Genie®
A TEREX BRAND

Service Manual

Serial Number Range

Z-80/60™

from Z80-101 to Z8013-4591

Part No. 88619
Rev F3
February 2015

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the *Genie Z-80/60 Operator's Manual* before attempting any maintenance or repair procedure.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting fault codes and repair procedures for qualified service professionals.

Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, we strongly recommend that maintenance and repair be performed at an authorized Genie dealer service center.

Compliance

Machine Classification
Group B/Type 3 as defined by ISO 16368

Machine Design Life
Unrestricted with proper operation, inspection and scheduled maintenance.

Technical Publications

Genie Industries has endeavored to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Genie policy. Therefore, product specifications are subject to change without notice.

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and all other manuals.

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♻ Printed on recycled paper

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Serial Number Legend

A TEREX COMPANY

Model: Z-80/60
Serial number: Z8006-12345
Model year: 2006 **Manufacture date:** 01/05/06
Electrical schematic number: ES0188
Machine unladen weight:

Rated work load (including occupants): 500 lb / 227 kg
Maximum number of platfrm occupants: 2
Maximum allowable side force : 150 lb / 670 N
Maximum allowable inclination of the chassis:
0 deg
Maximum wind speed : 28 mph/ 12.5 m/s
Maximum platform height : 86 ft/ 26.38 m
Maximum platform reach : 60 ft/ 18.28 m
Gradeability: N/A
Country of manufacture: USA
This machine complies with:
ANSI A92.5-
CAN B.354.4-

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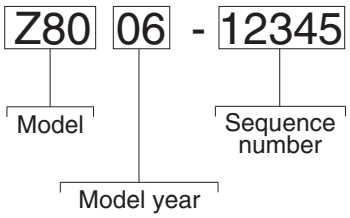
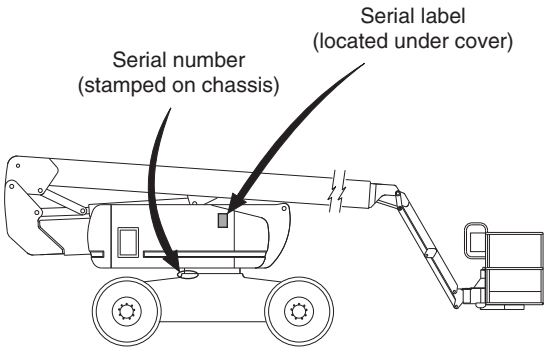
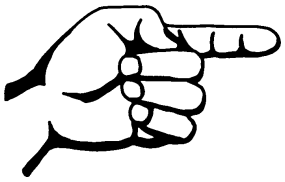
PN - 77055







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Safety Rules

Danger

Failure to obey the instructions and safety rules in this manual, and the Operator's Manual will result in death or serious injury.

Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- ☑ You are trained and qualified to perform maintenance on this machine.
- ☑ You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules and worksite regulations
  - applicable governmental regulations
- ☑ You have the appropriate tools, lifting equipment and a suitable workshop.

SAFETY RULES

Personal Safety

Any person working on or around a machine must be aware of all known safety hazards. Personal safety and the continued safe operation of the machine should be your top priority.

Read each procedure thoroughly. This manual and the decals on the machine use signal words to identify the following:

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE Used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

Be sure to wear protective eye wear and other protective clothing if the situation warrants it.

Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

Workplace Safety

Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.

Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.

Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.

Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.

Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.

Be sure that your workshop or work area is properly ventilated and well lit.

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Machine Specifications

Tires and wheels	
Tire size (foam filled and non-marking)	18-625 FF
Tire size (Hi-flotation)	445D50/70
Tire ply rating (foam filled and non-marking)	16
Tire weight, new foam-filled (minimum) (Rough terrain)	622 lbs 282 kg
Tire ply rating (Hi-flotation)	14
Overall tire diameter (foam filled and non-marking)	40.7 in 103.3 cm
Overall tire diameter (Hi-flotation)	45.47 in 115.5 cm
Wheel diameter (foam filled and non-marking)	24.5 in 62.2 cm
Wheel diameter (Hi-flotation)	28 in 71.1 cm
Wheel width (foam filled, non-marking and Hi-flotation)	15 in 38.1 cm
Tire Pressure (Hi-flotation)	80 lbs / 5.5 bar
Wheel lugs	10 @ 3/4 -16
Lug nut torque, lubricated	320 ft-lbs 434 Nm
Lug nut torque, dry	420 ft-lbs 570 Nm

Fluid capacities	
Fuel tank	35 gallons 132.5 liters
LPG tank	33.5 lbs 15.2 kg
Hydraulic tank	45 gallons 170 liters
Hydraulic system (including tank)	80 gallons 303 liters
Drive hubs (before serial number 958)	50 fl oz 1.5 liters
Drive hubs (after serial number 957)	44 fl oz 1.3 liters
Turntable rotation drive hub	40 fl oz 1.2 liters
Drive hub oil type:	EP 80-90W gear oil API Service Classification GL5

For operational specification, refer to the Operator's Manual.

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Performance Specifications

Drive speed, maximum (models with rough terrain tires)	
Stowed position	40 ft / 8.7-9.3 sec 12.2 m / 8.7-9.3 sec
Raised or extended position	40 ft / 40-45 sec 12.2 m / 40-45 sec

Drive speed, maximum (models with Hi-flotation tires)	
Stowed position	40 ft / 13.6-14.5 sec 12.2 m / 13.6-14.5 sec
Raised or extended position	40 ft / 62-70 sec 12.2 m / 62-70 sec

Gradeability - Refer to Operator's Manual

Braking distance, maximum	
High range on paved surface	6 ft 1.83 m

Function speeds	
Primary boom up, retracted (retracted -35° to 65°)	60 to 70 seconds
Primary boom down, retracted (retracted -35° to 65°)	75 to 85 seconds
Secondary boom up, retracted	38 to 48 seconds
Secondary boom down, retracted	38 to 48 seconds
Primary boom up, extended (-35° to 65°)	80 to 96 seconds
Primary boom down, extended (-35° to 65°)	80 to 96 seconds
Primary Boom extend	48 to 52 seconds
Primary Boom retract	38 to 42 seconds
Jib Boom up	23 to 33 seconds
Jib Boom down	21 to 31 seconds
Platform Rotate 160°	10 to 14 seconds
Turntable rotate, 360° boom fully retracted	114 to 126 seconds
Turntable rotate, 360° boom extended	200 to 240 seconds

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Hydraulic Oil Specifications

Hydraulic Oil Specifications	
Hydraulic oil type	Chevron Rando HD Premium MV equivalent
Viscosity grade	Multi-viscosity
Viscosity index	200
Cleanliness level, minimum	15/13
Water content, maximum	200 ppm

Chevron Rando HD Premium MV oil is fully compatible and mixable with Shell Donax TG (Dexron III) oils.

Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and the viscosity index should exceed 140. They should provide excellent antiwear, oxidation, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

Optional fluids	
Biodegradable	Petro Canada Environ MV46 Statoil Hydra Way Bio SE 32 BP Biohyd SE-S
Fire resistant	UCON Hydrolube HP-5046 Quintolubric 822
Mineral based	Shell Tellus T32 Shell Tellus T46 Chevron Aviation A

NOTICE Continued use of Chevron Aviation A hydraulic oil when ambient temperatures are consistently above 32°F / 0°C may result in component damage.

Note: Use Chevron Aviation A hydraulic oil when ambient temperatures are consistently below 0°F / -18°C.

Note: Use Shell Tellus T46 hydraulic oil when oil temperatures consistently exceed 205°F / 96°C.

Note: Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult the Genie Industries Service Department before use.

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Hydraulic Component Specifications

Drive pump	
Type: bi-directional variable displacement piston pump	
Displacement	2.81 cu in 46 cc
Flow rate @ 2300 rpm	28 gpm 106 L/min
Drive pressure, maximum	3625 psi 250 bar

Charge pump	
Type:	gerotor
Displacement	0.85 cu in 13.9 cc
Flow rate @ 2300 rpm	9 gpm 34 L/min
Charge pressure @ 2300 rpm Neutral position	320 psi 22 bar

Function pumps	
Type: two-section tandem gear pump	
Displacement - Pump 1 (inner)	1.94 cu in 31.8 cc
Flow rate @ 2300 rpm	17 gpm 64.4 L/min
Displacement - Pump 2 (outer)	0.58 cu in 9.5 cc
Flow rate @ 2300 rpm	5 gpm 19 L/min

Auxiliary pump	
Type: two-section fixed displacement gear pump	
Displacement - Section 1 (inner)	0.159 cu in 2.61 cc
Flow rate @ 2687 rpm	1.7 gpm 6.4 L/min
Displacement - Section 2 (outer)	0.051 cu in 0.84 cc
Flow rate @ 2687 rpm	0.3 gpm 1.1 L/min

Function manifold	
System relief pressure (measured at PTEST port)	3200 psi 220.6 bar
Primary boom down relief pressure (measured at PTEST port)	1300 psi 89.6 bar
Secondary boom down relief pressure (measured at PTEST port)	2500 psi 172 bar
Secondary boom up relief pressure (measured at PTEST port)	2500 psi 172 bar
Primary boom extend relief pressure (measured at PTEST port)	1300 psi 89.6 bar
Secondary boom extend relief pressure (measured at PTEST port)	2600 psi 179 bar
Platform manifold relief pressure	3000 psi 207 bar
Platform manifold flow regulator	3 gpm 11.4 L/min

Oscillate manifold	
Oscillate relief pressure (item BE or CH)	800 psi 55.1 bar

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Drive manifold	
Hot oil relief pressure	280 psi 19.3 bar
Brakes	
Brake release pressure	215 psi 14.8 bar
Drive motors	
Displacement per revolution, variable (2 speed motor)	0.9 to 2.7 cu in 14.7 to 45 cc
Hydraulic tank return filter	
High pressure filter	Beta $_3 \geq 200$
High pressure filter bypass pressure	102 psi 7 bar
Medium pressure filter	Beta $_3 \geq 200$
Medium pressure filter bypass pressure	51 psi 3.5 bar
Hydraulic tank return filter	10 micron with 25 psi / 1.7 bar bypass

Manifold Component Specifications

Plug torque	
SAE No. 2	50 in-lbs / 6 Nm
SAE No. 4	14 ft-lbs / 18.9 Nm
SAE No. 6	23 ft-lbs / 31.2 Nm
SAE No. 8	36 ft-lbs / 48.8 Nm
SAE No. 10	62 ft-lbs / 84.1 Nm
SAE No. 12	84 ft-lbs / 113.9 Nm

Valve Coil Resistance Specifications

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 20°C that your air temperature increases or decreases from 68°F / 20°C.

Proportional solenoid valve, 12V DC (schematic items G, W and AB)	4.8 Ω
Proportional solenoid valve, 12V DC (schematic items R)	9 Ω
3 position 4 way solenoid valve, 12V DC (schematic items BA, BB, CA, CB, CP, CQ, GB, GP and GQ)	9 Ω
3 position 4 way solenoid valve, 10V DC (schematic items O and S)	6.3 Ω
2 position 2 way solenoid valve, 10V DC (schematic items J)	3.3 Ω
2 position 2 way solenoid valve, 10V DC (schematic items C and P)	6.3 Ω
2 position 3 way solenoid valve, 10V DC (schematic items H, V, X, Z, AA, EE and EF)	6.3 Ω
2 position 3 way solenoid valve, 12V DC (schematic items BC, BD, CE, CF, FB and FC)	9 Ω

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SPECIFICATIONS REV G

GM 3.0L EFI Engine

Displacement	181 cu in 3 liters
Number of cylinders	4
Bore & stroke	4 x 3.6 inches 101.6 x 91.44 mm
Horsepower	
Intermittent	67 @ 2300 rpm 50 kW @ 2300 rpm
Continuous	60 @ 2300 rpm 45 kW @ 2300 rpm
Firing order	1 - 3 - 4 - 2
Low idle Frequency	1650 rpm 386.1 Hz
High idle Frequency	2300 rpm 538.2 Hz
Compression ratio	9.25:1
Compression pressure - minimum Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder	100 psi 6.9 bar
Valve clearances	Zero lash + 1 full turn
Lubrication system	
Oil pressure - minimum (operating temp. @ 2000 rpm)	18 psi 1.24 bar
Oil capacity (including filter)	5 quarts 4.7 liters
Oil viscosity requirements	
Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	
Starter motor	
Normal engine cranking speed	350 rpm
Current draw, normal load	400A
Current draw, maximum load	600A
Current draw, minimum	100A
Batteries	
Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Electronic fuel pump	
Fuel pressure, static	9 to 11 psi 0.6 to 0.76 bar
Fuel flow rate	0.3 gpm 1.14 L/min
Fuel Requirement	
For fuel requirements, refer to the engine Operator's Manual on your machine.	
Ignition system	
Spark plug type	AC ACMR-43-LTS
Spark plug gap	0.040 inch 1.01 mm
Engine coolant	
Capacity	12 quarts 11.4 liters
Alternator	
Output	66A, 12V DC
Fan belt deflection	0.5 inch 12 mm

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Ford LRG-425 EFI Engine

Displacement	153 cu in 2.5 liters
Number of cylinders	4
Bore & stroke	3.78 x 3.4 in 96.01 x 86.36 mm
Horsepower	
Continuous	60 @ 2500 rpm 45 kW @ 2500 rpm
Intermittent	70 @ 2500 rpm 52 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle Frequency	1600 rpm 396.8 Hz
High idle Frequency	2500 rpm 620 Hz
Compression ratio	9.4:1

Compression pressure (approx.)
Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder.

Valve clearances - collapsed tappet	0.035 to 0.055 in 0.889 to 1.397 mm
Lubrication system	
Oil pressure (operating temp. @ 2000 rpm)	40 to 60 psi 2.75 to 4.1 bar
Oil capacity (including filter)	5 quarts 4.7 liters

Oil viscosity requirements

Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Oil pressure switch specifications	
Torque	8-18 ft-lbs 11-24 Nm
Oil pressure switch point	3-5 psi 0.21-0.34 bar
Starter motor	
Normal engine cranking speed	200 to 250 rpm
Current draw, normal load	140-200A
Current draw, maximum load	800A
Current draw, no load	70A
Maximum circuit voltage drop while starting (normal temperature)	0.5V DC
Battery	
Type	12V DC
Group	34/78
Quantity	1
Cold cranking ampere	900A
Reserve capacity @ 25A rate	200 minutes
Electronic fuel pump	
Fuel pressure, static	64 psi 4.4 bar
Fuel flow rate	0.58 gpm 2.18 L/min

Fuel requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Ignition system	
Spark plug type	Motorcraft AWSF-52C
Spark plug gap	0.042 to 0.046 in 1.07 to 1.18 mm
Spark plug torque	5 to 10 ft-lbs 7 to 14 Nm

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SPECIFICATIONS REV G

Engine coolant	
Capacity	11.5 quarts 10.9 liters
Coolant temperature switch	
Torque	8-18 ft-lbs 11-24 Nm
Temperature switch point	230° F 112° C
Alternator	
Output	95A, 13.8V DC

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Continental TME27 Engine

Displacement	164 cu in 2.68 liters
Number of cylinders	4
Bore and stroke	3.58 x 4.06 inches 91 x 103.2 mm
Horsepower	59 @ 2500 rpm 44 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	8.2:1

Compression pressure
Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.

Low idle - computer controlled Frequency	1600 rpm 53.33 Hz
High idle - computer controlled Frequency	2500 rpm 83.33 Hz

Valve clearance, warm	
Intake	0.014 in 0.36 mm
Exhaust	0.018 in 0.46 mm

Lubrication system	
Oil pressure	40 to 60 psi 2.75 to 4.14 bar
Oil capacity (including filter)	7 quarts 6.65 liters

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Electronic fuel pump	
Fuel pressure, static	55 psi 3.8 bar
Fuel flow rate	0.42 gpm 1.59 L/min

Batteries	
Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	65A @ 13.8V DC
Fan belt deflection	1/2 inch 12 mm

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SPECIFICATIONS REV G

Deutz F4L- 913 Engine
(before serial number 339)

Displacement	249.3 cu in 4.085 liters
Number of cylinders	4
Bore and stroke	4.02 x 4.92 inches 102.1 x 125 mm
Horsepower	76 @ 2300 rpm 57 kW @ 2300 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	18:1

Compression pressure
Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.

Low idle - no load	1300 rpm
Frequency	385.7 Hz
High idle - no load	2300 rpm
Frequency	570.4 Hz

Valve clearance, cold	
Intake	0.006 in 0.15 mm
Exhaust	0.006 in 0.15 mm

Lubrication system	
Oil pressure	40 to 60 psi 2.75 to 4.14 bar
Oil capacity (including filter)	14.3 quarts 13.5 liters

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Injection system	
Injection pump make	IMSA
Injection pump pressure	8702 psi 600 bar
Injector opening pressure	3626 psi 250 bar

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Batteries	
Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	55A, 12V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

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REV G SPECIFICATIONS

Deutz BF4L-2011 Engine
(from serial number 339 to 2177)

Displacement	189.6 cu in 3.1 liters
Number of cylinders	4
Bore and stroke	3.7 x 4.409 inches 94 x 112 mm
Horsepower	
Continuous	69 @ 2500 rpm 51 kW @ 2500 rpm
Net intermittent	73 @ 2500 rpm 54 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle Frequency	1500 rpm 372 Hz
High idle Frequency	2350 rpm 582.8 Hz
Compression ratio	17.5:1

Compression pressure
Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.

Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 in 0.3 mm
Exhaust	0.020 in 0.5 mm

Lubrication system	
Oil pressure, hot (at 2000 rpm)	40 to 60 psi 2.8 to 4.1 bar
Oil capacity (including filter)	11 quarts 10.4 liters

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Oil temperature switch	
Torque	8-18 ft-lbs 11-24 Nm
Oil temperature switch point	275°F 135°C
Oil pressure switch	
Torque	8-18 ft-lbs 11-24 Nm
Oil pressure switch point	7 psi 0.48 bar

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SPECIFICATIONS REV G

Fuel injection system	
Injection pump make	Bosch
Injection pump pressure, maximum	15,000 psi 1034 bar
Injector opening pressure	3046 psi 210 bar
Fuel Requirement	
For fuel requirements, refer to the engine Operator's Manual on your machine.	
Starter motor	
Current draw, normal load	140-200A
Cranking speed	200-250 rpm
Battery - Engine starting and control system	
Type	12V DC, Group 31
Quantity	2
Cold cranking ampere	1000
Reserve capacity @ 25A rate	200 minutes
Alternator output	80A @ 14V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

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Deutz TD2011L04i Engine
(from serial number 2178)

Displacement	220.9 cu in 3.62 liters
Number of cylinders	4
Bore and stroke	3.78 x 4.92 inches 96 x 125 mm
Horsepower Net intermittent @ 2400 rpm	74 / 55 kW
Induction system	turbocharged
Firing order	1 - 3 - 4 - 2
Low idle	1500 rpm 383 Hz
High idle	2350 rpm 599 Hz
Compression ratio	17.5:1

Compression pressure
Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.

Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 in 0.3 mm
Exhaust	0.020 in 0.5 mm
Lubrication system	
Oil pressure, hot (at 2000 rpm)	40 to 60 psi 2.8 to 4.1 bar
Oil capacity (including filter)	12.8 quarts 12.1 liters

Oil viscosity requirements	
-22°F to 86°F / -30°C to 30°C	5W-30 (synthetic)
-4°F to 104°F / -20°C to 40°C	10W-40
Above 5°F / -15°C	15W-40

Units ship with 15W-40.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Oil temperature switch	
Installation torque	8-18 ft-lbs 11-24 Nm
Oil temperature switch point	275°F 135°C
Oil pressure switch	
Installation torque	8-18 ft-lbs 11-24 Nm
Oil pressure switch point	22 psi 1.5 bar
Fuel injection system	
Injection pump make	Motorpal
Injection pump pressure, maximum 15,000 psi 1034 bar	
Injector opening pressure	3046 psi 210 bar

Fuel requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Starter motor	
Current draw, normal load	140-200A
Cranking speed	250-350 rpm

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SPECIFICATIONS REV G

Battery - Auxiliary power units	
Type	6V DC
Quantity	2
AH rating	285AH
Reserve capacity @ 25A rate	745 minutes
Battery - Engine starting and control system	
Type	12V DC, Group 31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	80A @ 14V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

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Perkins 704-30 Engine

Displacement	183 cu in 3 liters
Number of cylinders	4
Bore and stroke	3.82 x 3.94 inches 97 x 100 mm
Horsepower	61 @ 2300 rpm 45.5 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	17.5:1
Compression pressure	300 to 500 psi 20.7 to 34.5 bar
Pressure (psi or bar) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder	
Low idle Frequency	1600 rpm 246.7 Hz
High idle Frequency	2300 rpm 385.4 Hz
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.014 in 0.35 mm
Exhaust	0.014 in 0.35 mm
Lubrication system	
Oil pressure @ 2300 rpm	41 psi 2.8 bar
Oil capacity (including filter)	7.4 quarts 7 liters
Oil viscosity requirements	
Units ship with 15W-40. Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	

Injection system	
Injection pump make	Zexel PFR-KX
Injection pump pressure	2755 psi 190 bar
Injector opening pressure	3626 psi 250 bar
Fuel Requirement	
For fuel requirements, refer to the engine Operator's Manual on your machine.	
Engine coolant	
Capacity	11.5 quarts 10.9 liters
Batteries	
Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	65A, 12V DC
Fan belt deflection	3/8 in 10 mm

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SPECIFICATIONS REV G

Perkins 804C-33 Engine
Perkins 804D-33 Engine

Displacement	201 cu in 3.3 liters
Number of cylinders	4
Bore and stroke	3.70 x 4.72 inches 94 x 120 mm
Horsepower	63 @ 2600 rpm 47 kW @ 2600 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	22:1
Compression pressure	300 to 500 psi 20.7 to 34.5 bar
Pressure (psi or bar) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder	
Low idle Frequency	1650 rpm 335.5 Hz
Low idle with generator Frequency	1400 rpm 284.7 Hz
High idle Frequency	2300 rpm 467.7 Hz
Governor	mechanical all speed
Valve clearance, cold	
Intake	0.0098 in 0.25 mm
Exhaust	0.0098 in 0.25 mm
Lubrication system	
Oil pressure @ 2000 rpm	40-60 psi 2.8-4.1 bar
Oil capacity (including filter)	10.6 quarts 10 liters

Oil viscosity requirements

Units ship with 15W-40.
Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Injection system	
Injection pump make	Zexel 10641-3932
Injection pump pressure	1707 to 1849 psi 117.7 to 127.5 bar
Injector opening pressure	~2000 psi ~138 bar

Fuel Requirement

For fuel requirements, refer to the engine Operator's Manual on your machine.

Engine coolant	
Capacity	12.5 quarts 11.8 liters
Batteries	
Type	12V DC
Group	31
Quantity	2
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	90A, 12V DC
Fan belt deflection	3/8 to 1/2 in 9 to 12 mm

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

Machine Torque Specifications

Platform rotator	
1-8 center bolt, GR 5, dry	640 ft-lbs 867 Nm
3/8 -16 bolts, GR 8 *(use blue thread locking compound)	35 ft-lbs* 47.5 Nm*
Turntable rotate assembly	
Rotate bearing mounting bolts, lubricated	180 ft-lbs 244 Nm
Rotate drive hub mounting bolts, lubricated	80 ft-lbs 108.4 Nm
Backlash plate mounting bolts, lubricated	280 ft-lbs 379 Nm
Drive motor and hubs	
Drive hub mounting bolts, lubricated *(use blue thread locking compound)	160 ft-lbs* 217 Nm
Drive hub mounting bolts, dry	210 ft-lbs 284 Nm
Drive motor mounting bolts, lubricated *(use blue thread locking compound)	80 ft-lbs* 108.4 Nm
Drive motor mounting bolts, dry	110 ft-lbs 149 Nm
Drive hub oil plug, O-ring seal	13 ft-lbs 18 Nm

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

SPECIFICATIONS REV G

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

SAE O-ring Boss Port
(tube fitting - installed into Aluminum)

SAE Dash size	Torque
-4	14 ft-lbs / 18.9 Nm
-6	23 ft-lbs / 31.2 Nm
-8	36 ft-lbs / 48.8 Nm
-10	62 ft-lbs / 84.1 Nm
-12	84 ft-lbs / 113.9 Nm
-16	125 ft-lbs / 169.5 Nm
-20	151 ft-lbs / 204.7 Nm
-24	184 ft-lbs / 250 Nm

Seal-Lok® fittings

1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

Note: The O-rings used in the Parker Seal Lok® fittings and hose ends are custom-size O-rings. They are not standard SAE size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

2 Lubricate the O-ring before installation.

3 Be sure that the face seal O-ring is seated and retained properly.

4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.

5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table.

6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

SAE O-ring Boss Port
(tube fitting - installed into Steel)

SAE Dash size	Torque
-4	15 ft-lbs / 20.3 Nm
-6	35 ft-lbs / 47.5 Nm
-8	60 ft-lbs / 81.3 Nm
-10	100 ft-lbs / 135.6 Nm
-12	135 ft-lbs / 183 Nm
-16	200 ft-lbs / 271 Nm
-20	250 ft-lbs / 334 Nm
-24	305 ft-lbs / 414 Nm

Seal-Lok® Fittings
(hose end)

SAE Dash size	Torque
-4	18 ft-lbs / 24.4 Nm
-6	30 ft-lbs / 40 Nm
-8	40 ft-lbs / 55 Nm
-10	60 ft-lbs / 80 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	140 ft-lbs / 190 Nm
-24	180 ft-lbs / 245 Nm

SAE FASTENER TORQUE CHART

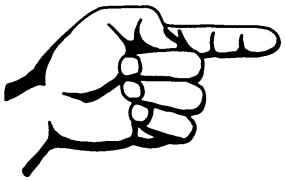
• This chart is to be used as a guide only unless noted elsewhere in this manual •

SIZE	THREAD	Grade 5				Grade 8				ASTM High Strength Black Oxide Bolts	
		LUBED		DRY		LUBED		DRY		LUBED	
		in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/4	20	80	9	100	11.3	110	12.4	140	15.8	130	14.7
	28	90	10.1	120	13.5	120	13.5	160	18	140	15.8
		LUBED		DRY		LUBED		DRY		LUBED	
		ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
5/16	18	13	17.6	17	23	18	24	25	33.9	21	28.4
	24	14	19	19	25.7	20	27.1	27	36.6	24	32.5
3/8	16	23	31.2	31	42	33	44.7	44	59.6	38	51.5
	24	26	35.2	35	47.4	37	50.1	49	66.4	43	58.3
7/16	14	37	50.1	49	66.4	50	67.8	70	94.7	61	82.7
	20	41	55.5	55	74.5	60	81.3	80	108.4	68	92.1
1/2	13	57	77.3	75	101.6	80	108.4	110	149	93	126
	20	64	86.7	85	115	90	122	120	162	105	142
9/16	12	80	108.4	110	149	120	162	150	203	130	176
	18	90	122	120	162	130	176	170	230	140	189
5/8	11	110	149	150	203	160	217	210	284	180	244
	18	130	176	170	230	180	244	240	325	200	271
3/4	10	200	271	270	366	280	379	380	515	320	433
	16	220	298	300	406	310	420	420	569	350	474
7/8	9	320	433	430	583	450	610	610	827	510	691
	14	350	474	470	637	500	678	670	908	560	759
1	8	480	650	640	867	680	922	910	1233	770	1044
	12	530	718	710	962	750	1016	990	1342	840	1139
1 1/8	7	590	800	790	1071	970	1315	1290	1749	1090	1477
	12	670	908	890	1206	1080	1464	1440	1952	1220	1654
1 1/4	7	840	1138	1120	1518	1360	1844	1820	2467	1530	2074
	12	930	1260	1240	1681	1510	2047	2010	2725	1700	2304
1 1/2	6	1460	1979	1950	2643	2370	3213	3160	4284	2670	3620
	12	1640	2223	2190	2969	2670	3620	3560	4826	3000	4067

METRIC FASTENER TORQUE CHART

• This chart is to be used as a guide only unless noted elsewhere in this manual •

Size (mm)	Class 4.6				Class 8.8				Class 10.9				Class 12.9			
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
5	16	1.8	21	2.4	41	4.63	54	6.18	58	6.63	78	8.84	68	7.75	91	10.3
6	19	3.05	36	4.07	69	7.87	93	10.5	100	11.3	132	15	116	13.2	155	17.6
7	45	5.12	60	6.83	116	13.2	155	17.6	167	18.9	223	25.2	1.95	22.1	260	29.4
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
8	5.4	7.41	7.2	9.88	14	19.1	18.8	25.5	20.1	27.3	26.9	36.5	23.6	32	31.4	42.6
10	10.8	14.7	14.4	19.6	27.9	37.8	37.2	50.5	39.9	54.1	53.2	72.2	46.7	63.3	62.3	84.4
12	18.9	25.6	25.1	34.1	48.6	66	64.9	88	69.7	94.5	92.2	125	81	110	108	147
14	30.1	40.8	40	54.3	77.4	105	103	140	110	150	147	200	129	175	172	234
16	46.9	63.6	62.5	84.8	125	170	166	226	173	235	230	313	202	274	269	365
18	64.5	87.5	86.2	117	171	233	229	311	238	323	317	430	278	377	371	503
20	91	124	121	165	243	330	325	441	337	458	450	610	394	535	525	713
22	124	169	166	225	331	450	442	600	458	622	612	830	536	727	715	970
24	157	214	210	285	420	570	562	762	583	791	778	1055	682	925	909	1233



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Scheduled Maintenance Procedures

Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly, six months, annually and every two years as specified on the *Maintenance Inspection Report.*

⚠WARNING Failure to perform each procedure as presented and scheduled could result in death, serious injury or substantial machine damage.

- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating machine.
- ☑ Machines that have been out of service for a period more than three months must complete the quarterly inspection.
- ☑ Unless otherwise specified, perform each procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Turntable rotated with the boom between the circle-end (yellow arrow) wheels
  - Turntable secured with the turntable rotation lock pin
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power supply disconnected from the machine

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety warnings and step-by-step instructions.

Symbols Legend

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE Used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

⊙ Indicates that a specific result is expected after performing a series of steps.

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

SCHEDULED MAINTENANCE PROCEDURES

Maintenance Symbols Legend

Note: The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appear at the beginning of a maintenance procedure, it conveys the meaning below.

Indicates that tools will be required to perform this procedure.

Indicates that new parts will be required to perform this procedure.

Indicates that a cold engine will be required to perform this procedure.

Indicates that a warm engine will be required to perform this procedure.

Indicates that dealer service is required to perform this procedure.

Pre-delivery Preparation Report

The pre-delivery preparation report contains checklists for each type of scheduled inspection.

Make copies of the *Pre-delivery Preparation* report to use for each inspection. Store completed forms as required.

Maintenance Schedule

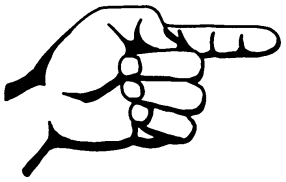
There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, six months, annual, and two years. The *Scheduled Maintenance Procedures Section* and the *Maintenance Inspection Report* have been divided into five subsections—A, B, C, D and E. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	Checklist
Daily or every 8 hours	A
Quarterly or every 250 hours	A + B
Six months or every 500 hours	A + B + C
Annual or every 1000 hours	A + B + C + D
Two years or every 2000 hours	A + B + C + D + E

Maintenance Inspection Report

The maintenance inspection report contains checklists for each type of scheduled inspection.

Make copies of the *Maintenance Inspection Report* to use for each inspection. Maintain completed forms for a minimum of 4 years or in compliance with employer, jobsite and governmental regulations and requirements.



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Pre-Delivery Preparation

Fundamentals

It is the responsibility of the dealer to perform the Pre-delivery Preparation.

The Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used. If damage or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specifications.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.

Instructions

Use the operator's manual on your machine.

The Pre-delivery Preparation consists of completing the Pre-operation Inspection, the Maintenance items and the Function Tests.

Use this form to record the results. Place a check in the appropriate box after each part is completed. Follow the instructions in the operator's manual.

If any inspection receives an N, remove the machine from service, repair and re-inspect it. After repair, place a check in the R box.

Legend

Y = yes, completed
N = no, unable to complete
R = repaired

Comments

Pre-Delivery Preparation	Y	N	R
Pre-operation inspection completed			
Maintenance items completed			
Function tests completed			

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Genie
A TEREX BRAND

Genie Industries USA
18340 NE 76th Street
PO Box 97030
Redmond, WA 98073-9730
(425) 881-1800

Genie UK
The Maltings, Wharf Road
Grantham, Lincolnshire
NG31- 6BH England
(44) 1476-584333

Rev B

Maintenance Inspection Report

Model

Serial number

Date

Hour meter

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Instructions

- Make copies of this report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

☐	**Daily or 8 hour Inspection:**	**A**
☐	**Quarterly or 250 hour Inspection:**	**A+B**
☐	**Six Month or 500 hour Inspection:**	**A+B+C**
☐	**Annual or 1000 hours Inspection:**	**A+B+C+D**
☐	**2 Year or 2000 hour Inspection:**	**A+B+C+D+E**

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section to learn how to perform these inspections.
- If any inspection receives an “N”, tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the “R” box.

Legend

Y = yes, acceptable

N = no, remove from service

R = repaired

Checklist A - Rev E		Y	N	R
A-1	Inspect the manuals and decals			
A-2	Pre-operation inspection			
A-3	Function tests			
A-4	Engine maintenance			
A-5	Hydraulic filter condition indicators			
Perform after 40 hours:				
A-6	30 Day Service			
Perform after 50 hours:				
A-7	Engine maintenance-Continental models			
Perform every 50 hours:				
A-8	Engine maintenance-Perkins and Continental models			
Perform every 100 hours:				
A-9	Engine maintenance			
A-10	Rotation bearing			
A-11	Filter/separator			
Perform after 150 hours:				
A-12	Replace drive hub oil			
Perform every 200 hours:				
A-13	Engine maintenance-GM and Ford models			

Checklist B - Rev G		Y	N	R
B-1	Batteries			
B-2	Electrical wiring			
B-3	Key switch			
B-4	Exhaust system			
B-5	Engine Air Filter			
B-6	Engine maintenance-Deutz 913, Perkins and Continental models			
B-7	Lug nut torque			
B-8	Brake configuration			
B-9	Drive hub maintenance			
B-10	Ground control override			
B-11	Platform self leveling			
B-12	Engine idle select			
B-13	Fuel select operation			
B-14	Drive brakes			
B-15	Drive speed - stowed			
B-16	Drive speed - raised or extended			
B-17	Alarm and beacon			
B-18	Hydraulic oil analysis			
B-19	Engine RPM			
B-20	Safety envelope and circuits			
B-21	Primary boom self-leveling			
B-22	Primary boom angle sensor			
B-23	Fuel and hydraulic tank cap venting system			
Perform every 400 hours:				
B-24	Engine maintenance-GM and Ford models			

Comments

MAINTENANCE INSPECTION REPORT

Model

Serial number

Date

Hour meter

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Instructions

- Make copies of this report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

	Daily or 8 hour Inspection: A
	Quarterly or 250 hour Inspection: A+B
	Six Month or 500 hour Inspection: A+B+C
	Annual or 1000 hours Inspection: A+B+C+D
	2 Year or 2000 hour Inspection: A+B+C+D+E

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section to learn how to perform these inspections.
- If any inspection receives an “N”, tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the “R” box.

Legend

Y = yes, acceptable

N = no, remove from service

R = repaired

Checklist C - Rev E		**Y**	**N**	**R**
C-1	Engine maintenance			
C-2	Grease platform overload (if equipped)			
C-3	Test the platform overload (if equipped)			
C-4	Engine Air Filter			
C-5	Replace filter/separator			
Perform every 800 hours:				
C-6	Engine maintenance-GM and Ford models			

Checklist D - Rev E		**Y**	**N**	**R**
D-1	Boom wear pads			
D-2	Free-wheel configuration			
D-3	Turntable rotation bolts			
D-4	Turntable bearing wear			
D-5	Drive hub oil			
D-6	Engine maintenance			
Perform every 1000 hours:				
D-7	Replace hydraulic filters			

Checklist E - Rev D		**Y**	**N**	**R**
E-1	Replace hydraulic oil			
E-2	Wheel bearings, 2WD models			
E-3	Engine maintenance			
Perform every 2400 hours:				
E-4	Engine maintenance-Ford models			
Perform every 3000 hours:				
E-5	Engine maintenance-Deutz and Perkins models			
Perform every 5000 hours:				
E-6	Engine maintenance-Deutz 2011 models			
Perform every 6000 hours:				
E-7	Engine maintenance-Deutz 2011 models			
Perform every 12000 hours:				
E-8	Engine maintenance-Deutz 2011 models			

Comments

REV E

Checklist A Procedures

A-1
Inspect the Manuals and Decals

Maintaining the operator's and safety manuals in good condition is essential to safe machine operation. Manuals are included with each machine and should be stored in the container provided in the platform. An illegible or missing manual will not provide safety and operational information necessary for a safe operating condition.

In addition, maintaining all of the safety and instructional decals in good condition is mandatory for safe machine operation. Decals alert operators and personnel to the many possible hazards associated with using this machine. They also provide users with operation and maintenance information. An illegible decal will fail to alert personnel of a procedure or hazard and could result in unsafe operating conditions.

1 Check to make sure that the operator's and safety manuals are present and complete in the storage container on the platform.

2 Examine the pages of each manual to be sure that they are legible and in good condition.

⊙ Result: The operator's manual is appropriate for the machine and all manuals are legible and in good condition.

⊠ Result: The operator's manual is not appropriate for the machine or all manuals are not in good condition or is illegible. Remove the machine from service until the manual is replaced.

3 Open the operator's manual to the decals inspection section. Carefully and thoroughly inspect all decals on the machine for legibility and damage.

⊙ Result: The machine is equipped with all required decals, and all decals are legible and in good condition.

⊠ Result: The machine is not equipped with all required decals, or one or more decals are illegible or in poor condition. Remove the machine from service until the decals are replaced.

4 Always return the manuals to the storage container after use.

Note: Contact your authorized Genie distributor or Genie Industries if replacement manuals or decals are needed.

CHECKLIST A PROCEDURES REV E

A-2
Perform Pre-operation Inspection

Genie specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Completing a pre-operation inspection is essential to safe machine operation. The pre-operation inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The pre-operation inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-3
Perform Function Tests

Genie specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-4
Perform Engine Maintenance


Engine specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547)..

Deutz 913 Operation Manual	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Deutz TD2011 Operation Manual	
Genie part number	139320

REV E CHECKLIST A PROCEDURES

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00) OR the *Perkins 804D Operation and Maintenance Manual* (Perkins part number SEBU8324-00).

Perkins 704-30 User's Handbook	
Genie part number	101840

Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

Perkins 804D-33 Operation and Maintenance Manual	
Genie part number	228841

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook	
Genie part number	77738

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook	
Genie part number	84792

Continental Models:

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual	
Genie part number	111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST A PROCEDURES REV E

A-5
Check the Hydraulic Filter Condition Indicators

Maintaining the hydraulic filters in good condition is essential to good system performance and safe machine operation. The filter condition indicators will show when the hydraulic flow is bypassing a clogged filter. If the filters are not frequently checked and replaced, impurities will remain in the hydraulic system and cause component damage.

Note: There are four hydraulic filters on the machine: one tank return filter, one medium pressure filter and two high pressure filters. All the filters have condition indicators on them, except the medium pressure filter.

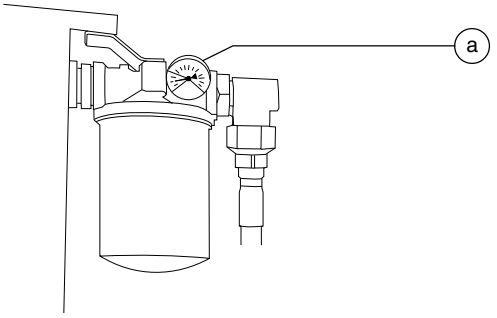
1 Start the engine from the ground controls.

2 Press and release the engine idle select button to change the engine rpm to high idle.

Tank return filter:

3 Open the ground control side turntable cover and inspect the filter condition indicator gauge.

⊙ Result: The needle on the gauge should be operating in the green area. If the needle is in the red area, this indicates that the hydraulic filter is being bypassed and the filter needs to be replaced. See D-7, *Replace the Hydraulic Filter Elements.*

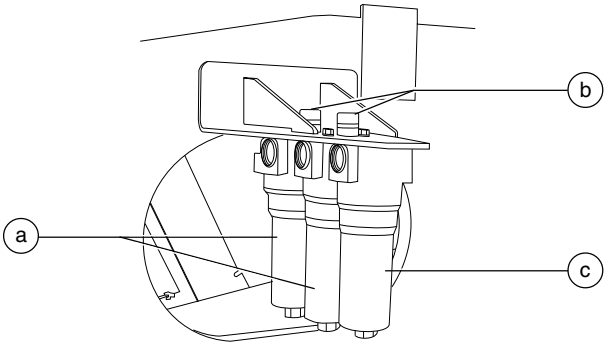


a filter condition indicator gauge

Medium and high pressure filters:

Note: The medium and high pressure filters are mounted to the engine side bulkhead.

4 Inspect the filter condition indicators.



a high pressure filters
b filter condition indicators
c medium pressure filter

⊙ Result: The filter condition indicators should be operating with the plungers in the green area.

⊠ Result: If any of the indicators display the plunger in the red area, this indicates that a hydraulic filter is being bypassed and the filter needs to be replaced. See D-7, *Replace the Hydraulic Filter Elements.*

A-6
Perform 30 Day Service

The 30 day maintenance procedure is a one time sequence of procedures to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

1 Perform the following maintenance procedures:

- A-10 Grease the Turntable Rotation Bearing and Rotate Gear
- B-7 Check the Tires, Wheels and Lug Nut Torque
- B-9 Check the Drive Hub Oil Level and Fastener Torque
- D-3 Check the Turntable Rotation Bearing Bolts
- D-7 Replace the Hydraulic Filter Elements

A-7
Perform Engine Maintenance - Continental Models

Engine specifications require that this one-time procedure be performed after the first 50 hours.

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual	
Genie part number	111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST A PROCEDURES REV E

A-8
Perform Engine Maintenance - Perkins and Continental Models


Engine specifications require that this procedure be performed every 50 hours or weekly, whichever comes first.

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00) OR the *Perkins 804D Operation and Maintenance Manual* (Perkins part number SEBU8324-00).

Perkins 704-30 User's Handbook	
Genie part number	101840
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332
Perkins 804D-33 Operation and Maintenance Manual	
Genie part number	228841

Continental Models:

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual	
Genie part number	111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV E CHECKLIST A PROCEDURES

A-9
Perform Engine Maintenance


Engine specifications require that this procedure be performed every 100 hours.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook
Genie part number 77738

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook
Genie part number 101840

Perkins 804C-33 Operation and Maintenance Manual
Genie part number 111332

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook
Genie part number 84792

Continental Models:

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual
Genie part number 111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST A PROCEDURES REV E

A-10
Grease the Turntable Rotation Bearing and Rotate Gear

Genie specifications require that this procedure be performed every 100 hours of operation. Perform this procedure more often if dusty conditions exist.

Frequent application of lubrication to the turntable bearing and rotate gear is essential to good machine performance and service life. Continued use of an improperly greased bearing and gear will result in component damage.

1 Locate the grease fitting next to the ground control box.

2 Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches / 10 to 13 cm at a time and repeat this step until the entire bearing has been greased.

3 Apply grease to each tooth of the drive gear, located under the turntable.

Grease Specification
Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

A-11
Inspect the Fuel Filter/Water Separator - Diesel Models

Note: Genie specifications require that this procedure be performed every 100 hours or monthly, whichever comes first.

Proper maintenance of the fuel filter/water separator is essential for good engine performance. Failure to perform this procedure can lead to poor engine performance and/or hard starting, and continued use may result in component damge. Extremely dirty conditions may require this procedure be performed more often.

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

Note: Perform this procedure with the engine off.

Perkins Models:

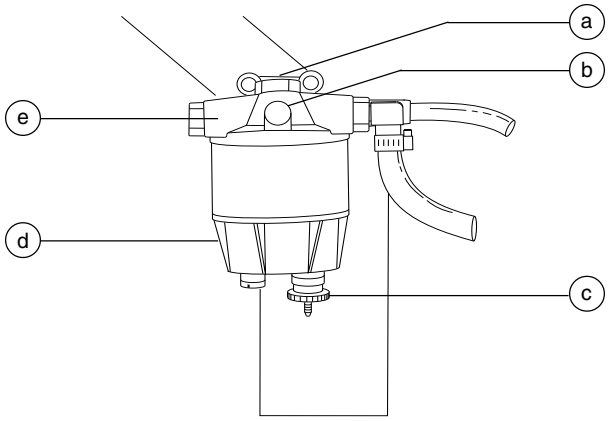
1 Put on protective clothing and eye wear.

2 Open the engine side turntable cover and locate the fuel filter/water separator next to the hydraulic return filter on the bulkhead.

3 Inspect the filter bowl for water buildup.

⊙ Result: If water is present in the filter bowl continue with steps 4 through 8.

4 Loosen the vent plug located on the fuel filter/ water separator head.



a vent plug
b drain plug
c filter bowl
d separator head

5 Loosen the drain plug located at the bottom of the bowl. Allow the water to drain into a suitable container until fuel starts to come out. Immediately tighten the drain plug.

6 Tighten the vent plug.

Note: If the fuel filter/water separator is completely drained, you must prime the fuel filter/water separator before starting the engine. See C-6, *Replace The Fuel Filter/Water Separator Element - Perkins Models,* for instructions on how to prime the fuel filter/water separator.

7 Clean up any fuel that may have spilled.

8 Start the engine from the ground controls and check the fuel filter/water separator and vent plug for leaks.

⚠DANGER Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

Deutz Models:

1 Put on protective clothing and eye wear.

2 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

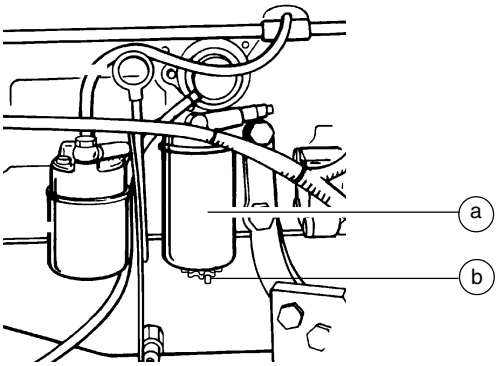
3 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

4 Locate the fuel filter/water separator next to the oil filter.

5 Loosen the drain plug located at the bottom of the filter. Allow the water to drain into a suitable container until fuel starts to come out. Immediately tighten the drain plug.

Note: Do not completely drain the filter.



a fuel filter/water separator
b drain valve

6 Clean up any fuel that may have spilled.

7 Start the engine from the ground controls and check the fuel filter/water separator for leaks.

⚠DANGER Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

8 Swing the engine back to its original position and install the engine pivot plate retaining fastener.

A-12
Replace the Drive Hub Oil

Manufacturer drive hub specifications require that this one-time procedure be performed after the first 150 hours.

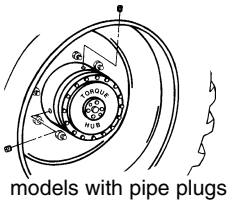
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil after the first 150 hours of use may cause the machine to perform poorly and continued use may cause component damage.

Drive Hubs:

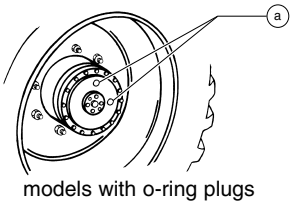
1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.

2 Remove both plugs and drain the oil into a suitable container.

3 Drive the machine until one plug is at the top and the other is at 90 degrees.



models with pipe plugs



models with o-ring plugs

4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side hole. Apply pipe thread sealant to the plugs. Install the plugs.

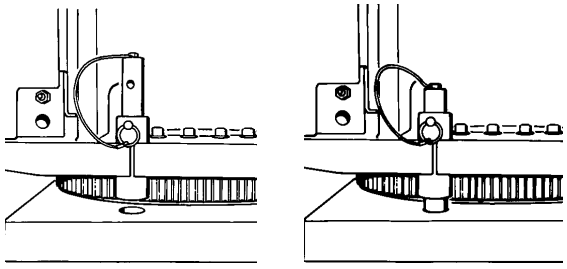
5 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.

Models with O-ring plugs: Install the plugs into the drive hub.

6 Repeat steps 1 through 5 for the other drive hub.

Turntable Rotate Drive Hub:

1 Secure the turntable from rotating with the turntable rotation lock pin.



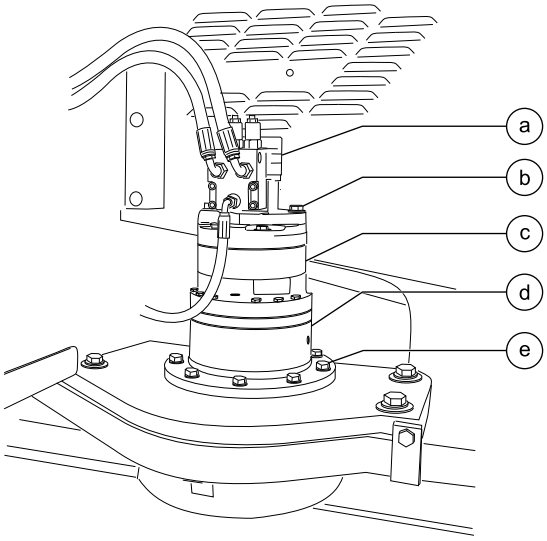
unlocked locked

2 Remove the motor/brake mounting bolts, and then remove the motor and brake from the drive hub and set them to the side.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Remove the drive hub mounting bolts, and use a lifting device to remove the drive hub from the machine.

⚠DANGER Tip-over hazard. Failure to secure the turntable from rotating iwht the turntable rotation lock pin could cause the machine to tip over resulting in death or serious injury.



a motor
b motor/brake mounting bolts
c brake
d drive hub
e drive hub mounting bolts

4 Remove the plug from the side of the drive hub. Drain the oil from the hub into a container of adequate capacity. Refer to Section 2, *Specifications.*

5 Install the drive hub. Torque the drive hub mounting bolts to specification. Refer to Section 2, *Specifications.*

6 Install the brake and motor onto the drive hub. Torque the motor/brake mounting bolts to specification. Refer to Section 2, *Specifications.*

7 Fill the hub with oil from the side hole until the oil level is even with the bottom of the hole. Apply pipe thread sealant to the plug. Install the plug.

8 Adjust turntable rotation gear backlash. Refer to Repair Procedure 9-1, *How to Adjust the Turntable Rotation Gear Backlash.*

CHECKLIST A PROCEDURES REV E

A-13
Perform Engine Maintenance - GM and Ford Models


Engine specifications require that this procedure be performed every 200 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook	
Genie part number	77738

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook	
Genie part number	84792

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

Checklist B Procedures

REV G

B-1
Inspect the Batteries

Note: Genie specifications require that this procedure be performed every 250 hours or quarterly, whichever comes first.

Proper battery condition is essential to good engine performance and operational safety. Improper fluid levels or damaged cables and connections can result in engine component damage and hazardous conditions.

⚠WARNING Electrocution/burn hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING Bodily injury hazard. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

1 Put on protective clothing and eye wear.

2 Be sure that the battery cable connections are free of corrosion.

Note: Adding terminal protectors and a corrosion preventative sealant will help eliminate corrosion on the battery terminals and cables.

3 Be sure that the battery hold downs and cable connections are tight.

4 Be sure that the battery separator wire connections are tight.

5 Fully charge the batteries and allow them to rest at least 6 hours.

6 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.

7 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:

- Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
- Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.

⊙ Result: All battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to step 11.

⊠ Result: One or more battery cells display a specific gravity of 1.217 or below. Proceed to step 8.

8 Perform an equalizing charge, OR fully charge the batteries and allow them to rest at least 6 hours.

9 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.

CHECKLIST B PROCEDURES REV G

10 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:

- Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
- Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.

⊙ Result: All battery cells display a specific gravity of 1.277 or greater. The battery is fully charged. Proceed to step 13.

⊠ Result: The difference in specific gravity readings between cells is greater than 0.1 OR the specific gravity of one or more cells is less than 1.177. Replace the battery.

11 Check the battery acid level. If needed, replenish with distilled water to 1/8 inch / 3 mm below the bottom of the battery fill tube. Do not overfill.

12 Install the vent caps and neutralize any electrolyte that may have spilled.

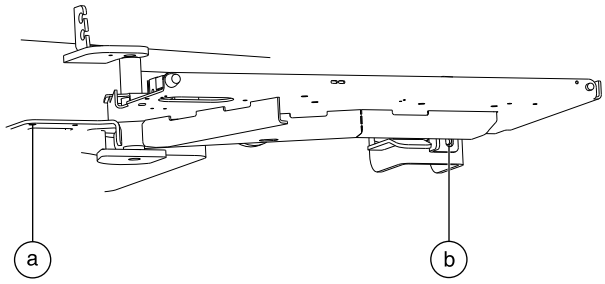
B-2
Inspect the Electrical Wiring

Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

⚠WARNING Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Open the engine side turntable cover.

2 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

3 Locate the engine tray anchor hole at the pivot end of the engine tray.

REV G CHECKLIST B PROCEDURES

4 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

5 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:

- Engine wiring harness
- Battery area wiring

6 Open the ground controls side turntable cover.

7 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:

- Inside of the ground control box
- Hydraulic manifold wiring
- Hydraulic oil cooler wiring

8 Inspect for a liberal coating of dielectric grease at the following location:

- All wire harness connectors to the ground control box
- Hydraulic manifold wiring

9 Start the engine from the ground controls and raise the secondary boom above the turntable covers.

10 Inspect the turntable area for burnt, chafed and pinched cables.

11 Lower the secondary boom to the stowed position and turn the engine off.

12 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:

- Cable track on the boom
- Cables on the boom and jib boom
- Jib boom/platform rotate manifold
- Inside of the platform control box

13 Remove the engine tray retaining fastener from the engine tray anchor hole at the pivot end of the engine tray.

14 Inspect for a liberal coating of dielectric grease at the following location:

- All wire harness connectors to the platform control box
- Hydraulic manifold wiring

15 Swing the engine tray in towards the machine.

16 Install the bolt that was just removed into the original hole to secure the engine tray.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

CHECKLIST B PROCEDURES REV G

B-3
Test the Key Switch

Proper key switch action and response is essential to safe machine operation. The machine can be operated from the ground or platform controls and the activation of one or the other is accomplished with the key switch. Failure of the key switch to activate the appropriate control panel could cause a hazardous operating situation.

1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

2 Turn the key switch to ground control, start the engine and then turn the key switch to **platform control**.

3 Check all machine function from the **ground controls**.

⊙ Result: All machine functions should **not** operate.

4 Turn the key switch to ground control.

5 Check all machine function from the **platform controls**.

⊙ Result: All machine functions should **not** operate.

6 Turn the key switch to the off position.

⊙ Result: The engine should stop and no functions should operate.

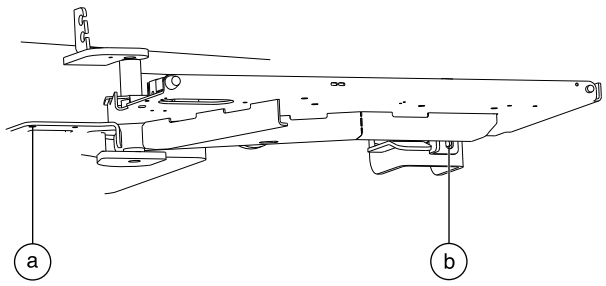
B-4
Check the Exhaust System

Maintaining the exhaust system is essential to good engine performance and service life. Operating the engine with a damaged or leaking exhaust system can cause component damage and unsafe operating conditions.

⚠WARNING Bodily injury hazard. Do not inspect while the engine is running. Remove the key to secure from operation.

⚠CAUTION Bodily injury hazard. Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

2 Locate the engine tray anchor hole at the pivot end of the engine tray.

3 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

4 Be sure that all nuts and bolts are tight.

5 Inspect all welds for cracks.

6 Inspect for exhaust leaks (i.e., carbon buildup) around seams and joints.

7 Remove the engine tray retaining fastener from the engine tray anchor hole at the pivot end of the engine tray.

8 Swing the engine tray in towards the machine.

9 Install the bolt that was just removed into the original hole to secure the engine tray.

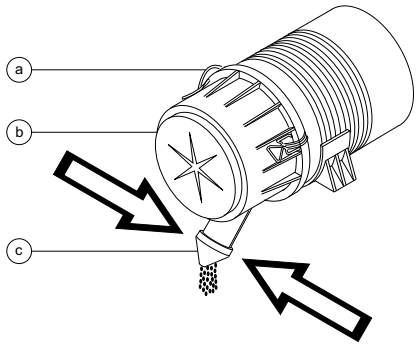
⚠DANGER Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

B-5
Inspect the Engine Air Filter

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Note: Perform this procedure with the engine off.

1 Open the engine side cover. Empty the dust discharge valve by pressing together the sides of the discharge slot. Clean the discharge slot as needed.



a retaining clamp
b canister end cap
c dust discharge valve

2 Disconnect the retaining clamp from the air cleaner canister.

3 Remove the filter element.

4 Clean the inside of the canister and the gasket with a damp cloth.

5 Inspect the air filter element. If needed, blow from the inside out using low pressure dry compressed air, or carefully tap out dust.

6 Install the filter element.

7 Install the air filter canister end cap and connect the end cap retaining clamp.

CHECKLIST B PROCEDURES REV G

B-6
Perform Engine Maintenance - Deutz, Perkins and Continental Models

Engine specifications require that this procedure be performed every 250 hours.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341)

Deutz 913 Operation Manual	
Genie part number	62446

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Perkins 704-30 User's Handbook	
Genie part number	101840

Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

Continental Models:

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual	
Genie part number	111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV G CHECKLIST B PROCEDURES

B-7
Check the Tires, Wheels and Lug Nut Torque

Maintaining the tires and wheels in good condition, including proper wheel fastener torque, is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

Note: The tires on this machine are foam filled and do not need air added to them with the exception of High Flotation tires.

1 Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.

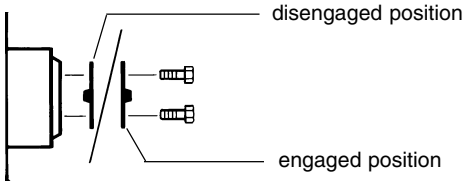
2 Check each wheel for damage, bends and cracked welds.

3 Check each lug nut for proper torque. Refer to Section 2, *Specifications*.

B-8
Confirm the Proper Brake Configuration

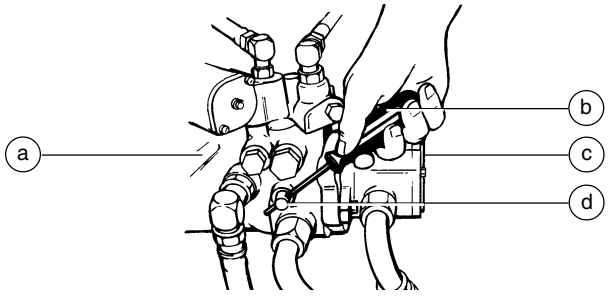
Proper brake configuration is essential to safe operation and good machine performance. Hydrostatic brakes and hydraulically-released, spring-applied individual wheel brakes can appear to operate normally when they are actually not fully operational.

1 Check each drive hub disconnect cap to be sure it is in the engaged position.



2 Be sure the free-wheel valve on the drive pump is closed (clockwise).

Note: The free-wheel valve is located on the drive pump.



a drive pump
b screwdriver
c lift pump
d free-wheel valve

Note: The free-wheel valve should always remain closed.

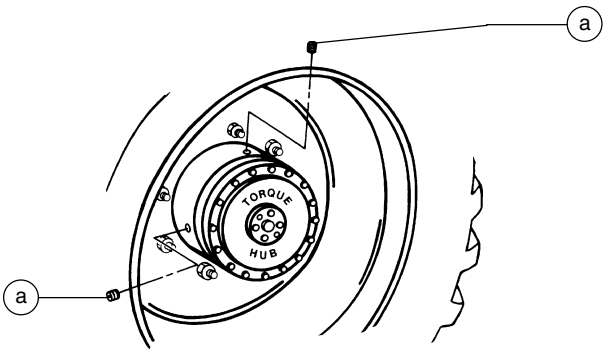
CHECKLIST B PROCEDURES REV G

B-9
Check the Drive Hub Oil Level and Fastener Torque

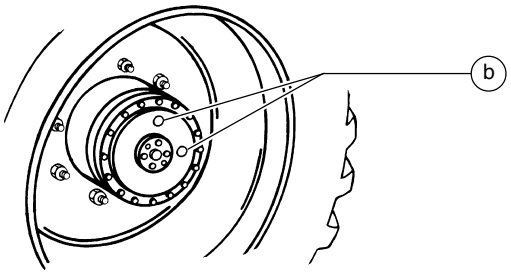
Failure to maintain proper drive hub oil levels may cause the machine to perform poorly and continued use may cause component damage.

Drive hubs:

1 Drive the machine to rotate the hub until one of the plugs is located on top and the other one is at 90 degrees.



a. models with pipe plugs



b. models with o-ring plugs

2 Remove the plug located at 90 degrees and check the oil level.

⊙ Result: The oil level should be even with the bottom of the side plug hole.

3 If necessary, remove the top plug and add oil until the oil level is even with the bottom of the side plug hole.

4 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.

Models with O-ring plugs: Install the plugs into the drive hub. Torque to Specification. Refer to Section 2, *Specifications*.

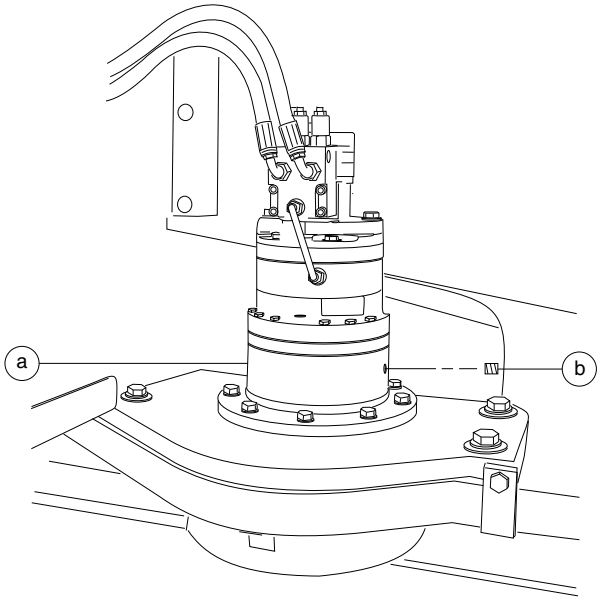
5 Check the torque of the drive hub mounting fasteners. Refer to Section 2, *Specifications*.

6 Repeat steps 1 through 4 for the other drive hubs.

Turntable rotate drive hub:

1 Remove the plug located on the side of the hub and check the oil level.

⊙ Result: The oil level should be even with the bottom of the plug hole opening.



a drive hub
b plug

2 If necessary, add oil until the oil level is even with the bottom of the plug hole opening.

3 Apply pipe thread sealant to the plug, and install the plug in the drive hub.

6 Check the torque of the turntable rotate drive hub mounting fasteners. Refer to Section 2, *Specifications*.

B-10
Test the Ground Control Override

A properly functioning ground control override is essential to safe machine operation. The ground control override function is intended to allow ground personnel to operate the machine from the ground controls whether or not the Emergency Stop button on the platform controls is in the ON or OFF position. This function is particularly useful if the operator at the platform controls cannot return the boom to the stowed position.

1 Push in the platform red Emergency Stop button to the off position.

2 Start the engine from the ground controls.

3 At the ground controls, operate each boom function through a partial cycle.

⊙ Result: All boom functions should operate.

CHECKLIST B PROCEDURES REV G

B-11
Test the Platform Self-leveling

Automatic platform self-leveling throughout the full cycle of primary boom raising and lowering is essential for safe machine operation. The platform is maintained level by the communication between the platform level sensor and the turntable level sensor. If the platform becomes out of level, the computer at the ground controls will open the appropriate solenoid valve(s) at the platform manifold to maintain a level platform. A platform self-leveling failure creates an unsafe working condition for platform and ground personnel.

1 Start the engine from the ground controls.

2 Press and hold a function enable/speed select button and fully retract the primary boom.

3 Push one of the LCD screen buttons shown until platform angle is displayed.

4 Press and hold a function enable/speed select button and adjust the platform to zero degrees using the platform level up/down buttons.

5 Push and hold a function enable/speed select button and fully raise the primary boom while observing the platform angle shown on the LCD display.

⊙ Result: The platform should remain level at all times to within ±2 degrees.

Note: If the platform becomes out of level, the tilt alarm will sound and the Platform Not Level Indicator will flash at the ground controls. The platform level up/down buttons will only work in the direction that will level the platform. Level the platform until the indicator light turns off.

6 Push and hold a function enable/speed select button and fully lower the primary boom.

⊙ Result: The platform should remain level at all times to within ±2 degrees.

Note: If the platform becomes out of level, the tilt alarm will sound and the Platform Not Level Indicator will flash at the ground controls. The platform level up/down buttons will only work in the direction that will level the platform. Level the platform until the indicator light turns off.

B-12
Test the Engine Idle Select Operation

A properly operating engine idle select function is essential to good engine performance and safe machine operation. There are three settings.

Low idle (turtle symbol) allows the operator to control multiple boom and/or drive functions simultaneously, though at reduced speed. This setting maintains a consistent low idle.

High idle (rabbit symbol) allows the operator to control multiple boom and/or drive functions simultaneously. This setting maintains a consistent high idle.

Foot switch activated high idle (rabbit and foot switch symbols) should be used for normal machine operation. This selection activates high idle only when the foot switch is pressed down.

1 Turn the key switch to ground controls.

2 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

3 Start the engine from the ground controls.

4 Push and release the rpm select button until high rpm is selected (rabbit symbol).

⊙ Result: The engine should change to high idle.

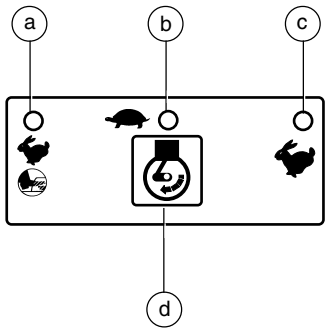
5 Push and release the rpm select button until low rpm is selected (turtle symbol).

⊙ Result: The engine should return to low idle.

6 Turn the key switch to platform controls.

7 At the platform controls, press the engine idle select button until high idle (rabbit symbol) is selected.

⊙ Result: The engine should change to high idle.



a foot switch activated high idle indicator light
b low idle indicator light
c high idle indicator light
d engine rpm select button

8 Press the engine idle select button until low idle (turtle symbol) is selected.

⊙ Result: The engine should change to low idle.

9 Press the engine idle select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected.

⊙ Result: The engine should **not** change to high idle.

10 Press down the foot switch.

⊙ Result: The engine should change to high idle.

CHECKLIST B PROCEDURES REV G

B-13
Test the Fuel Select Operation - Gasoline/LPG Models

The ability to select and switch between gasoline and LPG fuels as needed is essential to safe machine operation. A fuel selection can be made whether the engine is running or not. Switching malfunctions and/or the failure of the engine to start and run properly in both fuel modes and through all idle speeds can indicate fuel system problems that could develop into a hazardous situation.

Note: Perform this test after checking the gasoline and LPG fuel levels, and warming the engine to normal operating temperature.

1 Turn the key switch to platform controls and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.

2 Press the fuel select button to gasoline mode.

3 Start the engine from the platform controls and allow the engine to run at low idle.

4 At the platform controls, press the engine idle select button until foot switch activated high idle (rabbit and foot switch symbol) is selected.

5 Press down the foot switch to allow the engine to run at high idle.

⊙ Result: The engine should start promptly and operate smoothly in low and high idle.

