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DC133
DC163
Disc Mower Conditioner

SERVICE MANUAL

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CASE IH AGRICULTURE

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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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General specifications

Model	DC133	DC163
Overall Width		
Transport position	**4.04 m** (**13 ft 4 in**)	**5.05 m** (**16 ft 7 in**)
Field position – Two-point hitch	**6.5 m** (**21 ft 3 in**)	**7.8 m** (**25 ft 7 in**)
Field position – Drawbar	**6.0 m** (**19 ft 7 in**)	**7.3 m** (**23 ft 11 in**)
Overall Length		
Transport position – Two-point hitch	**8.4 m** (**27 ft 5 in**)	**9.7 m** (**32 ft 0 in**)
Transport position – Drawbar	**8.1 m** (**26 ft 5 in**)	**9.4 m** (**31 ft 0 in**)
Field position – Two-point hitch	**7.0 m** (**23 ft 0 in**)	**8.1 m** (**26 ft 7 in**)
Field position – Drawbar	**6.7 m** (**22 ft 0 in**)	**7.8 m** (**25 ft 7 in**)
Height		
Transport position	**2.26 m** (**7 ft 5 in**)	**2.26 m** (**7 ft 5 in**)
Field position	**2.01 m** (**6 ft 7 in**)	**2.01 m** (**6 ft 7 in**)
Ground clearance		
Header fully raised	**411 mm** (**16.2 in**)	
Weight		
Shipping – Without hitch	**2912 kg** (**6420 lb**)	**3104 kg** (**6843 lb**)
Shipping – Two-point hitch and drawbar	**2991 kg** (**6594 lb**)	**3184 kg** (**7020 lb**)
Operating	**2846 kg** (**6274 lb**)	**3039 kg** (**6700 lb**)
Tractor requirements		
Power	**67 kW** (**90 Hp**) or greater with standard Category 2 or Category 3 **ASAE/ASABE** hitch and PTO locations.	**75 kW** (**100 Hp**) or greater with standard Category 2 or Category 3 **ASAE/ASABE** hitch and PTO locations.
Hydraulic circuits required	Two remote hydraulic circuits capable of **104 bar** (**1500 psi**)	
Electrical	7-pin electrical connector for trailing and road transport lights	
Power Take-Off (PTO) shaft spline and size requirements	21-spline **1-3/8 in**	
Input speed	**1000 RPM** only	
Drive line protection	Overrunning and friction slip clutch assembly at the front of the secondary PTO shaft	
Header		
Flotation	Vertical and radial, adjustable springs	
Windrow width	**0.9 - 2.4 m** (**3.0 - 8.0 ft**)	
Swath width – Roll conditioner units	**3 m** (**10 ft**)	**3.7 m** (**12.0 ft**)
Swath width – Flail conditioner units	**3.4 m** (**11.0 ft**)	**4.0 m** (**13.0 ft**)
Header lift	Hydraulic (master-slave system)	
Cutterbar		
Type	Modular	
Number of discs	8 counter-rotating	8 counter rotating, 2 co-rotating
Knives per disc	2	
Disc cutting diameter	**618 mm** (**24.3 in**)	
Disc drive method	PTO drive with a friction slip clutch to a bevel gearbox at the left-hand end of header, then to a vertical PTO shaft to the cutterbar	
Cutterbar shear protection	Frangible splines in disc drive hub	
Disc speed at **1000 RPM** PTO speed	**2250 RPM**	
Knife tip speed at **1000 RPM** PTO speed	**261 km/h** (**162 mph**)	
Cutting width	**4.0 m** (**13 ft- 0 in**)	**4.95 m** (**16ft-3 in**)

