SECTION 1. SPECIFICATIONS

1.1 CAPACITIES

Table 1-1. Capacities

Fuel Tank	17 gallons (64.3 liters)
Hydraulic Tank (machines to S/N 0300070586)	28 gallons (106 liters)
Hydraulic Tank (S/N 0300070586 & SN 1300000001to Present)	27 gallons (102 liters) 23.6 gal. (89 liters) to the Full line on the sight gauge
Drive Hub	23.75 oz. (0.7 liters)
Drive Brake	2.7 oz. (0.08 liters)

1.2 TIRES

Table 1-2. Tires

Size	Type	Pressure	Weight
12x16.5	Pneumatic	90 psi (6 Bar)	128 lbs. (58 kg)
12x16.5	Foam-Filled	N/A	328 lbs. (149 kg)
33/1550x16.5	Pneumatic	90 psi (6 Bar)	135 lbs. (61 kg)
33/1550x16.5	Foam-Filled	N/A	395 lbs. (179 kg)
14 x 16.1	Pneumatic	40 lbs. (3 bar)	91.5 lbs. (41.5 kg)
14 x 16.1	Foam-Filled	N/A	426 lbs. (193 kg)

1.3 ENGINE

NOTE: *RPM Tolerances are ± 100.*

Table 1-3. Ford LRG-425 (Gas or Dual Fuel)

Type	4 cylinder, 4 stroke, spark ignition
Fuel	Gasoline or Gasoline/LP Gas
Bore	3 in. (96 mm)
Stroke	3.4 in. (86.4 mm)
Displacement	153 cu. in. (2.5 L)
Firing Order	1-3-4-2
BHP at Max. RPM	82
Oil Capacity	4.5 quarts (4.26 L)
Low RPM	1000
Mid RPM Tower Lift, Upper Lift, Tele Swing, Basket Level, Basket Rotate, Jib Lift	 1800 1500
High RPM	3000
Spark Plug	AWSF-52-C
Spark Plug Gap	0.044 in. (1.117 mm)

Table 1-4. Deutz F3M1011F

Fuel	Diesel
No. of Cylinders	3s
Bore	3.6 in. (91 mm)
Stroke	4.4 in. (112 mm)
Displacement	133 cu. in. (2184 cm^3)
BHP at Max. RPM	48
Oil Capacity crankcase cooler total capacity	 6.3 quarts (6 L) 4.75 quarts (4.5 L) 11 quarts (10.5 L)
Low RPM	1200
Mid RPM Tower Lift, Upper Lift, Tele Swing, Basket Level, Basket Rotate, Jib Lift	 1800 1500
High RPM	2800

Table 1-5. Deutz F3M2011F

Fuel	Diesel
No. of Cylinders	3s
Bore	3.7 in. (94 mm)
Stroke	4.4 in. (112 mm)
Displacement	142 cu. in. (2331 cm^3)
Oil Capacity crankcase cooler total capacity	 6.3 quarts (6 L) 4.75 quarts (4.5 L) 11 quarts (10.5 L)
Low RPM	1200
Mid RPM Tower Lift, Upper Lift, Tele Swing, Basket Level, Basket Rotate, Jib Lift	 1800 1500
High RPM	2800

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Table 2-3. Inspection and Preventive Maintenance Schedule

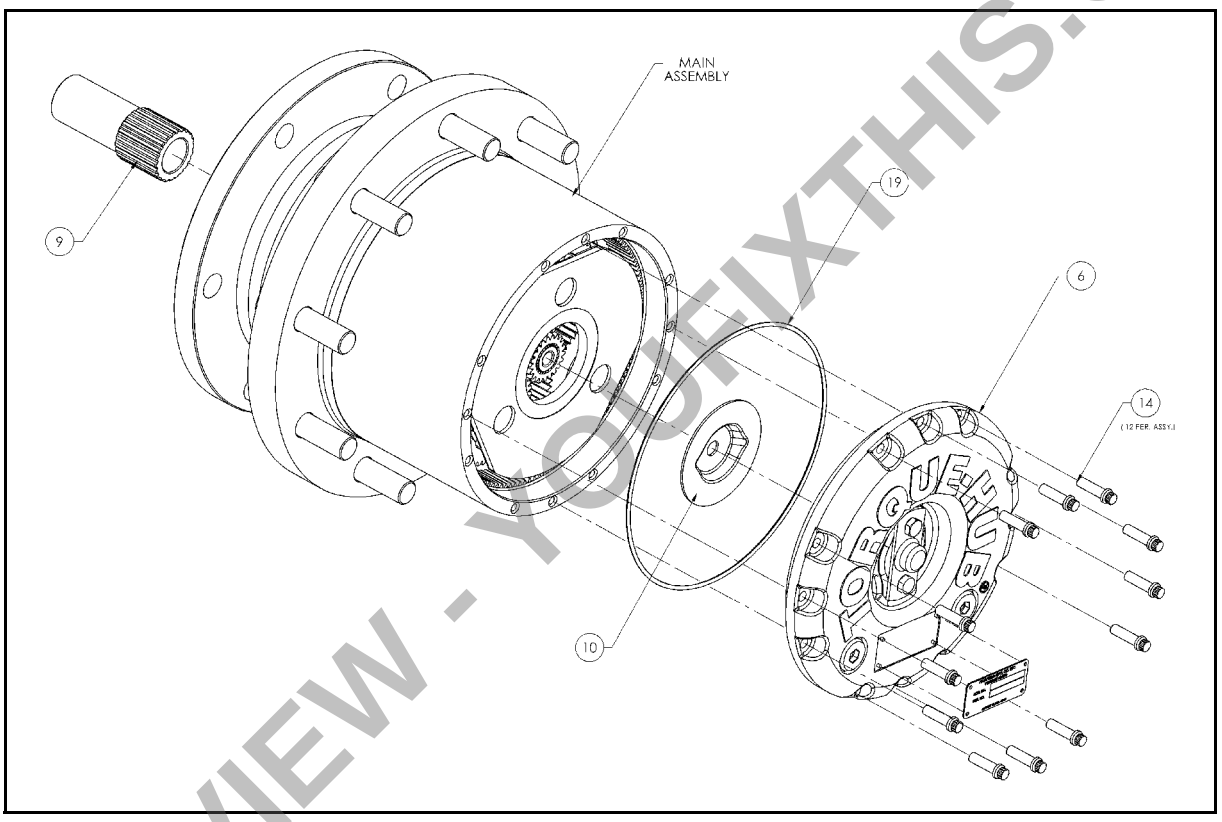
AREA	INTERVAL					
	Pre-Start[1] Inspection	Weekly Preventive Maintenance	Monthly Preventive Maintenance	Pre-Delivery[2] or Frequent[3] Inspection	Annual[4] (Yearly) Inspection	Every 2 Years
Boom Assembly	9					
Boom Weldments				1,2,4	1,2,4	
Hose/Cable Carrier Installations				1,2,9,12	1,2,9,12	
Pivot Pins and Pin Retainers				1,2	1,2	
Sheaves, Sheave Pins				1,2	1,2	
Bearings				1,2	1,2	
Wear Pads				1,2	1,2	
Covers or Shields				1,2	1,2	
Extend/Retract Chain or Cable Systems				1,2,3	1,2,3	
Platform Assembly	9					
Platform	1,2				1,2	
Railing	1,2			1	1,2	
Gate			5	1	1,5	
Floor	1,2			1	1,2	
Rotator		9,5		15		
Lanyard Anchorage Point	2			1,2,10	1,2,10	
Turntable Assembly	9					
Swing Bearing or Worm Gear				1,2,14	1,2,3,13,14	
Oil Coupling		9				
Swing Drive System						
Turntable Lock				1,2,5	1,2,5	
Hood, Hood Props, Hood Latches				5	1,2,5	
Chassis Assembly	9					
Tires	1	16,17		16,17,18	16,17,18	
Wheel Nuts/Bolts	1	15		15	15	
Wheel Bearings						14,24
Oscillating Axle/Lockout Cylinder Systems					5,8	
Outrigger or Extendable Axle Systems				5,8	5,8	
Steer Components						
Drive Motors						
Torque Hubs				11	11	
Functions/Controls	9					
Platform Controls	5	5		6	6	

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Main Disassembly

1. Perform Roll Check, Leak Check and Brake Check if applicable prior to disassembling unit.
2. Drain oil and note condition and volume.
3. Remove Input Coupling (9) from Spindle (1A) end of unit.
4. Remove Cover Bolts (14) and Cover (6).
5. Remove O-ring (19) and Thrust Spacer (10) from Cover (6).
6. Remove Input Sun Gear (17) from Input Carrier Sub-Assembly (3A).
7. Remove Input Carrier Sub-Assembly (3A) from Housing (1E).
8. Remove Output Sun Gear (8) from Output Carrier Sub-Assembly (4A).
9. Remove Input Shaft (7) from Output Carrier Sub-Assembly (4A).
10. Remove Output Carrier Sub-Assembly (4A) from Housing (1E).



