Contents

INTRODUCTION

Power Take-Off (PTO) 31

[31.201] Power Take-Off (PTO) drive shaft 31.1

[31.214] Secondary Power Take-Off (PTO) 31.2

[31.215] Intermediate Power Take-Off (PTO) 31.3

[31.220] Gearbox 31.4

[31.225] Clutches 31.5

Hydraulic systems 35

[35.000] Hydraulic systems 35.1

[35.410] Header or attachment height system 35.2

[35.415] Header or attachment tilting system 35.3

[35.947] Frame positioning swinging 35.4

Wheels 44

[44.530] Carrying and transport wheels 44.1

Electrical systems 55

[55.404] External lighting 55.1

Attachments/Headers 58

[58.110] Attachment/Header cutting mechanism 58.1

[58.130] Attachment/Header frame 58.2

Product feeding 60

[60.120] Header drive system 60.1

[60.620] Roll conditioning 60.2

[60.630] Flail conditioning 60.3

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Safety rules

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: *Notice indicates a situation that, if not avoided, could result in machine or property damage.*

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: *Note indicates additional information that clarifies steps, procedures, or other information in this manual.*

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

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Torque - Nominal tightening torques for normal assembly

NOTE: *In the metric tables, nominal sizes M4 through M8 hardware torque specifications are shown as a Newton meters (pound-inches) numerical value.*
Nominal sizes M10 through M24 hardware torque specifications are shown as a Newton meters (pound-feet) numerical value.

Metric hex head (non-flange) hardware

Plain (PLN) – an unplated hardware finish with residual manufacturing oils
Zinc-dichromate (ZND) – a yellow colored chemical plating formula yellow applied to the hardware

Nominal size	Class (CL) 8.8 bolt and Class (CL) 8 nut	Class (CL) 10.9 bolt and Class (CL) 10 nut	Locknut CL 8 w/CL 8.8 bolt	Locknut CL 10 w/CL 10.9 bolt
	PLN and ZND	PLN and ZND	ZND	ZND
	N·m (lb in)	N·m (lb in)	N·m (lb in)	N·m (lb in)
M4	3.5 (31)	5.0 (44)	1.4 (13)	2.8 (25)
M5	7.0 (62)	10 (88)	2.9 (26)	5.5 (49)
M6	11.8 (104)	17 (150)	4.9 (43)	9.4 (83)
M8	28.8 (255)	41.3 (366)	11.9 (105)	23 (204)
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
M10	57 (42)	82 (60)	24 (17)	45 (33)
M12	100 (74)	143 (105)	41 (30)	79 (38)
M14	159 (117)	227 (168)	66 (48)	125 (92)
M16	248 (183)	354 (261)	102 (75)	195 (144)
M18	352 (260)	487 (359)	145 (107)	268 (198)
M20	500 (369)	690 (509)	206 (152)	380 (280)
M24	865 (638)	1195 (882)	357 (263)	657 (485)

Metric flange head hardware

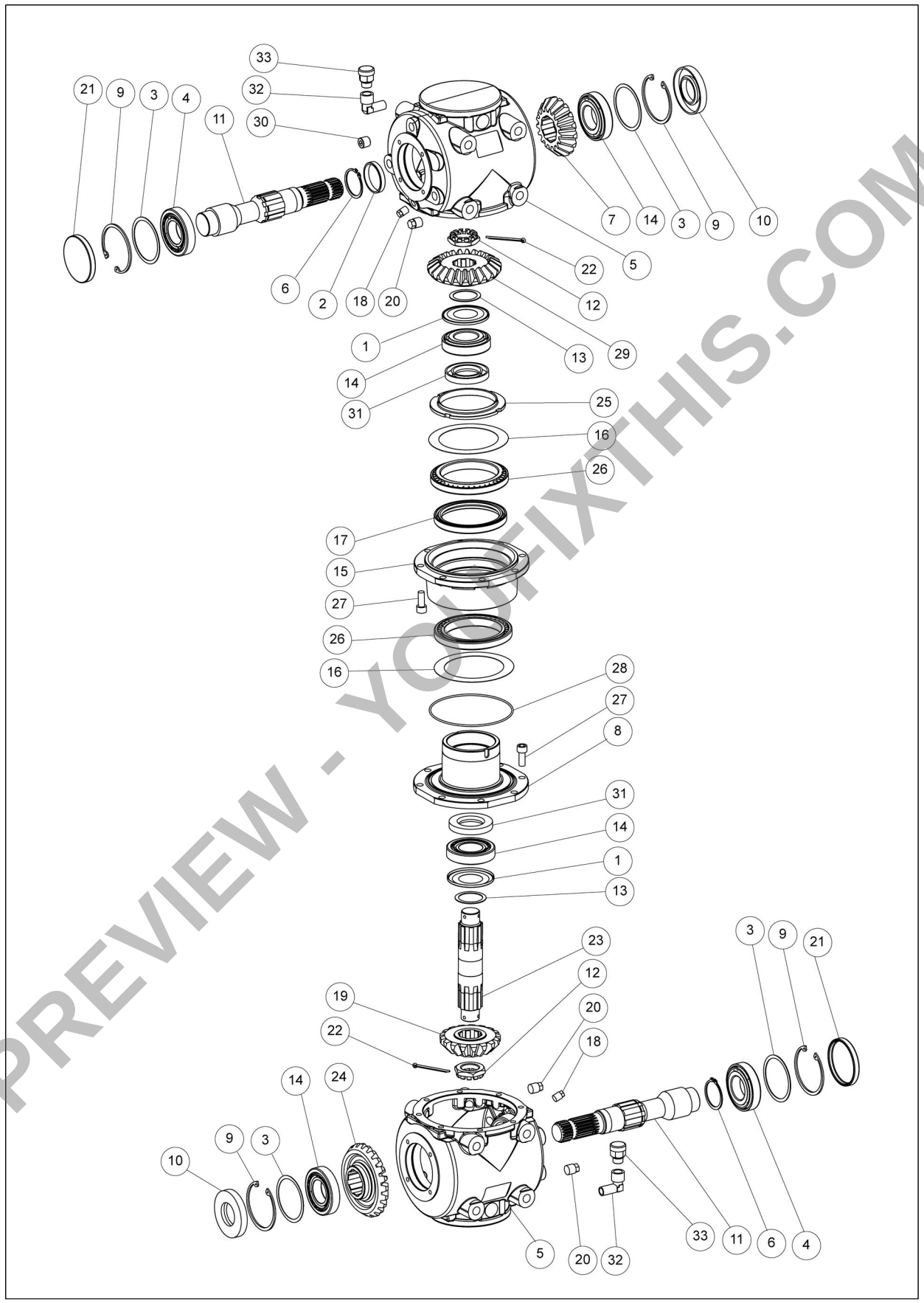
Plain (PLN) – an unplated hardware finish with residual manufacturing oils
Zinc-dichromate (ZND) – a yellow colored chemical plating formula yellow applied to the hardware