6 Release the foot switch and shut the engine off by pushing the red Emergency Stop button in to the off position.

7 Pull the red Emergency Stop button out to the on position at the platform controls.

8 Press the fuel select button to LPG mode.

9 Start the engine and allow it to run at low idle.

10 Press down the foot switch to allow the engine to run at high idle.

⊙ Result: The engine should start promptly and operate smoothly in low and high idle.

Note: The engine may hesitate momentarily and then continue to run on the selected fuel if the fuel source is switched while the engine is running.

REV G CHECKLIST B PROCEDURES

B-14
Test the Drive Brakes

Proper brake action is essential to safe machine operation. The drive brake function should operate smoothly, free of hesitation, jerking and unusual noise. Hydraulically-released individual wheel brakes can appear to operate normally when they are actually not fully operational.

⚠WARNING Collision hazard. Be sure that the machine is not in free-wheel or partial free-wheel configuration. See B-8, *Confirm the Proper Brake Configuration*.

Note: Select a test area that is firm, level and free of obstructions.

1 Mark a test line on the ground for reference.

2 Start the engine from the platform controls.

3 Press the engine rpm select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected, then lower the boom into the stowed position.

4 Choose a point on the machine (i.e., contact patch of a tire) as a visual reference for use when crossing the test line.

5 Bring the machine to top drive speed before reaching the test line. Release the drive controller when your reference point on the machine crosses the test line.

6 Measure the distance between the test line and your machine reference point. Refer to Section 2, *Specifications*.

Note: The brakes must be able to hold the machine on any slope it is able to climb.

B-15
Test the Drive Speed - Stowed Position

Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

Note: Select a test area that is firm, level and free of obstructions.

Note: Perform this procedure with the boom in the stowed position.

1 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.

2 Start the engine from the platform controls.

3 Press the engine rpm select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected.

4 Choose a point on the machine; i.e., contact patch of a tire as a visual reference for use when crossing the start and finish lines.

5 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.

6 Continue at full speed and note the time when the machine reference point crosses the finish line. Refer to Section 2, *Specifications*.

CHECKLIST B PROCEDURES REV G

B-16
Test the Drive Speed - Raised or Extended Position

Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

Note: Select a test area that is firm, level and free of obstructions.

1 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.

2 Start the engine from the platform controls.

3 Press the engine rpm select button until the foot switch activated high idle (rabbit and foot switch symbol) is selected.

4 Press down the foot switch and raise the boom until the engine switches to low idle.

5 Choose a point on the machine; i.e., contact patch of a tire as a visual reference for use when crossing the start and finish lines.

6 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.

7 Continue at full speed and note the time when the machine reference point crosses the finish line. Refer to Section 2, *Specifications*.

8 Lower the boom to the stowed position.

9 Extend the boom 4 feet / 1.2 m.

10 Choose a point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.

11 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.

12 Continue at top speed and note the time when the machine reference point crosses the finish line. Refer to Section 2, *Specifications*.

REV G CHECKLIST B PROCEDURES

B-17
Test the Alarm and Optional Flashing Beacon

An alarm and optional flashing beacon are installed to alert operators and ground personnel of machine proximity and motion. There are four alarm option modes that can be activated based on user preference or requirement. Refer to *Display Module* in the Repair Section for information.

1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.

⊙ Result: The alarm should sound twice. The flashing beacon (if equipped) should be on and flashing.

B-18
Perform Hydraulic Oil Analysis

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and a clogged suction strainer may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.**
See E-1, *Test or Replace the Hydraulic Oil.*

CHECKLIST B PROCEDURES REV G

B-19
Check and Adjust the Engine RPM

Maintaining the engine rpm at the proper setting for both low and high idle is essential to good engine performance and service life. The machine will not operate properly if the rpm is incorrect and continued use may cause component damage.

Ford, GM and Continental models:

Note: The engine rpm is controlled by the ECM and can only be adjusted by re-programming the ECM. If rpm adjustment or service is required, please contact Genie Industries Service Department or your local engine dealer.

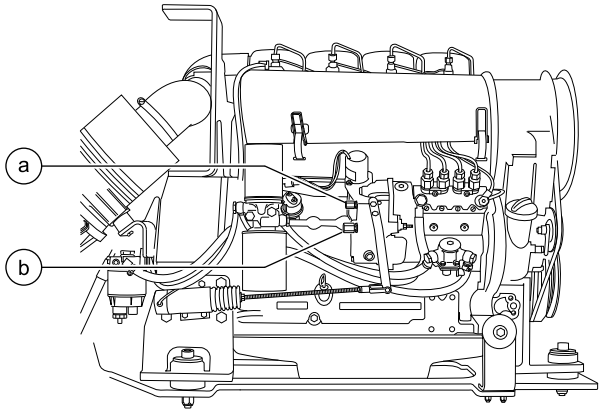
Deutz F4L913 models:

1 Start the engine from the ground controls.

2 Push one of the LCD screen buttons shown until engine rpm is displayed. Refer to Section 2, *Specifications.*

Skip to step 11 if the low idle rpm is correct.

3 Remove the secondary idle adjustment screw cap from the secondary idle adjustment screw on the injection pump. Loosen the locknut.



a primary idle adjustment screw
b secondary idle adjustment screw

4 Turn the secondary adjustment screw counterclockwise until the adjustment screw is loose. Tighten the locknut.

Note: Be sure the adjustment screw is loosened until there is no spring tension felt.

5 Remove the primary idle adjustment screw cap from the primary idle adjustment screw on the injection pump. Loosen the locknut.

6 Adjust the primary idle adjustment screw until low idle meets specification. Tighten the locknut.

7 Install the primary idle adjustment screw cap and tighten. Do not over tighten.

8 Loosen the secondary idle adjustment screw locknut.

9 Adjust the secondary adjustment screw until the low idle meets specification. Tighten the locknut.

10 Install the secondary idle adjustment screw cap and tighten. Do not over tighten.

11 Push and hold the function enable/high speed button. Note the engine rpm on the display. Refer to Section 2, *Specifications.*

If the high idle is correct, disregard adjustment step 12.

12 Loosen the yoke lock nut. Turn the high idle adjustment nut and solenoid boot counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and recheck the rpm.

Note: Be sure the solenoid fully retracts when activating high idle.

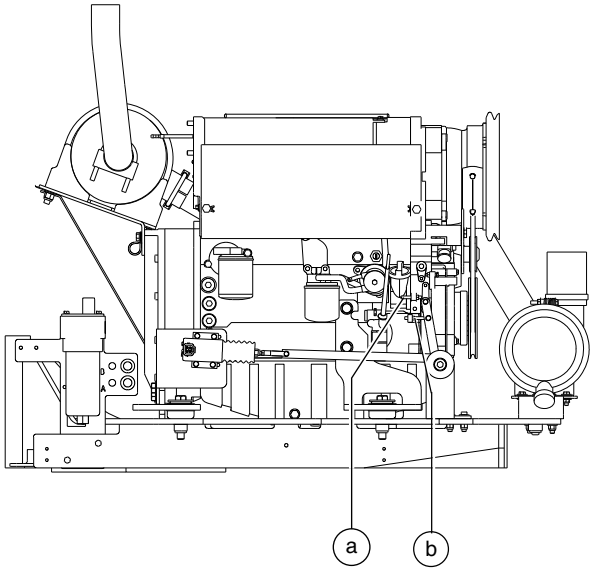
Deutz BF4L2011 models:

1 Start the engine from the ground controls.

2 Push one of the LCD screen buttons shown until engine rpm is displayed. Refer to Section 2, *Specifications.*

Skip to step 5 if the low idle rpm is correct.

3 Loosen the locknut on the low idle adjustment screw.



a low idle adjustment screw
b high idle adjustment screw

4 Adjust the low idle adjustment screw until low idle meets specification. Tighten the locknut.

5 Push and hold the function enable/high speed button. Note the engine rpm on the display. Refer to Section 2, *Specifications.*

If the high idle is correct, disregard adjustment step 6.

6 Loosen the yoke lock nut. Turn the high idle adjustment nut and solenoid boot counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and recheck the rpm.

Note: Be sure the solenoid fully retracts when activating high idle.

CHECKLIST B PROCEDURES REV G

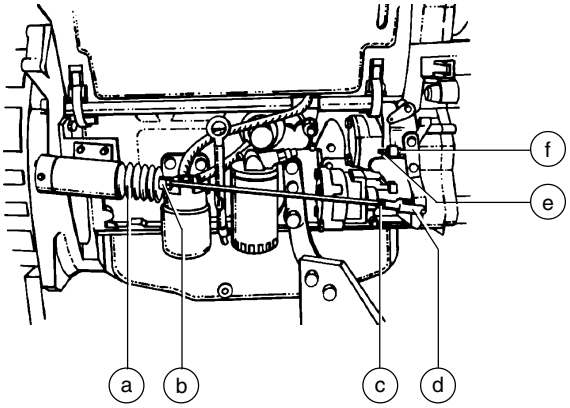
Perkins models:

1 Start the engine from the ground controls.

2 Push one of the LCD screen buttons shown until engine rpm is displayed. Refer to Section 2, *Specifications.*

Skip to step 4 if the low idle rpm is correct.

3 Loosen the low idle lock nut and turn the low idle adjustment screw clockwise to increase the rpm, or counterclockwise to decrease the rpm. Tighten the low idle lock nut and confirm the rpm.



a solenoid boot
b high idle adjustment nut
c yoke lock nut
d yoke
e low idle adjustment screw
f low idle lock nut

4 Push and hold the function enable/high speed button. Note the engine rpm on the display. Refer to Section 2, *Specifications.*

If high idle rpm is correct, disregard adjustment step 5.

5 Loosen the yoke lock nut, then turn the high idle adjustment nut and solenoid boot counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and confirm the rpm.

Note: Be sure the solenoid fully retracts when activating high idle.

B-20
Test the Safety Envelope and Circuits

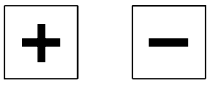
Testing the machine safety envelope is critical to safe machine operation. If the boom is allowed to operate when a safety switch is not functioning correctly, the machine stability is compromised and may tip over. Refer to Section 6 for limit switch and angle sensor information.

Secondary Boom #1 Angle Safety Limit Switch, LSS2AS

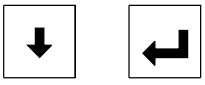
1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.

2 Start the engine from the ground controls.

3 Simultaneously push the LCD screen buttons shown to activate status mode.



4 Push one of the LCD screen buttons shown until secondary boom length is displayed.



5 Fully raise the secondary boom and extend the secondary boom approximately 2 feet / 61 cm.

6 Remove the fasteners from the turntable riser cover at the platform end of the secondary boom. Remove the cover.

7 Locate the Deutsch connectors from the secondary safety retract switch (LSS1RS) near the chassis at the platform end of the secondary boom. The connection will be marked with yellow zip ties on the wire assembly. Disconnect the connectors.

8 Locate the Deutsch connectors from the secondary boom #1 retract operational limit switch (LSS1RO) at the end of the secondary boom.The connection will be marked with red zip ties on the wire assembly. Disconnect the connectors.

9 Install a wire jumper between pin 1 and pin 2 of the Deutsch connector on the wire harness removed in step 8.

10 Install a second wire jumper between pin 3 and pin 4 of the Deutsch connector on the wire harness.

⊙ Result: The display should show = 0FT.

CHECKLIST B PROCEDURES REV G

11 Press and hold the high speed function enable button and lower the secondary boom.

⊙ Result: The secondary boom should lower to 60° and the engine should stop.

☒ Result: If the engine does not stop at 60° and the secondary boom continues to lower, the secondary boom #2 angle safety limit switch (LSS2AS) is out of adjustment or the wiring circuit is faulty and will need to be replaced or repaired. Immediately remove the machine from service until repairs are made.

⚠DANGER Bodily injury hazard. If the secondary boom lowers to less than 60° without stopping the engine, stop immediately and raise the secondary boom above 60°. Failure to raise the secondary boom could result in death or serious injury.

12 Remove the key from the main key switch, insert it into the service bypass/recovery key switch, turn the key to Service Bypass mode and raise the scondary boom above 60° using auxiliary power.

13 Remove the wire jumpers installed in steps 9 and 10 and connect the wire harness to LSS1RO removed in step 8.

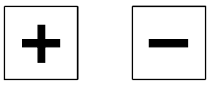
14 Fully raise the secondary boom and extend the secondary boom approximately 1 foot / 30.5 cm.

15 Turn the service bypass/recovery key switch back to run, return the key to the main key switch and start the engine from the ground controls.

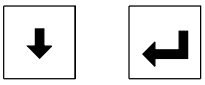
16 Re-connect the Deutsch connector from the secondary safety retract switch (LSS1RS) removed in step 7.

Secondary Boom #1 Retracted Safety Limit Switch, LSS1RS

17 Simultaneously push the LCD screen buttons shown to activate status mode.



18 Push one of the LCD screen buttons shown until secondary boom angle is displayed.



19 Raise the secondary boom until the display shows >=35 DEGREES.

20 Locate the Deutsch connectors from the secondary boom #2 angle safety limit switch (LSS2AS) on the inside of the turntable riser. The connection will be marked with purple zip ties on the wire assembly. Disconnect the connectors.

21 Locate the Deutsch connectors from the secondary boom #2 angle operational limit switch (LSS2AO) on the inside of the turntable riser. The connection will be marked with green zip ties on the wire assembly. Disconnect the connectors.

22 Install a wire jumper between pins 1 and 2 of the Deutsch connector on the wire harness removed in step 21.

⊙ Result: The display should show AT 65 DEGREES.

23 Press and hold the low speed function enable button and extend the secondary boom.

⊙ Result: The secondary boom should extend no more than 12 inches / 30.5 cm and stop. The engine should stop and the display will show P9B SAFETY FAULT and P11 SAFETY FAULT.

☒ Result: If the engine does not stop and the secondary boom continues to extend, the secondary boom #1 retracted safety limit switch (LSS1RS) is out of adjustment or the wiring circuit is faulty and will need to be replaced or repaired.

⚠ DANGER Bodily injury hazard. If the secondary boom continues to extend without stopping the engine, stop immediately and retract the secondary boom. Failure to retract the secondary boom could result in death or serious injury.

24 Remove the wire jumpers installed in step 22 and connect the wire harness to LSS2AO.

25 Re-connect the Deutsch connector from the secondary boom #2 angle safety limit switch (LSS2AS) removed in step 20.

CHECKLIST B PROCEDURES REV G

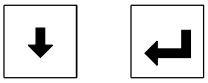
B-21
Test the Primary Boom Self-leveling

Note: The primary boom self-leveling function is adjustable on machines with software revision 1.03 and lower. This function is not adjustable on machines with a software revision higher than 1.03. Refer to Repair Procedure 6-1, *How to Determine the Revision Level*.

Automatic primary boom self-leveling throughout the full cycle of secondary boom raising and lowering is essential for safe machine operation. The primary boom is maintained level by the communication between the platform level sensor and the turntable level sensor. If the platform becomes out of level, the computer at the ground controls will open the appropriate solenoid valve(s) at the function manifold to maintain a level primary boom.

1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.

2 Push one of the LCD screen buttons shown until primary boom angle is displayed.



3 Start the engine and level the platform until the displays shows 0 DEGREES.

4 Fully raise the secondary boom while watching the display at the ground controls. Stop when the secondary boom just begins to extend.

⊙ Result: The primary boom should remain level at all times to within ±2 degrees.

Note: If the platform becomes out of level, the tilt alarm will sound and the platform not level indicator will turn on. Level the platform until the indicator light turns off.

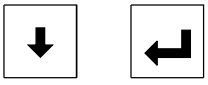
B-22
Test the Primary Boom Angle Sensor

A properly functioning primary boom angle sensor (PBAS) is essential to safe machine operation. The primary boom angle sensor is used to limit the angle of the primary boom relative to the angle of the secondary boom and gravity. The ECM at the ground controls (TCON) monitors the position and angle of the primary boom using the signal from PBAS. The PBAS signal is used to control the ramping of the primary boom as well as velocity control, limiting the speed of the primary boom to 1.3 feet / 0.4 meters per second.

Note: Perform this procedure on a firm, level surface.

1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.

2 Push one of the LCD screen buttons shown until primary boom angle is displayed.



3 Start the engine from the ground controls.

4 Raise the primary boom. The display will begin showing a boom angle of 40°.

5 Continue raising the primary boom until the display shows 65°.

⊙ Result: The primary boom should stop.

⊠ Result: The primary boom does not stop. Immediately release the function enable button and lower the boom. Calibrate the limit switch. Refer to Repair Procedure 4-7 *How to Calibrate the Primary Boom Limit Switch.*

⚠ DANGER Tip-over hazard. If the boom does not stop at 65°, immediately release the function enable button and lower the primary boom. Failure to lower the boom could cause the machine to tip over resulting in death or serious injury.

CHECKLIST B PROCEDURES REV G

B-23
Inspect the Fuel and Hydraulic Tank Cap Venting Systems

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first. Perform this procedure more often if dusty conditions exist.

Free-breathing fuel and hydraulic tank caps are essential for good machine performance and service life. A dirty or clogged tank cap may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the caps be inspected more often.

⚠ DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

Note: Perform this procedure with the engine off.

1 Remove the cap from the fuel tank.

2 Check for proper venting.

⊙ Result: Air passes through the fuel tank cap. Proceed to step 4.

⊠ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 3.

Note: When checking for positive tank cap venting, air should pass freely through the cap.

3 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 2.

4 Install the fuel tank cap onto the fuel tank.

5 Remove the breather cap from the hydraulic tank.

6 Check for proper venting.

⊙ Result: Air passes through the hydraulic tank cap. Proceed to step 8.

⊠ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 7.

Note: When checking for positive tank cap venting, air should pass freely through the cap.

7 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 6.

8 Install the breather cap onto the hydraulic tank.

REV G CHECKLIST B PROCEDURES

B24
Perform Engine Maintenance - GM and Ford Models

Engine specifications require that this procedure be performed every 400 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

GM Models:

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook	
Genie part number	77738

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook	
Genie part number	84792

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

Checklist C Procedures

REV E

C-1
Perform Engine Maintenance

Engine specifications require that this procedure be performed every 500 hours.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547)..

Deutz 913 Operation Manual	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Deutz TD2011 Operation Manual	
Genie part number	139320

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00) OR the *Perkins 804D Operation and Maintenance Manual* (Perkins part number SEBU8324-00).

Perkins 704-30 User's Handbook	
Genie part number	101840
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332
Perkins 804D-33 Operation and Maintenance Manual	
Genie part number	228841

Continental Models:

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual	
Genie part number	111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

REV E CHECKLIST C PROCEDURES

C-2
Grease the Platform Overload Mechanism (if equipped)

Genie specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first. Perform this procedure more often if dusty conditions exist.

Application of lubrication to the platform overload mechanism is essential to safe machine operation. Continued use of an improperly greased platform overload mechanism could result in the system not sensing an overloaded platform condition and will result in component damage.

1 Locate the grease fittings on each pivot pin of the platform overload assembly.

2 Thoroughly pump grease into each grease fitting using a multi-purpose grease.

Grease Specification
Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

C-3
Test the Platform Overload System (if equipped)

Genie specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first.

Testing the platform overload system regularly is essential to safe machine operation. Continued use of an improperly operating platform overload system could result in the system not sensing an overloaded platform condition. Machine stability could be compromised resulting in the machine tipping over.

Note: Perform this procedure with the machine on a firm, level surface.

1 Turn the key switch to platform control. Start the engine and level the platform.

2 Determine the maximum platform capacity. Refer to the machine serial plate.

3 Remove all weight, tools and accessories from the platform.

Note: Failure to remove all weight, tools and accessories from the platform will result in an inaccurate test.

CHECKLIST C PROCEDURES REV E

4 Using a suitable lifting device, place a test weight equal to that of the available capacity one of the locations shown.
Refer to Illustration 1.

⊙ Result: The platform overload indicator lights should be off at both the ground and platform controls and the alarm should not sound.

⊠ Result: The platform overload indicator lights are on and the alarm is sounding. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped).*

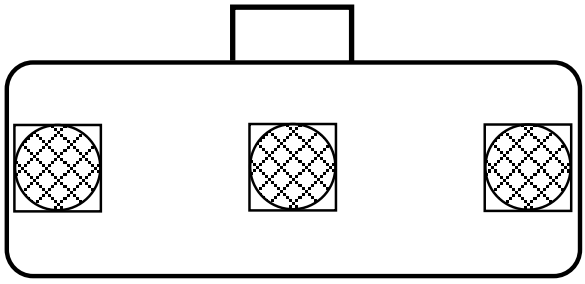


Illustration 1

5 Carefully move the test weight to each remaining location. Refer to Illustration 1.

⊙ Result: The platform overload indicator lights should be off at both the ground and platform controls and the alarm should not sound.

⊠ Result: The platform overload indicator lights are on and the alarm is sounding. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped).*

6 Using a suitable lifting device, place an additional 50 lbs / 23 kg of weight onto the platform.

⊙ Result: The alarm should sound. The platform overload indicator light should be flashing at the platform controls and “PLATFORM OVERLOAD” should be displayed on the LCD screen at the ground controls.

⊠ Result: The alarm is not sounding OR the platform overload indicator light is not flashing OR “PLATFORM OVERLOAD” is not displayed on the LCD screen at the ground controls. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped).*

Note: There may be a 2 second delay before the overload indicator lights flash and the alarm sounds.

7 Carefully move the test weights to each remaining location on the platform.
Refer to Illustration 1.

⊙ Result: The alarm should sound.
The platform overload indicator lights should be flashing at both the ground and platform controls.

⊠ Result: The alarm does not sound and the platform overload indicator lights are not flashing. Calibrate the platform overload system. Refer to Repair Procedure 2-4, *How to Calibrate the Platform Overload System (if equipped).*

Note: There may be a 2 second delay before the overload indicator lights flash and the alarm sounds.

8 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

9 Turn the key switch to ground control.

10 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

11 Press and hold the auxiliary power button.

Note: The engine must be shut off to access auxiliary power.

12 Using auxiliary power, test all machine functions from the ground controls.

⊙ Result: All ground control functions should operate except extend.

13 Using a suitable lifting device, lift the additional test weight from the platform.

⊙ Result: The platform overload indicator lights should turn off at both the ground and platform controls and the alarm should not sound.

Note: There may be an 2 second delay before the overload indicator lights and alarm turn off.

14 Start the engine and test all machine functions from the ground controls.

⊙ Result: All ground control functions should operate normally.

15 Turn the key switch to platform control.

16 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should operate.

Note: If the platform overload system is not operating properly, Refer to 2-4, *How to Calibrate the Platform Overload System (if equipped).*

17 Using a suitable lifting device, remove the remaining test weights from the platform.

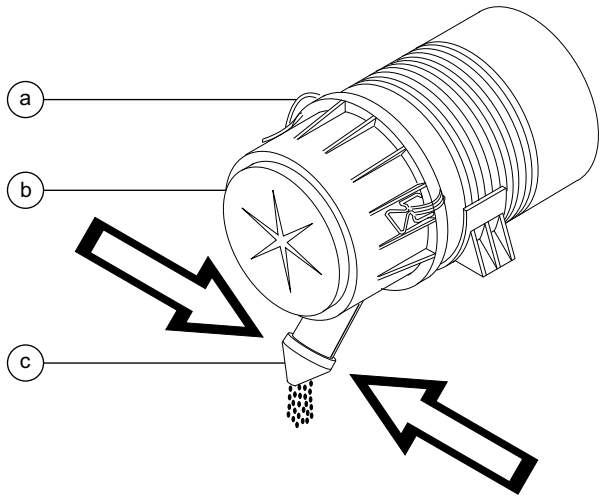
C-4
Replace the Engine Air Filter

Engine specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first.

Maintaining the engine air filter in good condition is essential to good engine performance and service life. Failure to perform this procedure can lead to poor engine performance and component damage..

Note: Perform this procedure with the engine off.

1 Open the engine side cover. Empty the dust discharge valve by pressing together the sides of the discharge slot. Clean the discharge slot as needed.



a retaining clamp
b canister end cap
c dust discharge valve

CHECKLIST C PROCEDURES REV E

Perkins 804C-33 or 804D-33 Models:

2 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

3 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

All Models:

4 Release the clamps from the end cap of the air filter canister. Remove the end cap.

5 Remove the filter element.

6 Clean the inside of the canister and the gasket with a damp cloth.

7 Install the new filter element.

8 Install the air filter canister end cap and connect the end cap retaining clamp.

C-5
Replace the Fuel/Water Separator - Diesel Models

Genie specifications require that this procedure be performed every 500 hours or annually, whichever comes first.

Regular replacement of the fuel filter/water separator is essential for good engine performance. Failure to perform this procedure can lead to poor engine performance and/or hard starting, and continued use may result in component damage. Extremely dirty conditions may require this procedure be performed more often.

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

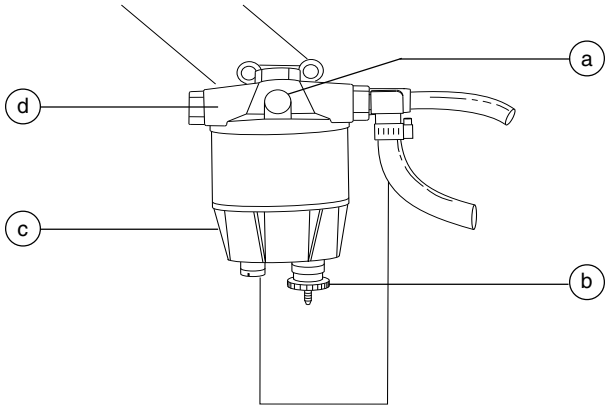
Note: Perform this procedure with the engine off.

1 Open the engine side turntable cover and locate the fuel filter/water separator.

Note: The fuel filter/water separator is located near the hydraulic pump.

2 Disconnect and plug the fuel supply hose from the fuel tank to the fuel filter/water separator head.

3 Loosen the vent plug located on the fuel filter/water separator head.



a vent plug
b drain plug
c filter bowl
d separator head

4 Place a suitable container under the filter bowl. Loosen the drain plug located at the bottom of the bowl. Completely drain the fuel.

5 Rotate the filter bowl counterclockwise and remove it from the element.

6 Rotate the filter element counterclockwise and remove it from the filter head.

7 Install the filter bowl onto the new filter element.

8 Apply a thin layer of oil onto the element gasket. Install the filter/bowl assembly onto the filter head. Tighten the drain plug and vent plug.

NOTICE Component damage hazard. The drain plug and vent plug can be damaged if they are overtightened.

9 Install the fuel supply hose from the fuel tank to the fuel filter/water separator. Tighten the clamp.

10 Clean up any diesel fuel that may have spilled during the installation procedure.

11 Use a permanent ink marker to write the date and number of hours from the hour meter on the filter element.

Bleed the fuel system:

Note: Before bleeding the system, fill the fuel tank.

12 Loosen the vent plug located on the fuel filter/water separator head.

13 Operate the priming lever of the fuel lift pump until fuel, free from air, comes from the vent plug. Tighten the vent plug.

14 Loosen the air vent screw, located on top of the fuel injection pump.

15 Tighten the air vent screw when air stops coming through the air vent.

16 Clean up any diesel fuel that may have spilled during the bleeding procedure and dispose of properly.

17 Start the engine from ground controls and check for leaks.

CHECKLIST C PROCEDURES REV E

C-6
Perform Engine Maintenance - GM and Ford Models

Engine specifications require that this procedure be performed every 800 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

GM Models:
Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007).

GM 3.0L Operator Handbook	
Genie part number	77738

Ford Models:
Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook	
Genie part number	84792

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

Checklist D Procedures

REV E

D-1
Check the Boom Wear Pads

Maintaining the boom wear pads in good condition is essential to safe machine operation. Wear pads are placed on boom tube surfaces to provide a low friction, replaceable wear pad between moving parts. Improperly shimmed wear pads or continued use of extremely worn wear pads may result in component damage and unsafe operating conditions.

Boom wear pad specifications	Minimum
Primary Boom	
Top, bottom and side wear pads	5/8 inch 15.9 mm
Primary Extension Boom	
Top wear pads	5/8 inch 15.9 mm
Side wear pads	1/2 inch 12.7 mm
Secondary Boom	
Top wear pads	1/2 inch 12.7 mm
Side and bottom wear pads	7/8 inch 22.2 mm
Secondary Extension Boom	
Top wear pads	5/8 inch 15.9 mm
Side wear pads	1/2 inch 12.7 mm

1 Start the engine from the ground controls.

2 Raise the end of the boom to a comfortable working height (chest high), then extend the boom 1 foot / 30 cm.

3 Measure each wear pad.

⊙ Result: Replace the wear pad if it is less than specification. If the wear pad is not less than specification, shim as necessary to obtain minimum clearance with no binding.

Note: The minimum shim clearance for the primary boom wear pads is .030 inch / .76 mm and the maximum allowable shim clearance is .090 inch / 2.29 mm. The minimum shim clearance for the secondary boom wear pads is .030 inch / .76 mm and the maximum allowable shim clearance is .125 inch / 3.2 mm.

Note: If the wear pads are still within specification, refer to refer to Repair Procedure 4-2, *How to Shim the Boom.*

4 Extend and retract the boom through the entire range of motion to check for tight spots that may cause binding or scraping of the boom.

Note: Always maintain squareness between the outer and inner boom tubes.

CHECKLIST D PROCEDURES REV E

D-2
Check the Free-wheel Configuration

Proper use of the free-wheel configuration is essential to safe machine operation. The free-wheel configuration is used primarily for towing. A machine configured to free-wheel without operator knowledge may cause death or serious injury and property damage.

⚠WARNING Collision hazard. Select a work site that is firm and level.

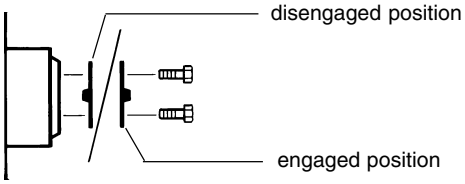
NOTICE Component damage hazard. If the machine must be towed, do not exceed 2 mph / 3.2 km/h.

1 Chock the steer wheels to prevent the machine from rolling.

2 Center a lifting jack of ample capacity (20,000 lbs / 10,000 kg) under the drive chassis between the wheels at the non-steer end of the machine.

3 Lift the wheels off the ground and place blocks under the drive chassis for support.

4 Disengage the drive hubs by turning over the drive hub disconnect caps on each non-steer wheel hub.



5 Manually rotate each non-steer wheel.

⊙ Result: Each non-steer wheel should rotate with minimum effort.

6 Re-engage the drive hubs by turning over the hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the blocks.

⚠WARNING Collision hazard. Failure to re-engage the drive hubs could result in death or serious injury and property damage.

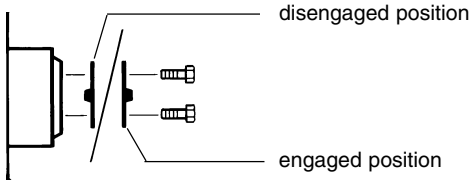
4WD models:

7 Chock the non-steering wheels to prevent the machine from rolling.

8 Center a lifting jack with a minimum capacity of 25,000 lbs / 12000 kg under the drive chassis between the steer wheels.

9 Lift the wheels off the ground and then place blocks under the drive chassis for support.

10 Disengage the drive hubs by turning over the drive hub disconnect caps on each steer wheel hub.



11 Manually rotate each steer wheel.

⊙ Result: Each steer wheel should rotate with minimum effort.

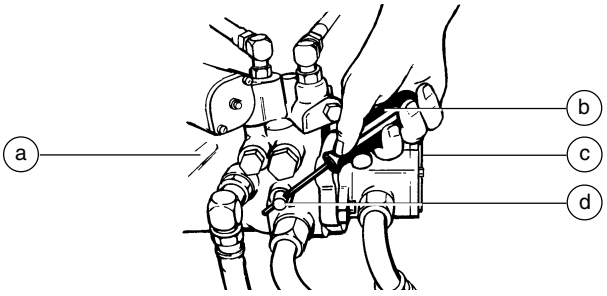
12 Re-engage the drive hubs by turning over the drive hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the blocks.

⚠WARNING Collision hazard. Failure to re-engage the drive hubs could result in death or serious injury and property damage.

All models:

13 Be sure the free-wheel valve on the drive pump is closed (clockwise).

Note: The free-wheel valve is located on the drive pump, and should always remain closed.



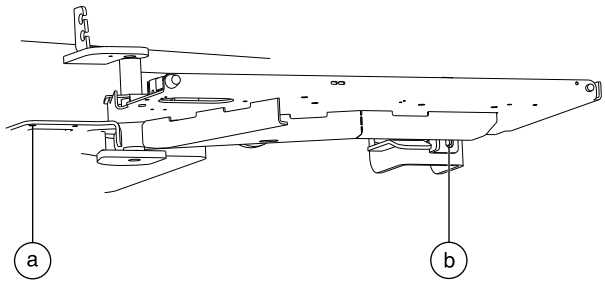
a drive pump
b screwdriver
c lift pump
d free-wheel valve

D-3
Check the Turntable Rotation Bearing Bolts

Maintaining proper torque on the turntable bearing bolts is essential to safe machine operation. Improper bolt torque could result in an unsafe operating condition and component damage.

1 Raise the secondary boom approximately 8 feet / 2.4 m.

2 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

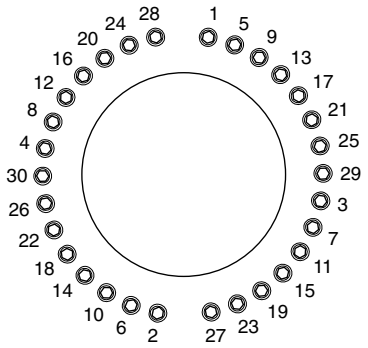
3 Locate the engine tray anchor hole at the pivot end of the engine tray.

CHECKLIST D PROCEDURES REV E

4 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

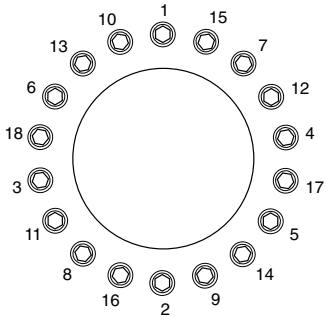
5 Confirm that each turntable mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence
(from above turntable)

6 Lower the boom to the stowed position.

7 Confirm that each bearing mounting bolt under the drive chassis is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence
(from below chassis)

8 Lower the secondary boom to the stowed position.

9 Remove the engine tray retaining fastener from the engine tray anchor hole at the pivot end of the engine tray.

10 Swing the engine tray in towards the machine.

11 Install the bolt that was just removed into the original hole to secure the engine tray.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

REV E CHECKLIST D PROCEDURES

D-4
Inspect for Turntable Bearing Wear

Periodic inspection of turntable bearing wear is essential to safe machine operation, good machine performance and service life. Continued use of a worn turntable bearing could create an unsafe operating condition, resulting in death or serious injury and component damage.

Note: Perform this procedure with the machine on a firm, level surface and the boom in the stowed position.

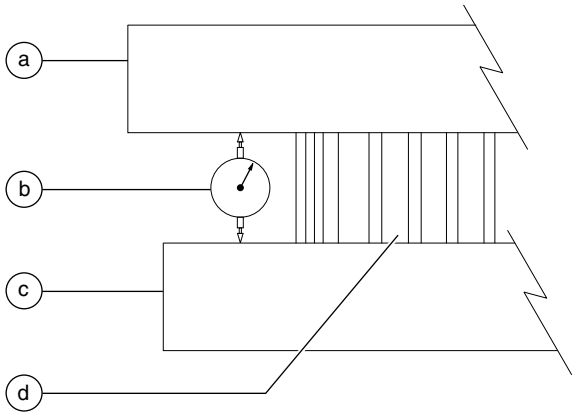
1 Grease the turntable bearing. See A-10, *Grease the Turntable Bearing and Rotate Gear.*

2 Torque the turntable bearing bolts to specification. See D-3, *Check the Turntable Rotation Bearing Bolts.*

3 Start the machine from the ground controls and fully elevate, but do not extend, the primary boom and jib. The riser should remain in its stowed position.

4 Place a dial indicator between the drive chassis and the turntable at a point that is directly under, or inline with, the boom and no more than 1 inch / 2.5 cm from the bearing.

Note: To obtain an accurate measurement, place the dial indicator no more than 1 inch / 2.5 cm from the turntable rotation bearing.



a turntable
b dial indicator
c drive chassis
d turntable rotation bearing

5 Adjust the dial indicator need to the "zero" position.

6 Elevate the riser, but do not extend it. Move the primary boom and jib to horizontal and fully extend.

7 Note the reading on the dial indicator.

⊙ Result: The measurement is less than 0.063 inch / 1.6 mm. The bearing is good.

⊠ Result: The measurement is more than 0.063 inch / 1.6 mm. The bearing is worn and needs to be replaced.

8 Move the boom sections to the positions indicated in step 3. Visually inspect the dial indicator to be sure the needle returns to the "zero" position.

9 Remove the dial indicator and rotate the turntable 90°.

10 Repeat steps 4 through 9 until the rotation bearing has been checked in at least four equally spaced areas 90° apart.

11 Lower the boom to the stowed position and turn the machine off.

12 Remove the dial indicator from the machine.

D-5
Replace the Drive Hub Oil

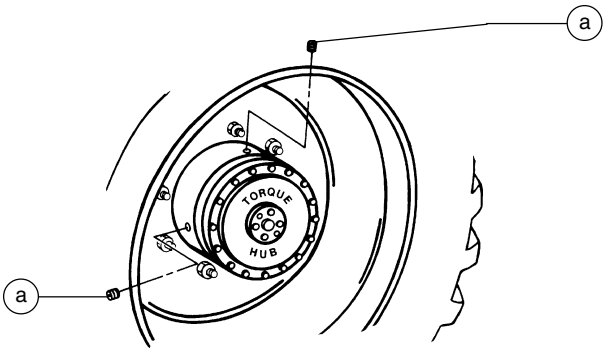
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

Drive Hubs:

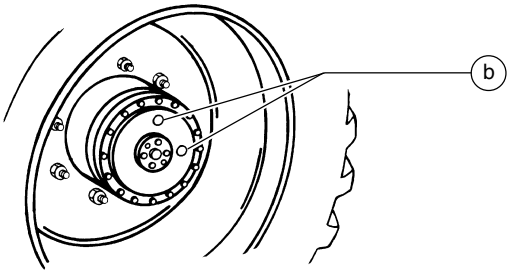
1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.

2 Remove both plugs and drain the oil into a suitable container.

3 Drive the machine until one plug is at the top and the other is at 90 degrees.



a models with pipe plugs



b models with o-ring plugs

REV E CHECKLIST D PROCEDURES

4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side hole. Apply pipe thread sealant to the plugs. Install the plugs.

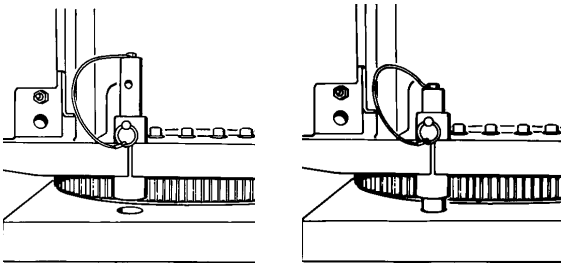
5 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.

Models with O-ring plugs: Install the plugs into the drive hub.

6 Repeat steps 1 through 5 for the other drive hub.

Turntable Rotate Drive Hub:

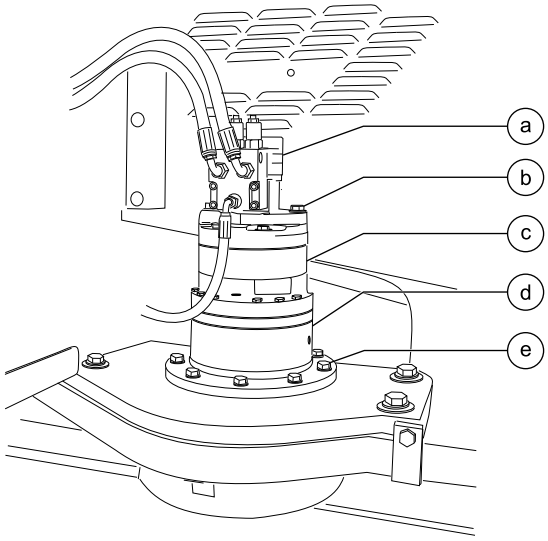
1 Secure the turntable from rotating with the turntable rotation lock pin.



unlocked locked

2 Remove the motor/brake mounting bolts, and then remove the motor and brake from the drive hub and set them to the side.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.



a motor
b motor/brake mounting bolts
c brake

3 Remove the drive hub mounting bolts, and use a lifting device to remove the drive hub from the machine.

4 Remove the plug from the side of the drive hub. Drain the oil from the hub into a container of adequate capacity. Refer to Section 2, *Specifications.*

5 Install the drive hub. Torque the drive hub mounting bolts to specification. Refer to Section 2, *Specifications.*

6 Install the brake and motor onto the drive hub. Torque the motor/brake mounting bolts to specification. Refer to Section 2, *Specifications.*

7 Fill the hub with oil from the side hole until the oil level is even with the bottom of the hole. Apply pipe thread sealant to the plug. Install the plug.

8 Adjust turntable rotation gear backlash. Refer to Repair Procedure 9-1, *How to Adjust the Turntable Rotation Gear Backlash.*

CHECKLIST D PROCEDURES REV E

D-6

Perform Engine Maintenance

Engine specifications require that this procedure be performed every 1000 hours.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547)..

Deutz 913 Operation Manual	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Deutz TD2011 Operation Manual	
Genie part number	139320

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00) OR the *Perkins 804D Operation and Maintenance Manual* (Perkins part number SEBU8324-00).

Perkins 704-30 User's Handbook	
Genie part number	101840
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332
Perkins 804D-33 Operation and Maintenance Manual	
Genie part number	228841

Continental Models:

Required maintenance procedures and additional engine information are available in the *Continental TME27 Owner's Manual* (Continental part number WM10303).

Continental TME27 Owner's Manual	
Genie part number	111901

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

D-7
Replace the Hydraulic Filter Elements

Genie requires that this procedure be performed annually or every 1000 hours, whichever comes first. Perform this procedure more often if dusty conditions exist.

Replacement of the hydraulic filters is essential for good machine performance and service life. A dirty or clogged filter may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

Note: Perform this procedure with the engine off.

Hydraulic return filter:

1 Open the ground controls side turntable cover and locate the hydraulic return filter mounted on the hydraulic tank.

2 Place a suitable container under the hydraulic tank return filter.

3 Remove the filter with an oil filter wrench.

4 Apply a thin layer of fresh oil to the gasket of the new oil filter.

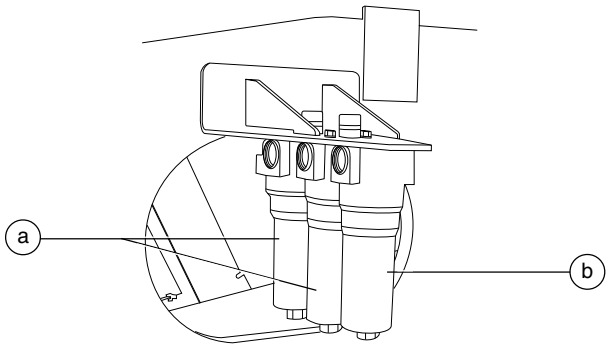
5 Install the new hydraulic return filter element and tighten it securely by hand. Clean up any oil that may have spilled during the installation procedure.

6 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter.

Medium and high pressure filters:

Note: The medium pressure filter is for the charge pump. One high pressure filter is for all boom and steer functions. The other high pressure filter is for the oscillating axle circuit and flatform manifold.

7 Open the engine side turntable cover and locate the three filters mounted to the bulkhead.



a high pressure filters
b medium pressure filter

8 Place a suitable container under the filters.

9 Remove the filter housing by using a wrench on the nut provided on the bottom of the housing.

CHECKLIST D PROCEDURES REV E

10 Remove the filter element from the housing.

11 Inspect the housing seal and replace it if necessary.

12 Install the new medium and high pressure filter elements into the housings and tighten them securely.

13 Clean up any oil that may have spilled during the installation procedure.

14 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter housings.

15 Start the engine from the ground controls.

16 Inspect the filter housings and related components to be sure that there are no leaks.

Checklist E Procedures

REV D

E-1
Test or Replace the Hydraulic Oil

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.**

Note: Perform this procedure with the boom in the stowed position.

1 **GM, Ford and Continental models:** Turn the valve on the LPG tank clockwise to the off position
(if equipped). Then slowly disconnect the hose from the LPG tank.

2 **GM, Ford and Continental models:** Open the clamps from the LPG tank straps and remove the LPG tank from the machine (if equipped).

3 **Models with hydraulic tank shut-off valves:** Locate the two hydraulic tank valves at the hydraulic tank through the access hole underneath the turntable. Close the valves.

4 Place a suitable container underneath the hydraulic tank.

5 Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

6 Tag, disconnect and plug the two suction hoses and supply hose for the auxiliary pump from the hydraulic tank. Cap the fittings on the tank.

Note: The hoses can be accessed through the access hole under the turntable.

7 Tag, disconnect and plug the return filter hydraulic hose at the return filter. Cap the fitting on the filter housing.

8 Remove the ground controls side turntable cover.

9 Support the hydraulic tank with an appropriate lifting device.

10 Remove the hydraulic tank mounting fasteners.

11 Remove the hydraulic tank from the machine.

⚠WARNING Crushing hazard. The hydraulic tank could become unbalanced and fall if not properly supported when removed from the machine.

12 Remove the hydraulic return filter housing mounting fasteners. Remove the hydraulic return filter housing from the hydraulic tank.

13 Remove the suction strainers from the tank and clean them using a mild solvent.

14 Rinse out the inside of the tank using a mild solvent.

CHECKLIST E PROCEDURES REV D

15 Install the suction strainers using a thread sealant on the threads.

16 Install the drain plug using a thread sealant on the threads.

17 Install the hydraulic return filter housing onto the hydraulic tank.

18 Install the hydraulic tank onto the machine.

19 Install the two suction hoses to the suction strainers.

20 Install the supply hose for the auxiliary power unit and the return filter hose.

Models with hydraulic tank shut-off valves:

21 Open the two hydraulic tank valves at the hydraulic tank.

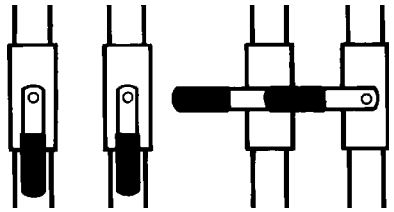
22 Fill the tank with hydraulic oil until the level is within the top 2 inches / 5 cm of the sight gauge. Do not overfill.

23 Clean up any oil that may have spilled.

24 Prime the pump. Refer to Repair Procedure 7-2, *How to Prime the Pump.*

Note: Always use pipe thread sealant when installing the suction hose fittings and the drain plug.

NOTICE Component damage hazard. The engine must not be started with the hydraulic tank shut-off valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



REV D CHECKLIST E PROCEDURES

E-2
Grease the Steer Axle Wheel Bearings, 2WD Models

Genie specifications require that this procedure be performed every 2000 hours or 2 years, whichever comes first.

Maintaining the steer axle wheel bearings is essential for safe machine operation and service life. Operating the machine with loose or worn wheel bearings may cause an unsafe operating condition and continued use may result in component damage. Extremely wet or dirty conditions or regular steam cleaning and pressure washing of the machine may require that this procedure be performed more often.

1 Loosen the wheel lug nuts. Do not remove them.

2 Block the non-steer wheels, then center a lifting jack with a minimum capacity of 25,000 lbs / 12000 kg under the drive chassis between the steer wheels.

3 Raise the machine 6 inches / 15 cm Place blocks under the drive chassis for support.

4 Remove the lug nuts. Remove the tire and wheel assembly.

5 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.

⊙ Result: There should be no side to side or up and down movement.

Skip to step 10 if there is no movement.

6 Remove the dust cap from the hub. Remove the cotter pin from the castle nut.

7 Tighten the castle nut to 158 ft-lbs / 214 Nm to seat the bearings.

Note: Rotate the hub by hand while torqueing the castle nut to make sure the bearings seat properly.

8 Loosen the castle nut one full turn and then torque to 35 ft-lbs / 47 Nm.

9 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.

⊙ Result: If there is no side to side or up and down movement, continue to step 11 and grease the wheel bearings.

⊠ Result: If there is side to side or up and down movement, continue to step 11 and replace the wheel bearings with new ones.

Note: When replacing a wheel bearing, both the inner and outer bearings, including the pressed-in races, must be replaced.

10 Remove the dust cap from the hub. Remove the cotter pin from the castle nut.

11 Remove the castle nut.

12 Pull the hub off of the spindle. The washer and outer bearing should fall loose from the hub.

13 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.

CHECKLIST E PROCEDURES REV D

14 Pack both bearings with clean, fresh grease.

15 Place the large inner bearing into the rear of the hub.

16 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.

Note: Always replace the bearing grease seal when removing the hub.

17 Slide the hub onto the yoke spindle.

NOTICE Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

18 Place the outer bearing into the hub.

19 Install the washer and castle nut.

20 Tighten the slotted nut to 158 ft-lbs / 214 Nm to seat the bearings.

21 Loosen the castle nut one full turn and then torque to 35 ft-lbs / 47 Nm.

22 Install a new cotter pin. Bend the cotter pin to lock it in.

23 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications*.

E-3
Perform Engine Maintenance

Engine specifications require that this procedure be performed every 2000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547)..

Deutz 913 Operation Manual	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Deutz TD2011 Operation Manual	
Genie part number	139320

REV D CHECKLIST E PROCEDURES

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00) OR the *Perkins 804D Operation and Maintenance Manual* (Perkins part number SEBU8324-00).

Perkins 704-30 User's Handbook	
Genie part number	101840

Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

Perkins 804D-33 Operation and Maintenance Manual	
Genie part number	228841

Ford Models:

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook	
Genie part number	84792

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

E-4
Perform Engine Maintenance - Ford Models

Engine specifications require that this procedure be performed every 2400 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Ford Models

Required maintenance procedures and additional engine information are available in the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

Ford LRG-425 EFI Operator Handbook	
Genie part number	84792

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST E PROCEDURES REV D

E-5
Perform Engine Maintenance - Deutz and Perkins Models

Engine specifications require that this procedure be performed every 3000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Deutz Models:

Required maintenance procedures and additional engine information are available in the *Deutz 913 Operation Manual* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547)..

Deutz 913 Operation Manual	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Deutz TD2011 Operation Manual	
Genie part number	139320

Perkins Models:

Required maintenance procedures and additional engine information are available in the *Perkins 704-30 User's Handbook* (Perkins part number TPD 1336E) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00) OR the *Perkins 804D Operation and Maintenance Manual* (Perkins part number SEBU8324-00).

Perkins 704-30 User's Handbook	
Genie part number	101840
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332
Perkins 804D-33 Operation and Maintenance Manual	
Genie part number	228841

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

E-6
Perform Engine Maintenance - Deutz 2011 Models

Engine specifications require that this procedure be performed every 5000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information are available in the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547).

Deutz BF4L2011 Operation Manual	
Genie part number	84794
Deutz TD2011 Operation Manual	
Genie part number	139320

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

CHECKLIST E PROCEDURES REV D

E-7
Perform Engine Maintenance - Deutz 2011 Models

Engine specifications require that this procedure be performed every 6000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information are available in the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Deutz TD2011 Operation Manual* (Deutz part number 0312 3547).

Deutz BF4L2011 Operation Manual	
Genie part number	84794

Deutz TD2011 Operation Manual	
Genie part number	139320

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

E-8
Perform Engine Maintenance - Deutz BF4L2011 Models

Engine specifications require that this procedure be performed every 12000 hours.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information are available in the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz BF4L2011 Operation Manual	
Genie part number	84794

To access the engine:

1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

2 Install the fastener that was just removed through the engine tray and into the engine tray anchor hole in the turntable.

⚠WARNING Crushing hazard. Failure to install the fastener into the engine tray anchor hole to secure the engine tray from moving could result in death or serious injury.

Repair Procedures

Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Use only Genie approved replacement parts.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Turntable rotated with the boom between the circle-end (yellow arrow) wheels
  - Turntable secured with the turntable rotation lock pin
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power supply disconnected from the machine

About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. To re-assemble, perform the disassembly steps in reverse order.

Symbols Legend

Safety alert symbol—used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION With safety alert symbol—used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

Note: Used to indicate operation or maintenance information.

⊙ Indicates that a specific result is expected after performing a series of steps.

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

Display Module

REV E

This table lists the various screens and menu options of the operating software. Some display menus are for informational purpose only, while others can be used to change the machine operating parameters. The key switch must be in the off position before entering the programming mode.
Always exit the programming mode before turning the red Emergency Stop button to the off position.

Screen	To Enter	Information Displayed	Range
	Power on, configuration message	Boom Type(Z80,4WS,ETC.), Engine Type, Software Version	
Operator	Default	Hour meter (On power up) Engine Speed & Engine Oil Pressure PSI (English) & Engine Oil Pressure kPa (metric) & Engine Temperature F (English) @ Engine Temperature C (metric) @ Primary Boom Angle Sensor TT Level Sensor X TT Level Sensor Y Platform Angle Battery Volts	Engine temperature is not displayed until engine is above 100°F / 38°C
Status	With the key switch on, press the + and − at the same time	Hydraulic Pressure PSI Hydraulic Pressure kPa Primary Boom Zone Primary Boom Length Secondary Boom Length Secondary Boom Angle	0-4500 PSI 0-31000 kPa <=0 DEG, >0 DEG, =65 DEG = 0', >0', >22' = 0 FT, > 0 FT = 0 DEG, .>0 DEG, = 65 DEG

REV E DISPLAY MODULE

Screen	To Enter	Information Displayed	Range
Unit/ Language	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ −↵ −↵ +↵.	Metric/English (measurement units)	Use +/- buttons to change
		Display Language	English, German, French, Spanish, Portuguese, Italian, Dutch, and Swedish. Check new translations. Check scrolling of messages in Spanish with more than 75 characters.
Drive Functions	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the↵ button and press +↵ +↵ ↵↵ ↵↵.	Forward Not Stowed Drive Speed pct	120% (default) 50% min
		Forward Low Drive Speed pct	120% (default) 50% min
		Forward High Drive Speed pct	120% max and 50% min, 100%(default)
		Reverse Not Stowed Drive Speed pct	120% max and 50% min, 100% (default)
		Reverse Low Drive Speed pct	120% max and 50% min, 100% (default)
		Reverse High Drive Speed pct	120% max and 50% min, 100% (default)
		Drive Accel pct	125% max and 25% min, 100% (default)
		Drive Decel pct	125% max and 25% min, 100% (default)
		Speed limit on steer angle	100% max and 0% min, 75% (default)

DISPLAY MODULE REV E

Screen	To Enter	Information Displayed	Range
Boom Functions Speeds	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ +↵ −↵ −↵.	Primary Boom Up speed Stowed	120% max and 50% min, 100% (default)
		Primary Boom Up speed not Stowed	120% max and 50% min, 100% (default)
		Primary Boom Down speed Stowed	120% max and 50% min, 100% (default)
		Primary Boom Down speed not Stowed	120% max and 50% min, 100% (default)
		Primary Boom Extend Speed	120% max and 50% min, 100% (default)
		Primary Boom Retract Speed	120% max and 50% min, 100% (default)
		Secondary Boom Up Speed Stowed	120% max and 50% min, 100% (default)
		Secondary Boom Up Speed Not Stowed	120% max and 50% min, 100% (default)
		Secondary Boom Down Speed Stowed	120% max and 50% min, 100% (default)
		Secondary Boom Down Speed Not Stowed	120% max and 50% min, 100% (default)
		Secondary Boom Ext Speed	120% max and 50% min, 100% (default)
		Secondary Boom Ret Speed	120% max and 50% min, 100% (default)
		TT-Rotate speed Retracted	120% max and 50% min, 100% (default)
		TT-Rotate speed Not Retracted	120% max and 50% min, 100% (default)
		Jib Up/Down speed	120% max and 75% min, 100% (default)

Screen	To Enter	Information Displayed	Range
Lift Functions Ramps	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ +↵ ↓↵ ↓↵.	Primary Boom Up/Down ramp accel %	150% max and 50% min, 100% (default) 5% increment
		Primary Boom Up/Down ramp decel %	150% max and 50% min, 100% (default) 5% increment
		Primary Boom Extend/Retract ramp accel %	150% max and 50% min, 100% (default) 5% increment
		Primary Boom Extend/Retract ramp decel %	150% max and 50% min, 100% (default) 5% increment
		Secondary Boom ramp accel %	150% max and 50% min, 100% (default) 5% increment
		Secondary Boom ramp decel %	150% max and 50% min, 100% (default) 5% increment
		TT-Rotate ramp accel %	150% max and 50% min, 100% (default) 5% increment
		TT-Rotate ramp decel %	150% max and 50% min, 100% (default) 5% increment
		Jib Up/Down ramp decel %	150% max and 50% min, 100% (default) 5% increment

DISPLAY MODULE REV E

Screen	To Enter	Information Displayed	Range
Valve calibration	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press −↵ −↵ ↵ ↵.	Reset Drive valve defaults (YES/NO) Reset Primary Boom Up/Down valve defaults (YES/NO) Reset Primary Boom Ext/Ret defaults (YES/NO) Reset Secondary Boom valve defaults (YES/NO) Reset TT Rotate valve defaults (YES/NO) Allow Primary Boom Up/Down speed calibration (YES/NO) Allow Primary Boom Ext/Ret speed calibration (YES/NO) Allow Secondary Boom Up/Down speed calibration (YES/NO) Allow TT Rotate speed calibration (YES/NO) Reset Drive joystick defaults (YES/NO) Reset Pri. Boom Up/Down joystick defaults (YES/NO) Reset Pri. Boom Ext/Ret joystick defaults (YES/NO) Reset Secondary Boom joystick defaults (YES/NO) Reset TT Rotate joystick defaults (YES/NO) Reset Steer joystick defaults (YES/NO)	

Screen	To Enter	Information Displayed	Range
Sensor calibration	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ ↵↵ +↵.	Set Unit levels to gravity Unit Level Y-axis Millivolts per degree Unit Level X-axis Millivolts per degree Set Platform level to gravity Platform Level Sensor Millivolts per degree Reset Blue End Blue Side Steer Sensor (YES/NO) Reset Yellow End Blue Side Steer Sensor (YES/NO) Reset Blue End Yellow Side Steer Sensor (YES/NO) Reset Yellow End Yellow Side Steer Sensor (YES/NO) Reset All Steer Sensors (YES/NO) Reset Primary Boom Angle Sensor (YES/NO) Primary Boom angle = 40deg (YES/NO) Primary Boom angle = 70deg (YES/NO)	
Default Reset	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press −↵ −↵ ↓↵ ↓↵.	Reset Drive Functions (YES/NO) Reset Boom Function Speeds (YES/NO) Reset Lift Function Ramps (YES/NO) Reset All (Machine Require Calibration) (YES/NO) Clear All Safety Switch Faults (YES/NO)	

DISPLAY MODULE REV E

Screen	To Enter	Information Displayed	Range
Options	With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the↵ button and press −| −| +| +|.	Boom Length Limit: No Limit (NO LT), Secondary Extend disabled (EXT LT), Secondary Function disabled (SEC LT)	
		AC Generator Options: (NONE, BELT, HI_LO, HYDRL, GHG10)	
		Alarm: No, Motion (MO AL), Travel (TR AL), Descent (DE AL), Travel and Decent (TD AL)	
		Lift/Drive OPT: No (NO CO), Drive cut out while not stowed (DCONS), Lifting or Driving (LORDR)	
		Aux Drive OPT: (YES/NO)	
		Proximity Kill Switch (NONE/PROX)	
		Platform Overload (NONE PLFTS)	
		Work Light: (YES/NO)	
		Flashing Beacon: (YES/NO)	
		Drive Lights: (YES/NO)	
		Disable Steer Mode Change while Driving: (YES/NO)	30.0 max and 0.0 min, 10.0 (default)
		Rocker Joystick Steering (YES/NO)	0 to 30 minutes
		Chassis Tilt Cutout (YES/NO)	0 to 10 minutes, 10 is the default Only shown when Hydraulic gen is selected.
		Foot Switch Lockout 0 to 30 minutes	Holding + or - button will cause display to scroll through options or increment number settings automatically. 0.2 min inc/dec

Platform Controls

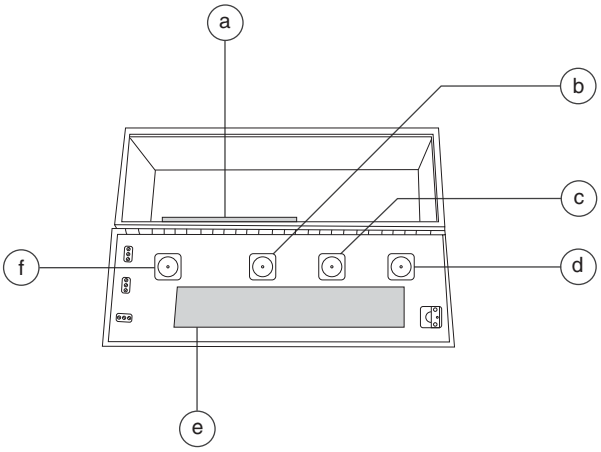
REV F

The platform controls contains two printed circuit boards:

The **LED circuit board** is mounted to the underside of the control box lid which contains the LED's. The LED circuit board sends the input from the operator to the platform controls ECM circuit board (PCON). The ECM circuit board (PCON) sends the data to the turntable control box (TCON) for processing.

The **platform controls ECM circuit board (ALC-1000)** communicates with the turntable controls. The joystick controllers at the platform controls utilize Hall Effect technology and require no adjustment. The operating parameters of the joysticks are stored in memory at the turntable controls. If a joystick controller error occurs or if a joystick is replaced, it will need to be calibrated before that particular machine function will operate. See 1-3, *How to Calibrate a Joystick.*

Each joystick controller should operate smoothly and provide proportional speed control over its entire range of motion.



a platform controls ALC-1000 circuit board
b primary boom extend/retract joystick
c secondary boom up/extend and down/retract joystick
d drive/steer joystick controller
e LED circuit board
f primary boom up/down and turntable rotate left/right joystick

1-1

ALC-1000 Circuit Board

Note: When the ALC-1000 circuit board is replaced, the joystick controllers will need to be calibrated. See 1-3, *How to Calibrate a Joystick.*

How to Remove the ALC-1000 Circuit Board

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Locate the cables that connect to the bottom of the control box. Tag each cable and its location at the control box.

3 Tag and disconnect the cables from the bottom of the platform control box.

4 Remove the control cable plug retaining fasteners from the bottom of the platform control box.

5 Remove the platform control box lid retaining fasteners. Open the control box lid.

6 Locate the ALC-1000 circuit board mounted to the inside of the platform control box.

7 Attach a grounded wrist strap to the ground screw inside the platform control box.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

8 Carefully disconnect the wire connectors from the circuit board.

9 Remove the ALC-1000 circuit board mounting fasteners.

10 Carefully remove the ALC-1000 circuit board from the platform control box.

How to Remove the LED Circuit Board

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Remove the platform control box lid retaining fasteners. Open the control box lid.

3 Locate the LED circuit board mounted to the inside of the platform control box lid.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

4 Carefully tag and disconnect the two ribbon cables from the membrane circuit board.

5 Remove the LED circuit board retaining fasteners.

6 Carefully remove the LED circuit board from the platform control box lid.

1-2 Membrane Decal

How to Replace the Membrane Decal

The membrane decal is a special decal that consists of a decal with an electronic membrane on the backside. The membrane contains touch sensitive areas that, when pushed, activates the machine functions. The membrane buttons activate machine functions similar to toggle switches, but do not have any moving parts.

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Remove the platform control box lid retaining fasteners. Open the control box lid.

3 Carefully tag and disconnect the two ribbon cables from the membrane circuit board.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

4 Close the control box lid.

5 Remove the platform controls decal from the platform control box.

6 Carefully remove the membrane decal from the platform control box while guiding the ribbon cables out of the control box lid.

7 Remove any decal adhesive from the control box lid with a mild solvent.

Note: Do not allow any solvent to come in contact with the membrane circuit board.

8 Install the new membrane decal while guiding the ribbon cables through the control box lid.

Note: Be sure that all LED locations on the membrane decal align with the LEDs on the membrane circuit board.

9 Install a new platform controls decal over the membrane decal.

10 Open the control box lid and carefully connect the ribbon cables from the membrane decal to the membrane circuit board.

1-3 Joysticks

How to Calibrate a Joystick

The joystick controllers on this machine utilize digital Hall Effect technology for proportional control. If a joystick controller is disconnected or replaced, it must be calibrated before that particular machine function will operate.

Note: The joystick must be calibrated before the threshold, max-out or ramping can be set.

Note: After each joystick is calibrated, check the display at the ground control box. There should be no calibration faults shown on the display. If calibration faults exist, repeat steps 1 through 8 for that joystick controlled function.

Note: Perform this procedure with the engine off.

Drive functions:

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET DRIVE JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the drive/steer joystick.

7 Move the drive/steer joystick full stroke in the forward direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the drive/steer joystick full stroke in the reverse direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

Steer functions:

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET STEER JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the drive/steer joystick.

7 Move the drive/steer joystick or thumb rocker switch (if equipped) full stroke in the left direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the drive/steer joystick or thumb rocker switch (if equipped) full stroke in the right direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

Primary boom extend/retract functions:

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET PRIMARY BOOM EXTEND/RETRACT JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the primary boom extend/retract joystick.

7 Move the primary boom extend/retract joystick full stroke in the extend direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the primary boom extend/retract joystick full stroke in the retract direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

Secondary boom up/down and extend/retract functions:

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET SECONDARY BOOM JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the secondary boom up/down and extend/retract joystick.

7 Move the secondary boom up/down and extend/retract joystick full stroke in the up/extend direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the secondary boom up/down and extend/retract joystick full stroke in the down/retract direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

Primary boom up/down functions:

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET PRIMARY BOOM UP/DOWN JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the primary boom/turntable rotate joystick.

7 Move the boom/turntable rotate joystick full stroke in the up direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the boom/turntable rotate joystick full stroke in the down direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

Turntable rotate functions:

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET TURNTABLE ROTATE LEFT/RIGHT JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the primary boom/turntable rotate joystick.

7 Move the boom/turntable joystick full stroke in the left direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the boom/turntable joystick full stroke in the right direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

How to Reset a Proportional Valve Coil Default

Note: This procedure only needs to be performed if a proportional valve has been replaced.

Note: After the valve coil defaults have been set, each machine function threshold and default function speed must be set. See *How to Set the Function Thresholds and Default Function Speeds.*

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until the function valve that needs to be reset is displayed. Press the [+] button to select YES, then press the [↵] button.

How to Set the Function Thresholds and Default Functions Speeds

Note: Before the threshold and default function speeds can be set, the boom function proportional valve coil defaults must be set first.
See *How to Reset a Proportional Valve Coil Default.*

Note: If a boom function proportional valve coil has not been replaced and just want to reset the function speed to original factory settings, begin with step 10.

Note: Perform this procedure with the machine parked on a firm, level surface which is free of obstructions.

1 Start the engine from the platform controls.

2 Press down the foot switch.

Note: Be sure the engine rpm is set to foot switch activated high idle.

Function threshold:

3 Select a joystick controlled function that needs to have the threshold set.

4 Slowly move the joystick off center in either direction just until the machine function starts to move, then move the joystick very slowly towards the neutral or center position just before the machine function stops.
Do not let go of the joystick.

5 While holding the joystick in position, press the engine start button at the platform controls to set the joystick controller threshold.

6 Repeat steps 3 through 5 for each joystick controlled machine function (primary boom up/down and turntable rotate left/right, primary boom extend/retract, secondary up/down and extend/retract, drive forward/reverse and steer left/right).

7 Once the threshold has been set, press and hold the engine start button until the engine shuts off. Do not press the red Emergency Stop button.

Note: Approximately 3 seconds after the engine shuts off, the alarm at the ground controls will sound to indicate the threshold settings are being saved in memory. Release the button.