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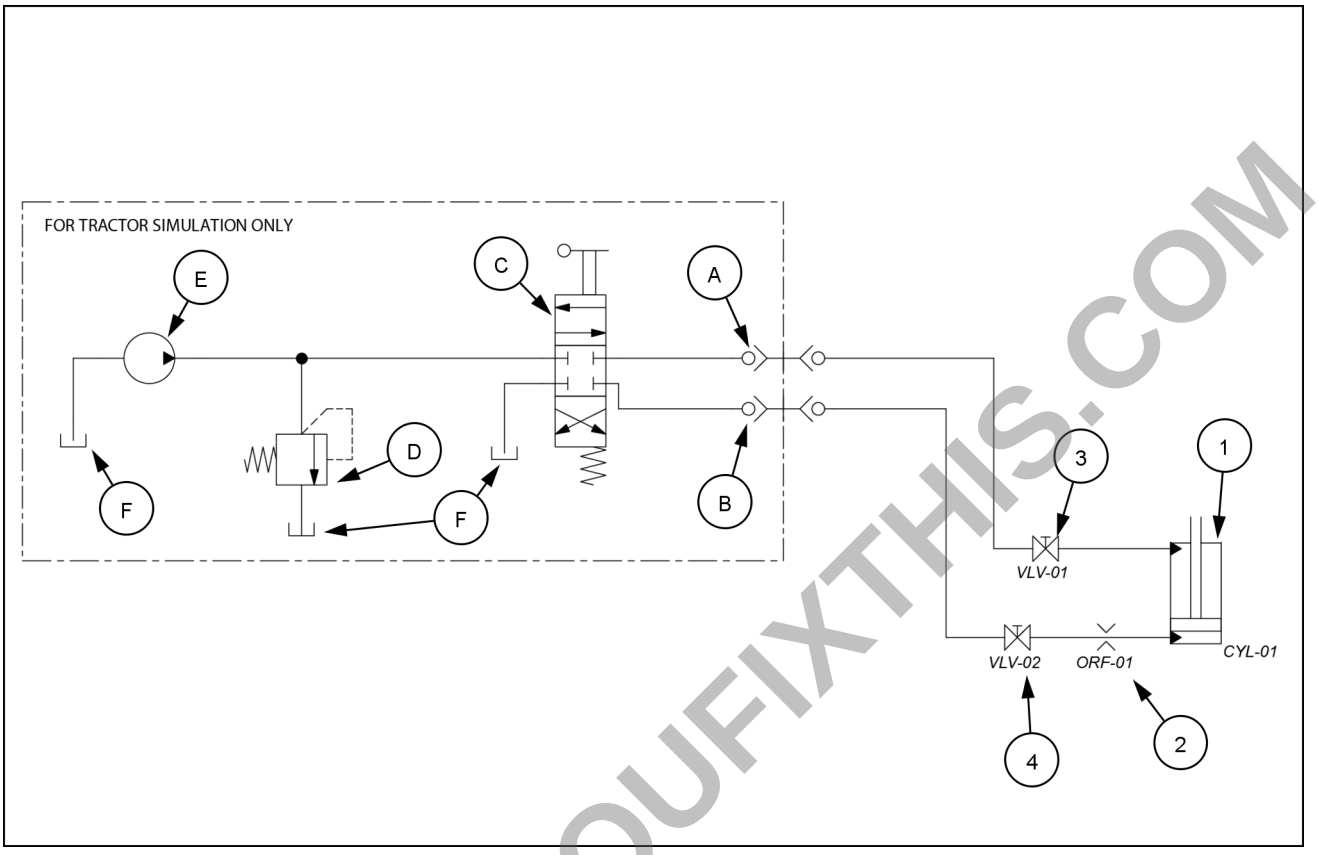
Capacities

Consumable product	Material specification	Use	Capacity
Grease lubricant			
CASE IH AKCELA PREMIUM GREASE EP-2	CNH Industrial: **MAT3550** Performance: **NLGI 2**, GC-LB	All grease fittings	As specified per the operator's manual maintenance section.
		Wheel bearings – Repack	Not specified; amount as required
Lubricating oils			
TUTELA HYPOIDE EP GEAR LUBE SAE 80W-90 OR **TUTELA HYPOIDE SSL SYNTHETIC GEAR LUBE SAE 75W-90** (synthetic) OR **CNH HYPOIDE SSL SYNTHETIC GEAR LUBE 75W-90** (synthetic)	CNH Industrial: **MAT3511** Performance: **API GL-5**, **SAE J2360**, **MIL-PRF-2105E**	Front lower-half swivel hitch gearbox	**2200 mL** (**74 US fl oz**)
		Front upper-half swivel hitch gearbox	**1200 mL** (**41 US fl oz**)
		Rear lower-half reversing swivel gearbox	**2200 mL** (**74 US fl oz**)
		Rear upper-half reversing swivel gearbox	**1200 mL** (**41 US fl oz**)
		Conditioner drive gearbox	**200 mL** (**7 US fl oz**)
		Bevel gearbox	**800 mL** (**27 US fl oz**)
		Cutterbar modules	**310 mL** (**10 US fl oz**) each
		Internal O-rings of the driven cutterbar module pinion shaft – Quantity 2	Amount as required to coat the O-rings
TUTELA MOLY GREASE GR-75	Not Applicable (NA)	Internal neck extension • O-ring	Amount as required to coat the O-ring
TUTELA SYNTHETIC GREASE GR-1000 SSL	MT-55	Cutterbar coupler shaft splines	Amount as required to coat the splines
Sealants			
LOCTITE® SI 598™ BLACK OR **DOW CORNING® 7091 ADHESIVE SEALANT BLACK**	Not Applicable (NA)	Swivel gearboxes • Neck assembly upper and lower mating surfaces • Between the cover and housing mating surfaces	Not specified; amount as required
		Cutterbar module • Top cap sealing flange • Top cap bolts	Not specified; amount as required
		Conditioner drive gearbox • Oil drain plug	Not specified; amount as required
		Bevel gearbox • Between the cover and housing mating surfaces	Not specified; amount as required
LOCTITE® 592™ PST	Not Applicable (NA)	Cutterbar module • Oil drain plug threads • Oil dip stick threads	Not specified; amount as required
LOCTITE® 263™	Not Applicable (NA)	Swivel gearboxes • Neck assembly hex socket screw threads • Locknut threads of the neck bearing assembly	Not specified; amount as required
LOCTITE® 270	Not Applicable (NA)	Bevel gearbox • Bevel shaft locknut threads	Not specified; amount as required

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Hydraulic systems - Hydraulic schematic frame 01 - Tongue swing circuit



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NOTE: *Hydraulic schematic is for reference only.*

