Genie
A TEREX BRAND

Service and Repair Manual

Serial Number Range

Z®-62/40

from Z6215A-101
to Z6216N-2999
from Z6216D-101
to Z6216D-149
from Z6216M-101
To Z6216M-399

from Z62D-150
from Z62H-3000
from Z62M-400

This manual includes:
Repair procedures
Fault Codes
Electrical and
Hydraulic Schematics

For detailed maintenance procedures, refer to the appropriate Maintenance Manual for your machine.

Original Instructions
Part No. 1268555GT
Rev B1
June 2022

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the appropriate Operator's Manual on your machine before attempting any procedure.

This manual provides troubleshooting 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:

Internet: www.genielift.com
E-mail: awp.techpub@terex.com

Find a Manual for this Model

Go to http://www.genielift.com

Use the links to locate Service Manuals, Maintenance Manuals, Service and Repair Manuals, Parts Manuals and Operator's Manuals.

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First Edition, Second Printing

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Revision History

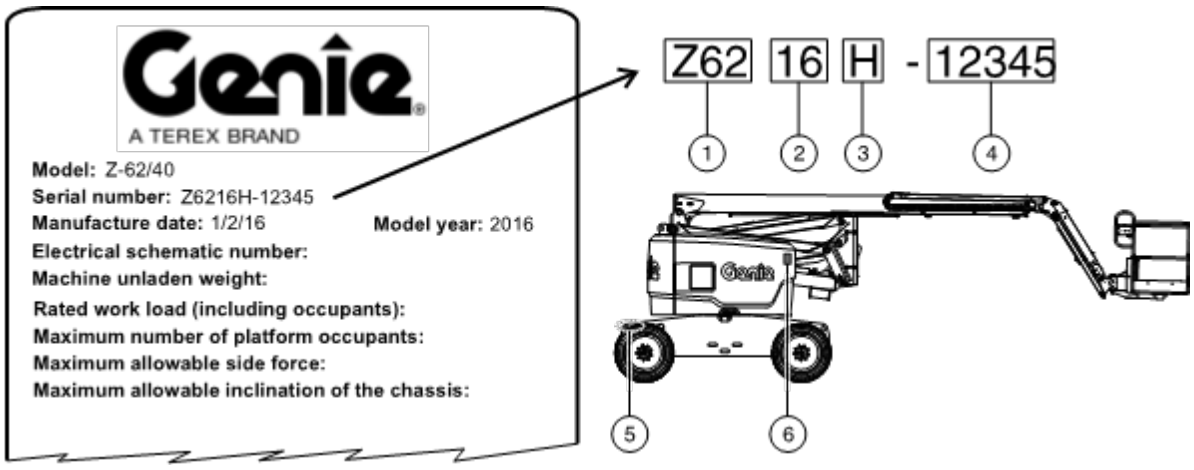
Revision	Date	Section	Procedure / Page / Description
A	9/2015		Initial Release
A1	9/2016	Introduction	Serial Number Legend
A2	11/2017	Specifications	Machine Specifications
A3	2/2020	Specifications	Hydraulic Component Specifications
B	5/2020	All Sections	Add Deutz TD 2.2 L3 Engine
		Fault Codes	Control System Fault Codes
B1	6/2022	Repair	5-1

Reference Examples:	**Electronic Version** Click on any content or procedure in the Table of Contents to view the update.
Section – Repair Procedure, 4-2	
Section – Fault Codes, All charts	
Section – Schematics, Legends and schematics	

Introduction

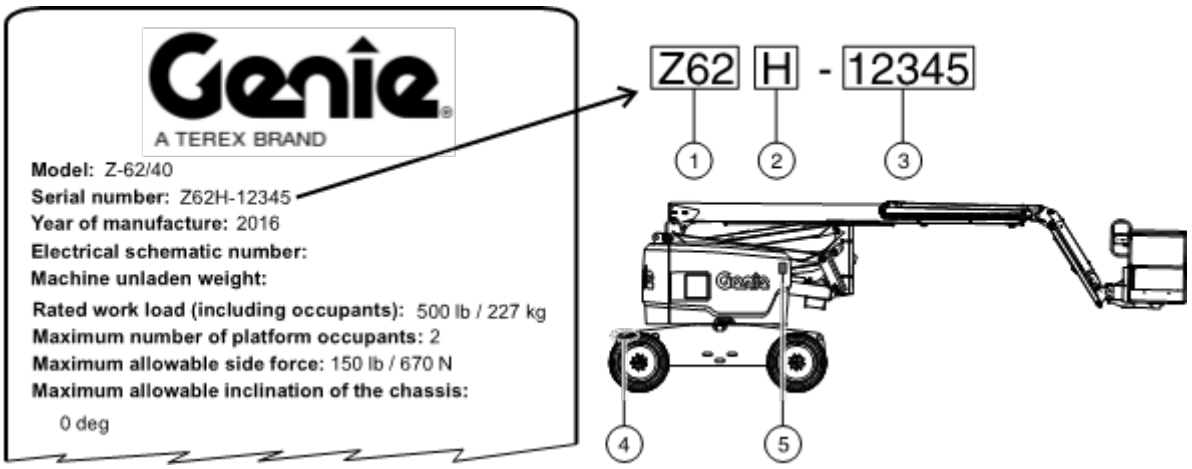
Serial Number Legend

To August 31, 2016



1 Model
2 Model year
3 Facility code
4 Sequence number
5 Serial number (stamped on chassis)
6 Serial label (located under cover)

From September 1, 2016



1 Model
2 Facility code
3 Sequence number
4 Serial number (stamped on chassis)
5 Serial label (located under cover)

Safety Rules



Danger

Failure to obey the instructions and safety rules in this manual and the appropriate Operator's Manual on your machine 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 modify or alter a MEWP without prior written permission from the manufacturer.

Do Not Perform Maintenance Unless:

☑ You are trained and qualified to perform maintenance on this machine.

☑ You read, understand and obey:

- manufacturer's instructions and safety rules
- employer's safety rules and worksite regulations
- applicable governmental regulations

☑ You have the appropriate tools, lifting equipment and a suitable workshop.

Safety Rules

Personal Safety

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



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



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

⚠ DANGER Indicates a 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 cause 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

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.



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 (Rough terrain)	355/55D625
Tire weight, new foam-filled (Rough terrain) (minimum)	415 lbs 188 kg
Tire size (High flotation)	41/18LL x 22.5
Tire ply rating (Rough terrain and Hi-flotation)	14
Wheel lugs	9 @ 5/8 - 18
Lug nut torque, dry	240 ft-lbs 325 Nm
Lug nut torque, lubricated	180 ft-lbs 244 Nm
Overall tire diameter (Rough terrain)	36.9 in 93.7 cm
Overall tire diameter (High flotation)	40.3 in 102.4 cm
Tire pressure (Rough terrain)	70 psi 4.92 bar
Tire pressure (High flotation)	60 psi 4.13 bar

Track Components	
Track material	Rubber
Tensioning system	Pressurized grease
Weight (each)	1500 lbs 680 kg

Fluid capacities	
LPG tank	33.5 lbs 15.2 kg
Fuel tank (Gas / LPG models)	20 gallons 75.7 liters
Fuel tank (Diesel models)	36 gallons 136.3 liters
Hydraulic tank	35 gallons 132.5 liters
Hydraulic system (including tank)	45 gallons 170.3 liters
Drive hubs	20 fl oz 591 cc
Turntable rotation drive hub	43 fl oz 1262 cc

Drive hub oil type: SAE 90 multipurpose hypoid gear oil API service classification GL5

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

Specifications

Performance Specifications

Drive speed, maximum stowed position	
2WD models	3.0 mph 4.8 km/h
	40 ft / 9.1 sec 12.2 m / 9.1 sec
4WD models	3.2 mph 5.1 km/h
	40 ft / 8.5 sec 12.2 m / 8.5 sec
TRAX models	2.3 mph 3.7 km/h
	40 ft / 11.9 sec 12.2 m / 11.9 sec
Elevated	0.7 mph 1.0 km/h
	40 ft / 40 sec 12.2 m / 40 sec
Gradeability	See Operator's Manual
Braking distance, maximum	
High range on paved surface	3 to 6 ft 0.9 to 1.8 m
Joystick function speeds, maximum from platform controls	
Jib boom up	68 to 73 seconds
Jib boom down	77 to 82 seconds
Primary boom up	60 to 65 seconds
Primary boom down	65 to 70 seconds
Primary boom extend	40 to 45 seconds
Primary boom retract	45 to 50 seconds
Secondary boom up	40 to 45 seconds
Secondary boom down	45 to 50 seconds
Turntable rotate, 360° Stowed	120 to 125 seconds
Turntable rotate, 360° Not stowed	240 to 245 seconds

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

Hydraulic Oil Specifications

Hydraulic Fluid Specifications

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 prevention, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

Cleanliness level, minimum	ISO 15/13
Water content, maximum	250 ppm

Recommended Hydraulic Fluid	
Hydraulic oil type	Chevron Rando HD Premium
Viscosity grade	32
Viscosity index	200
Optional Hydraulic Fluids	
Mineral based	Shell Tellus S2 V 32 Shell Tellus S2 V 46 Shell Tellus S4 VX 32 Shell Donax TG (Dexron III) Chevron 5606A
Biodegradable	Petro Canada Environ MV 46
Fire resistant	UCON Hydrolube HP-5046

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

NOTICE Optional fluids may not have the same hydraulic lifespan and may result in component damage.

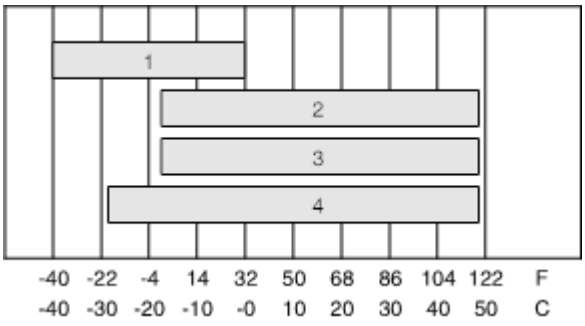
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond its maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

NOTICE

Do not top off with incompatible hydraulic fluids. Hydraulic fluids may be incompatible due to the differences in base additive chemistry. When incompatible fluids are mixed, insoluble materials may form and deposit in the hydraulic system, plugging hydraulic lines, filters, control valves and may result in component damage.

Note: Do not operate the machine when the ambient air temperature is consistently above 120°F / 49°C.

Hydraulic Fluid Temperature Range



Ambient air temperature

1 Chevron hydraulic oil 5606A
2 Petro-Canada Environ MV 46
3 UCON Hydrolube HP-5046D
4 Chevron Rando HD premium oil MV

Chevron Rando HD Premium Oil MV Fluid Properties

ISO Grade	32
Viscosity index	200
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C	 7.5 33.5
Brookfield Viscosity cP @ -4°F / -20°C cP @ -22°F / -30°C	 1040 3310
Flash point	375°F / 190°C
Pour point	-58°F / -50°C
Maximum continuous operating temperature	171°F / 77°C

Note: A hydraulic oil heating system is recommended when the ambient temperature is consistently below 0°F / -18°C.

Note: Do not operate the machine when the ambient temperature is below -20°F / -29°C with Rando HD Premium MV.

Specifications

Chevron 5606A Hydraulic Oil Fluid Properties

ISO Grade	15
Viscosity index	300
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C cSt @ -40°F / -40°C	 5.5 15.0 510
Flash point	180°F / 82°C
Pour point	-81°F / -63°C
Maximum continuous operating temperature	124°F / 51°C

Note: Use of Chevron 5606A hydraulic fluid, or equivalent, is required when ambient temperatures are consistently below 0°F / -17°C unless an oil heating system is used.

NOTICE

Continued use of Chevron 5606A hydraulic fluid, or equivalent, when ambient temperatures are consistently above 32°F / 0°C may result in component damage

Petro-Canada Environ MV 46 Fluid Properties

ISO Grade	46
Viscosity index	154
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C	 8.0 44.4
Flash point	482°F / 250°C
Pour point	-49°F / -45°C
Maximum continuous operating temperature	180°F / 82°C

Shell Tellus S4 VX Fluid Properties

ISO Grade	32
Viscosity index	300
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C	 9 33.8
Brookfield Viscosity cSt @ -4°F / -20°C cSt @ -13°F / -25°C cSt @ -40°F / -40°C	 481 702.4 2624
Flash point	>100
Pour point	-76°F / -60°C
Maximum continuous operating temperature	103°F / 75°C

Specifications

UCON Hydrolube HP-5046 Fluid Properties

ISO Grade	46
Viscosity index	192
Kinematic Viscosity cSt @ 149°F / 65°C cSt @ 104°F / 40°C cSt @ 0°F / -18°C	 22 46 1300
Flash point	None
Pour point	-81°F / -63°C
Maximum continuous operating temperature	189°F / 87°C

Hydraulic Component Specifications

Drive Pump	
Type: bi-directional variable displacement piston pump	
Flow rate @ 2500 rpm	32.4 gpm 122.6 L/min
Drive pressure, maximum	3750 psi 259 bar
Charge Pump	
Type	gerotor
Displacement per revolution	0.85 cu in 13.9 cc
Flow rate @ 2500 rpm	9 gpm 34 L/min
Charge pressure @ 2500 rpm	310 psi 21.4 bar
Function Pump	
Type	2 section tandem gear pump
Displacement - Pump 1 (inner)	1.3 cu in 21 cc
Flow rate @ 2500 rpm	14 gpm 53 L/min
Displacement - Pump 2 (outer) (oscillate models)	0.24 cu in 4 cc
Flow rate @ 2500 rpm	2 gpm 7.6 L/min
Auxiliary Pump	
Type: fixed displacement gear pump	
Displacement per revolution	1.7 gpm 6.4 L/min
Auxiliary pump relief pressure	3200 psi 220.6 bar

Specifications

Function manifold	
System relief valve pressure, maximum	3000 psi 207 bar
Platform level relief valve pressure	2800 psi 193 bar
Steer flow regulator	3.5 gpm 13.2 L/min
Boom extend flow regulator	
Extend	4.1 gpm 15.5 L/min
Retract	2.3 gpm 8.7 L/min
Jib boom / platform rotate flow regulator	0.6 gpm 2.3 L/min
Oscillate relief valve pressure (@1500 rpm)	650 psi 45 bar
Traction Manifold	
Hot oil relief pressure	280 psi 19.3 bar
Drive motors, 4WD models	
Displacement per revolution variable	0.79 to 1.83 cu in 13 to 30 cc
Drive motors, 2WD models	
Displacement per revolution variable	1.28 to 2.14 cu in 20.9 to 35 cc
Hydraulic Filters	
High pressure filter:	Beta 3 ˆ 200
High pressure filter bypass pressure	51 psi 3.5 bar
Medium pressure filter	Beta 3 ˆ 200
Medium pressure filter bypass pressure	51 psi 3.5 bar
Hydraulic tank return filter	10 micron with 25 psi / 1.7 bar bypass

Manifold Component Specifications

Plug torque	
SAE No. 4	13 ft-lbs / 18 Nm
SAE No. 6	18 ft-lbs / 24 Nm
SAE No. 8	50 ft-lbs / 68 Nm
SAE No.10	55 ft-lbs / 75 Nm
SAE No. 12	56 ft-lbs / 75.9 Nm

Specifications

Ford MSG-425 EFI Engine

Displacement	153 cu in 2,5 liters
Number of cylinders	4
Bore and Stroke	3.5 x 3.9 in 89 x 100 mm
Horsepower	60 @ 2500 rpm 45 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle, standby	1000 rpm 33,3 Hz
Low idle, function enable	1600 rpm 53,3 Hz
High idle	2500 rpm 83,3 Hz
Compression ratio	9.7:1
Compression pressure	
Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder.	
Lubrication system	
Oil pressure (operating temperature @ 2000 rpm)	29 - 39 psi 2,75 - 4,1 bar
Oil capacity (including filter)	6.7 quarts 6,4 liters
Oil Pressure switch	
Oil pressure switch point	7.5 psi 0,51 bar
Normal engine cranking speedOil viscosity requirements	
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	
Electronic fuel pump	
Fuel pressure, static	60 psi 4,1 bar
Fuel flow rate	0.58 gpm 2,2 L/min
Fuel requirement	
For fuel requirements, refer to the engine Operator Manual for your engine.	
Ignition system	
Spark plug type	Motorcraft AYFS-32Y-R
Spark plug gap	0.049 - 0.053 in 1,25 - 1,35 mm
Engine coolant	
Capacity	11.5 quarts 10,9 liters
Coolant temperature switch	
Temperature switch point	230°F 110°C
Starter motor	
Normal engine cranking speed	200 - 250 rpm
Current draw, normal load	140 - 200A
Current draw, maximum load	800A
Alternator	
Output	95A, 13.8V DC
Battery	
Type	12V DC, Group 34/78
Quantity	1
Cold cranking ampere @ 0°F	900A
Reserve capacity @ 25A rate	200 minutes

Specifications

Deutz D2011 L03i Engine

Displacement	142 cu in 2.33 liters
Number of cylinders	3
Bore and stroke	3.7 x 4.4 inches 94 x 112 mm
Horsepower	48 @ 2800 rpm 36 kW @ 2800 rpm
Firing order	1 - 2 - 3
Low idle	1500 rpm 313 Hz
High idle	2500 rpm 521.7 Hz
Compression ratio	19:01
Compression pressure	362 to 435 psi 25 to 30 bar
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 in 0.3 mm
Exhaust	0.020 in 0.5 mm
Lubrication system	
Oil pressure	20 to 44 psi 1.4 to 3 bar
Oil capacity (including filter)	9.5 quarts 9 liters
Oil viscosity requirements	
-22° F to 86° F/ -30° C to 30° C	5W-30 (synthetic)
-4° F to 90° F / -20° C to 32° C	10W-40
Above 23° F / -5° C	20W-50

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

Oil temperature switch	
Temperature switch point	300°F 149°C
Oil pressure switch	
Oil pressure switch point	22 psi 1.5 bar
Fuel injection system	
Injection pump make	Bosch
Injection pump pressure, maximum	15000 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, no load	90A
Brush length, new	0.72 in 18.5 mm
Brush length, minimum	0.27 in 7 mm
Battery	
Type	12V DC, Group 34/78
Quantity	1
Cold cranking ampere	900A
Reserve capacity @ 25A rate	200 minutes
Alternator output	60A @ 14V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

Specifications

Deutz TD2011 L04i Engine

Displacement	220.9 cu in 3.62 liters
Number of cylinders	3
Bore and stroke	3.78 x 4.92 inches 96 x 125 mm
Horsepower	75 @ 2400 rpm 55 kW @ 2400 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1500 rpm 450 Hz
High idle	2350 rpm 705 Hz
Compression ratio	17.5:1
Compression pressure	
Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder.	
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 in 0.3 mm
Exhaust	0.020 in 0.5 mm
Lubrication system	
Oil pressure. hot (at 2000 rpm)	40 to 60 psi 2.8 to 4.1 bar
Oil capacity (including filter)	12.8 quarts 12.1 liters
Oil viscosity requirements	
-22° F to 86° F/ -30° C to 30° C	5W-30 (synthetic)
-4° F to 104° F -20° C to 40° C	10W-40
Above 5° F / -15° C	15W-40
Units ship with 15W-40. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	

Oil temperature switch	
Installation torque	8 - 18 ft-lbs 11 - 24 Nm
Temperature switch point	275°F 135°C
Oil pressure switch	
Installation torque	8 - 18 ft-lbs 11 - 24 Nm
Oil pressure switch point	22 psi 1.5 bar
Fuel injection system	
Injection pump make	Motorpal
Injection pump pressure, maximum	15,000 psi 1,034 bar
Injector opening pressure	3,046 psi 210 bar
Fuel requirement	
For fuel requirements, refer to the engine Operator's Manual on your machine.	
Starter motor	
Current draw, normal load	140 - 200A
Cranking speed	250 - 350 rpm
Brush length, new	0.72 in 18.5 mm
Brush length, minimum	0.27 in 7 mm
Battery	
Type	12V DC, Group 34/78
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

Specifications

Deutz TD 2.2 L3 Engine

Displacement	134 cu. in 2,2 liters
Number of cylinders	3
Bore and Stroke	3.6 x 4.3 in 92 x 110 mm
Horsepower net intermittent @ 2600 rpm	49 hp 36 kW
Horsepower net intermittent @ 2600 rpm (TraX models)	60 hp 45 kW
Induction system	turbocharged
Firing order	1 - 2 - 3
Low idle, standby	1000 rpm
Low idle, function enable	1500 rpm
High idle	2400 rpm
Governor	electronic
Lubrication system	**Low ash oil required**
Oil pressure, hot (@ 2000 rpm)	40 - 60 psi 2,8 - 4,1 bar
Oil capacity (including filter)	8 quarts 7,6 liters
Oil viscosity requirements	
-22°F to 86°F / -30°C to 30°C	5W-30 (synthetic)
-4°F to 104°F / -20°C to 40°C	10W-40
Above 5°F / -15°C	15W-40
Unit ships with 15W-40. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Manual for your engine.	

Oil temperature switch	
Installation torque	8 - 18 ft-lbs 11 - 24 Nm
Temperature switch point	257°F 125°C
Oil Pressure switch	
Installation torque	8 - 18 ft-lbs 11 - 24 Nm
Pressure switch point	17.4 psi 1,2 bar
Fuel requirement	
For fuel requirements, refer to the engine Operator Manual for your engine.	
Engine coolant capacity	2.2 gallons 8,3 liters
Unit ships with Ethylene Glycol engine coolant. Consult your local supplier for compatibility before mixing alternative engine coolants.	
Starter motor	
Current draw, normal load	140 - 200A
Cranking speed	250 - 350 rpm
Battery – Engine starting and control system	
Type	12V DC, Group 31
Quantity	1
Battery capacity, maximum	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	95A @ 14V DC

Specifications

Deutz D 2.9 L4 Engine

Displacement	177 cu in 2.9 liters
Number of cylinders	4
Bore and stroke	3.6 x 4.3 inches 92 x 110 mm
Horsepower	48.8 @ 2600 rpm 37 kW @ 2600 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1500 rpm 313 Hz
High idle	2500 rpm 521.7 Hz
Compression ratio	18.4:1
Compression pressure	362 to 435 psi 25 to 30 bar
Governor	electronic
Lubrication system	
Oil pressure (@ 2000 rpm)	40 to 60 psi 1.4 to 3 bar
Oil capacity (including filter)	9.4 quarts 9 liters
Oil viscosity requirements	**Low ash oil required**
-22° F to 86° F/ -30° C to 30° C	5W-30 (synthetic)
-4° F to 90° F / -20° C to 32° C	10W-40
Above 23° F / -5° C	20W-50

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

Oil temperature switch	
Temperature switch point	257°F 125°C
Oil pressure switch	
Oil pressure switch point	20 psi 1.4 bar
Engine coolant	
Capacity	10 quarts 9.4 liters
Fuel injection system	
Injection pump make	Bosch
Injection pump pressure, maximum	15000 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	
Cranking speed	150-250 RPM
Current draw, normal load	250A to 400A
Output	3.2kW
Battery	
Type	12V DC
Quantity	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	95A @ 14V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

Specifications

Perkins 404D-22 Engine

Displacement	134 cu in 2.2 liters
Number of cylinders	4
Bore and stroke	3.31 x 3.94 inches 84 x 100 mm
Horsepower	51 @ 2500 rpm 38 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1300 rpm 229.7 Hz
High idle	2500 rpm 441.7 Hz
Compression ratio	23.3:1
Compression pressure	426 psi 29.4 bar
Pressure (psi) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder	
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.008 in 0.2 mm
Exhaust	0.008 in 0.2 mm
Lubrication system	
Oil pressure, cold (at 2500 rpm)	60 psi 4.1 bar
Oil capacity (including filter)	9.3 quarts 8.8 liters
Oil viscosity requirements	
Below 86°F / 30°C	5W-20
-4°F to 104°F / -20°C to 40°C	10W-30
Above 14°F / -10°C	15W-40

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

Oil pressure sending unit	
Oil pressure switch point	14.2 psi 1 bar
Fuel injection system	
Injection pump make	Zexel
Injection pressure	2133 psi 147 bar
Fuel requirement	
For fuel requirements, refer to the engine Operator's Manual on your machine.	
Alternator output	55A @ 12V DC
Fan belt deflection	3/8 in 10 mm
Starter motor	
Current draw, no load	140-200A
Brush length, new	0.7480 in 19 mm
Brush length, minimum	0.5 in 12.7 mm
Battery	
Type	12V DC, Group 34/78
Quantity	1
Cold cranking ampere	900A
Reserve capacity @ 25A rate	200 minutes
Engine coolant	
Capacity	7.7 quarts 7.3 liters
Coolant temperature sending unit	
Temperature switch point	221° F 105° C

Specifications

Perkins 404F-22 Engine

Displacement	134 cu in 2.2 liters
Number of cylinders	4
Bore and stroke	3.31 x 3.94 inches 84 x 100 mm
Horsepower	48 @ 2800 rpm 38 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1300 rpm 229.7 Hz
High idle	2500 rpm 441.7 Hz
Compression ratio	23.3:1
Compression pressure	426 psi 29.4 bar
Pressure (psi) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder	
Governor	electronic
Valve clearance, cold	
Intake	0.008 in 0.2 mm
Exhaust	0.008 in 0.2 mm
Lubrication system	
Oil pressure (@ 2000 rpm)	40 to 60 psi 1.4 to 3 bar
Oil capacity (including filter)	9.4 - 11.2 quarts 8.9 - 10.6 liters
Oil viscosity requirements	
Below 86°F / 30°C	5W-20
-4°F to 104°F / -20°C to 40°C	10W-30
Above 14°F / -10°C	15W-40
Units ship with 15W-40. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	
Oil pressure sending unit	
Oil pressure switch point	14.2 psi 1 bar
Fuel injection system	
Injection pump make	Zexel
Injection pressure	2133 psi 147 bar
Fuel requirement	
For fuel requirements, refer to the engine Operator's Manual on your machine.	
Alternator output	85A @ 12V DC
Fan belt deflection	3/8 in 10 mm
Starter motor	
Current draw, normal load	140A - 200A
Brush length, new	0.7480 in 19 mm
Brush length, minimum	0.5 in 12.7 mm
Battery	
Type	12V DC
Quantity	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Engine coolant	
Capacity	7.7 quarts 7.3 liters
Coolant temperature sending unit	
Temperature switch point	221° F 105° C

Specifications

Machine Torque Specifications

Platform rotator	
1-8 center bolt, GR 5	
Lubricated	480 ft-lbs 650 Nm
Dry	640 ft-lbs 867 Nm
3/8 -16 bolts, GR 8	
Lubricated	33 ft-lbs 45 Nm
Dry	44 ft-lbs 60 Nm
Turntable rotate assembly	
Rotate bearing mounting bolts, lubricated	160 ft-lbs 217 Nm
Drive motor/brake mounting bolts, dry	49 ft-lbs 66.4 Nm
Drive motor/brake mounting bolts, lubricated	37 ft-lbs 50 Nm
Drive motor and hubs	
Drive hub mounting bolts, dry	200 ft-lbs 271 Nm

TraX™ Torque Specifications

Sprocket to hub adapter fasteners	
3/4 -10 nuts, GR 8, dry	317 ft-lbs 430 Nm
3/4 -10 nuts, GR 8, lubricated	281 ft-lbs 381 Nm
1/2-13 FHS screws, dry	80 ft-lbs 108 Nm
1/2 -13 screws, lubricated	60 ft-lbs 81 Nm
Hub adapter to drive hub fasteners	
Lug nut torque, dry	240 ft-lbs 325 Nm
Lug nut torque, lubricated	180 ft-lbs 244 Nm
Sprocket bearing hub fasteners	
1-14 bolts, GR 8, dry	650 ft-lbs 881 Nm
1-14 bolts, GR 8, lubricated	488 ft-lbs 662 Nm
Idler and bogey wheel fasteners	
3/4-10 bolts, GR 8, dry	375 ft=lbs 508 Nm
3/4-10 bolts, GR 8, lubricated	281 ft-lbs 381 Nm

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok™ ORFS or 37° JIC 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.

Seal-Lok™ Fittings

(hose end - ORFS)

SAE Dash Size	Torque
-4	18 ft-lbs / 25 Nm
-6	30 ft-lbs / 41 Nm
-8	40 ft-lbs / 55 Nm
-10	60 ft-lbs / 81 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	150 ft-lbs / 205 Nm
-24	230 ft-lbs / 315 Nm

JIC 37° Fittings

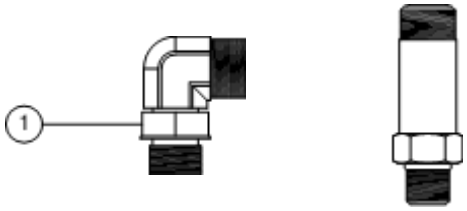
(swivel nut or hose connection)

SAE Dash Size	Thread Size	Flats
-4	7/16-20	2
-6	9/16-18	1 1/2
-8	3/4-16	1 1/2
-10	7/8-14	1 1/2
-12	1 1/16-12	1 1/4
-16	1 5/16-12	1
-20	1 5/8-12	1
-24	1 7/8-12	1

SAE O-ring Boss Port

(tube fitting - installed into Aluminum)
(all types)

SAE Dash Size	Torque
-4	14 ft-lbs / 19 Nm
-6	23 ft-lbs / 31,2 Nm
-8	36 ft-lbs / 49 Nm
-10	62 ft-lbs / 84 Nm
-12	84 ft-lbs / 114 Nm
-16	125 ft-lbs / 169,5 Nm
-20	151 ft-lbs / 204,7 Nm
-24	184 ft-lbs / 249,5 Nm



Adjustable Fitting

Non-adjustable fitting

1 jam nut

SAE O-ring Boss Port

(tube fitting - installed into Steel)

SAE Dash Size		Torque
-4	ORFS / 37° (Adj) ORFS (Non-adj) 37° (Non-adj)	15 ft-lbs / 20,3 Nm 26 ft-lbs / 35,3 Nm 22 ft-lbs / 30 Nm
-6	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	35 ft-lbs / 47,5 Nm 29 ft-lbs / 39,3 Nm
-8	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	60 ft-lbs / 81,3 Nm 52 ft-lbs / 70,5 Nm
-10	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	100 ft-lbs / 135,6 Nm 85 ft-lbs / 115,3 Nm
-12	(All types)	135 ft-lbs / 183 Nm
-16	(All types)	200 ft-lbs / 271,2 Nm
-20	(All types)	250 ft-lbs / 339 Nm
-24	(All types)	305 ft-lbs / 413,5 Nm

Specifications

Torque Procedure

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-ring in Parker Seal Lok™ fittings and hose end are custom-size O-rings. They are not standard 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 the O-ring face seal 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. Refer to the appropriate torque chart in this section.

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

JIC 37° fittings

1 Align the tube flare (hex nut) against the nose of the fitting body (body hex fitting) and tighten the hex nut to the body hex fitting to hand tight, approximately 30 in-lbs / 3.4 Nm.

2 Using a permanent ink marker, make a reference mark on one the flats of the hex nut and continue the mark onto the body of the hex fitting. Refer to Illustration 1.

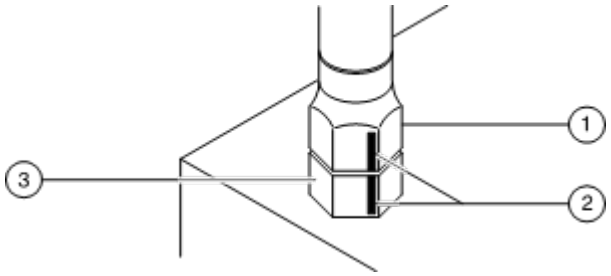


Illustration 1

1 hex nut
2 reference mark
3 body hex fitting

3 Working clockwise on the body hex fitting, make a second mark with a permanent ink marker to indicate the proper tightening position. Refer to Illustration 2.

Note: Use the JIC 37° Fitting table in this section to determine the correct number of flats, for the proper tightening position.

Note: The marks indicate the correct tightening positions have been determined. Use the second mark on the body hex fitting to properly tighten the joint after it has been loosened.

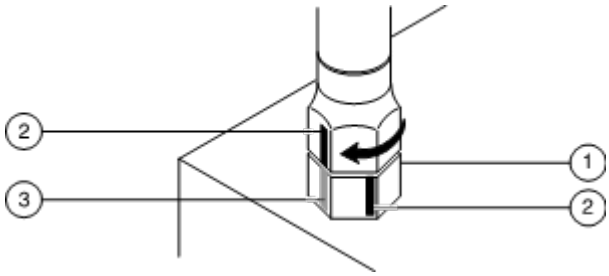


Illustration 2

1 body hex fitting
2 reference mark
3 second mark

4 Tighten the hex nut until the mark on the hex nut is aligned with the second mark on the body hex fitting.

5 Operate all machine functions and inspect the hose, fittings and related components to confirm there are no leaks.

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				Class 8.8				Class 10.9				Class 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

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 appropriate 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.

Machine Configuration:

☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:

- Machine parked on a firm, level surface
- Key switch in the off position with the key removed
- The red Emergency Stop button in the off position at both the ground and platform controls
- Wheels chocked
- All external AC power supply disconnected from the machine
- Boom in the stowed position
- Turntable secured with the turntable rotation lock

Repair Procedures

About This Section

Most of the procedures in this section should only be performed by 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 Indicates a 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 cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

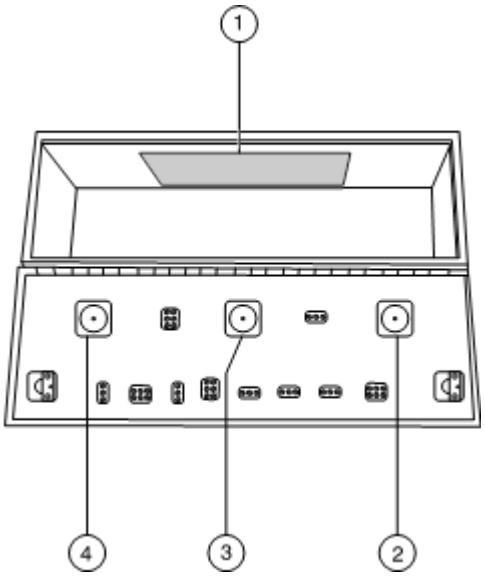
⊙ Indicates that a specific result is expected after performing a series of steps.

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

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. Refer to Repair Procedure, *How to Calibrate a Joystick*.

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



1 ALC-500 circuit board
2 drive/steer joystick controller
3 secondary boom up/down joystick controller
4 primary boom up/down and turntable rotate left/right joystick controller

1-1 ALC-500 Circuit Board

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

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

How to Remove the ALC-500 Circuit Board

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Remove the platform control box lid retaining fasteners. Open the control box lid.

3 Locate the ALC-500 circuit board mounted to the inside of the platform control box.

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.

Platform Controls

1-2 Joysticks

How to Calibrate a Joystick

The joystick controllers on this machine utilize digital Hall Effect technology for proportional control. If a joystick controller is disconnected or replaced, it must be calibrated before that particular machine function will operate.

Note: The joystick must be calibrated before the threshold, max-out or ramping can be set.

Note: Perform this procedure with the engine off.

1 Open the platform control box.

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

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

4 Select a joystick to calibrate.

5 Disconnect the wire harness connector from the joystick for approximately 10 seconds or until the alarm sounds. Connect the wire harness connector to the joystick.

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

7 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.

⊠ Result: The alarm does not sound. Check the electrical connections or replace the joystick.

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

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

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 towards 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.

Note: For each joystick axis, the threshold must be set for both directions.

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

13 Return the joystick to the neutral position and wait for approximately 10 seconds to allow the settings to be saved.

⊙ 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.

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.

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).

Platform Controls

10 Compare the machine function time with the function times listed in Refer to Specifications, *Performance Specifications*. 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 function speed or momentarily move the drive enable toggle switch in the left direction to decrease the function speed.

Note: Each time the drive enable toggle switch is momentarily moved, the function speed 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 to allow the settings to be saved.

⊙ 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.

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.

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 to allow the settings to be saved.

⊙ 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.

Ramp rate (factory settings)	
Primary boom up/down	
accelerate	3 seconds
decelerate	1 second
Secondary boom up/down	
accelerate	2 seconds
decelerate	1 second
Turntable rotate	
accelerate	2 seconds
decelerate	0.5 second
Drive	
accelerate	2 seconds
decelerate to neutral	0.5 second
decelerate, change of direction	0.5 second
decelerate, coasting	0.75 second
decelerate, braking	1.5 seconds
decelerate, shift from low to high speed	1.75 seconds
decelerate, shift from high to low speed - 2WD models	1 second
decelerate, shift from high to low speed - 4WD models	3.5 seconds

Platform Components

2-1 Platform Leveling 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 Cylinder

Note: Before cylinder removal is considered, bleed the leveling 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 hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

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

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

3 Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

Note: Do not rest the entire weight of the jib boom on the blocks.

4 Tag, disconnect and cap the hydraulic hoses from the slave cylinder. Plug the union hoses from the master 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.

5 Remove the pin retaining fastener from the slave cylinder rod-end pivot pin. Do not remove the pin.

6 Remove the external snap rings from the slave cylinder barrel-end pivot pin. Do not remove the pin.

7 Place a block under the slave cylinder for support. Protect the cylinder rod from damage.

8 Use a soft metal drift to drive the rod-end pivot pin out.

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

NOTICE Component damage hazard. The leveling cylinder rod may become damaged if it is allowed to fall if not properly supported by the lifting device.

9 Use a soft metal drift and drive the barrel-end pin out.

10 Carefully pull the cylinder out of the primary boom.

How to Bleed the Slave Cylinder

1 Simultaneously activate the primary boom up function and the platform level up function until the boom is fully raised.

2 Simultaneously activate the primary boom down function and the platform level down function until the boom is fully lowered.

Platform Components

2-2 Platform Rotator

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 hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the platform and platform support.

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.

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

⚠WARNING Crushing hazard. The platform rotator could fall when removed from the machine if not properly supported.

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

5 Support the jib boom leveling arms.

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

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

Note: When installing the platform rotator fasteners, torque the fasteners to 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.

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.

Platform Components

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.

2-3 Platform Overload System (if equipped)

How to Calibrate the Platform Overload System

Calibrating the platform overload system regularly is essential to safe machine operation. Continued use of an improperly operating platform overload system, could result in the system not sensing an overloaded platform condition. Machine stability could be compromised resulting in the machine tipping over.Note: Perform this procedure with the machine on a firm, level surface.

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

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

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

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

4 Using a suitable lifting device, place a test weight equal to the maximum platform capacity at the center of the platform floor. Refer to the machine serial plate.

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. Repeat 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 light and alarm responds.

6 Turn the key switch to ground controls, pull out the red Emergency Stop Button and start the engine.

7 Add an additional weight to the platform that is equal to, but does not exceed 15% of the maximum rated load.

⊙ Result: The overload indicator light is flashing at both the ground and platform controls, the alarm is sounding and the engine shuts down. Proceed to step 8.

⊠ Result: The overload indicator lights are off at the platform and ground controls, the alarm does not sound and the engine continues to run. 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, the alarm sounds and the engine shuts down. Remove the additional weight. Repeat the procedure starting with step 5.

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

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

⊙ Result: All ground control functions should operate.

9 Using a suitable lifting device, remove the additional weight from the platform.

⊙ 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.

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

⊙ Result: All ground control functions should operate.

Jib Boom Components

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 hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the platform and platform support.

2 Disconnect the electrical connector from the jib boom/platform rotate select valve manifold mounted to the platform support.

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

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Remove the platform rotator. Refer to Repair Procedure, *How to Remove the Platform rotator*.

5 Remove the pin retaining fastener from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

6 Slide both of the jib boom leveling arms off of the jib boom cylinder rod-end pivot pin.

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

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

9 Support the barrel end of the jib boom lift cylinder with a suitable lifting device.

10 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.

11 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin.

12 Use a soft metal drift to remove the pin and let the cylinder hang down.

⚠WARNING Crushing hazard. The jib boom could fall when the barrel-end pivot pin is removed if not properly supported by the lifting device.

13 Remove the pin retaining fastener from the jib boom pivot pin. Use a soft metal drift to remove the pin, then remove the jib boom.

⚠WARNING Crushing hazard. The jib boom may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead lifting device.

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 hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the jib boom slightly and place blocks under the platform support. 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 out enough to 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 Support the jib boom lift cylinder with a suitable lifting device.

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

⚠WARNING Crushing hazard. The jib boom may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead lifting device.

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

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

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

Primary Boom Components

4-1
Cable Track

The primary boom cable track guides the cables and hoses running up the boom. It can be repaired link by link without removing the cables and hoses that run through it. Removing the entire primary boom cable track is only necessary when performing major repairs that involve removing the primary boom.

How to Remove the Cable Track

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

1 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.

2 Disconnect the power to plat cable from the AC outlet box.

3 Remove the hose and cable clamps from the platform support.

4 Tag, disconnect and plug the platform leveling slave cylinder hydraulic hoses from the bulkhead fittings on the top of the primary boom. Cap the bulkhead fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Tag, disconnect and plug ports V1 and V2 on the platform rotate/jib manifold. Cap the fittings.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

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

7 Remove the retaining fasteners securing the cable track to the upper tube.

8 Pull the cable track back from the upper tube.

9 Remove the hose and cable clamps from inside the cable track at both ends.

10 Pull the hoses and cables out of the upper tube.

11 Pull the hoses and cables out of the cable track.

12 Remove the retaining fasteners that attach the cable track to the lower tube.

13 Remove the cable track from the machine.

Primary Boom Components

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 Service Parts Department.

1 Visually inspect the cable track and determine which 4-link section needs to be replaced.

2 Carefully remove the snap rings and pins 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 pins and 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.

4-2 Primary Boom

How to Remove the Primary Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Remove the jib boom. Refer to Repair Procedure, *How to Remove the Jib Boom.*

2 Remove the cable track. Refer to Repair Procedure, *How to Remove the Cable Track*.

3 Raise the primary boom to the horizontal position.

4 Raise the secondary boom until the primary lift cylinder rod end pivot pin is above the upper secondary arm.

5 Attach lifting straps from a 5 ton / 5000 kg overhead crane to each end of the boom. Support the boom. Do not apply lifting pressure.

Primary Boom Components

6 Remove the retaining fasteners from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin. Lower the master cylinder against the primary lift cylinder.

NOTICE Component damage hazard. When lowering the master cylinder down, be sure not to damage the master cylinder hoses or fittings.

7 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

8 Tag, disconnect and plug the hoses under the pivot end of the boom at the hose unions.

9 Using an overhead supporting device, attach a strap to the rod-end of the primary boom lift cylinder.

10 Remove the retaining fasteners from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The boom lift cylinder and primary boom will fall if not properly supported.

11 Place a support block across the upper secondary arm and lower the lift cylinder on it.

12 Remove the lower cable and hose tray located under the primary boom and set it on a supporting device.

13 Remove the retaining fasteners from the primary boom pivot pin.

14 Remove the primary boom pivot pin with a soft metal drift, then carefully remove the primary boom from the machine and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The primary boom could become unbalanced and fall when removed from the machine if not properly attached to the suitable lifting device.

How to Disassemble the Primary Boom

Complete disassembly of the boom is only necessary if the outer or inner boom tube must be replaced. The extension cylinder can be removed without completely disassembling the boom. Refer to Repair Procedure, *How to Remove the Primary Boom Extension Cylinder*.

1 Remove the extension cylinder. Refer to Repair Procedure, *How to Remove the Primary Boom Extension Cylinder*.

2 Remove the primary boom. Refer to Repair Procedure, *How to Remove the Primary Boom*.

3 At the pivot end of the primary boom, remove the two side wear pads from the extension tube.

4 At the platform end of the primary boom, remove the upper and lower wear pad plates.

5 Support and slide the extension tube out of the boom tube.

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

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

4-3
Primary Boom Lift Cylinder

The primary boom lift cylinder raises and lowers the primary boom. The primary boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Lift Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Raise the primary boom to a horizontal position.

2 Raise the secondary boom until the upper secondary arm is above the compression arms.

3 Place a block across both compression arms. Lower the secondary boom until it just rest on the block. Do not rest the entire weight of the boom on the block.

4 Attach a 5 ton / 5000 kg overhead crane to the primary boom for support.

5 Raise the primary boom with the overhead crane slightly to take the pressure off the primary boom lift cylinder pivot pins.

6 Support the rod end and the barrel end of the primary boom lift cylinder with a second overhead crane or similar lifting device.

7 Tag, disconnect and plug the primary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

8 Remove the retaining fasteners from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The primary boom will fall if not properly supported when the primary boom rod-end pivot pin is removed.

9 Place a support block across the upper arm under the primary boom lift cylinder.

10 Lower the rod end of the lift cylinder onto the block. Protect the cylinder rod from damage.

⚠WARNING Crushing hazard. The primary boom lift cylinder could become unbalanced and fall if not properly supported by the lifting device.

11 Remove the primary boom lift cylinder barrel-end pivot pin snap rings.

12 Use a soft metal drift to remove the pin. Carefully remove the primary boom lift cylinder from the machine.

⚠WARNING Crushing hazard. The lift cylinder could become unbalanced and fall if not properly supported and secured to the lifting device.

Primary Boom Components

4-4 Primary Boom Extension Cylinder

The primary boom extension cylinder extends and retracts the primary boom extension tube.The primary boom extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Extension Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Raise the primary boom to a horizontal position.

2 At the pivot end of the boom, remove the cover from the end of the #1 boom tube.

3 At the pivot end of the boom, remove the retaining fasteners and blocks securing the extend cylinder to the #2 boom tube through the access holes in the #1 boom tube.

4 Extend the primary boom until the primary boom extension cylinder rod-end pivot pin is accessible in the primary boom extension tube.

5 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

6 At the platform end of the boom, remove the external snap rings from the extension cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

7 At the pivot end of the boom, remove the retaining fasteners and blocks securing the extend cylinder to the #1 boom tube'

8 Support and slide the extension cylinder out of the primary boom.

⚠WARNING Crushing hazard. The extension cylinder could fall when removed from the extension boom if not properly supported.

NOTICE Component damage hazard. Be careful not to damage the counterbalance valves on the primary boom extension cylinder when removing the cylinder from the primary boom.

NOTICE Component damage hazard. Hoses and cables can be damaged if the primary boom extension cylinder is dragged across them.

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

4-5
Platform Leveling Master Cylinder

The master cylinder acts as a pump for the slave cylinder. It's part of the closed circuit hydraulic loop that keeps the platform level through the entire range of boom motion. The master cylinder is located at the base of the primary 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 hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the secondary boom until both the rod-end and barrel-end pivot pins on the master cylinder are accessible.

2 Use an overhead supporting device to support the platform. Do not apply lifting pressure.

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 Attach overhead crane or similar lifting device to the master cylinder.

5 Remove the retaining fasteners from the master cylinder barrel-end pivot pin.

6 Use a soft metal drift to remove the pin.

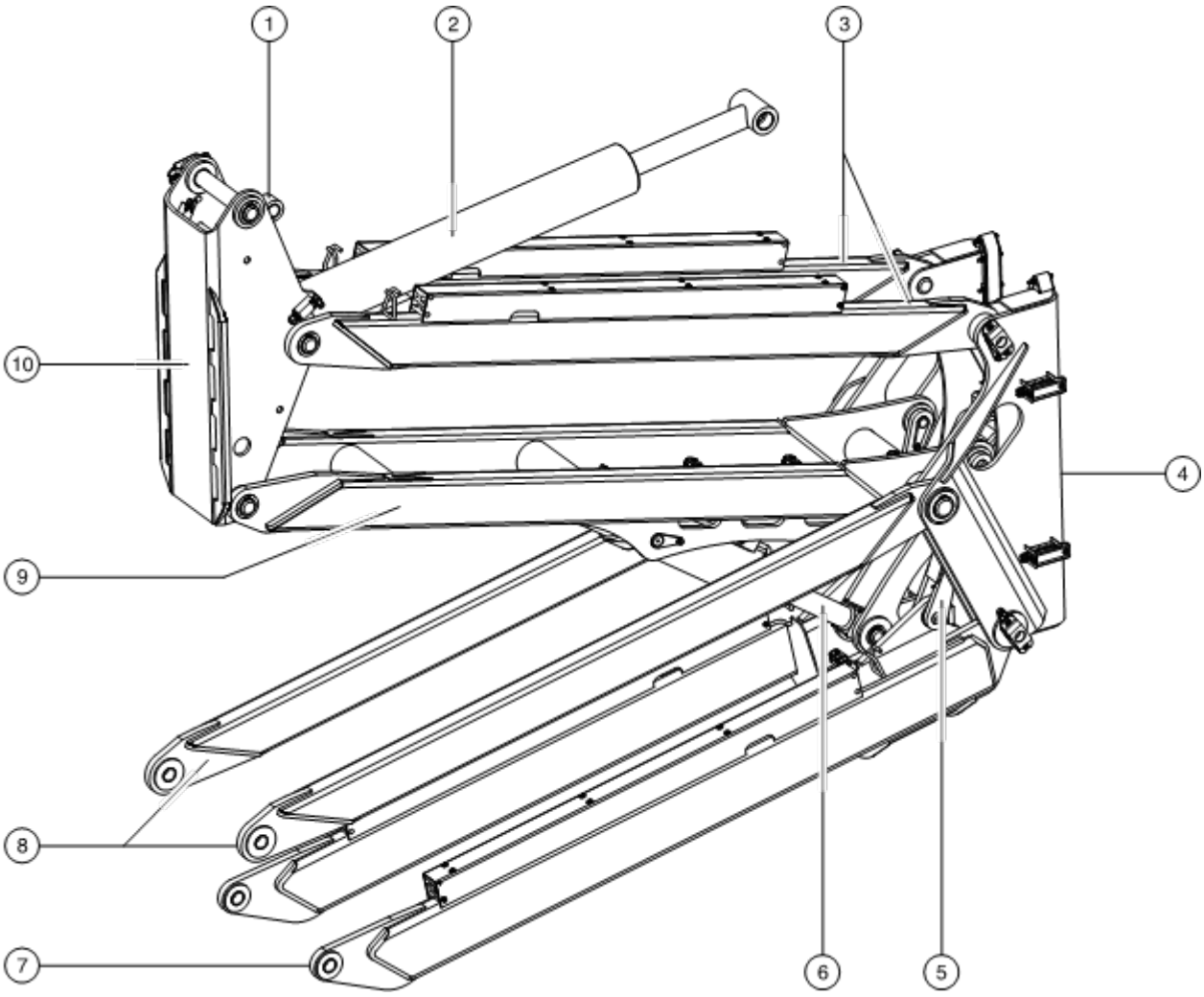
7 Remove the retaining fastener from the rod-end pivot pin.

8 Use a soft metal drift to remove the pin.

9 Remove the master cylinder from the machine.

⚠WARNING Crushing hazard. The master cylinder could become unbalanced and fall if not properly attached to the lifting device.

Secondary Boom Components



Secondary Boom components

1 master cylinder
2 primary boom lift cylinder
3 upper compression arms
4 mid-pivot
5 timing link
6 secondary boom lift cylinder
7 lower compression arm
8 lower tension arms
9 upper tension arm
10 upper pivot

Secondary Boom Components

5-1
Secondary Boom Lift Cylinder

There is one secondary boom lift cylinder incorporated in the structure of the secondary boom assembly. This cylinder requires hydraulic pressure to extend and retract. The secondary boom lift cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Secondary Boom Lift Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Raise the secondary boom until the rod end pivot pins of the secondary lift cylinder clear the lower tension arms.

2 Attach a lifting strap from an overhead supporting device (5 ton / 5000 kg) to the pivot end of the primary boom for support. Do not apply lifting pressure.

⚠DANGER Crushing hazard. The boom assembly can fall if not properly supported by the overhead crane.

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

3 Remove the pin retaining fasteners securing the barrel-end pivot pins of the secondary boom lift cylinder. Do not remove the pins.

4 Attach a strap from an overhead supporting device to the center of the secondary boom lift cylinder for support. Do not apply lifting pressure.

⚠WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly attached to the suitable lifting device.

5 Use a slide hammer to remove the pivot pins.

6 Use auxiliary power to retract the cylinder.

7 Tag, disconnect and plug the hydraulic hoses from the secondary 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.

8 Lower the cylinder onto the lower compression arm.

Secondary Boom Components

9 Remove the pin retaining fastener securing the rod-end pivot pin of the secondary boom lift cylinder. Remove the pivot pin securing the lift cylinder.

10 Lift and move the cylinder towards the center of the machine enough to lower it down through the lower compression arm. Pull the cylinder towards the platform and remove it from the machine.

⚠WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly attached to the suitable lifting device.

NOTICE Component damage hazard. When removing a secondary boom lift cylinder from the machine, be careful not to damage the counterbalance valve at the barrel end of the cylinder.

6-1 RPM Adjustment - Deutz Models

Refer to Maintenance Procedure in the appropriate Service or Maintenance Manual for your machine, *Check and Adjust the Engine RPM*.

6-2 RPM Adjustment - Perkins Models

Refer to Maintenance Procedure in the appropriate Service or Maintenance Manual for your machine, *Check and Adjust the Engine RPM*.

6-3 Flex Plate

The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.

How to Remove the Flex Plate

Deutz models:

1 Remove the tailpipe bracket mounting fasteners from the engine bell housing.

2 Support the drive pump assembly with an appropriate lifting device.

3 Remove all of the engine bell housing fasteners.

4 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.

5 Remove the flex plate mounting fasteners. Remove the flex plate from the flywheel.

Ford models:

1 Disconnect the electrical connectors from both oxygen sensors at the tailpipe and exhaust manifold. Do not remove the oxygen sensors.

2 Remove the exhaust pipe fasteners at the muffler.

3 Support the muffler and bracket assembly with a suitable lifting device.

4 Remove the muffler bracket mounting fasteners from the bell housing. Carefully remove the muffler and bracket assembly from the engine.

Engines

5 Support the engine with an overhead crane or other suitable lifting device. Do not lift it.

6 Remove the engine mounting plate to bell housing fasteners.

7 Raise the engine slightly using the overhead crane and place a block of wood under the oil pan for support.

8 Support the drive pump assembly with an overhead crane or other suitable lifting device. Do not apply any lifting pressure.

9 Remove all of the engine bell housing retaining fasteners.

10 Carefully pull the pump and bell housing assembly away from the engine and secure it from moving.

Perkins models:

1 Remove the fuel filter/water separator mounting fasteners.

2 Remove the fuel filter/water separator and lay it to the side. Do not disconnect the hoses.

3 Support the drive pump assembly with an appropriate lifting device.

4 Remove all of the engine bell housing fasteners.

5 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.

6 Remove the flex plate mounting fasteners.

7 Remove the flex plate from the flywheel.

How to Install the Flex Plate

1 Install the flex plate onto the engine flywheel with the rubber vibration isolators towards the pump.

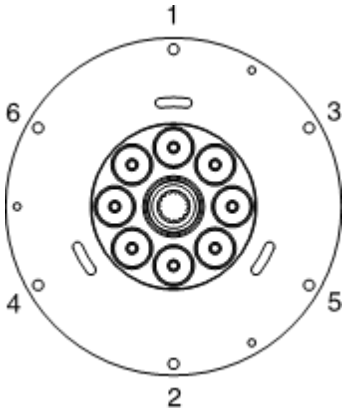
2 Apply Loctite® removable thread sealant to the flex plate fasteners and loosely install the fasteners.

3 **Deutz models:** Torque the flex plate mounting bolts in sequence to 28 ft-lbs / 38 Nm. Then torque the flex plate mounting bolts in sequence to 40 ft-lbs / 54 Nm.

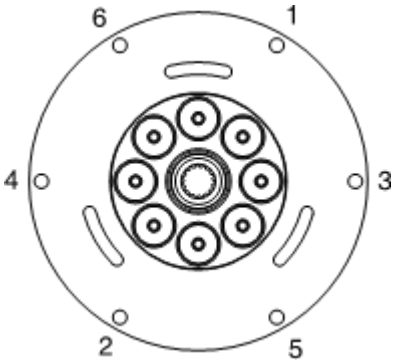
Ford and Perkins models: Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm. Then torque the flex plate mounting bolts in sequence to 20 ft-lbs / 27 Nm.

4 Apply a high viscosity coupling grease (Genie part number 128025) to the splines of the pump shaft and flex plate.

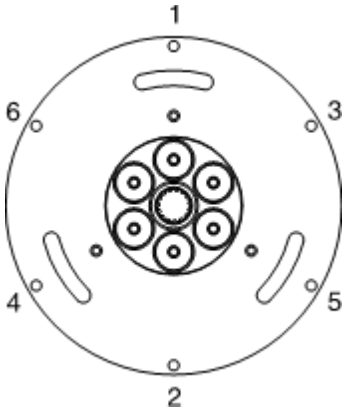
Grease Specification
Shell Alvania® Grease CG, NLGI 0/1 or equivalent.



Ford Models



Deutz Models



Perkins Models

Engines

How to Install the Pump and Bell Housing Assembly

1 Install the pump and bell housing assembly.

Deutz models: Torque the bell housing mounting bolts labeled "C" in sequence to 28 ft-lbs / 38 Nm. Then torque the bell housing mounting bolts labeled "C" in sequence to 40 ft-lbs / 54 Nm.

Ford models: Torque the bell housing mounting bolts labeled "A" and "B" in sequence to 28 ft-lbs / 38 Nm and the mounting bolts labeled "C" to 49 ft-lbs / 66 Nm. Then torque the bell housing mounting bolts labeled "A" and "B" in sequence to 40 ft-lbs / 54 Nm and the mounting bolts labeled "C" to 70 ft-lbs / 95 Nm**.**

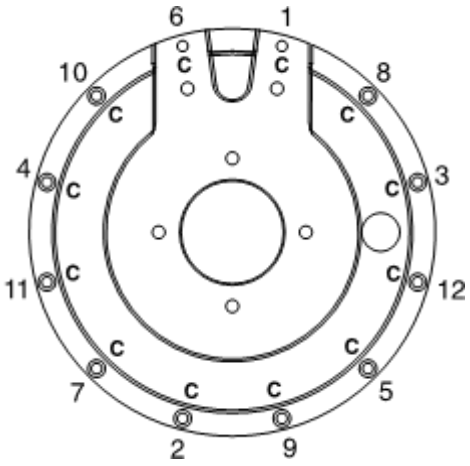
Perkins models: Torque the bell housing mounting bolts labeled "B" in sequence to 28 ft-lbs / 38 Nm and the mounting bolts labeled "A" to 49 ft-lbs / 66 Nm. Then torque the bell housing mounting bolts labeled "B" in sequence to 40 ft-lbs / 54 Nm and the mounting bolts labeled "A" to 70 ft-lbs / 95 Nm.

NOTICE

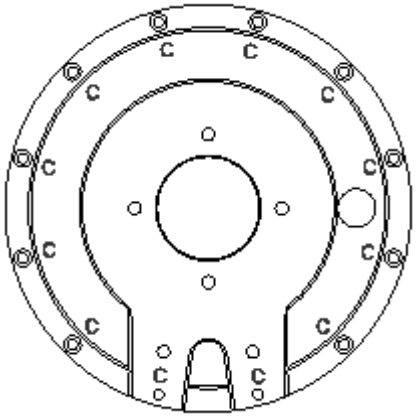
Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

NOTICE

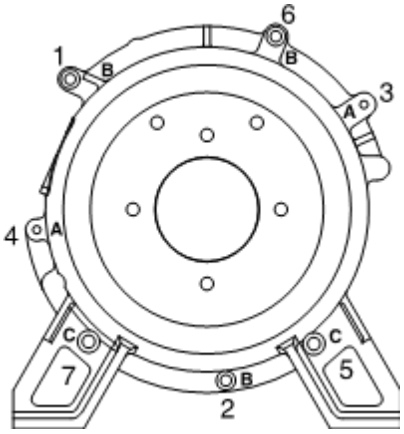
Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



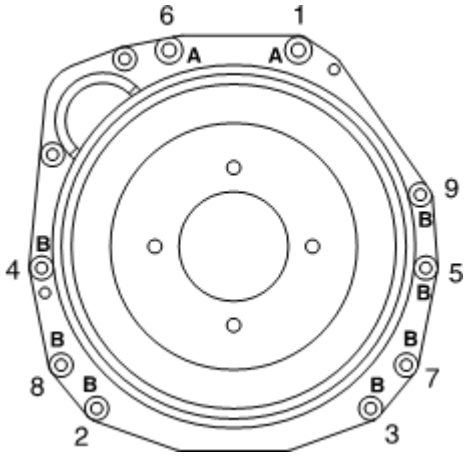
Deutz Models D2011L03i, TD2011L04i



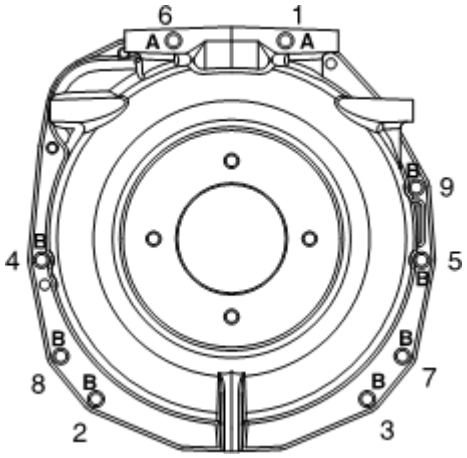
Deutz Models TD 2.2 L3, D 2.9 L4, TD 2.9 L4



Ford Models



Perkins Models 404D-22



Perkins Models 404F-E22T

6-4
Engine Fault Codes - Ford MSG-425 Models

How to Retrieve 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.

Refer to Fault Code Section, *How to Retrieve Ford Engine Fault Codes*. Use the Fault Code Chart to aid in identifying the fault.

Engines

6-5 Engine Fault Codes - Deutz TD 2.2 L3 Models

How to Retrieve 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. One or more faults will also be displayed on the LCD screen located at the ground controls.

If a fault occurs that does not result in an engine shutdown, the engine rpm will go into limp home mode resulting in the loss of high rpm.

Refer to Fault Code Section, *How to Retrieve Active Engine Fault Codes* for your specific engine model. Use the Fault Code Chart to aid in identifying the fault.

6-6 Engine Fault Codes - Deutz D 2.9 L4 and Perkins 404F-22 Models

How to Retrieve 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. One or more fault LED's will illuminate on the display located at the ground control box. The active fault code will also be displayed on the LCD screen.

If a fault occurs that does not result in an engine shutdown, the engine rpm will go into limp home mode resulting in the loss of high rpm.

Refer to Fault Code Section, *How to Retrieve Active Engine Fault Codes* for your specific engine model. Use the Fault Code Chart to aid in identifying the fault.

6-7
Diesel Particle Filter Regeneration - Deutz TD 2.2 L3 Engine

The combustion of diesel fuel results in soot, which is separated in the diesel particle filter (DPF). This must be regenerated as the contamination with soot increases. There are 3 types of regeneration.

Passive regeneration:

Under normal operating conditions when the exhaust temperature is >482°F / 250°C the particle filter contamination with soot remains in a permissible range. This process is automatically activated by the engine control unit, the operator does not need to perform any actions.

Standstill regeneration:

If passive regeneration does not attain an adequate reduction of the soot contamination, the particle filter will continue to become contaminated with soot and a standstill regeneration will be required by the operator.

To perform standstill regeneration, refer to the Operator's Manual on your machine.

Service regeneration:

If a fault occurs, the system reacts by reducing the engine performance. This can include limited machine functions, torque reduction, reduced engine rpm and replacement of the DPF.

If standstill regeneration is prohibited by the operator. Service regeneration must be performed by a trained technician with the use of the DEUTZ SerDia software tool and DeCom interface cable. Available from Deutz.

If service regeneration is not performed, replacement of the DPF will be required.