8 At the ground controls, turn the key switch to the off position, wait a moment and then turn the key switch to platform controls.

9 Check the display at the ground controls to be sure there are no calibration faults.

⊙ Result: There should be no calibration faults shown on the display. If calibration faults exist, repeat this procedure.

Function speeds:

Note: Be sure the machine is in the stowed position and the platform is rotated between the round end tires.

10 Start the engine from the platform controls.

11 Select a boom function that needs the function speed set.

12 **Boom up/down functions:** Move the joystick full stroke in the up direction. When the alarm sounds, move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

Boom extend/retract functions: Raise the primary boom until it no longer rests on the boom cradle. Then move the joystick full stroke in the extend direction. When the alarm sounds, move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

Turntable rotate functions: Raise the primary boom until it no longer rests on the boom cradle. Move the joystick full stroke in either the left or right direction until a drive enable zone is reached. Move the joystick in the opposite direction full stroke until the alarm sounds. Now move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

13 Once the function speeds have been set, press and hold the engine start button until the engine shuts off. Do not press the red Emergency Stop button.

Note: Approximately 3 seconds after the engine shuts off, the alarm at the ground controls will sound to indicate the speed settings are being saved in memory. Release the button.

14 At the ground controls, turn the key switch to the off position, wait three seconds and then turn the key switch to platform controls.

15 Inspect the display at the ground controls to be sure there are no calibration faults.

Note: There should be no calibration faults shown on the display. If calibration faults exist, repeat this procedure.

How to Adjust the Function Speeds

Note: Perform this procedure with the boom in the stowed position. Refer to Section 2, *Specifications.*

1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to ground controls.

3 Press the plus button [+] twice, then press the minus button [−] twice.

4 Press the scroll button [↓] until the function to be adjusted is displayed.

5 Press the plus button [+] to increase the speed or press the minus button [−] to decrease the speed.

6 Press the enter button [↵] to save the setting in memory.

7 Perform this procedure until the machine function speed meets specification.

How to Adjust the Function Ramp Rate Setting

The ramp rate setting of a joystick controls the time at which it takes for the joystick to reach maximum output, when moved out of the neutral position. The ramp rate settings of a joystick can be changed to compensate for hydraulic pump wear to maintain peak performance from the machine. Refer to Section 2, *Specifications.*

Note: Perform this procedure with the boom in the stowed position.

1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to ground controls.

3 Press the plus button [+] twice, then press the scroll button [↓] twice.

4 Press the scroll button [↓] until the function to be adjusted is displayed.

5 Press the plus button [+] to increase the ramp rate or press the minus button [−] to decrease the ramp rate.

6 Press the enter button [↵] to save the setting in memory.

7 Perform this procedure until the machine function speed meets specification.

Ramp Rate Specifications

Ramp rate (factory settings)	
Turntable rotate	
accelerate	4 seconds
decelerate	1.0 second
Primary boom up/down	
accelerate	3 seconds
decelerate	0.25 second
Primary boom extend/retract	
accelerate	3 seconds
decelerate	0.75 second
Secondary boom up/down	
accelerate	7 seconds
decelerate	0.75 second
Secondary boom extend/retract	
accelerate	7 seconds
decelerate	0.75 second
Drive	
accelerate	1.5 seconds
decelerate to neutral	0.5 second
decelerate, change of direction	0.5 second
decelerate, coasting	0.75 second
decelerate, braking	2 seconds
decelerate, shift from low to high speed	1 second
decelerate, shift from high to low speed	4 seconds

Platform Components

REV C

2-1 Platform

How to Remove the Platform

1 Separate the foot switch quick disconnect plug.

2 Support the platform with an appropriate lifting device.

3 Locate the cables that connect to the bottom of the control box. Number each cable and its location at the platform control box.

4 Disconnect the cables from the bottom of the platform control box.

5 Remove the platform control box mounting fasteners. Remove the platform control box and set it aside.

6 Remove the air line to platform bracket retaining fasteners (if equipped).

7 Remove the weld cables from the platform (if equipped).

8 Remove the platform mounting fasteners and remove the platform from the machine.

⚠WARNING Crushing hazard. The platform could become unbalanced and fall when it is removed from the machine if it is not properly supported.

2-2 Platform Leveling Cylinder

The platform leveling cylinder maintains platform leveling through the entire range of boom motion. This allows the platform to be level with the turntable. The ECM at the ground controls compares the difference in readings between the platform angle sensor and the turntable level sensor. The ECM at the ground controls sends a signal to the platform controls to open or close the appropriate platform level proportional valve on the platform manifold to maintain a level platform. The platform leveling cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Platform Leveling Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Extend the boom until the platform leveling cylinder barrel-end pivot pin is accessible.

2 Raise the jib boom slightly and place blocks under the platform.

3 Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

Note: Do not rest the entire weight of the boom on the blocks.

4 Tag, disconnect and plug the hydraulic hoses from the platform leveling cylinder at the bulkhead fittings located inside the boom tube at the platform end. Cap the bulkhead fittings on the boom tube.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Remove the pin retaining fasteners from the platform leveling cylinder rod-end pivot pin. Do not remove the pin.

6 Remove the external snap rings from the barrel-end pivot pin. Do not remove the pin.

7 Support and secure the jib boom cylinder to the jib boom with a strap or other suitable device. Protect the cylinder rod from damage.

⚠CAUTION Crushing hazard. The jib boom cylinder will fall if not properly supported when the platform level cylinder rod-end pivot pin is removed.

8 Use a soft metal drift to remove the barrel-end pivot pin.

⚠WARNING Crushing hazard. The platform and jib boom will fall when the platform leveling cylinder barrel-end pivot pin is removed if not properly supported.

9 Support the rod end of the platform level cylinder.

10 Use a soft metal drift to tap the platform level cylinder rod-end pivot pin half way out and lower one of the leveling arms to the ground. Tap the pin the other direction and lower the opposite leveling arm. Do not remove the pin.

11 Use a soft metal drift to remove the platform level cylinder rod-end pivot pin.

12 Carefully pull the platform leveling cylinder out of the boom.

⚠CAUTION Crushing hazard. The jib boom cylinder will fall if not properly supported when the platform level cylinder rod-end pivot pin is removed.

How to Bleed the Platform Leveling Cylinder

Note: Do not start the engine. Use auxiliary power for all machine functions in this procedure.

1 Raise the jib boom to a horizontal position.

2 Push the platform level up and down buttons through two complete platform leveling cycles to remove any air that might be in the system.

2-3 Platform Rotator

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 160 degrees.

How to Remove the Platform Rotator

NOTICE Component damage hazard. Mark the platform mounting weldment and the rotator flange before removing the platform mounting weldment. The platform mounting weldment must be replaced in the exact same position on the rotator flange as it was before removal. If a new rotator is installed or the rotator is disassembled, proper alignment can be achieved by rotating the rotator all the way to the left and then installing the platform mounting weldment all the way in the left position.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the platform. See 2-1, *How to Remove the Platform*.

2 Disconnect the wire harness from the platform angle sensor.

3 Tag, disconnect and plug the hydraulic hoses from the platform rotator manifold. Cap the fittings on the manifold.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Remove the hose and cable clamp from the platform support.

5 Remove the platform manifold mounting fasteners. Lay the platform manifold to the side.

NOTICE Component damage hazard. Cables can be damaged if they are kinked or pinched.

6 Remove the power to platform electrical outlet box bracket mounting fasteners.

7 Remove the power to platform electrical outlet box from the platform and lay it to the side.

8 Remove the weld cable from the platform (if equipped).

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

9 Support the platform mounting weldment. Do not apply any lifting pressure.

10 Remove the eight mounting bolts from the platform mounting weldment.

11 Remove the center bolt and slide the platform mounting weldment off of the platform rotator.

⚠WARNING Crushing hazard. The platform mounting weldment may become unbalanced and fall if it is not properly supported.

12 Support the platform rotator. Do not apply any lifting pressure.

13 Remove the pin retaining fasteners from the jib boom and jib boom leveling arms to platform rotator pivot pins. Do not remove the pins.

14 Support the jib boom leveling arms with a suitable lifting device.

15 Use a soft metal drift to remove both pins and remove the platform rotator from the machine.

⚠WARNING Crushing hazard. The jib boom leveling arms may fall if they are not properly supported when the jib boom leveling arm pivot pin is removed.

NOTICE Component damage hazard. The platform angle sensor is a very sensitive instrument. It can be damaged internally if the platform rotator is dropped or sustains any physical shock, even if the damage is not visible.

How to Bleed the Platform Rotator

Before serial number 229:

Note: Do not start the engine. Use auxiliary power for all machine functions in this procedure.

1 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any drainage. Secure the container to the boom.

2 Move the platform rotate switch to the left and then to the right through two platform rotation cycles, continue holding the switch to the right until the platform is fully rotated to the right.

3 Open the top bleed valve, but do not remove it.

4 Move the platform rotate switch to the left until the platform is fully rotated to the left. Continue holding the switch until air stops coming out of the bleed valve. Close the bleed valve.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

5 Connect the clear hose to the bottom bleed valve. Open the bottom bleed valve, but do not remove it.

6 Hold the platform rotate switch to the right until the platform is fully rotated to the right. Continue holding the switch until air stops coming out of the bleed valve. Close the bleed valve.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

7 Remove the hose from the bleed valve and clean up any hydraulic oil that may have spilled.

8 Rotate the platform full right, then full left and inspect the bleed valves for leaks.

After serial number 228:

1 Rotate the platform full right, then full left until air is completely out of the rotator. Bleeding the valve is not necessary.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

2-4 Platform Overload System

The platform overload system is designed to prevent the machine from continuing to operate when the load in the platform exceeds maximum rated capacity. Refer to the machine serial label for maximum capacity information.

If maximum platform capacity is exceeded, the alarm will sound and the platform overload indicator lights will flash at the platform control and "PLATFORM OVERLOAD" will display on the LCD screen at the ground control. The ground and platform controls will become disabled. Before normal machine operation can continue, the excess load will need to be removed from the platform.

If the excess load cannot be removed or if the operator at the platform controls is unable to correct the overloaded condition, another person at the ground controls can operate the machine using auxiliary power. There will be limited control of boom functions from the ground controls when using auxiliary power. Auxiliary power can be used to correct the overloaded platform condition in order to resume normal, safe operation of the machine.

Note: The engine must be turned off to use auxiliary power.

Note: ***Software versions 1.03 and lower.*** All ground control functions will not operate with auxiliary control. Refer to Repair Procedure 6-1, *How to Determine the Revision Level.*

Note: Recovery mode must be used. Refer to Repair Procedure 6-1*, Service Bypass / Recovery Keyswitch.*

Note: ***Software versions 1.04 and higher.*** All ground control functions will operate from auxiliary control. Refer to Repair Procedure 6-1, *How to Determine the Revision Level.*

How to Calibrate the Platform Overload System (if equipped)

Calibration of the platform overload system is essential to safe machine operation. Continued use of an improperly calibrated platform overload system could result in the system failing to sense an overloaded platform. The stability of the machine is compromised and it could tip over.

Note: Perform this procedure with the machine on a firm, level surface.

1 Turn the key switch to platform control. Start the engine and level the platform.

2 Determine the maximum platform capacity. Refer to the machine serial plate.

3 Remove all weight, tools and accessories from the platform.

Note: Failure to remove all weight, tools and accessories from the platform will result in an incorrect calibration.

4 Using a suitable lifting device, place a test weight equal to the maximum platform capacity at the center of the platform floor.

5 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Proceed to step 6.

⊠ Result: The alarm is sounding. The platform overload indicator light is flashing at the platform controls and “PLATFORM OVERLOAD” should is displayed on the LCD screen at the ground controls. Slowly tighten the load spring adjustment nut in a clockwise direction in 10° increments until the overload indicator light turns off, and the alarm does not sound. Proceed to step 8.

Note: The platform will need to be moved up and down and allowed to settle between each adjustment.

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

6 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Slowly loosen the load spring adjustment nut in a counterclockwise direction in 10° increments until the overload indicator light flashes at both the platform and ground controls, and the alarm sounds. Proceed to step 7.

⊠ Result: The alarm should be sounding. The platform overload indicator light should be flashing at the platform controls and “PLATFORM OVERLOAD” should be displayed on the LCD screen at the ground controls. Repeat this procedure beginning with step 5.

Note: The platform will need to be moved up and down and allowed to settle between each adjustment.

Note: There may be a 2 second delay before the platform overload indicator lights and alarm responds.

7 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Proceed to step 8.

⊠ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Repeat this procedure beginning with step 5.

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

8 Add an additional 10 lb / 4.5 kg test weight to the platform.

⊙ Result: The alarm should be sounding. The platform overload indicator light should be flashing at the platform controls and "PLATFORM OVERLOAD" should be displayed on the LCD screen at the ground controls. Proceed to step 9.

⊠ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Remove the additional 10 lb / 4.5 kg test weight. Repeat this procedure beginning with step 6.

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

9 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

10 Turn the key switch to ground control.

11 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

12 Using a suitable lifting device, lift the test weight off the platform floor.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls.

Note: There may be a 2 second delay before the overload indicator lights and alarm turn off.

13 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should operate normally.

14 Turn the key switch to platform control.

15 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should operate normally.

Jib Boom Components

REV B

3-1
Jib Boom

How to Remove the Jib Boom

Note: Perform this procedure with the boom in the stowed position.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

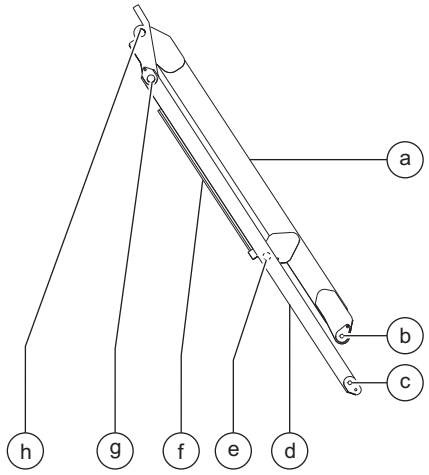
1 Remove the platform mounting weldment and the platform rotator. See 2-3, *How to Remove the Platform Rotator*.

2 Remove the hose and cable cover retaining fasteners from the jib boom. Remove the hose and cable cover from the machine.

3 Attach a lifting strap from an overhead crane to the jib boom for support. Do not apply lifitng pressure.

4 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.



a jib boom
b platform rotator upper pivot pin
c platform rotator lower pivot pin
d jib boom leveling arm
e jib cylinder pivot pin
f jib boom cylinder
g primary boom lower pivot pin
h primary boom upper pivot pin

5 Support the barrel end of the jib boom cylinder with another suitable lifting device.

6 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin.

7 Use a soft metal drift to remove the pin and let the cylinder hang down.

⚠WARNING Crushing hazard. The jib boom could become unbalanced and fall if not properly supported when the jib boom lift cylinder barrel-end pivot pin is removed.

8 Secure the jib boom bellcrank to prevent it from moving.

9 Remove the hose and cable clamp from the jib boom pivot pin.

10 Remove the pin retaining fastener from the jib boom pivot pin. Do not remove the pin.

11 Place blocks under the platform leveling cylinder for support. Protect the cylinder from damage.

12 Use a soft metal drift to remove the pin. Carefully remove the jib boom from the primary boom.

⚠WARNING Crushing hazard. The jib boom could become unbalanced and fall if not properly supported when removed from the machine.

13 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

14 Slide both of the jib boom leveling arms off of the jib boom cylinder rod-end pivot pin and lay them off to the side.

15 Attach a lifting strap from an overhead crane to the lug on the rod end of the jib boom lift cylinder.

16 Attach a lifting strap from a second overhead crane to the jib boom bellcrank.

17 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder and jib boom bellcrank from the machine.

⚠WARNING Crushing hazard. The jib boom lift cylinder and jib boom bellcrank could become unbalanced and fall if not properly supported when they are removed from the machine.

⚠CAUTION Crushing hazard. The platform leveling cylinder may fall if not supported when the rod-end pivot pin is removed.

3-2
Jib Boom Lift Cylinder

How to Remove the Jib Boom Lift Cylinder

Note: Perform this procedure with the boom in the stowed position.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the jib boom slightly and place blocks under the platform mounting weldment. Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

Note: Do not rest the entire weight of the boom on the blocks.

2 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

4 Use a soft metal drift to tap the jib boom lift cylinder rod-end pivot pin half way out and lower one of the leveling arms to the ground. Tap the pin the other direction and lower the opposite leveling arm. Do not remove the pin.

⚠CAUTION Crushing hazard. The jib boom lift cylinder may fall if not supported when the rod-end pivot pin is removed.

5 Support the jib boom lift cylinder with a suitable lifting device.

6 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the barrel-end pivot pin and let the cylinder hang down.

⚠WARNING Crushing hazard. The platform and jib boom lift cylinder could become unbalanced and fall if not properly supported when the jib boom lift cylinder barrel-end lift pivot pin is removed.

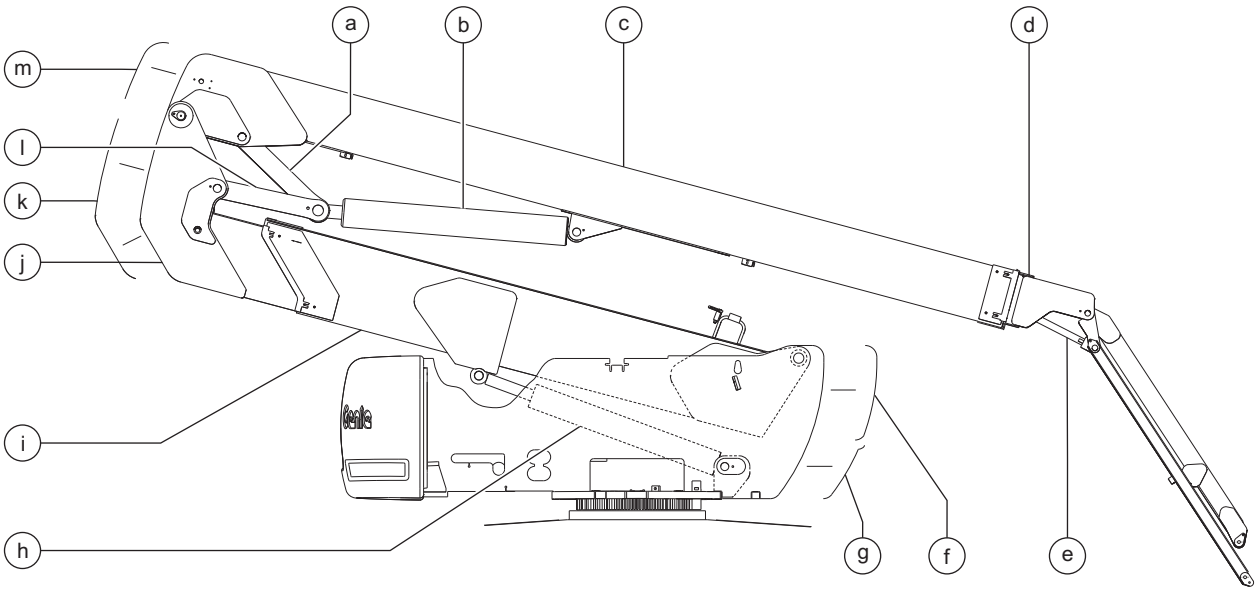
7 Place blocks under the platform leveling cylinder for support. Protect the cylinder from damage.

8 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the machine.

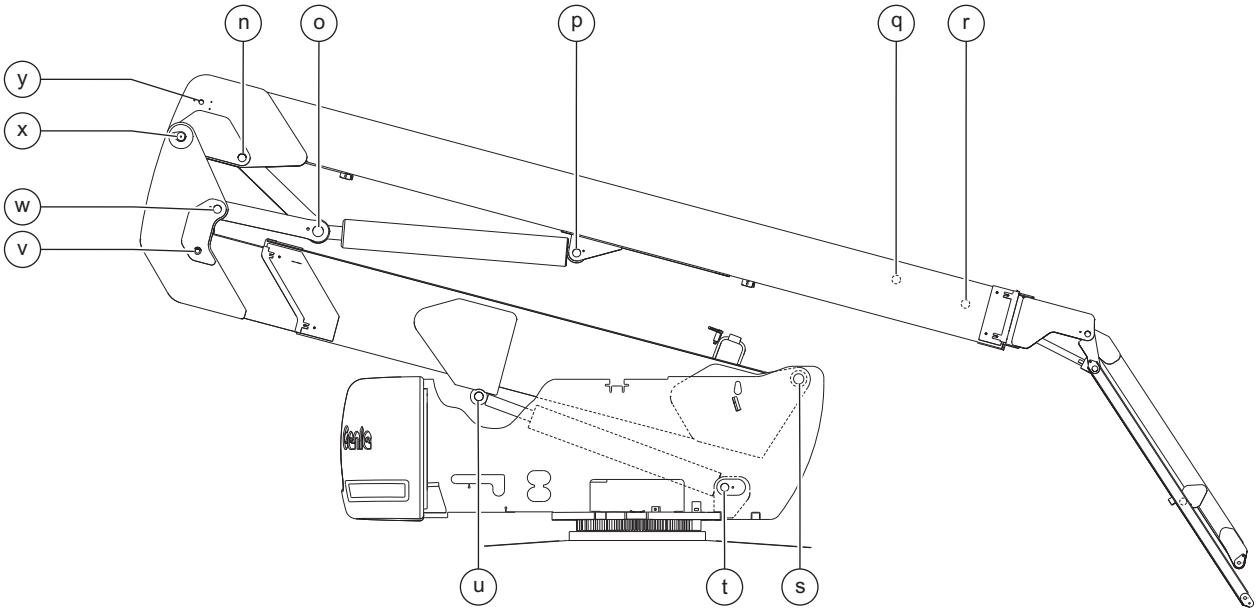
⚠WARNING Crushing hazard. The jib boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

Boom Components

REV D



a primary boom lift cylinder link arm
b primary boom lift cylinder
c primary boom
d primary extension boom
e platform leveling cylinder
f upper turntable cover
g lower turntable cover
h secondary boom lift cylinder
i secondary boom
j secondary extension boom
k secondary boom hose cover
l primary boom lift cylinder lever arm
m primary boom hose cover
n primary boom link arm pivot pin
o primary lift cylinder pivot pin - rod end
p primary lift cylinder pivot pin - barrel end
q primary extend cylinder pivot pin - rod end
r platform level cylinder pivot pin - barrel end
s secondary boom pivot pin
t secondary lift cylinder pivot pin - barrel end
u secondary lift cylinder pivot pin - rod end
v secondary extend cylinder pivot pin - rod end
w secondary boom lever arm pivot pin
x primary boom pivot pin
y primary extend cylinder pivot pins - barrel end



4-1
Primary Boom Cable Track

The primary boom cable track guides the cables and hoses running up the boom. It can be repaired link by link without removing the cables and hoses that run through it. Removing the entire primary boom cable track is only necessary when performing major repairs that involve removing the primary boom.

How to Remove the Cable Track

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Tag and disconnect the wire connectors from the platform control box.

2 Tag, disconnect and plug the hydraulic hoses from the counterbalance valve manifold located on the platform rotator. Cap the fittings on the manifold.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the mounting fasteners from the power to platform outlet box. Remove the outlet box and lay to the side.

4 Remove the hose clamp from the platform support.

5 Tag and disconnect the electrical connector from the platform angle sensor.

Note: The platform angle sensor is mounted to the platform rotator.

6 Tag and disconnect the electrical connectors for the foot switch and jib boom limit switch.

7 Remove the platform manifold mounting fasteners. Remove the manifold and lay to the side.

NOTICE Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

8 Remove the hose and cable cover retaining fasteners from the jib boom. Remove the hose and cable cover from the machine.

9 Remove the hose and cable clamp from the jib boom pivot pin.

⚠CAUTION Crushing hazard. The jib boom may fall if not supported when the jib boom pivot pin is removed.

10 Tag, disconnect and plug the slave cylinder hydraulic hoses from the bulkhead fittings at the platform end of the primary boom. Cap the bulkhead fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

11 Tag, disconnect and plug the jib boom cylinder hydraulic hoses. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

12 Remove the cotter pin from the platform end of the cable track tube.

Note: Always replace the cotter pin with a new one when installing the cable track.

13 Remove the fasteners from the cable track guide at the platform end of the primary boom. Remove the cable track guide from the machine.

14 Tag and disconnect the electrical connector from the limit switch at the pivot end of the primary boom.

15 Remove all hose clamps for the primary boom lift cylinder hydraulic hoses.

Note: The primary boom lift cylinder hydraulic hose clamps are located behind the cable track.

16 Support the end cover from the secondary boom at the pivot end of the primary boom.

17 Remove the cover retaining fasteners and remove the cover from the machine.

⚠WARNING Crushing hazard. The secondary boom hose cover could become unbalanced and fall if not properly supported when removed from the machine.

18 Tag, disconnect and plug each hydraulic hose from the bulkhead fittings that lead to the cable track. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

19 Tag and disconnect each electrical connector to wiring that leads to the cable track.

20 Pull all hoses and electrical cables through the opening in the primary boom at the pivot end.

21 Secure the upper and lower cable tracks together.

22 Attach a lifting strap from an overhead crane to the cable track.

23 Remove all cable track mounting fasteners.

24 Carefully remove the cable track from the machine and lay it on a structure capable of supporting it.

NOTICE Component damage hazard. The boom cable track can be damaged if it is twisted.

NOTICE Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

How to Repair the Cable Track

NOTICE Component damage hazard. The boom cable track can be damaged if it is twisted.

Note: A cable track repair kit is available through the Genie Industries Service Parts Department.

1 Visually inspect the cable track and determine which 4-link section needs to be replaced.

2 Carefully remove the snap rings from each end of the damaged section of cable track.

3 Remove the retaining fasteners from the upper black rollers from the 4-link section of cable track to be replaced. Remove the rollers.

4 Lift up the hoses and cables and carefully remove the damaged 4-link section of cable track.

NOTICE Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

5 Remove the upper rollers from the replacement section of cable track.

6 Lift up the hoses and cables and carefully insert the new 4-link section of cable track.

NOTICE Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

7 Connect the ends of the replacement cable track section to the existing cable track using the snap rings.

8 Install the rollers onto the new section of cable track.

9 Operate the boom extend/retract function through a full cycle to ensure smooth operation of the cable track.

4-2
Primary Boom

How to Shim the Boom

1 Measure each wear pad.

⊙ Result: Each wear pad meets minimum specification. Proceed to step 2.

⊠ Result: Each wear pad does not meet minimum specification. Replace any wear pad that does not meet minimum specification. Proceed to step 2.

2 Extend the boom until the wear pads are accessible.

3 Loosen the wear pad mounting fasteners.

4 Install the new shims under the wear pad to obtain zero clearance and zero drag.

5 Tighten the mounting fasteners.

6 Extend and retract the boom through an entire cycle. Check for tight spots that could cause binding or scraping.

Note: Always maintain squareness between the outer and inner boom tubes.

Wear Pad Specifications

Primary boom wear pad specifications	**Minimum**
Top, bottom and side wear pads (platform end of boom)	5/8 inch 15.9 mm
Side and bottom wear pads (pivot end of boom)	1/2 inch 12.7 mm
Top wear pads (pivot end of boom)	5/8 inch 15.9 mm
Secondary boom wear pad specifications	**Minimum**
Top, and side wear pads (extension end of boom)	5/8 inch 15.9 mm
Bottom wear pads (extension end of boom)	1/2 inch 12.7 mm
Top wear pads (pivot end of boom)	1/2 inch 12.7 mm
Bottom and side wear pads (pivot end of boom)	7/8 inch 22.2 mm

How to Remove the Primary Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: Perform this procedure with the boom in the stowed position.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the jib boom. See 3-1, *How to Remove the Jib Boom.*

2 Remove the fasteners securing the limit switch to the primary boom at the pivot end of the boom. Do not disconnect the wiring. Move the limit switch to a safe location.

3 Tag and disconnect the wire harness from the primary boom angle sensor (PBAS).

Note: The primary boom angle sensor is located inside the primary boom at the pivot end.

4 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder. Tag, disconnect and plug the hydraulic hoses routed through the primary boom at the union.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Attach a lifting strap from an overhead crane to the barrel end of the primary boom lift cylinder.

6 Remove the pin retaining fasteners from the primary boom lift cylinder barrel-end pivot pin.

7 Place blocks under both ends of the primary boom lift cylinder for support.

8 Use a soft metal drift to remove the barrel-end pivot pin. Rest the barrel end of the primary boom cylinder on the blocks.

⚠WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

9 Attach a lifting strap from an overhead crane to the primary boom lift cylinder linkage arm. Support the arm.

10 Remove the pin retaining fasteners from the primary boom lift cylinder linkage arm where it connects to the primary boom.

11 Use a soft metal drift to remove the upper primary boom lift cylinder linkage arm pivot pin. Using a suitable lifting device remove the linkage arm from the machine.

⚠CAUTION Crushing hazard. The upper primary boom lift cylinder linkage arm will fall if not properly supported when the pivot pin is removed.

12 Attach a 5 ton / 5000 kg overhead crane to the center point of the primary boom.

13 Remove the pin retaining fastener from the primary boom pivot pin.

14 Use a soft metal drift to remove the primary boom pivot pin.

⚠WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

15 Carefully remove the primary boom from the machine and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when removed from the machine.

Note: When the primary boom is installed, the primary boom angle sensor will need to be calibrated.

How to Disassemble the Primary Boom

Note: Complete disassembly of the primary boom is only necessary if the outer or inner primary boom tube must be replaced. The extension cylinder can be removed without completely disassembling the boom. See 4-4, *How to Remove the Primary Boom Extension Cylinder*.

1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.

2 Place blocks under the barrel end of the primary boom extension cylinder for support.

3 Remove the pin retaining fastener from the extension cylinder barrel-end pivot pin at the pivot end of the primary boom.

4 Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

5 Remove and label the location of the wear pads from the platform end of the primary boom.

Note: Pay careful attention to the location and number of shims used with each wear pad.

6 Attach a lifting strap from an overhead crane to the extension boom assembly.

7 Support and slide the extension boom assembly out of the primary boom tube and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The extension boom tube could become unbalanced and fall if not properly supported when removed from the primary boom tube.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

8 Remove the external snap rings from the extension cylinder rod-end pivot pin at the platform end of the extension tube.

⚠WARNING Crushing hazard. The extension cylinder could become unbalanced and fall if not properly supported when removed from primary boom extension tube.

9 Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The extension cylinder could become unbalanced and fall if not properly supported when removed from primary boom extension tube.

10 Attach a lifting strap from an overhead crane to the extension cylinder.

11 Working at the end of the extension boom tube opposite the jib boom mount, support and slide the extension cylinder out of the extension boom tube.

⚠WARNING Crushing hazard. The extension cylinder could become unbalanced and fall if not properly supported when removed from primary boom extension tube.

Note: During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

4-3
Primary Boom Lift Cylinder

The primary boom lift cylinder raises and lowers the primary boom. The primary boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Lift Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the primary boom to a horizontal position.

2 Raise the secondary boom until the primary boom lift cylinder rod-end pivot pin is above the counterweight.

3 Attach a 5 ton / 5000 kg overhead crane to the platform end of the primary boom. Support the boom. Do not apply any lifting pressure.

4 Support both ends of the primary boom lift cylinder with a second overhead crane or similar lifting device.

5 Place blocks under the primary boom lift cylinder linkage arms for support.

6 Tag, disconnect and plug the primary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

7 Remove the pin retaining fastener from the primary boom lift cylinder rod-end pivot pin.

8 Use a soft metal drift to remove the pin.

⚠DANGER Crushing hazard. The primary boom will fall if not properly supported when the pivot pin is removed.

⚠DANGER Crushing hazard. The lift cylinder will fall if not properly supported when the pivot pin is removed.

⚠CAUTION Crushing hazard. The primary boom lift cylinder linkage arms may fall if not properly supported when the pivot pin is removed.

9 Remove the primary boom lift cylinder barrel-end pivot pin retaining fasteners.

10 Use a soft metal drift to remove the barrel-end pivot pin. Remove the primary boom lift cylinder from the machine.

⚠DANGER Crushing hazard. The lift cylinder will become unbalanced and fall if not properly supported when the pin is removed.

4-4 Primary Boom Extension Cylinder

The primary boom extension cylinder extends and retracts the primary boom extension tube. The primary boom extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Extension Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the primary boom to a horizontal position.

2 Extend the primary boom until the primary boom extension cylinder rod-end pivot pin is accessible.

3 Remove the access cover from the pivot end of the primary boom.

4 Place blocks under the barrel end of the primary boom extension cylinder for support.

5 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

6 Working at the platform end of the boom, remove the external snap rings from the extension cylinder rod-end pivot pin.

7 Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The primary boom could fall when removed from the extension boom if not properly supported.

8 Remove the barrel-end pivot pin retaining fasteners.

9 Place a rod through the barrel-end pivot pin and twist to remove the pin.

10 Working at the pivot end of the boom, support and slide the extension cylinder out of the boom extension.

⚠WARNING Crushing hazard. The extension cylinder could fall when removed from the extension boom if not properly supported.

NOTICE Component damage hazard. Be careful not to damage the primary boom angle sensor (PBAS) when removing the cylinder from the primary boom.

NOTICE Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

Note: Note the length of the cylinder after removal. For ease of installation, the cylinder must be at the same length for reinstallation.

4-5 Primary Boom Angle Sensor

A properly functioning primary boom angle sensor (PBAS) is essential to safe machine operation. The primary boom angle sensor is used to limit the angle of the primary boom relative to ground. The ECM at the ground controls (TCON) monitors the position and angle of the primary boom using the signal from PBAS. The PBAS signal is used to control the ramping of the primary boom as well as velocity control, limiting the speed of the primary boom to 1.3 feet / 0.4 meters per second.

How to Replace the Primary Boom Angle Sensor

Note: Perform this procedure on a firm, level surface with the boom in the stowed position.

1 Remove the retaining fasteners from the boom end cover at the pivot end of the primary boom. Remove the cover from the machine.

2 Locate the primary boom angle sensor inside the primary boom at the boom pivot pin.

3 Tag and disconnect the electrical connector from the sensor.

4 Remove the angle sensor mounting bracket retaining fasteners.

5 Remove the wing nut from the threaded rod. Do not disconnect the threaded rod from the clevis yoke.

6 Remove the angle sensor and bracket assembly.

7 Remove the sensor retaining fasteners from the sensor bracket. Remove the angle sensor.

8 Install the new angle sensor onto the mounting bracket.

9 Install the angle sensor and bracket assembly.

Note: The sensor should be installed rotated in a fully counter clock-wise position.

10 Insert the threaded rod through the threaded rod adjustment bracket.

11 Move the threaded rod to the top of the slotted hole. Tighten the wing nut and hex nut towards each other.

12 Connect the electrical connector to the angle sensor.

13 Calibrate the primary boom angle sensor. See *How to Calibrate the Primary Boom Angle Sensor.*

⚠ DANGER Tip-over hazard. Failure to calibrate the primary boom sensor could result in the machine tipping over resulting in death or serious injury.

How to Calibrate the Primary Boom Angle Sensor

Note: Perform this procedure on a firm, level surface with the boom in the stowed position.

Note: A digital level will be required to perform this procedure.

1 Pull out the red Emergency Stop button at the platform controls. From the ground control box, turn the key switch to ground control and pull out the red Emergency Stop button while holding the enter button [↵] (3 or 4 seconds) until the engine symbol appears on the display at the ground control box, then release.

2 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

3 Press the scroll button [↓] until RESET PRIMARY BOOM ANGLE SENSOR is shown on the display.

4 Press the plus button [+] to select yes, then press and hold the enter button [↵] to accept.

5 Press the scroll button [↓] until EXIT is shown on the display. Press the plus button [+] to select yes, then press and hold the enter button [↵] to accept.

⊙ Result: The alarm should sound.

⊠ Result: The alarm does not sound. Repeat this procedure beginning with step 1.

6 Loosen the Primary Boom Angle Sensor (PBAS) assembly bracket fasteners attached to the primary boom. Loosen the wing nut and hex nut on the threaded rod to allow the threaded rod to move upward. Tighten the fasteners.

7 Set a digital level on top of the primary boom mast on a level part of the tube so it is viewable from the ground controls.

8 Start the engine.

9 Raise the boom until the digital level displays 70°.

10 Loosen the wing nut from threaded rod and move the threaded rod down until the engine turns off.

11 Screw threaded rod into clevis yoke. Tighten the wing nut to welded bracket. Tighten the jam nut to welded bracket. Tighten the PBAS fasteners to boom.

⊙ Result: The ground control box display should read P9B & P11 FAULT.

12 Push in the red Emergency Stop button to the off position. Wait until display turns off before proceeding.

13 Pull out the red Emergency Stop button while holding the enter button [↵] (3 or 4 seconds) until the endgine symbol appears on the display at the ground control box, then release.

14 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

15 Press the scroll button [↓] until PRIMARY BOOM ANGLE = 70° is shown on the display.

16 Press the plus button [+] to select yes, then press the enter button [↵] to accept.

17 Press the scroll button [↓] until EXIT is shown on the display. Press the plus button [+] to select yes, then press the enter button [↵] to accept.

18 At the ground controls, use auxiliary power and lower the boom until the faults are no longer shown on the display.

⊙ Result: The flashing arrow in the display at the ground controls will turn off.

⊗ Result: The flashing arrow in the display at the ground controls does not turn off. Repeat this procedure beginning with step 1.

19 Start the engine and activate the primary boom down function. Release the function enable button when the digital level displays 40°. Push in the red Emergency Stop button to the off position.

20 Pull out the red Emergency Stop button while holding the enter button [↵] (3 or 4 seconds) until the endgine symbol appears on the display at the ground control box, then release.

21 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

22 Press the scroll button [↓] until PRIMARY BOOM ANGLE = 40° is shown on the display.

23 Press the plus button [+] to select yes, then press the enter button [↵] to accept.

⊙ Result: The alarm should not sound.

⊠ Result: The alarm does sound. Repeat this procedure beginning with step 1.

24 Press the scroll button until EXIT is shown on the display. Press the plus button [+] to select yes, then press the enter button [↵] to accept.

25 Start the engine.

26 Activate the boom up function until the digital level reads 65°.

⊙ Result: The primary boom should stop.

⊠ Result: The primary boom does not stop. Immediately release the function enable button and lower the boom. Repeat this procedure beginning with step 1.

⚠DANGER Tip-over hazard. If the boom does not stop at 65°, immediately release the function enable button and lower the primary boom. Failure to lower the boom could cause the machine to tip over resulting in death or serious injury.

4-6 Secondary Boom Cable Track

The secondary boom cable track guides the cables and hoses running up through the inside of the secondary boom. It can be repaired link by link without removing the cables and hoses that run through it. Removal of the secondary boom cable track is required to repair it.

How to Remove the Cable Track

Note: The secondary boom cable track must be removed with the secondary boom extension cylinder. See 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

How to Repair the Cable Track

NOTICE Component damage hazard. The boom cable track can be damaged if it is twisted.

NOTICE A cable track repair kit is available through the Genie Industries Service Parts Department.

1 Remove the secondary boom extension cylinder.

Note: The secondary boom extension cylinder must be removed as an assembly with the cable tracks, cable track trays and cable track support tubes from the platform end of the secondary boom. See 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

2 Visually inspect the cable track and determine which 4-link section needs to be replaced.

3 Carefully remove the snap rings from each end of the damaged section of cable track.

4 Remove the retaining fasteners from the upper black rollers from the 4-link section of cable track to be replaced. Remove the rollers.

5 Lift up the hoses and cables and carefully remove the damaged 4-link section of cable track.

NOTICE Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

6 Remove the upper rollers from the replacement section of cable track.

7 Lift up the hoses and cables and carefully insert the new 4-link section of cable track.

NOTICE Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

8 Connect the ends of the replacement cable track section to the existing cable track using the snap rings.

9 Install the rollers onto the new section of cable track.

10 Re-assemble and install the extension cylinder assembly into the secondary extension boom.

11 Operate the boom extend/retract function through a full cycle to ensure smooth operation of the cable track.

4-7 Secondary Boom

How to Disassemble the Secondary Boom

Note: Complete disassembly of the secondary boom is only necessary if the outer or inner secondary boom tube must be replaced. The secondary extension boom tube can be removed with the secondary boom tube on the machine.

Note: The extension cylinder can be removed without completely disassembling the boom. See 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

⚠WARNING Bodily injury hazard. The procedures in this section require specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.

2 Tag, disconnect and plug the hydraulic hoses at the primary boom lift cylinder. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Attach a lifting strap from an overhead crane to the lug on the barrel end of the primary boom lift cylinder. Use the overhead crane to raise the primary boom lift cylinder to a vertical position.

4 Remove the pin retaining fastener from the primary boom rod end pivot pin.

5 Use a slide hammer to remove the pin. Remove the primary boom lift cylinder and linkage arms from the machine.

⚠WARNING Crushing hazard. The primary boom lift cylinder and linkage arms could become unbalanced and fall if not properly supported when the pin is removed.

6 At the platform end, remove the secondary boom access cover.

7 Tag, disconnect and plug the hydraulic hoses from the turntable. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt

8 Tag and disconnect the electrical cables from the turntable.

9 Remove the hose protector bracket.

10 Working at the platform end, place blocks under the barrel end of the secondary boom extension cylinder for support.

11 Remove the barrel-end retaining fasteners.

12 Using a suitable lifting device, lift the extension cylinder to clear the saddle blocks

13 Attach a lifting strap from an overhead crane to the secondary extension boom assembly.

14 Slide the secondary extension boom assembly out of the secondary boom tube approximately two feet and remove the wear pads from the secondary boom tube.

15 Support and slide the extension boom assembly out of the secondary boom tube and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The extension boom tube could become unbalanced and fall if not properly supported when removed from the primary boom tube.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

16 To remove the secondary boom extension cylinder, see 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

4-8
Secondary Boom Lift Cylinder

How to Remove the Secondary Boom Lift Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or the hose end must be replaced. All connections must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

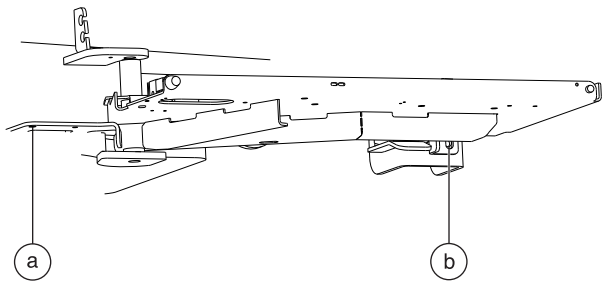
1 Lower the secondary boom to the stowed position.

2 Tag, disconnect, secure and remove the battery cables connecting the batteries. Remove battery fasteners and hooks from battery tray. Remove the batteries and store them in a safe and secure location away from the machine.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the retaining fasteners securing the upper and lower turntable covers from the turntable at the platform end. Remove the covers.

4 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

5 Locate the engine tray anchor hole at the pivot end of the engine tray.

6 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

7 Remove the fuel tank filler cap.

8 Using an approved hand-operated pump, drain the fuel tank into a suitable container. *Refer to Section 2, Specifications.*

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

⚠DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

Note: Be sure to only use a hand-operated pump suitable for use with gasoline and diesel fuels.

9 Tag and disconnect the wire harness from the fuel level sending unit.

10 Tag, disconnect and plug the fuel hoses from the fuel tank.

11 Clean up any fuel that may have spilled.

12 Remove the fuel tank mounting fasteners. Carefully remove the fuel tank from the machine.

NOTICE Component damage hazard. The fuel tank is plastic and may become damaged if allowed to fall.

Note: Clean the fuel tank and inspect for cracks and other damage before installing it onto the machine.

13 Tag, disconnect and plug the hydraulic hoses from the secondary boom lift cylinder. Cap the fitings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

14 Place blocks under each end of the secondary boom lift cylinder for support.

15 Remove the pin retaining fasteners from the secondary boom lift cylinder rod-end pivot pin.

16 Use a soft metal drift to remove the pin.

17 Remove the pin retaining fastener from the secondary boom lift cylinder barrel-end pivot pin.

18 Use a soft metal drift to remove the pin.

19 Remove the secondary boom lift cylinder from the machine by pulling it through the platform end of the secondary boom.

⚠WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

NOTICE Component damage hazard. When removing the secondary boom lift cylinder from the machine, be careful not to damage the counterbalance valves at the barrel end of the cylinder.

NOTICE Component damage hazard. Cables and hoses can be damaged if the cylinder is pulled across them.

4-9 Secondary Boom Extension Cylinder

The secondary boom extension cylinder extends and retracts the secondary boom extension tube. The secondary boom extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Secondary Boom Extension Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

Note: The secondary boom extension cylinder must be removed as an assembly with the cable tracks, cable track trays and cable track support tubes from the platform end of the secondary boom.

1 Raise the primary boom to a horizontal position.

2 Remove the access cover from the counterweight end of the secondary boom.

3 Remove the fasteners securing the cable track trays and cable track clamps to the secondary extension boom.

4 Remove the external snap rings from the extension cylinder rod-end pivot pin.

5 Use a soft metal drift to remove the pin.

6 Remove the access cover from the platform end of the secondary boom.

7 Working at the platform end, place blocks under the barrel end of the secondary boom extension cylinder for support.

8 Remove the barrel-end retaining fasteners.

9 Using a suitable lifting device, lift the extension cylinder to clear the saddle blocks

10 Support and slide the extension cylinder out of the boom extension and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The secondary boom extension cylinder could become unbalanced and fall if not properly supported when removed from the machine.

NOTICE Component damage hazard. When removing the secondary boom extension cylinder from the machine, be careful not to damage the counterbalance valves at the barrel end of the cylinder.

NOTICE Component damage hazard. Cables and hoses can be damaged if the cylinder is pulled across them.

11 Tag, disconnect and plug the secondary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

12 Remove the cable track fasteners and cable track support tubes from the extension cylinder.

NOTICE Component damage hazard. Be careful not to damage the secondary boom retract limit switch when installing the cylinder assembly into the secondary boom. Secure the roller arm to the switch body during assembly.

Engines

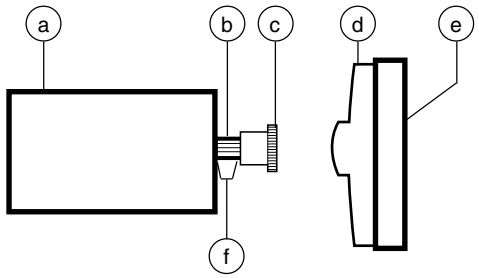
REV C

5-1 RPM Adjustment

Refer to Maintenance Procedure B-19, *Check and Adjust the Engine RPM.*

5-2 Flex Plate

The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.



a pump
b pump shaft
c pump coupler
d flex plate with raised spline
e engine flywheel
f 0.185 inch / 4.7 mm gap - Deutz Engines
0.15 inch / 3.8 mm gap - GM Engines
0.25 inch / 6.35 mm gap - Ford Engine
0.36 inch / 9.14 mm gap - Continental Engine
0.25 inch / 6.35 mm gap - Perkins 804C-33 Engine
0.3 inch / 7.6 mm gap - Perkins 704-30 Engine

How to Remove the Flex Plate

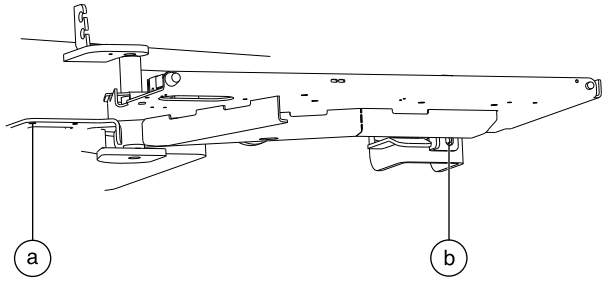
Note: Perform this procedure with the engine off and cool to the touch.

1 Open the engine side turntable cover.

2 Tag and disconnect the battery cables from the batteries.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

4 Tag and disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.

5 Locate the engine tray anchor hole at the pivot end of the engine tray.

6 Install the bolt that was just removed into the anchor hole to secure the engine tray from moving.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

GM models:

7 Remove the fasteners securing the muffler to the exhaust manifold.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

8 Remove muffler mounting bracket fasteners. Remove the muffler and bracket assembly from the engine.

9 Remove the hose clamp securing the air filter assembly to the air inlet tube.

10 Remove the air cleaner bracket fasteners. Remove the air cleaner and bracket assembly from the engine.

11 Support the drive pump with an appropriate lifting device. Do not apply any lifting pressure.

12 Remove all of the remaining bell housing to engine fasteners. Carefully pull the pump away from the engine and secure it from moving.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

13 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Ford models:

7 Tag and disconnect the wire harness from the oxygen sensor.

8 Remove the exhaust pipe heat shield fasteners from the top of the muffler.

⚠CAUTION Burn Hazard. Hot engine parts can cause severe burns.

9 Remove the muffler retainer bracket fasteners.

10 Remove the muffler fasteners securing the muffler to the exhaust manifold. Remove the muffler from the bracket.

11 Remove the muffler bracket retaining fasteners. Remove the muffler bracket from the engine.

12 Close the shutoff valve on the Liquid Petroleum Gas (LPG) tank by turning it clockwise (if equipped).

13 Tag and disconnect the wiring from the LPG solenoid.

14 Remove the engine starter retaining fasteners and remove the starter from the engine. Do not disconnect the wiring.

15 Remove the dipstick tube bracket fasteners.

16 Attach a lifting strap from an overhead crane to the lifting eyes on the engine.

17 Remove the bell housing engine tray fasteners.

18 Raise the engine slightly using the overhead crane. Do not apply any lifting pressure.

19 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine fasteners.

20 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched

21 Remove the flex plate mounting fasteners. Remove the flex plate from the engine fly wheel.

Continental models:

7 Tag and disconnect the wire harness from the oxygen sensor.

8 Remove the exhaust pipe heat shield fasteners from the top of the muffler.

⚠CAUTION Burn Hazard. Hot engine parts can cause severe burns.

9 Remove the muffler retainer bracket fasteners.

10 Remove the muffler fasteners securing the muffler to the exhaust manifold. Remove the muffler from the bracket.

11 Remove the relay housing from the muffler mount. Do not disconnect the relays.

12 Disconnect and remove the ECM from the muffler mount.

13 Close the shutoff valve on the Liquid Petroleum Gas (LPG) tank by turning it clockwise (if equipped).

14 Unbolt the EPR valve from the muffler mount. Leave the hoses attached to the EPR valve.

15 Remove the muffler mount.

16 Support the drive pump with an appropriate lifting device. Remove the pump plate mounting fasteners.

17 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

18 Remove the flex plate mounting fasteners. Remove the flex plate from the engine flywheel.

Deutz F4L-913 models:

7 Tag and disconnect the wiring from the bell housing.

8 Remove the exhaust tailpipe and air inlet tube U-bolts from the air cleaner mounting bracket.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

9 Remove the fuel filter/water separator retaining fasteners. Remove the filter/separator from the engine. Do not disconnect the fuel hoses.

10 Remove the air cleaner mounting bracket fasteners. Remove the air cleaner and bracket assembly from the engine.

11 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing to engine fasteners.

12 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

13 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Deutz BF4L-2011 models:

7 Tag and disconnect the wiring from the bell housing.

8 Remove the U-bolt from the exhaust flex pipe at the muffler.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

9 Remove the muffler bracket retaining fasteners from bell housing. Remove the muffler and bracket assembly from the engine.

10 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine fasteners.

11 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

12 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Perkins 704-30 Models:

7 Remove the clamp securing the air intake elbow to the air cleaner assembly. Remove the air intake tube from the engine. Do not remove the elbow from the air intake tube.

8 Support the drive pump with an appropriate lifting device. Remove all of the bell housing to engine fasteners.

9 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

10 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Perkins 804C-33 Models:

7 Tag and disconnect the wiring from the bell housing.

8 Remove the exhaust pipe clamp at the muffler.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

9 Remove the muffler mounting bracket fasteners. Remove the muffler and bracket assembly from the engine.

10 Remove the hose clamps from the air cleaner elbow and the engine intake manifold.

11 Remove the air cleaner mounting bracket fasteners. Remove the air cleaner and bracket assembly from the engine.

12 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing to engine fasteners.

13 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

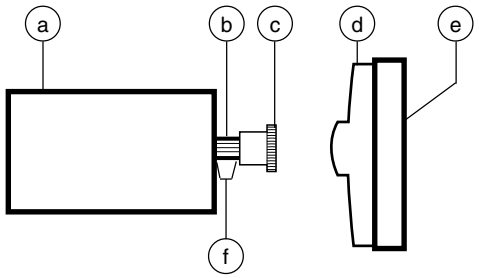
NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

14 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

How to Install the Flex Plate

1 Install the flex plate onto the engine flywheel with the raised spline towards the pump. Apply Loctite® removable thread sealant to the mounting screws.

2 **Ford models:** Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm. Then torque the flex plate mounting bolts in sequence to 20 ft-lbs / 27 Nm.



a pump
b pump shaft
c pump coupler
d flex plate with raised spline
e engine flywheel
f 0.185 inch / 4.7 mm gap - Deutz Engines
0.15 inch / 3.8 mm gap - GM Engines
0.25 inch / 6.35 mm gap - Ford Engine
0.36 inch / 9.14 mm gap - Continental Engine
0.25 inch / 6.35 mm gap - Perkins 804C-33 Engine
0.3 inch / 7.6 mm gap - Perkins 704-30 Engine

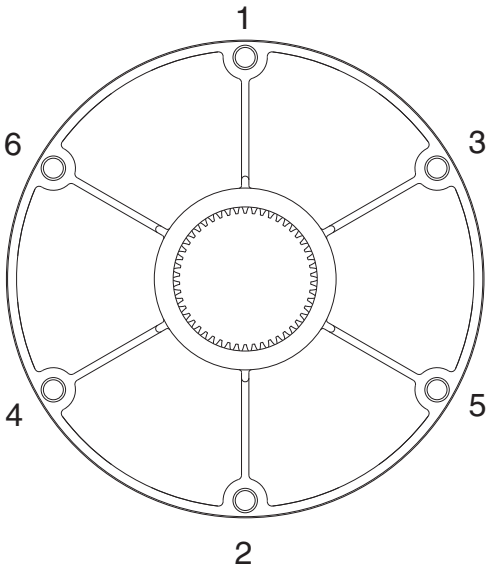
GM models: Torque the flex plate mounting bolts in sequence to 22 ft-lbs / 30 Nm. Then torque the flex plate mounting bolts in sequence to 31 ft-lbs / 42 Nm.
Continental models: Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm. Then torque the flex plate mounting bolts in sequence to 20.8 ft-lbs / 28 Nm.
Deutz models: Torque the flex plate mounting bolts in sequence to 26 ft-lbs / 35 Nm. Then torque the flex plate mounting bolts in sequence to 37 ft-lbs / 51 Nm.
Perkins models: Torque the flex plate mounting bolts in sequence to 13 ft-lbs / 18 Nm. Then torque the flex plate mounting bolts in sequence to 19 ft-lbs / 26 Nm.

3 Install the pump coupler onto the pump shaft with the set screw toward the pump. Leave the appropriate gap between coupler and pump end plate for your engine.

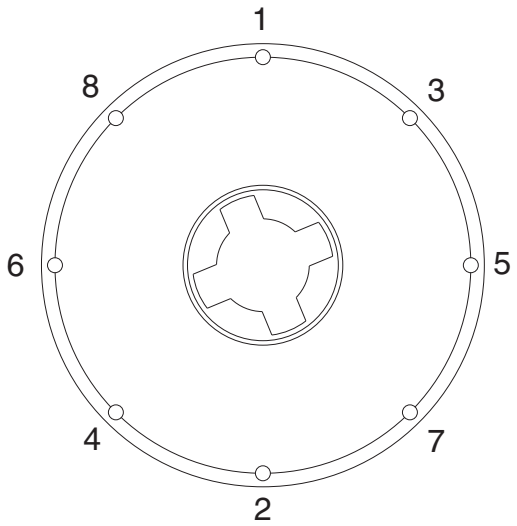
4 Apply Loctite® removable thread sealant to the pump coupler set screw. Torque the set screw to 61 ft-lbs / 83 Nm.

5 Install the pump onto the bell housing/mounting plate and torque the pump retaining fasteners to 57 ft-lbs / 77.3 Nm. Apply Loctite® removable thread sealant to the mounting fasteners.

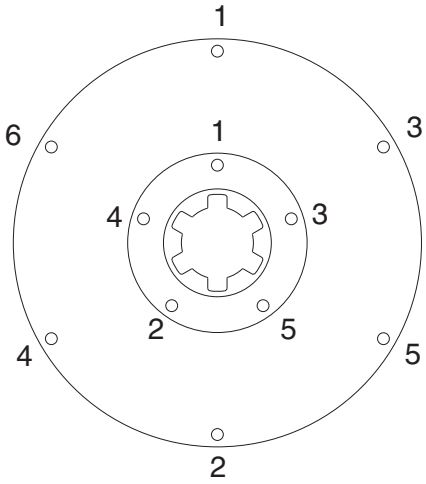
NOTICE Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



Ford, Perkins,
Deutz BF4L-2011 models and
Continental TME27 models



Deutz F4L-913 models



GM models

6 Install the pump and mounting plate assembly onto the engine. Apply Loctite® removable thread sealant to the mounting fasteners.

Perkins 704 models

Torque the pump mounting plate fasteners in sequence to 14 ft-lbs / 19.1 Nm.

Deutz 913, Perkins 804 and GM models

Torque the pump mounting plate fasteners in sequence to 28 ft-lbs / 38 Nm.

Deutz 2011 Models

Torque the pump mounting plate fasteners in sequence to 46.7 ft-lbs / 63.3 Nm.

Ford Models

Torque the pump mounting plate fasteners in sequence to 37 ft-lbs / 50.1 Nm.

Continental Models

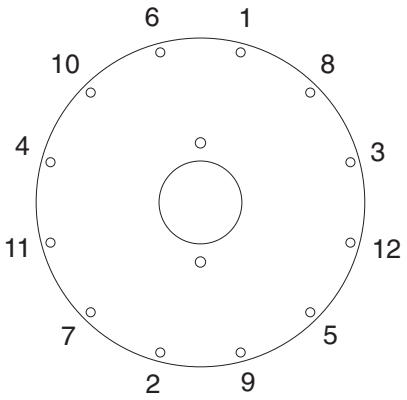
Torque the pump mounting plate fasteners in sequence to 23 ft-lbs / 31.2 Nm.

NOTICE

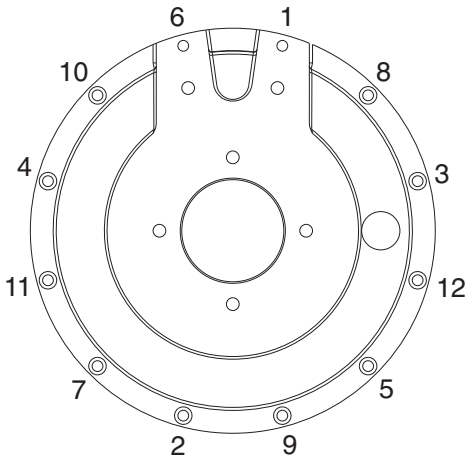
Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

NOTICE

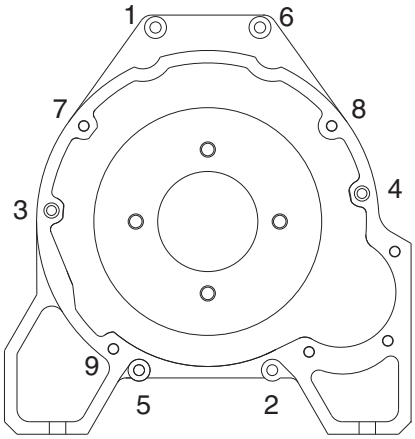
Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



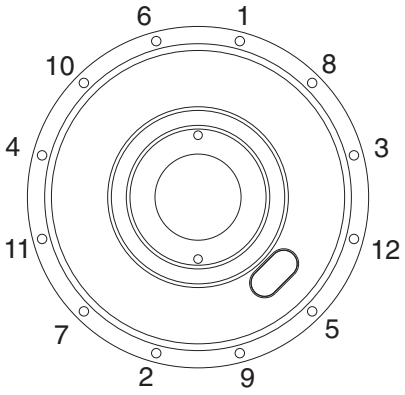
Deutz F4L-913 and
Perkins 704-30 models



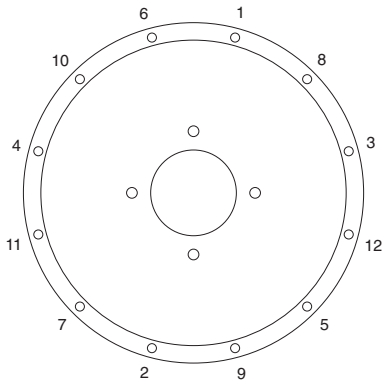
Deutz BF4L-2011 models



Ford models



Perkins 804C-33 and
GM models



Continental models

5-3
Engine Fault Codes - Gasoline/LPG Models

How to Retrieve Engine Fault Codes

When an engine malfunction is detected by the Electronic Control Module (ECM), a fault code is recorded and the check engine light will turn on at the platform controls. Use the following procedure to retrieve the engine fault code to determine the engine malfunction.

Note: Perform this procedure with the key switch in the off position.

1 Open the engine side turntable cover.

2 Locate the run/test toggle switch located on the relay box cover.

3 Pull out the red Emergency Stop button to the on position at the ground controls.

4 Hold the run/test toggle switch to the test position and turn the key switch to the ground controls position.

⊙ Result: The check engine light should turn on. The check engine light should begin to blink.

Note: The check engine light will blink a "123" code three times before blinking a fault code if one is present.

5 Continue to hold the run/test toggle switch in the test position and count the blinks.

Note: If any fault codes are present, the ECM will blink a three digit code. It will blink the first digit of a three digit code, pause, blink the second digit, pause, and then blink the third digit. For example: the check engine light blinks 5 consecutive times, blinks 3 times and then 1 time. That would indicate code 531.

Note: Before the fault codes are displayed, the check engine light will blink a code 123 times. After the fault codes, the check engine light will blink a code 123 three times again indicating the end of the stored codes.

6 Refer to Section 5, *Fault Codes* for definition of engine fault codes.

How to Clear Engine Fault Codes from the ECM

Note: Perform this procedure with the engine off and the key switch in the off position.

1 Open the engine side turntable cover and locate the battery.

2 Disconnect the negative battery cable from the battery for a minimum of 5 minutes.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Connect the negative battery cable to the battery.

Ground Controls

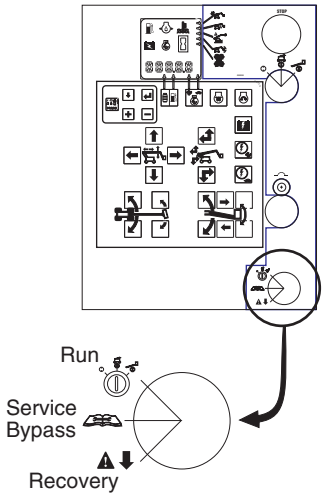
REV B

6-1 Service Bypass/Recovery Key Switch

The ground control box contains two key switches. The main key switch towards the top of the control box is for selection of ground or platform controls. The key switch at the bottom of the control box is the Service Bypass/Recovery key switch. Service Bypass and Recovery modes are only intended for certain circumstances and are not part of normal machine operation. If either the Service Bypass or the Recovery function is required, this indicates there may be faults with the machine. Contact trained personnel immediately.

Service Bypass is used for a platform out-of-envelope condition and certain service situations.

Recovery is only to be used as a last attempt to lower the platform when the operator in the platform is unable to do so, system failure or in emergency situations.



Service Bypass/
Recovery Key Switch

How to Use the Service Bypass Mode

⚠ DANGER Tip-over hazard. Operating the machine outside of the operating envelope while in Service Bypass mode will result in death or serious injury if proper operating procedures and safety precautions are not followed. Do not use this mode if you are not trained and familiar with the operating envelope of the machine.

Note: Before using the Service Bypass mode, make sure you understand the fault code or issue affecting the operation of the machine to be sure the use of service bypass is required.

The Service Bypass mode will allow the platform to be manually leveled when an out-of-envelope condition exists. In the event that the platform angle is greater than 10° from level, the boom angle and platform level functions are disabled. Use of the Service Bypass mode will allow the platform to be manually adjusted to within the normal operating envelope, ±4.5°. Only auxiliary power can be used to correct an out of level platform fault.

1 Turn the engine off.

2 Turn the main key switch to ground controls. Remove the key from the main key switch and insert the key into the service bypass/recovery key switch.

Note: The main key switch must remain in the ground control position.

3 Turn the service bypass/recovery key switch to the service bypass position.

4 Using auxiliary power, operate the platform level toggle switch to level the platform.

Note: Only the auxiliary power unit can be used to correct an out of level platform fault.

5 Turn the service bypass/recovery key switch to the run position.

6 Remove the key from the service bypass/ recovery key switch and insert the key into the main key switch.

Note: If the Service Bypass function has been used, there may be faults with the machine. Check the LCD screen on the ground control box for machine faults, then contact trained service personnel.

How to Use the Recovery Mode

Recovery is only to be used as a last attempt to lower the platform when the operator in the platform is unable to do so, system failure or in emergency situations.

⚠WARNING Bodily injury hazard. When using recovery mode, the platform may not fully lower to the ground when the recovery mode is completed. Failure to use only suitable equipment and/or practices to allow the operator to safely exit the platform could result in death or serious injury.

⚠WARNING Bodily injury hazard. Platform leveling is not active when using recovery mode. The platform could reach high out-of-level conditions when using this mode. The operator will need to secure themself to the platform to prevent falling injury.

The Recovery mode allows the platform to be lowered in the event the operator in the platform is unable to lower the platform using the platform controls, system failure or emergency situations. The recovery sequence will automatically retract the primary boom and then lower the primary boom using the auxiliary power unit to allow the operator at the platform controls to exit the platform.

1 Turn the main key switch to the off position. Remove the key from the main key switch and insert the key into the service bypass/recovery key switch.

2 Turn and hold the service bypass/recovery key switch to the recovery position. The switch must be held in the recovery position.

⊙ Result: The auxiliary power unit will turn on and the boom will begin the following recovery sequence.

- The primary boom will retract
- The primary boom will lower

Note: The key switch must be held in the recovery position until the recovery sequence is complete or until the operator in the platform can safely exit the platform.

Note: If any boom safety limit switches are faulty, the boom will only retract and not lower and the operator will need to be recovered from that point.

Note: If the Recovery function has been used, this may indicate there may be faults with the machine. Tag and remove the machine from service until the fault has been corrected by trained personnel.

6-2 Circuit Boards

The ground control box (TCON) is the communication and operations center for the machine. The ground control box contains two key switches. The key switch towards the top of the control box is for selection of ground or platform controls. The key switch at the bottom of the control box is the Service Bypass key switch. It is used to correct an out-of-level platform. If the machine trips an envelope safety switch, the operator at the ground controls can turn and hold the Service Bypass key switch in the RECOVER position, which will automatically retract the boom and lower the platform to the ground.

The ground control box contains a replaceable membrane decal with touch sensitive buttons for various machine functions. The ground control box also contains two printed circuit boards:

The **LCD (Liquid Crystal Display) circuit board** is mounted to the inside of the control box lid which controls the LCD display screen.

The **ECM circuit board** is the main circuit board for the machine. There are relays on the ECM circuit board that can be replaced. All operating parameters and configuration of options for the machine are stored in the ECM memory.

Note: The ECM circuit board inside the ground control box (TCON) cannot be replaced by itself. If the ECM circuit board is faulty and needs to be replaced, contact the Genie Industries Service Department.

Note: When an ECM circuit board is replaced, the proportional valves will need to be calibrated. See 1-3, *How to Calibrate a Joystick.*

How to Determine the Revision Level

1 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both platform and ground controls.

⊙ Result: The revision level of the ECM will appear in the LCD display window.

