Genie®
A TEREX BRAND

Service Manual

Serial Number Range

S™-80
S™-85

from S8003-3738
to S8007-5380

Part No. 111165
Rev C
February 2012

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the *Genie S-80* and *S-85 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 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.

Contact Us:

http://www.genielift.com
e-mail: awp.techpub@terex.com

Serial Number Information

Genie offers the following Service Manuals for these models:

Title	Part No.
Genie S-80 and S-85 Service Manual (from serial number 101 to 785)	34032
Genie S-80 and S-85 Service Manual (from serial number 786 to 965)	52270
Genie S-80 and S-85 Service Manual (from serial number 966 to 3081)	72062
Genie S-80 and S-85 Service Manual (from serial number 3082 to 3737)	77832
Genie S-80 and S-85 Service Manual (from serial number 5381 to 7999)	122149
Genie S-80, S-85 and S-80X Service Manual (from serial number 8000)	

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Revision History

Revision	Date	Section	Procedure / Schematic Page / Description
C	2/2012	Introduction	Revision History Added
		3 - Maint.	3-1

REFERENCE EXAMPLES:

Kubota Engine_Section 2_Specifications.
A-6,B-3,C-7_Section 3_Maintenance Procedure.
3-2, 6-4, 9-1_Section 4_Repair Procedure.
Fault Codes_Section 5.
6-35, 6-56, 6-104_Section 6_Schematic Page #.

Electronic Version

Click on any procedure or page number highlighted in blue to view the update.

REVISION HISTORY, CONTINUED

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A-6,B-3,C-7_Section 3_Maintenance Procedure.
3-2, 6-4, 9-1_Section 4_Repair Procedure.
Fault Codes_Section 5.
6-35, 6-56, 6-104_Section 6_Schematic Page #.

Electronic Version

Click on any procedure or page number highlighted in blue to view the update.

Serial Number Legend

Genie
A TEREX BRAND

Model: S-80
Serial number: S8006-12345
Model year: 2006 **Manufacture date:** 01/05/06
Electrical schematic number: E0180
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 : 60 ft 6 in/ 18.3 m
Maximum platform reach : 34 ft 3 in/ 10.4 m
Gradeability: N/A
Country of manufacture: USA
This machine complies with:
ANSI A92.5
CAN B.354.4

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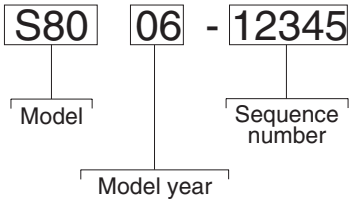
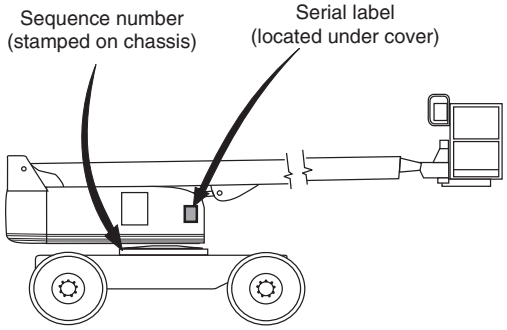
PN - 77055





Safety Rules

Danger

Failure to obey the instructions and safety rules in this manual, and the *Genie S-80 and Genie S-85 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.

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 Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE Indicates 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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Specifications

Machine Specifications

Tires and wheels	
Tire size	15-22.5 SAT 385/65-22.5
Tire ply rating	16
Overall tire diameter	43.5 in 110.5 cm
Tire pressure	100 psi 6.9 bar
Wheel diameter	22.5 in 57 cm
Wheel width	11.75 in 29.8 cm
Wheel lugs	10 @ 3/4 -16
Lug nut torque, dry	420 ft-lbs 569 Nm
Lug nut torque, lubricated	310 ft-lbs 420 Nm
Fluid capacities	
Fuel tank	30 gallons 114 liters
LPG tank	33.5 pounds 15.2 kg
Hydraulic tank	45 gallons 170 liters
Hydraulic system (including tank)	57 gallons 215 liters
Turntable rotation drive hub	40 fl oz 1.2 liters
Rexroth drive hubs	61 fl oz 1.8 liters
Bonfiglioli drive hubs	51 fl oz 1.5 liters
Drive hub oil type: SAE 90 multipurpose hypoid gear oil API service classification GL5	

For operational specifications, refer to the

Performance Specifications

Drive speed, maximum	
Stowed position	40 ft / 7.9-8.5 sec 12.2 m / 7.9-8.5 sec
Raised or extended position	40 ft / 40-45 sec 12.2 m / 40-45 sec
Braking distance, maximum	
High range on paved surface	3 ft 90 cm
Gradeability	Refer to the Operator's Manual
Boom function speeds, maximum from platform controls	
Jib boom up (S-85)	60 to 70 seconds
Jib boom down (S-85)	40 to 50 seconds
Boom up	89 to 93 seconds
Boom down	90 to 94 seconds
Boom extend	73 to 79 seconds
Boom retract	79 to 84 seconds
Turntable rotate, 360° boom fully stowed	95 to 103 seconds
Turntable rotate, 360° boom raised or extended	210 to 250 seconds
Platform rotate, 160°	8 to 12 seconds
Platform level up	50 to 60 seconds
Platform level down	40 to 50 seconds

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SPECIFICATIONS

Hydraulic Oil Specifications

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

Chevron Rykon 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 Pa 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 Service Department before use.

Hydraulic Component Specifications

Drive pump	
Type: bi-directional variable displacement piston pump	
Flow rate @ 2300 rpm	0 to 30.3 gpm 0 to 114.7 L/min
Drive pressure, maximum	4200 psi 290 bar

Charge pump	
Type:	gerotor
Displacement	0.85 cu in 13.9 cc
Flow rate @ 2300 rpm	8 gpm 30.3 L/min
Charge pressure @ 2300 rpm Neutral position	320 psi 22 bar

Function pump	
Type:	two-section tandem gear pump
Displacement - Pump 1 (inner)	1.4 cu in 22.9 cc
Flow rate @ 2300 rpm	12.7 gpm 48 L/min
Displacement - Pump 2 (outer)	0.24 cu in 4 cc
Flow rate @ 2300 rpm	2.25 gpm 8.5 L/min

Auxiliary pump	
Type:	fixed displacement gear pump
Displacement - static	0.151 cu in 2.47 cc

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SPECIFICATIONS

Function manifold	
System relief pressure (measured at PTEST port)	2900 psi 200 bar
Boom down relief pressure (measured at PTEST port)	2100 psi 145 bar
Boom extend (measured at PTEST port)	2500 psi 172 bar
Steer/axle extend flow regulator	3.5 gpm 13.2 L/min
Oscillate relief pressure	850 psi 58.6 bar
Drive manifold	
Hot oil relief pressure	280 psi 19.3 bar
Brake release pressure	
Rexroth hubs	217.5 psi 15 bar
Bonfiglioli hubs	189 psi 13 bar
Drive motors	
Displacement per revolution, variable (2 speed motor)	0.9 to 2.7 cu in 14.7 to 45 cc
Hydraulic filters	
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

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 (schematic items K and W)	4.8 Ω
2 position 3 way solenoid valve (schematic items D, R, X, TT and UU)	6.3 Ω
2 position 3 way solenoid valve (schematic items G)	3.3 Ω
3 position 4 way solenoid valve (schematic items A, E, N and S)	6.3 Ω
2 position 3 way solenoid valve (schematic items AK, AM, VV and WW)	6.3 Ω
2 position 3 way solenoid valve (schematic item G)	3.3 Ω

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SPECIFICATIONS

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
Continuous	60 @ 2300 rpm
Intermittent	50 kW @ 2300 rpm
Continuous	45 kW @ 2300 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1650 rpm
Frequency	386.1 Hz
High idle	2300 rpm
Frequency	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 may require the use of alternative engine oil. 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.	

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	1
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
Ignition system	
Spark plug type	AC ACMR-43-LTS
Spark plug gap	0.040 in 1.01 mm
Engine coolant	
Capacity	12 quarts 11.4 liters
Alternator	
Output	66A, 12V DC
Fan belt deflection	1/2 inch 12 mm

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SPECIFICATIONS

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 Intermittent Continuous Intermittent	60 @ 2500 rpm 70 @ 2500 rpm 44.7kW @ 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

Unit ships with 5W-30.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

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

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
Batteries	
Type	12V DC
Group	31
Quantity	1
Cold cranking ampere	1000A
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

SPECIFICATIONS

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

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

SPECIFICATIONS

Deutz F4L-913 Engine

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 may require the use of alternative engine oil. 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	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes

Alternator	55A, 12V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

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

SPECIFICATIONS

Deutz BF4L-2011 Engine

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	69.1 @ 2500 rpm
Net intermittent	72.8 @ 2500 rpm
Continuous	51.5 KW @ 2500 rpm
Net intermittent	54.3 KW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1500 rpm
Frequency	382.5 Hz
High idle	2350 rpm
Frequency	599.25 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

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

SPECIFICATIONS

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
Batteries	
Type	12V DC
Group	31
Quantity	1
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

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

SPECIFICATIONS

Perkins 804C-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	1650 rpm
Frequency	335.5 Hz
High idle	2300 rpm
Frequency	467.67 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
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	1
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, lubricated	480 ft-lbs 651 Nm
3/8 -16 bolts, GR 8 *(use blue thread locking compound)	35 ft-lbs* 47 Nm*
Turntable rotate assembly	
Rotate bearing mounting bolts, lubricated	180 ft-lbs 244 Nm
Rotate drive hub mounting bolts, lubricated	80 ft-lbs 108 Nm
Backlash plate mounting bolts, lubricated	280 ft-lbs 379 Nm
Drive motor and hubs	
Drive hub mounting bolts, dry	210 ft-lbs 284 Nm
Drive hub mounting bolts, lubricated *(use blue thread locking compound)	185 ft-lbs* 247 Nm
Drive motor mounting bolts, dry	110 ft-lbs 149 Nm
Drive motor mounting bolts, lubricated *(use blue thread locking compound)	80 ft-lbs* 108 Nm
Drive hub oil plug, O-ring seal	13 ft-lbs 18 Nm

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

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

SPECIFICATIONS

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

SPECIFICATIONS

SAE FASTENER TORQUE CHART

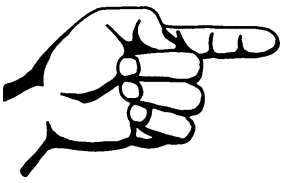
• This chart is to be used as a guide only unless noted elsewhere in this manual •

SIZE	THREAD	Grade 5				Grade 8				A574 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	Class 4.6 (4.6)				Class 8.8 (8.8)				Class 10.9 (10.9)				Class 12.9 (12.9)			
(mm)	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.* The frequency and extent of periodic examinations and tests may also depend on national regulations.

⚠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.
- ☑ Use only Genie approved replacement parts.
- ☑ 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 non-steer (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 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.

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.

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 year. To account for repeated procedures, 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 month or every 500 hours	A + B + C
Annual or every 1000 hours	A + B + C + D
Two year 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 your employer, jobsite and governmental regulations and requirements.

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

Make copies of this form to use for each Pre-Delivery Preparation.

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

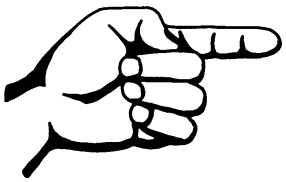
Inspector title

Inspector company

Genie®
A TEREX BRAND

Terex South Dakota, Inc USA
500 Oak Wood Road
PO Box 1150
Watertown, SD 57201-6150
(605) 882-4000

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



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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 hour 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	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 Filter condition indicator			
A-6 Grease Axles			
A-7 Oscillate axle			
A-8 Extendable axles			
Perform after 40 hours:			
A-9 30 day service			
Perform after 50 hours:			
A-10 Engine maintenance - Deutz models			
Perform every 100 hours:			
A-11 Inspect filter/separator - Diesel models			
A-12 Grease rotation bearing			
A-13 Engine maintenance			
Perform after 125 hours:			
A-14 Engine maintenance - Deutz models			
Perform after 150 hours:			
A-15 Replace Drive Hub oil			
Perform every 200 hours:			
A-16 Engine maintenance - GM, Ford and Perkins models			

Checklist B	Y	N	R
B-1 Battery(s)			
B-2 Electrical wiring			
B-3 Key switch			
B-4 Exhaust system			
B-5 Engine air filter			
B-6 Oil cooler and fins- Deutz models			
B-7 Brake configuration			
B-8 Tires, wheels and lug nut torque			
B-9 Drive hub maintenance			
B-10 Engine RPM			
B-11 Engine maintenance			
B-12 Oscillate directional Control			
B-13 Ground control override			
B-14 Platform self-leveling			
B-15 Engine idle select			
B-16 Fuel select operation			
B-17 Drive enable system			
B-18 Drive brakes			
B-19 Drive speed-stowed			
B-20 Drive speed-raised or extended			
B-21 Alarm package			
B-22 Fuel and hydraulic tank venting systems			
B-23 Hydraulic oil analysis			
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 hour 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		**Y**	**N**	**R**
C-1	Engine maintenance - Deutz and Perkins models			
C-2	Grease platform overload (if equipped)			
C-3	Test the platform overload (if equipped)			
C-4	Air filter element			
C-5	Replace filter/separator - Deutz and Perkins models			
Perform every 800 hours:				
C-6	Engine maintenance - GM and Ford models			

Checklist D		**Y**	**N**	**R**
D-1	Boom wear pads			
D-2	Axle wear pads			
D-3	Free-wheel configuration			
D-4	Turntable rotation bearing bolts			
D-5	Turntable bearing wear			
D-6	Engine maintenance - Deutz and Perkins models			
D-7	Replace hydraulic filters			
D-8	Drive hub oil			
Perform every 1500 hours:				
D-9	Engine maintenance - Deutz models			

Checklist E		**Y**	**N**	**R**
E-1	Hydraulic oil			
E-2	Engine maintenance - Perkins models			
E-3	Grease axle bearings, 2WD models			
Perform every 3000 hours:				
E-4	Engine maintenance - Deutz and Perkins models			

Comments

Checklist A Procedures

A-1
Inspect the Manuals and Decals

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

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 if replacement manuals or decals are needed.

CHECKLIST A PROCEDURES

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.

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 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *GM 3.0L Operator Handbook* (GM part number 36100007) OR the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Deutz 913 Operator Handbook	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
GM 3.0L Operator Handbook	
Genie part number	101095
Ford LRG-425 EFI Operator Handbook	
Genie part number	84792
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

To access the engine:

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

⚠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

A-5
Check the Hydraulic Filter Condition Indicators

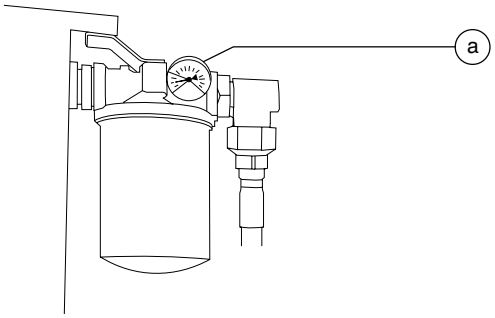
Genie specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

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 three hydraulic filters located on the machine: one tank return filter, one medium pressure filter and one high pressure filter. The tank return and high pressure filter have a condition indicator on them. The medium pressure filter does not have a filter condition indicator.

1 Start the engine from the platform controls.

2 Change the engine idle to high rpm (rabbit symbol).



a filter condition indicator gauge

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.

⊠ Result: If the needle is in the red area, this indicates that the hydraulic filter is being bypassed and the filter should be replaced. See D-7, *Replace the Hydraulic Filter Elements.*

High pressure filter:

Note: The high pressure filter is located to the left of the medium pressure filter below the hydraulic pumps. A filter condition indicator is located on the top of the high pressure filter.

4 Open the engine side turntable cover and Inspect the filter condition indicator.

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

⊠ Result: If the indicator displays the plunger in the red area, this indicates that the hydraulic filter is being bypassed and the filter should be replaced. See D-7, *Replace the Hydraulic Filter Elements.*

A-6
Grease the Extendable Axles

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

Proper lubrication of the extendable axle wear pads is essential to smooth operation and minimum wear of the wear pads.

⚠DANGER Tip-over hazard. Failure to perform this procedure on a firm, level surface will compromise the stability of the machine and could result in the machine tipping over.

Before serial number 4952:

1 Spread a liberal coating of grease on the top of the inner axle extension and bottom of the outer axle.

2 Repeat for each axle.

After serial number 4951:

1 Locate the grease fitting on the platform side of the non-steer extendable axle and behind the drive motor on the steer extendable axle.

2 Pump grease into each fitting until grease is visible between the axle and wear pads.

3 Repeat for each axle.

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

A-7
Test the Oscillate Axle

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

Proper axle oscillation is essential to safe machine operation. If the axle oscillation system is not operating correctly, the stability of the machine is compromised and it may tip over.

⚠DANGER Tip-over hazard. Failure to perform this procedure on a firm, level surface will compromise the stability of the machine and could result in the machine tipping over.

1 Start the engine from the platform controls.

2 Drive the right steer tire up onto a 6 inch / 15 cm block or curb.

⊙ Result: The three remaining tires should stay in firm contact with the ground and the chassis should remain level at all times.

3 Drive the left steer tire up onto a 6 inch / 15 cm block or curb.

⊙ Result: The three remaining tires should stay in firm contact with the ground and the chassis should remain level at all times.

4 Drive both steer tires up onto a 6 inch / 15 cm block or curb.

⊙ Result: The non-steer tires should stay in firm contact with the ground.

Note: If the chassis does not remain level during the test, refer to Repair Procedure 14-2, *How to Set Up the Directional Valve Linkage.*

CHECKLIST A PROCEDURES

A-8
Test the Extendable Axles

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

⚠ DANGER Tip-over hazard. Do not raise or extend the boom unless both axles are fully extended. If the axle extension system is not operating correctly, the stability of the machine is compromised and it may tip over.

Note: Be sure the axles are retracted before performing this procedure.

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

2 Start the engine from the ground controls.

3 Move and hold the function enable switch to either side and activate the boom up function.

⊙ Result: The boom should raise to 5° above horizontal and then stop. The boom should not raise above the limit switch unless both axles are extended.

4 Move and hold the function enable switch to either side and activate the boom down function.

⊙ Result: The boom should lower and return to the stowed position.

5 Move and hold the function enable switch to either side and activate the boom extend function.

⊙ Result: The boom will extend approximately 1 foot / 30 cm and then stop. The boom should not extend farther unless both axles are extended.

6 Move and hold the function enable switch to either side and activate the boom retract function.

⊙ Result: The boom should retract.

7 Turn the key switch to platform controls.

8 Press down the foot switch and move the drive control handle in the forward direction and activate the axle extend function.

⊙ Result: The machine will drive forward and the axles should extend.

Note: The axle extend function will only work while the machine is moving.

Note: The steer function will override the axle extend or the axle retract function.

9 Turn the key switch to ground controls.

10 At the ground controls, hold the function enable switch to either side and activate the boom up and boom down function.

⊙ Result: The boom should raise and lower normally.

11 At the ground controls, move and hold the function enable switch to either side and activate the boom extend and boom retract function.

⊙ Result: The boom should extend and retract normally.

A-9
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, whichever comes first. After this interval, refer to the maintenance tables for continued scheduled maintenance.

1 Perform the following maintenance procedures:

- A-12 Grease the Turntable Rotation Bearing and Rotate Gear
- B-8 Inspect the Tires, Wheels and Lug Nut Torque
- B-9 Check the Drive Hub Oil Level and Fastener Torque
- D-4 Check the Turnable Rotation Bearing Bolts
- D-7 Replace the Hydraulic Filter Elements

A-10
Perform Engine Maintenance - Deutz Models

Engine specifications require that this one-time procedure be performed after 50 hours of operation.

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 for commissioning new and overhauled engines and additional engine information are available in the *Deutz 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operator Handbook	
Genie part number	62446
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 away from the machine and secure it from moving.

⚠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

A-11
Inspect the Fuel Filter/Water Separator - Deutz and Perkins Models

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.

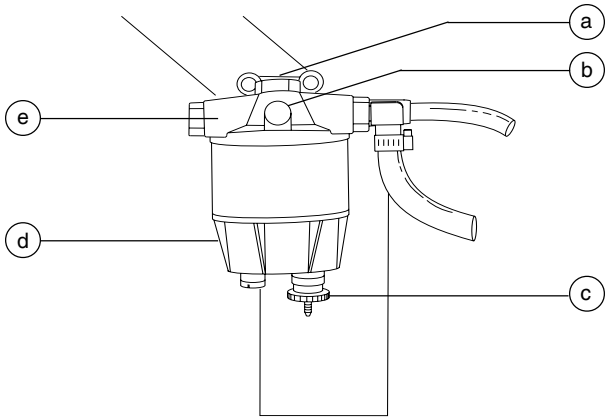
1 Open the turntable cover at the engine side of the machine. Locate the fuel filter/water separator.

2 Inspect the filter bowl for water.

⊙ Result: Water is not visible in the filter bowl.

⊠ Result: There is water present. Proceed to step 3.

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



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

4 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.

5 Clean up any fuel that may have spilled.

Note: If the fuel filter/water separator is completely drained, you must prime the fuel filter/water separator before starting the engine.
See C-5, *Replace The Fuel Filter/Water Separator Element,* for instructions on how to prime the fuel filter/water separator.

6 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.

A-12
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 on the platform end of the tank side bulkhead.

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-13
Perform Engine Maintenance

Engine specifications require that this procedure be performed every 100 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 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *GM 3.0L Operator Handbook* (GM part number 36100007) OR the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

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Deutz BF4L2011 Operation Manual	
Genie part number	84794
GM 3.0L Operator Handbook	
Genie part number	101095
Ford LRG-425 EFI Operator Handbook	
Genie part number	84792
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

CHECKLIST A PROCEDURES

To access the engine:

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

⚠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.

A-14
Perform Engine Maintenance - Deutz Models


Engine specifications require that this procedure be performed every 125 hours of operation.

Required maintenance procedures for commissioning new and overhauled engines and additional engine information are available in the *Deutz 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operator Handbook	
Genie part number	62446
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 away from the machine and secure it from moving.

⚠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.

A-15
Replace the Drive Hub Oil

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

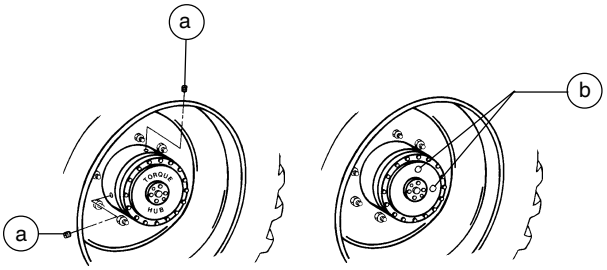
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil after the initial 150 hours of use may cause the machine to perform poorly and continued use may cause component damage.

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.



a. models with pipe plugs b. 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 plug hole. 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. Torque to Specification. Refer to Section 2, *Specifications*.

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

7 Check the torque of the drive hub mounting bolts. Refer to Section 2, *Specifications*.

Turntable rotate drive hub:

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

Note: The turntable rotation lock pin is located next to the boom rest pad.

2 Tag, disconnect and plug the hydraulic hoses from the turntable rotate drive motor. Cap the fittings on the drive motor.

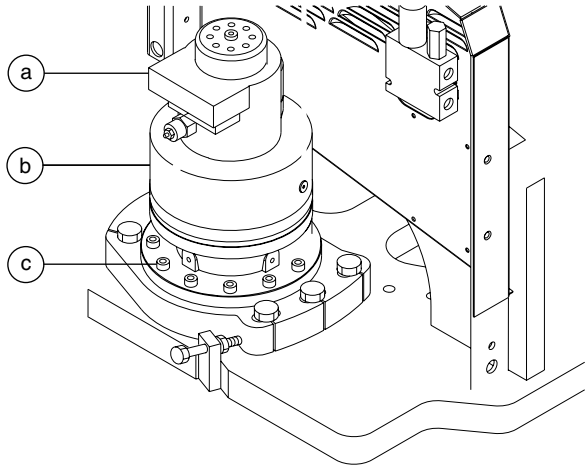
3 Attach a suitable lifting device to the lifting eyes located near the drive motor.

4 Remove the drive hub mounting bolts. Carefully remove the turntable rotate drive hub assembly from the machine.

⚠WARNING Crushing hazard. The turntable rotate drive hub assembly could become unbalanced and fall if not properly supported by the lifting device.

CHECKLIST A PROCEDURES

5 Remove the plug from the side of the drive hub. Drain the oil from the hub into a suitable container.



a motor
b drive hub
c drive hub mounting bolts

6 Install the drive hub assembly onto the machine. Torque the drive hub mounting bolts to specification. Refer to Section 2, *Specifications.*

7 Fill the drive hub with oil from the side plug 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 10-1, *How to Adjust the Turntable Rotation Gear Backlash.*

A-16
Perform Engine Maintenance - GM, Ford and Perkins 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.

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007) OR the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

GM 3.0L Operator Handbook	
Genie part number	101095
Ford LRG-425 EFI Operator Handbook	
Genie part number	84792
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	

To access the engine:

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

⚠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

B-1
Inspect the Battery(s)

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. A single battery configuraton is standard. A dual battery option is available, where one battery is used to start the engine and the other is used to power the control system and auxiliary power unit. The two batteries are charged by the alternator through a battery separator.

⚠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 (if equipped).

5 Fully charge the battery(s) and allow the battery(s) 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 battery(s) and allow the battery(s) 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

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 11.

⊠ 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

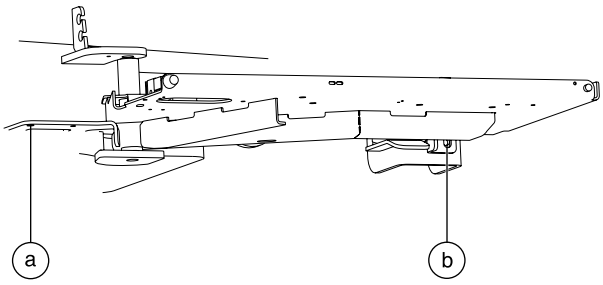
Genie specifications require that this procedure be performed every 250 hours or quarterly, whichever comes first.

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

1 Open the turntable cover at the engine side of the machine.

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 on the turntable.

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 pivot plate 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 turntable cover at the ground controls side of the machine.

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

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

8 Inspect for a liberal coating of dielectric grease in the following locations:

- All wire harness connectors to ground control box

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

- All wire harness connectors to platform control box

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

15 Swing the engine tray in towards the machine.

16 Install the engine tray retaining fasteners.

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

CHECKLIST B PROCEDURES

B-3
Test the Key Switch

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

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


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

Maintaining the exhaust system is essential to good engine performance and service life. Running 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 Burn hazard. Beware of hot engine components. Contact with hot engine components may result in severe burns.

To access the engine:

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

⚠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.

2 Be sure that all nuts and bolts are tight.

3 Inspect all welds for cracks.

4 Inspect for exhaust leaks; i.e., carbon buildup around seams and joints.

5 Swing the engine pivot plate in towards the machine.

6 Install the bolts that were just removed into the original holes to secure the engine pivot plate.

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

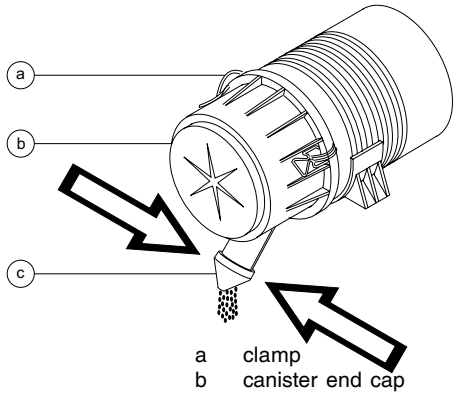
B-5
Inspect the Engine Air Filter

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

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 clamp
b canister end cap
c dust discharge valve

CHECKLIST B PROCEDURES

2 Release the latches on the air cleaner cap. Remove the end cap from the air cleaner canister.

3 Remove the filter element.

4 Clean the inside of the canister and the end cap 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. Replace the filter if needed.

6 Install the filter element.

7 Install the air filter canister end cap and secure the end cap latches.

Note: Be sure the discharge slot is pointing down.

B-6
Check the Oil Cooler and Cooling Fins - Deutz Models


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

Maintaining the oil cooler in good condition is essential for good engine performance. Operating a machine with a damaged oil cooler may result in engine damage. Also, restricting air flow through the oil cooler will affect the performance of the cooling system.

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

⚠CAUTION Burn hazard. Beware of hot engine components. Contact with hot engine components may result in severe burns.

Oil cooler:

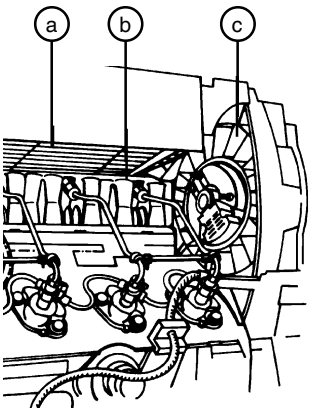
1 Remove the engine tray retaining fastener located under the engine tray. Swing the engine tray out and away from the machine.

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.

3 Remove the fasteners from the engine side cover, then remove the cover.

4 Inspect the oil cooler for leaks and physical damage.



a oil cooler
b cylinder head cooling fins
c fan blower fins

5 Clean the oil cooler of debris and foreign material.

Cooling and fan blower fins:

6 Inspect the fan blower fins for physical damage.

7 Clean the fan blower fins of debris and foreign material.

8 Inspect the head cooling passages and fins for physical damage or foreign material, using a flashlight.

9 Clean the cylinder head cooling passages of debris and foreign material.

10 Install the engine side cover.

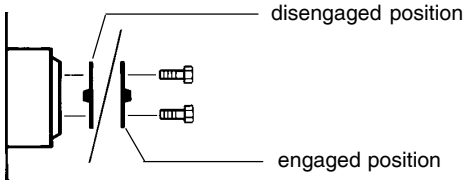
11 Swing the engine back to its original position and install the engine pivot plate retaining fastener.

B-7
Confirm the Proper Brake Configuration

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

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.

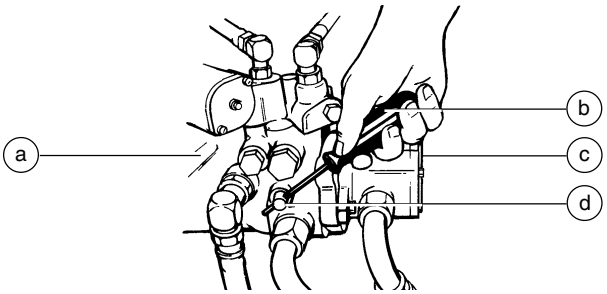
1 Check each drive hub disconnect cap to be sure it is in the engaged position.



CHECKLIST B PROCEDURES

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

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



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

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

B-8
Inspect the Tires, Wheels and Lug Nut Torque

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

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.

⚠WARNING Bodily injury hazard. An over-inflated tire can explode and could result in death or serious injury.

⚠WARNING Tip-over hazard. Do not use temporary flat tire repair products.

Note: The tires on some machines are foam filled and do not need air added to them.

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*.

4 Check the pressure in each air-filled tire. Add air as necessary. Refer to Section 2, *Specifications*.

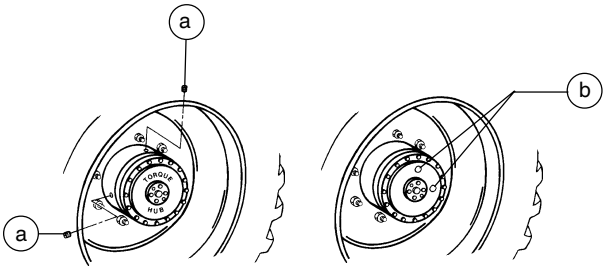
B-9
Check Drive Hub Oil Level and Fastener Torque

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

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*.

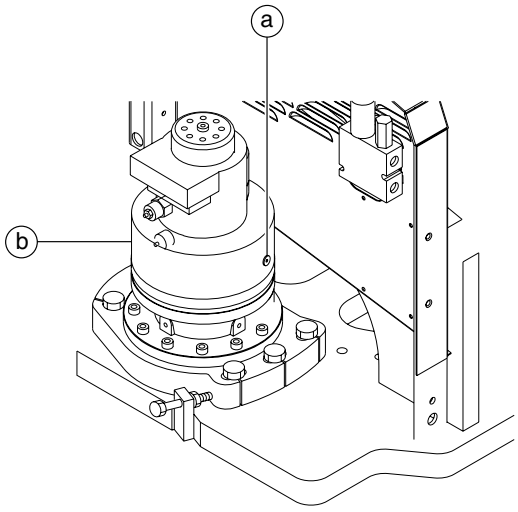
5 Check the torque of the drive hub mounting fasteners. Refer to Section 2, *Specifications*.

6 Repeat steps 1 through 5 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.



a plug
b drive hub

2 If necessary, add oil until the oil level is even with the bottom of the plug hole. Refer to Section 2, *Specifications*.

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

CHECKLIST B PROCEDURES

B-10
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.

GM 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 the Genie Service Department or your local GM dealer.

Ford models:

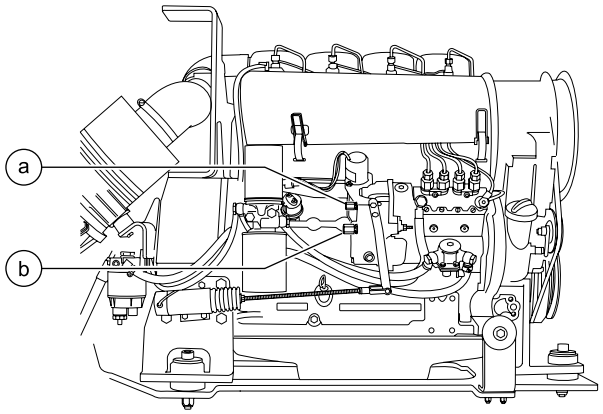
Note: The engine rpm is controlled by the ECM and can only be adjusted by re-programming the ECM. If rpm adjustment or service is required, please contact Genie Service Department or your local Ford dealer.

Deutz F4L 913 models:

1 Connect a tachometer to the engine. Start the engine from the ground controls and check the rpm. Refer to Section 2, *Specifications.*

Skip to step 10 if the low idle rpm is correct.

2 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

3 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.

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

5 Adjust the primary idle adjustment screw until low idle is 1250 rpm. Tighten the locknut.

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

7 Loosen the secondary idle adjustment screw locknut.

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

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

10 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 11.

11 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 BF4L 2011 models:

1 Connect a tachometer to the engine. Start the engine from the ground controls and check the rpm. Refer to Section 2, *Specifications.*

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

2 Loosen the locknut on the low idle adjustment screw.

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

4 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 5.

5 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.

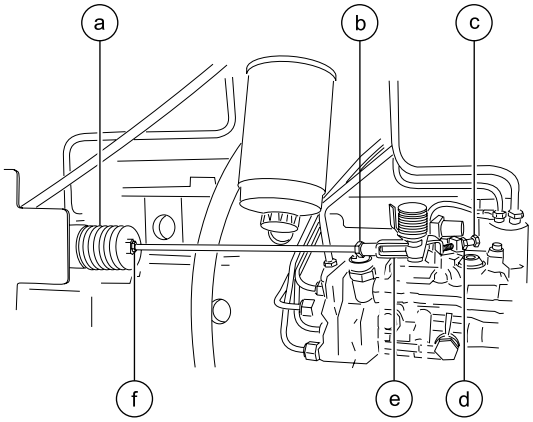
Note: Be sure the solenoid fully retracts when activating high idle.

Perkins models:

1 Connect a tachometer to the engine. Start the engine from the ground controls and check the rpm. Refer to Section 2, *Specifications*.

Skip to step 3 if the low idle rpm is correct.

2 Loosen the low idle lock nut. 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.



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

3 Move the function enable/rpm select toggle switch to the high idle (rabbit symbol) position. Refer to Section 2, *Specifications.*

If high idle rpm is correct, disregard adjustment step 4.

4 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

B-11
Perform Engine Maintenance


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

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 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *GM 3.0L Operator Handbook* (GM part number 36100007) OR the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Deutz 913 Operator Handbook	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
GM 3.0L Operator Handbook	
Genie part number	101095
Ford LRG-425 EFI Operator Handbook	
Genie part number	84792
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

To access the engine:

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

⚠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.

B-12
Check the Oscillate Directional Valve Linkage

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

Note: Perform this test only on models equipped with an oscillating axle.

Proper axle oscillation is essential to safe machine operation. If the oscillate directional valve linkage is not operating correctly, the stability of the machine is compromised and it may tip over.

1 Remove the drive chassis cover from the non-steer end of the machine.

2 Locate the oscillate directional valve inside of the non-steer axle and inspect the linkage for the following:

- Lock nut is tight against yoke
- Yoke clevis pins are installed
- Cotter pins are installed through clevis pins
- Linkage is properly attached to directional valve

B-13
Test the Ground Control Override

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

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 red Emergency Stop button at 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 red Emergency Stop button at the platform controls 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.

Note: The boom will not raise past horizontal and the boom will not extend more than 12 inches / 30.5 cm unless both axles are fully extended.

CHECKLIST B PROCEDURES

B-14
Test the Platform Self-leveling

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

Automatic platform self-leveling throughout the full cycle of boom raising and lowering is essential for safe machine operation. The platform is maintained at level by the platform leveling slave cylinder which operates in a closed loop hydraulic circuit with the master cylinder located at the base of the boom.
A platform self-leveling failure creates an unsafe working condition for platform and ground personnel.

1 Start the engine from the ground controls.

2 Hold the function enable toggle switch to either side and adjust the platform to a level position using the platform level toggle switch.

3 Raise and lower the boom through a full cycle.

⊙ Result: The platform should remain level at all times to within ±5 degrees.

Note: The boom will not raise past horizontal and the boom will not extend more than 12 inches / 30.5 cm unless both axles are fully extended.

B-15
Test the Engine Idle Select Operation

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

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

Low idle (turtle symbol) allows the operator to control individual boom functions only.

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 setting activates high idle only when the foot switch is pressed down.

1 Turn the key switch to ground control.

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 Move and hold the function enable toggle switch in the high idle (rabbit symbol) position.

⊙ Result: The engine rpm should change to high idle.

5 Release the function enable toggle switch.

⊙ Result: The engine rpm should change to low idle.

6 Turn the key switch to platform controls.

7 At the platform controls, move the engine idle select toggle switch to high idle (rabbit symbol). Do not press down the foot switch.

⊙ Result: The engine rpm should change to high idle.

8 Move the engine idle select toggle switch to low idle (turtle symbol).

⊙ Result: The engine rpm should change to low idle.

9 Move the engine idle select toggle switch to foot switch activated high idle (rabbit and foot switch symbol).

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

10 Press down the foot switch.

⊙ Result: The engine rpm should change to high idle.

B-16
Test the Fuel Select Operation - GM and Ford Models

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

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 Move the fuel select toggle switch to gasoline and then move the engine idle select switch to foot switch activated high idle (rabbit and foot switch symbol).

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

3 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.

CHECKLIST B PROCEDURES

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

5 Move the fuel select toggle switch to LPG.

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

7 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.

B-17
Test the Drive Enable System

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

Proper drive enable system operation is essential to safe machine operation. When the boom is past the non-steering wheels, drive movement is stopped and the indicator light turns on. The drive enable switch must be held to either side to reactivate the drive function and should alert the operator that the machine may move in the opposite direction that the drive and steer controls are moved. An improperly functioning drive enable system may allow the machine to be moved into an unsafe position.

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

1 Start the engine from the platform controls.

2 Press down the foot switch.

3 Rotate the turntable until the boom moves past one of the the non-steer wheels.

⊙ Result: The drive enable indicator light should turn on and remain on while the boom is anywhere in the range shown.

4 Slowly move the drive control handle off center.

⊙ Result: The drive function should not operate.

5 Rotate the turntable until the boom moves past the other non-steer wheel.

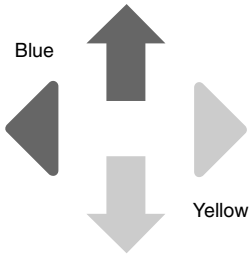
⊙ Result: The drive enable indicator light should come on and remain on while the boom is anywhere in the range shown.

6 Move and hold the drive enable toggle switch to either side and slowly move the drive control handle off center.

⊙ Result: The drive function should operate.

⚠WARNING Collision hazard. Always use the color-coded direction arrows on the platform controls and the drive chassis to identify the direction of travel.

Note: When the drive enable system is in use, the machine may drive in the opposite direction that the drive and steer control handle is moved.



B-18
Test the Drive Brakes

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

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-7, *Confirm the Proper Brake Configuration*.

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 Mark a test line on the ground for reference.

2 Start the engine from the platform controls.

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

4 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.

5 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.

CHECKLIST B PROCEDURES

B-19
Test the Drive Speed - Stowed Position

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

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 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.

4 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.

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

Note: To adjust the speed, refer to Repair procedure 1-2, *How to Adjust the Joystick Max-out Setting.*

B-20
Test the Drive Speed - Raised or Extended Position

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

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.

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 Extend the axles.

4 Move the engine idle select toggle switch to foot switch activated high idle (rabbit and foot switch symbol).

5 Press down the foot switch and raise the boom 10° above horizontal.

6 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.

7 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.

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

Note: To adjust the speed, refer to Repair procedure 1-2, *How to Adjust the Joystick Max-out Setting.*

9 Press down the foot switch and lower the boom to the stowed position.

10 Extend the boom 3 feet / 90 cm.

11 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.

12 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.

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

Note: To adjust the speed, refer to Repair procedure 1-2, *How to Adjust the Joystick Max-out Setting*.

B-21
Test the Alarm Package (if equipped) and the Descent Alarm

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

The alarm package includes:

- Travel alarm
- Flashing beacons

Alarms and beacons are installed to alert operators and ground personnel of machine proximity and motion. The alarm package is installed on the turntable rear cover. Beacons are installed on both turntable covers.

Note: The alarms and beacons will operate with the engine running or not running.

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

⊙ Result: Both flashing beacons should be on and flashing.

2 Move and hold the function enable toggle switch to either side and activate the boom toggle switch in the down position, hold for a moment and then release it.

⊙ Result: The descent alarm should sound when the toggle switch is held down.

CHECKLIST B PROCEDURES

3 Turn the key switch to platform controls.

⊙ Result: The flashing beacons should be on and flashing.

4 Press down the foot switch. Move the boom controller to the down position, hold for a moment and then release it.

⊙ Result: The descent alarm should sound when the controller is held down.

5 Press down the foot switch. Move the drive controller off center, hold for a moment and then release it. Move the drive controller off center in the opposite direction, hold for a moment and then release it.

⊙ Result: The travel alarm should sound when the drive controller is moved off center in either direction.

B-22
Inspect the Fuel and Hydraulic Tank Cap Venting Systems

Genie specifications require 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. Procced to step 4.

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

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.

B-23
Perform Hydraulic Oil Analysis

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

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 frequently.

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.**

CHECKLIST B PROCEDURES

B-24
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.

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007) OR the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

GM 3.0L Operator Handbook	
Genie part number	101095
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 away from the machine and secure.

⚠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

C-1
Perform Engine Maintenance - Deutz and Perkins Models

Engine specifications require that this procedure be performed every 500 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 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Deutz 913 Operator Handbook	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

To access the engine:

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

⚠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

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

Genie specifications require that this procedure be performed every 500 hours or six 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.

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 six 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 stablity 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

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).*

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).*

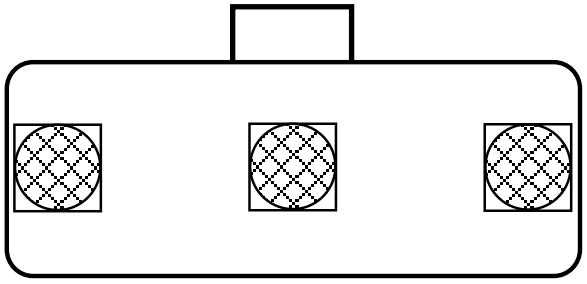


Illustration 1

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 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.

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.

CHECKLIST C PROCEDURES

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 Activate the auxiliary power toggle switch.

Note: The engine will turn off when the auxiliary power is activated.

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

⊙ Result: All ground control functions should operate.

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 Repair Procedure 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 Element - Deutz and Perkins Models

Engine specifications require that this procedure be performed every 500 hours or six 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 Release the latches on the air cleaner cap. Remove the end cap from the air cleaner canister.

2 Remove the filter element.

3 Use a damp cloth to wipe the filter sealing surface and the inside of the outlet tube. Make sure that all contaminant is removed before the filter is inserted.

4 Check new filter element gasket for damage before installing.

5 Install the new filter element.

6 Install the end cap on the canister and secure.

Note: Be sure the discharge slot is pointing down.

C-5
Replace the Fuel Filter/Water Separator Element - Deutz and Perkins Models

Genie specifications require that this procedure be performed every 500 hours or six months, 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 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.

Perform this procedure with the engine off.

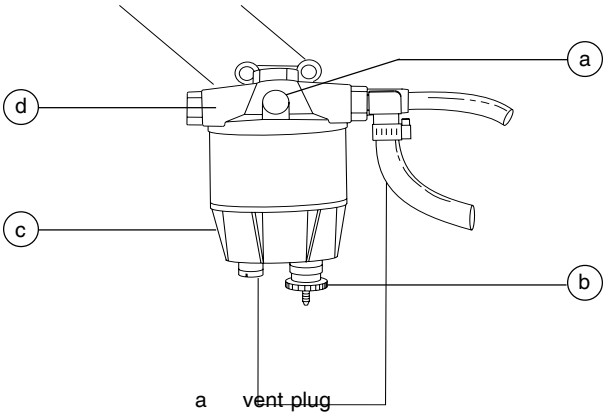
1 Open the engine side turntable cover and locate the fuel filter/water separator.

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.

CHECKLIST C PROCEDURES

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.

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.

Required maintenance procedures and additional engine information are available in the *GM 3.0L Operator Handbook* (GM part number 36100007) OR the *Ford LRG-425 EFI Operator Handbook* (Ford part number FPP 194-302).

GM 3.0L Operator Handbook	
Genie part number	101095
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 away from the machine and secure.

⚠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

D-1
Check the Boom Wear Pads

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

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.

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

1 Start the engine from the ground controls.

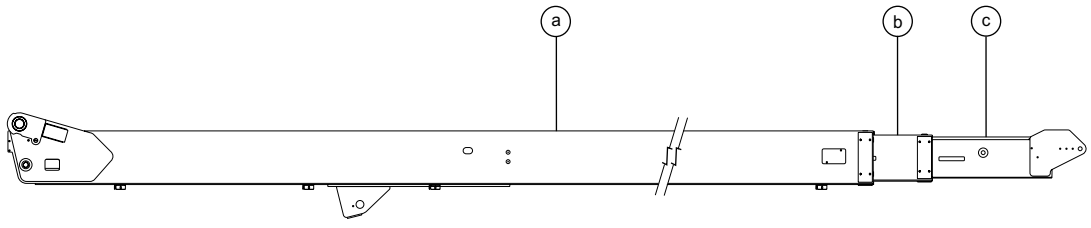
2 Raise the end of the boom to a comfortable working height (chest high), then extend the boom 1 foot / 30 cm.

3 Measure each wear pad. Replace the wear pad if it is less than specification. If the wear pad is still within specification, shim as necessary to obtain zero clearance and zero drag.

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.

Boom wear pad specifications	Minimum
Boom number one	
Top and bottom wear pads (extension end of boom)	1/2 inch 12.7 mm
Side wear pads (extension end of boom)	5/8 inch 15.9 mm
Boom number two	
Top and bottom wear pads (extension end of boom)	1/2 inch 12.7 mm
Side wear pads (extension end of boom)	5/8 inch 15.9 mm
Top, bottom and side wear pads (pivot end of boom)	1/2 inch 12.7 mm
Boom number three	
Top and bottom wear pads (pivot end of boom)	1/2 inch 12.7 mm



a boom 1
b boom 2
c boom 3

D-2
Check the Extendable Axle Wear Pads

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

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

Note: If the wear pads are not worn below specification but are still within specification, refer to Repair Procedure 15-1, *How to Shim an Extendable Axle.*

1 Start the engine from the platform controls and extend the axles.

2 Measure each wear pad.

⊙ If the wear pad is not less than specification, shim as necessary to obtain zero clearance and zero drag. Refer to Repair Procedure 15-1, *How to Shim an Extendable Axle.*

⊠ Replace the wear pad if it is less than specification. It is recommended to replace both inner and outer wear pads. Refer to Repair Procedure 15-1, *How to Remove an Inner Axle.*

3 Extend and retract the axles through the entire range of motion to check for tight spots that may cause binding or scraping of the axle tubes.

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

Axle wear pad specifications	Minimum
Outer axle	
Top, bottom and side wear pads (both ends of axle)	1/2 inch 12.7 mm
Extendable inner axle	
Top, bottom and side wear pads (both ends of axle)	1/2 inch 12.7 mm

CHECKLIST D PROCEDURES

D-3
Check the Free-wheel Configuration

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

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 could result in 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.

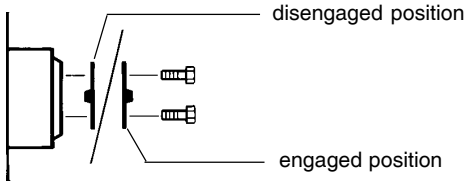
Non-steer wheels: All models

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 non-steer wheels.

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.

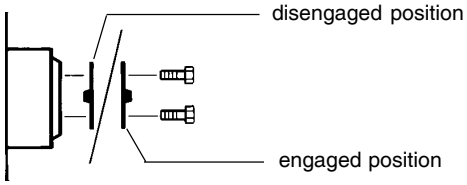
Steer wheels: 4WD models

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

8 Center a lifting jack of ample capacity (20,000 lbs / 10,000 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.

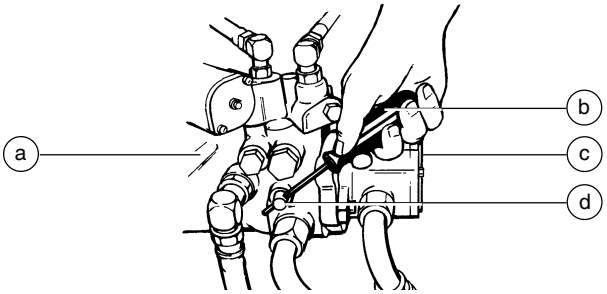
12 Re-engage the drive hubs by turning over the drive hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the blocks.

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

All models:

13 Turn the valve in a clockwise direction to be sure it is fully closed.

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



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

D-4
Check the Turntable Rotation Bearing Bolts

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

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 Start the engine from the platform controls and extend the axles.

2 Turn the key switch to ground controls.

3 Raise the boom and place a safety chock on the lift cylinder rod. Carefully lower the boom onto the lift cylinder safety chock.

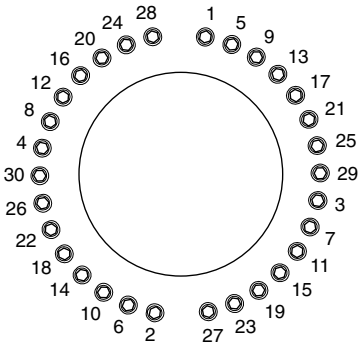
⚠WARNING Crushing hazard. Keep hands away from cylinder and all moving parts when lowering the boom.

Note: The lift cylinder safety chock is available through Genie Service Parts.

CHECKLIST D PROCEDURES

4 Remove the center turntable cover retaining fasteners. Remove the cover.

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



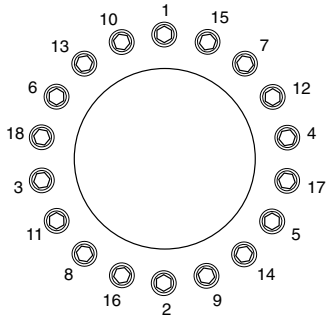
Bolt torque sequence

6 Install the center turntable cover and tighten the retaining fasteners.

7 Raise the boom and remove the safety chock.

8 Lower the boom to the stowed position.

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



Bolt torque sequence

D-5
Inspect for Turntable Bearing Wear

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

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.

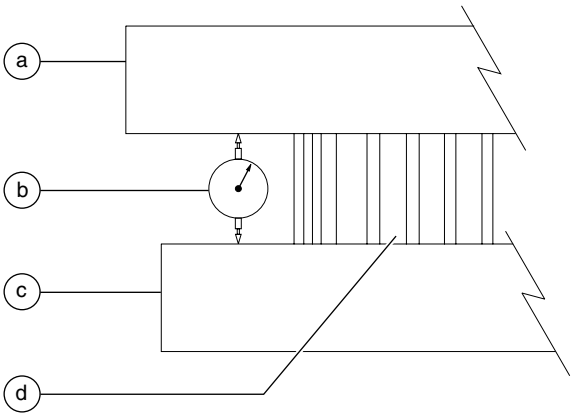
1 Grease the turntable bearing. See A-12, *Grease the Turntable Rotation Bearing and Rotate Gear.*

2 Torque the turntable bearing bolts to specification. See D-4, *Check the Turntable Rotation Bearing Bolts.*

3 Start the machine from the ground controls and raise the boom to full height. Do not extend the boom.

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 At the dial indicator, adjust it to "zero" the indicator.

6 Fully extend the boom and lower to a horizontal position.

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 Fully retract the boom and raise the boom to full height. Visually inspect the 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.

CHECKLIST D PROCEDURES

D-6
Perform Engine Maintenance - Deutz and Perkins Models

Engine specifications require that this procedure be performed every 1000 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 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Deutz 913 Operator Handbook	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

To access the engine:

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

⚠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 specifications requires that this procedure be performed every 1000 hours or annually, whichever come 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 filter 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 and the high pressure filter is for all machine functions except the drive circuit and oscillating axle circuit.

7 Open the engine side turntable cover and locate the two filters mounted below the hydraulic pumps.

Note: The medium pressure filter is located on the right. The high pressure filter is located on the left with the condition indicator.

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 housings.

10 Remove the filter element from the housings.

11 Inspect the housing seals and replace them if necessary.

CHECKLIST D PROCEDURES

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.

D-8
Replace the Drive Hub Oil

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

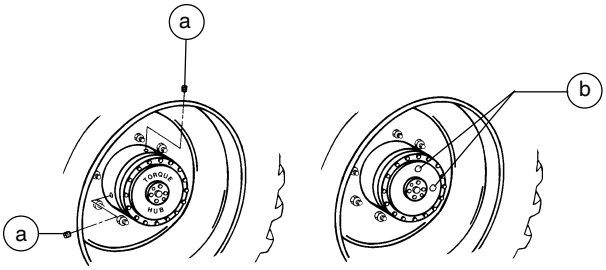
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

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

4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side plug hole. 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. Torque to Specification. Refer to Section 2, *Specifications*.

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

7 Check the torque of the drive hub mounting bolts. Refer to Section 2, *Specifications*.

Turntable rotate drive hub:

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

Note: The turntable rotation lock pin is located next to the boom rest pad.

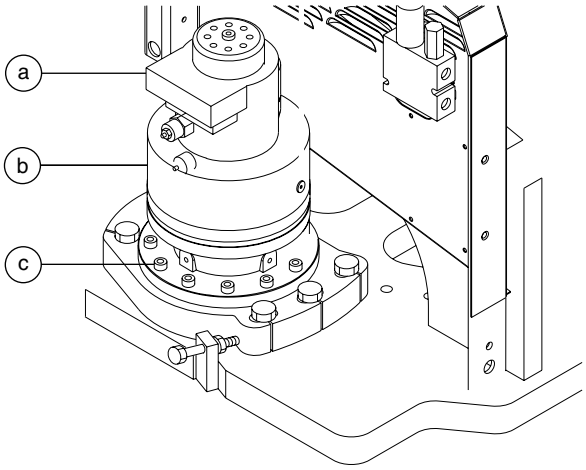
2 Tag, disconnect and plug the hydraulic hoses from the turntable rotate drive motor. Cap the fittings on the drive motor.

3 Attach a suitable lifting device to the lifting eyes located near the drive motor.

4 Remove the drive hub mounting bolts. Carefully remove the turntable rotate drive hub assembly from the machine.

⚠WARNING Crushing hazard. The turntable rotate drive hub assembly could become unbalanced and fall if not properly supported by the lifting device.

