INDEX

SECTION 1 - ENGINE SYSTEMS

Air inlet manifold removal 1-9
Air intake manifold assembly 1-42
Alternator assembly 1-44
Alternator removal 1-7
Backplate and oil seal 1-15
Backplate assembly 1-35
Bolt torque values 1-82
Camshaft 1-11
Camshaft assembly 1-33, 1-38
Camshaft disassembly 1-33
Camshaft inspection 1-33
Camshaft removal 1-13
Compression test and tools 1-84
Connecting rod assembly 1-28
Connecting rod bearing oil clearance check . . 1-27
Connecting rod bearings removal 1-14
Connecting rods disassembly and inspection 1-25
Connecting rods removal 1-14
Coolant 1-54
Cooling fan 1-55
Cooling fan assembly 1-42
Cooling system 1-52
Cooling system description and operation 1-52
Cooling system maintenance 1-54
Cooling system overhaul 1-56
Cooling system specifications 1-82
Crankshaft 1-29
Crankshaft bearing (bushing) inspection 1-30
Crankshaft bearing (bushing) replacement . . . 1-31
Crankshaft inspection 1-29
Crankshaft main bearing assembly 1-31
Crankshaft pulley 1-39
Crankshaft removal 1-15
Cylinder block 1-22
Cylinder block assembly 1-3
Cylinder head assembly 1-22, 1-40
Cylinder head components 1-3
Cylinder head disassembly 1-16
Cylinder head inspection and repair 1-16
Cylinder head removal 1-10
Description and operation 1-2
Engine disassembly 1-5
Engine identification 1-2
Engine lubrication system 1-45
Engine lubrication system description 1-45
Engine oil pressure check 1-50
Engine overhaul 1-5
Engine reassembly 1-35
Engine timing gear cover 1-11
Exhaust manifold assembly 1-44
External oil tube assembly 1-43
External oil tube removal 1-8
Fan removal 1-8
Flywheel 1-34, 1-36
Flywheel removal 1-15
Front oil seal replacement 1-34
Fuel injection pump assembly 1-39
Fuel injector assembly 1-43
Fuel injector removal 1-6
Fuel piping 1-44
Fuel shutoff solenoid removal 1-10
General information 1-2
Glow plug assembly 1-43
Glow plug removal 1-6
Head gasket selection 1-40
Idler gear assembly 1-38
Injection timing 1-38
Main bearing and thrust washer removal and inspection 1-29
Main bearings removal 1-15
Metric bolt torque specifications 1-83
Oil consumption 1-51
Oil filter construction and function 1-48
Oil filter maintenance 1-48
Oil pressure relief valve inspection 1-51
Oil pressure relief valve removal 1-51
Oil pressure switch 1-7
Oil pump adjustment 1-49
Oil pump assembly 1-38
Oil pump inspection 1-48
Oil pump installation 1-49
Oil pump removal 1-48
Oil strainer removal 1-14
Oil suction pipe and oil strainer 1-37
Oil suction pipe removal 1-14
Oil sump 1-37
Oil sump removal 1-13
Piston rings assembly 1-28
Piston rings disassembly and inspection 1-25
Piston rings removal 1-14
Pistons and connecting rods 1-36
Pistons assembly 1-28
Pistons disassembly and inspection 1-23
Pistons removal 1-14
Port block installation 1-32
Port block removal 1-32
Power steering pump 1-39
Push rods 1-21
Radiator cap 1-54
Radiator inspection 1-58
Radiator installation 1-58
Radiator removal 1-56
Radiator repair 1-58
Rear oil seal assembly 1-35
Rocker arms 1-20
Rocker arm shaft removal 1-9
Special tools 1-84
Specifications 1-68
Steering pump seal replacement 1-34
Support bracket removal 1-9
Temperature sending switch 1-7
Temperature sending switch assembly 1-44
Thermostat 1-55
Thermostat inspection 1-63
Thermostat installation 1-63

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GENERAL INFORMATION

DESCRIPTION AND OPERATION

This chapter describes the engine overhaul and repair procedures of the Models 1530, 1630, 1725, 1925, TC25, TC29, TC33, TC25D, TC29D, and TC33D tractors. Repair procedures are essentially the same for all models except as noted in the repair procedures.

The tractors are equipped with three-cylinder in-line engines. They are all four cycle, overhead valve, liquid cooled engines. The engines are identified by a code, 1, cast into the lower right side of the cylinder block.

NOTE: Numeric value, 2, under the Engine Code indicates displacement of the engine in liters.

Engine Identification	Tractor Model	Engine Power Hp (Kw)
J843	1530	25 (18.7)
J843	1630	27.3 (20.5)
J843	1725	29 (21.6)
N843	1925	34 (25.5)
J843	TC25	25 (18.7)
J843	TC25D	25 (18.7)
J843	TC29	29 (21.6)
J843	TC29D	29 (21.6)
N843	TC33	33 (24.6)
N843	TC33D	33 (24.6)

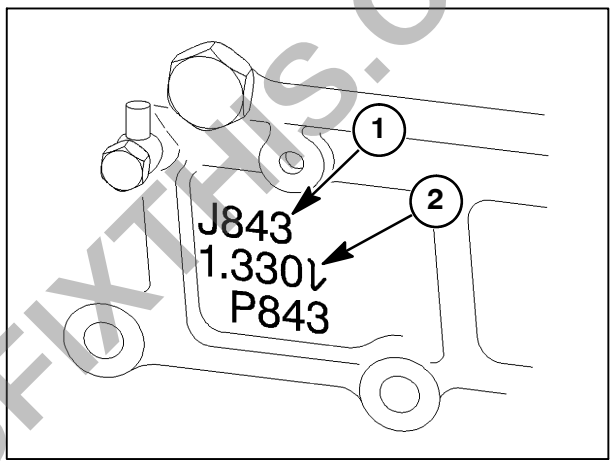

Figure 1-1

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ENGINE OVERHAUL

ENGINE DISASSEMBLY

1. Turn coolant tap bolt, 1, counterclockwise to drain fluid. Remove the radiator assembly. See “Radiator Removal”, discussed later in this section.

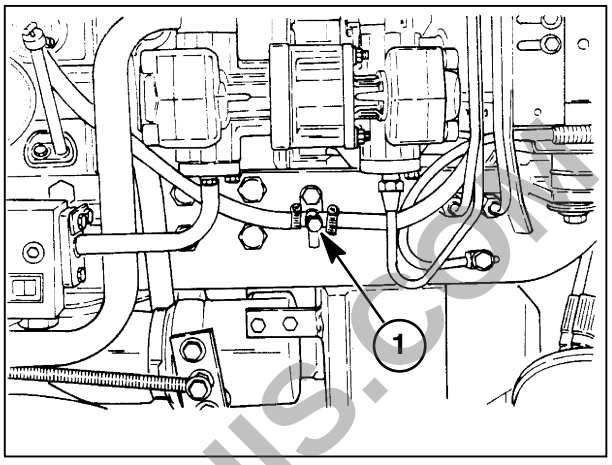

Figure 1-4

2. Remove the air cleaner assembly, 1, along with the air cleaner hoses. Push in on assembly, 1, and turn counterclockwise to remove.

