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CX Series Tractors

Service Manual SM 8-10602

Volume 1 Contains Tabs 1 to 6
Volume 2 Contains Tabs 7 to 10

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2 ENGINE		
NOTE: *For the Engine Service and Overhaul procedures refer to your Engine Service Manual SM 8-10010 (3 Cylinder Engines) or SM 8-10040 (for 4 Cylinder Engines).*		
3 FUEL SYSTEM		
Fuel Tank Removal and Servicing	3005	SM 8-10130
NOTE: *For the Fuel System Service and Overhaul procedures refer to your Engine Service Manual SM 8-10010 (3 Cylinder Engines) or SM 8-10040 (for 4 Cylinder Engines).*		
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Shiftable PTO (XtraShift Prior to Pin JJE0200493) (Synchronizer Prior to Pin JJE0902626)	6020	SM 8-10330
Shiftable PTO (XtraShift Pin JJE0200494 and After) (Synchronizer Pin JJE0902627 and After)	6020	SM 8-14020
MFD Axle	6021	SM 8-10341
Front PTO	6025	SM 8-10580

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McCORMICK

SM 8-10612

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STANDARD TORQUE DATA FOR NUTS AND BOLTS

NOTE: *A "click type" torque wrench is recommended for the bolt torques listed below.*

Chart 1 (Plain Nuts/Bolts)

BOLT SIZE (mm)	TYPE 8.8				TYPE 10.9			
	MIN		MAX		MIN		MAX	
	lb ft	Nm	lb ft	Nm	lb ft	Nm	lb ft	Nm
M4	3.0	4.0	3.4	4.5	4.3	5.8	4.8	6.5
M5	4.8	6.5	5.5	7.5	7.0	9.5	7.8	10.5
M6	8.2	11.0	9.2	12.5	11.8	16.0	13.3	18.0
M8	20.0	27.0	22.5	31.0	28.7	39.0	32.3	44.0
M10	40.0	54.0	45.0	61.0	56.0	77.0	64.0	87.0
M12	69.0	94.0	78.0	106.0	100.0	134.0	110.0	151.0
M14	110.0	150.0	125.0	170.0	160.0	215.0	180.0	240.0
M16	175.0	235.0	190.0	260.0	245.0	335.0	275.0	375.0
M20	345.0	470.0	390.0	530.0	480.0	650.0	540.0	730.0
M22	475.0	640.0	530.0	720.0	655.0	890.0	735.0	1000.0
M24	600.0	810.0	675.0	915.0	830.0	1125.0	930.0	1265.0
M30	1190.0	1615.0	1340.0	1815.0	1645.0	2235.0	1855.0	2515.0
M36	2080.0	2825.0	2340.0	3175.0	2875.0	3900.0	3235.0	4390.0

Chart 2 (Phosphate Coated Nuts/Bolts)

BOLT SIZE (mm)	TYPE 8.8				TYPE 10.9			
	MIN		MAX		MIN		MAX	
	lb ft	Nm	lb ft	Nm	lb ft	Nm	lb ft	Nm
M4	2.3	3.0	2.6	3.4	3.2	4.4	3.6	4.9
M5	3.6	4.9	4.1	5.6	5.2	7.1	5.9	8.0
M6	6.2	8.3	6.9	9.4	8.9	12.0	10.0	13.5
M8	15.0	20.3	16.9	23.3	21.5	29.2	24.2	32.8
M10	30.0	41.0	34.0	46.0	42.0	58.0	48.0	65.0
M12	52.0	71.0	59.0	80.0	75.0	101.0	83.0	113.0
M14	83.0	113.0	94.0	126.0	120.0	161.0	135.0	180.0
M16	131.0	176.0	143.0	195.0	185.0	251.0	205.0	280.0
M20	259.0	353.0	293.0	400.0	360.0	490.0	405.0	550.0
M22	355.0	480.0	400.0	540.0	490.0	665.0	550.0	750.0
M24	450.0	608.0	506.0	686.0	625.0	845.0	700.0	950.0
M30	893.0	1211.0	1005.0	1361.0	1235.0	1675.0	1390.0	1885.0
M36	1560.0	2119.0	1755.0	2381.0	2156.0	2925.0	2425.0	3295.0

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GENERAL SPECIFICATIONS

Capacities

TRANSMISSION/HYDRAULIC (HY-TRAN ® ULTA) OIL CAPACITY
- 2WD Tractors ..... 34.5 Litres
- MFD Tractors ..... 37 Litres

Fuel Tank ..... 155 Litres

Electrical Specifications

Type of System ..... 12 Volt, Negative Ground
Batteries ..... One or Two 12 Volt, Low Maintenance Hybrid Batteries Connected in Parallel
DIN Type 60527, Top Stud Terminals

BATTERY TYPE	SAE (COLD CRANKING CAPACITY)	IEC	DIN	AMPERE HOURS	RESERVE CAPACITY
644	660 Amps	440 Amps	400 Amps	95	180 mins
664	770 Amps	515 Amps	465 Amps	105	210 mins
648	810 Amps	545 Amps	490 Amps	120	220 mins

Fuel Level Sender Resistance
- Empty ..... 28 to 34 Ohms
- Full ..... 240 to 250 Ohms

Steering Specifications

TRACK ADJUSTMENT
- 2WD Toe-in ..... 0 to 5 mm
- MFD Toe-in ..... 0 to 2 mm

STEERING PUMP (ENGINE DRIVEN)
- CX50 and CX60
  - Direction of Rotation ..... Clockwise
  - Flow at 2250 engine rpm ..... 27.7 L/min.
  - Rated Working Pressure ..... 160 bar
- CX70, CX80, CX90 and CX100
  - Direction of Rotation ..... Counterclockwise
  - Flow at 2200 engine rpm ..... 30.3 L/min.
  - Rated Working Pressure ..... 160 bar

Transmission Specifications

CLUTCH
- CX50/60/70 Tractors
  - Maximum Clutch Plate Thickness ..... 10.4 mm
  - Clutch Plate Diameter ..... 305 mm
  - Number of Friction Plate Pads ..... 5 each side
- CX80/90/100 Tractors
  - Maximum Clutch Plate Thickness ..... 10.4 mm
  - Clutch Plate Diameter ..... 310 mm
  - Number of Friction Plate Pads ..... 7 each side

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SPEED TRANSMISSION
- Speed Transmission Synchronizer End Play ..... 0.05 to 0.30 mm

RANGE TRANSMISSION
- Pinion Bearing End Play (Maximum) ..... 0.076 mm
- Synchronizer Running Clearance ..... 0.05 to 0.30 mm
- Selector Fork Running Clearance ..... 0.05 mm

REAR AXLE
- Planetary Gear/Planetary Gear Carrier Shimming ..... refer to Section 6018

DIFFERENTIAL
- Differential Lock Selector Ring Clearance (Engaged Position) ..... 0.025 to 0.90 mm
- Ring Gear to Pinion Backlash ..... 0.152 to 0.304 mm
- Ring Gear to Differential Housing Run-out ..... 0 to 0.102 mm
- Differential Bearing Rolling Pull ..... 2.0 to 6.5 kg

PTO CLUTCH
- Standard Clutch
  - Number of Friction Plates 5
  - Number of Steel Separator Plates (2 between each Friction Plate) 8
- Heavy Duty Clutch
  - Number of Friction Plates 6
  - Number of Steel Separator Plates 5

MFD CLUTCH
- Friction Plate Thickness (New) ..... 2.25 to 2.35 mm
- Friction Plate Thickness (Minimum) ..... 2.00 mm
- MFD Clutch Torque ..... 638 to 792 Nm
- Output Shaft Bearing Preload (without oil seals) ..... 20 to 40 N
- MFD Drive Shaft Deflection (below the centre line of the shaft) (measured at Centre Support Bearing) ..... 0.50 to 0.55 mm

MFD PARKING BRAKE
- Front and Rear Brake Pads (New) ..... 10.70 to 10.90 mm
- Front and Rear Brake Pads (Minimum) ..... 10.50 mm
- Central Brake Pads (New) ..... 4.00 to 4.10 mm
- Central Brake Pads (Minimum) ..... 3.50 mm

