DESCRIPTION OF OPERATION

ELECTRICAL SYSTEM

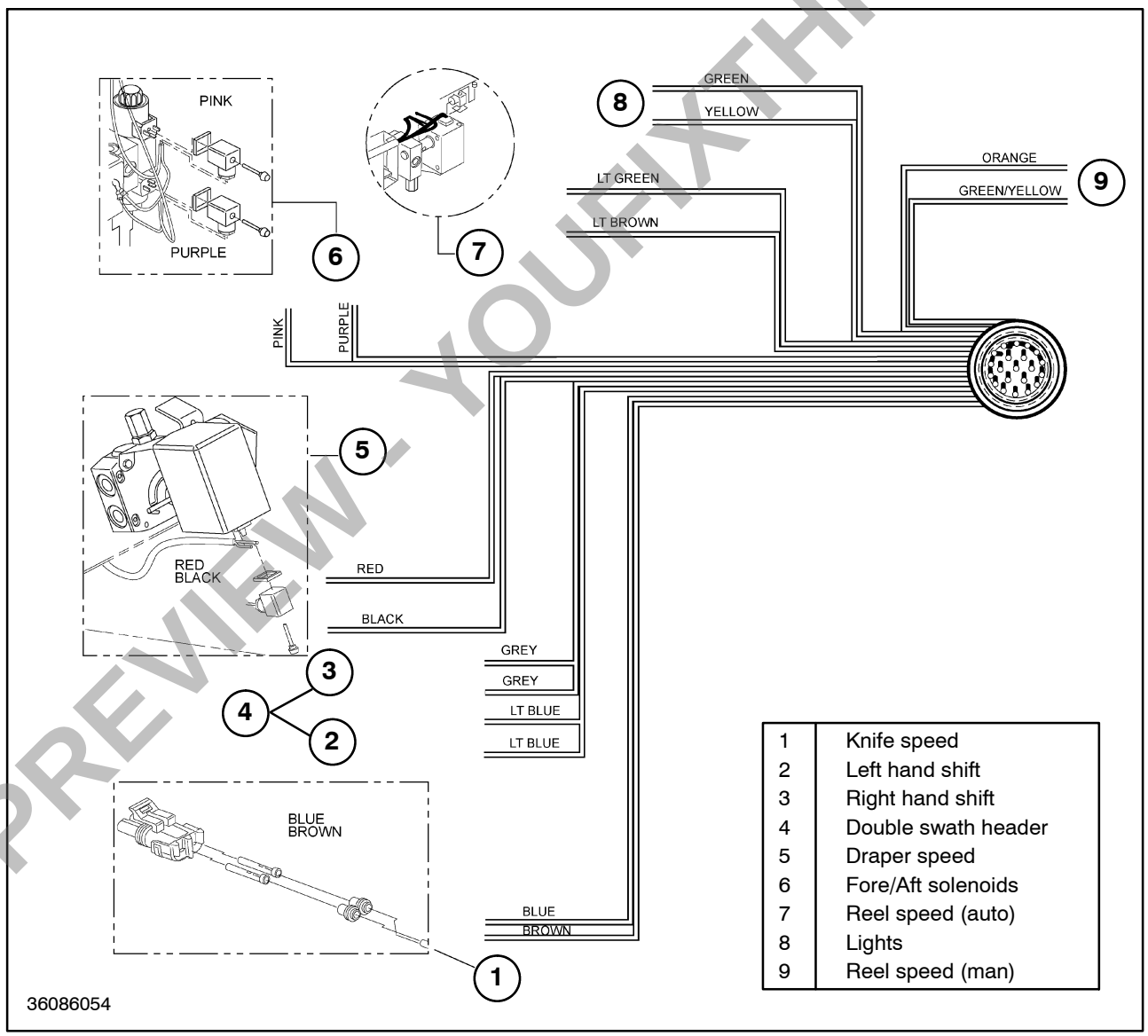
The electrical system on the HB series draper header consists of the flashing lights, the trailer lights and the wiring necessary for operating the lighting.

Draper headers also have a wiring harness that connects with the windrower. The harness allows the header features and options to be operated from the switches and controls in the windrower cab's electronic console or multi-function handle (MFH).

NOTICE: *Refer to the Windrower's Operator's Manual for more information on the electronic console and MFH.*

The windrower cab or MFH contains switches for the following features and options, which may or may not be installed on the draper header: reel speed, draper speed, deckshift, hydraulic fore/aft.

Power is provided from the windrower to operate all of the features and options through a wiring harness. Ground is supplied by the windrower and draper header because the ground wires are incorporated into the wiring harness.