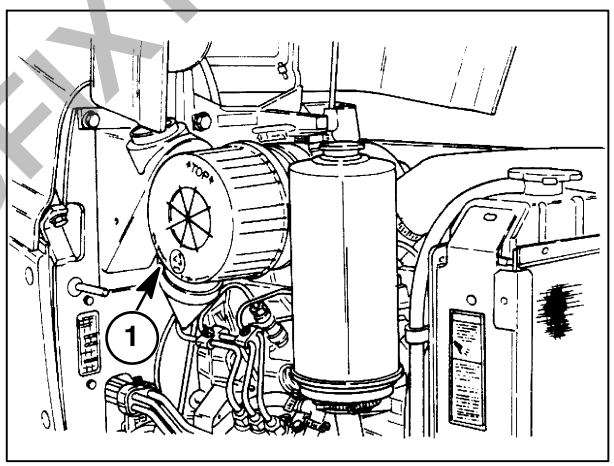

Figure 1-5

3. Remove bolts, 1, for final removal of air cleaner assembly.

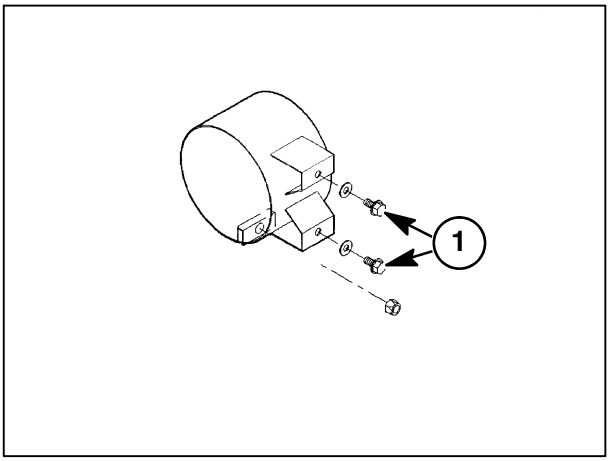

Figure 1-6

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TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine does not develop full power	Clogged air cleaner	Inspect and replace air cleaner if necessary
	Fuel line obstructed	Check for crimped fuel line. Inspect fuel filter for cleanliness
	Improper injection timing	Repair/ replace components as required
	Improper nozzle injection pressure and angle	Check injection timing Inspect for proper injection pressure an angle
	Low cylinder compression	Check engine compression
	Insufficient fuel injection	Repair at authorized shop
	Improper valve lash adjustment	Adjust valves to correct tolerances
	Burned, worn or sticking valves	Inspect and replace as necessary
	Blown head gasket	Replace head gasket
	Worn or sticking piston rings	Overhaul as necessary
	Faulty engine stop solenoid	Replace stop solenoid
Low oil pressure	Engine oil level low	Fill to proper level
	Wrong grade of oil	Replace with correct grade oil
	Clogged oil pump filter	Change oil and filter
	Faulty oil pressure relief valve	Replace relief valve
	Worn oil pump drive shaft gears, or broken oil pipe	Inspect oil system and components. Replace defective components
	Excessive main or connecting rod bearing clearances	Replace bearings or shaft if necessary
	Oil pump axial clearance not properly set	Check pump clearance and shim as needed to proper tolerance
Engine will not stop	Faulty engine stop solenoid	Replace the stop solenoid
	Faulty starter switch	Replace starter switch
Low cylinder compression	Burned, worn or sticking valves	Replace valves
	Bent valve stem	Replace valves
	Broken or weak valve spring	Replace valve spring
	Blown cylinder head gasket	Replace head gasket
	Worn or sticking piston rings	Replace piston rings
	Scored piston	Replace piston
Poor engine idling	Improper injection timing	Correct the injection timing
	Air in injection pump	Purge air from the system
	Improper governor adjustment	Adjust the governor

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SPECIFICATIONS

GENERAL	1530	TC25 / TC25D	1630	1725
Net Engine DIN in Kw(Hp)	18.3(24.5)	18.3(24.5)	20.0(26.8)	21.3(28.6)
Gross Engine in Kw(Hp)	18.7(25.0)	18.7(25.0)	20.4(27.3)	21.6(29.0)
PTO in Kw(Hp) w/9 x 3 w/HST	 16.2(21.7) 15.1(20.3)	 16.2(21.7) 15.1(20.3)	 17.9(24.0) 16.8(22.5)	 18.7(25.1) N / A
Engine Model	J843	J843	J843	J843
Number of Cylinders	3	3	3	3
Bore x Stroke in mm (in.)	84x80(3.31 x 3.15)	84x80(3.31 x 3.15)	84x80(3.31 x 3.15)	84x80(3.31 x 3.15)
Displacement in L(in.^{3})	1.33(81.2)	1.33(81.2)	1.33(81.2)	1.33(81.2)
Compression Ratio	23:1	23:1	23:1	23:1
Rated Speed in rpm	2600	2600	2600	2800
Muffler Location	Under Hood	Under Hood	Under Hood	Under Hood
Firing Order	1-2-3	1-2-3	1-2-3	1-2-3
Low Idle Speed rpm	900	1000	900	900
High Idle Speed rpm	2840	2840	2840	3040
Cylinder Arrange-ment	In-line Vertical	In-line Vertical	In-line Vertical	In-line Vertical
Valve Arrangement	Overhead	Overhead	Overhead	Overhead
CYLINDER BLOCK	**1530**	**TC25 / TC25D**	**1630**	**1725**
Bore Standard in mm (in.)	84 - 84.019 (3.307 - 3.308)	84 - 84.019 (3.307 - 3.308)	84 - 84.019 (3.307 - 3.308)	84 - 84.019 (3.307 - 3.308)
Bore Maximum in mm (in.)	85.2(3.354)	85.2(3.354)	85.2(3.354)	85.2(3.354)
Head Surface Warp Standard in mm (in.)	0.05 (0.002)	0.05 (0.002)	0.05 (0.002)	0.05 (0.002)
Head Surface Warp Maximum in mm (in.)	0.12 (0.005)	0.12 (0.005)	0.12 (0.005)	0.12 (0.005)
Re-Bore Size mm (in.) Oversize				
0.5mm (0.02 in)	84.2 - 84.7 (3.315 - 3.334)	84.2 - 84.7 (3.315 - 3.334)	84.2 - 84.7 (3.315 - 3.334)	84.2 - 84.7 (3.315 - 3.334)
1.0mm (0.04 in)	82.7 - 83.2 (3.334 - 3.354)	82.7 - 83.2 (3.334 - 3.354)	82.7 - 83.2 (3.334 - 3.354)	82.7 - 83.2 (3.334 - 3.354)

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METRIC BOLT TORQUE SPECIFICATIONS

		Coarse Thread			Fine Thread		
Bolt Size	**Grade No.**	**Pitch (mm)**	**Foot-Pounds**	**Newton-Meter**	**Pitch (mm)**	**Foot-Pounds**	**Newton-Meter**
	4T		3.6-5.1	4.9-6.9			
M6	7T	1.0	6.1-8.3	8.3-11.3	---	---	---
	10T		8.7-11.6	11.8-15.7			
	4T		9.4-12.3	12.7-16.7		11.2-14.8	15.2-20.1
M8	7T	1.25	16.6-21.0	22.6-28.4	1.0	19.5-25.3	26.5-34.3
	10T		21.0-26.8	28.4-36.3		22.4-29.7	30.4-40.2
	4T		18.8-24.6	25.5-33.3		21.0-26.8	28.4-36.3
M10	7T	1.5	32.5-41.2	44.1-55.9	1.25	36.2-46.3	49.0-62.8
	10T		39.8-51.4	53.9-69.6		42.7-54.2	57.9-73.5
	4T		27.5-34.7	37.3-47.1		31.8-40.5	43.1-54.9
M12	7T	1.75	48.5-61.5	65.7-83.4	1.25	55.0-69.4	74.5-94.1
	10T		68.0-85.4	92.2-116		73.1-93.3	99.0-127
	4T		46.3-59.3	62.8-80.4		51.4-64.4	69.6-87.3
M14	7T	2.0	76.7-96.9	104-131	1.5	86.1-109	117-148
	11T		102-129	139-175		108-137	147-186
	4T		63.6-81.0	86.3-110		67.3-84.6	91.2-115
M16	7T	2.0	110-136	140-184	1.5	116-142	157-192
	11T		152-188	206-255		163-199	221-270
	4T		83.9-104	114-141		96.9-120	131-163
M18	7T	2.0	145-174	196-235	1.5	170-206	230-279
	11T		203-246	275-333		221-271	299-368
	4T		106-132	144-141		127-156	172-211
M20	7T	2.5	177-213	240-289	1.5	203-246	275-333
	11T		268-325	363-441		293-358	397-485

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INDIVIDUAL CIRCUIT SCHEMATICS