6. Cover
9. Input Coupling
10. Thrust Spacer
14. Cover Bolts
19. O-ring

Figure 3-1. Main Disassembly Drawing 1

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Values for Zinc Yellow Chromate Fasteners (Ref 4150707)												
SAE GRADE 5 BOLTS & GRADE 2 NUTS												
Size	TPI	Bolt Dia	Tensile Stress Area	Clamp Load	Torque (Dry)		Torque Lubricated		Torque (Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140)		Torque (Loctite® 262™ or Vibra-TITE™ 131)	
		In	Sq In	LB	IN-LB	[N.m]	IN-LB	[N.m]	IN-LB	[N.m]	IN-LB	[N.m]
4	40	0.1120	0.00604	380	8	0.9	6	0.7				
	48	0.1120	0.00661	420	9	1.0	7	0.8				
6	32	0.1380	0.00909	580	16	1.8	12	1.4				
	40	0.1380	0.01015	610	18	2.0	13	1.5				
8	32	0.1640	0.01400	900	30	3.4	22	2.5				
	36	0.1640	0.01474	940	31	3.5	23	2.6				
10	24	0.1900	0.01750	1120	43	4.8	32	3.5				
	32	0.1900	0.02000	1285	49	5.5	36	4				
1/4	20	0.2500	0.0318	2020	96	10.8	75	9	105	12		
	28	0.2500	0.0364	2320	120	13.5	86	10	135	15		
		In	Sq In	LB	FT-LB	[N.m]	FT-LB	[N.m]	FT-LB	[N.m]	FT-LB	[N.m]
5/16	18	0.3125	0.0524	3340	17	23	13	18	19	26	16	22
	24	0.3125	0.0580	3700	19	26	14	19	21	29	17	23
3/8	16	0.3750	0.0775	4940	30	41	23	31	35	48	28	38
	24	0.3750	0.0878	5600	35	47	25	34	40	54	32	43
7/16	14	0.4375	0.1063	6800	50	68	35	47	55	75	45	61
	20	0.4375	0.1187	7550	55	75	40	54	60	82	50	68
1/2	13	0.5000	0.1419	9050	75	102	55	75	85	116	68	92
	20	0.5000	0.1599	10700	90	122	65	88	100	136	80	108
9/16	12	0.5625	0.1820	11600	110	149	80	108	120	163	98	133
	18	0.5625	0.2030	12950	120	163	90	122	135	184	109	148
5/8	11	0.6250	0.2260	14400	150	203	110	149	165	224	135	183
	18	0.6250	0.2560	16300	170	230	130	176	190	258	153	207
3/4	10	0.7500	0.3340	21300	260	353	200	271	285	388	240	325
	16	0.7500	0.3730	23800	300	407	220	298	330	449	268	363
7/8	9	0.8750	0.4620	29400	430	583	320	434	475	646	386	523
	14	0.8750	0.5090	32400	470	637	350	475	520	707	425	576
1	8	1.0000	0.6060	38600	640	868	480	651	675	918	579	785
	12	1.0000	0.6630	42200	700	949	530	719	735	1000	633	858
1 1/8	7	1.1250	0.7630	42300	800	1085	600	813	840	1142	714	968
	12	1.1250	0.8560	47500	880	1193	660	895	925	1258	802	1087
1 1/4	7	1.2500	0.9690	53800	1120	1518	840	1139	1175	1598	1009	1368
	12	1.2500	1.0730	59600	1240	1681	920	1247	1300	1768	1118	1516
1 3/8	6	1.3750	1.1550	64100	1460	1979	1100	1491	1525	2074	1322	1792
	12	1.3750	1.3150	73000	1680	2278	1260	1708	1750	2380	1506	2042
1 1/2	6	1.5000	1.4050	78000	1940	2630	1460	1979	2025	2754	1755	2379
	12	1.5000	1.5800	87700	2200	2983	1640	2224	2300	3128	1974	2676

NO. 5000059 REV. J

NOTES: 1. THESE TORQUE VALUES DO NOT APPLY TO CADMIUM PLATED FASTENERS
2. ALL TORQUE VALUES ARE STATIC TORQUE MEASURED PER STANDARD AUDIT METHODS TOLERANCE = ±10%
3. * ASSEMBLY USES HARDENED WASHER

	REFERENCE JLG ANEROBIC THREAD LOCKING COMPOUND			
JLG P/N	Loctite® P/N		ND Industries P/N	Description
0100011	242™		Vibra-TITE™ 121	Medium Strength (Blue)
0100019	271™		Vibra-TITE™ 140	High Strength (Red)
0100071	262™		Vibra-TITE™ 131	Medium - High Strength (Red)

Figure 1-4. Torque Chart (SAE Fasteners - Sheet 1 of 7)

