft.	Check bottom slack arm bearing. Check for obstructions.
	Not enough tension on bottom twine.	Increase twine tension on bottom twine tensioner.
	Needle twine not threaded correctly.	Check and correct needle twine threading.
	Broken or missing bottom slack spring or other bottom slack parts.	Replace bottom slack spring.
		Replace any broken or missing bottom slack parts.
	Bottom twine staying too long on backside of tucker finger when tucker finger retracts.	Remove rough edges from tucker finger.
	Tucker finger not retracting completely.	Adjust tucker finger.
		Make sure that tucker finger bearing rotates freely. Replace bearing if necessary.
		Make sure tucker finger shaft bearings rotate freely. Replace bearings if necessary.
		Check springs for tucker finger shaft and replace if necessary.
Knot in bottom twine only on second knot.	Tucker finger not adjusted close enough to tucker arm.	Adjust tucker finger forward toward tucker arm.
	Needle damaged or bent.	Repair or replace needle if damaged. If needle is bent, replace needle.
	Top twine not routed correctly.	Check and correct top twine threading.
	Spring for top twine slack arm broken or disconnected.	Replace or connect spring for top twine slack arm.
	Broken or missing top slack parts.	Replace any broken or missing top slack parts.
	Twine placement arm cam roller broken or not coming in contact with cam.	Replace cam roller and or straighten cam roller arm until roller is centered on cam.
Twine wrapped on top of billhook on second knot.	Bottom twine slack arm not moving.	Clean bottom twine slack arm and shaft. Check for obstructions.
	Broken or missing bottom slack spring or other bottom slack parts.	Replace bottom slack spring.
		Replace any broken or missing bottom slack parts.
	Not enough tension on bottom twine.	Increase bottom twine tension by tightening springs for bottom twine tensioner gears.
	Needle and twine placement arm out alignment causing needle to not get top twine. (Twine right-hand side of needle.)	Loosen bolts for twine placement arm and or needle and adjust until both parts are in alignment with each other.
	Twine disk rotated too far counterclockwise.	Rotate twine disk clockwise.
Twine wraps around top of billhook on first knot.	Twine disk rotated too far counterclockwise.	Rotate twine disk clockwise.
	Needle and twine placement arm out alignment causing needle to miss top twine. (Twine right-hand side of needle.)	Loosen bolts for twine finger arm and or needle and adjust until both parts are in alignment.

Continued on next page

No knot in either twine, one or all knotters.	Tucker finger not working correctly.	Inspect tucker finger linkage and tucker finger adjustment.
	Tucker finger roller not coming in contact with cam.	Replace or connect tucker finger spring.
		Lubricate tucker finger bushings. Make sure that tucker finger bushings are receiving lubricant. Clean or repair as necessary.
		Adjust tucker fingers.
		Lubricate tucker finger shaft pivot bearings.
		Check for any obstructions that can prevent twine finger from rotating freely.
	Damaged billhook tongue.	Replace billhook tongue.
	Not enough tension on billhook cam.	Increase tension on billhook cam.
	Twines to needle and knotter not routed correctly.	Check and correct twine routing.
	Twine holder spring too tight and does not permit enough twine to slip through disk to form knot.	Loosen twine holder spring adjusting screw. Clean dust and chaff from under twine holder spring. Adjust twine holder.
	Billhook not rotating.	Replace roll pin in billhook pinion.
	Twine cut in twine disks.	Loosen twine holder and or remove all sharp edges on twine holder and disks.
Double twine bow knot.	Twine holder spring set too loose.	Tighten twine holder spring adjustment bolt to shorten tail on knot.
	Not enough travel of wiper arm past billhook.	Adjust wiper arm to get more travel past billhook.
		Check knotter cam gear for wear and repair or replace as necessary.
		Check for worn or damaged roller on wiper arm.
	Twine tension not correct because of broken spring on top or bottom slack arm.	Replace broken spring.
	Twine tension not correct because of bottom slack arm not rotating freely on shaft.	Clean bottom slack arm and shaft. Check for obstructions.
	Dull or damaged twine knife.	Sharpen or replace twine knife.
Twine ends frayed.	Dull or damaged twine knife.	Sharpen or replace twine knife.
	Twine knife base holding twines.	Check twine disk adjustment or position of twine knife base.
Twine ends not even.	Dull or damaged twine knife.	Sharpen or replace twine knife.
	Not enough twine tension on either top or bottom twine.	Increase spring tension on twine tensioner gears.
Strands of one twine double back through knot.	Billhook is closing on top of twine.	Adjust timing of twine disk.
		Adjust wiper arm to hold twine over billhook tongue farther to right-hand side.
	Not enough spring tension on twine holder springs.	Increase tension on holder springs.
	Dull or damaged twine knife.	Sharpen or replace twine knife.
Frayed knot.	Twine tension too high.	Check and adjust twine tension at both top and bottom twine tensioners.
		Decrease tension on twine holder springs.
	Damaged twine disk or twine holder.	Inspect twine holder for rough and sharp areas that can damage twine. Repair as necessary.
	Rough or sharp areas on billhook or wiper arm.	Remove rough or sharp edges.
	Dull or damaged twine knife.	Sharpen or replace twine knife.

