

MASSEY FERGUSON

MF 2200

Large Square Baler

Models: 2240 / 2250 / 2260 / 2270 / 2270XD / 2290

SERVICE MANUAL

FROM MASSEY FERGUSON

TABLE OF CONTENT

General.....	1
Main frame.....	2
Drive system.....	3
Hydraulic system.....	4
Electrical system.....	5
Bale feeding system.....	6
Bale forming system.....	7
Accessories.....	8
Diagrams.....	9

3.1 Implement driveline

3.1.1 Power take-off types

Drive the machine with an American Society of Agricultural and Biological Engineers (ASABE) Type 2 or 3 power take-off (PTO). The PTO must rotate at 1000 rpm.

- Type 2 PTO shafts have 21 splines and have a diameter of 35 mm (1.375 in).
- Type 3 PTO shafts have 20 splines and have a diameter of 45 mm (1.75 in).

Type 2 and Type 3 PTOs use different equal angle implement drivelines (IDL).

The two types of equal angle IDLs have different lengths and different quick disconnect yokes.

IMPORTANT: *Adjust the tractor drawbar to prevent damage to the IDL.*

3.1.2 Equal angle implement driveline, if equipped

3.1.2.1 Connect a quick disconnect yoke to a power take-off



WARNING: Component failure hazard.

Injury or machine damage can occur.

The lock mechanism of the quick disconnect yoke must be in the groove on the shaft. Pull on the yoke after installation to make sure that the yoke will not pull off the shaft.

Procedure

1. Lubricate the splines (1) of the power take-off (PTO) shaft with oil or grease to help prevent spline wear.

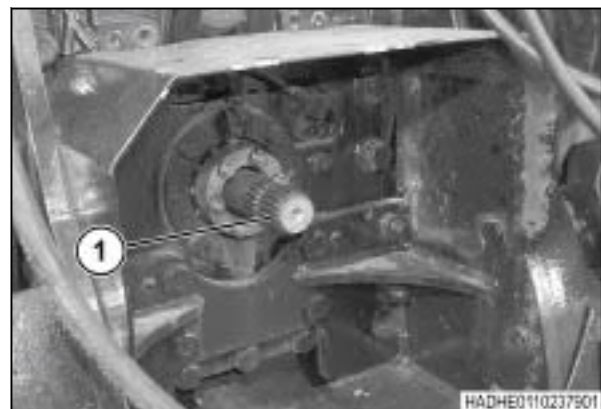


Fig. 1

2. Open the lubrication fitting (1) on the cone shield (2).
3. Turn the bearing (3) counterclockwise.
4. Pull the cone shield away from the quick disconnect yoke (4).

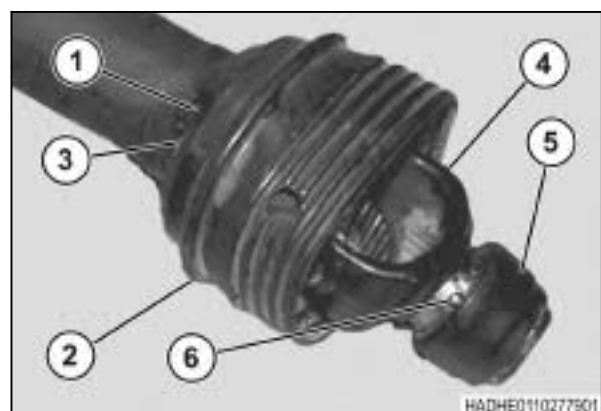


Fig. 2

5. Pull and hold the lock collar (5) of the quick disconnect yoke to the yoke.

3. Drive system

6. Move the quick disconnect yoke onto the PTO shaft. Make sure the lock mechanism (6) engages the groove on the PTO shaft.
Correct connection of the quick disconnect yoke and the PTO makes a sound.
7. Release the lock collar.
8. Pull the quick disconnect yoke to make sure the lock mechanism (2) has engaged the PTO shaft groove.
9. Move the cone shield (1) forward and lock in location.
10. Connect the chain (2) from the cone shield to the rear of the tractor.
11. Install the chain at right angles to the implement driveline (IDL). A chain at other angles puts a load on the cone shield bearings.
12. Wrap the chain around the cone shield 180 degrees. The additional extra length gives slack to prevent damage to the chain and cone shield.
13. Adjust or remove the tractor three point hitch arms to prevent interference with the machine tongue or the IDL.
If the arms touch the machine tongue or the IDL, damage will occur.