Nominal size	Class (CL) 8.8 bolt and Class (CL) 8 nut	Class (CL) 10.9 bolt and Class (CL) 10 nut	Flange locknut CL 8 w/CL 8.8 bolt	Flange locknut CL 10 w/CL 10.9 bolt
	PLN and ZND	PLN and ZND	ZND	ZND
	N·m (lb in)	N·m (lb in)	N·m (lb in)	N·m (lb in)
M4	3.8 (34)	5.5 (49)	4.2 (37)	6.1 (54)
M5	7.7 (68)	11 (97)	8.5 (75)	12 (106)
M6	13 (115)	18.7 (166)	14.3 (127)	20.6 (182)
M8	31.7 (281)	45.5 (403)	35 (310)	50 (443)
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
M10	63 (47)	90 (66)	69 (51)	99 (73)
M12	110 (81)	157 (116)	121 (89)	173 (128)
M14	175 (129)	250 (184)	193 (142)	275 (202)
M16	272 (201)	389 (287)	299 (221)	428 (316)
M18	387 (286)	535 (395)	426 (315)	589 (435)
M20	550 (406)	759 (560)	605 (447)	835 (616)
M24	951 (702)	1315 (970)	1046 (772)	1447 (1067)

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Gearbox - Exploded view of swivel gearbox



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Attachment/Header cutting mechanism - Troubleshooting for Roll Units

Problem	Possible Cause	Correction
Leaves damaged or stripped off stems.	Too much pressure on the rolls.	Reduce the pressure until the leaves are not damaged.
Leaving ragged or long stubble.	Ground speed too fast.	Reduce the ground speed.
	Dull, bent, or broken knives.	Turn over or replace the knives.
	Knives installed on wrong discs.	Install knives on correct discs.
	PTO speed too slow.	Maintain RPM on the tractor PTO. (Do not overspeed.)
	Cutting too high.	Remove high stubble kit, if installed. Increase header tilt.
	Header flotation too light.	Adjust flotation springs to increase header flotation weight.
Excessive breakage of the knives.	Cutting too low in stony conditions.	Raise the cutting height with header tilt. Install high stubble kit.
	Header flotation too heavy for stony fields.	Adjust the flotation springs to float the header with **45 kg** (**100 lb**) force, per side.
	Ground speed too high in stony conditions.	Reduce ground speed.
Not cutting short enough in down material.	Ground speed too fast.	Reduce ground speed.
	Broken, bent, or dull knives.	Replace the knives or turn over the knives.
	Cutting height too high.	Lower the cutting height by tilting the header.
	Tractor PTO speed too slow.	Maintain tractor PTO RPM. (Do not overspeed.)
Strip of run-down, uncut material.	Ground speed too fast.	Use slower ground speed.
	Crowding of the uncut material.	Do not crowd the uncut material.
	Missing or dull knives.	Replace or turn over the knives.
	Material buildup on cutter bar.	Clean off cutter bar. Tilt cutter bar back towards horizontal to reduce material buildup.
Forming poor or bunchy windrow	Tractor PTO speed too slow.	Maintain RPM on the tractor PTO. (Do not overspeed.)
	Incorrect swath gate adjustment.	Adjust the swath gate to even discharge flow.
	Incorrect windrow shield adjustment.	Adjust the windrow shields.
Pulling material out of the ground when cutting back swath or tall material is leaning into the machine. Excessive power requirements.	Excessive roll pressure.	Reduce roll pressure or increase roll clearance.
	Ground speed too slow.	Use faster ground speed.
Material being discharged out of the left side of the machine.	Cutter bar not taking a full cut; #1 disc not running in standing crop.	Shift unit right into standing crop to take full cut.
	Inner left side curtain worn or damaged.	Replace inner left side curtain.
Soil buildup on front of cutter bar.	Very wet crop conditions.	Adjust flotation springs to reduce header flotation weight.
		Raise the cutting height with header tilt.
		Install high stubble kit.

