Genie®
A TEREX BRAND

# Service and Repair Manual

| | Serial Number Range |
|---|---|
| **S-60** | from S6013-26296 to S6016A-31260<br>from S6016N-31261 to S6016N-35000<br>from S6016H-35001 to S6016H-3699 |
| **S-65** | from S6014D-101 to S6016D-639<br>from S6016M-101 to S6016M-399 |
| **S-60X** | from S60X13-26296 to S60X16H-36399<br>from S60XC13-26296 to S60XC16H-36399 |
| **S-60XC** | from S60HC13-26296 to S60HC15A-29544 |
| **S-60 HC** | from S60TX13-26296 to S60TX16H-36399<br>from S60TX14D-101 to S60TX16D-639<br>from S65TX13-26296 to S65TX16H-36399<br>from S65TX14D-101 to S65TX16D-639 |
| **S-60TraX** | from S60H-36400<br>from S60XH-36400<br>from S60XCH-3640<br>to S60XCH-45000<br>from S60TXH-36400<br>from S65TXH-36400<br>from S65TXM-101 |
| **S-65 TraX** | from S60D-640<br>from S60TXD-640<br>from S60XD-640<br>from S60M-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.

Part No. 1268492GT
Rev B
July 2017

# 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.



1268492GT Rev B, July 2017

First Edition, Second Printing

## Revision History

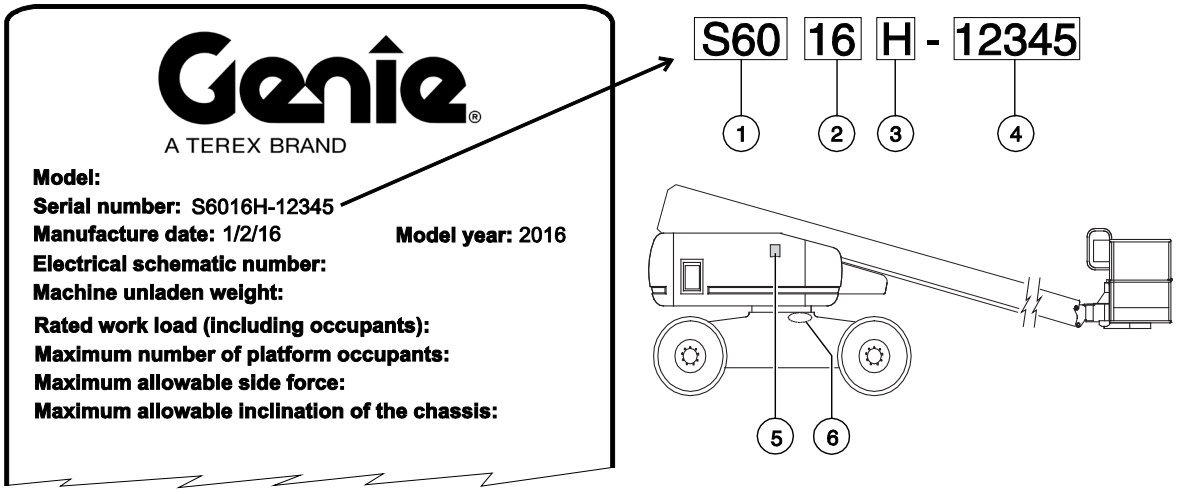
| Revision | Date | Section | Procedure / Page / Description |
|---|---|---|---|
| A | 9/2015 | | New Release |
| A1 | 9/2016 | Introduction | Serial Number Legend |
| B | 7/2017 | Specifications | Deutz D436 Engine Specifications, Machine Torque Specifications |
| | | Repair | 5-5 Engine Fault Codes |
| | | Fault Codes | Deutz D436 Engine Fault Codes |
| | | Schematics | Deutz D436 Electrical Schematics |

| **Reference Examples:** | **Electronic Version**<br>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

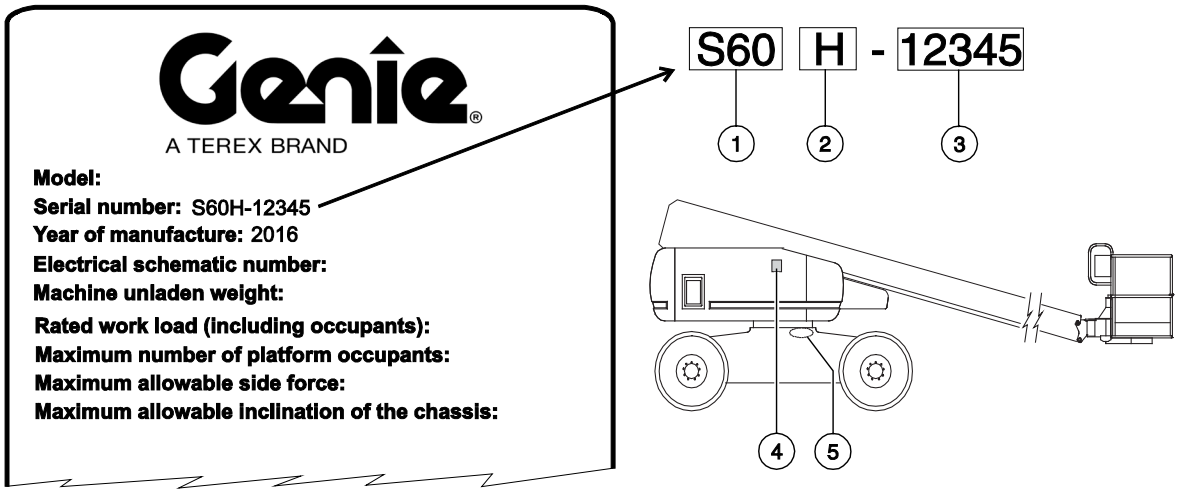
## Serial Number Legend

**To August 31, 2016**




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

**From September 1, 2016**




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

# 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 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, S-60, S-65, S-60 HC, S-60X and S-60XC | |
|---|---|
| Tire size (Rough terrain) | 355/55D625 |
| Tire weight, new foam-filled (minimum) (Rough terrain) | 415 lbs<br>188 kg |
| Tire size (Hi-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<br>325 Nm |
| Lug nut torque, lubricated | 180 ft-lbs<br>244 Nm |
| Overall tire diameter (Rough terrain, low profile tires) | 36.9 in<br>93.7 cm |
| Overall tire diameter (Hi-flotation tires) | 40.3 in<br>102.4 cm |
| Tire pressure (Rough terrain, low profile tires) | 70 psi<br>4.92 bar |
| Tire pressure (Hi-flotation tires) | 60 psi<br>4.13 bar |

| Track Components, S-60 TRAX and S-65 TRAX | |
|---|---|
| Track material | Rubber |
| Tensioning system | Pressurized grease |
| Weight (each) | 1,500 lbs<br>680 kg |

| Fluid capacities | |
|---|---|
| Fuel tank | |
| (Deutz and Perkins Models) | 35 gallons<br>132.5 liters |
| (Ford models) | 30 gallons<br>113.5 liters |
| LPG tank | 33.5 pounds<br>15.2 kg |
| Hydraulic tank | 45 gallons<br>170 liters |
| Hydraulic system(including tank) | 55 gallons<br>208 liters |
| Drive hubs | 20 fl oz<br>591 cc |
| Turntable rotation drive hub (before serial number 20367) | 40 fl oz<br>1183 cc |
| (after serial number 20366) | 43 oz<br>1262 cc |
| Drive hub oil type:SAE 90 multipurpose hypoid gear oil API service classification GL5 | |

# Specifications

## Performance Specifications

| Boom function speeds, maximum from platform controls | |
|---|---|
| Jib boom up (S-65 models) | 60 to 70 seconds |
| Jib boom down (S-65 models) | 40 to 50 seconds |
| Boom up | 60 to 70 seconds |
| Boom down | 60 to 70 seconds |
| Boom extend | 58 to 66 seconds |
| Boom retract | 53 to 62 seconds |
| Turntable rotate, 360° boom stowed | 78 to 86 seconds |
| Turntable rotate, 360° boom extended | 125 to 165 seconds |
| Platform rotate, 160° | 8 to 12 seconds |
| **Braking distance, maximum** | |
| High range on paved surface | 3 to 6 ft<br>0.9 to 1.8 m |
| **Drive speed, maximum stowed position** | |
| 2WD models | 40 ft / 6.2 sec<br>12.2 m / 6.2 sec |
| 4WD models | 40 ft / 7.2 sec<br>12.2 m / 7.2 sec |
| S-60 TRAX and S-65 TRAX | 40 ft / 12 sec<br>12.2 m / 12 sec |
| **Drive speed, maximum raised or extended position** | |
| S-60, S-65, S-60 HC, S-60X and S-60XC | 40 ft / 40 sec<br>12.2 m / 40 sec |
| S-60 TRAX and S-65 TRAX | 40 ft / 57 sec<br>12.2 m / 57 sec |
| **Gradeability** | See Operator's Manual |

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<br>Shell Tellus S2 V 46<br>Shell Tellus S4 VX 32 Shell<br>Shell Donax TG (Dexron III)<br>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.

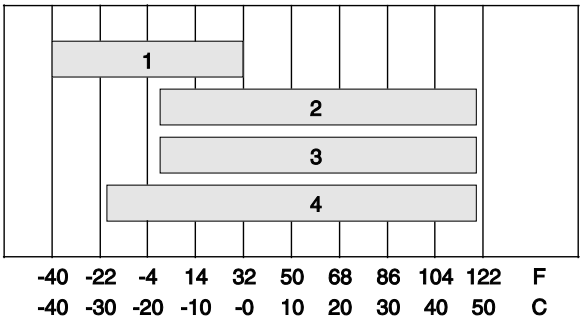
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond it's maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

**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

# Specifications

## Chevron Rando HD Premium Oil MV Fluid Properties

| | |
|---|---|
| ISO Grade | 32 |
| Viscosity index | 200 |
| Kinematic Viscosity | |
| cSt @ 200°F / 100°C | 7.5 |
| cSt @ 104°F / 40°C | 33.5 |
| Brookfield Viscosity | |
| cP @ -4°F / -20°C | 1040 |
| cP @ -22°F / -30°C | 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.

## Chevron 5606A Hydraulic Oil Fluid Properties

| | |
|---|---|
| ISO Grade | 15 |
| Viscosity index | 300 |
| Kinematic Viscosity | |
| cSt @ 200°F / 100°C | 5.5 |
| cSt @ 104°F / 40°C | 15.0 |
| cSt @ -40°F / -40°C | 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<br>cSt @ 200°F / 100°C<br>cSt @ 104°F / 40°C | <br>8.0<br>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<br>cSt @ 200°F / 100°C<br>cSt @ 104°F / 40°C | <br>9<br>33.8 |
| Brookfield Viscosity<br>cSt @ -4°F / -20°C<br>cSt @ -13°F / -25°C<br>cSt @ -40°F / -40°C | <br>481<br>702.4<br>2624 |
| Flash point | >100 |
| Pour point | -76°F / -60°C |
| Maximum continuous operating temperature | 103°F / 75°C |

## UCON Hydrolube HP-5046 Fluid Properties

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

# Specifications

## Hydraulic Component Specifications

| | |
|---|---|
| **Drive pump** | |
| Type: bi-directional, variable displacement piston pump | |
| Flow rate @ 2500 rpm | 32.4 gpm<br>122.6 L/min |
| Drive pressure, maximum | 3750 psi<br>259 bar |
| **Charge pump** | |
| Type: gerotor | |
| Displacement | 0.85 cu in<br>13.9 cc |
| Flow rate @ 2500 rp | 9.2 gpm<br>34.8 L/min |
| Charge pressure @ 2500 rpm | 310 psi<br>21.4 bar |
| **Function pump** | |
| Type: 2 section tandem gear pump | |
| Displacement - Pump 1 (inner) | 1.4 cu in<br>23 cc |
| Flow rate @ 2500 rpm | 15.3 gpm<br>58 L/min |
| Displacement - Pump 2 (outer)(oscillate models) | 0.24 cu in<br>4 cc |
| Flow rate @ 2500 rpm | 2 gpm<br>7.6 L/min |
| **Auxiliary pump** | |
| Type: gear, fixed displacement | |
| Displacement | 1.75 gpm<br>2.8 L/min |
| **Function manifold** | |
| System relief valve pressure | 3000 psi<br>207 bar |
| Steer flow regulator | 3.5 gpm<br>13.2 L/min |
| Jib boom / platform rotate flow regulator | 0.6 gpm<br>2.27 L/min |
| Oscillate relief valve pressure (@ 2500 rpm) | 800 psi<br>55 bar |
| **Drive manifold** | |
| Hot oil relief valve pressure | 280 psi<br>19.3 bar |
| **Drive motors, 4WD models** | |
| Displacement per revolution,high speed | 0.79 cu in<br>13 cc |
| Displacement per revolution,low speed | 1.83 cu in<br>30 cc |
| **Drive motors, 2WD models** | |
| Displacement per revolution,high speed | 1.28 cu in<br>20.9 cc |
| Displacement per revolution,low speed | 2.14 cu in<br>35 cc |

# Specifications

| Hydraulic filters | |
|---|---|
| High pressure filter | Beta 3 |
| High pressure filter bypass pressure | 51 psi<br>3.5 bar |
| Medium pressure filter | Beta 3 |
| Medium pressure filter bypass pressure | 51 psi<br>3.5 bar |
| Hydraulic return filter | 10 micron with 25 psi / 1.7 bar bypass |

| Manifold Component Specifications | |
|---|---|
| **Plug torque** | |
| SAE No. 2 | 36 in-lbs / 4 Nm |
| SAE No. 4 | 10 ft-lbs / 13 Nm |
| SAE No. 6 | 14 ft-lbs / 19 Nm |
| SAE No. 8 | 38 ft-lbs / 51 Nm |
| SAE No. 10 | 41 ft-lbs / 55 Nm |
| SAE No. 12 | 56 ft-lbs / 76 Nm |

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# Specifications

## Ford MSG-425 EFI Engine

| | |
|---|---|
| **Displacement** | 153 cu in<br>2.5 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.5 x 3.9 inches<br>89 x 100 mm |
| **Horsepower** | 60 @ 2500 rpm<br>45 kW @ 2500 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low function idle (computer controlled)** | 1600 rpm<br>53.3 Hz |
| **High function idle (computer controlled)** | 2500 rpm<br>83.3 Hz |
| **Compression ratio** | 9.7:1 |
| **Compression pressure (approx.)** | |
| Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder | |
| **Lubrication system** | |
| Oil pressure (operating temperature @ 2500 rpm) | 29 to 39 psi<br>2 to 2.7 bar |
| Oil capacity (including filter) | 6.7 quarts<br>6.4 liters |
| **Oil Pressure switch** | |
| Oil pressure switch point | 7 to 9 psi<br>0.48 to 0.62 bar |
| **Oil viscosity requirements** | |
| Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine. | |
| **Electronic fuel pump** | |
| Fuel pressure, static | 60 psi<br>4.1 bar |
| Fuel flow rate | 0.43 gpm<br>1.6 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 to 0.053 inches<br>1.25 to 1.35 mm |
| **Engine coolant** | |
| Capacity | 10 quarts<br>9.5 liters |
| **Coolant temperature switch** | |
| Temperature switch point | 230°F<br>110°C |
| **Cylinder head temperature sending unit** | |
| Fault code set temperature | 280°F<br>138°C |
| Engine shut-down temperature | 300°F<br>149°C |
| **Starter motor** | |
| Normal engine cranking speed | 200 to 250 rpm |
| Current draw, no load | 140-200A |
| Current draw, maximum load | 800A |
| **Alternator** | |
| Alternator output | 95A, 13.8V DC |
| **Battery** | |
| Type | 12V DC, Group 31 |
| Quantity | 1 |
| Cold cranking ampere @ 0°F | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |

# Specifications

## Deutz D436 L3i CN3 Engine

| | |
|---|---|
| **Displacement** | 177 cu in<br>2.9 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.6 x 4.3 inches<br>92 x 110 mm |
| **Horsepower** | 48.8 @ 2600 rpm<br>37 kW @ 2600 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1500 rpm<br>313 Hz |
| **High idle** | 2500 rpm<br>521.7 Hz |
| **Compression ratio** | 18.4:1 |
| **Compression pressure** | 362 to 435 psi<br>25 to 30 bar |
| **Governor** | electronic |
| **Lubrication system** | |
| Oil pressure (@ 2000 rpm) | 40 to 60 psi<br>1.4 to 3 bar |
| Oil capacity<br>(including filter) | 9.4 quarts<br>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 |
| 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** | |
| Temperature switch point | 257°F<br>125°C |
| **Oil Pressure switch** | |
| Oil pressure switch point | 20 psi<br>1.4 bar |
| **Engine coolant** | |
| Capacity | 10 quarts<br>9.4 liters |
| **Fuel injection system** | |
| Injection pump make | Bosch |
| Injection pump pressure, maximum | 15000 psi<br>1034 bar |
| Injector opening pressure | 3046 psi<br>210 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |

# Specifications

| Deutz D436 L3i CN3 Engine, continued | |
|---|---|
| **Starter motor** | |
| Current draw, normal load | 250A to 400A |
| Brush length, new | 0.72 in<br>18.5 mm |
| Brush length, minimum | 0.27 in<br>7 mm |
| **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<br>9 to 12 mm |

# Specifications

## Deutz D2011 L03i Engine

| | |
|---|---|
| **Displacement** | 142 cu in<br>2.33 liters |
| **Number of cylinders** | 3 |
| **Bore and Stroke** | 3.7 x 4.4 inches<br>94 x 112 mm |
| **Horsepower** | 48 @ 2800 rpm<br>36 kW @ 2800 rpm |
| **Firing order** | 1 - 2 - 3 |
| **Low idle** | 1500 rpm<br>313 Hz |
| **High idle** | 2500 rpm<br>521.7 Hz |
| **Compression ratio** | 19:01 |
| **Compression pressure** | 362 to 435 psi<br>25 to 30 bar |
| **Governor** | centrifugal mechanical |
| **Valve Clearance, cold** | |
| Intake | 0.012 in<br>0.3 mm |
| Exhaust | 0.020 in<br>0.5 mm |

| | |
|---|---|
| **Lubrication system** | |
| Oil pressure | 40 to 60 psi<br>1.4 to 3 bar |
| Oil capacity<br>(including filter) | 9.5 quarts<br>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 |
| 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** | |
| Temperature switch point | 220°F<br>104°C |
| **Oil Pressure switch** | |
| Oil pressure switch point | 22 psi<br>1.5 bar |

# Specifications

| Deutz D2011 L03i Engine, continued | |
|---|---|
| **Fuel injection system** | |
| Injection pump make | Bosch |
| Injection pump pressure, maximum | 15000 psi<br>1034 bar |
| Injector opening pressure | 3046 psi<br>210 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |
| **Starter motor** | |
| Current draw, normal load | 140A to 200A |
| Brush length, new | 0.72 in<br>18.5 mm |
| Brush length, minimum | 0.27 in<br>7 mm |
| **Battery** | |
| Type | 12V DC, Group 34/78 |
| Quantity | 1 |
| Cold cranking ampere | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |
| **Alternator output** | 60A @ 14V DC |
| **Fan belt deflection** | 3/8 to 1/2 inch<br>9 to 12 mm |

## Deutz TD2011L04i Engine

| | |
|---|---|
| **Displacement** | 220.9 cu in<br>3.62 liters |
| **Number of cylinders** | 4 |
| **Bore and stroke** | 3.78 x 4.92 inches<br>96 x 125 mm |
| **Horsepower**<br>Net intermittent @ 2400 rpm | 74 / 55 kW |
| **Induction system** | turbocharged |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1500 rpm<br>450 Hz |
| **High idle** | 2350 rpm<br>705 Hz |
| **Compression ratio** | 17.5:1 |
| **Compression pressure**<br>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<br>0.3 mm |
| Exhaust | 0.020 in<br>0.5 mm |

| | |
|---|---|
| **Lubrication system** | |
| Oil pressure, hot(at 2000 rpm) | 40 to 60 psi<br>2.8 to 4.1 bar |
| Oil capacity(including filter) | 12.8 quarts<br>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<br>11-24 Nm |
| Oil temperature switch point | 275°F<br>135°C |
| **Oil pressure switch** | |
| Installation torque | 8-18 ft-lbs<br>11-24 Nm |
| Oil pressure switch point | 22 psi<br>1.5 bar |

# Specifications

| Deutz TD2011L04i Engine, continued | |
|---|---|
| **Fuel injection system** | |
| Injection pump make | Motorpal |
| Injection pump pressure, maximum | 15,000 psi<br>1034 bar |
| Injector opening pressure | 3046 psi<br>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 |
| **Battery** | |
| Type | 12V DC |
| Size | 13 x 613/16 x 93/8 inches<br>33 x 17.3 x 23.8 cm |
| 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<br>9 to 12 mm |

# Specifications

## Deutz D 2.9 L4 Engine

| | |
|---|---|
| **Displacement** | 177 cu in<br>2.9 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.6 x 4.3 inches<br>92 x 110 mm |
| **Horsepower** | 48.8 @ 2600 rpm<br>37 kW @ 2600 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1500 rpm<br>313 Hz |
| **High idle** | 2500 rpm<br>521.7 Hz |
| **Compression ratio** | 18.4:1 |
| **Compression pressure** | 362 to 435 psi<br>25 to 30 bar |
| **Governor** | electronic |
| **Lubrication system** | |
| Oil pressure (@ 2000 rpm) | 40 to 60 psi<br>1.4 to 3 bar |
| Oil capacity<br>(including filter) | 9.4 quarts<br>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 |
| 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** | |
| Temperature switch point | 257°F<br>125°C |
| **Oil Pressure switch** | |
| Oil pressure switch point | 20 psi<br>1.4 bar |
| **Engine coolant** | |
| Capacity | 10 quarts<br>9.4 liters |
| **Fuel injection system** | |
| Injection pump make | Bosch |
| Injection pump pressure, maximum | 15000 psi<br>1034 bar |
| Injector opening pressure | 3046 psi<br>210 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |

# Specifications

| Deutz D 2.9 L4 Engine, continued | |
|---|---|
| **Starter motor** | |
| Current draw, normal load | 250A to 400A |
| Brush length, new | 0.72 in<br>18.5 mm |
| Brush length, minimum | 0.27 in<br>7 mm |
| **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<br>9 to 12 mm |

# Specifications

## Perkins 404D-22 Engine

| | |
|---|---|
| **Displacement** | 134 cu in<br>2.2 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.31 x 3.94 inches<br>84 x 100 mm |
| **Horsepower** | 51 @ 2500 rpm<br>38 kW @ 2500 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1300 rpm<br>229.7 Hz |
| **High idle** | 2500 rpm<br>441.7 Hz |
| **Compression ratio** | 23.3:1 |
| **Compression pressure** | 426 psi<br>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<br>0.2 mm |
| Exhaust | 0.008 in<br>0.2 mm |
| **Lubrication system** | |
| Oil pressure, cold (at 2500 rpm) | 60 psi<br>4.1 bar |
| Oil capacity<br>(including filter) | 9.3 quarts<br>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 |
| 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 pressure sending unit** | |
| Oil pressure switch point | 14.2 psi<br>1 bar |
| **Fuel injection system** | |
| Injection pump make | Zexel |
| Injection pressure | 2133 psi<br>147 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |
| **Alternator output** | 55A @ 12V DC |
| **Fan belt deflection** | 3/8 in<br>10 mm |
| **Starter motor** | |
| Current draw, no load | 90A |
| Brush length, new | 0.7480 in<br>19 mm |
| Brush length, minimum | 0.5 in<br>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<br>7.3 liters |
| **Coolant temperature switch** | |
| Temperature switch point | 221° F<br>105° C |

# Specifications

## Perkins 404F-22 Engine

| | |
|---|---|
| **Displacement** | 134 cu in<br>2.2 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.31 x 3.94 inches<br>84 x 100 mm |
| **Horsepower** | 48 @ 2800 rpm<br>38 kW @ 2500 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1300 rpm<br>229.7 Hz |
| **High idle** | 2500 rpm<br>441.7 Hz |
| **Compression ratio** | 23.3:1 |
| **Compression pressure** | 426 psi<br>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<br>0.2 mm |
| Exhaust | 0.008 in<br>0.2 mm |

| | |
|---|---|
| **Lubrication system** | |
| Oil pressure (@ 2000 rpm) | 40 to 60 psi<br>1.4 to 3 bar |
| Oil capacity<br>(including filter) | 9.4 - 11.2 quarts<br>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 |
| 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 pressure sending unit** | |
| Oil pressure switch point | 14.2 psi<br>1 bar |
| **Fuel injection system** | |
| Injection pump make | Zexel |
| Injection pressure | 2133 psi<br>147 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |
| **Alternator output** | 85A @ 12V DC |
| **Fan belt deflection** | 3/8 in<br>10 mm |
| **Starter motor** | |
| Current draw, no load | 140A - 200A |
| Brush length, new | 0.7480 in<br>19 mm |
| Brush length, minimum | 0.5 in<br>12.7 mm |

# Specifications

| Perkins 404F-22 Engine, continued | |
|---|---|
| **Battery** | |
| Type | 12V DC |
| Quantity | 1 |
| Cold cranking ampere | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |
| **Engine coolant** | |
| Capacity | 7.7 quarts<br>7.3 liters |
| **Coolant temperature switch** | |
| Temperature switch point | 221° F<br>105° C |

# Specifications

## Machine Torque Specifications

| | |
|---|---|
| **Platform rotator** | |
| 1-8 center bolt, GR 5 | 640 ft-lbs<br>867 Nm |
| 3/8 -16 bolts, GR 8<br>(use a removable thread locking compound) | 33 ft-lbs<br>*45 Nm |
| 1/2 -13 bolts, GR 8 | 80 ft-lbs<br>108 Nm |
| **Drive motor and hubs** | |
| Drive hub mounting bolts, lubricated | 160 ft-lbs<br>217 Nm |
| Drive motor mounting bolts, lubricated | 55 ft-lbs<br>75 Nm |
| **Turntable bearing** | |
| Rotate bearing mounting bolts, lubricated<br>(to serial number S60X15A-29677, S60XC15A-30038, S6016D-530) | 180 ft-lbs<br>244 Nm |
| (from serial number S60X15A-29678, S60XC15A-30039, S60X16H-35108, S60XC16H-35119, S60XCM-101, S65XCH-101, S65XCM-101, S6016D-531) | 160 ft-lbs<br>217 Nm |
| **Turntable rotation assembly** | |
| Backlash pivot plate, lubricated | 320 ft-lbs<br>433 Nm |

## TRAX Torque Specifications

| | |
|---|---|
| **Sprocket to hub adapter fasteners** | |
| 3/4 -10 nuts, GR 8, dry | 317 ft-lbs<br>430 Nm |
| 3/4 -10 nuts, GR 8, lubricated | 281 ft-lbs<br>381 Nm |
| 1/2 -13 FHS screws, dry | 80 ft-lbs<br>108 Nm |
| 1/2 -13 FHS screws, lubricated | 60 ft-lbs<br>81 Nm |
| **Hub adapter to drive hub fasteners** | |
| Lug nut torque, dry | 240 ft-lbs<br>325 Nm |
| Lug nut torque, lubricated | 180 ft-lbs<br>244 Nm |
| **Sprocket bearing hub fasteners** | |
| 1-14 bolts, GR 8, dry | 650 ft-lbs<br>881 Nm |
| 1-14 bolts, GR 8, lubricated | 488 ft-lbs<br>662 Nm |
| **Idler and bogey wheel fasteners** | |
| 3/4 -10 bolts, GR 8, dry | 375 ft-lbs<br>508 Nm |
| 3/4 -10 bolts, GR 8, lubricated | 281 ft-lbs3<br>81 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 | 10 ft-lbs / 13.6 Nm |
| -6 | 30 ft-lbs / 40.7 Nm |
| -8 | 40 ft-lbs / 54.2 Nm |
| -10 | 60 ft-lbs / 81.3 Nm |
| -12 | 85 ft-lbs / 115 Nm |
| -16 | 110 ft-lbs / 150 Nm |
| -20 | 140 ft-lbs / 190 Nm |
| -24 | 180 ft-lbs / 245 Nm |

### JIC 37° Fittings

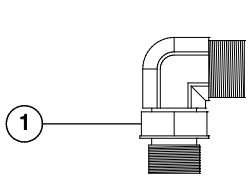
(swivel nut or hose connection)

| SAE Dash Size | Thread Size | Flats |
|---|---|---|
| -4 | 7/16-20 | 2 |
| -6 | 9/16-18 | 1 ¼ |
| -8 | 3/4-16 | 1 |
| -10 | 7/8-14 | 1 |
| -12 | 1 1/16-12 | 1 |
| -16 | 1 5/16-12 | 1 |
| -20 | 1 5/8-12 | 1 |
| -24 | 1 7/8-12 | 1 |

### SAE O-ring Boss Port

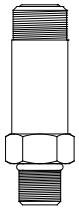
(tube fitting - installed into Aluminum)
(all types)

| SAE Dash Size | Torque |
|---|---|
| -4 | 14 ft-lbs / 19 Nm |
| -6 | 23 ft-lbs / 31.2 Nm |
| -8 | 36 ft-lbs / 54.2 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

1 jam nut



Non-adjustable fitting

### SAE O-ring Boss Port

(tube fitting - installed into Steel)

| SAE Dash Size | | Torque |
|---|---|---|
| -4 | ORFS / 37° (Adj)<br>ORFS (Non-adj)<br>37° (Non-adj) | 15 ft-lbs / 20.3 Nm<br>26 ft-lbs / 35.3 Nm<br>22 ft-lbs / 30 Nm |
| -6 | ORFS (Adj / Non-adj)<br>37° (Adj / Non-adj) | 35 ft-lbs / 47.5 Nm<br>29 ft-lbs / 39.3 Nm |
| -8 | ORFS (Adj / Non-adj)<br>37° (Adj / Non-adj) | 60 ft-lbs / 81.3 Nm<br>52 ft-lbs / 70.5 Nm |
| -10 | ORFS (Adj / Non-adj)<br>37° (Adj / Non-adj) | 100 ft-lbs / 135.6 Nm<br>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.

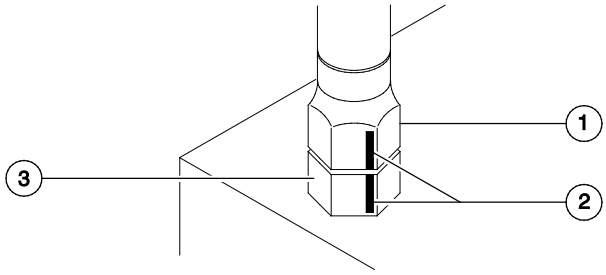



Illustration 1

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.

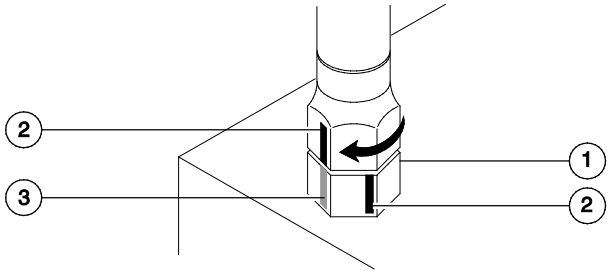



Illustration 2

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.

# 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

## 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.

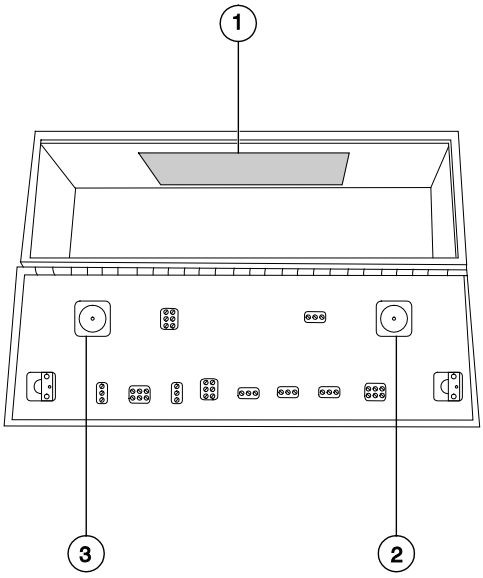
☒ Indicates that an incorrect result has occurred after performing a series of steps.

# Platform Controls

## 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 primary boom up/down,extend/retract and turntable rotate right/left joystick controller

## 1-1 ALC-500 Circuit Board

Note: When the ALC-500 circuit board is replaced, the joystick controllers will need to be calibrated. 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.

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

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

**NOTICE** Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

5 Carefully disconnect the wire connectors from the circuit board.

6 Remove the ALC-500 circuit board mounting fasteners.

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

# 1-2 Joysticks

## How to Calibrate a Joystick

The 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.

⊠ Result: The alarm does not sound. Repeat steps 3 through 7.

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

# Platform Controls

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.

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

## 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.

⊠ Result: The alarm does not sound. Repeat steps 3 through 7.

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

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

10 Compare the machine function time with the 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 from a default of 100%, with a minimum of 60% and a maximum of 120%.

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.

☒ Result: The alarm does not sound. Repeat steps 3 through 7.

# Platform Controls

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

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

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

11 Release the foot switch.

12 Activate the joystick and adjust 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 from a default of 100%, with a minimum of 50% and a maximum of 150%.

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

14 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.

⊠ Result: The alarm does not sound. The minimum or maximum adjustment has been obtained. No changes can be saved.

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

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

| **Ramp rate (factory settings)** | |
|---|---|
| **Boom up/down** | |
| transition accelerate | 1 second |
| transition decelerate | 10 seconds |
| S ramp accelerate | 1 second |
| S ramp decelerate | 0.45 second |
| **Boom extend/retract** | |
| accelerate | 2 seconds |
| decelerate | 0.5 second |
| **Turntable rotate** | |
| accelerate | 2 seconds |
| decelerate | 0.75 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 second |
| decelerate, shift from low to high speed | 1 second |
| decelerate, shift from high to low speed | 4 seconds |

## How to Calibrate the Boom Angle Sensor

The boom angle sensor controls the maximum angle that the boom can attain.

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

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

2 Turn the key switch to platform controls.

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

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

5 Momentarily activate the drive enable toggle switch to the right 12 times.

⊙ Result: There should be a pause and the alarm should sound 12 times indicating that the machine is in Angle Sensor calibration mode.

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

7 Momentarily activate the drive enable toggle switch to the right 1 time to set the stowed position.

Note: The alarm will not sound indicating the setting.

8 Raise the primary boom to the fully elevated position.

Note: Manually reduce the boom speed as it reaches the fully elevated position.

9 Momentarily activate the drive enable toggle switch to the right 1 time to set the elevated position.

⊙ Result: The alarm will sound indicating that the angle sensor has been calibrated.

10 Release the joystick and the foot switch and wait for 10 seconds.

⊙ Result: The alarm will sound indicating that the settings have been saved and is leaving calibration mode.

11 Cycle the red Emergency Stop button off, then back on. Start the machine and return to the stowed position.

# Platform Components

## 2-1 Platform Leveling Slave Cylinder

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

### How to Remove the Platform Leveling Slave Cylinder

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

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 boom until the slave cylinder barrel-end pivot pin is accessible.

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

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

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

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

**⚠WARNING** Crushing hazard. S-65 and S-65 TRAX: The jib boom could fall when the slave cylinder rod-end pivot pin is removed if not properly supported.

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

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

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

8 Tag, disconnect and plug the hydraulic hoses from the slave cylinder. Cap the fittings on the cylinder.

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

### How to Bleed the Slave Cylinder

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

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

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

## 2-2
## Platform Rotator

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 160 degrees.

### How to Remove the Platform Rotator

**NOTICE** Component damage hazard. Mark the platform mounting weldment and the rotator flange before removing the platform mounting weldment. The platform mounting weldment must be replaced in the exact same position on the rotator flange as it was before removal. If a new rotator is installed or the rotator is disassembled, proper alignment can be achieved by rotating the rotator all the way to the left and then installing the platform mounting weldment all the way in the left position.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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.

Note: **S-60 HC**: If the load sense components are disassembled and/or removed from the platform support, the platform load sense system will need to be calibrated. Refer to Repair Procedure, *Platform Load Sense System, S-60 HC.*

2 **S-60 HC:** Tag and disconnect the electrical connector from the platform load sense module.

3 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.

4 S-65 and S-65 TRAX: Support the jib boom leveling arms and the platform mounting weldment with an appropriate lifting device. Do not apply any lifting pressure.

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

**⚠WARNING** Crushing hazard. The platform mounting weldment may become unbalanced and fall if it is not properly supported.

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

# Platform Components

**S-60, S-60X, S-60XC and S-60 TRAX:**

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

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

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

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

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

10 Lower the jib boom leveling arms.

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

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

**S-65 and S-65 TRAX:**

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

12 Support the jib boom leveling arms.

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

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

14 Lower the jib boom leveling arms.

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

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.

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.

# Platform Components

## 2-3
## Platform Overload System, S-60, S-65, S-60 TRAX and S-65 TRAX (if equipped)

## How to Calibrate the Platform Overload System

Calibration of the platform overload system is essential to safe machine operation. Continued use of an improperly calibrated platform overload system could result in the system failing to sense an overloaded platform. The stability of the machine is compromised and it could tip over.

Note: For S-60 HC models, Refer to Repair Procedure, *Platform Load Sense System, S-60 HC.*

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

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

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

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

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

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

5 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

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

⊠ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Slowly tighten the load spring adjustment nut in a clockwise direction in 10° increments until the overload indicator light turns off, and the alarm does not sound. Proceed to step 8.

Note: The platform will need to be moved up and down and allowed to settle between each adjustment.

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

6 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⊙ Result: The overload indicator lights are off at the platform and ground controls, and the alarm does not sound. Slowly loosen the load spring adjustment nut in a counterclockwise direction in 10° increments until the overload indicator light flashes at both the platform and ground controls, and the alarm sounds. Proceed to step 7.

⊠ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Repeat this procedure beginning with step 5.

Note: The platform will need to be moved up and down and allowed to settle between each adjustment.

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

7 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⊙ Result: The overload indicator lights are off and the alarm does not sound. Proceed to step 8.

⊠ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Repeat this procedure beginning with step 5.

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

8 Add an additional 10 lb / 4.5 kg test weight to the platform.

⊙ Result: The overload indicator light is flashing at both the ground and platform controls, and the alarm is sounding. Proceed to step 9.

⊠ Result: The overload indicator light is off at both the ground and platform controls, and the alarm does not sound. Remove the additional 10 lb / 4.5 kg test weight. Repeat this procedure beginning with step 6.

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

9 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

10 Turn the key switch to ground control.

11 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

12 Using a suitable lifting device, lift the test weight off the platform floor.

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

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

13 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should operate normally.

14 Turn the key switch to platform control.

15 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should operate normally.

# Platform Components

## 2-4
## Platform Load Sense System, S-60 HC

## How to Calibrate the Platform Load Sense System

Proper calibration of the load sense system is essential to safe machine operation. Continued use of an improperly calibrated load sense system could result in the system failing to sense an overloaded platform. The stability of the machine is compromised and it could tip over.

Note: For S-60, S-65, S-60 TRAX and S-65 TRAX models, Refer to Repair Procedure, *Platform Overload System, S-60, S-65, S-60 TRAX and S-65 TRAX (if equipped)*.

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

Note: The platform overload system will not allow partial calibration and must be completed in its entirety.

1 At the ground controls, turn the key switch to the off position and push in the red Emergency Stop button to the off position. Pull out the red Emergency Stop button to the on position at the platform controls.

2 Remove all weight, tools and equipment from the platform.

**⚠ DANGER** Tip-over hazard. Failure to remove all weight, options, accessories and/or tools from the platform or subtracting the weight of those items from the test weights, will result in the platform load sense system not calibrating correctly. This will allow too much weight to be added to the platform which will result in the machine tipping over.

3 Open the ground control box and locate the calibration toggle switch near the relays.

Note: If either the operational and/or safety controller has been replaced or if the software has been updated, restore the system to the default settings and then continue to step 4. Refer to Repair Procedure, *How to Restore the Default Settings*. Otherwise, continue to step 4 to enter calibration mode.

4 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position.

⊙ Result: The alarm sound for approximately 2 seconds.

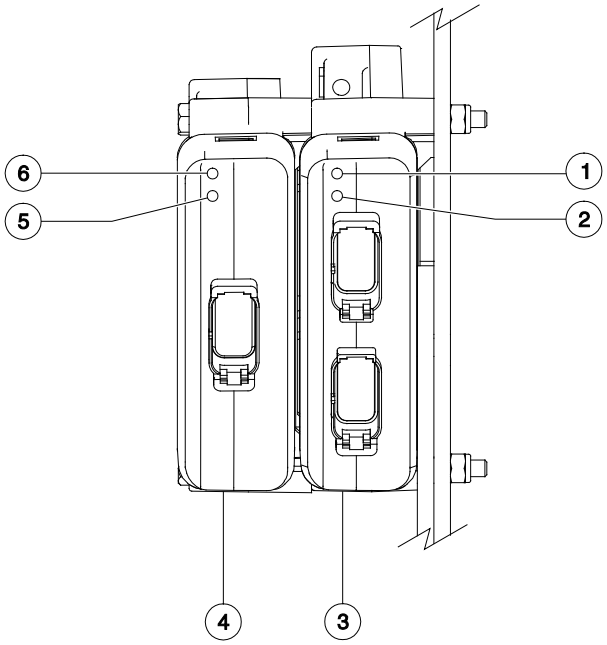
# Platform Components

5 Activate and release the calibration toggle switch 3 times within 2 seconds after the alarm sounds to enter calibration mode.

⊙ Result: The alarm should sound for 1 second indicating the first calibration step was accepted. The green LED on the operational controller should be blinking fast and the red LED should be blinking twice indicating that step 2 of calibration is next.

⊠ Result: The alarm did not sound and the green LED on the operational controller is not blinking fast. Repeat this procedure beginning with step 1.

Note: Once calibration mode is entered and begun, there is a 8 minute time limit between each calibration step. If any one step passes the 8 minute time limit, the system will time out and the calibration process will need to be repeated beginning with step 1.

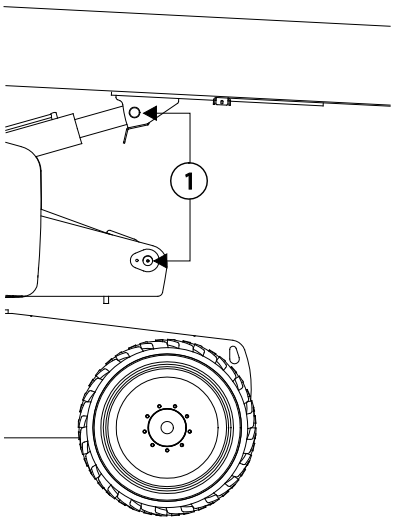



1 green LED (operational control module)
2 red LED (operational control module)
3 operational control module
4 safety control module
5 red LED (safety control module)
6 green LED (safety control module)

6 Start the engine from the ground controls.

7 Raise the boom until the distance, when measured between the centers of the pivot pins shown, equals 108.75 inches / 276 cm ± 0.75 inch / 19 mm.

**⚠WARNING** Crushing hazard. Keep clear of all moving parts of the boom while the boom is raising. Do not attempt to measure between the pivot pins while the boom is moving.



# Platform Components

| Operational Control Module LED Status | |
|---|---|
| **Description** | **Definition** |
| Green and Red LED's not flashing | System calibrated |
| Green LED flashing rapidly | System in calibration mode |
| Red LED flashing with pauses | Indicates next calibration step (ie; 2, 3, etc.) |
| **Safety Control Module LED Status** | |
| **Description** | **Definition** |
| Green and Red LED's not flashing | System calibrated |
| Green and Red LED's flashing alternately | System not calibrated |

8 Activate the calibration toggle switch inside the ground control box 1 time.

⊙ Result: The alarm should sound for 1 second indicating the second calibration step was accepted. The green LED on the operational controller should be blinking fast and the red LED should be blinking three times indicating that step 3 of calibration is next.

9 Raise the boom until the distance, when measured between the centers of the pivot pins shown, equals 167.25 inches / 424.8 cm ± 0.75 inch / 19 mm.

**⚠WARNING** Crushing hazard. Keep clear of all moving parts of the boom while the boom is raising. Do not attempt to measure between the pivot pins while the boom is moving.

10 Activate and release the calibration toggle switch inside the ground control box 1 time.

⊙ Result: The alarm should sound for 1 second indicating the third calibration step was accepted. The green LED on the operational controller should be blinking fast and the red LED should be blinking four times indicating that step 4 of calibration is next.

11 Fully raise and extend the boom.

12 Activate and release the calibration toggle switch inside the ground control box 1 time.

⊙ Result: The alarm should sound for 1 second indicating the fourth calibration step was accepted. The green LED on the operational controller should be blinking fast and the red LED should be blinking five times indicating that step 5 of calibration is next.

13 Fully retract and lower the boom to the stowed position.

14 Using a suitable lifting device, place an appropriate test weight equal to 750 lbs / 340.2 kg on to the center of the platform floor.

Note: If your machine is equipped with any platform accessories or options, they must be removed from the platform OR the weights of those options or accessories must be subtracted from the test weights to accurately calibrate the platform load sense system.

15 Activate and release the calibration toggle switch inside the ground control box 1 time.

⊙ Result: The alarm should sound for 1 second indicating the fifth calibration step was accepted. The green LED on the operational controller should be blinking fast and the red LED should be blinking six times indicating that step 6 of calibration is next.

16 Using a suitable lifting device, place an additional test weight equal to 510 lbs / 231.3 kg on to the center of the platform floor. The total weight in the platform must equal 1260 lbs / 571.5 kg.

17 Activate and release the calibration toggle switch inside the ground control box 1 time.

⊙ Result: The alarm should sound for 1 second indicating the sixth calibration step was accepted. The engine may turn off and the alarm may sound indicating an overloaded platform.

18 At the ground controls, push in the red Emergency Stop button to the off position, then pull out the red Emergency Stop button to the on position to reset the system.

19 Visually inspect the LEDs on the controllers.

⊙ Result: All LEDs on both controllers should be off indicating the platform load sense system is calibrated.

20 At the ground controls, push in the red Emergency Stop button to the off position.

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

22 Pull out the red Emergency Stop button to the on position at the ground controls and visually inspect the LEDs on the operational and safety controllers.

⊙ Result: Both the green and red LEDs on both controllers should be off indicating the system is calibrated.

Note: If an LED is blinking on either controller, the load sense system is not calibrated correctly or a fault may exist. Refer to Fault Codes Section to determine the system fault.

## How to Restore the System Default Settings

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

⊙ Result: The alarm should sound a long tone.

2 Activate and hold the calibration toggle switch for 5 seconds.

⊙ Result: The alarm should sound a tone for 1 second.

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

# 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.

2 Remove the platform mounting weldment.

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

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

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

5 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

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

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

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

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

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

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

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

# 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 mounting weldment. Then lower the jib boom until the platform is resting on the blocks just enough to support the platform.

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

2 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

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

4 Use a soft metal drift to tap the jib boom lift cylinder rod-end pivot pin half way out. Then lower one of the leveling arms to the ground. Tap the pin the other direction and lower the opposite leveling arm. Do not remove the pin.

5 Support the jib boom lift cylinder with a 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 platform and jib boom could become unbalanced and fall when the jib boom barrel-end pivot pin is removed if not properly supported.

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 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 overhead crane.

# 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, S-60, S-60X, S-60XC, S-60 HC and S-60 TRAX

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 boom to a horizontal position.

2 Locate the cables from the boom cable track to the platform control box. Number each cable and its entry location at the platform control box.

3 Disconnect the cables from the platform control box.

4 Remove the electrical outlet box bracket mounting fasteners. Remove the outlet box and lay it to the side.

5 Remove the hose and cable clamp from the platform support.

6 Tag, disconnect and plug the hydraulic hoses from the counterbalance valve manifold located on the platform rotator. Cap the fittings on the manifold.

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

7 Tag, disconnect and plug the platform leveling slave cylinder hydraulic hoses from the bulkhead fittings on the side 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.

8 Locate all electrical cables under the boom at the pivot end that enter the cable track.

9 Tag and disconnect the electrical connectors for all cables that enter the cable track.

10 Remove the retaining fasteners from the electrical connector receptacles for the cables that enter the cable track.

11 Carefully pull the cables and connector receptacles out of the primary boom.

12 Tag, disconnect and plug all hydraulic hoses that enter the cable track from the bulkhead fittings at the pivot end of the boom.

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

13 Pull the four hydraulic hoses toward the platform to clear the rod end of the primary boom lift cylinder.

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

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

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

16 Remove the cotter pin from the cable track pull tube at the platform end of the boom.

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

17 Remove the cable track pull tube guide fasteners from the cable track guide at the platform end of the boom. Remove the cable track guide from the boom.

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

19 Carefully remove the cable track from the machine and place it on a structure capable of supporting it.

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

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

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

## How to Remove the Cable Track, S-65 and S-65 TRAX

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 Open the platform control box.

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

3 Raise the boom to a horizontal position.

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

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

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

6 Remove the hose and cable clamps from the platform support and jib boom.

7 Tag, disconnect and plug the platform leveling slave cylinder hydraulic hoses from the bulkhead fittings on the side 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.

# Boom Components

8 Tag, disconnect and plug the hydraulic hoses from the "V1" and "V2" ports of the jib boom/platform rotate 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 hose and cable cover from the side of the jib boom.

10 Locate all electrical cables under the boom at the pivot end that enter the cable track.

11 Tag and disconnect the electrical connectors for all cables that enter the cable track.

12 Remove the retaining fasteners from the electrical connector receptacles for the cables that enter the cable track.

13 Carefully pull the cables and connector receptacles out of the primary boom.

14 Tag, disconnect and plug all hydraulic hoses that enter the cable track from the bulkhead fittings at the pivot end of the boom.

**⚠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.

15 Pull the hydraulic hoses out of the primary boom.

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

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

17 Remove the cable track pull tube guide fasteners from the cable track guide at the platform end of the boom. Remove the cable track guide from the boom.

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

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

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

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

21 Carefully remove the cable track from the machine and place it on a structure capable of supporting it.

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

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

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

## How to Repair the Cable Track

**NOTICE**

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

Note: A 4 link repair section of cable track 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 from each end of the damaged section of cable track.

3 Remove the retaining fasteners from the upper black rollers from the 4 link section of cable track to be replaced. Remove the rollers.

4 Lift up the hoses and cables and carefully remove the damaged 4 link section of cable track.

**NOTICE**

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

5 Remove the upper rollers from the replacement section of cable track.

6 Lift up the hoses and cables and carefully insert the new 4 link section of cable track.

**NOTICE**

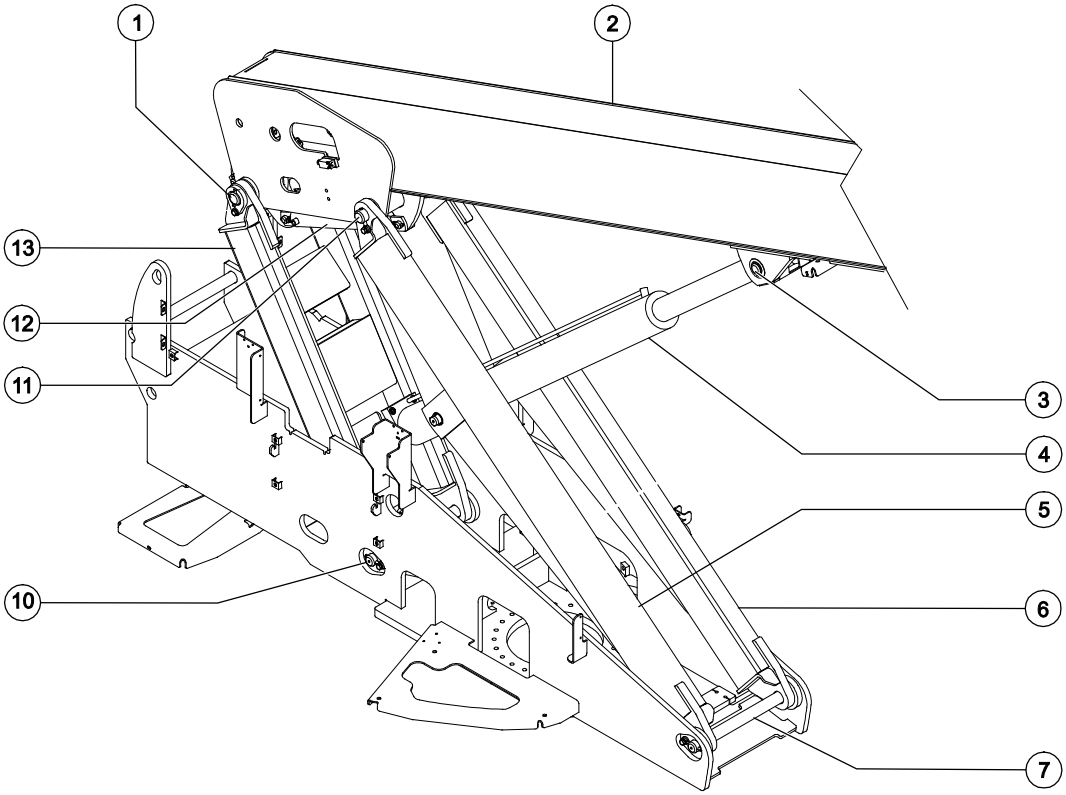
Component damage hazard. Hoses and cables can be damaged if they are kinked or pinched.

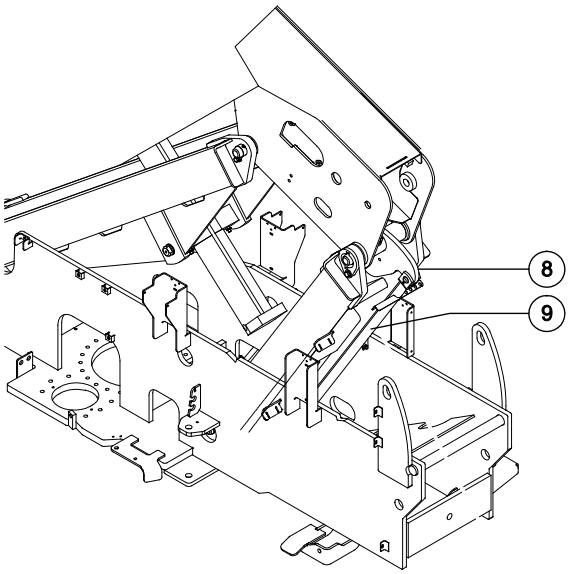
7 Connect the ends of the replacement cable track section to the existing cable track using the snap rings.

8 Install the rollers onto the new section of cable track.

9 Operate the boom extend/retract function through a full cycle to ensure smooth operation of the new section of cable track.

# Boom Components




**Boom components**

1 short link arm to boom pivot pin
2 boom
3 boom lift cylinder rod-end pivot pin
4 boom lift cylinder
5 long link arm (ground controls side)
6 long link arm (engine side)
7 long link arm to turntable pivot pin
8 master cylinder cam
9 master cylinder cam link
10 short link arm to turntable pivot pin
11 long link arm to boom pivot pin
12 master platform level cylinder
13 short link arm weldment

# 4-2 Boom

## How to Remove the Boom

**⚠ DANGER** TIp-over hazard. This procedure requires the removal of the turntable counterweight. Failure to remove the counterweight before removing the boom assembly will result in the machine tipping over. Do not remove the boom without first removing the counterweight.

**⚠ DANGER** TIp-over hazard. When installing the boom onto the machine, the boom assembly must be first installed prior to the installation of the counterweight. If the counterweight is installed before the boom assembly, the machine will tip over resulting in death or serious injury.

**⚠ DANGER** TIp-over hazard. The turntable counterweight is essential for machine stability. Failure to install the counterweight after installing the boom assembly will compromise machine stability resulting in the machine tipping over. Death or serious injury will result.

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

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

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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*.

Note: S-60X and S-60XC: Disconnect the two limit switch connectors at the platform end of the cable track.

3 Raise the boom until the short and long link arm to boom pivot pins are above the turntable covers.

4 Place a block of wood measuring 4 x 4 x 60 inches / 10 x 10 x 152 cm under the long link arm, across the turntable covers.

5 Slowly lower the boom until the long link arm contacts the wood block. Do not rest the entire weight of the boom on the block. Turn the machine off.

**NOTICE** Component damage hazard. The turntable covers can become damaged if the weight of the boom is allowed to rest on the block.

6 Place wood blocks between the short link arm and the turntable weldment for support.

# Boom Components

7 Insert a 1.125 x 12 inches / 32 x 300 mm eye-bolt through each hole located on the top surface of the counterweight. Secure the eye-bolts in position with flat washers and nuts.

8 Securely attach lifting straps or chains with a minimum rating of 5 tons / 5000 kg to the lifting points on the top of the turntable counterweight. Attach the lifting straps or chains to a 5 ton / 5000 kg overhead crane.

Note: A spreader bar and other hardware may be needed to safely remove the counterweight.

9 Slowly operate the overhead crane to apply tension to the lifting straps. Do not attempt to lift the machine with the overhead crane.

10 Locate and remove the counterweight retaining fastener at the center of the counterweight. Carefully lift the counterweight upwards and remove the counterweight from the machine. Set the counterweight on the ground. Do not leave the counterweight suspended above the ground.

**⚠DANGER** Crushing hazard. The turntable counterweight will fall if not properly supported by the overhead crane resulting in death or serious injury. Keep personnel away from the area when removing the counterweight.

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

12 Support and secure the rod end of the boom lift cylinder to a second overhead crane or similar lifting device.

13 Remove the lift cylinder rod-end pivot pin retaining fasteners. Use a soft metal drift to remove the pin.

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

14 Using auxiliary power, activate the boom down function so the cylinder will retract. Retract the cylinder just enough until the rod end of the cylinder will clear the mounting bracket on the boom. Turn the machine off.

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

15 Using the overhead crane, carefully lower the boom lift cylinder and allow it to rest on the boom rest pad. Protect the cylinder rod from damage.

16 **S-60, S-60X, S-60XC, S-65, S-60 TRAX and S-65 TRAX**: Remove the boom end cover retaining fasteners and remove the cover.S-60 HC: Remove the boom end cover from the pivot end of the boom while guiding the small cable from the string potentiometer out of the slot of the cover. Rest the cover and string potentiometer on the counterweight.

**NOTICE** Component damage hazard. The cable from the string potentiometer can become damaged if it is kinked or pinched.

17 S-60 HC: Remove the string potentiometer cable break limit switch mounting fasteners.

18 **S-60 HC**:Remove the pulley retaining plate from the string potentiometer pulley bracket. Carefully remove the string potentiometer cable and limit switch assembly from the boom.

19 **S-60X and S-60XC**: Disconnect the boom angle sensor harness.

20 Tag, disconnect and plug the 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.

21 Tag and disconnect the electrical connector for the cable break limit switch.

22 Tag and disconnect all boom wire harness electrical connectors located at the pivot end of the boom.

23 Support the platform leveling master cylinder. Remove the master cylinder rod-end pivot pin retaining fasteners. Place a rod through the pin and twist to remove. Carefully lower the master cylinder down.

24 Tag, disconnect and plug the hydraulic hoses from the bulkhead fittings at the pivot end of the 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.

25 Remove the external snap rings from both boom pivot pins at the short and long link arms. Do not remove the pins.

26 Using the overhead crane, adjust the boom as necessary to relieve pressure from the pivot pins.

27 Use a soft metal drift to remove each boom pivot pin. Carefully remove the boom assembly from the machine and place it on a structure capable of supporting it.

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

**⚠CAUTION** Crushing hazard. The long and short link arms may fall if not properly supported when the boom pivot pins are removed.

# Boom Components

## 4-3
## Boom Lift Cylinder

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

## How to Remove the Boom Lift Cylinder

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

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 boom to a horizontal position.

2 Attach a 5 ton / 5000 kg overhead crane to the boom at the platform end for support. Do not lift the boom.

3 Support and secure both ends of the boom lift cylinder to a second overhead crane or similar lifting device.

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

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

5 Using auxiliary power, activate the boom down function so the cylinder will retract. Retract the cylinder just enough until the rod end of the cylinder will clear the mounting bracket on the boom. Turn the machine off.

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

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

7 Remove the pin retaining fasteners from the boom lift cylinder barrel-end pivot pins. Do not remove the pins.

8 Use a slide hammer to remove the barrel-end pivot pins.

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

9 Move the boom lift cylinder towards the counterweight end of the machine. Rotate the boom lift cylinder until the barrel-end pivot pin bores will clear the boom linkage.

10 Carefully remove the 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.

## 4-4
## Boom Extension Cylinder

The boom extension cylinder is located inside the boom assembly and incorporates cables and pulleys that are responsible for extending the number 3 boom 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 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.*

Note: Perform this procedure with the boom fully retracted.

1 Raise the boom to a horizontal position.

2 **S-60, S-60X, S-60XC, S-65, S-60 TRAX and S-65 TRAX**: Remove the boom end cover retaining fasteners and remove the cover.S-60 HC: Remove the boom end cover from the pivot end of the boom while guiding the small cable from the string potentiometer out of the slot of the cover. Rest the cover and string potentiometer on the counterweight.

**NOTICE** Component damage hazard. The cable from the string potentiometer can become damaged if it is kinked or pinched.

3 S-60 HC: Remove the string potentiometer cable break limit switch mounting fasteners.

4 **S-60 HC**:Remove the pulley retaining plate from the string potentiometer pulley bracket. Carefully remove the string potentiometer cable and limit switch assembly from the boom.

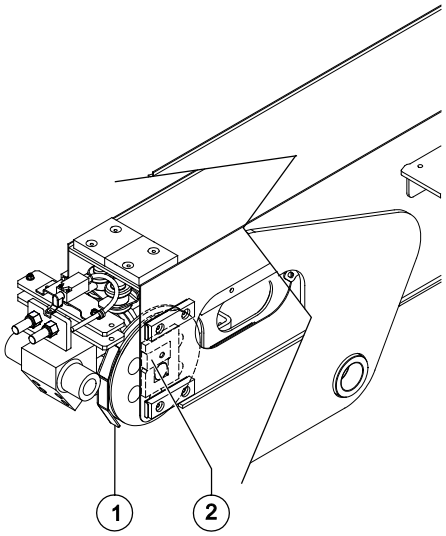
5 Remove the access covers from both sides of the boom at the pivot end.

6 Fully loosen the lock nuts on the extend cables. Do not remove the nuts.

7 Loosen the retract cable nut at the platform end of the boom. Pull the cable rod from the support and let it hang down.

# Boom Components

8 Remove the cable guard fasteners and remove the cable guard.




1 cable guard
2 retaining block

9 Locate the retaining plates that secure the retract cables to the inside of the number 3 boom tube.

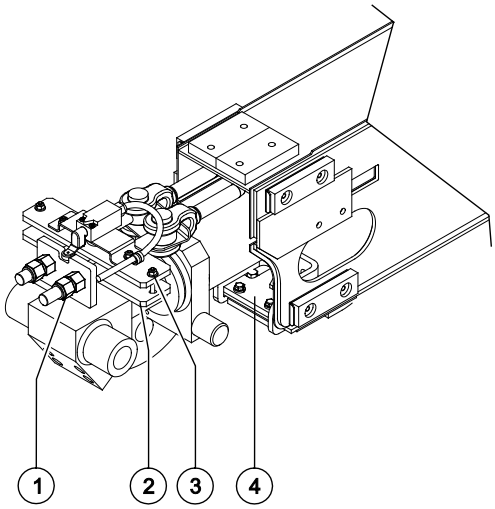
10 Remove the cable retaining plates and pull the retract cables off of the pulleys. Lay the cables flat and out of the way.

11 Remove the fasteners from the retaining blocks from the extension cylinder saddle. Remove the blocks.

Note: Access the fasteners through the access hole in the outer boom tube at the pivot end.

12 Disconnect the wire connector to the extend cable break limit switch.

13 Remove the retaining fasteners that secure the extend cable mounting plates to the inside of the number 1 boom tube.




1 extend cable lock nuts
2 extend cable mounting plate
3 extend cable mounting plate fastener
4 extend cable bracket

14 Pull back on the extend cable mounting plate until it clears the blocks welded to the inside of the number 1 boom tube.

15 Lift up the extend cable mounting plate and push the extend cables towards the platform to create slack in the cables. Rest the cable and bracket assembly on top of the extend cylinder.

16 Locate the lower extend cable bracket on the bottom of the number 3 boom tube.

17 Remove the lower extend cable bracket mounting fasteners and pull back on the bracket to release it from the number 3 boom tube.

18 While pushing the lower extend cable bracket towards the platform, pull the extend cable mounting plate towards the pivot end of the boom.

19 Secure the extend cable bracket and cables to the cylinder to prevent them from falling off when removing the cylinder.

20 Remove the external snap rings from the extension cylinder pin at the pivot end of the boom.

21 Use a soft metal drift to remove the pin.

22 Tag, disconnect and plug the 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.

23 Attach a lifting strap from a 5 ton / 5000 kg overhead crane to the lug at the rod end of the boom extension cylinder.

24 Lift the boom extension cylinder with the crane until it clears the cylinder saddle inside the number 2 boom tube.

25 Carefully support and slide the extension cylinder out of the 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 cable break limit switch.

**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.

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

# Boom Components

## 4-5
## Boom Extend/Retract Cables

### How to Adjust the Boom Extend/Retract Cables

The boom extend/retract cables are responsible for the extension and retraction of the number 3 boom tube. Proper adjustment of the boom extend/retract cables and related components on a regular basis is essential to good machine performance and safe machine operation. The boom extend and retract functions should operate smoothly and be free of hesitation, jerking and unusual noise.

Note: Perform this procedure with the boom in a horizontal position.

1 Fully retract the boom.

2 **S-60, S-60X, S-60XC, S-65, S-60 TRAX and S-65 TRAX**: Remove the boom end cover retaining fasteners and remove the cover.

**S-60 HC**: Remove the boom end cover from the pivot end of the boom while guiding the small cable from the string potentiometer out of the slot of the cover. Rest the cover and string potentiometer on the counterweight.

**NOTICE** Component damage hazard. The cable from the string potentiometer can become damaged if it is kinked or pinched.

3 Inspect the threaded ends of the boom extend cables. The threads must be clean and in good condition with no damaged threads.

4 Adjust the extend cable adjustment nuts until approximately 1.5 inches / 4 cm of threads are visible past the nylock nut.

Note: If the cables have been replaced, be sure the adjustment nuts have been replaced. Do not re-use the existing nuts.

5 Extend the boom until there is approximately 3 feet / 1 m of travel left. Do not fully extend the boom.

6 Locate the retract cable adjustment nut on the bottom of the number 1 boom tube at the platform end of the boom.

7 Using a dial type torque wrench, torque the retract cable adjustment nut to 32-36 ft lbs / 43-49 Nm using gentle and steady torque.

8 Retract and extend the boom approximately 3 feet / 1 m two times and stop during the extension cycle. This will create slack in the retract cables.

Note: Be sure to not fully extend the boom. Stop when there is approximately 3 feet / 1 m of travel left.

9 Repeat steps 7 and 8 two to three times.

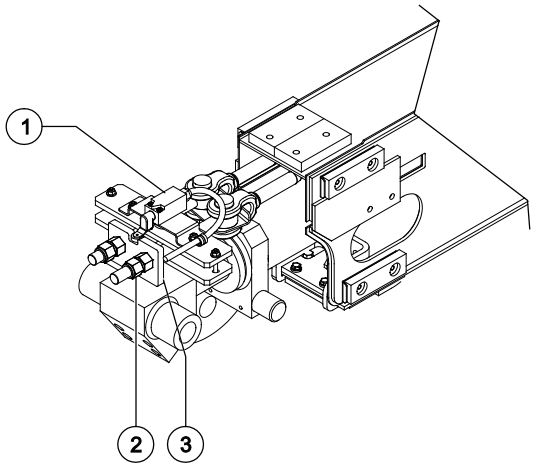
10 Fully extend the boom then retract the boom approximately 12 inches / 30 cm.

11 At the pivot end of the boom, visually inspect the boom extend cables for even cable droop or sag.

Note: If the boom extend cables are uneven, tighten the boom extend cable adjustment nut at the pivot end of the boom for the appropriate cable.

12 Visually inspect the cable break limit switch arm to be sure the wheel of the limit switch arm is centered in the notch of the pivot plate.

Note: If the boom extend cables are adjusted evenly, the wheel of the limit switch arm should be centered in the notch of the pivot plate.




1 cable break limit switch
2 extend cable adjustment nut
3 extend cable pivot plate

13 Install the boom end cover at the pivot end of the boom.

14 Fully retract and lower the boom to the stowed position.

## How to Replace the Boom Extend/Retract Cables

Note: The cable pulleys must also be replaced when replacing the cables.

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

**Boom extend cables:**

2 Remove the cables from the lower boom extend cable bracket that attaches to the number 3 boom tube.

3 Remove the rue rings and clevis pins from the boom extend cables located near the extend cable break limit switch.

4 Remove the external snap rings from the boom extend cable pulley pivot pin. Use a soft metal drift to remove the pin.

Note: When driving the pivot pin out, be sure to drive it from the shaped end of the pin.

5 Remove the pulley and boom extend cables from the extension cylinder assembly. Discard the old cables and pulleys.

6 Route the new boom extend cables through the boom extend pulley bracket.

7 Install the new boom extend cable pulley, pivot pin and snap rings.

Note: Be sure the boom extend cables are routed through the grooves of the pulley and the upper wear pad on the extension cylinder.

8 Install the boom extend cable clevis pins and rue rings to the pivot plate near the cable break limit switch.

9 Install the boom extend cables to the lower extend cable bracket that mounts to the number 3 boom tube.

# Boom Components

**Boom retract cables:**

10 Remove the cotter pins and clevis pins from the boom retract cables at the platform end of the boom.

Note: Always use a new cotter pin when installing a clevis pin.

11 Remove the wear pad fasteners from the upper wear pads on the number 1 boom tube. Remove the wear pads.

Note: Pay attention to the location of each wear pad and the quantity of shims for each one.

12 Attach a lifting strap from an overhead crane to the platform end of the boom.

13 Raise the boom using the overhead crane and place a wood block under the number 2 boom tube between the number 1 and number 2 boom tubes for support. This will create clearance between the boom tubes to remove the retract cables.

14 Attach the cable pulling tool or a rope to one of the boom retract cables at the pivot end of the boom.

Note: A cable pulling tool is available through Genie Service Parts Department (Genie part no. 94510)

15 At the platform end of the boom, pull on the boom retract cable that has the rope attached to it.

16 Pull the old cable completely out of the boom tube. Remove the rope. Discard the old boom retract cable.

17 Securely attach the rope to the same end of the new boom retract cable.

18 At the pivot end of the boom, carefully pull the rope with the new retract cable attached.

19 Pull the new cable towards the pivot end of the boom until the end of the cable is at the end of the boom tube. Remove the rope.

20 Repeat steps 14 through 19 for the other boom retract cable.

21 At the platform end of the boom, install the retract cables, clevis pins and new cotter pins to the adjustment plate.

22 Remove and discard the old boom retract pulleys from the pivot end of the boom extension cylinder.

23 Install the new boom retract pulleys to the pivot end of the boom extension cylinder.

24 Install the boom extension cylinder assembly into the boom.

Note: Before lowering the extension cylinder into the saddles of the number 1 boom tube, wrap the boom retract cables around the pulleys.

25 Adjust the boom extend/retract cables. Refer to Repair Procedure, *How to Adjust the Boom Extend/Retract Cables*.

# 4-6 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 pivot end of the boom.

## How to Remove the Platform Leveling Master Cylinder

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 boom until the master cylinder is above the turntable covers.

2 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.

3 Place a 2 x 4 x 48 inches / 5 x 10 x 120 cm block of wood across the turntable covers. Position the block under the master cylinder.

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

5 Place a rod through the rod-end pivot pin and twist to remove the pin. Lower the rod end of the master cylinder onto the block.

6 Remove the pin retaining fastener from the barrel-end pivot pin.

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

8 Remove the master cylinder from the machine.

# Boom Components

## 4-7
## Primary Boom Angle Sensor, S-60X and S-60XC

The primary boom angle sensor works in conjunction with the boom extend limit switches when restricted maximum platform load is selected from the platform controls maintaining the working envelope. The primary boom angle sensor is located on the ground control side long link arm.

## How to Replace the Primary Boom Angle Sensor

1 From the ground controls raise the primary boom until it is fully elevated.

2 Push in the red Emergency Stop button to the off position and turn the key switch to the off position.

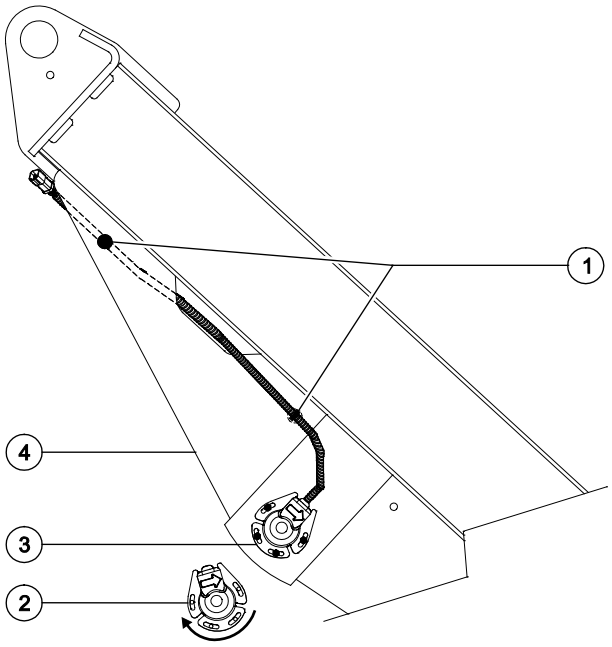
3 Locate the primary boom angle sensor mounted on the ground control side long link arm.

4 Cut and discard the two button cable ties securing the angle sensor harness to the gusset plate.

5 Locate and disconnect the angle sensor harness connector.

6 Remove the angle sensor retaining fasteners and set aside. Remove the angle sensor.

7 Install the angle sensor onto the hex key. Refer to the illustration for proper alignment.




1 button cable ties
2 start orientation
3 finish orientation
4 gusset plate

8 Install the angle sensor retaining fastners. Do not tighten at this time.

9 Route the angle sensor harness through the gusset plate and secure using two button cable ties.

10 Securely connect the angle sensor harness to the main harness.

11 Turn the key switch to platform controls. Pull up red Emergency Stop buttons at the ground and platform controls to the on position.

12 Using a volt meter set to DC volts, back probe the angle sensor harness connector. Insert the negative lead into terminal 2, the positive lead into terminal 3.

13 Adjust the angle sensor until the volt meter reads 3.8V dc to 4.2V dc and securely tighten the fasteners.

14 Calibrate the boom angle sensor. Refer to Repair Procedure, *How to Calibrate the Boom Angle Sensor*.

# Engines

## 5-1
## RPM Adjustment - Ford and Deutz Models

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

## 5-2
## RPM Adjustment - Perkins 404D-22 Models

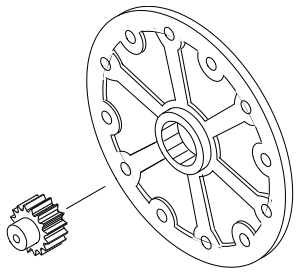
Refer to Maintenance Procedure in the appropriate Service or Maintenance Manual for your machine, *Check and Adjust the Engine RPM*.

## 5-3
## Flex Plate

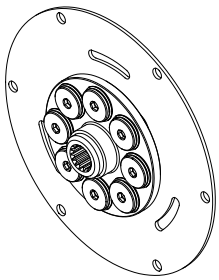
The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.

Two different styles of flex plates have been used in the production of your machine model. Type "A" flex plates utilize a flex plate installed onto the flywheel of the engine and a separate coupler installed onto the pump splined shaft.

Type "B" flex plates combines the pump coupler, as part of the flex plate, which is installed onto the engine flywheel.



**Type "A"**
(flexplate with separate coupler)



**Type "B"**
(flexplate with coupler combined)

## 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, then remove the flex plate from the engine 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.

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.

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

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

**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.

# Engines

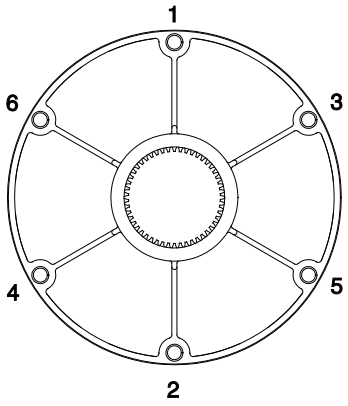
## How to Install a Type "A" Flex Plate

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

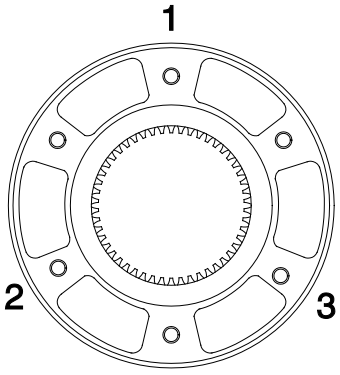
2 **Ford models:** Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm. Then torque the flex plate mounting bolts in sequence to 20 ft-lbs / 27 Nm.

**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.

**Perkins models:** Torque the flex plate mounting bolts in sequence to 49 ft-lbs / 66 Nm. Then torque the flex plate mounting bolts in sequence to 70 ft-lbs / 95 Nm.

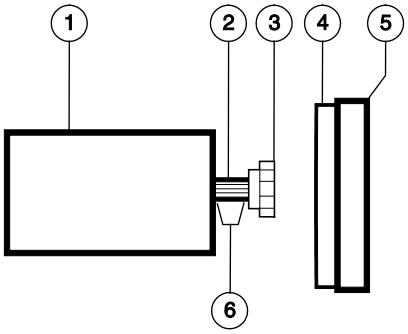



Ford and Deutz Models




Perkins Models

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




1 pump
2 pump shaft
3 pump coupler
4 flex plate with raised spline
5 engine flywheel
6 3/16 inch / 4.8 mm gap - Diesel Models
0.080 inch / 2 mm gap - Ford Models

4 Apply Loctite® removable thread sealant to the pump coupler set screw. Torque the set screw to 61 ft-lbs / 83 Nm.

5 Proceed to Repair Procedure, How to Install the Pump and Bell Housing Assembly.

## How to Install a Type "B" Flex Plate

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

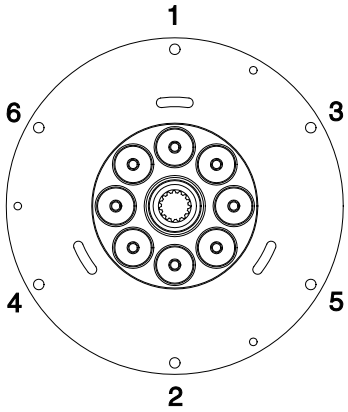
2 Apply Loctite® removable thread sealant to the flex plate fasteners and loosely install the fasteners.

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.