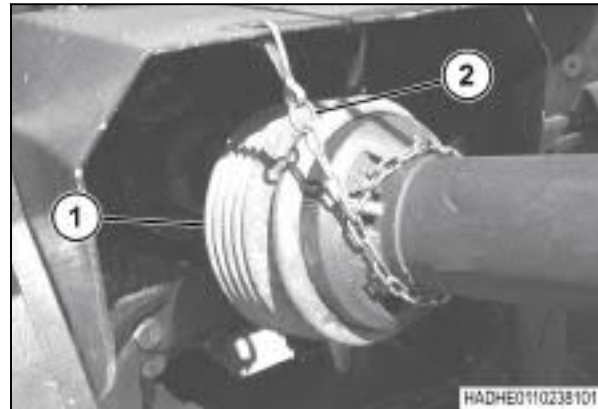


Fig. 3

3.1.2.2 Equal angle implement driveline angles

Make sure to:

- Park the tractor and machine on a solid level surface.
- Correctly connect the machine and tractor. See the information for connecting the machine to the tractor.

The distance (A) from the center of the hole (1) to the ground must be 550 mm (21.7 in)

The angles at the front U-joint (B) and the rear U-joint (C) must be equal to prevent vibration in the equal angle implement driveline (IDL).

Measure from the center of the power take-off (PTO) shaft to the ground (D).

- For Type 2 drivelines, the measurement (E) must be equal to measurement (D) plus 262 mm (10.3 in).
- For Type 3 drivelines, the measurement (E) must be equal to measurement (D) plus 310 mm (12.2 in).

NOTE: If angle B does not equal angle C, adjust the angles by adjusting the height of the intermediate bearing support (2).

Related Links

[Tractor setup dimensions with Type 2 or Type 3 power take-off](#) page 1-78

[Baler height setting](#) page 1-68

[Installing the machine hitch](#) page 1-80

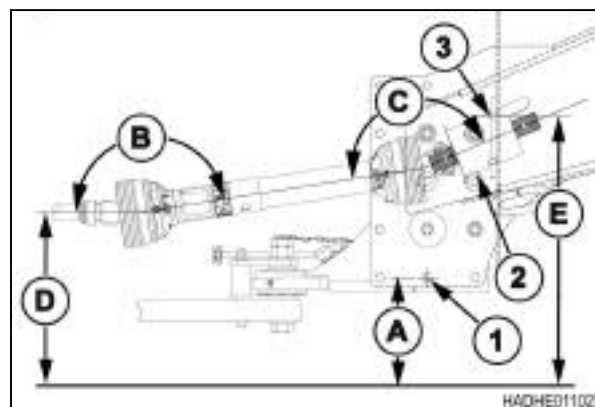


Fig. 4

3.1.2.3 Adjusting the angles of an equal angle implement driveline


Before starting the procedure

- Have the implement driveline (IDL) correctly connected to the tractor power take-off (PTO).
- Have the IDL correctly connected to the intermediate bearing support.

Procedure

1. Check the angles of the front and the rear U-joints.

The angles must be 169 degrees. If the angles do not equal 169 degrees do the following steps.

2.  **WARNING:**
WARNING: The intermediate bearing, shaft and support are heavy. Connect lifting equipment before removing the fastening hardware to avoid injury.

Connect lifting equipment to the intermediate bearing support (1).

The lifting equipment must support the weight of the intermediate bearing support and the shafts on both sides.

Remove the PTO sensor and the sensor wiring on the bottom side of the intermediate bearing support. If necessary, loosen a clamp on the wiring harness.

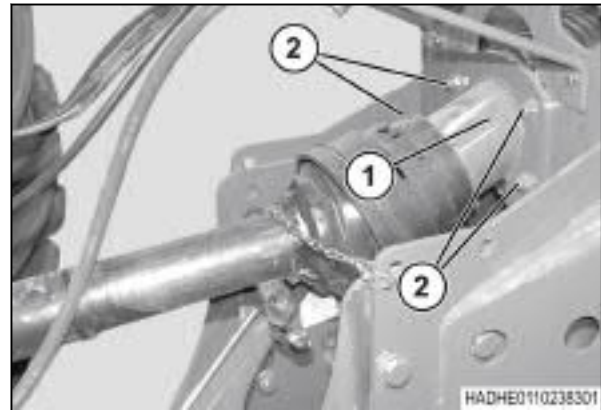


Fig. 5

3. Remove the fastening hardware (2) from the intermediate bearing support.
4. Adjust the position of the intermediate bearing support to make the angles equal.
5. Check the angles of the front and the rear U-joints.
The angles must be 169 degrees.
6. Install and tighten the fastening hardware.
7. Install the PTO sensor and the sensor wiring .

3.1.3 Constant velocity implement driveline, if equipped

3.1.3.1 Connecting a quick disconnect yoke to a power take off

Procedure

1. Lubricate the splines (1) of the power take off (PTO) with oil or grease to help prevent wear of the splines.

2. Remove the screws (1) holding the cone shield (2) in location.

3. Pull the cone shield away from the quick disconnect yoke.

4. Pull the locking collar (1) of the quick disconnect yoke toward the rear.

5. Slide the quick disconnect yoke onto the PTO.
The quick disconnect yoke makes a sound when the quick disconnect yoke connects to the PTO.