5 Remove the plug from the side of the drive hub. Drain the oil from the hub into a suitable container.



a motor
b drive hub
c drive hub mounting bolts

6 Install the drive hub assembly onto the machine. Torque the drive hub mounting bolts to specification. Refer to Section 2, *Specifications.*

7 Fill the drive 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 10-1, *How to Adjust the Turntable Rotation Gear Backlash.*

CHECKLIST D PROCEDURES

D-9
Perform Engine Maintenance - Deutz Models

Engine specifications require that this procedure be performed every 1500 hours of operation.

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 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929).

Deutz 913 Operator Handbook	
Genie part number	62446
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 away from the machine and secure.

⚠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

E-1
Test or Replace the Hydraulic Oil

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

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 frequently.

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.

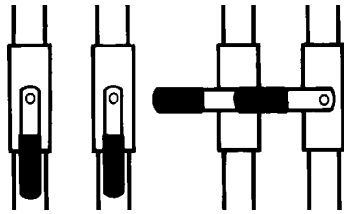
Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or the hose end must be replaced. All connections must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

1 Remove the fuel tank. Refer to Repair Procedure 9-1, *How to Remove the Fuel Tank.*

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.



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

4 Tag, disconnect and plug the two suction hoses that are attached to the hydraulic tank shutoff valves.

5 Disconnect and plug the T-fitting located at the return filter with the two hoses connected to it. Cap the fitting on the return filter housing.

6 Disconnect and plug the supply hose for the auxiliary power unit. Cap the fitting on the hydraulic tank.

CHECKLIST E PROCEDURES

7 Remove the retaining fasteners from the hydraulic tank hold down straps. Remove the hold down straps from the hydraulic tank.

8 Support the hydraulic tank with 2 lifting straps. Place one lifting strap at each end of the tank and attach the lifting straps to an appropriate lifting device.

9 Remove the hydraulic tank from the machine.

⚠WARNING Crushing hazard. The hydraulic tank may become unbalanced and fall if it is not properly supported and secured to the lifting device.

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

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

12 Install the suction strainers using pipe thread sealant on the threads.

13 Install the drain plug using pipe thread sealant on the threads.

14 Install the hydraulic tank onto the machine.

15 Install the two suction hoses and the supply hose for the auxiliary power unit.

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

17 Clean up any oil that may have spilled.

18 Open the hydraulic tank shutoff valves (if equipped).

NOTICE Component damage hazard. Be sure to open the two hydraulic tank shutoff valves and prime the pump after installing the hydraulic tank. Refer to Repair Procedure 7-2, *How to Prime the Pump*.

Note: Always use pipe thread sealant when installing the drain plug and strainers.

19 Operate all machine functions through a full cycle and check for leaks.

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

E-2
Perform Engine Maintenance - Perkins Models

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.

Required maintenance procedures and additional engine information are available in the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

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

To access the engine:

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

⚠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-3
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-steering wheels. Center a lifting jack under the steer axle.

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.

CHECKLIST E PROCEDURES

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 torquing 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 to 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.

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

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

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*.

24 Center a lifting jack under the steer axle.

25 Raise the machine approximately 6 inches / 15 cm. Remove the blocks from under the drive chassis.

26 Lower the machine

E-4
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.

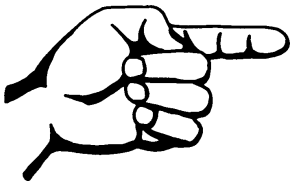
Required maintenance procedures and additional engine information are available in the *Deutz 913 Operator Handbook* (Deutz part number 0297 7341) OR the *Deutz BF4L2011 Operation Manual* (Deutz part number 0297 9929) OR the *Perkins 804C-33 Operation and Maintenance Manual* (Perkins part number SEBU7853-00).

Deutz 913 Operator Handbook	
Genie part number	62446
Deutz BF4L2011 Operation Manual	
Genie part number	84794
Perkins 804C-33 Operation and Maintenance Manual	
Genie part number	111332

To access the engine:

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

⚠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.



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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 *Genie S-80 and Genie S-85 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 non-steering 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. Then 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 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.

Note: Used to indicate operation or maintenance information.

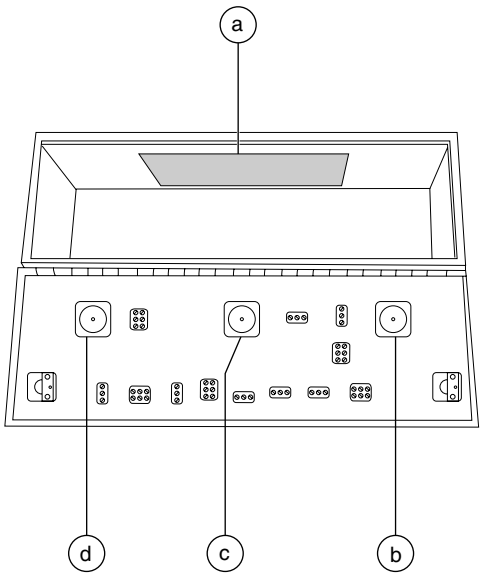
⊙ Indicates that a specific result is expected after performing a series of steps.

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

Platform Controls

The platform control box contains one printed circuit board. The ALC-500 circuit board inside the platform control box controls all proportional machine functions from the platform. 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 ECM circuit board at the platform controls. If a joystick error occurs or if a joystick is replaced, it will need to be calibrated before that particular machine function will operate. See 1-2, *How to Calibrate a Joystick*.

Each joystick controller should operate smoothly and provide proportional speed control over its entire range of motion.



a ALC-500 circuit board
b drive/steer joystick controller
c boom extend/retract joystick controller
d boom up/down and turntable rotate left/right joystick controller

1-1 ALC-500 Circuit Board

Note: When the ALC-500 circuit board is replaced, the joystick controllers will need to be calibrated. See 1-2, *How to Calibrate a Joystick*.

How to Remove the ALC-500 Circuit Board

1 Push in the 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 ALC-500 circuit board mounted to the inside of the platform control box.

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

4 Attach a grounded wrist strap to the ground screw inside the platform control box.

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 disconnect the wire connectors from the circuit board.

6 Remove the ALC-500 circuit board mounting fasteners.

7 Carefully remove the ALC-500 circuit board from the platform control box.

1-2 Joysticks

How to Calibrate a Joystick

The joysticks on this machine utilize digital Hall Effect technology for proportional control. If a joystick 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: Perform this procedure with the engine off.

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 platform control. Do not start the engine.

3 Press down the foot switch and select a joystick to calibrate.

4 Move the joystick full stroke in either direction and hold for 5 seconds.

5 Return the joystick to the neutral position, pause for a moment, then move the joystick full stroke in the opposite direction. Hold for 5 seconds and return the joystick to the neutral position.

⊙ Result: The alarm should sound indicating successful joystick calibration.

6 Repeat this procedure for each joystick controlled machine function including the thumb rocker steer switch.

Note: No machine fuction should operate while performing the joystick calibration procedure.

PLATFORM CONTROLS

How to Adjust the Joystick Max-out Setting

The max-out setting of a joystick controls the maximum speed of a joystick-controlled machine function. Whenever a hydraulic cylinder, drive motor or hydraulic pump is replaced, the max-out setting should be adjusted to maintain optimum performance. The max-out settings on the joystick can be changed to compensate for hydraulic pump wear to maintain peak performance from the machine.

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

Note: If a max-out adjustment has been made to any joystick function other than the limited drive speed (raised or extended), the limited drive speed must be checked. Refer to steps 14 thru 19.

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 platform control. Do not start the engine.

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

4 Do not press down the foot switch.

5 Move and hold the drive enable toggle switch in the right position and pull out the red Emergency Stop button to the on position.

6 When the alarm sounds, release the drive enable toggle switch.

7 Momentarily activate the drive enable toggle switch in the right direction 4 times.

⊙ Result: There should be a pause and the alarm should sound 4 times indicating that the machine is in max-out calibration mode.

8 Start the engine from the platform controls and press down the foot switch.

9 Start a timer and activate the machine function that needs to be adjusted. Record the time it takes for that function to complete a full cycle (ie; boom up).

10 Compare the machine function time with the table below and determine whether the function time needs to increase or decrease.

11 While the joystick is activated, adjust the max-out setting to achieve the proper function cycle time. Momentarily move the drive enable toggle switch in the right direction to increase the time or momentarily move the drive enable toggle switch in the left direction to decrease the time.

Note: Each time the drive enable toggle switch is momentarily moved, the time will change in 2% increments.

12 Repeat steps 9 through 11 for each joystick controlled machine function.

13 Return the joystick to the neutral position and wait for approximately 10 seconds.

⊙ Result: The alarm should sound indicating that the settings have been saved in memory.

Note: Do not operate any machine function during the 10 second waiting time.

14 Cycle the red Emergency Stop button off, then back on.

Function speeds (factory settings)	
Boom up	89 to 93 seconds
Boom down	90 to 94 seconds
Boom extend	73 to 79 seconds
Boom retract	79 to 84 seconds
Turntable rotate, 360° boom fully stowed	78 to 86 seconds
Drive speeds (factory settings)	
Stowed- high speed	7.9 to 8.5 seconds
Non-stowed	40 to 45 seconds

How to Adjust the Joystick 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.

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 Turn the key switch to platform control. Do not start the engine.

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

4 Do not press down the foot switch.

5 Move and hold the drive enable toggle switch in the right position and pull out the red Emergency Stop button to the on position.

6 When the alarm sounds, release the drive enable toggle switch.

7 Momentarily activate the drive enable toggle switch in the right direction 6 times.

⊙ Result: There should be a pause and the alarm should sound 6 times indicating that the machine is in ramp rate calibration mode.

PLATFORM CONTROLS

8 Start the engine from the platform controls and press down the foot switch.

9 Start a timer and simultaneously move the joystick in either direction full stroke. Note how long it takes the function to reach maximum speed. This is the ramp rate.

10 Compare the function ramp rate time with the table below and determine whether the ramp rate time needs to increase or decrease.

11 While the joystick is activated, set the ramp rate. Momentarily move the drive enable toggle switch in the right direction to increase the time or momentarily move the drive enable toggle switch in the left direction to decrease the time.

Note: Each time the drive enable toggle switch is momentarily moved, the time will change in 5% increments.

12 Repeat steps 9 through 11 for each joystick controlled machine function.

13 Return the joystick to the neutral position and wait for approximately 10 seconds.

⊙ Result: The alarm should sound indicating that the settings have been saved in memory.

Note: Do not operate any machine function during the 10 second waiting time.

14 Cycle the red Emergency Stop button off, then back on.

Ramp rate (factory settings)	
Boom up/down and turntable rotate	
accelerate	3 seconds
decelerate	1 second
Boom extend/retract	
accelerate	4 seconds
decelerate	1 second
Drive	
accelerate	4 seconds
decelerate to neutral	0.5 second
decelerate, change of direction	0.75 second
decelerate, coasting	1 second
decelerate, braking	1 second
decelerate, shift from low to high speed	1 second
decelerate, shift from high to low speed	4 seconds

How to Adjust the Joystick Threshold Setting

The threshold setting of a joystick is the minimum output at which a function proportional valve can open and allow the function to operate.

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 Turn the key switch to platform control. Do not start the engine.

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

4 Do not press down the foot switch.

5 Move and hold the drive enable toggle switch in the right position and pull out the red Emergency Stop button to the on position.

6 When the alarm sounds, release the drive enable toggle switch.

7 Momentarily activate the drive enable toggle switch in the right direction 8 times.

⊙ Result: There should be a pause and the alarm should sound 8 times indicating that the machine is in threshold calibration mode.

8 Start the engine from the platform controls and press down the foot switch.

9 Select a boom function joystick to set the threshold.

10 Slowly move the joystick off center in either direction just until the function begins to move.

11 Slowly move the joystick back to the neutral position. Just before the function stops moving, move the drive enable toggle switch to either side to set the threshold.

⊙ Result: The alarm should sound indicating a successful calibration.

12 Repeat steps 9 through 11 for each boom joystick controlled machine function (boom up/down, boom extend/retract and turntable rotate).

13 Return the joystick to the neutral position and wait for approximately 10 seconds.

⊙ Result: The alarm should sound indicating that the settings have been saved in memory.

Note: Do not operate any machine function during the 10 second waiting time.

14 Cycle the red Emergency Stop button off, then back on.

Platform Components

2-1 Platform

How to Remove the Platform

1 Remove the cable clamp from the top of the platform mounting weldment.

2 Remove the mounting fasteners from the power to platform outlet box bracket. Lay the outlet box and bracket assembly off to the side. Do not disconnect the wiring.

3 Remove the foot switch mounting fasteners.

4 Remove the cover plate from the bottom of the foot switch to access the foot switch wire terminals.

5 Tag and disconnect the foot switch wiring from the foot switch. Remove the cable from the back of the platform.

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

6 Remove the platform control box mounting fasteners. Lower the control box and set it aside.

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

Note: If your machine is equipped with an airline to platform option, the airline must be disconnected from the platform before removal.

7 Support and secure the platform to an appropriate lifting device.

8 Remove the platform mounting fasteners and remove the platform from the machine.

⚠WARNING Crushing hazard. The platform could become unstable and fall when it is removed from the machine if not properly supported.

2-2
Platform Leveling Slave Cylinder

The slave cylinder and the rotator pivot are the two primary supports for the platform. The slave cylinder keeps the platform level through the entire range of boom motion. It operates in a closed-circuit hydraulic loop with the master cylinder. The slave cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Platform Leveling Slave Cylinder

Note: Before cylinder removal is considered, bleed the slave cylinder to be sure there is no air in the closed loop.

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 Extend the primary boom until the slave cylinder barrel-end pivot pin is accessible.

2 Raise the primary boom slightly and place blocks under the platform for support.

3 Lower the primary 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 Remove the pin retaining fastener from the slave cylinder rod-end pivot pin. Use a soft metal drift to drive the rod-end pivot pin out.

⚠WARNING Crushing hazard. The jib boom could fall when the slave cylinder rod-end pivot pin is removed if not properly supported.

5 Remove the external snap rings from the barrel-end pivot pin.

6 Use a soft metal drift to drive the barrel-end pivot pin out.

7 Carefully pull the cylinder out of the primary boom to access the hydraulic hoses.

8 Tag, disconnect and plug the hydraulic hoses from the slave 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.

How to Bleed the Slave Cylinder

Note: Do not start the engine. Use auxiliary power for this procedure.

1 Raise the primary boom to a horizontal position.

2 Move the platform level toggle switch up and down through two platform leveling cycles to remove any air that might be in the system.

PLATFORM COMPONENTS

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 (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 Remove the platform. See 2-1, *How to Remove the Platform*.

2 Tag, disconnect and plug the hydraulic hoses from the platform rotator manifold. Cap the fittings on the rotator.

⚠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.

S-85:

3 Support the jib boom leveling arms and the platform mounting weldment with an appropriate lifting device. Do not apply any lifting pressure.

4 Remove the mounting bolts from the platform mounting weldment. Remove the center bolt and slide the platform mounting weldment off of the platform rotator.

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

5 Support the platform rotator with an appropriate lifting device. Do not apply any lifting pressure.

S-80:

6 Support the rod end of the platform leveling slave cylinder. Protect the cylinder rod from damage.

7 Remove the pivot pin retaining fasteners from both the slave cylinder rod-end pivot pin and the rotator pivot pin.

8 Use a soft metal drift to remove both pivot pins. Remove the platform rotator from the machine.

⚠CAUTION Crushing hazard. The platform rotator may become unbalanced and fall if not properly supported.

Note: When installing the platform rotator fasteners, torque the fasteners to specifications. Refer to Section 2, *Specifications.*

S-85:

6 Remove the pin retaining fasteners from the jib boom and jib boom leveling arms to platform rotator pivot pins. Do not remove the pins.

7 Support the jib boom leveling arms.

8 Use a soft metal drift to drive both pins out, then remove the platform rotator from the machine.

⚠CAUTION Bodily injury hazard. The jib boom leveling arms may fall if not properly supported.

9 Lower the jib boom leveling arms.

⚠CAUTION Crushing hazard. The platform rotator may become unbalanced and fall if not properly supported.

Note: When installing the platform rotator fasteners, torque the fasteners to specifications. Refer to Section 2, *Specifications*.

How to Bleed the Platform Rotator

Note: This procedure will require two people. Do not start the engine. Use auxiliary power for this procedure.

1 Move the function enable toggle switch to either side and activate the platform rotate toggle switch to the right then the left through two platform rotation cycles, then hold the switch to the right position until the platform is fully rotated to the right.

2 Place a suitable container underneath the platform rotator.

3 Open the top bleed screw on the rotator, but do not remove it.

⚠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.

PLATFORM COMPONENTS

4 Move the function enable toggle switch to either side and hold the platform rotate toggle switch to the left position until the platform is fully rotated to the left. Continue holding the toggle switch until air stops coming out of the bleed screw. Close the bleed screw.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

5 Open the bottom bleed screw on the rotator, but do not remove it.

⚠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 Move the function enable toggle switch to either side and hold the platform rotate toggle switch to the right position until the platform is fully rotated to the right. Continue holding the toggle switch until air stops coming out of the bleed screw. Close the bleed screw.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

7 Clean up any hydraulic oil that may have spilled.

8 Rotate the platform fully in both directions and inspect the bleed screws for leaks.

2-4 Platform Overload System

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.

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 overload indicator lights are off and the alarm does not sound. Proceed to step 6.

⊠ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. 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 overload indicator lights are off at the platform and ground controls, and the alarm does not sound. 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 overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. 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 overload indicator lights are off and the alarm does not sound. 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 overload indicator light is flashing at both the ground and platform controls, and the alarm is sounding. Proceed to step 9.

⊠ Result: The overload indicator light is off at both the ground and platform controls, and the alarm does not sound. 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.

PLATFORM COMPONENTS

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 platform overload indicator light should be off at both the ground and platform controls and the alarm should not sound.

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, S-85

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 (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 Remove the platform. See 2-1, *How to Remove the Platform*.

Note: **Models equipped with platform overoad system:** If the platform overload components are disassembled and/or removed from the platform support, the platform overload system will need to be calibrated. See 2-4, *How to Calibrate the Platform Overload System.*

2 **Models equipped with platform overload system:** Tag and disconnect the electrical connector from the platform load sense module.

3 Remove the hose and cable cover from the side of the jib boom.

4 Remove the hose and cable clamp from the jib boom pivot pin. Lay all hoses and cables to the side.

NOTICE Component damage hazard. Hoses and cables can become damaged if they are kinked or pinched.

5 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.

6 Attach a lifting strap from an overhead crane to the jib boom assembly.

7 Place blocks under the platform leveling cylinder for support. Protect the cylinder rod from damage.

8 Remove the pin retaining fastener from the slave cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The jib boom could fall when the slave cylinder rod-end pivot pin is removed if not properly attached to the overhead crane.

9 Remove the pin retaining fastener from the jib boom bellcrank to primary boom pivot pin.

10 Use a soft metal drift to remove the pin and carefully remove the jib boom assembly from the primary boom.

⚠WARNING Crushing hazard. The jib boom could become unbalanced and fall when removed from the machine if not properly attached to the overhead crane.

JIB BOOM COMPONENTS, S-85

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 (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 Raise the jib boom slightly and place blocks under the platform mounting weldment. Then 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. Then 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.

5 Attach a lifting strap from an overhead crane to the lug at the rod end of the jib boom lift cylinder.

6 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

7 Use a soft metal drift to remove the jib boom lift cylinder rod-end pin. Remove the 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

4-1 Cable Track

The boom cable track guides 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 boom cable track is necessary when performing major repairs that involve removing the boom.

How to Remove the Cable Track

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 Open the platform control box.

2 Tag and disconnect the foot switch wiring from the terminal strip inside the platform control box.

3 Loosen the squeeze connector and remove the foot switch cable from the control box.

4 Disconnect the wire connectors from the bottom of the platform control box.

Note: When installing the wire connectors to the bottom of the platform control box, match the color of the connectors to those on the control box to be sure they are installed in the correct location.

5 Remove the mounting fasteners from the power to platform outlet box bracket. Lay the outlet box and bracket assembly off to the side.

S-80:

6 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.

7 Tag, disconnect and plug the hydraulic hoses from the platform leveling slave cylinder at the union and connect the hoses from the cylinder together using a connector.

⚠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.

S-85:

8 Remove the hose and cable cover from the side of the jib boom.

9 Tag, disconnect and plug the hydraulic hoses from the jib boom/platform rotate select manifold. Cap the fittings on the manifold.

10 Tag, disconnect and plug the wiring from the jib boom/platform rotate select manifold.

BOOM COMPONENTS

11 Tag, disconnect and plug the hydraulic hoses from the jib 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.

All models:

12 From the ground controls, raise the boom to a horizontal position.

13 Remove the fasteners from the drive speed limit switch bracket (LS1RS) mounted on the side of the boom at the platform end of the boom. Do not remove the limit switch from the bracket.

14 Remove the cotter pin from the upper cable track at the platform end of the boom.

Note: Always replace the cotter pin with a new one.

15 Remove the cable track guide fasteners from the cable track guides at the platform end of the boom. Remove the cable track guides from the boom.

16 Remove the cable clamp from the pivot end of the boom.

17 Place blocks between the upper and lower cable tracks and secure the upper and lower tracks together.

⚠WARNING Crushing hazard. If the upper and lower cable tracks are not properly secured together, the cable track could become unbalanced and fall when removed from the machine.

18 Attach a lifting strap from an overhead crane to the cable track.

19 Remove the mounting fasteners that attach the lower cable track to the boom.

20 Remove the cable track from the machine and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The cable track could become unbalanced and fall if not properly attached to the overhead crane.

NOTICE Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

NOTICE Component damage hazard. The cable track can be damaged if it is twisted.

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, part no. 77896. The kit includes a 4-link section of cable track.

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 new section of cable track.

BOOM COMPONENTS

4-2 Boom

How to Shim the Boom

1 Measure each wear pad.

Note: Replace the pad if thickness is less than minimum specification. If thickness is more than minimum specification, perform the following procedure. Refer to Section 3, *D-1, Check the Boom Wear Pads.*

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.

How to Remove the 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 (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 Remove the platform. See 2-1, *How to Remove the Platform.*

2 Remove the platform rotator and leveling slave cylinder. See 2-3, *How to Remove the Platform Rotator*.

3 Remove the cable track. See 4-1, *How to Remove the Cable Track.*

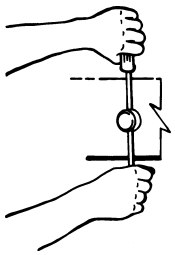
4 **S-85:** Remove the jib boom. See 3-1, *How to Remove the Jib Boom*.

5 Raise the boom to a horizontal position high enough that the boom lift cylinder rod end can clear the boom lift cylinder mounting boss.

6 Remove the turntable end cover.

7 Remove the pin retaining fasteners from the master cylinder rod-end pivot pin.

8 Place a rod through the pin and twist to remove the pin. Lower the rod end of the master cylinder.



9 Remove the fasteners from the boom angle limit switches (LS2RO and LS2RS) mounted to the inside of both turntable riser side plates at the pivot end of the boom. Do not disconnect the wiring.

10 Remove the fasteners from the boom extend limit switch (LS1RO) mounted next to the boom extension cylinder at the pivot end of the boom. Do not disconnect the wiring.

11 Tag, disconnect and plug the 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 Attach an overhead 5 ton / 5000 kg crane to the center point of the boom.

13 Attach a similar lifting device to the boom lift cylinder for support.

14 Place support blocks under the boom lift cylinder, across the turntable.

15 Remove the pin retaining fastener from the boom lift cylinder rod-end pin. Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The boom lift cylinder could fall if not properly supported.

16 Lower the rod end of the lift cylinder onto support blocks. Protect the cylinder rod from damage.

17 Remove the pin retaining fastener from the boom pivot pin.

18 Use a soft metal drift to remove the boom pivot pin. Carefully remove the boom from the machine.

⚠WARNING Crushing hazard. The boom could become unbalanced and fall if not properly supported by the overhead crane.

BOOM COMPONENTS

How to Disassemble the Boom

Note: Complete disassembly of the boom is only necessary if the outer or inner boom tubes must be replaced. The extension cylinder can be removed without completely disassembling the boom. See 4-4, *How to Remove the Boom Extension Cylinders*.

1 Remove the boom. See 4-2, *How to Remove the Boom*.

2 Remove the external snap rings from the extension cylinder pivot pin at the pivot end of the number 1 boom tube. Use a soft metal drift to remove the pin.

3 Remove and label the wear pads from the top, side, and bottom of the number 1 boom tube at the platform end of the boom.

Note: Note the location and quantity of shims used with each wear pad.

4 Remove the two wear pad stop bolts from each side of the number 1 boom tube (located on the outside).

5 Attach a lifting strap from an overhead crane to the number 2 and number 3 boom tubes at the platform end of the boom for support.

6 Support and slide the number 2 and 3 boom tubes out of the number 1 boom tube. Place the number 2 and 3 boom tubes on blocks for support.

⚠WARNING Crushing hazard. The number 2 and 3 boom tubes could become unbalanced and fall when they are removed from the number 1 boom tube if they are not properly supported.

Note: During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

7 Tag and remove the wear pads from the top, side, and bottom of the number 2 boom tube at the platform end of the boom.

8 Remove the trunnion pin retaining fasteners at the base end of the number 2 boom tube. Use a slide hammer to remove the trunnion pins.

9 Attach a lifting strap from an overhead crane to the number 3 boom tube at the platform end of the boom for support.

10 Support and slide the number 3 boom tube out of the number 2 boom tube. Place the number 3 boom tube on blocks for support.

⚠WARNING Crushing hazard. The number 3 boom tube could become unbalanced and fall when removed from the number 2 boom tube if not properly supported.

Note: During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

11 Remove the external snap rings from the extension cylinder pivot pin at the platform end of the number 3 boom tube. Use a soft metal drift to remove the pin.

12 Support and slide the extension cylinder out of the pivot end of the number 3 boom tube. Place the extension cylinder on blocks for support.

⚠WARNING Crushing hazard. The extension cylinder could become unbalanced and fall when it is removed from the number 3 boom tube if not properly supported.

Note: During removal, the overhead crane strap will need to be carefully adjusted for proper balancing.

4-3
Boom Lift Cylinder

How to Remove the 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 Raise the boom to a horizontal position high enough that the boom lift cylinder rod end can clear the boom lift cylinder mounting boss.

2 Remove the center turntable cover fasteners. Remove the cover.

3 Place support blocks under the boom lift cylinder across the turntable side plates.

4 Attach an overhead 5 ton / 5000 kg crane to the boom for support. Do not lift the boom.

BOOM COMPONENTS

5 Support the rod end of the boom lift cylinder with an overhead crane or similar lifting device.

⚠WARNING Crushing hazard. The boom lift cylinder could become unbalanced and fall when it is disconnected from the machine if not properly supported.

6 Tag, disconnect and plug the 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 boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin, and lower the lift cylinder onto the blocks. Protect the cylinder rod from damage.

⚠WARNING Crushing hazard. The boom lift cylinder could become unbalanced and fall when it is disconnected from the machine if not properly supported.

8 Remove the mounting fasteners from the barrel-end cylinder pivot pin retaining plates.

9 With the lift cylinder being supported by the overhead crane, pull the cylinder toward the platform and remove it from the machine.

⚠WARNING Crushing hazard. The lift cylinder could become unbalanced and fall if not properly supported.

NOTICE Component damage hazard. The cables and hydraulic hoses can be damaged if the lift cylinder is pulled across them.

4-4
Boom Extension Cylinders

The extension cylinder consists of two cylinders that are fastened together. The first cylinder extends and retracts the number 2 boom tube. The second cylinder extends and retracts the number 3 boom tube. The extension cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Boom Extension Cylinders

⚠WARNING 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 Raise the boom to a horizontal position, fully extend the boom and fully lower the platform.

2 Remove the 2 bolts that are located on each side of the number 3 boom tube near the platform end of the number 2 boom tube.

3 Place a 4 in x 4 in x 6 ft / 10 cm x 10 cm x 1.8 m block on top of the number 3 boom tube and place one end of the block against the weldment at the platform end of the boom.

4 Retract the boom until the number 2 boom tube is fully retracted into the number 1 boom tube.

Note: The number 3 boom tube will remain extended approximately 6 feet / 1.8 m.

5 Remove the external snap rings from the extension cylinder pivot pin at the platform end. Use a soft metal drift to remove the pin.

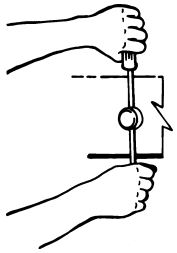
6 Remove the turntable end cover.

7 Support the rod end of the master cylinder with a lifting device.

8 Remove the pin retaining fastener from the master cylinder rod-end pivot pin. Place a rod through the pin and twist to remove the pin.

⚠WARNING Crushing hazard. The extension cylinder could become unbalanced and fall when it is removed from the machine if not properly supported.

Note: Use the platform level toggle switch with auxiliary power to relieve pressure on the master cylinder barrel-end pivot pin.



BOOM COMPONENTS

9 Lay the master cylinder down. Protect the cylinder rod from damage.

10 Remove the external snap rings from the extension cylinder pivot pin at the pivot end of the boom. Use a soft metal drift to remove the pin through the access holes in the turntable riser.

11 Using auxiliary power, move the boom extend/retract toggle switch in the extend direction and extend the extension cylinder out the pivot end of the boom approximately 1 foot / 30 cm.

12 Tag, disconnect and plug the 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.

13 Attach a lifting strap from an overhead crane to the end of the extension cylinder and lift slightly to relieve the pressure on the trunnion pins.

14 Remove the trunnion pin access covers from both sides of the number 1 boom tube at the pivot end of the boom.

15 Remove the trunnion pin retaining fastener and use a slide hammer to remove the pins.

16 Slide the cylinder out to access the wear pads on the bottom rod support bracket. Remove the wear pads.

17 Support and slide the extension cylinder out of the pivot end of the boom.

⚠WARNING Crushing hazard. The extension cylinder could become unbalanced and fall when it is removed from the machine if not properly supported.

Note: Note the length of the cylinder after removal. The cylinder must be at the same length for installation.

Note: During re-assembly of the boom, fully retract the boom after installing all pins. Install the two top ¼-20 fasteners through the access holes located mid-section of the number 1 boom. Then extend the boom and install the two lower ¼-20 fasteners in the number 3 boom tube.

4-5 Platform Leveling Master Cylinder

The master cylinder acts as a pump for the slave cylinder. It is part of the closed loop hydraulic circuit that keeps the platform level through the entire range of boom motion. The master cylinder is located inside the pivot end of the boom.

How to Remove the Platform Leveling Master Cylinder

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 Raise the boom until the master cylinder rod-end pivot pin is accessible.

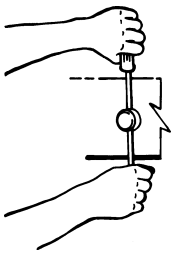
2 Remove the turntable end cover to access the master cylinder.

3 Tag, disconnect and plug the master 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.

4 Remove the pin retaining fastener from the master cylinder barrel-end pivot pin.

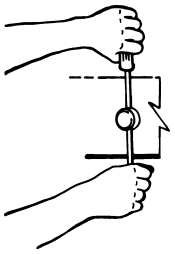
5 Place a rod through the barel-end pivot pin and twist to remove the pin.



6 Attach a lifting strap from an overhead crane to the lug on the rod end of the master cylinder.

7 Remove the pin retaining fastener from the rod-end pivot pin.

8 Place a rod through the rod-end pivot pin and twist to remove the pin.



9 Remove the master cylinder from the machine.

⚠WARNING Crushing hazard. The master cylinder could become unbalanced and fall if it is not properly supported by the lifting device when removed from the machine.

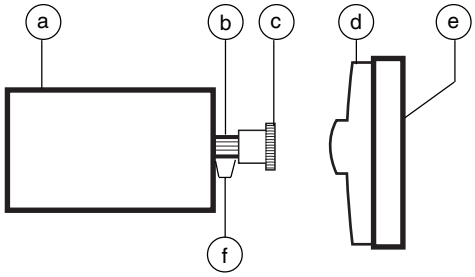
Engines

5-1 RPM Adjustment

Refer to Maintenance Procedure B-10, *Check and Adjust the Engine RPM.*

5-2 Flex Plate

The flex plate couples the engine to the pump. The flex plate is bolted to the engine flywheel and has a cut-out in the center for the pump coupler.



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
0.25 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

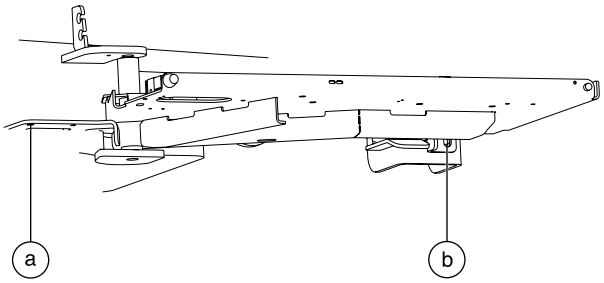
Note: Perform this procedure with the engine off and cool to the touch.

1 Open the engine side turntable cover.

2 Tag and disconnect the battery cables from the battery(s).

⚠WARNING Electrocution/burn 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.

GM models:

5 Remove the fasteners securing the muffler to the exhaust manifold.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

6 Remove muffler mounting bracket fasteners. Remove the muffler and bracket assembly from the engine.

7 Remove the hose clamp securing the air filter assembly to the air inlet tube.

8 Remove the air cleaner bracket fasteners. Remove the air cleaner and bracket assembly from the engine.

9 Support the drive pump with an appropriate lifting device. Do not apply any lifting pressure.

10 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

11 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Ford models:

5 Tag and disconnect the wire harness from the oxygen sensor on the exhaust pipe.

6 Remove the exhaust pipe heat shield fasteners from the top of the muffler.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

7 Remove the muffler retainer bracket fasteners.

8 Remove the muffler fasteners securing the muffler to the exhaust manifold. Remove the muffler from the bracket.

9 Remove the muffler bracket retaining fasteners. Remove the muffler bracket from the engine.

10 Close the shutoff valve on the Liquid Petroleum Gas (LPG) tank by turning it clockwise (if equipped).

11 Tag and disconnect the wiring from the LPG solenoid.

12 Remove the engine starter retaining fasteners and remove the starter from the engine. Do not disconnect the wiring.

13 Remove the dipstick tube bracket fasteners.

14 Attach a lifting strap from an overhead crane to the lifting eyes on the engine.

15 Remove the bell housing to engine tray fasteners.

ENGINES

16 Raise the engine slightly using the overhead crane. Do not apply any lifting pressure.

17 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine fasteners.

18 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

19 Remove the flex plate mounting fasteners. Remove the flex plate from the engine fly wheel.

Deutz F4L-913 models:

5 Tag and disconnect the wiring from the bell housing.

6 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.

7 Remove the fuel filter/water separator retaining fasteners. Remove the filter/separator from the engine. Do not disconnect the fuel hoses.

8 Remove the air cleaner mounting bracket fasteners. Remove the air cleaner and bracket assembly from the engine.

9 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing to engine fasteners.

10 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

11 Remove the flex plate mounting fasteners, and remove the flex plate from the engine flywheel.

Deutz BF4L-2011 models:

5 Tag and disconnect the wiring from the bell housing.

6 Remove the U-bolt from the exhaust flex pipe at the muffler.

⚠CAUTION Burn hazard. Hot engine parts can cause severe burns.

7 Remove the muffler bracket retaining fasteners from bell housing. Remove the muffler and bracket assembly from the engine.

8 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing 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.

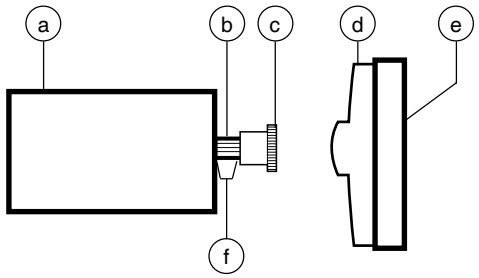
How to Install the Flex Plate

1 Install the flex plate onto the engine flywheel with the raised spline towards the pump.

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.
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.
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.



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
0.25 inch / 6.35 mm gap - Perkins 804C-33 Engine
0.3 inch / 7.6 mm gap - Perkins 704-30 Engine

5 Install the pump onto the bell housing/mounting plate. Torque the pump retaining fasteners to 57 ft-lbs / 83 Nm.

NOTICE Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.

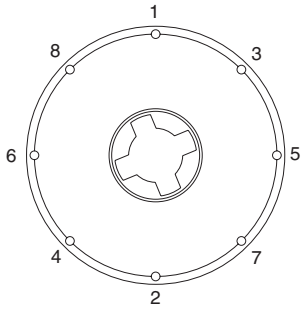
6 Install the pump coupler onto the pump shaft with the set screw toward the pump. Leave the appropriate gap between coupler and pump end plate for your engine.

7 Install the pump and bellhousing assembly onto the engine. Apply Loctite® removable thread sealant to the mounting screws.
Perkins 704 models
Torque the bellhousing mounting bolts in sequence to 14 ft-lbs / 19.1 Nm.
Deutz 913, Perkins 804 and GM models
Torque the bellhousing mounting bolts in sequence to 28 ft-lbs / 38 Nm.
Deutz 2011 Models
Torque the bellhousing mounting bolts in sequence to 46.7 ft-lbs / 63.3 Nm.
Ford Models
Torque the bellhousing mounting bolts in sequence to 37 ft-lbs / 50.1 Nm.

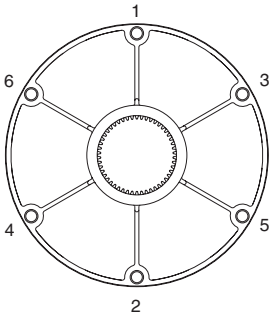
NOTICE Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

NOTICE Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.

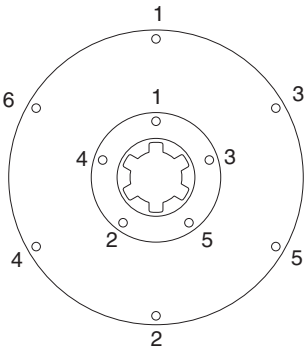
ENGINES



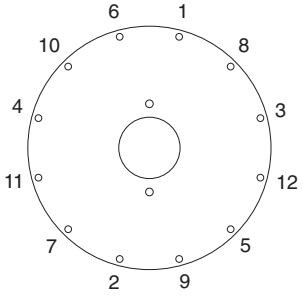
Deutz F4L-913
Flex Plate



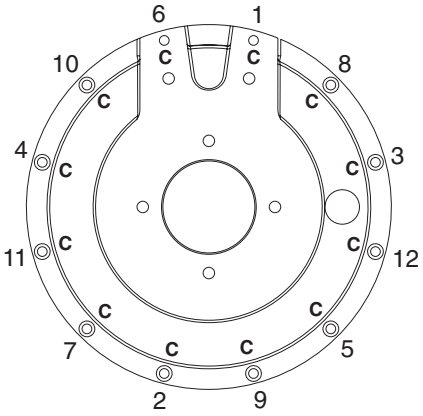
Ford, Perkins and
Deutz BF4L-2011
Flex Plate



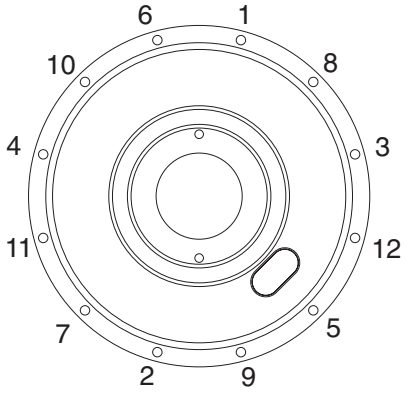
GM Flex Plate



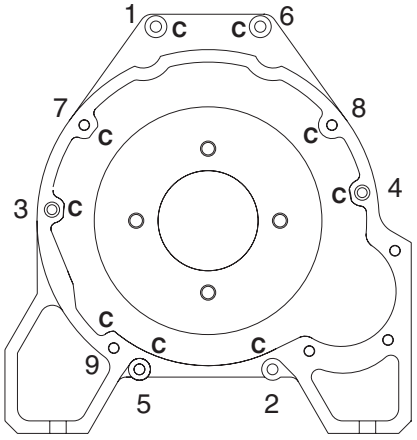
Deutz F4L-913 and Perkins 704-30
Pump Plate



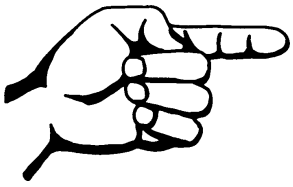
Deutz BF4L-2011
Pump Plate



Perkins 804C-33 and GM
Pump Plate



Ford Pump Plate



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Ground Controls

6-1
Control Relays

Relays used for single function switching are single pole double throw (SPDT) relays.

How to Test a Single Pole Double Throw Relay

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

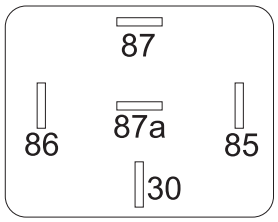
1 Tag and disconnect all the wiring from the relay to be tested.

2 Connect the leads from an ohmmeter or continuity tester to each terminal combination and check for continuity. Terminals 85 and 86 represent the coil and should not be tested in any other combination.

Test	Desired result
terminal 85 to 86 with resistor	75 to 85Ω
terminal 87 to 87a and 30	no continuity (infinite Ω)
terminal 87a to 30	continuity (zero Ω)

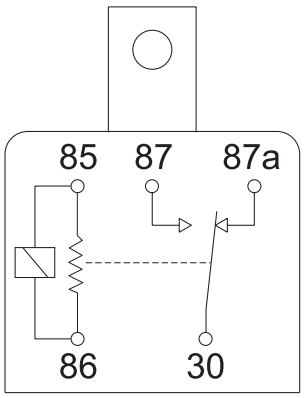
3 Connect 12V DC to terminal 85 and a ground wire to terminal 86, then test the following terminal combinations.

Test	Desired result
terminal 87 to 87a and 30	no continuity (infinite Ω)
terminal 87 to 30	continuity (zero Ω)



terminal no. 87a - N.C.
terminal no. 85 - coil negative (-)
terminal no. 30 - common
terminal no. 86 - coil positive (+)
terminal no. 87 - N.O.

Control Relay Schematic



6-2
Power Relay

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

Note: The power relay is mounted on the Auxiliary Power Unit.

How to Test the Power Relay

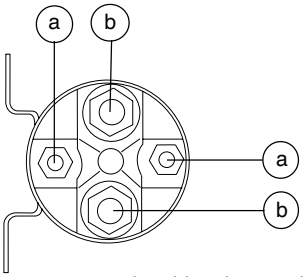
⚠WARNING Electrocution/burn hazard. Disconnect the ground cable from the battery before performing this procedure.

1 Connect the leads from an ohmmeter to each terminal combination and check for continuity.

Test	Desired result
2 small posts	12 to 16Ω
2 large posts	no continuity (infinite Ω)
Any small post to any large post	no continuity (infinite Ω)

2 Connect 12V DC to one of the small posts and a ground wire to the other small post, then test the following terminal combination.

Test	Desired result
2 large posts	continuity (zero Ω)



a solenoid activate coil terminal (small post)
b high amp power contact terminal

6-3
Terminal Strip

How to Remove a Terminal Strip Section

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could cause death or serious injury. Remove all rings, watches and other jewelry.

1 Disconnect the battery(s) from the machine.

2 Label the wiring from the terminal strip section to be removed.

3 Use a small flat blade screwdriver to push in and release the wire from the terminal strip.

4 Locate the removal tab on the bottom or top of the terminal strip section.

5 Use a small flat blade screwdriver to gently pry up on the tab of the terminal strip section and remove it.

Hydraulic Pumps

7-1
Function Pump

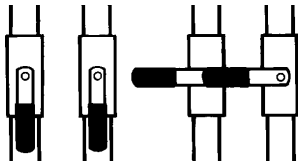
How to Remove the Function Pump

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 **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 from 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. The only adjustment that can be made to the pump is the neutral or null adjustment. Any internal service to the pump should only be performed at an authorized Sundstrand-Sauer service center. Call 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.

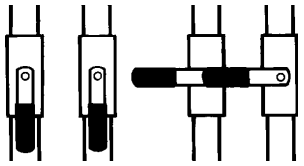
Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or the hose end must be replaced. All connections must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

1 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

HYDRAULIC PUMPS

3 Tag, disconnect and plug the hydraulic hoses from 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

NOTICE Component damage hazard. Be sure that the hydraulic tank shutoff valves (if equipped) are in the open position before priming the pump. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur.

1 Connect a 0 to 600 psi / 0 to 40 bar pressure gauge to the diagnostic nipple on the drive pump.

2 **GM and Ford models:** Close the valve on the LPG tank, then disconnect the hose from the tank. Move the fuel select toggle switch to the LPG position.
Deutz and Perkins models: Disconnect the engine wiring harness from the fuel solenoid at the injector pump.

3 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 300 psi / 20.7 bar.

4 **GM and Ford models:** Connect the LPG hose to the LPG tank and open the valve on the tank.
Deutz and Perkins models: Connect the engine wiring harness to the fuel solenoid.

5 Start the engine from the ground controls and check for hydraulic leaks.

Manifolds

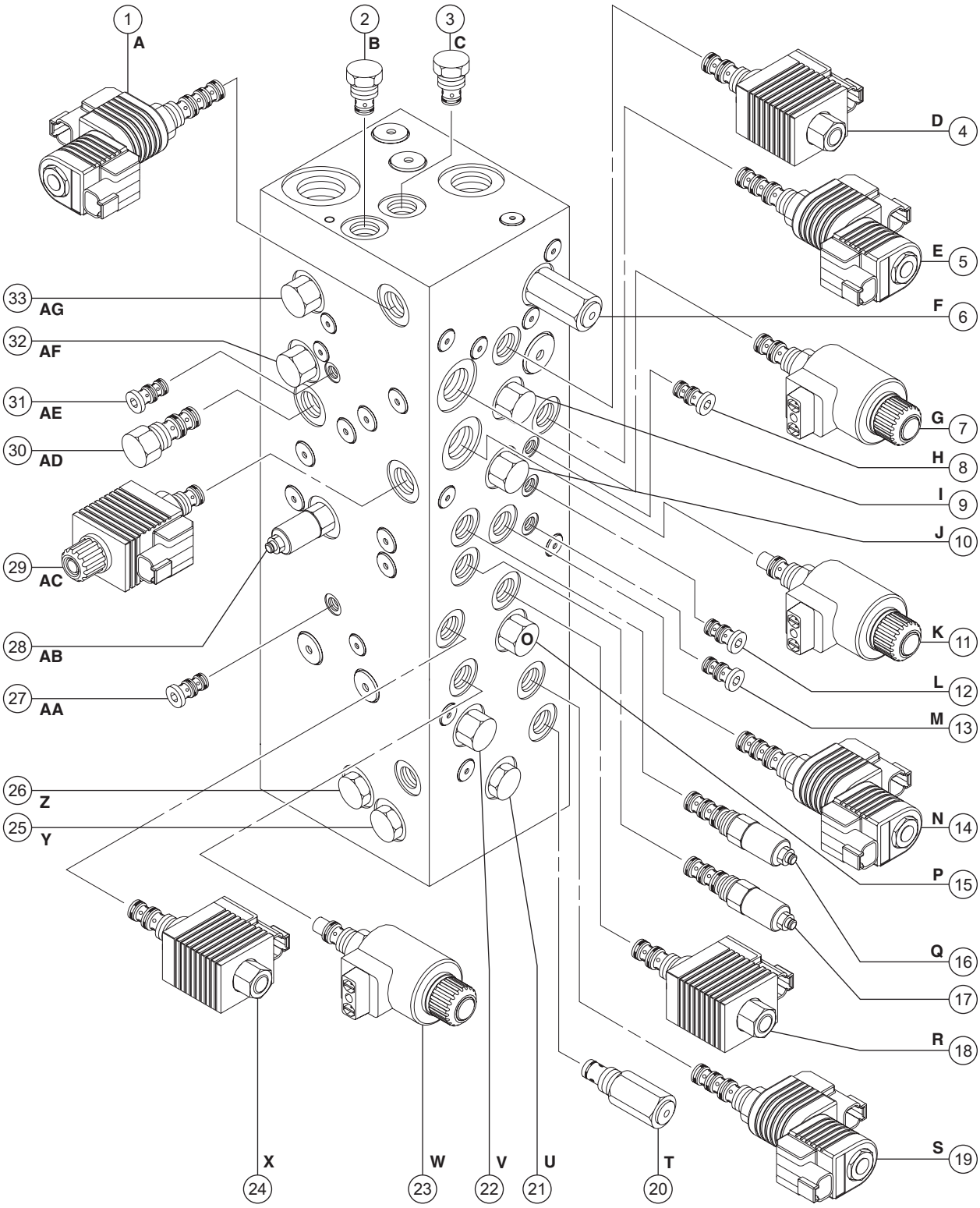
8-1
Function Manifold Components - View 1

The function manifold assembly is located on the tank side tray, behind the ground control box.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	A	Platform rotate left/right	25-30 ft-lbs / 34-41 Nm
2	Check valve, 30 psi / 2 bar	B	Platform rotate circuit (prevents hydraulic hoses from draining back to tank)	20-25 ft-lbs / 27-34 Nm
3	Check valve, 30 psi / 2 bar	C	Platform rotate circuit (prevents hydraulic hoses from draining back to tank)	20-25 ft-lbs / 27-34 Nm
4	Solenoid valve, 2 position 3 way	D	Boom retract	33-37 ft-lbs / 45-50 Nm
5	Solenoid valve, 3 position 4 way	E	Turntable rotate left/right	25-30 ft-lbs / 34-41 Nm
6	Relief valve, 2500 psi / 172 bar	F	Boom extend/retract circuit	20-25 ft-lbs / 27-34 Nm
7	Solenoid valve, 2 position 3 way	G	Boom extend	50-55 ft-lbs / 68-75 Nm
8	Check valve	H	Differential sensing circuit, turntable rotate left/right	8-10 ft-lbs / 10-15 Nm
9	Differential sensing valve	I	Boom extend/retract circuit (prevents overflowing the proportional valve)	30-35 ft-lbs / 41-47 Nm
10	Differential sensing valve	J	Turntable rotate left/right circuit (prevents overflowing the proportional valve)	30-35 ft-lbs / 41-47 Nm
11	Proportional solenoid valve	K	Boom extend/retract circuit	30-35 ft-lbs / 41-47 Nm
12	Check valve	L	Differential sensing circuit, platform level down	8-10 ft-lbs / 10-15 Nm
13	Check valve	M	Differential sensing circuit, platform level up	8-10 ft-lbs / 10-15 Nm
14	Solenoid valve, 3 position 4 way	N	Platform level up/down	25-30 ft-lbs / 34-41 Nm
15	Differential sensing valve	O	Boom up/down circuit (prevents overflowing the proportional valve)	30-35 ft-lbs / 41-47 Nm
16	Counterbalance valve	P	Platform level down circuit	35-40 ft-lbs / 47-54 Nm
17	Counterbalance valve	Q	Platform level up circuit	35-40 ft-lbs / 47-54 Nm
18	Solenoid valve, 2 position 3 way	R	Boom down	33-37 ft-lbs / 45-50 Nm
19	Solenoid valve, 3 position 4 way	S	Steer left/right and axle extend/retract	35-40 ft-lbs / 47-54 Nm
20	Relief valve, 2900 psi / 200 bar	T	System relief	30-35 ft-lbs / 41-47 Nm

This list continues. Please turn the page.

