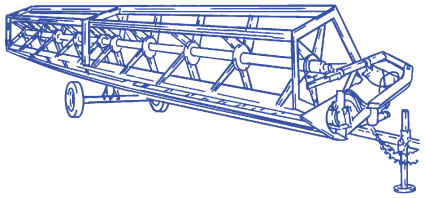


NEW HOLLAND

994
92C
94C

REPAIR MANUAL

NEW HOLLAND

SERVICE

86642406 4/02

994, 92C, 94C REPAIR MANUAL CONTENTS

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books.

The sections listed above are the sections utilized for the 994, 92C and 94C Headers.

SECTION 00 - GENERAL INFORMATION

Chapter 1 - General Information

CONTENTS

PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("**DANGER**", "**WARNING**", and "**CAUTION**") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.

DANGER

This word "DANGER" indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.

WARNING

This word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.

CAUTION

This word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also used to alert against unsafe practices. The color associated with Caution is YELLOW.

FAILURE TO FOLLOW THE "DANGER", "WARNING", AND "CAUTION" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

MACHINE SAFETY

The precautionary statement ("**IMPORTANT**") is followed by specific instructions. This statement is intended for machine safety.

IMPORTANT: *The word "IMPORTANT" is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.*

INFORMATION

NOTE: *Instructions used to identify and present supplementary information.*

GENERAL SAFETY

YOU are responsible for the safe operation and maintenance of your model 994/92C/94C Header. YOU must ensure that you and anyone else who is going to operate, maintain or work around the Header be familiar with the operating and maintenance procedures and related safety information contained in this manual.

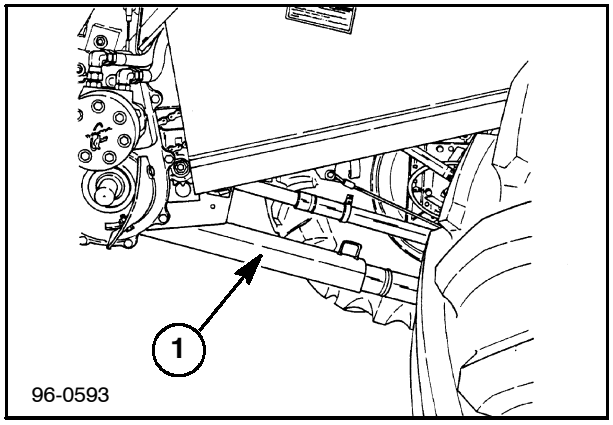
Remember YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

Review the operating instructions for this header at least once a year per OSHA regulations 1928.57. Know the meaning and location of each decal before operating the header.

Watch for this symbol in this manual and on the header:

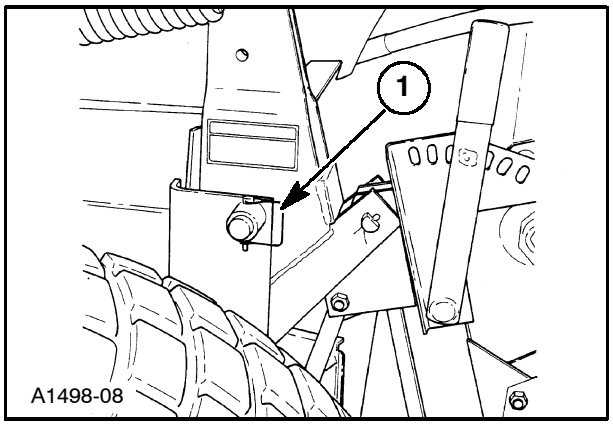
It will draw your attention to hazards that could cause injury or death.

1. Keep the hydraulic pump, gearbox and motors clean of all chaff and straw to prevent any possibility of fire.
2. Carry a multipurpose fire extinguisher in the machine in case of fire and know how to use it. Check the extinguisher regularly and keep it maintained.
3. Provide a first aid kit in the cab for emergencies and know how to use it.
4. Observe the following precautions whenever lubricating the machine or making adjustments.
   - Disengage all clutching levers or switches.
   - On combines, lower the header to the ground or raise the head completely and lower the cylinder safety stop, 1. This stop will prevent the header from lowering.



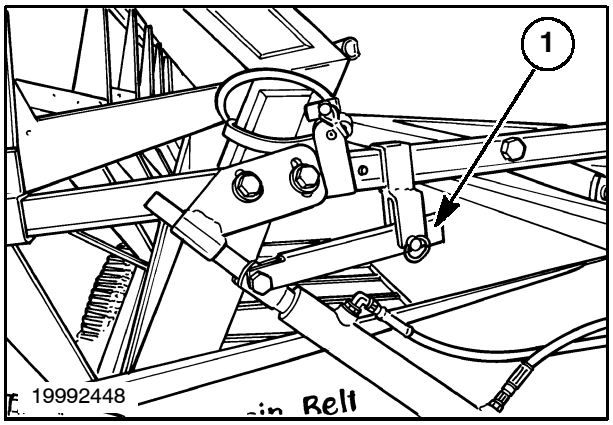
1

- On windrowers, lower the header to the ground or raise the header completely and engage the header lift locks, 1. These locks will prevent the header from lowering.