6. Release the locking collar.

7. Pull on the quick disconnect yoke. Make sure the spring loaded ball locking mechanism engages the groove on the PTO.



Fig. 6

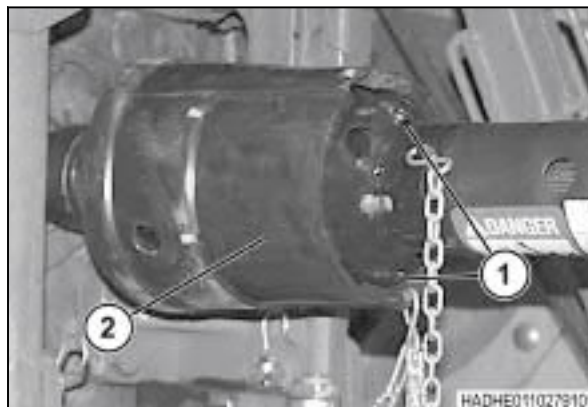


Fig. 7

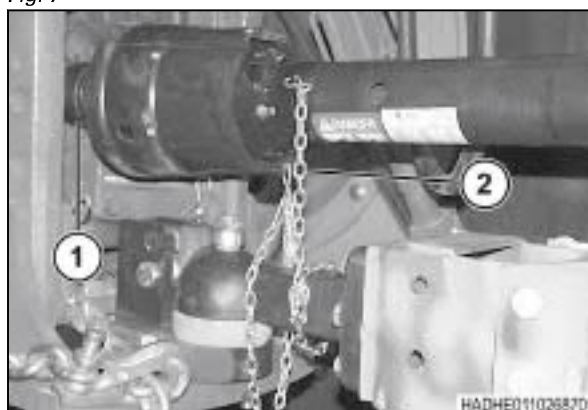


Fig. 8



WARNING:
A yoke that is not installed correctly can slip off a shaft and result in personal injury, or damage to the machine.
When installing a quick disconnect yoke the locking mechanism must be seated in the groove on the shaft.
Pull on the yoke after installing to make sure the yoke cannot be pulled off the shaft.

8. Pull the cone shield forward over the quick disconnect yoke.
9. Install the screws.
10. Connect the chain (2) on the implement driveline (IDL) guard to the back of the tractor.
11. Install the chain at right angles to the (IDL). A chain at other angles puts an excessive load on the cone shield bearings.
12. Wrap the chain around the cone shield 180 degrees. The extra length gives slack to prevent damage to the chain and cone shield.

3.1.3.2 Making marks on the constant velocity implement driveline

Before starting the procedure

Do not connect the constant velocity (CV) implement driveline (IDL) to the tractor.

Procedure

1. Completely retract the CV IDL.
2. Make a mark (1) on the inner shield even with the end of the outer shield.
 This mark indicates the minimum length of the CV IDL.
3. Extend the CV IDL 152 mm (6 in).
4. Make a mark (2) on the inner shield aligned with the end of the outer shield.
 This mark indicates the middle of the CV IDL.
5. Extend the CV IDL another 152 mm (6 in).
6. Make a mark (3) on the inner shield aligned with the end of the outer shield.
 This mark indicates the maximum length of the CV IDL.

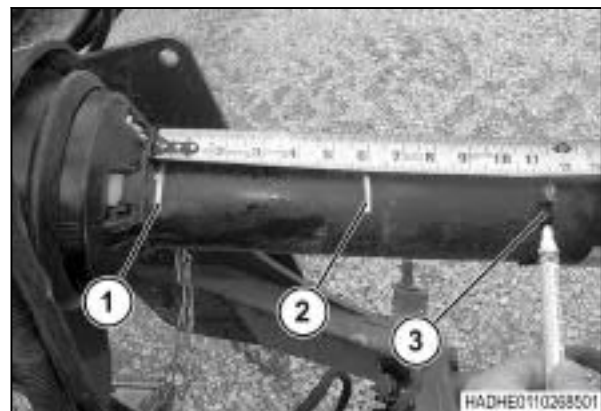


Fig. 9

3.1.3.3 Checking the constant velocity implement driveline angle

Procedure

1. Check the angle of the U-joint (1) on the rear of the constant velocity (CV) implement driveline (IDL).
The angle must be as straight as possible.
2. Align the CV IDL (2) with the intermediate shaft (3).
3. If necessary, adjust the position of the intermediate bearing support (4).