MANIFOLDS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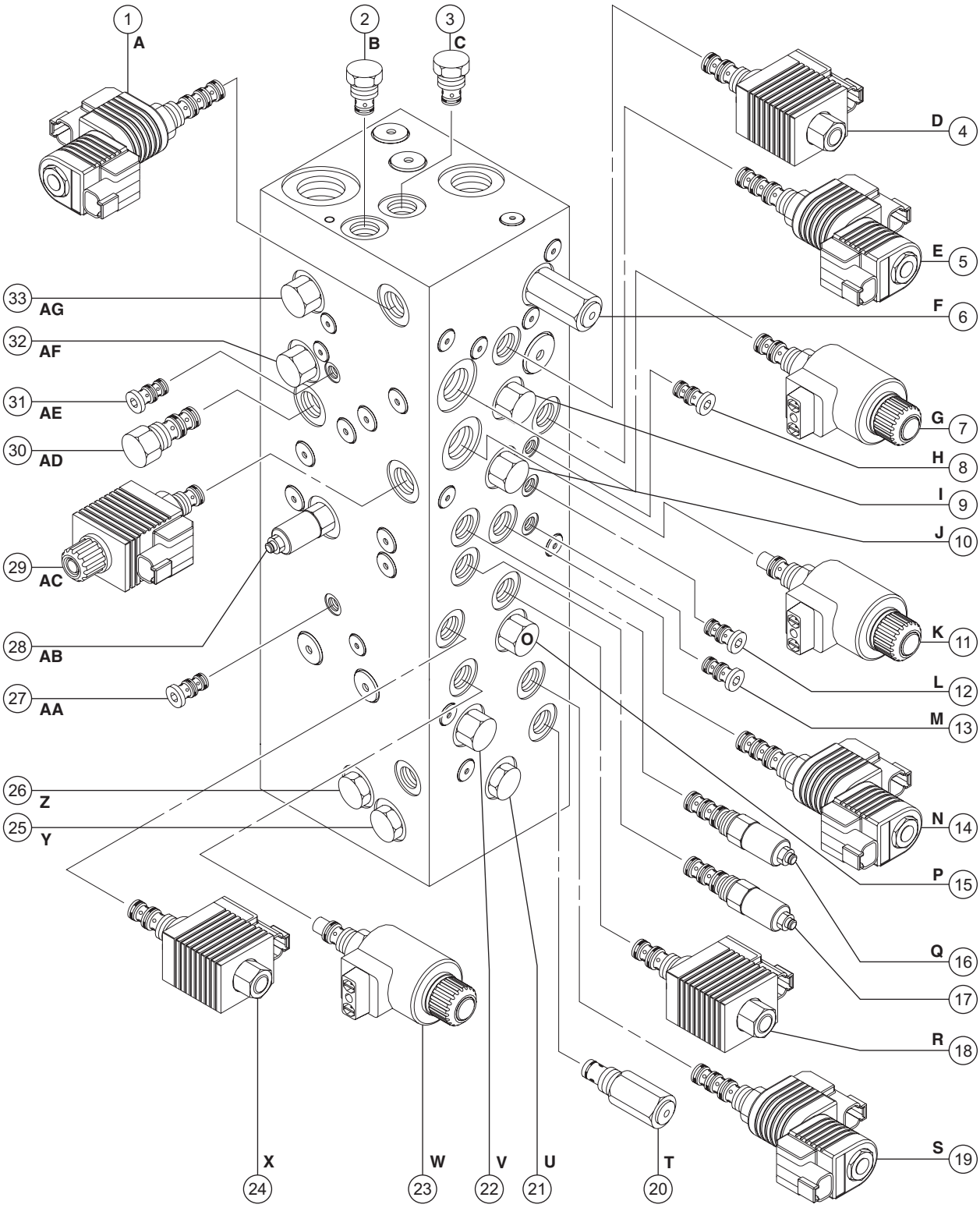
Function Manifold Components - View 1, continued

Index No.	Description	Schematic Item	Function	Torque
21	Check valve	U	Blocks flow from auxiliary pump to function pump	30-35 ft-lbs / 41-47 Nm
22	Priority flow regulator valve, 3.5 gpm / 13.2 L/min	V	Steer circuit	30-35 ft-lbs / 41-47 Nm
23	Proportional solenoid valve	W	Boom up/down circuit	30-35 ft-lbs / 41-47 Nm
24	Solenoid valve, 2 position 3 way	X	Boom up	33-37 ft-lbs / 45-50 Nm
25	Check valve	Y	Blocks flow from function pump to auxiliary pump	30-35 ft-lbs / 41-47 Nm
26	Check valve	Z	Hydraulic oil cooler bypass	30-35 ft-lbs / 41-47 Nm
27	Check valve	AA	Boom up/down circuit	8-10 ft-lbs / 10-15 Nm
28	Needle valve	AB	Platform level circuit	30-35 ft-lbs / 41-47 Nm
29	Proportional solenoid valve	AC	Turntable rotate circuit	20-30 ft-lbs / 27-47 Nm
30	Differential sensing valve	AD	Meters flow to functions	30-35 ft-lbs / 41-47 Nm
31	Check valve	AE	Differential sensing circuit, boom extend/retract	8-10 ft-lbs / 10-15 Nm
32	Flow regulator valve, 0.1 gpm / 0.37 L/min	AF	Bleeds off differential sensing valves to tank	20-25 ft-lbs / 27-34 Nm
33	Flow regulator valve, 0.6 gpm / 2.27 L/min	AG	Platform rotate circuit	20-25 ft-lbs / 27-34 Nm

MANIFOLDS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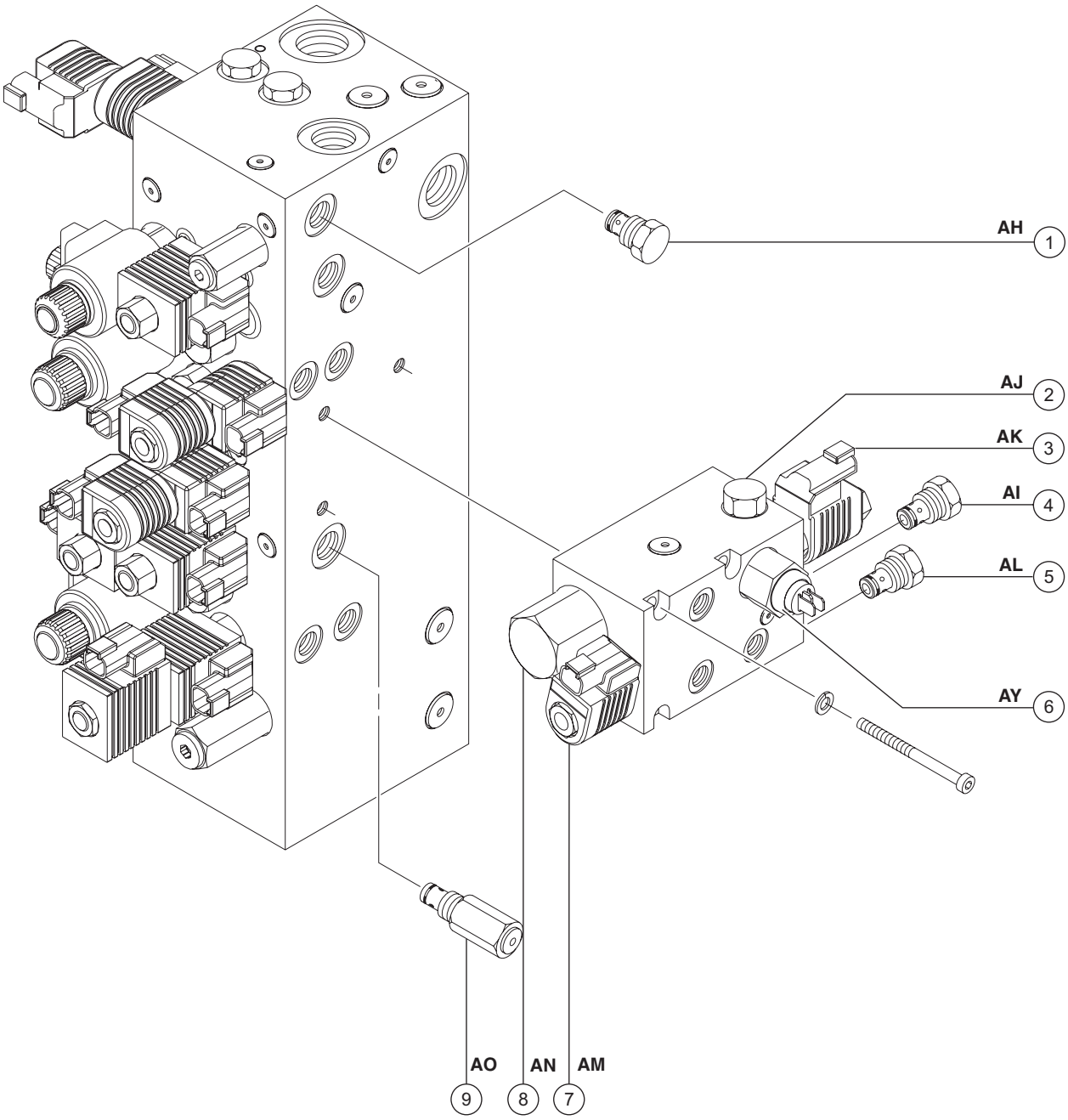
8-2
Function Manifold Components - View 2

The function manifold assembly is located on the tank side tray, behind the ground control box.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 30 psi / 2 bar	AH	Platform rotate circuit (prevents hydraulic hoses from draining back to tank)	20-25 ft-lbs / 27-34 Nm
2	Flow regulator valve, 0.3 gpm / 1.14 L/min	AJ	Dump circuit source from charge pump	20-25 ft-lbs / 27-34 Nm
3	Solenoid valve, 2 position 2 way	AK	Allows boom functions to operate with the boom in the stowed position	26-30 ft-lbs / 34-41 Nm
4	Check valve, 30 psi / 2 bar	AI	Blocks flow from charge pump to auxiliary pump	20-25 ft-lbs / 27-34 Nm
5	Check valve, 30 psi / 2 bar	AL	Blocks flow from auxiliary pump to charge pump	20-25 ft-lbs / 27-34 Nm
6	Pressure Switch, 180 psi / 12.4 bar	AY	Axle extend pressure switch	26-30 ft-lbs / 34-41 Nm
7	Solenoid valve, 2 position 3 way	AM	Provides pilot signal to redirect steer flow to axle extension system	26-30 ft-lbs / 34-41 Nm
8	Directional valve, 2 position 2 way, pilot operated	AN	Dump valve that allows boom functions to operate when axles are fully extended	90-100 ft-lbs / 122-136 Nm
9	Relief valve, 2100 psi / 145 bar	AO	Boom down	20-25 ft-lbs / 27-34 Nm

MANIFOLDS



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 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the diagnostic nipple (PTEST port) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable/rpm select toggle switch to the high idle position and activate and hold the boom retract toggle switch with the boom fully retracted. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Hydraulic Specifications.*

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item T) on the function manifold.

5 Adjust the internal hex socket. Turn it clockwise to increase pressure or counterclockwise to decrease pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valves higher than specified.

6 Repeat steps 2 through 5 to confirm relief valve pressure.

How to Adjust the 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 diagnostic nipple (PTEST port) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable/rpm select toggle switch to the high idle position and activate and hold the boom down toggle switch with the boom fully lowered. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Hydraulic Specifications.*

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AO) on the function manifold.

5 Adjust the internal hex socket. Turn it clockwise to increase pressure or counterclockwise to decrease pressure. Install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valves higher than specified.

6 Repeat steps 2 through 5 and confirm relief valve pressure.

MANIFOLDS

How to Adjust the Boom Extend Relief Valve

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

1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the diagnostic nipple (PTEST port) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable/rpm select toggle switch to the high idle position and activate and hold the boom extend toggle switch with the boom fully extended. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Hydraulic Specifications.*

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item F) on the function manifold.

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.

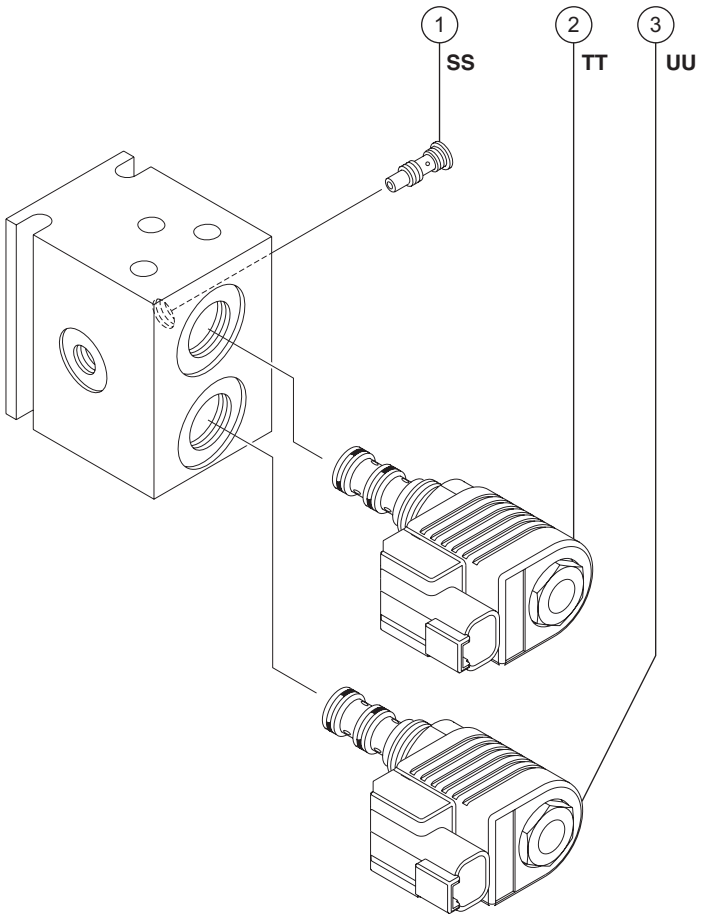
⚠WARNING Tip-over hazard. Do not adjust the relief valves higher than specified.

6 Repeat steps 2 through 5 to confirm relief valve pressure.

8-4
Brake/Two-Speed Manifold Components (from serial number 4436 to 4617 and before 4212)

The brake/two-speed manifold is mounted on the engine tray.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve	SS	Brake circuit	8-10 ft-lbs / 10-15 Nm
2	Solenoid valve, 2 position 3 way	TT	Brake release	25-30 ft-lbs / 34-41 Nm
3	Solenoid valve, 2 position 3 way	UU	2-Speed wheel motors (energized in high range to destroke the drive motor swash plates)	25-30 ft-lbs / 34-41 Nm

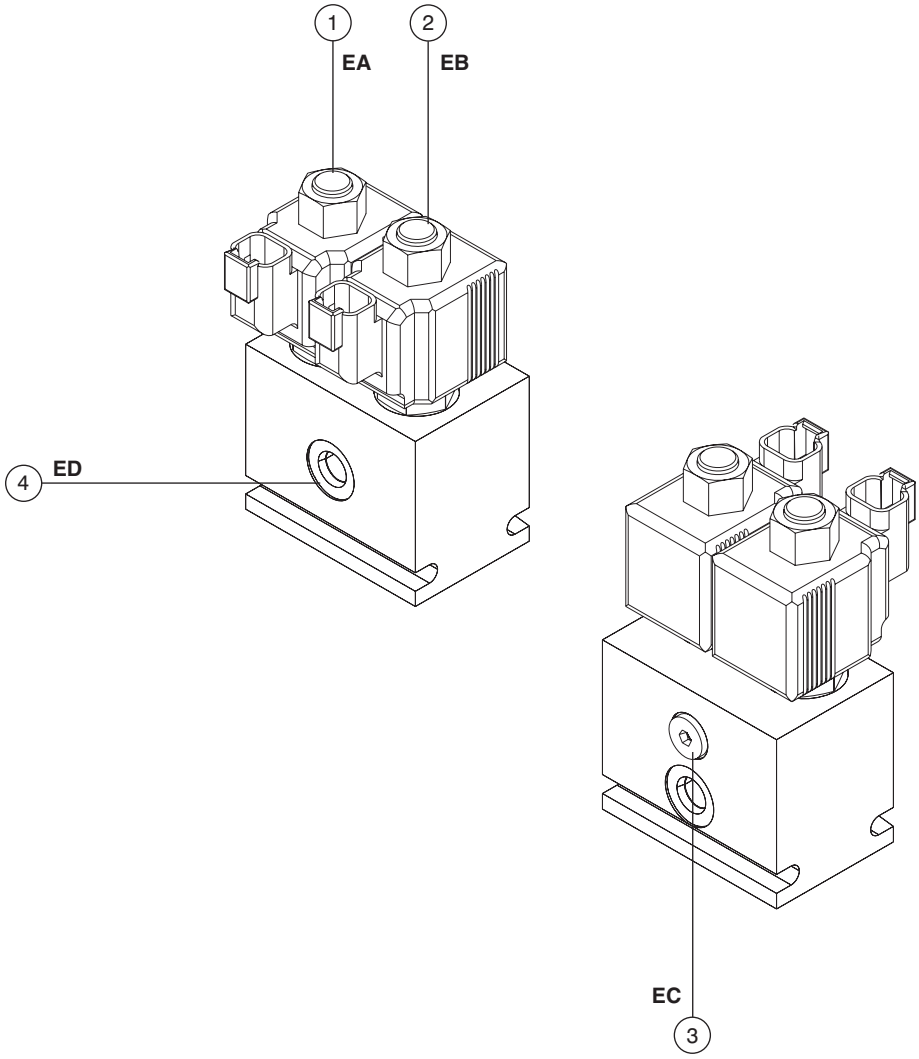


MANIFOLDS

8-5
Brake / Two Speed Manifold Components (from serial number 4212 to 4435 and after 4617)

The brake/two speed manifold is mounted inside the drive chassis.

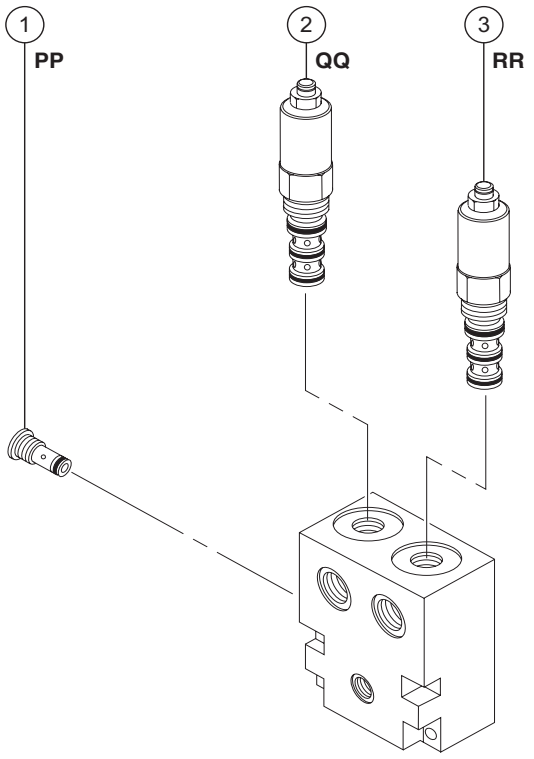
Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 3 way	EA	Releases brakes	47-52 ft-lbs / 64-70 Nm
2	Solenoid valve, 2 position 3 way	EB	2 speed motor shift	47-52 ft-lbs / 64-70 Nm
3	Check valve	EC	One way flow	8-10 ft-lbs / 11-14 Nm
4	Orifice, 0.042 inch / 1.07 mm	ED	Controls flow to tank	



8-6
Turntable Rotation Manifold Components

The turntable rotation manifold is mounted to the turntable rotation motor at the ground control side of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Shuttle valve, 2 position 3 way	PP	Turntable rotation brake release	8-10 ft-lbs / 10-15 Nm
2	Counterbalance valve	QQ	Turntable rotate left	25-30 ft-lbs / 34-41 Nm
3	Counterbalance valve	RR	Turntable rotate right	25-30 ft-lbs / 34-41 Nm

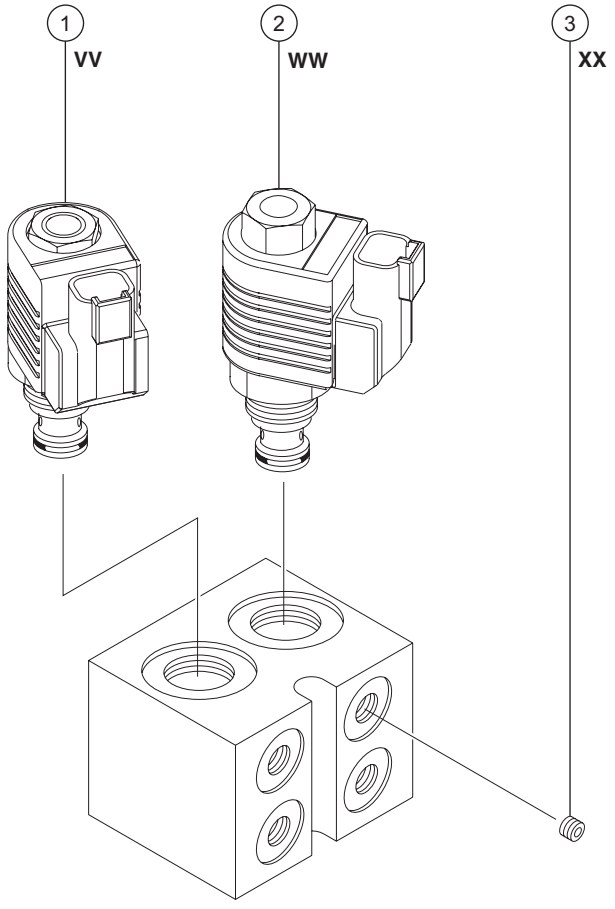


MANIFOLDS

8-7
Jib Boom Select Manifold Components, S-85

The jib boom/platform rotate manifold is mounted on the platform end of the boom.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 3 way	VV	Platform rotate select	8-10 ft-lbs / 11-14 Nm
2	Solenoid valve, 2 position 3 way	WW	Jib boom select	20-25 ft-lbs / 27-34 Nm
3	Orifice Plug, 0.035 inch / 0.89 mm	XX	Jib boom circuit	

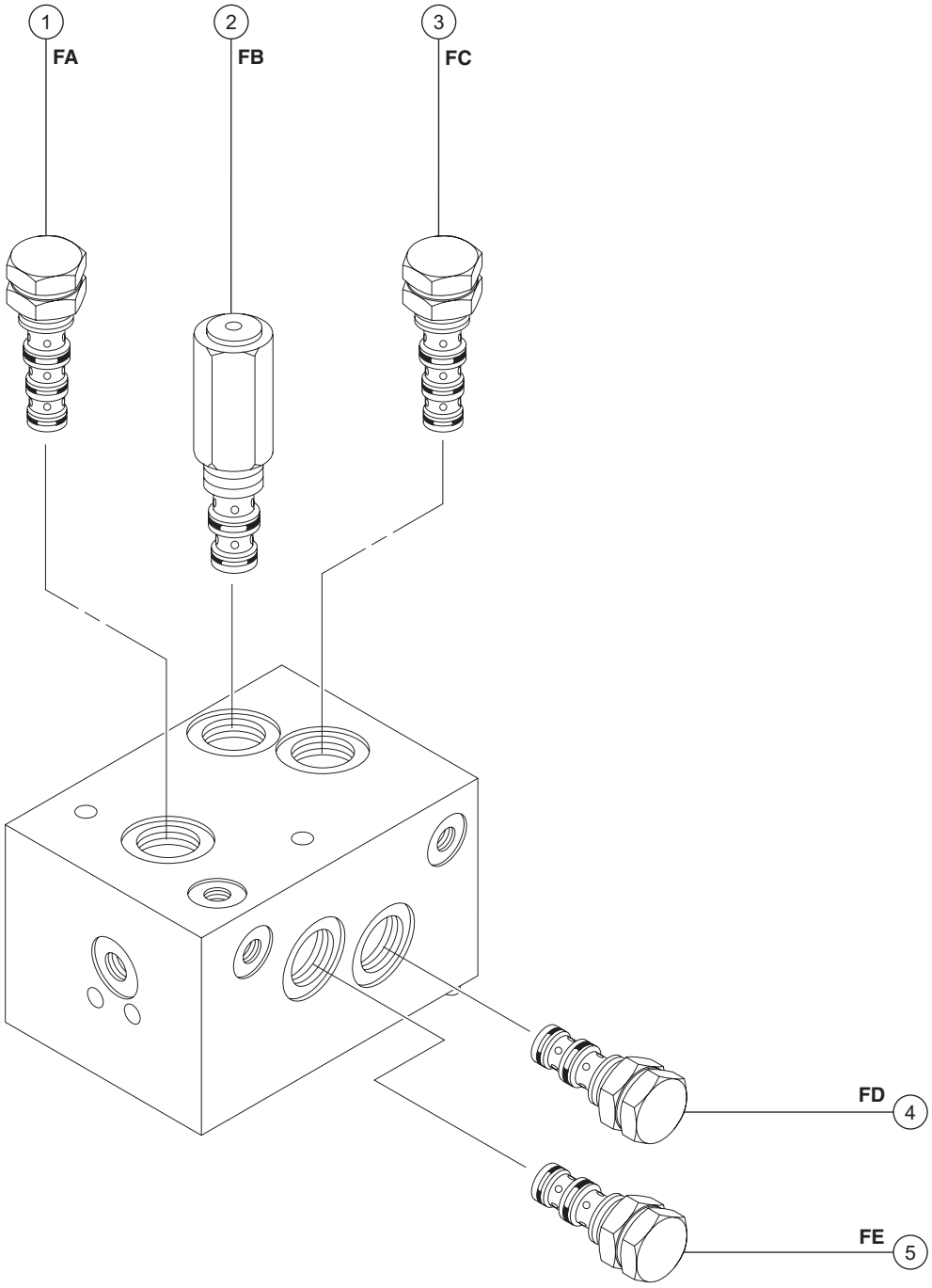


8-8
Axle Select Manifold Components

The axle select manifold is mounted next to the drive manifold at the non-steer end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Directional valve, pilot operated 2 position 3 way	FA	Directs flow from steer cylinders to axle extend circuit	30-35 ft-lbs / 41-47 Nm
2	Pressure reducing valve, 1000 psi / 69 bar	FB	Limits pressure to tie rod cylinder during axle extension	30-35 ft-lbs / 41-47 Nm
3	Directional valve, pilot operated 2 position 3 way	FC	Directs flow from steer cylinders to axle retract circuit	30-35 ft-lbs / 41-47 Nm
4	Directional valve, pilot operated 2 position 2 way	FD	Locks out steer cylinders during axle extend/retract	30-35 ft-lbs / 41-47 Nm
5	Directional valve, pilot operated 2 position 2 way	FE	Locks out steer cylinders during axle extend/retract	30-35 ft-lbs / 41-47 Nm

MANIFOLDS

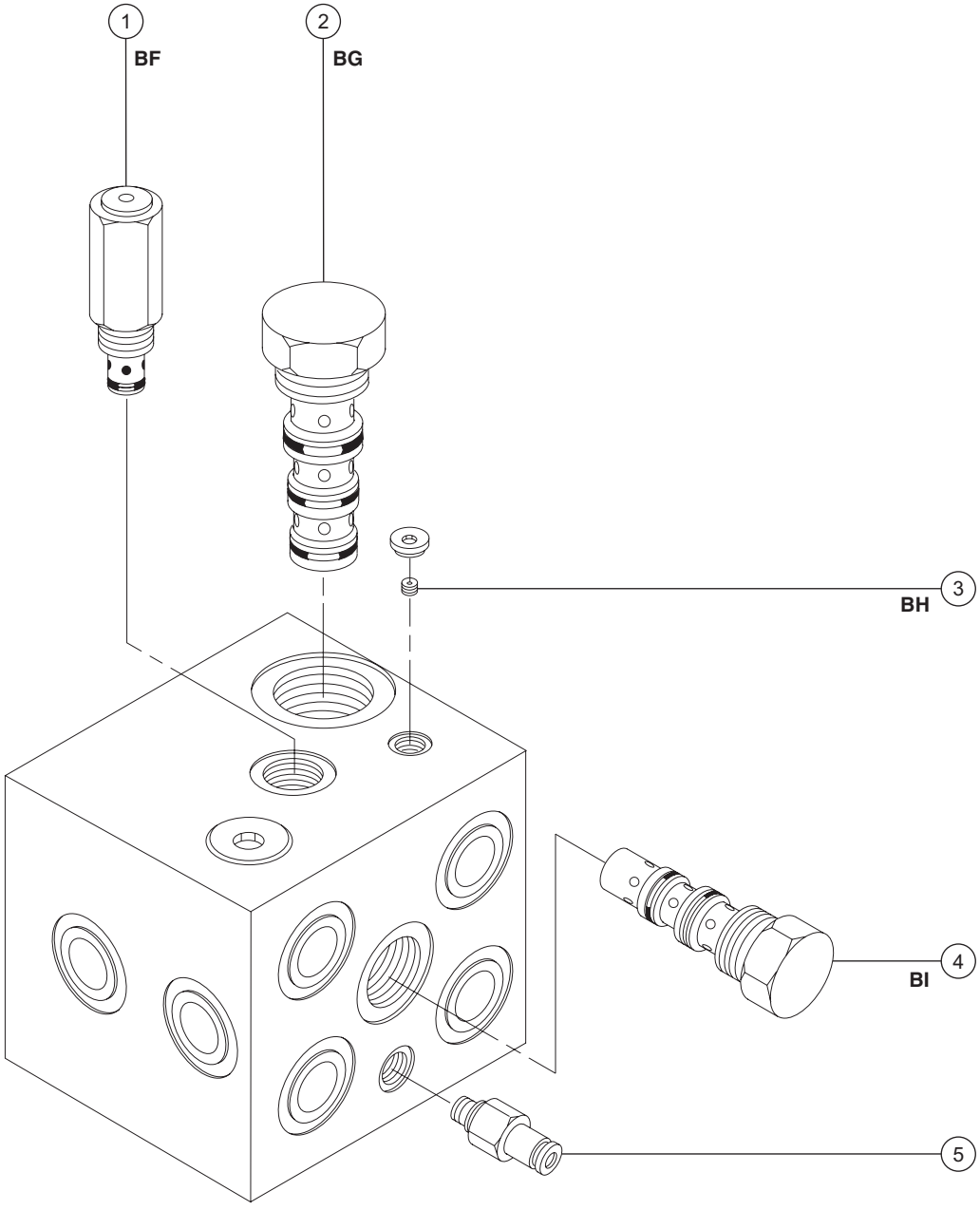


8-9
2WD Traction Manifold Components (before serial number 3853)

The drive manifold is mounted inside the drive chassis at the non-steer end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Relief valve, 280 psi / 19.3 bar	BF	Charge pressure circuit	30-35 ft-lbs / 41-47 Nm
2	Flow divider/combiner valve	BG	Controls flow to drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm
3	Orifice - plug, 0.070 inch / 1.77 mm	BH	Equalizes flow across flow divider/combiner valve (item BG)	
4	Shuttle valve	BI	Charge pressure circuit that gets hot oil out of low pressure side of drive pump	50-55 ft-lbs / 68-75 Nm
5	Diagnostic nipple		Testing	

MANIFOLDS

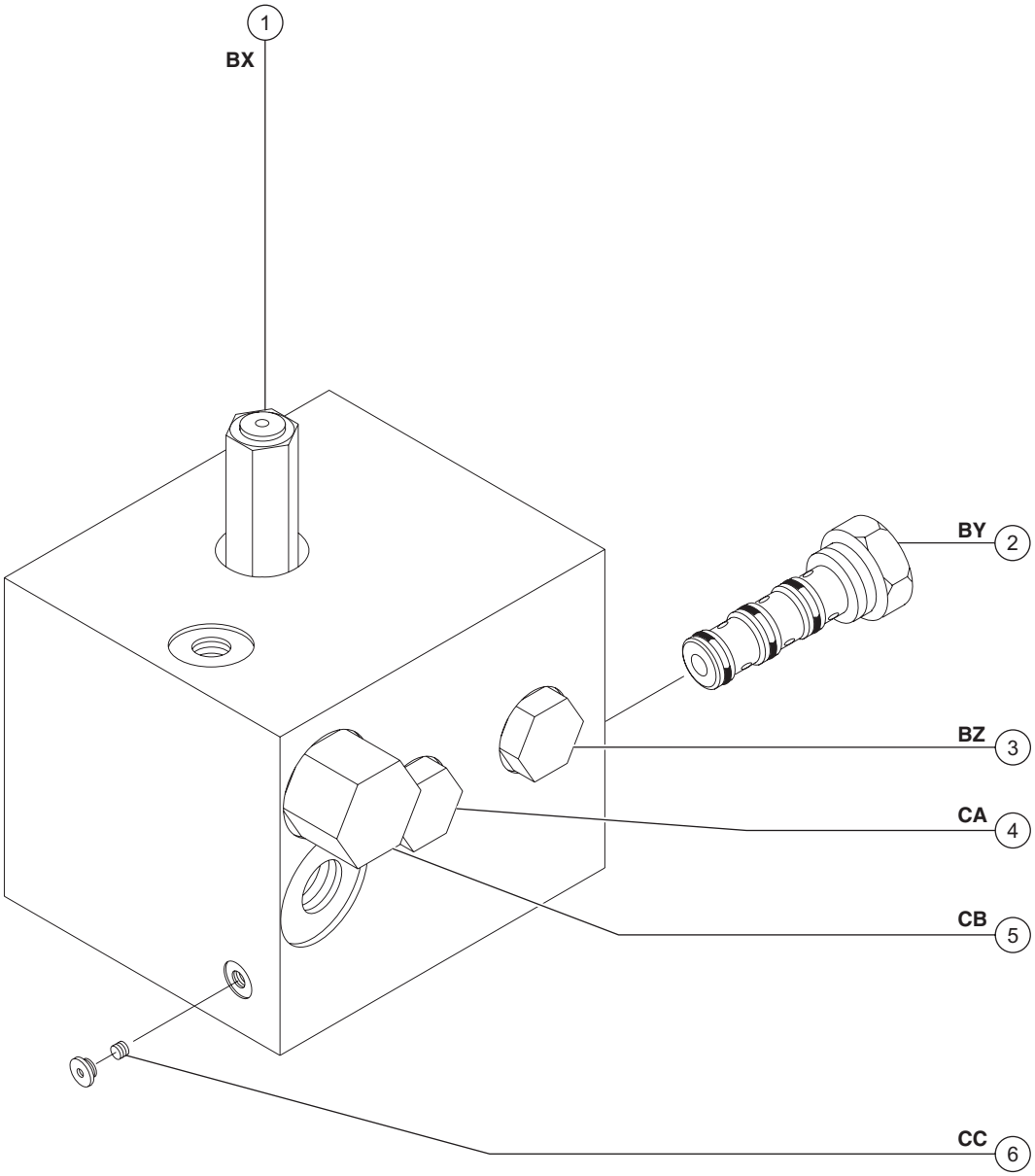


8-10
2WD Traction Manifold Components (after serial number 3852)

The drive manifold is mounted inside the drive chassis at the non-steer end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Relief Valve, 280 psi / 19.3 bar	BX	Charge pressure circuit	30-35 ft-lbs / 41-47 Nm
2	Flow Divider / Combiner Valve	BY	Controls flow to drive motors in forward and reverse	90-100 ft-lbs / 120-133 Nm
3	Check Valve, 5 psi / 0.34 bar	BZ	Drive circuit	30-35 ft-lbs / 41-47 Nm
4	Check Valve, 5 psi / 0.34 bar	CA	Drive circuit	30-35 ft-lbs / 41-47 Nm
5	Shuttle Valve, 3 position 3 way	CB	Controls flow to drive motors in forward and reverse	50-55 ft-lbs / 67-73 Nm
6	Orifice Plug, 0.070 inch / 1.78 mm	CC	Equalizes flow across flow combiner/ divider valve BY	

MANIFOLDS

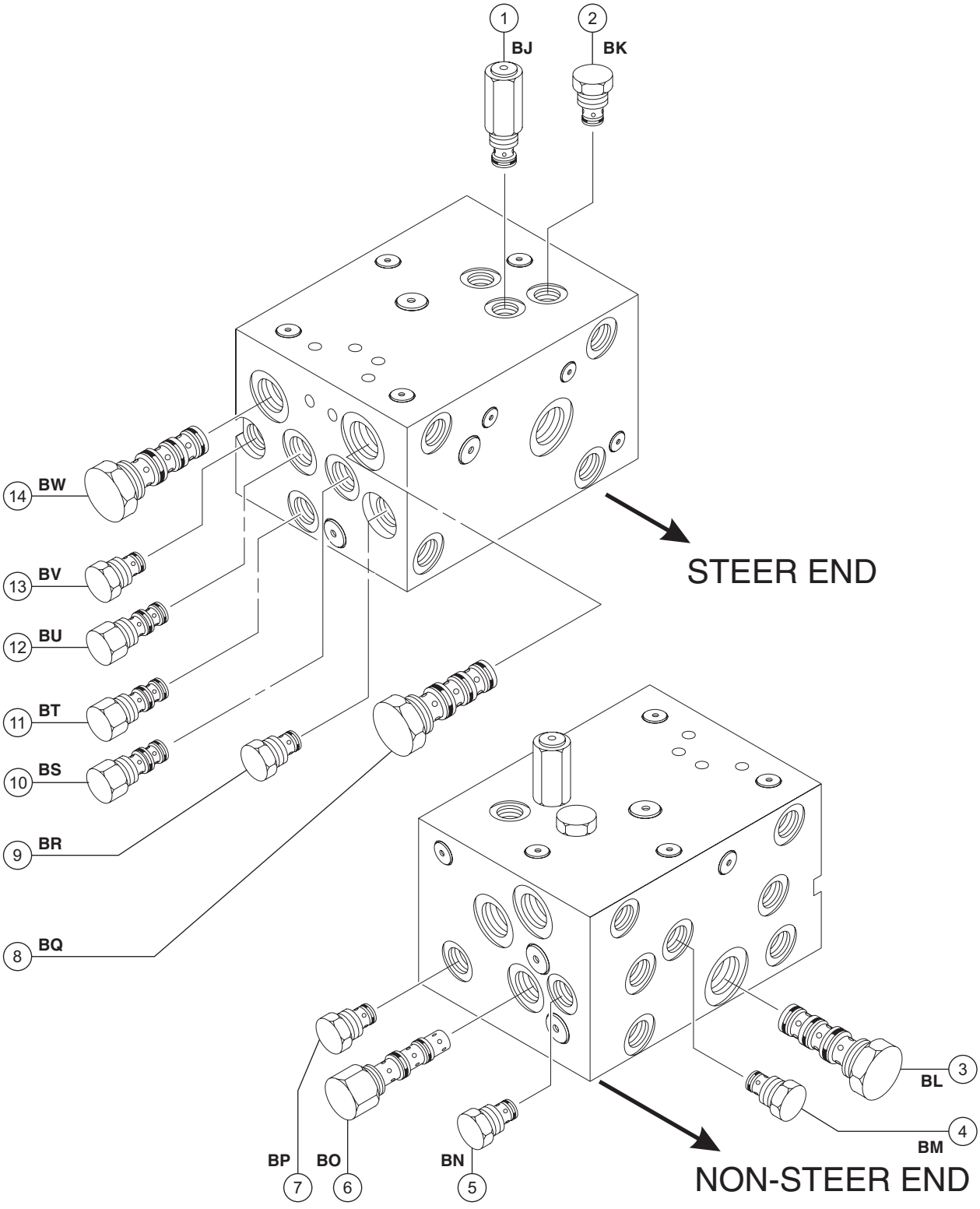


8-11
4WD Traction Manifold Components (before serial number 3835)

The drive manifold is mounted inside the drive chassis at the non-steer end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Relief valve, 280 psi / 19.3 bar	BJ	Charge pressure circuit	20-25 ft-lbs / 27-34 Nm
2	Check valve, 5 psi / 0.34 bar	BK	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
3	Flow divider/combiner valve	BL	Controls flow to flow divider/combiner valves BQ and BW	90-100 ft-lbs / 122-136 Nm
4	Check valve, 5 psi / 0.34 bar	BM	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
5	Check valve, 5 psi / 0.34 bar	BN	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
6	Shuttle valve	BO	Charge pressure circuit that gets hot oil out of low pressure side of drive pump	50-55 ft-lbs / 68-75 Nm
7	Check valve, 5 psi / 0.34 bar	BP	Drive motor anti-cavitation	30-35 ft-lbs / 41-47 Nm
8	Flow divider/combiner valve	BQ	Controls flow to steer end drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm
9	Check valve, 5 psi / 0.34 bar	BR	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
10	Flow regulator valve, 2 gpm / 7.6 L/min	BS	Equalizes pressure on both sides of flow divider/combiner valve BQ	30-35 ft-lbs / 41-47 Nm
11	Flow regulator valve, 2 gpm / 7.6 L/min	BT	Equalizes pressure on both sides of flow divider/combiner valve BL	30-35 ft-lbs / 41-47 Nm
12	Flow regulator valve, 2 gpm / 7.6 L/min	BU	Equalizes pressure on both sides of flow divider/combiner valve BW	30-35 ft-lbs / 41-47 Nm
13	Check valve, 5 psi / 0.34 bar	BV	Drive motor anti-cavitation	20-25 ft-lbs / 27-34 Nm
14	Flow divider/combiner valve	BW	Controls flow to non-steer end drive motors in forward and reverse	90-100 ft-lbs / 122-136 Nm

MANIFOLDS

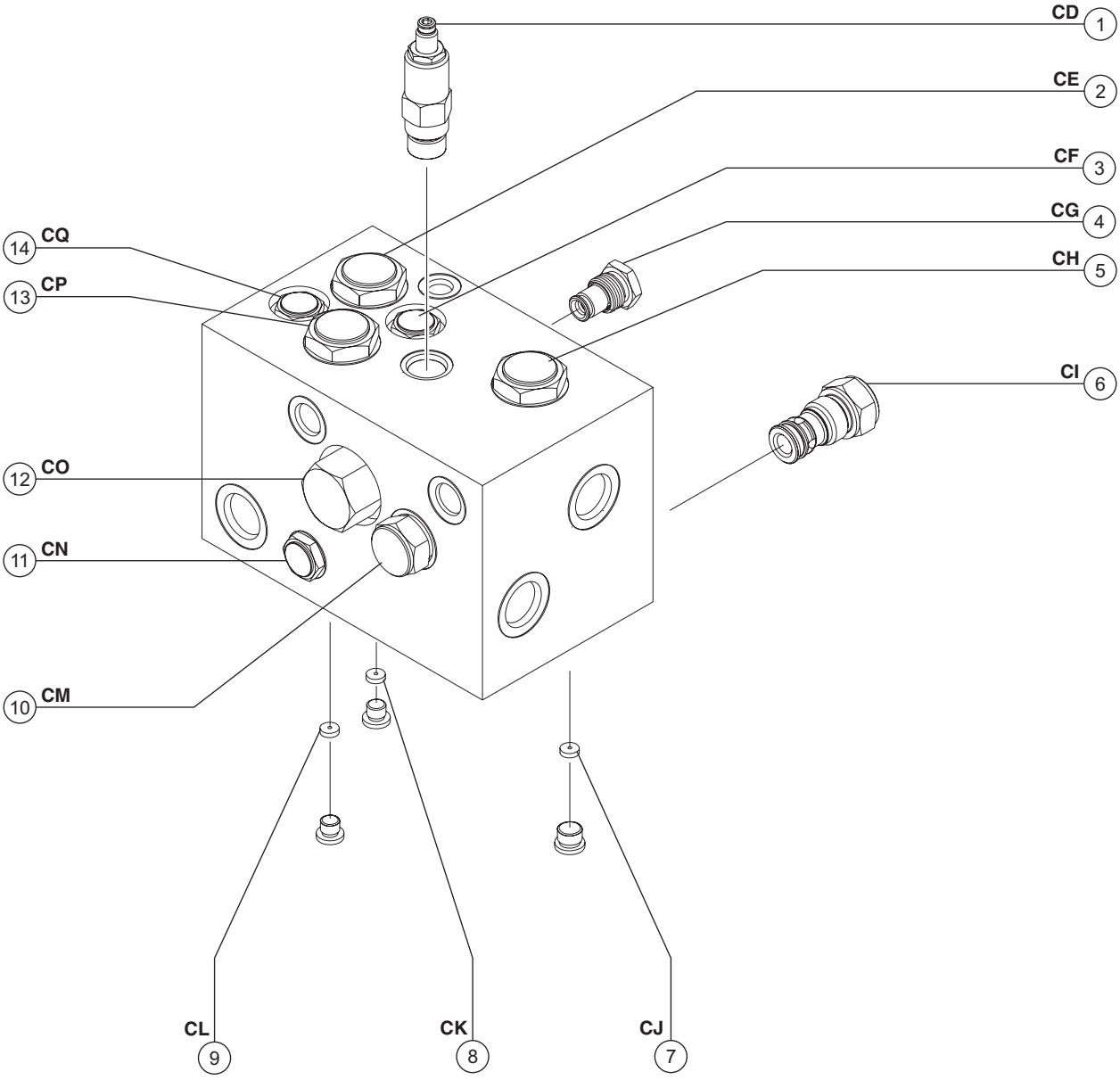

1
BJ
2
BK
14
BW
13
BV
12
BU
11
BT
10
BS
9
BR
8
BQ
STEER END
3
BL
4
BM
BP
7
BO
6
BN
5
NON-STEER END

8-12
4WD Traction Manifold Components (after serial number 3834)

The drive manifold is mounted inside the drive chassis at the non-steer end of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Relief valve, 280 psi / 19.3 bar	CD	Charge pressure circuit	35-40 ft-lbs / 48-54 Nm
2	Flow divider/combiner valve	CE	Controls flow to non-steer end drive motors in forward and reverse	80-90 ft-lbs / 108-122 Nm
3	Check valve	CF	Steer end drive motor circuit	35-40 ft-lbs / 48-54 Nm
4	Check valve	CG	Non-steer end drive motor circuit	35-40 ft-lbs / 48-54 Nm
5	Flow divider/combiner valve	CH	Controls flow to flow divider/combiner valves 2 and 13	80-90 ft-lbs / 108-122 Nm
6	Check valve	CI	Non-steer end drive motor circuit	60-70 ft-lbs / 81-95 Nm
7	Orifice, 0.040 inch / 1 mm	CJ	Equalizes pressure on both sides of flow divider/combiner valve 5	
8	Orifice, 0.040 inch / 1 mm	CK	Equalizes pressure on both sides of flow divider/combiner valve 2	
9	Orifice, 0.040 inch / 1 mm	CL	Equalizes pressure on both sides of flow divider/combiner valve 13	
10	Check valve	CM	Steer end drive motor circuit	60-70 ft-lbs / 81-95 Nm
11	Check valve	CN	Steer end drive motor circuit	35-40 ft-lbs / 48-54 Nm
12	Shuttle valve, 3 position 3 way	CO	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	80-90 ft-lbs / 108-122 Nm
13	Flow divider/combiner valve	CP	Controls flow to steer end drive motors in forward and reverse	80-90 ft-lbs / 108-122 Nm
14	Check valve	CQ	Non-steer end drive motor circuit	35-40 ft-lbs / 48-54 Nm

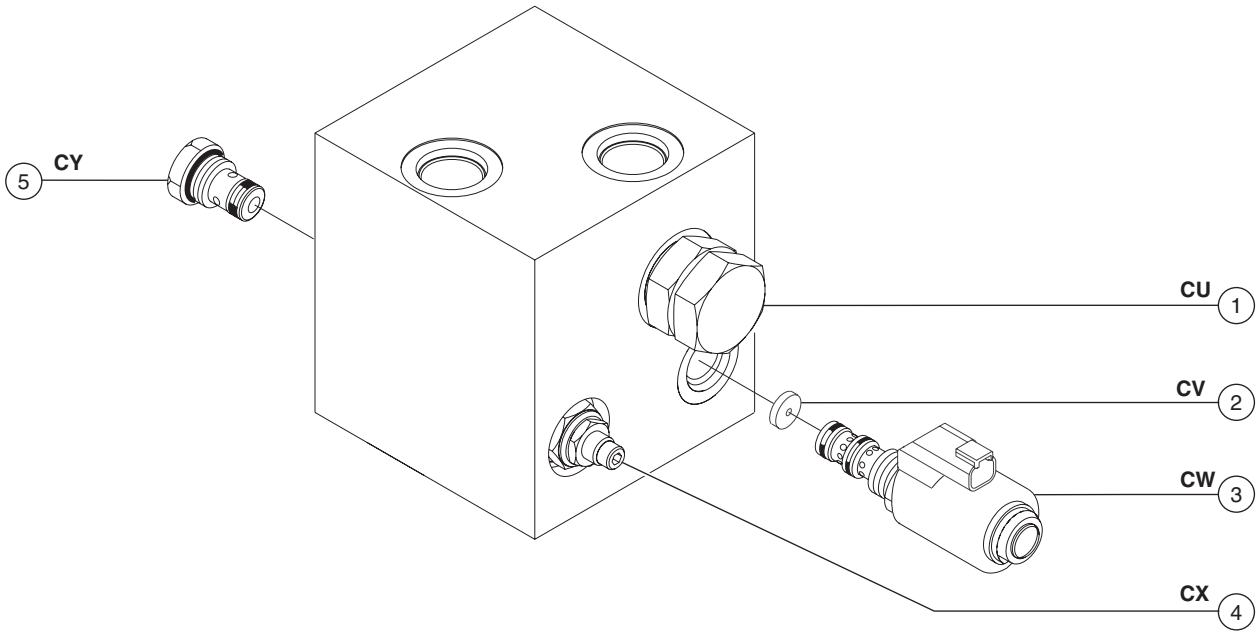
MANIFOLDS



8-13
Drive 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	Directional Valve	CU	Diverter valve	80-90 ft-lbs / 108-122 Nm
2	Orifice disc, 0.030 inch / 0.080 cm	CV	Delays shift to drive	
3	Solenoid valve	CW	Pilot valve to diverter	35-40 ft-lbs / 47-54 Nm
4	Relief valve	CX	Charge pressure circuit	35-40 ft-lbs / 47-54 Nm
5	Check valve	CY	Prevents oil to generator	35-40 ft-lbs / 47-54 Nm



MANIFOLDS

8-14 Valve Adjustments - Traction Manifold

How to Adjust the Hot Oil Shuttle Relief Valve

Note: The pressure differential between the charge pump relief valve (located in the drive pump) and the hot oil shuttle relief valve (located in the traction manifold) is necessary to return hot oil from the closed loop drive circuit to the hydraulic tank for cooling. This pressure differential must be maintained at 40 psi / 14.5 bar.

Note: The following procedure will require two people.

1 Open the engine side turntable cover and connect a 0 to 600 psi / 0 to 40 bar pressure gauge to the diagnostic nipple on the drive pump.

2 Start the engine from the platform controls and allow the engine to run at low idle. Note the pressure reading on the pressure gauge.

3 Turn the engine off and connect a 0 to 600 psi / 0 to 40 bar pressure gauge to the diagnostic nipple located on the traction manifold.

4 Start the engine from the platform controls and drive the machine slowly in the forward direction. Note the pressure reading on the pressure gauge.

5 Turn the engine off, and remove the hot oil shuttle relief valve cap (item BJ). Adjust the internal hex socket clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the valve cap.

6 Repeat steps 4 and 5 until a pressure differential (between the charge pump reading and the hot oil shuttle relief valve) of 40 psi / 14.5 bar is obtained.

8-15 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/burn 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.

Proportional solenoid valve (schematic items K and W)	4.8 Ω
2 position 3 way solenoid valve (schematic items D, R, X, TT and UU)	6.3 Ω
2 position 3 way solenoid valve (schematic items G)	3.3 Ω
3 position 4 way solenoid valve (schematic items A, E, N and S)	6.3 Ω
2 position 3 way solenoid valve (schematic items AK, AM, VV and WW)	6.3 Ω
2 position 3 way solenoid valve (schematic item G)	3.3 Ω

MANIFOLDS

How to Test a Coil Diode

Genie incorporates spike suppressing diodes in all of its directional valve coils except proportional valves and those coils with a metal case. 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/burn 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. Refer to, *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.

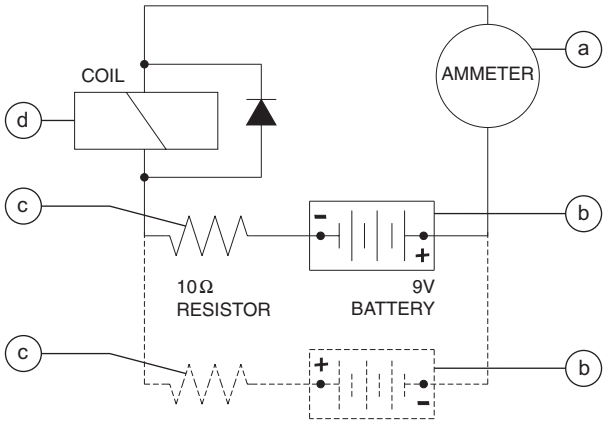
Note: The battery should read 9V DC or more when measured across the terminals.

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.

Note: If testing a single-terminal coil, connect the negative lead to the internal metallic ring at either end of the coil.



a multimeter
b 9V DC battery
c 10Ω resistor
d coil

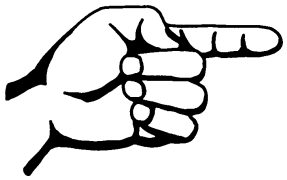
Note: Dotted lines in illustration indicate a reversed connection as specified in step 6.

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.



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Fuel and Hydraulic Tanks

9-1
Fuel Tank

How to Remove the Fuel Tank

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Remove the fuel tank 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.

1 Turn the manual fuel shutoff valve to the closed position (if equipped).

2 Remove the fuel filler cap from the tank.

3 Using an approved hand-operated pump, drain the fuel tank into a suitable container. Refer to capacity specifications.

⚠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 fuel.

4 Tag, disconnect, drain and plug the supply and return fuel hoses. Cap the fittings on the fuel tank.

5 Remove the fuel tank retaining fasteners.

6 Remove the fuel tank from the machine.

NOTICE Component damage hazard. The fuel tank is plastic and may become damaged if allowed to fall.

NOTICE Component damage hazard. When installing the plastic fuel tank, do not overtighten the retaining fasteners.

Note: Clean the fuel tank and inspect for damage before installing it onto the machine.

9-2 Hydraulic Tank

The primary functions of the hydraulic tank are to cool, clean and de-aerate the hydraulic fluid during operation. The tank utilizes internal suction strainers for the pump supply hoses and has an external return filter equipped with a filter condition indicator.

How to Remove the Hydraulic Tank

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.

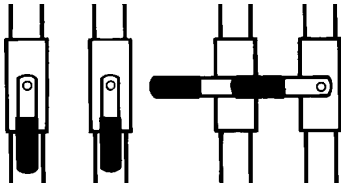
Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or the hose end must be replaced. All connections must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

1 Lower and retract the boom to the stowed position.

2 Remove the fuel tank. See 9-1, *How to Remove the Fuel Tank.*

3 Close the two hydraulic tank valves located at the hydraulic tank (if equipped).

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

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

5 Tag, disconnect and plug the two suction hoses that are attached to the hydraulic tank.

6 Tag and disconnect and plug the hose from the return filter. Cap the fitting on the return filter housing.

7 Tag and disconnect and plug the supply hose for the auxiliary power unit. Cap the fitting on the hydraulic tank.

8 Remove the retaining fasteners from the hydraulic tank hold down straps. Remove the hold down straps from the hydraulic tank.

FUEL AND HYDRAULIC TANKS

9 Support the hydraulic tank with 2 lifting straps. Place one lifting strap at each end of the tank and attach the lifting straps to an overhead crane.

10 Remove the hydraulic tank from the machine.

⚠WARNING Crushing hazard. The hydraulic tank could become unbalanced and fall if not properly supported and secured to the overhead crane.

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

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

13 Install the suction strainers using pipe thread sealant on the threads.

14 Install the drain plug using pipe thread sealant on the threads.

15 Install the hydraulic tank onto the machine.

16 Install the two suction hoses and the supply hose for the auxiliary power unit.

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

18 Clean up any oil that may have spilled.

19 Open the hydraulic tank shutoff valves (if equipped).

NOTICE Component damage hazard. Be sure to open the two hydraulic tank shutoff valves (if equipped) and prime the pump after installing the hydraulic tank.

Note: Always use pipe thread sealant when installing the drain plug and strainers.

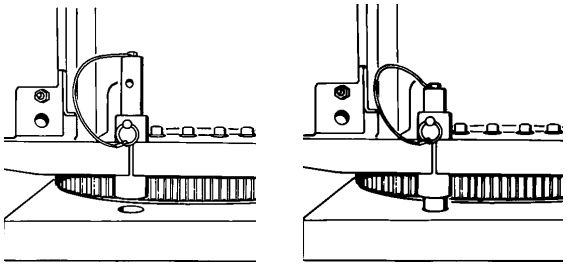
Turntable Rotation Components

10-1
Turntable Rotation Drive Hub Assembly

How to Remove the Turntable Rotation Drive Hub Assembly

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

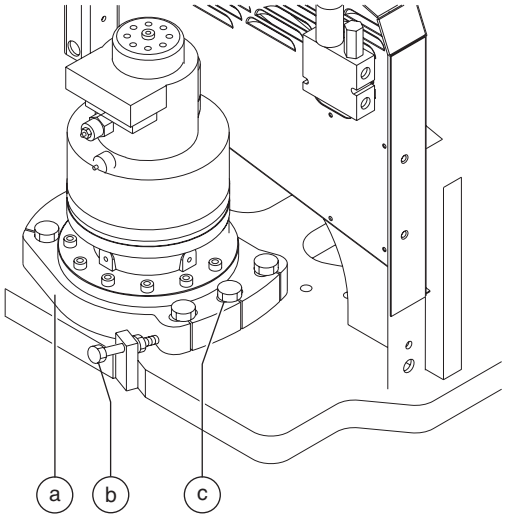


unlocked locked

2 Tag, disconnect and plug the hydraulic hoses from the drive motor. Cap the fittings on the motor.

⚠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 Loosen the backlash pivot plate and adjustment bolts.



a backlash pivot plate
b adjustment bolt with lock nut
c backlash pivot plate mounting bolts

4 Attach a suitable lifting device to the lifting eyes on the drive hub assembly.

5 Remove the backlash pivot plate mounting bolts. Carefully remove the drive hub assembly from the machine.

⚠WARNING Crushing hazard. The turntable rotation drive hub assembly could become unbalanced and fall when it is removed from the machine if not properly supported.

When installing the drive hub assembly:

6 Install the drive hub. Apply removable thread locking compound to fastener threads.Torque the backlash pivot plate mounting fasteners to specification. Refer to Section 2, *Machine Torque Specifications.*

7 Install the brake and then the motor onto the drive hub. Apply removable thread locking compound to fastener threads.Torque the motor/ brake mounting fasteners to specification. Refer to Section 2, *Machine Torque Specifications.*

8 Adjust turntable rotation gear backlash. See 10-1, *How to Adjust the Turntable Rotation Gear Backlash.*

TURNTABLE ROTATION COMPONENTS

How to Remove the Turntable Rotation Hydraulic Motor

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

Note: The turntable rotation lock pin is located next to the boom rest pad.

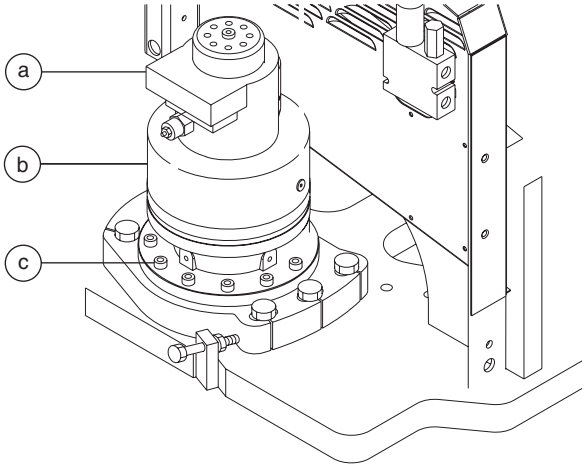
2 Tag, disconnect and plug the hydraulic hoses from the drive motor. Cap the fittings on the motor.

⚠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 hydraulic tube that connects from the counterbalance manifold to the brake. Cap the fittings on the brake and 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 motor/brake mounting fasteners. Carefully remove the motor from the brake.



a motor
b drive hub with brake
c drive hub mounting bolts

5 Clean up any oil that may have spilled.

How to Adjust the Turntable Rotation Gear Backlash

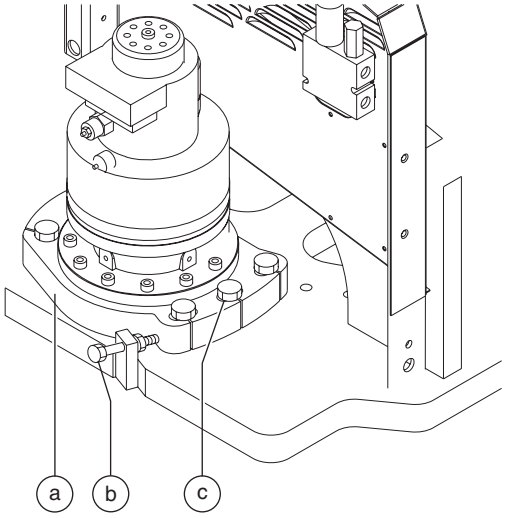
The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

Note: Perform this procedure with the boom between the non-steer end tires and with the machine on a firm and level surface.

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

Note: The turntable rotation lock pin is located next to the boom rest pad.

