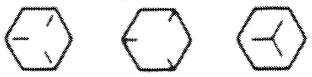
TORQUE SPECIFICATIONS - HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers, dry, or when lubricated with engine oil. Not applicable if special graphites, moly-disulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs



Size	Pound-Feet	Newton metres	Kilogram metres
1/4 in 6.4 mm	9-11	12-15	1.2-1.5
5/16 in 7.9 mm	17-21	23-28	2.4-2.9
3/8 in 9.5 mm	35-42	48-57	4.8-5.8
7/16 in 11.1 mm	54-64	73-87	7.5-8.8
1/2 in 12.7 mm	80-96	109-130	11.1-13.3
9/16 in 14.3 mm	110-132	149-179	15.2-18.2
5/8 in 15.9 mm	150-180	203-244	20.8-24.9
3/4 in 19.0 mm	270-324	366-439	37.3-44.8
7/8 in 22.2 mm	400-480	542-651	55.3-66.4
1.0 in 25.4 mm	580-696	787-944	80.2-96.2
1-1/8 in 28.6 mm	800-880	1085-1193	111-122
1-1/4 in 31.8 mm	1120-1240	1519-1681	155-171
1-3/8 in 34.9 mm	1460-1680	1980-2278	202-232
1-1/2 in 38.1 mm	1940-2200	2631-2983	268-304

Grade 8 Bolts, Nuts, and Studs



Size	Pound-Feet	Newton metres	Kilogram metres
1/4 in 6.4 mm	12-15	16-20	1.7-2.1
5/16 in 7.9 mm	24-29	33-39	3.3-4.0
3/8 in 9.5 mm	45-54	61-73	6.2-7.5
7/16 in 11.1 mm	70-84	95-114	9.7-11.6
1/2 in 12.7 mm	110-132	149-179	15.2-18.2
9/16 in 14.3 mm	160-192	217-260	22.1-26.5
5/8 in 15.9 mm	220-264	298-358	30.4-36.5
3/4 in 19.0 mm	380-456	515-618	52.5-63.0
7/8 in 22.2 mm	600-720	814-976	83.0-99.5
1.0 in 25.4 mm	900-1080	1220-1465	124-149
1-1/8 in 28.6 mm	1280-1440	1736-1953	177-199
1-1/4 in 31.8 mm	1820-2000	2468-2712	252-277
1-3/8 in 34.9 mm	2380-2720	3227-3688	329-376
1-1/2 in 38.1 mm	3160-3560	4285-4827	437-492

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MAINTENANCE SCHEDULE

REF. NUMBER	SERVICE POINTS	NO. OF POINTS	APPLY GREASE	APPLY OIL	CHECK	CLEAN	CHANGE	SECTION NO.	FREQUENCY
1	Caster Pin (1 each side of machine)*	8							○ 10 Hours **
2	Lift Arm Caster Pin* (1 each side of machine)	2							
3	Caster Pin - Dual Transport Wheel* (1 each side of machine)	2							
4	Parallel Arm Pivot Points* (4 each side of machine)	8							
5	Furrow Openers* 7 inch (178 mm) Rows 10 inch (254 mm) Rows 12 inch (305 mm) Rows	 77 54 45							
6	Axle Bushings - Single Gauge Wheel* (2 each side of machine)	4							
7	Axle Bushings - Dual Gauge Wheel* (2 each side of machine)	4							⬢ Yearly Or As Needed ***
8	Master Gauge Arm Bushing*	2							
9	Hitch Link* (1 each side of machine)	2							
10	Press Wheel Adjusting Screw* (1 each press wheel section)	6							
11	Press Wheel Bearings* (8 each press wheel section)	18							
12	Lift Arm Bushings* (2 each side of machine)	4							
13	Axle Bushings - Dual Transport Wheel* (2 each side of machine)	4							

***NOTE 1:** *Use Case IH Molydisulfide grease. Clean each grease fitting before and after you lubricate the pivot point or bearings.*

****NOTE 2:** *Every 10 hours of operation or each day, whichever occurs first.*

*****NOTE 3:** *Each year or at the end of the season.*

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TROUBLESHOOTING THE MONITOR SYSTEM

The monitor system on this machine has the following components:

1. Monitor inside the cab of the tractor.

2. Remote module fastened to the hopper frame below the electric clutch.

3. Fertilizer shaft sensor.

4. Grain shaft sensor.

5. Area sensor on the main jackshaft on the main jackshaft.

6. Fan speed sensor.

7. Fertilizer bin level sensor.

8. Grain bin level sensor.

9. Electric clutch switch.

10. Blockage modules. Machines with a complete blockage monitor system have a blockage module on each manifold pipe. Machines with a standard monitor system have one blockage module on the center manifold pipe.