How to Remove the LCD Display Screen Circuit Board

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Remove the ground control box lid fasteners. Open the control box lid.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

3 Carefully disconnect the ribbon cable from the LCD display circuit board.

4 Remove the LCD display circuit board retaining fasteners.

5 Carefully remove the LCD display circuit board from the ground control box lid.

6-3 Membrane Decal

The membrane decal is a special decal that consists of a decal with an electronic membrane on the backside. The membrane contains touch sensitive areas that, when pushed, activates the machine functions. The membrane buttons activate machine functions similar to toggle switches, but do not have any moving parts.

How to Replace the Membrane Decal

1 Turn the key switch at to the off position.

2 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

3 Remove the ground control box lid fasteners. Open the control box lid.

4 Tag and disconnect the two ribbon cables from the membrane decal at the ECM circuit board.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

5 Carefully remove the membrane decal from the control box lid while guiding the ribbon cables out of the control box lid.

6 Remove any decal adhesive from the control box lid with a mild solvent.

NOTICE Component damage hazard. Certain solvents can damage LCD display. Do not allow any solvent to come in contact with the LCD display screen.

7 Install the new membrane decal onto the control box lid while guiding the ribbon cables through the control box lid.

8 Connect the ribbon cables to the ECM circuit board.

9 Close the control box lid and install the retaining fasteners.

Hydraulic Pumps

REV B

7-1 Function Pump

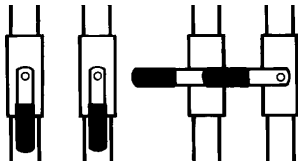
How to Remove the Function Pump

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 **Models without hydraulic tank shutoff valves:** Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

Models with hydraulic tank shutoff valves: Close the two hydraulic tank valves located at the hydraulic tank.

NOTICE Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



open closed

2 Tag, disconnect and plug the hydraulic hoses at the function pump. Cap the fittings on the pump.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pump mounting fasteners. Carefully remove the pump.

NOTICE Component damage hazard. Be sure to open the two hydraulic tank valves (if equipped) and prime the pump after installing the pump. See 7-2, *How to Prime the Pump*.

7-2 Drive Pump

The drive pump is a bi-directional variable displacement piston pump. The pump output is controlled by the electronic displacement controller (EDC), located on the pump. Any internal service to the pump should only be performed at an authorized Sauer-Danfoss service center. Contact the Genie Industries Service Department to locate your local authorized service center.

How to Remove the Drive Pump

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

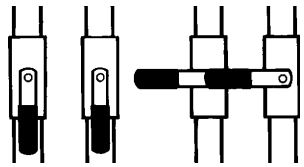
Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Disconnect the wire harness at the electronic displacement controller (EDC), located on the drive pump.

2 **Models without hydraulic tank shutoff valves:** Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

Models with hydraulic tank shutoff valves: Close the two hydraulic tank valves located at the hydraulic tank.

NOTICE Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



open closed

3 Tag, disconnect and plug the hydraulic hoses at the drive and function pumps. Cap the fittings on the pumps.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Support the pumps with a suitable lifting device and remove the two drive pump mounting fasteners.

5 Carefully pull the drive pump out until the pump coupler separates from the flex plate.

6 Remove the drive pump assembly from the machine.

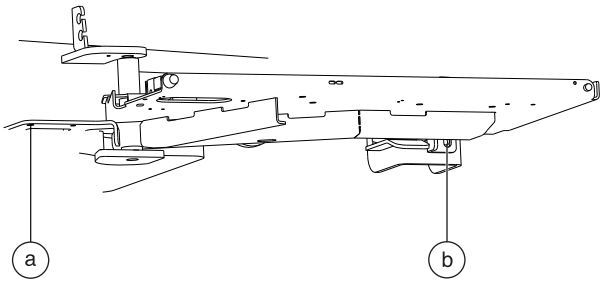
NOTICE Component damage hazard. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

Note: Before installing the pump, verify proper pump coupler spacing. See 5-2, *Flex Plate.*

How to Prime the Pump

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.



a engine tray anchor hole
b engine tray retaining fastener

3 Locate the engine tray anchor hole at the pivot end of the engine tray.

4 Install the bolt removed in step 4 into the anchor hole to secure the engine tray from moving.

⚠WARNING Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

5 **Deutz and Perkins models:** Tag and disconnect the engine wiring harness from the fuel shutoff solenoid at the injector pump.

GM and Ford models: Close the valve on the LPG tank. Disconnect the hose from the tank. Move the fuel select switch to the LPG position.

6 Have another person crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi / 22 bar.

7 **Deutz and Perkins models:** Connect the engine wiring harness to the fuel solenoid.

GM, Ford and Continental models: Connect the LPG hose to the LPG tank and open the valve on the tank.

8 Start the engine from the ground controls and check for hydraulic leaks.

Manifolds

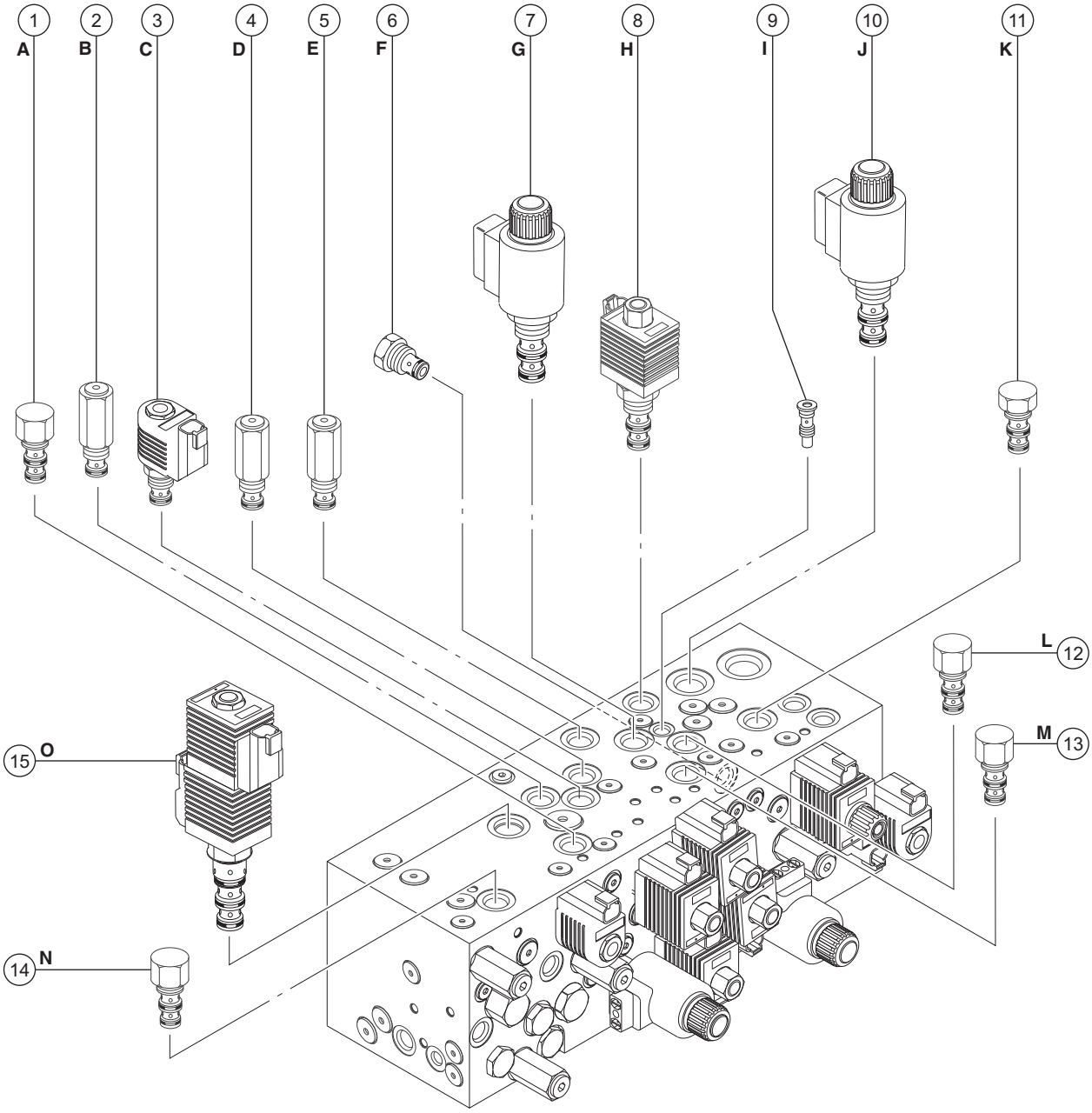
REV E

8-1
Function Manifold - View 1

The function manifold is located next to the ground control box.

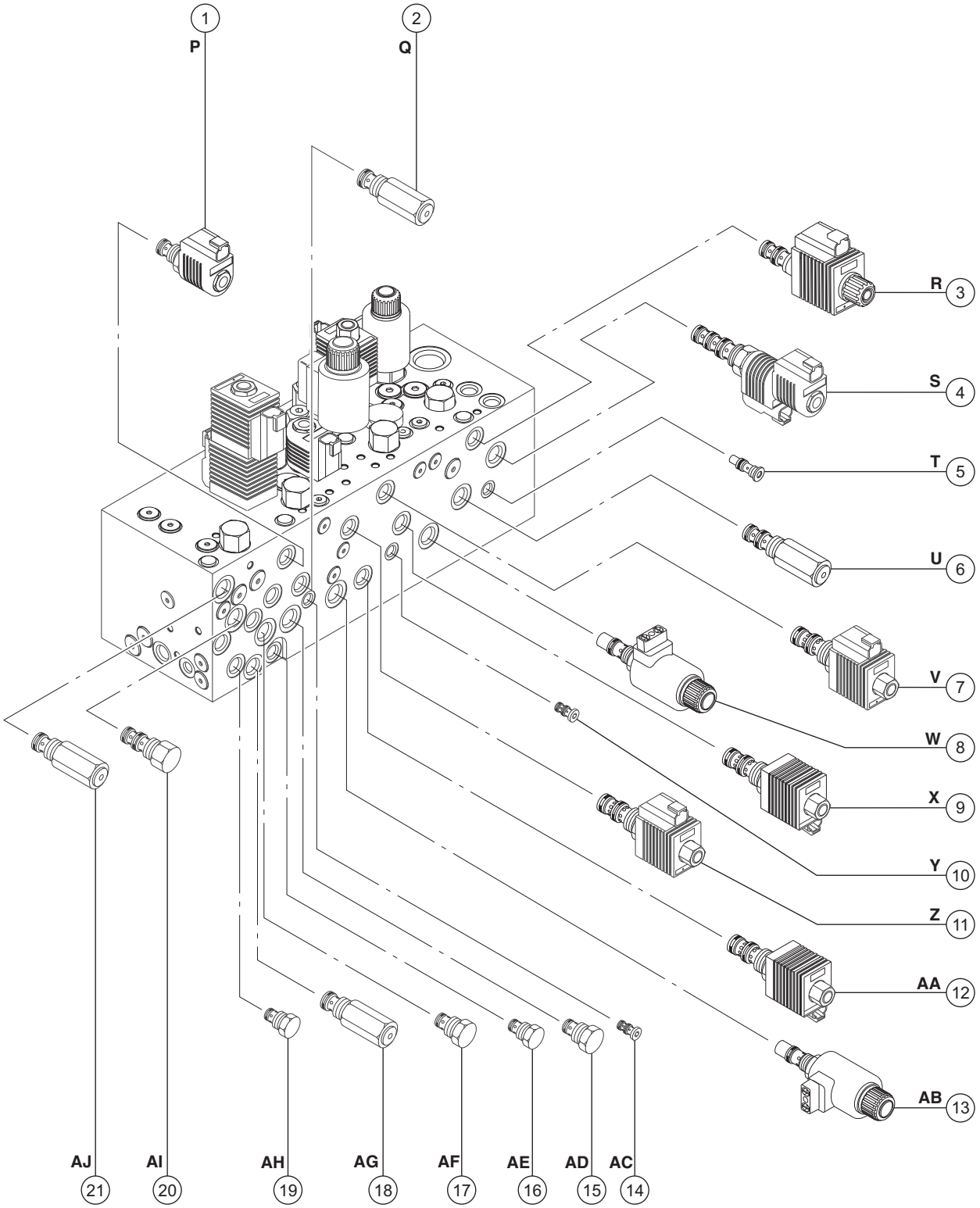
Index No.	Description	Schematic Item	Function	Torque
1	Differential sensing valve	A	Secondary boom up/extend and down/retract	30-35 ft-lbs / 41-47 Nm
2	Relief valve, 2500 psi / 172 bar	B	Secondary boom up	20-25 ft-lbs / 27-34 Nm
3	Solenoid valve, 2 position 2 way	C	Secondary boom up circuit	20-25 ft-lbs / 27-34 Nm
4	Relief valve, 2500 psi / 172 bar	D	Secondary boom down	20-25 ft-lbs / 27-34 Nm
5	Relief valve, 1300 psi / 89.6 bar	E	Primary boom down	20-25 ft-lbs / 27-34 Nm
6	Flow regulator valve, 0.1 gpm / 0.38 L/min	F	Bleeds off check valves in differential sensing circuits to tank	20-25 ft-lbs / 27-34 Nm
7	Proportional solenoid valve	G	Primary boom up/down	30-35 ft-lbs / 41-47 Nm
8	Solenoid valve, 2 position 3 way	H	Primary boom retract	33-37 ft-lbs / 45-50 Nm
9	Check valve	I	Differential sensing circuit, primary boom extend/retract	8-10 ft-lbs / 11-14 Nm
10	Solenoid valve, 2 position 3 way	J	Primary boom extend	50-55 ft-lbs / 68-75 Nm
11	Differential sensing valve	K	Turntable rotate left/right	30-35 ft-lbs / 41-47 Nm
12	Differential sensing valve	L	Primary boom extend/retract	30-35 ft-lbs / 41-47 Nm
13	Differential sensing valve	M	Primary boom up/down	30-35 ft-lbs / 41-47 Nm
14	Priority flow regulator valve, 3 gpm / 11.4 L/min	N	Controls flow to the oscillate and platform manifolds	30-35 ft-lbs / 41-47 Nm
15	Solenoid valve, 3 position 4 way	O	Secondary boom extend/retract	33-37 ft-lbs / 45-50 Nm

REV E MANIFOLDS



8-2
Function Manifold - View 2

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 2 way	P	Secondary boom extend circuit	20-25 ft-lbs / 27-34 Nm
2	Relief valve, 2600 psi / 179 bar	Q	Secondary boom extend	20-25 ft-lbs / 27-34 Nm
3	Proportional solenoid valve	R	Turntable rotate left/right	20-25 ft-lbs / 27-34 Nm
4	Solenoid valve, 3 position 4 way	S	Turntable rotate left/right	26-30 ft-lbs / 35-41 Nm
5	Check valve	T	Differential sensing circuit, turntable rotate	8-10 ft-lbs / 11-14 Nm
6	Relief valve, 1300 psi / 89.6 bar	U	Primary boom extend	30-35 ft-lbs / 41-47 Nm
7	Solenoid valve, 2 position 3 way	V	Primary boom up	33-37 ft-lbs / 45-50 Nm
8	Proportional solenoid valve	W	Primary boom extend/retract	30-35 ft-lbs / 41-47 Nm
9	Solenoid valve, 2 position 3 way	X	Primary boom down	33-37 ft-lbs / 45-50 Nm
10	Check valve	Y	Differential sensing circuit, primary boom up/down	8-10 ft-lbs / 11-14 Nm
11	Solenoid valve, 2 position 3 way	Z	Secondary boom up	33-37 ft-lbs / 45-50 Nm
12	Solenoid valve, 2 position 3 way	AA	Secondary boom down	33-37 ft-lbs / 45-50 Nm
13	Proportional solenoid valve	AB	Secondary boom extend/retract	30-35 ft-lbs / 41-47 Nm
14	Check valve	AC	Differential sensing circuit, secondary boom extend/retract	8-10 ft-lbs / 11-14 Nm
15	Check valve, 5 psi / 0.34 bar	AD	Blocks flow from auxiliary pump #1 to function pump #1	30-35 ft-lbs / 41-47 Nm
16	Check valve, 5 psi / 0.34 bar	AE	Blocks flow from function pump #1 to auxiliary pump #1	20-25 ft-lbs / 27-34 Nm
17	Check valve, 5 psi / 0.34 bar	AF	Blocks flow from auxiliary pump #2 to function pump #2	20-25 ft-lbs / 27-34 Nm
18	Relief valve, 3000 psi / 207 bar	AG	Oscillate and platform manifold system relief	20-25 ft-lbs / 27-34 Nm
19	Check valve, 5 psi / 0.34 bar	AH	Blocks flow from function pump #2 to auxiliary pump #2	20-25 ft-lbs / 27-34 Nm
20	Differential sensing valve, 150 psi / 10.3 bar	AI	Meters flow to functions	30-35 ft-lbs / 41-47 Nm
21	Relief valve, 3200 psi / 220.6 bar	AJ	Boom functions system relief	30-35 ft-lbs / 41-47 Nm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8-3
Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

Note: Perform this procedure with the boom in the stowed position.

1 Locate the boom retracted limit switch (LSP1RO) limit switch on the outside of the primary boom at the pivot end of the primary boom.

2 Tag and disconnect the wire harness from the limit switch, and install a wire jumper between pins 1 and 2 of the limit switch connector. Place another wire jumper between pins 3 and 4 of the limit switch connector.

3 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the PTEST port on the function manifold.

4 Start the engine from the ground controls.

5 Press and release the rpm select button until the engine changes to high idle.

6 Simultaneously push and hold the function enable/high speed button and the primary boom retract button with the primary boom fully retracted. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AJ).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

9 Repeat steps 4 through 8 confirm the relief valve pressure.

10 Remove the pressure gauge.

11 Remove the wire jumpers from the limit switch connector.

12 Securely install the LSP1RO pig tail into the wire harness.

How to Adjust the Primary Boom Down Relief Valve

Note: Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Press and release the rpm select button until the engine changes to high idle.

4 Raise the primary boom approximately 5 feet / 1.5 m.

5 Place a 4 x 4 inch / 10 x 10 cm block on the primary boom rest pad. Lower the primary boom onto the block.

⚠WARNING Crushing hazard. Keep hands clear of the block when lowering the primary boom.

6 Simultaneously push and hold the function enable/high speed button and the primary boom down button. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications.*

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item E).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

9 Start the engine and repeat steps 6 through 8 to confirm the relief valve pressure.

10 Start the engine and raise the primary boom approximately 12 inches / 30 cm. Remove the block and lower the primary boom to the stowed position.

11 Turn the engine off and remove the pressure gauge.

How to Adjust the Primary Boom Extend Relief Valve

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Raise the boom to a horizontal position. Turn the engine off.

4 Locate the boom extended limit switch (LSP1EO) on the outside of the primary boom.

5 Remove the limit switch mounting bracket retaining fasteners.

6 Pull the limit switch and bracket assembly out of the boom tube and let it hang down.

7 Start the engine from the ground controls and press and release the rpm select button until the engine changes to high idle.

8 Simultaneously push and hold the function enable/high speed button and the primary boom extend button with the primary boom fully extended. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

9 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item U).

10 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

11 Repeat steps 7 through 8 to confirm relief valve pressure.

12 Start the engine and fully retract the primary boom. Turn the engine off.

13 Install the limit switch and bracket assembly to the primary boom.

14 Remove the pressure gauge.

How to Adjust the Secondary Boom Up Relief Valve

1 Remove the cover retaining fasteners from the secondary boom end cover. Remove the cover from the machine.

2 Locate the wire connector for secondary boom limit switch LSS2AO. Disconnect the connector.

Note: The secondary boom limit switch LSS2AO is the upper limit switch located on the inside of the riser plate at the engine side of the machine.

3 Install a jumper wire between pins 3 and 4 of the LSS2AO Deutsch connector on the wire harness end.

4 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

5 Start the engine from the ground controls.

6 Simultaneously push and hold the function enable/high speed button and the secondary boom up/extend button and fully raise the secondary boom.

7 Continue holding the function enable/high speed button and the secondary boom up/extend button while observing the reading on the pressure gauge. Refer to Section 2, *Specifications.*

8 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item B).

9 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

10 Repeat steps 5 through 7 to confirm relief valve pressure.

11 Remove the pressure gauge.

12 Remove the jumper wire from LSS2AO limit switch connector. Connect the limit switch to the wire harness.

13 Install the secondary boom end cover and tighten the retaining fasteners.

How to Adjust the Secondary Boom Down Relief Valve

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Press and release the rpm select button until the engine changes to high idle.

4 Raise the secondary boom approximately 12 inches / 30 cm.

5 Place a 4 x 4 inch / 10 x 10 cm block on the secondary boom rest pad. Lower the secondary boom onto the block.

⚠WARNING Crushing hazard. Keep hands clear of the block when lowering the secondary boom.

6 Simultaneously push and hold the function enable/high speed button and the secondary boom down button. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item D).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

9 Start the engine and repeat step to confirm relief valve pressure.

10 Start the engine and raise the secondary boom approximately 12 inches / 30 cm. Remove the block and lower the secondary boom to the stowed position.

11 Turn the engine off and remove the pressure gauge.

How to Adjust the Secondary Boom Extend Relief Valve

Note: Perform this procedure with the secondary boom fully raised.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Simultaneously push and hold the function enable/high speed button and the secondary boom up/extend button with the secondary boom fully raised and extended. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications.*

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item Q).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 5 to confirm relief valve pressure.

7 Remove the pressure gauge.

How to Adjust the Platform Manifold Relief Valve

Note: Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the PTEST 2 port on the function manifold.

2 Start the engine from the ground controls.

3 Simultaneously push and hold the function enable/high speed button and the jib boom down button with the jib boom fully lowered. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AG).

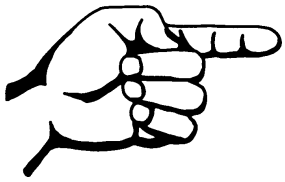
5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 3 to confirm relief valve pressure.

7 Remove the pressure gauge.

MANIFOLDS



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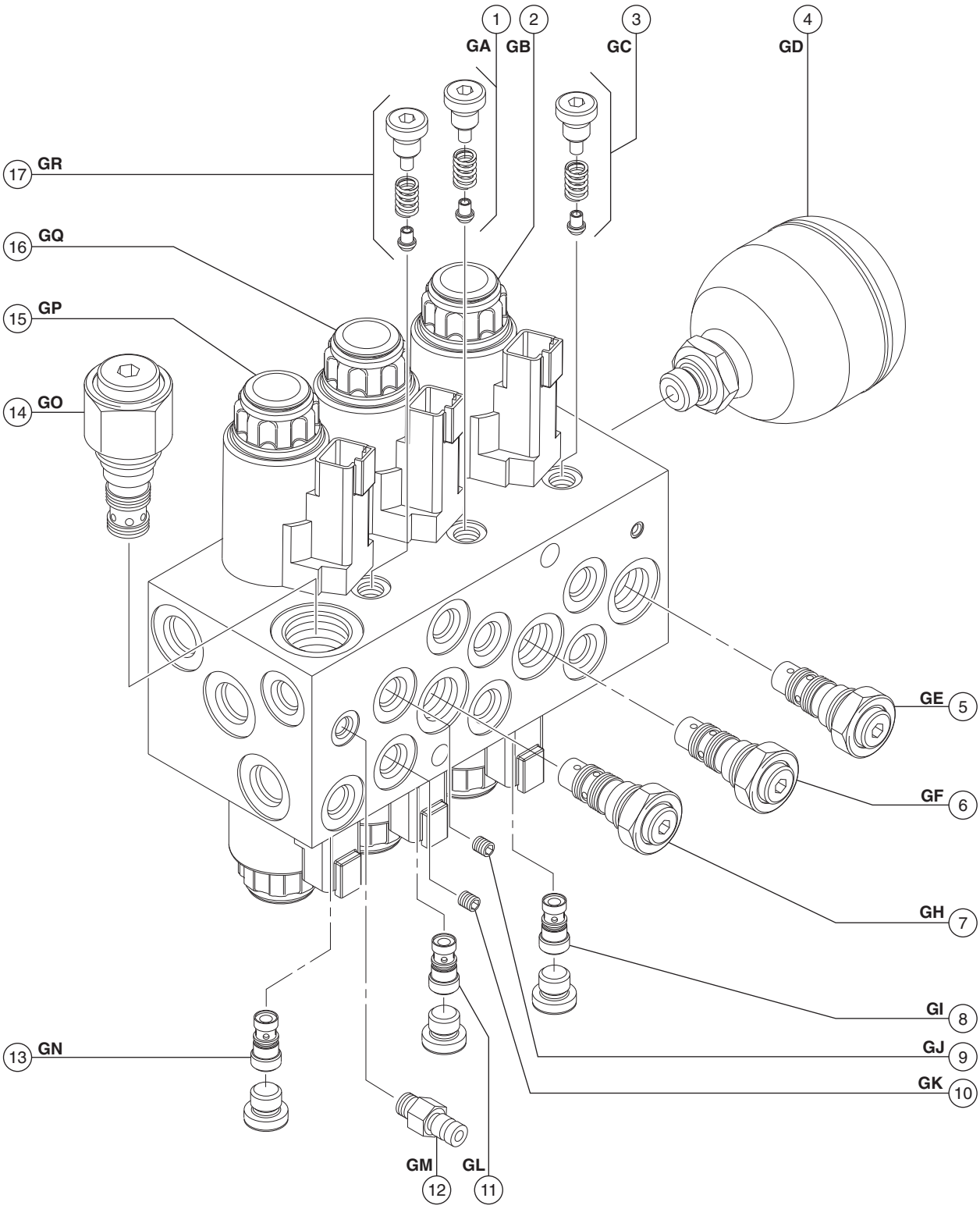
8-4
Platform Manifold

The platform Manifold is mounted to the platform mounting weldment.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve	GA	Platform level circuit	
2	Proportional solenoid valve, 3 position 4 way	GB	Jib boom up/down	
—	Core Tube, Top			7.5-9 ft-lbs / 10-12 Nm
—	Core Tube, Bottom			3.7-4.5 ft-lbs / 5-6 Nm
—	Coil Nut			3.7-4.5 ft-lbs / 5-6 Nm (Hand Tighten Only)
3	Check valve	GC	Jib boom circuit	
4	Accumulator, 500 psi / 34.5 bar	GD	Hydraulic dampening	23 ft-lbs / 31 Nm
5	Differential sensing valve, N.O.	GE	Jib boom differential sensing circuit	23-25 ft-lbs / 31-34 Nm
6	Differential sensing valve, N.O.	GF	Platform level differential sensing circuit	23-25 ft-lbs / 31-34 Nm
7	Differential sensing valve, N.O.	GH	Platform rotate differential sensing circuit	23-25 ft-lbs / 31-34 Nm
8	Shuttle valve	GI	Jib boom load sense circuit	7.5-9 ft-lbs / 10-12 Nm
9	Orifice plug, 0.030 inch / 0.762 mm	GJ	Platform rotate left circuit	
10	Orifice plug, 0.030 inch / 0.762 mm	GK	Platform rotate right circuit	
11	Shuttle valve	GL	Platform level load sense circuit	7.5-9 ft-lbs / 10-12 Nm
12	Diagnostic nipple	GM	Testing	
13	Shuttle valve	GN	Platform rotate load sense circuit	7.5-9 ft-lbs / 10-12 Nm
14	Differential sensing valve, N.C.	GO	Directs flow to functions	23-25 ft-lbs / 31-34 Nm
15	Proportional solenoid valve, 3 position 4 way	GP	Platform rotate left/right	
—	Core Tube, Top			7.5-9 ft-lbs / 10-12 Nm
—	Core Tube, Bottom			3.7-4.5 ft-lbs / 5-6 Nm
—	Coil Nut			3.7-4.5 ft-lbs / 5-6 Nm (Hand Tighten Only)
16	Proportional solenoid valve, 3 position 4 way	GQ	Platform level up/down	
—	Core Tube, Top			7.5-9 ft-lbs / 10-12 Nm
—	Core Tube, Bottom			3.7-4.5 ft-lbs / 5-6 Nm
—	Coil Nut			3.7-4.5 ft-lbs / 5-6 Nm (Hand Tighten Only)
17	Check valve	GR	Platform rotate circuit	

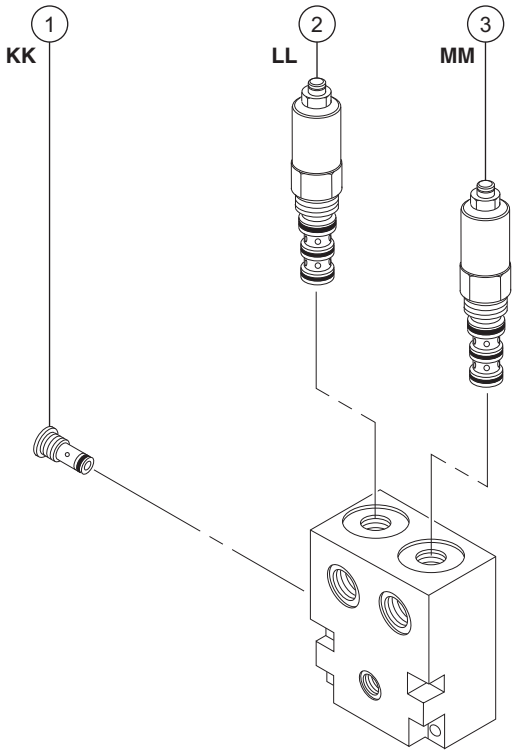
REV E MANIFOLDS



8-5
Turntable Rotation Manifold

The turntable rotation manifold is mounted to the turntable rotation motor located in the boom storage compartment.

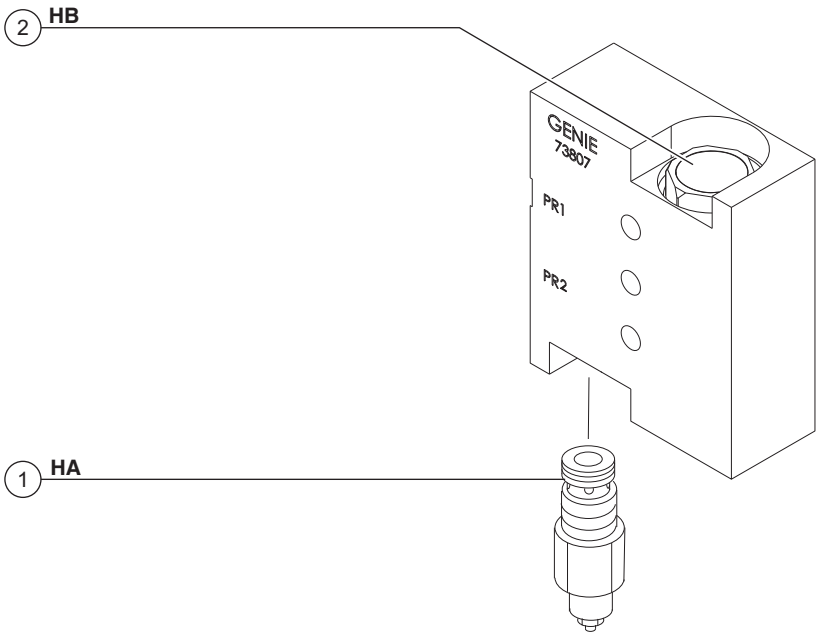
Index No.	Description	Schematic Item	Function	Torque
1	Shuttle valve, 2 position 3 way	KK	Turntable rotation brake release	10-13 ft-lbs / 14-18 Nm
2	Counterbalance valve	LL	Turntable rotate right	35-40 ft-lbs / 47-54 Nm
3	Counterbalance valve	MM	Turntable rotate left	35-40 ft-lbs / 47-54 Nm



8-6
Platform Rotate Manifold

The platform rotate manifold is mounted on the platform rotator.

Index No.	Description	Schematic Item	Function	Torque
1	Counterbalance valve	HA	Turntable rotation brake release	35-40 ft-lbs / 47-54 Nm
2	Counterbalance valve	HB	Turntable rotate left	35-40 ft-lbs / 47-54 Nm



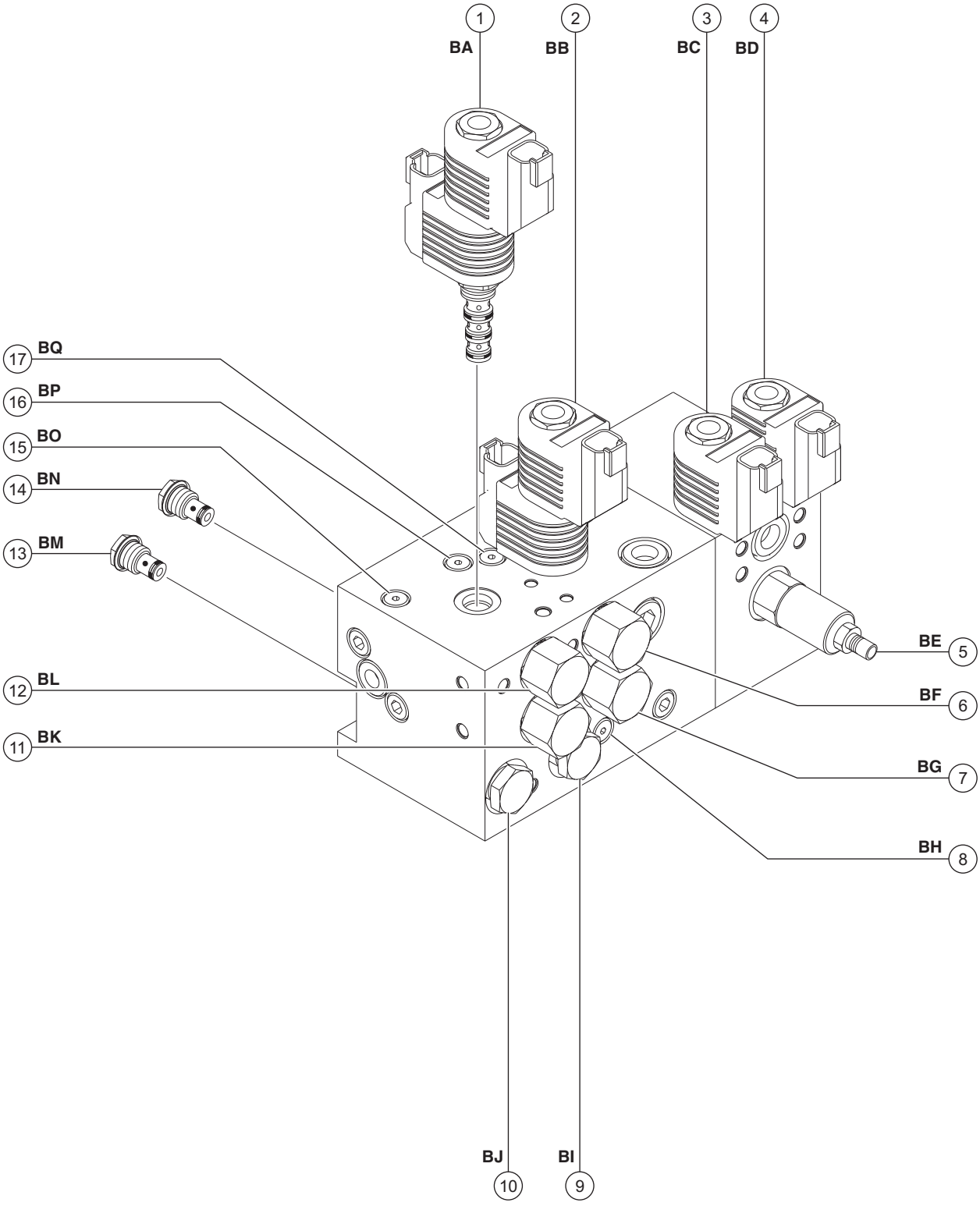
8-7
Two Wheel Steer and Oscillate Manifold
(before serial number 990)

The Two Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	BA	Steer left/right, yellow side steer cylinder	26-30 ft-lbs / 35-41 Nm
2	Solenoid valve, 3 position 4 way	BB	Steer left/right, blue side steer cylinder	26-30 ft-lbs / 35-41 Nm
3	Solenoid valve, 2 position 3 way	BC	Oscillate cylinder, blue side	26-30 ft-lbs / 35-41 Nm
4	Solenoid valve, 2 position 3 way	BD	Oscillate cylinder, yellow side	26-30 ft-lbs / 35-41 Nm
5	Relief valve, 750 to 860 psi / 51.71 to 59.3 bar	BE	Oscillate circuit	20-25 ft-lbs / 27-34 Nm
6	Flow regulator valve, 2.3 gpm / 8.7 L/min	BF	Blue side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
7	Flow regulator valve, 1.2 gpm / 4.5 L/min (before serial number 928) 1.5 gpm / 5.7 L/min (after serial number 927)	BG	Blue side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
8	Check valve	BH	Load sensing circuit, blue side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
9	Check valve	BI	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
10	Check valve	BJ	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm

This list continues on the next page.

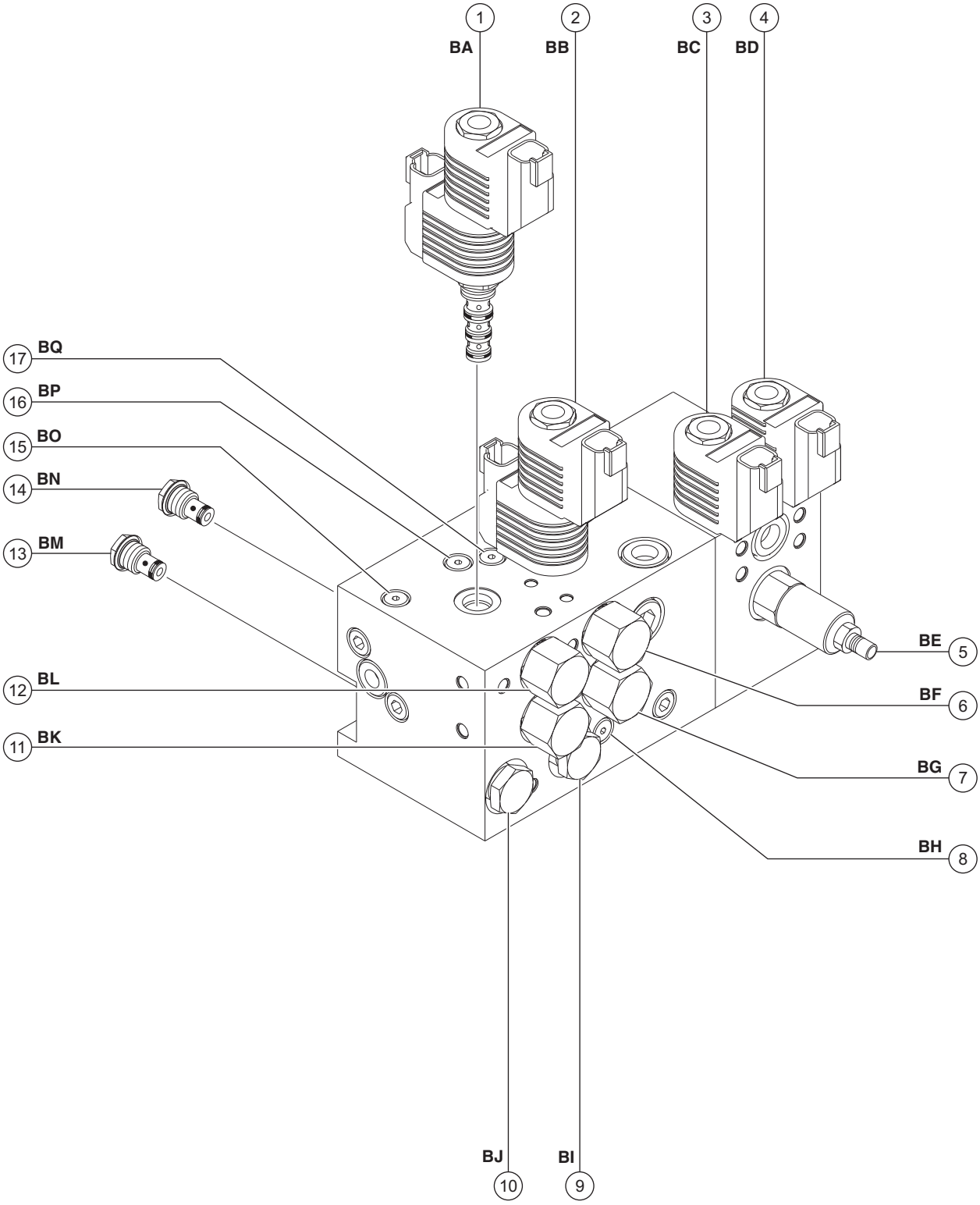
REV E MANIFOLDS



Two Wheel Steer and Oscillate Manifold, continued
(before serial number 990)

Index No.	Description	Schematic Item	Function	Torque
11	Flow regulator valve, 2.3 gpm / 8.7 L/min	BK	Yellow side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
12	Flow regulator valve, 1.2 gpm / 4.5 L/min (before serial number 928) 1.5 gpm / 5.7 L/min (after serial number 927)	BL	Yellow side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
13	Check valve, 65 psi / 4.5 bar	BM	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
14	Check valve, 65 psi / 4.5 bar	BN	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
15	Check valve	BO	Load sensing circuit, yellow side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
16	Check valve	BP	Load sensing circuit, yellow side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
17	Check valve	BQ	Load sensing circuit, blue side steer cylinder extend	8-10 ft-lbs / 11-14 Nm

REV E MANIFOLDS

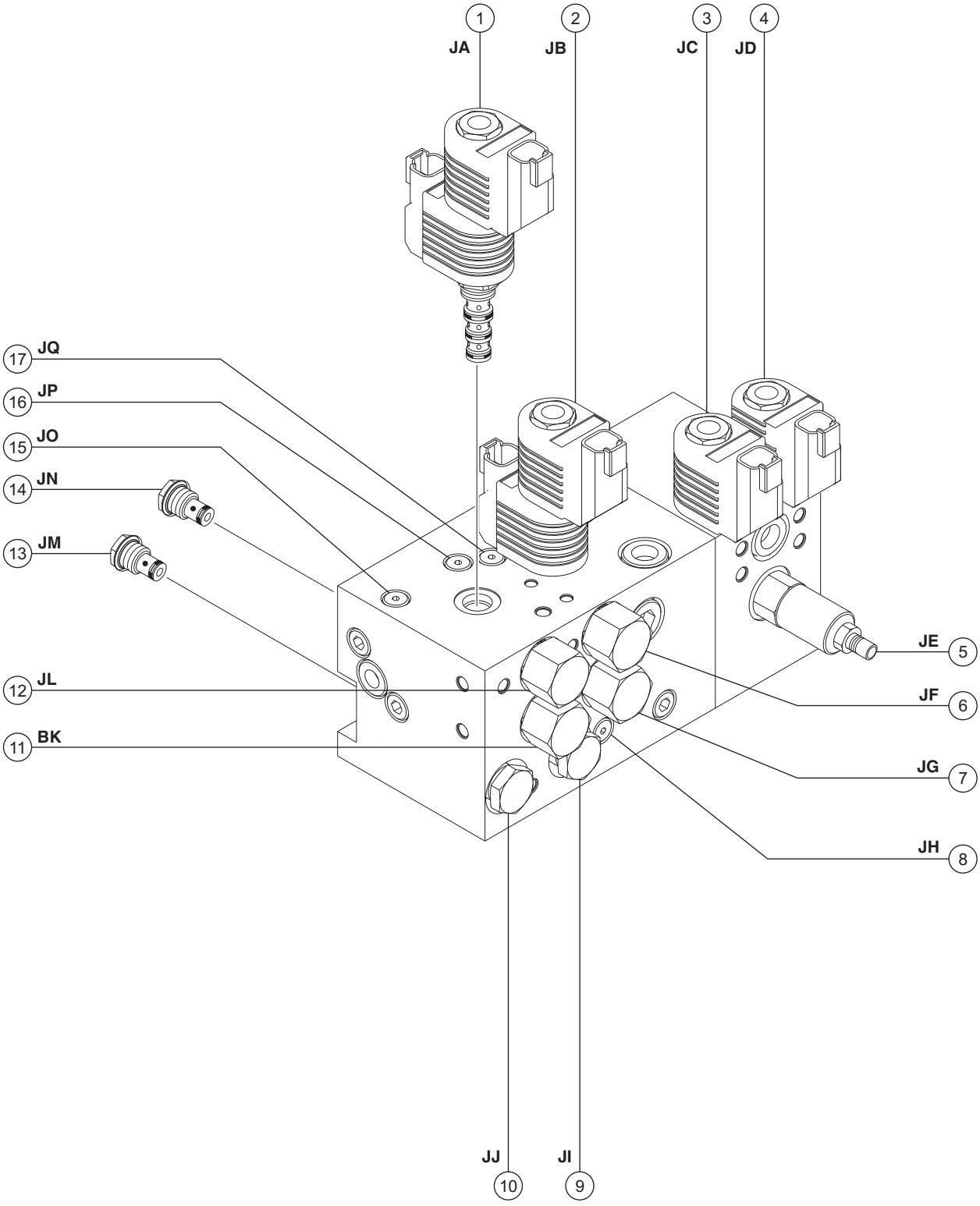


8-8
Two Wheel Steer and Oscillate Manifold
(from serial number 990)

The Two Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	JA	Steer left/right, yellow side steer cylinder	26-30 ft-lbs / 35-41 Nm
2	Solenoid valve, 3 position 4 way	JB	Steer left/right, blue side steer cylinder	26-30 ft-lbs / 35-41 Nm
3	Solenoid valve, 2 position 3 way	JC	Oscillate cylinder, blue side	26-30 ft-lbs / 35-41 Nm
4	Solenoid valve, 2 position 3 way	JD	Oscillate cylinder, yellow side	26-30 ft-lbs / 35-41 Nm
5	Relief valve, 750 to 860 psi / 51.71 to 59.3 bar	JE	Oscillate circuit	20-25 ft-lbs / 27-34 Nm
6	Flow regulator valve, 1.5 gpm / 5.7 L/min	JF	Blue side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
7	Flow regulator valve, 1.0 gpm / 3.8 L/min	JG	Blue side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
8	Check valve	JH	Load sensing circuit, blue side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
9	Check valve	JI	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
10	Check valve	JJ	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm

REV E MANIFOLDS



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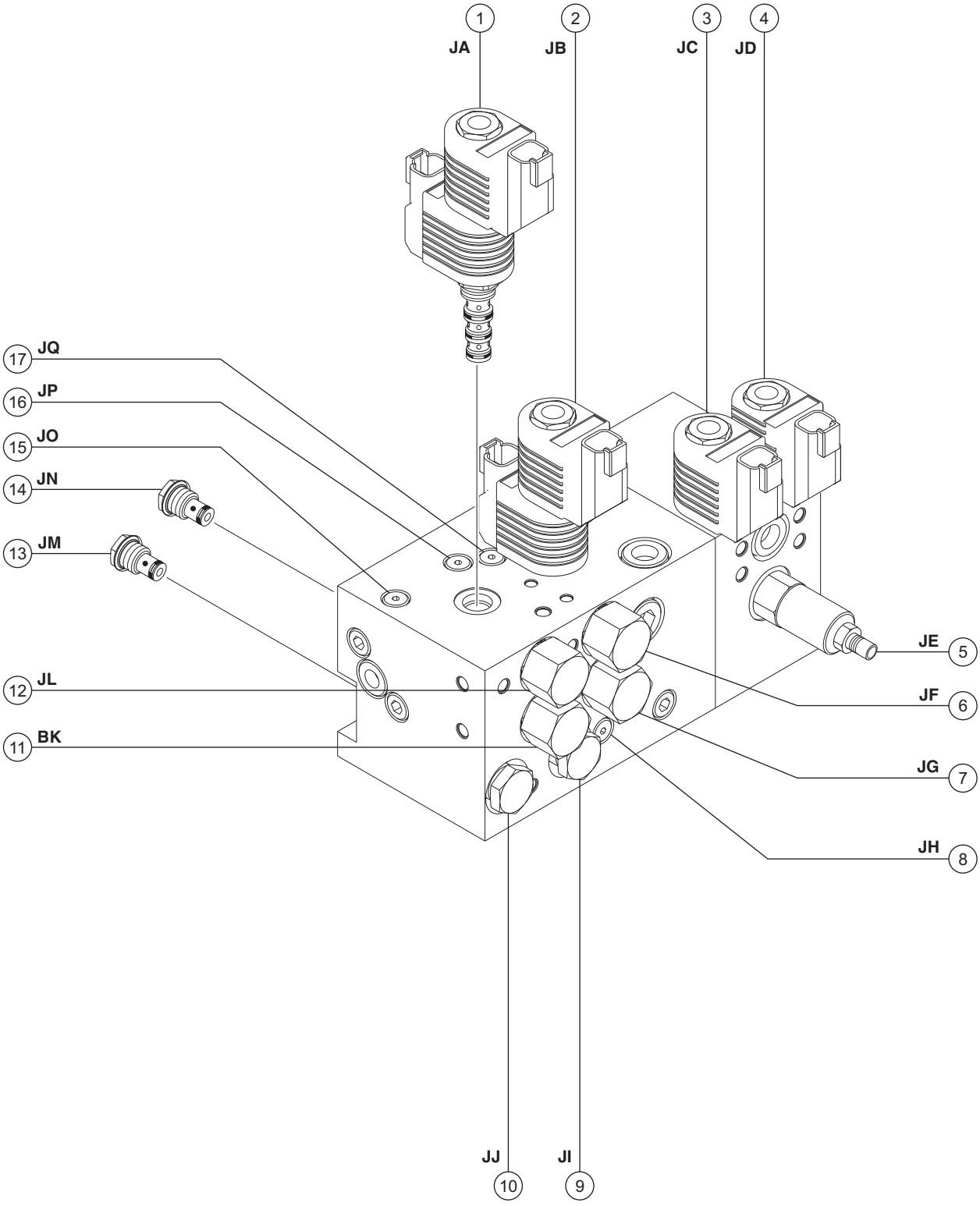
Two Wheel Steer and Oscillate Manifold, continued
(from serial number 990)

Index No.	Description	Schematic Item	Function	Torque
11	Flow regulator valve, 1.5 gpm / 5.7 L/min	JK	Yellow side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
12	Flow regulator valve, 1.0 gpm / 3.8 L/min	JL	Yellow side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
13	Check valve, 65 psi / 4.5 bar	JM	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
14	Check valve, 65 psi / 4.5 bar	JN	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
15	Check valve	JO	Load sensing circuit, yellow side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
16	Check valve	JP	Load sensing circuit, yellow side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
17	Check valve	JQ	Load sensing circuit, blue side steer cylinder extend	8-10 ft-lbs / 11-14 Nm

REV E MANIFOLDS



How to Adjust the Oscillate Relief Valve

Note: Perform this procedure with the boom in the stowed position.

Note: Perform this procedure with the engine running at high RPM.

Note: This procedure will require two people.

1 Remove the drive chassis cover from the square-end of the machine.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the two wheel steer and oscillate manifold.

3 Start the engine from the platform controls.

4 Press down the foot switch and manually activate one of the oscillate limit switches. Hold the switch in the activated position and observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

5 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item BE, before SN 1291 or JE, after SN 1290).

6 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

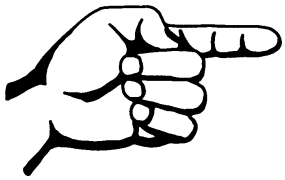
⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

7 Repeat steps 3 through 4 to confirm relief valve pressure.

8 Remove the pressure gauge.

9 Install the drive chassis cover.

MANIFOLDS



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8-9
Four Wheel Steer and Oscillate Manifold
(before serial number 990)

The Four Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	CA	Steer left/right, square end yellow side steer cylinder	26-30 ft-lbs / 35-41 Nm
2	Solenoid valve, 3 position 4 way	CB	Steer left/right, square end blue side steer cylinder	26-30 ft-lbs / 35-41 Nm
3	Check valve	CC	Load sensing circuit, circle end yellow side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
4	Check valve, 65 psi / 4.5 bar	CD	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
5	Solenoid valve, 2 position 3 way	CE	Oscillate cylinder, blue side	26-30 ft-lbs / 35-41 Nm
6	Solenoid valve, 2 position 3 way	CF	Oscillate cylinder, yellow side	26-30 ft-lbs / 35-41 Nm
7	Check valve, 65 psi / 4.5 bar	CG	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
8	Relief valve, 750 to 860 psi / 51.71 to 59.3 bar	CH	Oscillate circuit	20-25 ft-lbs / 27-34 Nm
9	Flow regulator valve, 2.3 gpm / 8.7 L/min	CI	Circle end, blue side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
10	Flow regulator valve, 1.2 gpm / 4.5 L/min (before serial number 928) 1.5 gpm / 5.7 L/min (after serial number 927)	CJ	Circle end, blue side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
11	Flow regulator valve, 1.2 gpm / 4.5 L/min (before serial number 928) 1.5 gpm / 5.7 L/min (after serial number 927)	CK	Circle end, yellow side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
12	Flow regulator valve, 2.3 gpm / 8.7 L/min	CL	Circle end, yellow side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm

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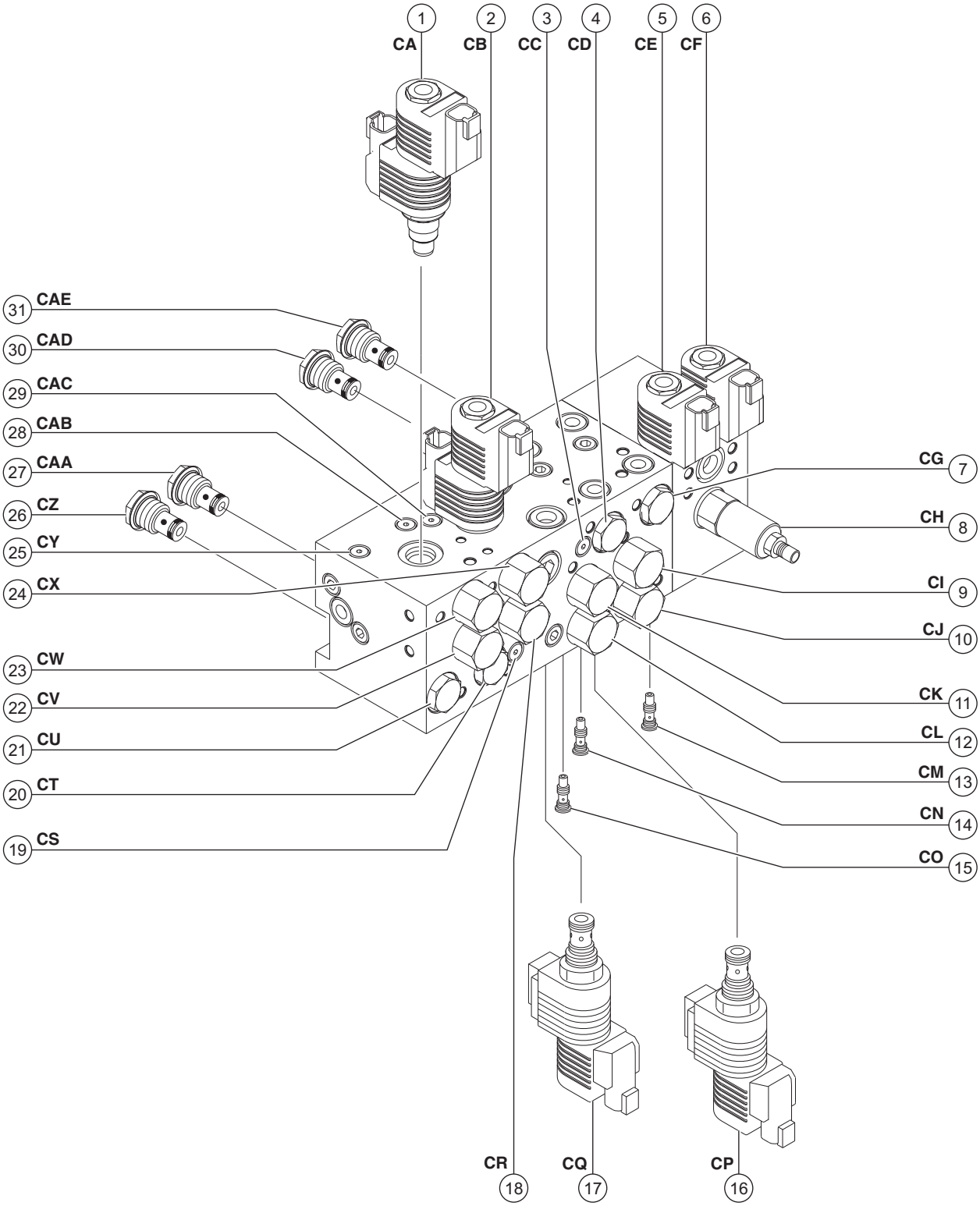
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21 CU
20 CT
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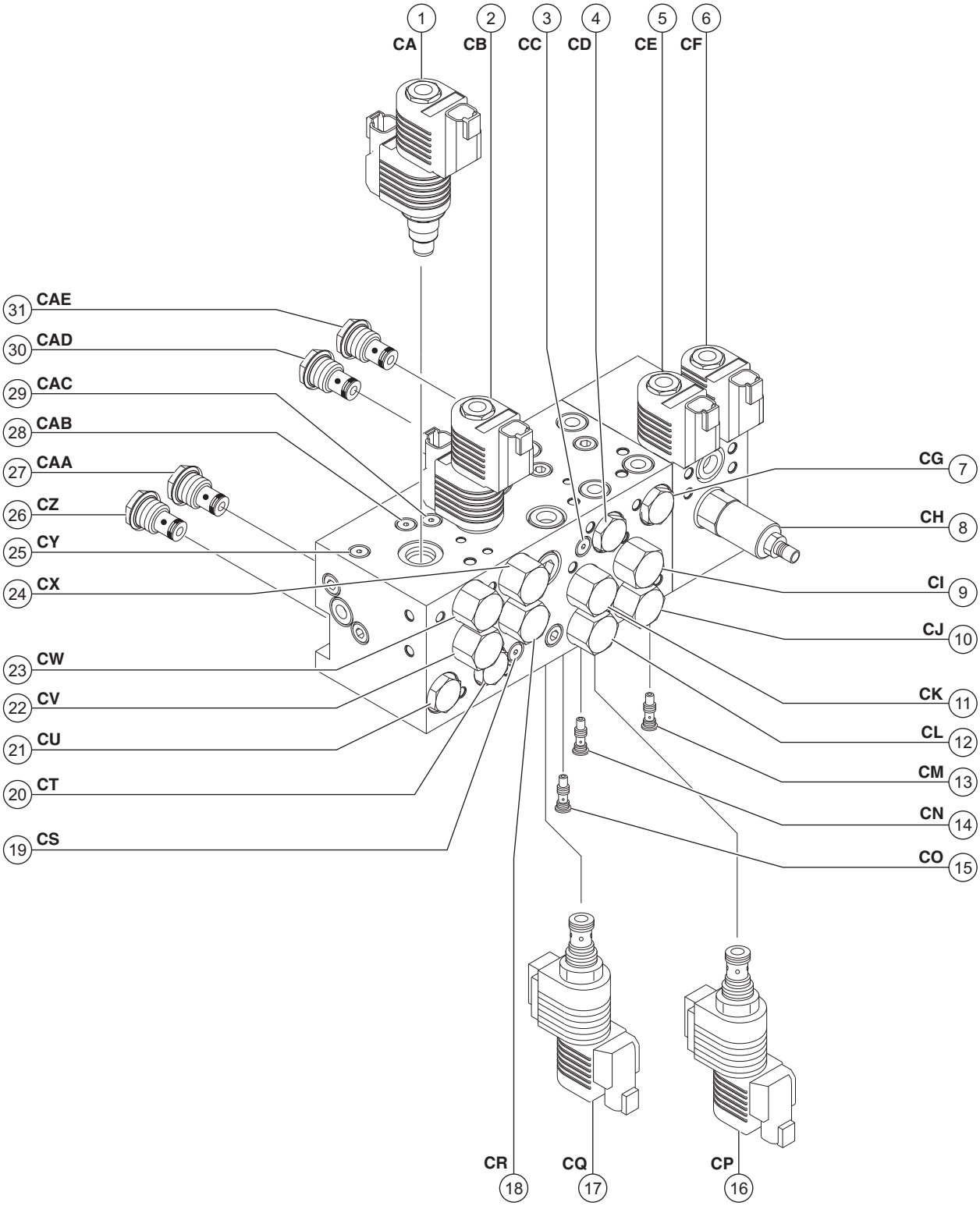
CG 7
CH 8
CI 9
CJ 10
CK 11
CL 12
CM 13
CN 14
CO 15
CR 18
CQ 17
CP 16

Four Wheel Steer and Oscillate Manifold, continued

Index No.	Description	Schematic Item	Function	Torque
13	Check valve	CM	Load sensing circuit, circle end blue side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
14	Check valve	CN	Load sensing circuit, circle end blue side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
15	Check valve	CO	Load sensing circuit, circle end yellow side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
16	Solenoid valve, 3 position 4 way	CP	Steer left/right, circle end blue side steer cylinder	26-30 ft-lbs / 35-41 Nm
17	Solenoid valve, 3 position 4 way	CQ	Steer left/right, circle end yellow side steer cylinder	26-30 ft-lbs / 35-41 Nm
18	Flow regulator valve, 1.2 gpm / 4.5 L/min (before serial number 928) 1.5 gpm / 5.7 L/min (after serial number 927)	CR	Square end, left side steer cylinder retract circuit	26-30 ft-lbs / 35-41 Nm
19	Check valve	CS	Load sensing circuit, square end blue side steer cylinder retract	20-25 ft-lbs / 27-34 Nm
20	Check valve, 65 psi / 4.5 bar	CT	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
21	Check valve, 65 psi / 4.5 bar	CU	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
22	Flow regulator valve, 2.3 gpm / 8.7 L/min	CV	Square end, yellow side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
23	Flow regulator valve, 1.2 gpm / 4.5 L/min (before serial number 928) 1.5 gpm / 5.7 L/min (after serial number 927)	CW	Square end, yellow side steer cylinder retract circuit	26-30 ft-lbs / 35-41 Nm
24	Flow regulator valve, 2.3 gpm / 8.7 L/min	CX	Square end, blue side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
25	Check valve	CY	Load sensing circuit, square end yellow side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
26	Check valve, 65 psi / 4.5 bar	CZ	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
27	Check valve, 65 psi / 4.5 bar	CAA	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
28	Check valve	CAB	Load sensing circuit, square end yellow side steer cylinder extend	8-10 ft-lbs / 11-14 Nm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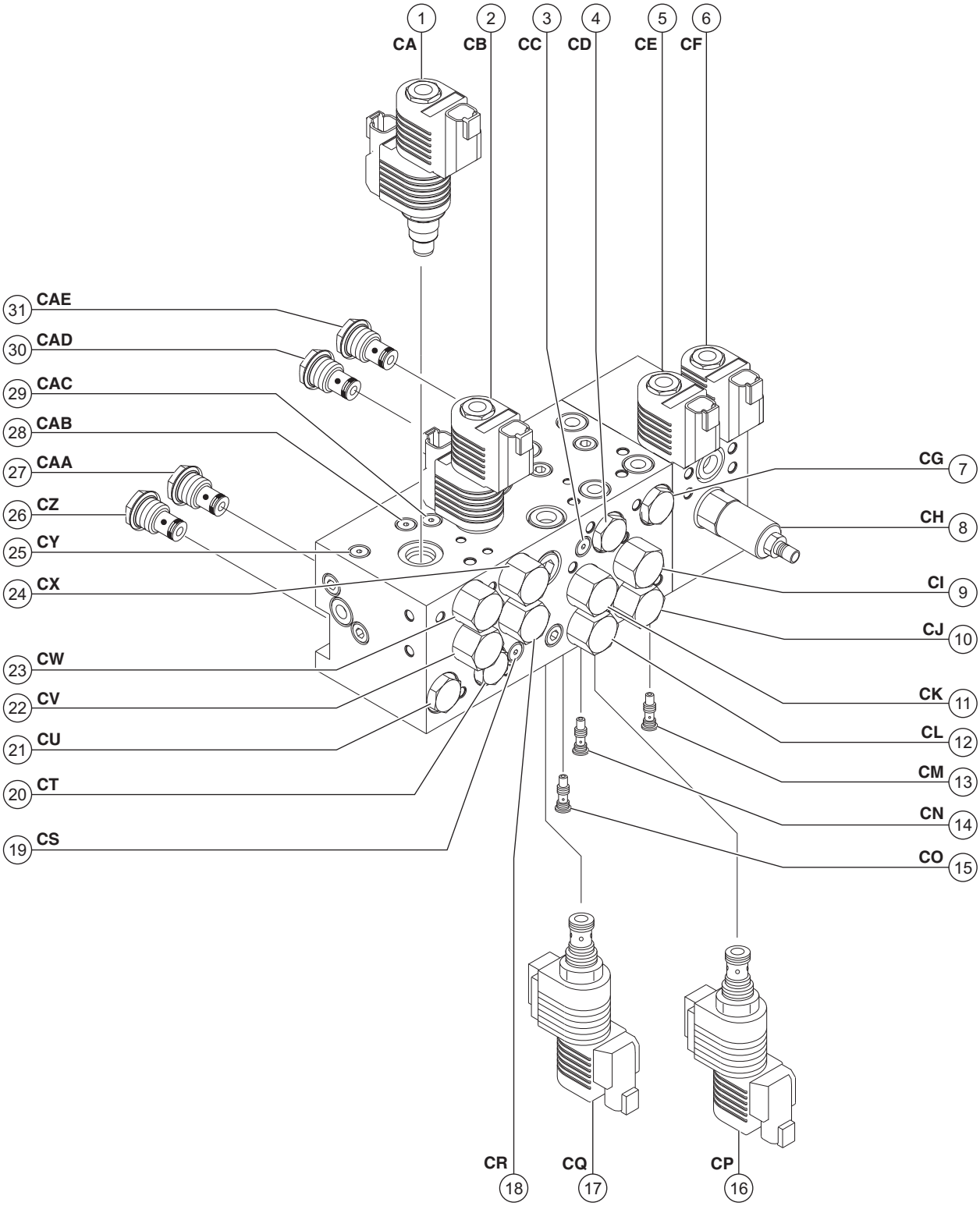
21 CU
20 CT
19 CS
CG 7
CH 8
CI 9
CJ 10
CK 11
CL 12
CM 13
CN 14
CO 15
CR 18
CQ 17
CP 16

Four Wheel Steer and Oscillate Manifold, continued

Index No.	Description	Schematic Item	Function	Torque
29	Check valve	CAC	Load sensing circuit, square end blue side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
30	Check valve, 65 psi / 4.5 bar	CAD	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
31	Check valve, 65 psi / 4.5 bar	CAE	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm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20 CT
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CG 7
CH 8
CI 9
CJ 10
CK 11
CL 12
CM 13
CN 14
CO 15
CR 18
CQ 17
CP 16

8-10
Four Wheel Steer and Oscillate Manifold
(from serial number 990)

The Four Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	KA	Steer left/right, square end yellow side steer cylinder	26-30 ft-lbs / 35-41 Nm
2	Solenoid valve, 3 position 4 way	KB	Steer left/right, square end blue side steer cylinder	26-30 ft-lbs / 35-41 Nm
3	Check valve	KC	Load sensing circuit, circle end yellow side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
4	Check valve, 65 psi / 4.5 bar	KD	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
5	Solenoid valve, 2 position 3 way	KE	Oscillate cylinder, blue side	26-30 ft-lbs / 35-41 Nm
6	Solenoid valve, 2 position 3 way	KF	Oscillate cylinder, yellow side	26-30 ft-lbs / 35-41 Nm
7	Check valve, 65 psi / 4.5 bar	KG	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
8	Relief valve, 750 to 860 psi / 51.71 to 59.3 bar	KH	Oscillate circuit	20-25 ft-lbs / 27-34 Nm
9	Flow regulator valve, 1.5 gpm / 5.7 L/min	KI	Circle end, blue side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
10	Flow regulator valve, 1.0 gpm / 3.8 L/min	KJ	Circle end, blue side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
11	Flow regulator valve, 1.0 gpm / 3.8 L/min	KK	Circle end, yellow side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
12	Flow regulator valve, 1.5 gpm / 5.7 L/min	KL	Circle end, yellow side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
13	Check valve	KM	Load sensing circuit, circle end blue side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
14	Check valve	KN	Load sensing circuit, circle end blue side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
15	Check valve	KO	Load sensing circuit, circle end yellow side steer cylinder extend	8-10 ft-lbs / 11-14 Nm

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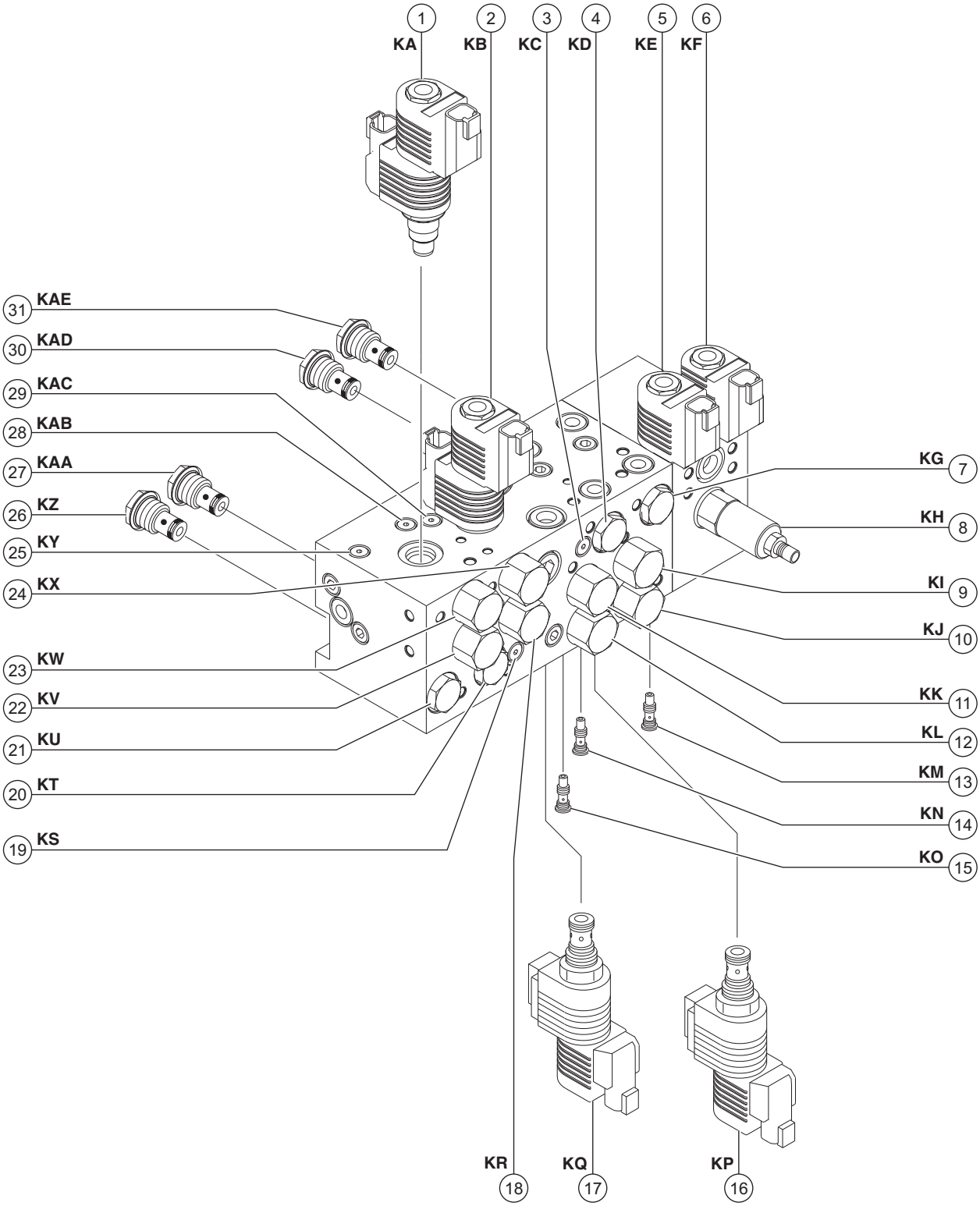
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10 KJ
11 KK
12 KL
13 KM
14 KN
15 KO
18 KR
17 KQ
16 KP

Four Wheel Steer and Oscillate Manifold, continued

Index No.	Description	Schematic Item	Function	Torque
16	Solenoid valve, 3 position 4 way	KP	Steer left/right, circle end blue side steer cylinder	26-30 ft-lbs / 35-41 Nm
17	Solenoid valve, 3 position 4 way	KQ	Steer left/right, circle end yellow side steer cylinder	26-30 ft-lbs / 35-41 Nm
18	Flow regulator valve, 1.0 gpm / 3.8 L/min	KR	Square end, left side steer cylinder retract circuit	20-25 ft-lbs / 27-34 Nm
19	Check valve	KS	Load sensing circuit, square end blue side steer cylinder retract	20-25 ft-lbs / 27-34 Nm
20	Check valve, 65 psi / 4.5 bar	KT	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
21	Check valve, 65 psi / 4.5 bar	KU	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
22	Flow regulator valve, 1.5 gpm / 5.7 L/min	KV	Square end, yellow side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
23	Flow regulator valve, 1.0 gpm / 3.8 L/min	KW	Square end, yellow side steer cylinder retract circuit	26-30 ft-lbs / 35-41 Nm
24	Flow regulator valve, 1.5 gpm / 5.7 L/min	KX	Square end, blue side steer cylinder extend circuit	20-25 ft-lbs / 27-34 Nm
25	Check valve	KY	Load sensing circuit, square end yellow side steer cylinder retract	8-10 ft-lbs / 11-14 Nm
26	Check valve, 65 psi / 4.5 bar	KZ	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
27	Check valve, 65 psi / 4.5 bar	KAA	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
28	Check valve	KAB	Load sensing circuit, square end yellow side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
29	Check valve	KAC	Load sensing circuit, square end blue side steer cylinder extend	8-10 ft-lbs / 11-14 Nm
30	Check valve, 65 psi / 4.5 bar	KAD	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm
31	Check valve, 65 psi / 4.5 bar	KAE	Prevents steer cylinder from moving when not steering	20-25 ft-lbs / 27-34 Nm

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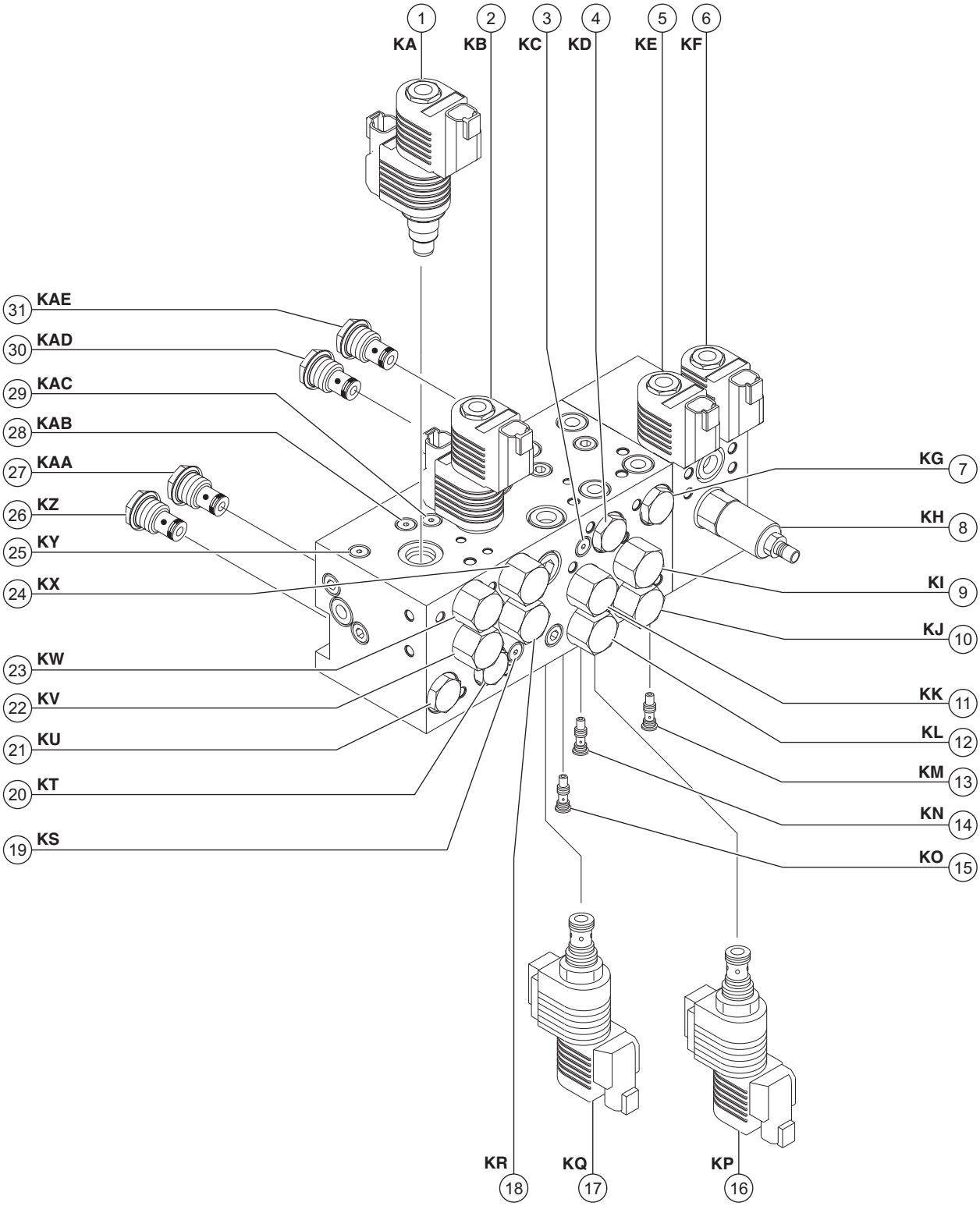
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KM 13
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KO 15
KR 18
KQ 17
KP 16

How to Adjust the Oscillate Relief Valve

Note: Perform this procedure with the boom in the stowed position.