Hydraulic Pumps

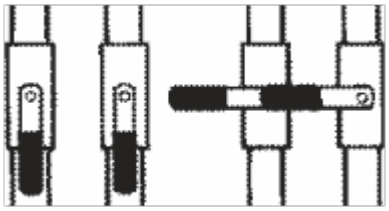
7-1 Function Pump

How to Remove the Function Pump

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

1 Locate the two hydraulic tank valves at the hydraulic tank. Close the valves.

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



open closed

2 Tag, disconnect and plug the function pump hydraulic hoses. 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 Support the pump with a suitable lifting device.

4 Remove the pump mounting bolts. Carefully remove the pump.

NOTICE Component damage hazard. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

7-2 Drive Pump

The drive pump is a bi-directional variable displacement piston pump. The pump output is controlled by the electro-proportional controller, 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 Eaton Hydraulics center. Call Genie Product Support to locate your local authorized service center.

How to Remove the Drive Pump

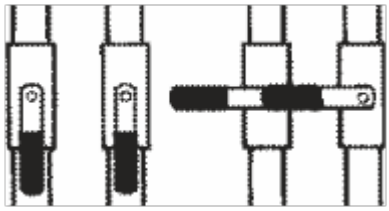
NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

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

1 Disconnect the electrical connectors at the electrical proportional controller located on the drive pump.

2 Locate the two hydraulic tank valves at the hydraulic tank. Close the valves.

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



open closed

3 Tag and 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 pump with a lifting device and remove the pump mounting fasteners.

Hydraulic Pumps

5 Carefully pull the drive pump out until the pump coupler separates from the flex plate.

6 Remove the drive pump from the machine.

NOTICE Component damage hazard. The pump(s) may become unbalanced and fall if not properly supported.

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. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

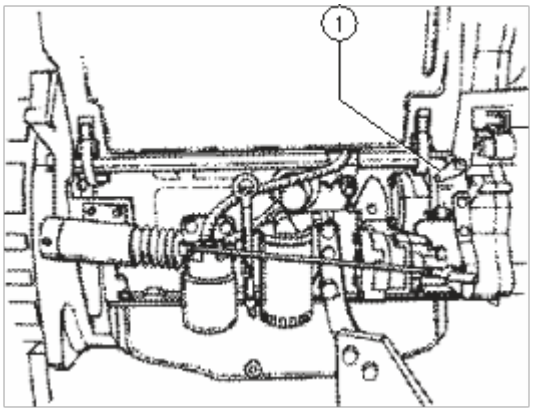
How to Prime the Drive Pump

1 Connect a 0 to 600 psi / 0 to 41 bar pressure gauge to the test port on the drive pump.

2 **Ford models:** Close the valve on the LPG tank then disconnect the hose from the tank. Then move the fuel select switch to the LPG position.

Perkins 404D-22 models: Disconnect the engine wiring harness from the fuel solenoid at the injector pump.

Deutz D2011 L03i models: Hold the manual fuel shutoff valve clockwise to the closed position.



1 manual fuel shutoff valve

3 Have another person crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 310 psi / 21 bar.

4 **Ford models:** Connect the LPG hose to the LPG tank and open the valve on the tank.

Perkins 404D-22 models: Connect the engine wiring harness to the fuel solenoid.

Deutz D2011 L03i models: Release the manual fuel shutoff valve.

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

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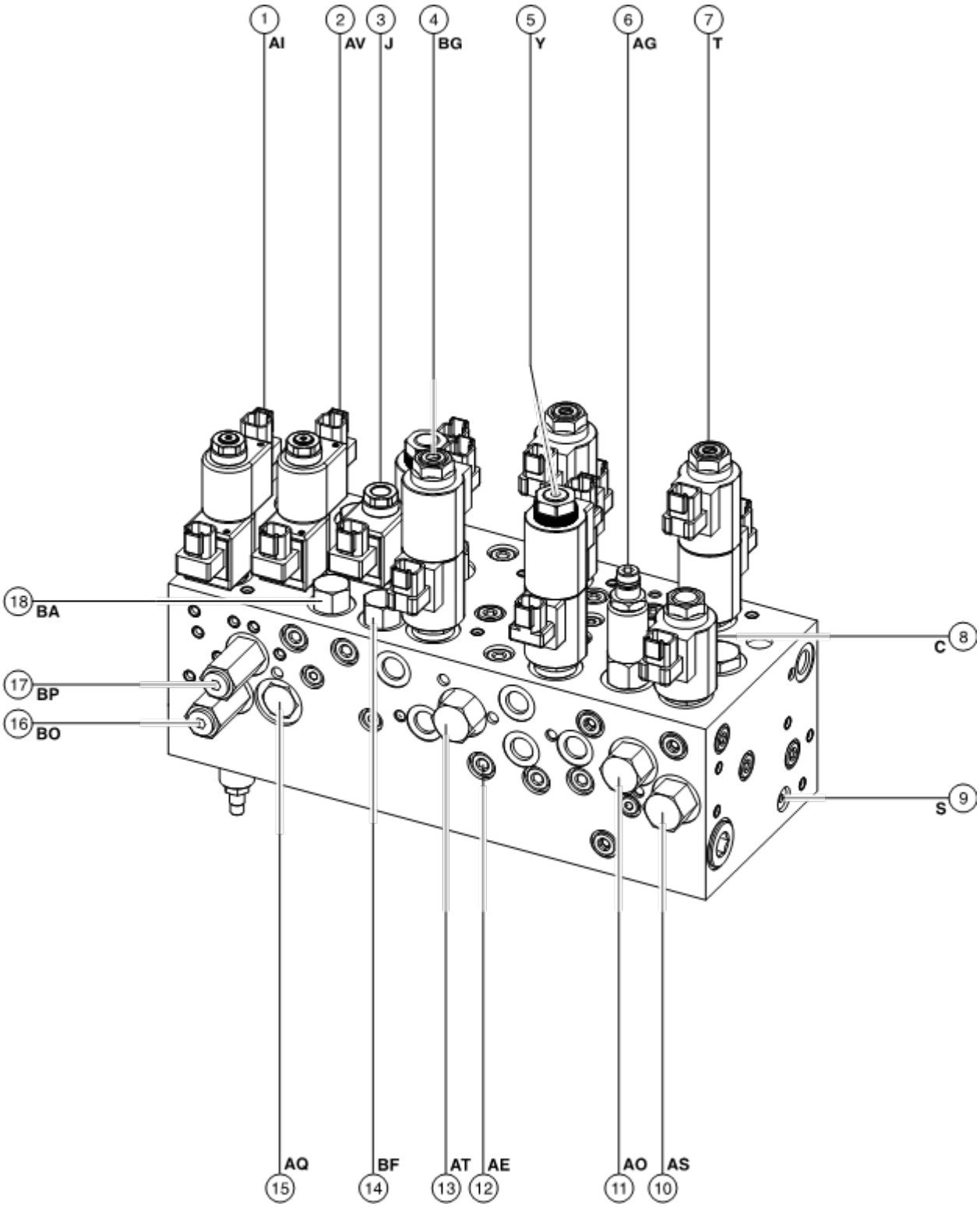
Manifolds

8-1
Function Manifold Components

The function manifold is located between the fuel and hydraulic tanks.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	AI	Platform level up/down	25 ft-lbs / 34 Nm
2	Solenoid valve, 3 position 4 way	AV	Platform rotate left/right and jib boom up/down	25 ft-lbs / 34 Nm
3	Solenoid valve, 2 position 2 way (normally open)	J	Primary Boom retract circuit	20 ft-lbs / 27 Nm
4	Proportional directional valve, 3 position 4 way	BG	Turntable rotate left/right	16-20 ft-lbs / 22-27 Nm
5	Solenoid valve, 3 position 4 way	Y	Steer left/right	25 ft-lbs / 34 Nm
6	Relief valve, 3000 psi / 207 bar	AG	System relief	25-30 ft-lbs / 34-41 Nm
7	Proportional directional valve, 3 position 4 way	T	Secondary boom up/down	16-20 ft-lbs / 22-27 Nm
8	Solenoid valve, 2 position 2 way (normally open)	C	Function enable valve	33-37 ft-lbs / 45-50 Nm
9	Check valve	S	Differential sensing circuit, secondary boom	8-10 ft-lbs / 10-15 Nm
10	Differential sensing valve, 190 psi / 13 bar	AS	Differential sensing circuit, meters flow to functions	50-55 ft-lbs / 68-75 Nm
11	Differential sensing valve, 150 psi / 10.3 bar	AO	Differential sensing circuit, secondary boom	30-35 ft-lbs / 41-47 Nm
12	Check valve	AE	Differential sensing circuit, primary boom	8-10 ft-lbs / 10-15 Nm
13	Differential sensing valve, 110 psi / 7.6 bar	AT	Differential sensing circuit, primary boom	30-35 ft-lbs / 41-47 Nm
14	Flow control valve, 2.3 gpm / 8.7 L/min	BF	Primary Boom retract circuit	25-30 ft-lbs / 34-41 Nm
15	Check valve, 30 psi / 2 bar	AQ	Platform rotate left/right and jib boom up/down	20-25 ft-lbs / 27-34 Nm
16	Relief valve, 2800 psi / 193 bar	BO	Platform level up circuit	25-30 ft-lbs / 34-41 Nm
17	Relief valve, 2800 psi / 193 bar	BP	Platform level down circuit	25-30 ft-lbs / 34-41 Nm
18	Flow control valve, 0.6 gpm / 2.3 L/min	BA	Platform rotate left/right and jib boom up/down	25-30 ft-lbs / 34-41 Nm

Manifolds

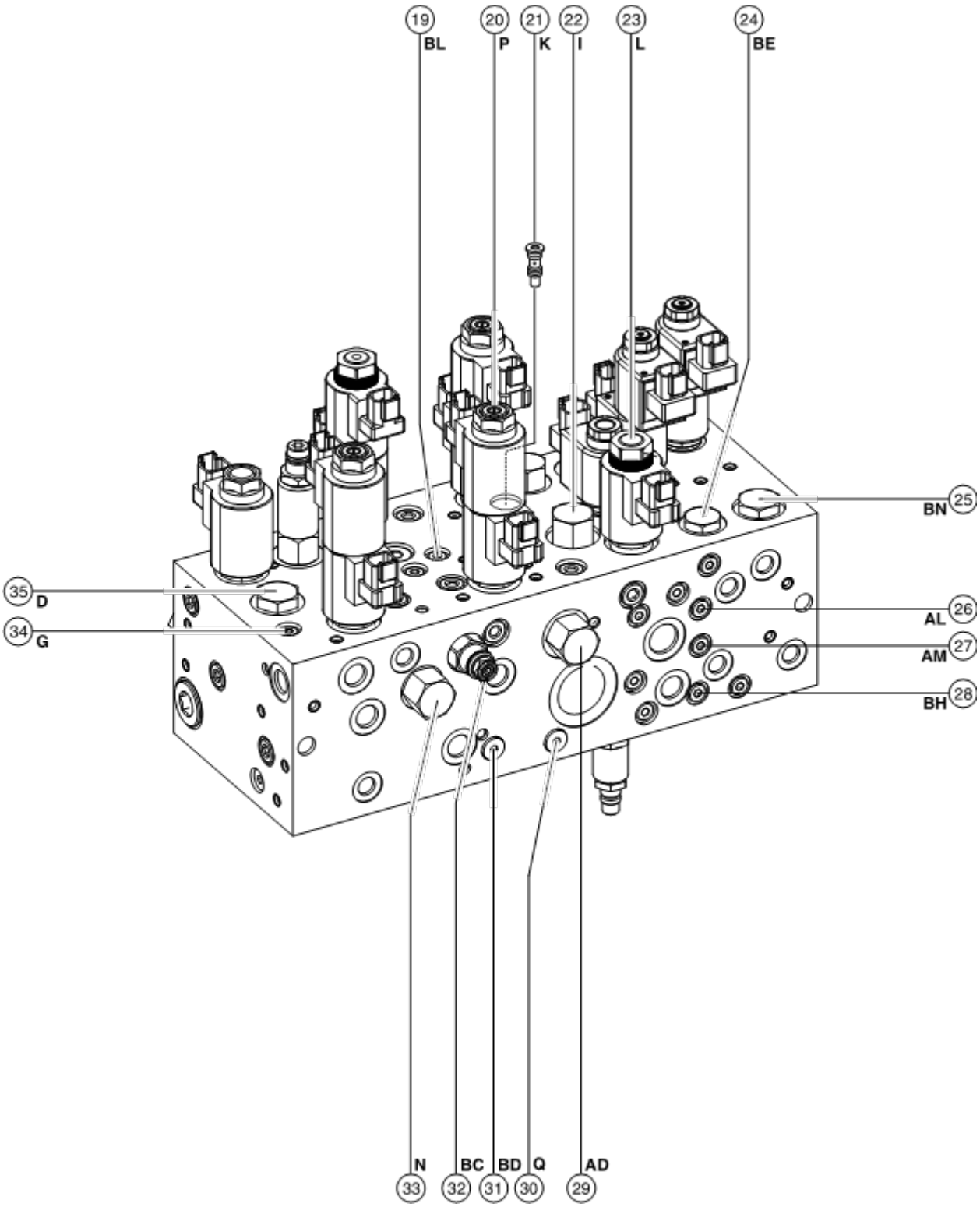

1 AI
2 AV
3 J
4 BG
5 Y
6 AG
7 T
18 BA
17 BP
16 BO
C 8
S 9
15 AQ
14 BF
13 AT
12 AE
11 AO
10 AS

Manifolds

Function Manifold Components, continued

Index No.	Description	Schematic Item	Function	Torque
19	Shuttle valve	BL	Differential sensing circuit, primary boom	12-14 ft-lbs / 16-19 Nm
20	Proportional directional valve, 3 position 4 way	P	Primary boom up/down	33-37 ft-lbs / 45-50 Nm
21	Shuttle valve	K	Differential sensing circuit, turntable rotate	25 ft-lbs / 34 Nm
22	Flow regulator valve, 4.1 gpm / 15.5 L/min	I	Primary boom extend	35-40 ft-lbs / 47-54 Nm
23	Solenoid operated 2 position 2 way directional valve	L	Primary boom extend	25 ft-lbs / 34 Nm
24	Check valve, 30 psi / 2 bar	BE	Differential sensing circuit, platform rotate right and jib boom down	20-25 ft-lbs / 27-34 Nm
25	Check valve, 65 psi / 5 bar	BN	Platform level down circuit	20-25 ft-lbs / 27-34 Nm
26	Check valve	AL	Differential sensing circuit, platform level down	8-10 ft-lbs / 10-15 Nm
27	Check valve	AM	Differential sensing circuit, platform level up	8-10 ft-lbs / 10-15 Nm
28	Check valve	BH	Differential sensing circuit, primary boom extend/retract	8-10 ft-lbs / 10-15 Nm
29	Differential sensing valve, 80 psi / 5.5 bar	AD	Turntable rotate left/right	30-35 ft-lbs / 41-47 Nm
30	Check valve	Q	Differential sensing circuit, turntable rotate	8-10 ft-lbs / 10-15 Nm
31	Shuttle valve	BD	Primary boom up and secondary boom down circuit	20 ft-lbs / 27 Nm
32	Counterbalance valve, 2000 psi / 138 bar, 4.5:1	BC	Primary boom retract	30-35 ft-lbs / 41-47 Nm
33	Priority flow regulator valve	N	Steer left/right circuit	35-40 ft-lbs / 47-54 Nm
34	Shuttle valve	G	Differential sensing circuit, secondary boom	8-10 ft-lbs / 10-15 Nm
35	Check valve, 5 psi / 0.3 bar	D	Blocks flow from auxiliary pump to function pump	35-40 ft-lbs / 47-54 Nm

Manifolds

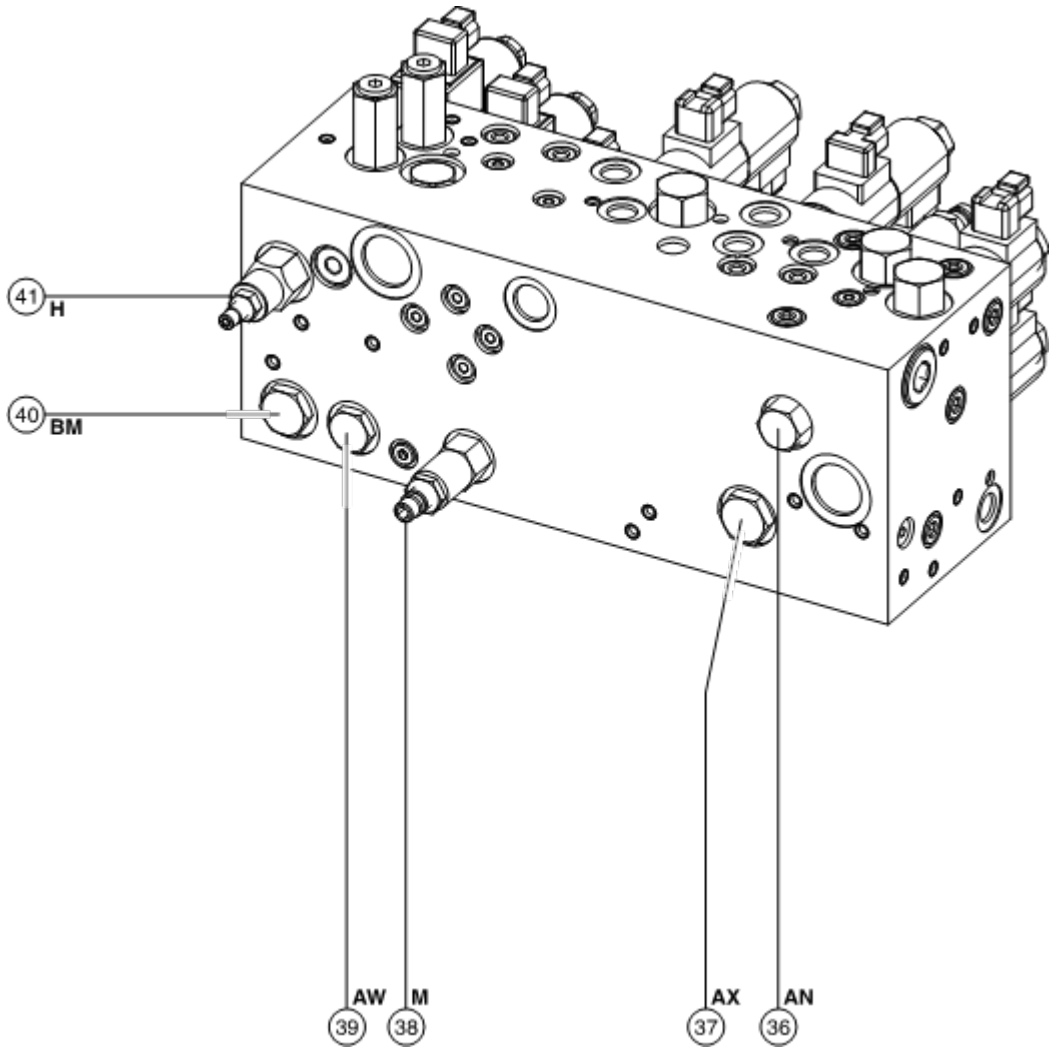

19 BL
20 P
21 K
22 I
23 L
24 BE
25 BN
26 AL
27 AM
28 BH
35 D
34 G
N 33
BC 32
BD 31
Q 30
AD 29

Manifolds

Function Manifold Components, continued

Index No.	Description	Schematic Item	Function	Torque
36	Flow control valve, 0.1 gpm / 0.38 L/min	AN	Bleeds off differential sensing valves to tank	25-30 ft-lbs / 34-41 Nm
37	Check valve, 100 psi / 7 bar	AX	Primary boom and secondary boom circuit	35-40 ft-lbs / 47-54 Nm
38	Relief valve, 1250 psi / 86 bar	M	Primary boom retract	25-30 ft-lbs / 34-41 Nm
39	Check valve, 30 psi / 2 bar	AW	Platform rotate left and jib boom up	20-25 ft-lbs / 27-34 Nm
40	Check valve	BM	Platform level up circuit	20-25 ft-lbs / 27-34 Nm
41	Flow control valve	H	Platform level up/down	30-35 ft-lbs / 41-47 Nm

Manifolds



Manifolds

8-2 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

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

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.

2 Start the engine from the ground controls.

3 Press and hold the function enable button. Activate and hold the primary boom retract switch with the boom fully retracted.

4 Observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Component Specifications*.

5 Turn the engine off. Use a wrench to hold the relief valve and remove the cap.

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

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

7 Repeat this procedure beginning with step 2 to confirm the relief valve pressure.

8 Remove the pressure gauge.

How to Adjust the Platform Level Up Relief Valve

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

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.

2 Start the engine from the ground controls.

3 Set the engine speed to high rpm.

4 Raise the jib to the horizontal position.

5 Press and hold the function enable button. Activate and hold the platform level up switch with the platform fully elevated.

6 Observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Component Specifications*.

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap.

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

9 Repeat this procedure beginning with step 2 to confirm the relief valve pressure.

10 Remove the pressure gauge.

How to Adjust the Platform Level Down Relief Valve

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

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.

2 Start the engine from the ground controls.

3 Set the engine speed to high rpm.

4 Raise the jib to the horizontal position.

5 Press and hold the function enable button. Activate and hold the platform level down switch with the platform fully lowered.

6 Observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Component Specifications*.

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap.

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

9 Repeat this procedure beginning with step 2 to confirm the relief valve pressure.

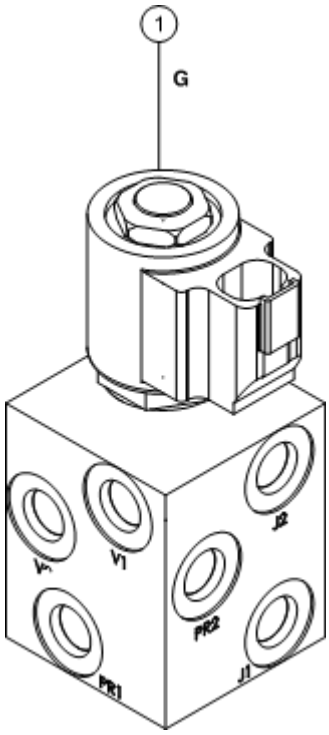
10 Remove the pressure gauge.

Manifolds

8-3
Jib Boom / Platform Rotate Manifold Components

The jib boom / platform rotate manifold is mounted to the platform support.

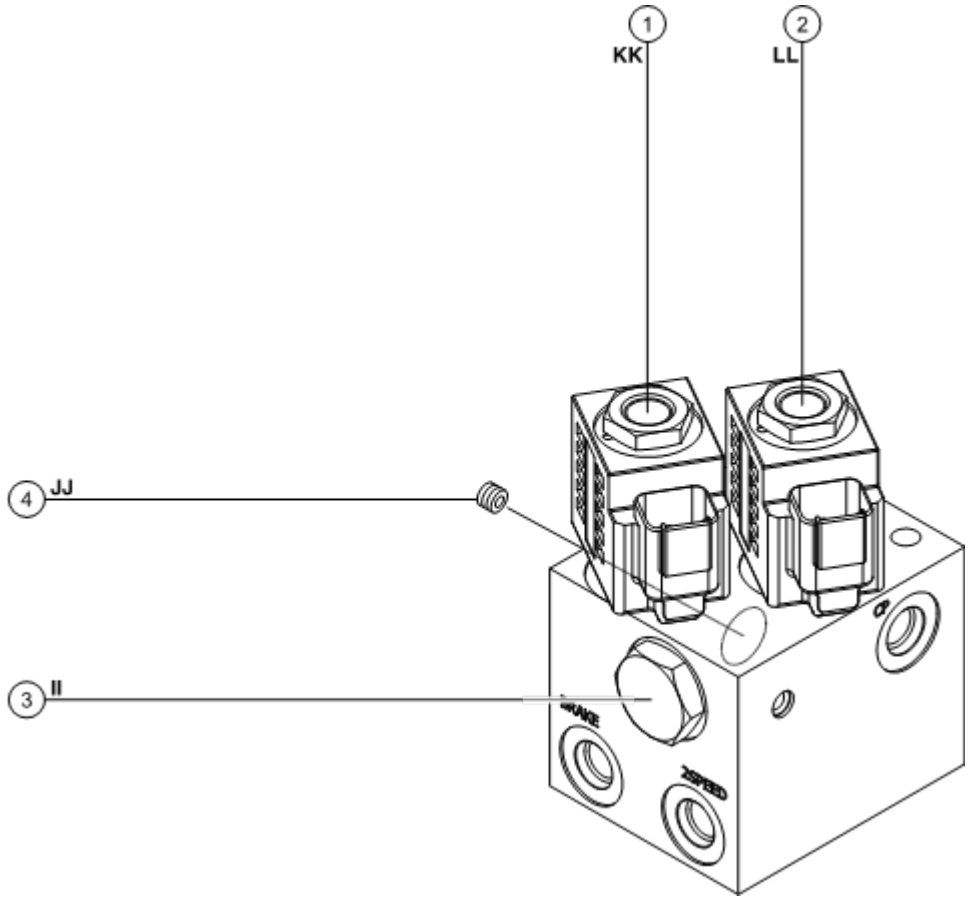
Index No.	Description	Schematic Item	Function	Torque
1	Solenoid Valve, 2 position 3 way	G	Platform rotate/jib boom select	8-10 ft-lbs / 11-14 Nm



8-4
Brake / Two Speed Manifold Components

The brake / two speed manifold is located under the turntable cover at the platform end.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid Valve, 2 position 3 way	KK	Brake release	8-10 ft-lbs / 11-14 Nm
2	Solenoid Valve, 2 position 3 way	LL	Two-speed drive motor shift	
3	Check valve	II	Brake circuit	
4	Orifice	JJ	Brake and two-speed circuit	

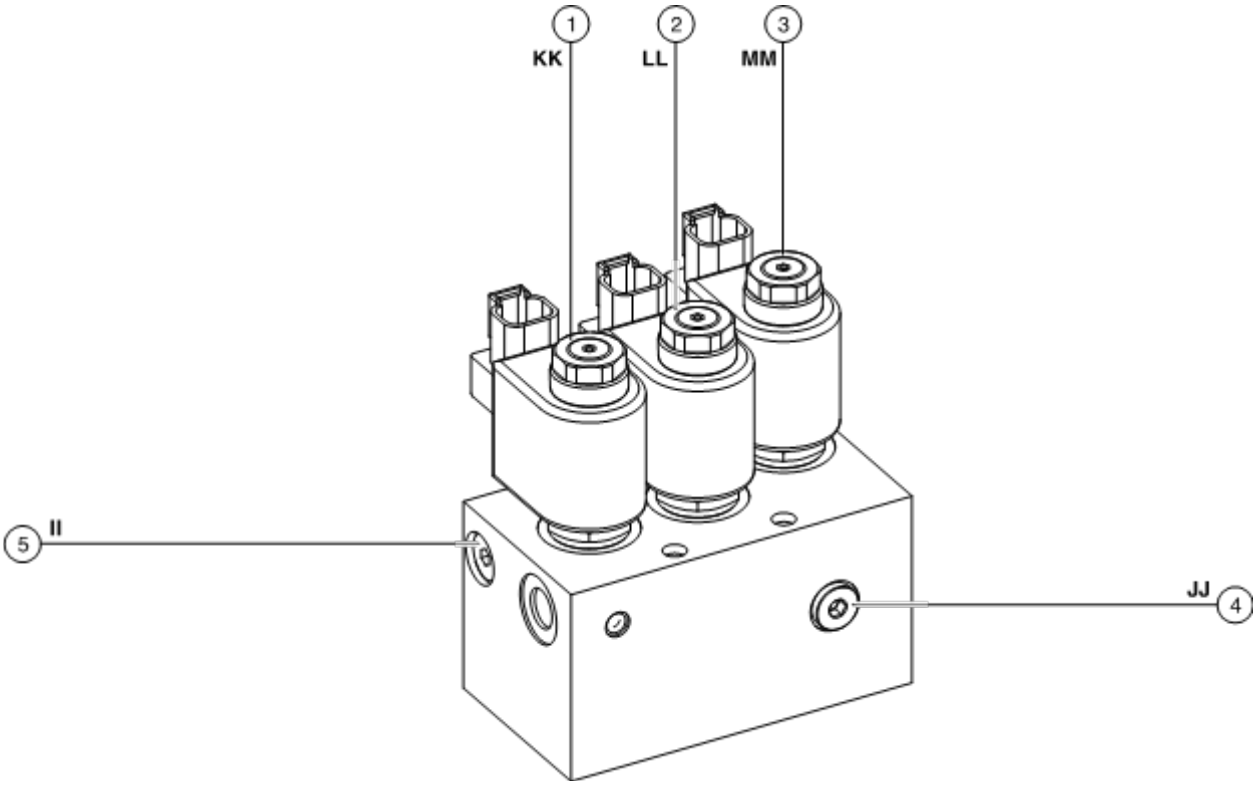


Manifolds

8-5
Brake / Two Speed / Steer Mode Manifold Components

The brake / two speed manifold is located under the turntable cover at the platform end.

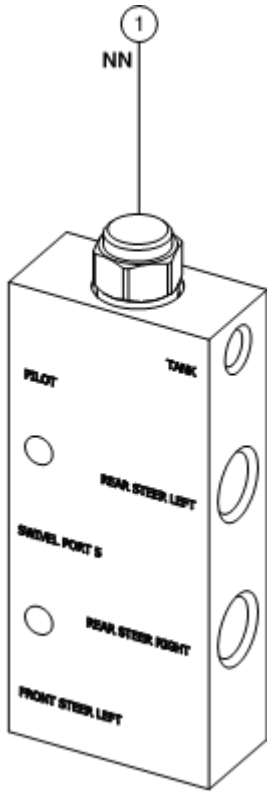
Index No.	Description	Schematic Item	Function	Torque
1	Solenoid Valve, 2 position 3 way	MM	Steer circuit	20 ft-lbs / 27 Nm
2	Solenoid Valve, 2 position 3 way	LL	Two-speed drive motor shift	20 ft-lbs / 27 Nm
3	Solenoid Valve, 2 position 3 way	KK	Brake release	20 ft-lbs / 27 Nm
4	Orifice	JJ	Brake and two-speed circuit	
5	Check valve	II	Brake circuit	8-10 ft-lbs / 10-15 Nm



8-6
Steer Select Manifold Components

The brake / two speed manifold is located under the turntable cover at the platform end.

Index No.	Description	Schematic Item	Function	Torque
1	Pilot operated 2 position, 4 way directional valve	NN	Steer circuit	30-35 ft-lbs / 41-47 Nm

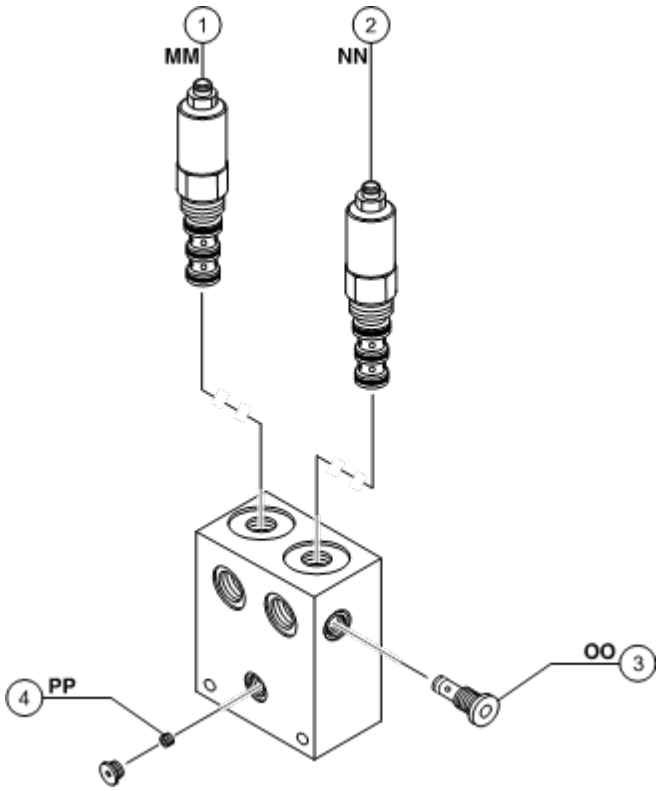


Manifolds

8-7
Turntable Rotation Manifold Components

The turntable rotation manifold is mounted to the turntable rotation motor located in the center of the turntable.

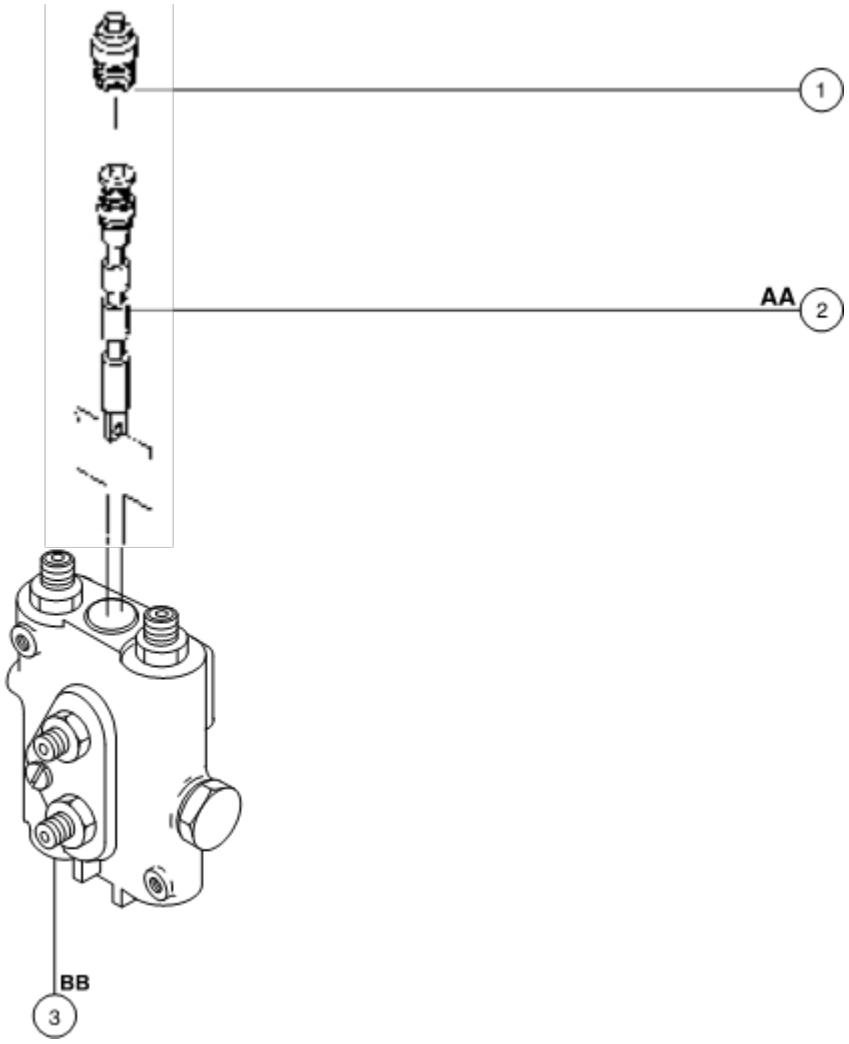
Index No.	Description	Schematic Item	Function
1	Counterbalance valve	MM	Turntable rotate right
2	Counterbalance valve	NN	Turntable rotate left
3	Shuttle valve	OO	Brake circuit
4	Orifice	PP	Brake circuit



8-8
Directional Valve Manifold Components

The directional valve manifold is mounted inside the drive chassis at the non-steer end.

Index No.	Description	Schematic Item	Function	Torque
1	Cap		Breather	20-25 ft-lbs / 27-33 Nm
2	Spool valve	AA	Directional control	
3	Relief valve, 800 psi / 55 bar	BB	Oscillate relief	30-35 ft-lbs / 41-47 Nm



Manifolds

8-9
How to Set Up the Directional Valve Linkage

Note: Adjustment of the oscillate directional valve linkage is only necessary when the linkage or valve has been replaced.

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

1 Use a "bubble type" level to verify the working surface is completely level.

⚠WARNING Tip-over hazard. Failure to perform this procedure on a level floor could compromise the stability of the machine resulting in the machine tipping over.

2 Check the tire pressure in all four tires and add air if needed to meet specification.

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

3 Remove the non-steer end drive chassis cover and axle covers.

4 Remove the ball joint retaining fastener from the bracket.

5 To level the drive chassis, start the engine and push up or pull down on the threaded rod until the machine is completely level.

6 Verify that the ground and drive chassis are completely level.

7 Adjust the ball joint until the hole lines up with the retaining fastener hole in the bracket.

8 Install the ball joint to the axle and tighten the jam nut.

9 Check to be sure the drive chassis is completely level.

10 Measure the distance between the drive chassis and the non-steer axle on both sides (from the inside of the drive chassis).

Note: If the distance is not equal and the adjustment to the linkage was completed with the ground and drive chassis level, repeat steps 5 through 10 OR consult Genie Product Support.

8-10
Valve Adjustments - Oscillate Relief Valve

How to Adjust the Oscillate Relief Valve

Note: Two people will be required to perform this procedure.

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 heim joint and retaining fastener from the axle.

4 Start the engine from the platform controls. Move the engine idle toggle switch to the high idle position. Activate the foot switch.

5 With the engine running in high rpm, manually activate the directional valve linkage in either direction. Observe the pressure spike on the pressure gauge when the machine fully oscillates. Refer to Specifications, *Hydraulic Component Specifications*.

6 Turn the engine off.

7 Locate the relief valve on the directional valve and loosen the jamb nut.

8 Adjust the hex screw. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Tighten the jamb nut.

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

9 Repeat steps 4 and 5 to confirm the valve pressure.

10 Turn the engine off, remove the pressure gauge and assemble the directional valve linkage.

11 Install the cover on the non-steer end of the drive chassis.

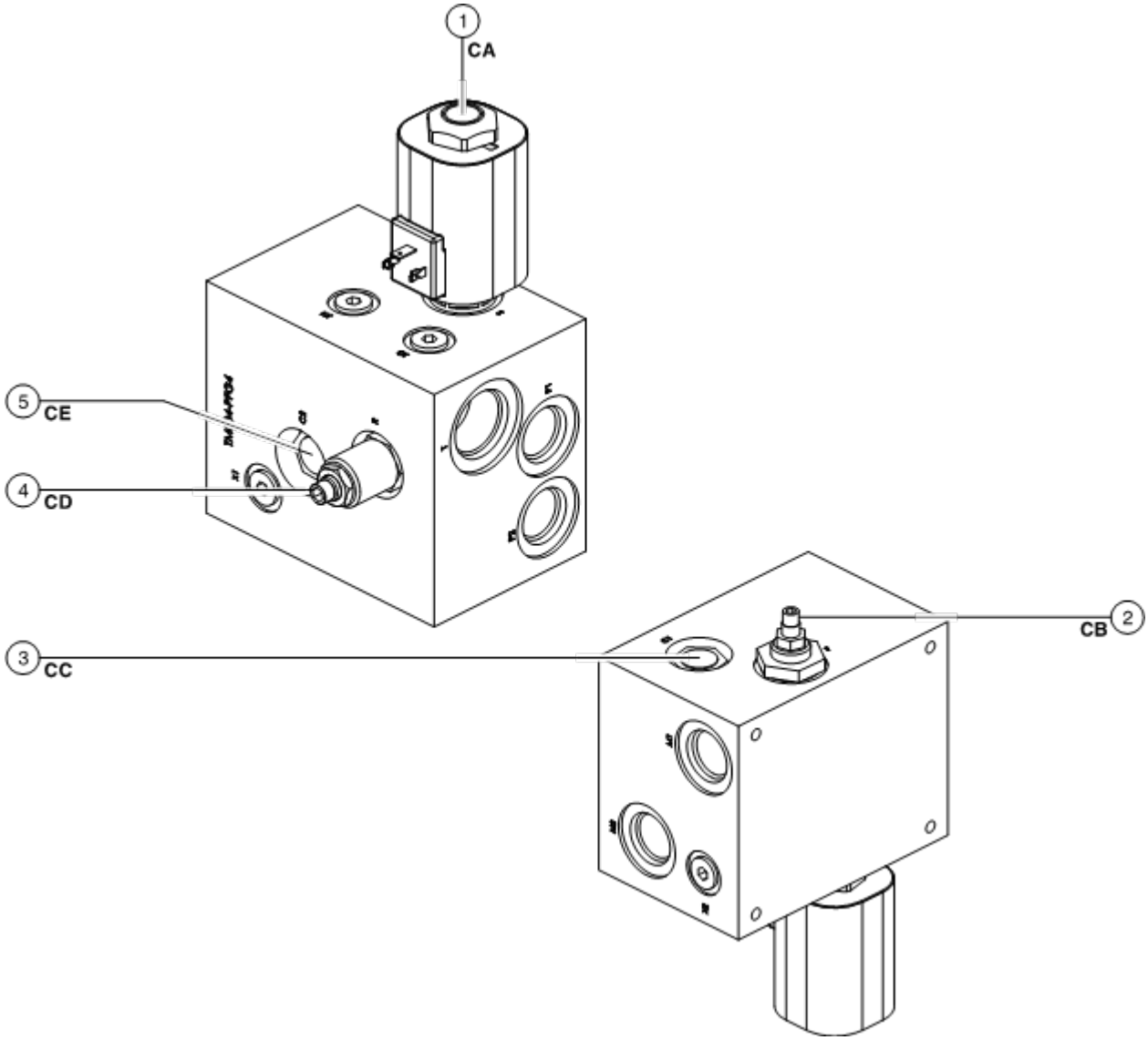
Manifolds

8-11
Diverter Manifold Components (welder option)

The oil diverter manifold is mounted on the ground control side of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 2 way	CA	Diverts oil from the drive circuit to the welder	35-40 ft-lbs / 47-54 Nm
2	Flow control valve	CB	Controls flow to the hydraulic motor	
3	Check valve, 65 psi / 4.5 bar	CC	Flow control circuit	35-40 ft-lbs / 47-54 Nm
4	Relief valve, 3500 psi / 241 bar	CD	Charge pressure circuit	30-35 ft-lbs / 41-47 Nm
5	Check valve, 65 psi / 4.5 bar	CE	Low pressure circuit	35-40 ft-lbs / 47-54 Nm

Manifolds

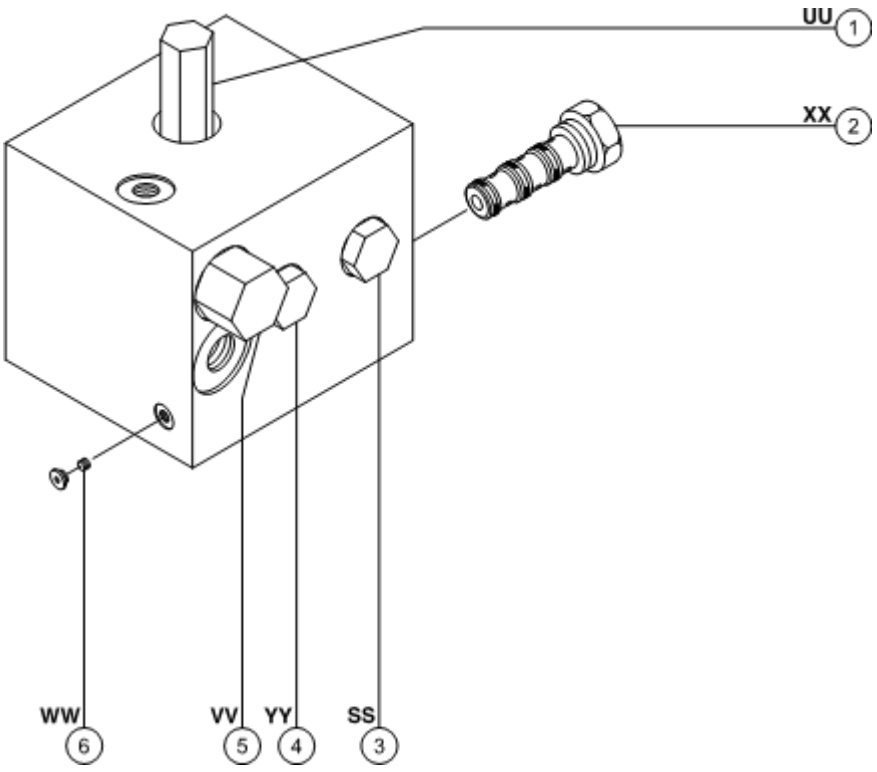


Manifolds

8-12
Traction Manifold Components, 2WD

The traction 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	UU	Charge pressure circuit	30-35 ft-lbs / 41-47 Nm
2	Flow divider/combiner valve	XX	Controls flow to drive motors in forward and reverse	80-90 ft-lbs / 108-122 Nm
3	Check valve	SS	Drive circuit	90-100 ft-lbs / 122-136 Nm
4	Check valve	YY	Drive circuit	30-35 ft-lbs / 41-47 Nm
5	Shuttle Valve, 3 position 3 way	VV	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	30-35 ft-lbs / 41-47 Nm
6	Orifice	WW	Equalizes pressure on both sides of divider/combiner valve.	



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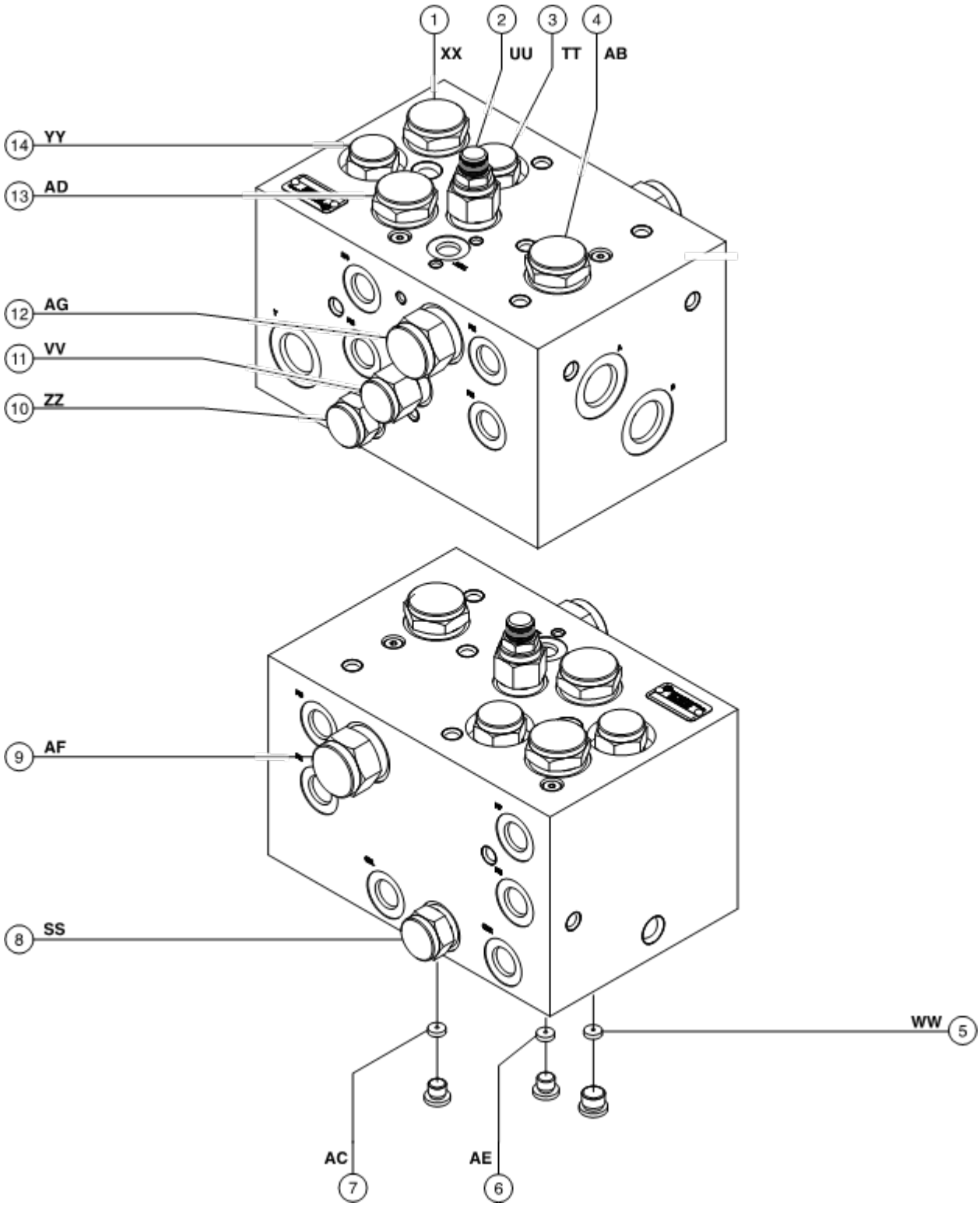
Manifolds

8-13
Traction Manifold Components, 4WD

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

Index No.	Description	Schematic Item	Function	Torque
1	Flow divider/combiner valve	XX	Controls flow to non-steer end drive motors in forward and reverse	80-90 ft-lbs / 108-122 Nm
2	Relief valve, 280 psi / 19.3 bar	UU	Charge pressure circuit	35-40 ft-lbs / 14-16 Nm
3	Check valve	TT	Steer end drive motor circuit	35-40 ft-lbs / 14-16 Nm
4	Flow divider/combiner valve	AB	Controls flow to divider/combiner valves 1 and 13	80-90 ft-lbs / 108-122 Nm
5	Orifice, 0.040 inch / 1 mm	WW	Equalizes pressure on both sides of divider/combiner valve 1	
6	Orifice, 0.040 inch / 1 mm	AE	Equalizes pressure on both sides of divider/combiner valve 13	
7	Orifice, 0.040 inch / 1 mm	AC	Equalizes pressure on both sides of divider/combiner valve 4	
8	Check valve	SS	Non-steer end drive motor circuit	35-40 ft-lbs / 14-16 Nm
9	Check valve	AF	Non-steer end drive motor circuit	60-70 ft-lbs / 81-95 Nm
10	Check valve	ZZ	Steer end drive motor circuit	35-40 ft-lbs / 14-16 Nm
11	Shuttle Valve, 3 position 3 way	VV	Charge pressure circuit that directs hot oil out of low pressure side of drive pump	80-790 ft-lbs / 108-122 Nm
12	Check valve	AG	Steer end drive motor circuit	60-70 ft-lbs / 81-95 Nm
13	Flow divider/combiner valve	AD	Controls flow to steer end drive motors in forward and reverse	80-90 ft-lbs / 108-122 Nm
14	Check valve	YY	Non-steer end drive motor circuit	35-40 ft-lbs / 14-16 Nm

Manifolds



Manifolds

8-14
Valve Adjustments - Traction Manifold

How to Adjust the Charge Pressure Relief Valve

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 **2WD models:** Hold the charge pressure relief valve located on the traction manifold and remove the cap (item UU).
4WD models: Hold the charge pressure relief valve located on the traction manifold and loosen the jam nut (item UU).

3 **2WD models:** Turn the internal hex socket clockwise fully until it stops. Install the cap.
4WD models: Turn the external stem clockwise fully until it stops. Tighten the jam nut.

4 Start the engine and move and hold the function enable/rpm select toggle switch to the high rpm (rabbit symbol) position. Note the reading on the pressure gauge.

5 Turn the engine off.

6 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the traction manifold.

7 **2WD models:** Hold the charge pressure relief valve and remove the cap (item UU).
4WD models: Hold the charge pressure relief valve and loosen the jam nut. (item UU).

8 Start the engine and move and hold the function enable/rpm select toggle switch to the high rpm (rabbit symbol) position.

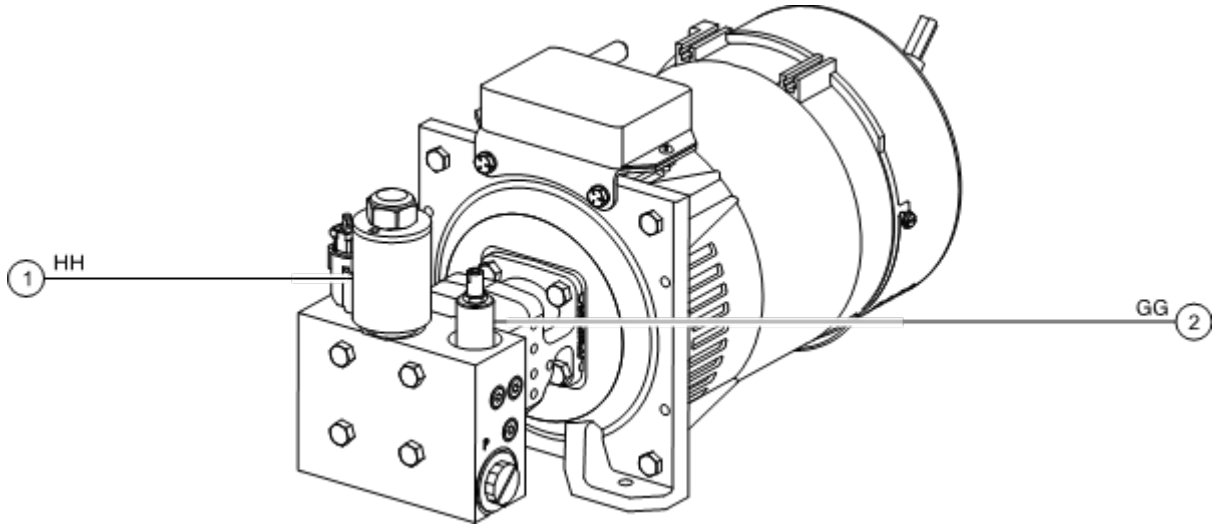
9 Adjust the relief valve until the pressure reading on the gauge is 30 psi / 2 bar less than the pressure reading on the pump. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the valve cap or tighten the jam nut.

10 Turn the engine off and remove the pressure gauge.

8-15
Hydraulic Generator Manifold Components, 3kW

The generator manifold is mounted to the hydraulic generator located in the ground controls compartment.

Index No.	Description	Schematic Item	Function	Torque
1	Proportional solenoid valve	HH	Controls generator speed	33-37 ft-lbs / 45-50 Nm
2	Relief valve, 3000 psi / 207 bar	GG	Generator relief valve	20-25 ft-lbs / 27-34 Nm



Manifolds

8-16 Valve Coils

How to Test a Coil

A properly functioning coil provides an electromotive force which operates the solenoid valve. Critical to normal operation is continuity within the coil that provides this force field.

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.

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance.

⊙ Result: The resistance should be within specification, plus or minus 30%.

⊠ Result: If the resistance is not within specification, plus or minus 30%, replace the coil.

Valve Coil Resistance Specification

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 / 10°C that your air temperature increases or decreases from 68°F / 20°C.

Valve Coil Resistance Specification	
Solenoid valve, 3 position 4 way, 10V DC (schematic items D, V and Y)	5 to 7Ω
Solenoid valve, 3 position 4 way, 10V DC (schematic item BB)	4 to 6Ω
Solenoid Valve, 2 position 3 way, 10V DC (schematic items B, C, E, F and FF)	5 to 7Ω
Solenoid Valve, 2 position 3 way, 10V DC schematic items(KK and LL)	5.5 to 7.5Ω
Proportional solenoid valve, 12V DC schematic items(M and T)	4 to 6Ω
Proportional solenoid valve, 12V DC (schematic item Q)	3.7 to 5.7Ω

How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

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

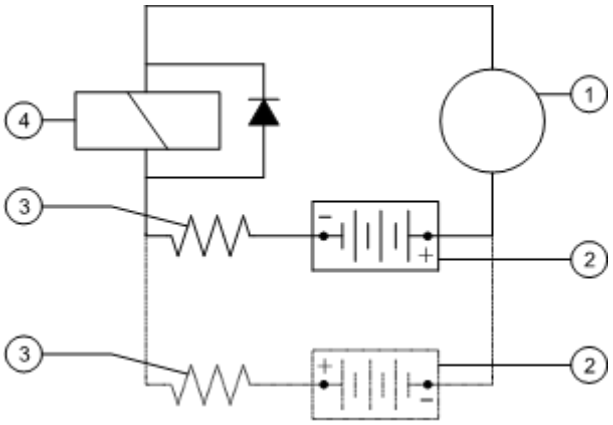
1 Test the coil for resistance. Refer to Repair Procedure, *How to Test a Coil*.

2 Connect a 10W resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor 10Ω

Genie part number 27287

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



1 multimeter
2 9v DC battery
3 10Ω resistor
4 coil

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

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

7 Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Turntable Rotation Components

9-1
Turntable Rotation Assembly

How to Remove the Turntable Rotation Assembly

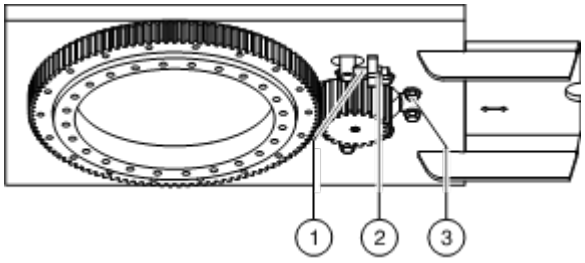
Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

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

1 Start the machine and rotate the boom 90° to either side of the drive chassis.

2 Loosen the retaining fasteners securing the turntable rotation gear backlash plate.

Note: Do not loosen the jam nut securing the backlash adjustment bolt.



1 jam nut
2 adjustment bolt
3 pivot plate retaining fasteners

3 Start the machine and rotate the boom back to the stowed position.

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

⚠DANGER Tip-over hazard. The machine could tip over when the turntable rotation assembly is removed if the turntable rotation lock is not in the locked position.

5 Raise the secondary boom until the upper pivot is 6 feet / 2 m above the counterweight.

6 Install a cylinder chock (Genie part number 33484) onto the secondary lift cylinder rod. Lower the secondary just until the chock makes contact with the barrel of the lift cylinder.

Note: Do not apply all the weight of the secondary boom on the chock.

7 Loosen the jam nut securing the backlash adjustment bolt. Turn the adjustment bolt counter-clockwise until the turntable rotation assembly can move freely.

8 Tag, disconnect and plug the hydraulic hoses from the turntable rotation motor 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.

9 Remove the turntable rotation assembly mounting fasteners.

Turntable Rotation Components

10 Attach a suitable lifting device to the lifting eyes on the turntable rotation assembly.

11 Carefully remove the turntable rotation assembly from the machine.

⚠DANGER Tip-over hazard. The machine could tip over when the turntable rotation assembly is removed if the turntable rotation lock is not in the locked position.

⚠WARNING Crushing hazard. The turntable rotation assembly could become unbalanced and fall when removed from the machine if not properly supported by the lifting device.

When installing the turntable rotation assembly:

1 Install the turntable rotation assembly. Torque the mounting fasteners to 80 ft-lbs / 108 Nm.

2 Push the backlash pivot plate towards the turntable bearing as far as possible.

3 Fully turn the backlash adjustment bolt clockwise. Turn the adjustment bolt 1/2 turn counterclockwise. Tighten the jam nut.

4 Adjust the turntable rotation gear backlash. Refer to *How to Adjust the Turntable Gear Backlash*.

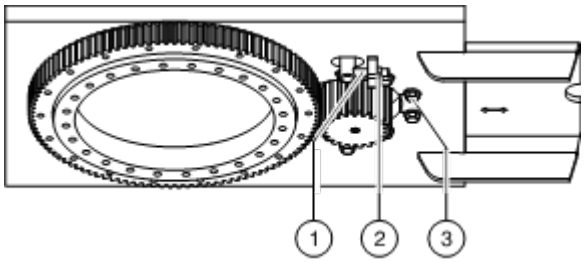
How to Adjust the Turntable Rotation Gear Backlash

The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

Note: Perform this procedure with the machine on a firm, level surface and the boom rotated 90° to either side of the drive chassis.

1 Push the backlash plate towards the platform end of the machine as far as possible (this will push the rotation gear into the turntable bearing ring gear).

2 Loosen the lock nut on the adjustment bolt.



1 adjustment bolt
2 jam nut
3 pivot plate retaining fasteners

3 Turn the adjustment bolt clockwise until it contacts the backlash pivot plate pin.

4 Turn the adjustment bolt 1/2 turn counterclockwise. Tighten the lock nut on the adjustment bolt.

5 Rotate the backlash pivot plate away from the turntable bearing until it contacts the adjustment bolt. Torque the retaining fasteners securing the backlash pivot plate to specification. Refer to Specifications, *Machine Torque Specifications*.

6 Rotate the turntable through an entire rotation. Check for tight spots that could cause binding. Readjust if necessary.

Axle Components

10-1 Oscillating Axle Cylinders

The oscillating axle cylinders extend and retract between the drive chassis and the oscillating axle. The cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure. The valves are not adjustable.

How to Remove an Oscillating Axle Cylinder

Note: Perform this procedure with the machine on a 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 hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Rotate the turntable until the boom is between the steer tires or tracks.

2 Tag, disconnect and plug the oscillating axle cylinder hydraulic hoses. Cap the fittings on the oscillate cylinder.

⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pin retaining fasteners from the rod-end pivot pin. Use a soft metal drift to remove the pin.

4 Attach a lifting strap from an overhead lifting device to the barrel end of the oscillating cylinder.

5 Remove the pin retaining fasteners from the barrel-end pivot pin. Use a soft metal drift to remove the pin.

6 Remove the oscillate cylinder from the machine.

⚠ CAUTION Crushing hazard. The oscillate cylinder may become unbalanced and fall when removed from the machine if not properly attached to the lifting device.

11-1 Track Assembly

How to Remove a Track Assembly

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

1 Select a track assembly to remove. Loosen and remove as many sprocket retaining fasteners as possible from the hub adapter.

2 Drive the machine in either direction just enough to access the remaining fasteners. Do not remove the retaining fasteners.

3 Chock the tracks at the opposite end of the machine to prevent the machine from rolling.

4 Center a lifting jack of ample capacity (20,000 lbs / 10,000 kg) under the drive chassis between the tracks.

5 Lift the machine until the tracks are off the ground and then place jack stands under the drive chassis for support.

6 Attach a lifting strap from an overhead crane to the center-point of the track assembly, above the sprocket.

7 Remove the remaining sprocket retaining fasteners from the hub adapter.

8 Carefully remove the track assembly from the drive hub and set aside.

⚠ CAUTION Crushing hazard. The track assembly could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

How to Replace the Track

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

1 Remove the track assembly from the machine. Refer to Repair Procedure, *How to Remove a Track Assembly*.

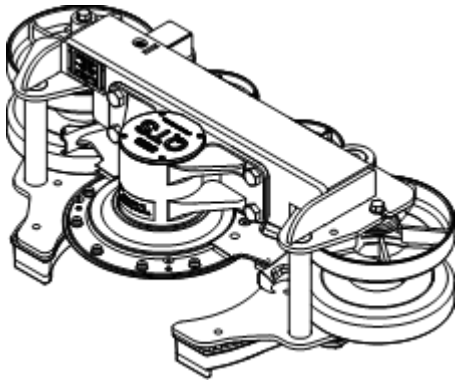
Note: The sprocket is comprised of two halves. Before removing the track assembly from the machine and to ease the removal of the sprocket, drive the machine until one complete half of the sprocket is located above the undercarriage of the track assembly.

2 Loosen the grease plug on the track tension cylinder to relieve the track tension. Clean up any grease that has spilled.

3 Remove the 2 sprocket retaining fasteners. Remove the sprocket half from the track assembly.

4 Carefully remove the track from the undercarriage.

5 Use an overhead supporting device to lay the undercarriage on its side with the drive sprocket bearing assembly facing upward and the track tension cylinder towards the ground.