11. Flow sensors. Machines with a complete blockage monitor system have a flow sensor for each furrow opener. Machines with a standard monitor system have a flow sensor for each manifold pipe.

12. Taillamps and turn signal lamps.

13. All necessary wiring harnesses and connections.

The monitor on this machine is designed to self-test the monitor system. If you understand the indications on the display screen you will be able to correct the problems quickly and easily. The first few pages of this section explain the controls and functions of the monitor. This part of the section also explains Self-test, Test Mode 1, Test Mode 2, and the program functions of the monitor.

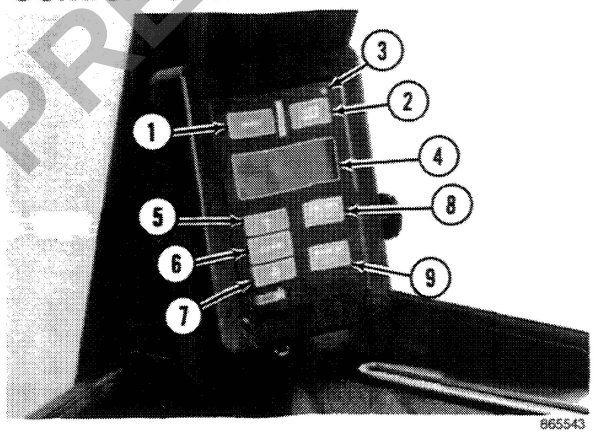
Use the schematics in Section 4003 and the Troubleshooting Chart beginning on page 4002-9 for more testing of the monitor system.

NOTE: *There are no service parts inside the modules.*

MONITOR OPERATION

The monitor system on this machine continously checks the machine for correct seeding operation. The monitor controls the electric clutch for seed and fertilizer drives, checks to make sure the seed and fertilizer drives are rotating, checks the bin levels in the hopper, checks to make sure the fan is operating at the correct rpm (r/min), and checks for restrictions (blockages) in the seeding system.

Control Panel



1. ON-OFF SWITCH: This switch has two positions, ON and OFF. Push the switch for ON and push the switch again for OFF. The monitor system shuts OFF if the machine has a fan speed below 500 rpm (r/min) for 20 minutes.

2. CLUTCH ENGAGE SWITCH: This switch has two positions, ON and OFF. This switch is used to engage and disengage the electric clutch for the hopper (seed and fertilizer drives). When the switch is ON, the clutch warning lamp (Item 3) will illuminate and the seed and fertilizer drive system will operate if the machine is moving with the frame lowered. Push the switch for ON (engage) and push the switch for OFF (disengage).