Note: This procedure will require two people.

1 Remove the drive chassis cover from the square-end of the machine.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the steer/oscillate manifold.

3 Start the engine from the platform controls.

4 Press down the foot switch and manually activate one of the oscillate limit switches. Hold the switch in the activated position and observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

5 Turn the engine off. Use a wrench to hold the relief valve and loosen the jam nut. (item CH, before SN 1301 or item KH, after SN 1300).

6 Adjust the stud with a hex wrench. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

7 Repeat steps 3 through 4 to confirm relief valve pressure.

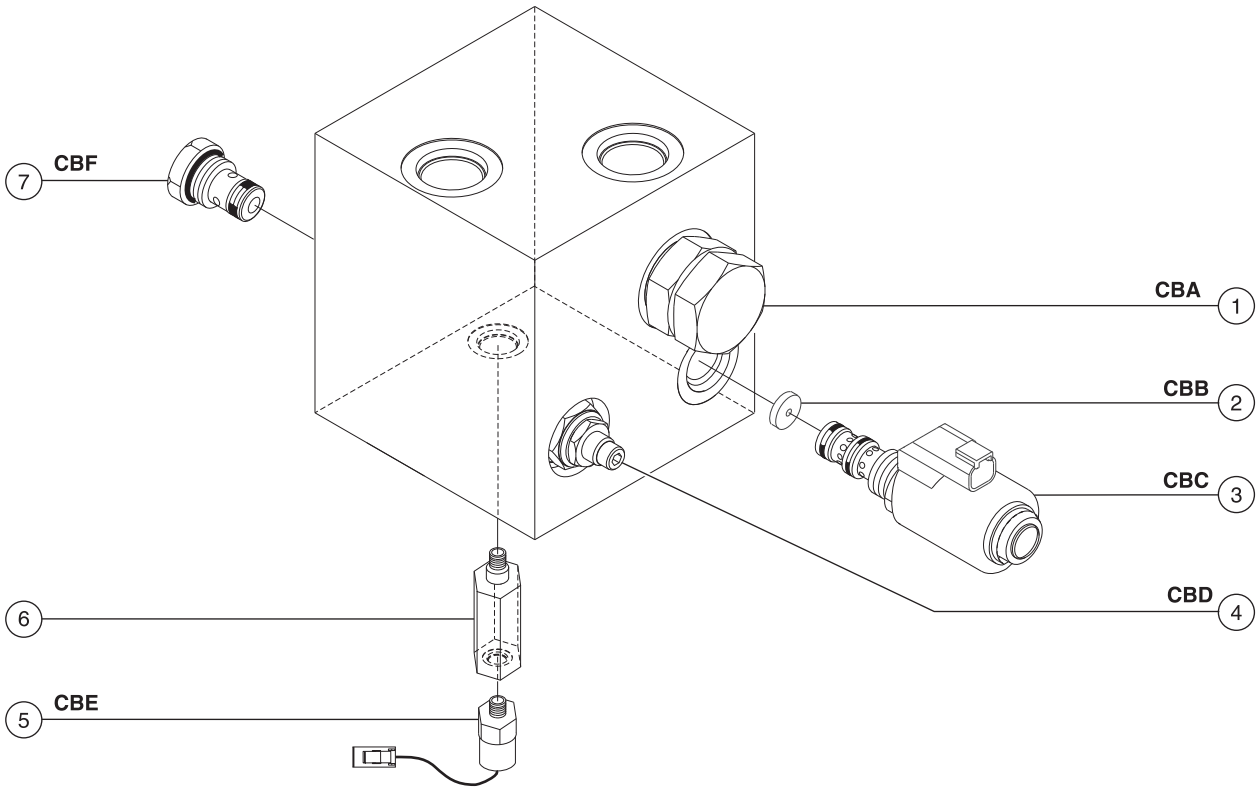
8 Remove the pressure gauge.

9 Install the drive chassis cover.

8-11
Oil Diverter Manifold Components (welder option)

The oil diverter manifold is mounted to the hydraulic generator located in the engine compartment.

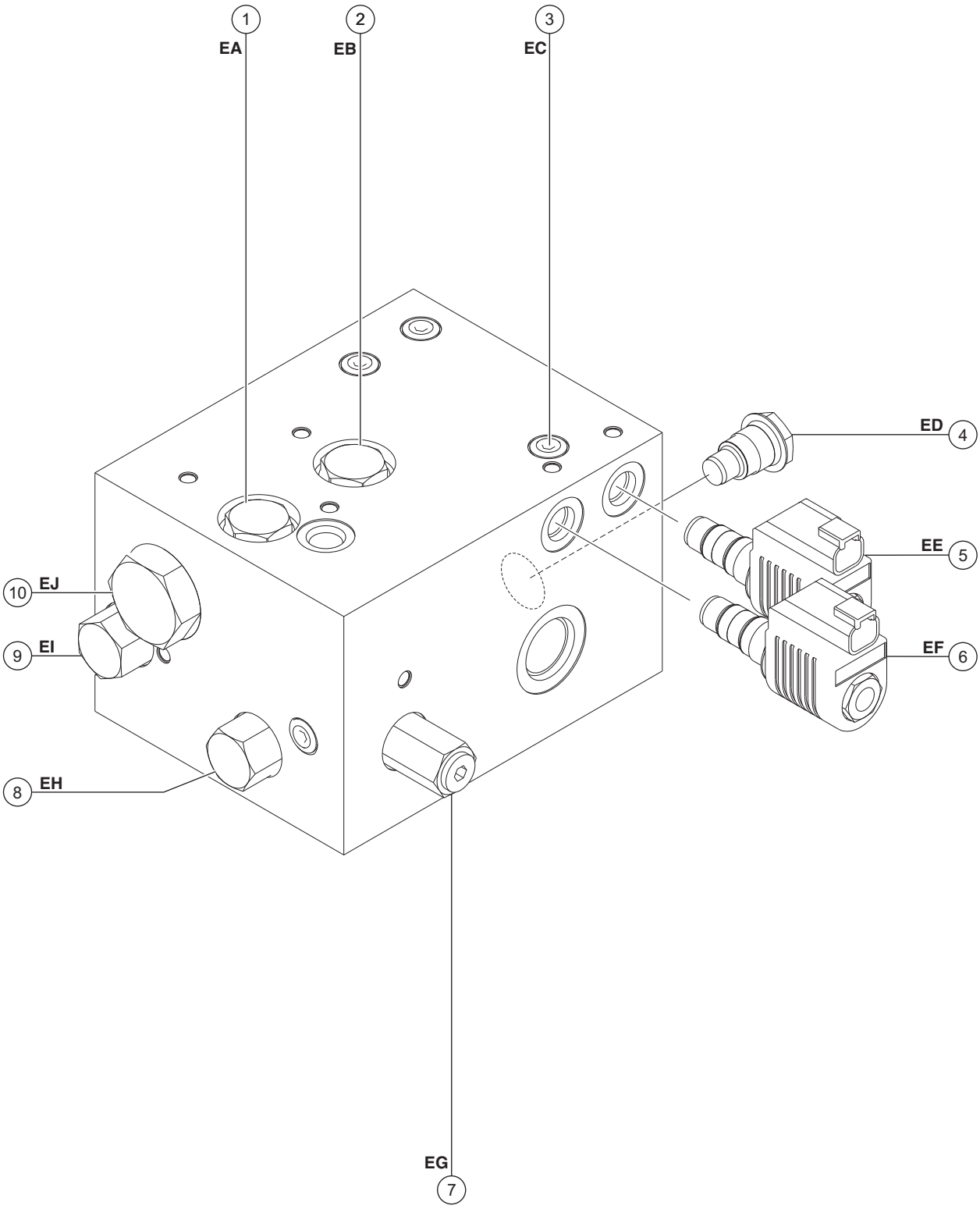
Index No.	Description	Schematic Item	Function	Torque
1	Pilot Operated Directional valve, 2 position 3 way	CBA	Activates generator	80-90 ft-lbs / 108-122 Nm
2	Orifice disc, 0.031 inch / 0.79 mm	CBB	Delays shift to drive	35-40 ft-lbs / 47-54 Nm
3	Solenoid valve, 2 position 3 way	CBC	Pilot valve to diverter	35-40 ft-lbs / 47-54 Nm
4	Relief valve, 280 psi @ 3.5 gpm / 19.3 bar @ 13.2 L/min	CBD	Charge pressure circuit	35-40 ft-lbs / 47-54 Nm
5	Pressure switch 200 psi / 18.6 bar	CBE	Generator relay switch	16 ft-lbs / 22 Nm
6	Connector fitting			11 ft-lbs / 15 Nm
7	Check valve	CBF	Prevents oil flowing into generator	35-40 ft-lbs / 47-54 Nm



8-12
Traction Manifold, 2WD

The 2WD traction manifold is mounted inside the drive chassis at the circle-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.34 bar	EA	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
2	Check valve, 5 psi / 0.34 bar	EB	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
3	Orifice, 0.031 in / 0.79 mm	EC	Brake and 2-speed circuit	
4	Check valve	ED	Keeps brakes released in case of temporary loss of charge pressure	20-25 ft-lbs / 27-34 Nm
5	Solenoid valve, 2 position 3 way	EE	Brake release	26-30 ft-lbs / 35-41 Nm
6	Solenoid valve, 2 position 3 way	EF	2-speed drive motor shift	26-30 ft-lbs / 35-41 Nm
7	Relief valve, 250 psi / 17.2 bar	EG	Charge pressure circuit	20-25 ft-lbs / 27-34 Nm
8	Shuttle valve, 3 position 3 way	EH	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	30-35 ft-lbs / 41-47 Nm
9	Bi-directional flow control valve, 4.5 gpm / 17 L/min	EI	Equalizes pressure on both sides of divider/combiner valve EJ	30-35 ft-lbs / 41-47 Nm
10	Flow divider/combiner valve	EJ	Controls flow to drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm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EI
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8-13
Valve Adjustments, 2WD Traction Manifold

How to Adjust the Charge Pressure Relief Valve

Note: Perform this procedure with the hydraulic oil temperature from 100°F to 150°F / 38°C to 65.5°C.

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 Use a wrench to hold the charge pressure relief valve and remove the cap (item EG).

3 Turn the internal hex socket fully in a clockwise direction until it stops. Install the cap.

4 Start the engine from the ground controls.

5 Press and hold the function enable/high rpm select button (rabbit symbol) position. Note the reading on the pressure gauge.

6 Turn the engine off.

7 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the drive manifold.

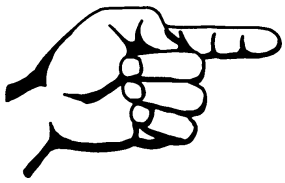
8 Use a wrench to hold the charge pressure relief valve and remove the cap from the valve (item EG).

9 Start the engine from the ground controls.

10 Press and hold the function enable/high rpm select button (rabbit symbol) position.

11 Adjust the internal hex socket until the pressure reading on the gauge is 40 psi / 2.8 bar less than the pressure reading taken in step 5. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the valve cap.

12 Turn the engine off and remove the pressure gauge.



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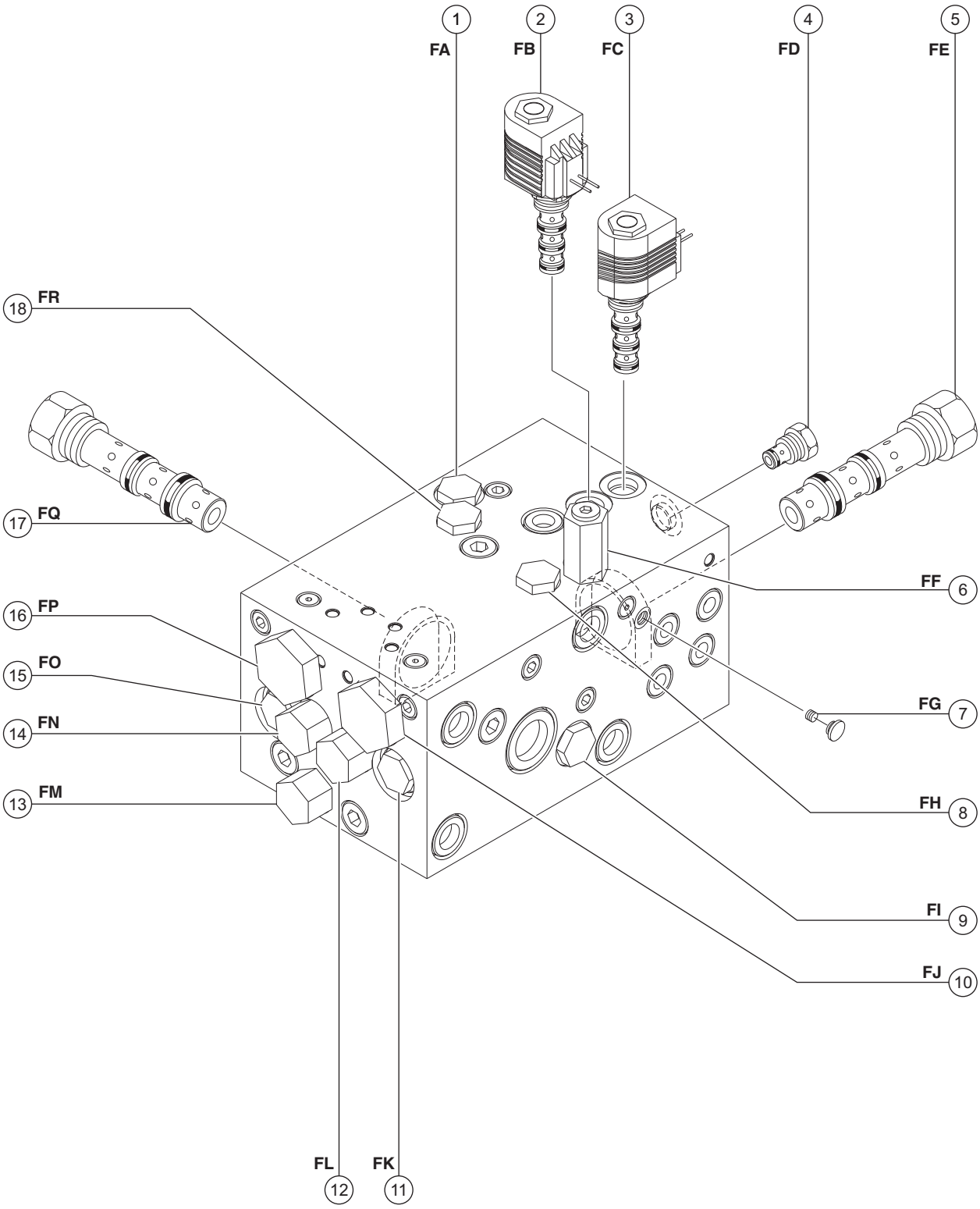
8-14
Traction Manifold, 4WD

The 4WD traction manifold is mounted inside the drive chassis at the circle-end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.34 bar	FA	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
2	Solenoid valve, 2 position 3 way	FB	2-speed drive motor shift	26-30 ft-lbs / 35-41 Nm
3	Solenoid valve, 2 position 3 way	FC	Brake release	26-30 ft-lbs / 35-41 Nm
4	Check valve	FD	Keeps brakes released in case of temporary loss of charge pressure	20-25 ft-lbs / 27-34 Nm
5	Shuttle valve, 3 position 3 way	FE	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	30-35 ft-lbs / 41-47 Nm
6	Relief valve, 250 psi / 17.2 bar	FF	Charge pressure circuit	20-25 ft-lbs / 27-34 Nm
7	Orifice, 0.030 in / 0.76 mm	FG	Brake and 2-speed circuit	
8	Check valve	FH	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
9	Check valve	FI	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
10	Flow divider/combiner valve	FJ	Controls flow to square end drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm
11	Check valve, 5 psi / 0.34 bar	FK	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
12	Bi-directional flow control valve, 2 gpm / 7.6 L/min	FL	Equalizes pressure on both sides of divider/combiner valve FJ	30-35 ft-lbs / 41-47 Nm
13	Bi-directional flow control valve, 2 gpm / 7.6 L/min	FM	Equalizes pressure on both sides of divider/combiner valve FQ	30-35 ft-lbs / 41-47 Nm
14	Bi-directional flow control valve, 2 gpm / 7.6 L/min	FN	Equalizes pressure on both sides of divider/combiner valve FP	30-35 ft-lbs / 41-47 Nm
15	Check valve	FO	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
16	Flow divider/combiner valve	FP	Controls flow to circle end drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm
17	Flow divider/combiner valve	FQ	Controls flow to divider/ combiner valves FJ and FP	90-100 ft-lbs / 122-136 Nm
18	Check valve	FR	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm

REV E MANIFOLDS



8-15
Valve Adjustments, 4WD Traction Manifold

How to Adjust the Charge Pressure Relief Valve

Note: Perform this procedure with the hydraulic oil temperature must be 100°F to 150°F / 38°C to 65.5°C.

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 Use a wrench to hold the charge pressure relief valve and remove the cap (item FF).

3 Turn the internal hex socket fully in a clockwise direction until it stops. Install the cap.

4 Start the engine from the ground controls.

5 Press and hold the function enable/high rpm select button (rabbit symbol) position. Note the reading on the pressure gauge.

6 Turn the engine off.

7 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the drive manifold.

8 Use a wrench to hold the charge pressure relief valve and remove the cap from the valve (item FF).

9 Start the engine from the ground controls.

10 Press and hold the function enable/high rpm select button (rabbit symbol).

11 Adjust the internal hex socket until the pressure reading on the gauge is 40 psi / 2.8 bar less than the pressure reading taken in step 5. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the valve cap.

12 Turn the engine off and remove the pressure gauge.

8-16 Valve Coils

How to Test a Coil

A properly functioning coil provides an electromagnetic force which operates the solenoid valve. Critical to normal operation is continuity within the coil. Zero resistance or infinite resistance indicates the coil has failed.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Note: If the machine has been in operation, allow the coil to cool at least 3 hours before performing this test.

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance using a multimeter set to resistance (Ω). Refer to the Valve Coil Resistance Specification table.

Result: If the resistance is not within the adjusted specification, plus or minus 10%, replace the coil.

Valve Coil Resistance Specifications

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 20°C that your air temperature increases or decreases from 68°F / 20°C.

Valve coil resistance specifications	
Proportional solenoid valve, 12V DC (schematic items G, W and AB)	4.8 Ω
Proportional solenoid valve, 12V DC (schematic items R)	9 Ω
3 position 4 way solenoid valve, 12V DC (schematic items BA, BB, CA, CB, CP, CQ, GB, GP and GQ)	9 Ω
3 position 4 way solenoid valve, 10V DC (schematic items O and S)	6.3 Ω
2 position 2 way solenoid valve, 10V DC (schematic items J)	3.3 Ω
2 position 2 way solenoid valve, 10V DC (schematic items C and P)	6.3 Ω
2 position 3 way solenoid valve, 10V DC (schematic items H, V, X, Z, AA, EE and EF)	6.3 Ω
2 position 3 way solenoid valve, 12V DC (schematic items BC, BD, CE, CF, FB and FC)	9 Ω

How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

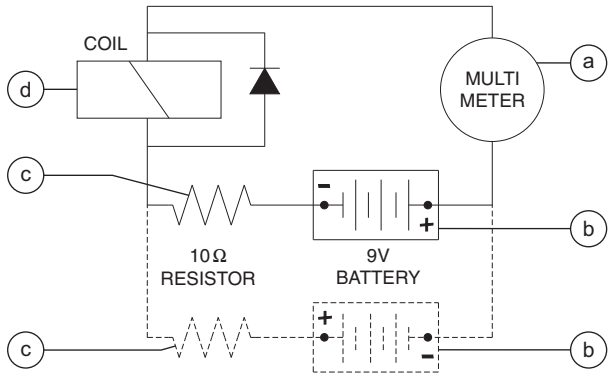
⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Test the coil for resistance. See 8-14, *How to Test a Coil.*

2 Connect a 10Ω resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor, 10Ω	
Genie part number	27287

Note: The battery should read 9V DC or more when measured across the terminals.



a multimeter
b 9V DC battery
c 10Ω resistor
d coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

⊠ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Turntable Rotation Components

REV B

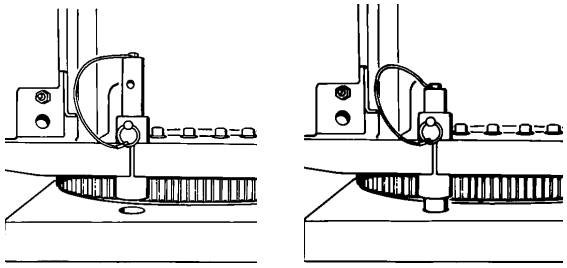
9-1
Turntable Rotation Assembly

How to Remove a Turntable Rotation Assembly

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

Note: Perform this procedure with the platform between the circle-end tires and with the machine on a firm, level surface.

1 Secure the turntable from rotating with the turntable rotation lock pin.



unlocked locked

2 Remove the ground controls side fixed turntable cover.

3 Tag, disconnect the hydraulic hoses from the turntable rotation motor. Cap the fittings on the motor.

4 Attach a lifting strap from an overhead crane or other suitable lifting device to the lifting eye on the turntable rotation assembly.

5 Remove the turntable rotator mounting bolts and remove the turntable rotation assembly from the machine.

6 Repeat steps 3 through 5 for the other turntable rotation assembly.

⚠DANGER Tip-over hazard. If the turntable rotation lock pin is not properly installed, machine stability is compromised and the machine could tip over when the drive hub is removed from the machine, which will result in death or serious injury.

⚠WARNING Crushing hazard. The drive hub could become unbalanced and fall if not properly supported by the overhead crane or lifting device when removed from the machine.

Note: When installing a turntable rotation assembly, the rotation gear backlash must be adjusted. See 9-1, *Adjust the Turntable Rotation Gear Backlash*.

How to Adjust the Turntable Rotation Gear Backlash

The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

Note: Perform this procedure with the platform between the circle-end tires and with the machine on a firm, level surface.

1 Secure the turntable from rotating with the turntable rotation lock pin.

2 Loosen the backlash pivot plate mounting fasteners.

3 Push the backlash pivot plate towards the turntable as far as possible (this will push the rotation gear into the turntable bearing ring gear).

4 Loosen the lock nut on the adjustment bolt.

5 Turn the adjustment bolt clockwise until it contacts the backlash pivot plate.

6 Turn the adjustment bolt 1/2 turn counterclockwise. Tighten the lock nut on the adjustment bolt.

7 Rotate the backlash pivot plate away from the turntable until it contacts the adjustment bolt. Torque the mounting fasteners on the backlash pivot plate to specification. Refer to Section 2, *Specifications.*

8 Rotate the turntable through an entire rotation. Check for tight spots that could cause binding. Readjust if necessary.

REV B

Axle Components

10-1 Steer Sensors

The steer sensor measures steer angle and communicates that information to the ground controls ECM. The steer sensor on the ground controls side of the machine at the square end acts as the lead sensor. The other three sensors follow the position, or steer angle, of the lead sensor. There is a steer sensor mounted to the top of each upper yoke pivot pin.

Note: If the square-end steering function becomes inoperative, switch to circle-end steer mode and the ground controls side circle-end steer sensor will become the lead sensor.

Note: This procedure will require a minimum of two people.

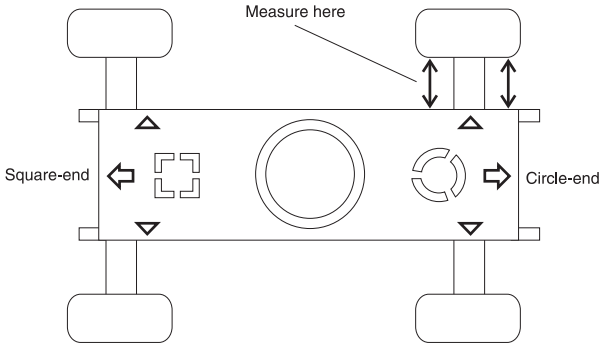
How to Measure the Tire Alignment

1 Start the engine from the platform controls.

2 Press down the foot switch.

Measure the circle-end tires:

3 Press the square-end steer mode button.



4 Measure the distance between the inside of one circle-end tire and the chassis side plate on both sides of the axle.

⊙ Result: Both measurements should be the same to indicate that the tires are parallel with the chassis.

Note: If the measurements are different or if a tire is not parallel with the chassis, the steer sensor of that tire will need to be adjusted. See *How to Adjust a Steer Sensor*.

5 Repeat step 4 for the other circle-end tire.

Measure the square-end tires:

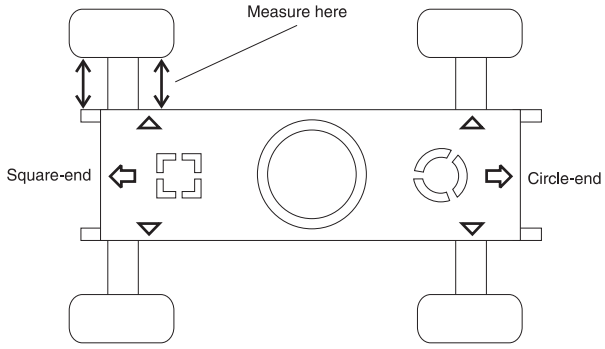
6 Press the circle-end steer mode button.

7 Measure the distance between the inside of one square-end tire and the chassis side plate on both sides of the axle.

⊙ Result: Both measurements should be the same to indicate that the tires are parallel with the chassis.

Note: If the measurements are different or if a tire is not parallel with the chassis, the steer sensor of that tire will need to be adjusted. See *How to Adjust a Steer Sensor*.

8 Repeat step 4 for the other square-end tire.



How to Adjust a Steer Sensor

1 Start the engine from the platform controls.

2 Press down the foot switch and push the engine idle select button until the engine switches to high rpm.

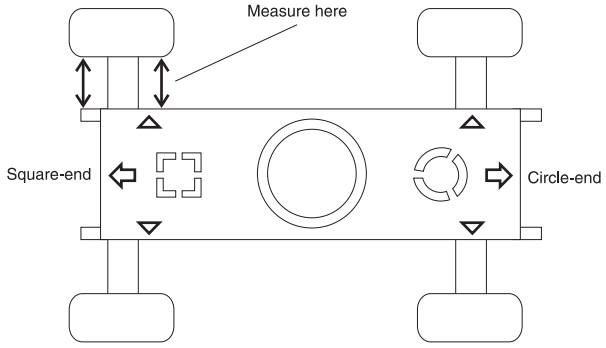
Square-end steer sensors:

3 At the platform controls, press the circle-end steer mode button.

4 Locate the steer sensor on top of the yoke pivot pin.

5 Loosen the steer sensor cover retaining fasteners. Do not remove them.

6 Rotate the steer sensor cover either clockwise or counterclockwise. Measure the distance between the inside of tire and the chassis side plate on both sides of the axle.



7 Repeat step 4 until the tire is parallel with the chassis.

8 Tighten the steer sensor cover fasteners.

9 Repeat steps 2 through 6 for the other square-end steer sensor.

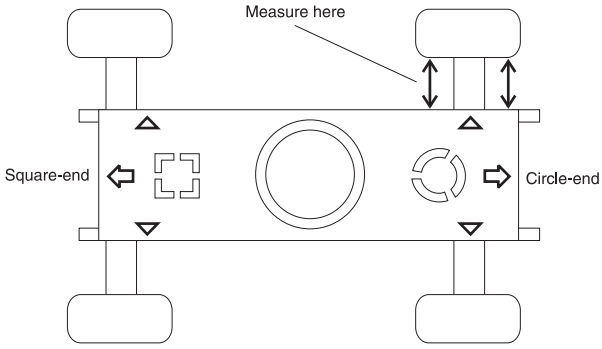
Circle-end steer sensors:

10 At the platform controls, press the square-end steer mode button.

11 Locate the steer sensor on top of the yoke pivot pin.

12 Loosen the steer sensor cover retaining fasteners. Do not remove them.

13 Rotate the steer sensor cover either clockwise or counterclockwise. Measure the distance between the inside of tire and the chassis side plate on both sides of the axle.



14 Repeat step 4 until the tire is parallel with the chassis.

15 Tighten the steer sensor cover fasteners.

16 Repeat steps 9 through 13 for the other circle-end steer sensor.

17 At the platform controls, press the four-wheel steer mode button. Measure the distance between the inside of the tire and the chassis side plate on both sides of the axle on each tire.

18 If any tire is not parallel, repeat the process beginning with step 3.

How to Calibrate the Steer Sensors

If a steer sensor reaches the limit of travel before a tire is adjusted parallel to the chassis, the steer sensor must be calibrated. This procedure will re-establish a center position on the steer sensor.

Note: Perform this procedure with the machine in the stowed position.

Note: This procedure will require two people.

1 Start the engine from the platform controls.

2 Press down the foot switch.

3 Choose a steer mode based on the tire that needs alignment.

Note: If a circle-end tire cannot be aligned, press the square-end steer mode button. If a square-end tire cannot be aligned, press the circle-end steer mode button.

4 Loosen the steer sensor cover retaining fasteners. Do not remove them.

5 Rotate the steer sensor cover either clockwise or counterclockwise to bring the tire as close to alignment as possible.

6 Turn off the engine.

7 Press and hold the enter button [↵] on the ground control panel while pulling out the ground controls red Emergency Stop button to the on position. Hold the enter button for approximately 5 seconds and then release it.

8 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

9 Use the [↓] button to scroll through the menu until the appropriate steer sensor is displayed. Choose from:
RESET BLUE END BLUE SIDE STEER SENSOR
RESET YELLOW END BLUE SIDE STEER SENSOR
RESET YELLOW END YELLOW SIDE STEER SENSOR,
RESET BLUE END YELLOW SIDE STEER SENSOR.
Press the [↓] button to select YES, then press the [↵] button.

10 Exit the sensor calibration mode and turn the keyswitch to the off position.

11 Rotate the steer sensor to the opposite limit of travel.

12 Using a voltmeter set to DC voltage, probe the back of the steer sensor electrical connector at pins B and C.

13 Turn the keyswitch on at the ground controls. Rotate the sensor slowly until the voltage reading is between 2.4 to 2.5V DC. The alarm at the ground control box should sound.

14 Turn the keyswitch to platform controls. Start the engine from the platform controls.

15 Press down the foot switch.

16 Rotate the steer sensor cover to adjust the tire alignment. Measure the distance between the inside of the tire and the chassis side plate on both sides of the axle.

17 Repeat step 14 until the tire is parallel with the chassis.

18 Tighten the steer sensor cover fasteners.

10-2
Hub and Bearings, 2WD Models

How to Remove the Hub and Bearings, 2WD Models

1 Loosen the wheel lug nuts. Do not remove them.

2 Block the non-steer wheels.

3 Center a lifting jack with a minimum capacity of 25,000 lbs / 12000 kg under the drive chassis between the steer wheels.

4 Raise the machine 6 inches / 15 cm and place blocks under the chassis for support.

⚠CAUTION Crushing hazard. The machine may fall if not properly supported.

5 Remove the lug nuts. Remove the tire and wheel assembly.

6 Remove the dust cap, cotter pin and castle nut.

Note: Always use a new cotter pin when installing a castle nut.

7 Pull the hub off the spindle. The washer and outer bearing should fall loose from the hub.

8 Place the hub on a flat surface and gently pry the bearing seal out of the hub.

9 Remove the rear bearing.

How to Install the Hub and Bearings, 2WD Models

Note: When replacing a wheel bearing, both the inner and outer bearings including the pressed-in races must be replaced.

1 Be sure that both bearings are packed with clean, fresh grease.

2 Place the large inner bearing into the rear of the hub.

3 Press the bearing seal evenly into the hub until it is flush.

4 Slide the hub onto the yoke spindle.

NOTICE Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

5 Place the outer bearing into the hub.

6 Install the washer and castle nut.

7 Tighten the castle nut to 158 ft-lbs / 214 Nm to seat the bearing.

Note: Rotate the hub by hand while torquing the castle nut to make sure the bearings seat properly.

8 Loosen the castle nut one turn, and then torque to 35 ft-lbs / 47 Nm.

9 Install a new cotter pin. Bend the cotter pin to secure the castle nut.

Note: Always use a new cotter pin when installing a castle nut.

10 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications.*

How to Adjust the Oscillate Limit Switches

⚠ DANGER Tip-over hazard. Failure to perform this procedure on a firm, level surface could compromise the stability of the machine and could cause the machine to tip over which will result in death or serious injury.

Note: Perform this procedure with the machine on a firm, level surface that is free of obstructions. Use a digital level to confirm.

Note: This procedure will require two people.

1 Lower the boom to the stowed position.

2 Remove the drive chassis cover from the circle-end of the machine.

3 Remove the oscillate axle limit switch mounting fasteners. Remove the limit switches.

Note: The oscillate axle limit switches are located inside the drive chassis above the axle.

4 Place a digital level on the turntable rotate bearing plate.

5 Start the engine and level the drive chassis. Press down the foot switch and manually activate the oscillate limit switches until the machine is completely level.

6 Loosely install the limit switches. Using a feeler gauge, establish a gap of 0.015 - 0.030 inches / 0.381 - 0.762 mm between the limit switch plunger and the top of the axle.

7 Carefully hold the position of each limit switch and tighten the limit switch mounting fasteners.

8 Verify the gap is 0.015 - 0.030 inches / 0.381 - 0.762 mm between the limit switch plunger and the top of the axle.

9 Measure the distance between the drive chassis and the axle on both sides (from the inside of the drive chassis).

⊙ Result: The measurements should be equal.

Note: If the distance is not equal and the adjustment to the limit switches was completed with the ground and drive chassis level, consult Genie Industries Service Department.

10-3
Oscillating Axle Cylinders

The oscillating axle cylinders extend and retract between the drive chassis and the oscillating axle. The cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure. The valves are not adjustable.

How to Remove an Oscillating Axle Cylinder

Note: Perform this procedure on a firm, level surface with the boom in the stowed position.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Rotate the boom until the turntable counterweight is between the circle-end and square-end tires.

2 Tag, disconnect and plug the oscillating axle cylinder hydraulic hoses. Cap the fittings on the oscillate cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pin retaining fasteners from the oscillate cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

4 Attach a lifting strap from an overhead crane to the barrel end of the oscillating cylinder.

5 Remove the pin retaining fasteners from the oscillate cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

⚠CAUTION Crushing hazard. The oscillate cylinder may become unbalanced and fall if not properly supported when removed from the machine.

6 Remove the oscillate cylinder from the machine.

Fault Codes

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - · Machine parked on a firm, level surface
  - · Boom in stowed position
  - · Turntable rotated with the boom between the circle-end (yellow arrow) wheels.
  - · Turntable secured with the turntable rotation lock pin
  - · Key switch in the off position with the key removed
  - · Welder disconnected from the machine (if equipped with the weld cable to platform option)
  - · Wheels chocked
  - · All external AC power supply disconnected from the machine

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropriate fault code thoroughly. Attempting shortcuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

⚠DANGER Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Note: Two persons will be required to safely perform some troubleshooting procedures.

CONTROL SYSTEM FAULT CODES REV C

Fault Diagnostics - Control System

How to Read Control System Fault Codes

Note: Initial fault testing occurs at power-up.

Faults are abnormal conditions that exist due to component failure or System misuse. CPU, memory, LCD, LED, limited joystick and limited operator switch testing is done on power-up. If an operator switch is depressed on power-up, the display should show and error and not allow any machine functions.

Releasing the switch will clear the error and allow all machine functions. The joystick operates similarly.

All other fault testing is done continuously.

1 When a fualt is diagnosed, the PCON fault indicator will flash and a fault message will be displayed on the TCON LCD. The message will contain the fault source and type.

2 Additional information, including the occurrence counter and a time-stamp is available with a PC, connected to one of the RS232 ports. Up to 30 unique fault messages can be saved. Each fault is saved with the device identity, fault type, engine hour time-stamp and an 8-bit occurrence counter.

3 The fault code table on the following pages lists the functions or components monitored by the system and recovery actions.

REV C CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
PRIMARY BOOM EXT/RET FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		
PRI BOOM EXT VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
PRI BOOM RET VALVE			
PRI BOOM UP VALVE			
PRI BOOM DOWN VALVE			
SEC BOOM LENGTH	Fault check (unknown length)	Stop all secondary boom functions, allow only secondary boom retract. Display message on LCD.	Power up controller with the problem corrected.
SEC BOOM ANGLE	Fault check (unknown angle)	Stop all secondary boom functions, allow only secondary boom retract. Once the boom is retracted allow secondary boom down. Display message on LCD.	Power up controller with the problem corrected.
SEC BOOM UP/DOWN SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
SEC BOOM UP/DOWN/EXT/RET FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		
SEC BOOM EXT VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
SEC BOOM RET VALVE			
SEC BOOM UP VALVE			
SEC BOOM DOWN VALVE			
SEC EXT SEQ VALVE			
SEC DWN SEQ VALVE			

Continued on next page

CONTROL SYSTEM FAULT CODES REV C

Error Source	Error Type	Effects	Recovery Actions
ENGINE SPEED	Range check (underspeed)	Display message on LCD.	Power up controller with the problem corrected.
OIL PRESSURE	Range check (low oil pressure)		
WATER/OIL TEMP	Range check (high temperature)		
OIL PRESSURE SENSOR	Fault check	Display message on LCD.	Power up controller with the problem corrected.
WATER/OIL TEMP SENSOR			
AXLE EXT/RET BUTTONS		Axle extend/retract disabled, display message on LCD.	Power up controller with the problem corrected.
CAN BUS	Fault check	Display message on LCD.	Power up controller with the problem corrected.
PRIMARY BOOM UP/DOWN JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick Speed and Direction frozen at zero and neutral	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
SECONDARY BOOM JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PRIMARY EXTEND/RETRACT JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)

REV C CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
STEER JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PRIMARY BOOM UP/DOWN SWITCHES ON TCON	Fault Check, (both buttons pressed)	Primary boom up/down disabled, display message on LCD.	Power up controller with the problem corrected.
SEC BOOM UP/EXT/DWN/RET SWITCHES ON TCON	Fault Check, (both buttons pressed)	Secondary boom up/extend and down/retract disabled, display message on LCD.	Power up controller with the problem corrected
PRIMARY BOOM EXT/RET SWITCHES ON TCON	Fault Check, (both buttons pressed)	Primary boom extend/retract disabled, display message on LCD.	Power up controller with the problem corrected.
PRIMARY BOOM LENGTH	Fault check (unknown length)	Display message on LCD.	Power up controller with the problem corrected.
PRIMARY BOOM ANGLE	Fault check (unknown angle)	Allow only primary boom retract and down. Display message on LCD.	Power up controller with the problem corrected.
PRIMARY UP/DOWN SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
PRIMARY EXTEND/RETRACT SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
PRIMARY BOOM UP/DOWN FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds..	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		

Continued on next page

CONTROL SYSTEM FAULT CODES REV C

Error Source	Error Type	Effects	Recovery Actions
SAFETY SWITCH P3	Fault check	Display message on LCD. P3 SAFETY SWITCH FAULT	Power up controller with the problem corrected.
SAFETY SWITCH P6R1		Display message on LCD. P6R1 SAFETY SWITCH FAULT	
SAFETY SWITCH P6R2		Display message on LCD. P6R2 SAFETY SWITCH FAULT	
SAFETY SWITCH P7		Display message on LCD. P7 SAFETY SWITCH FAULT	
SAFETY SWITCH P7R		Display message on LCD. P7R SAFETY SWITCH FAULT	
SAFETY SWITCH P9A		Display message on LCD. P9A SAFETY SWITCH FAULT	
SAFETY SWITCH P9B		Display message on LCD. P9B SAFETY SWITCH FAULT	
SAFETY SWITCH P10		Display message on LCD. P10 SAFETY SWITCH FAULT	
SAFETY SWITCH P11		Display message on LCD. P11 SAFETY SWITCH FAULT	
SAFETY SWITCH P12		Display message on LCD. P12 SAFETY SWITCH FAULT	
SAFETY SWITCH P14		Display message on LCD. P14 SAFETY SWITCH FAULT	
SAFETY SWITCH P18		Display message on LCD. P18 SAFETY SWITCH FAULT	
SAFETY SWITCH P22		Display message on LCD. P22 SAFETY SWITCH FAULT	
SAFETY SWITCH P22R		Display message on LCD. P22R SAFETY SWITCH FAULT	
SAFETY SWITCH P30		Display message on LCD. P30 SAFETY SWITCH FAULT	
PLATFORM OVERLOAD SENSOR	Fault check (if active)	Display message on LCD.	Power up controller with the problem corrected.
BOOM UP OVERLOAD			
BOOM DOWN OVERLOAD			
SHUT DOWN MODE			

REV C CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
TURNTABLE ROTATE JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
TURNTABLE ROTATE BUTTONS	Fault Check, (both buttons pressed)	Turntable rotate disabled, display message on LCD.	Power up controller with the problem corrected.
TURNTABLE ROTATE SPEED	Not calibrated	Display message on LCD and allow operation at default speed.	Perform auto calibrate procedure.
TURNTABLE ROTATE FLOW VALVE	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		
TURNTABLE ROTATE CW VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
TURNTABLE ROTATE CCW VALVE			
TURNTABLE LEVEL SENSOR X-DIRECTION	Fault check	Display message on LCD and sound audible alarm.	Correct problem.
TURNTABLE LEVEL SENSOR Y-DIRECTION			
PLATFORM LEVEL SENSOR Y-DIRECTION			

Continued on next page

CONTROL SYSTEM FAULT CODES REV C

Error Source	Error Type	Effects	Recovery Actions
PRIMARY BOOM ANGLE SENSOR	Value at 5.0 V	Sound audible warning and flash primary boom down LED at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR SHORTED HIGH. Primary boom up inhibited. Primary boom velocity limited to 50% of default value.	Correct problem.
	Value at 0 V	Sound audible warning and flash primary boom down LED at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR SHORTED LOW. Primary boom up inhibited. Primary boom velocity limited to 50% of default value.	Correct problem.
	Not calibrated	Sound audible warning at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR NOT CALIBRATED, inhibit primary boom up from platform control.	Calibrate primary boom angle sensor.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PROPEL JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
PROPEL VALVES FWD PROPEL VALVES REV PROPEL EDC FWD PROPEL EDC REV	Not calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate thresholds.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing, (transient)
	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
	Value Too High		
	Value Too Low		
	Value at 0 V		

REV C CONTROL SYSTEM FAULT CODES

Error Source	Error Type	Effects	Recovery Actions
MOTOR SPEED VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
BRAKE VALVE			
AUX PROPEL VALVE			
PLAT LEV UP VALVE			
PLAT LEV DN VALVE			
PLAT ROT CW VALVE			
PLAT ROT CCW VALVE			
JIB UP VALVE			
JIB DN VALVE			
JIB SWITCHES	Fault Check, (both contacts closed)	Affected functions disabled, display message on LCD.	Power up controller with the problem corrected.
PLAT ROT SWITCHES			
STEERING JOYSTICK	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
	Just calibrated	Initiate one second beep of audible warning device.	Self-clearing (transient)
LF STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
RF STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
LR STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
RR STR ANG SNSR	Value at 5.0 V	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with problem corrected.
	Value too high		
	Value too low		
	Value at 0 V		
LF STEER VALVE	Fault check	Limited speed and direction frozen at zero and neutral, alarm sounds.	Power up controller with the problem corrected.
RF STEER VALVE			
LR STEER VALVE			
RR STEER VALVE			
FOOTSWITCH TIMEOUT		Display message on LCD display.	Recycle power.

Continued on next page

Control System Fault Codes

How to Clear Secondary Boom Safety Switch Faults

Note: Beginning with software release 2.0, the secondary boom envelope switches will latch and faults must be reset in software or through the use of the TCON LCD. They will not clear by re-powering the machine.

Note: There are two methods to reset the faults, by using Web GPI or through the menu available on the TCON LCD.

Using Web GPI

1 Connect the device containing the WEB GPI software to the TCON with an RS-232 cable.

2 Select the Secondary Boom, then the Safety Switch Status Flags screen.

3 Change any safety switch drop down menus displaying FAULT to OK. Press SEND.

4 Exit Web GPI.

Using the TCON LCD

Note: Take care when using this method to avoid resetting threshold defaults.

1 With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button after five seconds and press the – – ↓ ↓ buttons.

2 Press the ↓ button until CLEAR ALL SAFETY SWITCH FAULTS appears.

3 Select YES, then press the ↵ button.

4 Press the ↓ button until EXIT appears.

5 Select YES, then press the ↵ button.

Note: This clears all latching faults, not standard faults.

Engine Fault Codes - Ford and Continental Models

How to Retrieve Ford and Continental Engine Fault Codes

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instantaneous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor and will turn on the Check Engine Light.

Note: Perform this procedure with the key switch in the off position.

1 Open the ground controls side cover and locate the run/test toggle switch on the side of the ground control box.

2 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

3 Quickly activate and release the start toggle switch/button. Do not start the engine.

4 Move and hold the run/test toggle switch to the test position.

⊙ Result: The check engine light should turn on. The check engine light should begin to blink.

5 Continue to hold the run/test toggle switch in the test position and count the blinks.

Note: Before the fault codes are displayed, the check engine light will blink a code 123 three times. After the fault codes, the check engine light will blink a code 123 three times again indicating the end of the stored codes.

Note: If any fault codes are present, the ECM will blink a three digit code three times for each code stored in memory. It will blink the first digit of a three digit code, pause, blink the second digit, pause, and then blink the third digit. For example: the check engine light blinks 5 consecutive times, blinks 3 times and then 1 time. That would indicate code 531.

Note: Once a fault code has been retrieved and the repair has been completed, the ECM memory must be reset to clear the fault code from the ECM. See *How to Clear Engine Fault Codes from the ECM.*

How to Clear Engine Fault Codes from the ECM

Note: Perform this procedure with the engine off and the key switch in the off position.

1 Open the engine side turntable cover and locate the battery.

2 Disconnect the negative battery cable from the battery for a minimum of 5 minutes.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Connect the negative battery cable to the battery.

Ford Engine ECM Fault Code Chart

REV B

Code	Problem	Cause	Solution
111	Closed Loop Multiplier High (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks.	Repair wiring and/or connections OR replace sensor OR repair vacuum and exhaust leaks.
112	HO2S Open/Inactive (Bank 1)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
113	HO2S Open/Inactive S(Bank 2)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
114	Post-cat oxygen sensor open	The post cat Heated Oxygen Sensor wiring and/or connections are open or shorted OR sensor is cold, non-responsive or inactive for 60 seconds or longer.	Repair wiring and/or connections OR replace the post cat oxygen sensor.
121	Closed Loop Multiplier High (Gasoline)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks OR fuel pressure is low OR the fuel injectors need cleaning or replacing.	Repair wiring and/or connections OR replace sensor OR repair any vacuum and exhaust leaks OR test the fuel pressure OR clean or replace the fuel injectors.
122	Closed Loop Multiplier Low (Gasoline)	MAP, IAT or ECT sensors not in correct position OR wiring and/or connections for sensors open or shorted OR sensor is faulty OR one or more fuel injectors are stuck open OR there is electro-magnetic interference from a faulty crankshaft and/or camshaft position sensor.	Adjust or replace sensors OR clean or repair fuel injectors.
124	Closed Loop Multiplier Low (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR fuel quality is poor OR fuel system components may be faulty.	Repair wiring and/or connections OR replace sensor OR replace fuel OR test and repair the fuel system components.
133	Gasoline cat monitor	There are exhaust leaks OR the catalyst system efficiency is below the acceptable level.	Repair exhaust leaks OR there is an emissions compliance issue. Contact Ford Power Products for assistance.
134	LPG cat monitor	There are exhaust leaks OR the catalyst system efficiency is below the acceptable level.	Repair exhaust leaks OR there is an emissions compliance issue. Contact Ford Power Products for assistance.
135	NG cat monitor	There are exhaust leaks OR the catalyst system efficiency is below the acceptable level.	Repair exhaust leaks OR there is an emissions compliance issue. Contact Ford Power Products for assistance.
141	Adaptive Lean Fault - High Limit (Gasoline)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum or exhaust leaks OR one or more fuel injectors faulty or stuck closed OR fuel quality is poor OR fuel pressure is too low.	Repair heated oxygen sensor wiring and/or connections OR replace sensor OR repair vacuum and exhaust leaks OR test the fuel pressure OR clean or replace the fuel injectors.
142	Adaptive Rich Fault - Low Limit (Gasoline)	MAP, IAT or ECT sensors not in correct position OR wiring and/or connections for sensors open or shorted OR sensor is faulty OR one or more fuel injectors are stuck closed OR there is electro-magnetic interference from a faulty crankshaft and/or camshaft position sensor.	Adjust or replace sensors OR clean or repair fuel injectors.
143	Adaptive Learn High (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks OR fuel quality is poor OR fuel system components may be faulty.	Repair wiring and/or connections OR replace sensor OR repair any vacuum and exhaust leaks OR replace fuel OR test and repair the fuel system components.
111	Closed Loop Multiplier High (LPG)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks.	Repair wiring and/or connections OR replace sensor OR repair vacuum and exhaust leaks.
112	HO2S Open/Inactive (Bank 1)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
113	HO2S Open/Inactive S(Bank 2)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections OR replace sensor.
114	Post-cat oxygen sensor open	The post cat Heated Oxygen Sensor wiring and/or connections are open or shorted OR sensor is cold, non-responsive or inactive for 60 seconds or longer.	Repair wiring and/or connections OR replace the post cat oxygen sensor.
121	Closed Loop Multiplier High (Gasoline)	Heated Oxygen Sensor wiring and/or connections open or shorted OR sensor is faulty OR there are vacuum leaks or exhaust leaks OR fuel pressure is low OR the fuel injectors need cleaning or replacing.	Repair wiring and/or connections OR replace sensor OR repair any vacuum and exhaust leaks OR test the fuel pressure OR clean or replace the fuel injectors.

REV B

FORD ECM FAULT CODE CHART

Code	Problem	Cause	Solution
144	Adaptive Learn Low (LPG)	Engine wire harness may have an intermittent short to 5V DC or 12V DC OR fuel system components may be faulty.	Repair short in engine wire harness OR test and repair the fuel system components.
161	System Voltage Low	Battery is faulty OR alternator is not charging OR battery supply wiring to ECM is open or shorted.	Replace battery OR repair alternator OR repair battery supply wiring to ECM.
162	System Voltage High	Alternator is overcharging the battery when engine RPM is greater than 1500 rpm.	Repair or replace the alternator.
211	IAT High Voltage	IAT sensor wiring and/or connections are open or shorted OR sensor is faulty OR engine intake air temperature is too cold.	Repair wiring and/or connections OR replace sensor OR direct warmer air into air intake.
212	IAT Low Voltage	IAT sensor wiring and/or connections are open or shorted OR sensor is faulty OR engine intake air temperature is too hot.	Repair wiring and/or connections OR replace sensor OR direct cooler air into air intake.
213	IAT Higher Than Expected (1)	Air intake temperature is greater than 200° F with the engine greater than 1000 rpm OR air intake system has leaks OR IAT sensor is faulty.	Check air intake system for damage and proper routing of air intake components OR replace the IAT sensor.
214	IAT Higher Than Expected (2)	Air intake temperature is greater than 210° F with the engine greater than 1000 rpm OR air intake system has leaks OR IAT sensor is faulty.	Check air intake system for damage and proper routing of air intake components OR replace the IAT sensor.
215	Oil Pressure Low	Faulty oil pressure sensor OR sensor wiring and/or connections open or shorted OR engine oil level too low.	Replace oil pressure sensor OR repair sensor wiring and/or connections OR fill engine oil level to specification.
221	CHT/ECT High Voltage	Engine cooling system is malfunctioning OR sensor wires and/or connections open or shorted OR sensor is faulty.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor.
222	CHT/ECT Low Voltage	Engine cooling system is malfunctioning and overheating the engine OR sensor wires and/or connections open or shorted OR sensor is faulty OR coolant level is low.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor OR fill engine coolant level to specification.
223	CHT Higher Than Expected (1)	Coolant temperature at the cylinder head is 240° F. Engine cooling system is malfunctioning and overheating the engine OR sensor wires and/or connections open or shorted OR sensor is faulty OR coolant level is low.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor OR fill engine coolant level to specification.
224	CHT Higher Than Expected (2)	Coolant temperature at the cylinder head is 250° F. Engine cooling system is malfunctioning and overheating the engine OR sensor wires and/or connections open or shorted OR sensor is faulty OR coolant level is low.	Repair engine cooling system problems OR repair open or shorted wiring to sensor OR replace sensor OR fill engine coolant level to specification.
231	MAP High Pressure	Open or shorted wiring and/or connections to MAP sensor OR sensor is faulty.	Repair wiring and/or connections to sensor OR replace MAP sensor.
232	MAP Low Voltage	Open or shorted wiring and/or connections to MAP sensor OR sensor is faulty.	Repair wiring and/or connections to sensor OR replace MAP sensor.
234	BP High Pressure	MAP sensor is faulty OR ECM is faulty.	Replace MAP sensor OR replace the ECM.
235	BP Low Pressure	MAP sensor is faulty OR ECM is faulty.	Replace MAP sensor OR replace the ECM.
242	Crank Sync Noise	Crankshaft position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR sensor is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace sensor.
243	Never Crank Synced At Start	Crankshaft position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR sensor is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace sensor.

FORD ECM FAULT CODE CHART REV B

Code	Problem	Cause	Solution
245	Camshaft Sensor Noise	Camshaft position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR sensor is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace sensor.
253	Knock Sensor Open	Knock sensor wiring and/or connections open or shorted OR sensor is faulty.	Repair wiring and/or connections to knock sensor OR replace knock sensor.
254	Excessive Knock Signal	Knock sensor wiring and/or connections open or shorted OR there is excessive engine vibration OR sensor is faulty.	Check for excessive engine vibration OR repair wiring and/or connections to knock sensor OR replace knock sensor.
311	Injector Driver #1 Open	Open wiring and/or connections to fuel injector #1 OR fuel injector #1 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #1 OR replace fuel injector #1 OR replace the ECM.
312	Injector Driver #1 Shorted	Wiring and/or connections to fuel injector #1 shorted OR fuel injector #1 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #1 OR replace fuel injector #1 OR replace the ECM.
313	Injector Driver #2 Open	Open wiring and/or connections to fuel injector #2 OR fuel injector #2 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #2 OR replace fuel injector #2 OR replace the ECM.
314	Injector Driver #2 Shorted	Wiring and/or connections to fuel injector #2 shorted OR fuel injector #2 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #2 OR replace fuel injector #2 OR replace the ECM.
315	Injector Driver #3 Open	Open wiring and/or connections to fuel injector #3 OR fuel injector #3 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #3 OR replace fuel injector #3 OR replace the ECM.
316	Injector Driver #3 Shorted	Wiring and/or connections to fuel injector #3 shorted OR fuel injector #3 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #3 OR replace fuel injector #3 OR replace the ECM.
321	Injector Driver #4 Open	Open wiring and/or connections to fuel injector #4 OR fuel injector #4 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #4 OR replace fuel injector #4 OR replace the ECM.
322	Injector Driver #4 Shorted	Wiring and/or connections to fuel injector #4 shorted OR fuel injector #4 is faulty OR ECM is faulty.	Repair wiring and/or connections to fuel injector #4 OR replace fuel injector #4 OR replace the ECM.
351	Fuel Pump Loop Open or High Side Short To Ground	Open wiring and/or connections to fuel pump OR fuel pump power shorted to ground OR fuel pump is faulty.	Repair wiring and/or connections to fuel pump OR replace fuel pump.
352	Fuel Pump High Side Shorted To Power	Wiring and/or connections to fuel pump shorted to power OR fuel pump is faulty.	Repair wiring and/or connections to fuel pump OR replace fuel pump.
353	MegaJector delivery pressure higher than expected	Fuel pressure too high OR LPG lockoff not sealing correctly OR the line between the MegaJector and carburetor is kinked or restricted or is leaking OR engine cooling system is not operating properly OR MegaJector is faulty.	Check fuel pressure OR repair LPG lockoff OR repair the line between the MegaJector and carburetor OR repair engine cooling system OR replace MegaJector.
354	Megajector delivery pressure lower than expected	Fuel pressure too low OR LPG lockoff not opening completely OR the line between the MegaJector and carburetor is kinked or restricted or is leaking OR engine cooling system is not operating properly OR MegaJector is faulty.	Check fuel pressure OR repair LPG lockoff OR repair the line between the MegaJector and carburetor OR repair engine cooling system OR replace the MegaJector.
355	MegaJector communication lost	The ECM doesn't get any response from the MegaJector, or an incorrect response for 500ms period or longer.	Check CAN circuits for continuity and shorts to power or ground and for continuity and repair as necessary OR replace the MegaJector.
361	MegaJector voltage supply high	The MegaJector detects voltage greater than 18 volts for 5 seconds anytime the engine is cranking or running.	Repair charging system OR replace the MegaJector.
362	MegaJector voltage supply low	The MegaJector detects voltage less than 9.5 volts for 5 seconds anytime the engine is cranking or running.	Repair VBAT power or ground circuit to ECM and MegaJector OR replace battery OR repair charging system OR replace the MegaJector.