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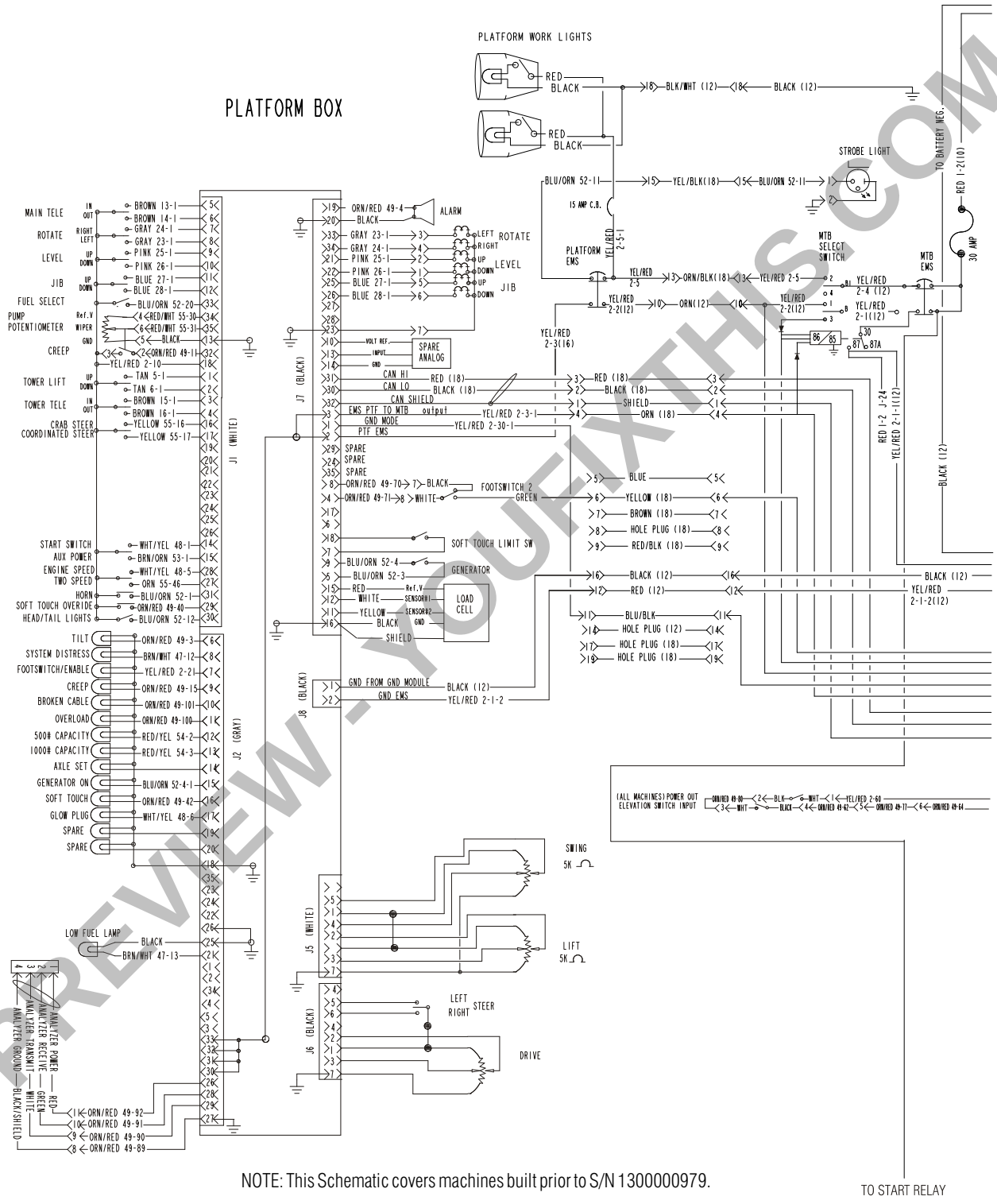
Fault group	Fault no. (in SERDIA)	Fault locality/ Fault description	SPN	FMI	Cause	Remarks	Help
Zero error display	-	No faults	524287	31	No **active** faults present		
Revolutions / speed acquisition	01	Speed sensor 1	190	8	Sensor failure. Distance from gear too far. Additional fault impulses. Cable joint interrupted.	Governor in emergency operation (if sensor 2 available). Emergency switch-off (if sensor 2 not available or failed).	Check distance. Check cable connection. Check sensor and replace if required.
						Governor in emergency operation (with sensor 1) Emergency switch-off (if sensor 1 not available or failed).	
	03	Speed sensor	84	8	Tacho failed. Additional fault impulses. Cable connection interrupted.	Governor in emergency operation.	Check cable connection and Tacho. Replace if required.
	04	Excess speed switch-off	190	0	Speed was/is in excess of limit.e.	Engine stop.	Check parameter (21). Check speed settings.
					Check PID setting. Check rods. Check actuator and replace if required. Check cable to actuator (impulse on incorrect speed). Check No. of teeth. For vehicles check for possible thrust mode.		
Sensors	07	Charge air pressure	102	2	Fault at corresponding sensor entry (e.g. short circuit or cable break).	With failure of the sensor, the associated monitoring function is de-activated.	Check sensor cable. Check sensor and replace if required. Check fault limits for sensor.
	08	Oil pressure	100	2			
	09	Coolant temperature	110	2			
	10	Charge air temperature	105	2			
	11	Fuel temperature	174	2			

NOTE: SID is equal to 512. To get SPN #, add 512 + number. For example, SID 254 would be 512+254 or an SPN of 766.

Figure 3-71. EMR2 Fault Codes - Sheet 1 of 5

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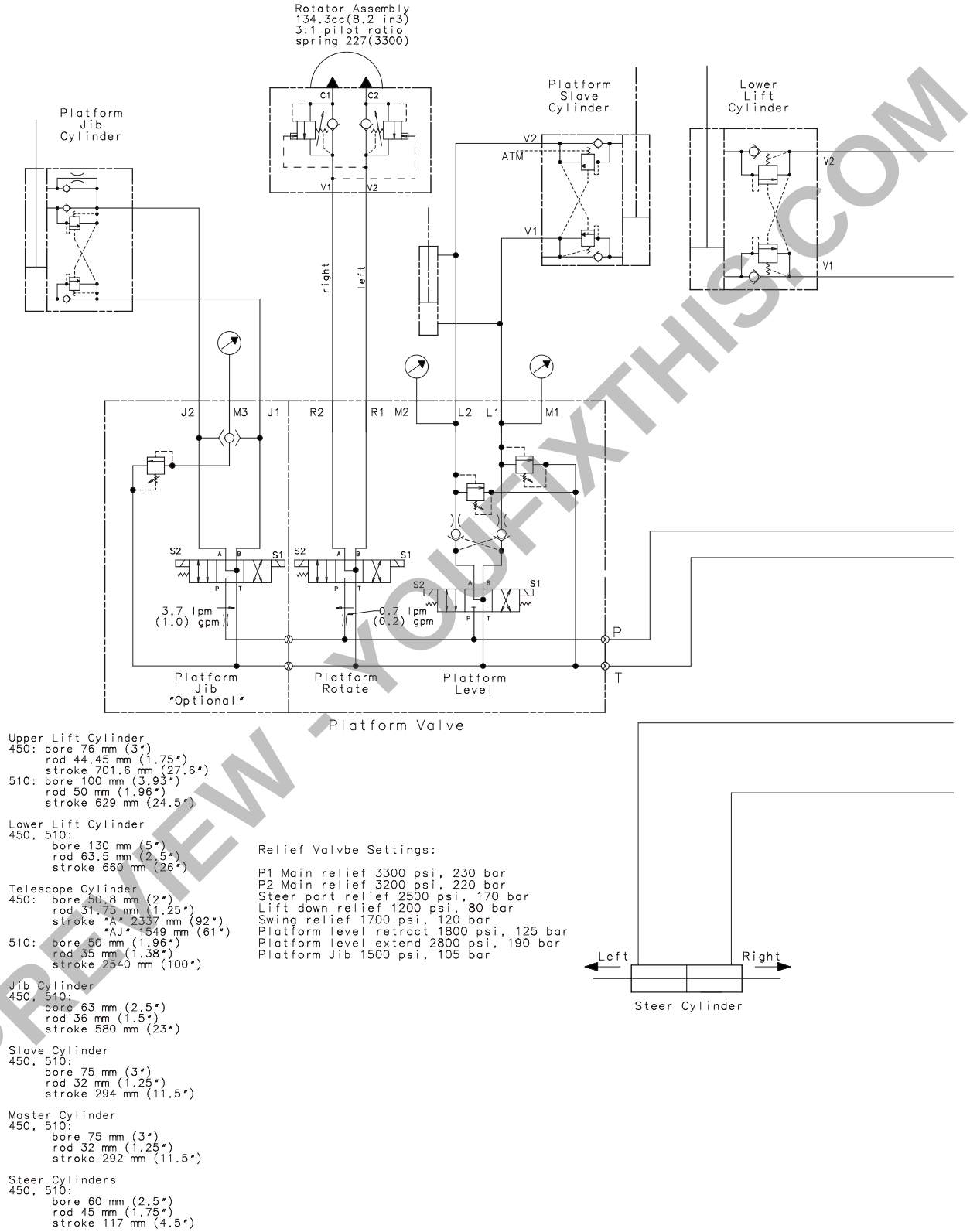


NOTE: This Schematic covers machines built prior to S/N 1300000979.