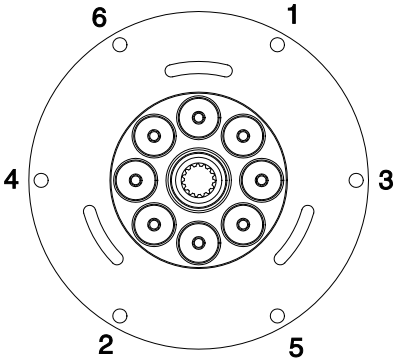
**Ford and Perkins models:** Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm. Then torque the flex plate mounting bolts in sequence to 20 ft-lbs / 27 Nm.

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

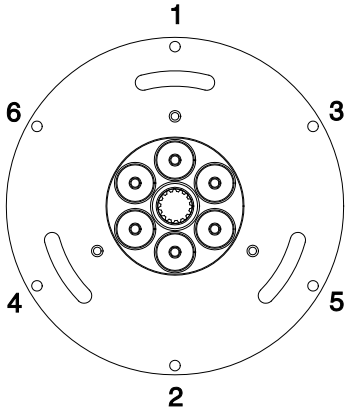
| Grease Specification |
| --- |
| Shell Alvania® Grease CG, NLGI 0/1 or equivalent. |




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 model**s: 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**.**

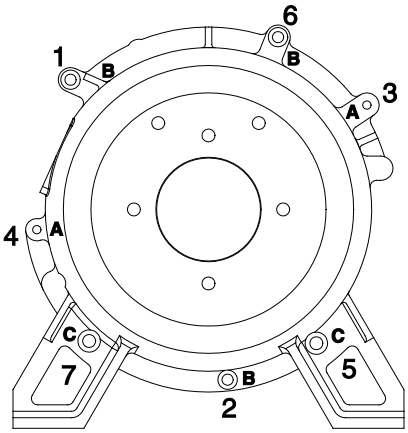
**Perkins mode**ls: Torque the bell housing mounting bolts labeled "B" in sequence to 28 ft-lbs / 38 Nm and the mounting bolts labeled "A" to 49 ft-lbs / 66 Nm. Then torque the bell housing mounting bolts labeled "B" in sequence to 40 ft-lbs / 54 Nm and the mounting bolts labeled "A" to 70 ft-lbs / 95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

**NOTICE**

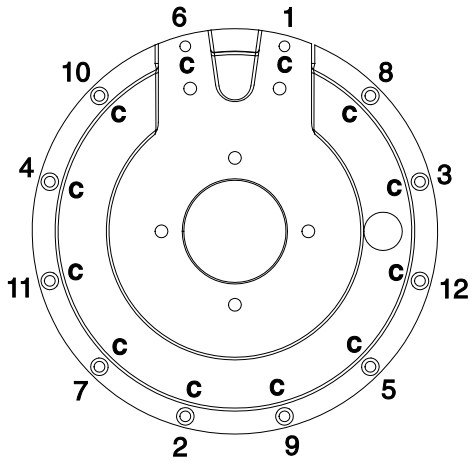
Component damage hazard. Type "A" flexplate: When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

**NOTICE**

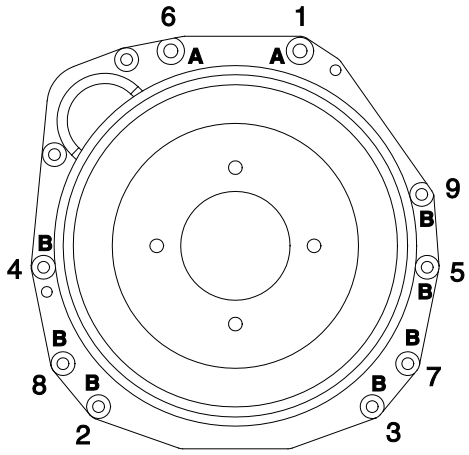
Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



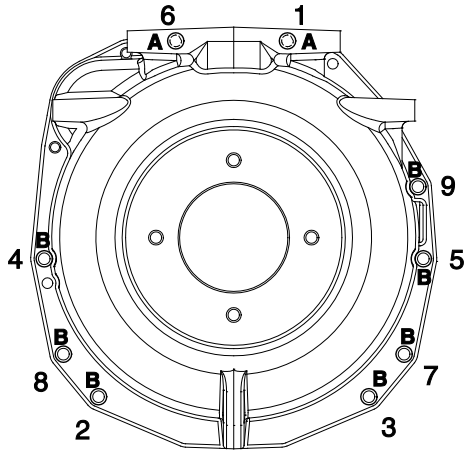

Ford Models




Deutz Models




Perkins 404D-22 models




Perkins 404F-22 models

## 5-4
## Ford MSG-425 Engine Fault Codes

## 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 Codes Section, *How to Retrieve Ford MSG-425 Engine Fault Codes* for your specific model of engine. Use the Fault Code Charts to aid in identifying the fault.

# Engines

## 5-5
## Engine Fault Codes - Deutz D 2.9 L4, D436 L3i 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 Codes Section, *How to Retrieve Active Engine Fault Codes* for your specific model of engine. Use the Fault Code Charts to aid in identifying the fault.

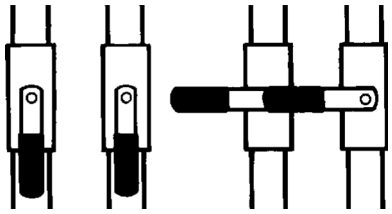
# 6-1 Function Pump

## 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 through the access hole underneath the turntable. 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 pum

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

3 Remove the pump mounting 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.

# Hydraulic Pump

## 6-2 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 Industries Service Department to locate your local authorized service center.

## How to Remove the Drive Pump

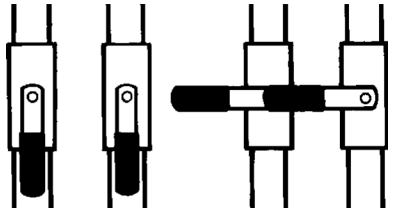
**NOTICE** Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 through the access hole underneath the turntable. 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 two drive pump mounting fasteners.

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

6 Remove the drive pump 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 Pump

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

2 Remove the safety pin from the engine pivot plate latch.

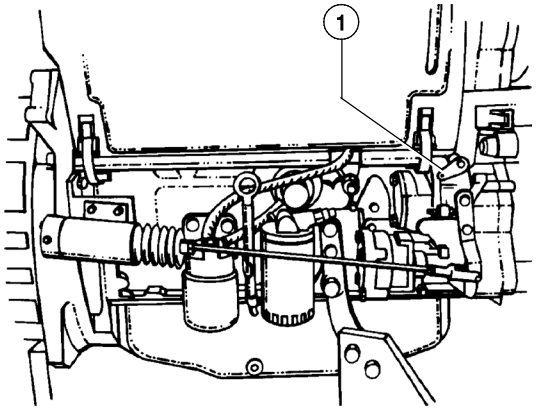
Note: The engine pivot plate latch is located under the engine turntable pivot plate at the counterweight end of the machine.

3 Open the engine pivot plate latch and swing the engine pivot plate out and away from the machine.

4 **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 D2011L03i, D436 L3i and TD2011L04i models:** Hold the manual fuel shutoff valve clockwise to the closed position.




1 manual fuel shutoff valve

5 Have another person crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi / 22 bar.

6 **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 D2011L03i, D436 L3i and TD2011L04i models:** Release the manual fuel shutoff valve.

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

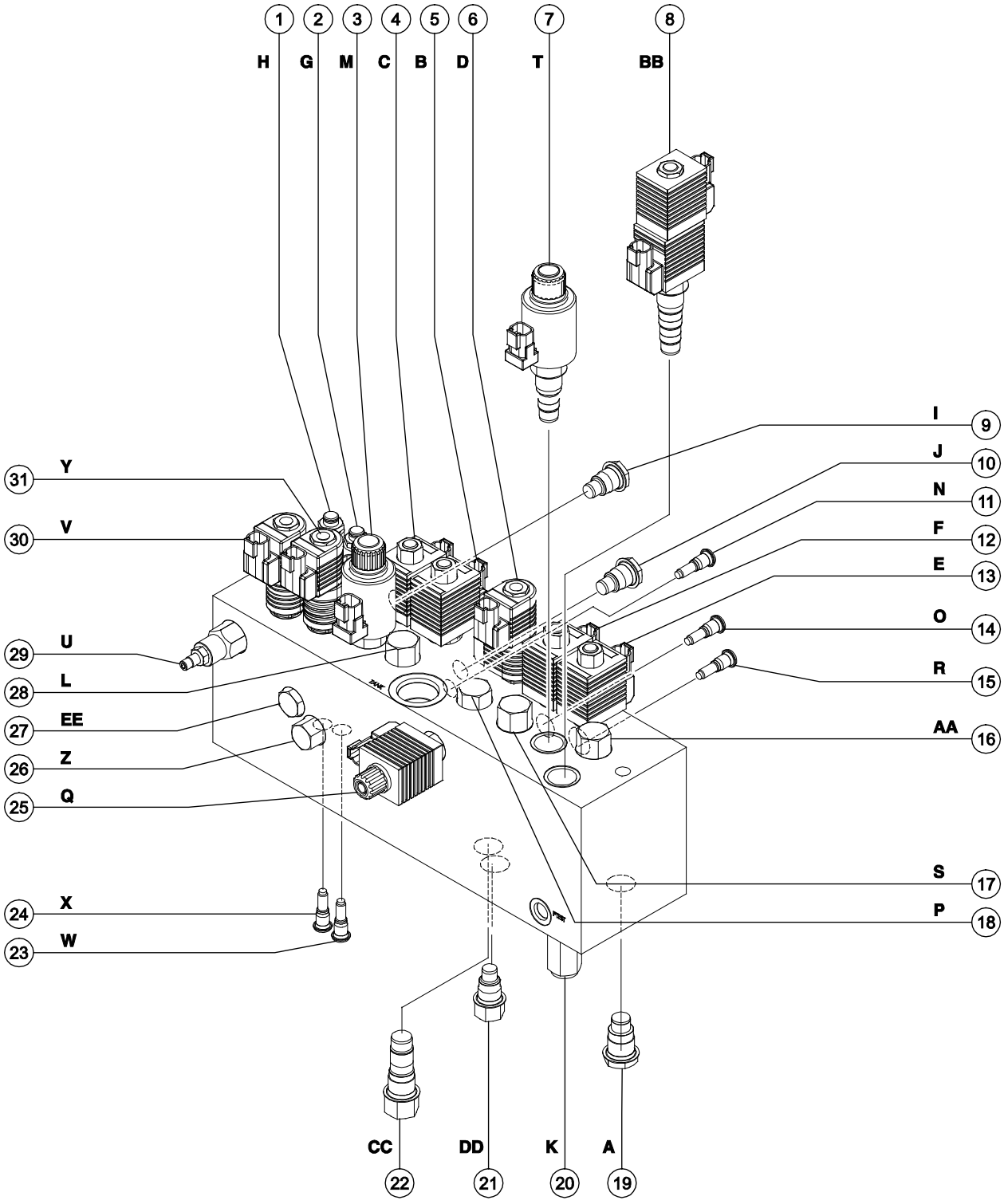
# Manifolds

## 7-1 Function Manifold Components (to serial number 26514)

The function manifold is located underneath the ground controls side turntable cover.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Counterbalance valve | H | Platform level down | 30-35 ft-lbs / 41-47 Nm |
| 2 | Counterbalance valve | G | Platform level up | 30-35 ft-lbs / 41-47 Nm |
| 3 | Proportional solenoid valve | M | Boom extend/retract | 30-35 ft-lbs / 41-47 Nm |
| 4 | Solenoid valve, 2 position 3 way | C | Boom retract | 30-35 ft-lbs / 41-47 Nm |
| 5 | Solenoid valve, 2 position 3 way | B | Boom extend | 30-35 ft-lbs / 41-47 Nm |
| 6 | Solenoid valve, 3 position 4 way | D | Turntable rotate | 20-25 ft-lbs / 27-34 Nm |
| 7 | Proportional solenoid valve | T | Boom up/down circuit | 30-35 ft-lbs / 41-47 Nm |
| 8 | Solenoid valve, 3 position 4 way | BB | Steer left/right | 20-25 ft-lbs / 27-34 Nm |
| 9 | Check valve, 30 psi / 2 bar | I | Differential sensing circuit,platform rotate left and jib boom up (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |
| 10 | Check valve, 30 psi / 2 bar | J | Differential sensing circuit,platform rotate right and jib boom down (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |
| 11 | Check valve | N | Differential sensing circuit,boom extend/retract | 10-12 ft-lbs / 14-16 Nm |
| 12 | Solenoid valve, 2 position 3 way | F | Boom down | 30-35 ft-lbs / 41-47 Nm |
| 13 | Solenoid valve, 2 position 3 way | E | Boom up | 30-35 ft-lbs / 41-47 Nm |
| 14 | Check valve | O | Differential sensing circuit,turntable rotate | 10-12 ft-lbs / 14-16 Nm |
| 15 | Check valve | R | Differential sensing circuit,boom up/down | 10-12 ft-lbs / 14-16 Nm |
| 16 | Priority flow regulator valve, 3.5 gpm / 13.2 L/min | AA | Steer left/right circuit | 30-35 ft-lbs / 41-47 Nm |
| 17 | Differential sensing valve, 110 psi / 7.6 bar | S | Boom up/down circuit | 30-35 ft-lbs / 41-47 Nm |
| 18 | Differential sensing valve, 150 psi / 10.3 bar | P | Turntable rotate circuit | 30-35 ft-lbs / 41-47 Nm |

# Manifolds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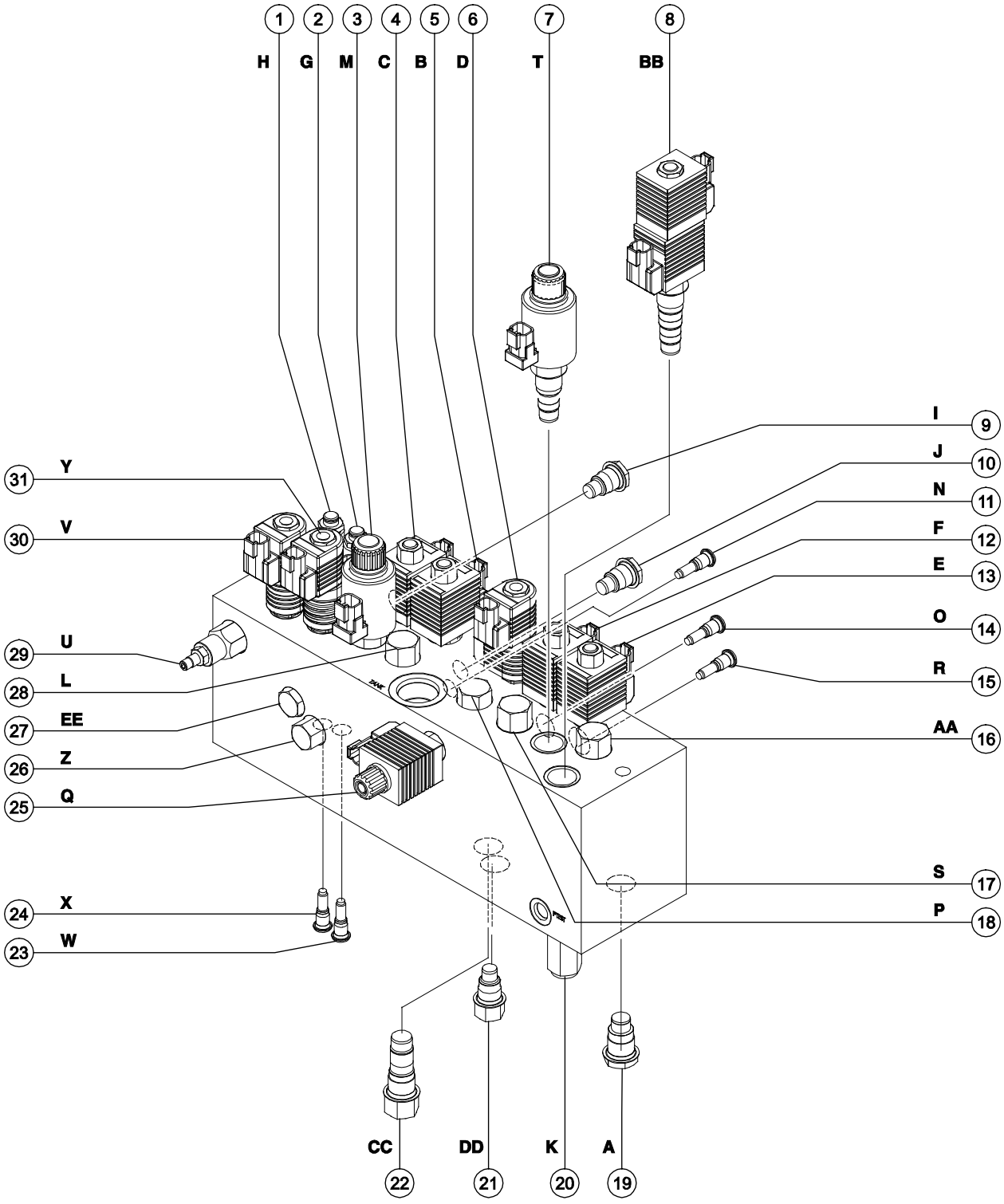
# Manifolds

### Function Manifold Components, continued (to serial number 26514)

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 19 | Check valve, 5 psi / 0.3 bar | A | Blocks flow from auxiliary pump to function pump | 30-35 ft-lbs / 41-47 Nm |
| 20 | Relief valve, 3000 psi / 206.8 bar | K | System relief | 30-35 ft-lbs / 41-47 Nm |
| 21 | Flow control valve, 0.1 gpm / 0.38 L/min | DD | Bleeds off differential sensing valves to tank | 20-25 ft-lbs / 27-34 Nm |
| 22 | Differential sensing valve, 150 psi / 10.3 bar | CC | Differential sensing circuit,meters flow to functions | 30-35 ft-lbs / 41-47 Nm |
| 23 | Check valve | W | Differential sensing circuit,platform level up | 10-12 ft-lbs / 14-16 Nm |
| 24 | Check valve | X | Differential sensing circuit,platform level down | 10-12 ft-lbs / 14-16 Nm |
| 25 | Proportional solenoid valve | Q | Turntable rotate left/right | 20-25 ft-lbs / 27-34 Nm |
| 26 | Flow control valve, 0.6 gpm / 2.27 L/min | Z | Platform rotate and jib boom (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |
| 27 | Check valve, 30 psi / 2 bar | EE | Platform rotate and jib boom circuit (S-65, S-65 TRAX) (prevents hydraulic hoses from draining back to tank) | 20-25 ft-lbs / 27-34 Nm |
| 28 | Differential sensing valve, 110 psi / 7.6 bar | L | Boom extend/retract circuit | 30-35 ft-lbs / 41-47 Nm |
| 29 | Needle valve | U | Platform level circuit | 30-35 ft-lbs / 41-47 Nm |
| 30 | Solenoid valve, 3 position 4 way | V | Platform level up/down | 20-25 ft-lbs / 27-34 Nm |
| 31 | Solenoid valve, 3 position 4 way | Y | Platform rotate and jib boom up/down (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |

# Manifolds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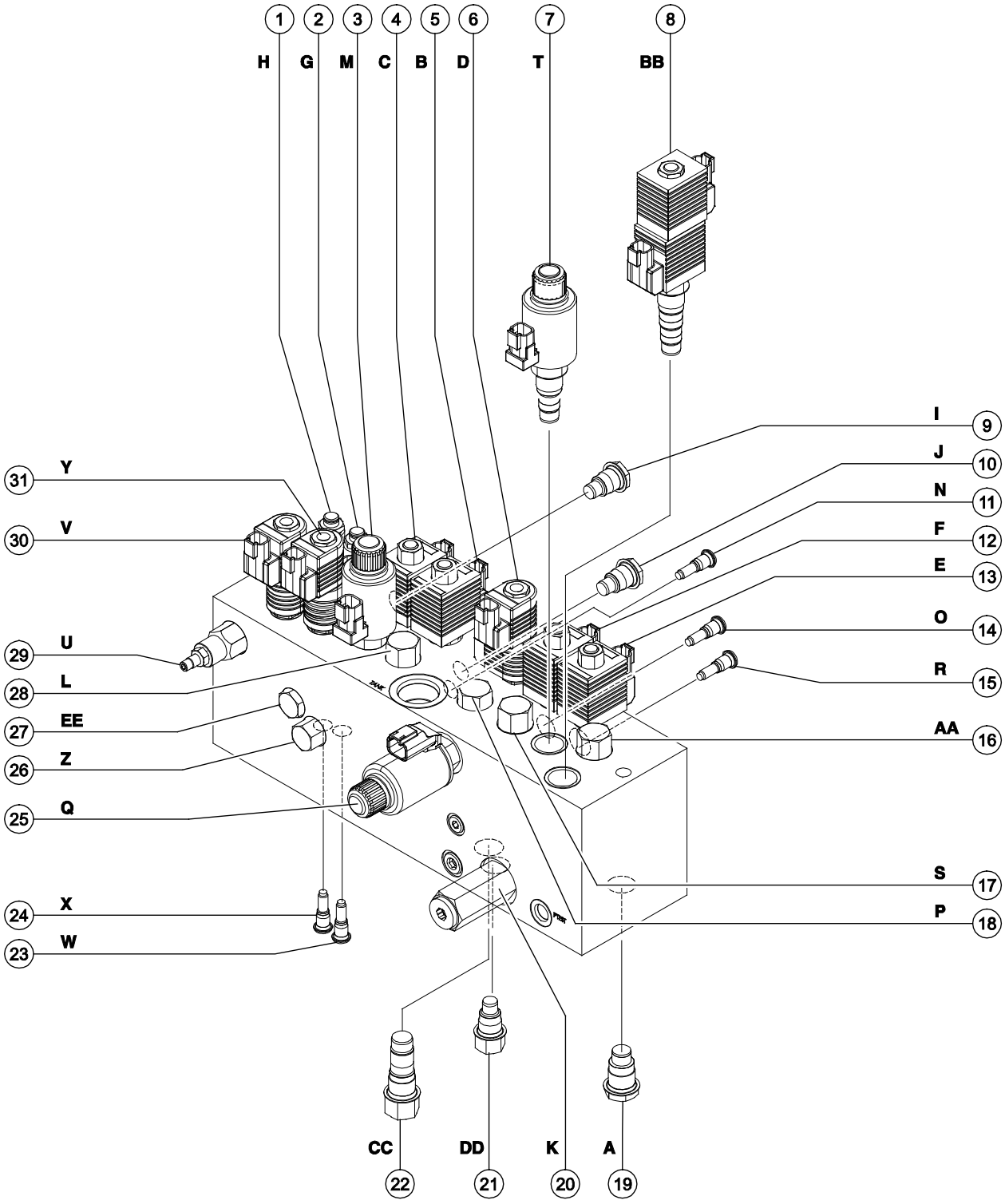
# Manifolds

## Function Manifold Components (from serial number 26515)

The function manifold is located underneath the ground controls side turntable cover.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Counterbalance valve | H | Platform level down | 30-35 ft-lbs / 41-47 Nm |
| 2 | Counterbalance valve | G | Platform level up | 30-35 ft-lbs / 41-47 Nm |
| 3 | Proportional solenoid valve | M | Boom extend/retract | 30-35 ft-lbs / 41-47 Nm |
| 4 | Solenoid valve, 2 position 3 way | C | Boom retract | 30-35 ft-lbs / 41-47 Nm |
| 5 | Solenoid valve, 2 position 3 way | B | Boom extend | 30-35 ft-lbs / 41-47 Nm |
| 6 | Solenoid valve, 3 position 4 way | D | Turntable rotate | 20-25 ft-lbs / 27-34 Nm |
| 7 | Proportional solenoid valve | T | Boom up/down circuit | 30-35 ft-lbs / 41-47 Nm |
| 8 | Solenoid valve, 3 position 4 way | BB | Steer left/right | 20-25 ft-lbs / 27-34 Nm |
| 9 | Check valve, 30 psi / 2 bar | I | Differential sensing circuit,platform rotate left andjib boom up (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |
| 10 | Check valve, 30 psi / 2 bar | J | Differential sensing circuit,platform rotate right andjib boom down (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |
| 11 | Check valve | N | Differential sensing circuit,boom extend/retract | 10-12 ft-lbs / 14-16 Nm |
| 12 | Solenoid valve, 2 position 3 way | F | Boom down | 30-35 ft-lbs / 41-47 Nm |
| 13 | Solenoid valve, 2 position 3 way | E | Boom up | 30-35 ft-lbs / 41-47 Nm |
| 14 | Check valve | O | Differential sensing circuit,turntable rotate | 10-12 ft-lbs / 14-16 Nm |
| 15 | Check valve | R | Differential sensing circuit,boom up/down | 10-12 ft-lbs / 14-16 Nm |
| 16 | Priority flow regulator valve, 3.5 gpm / 13.2 L/min | AA | Steer left/right circuit | 30-35 ft-lbs / 41-47 Nm |
| 17 | Differential sensing valve, 110 psi / 7.6 bar | S | Boom up/down circuit | 30-35 ft-lbs / 41-47 Nm |
| 18 | Differential sensing valve, 150 psi / 10.3 bar | P | Turntable rotate circuit | 30-35 ft-lbs / 41-47 Nm |

# Manifolds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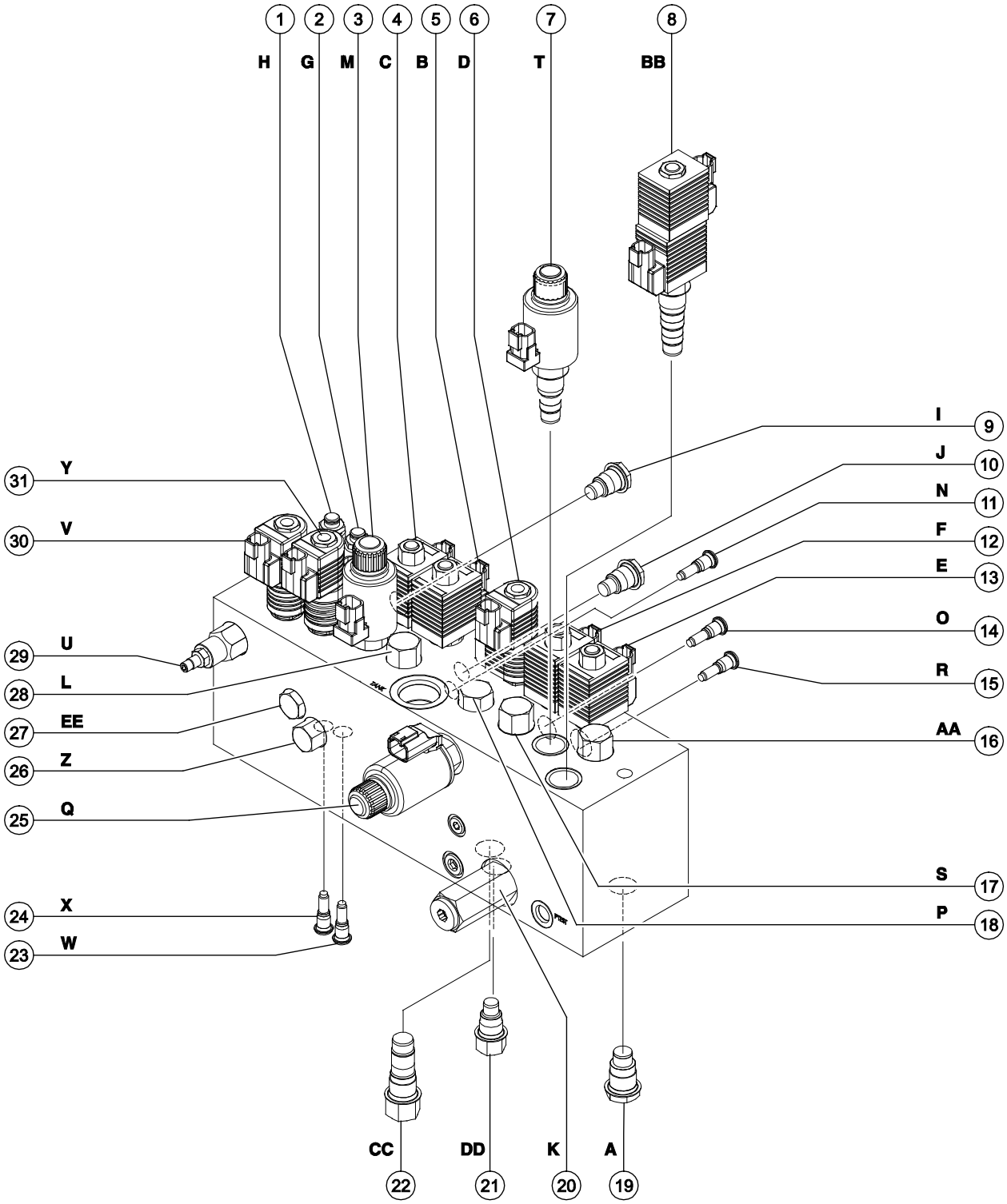
# Manifolds

### Function Manifold Components, continued (from serial number 26515)

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 19 | Check valve, 5 psi / 0.3 bar | A | Blocks flow from auxiliary pump to function pump | 30-35 ft-lbs / 41-47 Nm |
| 20 | Relief valve, 3000 psi / 206.8 bar | K | System relief | 30-35 ft-lbs / 41-47 Nm |
| 21 | Flow control valve, 0.1 gpm / 0.38 L/min | DD | Bleeds off differential sensing valves to tank | 20-25 ft-lbs / 27-34 Nm |
| 22 | Differential sensing valve, 150 psi / 10.3 bar | CC | Differential sensing circuit,meters flow to functions | 30-35 ft-lbs / 41-47 Nm |
| 23 | Check valve | W | Differential sensing circuit,platform level up | 10-12 ft-lbs / 14-16 Nm |
| 24 | Check valve | X | Differential sensing circuit,platform level down | 10-12 ft-lbs / 14-16 Nm |
| 25 | Proportional solenoid valve | Q | Turntable rotate left/right | 20-25 ft-lbs / 27-34 Nm |
| 26 | Flow control valve, 0.6 gpm / 2.27 L/min | Z | Platform rotate and jib boom (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |
| 27 | Check valve, 30 psi / 2 bar | EE | Platform rotate and jib boom circuit (S-65, S-65 TRAX)(prevents hydraulic hoses from draining back to tank) | 20-25 ft-lbs / 27-34 Nm |
| 28 | Differential sensing valve, 110 psi / 7.6 bar | L | Boom extend/retract circuit | 30-35 ft-lbs / 41-47 Nm |
| 29 | Needle valve | U | Platform level circuit | 30-35 ft-lbs / 41-47 Nm |
| 30 | Solenoid valve, 3 position 4 way | V | Platform level up/down | 20-25 ft-lbs / 27-34 Nm |
| 31 | Solenoid valve, 3 position 4 way | Y | Platform rotate and jib boom up/down (S-65, S-65 TRAX) | 20-25 ft-lbs / 27-34 Nm |

# Manifolds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# Manifolds

## 7-2 Valve Adjustments - Function Manifold

## How to Adjust the System Relief Valve

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

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

2 Start the engine from the ground controls.

3 Hold the function enable/rpm select toggle switch to the high idle position. Activate and hold the boom retract toggle switch with the boom fully retracted.

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

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

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

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

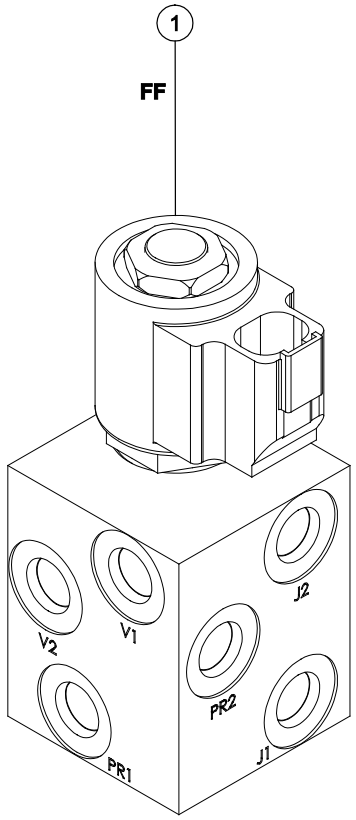
7 Repeat steps 2 through 5 and recheck relief valve pressure.

8 Remove the pressure gauge.

## 7-3
## 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 | FF | Platform rotate/jib boom select | 20-25 ft-lbs / 27-34 Nm |

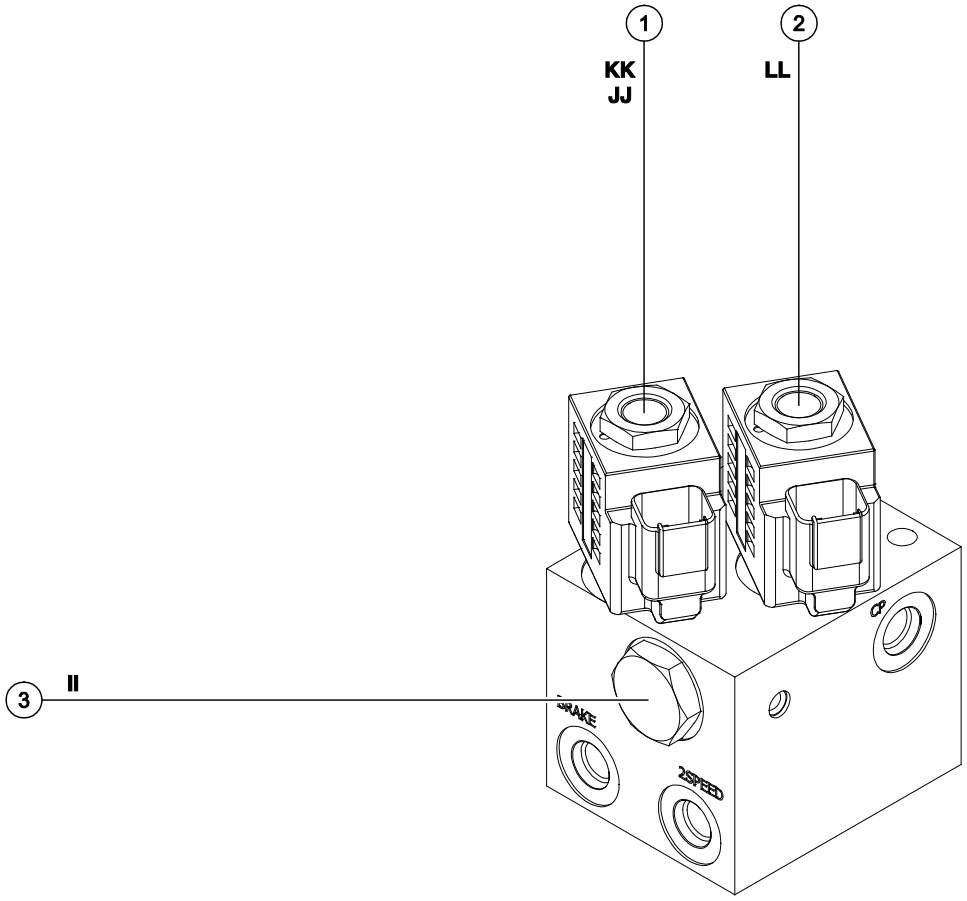


# Manifolds

## 7-4
## Brake/Two-Speed Manifold Components

The brake/two-speed manifold is mounted near the turntable rotator.

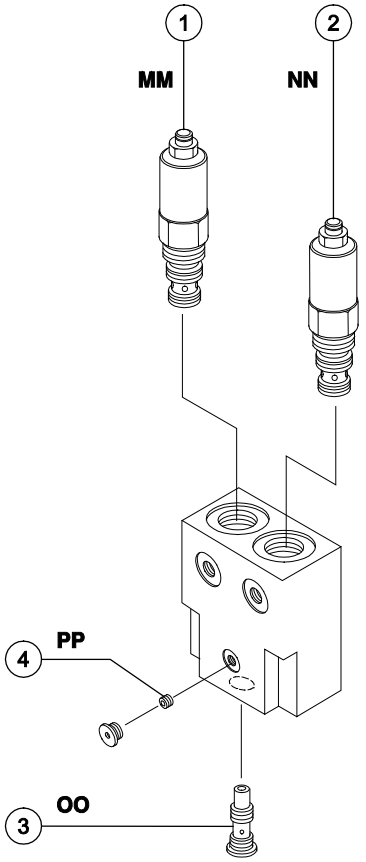
| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid valve, 2 position 3 way | KK | Brake release | 20-25 ft-lbs / 27-34 Nm |
| | Orifice, 0.025 inch / 0.64 mm | JJ | Brake release | |
| 2 | Solenoid valve, 2 position 3 way | LL | Two-speed motor shift | 20-25 ft-lbs / 27-34 Nm |
| 3 | Check valve | II | Brake release circuit | 20-25 ft-lbs / 27-34 Nm |



## 7-5
## Turntable Rotation Manifold Componentss

The turntable rotation manifold is mounted to the turntable rotation motor.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Counterbalance valve | MM | Turntable rotate right | 35-40 ft-lbs / 47-54 Nm |
| 2 | Counterbalance valve | NN | Turntable rotate left | 35-40 ft-lbs / 47-54 Nm |
| 3 | Shuttle valve, 2 position 3 way | OO | Turntable rotation brake release | 10-13 ft-lbs / 14-18 Nm |
| 4 | Orifice, 0.030 inch / 0.76 mm | PP | Brake release circuit(located inside port) | |

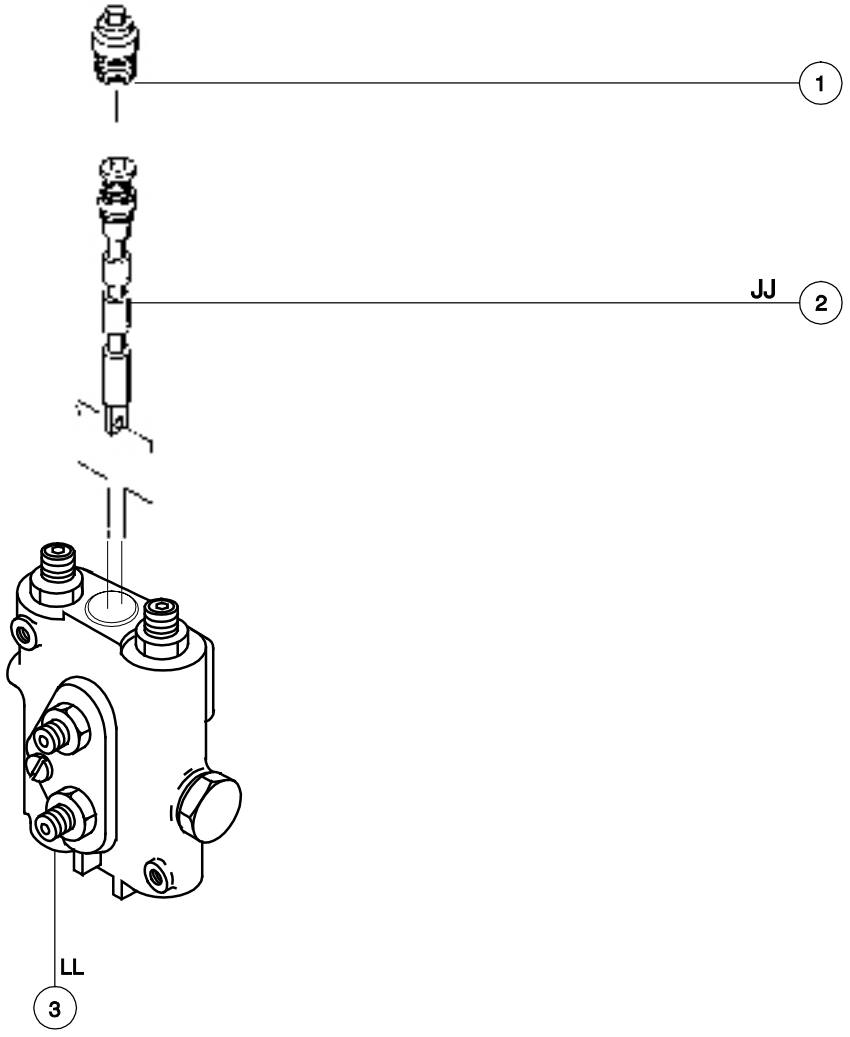


# Manifolds

## 7-6
## Oscillate Directional Valve Components

The oscillate directional valve 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 | JJ | Directional control | |
| 3 | Relief valve, 800 psi / 55 bar | LL | Oscillate relief | 30-35 ft-lbs / 41-47 Nm |



## How to Set Up the Oscillate Directional Valve

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

1 Lower the boom to the stowed position.

2 Use a "bubble type" level to be sure the floor 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.

3 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.

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

5 Place a "bubble type" level across the drive chassis non-steer end. Check to be sure the drive chassis is completely level.

6 Remove the heim joint retaining fastener from the axle.

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

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

9 Adjust the heim joint until the hole lines up with the retaining fastener hole in the axle.

10 Install the heim joint to the axle and tighten the jam nut.

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

12 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 6 through 11 OR consult Genie Product Support.

# Manifolds

## 7-7
## Valve Adjustments - Oscillate Relief Valve

### How to Adjust the Oscillate Relief Valve Pressure

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

2 Connect a 0 to 2000 psi / 0 to 150 bar pressure gauge to the diagnostic nipple located near the oscillate directional valve.

3 Disconnect the directional valve linkage, by removing the heim joint and retaining fastener from the axle.

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

5 With the engine running in high rpm, manually activate the valve and observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic 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 through 7 and manually activate the valve to confirm the valve pressure.

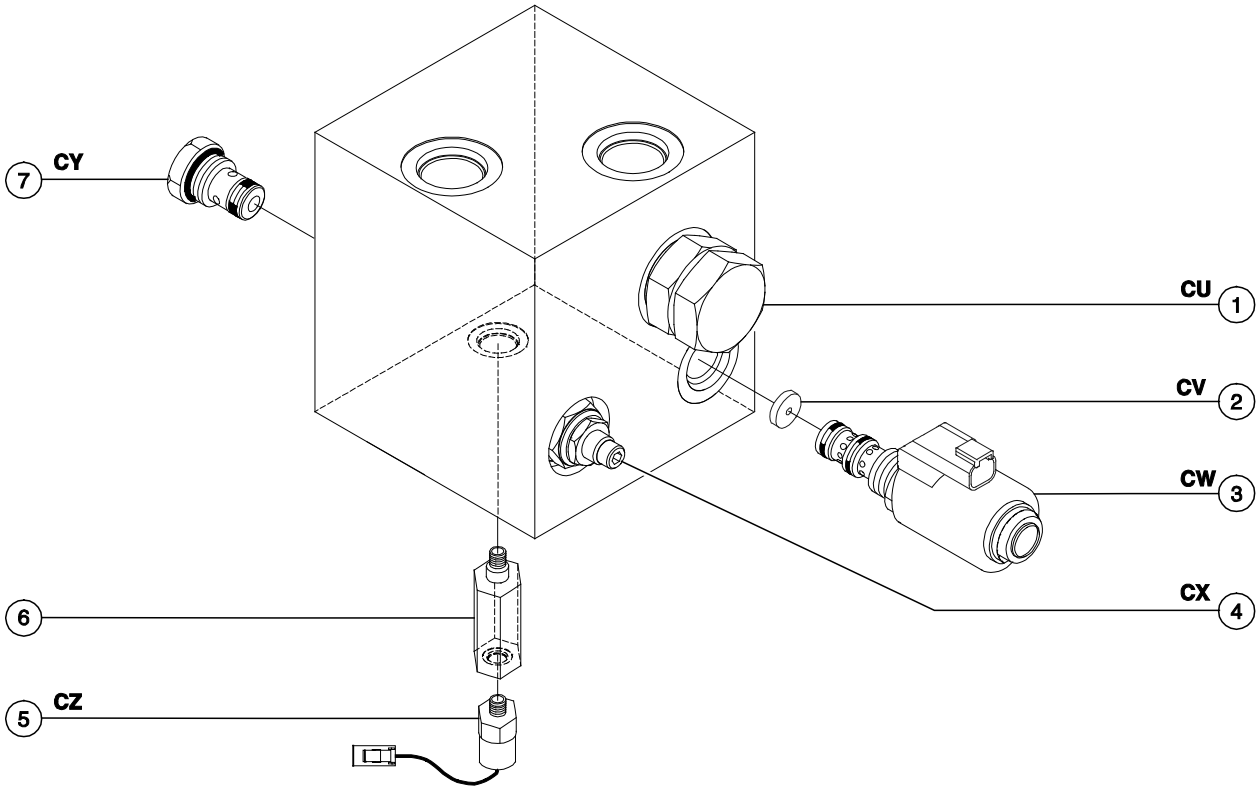
10 Turn the engine off, remove the pressure gauge and assemble the directional valve linkage.

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

## 7-8
## Drive Oil Diverter Manifold Components (welder option)

The oil diverter manifold is mounted to the hydraulic generator located in the engine compartment.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Directional valve | CU | Diverter valve | 80-90 ft-lbs / 108-122 Nm |
| 2 | Orifice disc, 0.030 inch / 0.080 cm | CV | Delays shift to drive | |
| 3 | Solenoid valve | CW | Pilot valve to diverter | 35-40 ft-lbs / 47-54 Nm |
| 4 | Relief valve | CX | Charge pressure circuit | 35-40 ft-lbs / 47-54 Nm |
| 5 | Pressure switch 200 psi / 18.6 bar | CZ | Generator relay switch | 16 ft-lbs / 22 Nm |
| 6 | Connector fitting | | | 11 ft-lbs / 15 Nm |
| 7 | Check valve | CY | Prevents oil to generator | 35-40 ft-lbs / 47-54 Nm |

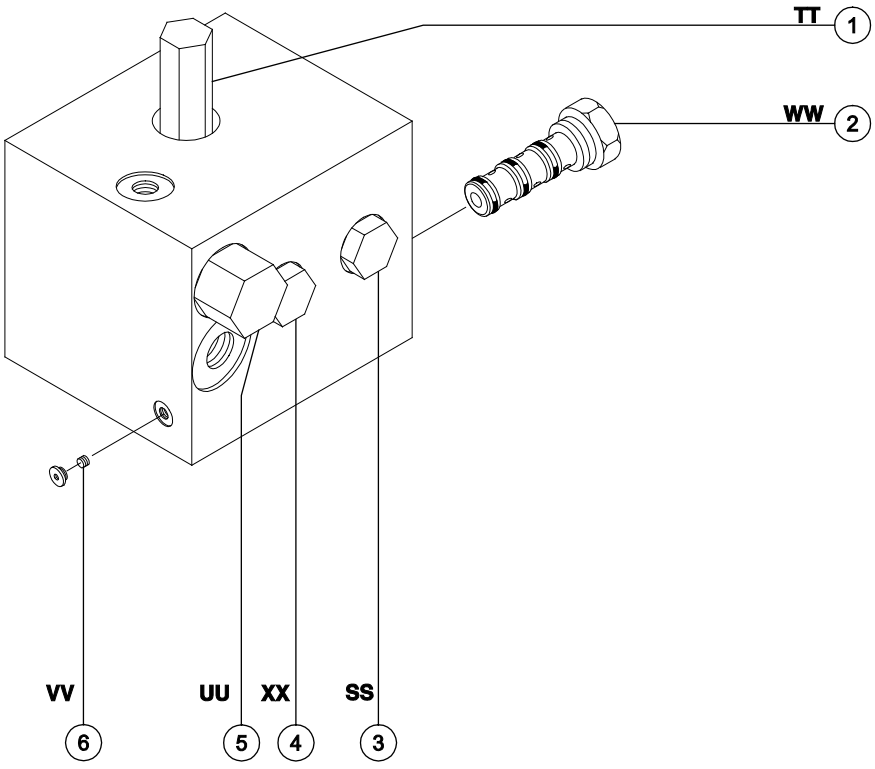


# Manifolds

## 7-9
## Traction Manifold Components, 2WD

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

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Relief valve, 280 psi / 19.3 bar | TT | Charge pressure circuit | 30-35 ft-lbs / 41-47 Nm |
| 2 | Flow divider/combiner valve | WW | Controls flow to drive motors in forward and reverse | 90-100 ft-lbs / 122-136 Nm |
| 3 | Check valve | SS | Drive circuit | 30-35 ft-lbs / 41-47 Nm |
| 4 | Check valve | XX | Drive circuit | 30-35 ft-lbs / 41-47 Nm |
| 5 | Shuttle valve, 3 position 3 way | UU | Charge pressure circuit tha tdirects hot oil out of low pressure side of drive pump | 50-55 ft-lbs / 68-75 Nm |
| 6 | Orifice, 0.070 inch / 1.78 mm | VV | Drive motor circuit | |



# 7-10
# Valve Adjustments, 2WD 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 Hold the charge pressure relief valve and remove the cap (item TT).

3 Turn the internal hex socket clockwise fully until it stops. Install the cap.

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 Start the engine from the platform controls. Press down the foot switch and slowly move the drive control handle off center just until the machine begines to move. Note the reading on the pressure gauge. Turn the machine off.

8 Hold the charge pressure relief valve and remove the cap (item TT).

9 Adjust the internal hex socket 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.

10 Repeat steps 7 through 9 until the pressure reading at the drive manifold is 30 psi / 2 bar less than the pressure reading at the pump.

11 Turn the engine off and remove the pressure gauge.

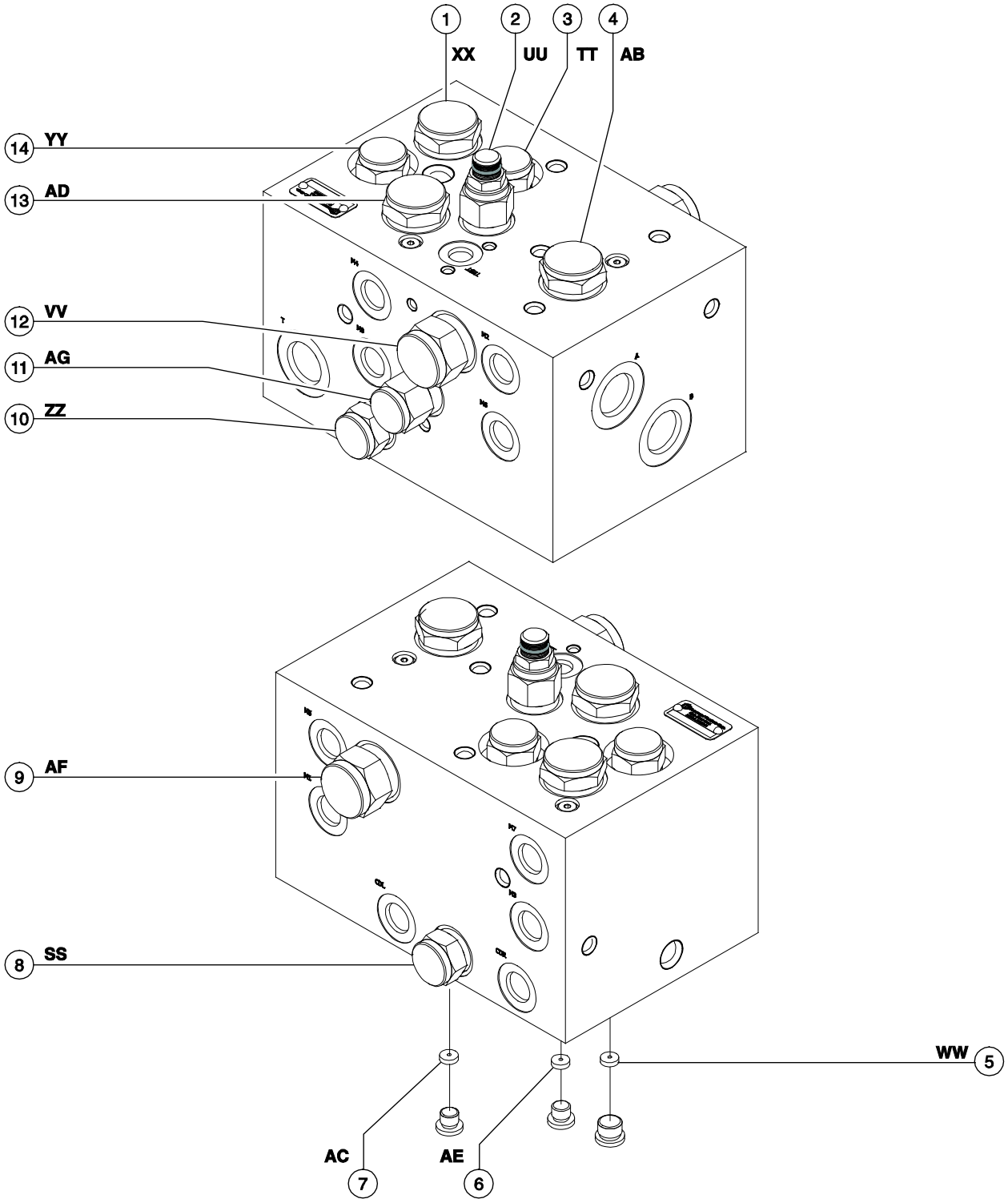
# Manifolds

## 7-11
## Traction Manifold Components, 4WD

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

| 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 flow 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 flow divider/combiner valve 1 | |
| 6 | Orifice, 0.040 inch / 1 mm | AE | Equalizes pressure on both sides of flow divider/combiner valve 13 | |
| 7 | Orifice, 0.040 inch / 1 mm | AC | Equalizes pressure on both sides of flow 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 | Check valve | AG | Steer end drive motor circuit | 60-70 ft-lbs / 81-95 Nm |
| 12 | Shuttle valve, 3 position 3 way | VV | Charge pressure circuit that directs hot oil out of low pressure side of drive pump | 80-90 ft-lbs / 108-122 Nm |
| 13 | Flow divider/combiner valve | 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

## 7-12
## Valve Adjustments, 4WD 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 Hold the charge pressure relief valve and remove the cap (item UU).

3 Turn the internal hex socket clockwise fully until it stops. Install the cap.

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 Start the engine from the platform controls. Press down the foot switch and slowly move the drive control handle off center just until the machine begines to move. Note the reading on the pressure gauge. Turn the machine off.

8 Hold the charge pressure relief valve and remove the cap (item UU).

9 Adjust the internal hex socket 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.

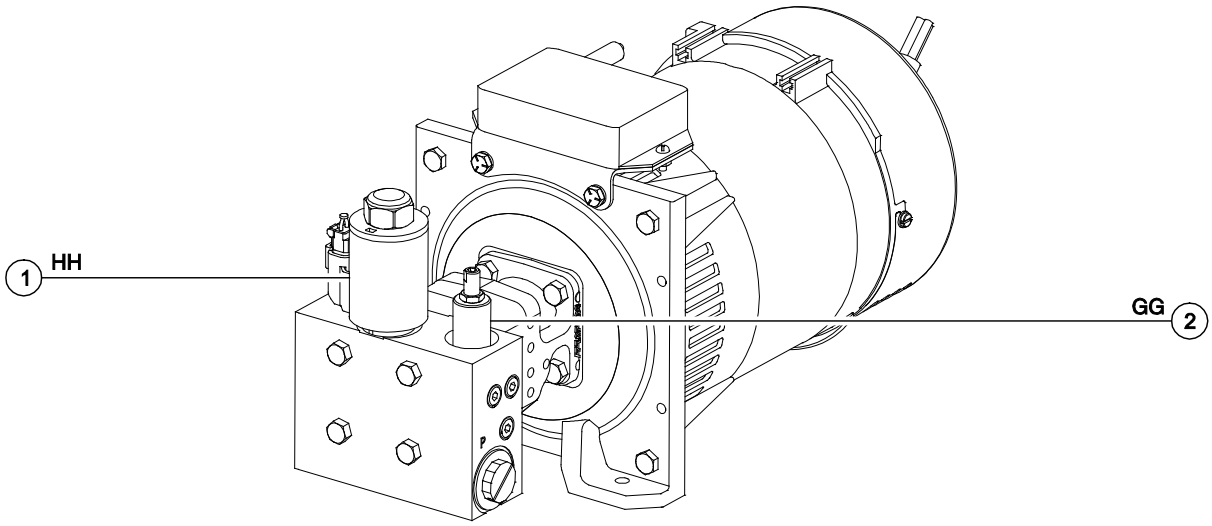
10 Repeat steps 7 through 9 until the pressure reading at the drive manifold is 30 psi / 2 bar less than the pressure reading at the pump.

11 Turn the engine off and remove the pressure gauge.

## 7-13
## Hydraulic Generator Manifold Components, 3kW

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

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



# Manifolds

## 7-14 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. Zero resistance indicates the coil has failed.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

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

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.

| Description | 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

Genie incorporates spike suppressing diodes in all of its directional valve coils except proportional valves and those coils with a metal case. Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

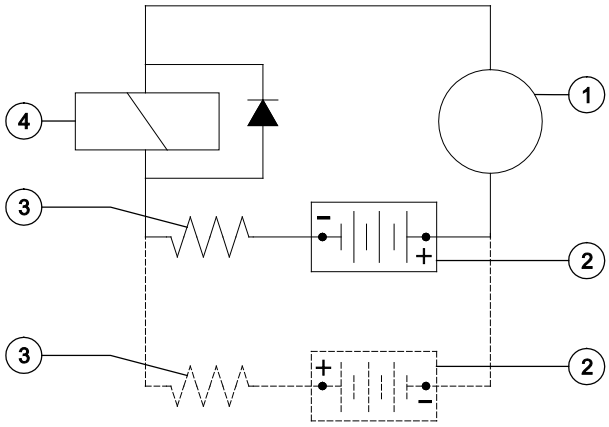
**⚠WARNING** Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

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

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

| **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.

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

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

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

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

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

# Turntable Rotation Components

## 8-1
## 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 and level surface.

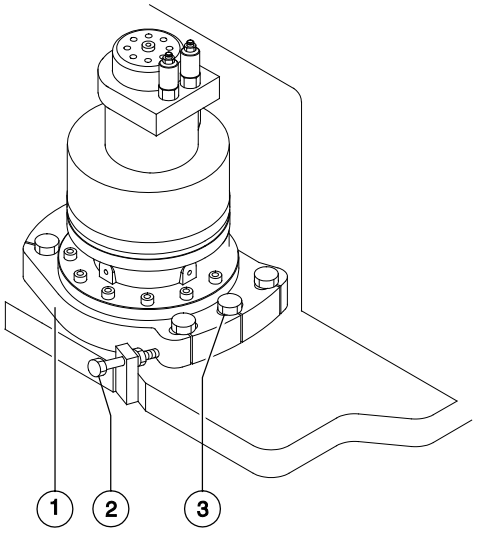
1 Secure the turntable from rotating with the turntable rotation lock pin.

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

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

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

3 Loosen the backlash pivot plate and adjustment bolts.




1 backlash pivot plate
2 adjustment bolt with lock nut
3 backlash pivot plate mounting bolts

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

# Turntable Rotation Components

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

**⚠WARNING** Crushing hazard. The turntable could rotate unexpectedly when the rotation drive hub assembly is removed if the turntable is not secured with the turntable rotation lock pin.

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

When installing the drive hub assembly:

6 Install the drive hub. Torque the back lash pivot plate to specification. Refer to Specifications, *Machine Torque Specifications*.

7 Adjust turntable rotation gear backlash. Refer to Repair Procedure, *How to Adjust the Turntable Rotation Gear Backlash*.

## How to Adjust the Turntable Rotation Gear Backlash

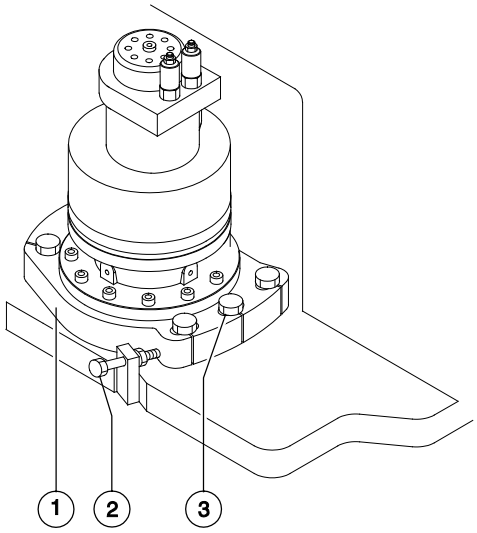
The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

Note: Perform this procedure with the boom between the non-steer end tires and with the machine on a firm and level surface.

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

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

2 Loosen the backlash pivot plate mounting fasteners.




1 backlash pivot plate
2 adjustment bolt with lock nut
3 backlash pivot plate mounting bolts

# Turntable Rotation Components

3 Push the backlash pivot plate towards the turntable as far as possible (this will push the rotation gear into the turntable bearing ring gear).

4 Loosen the lock nut on the adjustment bolt.

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

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

7 Rotate the backlash pivot plate away from the turntable until it contacts the adjustment bolt. Then torque the mounting fasteners on the backlash pivot plate to specification. Refer to Specifications, *Machine Torque Specifications*.

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

## 9-1
## Oscillating Axle Cylinders

The oscillating axle cylinders extend and retract between the drive chassis and the axle to maintain a level chassis while driving over uneven terrain. The cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic hose failure.

### How to Remove an Oscillate Axle Cylinder

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

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 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 crane 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 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 overhead crane.

# Track Components

## 10-1
## Track Assembly, S-60 TRAX and S-65 TRAX

### How to Remove a Track Assembly

Note: Perform this procedure on 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 a Track Assembly

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

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

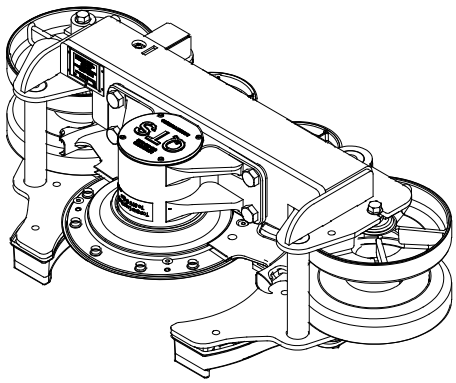
Note: The sprocket is comprised of two halves. Before removing the track assembly from the machine and to ease the removal of the sprocket, drive the machine until one complete half of the sprocket is located above the undercarriage of the track assembly.

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 crane to lay the undercarriage on its side with the drive sprocket bearing assembly facing upward and the track tension cylinder towards the ground.



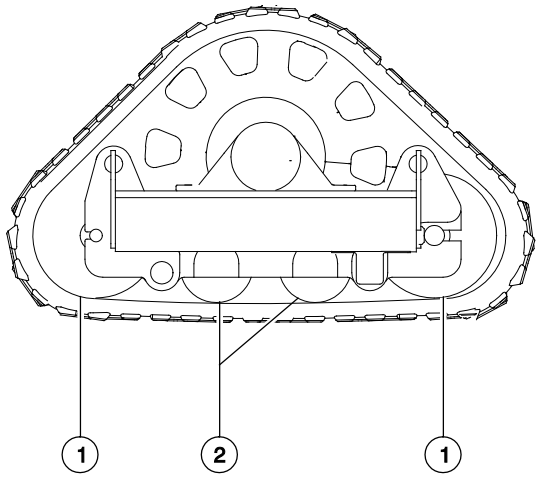
# Track Components

6 Install the new track onto the undercarriage.

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

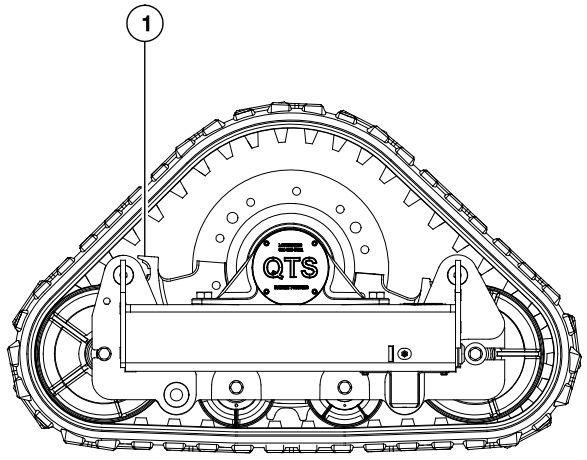
8 Use the overhead crane to raise the track assembly to an upright position. Rest the assembly on the floor or ground to remove any slack in the lower portion of the track.

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 crane or other suitable lifting 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.

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 crane to the center-point of the track assembly, above the sprocket.

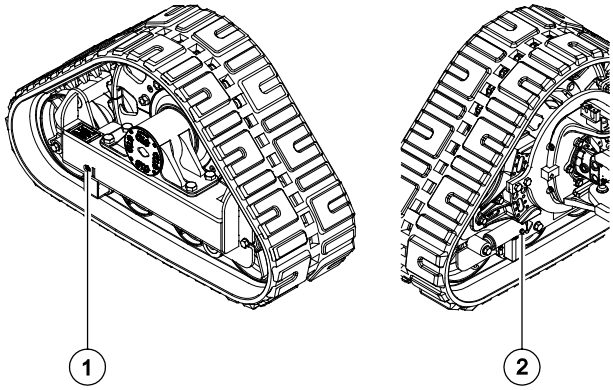
16 Install the track assembly onto the drive hub adapter while guiding the hub adapter studs into the sprocket of the track assembly. Install as many sprocket retaining fasteners as possible to the hub adapter and torque to specification. Refer to Specifications, *TRAX Torque Specifications.*

**⚠ 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.

# Track Components

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



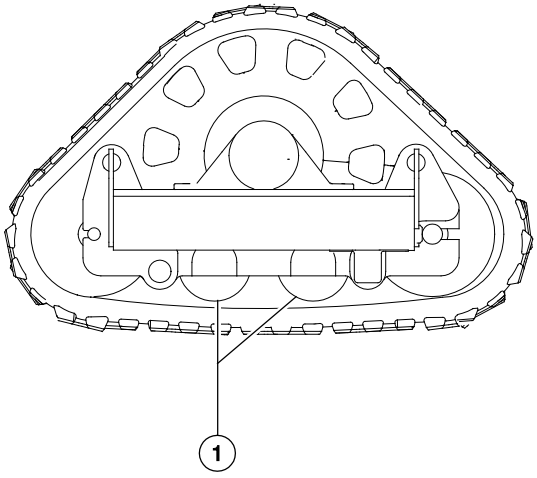

1 grease zerk
2 grease plug

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 overtighten.

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

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

**NOTICE** Component damage hazard. Do not over tighten the track. Overtightening 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 |

# 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 Fault Codes

## 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 | Function is inoperative.Alarm sounds indicating a fault. | Cycle power off, then on after problem has been corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | | Calibrate Joystick |
| 22 | Primary Up / Down Directional Valves | 21 | Fault | Valve is operating outside of limits. | Cycle power off, then on after problem has been corrected. |
| | | | | Alarm sounds indicating a fault. | |
| 23 | Primary Up / Down Flow Valve | 12 | Value Too High | Valve is operating outside of limits. | Cycle power off, then on after problem has been corrected. |
| | | 15 | Value Too Low | Alarm sounds indicating a fault. | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 24 | Angle sensor | 11 | Value at 5.0 V | Reduced speed function. | Cycle power off, then on after problem has been corrected. |
| | | 12 | Value Too High | Alarm sounds indicating a fault. | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | | Calibrate angle sensor. |
| | | 31 | Invalid setup | Initiate 1 -second beep of Alarm Buzzer and required retract into safe envelope | Calibrate angle sensor. |
| 26 | Angle sensor cross check | 19 | Out of Range | Reduced speed, required retract into safe envelope | Power up controller with problem corrected. |
| 31 | Secondary Up / Down. Joystick | 11 | Value at 5.0 V | Function is inoperative. Alarm sounds indicating a fault. | Cycle power off, then on after problem has been corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | | Calibrate Joystick |

# Control System Fault Codes

| Error Source | | Error Type | | Condition | Solution |
|---|---|---|---|---|---|
| ID | Name | ID | Name | | |
| 32 | Secondary Up / Down. Directional Valves | 21 | Fault | Valve is operating outside of limits. Alarm sounds indicating a fault. | Cycle power off, then on after problem has been corrected. |
| 33 | Secondary Up / Down Flow Valve | 12 | Value Too High | Valve is operating outside of limits. | Cycle power off, then on after problem has been corrected. |
| | | 15 | Value Too Low | Alarm sounds indicating a fault. | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 34 | Ext. Ret. Limit Switch | 31 | Invalid setup | Initiate 1-second beep of Alarm Buzzer | Fully retract, then lower boom |
| | | | | 1000lb. Mode: Required retract into FULLY RETRACTED state before lowering. | Check and service ext/ret and fully stowed switches |
| | | | | 500lb. Mode: Operates normally | |
| | | 36 | Cross check fault | Alarm sounds indicating a fault. | Check primary boom retracted operational (LS1) and safety (LS5) limit switches. |
| | | | | Overload LED is on. | |
| | | | | Functions disabled, engine shutdown. | |
| | | | | Auxiliary functions enabled except extend. | Boom retracted:<br>0 volts at C42LS of LS1.<br>12 volts at C166LS of LS5. |
| 41 | Turntable Rotate Joystick | 11 | Value at 5.0 V | Limited speed and direction frozen at zero and neutral. | Cycle power off, then on after problem has been corrected. |
| | | 12 | Value Too High | Alarm sounds indicating a fault. | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | | Calibrate Joystick |
| 42 | Turntable Rotate Directional Valves | 21 | Fault | Limited direction. Frozen at zero and neutral. Alarm sounds indicating a fault. | Cycle power off, then on after problem has been corrected. |
| 43 | Turntable Rotate Flow Valve | 12 | Value Too High | Limited speed and direction. | Cycle power off, then on after problem has been corrected. |
| | | 15 | Value Too Low | Frozen at zero and neutral. | |
| | | | | Alarm sounds indicating a fault. | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 44 | Drive Enable Override Switch | 21 | Fault | Drive enable override direction is frozen at neutral. | Cycle power off, then on after problem has been corrected. |

# Control System Fault Codes

| Error Source | | Error Type | | Condition | Solution |
|---|---|---|---|---|---|
| ID | Name | ID | Name | | |
| 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 Ext/Ret frozen at neutral | Power up controller with problem corrected. |
| 51 | Drive Joystick | 11 | Value at 5.0 V | Limited speed and direction. Frozen at zero and neutral. Alarm sounds indicating a fault. | Cycle power off, then on after problem has been corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | | Calibrate Joystick |
| 53 | Drive Flow Valve (EDC) | 12 | Value Too High | Limited speed and direction. Frozen at zero and neutral. Alarm sounds indicating a fault. | Cycle power off, then on after problem has been corrected. |
| | | 15 | Value Too Low | | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |

# Control System Fault Codes

| Error Source | | Error Type | | Condition | Solution |
|---|---|---|---|---|---|
| **ID** | **Name** | **ID** | **Name** | | |
| 75 | SCON | 34 | Software mismatch<br>Primary and secondary micro-controllers software do not match. | Alarm sounds indicating a fault.<br>Overload LED is on.<br>Functions disabled, engine shutdown.<br>Auxiliary functions enabled except extend. | Install correct software part number and version in secondary micro-controller. |
| | | 12 | Value Too High | | Platform overloaded. |
| | | 13 | No Response | | Check CAN bus circuit for open or short.<br>Check for cable damage to load cell.<br>Check for power at load cell. |
| | | 15 | Value Too Low | | Confirm the platform load cell is properly pre-loaded and is free of obstructions. |
| 76 | Platform load cell overloaded | 17 | Not calibrated | **Zero load not calibrated:**<br>Alarm sounds indicating a fault.<br>Overload LED is on.<br>Functions disabled, engine shutdown<br>Auxiliary functions enabled except extend.<br>**Zero load calibrated, gain is not:**<br>Unit operates with reduced load capacity. | Calibrate the load cell. |
| | | 21 | Internal load cell status | Alarm sounds indicating a fault.<br>Overload LED is on.<br>Functions disabled, engine shutdown.<br>Auxiliary functions enabled except extend. | Inspect load cell for damage.<br>Cycle power off then back on. If fault persist, replace load cell. |
| | | 31 | Invalid setup | | Calibrate load cell with proper. load or replace |
| | | 36 | Cross check fault | | Inspect load cell for damage.<br>Cycle power off then back on. If fault persist, replace load cell. |

# Control System Fault Codes

| Error Source | | Error Type | | Condition | Solution |
|---|---|---|---|---|---|
| ID | Name | ID | Name | | |
| 79 | Hour meter | 13 | No Response | Loss of communication to hour meter.<br>Machine functions normal. | Check power and ground to hour meter.<br>Check CAN bus circuit for open or short.<br>Check CAN bus resistance between CAN high and CAN low. 60 ohms. |
| 82 | Overload recovery | 21 | Fault | Platform overloaded and machine operated using auxiliary power.<br>Fault remains active until reset is performed. | Enter reset code using calibration mode.<br><gain> <gain> <gain> <zero> (<up> <up> <up> <down>) |
| 102 | Overload function cutout relay | 12 | Value Too High | SCON detects 12VDC from CR54 or CR55 terminal 87 when terminals 85 and 86 are not activated.<br>Alarm sounds indicating a fault.<br>Overload LED is on.<br>Functions disabled, engine shutdown.<br>Auxiliary functions enabled except extend. | Check for 12VDC at SCON C41-6. Should be 0VDC.<br>Replace CR54 or CR55.<br>Check for short to 12VDC in harness to SCON C41-6. |
| | | 15 | Value Too Low | SCON detects 0VDC from CR54 or CR55 terminal 87 when terminals 85 and 86 are activated.<br>Alarm sounds indicating a fault.<br>Overload LED is on.<br>Functions disabled, engine shutdown.<br>Auxiliary functions enabled except extend. | Check for 0VDC at SCON C41-6. Should be 12VDC.<br>Replace CR54 or CR55.<br>Check for open in harness to SCON C41-6. |
| 103 | Overload engine cutout relay | 12 | Value Too High | SCON detects input from TB21 when CR56 terminals 85 and 86 are not activated.<br>Alarm sounds indicating a fault.<br>Overload LED is on.<br>Functions disabled, engine shutdown.<br>Auxiliary functions enabled except extend. | Replace CR56.<br>Check for short from TB21 in harness to SCON C42-2. |

# Fault Code Display - Deutz and Perkins Models

## How to Retrieve Active Engine Fault Codes - Deutz D 2.9 L4, D436 L3i 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.

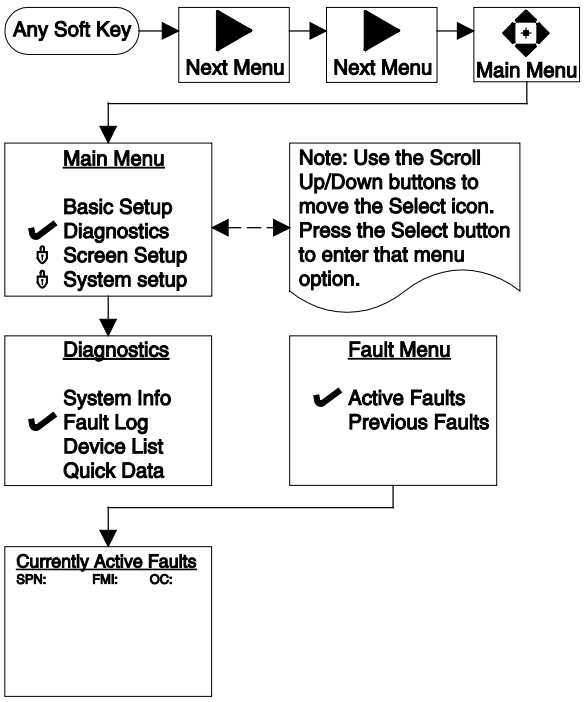
**With the engine not running:**

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.

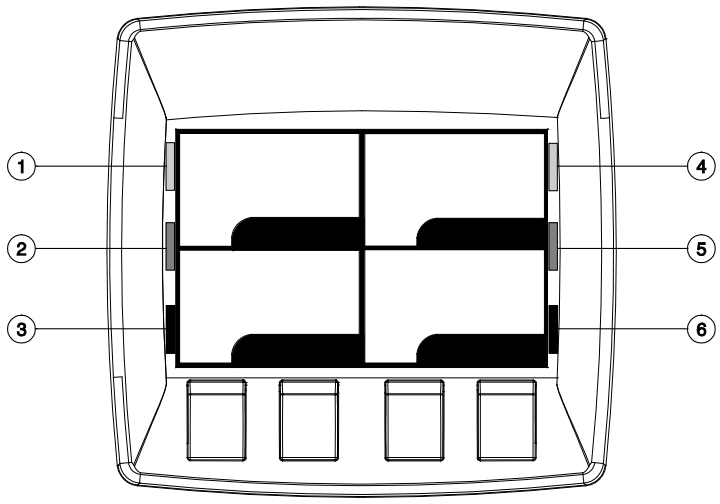
Note: Deutz D436 L3i models, refer to the main menu structure.