25 Series Economy Electrical Schematic

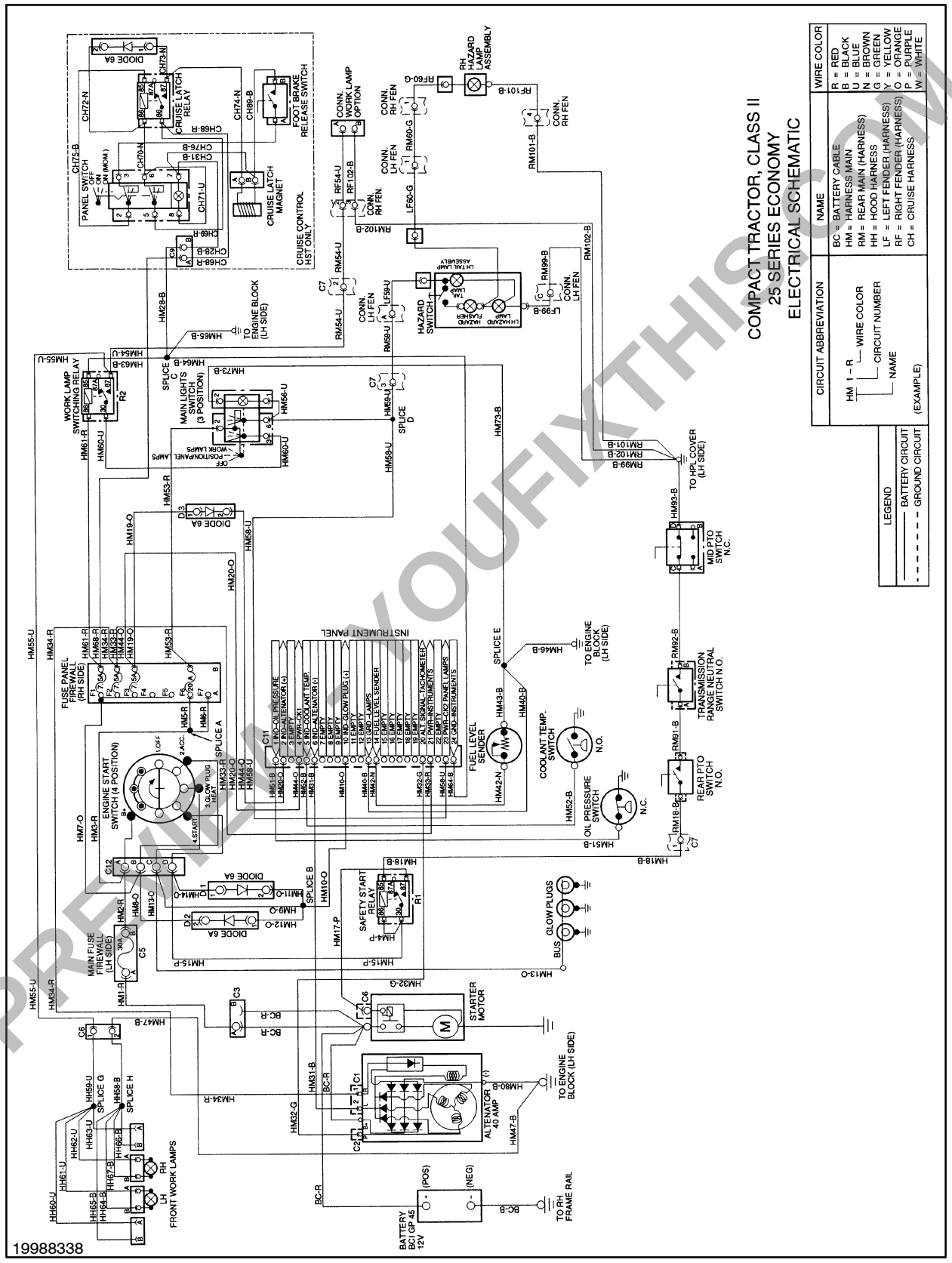

Figure 3-98

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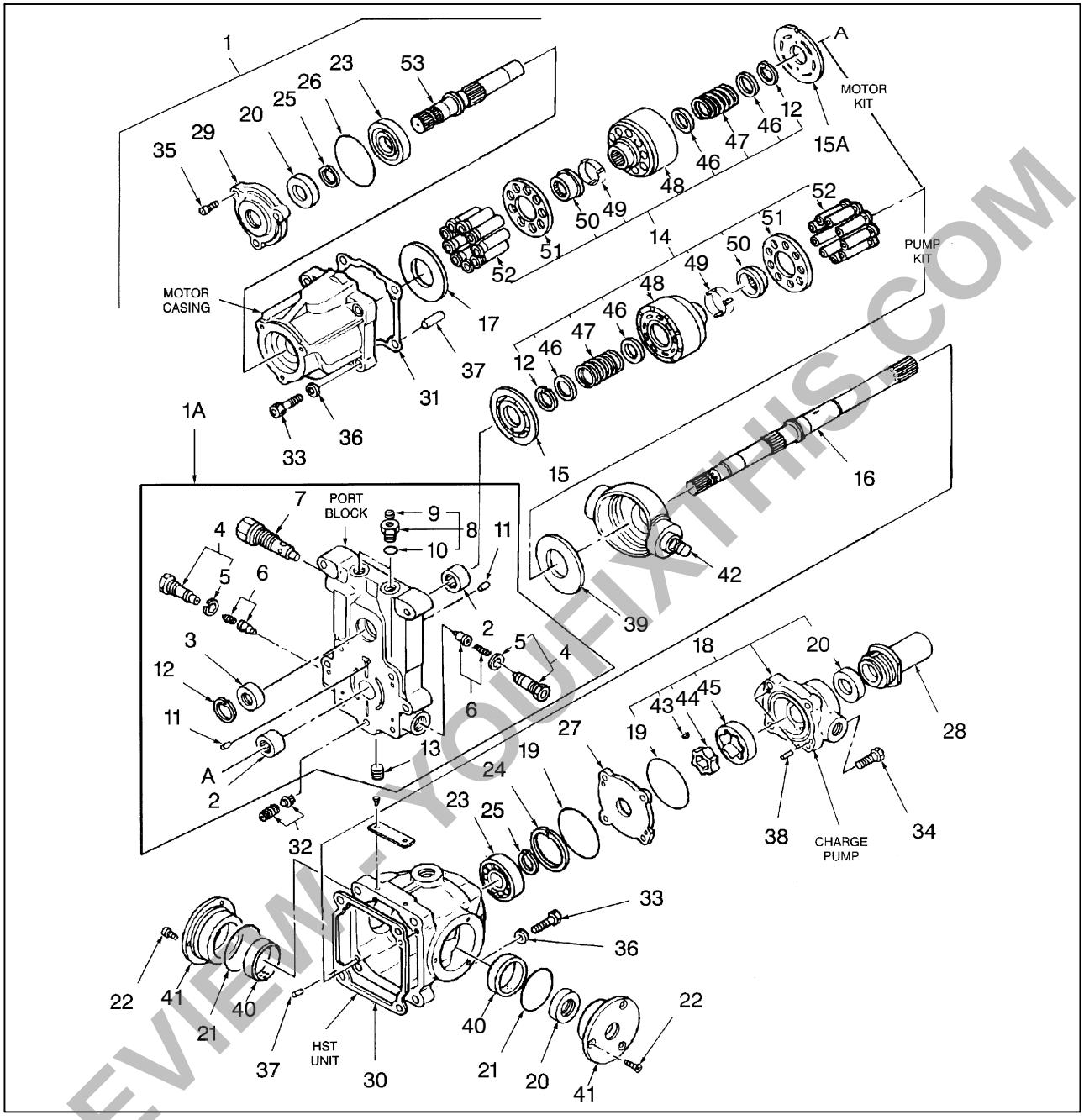

Figure 5-62

DISASSEMBLY

1. HST Assembly
1A. Block Kit
2. Needle Bearing
3. Oil Seal
4. Neutral Valve Assembly
5. Seal
6. Feed (Check) Valve Kit
7. Relief Valve Assembly
8. Plug Assembly
9. Gasket
10. O Ring
11. Pin
12. Snap Ring
13. 1/8 Pipe Thread Plug
14. Rotating Pump/Motor Group
15. Valve Plate (Pump)
15A. Valve Plate (Motor)
16. Input Shaft ((PTO)
17. Thrust Plate (Motor)
18. Charge Pump Kit
19. O Ring
20. Oil Seal
21. O Ring
22. Screw
23. Ball Bearing
24. Snap Ring
25. Snap Ring
26. O Ring
27. Plate
28. Holder
29. Cover (Motor)
30. Gasket (Pump)
31. Gasket (Motor)
32. Charge Relief Valve
33. Bolt
34. Bolt
35. M6 x 20 Bolt
36. Washer
37. Dowel Pin
38. Dowel Pin
39. Thrust Plate (Pump)
40. Bushing
41. Swash Plate Cover
42. Swash Plate
43. Key
44. Inner Rotor
45. Outer Rotor
46. Washer
47. Spring
48. Cylinder Block
49. Pins
50. Retainer Holder
51. Piston Retainer
52. Pistons
53. Output Shaft (Transmission)