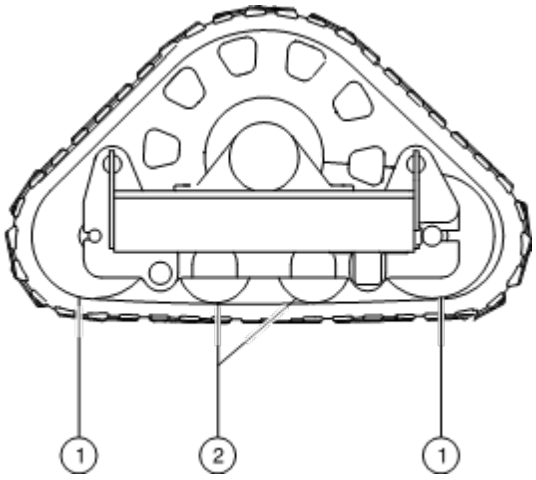
Track Components

6 Install the new track onto the undercarriage.

7 Attach a lifting strap from an overhead supporting device to the center-point of the track, above the sprocket.

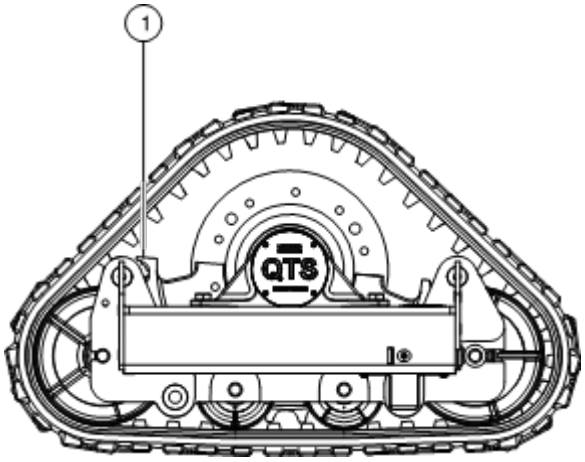
8 Use the overhead supporting device to raise the track assembly to an upright position. Rest the assembly on the floor or ground to remove any slack in the lower portion of the track.

Note: Be sure the idler and bogey wheels are aligned with the inside surface of the track.



1 idler wheels
2 bogey wheels

9 Rotate the sprocket half until the split tooth of the sprocket is lower than the other side.



1 split tooth

10 Using an overhead supporting device, lift up on the rubber track to create enough room to install the other sprocket half.

11 Install the sprocket half, removed in step 3, while engaging the sprocket teeth with the rubber track.

Note: Be sure to align the split tooth in both of the sprocket halves.

12 Insert a pin or rod through the wheel stud hole closest to the split tooth to hold the sprocket in place.

13 Insert a pointed pry bar into the wheel stud hole near the top of the sprocket. Insert another pointed pry bar into the wheel stud hole at the opposite side of the split tooth.

Track Components

14 Using the pry bars, lift the sprocket half into position. Install the 2 sprocket retaining fasteners and torque to specification. Refer to Specifications, *TraX Torque Specifications*.

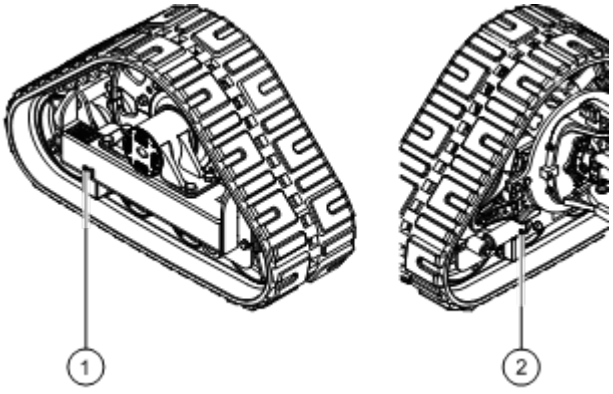
15 Attach a lifting strap from an overhead supporting device to the center-point of the track assembly, above the sprocket.

16 Install the track assembly onto the drive hub adapter while guiding the hub adapter studs into the sprocket of the track assembly. Install as many sprocket retaining fasteners as possible to the hub adapter and torque to specification. Refer to Specifications, *TraX Torque Specifications*.

⚠ CAUTION Crushing hazard. The track assembly could become unbalanced and fall when installed onto the machine if not properly supported by the overhead crane.

17 Adjust the track tension. Locate the grease plug on the track tension cylinder. Loosen the plug, but do not remove it.

18 Locate the grease zerk fitting on the other side of the track tension cylinder.



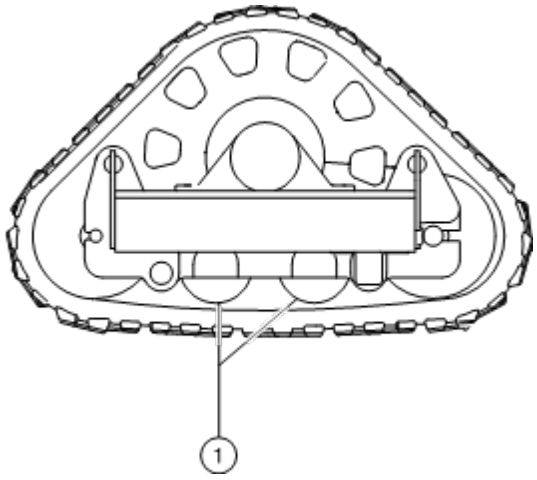
1 grease zerk
2 grease plug

19 Pump grease into the grease zerk fitting until grease, free from air, comes out of the grease plug. Securely tighten the grease plug. Do not over tighten.

20 Continue to pump grease into the grease fitting just until the idler wheel moves. Check the track tension.

⊙ Result: There should be less than 1 inch / 2.5 cm of gap between the bogey wheels and the inside surface of the track. Proceed to step 22.

⊠ Result: There is 1 inch / 2.5 cm or more of gap between the bogey wheels and the inside surface of the track. Proceed to step 21.



1 bogey wheels

Track Components

21 Continue to pump grease into the cylinder until the track has proper tension.

NOTICE Component damage hazard. Do not over tighten the track. Over tightening the track will cause the machine to lose power during operation.

Note: If the track becomes too tight, loosen the grease plug on the cylinder to remove grease and loosen the track.

22 Raise the machine, remove the jack stands and lower the machine.

23 Drive the machine in either direction just until the remaining sprocket retaining fasteners can be installed onto the drive hub adapter. Turn the machine off.

24 Install the remaining sprocket retaining fasteners to the drive hub adapter and torque to specification. Refer to Specifications, *TraX Torque Specifications*.

Grease Specification
Chevron Ultra-duty grease, EP NLGI 1 (lithium based) or equivalent

1

12-1
Hydraulic Generator

How to Purge the Hydraulic Line on the MTE Generator

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

Note: This procedure should be performed if the hydraulic line to the generator has been removed.

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

1 Locate the blue purge wire with the male spade connector from the MTE generator harness.

2 Connect a jumper wire of sufficient length from the positive battery terminal to the spade connector on the purge wire.

3 Start the engine and turn on the generator. Allow the generator to run for three minutes.

4 Turn off the generator and turn off the engine.

5 Remove the jumper wire from the positive battery terminal and disconnect from the purge wire.

6 Start the engine and turn on the generator. Using a digital multimeter check the voltage at the outlet.

⊙ Result: The generator produces a voltage ±10% of rated output. The generator is ready for use.

☒ Result: The generator output voltage is outside the ±10% voltage range. Repeat the procedure beginning with step 2.

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 procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Key switch in the off position with the key removed
  - The red Emergency Stop button in the off position at both the ground and platform controls
  - Wheels chocked
  - All external AC power supply disconnected from the machine
  - Boom in the stowed position
  - Turntable secured with the turntable rotation lock
  - Welder disconnected from the machine (if equipped with the weld cable to platform option)

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropriate fault code thoroughly. Attempting short cuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

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

Note: Two persons will be required to safely perform some troubleshooting procedures.

Control System

How to Retrieve Control System Fault Codes

At least one fault code is present when the alarm at the platform controls produces two short beeps every 30 seconds for 10 minutes.

Perform this procedure with the engine off, the key switch turned to platform controls and the 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. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

3 **Determine the error source:** The red LED indicates 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 indicates 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.

Control System Fault Codes

Error Source		Error Type		Condition	Solution
ID	Name	ID	Name		
21	Primary Up / Down Joystick	11	Value at 5.0 V	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		12	Value too high		
		15	Value too low		
		16	Value at 0 V		
		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	Primary Up / Down Directional Valves	21	Fault	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
23	Primary Up / Down Flow Valve	12	Value too high	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		15	Value too low		
		17	Not Calibrated	Normal function except threshold for one or both directions is zero.	Calibrate valve threshold.
		18	Just calibrated	Initiate 1 second beep of Alarm.	Self-clearing (transient)
24	Angle sensor	11	Value at 5.0 V	Reduced function speed	Retract before lowering required. Dual capacity models.
		12	Value too high		
		15	Value too low		Power up controller with problem corrected.
		16	Value at 0 V		
		17	Not Calibrated		Calibrate angle sensor.
		31	Invalid setup	Initiate 1 second beep of Alarm.	Retract before lowering required. Dual capacity models.
					Calibrate angle sensor.
26	Angle sensor cross check	19	Out of Range	Reduced function speed	Retract before lowering required. Dual capacity models.
					Power up controller with problem corrected.
31	Secondary Up / Down. Joystick	11	Value at 5.0 V	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		12	Value too high		
		15	Value too low		
		16	Value at 0 V		
		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)

Control System Fault Codes

Error Source		Error Type		Condition	Solution
ID	Name	ID	Name		
32	Secondary Up / Down. Directional Valves	21	Fault	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
33	Secondary Up / Down Flow Valve	12	Value too high	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		15	Value too low		
		17	Not Calibrated	Normal function except threshold for one or both directions is zero.	Calibrate valve threshold.
		18	Just calibrated	Initiate 1 second beep of Alarm.	Self-clearing (transient)
34	primary Boom Extend / Retract Limit Switches	31	Invalid setup	Initiate 1 second beep of Alarm. 1000lb. Mode: Required retract into FULLY RETRACTED state before lowering. 500lb. Mode: Operates normally. Dual capacity models.	Fully retract, then lower boom. Check and service ext/ret and fully stowed switches.
41	Turntable Rotate Joystick	11	Value at 5.0 V	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		12	Value too high		
		15	Value too low		
		16	Value at 0 V		
		17	Not Calibrated	Initiate 1 second beep of Alarm.	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.	Power up controller with problem corrected.
43	Turntable Rotate Flow Valve	12	Value too high	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		15	Value too low		
		17	Not Calibrated	Normal function except threshold for one or the other direction is zero. Display message on LCD.	Calibrate valve threshold.
		18	Just calibrated	Initiate 1 second beep of Alarm.	Self-clearing (transient)
44	Drive Enable Override Switch	21	Fault	Drive enable override direction is frozen at neutral.	Power up controller with problem corrected.
45	Platform Level Switch	21	Fault	Platform level frozen at neutral.	Power up controller with problem corrected.
46	Primary Extend / Retract Switch	21	Fault	Platform Extend / Retract frozen at neutral.	Power up controller with problem corrected.

Control System Fault Codes

Error Source		Error Type		Condition	Solution
ID	Name	ID	Name		
51	Drive Joystick	11	Value at 5.0 V	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		12	Value too high		
		15	Value too low		
		16	Value at 0 V		
		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	Value too high	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		15	Value too low		
		17	Not Calibrated	Normal function except threshold for one or both directions is zero.	Calibrate valve threshold.
		18	Just calibrated	Initiate 1 second beep of Alarm.	Self-clearing (transient)
54	Propel Brake Valve	21	Fault	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
55	Propel High Motor Speed Valve	21	Fault	Motor speed frozen in the low state.	Power up controller with problem corrected.
56	Platform Level Valve	21	Fault	Direction frozen at zero and neutral.	Power up controller with problem corrected.
57	Foot switch / ECU Power Crosscheck	12	Value too high	Direction frozen at zero and neutral.	Power up controller with problem corrected.
		15	Value too low		
61	Steer Joystick	11	Value at 5.0 V	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
		12	Value too high		
		15	Value too low		
		16	Value at 0 V		
		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 Direction Valves	21	Fault	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Power up controller with problem corrected.
81	Platform Load Sense Overload	21	Fault	Limited Speed and Direction frozen at zero and neutral, Alarm sounds.	Self-clearing (transient)
82	Load Sense Overload Recovery	21	Fault	Limited Primary Up, Secondary Up and Primary extend and 5 seconds timeout.	Self-clearing after timeout.

Fault Code Display - Deutz and Perkins Models

How to Retrieve Active Engine Fault Codes - Deutz D 2.9 L4 and Perkins 404F-22 Models

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. One or more fault LED's will illuminate on the display located at the ground control box. The active fault code will also be displayed on the LCD screen.

Note: The Perkins 404F-22 is equipped with an engine fault LED located at the platform control box.

If an engine fault occurs that does not result in an engine shutdown, the engine rpm will go into limp home mode resulting in the loss of high rpm.

When operating from the platform, if the red Emergency Stop button is pushed in, the active fault code(s) will be erased from the display.

Start the engine from the ground control box and operate various boom functions to verify that an active engine fault occurs and is shown on the display.

Note: All faults are stored in the Previous Fault history menu. These faults will not be erased when corrective action has been completed.

With an active fault and the engine running: (preferred method)

1 At the ground controls, activate the auxiliary pump toggle switch to shut the engine off.

Note: Do not push in the red Emergency Stop button or turn the key switch to the off position.

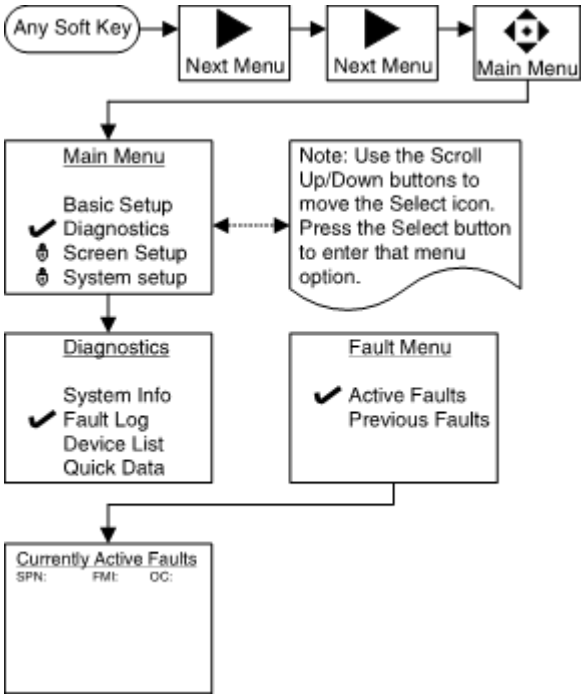
2 Press any soft key below the display.

3 Use the scroll up / down keys to check for multiple engine fault codes.

With the engine not running:

1 At the ground controls, turn the key switch to ground controls and pull out the red Emergency Stop button.

2 Navigate to the Active Fault Menu and use the scroll up / down keys to check for multiple engine fault codes.



Fault Code Display - Deutz and Perkins Models

How to Retrieve Active Engine Fault Codes - Deutz TD 2.2 L3 Models

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. One or more fault LED's will illuminate on the display located at the ground control box. The active fault code will also be displayed on the LCD screen.

If an engine fault occurs that does not result in an engine shutdown, the engine rpm will go into limp home mode resulting in the loss of high rpm.

When operating from the platform, if the red Emergency Stop button is pushed in, the active fault code(s) will be erased from the display.

Start the engine from the ground control box and operate various boom functions to verify that an active engine fault occurs and is shown on the display.

Note: All faults are stored in the Previous Fault history menu. These faults will not be erased when corrective action has been completed.

With an active fault and the engine running: (preferred method)

1 At the ground controls, activate the auxiliary pump toggle switch to shut the engine off.

Note: Do not push in the red Emergency Stop button or turn the key switch to the off position.

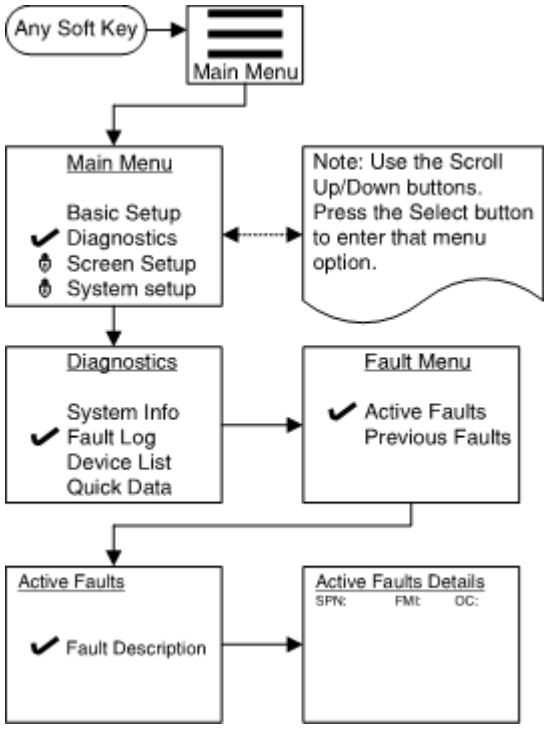
2 Press any soft key below the display.

3 Use the scroll up / down keys to check for multiple engine fault codes.

With the engine not running:

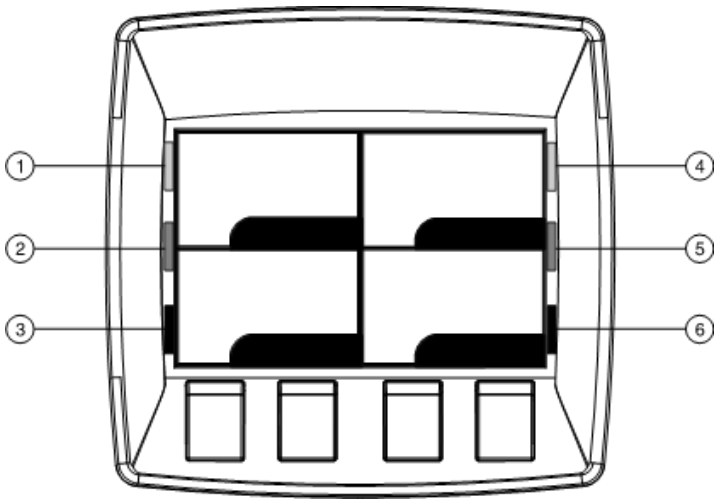
1 At the ground controls, turn the key switch to ground controls and pull out the red Emergency Stop button.

2 Navigate to the Active Fault Menu and use the scroll up / down keys to check for multiple engine fault codes.



Fault Code Display - Deutz and Perkins Models

Flashing and Solid LED's - Deutz D 2.9 L4 and Perkins 404F-22 Models



1 Left green LED:

Flashing, engine fault detected. Contact service.

Solid, fault acknowledged. Contact service.

2 Left amber LED: (Perkins models)

Solid,

a) Regeneration is inhibited. No service required.

b) High exhaust temperature during regeneration mode. No service required.

3 Left red LED:

Flashing, engine fault detected. Contact service.

Flashing with right flashing amber LED, engine soot level over 140%. Engine shut down. Contact service.

4 Right green LED:

Flashing, engine fault detected. Contact service.

Solid, fault acknowledged. Contact service.

5 Right amber LED: (Perkins models)

Solid with left amber LED on solid, regeneration has been inhibited and engine soot level is between 80 - 100%. Regeneration is required.

Flashing with left amber LED on solid, regeneration has been inhibited and soot level is between 100 - 140%. Engine rpm is de-rated. Regeneration is required.

Flashing with left and right red LED's flashing, engine soot level over 140%. Engine shut down. Contact service.

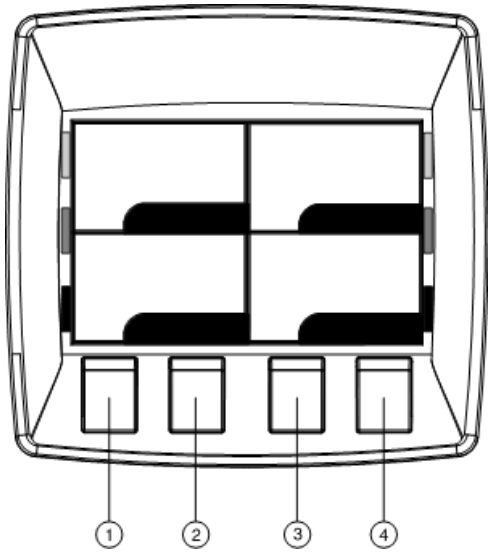
6 Right red LED:

Flashing, engine fault detected. Contact service.

Flashing with right flashing amber LED, engine soot level over 140%. Engine shut down. Contact service.

Fault Code Display - Deutz and Perkins Models

Soft Key Functions and Icons - Deutz D 2.9 L4 and Perkins 404F-22 Models



1 Next menu • Exit / Back one screen • Decrease brightness (-)

2 Brightness / Contrast • Scroll up • Increase • Increase brightness (+)

3 Regeneration forced • Scroll down • Decrease • Decrease contrast (-)

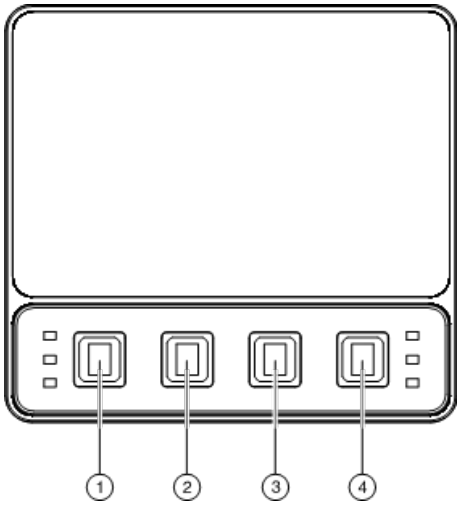
4 Regeneration inhibited • Select / Next • Main menu • Increase contrast (+)

Next Menu	Brightness/ Contrast	Initiate Switch	Inhibit Switch
Exit / Back One Screen	Scroll Up	Scroll Down	Select
Main Menu	Hour Meter	Oil Pressure	Coolant Temp.
Engine RPM	Soot Soot Level Percent (%)	Voltage	Pin # Protected

Note: Regeneration, initiate, inhibit and soot only apply to the Perkins 404F-22 models.

Fault Code Display - Deutz and Perkins Models

Soft Key Functions and Icons - Deutz TD 2.2 L3 Models



1 Exit / Back one screen

2 Scroll up • Increase Time / Date • Decrease brightness

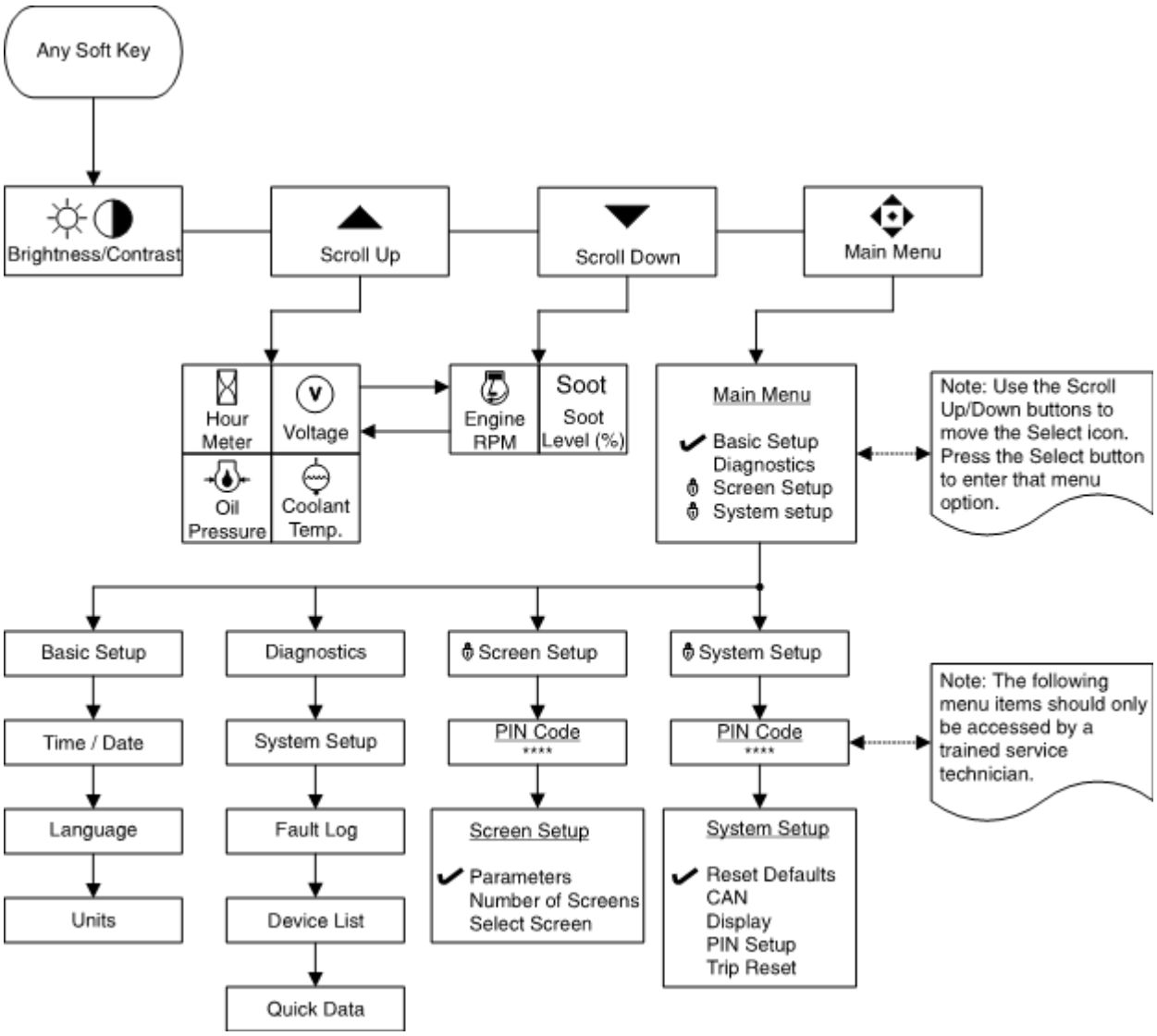
3 Scroll down • Decrease Time / Date • Increase brightness

4 Main menu • Select

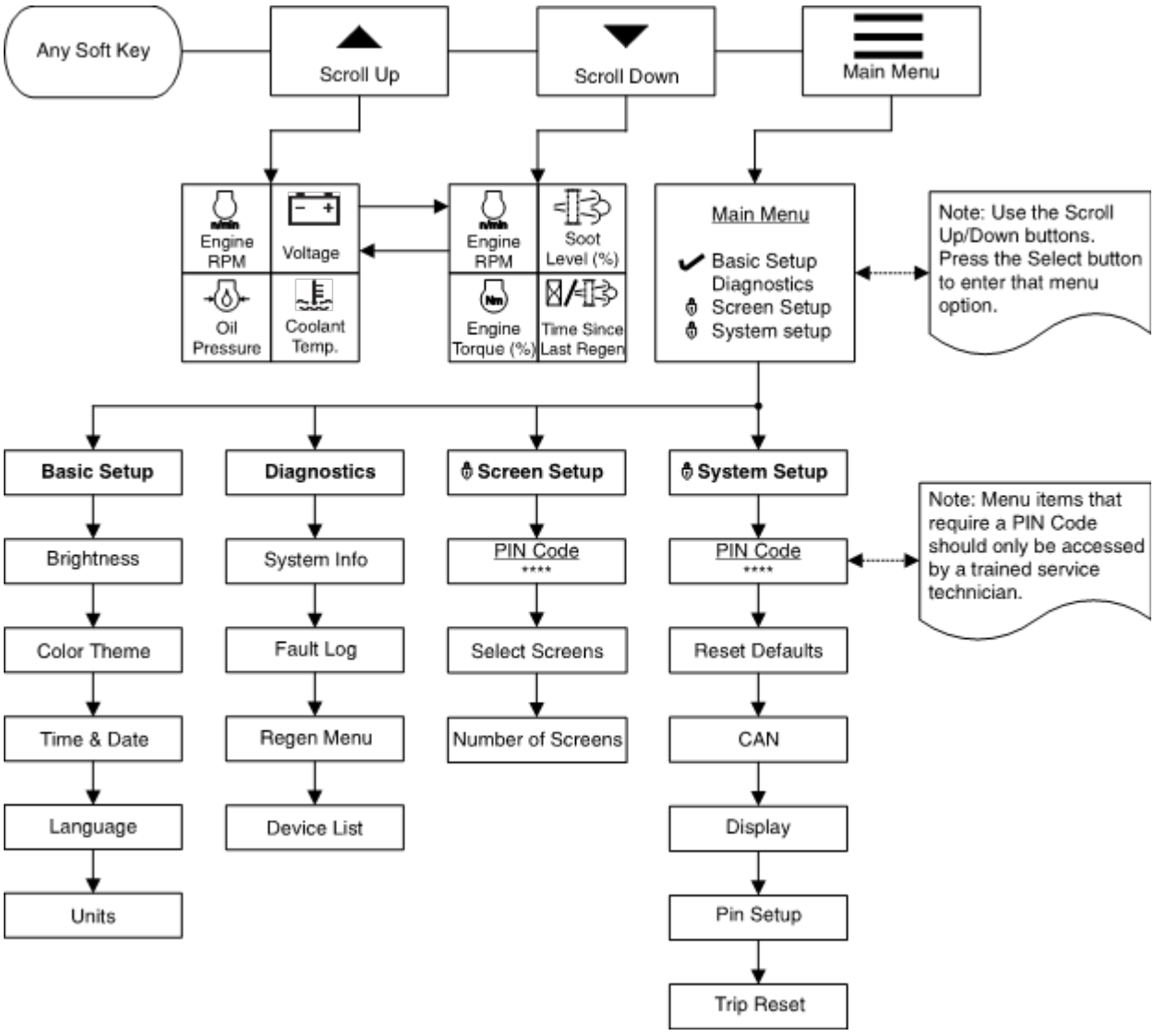
Main Screen Icons				Engine Warning Icons			
Engine RPM	Voltage	Oil pressure	Coolant temperature	Regen required	DPF service required	Replace DPF	Change oil
Soot load (%)	Engine torque	Hour meter	Time since last regen	Low coolant	Fuel/Water separator	Engine stop	Engine start
Exit / Back one screen	Scroll up	Scroll down	Select	Standstill regen active	Engine failure		
Main menu	Pin code required						

Fault Codes

Main Menu Structure - Deutz D 2.9 L4 Models

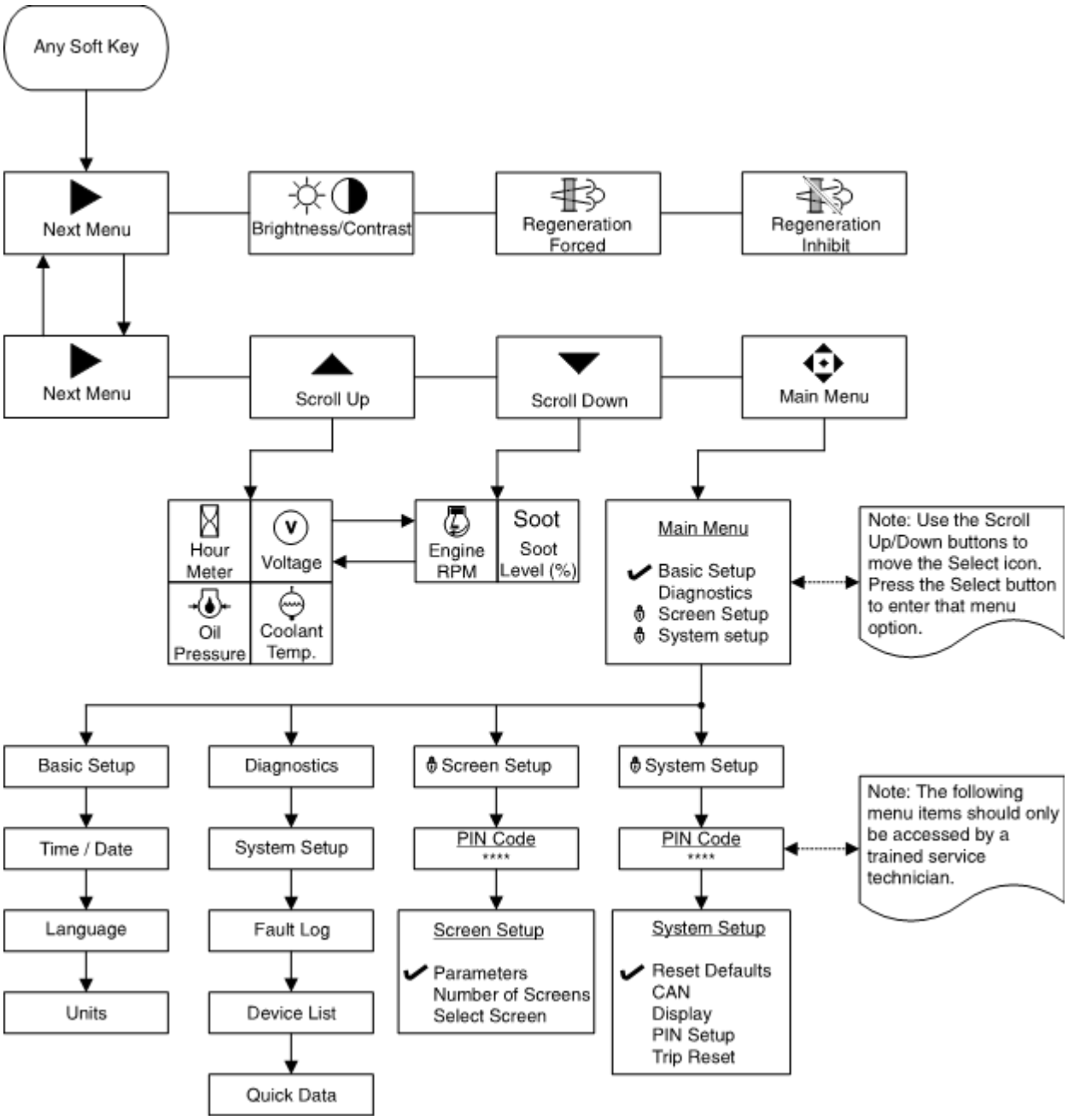


Main Menu Structure - Deutz TD 2.2 L3 Models



Fault Codes

Main Menu Structure - Perkins 404F-22 Models



Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
1000	98	2	Engine oil level sensor internal error. Sensor reports error. Open/short transducer.
1001	98	31	Engine oil level out of range. Level low, high, foaming.
1002	98	31	Oil sensor voltage out of range. <8,5V ±0,5V; >16,5V ±0,5V.
1003	98	2	Oil sensor invalid sensor status.
1004	98	31	Oil sensor temperature out of range.
1005	98	14	Oil sensor is broken or disconnected.
1021	100	3	Oil pressure voltage above normal or shorted to high.
1022	100	4	Oil pressure voltage below normal or shorted to low.
1025	100	1	Low oil pressure. Warning threshold exceeded.
1026	100	1	Low oil pressure. Shut off threshold exceeded.
1043	107	0	Air filter differential pressure. Air filter clogged.
1071	411	2	Engine exhaust gas recirculation. Pressure does not change between engine operating points.
1072	411	0	Engine exhaust gas recirculation. Pressure above normal operational range.
1073	411	1	Engine exhaust gas recirculation. Pressure below normal operational range.
1074	411	2	Engine exhaust gas recirculation. Negative measured differential pressure.
1075	411	2	Engine exhaust gas recirculation. Positive measured differential pressure.
1077	411	3	Engine exhaust gas recirculation. Signal value above maximum limit.
1078	411	4	Engine exhaust gas recirculation. Signal value below maximum limit.
1079	108	0	Ambient air pressure sensor above normal operational range.
1080	108	1	Ambient air pressure sensor below normal operational range.
1081	108	15	Fault check max signal range violated for ambient air pressure sensor.
1082	108	17	Fault check min signal range violated for ambient air pressure sensor.
1083	108	2	Ambient air pressure sensor error by component self diagnosis.
1084	3720	0	DPF ash load above normal operational range.
1086	3734	0	DPF soot load exceeded. Remove filter level.
1087	4781	14	DPF soot load exceeded shut off level.
1088	4781	0	DPF soot load exceeded warning level.
1089	4781	16	DPF. Too much standstill time in short time interval.
1090	10156	0	DPF. The standstill-regeneration mode time exceeds the short-limit.
1091	3735	16	DPF. Standstill required and no successful standstill longer than escalation threshold. Moderately severe.
1092	3735	0	DPF. Standstill required and no successful standstill longer than escalation threshold. Most severe.
1093	4766	1	DOC. Regeneration temperature in standstill main phase not reached.
1102	171	2	Ambient air temperature shows a deviation from expected value at cold start conditions.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
111	102	0	Engine intake manifold pressure above normal operational range.
1114	102	1	Engine intake manifold pressure below normal operational range.
1115	102	3	Intake manifold pressure sensor voltage above normal or shorted to high.
1116	102	4	Intake manifold pressure sensor voltage below normal or shorted to low.
1118	102	1	Intake manifold pressure below normal operational range.
1121	102	2	DFC for signal variation check for pressure sensor of the intake manifold.
1122	102	0	Intake air pressure valve sensor, warning condition exceeded.
1123	102	1	Intake air pressure valve sensor, shutoff condition exceeded.
1124	1209	2	Engine exhaust pressure turbine upstream differs from ambient pressure while engine not running.
1125	1209	15	Engine exhaust pressure turbine upstream above upper limit.
1126	1176	1	Engine turbocharger compressor intake pressure below normal operational range.
1127	1209	2	Engine exhaust pressure turbine upstream tuck check failed. Pressure does not change between engine operating points.
1130	1209	3	Engine exhaust pressure sensor voltage above normal or shorted to high.
1131	1209	4	Engine exhaust pressure sensor voltage below normal or shorted to low.
1134	3251	3	DPF voltage above normal or shorted to high.
1135	3251	4	DPF voltage below normal or shorted to low.
1136	3251	14	DPF reporting communication error.
1137	3251	14	DPF reporting data error.
1138	3251	14	DPF reporting fast channel 1 error.
1139	3251	14	DPF reporting fast channel 2 signal range error.
1149	3251	2	DPF difference pressure value not plausible.
1150	3251	0	DPF difference pressure above shut off threshold.
1151	3251	16	DPF difference pressure above warning threshold.
1152	3251	1	DPF difference pressure below shut off threshold.
1153	3251	18	DPF difference pressure below warning threshold.
1161	5571	16	Rail fuel pressure relief valve above normal operational range.
1162	5571	2	Rail fuel pressure relief valve is forced to open, perform pressure increase.
1163	5571	2	Rail fuel pressure relief valve is forced to open. Performed by pressure increase.
1164	5571	16	Rail fuel pressure relief valve is forced to open. Shutoff conditions.
1165	5571	15	Rail fuel pressure relief valve is forced to open. Warning conditions.
1166	5571	0	Open rail fuel pressure relief valve was detected.
1167	5571	2	Unexpected opening of the rail fuel pressure relief valve.
1168	5571	2	Successful rail fuel pressure relief valve opening cannot be ensured.
1169	5571	13	Averaged rail fuel pressure after valve opening is outside the expected tolerance range.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
1170	5571	16	Open time of rail fuel pressure relief valve for wear out monitoring had exceeded.
1171	94	1	Fuel pressure build up during engine start not successful.
1172	1347	5	Electrical fuel pump current below normal or open circuit.
1174	1347	3	Electrical fuel pump voltage above normal or shorted to high.
1175	1347	4	Electrical fuel pump voltage below normal or shorted to low.
119	1231	14	CAN Bus 2 off Error for Application CAN.
1190	7103	13	Rail fuel pressure below set point, speed-dependent threshold exceeded.
1191	7103	13	Rail fuel pressure metering unit. Fuel quantity balance is disrupted.
1194	7103	13	Negative rail fuel pressure governor deviation at zero delivery by metering unit.
1195	7103	1	Rail fuel pressure value is below minimum rail pressure threshold.
1197	7103	0	Maximum rail fuel pressure exceeded.
1198	7103	2	Set point of fuel metering unit in overrun mode not plausible.
120	639	14	CAN Bus 1 off Error for Power train CAN.
1200	5357	14	Shut-off due to undershoot of minimum rail pressure.
1202	157	0	Maximum rail pressure exceeded in limp home mode.
1208	157	3	Engine fuel injector metering rail pressure voltage above normal or shorted to high.
1209	157	4	Engine fuel injector metering rail pressure voltage below normal or shorted to low.
121	520252	2	Wrong checksum in the CAN message EAT Control.
1212	629	12	ECU. Keep alive error during runtime at an external device.
1213	629	12	ECU. Keep alive error during initialization phase at an external device.
1215	629	12	ECU. Read diagnosis error for non volatile memory.
1216	629	12	ECU. Write diagnosis error for non volatile memory.
1218	629	12	ECU. Stack memory threshold overrun.
1219	629	12	ECU. Observation counter irregular switch off counter triggered by engine running.
122	4207	2	TSC1 message checksum fault.
123	4207	2	TSC1 message checksum fault.
1233	5826	15	Emission control system operator inducement level 1 severity above normal operational range.
1235	5826	0	Emission control system operator inducement level 2 severity above normal operational range.
1236	5826	14	Emission control system operator pre-trigger inducement level 2 severity.
124	4207	2	TSC1 message checksum fault.
125	4207	2	TSC1 message checksum fault.
1274	91	3	Accelerator pedal sensor position 1 voltage above normal or shorted to high.
1275	2623	3	Accelerator pedal 1, channel 2 voltage above normal or shorted to high.
1276	29	3	Accelerator pedal 2 voltage above normal or shorted to high.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
1277	2625	3	Accelerator pedal 2, channel 2 voltage above normal or shorted to high.
1280	91	4	Accelerator pedal sensor position 1 voltage below normal or shorted to low.
1281	2623	4	Accelerator pedal 1, channel 2 voltage below normal or shorted to low.
1282	29	4	Accelerator pedal 2 voltage below normal or shorted to low.
1283	2625	4	Accelerator pedal 2, channel 2 voltage below normal or shorted to low.
1289	3509	14	Failure of sensor supply voltage 1 from ECU.
1290	3509	0	Sensor supply voltage 1 from ECU above normal operational range.
1291	3509	6	Sensor supply voltage 1 from ECU current above normal or grounded circuit.
1292	3509	1	Sensor supply voltage 1 from ECU below normal operational range.
1293	3510	14	Failure of sensor supply voltage 2 from ECU.
1294	3510	0	Sensor supply voltage 2 from ECU above normal operational range.
1295	3510	6	Sensor supply voltage 2 from ECU current above normal or grounded circuit.
1296	3510	1	Sensor supply voltage 2 from ECU below normal operational range.
1306	677	3	Engine starter motor relay voltage above normal or shorted to high.
1307	677	4	Engine starter motor relay voltage below normal or shorted to low.
1308	677	5	Engine starter motor relay current below normal or shorted to low.
1310	677	3	Engine starter motor relay voltage above normal or shorted to high.
1311	677	4	Engine starter motor relay voltage below normal or shorted to low.
1323	91	11	Accelerator pedal position 1. Possible error between APP1 and APP2 or APP1 and idle switch.
1326	29	11	Accelerator Pedal 2 Position. Possible error between APP1 and idle switch.
1346	1041	14	Start signal indicator. Terminal 50 was operated too long.
1354	105	0	Engine intake manifold 1 temperature data above normal operational range. Warning threshold exceeded.
1355	105	0	Engine intake manifold 1 temperature above normal operational range. Shutoff threshold exceeded.
1357	1136	0	Engine ECU temperature above normal operational range. Most severe.
1358	1136	1	Engine ECU temperature below normal operational range. Most severe.
1359	1136	15	Engine ECU temperature above normal operational range. Least severe.
1360	1136	17	Engine ECU temperature below normal operational range. Least severe.
1361	1136	2	Engine ECU temperature fault check.
1362	412	15	Engine exhaust gas recirculation temperature above normal operational range.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
1363	412	17	Engine exhaust gas recirculation temperature below normal operational range.
1364	412	3	Engine exhaust gas recirculation temperature voltage above normal or shorted to high.
1365	412	4	Engine exhaust gas recirculation temperature voltage below normal or shorted to low.
1372	51	5	Engine throttle valve 1, position 1 current below normal or open circuit.
1375	51	3	Engine throttle valve 1, position 1 voltage above normal or shorted to high. Short circuit to battery 1.
1376	51	3	Engine throttle valve 1, position 1 voltage above normal or shorted to high. Short circuit to battery 2.
1377	51	4	Engine throttle valve 1, position 1 voltage below normal or shorted to low. Short circuit to ground 1.
1378	51	4	Engine throttle valve 1, position 1 voltage below normal or shorted to low. Short circuit to ground 2.
1379	51	6	Engine throttle valve 1, position 1 current above normal or grounded circuit.
1382	51	7	Engine throttle valve 1 position 1 mechanical system not responding or out of adjustment. Valve stuck closed.
1383	51	7	Engine throttle valve 1 position 1 mechanical system not responding or out of adjustment. Valve stuck open.
1391	51	3	Engine throttle valve 1, position 1 voltage above normal or shorted to high.
1392	51	4	Engine throttle valve 1, position 1 voltage below normal or shorted to low.
1397	105	0	Engine intake manifold 1 temperature above normal operational range.
1398	105	1	Engine intake manifold 1 temperature below normal operational range.
1399	4766	2	DOC temperature too high.
1400	4766	2	DOC temperature too low.
1401	4766	15	DOC outlet temperature above normal operational range.
1402	4766	3	DOC outlet temperature voltage above normal or shorted to high.
1403	4766	4	DOC outlet temperature voltage below normal or shorted to low.
1404	4766	2	DOC intake temperature error.
1405	4766	15	DOC Intake temperature above normal operational range.
1406	4766	3	DOC intake temperature voltage above normal or shorted to high.
1407	4766	4	DOC intake temperature voltage below normal or shorted to low.
1408	4766	2	DOC intake temperature does not change.
142	520256	9	Timeout of EAT control receive message. CAN message is not received.
144	523211	9	Timeout error of CAN receive frame EBC1.
154	523212	9	Timeout error of CAN receive frame engine protection.
1540	520254	8	The stand still regeneration mode time exceeds the long limit threshold.
1541	520255	2	Hoses connected to the dp DPF SENT sensor inverted. Swap hoses.
155	523741	14	Engine shutdown request via CAN.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
1587	97	0	Water in fuel level prefilter; maximum value exceeded.
188	523240	9	Timeout CAN message function mode control.
219	520253	2	Rolling counter fault CAN message EAT Control.
220	4206	2	Fault check for Rolling Counter of TSC1AE.
221	4206	2	Fault check for Rolling Counter of TSC1AR.
222	4206	2	Fault check for Rolling Counter of TSC1TE.
223	4206	2	Fault check for Rolling Counter of TSC1TR.
349	3349	0	Timeout error of CAN receive frame active TSC1AE.
350	3349	0	Timeout error of CAN receive frame passive TSC1AE.
351	3349	0	Timeout error of CAN receive frame active TSC1AR.
352	3349	0	Timeout error of CAN receive frame passive TSC1AR.
353	3349	0	Timeout error of CAN receive frame TSC1TE active.
354	3349	0	TSC1 receive timeout error. Short circuit to ground error.
355	3349	0	Timeout error of CAN receive frame TSC1TR.
356	3349	0	Passive timeout error of CAN receive frame TSC1TR.
361	3349	0	Timeout error of CAN receive frame TSC1AE. Traction Control.
363	3349	0	Timeout error of CAN receive frame TSC1AR. Retarder.
365	3349	0	Timeout error of CAN receive frame TSC1TE. Setpoint.
367	3349	0	Timeout Error of CAN receive frame TSC1TR; control signal.
38	1485	3	ECM main relay voltage above normal or shorted to high.
39	1485	3	ECM main relay voltage above normal or shorted to high of actuator relay 2.
40	1485	3	ECM main relay voltage above normal or shorted to high of actuator relay 3.
41	1485	4	ECM main relay voltage below normal or shorted to low.
42	1485	4	ECM main relay voltage below normal or shorted to low of actuator relay 2.
43	1485	4	ECM main relay voltage below normal or shorted to low of actuator relay 3.
48	168	0	Battery voltage above normal operational range.
49	168	1	Battery voltage low normal operational range.
50	168	3	Battery voltage above normal or shorted to high.
51	168	4	Battery voltage above normal or shorted to low.
516	523982	0	Power stage diagnosis disabled. High battery voltage.
517	523982	1	Power stage diagnosis disabled. Low battery voltage.
52	168	0	High battery voltage. Warning threshold is exceeded.
567	27	5	Engine exhaust gas recirculation 1 valve position current below normal or open circuit.
570	27	3	Engine exhaust gas recirculation 1 valve position voltage above normal or shorted to battery 1.
571	27	3	Engine exhaust gas recirculation 1 valve position voltage above normal or shorted to battery 2.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
572	27	4	Engine exhaust gas recirculation 1 valve position voltage below normal or shorted to ground 1.
573	27	4	Engine exhaust gas recirculation 1 valve position voltage below normal or shorted to ground 2.
574	27	6	Engine exhaust gas recirculation 1 valve position current above normal or grounded circuit.
577	27	7	Engine exhaust gas recirculation 1 valve position. Mechanical system not responding or out of adjustment. Valve stuck closed.
578	27	7	Engine exhaust gas recirculation 1 valve position. Mechanical system not responding or out of adjustment. Valve stuck open.
582	5763	3	Engine exhaust gas recirculation 1, actuator 1 voltage above normal or shorted to high.
583	5763	4	Engine exhaust gas recirculation 1, actuator 1 voltage below normal or shorted to low.
586	3055	14	Internal software error ECU. Injection cut off.
587	190	0	Engine speed above warning threshold. Over speed detection in component engine protection.
588	190	0	Engine speed above warning threshold. FOC-Level 1.
589	190	0	Engine speed above warning threshold. FOC-Level 2.
590	190	0	Engine speed above warning threshold. Overrun Mode.
610	171	15	Environment temperature sensor, temperature above upper physical threshold.
613	171	3	Ambient air temperature sensor voltage above normal or shorted to high.
614	171	4	Ambient air temperature sensor voltage below normal or shorted to low.
615	723	8	Camshaft speed sensor abnormal frequency or pulse width or period.
616	723	14	Camshaft sensor detection. Out of range, signal disrupted, no signal.
617	723	13	Offset angle between crank and camshaft sensor is too large.
618	4201	8	Crankshaft sensor detection. Out of range, signal disrupted, no signal.
619	4201	14	Crankshaft speed sensor. Speed detection, out of range, signal disrupted or no signal.
68	1669	14	CAN Bus ID-5. CAN Hardware registers are not updated within the expected time.
70	110	2	Engine Coolant Temperature. Data erratic, intermittent or incorrect.
709	97	3	Water in fuel indicator 1. Voltage above normal or shorted to high.
710	97	4	Water in fuel indicator 1. Voltage below normal or shorted to low.
721	94	15	Low fuel pressure system, max. physical range exceeded.
723	94	3	Engine fuel pressure sensor voltage above normal or shorted to high.
724	94	4	Engine fuel pressure sensor voltage below normal or shorted to low.
725	94	1	Low fuel pressure system, warning threshold exceeded.
726	94	1	Low fuel pressure, shut off threshold exceeded.
75	110	3	Engine coolant temperature voltage above normal or shorted to high.
76	110	4	Engine coolant temperature voltage below normal or shorted to low.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
77	110	0	High coolant temperature. Warning threshold exceeded.
78	110	0	Coolant temperature. System reaction initiated.
797	676	12	Engine cold start aid relay error.
798	676	5	Engine cold start aid relay current below normal or open circuit.
799	676	5	Engine cold start aid relay current below normal or open circuit.
80	411	2	Intake air massflow not in expected range.
803	676	3	Engine cold start aid relay voltage above normal or shorted to high.
805	676	4	Engine cold start aid relay voltage below normal or shorted to low.
807	2797	14	Engine fuel 1 injector, Group 1. Number of possible injections limited by the injection valve.
815	2797	4	Engine fuel 1 injector, Group 1 voltage below normal or shorted to low.
816	5358	5	Engine cylinder 1 fuel injection quantity current below normal or open circuit.
817	5359	5	Engine cylinder 2 fuel injection quantity current below normal or open circuit.
818	5360	5	Engine cylinder 3 fuel injection quantity current below normal or open circuit.
819	5361	5	Engine cylinder 4 fuel injection quantity current below normal or open circuit.
820	5362	5	Engine cylinder 5 fuel injection quantity current below normal or open circuit.
821	5363	5	Engine cylinder 6 fuel injection quantity current below normal or open circuit.
822	2797	6	Engine fuel 1 injector, Group 1 current above normal or grounded circuit.
823	2798	6	Engine fuel 1 injector, Group 2 current above normal or grounded circuit.
824	5358	6	Engine cylinder 1 fuel injection quantity above normal or grounded circuit. Short circuit of the power stage low-side.
825	5359	6	Engine cylinder 2 fuel injection quantity above normal or grounded circuit. Short circuit of the power stage low-side.
826	5360	6	Engine cylinder 3 fuel injection quantity above normal or grounded circuit. Short circuit of the power stage low-side.
827	5361	6	Engine cylinder 4 fuel injection quantity above normal or grounded circuit. Short circuit of the power stage low-side.
828	5362	6	Engine cylinder 5 fuel injection quantity above normal or grounded circuit. Short circuit of the power stage low-side.
829	5363	6	Engine cylinder 6 fuel injection quantity above normal or grounded circuit. Short circuit of the power stage low-side.
83	111	1	Coolant level too low.
830	5358	6	Engine cylinder 1 fuel injection quantity above normal or grounded circuit. Short circuit between high-side and low-side of the power stage.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
831	5359	6	Engine cylinder 2 fuel injection quantity above normal or grounded circuit. Short circuit between high-side and low-side of the power stage.
832	5360	6	Engine cylinder 3 fuel injection quantity above normal or grounded circuit. Short circuit between high-side and low-side of the power stage.
833	5361	6	Engine cylinder 4 fuel injection quantity above normal or grounded circuit. Short circuit between high-side and low-side of the power stage.
834	5362	6	Engine cylinder 5 fuel injection quantity above normal or grounded circuit. Short circuit between high-side and low-side of the power stage.
835	5363	6	Engine cylinder 6 fuel injection quantity above normal or grounded circuit. Short circuit between high-side and low-side of the power stage.
836	105	3	Engine intake manifold temperature voltage above normal or shorted to high.
837	105	4	Engine intake manifold temperature voltage below normal or shorted to low.
838	2797	14	Engine fuel 1 injector, group 1 missing injector adjustment value programming injector 1.
839	2798	14	Engine fuel 1 injector, group 2 missing injector adjustment value programming injector 2.
840	4257	14	Engine fuel 1 injector, group 3 missing injector adjustment value programming injector 3.
854	7103	5	Engine fuel metering rail pump current below normal or open circuit.
855	7103	3	Engine fuel metering rail pump voltage above normal or shorted to high. Short circuit to battery on the high side power stage.
856	7103	3	Engine fuel metering rail pump voltage above normal or shorted to high. Short circuit to battery on the low side power stage.
857	7103	4	Engine fuel metering rail pump voltage below normal or shorted to low. Short circuit to battery on the high side power stage.
858	7103	4	Engine fuel metering rail pump voltage below normal or shorted to low. Short circuit to battery on the low side power stage.
859	7103	6	Engine fuel metering rail pump current above normal or grounded circuit.
868	629	12	Function monitoring: fault of ECU ADC. Null load test pulse.
869	629	12	Function monitoring: fault of ECU ADC. Test voltage.
870	629	12	ECU. DFC to indicate ICO request from MoCSOP module.
871	91	14	Function monitoring: Monitoring of accelerator pedal position.
875	190	2	Function monitoring: Fault of engine speed check.
876	5357	2	Engine fuel injection error for multiple cylinders. Diagnostic fault check error between level 1 energizing time and level 2 information.

Deutz TD 2.2 L3 Engine Fault Codes

DTC = Diagnostic Trouble Code
FMI = Failure Mode Identifier
SPN = Suspect Parameter Number

DTC	SPN	FMI	Description
877	5441	2	Engine fuel injection timing error for multiple cylinders.
878	5357	2	Engine fuel injection error for multiple cylinders. Diagnostic fault check to report the error due to non plausibility in ZFC.
879	523612	12	Internal recovery. Diagnosis fault check to report the error to demand for an ICO due to an error in the PoI2 shut-off.
88	598	10	Clutch switch. Abnormal rate of change.
880	523612	12	Internal recovery. Diagnosis fault check to report the error to demand for an ICO due to an error in the PoI3 efficiency factor.
881	523612	12	Internal recovery. Diagnosis fault check to report the error to demand for an ICO due to an error in change of EOM.
882	5357	2	Engine fuel injection error for multiple cylinders. Diagnosis fault check to report the error to demand for an ICO due to an error in total torque relevant quantity.
883	5357	2	Engine fuel injection error for multiple cylinders. Diagnostic fault check to report the error due to injection quantity correction.
884	5442	2	Engine fuel injection pressure error for multiple cylinders.
885	29	2	Accelerator pedal 2 position.
886	677	2	Engine starter motor relay. Function monitoring: Fault of ECU power train active.
887	513	2	Actual engine percent torque. DFC to report the fault in energizing time comparison.
888	513	2	Actual engine percent torque. DFC to report in torque comparison error.
889	520250	2	Function monitoring: Error in the post-build selectable monitoring.
890	629	12	ECU. Status of the EMM alarm FCCU0 which is read out of the FCCU hardware module.
91	1109	2	Engine protection system approaching shutdown. Engine shut off demand ignored.
92	1109	14	Engine protection system approaching shutdown. Shut off request from supervisory monitoring function.
996	629	12	ECU. Diagnostic fault check to report ABE active state.
997	629	12	Function monitoring: Fault of ECU, WDA active by inquiry/response communication.
998	629	12	Function monitoring: Fault of ECU, Error Pin active suspision of HW fault.
999	629	12	Function monitoring: Fault of ECU, WDA active by overvoltage detection.

The following DTC fault code range shares the same description. Replace the ECU.