2

- Lower the reel to its down position, or raise the reel completely and engage the lift cylinder stops, 1, on each cylinder. These stops will prevent the reel from lowering.
- Engage the parking brake.
- Shut off the vehicle engine, and remove the key.



3

5. Do not wear loose clothing or jewelry around moving parts.
6. Wear appropriate protective gear. This list includes but is not limited to:
   - Protective shoes with slip resistant soles.
   - Protective glasses or goggles.
   - Leather gloves.
   - Hearing protection.
   - Respirator or filter mask.
7. Do not allow anyone to ride on the header.
8. Engage the parking brake and put the transmission in neutral before starting the engine. Clear the area of bystanders before starting the engine.
9. Do not allow anyone to operate the header who has not been instructed in how to operate the machine. All operators should familiarize themselves with the “Safety” section in the Combine Operator’s Manual.
10. Some illustrations may not show protective shields in place. Make certain that all protective shields are in place before operating the machine.

OPERATING AND MAINTENANCE SAFETY

1. STOP the machine, engage the parking brake, place the transmission in neutral, remove the key, and wait until all the moving parts stop before leaving the cab.
2. Lower both the table and the reel or raise the header to its full height and use the feeder housing cylinder locks or header lift locks before leaving the cab or servicing the header. If working under the reel, use reel cylinder locks. A sudden loss of hydraulic pressure could cause the header and reel to fall.
3. NEVER operate the machine and the header while tired, sick, or impaired.
4. DO NOT stand between the machine and the header while raising or lowering the header.
5. DO NOT operate the header in crowded or confined areas.
6. Care should be taken when maintaining the knife. The sickle sections are very sharp and can easily cause injury. Use heavy leather or canvas gloves when working with the knife.

HYDRAULIC SAFETY

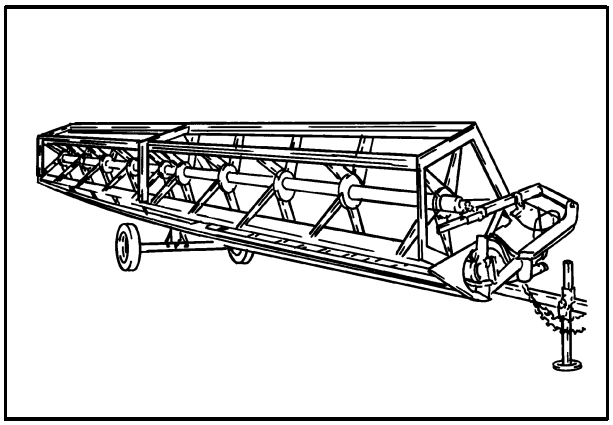
WARNING

This machine is powered and run by hydraulics. Caution must be taken around the machine because high pressured hydraulic fluid can penetrate the skin causing serious injury and possibly death. When looking for a leak always use a piece of cardboard to find the leak. Never use your hands to feel for the leak and always wear eye protection, gloves and long sleeve clothing when working on hydraulics. Some small leaks can be invisible, so caution should be taken around hydraulics.

1. Release all the pressure from the hydraulic lines before making any repairs. Replace or repair damaged hoses immediately.

BEFORE TRANSPORTING

1. Do a complete walk-around visual check to be sure there are no loose parts or components.
2. Check wheel bolts to make sure they are tight.
3. Check transport tire pressure. Recommended pressure is 3.4 bar (50 PSI) for 225/75R15 radials, and 8.00–16 10 ply bias tires.
4. Check spindle and hitch lockpins to make sure they are in place and securely fastened.
5. Do a visual check of all hoses to make sure they are securely tied so they will not pinch or drag during transporting.
6. Be sure hitch tongue and safety chain are fastened securely to the header and to the transporting vehicle.



4

TRANSPORT SAFETY

1. Transport the header with the SMV (Slow Moving Vehicle) sign displayed on the rear of the header and use your hazard lights if the law permits. Check local road laws before transporting.
2. When transporting the header on the roads be aware of the width of the header.
3. For long distance transporting, put the header into full transport (see “Dismount” section).
4. Do not transport the machine at night, at dawn, or at dusk.
5. Do not exceed 32 KPH (20 MPH) during transport.

TRANSPORTING CHECKS

1. If you are towing your header to its destination, stop after the first 5–10 kilometers (3–6 miles) and check to make sure the wheel bolts are tight and the wheel hubs are not hot. Make periodic checks 50–60 km (31–37 miles) if towing the header long distances.
2. Check the hitch bolt and safety chain periodically to make sure they are secure.

GENERAL INFORMATION

The Model 994, 92C and 94C Headers consist of the main components listed on the following page.