Continued on next page

Knot in end of one twine and not knot in end of other twine on all six twines.	One or more tucker fingers do not work freely, causing all tucker fingers to not work correctly.	Lubricate tucker finger bushings. Make sure that tucker finger bushing is receiving lubricant. Clean or repair as necessary.
		Adjust tucker finger.
	Tucker finger going over center.	Adjust tucker finger.
	Tucker finger shaft does not rotate freely.	Lubricate tucker finger shaft bearings.
		Adjust center bearing for tucker finger shaft.
	Spring for tucker finger shaft is weak; roller on tucker finger shaft does not contact cam through complete cycle.	Replace tucker finger shaft spring.
Weak knot.	Twine holder spring tension too tight.	Adjust twine holder spring tension.
Short ends of knot frequently pull loose (normally second knot).	Twine holder spring set too tight.	Decrease tension on twine holder springs.
	Twine tension not correct.	Check twine tension at both top and bottom twine tensioners. Increasing twine tension normally increases length of short ends of knots.
	Not enough tension on billhook cam.	Adjust billhook cam.
Twine disks do not stay in time.	Worm drive gear groove pin breaks.	Replace groove pin.
	Worm gear slips on worm shaft.	Tighten nut on worm shaft.
		Remove shims to let worm gearset on tapered area of worm shaft. Measure end play for worm gear shaft and adjust as necessary.
		Check for cracks in worm gear and replace if cracks are present.
	Worn or broken worm gear or worm drive gear.	Replace worm gear or worm drive gear.
Failure to apply enough tension on twine with twine tensioner.	Adjustment bolt threads worn.	Replace adjustment bolt.
	Groove worn in tension gears.	Replace tensioner or remove tensioner assembly and install from opposite side of baler.
	No travel left in springs.	Replace bad parts. Straighten gear mounting bracket or shorten rear spacers.
Needle breaking or bending.	Solid object in needle slot.	Remove object and clean slot.
	Needle not adjusted correctly.	Adjust needle.
	Needle timing not correct.	Adjust needle timing.
	Crop deposits in plunger needle slots.	Remove crop from plunger needle slots. Check that crop is not too wet for baling. Permit crop to dry properly.
	Needle protection linkage not adjusted correctly.	Adjust needle protection linkage.
	Knotter clutch arm does not rotate freely on shaft.	Clean and lubricate knotter clutch arm and shaft. *NOTE: Lubricate knotter clutch arm every 2000 bales.*
	Excessive wear on stuffer/knotter drive chain.	Check timing of sprockets connected by stuffer/knotter drive chain.
	Damaged parts in stuffer/knotter drive sprocket shear bolt system.	Replace or repair damaged parts.
	Knotter repeating cycle.	Check knotter trip linkage for damaged parts. Replace or repair damaged parts.
	Knotter trip linkage does not move freely.	Check knotter trip linkage for damaged parts. Replace or repair damaged parts.
	Loose bolts in needle.	Adjust needle and make sure that bolts are tight.