2 Loosen the backlash pivot plate mounting fasteners.



a backlash pivot plate
b adjustment bolt with lock nut
c backlash pivot plate mounting bolts

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 one half 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. Then torque the mounting fasteners on the backlash pivot plate. Refer to Section 2, *Specifications*.

8 Rotate the turntable through an entire rotation. Check for tight spots that could cause binding. Readjust if necessary.

2WD Steer Axle Components

11-1 Yoke and Hub

How to Remove the Yoke and Hub

1 Remove the pin retaining fasteners from both the steering cylinder and the tie rod cylinder pivot pins. Use a soft metal drift to remove the pins.

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

3 Block the non-steer wheels and center a lifting jack of ample capacity under the steer axle.

4 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

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

6 Remove the pin retaining fasteners from the yoke pivot pins.

7 Support and secure the yoke and hub assembly to a lifting jack.

8 Use a slide hammer to remove the upper yoke pivot pin, then use a soft metal drift to drive the lower yoke pivot pin down and out.

9 Remove the yoke and hub assembly from the machine.

⚠CAUTION Crushing hazard. The yoke and hub assembly may become unbalanced and fall if not properly supported and secured to the lifting jack when it is removed from the machine.

How to Remove the Hub and Bearings

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

2 Block the non-steer wheels and center a lifting jack of ample capacity under the steer axle.

3 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

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

5 Remove the dust cap, cotter pin and castle nut.

Note: Always replace the cotter pin with a new one when installing the castle nut.

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

7 Place the hub on a flat surface and gently pry the bearing seal out of the hub. 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.*

11-2 Steer Cylinder

How to Remove a Steer Cylinder

There are two identical steer cylinders that work in parallel. They are part of the same hydraulic circuit, but move in opposite directions. The tie rod cylinder maintains equal movement of the tires.

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 Tag, disconnect and plug the hydraulic hoses from the steer 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.

2 Remove the pin retaining fasteners from the steer cylinder pivot pins. Remove the pivot pin from each end of the steer cylinder.

3 Remove the steer cylinder from the machine.

2WD STEER AXLE COMPONENTS

11-3 Tie Rod Cylinder

How to Remove the Tie Rod Cylinder

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 Tag, disconnect and plug the hydraulic hoses from the tie rod 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.

2 Support and secure the tie rod cylinder to a lifting jack.

3 Remove the pin retaining fasteners from each tie rod cylinder pivot pin.

4 Remove the pivot pin from each end of the tie rod cylinder.

5 Remove the tie rod cylinder from the machine.

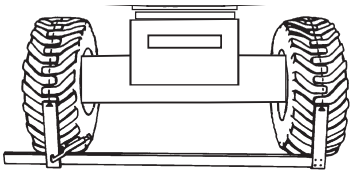
⚠CAUTION Crushing hazard. The tie rod cylinder may become unbalanced and fall if not properly supported and secured to the lifting jack when it is removed from the machine.

How to Perform the Toe-in Adjustment

Note: Perform this procedure on a firm, level surface. Block the non-steer tires and be sure that the machine is in the stowed position.

1 Straighten the steer wheels.

2 Measure the steer tires, front to front and back to back, using a measuring fixture.



3 Center a lifting jack of ample capacity under the steer axle and raise the machine until the steer tires are off the ground.

4 Loosen the jam nut on the adjustable end of the tie rod cylinder.

5 Remove the pin retaining fasteners from the adjustable end of the tie rod cylinder. Remove the pivot pin.

6 Slide the tie rod cylinder off of the yoke and adjust it by turning the end.

Note: One half turn on the adjustable end equals approximately $^{1}/_{8}$ inch / 3.2 mm change in the front and rear measurements.

7 Slide the tie rod cylinder onto the yoke. Install the pivot pin and the pin retaining fastener.

8 Tighten the jam nut against the tie rod cylinder.

9 Lower the machine and repeat step 2. If further adjustment is needed, repeat this procedure beginning with step 3.

Toe-in specification	0 ± $^{1}/_{8}$ inch / 6.35 mm

4WD Steer Axle Components

12-1
Yoke and Drive Hub

How to Remove the Yoke and Drive Hub Assembly

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 Remove the pin retaining fasteners from both the steer cylinder and the tie rod cylinder pivot pins. Remove the pins.

2 Tag, disconnect and plug the hydraulic hoses from the drive motor. Cap the fittings on the drive motor.

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

4 Block the non-steer wheels, and center a lifting jack of ample capacity under the steer axle.

5 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

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

7 Remove the hydraulic hose clamp retaining fastener from the top of the yoke pivot pin.

8 Remove the drive motor mounting fasteners.

9 Slide the drive motor shaft out of the drive hub and remove the drive motor from the machine.

10 Remove the pin retaining fasteners from the upper and lower yoke pivot pins.

11 Support and secure the yoke and drive hub assembly to a lifting jack.

12 Use a slide hammer to remove the upper yoke pivot pin. Use a soft metal drift to drive the lower yoke pivot pin down and out.

⚠WARNING Crushing hazard. The yoke and drive hub assembly could become unbalanced and fall when the yoke pivot pins are removed if not properly supported and secured to the lifting jack.

13 Place the yoke and drive hub assembly on a flat surface with the drive hub facing down.

14 Remove the drive hub mounting fasteners that attach the drive hub to the yoke. Remove the yoke from the drive hub. Refer to Section 2, *Specifications*.

Note: Replace the thrust washer when installing the yoke and drive hub assembly onto the axle.

4WD STEER AXLE COMPONENTS

12-2
Drive Motor

How to Remove a Drive Motor

NOTICE Component damage hazard. Repairs to the motor should only be performed by an authorized Sauer dealer.

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 (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 Extend the axles.

2 Remove the drive motor access covers from both sides of the inner axle.

3 Tag, disconnect and plug the hydraulic hoses from the drive motor. Cap the fittings on the drive motor.

⚠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 drive motor mounting fasteners.

5 Slide the drive motor shaft out of the drive hub, and remove the drive motor from the machine. Refer to Section 2, *Specifications*.

12-3 Drive Hub

How to Remove a Drive Hub

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 Remove the drive motor. See 12-2, *How to Remove a Drive Motor*.

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

3 Center a lifting jack of ample capacity under the non-steer axle.

4 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

5 Remove the wheel lug nuts, then the tire and wheel assembly.

6 Place a second lifting jack under the drive hub for support and secure the drive hub to the lifting jack.

7 Remove the drive hub mounting fasteners that attach the drive hub to the axle. Remove the drive hub.

⚠WARNING Crushing hazard. The drive hub could become unbalanced and fall if not properly supported and secured to the lifting jack when removed from the machine.

Note: Do not re-use the drive hub mounting fasteners. Genie specifications require the use of new fasteners.

12-4 Steer Cylinders

How to Remove a Steer Cylinder

There are two identical steer cylinders that work in parallel. They are part of the same hydraulic circuit, but move in opposite directions. The tie rod cylinder maintains equal movement of the tires.

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 Tag, disconnect and plug the hydraulic hoses from the steer 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.

2 Remove the hose bracket mounting fastener on the steer cylinder barrel-end pivot pin.

3 Remove the pin retaining fasteners from the steer cylinder pivot pins. Remove the pivot pin from each end of the steer cylinder.

4 Remove the steer cylinder from the machine.

4WD STEER AXLE COMPONENTS

12-5 Tie Rod Cylinder

How to Remove the Tie Rod Cylinder

This procedure is the same as the 2WD procedure. See 11-3, *How to Remove the Tie Rod Cylinder.*

How to Perform the Toe-in Adjustment

This procedure is the same as the 2WD procedure. See 11-3, *How to Perform the Toe-in Adjustment.*

Non-steer Axle Components

13-1 Drive Motor

How to Remove a Drive Motor

This procedure is the same as the steer axle procedure. See 12-2, *How to Remove a Drive Motor.*

13-2 Drive Hub

How to Remove a Drive Hub

This procedure is the same as the steer axle procedure. See 12-3, *How to Remove a Drive Hub.*

Oscillating Axle Components

14-1
Oscillate Axle Cylinders

The oscillating axle cylinders extend and retract between the drive chassis and the axle to maintain a level chassis while driving over uneven terrain. The cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic hose failure.

How to Remove an Oscillate Axle Cylinder

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

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 Rotate the turntable until the boom is between the steer tires.

2 Remove the fasteners from the drive chassis cover at the steer end. Remove the cover.

3 Tag, disconnect and plug the oscillating axle 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.

4 Remove the pin retaining fasteners from the rod-end pivot pin. Use a soft metal drift to remove the pin.

5 Attach a lifting strap from an overhead crane to the barrel end of the oscillating cylinder.

6 Remove the pin retaining fasteners from the barrel-end pivot pin. Use a soft metal drift to remove the pin.

7 Remove the cylinder from the machine.

⚠WARNING Crushing hazard. The oscillate cylinder could become unbalanced and fall if not properly attached to the overhead crane when removed from the machine.

14-2
Oscillate Directional Valve

How to Adjust the Oscillate Relief Valve Pressure

1 Remove the drive chassis cover from the non-steer end of the machine.

2 Connect a 0 to 2000 psi / 0 to 150 bar pressure gauge to the diagnostic nipple located near the oscillate directional valve.

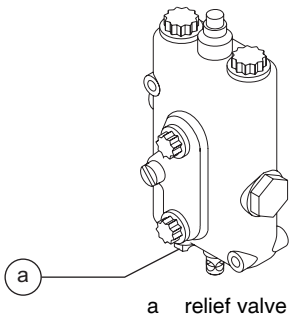
3 Disconnect the directional valve linkage, by removing the clevis yoke from the drive chassis.

4 Start the engine from the ground control.

5 With the engine running, manually activate the valve and observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.

6 Turn the engine off.

7 Locate the relief valve on the directional valve.



a relief valve

8 Loosen the jam nut on the relief valve.

9 Turn the valve clockwise to increase the pressure or counterclockwise to decrease the pressure.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

10 Tighten the jam nut.

11 Start the engine and manually activate the valve to confirm the valve pressure.

⊙ Result: Pressure is between 800 to 900 psi / 55 to 65 bar.

⊠ Result: Pressure is less than 800 psi / 55 bar or more than 900 psi / 65 bar. Repeat this procedure beginning with step 5.

12 Turn the engine off, remove the pressure gauge and assemble the directional valve linkage.

13 Install the cover on the non-steer end of the drive chassis.

OSCILLATING AXLE COMPONENTS

How to Set Up the Directional Valve Linkage

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

1 Lower the boom to the stowed position.

2 Use a "bubble type" level to be sure the surface the machine is on is completely level.

⚠ DANGER Tip-over hazard. Failure to perform this procedure on a firm, level surface will compromise the stability of the machine and could result in the machine tipping over.

3 Check the tire pressure in all four tires and add air if needed to meet specification.

4 Remove the drive chassis cover from the non-steer end of the machine.

5 Disconnect the linkage clevis yoke from the axle.

6 Place a "bubble type" level on the turntable rotate bearing plate at the non-steer end. Confirm whether the drive chassis is completely level.

7 If the drive chassis is not level, start the engine and push up or pull down on the linkage adjustment rod until the machine is completely level.

8 Verify that the ground and drive chassis are completely level.

9 Adjust the length of the rod by turning the clevis yoke until the clevis yoke can be pinned to the axle.

10 Install the shoulder bolt and nut.

11 Measure the distance between the drive chassis and the non-steer 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 linkage was completed with the ground and drive chassis level, consult Genie Industries Service Department.

Extendable Axle Components

15-1 Extendable Axles

The extendable axles are used to widen the foot print of the drive chassis for stability.

How to Shim an Extendable Axle

Note: Replace the pad if thickness is less than minimum specification. If thickness is more than minimum specification, perform the following procedure. Refer to Maintenance Procedure *D-2, Check the Extendable Axle Wear Pads.*

1 Extend the axles.

Side wear pads:

2 Loosen the side wear pad mounting fasteners on the outer axle.

3 Install the new shims under the wear pads to obtain zero clearance and zero drag.

4 Use a round punch to align the shim to the wear pad. Tighten the mounting fasteners.

5 Extend and retract the axle through an entire cycle. Check for tight spots that could cause binding or scraping.

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

Top and bottom wear pads:

1 Center a lifting jack of sufficient capacity under the outer axle that needs to be shimmed. Do not raise the machine.

2 Block the wheels at the opposite end of the machine.

3 Raise the machine just until the weight of the machine is relieved off of the inner axle. Do not raise the wheels off of the ground.

4 Remove the drive chassis cover.

5 Loosen the wear pad mounting fasteners from the top and bottom wear pads on both the inner and outer axles.

6 Install the new shims under the wear pads of the inner and outer axle to obtain zero clearance and zero drag.

7 Use a round punch through the wear pad mounting holes to align the shims with the wear pad. Install the wear pad retaining fasteners.

8 Extend and retract the axle through an entire cycle. Check for tight spots that could cause binding or scraping of the axle tubes.

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

EXTENDABLE AXLE COMPONENTS

How to Remove an Inner Axle

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 boom in the stowed position and boom between the non-steer end tires.

Steer end:

1 Extend the axles.

2 Remove the drive chassis cover.

3 **2WD models:** Remove the yoke and hub assembly. See 11-1, *How to Remove the Yoke and Hub*.

4WD models: Remove the yoke and drive hub. See 12-1, *How to Remove the Yoke and Drive Hub Assembly*.

4 **4WD models:** Remove the hose bracket from the steer cylinder barrel-end pivot pin.

5 Remove the remaining steer cylinder pivot pin. Remove the steer cylinder and lay off to the side.

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

6 Remove the steer cylinder mounting lug from the inner axle.

7 Place blocks under the axle extension cylinder for support.

8 Remove the external snap ring from the axle extension cylinder pivot pin. Use a soft metal drift to remove the pin.

9 Attach a lifting strap from an overhead crane to the inner axle for support.

10 Remove all wear pads from the outer axle.

Note: Pay careful attention to the quantity and location of shims used when removing the wear pads.

11 Carefully remove the inner axle from the outer axle.

⚠WARNING Crushing hazard. The inner axle could become unbalanced and fall if not properly supported when it is removed from the outer axle.

Non-steer end:

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

13 Block the steer tires and center a lifting jack under the outer axle.

14 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

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

16 Remove the drive motor covers from both sides of the inner axle.

17 Tag, disconnect and plug the hydraulic hoses at the drive motor. Cap the fittings on the drive motor.

⚠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.

18 Place blocks under the axle extension cylinder for support.

19 Remove the external snap rings from the axle extension cylinder pivot pin of the inner axle to be removed. Use a soft metal drift to remove the pin.

20 Attach a strap from a lifting device through the inner axle close to the drive hub for support.

21 Remove all wear pads from the outer axle.

Note: Pay careful attention to the location and number of shims used when removing the wear pads.

22 Carefully remove the inner axle from the outer axle.

⚠WARNING Crushing hazard. The inner axle could become unbalanced and fall if not properly supported when it is removed from the outer axle.

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

15-2
Axle Extension Cylinder

How to Remove the Axle Extension 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.*

Note: Perform this procedure with the boom in the stowed position and boom between the non-steer end tires.

1 Extend the axles.

2 Remove the drive chassis cover.

Steer end:

3 Remove the engine side yoke and hub.

2WD models: Remove the yoke and hub assembly. See 11-1, *How to Remove the Yoke and Hub*.

4WD models: Remove the yoke and drive hub. See 12-1, *How to Remove the Yoke and Drive Hub Assembly*.

4 Remove the access cover at the end of the inner axle.

EXTENDABLE AXLE COMPONENTS

5 Tag, disconnect and plug the axle extend 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 Place blocks under the axle extension cylinder for support.

7 Remove the external snap rings from the axle extension cylinder pivot pins. Use a soft metal drift to remove the pins.

8 Carefully remove the axle extension cylinder from the machine by pulling it out the end of the inner axle.

⚠WARNING Crushing hazard. The axle extension cylinder could become unbalanced and fall if not properly supported when it is removed from the axle.

Non-steer end:

9 Remove the drive motor access covers from both sides of the axle.

10 Remove the drive motor. Refer to 12-2, *How to Remove a Drive Motor*.

11 Remove the drive hub. Refer to 12-3, *How to Remove a Drive Hub*.

12 Tag, disconnect and plug the axle extend cylinder hydraulic hoses from RAE and RAR ports on the axle select 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.

13 Place blocks under the axle extension cylinder for support.

14 Remove the external snap rings from the axle extension cylinder pivot pins. Use a soft metal drift to remove the pins.

15 Carefully remove the axle extension cylinder from the machine by pulling it out the end of the inner axle.

⚠WARNING Crushing hazard. The axle extension cylinder could become unbalanced and fall if not properly supported when it is removed from the axle.

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 non-steer wheels
  - Turntable secured with the turntable rotation lock
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power disconnected from the machine

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the *Genie S-80 and Genie S-85 Operator's Manual.*
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropiate 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/burn 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: Perform all troubleshooting on a firm, level surface.

Note: Two persons will be required to safely perform some troubleshooting procedures.

FAULT CODES

Fault Codes - Control System

How to Retrieve Control System Fault Codes

Note: At least one fault code is present when the alarm at the platform controls produces two short beeps every 30 seconds for 10 minutes.

Note: Perform this procedure with the engine off, the key switch turned to platform controls and both red Emergency Stop button pulled out to the on position at both the ground and platform controls.

1 Open the platform control box lid.

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

2 Locate the red and yellow fault LEDs on the ALC-500 circuit board inside the platform control box. Do not touch the circuit board.

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. If the circuit board does need to be handled, maintain firm contact with a metal part of the machine that is grounded at all times when handling the printed circuit board OR use a grounded wrist strap.

3 **Determine the error source:** The red LED indidates the error source and will flash two separate codes. The first code will indicate the first digit of the two digit code, flashing once per second. It will then pause for 1.5 seconds and flash the second digit once per 0.5 second.

Note: When the red LED is flashing the code, the yellow LED will be on solid.

4 **Determine the error type:** The yellow LED indidates the error type and will flash two separate codes. The first code will indicate the first digit of the two digit code, flashing once per second. It will then pause for 1.5 seconds and flash the second digit once per 0.5 second.

Note: When the yellow LED is flashing the code, the red LED will be on solid.

5 Use the fault code table on the following pages to aid in troubleshooting the machine by pinpointing the area or component affected.

FAULT CODES

Error Source		Error Type		Condition	Solution
ID	Name	ID	Name		
21	Boom 1 Joystick (primary boom up/down)	11 12 15 16	Value at 5V Value too high Value too low Value at 0V	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
		18	Just calibrated	Initiate 1-second beep of alarm.	Self-clearing. (transient)
22	Boom 1 directional valves	21	Fault	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
23	Boom 1 flow control valve	12 15	Value too high Value too low	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Normal function **except** threshold for one or both directions is zero.	Calibrate valve thresholds.
		18	Just calibrated		Self-clearing. (transient)
31	Boom 2 Joystick (secondary boom up/down or primary boom extend/retract)	11 12 15 16	Value at 5V Value too high Value too low Value at 0V	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
		18	Just calibrated	Initiate 1 second beep of alarm.	Self-clearing. (transient)
32	Boom 2 directional valves	21	Fault	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.

Continued on next page

FAULT CODES

Error Source		Error Type		Condition	Solution
ID	Name	ID	Name		
33	Boom 2 flow control valve	12 15	Value too high Value too low	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Normal function **except** threshold for one or both directions is zero.	Calibrate valve thresholds.
		18	Just calibrated		Self-clearing. (transient)
41	Turntable rotate joystick	11 12 15 16	Value at 5V Value too high Value too low Value at 0V	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
		18	Just calibrated	Initiate 1-second beep of alarm.	Self-clearing. (transient)
42	Turntable rotate directional valves	21	Fault	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
43	Turntable rotate flow control valve	12 15	Value too high Value too low	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Normal function **except** threshold for one or both directions is zero.	Calibrate valve thresholds.
		18	Just calibrated		Self-clearing. (transient)
44	Drive enable override switches	21	Fault	Enable override direction is frozen at neutral.	Power up controller with problem corrected.

FAULT CODES

Error Source		Error Type		Condition	Solution
ID	Name	ID	Name		
51	Drive joystick	11 12 15 16	Value at 5V Value too high Value too low Value at 0V	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
		18	Just calibrated	Initiate 1-second beep of alarm.	Self-clearing. (transient)
53	Drive flow valve (EDC)	12 15	Value too high Value too low	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Normal function **except** threshold for one or both directions is zero.	Calibrate valve thresholds.
		18	Just calibrated		Self-clearing. (transient)
54	Drive brake valve	21	Fault	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
55	High speed drive motor Valve	21	Fault	Motor speed frozen in the low state. Alarm sounds indicating fault.	Power up controller with problem corrected.
61	Steer joystick	11 12 15 16	Value at 5V Value too high Value too low Value at 0V	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.
		17	Not calibrated	Joystick speed and direction frozen at zero and neutral.	Calibrate joystick.
		18	Just calibrated	Initiate 1-second beep of alarm.	Self-clearing. (transient)
62	Steer directional valves	21	Fault	Limited speed and direction frozen at zero and neutral. Alarm sounds indicating fault.	Power up controller with problem corrected.

FAULT CODES

Engine Fault Codes - GM and Ford Models

How to Retrieve GM 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 ground controls. Special equipment is required to retrieve fault codes stored within the ECM. Contact Genie Service Department for assistance in retrieving fault codes.

Note: If the check engine light is on and the engine is stopped, tag the machine and remove from service. Contact service personnel immediately.

Note: If the check engine light is on and the engine is still running, contact service personnel within 24 hours.

How to Retrieve Ford 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/burn 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.

Continued on next page

FAULT CODES

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.

FAULT CODES

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.

Continued on next page

FAULT CODES

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.

FAULT CODES

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

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.

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 *Genie S-80 and Genie S-85 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. An illustration legend precedes the drawings.

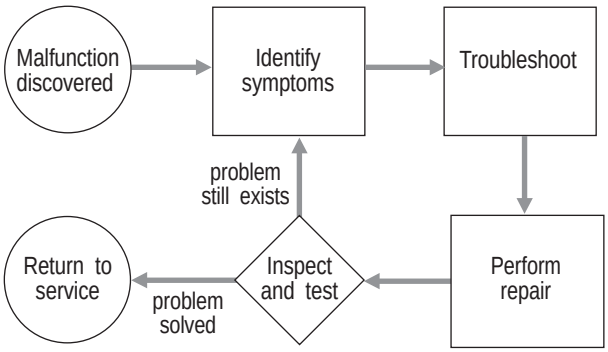
Electrical Schematics

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

Hydraulic Schematics

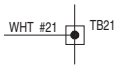
⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

General Repair Process



Electrical Symbols Legend

Quick disconnect terminal



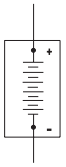
T-circuits connect at terminal


T-circuits connect

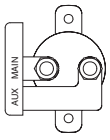

Connection no terminal


Circuits crossing no connection

Diode

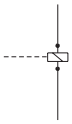


Battery



Battery separator

Circuit breaker with amperage

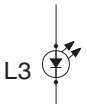

Coil solenoid or relay

Horn or alarm

Flashing beacon

Gauge

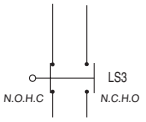
Hour meter



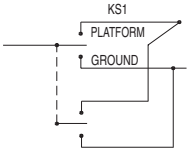
LED

Fuse with amperage

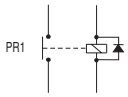

Starting aid: glow plug or flame ignitor



Limit switch

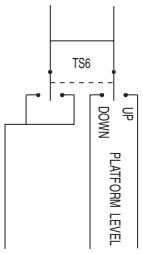


Key switch

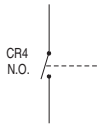


Power relay

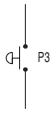
Toggle switch SPDT



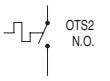
Toggle switch DPDT



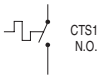
Control relay contact normally open



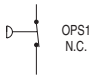
Horn button normally open



Oil temperature switch normally open

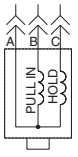


Coolant temperature switch normally open



Oil pressure switch normally closed

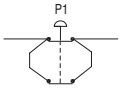

Gauge sending unit



Fuel or RPM solenoid


Coil

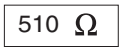
Foot switch



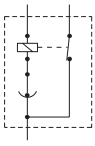
Emergency Stop button normally closed

Hydraulic oil cooling fan

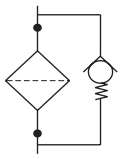
Auxiliary pump



Resistor with ohm value


Tilt sensor

Hydraulic Symbols Legend



Filter with bypass valve relief setting

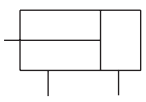
Pump fixed displacement

Pump bi-directional, variable displacement

Motor bi-directional

Motor 2-speed, bi-directional

Pump prime mover (engine or motor)



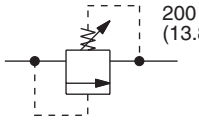
Double acting cylinder

Accumulator

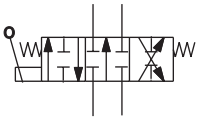
Orifice with size

Shut off valve

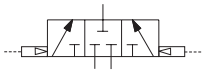
Check valve



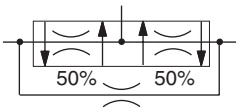
Relief valve with pressure setting



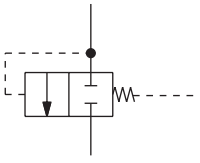
Directional valve (mechanically activated)



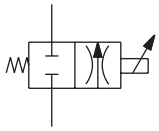
Pilot operated 3 position, 3 way, shuttle valve



Flow divider/combiner valve with pressure balancing orifice and flow percentages

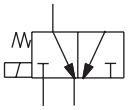


Differential sensing valve

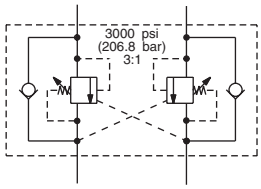


Solenoid operated proportional valve

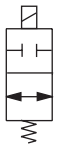
Priority flow regulator valve



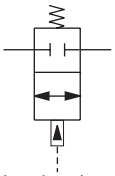
Solenoid operated 2 position, 3 way, directional valve



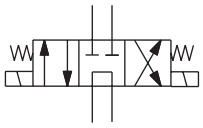
Counterbalance valve with pressure and pilot ratio



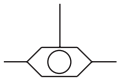
2 position, 2 way solenoid valve



Directional valve pilot operated 2 position, 2 way



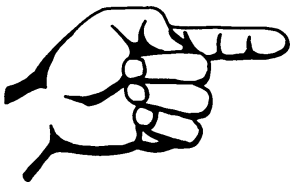
Solenoid operated 3 position, 4 way, directional valve



2 position, 3 way, shuttle valve

Hydraulic oil cooler

Brake



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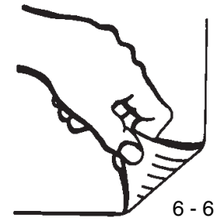
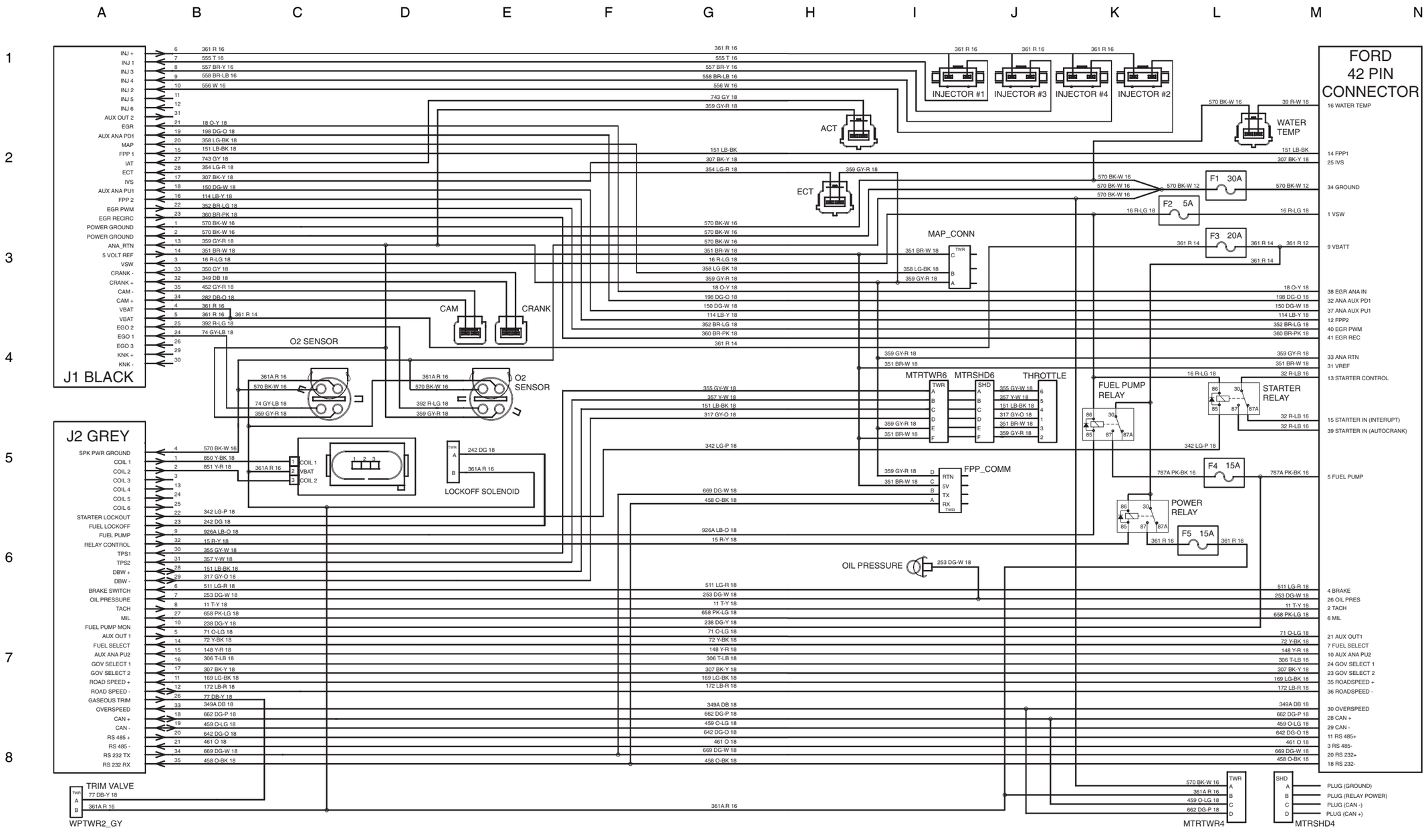
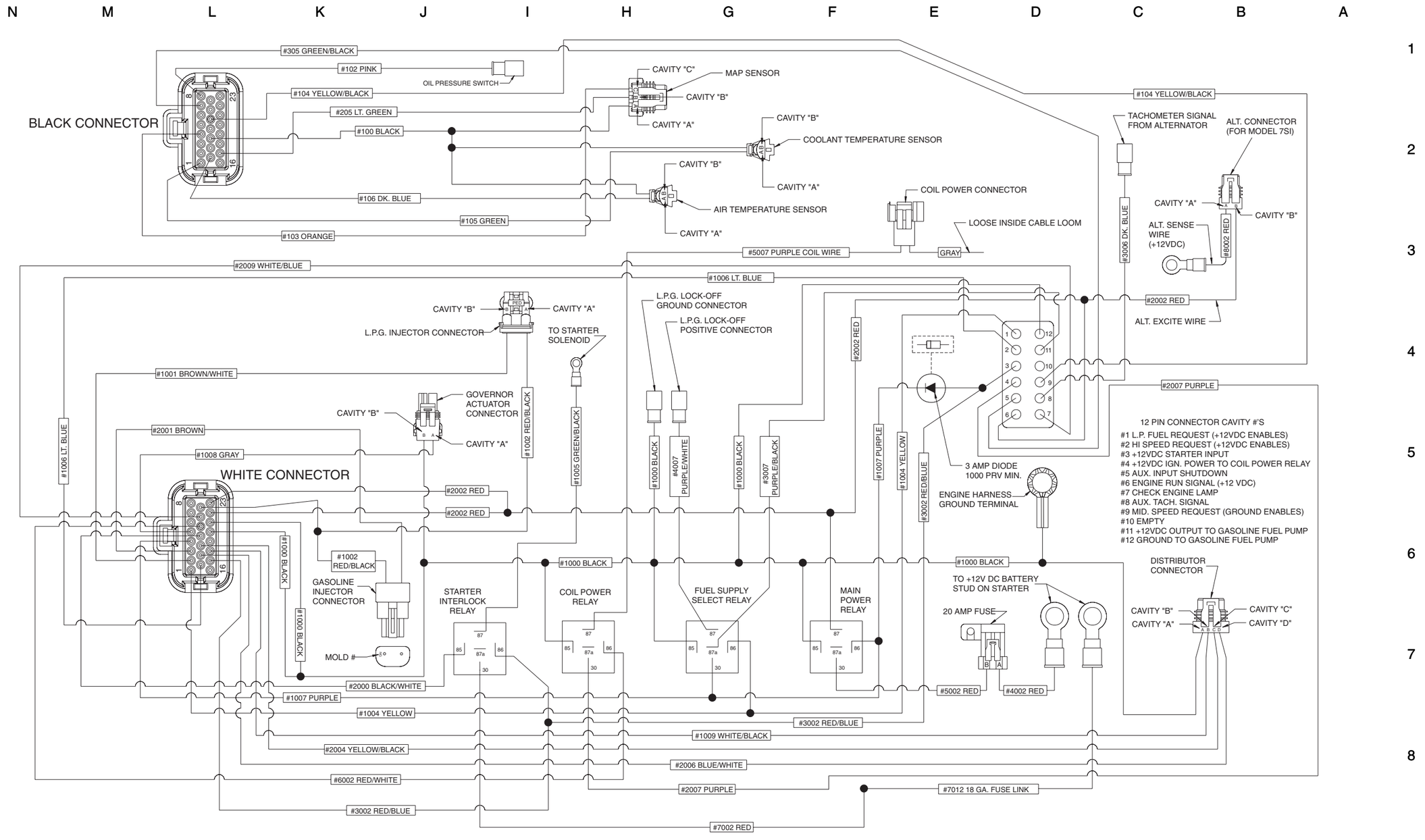
Ford LRG-425 EFI Engine Wiring Harness



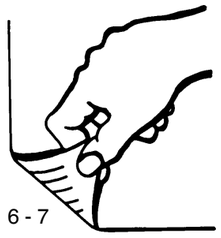
Ford LRG-425 EFI Engine Wiring Harness



GM 3.0L Engine Wiring Harness

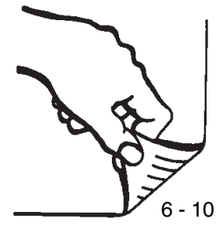


GM 3.0L Engine Wiring Harness



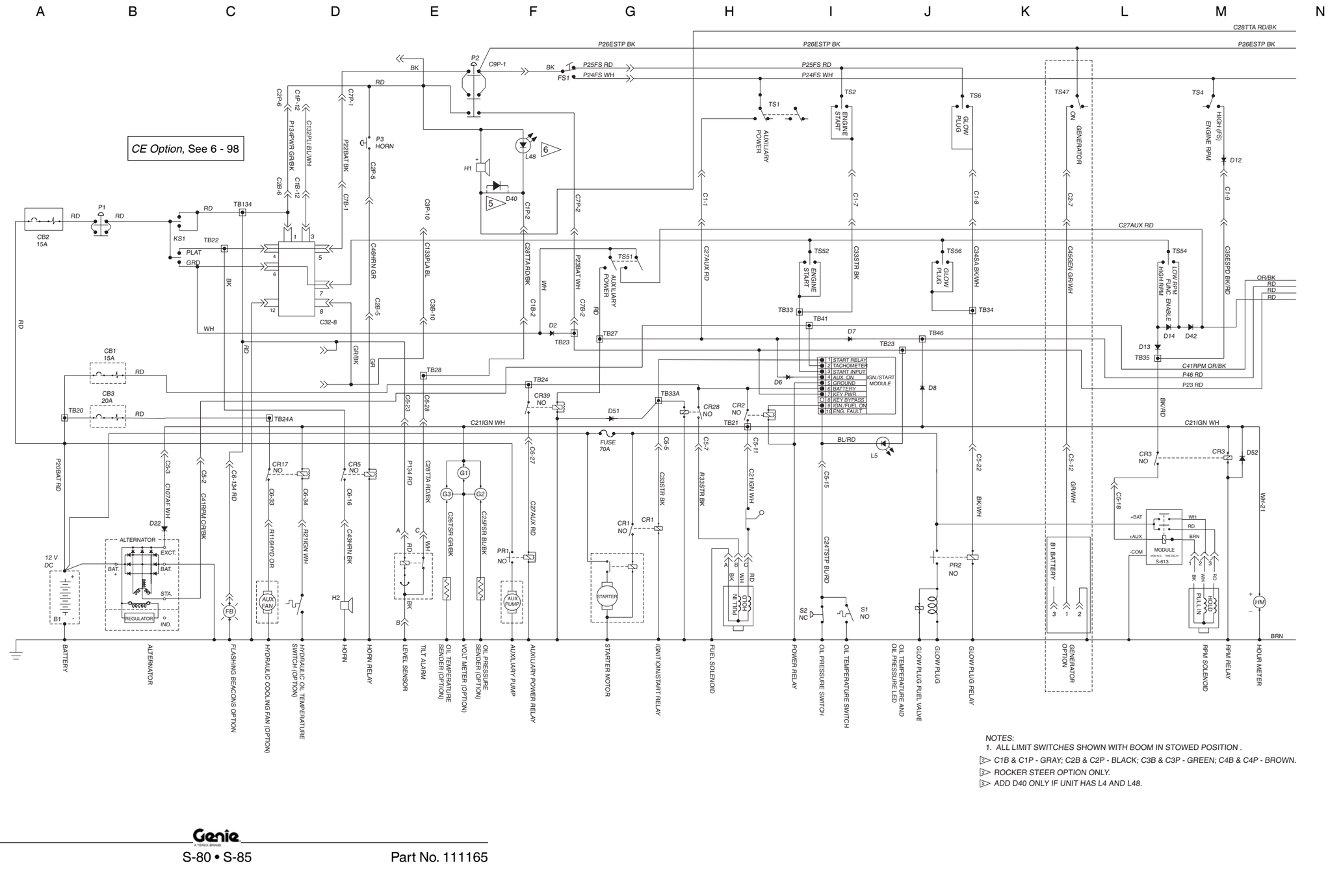
Electrical Schematic, S-80

Deutz F4L 913 Models



Electrical Schematic, S-80

Deutz F4L 913 Models



NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION .

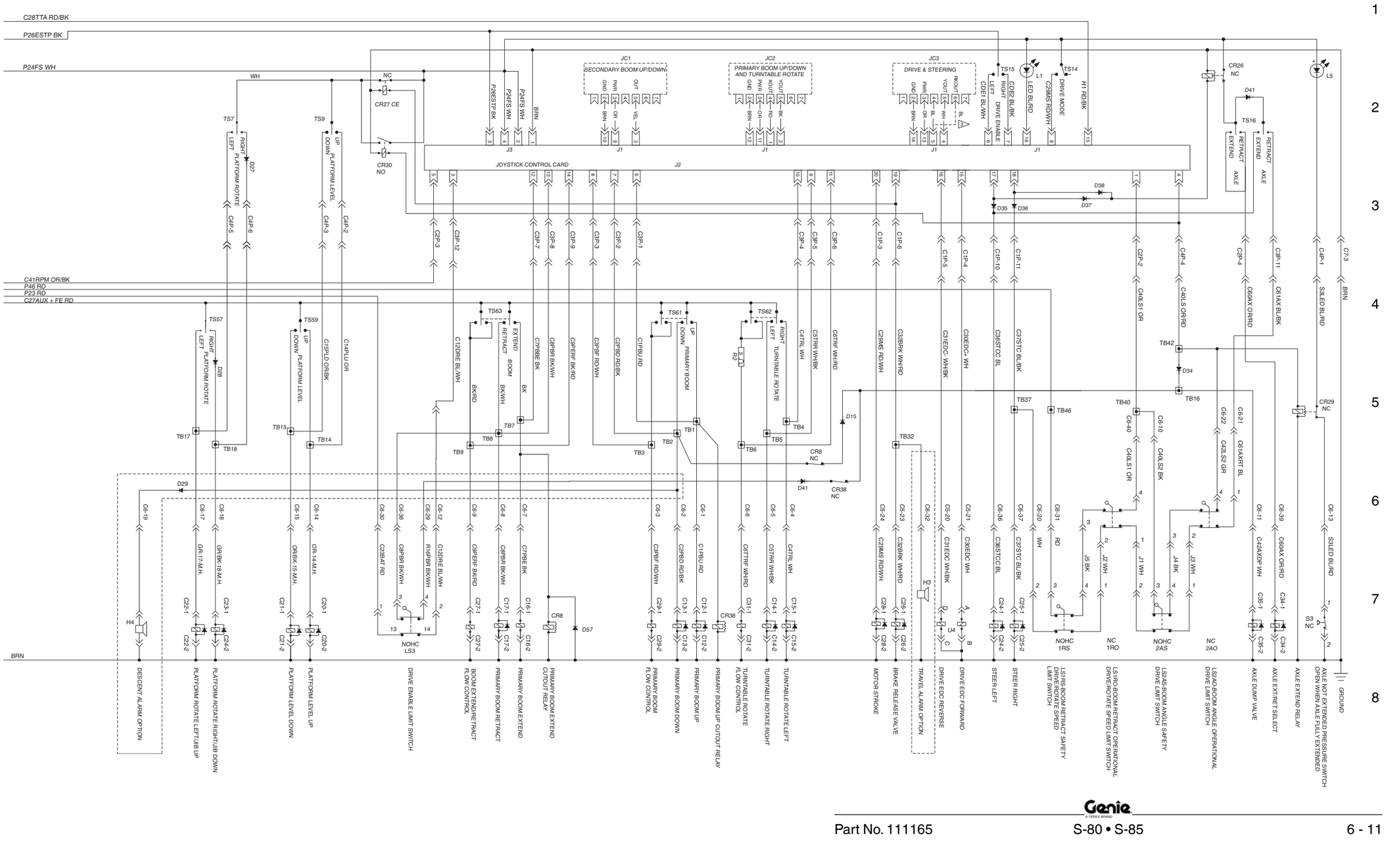
▷ C1B & C1P - GRAY; C2B & C2P - BLACK; C3B & C3P - GREEN; C4B & C4P - BROWN.

▷ ROCKER STEER OPTION ONLY.

▷ ADD D40 ONLY IF UNIT HAS L4 AND L48.

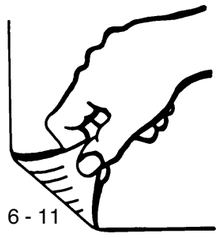
Electrical Schematic, S-80

Deutz F4L 913 Models



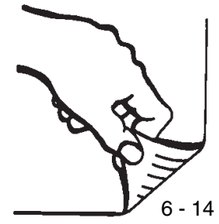
Electrical Schematic, S-80

Deutz F4L 913 Models



Ground Control Box Wiring Diagram, S-80

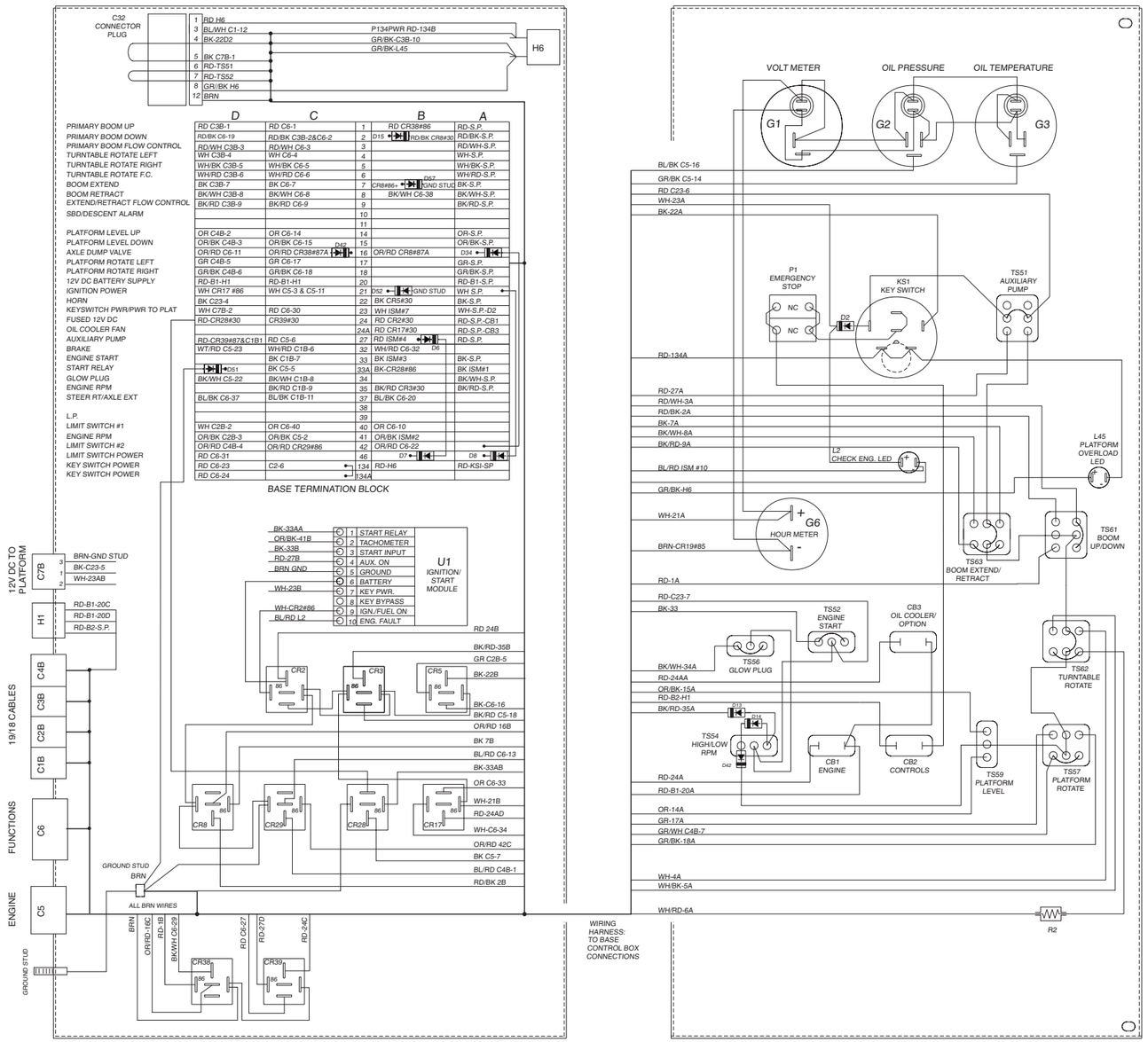
Deutz F4L 913 Models

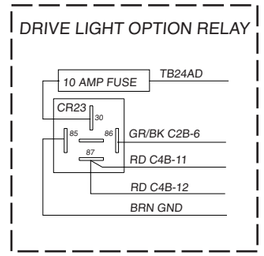


Ground Control Box Wiring Diagram, S-80

Deutz F4L 913 Models

NOTE: CE OPTION- LOADSENSE MODULE CONNECTS TO C32.





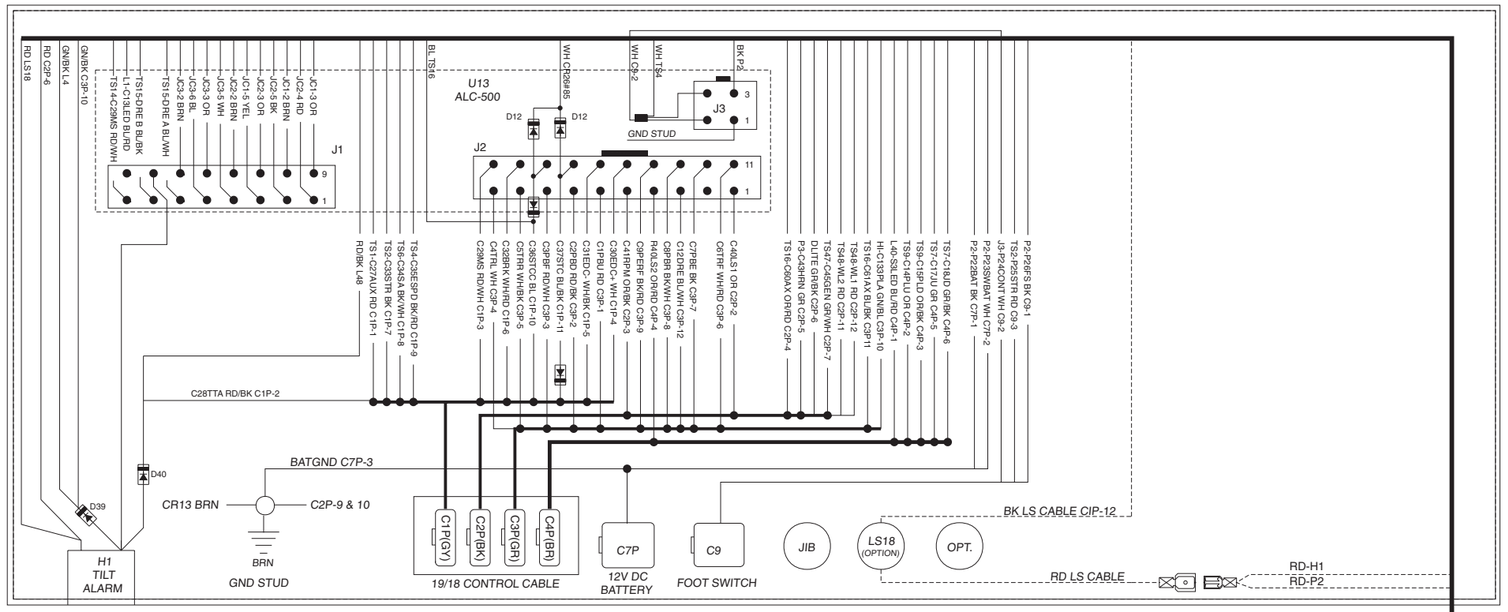
LABEL	DESCRIPTION
P1	RED EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY TOGGLE SWITCH
TS52	ENGINE START TOGGLE SWITCH
TS56	GLOW PLUG TOGGLE SWITCH
TS54	FUNCTION ENABLE TOGGLE SWITCH
TS57	PLATFORM ROTATE TOGGLE SWITCH
TS59	PLATFORM LEVEL TOGGLE SWITCH
TS61	PRIMARY BOOM UP/DOWN TOGGLE SWITCH
TS62	TURNTABLE ROTATE TOGGLE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT TOGGLE SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 15A
G1	VOLT METER GAUGE (OPTIONAL)
G2	OIL PRESSURE GAUGE (OPTIONAL)
G3	OIL TEMPERATURE GAUGE (OPTIONAL)
G6	HOUR METER
L2	CHECK ENGINE LED
L45	PLATFORM OVERLOAD LED
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	HORN RELAY
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR28	TROMBETTA PULL IN RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT RELAY
CR39	AUXILIARY PUMP RELAY
R2	5 OHM RESISTOR
U1	IGNITION/START MODULE

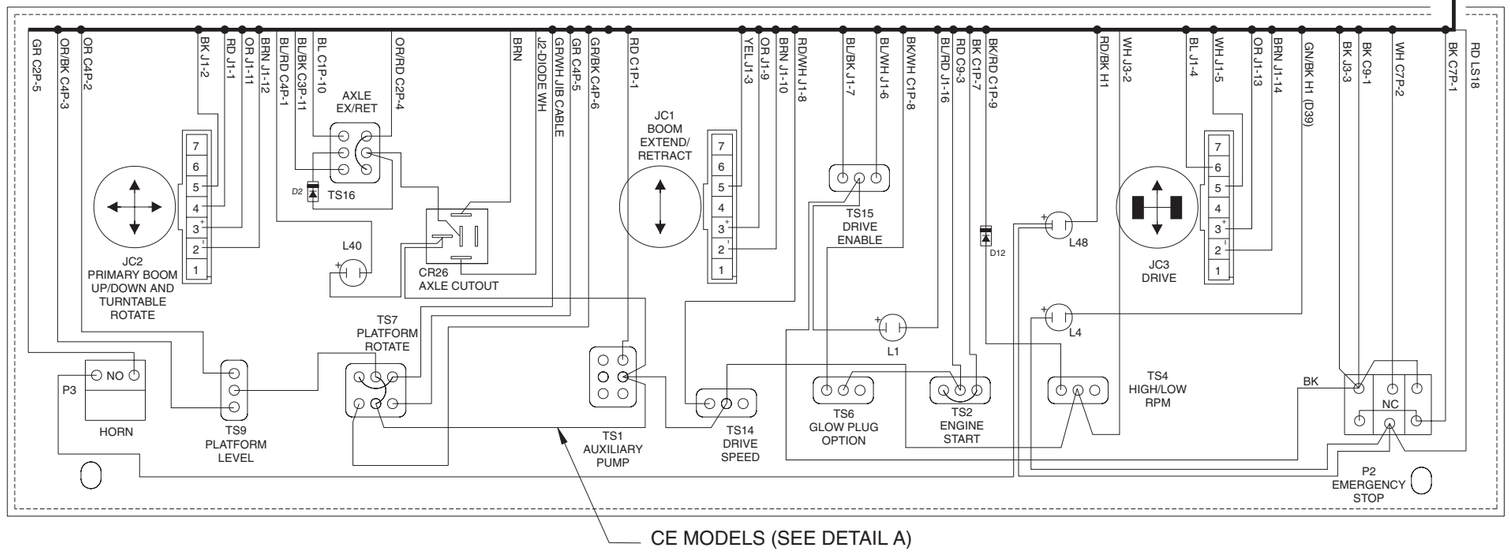
CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSURE SENDER	BL/BK C5-16	BL/BK-S.P
26 OIL TEMP SENDER	GR/BK C5-14	GR/BK-S.P.
28 TILT ALARM	RD/BK C1-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. REV	WH C1B-4	WH C5-21
31 E.D.C. FWD	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL CB1-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

Platform Control Box Wiring Diagram, S-80

Deutz F4L 913 Models

N M L K J I H G F E D C B A



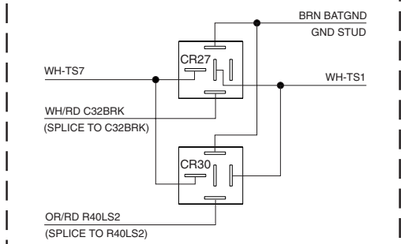


COMPONENT INDEX

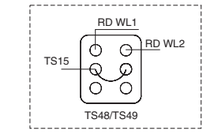
P2	*EMERGENCY STOP BUTTON*
P3	*HORN SWITCH*
TS1	*AUXILIARY TOGGLE SWITCH*
TS2	*ENGINE START SWITCH*
TS4	*HIGH RPM SWITCH*
TS6	*GLOW PLUG OPTION*
TS7	*PLATFORM ROTATE TOGGLE SWITCH*
TS9	*PLATFORM LEVEL TOGGLE SWITCH*
TS14	*LOW/HIGH DRIVE SPEED TOGGLE SWITCH*
TS15	*DRIVE ENABLE TOGGLE SWITCH*
TS16	*AXLE EXTEND/RETRACT TOGGLE SWITCH*
TS47	*GENERATOR TOGGLE SWITCH (OPTION)*
TS48	*WORK LIGHT TOGGLE SWITCH (OPTION)*
TS49	*DRIVE LIGHT TOGGLE SWITCH (OPTION)*
LS18	*PLATFORM OVERLOAD LIMIT SWITCH*
L1	*DRIVE ENABLE LED*
L4	*PLATFORM OVERLOAD LED*
L40	*AXLE EXTENDED LED*
L48	*TILT ALARM LED*
JC3	*DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT*
JC2	*BOOM PROPORTIONAL JOYSTICK: SECONDARY BOOM UP/DOWN*
JC1	*BOOM PROPORTIONAL JOYSTICK: BOOM UP/DOWN, TURNTABLE ROTATE*
U13	*ALC500*
CR26	*AXLE CUTOUT RELAY*
H1	*TILT ALARM*

CE LIFT/DRIVE OPTION

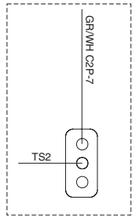
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL C: WORKLIGHT/DRIVELIGHT OPTION

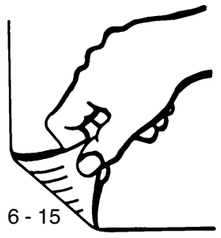


DETAIL B: GENERATOR OPTION



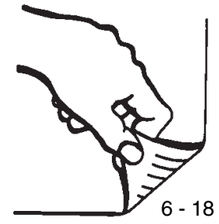
Platform Control Box Wiring Diagram, S-80

Deutz F4L 913 Models



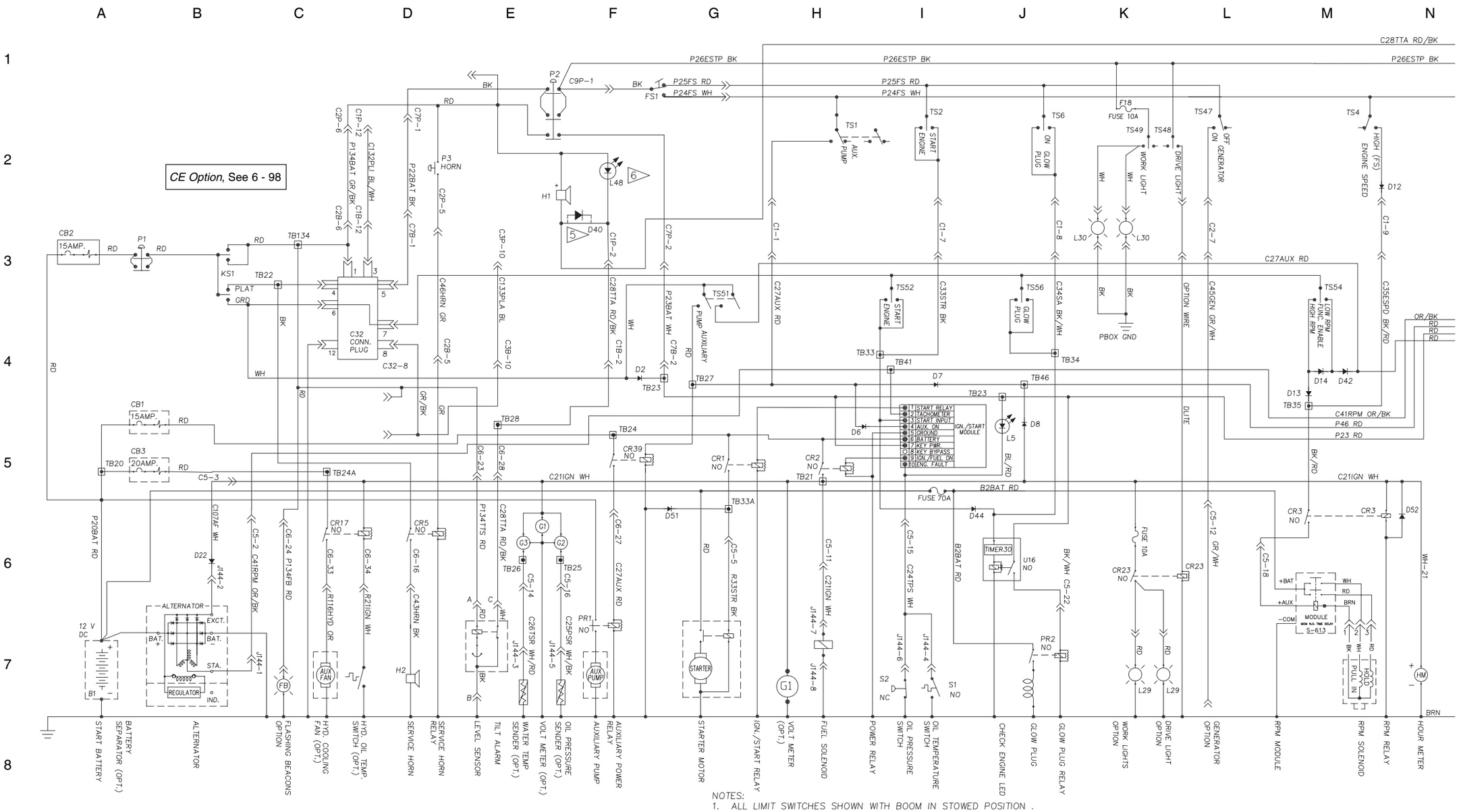
Electrical Schematic, S-80

Deutz BF4L 2011 Models



Electrical Schematic, S-80

Deutz BF4L 2011 Models



NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION .
   SEE E0180 SHEET7 FOR SECOND BATTERY OPTION.