For combine applications, an adapter/subframe attaches to the feeder housing of the combine. The hydraulic power to run the header comes from a hydraulic pump driven off the feeder house of the combine. Power for the epicycle knife drive is provided by a hydraulic motor to cut the crop. The bat reel or optional pickup reel lays the crop on the canvases. The lateral canvases carry the crop to the feeder canvas that feeds the finger auger mounted in the auger adapter. The finger auger completes the delivery of the grain to the feeder house of the combine.

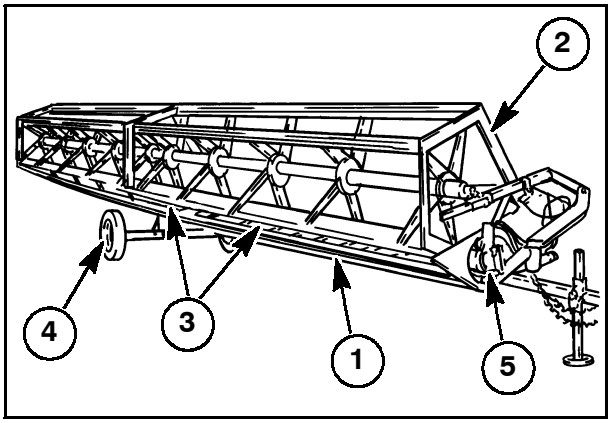
When in the field position, header flotation is achieved through the use of heavy duty leaf springs and castor gauge wheels.

For windrower applications, lift arm adapters are installed on the windrower to enable it to be coupled directly to the header. They hydraulic power to run the header is supplied by the windrower's header drive pump. Power for the epicycle knife drive is provided by a hydraulic motor to cut the crop. A bat reel or pick-up reel lays the crop on the canvases. The lateral canvases carry the crop to the feed opening, and discharge the cut crop onto the ground in the form of a windrow.

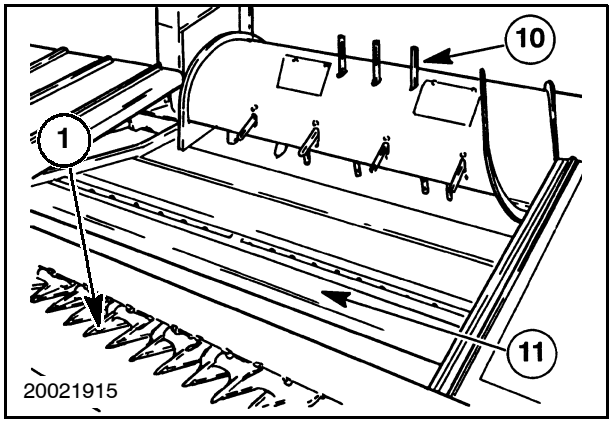
When in the field position, header flotation is achieved through the use of four flotation springs mounted on the windrower, and acting through the lift arms. Optional castoring gauge wheels are also available to prevent the ends of the header from contacting the ground.

PRINCIPAL COMPONENTS:

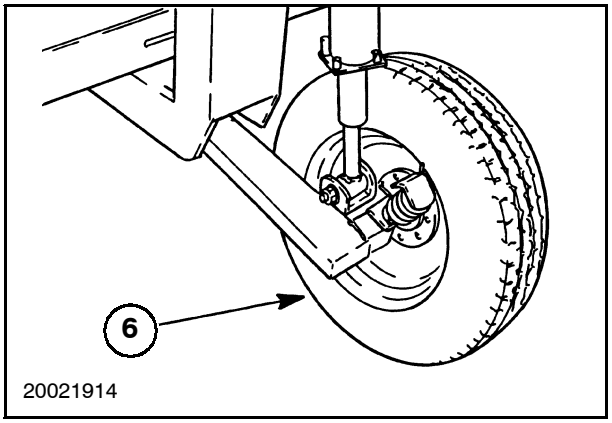
1. Cutter Bar
2. Reel
3. Canvases
4. Transport Axle
5. Knife Drive
6. Gauge Wheels
7. Hydraulic Pump (combine applications only)
8. Adapter/Subframe (combine applications only)
9. Suspension System (combine applications only)
10. Finger Auger (combine applications only)
11. Feeder Deck (combine applications only)