Figure 7-20. Electrical Schematic - Sheet 1 of 4

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Upper Lift Cylinder
450: bore 76 mm (3")
rod 44.45 mm (1.75")
stroke 701.6 mm (27.6")
510: bore 100 mm (3.93")
rod 50 mm (1.96")
stroke 629 mm (24.5")

Lower Lift Cylinder
450, 510:
bore 130 mm (5")
rod 63.5 mm (2.5")
stroke 660 mm (26")

Telescope Cylinder
450: bore 50.8 mm (2")
rod 31.75 mm (1.25")
stroke "A" 2337 mm (92")
"AJ" 1549 mm (61")
510: bore 50 mm (1.96")
rod 35 mm (1.38")
stroke 2540 mm (100")

Jib Cylinder
450, 510:
bore 63 mm (2.5")
rod 36 mm (1.5")
stroke 580 mm (23")

Slave Cylinder
450, 510:
bore 75 mm (3")
rod 32 mm (1.25")
stroke 294 mm (11.5")

Master Cylinder
450, 510:
bore 75 mm (3")
rod 32 mm (1.25")
stroke 292 mm (11.5")

Steer Cylinders
450, 510:
bore 60 mm (2.5")
rod 45 mm (1.75")
stroke 117 mm (4.5")

Relief Valvbe Settings:

P1 Main relief 3300 psi, 230 bar
P2 Main relief 3200 psi, 220 bar
Steer port relief 2500 psi, 170 bar
Lift down relief 1200 psi, 80 bar
Swing relief 1700 psi, 120 bar
Platform level retract 1800 psi, 125 bar
Platform level extend 2800 psi, 190 bar
Platform Jib 1500 psi, 105 bar

Figure 7-44. Hydraulic Schematic 2792780 D - Sheet 1 of 3 (LH)

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Table 1-6. Caterpillar 3024/C2.2

Fuel	Diesel
No. of Cylinders	4
BHP	46.5 hp (34 kW)
Bore	3.307 in. (84 mm)
Stroke	3.9370 in. (112 mm)
Displacement	134.3 cu. in. (2.2L)
Oil Capacity	10 qt. (9.4 L)
Compression Ratio	19:1
Firing Order	1-3-4-2
Max. RPM	2800

Table 1-7. GM 3.0L

Fuel	Gasoline or Gasoline/LP Gas
No. of Cylinders	4
BHP Gasoline LP	 83 hp @ 3000 rpm 75 hp @ 3000 rpm
Bore	4.0 in. (101.6 mm)
Stroke	3.6 in. (91.44 mm)
Displacement	181 cu.in. (3.0 L, 2966 cc)
Oil Capacity w/filter	4.5 qts. (4.25 L)
Minimum Oil Pressure at idle Hot	 6 psi (0.4 Bar) @ 1000 rpm 18 psi (1.2 Bar) @ 2000 rpm
Compression Ratio	9.2:1
Firing Order	1-3-4-2
Max. RPM	2800

Table 1-8. Perkins 404C-22

Fuel	Diesel
No. of Cylinders	4
BHP	50 HP (37.3 kW)
Bore	3.3 in. (84 mm)
Stroke	3.9 in. (100 mm)
Firing Order	1-3-4-2
Displacement	135 cu.in. (2.2 L)
Oil Capacity w/filter	10 qt. (9.4 L)
Compression Ratio	23.3:1
Fuel Consumption	0.63 gal. (2.38 L) /hour

1.4 SPECIFICATIONS AND PERFORMANCE DATA

Reach Specifications

Table 1-9. Reach Specifications - 450

Max. Platform Height	45ft. (13.72 M)
Max. Horizontal Reach	24.5ft. (7.47 M)
Up & Over Height	25 ft. 2 in. (7.7 M)
Main Boom Up Angle	75°
Main Boom Down Angle	-24°

Dimensional Data

Table 1-10. Dimensional Data - 450

Overall Width (12 x 16.5 tire) (33/1550 tire) (14 x 16.1 tire)	 6 ft. 6 in. (1.98 m) 6 ft. 10 in. (2.08 m) 6 ft. 11 in. (2.11 m)
Tailswing	0
Stowed Height	7 ft. 4.4 in. (2.25 m)
Stowed Length	21 ft. 4 in. (6.5 m)
Wheel base	78 in. (1.98 m)
Track Width (12 x 16.5 tire) (33/1550 tire) (14 x 16.1 tire)	 65.3 in. (1.66 m) 66.3 in. (1.69 m) 66.6 in. (1.69 m)
Ground Clearance	14 in. (0.36 m)

Chassis

Table 1-11. Chassis Specifications - 450

Swing	357° non-continuous
Rated Gradeability 2WD 4WD	 30% 45%
Max. Tire Load	7900 lb. (3583 kg)
Axle Oscillation	8 in. (0.2 m)
System Voltage	12 Volts
Max. Hydraulic System Operating Pressure	4500 psi (310 bar)
Gross Machine Weight 450A SII 450AJ SII	 14,500 lbs. (6577 kg) 16,500 lbs. (7484 kg)

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Table 2-3. Inspection and Preventive Maintenance Schedule

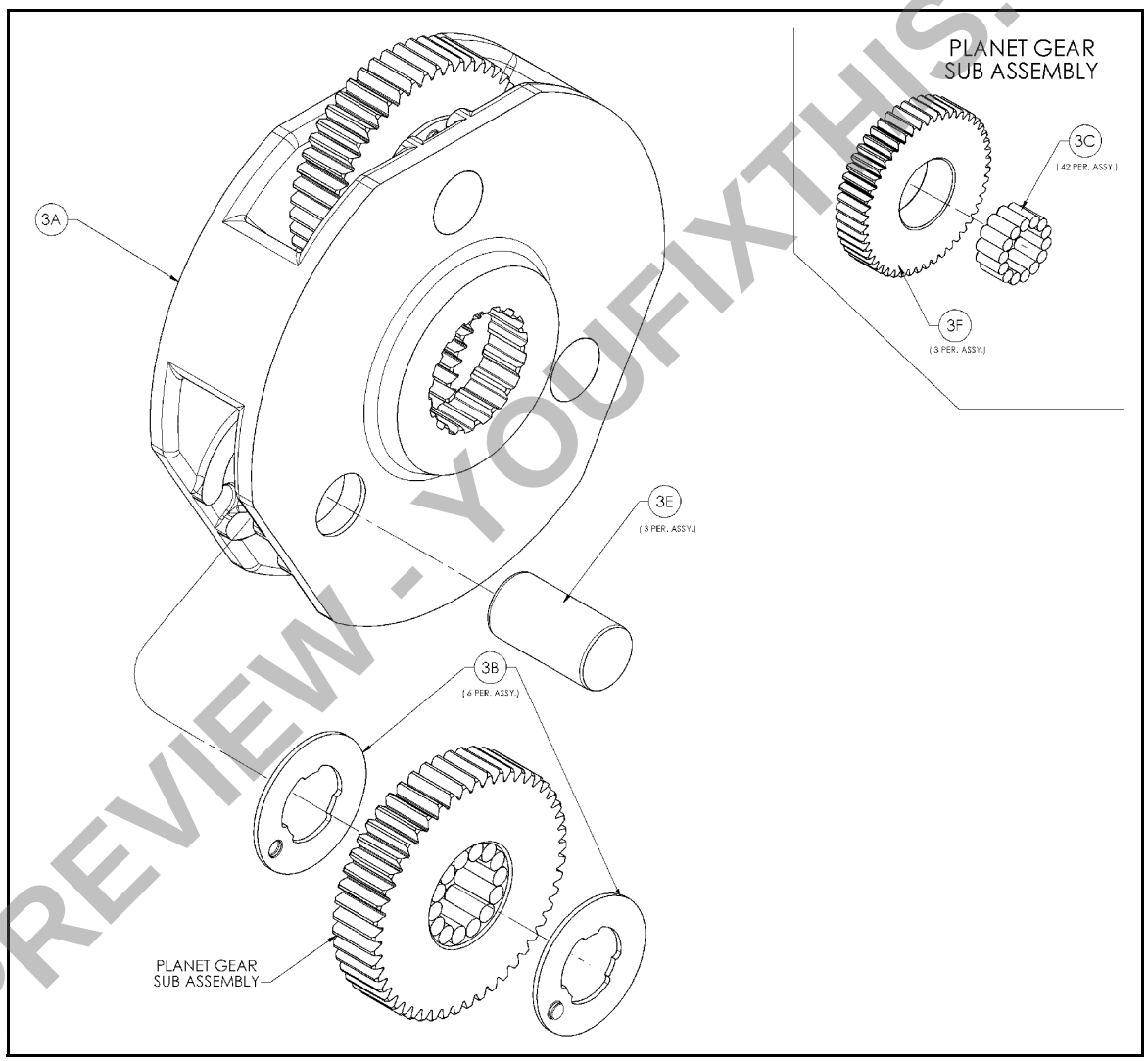
AREA	INTERVAL					
	Pre-Start[1] Inspection	Weekly Preventive Maintenance	Monthly Preventive Maintenance	Pre-Delivery[2] or Frequent[3] Inspection	Annual[4] (Yearly) Inspection	Every 2 Years
Ground Controls	5	5		6	6	
Function Control Locks, Guards, or Detents	1,5	1,5		5	5	
Footswitch	1,5			5	5	
Emergency Stop Switches (Ground & Platform)	5			5	5	
Function Limit or Cutout Switch Systems				5	5	
Capacity Indicator					5	
Drive Brakes				5		
Swing Brakes				5		
Boom Synchronization/Sequencing Systems					5	
Manual Descent or Auxiliary Power				5	5	
Power System	9					
Engine Idle, Throttle, and RPM				3	3	
Engine Fluids (Oil, Coolant, Fuel)	11	9,11		11	11	
Air/Fuel Filter		1,7		7	7	
Exhaust System			1,9	9	9	
Batteries	5	1,9			19	
Battery Fluid		11		11	11	
Battery Charger		5			5	
Fuel Reservoir, Cap, and Breather	11,9		2	1,5	1,5	
Hydraulic/Electric System	9					
Hydraulic Pumps		1,9		1,2,9		
Hydraulic Cylinders		1,9,7	2	1,2,9	1,2,9	
Cylinder Attachment Pins and Pin Retainers		1,9		1,2	1,2	
Hydraulic Hoses, Lines, and Fittings		1,9	12	1,2,9,12	1,2,9,12	
Hydraulic Reservoir, Cap, and Breather	11	1,9	2	1,5	1,5	24
Hydraulic Filter		1,9		7	7	
Hydraulic Fluid	11			7,11	7,11	
Electrical Connections		1		20	20	
Instruments, Gauges, Switches, Lights, Horn		1			5,23	
General						
Operators and Safety Manuals in Storage Box	21			21	21	
ANSI and EMI Manuals/Handbooks Installed					21	
Capacity Decals Installed, Secure, Legible	21			21	21	
All Decals/Placards Installed, Secure, Legible	21			21	21	

