

Massey Ferguson®

9195 / 9196
Rotary Disc Header

SERVICE MANUAL 4283440M1

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DRIVES

BELT REPLACEMENTS

General Information

Banded Drive Belt

FIG. 1: A banded drive belt is made of two or more V-belts (of a standard cross section size) banded together at the top with a tie band (1). The V-belts and the tie band are vulcanized together to form a multiple strand banded belt.

The cross section and spacing of the strands are such that the banded belt operates on standard sheaves.

The tie band clears the top of the sheaves so that each belt strand has full wedging capacity in the sheave grooves, just as a single belt. The banded belt operates at the same tension as matched belts on an regular multiple strand V-belt drive.

Most V-belt drives operate without any problem, requiring only regular maintenance. There are times where forces acting on the drive can cause belts to whip, turn over, or come off the sheaves. The banded belt was designed to correct these belt stability problems which are most frequently caused by intermittent or shock loading of the drive.

Banded belts have standard dimensions and cross section sizes and are made to order, with the number of strands being determined by the power needs of the drive. Spacing between the strands of the belt are the same as the Rubber Manufacturers Association (RMA) standard spacing for multiple groove sheaves.

NOTE: Never pry off a belt, as the sheave can be damaged. Prying off belts also adds risk of injury.

Installation

FIG. 2: Order a new belt by the part number, not by measuring the old belt.

Time must be taken to make sure the selection of the proper size belts for the different sheaves is correct.

(A) Indicates the wrong belt installed.

(B) Indicates the correct belt installed.

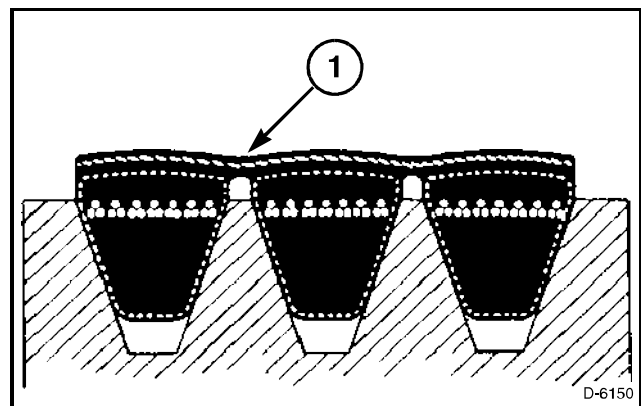


FIG. 1

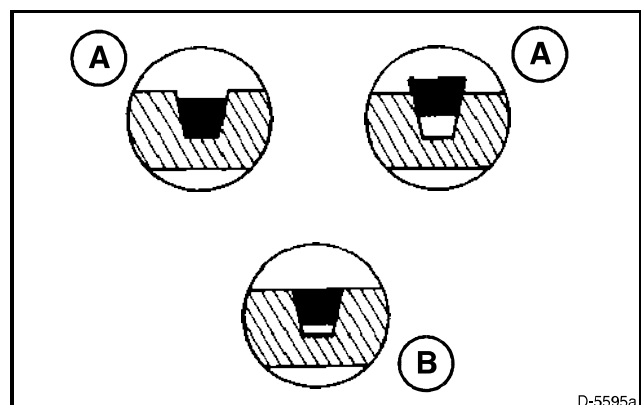


FIG. 2

Drives

FIG. 3: Replace all belts on multiple belt drives. Never replace a single belt or part of a multiple belt drive. If a new belt is used with old belts, the load will not be divided evenly between the belts. Mixing new and old belts can lead to early belt failure and not even sheave wear.

(A) Indicates a new belt position.

(B) Indicates a used belt position.

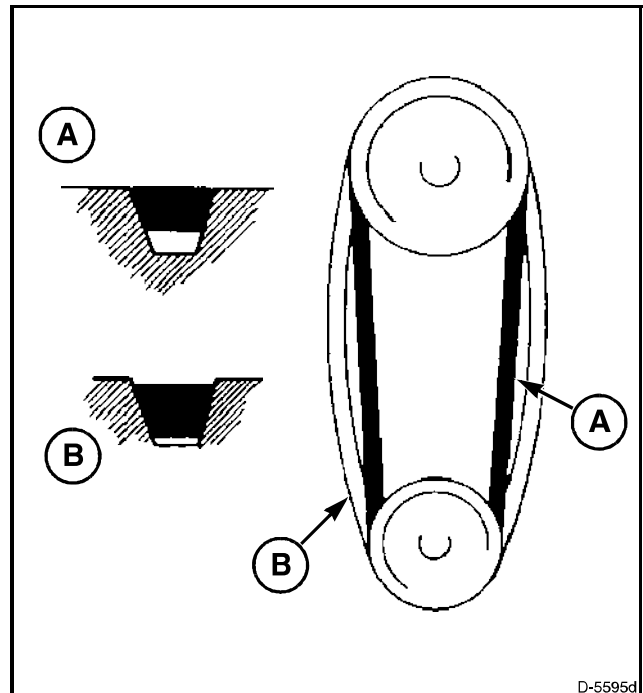


FIG. 3

FIG. 4: When replacing a belt, never force a belt over the rim of a pulley. Do not pry or use force to install the belt (A). This can break the cords in the belt. Loosen the tensioner before installing the new belt. If the belt still can not be easily installed, run the belt over the rim while rotating the pulley (B).

Tighten the belts making sure the belts are at the correct tension. More belts are damaged by not enough tension than by too much tension. But, do not over tension the belt as this damages the belt tensile members and puts an additional load on the shafts and bearings.

Rotate the belt drive three revolutions. Check the belt tension and adjust as necessary.

Check the drive alignment and adjust as necessary.

Install the guards or shields.

Start the drive, looking and listening for any not normal noise or vibration. If possible, stop the drive and check the bearings and sheaves for excessive heat. If the bearings and sheaves are too hot the belt tension can be too high or the bearings are not properly lubricated or failing. Temperature can be checked with an infrared pyrometer.