DTC	891 - 945	Description
SPN	629	Internal ECU error.
FMI	12	

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
51	3	1019	EGR-Valve, short circuit to battery
51	3	1024	Position sensor error of actuator EGR-Valve; signal range check high
51	3	1226	EGR-Valve; short circuit to battery (A02)
51	3	1227	EGR-Valve; short circuit to battery (A67)
51	4	1020	EGR-Valve; short circuit to ground
51	4	1025	Position sensor error actuator EGR-Valve; signal range check low
51	4	1228	EGR-Valve; short circuit to ground (A02)
51	4	1229	EGR-Valve; short circuit to ground (A67)
1	4	1232	Actuator error EGR-Valve; Voltage below threshold
51	5	1015	Actuator error EGR-Valve; signal range check low
51	5	1017	Actuator EGR-Valve; open load
51	5	1023	Actuator error EGR-Valve; signal range check low
51	5	1223	Actuator EGR-Valve; open load
51	6	1014	Actuator error EGR-Valve; signal range check high
51	6	1022	Actuator error EGR-Valve; signal range check high
51	6	1224	Actuator EGR-Valve; over current
51	6	1230	Actuator error EGR-Valve; Overload by short-circuit
51	7	1016	Actuator position for EGR-Valve not plausible
51	11	1231	Actuator error EGR-Valve; Power stage over temp due to high current
51	12	1018	Actuator EGR-Valve; powerstage over temperature
51	12	1021	Mechanical actuator defect EGR-Valve
51	12	1225	Actuator EGR-Valve; over temperature
94	1	474	Low fuel pressure; warning threshold exceeded
94	1	475	Low fuel pressure; shut off threshold exceeded
94	3	472	Sensor error low fuel pressure; signal range check high
94	4	473	Sensor error low fuel pressure; signal range check low
97	3	464	Sensor error water in fuel; signal range check high
97	4	465	Sensor error water in fuel; signal range check low
97	12	1157	Water in fuel level prefilter; maximum value exceeded
100	0	734	High oil pressure; warning threshold exceeded
100	0	735	High oil pressure; shut off threshold exceeded
100	1	736	Low oil pressure; warning threshold exceeded
100	1	737	Low oil pressure; shut off threshold exceeded
100	3	732	Sensor error oil pressure; signal range check high
100	4	733	Sensor error oil pressure sensor; signal range check low
102	2	88	Charged air pressure above warning threshold
102	2	89	Charged air pressure above shut off threshold
102	4	777	Sensor error charged air press.; signal range check low

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
105	0	996	High charged air cooler temperature; warning threshold exceeded
105	0	997	High charged air cooler temperature; shut off threshold exceeded
105	3	994	Sensor error charged air temperature; signal range check high
105	4	995	Sensor error charged air temperature; signal range check low
108	3	412	Sensor error ambient air press.; signal range check high
108	4	413	Sensor error ambient air press.; signal range check low
110	0	98	High coolant temperature; warning threshold exceeded
110	0	99	High coolant temperature; shut off threshold exceeded
110	3	96	Sensor error coolant temp.; signal range check high
110	4	97	Sensor error coolant temp.; signal range check low
111	1	101	Coolant level too low
132	11	1	Air flow sensor load correction factor exceeding the maximum drift limit; plausibility error
132	11	2	Air flow sensor load correction factor exceeding drift limit; plausibility error
132	11	3	Air flow sensor low idle correction factor exceeding the maximum drift limit
132	11	4	Air flow sensor load correction factor exceeding the maximum drift limit
157	3	877	Sensor error rail pressure; signal range check high
157	4	878	Sensor error rail pressure; signal range check low
168	0	1180	Physical range check high for battery voltage
168	1	1181	Physical range check low for battery voltage
168	2	47	High battery voltage; warning threshold exceeded
168	2	48	Low battery voltage; warning threshold exceeded
168	3	45	Sensor error battery voltage; signal range check high
168	4	46	Sensor error battery voltage; signal range check low
171	3	417	Sensor error environment temperature; signal range check high
171	4	418	Sensor error environment temperature; signal range check low
172	0	1182	Physical range check high for intake air temperature
172	1	1183	Physical range check low for intake air temperature
172	2	9	Sensor ambient air temperature; plausibility error
172	2	983	Intake air sensor; plausibility error
172	3	981	Sensor error intake air; signal range check high
172	4	982	Sensor error intake air sensor; signal range check low
174	0	481	High low fuel temperature; warning threshold exceeded
174	0	482	High Low fuel temperature; shut off threshold exceeded
175	0	740	Physical range check high for oil temperature
175	0	745	High oil temperature; warning threshold exceeded
175	0	746	High oil temperature; shut off threshold exceeded
175	1	741	Physical range check low for oil temperature

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
175	2	738	Sensor oil temperature; plausibility error
175	2	739	Sensor oil temperature; plausibility error oil temperature too high
175	3	743	Sensor error oil temperature; signal range check high
175	4	744	Sensor error oil temperature; signal range check low
190	0	389	Engine speed above warning threshold (FOC-Level 1)
190	2	421	Offset angle between crank- and camshaft sensor is too large
190	8	419	Sensor camshaft speed; disturbed signal
190	8	422	Sensor crankshaft speed; disturbed signal
190	11	390	Engine speed above warning threshold (FOC-Level 2)
190	12	420	Sensor camshaft speed; no signal
190	12	423	Sensor crankshaft speed; no signal
190	14	391	Engine speed above warning threshold (Overrun Mode)
190	14	1222	Camshaft- and Crankshaft speed sensor signal not available on CAN
411	0	791	Physical range check high for differential pressure Venturiunit (EGR)
411	1	792	Physical range check low for differential pressure Venturiunit (EGR)
411	3	795	Sensor error differential pressure Venturiunit (EGR); signal range check high
411	4	381	Physical range check low for EGR differential pressure
411	4	796	Sensor error differential pressure Venturiunit (EGR); signal range check low
412	3	1007	Sensor error EGR cooler downstream temperature; signal range check high
412	4	1008	Sensor error EGR cooler downstream temperature; signal range check low
520	9	306	Timeout Error of CAN-Receive-Frame TSC1TR; Setpoint
597	2	49	Break lever mainswitch and break lever redundancy switch status not plausible
624	3	971	SVS lamp; short circuit to batt.
624	4	972	SVS lamp; short circuit to grd.
624	5	969	SVS lamp; open load
624	12	970	SVS lamp; powerstage over temperature
630	12	376	Access error EEPROM memory (delete)
630	12	377	Access error EEPROM memory (read)
630	12	378	Access error EEPROM memory (write)
639	14	84	CAN-Bus 0 "BusOff-Status"
651	3	580	Injector 1 (in firing order); short circuit
651	4	586	High side to low side short circuit in the injector 1 (in firing order)
651	5	568	Injector 1 (in firing order); interruption of electric connection
652	3	581	Injector 2 (in firing order); short circuit
652	4	587	High side to low side short circuit in the injector 2 (in firing order)
652	5	569	Injector 2 (in firing order); interruption of electric connection
653	3	582	Injector 3 (in firing order); short circuit
653	4	588	High side to low side short circuit in the injector 3 (in firing order)
653	5	570	Injector 3 (in firing order); interruption of electric connection

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
654	3	583	Injector 4 (in firing order); short circuit
654	4	589	High side to low side short circuit in the injector 4 (in firing order)
654	5	571	Injector 4 (in firing order); interruption of electric connection
676	11	543	Cold start aid relay error.
676	11	544	Cold start aid relay open load
677	3	956	Starter relay high side; short circuit to battery
677	3	960	Starter relay low side; short circuit to battery
677	4	957	Starter relay high side; short circuit to ground
677	4	961	Starter relay low side; short circuit to ground
677	5	958	Starter relay; no load error
677	12	959	Starter relay; powerstage over temperature
703	3	426	Engine running lamp; short circuit to battery
703	4	427	Engine running lamp; short circuit to ground
703	5	424	Engine running lamp; open load
703	12	425	Engine running lamp; powerstage over temperature
729	5	545	Cold start aid relay open load
729	12	547	Cold start aid relay; over temperature error
898	9	305	Timeout Error of CAN-Receive-Frame TSC1TE; Setpoint
1079	13	946	Sensor supply voltage monitor 1 error (ECU)
1080	13	947	Sensor supply voltage monitor 2 error (ECU)
1109	2	121	Engine shut off demand ignored
1136	0	1398	Physikal range check high for ECU temperature
1136	1	1399	Physikal range check low for ECU temperature
1136	3	1400	Sensor error ECU temperature; signal range check high
1136	4	1401	Sensor error ECU temperature; signal range check low
1176	3	849	Sensor error pressure sensor upstream turbine; signal range check high
1176	4	850	Sensor error pressure sensor downstream turbine; signal range check high
1180	0	1193	Physical range check high for exhaust gas temperature upstream turbine
1180	0	1460	Turbocharger Wastegate CAN feedback; warning threshold exceeded
1180	0	1462	Exhaust gas temperature upstream turbine; warning threshold exceeded
1180	1	1194	Physical range check low for exhaust gas temperature upstream turbine
1180	1	1461	Turbocharger Wastegate CAN feedback; shut off threshold exceeded
1180	1	1463	Exhaust gas temperature upstream turbine; shut off threshold exceeded
1180	3	1067	Sensor error exhaust gas temperature upstream turbine; signal range check high
1180	11	1066	Sensor exhaust gas temperature upstream turbine; plausibility error
1188	2	1414	Wastegate; status message from ECU missing

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
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SPN	FMI	KWP	Description
1188	7	1415	Wastegate actuator; blocked
1188	11	1411	Wastegate actuator; internal error
1188	11	1412	Wastegate actuator; EOL calibration not performed correctly
1188	11	1416	Wastegate actuator; over temperature (> 145øC)
1188	11	1417	Wastegate actuator; over temperature (> 135øC)
1188	11	1418	Wastegate actuator; operating voltage error
1188	13	1413	Wastegate actuator calibration deviation too large, recalibration required
1231	14	85	CAN-Bus 1 "BusOff-Status"
1235	14	86	CAN-Bus 2 "BusOff-Status"
1237	2	747	Override switch; plausibility error
1322	12	610	Too many recognized misfires in more than one cylinder
1323	12	604	Too many recognized misfires in cylinder 1 (in firing order)
1324	12	605	Too many recognized misfires in cylinder 2 (in firing order)
1325	12	606	Too many recognized misfires in cylinder 3 (in firing order)
1326	12	607	Too many recognized misfires in cylinder 4 (in firing order)
2659	0	1524	Physical range check high for EGR exhaust gas mass flow
2659	1	1525	Physical range check low for EGR exhaust gas mass flow
2659	2	1523	Exhaust gas recirculation AGS sensor; plausibility error
2659	2	1527	AGS sensor temperature exhaust gas mass flow; plausibility error
2659	12	1526	Exhaust gas recirculation; AGS sensor has "burn off" not performed
2797	4	1337	Injector diagnostics; timeout error of short circuit to ground measurement cyl. Bank 0
2798	4	1338	Injector diagnostics; timeout error of short circuit to ground measurement cyl. Bank 1
2798	4	1339	Injector diagnostics; short circuit to ground monitoring Test in Cyl. Bank 0
2798	4	1340	Injector diagnostics; short circuit to ground monitoring Test in Cyl. Bank 1
3224	2	127	DLC Error of CAN-Receive-Frame AT1IG1 NOX Sensor (SCR-system upstream cat; DPF-system downstream cat); length of frame incorrect
3224	9	128	Timeout Error of CAN-Receive-Frame AT1IG1; NOX sensor upstream
3248	4	1047	Sensor error particle filter downstream temperature; signal range check low
3699	2	1616	DPF differential pressure sensor and a further sensor or actuator CRT system defective
3699	2	1617	Temperature sensor us. and ds. DOC simultaneously defect
3699	14	1615	Maximum stand-still-duration reached; oil exchange required
4765	0	1039	Physical range check high for exhaust gas temperature upstream (DOC)
4765	1	1042	Physical range check low for exhaust gas temperature upstream (DOC)

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
4766	0	1029	Physical range check high for exhaust gas temperature downstream (DOC)
4766	1	1032	Physical range check low for exhaust gas temperature downstream (DOC)
4768	2	1036	Sensor exhaust gas temperature upstream (DOC); plausibility error
4768	3	1044	Sensor error exhaust gas temperature upstream (DOC); signal range check high
4768	4	1045	Sensor error exhaust gas temperature upstream (DOC) signal range check low
4769	2	1026	Sensor exhaust gas temperature downstream (DOC); plausibility error
4769	3	1034	Sensor error exhaust gas temperature downstream (DOC); signal range check high
4769	4	1035	Sensor error exhaust gas temperature downstream (DOC); signal range check low
523006	3	34	Controller mode switch; short circuit to battery
523006	4	35	Controller mode switch; short circuit to ground
523008	1	648	Manipulation control was triggered
523008	2	649	Timeout error in Manipulation control
523009	9	825	Pressure Relief Valve (PRV) reached maximun allowed opening count
523009	10	833	Pressure relief valve (PRV) reached maximun allowed open time
523212	9	171	Timeout Error of CAN-Receive-Frame ComEngPrt; Engine Protection
523216	9	198	Timeout Error of CAN-Receive-Frame PrHtEnCmd; pre-heat command, engine command
523240	9	179	Timeout CAN-message FunModCtl; Function Mode Control
523350	4	565	Injector cylinder-bank 1; short circuit
523352	4	566	Injector cylinder-bank 2; short circuit
523354	12	567	Injector powerstage output defect
523470	2	826	Pressure Relief Valve (PRV) forced to open; performed by pressure increase
523470	2	827	Pressure Relief Valve (PRV) forced to open; performed by pressure shock
523470	7	876	Maximum rail pressure in limp home mode exceeded (PRV)
523470	11	831	The PRV can not be opened at this operating point with a pressure shock
523470	11	832	Rail pressure out of tolerance range
523470	12	828	Open Pressure Relief Valve (PRV); shut off condition
523470	12	829	Open Pressure Relief Valve (PRV); warning condition
523470	14	830	Pressure Relief Valve (PRV) is open
523550	12	980	T50 start switch active for too long
523601	13	948	Sensor supply voltage monitor 3 error (ECU)
523603	9	126	Timeout Error of CAN-Receive-Frame AMB; Ambient Temperature Sensor

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
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SPN	FMI	KWP	Description
523605	9	300	Timeout Error of CAN-Receive-Frame TSC1AE; Traction Control
523606	9	301	Timeout Error of CAN-Receive-Frame TSC1AR; Retarder
523612	12	387	Internal software error ECU; injection cut off
523612	12	612	Internal ECU monitoring detection reported error
523612	12	613	Internal ECU monitoring detection reported error
523612	12	614	Internal ECU monitoring detection reported error
523612	12	615	Internal ECU monitoring detection reported error
523612	12	616	Internal ECU monitoring detection reported error
523612	12	617	Internal ECU monitoring detection reported error
523612	12	618	Internal ECU monitoring detection reported error
523612	12	619	Internal ECU monitoring detection reported error
523612	12	620	Internal ECU monitoring detection reported error
523612	12	621	Internal ECU monitoring detection reported error
523612	12	623	Internal ECU monitoring detection reported error
523612	12	624	Internal ECU monitoring detection reported error
523612	12	625	Internal ECU monitoring detection reported error
523612	12	627	Internal ECU monitoring detection reported error
523612	12	628	Internal ECU monitoring detection reported error
523612	12	637	Internal ECU monitoring detection reported error
523612	12	1170	Internal software error ECU
523612	14	973	Softwarereset CPU SWReset_0
523612	14	974	Softwarereset CPU SWReset_1
523612	14	975	Softwarereset CPU SWReset_2
523613	0	856	Maximum positive deviation of rail pressure exceeded (RailMeUn0)
523613	0	857	Maximum positive deviation of rail pressure in metering unit exceeded (RailMeUn1)
523613	0	858	Railsystem leakage detected (RailMeUn10)
523613	0	859	Maximum negative deviation of rail pressure in metering unit exceeded (RailMeUn2)
523613	0	860	Negative deviation of rail pressure second stage (RailMeUn22)
523613	0	862	Maximum rail pressure exceeded (RailMeUn4)
523613	1	861	Minimum rail pressure exceeded (RailMeUn3)
523613	2	864	Setpoint of metering unit in overrun mode not plausible
523615	3	594	Metering unit (Fuel-System); short circuit to battery highside
523615	3	596	Metering unit (Fuel-System); short circuit to battery low side
523615	4	595	Metering unit (Fuel-System); short circuit to ground high side
523615	4	597	Metering Unit (Fuel-System); short circuit to ground low side
523615	5	592	Metering unit (Fuel-System); open load
523615	12	593	Metering unit (Fuel-System); powerstage over temperature
523619	2	488	Physical range check high for exhaust gas temperature upstrem (SCR-CAT)
523698	11	122	Shut off request from supervisory monitoring function

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
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SPN	FMI	KWP	Description
523717	12	125	Timeout Error of CAN-Transmit-Frame AmbCon; Weather environments
523718	3	1488	SCR mainrelay; short circuit to battery (only CV56B)
523718	4	1489	SCR mainrelay; short circuit to ground (only CV56B)
523718	5	1486	SCR mainrelay; open load (only CV56B)
523718	12	1487	SCR mainrelay; powerstage over temperature (only CV56B)
523766	9	281	Timeout Error of CAN-Receive-Frame Active TSC1AE
523767	9	282	Timeout Error of CAN-Receive-Frame Passive TSC1AE
523768	9	283	Timeout Error of CAN-Receive-Frame Active TSC1AR
523769	9	284	Timeout Error of CAN-Receive-Frame Passive TSC1AR
523770	9	285	Timeout Error of CAN-Receive-Frame Passive TSC1DE
523776	9	291	Timeout Error of CAN-Receive-Frame TSC1TE - active
523777	9	292	Passive Timeout Error of CAN-Receive-Frame TSC1TE; Setpoint
523778	9	293	Active Timeout Errorof CAN-Receive-Frame TSC1TR
523779	9	294	Passive Timeout Error of CAN-Receive-Frame TSC1TR
523788	12	299	Timeout Error of CAN-Transmit-Frame TrbCH; Status Wastegate
523793	9	202	Timeout Error of CAN-Receive-Frame UAA10; AGS sensor service message
523794	9	203	Timeout Error of CAN-Receive-Frame UAA11; AGS sensor data
523895	13	559	Check of missing injector adjustment value programming (IMA) injector 1 (in firing order)
523896	13	560	check of missing injector adjustment value programming (IMA) injector 2 (in firing order)
523897	13	561	check of missing injector adjustment value programming (IMA) injector 3 (in firing order)
523898	13	562	check of missing injector adjustment value programming (IMA) injector 4 (in firing order)
523910	6	1261	Air Pump; over current
523913	3	74	Sensor error glow plug control diagnostic line voltage; signal range check high
523913	4	75	Sensor error glow plug control diagnostic line voltage; signal range check low
523914	3	78	Glow plug control; short circuit to battery
523914	4	79	Glow plug control; short circuit to ground
523914	5	76	Glow plug control; open load
523914	5	1216	Glow plug control release line; short circuit error
523914	11	1217	Glow plug control; internal error
523914	12	77	Glow plug control; powerstage over temperature
523919	2	1378	Sensor air pump airpressure; plausibility error
523920	2	1379	Sensor exhaust gas back pressure burner; plausibility error

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
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SPN	FMI	KWP	Description
523922	7	1262	Burner Shut Off Valve; blocked closed
523922	7	1264	Burner Shut Off Valve; blocked closed
523929	0	109	Fuel Balance Control integrator injector 1 (in firing order); maximum value exceeded
523929	1	115	Fuel Balance Control integrator injector 1 (in firing order); minimum value exceeded
523930	0	110	Fuel Balance Control integrator injector 2 (in firing order); maximum value exceeded
523930	1	116	Fuel Balance Control integrator injector 2 (in firing order); minimum value exceeded
523931	0	111	Fuel Balance Control integrator injector 3 (in firing order); maximum value exceeded
523931	1	117	Fuel Balance Control integrator injector 3 (in firing order); minimum value exceeded
523932	0	112	Fuel Balance Control integrator injector 4 (in firing order); maximum value exceeded
523932	1	118	Fuel Balance Control integrator injector 4 (in firing order); minimum value exceeded
523935	12	168	Timeout Error of CAN-Transmit-Frame EEC3VOL1; Engine send messages
523936	12	169	Timeout Error of CAN-Transmit-Frame EEC3VOL2; Engine send messages
523946	0	1158	Zero fuel calibration injector 1 (in firing order); maximum value exceeded
523946	1	1164	Zero fuel calibration injector 1 (in firing order); minimum value exceeded
523947	0	1159	Zerofuel calibration injector 2 (in firing order); maximum value exceeded
523947	1	1165	Zerofuel calibration injector 2 (in firing order); minimum value exceeded
523948	0	1160	Zerofuel calibration injector 3 (in firing order); maximum value exceeded
523948	1	1166	Zerofuel calibration injector 3 (in firing order); minimum value exceeded
523949	0	1161	Zerofuel calibration injector 4 (in firing order); maximum value exceeded
523949	1	1167	Zerofuel calibration injector 4 (in firing order); minimum value exceeded
523960	0	1011	Physical range check high for EGR cooler downstream temp.
523960	0	1458	High exhaust gas temperature EGR cooler downstream; warning threshold exceeded
523960	1	1012	Physical range check low for EGR cooler downstream temp.
523960	1	1459	High exhaust gas temperature EGR cooler downstream; shut off threshold exceeded
523980	14	1187	Bad quality of reduction agent detected
523981	11	918	Urea-tank without heating function (heating phase)
523982	0	360	Powerstage diagnosis disabled; high battery voltage
523982	1	361	Powerstage diagnosis disabled; low battery voltage

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
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SPN	FMI	KWP	Description
523988	3	1245	Charging lamp; short circuit to battery
523988	4	1246	Charging lamp; short circuit to ground
523988	5	1243	Charging lamp; open load
523988	12	1244	Charging lamp; over temp.
523998	4	1327	Injector cylinder bank 2 slave; short circuit
523999	12	1328	Injector powerstage output Slave defect
524014	1	1254	Air pressure glow plug flush line; below limit
524016	2	1259	Amount of air is not plausible to pump speed
524016	2	1260	Calculated amount of air is not plausible to HFM reading
524016	11	1258	HFM sensor; electrical fault
524021	11	1263	Burner fuel line pipe leak behind Shut Off Valve
524024	11	1302	Deviation of the exhaust gas temp. setpoint to actual value downstream (DOC) too high
524028	2	1431	CAN message PROEGRActr; plausibility error
524029	2	1432	Timeout Error of CAN-Receive-Frame ComEGRActr - exhaust gas recirculation positioner
524030	7	1440	EGR actuator; internal error
524031	13	1441	EGR actuator; calibration error
524032	2	1442	EGR actuator; status message EGRCust is missing
524033	7	1443	EGR actuator; due to overload in Save Mode
524034	3	1438	Disc separator; short circuit to battery
524034	4	1439	Disc separator; short circuit to ground
524034	5	1436	Disc Separator; open load
524034	12	1437	Disc Separator; powerstage over temperature
524035	12	1341	Injector diagnostics; time out error in the SPI communication
524057	2	1505	Electric fuel pump; fuel pressure build up error
524097	9	1663	Timeout error of CAN-Transmit-Frame DPFBrnAirPmpCtl
524098	9	1664	Timeout error of CAN-Transmit-Frame ComDPFBrnPT
524099	9	1665	Timeout error of CAN-Transmit-Frame ComDPFC1
524100	9	1666	Timeout error of CAN-Transmit-Frame ComDPFHisDat
524101	9	1667	Timeout error of CAN-Transmit-Frame ComDPFTstMon

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
524102	9	1674	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmpCtl
524103	9	1675	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmp
524104	9	1676	Timeout error of CAN-Receive-Frame ComRxDPFCtl
524105	9	1668	Timeout error of CAN-Transmit-Frame ComEGRMsFlw
524106	9	1677	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw1
524107	9	1678	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw2
524108	9	1669	Timeout error of CAN-Transmit-Frame ComEGRTVActr
524109	9	1679	Timeout error of CAN-Receive-Frame ComRxEGRTVActr
524110	9	1670	Timeout error of CAN-Transmit-Frame ComETVActr
524111	9	1680	Timeout error of CAN-Receive-Frame ComRxETVActr
524112	9	1671	Timeout ComITVActr
524113	9	1681	Timeout error of CAN-Receive-Frame ComRxITVActr
524114	9	1659	Timeout error of CAN-Transmit-Frame A1DOC
524115	9	1660	Timeout error of CAN-Transmit-Frame AT1S
524116	9	1661	Timeout error of CAN-Transmit-Frame SCR2
524117	9	1662	Timeout error of CAN-Transmit-Frame SCR3
524118	9	1672	Timeout error of CAN-Receive-Frame ComRxCM1
524119	9	1673	Timeout error of CAN-Receive-Frame ComRxCustSCR3
524120	9	1682	Timeout error of CAN-Receive-Frame ComRxSCRHtDiag
524121	9	1683	Timeout error of CAN-Receive-Frame ComRxTrbChActr
524122	9	1684	Timeout error of CAN-Receive-Frame ComRxUQSens
524123	9	1685	Timeout error of CAN-Receive-Frame ComSCRHtCtl
524124	9	1686	Timeout error of CAN-Receive-Frame ComTxAT1IMG
524125	9	1687	Timeout error of CAN-Receive-Frame ComTxTrbChActr

Perkins 404F-E22T Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description
29	3	Accelerator Pedal Position 2: Voltage Above Normal
29	4	Accelerator Pedal Position 2: Voltage Below Normal
91	3	Accelerator Pedal Position 1: Voltage Above Normal
91	4	Accelerator Pedal Position 1: Voltage Below Normal
100	1	Engine Oil Pressure :Low- most severe (3)
108	3	Barometric Pressure : Voltage Above Normal
108	4	Barometric Pressure : Voltage Below Normal
110	3	Engine Coolant Temperature : Voltage Above Normal
110	4	Engine Coolant Temperature : Voltage Below Normal
110	15	Engine Coolant Temperature : High -least severe (1)
168	0	Battery Potential/ Power Input 1 : High- most severe (3)
168	3	Battery Potential/ Power Input 1: Voltage Above Normal
168	4	Battery Potential/ Power Input 1: Voltage Below Normal
172	3	Engine Air Inlet Temperature: Voltage Above Normal
172	4	Engine Air Inlet Temperature: Voltage Below Normal
190	0	Engine Speed : High- most severe (3)
190	8	Engine Speed : Abnormal Frequency, Pulse Width or Period
558	3	Accelerator Pedal1 Low Idle Switch: Voltage Above Normal
558	4	Accelerator Pedal1 Low Idle Switch: Voltage Below Normal
638	6	Engine Fuel Rack Actuator: Current Above Normal
639	14	J1939 Network#1: Special Instruction
723	3	Engine Speed Sensor #2: Voltage Above Normal
723	4	Engine Speed Sensor #2: Voltage Below Normal
723	8	Engine Speed Sensor#2: Abnormal Frequency, Pulse Width or Period"
723	10	Engine Speed Sensor #2: Abnormal Rate of Change
733	3	Engine Rack Position Sensor: Voltage Above Normal
733	4	Engine Rack Position Sensor: Voltage Below Normal
1485	7	ECU Main Relay : Not Responding Property
2840	11	ECU Instance: Other Failure Mode
2840	12	ECU Instance: Failure
2840	13	ECU Instance: Out of Calibration
2970	3	Accelerator Pedal 2 Low Idle Switch: Voltage Above Normal
2970	4	Accelerator Pedal 2 Low Idle Switch: Voltage Below Normal
3241	1	Exhaust Gas Temperature 1: Low-most severe (3)
3241	3	Exhaust Gas Temperature 1: Voltage Above Normal
241	4	Exhaust Gas Temperature 1: Voltage Below Normal
3241	15	Exhaust Gas Temperature 1: High-least severe (1)
3241	16	Exhaust Gas Temperature 1: High-moderate severity (2)
3242	1	Particulate Trap Intake Gas Temp: Low- most severe(3)"
3242	3	Particulate Trap Intake Gas Temp: Voltage Above Normal"
3242	4	Particulate Trap Intake Gas Temp: Voltage Below Normal"
3242	15	Particulate Trap Intake Gas Temp: High - least severe(1)"
3242	16	Particulate Trap Intake Gas Temp: High-moderate severity (2)

Perkins 404F-E22T Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description
3251	3	Particulate Trap Differential Pressure: Voltage Above Normal
3251	4	Particulate Trap Differential Pressure: Voltage Below Normal
3473	7	Aftertreatmert #1 Failed to Ignite: Not Responding Properly
3473	11	Aftertreatmert #1 Failed to Ignite : Other Failure Mode
3484	0	Aftertreatmert #1 Ignition : High-most severe (3)
3484	3	Aftertreatmert #1 Ignition : Voltage Above Normal
3484	4	Aftertreatmert #1 Ignition : Voltage Below Normal
3556	6	Aftertreatmert 1 Hydrocarbon Doser 1: Current Above Normal
3610	3	Diesel Particulate Filter Outlet Pressure or 1: Voltage Above Normal"
3610	4	DieselParticulate Filter Outlet Pressure Sensor 1: Voltage Below Normal
3713	7	DPF Active Regeneration Inhibited Due to System Timeout: Not Responding Properly
3713	31	DPF Active Regeneration Inhibited Due to System Timeout
3719	0	Particulate Trap #1 Soot Load Percent: High- most severe (3)
3719	16	Particulate Trap #1 Soot Load Percent: High-moderate severity (2)
4016	6	High Current Auxiliary Power Relay 1: Current Above Normal
4201	3	Engine Speed Sensor #1: Voltage Above Normal
4201	4	Engine Speed Sensor #1: Voltage Below Normal
4201	8	Engine Speed Sensor #1: Abnormal Frequency, Pulse \Nidth, or Period
4201	10	Engine Speed Sensor #1: Abnormal Rate of Change
4765	1	Aftertreatmert #1 Diesel Oxidation Catalyst Intake Gas Temperature: Low-most severe (3)
4765	3	Aftertreatmert #1 Diesel Oxidation Catalyst Intake Gas Temperature: Voltage Above Normal
4765	4	Aftertreatmert #1 Diesel Oxidation Catalyst Intake Gas Temperature: Voltage Below Normal
4765	15	Aftertreatmert #1Diesel Oxidation Catalyst Intake Gas Temperature: High-least severe (1)
4765	16	Aftertreatmert #1 Diesel Oxidation Catalyst Intake Gas Temperature: High-moderate severity (2)
5487	3	Aftertreatmert 1 Burner Unit Combustion Chamber Temperature: Voltage Above Normal
5487	4	Aftertreatmert 1 Burner Unit Combustion Chamber Temperature: Voltage Below Normal
6581	6	Aftertreatmert 1 Hydrocarbon Doser 2 : Current Above Normal

Ford MSG-425 Engine Fault Codes

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 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.

4 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 1-6-5-4 three times. After the fault codes, the check engine light will blink a code 1-6-5-4 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. Refer to Fault Codes Procedure, *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.

Ford MSG-425 Engine Fault Codes

Code	Description
16	Never crank synced at start
91	FP low voltage
92	FP high voltage
107	MAP Low Voltage
108	MAP High Pressure
111	IAT higher than expected 1
112	IAT low voltage
113	IAT high voltage
116	ECT higher than expected 1
117	ECT/CHT Low Voltage
118	ECT/CHT High Voltage
121	TPS1 lower than TPS2
122	TPS1 low voltage
123	TPS1 high voltage
127	IAT higher than expected 2
129	BP low pressure
134	EGO open/lazy pre-cat 1
140	EGO open/lazy post-cat 1
154	EGO open/lazy pre-cat 2/post-cat 1
160	EGO open/lazy post-cat 2
171	AL high gasoline bank1
172	AL low gasoline bank1
174	AL high gasoline bank2
175	AL low gasoline bank2
182	FT Gasoline Low Voltage
183	FT Gasoline High Voltage
187	FT Gaseaous fuel low voltage
188	FT Gaseaous fuel high voltage
217	ECT higher than expected 2
219	Max govern speed override
221	TPS1 higher than TPS2
222	TPS2 low voltage
223	TPS2 high voltage
236	TIP Active

Code	Description
237	TIP Low Voltage
238	TIP High Voltage
261	Injector Loop Open or Low-side short to Ground
262	Injector Coil Shorted
264	Injector Loop Open or Low-side short to Ground
265	Injector Coil Shorted
267	Injector Loop Open or Low-side short to Ground
268	Injector Coil Shorted
270	Injector Loop Open or Low-side short to Ground
271	Injector Coil Shorted
273	Injector Loop Open or Low-side short to Ground
274	Injector Coil Shorted
276	Injector Loop Open or Low-side short to Ground
277	Injector Coil Shorted
279	Injector Loop Open or Low-side short to Ground
280	Injector Coil Shorted
282	Injector Loop Open or Low- side short to Ground
283	Injector Coil Shorted
285	Injector Loop Open or Low-side short to Ground
286	Injector Coil Shorted
288	Injector Loop Open or Low-side short to Ground
289	Injector Coil Shorted

Ford MSG-425 EFI Diagnostic Manual

Genie part number 162067GT

Ford MSG-425 Engine Fault Codes

Code	Description
301	Emissions/catalyst damaging misfire
302	Emissions/catalyst damaging misfire
303	Emissions/catalyst damaging misfire
304	Emissions/catalyst damaging misfire
305	Emissions/catalyst damaging misfire
306	Emissions/catalyst damaging misfire
307	Emissions/catalyst damaging misfire
308	Emissions/catalyst damaging misfire
326	Knock 1 Excessive Signal
327	Knock 1 sensor Open
331	Knock 2 Excessive Signal
332	Knock 2 sensor Open
336	Crank sync noise
337	Crank loss
341	Cam sync noise
342	Cam loss
420	Gasoline cat monitor
430	Gasoline cat monitor
524	Oil pressure low
562	Battery Voltage Low
563	Battery Voltage High
601	Flash checksum invalid
604	RAM failure
606	COP failure
615	Start relay coil open
616	Start relay control ground short
617	Start relay coil short to power
627	Fpump relay coil open
628	FPump motor loop open or high-side shorted to ground
628	Fpump relay control ground short
629	FPump motor high-side shorted to power
629	Fpump relay coil short to power

Code	Description
642	5VE1 low voltage
643	5VE1 high voltage
650	MIL open
652	5VE2 low voltage
653	5VE2 high voltage
685	Relay Coil Open
686	Relay Control ground short
687	Relay coil short to power
1111	Fuel rev limit
1112	Spark rev limit
1121	FPP1/2 simultaneous voltages out of range
1122	FPP1/2 do not match each other or the IVS
1151	CL high LPG
1152	CL low LPG
1153	CL high NG
1154	CL low NG
1155	CL high gasoline bank1
1156	CL low gasoline bank1
1157	CL high gasoline bank2
1158	CL low gasoline bank2
1161	AL high LPG
1162	AL low LPG
1163	AL high NG
1164	AL low NG
1165	LPG cat monitor
1166	NG cat monitor
1171	Megajector delivery pressure higher than expected
1172	Megajector delivery pressure lower than expected

Ford MSG-425 EFI Diagnostic Manual

Genie part number 162067GT

Ford MSG-425 Engine Fault Codes

Code	Description
1173	Megajector comm lost
1174	Megajector voltage supply high
1175	Megajector voltage supply low
1176	Megajector internal actuator fault detection
1177	Megajector internal circuitry fault detection
1178	Megajector internal comm fault detection
1311	Misfire detected
1312	Misfire detected
1313	Misfire detected
1314	Misfire detected
1315	Misfire detected
1316	Misfire detected
1317	Misfire detected
1318	Misfire detected
1511	AUX analog PU1 high
1512	AUX analog PU1 low
1513	AUX analog PU2 high
1514	AUX analog PU2 low
1515	AUX analog PD1 high
1516	AUX analog PD1 low
1517	AUX analog PU3 high
1518	AUX analog PU3 low
1521	CHT higher than expected 1
1522	CHT higher than expected 2
1531	IVS/Brake/Trans-Park interlock failure
1541	AUX analog PUD1 high
1542	AUX analog PUD1 low
1543	AUX analog PUD2 high
1544	AUX analog PUD2 low
1545	AUX analog PUD3 high

Code	Description
1551	AUX DIG1 high
1552	AUX DIG1 low
1553	AUX DIG2 high
1554	AUX DIG2 low
1555	AUX DIG3 high
1556	AUX DIG3 low
1561	AUX analog PD2 high
1562	AUX analog PD2 low
1563	AUX analog PD3 high
1564	AUX analog PD3 low
1611	5VE 1/2 simultaneous out of range
1612	RTI 1 loss
1613	RTI 2 loss
1614	RTI 3 loss
1615	A/D loss
1616	Invalid interrupt
1621	Rx Inactive
1622	Rx Noise
1623	Invalid Packet Format
1624	Shutdown Request
1625	Shutdown Request
1626	CAN Tx failure
1627	CAN Rx failure
1628	CAN addresss conflict failure

Ford MSG-425 EFI Diagnostic Manual

Genie part number 162067GT

Ford MSG-425 Engine Fault Codes

Code	Description
1629	J1939 TSC1 message receipt lost
1630	J1939 ETC message receipt lost
1631	PWM1-Gauge1 open / ground short
1632	PWM1-Gauge1 short to power
1633	PWM2-Gauge2 open /ground short
1634	PWM2-Gauge2 short to power
1635	PWM3-Gauge3 open / ground short
1636	PWM3-Gauge3 short to power
1641	Buzzer control ground short
1642	Buzzer open
1643	Buzzer control short to power
1644	MIL control ground short
1645	MIL control short to power
2111	Unable to reach lower TPS
2112	Unable to reach higher TPS
2115	FPP1 higher than IVS limit
2116	FPP2 higher than IVS limit
2120	FPP1 invalid voltage and FPP2 disagrees with IVS
2121	FPP1 lower than FPP2
2122	FPP1 high voltage
2123	FPP1 low voltage
2125	FPP2 invalid voltage and FPP1 disagrees with IVS
2126	FPP1 higher than FPP2
2127	FPP2 low voltage
2128	FPP2 high voltage

Code	Description
2130	IVS stuck at-idle, FPP1/2 match
2131	IVS stuck off-idle, FPP1/2 match
2135	TPS1/2 simultaneous voltages out of range
2139	FPP1 lower than IVS limit
2140	FPP2 lower than IVS limit
2229	BP high pressure
2300	Primary Loop Open or Low-side Short to Ground
2301	Primary Coil Shorted
2303	Primary Loop Open or Low-side Short to Ground
2304	Primary Coil Shorted
2306	Primary Loop Open or Low-side Short to Ground
2307	Primary Coil Shorted

Ford MSG-425 EFI Diagnostic Manual

Genie part number 162067GT

Ford MSG-425 Engine Fault Codes

Code	Description
2309	Primary Loop Open or Low-side Short to Ground
2310	Primary Coil Shorted
2312	Primary Loop Open or Low-side Short to Ground
2313	Primary Coil Shorted
2315	Primary Loop Open or Low-side Short to Ground
2316	Primary Coil Shorted
2318	Primary Loop Open or Low-side Short to Ground
2319	Primary Coil Shorted
2321	Primary Loop Open or Low-side Short to Ground
2322	Primary Coil Shorted
2618	Tach output ground short
2619	Tach output short to power

Ford MSG-425 EFI Diagnostic Manual

Genie part number 162067GT

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 in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

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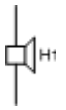
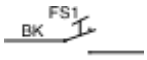
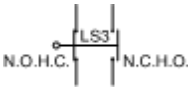
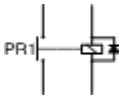
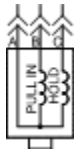
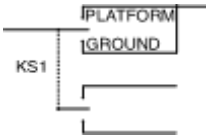
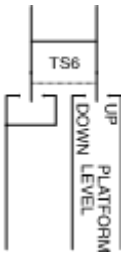
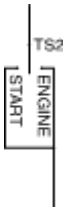
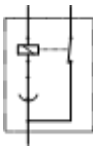
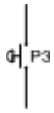
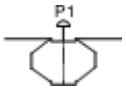
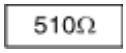
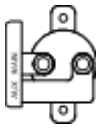
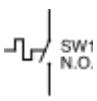
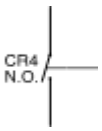
Electrical Schematics

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

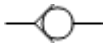
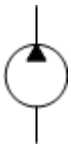
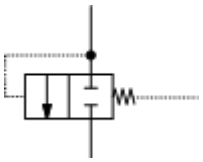
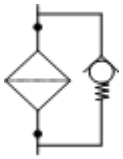
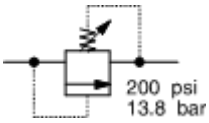
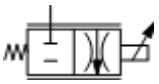
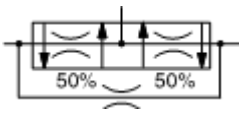
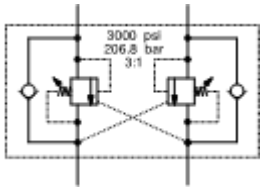
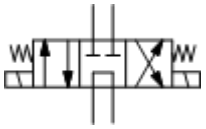
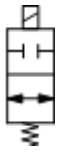
Hydraulic Schematics

⚠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.

Electrical Symbol Legend

 Battery	 Coil, solenoid or relay	 Horn or alarm	 Flashing beacon	 Gauge
 Diode	 Hour meter	 LED	 Fuse with amperage	 Foot switch
 T-circuits connect	 Limit switch	 Power relay	 Coil with suppression	 Fuel or RPM solenoid
 Connection - no terminal	 T-circuits connect at terminal	 Circuits crossing no connection	 Quick disconnect terminal	 Circuit breaker with amperage
 Key switch	 Toggle Switch DPDT	 Toggle Switch SPDT	 Pump or Motor	 Tilt sensor
 Horn button - normally open	 Emergency Stop button - normally closed	 Resistor with ohm value	 Battery separator	 Gauge sending unit
 Oil temperature switch normally open	 Coolant temperature switch - normally open	 Oil pressure switch normally closed	 Control relay contact normally open	 Diode starting aid, glow plug or flame ignitor

Hydraulic Symbols Legend

 Orifice with size	 Check valve	 Shut off valve	 Brake
 Pump, fixed displacement	 Pump, bi-directional variable displacement	 Motor, bi-directional	 Motor, 2 speed bi-directional
 Cylinder, double acting	 Pump, prime mover (engine or motor)	 Shuttle valve. 2 position, 3 way	 Differential sensing valve
 Filter with bypass relief valve	 Relief valve with pressure setting	 Priority flow regulator valve	 Solenoid operated proportional valve
 Directional valve (mechanically activated)	 Flow divider/combiner valve	 Pilot operated 3 position, 3 way shuttle valve	 Solenoid operated 2 position, 3 way directional valve
 Counterbalance valve with pressure and pilot ratio	 Solenoid operated 3 position 4 way directional valve	 Solenoid operated 3 position, 4 way proportional directional valve	 Solenoid valve, 2 position 2 way

Electrical Component and Wire Color Legends

Item	Description
B	**Battery**
B1	Engine Start - 12V DC
C	**Connector**
C1, C3	Controls cables
C5	Engine
C6	Functions
C7	Power to platform, 12V DC
C9	Foot switch
C32	U33 (AS and CE models)
C54	Options
C56	Telematics
CB	**Circuit Breaker**
CB1	Engine power, 15A
CB2	Controls power, 15A
CB3	Oil cooler, 15A
CB4	Drive lights, 10A (option)
CB7	Engine rpm, 10A
CR	**Control Relay**
CR1	Engine start
CR2	Ignition power
CR2A	Ignition power
CR4	High idle
CR5	Horn
CR13	Jib (jib option)
CR14	Jib (jib option)
CR17	Hydraulic oil cooling fan (option)
CR18	Platform level cutout (CE models)
CR23	Drive lights
CR27	Brake circuit (lift/drive option)
CR30	Limit switch (lift/drive option)
CR39	High idle
CR51	Aircraft package (option)
CR75	Tilt alarm
CR76	Load sense aux recovery
CR80	Telematics

F	Fuse
F18	Work lights, 5A
F33	Telematics, 6A
G	**Gauge**
G1	Battery Charge Indicator
G2	Engine oil pressure
G3	Engine coolant temp.
G4	Engine oil temp.
G6	Hour meter

Electrical Component and Wire Color Legends

Item	Description
H	**Horn or Alarm**
H1	Tilt / Platform overload
H2	Horn
H4	Descent / Travel
H6	Platform overload
JC	**Joystick**
JC1	Boom proportional joystick: secondary boom up/down
JC2	Boom proportional joystick: primary up/down, turntable rotate
JC3	Drive proportional joystick
KS	**Keyswitch**
KS1	Key switch
L	**LED or Light**
L1	Drive enable led
L2	Check engine led
L4	Platform overload led (AS/CE models)
L29	Drive lights
L45	Platform overload led (AS/CE models)
L48	Tilt alarm led (ANSI/CSA models)
LS	**Limit Switch**
LS1	Primary boom extend
LS2	Primary boom up
LS3	Drive enable
LS4	Secondary boom up
LS18	Platform overload (AS/CE models)
LS18A	Platform overload (AS/CE models)

Item	Description
M	**Motor**
M1	Oil cooler fan
M2	Auxiliary pump
M3	Engine starter
M4	Fuel pump
P	**Button**
P1	Red emergency stop (ground)
P2	Red emergency stop (platform)
P3	Horn
P4	Function enable
PR	**Power Relay**
PR1	Auxiliary pump (M2)
PR2	Engine starter (M3)
PR3	Starting aid / glow plugs
R	**Resistor**
R4	Speed limiting variable 20 ohms
R14	Secondary boom down, 5 ohms
R18	Primary boom down, 5 ohms
R20	Platform overload, 4.7k ohms (AS/CE)
R21	Platform box heater, 4.7k ohms (Option)
R22	Platform box heater, 4.7k ohms (Option)
SW	**Switch**
SW2	Engine oil pressure
SW3	Engine oil temperature

Electrical Component and Wire Color Legends

Item	Description
TS	**Toggle Switch**
TS1	Auxiliary pump
TS2	Start engine
TS3	Fuel select (MSG-425 models)
TS4	Hi/low rpm
TS6	Glow plug (diesel models)
TS7	Platform rotate
TS8	Jib boom (jib option)
TS9	Platform level
TS13	Primary boom extend/retract
TS14	Drive speed
TS15	Drive enable
TS43	Platform box heater (option)
TS46	Proximity kill (option)
TS47	Generator (option)
TS51	Auxiliary pump
TS52	Engine start
TS53	Fuel select (MSG-425 models)
TS54	Rpm select
TS56	Glow plug (diesel models)
TS57	Platform rotate
TS58	Jib boom up/down (option)
TS59	Platform level up/down
TS60	Secondary boom up/down
TS61	Primary boom up/down
TS62	Turntable rotate
TS63	Primary boom extend/retract
TS64	Run/test (Ford)
TS74	Run/test (Deutz)

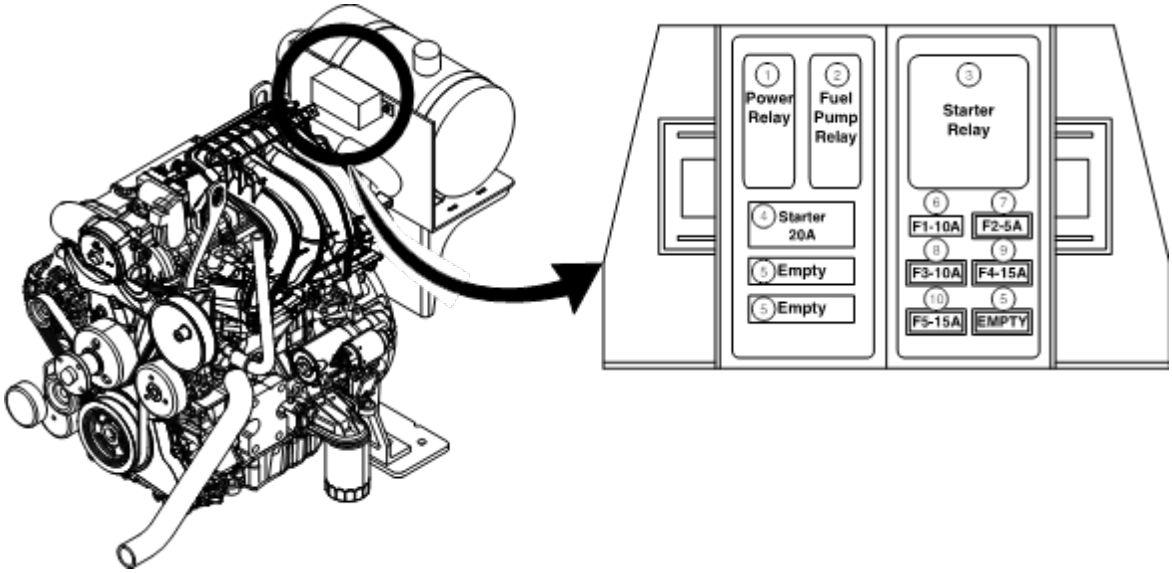
Item	Description
U	**Module**
U1	Ignition start module
U4	EDC - drive pump
U13	ALC-500 joystick controller card
U33	Load sense module
U34	Time delay relay - 2 seconds, 10A
U35	Time delay relay - 2 seconds, 30A
U38	Time delay relay - 2 seconds, 10A
U39	J1939 Ground Control Box Display
X	**ALC500 connectors**
X101	ALC500 input/out connectors
X102	ALC500 input/out connectors
X103	ALC500 input/out connectors
X104	ALC500 input/out connectors
X105	ALC500 input/out connectors
X106	ALC500 input/out connectors
X107	ALC500 input/out connectors
X108	ALC500 input/out connectors
X109	ALC500 input/out connectors
X1-4	Circuit splice

Electrical Component and Wire Color Legends

Wire Color Legend	
Item	**Description**
BL	Blue
BK	Black
BR	Brown
GR	Green
OR	Orange
PP	Purple
RD	Red
WH	White
YL	Yellow
BL/BK	Blue/Black
BL/RD	Blue/Red
BL/WH	Blue/White
BK/RD	Black/Red
GR/BK	Green/Black
GR/WH	Green/White
OR/BK	Orange/Black
OR/RD	Orange/Red
OR/WH	Orange/White
RD/BK	Red/Black
RD/WH	Red/White
WH/BK	White/Black
WH/RD	White/Red
WH/YL	White/Yellow
YL/BK	Yellow/Black

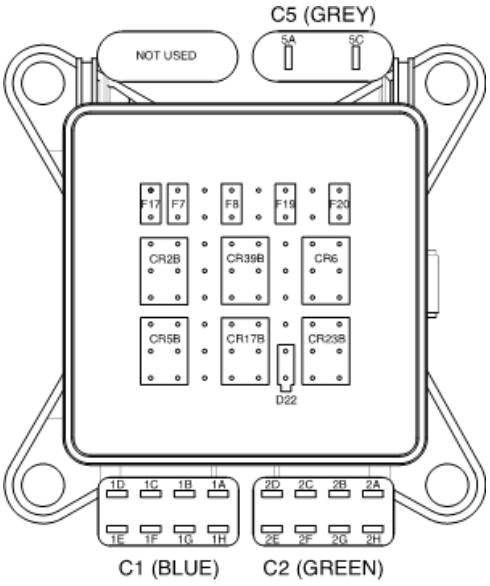
Ford Engine Relay Layout

Ford MSG-425 EFI



1 Power Relay
2 Fuel Pump Relay
3 Starter Relay
4 Starter - 20A
5 Empty
6 Fuse 1 - 10A
7 Fuse 2 - 5A
8 Fuse 3 - 10A
9 Fuse 4 - 15A
10 Fuse 5 - 15A

Engine Relay Layout - Deutz TD 2.2 L3, D 2.9 L4 and Perkins 404F-22



Deutz TD 2.2 L3, D 2.9 L4

Fuses

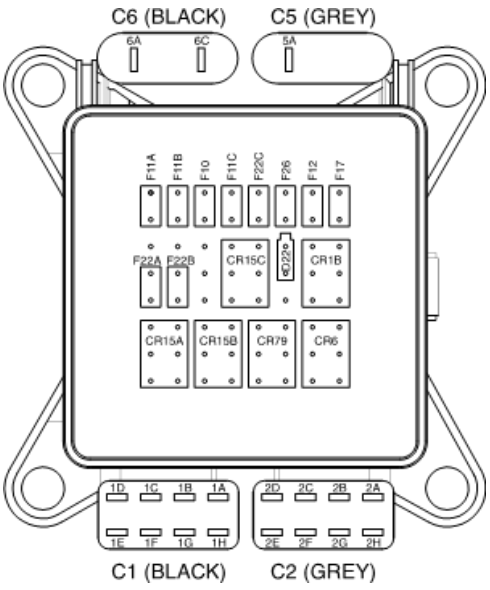
F7	20A	Horn, Hydraulic Oil Cooler
F8	30A	ECU Power
F17	15A	Ignition
F19	10A	Engine accessory
F20	20A	Fuel Pump

Diode

D22	6A	Alternator Ext.

Relays

CR2B	Ignition on
CR5B	Horn
CR6	Fuel pump
CR17B	Hydraulic oil cooler (option)
CR23B	Engine accessory
CR39B	Auxiliary pump



Perkins 404F-22

Fuses

F10	15A	Relay power
F11A	15A	ARD Injector 1
F11B	15A	ARD Injector 2
F11C	5A	Linear solenoid
F12	7.5A	Engine start
F17	10A	Fuel, Alternator Ext.
F22A	15A	Glow plug 1
F22B	20A	Glow plug 2
F22C	20A	ARD Glow plug

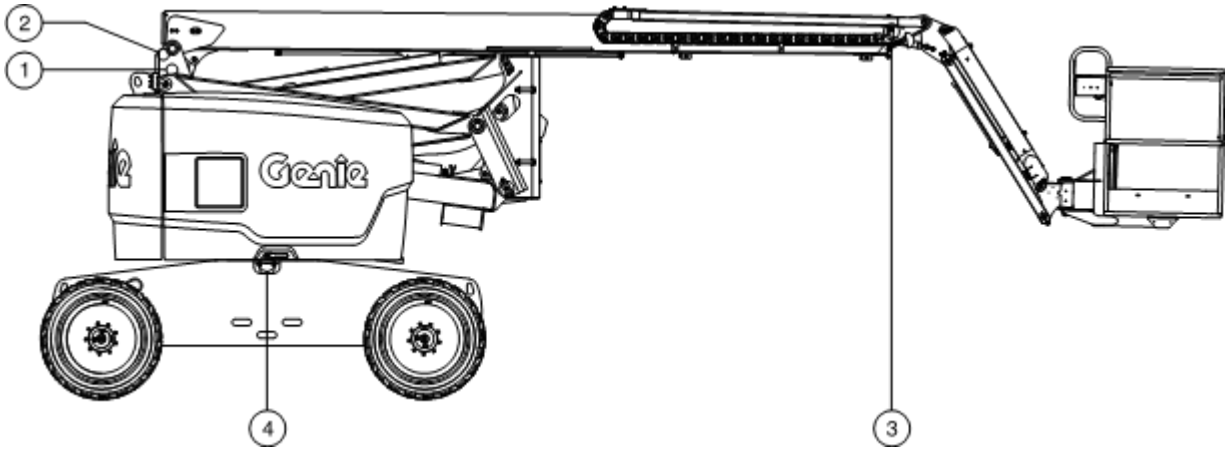
Diode

D22	6A	Alternator Ext.

Relays

CR1B	Engine start
CR6	Fuel, Alternator Ext.
CR15A	Glow plug 1
CR15B	Glow plug 2
CR15C	ARD Glow plug
CR79	Burner air pump

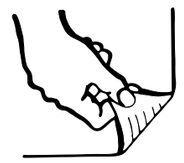
Limit Switch Legend



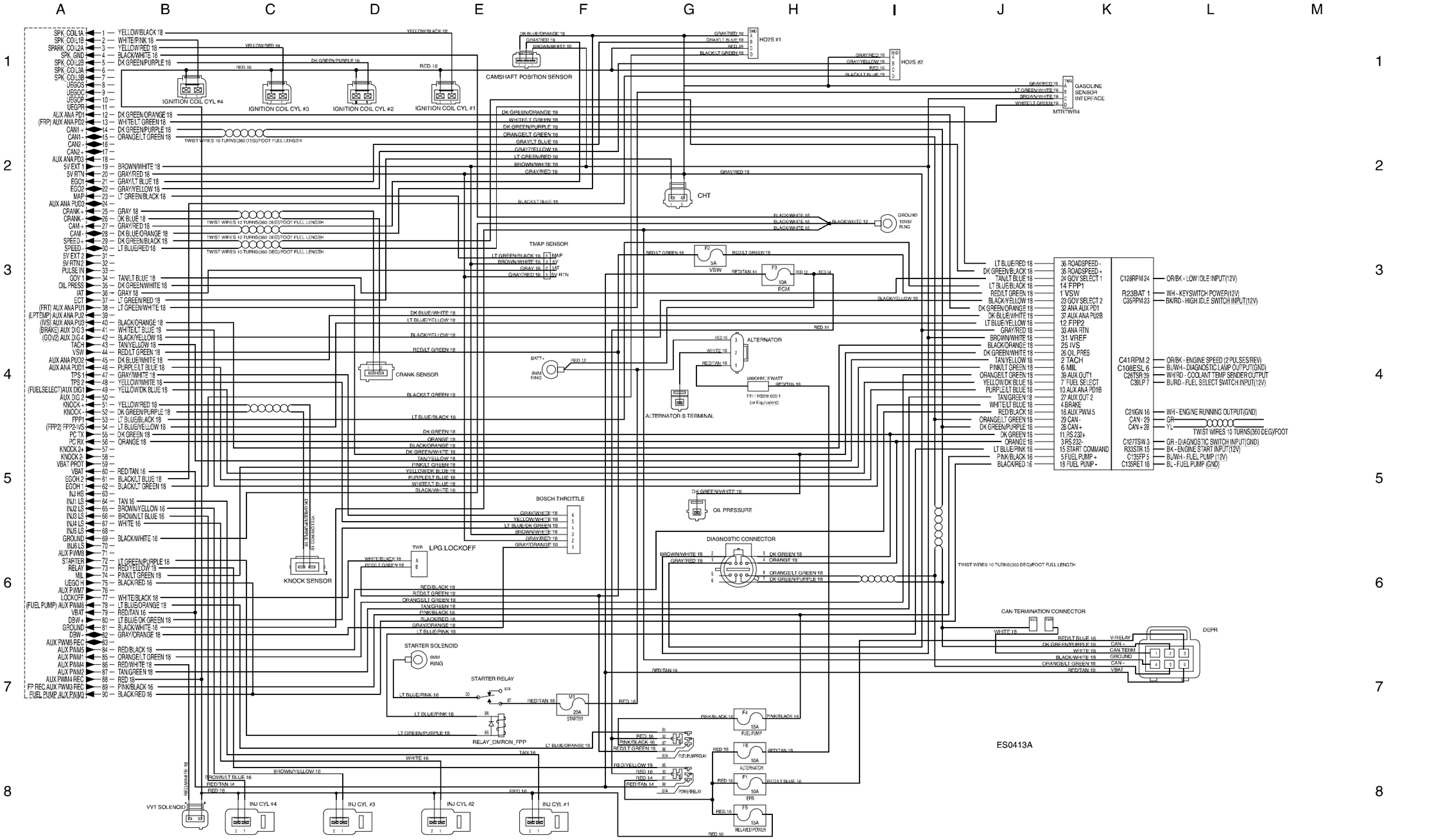
1 LS4 - Secondary boom up
2 LS2 - Primary boom up
3 LS1 - Primary boom extend
4 LS3 - Drive enable

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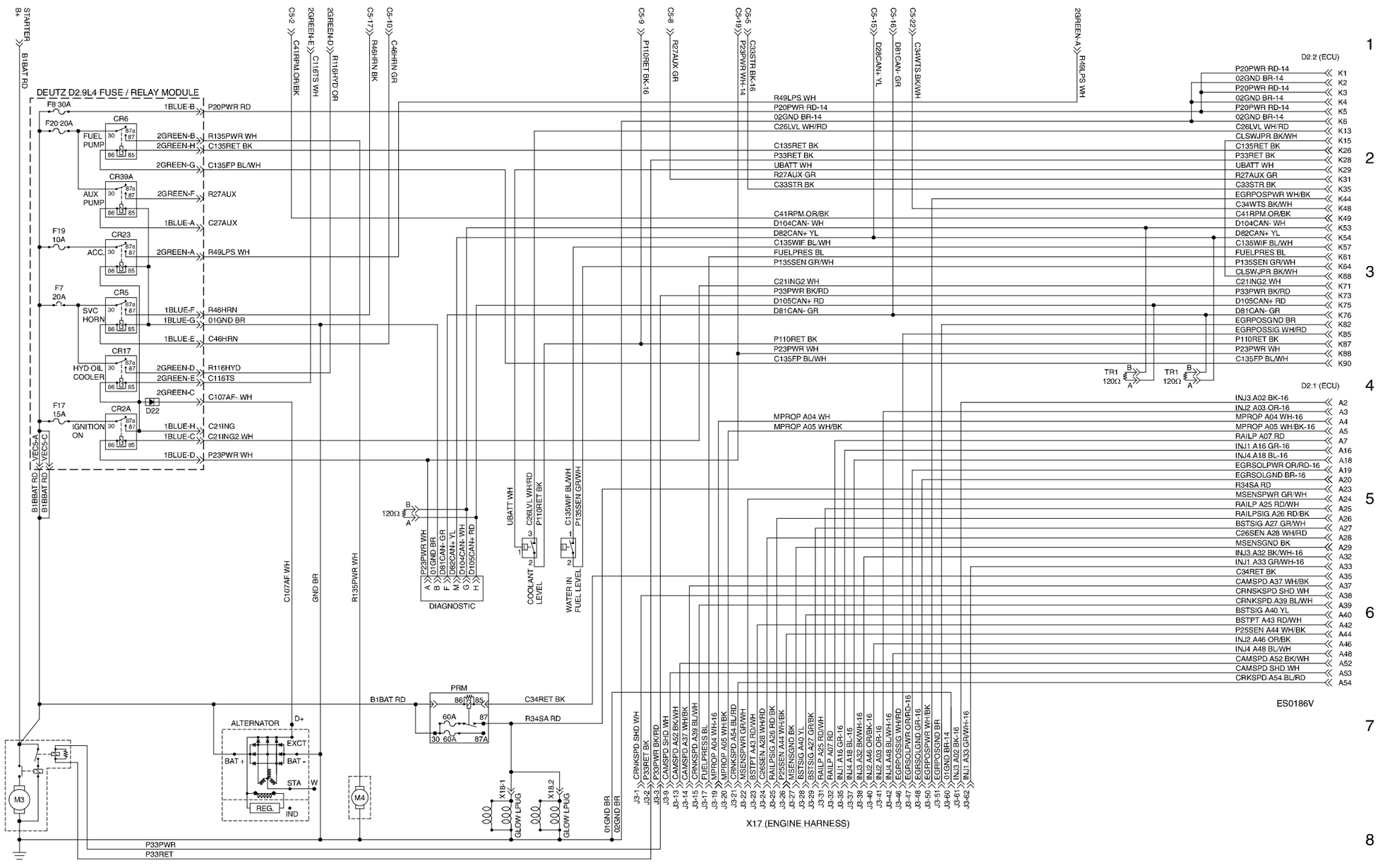
Ford MSG-425 Engine Wire Harness