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Input Carrier Disassembly

1. Place Carrier (3A) on a press with spline end up. Drive Planet Shaft (3E) out of Carrier (3A).
2. Slide Planet Gear (3F) and two Thrust Washers (3B) out of Carrier (3A).
3. Remove 14 needle Bearings (3C) from bore of Planet Gear (3F).
4. Repeat steps 1 through 3 for remaining planet gears.



3A. Carrier
3B. Thrust Washers
3C. Needle Bearings
3E. Planet Shaft
3F. Planet Gear

Figure 3-3. Input Carrier Disassembly

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Values for Zinc Yellow Chromate Fasteners (Ref 4150707)										
SAE GRADE 8 (HEX HD) BOLTS & GRADE 8 NUTS*										
Size	TPI	Bolt Dia	Tensile Stress Area	Clamp Load	Torque (Dry or Loctite® 263) K= 0.20		Torque (Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140) K=.18		Torque (Loctite® 262™ or Vibra-TITE™ 131) K=0.15	
		In	Sq In	LB	IN-LB	[N.m]	IN-LB	[N.m]	IN-LB	[N.m]
4	40	0.1120	0.00604							
	48	0.1120	0.00661							
6	32	0.1380	0.00909							
	40	0.1380	0.01015							
8	32	0.1640	0.01400							
	36	0.1640	0.01474	1320	43	5				
10	24	0.1900	0.01750	1580	60	7				
	32	0.1900	0.02000	1800	68	8				
1/4	20	0.2500	0.0318	2860	143	16	129	15		
	28	0.2500	0.0364	3280	164	19	148	17		
		In	Sq In	LB	FT-LB	[N.m]	FT-LB	[N.m]	FT-LB	[N.m
5/16	18	0.3125	0.0524	4720	25	35	20	25	20	25
	24	0.3125	0.0580	5220	25	35	25	35	20	25
3/8	16	0.3750	0.0775	7000	45	60	40	55	35	50
	24	0.3750	0.0878	7900	50	70	45	60	35	50
7/16	14	0.4375	0.1063	9550	70	95	65	90	50	70
	20	0.4375	0.1187	10700	80	110	70	95	60	80
1/2	13	0.5000	0.1419	12750	105	145	95	130	80	110
	20	0.5000	0.1599	14400	120	165	110	150	90	120
9/16	12	0.5625	0.1820	16400	155	210	140	190	115	155
	18	0.5625	0.2030	18250	170	230	155	210	130	175
5/8	11	0.6250	0.2260	20350	210	285	190	260	160	220
	18	0.6250	0.2560	23000	240	325	215	290	180	245
3/4	10	0.7500	0.3340	30100	375	510	340	460	280	380
	16	0.7500	0.3730	33600	420	570	380	515	315	430
7/8	9	0.8750	0.4620	41600	605	825	545	740	455	620
	14	0.8750	0.5090	45800	670	910	600	815	500	680
1	8	1.0000	0.6060	51500	860	1170	770	1045	645	875
	12	1.0000	0.6630	59700	995	1355	895	1215	745	1015
1 1/8	7	1.1250	0.7630	68700	1290	1755	1160	1580	965	1310
	12	1.1250	0.8560	77000	1445	1965	1300	1770	1085	1475
1 1/4	7	1.2500	0.9690	87200	1815	2470	1635	2225	1365	1855
	12	1.2500	1.0730	96600	2015	2740	1810	2460	1510	2055
1 3/8	6	1.3750	1.1550	104000	2385	3245	2145	2915	1785	2430
	12	1.3750	1.3150	118100	2705	3680	2435	3310	2030	2760
1 1/2	6	1.5000	1.4050	126500	3165	4305	2845	3870	2370	3225
	12	1.5000	1.5800	142200	3555	4835	3200	4350	2665	3625

NO. 5000059 REV. J

NOTES: 1. THESE TORQUE VALUES DO NOT APPLY TO CADMIUM PLATED FASTENERS
2. ALL TORQUE VALUES ARE STATIC TORQUE MEASURED PER STANDARD AUDIT METHODS TOLERANCE = ±10%
3. * ASSEMBLY USES HARDENED WASHER

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Figure 1-5. Torque Chart (SAE Fasteners - Sheet 2 of 7)

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Fault group	Fault no. (in SERDIA)	Fault locality/ Fault description	SPN	FMI	Cause	Remarks	Help
Functional fault warning	30	Oil pressure warning	100	1	Oil pressure below speed-dependent warning line characteristic	Fault message (disappears when oil pressure is again above recovery limit). After a delay time - fill limitation.	Check engine (oil level, oil pump). Check oil pressure sensor and cable. Check oil pressure warning line characteristic.
	31	Coolant temperature warning	110	0	Coolant temperature has exceeded warning level.	Fault message (disappears when coolant temperature again drops below recovery level). After a delay time - fill limitation.	Check coolant. Check coolant temperature sensor and cable.
	32	Charge air temperature warning	105	0	Charge air temperature has exceeded warning level.	Fault message (disappears when charge air temperature gain drops below recovery level). After a delay time - fill limitation.	Check charge air. Check charge air-temperature sensor and cable.
	34	Coolant level warning	111	1	Switch input “Low coolant level” is active.	Fault message.	Check coolant level. Check coolant level sensor and cable.
	35	Speed warning (with thrust mode operation).	SID 190	14	revolutions was/is above (top) revolution speed limit. “Thrust mode” function is active.		Check parameters. Check speed settings.
					Check PID setting. Check rods. Check actuator and replace if required. Check cable to actuator. Check speed sensor (impulses on incorrect speed). Check No. of teeth. For vehicles check for possible thrust mode.		
	36	Fuel temperature warning	174	0	Fuel-temperature has exceeded warning level.	Fault message (disappears when fuel temperature again drops below recovery level).	Check fuel. Check fuel temperature sensor and cable.

NOTE: SID is equal to 512. To get SPN #, add 512 + number. For example, SID 254 would be 512+254 or an SPN of 766.