### Deutz D 2.9 L4 and Perkins 404F-22 models:



# 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.

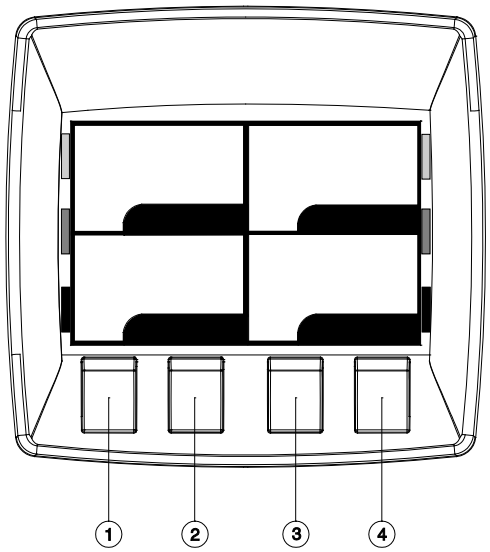
6 Right red LED:

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 (-)

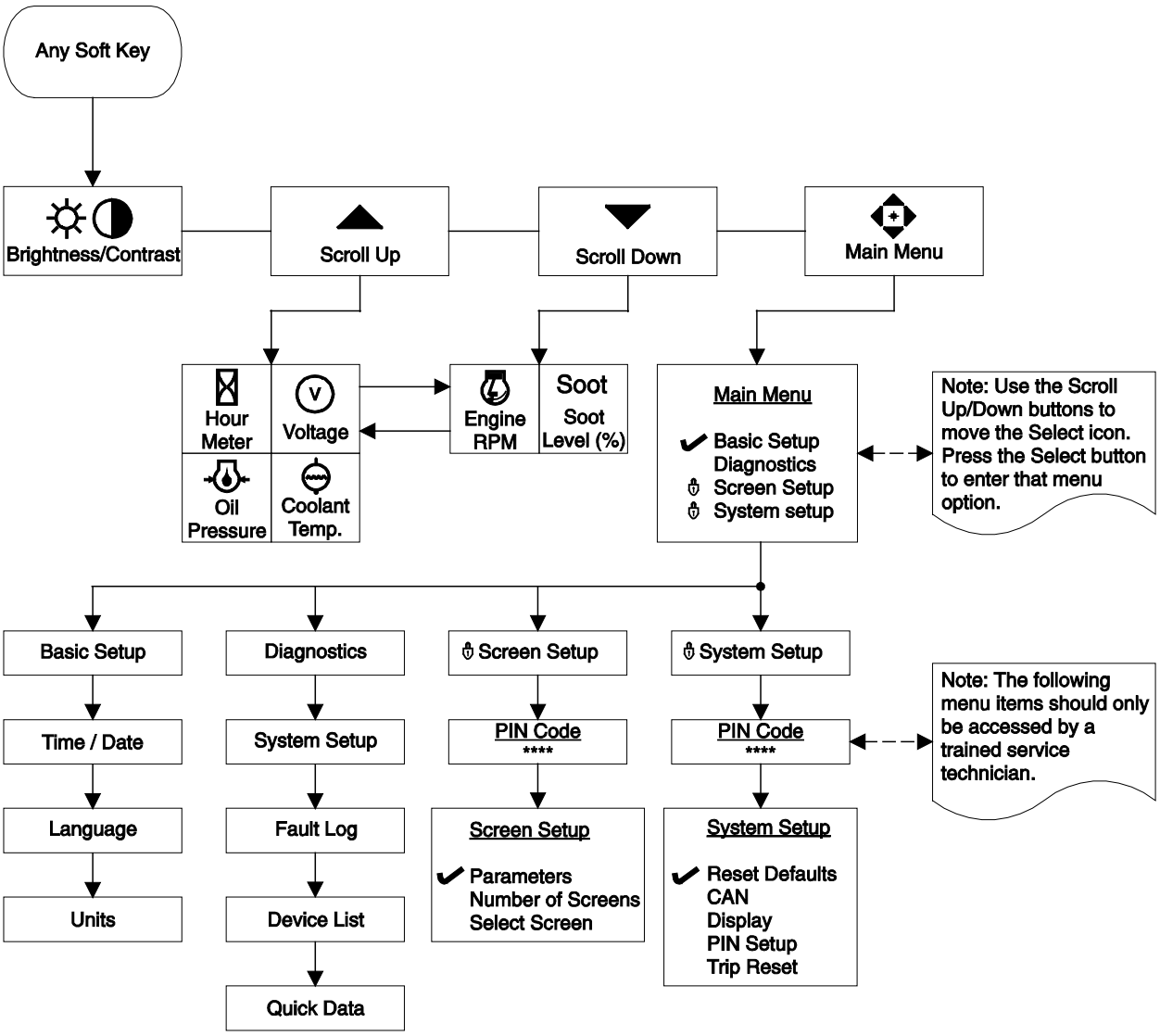
4 Regeneration inhibited • Select / Next • Main menu • Increase contarst (+)

| | | | |
|---|---|---|---|
| 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.

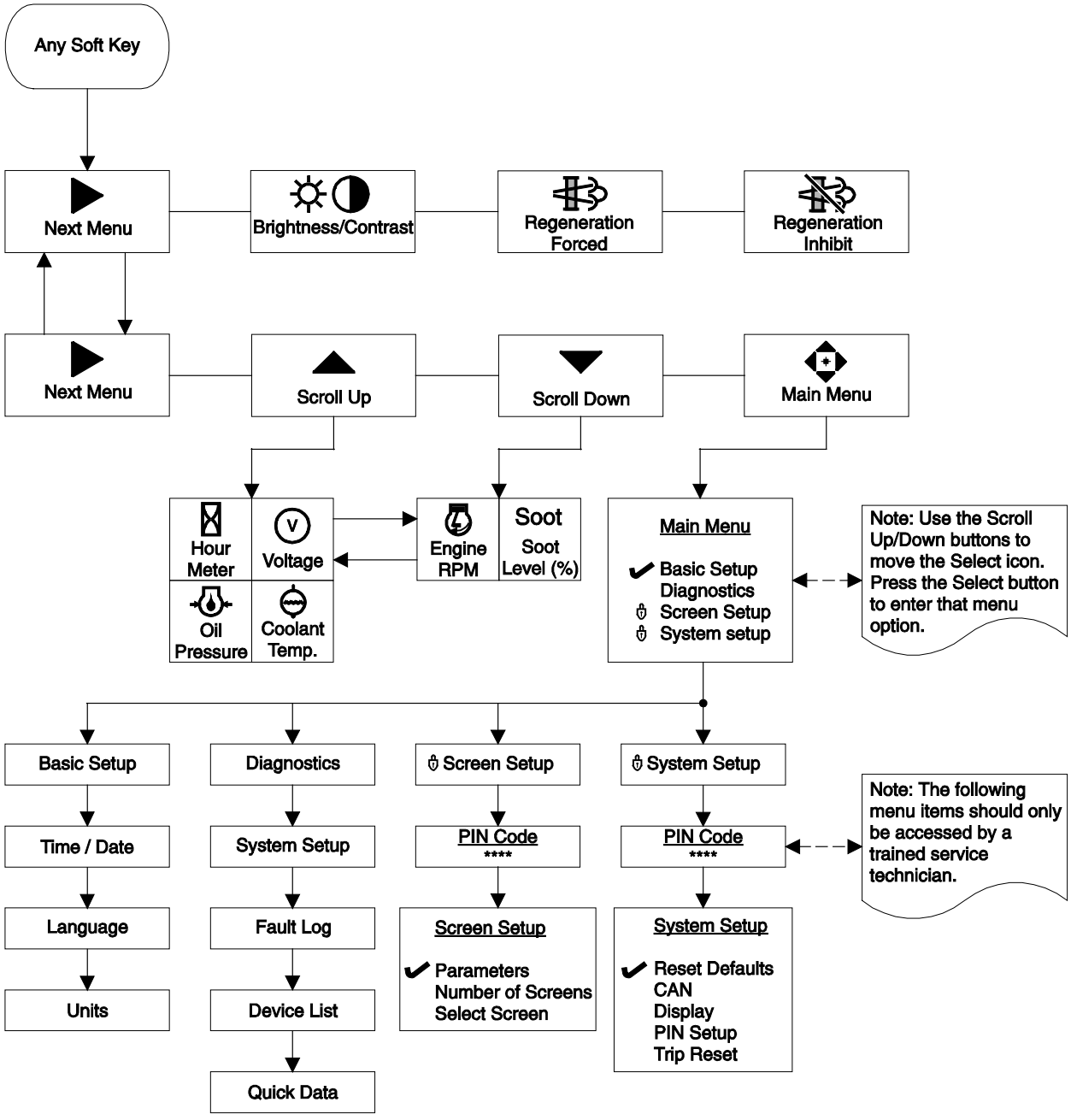
# Fault Code Display - Deutz and Perkins Models

## Main Menu Structure - Deutz D 2.9 L4 Models



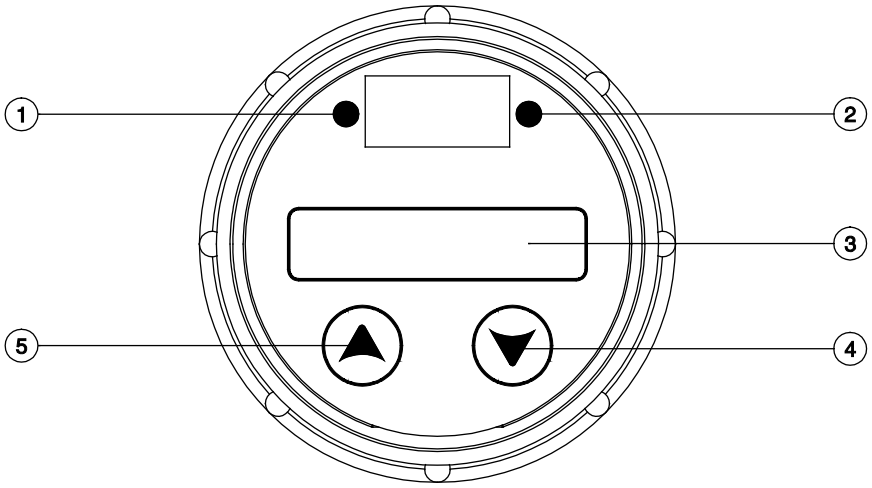
# Fault Code Display - Deutz and Perkins Models

## Main Menu Structure - Perkins 404F-22 Models



# Fault Code Display - Deutz and Perkins Models

## Deutz D436 L3i Display




1 Amber LED:
Solid, engine fault detected. Contact service.

2 Red LED:
Solid, engine power deration or engine shutdown.

3 LCD display

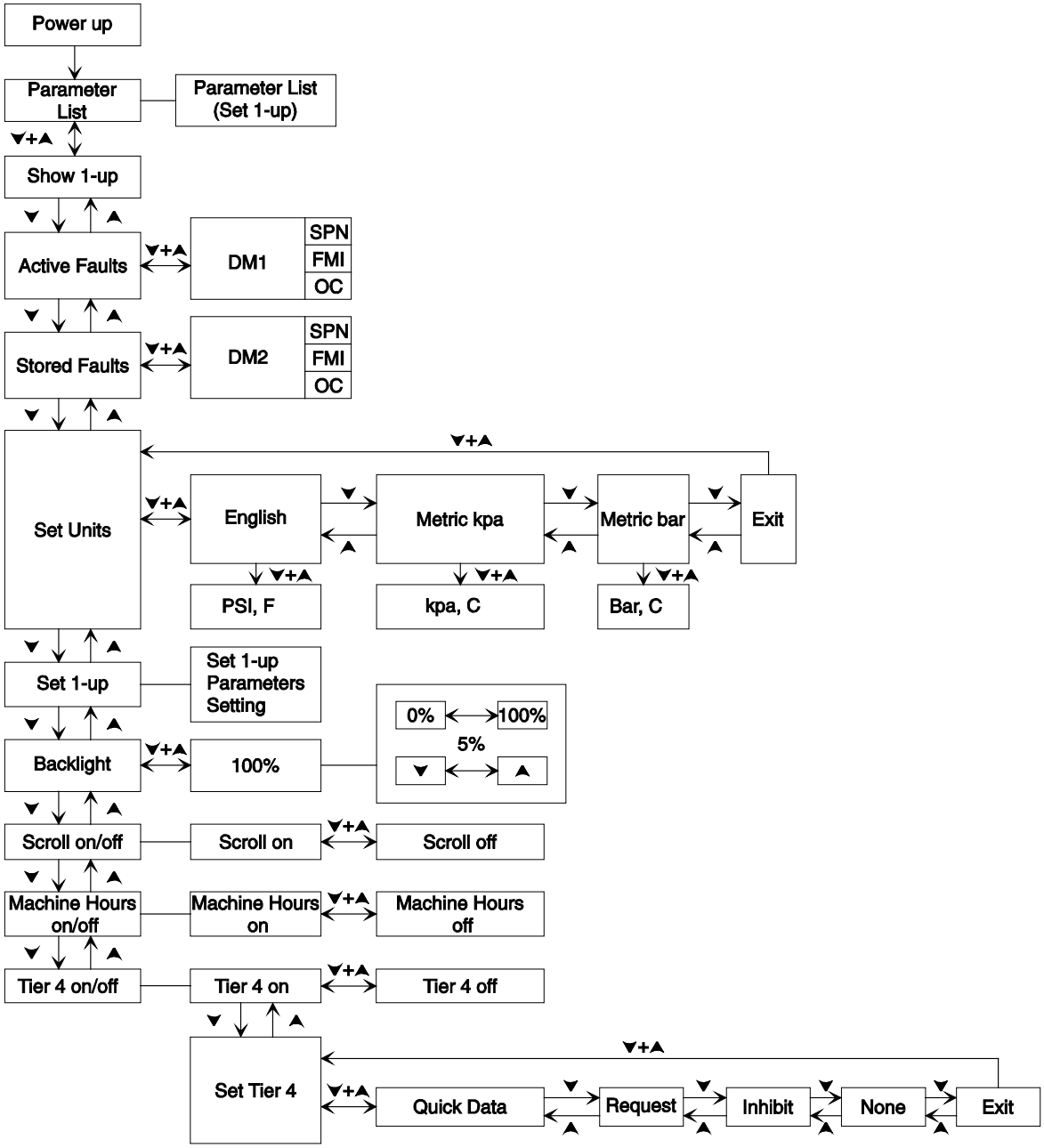
4 Scroll down
Navigate menus and display functions.

5 Scroll up
Navigate menus and display functions.

Note: Momentarily press scroll up and scroll down at the same time to enter the main menu structure, enter sub-menus, activate menu selections and return to previous menus.

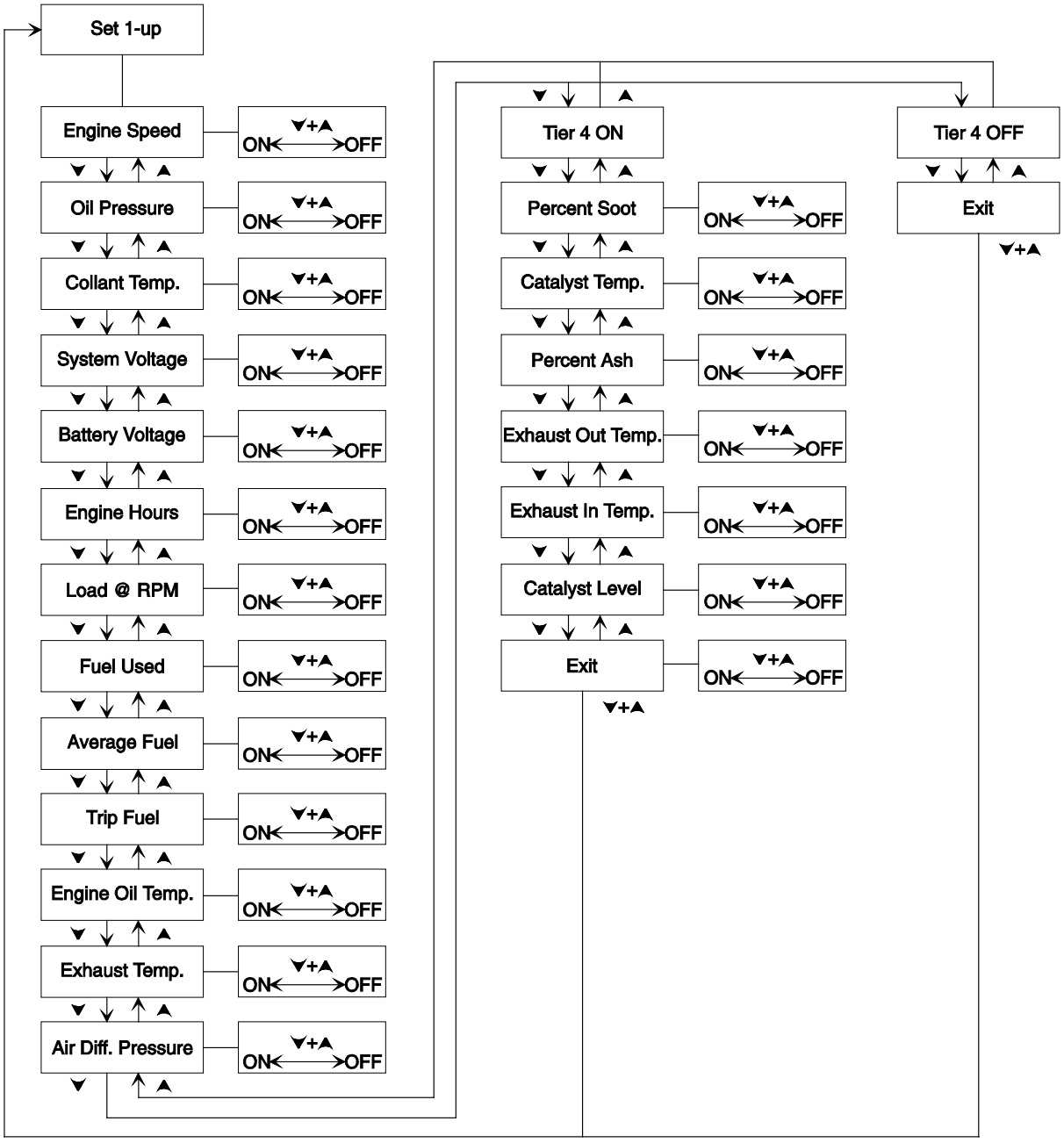
# Fault Code Display - Deutz and Perkins Models

## Main Menu Structure - Deutz D436 L3i Models



# Fault Code Display - Deutz and Perkins Models

## Main Menu Structure - Deutz D436 L3i Models - continued



# 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 | Sesnor 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
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| 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
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| 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

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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

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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

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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

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| 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 |

# Deutz D436 L3i Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

| SPN | FMI | Description |
|---|---|---|
| | | **Revolutions / Speed** |
| 190 | 8 | Speed sensor 1: sensor fault; distance from gear; harness |
| 190 | 8 | Speed sensor 2: sensor fault; distance from gear; harness |
| 84 | 8 | Speed sensor: no tach; harness |
| 190 | 0 | Excess speed switch-off: speed i excess of limit |
| | | **Sensors** |
| 91 | 2 | Set point sensor 1: short circuit; harness |
| 201 | 2 | Set point sensor 2: short circuit; harness |
| 102 | 2 | Charge air pressure: short circuit; harness |
| 100 | 2 | Oil pressure: short circuit; harness |
| 110 | 2 | Coolant temp: short circuit; harness |
| 105 | 2 | Charge air temp: short circuit; harness |
| 174 | 2 | Fuel temp: short circuit; harness |
| | | **Functional fault warning** |
| 100 | 1 | Oil pressure warning: oil pressure below speed |
| 110 | 0 | Coolant temperature warning: exceeded warning level |
| 105 | 0 | Charge air temp: warning: exceeded warning level |
| 111 | 1 | Coolant level warning: switch input "Low coolant level" is active |
| SID 190 | 14 | Speed warning: revolutions above top revolution speed limit |
| 174 | 0 | Fuel temperature warning: exceeded level |

| SPN | FMI | Description |
|---|---|---|
| | | **Functional fault, switch off** |
| 100 | 1 | Oil pressure switch: pressure below switch off limit |
| 110 | 0 | Coolant temperature switch: exceeded switch off limit |
| 105 | 0 | Charge air temp. switch: exceeded switch off limit |
| 111 | 1 | Coolant level switch: switch input "low coolant level" active |
| | | **Actuator** |
| SID 24 | 12 | Feedback: Actuator not connected. Faulty actuator. |
| SID 24 | 13 | Reference feedback: Actuator not connected. Faulty actuator. |
| SID 23 | 7 | Control travel difference: Injector pump/actuator stuck or not connected. Difference between nominal/actual travel is >10%. |
| SID 23 | 13 | Auto calibration, faulty operation: No automatic actuator equalization. Incorrect actuator input values. |
| | | **Hardware inputs/outputs** |
| SID 51 | 2 | Digital output 3. switch off solenoid, pin M2: Short or open circuit at digital output. |
| SID 60 | 2 | Digital output 6, pin M7: Short or open circuit at digital output. |
| SID 51 | 6 | Excess voltage, switch off solenoid: Contact Genie product support. |
| 91 | 11 | Error Hand Setp1: Contact Genie product support. |
| 898 | 2 | Error CAN setp1: Contact Genie product support. |

# Deutz D436 L3i Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

| SPN | FMI | Description |
|---|---|---|
| | | **Communication** |
| SID 231 | 12 | CAN-Bus controller: CAN controller faulty. |
| SID 231 | 9 | CAN interface. SAE J1939: Overflow in input buffer. Transmission cannot be placed on bus. |
| SID 231 | 14 | Short or open circuit. Bus error: Open circuit. |
| | | **Memory** |
| SID 253 | 12 | Parameter programming: Fault in parameter programming in governor fixed memory. |
| SID 240 | 12 | Cyclic program test: Monitoring of program memory shows error. |
| SID 254 | 2 | Cyclic RAM test: Monitoring of working memory shows error. |
| | | **Control unit hardware** |
| SID 254 | 2 | Power supply, actuator: Actuator power supply out of range. |
| SID 254 | 2 | Reference voltage 1: Actuator reference voltage out of range. |
| SID 254 | 2 | Reference voltage 2: Actuator reference voltage out of range. |
| SID 254 | 2 | Reference voltage 3: Actuator reference voltage out of range. |
| 171 | 12 | Internal temperature: Control unit internal temperature out of range. |
| 108 | 12 | Atmospheric pressure: Out of range. |
| | | **Program logic** |
| SID 253 | 2 | Parameter fault: No data found or checksum data faulty. |
| SID 240 | 2 | Stack overflow: Internal calculation fault. |
| SID 254 | 2 | Internal fault: Contact Genie product support. |

# Perkins 404F-22 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-22 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 |
| 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 |

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

| **Ford MSG-425 EFI Diagnostic Manual** | |
|---|---|
| Genie part number | 162067 |

# 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 |

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

| **Ford MSG-425 EFI Diagnostic Manual** | |
|---|---|
| Genie part number | 162067 |

# 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 |

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

| **Ford MSG-425 EFI Diagnostic Manual** | |
|---|---|
| Genie part number | 162067 |

# 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 |
| 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 |

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

| **Ford MSG-425 EFI Diagnostic Manual** | |
|---|---|
| Genie part number | 162067 |

# 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 |

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

| **Ford MSG-425 EFI Diagnostic Manual** | |
|---|---|
| Genie part number | 162067 |

# Load Sense System Fault Codes

## Platform Load Sense System, S-60 HC

## How to Retrieve Platform Load Sense System Fault Codes

Note: Perform this procedure with the engine off, the key switch turned to ground controls and the red Emergency Stop buttons pulled out to the on position at both the ground and platform controls.

1 Open the ground controls side turntable cover.

2 Locate the operational and safety controllers near the ground control box.

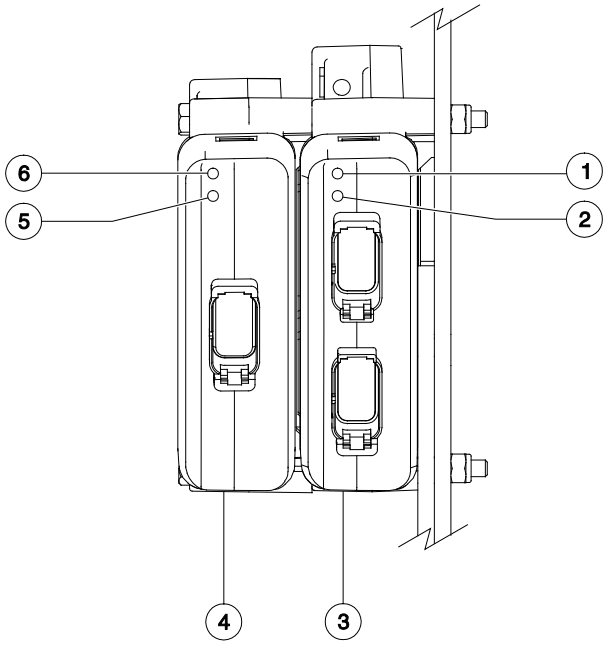
3 Determine whether a safety or operational fault exists by visually inspecting which controller has flashing LEDs.

Note: If the LEDs are flashing on both controllers, determine the fault code on one controller at a time.

4 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.

5 Determine the error type: The green 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.

6 Use the fault code table on the following pages to aid in troubleshooting the machine by pinpointing the area or component affected.




1 green LED (operational control module)
2 red LED (operational control module)
3 operational control module
4 safety control module
5 red LED (safety control module)
6 green LED (safety control module)

# Fault Codes

**Error Source 12, System Checks**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 11 | Safety envelope reached | Power relays disengaged. | Use recovery switch and APU from the ground controls to recover the machine to stowed position or within the operating envelope. |
| 12 | Platform load greater 1200 lbs/544 kg or less. | Power relays disengaged. | Remove weight from platform until load is than 1250 lbs/567 kg |
| 13 | CAN communication failure | Power relays disengaged. | Repair CAN bus wiring and/or connections. |
| 14 | Sensor power failure | Power relays disengaged. | Use recovery switch and APU from the ground controls to recover the machine to stowed position or within the operating envelope. |
| 21 | Angle sensor not active | Power relays disengaged. | Inspect boom angle sensor for proper operation and be sure it is connected to boom properly OR replace boom angle sensor. |
| 22 | String potentiometer not active | Power relays disengaged. | Inspect string potentiometer for proper operation and be sure it is connected to boom properly OR replace string potentiometer. |
| 23 | Power relay output short high | Power relays disengaged. | Repair system wiring and/or connections.Relay wiring open or shorted to voltage. |
| 24 | Power relay output short low | Power relays disengaged. | Repair system wiring and/or connections.Relay wiring open or shorted to ground. |
| 25 | Directional relay output short high | Boom up/down and extend/retract inoperative. Relay wiring open or shorted to voltage. | Repair system wiring and/or connections. |
| 26 | Output short low | Boom up/down and extend/retract inoperative. Relay wiring open or shorted to ground. | Repair system wiring and/or connections. |

**Error Source 21, String Potentiometer Operational Sensor (C167PSL)**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 5 | Sensor tolerance fault | Power relays disengaged. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 11 | Output short high | Power relays disengaged. String potentiometer wiring open or shorted to voltage. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 12 | Value too high | Power relays disengaged. String potentiometer wiring open or shorted to voltage. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 15 | Value too low | Power relays disengaged. String potentiometer wiring open or shorted to ground. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 16 | Output short low | Power relays disengaged. String potentiometer wiring open or shorted to ground. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 17 | Not calibrated | Boom range of motion is limited. | Calibrate the platform load sense system. |
| 18 | Just calibrated | Used to clear diagnostic codes. | Self-clearing. |

# Fault Codes

**Error Source 22, String Potentiometer Safety Sensor (C167PSL)**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 5 | Sensor tolerance fault | Power relays disengaged. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 11 | Output short high | Power relays disengaged. String potentiometer wiring open or shorted to voltage. | Repair wiring and/or connections OR String potentiometer replace string potentiometer and calibrate overload system.to voltage. |
| 12 | Value too high | Power relays disengaged. String potentiometer wiring open or shorted to voltage. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 15 | Value too low | Power relays disengaged. String potentiometer wiring open OR shorted to ground OR string potentiometer is faulty. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 16 | Output short low | Power relays disengaged. String potentiometer wiring open OR shorted to ground. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |
| 17 | Not calibrated | Boom range of motion is limited. | Calibrate the platform load sense system. |
| 18 | Just calibrated | Used to clear diagnostic codes. | Self-clearing. |
| 21 | Inconsistent | Checks operational and safety sensor values against each other. | Repair wiring and/or connections OR replace string potentiometer and calibrate overload system. |

**Error Source 31, Boom Angle Operational Sensor (C123PBS)**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 5 | Sensor tolerance fault | Power relays disengaged. | Repair wiring and/or connections OR replace boom angle sensor and calibrate overload system. |
| 11 | Output short high | Power relays disengaged. Boom angle sensor wiring open or shorted to voltage. | Repair wiring and/or connections OR replace boom angle sensor and calibrate overload system. |
| 12 | Value too high | Power relays disengaged. Boom angle sensor wiring open or shorted to voltage OR sensor is out of operating range | Repair wiring and/or connections OR adjust or replace boom angle sensor and calibrate overload system. |
| 15 | Value too low | Power relays disengaged. Boom angle sensor wiring open OR shorted to ground OR sensor is out of operating range. | Repair wiring and/or connections OR adjust or replace boom angle sensor and calibrate overload system. |
| 16 | Output short low | Power relays disengaged. Boom angle sensor wiring open OR shorted to ground. | Repair wiring and/or connections OR replace boom angle sensor and calibrate overload system. |
| 17 | Not calibrated | Boom range of motion is limited. | Calibrate the platform load sense system. |
| 18 | Just calibrated | Used to clear diagnostic codes. | Self-clearing. |

# Fault Codes

**Error Source 32, Boom Angle Safety Sensor (C141PBS)**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 5 | Sensor tolerance fault | Power relays disengaged. | Repair wiring and/or connections OR |
| 11 | Output short high | Power relays disengaged. Boom angle sensor wiring open or shorted to voltage. | Repair wiring and/or connections OR replace boom angle sensor and calibrate overload system. |
| 12 | Value too high | Power relays disengaged. Boom angle sensor wiring open or shorted to voltage OR sensor is out of operating range. | Repair wiring and/or connections OR adjust or replace boom angle sensor and calibrate overload system. |
| 15 | Value too low | Power relays disengaged. Boom angle sensor wiring open OR shorted to ground OR sensor is out of operating range. | Repair wiring and/or connections OR adjust or replace boom angle sensor and calibrate overload system. |
| 16 | Output short low | Power relays disengaged. Boom angle sensor wiring open OR shorted to ground. | Repair wiring and/or connections OR replace boom angle sensor and calibrate overload system. |
| 17 | Not calibrated | Boom range of motion is limited. | Calibrate the platform load sense system. |
| 18 | Just calibrated | Used to clear diagnostic codes. | Self-clearing. |
| 21 | Inconsistent | Checks operational and safety sensor values against each other. | Repair wiring and/or connections OR replace boom angle sensor and calibrate overload system. |

**Error Source 41, Load Cell Operational (C175LDS)**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 5 | Sensor tolerance fault | Power relays disengaged. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |
| 11 | Output short high | Power relays disengaged. Load cell wiring open OR shorted to voltage. Platform may be overloaded. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |
| 12 | Value too high | Power relays disengaged. Load cell wiring open OR shorted to voltage. Platform may be reverse loaded. | Repair wiring and/or connections OR replace platform load cell OR remove excess weight from platform. |
| 15 | Value too low | Power relays disengaged. Load cell wiring open OR shorted to ground. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. Check for binding of the overload component linkage and be sure platform is NOT on the ground OR supported from underneath. |
| 16 | Output short low | Power relays disengaged. Load cell wiring open OR shorted to ground. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |
| 17 | Not calibrated | Boom range of motion is limited. | Calibrate the platform load sense system. |
| 18 | Just calibrated | Used to clear diagnostic codes. | Self-clearing. |

# Fault Codes

**Error Source 42, Load Cell Safety (C94LDS)**

| Error Type | | Condition | Solution |
|---|---|---|---|
| **ID** | **Name** | | |
| 5 | Sensor tolerance fault | Power relays disengaged. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |
| 11 | Output short high | Power relays disengaged. Load cell wiring open OR shorted to voltage. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |
| 12 | Value too high | Power relays disengaged. Load cell wiring open OR shorted to voltage. Platform may be overloaded. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system OR remove excess weight from platform. |
| 15 | Value too low | Power relays disengaged. Load cell wiring open OR shorted to ground. Platform may be reverse loaded. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. Check for binding of the overload component linkage and be sure platform is NOT on the ground OR supported from underneath. |
| 16 | Output short low | Power relays disengaged. Load cell wiring open OR shorted to ground. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |
| 17 | Not calibrated | Boom range of motion is limited. | Calibrate the platform load sense system. |
| 18 | Just calibrated | Used to clear diagnostic codes. | Self-clearing. |
| 21 | Inconsistent | Checks operational and safety sensor values against each other. | Repair wiring and/or connections OR replace platform load cell and calibrate overload system. |

# 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

There are two groups of schematics in this section.

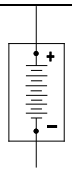
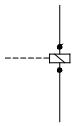
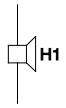
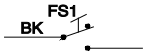
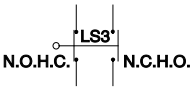
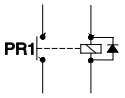
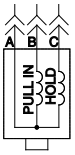
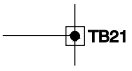
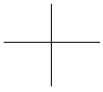
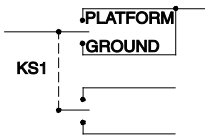
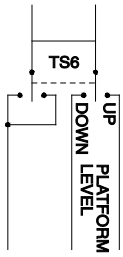
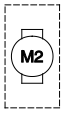
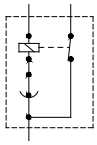
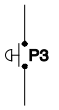
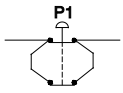
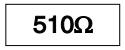
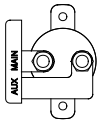
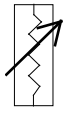
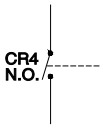
### Electrical Schematics

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

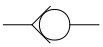
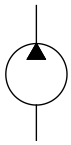
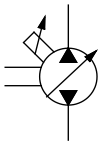
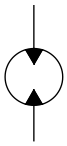
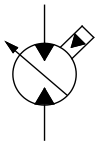
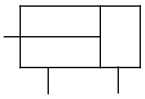
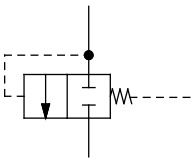
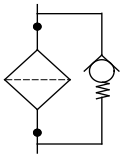
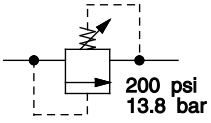
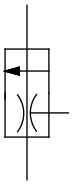
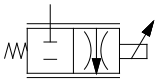
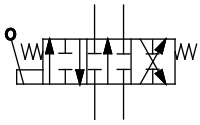
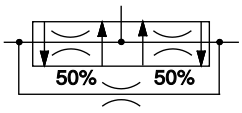
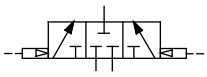
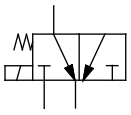
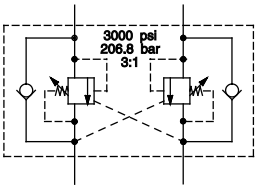
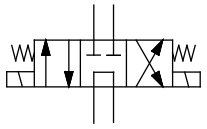
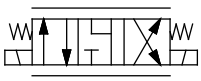
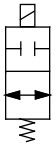
### Hydraulic Schematics

**⚠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.

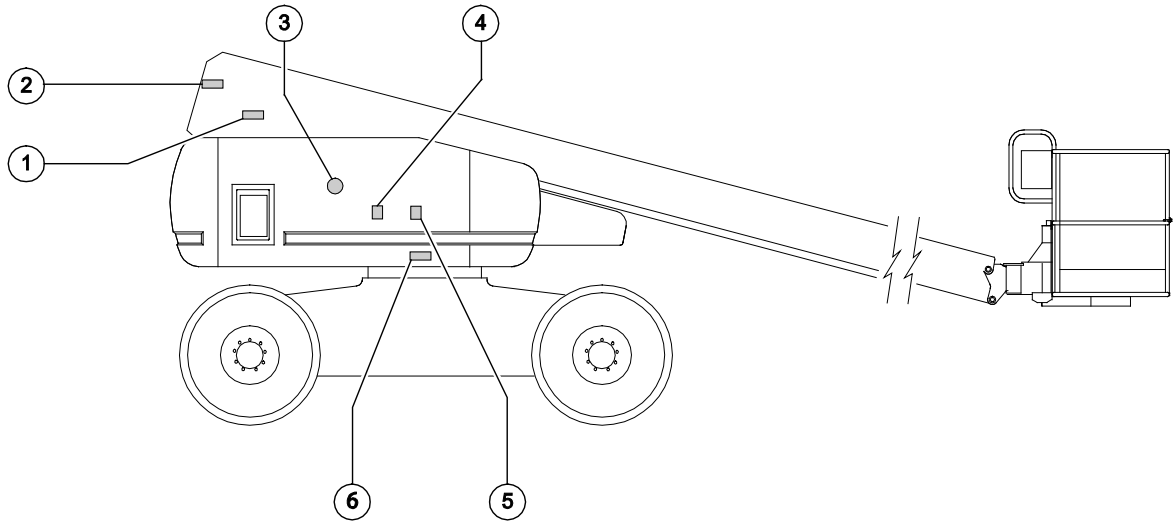
# Electrical Symbol Legend

| | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| 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

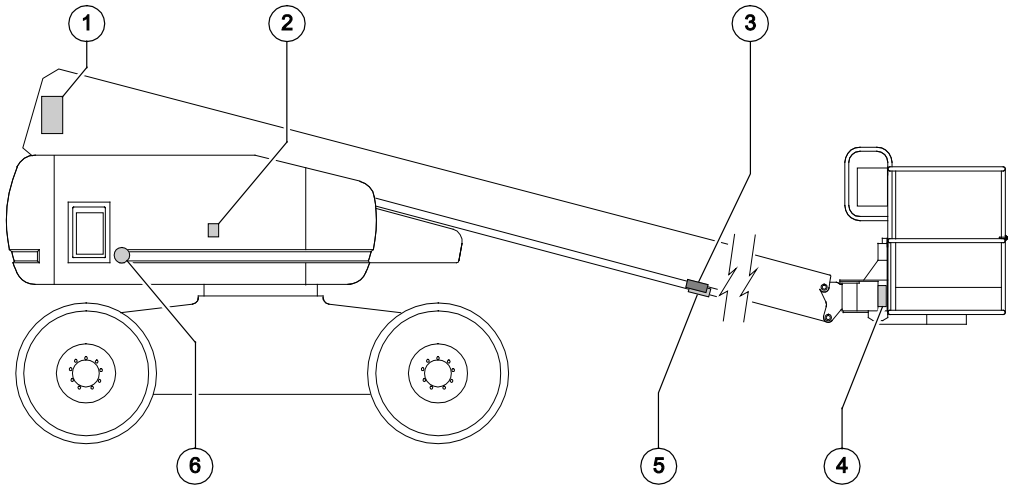
| | | | |
|---|---|---|---|
|  Orifice with size |  Check valve |  Shut off valve |  Brake |
|  Pump, fixed displacement |  Pump, bi-directional variable displacement |  Motor, bi-directional |  Motor, 2 speed bi-directional |
|  Cylinder, double acting |  Pump, prime mover (engine or motor) |  Shuttle 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 |

# Limit Switch Location Legend




**All models except as noted**

1 LSB1RO
2 LSB2S
3 Primary boom angle sensor (excludes the S-60 HC)
4 LST3O
5 LST2O
6 LST1O

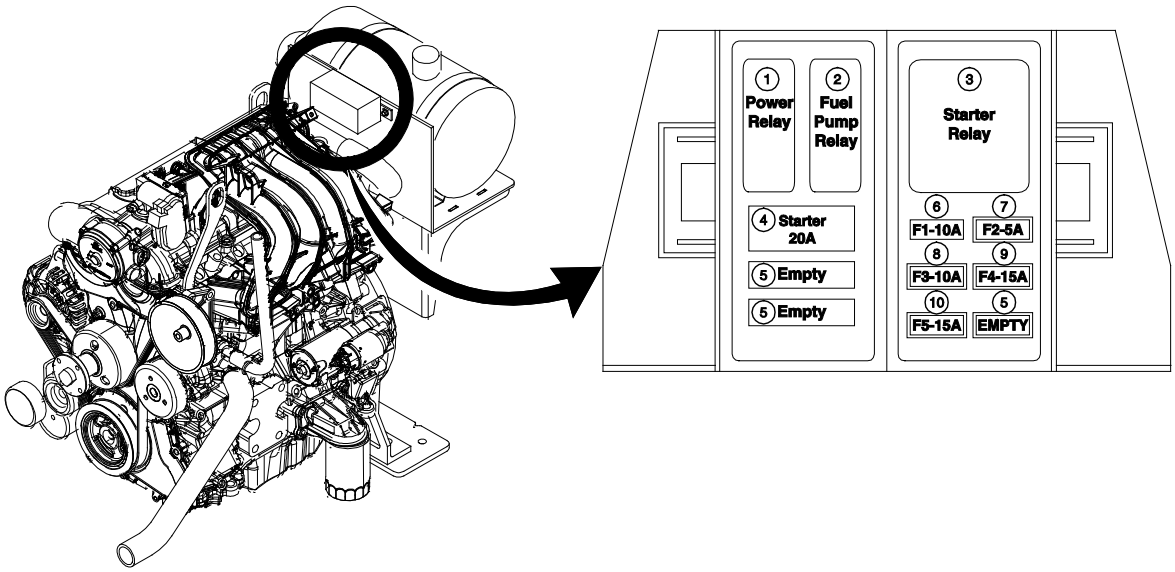



**S-60 HC, S-60X and S-60XC as noted**

1 String pot (S-60 HC MODELS)
2 LST3S (S-60X / S-60XC)
3 LSB1ES (S-60X / S-60XC)
4 LS18 / LS18A (CE MODELS)
5 LSB1EO (S-60X / S-60XC)
6 Primary boom angle sensor (S-60 HC

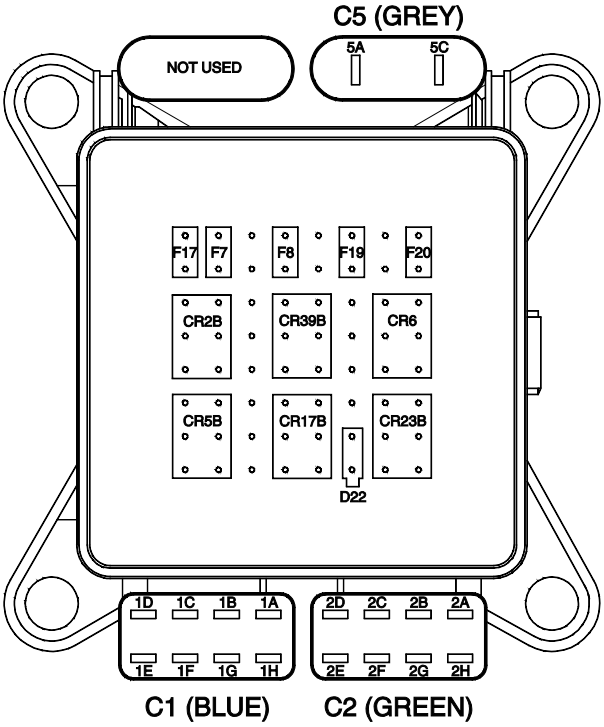
# Ford Engine Relay Layout

## 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 D 2.9 L4 and Perkins 404F-22




**Deutz D 2.9 L4**

**Fuses**

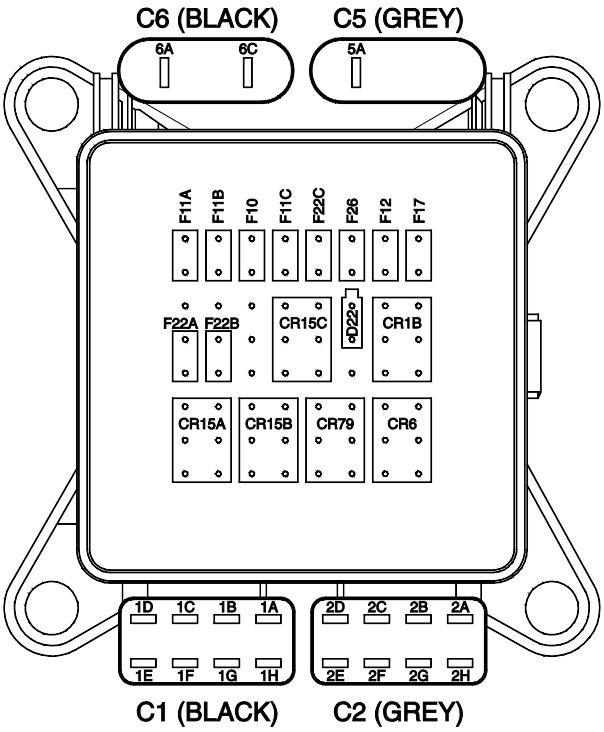
| | | |
|---|---|---|
| F7 | 20A | Horn, Hydraulic Oil Cooler |
| F8 | 30A | ECU Power |
| F17 | 15A | Ignition |
| F19 | 10A | Engine accessory |
| F20 | 20A | Fuel Pump |

**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 |

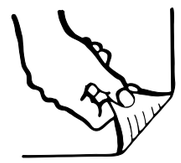
**Diode**

| | | |
|---|---|---|
| D22 | 6A | Alternator Ext. |

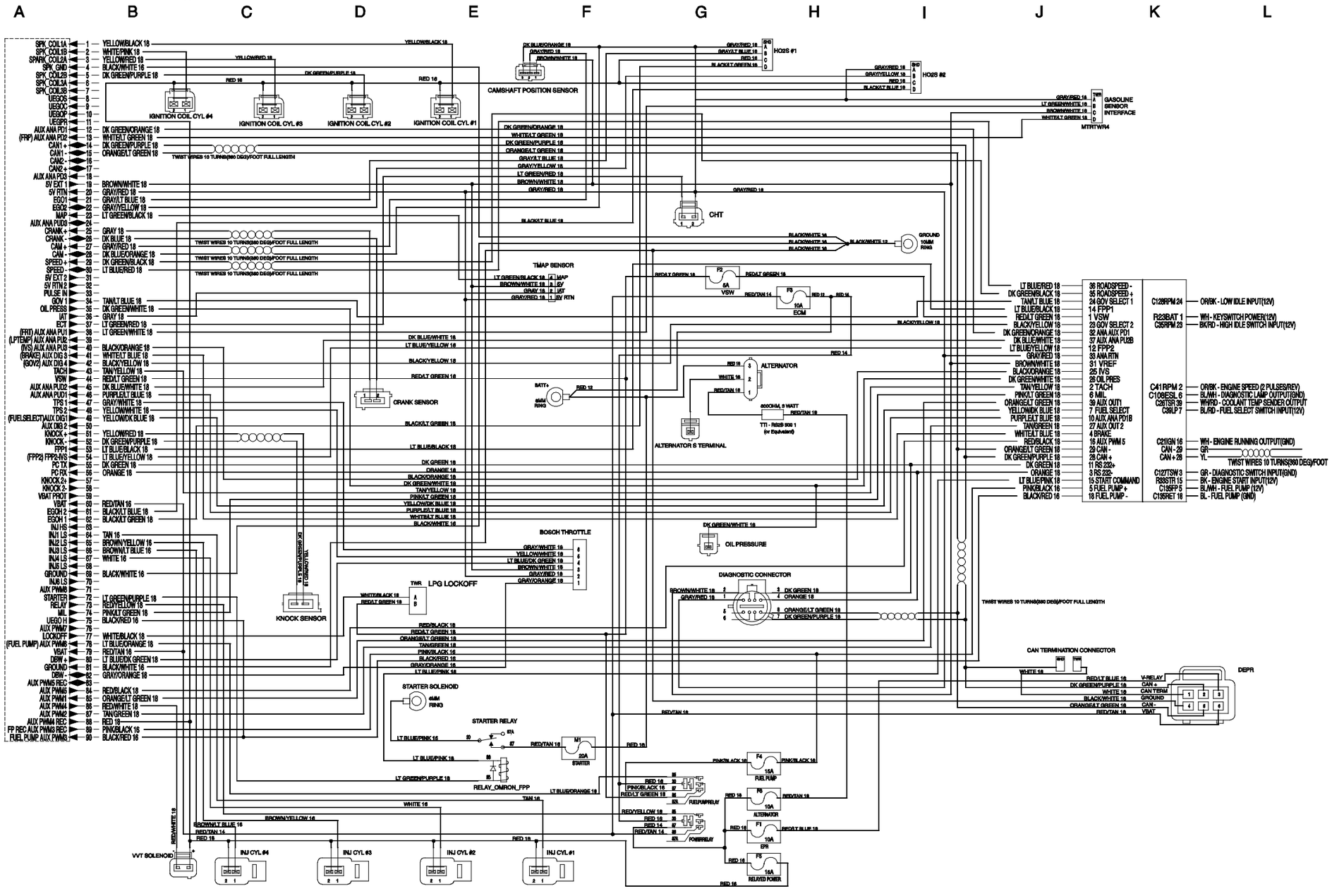
**Relays**

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

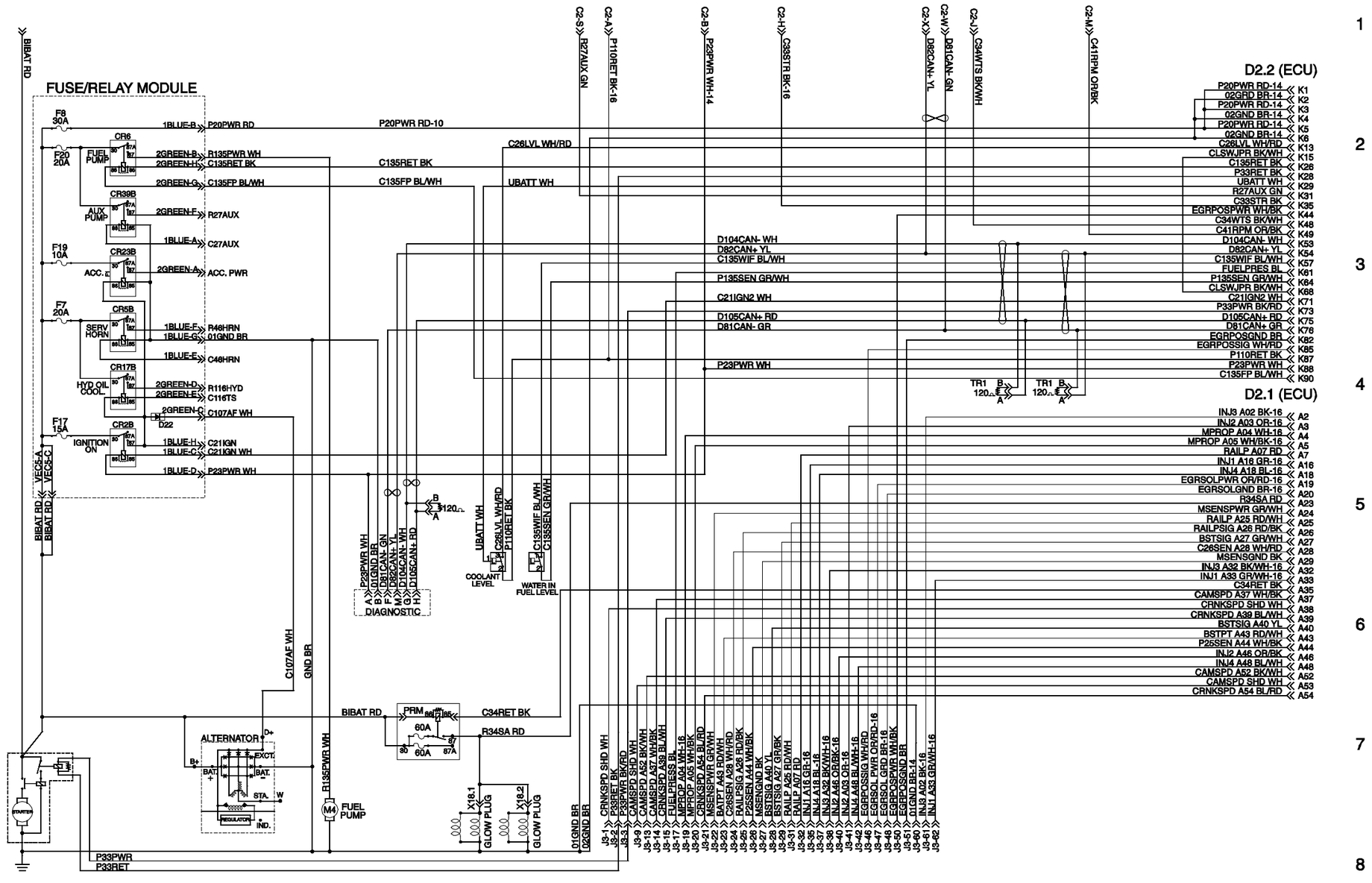
# Ford MSG-425 Engine Wire Harness



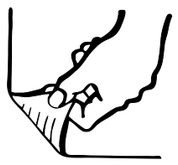
# Ford MSG-425 EFI Engine Wire Harness



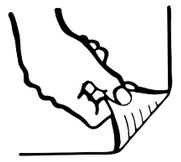
# Deutz D 2.9 L4 Engine Wire Harness



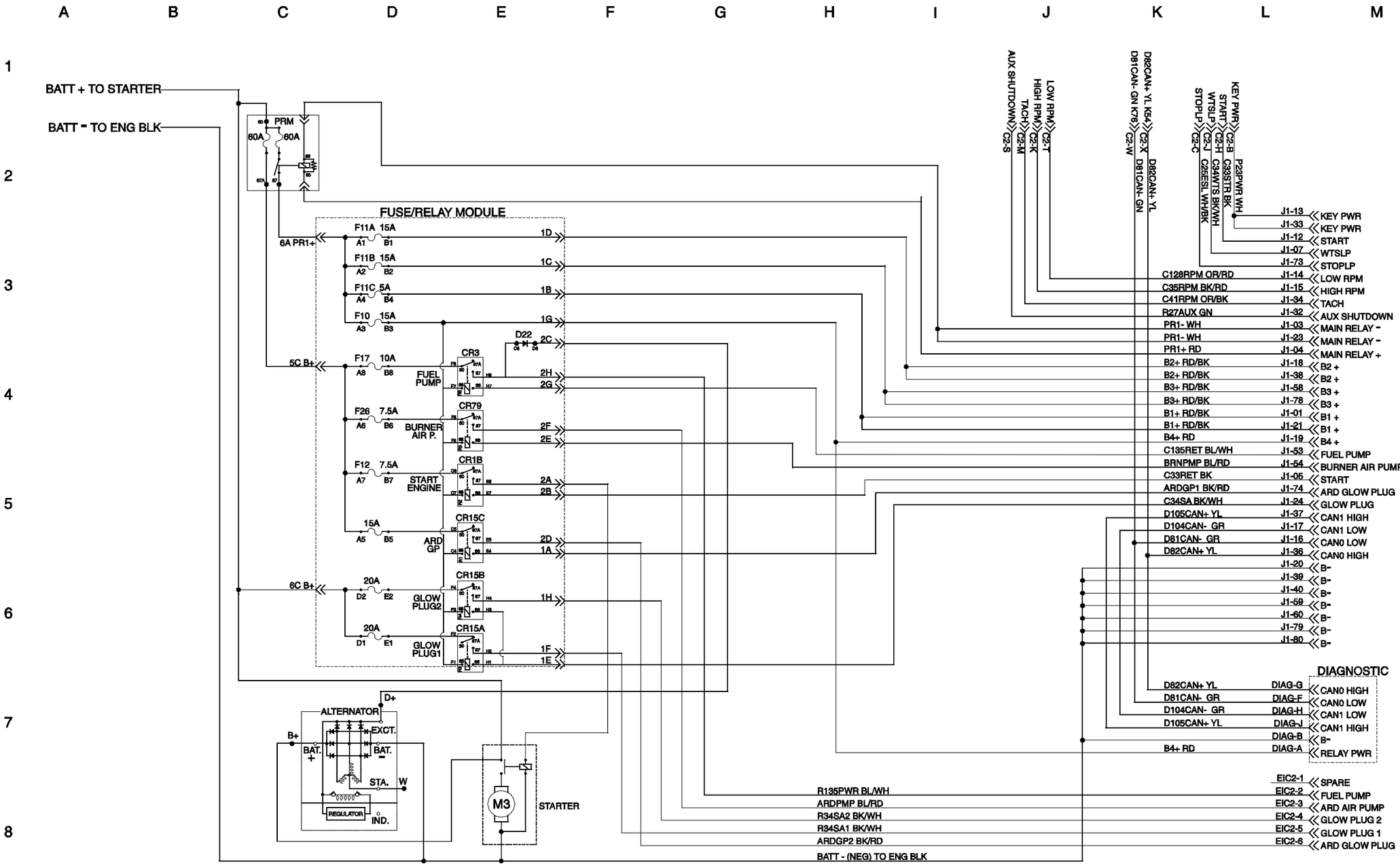
# Deutz D 2.9 L4 Engine Wire Harness



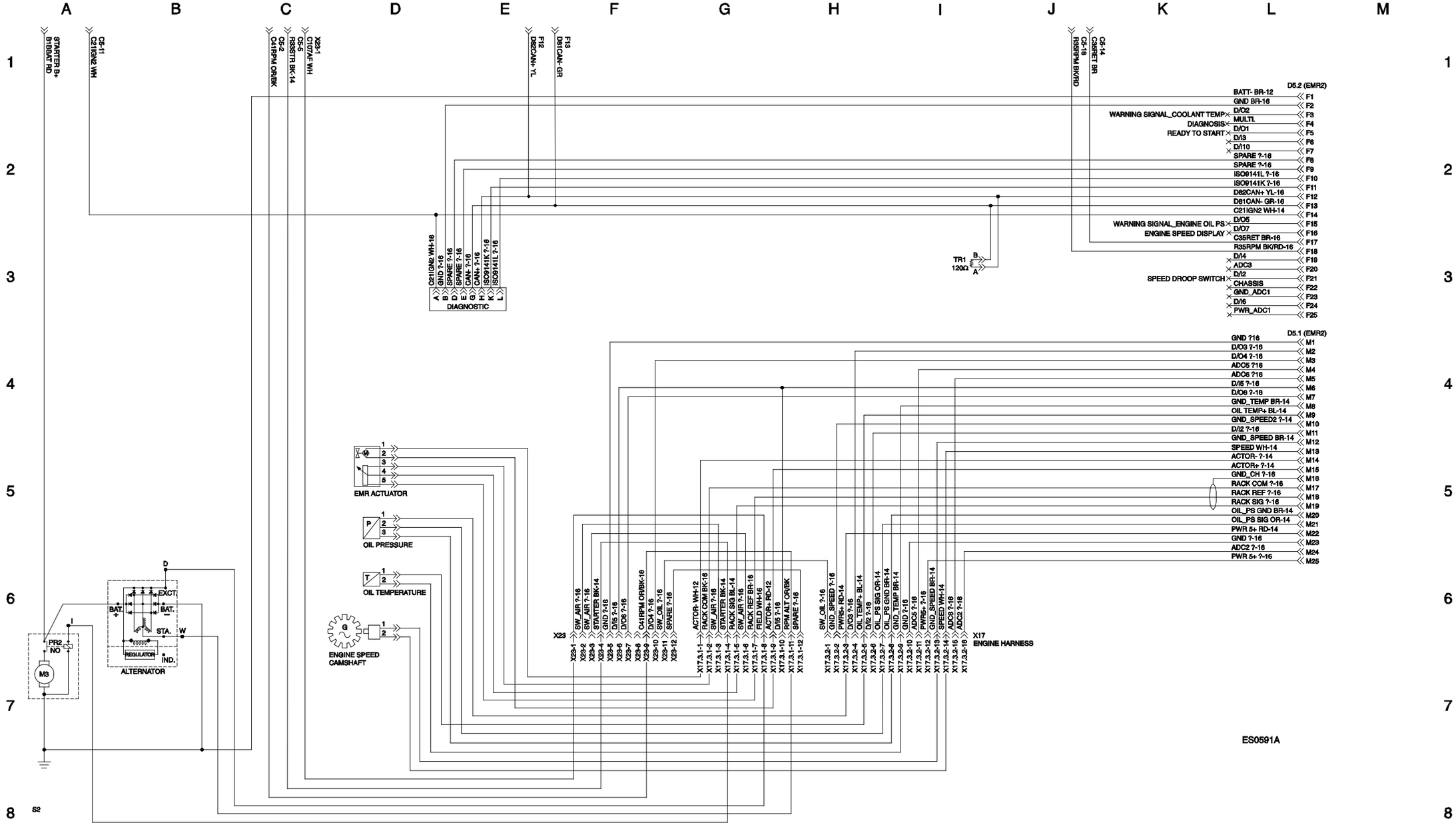
# Perkins 404F-22 Engine Wire Harness



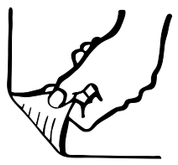
# Perkins 404F-22 Engine Wire Harness



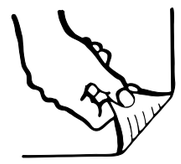
# Deutz D436 L3i Engine Wire Harness



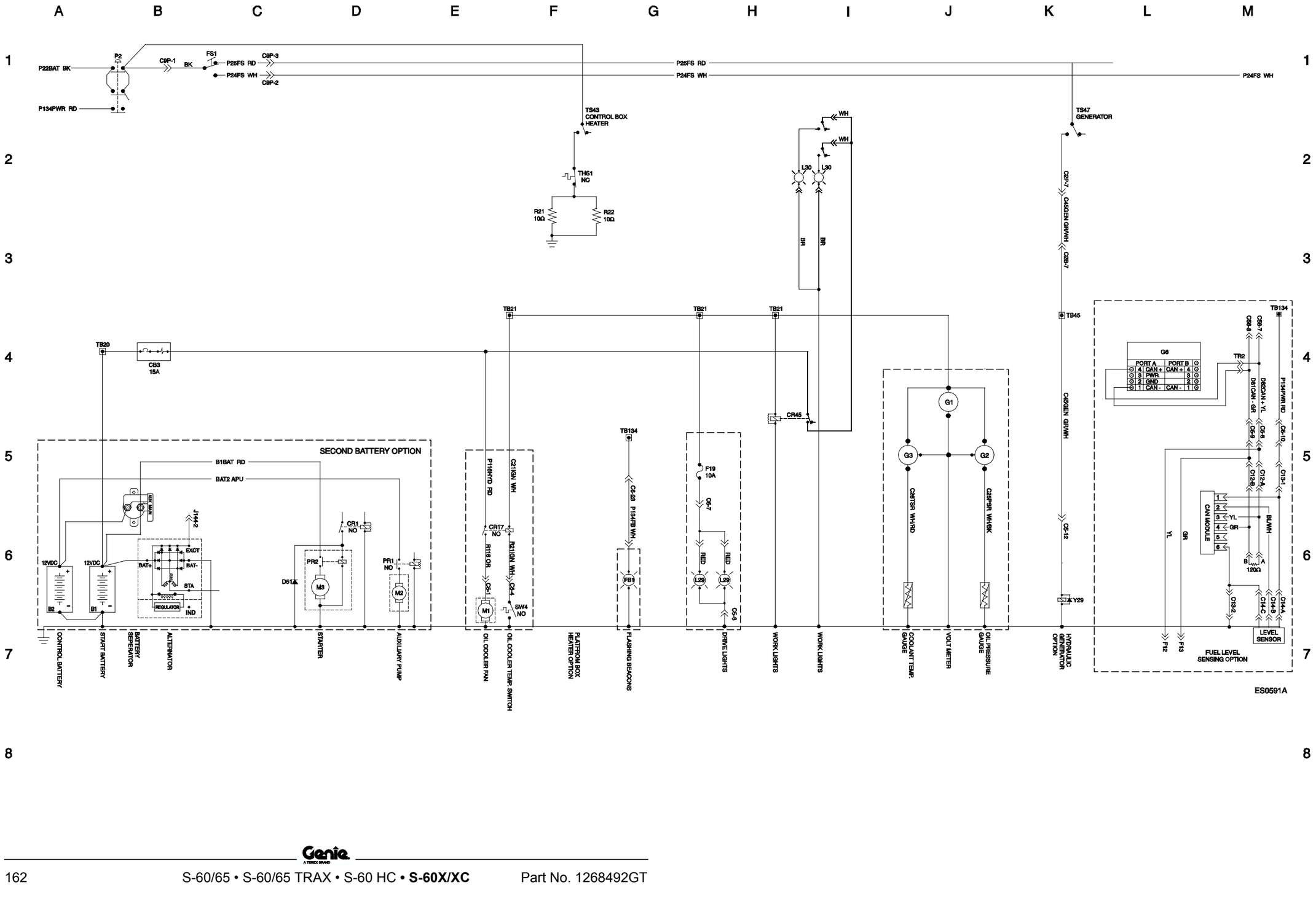
# Deutz D436 L3i Engine Wire Harness



# Electrical Schematic, Options - Deutz D436 L3i

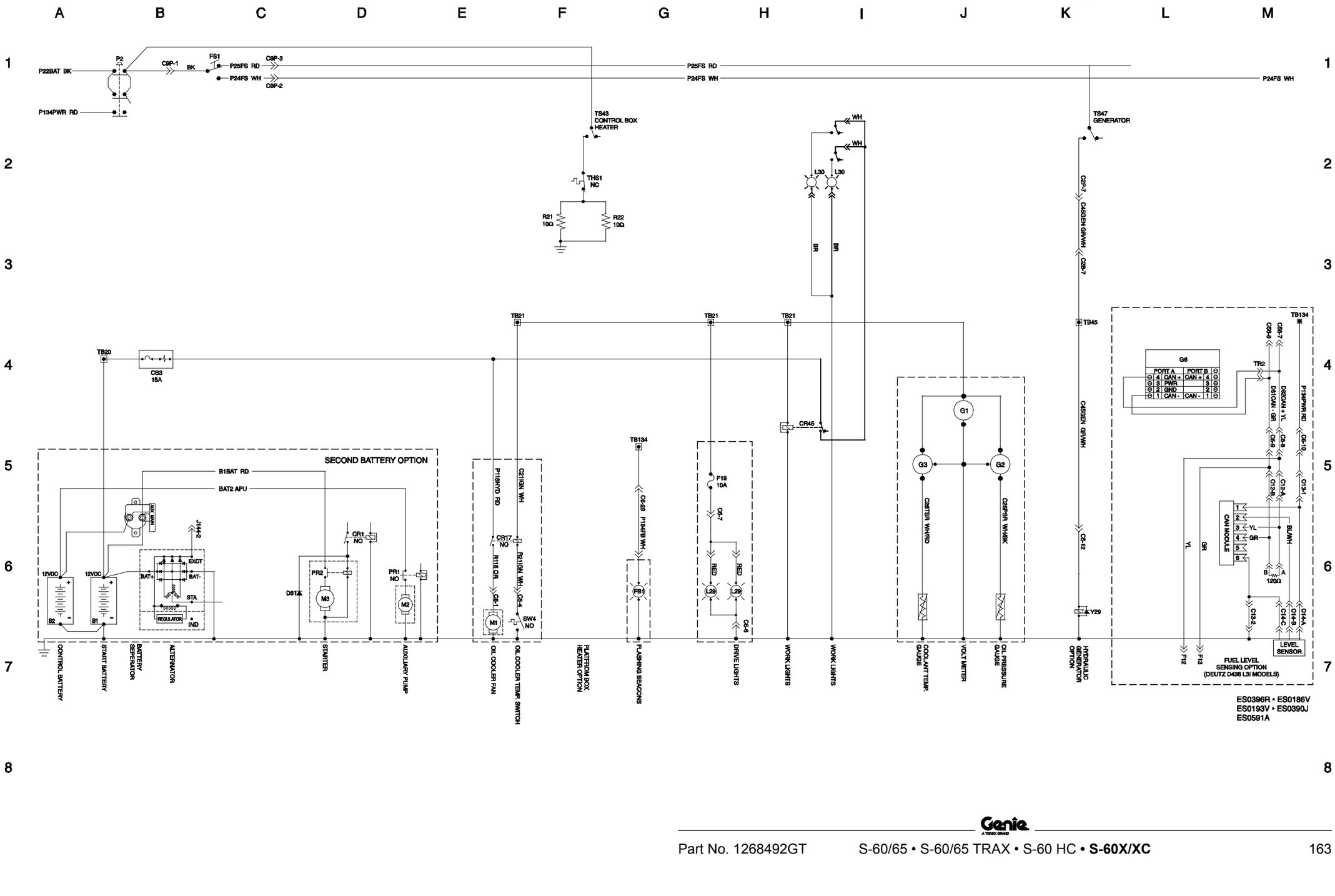


# Electrical Schematic, Options - Deutz D436 L3i



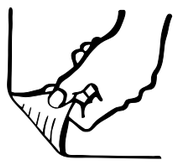
# Electrical Schematic, Options

## Deutz D2011L03i, TD2011L04i and Perkins 404D-22

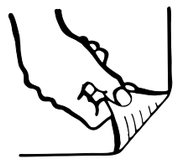



ES0396R • ES0186V
ES0193V • ES0390J
ES0591A

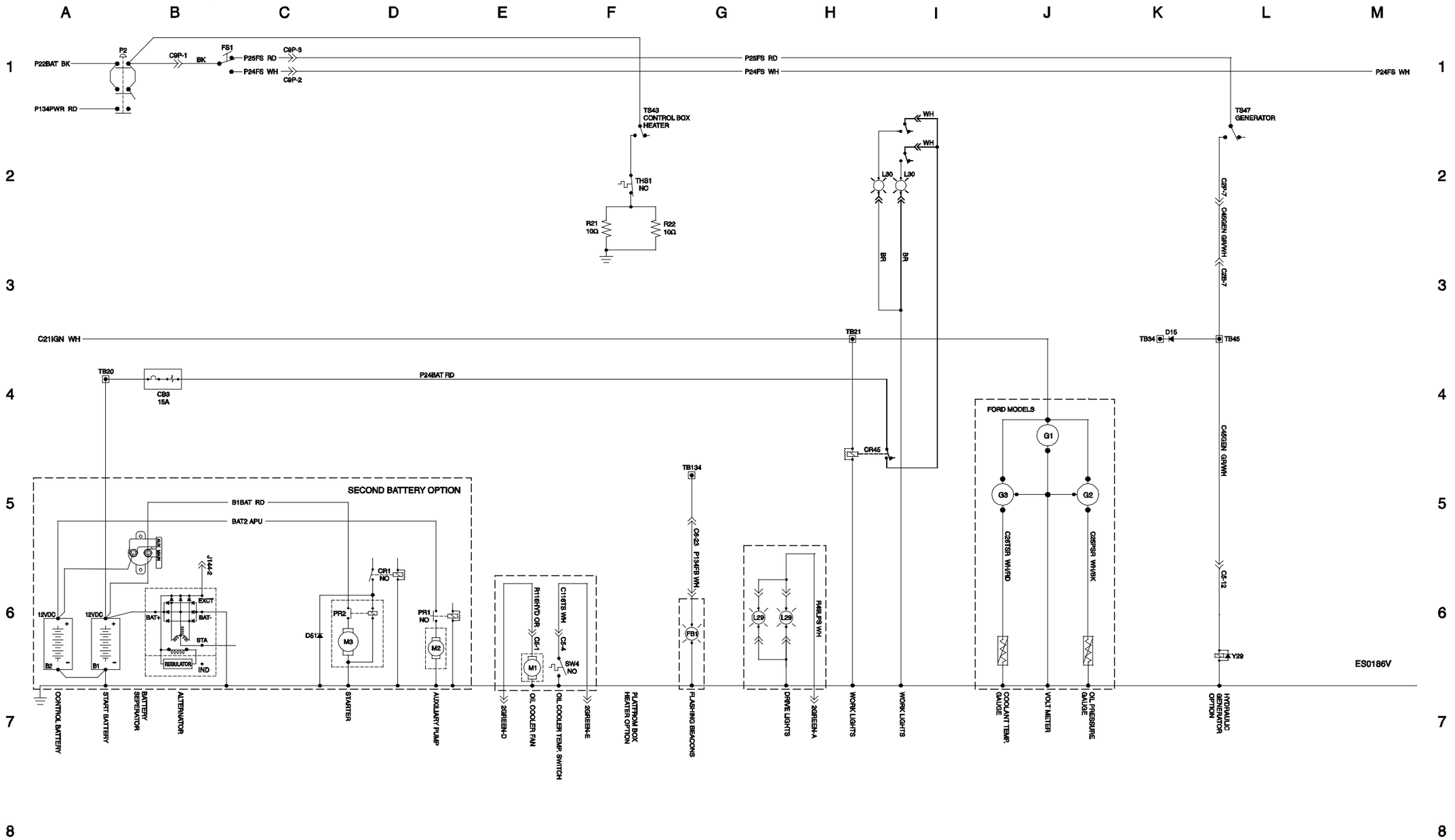
# Electrical Schematic, Options
# Deutz D2011L03i, TD2011L04i and Perkins 404D-22



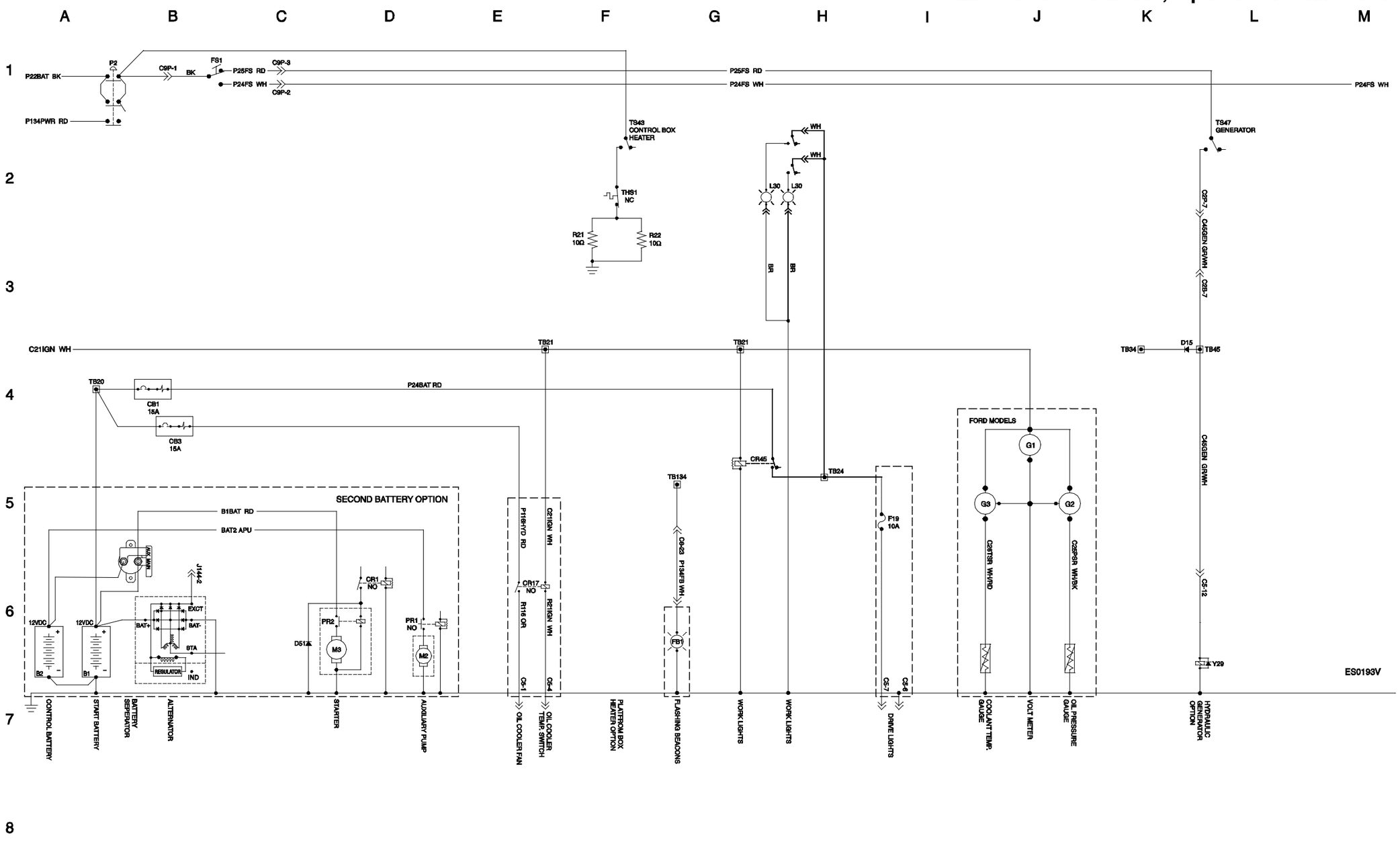
# Electrical Schematic, Options - Deutz D 2.9 L4



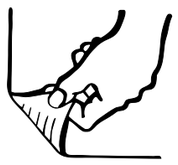
# Electrical Schematic, Options - Deutz D 2.9 L4



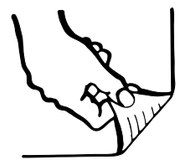
# Electrical Schematic, Options - Perkins 404F-22