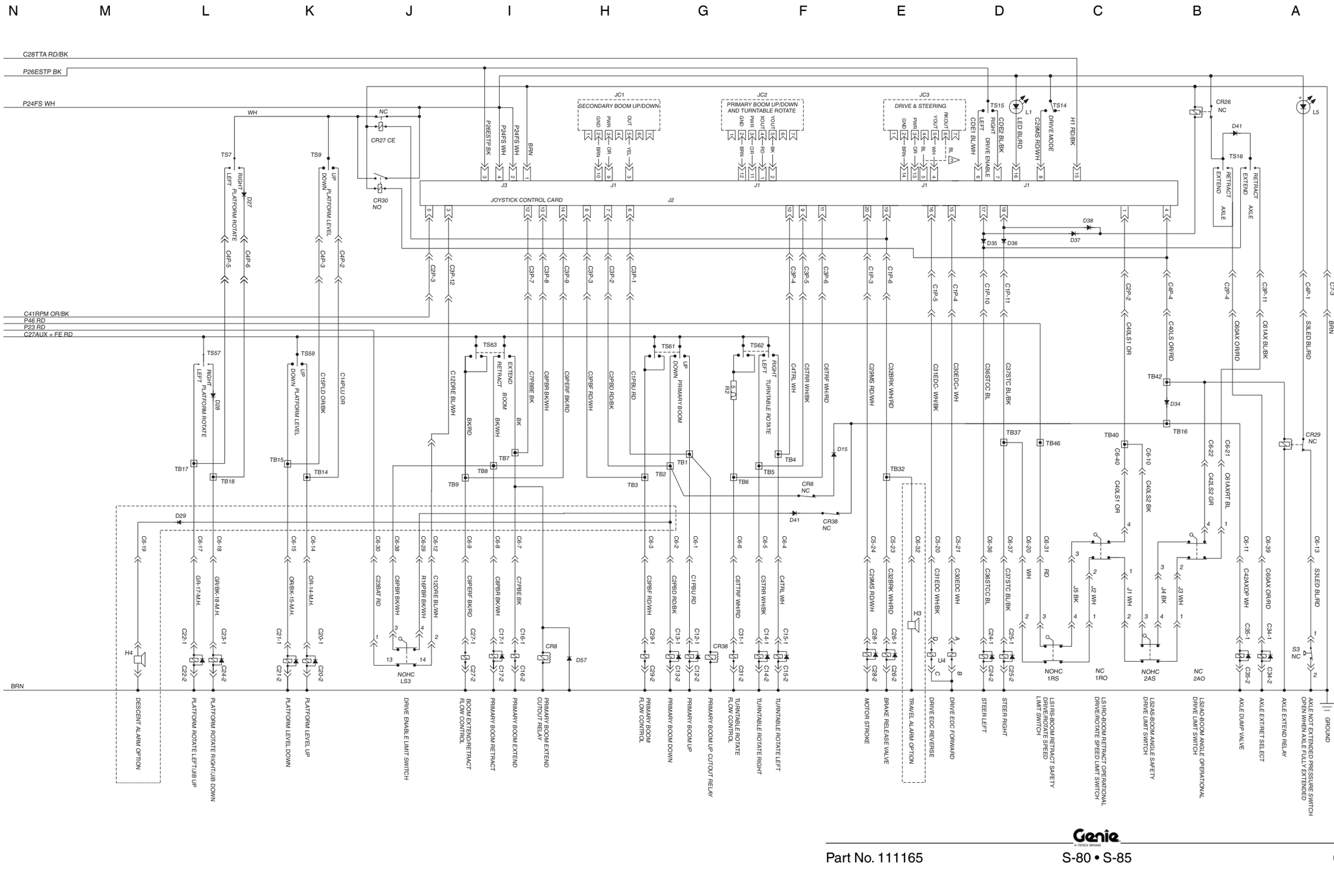
△ C1B & C1P – GRAY; C2B & C2P – BLACK; C3B & C3P – GREEN; C4B & C4P – BROWN.

△ ADD D40 ONLY IF UNIT HAS L4 AND L48.

△ ANSI/CSA (DOMESTIC MACHINE) ADD L48.

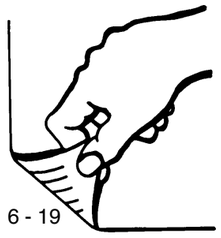
Electrical Schematic, S-80

Deutz BF4L 2011 Models



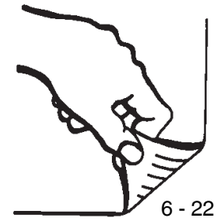
Electrical Schematic, S-80

Deutz BF4L 2011 Models



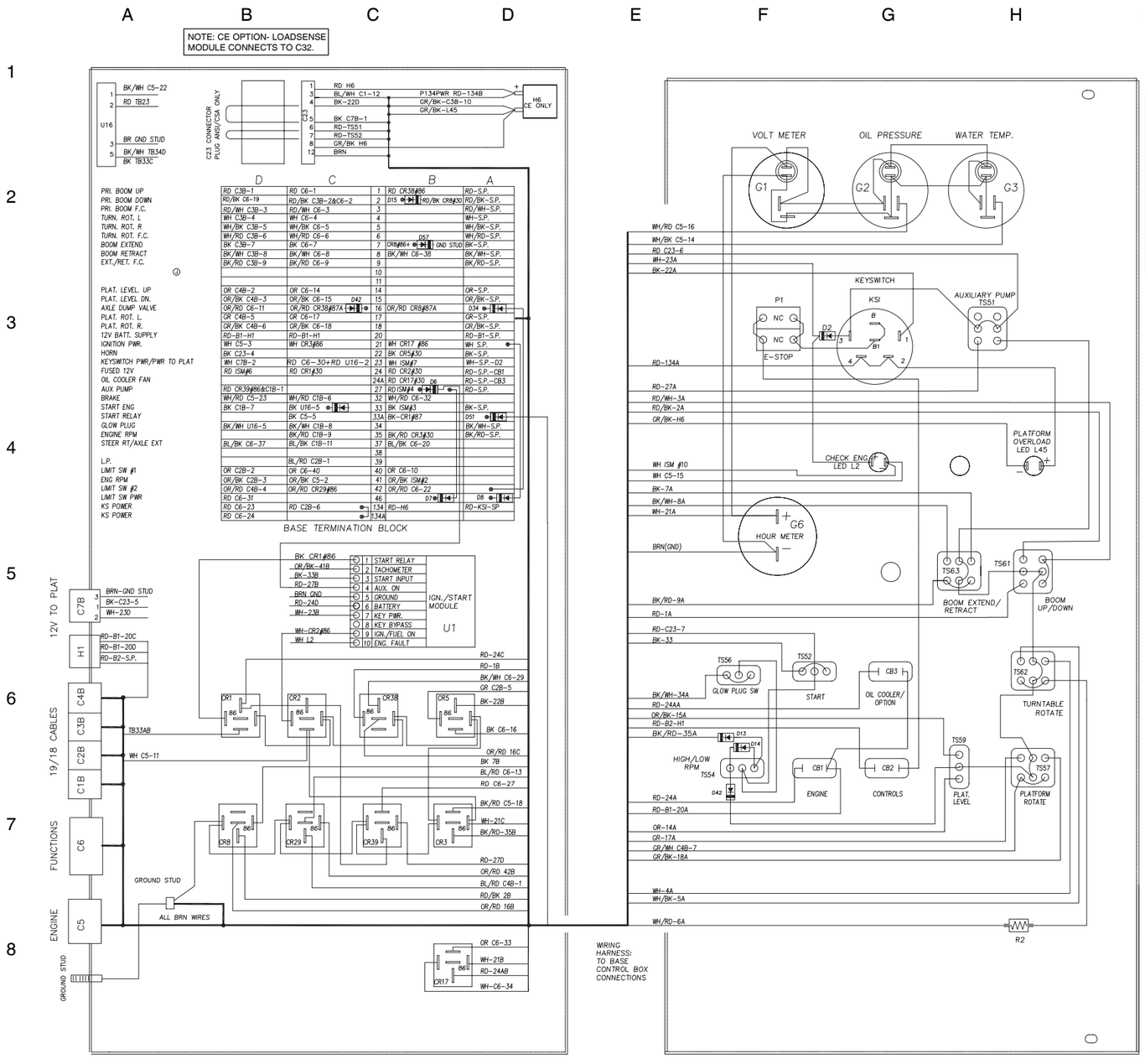
Ground Control Box Wiring Diagram, S-80

Deutz BF4L 2011 Models



Ground Control Box Wiring Diagram, S-80

Deutz BF4L 2011 Models

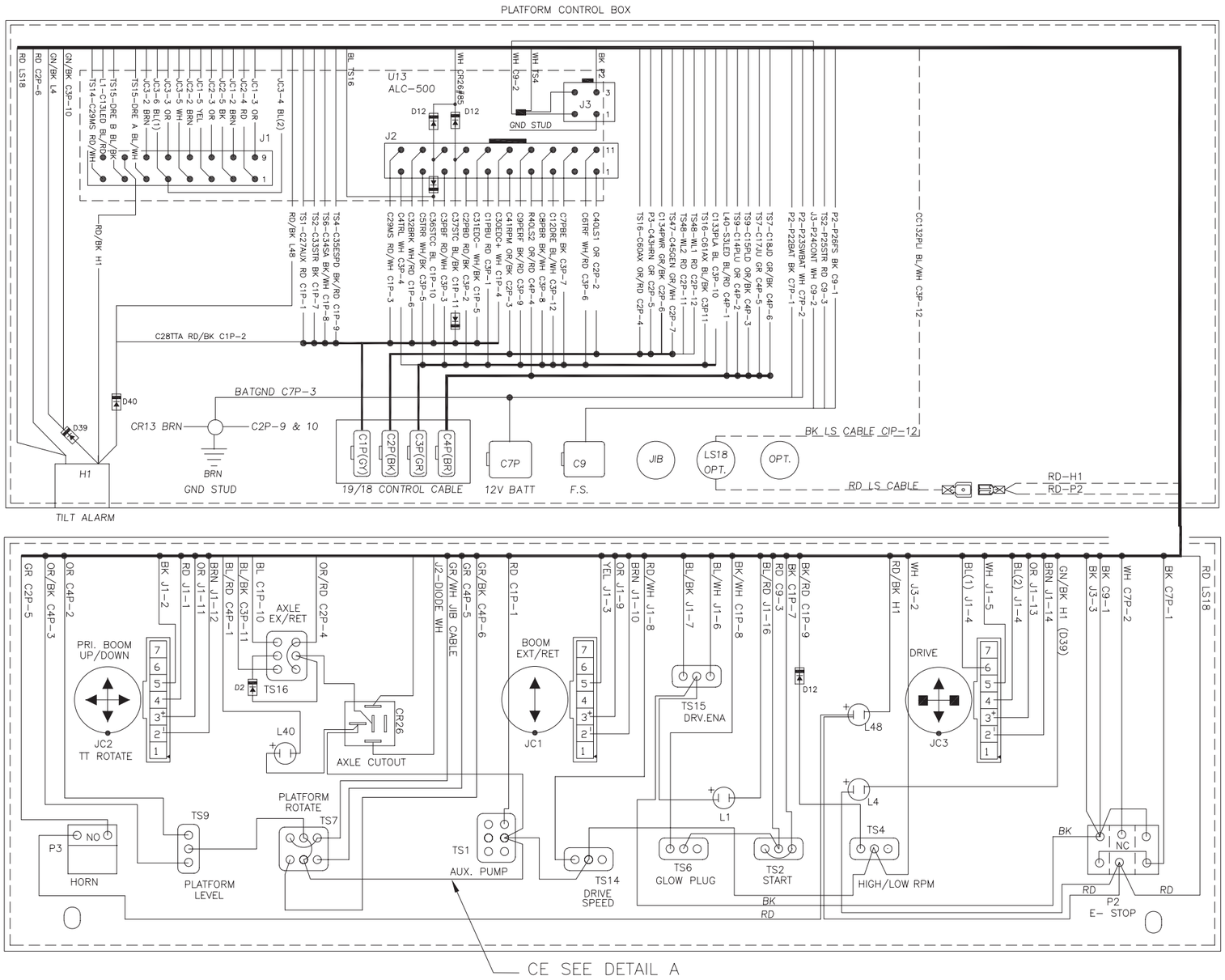


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	START ENGINE SWITCH
TS56	GLOW PLUG SWITCH (DIESEL ONLY)
TS54	FUNCTION ENABLE SWITCH
TS57	PLATFORM ROTATE SWITCH
TS59	PLATFORM LEVEL SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G6	HOUR METER
G1	VOLT METER GAUGE (OPT.)
G2	OIL PRESSURE GAUGE (OPT.)
G3	WATER TEMP. GAUGE (OPT.)
L2	CHECK ENGINE LED
L45	PLATFORM OVERLOAD LED
CR1	IGNITION / START RELAY
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	SERVICE HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT
CR39	AUXILARY PUMP RELAY
R2	TURNTABLE ROTATE LIMITING RESISTOR 5 OHMS
U1	IGNITION/START MODULE
U33	PLATFORM OVERLOAD MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSEURE SENDER	WH/RD C5-16	WH/RD-S.P
26 WATER TEMP SENDER	WH/BK C5-14	WH/BK-S.P.
28 TILT ALARM	RD/BK C1B-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. FWD	WH C1B-4	WH C5-21
31 E.D.C. REV	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL C1B-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

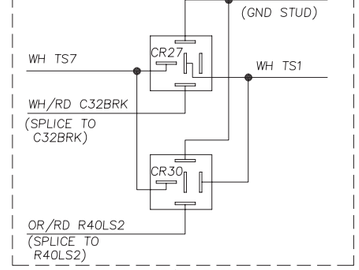
Platform Control Box Wiring Diagram, S-80

Deutz BF4L 2011 Models

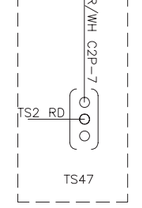


COMPONENT INDEX

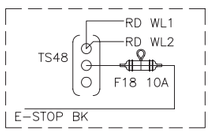
P2	EMERGENCY STOP BUTTON
P3	HORN SWITCH
TS1	AUXILIARY SWITCH
TS2	START ENGINE SWITCH
TS6	GLOW PLUG OPTION (DIESEL ENGINE ONLY)
TS4	HIGH RPM SWITCH
TS7	PLATFORM ROTATE SWITCH
TS9	PLATFORM LEVEL SWITCH
TS14	DRIVE SPEED LOW/HIGH SWITCH
TS15	DRIVE ENABLE SWITCH
TS16	AXLE EXT/RET SWITCH
TS47	GENERATOR SWITCH (OPTION)
TS48	WORK LIGHT RELAY (OPTION)
TS48	DRIVE LIGHT RELAY (OPTION)
L1	DRIVE ENABLE LED
L4	PLATFORM OVERLOAD LED (OPTION)
L40	AXLE EXTENDED LED
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT
JC1	BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN , TURNTABLE ROTATE
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY UP/DOWN
U13	ALC500
H1	TILT ALARM
LS18	PLATFORM OVERLOAD LIMIT SWITCH
L48	TILT ALARM LED



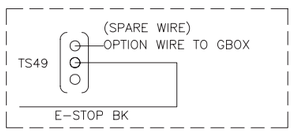
DETAIL A: LIFT/DRIVE OPTION
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL B:
GENERATOR OPTION



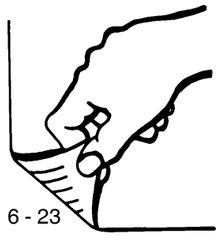
DETAIL C: WORKLIGHT OPTION



DRIVELIGHT OPTION

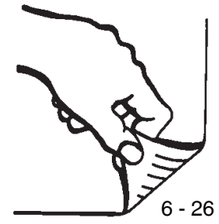
Platform Control Box Wiring Diagram, S-80

Deutz BF4L 2011 Models



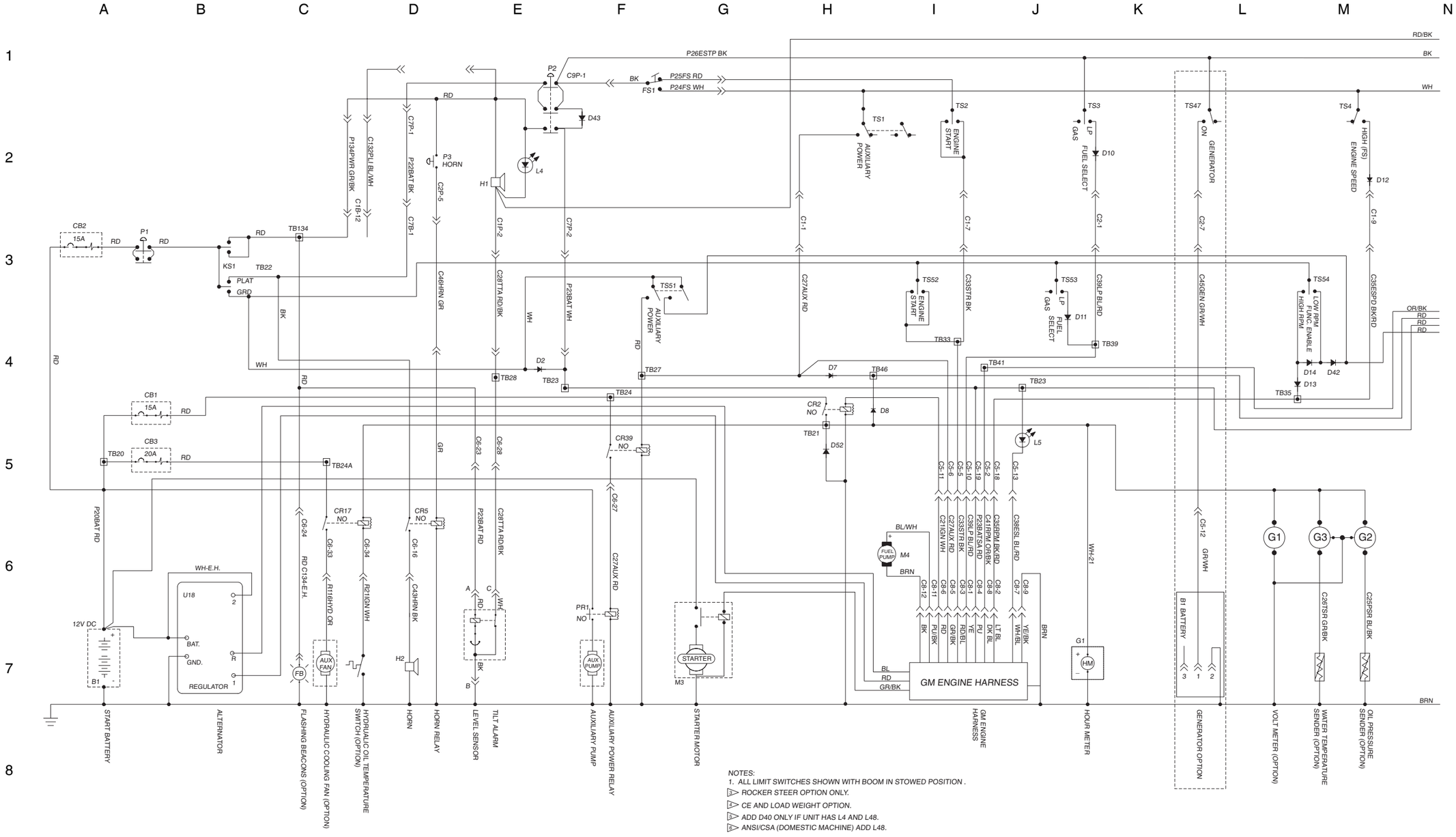
Electrical Schematic, S-80

GM 3.0L Models



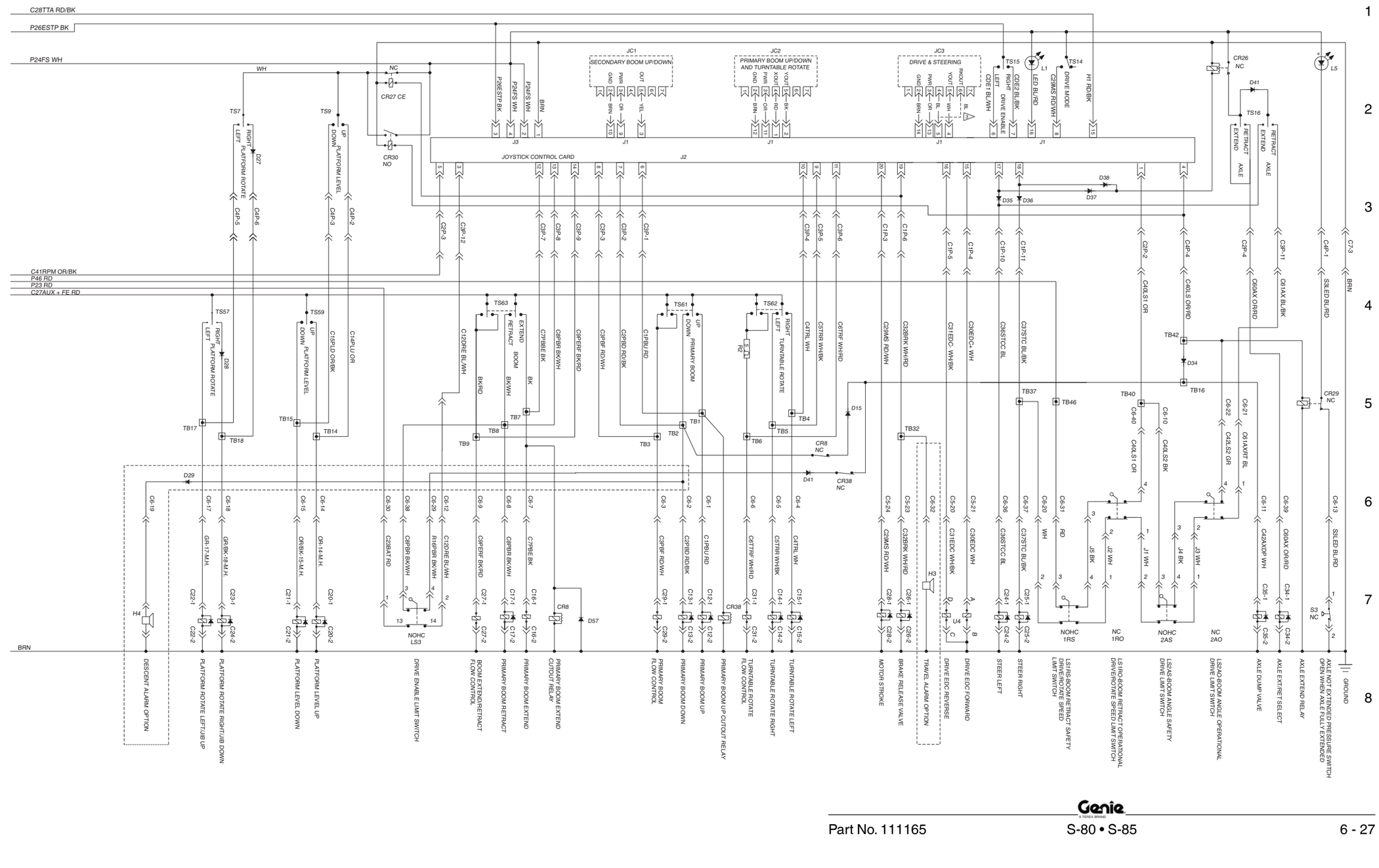
Electrical Schematic, S-80

GM 3.0L Models



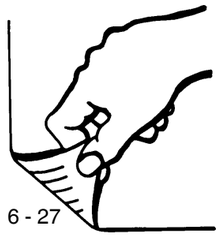
NOTES:
1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION .
2. ROCKER STEER OPTION ONLY.
3. CE AND LOAD WEIGHT OPTION.
4. ADD D40 ONLY IF UNIT HAS L4 AND L48.
5. ANSI/CSA (DOMESTIC MACHINE) ADD L48.

Electrical Schematic, S-80
GM 3.0L Models



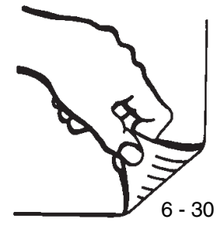
Electrical Schematic, S-80

GM 3.0L Models



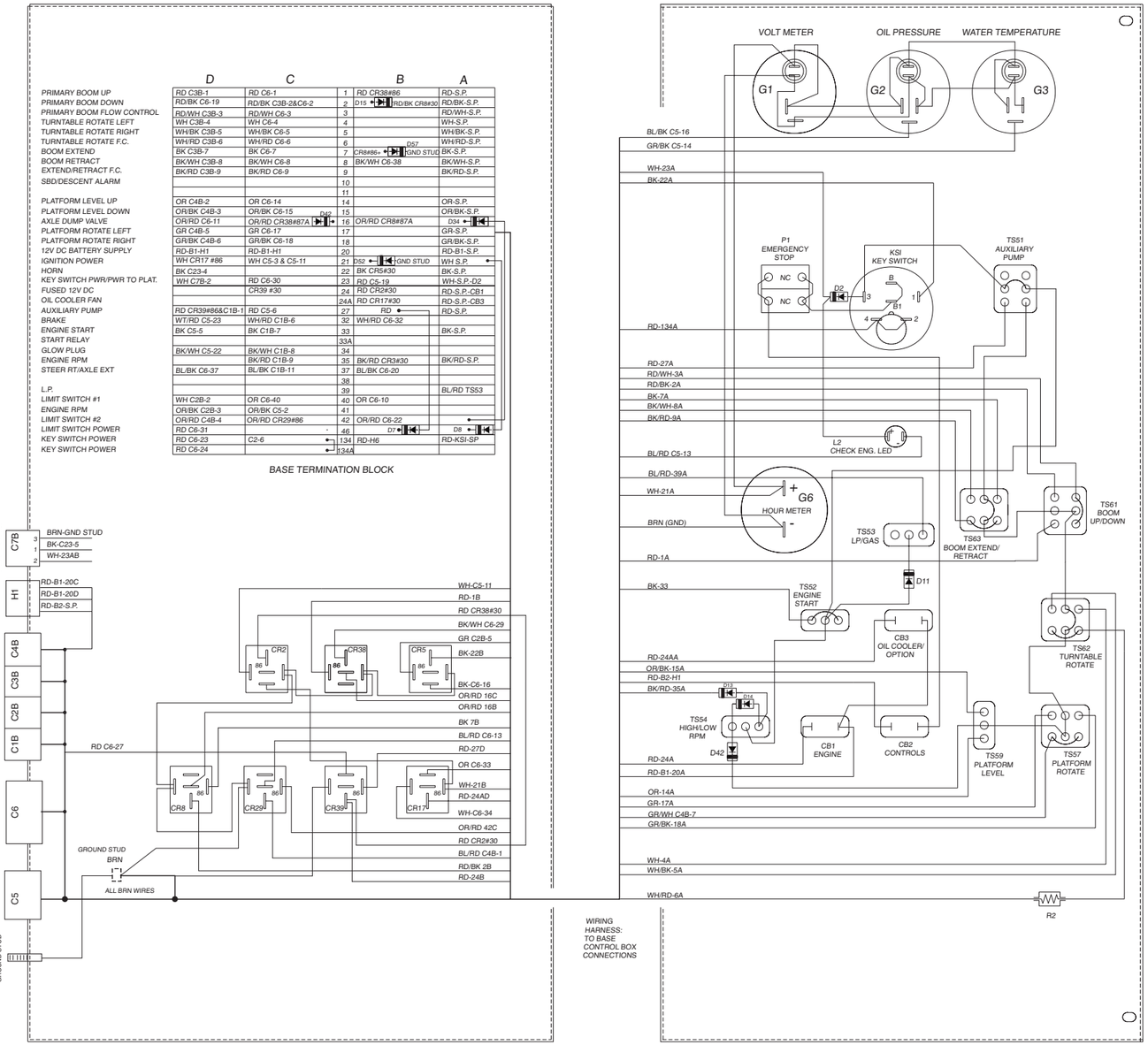
Ground Control Box Wiring Diagram, S-80

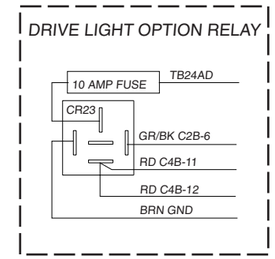
GM 3.0L Models



Ground Control Box Wiring Diagram, S-80

GM 3.0L Models



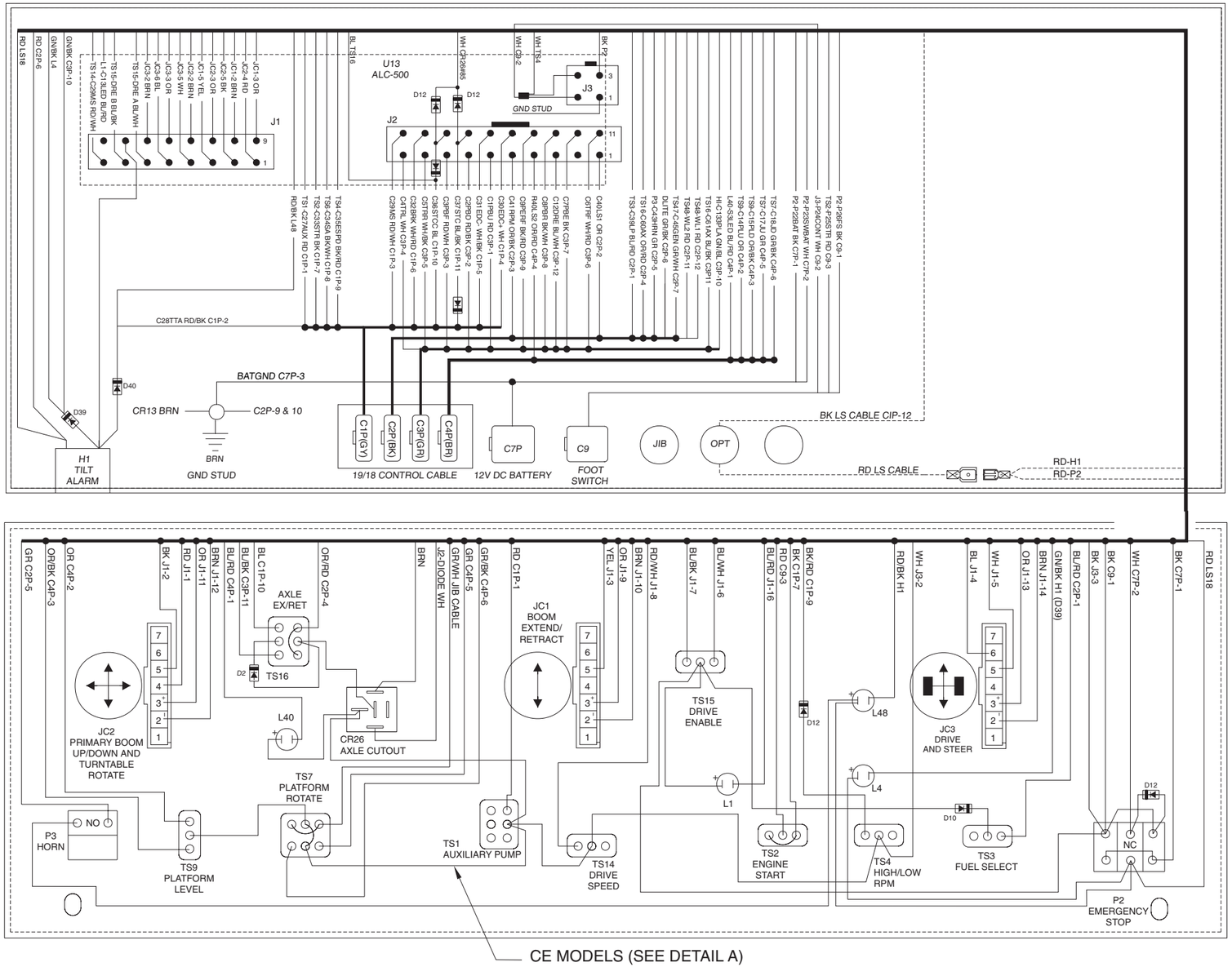


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY POWER TOGGLE SWITCH
TS52	ENGINE START TOGGLE SWITCH
TS53	LP/GAS SELECT TOGGLE SWITCH
TS54	FUNCTION ENABLE/RPM SELECT TOGGLE SWITCH
TS57	PLATFORM ROTATE TOGGLE SWITCH
TS59	PLATFORM LEVEL TOGGLE SWITCH
TS61	PRIMARY BOOM UP/DOWN TOGGLE SWITCH
TS62	TURNTABLE ROTATE TOGGLE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT TOGGLE SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G1	VOLT METER GAUGE (OPTIONAL)
G2	OIL PRESSURE GAUGE (OPTIONAL)
G3	WATER TEMP. GAUGE (OPTIONAL)
G6	HOUR METER
L2	CHECK ENGINE LED
R2	TURNTABLE ROTATE LIMITING RESISTOR, 5 OHMS
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY (OPTIONAL)
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT RELAY
CR39	AUXILIARY PUMP RELAY
U1	IGNITION/START MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSURE SENDER	BL/BK C5-16	BL/BK-S.P
26 WATER TEMP SENDER	GR/BK C5-14	GR/BK-S.P.
28 TILT ALARM	RD/BK C1-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. REVERSE	WH C1B-4	WH C5-21
31 E.D.C. FORWARD	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL CB1-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GENERATOR OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXTEND/RETRACT SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

Platform Control Box Wiring Diagram, S-80
GM 3.0L Models

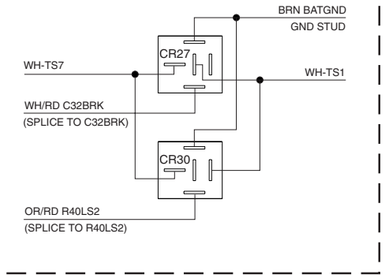
N M L K J I H G F E D C B A



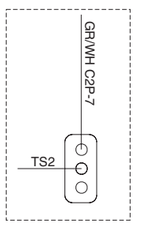
COMPONENT INDEX

P2	*EMERGENCY STOP BUTTON*
P3	*HORN SWITCH*
TS1	*AUXILIARY TOGGLE SWITCH*
TS2	*ENGINE START TOGGLE SWITCH*
TS3	*FUEL SELECT TOGGLE SWITCH (FORD)*
TS4	*HIGH RPM TOGGLE SWITCH*
TS7	*PLATFORM ROTATE TOGGLE SWITCH*
TS9	*PLATFORM LEVEL TOGGLE SWITCH*
TS14	*DRIVE SPEED LOW/HIGH TOGGLE SWITCH*
TS15	*DRIVE ENABLE TOGGLE SWITCH*
TS16	*AXLE EXTEND/RETRACT TOGGLE SWITCH*
TS47	*GENERATOR TOGGLE SWITCH (OPTION)*
TS48	*WORK LIGHT RELAY (OPTION)*
TS49	*DRIVE LIGHT RELAY (OPTION)*
L1	*DRIVE ENABLE LED*
L4	*PLATFORM OVERLOAD LED*
L40	*AXLE EXTENDED LED*
JC3	*DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT*
JC2	*BOOM PROPORTIONAL JOYSTICK: PRIMARY BOOM UP/DOWN , TURNTABLE ROTATE*
JC1	*BOOM PROPORTIONAL JOYSTICK: BOOM EXTEND/RETRACT*
CR26	*AXLE CUTOUT RELAY*
U13	*ALC500*
H1	*TILT ALARM*
LS18	*PLATFORM OVERLOAD LIMIT SWITCH*
L48	*TILT ALARM LED*

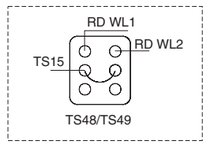
CE LIFT/DRIVE OPTION
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL B:
GENERATOR OPTION



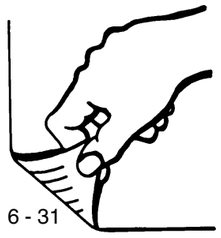
DETAIL C: WORKLIGHT/DRIVELIGHT OPTION



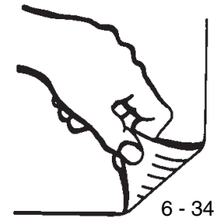
1 2 3 4 5 6 7 8

Platform Control Box Wiring Diagram, S-80

GM 3.0L Models

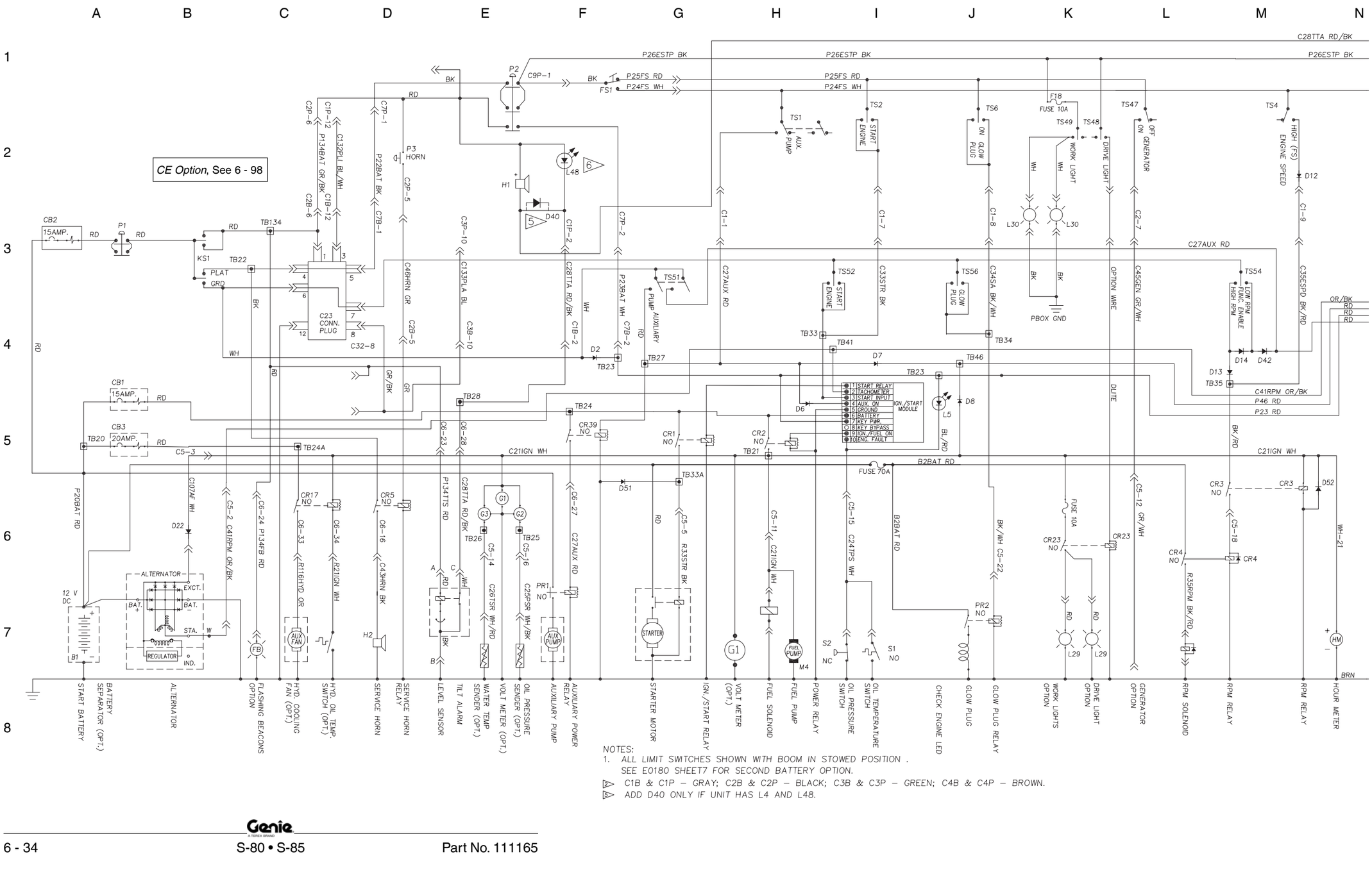


Electrical Schematic, S-80
Perkins 804-33 Models



Electrical Schematic, S-80

Perkins 804-33 Models



NOTES:

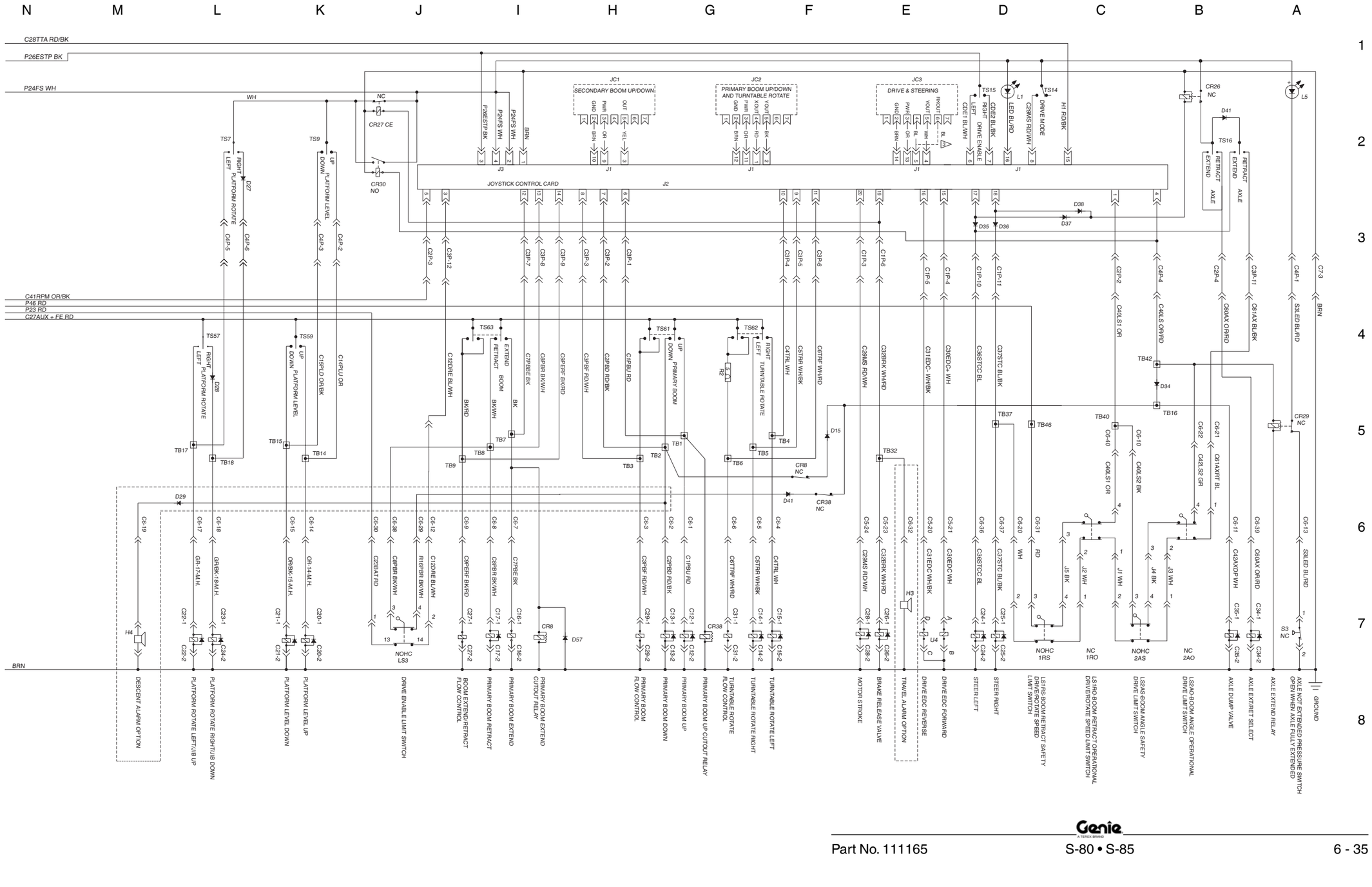
1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION . SEE E0180 SHEET7 FOR SECOND BATTERY OPTION.

⚠ C1B & C1P – GRAY; C2B & C2P – BLACK; C3B & C3P – GREEN; C4B & C4P – BROWN.

⚠ ADD D40 ONLY IF UNIT HAS L4 AND L48.