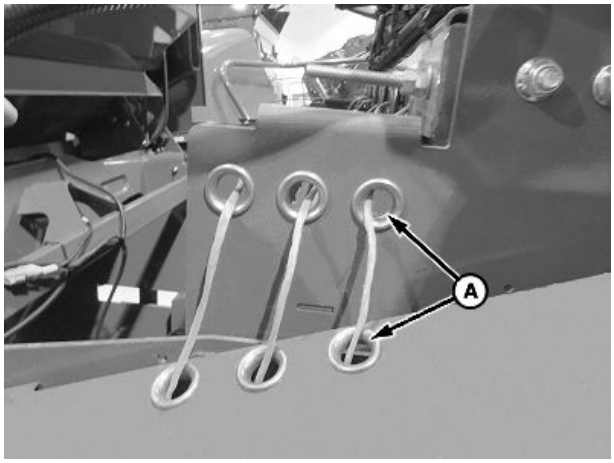
SF04007,0000586 -19-13AUG14-4/4

Wear Limits on Twine Contacting Points

If any abnormal fraying of twine or twine shavings are noticed, check for sharp edges (A) on twine route components.

NOTE: Eyelets can be rotated to avoid twine running in worn grooves.

A—Sharp Edges



W24597 —UN—17MAR14

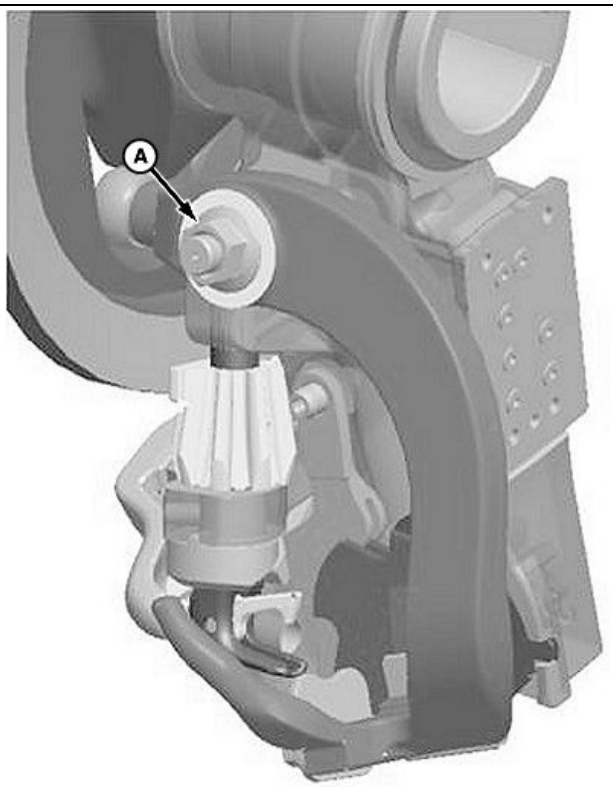
SF04007,000051B -19-10JUN14-1/1

Wiper Arm End Play

NOTE: Wiper arm casting should bottom out on wiper arm shaft. Casting should not bottom out on knotter frame.

Adjust using shim (A) FH323583.

A—Shim, 0.1—0.5 mm (0.004—0.02 in.).