# Electrical Schematic, Options - Perkins 404F-22

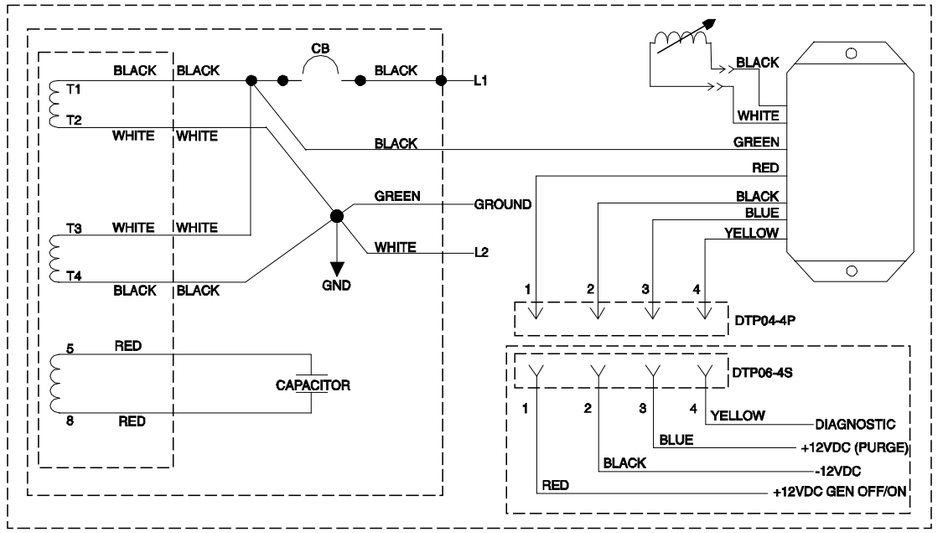


# Wiring Diagram, 3kW Hydraulic Generator

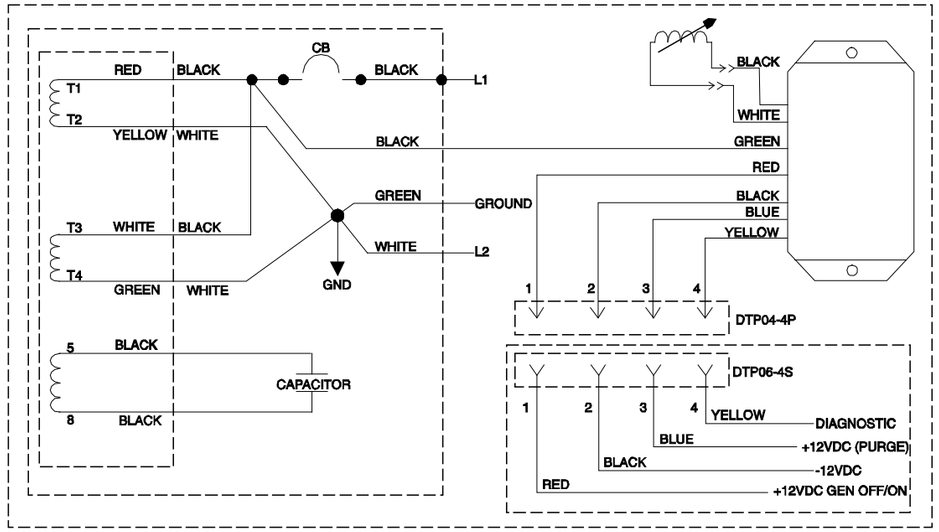


# Wiring Diagram, 3kW Hydraulic Generator

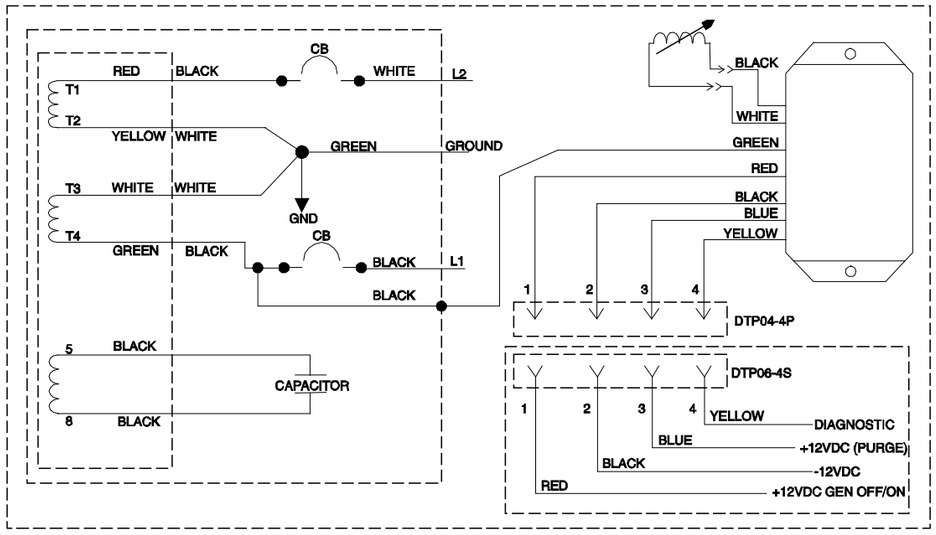
## 120V AC 60HZ



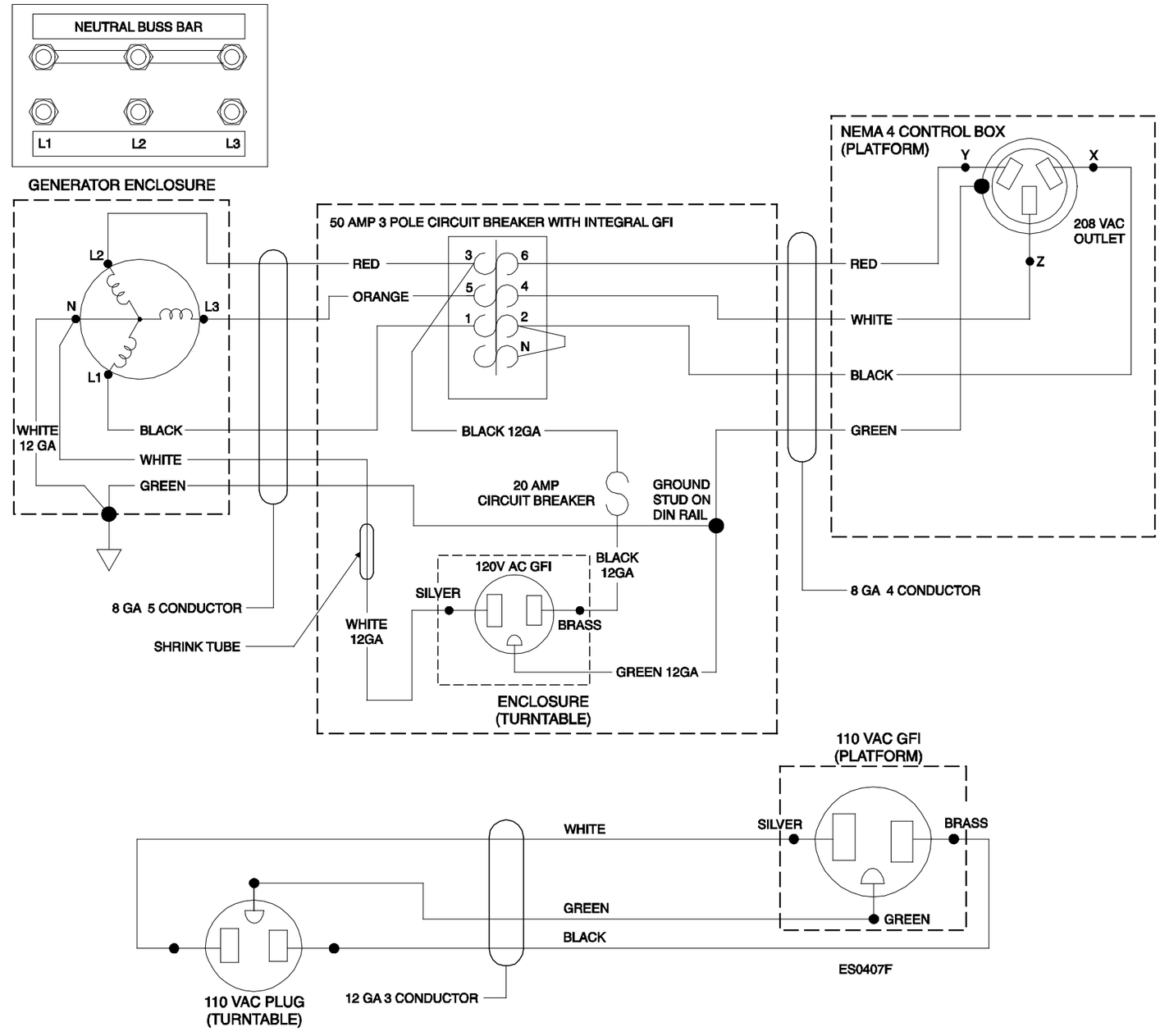

## 120V AC 50HZ



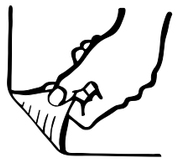

## 240VAC 50HZ



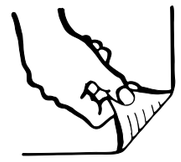
# Wiring Diagram, 12kW Hydraulic Generator - Welder Option



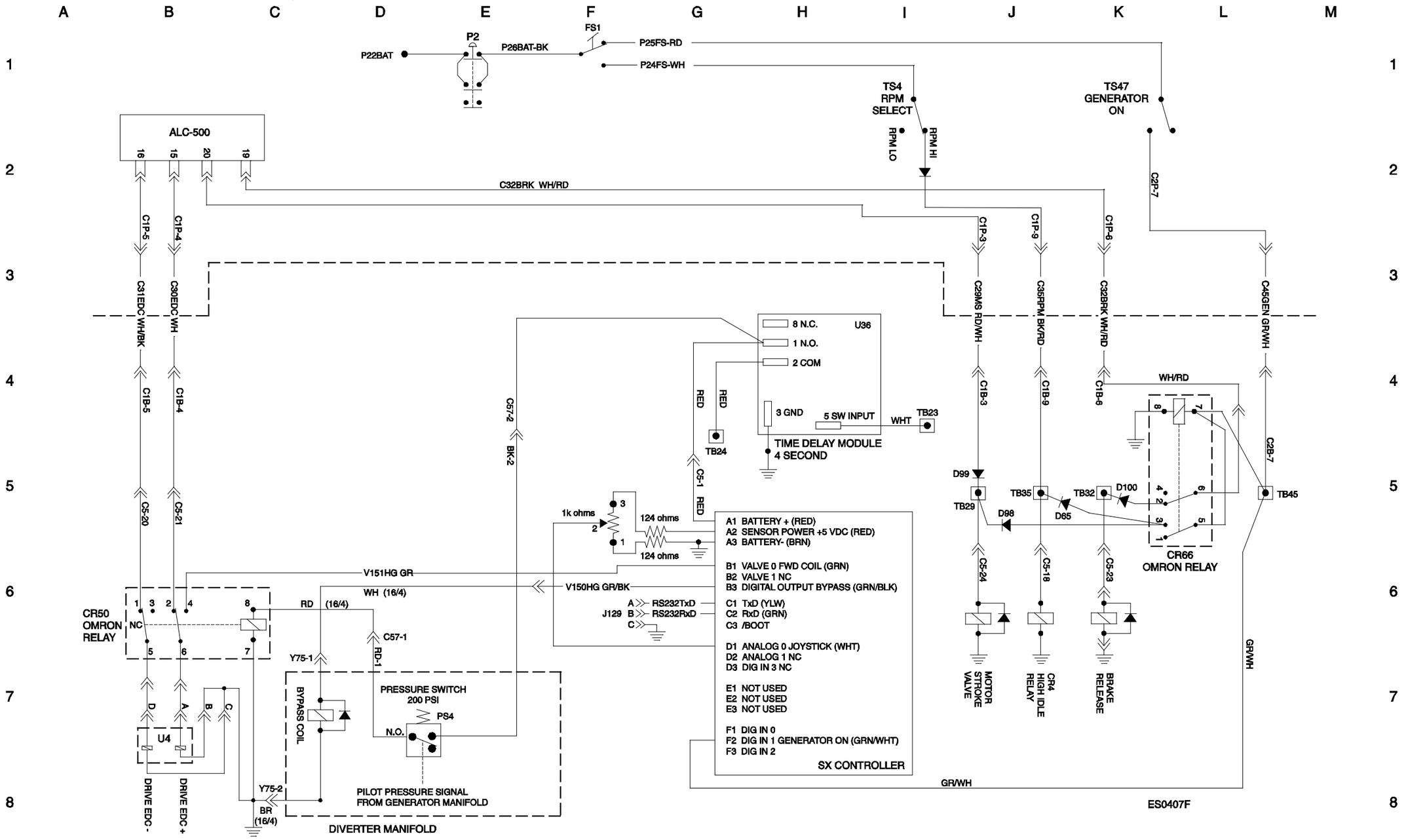
# Wiring Diagram, 12kW Hydraulic Generator - Welder Option



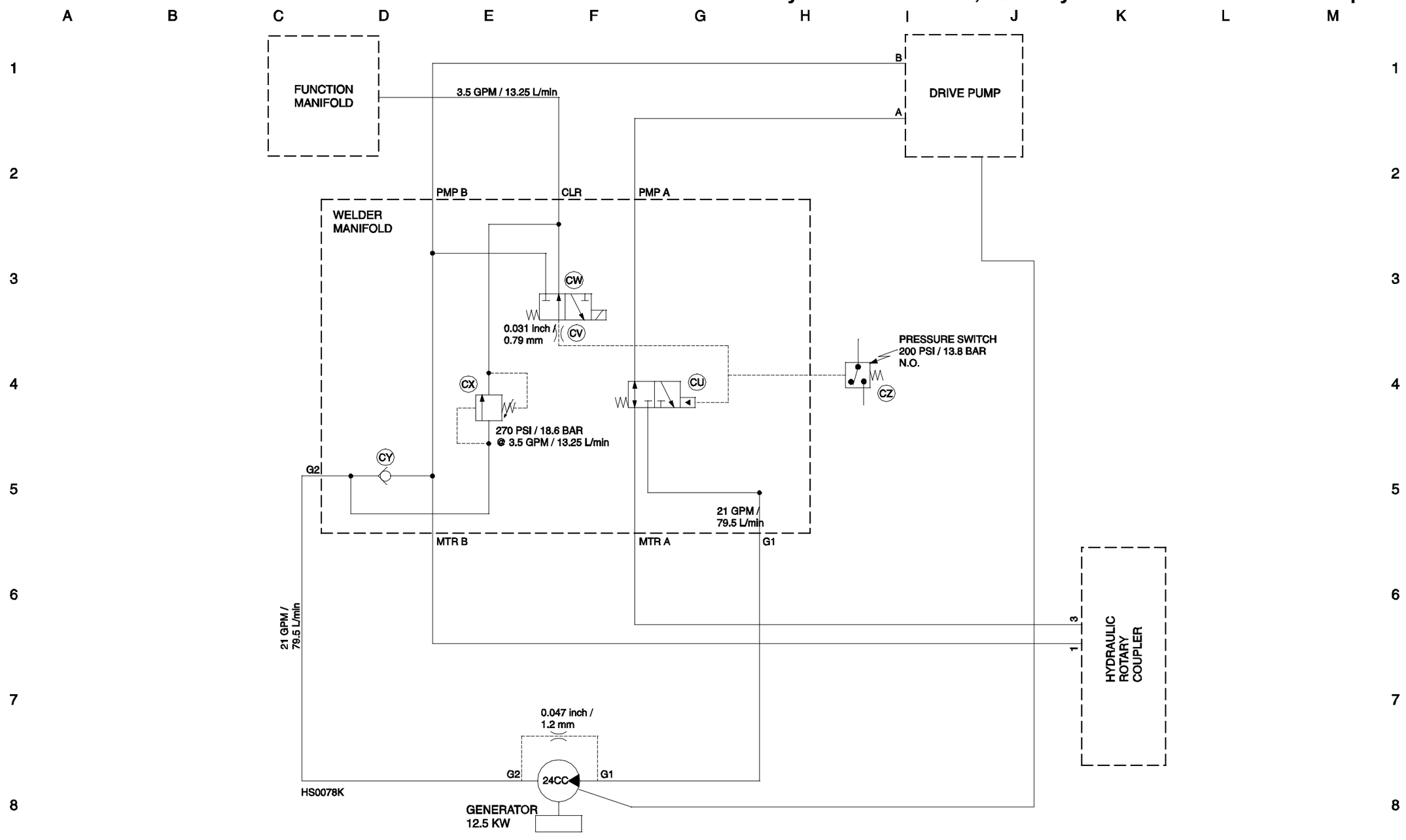
# Electrical Schematic, 12kW Hydraulic Generator - Welder Option



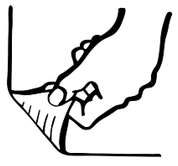
# Electrical Schematic, 12kW Hydraulic Generator - Welder Option



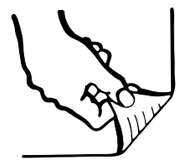
## Hydraulic Schematic, 12kW Hydraulic Generator - Welder Option



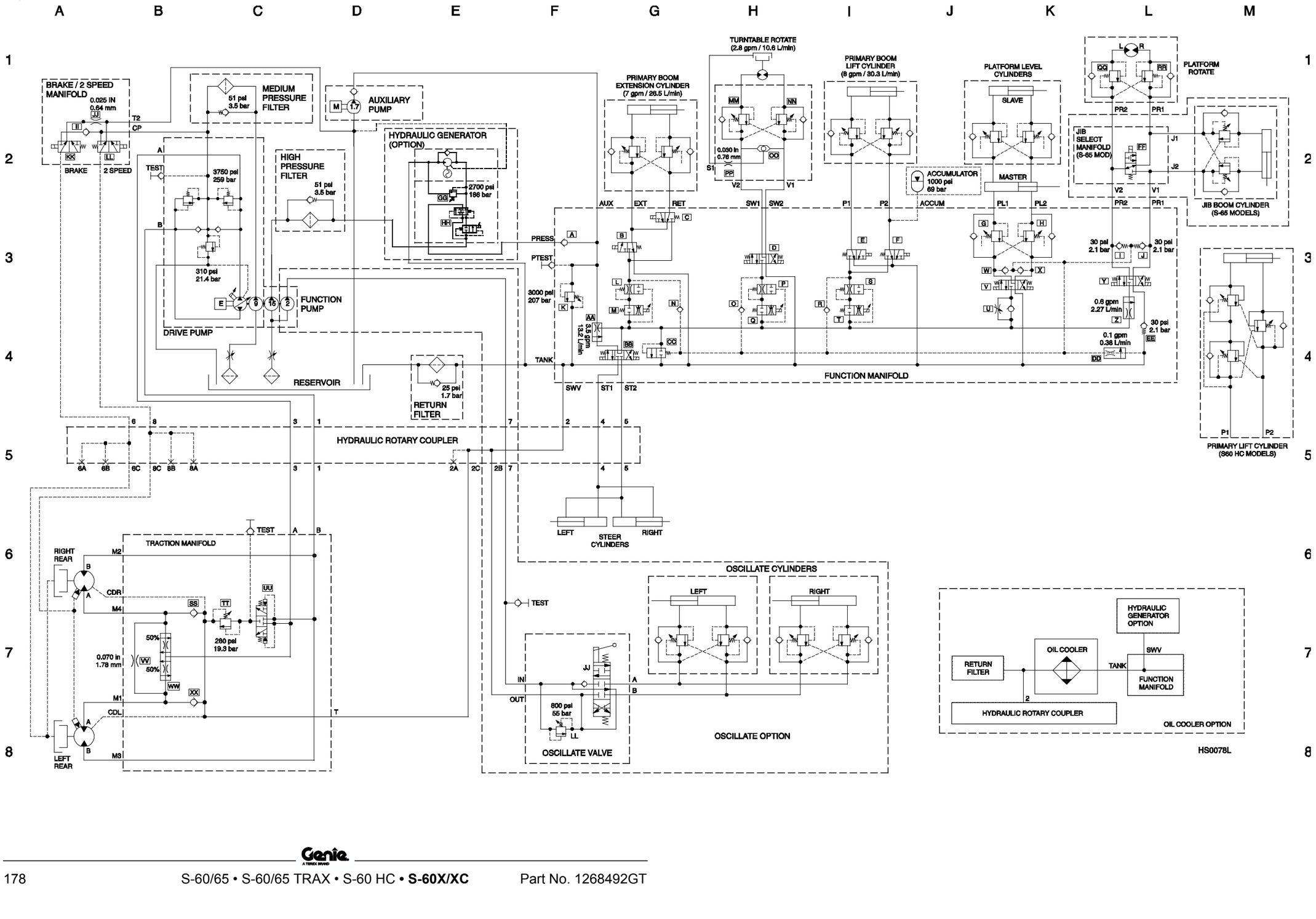
# Hydraulic Schematic, 12kW Hydraulic Generator - Welder Option



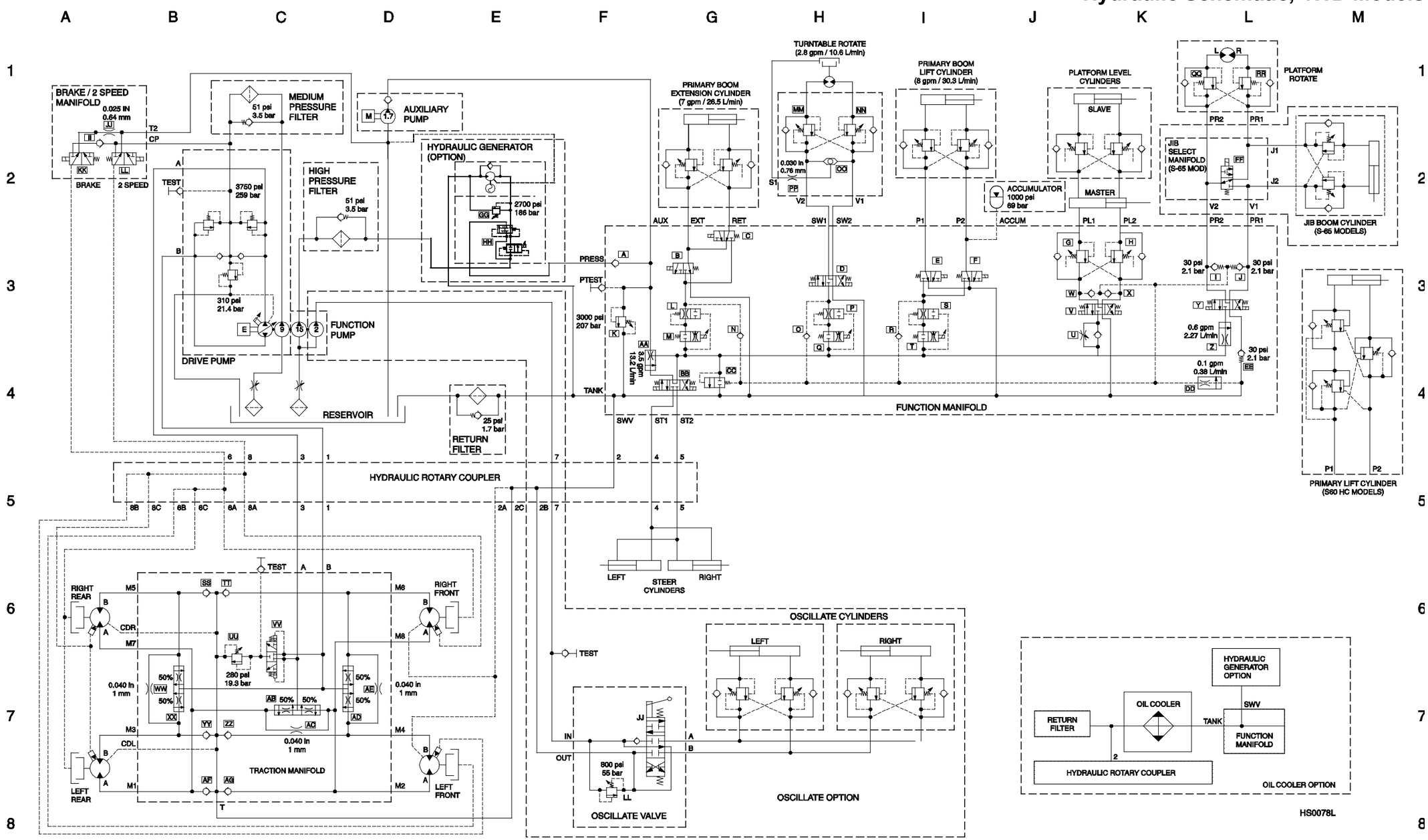
## Hydraulic Schematic, 2WD Models



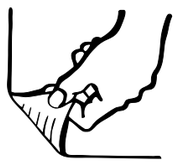
# Hydraulic Schematic, 2WD Models



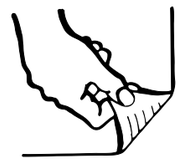
# Hydraulic Schematic, 4WD Models



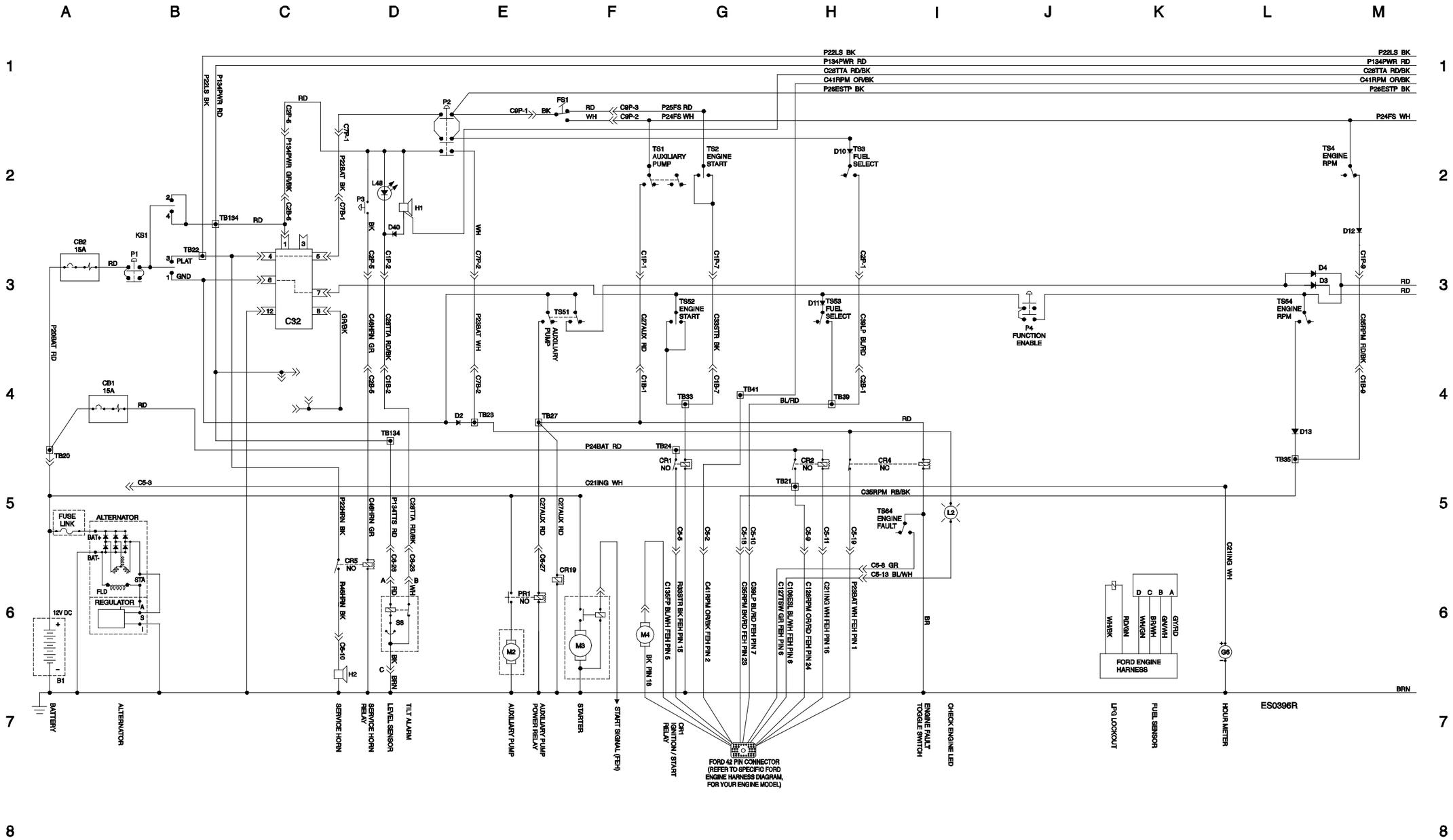
# Hydraulic Schematic, 4WD Models



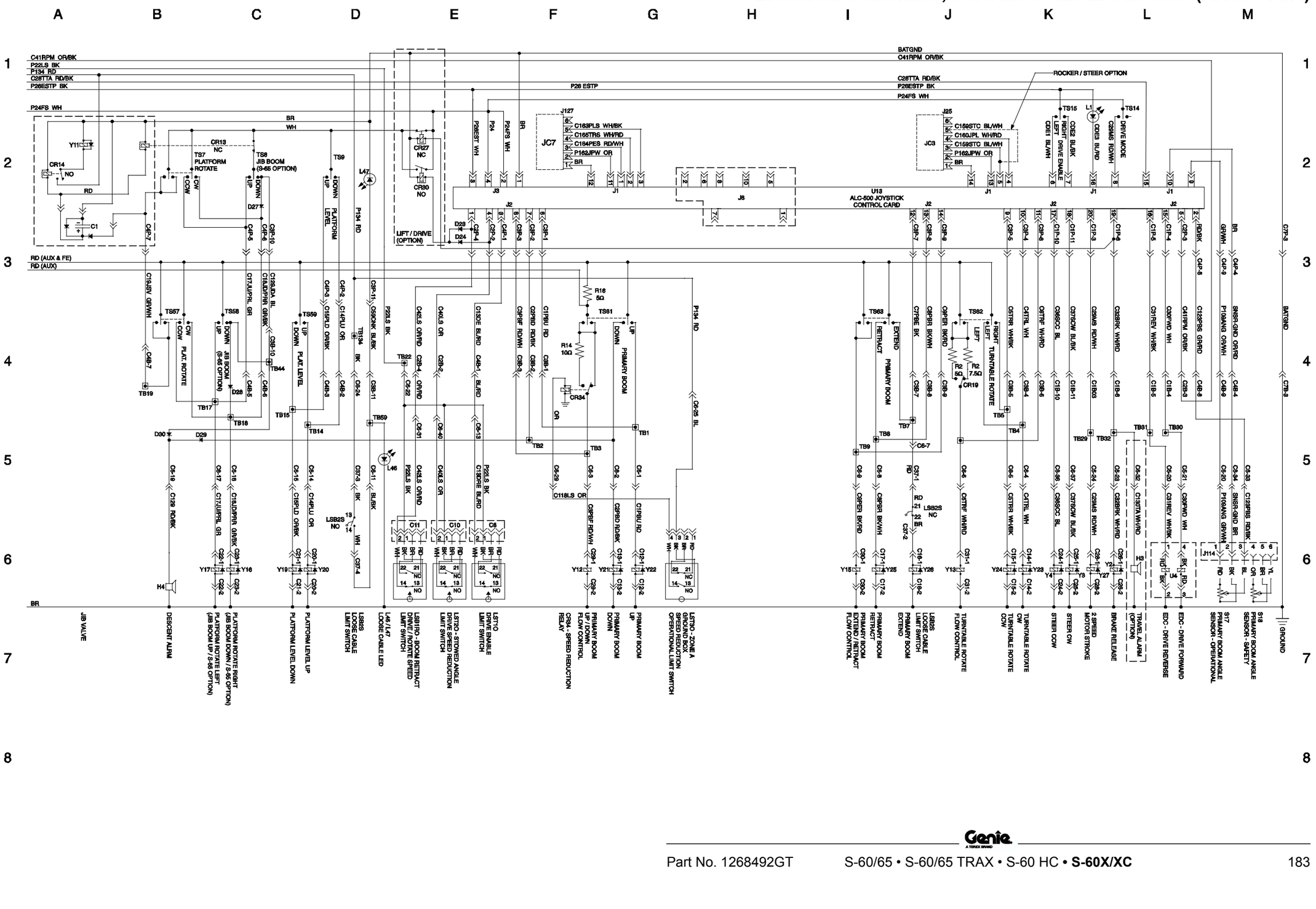
# Electrical Schematic, Ford MSG-425 EFI Models (ANSI • CSA)



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



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


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134 RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
RD (AUX & FE)
RD (AUX)
BR
WH
Y11
CR14
NO
RD
C1
CR13
NC
TS7
PLATFORM ROTATE
TS8
JIB BOOM (S-65 OPTION)
TS9
PLATFORM LEVEL
L47
CR27
NC
CR30
NO
LIFT / DRIVE (OPTION)
D23
D24
P26 ESTP
P26EST WH
P24
P24F3 WH
J127
JC7
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
J3
J2
J1
J8
U13
ALC-500 JOYSTICK CONTROL CARD
BATGND
ROCKER / STEER OPTION
J25
JC3
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
TS15
L1
TS14
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
C2DE1 BL/WH
C2DE2 BL/BK
C2DE3 BL/RD
C28MS RD/WH
DRIVE MODE
C19STA WH/RD
C19STB WH/BK
C19STC BL/WH
C19STD BL/BK
C19STE BL/RD
C19STF WH/RD
C19STG BL/BK
C28MS RD/WH
C28BRK WH/RD
C31REV WH/BK
C30FWD WH
C31REV WH/BK
C41RPM OR/BK
C123PBS GR/RD
RD/BK
P106ANG GR/WH
SNSR-GND OR/RD
SNSR-GND BR
C129PBS RD/BK
P106ANG GR/WH
BR
BATGND
C41TRL WH
C41TRR WH/BK
C30FWD WH
C31REV WH/BK
C123PBS GR/RD
C129 RD/BK
C17JU/PRL GR
C17JD/PRR GR/BK
C16JDA BL
C15PLD OR/BK
C14PLU OR
C16JDPRR GR/BK
C17JU/PRL GR
C15PLD OR/BK
C14PLU OR
C16JDA BL
C15PLD OR/BK
C14PLU OR
C16SDHK BL/BK
C37G-3
C37G-4
C16SDHK BL/BK
P22LS BK
C43LS OR/RD
C43LS OR
C13SE BL/RD
C2PBD RD/WH
C2PBD RD/BK
C1PBU RD
C118LS OR
C2PBF RD/WH
C2PBF BK/WH
C2PBF BK/RD
C2PER BK/RD
C2PBR BK/WH
C7PBE BK
C37G-1
C37G-2
C1PBU RD
C2PBD RD/BK
C2PBF RD/WH
C2PBF BK/WH
C2PBF BK/RD
C2PER BK/RD
C2PBR BK/WH
C7PBE BK
R16 5Ω
R14 10Ω
R2 5Ω
R2 7.5Ω
CR34
CR19
TS61
TS62
TS63
PRIMARY BOOM
DOWN
UP
RIGHT
LEFT
TURNTABLE ROTATE
EXTEND
RETRACT
PRIMARY BOOM
TB1
TB2
TB3
TB4
TB5
TB6
TB7
TB8
TB9
TB14
TB15
TB16
TB17
TB18
TB19
TB22
TB29
TB30
TB31
TB32
TB44
TB59
TS57
TS58
TS59
PLAT. ROTATE
JIB BOOM (S-65 OPTION)
PLAT. LEVEL
C39-10
C4P-5
C4P-6
C4P-7
C4P-8
C4P-9
C4P-4
C4P-3
C4P-2
C4P-1
C3P-11
C3P-10
C3P-9
C3P-8
C3P-7
C3P-6
C3P-5
C3P-4
C3P-3
C3P-2
C3P-1
C1P-11
C1P-10
C1P-9
C1P-8
C1P-7
C1P-6
C1P-5
C1P-4
C2P-3
C4P-8
C4P-9
C4P-4
C7P-3
C1B-11
C1B-10
C1B-9
C1B-8
C1B-7
C1B-6
C1B-5
C1B-4
C2B-3
C4B-8
C4B-9
C4B-4
C7B-3
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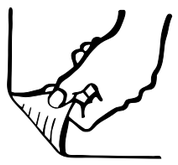
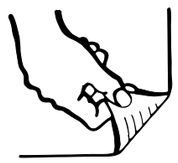
C6-69
C6-70
C6-71

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

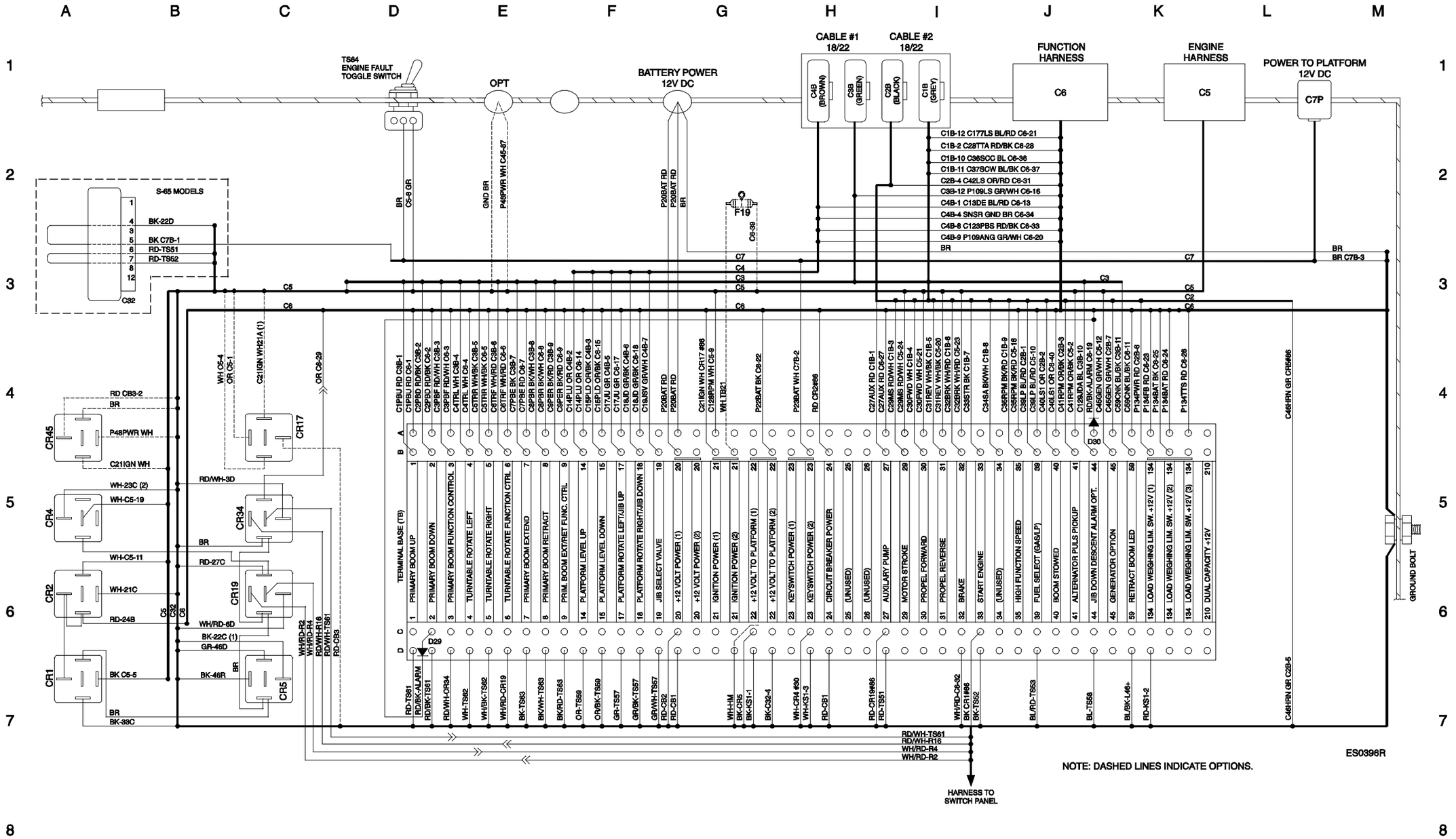


# Ground Control Box Terminal Strip Wiring Diagram, Ford MSG-425 EFI Models (ANSI • CSA)



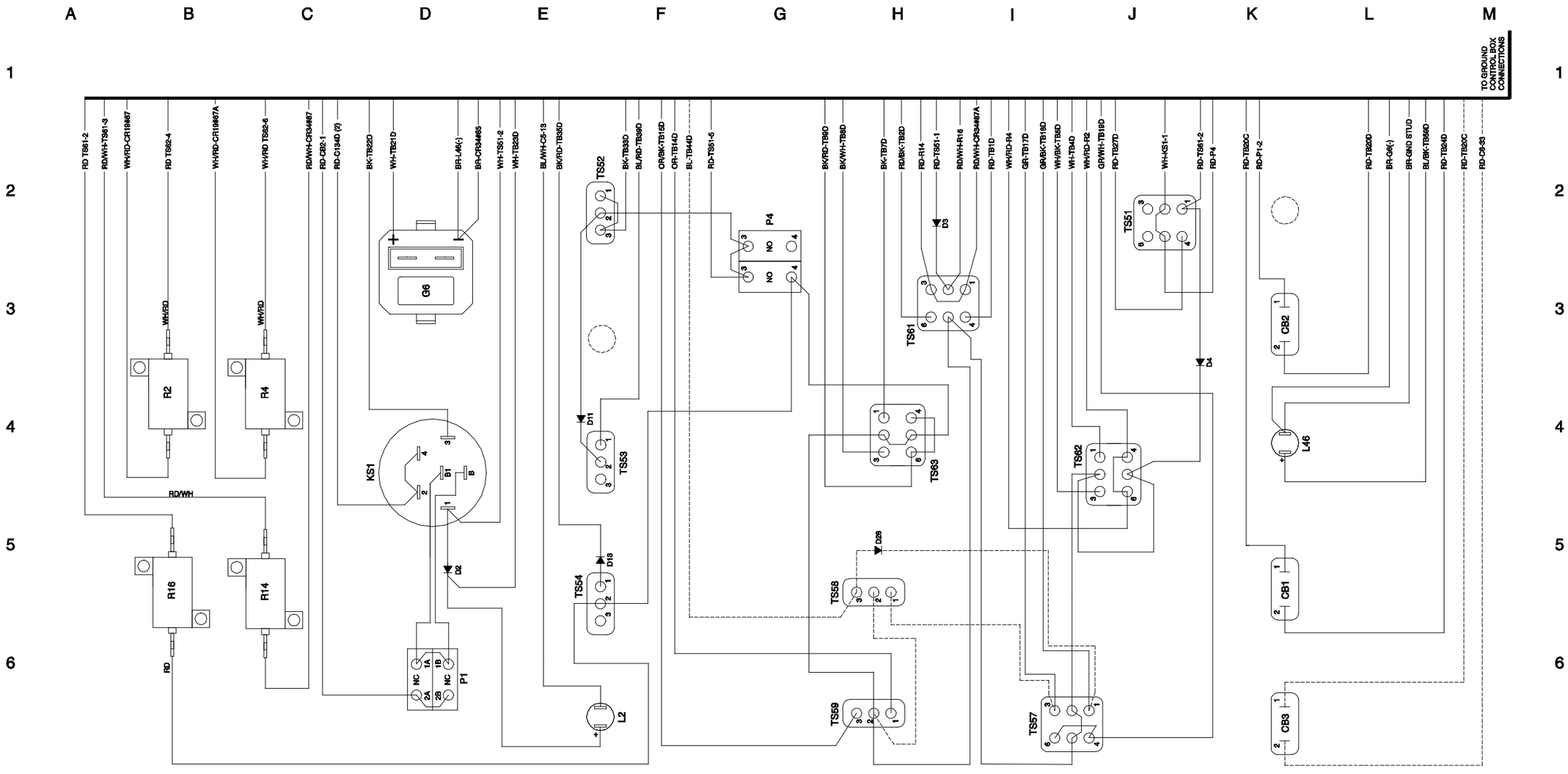
# Ground Control Box Terminal Strip Wiring Diagram,

## Ford MSG-425 EFI Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram,

## Ford MSG-425 EFI Models (ANSI • CSA)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR28 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| KS1 | KEY SWITCH |

| | |
|---|---|
| L2 | LED - CHECK ENGINE |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS53 | FUEL SELECT TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

| | |
|---|---|
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |

NOTE: DASHED LINES INDICATE OPTIONS.

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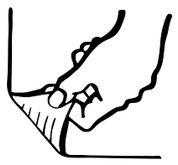
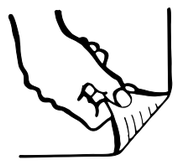
# Ground Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (ANSI • CSA)

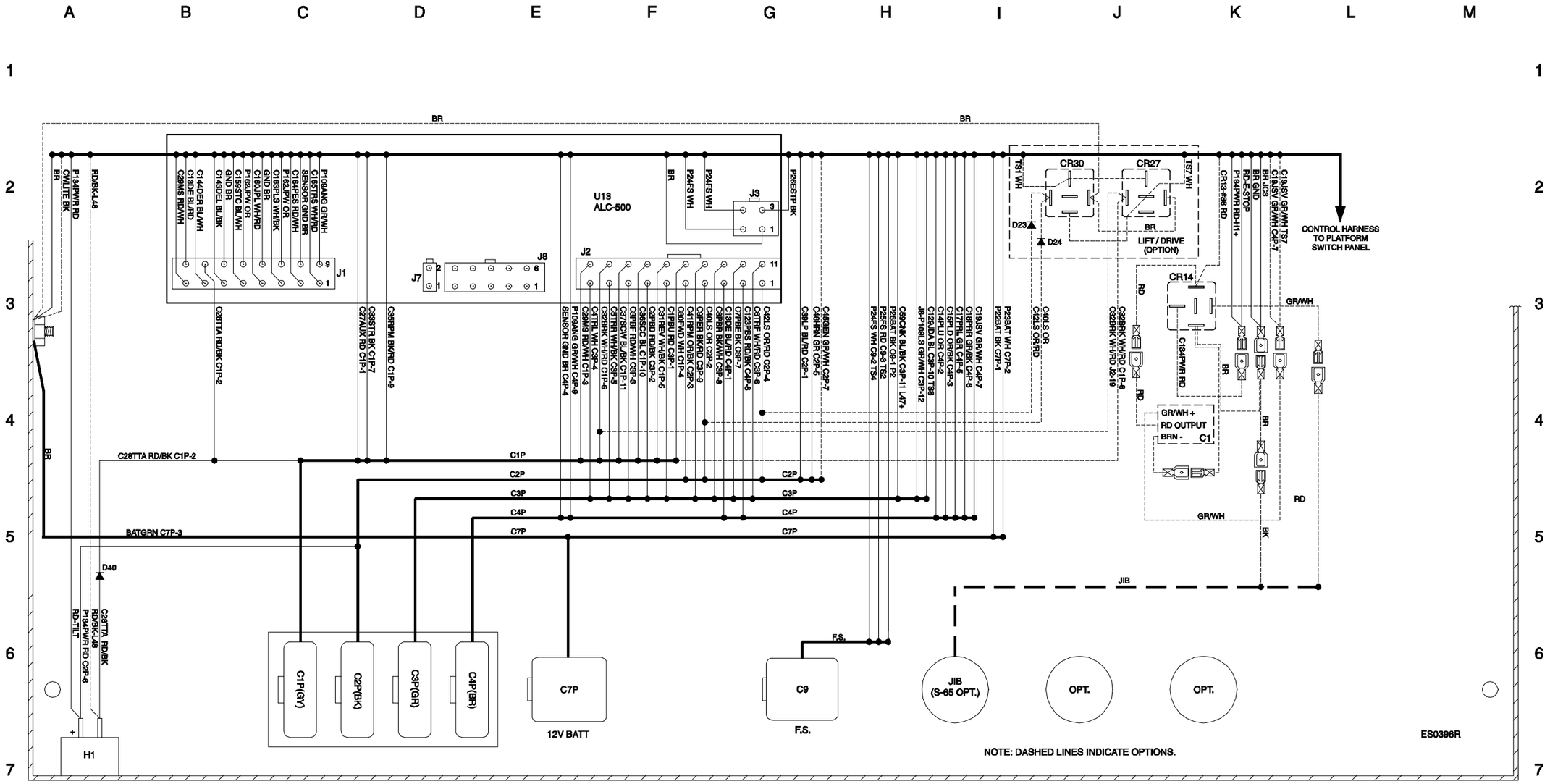


# Platform Control Box Wiring Diagram, Ford MSG-425 EFI Models (ANSI • CSA)



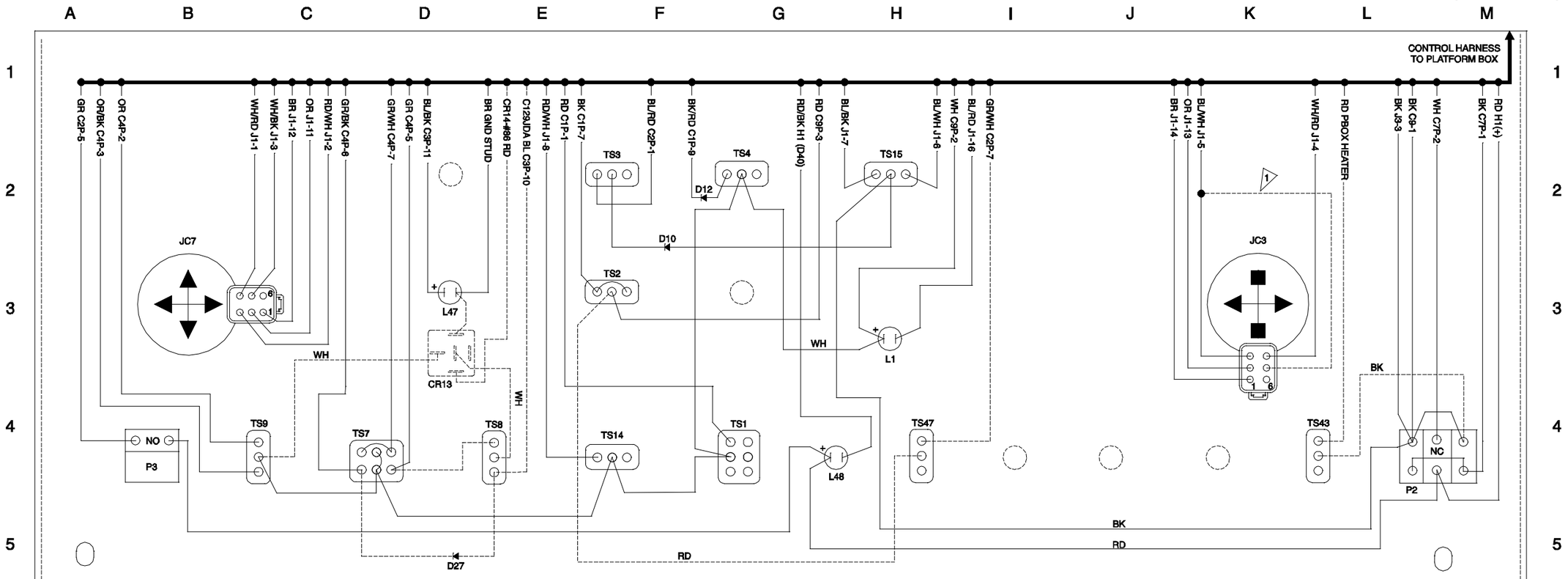
# Platform Control Box Wiring Diagram,

## Ford MSG-425 EFI Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram,

## Ford MSG-425 EFI Models (ANSI • CSA)




| COMPONENT INDEX | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH CIRCUIT (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS3 | FUEL SELECT TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

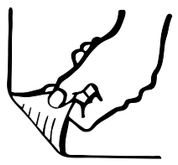
| | |
|---|---|
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

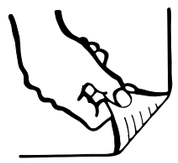
1 ROCKER / STEER OPTION.

ES0396R

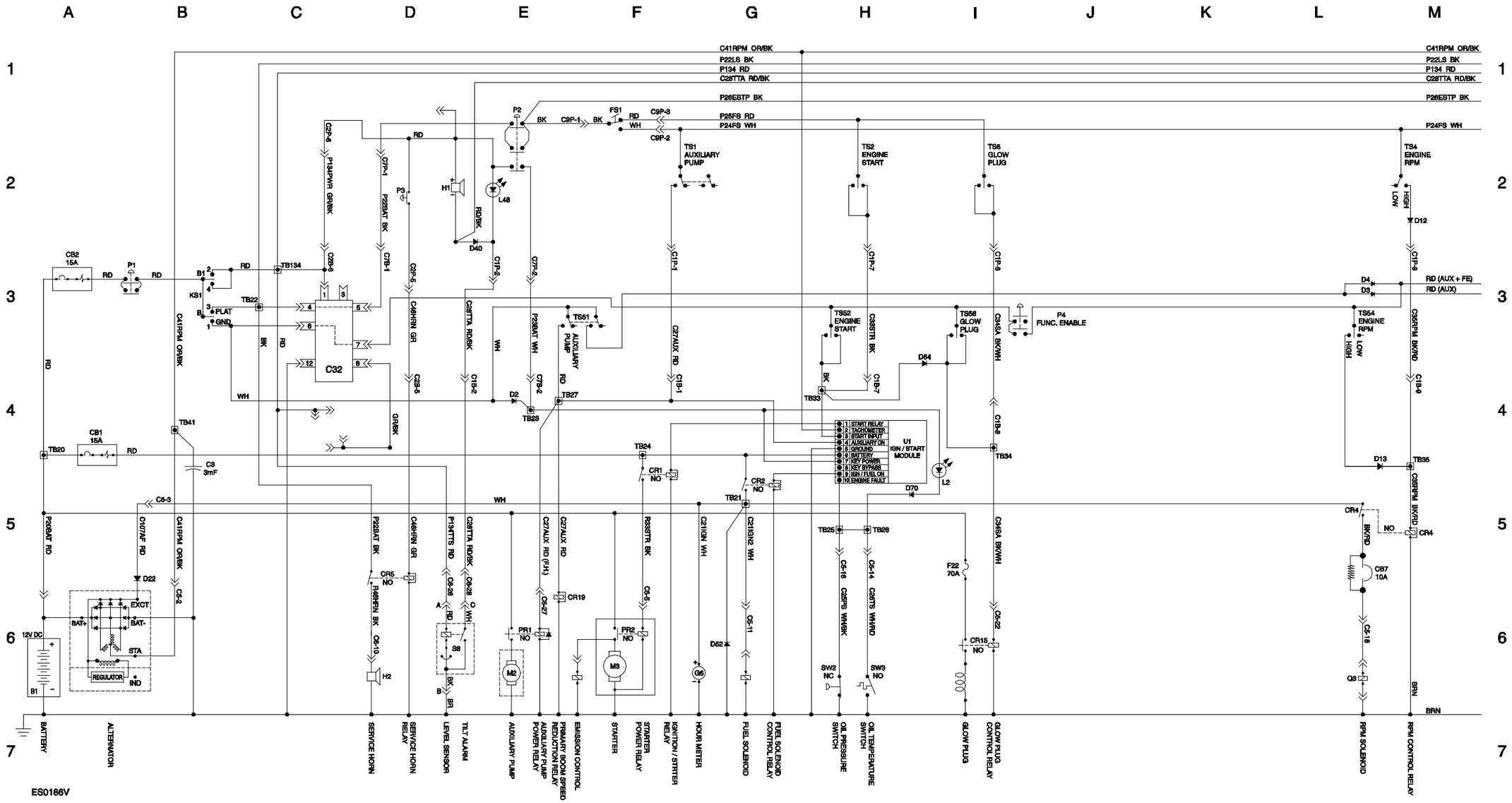
# Platform Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (ANSI • CSA)



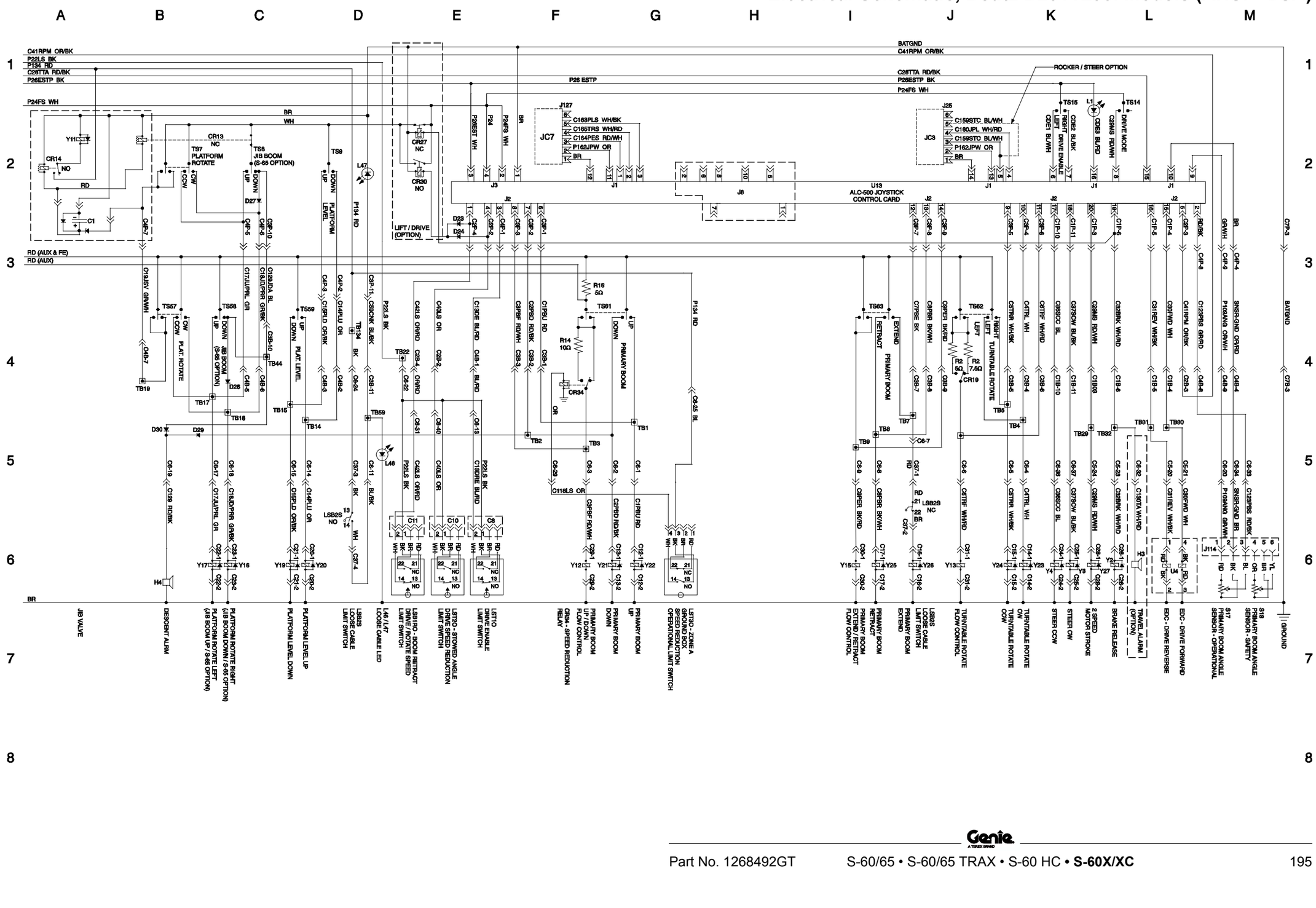
# Electrical Schematic, Deutz D2011L03i Models (ANSI • CSA)



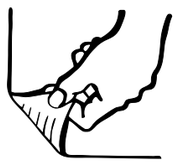
# Electrical Schematic, Deutz D2011L03i Models (ANSI • CSA)



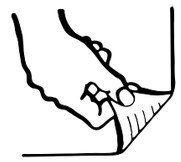
# Electrical Schematic, Deutz D2011L03i Models (ANSI • CSA)



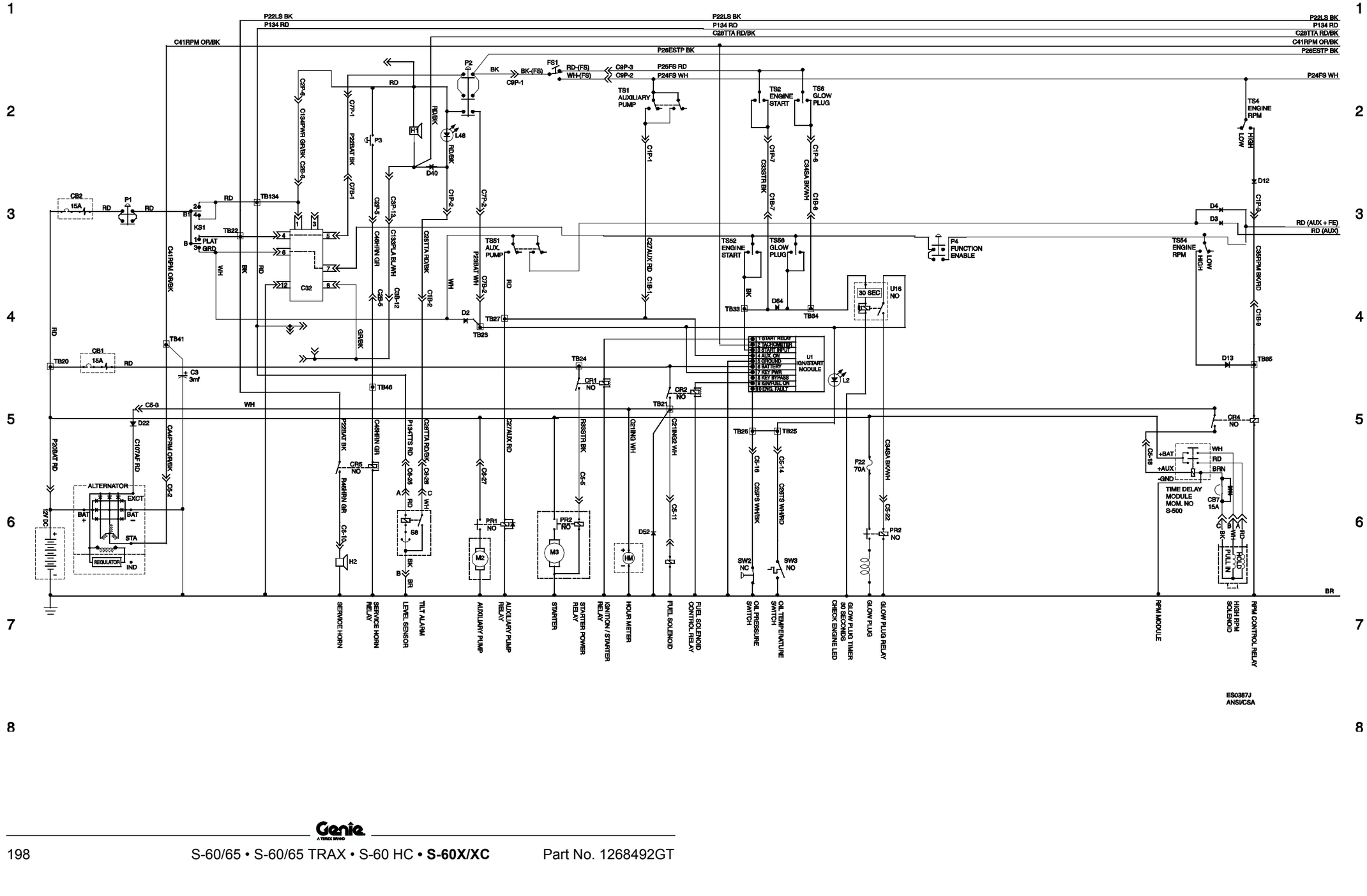
# Electrical Schematic, Deutz D2011L03i Models (ANSI • CSA)



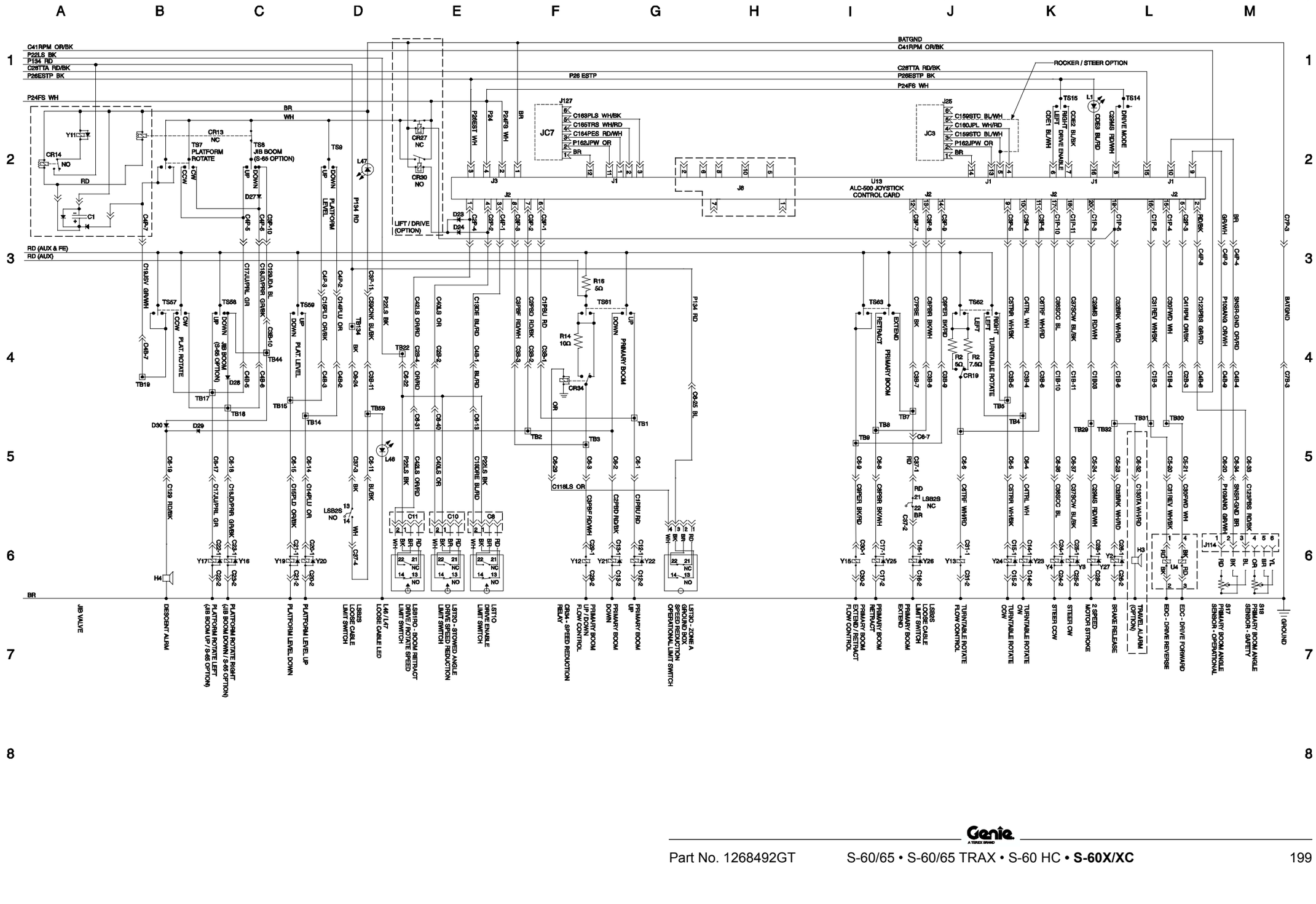
# Electrical Schematic, Deutz TD2011L04i Models (ANSI • CSA)



# Electrical Schematic, Deutz TD2011L04i Models (ANSI • CSA)



# Electrical Schematic, Deutz TD2011L04i Models (ANSI • CSA)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134 RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BR
WH
RD
RD (AUX & FE)
RD (AUX)
P26 ESTP
P26ESRT WH
P24
P24FS WH
BR
J127
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
JC7
J3
J1
J8
LIFT / DRIVE (OPTION)
D23
D24
P134 RD
P22LS BK
C39-15, C59CNK BL/BK
C40LS OR
C39-9
C18DE BL/RD
C39-1
C39-4
C6-22
C6-31
C6-40
C6-13
C6-25 BL
C6-1
C6-2
C6-3
C6-29
C118LS OR
TB1
TB2
TB3
TB22
TB34
TB59
R16 5Ω
R14 10Ω
TS61
CR34
OR
PRIMARY BOOM DOWN
C1PBU RD
C2PBD RD/BK
C3PBF RD/WH
C39-2
C39-3
C39-1
C1PBU RD
C12-1
C12-2
C19-1
C19-2
C2PBD RD/BK
C20-1
C20-2
C3PBF RD/WH
C21-1
C21-2
Y12
Y21
Y22
LST3O - ZONE A GROUND BOX SPEED REDUCTION OPERATIONAL LIMIT SWITCH
PRIMARY BOOM UP / DOWN FLOW CONTROL
CR34 - SPEED REDUCTION RELAY
PRIMARY BOOM DOWN
PRIMARY BOOM UP
BATGND
C41RPM OR/BK
C28TTA RD/BK
P26ESTP BK
P24FS WH
ROCKER / STEER OPTION
JC3
J25
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
BR
TS15
L1
TS14
CDE1 BL/WH
CDE2 BL/BK
CDE3 BL/RD
C28MS RD/WH
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
DRIVE MODE
J1
J2
U13
ALC-500 JOYSTICK CONTROL CARD
C2-7
C2-8
C2-9
C2-5
C2-4
C2-3
C1-10
C1-11
C1-3
C1-4
C1-5
C1-6
C2-1
C2-2
C1-1
C1-2
C4-9
C4-4
C4-8
C4-7
C4-6
C4-5
C4-3
C4-2
C4-1
GR/WH
BR
C7-3
BATGND
C4-9
C4-4
C4-8
P109ANG GR/WH
SNSR-GND GR/RD
C7-3
BATGND
TS63
RETRACT
EXTEND
PRIMARY BOOM
C7FBE BK
C8FBR BK/WH
C9FPE1 BK/RD
C9FPE1 BK/RD
R2 5Ω
R2 7.5Ω
CR19
TS62
LEFT
RIGHT TURNTABLE ROTATE
C5TRR WH/BK
C4TRL WH
C4TRF WH/RD
C6TRF WH/RD
C6TRR WH/BK
C4TRL WH
C4TRF WH/RD
C8SOC BL
C8TSCW BU/BK
C28MS RD/WH
C28BRK WH/RD
C31REV WH/BK
C30FWD WH
C41RPM OR/BK
C12PBS GR/RD
C4-9
C4-4
C4-8
C4-7
C4-6
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C4-3
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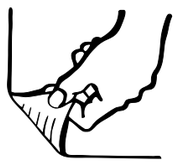
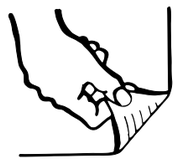
C37-31
C37-32
C37-33
C37-34
C37-35
C37-36
C37-37
C37-38
C37-39
C37-40

# Electrical Schematic, Deutz TD2011L04i Models (ANSI • CSA)

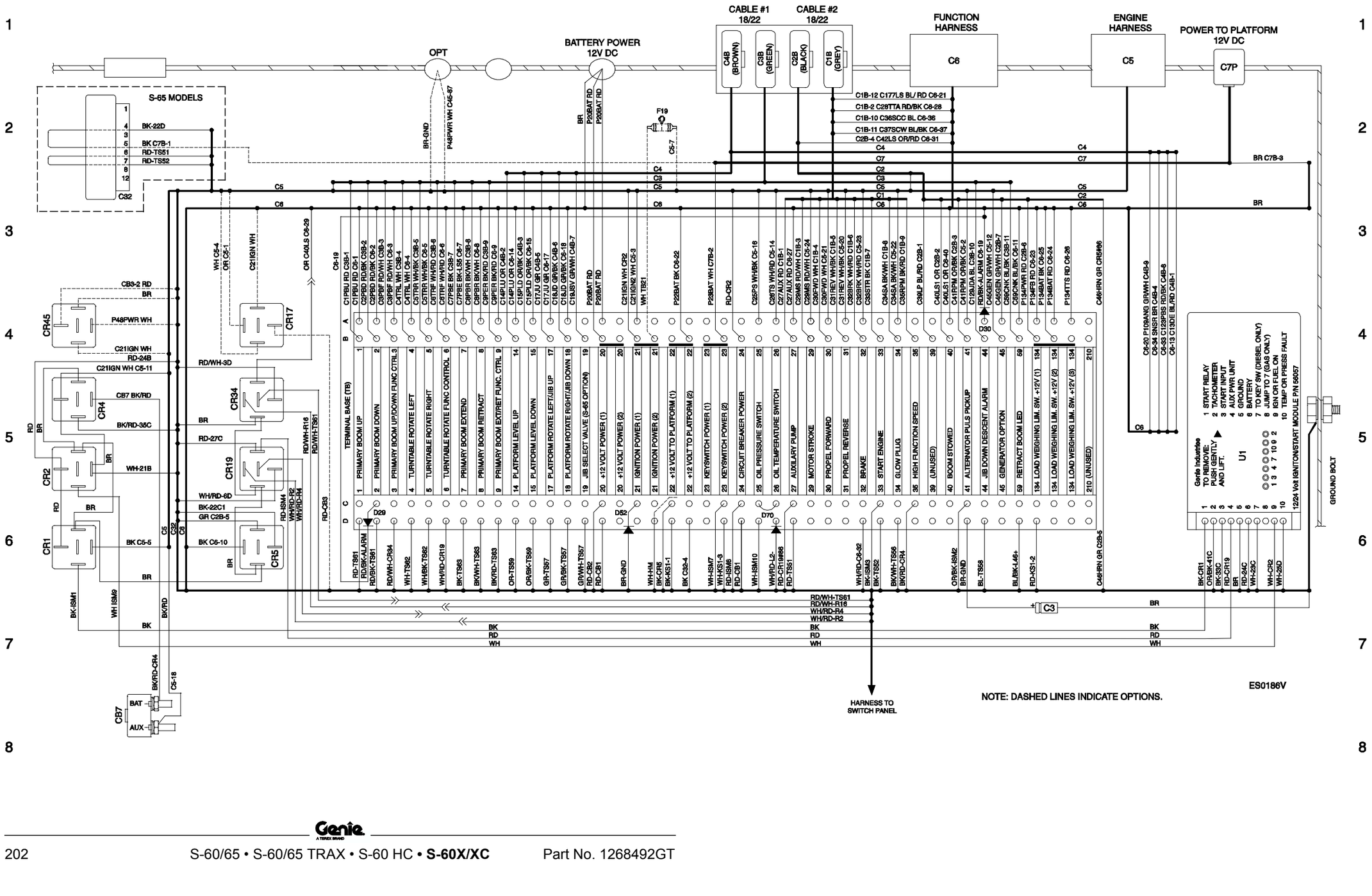


# Ground Control Box Terminal Strip Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



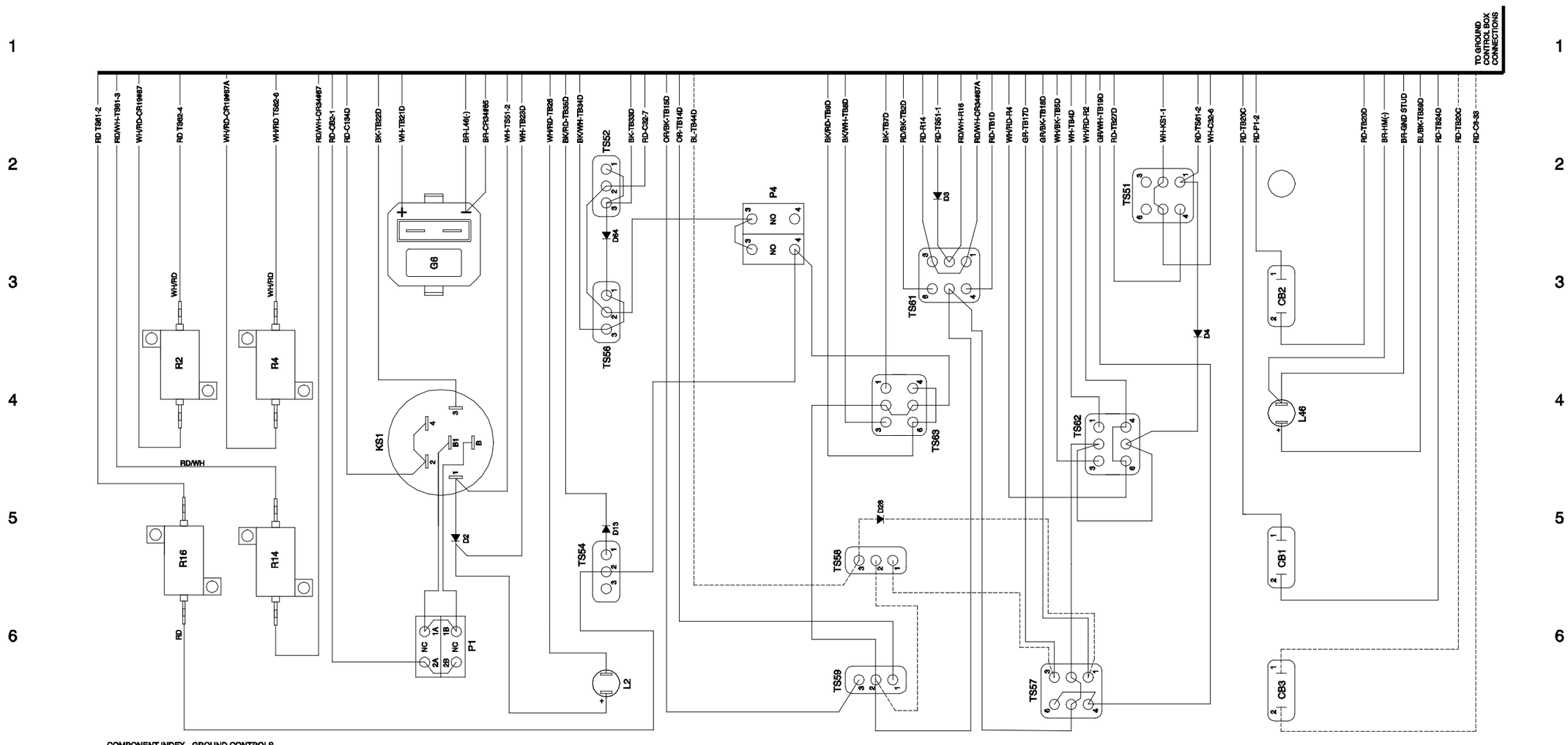
# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| CR45 | WORK LIGHTS RELAY (OPTION) |
| G6 | HOUR METER |
| KS1 | KEY SWITCH |

| | |
|---|---|
| L2 | LED - CHECK ENGINE |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

| | |
|---|---|
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |

NOTE: DASHED LINES INDICATE OPTIONS.

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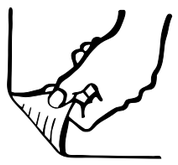
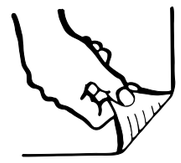
# Ground Control Box Switch Panel Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)

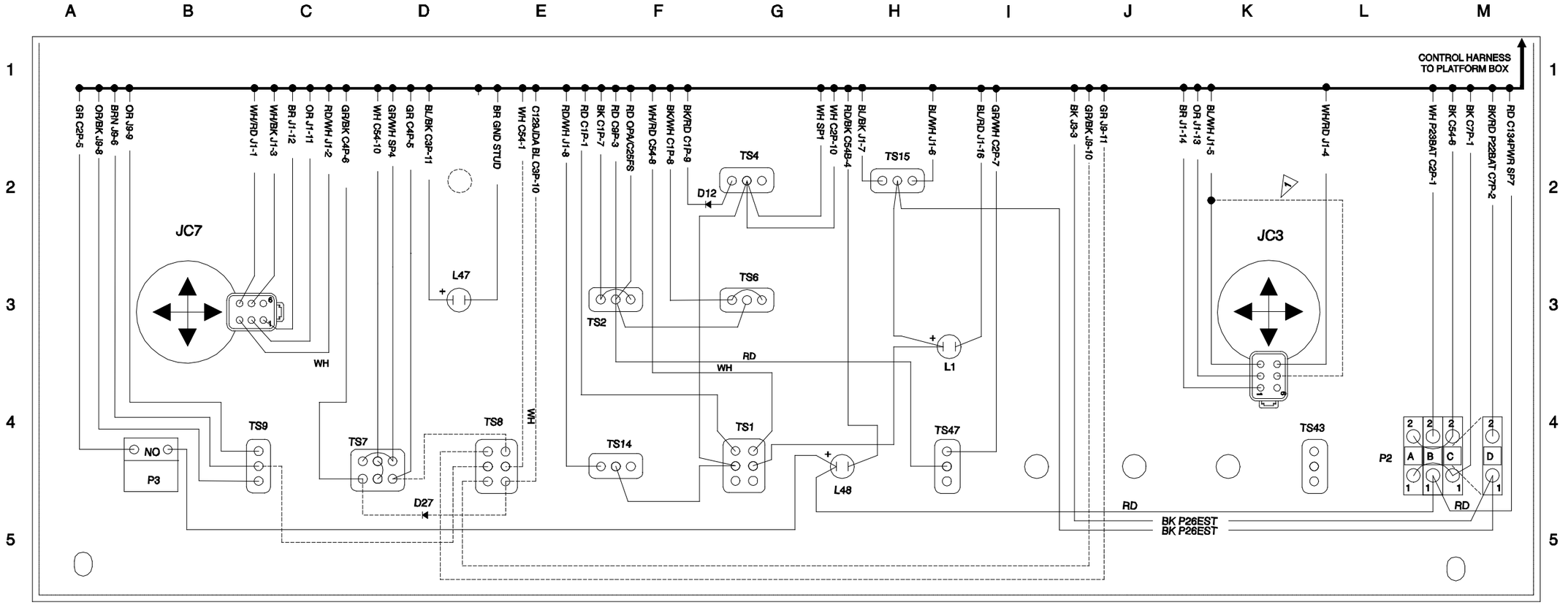


# Platform Control Box Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



# Platform Control Box Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)




COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| L1 | DRIVE ENABLE LED |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/ RIGHT (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM PROPORTIONAL JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE (DUAL AXIS ROCKER) |
| H1 | TILT ALARM |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |

| | |
|---|---|
| CR13 | JIB SELECT RELAY (JIB MACHINE ONLY) |
| CR14 | JIB RELAY (JIB MACHINE ONLY) |
| C7P | 12 V PLATFORM POWER CONNECTOR |
| C9 | FOOTSWITCH CONNECTOR |
| C1-4 | CP1-CP4; 48 PIN CONNECTOR BLOCK |
| U13 | ALC-500 CONTROL BOARD |
| J1 | CONTROL BOARD INPUT CONNECTOR |
| J2 | CONTROL BOARD OUTPUT CONNECTOR |
| J3 | CONTROL BOARD POWER CONNECTOR |

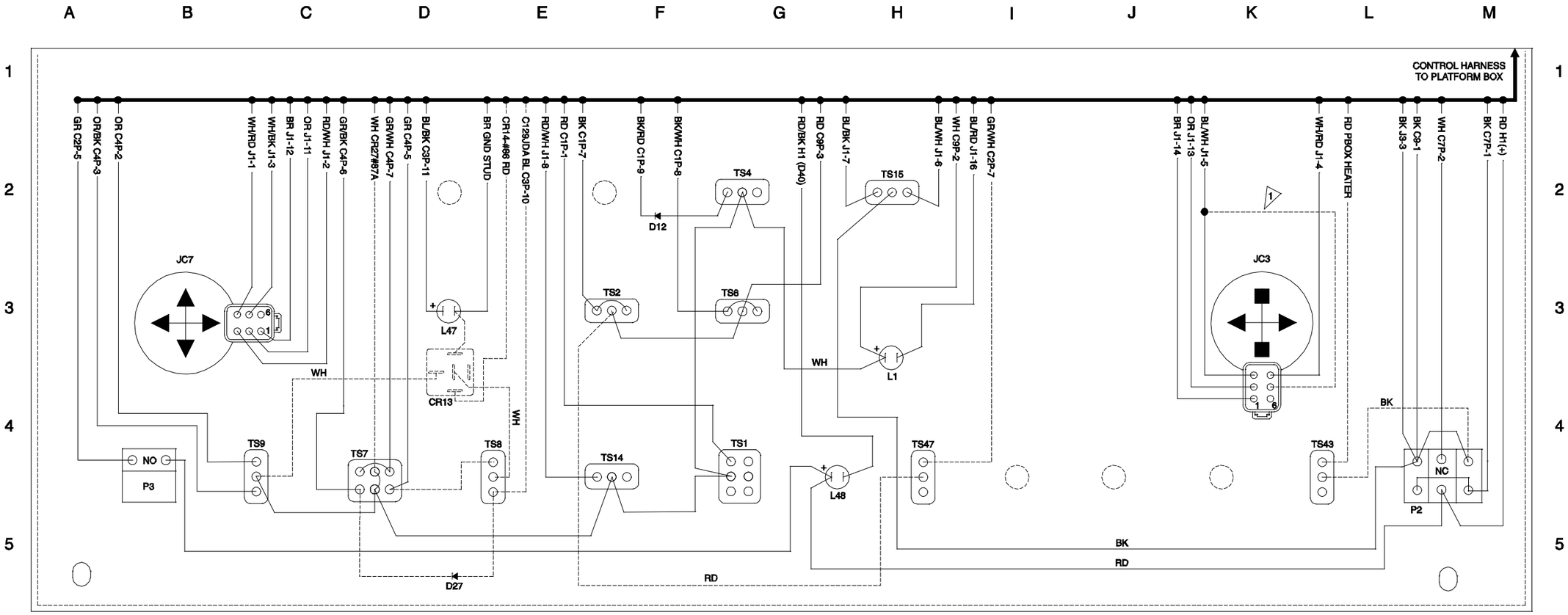
NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

ES0186AA

# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)




COMPONENT INDEX

| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH CIRCUIT (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

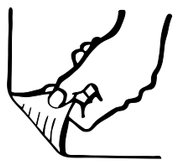
| | |
|---|---|
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

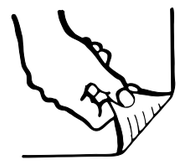
1 ROCKER / STEER OPTION.