MFD AXLE
- Differential
  - Separator Plate Thickness ..... 1.5 mm
  - Friction Disc Thickness ..... 1.45 to 1.6 mm
  - Thrust Plate Thickness ..... 2.7 to 2.8 mm
  - Pinion Shaft Bearing Preload ..... 105 to 157 N
- Pinion Shaft/Differential Bearing
  - Total Preload ..... 105 to 157 (+ 29.5 to 44.1) N
- Bevel Gear to Pinion Backlash ..... 0.16 to 0.22 mm
- Lubricants
  - Planetary and Wheel Hub
    - Type ..... SAE 85W-140EP
    - Capacity, per Hub ..... 0.6 Litres
  - Differential/Axle Housing
    - Type ..... SAE 85W-140EP
    - Capacity ..... 6 Litres
  - Grease ..... Multi-Purpose Lithium Grease

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FUEL TANK

Removal and Installation

NOTE: *For Installation follow the Removal procedure in reverse order.*

Before removing the Fuel Tank carry out the following:

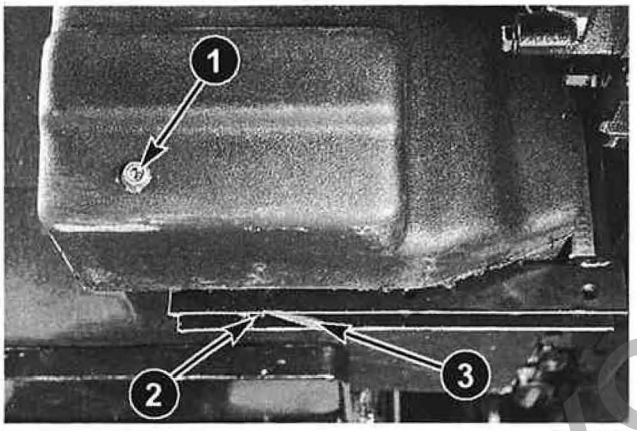
- Park the tractor on hard level ground and apply the parking brake.
- Stop the engine and remove the key.
- Put blocks in front of and behind the rear wheels.

STEP 1

Disconnect the battery, negative (-) terminal first.

NOTE: *For Installation, connect the positive (+) terminal first.*

STEP 2

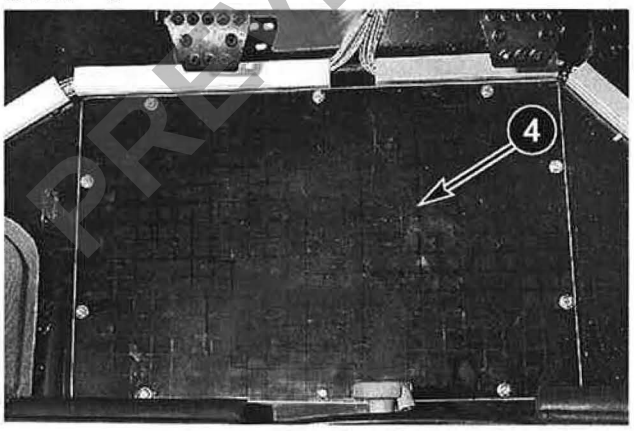


DP98A146

Place a suitable container under fuel tank drain plug (1). Remove the plug and drain the fuel. When fuel has drained install and tighten the plug. Remove retaining nut (2) and disconnect retaining strap (3).

NOTE: *The capacity of a full fuel tank is 155 Litres.*

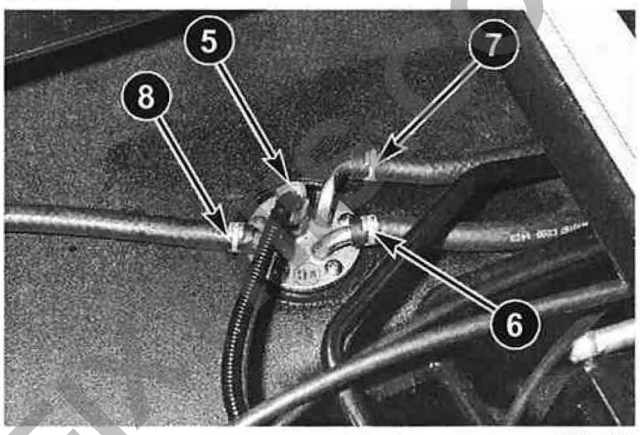
STEP 3



DP98A149

Remove the cab floor mat, remove the retaining bolts and remove access plate (4).

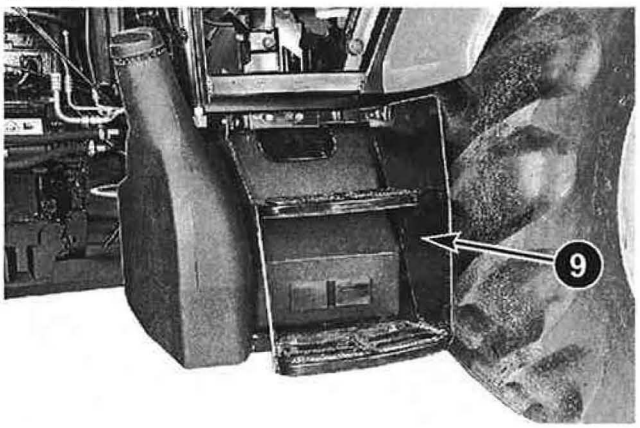
STEP 4



DP98A148

Disconnect harness connector (5). Put identification marks on fuel feed hose (6), return hose (7) and breather hose (8). Release the hose clips and disconnect the hoses from the fuel sender. Cap the hoses and tubes.

STEP 5

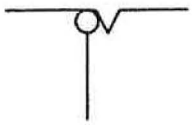
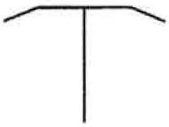
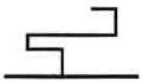
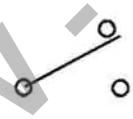
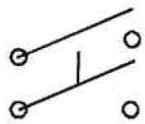
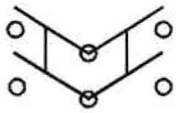


DP98A145

Support the left hand cab steps and remove the retaining bolts. Remove steps (9).

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Schematic Symbols

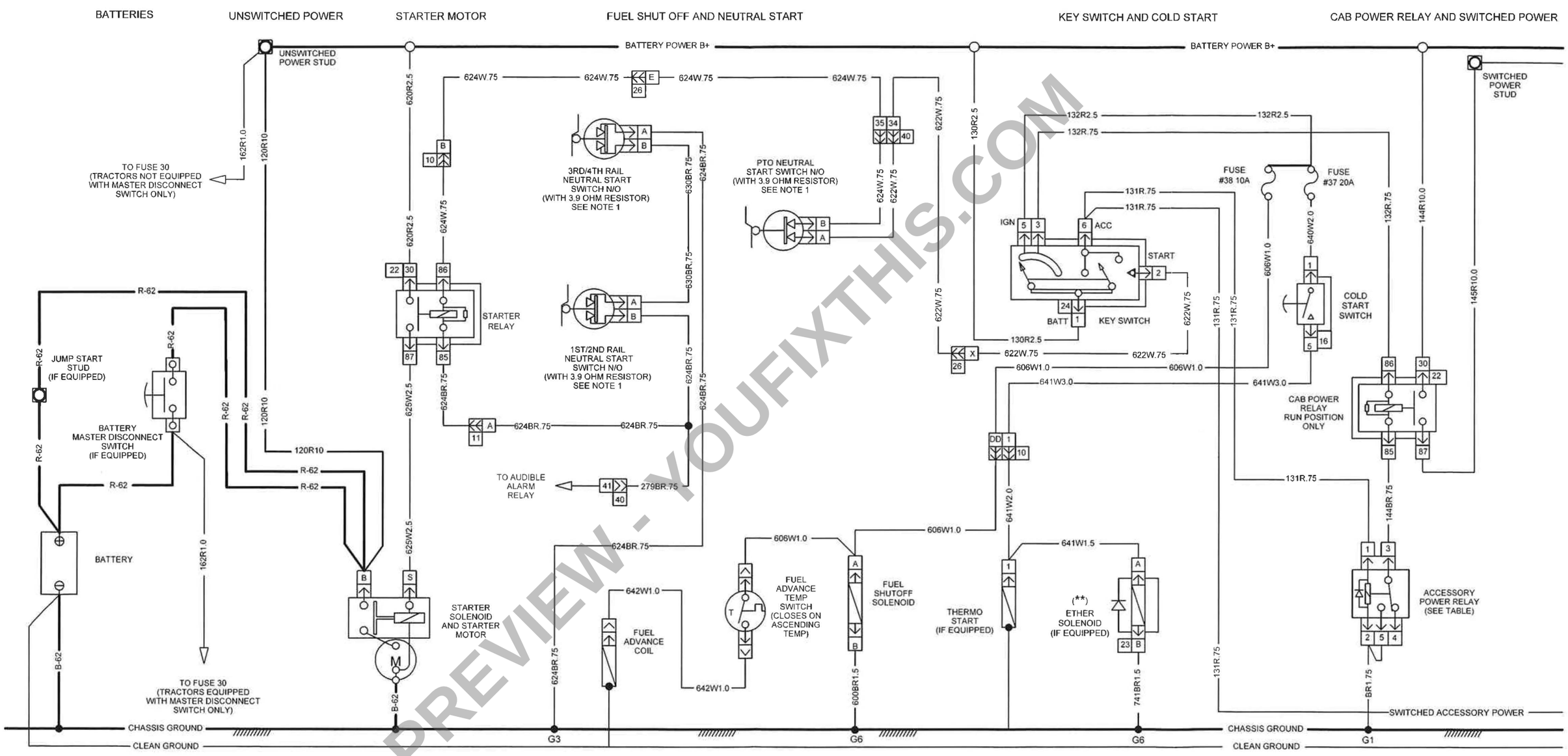
ACTUATORS			
 LEVER	 HAND	 FOOT	 TEMPERATURE
 LIQUID LEVEL FLOAT	 PRESSURE	 COIL	 DIODE
 VARIABLE RESISTOR	 RESISTOR	 MAGNETIC	CONTACTS ▲ MOMENTARY ○ MAINTAINED
HOUSINGS			
 VACUUM SWITCH	 PRESSURE SWITCH	 TEMPERATURE SWITCH	 MOTOR
 LIGHT			
SWITCH CONTACT CONFIGURATION			
 S.P.S.T. (SINGLE POLE SINGLE THROW)	 S.P.D.T. (SINGLE POLE DOUBLE THROW)	 D.P.S.T. (DOUBLE POLE SINGLE THROW)	 D.P.D.T. (DOUBLE POLE DOUBLE THROW)
MISCELLANEOUS SYMBOLS			
 FUSE	 CIRCUIT BREAKER		