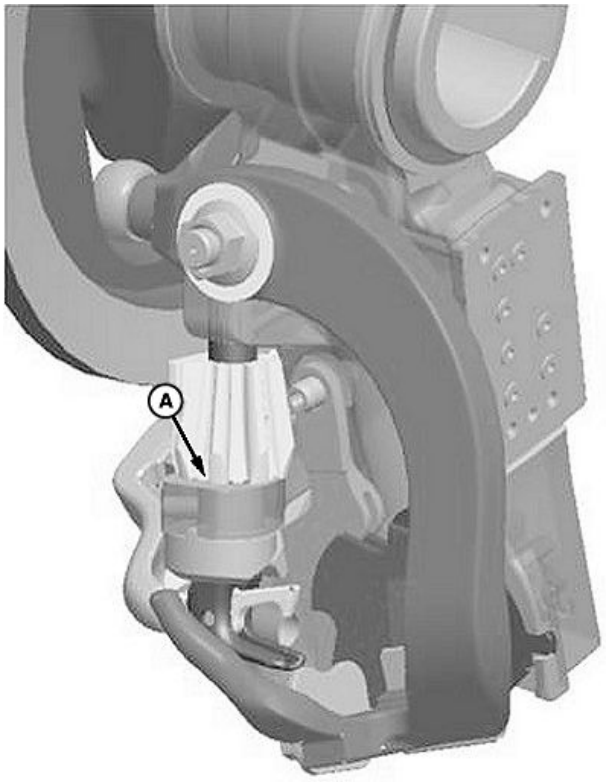
W24475 —UN—21OCT13

SF04007,000051C -19-13AUG14-1/1

Billhook Shaft End Play

Adjust using shim (A) FH322776.

A—Shim, 0.1—0.4 mm (0.004—0.016 in.).



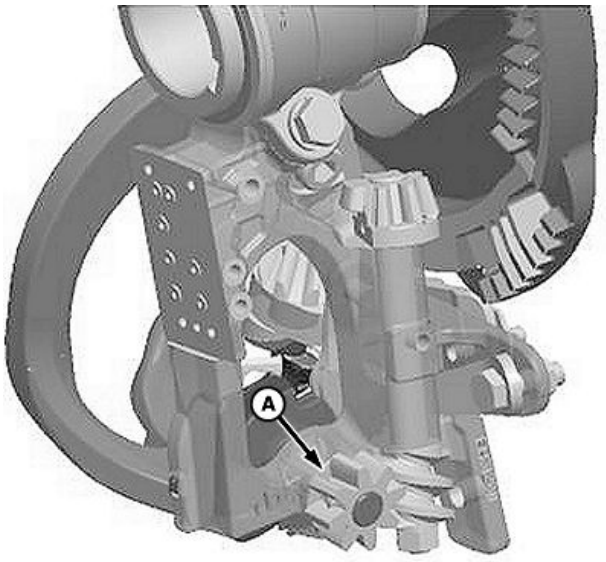
W24476 —UN—21OCT13

SF04007,000051D -19-10JUN14-1/1

Twine Disk End Play

Adjust using shim (A) FH322776.

A—Shim, 0.1—0.4 mm (0.004—0.016 in.)



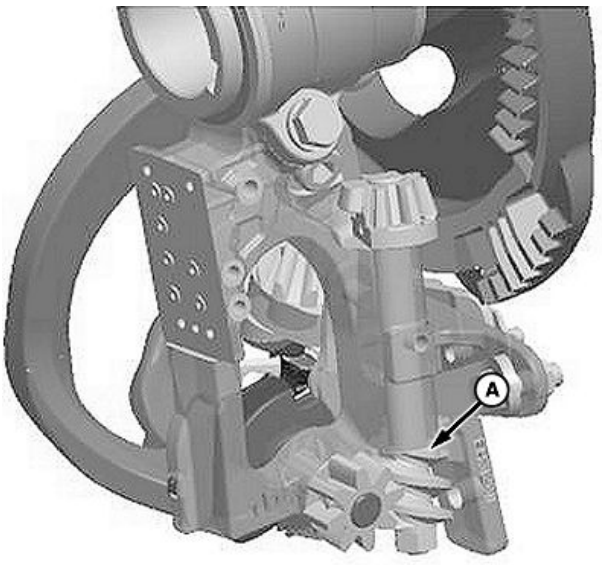
W24473 —UN—21OCT13

SF04007,000051E -19-10JUN14-1/1

Worm Gear Spindle End Play

Adjust end play using shim (A) FH322776 or FH322777.