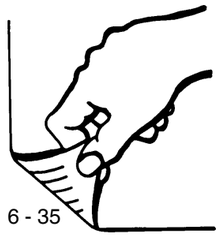
Electrical Schematic, S-80

Perkins 804-33 Models



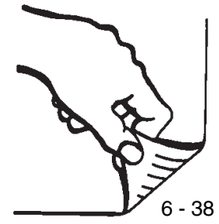
Electrical Schematic, S-80

Perkins 804-33 Models



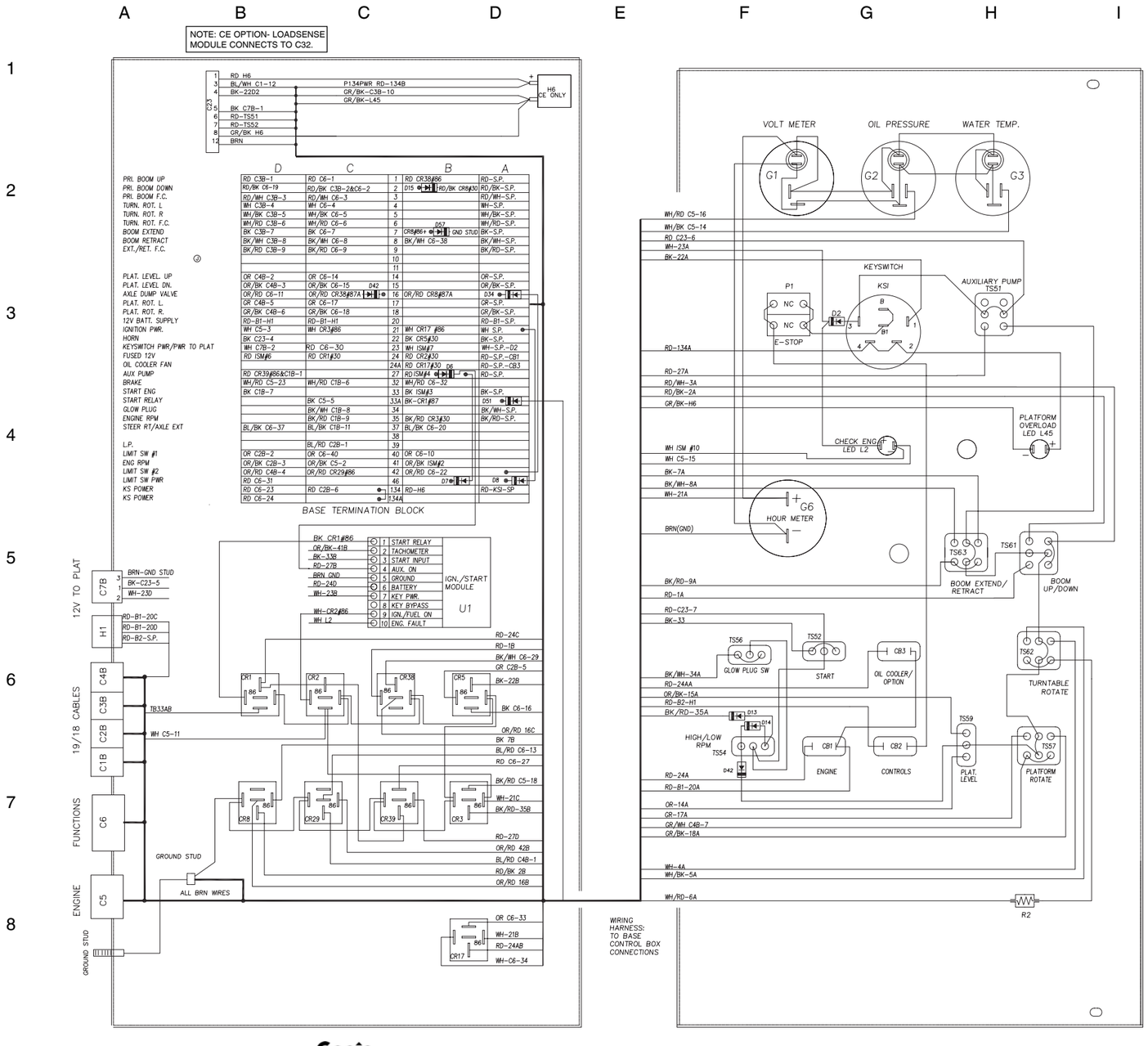
Ground Control Box Wiring Diagram, S-80

Perkins 804-33 Models



Ground Control Box Wiring Diagram, S-80

Perkins 804-33 Models



LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	START ENGINE SWITCH
TS56	GLOW PLUG SWITCH (DIESEL ONLY)
TS54	FUNCTION ENABLE SWITCH
TS57	PLATFORM ROTATE SWITCH
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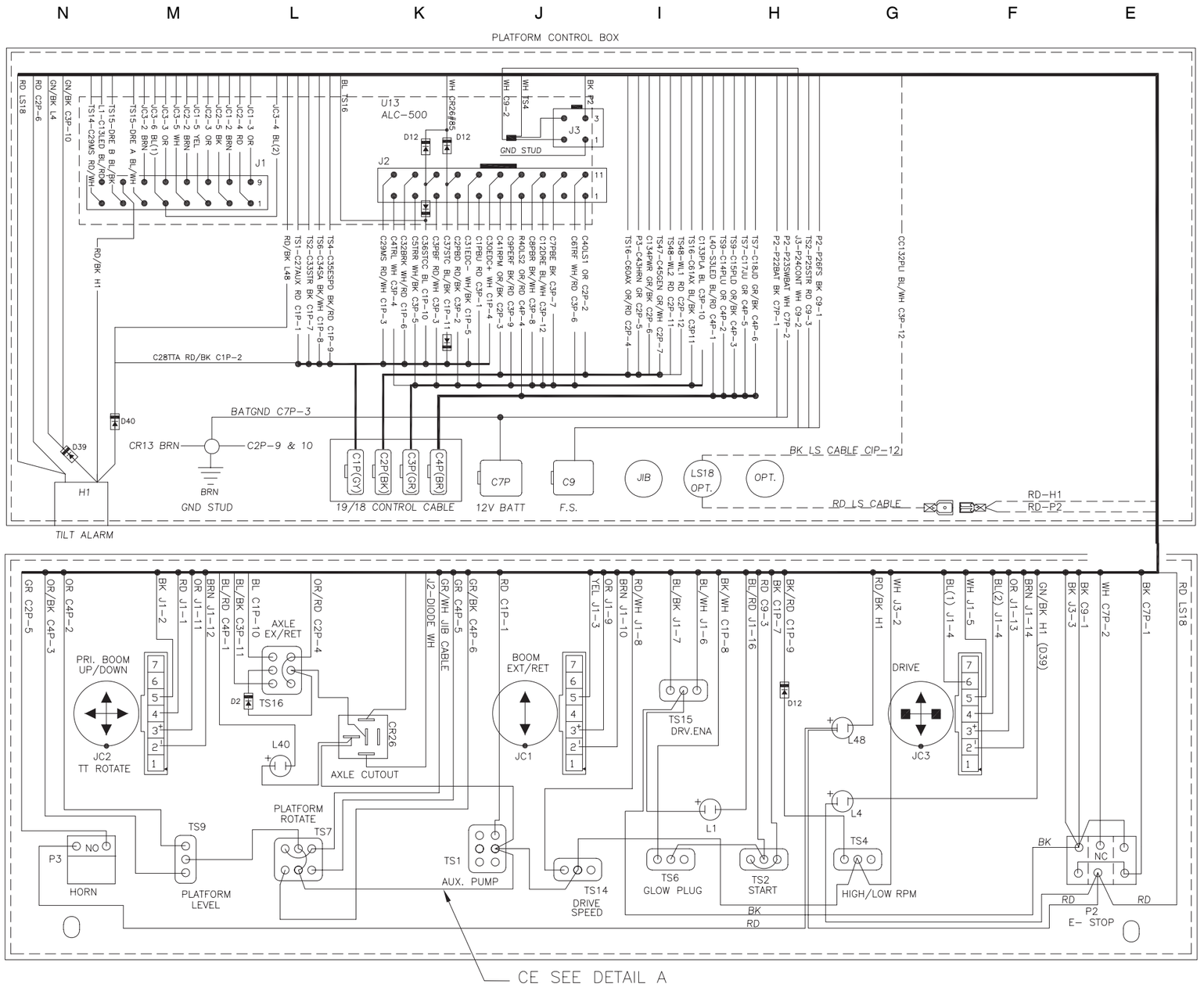
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G6	HOUR METER
G1	VOLT METER GAUGE (OPT.)
G2	OIL PRESSURE GAUGE (OPT.)
G3	WATER TEMP. GAUGE (OPT.)
L2	CHECK ENGINE LED
L45	PLATFORM OVERLOAD LED
CR1	IGNITION / START RELAY
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	SERVICE HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT
CR39	AUXILARY PUMP RELAY
R2	TURNTABLE ROTATE LIMITING RESISTOR 5 OHMS
U1	IGNITION/START MODULE
U33	PLATFORM OVERLOAD MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSEURE SENDER	WH/RD C5-16	WH/RD-S.P
26 WATER TEMP SENDER	WH/BK C5-14	WH/BK-S.P.
28 TILT ALARM	RD/BK C1B-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. FWD	WH C1B-4	WH C5-21
31 E.D.C. REV	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL C1B-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

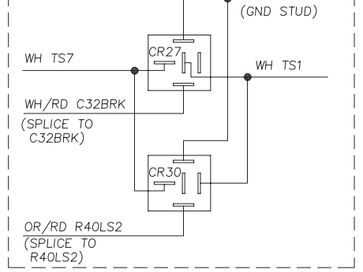
Platform Control Box Wiring Diagram, S-80

Perkins 804-33 Models

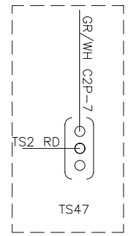


COMPONENT INDEX

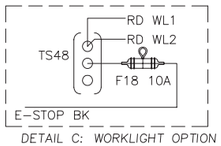
P2	EMERGENCY STOP BUTTON
P3	HORN SWITCH
TS1	AUXILIARY SWITCH
TS2	START ENGINE SWITCH
TS6	GLOW PLUG OPTION (DIESEL ENGINE ONLY)
TS4	HIGH RPM SWITCH
TS7	PLATFORM ROTATE SWITCH
TS9	PLATFORM LEVEL SWITCH
TS14	DRIVE SPEED LOW/HIGH SWITCH
TS15	DRIVE ENABLE SWITCH
TS16	AXLE EXT/RET SWITCH
TS47	GENERATOR SWITCH (OPTION)
TS48	WORK LIGHT RELAY (OPTION)
TS48	DRIVE LIGHT RELAY (OPTION)
L1	DRIVE ENABLE LED
L4	PLATFORM OVERLOAD LED (OPTION)
L40	AXLE EXTENDED LED
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT
JC1	BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN , TURNTABLE ROTATE
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY UP/DOWN
U13	ALC500
H1	TILT ALARM
LS18	PLATFORM OVERLOAD LIMIT SWITCH
L48	TILT ALARM LED



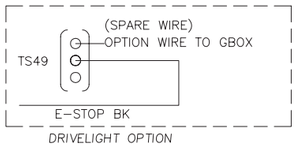
DETAIL A: LIFT/DRIVE OPTION
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL B:
GENERATOR OPTION



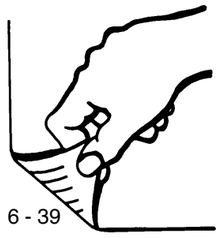
DETAIL C: WORKLIGHT OPTION



DRIVELIGHT OPTION

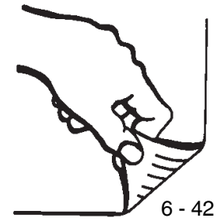
Platform Control Box Wiring Diagram, S-80

Perkins 804-33 Models



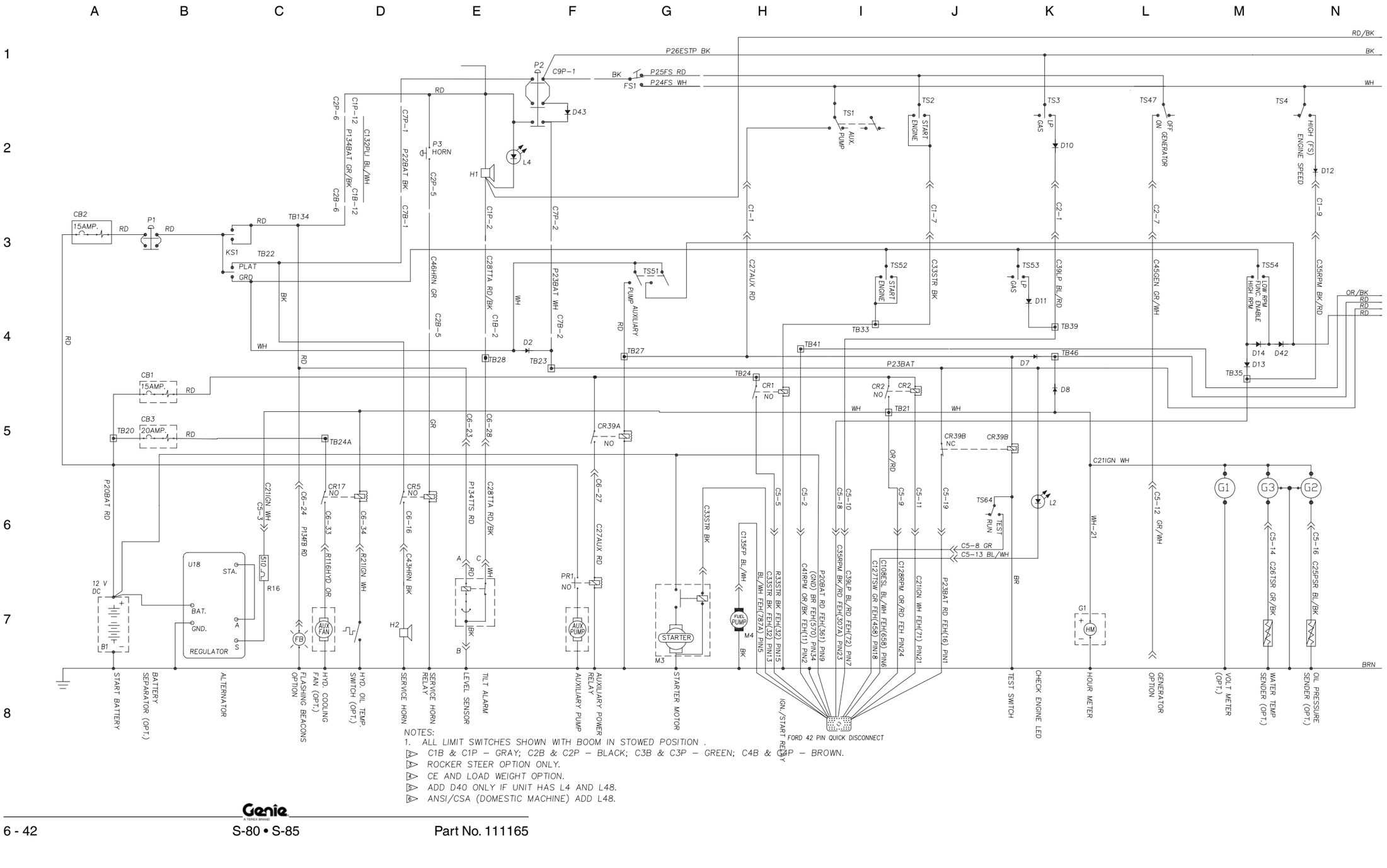
Electrical Schematic, S-80

Ford LRG-425 EFI



Electrical Schematic, S-80

Ford LRG-425 EFI

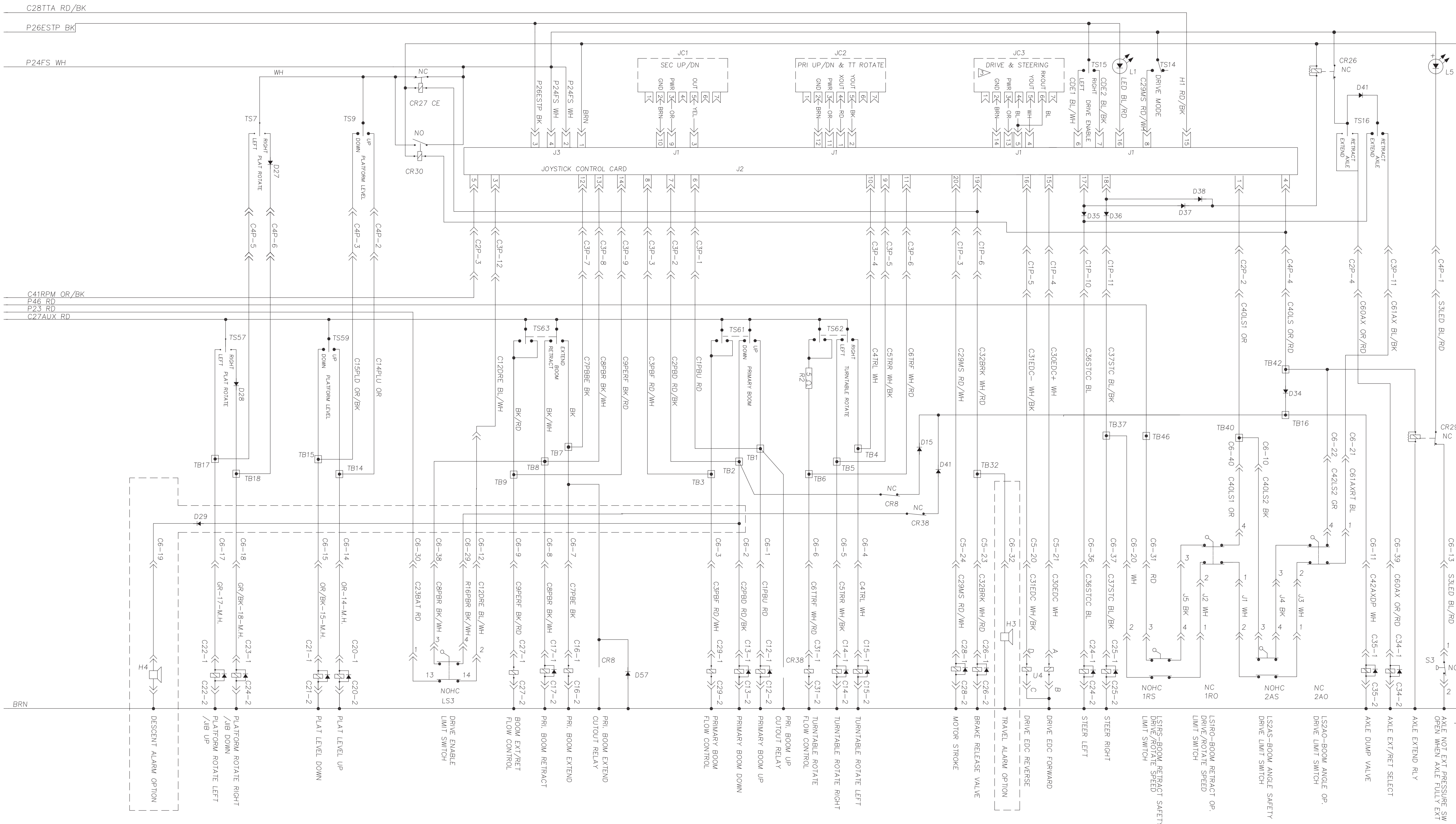


NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION .
2. C1B & C1P – GRAY; C2B & C2P – BLACK; C3B & C3P – GREEN; C4B & C4P – BROWN.
3. ROCKER STEER OPTION ONLY.
4. CE AND LOAD WEIGHT OPTION.
5. ADD D40 ONLY IF UNIT HAS L4 AND L48.
6. ANSI/CSA (DOMESTIC MACHINE) ADD L48.

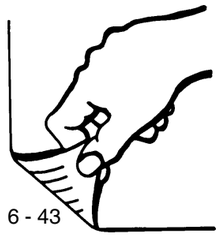
Electrical Schematic, S-80

Ford LRG-425 EFI



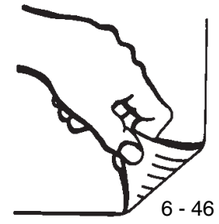
Electrical Schematic, S-80

Ford LRG-425 EFI



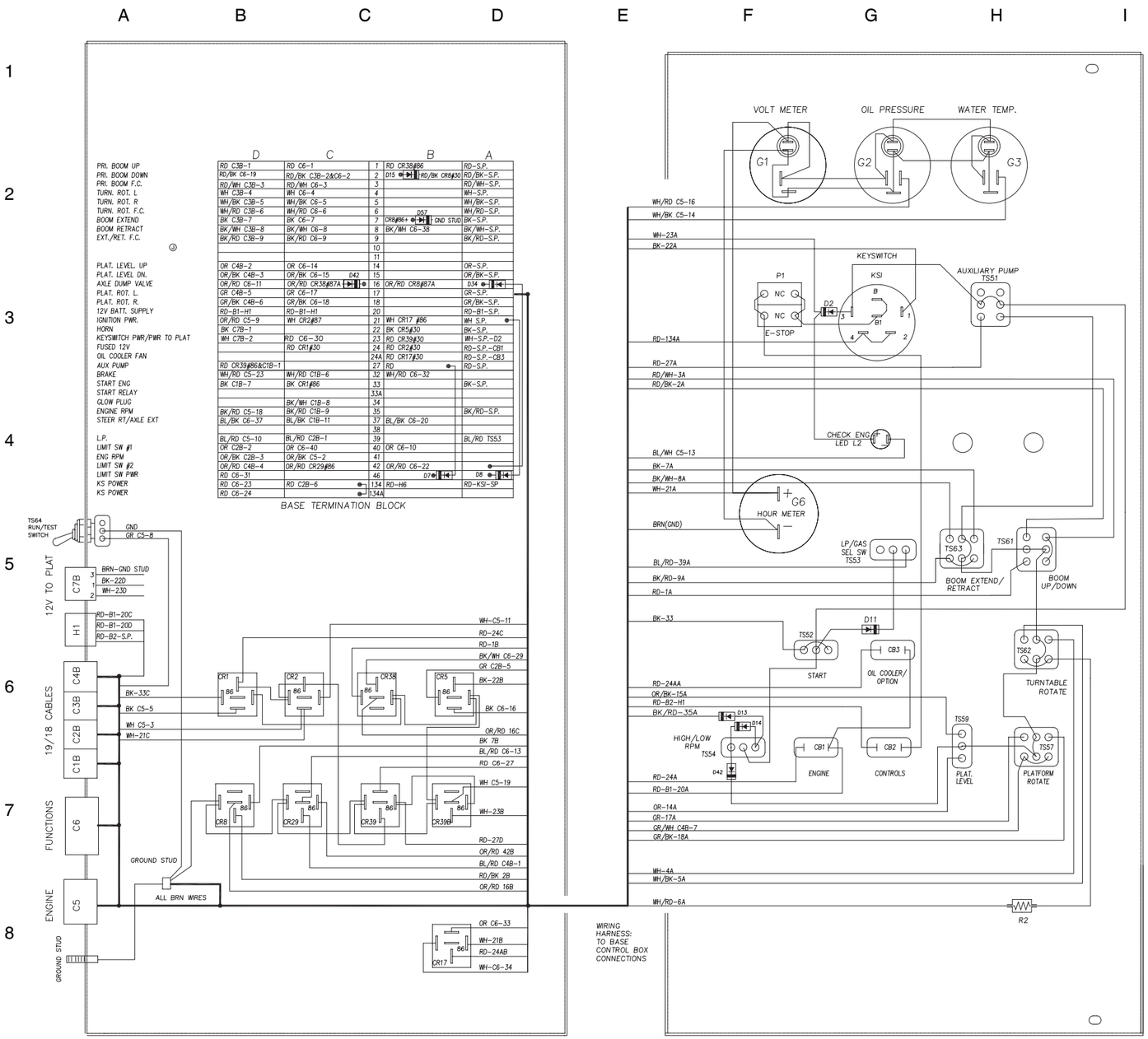
Ground Control Box Wiring Diagram, S-80

Ford LRG-425 EFI



Ground Control Box Wiring Diagram, S-80

Ford LRG-425 EFI

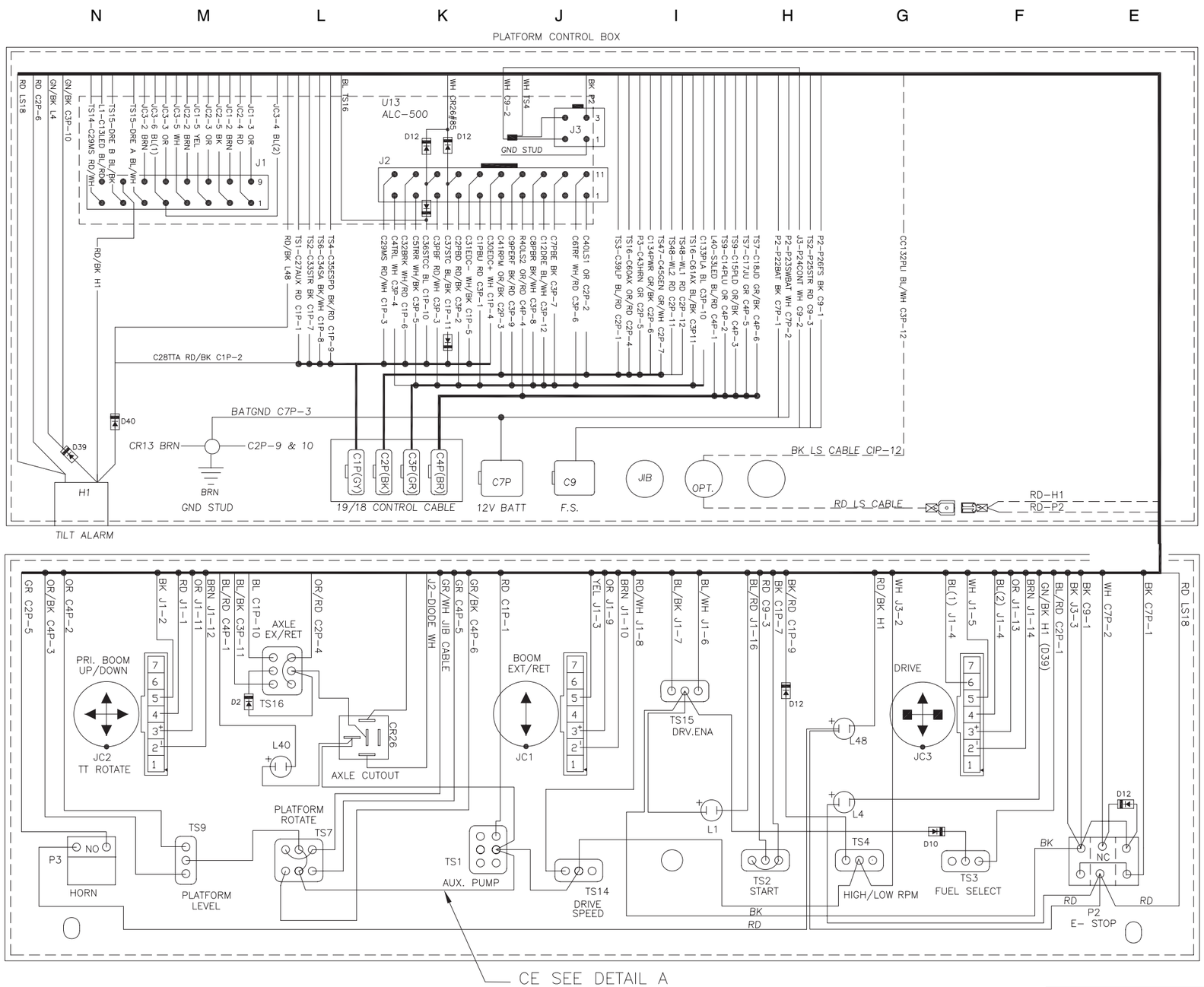


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	START ENGINE SWITCH
TS53	GAS/LP (DUAL FUEL OPTION)
TS54	FUNCTION ENABLE SWITCH
TS57	PLATFORM ROTATE SWITCH
TS59	PLATFORM LEVEL SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G6	HOUR METER
G1	VOLT METER GAUGE (OPT.)
G2	OIL PRESSURE GAUGE (OPT.)
G3	WATER TEMP. GAUGE (OPT.)
L2	CHECK ENGINE LED
CR1	IGNITION / START RELAY
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	SERVICE HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT
CR39	AUXILARY PUMP RELAY
CR39A	AUXILARY PUMP/ENGINE SHUT DOWN RELAY
R2	TURNTABLE ROTATE LIMITING RESISTOR 5 OHMS
U1	IGNITION/START MODULE
U33	PLATFORM OVERLOAD MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSEURE SENDER	WH/RD C5-16	WH/RD-S.P
26 WATER TEMP SENDER	WH/BK C5-14	WH/BK-S.P.
28 TILT ALARM	RD/BK C1B-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. FWD	WH C1B-4	WH C5-21
31 E.D.C. REV	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL C1B-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

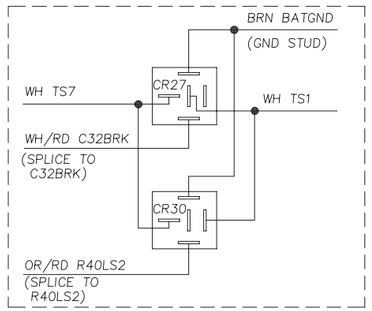
Platform Control Box Wiring Diagram, S-80

Ford LRG-425 EFI

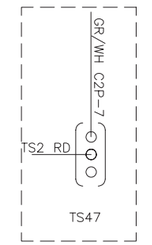


COMPONENT INDEX

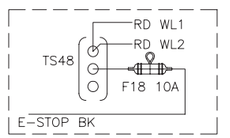
P2	EMERGENCY STOP BUTTON
P3	HORN SWITCH
TS1	AUXILIARY SWITCH
TS2	START ENGINE SWITCH
TS3	FUEL SELECT SWITCH (FORD)
TS4	HIGH RPM SWITCH
TS7	PLATFORM ROTATE SWITCH
TS9	PLATFORM LEVEL SWITCH
TS14	DRIVE SPEED LOW/HIGH SWITCH
TS15	DRIVE ENABLE SWITCH
TS16	AXLE EXT/RET SWITCH
TS47	GENERATOR SWITCH (OPTION)
TS48	WORK LIGHT RELAY (OPTION)
TS48	DRIVE LIGHT RELAY (OPTION)
L1	DRIVE ENABLE LED
L4	PLATFORM OVERLOAD LED (OPTION)
L40	AXLE EXTENDED LED
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT
JC1	BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN , TURNTABLE ROTATE
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY UP/DOWN
U13	ALC500
H1	TILT ALARM
LS18	PLATFORM OVERLOAD LIMIT SWITCH
L48	TILT ALARM LED



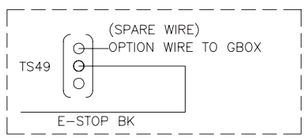
DETAIL A: LIFT/DRIVE OPTION
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL B:
GENERATOR OPTION



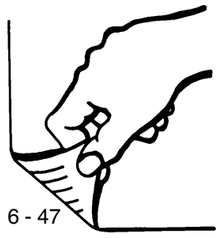
DETAIL C: WORKLIGHT OPTION



DRIVELIGHT OPTION

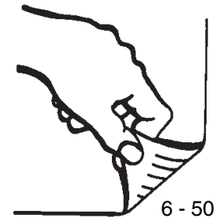
Platform Control Box Wiring Diagram, S-80

Ford LRG-425 EFI



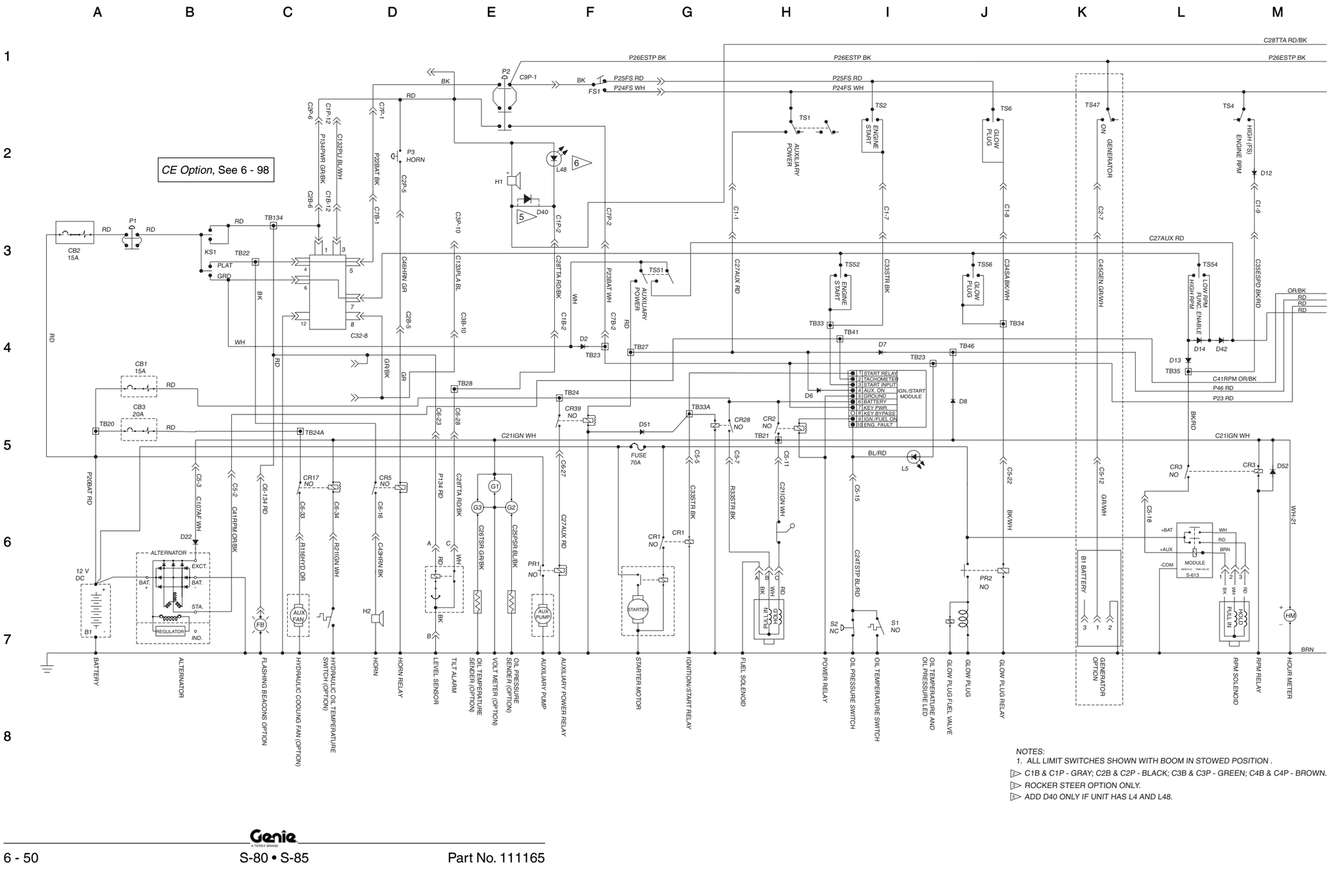
Electrical Schematic, S-85

Deutz F4L 913 Models



Electrical Schematic, S-85

Deutz F4L 913 Models



NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION .

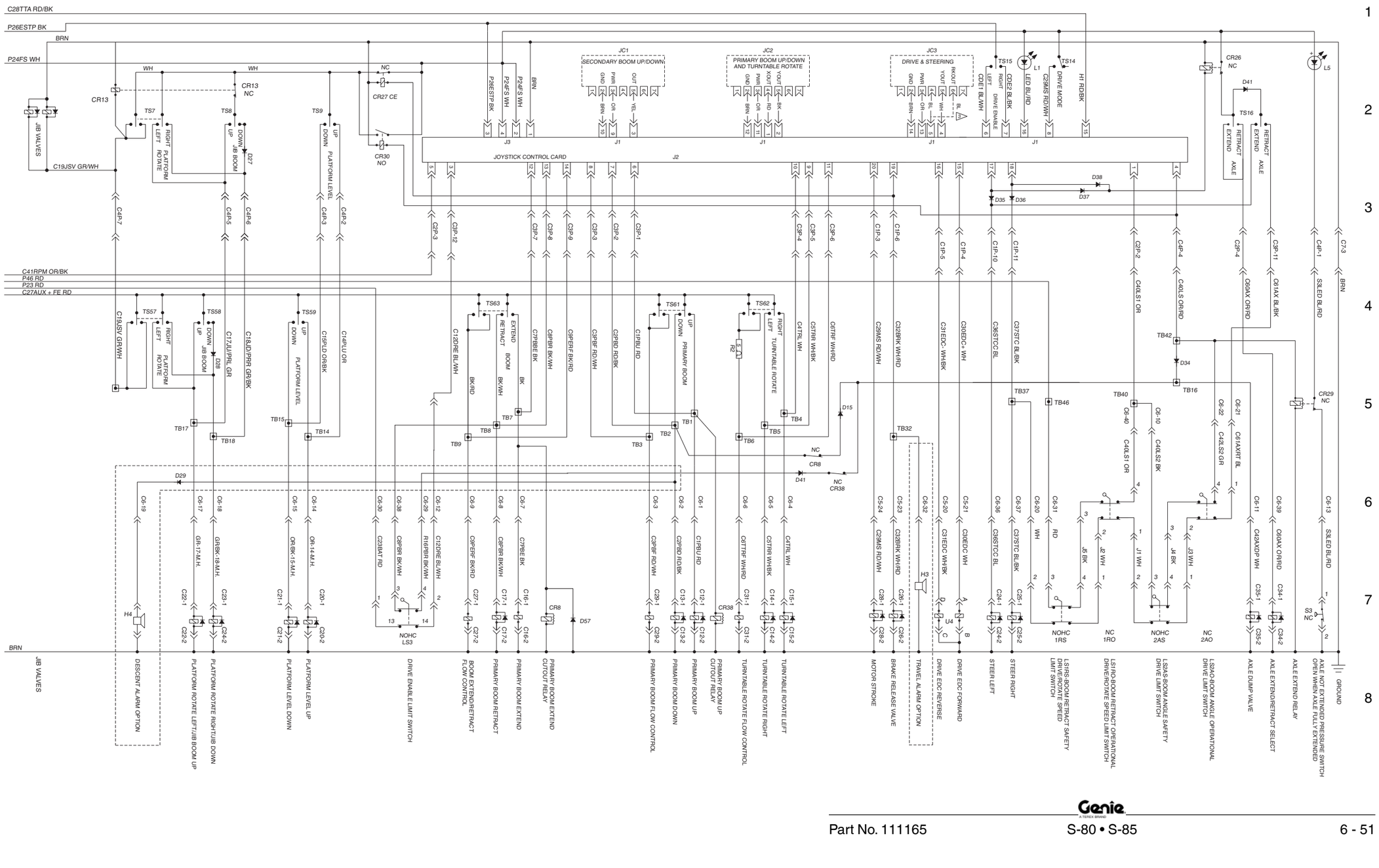
▷ C1B & C1P - GRAY; C2B & C2P - BLACK; C3B & C3P - GREEN; C4B & C4P - BROWN.

▷ ROCKER STEER OPTION ONLY.

▷ ADD D40 ONLY IF UNIT HAS L4 AND L48.

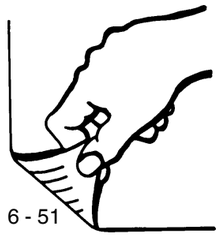
Electrical Schematic, S-85

Deutz F4L 913 Models



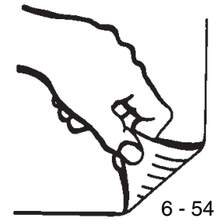
Electrical Schematic, S-85

Deutz F4L 913 Models



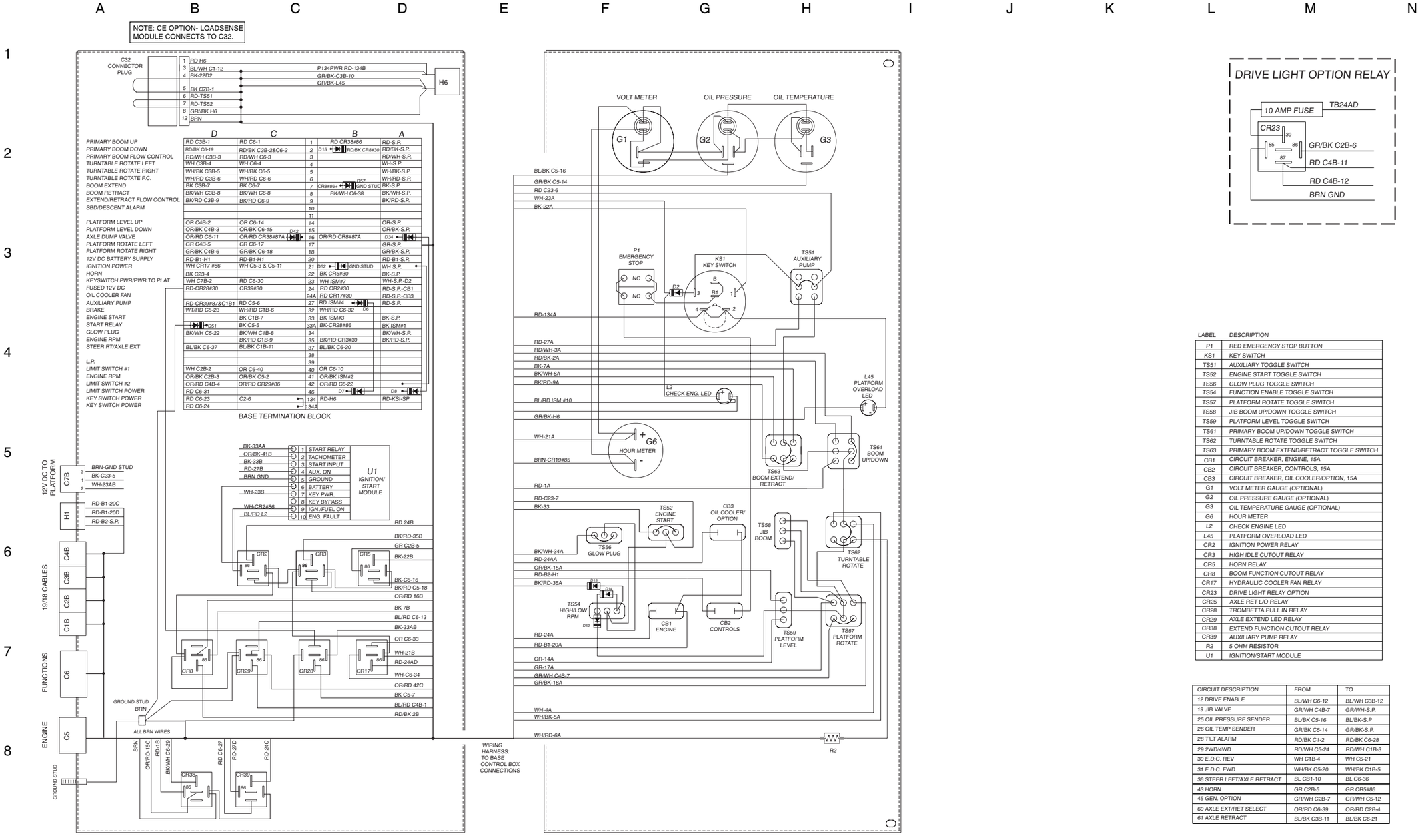
Ground Control Box Wiring Diagram, S-85

Deutz F4L 913 Models



Ground Control Box Wiring Diagram, S-85

Deutz F4L 913 Models

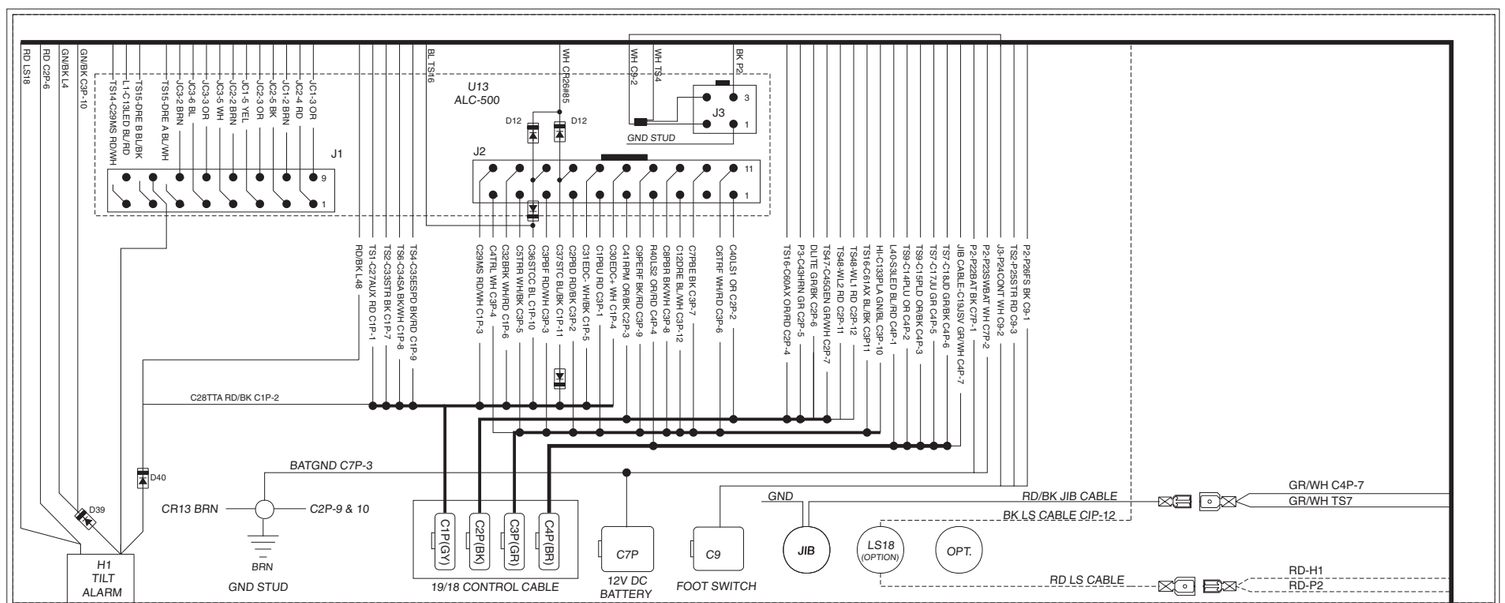


LABEL	DESCRIPTION
P1	RED EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY TOGGLE SWITCH
TS52	ENGINE START TOGGLE SWITCH
TS56	GLOW PLUG TOGGLE SWITCH
TS54	FUNCTION ENABLE TOGGLE SWITCH
TS57	PLATFORM ROTATE TOGGLE SWITCH
TS58	JIB BOOM UP/DOWN TOGGLE SWITCH
TS59	PLATFORM LEVEL TOGGLE SWITCH
TS61	PRIMARY BOOM UP/DOWN TOGGLE SWITCH
TS62	TURNTABLE ROTATE TOGGLE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT TOGGLE SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 15A
G1	VOLT METER GAUGE (OPTIONAL)
G2	OIL PRESSURE GAUGE (OPTIONAL)
G3	OIL TEMPERATURE GAUGE (OPTIONAL)
G6	HOUR METER
L2	CHECK ENGINE LED
L45	PLATFORM OVERLOAD LED
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	HORN RELAY
CR8	BOOM FUNCTION CUTOUT RELAY
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR28	TROMBETTA PULL IN RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT RELAY
CR39	AUXILIARY PUMP RELAY
R2	5 OHM RESISTOR
U1	IGNITION/START MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSURE SENDER	BL/BK C5-16	BL/BK-S.P.
26 OIL TEMP SENDER	GR/BK C5-14	GR/BK-S.P.
28 TILT ALARM	RD/BK C1-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. REV	WH C1B-4	WH C5-21
31 E.D.C. FWD	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL CB1-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

Platform Control Box Wiring Diagram, S-85

Deutz F4L 913 Models

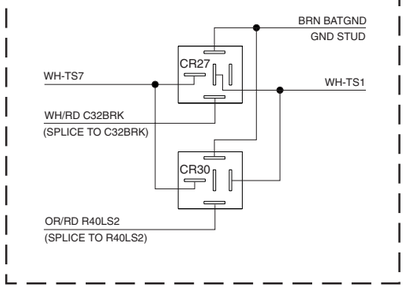


COMPONENT INDEX

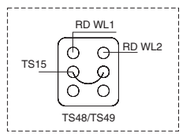
P2	EMERGENCY STOP BUTTON
P3	HORN SWITCH
TS1	AUXILIARY TOGGLE SWITCH
TS2	ENGINE START SWITCH
TS4	HIGH RPM SWITCH
TS6	GLOW PLUG OPTION
TS7	PLATFORM ROTATE TOGGLE SWITCH
TS8	JIB BOOM UP/DOWN TOGGLE SWITCH
TS9	PLATFORM LEVEL TOGGLE SWITCH
TS14	LOW/HIGH DRIVE SPEED TOGGLE SWITCH
TS15	DRIVE ENABLE TOGGLE SWITCH
TS16	AXLE EXTEND/RETRACT TOGGLE SWITCH
TS47	GENERATOR TOGGLE SWITCH (OPTION)
TS48	WORK LIGHT TOGGLE SWITCH (OPTION)
TS49	DRIVE LIGHT TOGGLE SWITCH (OPTION)
LS18	PLATFORM OVERLOAD LIMIT SWITCH
L1	DRIVE ENABLE LED
L4	PLATFORM OVERLOAD LED
L40	AXLE EXTENDED LED
L48	TILT ALARM LED
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY BOOM UP/DOWN
JC1	BOOM PROPORTIONAL JOYSTICK: BOOM UP/DOWN, TURNTABLE ROTATE
U13	ALC500
CR13	JIB BOOM CUTOUT RELAY
CR26	AXLE CUTOUT RELAY
H1	TILT ALARM

CE LIFT/DRIVE OPTION

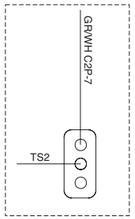
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL C: WORKLIGHT/DRIVELIGHT OPTION

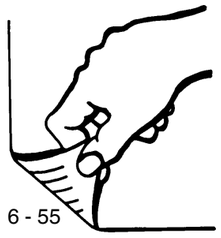


DETAIL B: GENERATOR OPTION



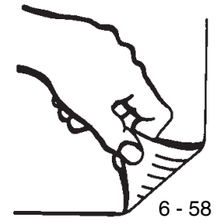
Platform Control Box Wiring Diagram, S-85

Deutz F4L 913 Models



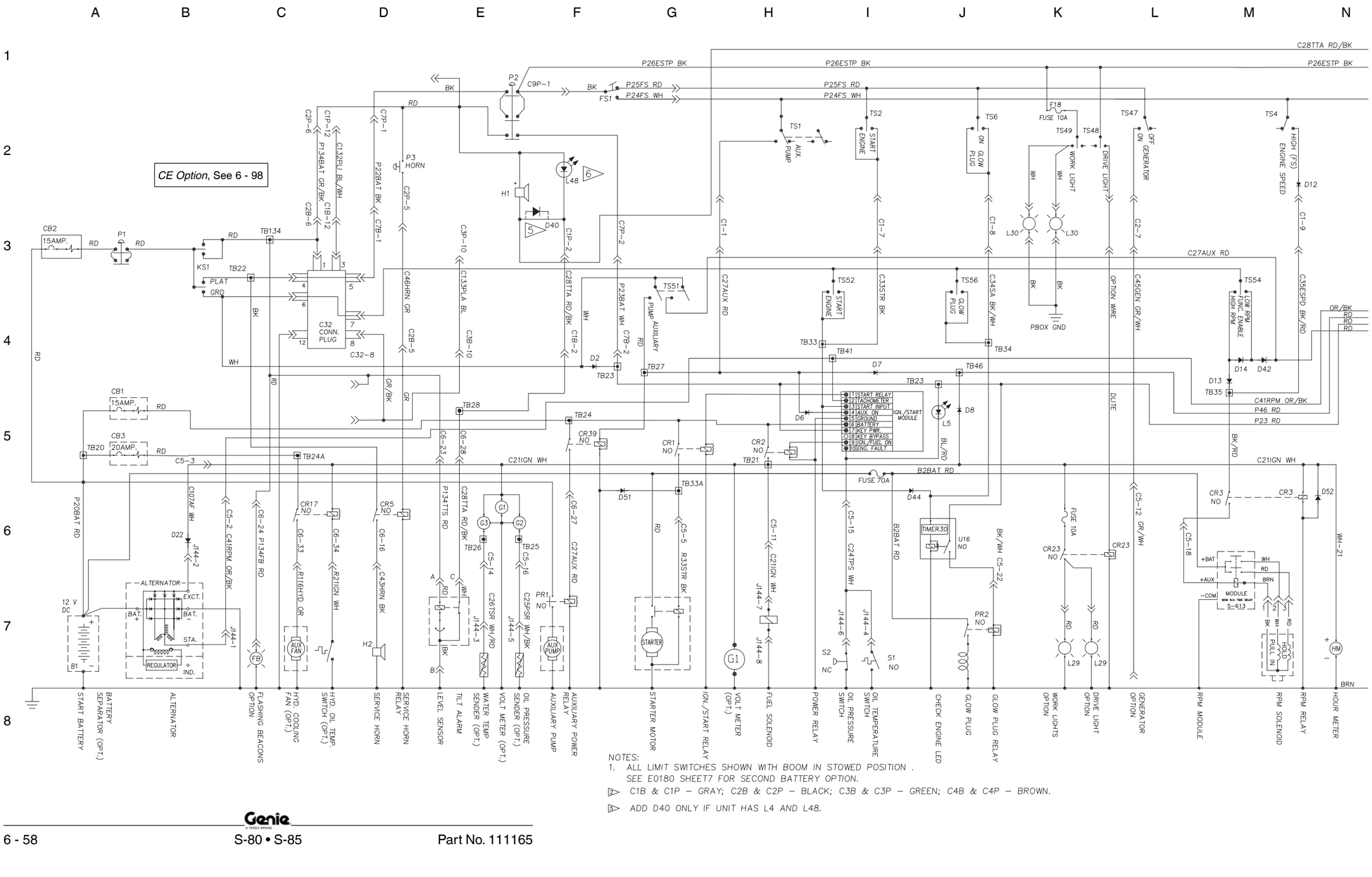
Electrical Schematic, S-85

Deutz BF4L 2011 Models



Electrical Schematic, S-85

Deutz BF4L 2011 Models



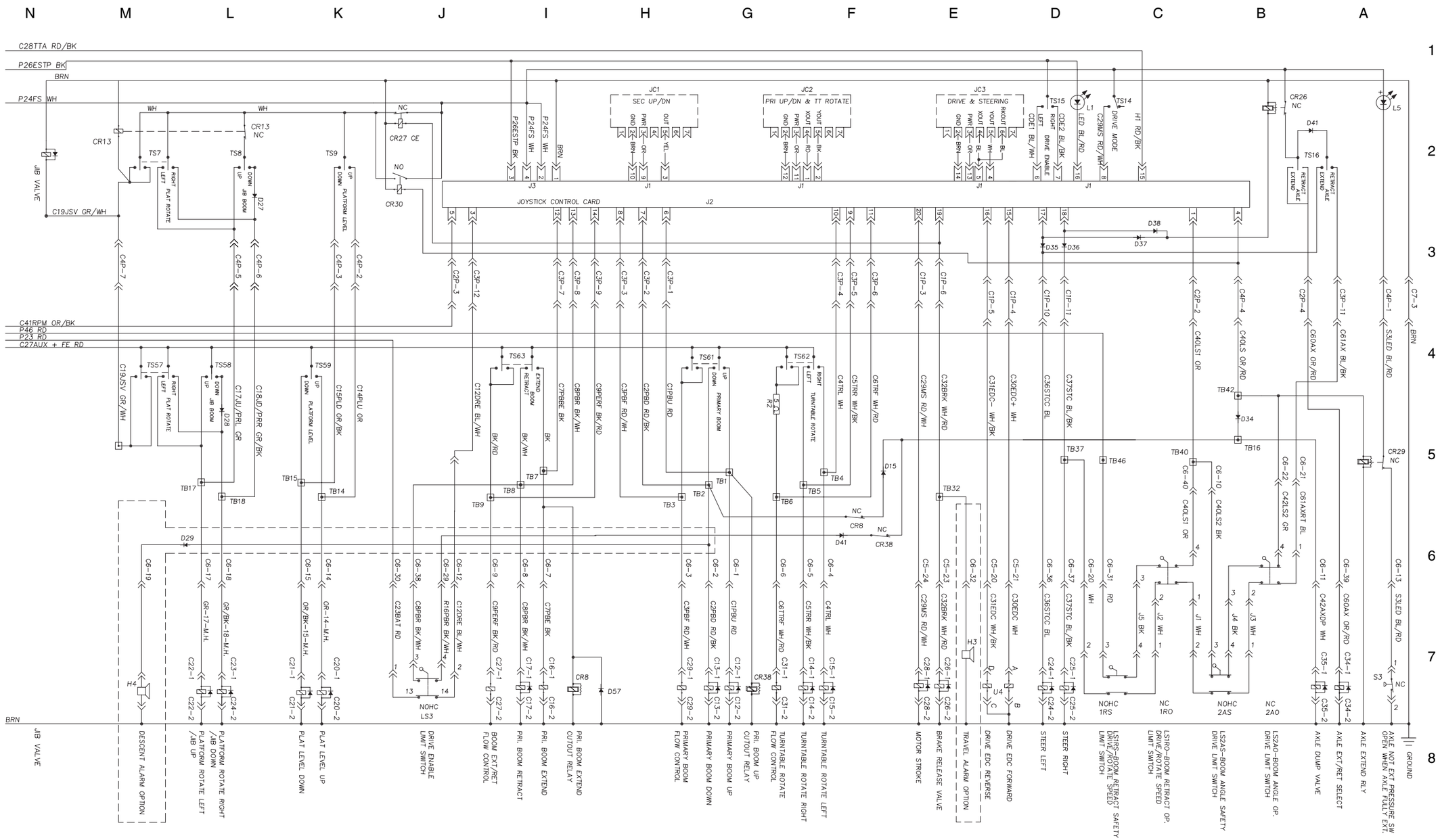
NOTES:
1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION . SEE E0180 SHEET7 FOR SECOND BATTERY OPTION.

△ C1B & C1P – GRAY; C2B & C2P – BLACK; C3B & C3P – GREEN; C4B & C4P – BROWN.

△ ADD D40 ONLY IF UNIT HAS L4 AND L48.