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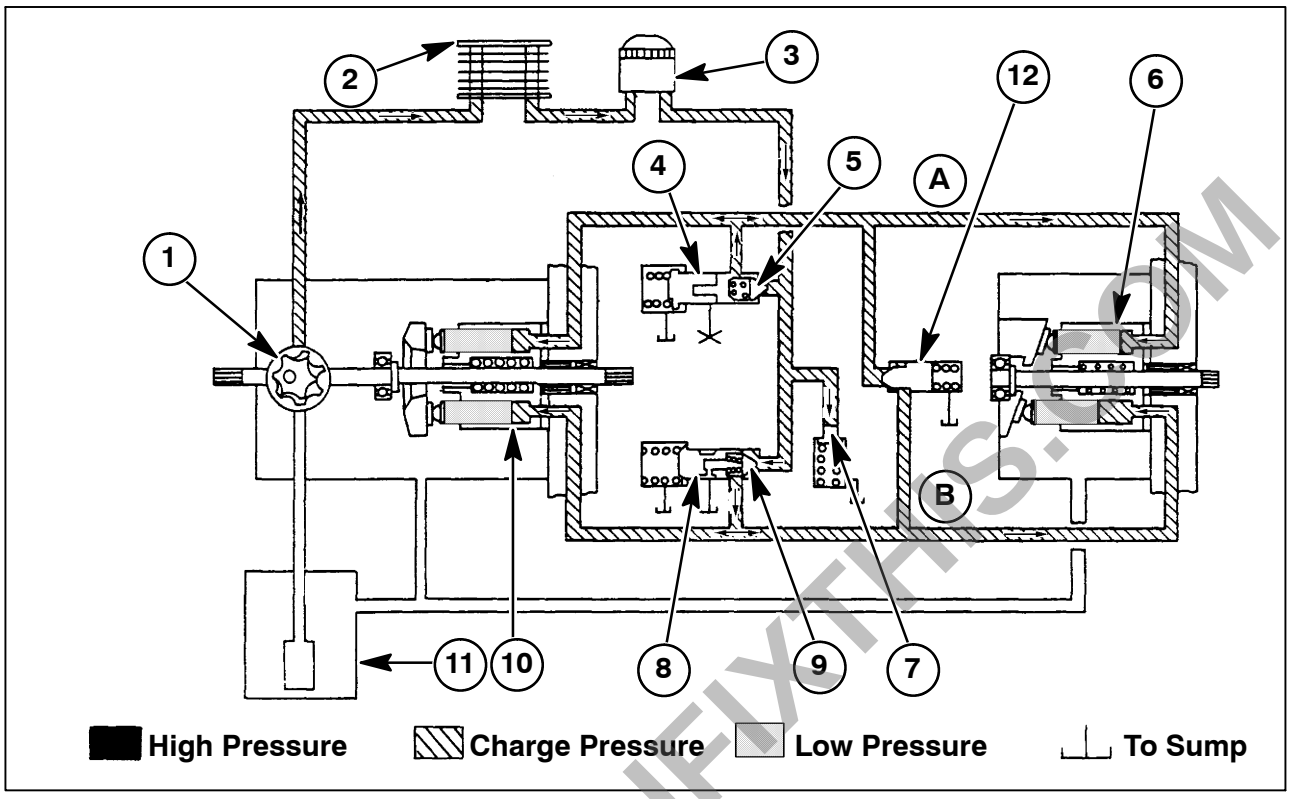

Figure 5-56

FLUID FLOW NEUTRAL POSITION

1. Charge Pump
2. Cooler
3. Filter (HST)
4. Neutral Valve
5. Feed (Check) Valve “A”
6. Hydrostatic Motor
7. Charge Pump Relief Valve
8. Neutral Valve
9. Feed (Check) Valve “B”
10. Hydrostatic Pump
11. Reservoir
12. High Pressure Relief

FLUID FLOW NEUTRAL POSITION

Fluid drawn from the transmission reservoir, 11, is pressurized by the rotor type charge pump, 1. The fluid flows from the charge pump to the cooler, 2, and filter, 3, through feed (check) valves, 5 and 9, and neutral valves, 4 and 8, assemblies and returns to the sump via the charge pump relief valve, 7. The charge pump relief valve maintains 4.2 - 5.6 bar (61 - 81 psi) pressure to the feed (check) valves, 5 and 9, at all times. Fluid flow past the feed (check) valves pressurizes the passages “A” and “B” and the pump and motor cylinder blocks. Because of equal pressures in passages “A” and “B” the motor does not rotate. The neutral valves, 4 and 8, are in a normally open position allowing fluid flow past the feed (check) valves, 5 and 9, to return to the sump. The neutral valves are set at 34.3 - 37.2 bar (498 - 540 psi) and remain open until this pressure is exceeded.

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SECTION 4 - CLUTCHES

Clutch cross shaft bushings assembly 4-17
Clutch cross shaft bushings removal 4-17
Clutch linkage components 4-17
Clutch pedal bushings assembly 4-18
Clutch pedal bushings removal 4-18
Clutch pilot bearing description 4-15
Clutch pilot bearing installation 4-15
Clutch pilot bearing removal 4-15
Clutch release bearing assembly 4-17
Clutch release bearing description 4-16
Clutch release bearing inspection 4-16
Clutch release bearing removal 4-16
Double clutch adjustment 4-11, 4-14
Double clutch assembly 4-13
Double clutch description 4-10
Double clutch disassembly 4-12
Double clutch inspection 4-13
Double clutch overhaul 4-12
Free-play adjustment 4-5, 4-11
Release lever height adjustment 4-8
Servicing clutch-related components 4-15
Single clutch adjustment 4-5
Single clutch description 4-2
Single clutch inspection 4-6
Single clutch installation 4-7
Single clutch removal 4-6
Single clutch operation 4-4
Single clutch overhaul 4-6
Special tools 4-21
Specifications 4-20
Troubleshooting 4-19

SECTION 5 - TRANSMISSION SYSTEMS

Adjustment of shift arms 5-19
Bolt torque specifications 5-70
Charge pump relief valve 5-43
Charge pump relief valve assembly 5-43
Charge pump relief valve disassembly 5-43
Charge pump relief valve inspection 5-43
Charge pump relief valve test 5-49
Charge pump removal 5-35
Check valve 5-47
Check valve assembly 5-47
Check valve disassembly 5-47
Check valve inspection 5-47
Countershaft assembly 5-18
Countershaft removal 5-12
Cruise control adjustment 5-67
Drive pinion assembly 5-16, 5-62
Drive pinion removal 5-14, 5-60
Fixed displacement motor operation 5-25
Fluid flow forward position 5-27
Fluid flow neutral position 5-26
Fluid flow reverse position 5-28
FWD drive shaft assembly 5-17
FWD drive shaft removal 5-13, 5-59
FWD main shaft 5-63
FWD shift rod assembly 5-17, 5-63
FWD shift rod removal 5-13, 5-58
9 x 3 Gear transmission 5-2
9 x 3 Gear transmission assembly 5-15
9 x 3 Gear transmission description and operation 5-2
9 x 3 Gear transmission disassembly 5-10
9 x 3 Gear transmission inspection 5-15
9 x 3 Gear transmission power flow 5-5
9 x 3 Gear transmission removal 5-10
High pressure relief valve 5-44
High pressure relief valve installation 5-44
High pressure relief valve removal 5-44
High pressure relief valve test 5-48
Hydrostatic motor disassembly 5-33
Hydrostatic motor shaft removal 5-35
Hydrostatic pump and port block assembly . . . 5-44
Hydrostatic pump assembly 5-38
Hydrostatic pump disassembly 5-32
Hydrostatic transmission assembly 5–37
Hydrostatic transmission description and operation 5-22
Hydrostatic transmission disassembly 5-31
Hydrostatic transmission gearbox adjustments 5-65
Hydrostatic transmission gearbox assembly . . 5-62
Hydrostatic transmission gearbox description and operation 5-51
Hydrostatic transmission gearbox inspection 5-61
Hydrostatic transmission gearbox overhaul . . . 5-56
Hydrostatic transmission gearbox power flow 5-52
Hydrostatic transmission gearbox disassembly 5-56
Hydrostatic transmission gearbox removal . . . 5-56
Hydrostatic transmission inspection 5-36
Hydrostatic transmission overhaul 5-29
Hydrostatic transmission removal 5-29
Hydrostatic unit removal 5-29
HST 5-52
HST motor cylinder block assembly 5-41
HST neutral adjustment 5-66
HST neutralizer adjustment 5-67
HST neutralizer (spring holder) 5-67
HST piston pump cylinder block assembly . . . 5-40
Input shaft assembly (double clutch) 5-21
Input shaft assembly (single clutch) 5-21
Input shaft removal (single clutch) 5-10
Input shaft removal (double clutch) 5-10
Main gear shifter rod assembly 5-19
Main gear shifter rod removal 5-11
Main shaft assembly 5-18
Main shaft removal 5-12
Main transmission shift lever 5-20
Mid-PTO link adjustment 5-65
Motor and port block assembly 5-46
Port block 5-42
Port block assembly 5-43
Port block disassembly 5-42
Port block inspection 5-42
Port block neutral and feed valves 5-42
Pressure tests 5-48
PTO countershaft assembly 5-17, 5-62
PTO countershaft removal 5-13, 5-60
PTO input shaft assembly 5-64
PTO input shaft removal 5-57

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FLYWHEEL

1. Fit the flywheel, 2, to the crankshaft, 1, and align the bolt holes.
2. Install the flywheel retaining bolts and tighten to 58 - 68 N·m (43 - 50 ft lbs).