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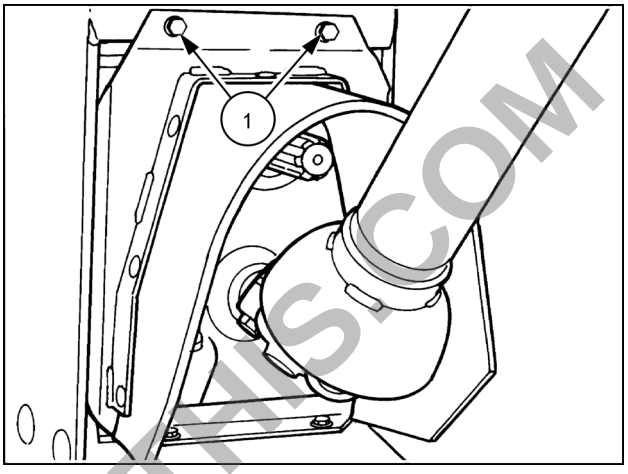
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Power Take-Off (PTO) drive shaft - Remove - 540 RPM

NOTE: *The rear half of the primary Power Take-Off (PTO) shaft and the secondary drive shaft must be removed from the machine in order to repair the universal joints or guards.*

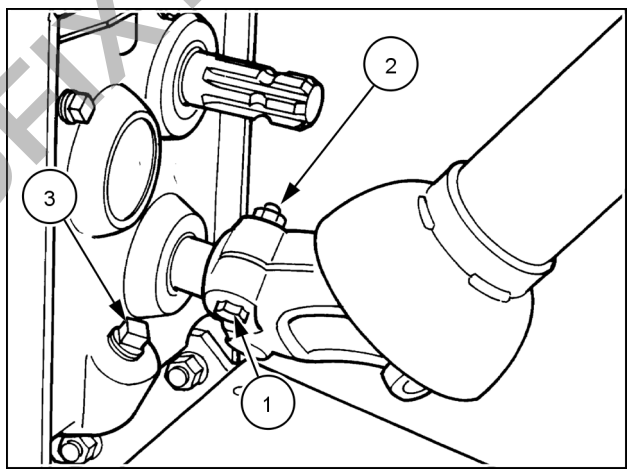
Standard tongue

1. Remove the front PTO shield by removing two **5/16 in** x **3/4 in** bolts and lock washers at **(1)**.



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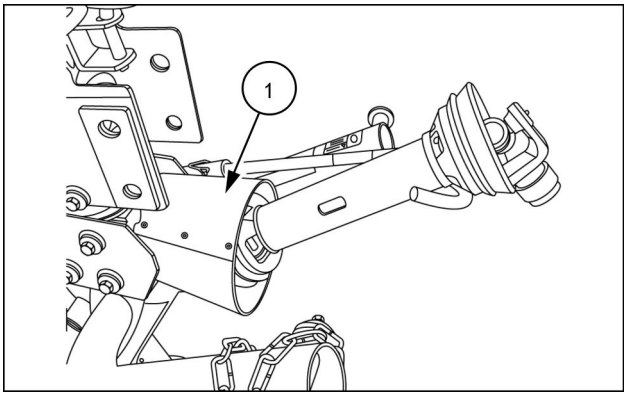
2. Remove the **1/2 in** x **3 in** bolt **(1)** and locknut, and then slide the PTO shaft off of the gearbox shaft.



3657-6 2

Swivel tongue

3. Remove the plastic PTO shield **(1)** and slide it back to gain access to the PTO slide collar.
4. Pull back on the collar to unlock the pins and remove the PTO shaft off the swivel gearbox PTO shaft.



93098062 3

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INTRODUCTION

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Contents

Power Take-Off (PTO) - 31

Power Take-Off (PTO) drive shaft - 201

FUNCTIONAL DATA

Power Take-Off (PTO) drive shaft
Overview . . . 3

Yoke assembly
Overview - Auto slide lock . . . 4

Universal joint
Overview . . . 5

SERVICE

Power Take-Off (PTO) drive shaft
Remove - 540 RPM . . . 6
Disassemble - 540 RPM - Guards . . . 7
Inspect - 540 RPM - Guards . . . 9
Assemble - 540 RPM - Guards . . . 10
Install - 540 RPM . . . 12
Remove - 1000 RPM . . . 13
Disassemble - 1000 RPM - Guards . . . 14
Assemble - 1000 RPM - Guards . . . 16
Install - 1000 RPM . . . 20

Yoke assembly
Disassemble - Auto slide lock . . . 21
Assemble - Auto slide lock . . . 22

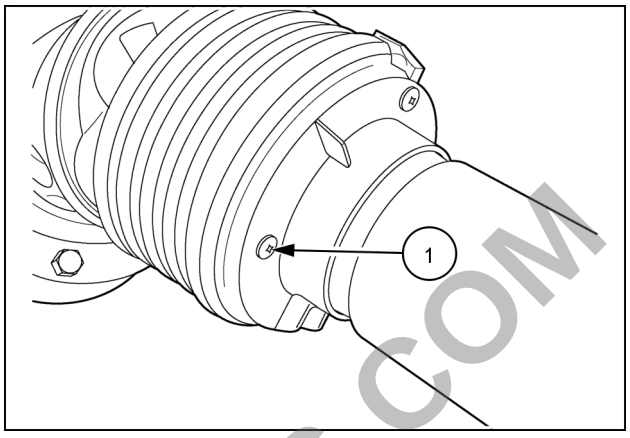
Universal joint
Disassemble . . . 23
Inspect . . . 24
Assemble . . . 25