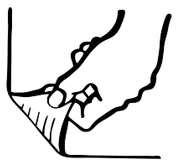
Ford MSG-425 EFI Engine Wire Harness



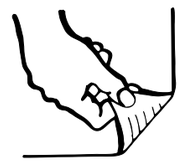
Deutz D 2.9 L4 Engine Wire Harness



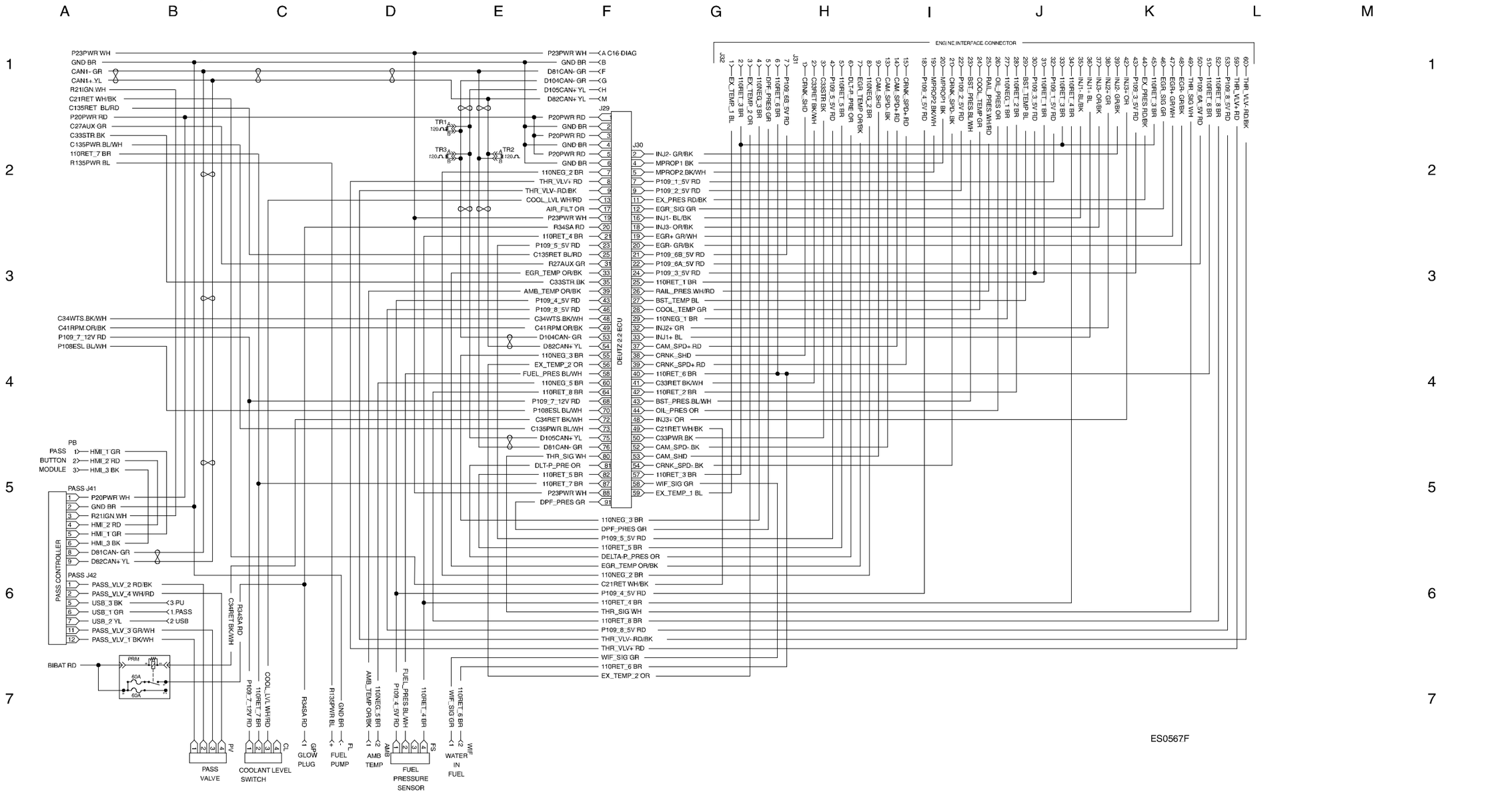
Deutz D 2.9 L4 Engine Wire Harness



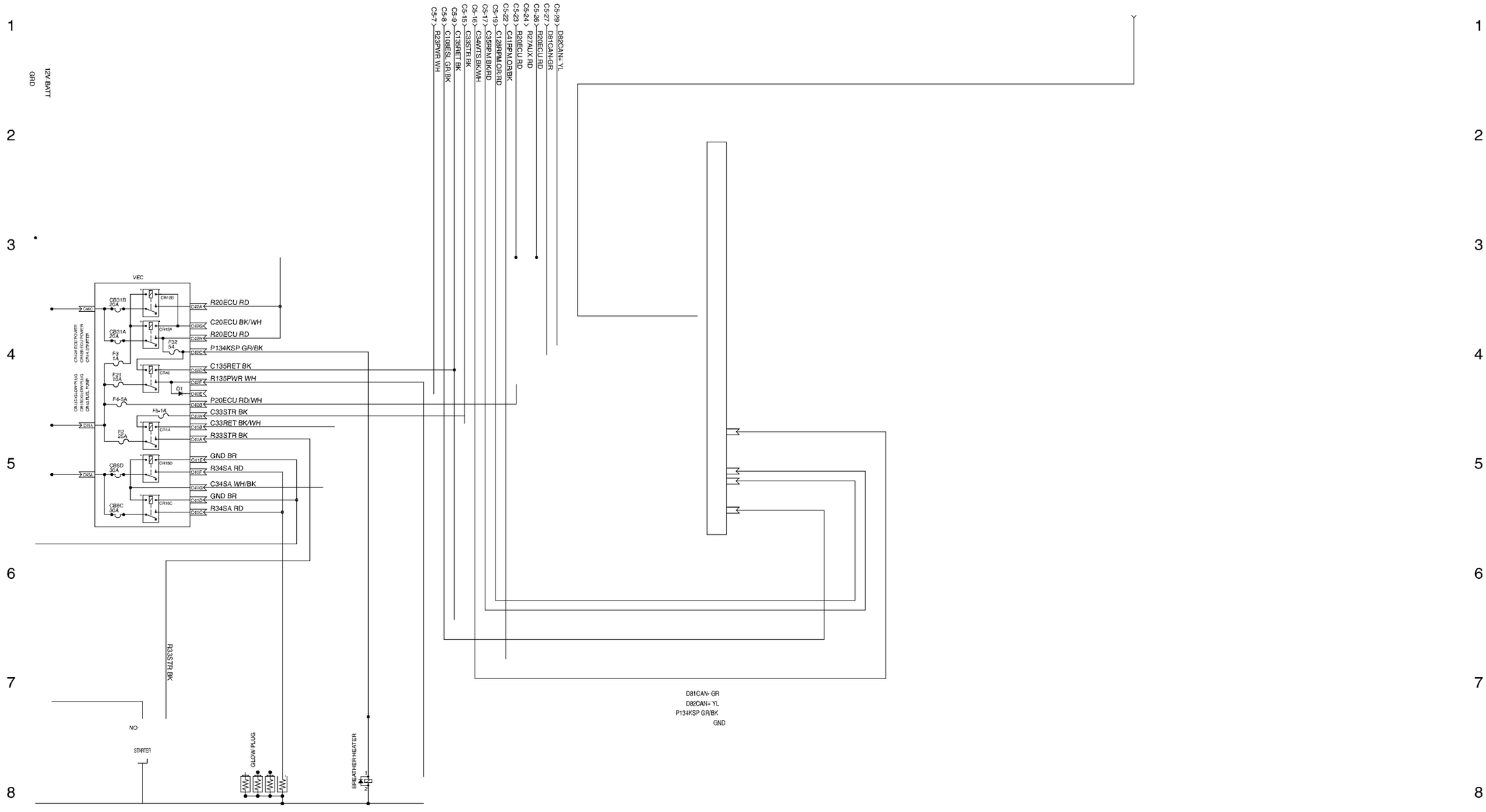
Deutz TD 2.2 L3 Engine Wire Harness



Deutz TD 2.2 L3 Engine Wire Harness



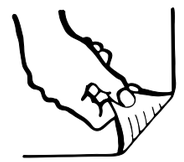
Perkins 404F-E22T Engine Wire Harness



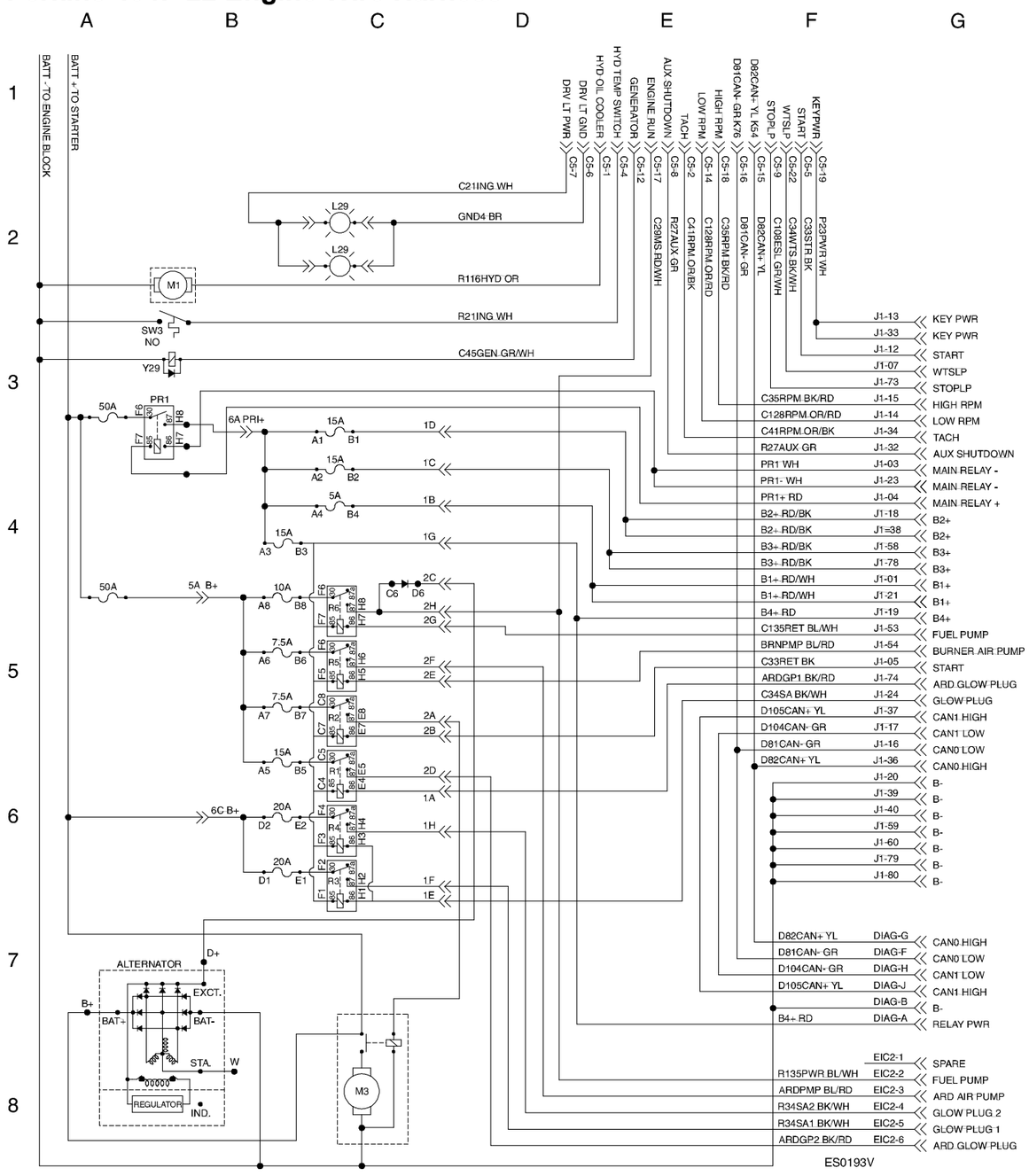
Perkins 404F-E22T Engine Wire Harness



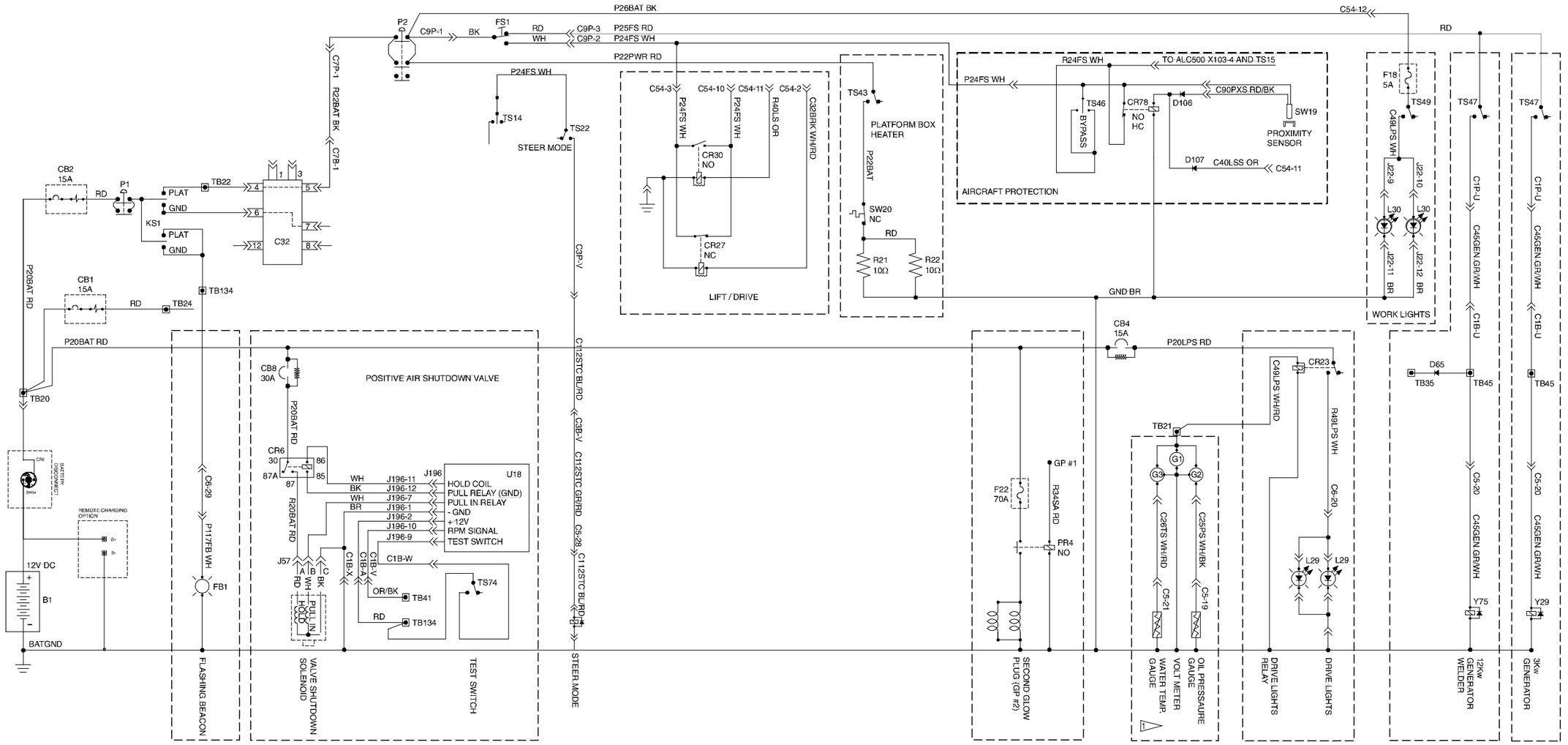
Perkins 404F-22 Engine Wire Harness



Perkins 404F-22 Engine Wire Harness



Electrical Schematic, Options (All Models)



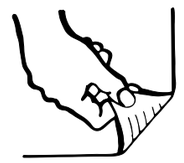
1 DEUTZ D2011L03i, TD2011L04i AND PERKINS 404D-22 MODELS ONLY.

ES0550L

Electrical Schematic, Options (All Models)

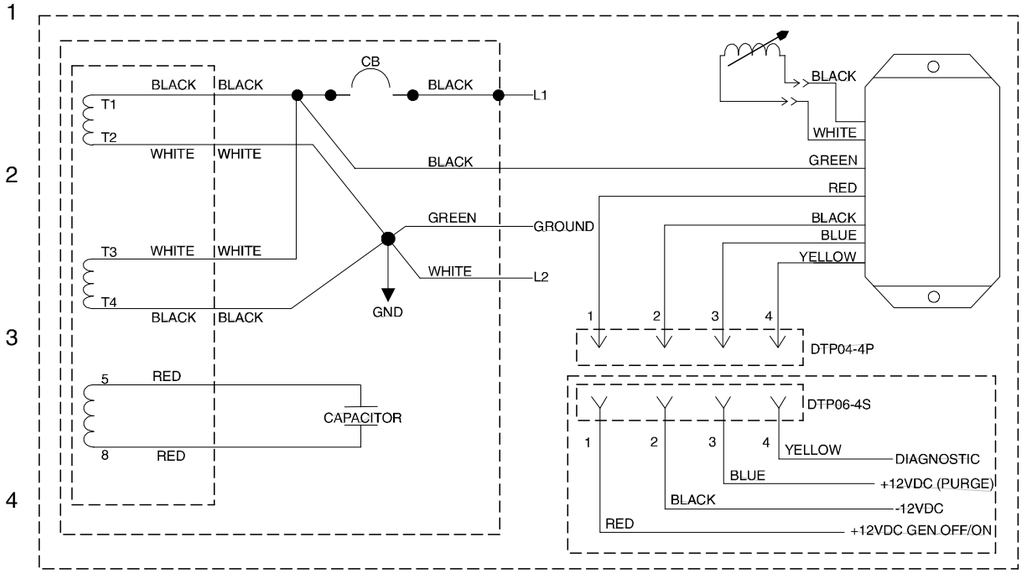


Wiring Diagram, 3kW Hydraulic Generator

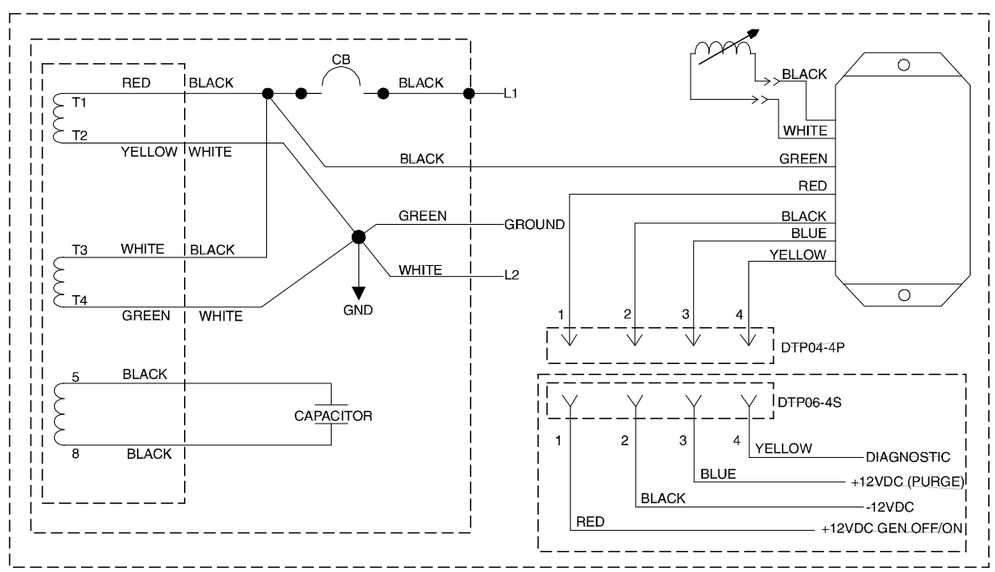


Wiring Diagram, 3kW Hydraulic Generator

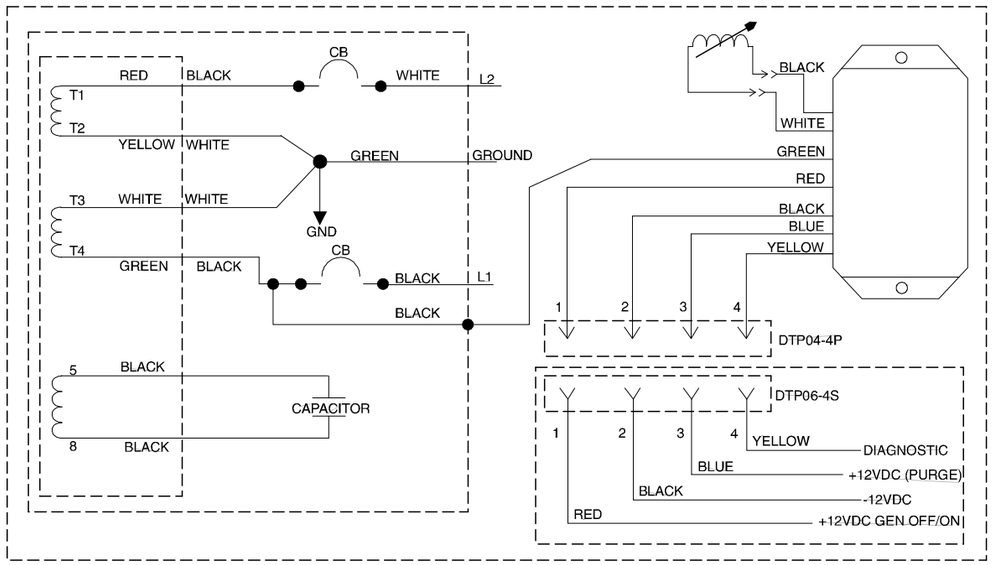
120V AC 60HZ



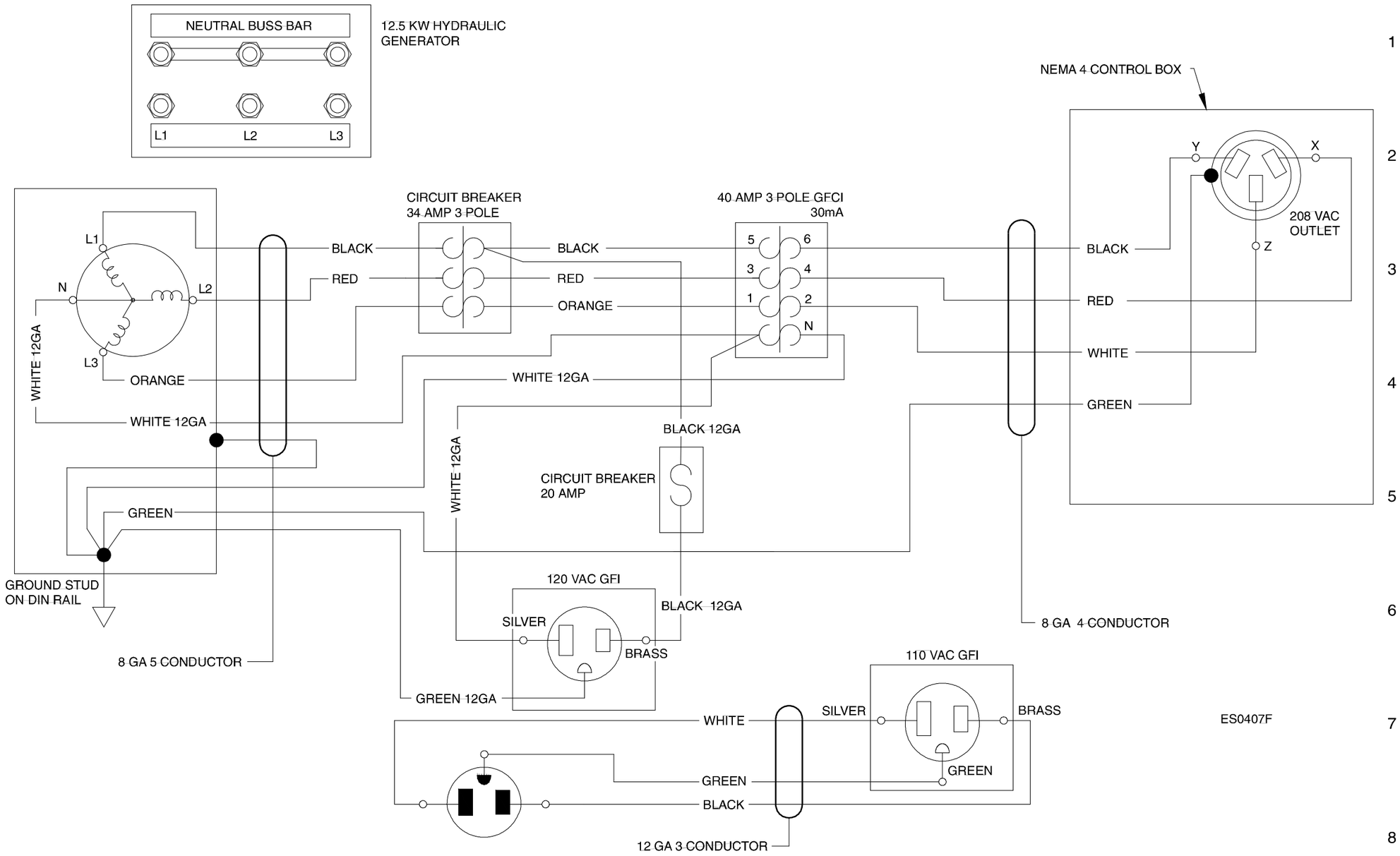
120V AC 50HZ



240VAC 50HZ



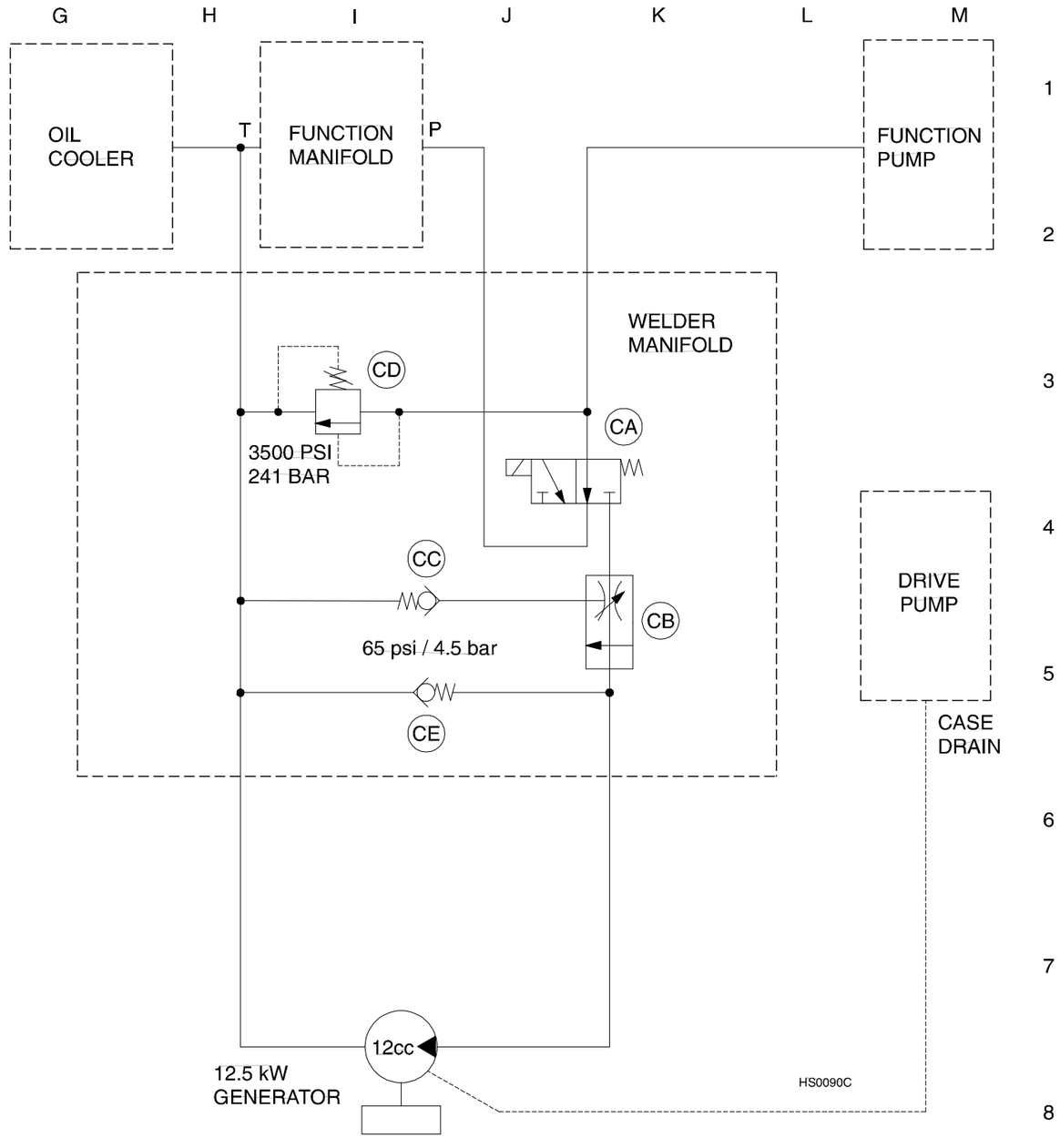
Wiring Diagram, 12kW Hydraulic Generator - Welder Option



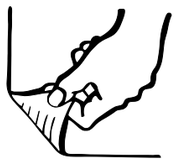
ES0407F

Wiring Diagram, 12kW Hydraulic Generator - Welder Option

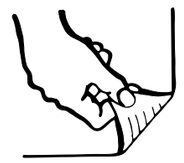
Hydraulic Schematic, 12kw Hydraulic Generator - Welder Option



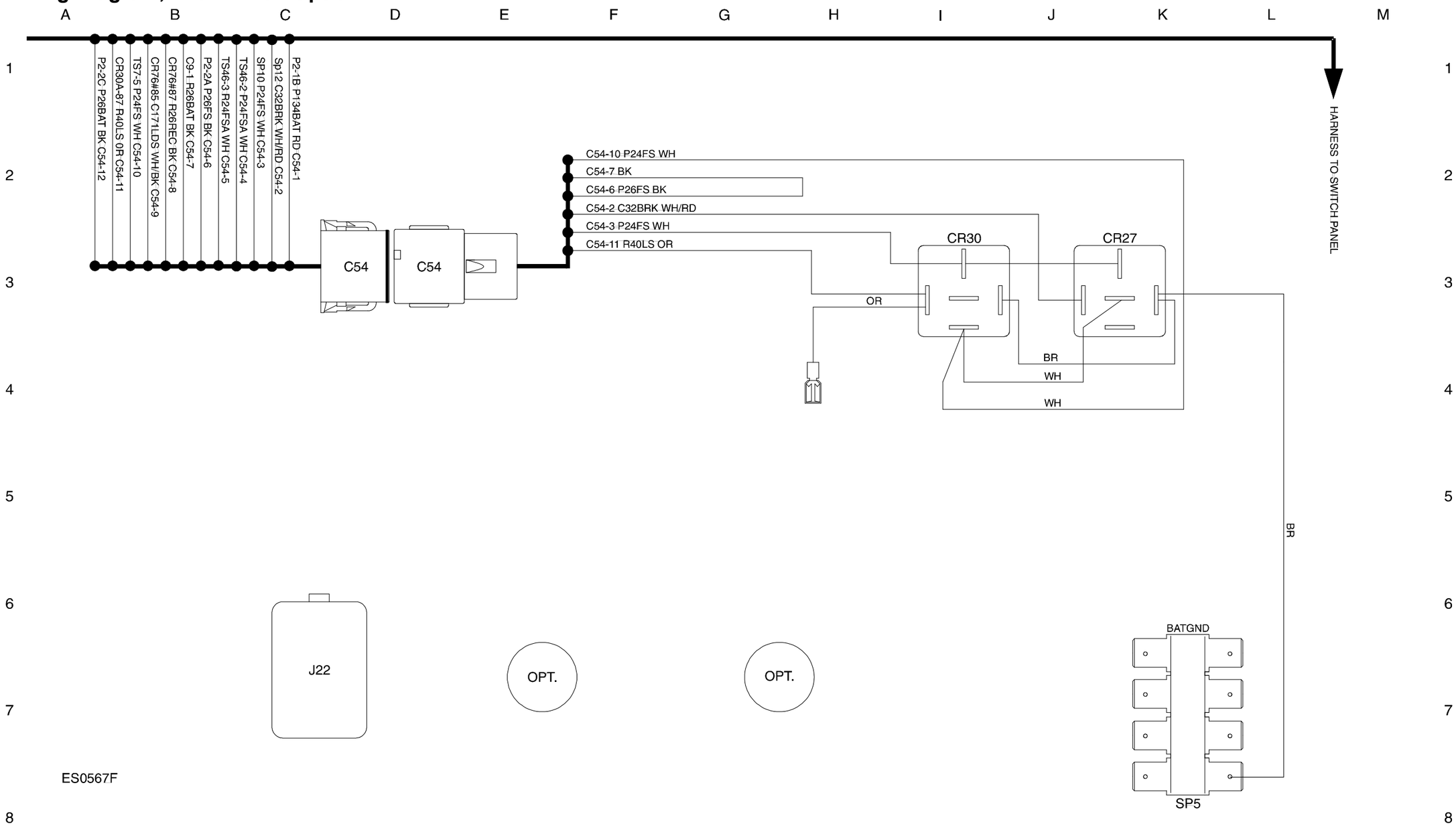
Hydraulic Schematic, 12kw Hydraulic Generator - Welder Option



Wiring Diagram, Lift / Drive - Option

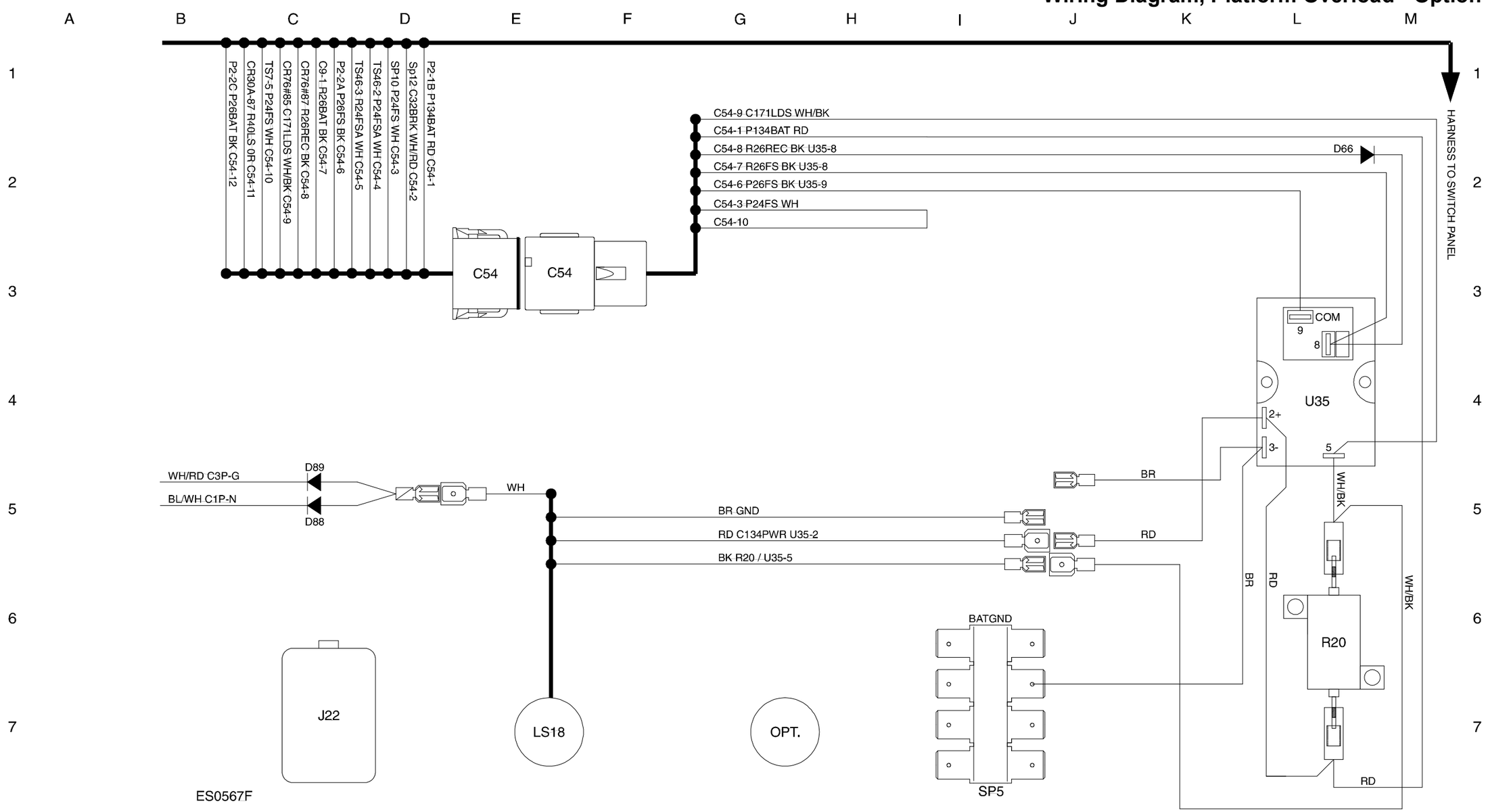


Wiring Diagram, Lift / Drive - Option



ES0567F

Wiring Diagram, Platform Overload - Option

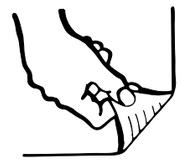


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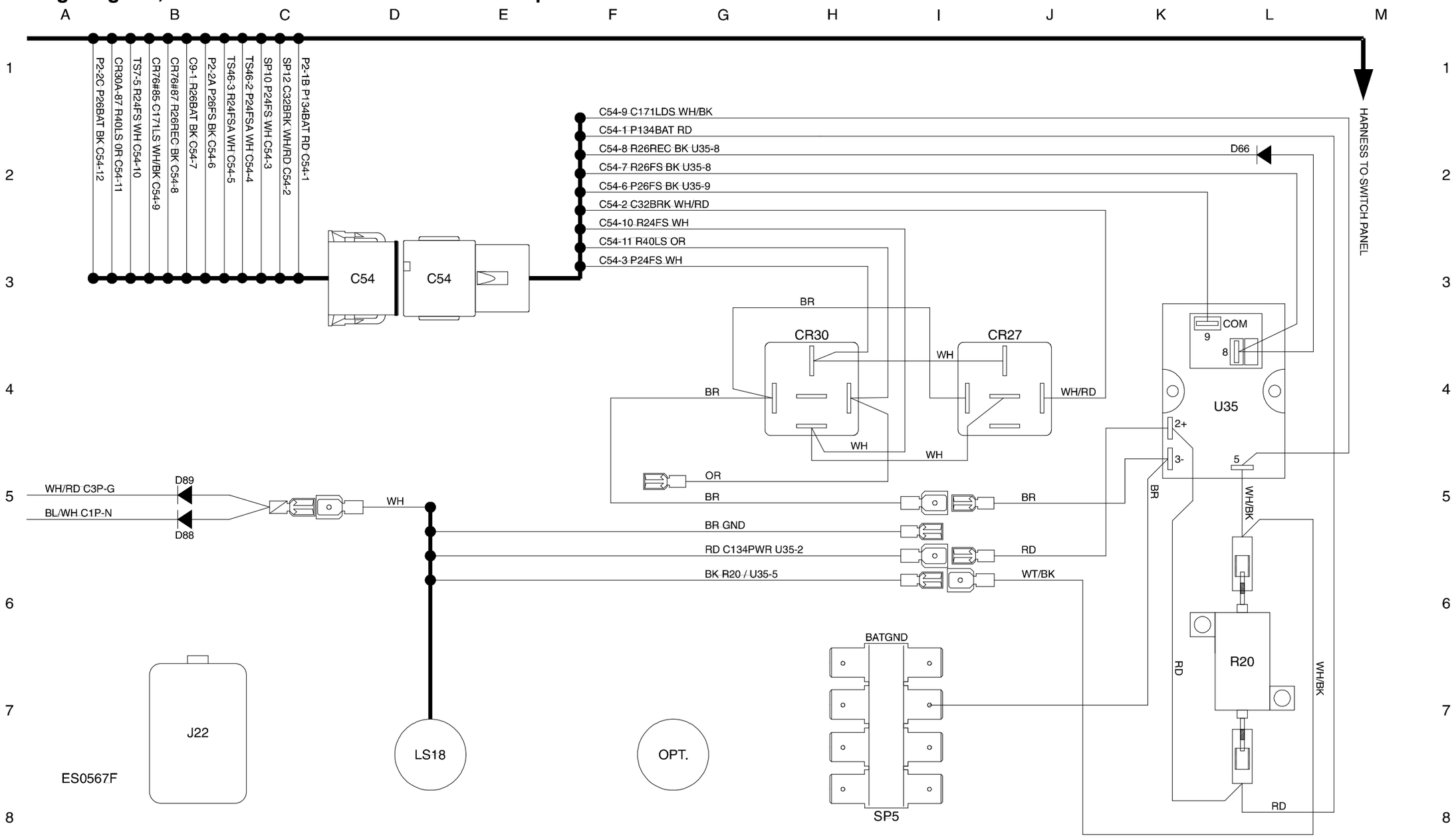
Wiring Diagram, Platform Overload - Option



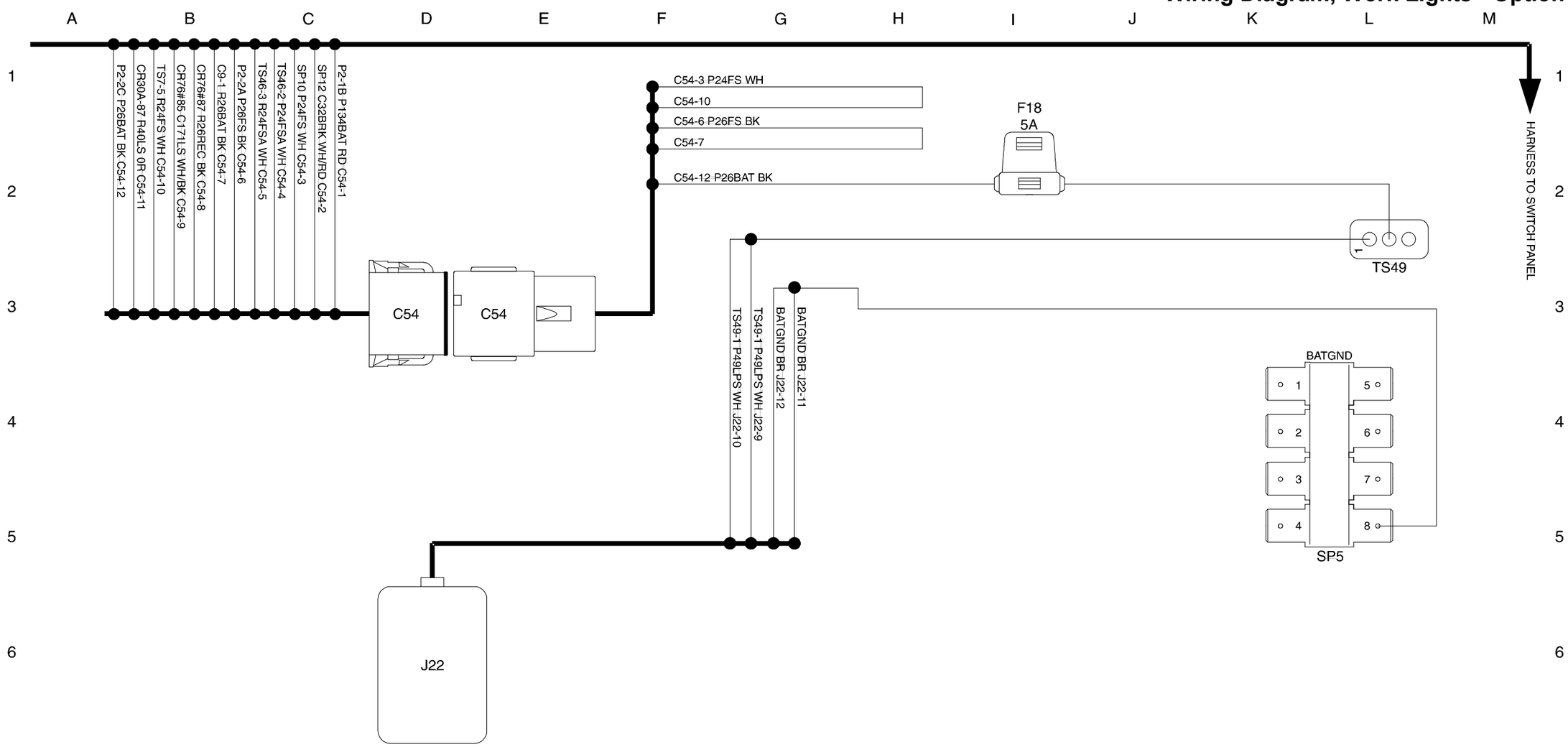
Wiring Diagram, Platform Overload and Lift / Drive - Option



Wiring Diagram, Platform Overload and Lift / Drive - Option



Wiring Diagram, Work Lights - Option

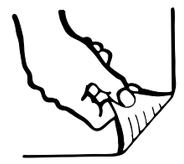


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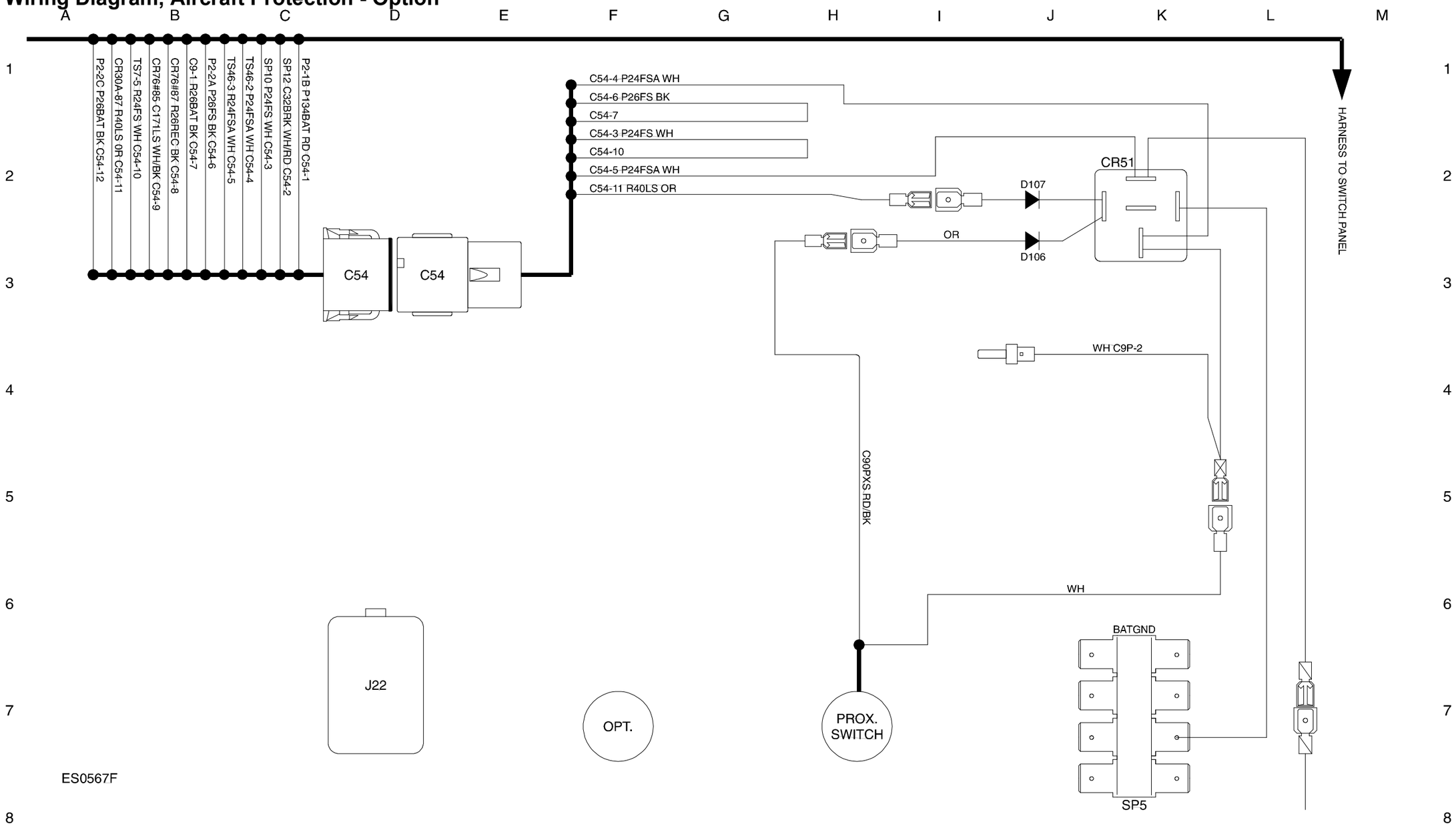
Wiring Diagram, Work Lights - Option



Wiring Diagram, Aircraft Protection - Option

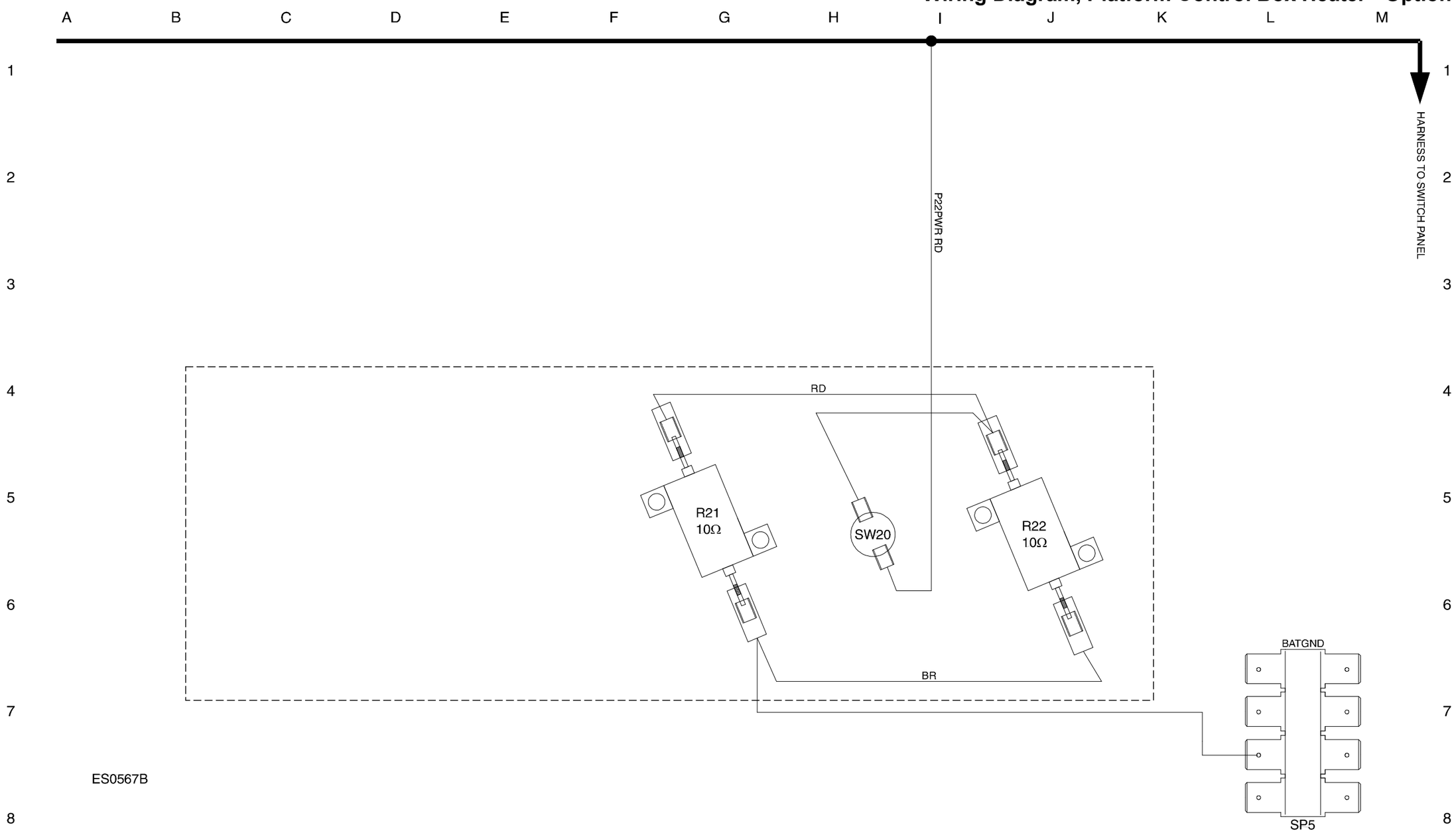


Wiring Diagram, Aircraft Protection - Option



ES0567F

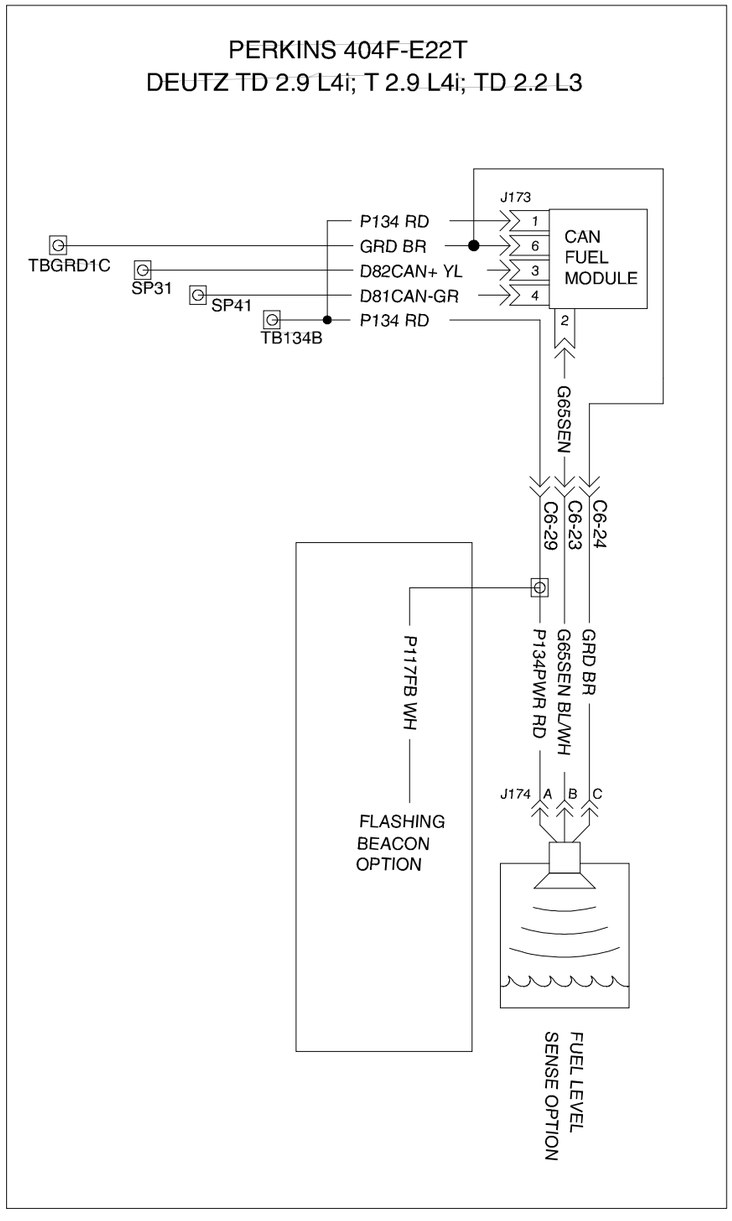
Wiring Diagram, Platform Control Box Heater - Option

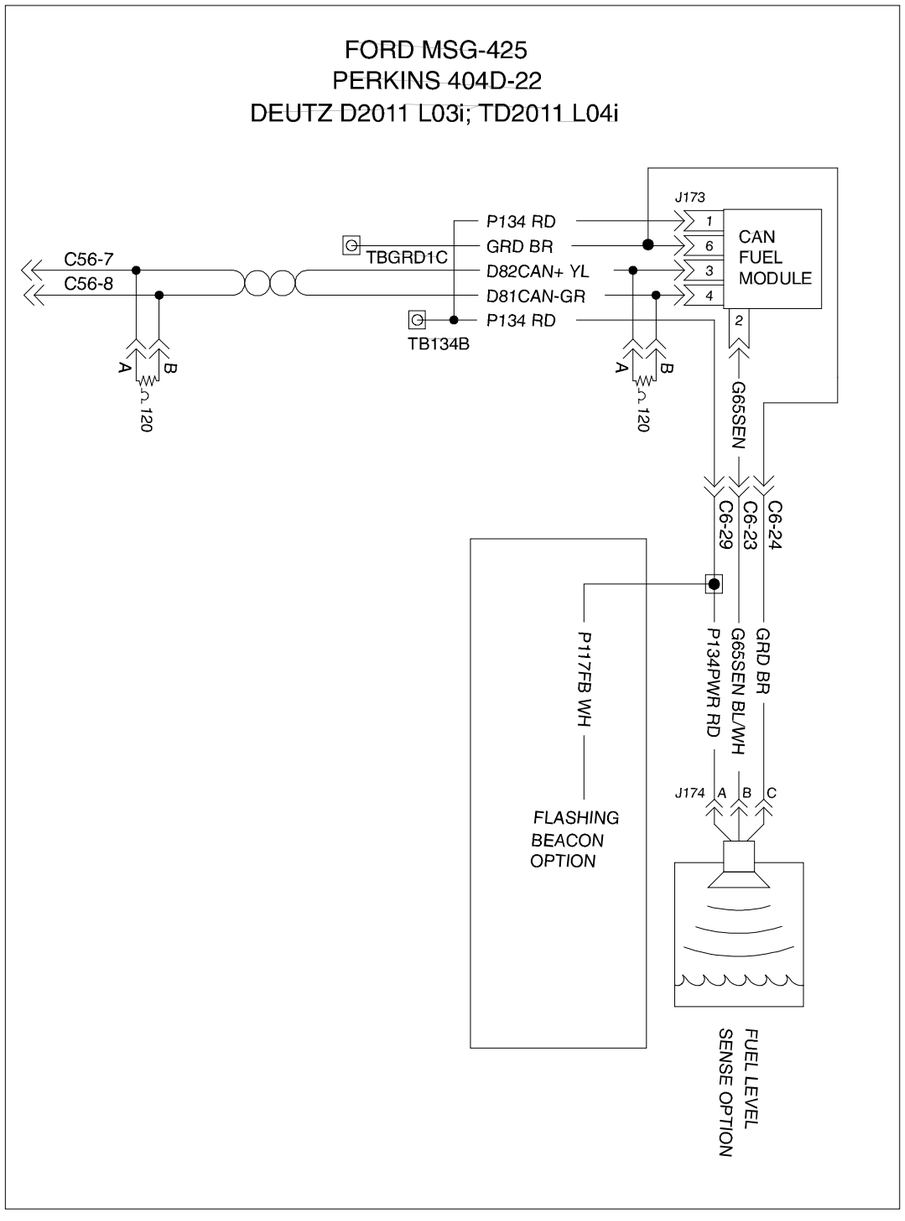


ES0567B

Wiring Diagram, Platform Control Box Heater - Option

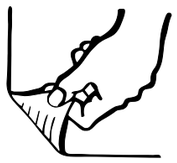
Fuel Level Sensing - Option





ES0550L

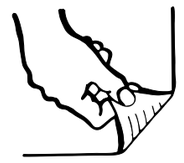
Fuel Level Sensing - Option



Hydraulic Schematic, 2WD - 2 Wheel Steer Models

[to serial numbers Z62D-546, Z62H-4484]

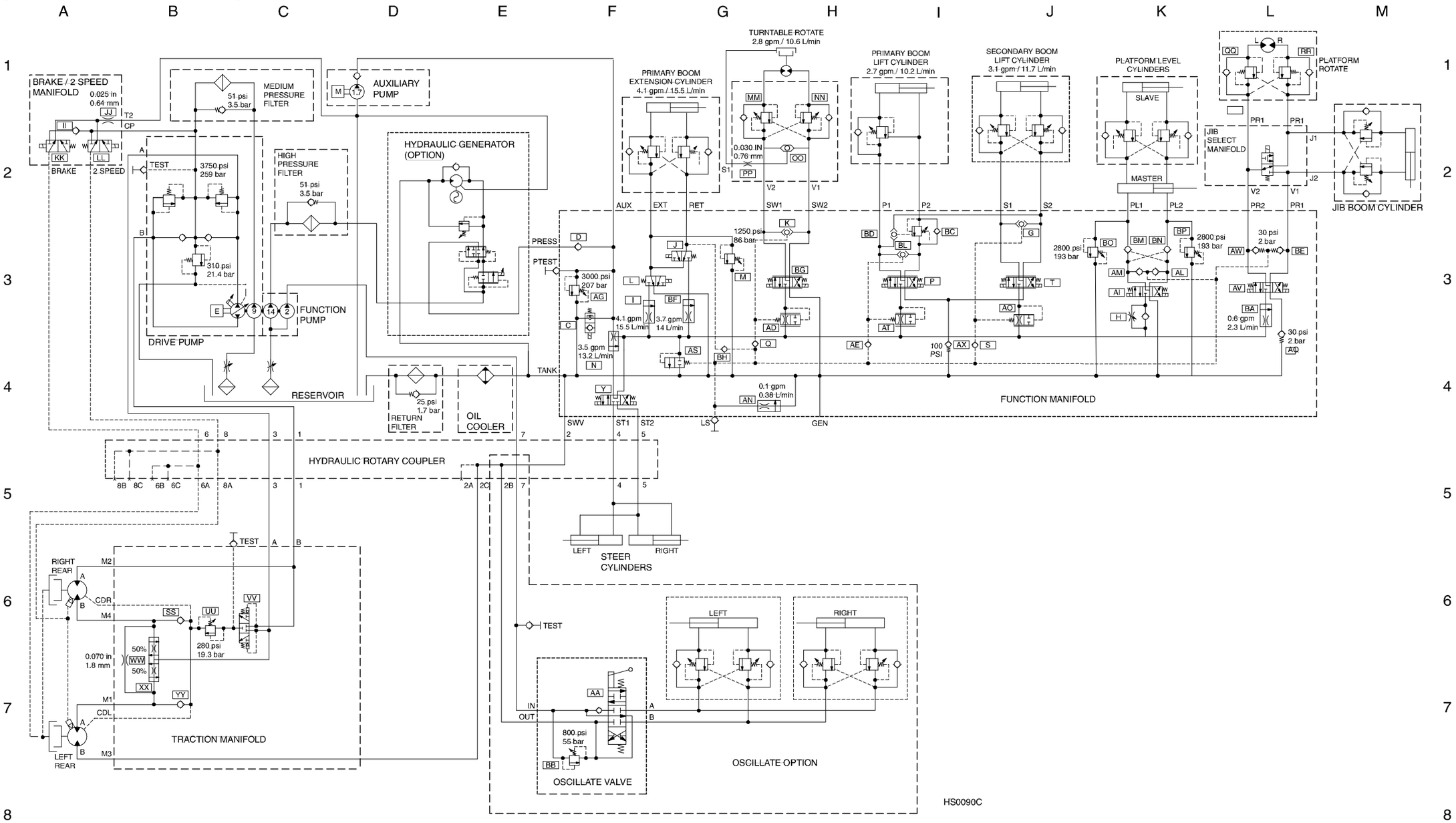
[from serial number Z62M-101]



Hydraulic Schematic, 2WD - 2 Wheel Steer Models

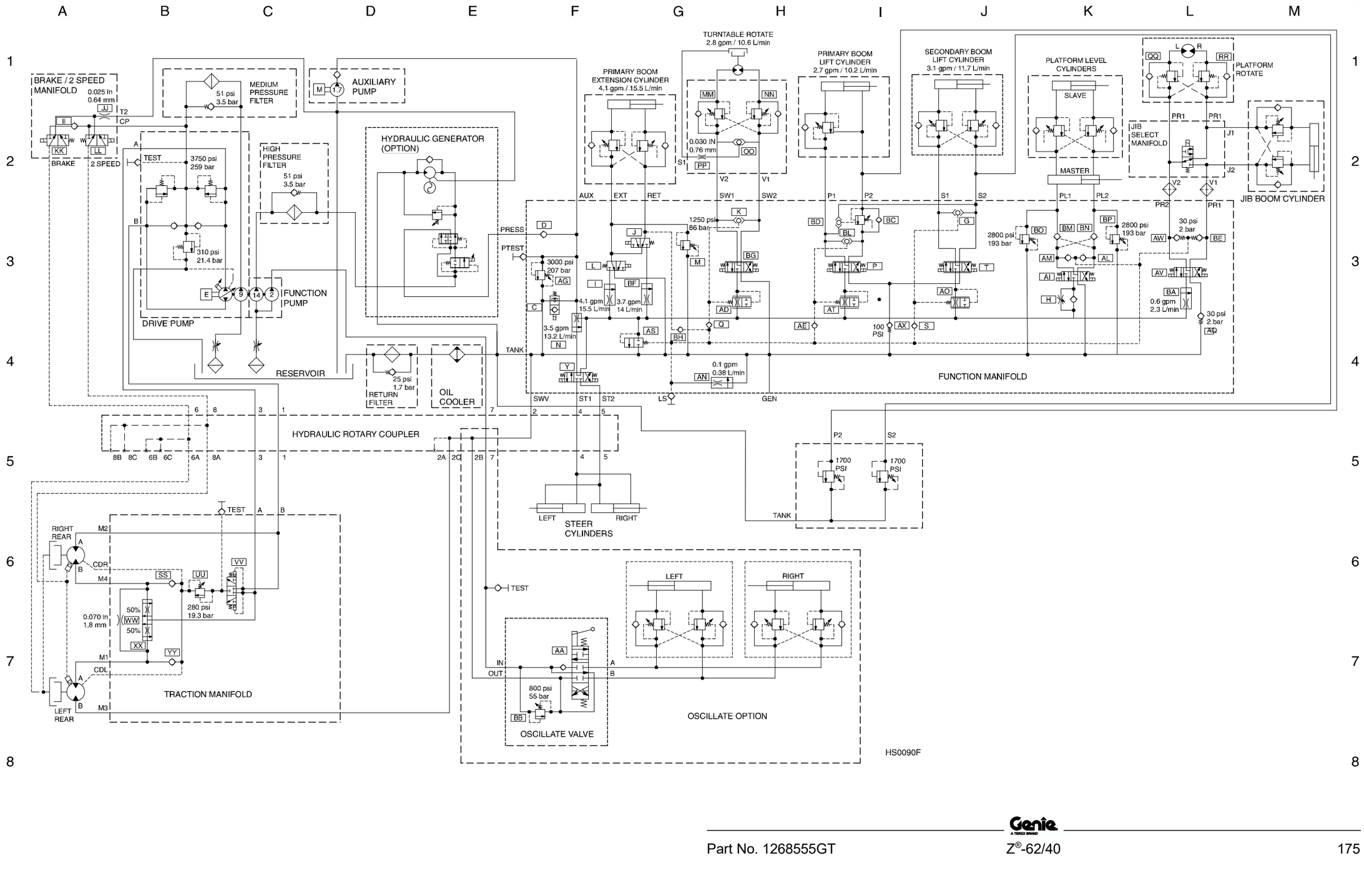
[to serial numbers Z62D-546, Z62H-4484]

[from serial number Z62M-101]



Hydraulic Schematic, 2WD - 2 Wheel Steer Models

[from serial numbers Z62D-547, Z62H-4485]



Hydraulic Schematic, 2WD - 2 Wheel Steer Models

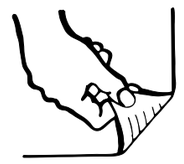
[from serial numbers Z62D-547, Z62H-4485]



Hydraulic Schematic, 4WD - 2 Wheel Steer Models

[to serial numbers Z62D-546, Z62H-4484]