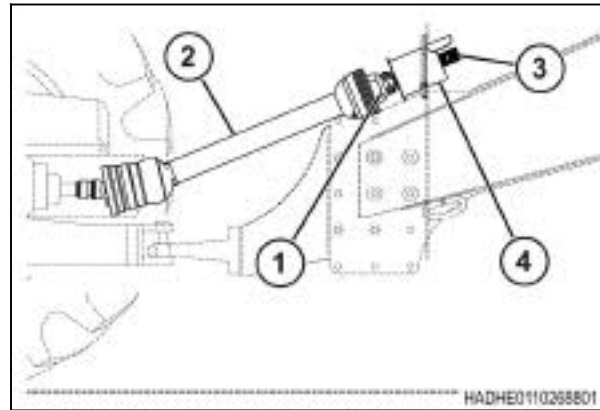



Fig. 10

3.1.3.4 Adjusting the constant velocity implement driveline angle

Procedure

1.  **WARNING:**
The intermediate bearing, shaft and support are heavy. Connect lifting equipment before removing the bolts to avoid injury.

IMPORTANT: Be careful not to damage the PTO sensor or wiring, on the bottom side of the intermediate bearing support. Loosen the clamp on the wiring harness if necessary.

Connect lifting equipment with the correct capacity to the intermediate bearing support (1).

2. Remove the hardware (2) that fastens the intermediate bearing support to the mounting plate.
3. Adjust the intermediate bearing support to make the U-joint (3) as straight as possible.
NOTE: In some installations, the intermediate bearing support cannot be raised high enough. The rear U-joint will have to operate at an angle.
4. On high mount hitches, check for clearance (4) between the CV IDL and the front of the hitch bracket.
If necessary, lower the intermediate bearing support to get the correct clearance.
5. Install and tighten the hardware.

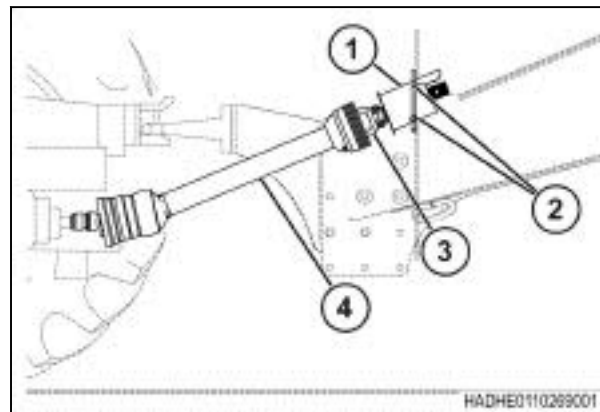


Fig. 11

3.1.3.5 Checking the constant velocity implement driveline clearance

Procedure

1. Check the three point hitch arms, the machine tongue, and the constant velocity (CV) implement driveline (IDL) for interference.

If the three point hitch arms contact the machine tongue or the CV IDL, damage can occur.

2. Adjust or remove the three point hitch arms to stop interference with the machine tongue or CV IDL.
3. Watch the CV IDL when driving over ridges or through ditches. Make sure the following conditions do not occur.

- The CV IDL must not retract or extend too far.
- The CV IDL must not touch any hitch components.

4. Do the following instructions for each of the four positions.

The positions are like making turns, driving over ridges, and driving through ditches.

See information for making marks on the CV IDL.

(1) Align the tractor and the machine. Put the front of the tractor 15 degrees down. Have the machine level.

(2) Align the tractor and machine. Put the front of the tractor 15 degrees up. Have the machine level.

(3) Steer the tractor as far to the right-hand as possible. Put the front of the tractor 15 degrees down. Have the machine level.

(4) Steer the tractor as far to the right-hand as possible. Put the front of the tractor 15 degrees up. Have the machine level.

a) Check the marks on the inner shield of the CV IDL. Make sure the CV IDL does not retract beyond the front mark on the inner shield.

b) Check the marks on the inner shield of the CV IDL. Make sure the inner shield does not have a gap between the rear mark and the outer shield.

c) Check for interference between the CV IDL and the hitch components.

d) Correct any problems by changing or replacing the tractor drawbar.

e) Check the machine hitch and CV IDL adjustments again.