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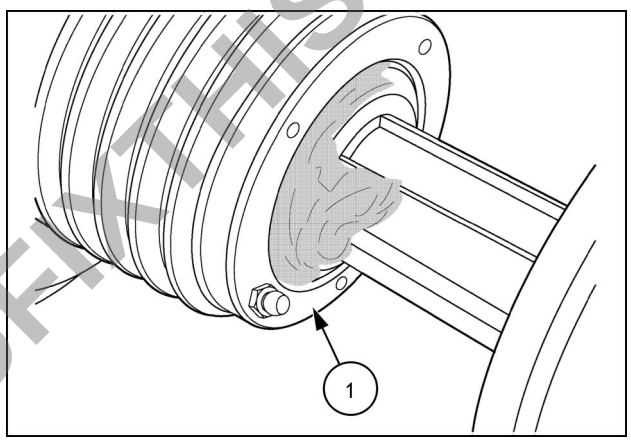
Drive shaft - Disassemble

1. At either end, remove the screws **(1)** that secure the shield, the cone shield, and the support ring together.



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2. Slide the two shafts apart.
3. Slide the cone shield **(1)** off of the support ring.

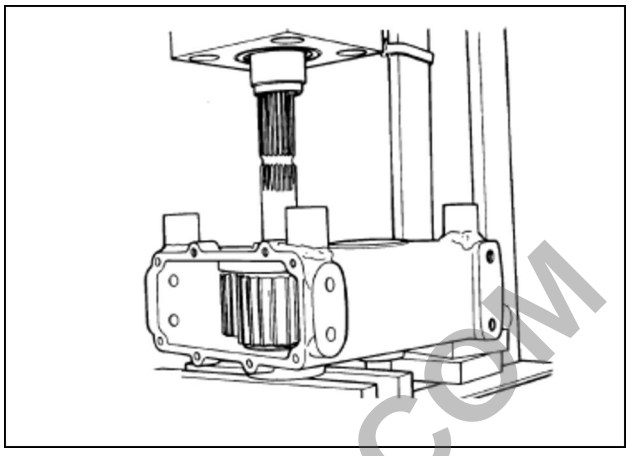


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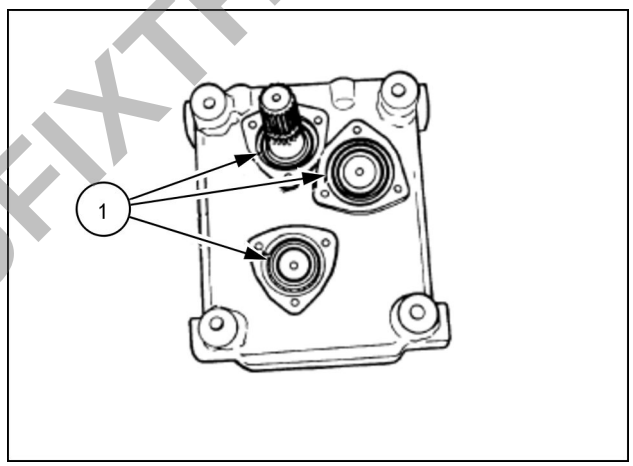
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6. Position the gearbox housing in a press with the front of the gearbox facing down. Apply oil to the bearing cone, and install it into the bearing cup in the housing. Place the 39T drive gear into the housing over the bearing and insert the input shaft through the gear and bearing cone. Press the input shaft as required to fully seat bearing cone against the shoulder on the shaft.
7. Apply oil to the new intermediate shaft bearing cone, and install it into the bearing cup in the housing; place a 21T gear over bearing. Insert the intermediate shaft down through the gear until end of shaft is started into bearing cone. Press the shaft to seat bearing cone against the shoulder on shaft.
8. Apply oil to the new output shaft bearing cone, and install it into the bearing cup in the housing; lace the remaining 21T gear over the bearing. Insert the 6-spline end of the output shaft down through the gear and bearing cone. Press the output shaft as required to seat the bearing cone against the shoulder on shaft.
9. Install the three bearing cups **(1)** into the rear of the gearbox.

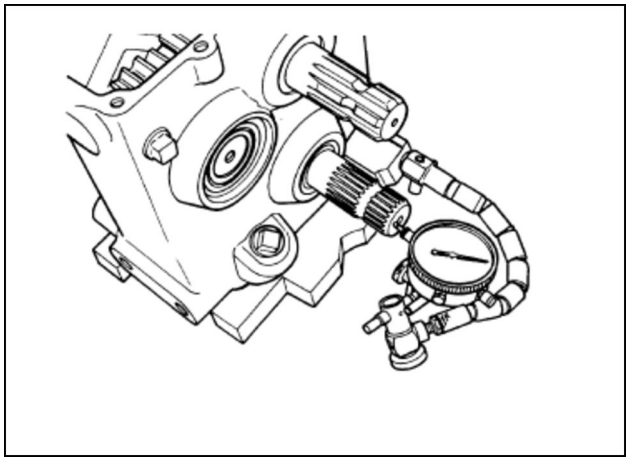


1411_4_8 4



1411_4_9 5

10. Install the input shaft bearing cap and original shim pack using three bolts and lock washers. If the original shim pack is destroyed, or if all new parts are being used, use a starting shim pack thickness of **1.02 - 1.27 mm** (**0.040 - 0.050 in**). Install a dial indicator and measure input shaft end play. Install shims as required to adjust the end play of the shaft between **0.025 - 0.076 mm** (**0.001 - 0.003 in**).