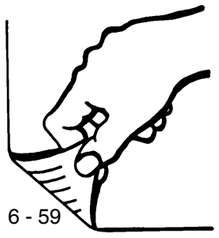
Electrical Schematic, S-85

Deutz BF4L 2011 Models



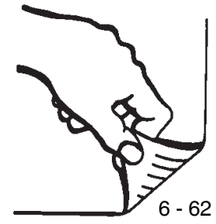
Electrical Schematic, S-85

Deutz BF4L 2011 Models



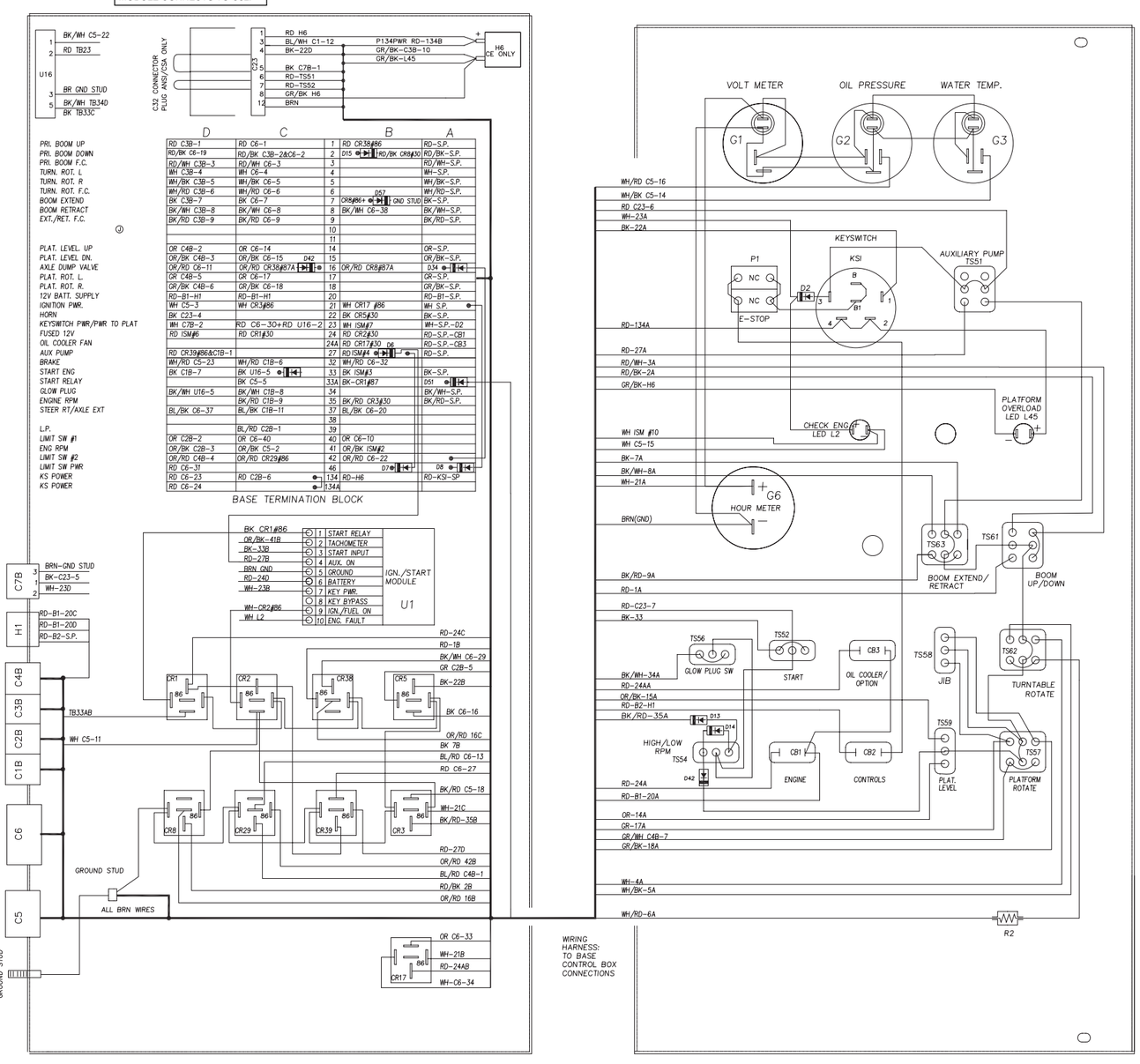
Ground Control Box Wiring Diagram, S-85

Deutz BF4L 2011 Models



Ground Control Box Wiring Diagram, S-85

Deutz BF4L 2011 Models

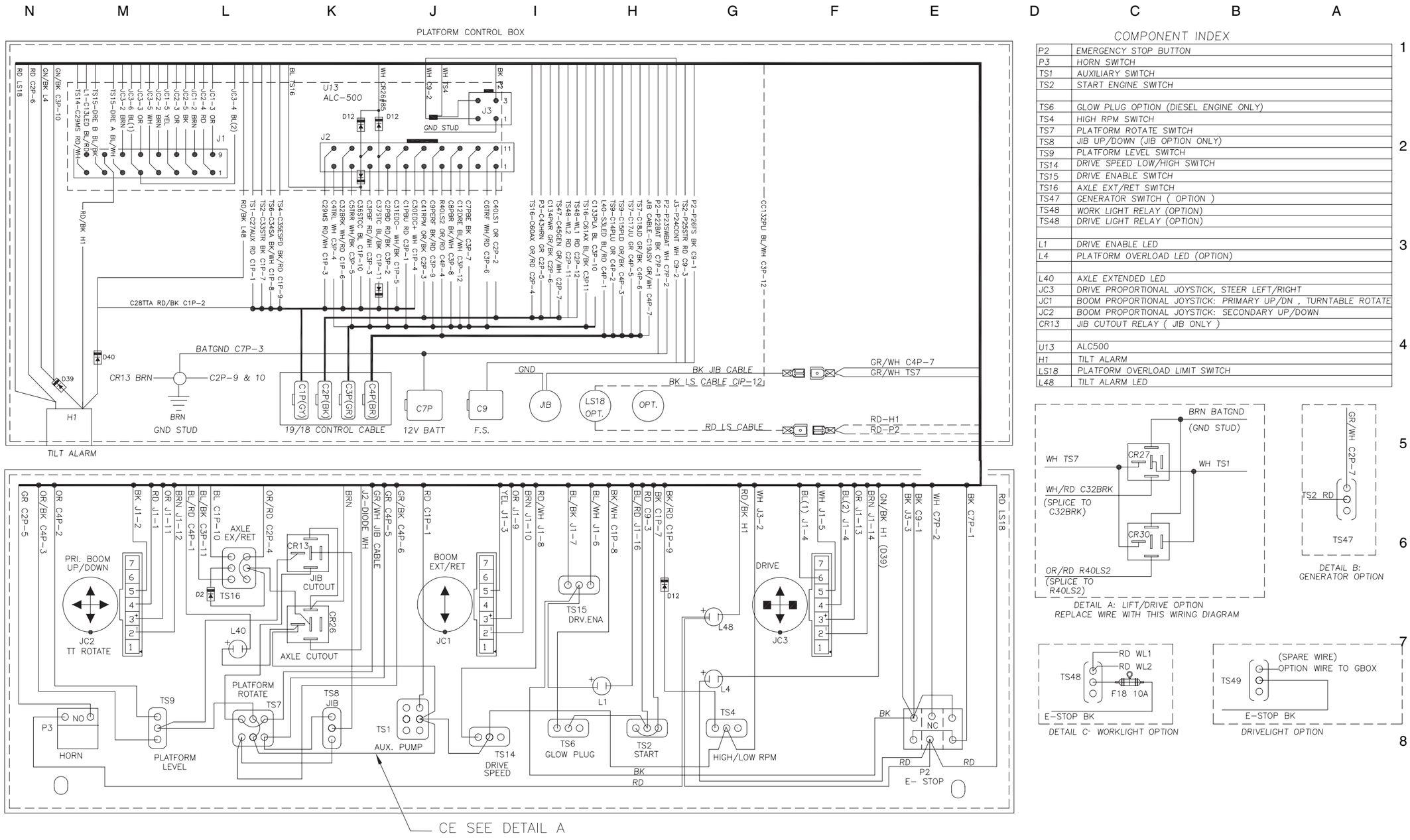


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	START ENGINE SWITCH
TS56	GLOW PLUG SWITCH (DIESEL ONLY)
TS54	FUNCTION ENABLE SWITCH
TS57	PLATFORM ROTATE SWITCH
TS58	JIB UP/DOWN (JIB OPTION ONLY)
TS59	PLATFORM LEVEL SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G6	HOUR METER
G1	VOLT METER GAUGE (OPT.)
G2	OIL PRESSURE GAUGE (OPT.)
G3	WATER TEMP. GAUGE (OPT.)
L2	CHECK ENGINE LED
L45	PLATFORM OVERLOAD LED
CR1	IGNITION / START RELAY
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	SERVICE HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT
CR39	AUXILARY PUMP RELAY
R2	TURNTABLE ROTATE LIMITING RESISTOR 5 OHMS
U1	IGNITION/START MODULE
U33	PLATFORM OVERLOAD MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSEURE SENDER	WH/RD C5-16	WH/RD-S.P
26 WATER TEMP SENDER	WH/BK C5-14	WH/BK-S.P.
28 TILT ALARM	RD/BK C1B-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. FWD	WH C1B-4	WH C5-21
31 E.D.C. REV	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL C1B-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

Platform Control Box Wiring Diagram, S-85

Deutz BF4L 2011 Models

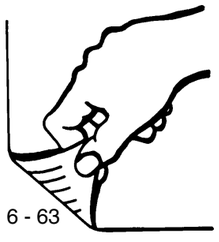


COMPONENT INDEX

P2	EMERGENCY STOP BUTTON
P3	HORN SWITCH
TS1	AUXILIARY SWITCH
TS2	START ENGINE SWITCH
TS6	GLOW PLUG OPTION (DIESEL ENGINE ONLY)
TS4	HIGH RPM SWITCH
TS7	PLATFORM ROTATE SWITCH
TS8	JIB UP/DOWN (JIB OPTION ONLY)
TS9	PLATFORM LEVEL SWITCH
TS14	DRIVE SPEED LOW/HIGH SWITCH
TS15	DRIVE ENABLE SWITCH
TS16	AXLE EXT/RET SWITCH
TS47	GENERATOR SWITCH (OPTION)
TS48	WORK LIGHT RELAY (OPTION)
TS48	DRIVE LIGHT RELAY (OPTION)
L1	DRIVE ENABLE LED
L4	PLATFORM OVERLOAD LED (OPTION)
L40	AXLE EXTENDED LED
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT
JC1	BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN , TURNTABLE ROTATE
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY UP/DOWN
CR13	JIB CUTOUT RELAY (JIB ONLY)
U13	ALC500
H1	TILT ALARM
LS18	PLATFORM OVERLOAD LIMIT SWITCH
L48	TILT ALARM LED

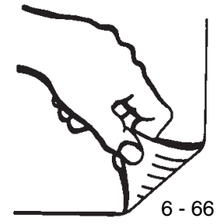
Platform Control Box Wiring Diagram, S-85

Deutz BF4L 2011 Models



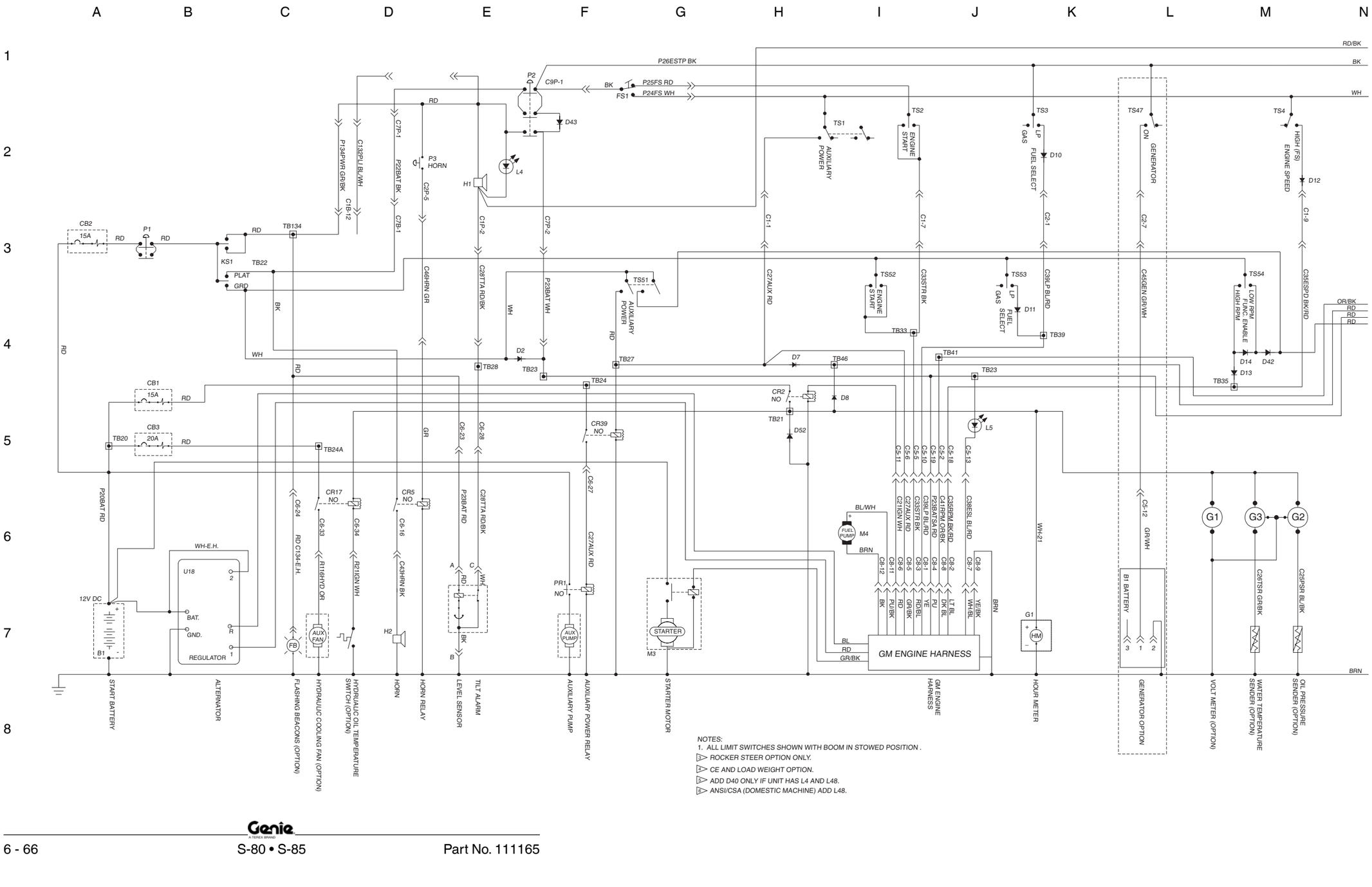
Electrical Schematic, S-85

GM 3.0L Models



Electrical Schematic, S-85

GM 3.0L Models



NOTES:
1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION .

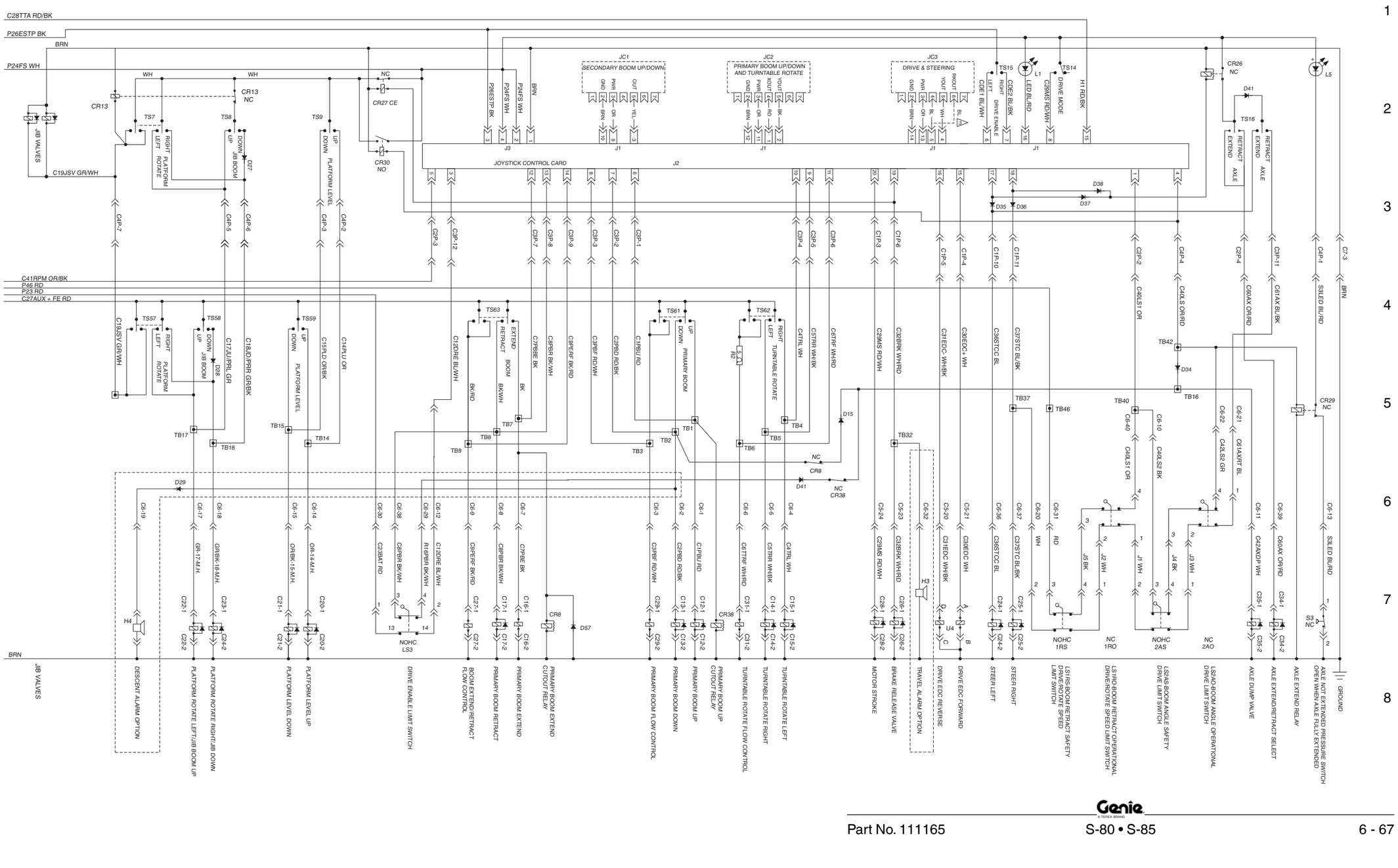
[A] ROCKER STEER OPTION ONLY.

[A] CE AND LOAD WEIGHT OPTION.

[A] ADD D40 ONLY IF UNIT HAS L4 AND L48.

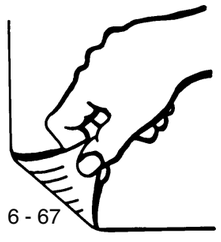
[B] ANSI/CSA (DOMESTIC MACHINE) ADD L48.

Electrical Schematic, S-85
GM 3.0L Models



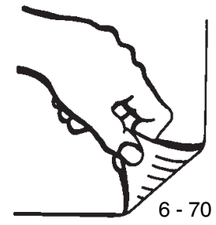
Electrical Schematic, S-85

GM 3.0L Models



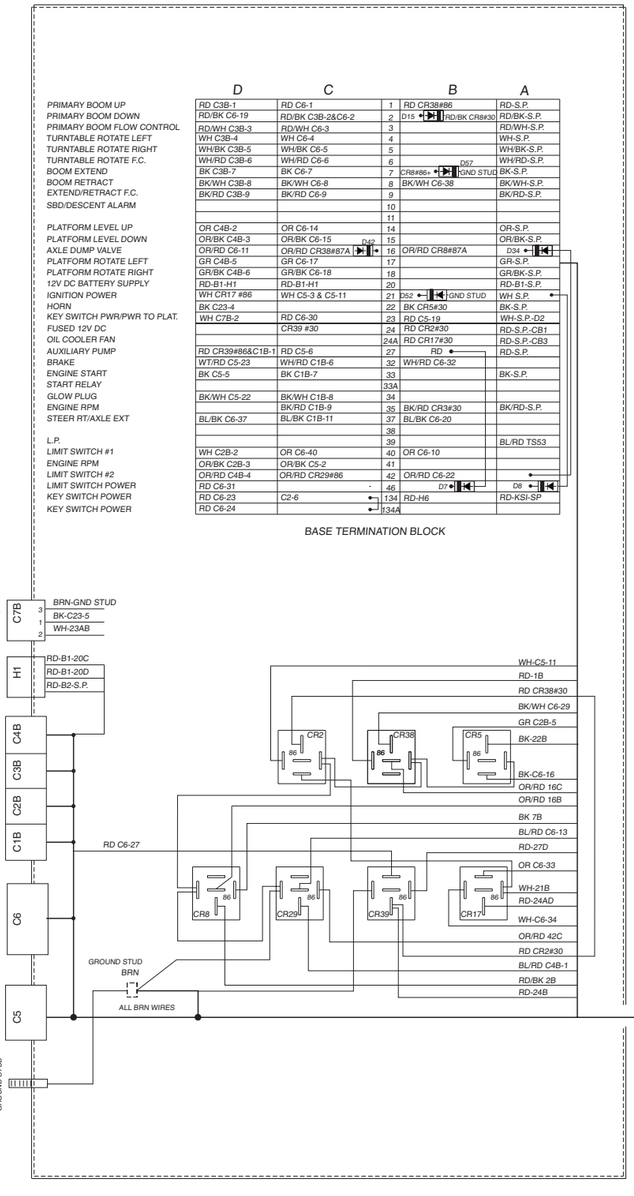
Ground Control Box Wiring Diagram, S-85

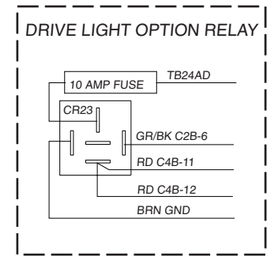
GM 3.0L Models



Ground Control Box Wiring Diagram, S-85

GM 3.0L Models





LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY POWER TOGGLE SWITCH
TS52	ENGINE START TOGGLE SWITCH
TS53	LP/GAS SELECT TOGGLE SWITCH
TS54	FUNCTION ENABLE/RPM SELECT TOGGLE SWITCH
TS57	PLATFORM ROTATE TOGGLE SWITCH
TS58	JIB BOOM UP/DOWN TOGGLE SWITCH
TS59	PLATFORM LEVEL TOGGLE SWITCH
TS61	PRIMARY BOOM UP/DOWN TOGGLE SWITCH
TS62	TURNTABLE ROTATE TOGGLE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT TOGGLE SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G1	VOLT METER GAUGE (OPTIONAL)
G2	OIL PRESSURE GAUGE (OPTIONAL)
G3	WATER TEMP. GAUGE (OPTIONAL)
G6	HOUR METER
L2	CHECK ENGINE LED
R2	TURNTABLE ROTATE LIMITING RESISTOR, 5 OHMS
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY (OPTIONAL)
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT RELAY
CR39	AUXILIARY PUMP RELAY
U1	IGNITION/START MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSURE SENDER	BL/BK C5-16	BL/BK-S.P
26 WATER TEMP SENDER	GR/BK C5-14	GR/BK-S.P.
28 TILT ALARM	RD/BK C1-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. REVERSE	WH C1B-4	WH C5-21
31 E.D.C. FORWARD	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL CB1-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GENERATOR OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXTEND/RETRACT SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

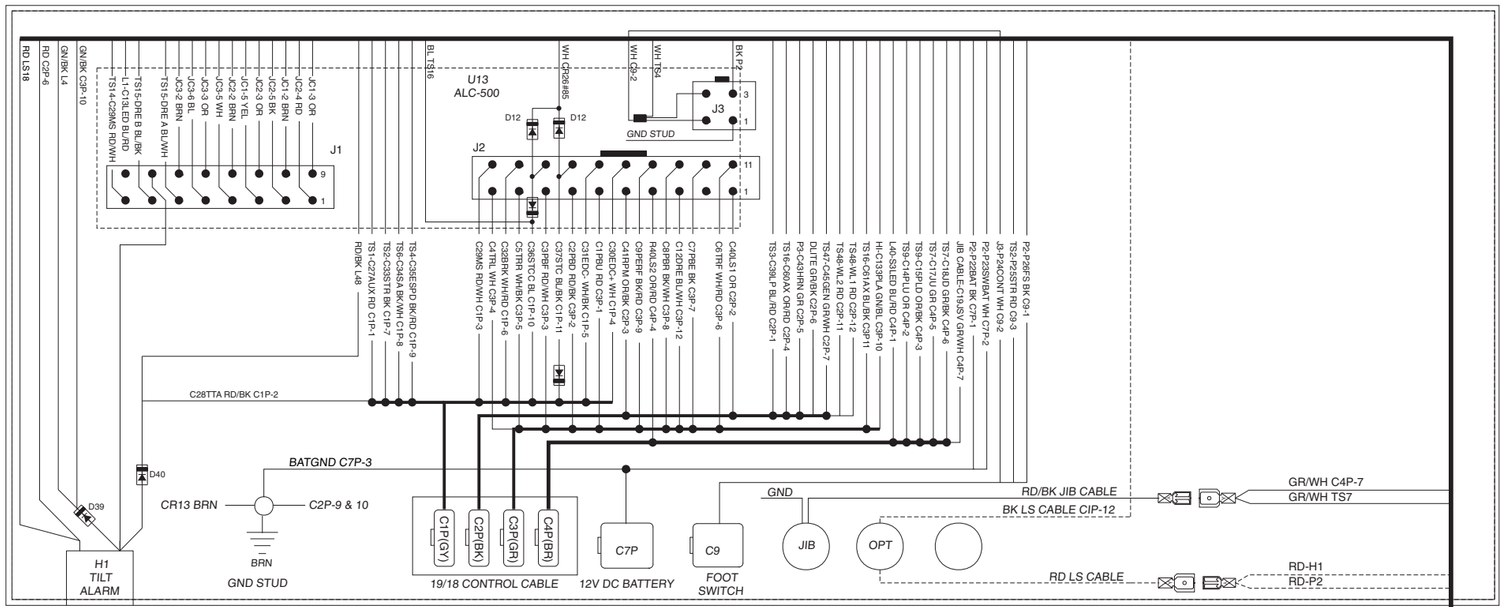
Platform Control Box Wiring Diagram, S-85

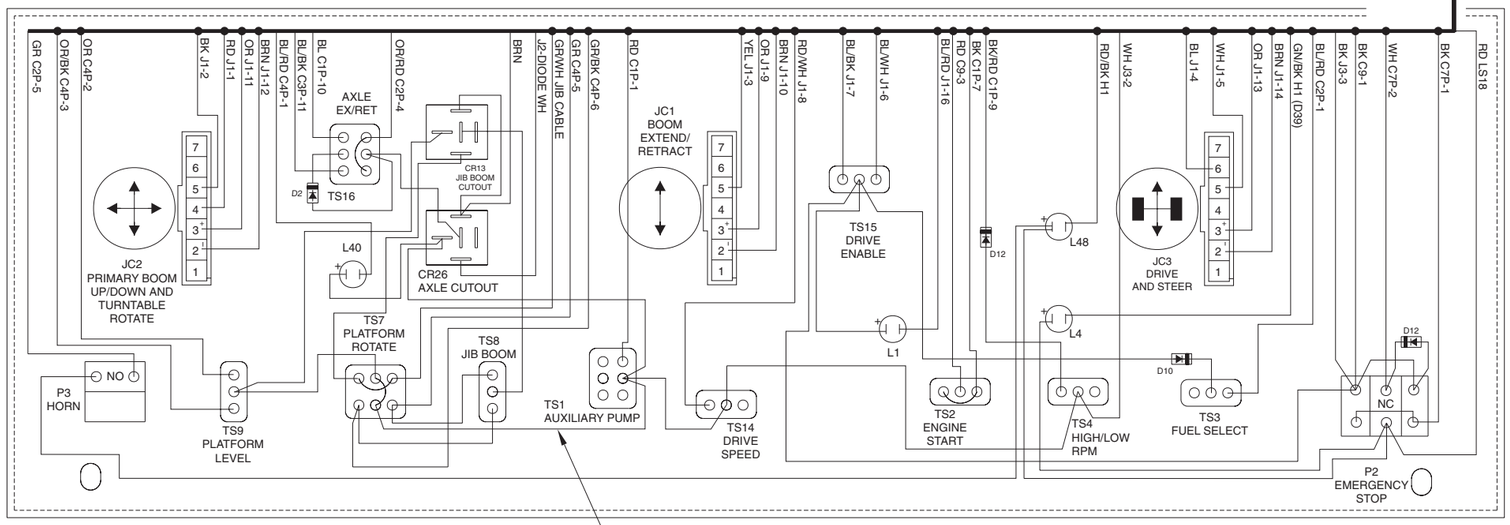
GM 3.0L Models

N M L K J I H G F E D C B A

COMPONENT INDEX

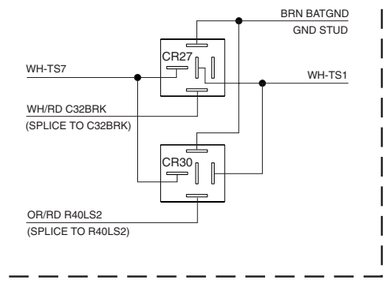
P2	EMERGENCY STOP BUTTON
P3	HORN SWITCH
TS1	AUXILIARY TOGGLE SWITCH
TS2	ENGINE START TOGGLE SWITCH
TS3	FUEL SELECT TOGGLE SWITCH (FORD)
TS4	HIGH RPM TOGGLE SWITCH
TS7	PLATFORM ROTATE TOGGLE SWITCH
TS8	JIB BOOM UP/DOWN TOGGLE SWITCH
TS9	PLATFORM LEVEL TOGGLE SWITCH
TS14	DRIVE SPEED LOW/HIGH TOGGLE SWITCH
TS15	DRIVE ENABLE TOGGLE SWITCH
TS16	AXLE EXTEND/RETRACT TOGGLE SWITCH
TS47	GENERATOR TOGGLE SWITCH (OPTION)
TS48	WORK LIGHT RELAY (OPTION)
TS49	DRIVE LIGHT RELAY (OPTION)
L1	DRIVE ENABLE LED
L4	PLATFORM OVERLOAD LED
L40	AXLE EXTENDED LED
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT
JC2	BOOM PROPORTIONAL JOYSTICK: PRIMARY BOOM UP/DOWN , TURNTABLE ROTATE
JC1	BOOM PROPORTIONAL JOYSTICK: BOOM EXTEND/RETRACT
CR13	JIB BOOM CUTOUT RELAY
CR26	AXLE CUTOUT RELAY
U13	ALC500
H1	TILT ALARM
LS18	PLATFORM OVERLOAD LIMIT SWITCH
L48	TILT ALARM LED



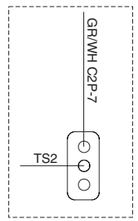


CE LIFT/DRIVE OPTION

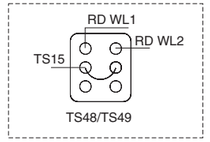
REPLACE WIRE WITH THIS WIRING DIAGRAM



DETAIL B: GENERATOR OPTION

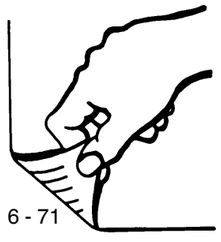


DETAIL C: WORKLIGHT/DRIVELIGHT OPTION



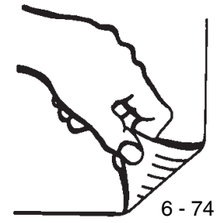
Platform Control Box Wiring Diagram, S-85

GM 3.0L Models



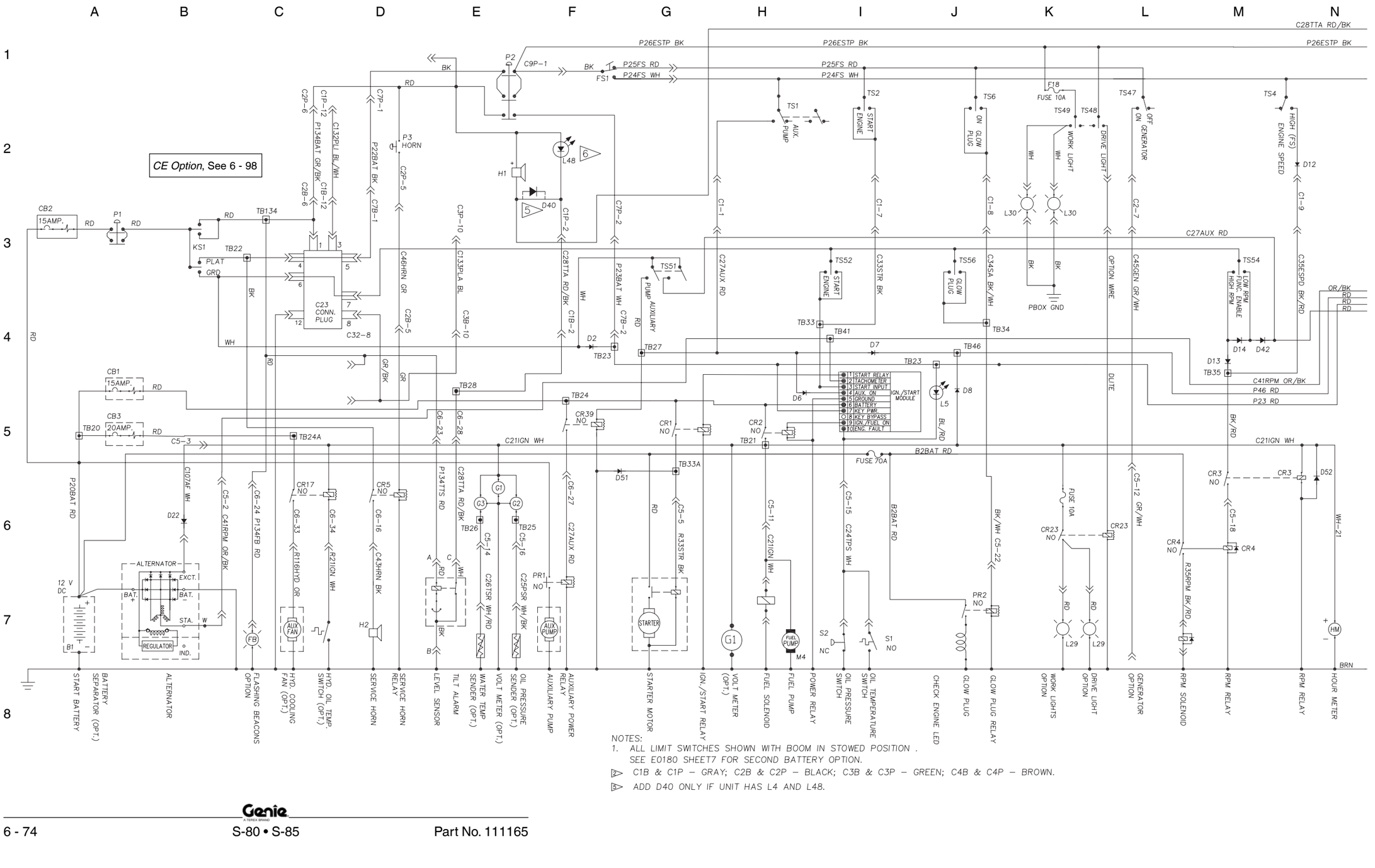
Electrical Schematic, S-85

Perkins 804-33 Models



Electrical Schematic, S-85

Perkins 804-33 Models



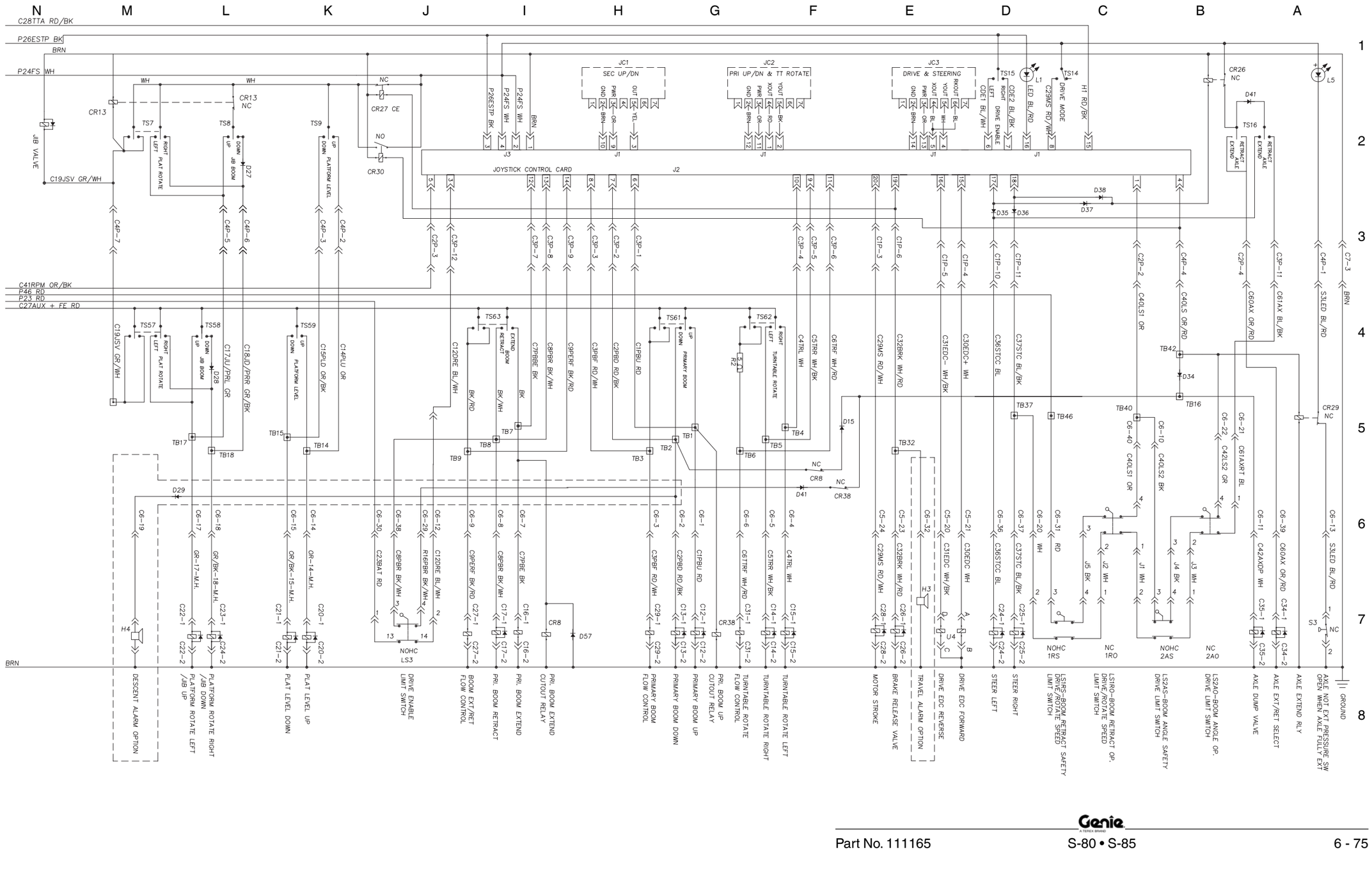
NOTES:
1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION . SEE E0180 SHEET7 FOR SECOND BATTERY OPTION.

△ C1B & C1P – GRAY; C2B & C2P – BLACK; C3B & C3P – GREEN; C4B & C4P – BROWN.

△ ADD D40 ONLY IF UNIT HAS L4 AND L48.

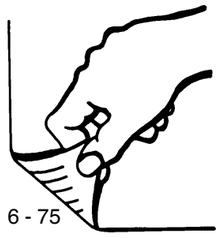
Electrical Schematic, S-85

Perkins 804-33 Models



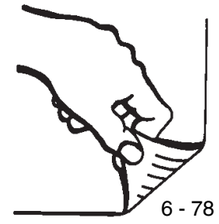
Electrical Schematic, S-85

Perkins 804-33 Models



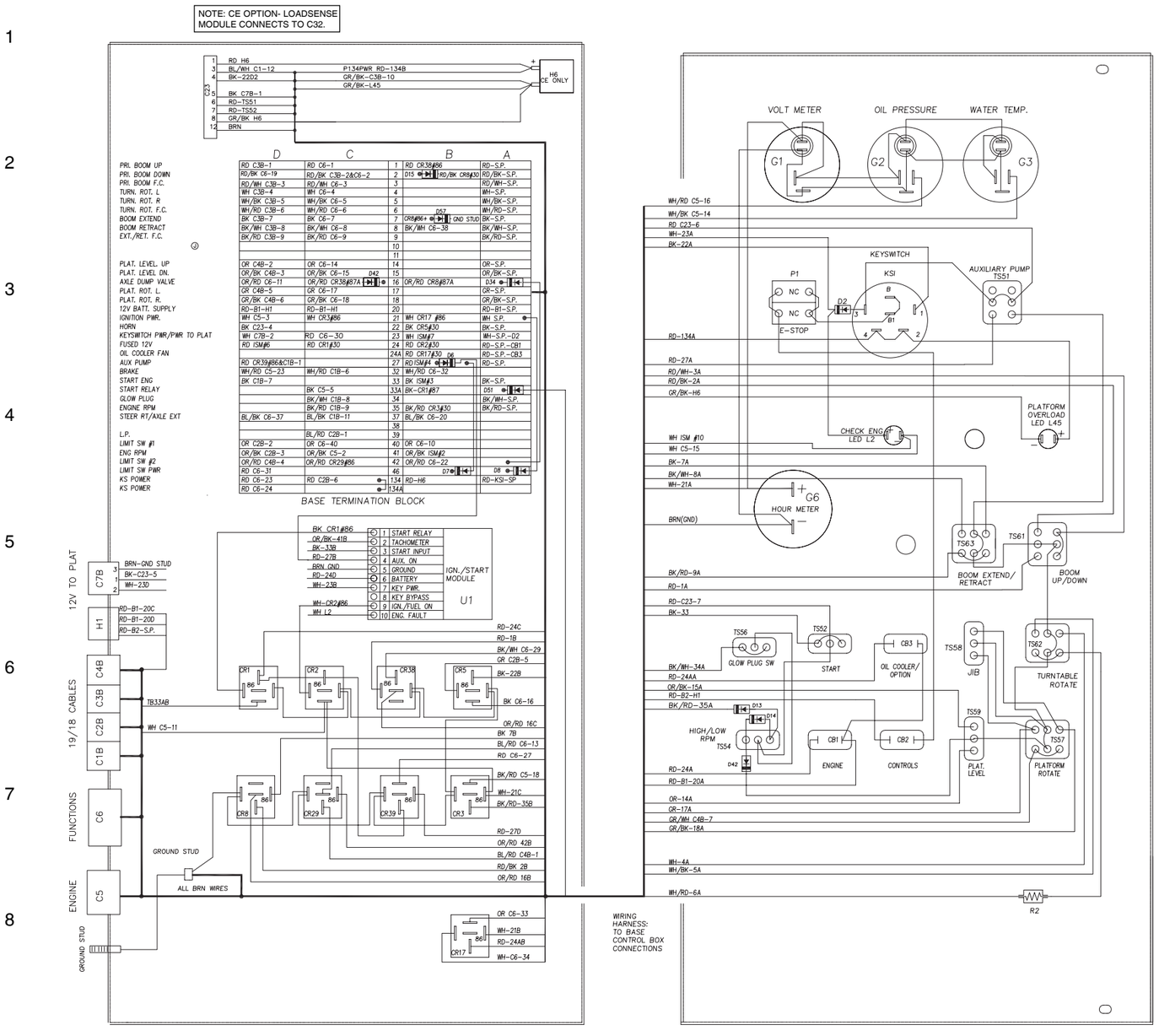
Ground Control Box Wiring Diagram, S-85

Perkins 804-33 Models



Ground Control Box Wiring Diagram, S-85

Perkins 804-33 Models

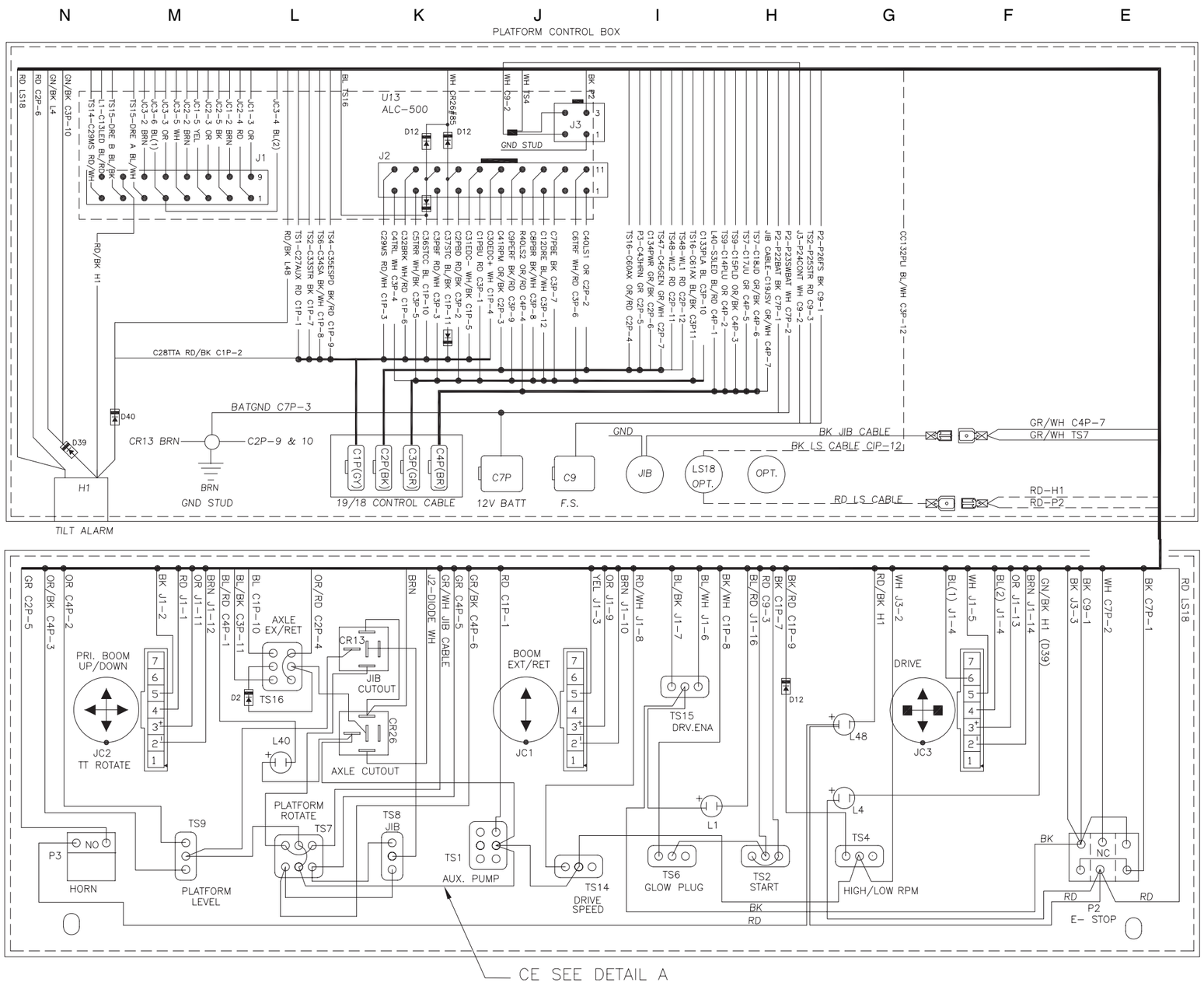


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	START ENGINE SWITCH
TS56	GLOW PLUG SWITCH (DIESEL ONLY)
TS54	FUNCTION ENABLE SWITCH
TS57	PLATFORM ROTATE SWITCH
TS58	JIB UP/DOWN (JIB OPTION ONLY)
TS59	PLATFORM LEVEL SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G6	HOUR METER
G1	VOLT METER GAUGE (OPT.)
G2	OIL PRESSURE GAUGE (OPT.)
G3	WATER TEMP. GAUGE (OPT.)
L2	CHECK ENGINE LED
L45	PLATFORM OVERLOAD LED
CR1	IGNITION / START RELAY
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	SERVICE HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT
CR39	AUXILARY PUMP RELAY
R2	TURNTABLE ROTATE LIMITING RESISTOR 5 OHMS
U1	IGNITION/START MODULE
U33	PLATFORM OVERLOAD MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSEURE SENDER	WH/RD C5-16	WH/RD-S.P
26 WATER TEMP SENDER	WH/BK C5-14	WH/BK-S.P.
28 TILT ALARM	RD/BK C1B-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. FWD	WH C1B-4	WH C5-21
31 E.D.C. REV	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL C1B-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

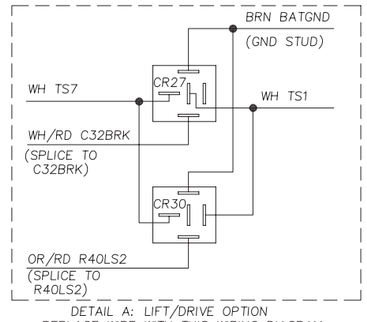
Platform Control Box Wiring Diagram, S-85

Perkins 804-33 Models



COMPONENT INDEX

P2	EMERGENCY STOP BUTTON	1
P3	HORN SWITCH	
TS1	AUXILIARY SWITCH	
TS2	START ENGINE SWITCH	
TS6	GLOW PLUG OPTION (DIESEL ENGINE ONLY)	
TS4	HIGH RPM SWITCH	
TS7	PLATFORM ROTATE SWITCH	
TS8	JIB UP/DOWN (JIB OPTION ONLY)	
TS9	PLATFORM LEVEL SWITCH	2
TS14	DRIVE SPEED LOW/HIGH SWITCH	
TS15	DRIVE ENABLE SWITCH	
TS16	AXLE EXT/RET SWITCH	
TS47	GENERATOR SWITCH (OPTION)	
TS48	WORK LIGHT RELAY (OPTION)	
TS48	DRIVE LIGHT RELAY (OPTION)	
L1	DRIVE ENABLE LED	3
L4	PLATFORM OVERLOAD LED (OPTION)	
L40	AXLE EXTENDED LED	
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT	
JC1	BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN , TURNTABLE ROTATE	
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY UP/DOWN	
CR13	JIB CUTOUT RELAY (JIB ONLY)	
U13	ALC500	4
H1	TILT ALARM	
LS18	PLATFORM OVERLOAD LIMIT SWITCH	
L48	TILT ALARM LED	



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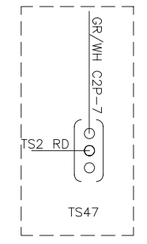

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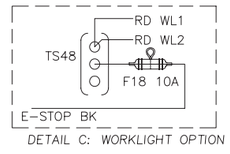

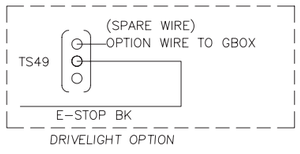

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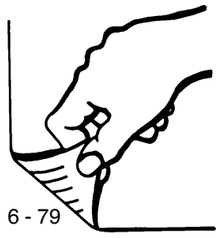
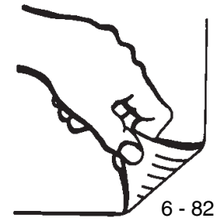
Platform Control Box Wiring Diagram, S-85

Perkins 804-33 Models



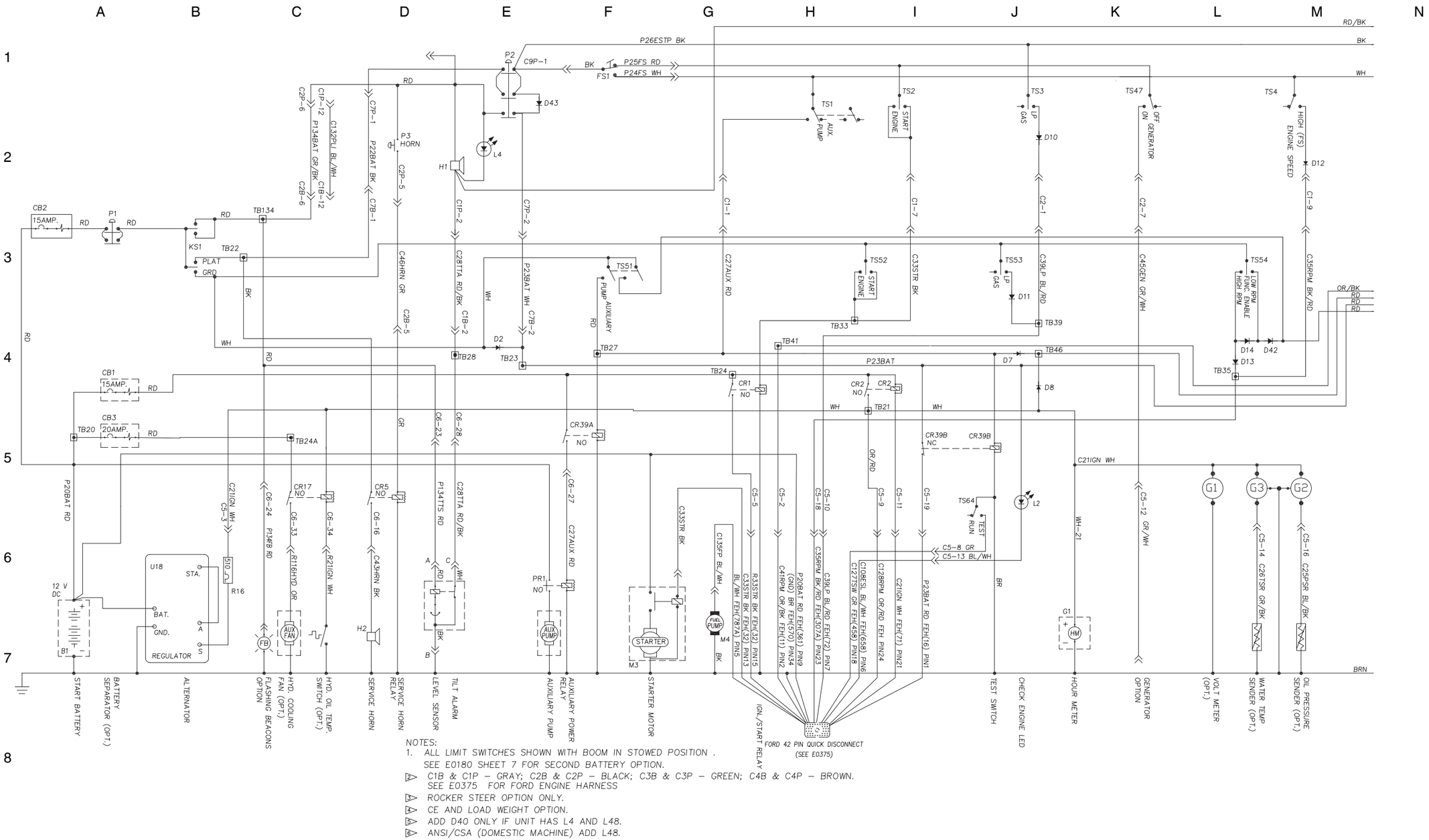
Electrical Schematic, S-85

Ford LRG-425 EFI



Electrical Schematic, S-85

Ford LRG-425 EFI



NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION . SEE E0180 SHEET 7 FOR SECOND BATTERY OPTION.

A C1B & C1P – GRAY; C2B & C2P – BLACK; C3B & C3P – GREEN; C4B & C4P – BROWN. SEE E0375 FOR FORD ENGINE HARNESS

A ROCKER STEER OPTION ONLY.

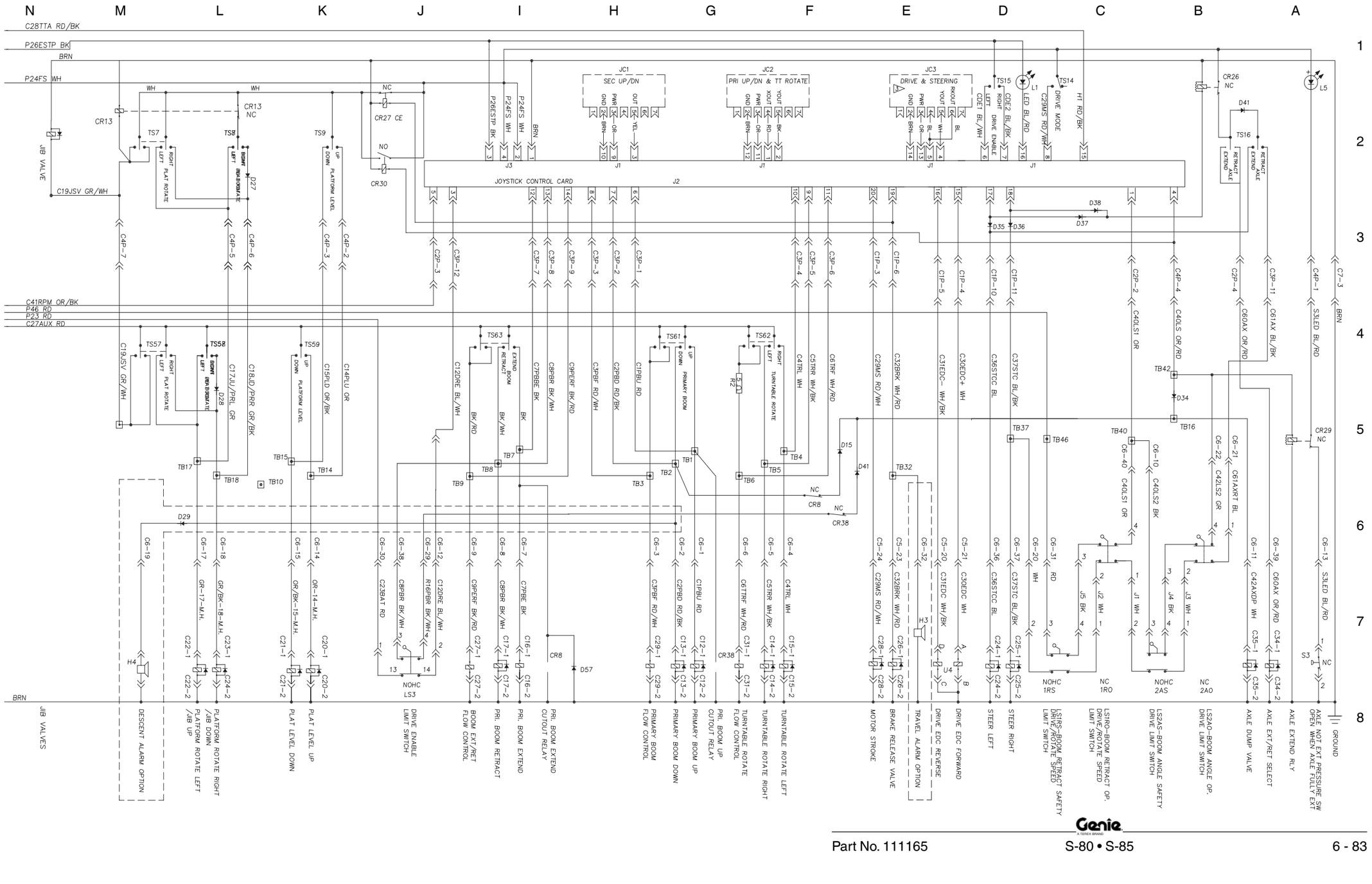
A CE AND LOAD WEIGHT OPTION.

A ADD D40 ONLY IF UNIT HAS L4 AND L48.

A ANSI/CSA (DOMESTIC MACHINE) ADD L48.