5. Do this procedure until the CV IDL, the hitch components, and the tractor drawbar work correctly.



Fig. 12

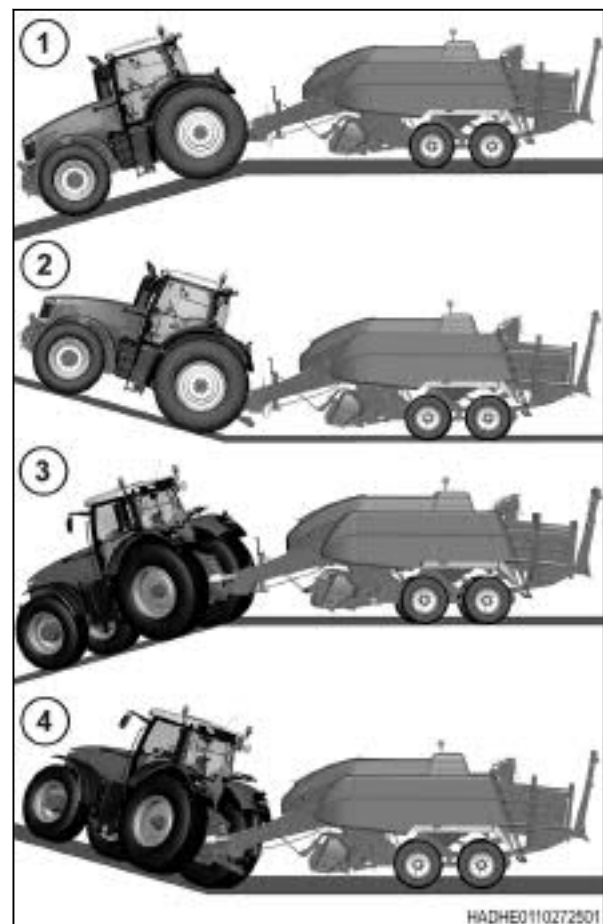


Fig. 13

3.1.4 Removing the implement driveline (IDL)

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
2. Remove the implement driveline (IDL) shields.
3. Rotate the nylon bearing (1) to align the split with the arrow (2) on the shield.

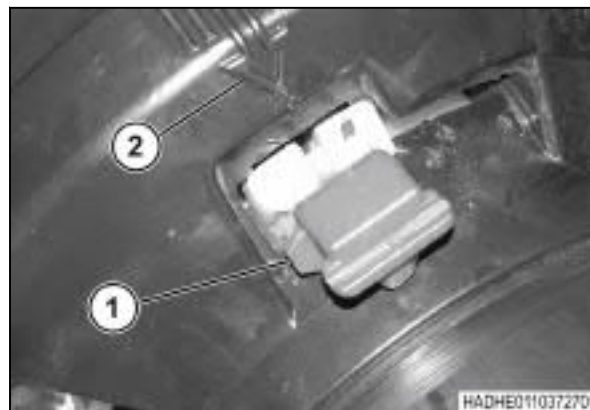


Fig. 14

4. Slide the shield (1) away from the constant velocity joint (CV joint) or the U-joint.
5. If there is a clamp yoke at the front of the implement driveline (IDL), remove the bolts from the clamp yoke and remove the clamp yoke from the power take-off (PTO).
6. If there is a quick disconnect at the front of the IDL, release the quick disconnect yoke and remove the quick disconnect yoke from the PTO shaft.
7. Slide the tractor and the implement sides of the IDL away from each other to separate the shafts.
8. Hold the IDL and remove the bolts from the clamp yoke at the rear of the IDL. Remove the IDL from the main drive shaft.



Fig. 15

3.1.5 Installing the implement driveline (IDL)

Procedure

1. Release the latches (1) that hold the outer shield (2) to the intermediate bearing support.
2. Remove the retaining ring and the outer shield.
3. Find the cone shield on the rear of the implement driveline (IDL).
4. Rotate the bearing (1) counterclockwise until the split (2) in the bearing aligns with the arrow (3) on the cone shield.
5. Slide the cone shield forward on the IDL.
6. Slide the rear retaining ring and the outer shield (1) forward on the IDL.
7. Remove the bolts and the nuts from the clamp yoke (2) on the rear of the IDL.
8. Lubricate the splines of the intermediate shaft. This will help reduce wear on the splines.
9. Make sure the intermediate bearing support height is correct before installing the IDL.

IMPORTANT: *Correct intermediate bearing support height adjustment gives equal joint angles. Equal joint angles make for smooth operation and long IDL life.*

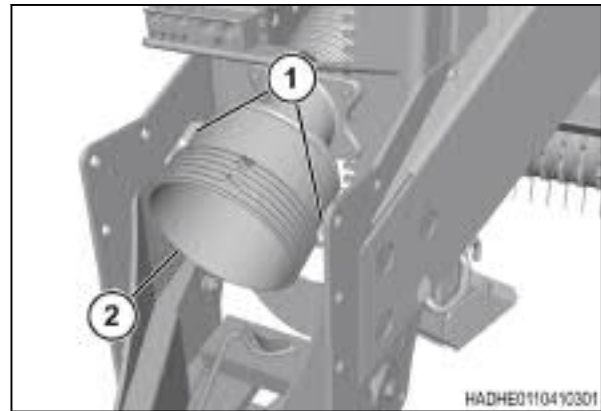


Fig. 16



Fig. 17



Fig. 18

3. Drive system



10. Slide the clamp yoke (1) onto the intermediate shaft (2).
11. Align the holes in the clamp yoke with the groove on the intermediate shaft.
12. Install the bolts and the nuts.
13. Tighten the nuts on the clamp yoke to 205 Nm (150 lbf ft).