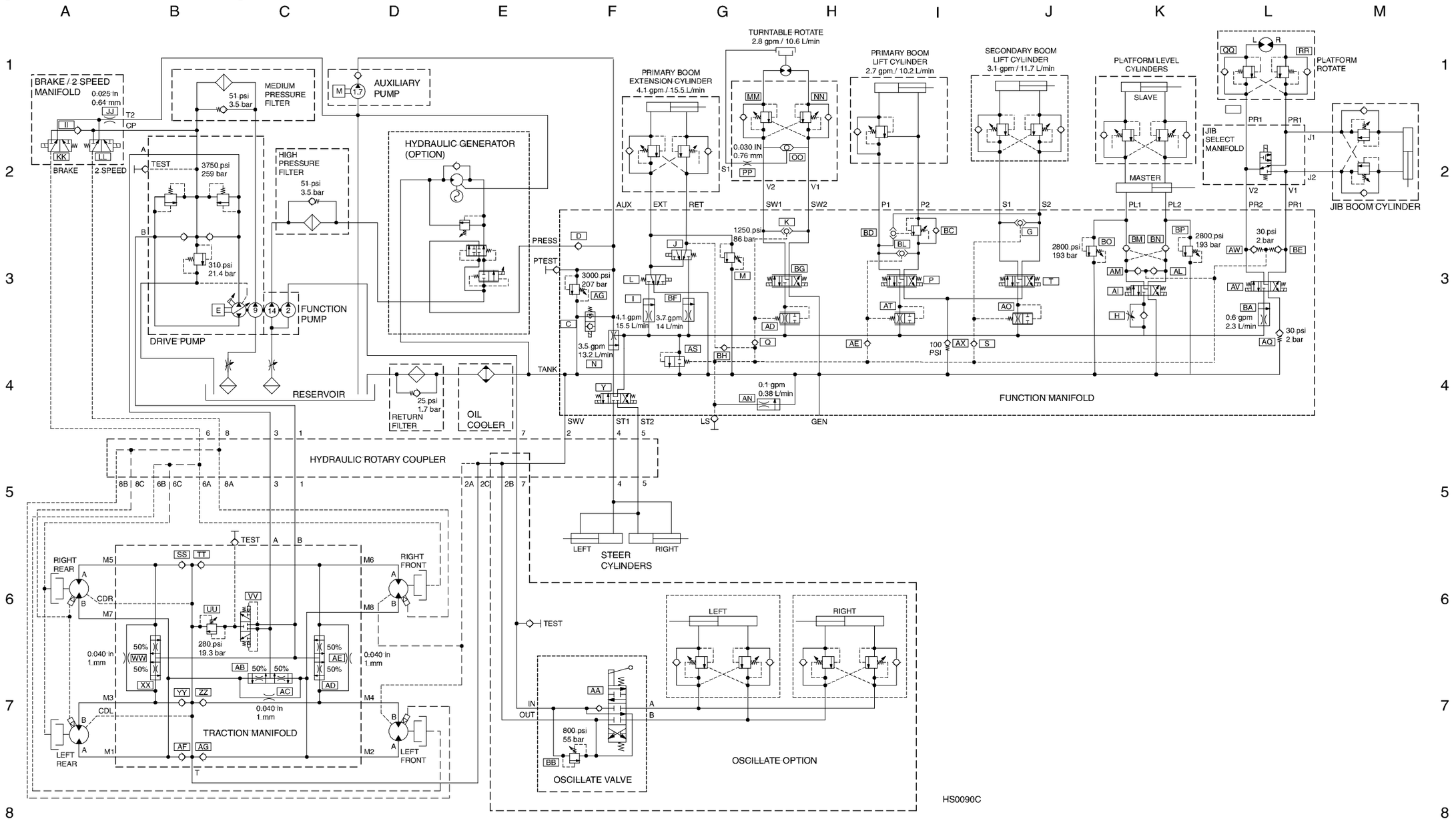
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Hydraulic Schematic, 4WD - 2 Wheel Steer Models

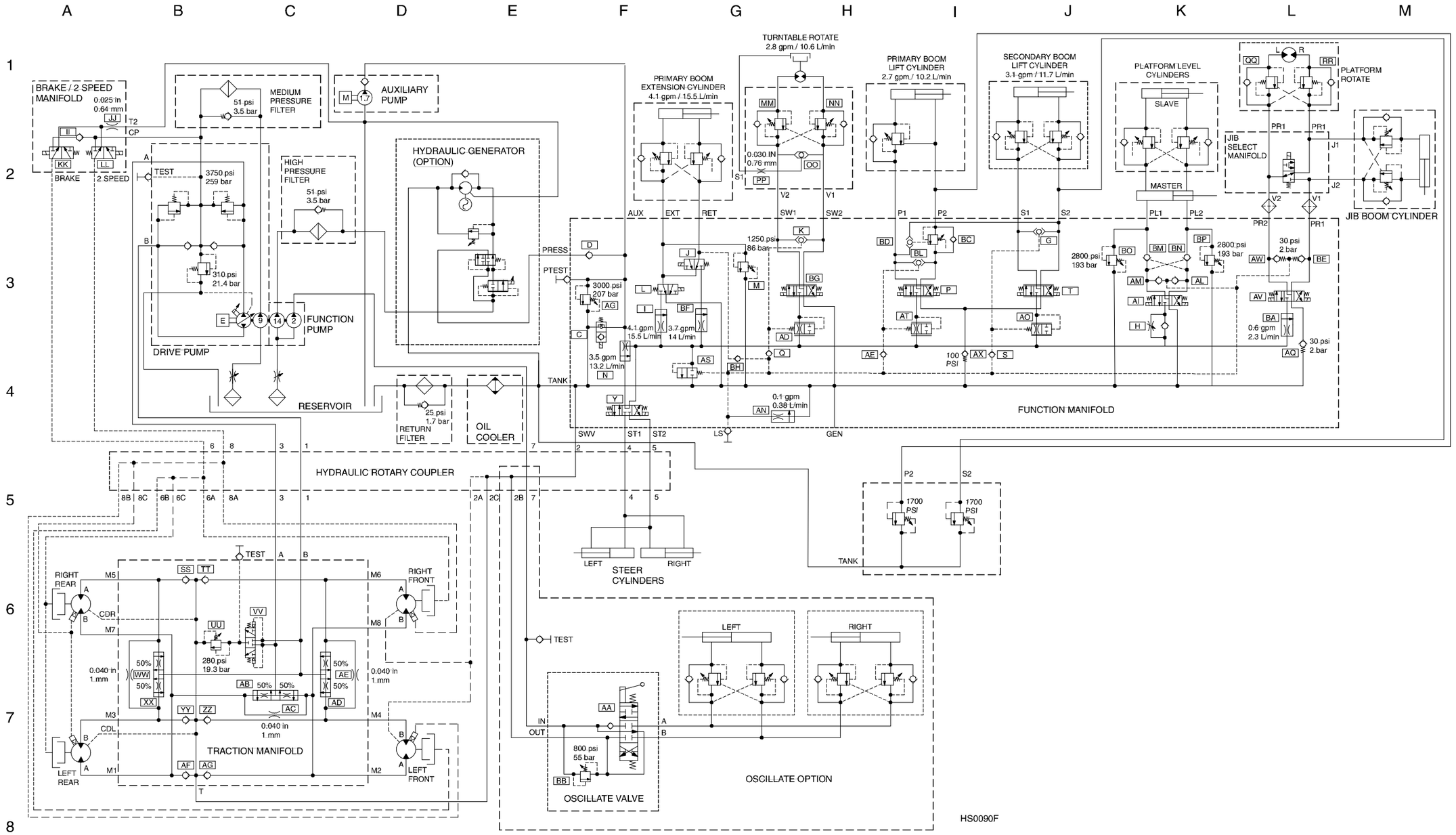
[to serial numbers Z62D-546, Z62H-4484]

[from serial number Z62M-101]



Hydraulic Schematic, 4WD - 2 Wheel Steer Models

[from serial numbers Z62D-547, Z62H-4485]



Hydraulic Schematic, 4WD - 2 Wheel Steer Models

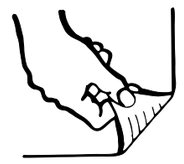
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Hydraulic Schematic, 4WD - 4 Wheel Steer Models

[to serial numbers Z62D-546, Z62H-4484]

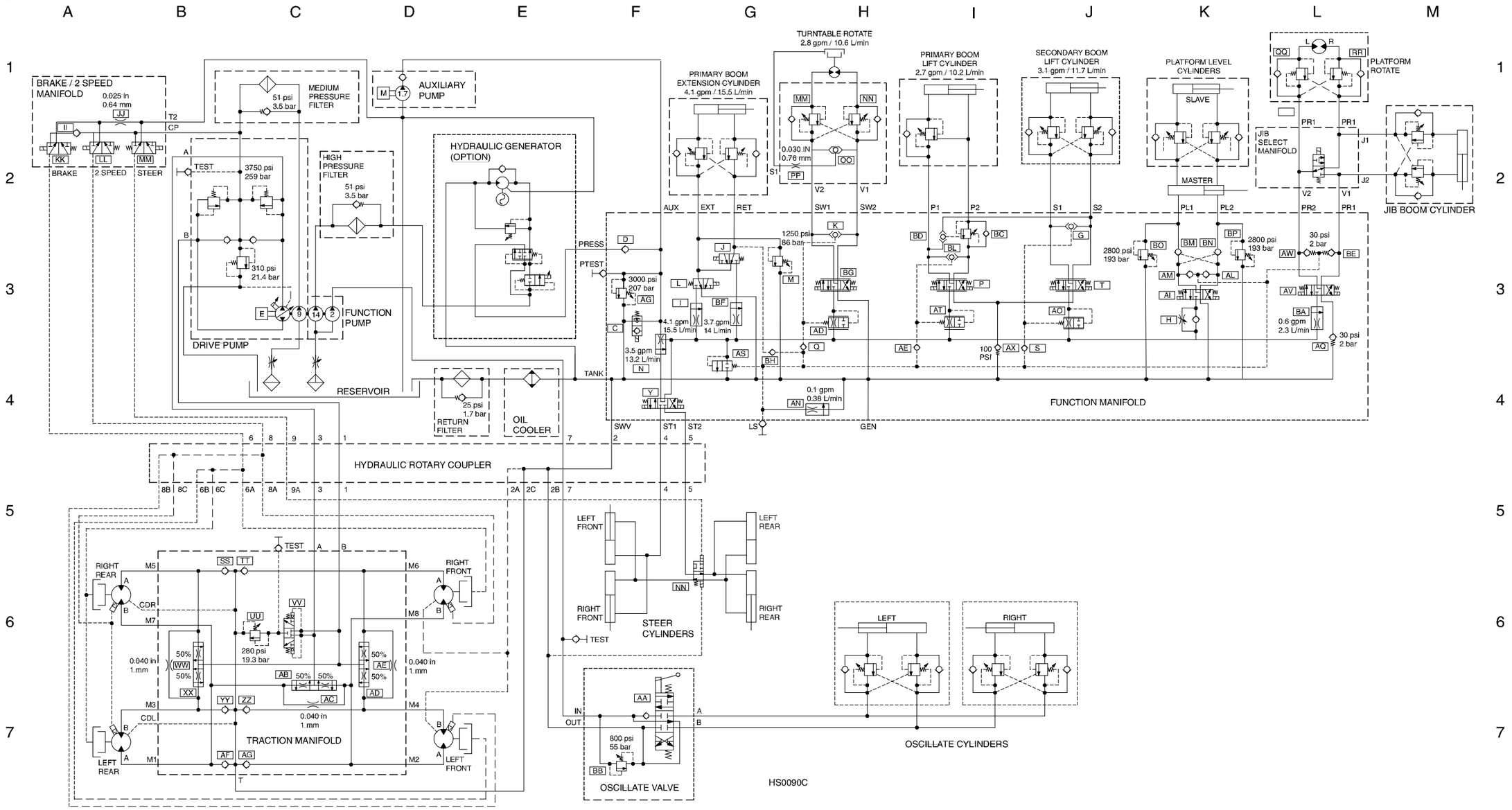
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Hydraulic Schematic, 4WD - 4 Wheel Steer Models

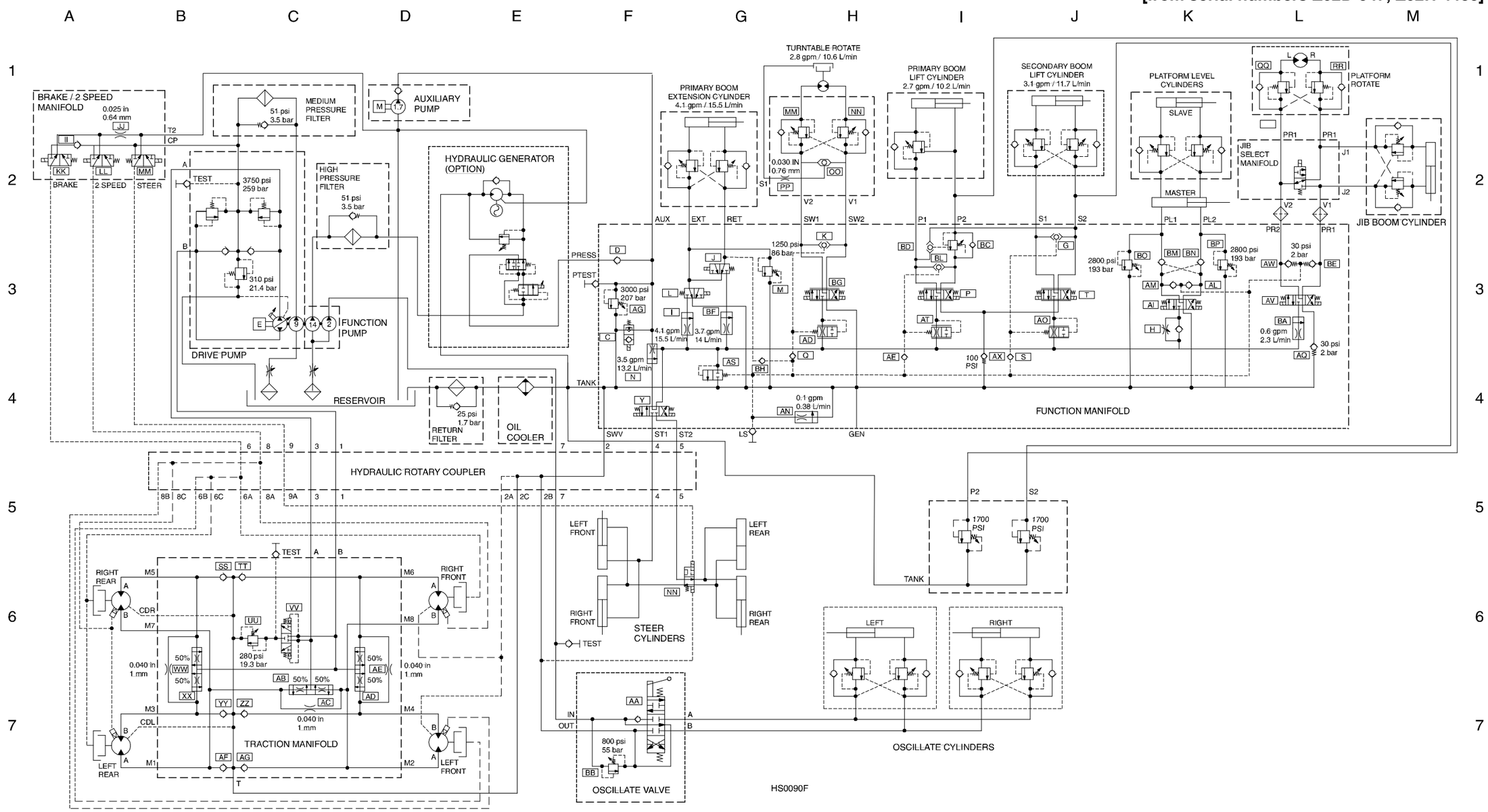
[to serial numbers Z62D-546, Z62H-4484]

[from serial number Z62M-101]



Hydraulic Schematic, 4WD - 4 Wheel Steer Models

[from serial numbers Z62D-547, Z62H-4485]

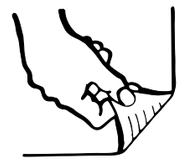


Hydraulic Schematic, 4WD - 4 Wheel Steer Models

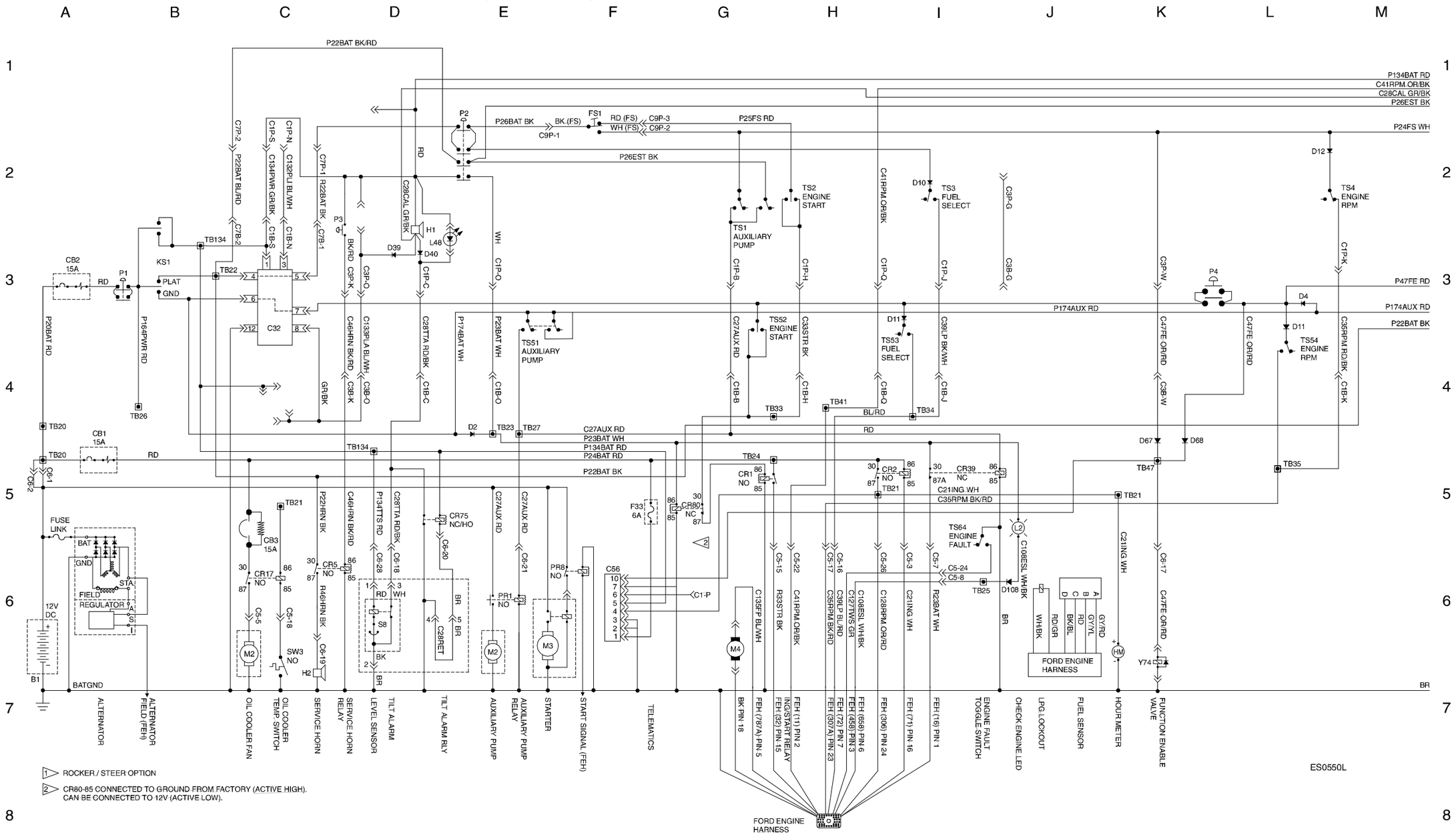
[from serial numbers Z62D-547, Z62H-4485]



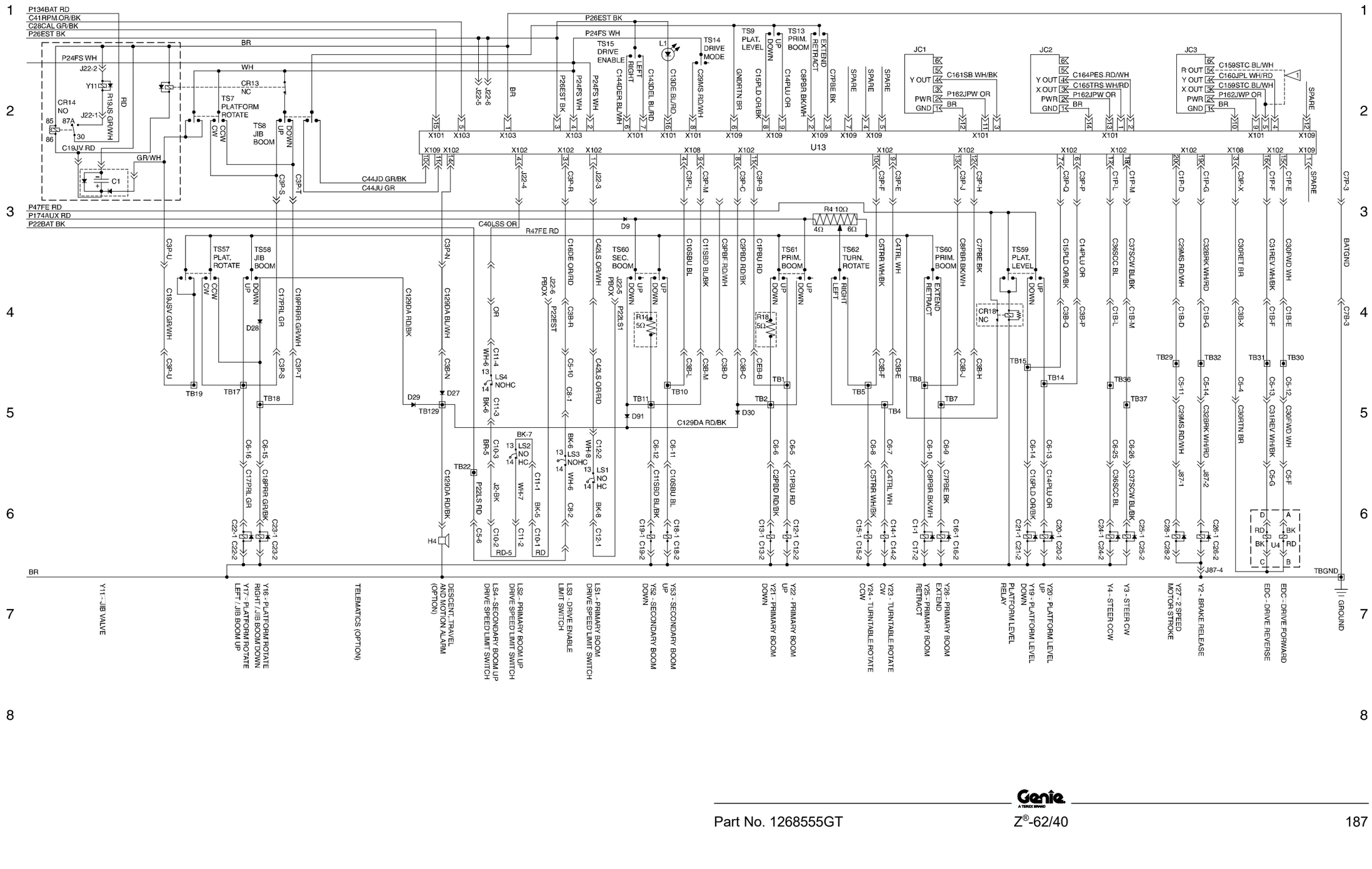
Electrical Schematic, Ford MSG-425 EFI Models (ANSI/CSA)



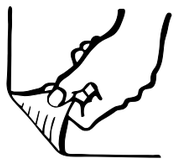
Electrical Schematic, Ford MSG-425 EFI Models (ANSI/CSA)



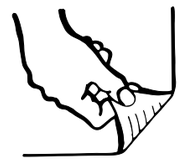
Electrical Schematic, Ford MSG-425 EFI Models (ANSI/CSA)



Electrical Schematic, Ford MSG-425 EFI Models (ANSI/CSA)

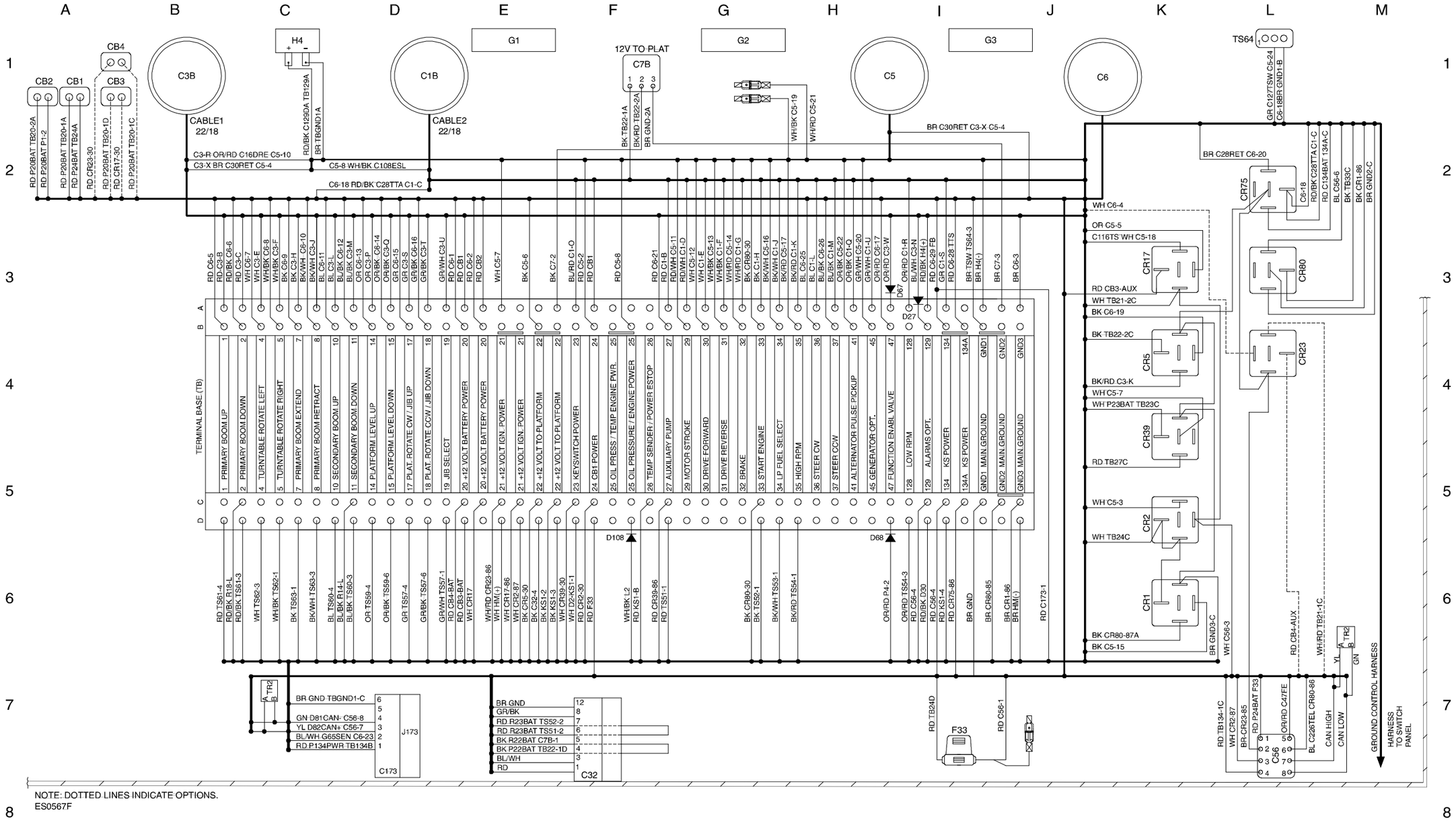


Ground Control Box Terminal Strip Wiring Diagram, Ford MSG-425 EFI Models (ANSI/CSA)



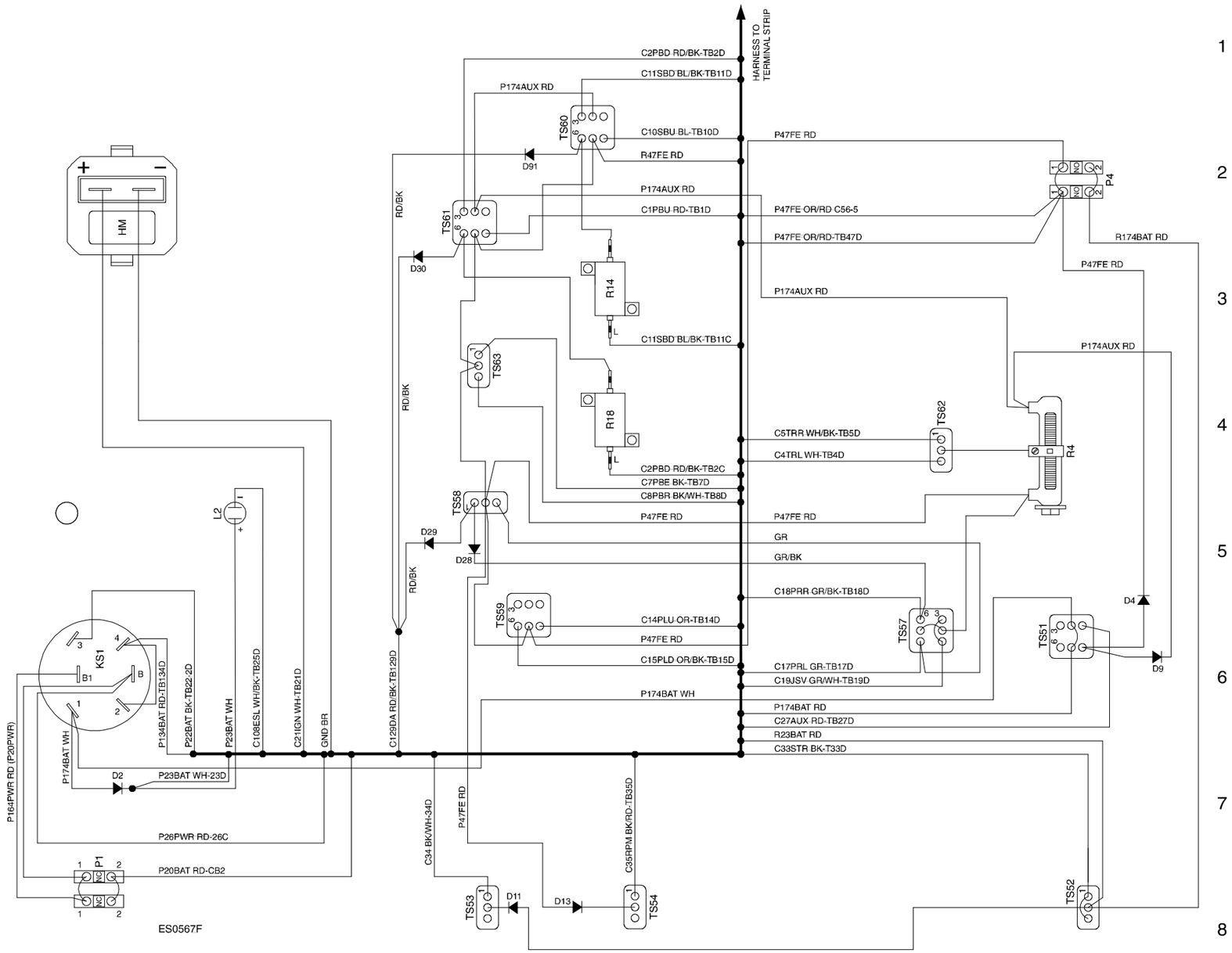
Ground Control Box Terminal Strip Wiring Diagram,

Ford MSG-425 EFI Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram,

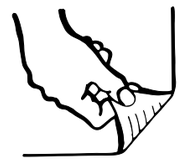
Ford MSG-425 EFI Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (ANSI/CSA)

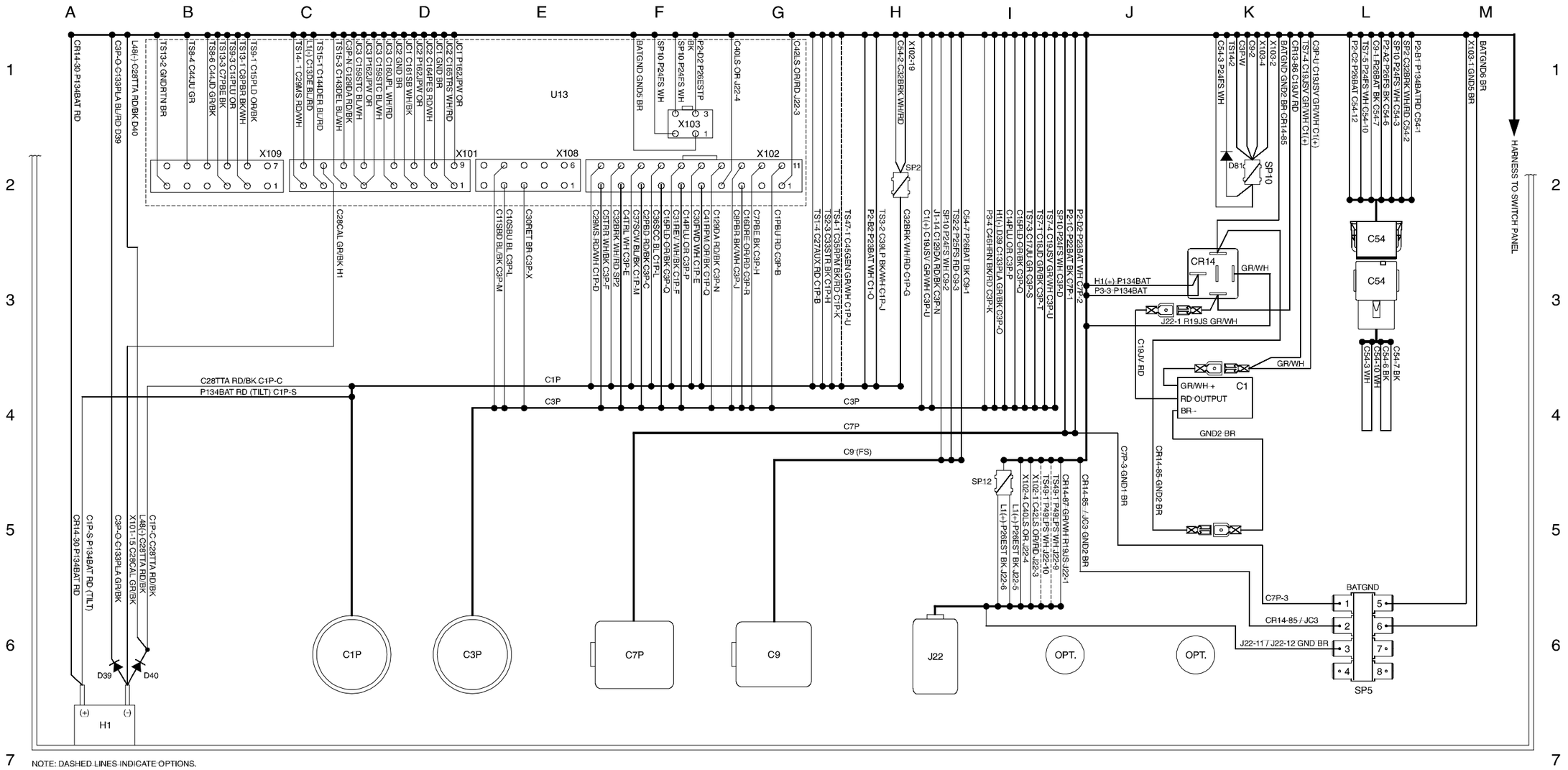


Platform Control Box Wiring Diagram, Ford MSG-425 EFI Models (ANSI/CSA)



Platform Control Box Wiring Diagram,

Ford MSG-425 EFI Models (ANSI/CSA)

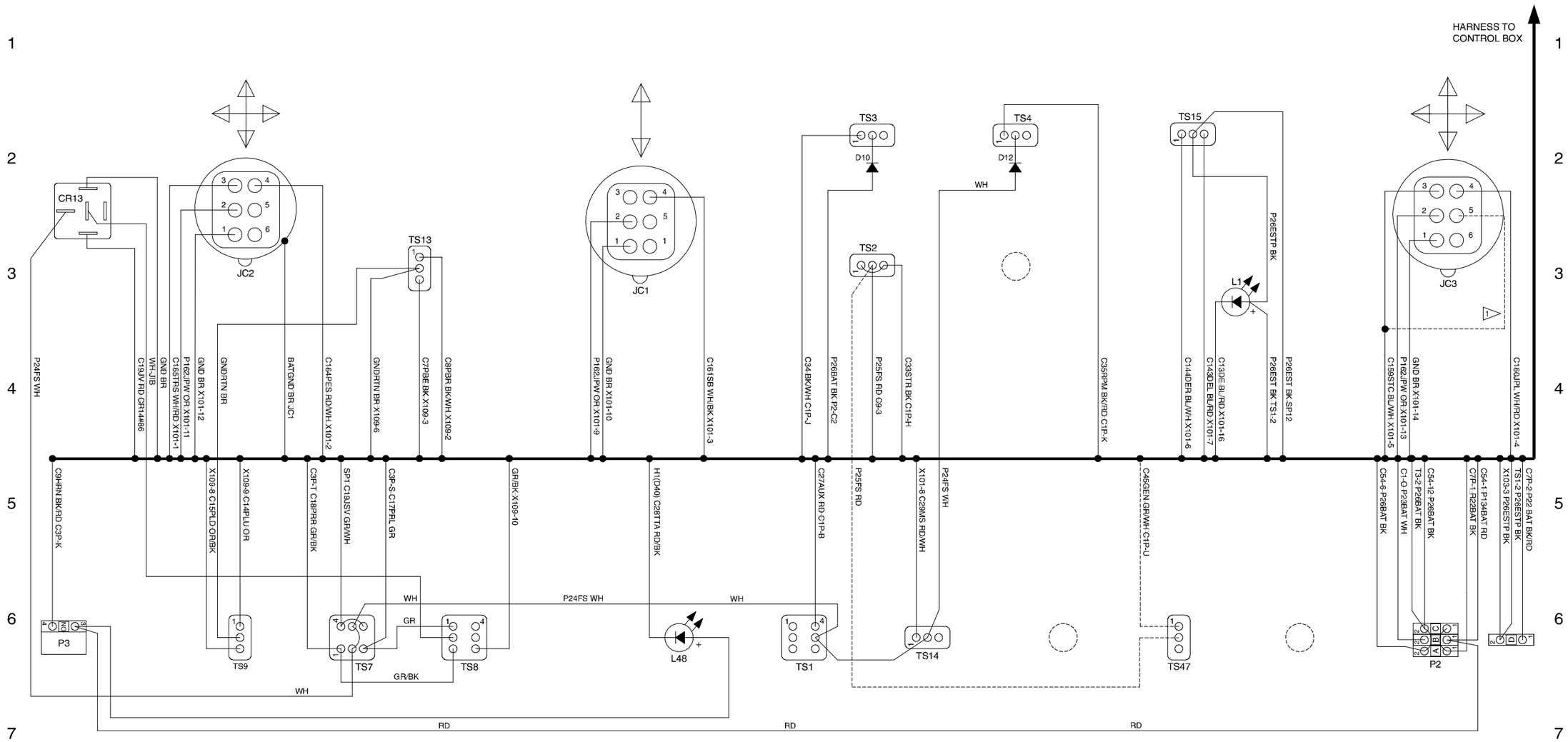


NOTE: DASHED LINES INDICATE OPTIONS.

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Platform Control Box Switch Panel Wiring Diagram,

Ford MSG-425 EFI Models (ANSI/CSA)



NOTE: DASHED LINES INDICATE OPTIONS.

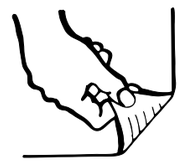
1 ROCKER STEER OPTION

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Platform Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (ANSI/CSA)

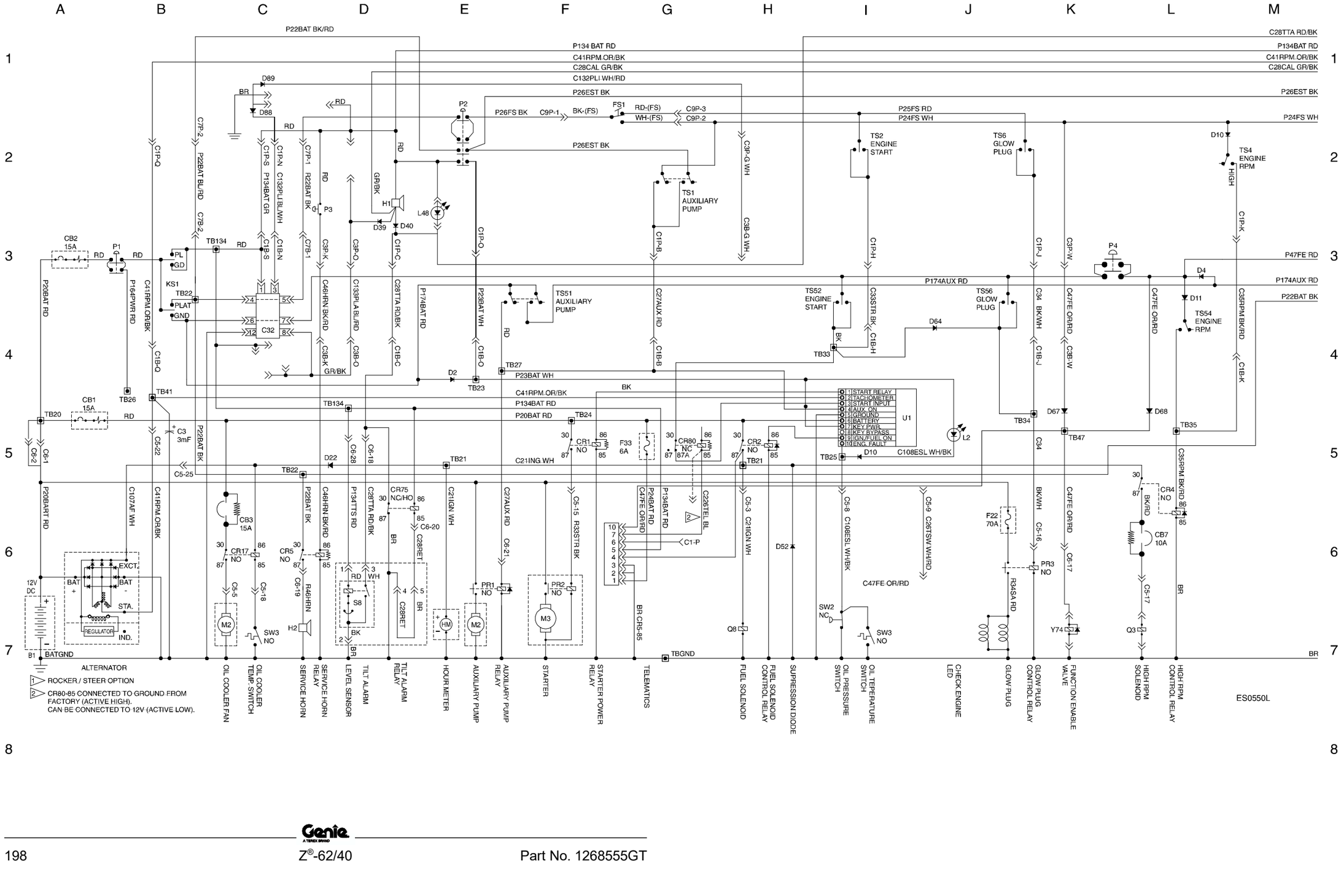


Electrical Schematic,
Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



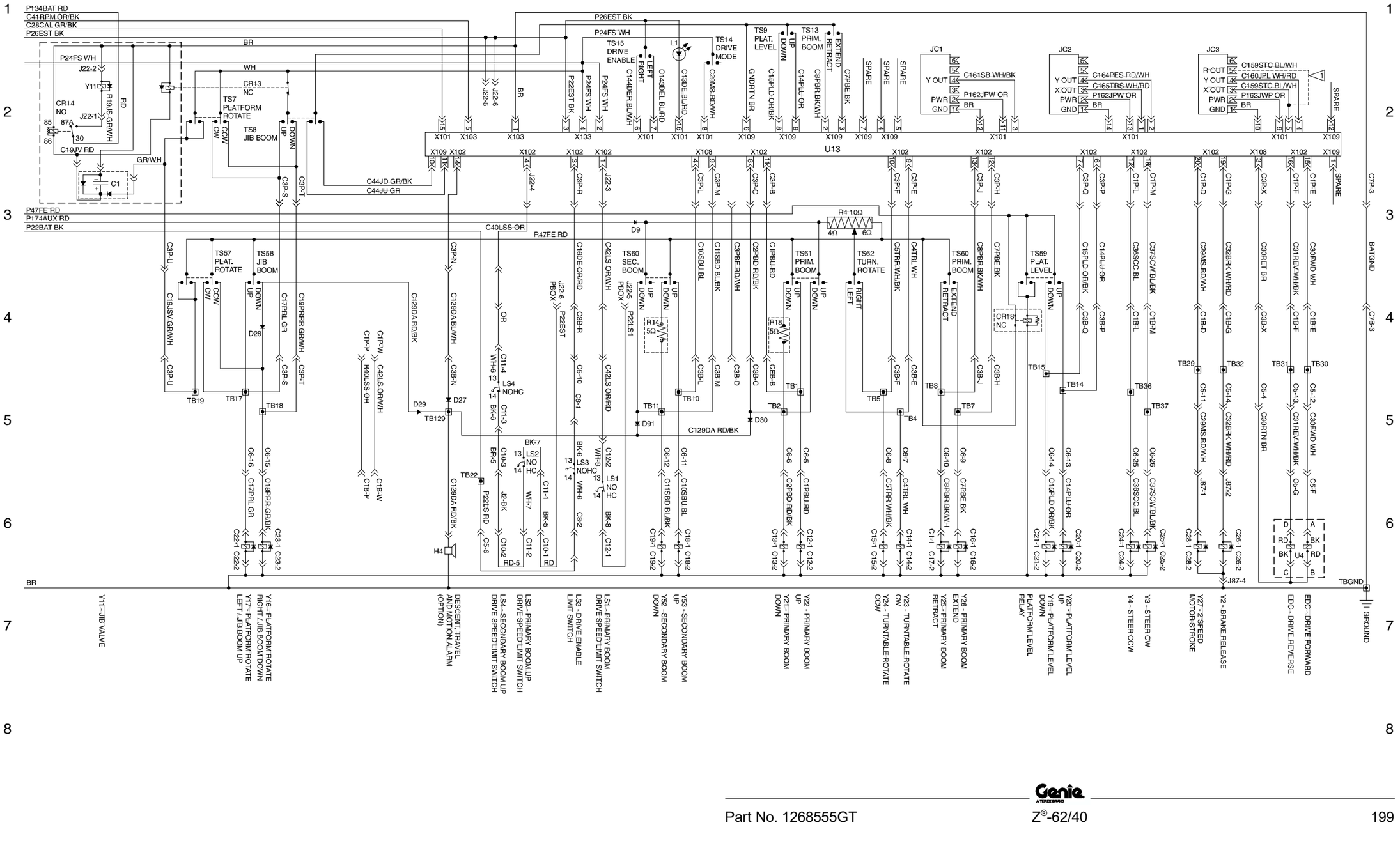
Electrical Schematic,

Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)

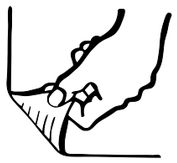


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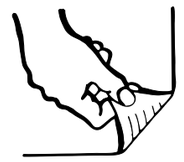
Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



Electrical Schematic,
Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)

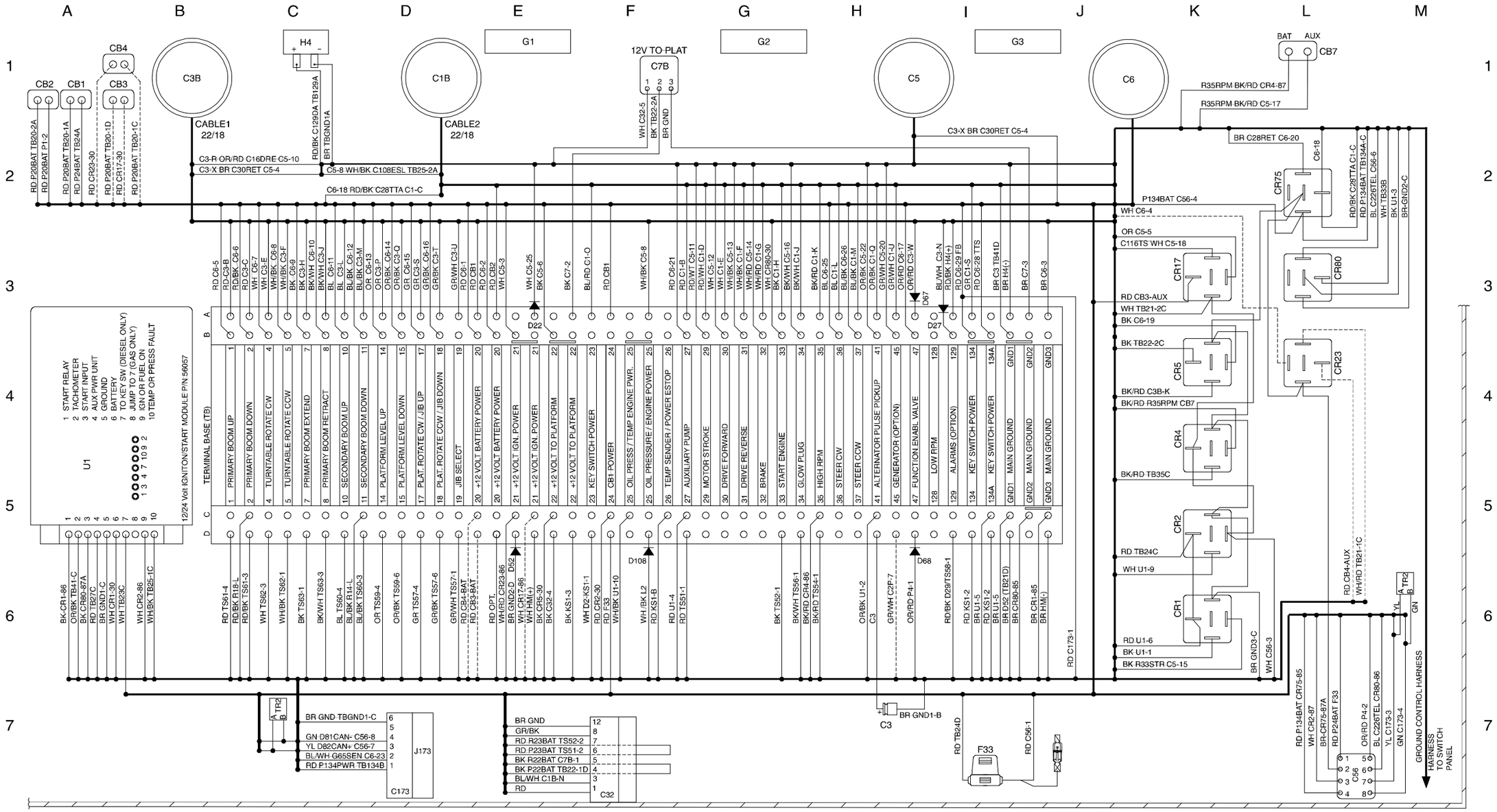


Ground Control Box Terminal Strip Wiring Diagram, Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



Ground Control Box Terminal Strip Wiring Diagram,

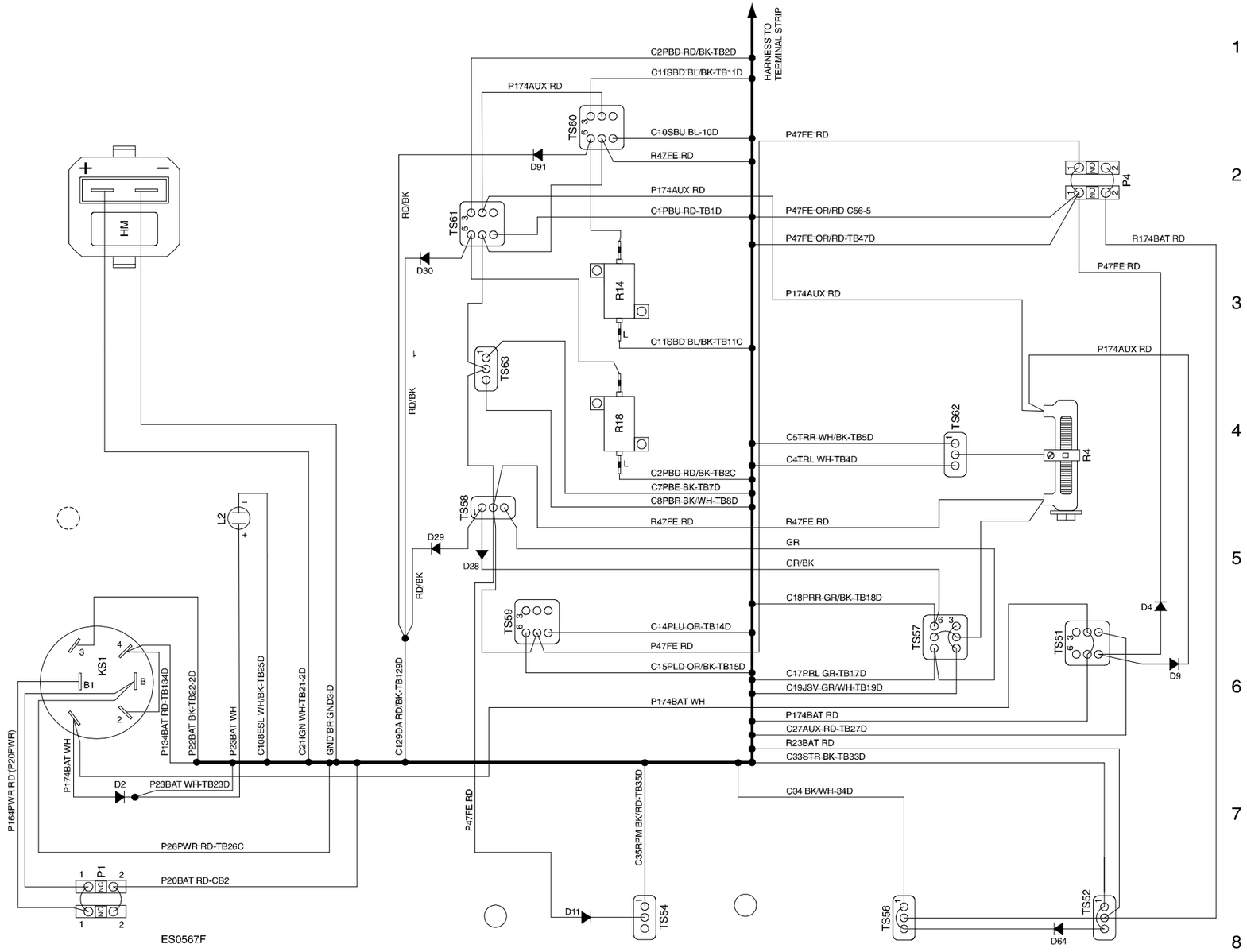
Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



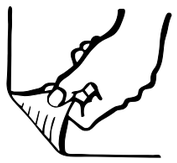
NOTE: DOTTED LINES INDICATE OPTIONS.
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Ground Control Box Switch Panel Wiring Diagram,

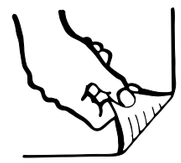
Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram, Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)

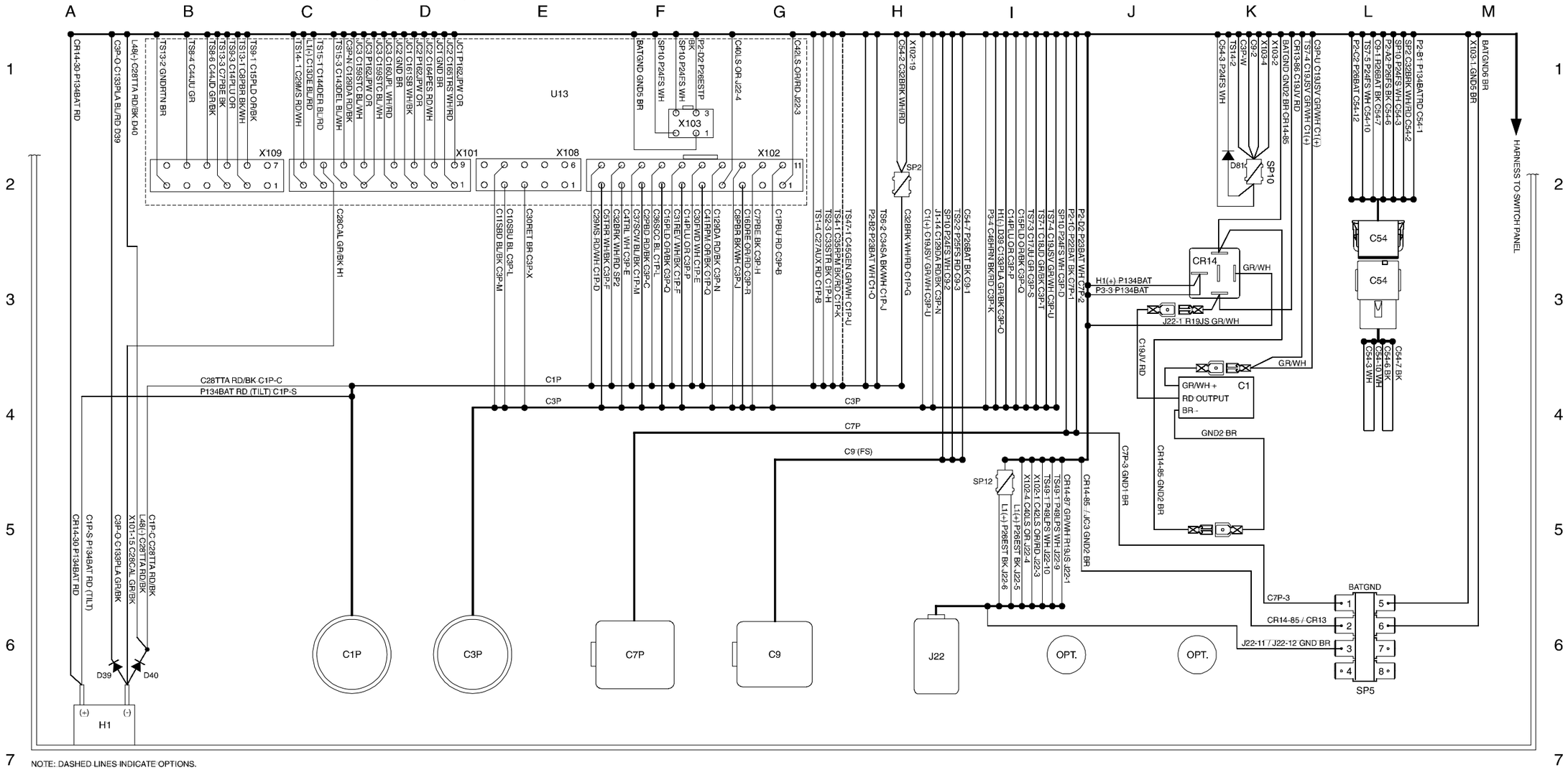


Platform Control Box Wiring Diagram, Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



Platform Control Box Wiring Diagram,

Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)

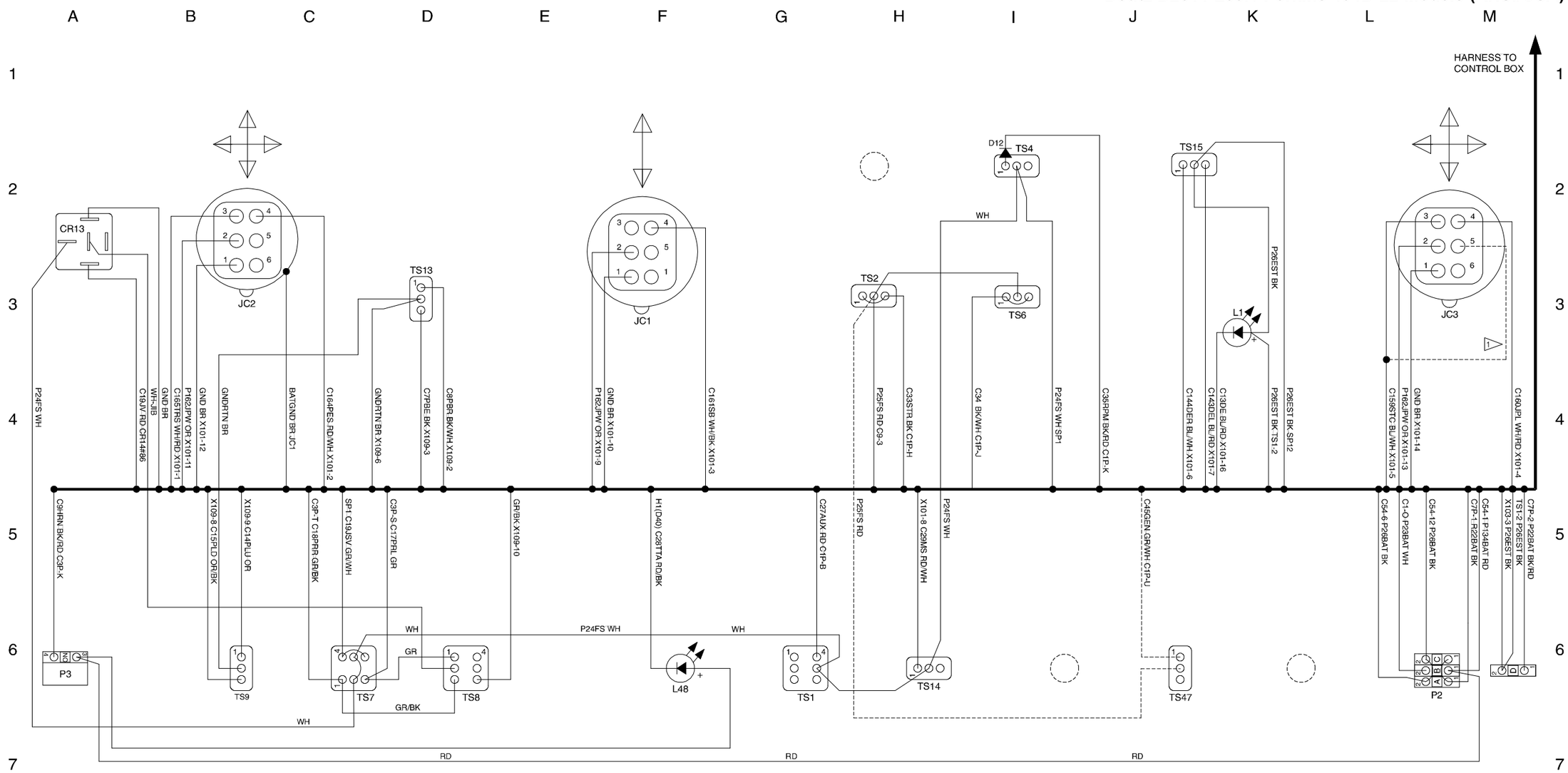


NOTE: DASHED LINES INDICATE OPTIONS.