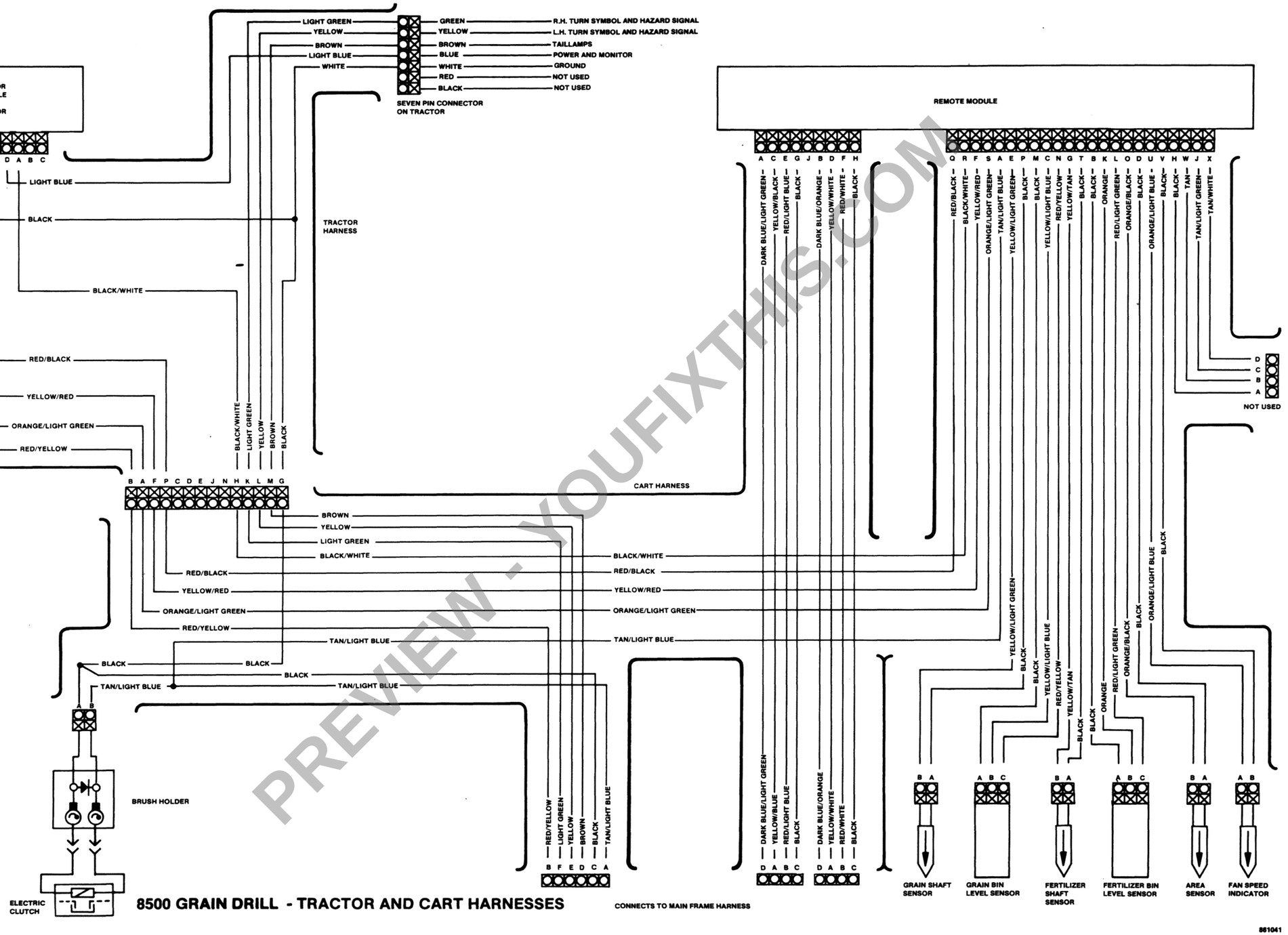
3. CLUTCH WARNING LAMP: This lamp will illuminate when the clutch engage switch (Item 2) is ON. This lamp flashes when the frame is raised and stays illuminated when the frame is lowered.

4. DISPLAY SCREEN: This screen will show the different monitoring operations for the air drill.

5. ARROW (Tip up): This switch is used with Item 7 to show the different test modes, programs, and to change information for some programs.

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8500 GRAIN DRILL - TRACTOR AND CART HARNESSES

8500 Air Drill - Tractor and Cart Harnesses

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SPECIFICATIONS

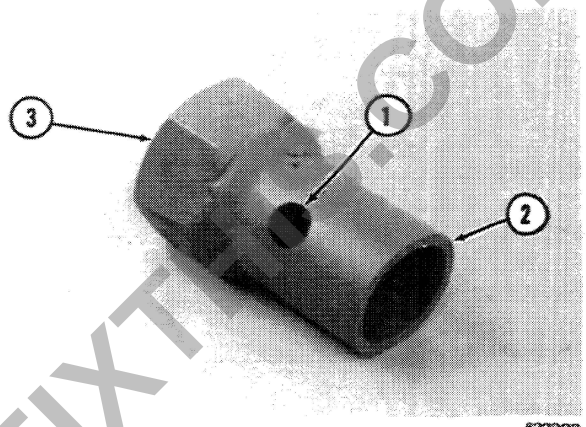
Manufacturer ..... Warner Electric

Space between magnet and armature ..... 0.030 to 0.090 inch (0.76 to 2.28 mm)