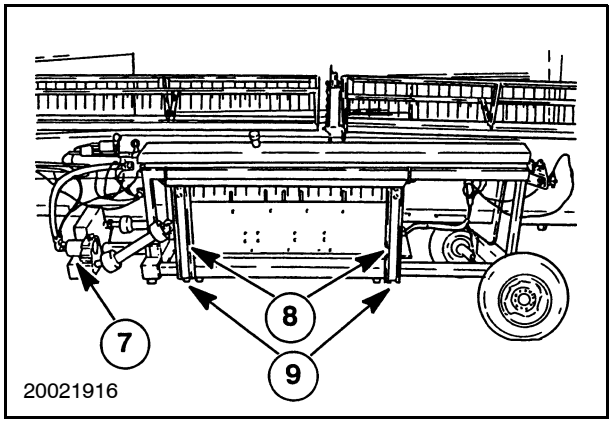
5



7



6



8

CONFIGURATIONS, COMBINE APPLICATIONS

Model	Sizes	Mount	Deck Shift Capabilities			Knife Drive	Hyd Reel Fore/Aft
			Fixed	Manual	Hydraulic		
994, 94C	25′	Center	X	N/A	N/A	Single	Avail.
994, 94C	30′	12″ Offset	X	X	X	Single	Avail.
94C	30′	Center	X	N/A	N/A	Single	Avail.
994, 94C	36′	12″ Offset	X	X	X	Single	Avail.
994, 94C	39′	30″ Offset	X	X	X	Single	Avail.
994, 94C	42′	30″ Offset	X	X	X	Double	Avail.
994, 92C	21′ Rice* 25′ Rice*	Center Center	X X	N/A N/A	N/A N/A	Single or Double	Std. Std.

*Rice headers also include dual hydraulic reel drive, standard UHMW plastic skid plates, stainless steel wear plate under the feed auger, and vulcanized rubber drive rolls for drapers.

CONFIGURATIONS, WINDROWER APPLICATIONS

Model	Sizes	Delivery Capabilities		Knife Drive	Windrower Compatibility		
		Center	Hydraulic Double Swath		HW300/2450	HW320/2550	HW340
994	18′	X	N/A	Single or Double	X		
994	21′	X	N/A	Single or Double	X	X	X
994	25′	X	X	Single or Double	X	X	X
994	30′	X	X	Single or Double	X	X	X
994	36′	X	N/A	Single or Double		X	X

SERIAL NUMBERING

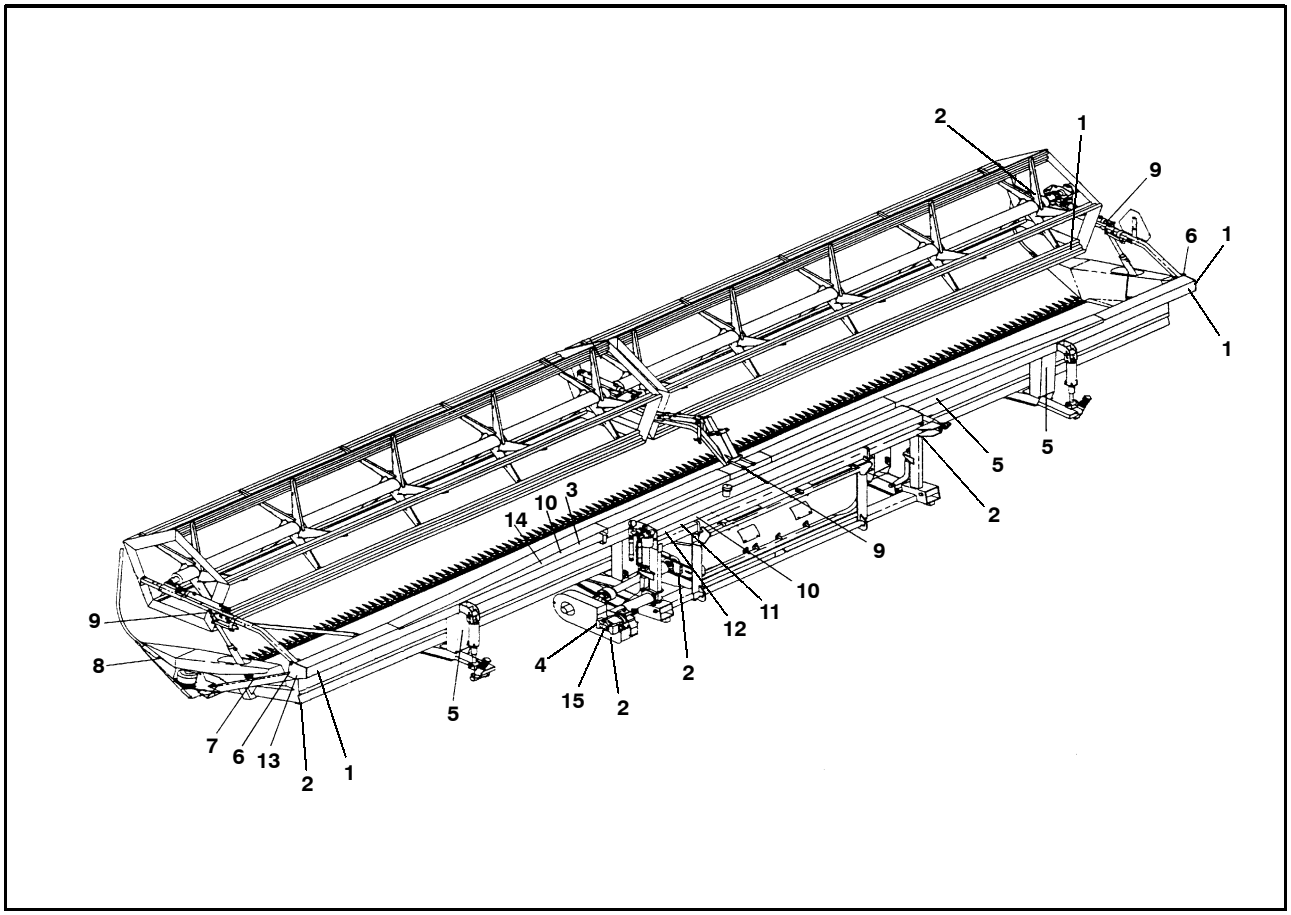
The serial number tag on the header provides the model number, header series number, header width, date the header was built, and the serial number in the order shown in the following example:

MODEL	SERIAL NO.
994	C24 430981842

994	C24	4	30	98	1842
Model	Month and Day Built (March 24)	Series #	Width (ft)	Year Built	Serial Number

HEADER DRIVE SYSTEMS

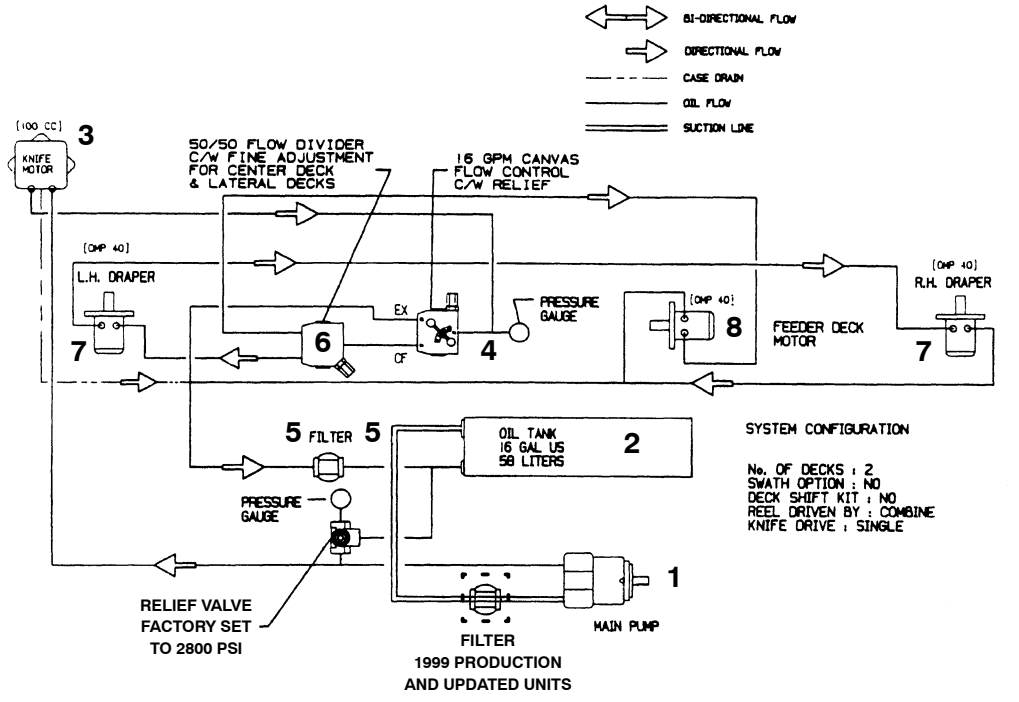
COMBINE APPLICATIONS



9

Grain belt headers used in combine applications have a self-contained hydraulic system used to drive the cutter bar, 1, main drapers, 2, and center feed draper, 3. A PTO shaft, 4, connected to the left end of the feeder jackshaft on the combine, is connected to a speed increasing (1:3.73) gearbox, 5. The output shaft of the gearbox drives the hydraulic pump, 6, at the increased speed, and the finger auger drum, 7, through sprockets and chain.

Reel drive comes from the combine hydraulic reel drive circuit.