NOTE: *Schematic symbols shown with tractor parked and power OFF.*

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SCHEMATIC CIRCUIT - Tractors Without XtraShift



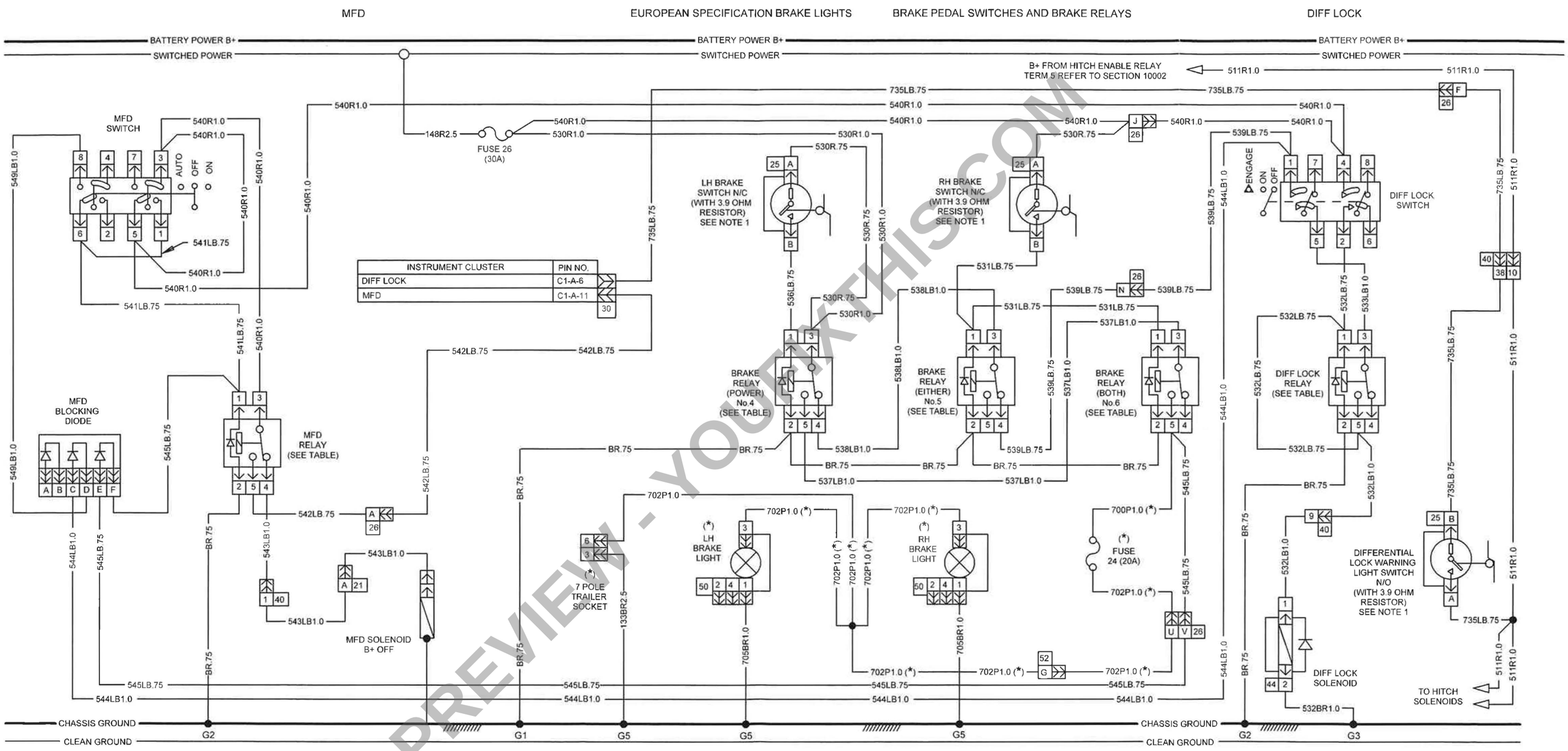
NOTE 1: *Only use a HIGH IMPEDANCE multimeter to test the switches and circuits. Do not use a test lamp or damage to the switches may occur.*

(**) American Specification Tractors Only.

RELAY TERMINAL BLOCK REFERENCE	RELAY TERMINAL REFERENCE
1	86
2	85
3	30
4	87A
5	87

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SCHEMATIC CIRCUIT



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NOTE 1: *Only use a HIGH IMPEDANCE multimeter to test the switches and circuits. Do not use a test lamp or damage to the switches may occur.*

(*) European Specification Tractors Only.

RELAY TERMINAL BLOCK REFERENCE	RELAY TERMINAL REFERENCE
1	86
2	85
3	30
4	87A
5	87

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BATTERY TESTING

Method One - Five Step Battery Test

Follow STEP 1 to STEP 5 to correctly determine the condition of the battery if Automatic Battery Tester MC10930 is not available.

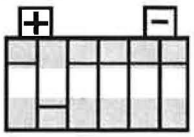
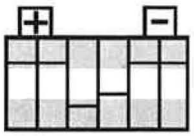
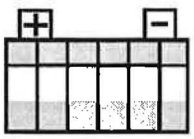
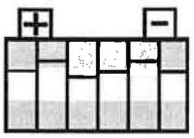
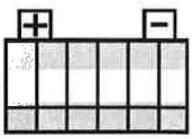
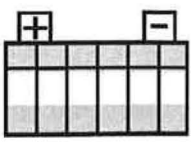
NOTE: *Batteries may be overcharged or undercharged due to a fault in the tractors electrical system. Always make sure the electrical system is working correctly.*

NOTE: *If the Voltmeter Reading in STEP 2 shows a reading of below 10 volts, it may not be possible to successfully recharge the battery and its further service life is often greatly reduced.*

NOTE: *Where discoloured electrolyte is observed, this is always due to a service related condition.*

STEP 1. VISUAL CHECK

- Make sure cable connections are clean and tight. Clean foreign material from the battery top.
- Inspect the battery case, battery posts and cables for damage.
- Check the electrolyte level, refer to "Electrolyte Level" on page 4
- If you added distilled water to the battery, the battery must be charged for 15 minutes at 15 to 20 amperes to mix the water with the electrolyte.