Wear of magnet and armature ..... See pages 4012-7 and 4012-10

SPECIAL TOOL

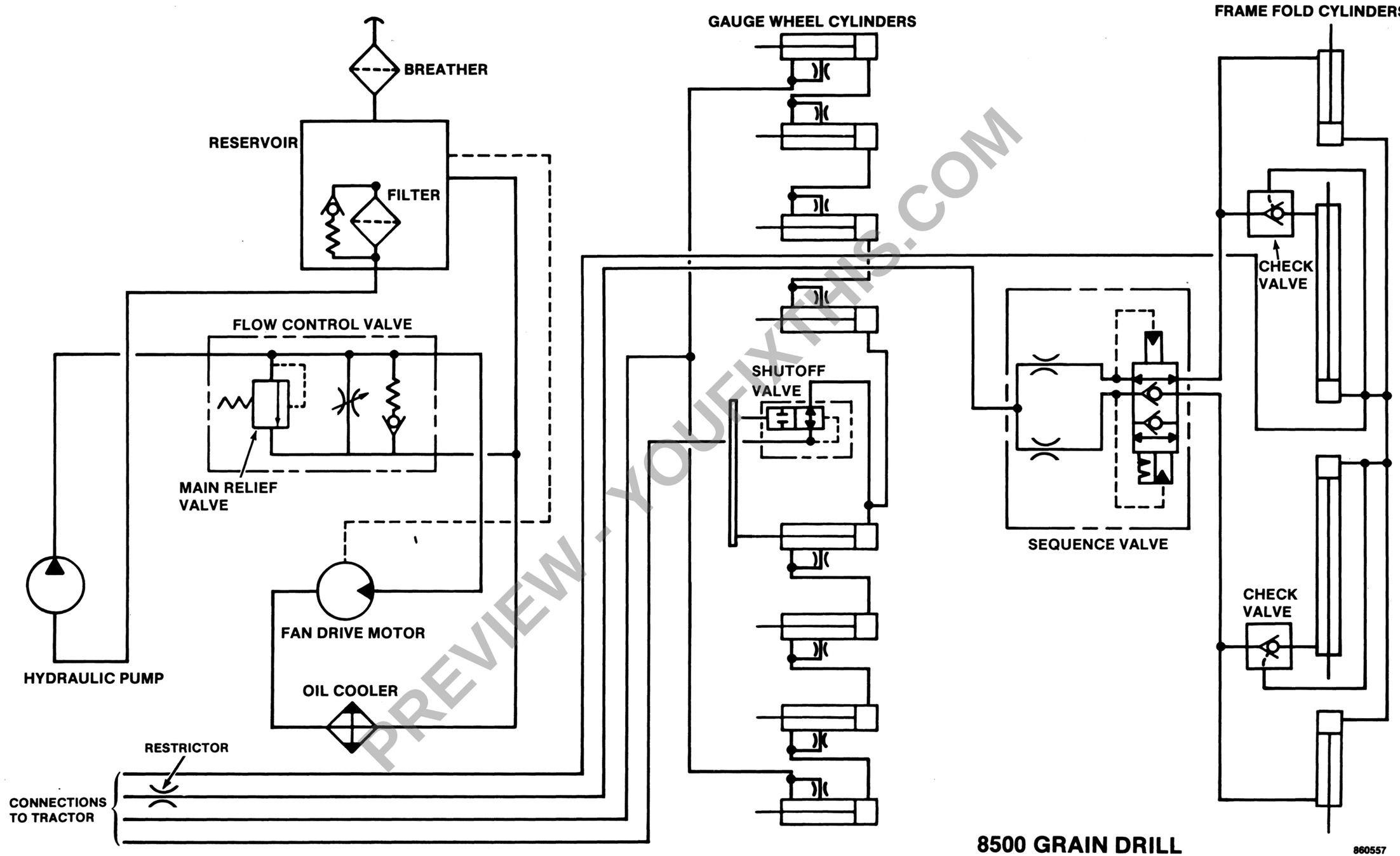
Make the tool shown below to check the torque of the electric clutch.



1. *7/16 Inch (11 mm) Through Hole*
2. *1-1/16 Inch (27 mm) ID Tubing 1/8 Inch (3 mm) Wall Thickness*
3. *1-1/16 Inch (27 mm) Not Welded to Tube*

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Hydraulic Schematic

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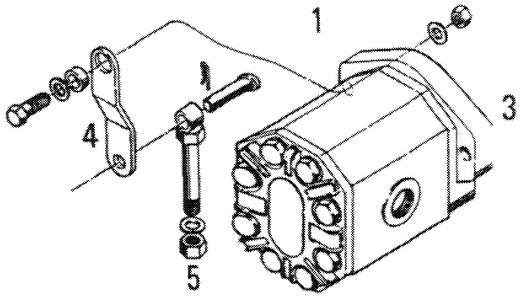
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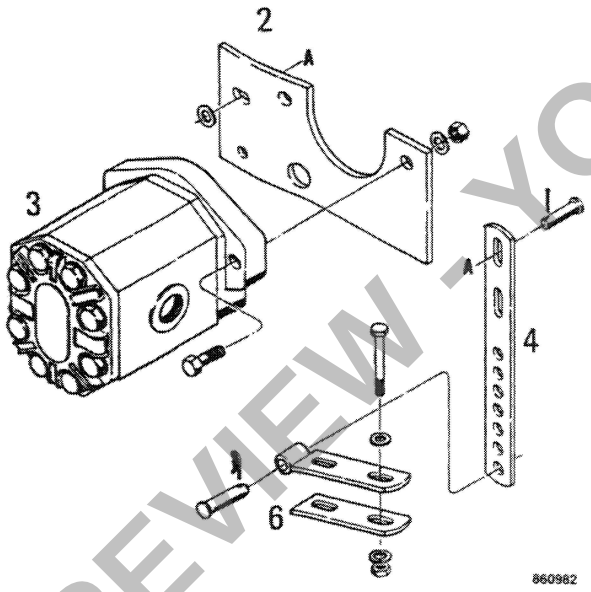
HYDRAULIC PUMP

Removal

1. Park the machine on a level surface. Stop the engine of the tractor.

2. See the illustration below. Remove the pump retaining bracket. Remove the hydraulic pump from the PTO shaft of the tractor.