19997975

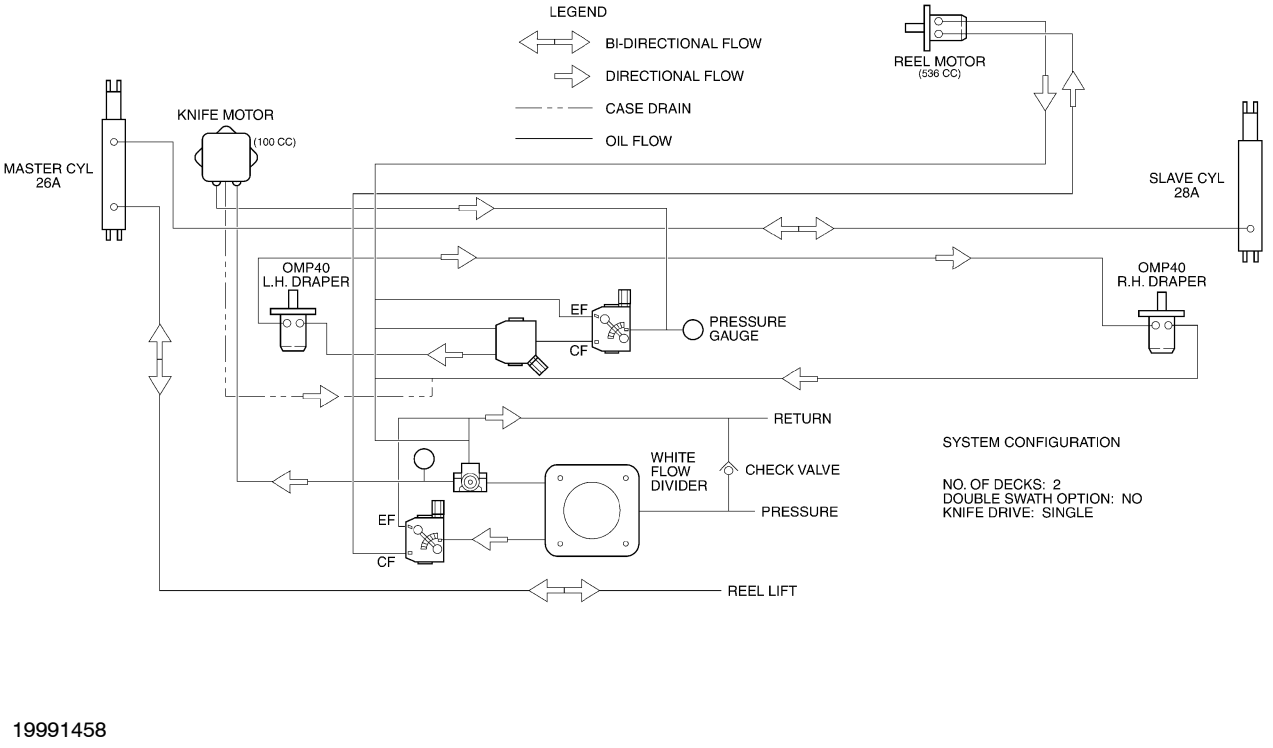
10

The main hydraulic pump, 1, pulls oil from the oil tank (reservoir), 2, through a suction filter (on all 1999 production units and updated units). All oil flow from the hydraulic pump goes first to the knife drive motor(s), 3, then to the canvas flow control valve, 4. The canvas flow control valve limits maximum flow to 60.5 Lpm (16 GPM) and is used to control the speed of the draper canvases between 0 and 167 metres/sec (0 and 550 ft./sec.). Excess flow, from the EF port on the flow control valve, returns to the reservoir through a return filter, 5. Control flow, from the CF port on the flow control valve, enters a 50/50 flow divider valve, 6, where it is split equally between the main draper motors, 7, (plumbed in series) and the center, feeder deck draper motor, 8. Return flow from the draper motors returns to the tank through the return filter, 5.

The knife drive motors are protected by a 193 bar (2800 PSI) relief valve. The draper motors are protected by a 103 bar (1500 PSI) relief valve contained in the flow control valve.

Two gauges are installed on the header to allow the operator to monitor operating pressures, while the header is running, and to aid in troubleshooting. One gauge, mounted on the main system relief valve housing, indicates total system pressure. The other gauge, mounted at the inlet to the draper flow control valve, indicates draper drive pressure.

WINDROWER APPLICATIONS



11

All hydraulic power for the header is provided by the windrower hydraulic system. Pressure from the main windrower hydraulic system is delivered to a flow divider. The flow divider splits the flow two ways.

One output from the flow divider goes to a flow control valve, out through the CF port, then to the reel motor. The flow control valve is used to control the speed of the pick up reel. Oil from the EF port of the flow control goes to the return line then to the reservoir.

Reel height is controlled from the windrower by the reel lift hydraulic circuit.

The other output from the flow divider goes through a pressure-limiting relief valve, set at 193 bar (2800 PSI), then oil goes first to the knife drive motor(s) next to the canvas flow control valve. The canvas flow control valve is used to control the speed of the draper canvases between 0 and 167 metres/sec (0 and 550 ft./sec.). The draper motors are protected by a 103 bar (1500 PSI) relief valve contained in the flow control valve. Excess flow, from the EF port on the flow control valve, returns to the reservoir. Control flow, from the CF port on the flow control valve, enters a flow divider valve used to control the speed of the main draper motors (plumbed in series). Return flow from the draper motors returns to the tank.

Two gauges are installed on the header to allow the operator to monitor operating pressures while the header is running, and to aid in troubleshooting. One gauge, mounted on the main system relief valve housing, indicates total system pressure. The other gauge, mounted at the inlet to the draper flow control valve, indicates draper drive pressure.

NOTE: *Flow divider provides oil flow to the knife and canvas drives.*

- *60% for knife and canvas drive*
- *40% for reel*

ECOLOGY AND THE ENVIRONMENT

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances which are required by advanced technology, common sense should govern the use and disposal of products of a chemical and petrochemical nature.

The following are recommendations which may be of assistance:

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use and dispose of these substances. Agricultural consultants will, in many cases, be able to help you as well.