REV B FORD ECM FAULT CODE CHART

Code	Problem	Cause	Solution
363	Megajector internal actuator fault detection	The MegaJector detects an internal fault. Open or short in power, ground or CAN circuits.s	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.
364	Megajector internal circuitry fault detection	The MegaJector detects an internal circuitry failure. Open or short in power, ground or CAN circuits.	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.
365	MegaJector internal communication fault detection	The MegaJector detects an internal communications failure. Open or short in power, ground or CAN circuits.	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.
411	Coil Driver #1 Open	Open wiring and/or connections to ignition coil #1 OR ignition coil #1 is faulty.	Repair wiring and/or connections to ignition coil #1 OR replace ignition coil #1.
412	Coil Driver #1 Shorted	Wiring and/or connections to ignition coil #1 shorted OR ignition coil #1 is faulty.	Repair wiring and/or connections to ignition coil #1 OR replace ignition coil #1.
413	Coil Driver #2 Open	Open wiring and/or connections to ignition coil #2 OR ignition coil #2 is faulty.	Repair wiring and/or connections to ignition coil #1 OR replace ignition coil #1.
414	Coil Driver #2 Shorted	Wiring and/or connections to ignition coil #2 shorted OR ignition coil #2 is faulty.	Repair wiring and/or connections to ignition coil #2 OR replace ignition coil #2.
511	FPP1 High Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
512	FPP1 Low Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
513	FPP1 Higher than IVS Limit	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
514	FPP1 Lower than IVS Limit	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
521	FPP2 High Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
522	FPP2 Low Voltage	Not used.	If this fault appears on your machine, contact Genie Industries Service Department.
531	TPS1 (Signal Voltage) High	The #1 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #1 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #1.
532	TPS1 (Signal Voltage) Low	The #1 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #1 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #1.
533	TPS2 (Signal Voltage) High	The #2 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #2 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #2.
534	TPS2 (Signal Voltage) Low	The #2 throttle position sensor wiring and/or connections open or shorted OR there is a poor system ground connection OR throttle position sensor #2 is faulty.	Be sure system ground connections are in place and secure OR repair wiring and/or connections to sensor OR replace throttle position sensor #2.
363	Megajector internal actuator fault detection	The MegaJector detects an internal fault. Open or short in power, ground or CAN circuits.s	Check Power, Ground and CAN circuits at MegaJector and all connections and repair as necessary OR MegaJector has an internal fault. Contact Ford Power Products for assistance.

Continued on next page

FORD ECM FAULT CODE CHART REV B

Code	Problem	Cause	Solution
535	TPS1 Higher than TPS2	The throttle position sensor wiring and/or connections for either TPS1 or TPS2 open or shorted OR there is a poor system ground connection OR one or both throttle position sensors are faulty.	Be sure engine harness wiring and connections are in place and secure OR repair wiring and/or connections to one or both TPS sensors OR replace one or both TPS sensors.
536	TPS1 Lower than TPS2	The throttle position sensor wiring and/or connections for either TPS1 or TPS2 open or shorted OR there is a poor system ground connection OR one or both throttle position sensors are faulty.	Be sure engine harness wiring and connections are in place and secure OR repair wiring and/or connections to one or both TPS sensors OR replace one or both TPS sensors.
537	Throttle Unable to Open	Governor actuator is stuck closed OR wiring and/or connections open or shorted OR governor actuator is faulty.	Repair wiring and/or connections to governor actuator OR replace the governor actuator.
538	Throttle Unable to Close	Governor actuator is stuck open OR wiring and/or connections open or shorted OR governor actuator is faulty.	Repair wiring and/or connections to governor actuator OR replace the governor actuator.
545	Governor Interlock Failure	Engine harness wiring and/or connections open or shorted OR there is a poor system ground connection OR ECM is faulty.	Repair wiring and/or connections in engine harness OR replace the ECM.
551	Max Governor Speed Override	ECM needs to be re-programmed OR throttle is sticking open OR there are air leaks between the throttle body and cylinder head.	Re-program ECM OR repair binding throttle operation OR repair any air leaks between the throttle body and cylinder head.
552	Fuel Rev Limit	ECM needs to be re-programmed OR throttle is sticking open OR there are air leaks between the throttle body and cylinder head.	Re-program ECM OR repair binding throttle operation OR repair any air leaks between the throttle body and cylinder head.
553	Spark Rev Limit	ECM needs to be re-programmed OR throttle is sticking open OR there are air leaks between the throttle body and cylinder head.	Re-program ECM OR repair binding throttle operation OR repair any air leaks between the throttle body and cylinder head.
611	COP Failure	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
612	Invalid Interrupt	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
613	A/D Loss	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
614	RTI 1 Loss	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
615	Flash Checksum Invalid	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
616	RAM Failure	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
631	External 5V DC Ref Lower than Expected	Engine harness wiring and/or connections open or shorted to ground OR there is a faulty engine sensor OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts OR locate and troubleshoot or repair faulty engine sensor OR replace ECM.
632	External 5V DC Ref Higher than Expected	Engine harness wiring and/or connections open or shorted to ground OR there is a faulty engine sensor OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts OR locate and troubleshoot or repair faulty engine sensor OR replace ECM.
655	RTI 2 Loss	Loose wire connections to ECM OR ECM is faulty.	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.
656	RTI 3 Loss	Loose wire connections to ECM OR ECM is faulty.S	Locate and repair any engine harness wiring damage or shorts to ECM to be sure they are secure OR replace ECM.

Continental Engine ECM Fault Code Chart

REV B

System	Code	Fault Name	Shutdown	Adaptive Learn	Adaptive Learn KC*	Power Derate 1	Power Derate 2	Low Rev Limit	Fault Conditions
MAP	**108**	MAP Pressure High		Y	Y				MAP pressure > 16 psi and TPS < 10% and RPM > 1800 To Unlatch, MAP pressure must be < 10 psi
	107	MAP Voltage Low		Y	Y				MAP voltage < 0.05 vdc and TPS > 2% and RPM < 7000 To Unlatch, MAP voltage must be > 0.5 vdc
ECT/ CHT	**118**	ECT Voltage High		Y					ECT voltage > 4.95 vdc
	117	ECT Voltage Low		Y					ECT voltage < 0.05 vdc
	116	ECT higher than expected 1		Y	Y	Y			ECT > 210° F and RPM > 600
	217	ECT higher than expected 2	**Y**						ECT > 230° F and RPM > 600
IAT	**113**	IAT Voltage High		Y					IAT voltage > 4.95 vdc
	112	IAT Voltage Low		Y					IAT voltage < 0.05 vdc
	111	IAT higher than expected 1		Y		Y			IAT > 200° F and RPM > 1000
	127	IAT higher than expected 2	**Y**						IAT > 210° F and RPM > 1000
BP	**2229**	BP Pressure High		Y	Y				BP pressure > 16 psi
	129	BP Pressure Low		Y	Y				BP pressure < 8.3 psi
Battery Voltage	**563**	Voltage High		Y	Y				Voltage > 18 vdc
	562	Voltage Low		Y	Y				Voltage < 9.5 vdc and RPM > 1500
5V External	**643**	5VE1 High Voltage		Y					5VE1 > 5.4 vdc
	642	5VE1 Low Voltage		Y					5VE1 < 4.6 vdc
TPS	**123**	TPS1 High Voltage	**Y**						TPS1 voltage > 4.8 vdc
	122	TPS1 Low Voltage	**Y**						TPS1 voltage < 0.2 vdc
	223	TPS2 High Voltage	**Y**						TPS2 voltage > 4.8 vdc
	222	TPS2 Low Voltage	**Y**						TPS2 voltage < 0.2 vdc
	221	TPS1 > than TPS2	**Y**						(TPS1 percent - TPS2 percent) > 20%
	121	TPS1 < than TPS2	**Y**						(TPS1 percent - TPS2 percent) < -20%
	2112	Unable to reach > TPS	**Y**						(target TPS - actual TPS) > 20%
	2111	Unable to reach < TPS	**Y**						(target TPS - actual TPS) < -20%
	2135	TPS1/2 simultaneous voltages out of range	**Y**						Uses same parameters as individual TPS1/2 voltage fault detection above

CONTINENTAL ECM FAULT CODE CHART REV B

System	Code	Fault Name	Shutdown	Adaptive Learn	Adaptive Learn KC*	Power Derate 1	Power Derate 2	Low Rev Limit	Fault Conditions
FPP	**2122**	FPP1 High Voltage						Y	FPP1 voltage > 4.8 vdc
	2123	FPP1 Low Voltage						Y	FPP1 voltage < 0.2 vdc
Engine Speed	**219**	Max Govern Speed Override							RPM > 3400
	1111	Rev Fuel Limit							RPM > 3600
	1112	Spark Rev Limit	**Y**						RPM > 3800
Oil Pressure	**524**	Oil Pressure Low	**Y**						Oil pressure pulled-up input with a threshold voltage of 2.5 vdc and RPM > 500 and run-time > 30 s
Adaptive Learn	**171**	AL High Gasoline Bank 1							AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi
	172	AL Low Gasoline Bank 1							AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi
	1161	AL High LPG							AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi
	1162	AL Low LPG							AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi
Closed Loop	**1155**	CL High Gasoline Bank 1							CL_BM > 40% and RPM between 0-9999 and MAP between 0-99 psi
	1156	CL Low Gasoline Bank 1							CL_BM <-40% and RPM between 0-9999 and MAP between 0-99 psi
	1151	CL High LPG							CL_BM > 35% and RPM between 0-9999 and MAP between 0-99 psi
	1152	CL Low LPG							CL_BM < -35% and RPM between 0-9999 and MAP between 0-99 psi
Catalyst Monitor	**420**	Gasoline Cat Monitor		Y	Y				EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50%
	1165	LPG Cat Monitor		Y	Y				EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50%

* Adaptive Learn Key Cycle

REV B CONTINENTAL ECM FAULT CODE CHART

System	Code	Fault Name	Shutdown	Adaptive Learn	Adaptive Learn KC*	Power Derate 1	Power Derate 2	Low Rev Limit	Fault Conditions
EGO Sensors	**134**	EGO Open/Lazy Pre-cat 1		Y	Y				EGO cold persistently > 120 seconds
	154	EGO Open/Lazy Post-cat 1		Y	Y				EGO cold persistently > 120 seconds
Injectors	**261**	Injector Loop Open or Low-Side Short to Ground		Y	Y	Y			Injector off-state low-side < 4 vdc and battery voltage > 9 vdc
	262	Injector Coil Shorted		Y	Y	Y			Injector on-state low-side > 4 vdc and battery voltage < 16 vdc
Power Relay Control Coil	**686**	Relay Control Ground Short							
	685	Relay Coil Short							
	687	Relay Coil Short to Pwr							
Tach Output	**2618**	Tach Output Ground Short							Does not turn on MIL
	2619	Tach Output Short to Pwr							Does not turn on MIL
EPR Diagnostics LPG	**1171**	EPR Delivery Pressure > than expected		Y			Y		MJ actual-commanded press > 4 in. H20
	1172	EPR Delivery Pressure < than expected		Y			Y		MJ actual-commanded press < 4 in. H20
	1173	EPR Comm Lost		Y			Y		No MJ packets received within 500 ms
	1174	EPR Voltage Supply High		Y			Y		
	1175	EPR Voltage Supply Low		Y			Y		
	1176	EPR Internal Actuator		Y			Y		
		fault detection							
	1177	EPR Internal Circuitry fault detection		Y			Y		
	1178	EPR Internal Comm fault detection		Y			Y		

* Adaptive Learn Key Cycle

Continued on next page

CONTINENTAL ECM FAULT CODE CHART REV B

System	Code	Fault Name	Shutdown	Adaptive Learn	Adaptive Learn KC*	Power Derate 1	Power Derate 2	Low Rev Limit	Fault Conditions
Cam Crank Sensors	**342**	Cam Loss		Y	Y				No cam pulse in 4 cycles and RPM > 1000
	337	Crank Loss							Cam pulses without crank activity > 6 cam pulses
	341	Cam Sync Noise		Y	Y				Number of invalid cam re-syncs = 1 within a time window of <= 700 ms
	336	Crank Sync Noise		Y	Y				Number of invalid crank re-syncs = 1 within a time window of <= 800 ms
	16	Never Crank Synced at Start							Cranking revs without sync < 4 revs and RPM > 90 rpm
Internal Processor Diagnostics	**606**	COP Failure			Y		Y		
	1612	RTI 1 Loss			Y		Y		
	1613	RTI 2 Loss			Y		Y		
	1614	RTI 3 Loss			Y		Y		
	1615	A/D Loss			Y		Y		
	1616	Invalid Interrupt			Y		Y		
	601	Flash Checksum Invalid			Y		Y		
	604	RAM Failure			Y		Y		
J1939 Network	**1625**	Shutdown Request							Number of shutdown requests >= 1
	1626	CAN Tx Failure							TX error counter > 100
	1627	CAN Rx Failure							Rx error counter > 100
	1628	CAN Address Conflict Failure							Address conflict counter > 5

* Adaptive Learn Key Cycle

Schematics

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section.

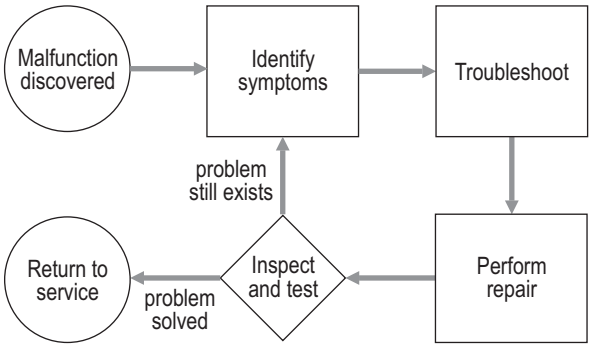
Electrical Schematics

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Hydraulic Schematics

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

General Repair Process



Wire Circuit Legend

REV B

Circuit numbering

1 Circuit numbers consist of three parts: the circuit prefix, circuit number and circuit suffix. The circuit prefix indicates the type of circuit. The circuit number describes the function of the circuit. The circuit suffix provides an abbreviation for the number or may be used to further define the function of this portion of the circuit. It also may be used to indicate the final end of the circuit, i.e., LS or limit sw.

2 The circuit number may be used more than once in a circuit.

For Example:

C 74 PL – This is the circuit for the lockout valve #1. C stands for control, 74 is the number of the circuit for the primary #1 lock out valve. PL stands for Primary Lockout.

S 62 BST – This is the circuit that communicates to the onboard computers of the machine that the boom is fully stowed. S stands for safety, 62 is the number of the circuit for boom stowed and BST stands for Boom Stowed.

P 48 LP – P stands for power. 48 is the circuit number for work lamps and LP stands for Lamp.

R 48 LP – R stands for relay. In this case it is the wire that feeds the relay coil for the work lamp. All other numbers remain the same.

Circuit prefix

C ..... Control

D ..... Data

E ..... Engine

G ..... Gauges

N ..... Neutral

P ..... Power

R ..... Relay Output

S ..... Safety

V ..... Valve

Circuit suffix

Definition	Suffix
AC Generator	GEN
Alternator Field	AF
Angle	ANG
Auxiliary Boom Valve	ABV
Auxiliary Forward Valve	AFV
Auxiliary Hydraulic Pump	AH
Auxiliary Platform Valve	APV
Auxiliary Reverse Valve	ARV
Auxiliary Steer/Drive Valve	ASV
Axle Extend Valve	AXE
Axle Oscillate	AXO
Axle Retract Valve	AXR
Axle Front Position	FAP
Axle Rear Position	RAP
Battery	BAT
Boom Extended	BEX
Boom Stowed	BST
Brake	BRK
Bypass Valves	BV
Calibrate	CAL
CAN Signal	CAN
CAN Shield	SHD
CATS Module	CAT
Chain Break	CNK
Data High	DTH
Data Low	DTL
Drive Chassis Controller	DCN
Drive Enable	DE
Drive Enable Left	DEL
Drive Enable Right	DER
Electrical Displacement Control	EDC
Envelope Light	ENV
Engine Speed Select	ESP
Engine Status Lamp	ESL
Envelope Lockout	ENL
Extend/retract Lockout	ERL
Filter Restricted	FLR
Filter Switch	FLT
Flashing Beacon	FB
Float Switch	FS
Footswitch Signal	FTS
Forward	FWD
Fuel Pump	FP
Fuel Select (gas/LP)	FL
Fuel Solenoid	FSL

REV B

WIRE CIRCUIT LEGEND

Definition	Suffix
Function Enable	FE
Ground Control	TCN
Ground	GND
Horn	HRN
High RPM	HS
Hydraulic Generator	HG
Ignition	IGN
Jib Bellcrank Down	JBD
Jib Bellcrank Up	JBU
Jib Sensor	JBS
Jib U/D Control	JUD
Jib Down	JD
Jib Up/Down Flow Control	JFC
Jib Select Valve	JSV
Jib Up	JU
Jib E/R Control	JER
Jib Ext	JBE
Jib Ret	JBR
Jib Rotate Left (CCW)	JRL
Jib Rotate Right (CW)	JRR
Joystick 5 VDC Power	JPW
Lamps	LPS
Left Front	LF
Left Front Steer Sensor	LFS
Left Rear	LR
Left Rear Steer Sensor	LRS
Limit Switch	LS
Lift Speed Reduction	LSR
Load Sensor	LDS
Lockout	LO
Low RPM	LS
Low fuel	LOF
Motor Shift (Speed)	MS
Multi Function Valve	MFV
Platform Control	PCN
Primary Ext/Ret Lockout	PEL
Platform Level Down	PLD
Platform Level Flow Control	PLF
Platform Level Up	PLU
Platform Rotate Flow Control	PRF
Platform Rotate Control	PRC
Platform Rotate Left (CCW)	PRL
Platform Rotate Right (CW)	PRR
Power	PWR
Power to Length Sensor	PSL
Platform Tilt Alarm	PTA
Platform Tilt Sensor	PTS
Pressure Comp Enable	PCE
Pressure Sender	PSR
Pressure Switches	PS
Primary Boom Angle Sensor	PBS
Primary Boom Down	PBD
Primary Boom Ext/Ret Lockout Valve	PBL
Primary Boom Extend	PBE
Primary Boom Extend/Retract Flow Control	PER
Primary Boom Retract	PBR
Primary Boom Angle Sensor	PBS
Primary Boom Down	PBD
Primary Boom Ext/Ret Lockout Valve	PBL
Primary Boom Extend	PBE
Primary Boom Extend/Retract Flow Control	PER
Primary Boom Retract	PBR
Primary Boom Up	PBU
Primary Boom Up/Dwn Flow Control	PUD
Primary Boom Extend/Retract Signal	PLS
Primary Boom Up/Down Signal	PES
Primary Lockout	PL
Primary Length Sensor	PSL
Propel Signal	JPL
Program Setup Enable	PSE
Propel Lockout	PLL
Proportional Valve	PRV
Proximity Sensor	PXS
Receptacle	REC
Recovery	RCV
Retract Lockout	RL
Return	RET
Reverse	REV
Right Front	RF
Right Front Steer Sensor	RFS
Right Rear	RR
Right Rear Steer Sensor	RRS
RPM	RPM
Secondary Boom Angle Sensor	SBS
Secondary Boom Elevated	SBL
Sec Boom Down	SBD
Sec Boom Extend	SBE
Sec Boom Extend/Retract Flow Control	SER
Sec Boom Retract	SBR
Sec Boom Up	SBU
Sec Boom Up/Dwn Flow Control	SUD
Secondary Boom	SB

This list continues on the next page.

WIRE CIRCUIT LEGEND REV B

Definition	Suffix
Secondary Boom Lockout Valve (Extend)	SLE
Secondary Boom Lockout Valve (Riser Down)	SLD
Sensor	SEN
Spare	SP
Speed Sensor	SS
Start Aid (Glow Plug or choke)	SA
Starter	STR
Steer Control Signal	STC
Steering Valve Clockwise	SCW
Steering Valve Counter Clockwise	SCC
Temp Sender	TSR
Temp Switches	TS
Tether	TET
Tilt Alarm X axis	TAX
Tilt Alarm Y axis	TAY
Turntable or Ground Control Panel	TCN
Turntable Rotate Flow Control	TRF
Turntable Rotate Right (CW)	TRR
Turntable Rotate Signal	TRS
Turntable Tilt Alarm	TTA
Turntable Tilt Sensor	TTS
Test Switch	TSW

Wire Coloring

1 All cylinder extension colors are solid and all retract functions are striped black. When using black wire, the stripe shall be white.

2 All rotations that are LEFT or CW are solid, RIGHT or CCW are striped and black. When the wire is black, the stripe is white.

3 All proportional valve wiring is striped.

Wire Color Legend

BL	Blue
BL/BK	Blue/Black
BL/RD	Blue/Red
BL/WH	Blue/White
BK	Black
BK/RD	Black/Red
BK/WH	Black/White
BR	Brown
GR	Green
GR/BK	Green/Black
GR/WH	Green/White
RD	Red
RD/BK	Red/Black
RD/WH	Red/White
OR	Orange
OR/BL	Orange/Blue
OR/BK	Orange/Black
OR/RD	Orange/Red
WH	White
WH/BK	White/Black
WH/RD	White/Red
YL	Yellow

REV B

WIRE CIRCUIT LEGEND

Color	Circuit #	Primary function
RD	1	Primary boom up drive
RD/BK	2	Primary boom down drive
RD/WH	3	Primary boom up/dwn FC proportional valve drive
WH	4	Turntable rotate left valve drive
WH/BK	5	Turntable rotate right valve drive
WH/RD	6	Turntable rotate FC proportional valve drive
BK	7	Primary boom extend
BK/WH	8	Primary boom retract
BK/RD	9	Primary boom Extend/Retract proportional valve drive
BL	10	Secondary boom up valve drive
BL/BK	11	Secondary boom down valve drive
BL/WH	12	Secondary boom up/dwn FC proportional valve drive
BL/RD	13	Drive enable
OR	14	Platform level up valve
OR/BK	15	Platform level down valve
OR/RD	16	Platform up/dwn FC proportional valve drive
GR	17	Platform rotate left valve driver
GR/BK	18	Platform rotate right valve driver
GR/WH	19	Jib select valve driver circuit
RD	20	12 battery supply
WH	21	12 ignition supply
BK	22	Keyswitch power to platform ESTOP
WH	23	Power to platform
RD	24	Power to warning senders
WH/BK	25	Power to oil pressure sender
WH/RD	26	Power to temp sender
RD	27	Auxiliary power
RD/BK	28	Platform level alarm
RD/WH	29	Drive motor shift (speed)
WH	30	Forward/EDC-A
WH/BK	31	Reverse/EDC-B
WH/RD	32	Brake
BK	33	Start
BK/WH	34	Start aid (glow plug or choke)
BK/RD	35	High engine speed select
BL	36	Steer clockwise
BL/BK	37	Steer counterclockwise
BL/WH	38	Gas
BL/RD	39	LP
OR	40	Limit switch signal stowed
OR/BK	41	RPM signal
OR/RD	42	Boom retracted signal
GR	43	Jib up
GR/BK	44	Jib down
GR/WH	45	AC Generator
WH	46	Drive horn
WH/BK	47	Output power enable
WH/RD	48	Work lamp
WH/BK	49	Motion lamp
BL	50	Auxiliary boom
BL/WH	51	Auxiliary steer
BL/RD	52	Auxiliary platform
WH/BK	53	Boom envelope safety valve cutoff
BK/WH	54	Power to safety interlock switches (engine)
GR/BK	55	Axle oscillation
RD	56	Foot switch/TCON estop power
RD/WH	57	Boom down safety interlock
RD/BK	58	Safety interlock to engine
GR/WH	59	Chain break circuit
GR/WH	60	Axle extend
GR	61	Axle retract
OR	62	Boom stowed (safety)
OR/RD	63	Power to boom envelope safety switch

This list continues on the next page.

WIRE CIRCUIT LEGEND REV B

Color	Circuit #	Primary function
OR/BK	64	Power for operational switches
BL/WH	65	Low fuel indication
BL	66	Drive enable
BL	67	Secondary boom not stowed
RD	68	Primary boom lowered (operational)
BL	69	Primary boom #1 extended
BL/WH	70	Primary boom #2 retracted
BL/BK	71	Primary boom #2 extended
GN	72	Secondary boom extend
GN/BK	73	Secondary boom retract
RD	74	Primary #1 Lockout
RD/WH	75	Primary #2 Lockout
BL	76	Pri boom #3 extended
WH	77	Lower angle #1 operational
WH/BK	78	Upper angle #2 operational
BK	79	power from TCON ESTOP
N/A	80	Can 2.0/J1939 Shield
GR	81	Can 2.0/J1939 Low
YL	82	Can 2.0/J1939 High
GR/WH	83	Tilt signal x axis
GR/BK	84	Tilt signal y axis
GR	85	Tilt sensor power
OR	86	Hydraulic filter restricted
RD	87	Platform level safety power
RD/BK	88	Platform level safety output
BR	89	Platform level safety ground
RD/BK	90	Proximity kill
RD/WH	91	Gate Interlock
WH/BK	92	Motor speed (LO/HI)
WH/RD	93	Motor bypass
WH	94	Load sensor
OR	95	Tether ESTOP return
RD	96	Tether power
BK	97	Tether ESTOP power
WH	98	J1708 + (high)

Color	Circuit #	Primary function
BK	99	J1708 - (low)
WH/RD	100	Outrigger lowered
WH/BK	101	Outrigger raised
OR	102	Pothole protector up
OR/RD	103	Pothole protector down
BK/WH	104	Proprietary data buss – (i.e. ITT or AP)
BK/RD	105	Proprietary data buss + (i.e. ITT or AP)
GR	106	Spare
RD	107	Alternator field
BL/WH	108	Engine status
GR/WH	109	Sensor pwr
BK	110	Sensor return
OR	111	Steer signal
RD	112	Steer signal to solenoid valve
OR/RD	113	Multi function valve
BK/RD	114	Load moment overweight
RD/BK	115	Load moment underweight
OR	116	Hydraulic oil cooler
RD	117	Flashing beacon
OR	118	Lift speed reduction
BL	119	Hydraulic pressure sensor output
OR	120	Oil cooler fan
GR	121	Axle oscillate LEFT
GR/BK	122	Axle oscillate RIGHT
RD/BK	123	Primary boom angle signal operational
RD/WH	124	Secondary boom angle signal operational
WH/RD	125	Secondary boomlockout (Ext Enable)
WH/BK	126	Secondary boom lockout (Riser Down Enable)
GR	127	ECU test switch
OR/RD	128	Low engine speed

REV B WIRE CIRCUIT LEGEND

Color	Circuit #	Primary function
RD/BK	129	Descent alarm
WH/RD	130	Travel alarm
BL	131	Motion alarm
GR	132	Platform load input
GR/WH	133	Platform load alarm
GR/BK	134	Key switch power
BL/WH	135	Fuel pump
RD	136	Power to safety module
RD/WH	137	Propel power (P_38)
RD/BK	138	Pri boom up/sec boom dwn-Ext (P_11/30)
WH/RD	139	Turntable rot FC safety (P_39)
OR/RD	140	Boom envelope safety
RD	141	Primary boom angle signal safety
OR	142	Secondary boom angle signal safety
BL/RD	143	Drive enable left
BL/WH	144	Drive enable right
RD/WH	145	Calibrate
BL	146	Jib bellcrank up FC
BL/BK	147	Jib bellcrank down FC
BL/WH	148	Jib bellcrank sensor
GR/WH	149	Jib Up/Down FC
GR/BK	150	Hydraulic generator bypass
GR	151	Hydraulic EDCoutput
BK	152	Injector retard
BK	153	Jib extend
BK/WH	154	Jib retract
OR/RD	155	Pressure comp enable
GN/WH	156	Jib Up/Down
BK/RD	157	Jib Ext/Ret
BL/RD	158	Spare
BL/WH	159	Steer joystick signal
WH/RD	160	Propel joystick signal
WH/BK	161	Sec boom joystick signal
OR	162	Joystick 5 VDC power

Color	Circuit #	Primary function
BL/WH	163	Pri extend/retract signal
RD/WH	164	Pri up/down signal
WH/RD	165	TT Rotate signal
OR	166	Boom length signal safety
OR/BK	167	Boom length signal operational
BL/RD	168	Primary boom hydraulic valve lockout
GN	169	Envelope active LED
WH/RD	170	Load sense relay source
WH/BK	171	Load sense relay sink
BL	172	UP/DN flow control ground
BK	173	Ext/Ret flow control ground
WH	174	Key switch power, ground position
WH/BK	175	Load sensor signal operational
GN/WH	176	Secondary extend/retract FC
BL/RD	177	Extend/retract lockout
BK	178	Control module status light
GN	179	Drive power relay
BK	180	Lift power relay
OR	181	48 Volt alternator field (or battery)
RD	182	24 Volt battery
BL	183	Envelope or load sense recovery
WH	184	Program setup enable
WH	185	Encode A
BL	186	Encode B
BL	187	Bootstrap or program enable
GR	188	Safety cross check
BK	189	Data receive
BK/WH	190	Data transmit
WH/RD	191	Multi-Function pressure relief
WH/BK	192	Jib rotate left
WH/RD	193	Jib rotate right
WH/RD	194	Speed select input
OR/RD	195	Electric brake source
YL	196	2.5V Sensor power
BR	N/A	Ground or return

Limit Switches and Angle Sensors

REV C

Types of Limit Switches

There are two types of limit switches, found in various locations throughout the machine: mechanical-type **operational** or **safety** switches. As in aircraft, which features redundant safety systems, each mechanical operational switch is backed up with a separate, independently functioning safety switch.

The mechanical-type **operational** or **safety** switches are used to sense a positive displacement or movement of the limit switch actuator, or arm, as the machine moves through its range of operational functions. Included in this group are envelope limit switches which sense the extended length and angle of the booms and rotational position of the turntable.

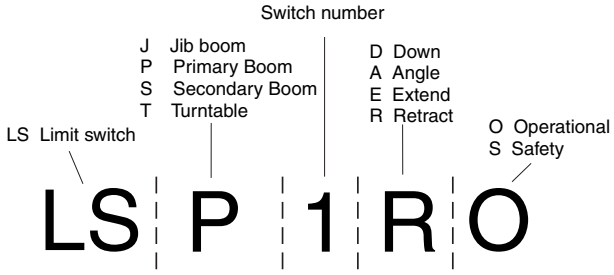
For example, when the secondary boom is fully raised and the operational switch is activated, it tells the ECM at the ground controls to start extending the secondary boom.

Another example is the drive enable limit switch, which disables the drive function anytime the boom is rotated past the rear axles, indicated by the 'circle' end of the drive chassis.
In some cases, the engine will be stopped if safety parameters are exceeded.

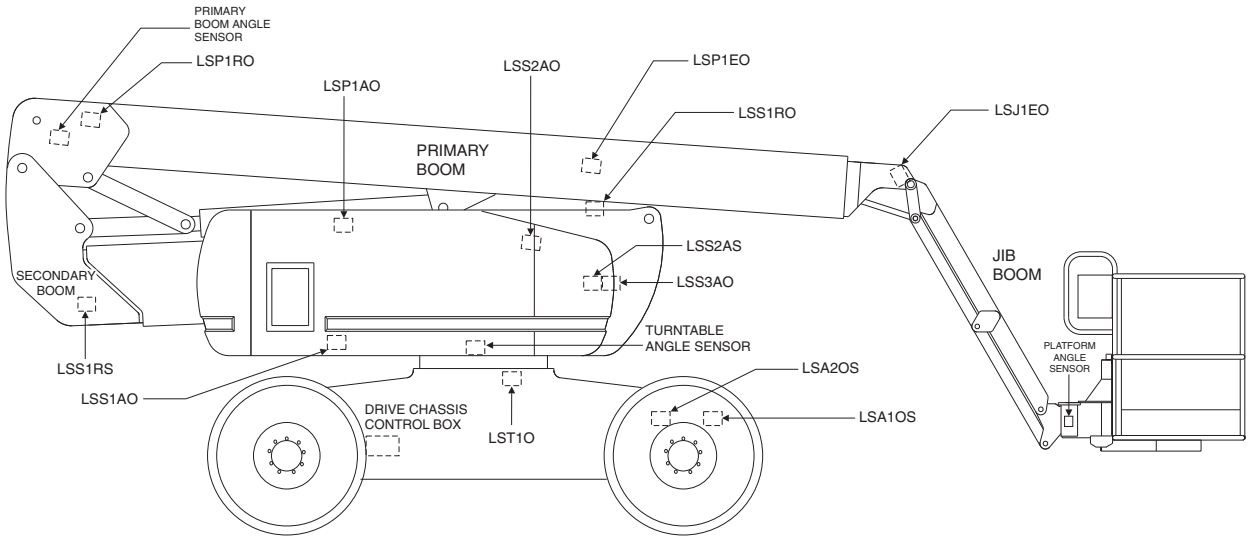
Limit Switch Numbering

LSP1AO	Primary boom angle stowed
LSP1RO	Primary boom length retracted
LSP1EO	Primary boom length fully extended
LSS1AO	Secondary boom angle, fully stowed
LSS2AO	Secondary boom angle, fully raised
LSS3AO	Secondary boom angle, 25° to 30°
LSS2AS	Secondary boom angle safety
LSS1RO	Secondary boom fully retracted
LSS1RS	Secondary boom fully retracted, safety
LSJ1EO	Platform level fully extended
LST1O	Drive enable mechanical
LSA1OS	Oscillate axle, right side
LSA2OS	Oscillate axle, left side

Numbering Legend



Limit Switch and Angle Sensor Legend



LSA1OS: Limit switch, Axle #1 Oscillating Operational. Activates the axle oscillate circuit on the right side.

LSA2OS: Limit switch, Axle #2 Oscillating Operational. Activates the axle oscillate circuit on the left side.

LST1O: Limit switch, Operational. Activates the drive enable zone.

Turntable Angle Sensor: Measures the X axis and Y axis of the turntable. The alarm sounds at 4.5 degrees.

Primary Boom Angle Sensor (PBS): Measures the Y axis angle of the primary boom. The operational range shall be +33 degrees to +73 degrees. The safety cutouts are set at +70 degrees and will disable boom up and stop the engine.

Platform Angle Sensor: Measures the angle of the platform. The range of measurement is +/- 20 degrees. The safety cutout is set at +/- 10 degrees from gravity and will disable the primary and secondary boom up/down functions and the platform level up/down functions.

LSS2AO: Limit switch, Secondary Boom #2 Angle Operational Switch. Secondary boom angle full extension, angle up all the way (secondary boom extend allowed).

LSS3AO: Limit switch, Secondary Boom #3 Angle Operational Switch. Secondary boom elevated to 30-35 degrees. Used to switch platform/primary boom leveling parameters.

LSS2AS: Limit switch, Secondary Boom #2 Angle Safety Switch. Secondary boom angle full extension, angle up all the way (secondary boom extend allowed).
Backup switch for LSS2AO.

LSS1RO: Limit switch, Secondary Boom #1 Retract Operational Switch. Secondary boom fully retracted (secondary boom down allowed).

LSS1RS: Limit switch, Secondary Boom #1 Retract Safety Switch. Secondary boom fully retracted (secondary boom down allowed). Backup switch for LSS1RO.

LSS1AO: Limit switch, Secondary Boom #1 Angle Operational Switch. Open when the secondary boom is fully lowered, closes when the boom is raised out of the stowed position. This switch limits the drive speed and disables the drive motor destroke. The other contacts close when the boom is fully lowered allowing the platform to be tucked underneath the mast for transport.

LSP1AO: Limit Switch, Primary Boom #1 Angle Operational. One side closes when the primary boom is raised from the stowed position, disabling the drive motor destroke and limiting the drive speed. The other side of the switch closes when the boom is fully lowered allowing the platform to be tucked underneath the mast for transport.

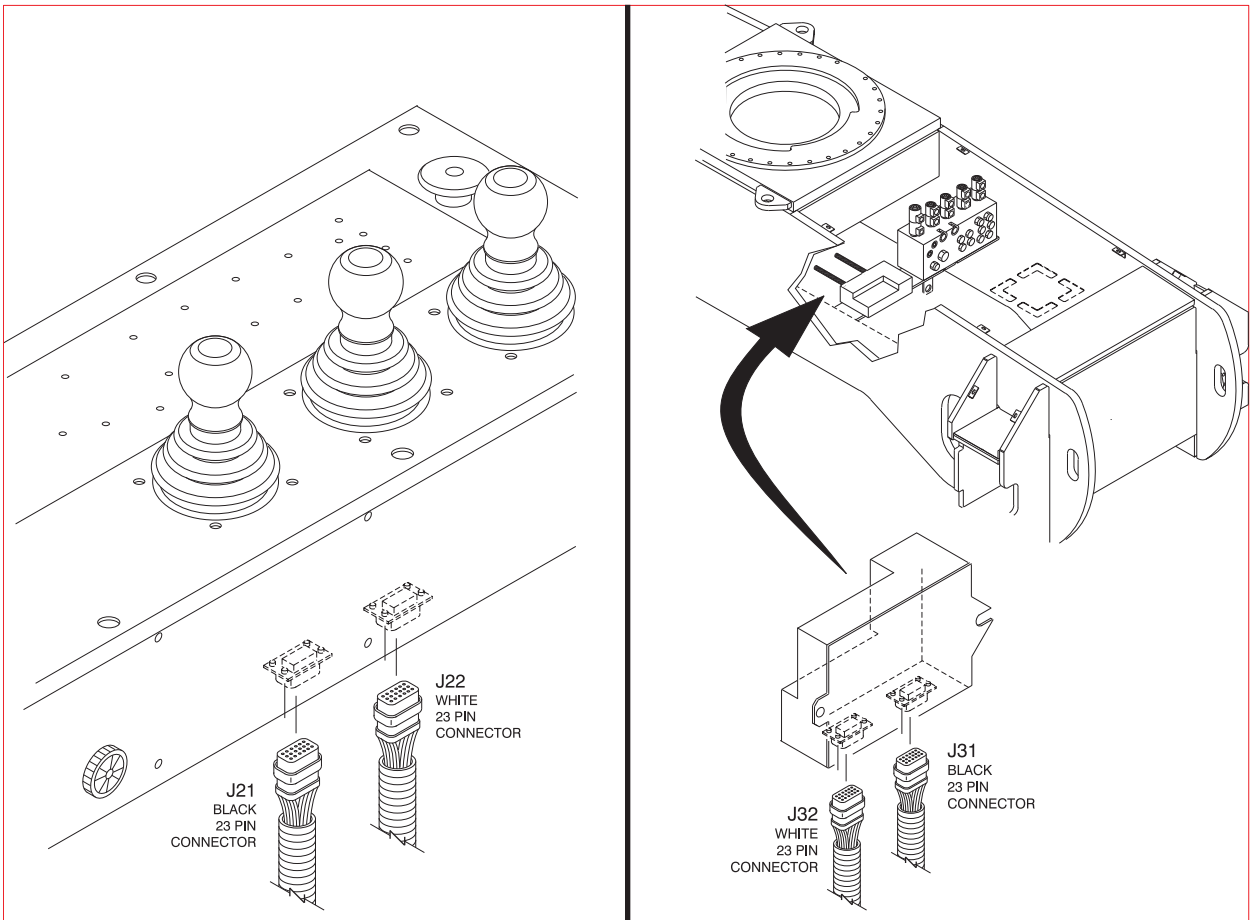
LSJ1EO: Limit Switch, Jib Boom #1. Closes when the platform leveling cylinder is fully extended, disabling the primary boom down function.

LSP1EO: Limit Switch, Primary Boom #1 Extend Operational. Switch closes as the primary boom extends the last 6 to 12 inches signaling the computer.

LSP1RO: Limit Switch, Primary Boom #1 Retract Operational. Switch closes when the primary boom is fully retracted.

Drive Chassis and Platform Controller Pin Legend

REV C

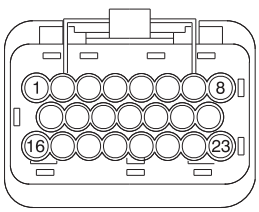


PCON
PLATFORM CONTROLLER
J22

1 = VLVRET7 - BR
2 = (UNUSED)
3 = C17PRL - GR
4 = C18PRR - GR/BK
5 = C43JU - GR
6 = C44JD - GR/BK
7 = C14PLU - OR
8 = C15PLD - OR/BK
9 = (UNUSED)
10 = R90PXS - RD/BK
11 = C90PXS - RD/BK
12 = (UNUSED)
13 = (UNUSED)
14 = (UNUSED)
15 = C88PTS - RD/BK
16 = R56PTS - RD
17 = C56PTS - RD
18 = S14PLU - RD
19 = PLATRET - BR
20 = C84TAY - GR/BK
21 = P85PTS - GR
22 = PTSRET - BR
23 = P87PTS - RD

PCON
PLATFORM CONTROLLER
J21

1 = GND PCON - BR
2 = P52PCON - BL/RD
3 = (UNUSED)
4 = S56PRV - RD
5 = (UNUSED)
6 = (UNUSED)
7 = P56PRV - RD
8 = (UNUSED)
9 = (UNUSED)
10 = D80SHIELD
11 = (UNUSED)
12 = (UNUSED)
13 = (UNUSED)
14 = (UNUSED)
15 = C47OUT - WH/BK
16 = C46HRN - WH
17 = D81CAN(-) - GR
18 = D82CAN(+) - YL
19 = (UNUSED)
20 = (UNUSED)
21 = (UNUSED)
22 = (UNUSED)
23 = P23PCON - BK



PIN NUMBERING FOR
23 PIN
CONNECTORS

DCON
DRIVE CHASSIS CONTROLLER
J32

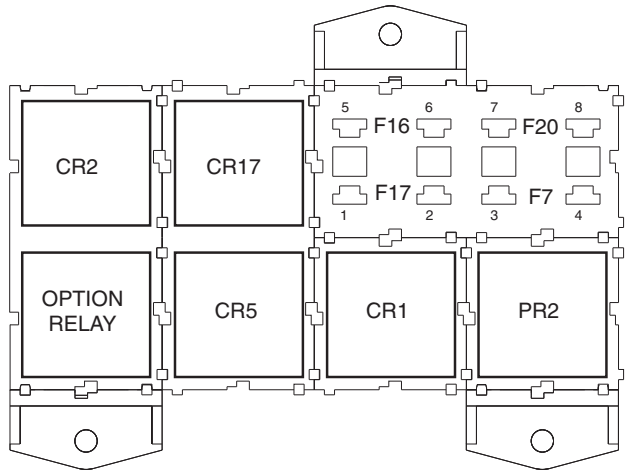
1 = VLVRET - BR
2 = V61AXRT - GR
3 = V60AXEX - GR/WH
4 = V29MS - RD/WH
5 = (UNUSED)
6 = V52AFV - BL/RD
7 = V52REV - BL/RD
8 = V36RRS - BL
9 = V37RRS - BL/BK
10 = C111RRS - OR
11 = C111LRS - OR
12 = C111RFS - OR
13 = C111LFS - OR
14 = VLVRET2 - BR
15 = V32BRK - WH/RD
16 = V36LRS - BL
17 = V37LRS - BL/BK
18 = V36RFS - BL
19 = P110RT - BK
20 = P109ANG - GR/WH
21 = V37RFS - BL/BK
22 = V36LFS - BL
23 = V37LFS - BL/BK

DCON
DRIVE CHASSIS CONTROLLER
J31

1 = GND-DCON - BR
2 = P21DCON - WH
3 = P53LS - RD
4 = (UNUSED)
5 = S56PRV - RD
6 = C61AXRT - GR
7 = (UNUSED)
8 = AXLE RET GND
9 = C61LS - GR
10 = D80SHLD
11 = RS232 RXD
12 = RS232 TXD
13 = BOOT
14 = (UNUSED)
15 = C61LS(A) - GR
16 = (UNUSED)
17 = D81CAN(-) - GR
18 = D82CAN(+) - YL
19 = RS232 GND
20 = (UNUSED)
21 = (UNUSED)
22 = (UNUSED)
23 = C61LS(A) - GR

Engine Relay and Fuse Panel Legend

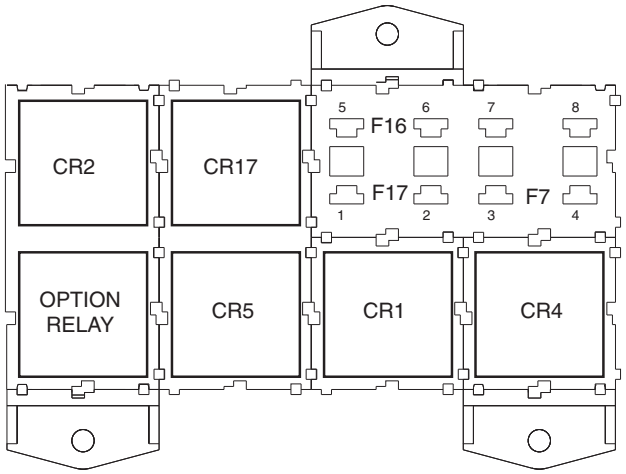
REV D



DEUTZ F4L 913

(before serial number 339)

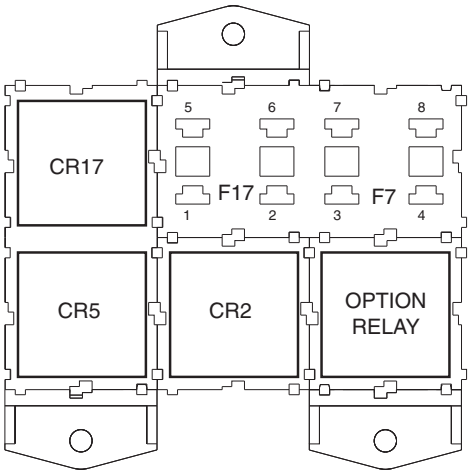
LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61225
CR2	IGNITION/FUEL RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F16	FUSE, 70A, ENGINE RPM AND COLD START	88151
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536
F20	FUSE, 20A, ENGINE RPM	60536
PR2	STARTING AID RELAY	61225



PERKINS 704-30

(before serial number 329)

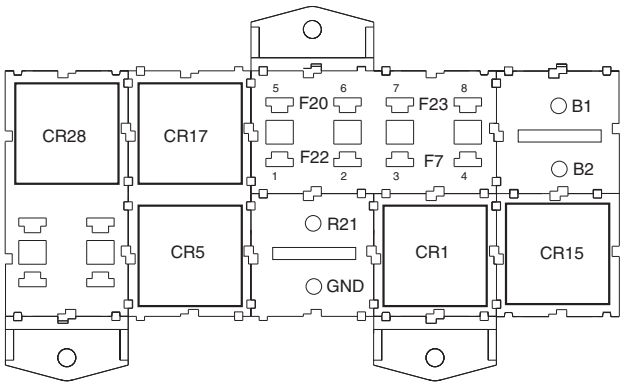
LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	34052
CR2	IGNITION/FUEL RELAY	34052
CR4	RPM RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F16	FUSE, 20A, ENGINE RPM AND COLD START	60536
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536



GM 3.0L

LABEL	DESCRIPTION	GENIE P/N
CR2	IGNITION/FUEL RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536

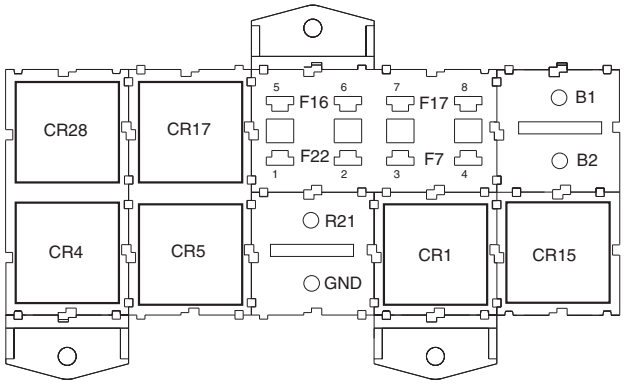
ENGINE RELAY AND FUSE PANEL LEGEND REV D



DEUTZ 2011

(after serial number 338)

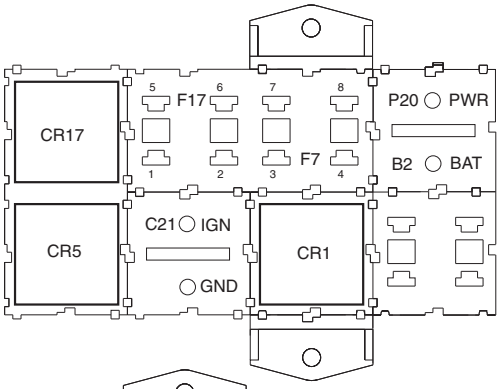
LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61225
CR28	ENGINE RUN/ALTERNATOR FIELD RELAY	34052
CR5	HORN RELAY	34052
CR15	GLOW PLUG RELAY	61225
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER FAN	60536
F20	FUSE, 20A, ENGINE RPM	60536
F22	FUSE, 60A, GLOW PLUG	101340
F23	FUSE, 30A, ENGINE	94327



PERKINS 804

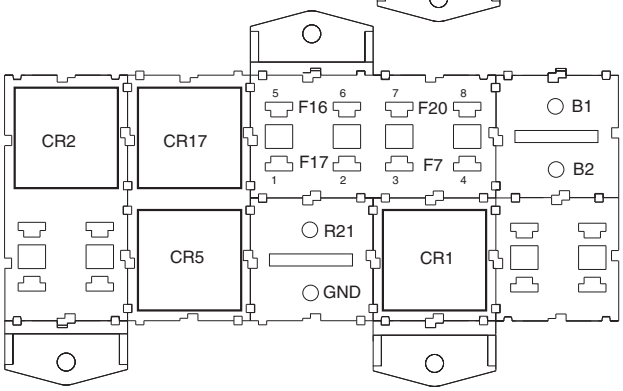
(after serial number 328)

LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61225
CR2	IGNITION POWER RELAY	34052
CR5	HORN RELAY	34052
CR15	GLOW PLUG RELAY	61225
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
CR4	RPM RELAY	34052
F17	FUSE, 20A, ENGINE	60536
F7	FUSE, 30A, OIL COOLER, RPM	94327
F16	FUSE, 20A, STARTER	60536
F22	FUSE, 70A, GLOW PLUG	88151



CONTINENTAL TME27

LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	34052
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
F7	FUSE, 30A, HYDRAULIC OIL COOLER	94327
F17	FUSE, 30A, STARTER	94327



FORD LRG 425

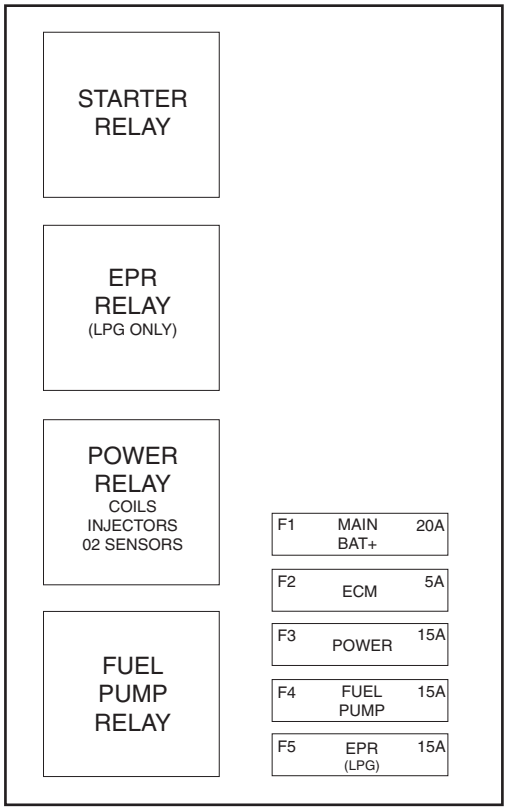
(after serial number 262)

LABEL	DESCRIPTION	GENIE P/N
CR1	START RELAY	61255
CR5	HORN RELAY	34052
CR17	HYDRAULIC OIL COOLER FAN RELAY	34052
CR4	RPM RELAY	34052
F7	FUSE, 20A, HYDRAULIC OIL COOLER	60536
F17	FUSE, 20A, STARTER AND ALTERNATOR	60536

REV D

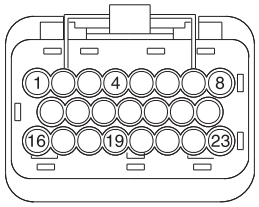
ENGINE RELAY AND FUSE PANEL LEGEND

CONTINENTAL TME27 ENGINE FUSE PANEL

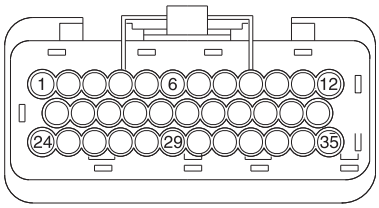


Turntable Controller Pin Legend

REV C

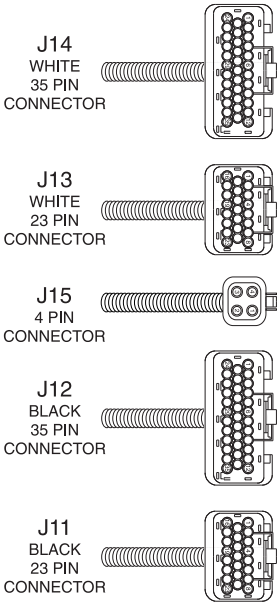


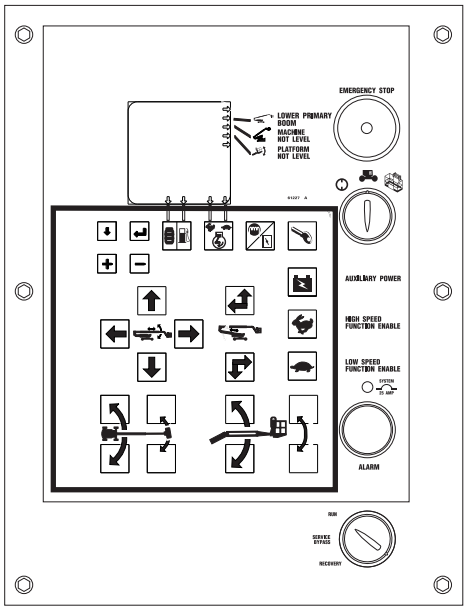
PIN NUMBERING FOR
23 PIN
CONNECTORS



PIN NUMBERING FOR
35 PIN
CONNECTORS

PIN NUMBERING FOR
4 PIN
CONNECTOR





TCON
TURNTABLE CONTROLLER
J11

1 = GNDPCON - BR
2 = P52PCON - BL/RD
3 = C46HN - WH
4 = C47OUT - WH/BK
5 = P23PCON - BK
6 = S56PRV - RD
7 = P56PRV - RD
8 = R48LP - WH/RD
9 = R49LP - WH/BK
10 = D80-SHIELD
11 = (UNUSED)
12 = (UNUSED)
13 = (UNUSED)
14 = CAL FREQ 1
15 = P97TET - BK
16 = CAL FREQ 2
17 = D81CAN(-) - GR
18 = D82CAN(+) - YL
19 = (UNUSED)
20 = TETFUNC - WH
21 = TETGND - BR
22 = P96TET - RD
23 = P95TET - OR

TCON
TURNTABLE CONTROLLER
J12

1 = GNDDCON - BR
2 = P21DCON - RD
3 = P53LS - WH/BK
4 = P54ENG - BK/WH
5 = S56PRV - RD
6 = P21DCON - RD
7 = P58LS - RD/BK
8 = S59SBE - GR/WH
9 = S121PBU - GR
10 = P53LS - WH/BK
11 = P53LS - WH/BK
12 = S59SBE- GR/WH
13 = C64LS - OR/BL
14 = C65LOF - BL/WH
15 = C66DREN - BL
16 = C73SBR - BL/RD
17 = C68PBD - RD
18 = C64LS - OR/BL
19 = C70PBR - BL/WH
20 = C71PBE - BL/BK
21 = C67SBD - BL
22 = C77SBU - WH
23 = V74PRLO - RD
24 = V75PRLO - RD/WH
25 = SNSR GND - BR
26 = BOOM ANGLE PWR
27 = G119SR - BL
28 = C124SBL - RD/BK
29 = C77AS - WH
30 = C78PS - WH/BK
31 = P56PRV - RD
32 = PRIMARY ANGLE SENSOR INPUT
33 = SEC. ANGLE SENSOR INPUT
34 = P30
35 = VLVRET1 - BR

TCON
TURNTABLE CONTROLLER
J13

1 = VLVRET1 - BR
2 = C35RPM - BK/RD
3 = C21IGN - WH
4 = C34SA - BK/WH
5 = V30FWD - WH
6 = V31REV - WH/BK
7 = C46HN - WH
8 = C39LP - BL/RD
9 = C33STR - BK
10 = C30EDC - WH
11 = C31EDC - WH/BK
12 = C25PSR - WH/BK
13 = C26TSR - WH/RD
14 = RET85TTSR - GR
15 = P85TTSR - GR
16 = VLVRET2 - BR
17 = (UNUSED)
18 = C41RPM - OR/BK
19 = (UNUSED)
20 = C83TAX - GR/WH
21 = C84TAY - GR/BK
22 = C45GEN - GR/WH
23 = VLVRET3 - BR

TCON
TURNTABLE CONTROLLER
J15

1 = BATVLV - RD
2 = BATGND - BR
3 = BATGND - BR
4 = BATECU - RD

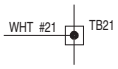
TCON
TURNTABLE CONTROLLER
J14

1 = VLVRET4 - BR
2 = C03PBF - RD/WH
3 = C09PERF - BK/RD
4 = C06TRF - WH/RD
5 = C12FBFC - BL/WH
6 = C72SBE - BL/WH
7 = CO1PBU - RD
8 = C02PBD - RD/BK
9 = C07PBE - BK
10 = C08PBR - BK/WH
11 = (UNUSED)
12 = C115SD - BL/BK
13 = R49LP - WH/BK
14 = VLVRET5 - BR
15 = (UNUSED)
16 = (UNUSED)
17 = C115LS - RD/BK
18 = C114LS - BK/RD
19 = C10SBU - BL
20 = C73SBR - BL/RD
21 = C72SBE - BL/WH
22 = (UNUSED)
23 = C113MFV - OR/RD
24 = (UNUSED)
25 = C04TRL - WH
26 = C05TRR - WH/BK
27 = VLVRTN7 - BR
28 = (UNUSED)
29 = (UNUSED)
30 = VLVRET6 - BR
31 = (UNUSED)
32 = C27AUX - RD
33 = P125SBLE - WH/RD
34 = P126SBLD - WH/BK
35 = (UNUSED)

Electrical Symbols Legend

REV B

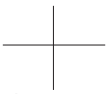
Quick disconnect terminal



T-circuits connect at terminal

T-circuits connect

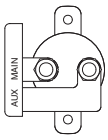
Connection no terminal



Circuits crossing no connection

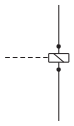
Diode

Battery



Battery separator

Circuit breaker with amperage



Coil solenoid or relay

Horn or alarm

Flashing beacon

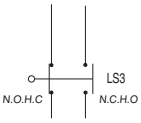
Gauge

Hour meter

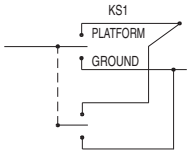
LED

Fuse with amperage

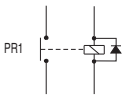
Starting aid: glow plug or flame ignitor



Limit switch

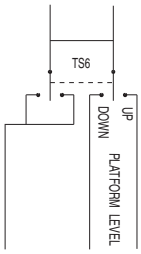


Key switch



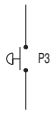
Power relay

Toggle switch SPDT



Toggle switch DPDT

Control relay contact normally open



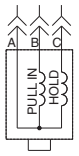
Horn button normally open

Oil temperature switch normally open

Coolant temperature switch normally open

Oil pressure switch normally closed

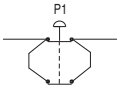
Gauge sending unit



Fuel or RPM solenoid

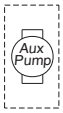
Coil

Foot switch

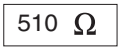


Emergency Stop button normally closed

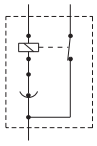
Hydraulic oil cooling fan



Auxiliary pump



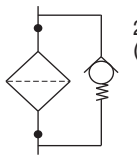
Resistor with ohm value



Tilt sensor

Hydraulic Symbols Legend

REV B



Filter with bypass valve relief setting

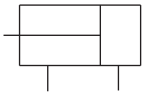
Pump fixed displacement

Pump bi-directional, variable displacement

Motor bi-directional

Motor 2-speed, bi-directional

Pump prime mover (engine or motor)



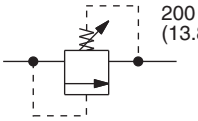
Double acting cylinder

Accumulator

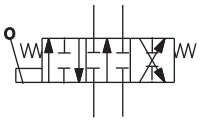
Orifice with size

Shut off valve

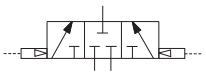
Check valve



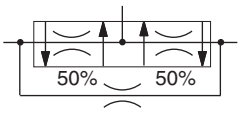
Relief valve with pressure setting



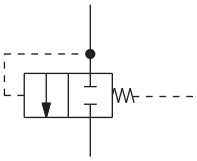
Directional valve (mechanically activated)



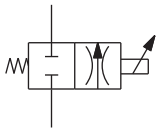
Pilot operated 3 position, 3 way, shuttle valve



Flow divider/combiner valve with pressure balancing orifice and flow percentages

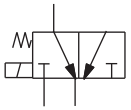


Differential sensing valve

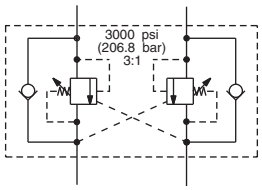


Solenoid operated proportional valve

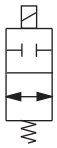
Priority flow regulator valve



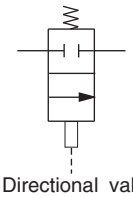
Solenoid operated 2 position, 3 way, directional valve



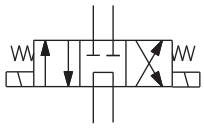
Counterbalance valve with pressure and pilot ratio



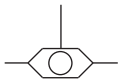
2 position, 2 way solenoid valve



Directional valve pilot operated 2 position, 2 way



Solenoid operated 3 position, 4 way, directional valve



2 position, 3 way, shuttle valve

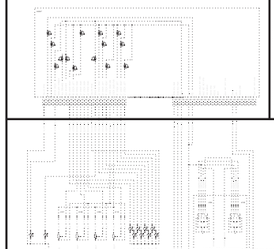
Hydraulic oil cooler

Brake

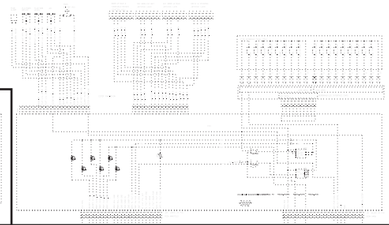
REV D

Electrical Schematic Layout
(before serial number 2511)

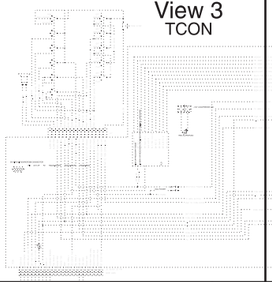
View 1
DCON



View 2
PCON

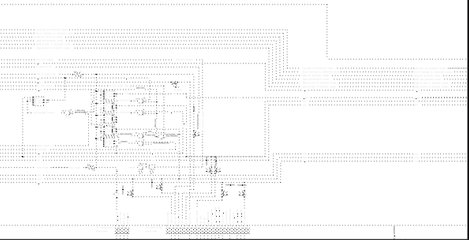


View 3
TCON

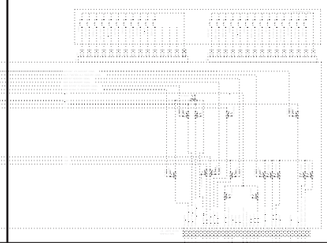


View 4

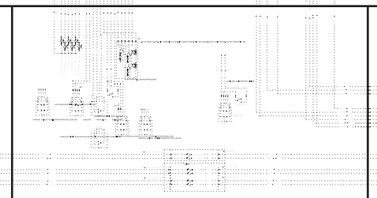
View 5



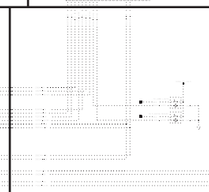
View 6
TCON



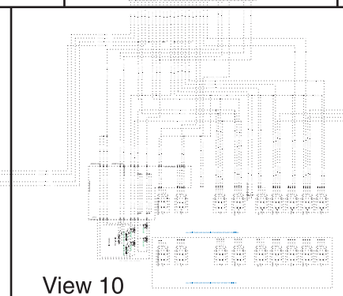
View 7



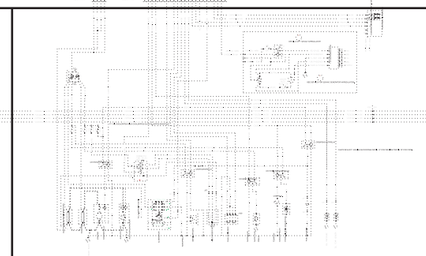
View 8



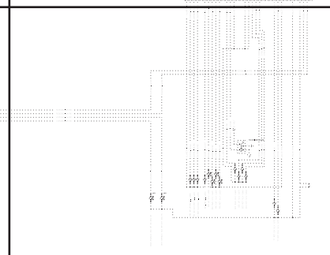
View 9



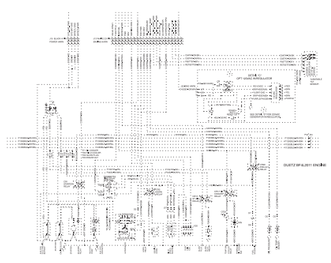
View 10
Limit Switches



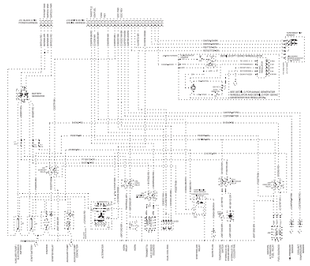
View 11
Deutz F4L-913



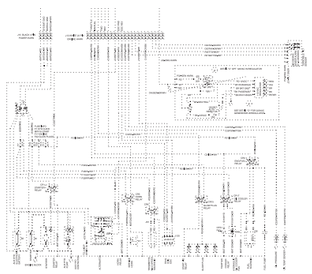
View 12



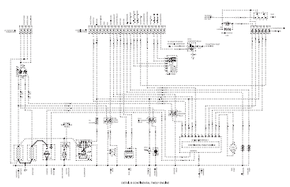
View 11
Deutz 2011



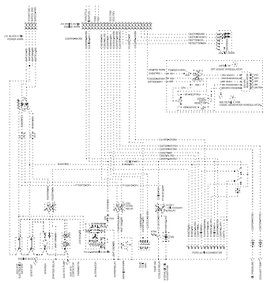
Perkins 704-30



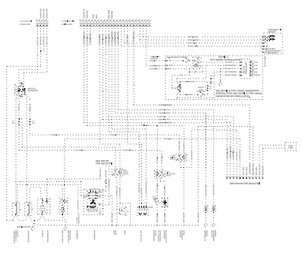
Perkins 804C & 804D



Continental TME27 Engine

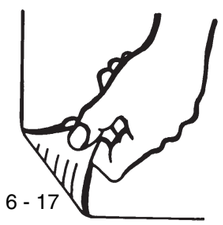


Ford LRG-425



GM 3.0L

Electrical Schematic Layout
(before serial number 2511)