ES0186V

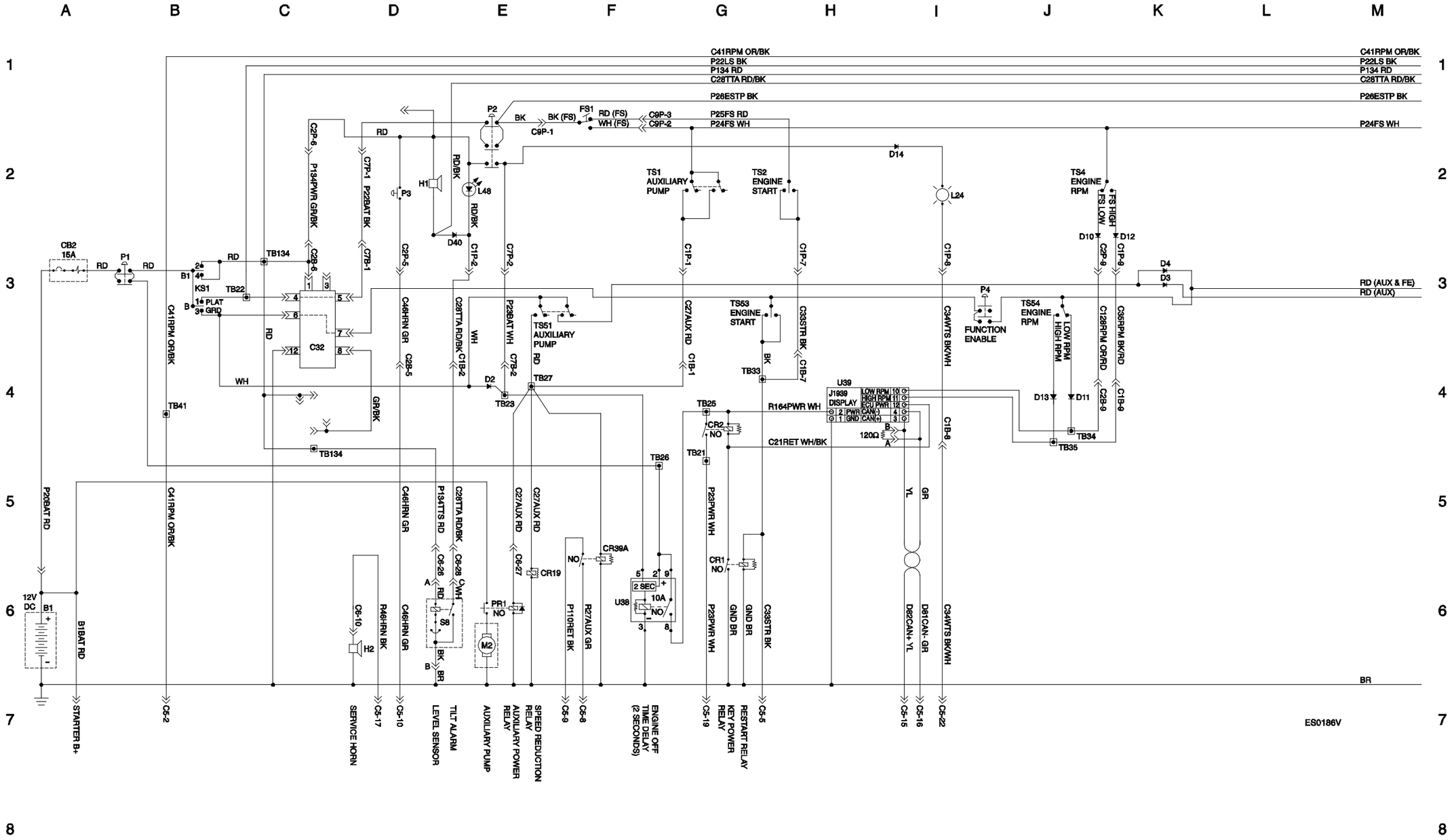
# Platform Control Box Switch Panel Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



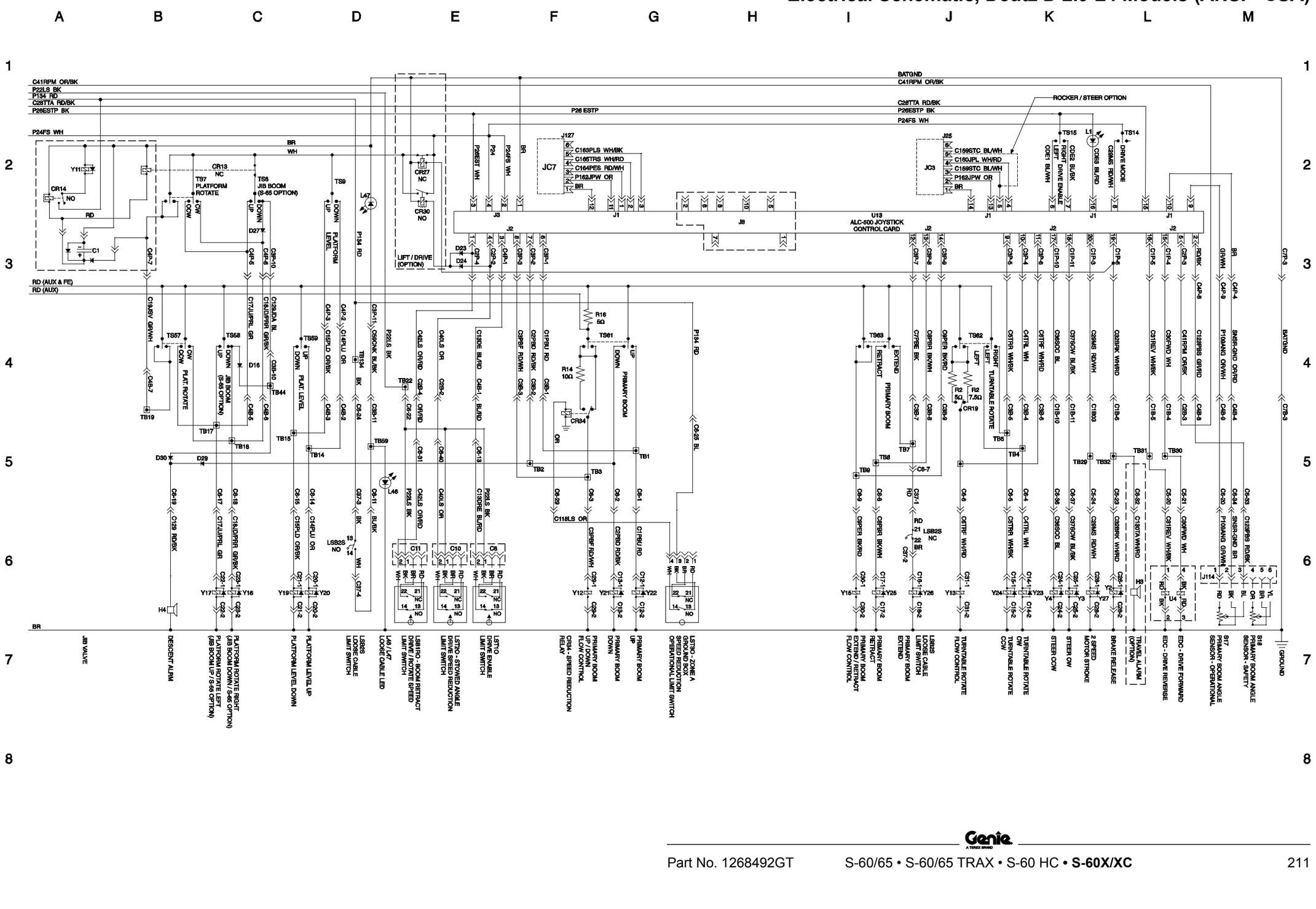
# Electrical Schematic, Deutz D 2.9 L4 Models (ANSI • CSA)



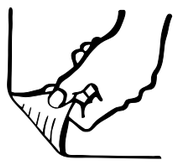
# Electrical Schematic, Deutz D 2.9 L4 Models (ANSI • CSA)



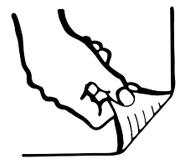
# Electrical Schematic, Deutz D 2.9 L4 Models (ANSI • CSA)



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

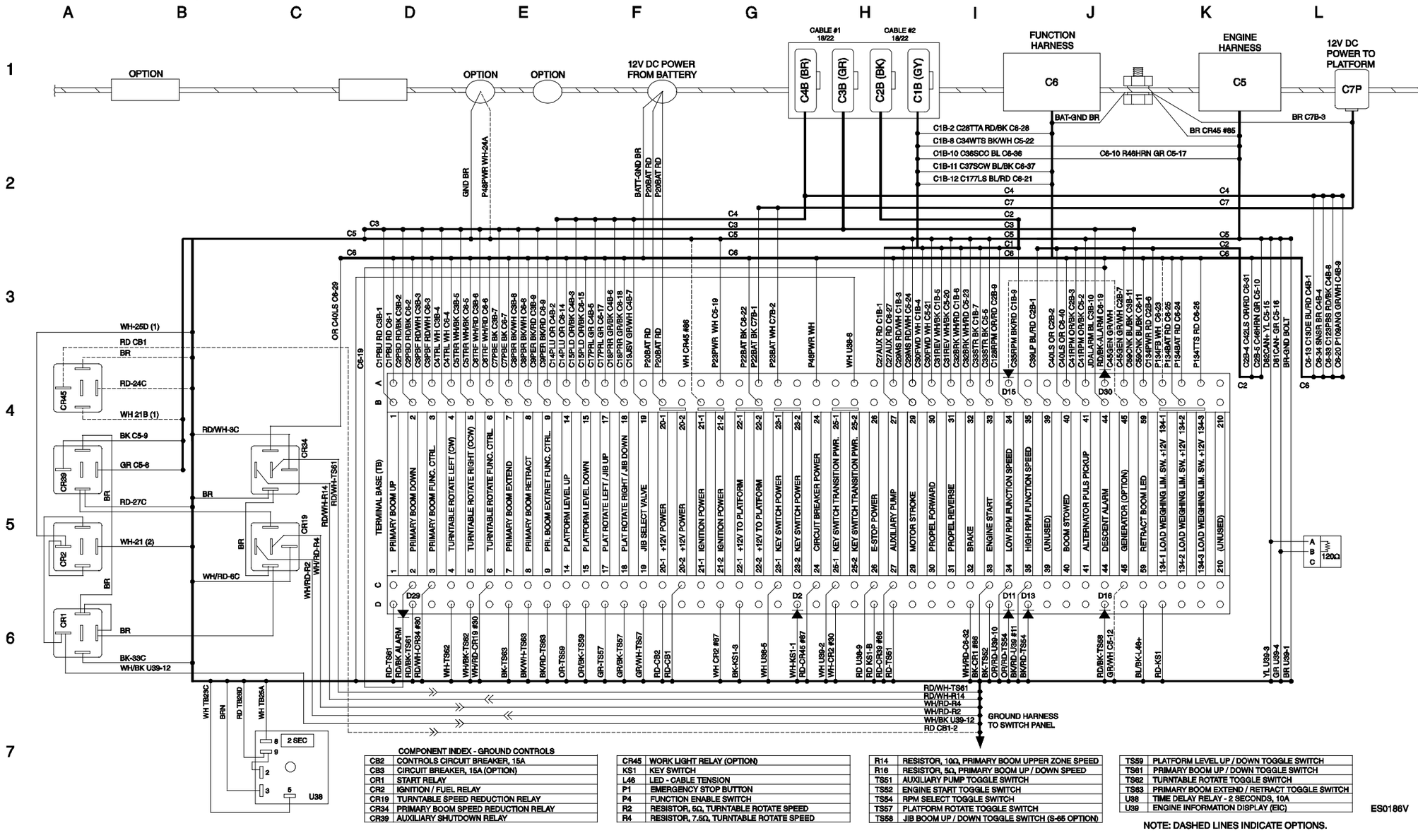


# Ground Control Box Terminal Strip Wiring Diagram, Deutz D 2.9 L4 Models (ANSI • CSA)



# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D 2.9 L4 Models (ANSI • CSA)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| CR39 | AUXILIARY SHUTDOWN RELAY |

| | |
|---|---|
| CR45 | WORK LIGHT RELAY (OPTION) |
| KS1 | KEY SWITCH |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |

| | |
|---|---|
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

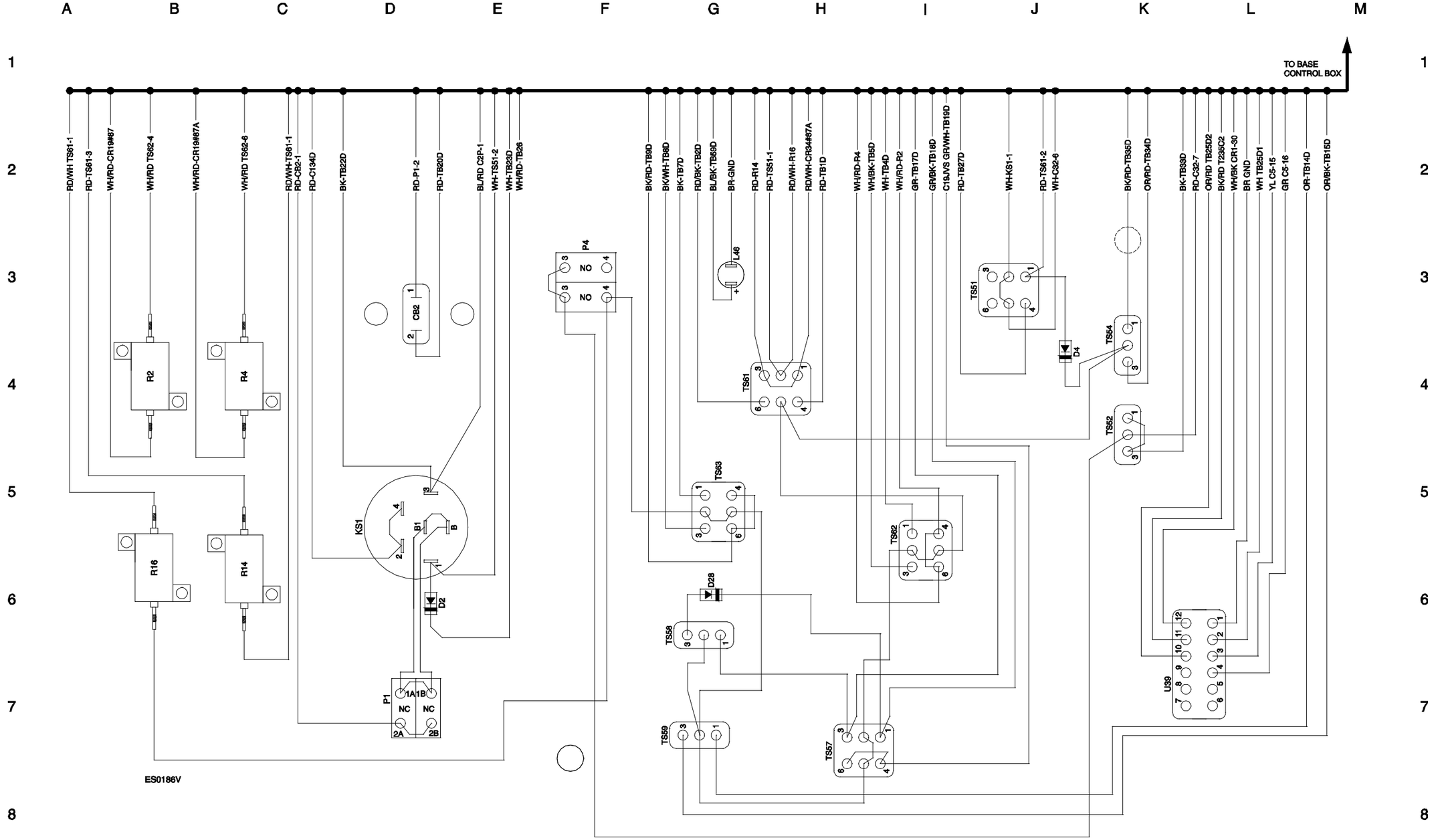
| | |
|---|---|
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U38 | TIME DELAY RELAY - 2 SECONDS, 10A |
| U39 | ENGINE INFORMATION DISPLAY (EIC) |

ES0186V

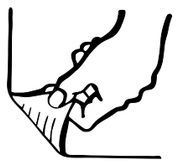
NOTE: DASHED LINES INDICATE OPTIONS.

# Ground Control Box Switch Panel Wiring Diagram,

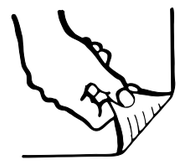
## Deutz D 2.9 L4 Models (ANSI • CSA)



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

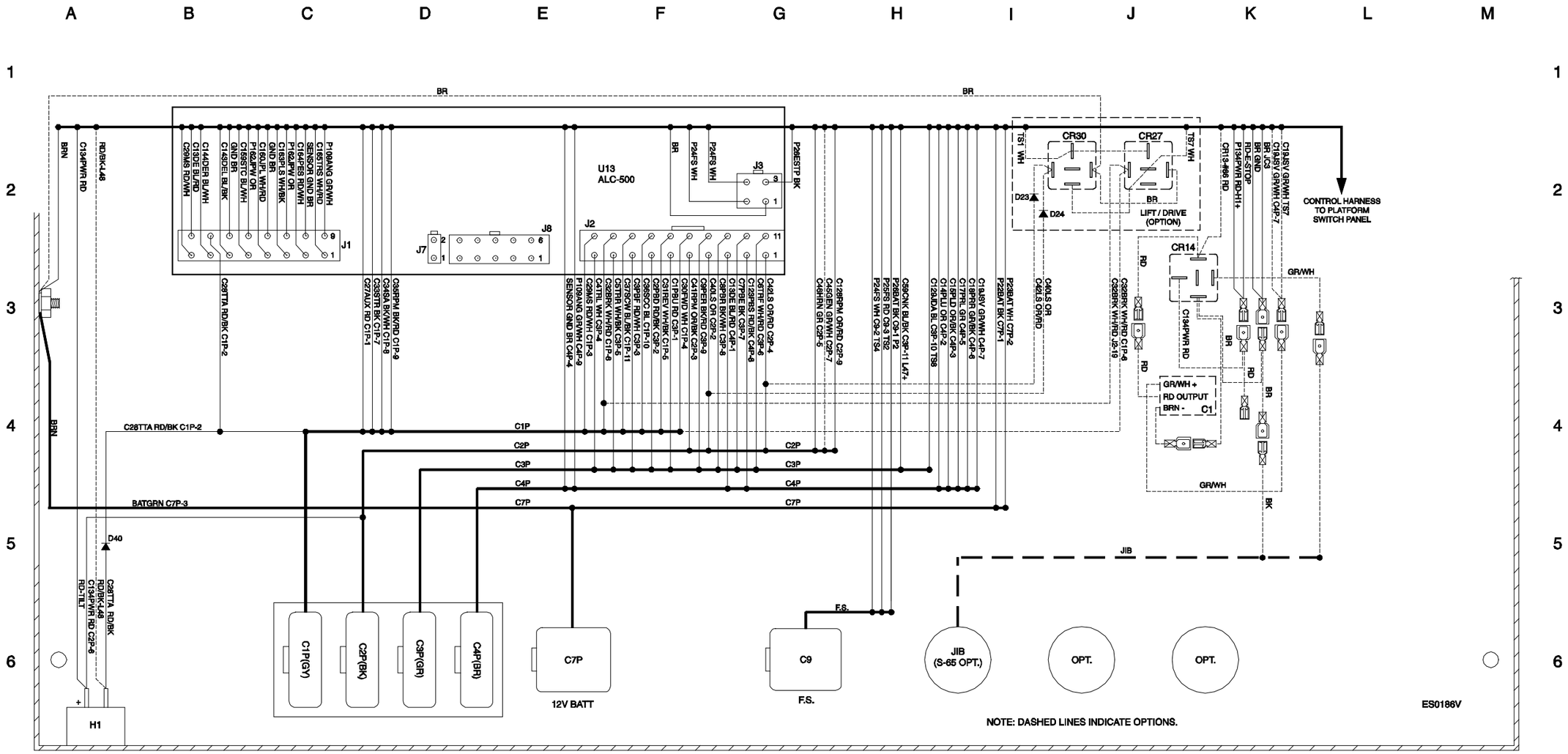


# Platform Control Box Wiring Diagram, Deutz D 2.9 L4 Models (ANSI • CSA)



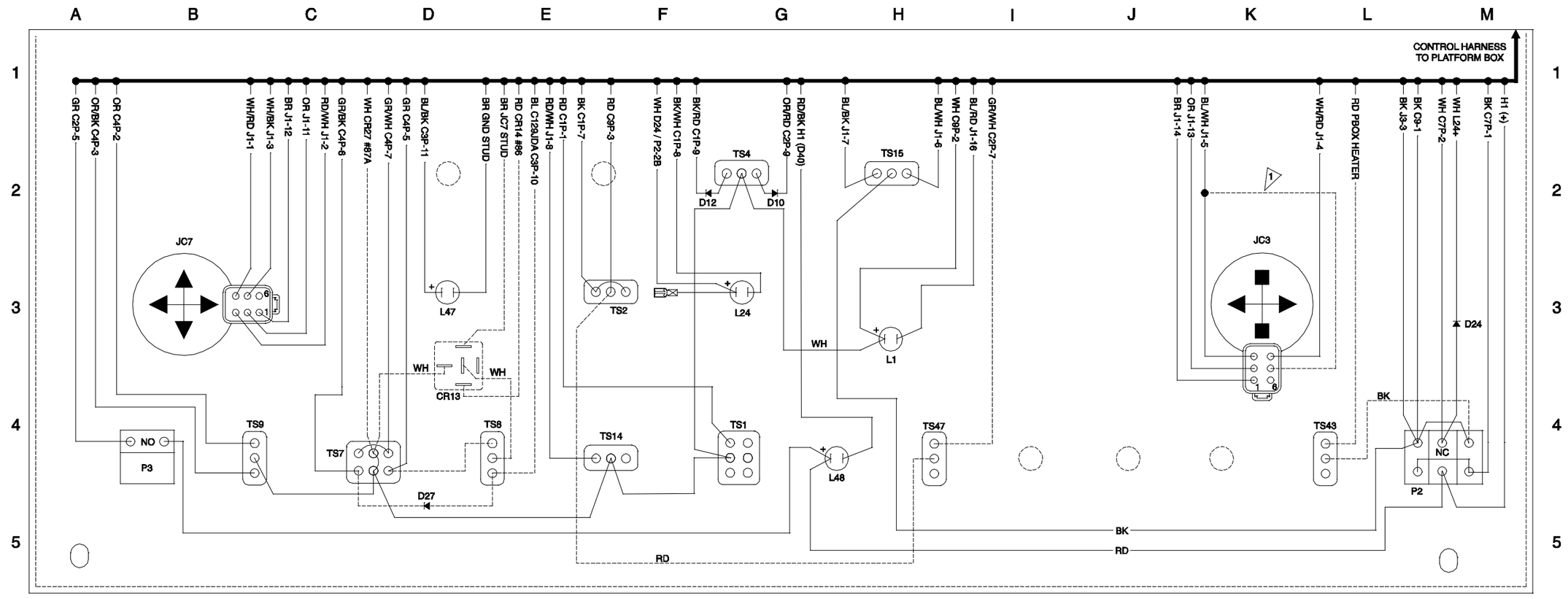
# Platform Control Box Wiring Diagram,

## Deutz D 2.9 L4 Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D 2.9 L4 Models (ANSI • CSA)




| | COMPONENT INDEX - GROUND CONTROLS |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | RELAY - JIB SELECT (S-65 OPTION) |
| CR14 | RELAY - JIB VALVE (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L24 | LED - GLOW PLUG |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |

| | |
|---|---|
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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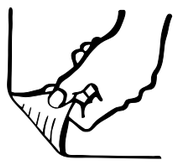
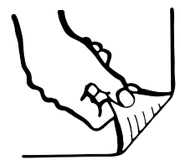
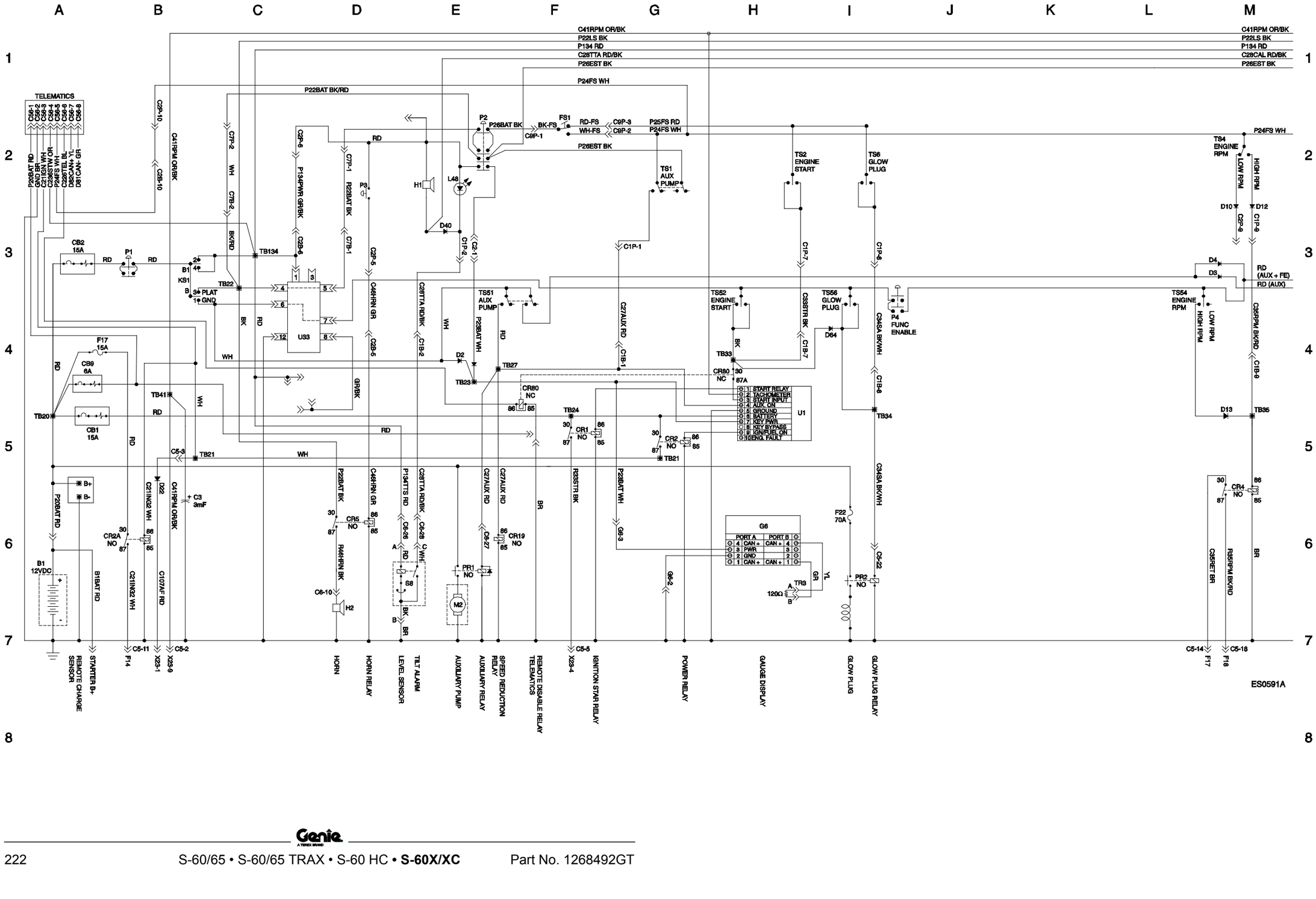
# Platform Control Box Switch Panel Wiring Diagram, Deutz D 2.9 L4 Models (ANSI • CSA)



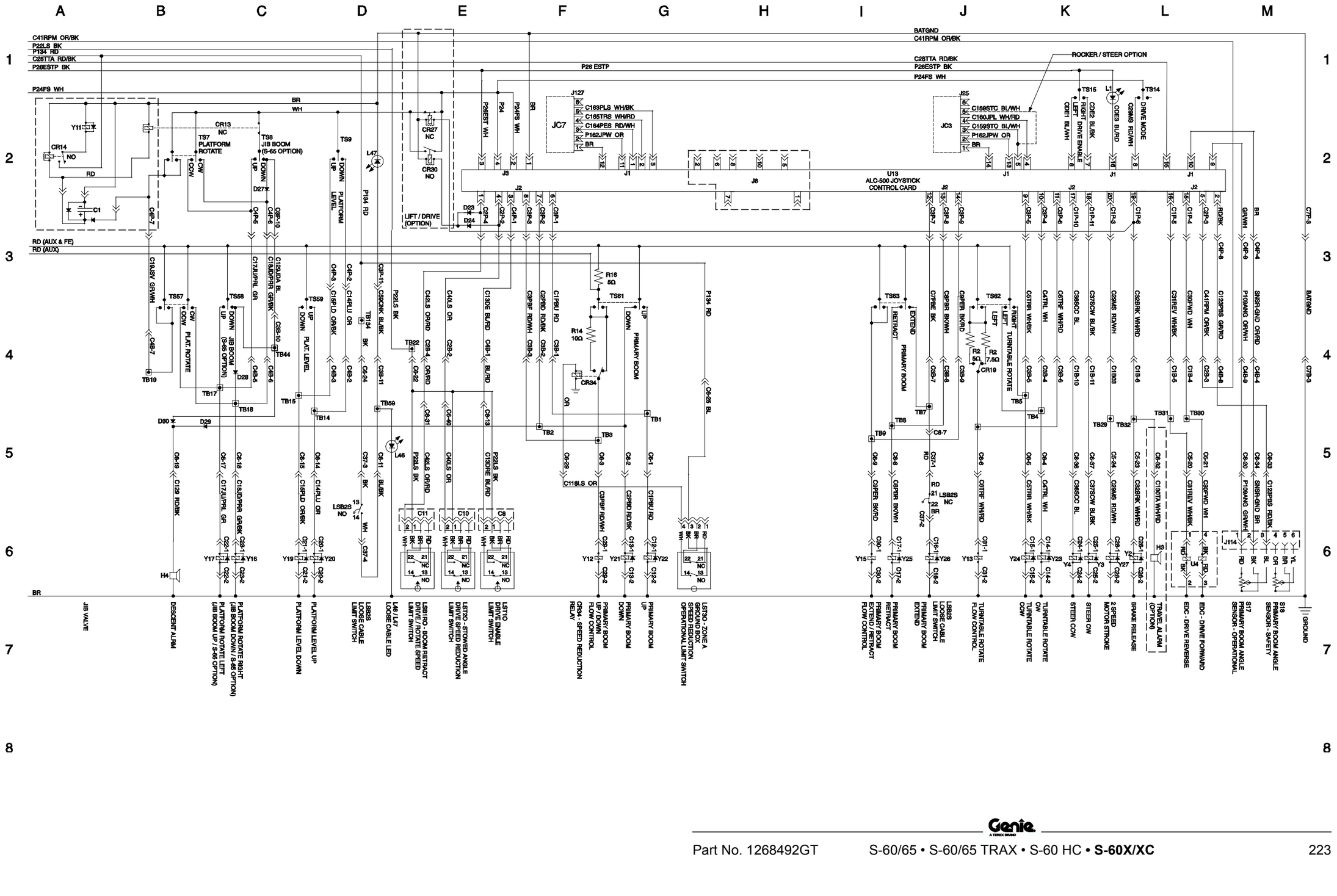
# Electrical Schematic, Deutz D436 L3i Models (ANSI • CSA)



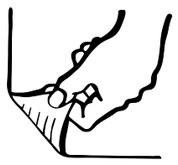
# Electrical Schematic, Deutz D436 L3i Models (ANSI • CSA)



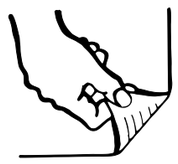
## Electrical Schematic, Deutz D436 L3i Models (ANSI • CSA)



# Electrical Schematic, Deutz D436 L3i Models (ANSI • CSA)

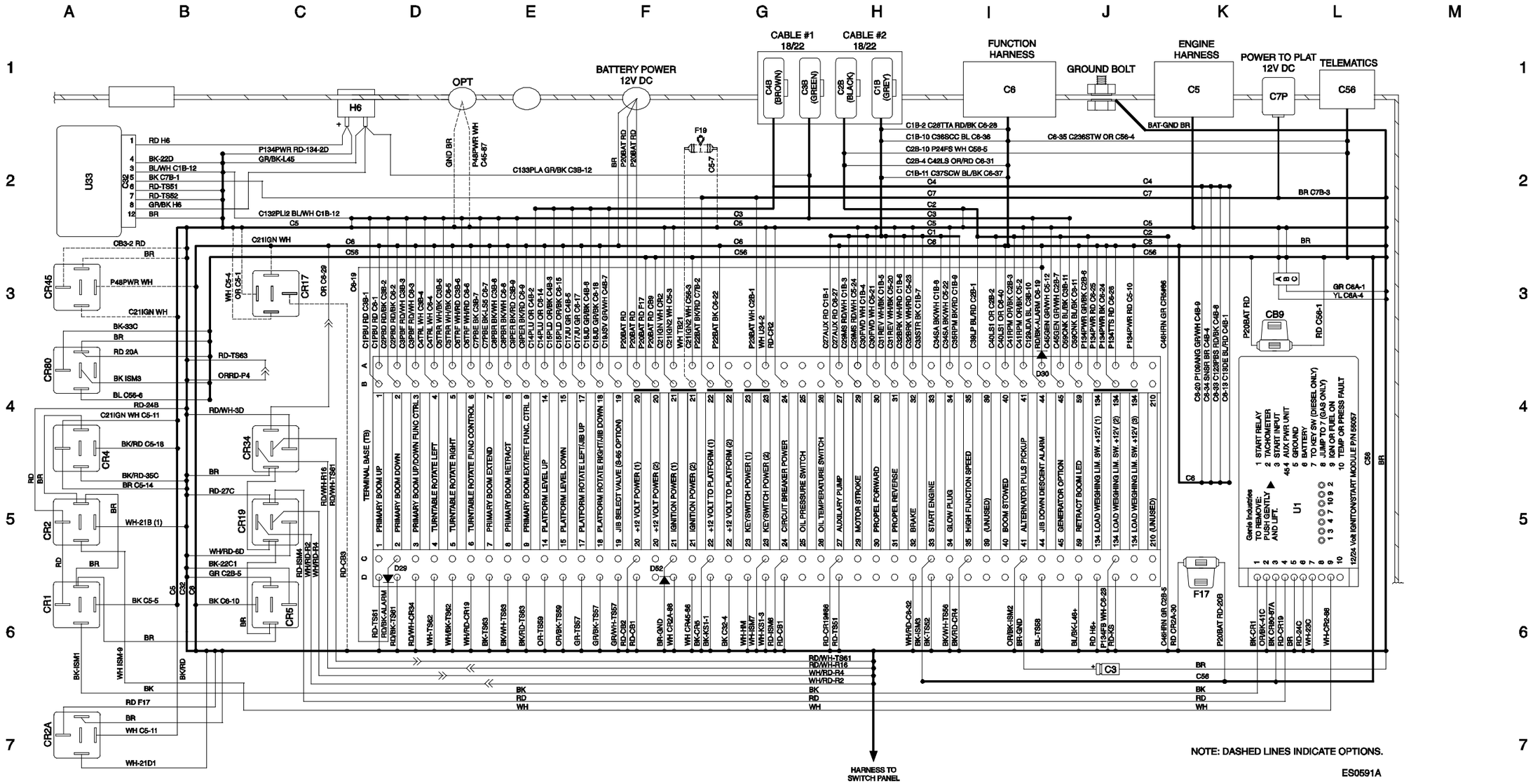


# Ground Control Box Terminal Strip Wiring Diagram, Deutz D436 L3i Models (ANSI • CSA)



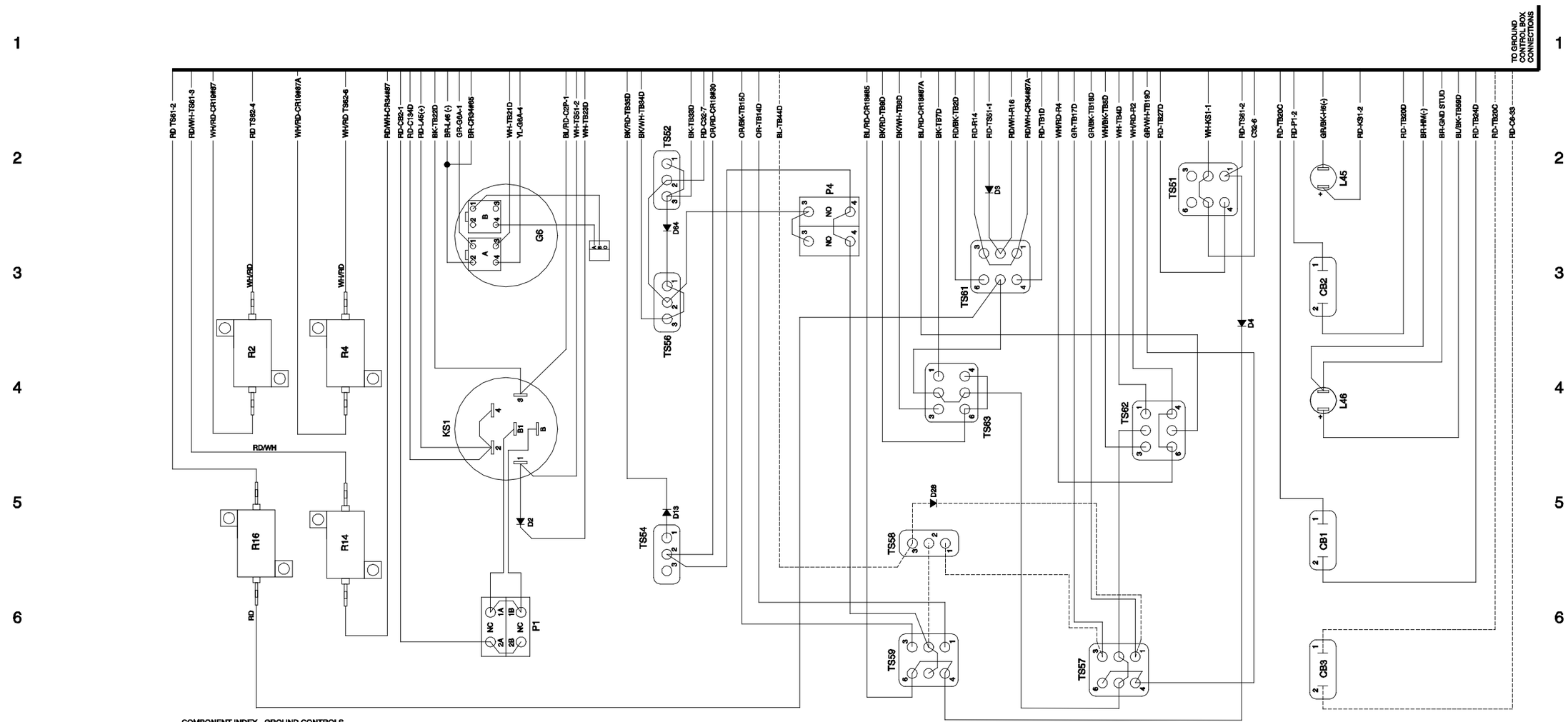
# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D436 L3i Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram,

## Deutz D436 L3i Models (ANSI • CSA)




| | COMPONENT INDEX - GROUND CONTROLS |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |

| | |
|---|---|
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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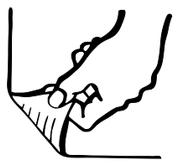
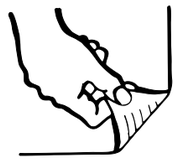
# Ground Control Box Switch Panel Wiring Diagram, Deutz D436 L3i Models (ANSI • CSA)

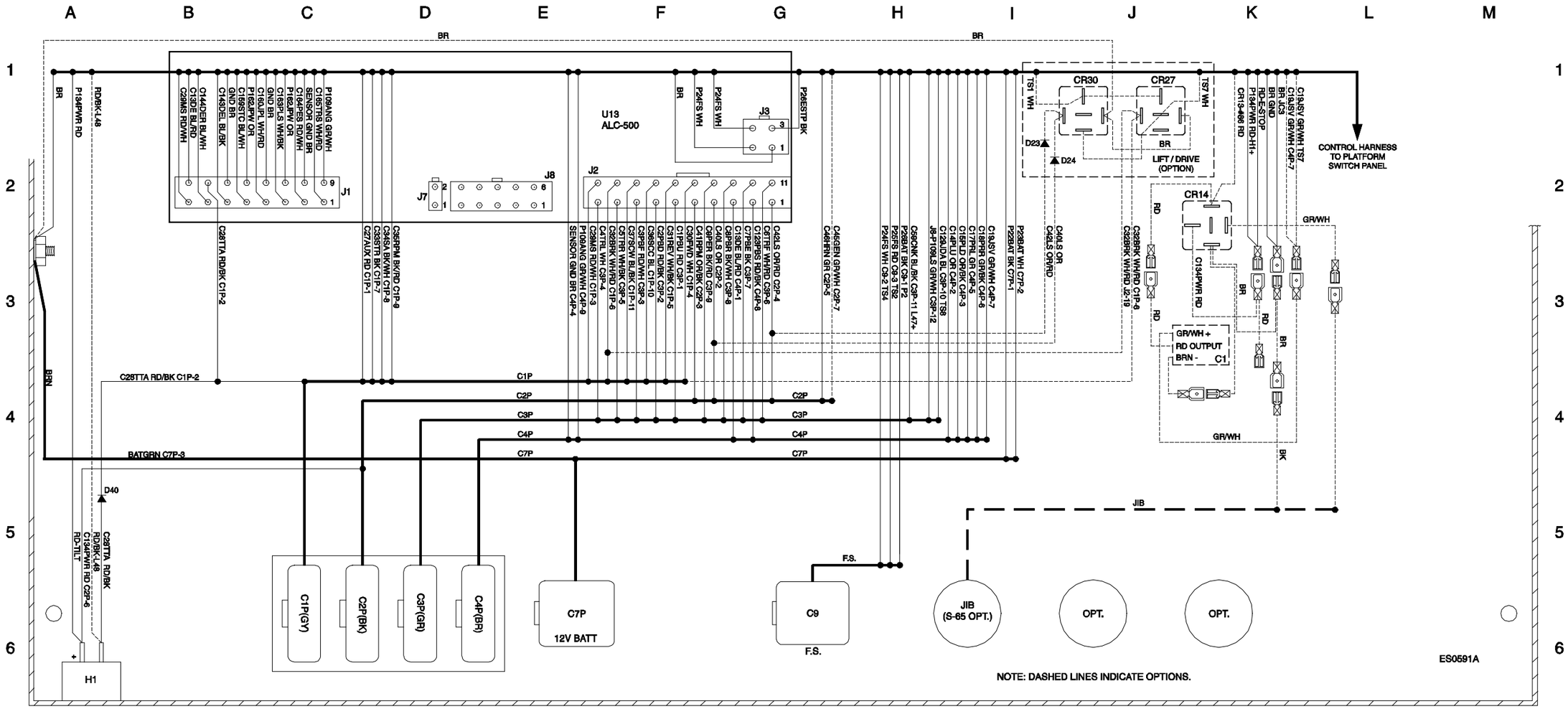


# Platform Control Box Wiring Diagram, Deutz D436 L3i Models (ANSI • CSA)



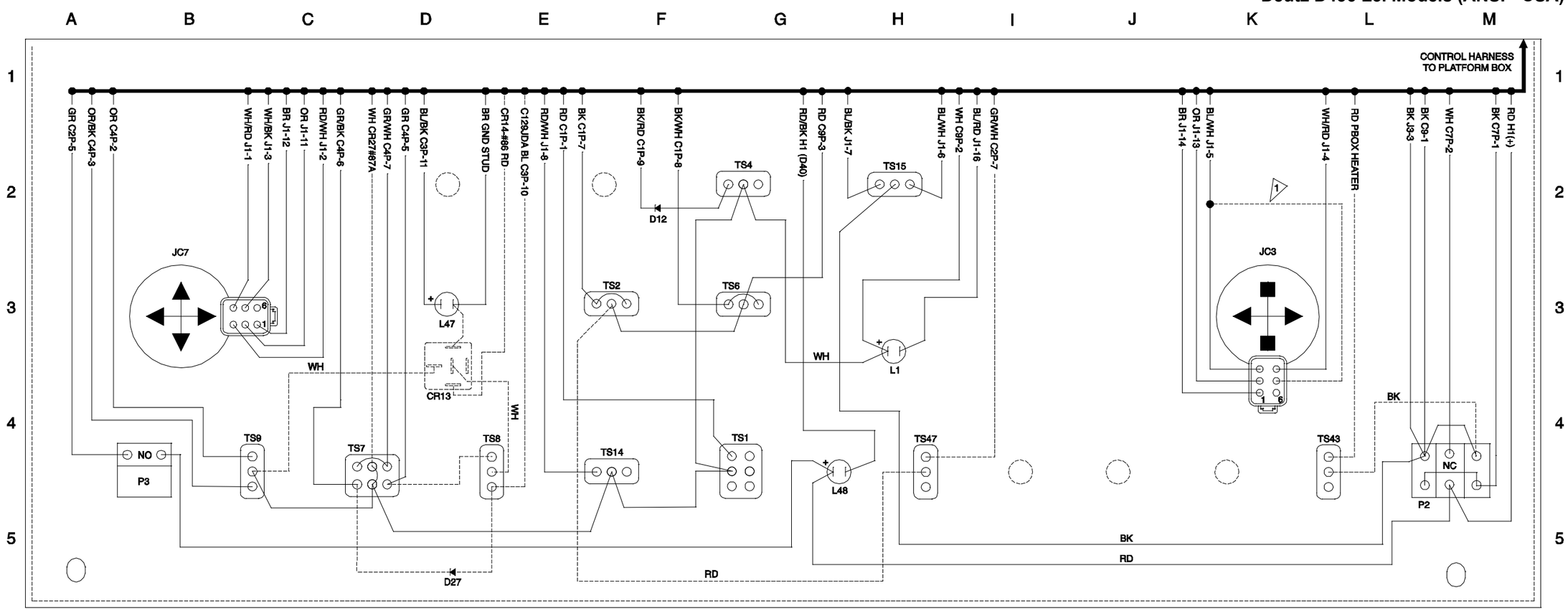
# Platform Control Box Wiring Diagram,

## Deutz D436 L3i Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D436 L3i Models (ANSI • CSA)




| | COMPONENT INDEX |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH CIRCUIT (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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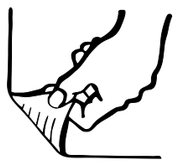
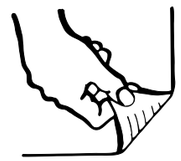
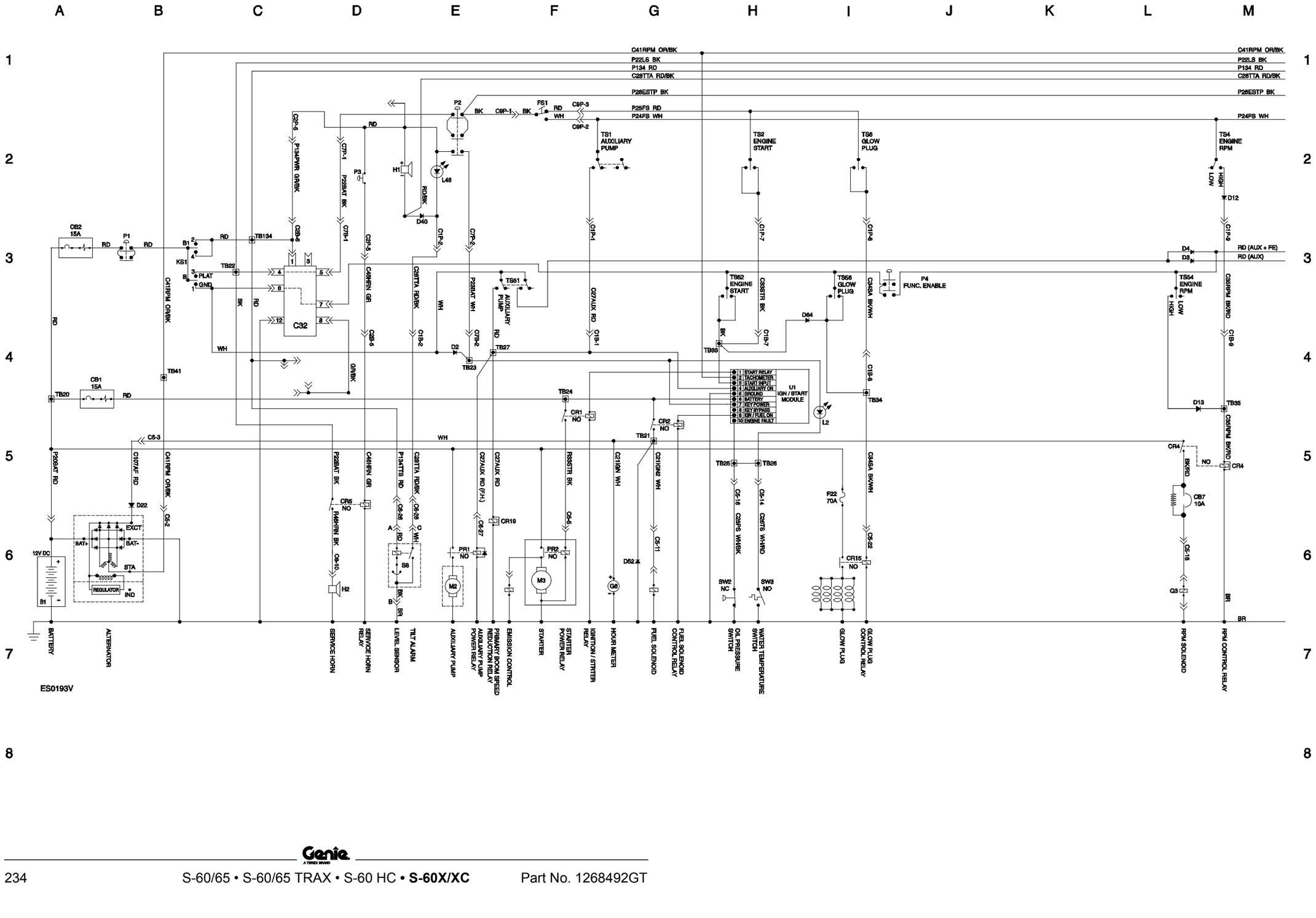
# Platform Control Box Switch Panel Wiring Diagram, Deutz D436 L3i Models (ANSI • CSA)



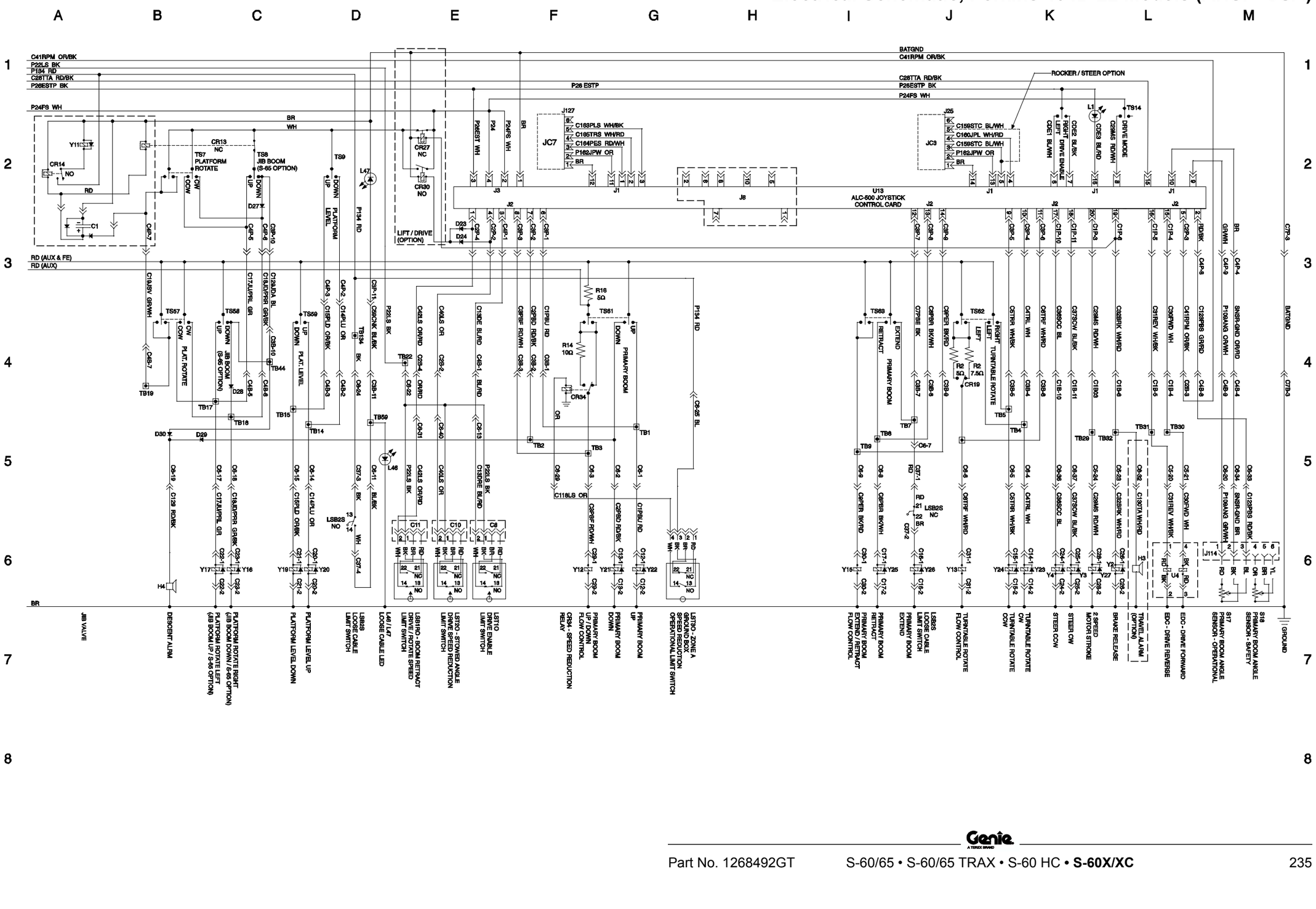
# Electrical Schematic, Perkins 404D-22 Models (ANSI • CSA)



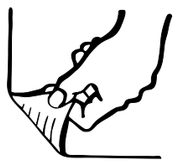
# Electrical Schematic, Perkins 404D-22 Models (ANSI • CSA)



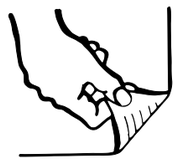
# Electrical Schematic, Perkins 404D-22 Models (ANSI • CSA)



# Electrical Schematic, Perkins 404D-22 Models (ANSI • CSA)

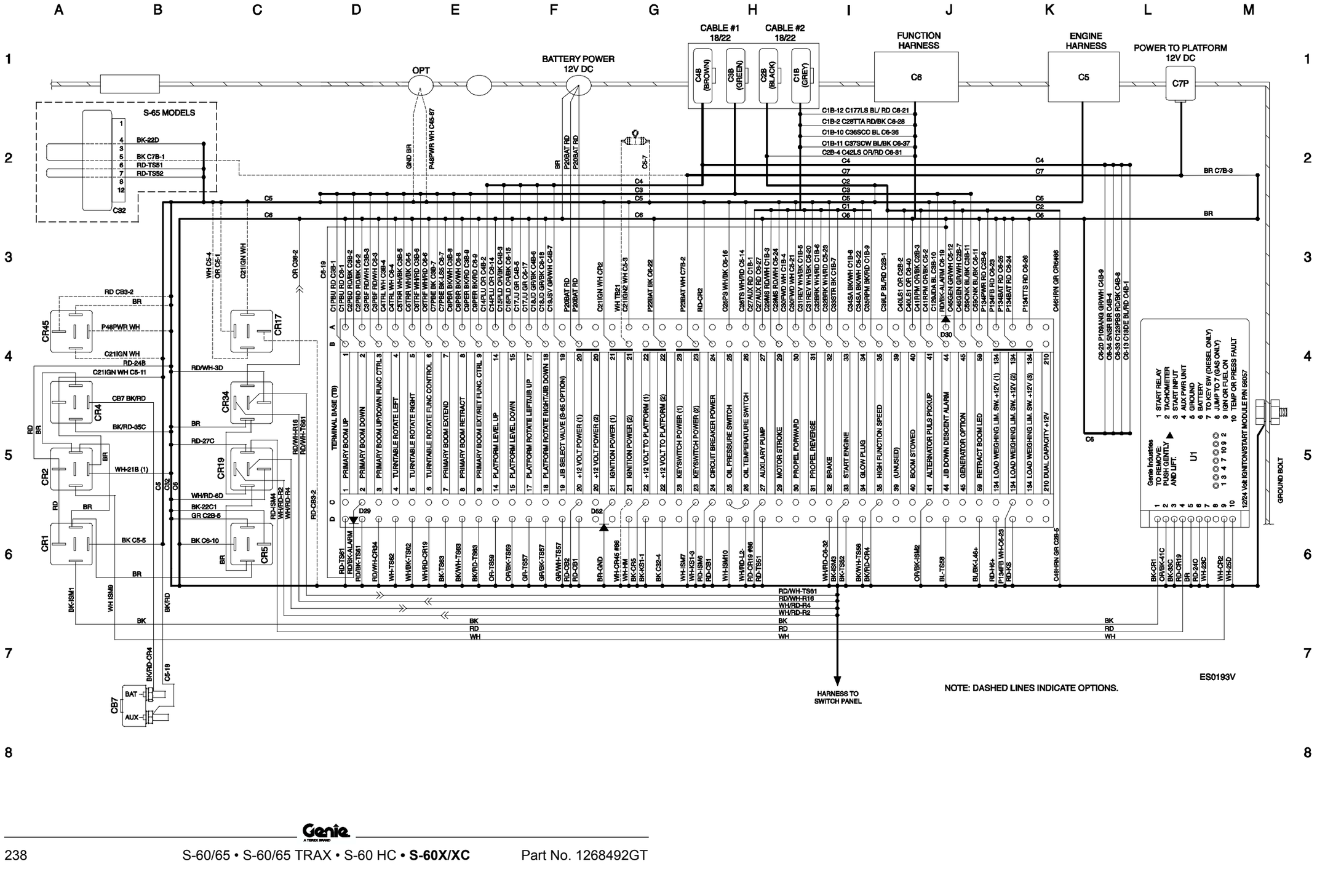


# Ground Control Box Terminal Strip Wiring Diagram, Perkins 404D-22 Models (ANSI • CSA)



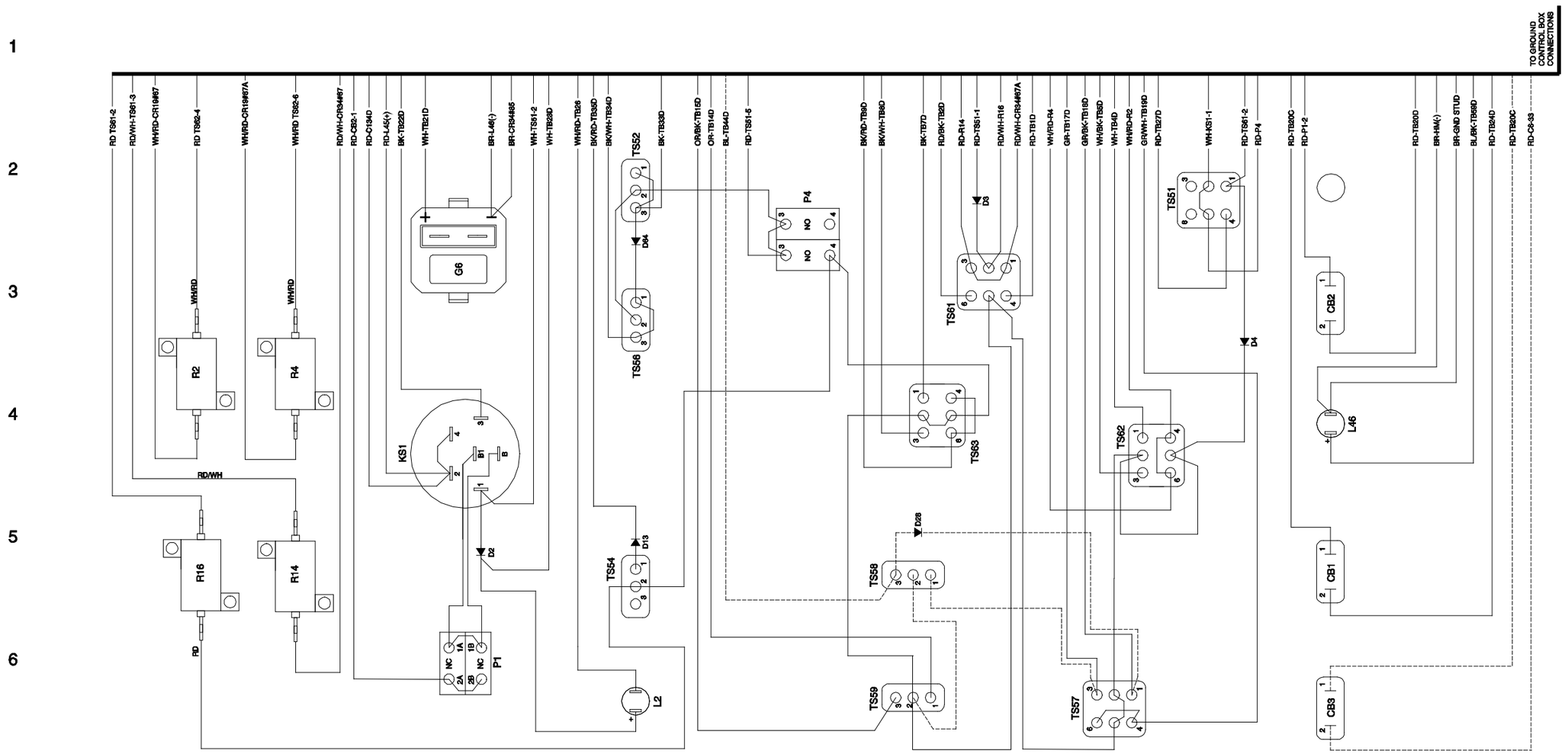
# Ground Control Box Terminal Strip Wiring Diagram,

## Perkins 404D-22 Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram,

## Perkins 404D-22 Models (ANSI • CSA)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| KS1 | KEY SWITCH |

| | |
|---|---|
| L2 | LED - CHECK ENGINE |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

| | |
|---|---|
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |

NOTE: DASHED LINES INDICATE OPTIONS.

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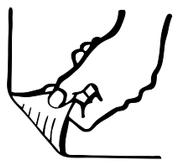
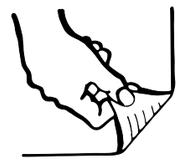
# Ground Control Box Switch Panel Wiring Diagram, Perkins 404D-22 Models (ANSI • CSA)

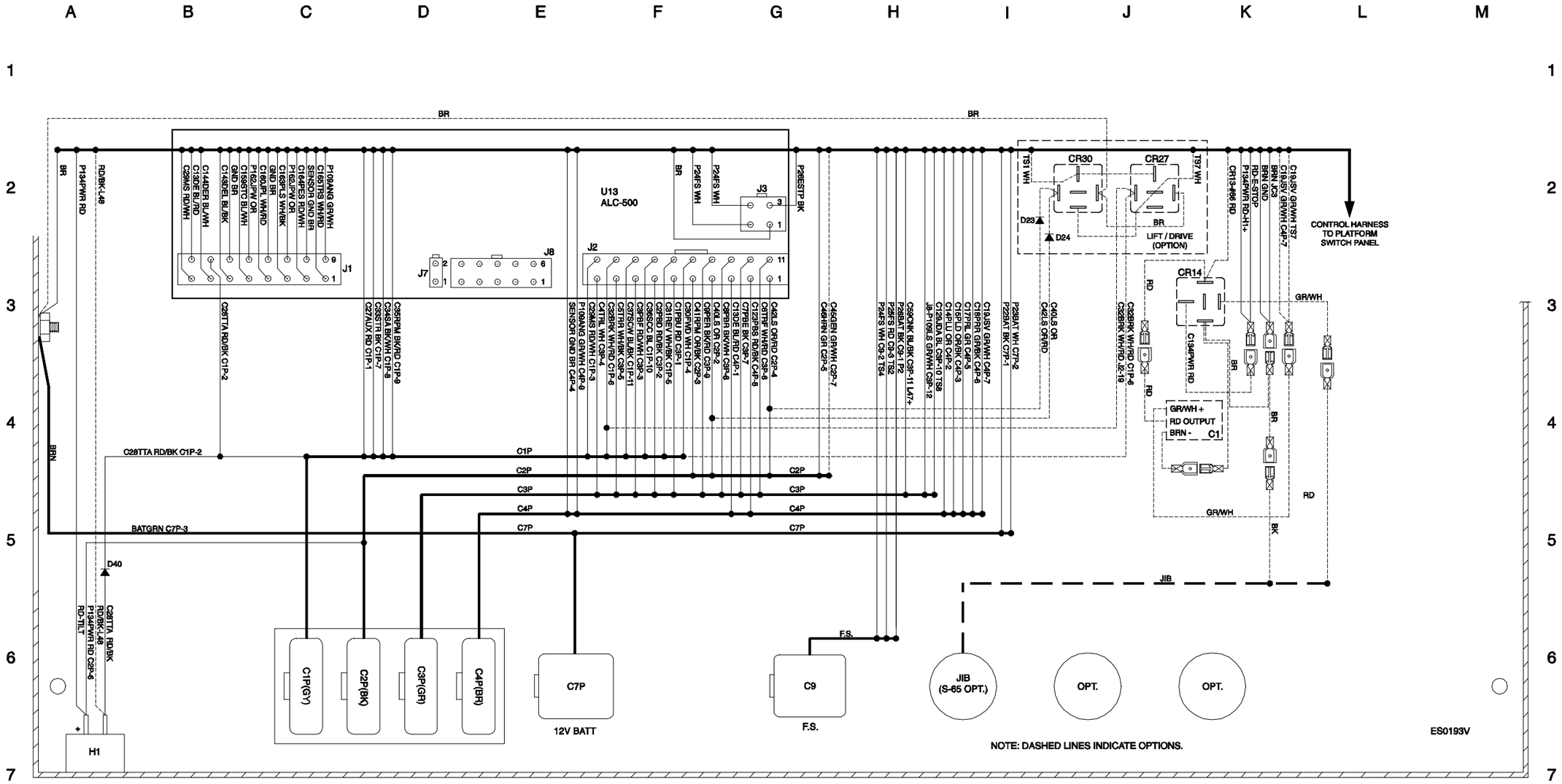


# Platform Control Box Wiring Diagram, Perkins 404D-22 Models (ANSI • CSA)



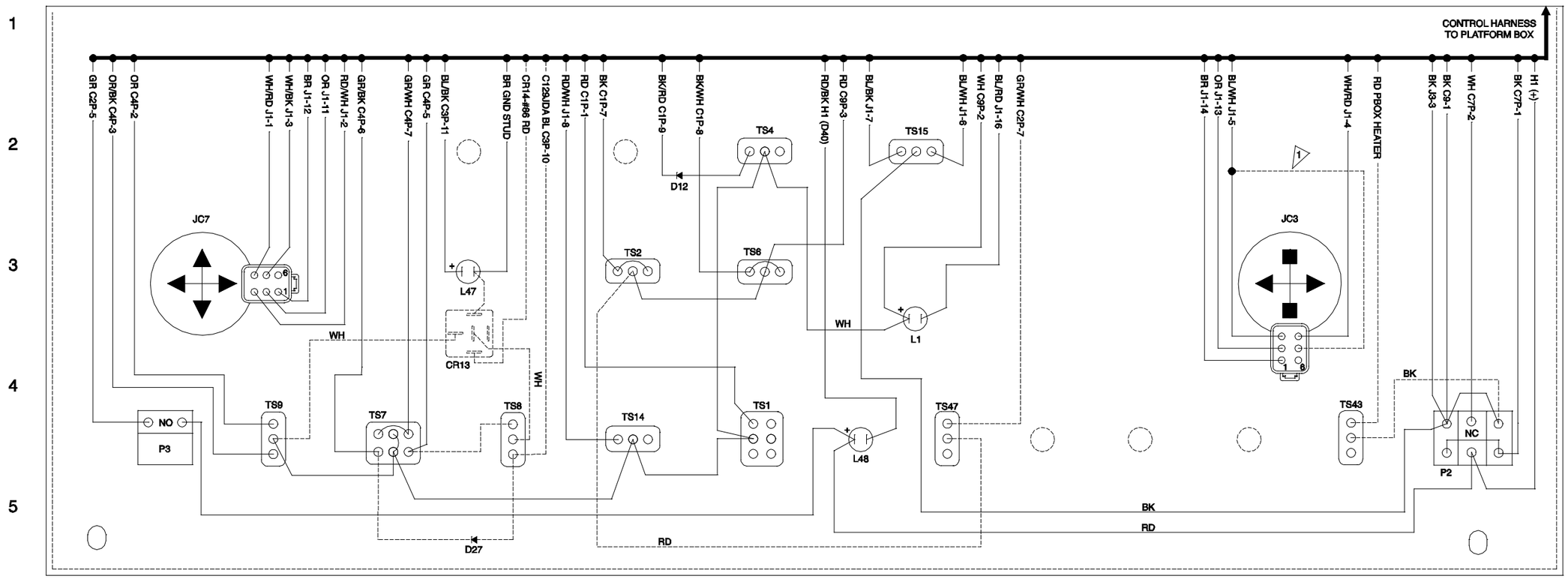
# Platform Control Box Wiring Diagram,

## Perkins 404D-22 Models (ANSI • CSA)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
BR
P134PWR RD
RD/BK-L48
BRN
C28TTA RD/BK C1P-2
C1P
C2P
C3P
C4P
C7P
BATGRN C7P-3
D40
C28TTA RD/BK
RD/BK-L48
P134PWR RD C2P-6
RD-TILT
H1
C1P(GY)
C2P(BK)
C3P(GR)
C4P(BR)
C7P
12V BATT
F.S.
C9
JIB
(S-65 OPT.)
OPT.
OPT.
U13
ALC-500
J1
J2
J3
J7
J8
P24FS WH
P26ESTP BK
CR30
CR27
CR14
TS1 WH
TS7 WH
D23
D24
LIFT / DRIVE
(OPTION)
CONTROL HARNESS
TO PLATFORM
SWITCH PANEL
GR/WH +
RD OUTPUT
BRN - C1
GR/WH
RD
BK
JIB
C19JSV GR/WH TS7
C19JSV GR/WH C4P-7
BRN JC3
P134PWR RD-H1+
C19JSV GR/WH C7P-1
P29BAT WH C7P-2
P29BAT BK C7P-1
C40LS OR
C42LS OR/RD
C45GBN GR/WH C2P-7
C46HRN GR C2P-5
C28RPM BK/RD C1P-9
C28SSTR BK C1P-7
C27AUX RD C1P-1
C28RPM BK/RD C2P-4
C28SSTR BK C2P-6
C27AUX RD C2P-5
P109ANG GR/WH C4P-9
SENSOR GND BR C4P-4
C28SNK BL/BK C3P-11 L47+
P29BAT BK C3P-1 P2
P25FS RD C3-3 TS2
P24FS WH C3-2 TS4
C28SBK WH/RD C1P-6
C28SBK WH/RD J2-19
C28SBK WH/RD C1P-6
C28SBK WH/RD C4P-1
C28SBK WH/RD C4P-2
C28SBK WH/RD C4P-3
C28SBK WH/RD C4P-5
C28SBK WH/RD C4P-6
C37FRL GR C4P-5
C18PRR GR/BK C4P-6
C19PLD OR/BK C4P-3
C19PLU OR C4P-2
C19PLU OR TS8
J8-P109LS GR/WH C3P-12
C41RPM OR/BK C2P-8
C40LS OR C2P-2
C8FER BK/RD C3P-9
C8FBR BK/WH C3P-8
C19DE BL/RD C4P-1
C7TPE BK C3P-7
C37TRR WH/BK C4P-8
C45LS OR/RD C2P-4
C8FBR RD/WH C3P-3
C37SCW BL/BK C1P-11
C28TRR WH/BK C3P-5
C28SBK WH/RD C1P-8
C28SNK RD/WH C1P-3
C28SBK WH/RD C3P-4
C8SSCC BL C1P-10
C2FBD RD/BK C3P-2
C1FBU RD C3P-1
C81REV WH/BK C1P-5
C30FWD WH C1P-4
C28SBK WH/RD C2P-3
C28SBK WH/RD C2P-1
C28SBK WH/RD C2P-2
C28SBK WH/RD C3P-1
C28SBK WH/RD C3P-2
C28SBK WH/RD C4P-7
C28SBK WH/RD C4P-8
C28SBK WH/RD C4P-9
C28SBK WH/RD C4P-10
C28SBK WH/RD C4P-11
C28SBK WH/RD C4P-12
C28SBK WH/RD C4P-13
C28SBK WH/RD C4P-14
C28SBK WH/RD C4P-15
C28SBK WH/RD C4P-16
C28SBK WH/RD C4P-17
C28SBK WH/RD C4P-18
C28SBK WH/RD C4P-19
C28SBK WH/RD

# Platform Control Box Switch Panel Wiring Diagram,

## Perkins 404D-22 Models (ANSI • CSA)




| | COMPONENT INDEX |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH CIRCUIT (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |

| | |
|---|---|
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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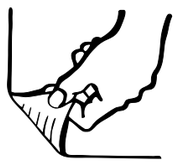
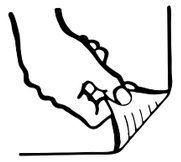
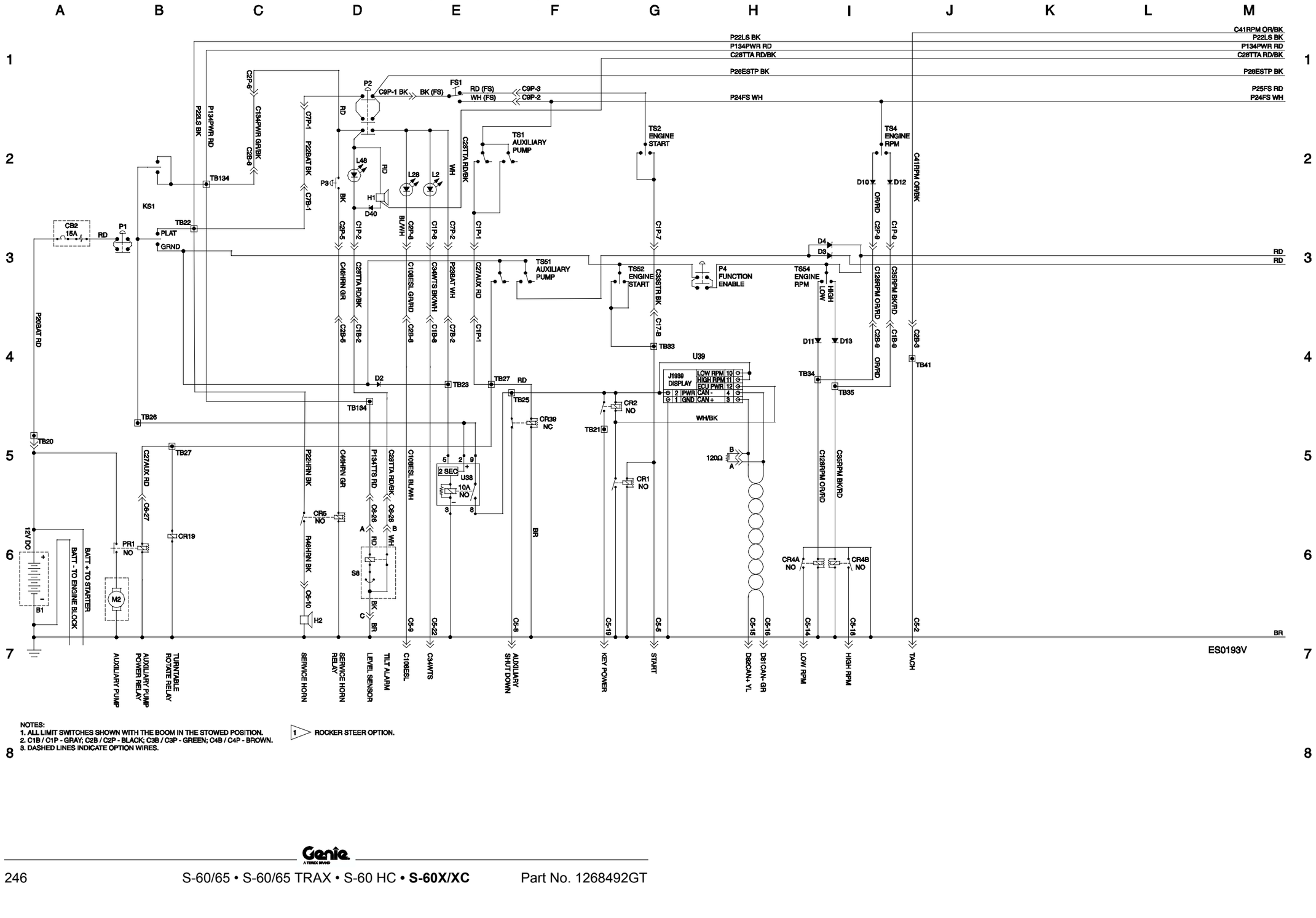
# Platform Control Box Switch Panel Wiring Diagram, Perkins 404D-22 Models (ANSI • CSA)



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



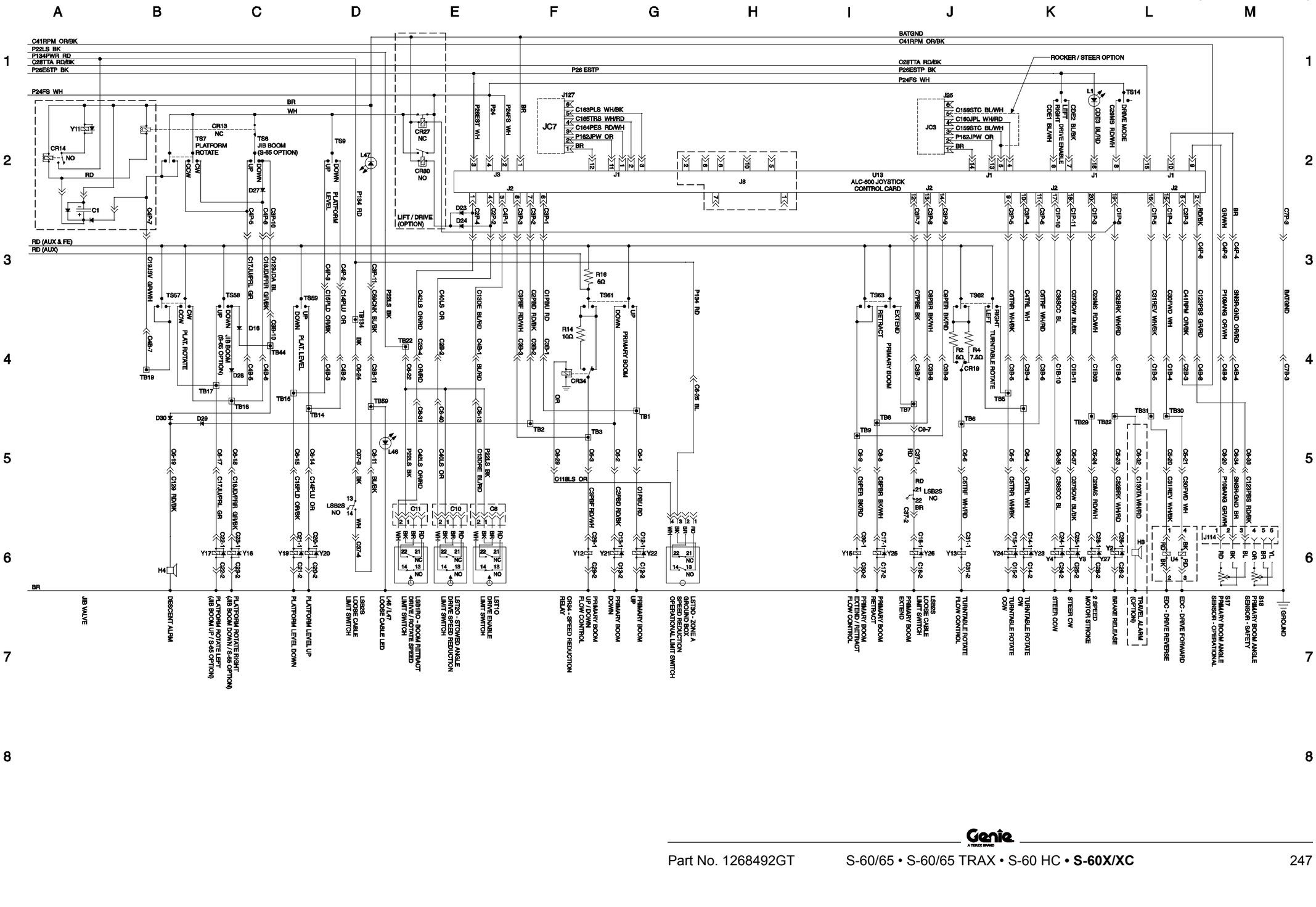
# Electrical Schematic, Perkins 404F-22 Models (ANSI • CSA)




NOTES:
1. ALL LIMIT SWITCHES SHOWN WITH THE BOOM IN THE STOWED POSITION.
2. C1B / C1P - GRAY; C2B / C2P - BLACK; C3B / C3P - GREEN; C4B / C4P - BROWN.
3. DASHED LINES INDICATE OPTION WIRES.