Hydraulic port and tractor component identification

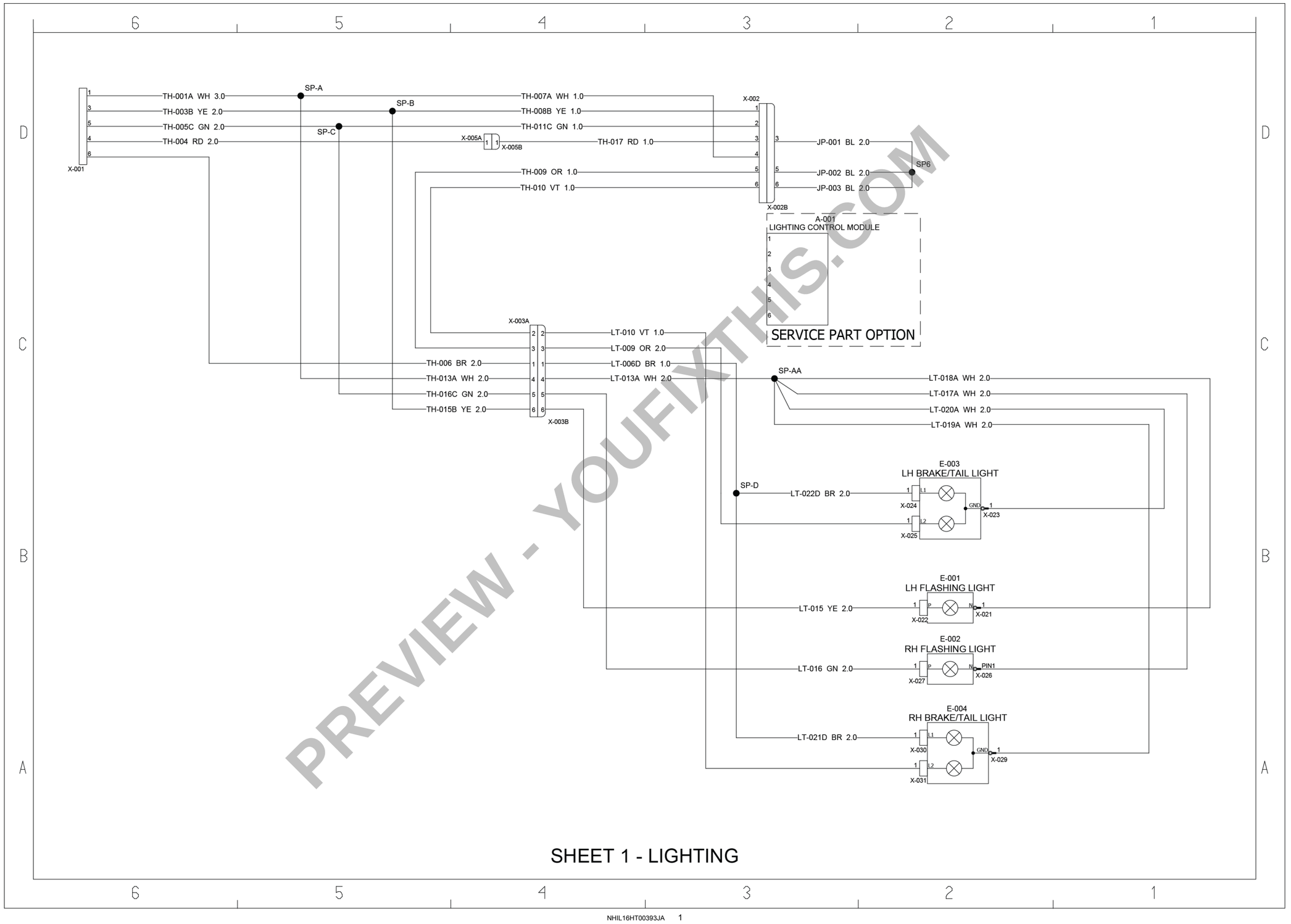
Item	Description
(A)	Pressure
(B)	Return
(C)	Directional Control Valve (DCV)
(D)	Pressure relief valve
(E)	Hydraulic pump
(F)	Hydraulic reservoir

Hydraulic component identification

Item	Name	Description
(1)	CYL-01	Tongue swing cylinder
(2)	ORF-01	Swing cylinder orifice
(3)	VLV-01	Swing cylinder lock 1
(4)	VLV-02	Swing cylinder lock 2