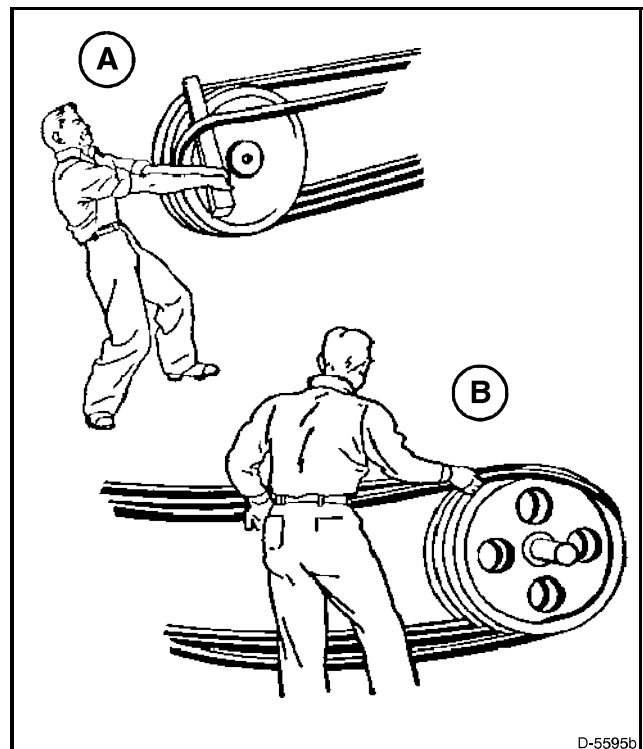


FIG. 4

Belt Sheave Alignment

FIG. 5: Check the sheave and shaft alignment. Running the belts with the sheaves out of alignment will cause severe side wear.

Not aligned belt drives will be louder than properly aligned drives since interference is where the belts engage the sheave.

To check the alignment use a long straight edge (1) made of wood, metal, or any rigid material. Line the straight edge along the outside face of both sheaves. If the drive is properly aligned, the straight edge will contact each sheave evenly. The straight edge must touch the two outer edges of each sheave for a total of four points of contact.

Shafts not in alignment (C) will show up as a gap (2) between the outside face of the sheave and the straight edge.

Check for tilting or shafts not aligned by using a bubble level. For proper alignment, the bubble must be in the same position as measured on each shaft.

Not aligned correctly Parallel (A).

Not aligned correctly Angular (B).

Rotate the drive and look for excessive sheave movement. If excessive sheave movement is seen inspect the sheave and shaft. If no problem can be seen, remove and install the sheave. Not correctly mounted sheaves or out of round sheaves are some times the root of vibration or more severe problems. A dial indicator can be used to measure side to side sheave movement or diameter vibration by holding the dial indicator up to the sheave sidewall or the top of the belt inside the pulley groove.

IMPORTANT: Always turn off the machine before using the dial indicator. Rotate the drive by hand to make measurements.

Belt Run In Procedure

A run in procedure is needed for all belt drives so that the best belt life can be reached.

A run in procedure is made of starting the drive and operating the drive under full load for up to 24 hours. After the belts have run-in, stop the drive and check the belt tension.

Running the belts under full load for an extended period of time will seat the belts into the sheave grooves.

Belt tension will drop after the first run-in and seating procedure. This is normal. Adjust the belt tension as necessary.

Since tension in belts will drop after the first run-in and seating procedure, failure to check and tension the belt will result in low belt tension and belt slippage. This slippage will result in early belt failure.

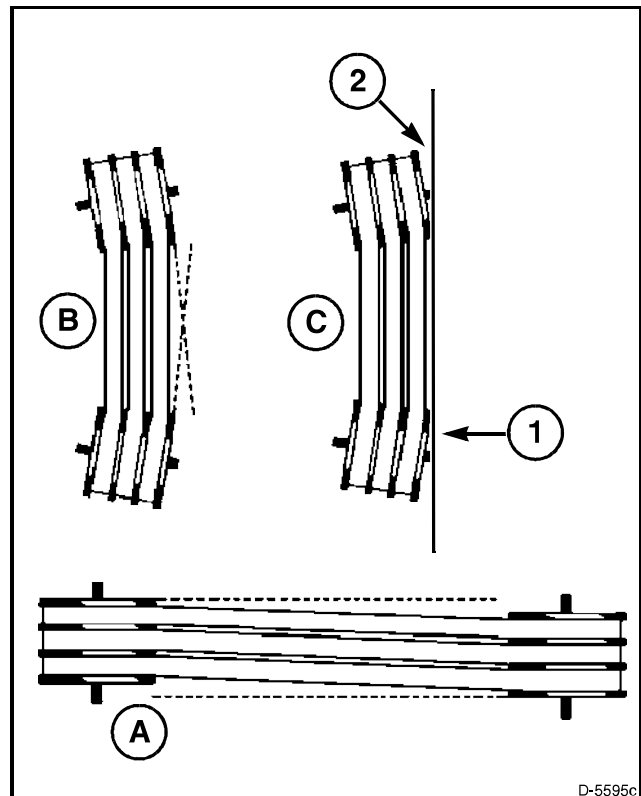


FIG. 5

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Drives

Center Cage Drive

General Information

The double conditioner machines, the following procedures are the same for both sides of the machine.

Single conditioner machines, right-hand side will be the same as the left-hand side of the machine. The gearbox will be different but procedure will be the same.

NOTE: Never pry off a belt, as the sheave can be damaged. Prying off belts also adds risk of injury.

Removal

Never pry off a belt, as the sheave can be damaged.

FIG. 6: Remove the two flange head screws (1) securing the sensor support (2) to the spindle assembly (3).

Locate the sensors (4) and the sensor support out of the work area.

Loosen the four flange head screws (5) securing the spindle assembly and the grass ring on the under side of the frame.

Loosen and remove the adjusting bolt (6) to take the tension off of the drive belts (7).

Remove the drive belts from the spindle assembly sheave.

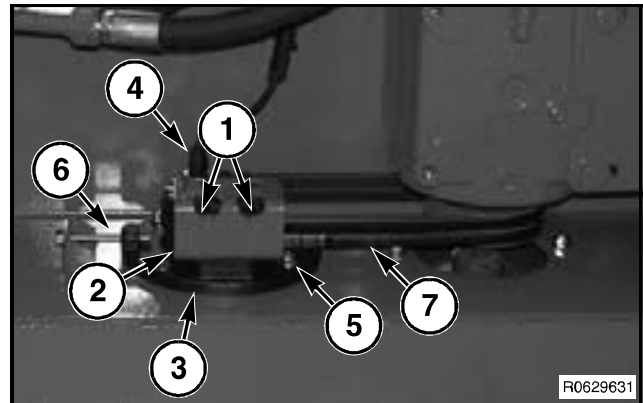


FIG. 6

FIG. 7: Remove the eight carriage bolts (1) and flange top lock nuts (2) securing the cage halves (3).