1 ROCKER STEER OPTION.

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


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134PWR RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BR
WH
RD (AUX & FE)
RD (AUX)
BATGND
P26 ESTP
ROCKER / STEER OPTION
U13
ALC-500 JOYSTICK
CONTROL CARD
LIFT / DRIVE
(OPTION)
JIB VALVE
DESCENT ALARM
PLATFORM ROTATE RIGHT
(JIB BOOM DOWN / S-60 OPTION)
PLATFORM ROTATE LEFT
(JIB BOOM UP / S-60 OPTION)
PLATFORM LEVEL DOWN
PLATFORM LEVEL UP
LSB2S
LOOSE CABLE
LIMIT SWITCH
L46 / L47
LOOSE CABLE LED
LST2D - BOOM RETRACT
SPEED REDUCTION
LIMIT SWITCH
LST2I - STOWED ANGLE
DRIVE SPEED REDUCTION
LIMIT SWITCH
LST1C
DRIVE ENABLE
LIMIT SWITCH
CR34 - SPEED REDUCTION
RELAY
PRIMARY BOOM
UP / DOWN
FLOW CONTROL
PRIMARY BOOM
DOWN
PRIMARY BOOM
UP
LST3D - ZONE A
GROUND SPEED
REDUCTION
OPERATIONAL LIMIT SWITCH
TURNTABLE ROTATE
FLOW CONTROL
TURNTABLE ROTATE
CW
TURNTABLE ROTATE
CCW
STEER CW
STEER CCW
2 SPEED
MOTOR STROKE
BRAKE RELEASE
TRAVEL ALARM
(OPTION)
EDC - DRIVE REVERSE
EDC - DRIVE FORWARD
PRIMARY BOOM ANGLE
SENSOR - OPERATIONAL
S17
PRIMARY BOOM ANGLE
SENSOR - SAFETY
S18
PRIMARY BOOM ANGLE
SENSOR - SAFETY
GROUND
PRIMARY BOOM
EXTEND / RETRACT
FLOW CONTROL
PRIMARY BOOM
RETRACT
PRIMARY BOOM
EXTEND
PLAT. ROTATE
PLAT. LEVEL
JIB BOOM
(S-60 OPTION)
JIB BOOM
(S-65 OPTION)
PLATFORM
ROTATE
PLATFORM
LEVEL
LEFT
RIGHT
TURNTABLE ROTATE
EXTEND
RETRACT
PRIMARY BOOM
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
DRIVE MODE
LIFT / DRIVE (OPTION)
CR13 NC
CR14 NO
CR27 NC
CR28 NO
L1
L47
L46
H1
H2
H3
H4
Y11
C1
D16
D23
D24
D27
D28
D29
D30
R16 5Ω
R14 10Ω
R2 5Ω
R4 7.5Ω
CR19
CR34
TS57
TS58
TS59
TS61
TS62
TS63
TS69
TS9
TS14
TB1
TB2
TB3
TB5
TB6
TB7
TB9
TB14
TB15
TB16
TB17
TB19
TB22
TB29
TB30
TB31
TB32
TB44
TB59
J1
J2
J3
J8
J25
J114
JC3
JC7
J127
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
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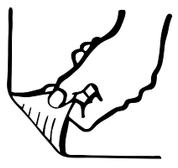
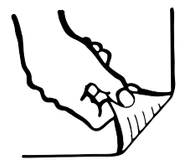
C33
C34
C35
C36
C37
C38
C39
C40

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

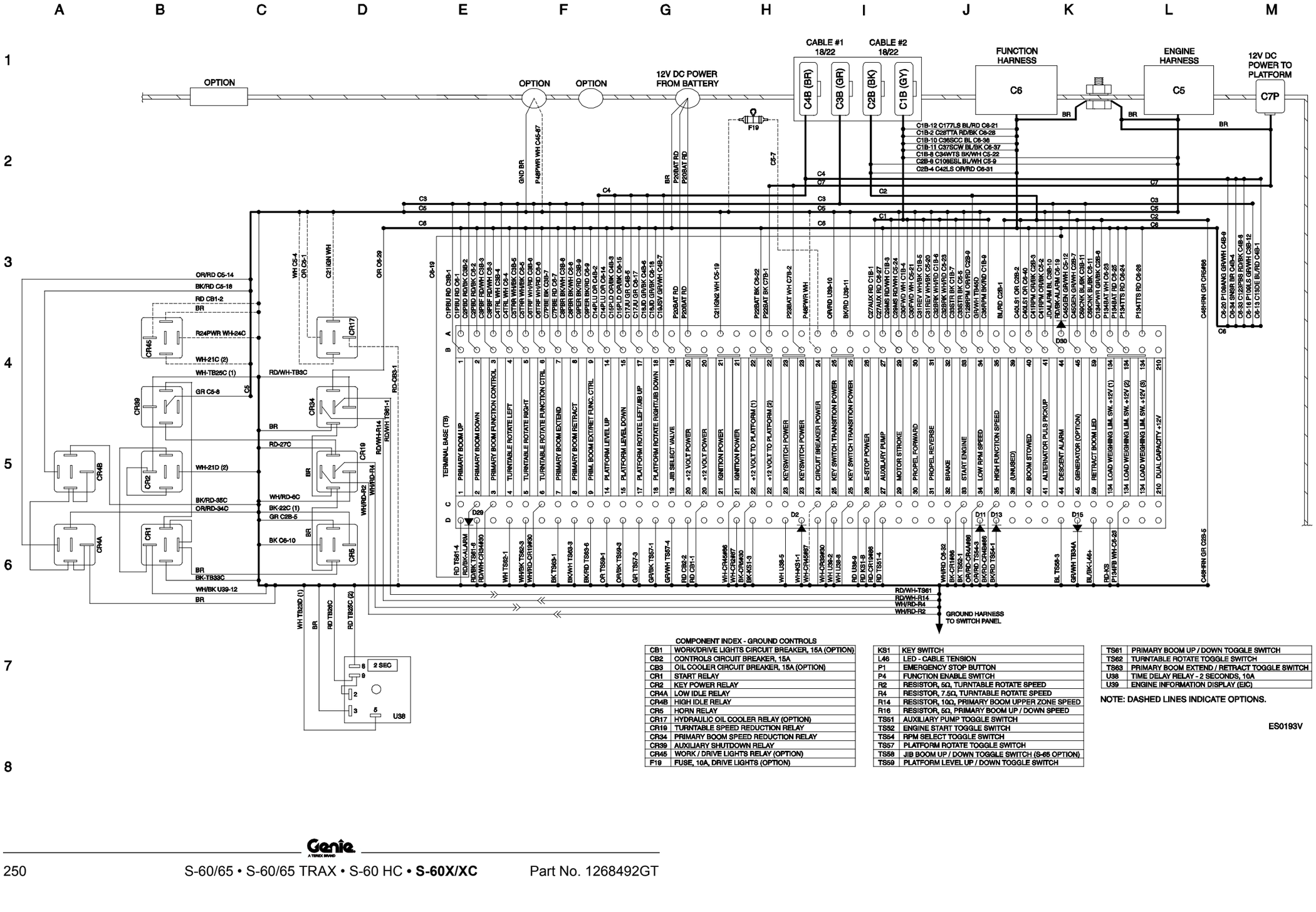


# Ground Control Box Terminal Strip Wiring Diagram, Perkins 404F-22 Models (ANSI • CSA)



# Ground Control Box Terminal Strip Wiring Diagram,

## Perkins 404F-22 Models (ANSI • CSA)




**COMPONENT INDEX - GROUND CONTROLS**

| | |
|---|---|
| CB1 | WORK/DRIVE LIGHTS CIRCUIT BREAKER, 15A (OPTION) |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | OIL COOLER CIRCUIT BREAKER, 15A (OPTION) |
| CR1 | START RELAY |
| CR2 | KEY POWER RELAY |
| CR4A | LOW IDLE RELAY |
| CR4B | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| CR39 | AUXILIARY SHUTDOWN RELAY |
| CR45 | WORK / DRIVE LIGHTS RELAY (OPTION) |
| F19 | FUSE, 10A, DRIVE LIGHTS (OPTION) |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |

| | |
|---|---|
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U38 | TIME DELAY RELAY - 2 SECONDS, 10A |
| U39 | ENGINE INFORMATION DISPLAY (EIC) |

NOTE: DASHED LINES INDICATE OPTIONS.

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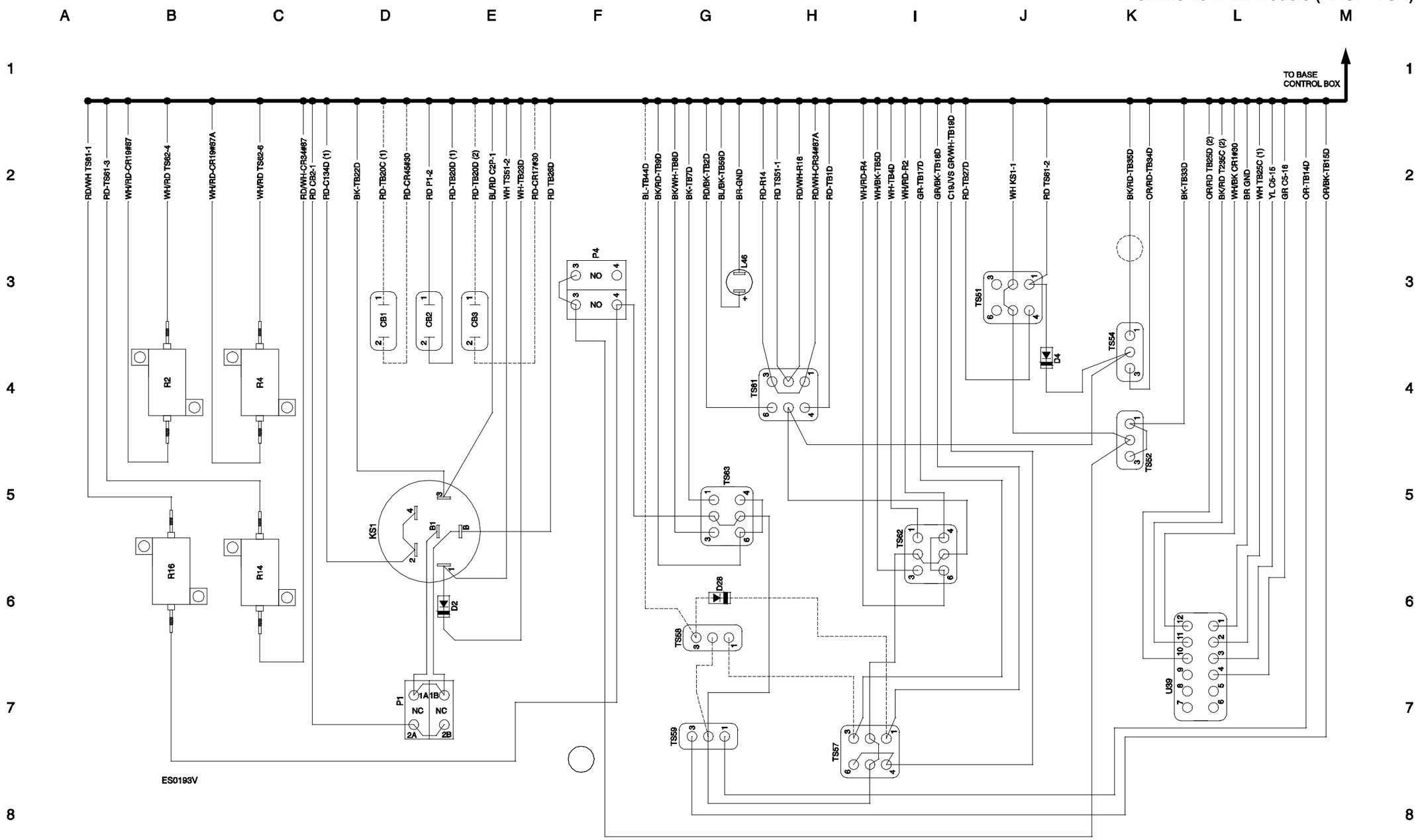
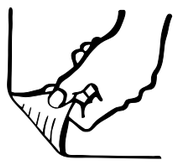
# Ground Control Box Switch Panel Wiring Diagram,

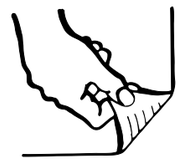
## Perkins 404F-22 Models (ANSI • CSA)



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

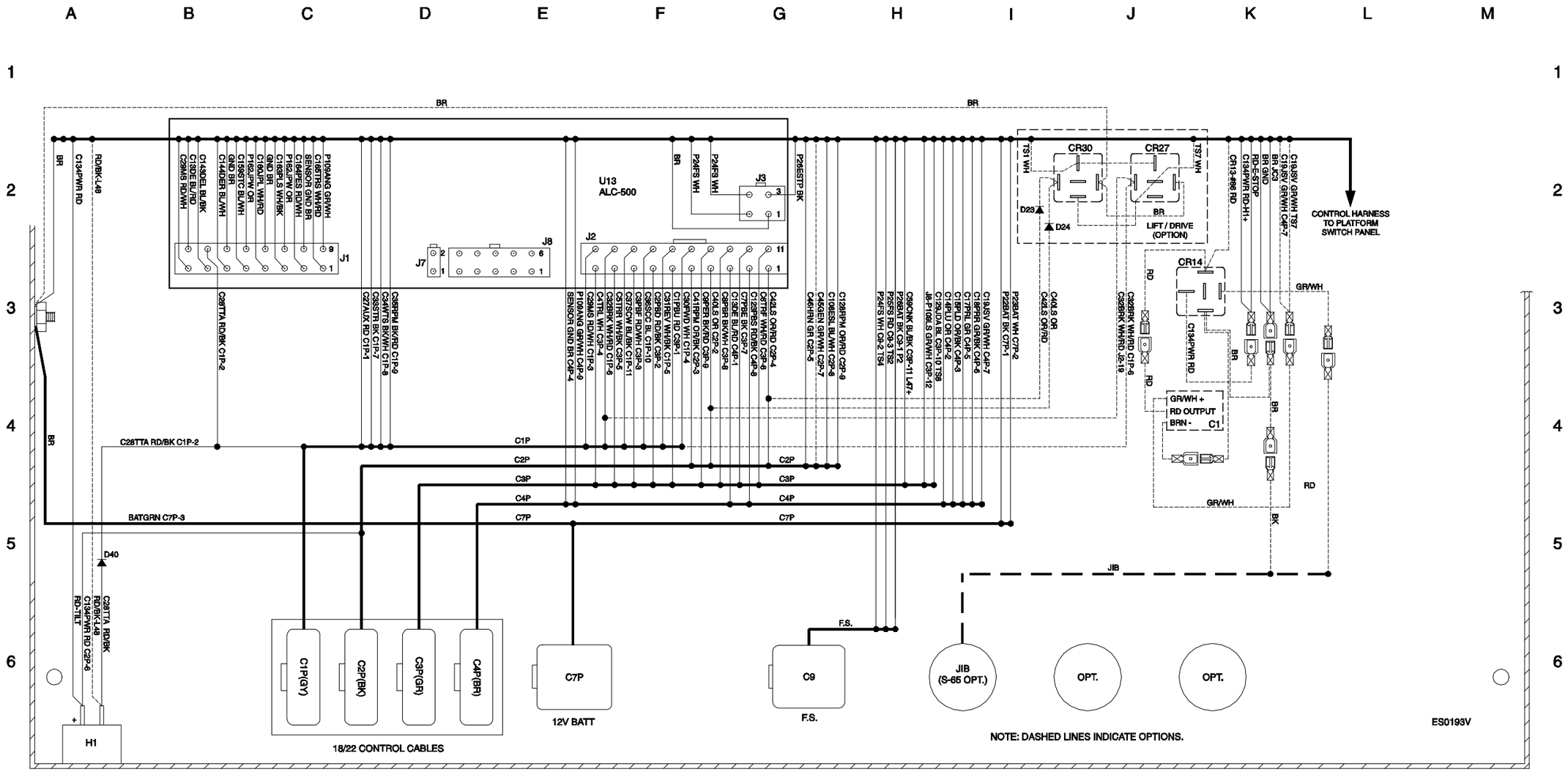


# Platform Control Box Wiring Diagram, Perkins 404F-22 Models (ANSI • CSA)



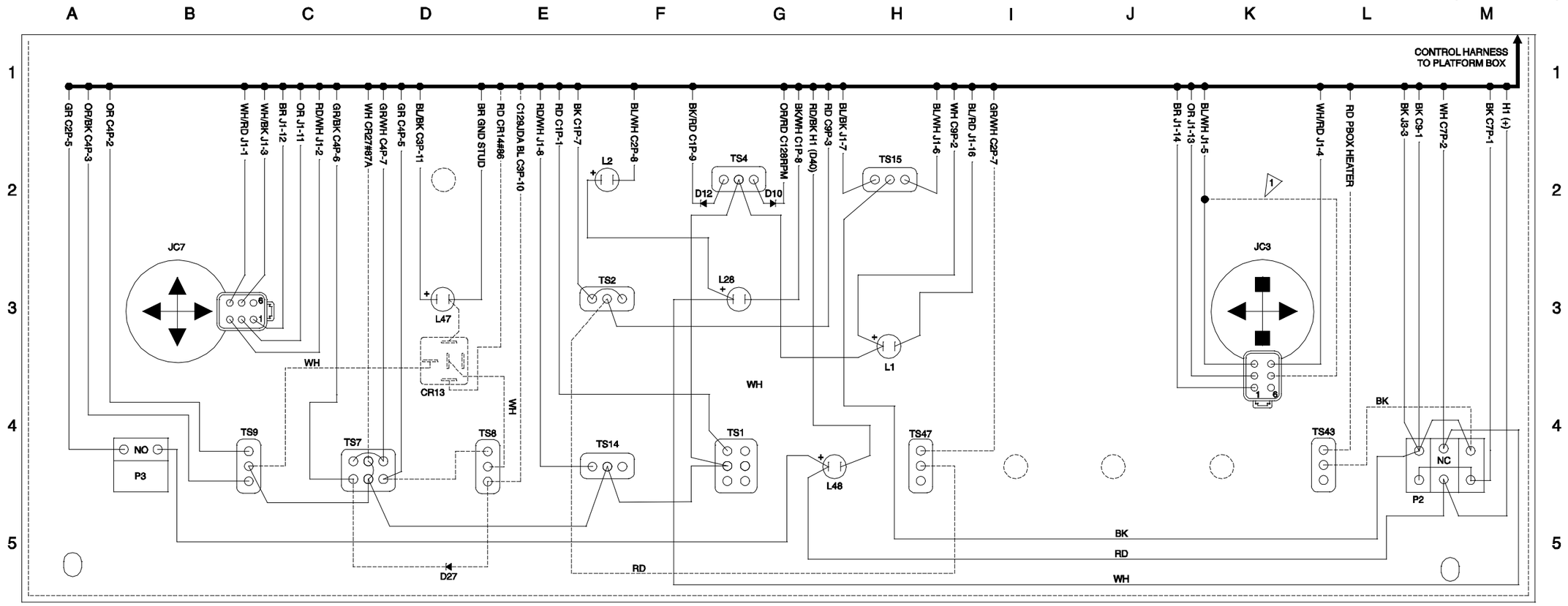
# Platform Control Box Wiring Diagram,

## Perkins 404F-22 Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram,

## Perkins 404F-22 Models (ANSI • CSA)




COMPONENT INDEX

| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH CIRCUIT (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L2 | LED - CHECK ENGINE |
| L28 | LED - WAIT TO START (GLOW PLUGS) |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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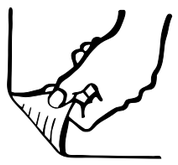
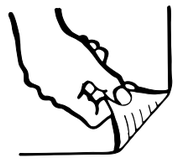
# Platform Control Box Switch Panel Wiring Diagram, Perkins 404F-22 Models (ANSI • CSA)

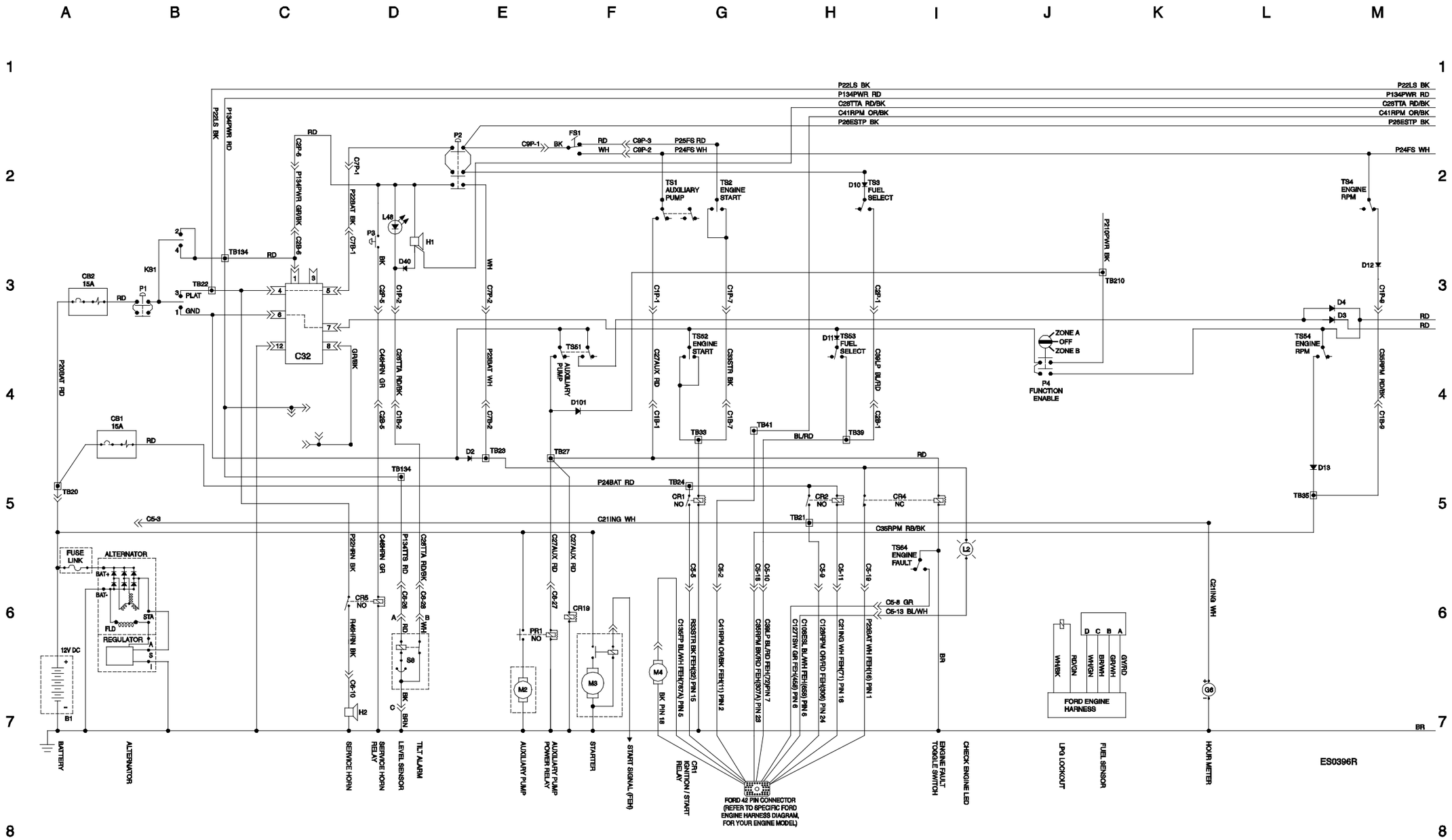


# Electrical Schematic, S-60X • S-60XC
# Ford MSG-425 EFI Models (ANSI • CSA)



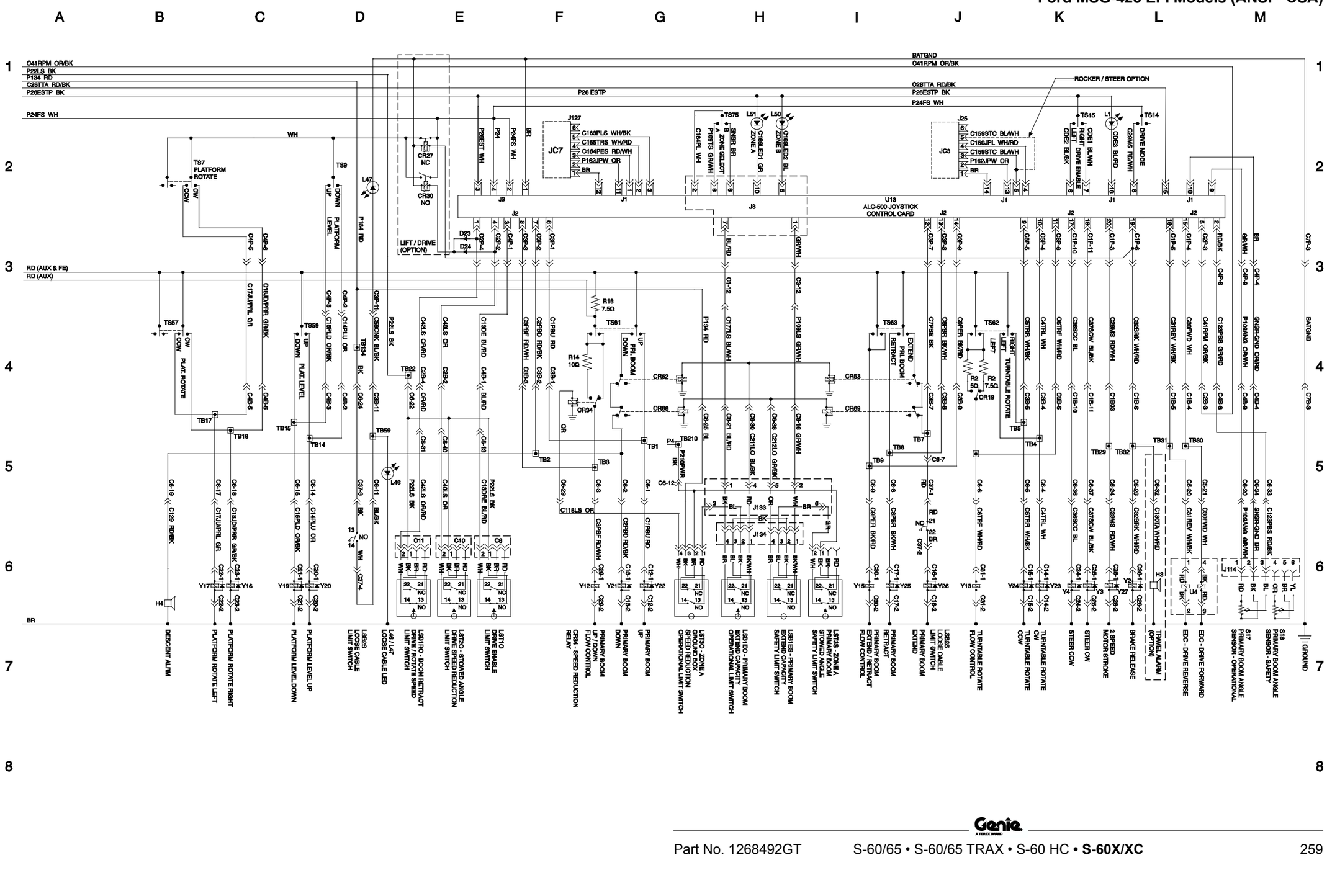
# Electrical Schematic, S-60X • S-60XC Ford

## MSG-425 EFI Models (ANSI • CSA)

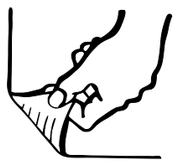


# Electrical Schematic, S-60X • S-60XC

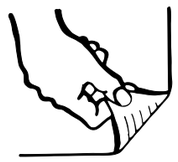
## Ford MSG-425 EFI Models (ANSI • CSA)



# Electrical Schematic, S-60X • S-60XC
# Ford MSG-425 EFI Models (ANSI • CSA)

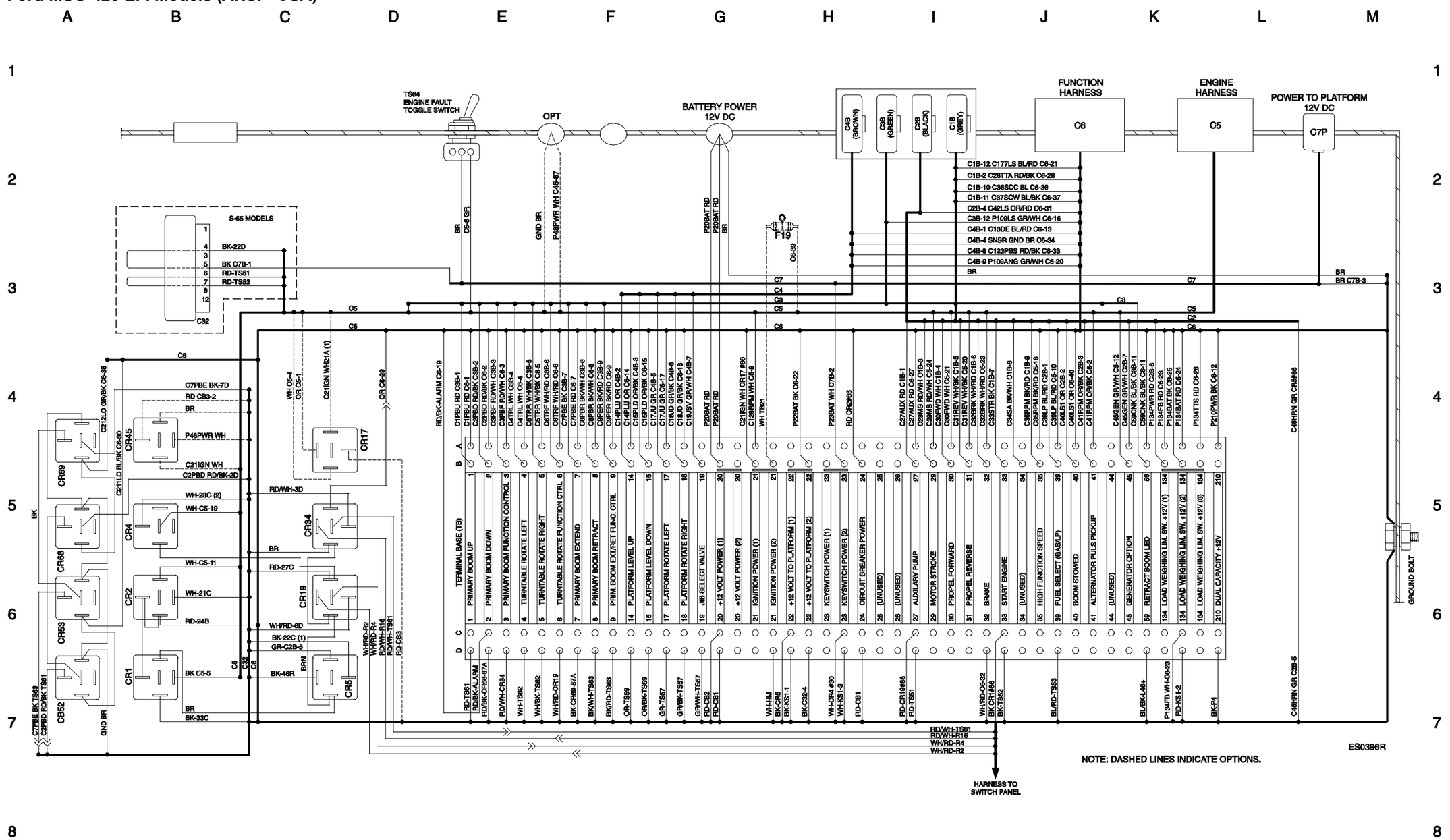


# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC Ford MSG-425 EFI Models (ANSI • CSA)



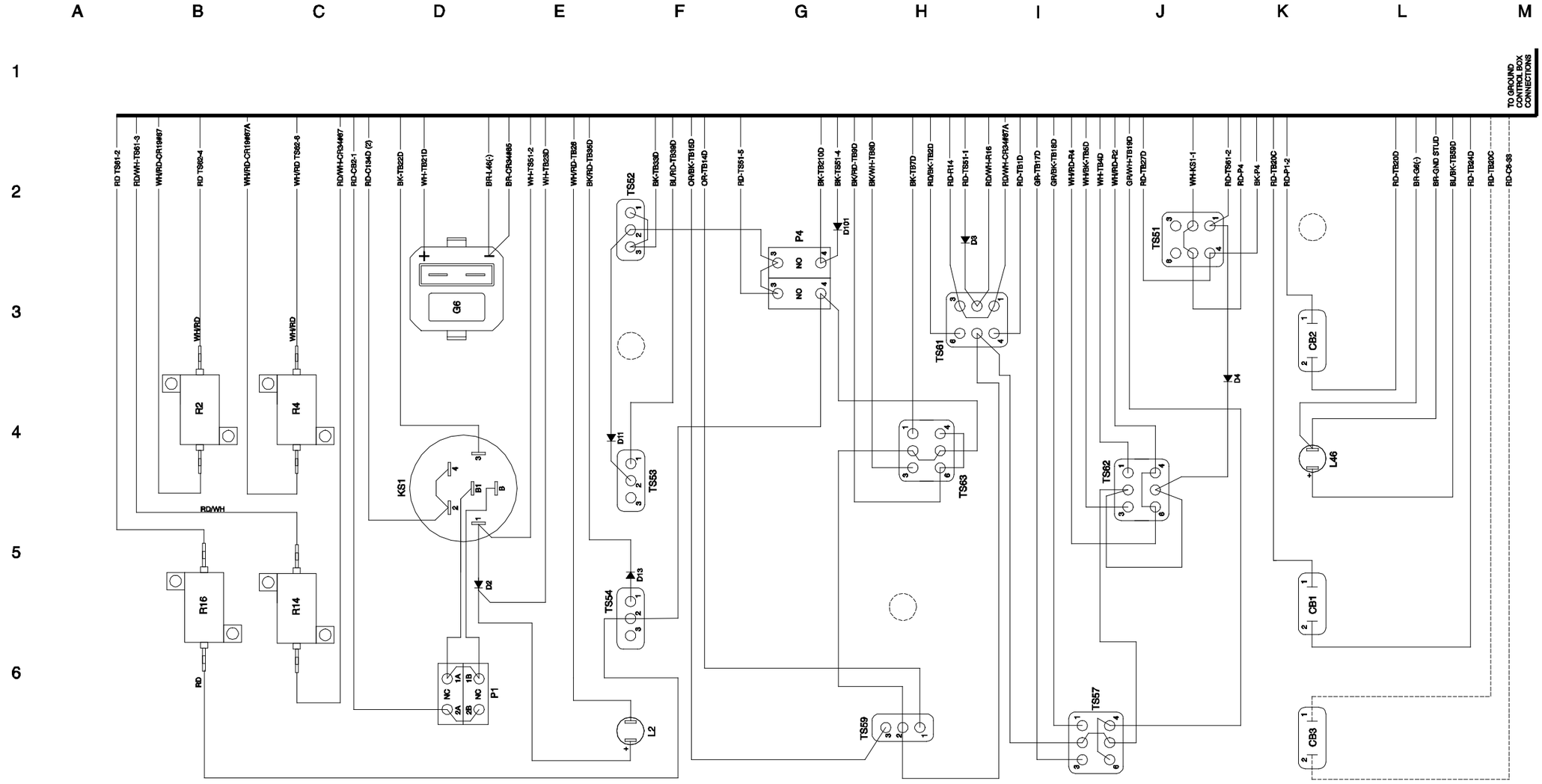
# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC

## Ford MSG-425 EFI Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Ford MSG-425 EFI Models (ANSI • CSA)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| KS1 | KEY SWITCH |

| | |
|---|---|
| L2 | LED - CHECK ENGINE |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 7.5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS53 | FUEL SELECT TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |

| | |
|---|---|
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |

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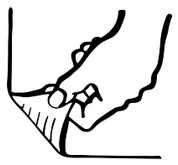
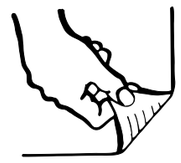
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Ford MSG-425 EFI Models (ANSI • CSA)

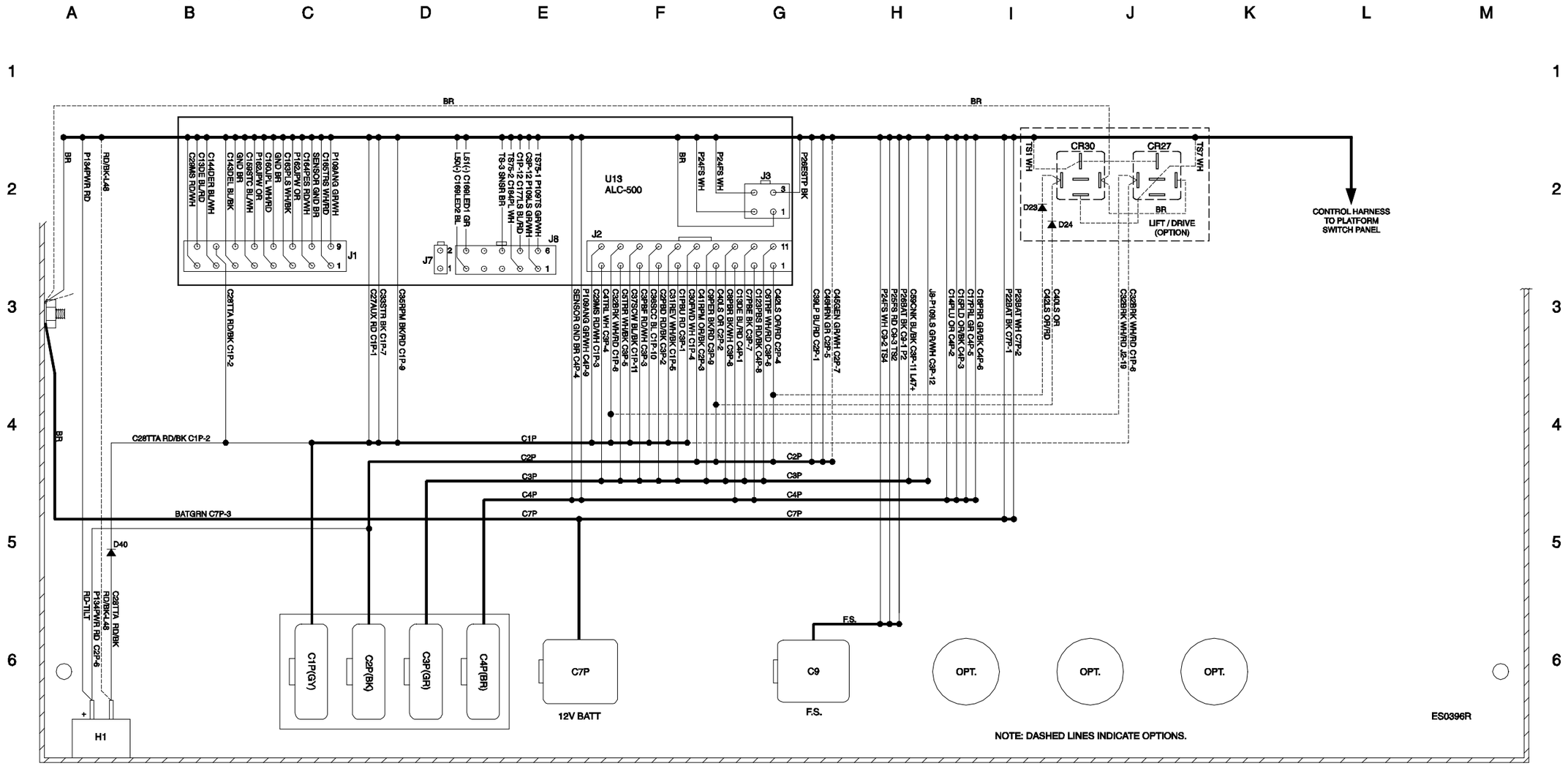


# Platform Control Box Wiring Diagram, S-60X • S-60XC
# Ford MSG-425 EFI Models (ANSI • CSA)



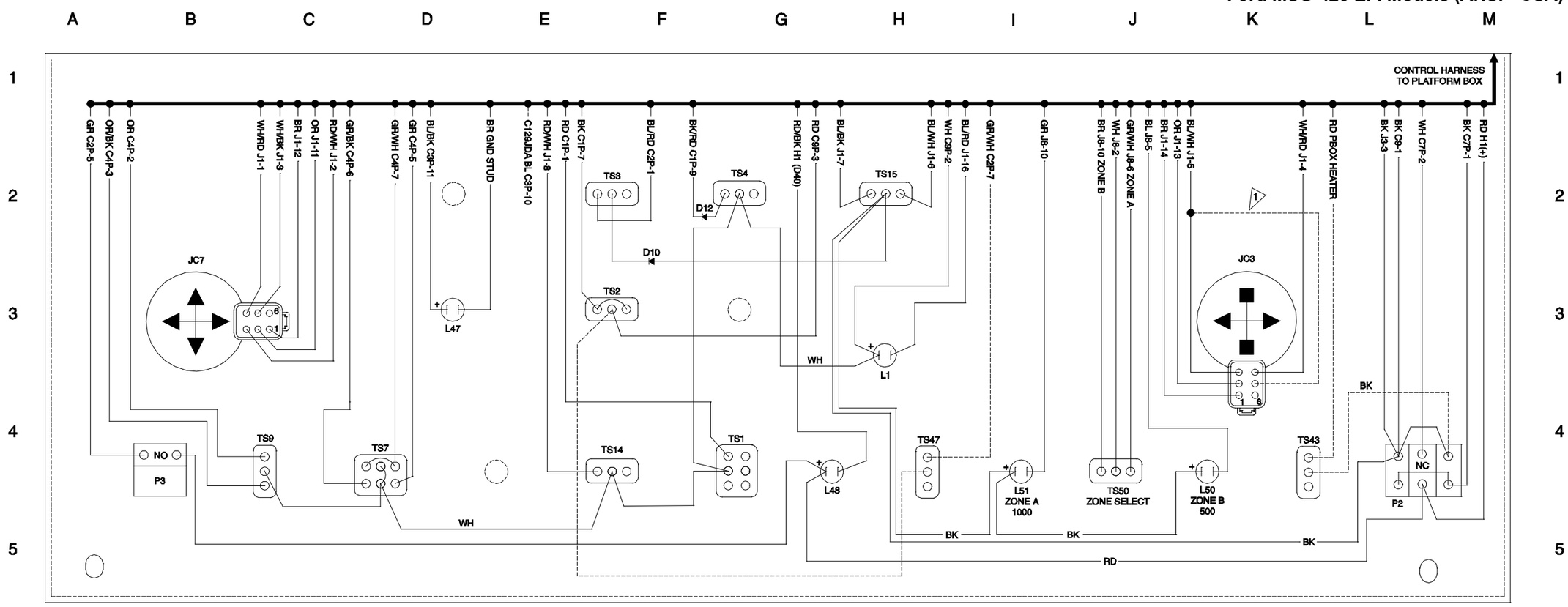
# Platform Control Box Wiring Diagram, S-60X • S-60XC

## Ford MSG-425 EFI Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Ford MSG-425 EFI Models (ANSI • CSA)

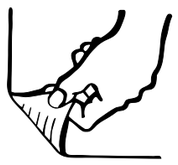



| COMPONENT INDEX | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | LIMIT SWITCH (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| L50 | LED - ZONE A |
| L51 | LED - ZONE B |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS3 | FUEL SELECT TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| TS50 | ZONE SELECT TOGGLE SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

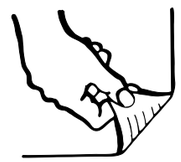
1 ROCKER / STEER OPTION.

ES0396R

# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC Ford MSG-425 EFI Models (ANSI • CSA)

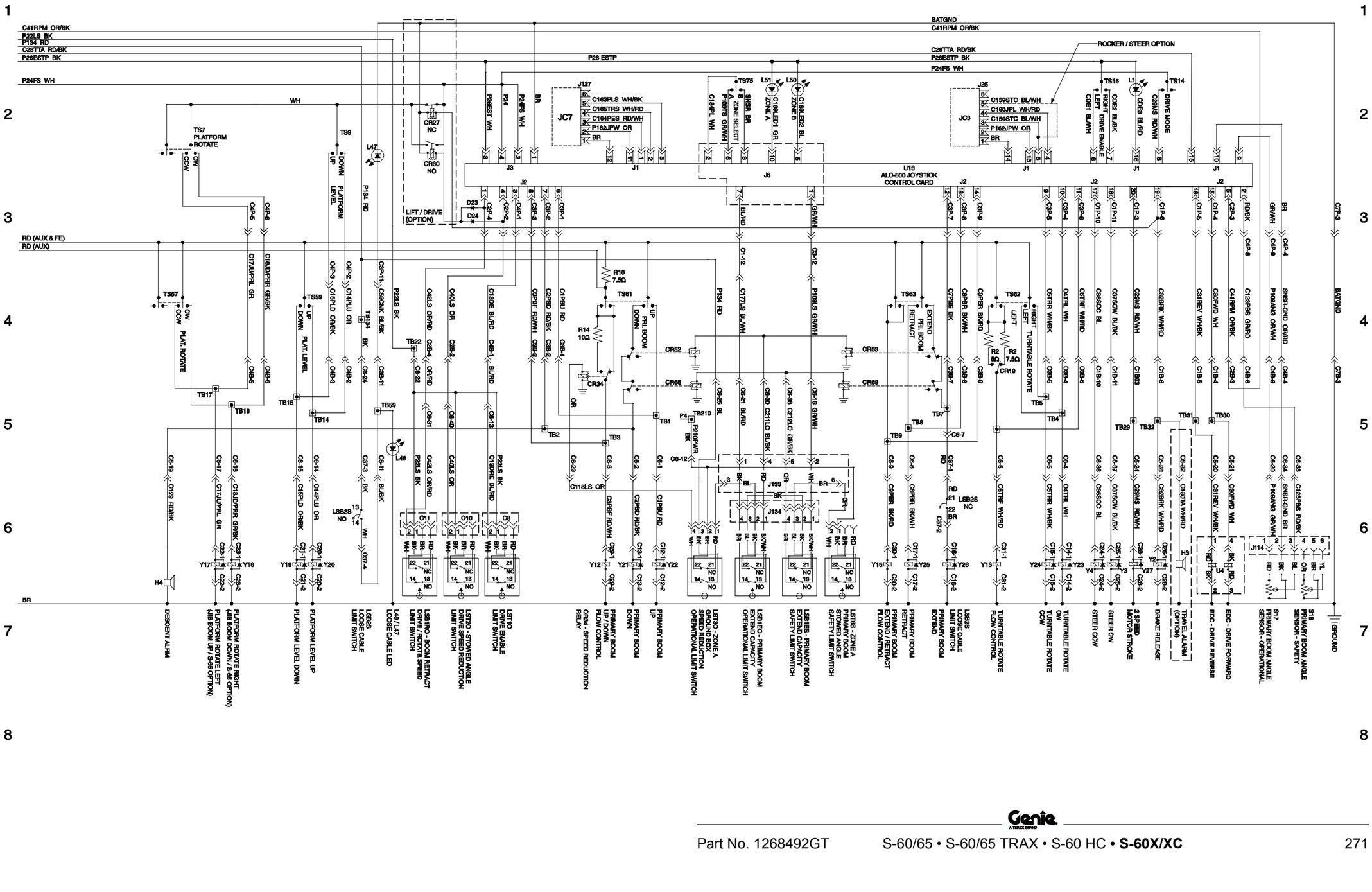


# Electrical Schematic, S-60X • S-60XC, Deutz D2011L03i Models (ANSI • CSA)

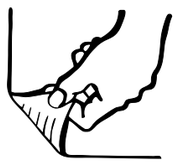


# Electrical Schematic, S-60X • S-60XC, Deutz D2011L03i Models (ANSI • CSA)

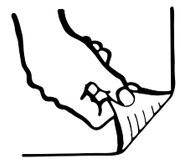
# Electrical Schematic, S-60X • S-60XC, Deutz D2011L03i Models (ANSI • CSA)



# Electrical Schematic, S-60X • S-60XC, Deutz D2011L03i Models (ANSI • CSA)

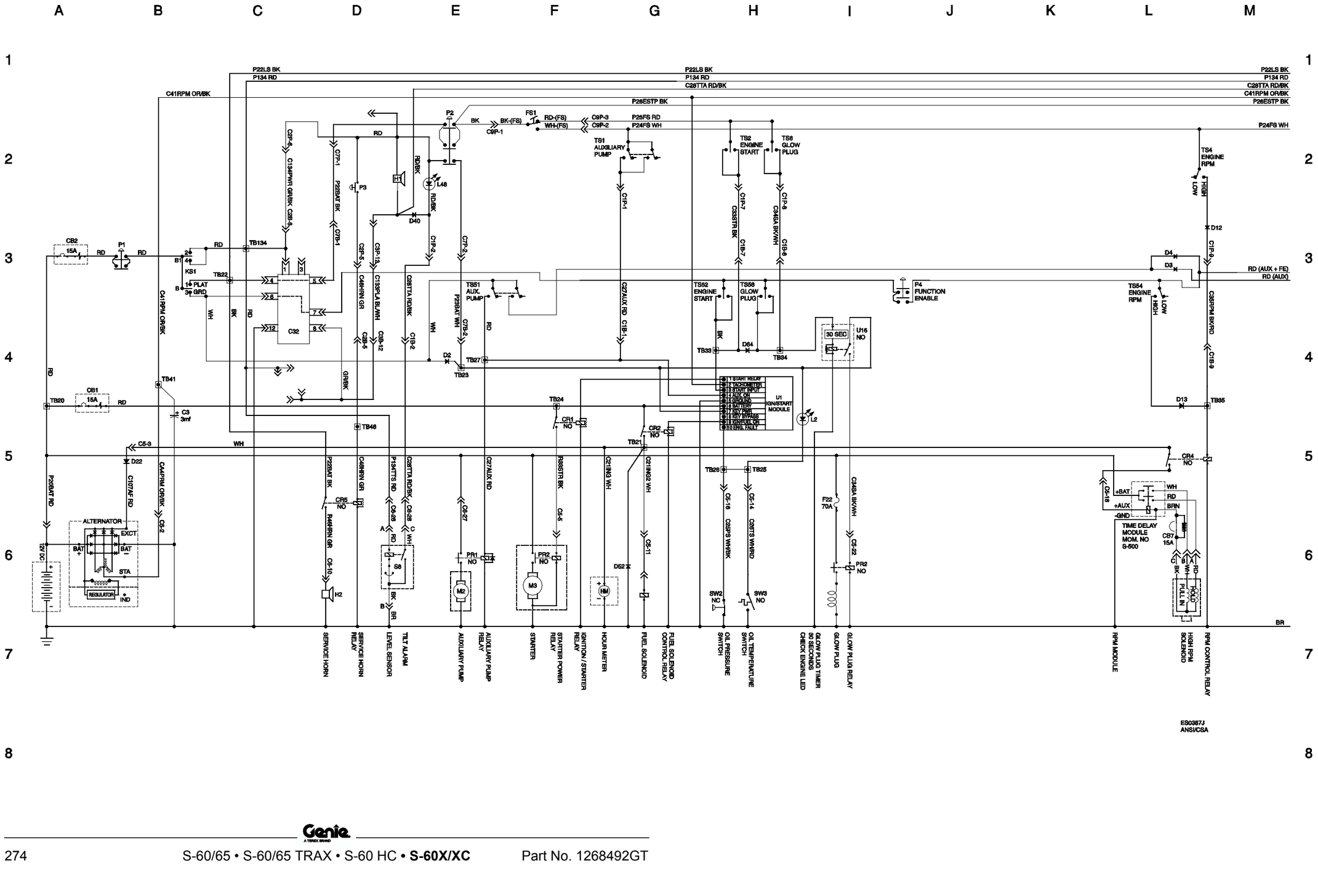


# Electrical Schematic, S-60X • S-60XC
# Deutz TD2011L04i Models (ANSI • CSA)



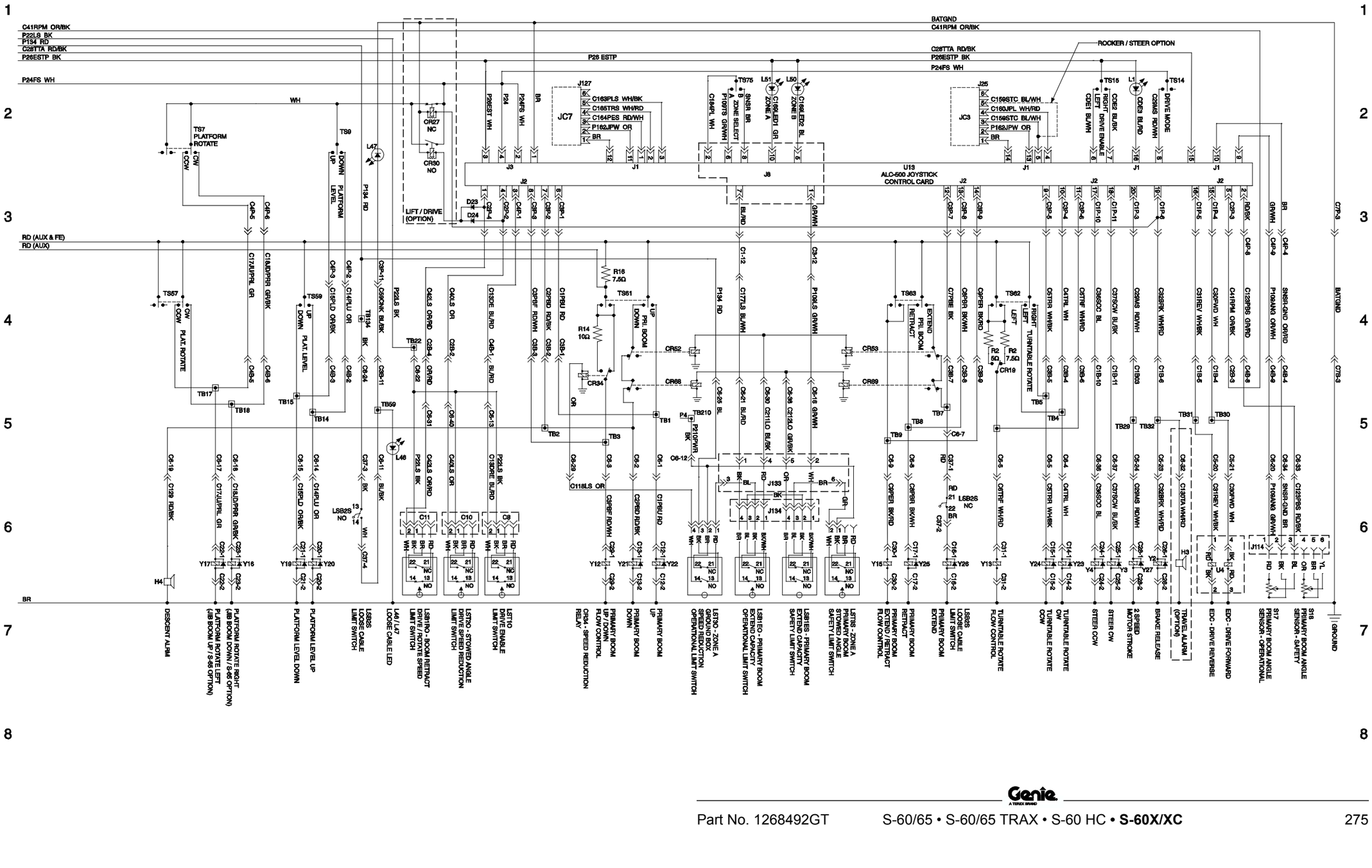
# Electrical Schematic, S-60X • S-60XC

## Deutz TD2011L04i Models (ANSI • CSA)



# Electrical Schematic, S-60X • S-60XC

## Deutz TD2011L04i Models (ANSI • CSA)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134 RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BATGND
P26 ESTP
ROCKER / STEER OPTION
WH
TS7 PLATFORM ROTATE
TS9
L47
CR27 NC
CR30 NO
LIFT / DRIVE (OPTION)
J127
JC7
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
TS75
L51
L50
C169LED1 GR
C166LED2 BL
P109TS GR/WH
SNSR BR
ZONE SELECT
C164PEL WH
ZONE A
ZONE B
U13
ALC-500 JOYSTICK CONTROL CARD
JC3
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
TS15
TS14
L1
CDE2 BL/BK
CDE3 BL/RD
C23MS RD/WH
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
DRIVE MODE
CDE1 BL/WH
RD (AUX & FE)
RD (AUX)
R16 7.5Ω
R14 10Ω
TS61
TS57
TS59
TS63
TS62
EXTEND PRI. BOOM
RETRACT
LEFT
RIGHT
TURNTABLE ROTATE
E2 5Ω
E2 7.5Ω
CR19
CR52
CR53
CR66
CR69
CR34
TB1
TB2
TB3
TB4
TB5
TB6
TB7
TB8
TB9
TB14
TB15
TB17
TB18
TB22
TB59
TB29
TB30
TB31
TB32
P4
TB210
P210PWR
C6-12
L46
L48
C6-11
C6-14
C6-15
C6-16
C6-17
C6-18
C6-19
C6-20
C6-21
C6-22
C6-23
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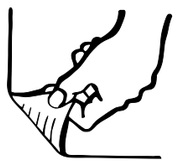
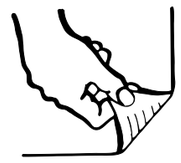
C6-50
C6-51
C6-52
C6-53

# Electrical Schematic, S-60X • S-60XC
# Deutz TD2011L04i Models (ANSI • CSA)

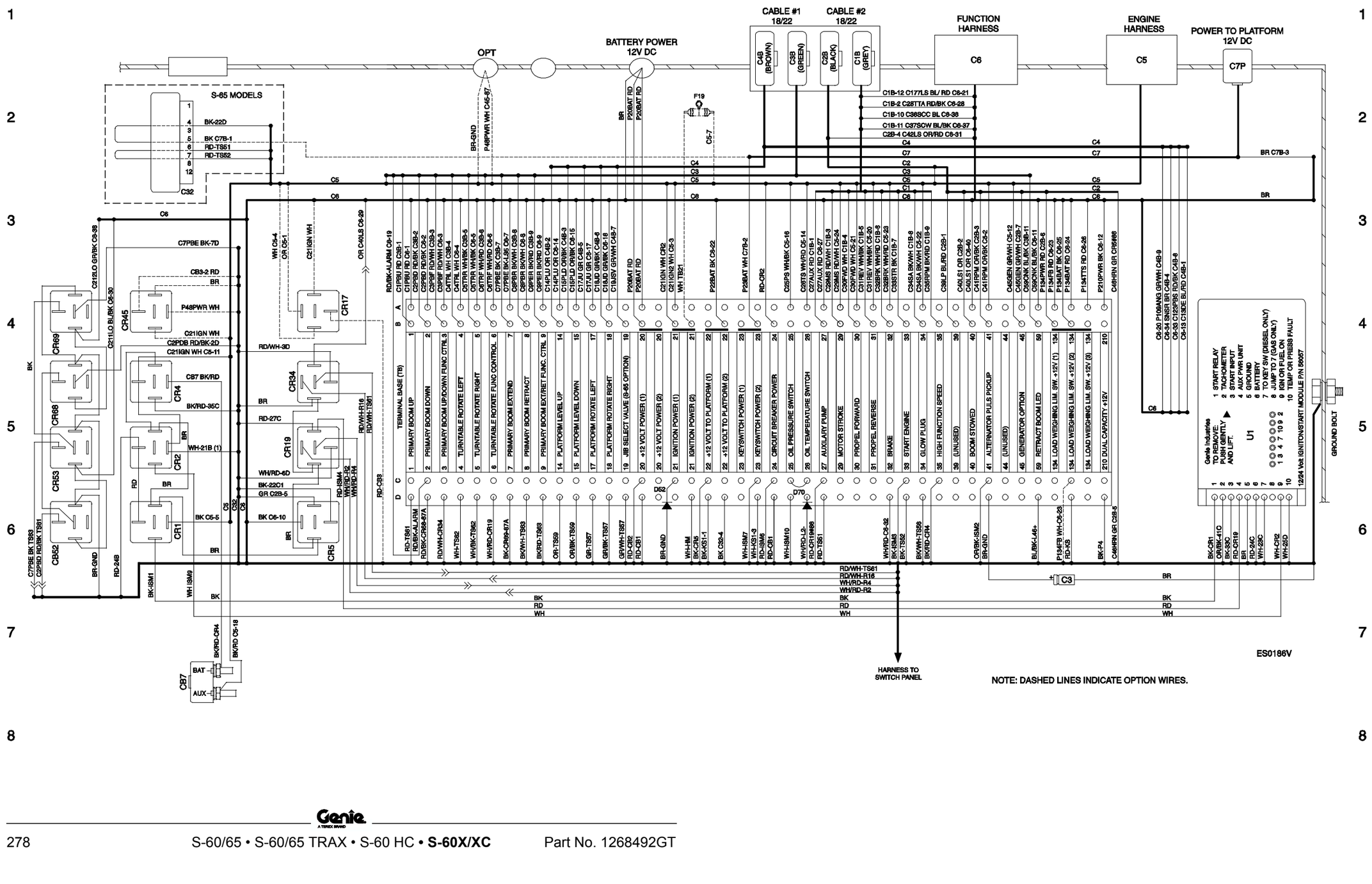


# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



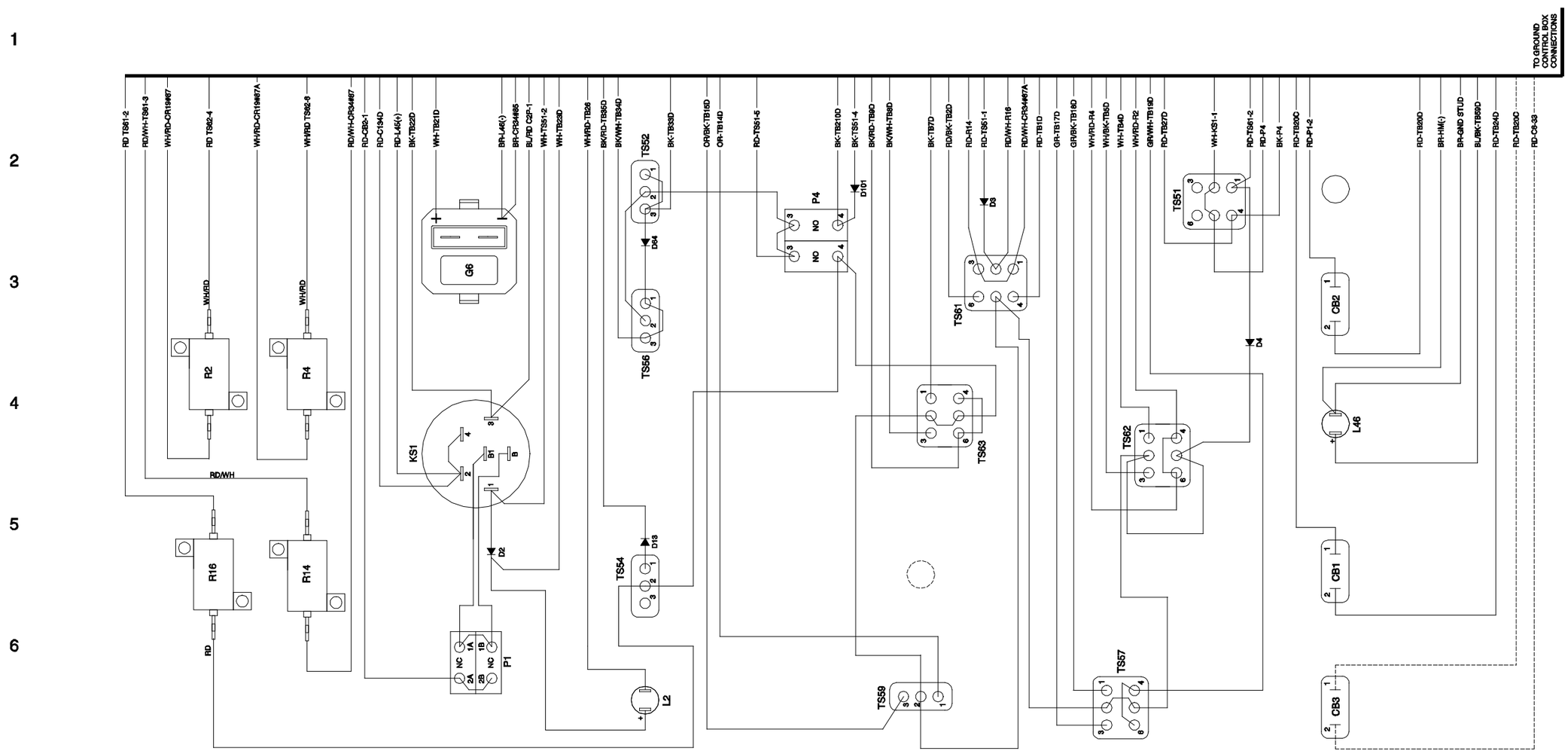
# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC,

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| CR45 | WORK LIGHTS RELAY (OPTION) |
| G6 | HOUR METER |
| KS1 | KEY SWITCH |

| | |
|---|---|
| L2 | LED - CHECK ENGINE |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 7.5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |

| | |
|---|---|
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |

NOTE: DASHED LINES INDICATE OPTIONS.

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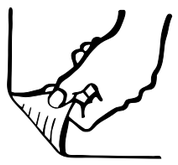
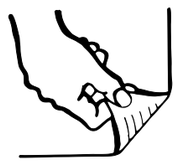
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)

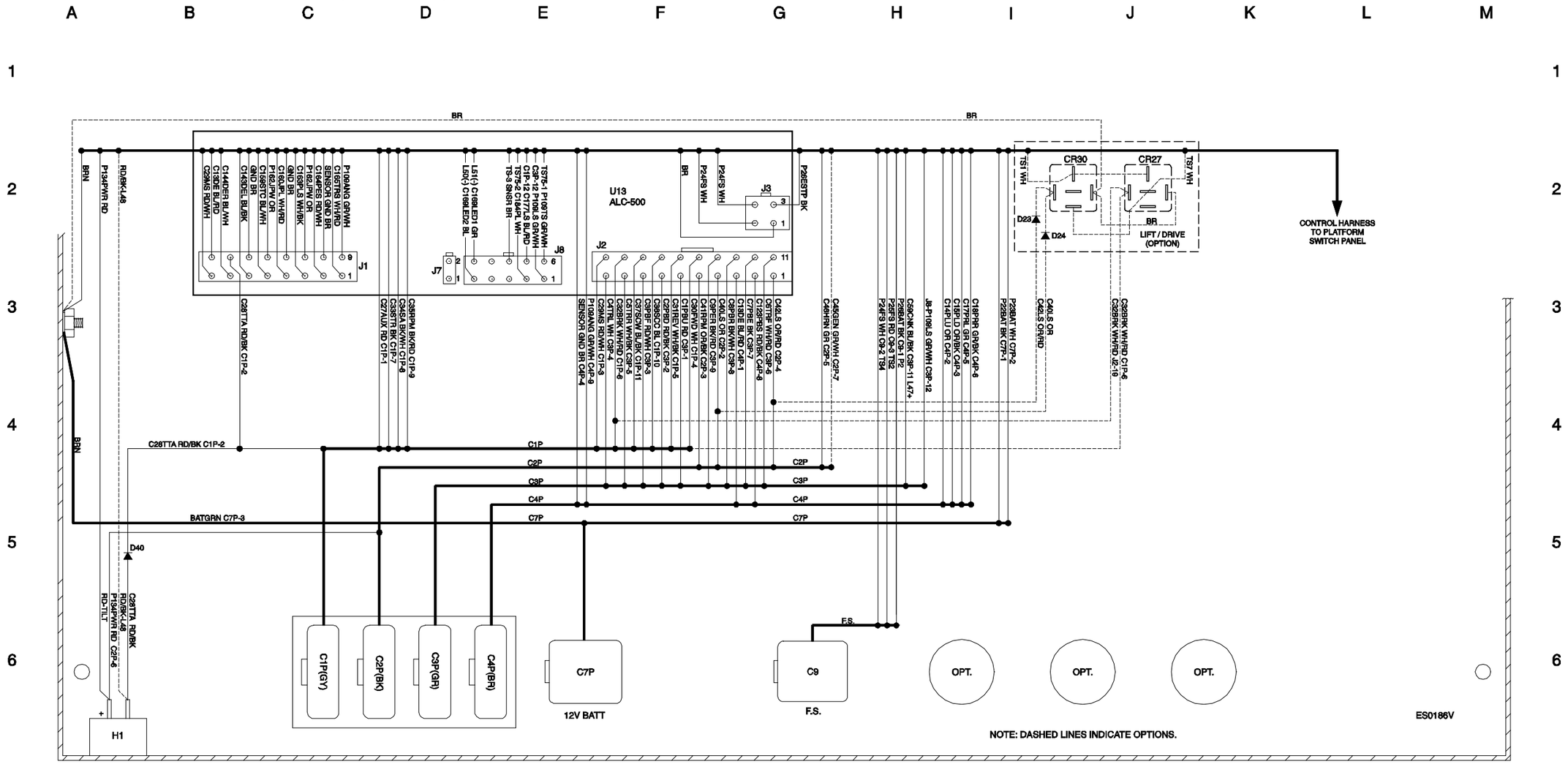


# Platform Control Box Wiring Diagram, S-60X • S-60XC Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



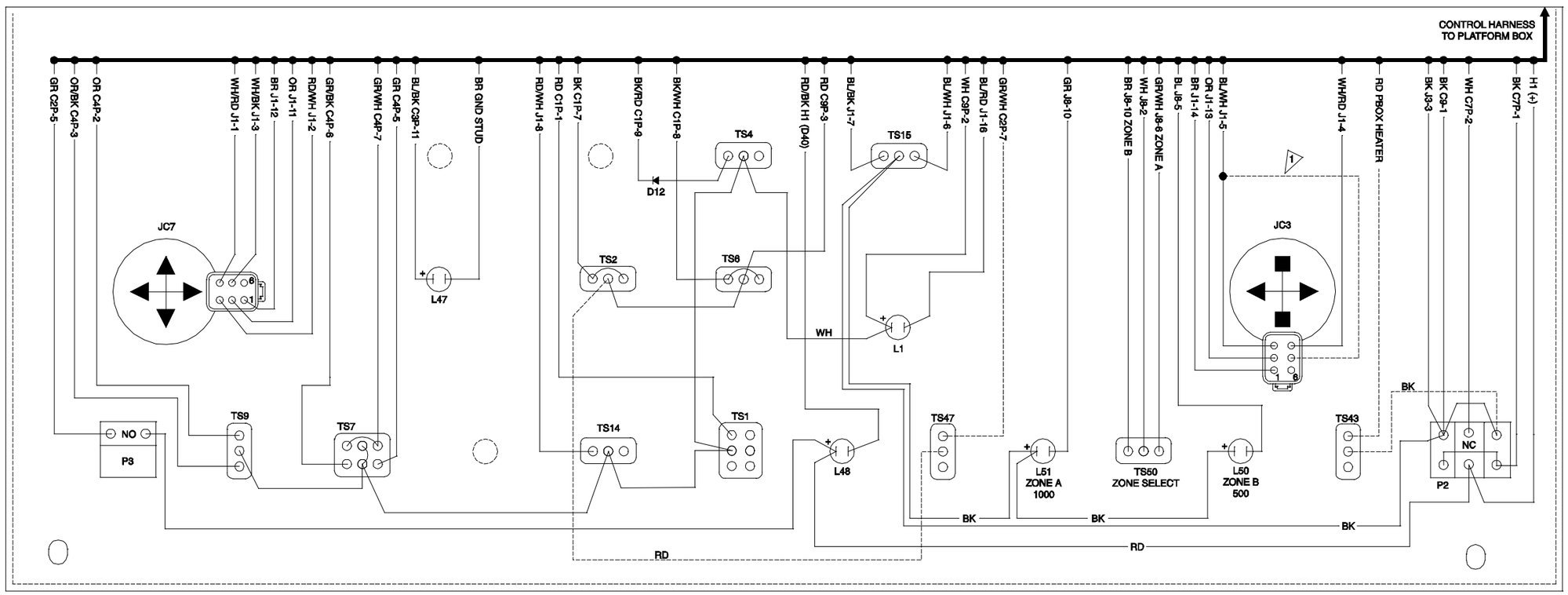
# Platform Control Box Wiring Diagram, S-60X • S-60XC

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)




COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | LIMIT SWITCH (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| L50 | LED - ZONE A |
| L51 | LED - ZONE B |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |

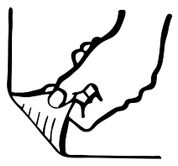
| | |
|---|---|
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| TS50 | ZONE SELECT TOGGLE SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

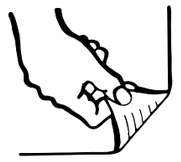
1 ROCKER / STEER OPTION.