HELPFUL HINTS

1. Avoid filling tanks using cans or inappropriate pressurized fuel delivery systems which may cause considerable spillage.
2. In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances which may be harmful to your health.
3. Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
4. Avoid spillage when draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
5. Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil but should be collected and disposed of safely.
6. Do not open the air-conditioning system yourself. It contains gases which should not be released into the atmosphere. Your dealer or air conditioning specialist has a special extractor for this purpose and will have to recharge the system properly.
7. Repair any leaks or defects in the engine cooling or hydraulic system immediately.
8. Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
9. Protect hoses during welding as penetrating weld splatter may burn a hole or weaken them, allowing the loss of oils, coolant, etc.

INTERNATIONAL SYMBOLS

As a guide to the operation of your tractor, various universal symbols have been utilized on the instruments, controls, switches, and fuse box. The symbols are shown below with an indication of their meaning.


Thermostart starting aid


Alternator charge


Fuel level


Automatic Fuel shut-off


Engine speed (rev/min x 100)


Hours recorded


Engine oil pressure


Engine coolant temperature


Coolant level


Tractor lights


Headlamp main beam


Headlamp dipped beam


Work lamps

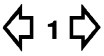

Stop lamps

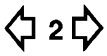

Horn


Radio

KAM Keep alive memory


Turn signals


Turn signals –one trailer


Turn signals –two trailers


Front wind-screen wash/wipe


Rear wind-screen wash/wipe


Heater temp-erature control


Heater fan


Air conditioner


Air filter blocked


Parking brake


Brake fluid level


Trailer brake


Roof beacon


Warning! Corrosive substance


P.T.O.

N Transmission in neutral


Creeper gears


Slow or low setting


Fast or high setting


Ground speed


Differential lock


Rear axle oil tem-perature


Transmission oil pressure


FWD engaged


FWD disengaged


Warning!


Hazard warning lights


Variable control


Pressurized! Open carefully


Position Control


Draft Control


Accessory socket


Implement socket


%age slip


Hitch raise (rear)


Hitch lower (rear)


Hitch height limit (rear)


Hitch height limit (front)


Hitch disabled


Hydraulic and transmission filters


Remote valve extend


Remote valve retract


Remote valve float


Malfunction! See Operator's Manual


Malfunction! (alternative symbol) See Operator's Manual

MINIMUM HARDWARE TIGHTENING TORQUES

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

INCH 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	55* (6.2)	72* (8.1)	86* (9.7)	112* (13)	121* (14)	157* (18)	61* (6.9)	86* (9.8)	1/4
5/16	115* (13)	149* (17)	178* (20)	229* (26)	250* (28)	324* (37)	125* (14)	176* (20)	5/16
3/8	17 (23)	22 (30)	26 (35)	34 (46)	37 (50)	48 (65)	19 (26)	26 (35)	3/8
7/16	27 (37)	35 (47)	42 (57)	54 (73)	59 (80)	77 (104)	30 (41)	42 (57)	7/16
1/2	42 (57)	54 (73)	64 (87)	83 (113)	91 (123)	117 (159)	45 (61)	64 (88)	1/2
9/16	60 (81)	77 (104)	92 (125)	120 (163)	130 (176)	169 (229)	65 (88)	92 (125)	9/16
5/8	83 (112)	107 (145)	128 (174)	165 (224)	180 (244)	233 (316)	90 (122)	127 (172)	5/8
3/4	146 (198)	189 (256)	226 (306)	293 (397)	319 (432)	413 (560)	160 (217)	226 (306)	3/4
7/8	142 (193)	183 (248)	365 (495)	473 (641)	515 (698)	667 (904)	258 (350)	364 (494)	7/8
1	213 (289)	275 (373)	547 (742)	708 (960)	773 (1048)	1000 (1356)	386 (523)	545 (739)	1

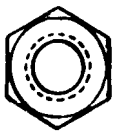
NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION
CAP SCREWS AND CARRIAGE BOLTS

SAE GRADE 2

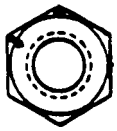
SAE GRADE 5

SAE GRADE 8



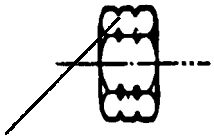
REGULAR NUTS

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

MINIMUM HARDWARE TIGHTENING TORQUES

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

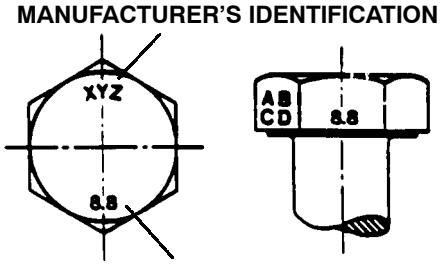
METRIC HARDWARE AND LOCKNUTS

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	15* (1.7)	19* (2.2)	23* (2.6)	30* (3.4)	33* (3.7)	42* (4.8)	16* (1.8)
M6	51* (5.8)	67* (7.6)	79* (8.9)	102* (12)	115* (13)	150* (17)	56* (6.3)
M8	124* (14)	159* (18)	195* (22)	248* (28)	274* (31)	354* (40)	133* (15)
M10	21 (28)	27 (36)	32 (43)	41 (56)	45 (61)	58 (79)	22 (30)
M12	36 (49)	46 (63)	55 (75)	72 (97)	79 (107)	102 (138)	39 (53)
M16	89 (121)	117 (158)	137 (186)	177 (240)	196 (266)	254 (344)	97 (131)
M20	175 (237)	226 (307)	277 (375)	358 (485)	383 (519)	495 (671)	195 (265)
M24	303 (411)	392 (531)	478 (648)	619 (839)	662 (897)	855 (1160)	338 (458)