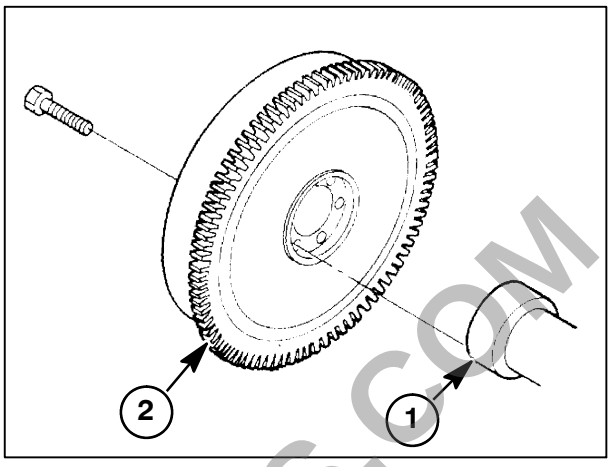

Figure 1-84

PISTONS AND CONNECTING RODS

1. Coat the bearing faces, pistons, and piston rings with clean engine oil. Slide the piston rings to permit a sufficient amount of oil to be applied in the grooves.
2. Set the piston ring gaps 90 degrees apart from each other. Do not position these gaps toward the piston pin or the right angle of the pin.
3. Using a piston ring compressor, 1, insert the pistons in the cylinders with the prechamber side of the piston facing the injection pump side. The connecting rod marks should also face the injection pump side.

   NOTE: Install the pistons from the front to the rear in order.

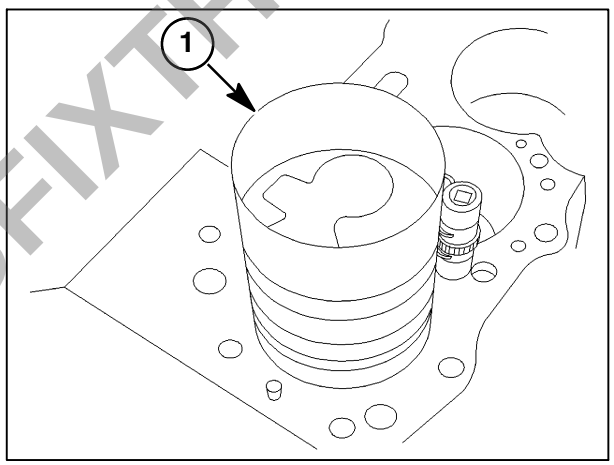

Figure 1-85

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CAMSHAFT	TC29 / TC29D	1925	TC33 / TC33D
Cam Height - Valve mm (in.)			
Standard	34.065 - 34.12 (1.341 - 1.343)	34.065 - 34.12 (1.341 - 1.343)	34.065 - 34.12 (1.341 - 1.343)
Minimum	33.7 (1.327)	33.7 (1.327)	33.7 (1.327)
Bend in mm (in.)			
Standard	0.03 (0.001)	0.03 (0.001)	0.03 (0.001)
Maximum	0.1 (0.004)	0.1 (0.004)	0.1 (0.004)
Cam Height - Fuel mm (in.)			
Standard	41.94 - 42.06 (1.651 - 1.656)	41.94 - 42.06 (1.651 - 1.656)	41.94 - 42.06 (1.651 - 1.656)
Minimum	41.8 (1.646)	41.8 (1.646)	41.8 (1.646)
VALVES	**TC29 / TC29D**	1925	**TC33 / TC33D**
Stem Diameter - Intake in mm (in.)			
Standard	6.955 - 6.97 (0.2738 - 0.2744)	6.955 - 6.97 (0.2738 - 0.2744)	6.955 - 6.97 (0.2738 - 0.2744)
Minimum	6.89 (0.271)	6.89 (0.271)	6.89 (0.271)
Stem Diameter - Exhaust in mm (in.)			
Standard	6.94 - 6.95 (0.273 - 0.274)	6.94 - 6.95 (0.273 - 0.274)	6.94 - 6.95 (0.273 - 0.274)
Minimum	6.84 (0.269)	6.84 (0.269)	6.84 (0.269)
Guide Clearance-Intake in mm (in.)			
Standard	0.03 - 0.06 (0.001 - 0.002)	0.03 - 0.06 (0.001 - 0.002)	0.03 - 0.06 (0.001 - 0.002)
Maximum	0.2 (0.008)	0.2 (0.008)	0.2 (0.008)
Guide Clearance-Exhaust in mm (in.)			
Standard	0.04 - 0.065 (0.002 - 0.003)	0.04 - 0.065 (0.002 - 0.003)	0.04 - 0.065 (0.002 - 0.003)
Maximum	0.25 (0.010)	0.25 (0.010)	0.25 (0.010)
Valve Margin in mm (in.)			
Standard	0.925 - 1.075 (0.0364 - 0.0423)	0.925 - 1.075 (0.0364 - 0.0423)	0.925 - 1.075 (0.0364 - 0.0423)
Maximum	0.5 (0.0197)	0.5 (0.0197)	0.5 (0.0197)
Valve Lash in mm (in.)	0.2(0.008)	0.2(0.008)	0.2(0.008)
Valve Spring-Free Height in mm (in.)			
Standard	35 (1.378)	35 (1.378)	35 (1.378)
Minimum	33.5 (1.319)	33.5 (1.319)	33.5 (1.319)

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TROUBLESHOOTING - GENERAL

CONDITION	CAUSE	REMEDY
Fuel not reaching injection point	1. Fuel shutoff valve closed	1. Open the fuel shut-off valve
	2. Restricted fuel filter	2. Check and flush the fuel filter clean
	3. Faulty fuel stop solenoid	3. Check fuel stop solenoid. See “Fuel Stop Solenoid,” Section 3
	4. Air in fuel system	4. Check for air leaks on suction side of system. Bleed the fuel system
	5. Fuel leakage	5. Check all the fuel lines and connections for tightness or possible damage
Fuel reaching nozzles but engine will not start	1. Low cranking speed	1. Check cranking
	2. Incorrect throttle adjustment	2. Check throttle control rod travel
	3. Incorrect pump	3. Check pump timing
	4. Fuel leakage	4. Check all fuel lines for leakage or possible damage
	5. Faulty injectors	5. See “Injector Troubleshooting,” later in this section
	6. Low compression	6. Check engine compression. See “Engine Compression Test,” discussed in Section 1
Engine hard to start	1. Low cranking speed	1. Check cranking speed
	2. Incorrect pump timing	2. Check pump timing
	3. Restricted fuel filter	3. Check and flush fuel filter clean
	4. Contaminated fuel	4. Check fuel for water in the fuel
	5. Low compression	5. Check engine compression. See “Engine Compression Test,” discussed in Section 1
	6. Air in fuel system	6. Check for air leaks on suction side of system. Bleed the fuel system
Engine starts and stops	1. Fuel restriction	1. Check and flush restricted fuel lines or fuel filter
	2. Contaminated fuel	2. Check for water in the fuel
	3. Restricted air intake	3. Check for restrictions in the air intake
	4. Engine overheating	4. Check cooling system
	5. Air in system	5. Check for air leaks on suction side of system. Bleed fuel system

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GLOW PLUGS

Description

Glow plugs are heating elements used to warm the air in the combustion chambers before and during engine startup. The glow plugs are located on the right side of the engine cylinder head.

The heating element wire is contained in a stainless steel sheath, 1, with the fine heat wire in coil form, 2, immersed in sintered magnesium oxide powder, 3. One end of this heat wire is welded to the sheath front tip. The other end is attached to the center electrode, 4.

NOTE: Glow plugs used on 1530, 1630, TC25D, TC29D, and TC33D tractors are a faster heating glow plug (markings Y-701RSS or Y-701M). Glow plugs used on 1725, 1925, TC25, TC29, and TC33 tractors are a slower heating glow plug (markings Y-107V).

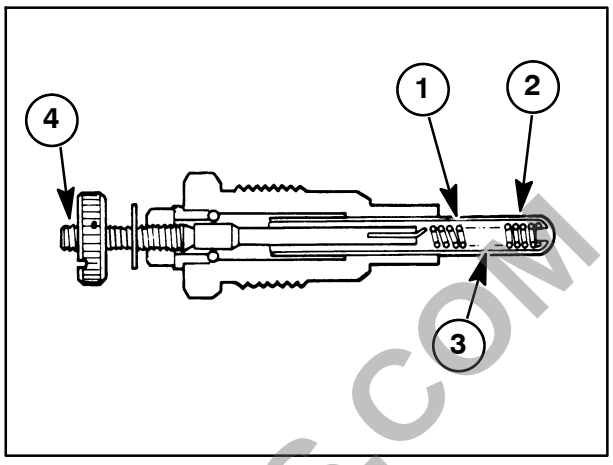

Figure 3-71

Glow Plug Testing

Use an ohmmeter to test the glow plugs.

Place one lead on the center electrode, 1, and the other lead on the glow plug body, 2.

- A resistance reading of 0.8 ohms maximum is normal for the Y701 glow plug.
- A resistance reading of 1.0 ohms maximum is normal for the Y107V glow plug.

If test results are not as outlined as above, replace the faulty glow plug.