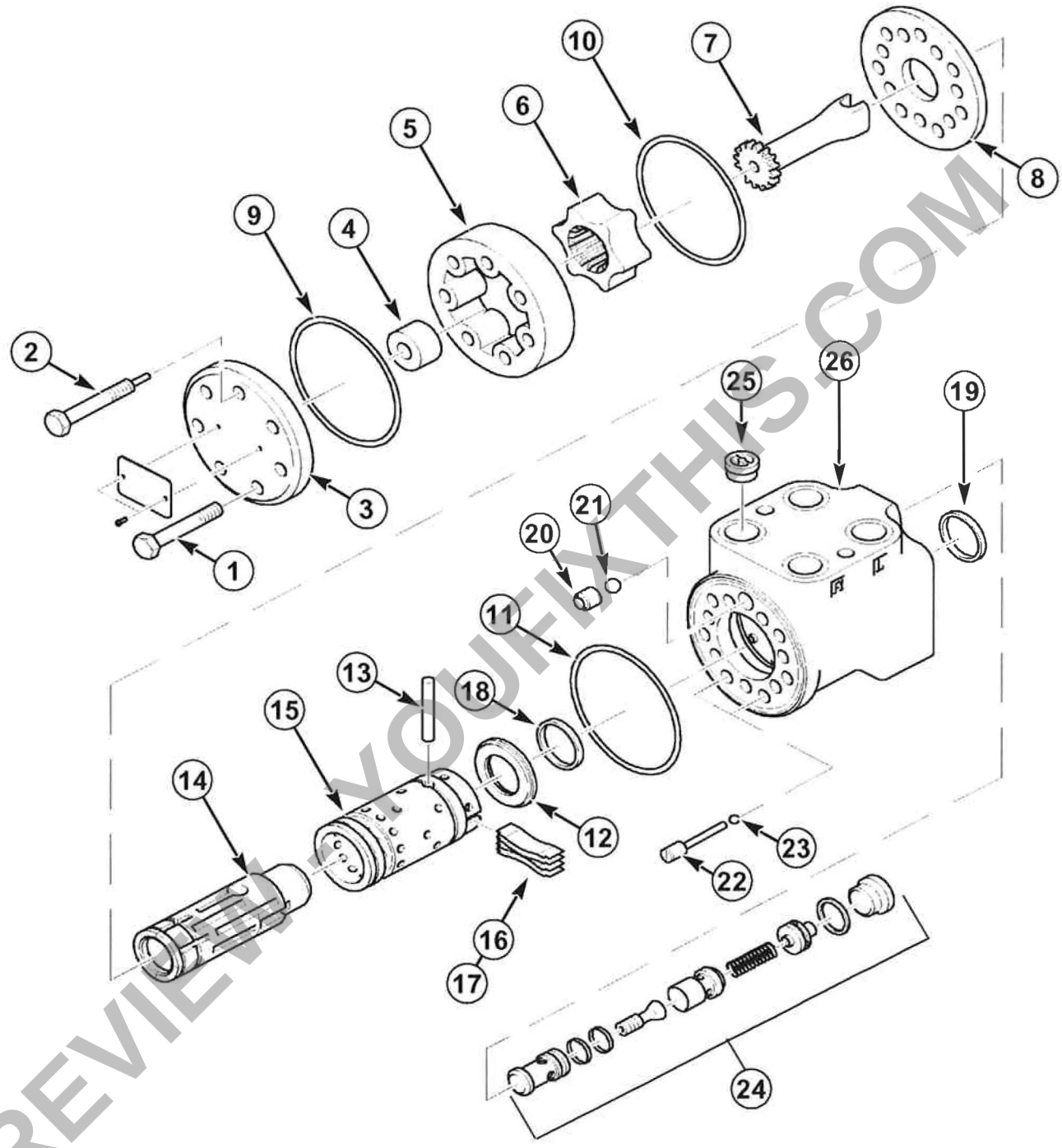
STEP 2. VOLTMETER READING	STEP 3. HIGH RATE DISCHARGE TEST	STEP 4. HYDROMETER READING (see NOTE 1)	STEP 5. BATTERY CONDITION
10 to 11.5 volts	Below 9 volts (voltage often rises)	GREEN (ABOVE 1260 SG) WHITE (1225 to 1260 SG) RED (BELOW 1225 SG) 	REPLACE BATTERY
10 to 11.5 volts	Below 9 volts (voltage often rises)	GREEN (ABOVE 1260 SG) WHITE (1225 to 1260 SG) RED (BELOW 1225 SG) 	REPLACE BATTERY
0 to 12.6 volts	Below 3 volts (voltage normally zero)	GREEN (ABOVE 1260 SG) WHITE (1225 to 1260 SG) RED (BELOW 1225 SG) 	REPLACE BATTERY
6 to 12.4 volts	Below 9 volts (voltage steadily falls)	GREEN (ABOVE 1260 SG) WHITE (1225 to 1260 SG) RED (BELOW 1225 SG) 	REPLACE BATTERY
Below 10 volts	Below 3 volts (voltage can be zero)	GREEN (ABOVE 1260 SG) WHITE (1225 to 1260 SG) RED (BELOW 1225 SG) 	RECHARGE BATTERY (see NOTE 2)
Above 11.5 volts	3 to 9 volts (voltage remains stable)	GREEN (ABOVE 1260 SG) WHITE (1225 to 1260 SG) RED (BELOW 1225 SG) 	RECHARGE BATTERY

NOTE 1: *Record readings from each battery cell. The cell nearest the positive terminal is cell number 1. Using the hydrometer as a pump check the two end cells for discoloured electrolyte.*

NOTE 2: *The battery is over discharged and may not recover after recharging.*

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NOTE: *Items are numbered in order of Disassembly.*