Remove the four cap screws (4) along with plain washers securing the U-joint assembly (5), cage assembly, lifter (6), and the disc assembly (7) to the spindle assembly.

Remove both cage halves.

Remove the U-joint assembly.

Remove the drive belts.

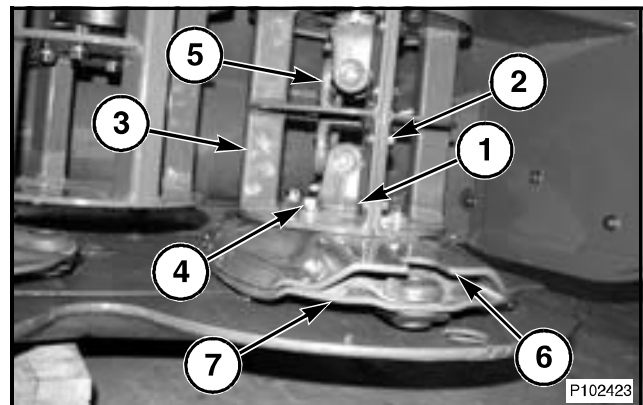


FIG. 7

Inspection

Check belts for excessive wear, tearing, breaking and unraveling.

Belts that are running hot, running in a hot environment, or from slipping will harden and form cracks from the bottom of the belt up.

Inspect for oil or grease leaking on the drive. This can indicate over lubricated parts or a fluid leak. If this material gets on rubber belts, the belts can increase in size and become distorted, causing an early belt failure.

Belts must be replaced if there are signs of cracking, fraying, or not normal wear.

Inspect the old belt for any not normal wear. Excessive or not normal wear can indicate problems with the drive or past maintenance procedures.

Inspect the sheaves for not normal or excessive wear, damage, distortion, and pitting. If surfaces show pitting or excessive wear, the sheave must be replaced.

Check the sheaves for deposits of dirt and dust in the bottom of the grooves. Clean the sheaves with a damp cloth. Do not sand or scrape the grooves to remove debris.

Check the sheave alignment. For long belt life the sheaves must be aligned properly.

Inspect all parts and replace as needed.

Installation

FIG. 8: Install the drive belts (matched set).

Install one half of the two cage halves (1).

Install the U-joint assembly (2) onto the splines of the gearbox.

Install the other half of the cage half.

Install the eight carriage bolts (3) and flange top lock nuts (4) securing the cage halves.

NOTE: The hardware needs to be installed with the head of the carriage bolts in the direction of the rotation.

Align the four holes in each of the cage halves with the holes in the U-joint assembly.

Install the four cap screws (5) along with plain washers. Tighten the cap screws to 115 Nm (85 lbf ft).

Tighten the eight flange top lock nuts that secures the cage halves.

FIG. 9: Install the matched set of drive belts (1) onto the sheave (2) of the spindle assembly (3).

Install the drive belts onto the sheave of the gearbox.

NOTE: Do not tighten the flange head screws that secure the spindle assembly to the frame.

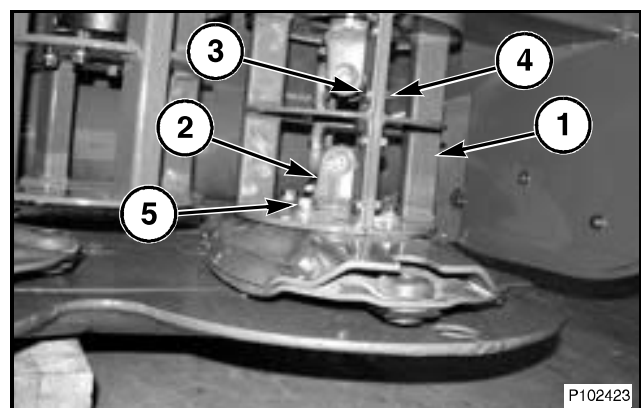


FIG. 8

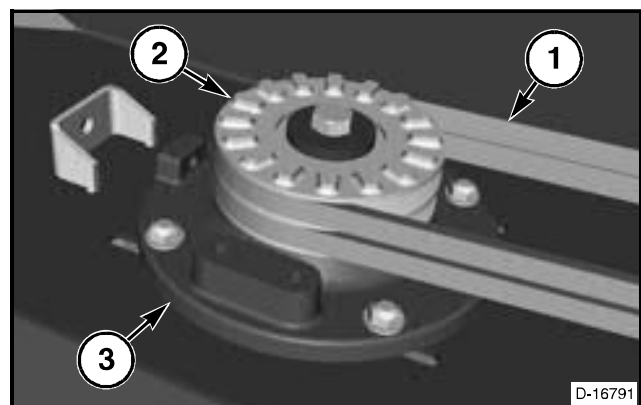


FIG. 9

Drives

FIG. 10: Install the adjusting bolt (1) and plain washer.

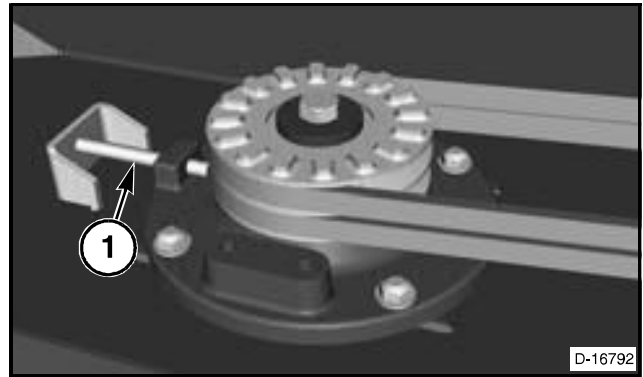


FIG. 10

FIG. 11: Locate the sensor support (1) along with the sensor (2) onto the spindle assembly (3).

Install the two flange head screws (4) securing the sensor support.

NOTE: Make sure the sensor(s) are connected to the wiring harness correctly.