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Platform Control Box Switch Panel Wiring Diagram,

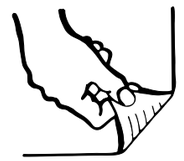
Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



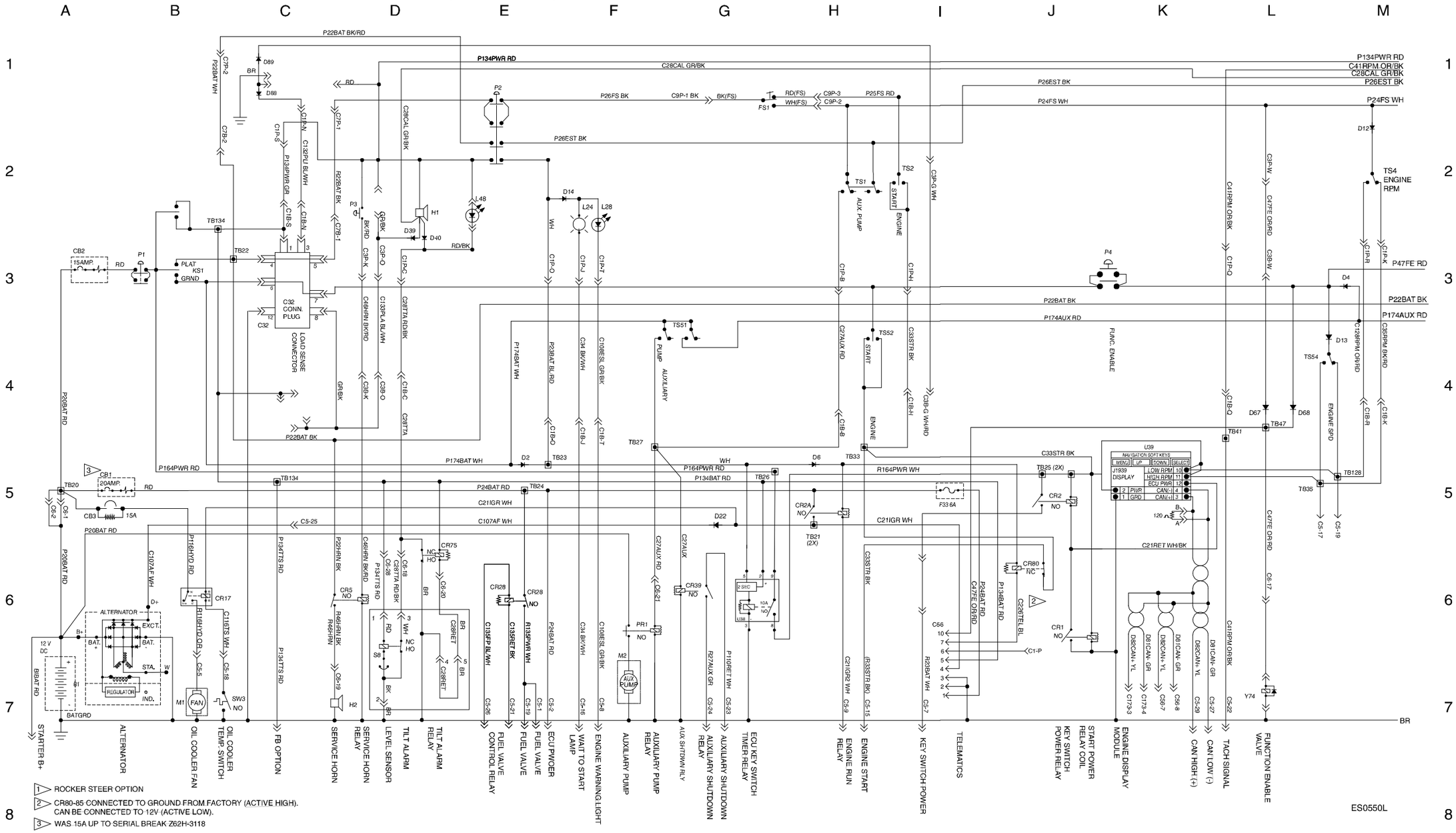
Platform Control Box Switch Panel Wiring Diagram, Deutz D2011 L03i / Perkins 404D-22 Models (ANSI/CSA)



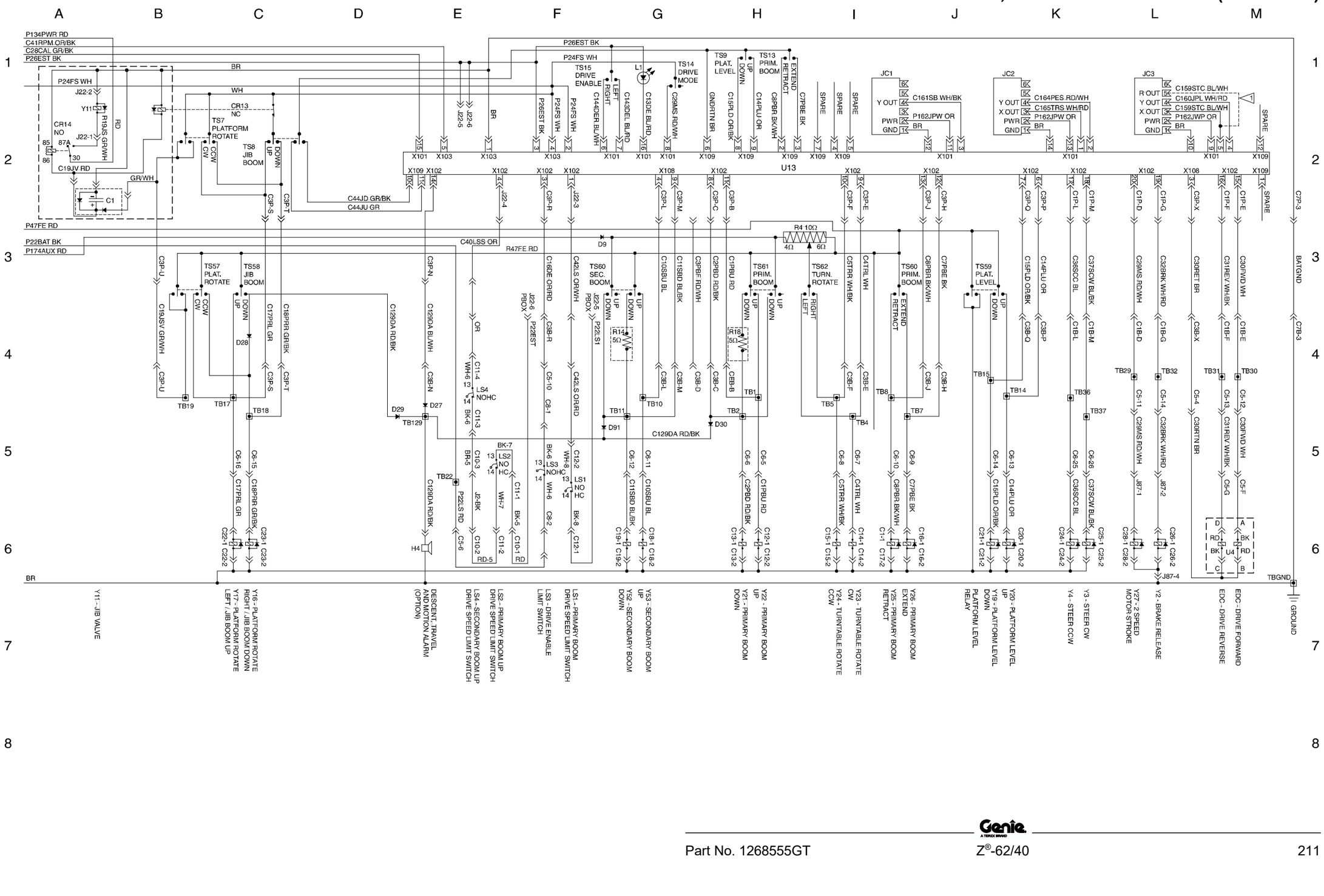
Electrical Schematic, Deutz D 2.9 L4 Models (ANSI/CSA)



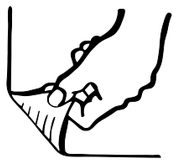
Electrical Schematic, Deutz D 2.9 L4 Models (ANSI/CSA)



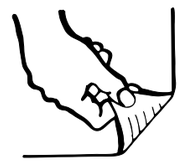
Electrical Schematic, Deutz D 2.9 L4 Models (ANSI/CSA)



Electrical Schematic, Deutz D 2.9 L4 Models (ANSI/CSA)

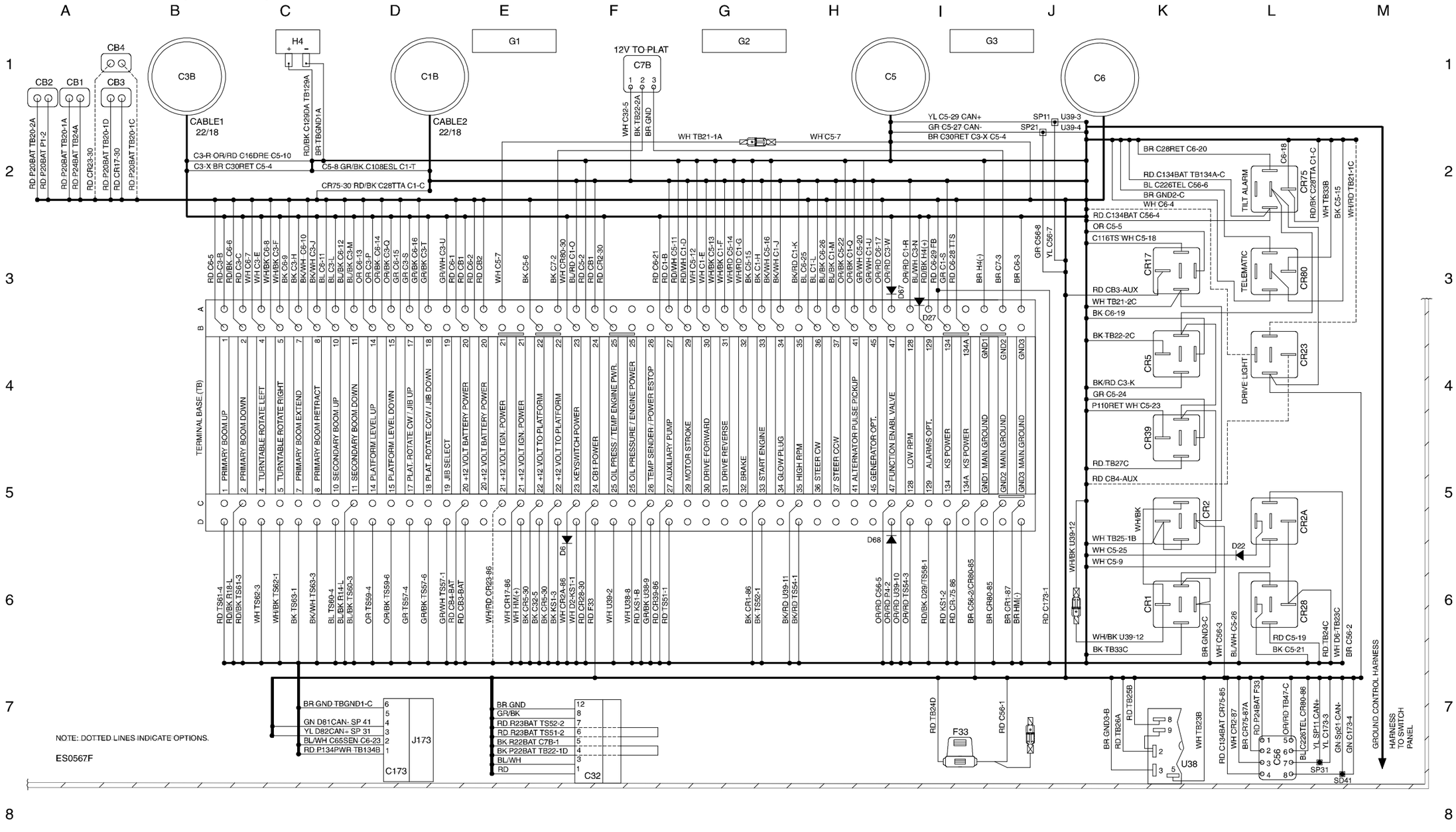


Ground Control Box Terminal Strip Wiring Diagram, Deutz D 2.9 L4 Models (ANSI/CSA)



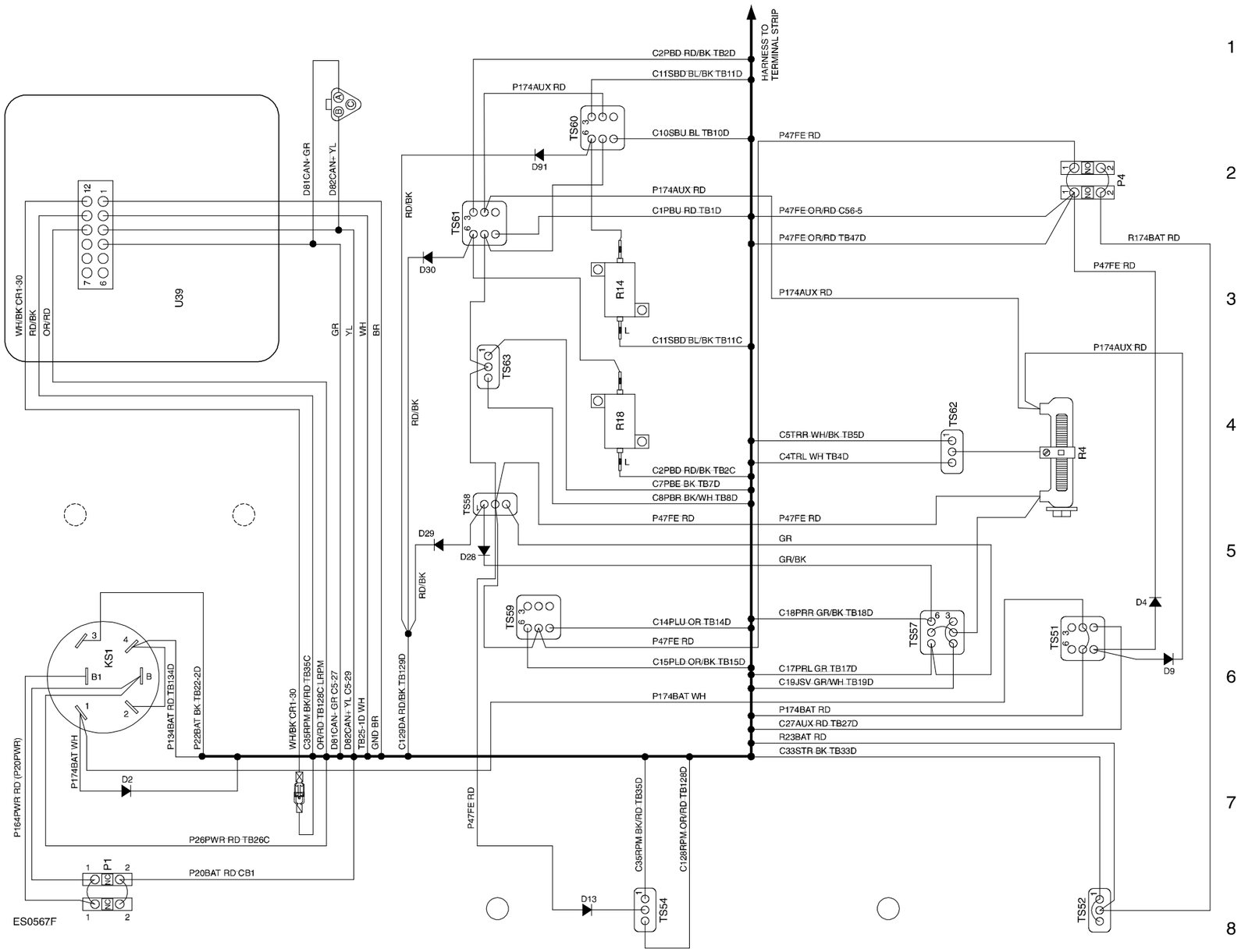
Ground Control Box Terminal Strip Wiring Diagram,

Deutz D 2.9 L4 Models (ANSI/CSA)

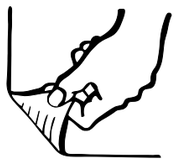


Ground Control Box Switch Panel Wiring Diagram,

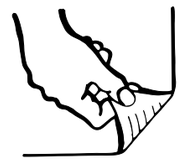
Deutz D 2.9 L4 Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram, Deutz D 2.9 L4 Models (ANSI/CSA)

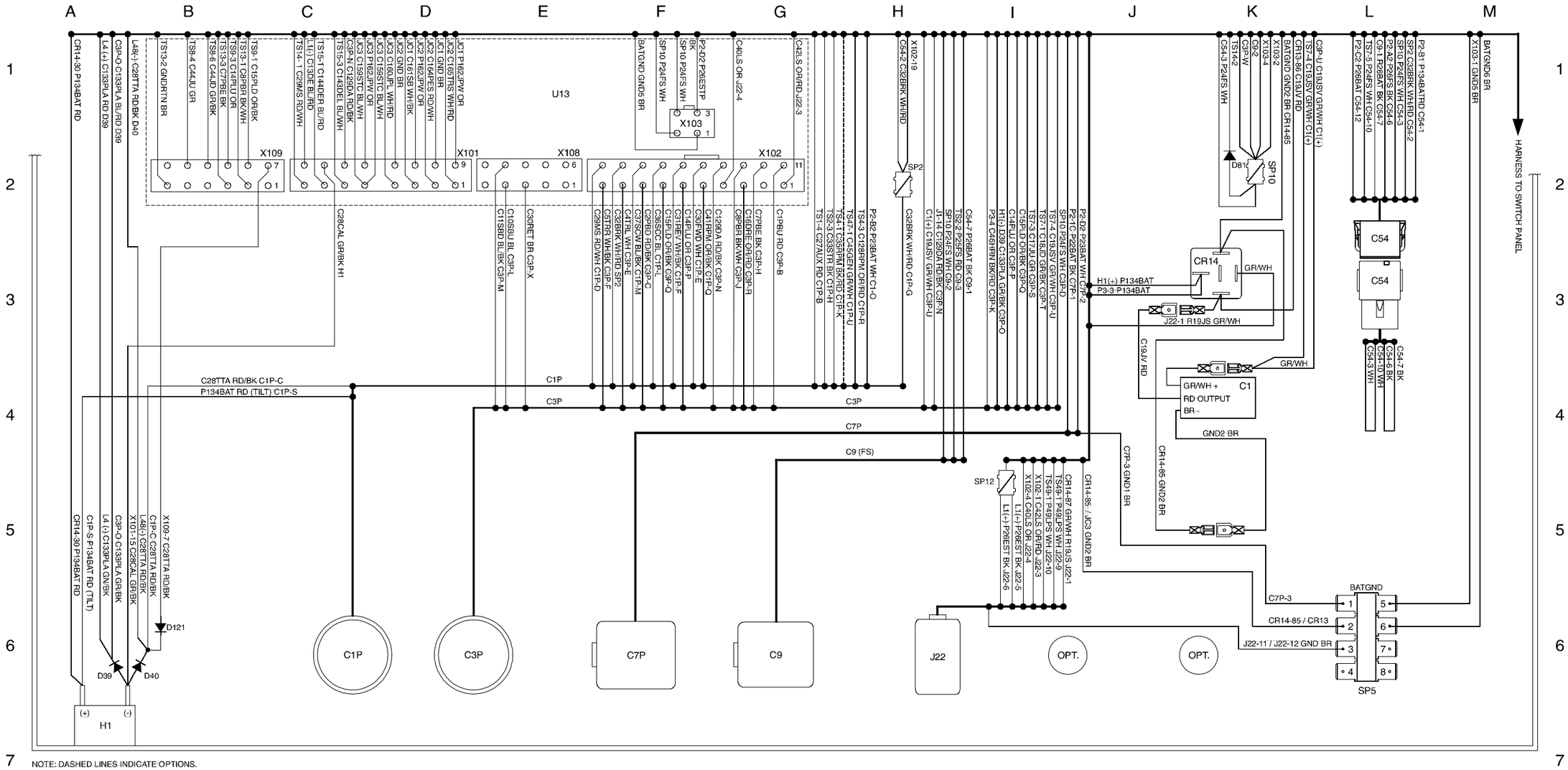


Platform Control Box Wiring Diagram, Deutz D 2.9 L4 Models (ANSI/CSA)



Platform Control Box Wiring Diagram,

Deutz D 2.9 L4 Models (ANSI/CSA)

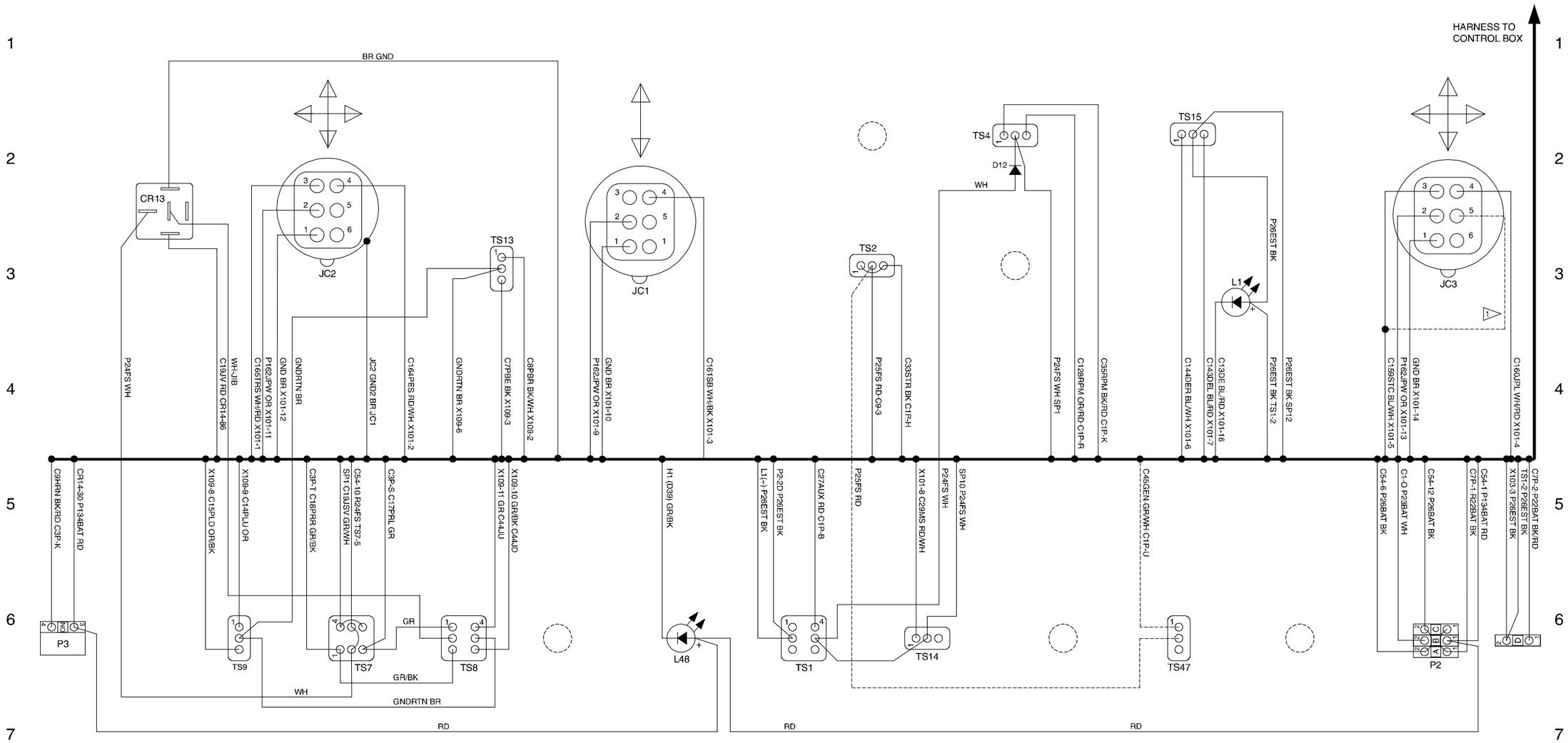


NOTE: DASHED LINES INDICATE OPTIONS.

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Platform Control Box Switch Panel Wiring Diagram,

Deutz D 2.9 L4 Models (ANSI/CSA)



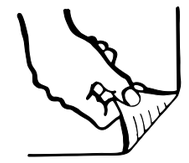
1 ROCKER STEER OPTION

NOTE: DASHED LINES INDICATE OPTIONS.

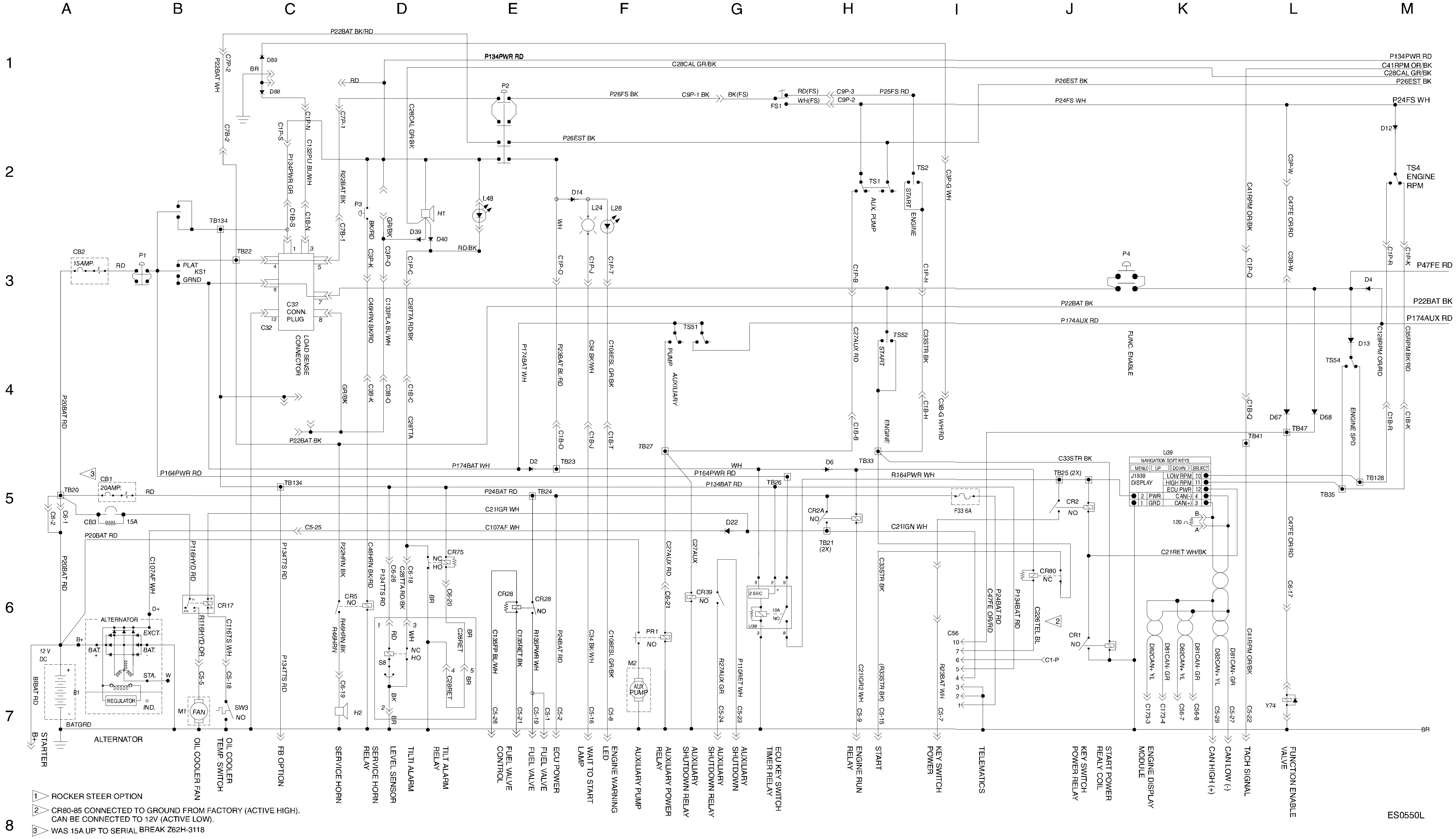
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Platform Control Box Switch Panel Wiring Diagram, Deutz D 2.9 L4 Models (ANSI/CSA)

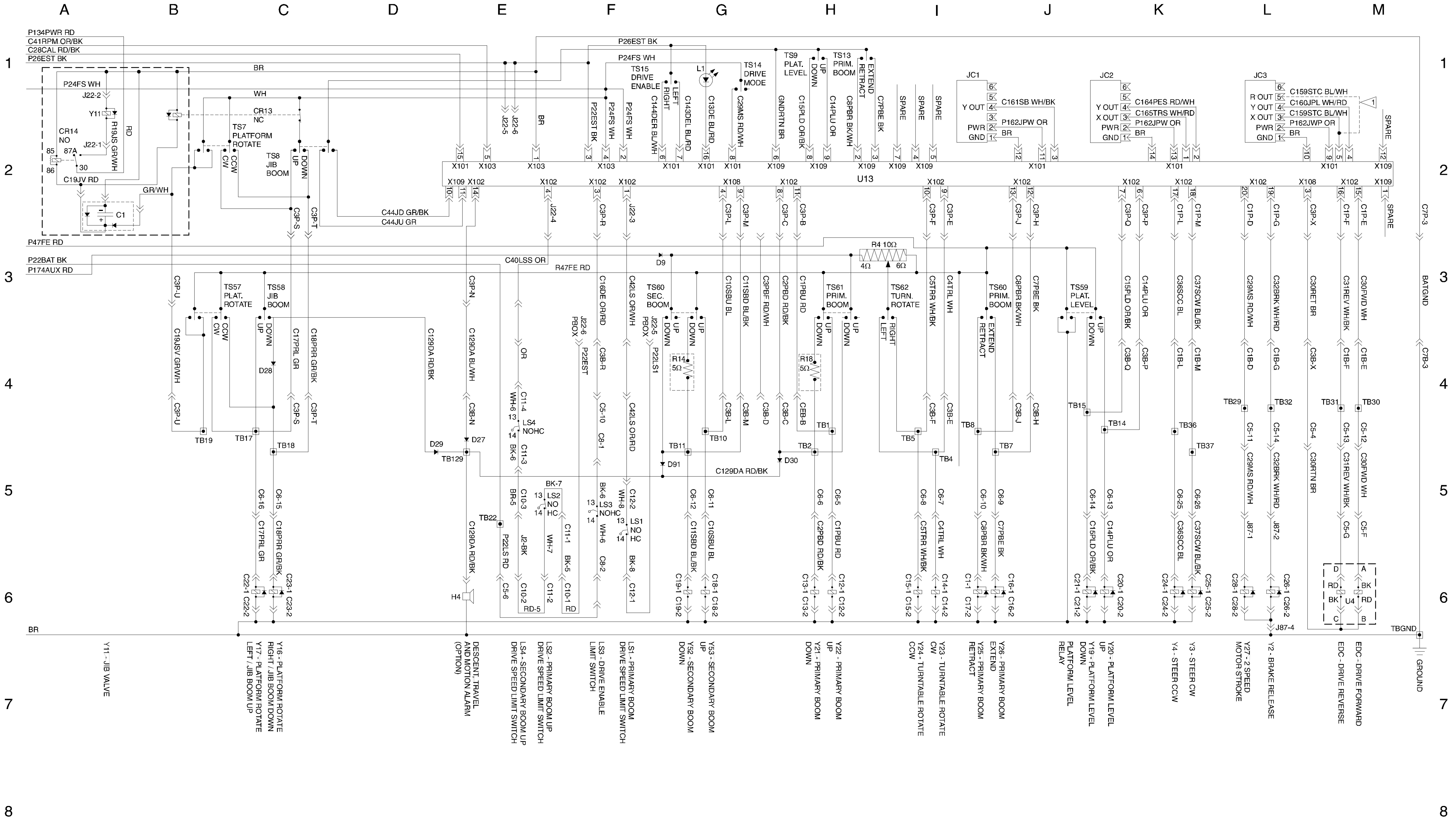
Electrical Schematic, Perkins 404F-22 Models (ANSI/CSA)



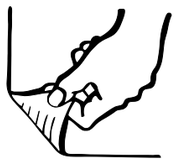
Electrical Schematic, Perkins 404F-22 Models (ANSI/CSA)



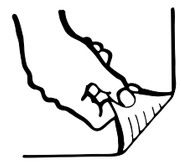
Electrical Schematic, Perkins 404F-22 Models (ANSI/CSA)



Electrical Schematic, Perkins 404F-22 Models (ANSI/CSA)

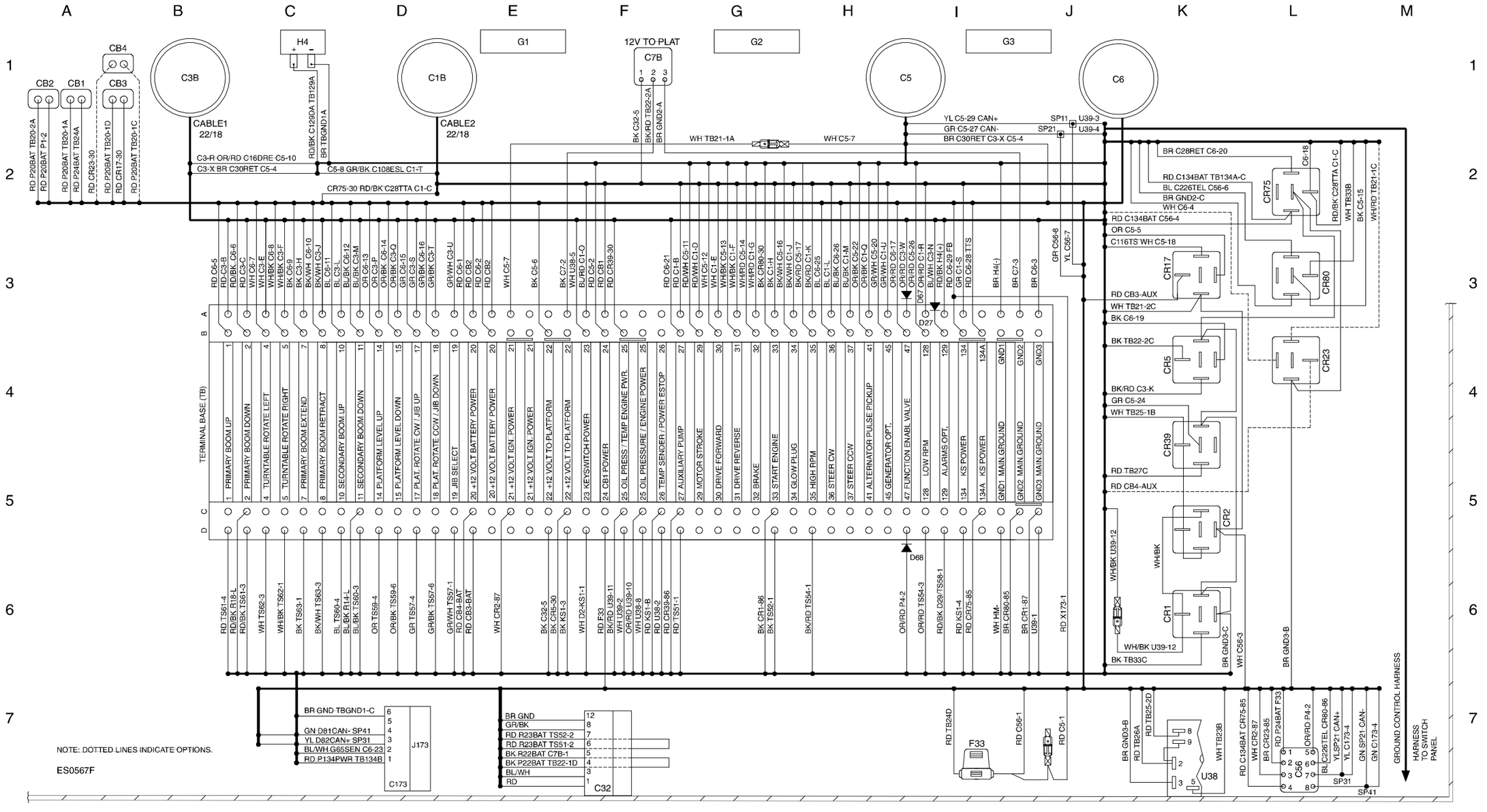


Ground Control Box Terminal Strip Wiring Diagram, Perkins 404F-22 Models (ANSI/CSA)



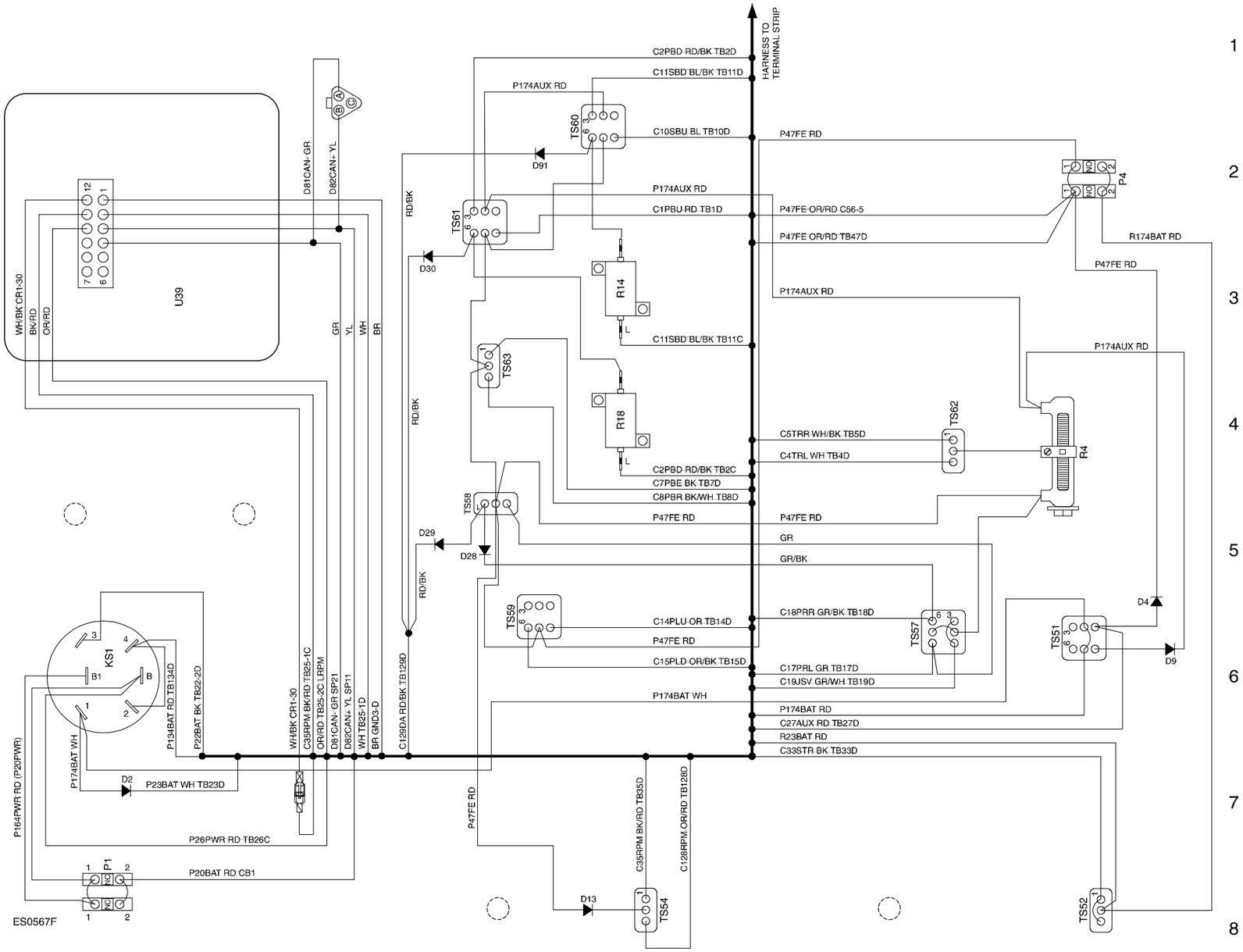
Ground Control Box Terminal Strip Wiring Diagram,

Perkins 404F-22 Models (ANSI/CSA)

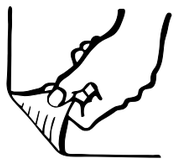


Ground Control Box Switch Panel Wiring Diagram,

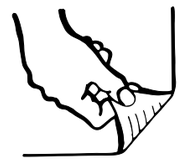
Perkins 404F-22 Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram, Perkins 404F-22 Models (ANSI/CSA)

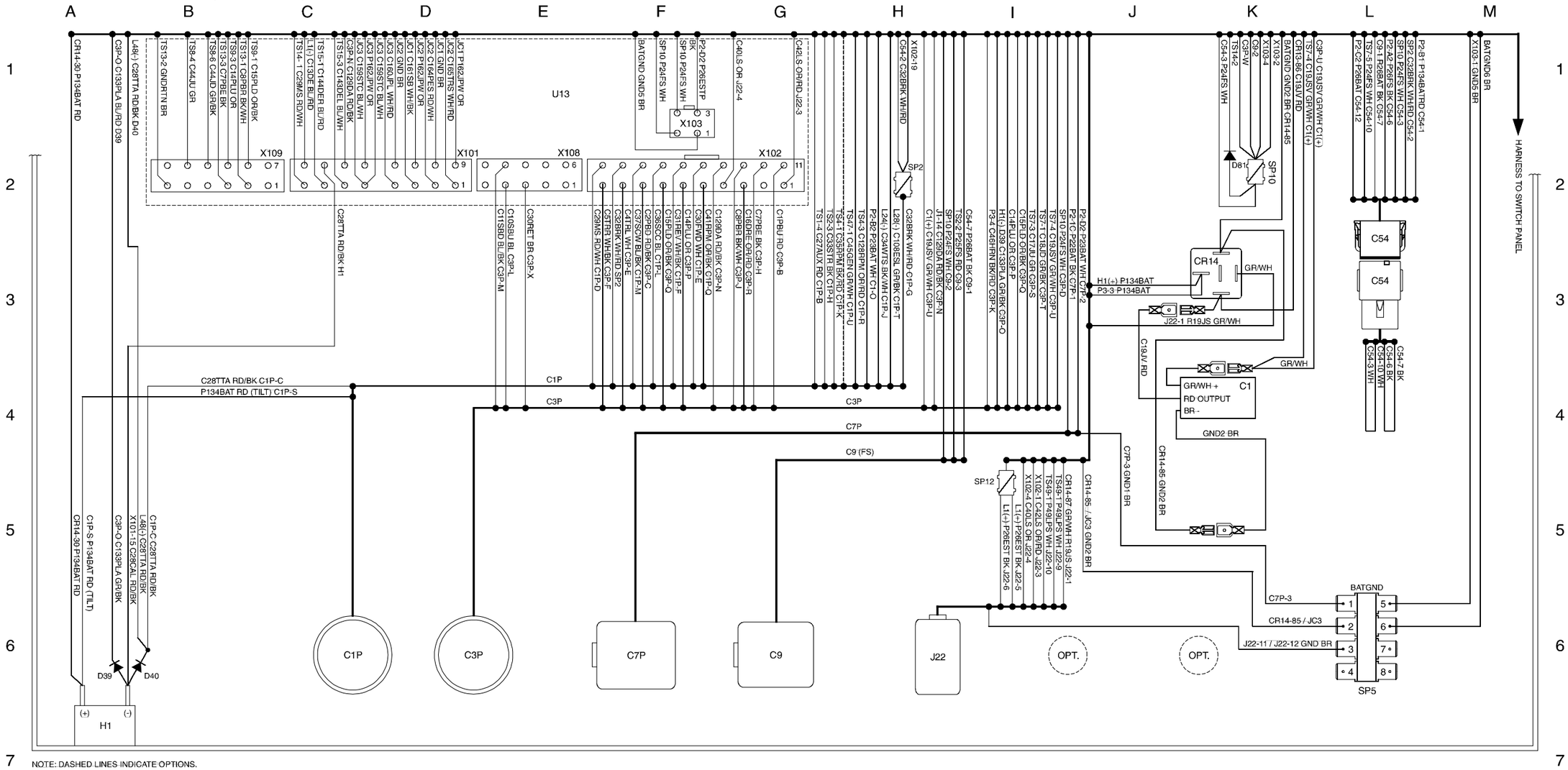


Platform Control Box Wiring Diagram, Perkins 404F-22 Models (ANSI/CSA)



Platform Control Box Wiring Diagram,

Perkins 404F-22 Models (ANSI/CSA)

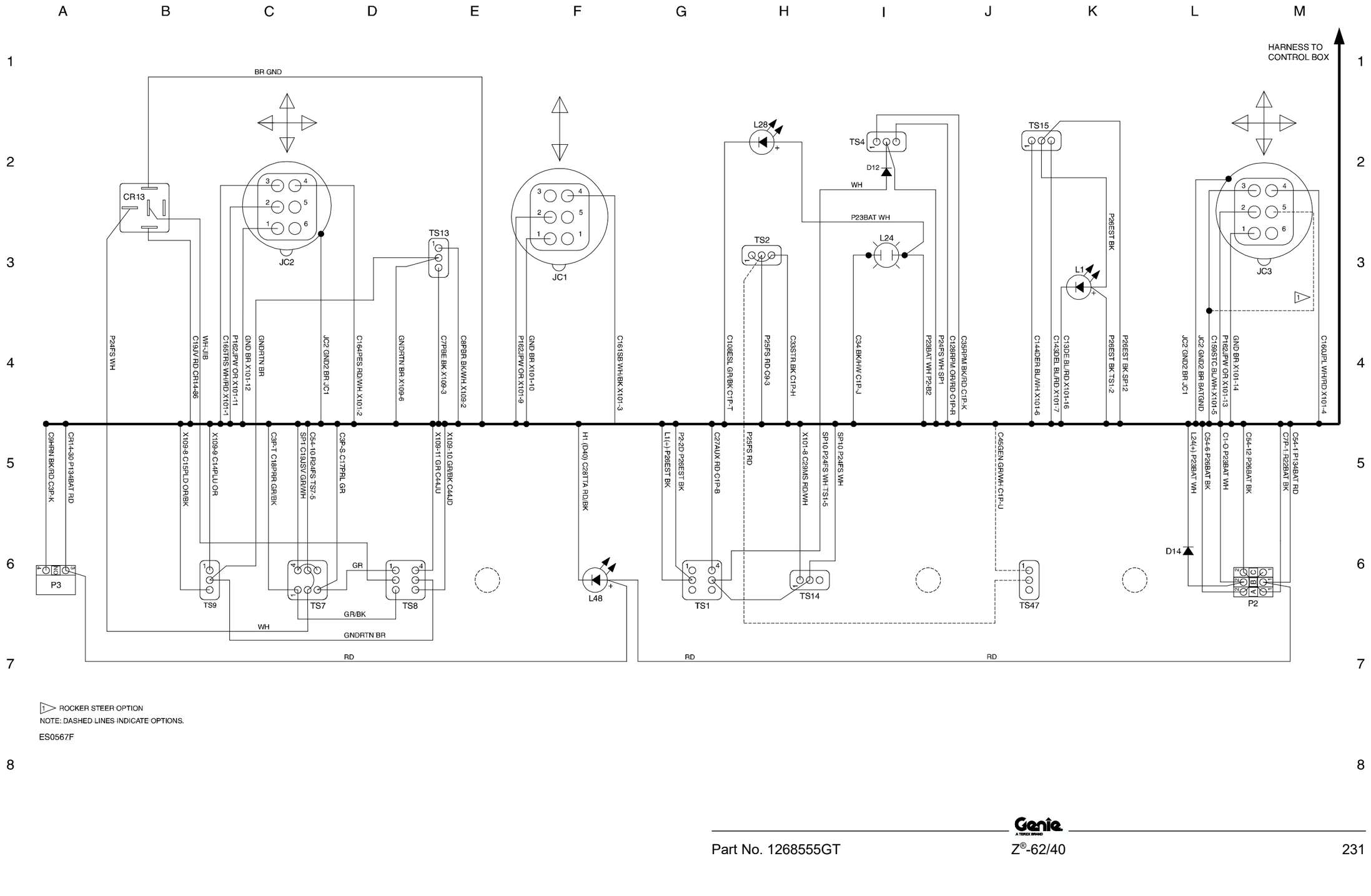


NOTE: DASHED LINES INDICATE OPTIONS.

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Platform Control Box Switch Panel Wiring Diagram,

Perkins 404F-22 Models (ANSI/CSA)



1 ROCKER STEER OPTION

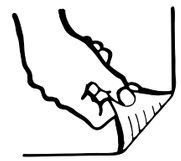
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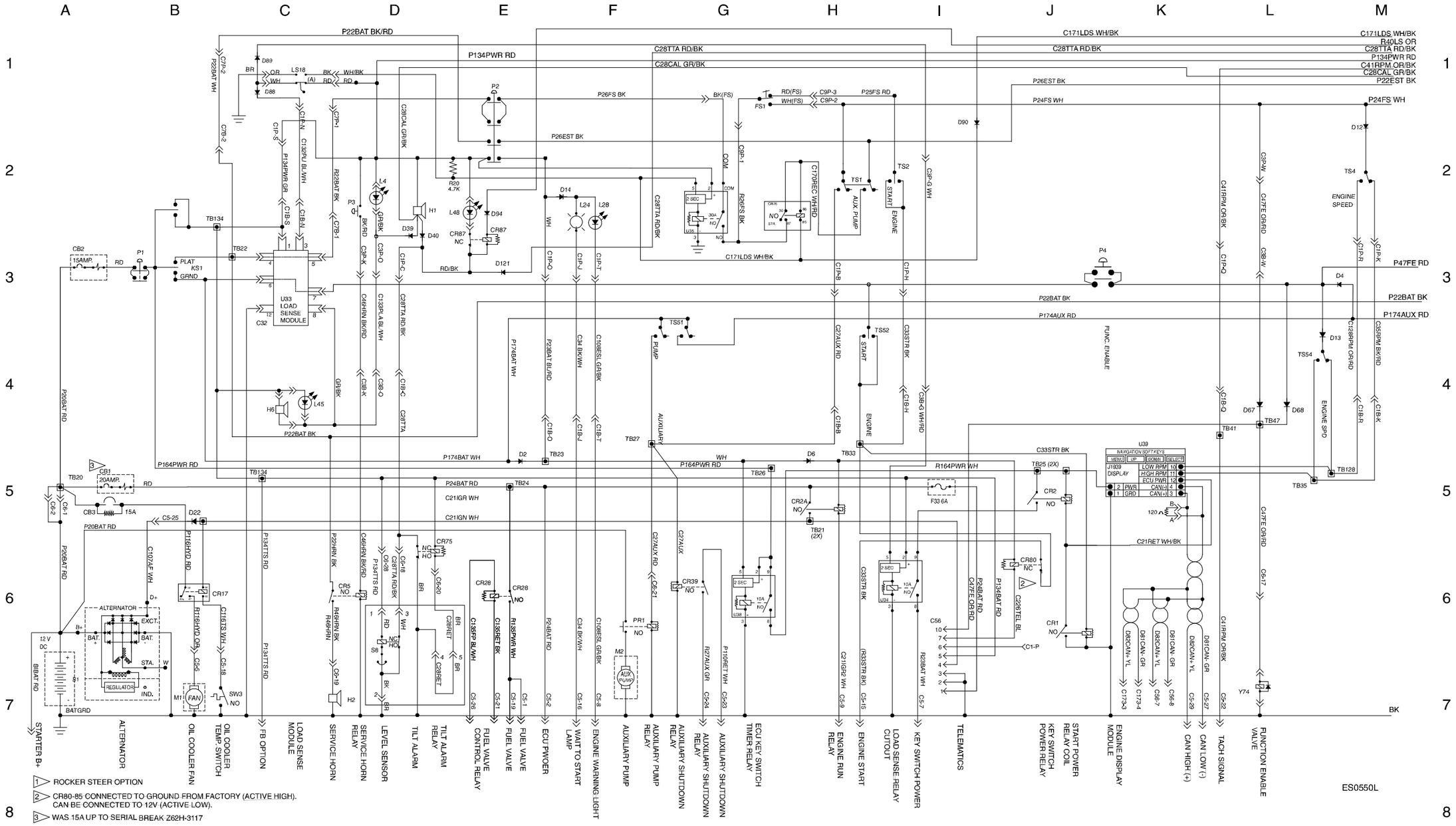
Platform Control Box Switch Panel Wiring Diagram, Perkins 404F-22 Models (ANSI/CSA)



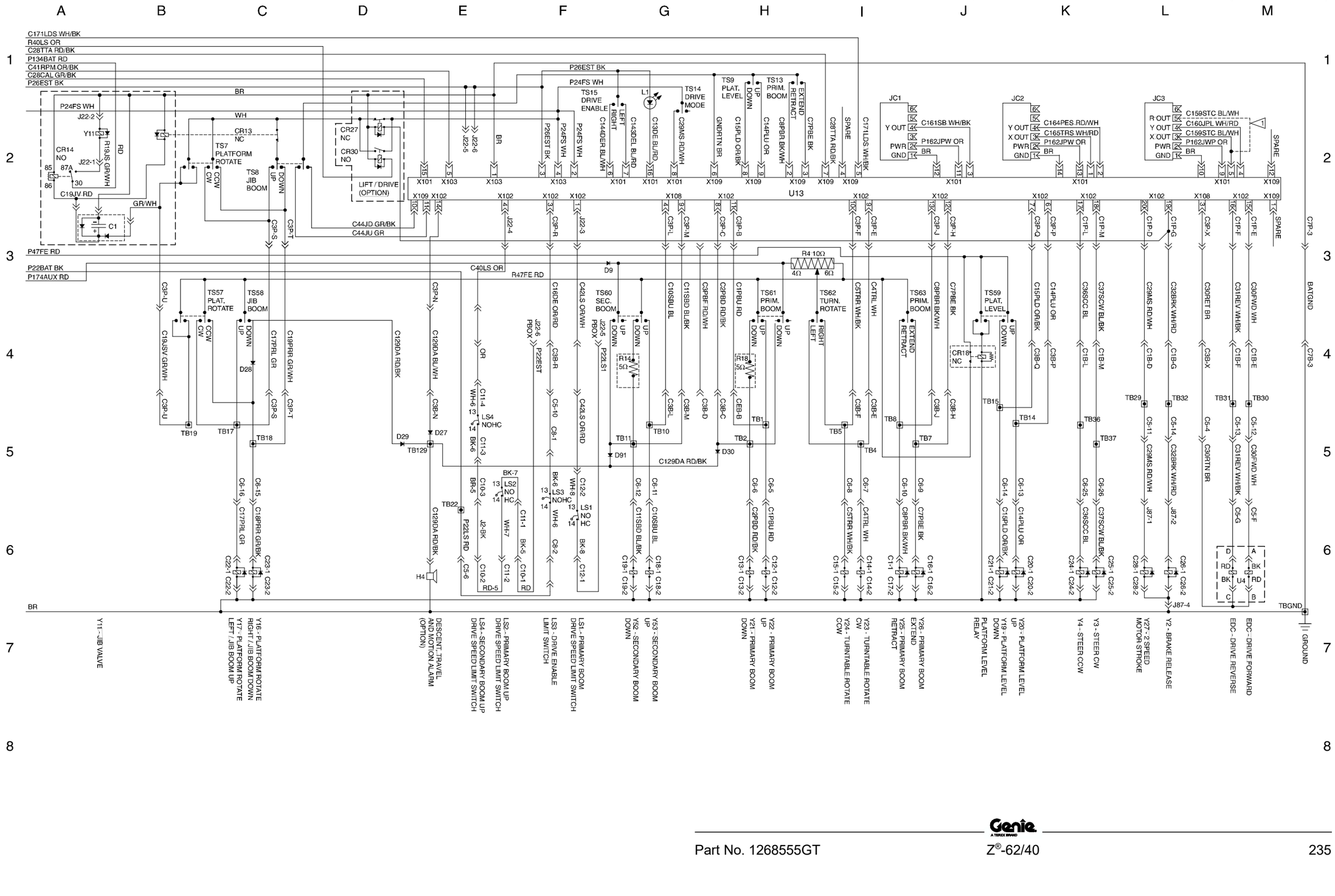
Electrical Schematic, Perkins 404F-E22T Models (ANSI/CSA)



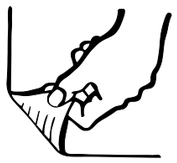
Electrical Schematic, Perkins 404F-E22T Models (ANSI/CSA)



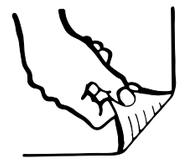
Electrical Schematic, Perkins 404F-E22T Models (ANSI/CSA)



Electrical Schematic, Perkins 404F-E22T Models (ANSI/CSA)

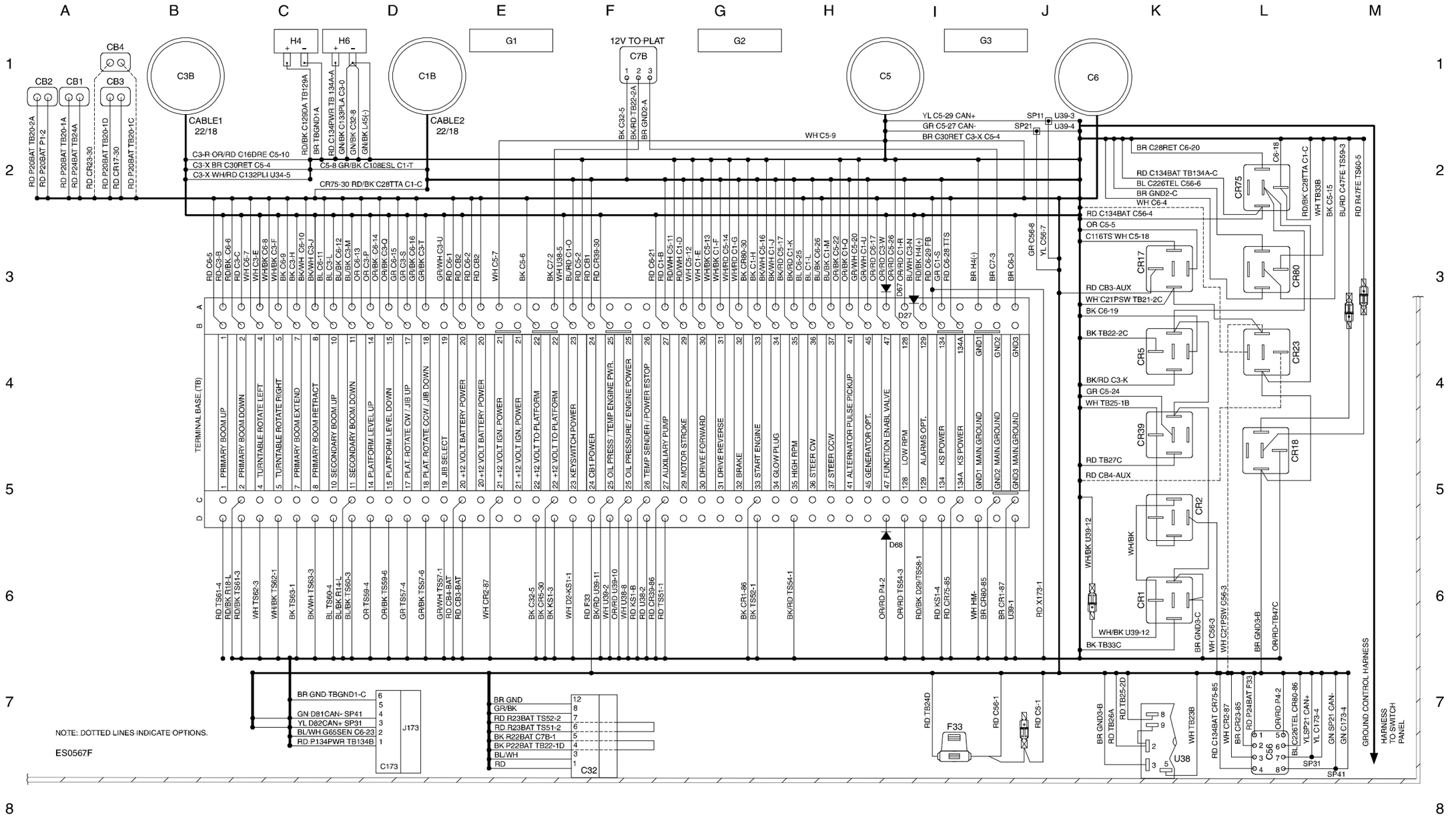


Ground Control Box Terminal Strip Wiring Diagram, Perkins 404F-E22T Models (ANSI/CSA)



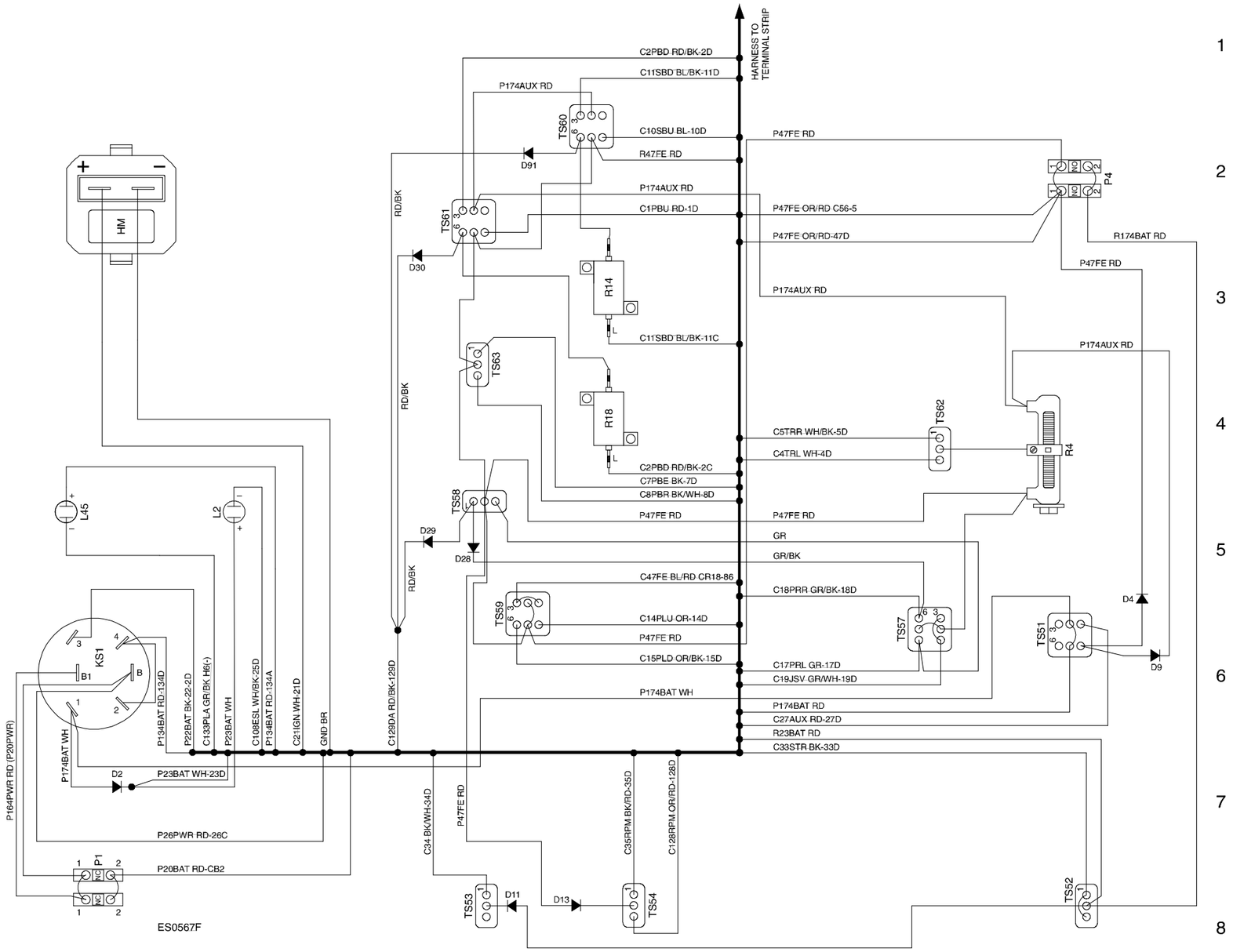
Ground Control Box Terminal Strip Wiring Diagram,

Perkins 404F-E22T Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram,

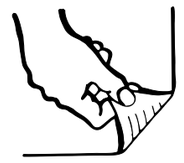
Perkins 404F-E22T Models (ANSI/CSA)



Ground Control Box Switch Panel Wiring Diagram, Perkins 404F-E22T Models (ANSI/CSA)

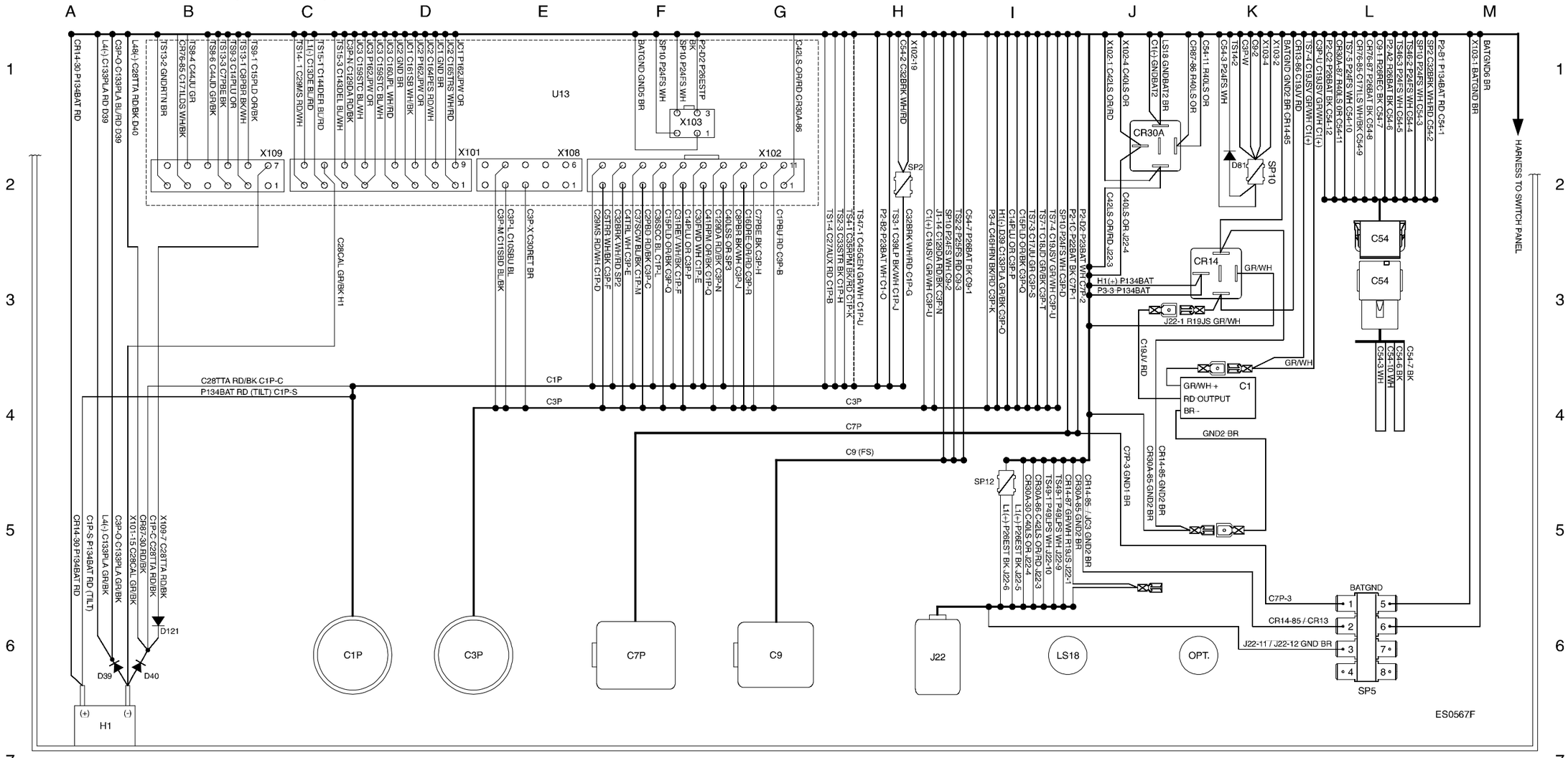


Platform Control Box Wiring Diagram, Perkins 404F-E22T Models (ANSI/CSA)



Platform Control Box Wiring Diagram,

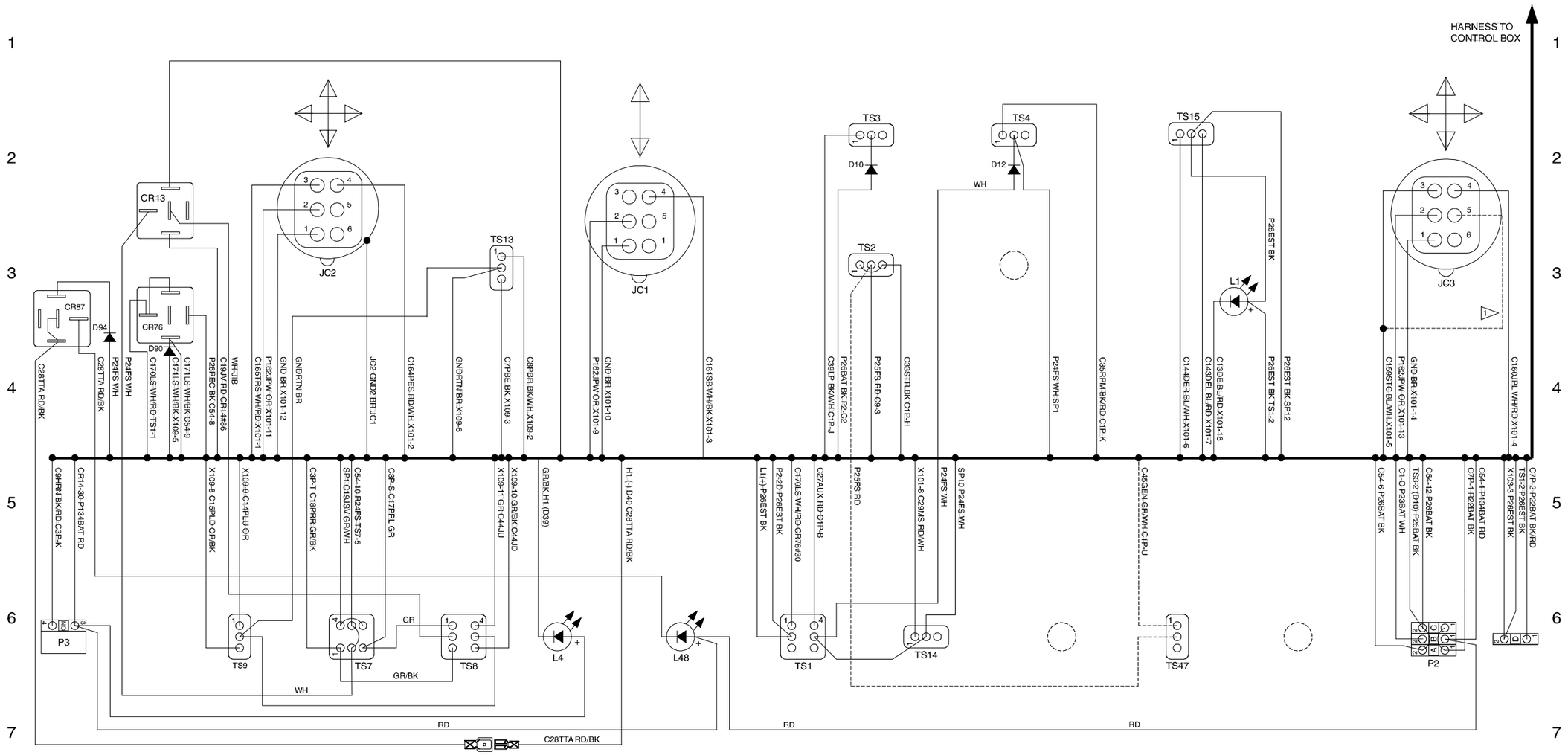
Perkins 404F-E22T Models (ANSI/CSA)



NOTE: DASHED LINES INDICATE OPTIONS.