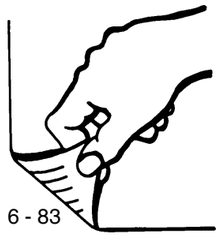
Electrical Schematic, S-85

Ford LRG-425 EFI



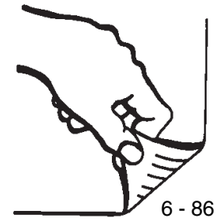
Electrical Schematic, S-85

Ford LRG-425 EFI



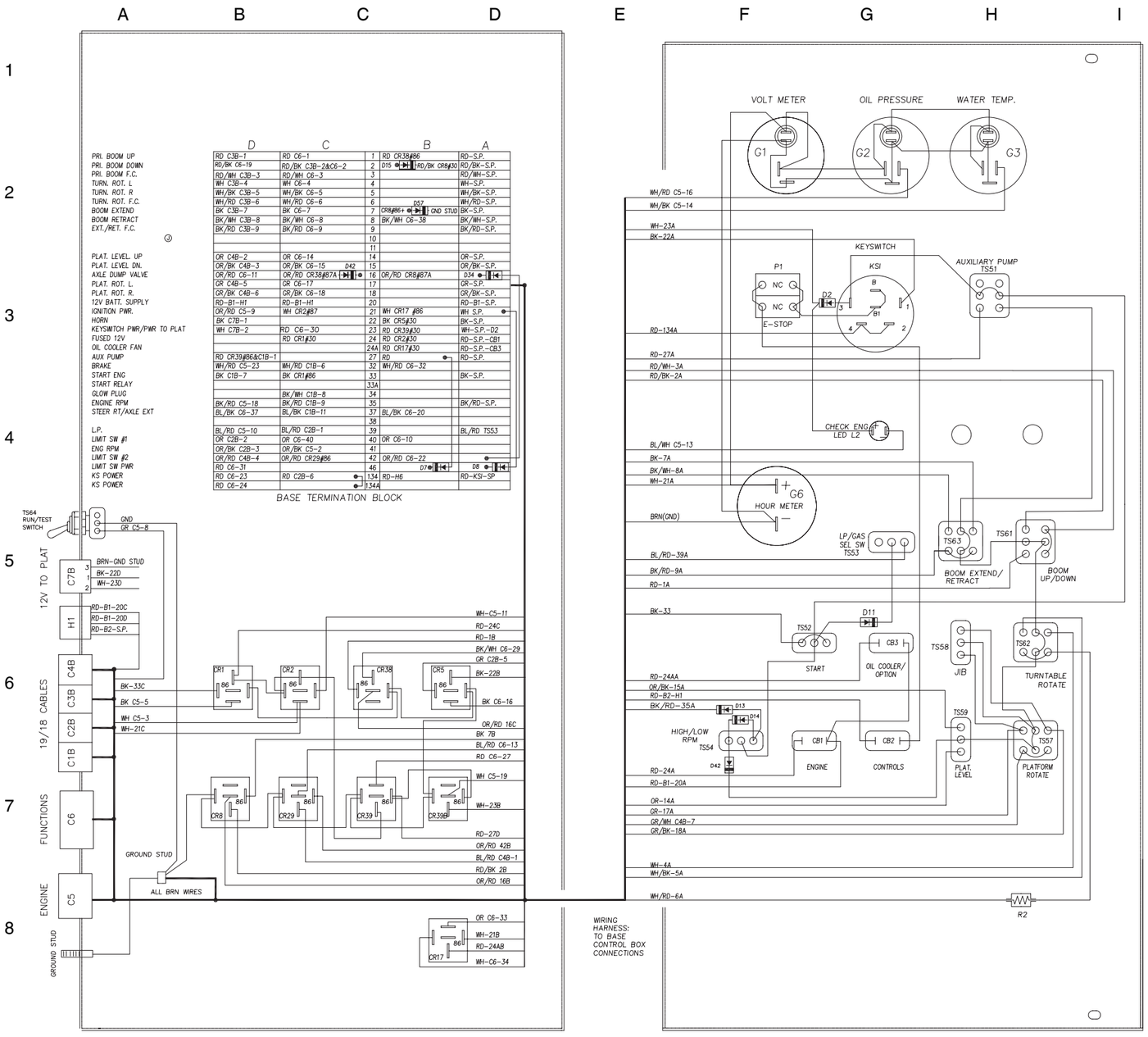
Ground Control Box Wiring Diagram, S-85

Ford LRG-425 EFI



Ground Control Box Wiring Diagram, S-85

Ford LRG-425 EFI

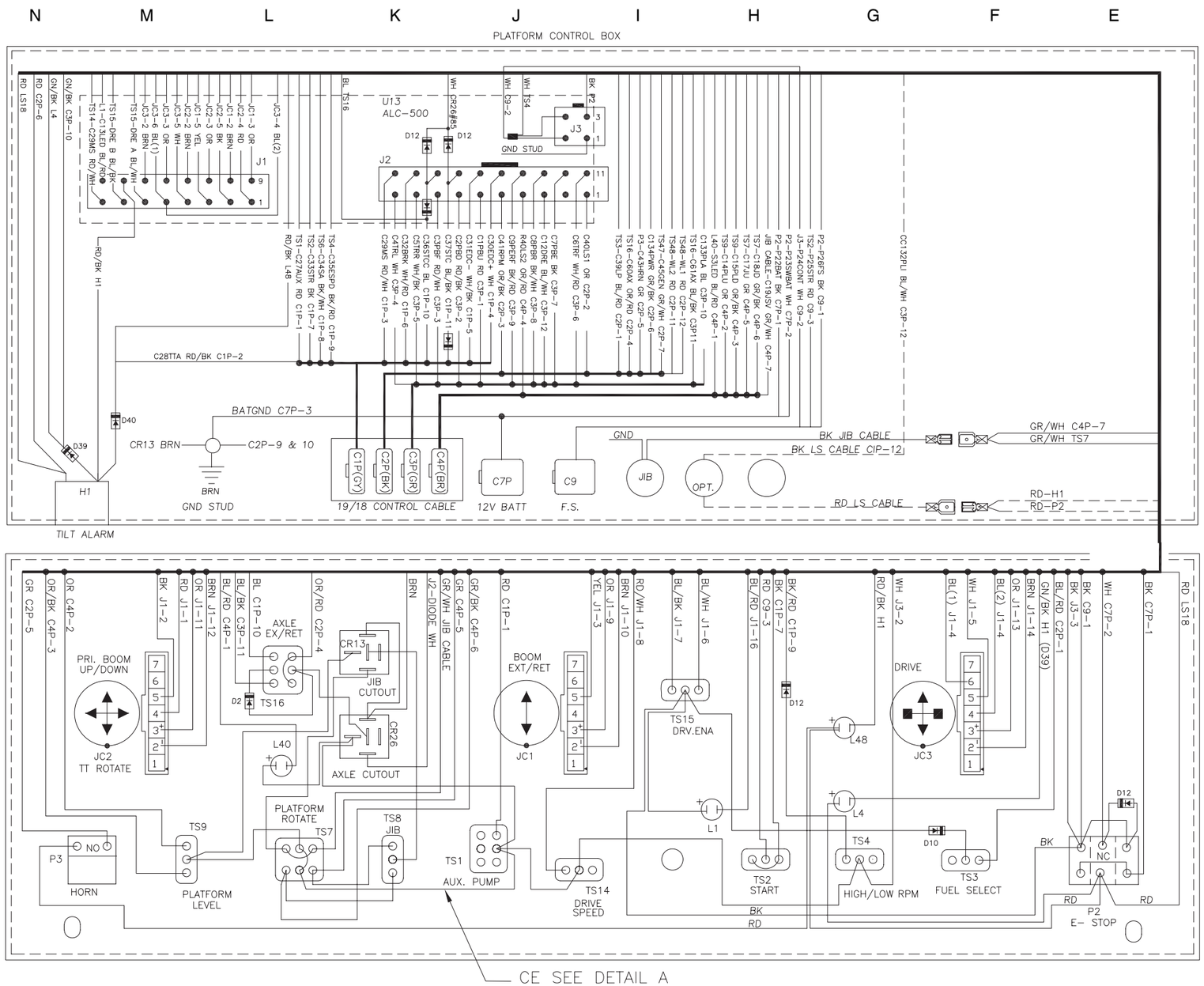


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	START ENGINE SWITCH
TS53	GAS/LP (DUAL FUEL OPTION)
TS54	FUNCTION ENABLE SWITCH
TS57	PLATFORM ROTATE SWITCH
TS58	JIB UP/DOWN (JIB OPTION ONLY)
TS59	PLATFORM LEVEL SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	PRIMARY BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 15A
CB3	CIRCUIT BREAKER, OIL COOLER/OPTION, 20A
G6	HOUR METER
G1	VOLT METER GAUGE (OPT.)
G2	OIL PRESSURE GAUGE (OPT.)
G3	WATER TEMP. GAUGE (OPT.)
L2	CHECK ENGINE LED
CR1	IGNITION / START RELAY
CR2	IGNITION POWER RELAY
CR3	HIGH IDLE CUTOUT RELAY
CR5	SERVICE HORN RELAY
CR8	BOOM FUNCTION CUTOUT
CR17	HYDRAULIC COOLER FAN RELAY
CR23	DRIVE LIGHT RELAY OPTION
CR25	AXLE RET L/O RELAY
CR29	AXLE EXTEND LED RELAY
CR38	EXTEND FUNCTION CUTOUT
CR39	AUXILARY PUMP RELAY
CR39A	AUXILARY PUMP/ENGINE SHUT DOWN RELAY
R2	TURNTABLE ROTATE LIMITING RESISTOR 5 OHMS
U1	IGNITION/START MODULE
U33	PLATFORM OVERLOAD MODULE

CIRCUIT DESCRIPTION	FROM	TO
12 DRIVE ENABLE	BL/WH C6-12	BL/WH C3B-12
19 JIB VALVE	GR/WH C4B-7	GR/WH-S.P.
25 OIL PRESSEURE SENDER	WH/RD C5-16	WH/RD-S.P
26 WATER TEMP SENDER	WH/BK C5-14	WH/BK-S.P.
28 TILT ALARM	RD/BK C1B-2	RD/BK C6-28
29 2WD/4WD	RD/WH C5-24	RD/WH C1B-3
30 E.D.C. FWD	WH C1B-4	WH C5-21
31 E.D.C. REV	WH/BK C5-20	WH/BK C1B-5
36 STEER LEFT/AXLE RETRACT	BL C1B-10	BL C6-36
43 HORN	GR C2B-5	GR CR5#86
45 GEN. OPTION	GR/WH C2B-7	GR/WH C5-12
60 AXLE EXT/RET SELECT	OR/RD C6-39	OR/RD C2B-4
61 AXLE RETRACT	BL/BK C3B-11	BL/BK C6-21

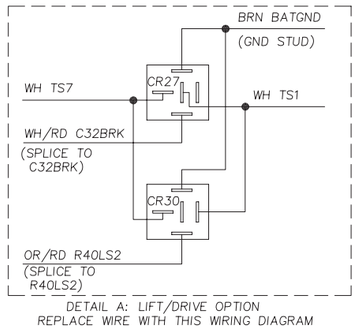
Platform Control Box Wiring Diagram, S-85

Ford LRG-425 EFI



COMPONENT INDEX

P2	EMERGENCY STOP BUTTON	1
P3	HORN SWITCH	
TS1	AUXILIARY SWITCH	
TS2	START ENGINE SWITCH	
TS3	FUEL SELECT SWITCH (FORD)	
TS4	HIGH RPM SWITCH	
TS7	PLATFORM ROTATE SWITCH	
TS8	JIB UP/DOWN (JIB OPTION ONLY)	
TS9	PLATFORM LEVEL SWITCH	2
TS14	DRIVE SPEED LOW/HIGH SWITCH	
TS15	DRIVE ENABLE SWITCH	
TS16	AXLE EXT/RET SWITCH	
TS47	GENERATOR SWITCH (OPTION)	
TS48	WORK LIGHT RELAY (OPTION)	
TS48	DRIVE LIGHT RELAY (OPTION)	
L1	DRIVE ENABLE LED	3
L4	PLATFORM OVERLOAD LED (OPTION)	
L40	AXLE EXTENDED LED	
JC3	DRIVE PROPORTIONAL JOYSTICK, STEER LEFT/RIGHT	
JC1	BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN , TURNTABLE ROTATE	
JC2	BOOM PROPORTIONAL JOYSTICK: SECONDARY UP/DOWN	
CR13	JIB CUTOUT RELAY (JIB ONLY)	
U13	ALC500	4
H1	TILT ALARM	
LS18	PLATFORM OVERLOAD LIMIT SWITCH	
L48	TILT ALARM LED	



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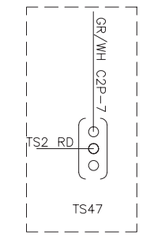

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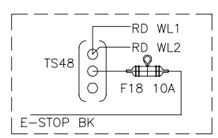

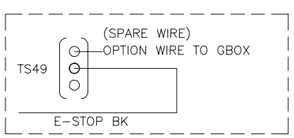

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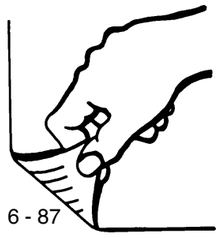
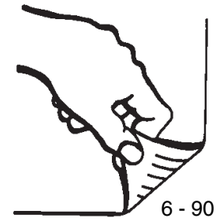
Platform Control Box Wiring Diagram, S-85

Ford LRG-425 EFI



Connector Pin Legend - Sheet 1



Connector Pin Legend - Sheet 1

A B C D E F G H I J K L M N

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C1 DT06-12SC

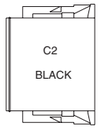
COLOR	CKT # PIN #	
RD	C27AUX	1
RD/BK	C28TTA	2
RD/WH	C29MS	3
WH	C30EDC+	4
WH/BK	C31EDC-	5
WH/RD	C32BRK	6
BK	C33STR	7
BK/WH	C34SA	8
BK/RD	C35RPM	9
BL	C36STCC	10
BL/BK	C37STC	11
BL/WH	C132PLI	12

C1

C2 DT06-12SD

COLOR	CKT # PIN #	
BL/RD	C39LP	1
OR	C40LS1	2
OR/BK	C41RPM	3
OR/RD	C60AX	4
GR	C43HRN	5
GR/BK	C134BAT	6
GR/WH	C45GEN	7
	NC	8
BRN	NC	9
BRN	NC	10
RD	NC	11
RD	NC	12

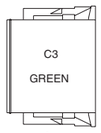
C2



C3 DT06-12SA

COLOR	CKT # PIN #	
RD	C1PBU	1
RD/BK	C2PBD	2
RD/WH	C3PBF	3
WH	C4TRL	4
WH/BK	C5TRR	5
WH/RD	C6TRF	6
BK	C7PBE	7
BK/WH	C8PBR	8
BK/RD	C9PERF	9
BL	C133PLA	10
BL/BK	C61AX	11
BL/WH	C12DRE	12

C3

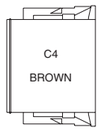


A

C4 DT06-12SB

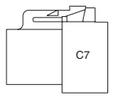
COLOR	CKT # PIN #	
BL/RD	S3LED (AX)	1
OR	C14PLU	2
OR/BK	C15PLD	3
OR/RD	C40LS2	4
GR	C17JU	5
GR/BK	C18JD	6
GR/WH	C19JSV	7
	NC	8
	NC	9
	NC	10
RD	R1DRVLITE	11
RD	R2DRVLITE	12

C4

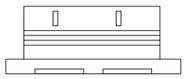


C7: DTP06-4S

COLOR	CKT # PIN #	
BK	P22BAT	1
WH	P23SWBAT	2
BRN	BATGND	3
	N/C	4

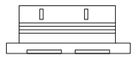


C3



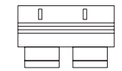
C6

	CIRCUIT #	COLOR
1	C1PBU	RD-3
2	C2PBD	RD/BK-3
3	C3PBF	RD/WH-3
4	C4TRL	WH-3
5	C5TRR	WH/BK-3
6	C6TRF	WH/RD-3
7	C7PBE	BK-3
8	C8PBR	BK/WH-3
9	C9PERF	BK/RD-3
10	C40LS2	OR
11	C42LD	WH
12	C12DRE	BL/WH-3
13	S3LED	BL/RD-3
14	C14PLU	OR-3
15	C15PLD	OR/BK-3
16	R43HRN	BK
17	C17JU	GR-3
18	C18JD	GR/BK-3
19	C2DA	RD/BK
20	C37STC	BL/BK
21	C61AXRT	BL/BK
22	C42LS2	OR/RD-1
23	P23BATSR	RD
24	P23BAT	RD
25	C46BBR	RD
26	C46BBR	GR
27	C27AUX	RD-1
28	C28TTA	RD/BK
29	R16PBR	BK/WH
30	C46PWR	RD
31	C46PWR	RD
32	C32TA	WH/RD-1
33	R116HYD	OR
34	R21IGN	WH
35		
36	C36STCC	BL-1
37	C37STC	BL/BK-1
38	C8PBR	BK/WH
39	C60AX	OR/RD
40	C40LS1	OR-1



C5-GBOX

PIN #	CKT #	FORD ENGINE	DEUTZ ENGINE	PERKINS ENGINE	3.0L GM ENGINE
1	P24BAT				
2	C41RPM	OR/BK	OR/BK	OR/BK	OR/BK
3	C107AF	WH	WH	WH	WH
4					
5	R33STR	BK(14)	BK(14)	BK(14)	BK(14)
6					RD
7					
8	C127TSW	GR			GR
9	C128RPM(OPT)	OR/RD	OR/RD	OR/RD	OR/RD
10	C39LP	BL/RD			BL/RD
11	C21IGN	WH	WH(14)	WH(14)	WH
12	C45GEN	GR/WH	GR/WH	GR/WH	GR/WH
13	C108ESL	BL/WH	BL/WH		
14	C26TSR OPT.		WH/RD	WH/RD	
15	C24SW		WH	WH	WH
16	C25PSR OPT.		WH/BK	WH/BK	
17	P134BAT				
18	C35RPM	BK/RD	BK/RD(14)	BK/RD(14)	BK/RD
19	P23BAT	WH(14)		WH	WH
20	C31EDC-	WH/BK	WH/BK	WH/BK	WH/BK
21	C30EDC+	WH	WH	WH	WH
22	C34SA		BK/WH	BK/WH	
23	C32BRK	WH/RD	WH/RD	WH/RD	WH/RD
24	C29MS	RD/WH	RD/WH	RD/WH	RD/WH



C5-ENGINE HARNESS

PIN #	CKT #	FORD ENGINE	DEUTZ ENGINE	PERKINS ENGINE	3.0L GM ENGINE
1	P24BAT				
2	C41RPM	OR/BK	OR/BK	OR/BK	OR/BK
3	C107AF	WH	WH	WH	WH
4					
5	R33STR	BK(14)	BK(14)	BK(14)	BK(14)
6					RD
7					
8	C127TSW	GR			GR
9	C128RPM(OPT)	OR/RD	OR/RD	OR/RD	OR/RD
10	C39LP	BL/RD			BL/RD
11	C21IGN	WH	WH(14)	WH(14)	WH
12	C45GEN	GR/WH	GR/WH	GR/WH	GR/WH
13	C108ESL	BL/WH	BL/WH		BL/RD
14	C26TSR OPT.	WH/RD	WH/RD	WH/RD	
15	C24SW	WH	WH	WH	WH
16	C25PSR OPT.	WH/BK	WH/BK	WH/BK	
17	P24BAT	RD			
18	C35RPM	BK/RD	BK/RD(14)	BK/RD(14)	BK/RD
19	P23BAT	WH(14)		WH	WH
20	C31EDC	WH/BK	WH/BK	WH/BK	WH/BK
21	C30EDC	WH	WH	WH	WH
22	C34SA		BK/WH	BK/WH	
23	C32BRK	WH/RD	WH/RD	WH/RD	WH/RD
24	C29MS	RD/WH	RD/WH	RD/WH	RD/WH

DC

C9 FS DT04-4P

COLOR	CKT # PIN #	
BK	P22BAT	1
WH	P24BAT	2
RD	P25BAT	3
	N/C	4

AC

C9 FS DT04-4P

COLOR	CKT # PIN #	
	N/C	1
WH	NEUTRAL	2
GRN	CHASSIC	3
BK	LINE	4

MARK NUMBER ON CABLE 3

Connector Pin Legend - Sheet 2

N M L K J I H G F E D C B A

1

2

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4

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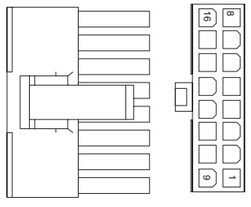
ALC500 JOYSTICKS/INPUT

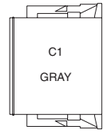
PIN#	CKT#	WIRE
1	JC2-4	RD
2	JC2-5	BK
3	JC1-5	YL
4	JC3-5	WH
5	JC3-6	BL
6	DRE A	BL/WH
7	DRE B	BL/BK
8	C29MS	RD/WH
9	JC1-3	OR
10	JC1-2	BRN
11	JC2-3	OR
12	JC2-2	BRN
13	JC3-3	OR
14	JC3-2	BRN
15	H1	RD/BK
16	C13LED	BL/RD

J1



GM PLUG

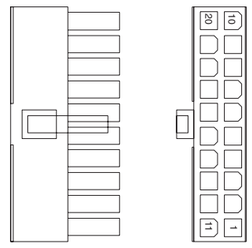
PIN#	CKT#	HARN	GM ENGINE
1	C39LP	BL/RD	YL
2	C35RPM	BK/RD	LT BL
3	C33STR	BK	RD/BL
4	P23BATSA	RD	PU
5	C27AUX	RD	GR/BK
6	C21IGN	WH	RD
7	C38ESL	BL/RD	WH/BL
8	C41RPM	OR/BK	DK BL
9	-----	BRN	YL/BK
10	-----	-----	-----
11	PUMP+	BL/WH	PU/BK
12	GND1	BRN	BK



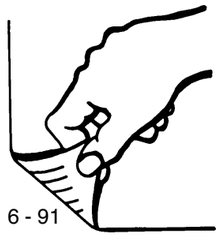
ALC500 OUTPUT

PIN#	CKT#	WIRE
1	R40LS2	OR/RD
2	NC	
3	C12DRE	BL/WH
4	C40LS1	OR
5	C41RPM	OR/BK
6	C1PBU	RD
7	C2PBD	RD/BK
8	C3PBF	RD/WH
9	C4TRL	WH
10	C5TRR	WH/BK
11	C6TRF	WH/RD
12	C7PBE	BK
13	C8PBR	BK/WH
14	C9PERF	BK/RD
15	C30EDC+	WH
16	C31EDC-	WH/BK
17	C36STCC	BL
18	C37STC	BL/BK
19	C32BRK	WH/RD
20	C29MS	RD/WH

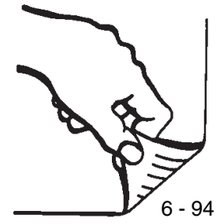
J2



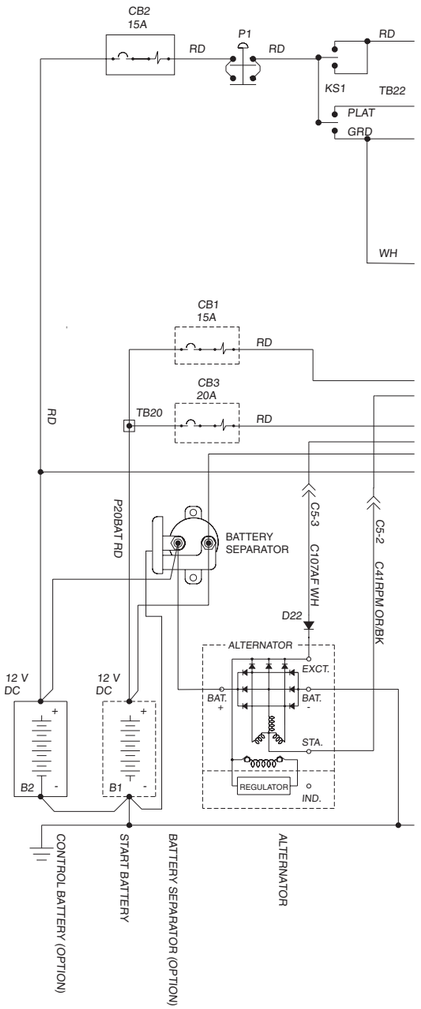
Connector Pin Legend - Sheet 2



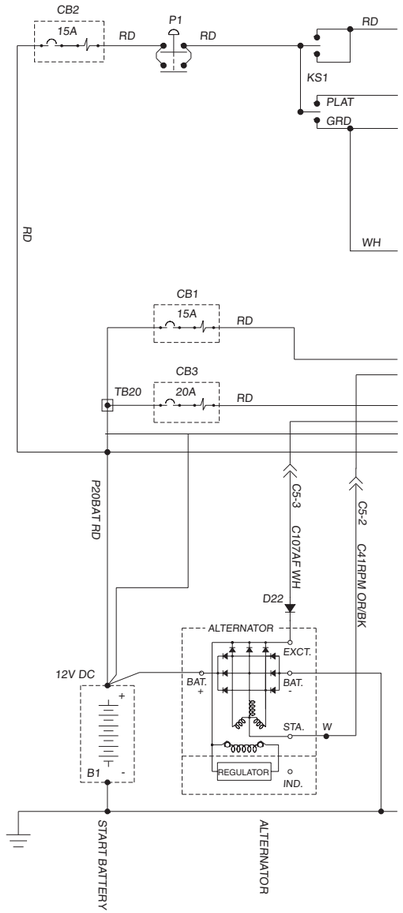
Dual Battery Option



Dual Battery Option

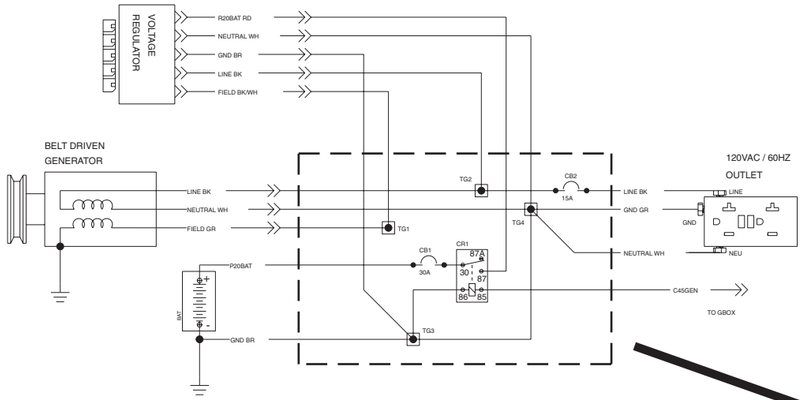


DUAL BATTERY (OPTION)

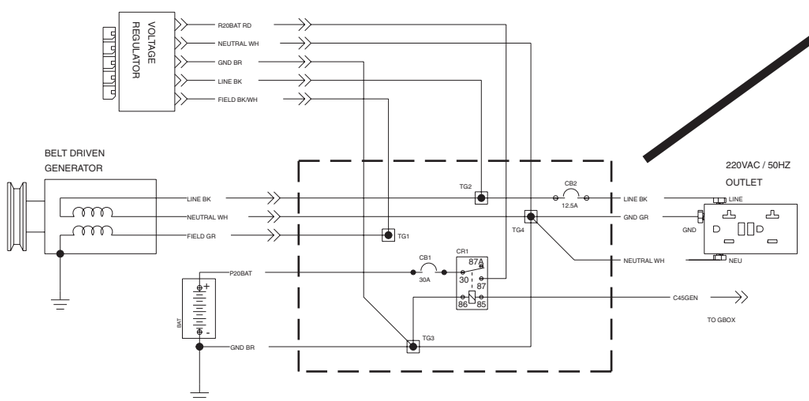


SINGLE BATTERY (STANDARD)

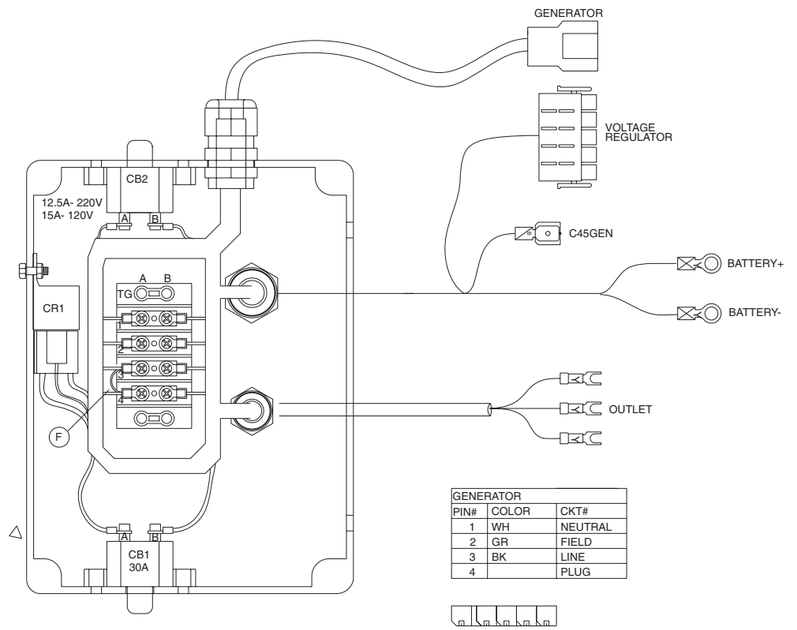
Belt Drive Generator Option



120 VAC / 60 HZ with Regulator



220 VAC / 50 HZ with Regulator

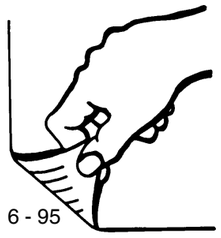


GENERATOR		
PIN#	COLOR	CKT#
1	WH	NEUTRAL
2	GR	FIELD
3	BK	LINE
4		PLUG

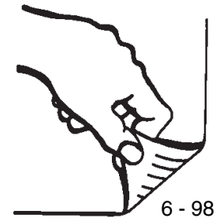
1 2 3 4 5

VOLTAGE REGULATOR		
PIN#	COLOR	CKT#
1	RD 12GA	R20BAT
2	WH 12GA	NEUTRAL
3	BR 12GA	GND
4	BK 12GA	LINE
5	BK/WH 14GA	FIELD

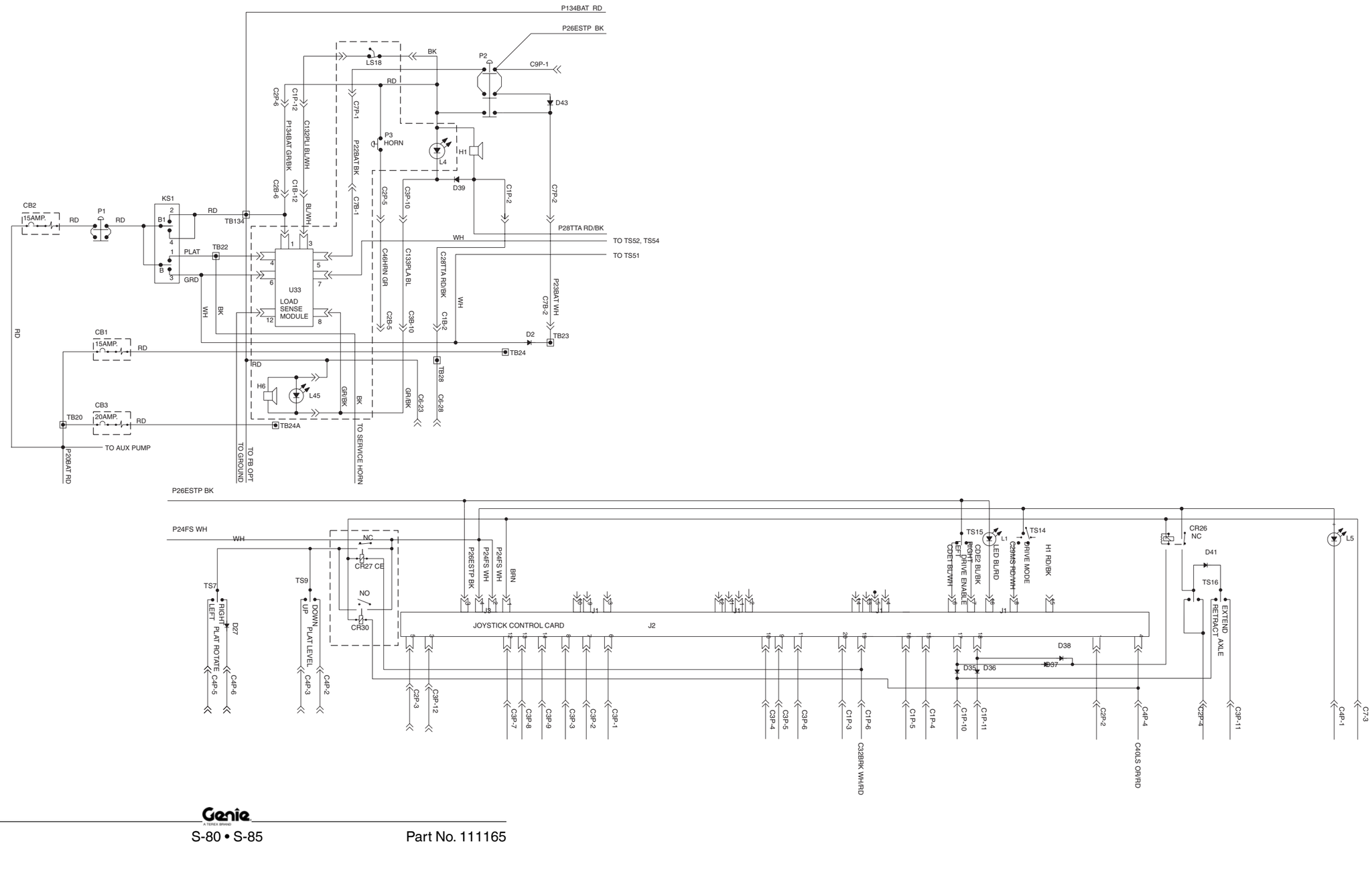
Belt Drive Generator Option



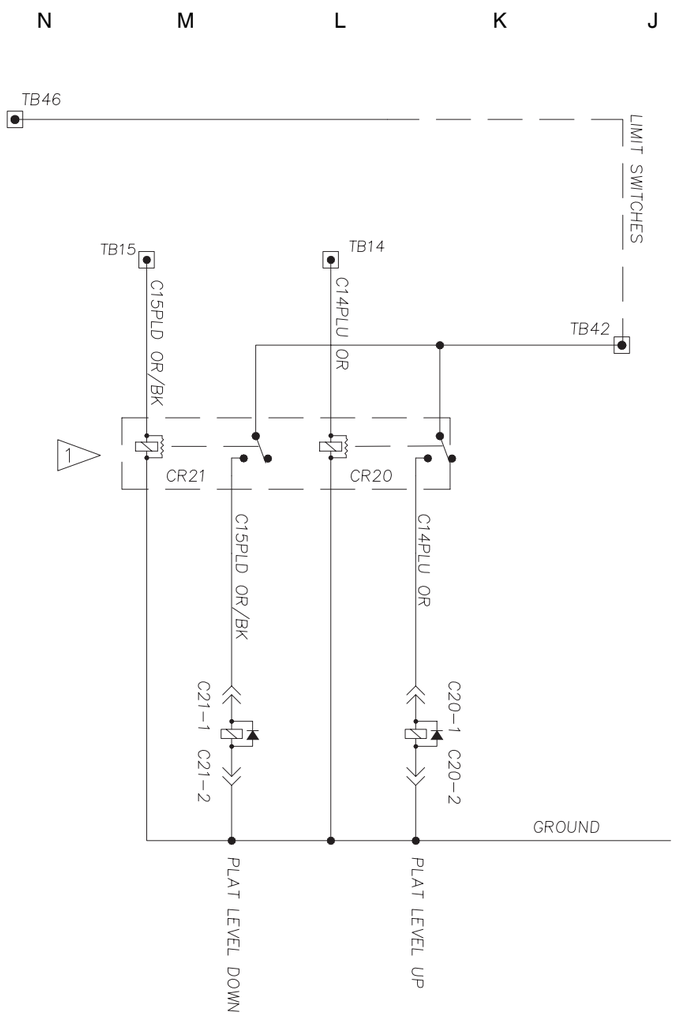
CE Option



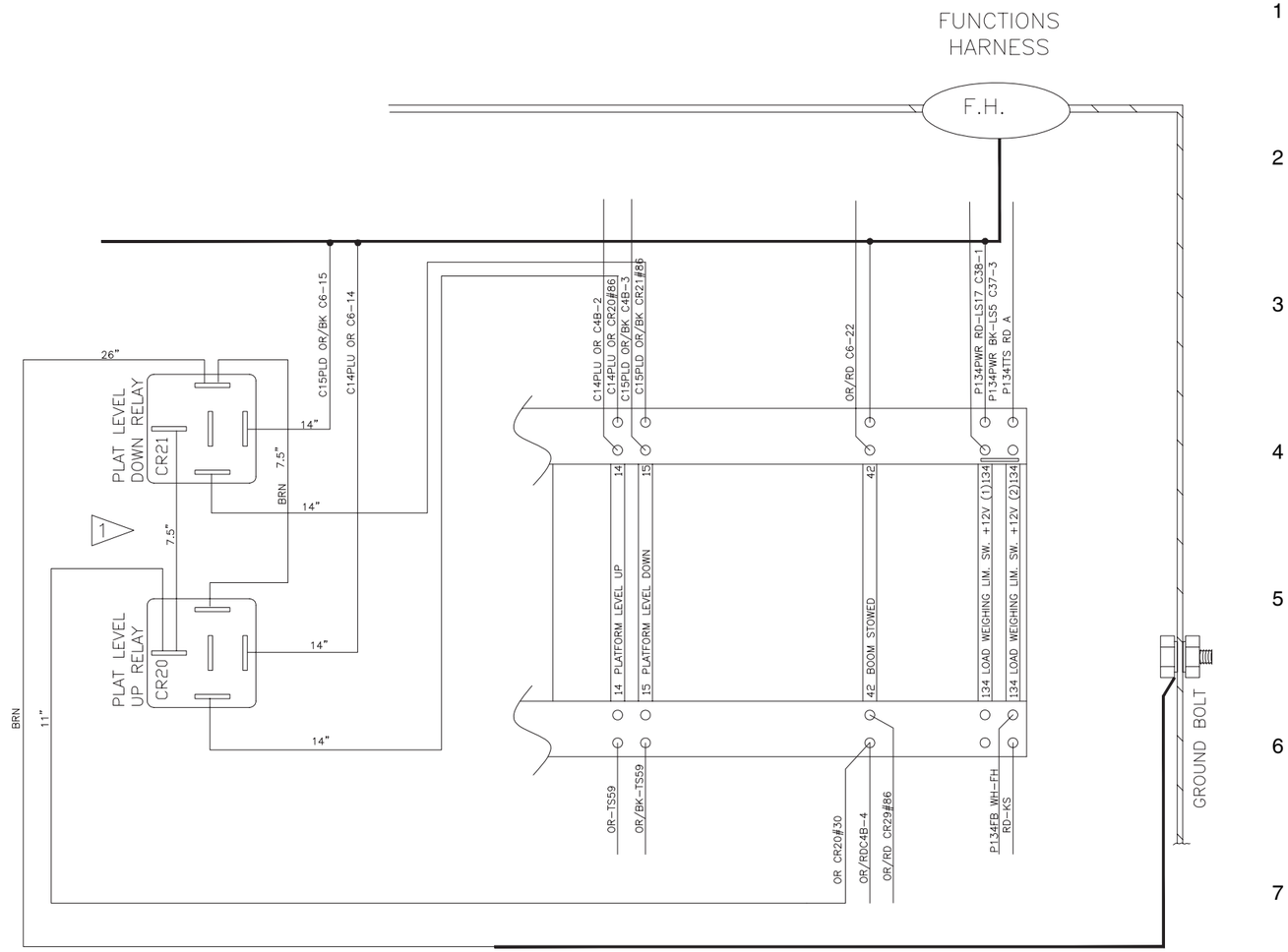
CE Option


P134BAT RD
P26ESTP BK
LS18
BK
P2
C9P-1
RD
D43
C2P-6
C1P-12
C7P-1
P134BAT GR/BK
C132PLI BL/WH
P22BATBK
P3 HORN
H1
L4
C2B-6
C1B-12
C2P-5
C2P-10
D39
C1P-2
C7P-2
CB2 15AMP.
P1
KS1
B1
TB134
BL/WH
C7B-1
P28TTA RD/BK
WH
TO TS52, TS54
TO TS51
PLAT
TB22
C46HRN GR
C133PLA BL
C28TTA RD/BK
GRD
U33 LOAD SENSE MODULE
C2B-5
C3B-10
C1B-2
C7B-2
P23BAT WH
D2
TB23
TB24
CB1 15AMP.
TB28
H6
L45
GR/BK
C6-23
C6-28
CB3 20AMP.
TB20
TB24A
TO AUX PUMP
P26BAT RD
TO GROUND
TO FB OPT
TO SERVICE HORN
P26ESTP BK
P24FS WH
NC
CR27 CE
NO
CR30
TS7
TS9
RIGHT
LEFT
PLAT ROTATE
UP
DOWN
PLAT LEVEL
D27
C4P-5
C4P-6
C4P-3
C4P-2
JOYSTICK CONTROL CARD
J2
J3
J1
P26ESTP BK
P24FS WH
BRN
TS15
L1
TS14
CDE1 BU/WH
CDE2 BL/BK
LED BL/RD
C28HYS RD/WH
DRIVE MODE
H1 RD/BK
CR26 NC
D41
TS16
EXTEND RETRACT AXLE
L5
D38
D35
D36
D37
C2P-3
C3P-12
C3P-7
C3P-8
C3P-9
C3P-3
C3P-2
C3P-1
C3P-4
C3P-5
C3P-6
C1P-3
C1P-6
C32BRK WH/RD
C1P-5
C1P-4
C1P-10
C1P-11
C2P-2
C4P-4
C40LS OR/RD
C2P-4
C3P-11
C4P-1
C7-3

Platform Level Cutout, CTE Option



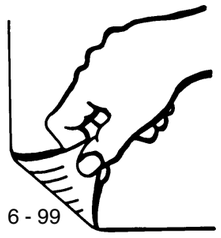
SCHEMATIC – PLATFORM LEVEL CUTOUT



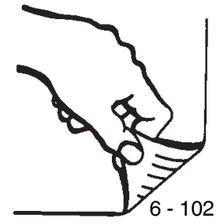
WIRING DIAGRAM

1. ADD CR20 AND CR21, PLATFORM LEVEL CUTOUT RELAY.
2. WIRE PLATFORM LEVEL CUTOUT PER SCHEMATIC. PLATFROM LEVEL CUTOUT WHEN MACHINE IS OUT OF STOWED POSITION.

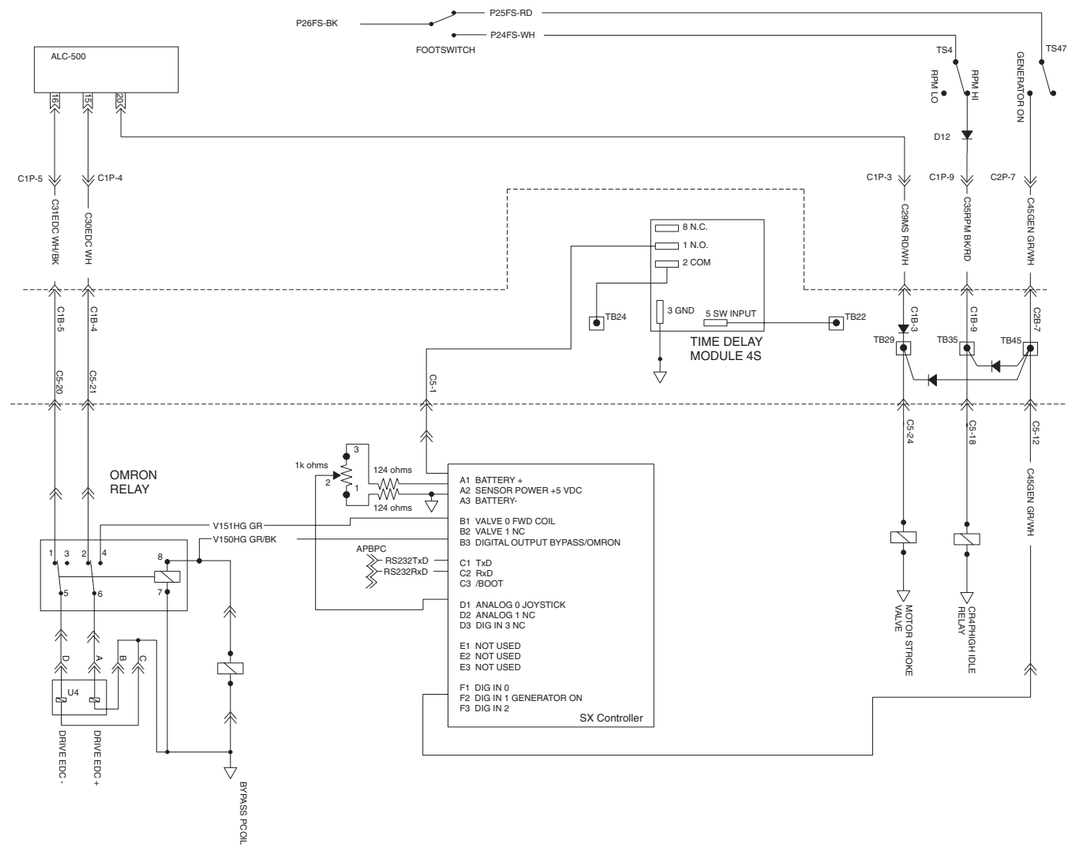
Platform Level Cutout, CTE Option



12 kW Hydraulic Generator Wiring Diagram



12 kW Hydraulic Generator Wiring Diagram



1. Turning on the Generator supplies current to the high idle relay through the diode switching the engine to high RPM. In addition the diode between TB45 and TB29 supplies power to the motor stroke valve switching the motors to high speed/low torque mode.

2. The SX controller is turned ON supplying power to bypass valve and the change over relay. The EDC valve is switched over to the output of the SX controller.

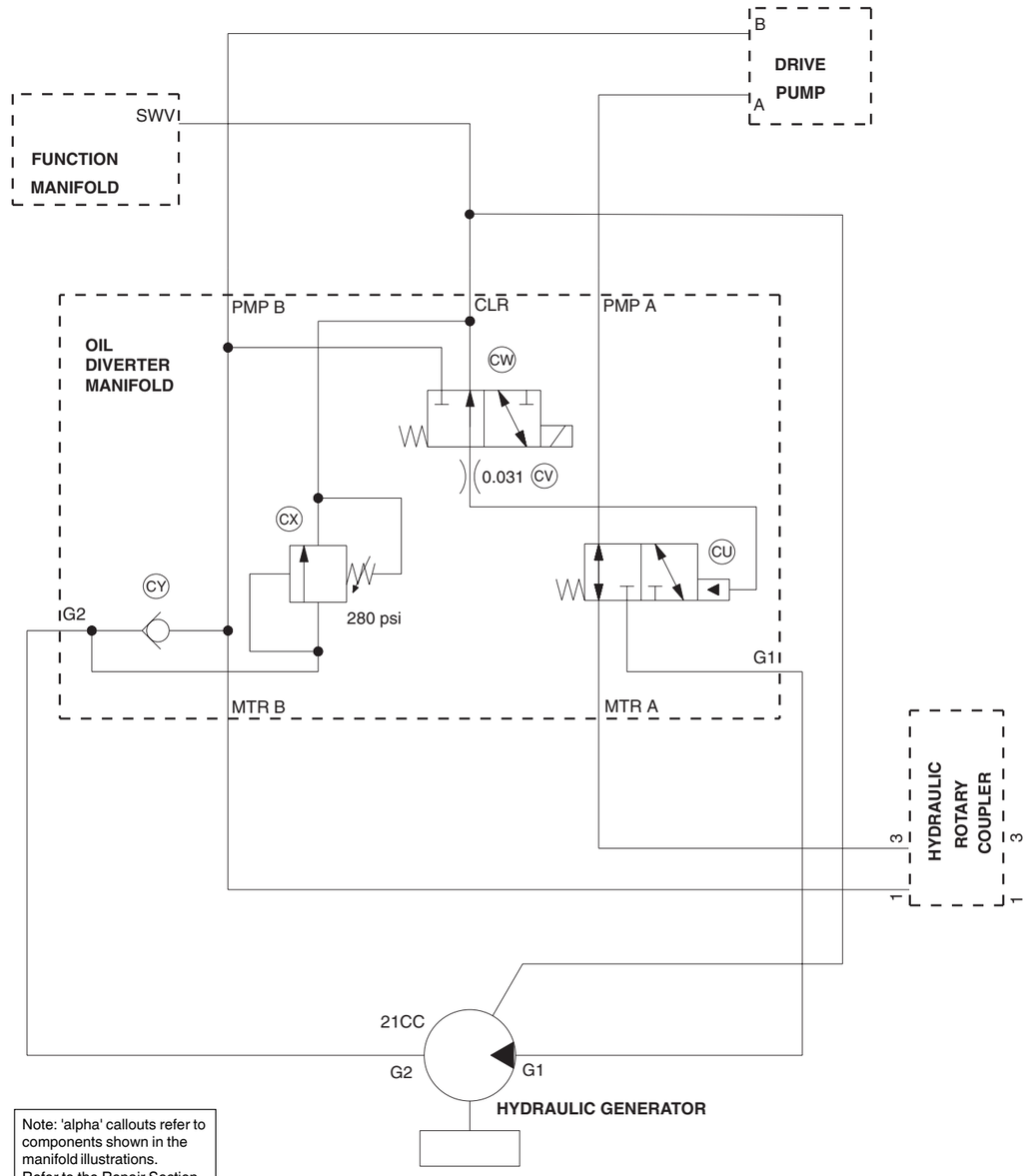
3. When the AC generator is turned OFF the SX module will ramp the output to the EDC to threshold preventing cavitation to the hydraulic motor powering the generator. When threshold is reached the bypass valve is turned OFF.

	Harness		Inside Enclosure
PIN#	COLOR	CKT#	COLOR
1	BR	GND	WH/RD
2	WH	C30EDC+	WH
3	WH/BK	C31EDC-	WH/BK
4	BR	GND	BK/RD
5	BR	GND	BL/RD
6	WH	C30EDC+(A)	RD
7	WH/BK	C31EDC-(A)	RD/BK
8	BR	GND	OR/RD
9	GR/WH	C45GEN	GR/WH
10	GR/BK	V150HG	GR/BK
11	WH	C22PWR	RD/WH
12	BR	GND	GR

12 kW Hydraulic Generator Option

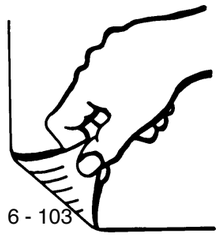
N M L K J I H G F E D C B A

1 2 3 4 5 6 7 8



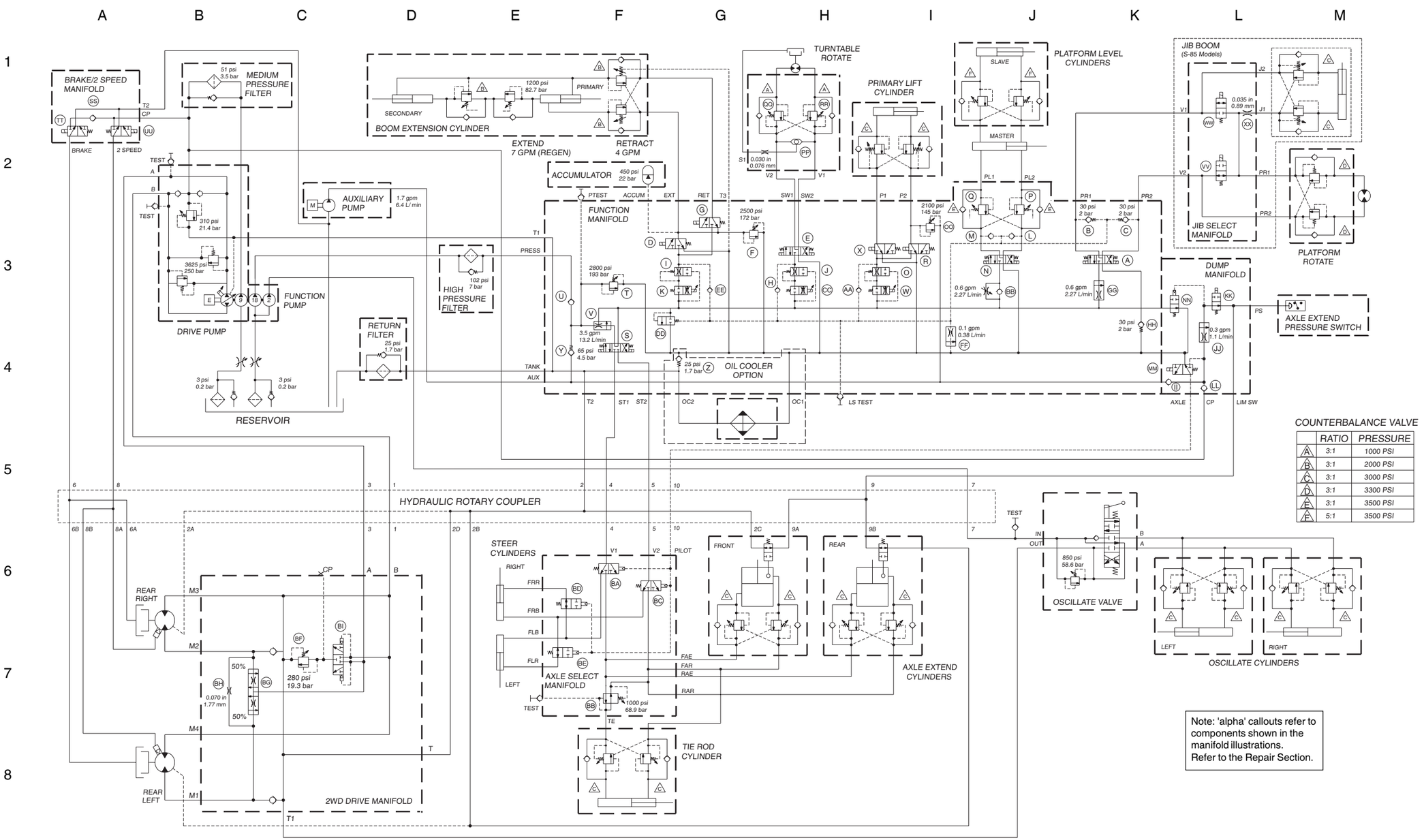
Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

12 kW Hydraulic Generator Option

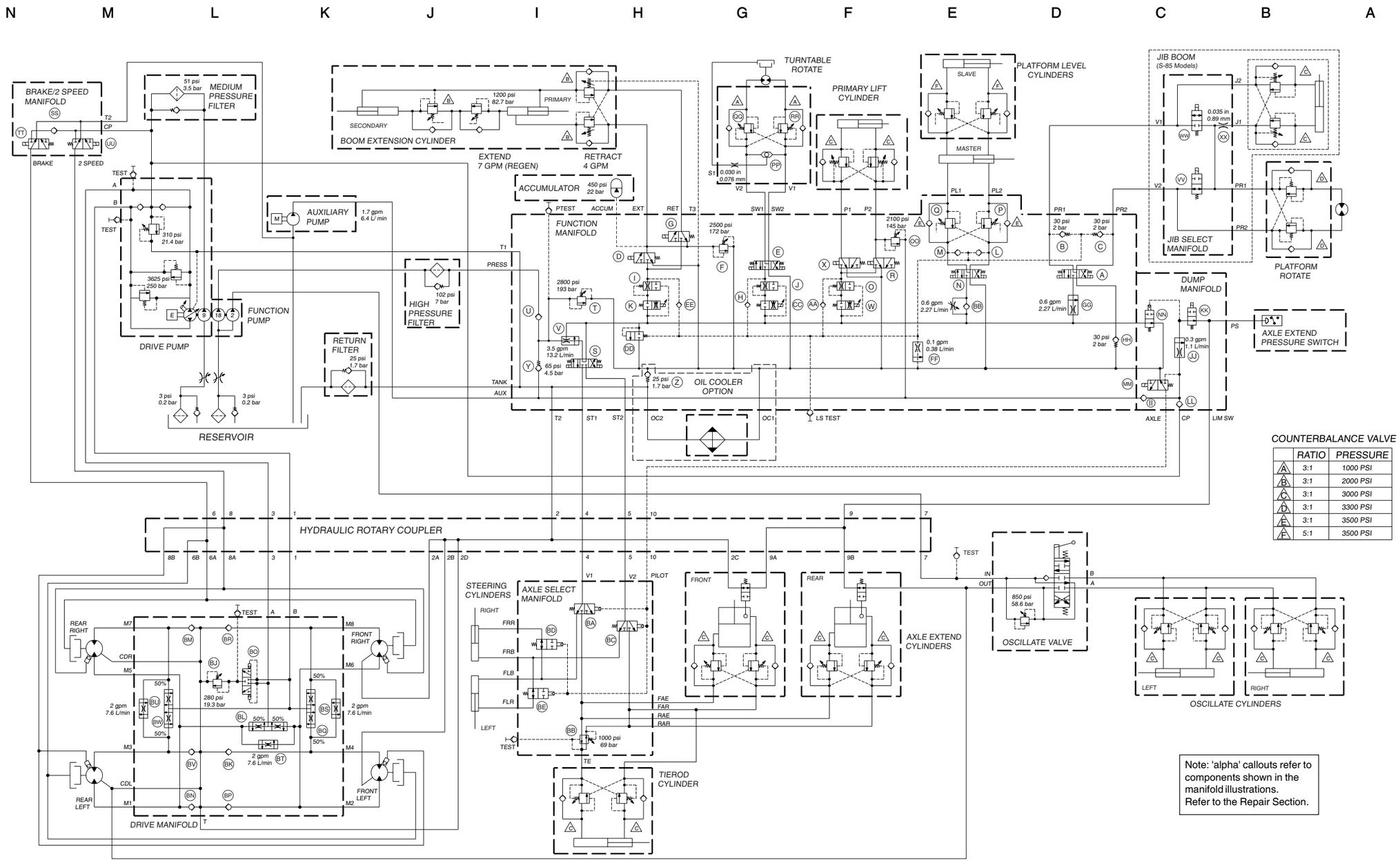


Hydraulic Schematic, 2WD Models

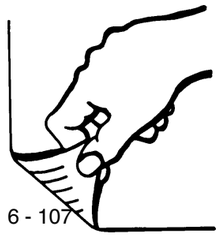
Hydraulic Schematic, 2WD Models



Hydraulic Schematic, 4WD Models



Hydraulic Schematic, 4WD Models



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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