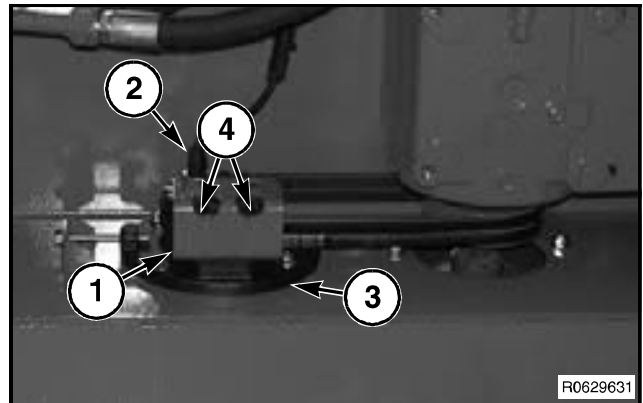


FIG. 11

Adjustments

FIG. 12: Make sure the drive sheave (1) and the driven sheave (2) are aligned.

Only the drive sheave is adjustable.

To adjust the drive sheave, remove the belts (3) from the drive and driven sheaves.

Put a straight edge in the top groove of each sheave.

If needed, loosen the two set screws in the drive sheave.

Adjust the drive sheave up and down as needed.

Tighten the set screw over the key first.

Tighten the two set screws to 42 Nm (31 lbf ft).

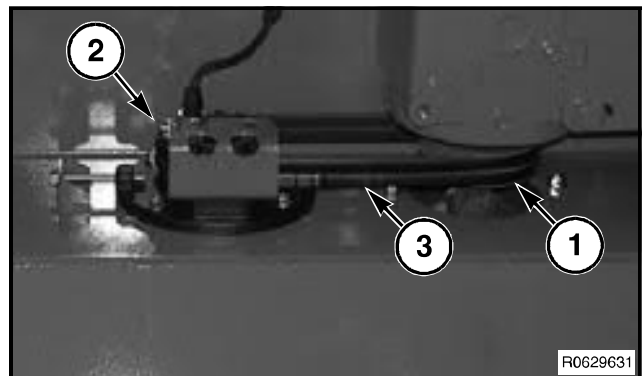


FIG. 12

FIG. 13: To adjust the drive belts (1) loosen the flange head screws (2).

Tighten or loosen the adjusting bolt (3) to move the position of the spindle assembly (4).

Check the tension of the drive belts. The tension is correct when there is 4.1 mm (0.161 in) of deflection at mid span (one belt) with 11.1 to 12.0 Nm (2.6 to 2.7 lbf) of force.

When the tension is correct, tighten the flange head screws.

NOTE: Over tightening puts too much strain on the belt and too much loading on the shafts and bearings.

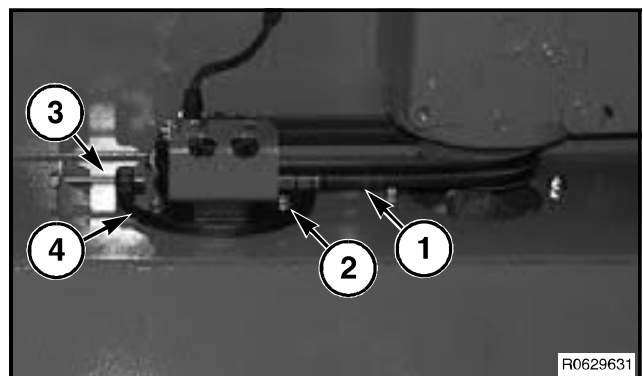


FIG. 13

FIG. 14: To adjust the gap for the sensor (1), loosen the jam nuts (2) on the sensor.

Adjust the sensor gap.

The gap between the lugs (3) on the sheave (4) and the sensor or the teeth on the sensor disc must be 0.75 to 1.25 mm (0.030 to 0.050 in) (A).

Tighten the jam nut to 10 Nm (90 lbf inch).

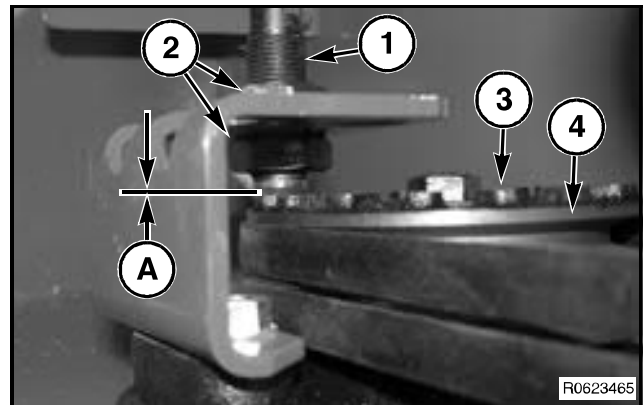


FIG. 14

FIG. 15: Adjust the inside diameter of the grass ring bulkhead (1) to cage assembly (2) within 2 mm (.08 inches) (A).

To adjust the grass ring bulkhead to the cage assembly, loosen the two bolts and nuts that fasten the grass ring bulkhead to the frame of the machine.

Adjust the grass ring bulkhead.

Tighten the nuts and bolts that attach the grass ring bulkhead to the frame.

NOTE: This procedure will be completed on the outboard cage only.

This procedure is the same for both sides of the single and double conditioner machines.

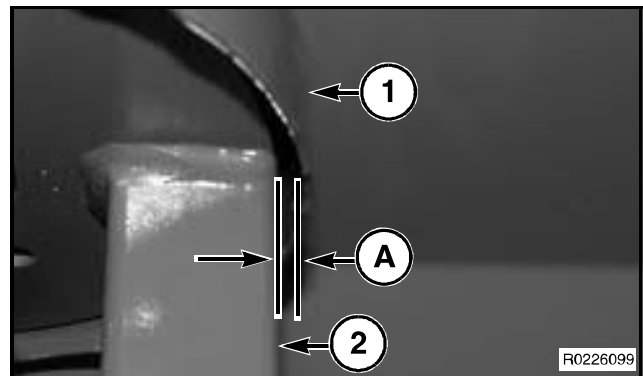


FIG. 15

Drives

Left-Hand Drive Belt

General Information

The removal and installation process for the left-hand side of the machine is the same for the single and double conditioner rolls.

NOTE: Never pry off a belt, as the sheave can be damaged. Prying off belts also adds risk of injury.

Removal

FIG. 16: Hold the retaining nut (1) next to the rod guide (2).

Loosen the jam nut (3) installed on the adjustment rod (4).

Relieve the compression on the idler spring.