1	Knife speed
2	Left hand shift
3	Right hand shift
4	Double swath header
5	Draper speed
6	Fore/Aft solenoids
7	Reel speed (auto)
8	Lights
9	Reel speed (man)

1

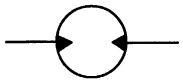
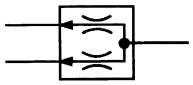
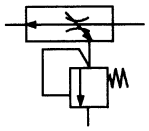
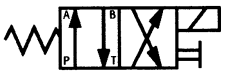
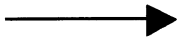
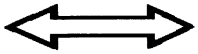
Wiring Harness Diagram

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DRAPER DRIVE

HYDRAULIC SCHEMATIC SYMBOLS

	Hydraulic motor – fixed displacement, reversible. ***NOTICE:*** *All our motors are reversible, but in instances where motor rotation is indicated with a single arrowhead, they are intended to run in one direction only due to unidirectional oil flow.*
	Flow – divider (Prince – RD510P)
	Flow control valve (Prince RDRS110 – 20 gallons per minute, with relief)
	4 port, 2 position, solenoid operated directional control valve
	4 port, 2 position, solenoid operated directional spool valve with manual override
	Pressure gauge (0 – 4,000 psi)
	Oil flow (unidirectional)
	Oil flow (bidirectional)
	Case drain/bypass flow
	Junction/Intersection
	Motor rotation (unidirectional)
	Motor rotation (bidirectional)

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MINIMUM HARDWARE TIGHTENING TORQUES

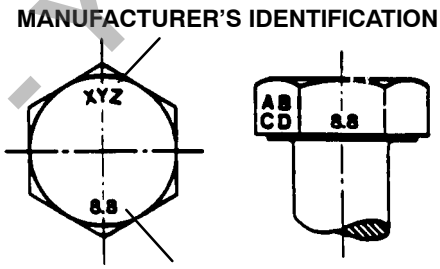
IN NEWTON-METERS (FOOT POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS

METRIC NON-FLANGED HARDWARE AND LOCKNUTS

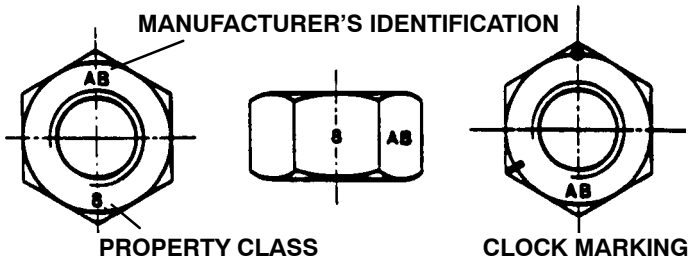
NOMINAL SIZE	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCKNUT CL.8 W/CL8.8 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	
M4	1.7 (15)*	2.2 (19)*	2.6 (23)*	3.4 (30)*	3.7 (33)*	4.8 (42)*	2.3 (20)*
M6	5.8 (51)*	7.6 (67)*	8.9 (79)*	12 (102)*	13 (115)*	17 (150)*	7.8 (69)*
M8	14 (124)*	18 (159)*	22 (195)*	28 (248)*	31 (274)*	40 (354)*	19 (169)*
M10	28 (21)	36 (27)	43 (32)	56 (41)	61 (45)	79 (58)	38 (28)
M12	49 (36)	63 (46)	75 (55)	97 (72)	107 (79)	138 (102)	66 (49)
M16	121 (89)	158 (117)	186 (137)	240 (177)	266 (196)	344 (254)	164 (121)
M20	237 (175)	307 (226)	375 (277)	485 (358)	519 (383)	671 (495)	330 (243)
M24	411 (303)	531 (392)	648 (478)	839 (619)	897 (662)	1160 (855)	572 (422)

NOTICE: Torque values shown with * are inch pounds.

IDENTIFICATION
HEX CAP SCREW AND CARRIAGE BOLTS
CLASSES 5.6 AND UP



HEX NUTS AND LOCKNUTS
CLASSES 05 AND UP



86529681 REV F 5.1

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WHITE (ROLLER STATOR) HYDRAULIC MOTOR SEAL REPLACEMENT

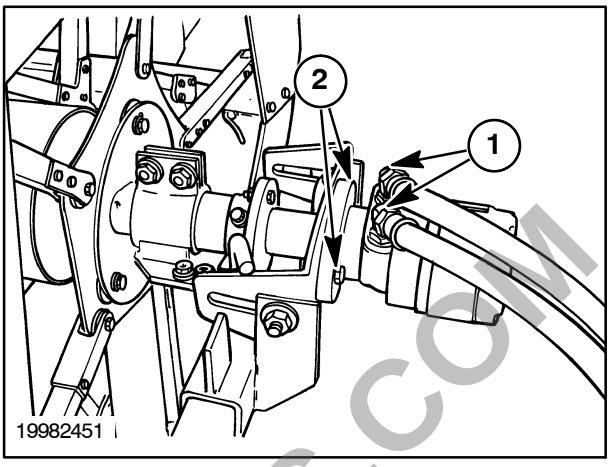
REVERSER MOTOR

Removal

Before disconnecting the hoses, thoroughly clean off all outside dirt around the fittings. After disconnecting the hose, **IMMEDIATELY** plug the port holes.