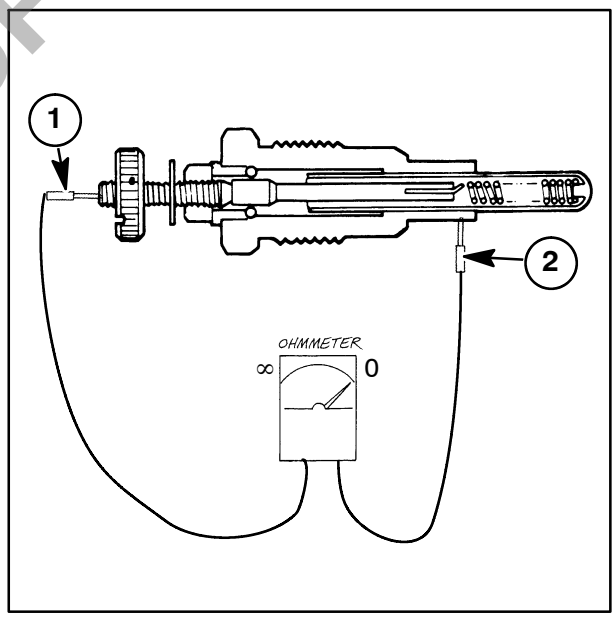

Figure 3-72

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ENGINE OIL PRESSURE (30 AND 25 SERIES)

1. Current flows from the battery to the 30 amp main fuse.
2. From the main fuse, current passes through the (B) terminal of the starter switch. When the starter switch is in the (RUN) position, current is transferred from the (B) terminal to the (ACC) terminal.
3. From the (ACC) terminal, current flows to the (F1) 7.5 amp fuse on 30 Series models, and to the (F3) 7.5 amp fuse on 25 Series models. From the fuse, current is provided to pin 4 on the instrument panel connector.
4. The ground circuit for the oil pressure indicator light is completed from pin 1 of the instrument panel connector, through the oil pressure switch when closed, to the ground of the engine block.

The oil pressure switch closes when oil pressure is below 6 PSI.

TROUBLESHOOTING
OIL PRESSURE CIRCUIT
25 & 30 SERIES

CONDITION	POSSIBLE CAUSE	REMEDY
Oil pressure warning light stays on.	Low oil pressure	Check engine lubrication system
	Malfunctioning sender	Check the sender and replace if necessary.
	Short circuit of sender wire to ground	Check the sender wire for short to ground.
	Malfunctioning instrument panel	Replace the instrument panel.
Oil pressure light will not illuminate.	Blown (F1) 7.5 amp fuse (30 Series)	Replace the 7.5 amp fuse.
	Blown (F3) 7.5 amp fuse (25 Series)	Replace the 7.5 amp fuse.
	Open circuit of sender wire to warning light	Check connection of sender wire at the sender.
	Faulty indicator bulb	Replace indicator bulb.

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DELUXE COOLANT TEMPERATURE CIRCUIT

1. Current flow starts at the battery positive (+) terminal and is transferred to the starter battery terminal by the positive (+) battery cable.
2. From the starter, current flows to the main (30 amp) fuse. The main fuse supplies current to the (B+) battery terminal of the engine start switch through terminal (A) of the engine start switch connector.
3. When the engine start switch is in the (RUN) position, current is transferred from the (B+) terminal to the (ACC) terminal. From there current travels to the (B) terminal of switch connector.
4. From the (B) terminal, current travels to the F2 (7.5 amp) fuse. From the fuse, current is provided to pin 21 on the instrument panel connector.
5. The gauge's temperature reading is controlled by the variable resistance of the coolant temperature sender located on the engine's thermostat housing. The higher the engine temperature, the lower the resistance of the sender, resulting in a higher temperature reading.
6. The ground circuit for the temperature gauge is completed from pin 15 of the instrument panel connector, through the temperature gauge, to the ground of the engine block

NOTE: Use same troubleshooting chart as 30 Series.

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BENCH CHECK

To check the alternator on a test bench, proceed as follows:

1. Make the connection as shown, except leave the load resistor disconnected.
2. Slowly increase the alternator speed and observe the voltage.
3. If the voltage is uncontrolled with speed, and increases above 15.5 V, check the alternator.
4. If the voltage is below 15.5 V, connect the load resistor as shown.
5. Operate the alternator at 2500 rpm and adjust the load resistor as required to obtain maximum output.
6. Measure the output current. The output must be within the limits given in specifications, discussed later in this section. If the output is less than the specified value, disassemble and check the alternator.

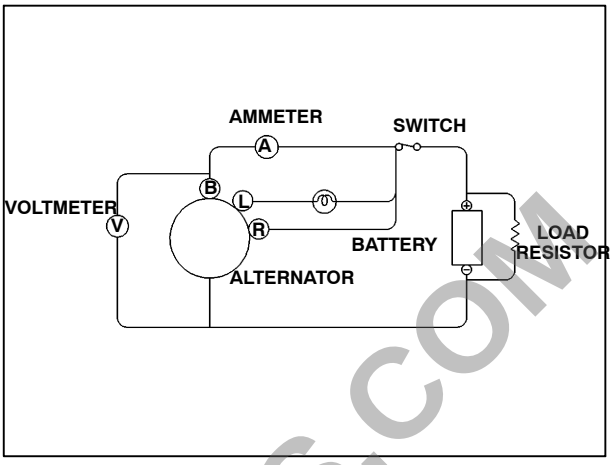

Figure 3-185

IMPORTANT:

1. *Reversed battery connections will damage the alternator and/or wiring.*
2. *When connecting a booster battery, make certain to connect the negative battery terminals together and the positive terminals together.*
3. *When a fast charger is used to charge the battery, disconnect the equipment battery cables.*
4. *Grounding of the alternator output terminal will damage the alternator and/or circuit.*
5. *Do not connect a load of over 1A to the terminal L.*
6. *If the alternator is operated with terminal L and B short-circuited, it may damage the diode trio.*

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SPECIAL TOOLS

Gauge—Lever height adjustment single clutch . . . . . NH 01300
Gauge—Lever height adjustment double clutch . . . . . NH 01267
Alignment arbor—1530, 1630, 1725, TC25, TC25D, TC29, TC29D single clutch . . . . . NH 00091
Alignment arbor—1925, TC33, TC33D single clutch . . . . . NH 01260
Alignment arbor—1530-1630 double clutch . . . . . NH 00077

BOLT TORQUES

Flywheel Mounting Bolts . . . . . 59 - 96 N·m (43.4 - 51 ft lbs)
Clutch Mounting Bolts . . . . . 22.6 - 28.4 N·m (16.6 - 21 ft lbs)

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HST Piston Pump Cylinder Block Assembly

1. Assemble the pins, 2, and retainer holder, 1, to the cylinder block, 3.

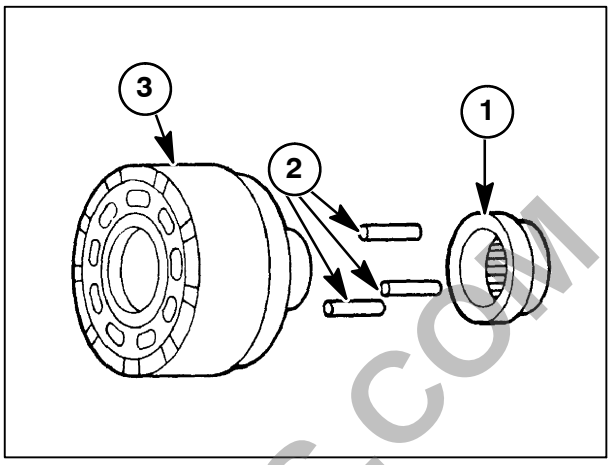

Figure 5-82

2. If removed, assemble the washers, 2, spring, 3, and snap ring, 4, in the cylinder block, 1.

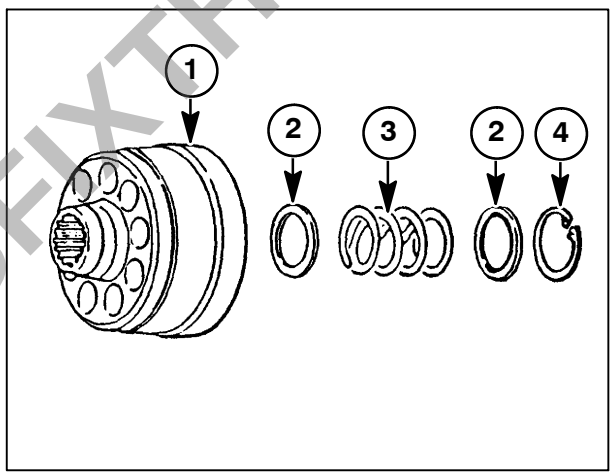

Figure 5-83

3. Assemble the piston and retainer assembly, 1, into the cylinder block, 2.

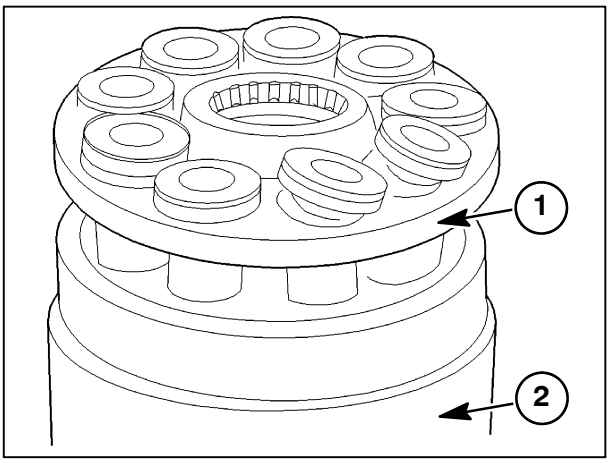

Figure 5-84

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3. Drive the roll pin, 4, out of the change lever, 7, and remove the lever.
4. Remove retaining plate, 9, and remove the shift arm, 1.