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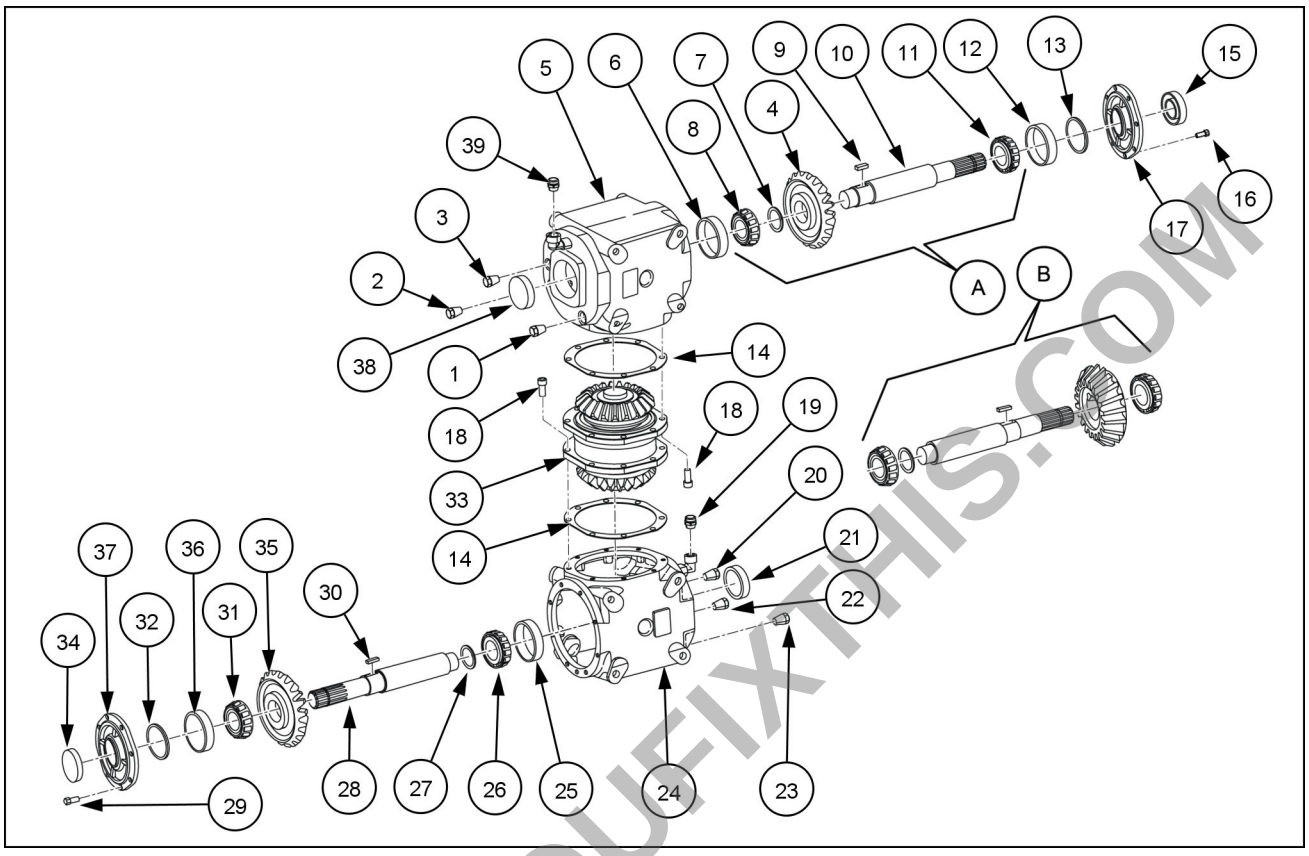
SHEET 1 - LIGHTING

NHIL16HT00393JA 1

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Gearbox - Exploded view - Swivel gearboxes



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Swivel gearboxes – Exploded view

Shaft component orientation:

(A) – Reversing swivel gearbox

(B) – Swivel hitch gearbox

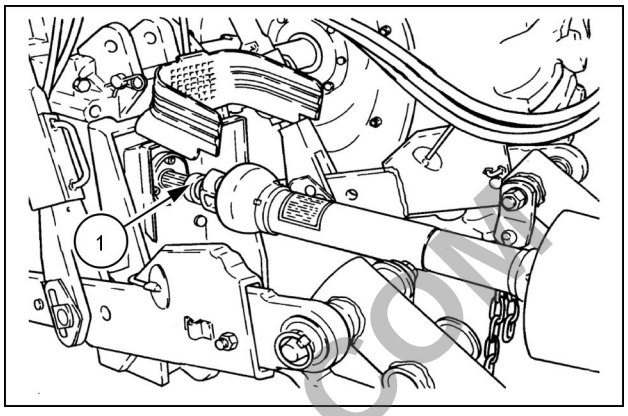
(1) – Drain plug, 3/8 inch NPT
(2) – Oil level check plug, 3/8 inch NPT
(3) – Plug, 3/8 inch NPT
(4) – Gear
(5) – Upper gearbox housing
(6) – Bearing cup
(7) – Shim
(8) – Bearing cone
(9) – Key
(10) – Shaft
(11) – Bearing cone
(12) – Bearing cup
(13) – Shim
(14) – Gasket
(15) – Cap
(16) – Bolt, M10 x 22
(17) – Cover
(18) – Screw, hex socket, M10 x 25
(19) – Breather / fill plug, 3/8 inch NPT
(20) – Oil level check plug, 3/8 inch NPT
(21) – Cap
(22) – Plug, 3/8 inch NPT
(23) – Drain plug, 3/8 inch NPT
(24) – Lower gearbox housing
(25) – Bearing cup
(26) – Bearing cone
(27) – Shim
(28) – Shaft
(29) – Bolt, M10 x 22
(30) – Key
(31) – Bearing cone
(32) – Shim
(33) – Neck assembly – See **Gearbox - Exploded view - Swivel gearbox neck (31.220)**.
(34) – Cap
(35) – Gear
(36) – Bearing cup
(37) – Cover
(38) – Cap
(39) – Breather / fill plug, 3/8 inch NPT