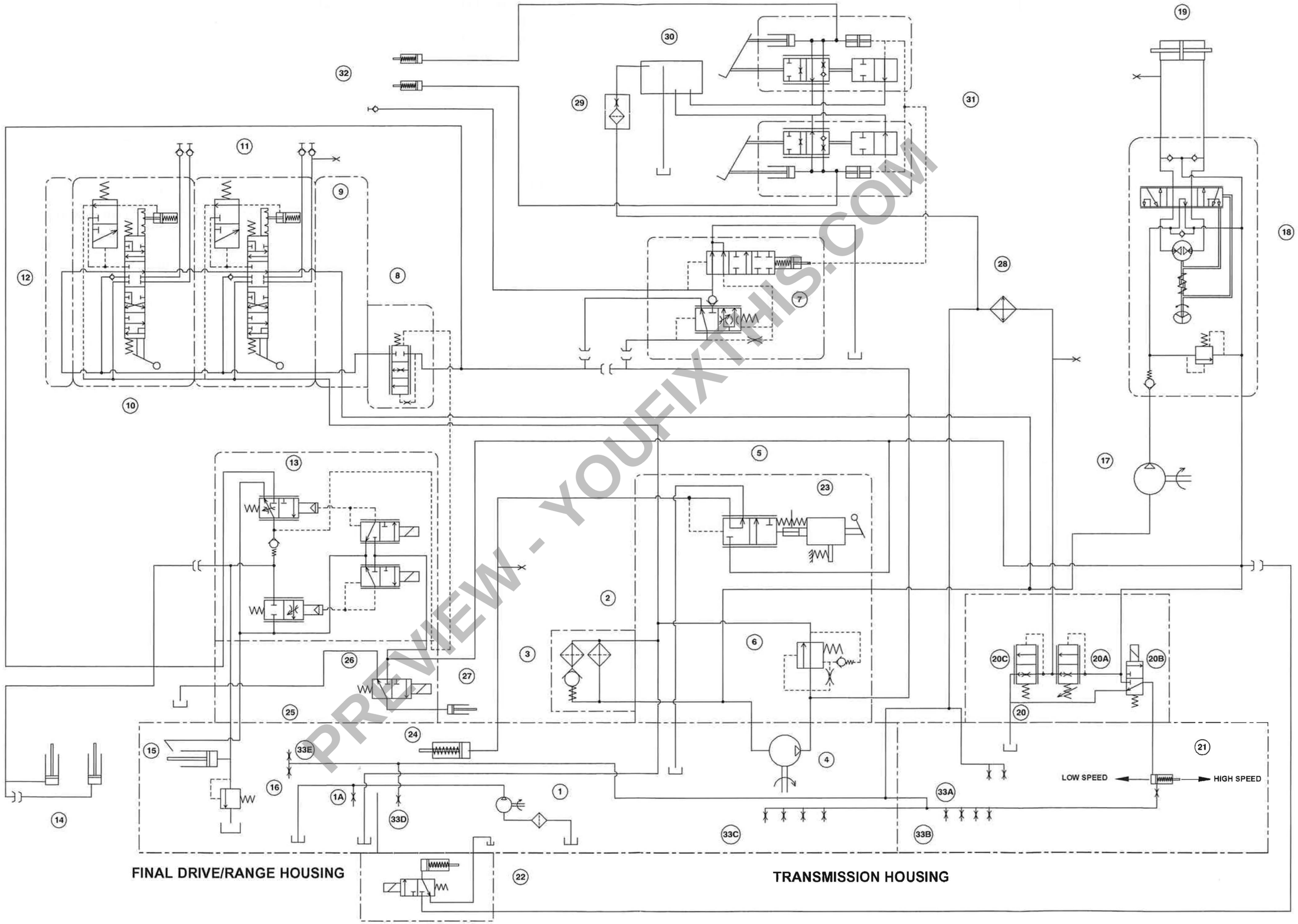


DI99J103

1. RETAINING BOLT (6)
2. SPECIAL BOLT
3. END COVER
4. SPACER
5. STATOR
6. ROTOR
7. DRIVE SHAFT
8. VALVE PLATE
9. O-RING
10. O-RING
11. O-RING
12. THRUST BEARING
13. PIN
14. SPOOL
15. SLEEVE
16. OUTER CENTERING SPRING (2)
17. INNER CENTERING SPRING (2)
18. SEAL
19. DUST SEAL
20. THREADED BUSHING
21. BALL
22. VALVE PIN (2)
23. BALL (2)
24. RELIEF VALVE ASSEMBLY
25. CHECK VALVE
26. PUMP BODY

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HYDRAULIC SYSTEM TROUBLESHOOTING

When troubleshooting an electro-hydraulic system problem check for electrical power to the solenoid coils as they are activated. This will isolate hydraulic system problems from electrical problems. Use a high impedance multimeter for any electrical checks. Refer to Sections 4001 and 10002.

Before making any hydraulic system tests make sure that the hydraulic oil reservoir is full, hydraulic filters are clean and the hydraulic oil temperature is above 49°C.

Steering System Problems

PROBLEM: Excessive effort required for steering

POSSIBLE CAUSE	PROCEDURE
A. Mechanical interference in steering mechanism.	A. Inspect and repair as necessary.
B. Steering relief valve adjustment.	B. Carry out Test 3 - Steering Relief Valve Pressure and Cylinder Internal Leakage.
C. Steering hydraulic pump worn.	C. Carry out Test 4 - Steering Hydraulic Pump Efficiency.
D. Cylinder piston moved on ram (2WD only).	D. Inspect and repair as necessary.

PROBLEM: No power steering

POSSIBLE CAUSE	PROCEDURE
A. Steering relief valve adjustment.	A. Carry out Test 3 - Steering Relief Valve Pressure and Cylinder Internal Leakage.
B. Cylinder piston moved on ram (2WD only).	B. Inspect and repair as necessary.

PROBLEM: Excessive turns lock to lock

POSSIBLE CAUSE	PROCEDURE
A. Steering cylinder internal leakage.	A. Carry out Test 3 - Steering Relief Valve Pressure and Cylinder Internal Leakage.
B. Steering hand pump faulty.	B. Refer to Steering Hand Pump, Section 5001.

PROBLEM: Intermittent Steering

POSSIBLE CAUSE	PROCEDURE
A. Steering cylinder internal leakage.	A. Inspect and repair as necessary.
B. Steering hand pump faulty.	B. Refer to Steering Hand Pump, Section 5001.

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HITCH CALIBRATION

Before starting the calibration procedure make sure:

1. 46 to 91 kg of weight is mounted on the lift arms.
2. Transmission oil temperature must be above 38°C.
3. Remove the Auto Hitch lift rods (if equipped).

IMPORTANT: *If an unexpected code appears on the diagnostic display during any Step of calibration there is an error in the electronic hitch system. Error codes must be identified and corrected before hitch calibration can proceed. Refer to CALIBRATION ERROR CODE CHART on page 12.*

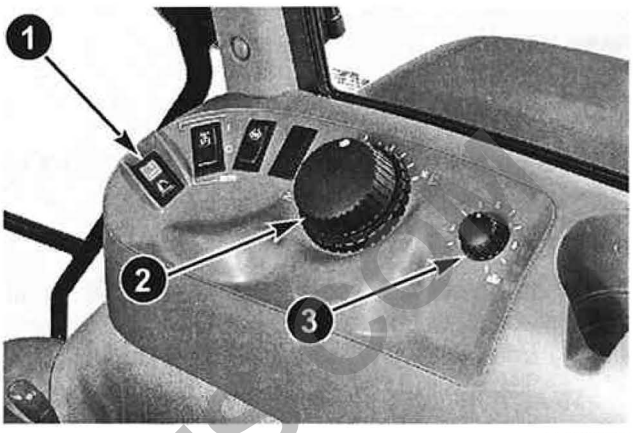
YES and **NO** are signaled by using the hitch up/down switch (1) as follows:

YES = Push hitch up/down switch into the DOWN MOMENTARY position and release.

NO = Push hitch up/down switch into the UP position then back to the DOWN (centre) position.

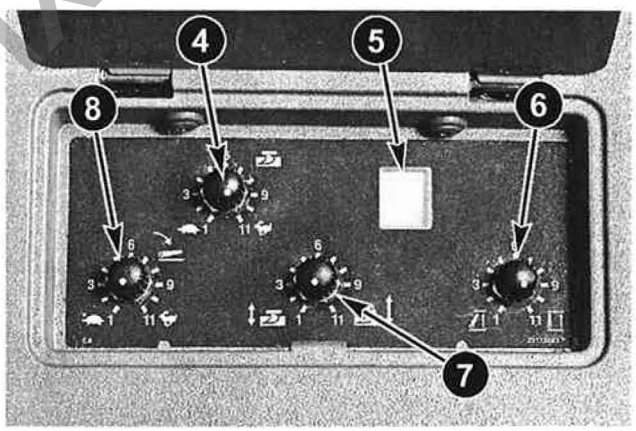
NOTE: *The DOWN MOMENTARY position is below the centre position and spring loaded to return to the centre position when released. DOWN and UP positions are detented.*

*The calibration procedure may be exited at any time by toggling the hitch up/down switch UP then DOWN except when answering a **YES** or **NO** question.*



DP97N008

1. HITCH UP/DOWN SWITCH AND HITCH ENABLE LAMP
2. POSITION CONTROL KNOB
3. LOAD CONTROL



DP97N009

4. HITCH RESPONSE CONTROL
5. DIAGNOSTIC DISPLAY
6. UPPER LIMIT CONTROL
7. TRAVEL CONTROL
8. HITCH DROP SPEED

STEP 1

Push and hold the hitch up/down switch (1) in the DOWN MOMENTARY position while starting the engine. Release the hitch up/down switch when the first character after the **8** appears in the diagnostic display (4) of the hitch control panel. If the hitch up/down switch is NOT released, the calibration sequence will terminate.

STEP 2

The diagnostic display will read **c**, do you want to calibrate the hitch?

Answer **YES** to calibrate the hitch and continue to STEP 3 or **NO** to display error codes, refer to Page 14.

STEP 3

The diagnostic display will read **c**, do you want to continue calibration?

Answer **YES**.

STEP 4

The diagnostic display will read **g**, does the tractor have two load sensing hitch pins?
Answer **NO**.