Platform Control Box Switch Panel Wiring Diagram,

Perkins 404F-E22T Models (ANSI/CSA)



NOTE: DASHED LINES INDICATE OPTIONS.

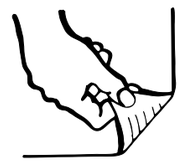
1 ROCKER STEER OPTION

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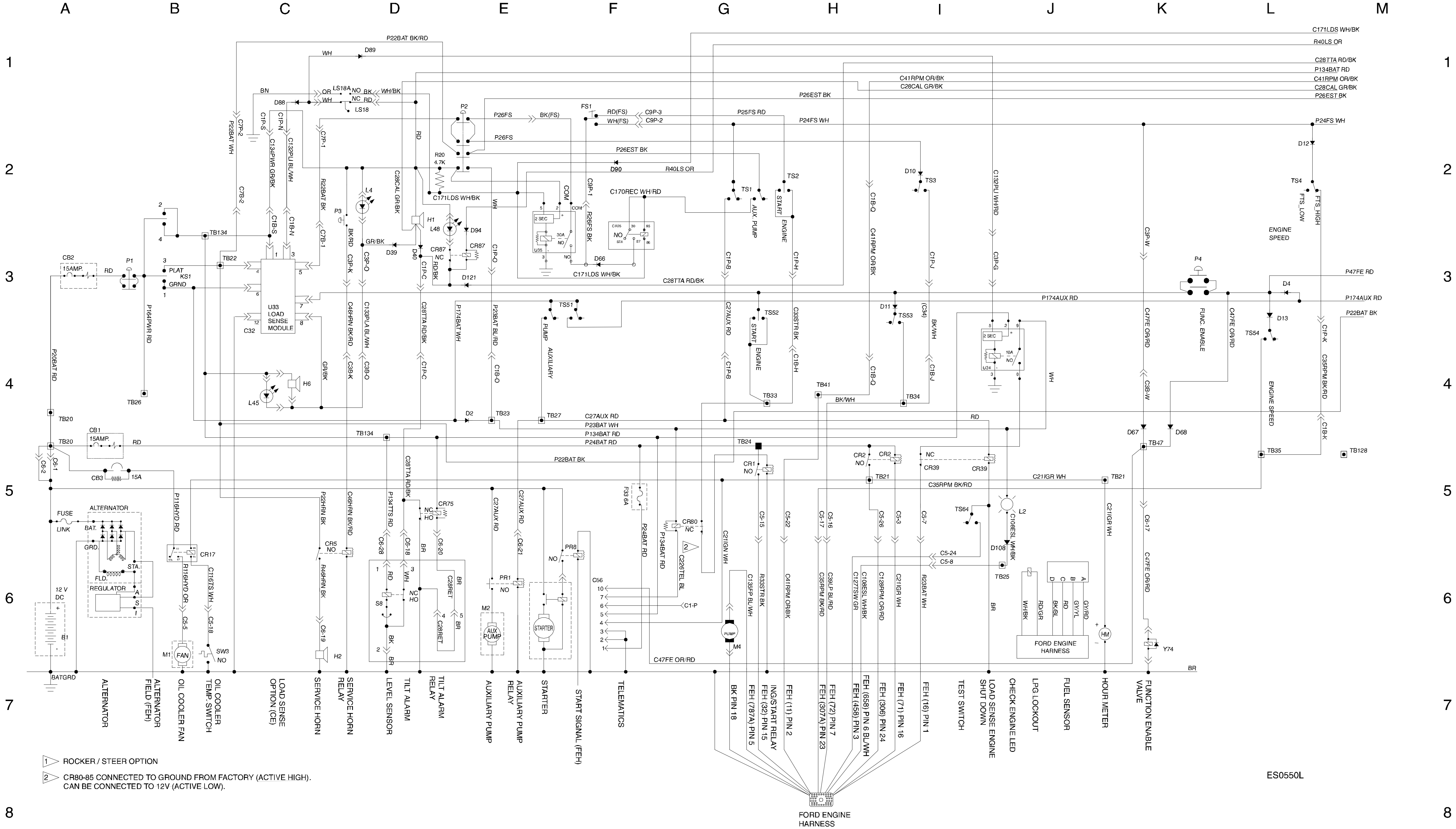
Platform Control Box Switch Panel Wiring Diagram, Perkins 404F-E22T Models (ANSI/CSA)



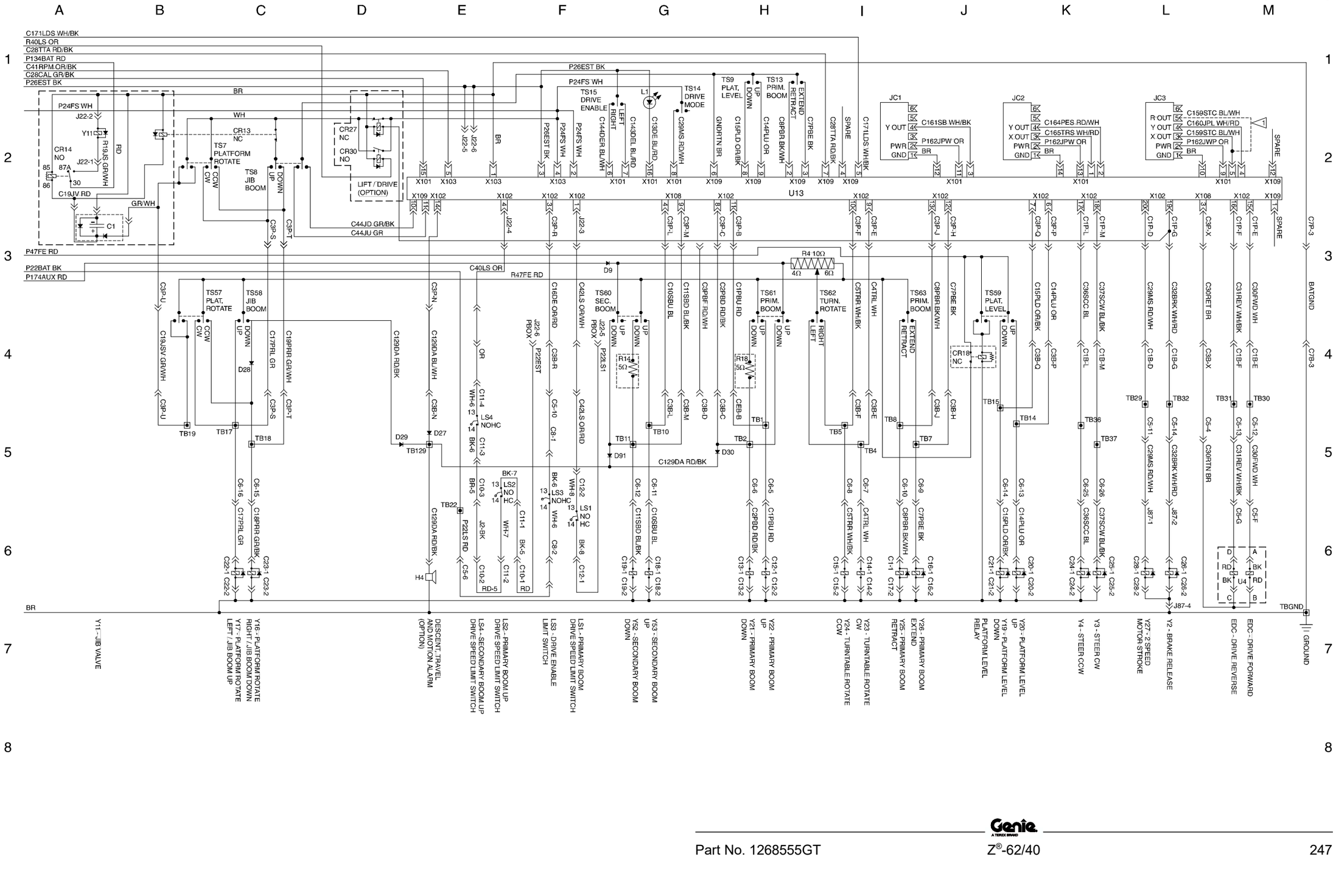
Electrical Schematic, Ford MSG-425 EFI Models (AS/CE)



Electrical Schematic, Ford MSG-425 EFI Models (AS/CE)



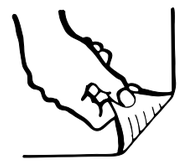
Electrical Schematic, Ford MSG-425 EFI Models (AS/CE)



Electrical Schematic, Ford MSG-425 EFI Models (AS/CE)

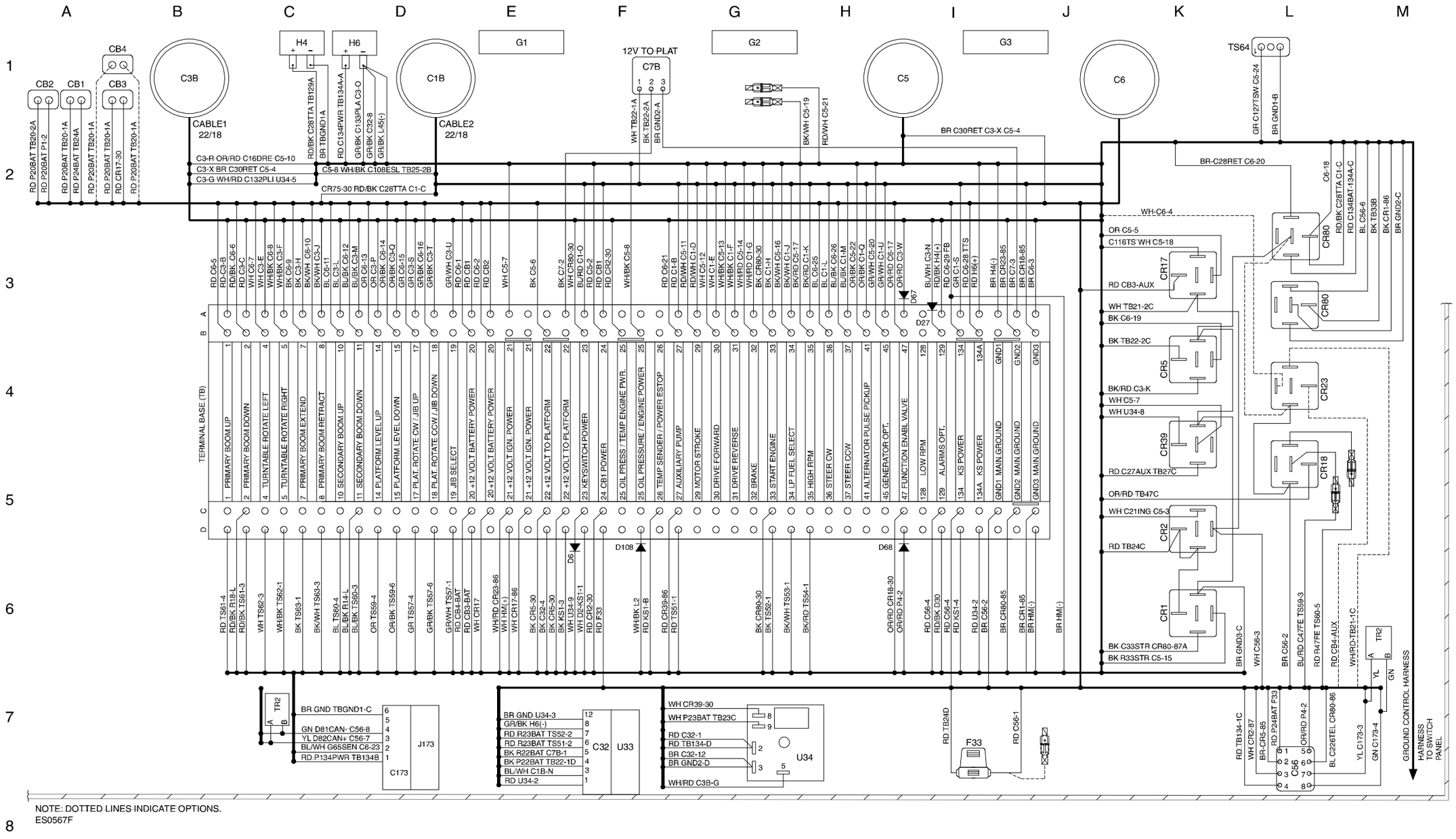


Ground Control Box Terminal Strip Wiring Diagram, Ford MSG-425 EFI Models (AS/CE)



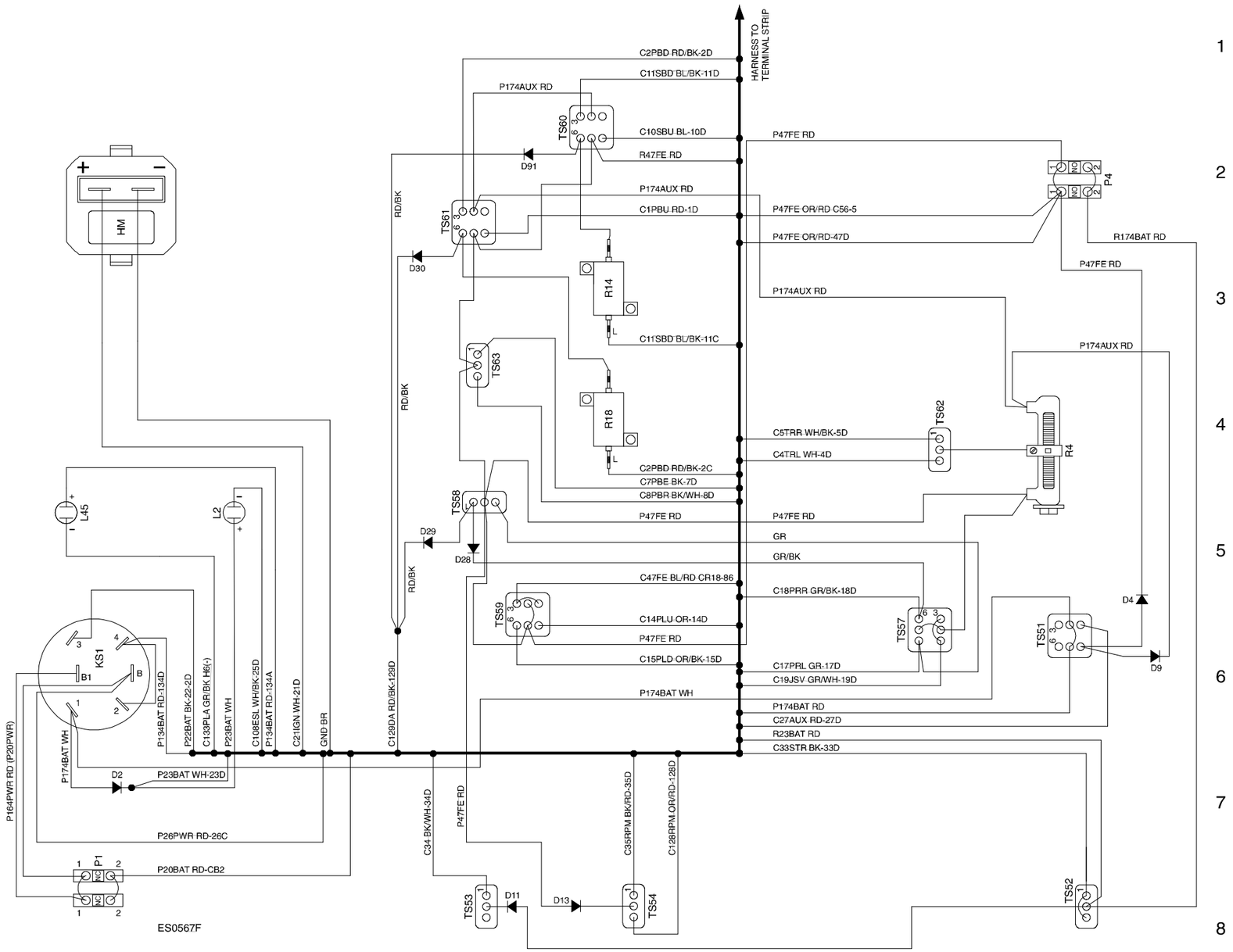
Ground Control Box Terminal Strip Wiring Diagram,

Ford MSG-425 EFI Models (AS/CE)

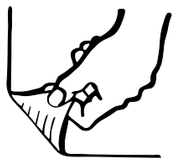


NOTE: DOTTED LINES INDICATE OPTIONS.
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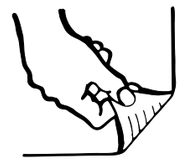
Ground Control Box Switch Panel Wiring Diagram,
Ford MSG-425 EFI Models (AS/CE)



Ground Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (AS/CE)

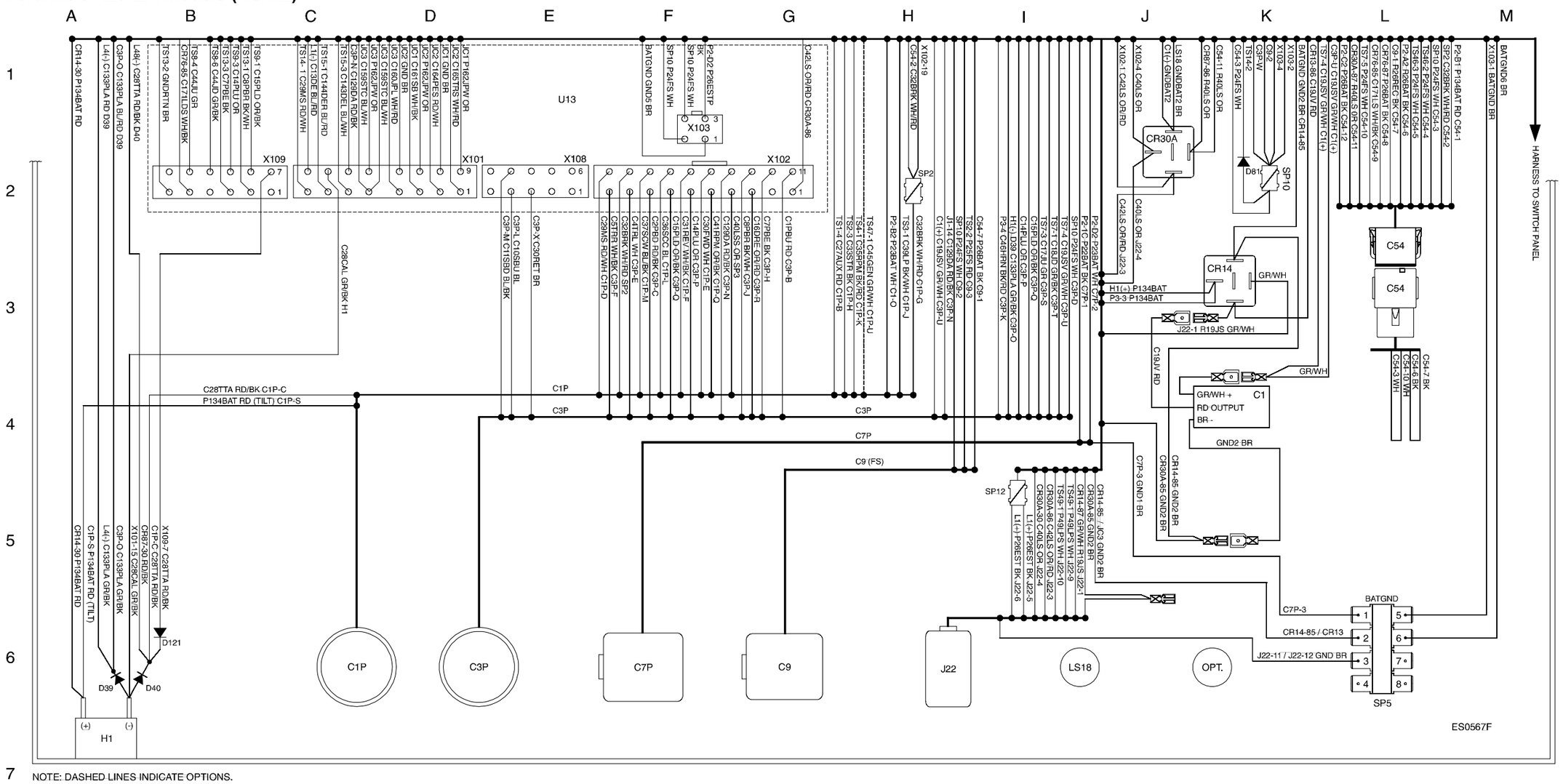


Platform Control Box Wiring Diagram, Ford MSG-425 EFI Models (AS/CE)



Platform Control Box Wiring Diagram,

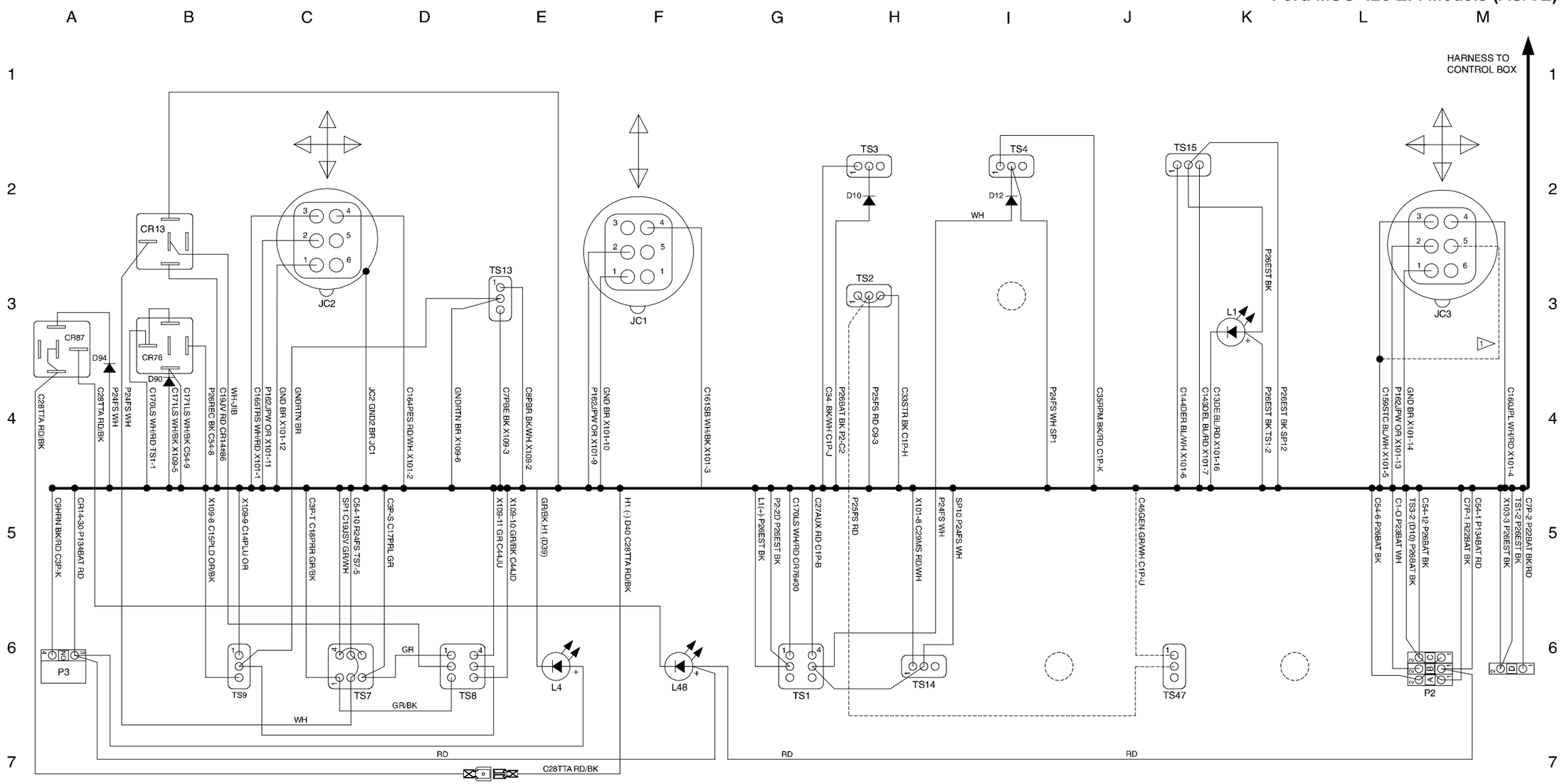
Ford MSG-425 EFI Models (AS/CE)



NOTE: DASHED LINES INDICATE OPTIONS.

Platform Control Box Switch Panel Wiring Diagram,

Ford MSG-425 EFI Models (AS/CE)



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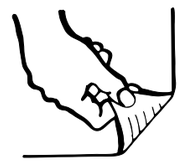
1 ROCKER STEER OPTION

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Platform Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (AS/CE)

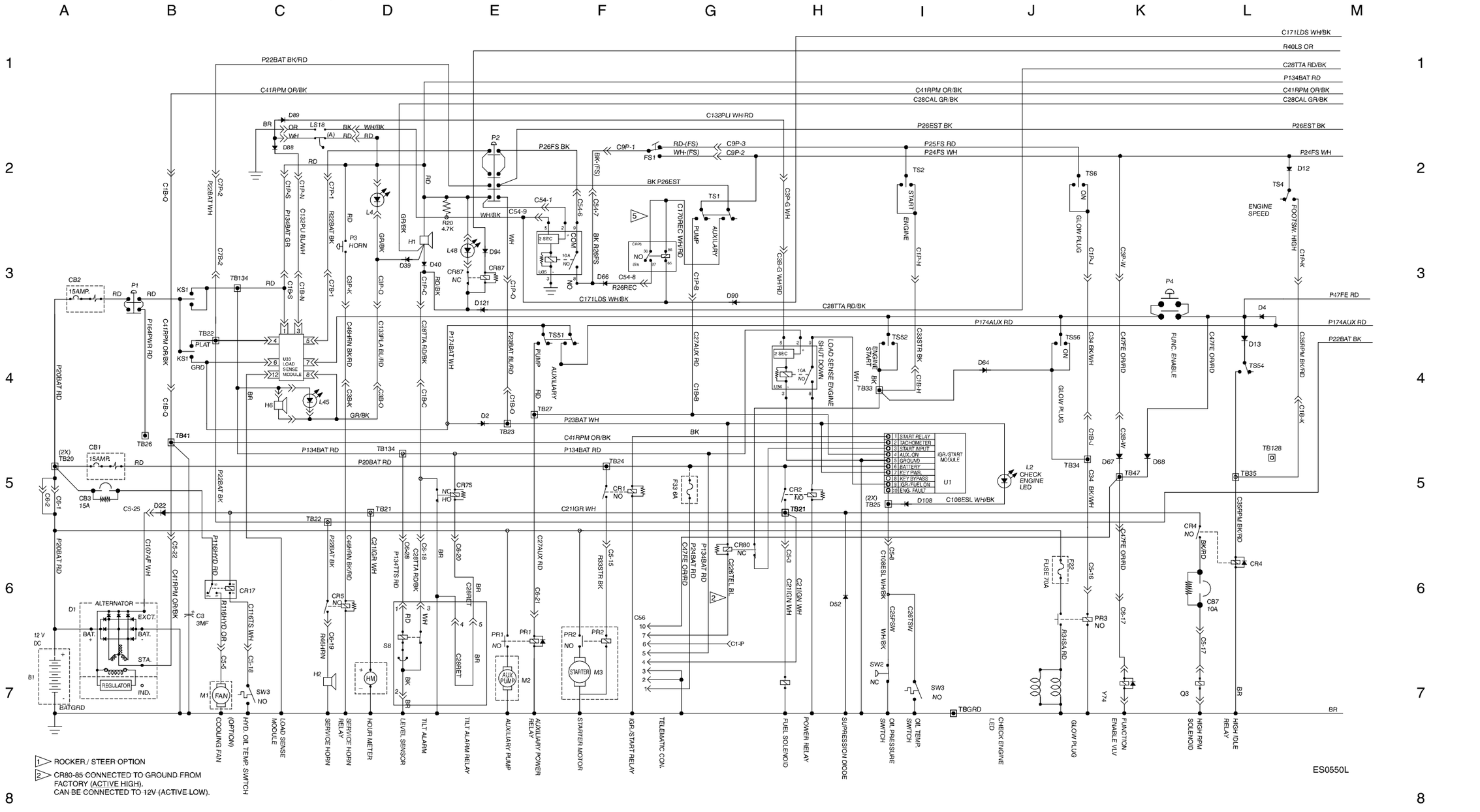


Electrical Schematic,
Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



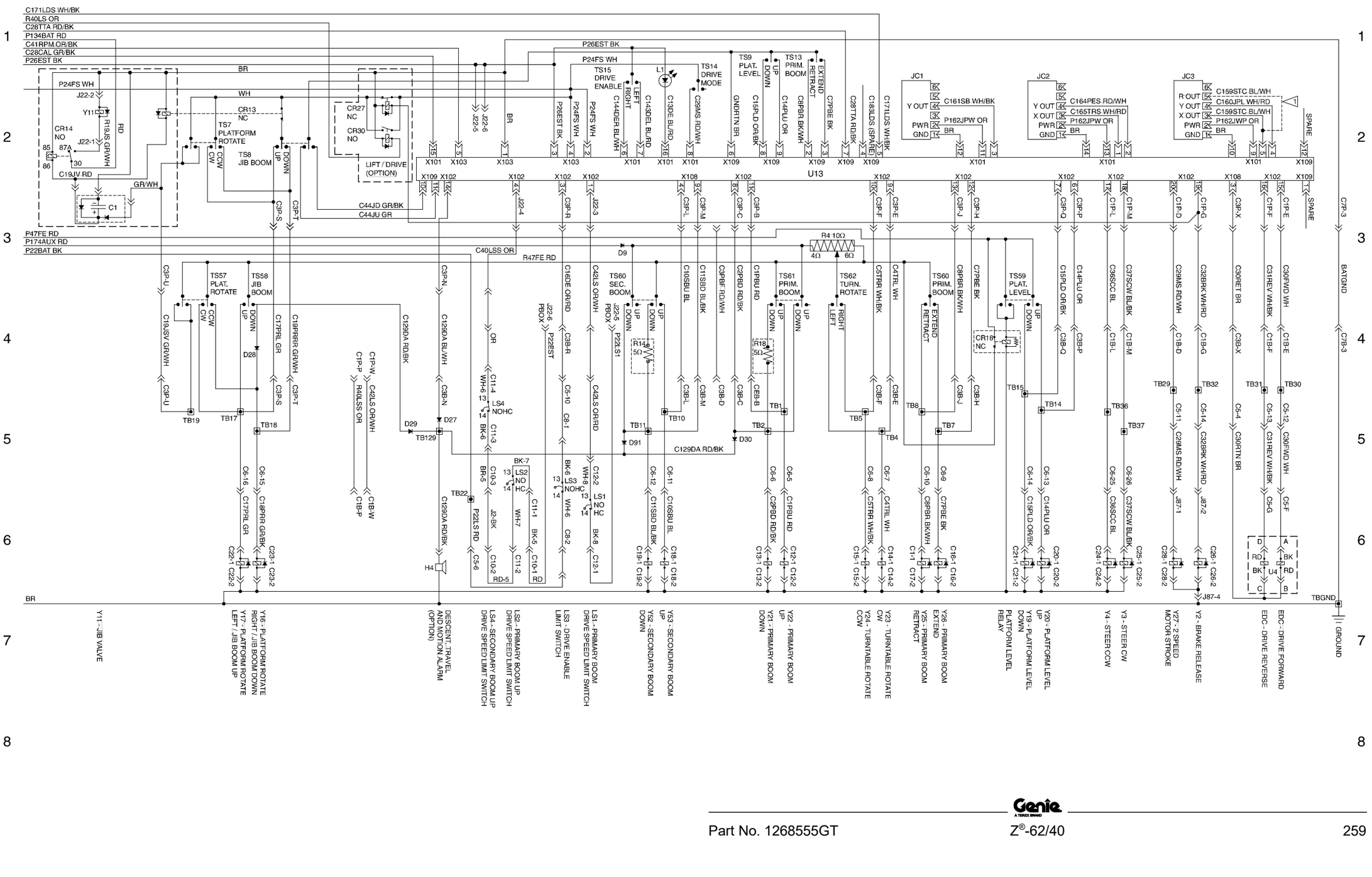
Electrical Schematic,

Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)

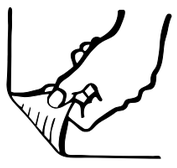


Electrical Schematic,

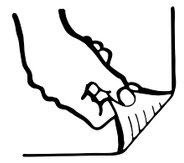
Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



Electrical Schematic,
Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)

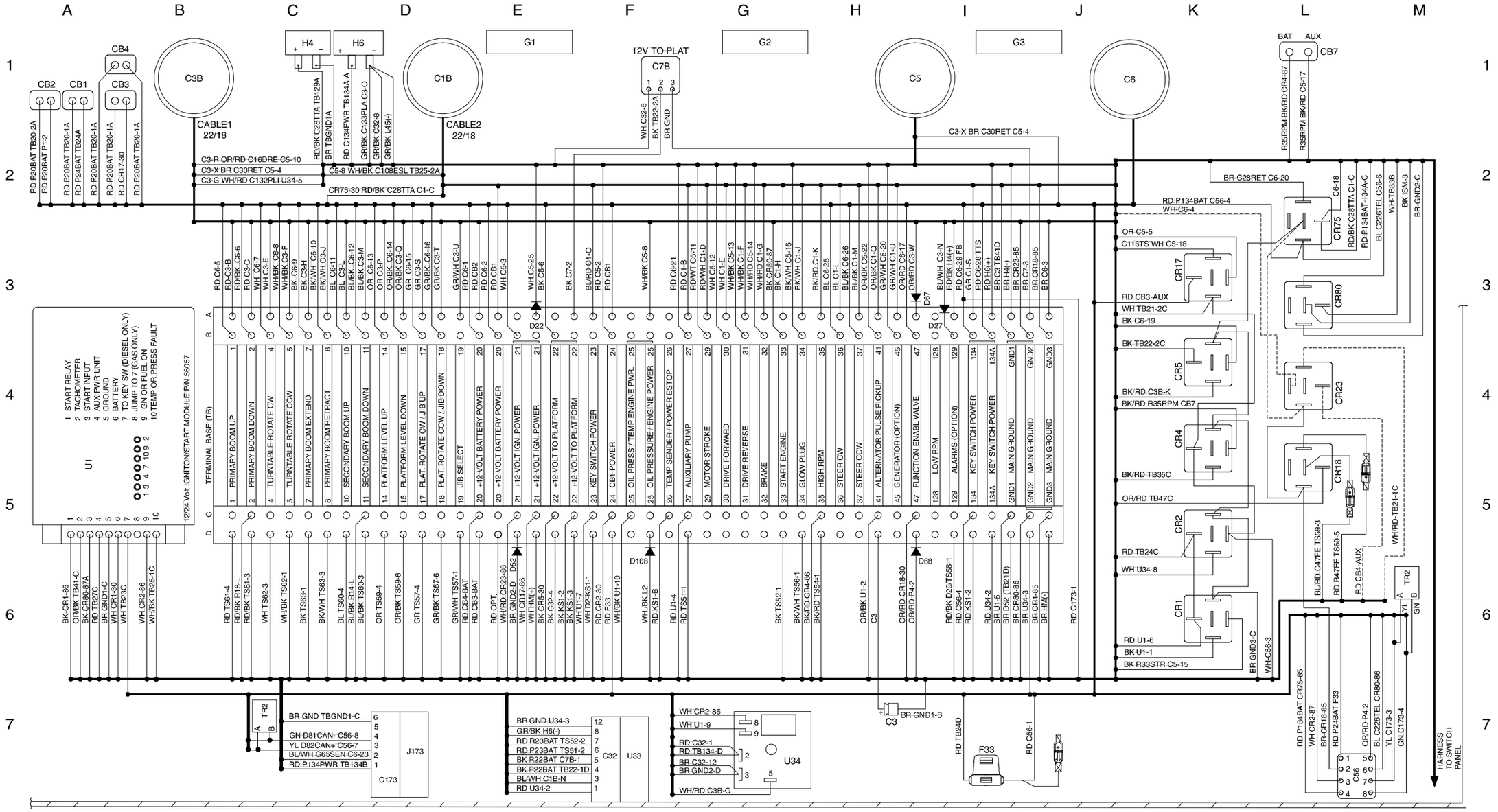


Ground Control Box Terminal Strip Wiring Diagram, Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



Ground Control Box Terminal Strip Wiring Diagram,

Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)

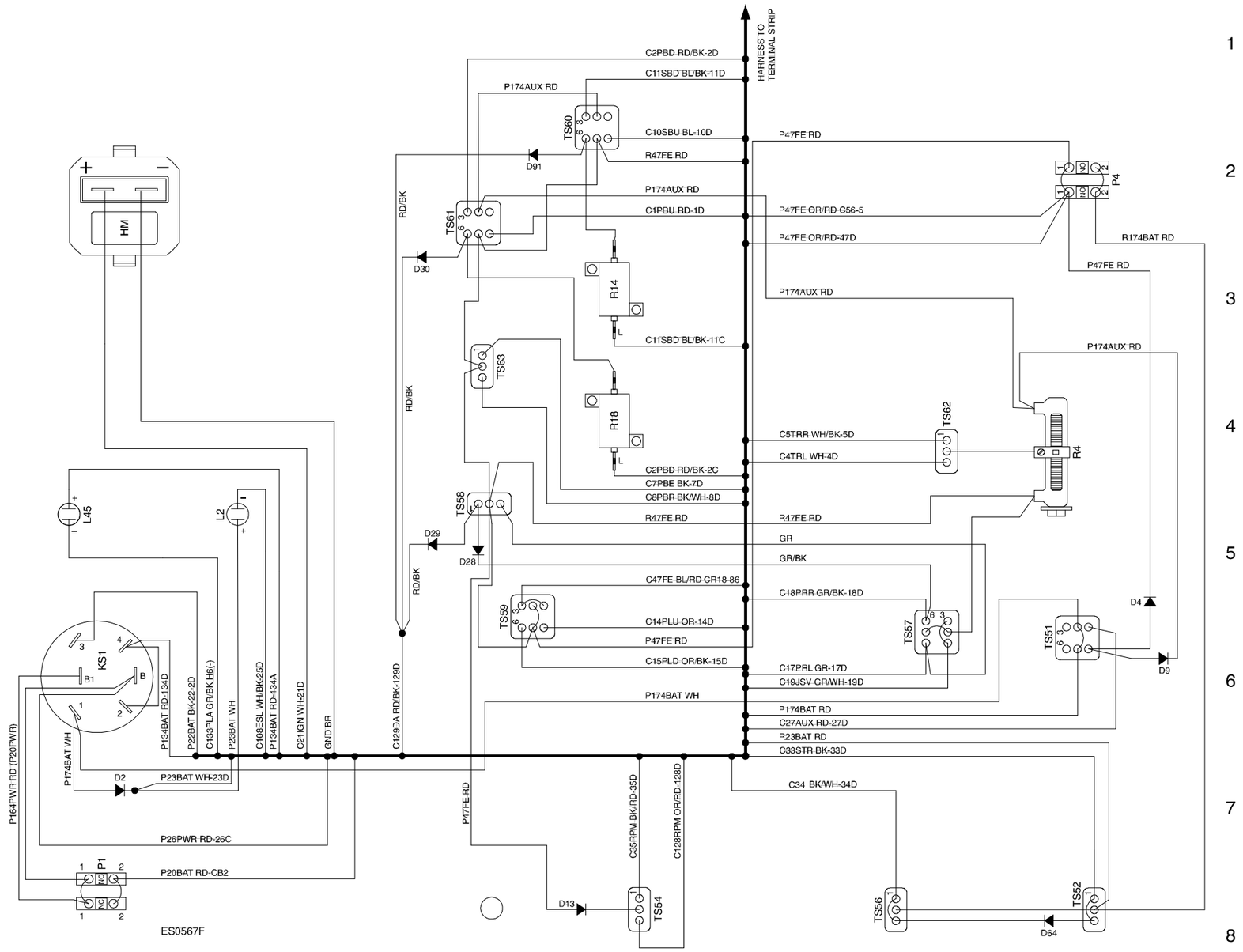


NOTE: DOTTED LINES INDICATE OPTIONS.

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Ground Control Box Switch Panel Wiring Diagram,

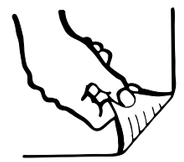
Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



Ground Control Box Switch Panel Wiring Diagram, Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)

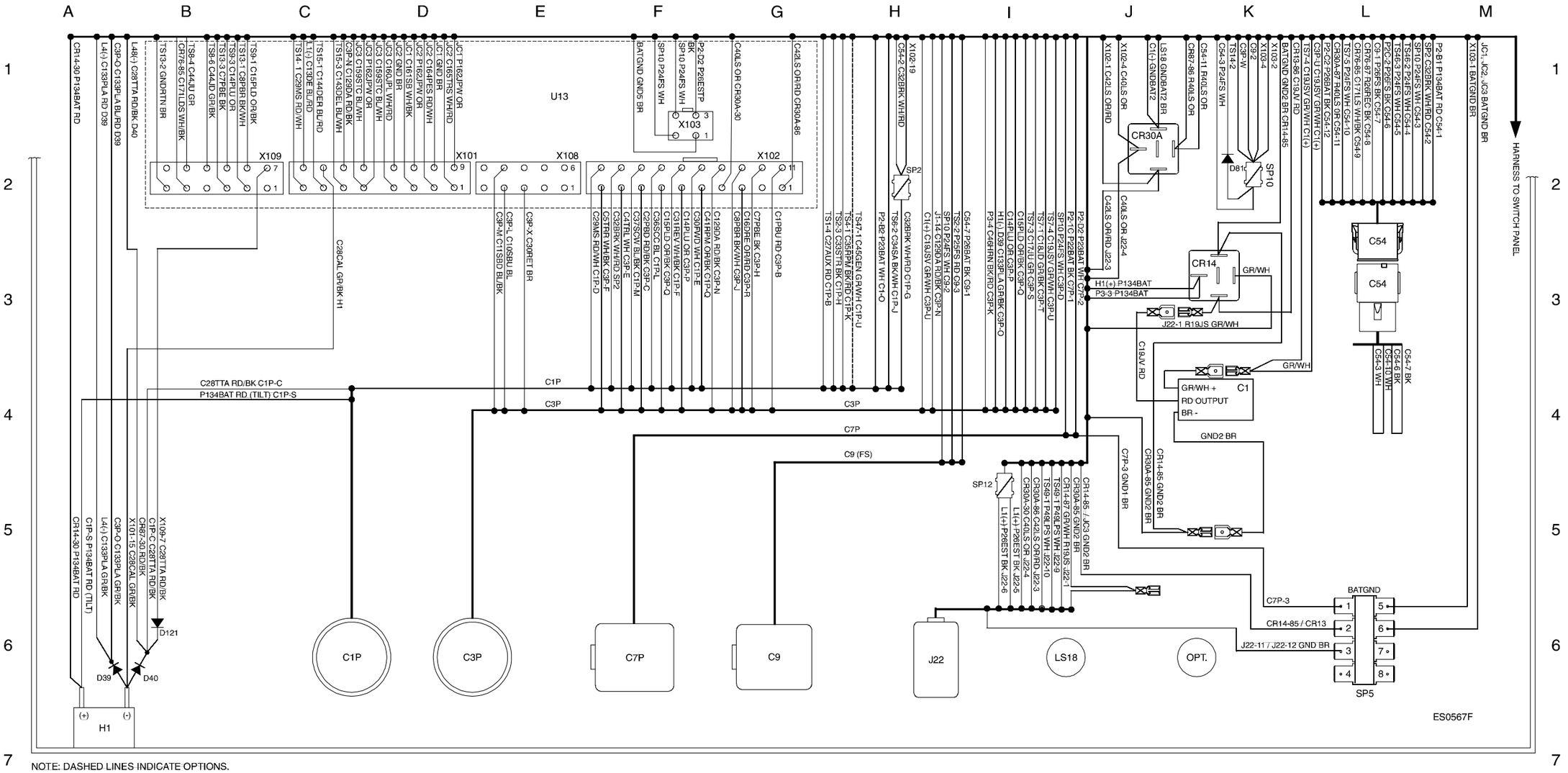


Platform Control Box Wiring Diagram, Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



Platform Control Box Wiring Diagram,

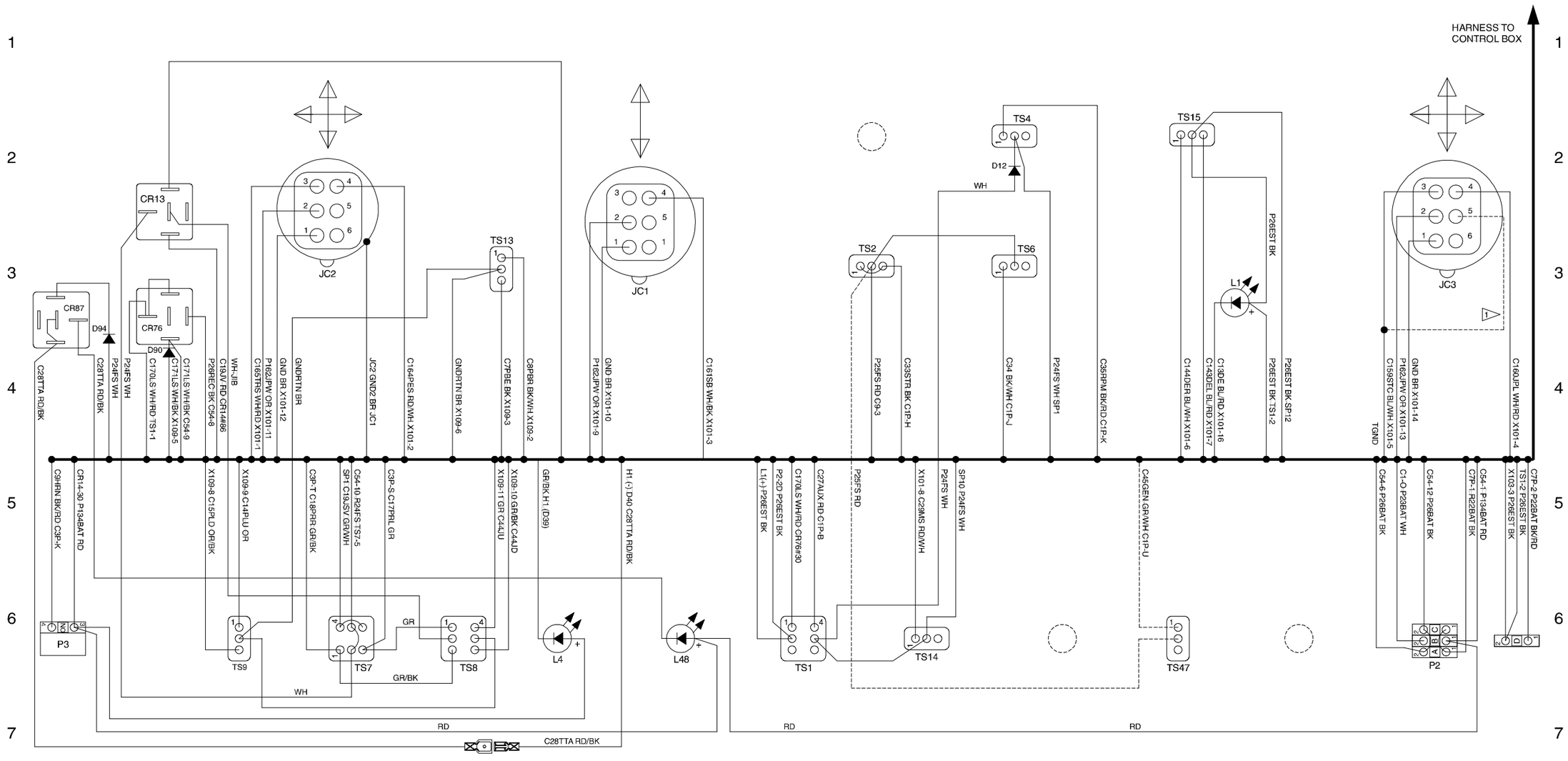
Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



NOTE: DASHED LINES INDICATE OPTIONS.

Platform Control Box Switch Panel Wiring Diagram,

Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)



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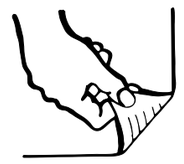
1 ROCKER STEER OPTION

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Platform Control Box Switch Panel Wiring Diagram, Deutz 2011 L03i / Perkins 404D-22 Models (AS/CE)

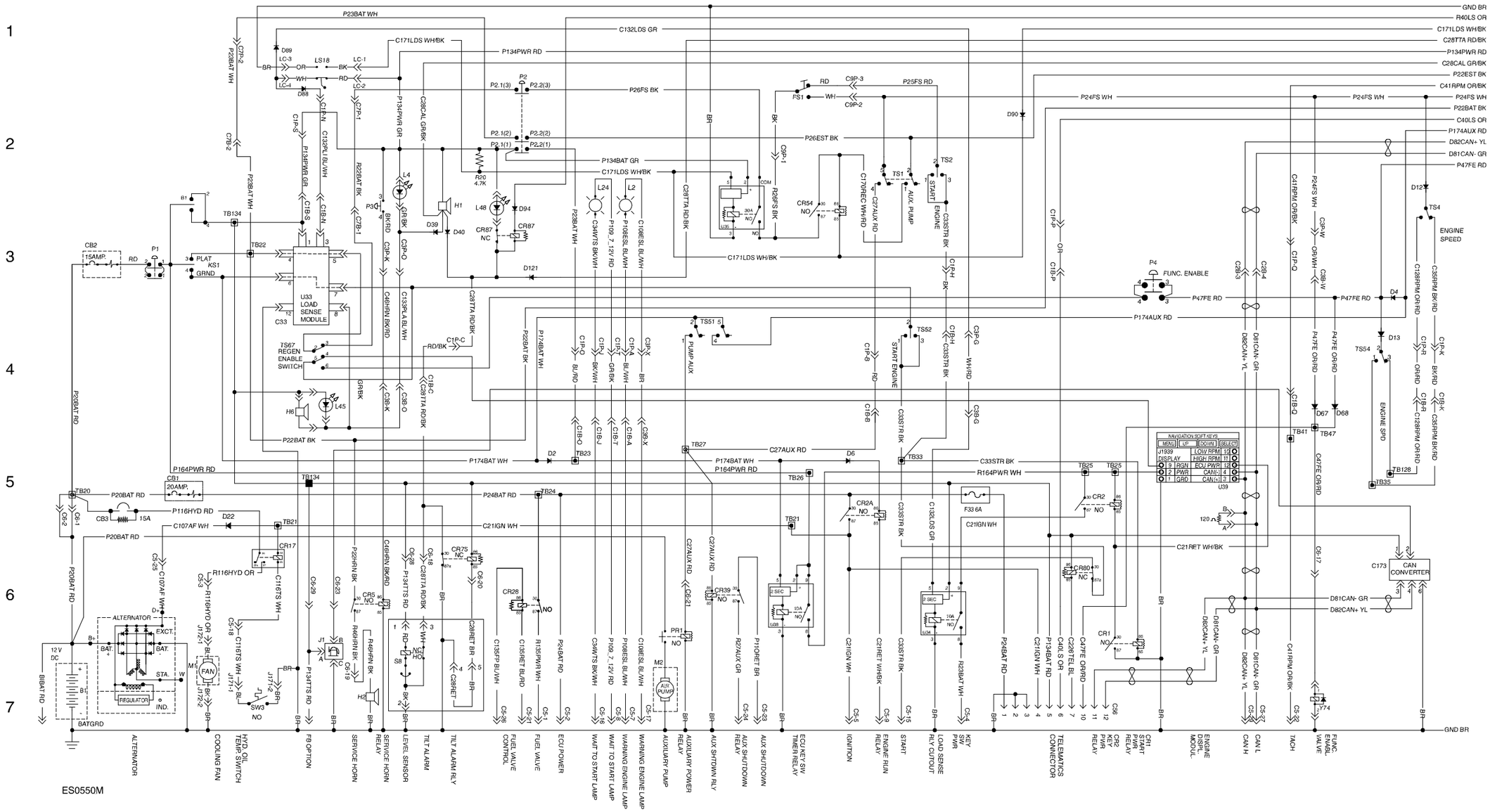


Electrical Schematic,
Deutz TD 2.2 L3 Models (CE)



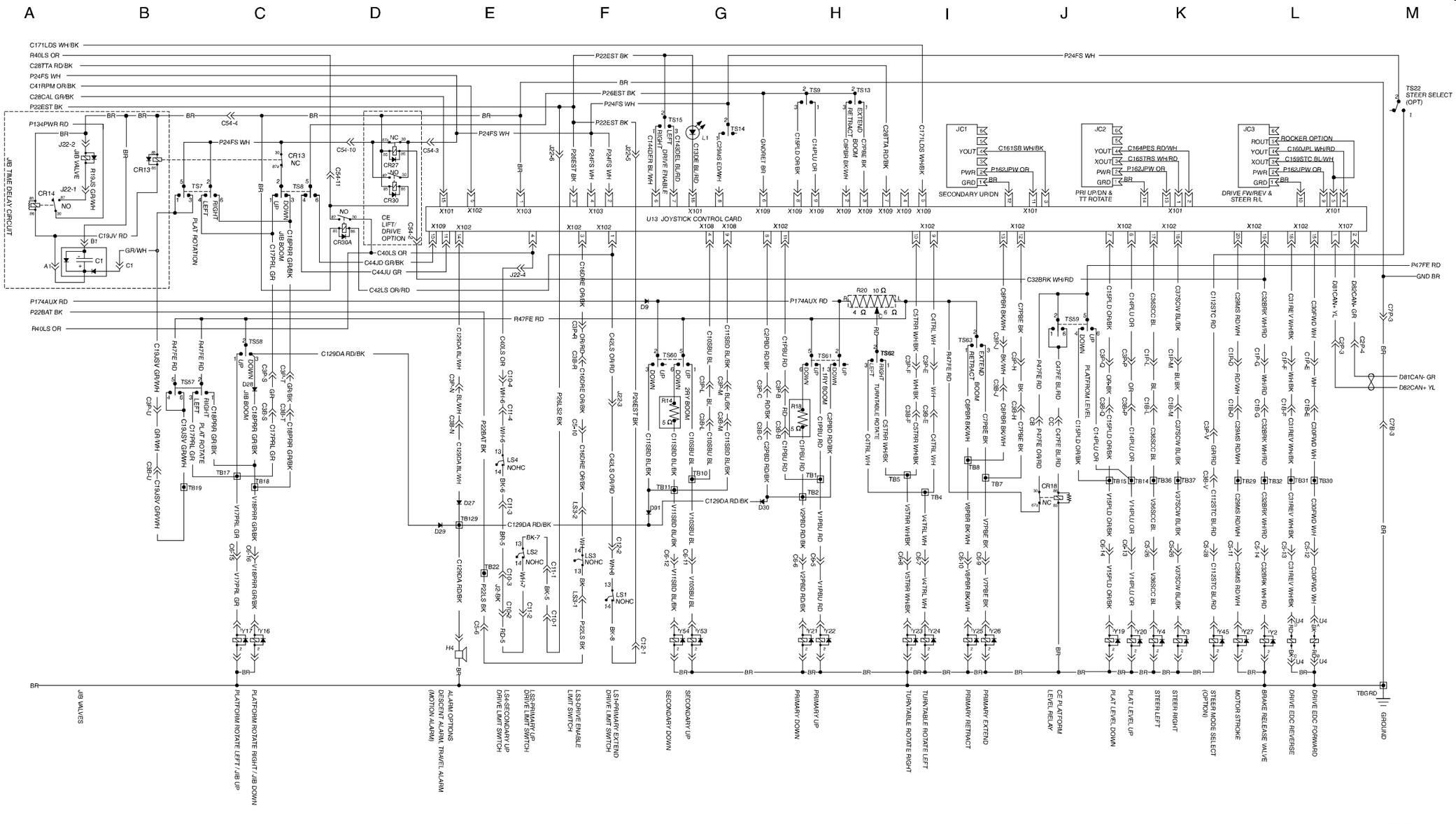
Electrical Schematic,

Deutz TD 2.2 L3 Models (CE)

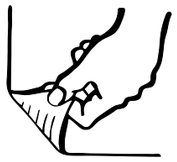


Electrical Schematic,

Deutz TD 2.2 L3 Models (CE)



Electrical Schematic, Deutz TD 2.2 L3 Models (CE)



California Proposition 65

WARNING

Operating, servicing and maintaining this equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. These chemicals can be emitted from or contained in other various parts and systems, fluids and some component wear by-products. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your equipment and vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your equipment or vehicle and after operation. For more information go to www.P65Warnings.ca.gov/passenger-vehicle.

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

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