A—Shim, 0.1—0.4 mm (0.004—0.016 in.)



W24474 —UN—21OCT13

SF04007,000051F -19-10JUN14-1/1

Settings

Knotter Settings

Description	Setting
Twine disk end play.	0.1—0.4 mm
Worm gear spindle end play.	0.1—0.4 mm
Billhook end play.	0.1—0.4 mm
Wiper arm end play.	0.1—0.4 mm
Torque on worm gear.	25 ft.- lbs.
Twine disk gear to intermittent gear gap.	0.15—0.5 mm
Billhook gear to intermittent gear gap.	0.15—0.5 mm
Knotter assembly preload.	15—45 ft.- lbs.
Twine disk timing.	+/- 1 mm from edge of cleaner plate with cleaner plate pushed to left.
Twine holder pressure.	1 inch tail. Balance with twine tension. 15.5—17 mm
Wiper plate to billhook.	With wiper plate centered on billhook, 9—20 lbs. Wiper arm pull across billhook.
Billhook tongue pressure.	9—20 lbs.
Twine box pressure.	2—4 lbs.
Needle penetration.	120—130 mm, Lower roller center to top surface of twine disk.
Needle roller to cleaner gap.	2—3 mm

Tie System Settings

Description	Setting
Needle to stabilizer.	0 to (-2) mm. Steel on needle is 3 mm thick.
Needle to knotter pinion gear.	0.5 to (-1) mm
Needle in bale case slot.	Base of needle centered in slot.
Knotter pitch (Measure from intermittent gear to intermittent gear.)	180 +/- 2 mm
Needle lower roller to twine disk cleaner.	2—3 mm
Needle penetration.	120—130 mm, Lower roller center to top surface of twine disk.
Needle to plunger timing.	54—89 mm behind plunger face with needle tips flush to top of hay retainer and plunger moving to the rear.
Tucker finger to twine placement arm roller gap.	2—3 mm
Tucker finger timing.	Wipe off first knot, tucker finger sweeps parallel to slot (off position). This is smallest diameter on cam. Tip to be flush to minus 3 mm away from slot side.
Tucker finger spring.	Fully tension spring. Bracket in most forward position (full tension).
Twine placement arm setting to stabilizer.	2—3 mm
Twine box tension.	2—4 lbs.
Upper twine tension.	10—16 lbs., upper slack arms to bottom out on bar.
Lower twine tension.	20—24 lbs., lower slack arms to bottom out on frame.
Knotter shaft brake spring length.	43—45 mm

SF04007,00007CB -19-03MAR15-1/1

Index

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TS100 —UN—23AUG88

DX,IBC,A -19-04JUN90-1/1

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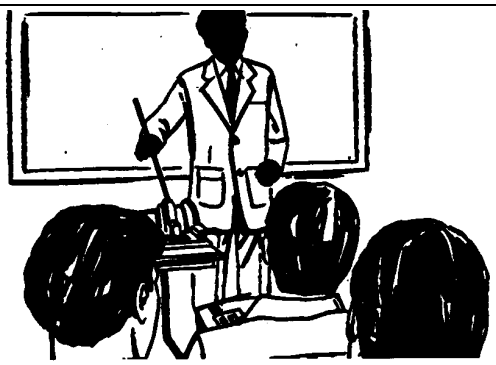

TS102 —UN—23AUG88

DX,IBC,C -19-04JUN90-1/1

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