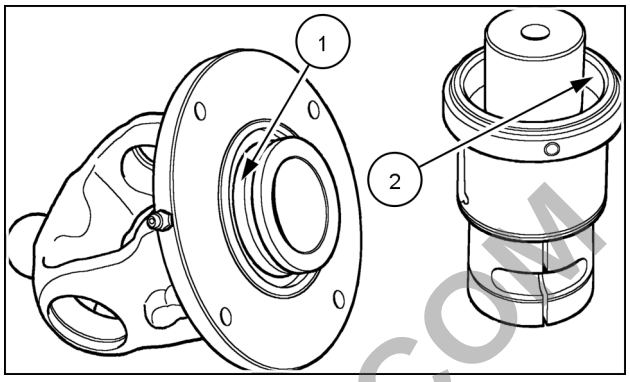
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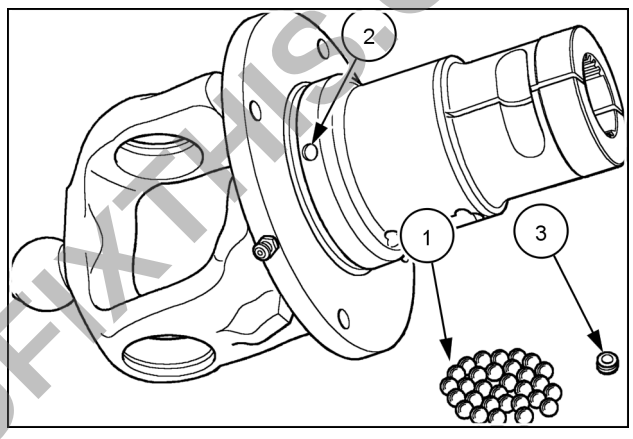
Overrunning clutch - Assemble

1. Apply a film of grease to the inner **(1)** and outer **(2)** race of the ball bearing cavity.



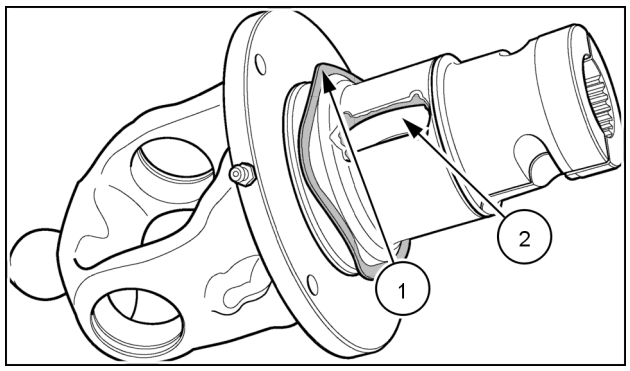
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2. Set the outer yoke shaft onto the inner shaft. Insert the ball bearings **(1)** into the cavity **(2)** until all thirty are in place. Turn in the set screw **(3)** and tighten it securely. Apply grease through the zerk while rotating the overrunning hub to distribute the lubricant evenly. Wipe away and excess grease.



50006852 2

3. Slide the spring washer **(1)** in place over the yoke shaft. Apply grease to the spring recesses in the shaft and set the leaf springs **(2)** into place with the concave side facing toward the center.



50006853 3

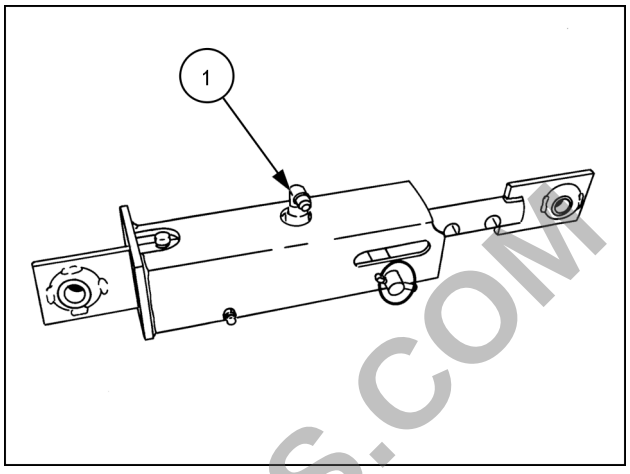
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Cylinder - Disassemble - Tilt cylinder

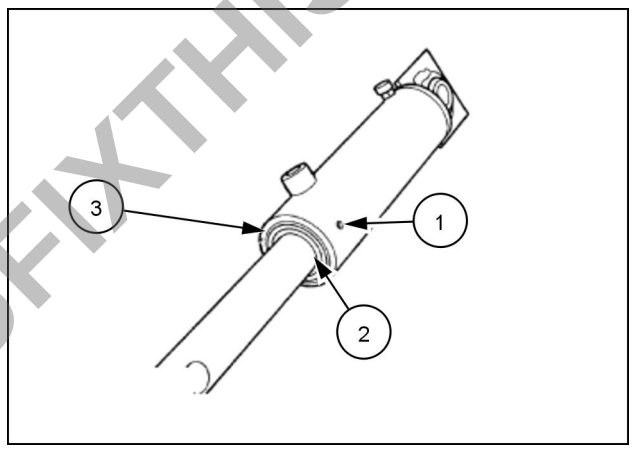
1. Remove the **90 °** elbow **(1)** from the cylinder port, if not already removed. This will allow removal of the limit channel.