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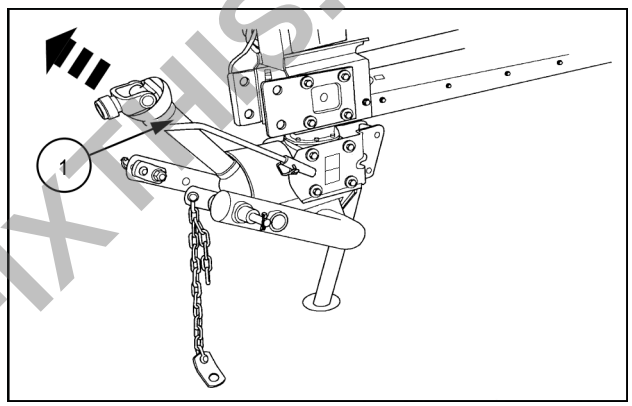
Front half drive shaft - Remove

1. Pull back on the locking collar **(1)** and detach the Power Take-Off (PTO) shaft assembly from the towing tractor.



97-1539RN 1

2. Slide the front Power Take-Off (PTO) shaft **(1)** off of the rear PTO shaft **(2)**.



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Header or attachment height system - Troubleshooting

Problem	Possible Cause	Correction
The header raises or lowers unevenly.	There is entrapped air in the system.	Bleed the system. See **Positioning cylinder - Bleed (35.410)**.
The header drifts down when in the fully raised position.	The tractor remote does not seal.	Check tractor and repair the remote valves if necessary.
	The seals in the cylinder are worn or damaged.	Replace seals.

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Gearbox - Change fluid - Swivel hitch gearbox

Overview

- The swivel gearbox assembly at the front of the tongue consists of an upper gearbox and a lower gearbox that are connected together.

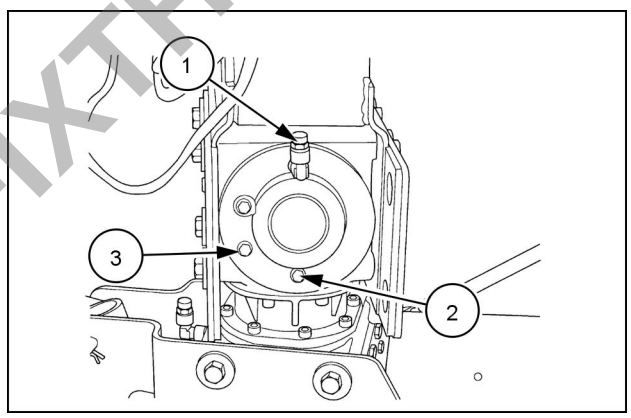
NOTICE: *You must separately change the oil in both the upper half and the lower half of the swivel gearbox assembly after the first 50 hours of operation, and then every 300 hours of operation or yearly thereafter.*

NOTICE: *Immediately prior to draining the oil from both gearboxes, run the machine so that the operation of the gearboxes will help to suspend any particulates or metal fines in the oil so that they will drain out with oil as opposed to settling at the base of each gearbox.*

- Drain the oil from both the upper and the lower swivel hitch gearboxes as soon as possible after running the machine, rather than full servicing each gearbox individually.
- Fill the both the upper half and lower half of the gearbox assembly as specified with fresh **TUTELA HYPOIDE EP GEAR LUBE SAE 80W-90** gear oil or **CNH HYPOIDE SSL SYNTHETIC GEAR LUBE 75W-90** (synthetic).

Upper swivel hitch gearbox

1. Position a pan underneath the upper swivel hitch gearbox to drain the oil into.
2. Remove the oil drain plug **(2)** from the upper swivel hitch gearbox.
3. Remove the combination breather and oil fill plug **(1)** from the top of the upper swivel hitch gearbox.
4. Allow the oil to completely drain from the upper swivel hitch gearbox.
5. Clean the threads of the oil drain plug.



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6. Apply **LOCTITE® SI 598™ BLACK** sealant to the threads of the oil drain plug.
7. Install the oil drain plug **(2)** in the oil drain plug hole and tighten drain plug securely.
8. Remove the oil level check plug **(3)** from the oil level check plug hole.
9. Use a funnel to fill the upper reversing swivel gearbox with fresh oil via the oil fill hole until the oil level reaches the oil level check plug hole.

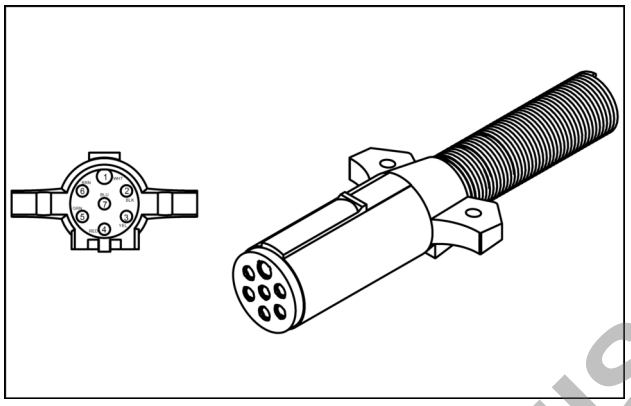
   NOTE: *The upper swivel hitch gearbox has a total capacity of approximately* ***1200 mL*** *(****41 US fl oz****).*
10. Apply **LOCTITE® SI 598™ BLACK** sealant to the threads of the oil level check plug.
11. Install the oil level check plug **(3)** in the oil level check plug hole and tighten the check plug securely.
12. Apply **LOCTITE® SI 598™ BLACK** sealant to the threads of the combination breather and oil fill plug.
13. Install the combination breather and oil fill plug **(1)** into the oil fill hole at the top of the upper of the swivel gearbox, and then tighten the fill plug securely.