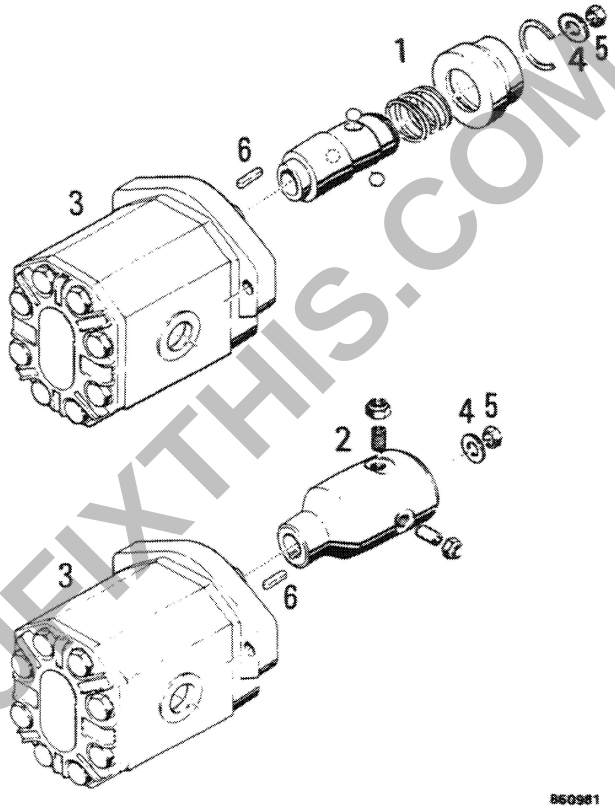




1. *Case IH Four Wheel Drive Tractors*
2. *All Other Tractors*
3. *Hydraulic Pump*
4. *Retaining Strap*
5. *Connects Through Hole In Drawbar*
6. *Clamps to Drawbar*

3. Disconnect the hoses from the fittings in the hydraulic pump. Install plugs in the hoses and caps on the fittings.

4. See the following illustration. Remove the PTO coupling.



1. *1-3/8 Inch (35 mm) Diameter Coupling*
2. *1-3/4 Inch (44 mm) Diameter Coupling*
3. *Hydraulic Pump*
4. *Flat Washer*
5. *Nut*
6. *Key*

Installation

1. See the illustrations on this page. Install the PTO coupling. Tighten the nut to 40 to 45 pound-feet (54 to 61 N m, 5.5 to 6.2 kg/m).

2. Connect the hoses to the fittings in the hydraulic pump.

3. Apply Molykote grease to the PTO shaft. Install the hydraulic pump on the PTO shaft.

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TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres	Kilogram metres
37 Degree Flare Fittings				
1/4 in 6.4 mm	7/16-20	6-12	8-16	0.8-1.7
5/16 in 7.9 mm	1/2-20	8-16	11-21	1.1-2.2
3/8 in 9.5 mm	9/16-18	10-25	14-33	1.4-3.5
1/2 in 12.7 mm	3/4-16	15-42	20-56	2.1-5.8
5/8 in 15.9 mm	7/8-14	25-58	34-78	3.5-8.0
3/4 in 19.0 mm	1-1/16-12	40-80	54-108	5.5-11.1
7/8 in 22.2 mm	1-3/16-12	60-100	81-135	8.3-13.9
1.0 in 25.4 mm	1-5/16-12	75-117	102-158	10.4-16.2
1-1/4 in 31.8 mm	1-5/8-12	125-165	169-223	17.3-22.8
1-1/2 in 38.1 mm	1-7/8-12	210-250	285-338	29.0-34.6

Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres	Kilogram metres
Straight Threads with O-ring				
1/4 in 6.4 mm	7/16-20	12-19	16-25	1.7-2.6
5/16 in 7.9 mm	1/2-20	16-25	22-33	2.2-3.5
3/8 in 9.5 mm	9/16-18	25-40	34-54	3.5-5.5
1/2 in 12.7 mm	3/4-16	42-67	57-90	5.8-9.3
5/8 in 15.9 mm	7/8-14	58-92	79-124	8.0-12.7
3/4 in 19.0 mm	1-1/16-12	80-128	108-174	11.1-17.8
7/8 in 22.2 mm	1-3/16-12	100-160	136-216	13.8-22.1
1.0 in 25.4 mm	1-5/16-12	117-187	159-253	16.2-25.9
1-1/4 in 31.8 mm	1-5/8-12	165-264	224-357	22.8-36.5
1-1/2 in 38.1 mm	1-7/8-12	250-400	339-542	34.6-55.3