NOTE: *Art for reference only.*



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2. Remove the set screw **(1)**.
3. Tap the cylinder head **(2)** into the cylinder far enough to remove the retaining ring **(3)** with a screwdriver.

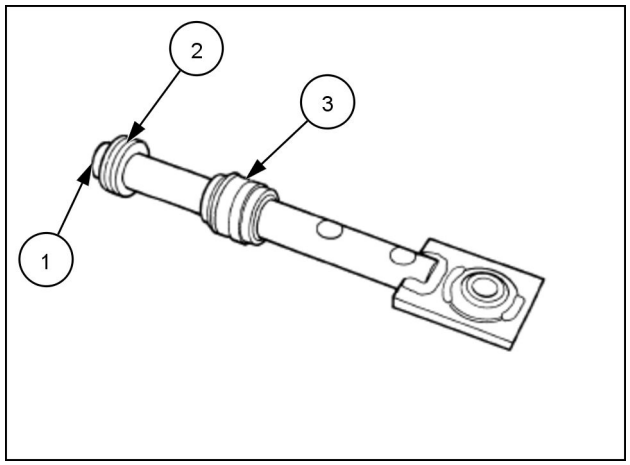


1411_9_3 2

4. Pull the complete piston rod assembly out of the cylinder barrel.

NOTE: *All O-rings and seals should be replaced.*

5. Capture the piston rod using a bar through the one of the holes in the rod, and then remove rod nut, Slide off the piston **(2)** and the cylinder head **(3)**.



1411_9_4 3

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Turn signal and/or hazard lights - General information

	Implement lights			
Tractor lights	**Left-hand amber**	**Left-hand red**	**Right-hand red**	**Right-hand amber**
Headlights OFF	-	Off	Off	-
Headlights ON	-	Dim	Dim	-
Amber flashing lights OFF	Off	-	-	Off
Amber flashing lights ON	Flashing (same rate as right-hand light)	-	-	Flashing (same rate as left-hand light)
Brake lamps* (brakes applied)	-	Bright*	Bright*	-
Amber flashing lamps ON -no turn indicated (tractor with brake lamps)	Flashing (same rate as right-hand light)	Bright*	Bright*	Flashing (same rate as left-hand light)
Amber flashing lamps ON -no turn indicated (no tractor brake lamps)	Flashing (same rate as right-hand light)	Off**	Off**	Flashing (same rate as left-hand light)
Left-hand turn indicated	Increased flash rate	Off, dim, or flashing*** in unison with left-hand light	Off or dim	Illuminated, no flashing
Right-hand turn indicated	Illuminated, no flashing	Off or dim	Off, dim, or flashing*** in unison with right-hand light	Increased flash rate

NOTE: *Check local laws or regulations concerning agricultural machinery lighting and marking.*

NOTE: *CASE IH recommends the use of headlights when you travel on roads.*

* Implement brake lights (red) to illuminate when the tractor brakes are applied (tractor with brake lights).

** If the tractor does not have brake lights, install an implement lighting control module to attain enhanced turn signal function.

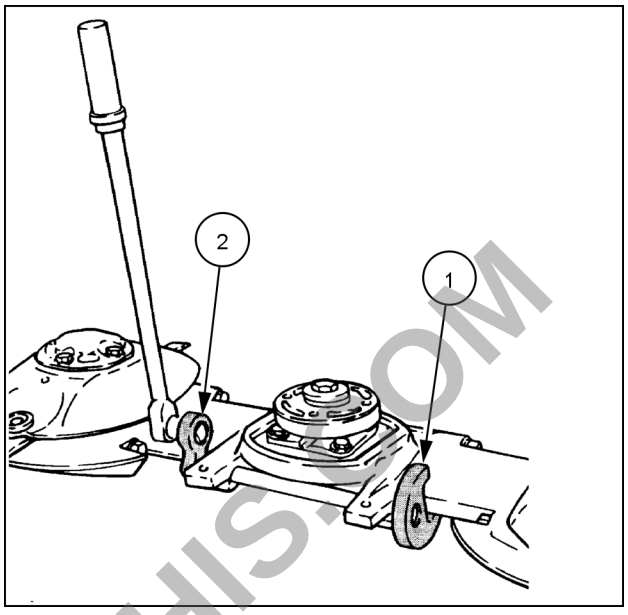
*** If the brake light (red) flashes in unison with the amber flasher indicating the direction of the turn (if the tractor is not equipped with brake lights), install an implement lighting control module.