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Wire connectors - Component diagram 00 - Connectors X-000 to X-009

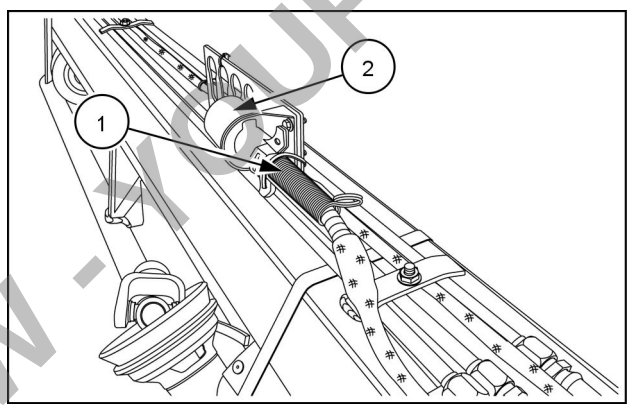
X-001 - Vehicle trailer lighting connector (84137504) (Female)



84137504 1

84137504

Pin	From	Wire	Description	Color-Size	Frame
1	SP-A	TH-001A	Ground	WH-3.0	**SHEET 01**
3	SP-B	TH-003B	Left turn signal	YE-2.0	
4	**X-005A (Female) pin 1**	TH-004	Brake signal	RD-2.0	
5	SP-C	TH-005C	Right turn signal	GN-2.0	
6	**X-003A (Female) pin 1**	TH-006	Tail lights signal	BR-2.0	



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Connector X-001 plugs into the vehicle trailer light connector. When not in use connector X-001 **(1)** stores in a holster **(2)** on top of the tongue.

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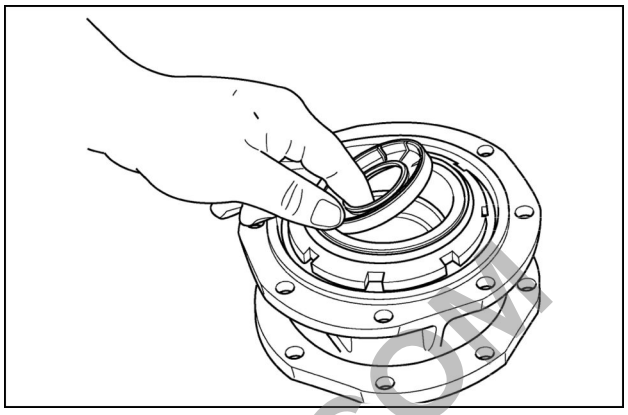
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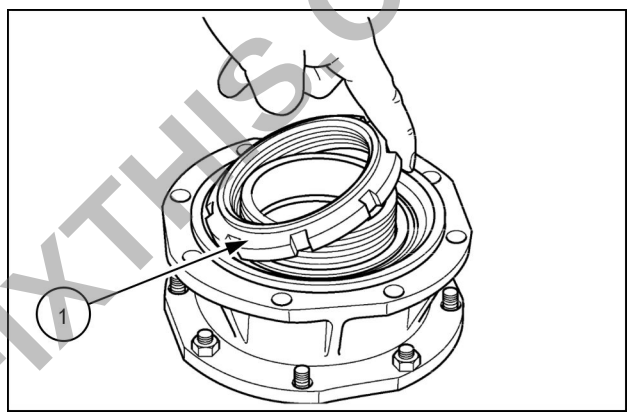
8. Remove the seal from the outer neck assembly.

NOTICE: *Replace all seals that you remove from the gearbox. Seals are damaged when removed.*



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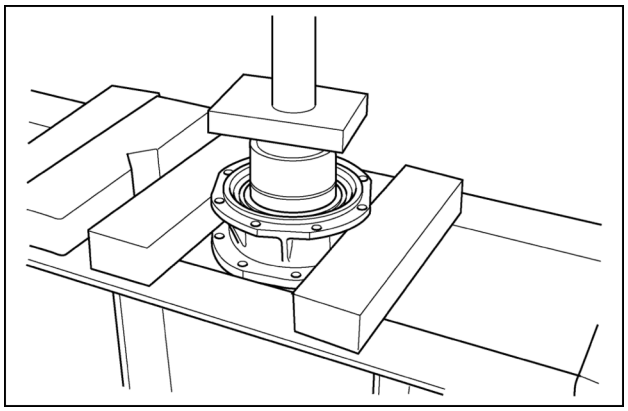
9. Remove the locknut **(1)** from the outer neck assembly.
   - Use the special locknut tool; see **Gearbox - Special tools - Swivel neck tools - Neck locknut tool (locally manufacture) (31.220)** (local manufacture).
   - Leave two or more of the neck bolts and nuts assembled to hold the inner neck in place during locknut removal.