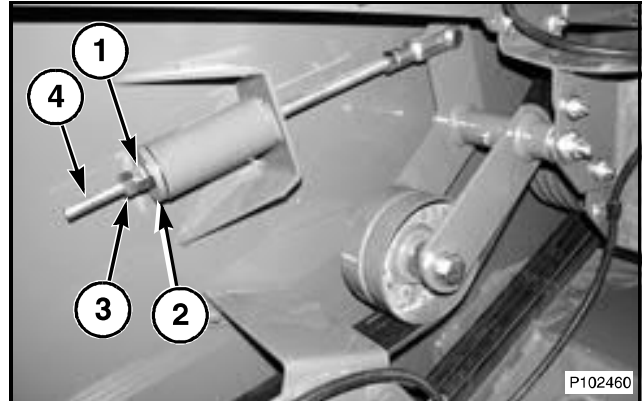


FIG. 16

FIG. 17: To expose the drive and the driven sheaves, remove the three washer head screws (1) retaining both cover plates (2).

Remove both cover plates.

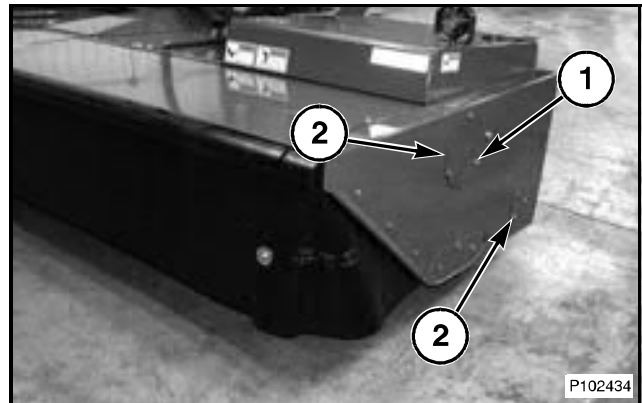


FIG. 17

FIG. 18: Move the belt (1) on the drive sheave (2) one rib at a time toward the side panel (3).

Never pry off a belt, as the sheave can be damaged.

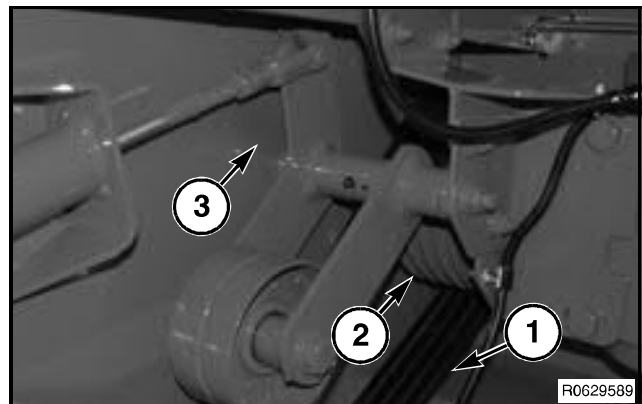


FIG. 18

FIG. 19: Twist the backside of the belt and remove the belt from the drive sheave (1) using the hole (2) in the side panel for clearance.

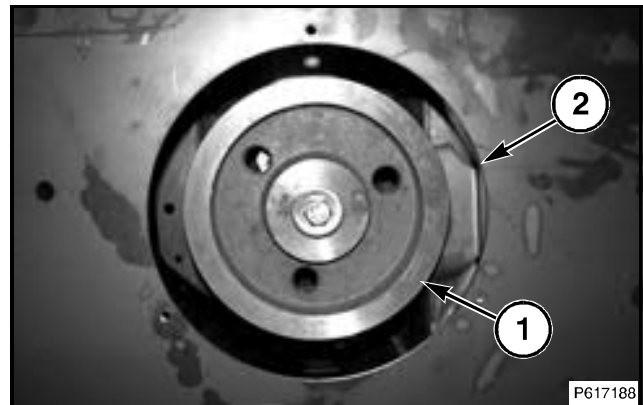


FIG. 19

FIG. 20: To remove the belt (1) from the driven sheave (2), move as much of the belt slack below the driven sheave as possible.

NOTE: Loosely attach a vice grip to the threaded rod to hold the idler assembly out of the way.

Twist the back side of the belt and remove the belt from the driven sheave.

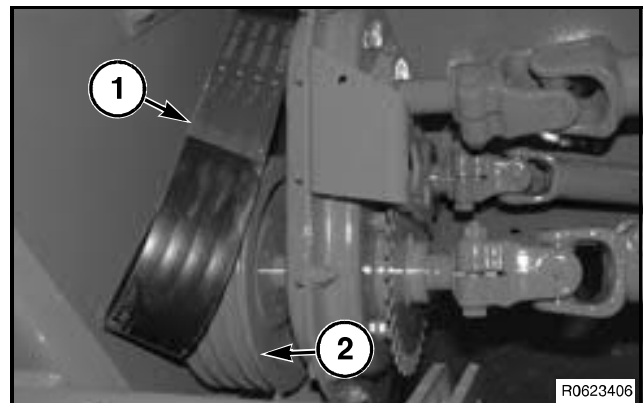


FIG. 20

Inspection

Check belts for excessive wear, tearing, breaking and unraveling.

Belts that are running hot, running in a hot environment, or from slipping will harden and form cracks from the bottom of the belt up.

Inspect for oil or grease leaking on the drive. This can indicate over lubricated parts or a fluid leak. If this material gets on rubber belts, the belts can increase in size and become distorted, causing an early belt failure.

Belts must be replaced if there are signs of cracking, fraying, or not normal wear.

Inspect the old belt for any not normal wear. Excessive or not normal wear can indicate problems with the drive or past maintenance procedures.

Inspect the sheaves for not normal or excessive wear, damage, distortion, and pitting. If surfaces show pitting or excessive wear, the sheave must be replaced.

Check the sheaves for deposits of dirt and dust in the bottom of the grooves. Clean the sheaves with a damp cloth. Do not sand or scrape the grooves to remove debris.

Check the sheave alignment. For long belt life the sheaves must be aligned properly.

Inspect all parts and replace as needed.

Drives

Installation

FIG. 21: To install the belt (1), twist the back side of the belt and move the belt around the end of the driven sheave (2). Do not move the belt fully onto the four ribs at this time.

Push the excess belt under the idler assembly and against the drive sheave.

Twist the backside of the belt and move the belt around the drive sheave using the hole in the side panel for clearance. Move the belt on the drive sheave and the driven sheave one rib at a time until all four ribs are installed in the proper grooves.