Figure 3-72. EMR2 Fault Codes - Sheet 2 of 5

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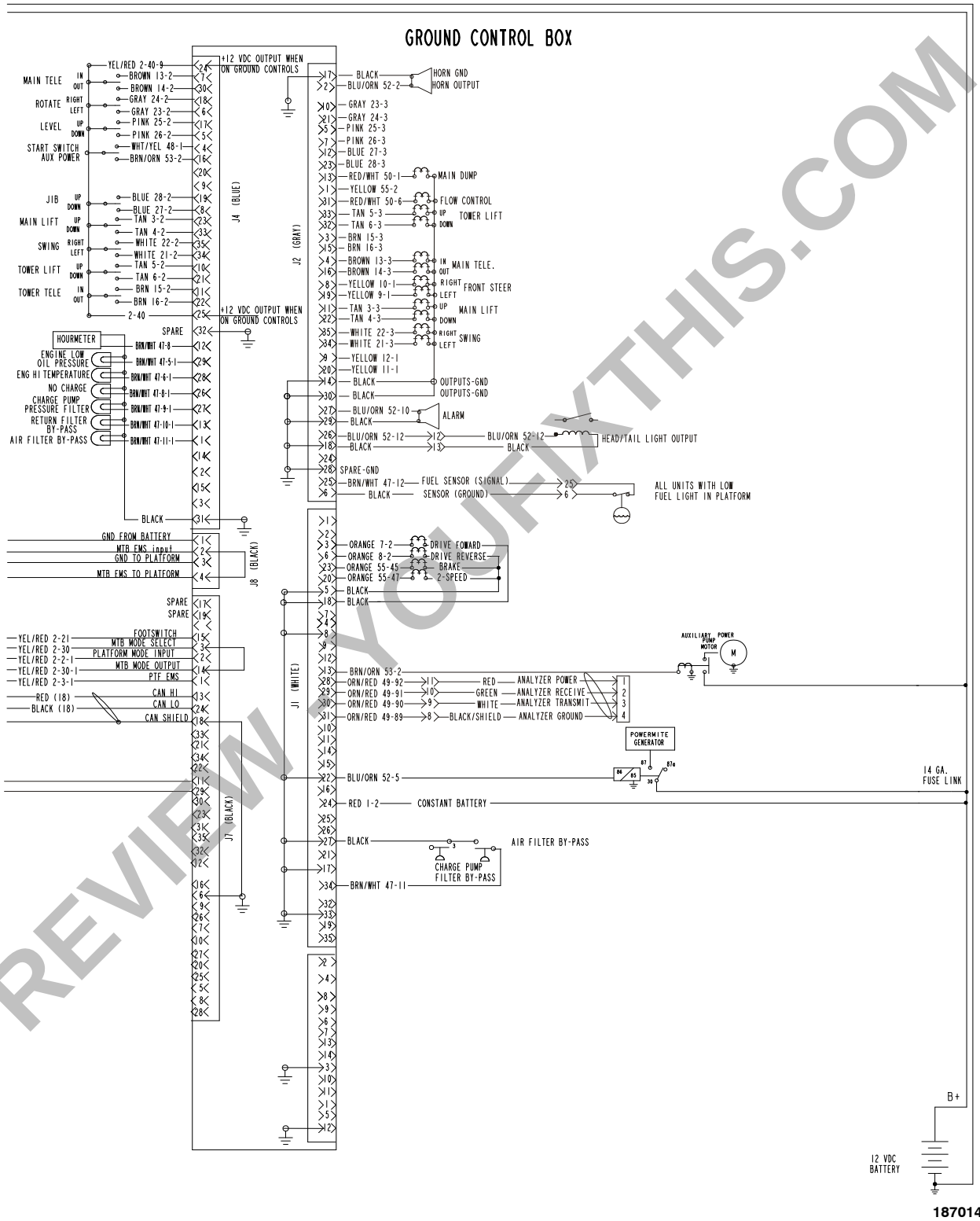


Figure 7-21. Electrical Schematic - Sheet 2 of 4

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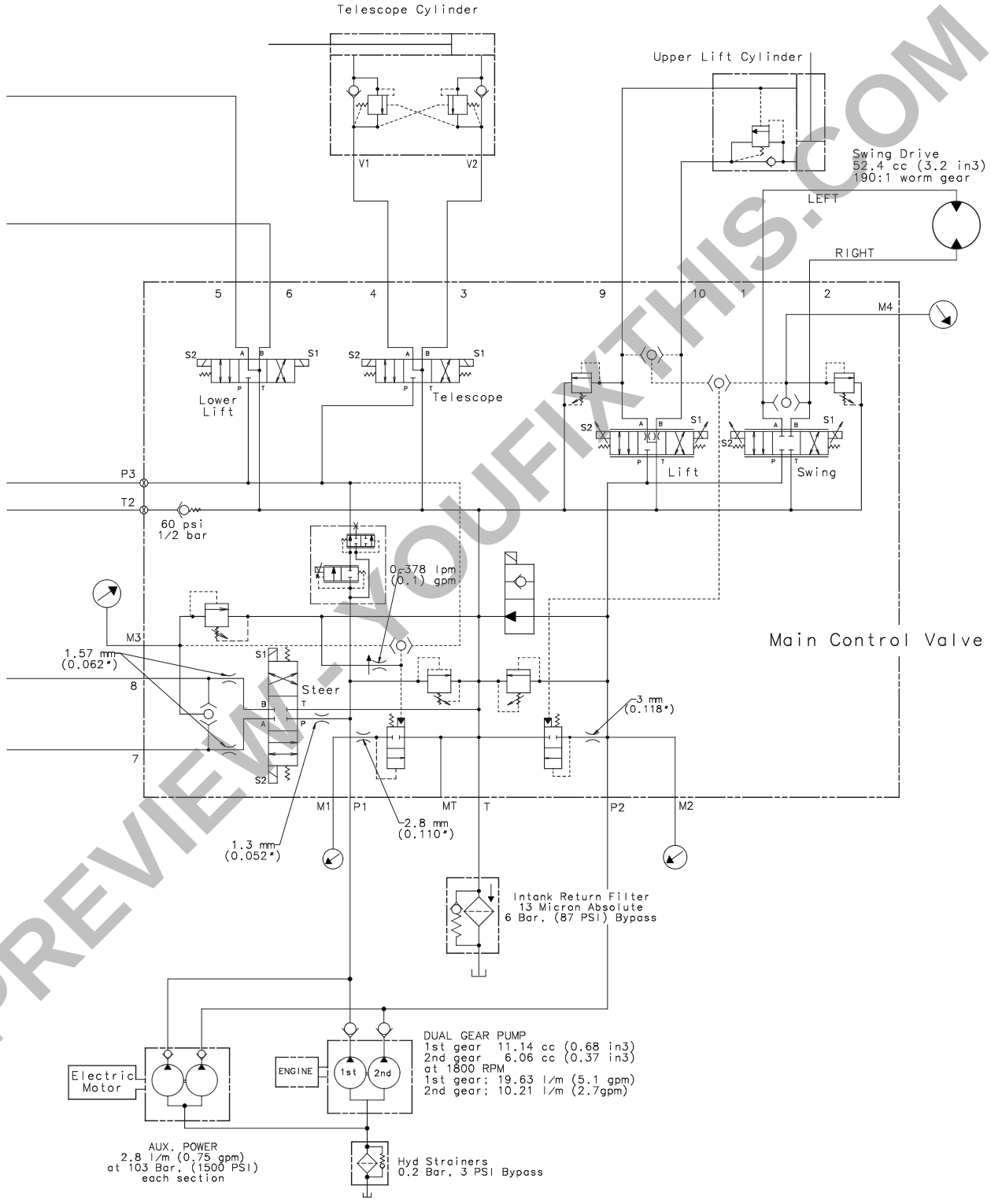


Figure 7-45. Hydraulic Schematic 2792780 D - Sheet 1 of 3 (RH)