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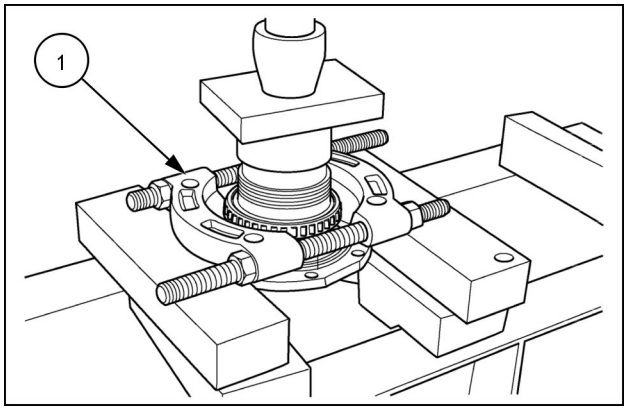
NOTE: *The locknut is assembled with a thread-locking sealant. Use heat if necessary to loosen the locknut.*

10. Press the inner neck out of the outer neck, removing the bearings and thrust washers in the process.



10992660N 10

11. Use a bearing separator tool **(1)** or equivalent tool to press the inner neck bearing off the neck.
    - Remove the O-ring from the lower neck.



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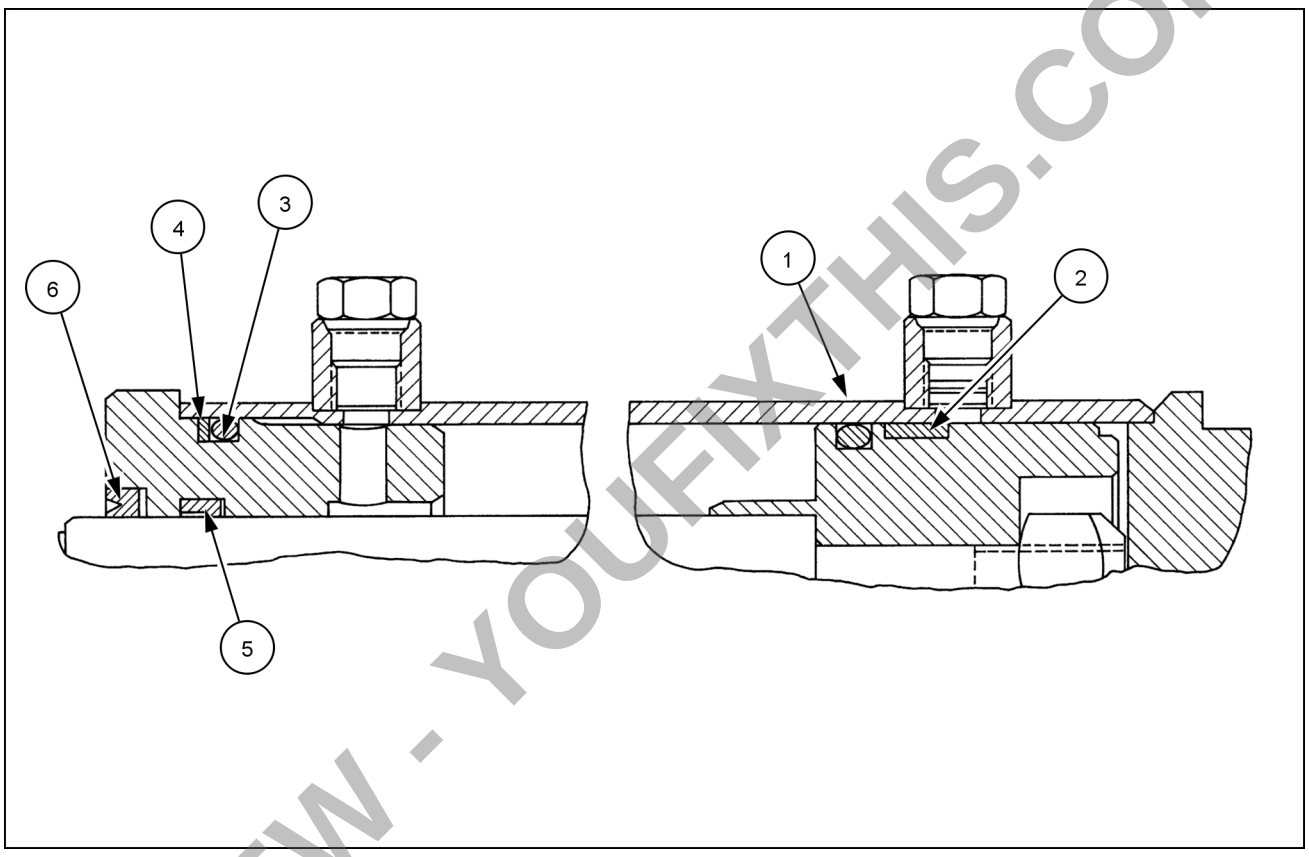
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Cylinder - Assemble

Prior operation:
Cylinder - Inspect (35.947)

1. Remove the worn seals from the piston and cylinder head.
2. Apply a light coating of **CASE IH AKCELA HY-TRAN® ULTRACTION** to lubricate the cylinder head, piston, and seals prior to installing them.



20002690N 1

3. Install the 3-piece seal **(1)** onto the piston.
4. Install the wear ring **(2)** onto the piston.
5. Install the O-ring **(3)** and backup ring **(4)** onto the cylinder head.
6. Install the inner seal **(5)** onto the cylinder head.
7. Install the oil seal **(6)** into the end of the cylinder head.