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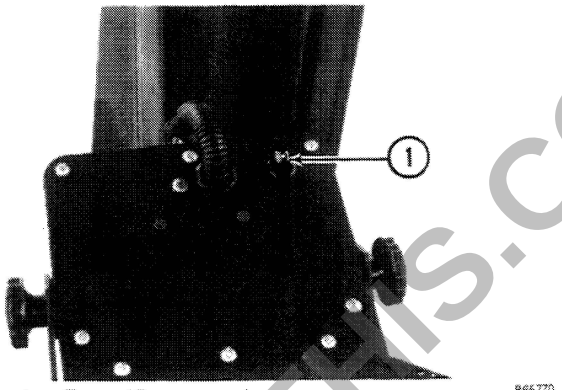
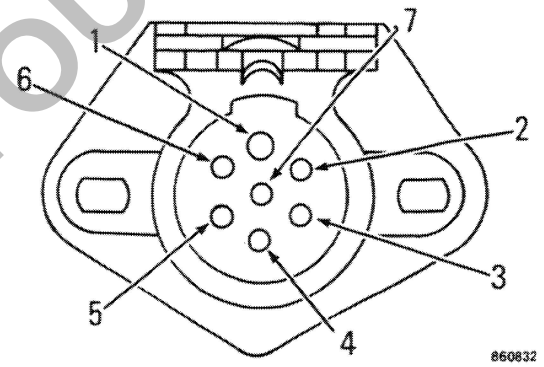
REF. NUMBER	SERVICE POINTS	NO. OF POINTS	APPLY GREASE	APPLY OIL	CHECK	CLEAN	CHANGE	SECTION NO.	FREQUENCY
14	Fertilizer Wheel Shear Pins 7 inch (178 mm) row machines 10 inch (254 mm) row machines 12 inch (305 mm) row machines	 7 6 5			▒			9006	○ 10 Hours **
15	Hydraulic Pump Coupling	1	▒					74	
16	Rotate Fertilizer Shaft Before Starting Machine Operation	1			▒			74	
17	Press Wheel Pivots* (2 each press wheel section)	12	▒					74	
18	Hydraulic Reservoir Oil Level	1			▒			8001	
19	Main Jackshaft Drive Chain Tension	1			▒			9001	⬢ Yearly Or As Needed ***
20	Clutch Drive Chain Tension	1			▒			9001	
21	Grain Drive Chain Tension	1			▒			9001	
22	Fertilizer Jackshaft Drive Chain Tension	1			▒			9001	
23	Fertilizer Drive Chain	1			▒			9001	
24	Gap for Fertilizer Gates 7 inch (178 mm) row machines 10 inch (254 mm) row machines 12 inch (305 mm) row machines	 7 6 5			▒			9006	
25	Feed Cup Alignment 7 inch (178 mm) row machines 10 inch (254 mm) row machines 12 inch (305 mm) row machines	 7 6 5			▒			9004	
26	Air pressure and condition of tires	16			▒			9010	
27	Hydraulic System Cooler	1				▒		8001	
28	Hydraulic System Oil	1					▒	8001	
29	Hydraulic System Filter Element	1					▒	8001	
30	Hydraulic System Breather	1				▒		8001	
31	Machine Storage	1	▒	▒	▒	▒	▒		
32	Wheel Bearings****	16	▒					9012	