ES0186V

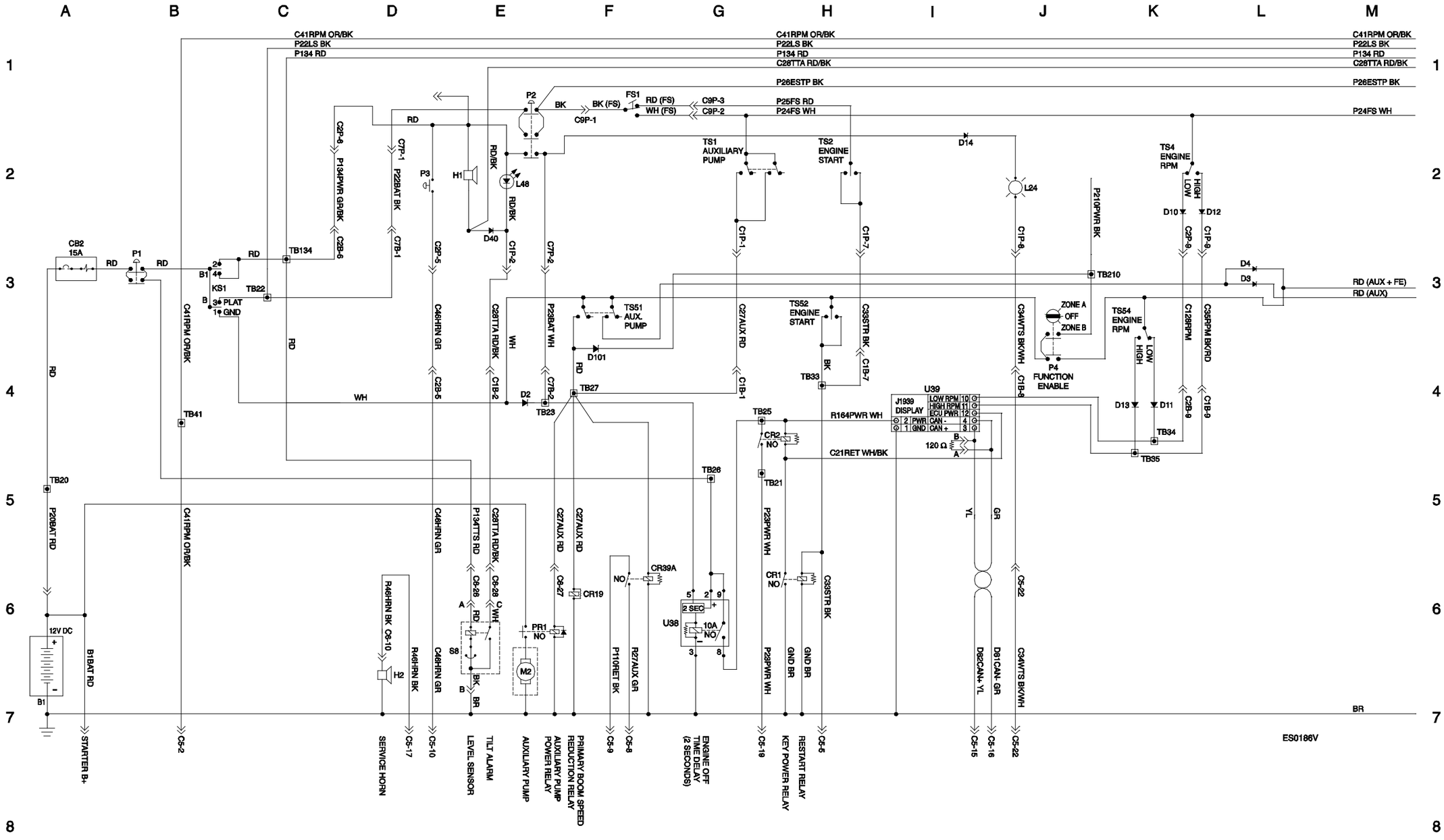
# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC Deutz D2011L03i • TD2011L04i Models (ANSI • CSA)



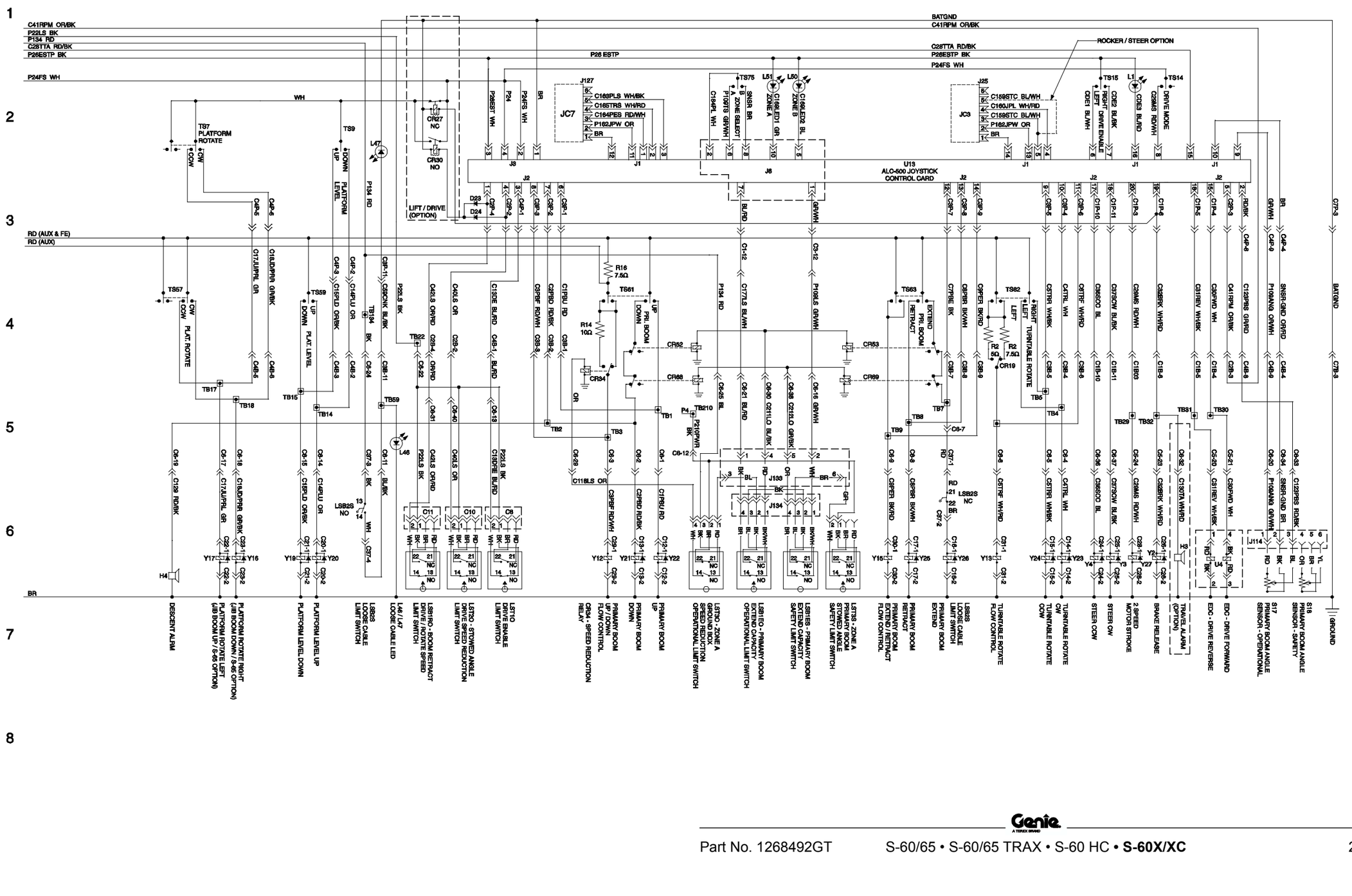
# Electrical Schematic, S-60X • S-60XC
# Deutz D 2.9 L4 Models (ANSI • CSA)



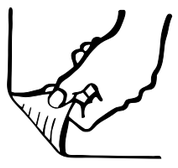
# Electrical Schematic, S-60X • S-60XC, Deutz D 2.9 L4 Models (ANSI • CSA)



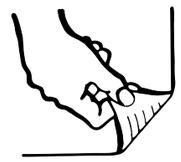
# Electrical Schematic, S-60X • S-60XC, Deutz D 2.9 L4 Models (ANSI • CSA)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134 RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
WH
RD (AUX & FE)
RD (AUX)
BR
BATGND
C41RPM OR/BK
C28TTA RD/BK
P26ESTP BK
P24FS WH
P26 ESTP
ROCKER / STEER OPTION
TS7 PLATFORM ROTATE
CCW
CW
TS9
UP
DOWN
PLATFORM LEVEL
L47
P134 RD
CR27 NC
CR30 NO
LIFT / DRIVE (OPTION)
D23
D24
J127
JC7
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
TS75
L51
L50
C164PL WH
ZONE SELECT
P160TS GR/WH
SNSR BR
C166LED1 GR
ZONE A
C166LED2 BL
ZONE B
J25
JC3
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
BR
TS15
L1
TS14
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
DRIVE MODE
C2E1 BU/BK
C2E2 BU/BK
C2E3 BU/RD
C28MS RD/WH
U13
ALC-500 JOYSTICK CONTROL CARD
TS57 PLAT. ROTATE
TS59 PLAT. LEVEL
TB17
TB18
TB15
TB14
TB59
L46
C4F-4
LSB2S NO
C57F-4
C57F-3
H4
C129 RD/BK
C17JU/PRL GR
C18JD/PRR GR/BK
C15PLD OR/BK
C14PLU OR
BK
C28F-11
C28CHK BL/BK
P22LS BK
C4-40
C4-51
C4-13
C4-19
C4-17
C4-18
C4-14
C4-11
C28-1
C28-2
Y17
Y16
Y19
Y20
C22-1
C22-2
C21-1
C21-2
C28-3
C28-4
TB22
C4-22
C4-21
C4-30
C4-38
C4-16
C4-25
C4-12
C4-29
C4-3
C4-2
C4-1
C28-5
C28-6
C28-7
C28-8
C28-9
C28-10
C28-11
C28-12
C1-12
C2-12
C17-12
C18-12
C19-12
C22-12
C21-12
C28-12
C4P-1
C4P-2
C4P-3
C4P-5
C4P-6
C4P-8
C4P-9
C4P-10
C4P-11
C4P-12
C4P-13
C4P-14
C4P-15
C4P-16
C4P-17
C4P-18
C4P-19
C4P-20
C4P-21
C4P-22
C4P-23
C4P-24
C4P-25
C4P-26
C4P-27
C4P-28
C4P-29
C4P-30
C4P-31
C4P-32
C4P-33
C4P-34
C4P-35
C4P-36
C4P-37
C4P-38
C4P-39
C4P-40
C4P-41
C4P-42
C4P-43
C4P-44
C4P-45
C4P-46
C4P-47

# Electrical Schematic, S-60X • S-60XC
# Deutz D 2.9 L4 Models (ANSI • CSA)

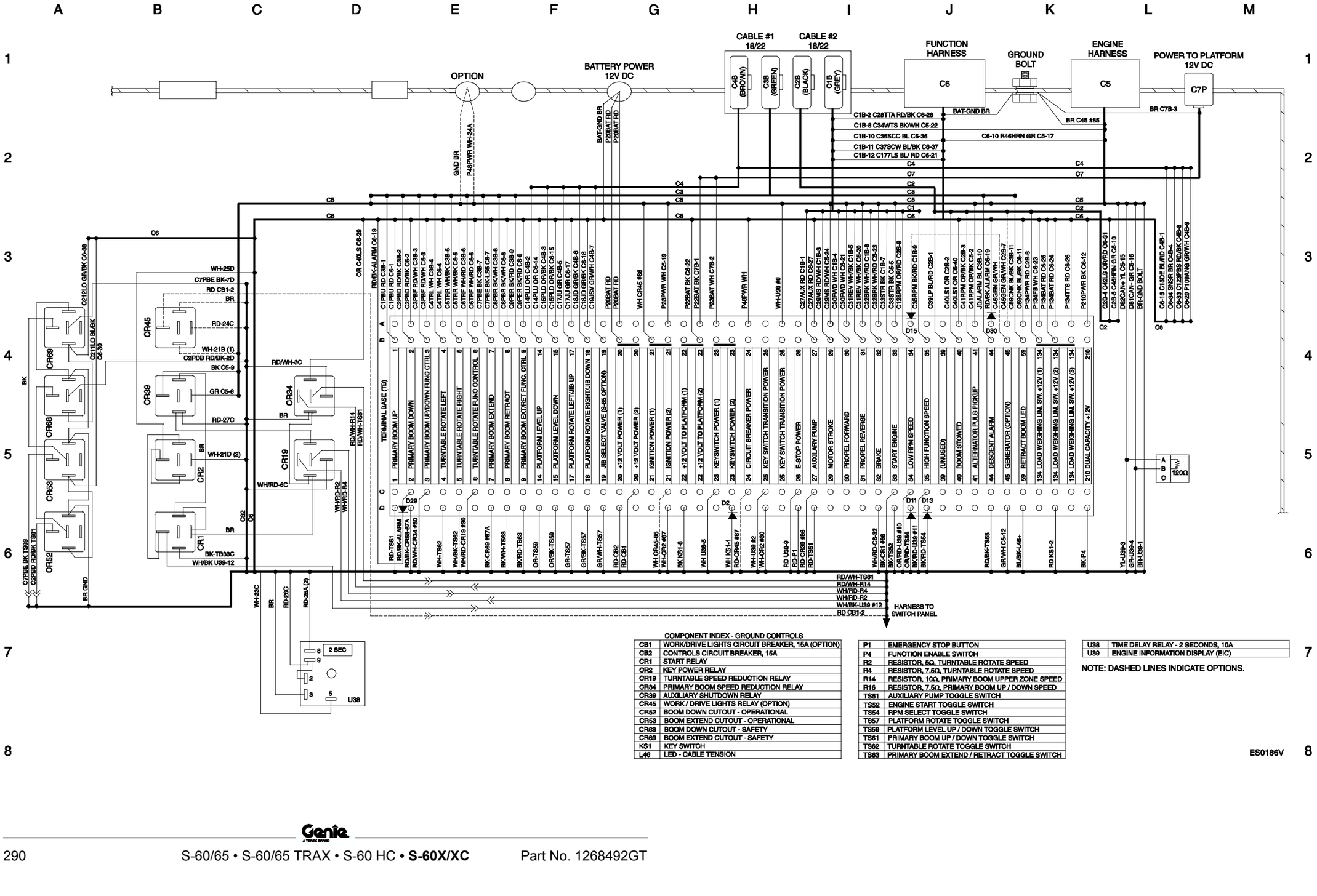


# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC Deutz D 2.9 L4 Models (ANSI • CSA)



# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC

## Deutz D 2.9 L4 Models (ANSI • CSA)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | WORK/DRIVE LIGHTS CIRCUIT BREAKER, 15A (OPTION) |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CR1 | START RELAY |
| CR2 | KEY POWER RELAY |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| CR39 | AUXILIARY SHUTDOWN RELAY |
| CR45 | WORK / DRIVE LIGHTS RELAY (OPTION) |
| CR52 | BOOM DOWN CUTOUT - OPERATIONAL |
| CR53 | BOOM EXTEND CUTOUT - OPERATIONAL |
| CR68 | BOOM DOWN CUTOUT - SAFETY |
| CR69 | BOOM EXTEND CUTOUT - SAFETY |
| KS1 | KEY SWITCH |
| L46 | LED - CABLE TENSION |

| | |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 7.5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |

| | |
|---|---|
| U38 | TIME DELAY RELAY - 2 SECONDS, 10A |
| U39 | ENGINE INFORMATION DISPLAY (EIC) |

NOTE: DASHED LINES INDICATE OPTIONS.

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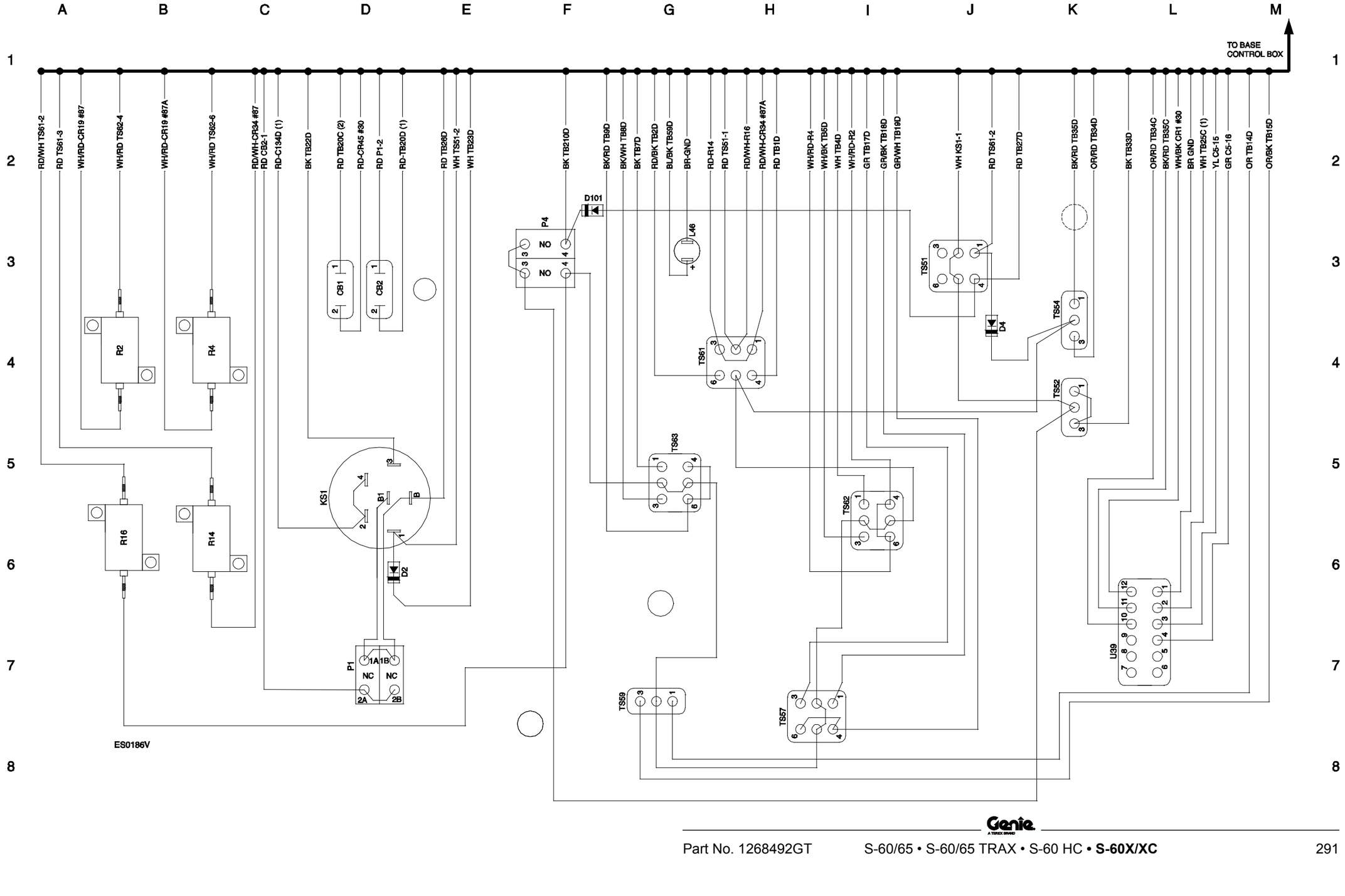
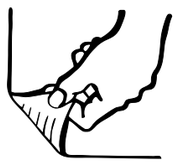
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

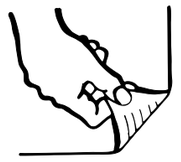
## Deutz D 2.9 L4 (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Deutz D 2.9 L4 (ANSI • CSA)

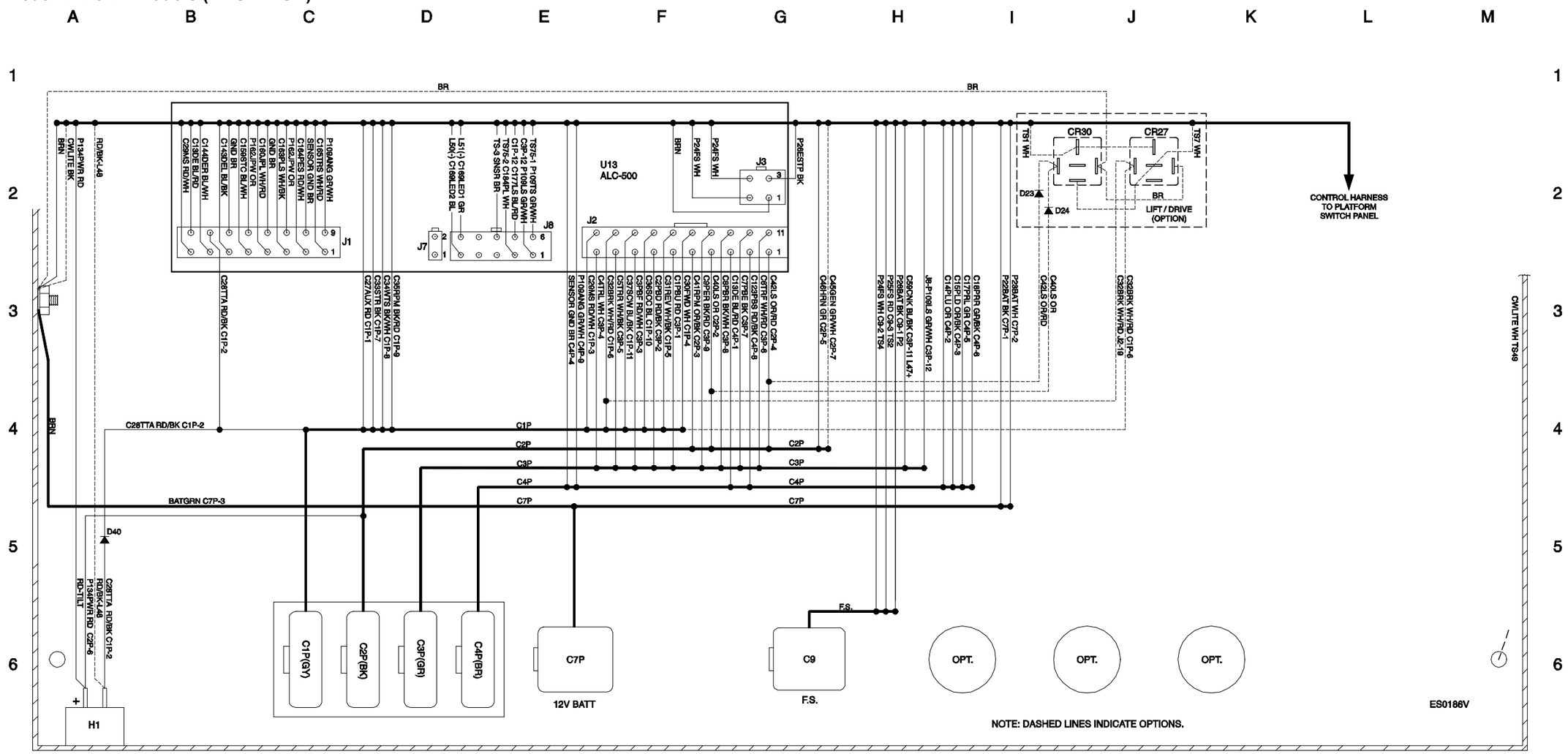


# Platform Control Box Wiring Diagram, S-60X • S-60XC Deutz D 2.9 L4 Models (ANSI • CSA)



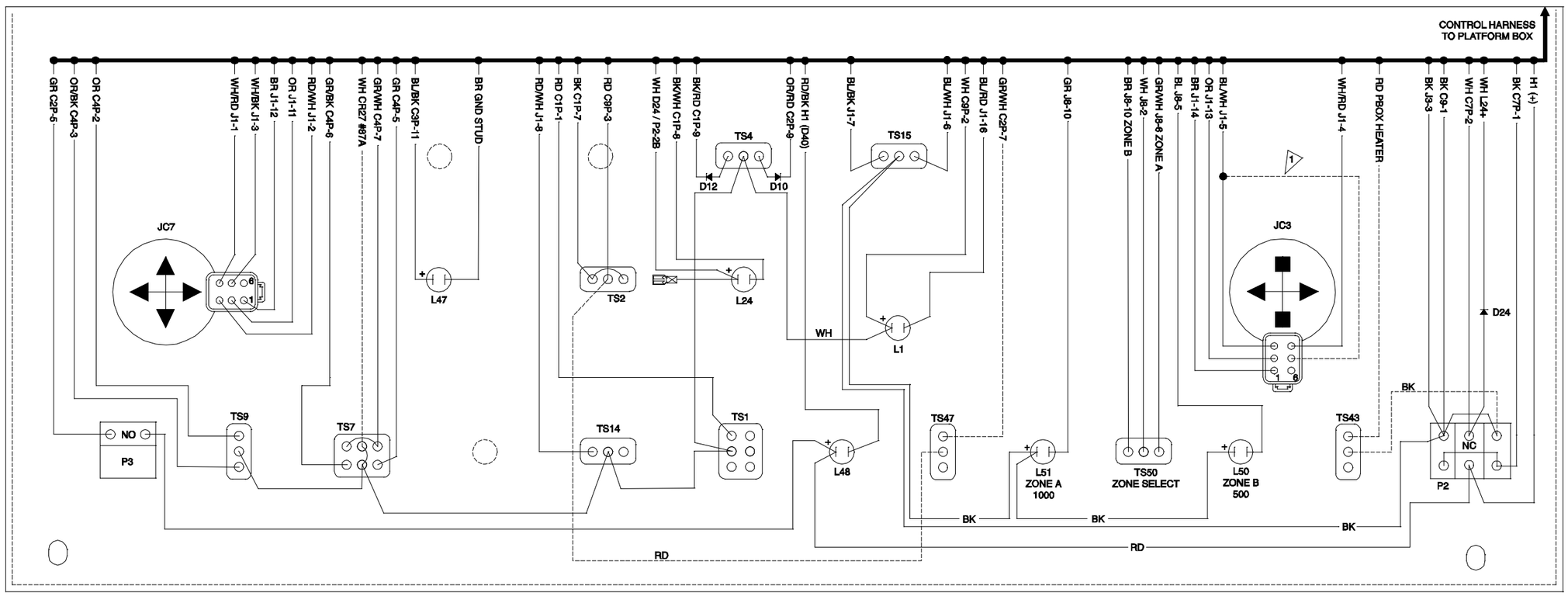
# Platform Control Box Wiring Diagram, S-60X • S-60XC

## Deutz D 2.9 L4 Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Deutz D 2.9 L4 Models (ANSI • CSA)




COMPONENT INDEX - GROUND CONTROLS

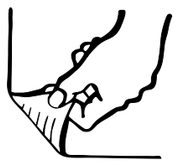
| | |
|---|---|
| CR27 | BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | LIMIT SWITCH (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L24 | LED - GLOW PLUG |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| L50 | LED - ZONE A |
| L51 | LED - ZONE B |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| TS50 | ZONE SELECT TOGGLE SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

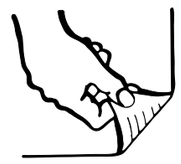
1 ROCKER / STEER OPTION.

ES0186V

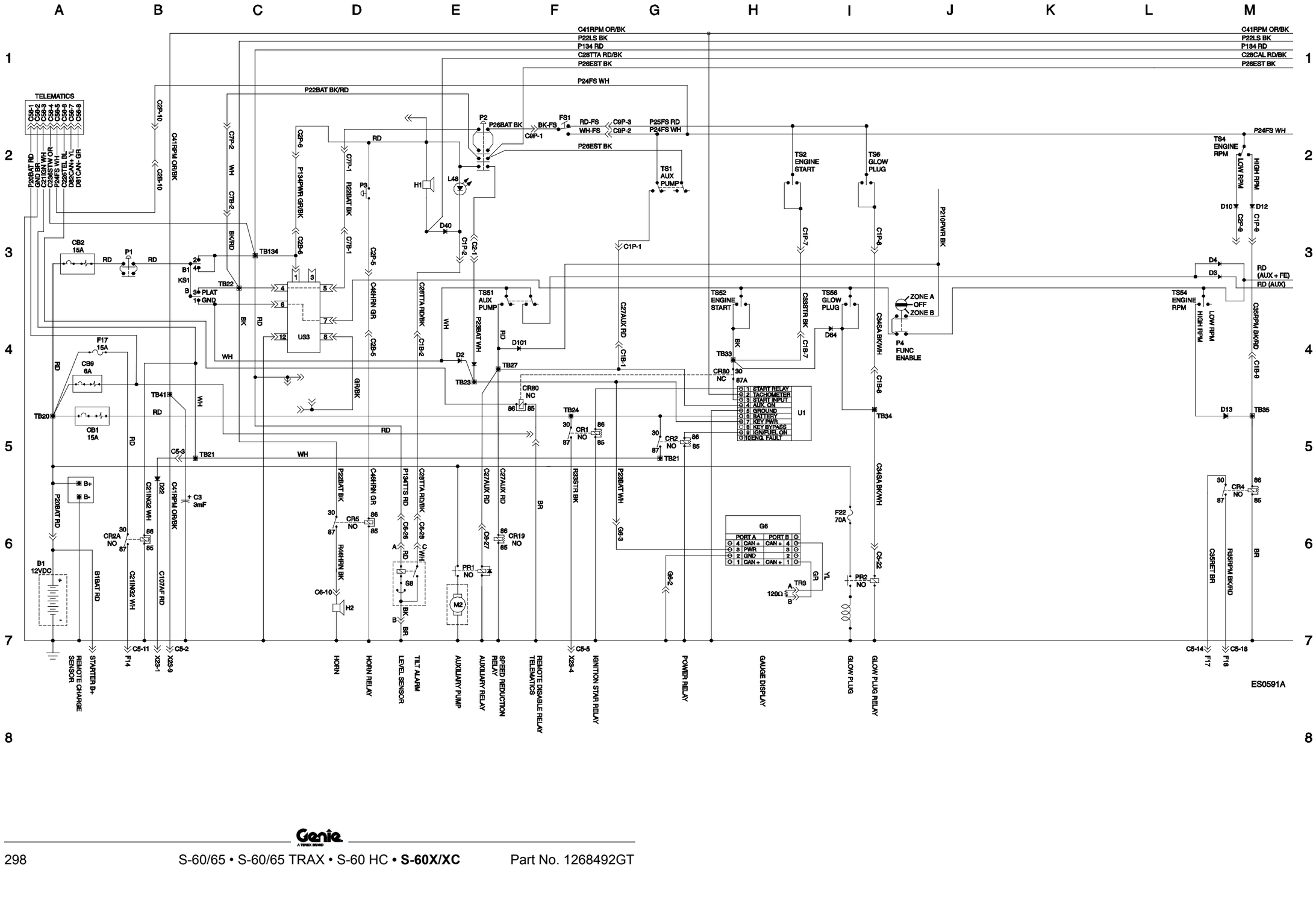
# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC Deutz D 2.9 L4 Models (ANSI • CSA)



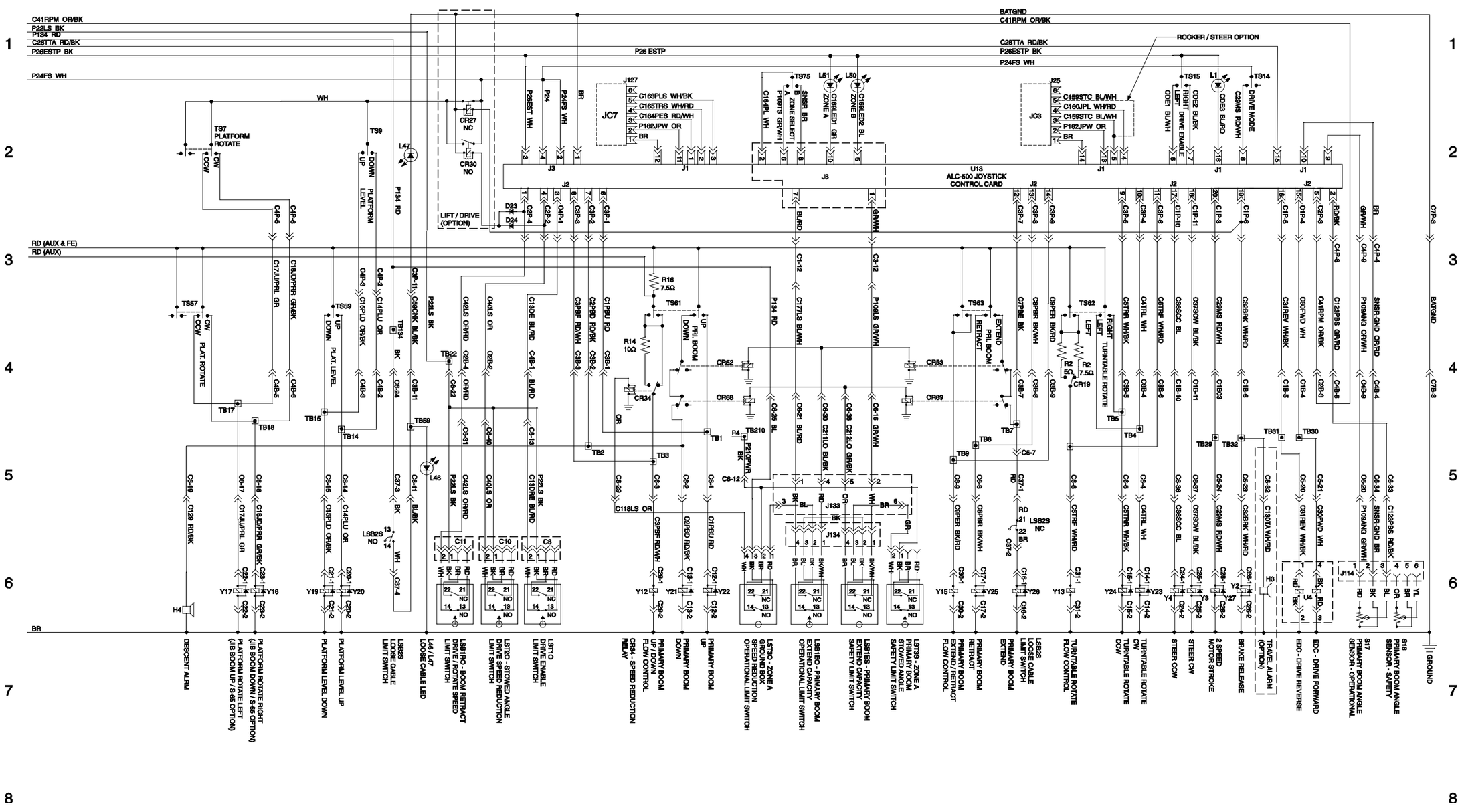
# Electrical Schematic, S-60X • S-60XC
# Deutz D436 L3i Models (ANSI • CSA)



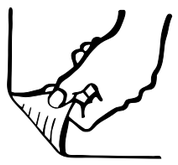
# Electrical Schematic, S-60X • S-60XC, Deutz D436 L3i Models (ANSI • CSA)



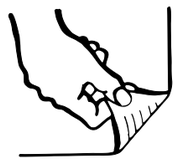
# Electrical Schematic, S-60X • S-60XC, Deutz D436 L3i Models (ANSI • CSA)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134 RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
WH
RD (AUX & FE)
RD (AUX)
BR
P26 ESTP
BATGND
C41RPM OR/BK
C28TTA RD/BK
P26ESTP BK
P24FS WH
ROCKER / STEER OPTION
TS7 PLATFORM ROTATE
CW
CCW
TS9
UP
DOWN
PLATFORM LEVEL
L47
CR27 NC
CR30 NO
LIFT / DRIVE (OPTION)
D23
D24
J127
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
JC7
TS75
P109TS GR/WH
SNSR BR
ZONE SELECT
C194PL WH
L51
C166LED1 GR
ZONE A
L50
C166LED2 BL
ZONE B
J8
U13
ALC-500 JOYSTICK CONTROL CARD
J25
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
BR
JC3
TS15
L1
TS14
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
CDE1 BL/WH
CDE2 BL/BK
CDE3 BL/RD
C29MS RD/WH
DRIVE MODE
J1
J2
J3
C4P-5
C4P-6
C17JU/PRL GR
C18JD/PRR GR/BK
C4P-3
C19PLD OR/BK
C4P-2
C14PLU OR
C4P-1
C3P-11
C99DRK BL/BK
P23LS BK
C42LS OR/RD
C40LS OR
C19DE BL/RD
C2P-4
C2P-2
C4P-1
C3P-3
C2P-3
C3P-2
C3P-1
C2PBF RD/WH
C2PBD RD/BK
C1PBU RD
C3B-1
C1-12
C177LS BL/WH
P109LS GR/WH
C3-12
C7PBE BK
C8PBR BK/WH
C8PER BK/RD
C8PBF RD/WH
C8PBD RD/BK
C8PBU RD
C1P-7
C1P-8
C1P-9
C1P-6
C1P-10
C1P-11
C1P-3
C1P-12
C1P-5
C1P-4
C2P-3
C2P-1
C3P-5
C3P-4
C3P-2
C3P-1
C4P-4
C4P-9
C4P-8
C4P-6
C4P-9
C4P-8
C4P-4
C7P-3
C4P-5
C4P-6
C4P-3
C4P-2
C4P-1
C3B-11
C4B-1
C4B-2
C4B-3
C4B-4
C4B-5
C4B-6
C4B-7
C4B-8
C4B-9
C4B-10
C4B-11
C4B-12
C4B-13
C4B-14
C4B-15
C4B-16
C4B-17
C4B-18
C4B-19
C4B-20
C4B-21
C4B-22
C4B-23
C4B-24
C4B-25
C4B-26
C4B-27
C4B-28
C4B-29
C4B-30
C4B-31
C4B-32
C4B-33
C4B-34
C4B-35
C4B-36
C4B-37
C4B-38
C4B-39
C4B-40

# Electrical Schematic, S-60X • S-60XC
# Deutz D436 L3i Models (ANSI • CSA)

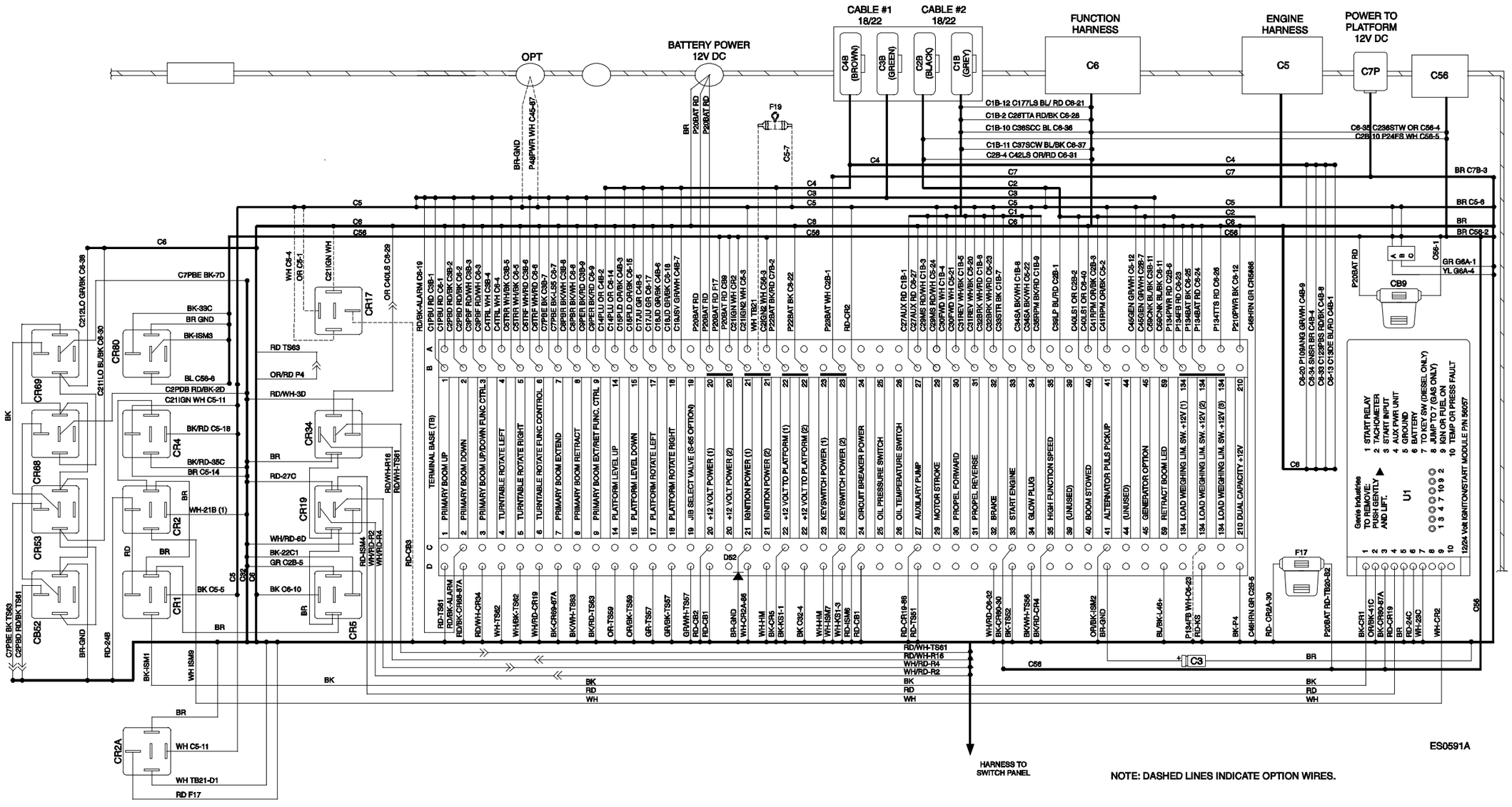


# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC Deutz D436 L3i Models (ANSI • CSA)



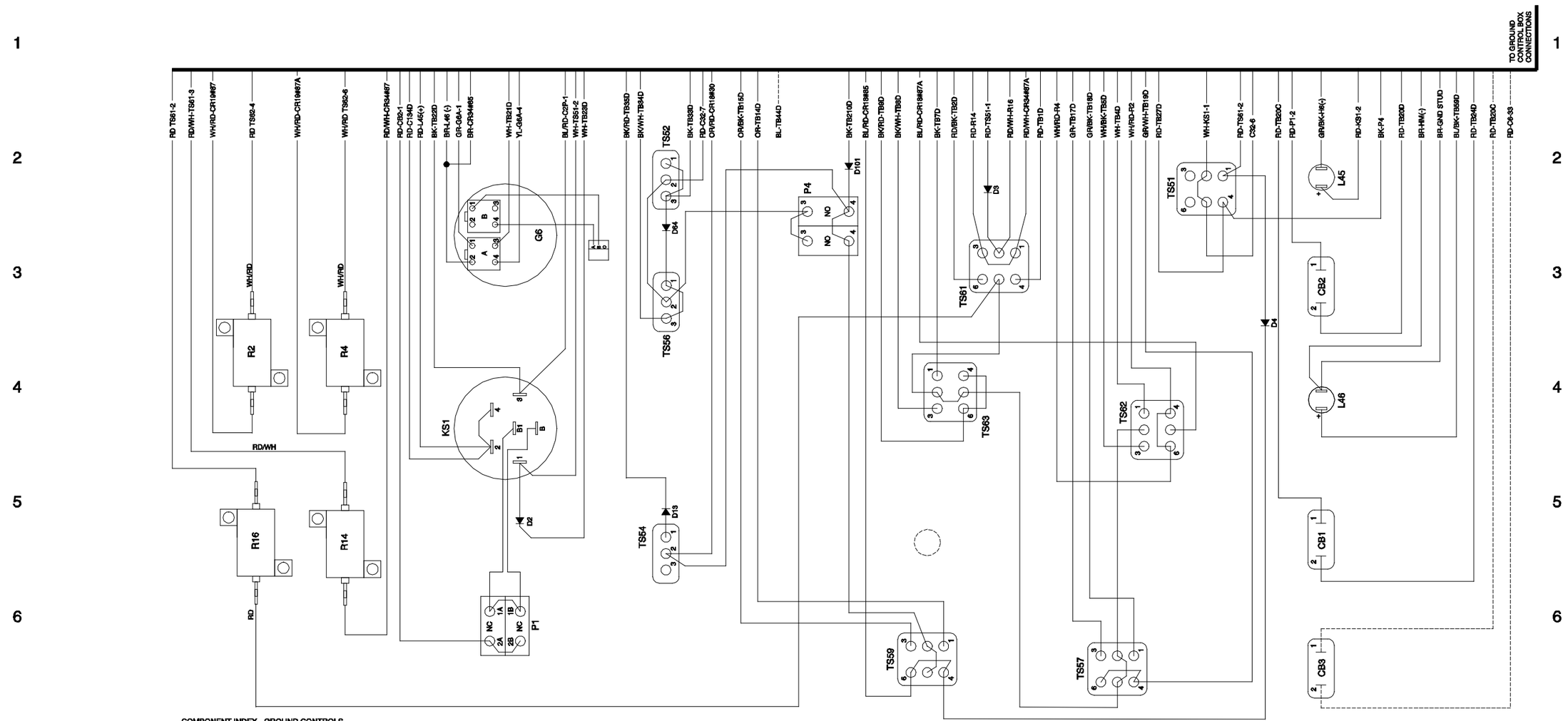
# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC

## Deutz D436 L3i Models (ANSI • CSA)


CABLE #1 18/22
CABLE #2 18/22
FUNCTION HARNESS
ENGINE HARNESS
POWER TO PLATFORM 12V DC
OPT
BATTERY POWER 12V DC
C4B (BROWN)
C3B (GREEN)
C2B (BLACK)
C1B (GREY)
C6
C5
C7P
C56
F19
C5-7
BR-GND
P48PWR WH C45-57
P20BAT RD
C1B-12 C177L9 BL/ RD C6-21
C1B-2 C28TTA RD/BK C6-28
C1B-10 C36SCC BL C6-36
C1B-11 C37SCW BL/BK C6-37
C2B-4 C42LS OR/RD C6-31
C6-35 C236STW OR C56-4
C2B-10 P24FS WH C56-5
BR C7B-3
BR C5-6
BR
BR C56-2
GR G6A-1
YL G6A-4
CB9
C56-1
C6-20 P109ANG GR/WH C4B-9
C6-34 SNSR BR C4B-4
C6-33 C123PBS RD/BK C4B-8
C6-13 C130E BL/RD C4B-1
C6
F17
C3
CR69
CR68
CR53
CR52
CR80
CR4
CR2
CR1
CR17
CR34
CR19
CR5
CR2A
CB52
C7PBE BK-7D
C2PBD RD/BK-2D
C212LO GR/BK C6-38
C211LO BL/BK C6-35
BK-33C
BR GND
BK-ISM3
BL C56-6
C21IGN WH C5-11
BK/RD C5-18
BK/RD-35C
BR C5-14
RD-27C
WH-21B (1)
WH/RD-6D
BK-22C1
GR C2B-5
BK C5-5
BK C6-10
RD TS63
OR/RD P4
RD/WH-3D
WH C5-4
OR C5-1
OR C40LS C6-29
BR-GND
RD-24B
BK-ISM1
WH ISM9
WH C5-11
WH TB21-D1
RD F17
RD/WH-R16
RD/WH-R1
RD/WH-R2
WH/RD-R4
RD-CB3
TERMINAL BASE (TB)
1 PRIMARY BOOM UP
2 PRIMARY BOOM DOWN
3 PRIMARY BOOM UP/DOWN FUNC CTRL
4 TURNTABLE ROTATE LEFT
5 TURNTABLE ROTATE RIGHT
6 TURNTABLE ROTATE FUNC CONTROL
7 PRIMARY BOOM EXTEND
8 PRIMARY BOOM RETRACT
9 PRIMARY BOOM EXT/RET FUNC. CTRL
14 PLATFORM LEVEL UP
15 PLATFORM LEVEL DOWN
17 PLATFORM ROTATE LEFT
18 PLATFORM ROTATE RIGHT
19 JIB SELECT VALVE (S-45 OPTION)
20 +12 VOLT POWER (1)
20 +12 VOLT POWER (2)
21 IGNITION POWER (1)
21 IGNITION POWER (2)
22 +12 VOLT TO PLATFORM (1)
22 +12 VOLT TO PLATFORM (2)
23 KEYSWITCH POWER (1)
23 KEYSWITCH POWER (2)
24 CIRCUIT BREAKER POWER
25 OIL PRESSURE SWITCH
26 OIL TEMPERATURE SWITCH
27 AUXILIARY PUMP
29 MOTOR STROKE
30 PROPEL FORWARD
31 PROPEL REVERSE
32 BRAKE
33 START ENGINE
34 GLOW PLUG
35 HIGH FUNCTION SPEED
38 (UNUSED)
40 BOOM STOWED
41 ALTERNATOR PULS PICKUP
44 (UNUSED)
45 GENERATOR OPTION
59 RETRACT BOOM LED
134 LOAD WEIGHING LIM. SW. +12V (1)
134 LOAD WEIGHING LIM. SW. +12V (2)
134 LOAD WEIGHING LIM. SW. +12V (9)
210 DUAL CAPACITY +12V
RD-CR1
RD-CR2
RD-CR3
RD-CR4
RD-CR5
RD-CR6
RD-CR7
RD-CR8
RD-CR9
RD-CR10
RD-CR11
RD-CR12
RD-CR13
RD-CR14
RD-CR15
RD-CR16
RD-CR17
RD-CR18
RD-CR19
RD-CR20
RD-CR21
RD-CR22
RD-CR23
RD-CR24
RD-CR25
RD-CR26
RD-CR27
RD-CR28
RD-CR29
RD-CR30
RD-CR31
RD-CR32
RD-CR33
RD-CR34
RD-CR35
RD-CR36
RD-CR37
RD-CR38
RD-CR39
RD-CR40

# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Deutz D436 L3i (ANSI • CSA)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |

| | |
|---|---|
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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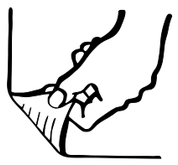
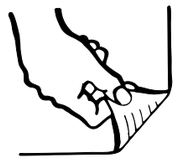
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Deutz D436 L3i (ANSI • CSA)

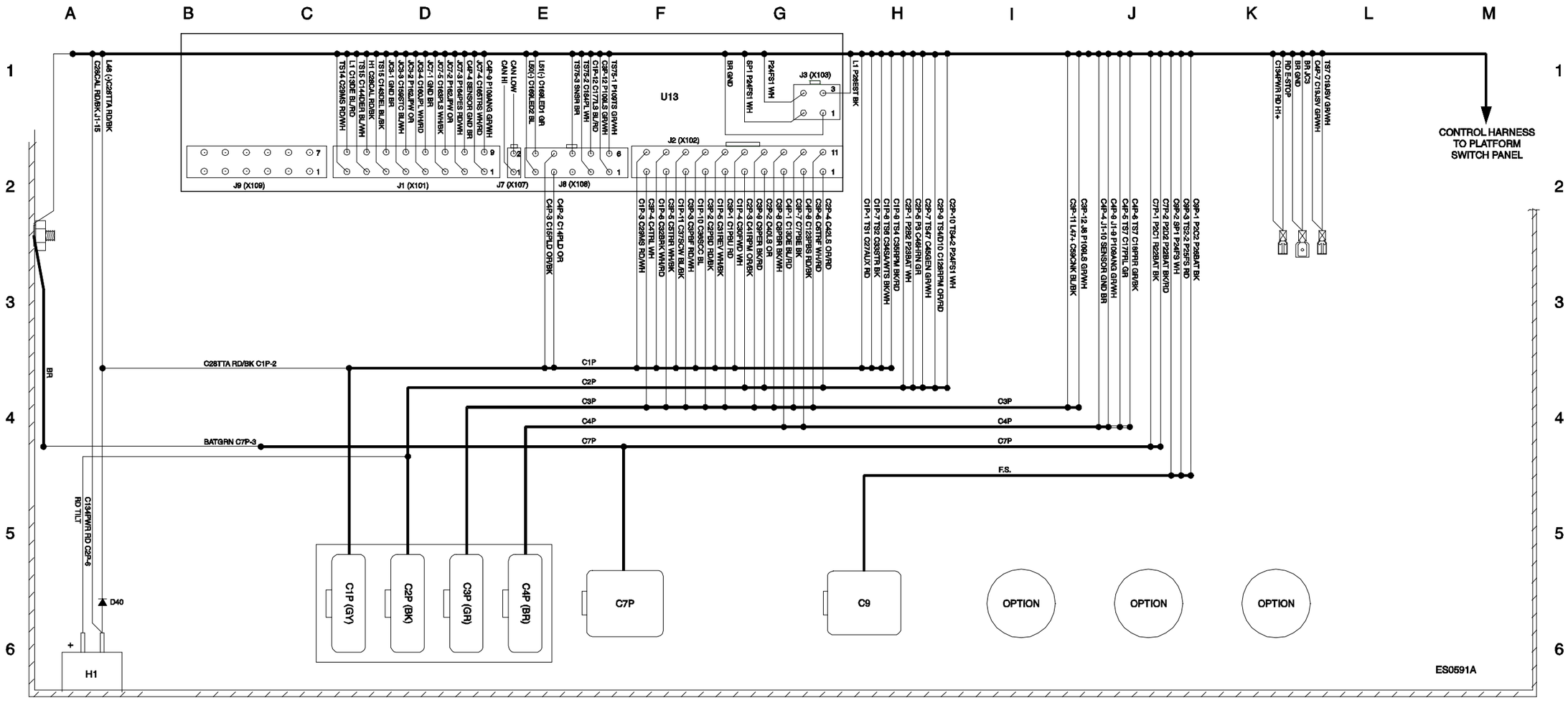


# Platform Control Box Wiring Diagram, S-60X • S-60XC
# Deutz D436 L3i Models (ANSI • CSA)



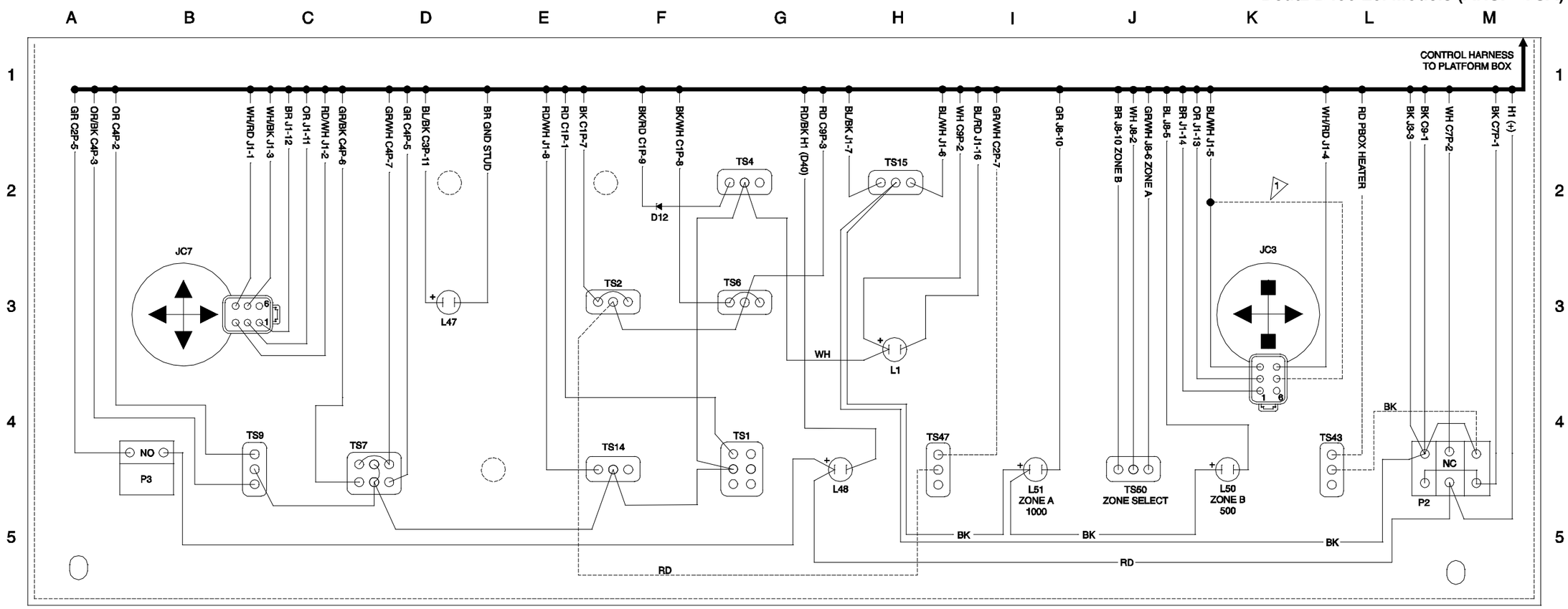
# Platform Control Box Wiring Diagram, S-60X • S-60XC

## Deutz D436 L3i Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC

## Deutz D436 L3i Models (ANSI • CSA)




COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CR27 | BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | LIMIT SWITCH (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| L50 | LED - ZONE A |
| L51 | LED - ZONE B |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| TS50 | ZONE SELECT TOGGLE SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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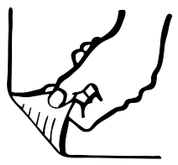
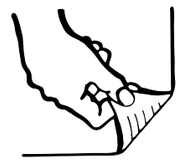
# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC Deutz D436 L3i Models (ANSI • CSA)

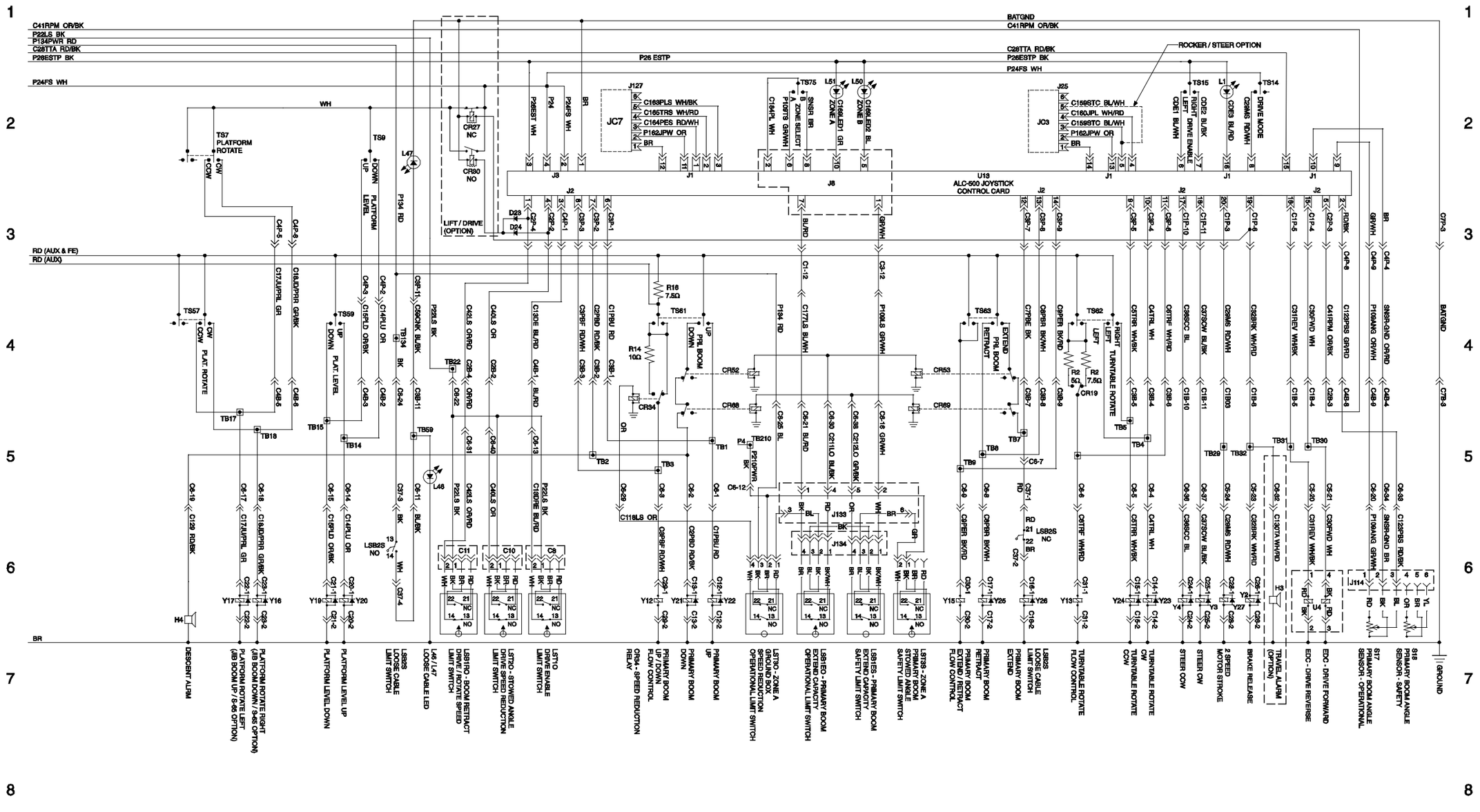


# Electrical Schematic, S-60X • S-60XC
# Perkins 404D-22 Models (ANSI • CSA)

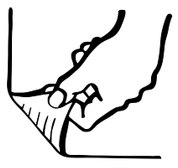


# Electrical Schematic, S-60X • S-60XC, Perkins 404D-22 Models (ANSI • CSA)

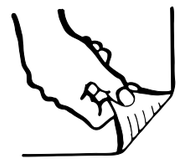
## Electrical Schematic, S-60X • S-60XC, Perkins 404D-22 Models (ANSI • CSA)



# Electrical Schematic, S-60X • S-60XC
# Perkins 404D-22 Models (ANSI • CSA)

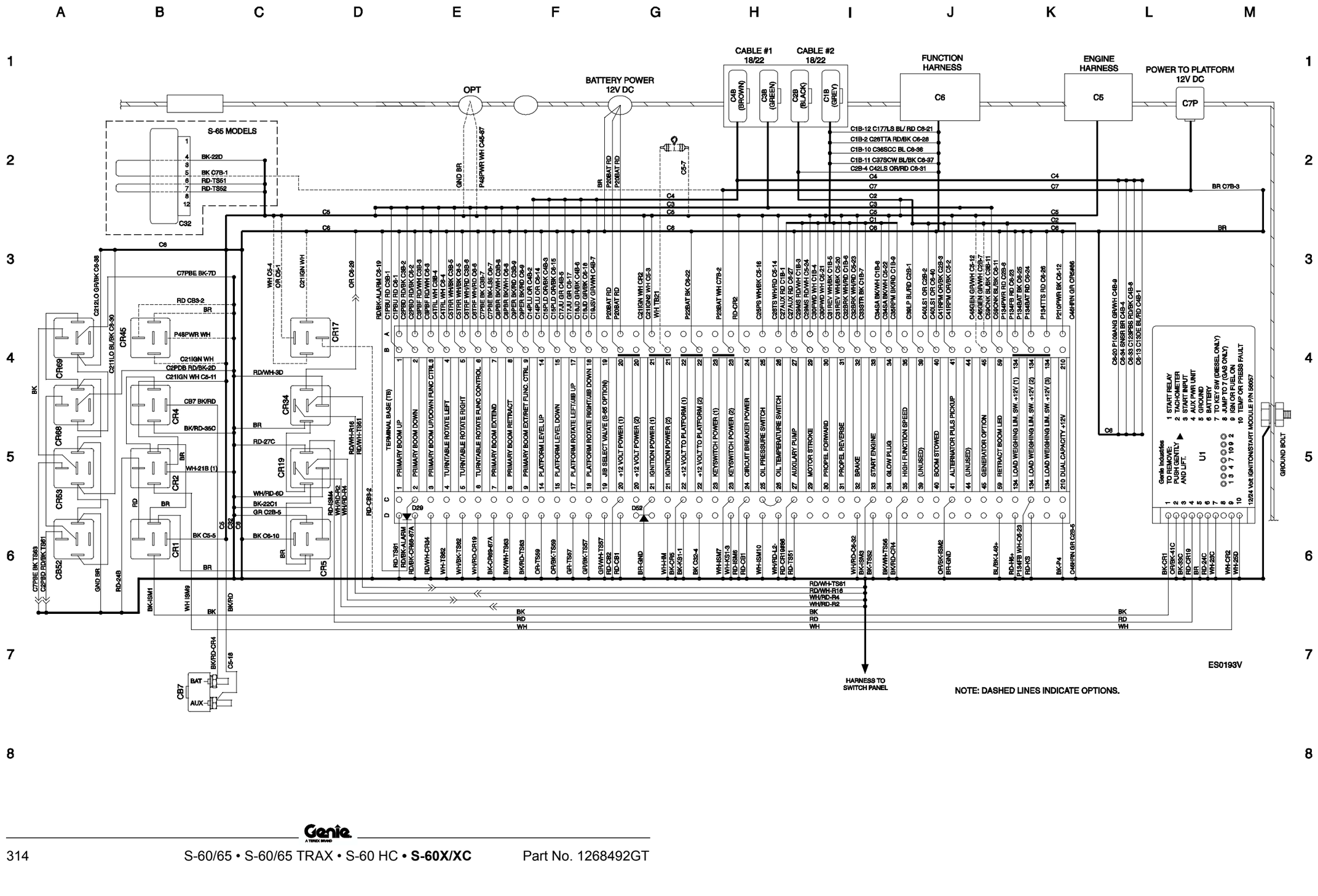


# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC, Perkins 404D-22 Models (ANSI • CSA)



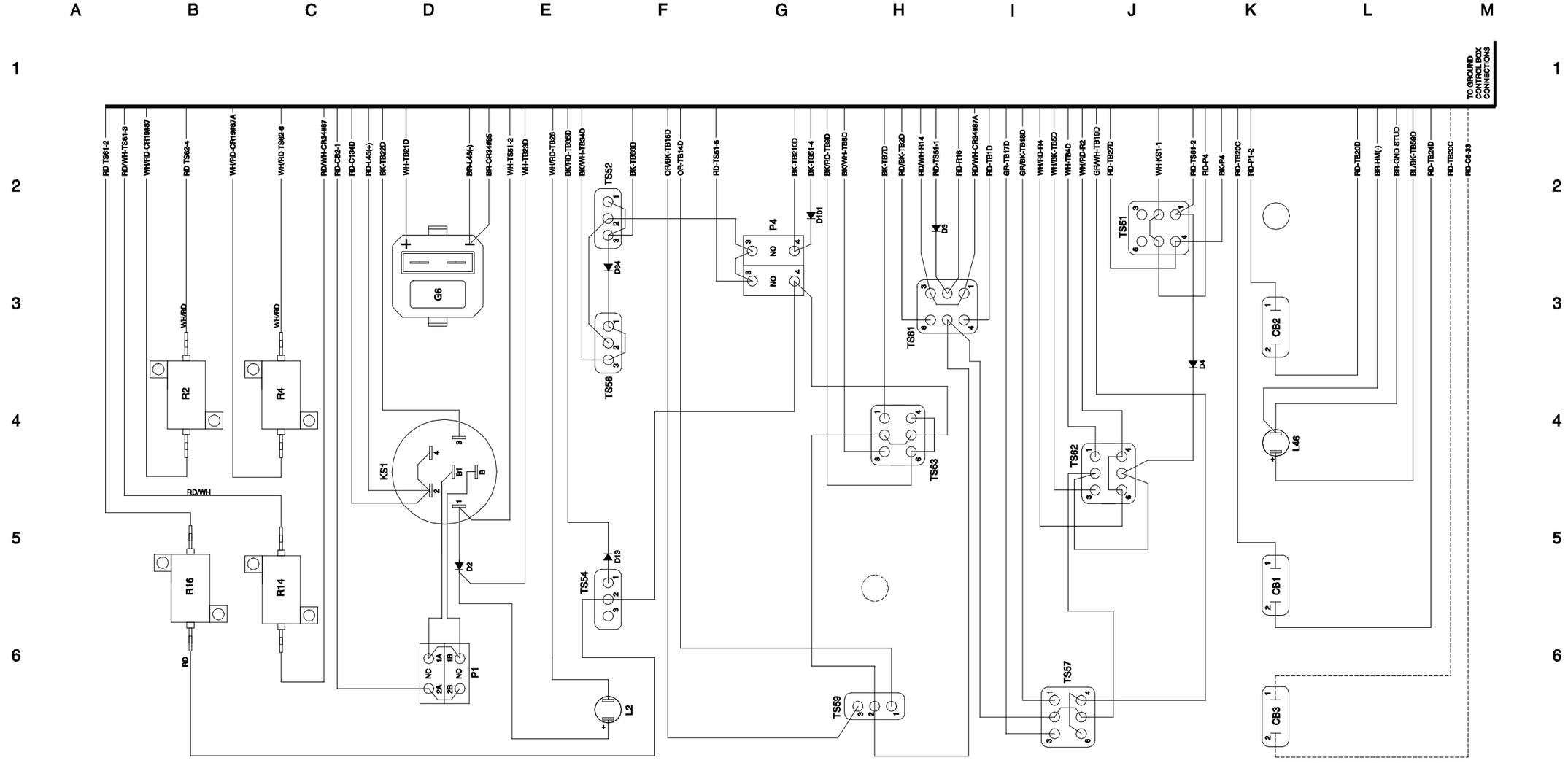
# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC,

## Perkins 404D-22 Models (ANSI • CSA)



# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC,

## Perkins 404D-22 Models (ANSI • CSA)




| | COMPONENT INDEX - GROUND CONTROLS |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| KS1 | KEY SWITCH |

| | |
|---|---|
| L2 | LED - CHECK ENGINE |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 7.5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |

| | |
|---|---|
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |

NOTE: DASHED LINES INDICATE OPTIONS.