1. Disconnect hoses, 1. Mark the hoses for correct assembly of forward and reverse.
2. Remove the cap screws, 2.
3. Drain the fluid from the motor. Wash the exterior of the motor in clean solvent.

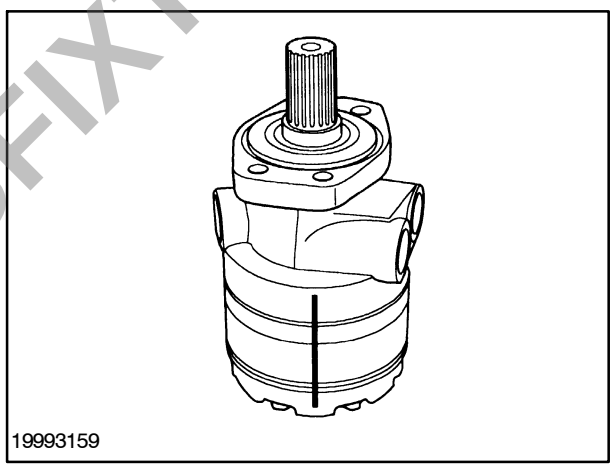
All disassembled parts should be cleaned separately in clean solvent and blown dry with air to avoid nicks and burrs.



6

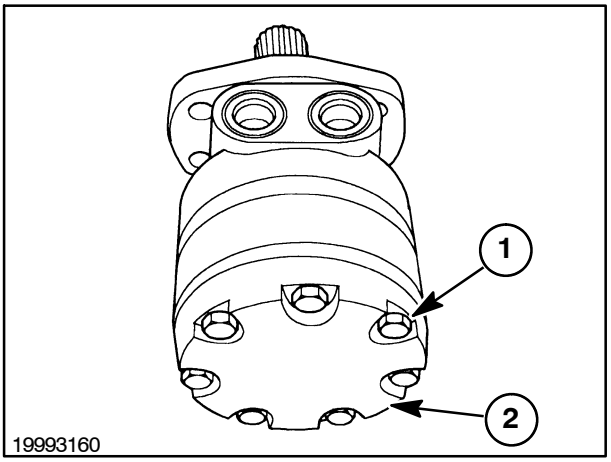
Disassembly

1. Mark the motor assembly as shown, to facilitate proper reassembly.
2. Place the motor in a vise, clamping down on the housing port bosses with the coupling shaft pointed down.



7

3. Remove the seven cap screws, 1. Inspect screws for damaged threads, or the sealing ring under the bolt head. Replace the damaged bolts.
4. Remove end cap, 2.



8

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TROUBLESHOOTING

TROUBLESHOOTING CHARTS

Use the following troubleshooting charts to identify and correct problems in reel lift systems.

PROBLEM	POSSIBLE CAUSE	SOLUTION
REEL		
Reel will not hold height.	Leaking hose or fitting. Valve in windrower leaking.	Repair or replace. See Windrower's Repair Manual.
Reel will not hold level.	Leaking hose or fitting. Air in system. Faulty master cylinder. Leaking cylinder seal.	Repair or replace. Bleed slave cylinder. Repair or replace. Replace seal.
Reel raises or lowers erratically and/or reel will not raise.	Reel cylinders binding. Arms bent or binding. Low hydraulic oil. Hydraulic couplers don't match. Hydraulic couplers not engaged. Faulty hydraulics.	Replace cylinder. Repair or replace. See Windrower's Repair Manual. Install correct couplers. Re-couple properly. See Windrower's Repair Manual.
Reel raises slowly.	Elbow in master cylinder too tight.	Loosen fitting.
Damage to center of reel.	Reel set too low.	Adjust height.
Reel hitting at end.	Reel not centered.	Adjust centering.
Reel will not turn or turns erratically.	Flow control set too low. Low engine RPM. Faulty relief valve. Seized bearing(s). Faulty drive motor. Reel tied down. Hydraulic couplers not engaged.	Advance setting. Increase engine RPM. Clean or replace. Replace bearing(s). Replace motor. Release reel. Re-couple properly.
Reel speed cannot be adjusted. – Header driven reel.	Poor connection in electrical wires or cable. Defective reel speed motor. Faulty flow control.	Check connections and cable. Replace motor. Replace flow control valve.
Single Reel		
Reel does not raise level.	Air in system.	Bleed slave cylinder.
Right side goes up slow.	Air in system. Restricted hydraulic hose.	Bleed slave cylinder. Replace hose.
Right side will not raise.	Leaking hose, fitting, or cylinder.	Repair or replace.
Left side goes up slow.	Faulty piston seal.	Replace seals.
Left side will not raise.	Faulty cylinder. Faulty bypass port. Faulty piston seal.	Replace cylinder. Replace cylinder. Replace seals.