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TROUBLESHOOTING CHART

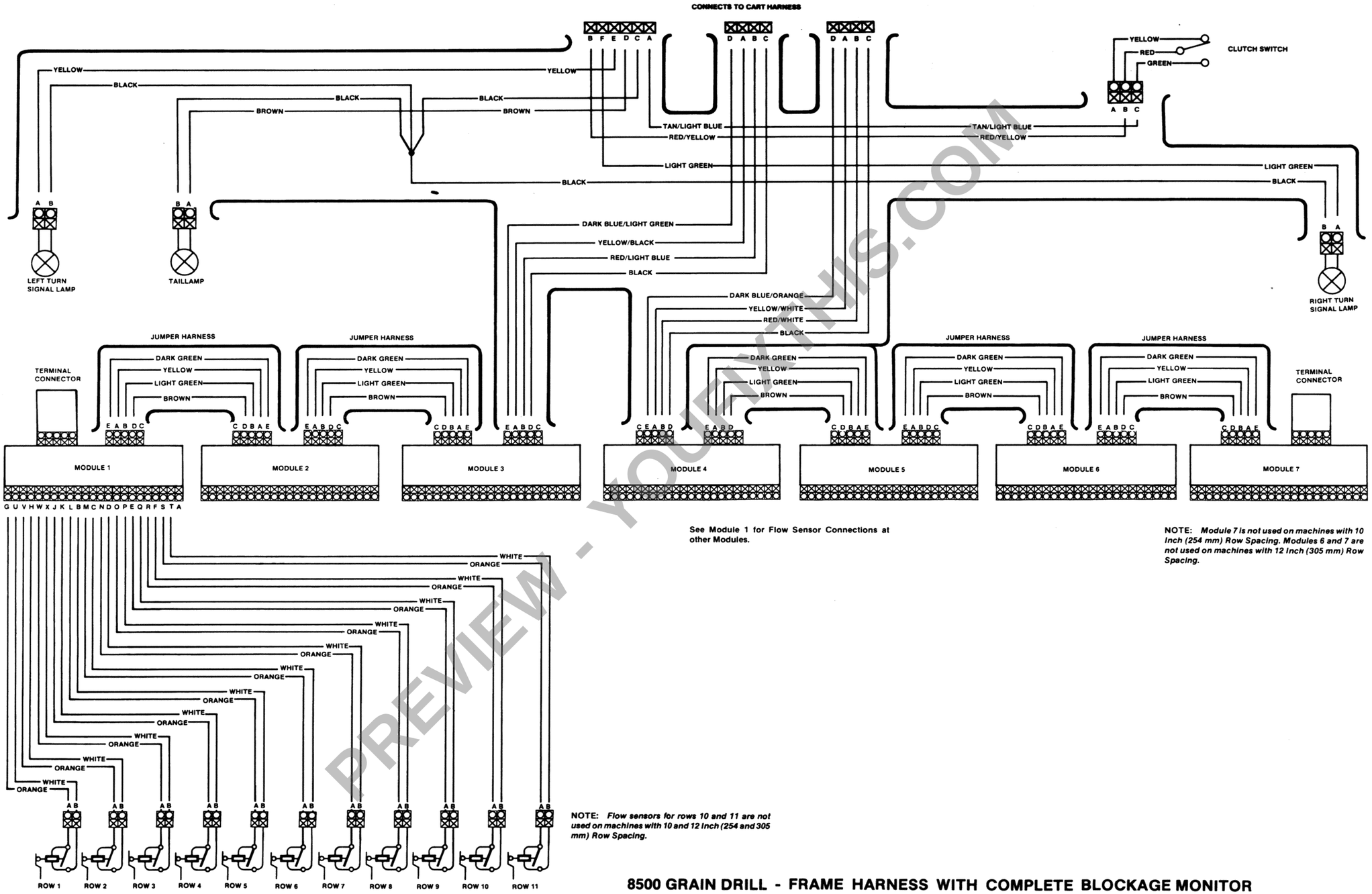
Monitor Does Not Work When the ON/OFF Switch is Pressed

POSSIBLE CAUSE	CORRECTION
Fuse in the monitor	Check the fuse in the back of the monitor.  *1. Fuse (5 ampere)*
Power supply from the tractor	Check the monitor harness. Make sure the harness is connected to the monitor and to the seven pin connector on the tractor. Check to make sure there is a minimum of 10 volts at pin number 7 of the seven pin connector on the tractor. Make sure there is a good ground connection at pin number 1.  *1. White Wire - Ground* *2. Black Wire - Work Lights* *3. Yellow Wire - Left Flashing And Turn Signal* *4. Red Wire - Auxiliary 12 Volt Power Supply* *5. Green wire - Right Flashing And Turn Signal* *6. Brown Wire - Taillights* *7. Blue Wire - Monitor 12 Volt Power Supply*
Monitor harness	Disconnect the monitor harness from the monitor. Check for power between pin D and pin A in the monitor harness connector. There must be a minimum of 10 volts between pin D and pin A. If the voltage is not correct, see the schematics in Section 4003 and check the monitor harness.
Monitor	Install a new monitor.

NOTE: *If a new monitor is not available, you can temporarily power the clutch directly. Disconnect the connector from the rear of the monitor. Connect a jumper wire between pins D and F in the tractor harness. With this jumper wire in place, the complete monitor system will not function. Disconnect the jumper wire when the machine is not in use.*

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See Module 1 for Flow Sensor Connections at other Modules.