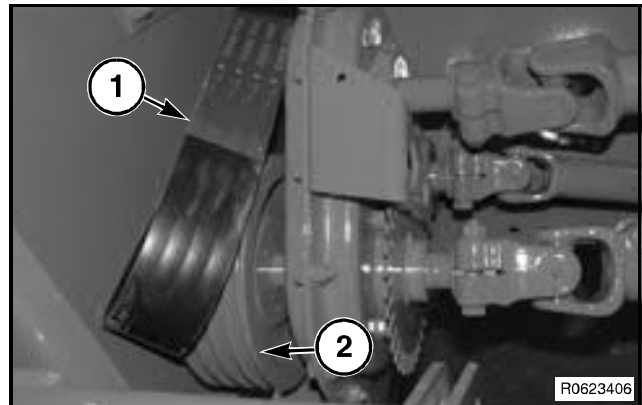


FIG. 21

Adjustments

FIG. 22: The belt (1) must be centered on the idler pulley (2).

Make sure the driven sheave and the drive sheave (3) are aligned.

To center the idler pulley on the belt, loosen and remove the flange top lock nut (4) located on the idler pivot bolt (5).

Remove the pivot bolt and add or remove washers (6) to either side of the idler pulley to center the idler pulley on the belt.

Install the pivot bolt and flange top lock nut.

NOTE: The washers are used to center the idler assembly to the belt. The washers may all be located on one side or the other, or any combination.

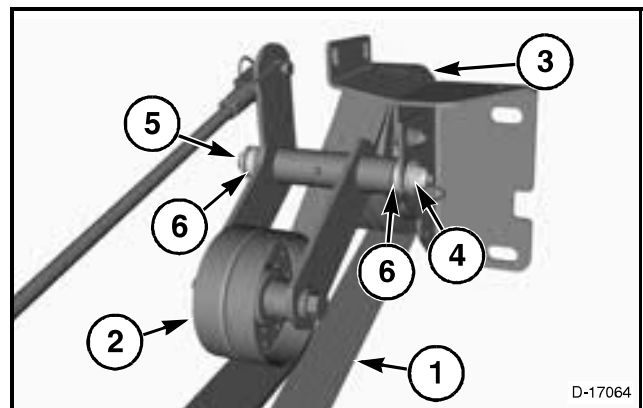


FIG. 22

FIG. 23: Other adjustments must be made when the alignment of the idler pulley (1) to the belt (2) is not correct.

Loosen the two bolts (3) that attach the idler plate (4) to the pivot support bracket (5).

Adjust the idler plate up and down until the idler pulley's flat surface is parallel to the face of the belt.

Tighten the two bolts that attach the idler plate to the pivot support bracket.

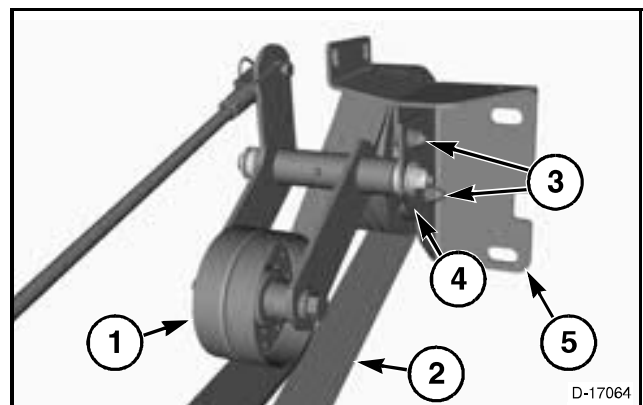


FIG. 23

FIG. 24: Turn the retaining nut (1) next to the rod guide (2) to adjust the tension on the belt.

Adjust the gap between the idler spring tube (3) and the rod guide is within 2 mm (0.07 in) (A). Hold the retaining nut and tighten the jam nut (4).

IMPORTANT: Too much tension can cause premature belt failure.

After run-in, readjust the tension if the gap is not 2 to 4 mm (0.07 to 0.15 in).

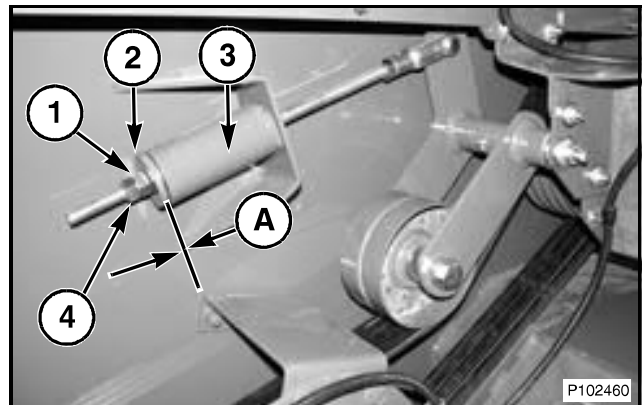


FIG. 24

FIG. 25: Install both cover plates (1).

Install the three washer head screws (2) retaining both cover plates.

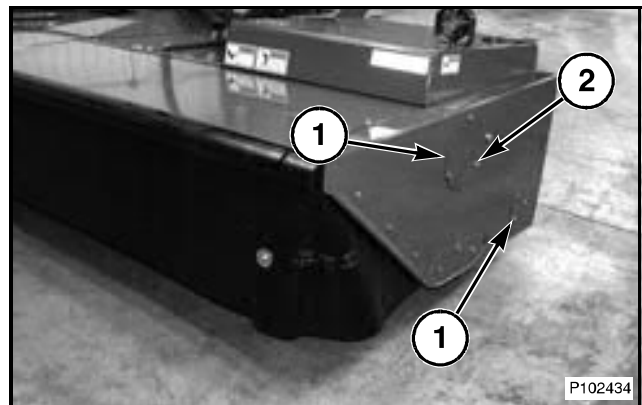


FIG. 25

Drives

Right-Hand Drive Belt

General Information

The following procedures will complete the removal and installation process for the double conditioner machine only.

The single conditioner machine does not have a secondary belt on the right-hand side of the machine.

NOTE: Never pry off a belt, as the sheave can be damaged. Prying off belts also adds risk of injury.

Removal

FIG. 26: Hold the retaining nut (1) next to the rod guide (2). Loosen the jam nut (3) installed on the adjustment rod (4).

Remove the compression on the idler spring.