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SPECIFICATIONS

HEADERS

Model	18HB	21HB	25HB	30HB	36HB
Cut Width	5.5 m (18 ft)	6.4 m (21 ft)	7.6 m (25 ft)	9.1 m (30 ft)	11 m (36 ft)
Crop Delivery	Center Only	Center or Double Swath	Center or Double Swath	Center or Double Swath	Center or Double Swath
Recommended NH Windrowers	HW305/305S, HW325, HW345 and HW365, H8040, H8060, H8080 Will not fit prior-model New Holland windrowers HW300, HW320 and HW340				
Header Flotation	Windrower-based standard hydraulic flotation on 4-cylinder windrowers. Independent hydraulic flotation on 6-cylinder windrowers.				
Knife Drive	Single or Double				
Crop Cutting System	Choice of single- or double-knife Schumacher Easy-Cut™ system with spring steel guards and bolted knife sections, or double-knife New Holland system with forged steel guards, adjustable hold-down clips and bolted knife sections.				
Knife Stroke/Speed	84 mm (3.31 in) stroke/1400 spm				
Drive Rolls	Steel				
Draper Belts	1066 mm (42 in) rubberized polyester belt with fiberglass reinforcement. Tie-bar end connection. Belt speed infinitely variable from 0–705 fpm				
Reel Choice*	UII 5- or 6-bat with steel or plastic fingers, HCC 6-bat with plastic fingers. (UII 6-bat with steel fingers recommended for green hay cutting)				
Reel Positioning	Hydraulic raise/lower adjustment standard equipment. Manual fore/aft adjustment standard, with hydraulic fore/aft adjustment option				
Reel Speed	20–48 rpm				
Skid Plates	Full-width steel or UHMW skid plates optionally available				
On-farm Transport Axle	Standard				
Castoring Gauge Wheels	Optional on 25 ft; Standard on 30 ft and 36 ft				
End Gauge Wheels	Optional				
Hyd. Fore/Aft Reel Adjust	Optional				

* All reels listed may not be available on all models or markets. See your dealer for details.

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DESCRIPTION OF OPERATION AND OVERHAUL

KNIFE DRIVE

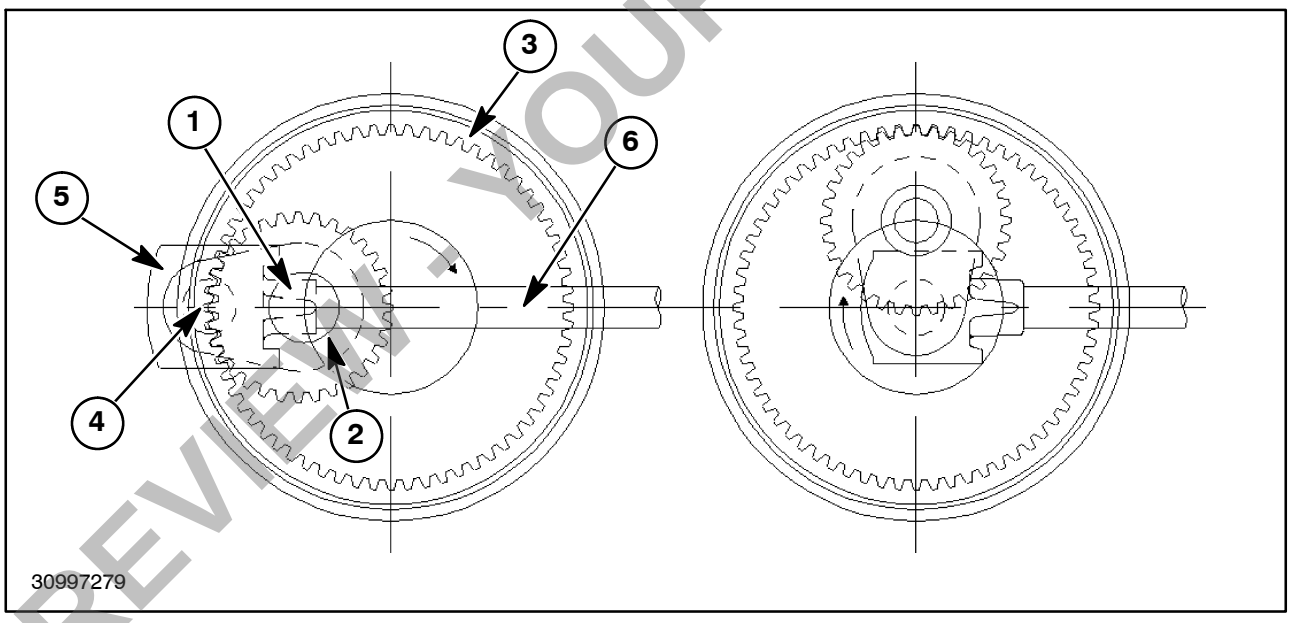
The knife drive is designed to apply an absolutely linear, or straight-line, drive to the knife. This is done by using planetary gears to convert the rotary motion of the hydraulic motor to a straight-line motion for the knife.