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ERROR CODE AND PROBLEM	CAUSE	CORRECTIVE ACTION
"H", "E" 334L96G Current to lower hitch is above specified limit.	1. .Battery voltage is low. 2. No power to lower solenoid or solenoid resistance is high. 3. Hitch valve lower spool is stuck closed.	1. Check battery condition, refer to Section 4004, Battery Servicing and Testing. 2. Go to Test 6 - Hitch Solenoids Circuit on page 27. 3. Refer to Section 8009, Hitch Valve and EDC Manifold.
"H", "O" 334L96H Current to lower hitch is below specified limit.	1. Battery voltage is high. 2. Bad LOWER solenoid or solenoid resistance is low.	1. Check battery condition, refer to Section 4004, Battery Servicing and Testing. 2. Go to Test 6 - Hitch Solenoids Circuit on page 27.
"H", "d" 334L96J Calibration time expired.	1. Operator did not acknowledge when hitch was fully lowered and the module was displaying U within six minutes.	1. Re-calibrate hitch. Refer to HITCH CALIBRATION on page 7.
"H", "n" 334L96K Hitch position is not at minimum	1. Position potentiometer is defective or retaining nut is loose.	1. Go to Test 9 - Hitch Position Potentiometer on page 33.
"H" "n" 334L96L Hitch position range is out of limits.	1. Position potentiometer is defective or retaining nut is loose.	1. Go to Test 9 - Hitch Position Potentiometer on page 33.
"H", "–" 334L96M Position command and hitch position potentiometers are not aligned.	1. Position command potentiometer, hitch position potentiometer or both are defective or retaining nuts are loose.	1. Go to Test 9 - Hitch Position Potentiometer on page 33 and Test 10 - Hitch Position Command Potentiometer on page 36.

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Section 1001

SAFETY, GENERAL INFORMATION AND STANDARD TORQUE SPECIFICATIONS

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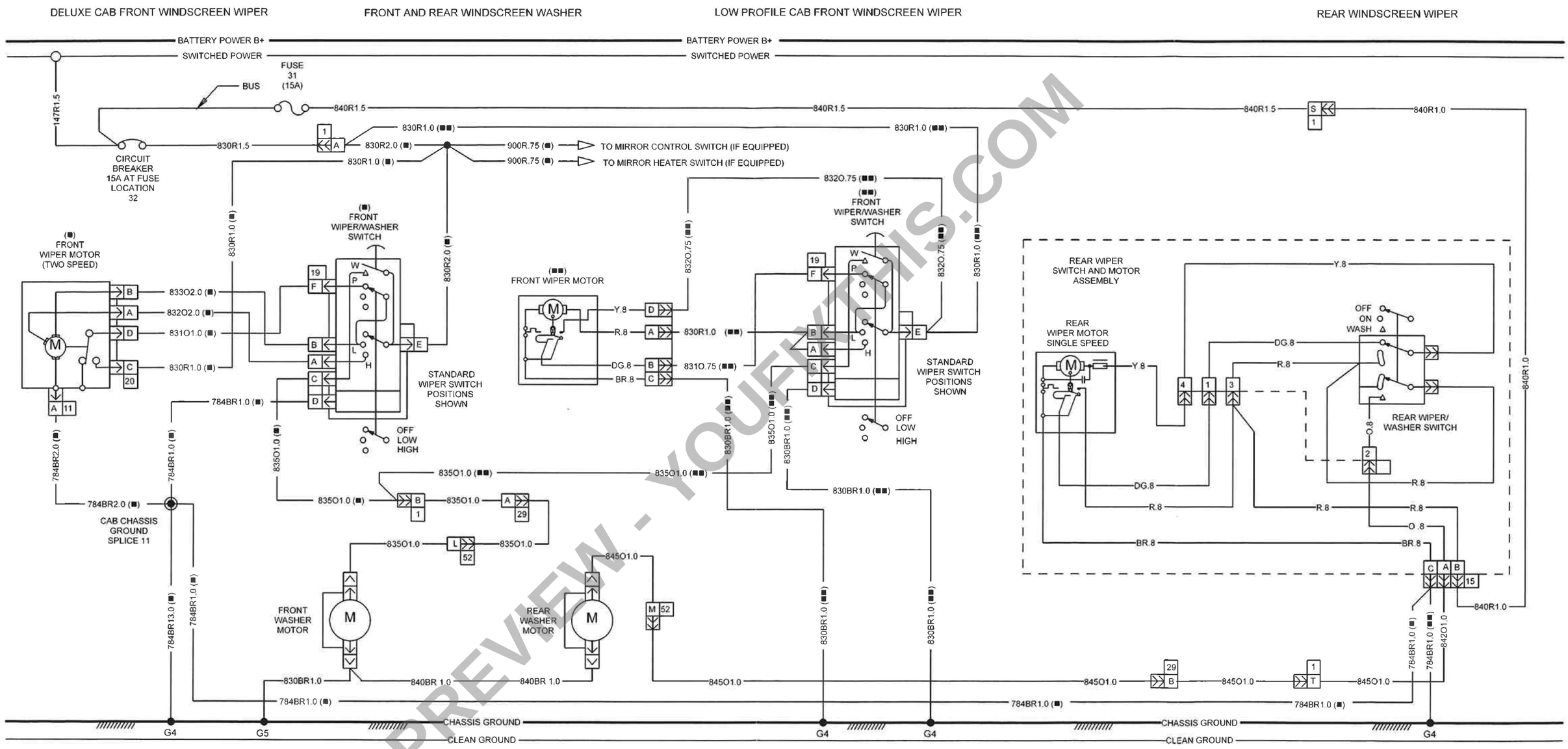
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SCHEMATIC CIRCUIT



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(■■) European Specification Low Profile Cab Tractors Only.

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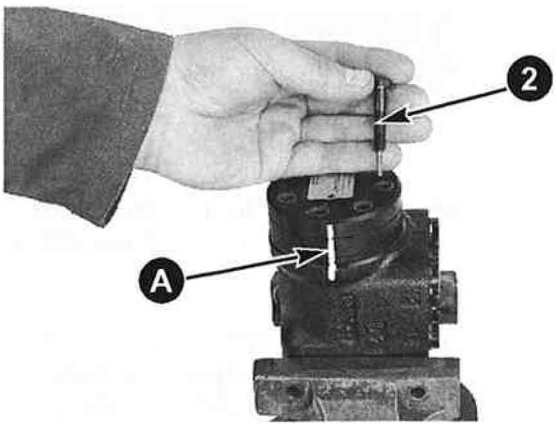
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Disassembly

STEP 1

Put the steering hand pump in a clean soft jaw vice, DO NOT overtighten the vice. Remove the fittings and discard the o-rings.

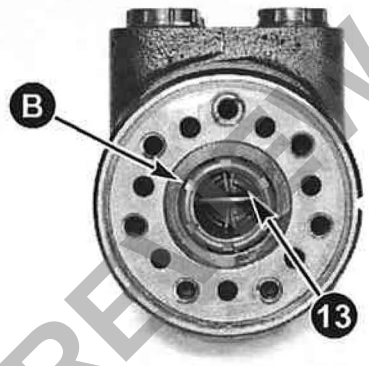
STEP 2



DD00F064

Put alignment marks (A) on pump body (26), valve plate (8), stator (5) and end cover (3). Remove retaining bolts (1), mark the position and remove special bolt (2), remove end cover (3). Remove spacer (4), stator (5), rotor (6), drive shaft (7) and valve plate (8). Remove and discard o-rings (9), (10) and (11).

STEP 3



DD00F065

Turn the spool and sleeve assembly (B) until pin (13) is parallel to the hydraulic fitting mounting face. Remove spool and sleeve assembly (B) and thrust bearing assembly (12) from pump body (26).

STEP 4

Remove pin (13) from the spool and sleeve assembly (B). Remove the spool (14) from sleeve (15), remove centring springs (16) and (17) from spool (14).

STEP 5

Remove and discard seal (18) and dust seal (19).

STEP 6

Remove threaded bushing (20) and ball (21), valve pins (22) and balls (23).

IMPORTANT: *DO NOT use a magnet to remove balls (21) and (23).*

STEP 7

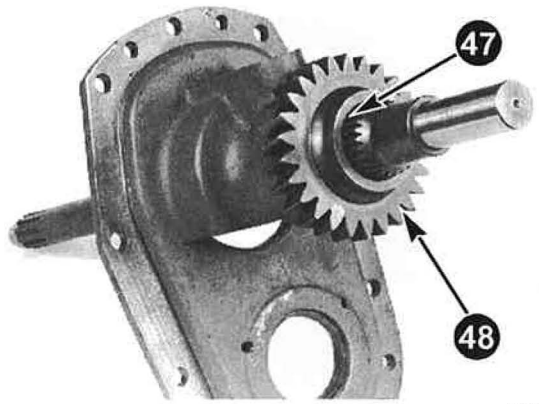
Remove relief valve assembly (24), remove and discard seals.