WARNING:

A yoke that is not installed correctly can slip off a shaft and result in personal injury or damage to the machine. When installing a clamp yoke, tighten the bolts to the correct torque. Pull on the yoke after installing to make sure the yoke cannot be pulled off the shaft.

14. Align the bolts (1) with the holes (2) in the bearing housing.
15. Install the outer shield and fasten the latches.

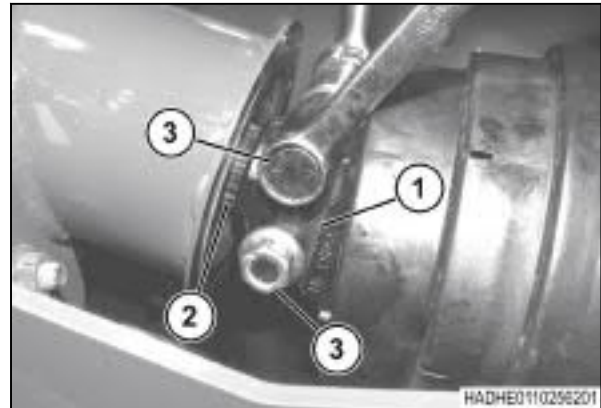


Fig. 19

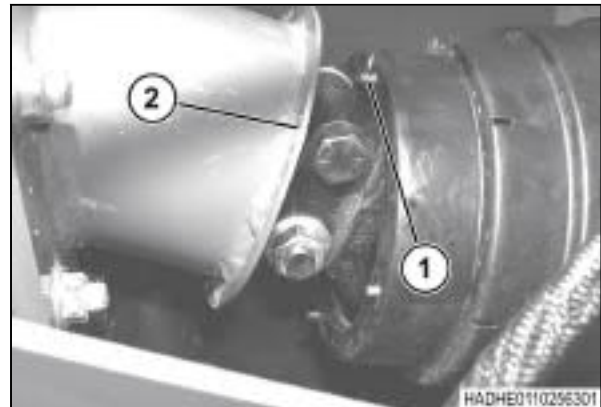


Fig. 20

16. Slide the shields on the IDL to the rear.
17. Rotate the bearing (1) clockwise until the split (2) in the bearing is all the way to the right-hand side of the slot (3).



Fig. 21

18. Connect the rear IDL chain (1) to the machine at 90 degrees to the IDL. The chains must be able to wrap at least 180 degrees around the IDL cover.
19. Lubricate the cone shield bearings and all other lubrication locations on the IDL.

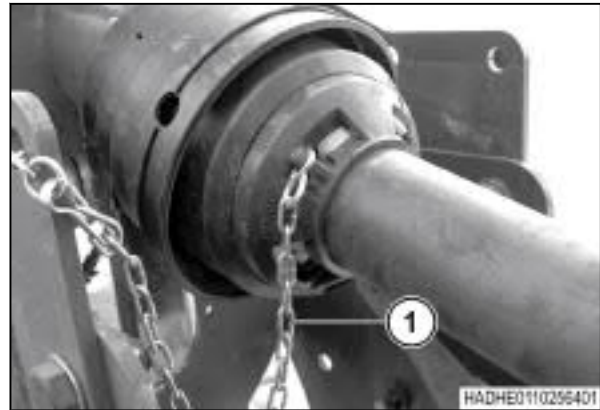


Fig. 22

20. Put the IDL support (1) in the support position.
21. Install the IDL (2) onto the IDL support.
22. Lubricate the cone shield bearings through the lubrication fittings (3). Make sure to lubricate all other lubrication locations on the IDL.

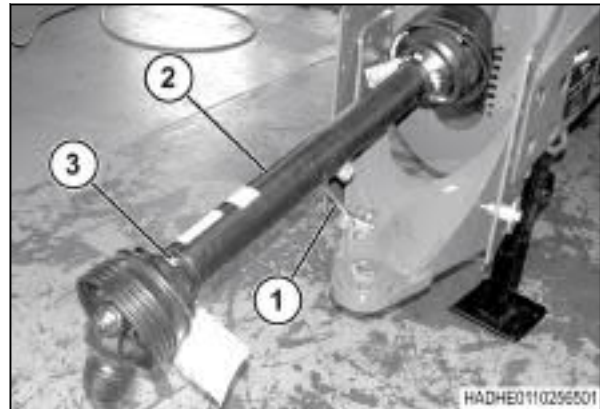


Fig. 23

3.1.6 Replacing a pawl on a quick disconnect yoke

Procedure

1. Park the machine on a solid level surface. Stop the engine, apply the park brake, and take the key with you.
2. Remove the implement driveline (IDL) from the tractor. See the information for removing an implement driveline.
3. Rotate the nylon bearing (1) to align the split with the arrow (2) on the shield.