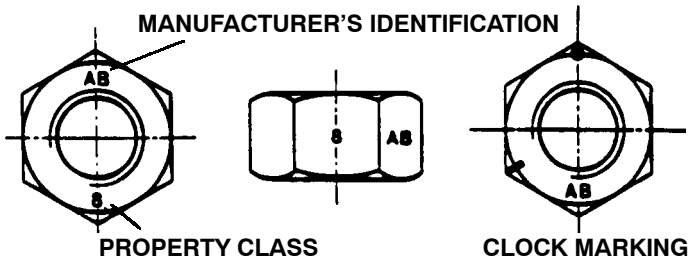
NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION

HEX CAP SCREW AND CARRIAGE BOLTS CLASSES 5.6 AND UP



HEX NUTS AND LOCKNUTS CLASSES 05 AND UP

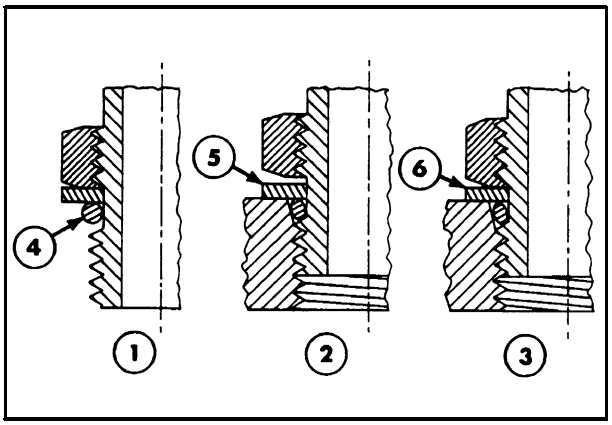


INSTALLATION OF ADJUSTABLE FITTINGS IN STRAIGHT THREAD O RING BOSSES

1. Lubricate the O ring by coating it with a light oil or petroleum. Install the O ring in the groove adjacent to the metal backup washer which is assembled at the extreme end of the groove, 4.
2. Install the fitting into the SAE straight thread boss until the metal backup washer contacts the face of the boss, 5.

NOTE: *Do not over tighten and distort the metal backup washer.*

3. Position the fitting by turning out (counterclockwise) up to a maximum of one turn. Holding the pad of the fitting with a wrench, tighten the locknut and washer against the face of the boss, 6.



12

STANDARD TORQUE DATA FOR HYDRAULIC TUBES AND FITTINGS

TUBE NUTS FOR 37° FLARED FITTINGS								O RING BOSS PLUGS ADJUSTABLE FITTING LOCKNUTS, SWIVEL JIC - 37° SEATS			
				TORQUE				TORQUE			
SIZE	TUBING OD		THREAD SIZE	FOOT POUNDS		NEWTON METERS		FOOT POUNDS		NEWTON METERS	
	In.	mm		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
4	1/4	6.4	7/16-20	9	12	12	16	6	10	8	14
5	5/16	7.9	1/2-20	12	15	16	20	10	15	14	20
6	3/8	9.5	9/16-18	21	24	29	33	15	20	20	27
8	1/2	12.7	3/4-18	35	40	47	54	25	30	34	41
10	5/8	15.9	7/8-14	53	53	72	79	35	40	47	54
12	3/4	19.1	1-1/16-12	77	82	104	111	60	70	81	95
14	7/8	22.2	1-3/16-12	90	100	122	136	70	80	95	109
16	1	25.4	1-5/16-12	110	120	149	163	80	90	108	122
20	1-1/4	31.8	1-5/8-12	140	150	190	204	95	115	129	158
24	1-1/2	38.1	1-7/8-12	160	175	217	237	120	140	163	190
32	2	50.8	2-1/2-12	225	240	305	325	250	300	339	407

These torques are not recommended for tubes of 1/2″ (12.7 mm) OD and larger with wall thickness of 0.035″ (0.889 mm) or less. The torque is specified for 0.035″ (0.889 mm) wall tubes on each application individually.

Before installing and torquing 37° flared fittings, clean the face of the flare and threads with a clean solvent or Loctite cleaner and apply hydraulic sealant Loctite no. 569 to the 37° flare and the threads.

Install fitting and torque to specified torque, loosen fitting and retorque to specifications.