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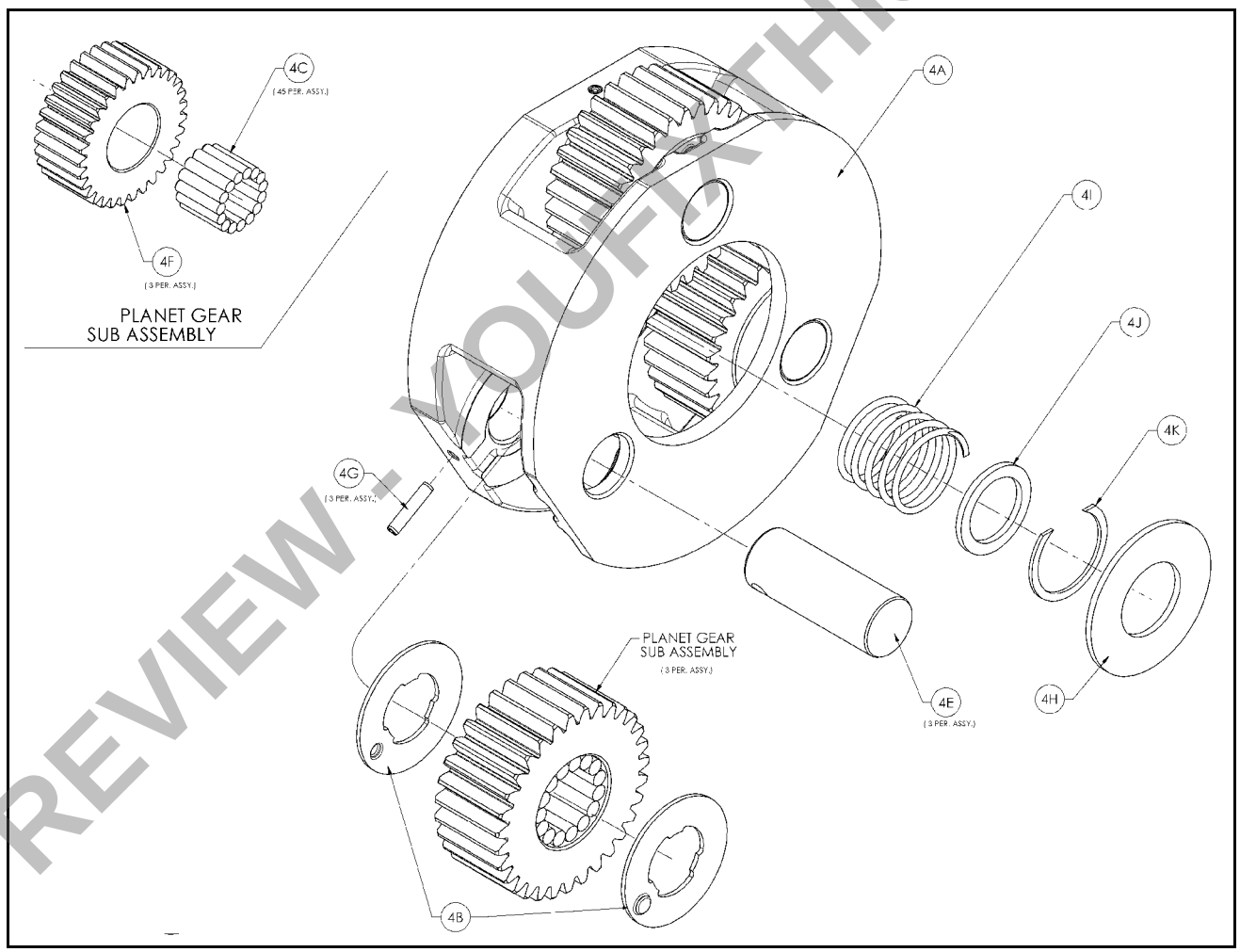
Output Carrier Disassembly

1. Using a small diameter punch, drive Roll Pin (4G) which holds Planet Shaft (4E) in Carrier (4A) into Planet Shaft (4E) until it bottoms.

NOTICE

MAKE SURE ROLL PIN HAS BOTTOMED OR CARRIER CAN BE DAMAGED WHEN PLANET SHAFT IS REMOVED.

2. Remove Planet Shaft (4E) from Carrier (4A). Use a small punch to remove Roll Pin (4G) from Planet Shaft (4E).
3. Slide Planet Gear (4F) and two Thrust Washers (4B) out of Carrier (4A).
4. Remove 15 needle Bearings (4C) from bore of Planet Gear (4F).
5. Repeat steps 1 through 4 for remaining planet gears.
6. Remove Thrust Washer (4H) from Carrier (4A).
7. Remove Retaining Ring (4K) from Carrier (4A) using retaining ring pliers. Pull Thrust Washer (4J) and Spring (4I) out of Carrier (4A).



4A.	Carrier	4G.	Roll Pin
4B.	Thrust Washers	4H.	Thrust Washer
4C.	Needle Bearings	4I.	Spring
4E.	Planet Shaft	4J.	Thrust Washer
4F.	Planet Gear	4K.	Retaining Ring

Figure 3-4. Output Carrier Disassembly

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SOCKET HEAD CAP SCREWS										
Magni Coating (Ref 4150701)*										
Size	TPI	Bolt Dia	Tensile Stress Area	Clamp Load See Note 4	Torque (Dry) K = .17		Torque (Loctite® 242™ or 271™ OR Vibra-TITE™ 111 or 140 OR Precoat 85® K=0.16		Torque (Loctite® 262™ or Vibra-TITE™ 131) K=0.15	
		In	Sq In	LB	IN-LB	[N.m]	IN-LB	[N.m]	IN-LB	[N.m]
4	40	0.1120	0.00604							
	48	0.1120	0.00661							
6	32	0.1380	0.00909							
	40	0.1380	0.01015							
8	32	0.1640	0.01400							
	36	0.1640	0.01474							
10	24	0.1900	0.01750							
	32	0.1900	0.02000							
1/4	20	0.2500	0.0318	2860	122	14	114	13		
	28	0.2500	0.0364	3280	139	16	131	15		
		In	Sq In	LB	FT-LB	[N.m]	FT-LB	[N.m]	FT-LB	[N.m]
5/16	18	0.3125	0.0524	4720	20	25	20	25	20	25
	24	0.3125	0.0580	5220	25	35	20	25	20	25
3/8	16	0.3750	0.0775	7000	35	50	35	50	35	50
	24	0.3750	0.0878	7900	40	55	40	55	35	50
7/16	14	0.4375	0.1063	9550	60	80	55	75	50	70
	20	0.4375	0.1187	10700	65	90	60	80	60	80
1/2	13	0.5000	0.1419	12750	90	120	85	115	80	110
	20	0.5000	0.1599	14400	100	135	95	130	90	120
9/16	12	0.5625	0.1820	16400	130	175	125	170	115	155
	18	0.5625	0.2030	18250	145	195	135	185	130	175
5/8	11	0.6250	0.2260	20350	180	245	170	230	160	220
	18	0.6250	0.2560	23000	205	280	190	260	180	245
3/4	10	0.7500	0.3340	30100	320	435	300	410	280	380
	16	0.7500	0.3730	33600	355	485	335	455	315	430
7/8	9	0.8750	0.4620	41600	515	700	485	660	455	620
	14	0.8750	0.5090	45800	570	775	535	730	500	680
1	8	1.0000	0.6060	51500	730	995	685	930	645	875
	12	1.0000	0.6630	59700	845	1150	795	1080	745	1015
1 1/8	7	1.1250	0.7630	68700	1095	1490	1030	1400	965	1310
	12	1.1250	0.8560	77000	1225	1665	1155	1570	1085	1475
1 1/4	7	1.2500	0.9690	87200	1545	2100	1455	1980	1365	1855
	12	1.2500	1.0730	96600	1710	2325	1610	2190	1510	2055
1 3/8	6	1.3750	1.1550	104000	2025	2755	1905	2590	1785	2430
	12	1.3750	1.3150	118100	2300	3130	2165	2945	2030	2760
1 1/2	6	1.5000	1.4050	126500	2690	3660	2530	3440	2370	3225
	12	1.5000	1.5800	142200	3020	4105	2845	3870	2665	3625

NO. 5000059 REV. J

NOTES: 1. THESE TORQUE VALUES DO NOT APPLY TO CADMIUM PLATED FASTENERS
2. ALL TORQUE VALUES ARE STATIC TORQUE MEASURED PER STANDARD AUDIT METHODS TOLERANCE = ±10%
*3. ASSEMBLY USES HARDENED WASHER OR FASTENER IS PLACED AGAINST PLATED STEEL OR RAW ALUMINUM
4. CLAMP LOAD LISTED FOR SHCS IS SAME AS GRADE 8 OR CLASS 10.9 AND DOES NOT REPRESENT FULL STRENGTH CAPABILITY OF SHCS. IF HIGHER LOAD IS REQUIRED, ADDITIONAL TESTING IS REQUIRED.