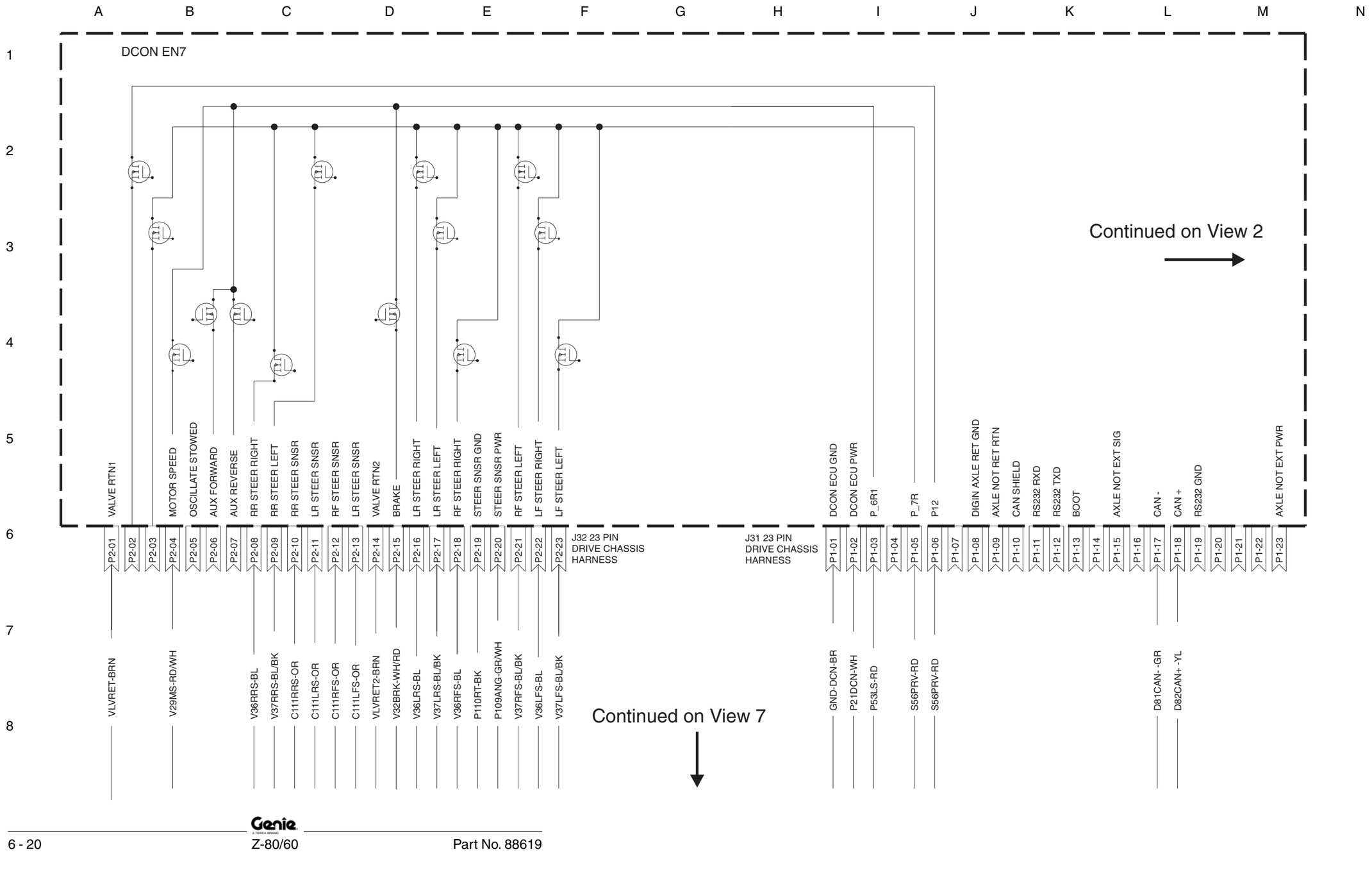
Electrical Schematic - View 1

Drive Chassis Controller (DCON) (before serial number 2511)

Electrical Schematic - View 1

REV C

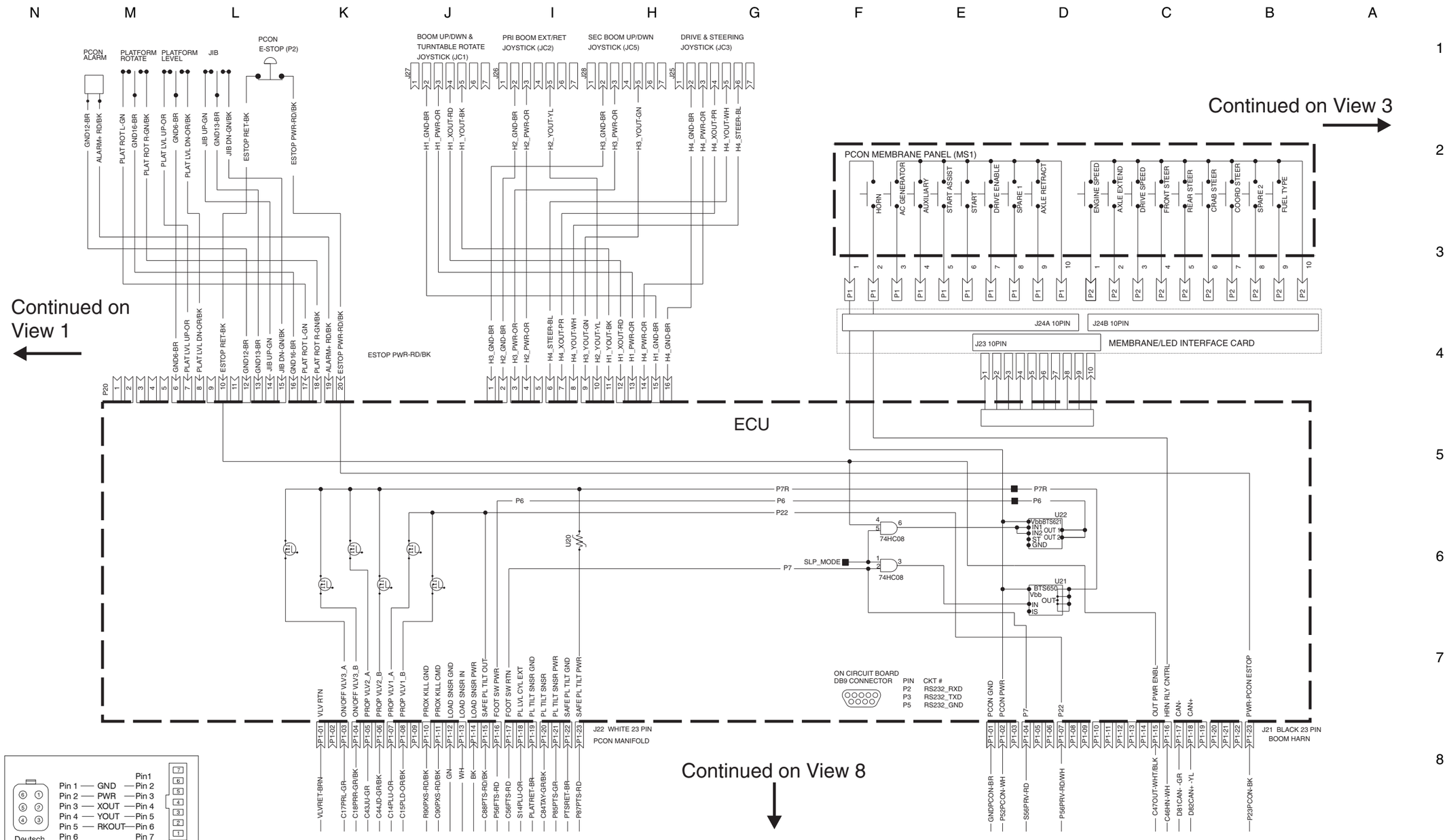
Drive Chassis Controller (DCON) (before serial number 2511)



REV D

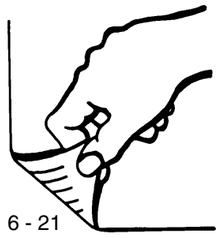
Electrical Schematic - View 2

Platform Controls (PCON) (before serial number 1167)



Electrical Schematic - View 2

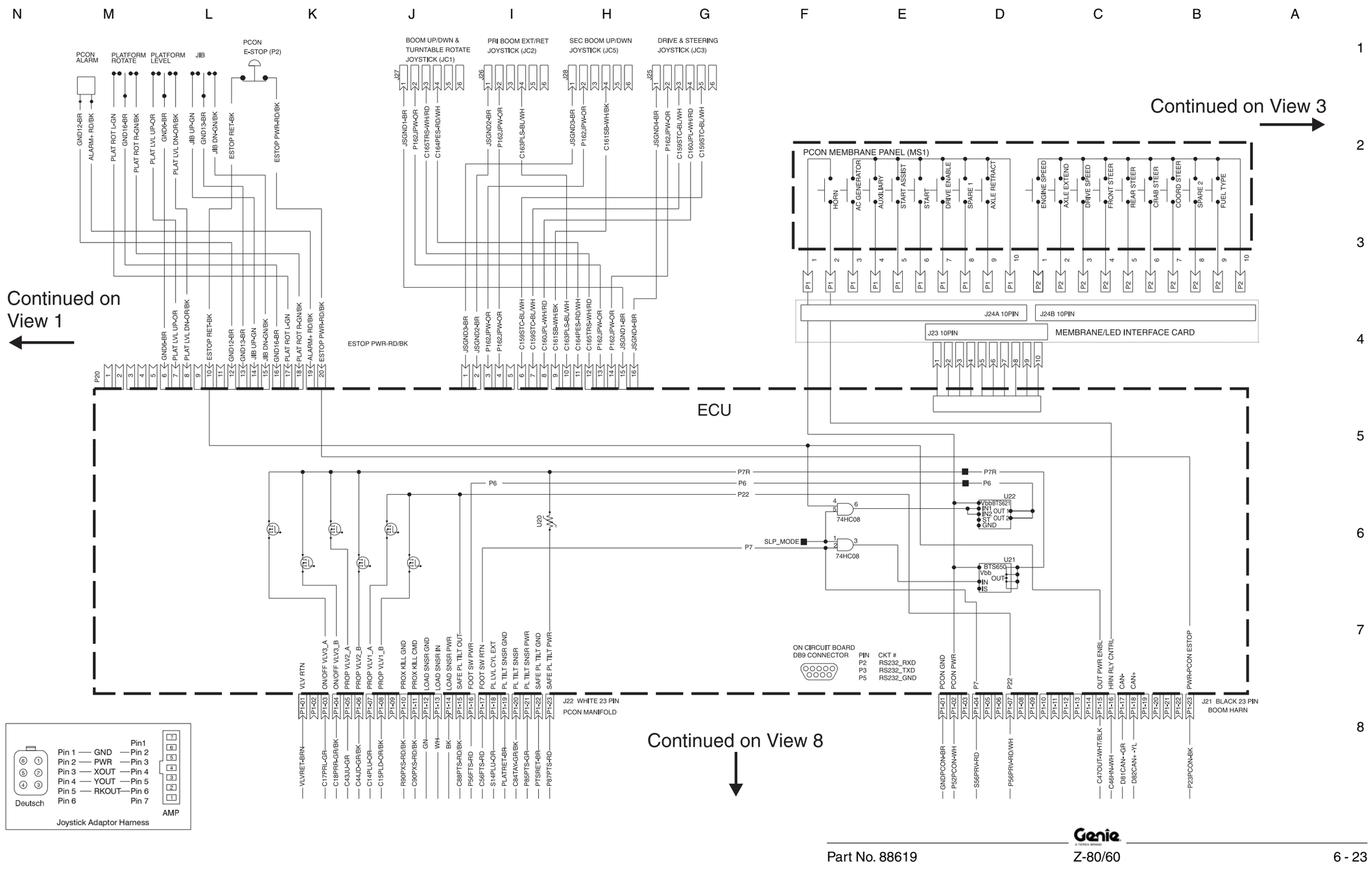
Platform Controls (PCON) (before serial number 1167)



REV A

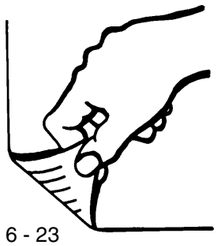
Electrical Schematic - View 2

Platform Controls (PCON) (from serial number 1167 to 2510)



Electrical Schematic - View 2

Platform Controls (PCON) (from serial number 1167 to 2510)



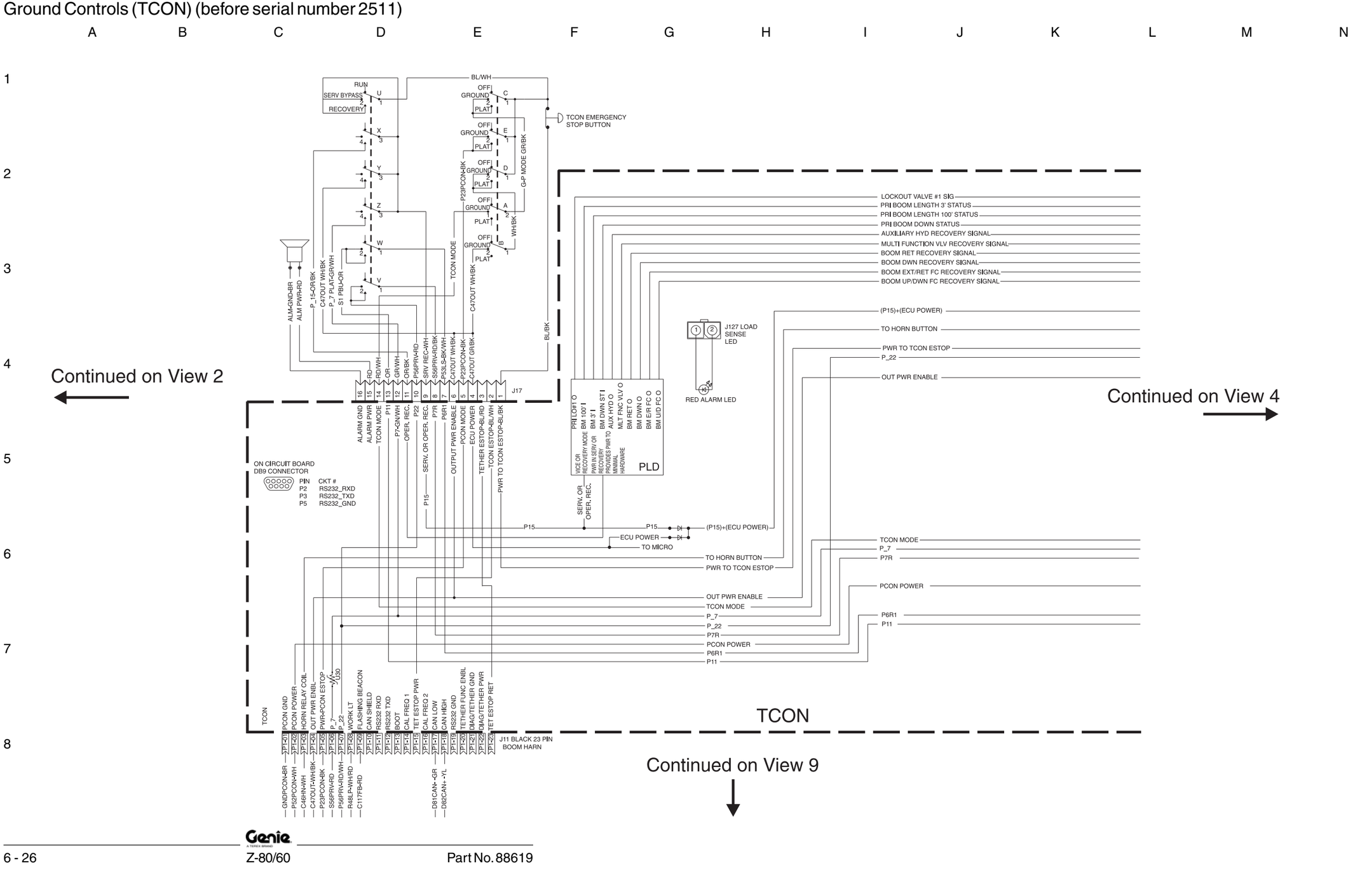
Electrical Schematic - View 3

Ground Controls (TCON)(before serial number 2511)

Electrical Schematic - View 3

REV D

Ground Controls (TCON) (before serial number 2511)



REV C

Electrical Schematic - View 4

(before serial number 2511)

N M L K J I H G F E D C B A

1

LOCKOUT VALVE #1 SIG
PRI BOOM LENGTH 3' STATUS
PRI BOOM LENGTH 100' STATUS
PRI BOOM DOWN STATUS
AUXILIARY HYD RECOVERY SIGNAL
MULTI FUNCTION VLV RECOVERY SIGNAL
BOOM RET RECOVERY SIGNAL
BOOM DWN RECOVERY SIGNAL
BOOM EXT/RET FC RECOVERY SIGNAL
BOOM UP/DWN FC RECOVERY SIGNAL

2

AUXILIARY HYD RECOVERY SIGNAL
MULTI FUNCTION VLV RECOVERY SIGNAL
BOOM RET RECOVERY SIGNAL
BOOM DWN RECOVERY SIGNAL
BOOM EXT/RET FC RECOVERY SIGNAL
BOOM UP/DWN FC RECOVERY SIGNAL

J127 LOAD SENSE LED

RED ALARM LED

(P15)+(ECU POWER)
TO HORN BUTTON
PWR TO TCON ESTOP
P_22
OUT PWR ENABLE

3

(P15)+(ECU POWER)
P_30
TO HORN BUTTON
PWR TO TCON ESTOP
P_22
P_9B
OUT PWR ENABLE
P_6R2

Continued on View 3

4

Continued on View 5

5

(P15)+(ECU POWER)
TO HORN BUTTON
PWR TO TCON ESTOP
OUT PWR ENABLE
TCON MODE
P_7
P_22
P7R
PCON POWER
P6R1
P11

TCON MODE
P_7
P7R
PCON POWER
P6R1
P11

TCON MODE
P_7
P7R
P10
PCON POWER
P9A
P6R1
P11

BOOM STOWED
TCON MODE
P_7
P7R
P10
PCON POWER
P9A
P6R1
P11

6

7

J12 BLACK 35 PIN LIMIT SWITCH HARN

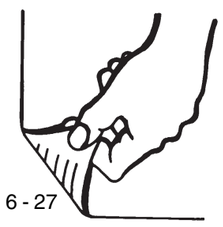
DCON ECU GND	DCON ECU PWR	P_6R1	P_6R2	P_7R	P_9A	P_9B	P_10	P_11	P_12	P_14	P_18	OPER SW PWR	FST1S	LST10	LSB12RO	LSP1AO	LSB2RO	LSP1RO	LSP1EO	LSS1AO	LSS2AO	P1 SEQ	P2 SEQ	SNSR GND	SNSR PWR	PRESSURE GA	DIGITAL IN	LSB13AO	LSB14AO	BOOM STOWED	PRI ANG INPUT	SEC ANG INPUT	P_30	VLV RET
J2-01	J2-02	J2-03	J2-04	J2-05	J2-06	J2-07	J2-08	J2-09	J2-10	J2-11	J2-12	J2-13	J2-14	J2-15	J2-16	J2-17	J2-18	J2-19	J2-20	J2-21	J2-22	J2-23	J2-24	J2-25	J2-26	J2-27	J2-28	J2-29	J2-30	J2-31	J2-32	J2-33	J2-34	J2-35
GND/DCN-BR	P21/DCN-WH	P53LS-WH/BK	P54ENG-BK/WH	S56PRV-RD	P53LS-WH/BK	P58LS RD/BK	P54ENG-BK/WH	S12SBU-BL/WH	P53LS-WH/BK	P53LS-WH/BK	P54ENG-BK/WH	C64LS-OR/BK	C65LOF-BL/WH	C66/DREN-BL	C73SBR-BL/RD	C68PBD-RD	C64LS-OR/BK	C70PBR-BL/WH	C71PBE-BL/BK	C67SBD-BL	C77SBU-WH			SNSR GND-BR	P109PBS-GR/WH	C124SBL RD/WH				C123PBD RD/BK		S12SBL-BL/WH		

TO PLD
TO MICRO
D30
D31
D32
TO PLD
TO MICRO
TO PLD
TO MICRO
TO PLD
TO MICRO
TO PLD
TO MICRO

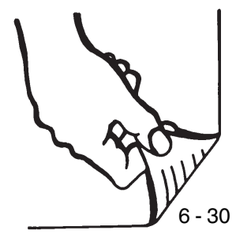
8

Continued on View 10

Electrical Schematic - View 4
(before serial number 2511)



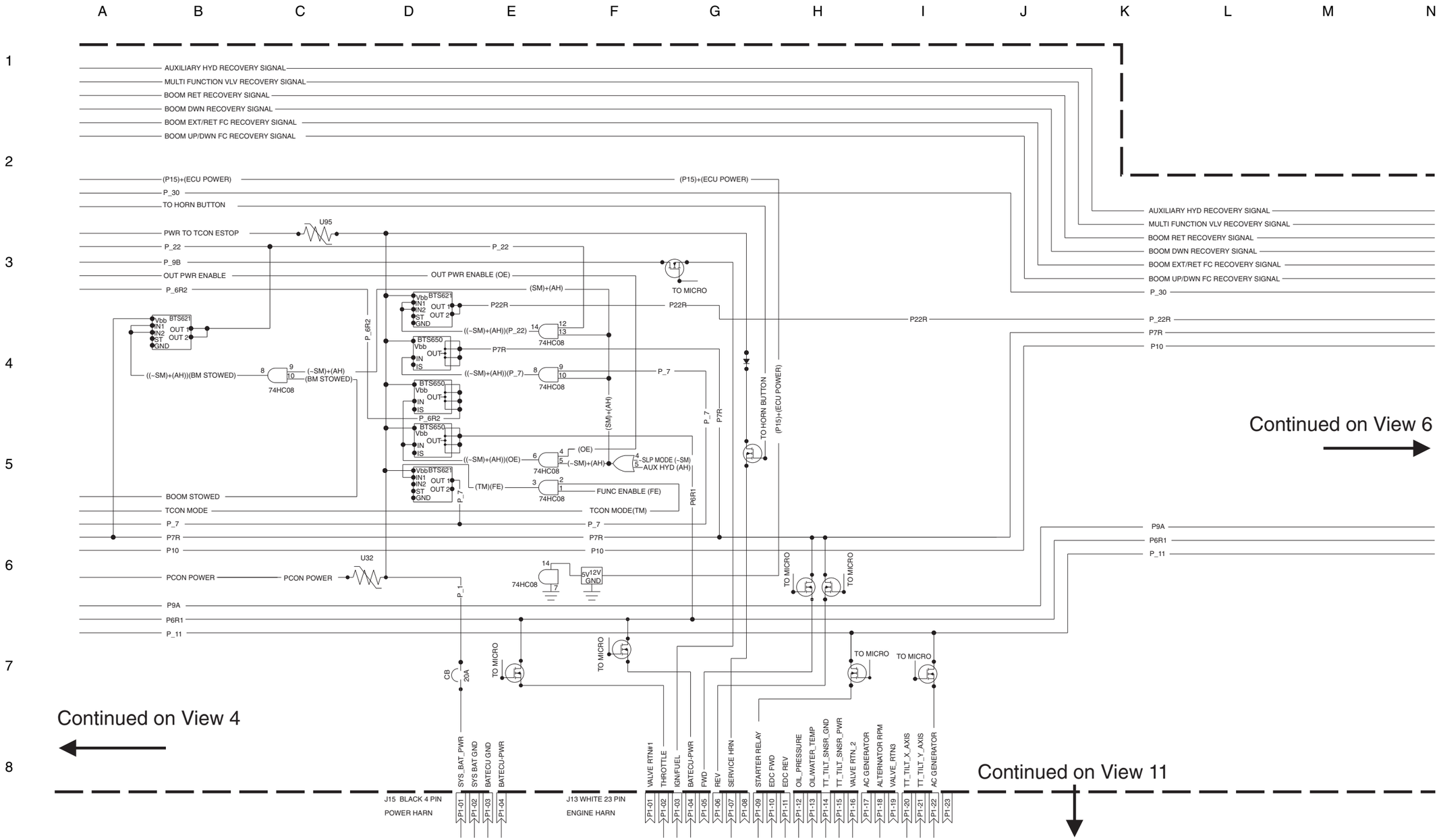
Electrical Schematic - View 5
(before serial number 2511)



Electrical Schematic - View 5

(before serial number 2511)

REV C



REV C

Electrical Schematic - View 6

Ground Controls (TCON) (before serial number 2511)

N M L K J I H G F E D C B A

TCON MEMBRANE PANEL

START, STRT ASST, SCROLL R, SCRL F/ENT, - BUTTON, + BUTTON, GAS/LP, ENG SPEED, AUXILIARY, SEC. UP, BOOM UP

ROOM RET, BOOM DOWN, BOOM EXT, RABBIT, SEC. DOWN, TURTLE, BOOM CCW, PLTFRM CCW, JIB UP, PLTFRM UP, PLTFRM DOWN, JIB DOWN, PLTFRM CW, BOOM CW

P10 J10 P11 J11

AUXILIARY HYD RECOVERY SIGNAL
MULTI FUNCTION VLV RECOVERY SIGNAL
BOOM RET RECOVERY SIGNAL
BOOM DWN RECOVERY SIGNAL
BOOM EXT/RET FC RECOVERY SIGNAL
BOOM UP/DWN FC RECOVERY SIGNAL
P_30
P_22R
P7R
P10
P9A
P6R1
P11

TO MICRO, TO PLD, P_30

Continued on View 5

Continued on View 12

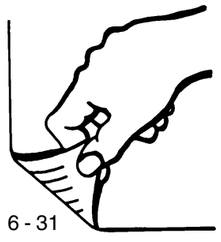
J14 WHITE 35 PIN MANIFOLD HARN

VLVRET4-BR	FA4-01	VALVE_RTN4
C03PBF-RD/WH	FA4-02	BOOM_UP/DOWN_VLV
C09PERF-BK/RD	FA4-03	BOOM_EXT/RET_VLV
C06TRF-WH/RD	FA4-04	TURNTABLE_ROTATE_VLV
C12SBFC-BL/WH	FA4-06	SEC. BOOM F.C.
C01PBU-RD	FA4-07	PRI_UP_VLV
C02PBD-RD/BK	FA4-08	PRI_DOWN_VLV
C07PBE-BK	FA4-09	PRI_EXTEND_VLV
C08PBR-BK/WH	FA4-10	PRI_RET_VALVE
C11SBD-BL/BK	FA4-12	SEC_DWN_VLV
R49LP - WT/BK	FA4-13	DRIVE LIGHTS RELAY
VLVRET5-BR	FA4-14	VALVE_RTN5
	FA4-15	HYD_FILTER1
	FA4-16	HYD_FILTER2
VLVRET5-BR	FA4-17	BOOM REVERSE LOAD
VLVRET5-BR	FA4-18	BOOM OVERLOAD
C10SBU-BL	FA4-19	SEC_UP_VLV
C72SBR-BL/RD	FA4-20	SEC_RET_VLV
C72SBE-BL/WH	FA4-21	SEC_EXT_VLV
	FA4-22	
	FA4-23	MULTI_FUNCT_VLV
	FA4-24	
C04TRL-WH	FA4-25	ROTATE_CW_VLV
C05TRR-WH/BK	FA4-26	ROTATE_CCW_VLV
VALVE RTN7	FA4-27	VALVE_RTN7
	FA4-28	
	FA4-29	
VALVE RTN6	FA4-30	VALVE_RTN6
	FA4-31	
C27AUX-RD	FA4-32	AUX_RELAY
P12SSBLE-WH/RD	FA4-33	SEC BOOM EXT SEQ #1 VLV
P126SBLD-WH/BK	FA4-34	SEC BOOM DOWN SEQ #2 VALVE
	FA4-35	

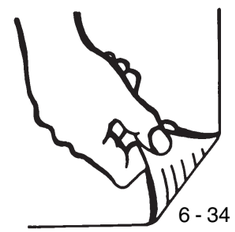
1 2 3 4 5 6 7 8

Electrical Schematic - View 6

Ground Controls (TCON) (before serial number 2511)



Electrical Schematic - View 7
(before serial number 2511)



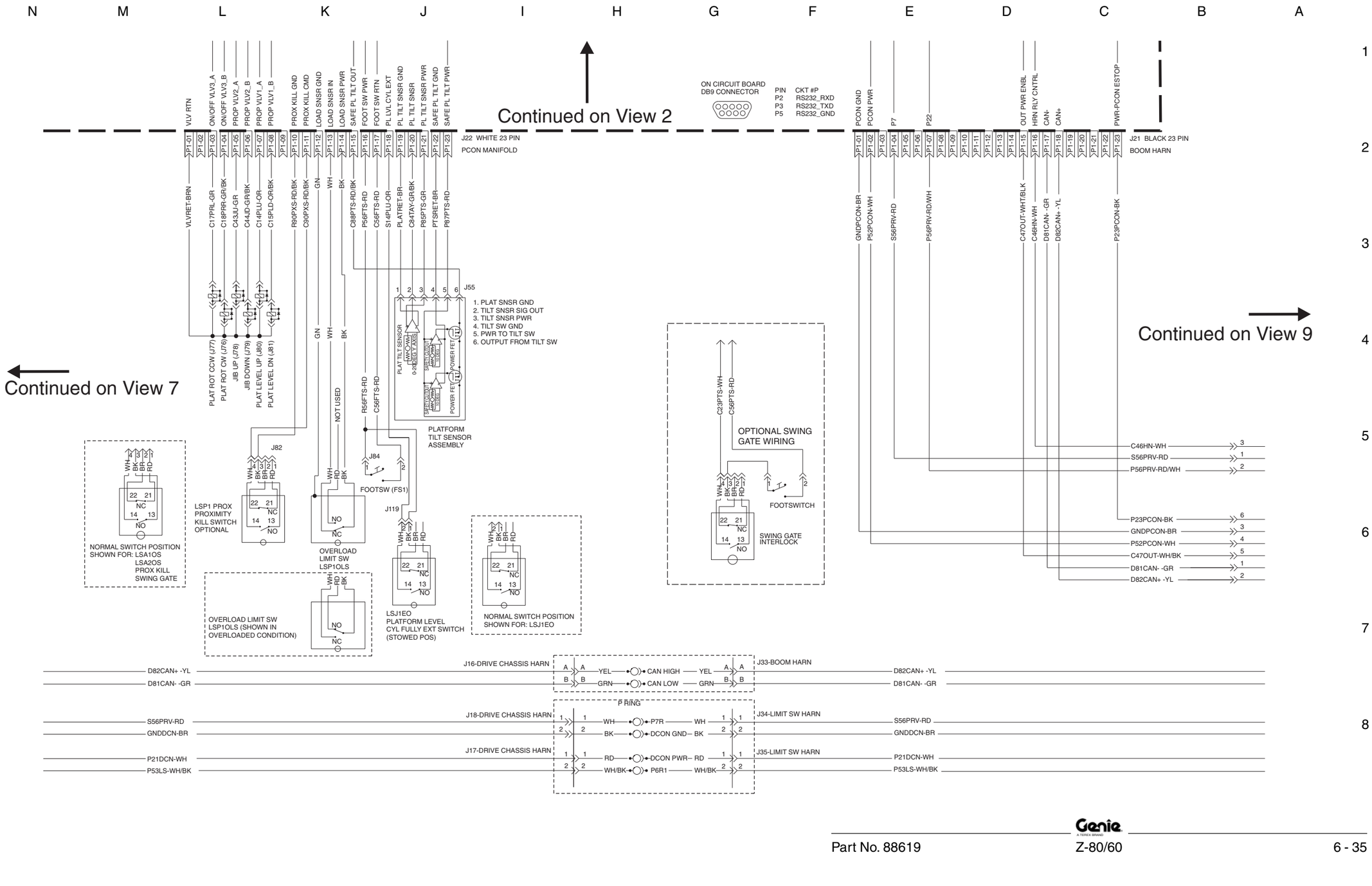
Electrical Schematic - View 7

(before serial number 2511)

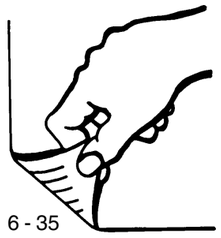
REV C

REV C

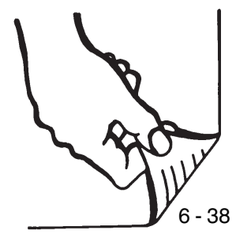
Electrical Schematic - View 8
(before serial number 2511)



Electrical Schematic - View 8
(before serial number 2511)



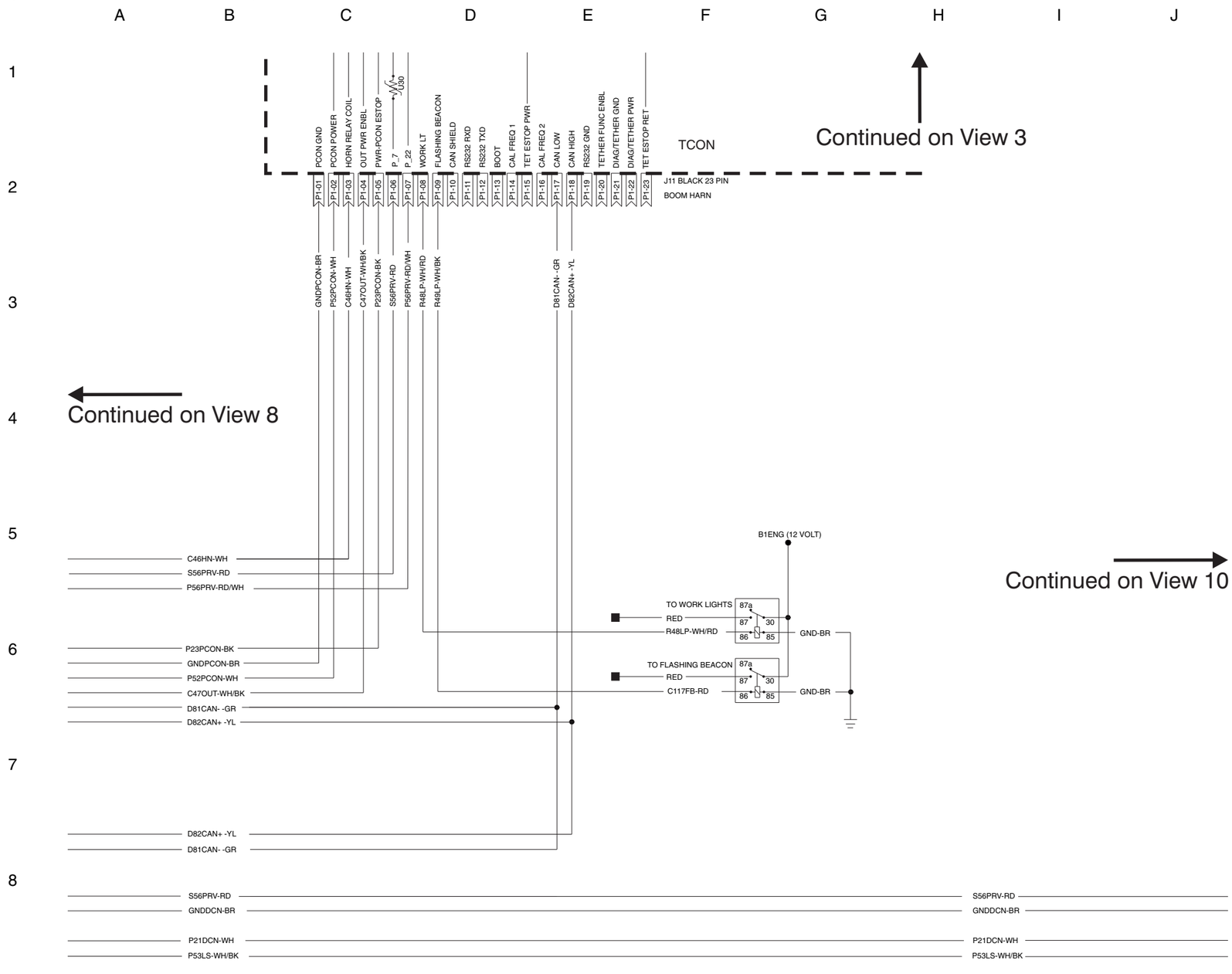
Electrical Schematic - View 9
(before serial number 2511)



Electrical Schematic - View 9

(before serial number 2511)

REV D



REV C

Electrical Schematic - View 10

Limit Switches (before serial number 2511)

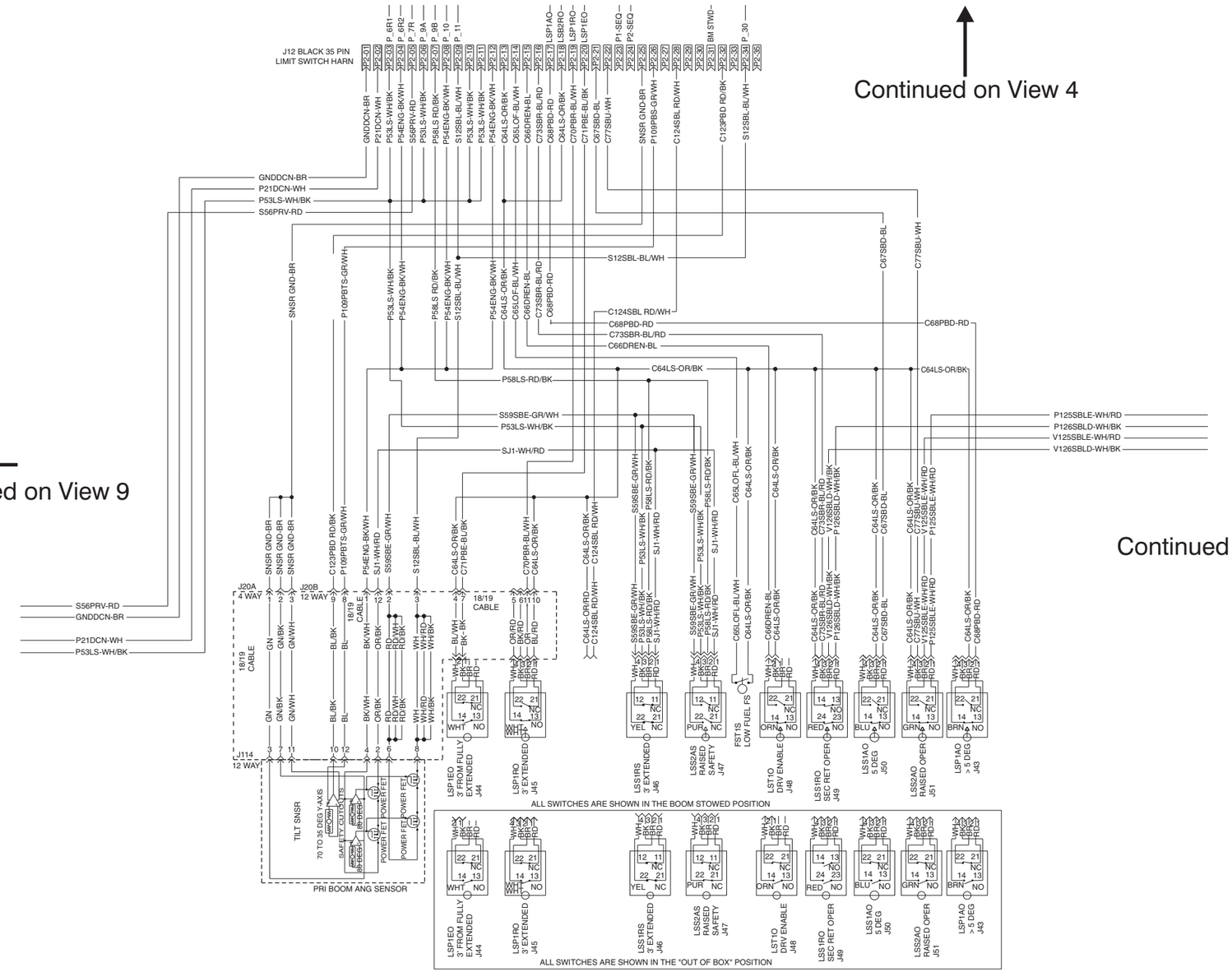
N M L K J I H G F E D C B A

1 2 3 4 5 6 7 8

Continued on View 4

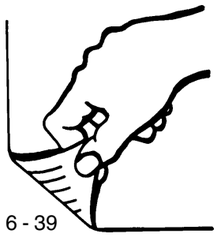
Continued on View 9

Continued on View 11



Electrical Schematic - View 10

Limit Switches (before serial number 2511)



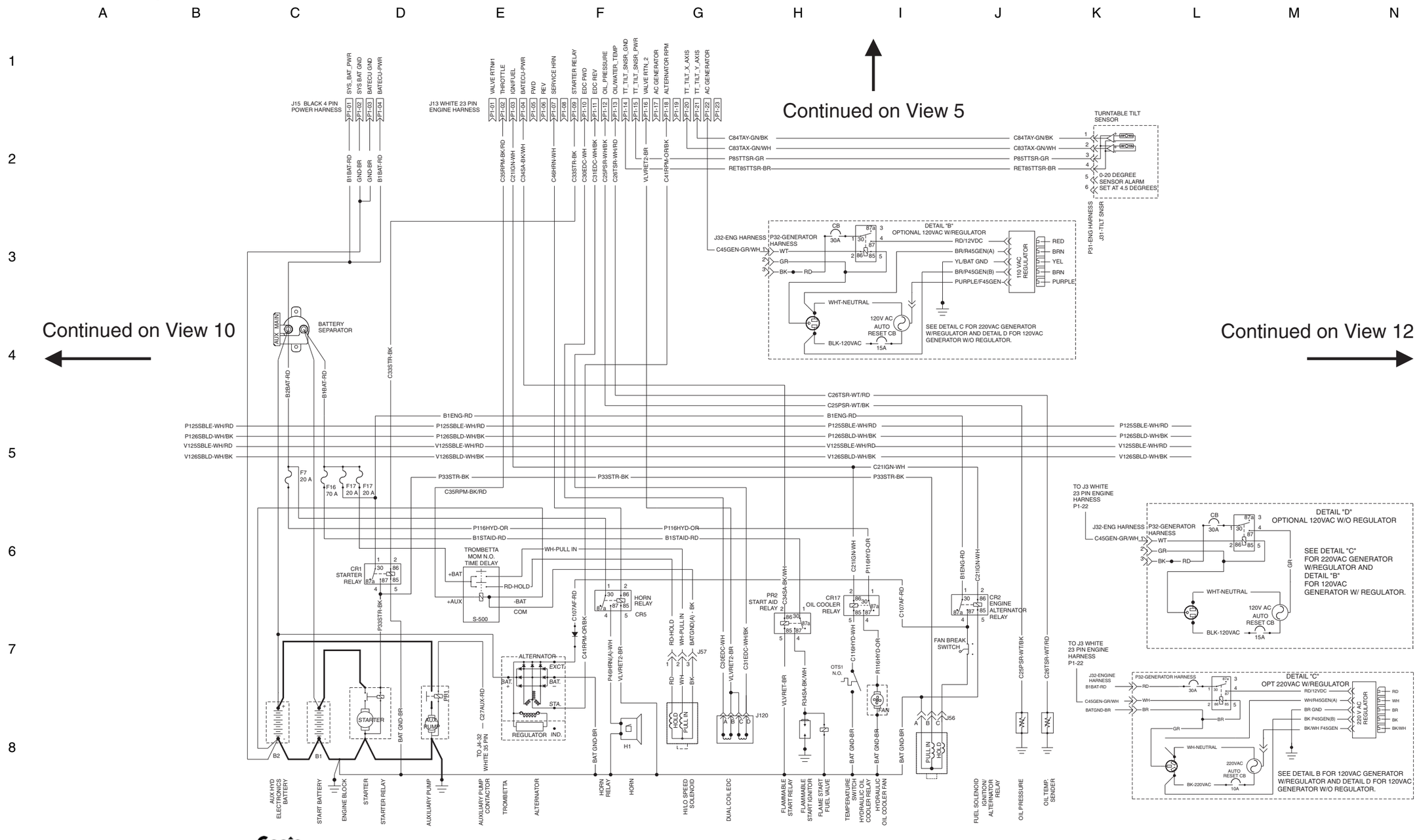
Electrical Schematic - View 11

Deutz F4L-913 Engine (before serial number 339)

Electrical Schematic - View 11

Deutz F4L-913 Engine (before serial number 339)

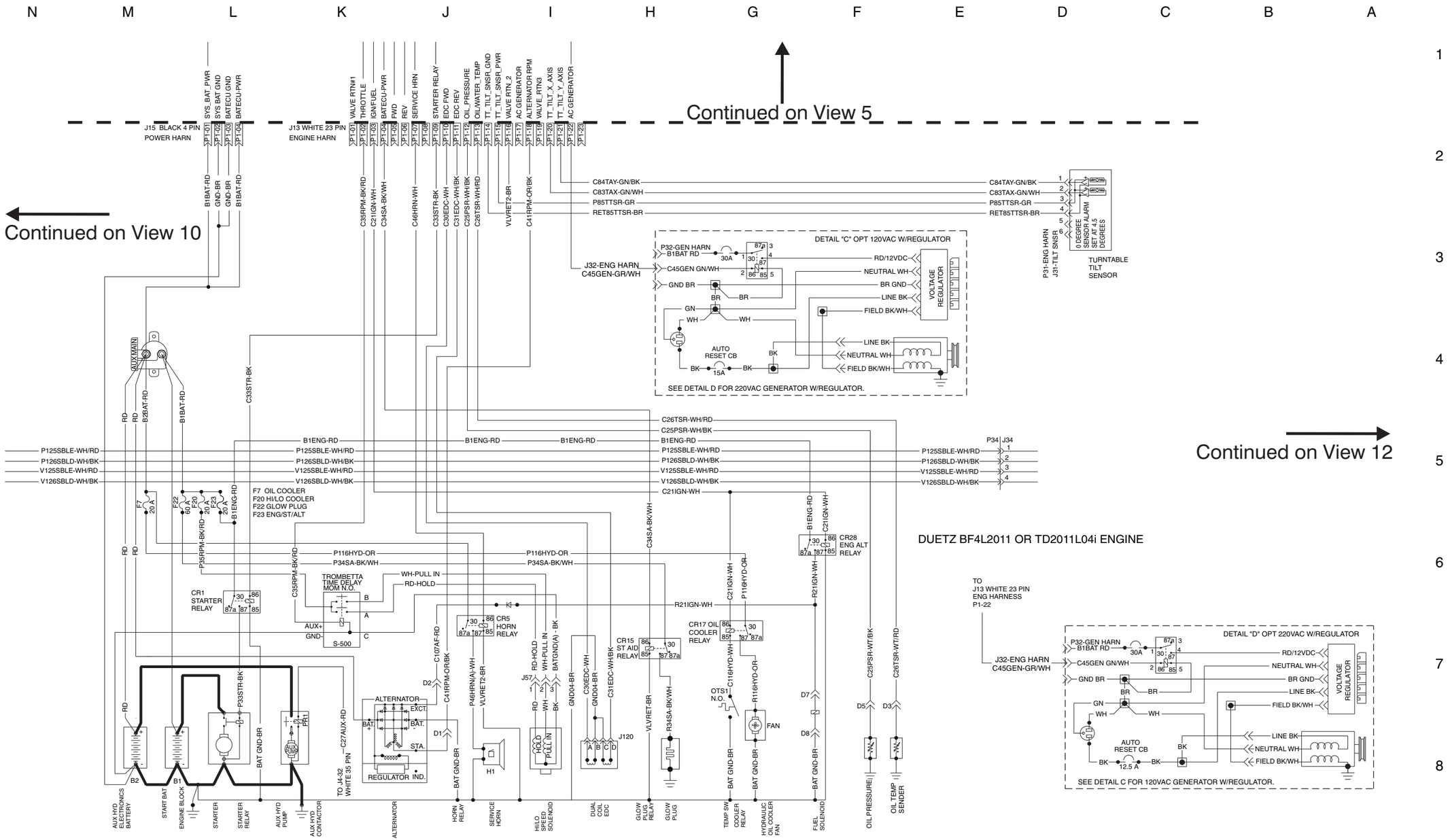
REV B



REV C

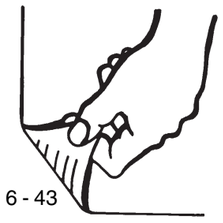
Electrical Schematic - View 11

Deutz BF4L-2011 & TD2011L04i Engine (from serial number 339 to 2316)



Electrical Schematic - View 11

Deutz BF4L-2011 & TD2011L04i (from serial number 339 to 2316)



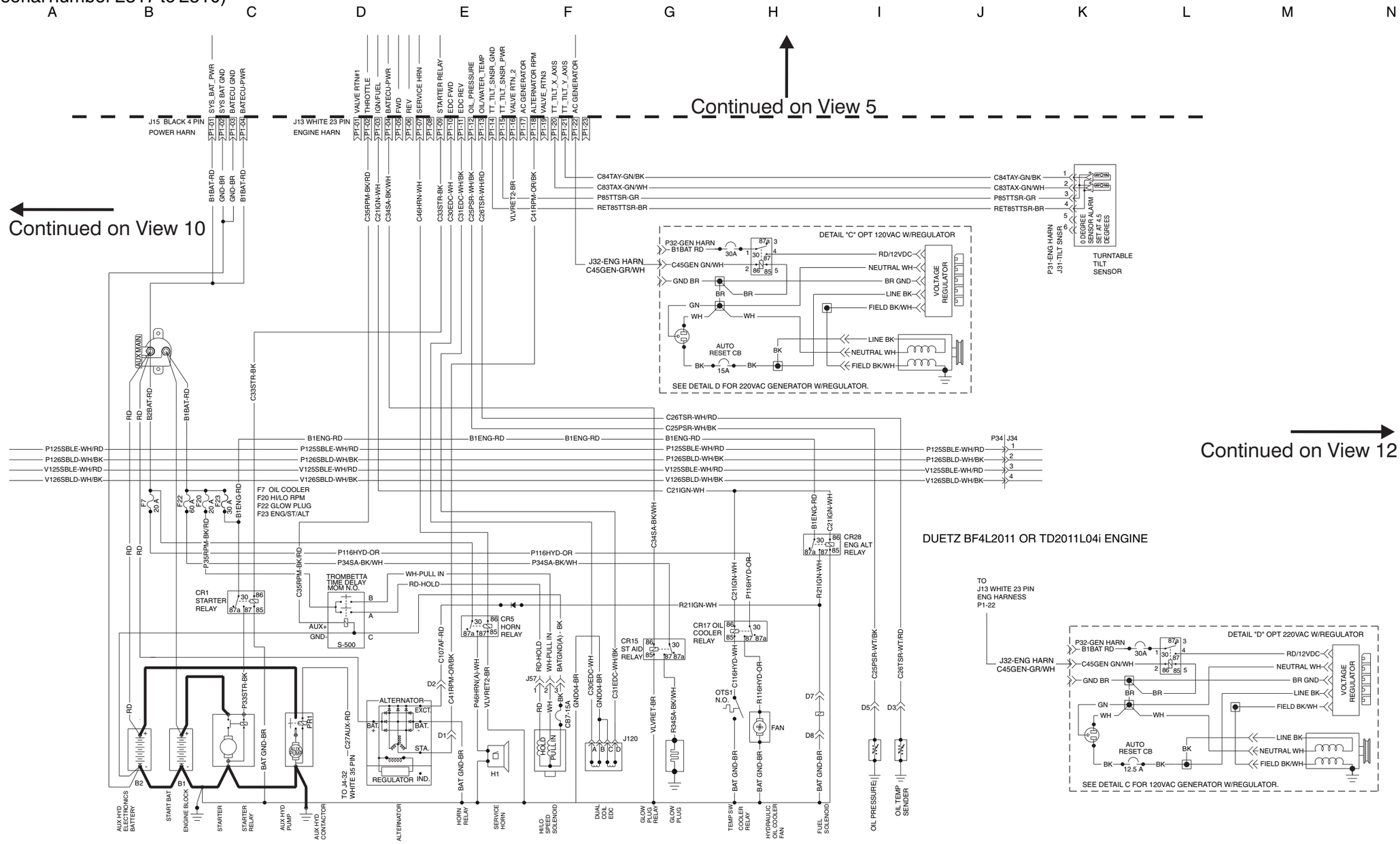
Electrical Schematic - View 11

Deutz BF4L-2011 & TD2011L04i Engine
(from serial number 2317 to 2510)

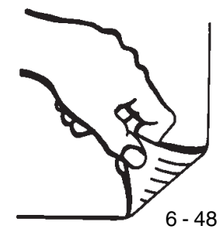
Electrical Schematic - View 11

Deutz BF4L-2011 & TD2011L04i
(from serial number 2317 to 2510)

REV A



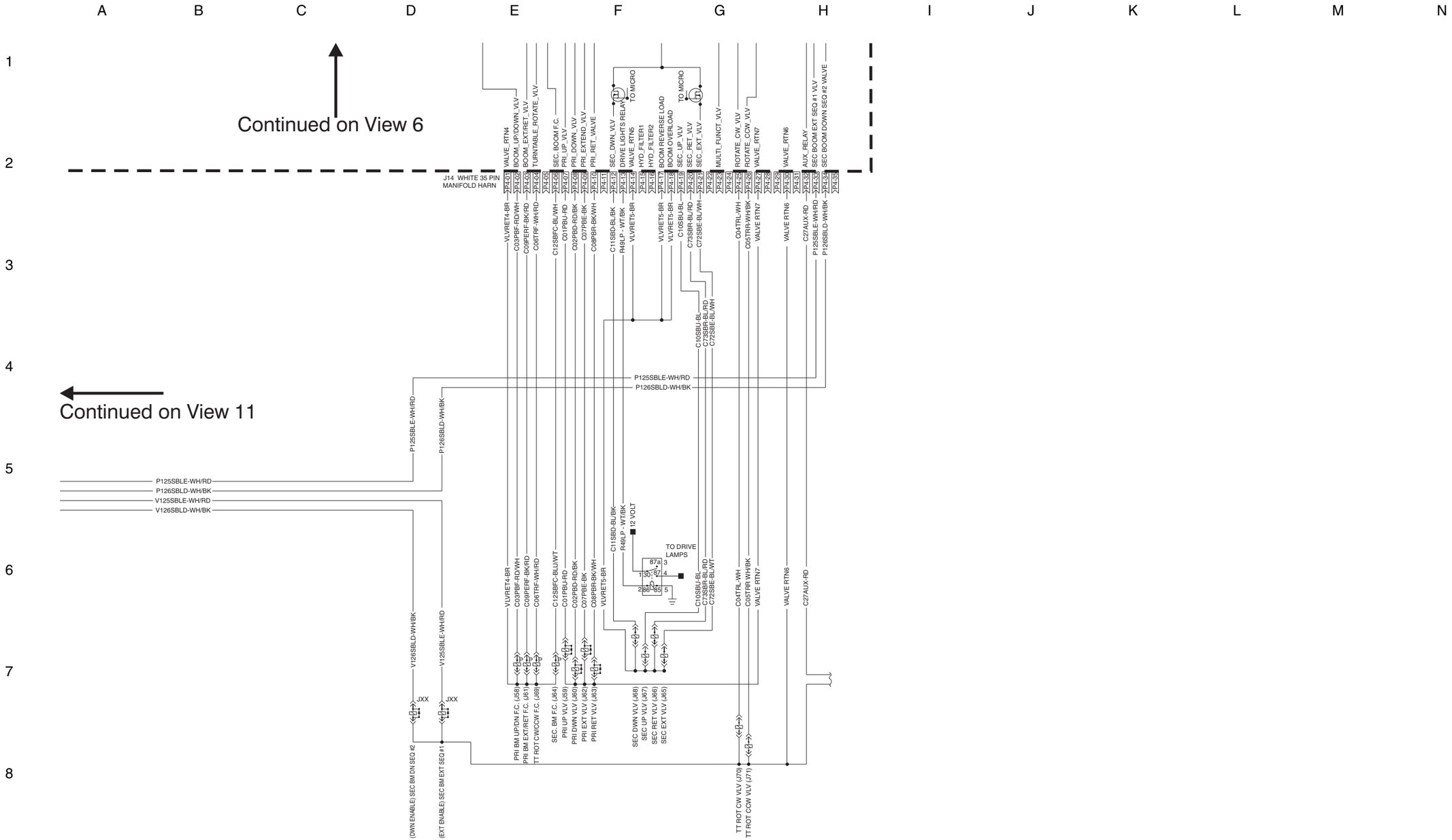
Electrical Schematic - View 12
(before serial number 2511)



Electrical Schematic - View 12

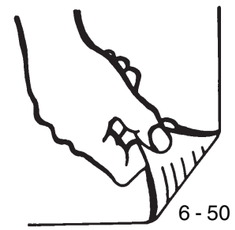
(before serial number 2511)

REV C



Electrical Schematic

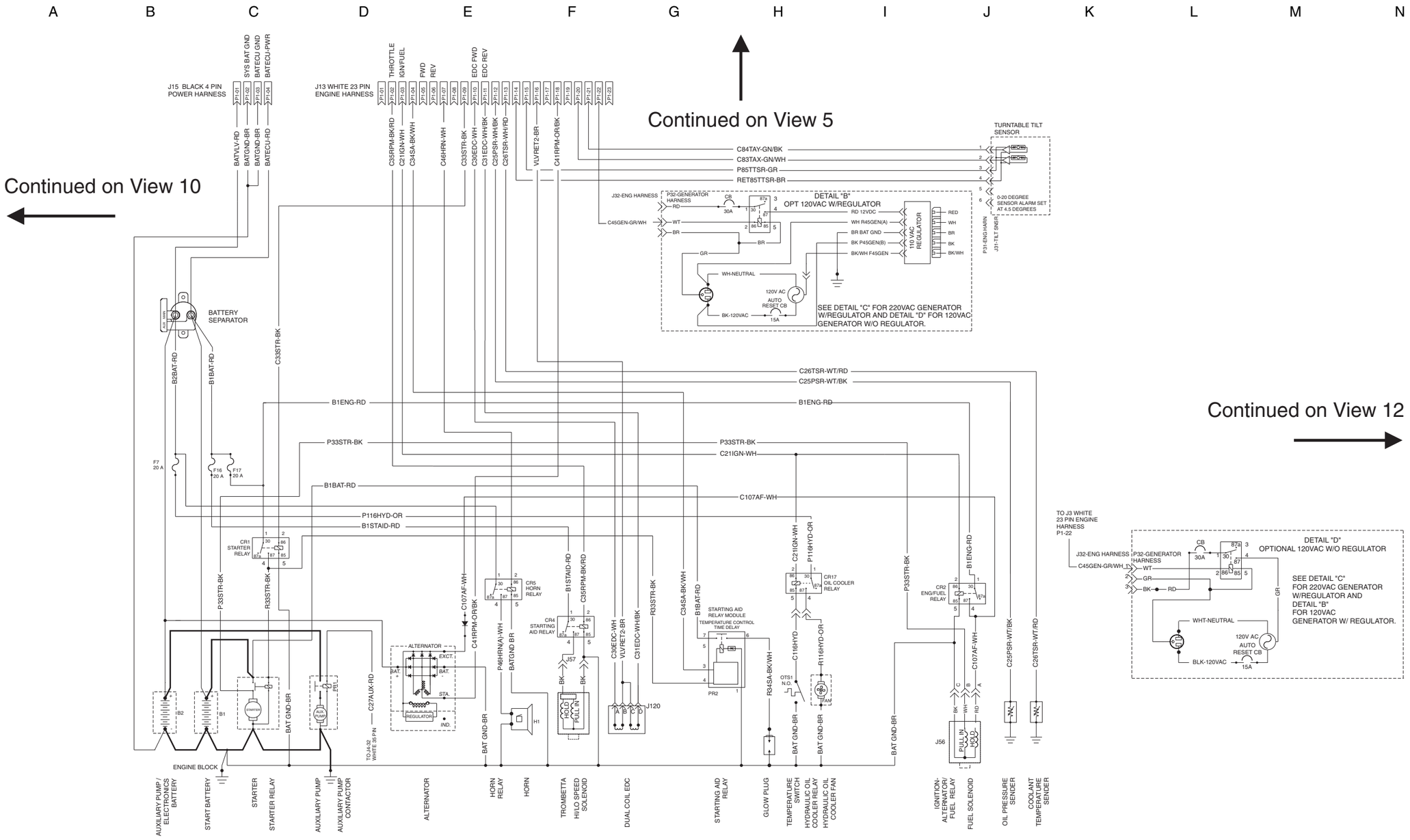
Perkins 704-30 Engine (before serial number 329)



Electrical Schematic

REV A

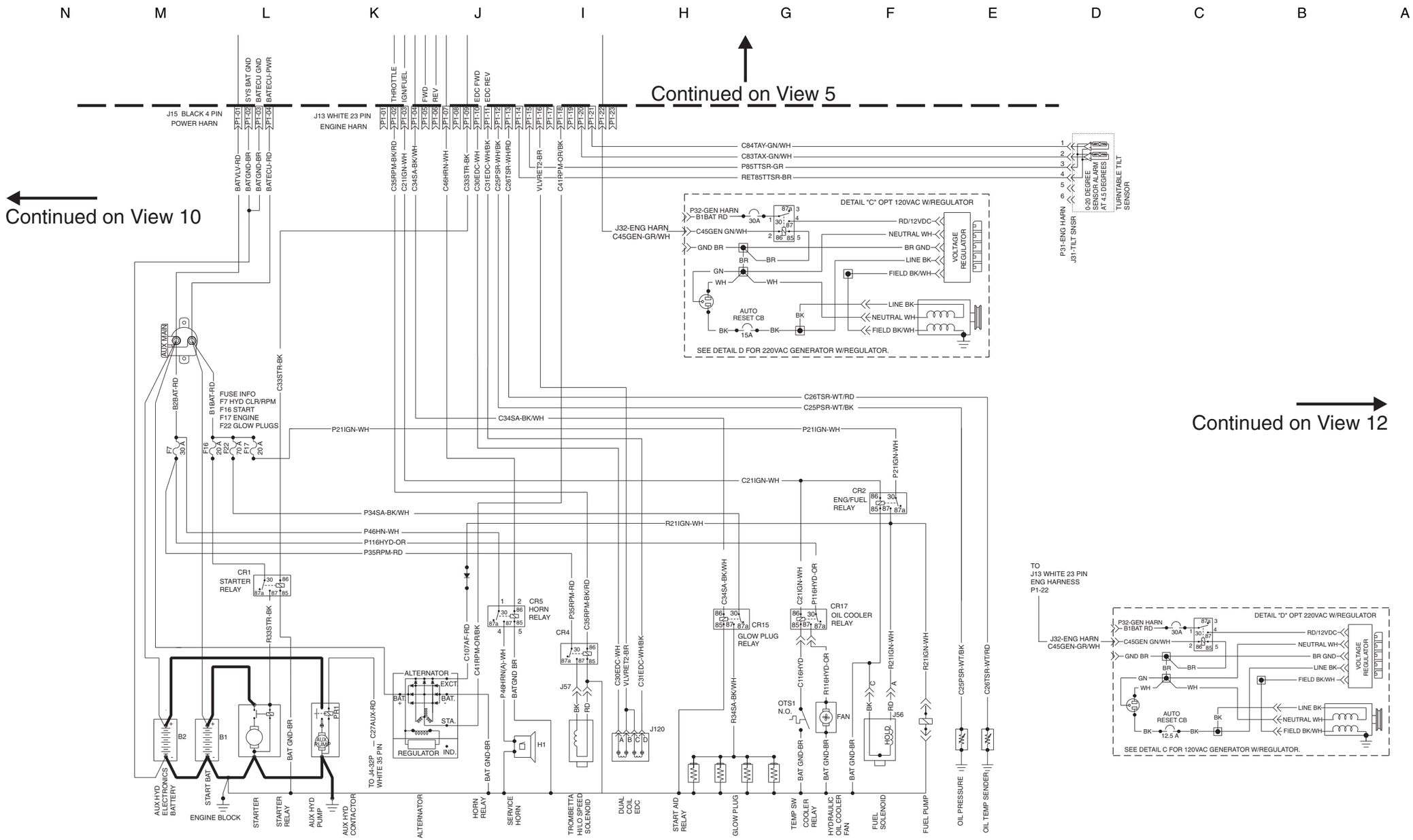
Perkins 704-30 Engine (before serial number 329)



REV C

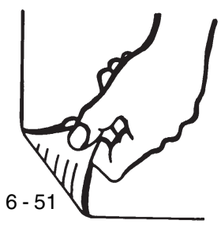
Electrical Schematic

Perkins 804C-33 & 804D-33 Engine (from serial number 329 to 2316)



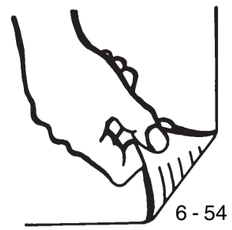
Electrical Schematic

Perkins 804C-33 & 804D-33 Engine (from serial number 329 to 2316)



Electrical Schematic

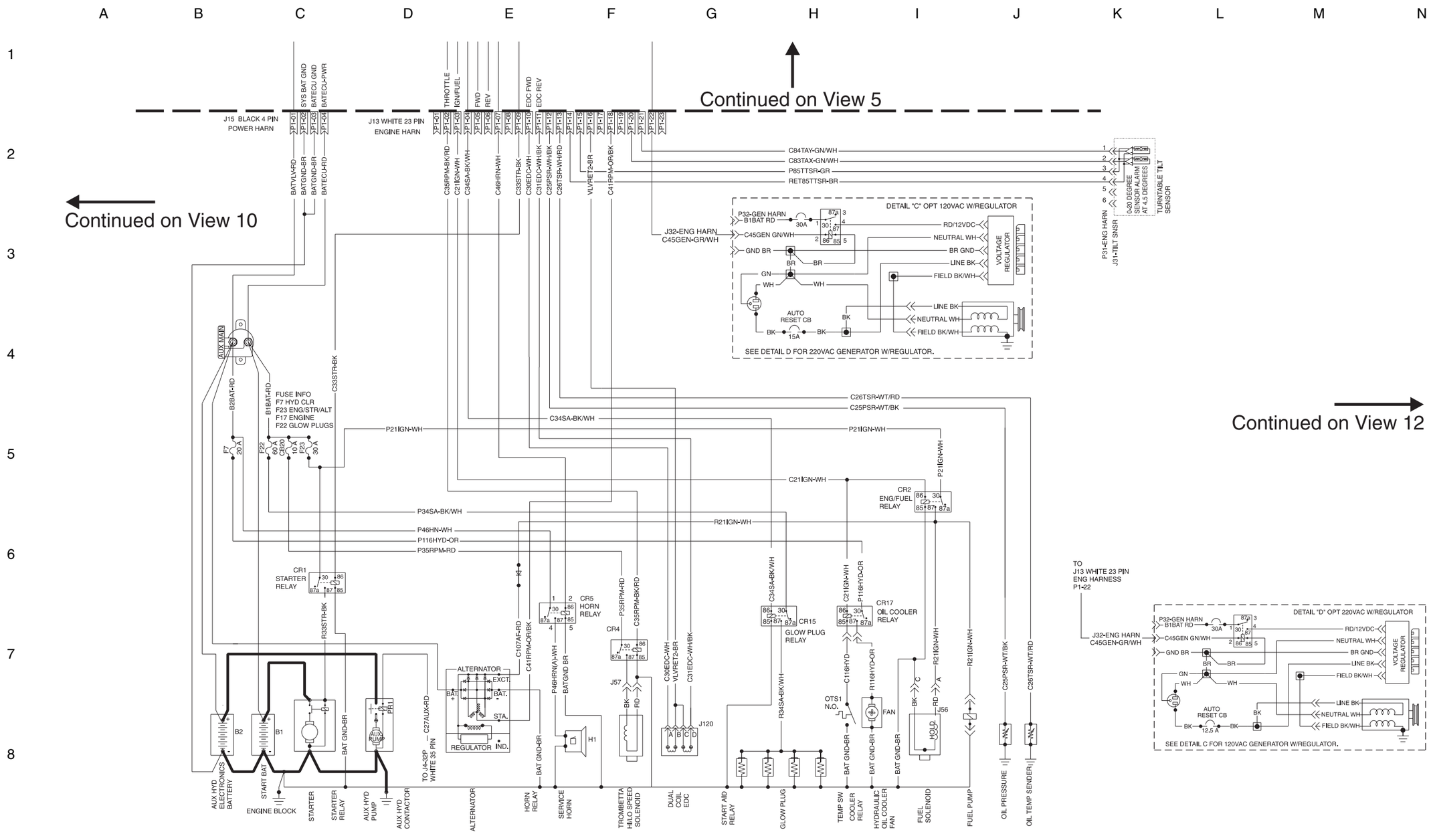
Perkins 804D-33 Engine (from serial number 2317 to 2510)



Electrical Schematic

Perkins 804D-33 Engine (from serial number 2317 to 2510)