***NOTICE**: To keep the bottom cap screw of the knife head bearing from coming loose, the hydraulics should be hooked up such that the knife drives always rotate counter-clockwise.*

The hydraulic motor drives a large driving gear (not shown) which has a solid web carrying the stud, 1, on which the crank pinion, 2, is mounted. This crank pinion has exactly half as many teeth as internal gear, 3, which is fastened to the frame of the drive. The crankpin, 4, is attached to the pinion, 2, and engages cross-head, 5. Attached to cross-head, 5, is knife, 6.

When the large driving gear is turned by the hydraulic motor, the crank pinion stud, 1, moves in a circular path, as indicated by the arrows, causing pinion, 2, to revolve about the stud, 1, and around the internal gear, 3. When pin, 1, has moved one-quarter of a revolution, it will be in the position shown in view B. Pin, 4, attached to cross-head, 5, will be in the center of the internal gear, 3. After pin, 1, has moved one-half revolution, pin, 4, will have moved in a straight line a distance equal to the pitch diameter of the internal gear, 3, and will be at the right-hand end of its stroke. At three-quarters of a revolution, the pin, 4, will again be in mid position, and at the end of a full revolution, the pin will be at the starting point as shown in view A. In this way, the crank pinion, 2, as it revolves around the internal gear, 3, transmits to pin, 4, and attached cross-head, 5, a linear, perfectly straight, left and right movement.

The knife head is attached to the drive by two bolts at a trapezoidal claw joint. This joint eliminates the need to adjust or shim bearings and provides quick and accurate alignment of the bolts.

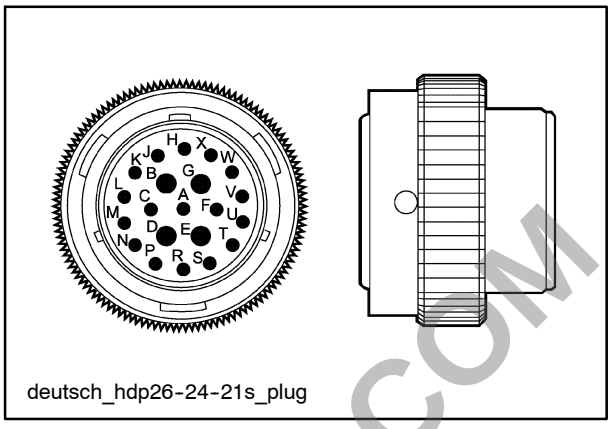


1

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The tables below list the wire color and function for each wire on the plug. The first table is for the 21-pin female plug on the draper header; the second table is for the 21-pin male plug on the windrower.