NOTE: *The implement lighting control module controls the amber lamps and the brake light circuits. The tail lamps are on only when the tractor park or road lights are on.*

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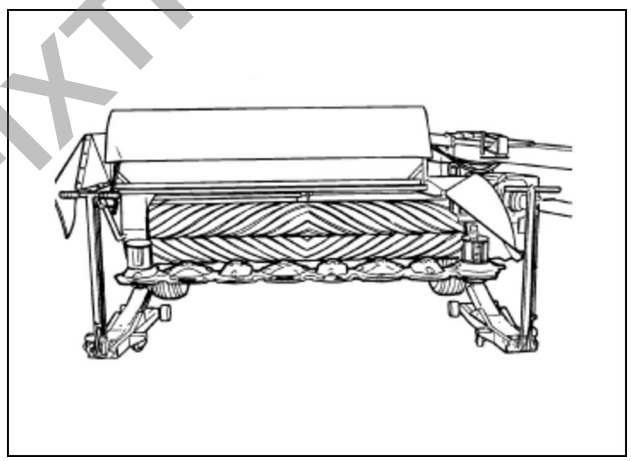
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4. The tie bolts clamping the spacers to the disc modules are extremely tight, and are easier to loosen while the cutterbar is still clamped in the header frame. To gain access to the tie bolts, remove the rock guard and skid shoe from the module to be removed. Loosen the tie bolts by installing the holding tool **FNH012212 (1)** on one end of each tie bolt. Use wrench **FNH012213 (2)** with a **3/4 in** breaker bar to loosen the tie bolts 1/2 turn total by turning the front and rear nuts alternating one flat at a time.



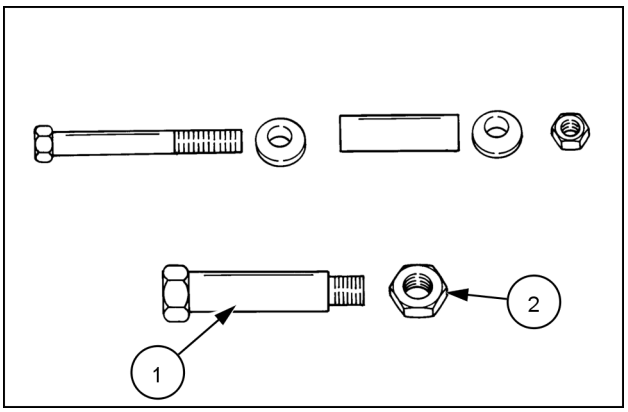
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5. Place a floor jack under each end of the cutterbar as shown.



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6. A special bolt **(1)** and nut **(2)** are used to retain the cutterbar.



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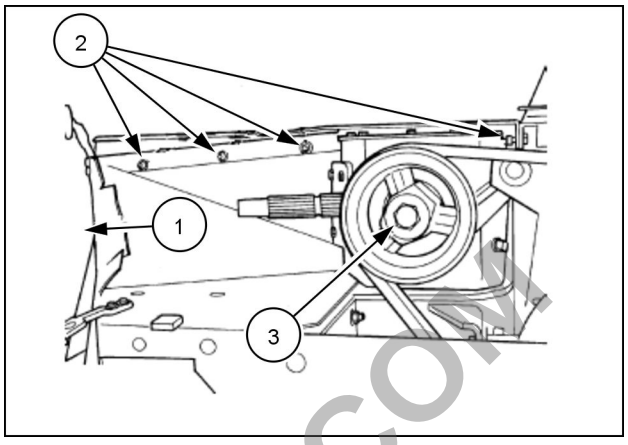
Attachment/Header cutting mechanism - Troubleshooting for Flail Units

Problem	Possible Cause	Correction
Leaves damaged or stripped off stems.	Over conditioning.	Raise rotor hood. Slow speed rotor. Smooth liner.
Crop stems not scuffed.	Under conditioning.	Lower rotor hood or install dimpled hood liner and high speed rotor.
Leaving ragged or long stubble.	Ground speed too fast.	Reduce the ground speed.
	Dull, bent, or broken knives.	Turn over or replace the knives.
	Knives installed on wrong discs.	Install knives on correct discs.
	PTO speed too slow.	Maintain RPM on the tractor PTO. (Do not overspeed.)
	Cutting too high.	Remove high stubble kit, if installed. Increase header tilt.
	Header flotation too light.	Adjust flotation springs to increase header flotation weight to reduce header bouncing on uneven ground.
Excessive breakage of the knives.	Cutting too low in stony conditions.	Raise the cutting height with header tilt. Install high stubble kit.
	Header flotation too heavy for stony fields.	Adjust the flotation springs to float the header with **45.4 kg** (**100 lb**) force, per side.
	Ground speed too high in stony conditions.	Reduce ground speed.
Not cutting short enough in down material.	Ground speed too fast.	Reduce ground speed.
	Broken, bent, or dull knives.	Replace the knives or turn over the knives.
	Cutting height too high.	Lower the cutting height by tilting the header.
	Tractor PTO speed too slow.	Maintain tractor PTO RPM. (Do not overspeed.)
Discs out of time or jump time occasionally.	Impact with rock.	Remove top cap and inspect for damage. Replace top cap assembly if necessary.
Strip of run-down, uncut material.	Ground speed too fast.	Use slower ground speed.
	Crowding of the uncut material.	Do not crowd the uncut material.
	Missing or dull knives.	Replace or turn over the knives.
	Material buildup on cutter bar.	Clean off cutter bar. Tilt cutter bar back towards horizontal to reduce material buildup.
Forming poor or bunchy windrow.	Tractor PTO speed too slow.	Maintain RPM on the tractor PTO. (Do not overspeed.)
	Incorrect swath gate adjustment.	Adjust the swath gate to even discharge flow.
	Incorrect windrow shield adjustment.	Adjust the windrow shields.
Pulling material out of the ground when cutting back swath or tall material is leaning into the machine. Excessive power requirements.	Ground speed too slow.	Use faster ground speed.
Material being discharged out of the left side of the machine.	Cutter bar not taking a full cut; #1 disc not running in standing crop.	Shift unit right into standing crop to take full cut.
	Inner left side curtain worn or damaged.	Replace inner left side curtain.
Soil buildup on front of cutter bar.	Very wet crop/soil conditions.	Adjust flotation springs to reduce header flotation weight.
		Raise the cutting height with header tilt.
		Install high stubble kit.
Loose knife hardware.	Impact with rock.	Inspect for damage, retighten hardware.