NOTE: *Module 7 is not used on machines with 10 Inch (254 mm) Row Spacing. Modules 6 and 7 are not used on machines with 12 Inch (305 mm) Row Spacing.*

NOTE: *Flow sensors for rows 10 and 11 are not used on machines with 10 and 12 Inch (254 and 305 mm) Row Spacing.*

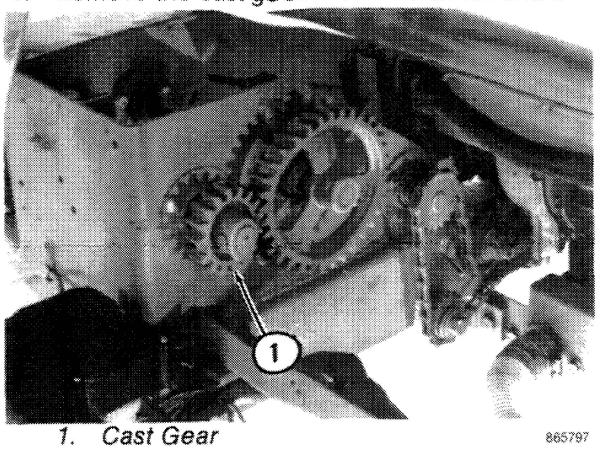
8500 GRAIN DRILL - FRAME HARNESS WITH COMPLETE BLOCKAGE MONITOR

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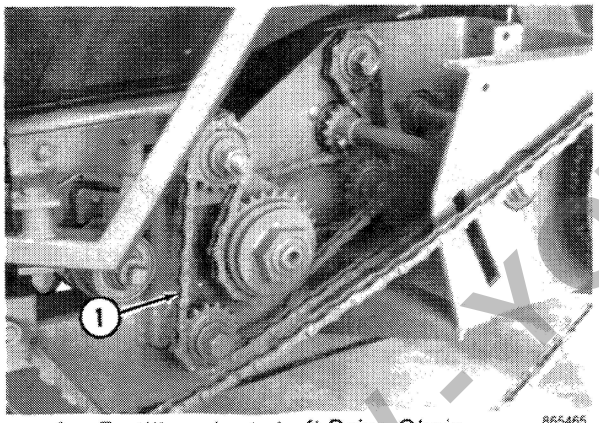
CHECKING THE TORQUE OF THE ELECTRIC CLUTCH

1. Remove the cast gear from the clutch shaft.



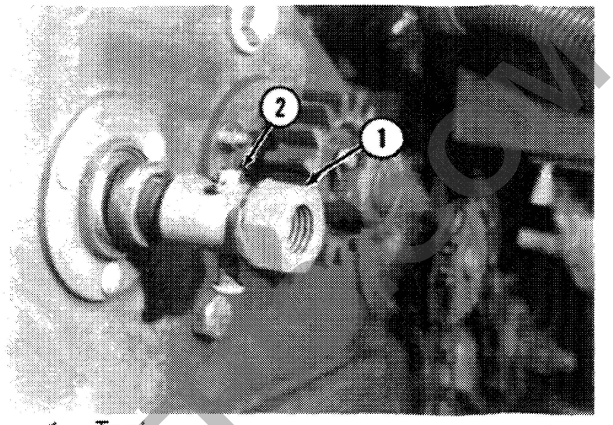
1. Cast Gear 865797

2. Disconnect the fertilizer jackshaft drive chain.



1. Fertilizer Jackshaft Drive Chain 865465

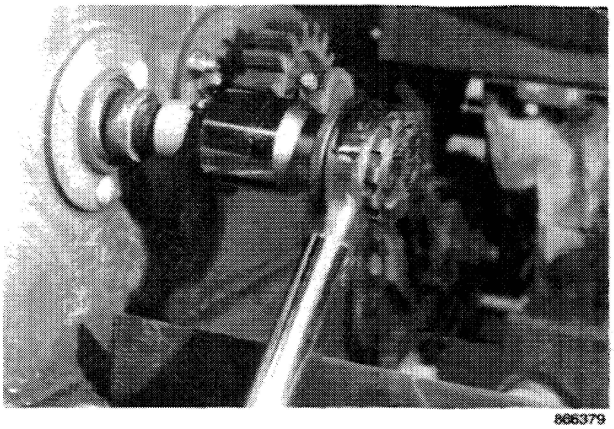
3. Make the tool shown on page 4012-2. Install the tool on the shaft. Use the pin and cotter pin to fasten the tool to the shaft.



1. Tool
2. Pin and Cotter Pin 866378

4. Actuate the electric clutch. Make sure that the frame is lowered.

5. Connect a torque wrench to the tool. Check the torque of the electric clutch. If the shaft turns before you reach 250 pound-feet (339 N m, 34 kg/m), the electric clutch must be burnished.



866379

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