   NOTE: Must remove mid-PTO countershaft to remove PTO shift arm, 1.

5. Remove rear PTO safety switch, 14, washer, 15, pin, 16, and shims, 17.
6. Remove the bolt, 10, and remove the detent spring, 12, detent ball, 13, and seal washer, 11.

   NOTE: Use care to not lose the detent spring as it will be expelled with considerable force when the bolt is removed.

7. Drive out the roll pin, 4, and remove boss, 3, from the shifter rod, 5.
8. Drive the roll pin, 4, out of the shifter fork, 6, and remove the shifter fork.
9. Slide the shift rail, 5, out the front of the case.

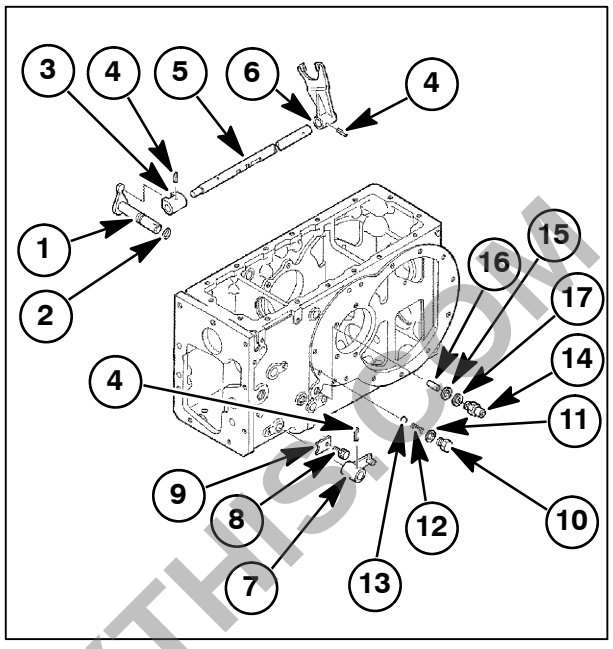

Figure 6-9

1. Shift Arm
2. O ring
3. Shifter Boss
4. Roll Pin
5. Shifter Rod
6. Shifter Fork
7. Change Lever
8. Bolt
9. Plate
10. Bolt
11. Seal Washer
12. Detent Spring
13. Detent Ball
14. PTO Safety Switch
15. Seal Washer
16. Pin
17. Shim— 0.008″
    0 .02″

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COMBINATION SYSTEM RELIEF-DIVERTER VALVE MANIFOLD ASSEMBLY

The combination system relief-diverter valve manifold, 1, is located in the high-pressure line on the right side of the tractor. Line, 9, supplies the pump from the reservoir. Line, 2, brings fluid from the pump to the manifold. Line, 3, supplies the hydraulic powered lift valve (control valve). Line, 4, provides a return path back to reservoir. The diverter spool, 7, normally provides flow directly to the HPL when the slot is in the 2 o'clock position.

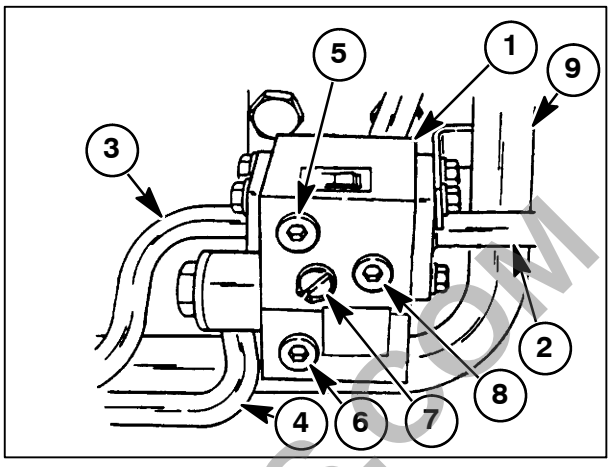

Figure 8-6

The diverter spool, 7, when rotated to the 10 o'clock position supplies the auxiliary hydraulics. The plugs, 5, 6, and 8, are removed to connect the auxiliary pumping. Port, 5, (PB for power beyond) bring flow pressure back from the front remote. This flow now supplies the HPL valve or rear remote. Port, 6, (T for tank) connects the front remote with a path to the reservoir. Port, 8, (P for pressure) provides pressure out of the manifold to the front remote valve.

The valve assembly contains the system relief valve,13, which protects the hydraulic pump from overload conditions. The valve body, 1, also serves as a manifold, containing hose connection ports for use with auxiliary hydraulic equipment, such as loaders. The diverter valve spool, 2, permits the operator to select operation of either the auxiliary hydraulic lift system circuits or the hydraulic lift system by rotating the diverter valve spool to the desired position.

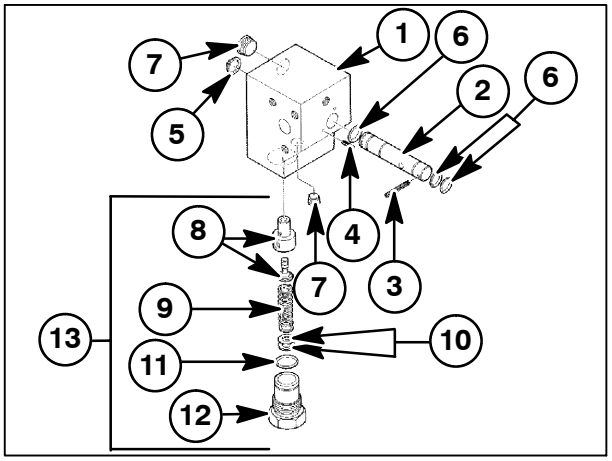

Figure 8-7

1. Valve Body
2. Diverter Valve Spool
3. Roll Pin
4. Roll Pin
5. Snap Ring
6. O Rings
7. Plug
8. Housing and Poppet
9. Spring
10. Shim
11. O Ring
12. Cap Plug
13. System Relief Valve Assembly

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RELIEF VALVE DISASSEMBLY

1. Loosen the adjusting screw locknut, 15, and back off the adjusting screw, 16.
2. Remove the relief valve bonnet, 14, with O ring, 9, adjusting screw, 16, and locknut, 15.
3. Remove the spring seat, 13, spring, 12, and valve disc, 11, from the body, 10.
4. Remove and replace the O rings and backup rings, 1 through 9.

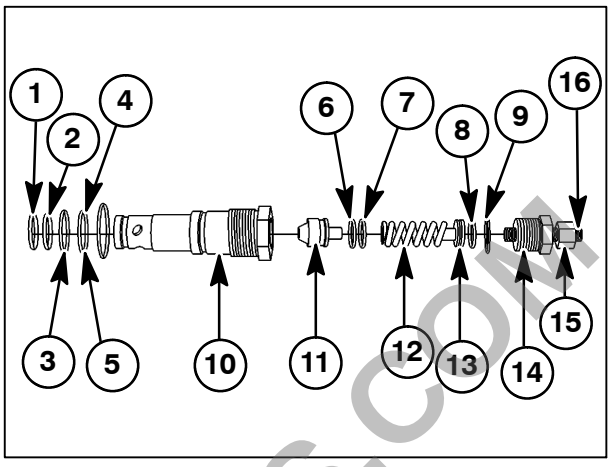

Figure 8-76

INSPECTION

Inspect the valve seat and disc for scratches, nicks, or other damage. If any damage is found to any part of the valve, replace the complete assembly.

RELIEF VALVE ASSEMBLY

1. Install new O rings and backup rings, 1 through 9.
2. Install the valve disc, 11, spring, 12, and spring seat, 13, in the valve body, 10.
3. Install the relief valve bonnet, 14, with locknut, 15, and adjusting screw, 16.
4. Install the relief valve in the double-spool valve body and adjust the valve as described later in this section.

RELIEF VALVE ADJUSTMENT

Loosen locknut, 15, and turn screw, 16, clockwise to increase pressure. Turn the screw counterclockwise to decrease pressure.

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Inspection

1. Check that the gas shock assembly, 1, is not bent or deformed in any way. Check that the handle moves freely and the spring expands and compresses when operating the handle. Check that the bracket, 2, where the dowel pin fits is not bent or damaged. Check the rest of the housing for any obvious damage.