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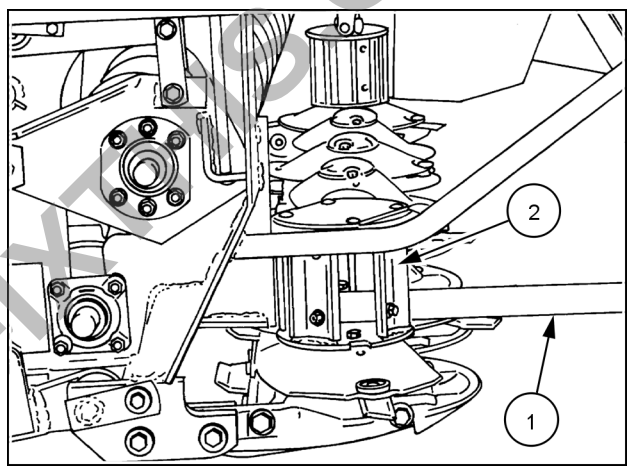
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6. Remove the upper shielding by removing four carriage bolts, flat washers, and flange nuts at **(1)** and four carriage bolts, flat washers, and flange nuts at **(2)**. It may be necessary to loosen two or three bolts between the lower shield and the header frame if the shield is sandwiched between these components.
7. If the conditioner drive shaft assembly **(3)** requires repair, it should be partially disassembled before the bevel gearbox is removed from the machine as the sheave retaining bolt may be removed easier.



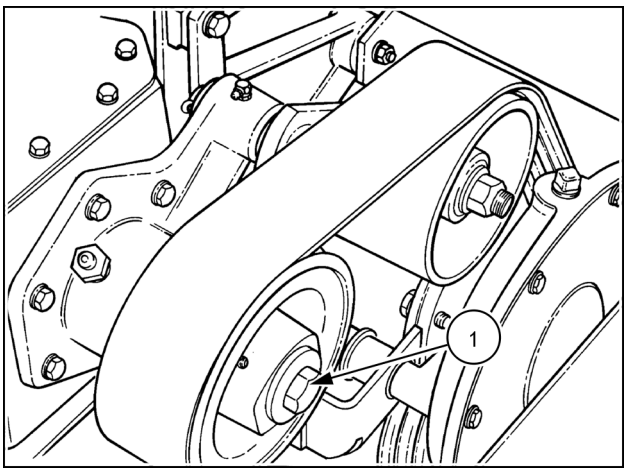
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8. Block the cutterbar discs in place with a bar **(1)** through the right-hand hand tower **(2)**.



3996-4 5

9. Remove the bolt **(1)** and the flat washer from the end of the conditioner roll drive sheave.

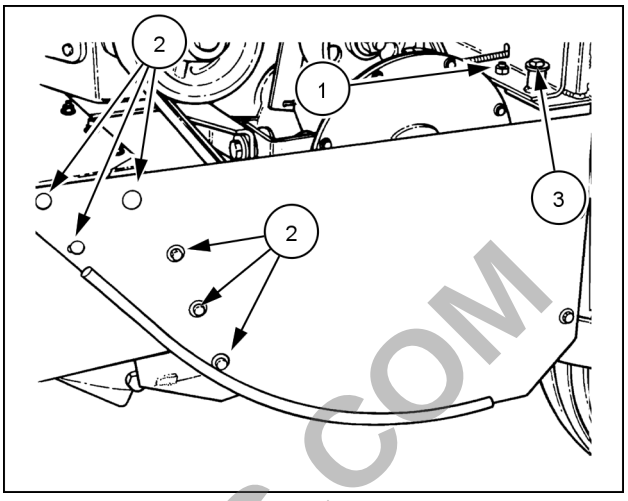


3659-19 6

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21. Install the divider sheet assembly using a bolt and locknut **(1)** and six carriage bolts, lock washers, and nuts **(2)**. If the left-hand swing out shield was removed, install it on the unit using two bolts and locknuts at **(3)**.



A3659-25 16

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Index

Product feeding - 60

Roll conditioning - 620

Conditioner roll gearbox - Assemble 40
Conditioner roll gearbox - Disassemble 38
Conditioner roll gearbox - Install 41
Conditioner roll gearbox - Overview - Roll timing 5
Conditioner roll gearbox - Remove 36
Lower conditioner roll - Install 10
Lower conditioner roll - Remove 6
Roll conditioning - Overview 3
Tension arm and torsion bar - Adjust - Roll pressure 27
Tension arm and torsion bar - Install 32
Tension arm and torsion bar - Remove 28
Upper conditioner roll - Assemble - Drive shaft 24
Upper conditioner roll - Disassemble - Drive shaft 23
Upper conditioner roll - Install 19
Upper conditioner roll - Install - Drive shaft 25
Upper conditioner roll - Overview - Roll gap 4
Upper conditioner roll - Remove 16
Upper conditioner roll - Remove - Drive shaft 22

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