IMPORTANT: *DO NOT remove check valve (25) from pump body (26).*

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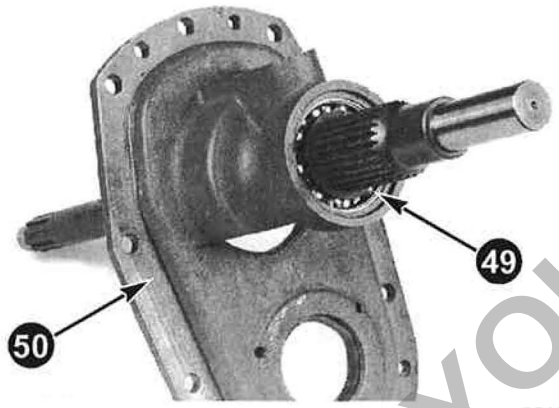
STEP 25



DD99C120

Remove retaining ring (47). and drive gear (48).

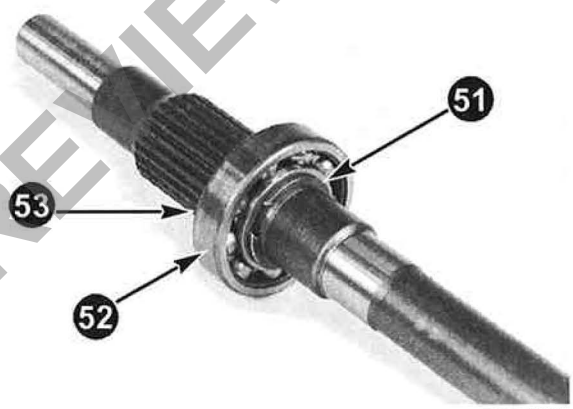
STEP 26



DD99C121

Remove retaining ring (49). Remove shaft and bearing from housing (50) check for wear or damage and replace if necessary.

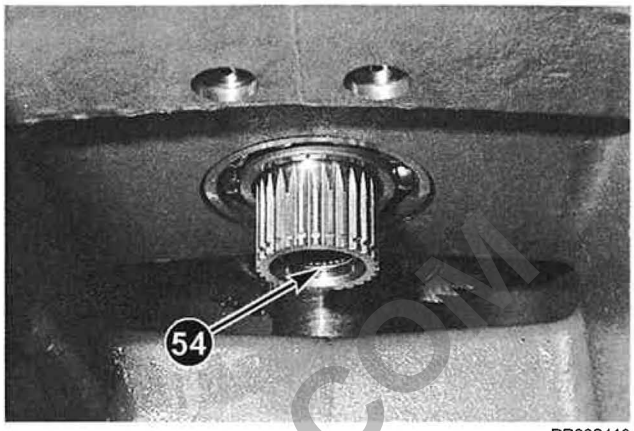
STEP 27



DD99C1221

Remove retaining ring (51). Use a hydraulic press to remove bearing (52) from the shaft and remove thrust washer (53).

STEP 28



DD99C119

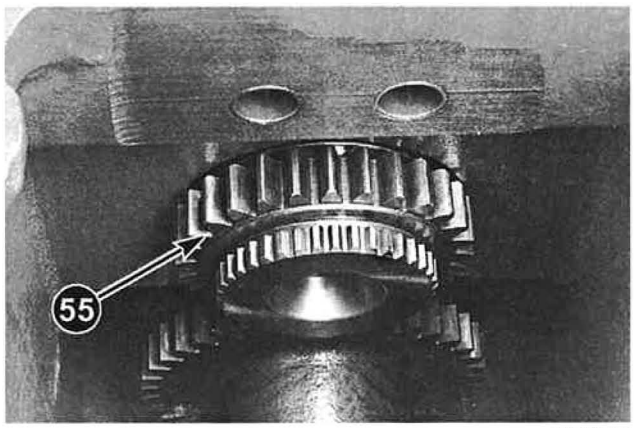
Check for wear or damage to the needle roller bearings (54) in the drive gear assembly.

NOTE: *Refer to STEP 29 to STEP 32 if the drive gear or needle roller bearings are to be replaced.*

STEP 29

Remove the Mainshaft, Gears and Synchronizers, refer to Section 6006.

STEP 30



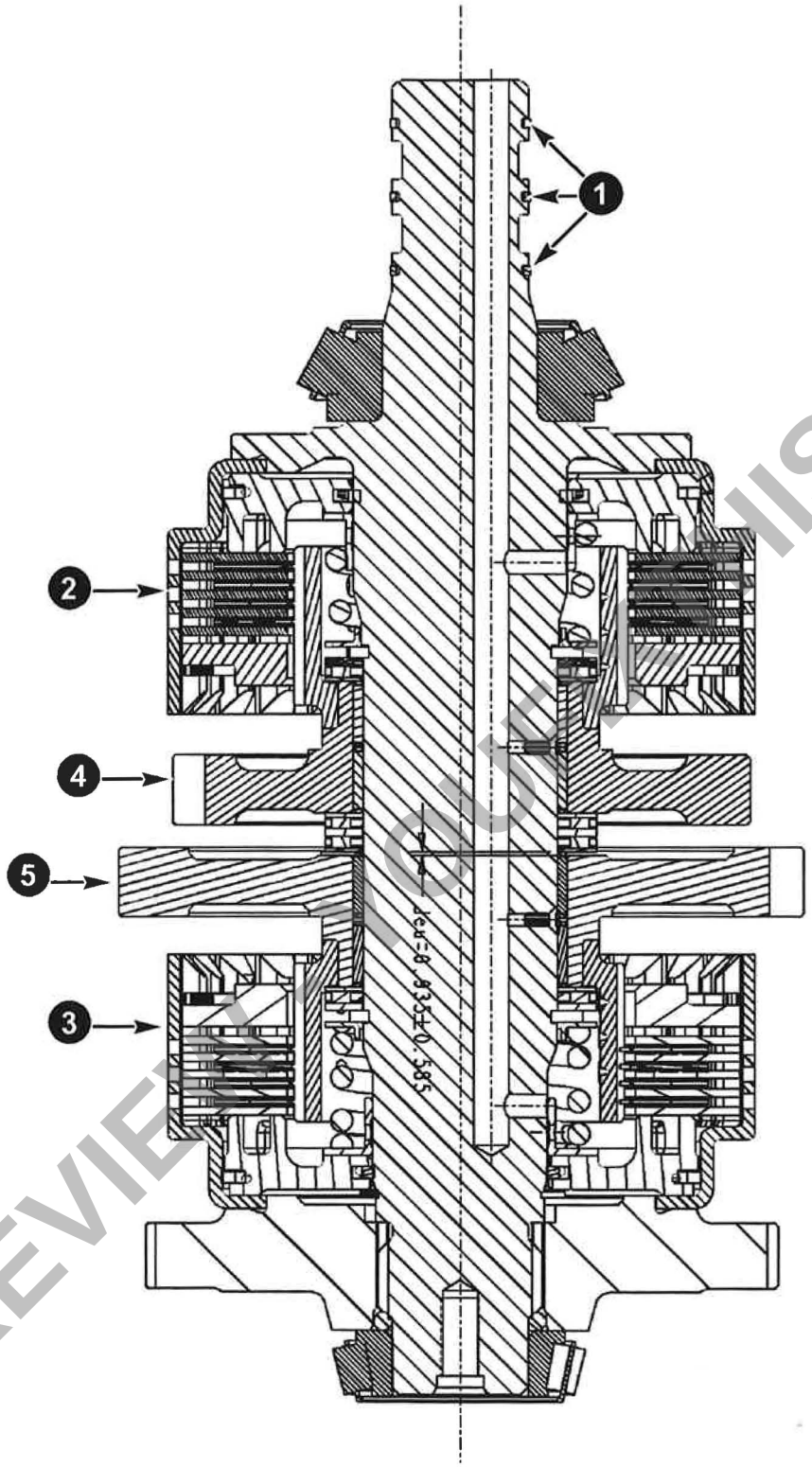
DD97F062

Remove drive gear assembly (55).