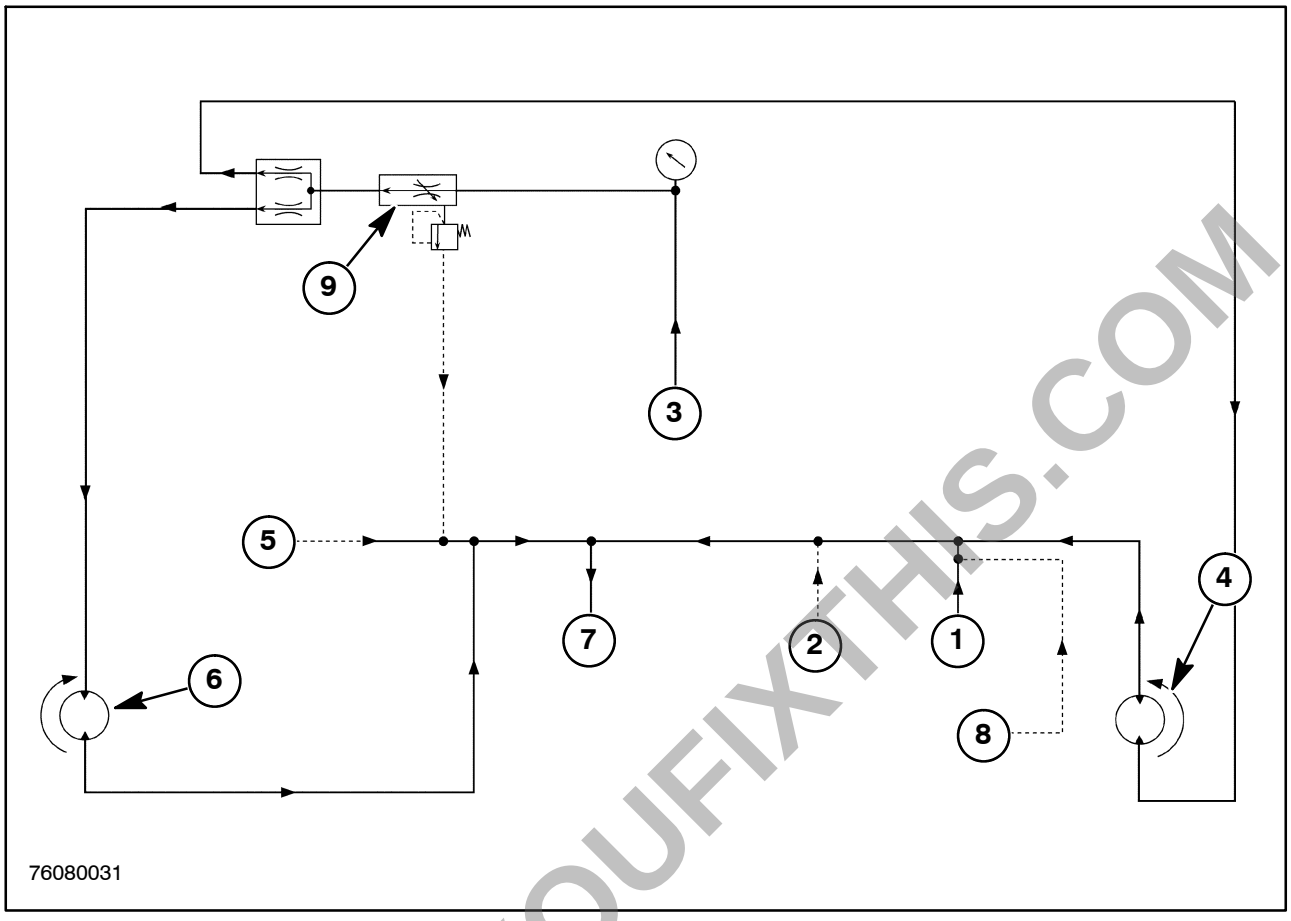
2

Draper header 21-pin female plug		
Cav	**Wire**	**Circuit Reference**
A	White	Power Ground
B	-	
C	Yellow	LH header Flashing Light
D	-	
E	-	
F	Green	RH header Flashing Light
G	White	Recog Jumper to V
H	Blue	Header Speed Sensor
I	-	
J	Lt Green	Auto Reel Speed
K	Lt Brown	Auto Reel Speed
L	Brown	Knife Speed
M	Black	Draper Speed (decrease)
N	Red	Draper Speed (increase)
O	-	
P	Grn/Yellow	Reel Speed (decrease) (man)
R	Orange	Reel Speed (increase) (man)
S	Lt Blue	LH Deck Shift*
T	Grey	RH Deck Shift*
U	-	
V	White	Recog Jumper to G
W	Purple	Fore/Aft
X	Pink	Fore/Aft

* Double Swath Header only

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1

Draper Drive - Single Swath (WS Models)

1. Reel Drive Return
2. Reel Drive Flow Control (excess flow)
3. Knife Drive Return
4. Right Draper Drive Motor
5. Left Knife Motor Drain
6. Left Draper Drive Motor
7. Main Return
8. Right Knife Motor Drain (double models drive only)
9. 20 gpm Flow Control

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MINIMUM HARDWARE TIGHTENING TORQUES