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Disc cutterbar - Replace - Crop lifter

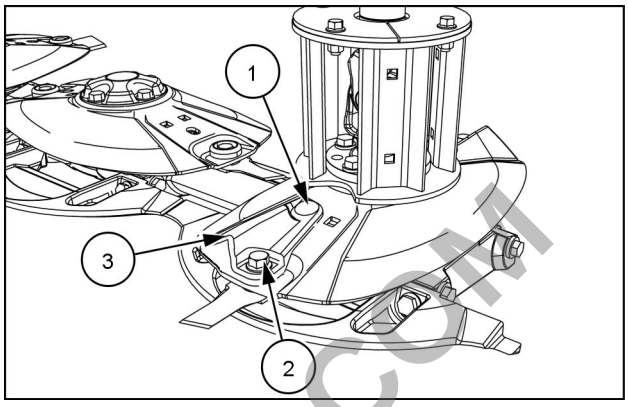
1. To replace the lifter **(3)** by removing the knife bolt **(2)** and the lifter bolt **(1)**. To remove the flange nut on the lifter bolt you need to slide a wrench under the disc cover to access the nut for removal.

NOTE: *You may find that hardware access is easier if you remove the four bolts that secure the disc cover on the all disc modules other than the drive disc module for which you will need to remove the drum shield, drum, and drive shaft.*

2. Install the new crop lifter and secure with existing hardware.

NOTICE: *Replace both lifters on a disc to maintain balance. Do not make weld repairs to the lifters, as this will affect lifter strength and balance.*

3. Torque the lifter bolt **(1)** to **180 N·m** (**133 lb ft**).
4. Torque the knife bolt **(2)** to **137 N·m** (**101 lb ft**).



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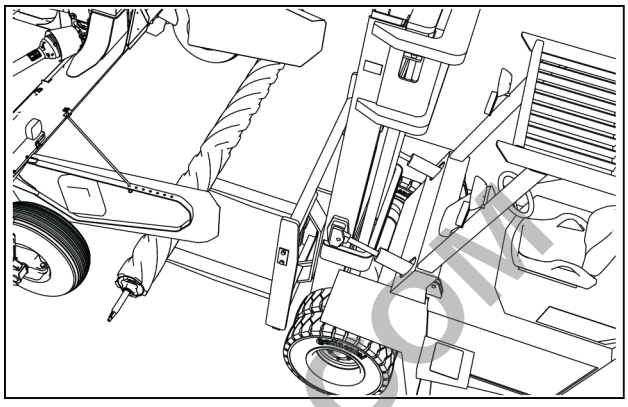
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Lower conditioner roll - Install

1. With the lower conditioner roll on a lifting device, install the conditioner roll through the slots in the header frame.

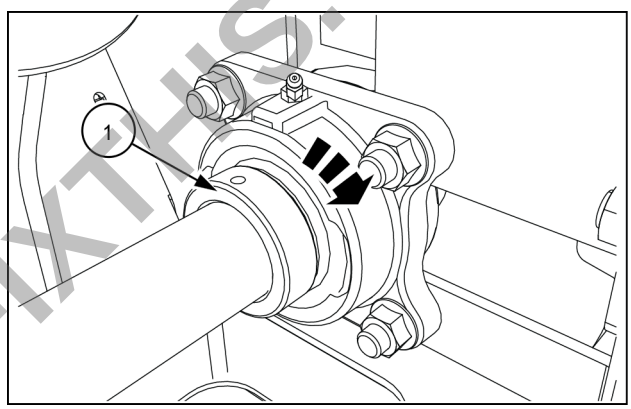
NOTE: *A longer stub shaft protrudes from the left-hand side of the lower conditioning roll. Pivot the right-hand side of the lower conditioning roll in first, and then slide the left-hand side in.*

2. Secure the flange bearings to the header frame with four 1/2 x 1-1/2 inch carriage bolts and 1/2 inch flange nuts.

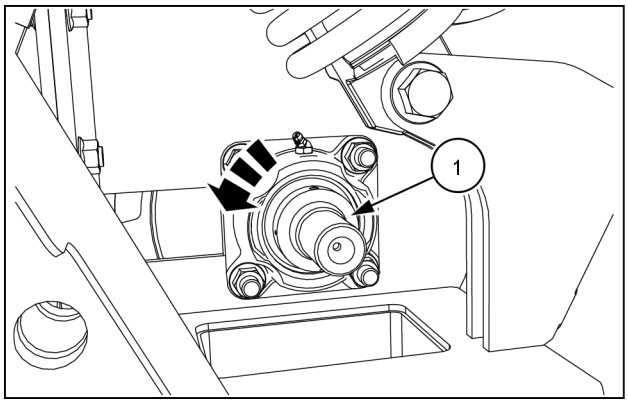


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3. On both sides of the lower conditioner roll:
   A. Center the lower conditioner roll between the header frame side sheets.
   B. Install and tighten the lock collar **(1)** by placing a punch in the drift hole and striking it sharply with a hammer in the direction of shaft rotation, as indicated by the arrow in Figures **2** and **3**.
   C. Tighten the set screw on the lock collar.



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NHIL14HT00099AA 3

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