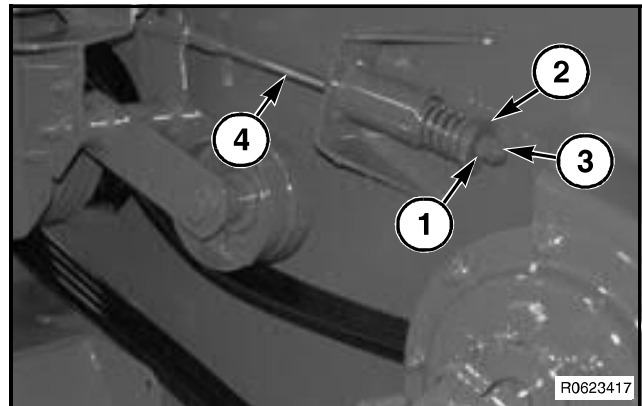


FIG. 26

FIG. 27: To expose the drive and the driven sheaves, remove the three washer head screws (1) retaining each cover plate (2).

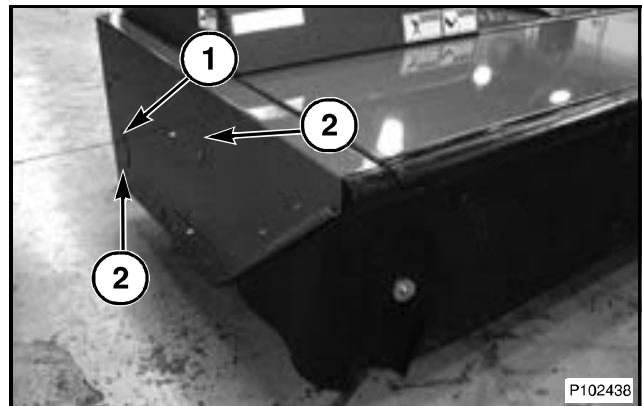


FIG. 27

FIG. 28: To remove the belt (1) from the driven sheave (2), move the belt off the driven sheave one rib at a time toward the side panel (3).

Move the free end of the belt to the right.

NOTE: Loosely attach a vice grip to the threaded rod to hold the idler assembly out of the way.

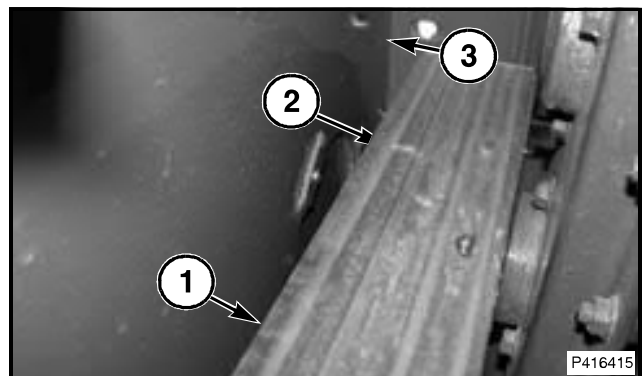


FIG. 28

FIG. 29: Twist the back side of the belt (1) and remove the belt from the driven sheave.

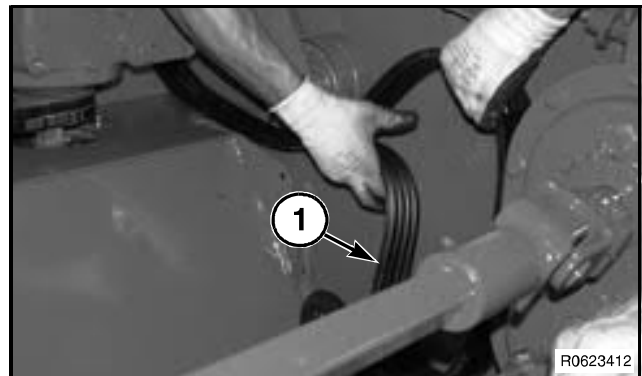


FIG. 29

FIG. 30: Move the belt (1) off the drive sheave (2) one rib at a time toward the side panel (3).

Twist the backside of the belt and remove the belt from the drive sheave using the hole in the side panel for clearance.

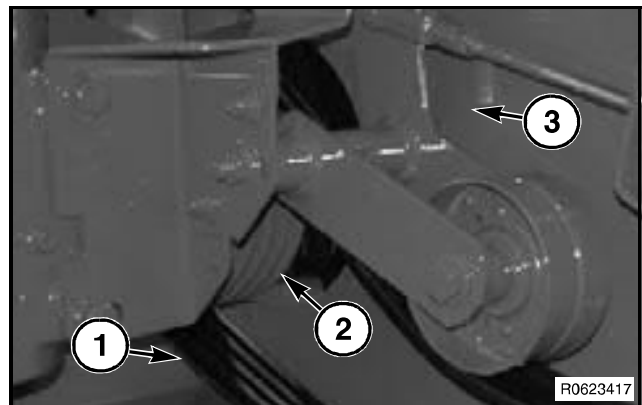


FIG. 30

Inspection

Check belts for excessive wear, tearing, breaking and unraveling.

Belts that are running hot, running in a hot environment, or from slipping will harden and form cracks from the bottom of the belt up.

Inspect for oil or grease leaking on the drive. This can indicate over lubricated parts or a fluid leak. If this material gets on rubber belts, the belts can increase in size and become distorted, causing an early belt failure.

Belts must be replaced if there are signs of cracking, fraying, or not normal wear.

Inspect the old belt for any not normal wear. Excessive or not normal wear can indicate problems with the drive or past maintenance procedures.

Inspect the sheaves for not normal or excessive wear, damage, distortion, and pitting. If surfaces show pitting or excessive wear, the sheave must be replaced.

Check the sheaves for deposits of dirt and dust in the bottom of the grooves. Clean the sheaves with a damp cloth. Do not sand or scrape the grooves to remove debris.

Check the sheave alignment. For long belt life the sheaves must be aligned properly.

Inspect all parts and replace as needed.

Drives

Installation

FIG. 31: Move the belt (1) on the drive sheave (2) one rib at a time until all four ribs are installed in the proper grooves.