IN NEWTON-METERS (FOOT POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS

INCH NON-FLANGED HARDWARE AND LOCKNUTS

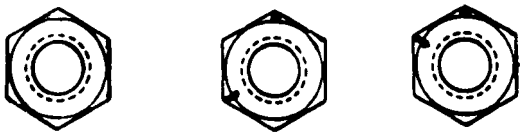
NOMINAL SIZE	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		LOCKNUTS		NOMINAL SIZE
	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	GR.B w/GR5 BOLT	GR.C w/GR8 BOLT	
1/4	6.2 (55)*	8.1 (72)*	9.7 (86)*	13 (112)*	14 (121)*	18 (157)*	8.5 (75)*	12.2 (109)*	1/4
5/16	13 (115)*	17 (149)*	20 (178)*	26 (229)*	28 (250)*	37 (324)*	17.5 (155)*	25 (220)*	5/16
3/8	23 (17)	30 (22)	35 (26)	46 (34)	50 (37)	65 (48)	31 (23)	44 (33)	3/8
7/16	37 (27)	47 (35)	57 (42)	73 (54)	80 (59)	104 (77)	50 (37)	71 (53)	7/16
1/2	57 (42)	73 (54)	87 (64)	113 (83)	123 (91)	159 (117)	76 (56)	108 (80)	1/2
9/16	81 (60)	104 (77)	125 (92)	163 (120)	176 (130)	229 (169)	111 (82)	156 (115)	9/16
5/8	112 (83)	145 (107)	174 (128)	224 (165)	244 (180)	316 (233)	153 (113)	215 (159)	5/8
3/4	198 (146)	256 (189)	306 (226)	397 (293)	432 (319)	560 (413)	271 (200)	383 (282)	3/4
7/8	193 (142)	248 (183)	495 (365)	641 (473)	698 (515)	904 (667)	437 (323)	617 (455)	7/8
1	289 (213)	373 (275)	742 (547)	960 (708)	1048 (773)	1356 (1000)	654 (483)	924 (681)	1

NOTICE: Torque values shown with * are inch pounds.