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Figure 1-6. Torque Chart (SAE Fasteners - Sheet 3 of 7)

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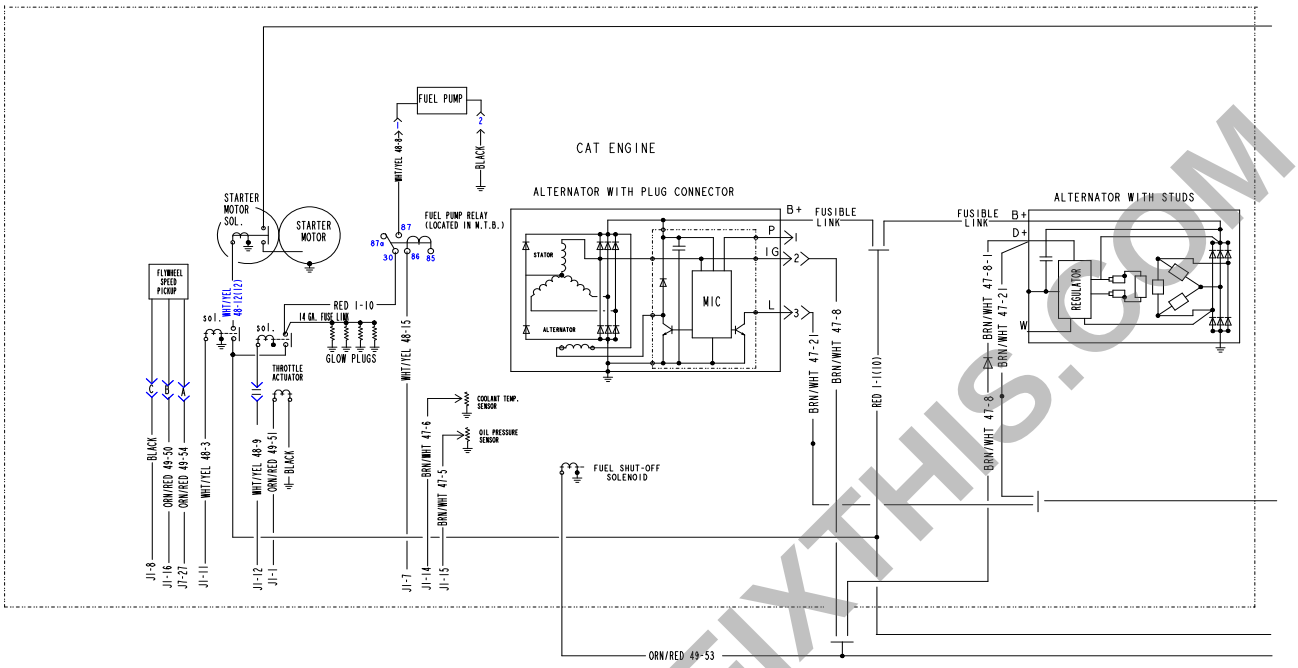
Fault group	Fault no. (in SERDIA)	Fault locality/ Fault description	SPN	FMI	Cause	Remarks	Help
Functional fault, switch-off	42	Charge air temperature switch-off	105	0	Charge air temperature has exceeded switch-off limit.	Emergency stop	Check charge air. Check charge air-temperature sensor and cable. Check switch-off limit.
	44	Coolant level switch-off	111	1	Switch input "Low coolant level" is active.	Emergency stop. Start lock.	Check coolant level. Check coolant level sensor and cable.
Actuator	50	Feedback	SID 24	12	Actuator not connected. Fault in actuator confirmation.	Emergency switch-off. Actuator cannot be operated.	Check actuator, replace if required. Check cable, check fault limits for "Confirmation".
	52	Reference feedback	SID 24	13			Check actuator, replace if required. Check cable, check fault limits for "Rifeness confirmation".
	53	Control travel difference	SID 23	7	Injection pump/actuator jammed or not connected. Difference between nominal/actual control travel is > 10 % of the overall control path.	Fault message (disappears when difference is < 10 %).	Check actuator/actuator rods / injection pump, replace if required. Check actuator cable.
	59	Auto calibration BOSCH-EDC pumps faulty operation	SID 23	13	No automatic actuator equalization possible. Incorrect input of the actuator reference values.	Engine stop / start lock. Governor cannot be taken into use. EDC actuator calibration required.	Check actuator and replaced if required. Check feedback cable. Check fault limits and reference values of the feedback. Program the fault limits for feedback, save values. Switch ignition off and on again.Check again. If faulty, inform DEUTZ-Service and carry out automatic equalization again. Set fault limits again.

NOTE: SID is equal to 512. To get SPN #, add 512 + number. For example, SID 254 would be 512+254 or an SPN of 766.

Figure 3-73. EMR2 Fault Codes - Sheet 3 of 5

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NOTE: This Schematic covers machines built prior to S/N 1300000979.

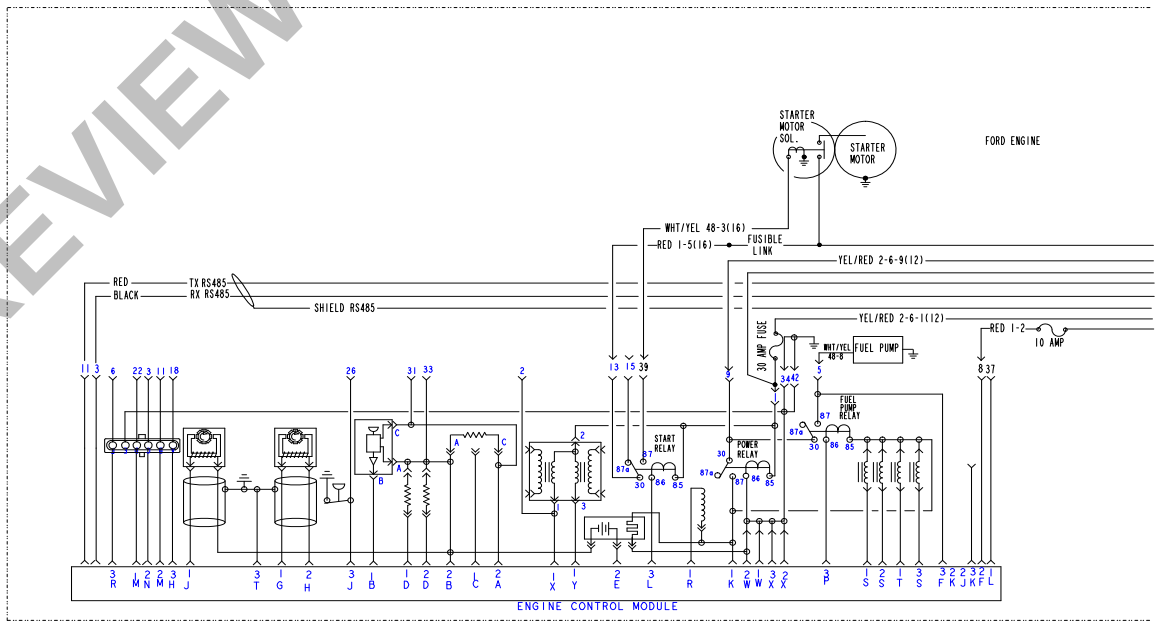


Figure 7-22. Electrical Schematic - Sheet 3 of 4

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