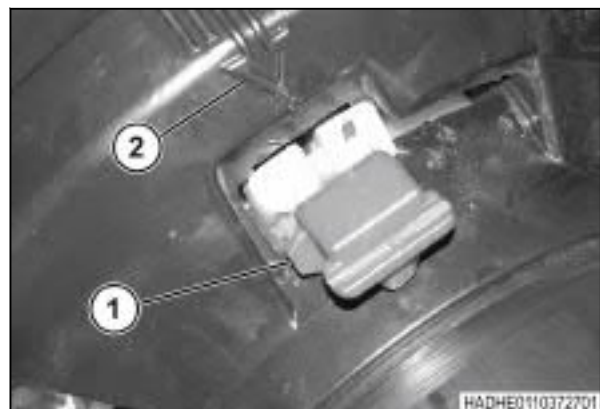


Fig. 24

3. Drive system

4. Slide the shield (1) away from the constant velocity joint (CV joint) or the U-joint.



Fig. 25

5. Pull the collar back to compress the spring and remove the retaining ring (1).

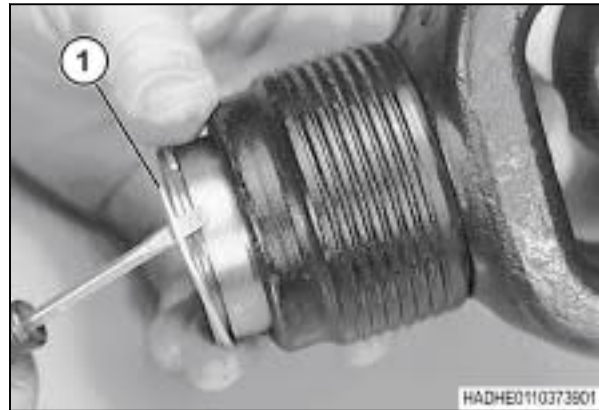


Fig. 26

6. Remove the collar (1) and the spring (2).

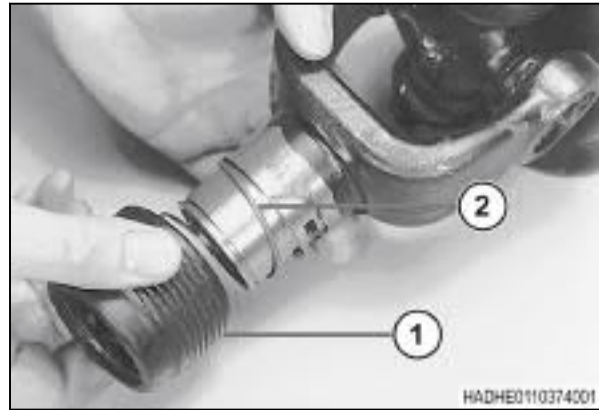


Fig. 27

7. Remove the pawls (1) from the yoke.

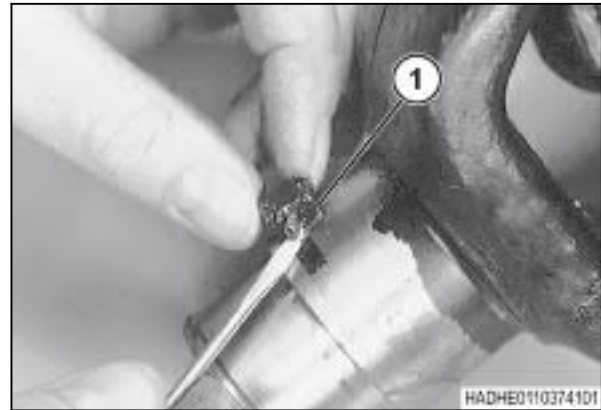


Fig. 28

8. Apply grease to the new pawls (1) and install the pawls in the yoke.

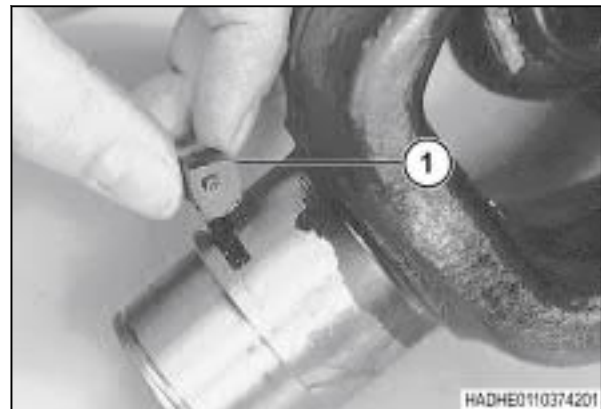


Fig. 29

9. Install the small end of the spring (2) on the yoke, then install the collar (1).



Fig. 30

10. Pull the collar back to compress the spring and then install the retaining ring (1).
11. Install the IDL on the machine. See the information for installing the IDL.