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Cross Sectional Drawing of the Counter shaft



1. SEALING RING
2. 1ST SPEED CLUTCH PACK
3. 3RD SPEED CLUTCH PACK
4. LOW GEAR
5. HIGH GEAR

NOTE: *The 1nd and 3rd speed clutch packs have 4 friction and 5 metal separator plates.*

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6021

Section 6021

MFD AXLE

CX Series Tractors

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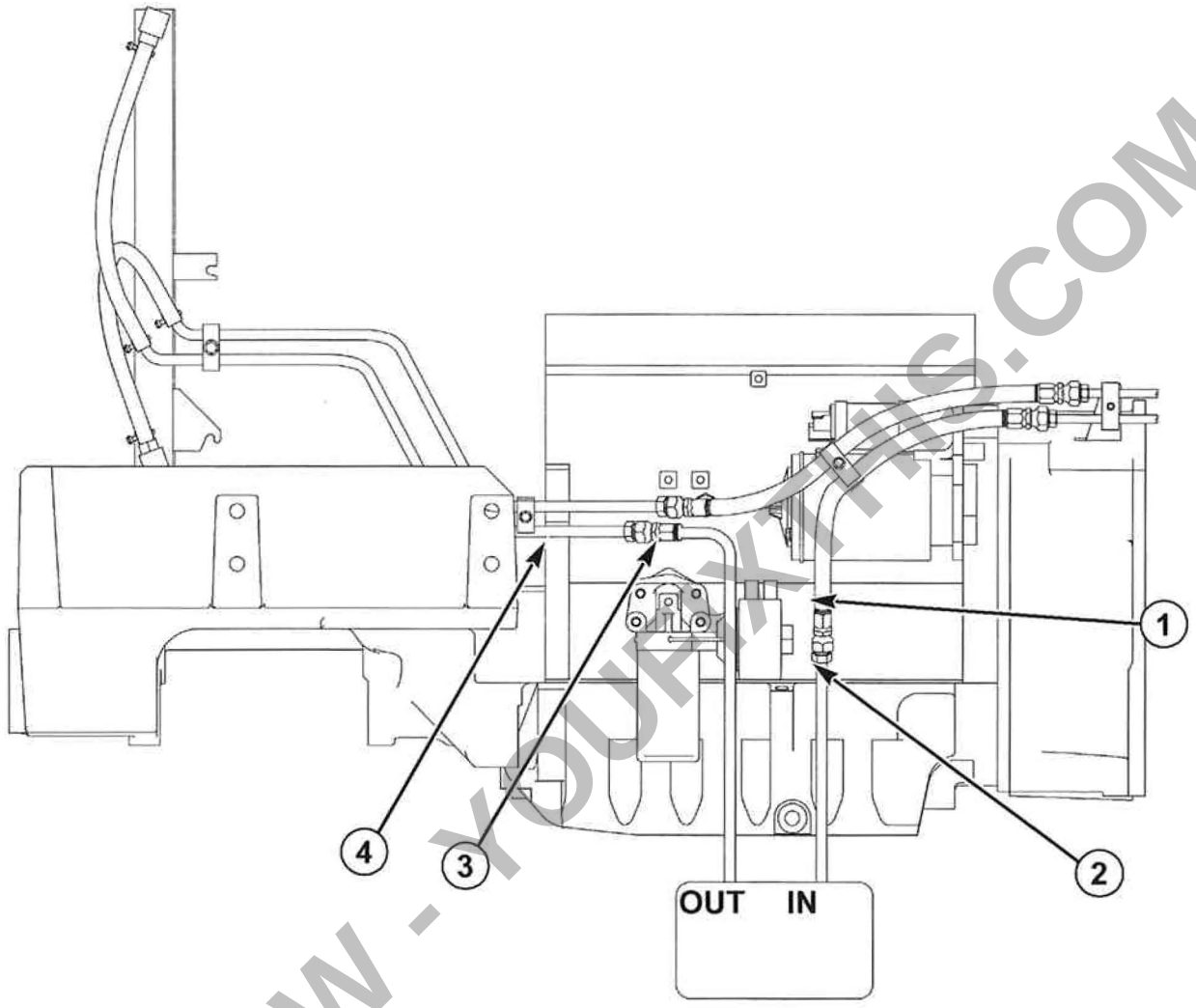
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Test 8 - Regulated Circuit Leakage Test



DI97E337

1. OIL COOLER SUPPLY HOSE
2. FLOWMETER INLET TO OIL COOLER SUPPLY HOSE
3. FLOWMETER OUTLET TO OIL COOLER SUPPLY HOSE
4. OIL COOLER SUPPLYTUBE

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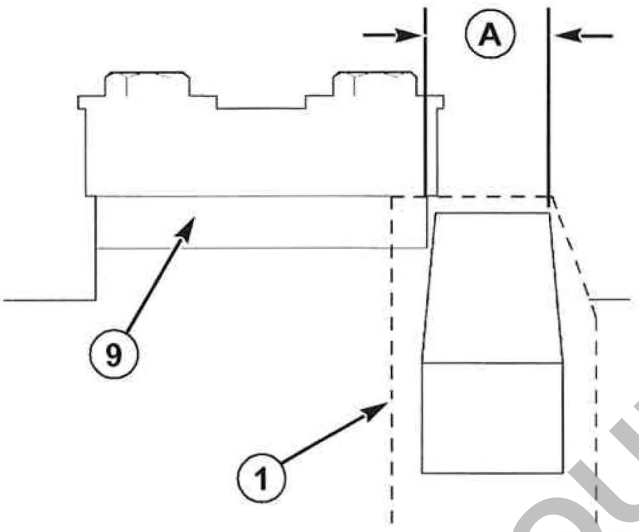
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Forward Position Switch Setting

Before any adjustments or troubleshooting to the Forward Position Switch are made carry out the following:

- Park the tractor on hard level ground and apply the parking brake.
- Stop the engine and remove the key.

Neutral Position



STEP 1

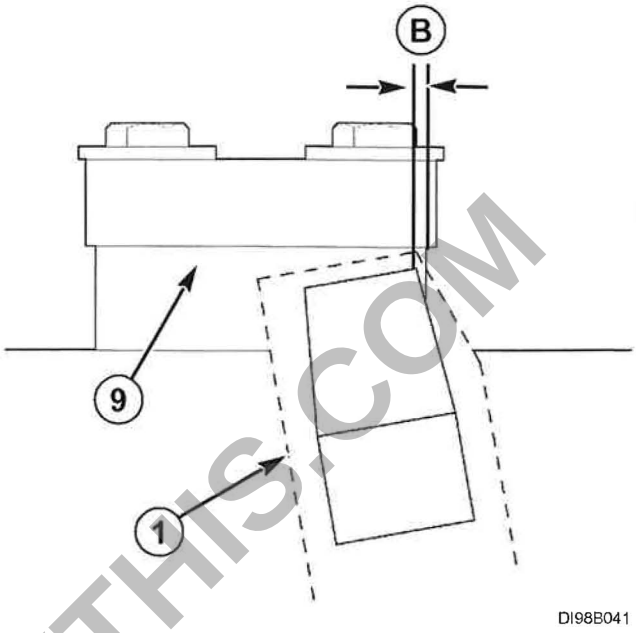
Put the lever (1) in the NEUTRAL position.
Measure and make a note of the distance (A) between the rear edge of the vane on the lever (1) and the rear face of the forward position switch (9).

STEP 2

Disconnect the forward position switch (9) from the harness.

NOTE: *Use a HIGH IMPEDENCE multimeter MC2616 and test probes MC2656 when carrying out the following check, DO NOT use a test light or damage to the switch may occur.*

Point of Switch Closure



STEP 3

Move the forward/reverse control lever towards the FORWARD position to the point where the forward position switch (9) closes (multimeter reading of approximately 4 Ohms) and hold in this position.
Measure and make a note of the distance (B) between the rear edge of the vane on the lever (1) and the rear face of the forward position switch (9).

STEP 4

Calculate the difference between the measurements taken in STEP 1 and STEP 3, this must be between 12.5 and 17.5 mm.

NOTE: *If the rear edge of the vane on the lever (1) is inside the forward position switch (9) add together dimensions (A) and (B).*
If the rear edge of the vane on the lever (1) is outside the forward position switch (9) subtract dimension (B) from dimension (A).

NOTE: *Replace the forward position switch (1) if it does not close between the above dimensions.*

STEP 5

From the point of forward position switch closure (B) move the lever (1) towards the NEUTRAL position, the forward position switch (9) should open within 3 mm of travel.

NOTE: *Replace the forward position switch (1) if it does not open within the above dimension.*

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