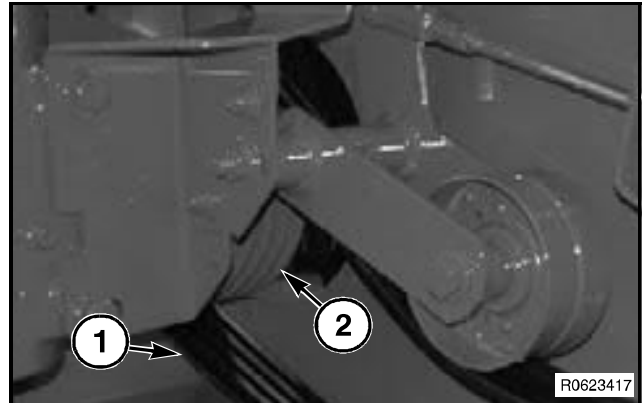


FIG. 31

FIG. 32: To install the belt (1) onto the driven sheave, twist the back side of the belt and move the belt around the end of the driven sheave.

Install the belt onto the driven sheave one rib at a time until all four ribs are installed in the proper grooves.

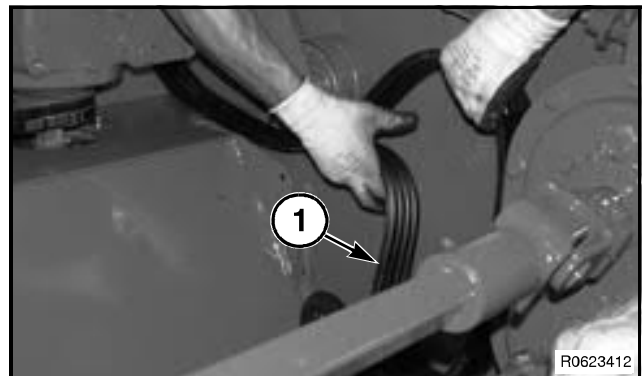


FIG. 32

Adjustments

FIG. 33: The belt (1) must be centered on the idler pulley (2).

Make sure the driven sheave and the drive sheave (3) are aligned.

To center the belt on the idler pulley, loosen and remove the flange top lock nut (4) located on the idler pivot bolt (5).

Remove the pivot bolt and add or remove washers (6) to either side of the idler pulley to center the idler pulley on the belt.

Install the pivot bolt and flange top lock nut.

NOTE: The washers are used to center the idler assembly to the belt. The washers may all be located on one side or the other, or any combination.

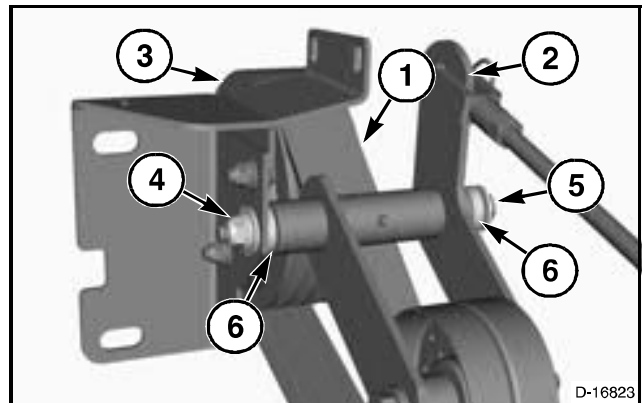


FIG. 33

FIG. 34: Other adjustments must be made when the alignment of the idler pulley (1) to the belt (2) is not correct.

Loosen the two bolts (3) that attach the idler plate (4) to the pivot support bracket (5).

Adjust the idler plate up and down until the idler pulley's flat surface is parallel to the face of the belt.

Tighten the two bolts that attach the idler plate to the pivot support bracket.

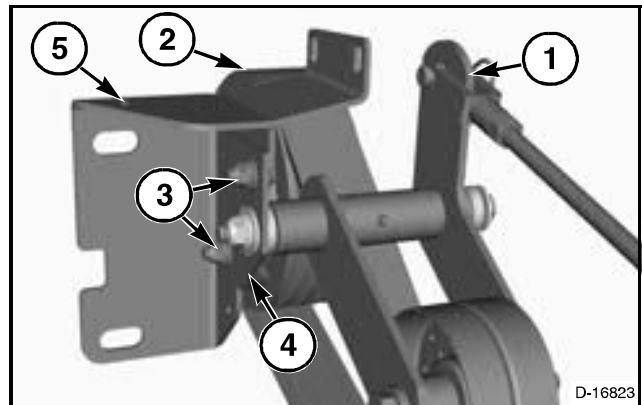


FIG. 34

FIG. 35: Turn the retaining nut (1) next to the rod guide (2) to adjust the tension on the belt (3).

Adjust the gap between the idler spring tube (4) and the rod guide to within 2 mm (0.07 in) (A). Hold the retaining nut and tighten the jam nut (5).

IMPORTANT: Too much tension can cause premature belt failure.

After run-in, readjust the tension if the gap is not 2 to 4 mm (0.07 to 0.15 in) (A).

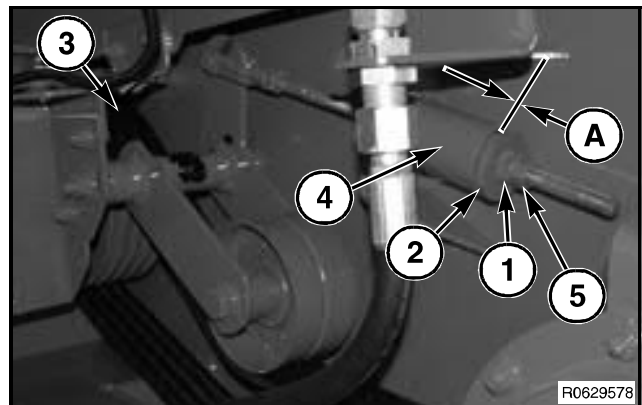


FIG. 35

FIG. 36: Install both cover plates (1).

Install the three washer head screws (2) retaining each cover plate.

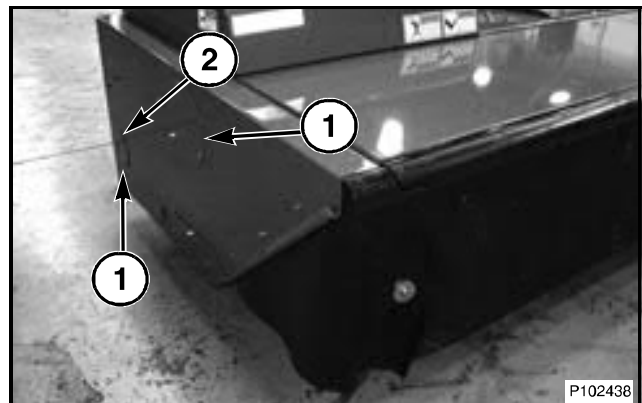


FIG. 36

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