IDENTIFICATION
CAP SCREWS AND CARRIAGE BOLTS



SAE GRADE 2 | SAE GRADE 5 | SAE GRADE 8



REGULAR NUTS | SAE GRADE 5 HEX NUTS | SAE GRADE 8 HEX NUTS

LOCKNUTS



GRADE IDENTIFICATION
GRADE A NO NOTCHES
GRADE B ONE CIRCUMFERENTIAL NOTCH
GRADE C TWO CIRCUMFERENTIAL NOTCHES



GRADE IDENTIFICATION
GRADE A NO MARKS
GRADE B THREE MARKS
GRADE C SIX MARKS
MARKS NEED NOT BE LOCATED AT CORNERS



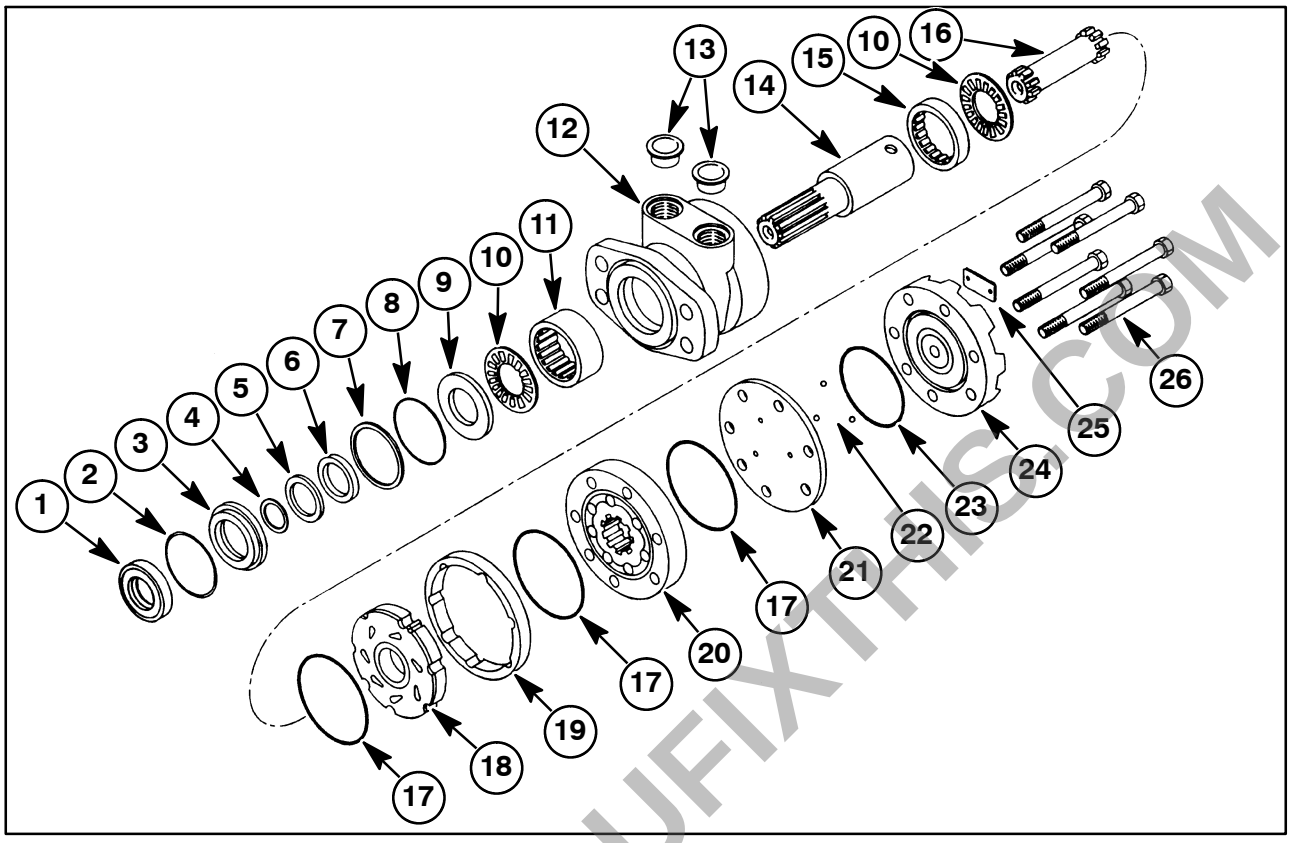
GRADE A NO MARK
GRADE B LETTER B
GRADE C LETTER C

GRADE IDENTIFICATION

86529681 REV F 5.2

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17

Assembly

Clean all components and put a coating of New Holland Ambra Multi G 134 hydraulic oil on the parts prior to assembly.

1. Place the housing in a vise with the mounting flange up.
2. Slide the shaft, 14, into the housing so that the seal carrier, 3, is beyond the inner bore seal groove.
3. Install the lathe cut seal, 8, into the inner bore groove.

NOTICE: *Use the proper size seal. Refer to the seal that was removed.*

4. Install the steel back up shim, 7, next to seal, 8.

NOTICE: *The shim must be folded and bent slightly and worked into place with a small screwdriver.*

5. Install the wire retaining ring, 2, next to the steel back up shim, 7.
6. Turn the housing over and place it in a vise with the shaft end down.

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PROBLEM	POSSIBLE CAUSE	SOLUTION
Double Reel		
Reel does not raise level.	Air in system.	Bleed slave cylinder.
Right side goes up slow.	Air in system.	Bleed slave cylinder.
Right side cylinder does not fully extend.	Air in system. Lift cylinders out of phase.	Bleed slave cylinder. Install spacer inside center master cylinder.
Ends lift before center.	Center master cylinder O-ring damaged.	Replace seal.
Right-hand reel goes out of phase.	Air in system. System loses residual pressure.	Bleed slave cylinder. Install spacer inside center master cylinder.
KNIFE		
Knife will not run.	Low hydraulic oil. Low engine rpm. Faulty drive motor. Faulty knife drive. Faulty hydraulic pump. Cutter bar jammed.	Add oil. Determine cause of low oil. Increase engine rpm. Repair or replace motor. Repair or replace. Repair or replace. Clean cutter bar. Check for damaged guards or sections.
Knife stalls easily.	Type of material being cut. Low oil volume (less than 14 gpm). Low pressure at knife motor. Bent guards or cutter bar. Dull or wrong type of sections. Faulty knife drive. Seized knife head bearing. Knife head out of alignment. Unloaded system pressure too high. Relief valve stuck open.	Reduce ground speed. Check flow; should be 19.5 gpm. Check system pressure. Repair or replace. Replace sections. Check knife adjustment or knife drive bearing. Replace. Adjust alignment on knife head bearing. Check for faulty draper. Check that all drapers are running freely. Remove and clean cartridge.
Knife running too slow or too fast. (700 rpm recommended)	Low oil level. Relief valve stuck open. Worn pump or knife motor.	Add oil. Clean or replace cartridge. Repair or replace.
Excessive vibration.	Knife running too fast. Loose bearings in drive. Loose knife head bolts.	Check speed (680–720 rpm). Replace bearings. Tighten.
Sickle sections breaking.	Steel tines of reel catching in the knife.	Raise reel to allow more clearance from reel tines to cutter bar.

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