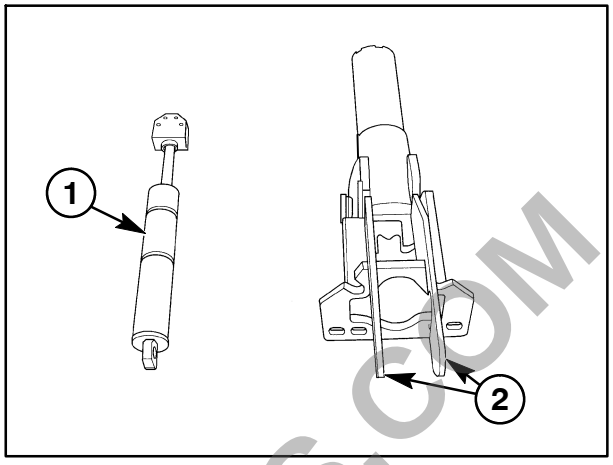

Figure 9-55

2. Inspect the bearing, 1, and tube, 2, of the top housing for wear. Check that the bearing spins and the inside of the tube is not excessively worn, scored, or deformed.

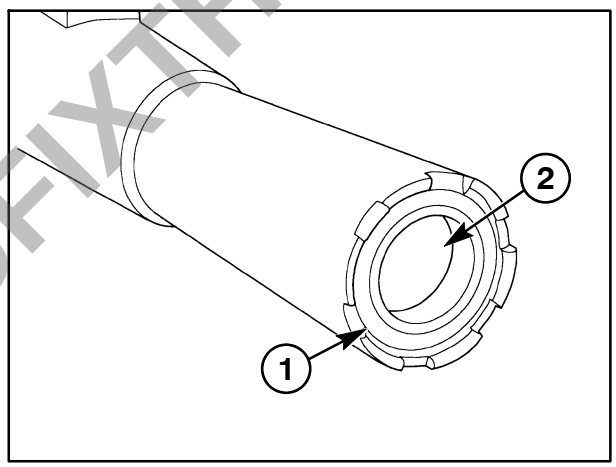

Figure 9-56

3. Inspect the steering wheel splines, 1, at the top end of the shaft for stripping or excessive wear. Check that the telescoping adjusting bolt, 2, works properly. When the bolt is loosened counterclockwise, the shaft is adjustable. When the bolt is tightened clockwise, the shaft is locked in place.

4. Inspect the shaft splines for excessive wear. Check that the universal joints move freely in all directions.

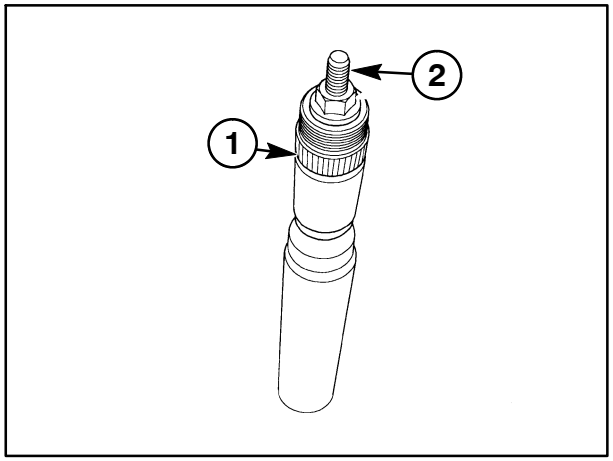

Figure 9-57

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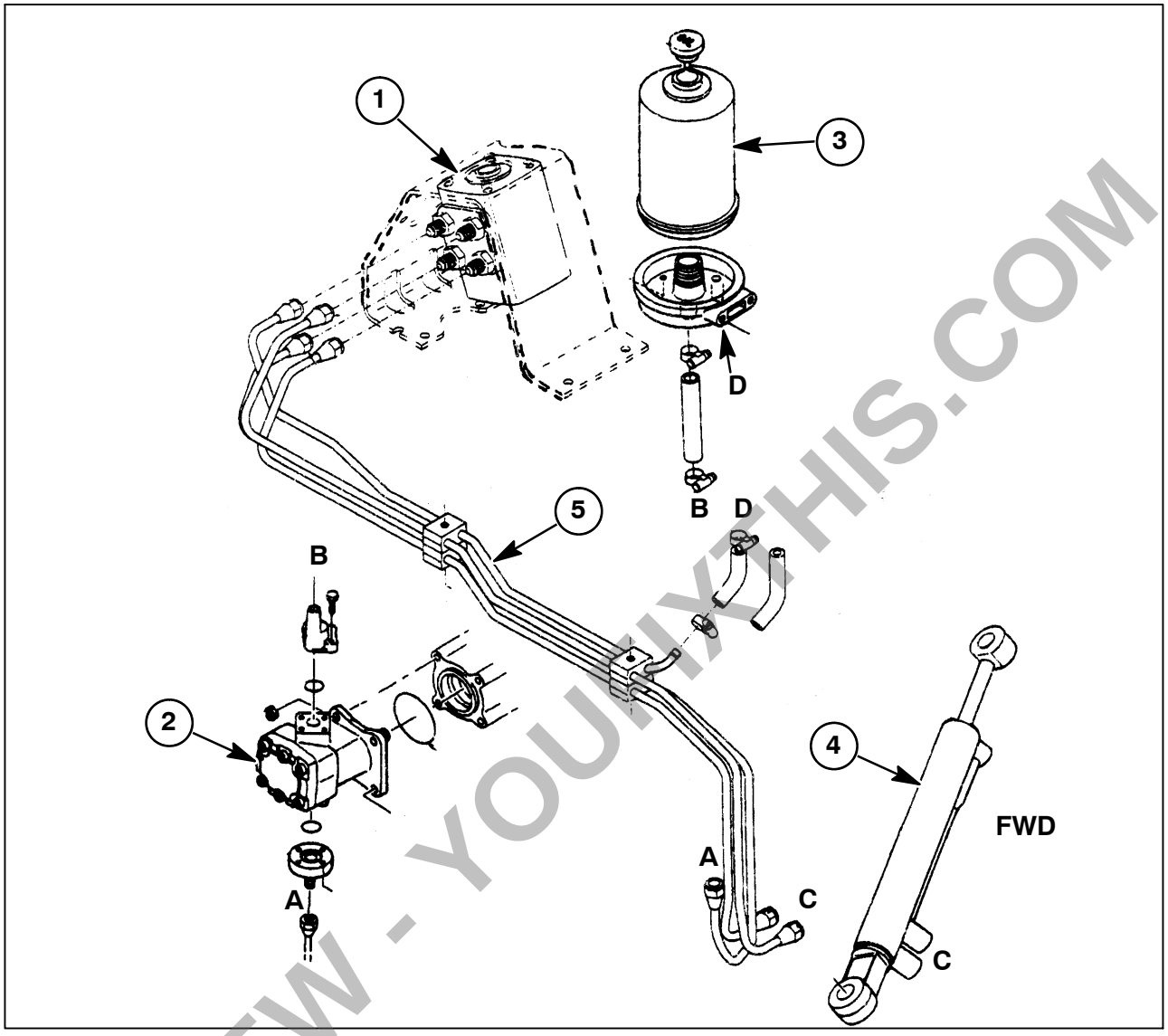

Figure 11-4

POWER STEERING DESCRIPTION AND OPERATION

The power steering system for SuperSteer tractors is identical to the standard system described in Section 9 “Steering Systems - Power Steering.” The power steering system is a fully hydraulic system.

The power steering system consists of a power steering control motor, 1, pump, 2, reservoir, 3, cylinder assembly, 4, and tubing, 5.

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Differential Inspection and Repair

1. Wash all parts in a suitable solvent and air dry.
2. Using a telescoping gauge and micrometer, measure the pinion gear bore and the pinion shaft and determine the gear to shaft clearance. Replace the gear and/or shaft if the clearance exceeds 0.1 mm (0.004″).
3. Measure the differential to side gear thrust washer thickness. Replace the thrust washers if the thickness is less than 1.2 mm(0.047″).

   NOTE: If the thrust washers are replaced, recheck the side gear to pinion gear backlash during assembly. Refer to backlash check made during disassembly.

4. Inspect all gear teeth for excess wear or damage. Replace gears if teeth wear is excessive.

Reduction Gear — Drop Box Inspection and Repair

1. Wash all parts in a suitable solvent and air dry.
2. Inspect the gears for excess wear or damage. Replace gears that show excessive wear. See “Assembly,” for gear backlash checks.
3. Inspect the splines on the pinion gears, idler shaft, and axle shaft for excess wear or damage.
4. Check the bearings for wear or roughness. Rotate the bearings by hand and replace bearings as required.
5. On assembly, check the bevel gear and pinion backlash. See “Gear Reduction — Drop Box Assembly,” discussed later in this section.

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