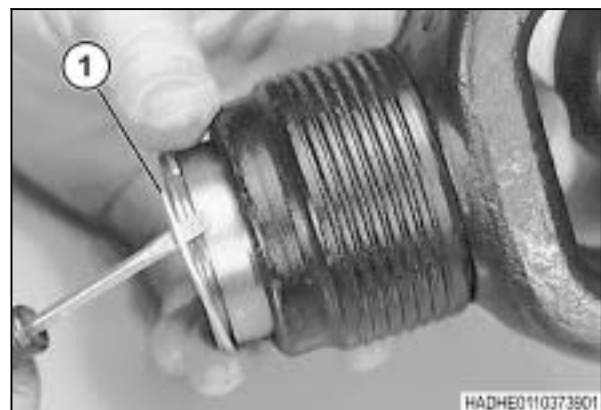


Fig. 31

3.1.7 Replacing the cross and bearing

The procedures for different types of U-joints are the same or almost the same as shown. The pictures and types can be different but the procedure will apply.

Procedure

1. Remove the drive shaft from the machine.
2. Remove the lock rings (1).
3. Put the yoke on a support that has an opening that is larger than the bearing cap. Press the bearing cap most of the way out of the yoke. Do not press the bearing cap all the way out of the yoke.
4. Fasten the bearing cap in a vise and pull the yoke from the bearing cap.
5. Put the yoke on the support and press the opposite bearing cap out of the yoke. If the bearing cap cannot be pressed all the way out, fasten the bearing cap in a vise. Pull the yoke from the bearing cap.



Fig. 32



Fig. 33



Fig. 34

6. Remove the yoke from the cross.



Fig. 35

7. Put the yoke on the support and press the bearing cap most of the way out of the yoke. Do not press the bearing cap all the way out of the yoke.
8. Fasten the bearing cap in a vise and pull the yoke from the bearing cap.

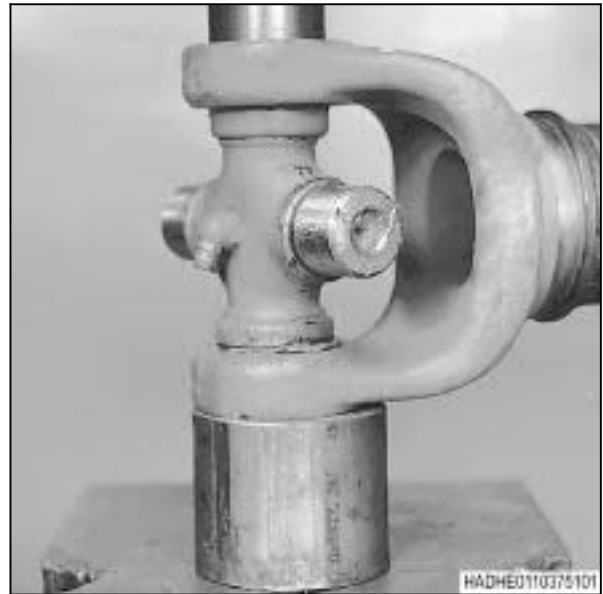


Fig. 36

9. Put the yoke on the support and press the opposite bearing cap out of the yoke.

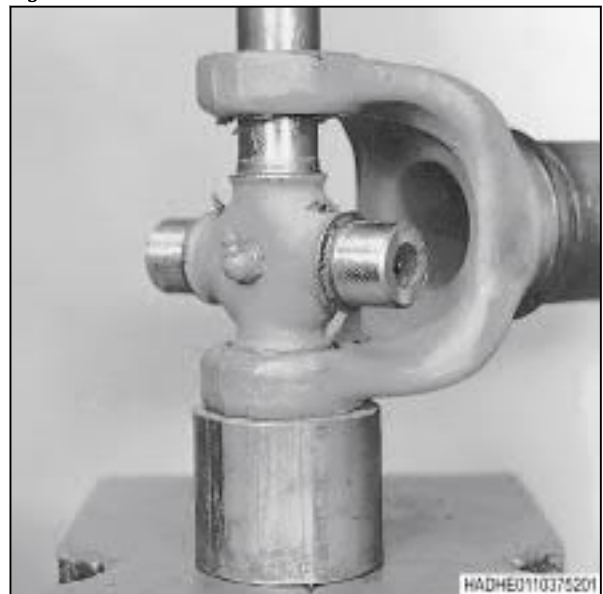


Fig. 37

3. Drive system

10. Remove the cross from the yoke.
11. Remove the bearing caps from the new cross.



Fig. 38

12. Press a new bearing cap approximately half the length of the bearing cap into the yoke.



Fig. 39

13. Carefully install the cross into the bearing cap.



Fig. 40

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