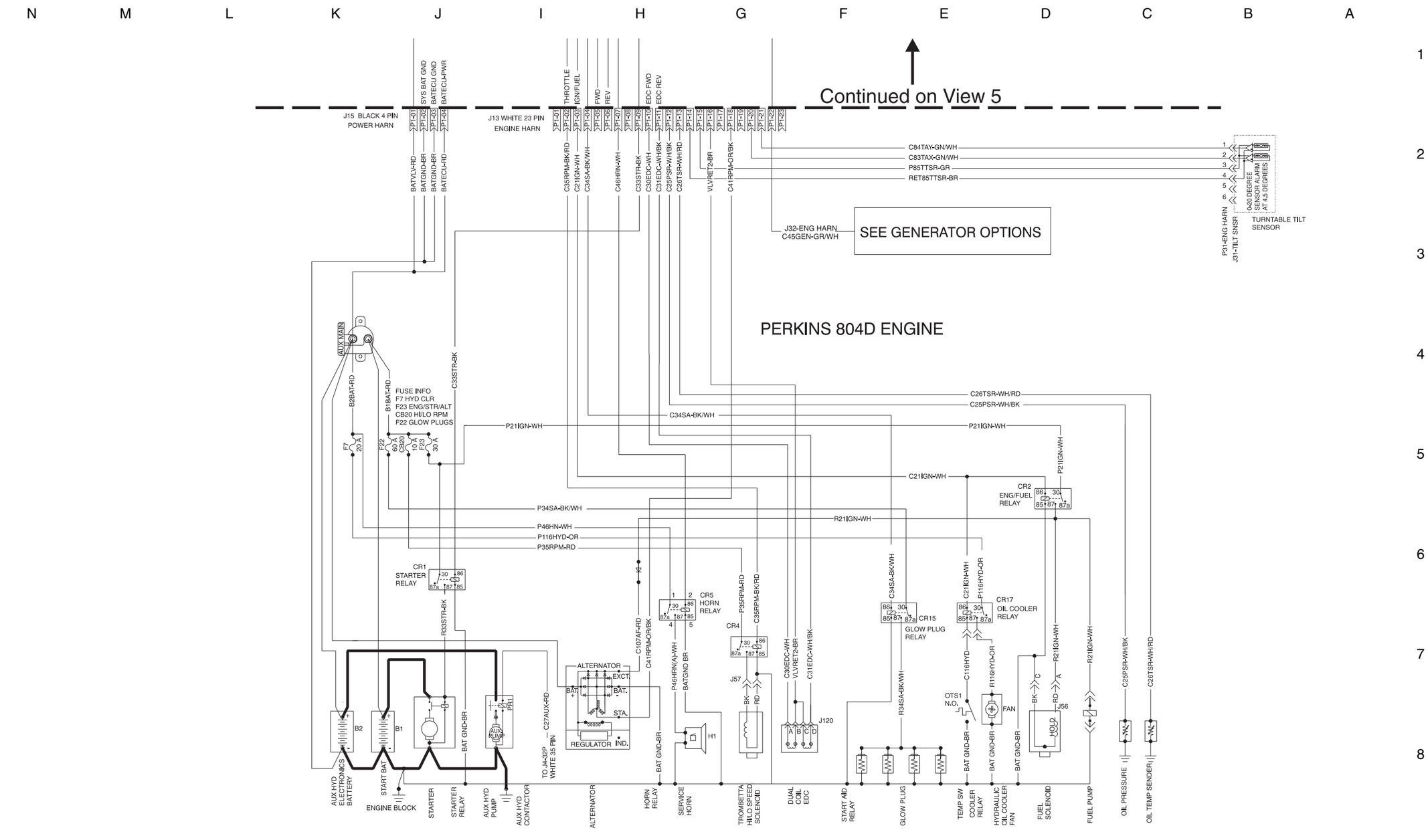
REV A



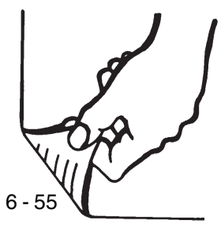
REV A

Electrical Schematic

Perkins 804D (from serial number 2511)

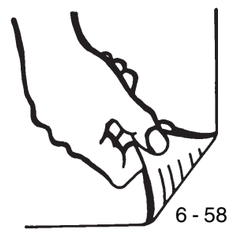


Electrical Schematic
Perkins 804D (from serial number 2511)



Electrical Schematic

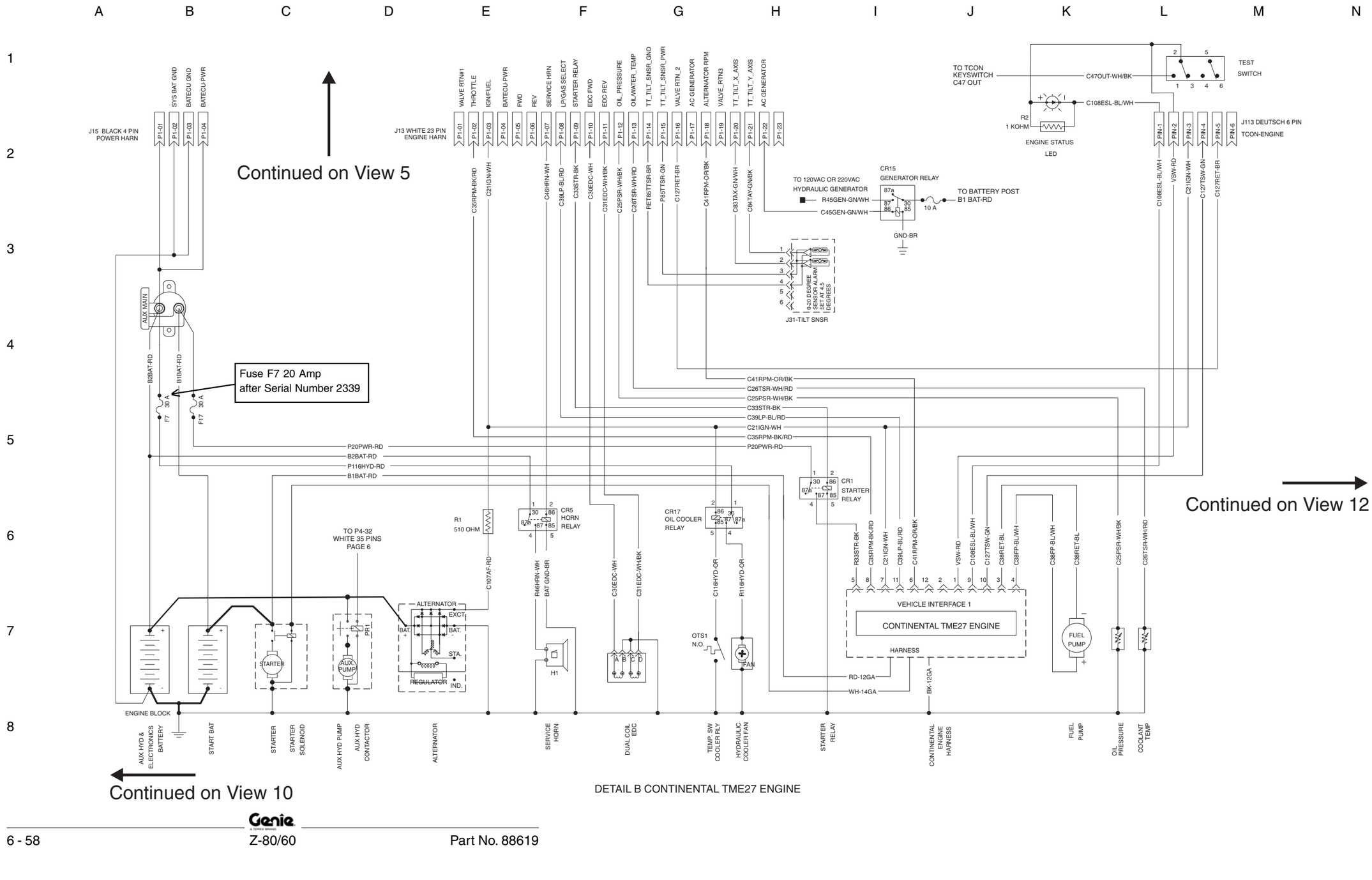
Continental TME27 Engine (before serial number 2511)



Electrical Schematic

REV B

Continental TME27 Engine (before serial number 2511)

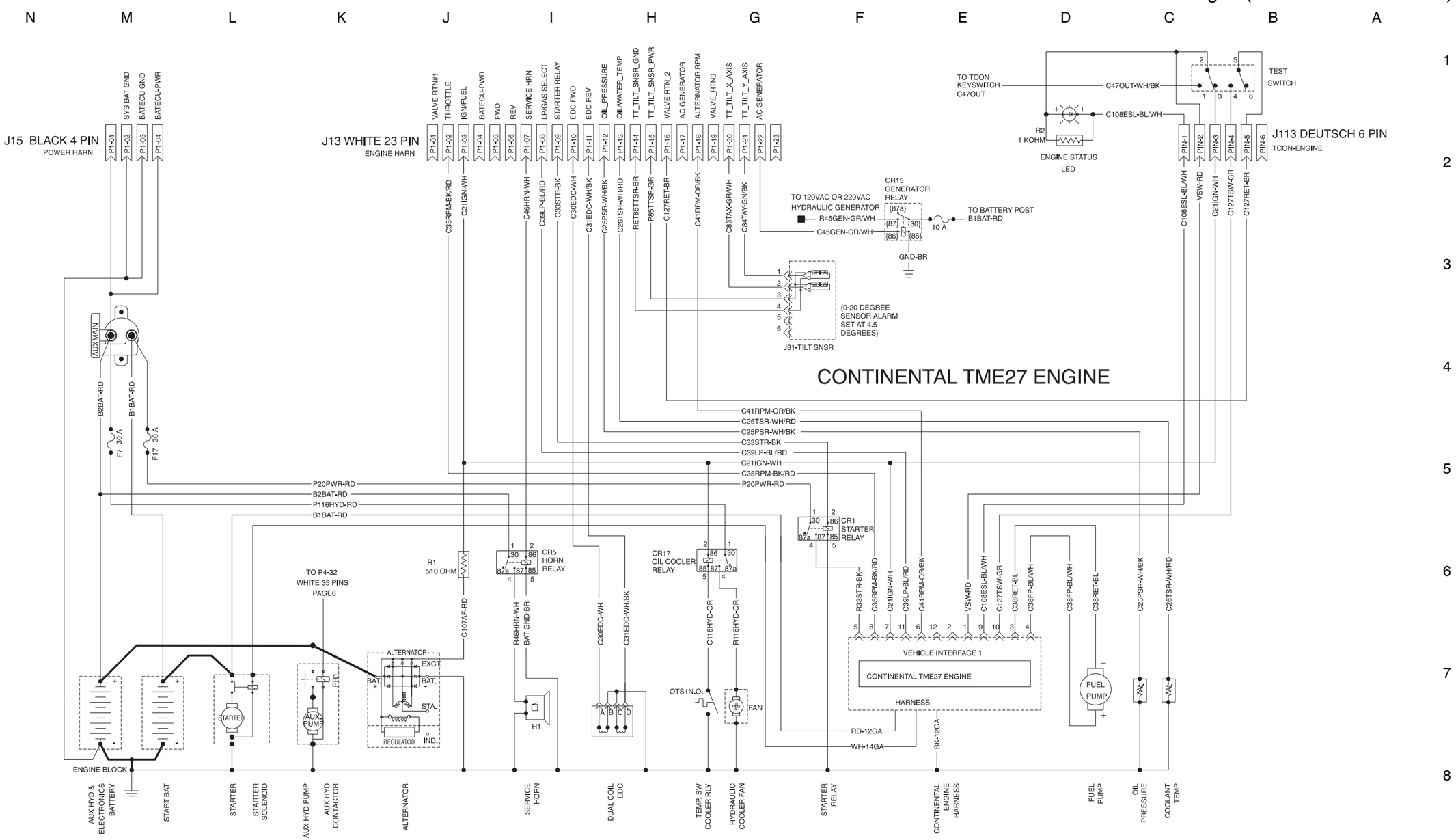


DETAIL B CONTINENTAL TME27 ENGINE

REV A

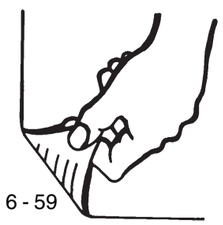
Electrical Schematic - Engine Options

Continental TME27 Engine (from serial number 2510)

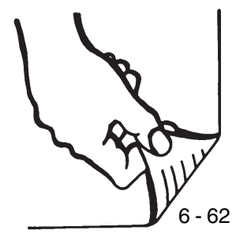


Electrical Schematic - Engine Options

Continental TME27 Engine (from serial number 2510)



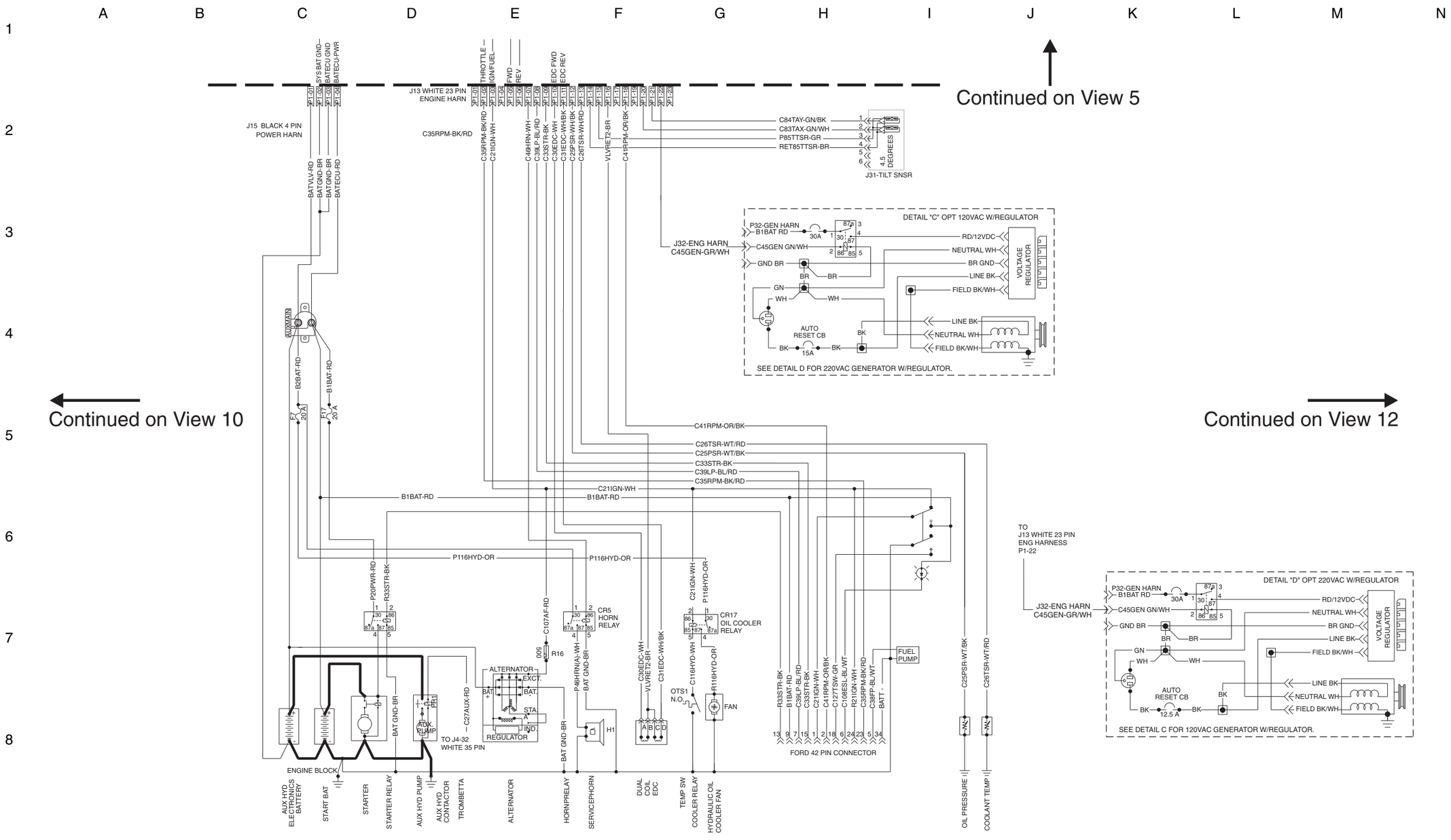
Electrical Schematic
Ford LRG 425 Engine



REV A

Electrical Schematic

Ford LRG 425 Engine



Electrical Schematic
GM 3.0L Engine

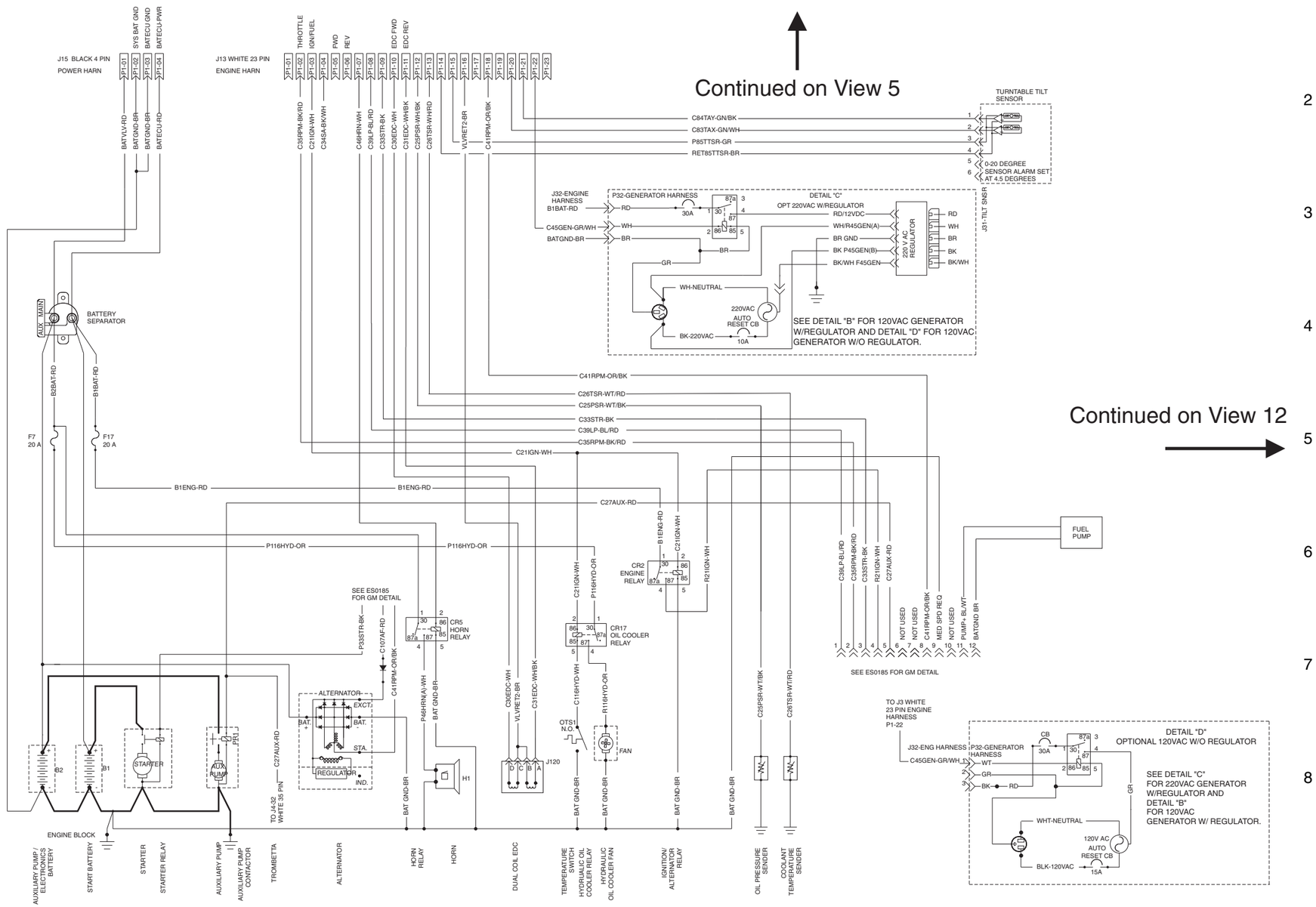
N M L K J I H G F E D C B A

1 2 3 4 5 6 7 8

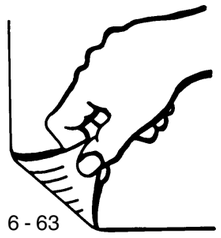
Continued on View 5

Continued on View 10

Continued on View 12



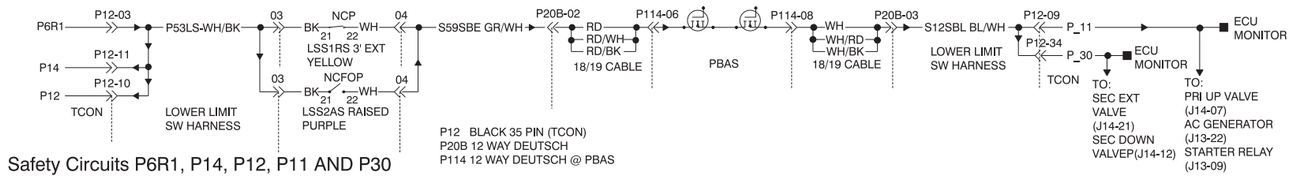
Electrical Schematic
GM 3.0L Engine



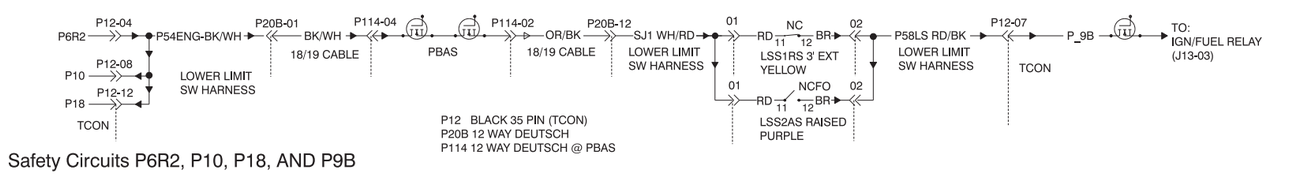
REV A

Electrical Schematic
Safety Circuits

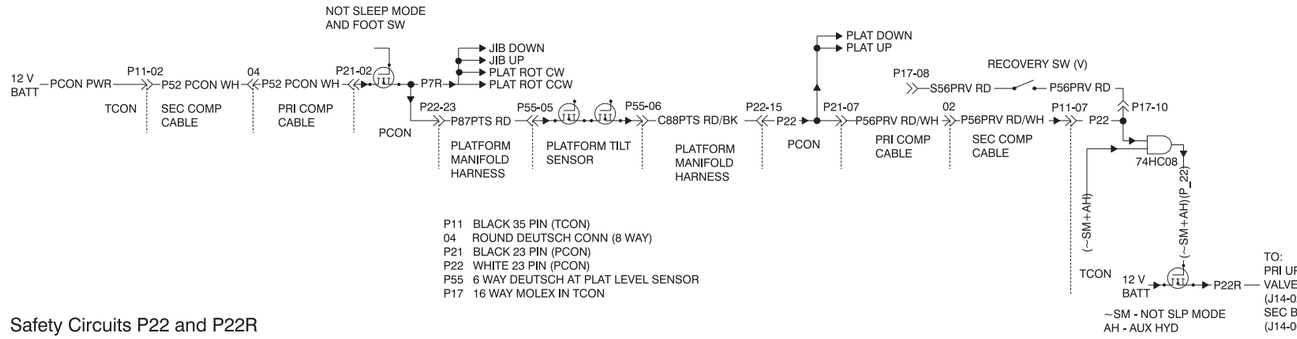
N M L K J I H G F E D C B A



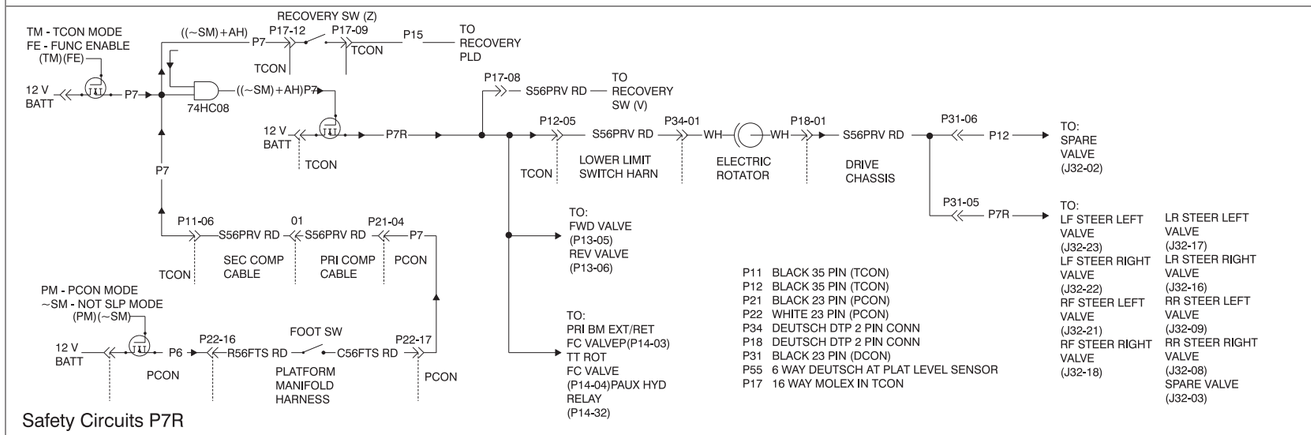
Safety Circuits P6R1, P14, P12, P11 AND P30



Safety Circuits P6R2, P10, P18, AND P9B

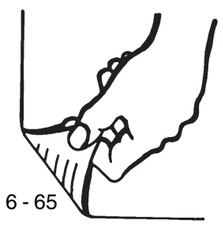


Safety Circuits P22 and P22R



Safety Circuits P7R

Electrical Schematic
Safety Circuits

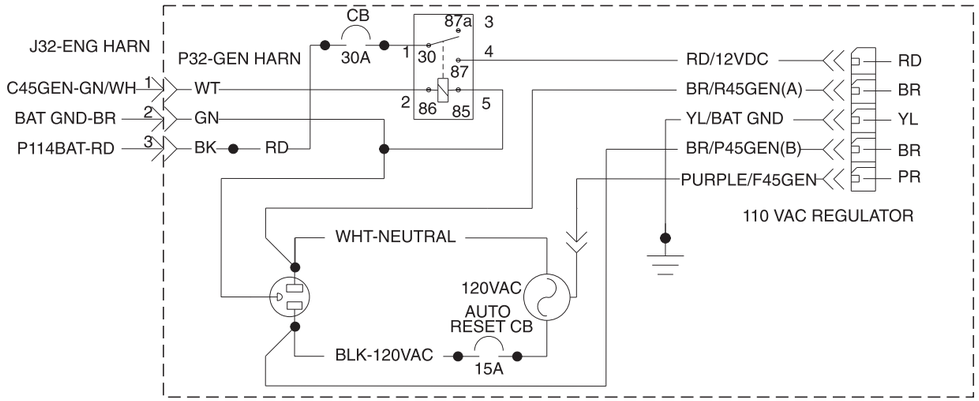


Electrical Schematic - Generator Options

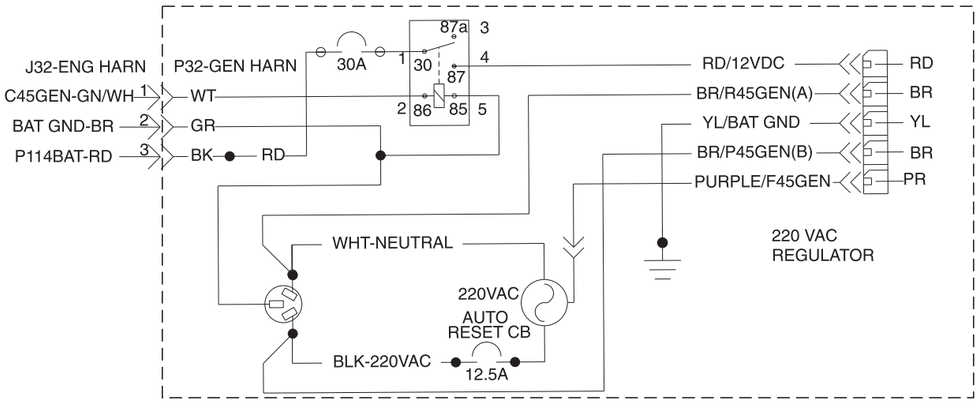
Electrical Schematic - Generator Options

REV A

Belt Driven Generator Option

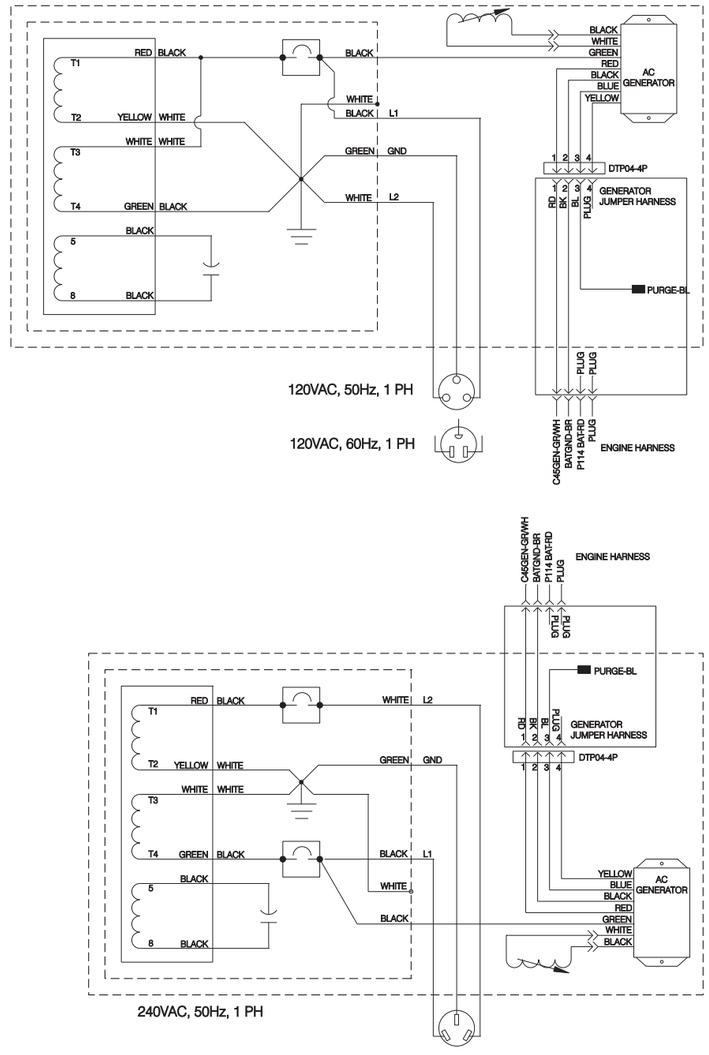


120VAC GENERATOR W/REGULATOR.



220VAC GENERATOR W/REGULATOR.

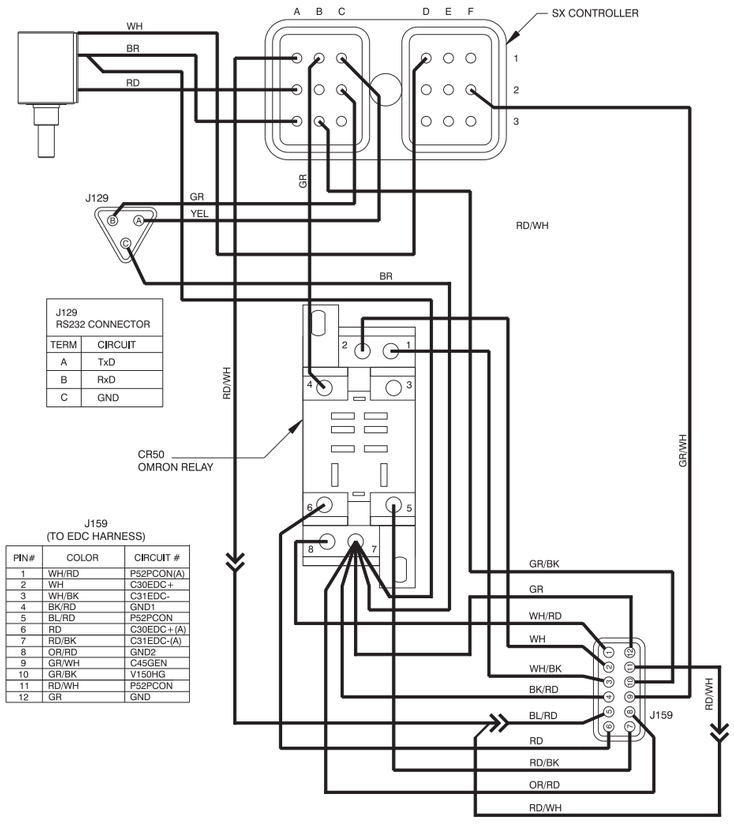
MTE Hydraulic Generator Option



REV A

Electrical Schematic
Welder Generator Option

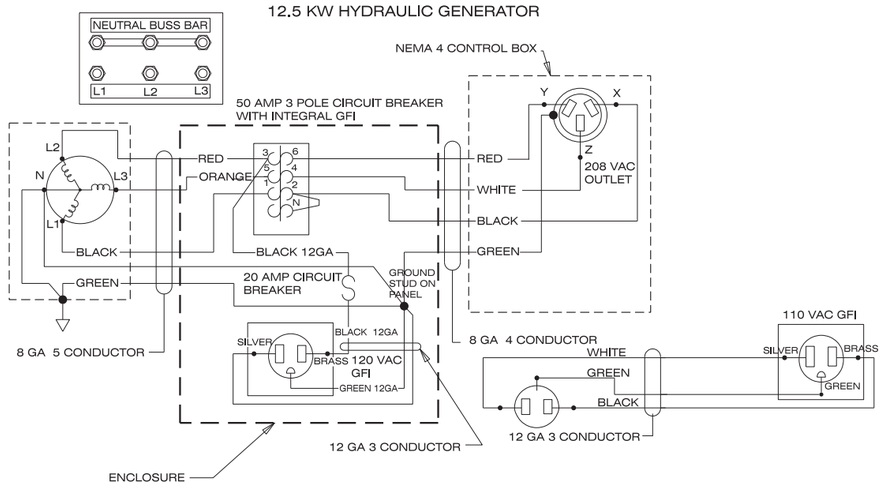
SX CONTROLLER SAUER #K23334		
TERMINAL	CIRCUIT	COLOR
A1	P52PCON	RD/WH
A2	SENSOR POWER +5V	RD
A3	BATTERY-	BR
B1	V151HG	GR
B2	NC	
B3	V150HG	GR/BK
C1	TxD	YEL
C2	RxD	GR
C3	/BOOT	
D1	JOYSTICK	WH
D2	NC	
D3	NC	
E1	NOT USED	
E2	NOT USED	
E3	NOT USED	
F1	NOT USED	
F2	C45GEN	GR/WH
F3	NOT USED	



J129 RS232 CONNECTOR	
TERM	CIRCUIT
A	TxD
B	RxD
C	GND

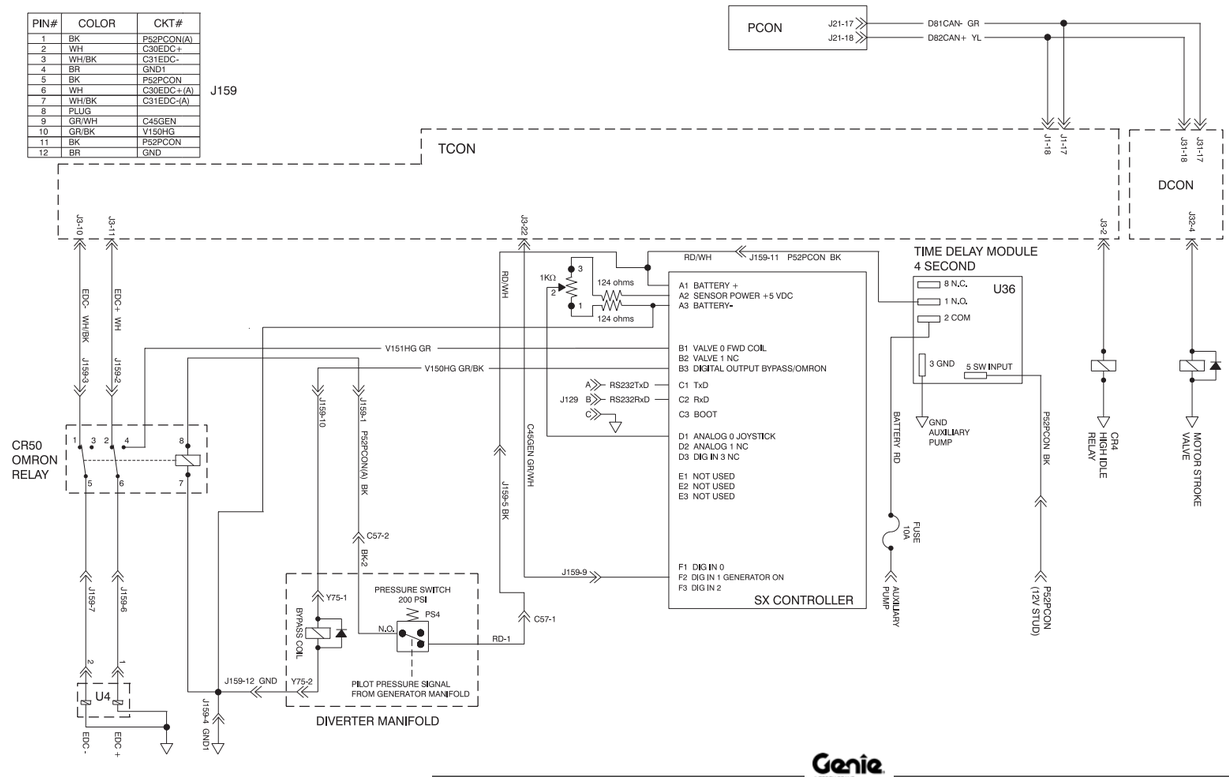
J159
(TO EDC HARNESS)

PIN#	COLOR	CIRCUIT #
1	WH/RD	P52PCON(A)
2	WH	C30EDC+
3	WH/BK	C31EDC-
4	BK/RD	GND1
5	BL/RD	P52PCON
6	RD	C30EDC+(A)
7	RD/BK	C31EDC-(A)
8	OR/RD	GND2
9	GR/WH	C45GEN
10	GR/BK	V150HG
11	RD/WH	P52PCON
12	GR	GND

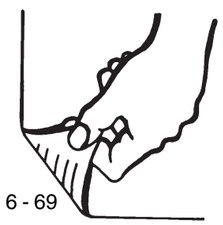


PIN#	COLOR	CKT#
1	BK	P52PCON(A)
2	WH	C30EDC+
3	WH/BK	C31EDC-
4	BR	GND1
5	BK	P52PCON
6	WH	C30EDC+(A)
7	WH/BK	C31EDC-(A)
8	PLUG	
9	GR/WH	C45GEN
10	GR/BK	V150HG
11	BK	P52PCON
12	BR	GND

J159



Electrical Schematic
Welder Generator Option



Hydraulic Schematic

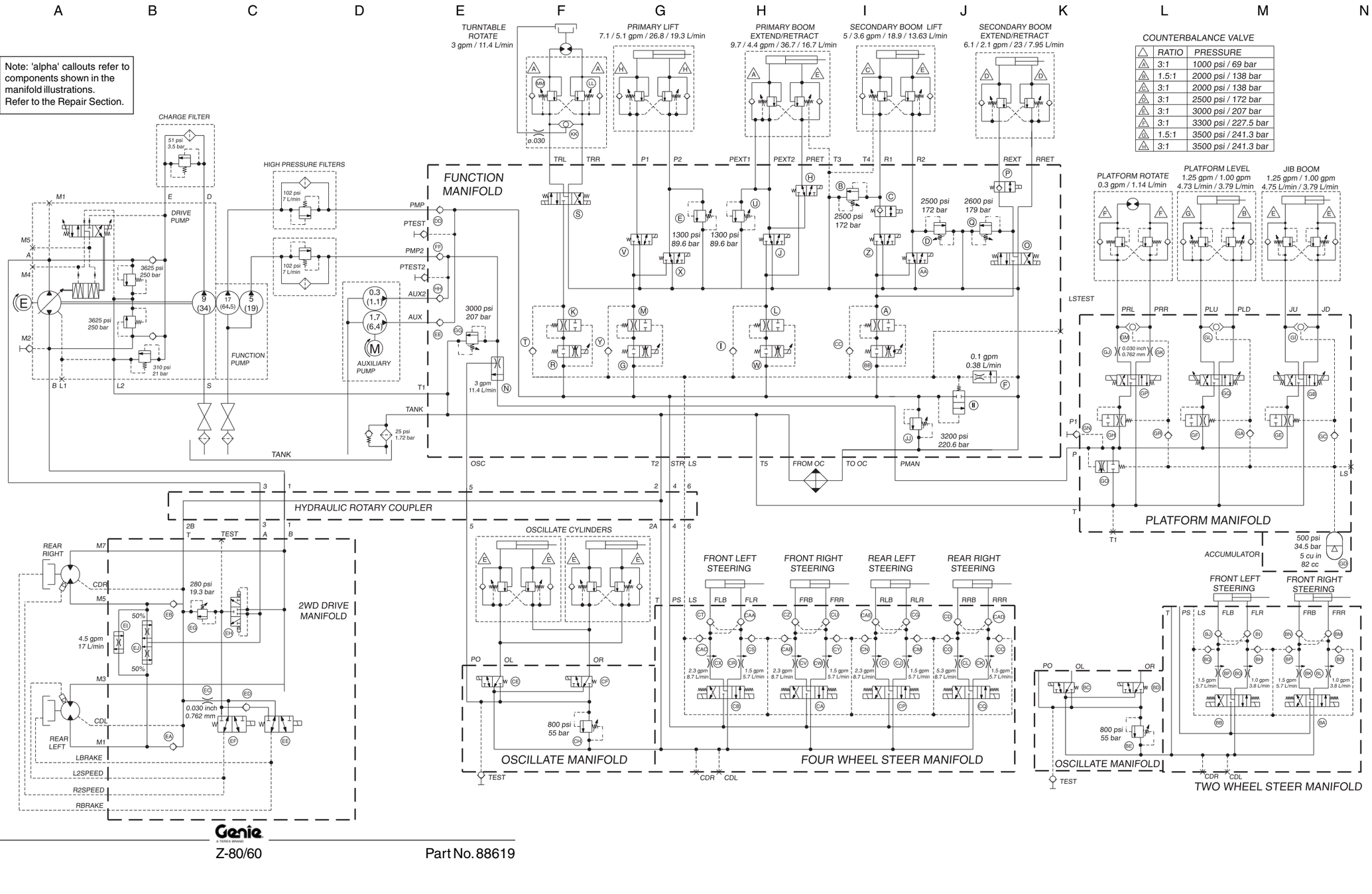
2 Wheel Drive (2 and 4 Wheel Steer)
(before serial number 990)

Hydraulic Schematic

REV D

2 Wheel Drive (2 and 4 Wheel Steer)
(before serial number 990)

Note: 'alpha' callouts refer to components shown in the manifold illustrations.
Refer to the Repair Section.



Hydraulic Schematic

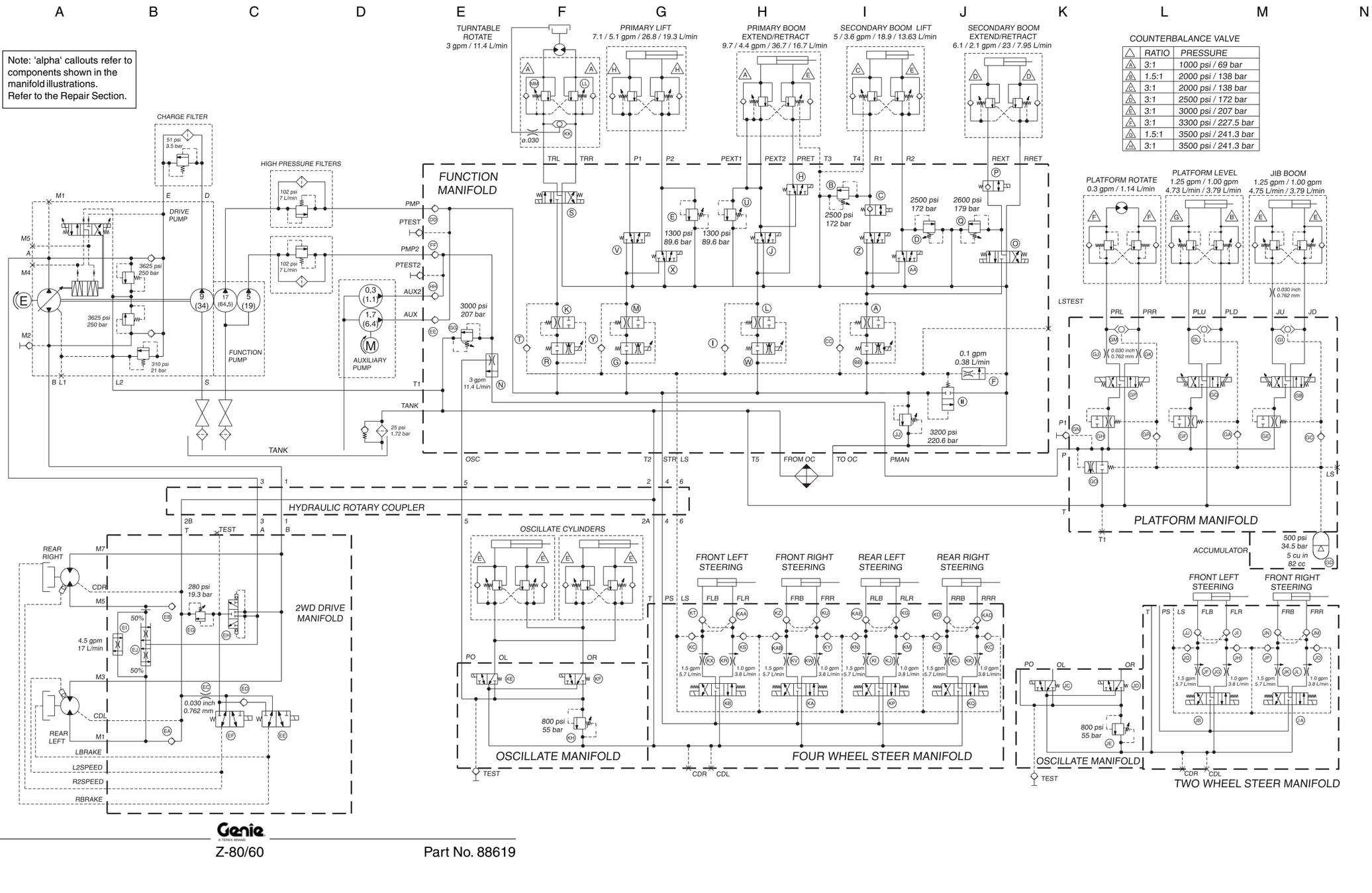
2 Wheel Drive (2 and 4 Wheel Steer)
(from serial number 990 to 2674)

Hydraulic Schematic

REV D

2 Wheel Drive (2 and 4 Wheel Steer) (from serial number 990 to 2674)

Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

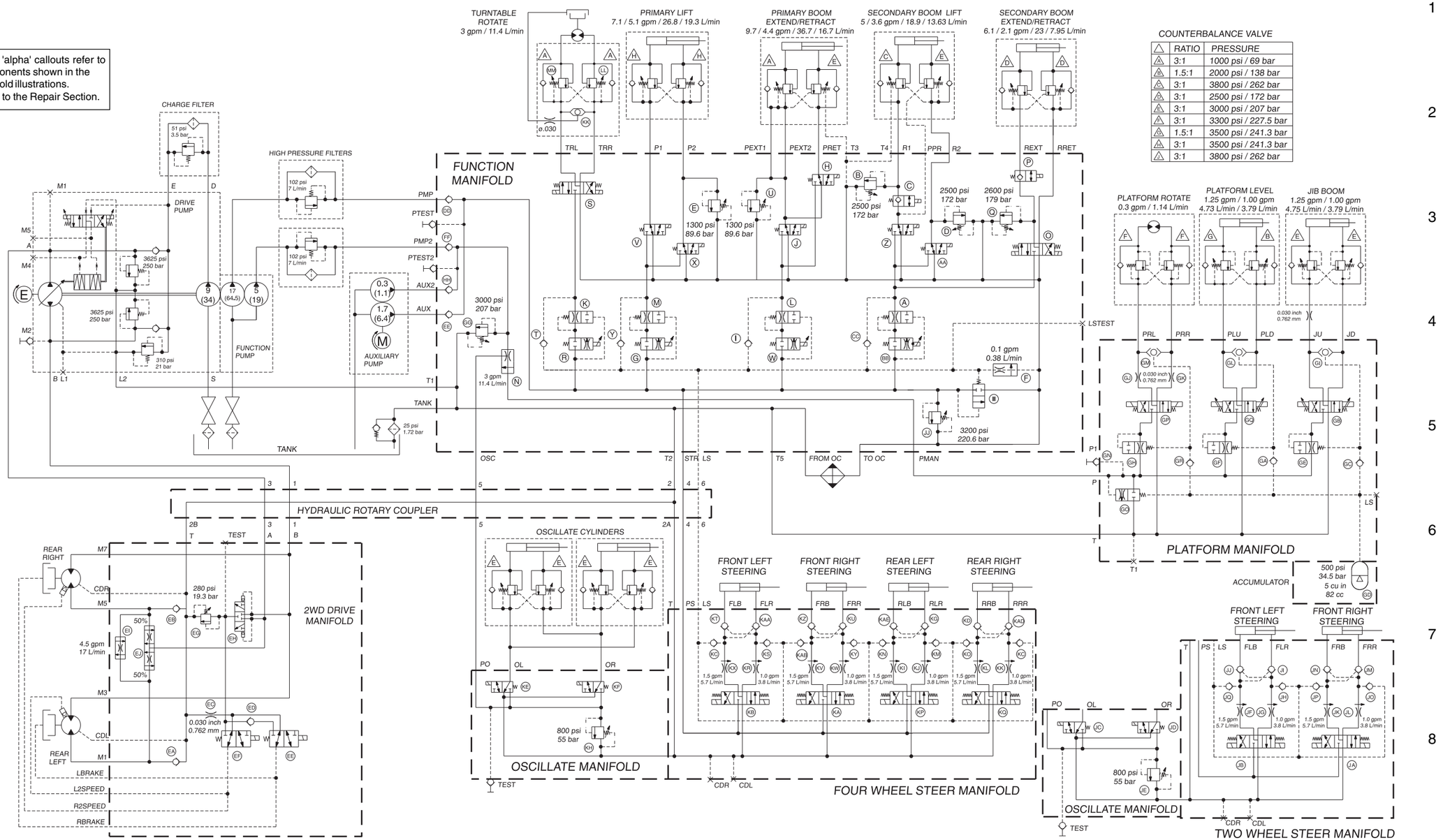


REV A

Hydraulic Schematic

2 Wheel Drive (2 and 4 Wheel Steer)
(serial number 1543 and from serial number 2675)

Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

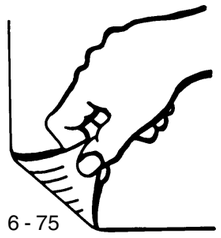


COUNTERBALANCE VALVE

	RATIO	PRESSURE
1	3:1	1000 psi / 69 bar
2	1.5:1	2000 psi / 138 bar
3	3:1	3800 psi / 262 bar
4	3:1	2500 psi / 172 bar
5	3:1	3000 psi / 207 bar
6	3:1	3300 psi / 227.5 bar
7	1.5:1	3500 psi / 241.3 bar
8	3:1	3500 psi / 241.3 bar
9	3:1	3800 psi / 262 bar

Hydraulic Schematic

2 Wheel Drive (2 and 4 Wheel Steer)
(serial number 1543 and from serial number 2675)



Hydraulic Schematic

4 Wheel Drive (2 and 4 Wheel Steer)
(before serial number 990)

Hydraulic Schematic

REV D

4 Wheel Drive (2 and 4 Wheel Steer)
(before serial number 990)

Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

	RATIO	PRESSURE
△1	3:1	1000 psi / 69 bar
△2	1.5:1	2000 psi / 138 bar
△3	3:1	2000 psi / 138 bar
△4	3:1	2500 psi / 172 bar
△5	3:1	3000 psi / 207 bar
△6	3:1	3300 psi / 227.5 bar
△7	1.5:1	3500 psi / 241.3 bar
△8	3:1	3500 psi / 241.3 bar

Hydraulic Schematic

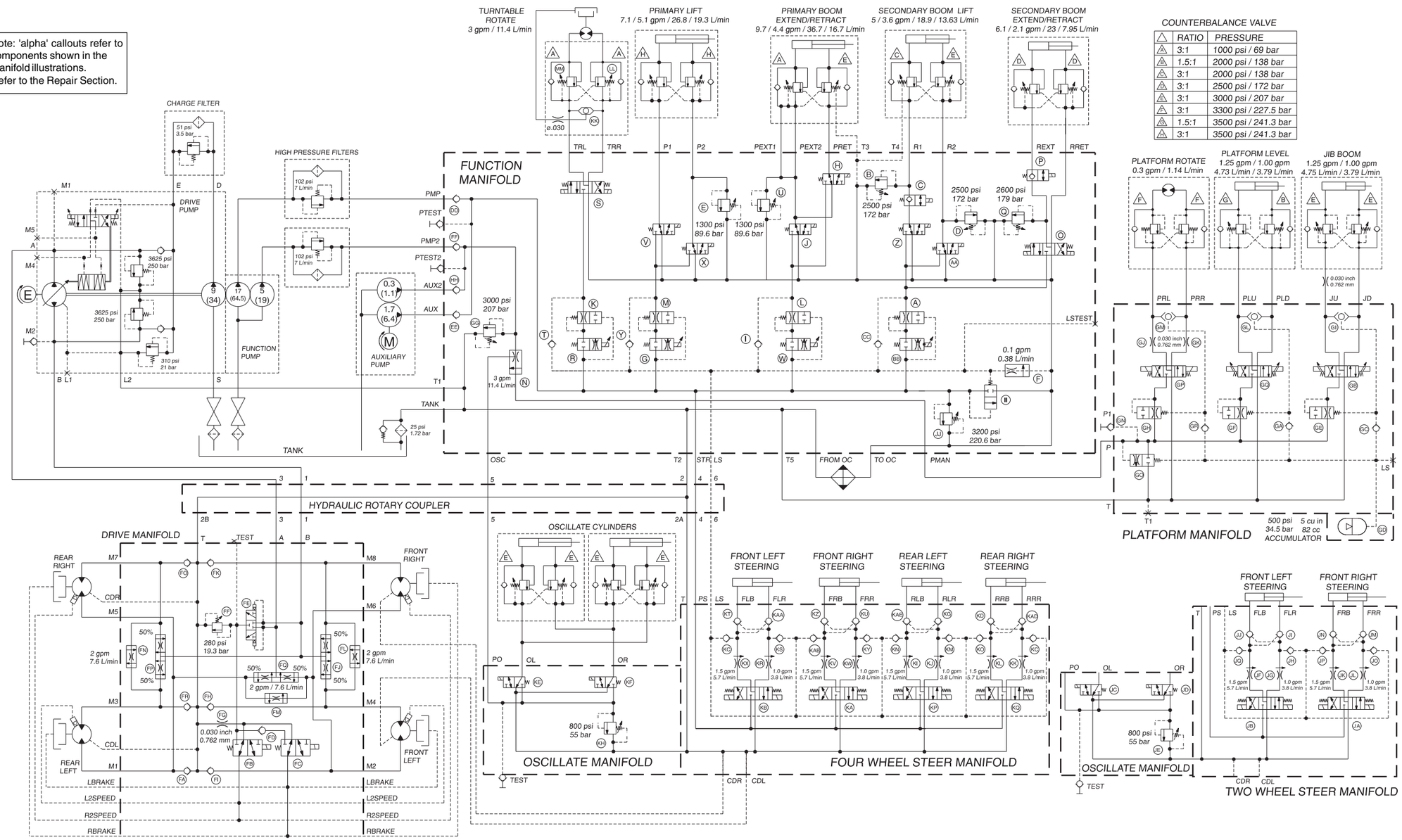
4 Wheel Drive (2 and 4 Wheel Steer)
(from serial number 990 to 2674)

Hydraulic Schematic

REV D

4 Wheel Drive (2 and 4 Wheel Steer)
(from serial number 990 to 2674)

Note: 'alpha' callouts refer to components shown in the manifold illustrations.
Refer to the Repair Section.



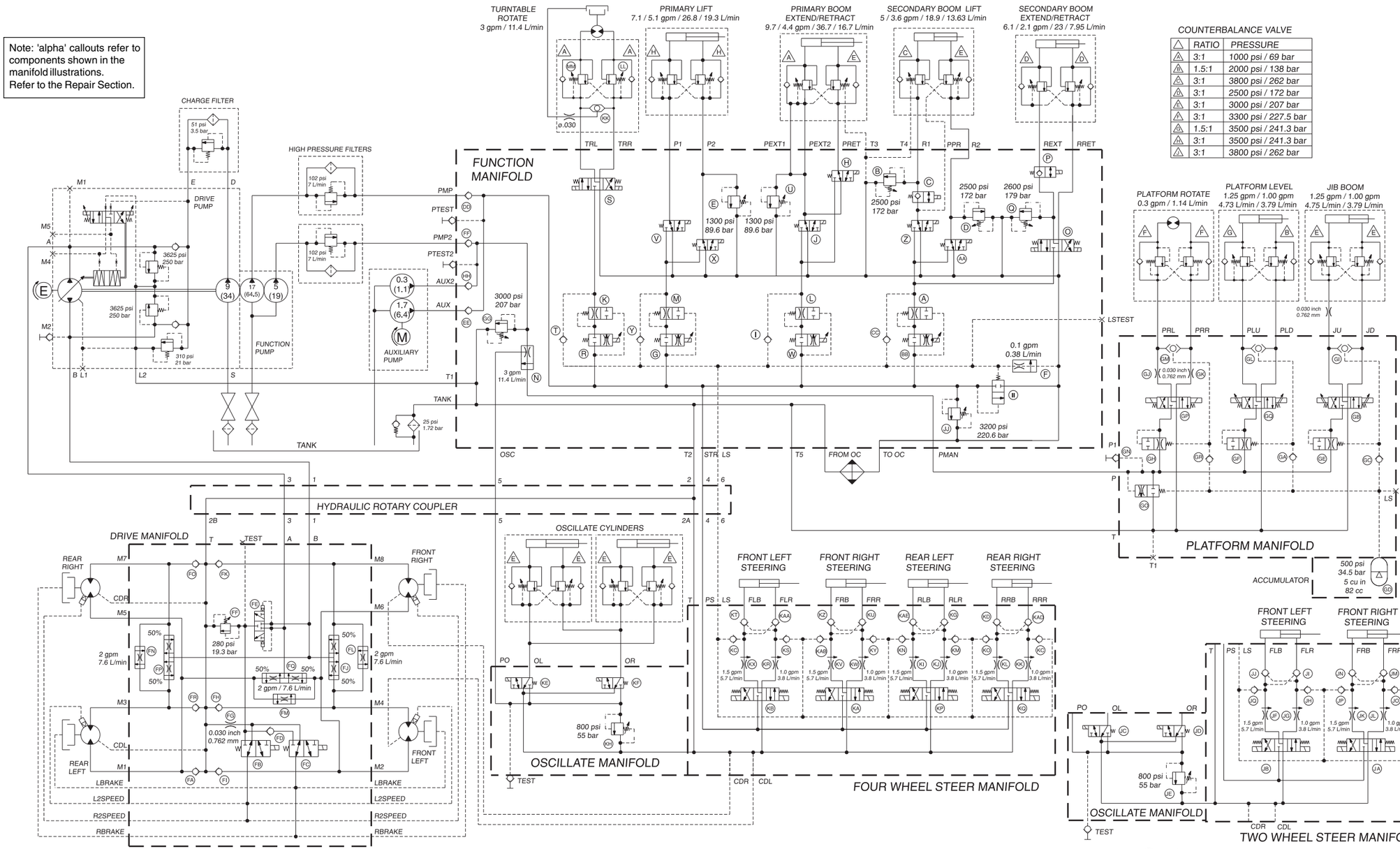
REV A

Hydraulic Schematic

4 Wheel Drive (2 and 4 Wheel Steer)
(serial number 1543 and from serial number 2675)

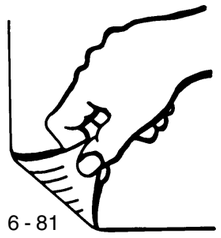
Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

COUNTERBALANCE VALVE		
△	RATIO	PRESSURE
△	3:1	1000 psi / 69 bar
△	1.5:1	2000 psi / 138 bar
△	3:1	3800 psi / 262 bar
△	3:1	2500 psi / 172 bar
△	3:1	3000 psi / 207 bar
△	3:1	3300 psi / 227.5 bar
△	1.5:1	3500 psi / 241.3 bar
△	3:1	3500 psi / 241.3 bar
△	3:1	3800 psi / 262 bar



Hydraulic Schematic

4 Wheel Drive (serial number 1543 and from serial number 2675)



REV A

Hydraulic Schematic

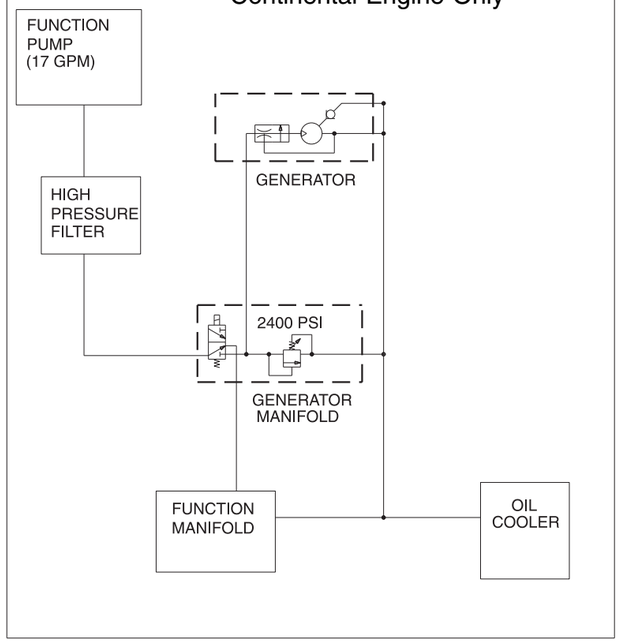
Hydraulic Generator Options

N M L K J I H G F E D C B A

1 2 3 4 5 6 7 8

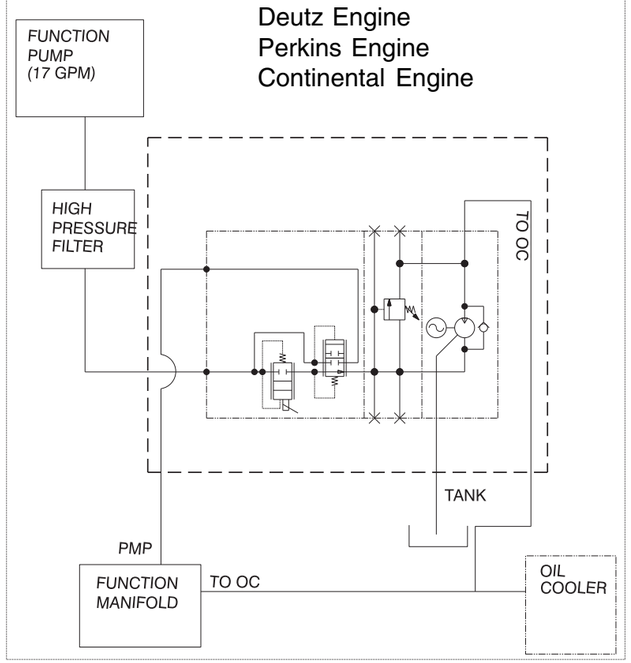
HYDRAULIC GENERATOR OPTION

Continental Engine Only

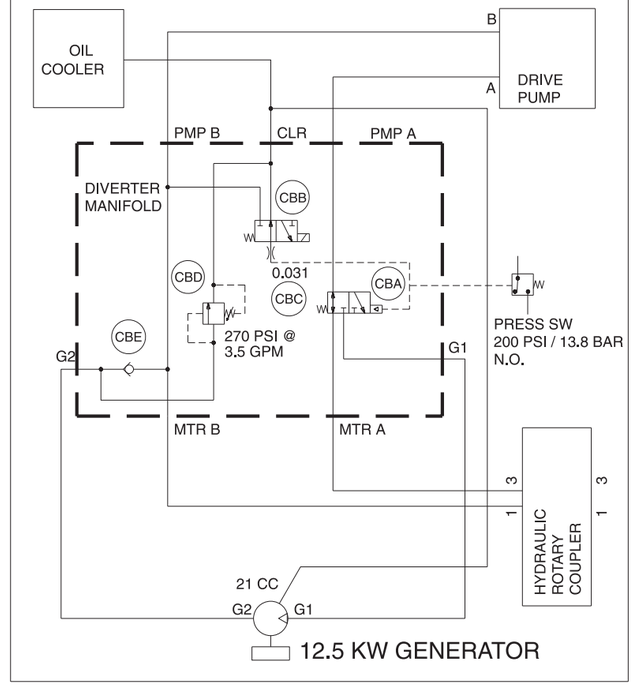


MTE HYDRAULIC GENERATOR OPTION

Deutz Engine
Perkins Engine
Continental Engine

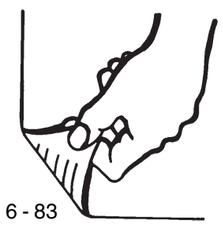


HYDRAULIC WELDER OPTION

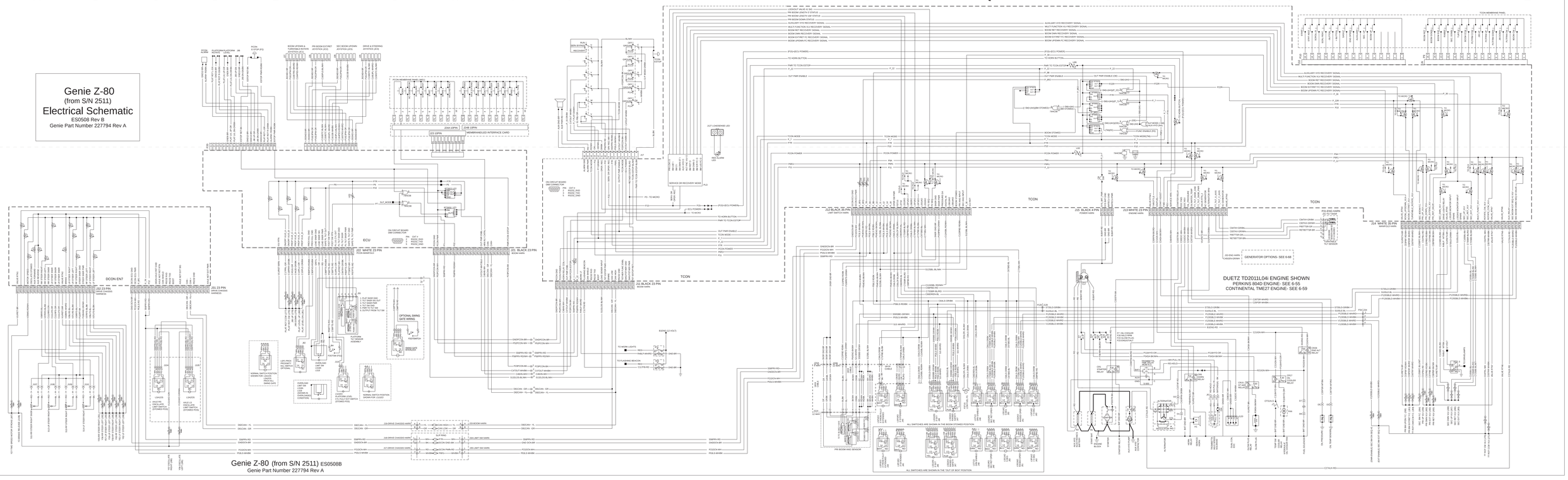


Hydraulic Schematic

Hydraulic Generator Options



Genie Z-80
(from S/N 2511)
Electrical Schematic
ES0508 Rev B
Genie Part Number 227794 Rev A



California Proposition 65

Warning

The exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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