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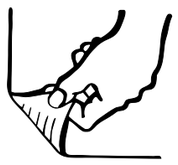
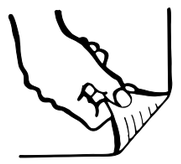
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Perkins 404D-22 Models (ANSI • CSA)

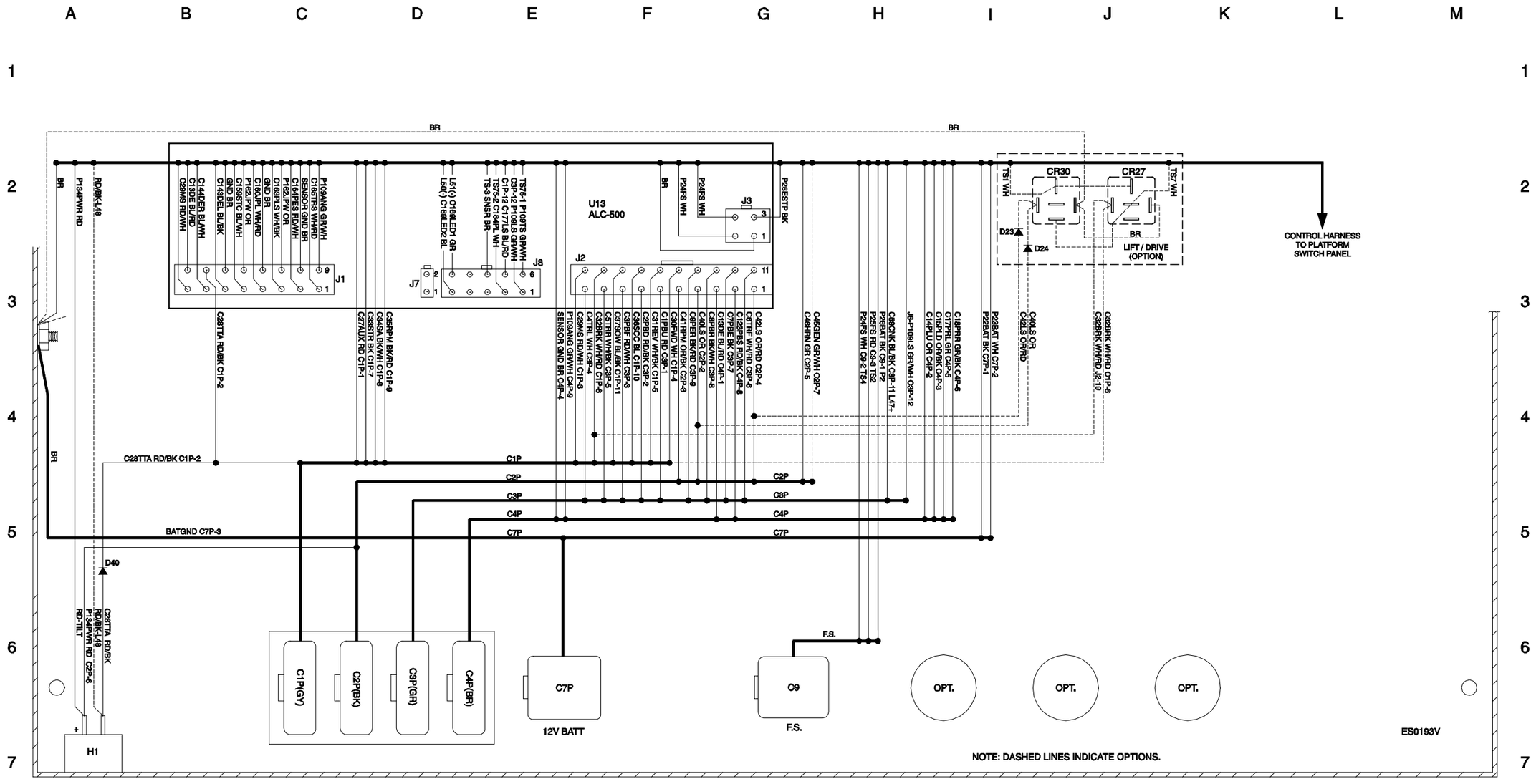


# Platform Control Box Wiring Diagram, S-60X • S-60XC, Perkins 404D-22 Models (ANSI • CSA)



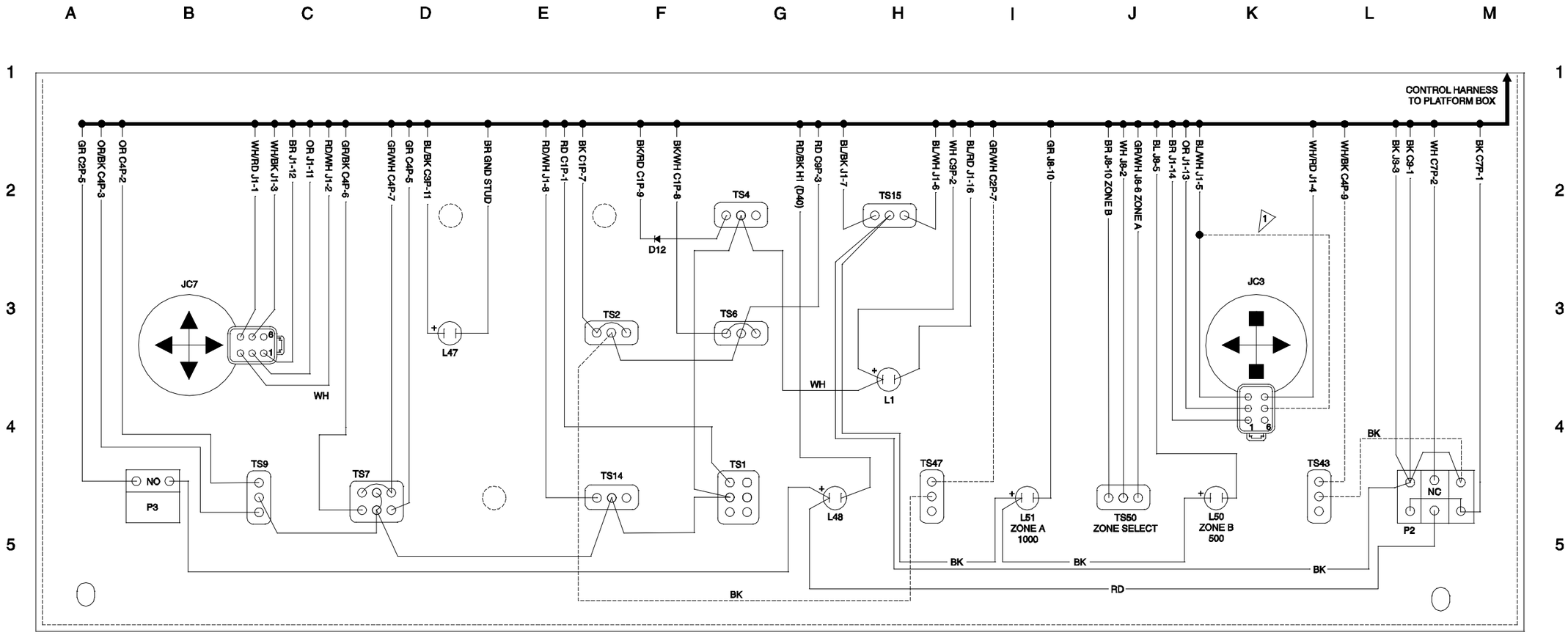
# Platform Control Box Wiring Diagram, S-60X • S-60XC,

## Perkins 404D-22 Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC,

## Perkins 404D-22 Models (ANSI • CSA)




COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CR27 | BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | LIMIT SWITCH (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| L50 | LED - ZONE A |
| L51 | LED - ZONE B |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| TS50 | ZONE SELECT TOGGLE SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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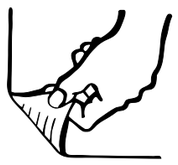
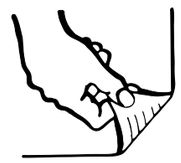
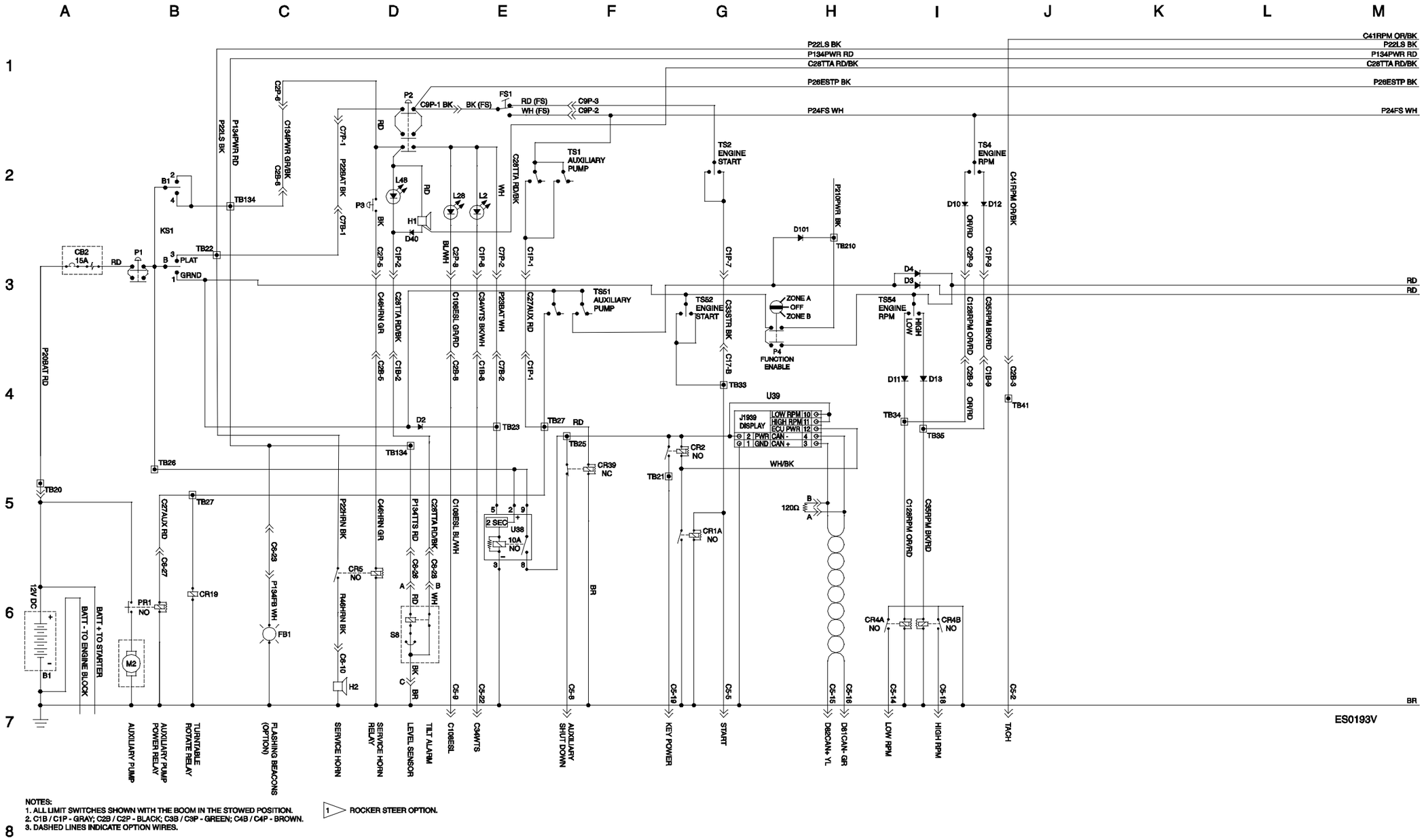
# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Perkins 404D-22 Models (ANSI • CSA)



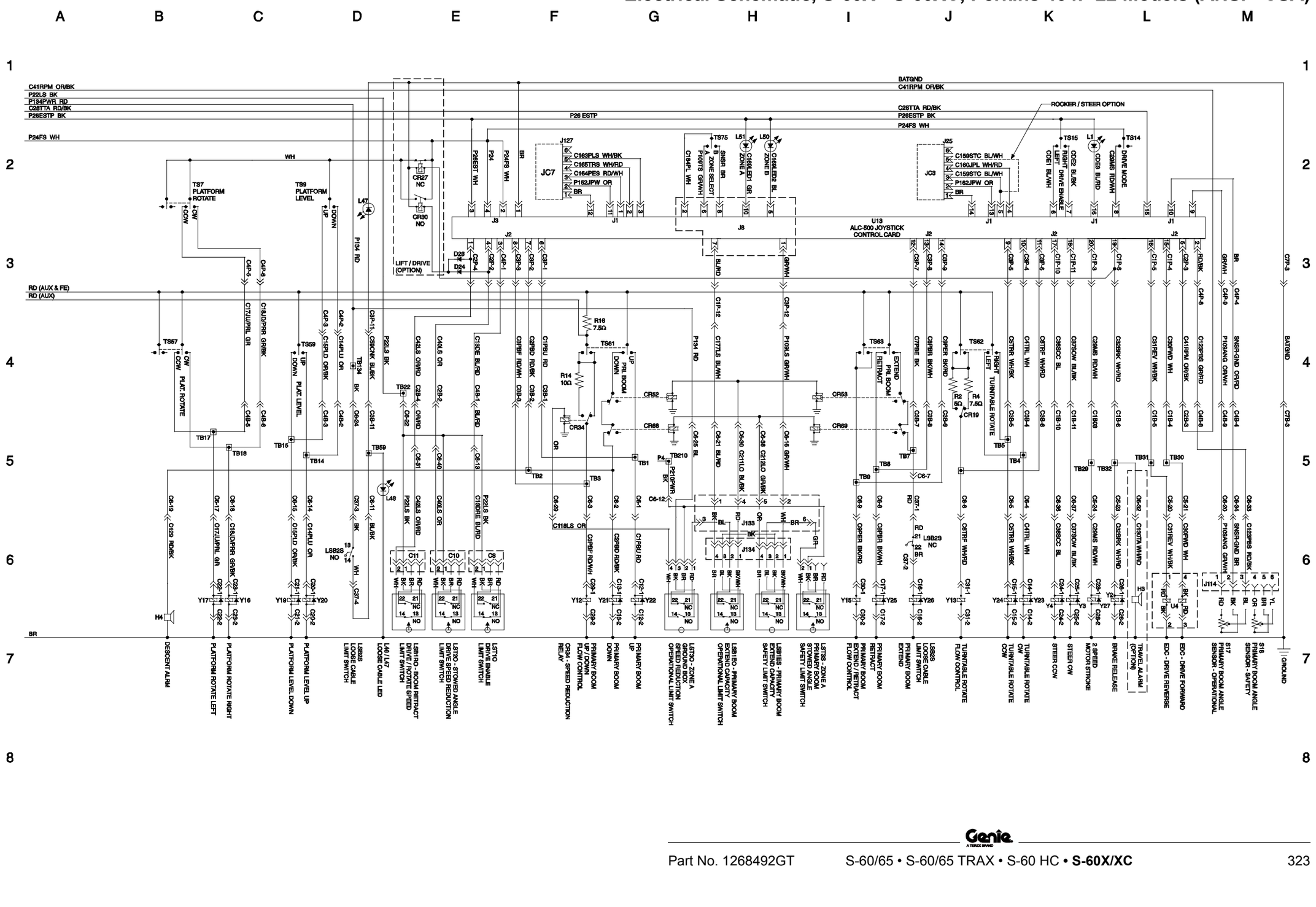
# Electrical Schematic, S-60X • S-60XC
# Perkins 404F-22 Models (ANSI • CSA)



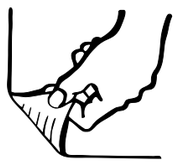
# Electrical Schematic, S-60X • S-60XC, Perkins 404F-22 Models (ANSI • CSA)



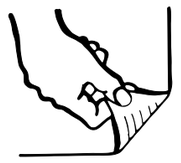
# Electrical Schematic, S-60X • S-60XC, Perkins 404F-22 Models (ANSI • CSA)



# Electrical Schematic, S-60X • S-60XC
# Perkins 404F-22 Models (ANSI • CSA)

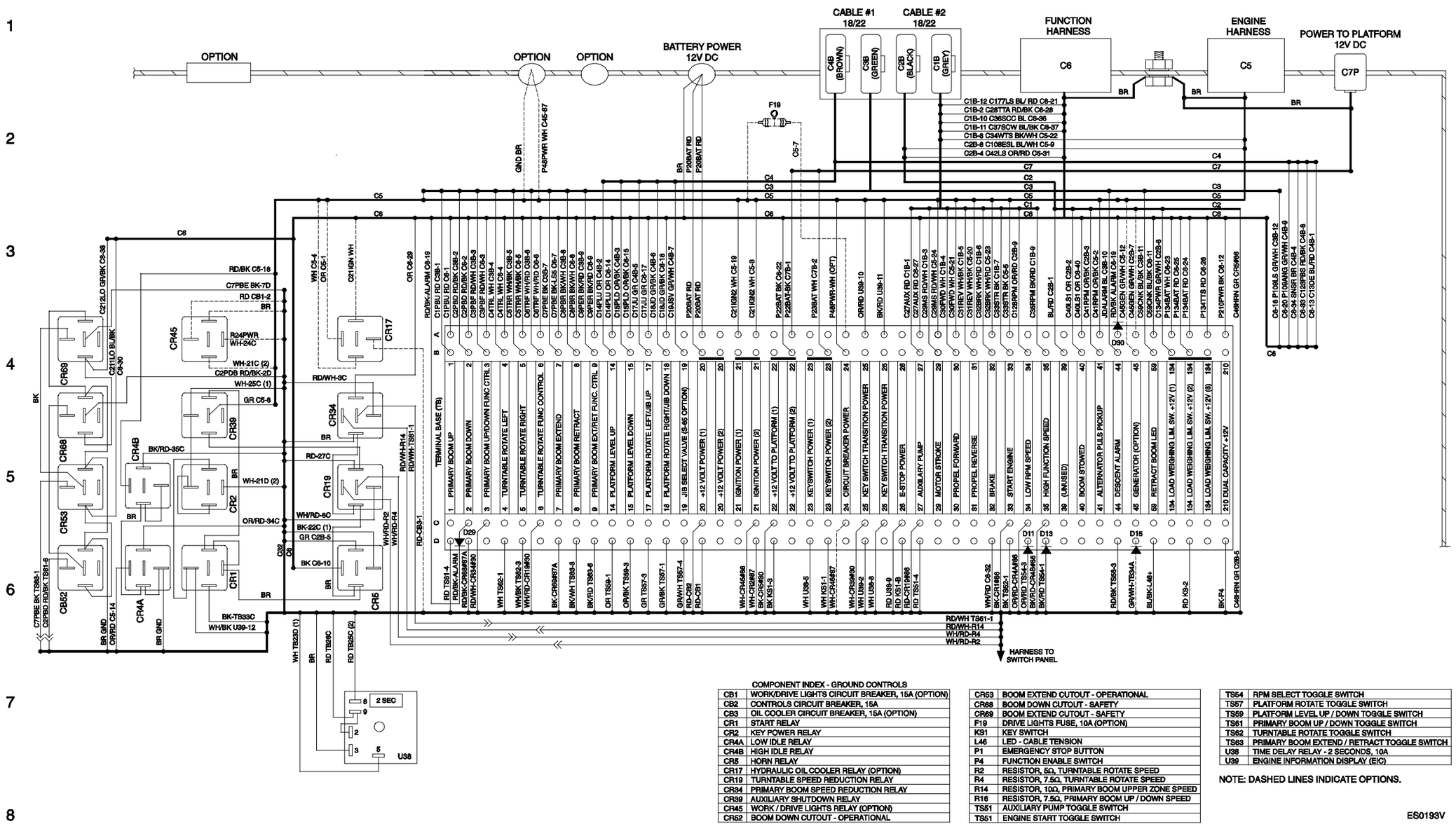


# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC, Perkins 404F-22 Models (ANSI • CSA)



# Ground Control Box Terminal Strip Wiring Diagram, S-60X • S-60XC,

## Perkins 404F-22 Models (ANSI • CSA)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | WORK/DRIVE LIGHTS CIRCUIT BREAKER, 15A (OPTION) |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | OIL COOLER CIRCUIT BREAKER, 15A (OPTION) |
| CR1 | START RELAY |
| CR2 | KEY POWER RELAY |
| CR4A | LOW IDLE RELAY |
| CR4B | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| CR39 | AUXILIARY SHUTDOWN RELAY |
| CR45 | WORK / DRIVE LIGHTS RELAY (OPTION) |
| CR52 | BOOM DOWN CUTOUT - OPERATIONAL |

| | |
|---|---|
| CR53 | BOOM EXTEND CUTOUT - OPERATIONAL |
| CR88 | BOOM DOWN CUTOUT - SAFETY |
| CR69 | BOOM EXTEND CUTOUT - SAFETY |
| F19 | DRIVE LIGHTS FUSE, 10A (OPTION) |
| K51 | KEY SWITCH |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 7.5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS51 | ENGINE START TOGGLE SWITCH |

| | |
|---|---|
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U38 | TIME DELAY RELAY - 2 SECONDS, 10A |
| U39 | ENGINE INFORMATION DISPLAY (EIC) |

NOTE: DASHED LINES INDICATE OPTIONS.

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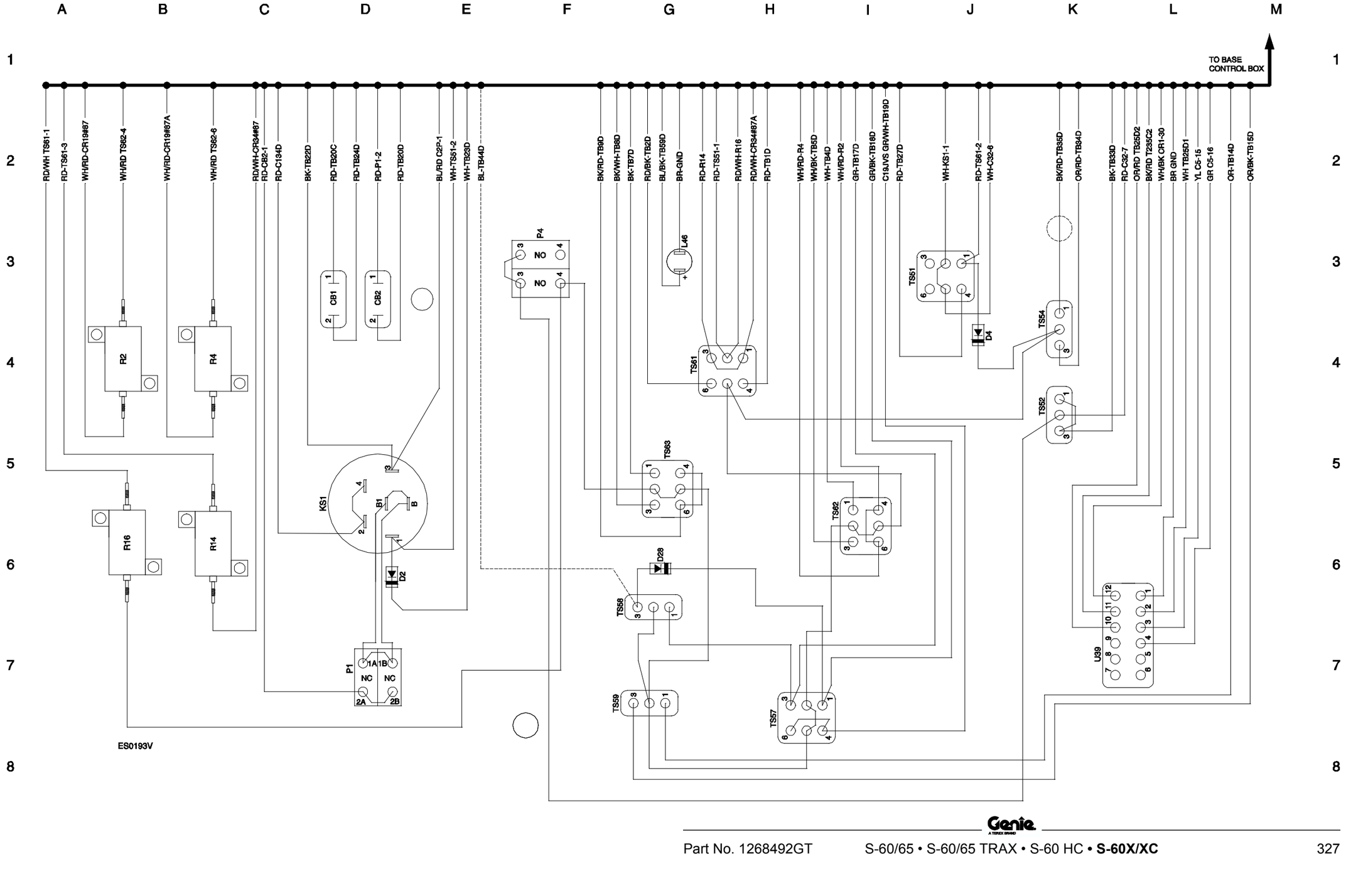
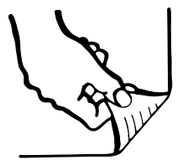
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC,

## Perkins 404F-22 Models (ANSI • CSA)



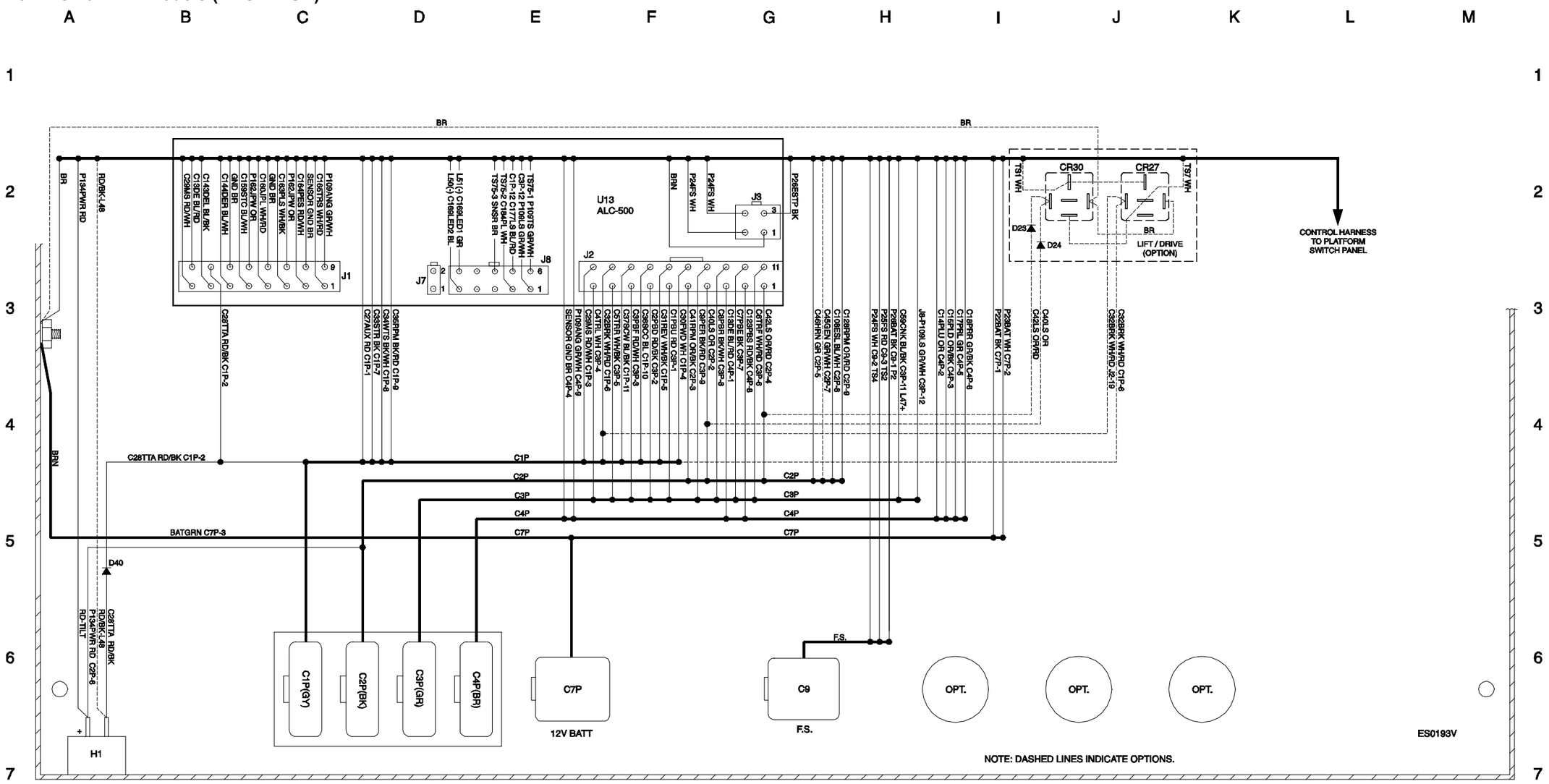
# Ground Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Perkins 404F-22 Models (ANSI • CSA)

# Platform Control Box Wiring Diagram, S-60X • S-60XC, Perkins 404F-22 Models (ANSI • CSA)



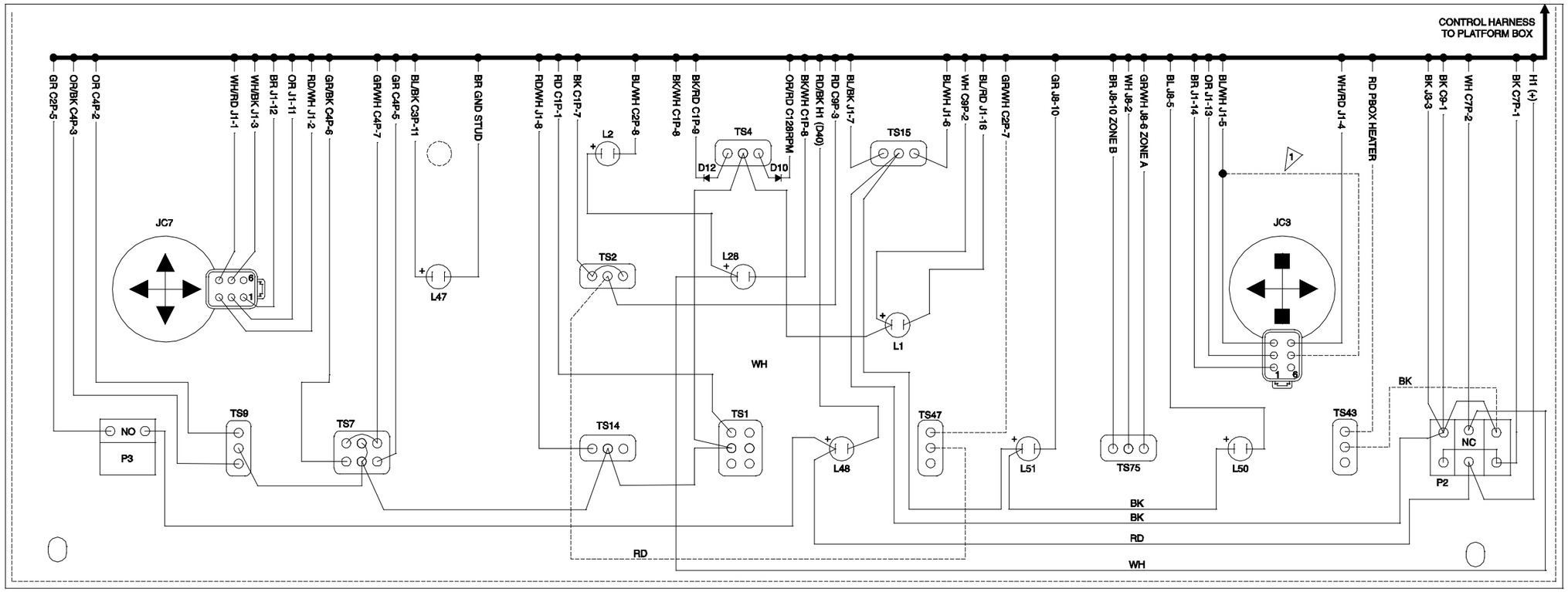
# Platform Control Box Wiring Diagram, S-60X • S-60XC,

## Perkins 404F-22 Models (ANSI • CSA)



# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC,

## Perkins 404F-22 Models (ANSI • CSA)




COMPONENT INDEX

| | |
|---|---|
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH CIRCUIT (LIFT / DRIVE OPTION) |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L2 | LED - CHECK ENGINE |
| L28 | LED - WAIT TO START (GLOW PLUGS) |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| L50 | LED - ZONE A |
| L51 | LED - ZONE B |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |

| | |
|---|---|
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| TS75 | ZONE SELCT TOGGLE SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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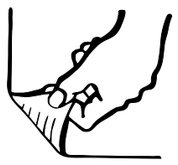
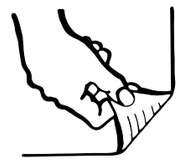
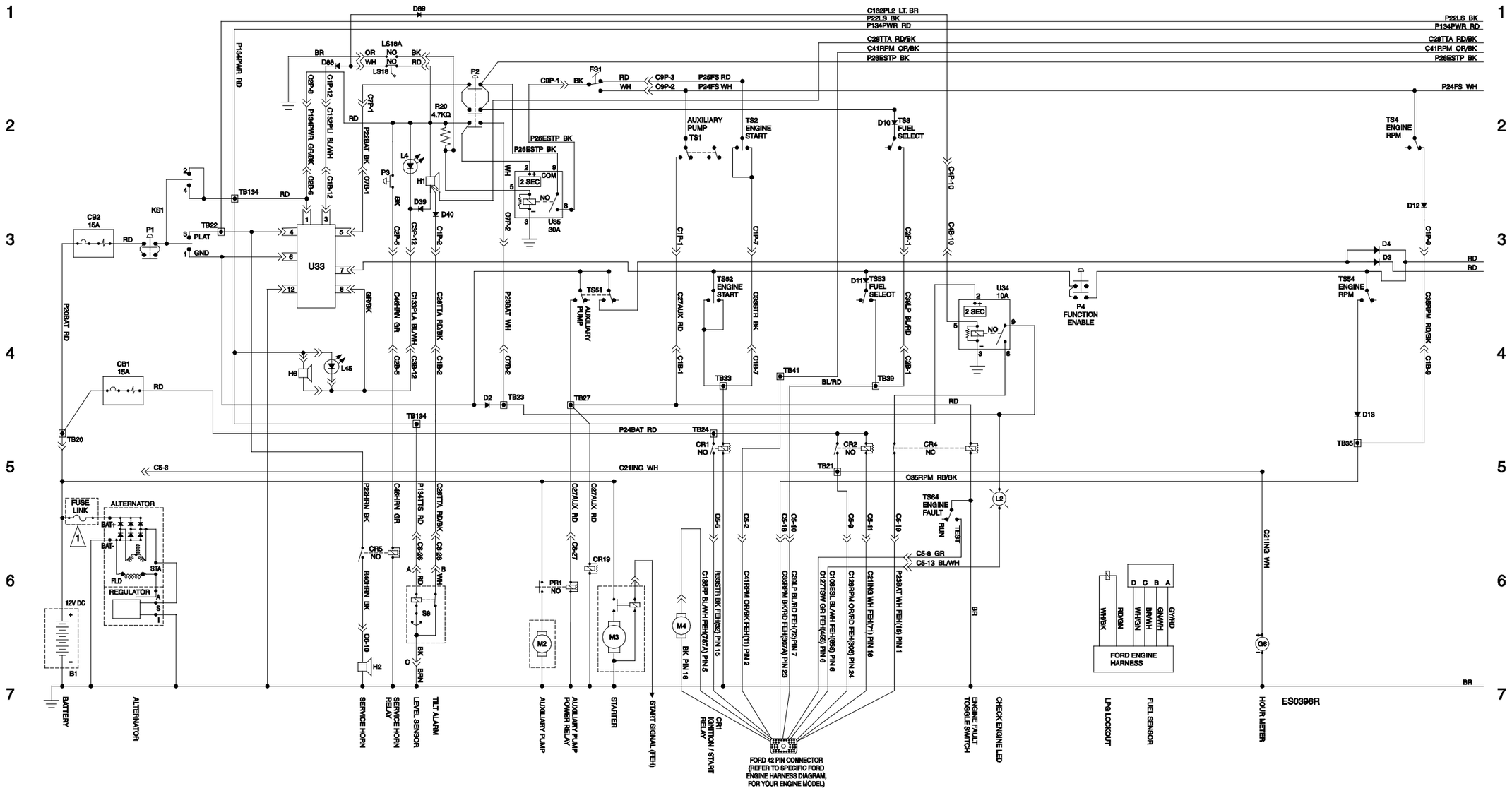
# Platform Control Box Switch Panel Wiring Diagram, S-60X • S-60XC, Perkins 404F-22 Models (ANSI • CSA)



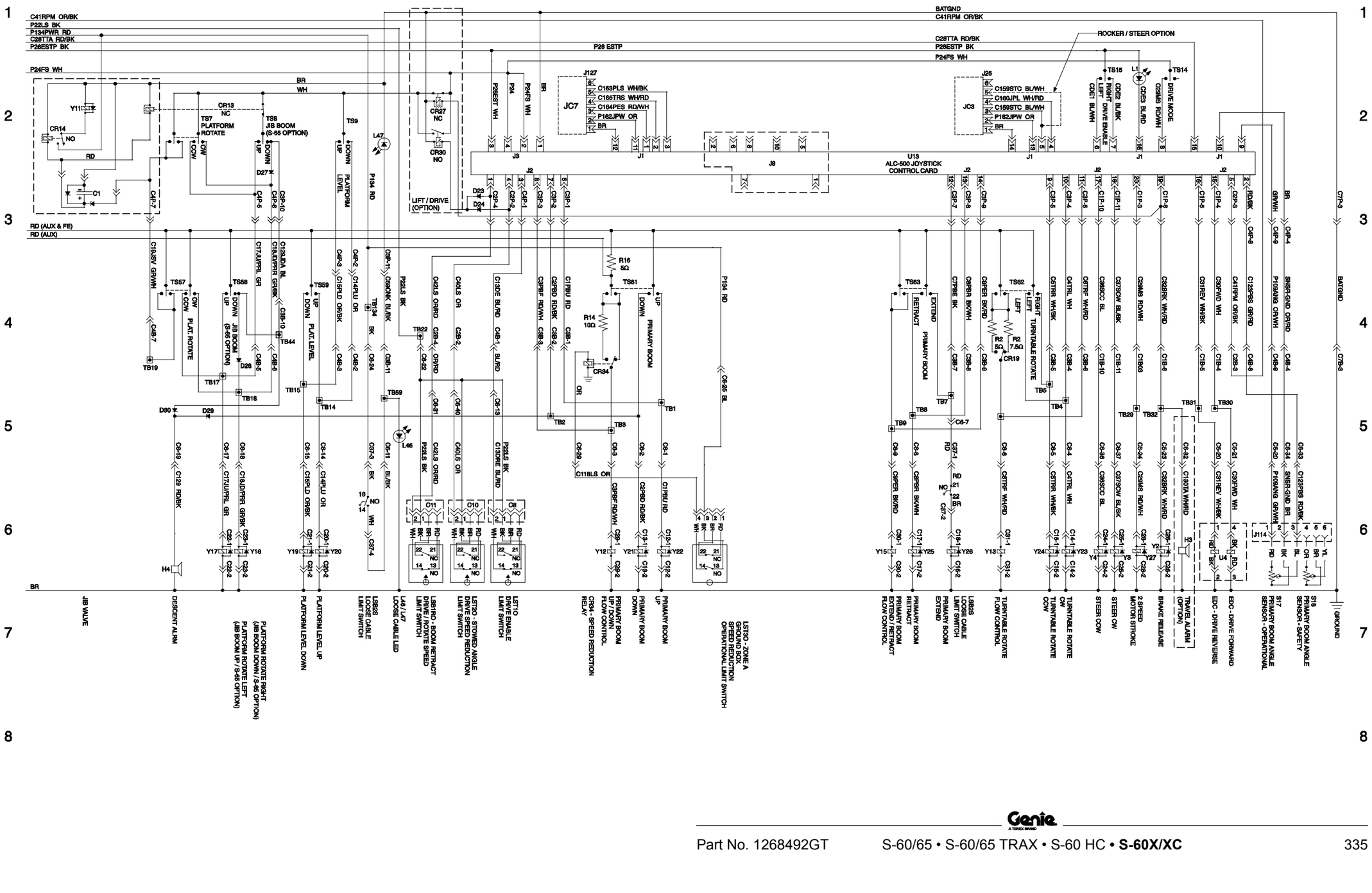
# Electrical Schematic, Ford MSG-425 EFI Models (CE)



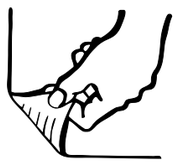
# Electrical Schematic, Ford MSG-425 EFI Models (CE)



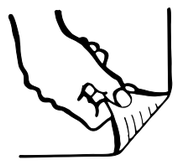
# Electrical Schematic, Ford MSG-425 EFI Models (CE)



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

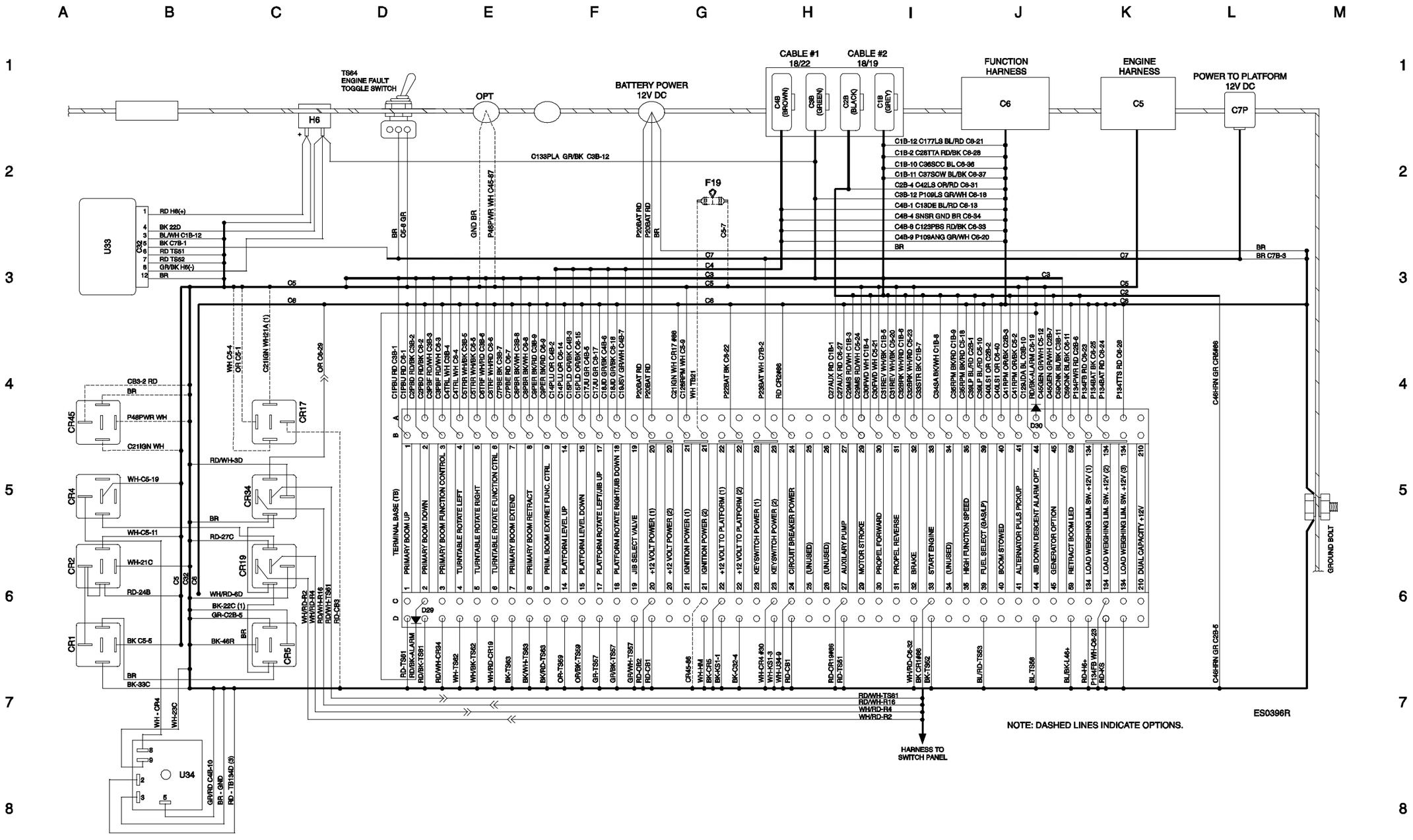


# Ground Control Box Terminal Strip Wiring Diagram, Ford MSG-425 EFI Models (CE)



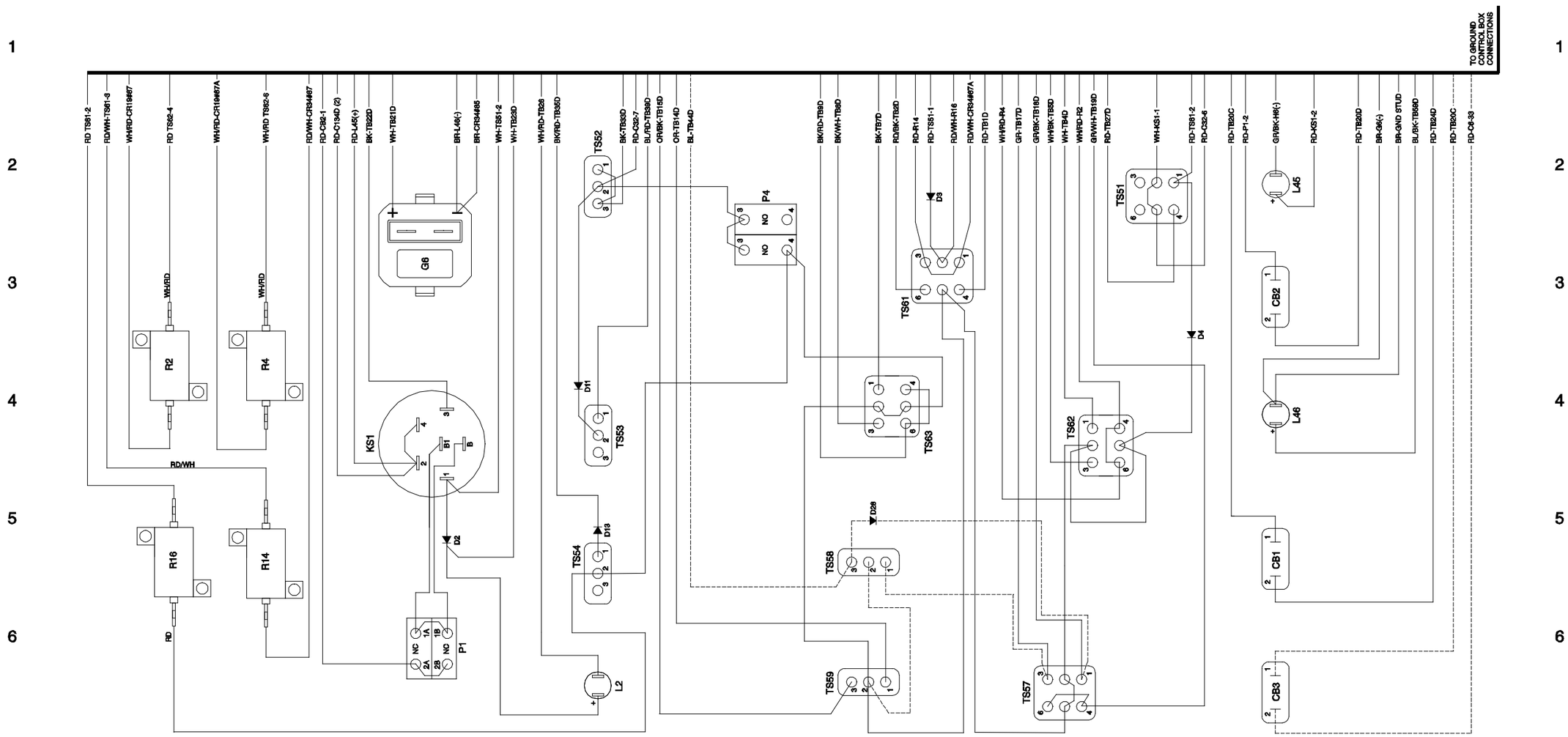
# Ground Control Box Terminal Strip Wiring Diagram,

## Ford MSG-425 EFI Models (CE)



# Ground Control Box Switch Panel Wiring Diagram,

## Ford MSG-425 EFI Models (CE)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L2 | LED - CHECK ENGINE |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS53 | FUEL SELECT TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |

| | |
|---|---|
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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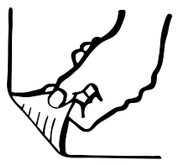
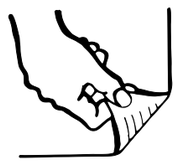
# Ground Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (CE)

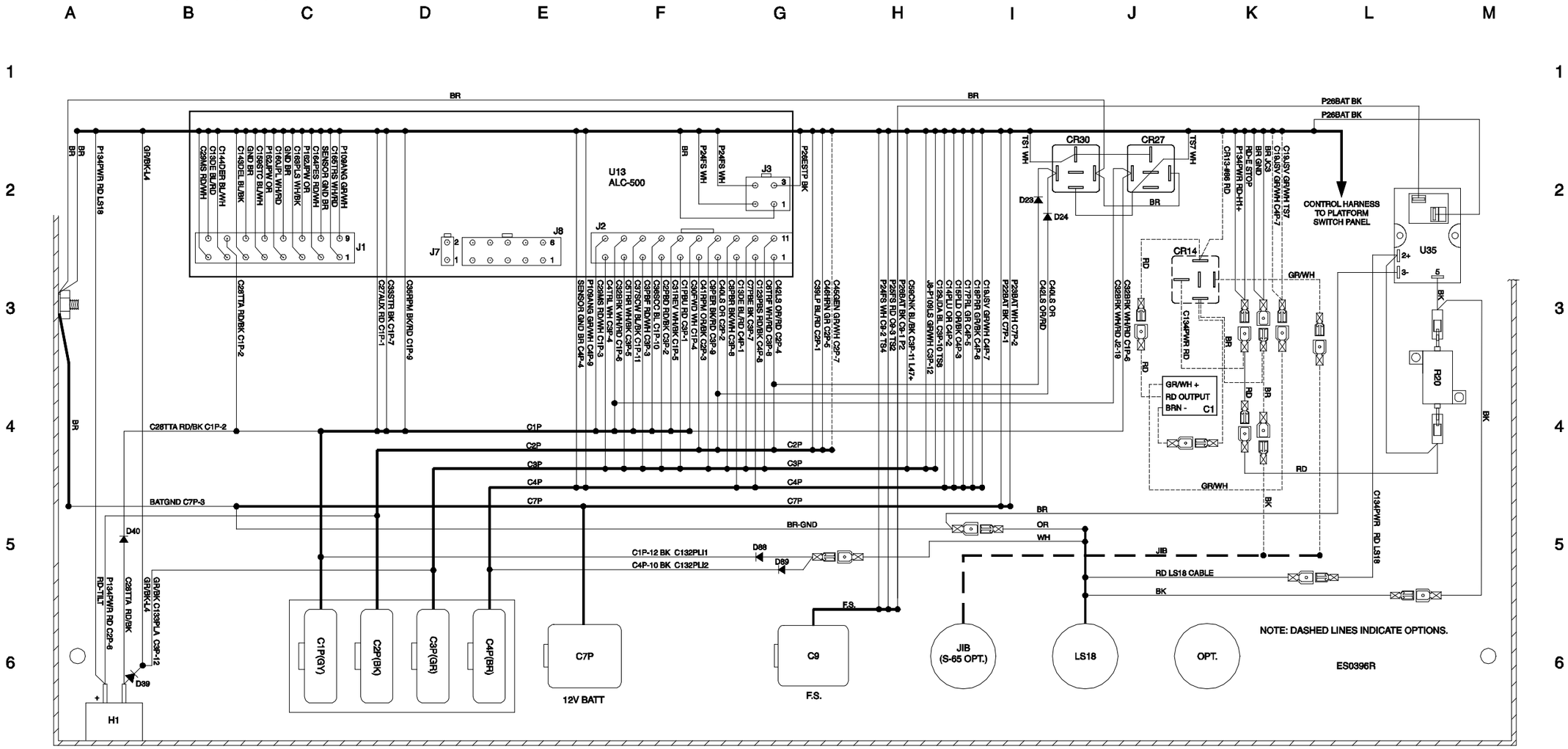


# Platform Control Box Wiring Diagram, Ford MSG-425 EFI Models (CE)



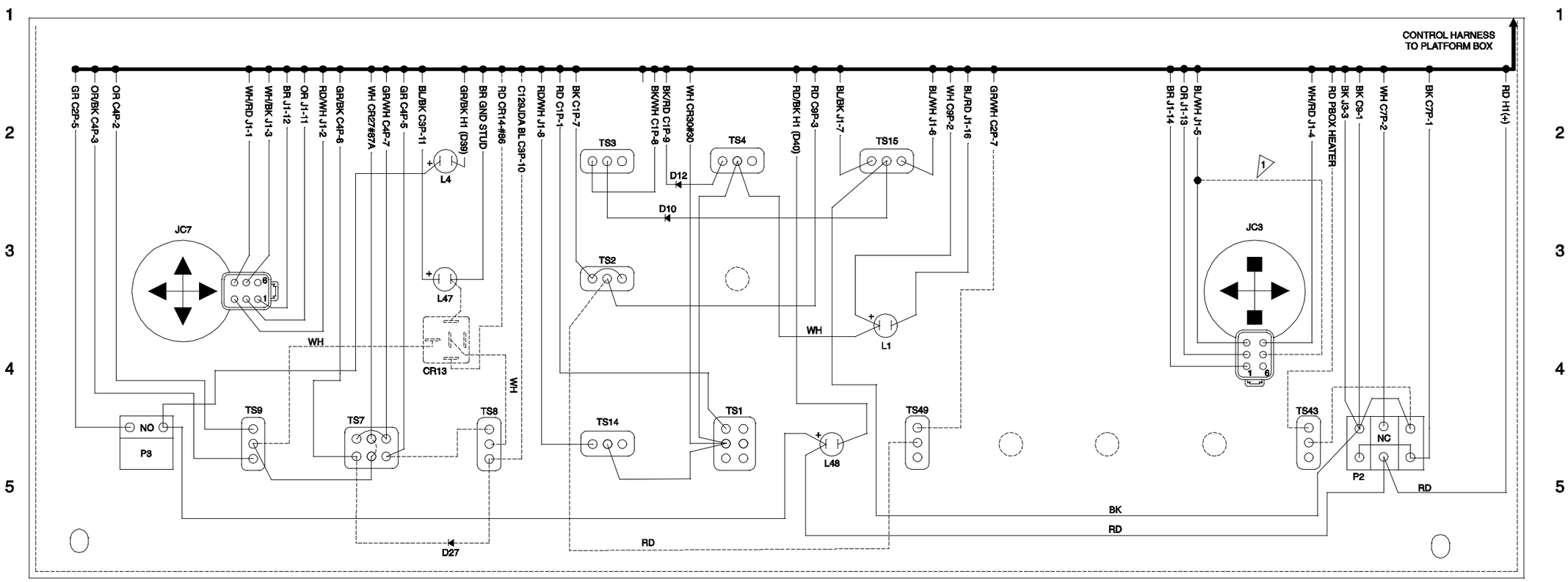
# Platform Control Box Wiring Diagram,

## Ford MSG-425 EFI Models (CE)



# Platform Control Box Switch Panel Wiring Diagram,

## Ford MSG-425 EFI Models (CE)




### COMPONENT INDEX

| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |

| | |
|---|---|
| TS3 | FUEL SELECT TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

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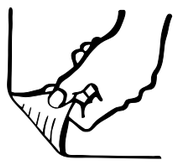
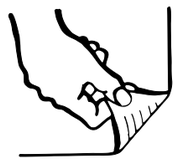
# Platform Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (CE)



# Electrical Schematic, Deutz D2011L03i Models (CE)



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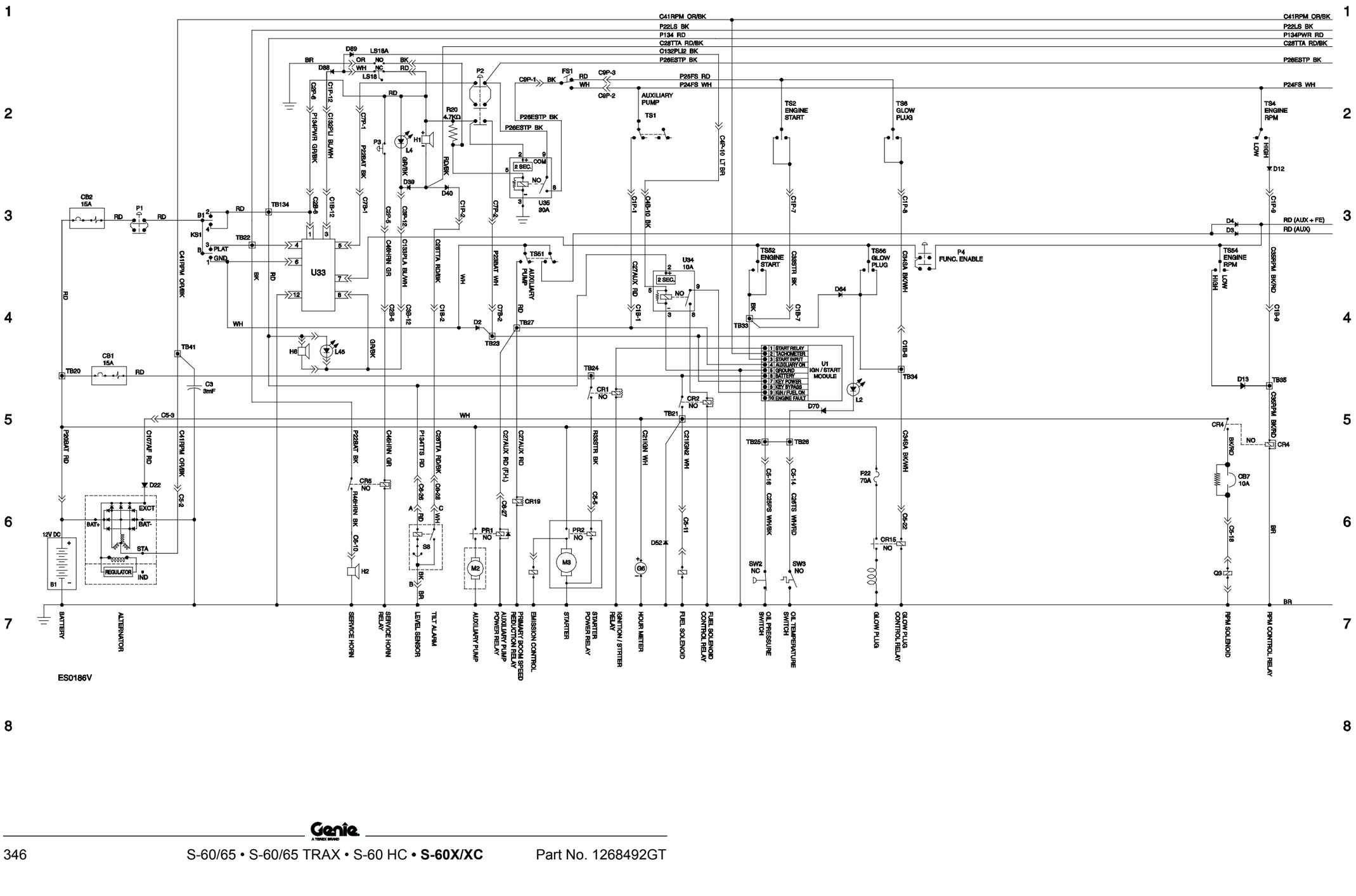

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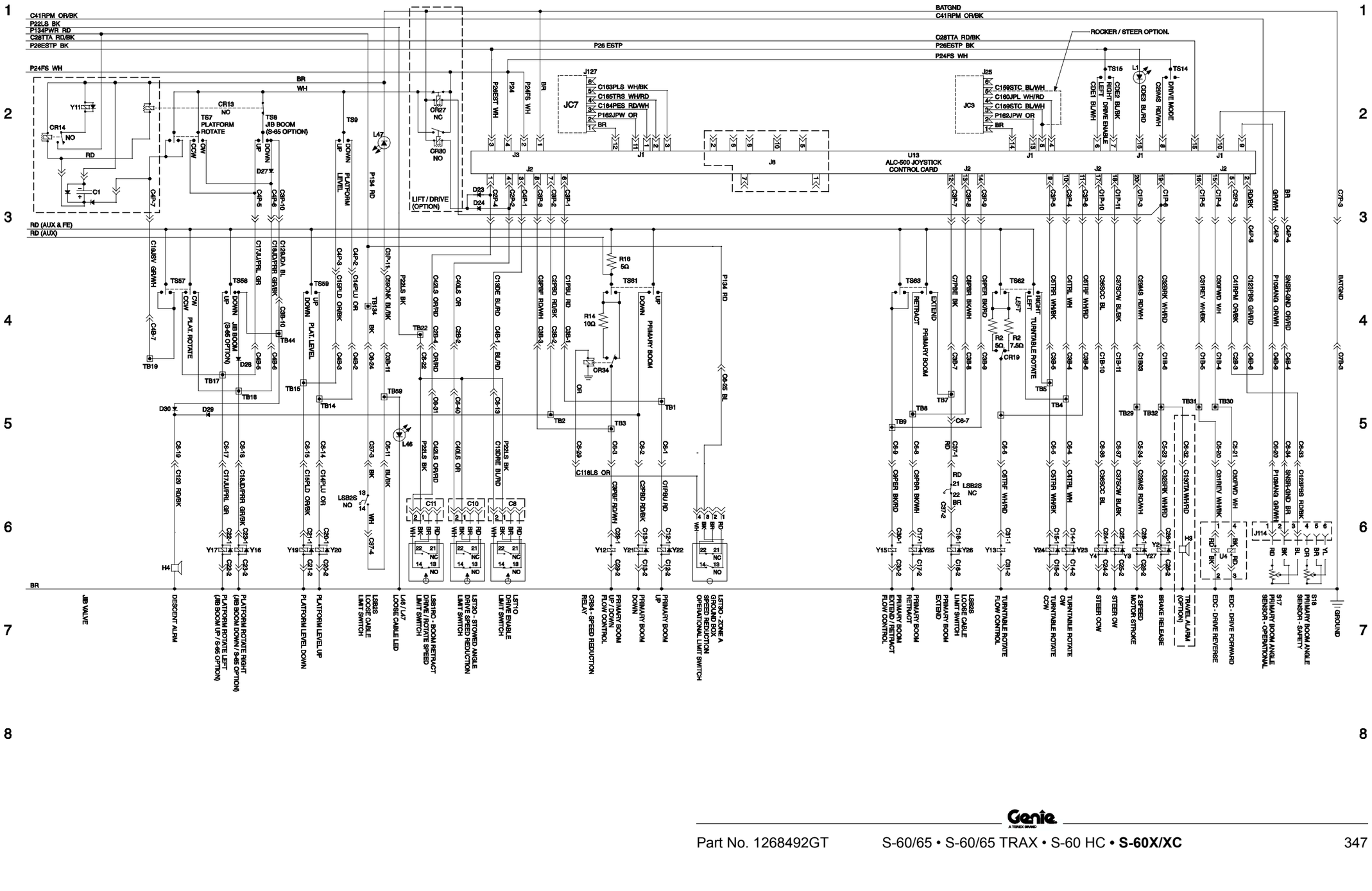
A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134PWR RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BR
WH
RD
Y11
CR14
NO
C1
CR13
NC
TS7
PLATFORM ROTATE
TS8
JIB BOOM (S-65 OPTION)
TS9
L47
CR27
NC
CR30
NO
LIFT / DRIVE (OPTION)
P26 ESTP
P26EST WH
P24
P24FS WH
J127
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
JC7
J3
J2
J1
J6
D23
D24
BATGND
C41RPM OR/BK
C28TTA RD/BK
P26ESTP BK
P24FS WH
ROCKER / STEER OPTION.
J25
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
JC3
TS15
TS14
L1
CDE1 LEFT DRIVE ENABLE
CDE2 RIGHT DRIVE ENABLE
CDE3 BL/BK
CDE5 BL/RD
C28MS RD/WH
DRIVE MODE
U13
ALC-500 JOYSTICK CONTROL CARD
RD (AUX & FE)
RD (AUX)
C16ASV GR/WH
C17AJ/PRL GR
C16AD/PRR GR/BK
C12BJDA BL
C15PLD OR/BK
C14PLU OR
P134 RD
TB34
BK
C6-24
C6P-11, C6RCNK BL/BK
P22LS BK
C40LS OR/RD
C40LS OR
C19DE BL/RD
C28FBF RD/WH
C28FBD RD/BK
C1PBU RD
C6P-15, C6PCNK BL/BK
R18 5Ω
R14 10Ω
TS61
CR34
OR
PRIMARY BOOM
DOWN
UP
C6-25 BL
TB1
TB2
TB3
C6-29
C118LS OR
C28FBF RD/WH
C28FBD RD/BK
C1PBU RD
C12-1
C12-2
Y12
Y21
Y22
C13-1
C13-2
TS63
TS62
TS61
RETRACT
EXTEND
PRIMARY BOOM
LEFT
RIGHT
TURNTABLE ROTATE
R2 5Ω
R2 7.5Ω
CR19
C7FBE BK
C8FBR BK/WH
C8FPER BK/RD
C6TTR WH/BK
C6TTRL WH
C6TRF WH/RD
C6TFF WH/RD
C6TFL WH
C6TTL WH/BK
C7FBE BK
C8FBR BK/WH
C8FPER BK/RD
C6TRF WH/RD
C6TFF WH/RD
C6TTR WH/BK
C6TTL WH
C6TRL WH
C6TFL WH/BK
C6-7
C37-1
C37-2
RD
BR
LSB2S
NC
NO
C16-1
C16-2
Y26
Y13
Y24
Y23
C6-4
C6-5
C6-6
C6-8
C6-9
C6-10
C6-11
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C6-13
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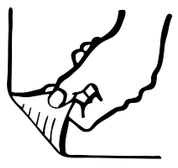
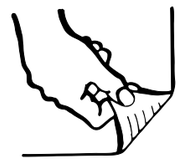
C6-44
C6-45
C6-46
C6-47

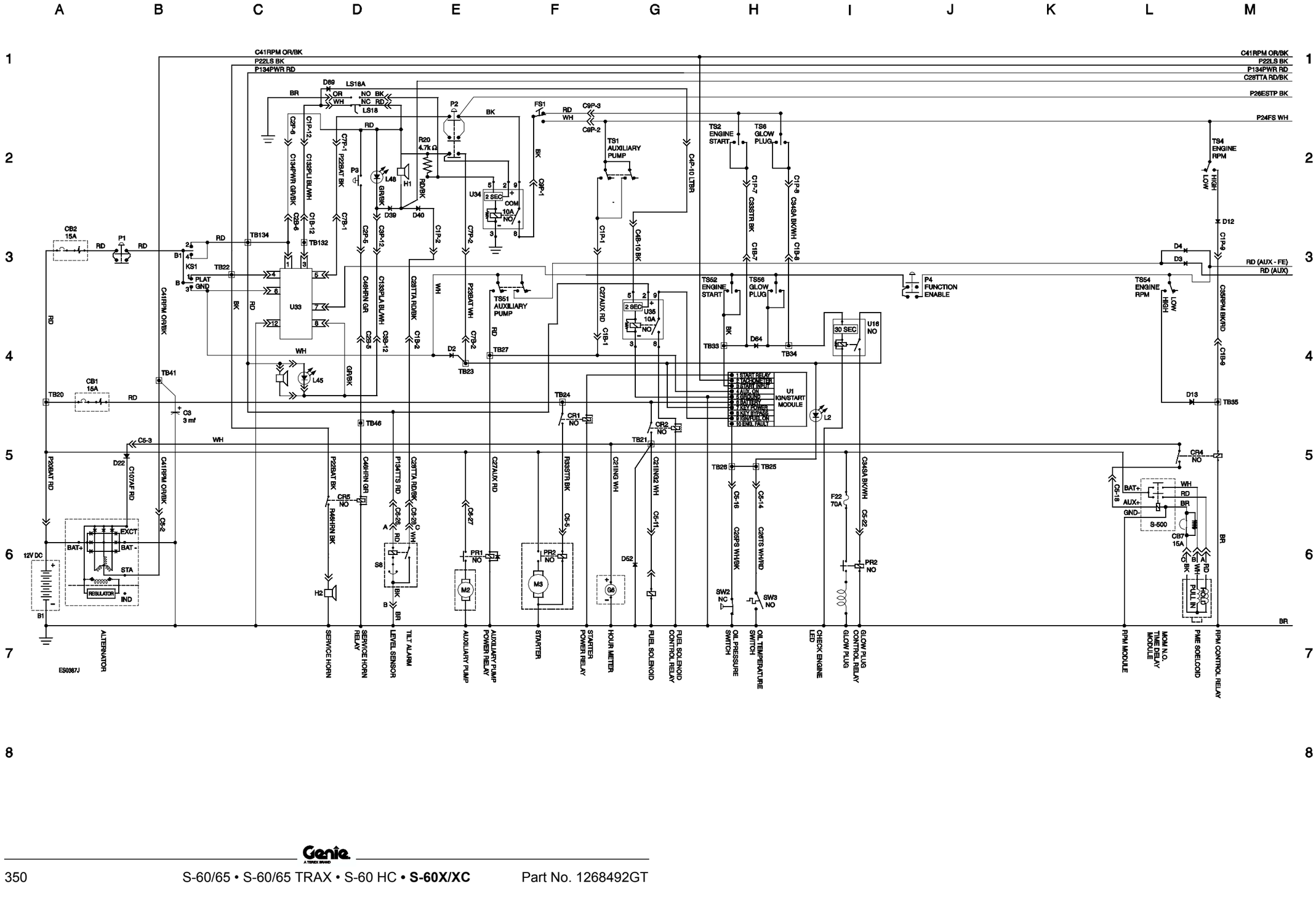
# Electrical Schematic, Deutz D2011L03i Models (CE)



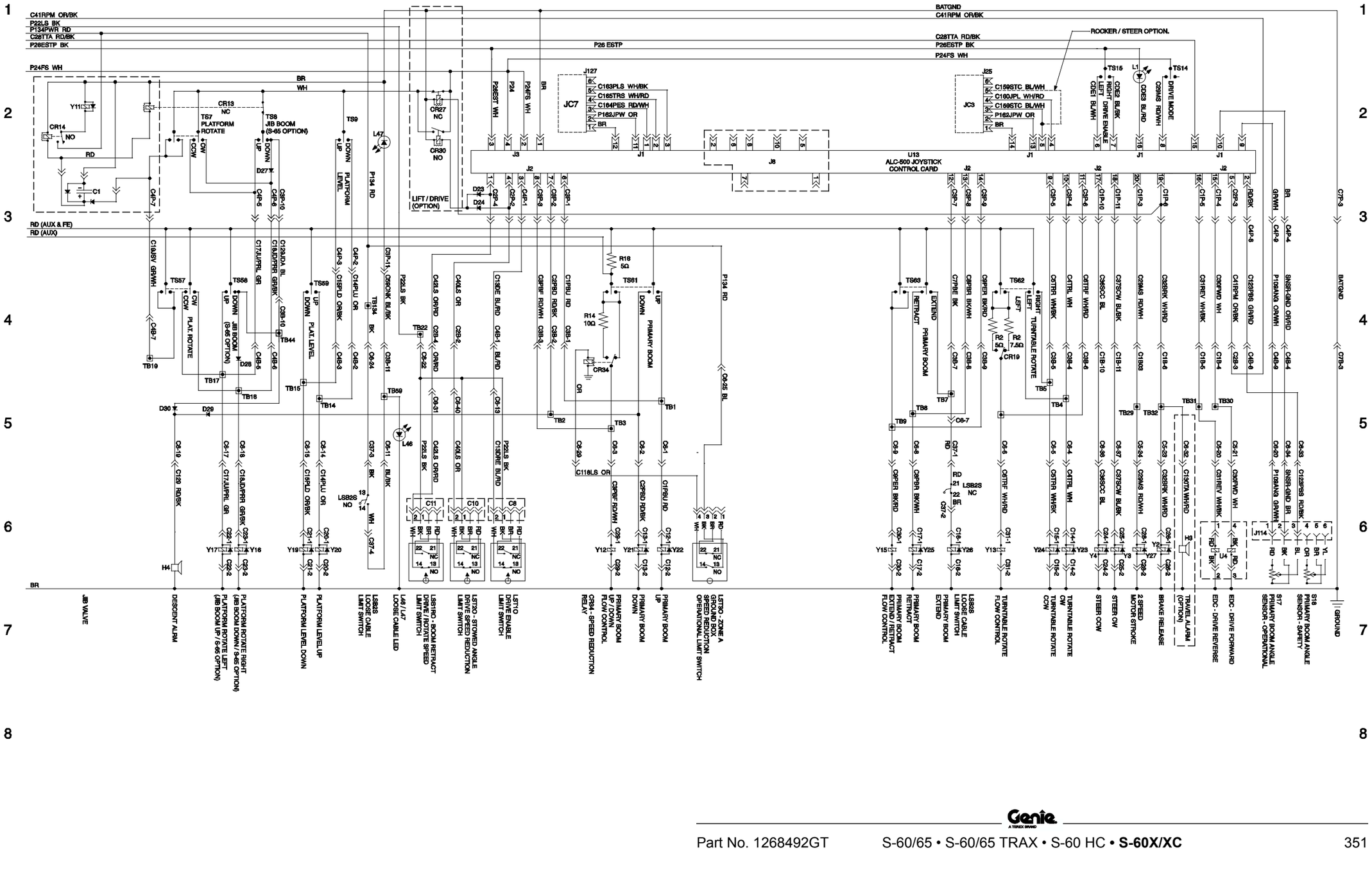
# Electrical Schematic, Deutz TD2011L04i Models (CE)



# Electrical Schematic, Deutz TD2011L04i Models (CE)



# Electrical Schematic, Deutz TD2011L04i Models (CE)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134PWR RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BR
WH
RD
Y11
CR14
NO
C1
CR13
NC
TS7
PLATFORM ROTATE
TS8
JIB BOOM (S-65 OPTION)
TS9
L47
CR27
NC
CR30
NO
LIFT / DRIVE (OPTION)
D23
D24
P26 ESTP
P26EST WH
P24
P24FS WH
BR
J127
JC7
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
J3
J2
J1
J8
U13
ALC-500 JOYSTICK CONTROL CARD
BATGND
C41RPM OR/BK
C28TTA RD/BK
P26ESTP BK
P24FS WH
ROCKER / STEER OPTION.
JC3
J25
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P162JPW OR
BR
TS15
L1
TS14
CDE1 BL/WH
CDE2 BL/BK
CDE3 BL/RD
C28MS RD/WH
LEFT DRIVE ENABLE
RIGHT DRIVE ENABLE
DRIVE MODE
RD (AUX & FE)
RD (AUX)
C16ASV GR/WH
C17AUPRL GR
C16ADPRR GR/BK
C12BUDA BL
TS57
TS58
TS59
TS61
TS63
TS62
C4P-7
C4P-6
C4P-5
C8P-10
C4P-3
C15PLD OR/BK
C14PLU OR
C4P-2
C8P-11
C6R-24
TB134
BK
C6R-11
C8P-1
C6R-ONK BL/BK
P22LS BK
C40LS OR/RD
C39-4
C6-22
C40LS OR
C39-2
C1BDE BL/RD
C48-1
C39FBF RD/WH
C39-3
C39FBD RD/BK
C39-1
C1PBU RD
R18
5Ω
R14
10Ω
CR34
OR
TB22
TB44
TB19
TB17
TB18
TB15
TB14
TB59
TB1
TB2
TB3
D30
D29
D28
D27
C6-25 BL
C6-23
C118LS OR
C39FBF RD/WH
C39-1
C6-2
C1PBU RD
C12-1
C12-2
C6-1
C39FBD RD/BK
C13-1
C13-2
P134 RD
PRIMARY BOOM
DOWN
PRIMARY BOOM
UP
C7BBE BK
C39-7
C39FBR BK/WH
C39-8
C39FER BK/RD
C39-9
C7TRR WH/BK
C38-5
C7TRL WH
C38-4
C8TRF WH/RD
C38-6
C38SCC BL
C1B-10
C37SCW BL/BK
C1B-11
C29MS RD/WH
C1B-3
C28SRK WH/RD
C1B-6
C31REV WH/BK
C1B-5
C30FWD WH
C1B-4
C41RPM OR/BK
C2B-3
C123PBS GR/RD
C4B-8
C123PBS RD/BK
C6-33
C6-34
C6-20
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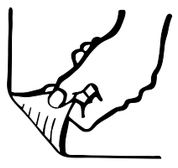
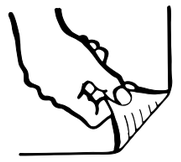
C6-73
C6-74

# Electrical Schematic, Deutz TD2011L04i Models (CE)



# Ground Control Box Terminal Strip Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (CE)

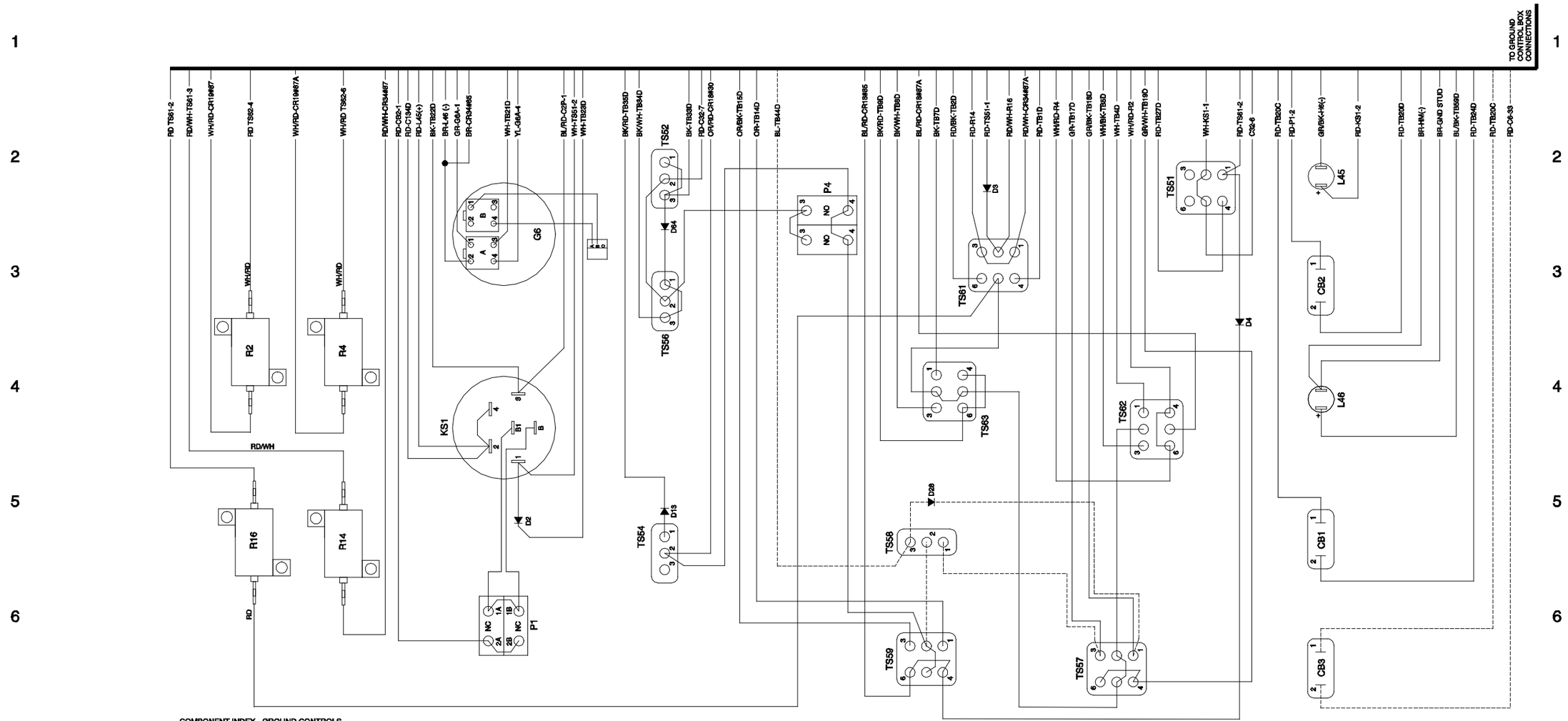


# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (CE)

# Ground Control Box Switch Panel Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (CE)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |

| | |
|---|---|
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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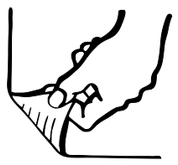
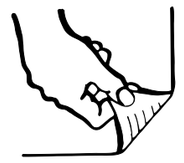
# Ground Control Box Switch Panel Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (CE)

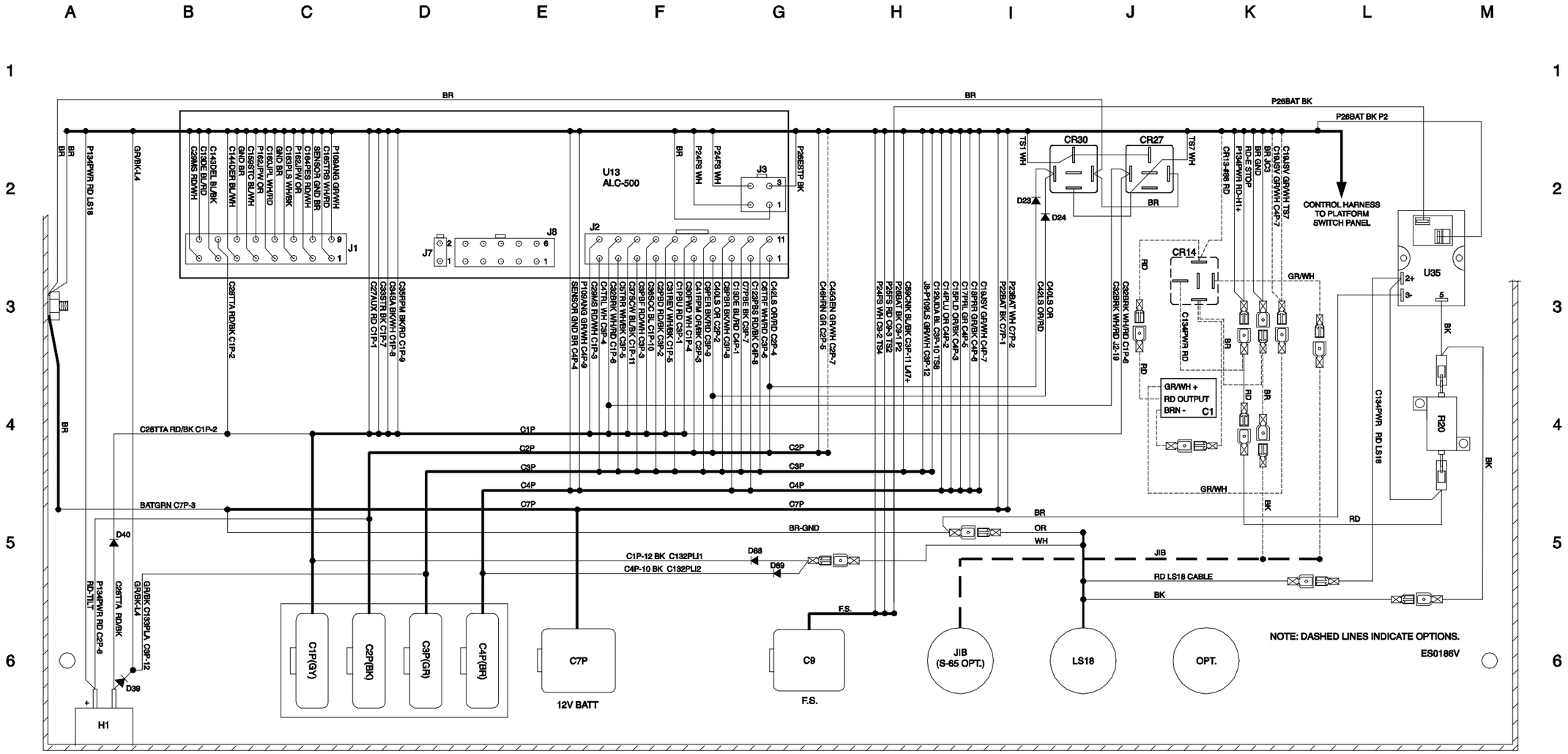


# Platform Control Box Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (CE)



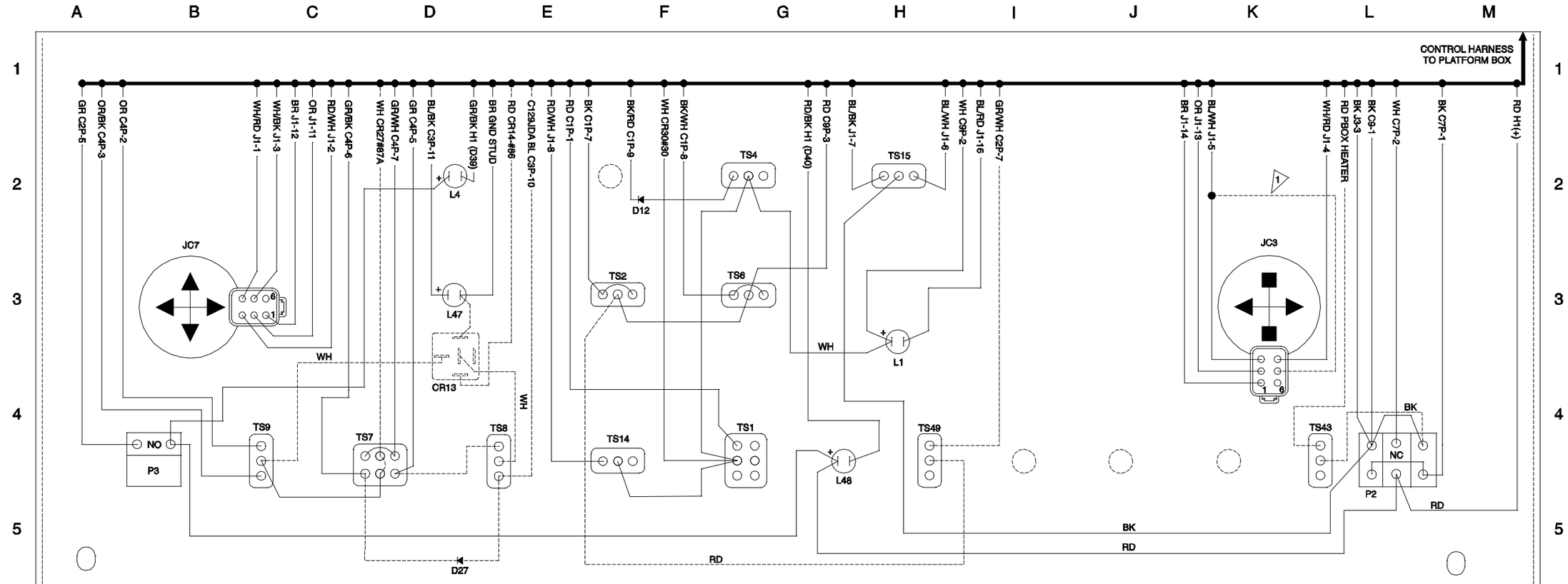
# Platform Control Box Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (CE)



# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (CE)




| | COMPONENT INDEX |
|---|---|
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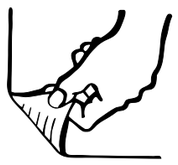
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

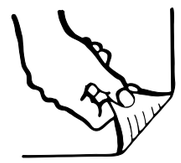
1 ROCKER / STEER OPTION.

ES0591A

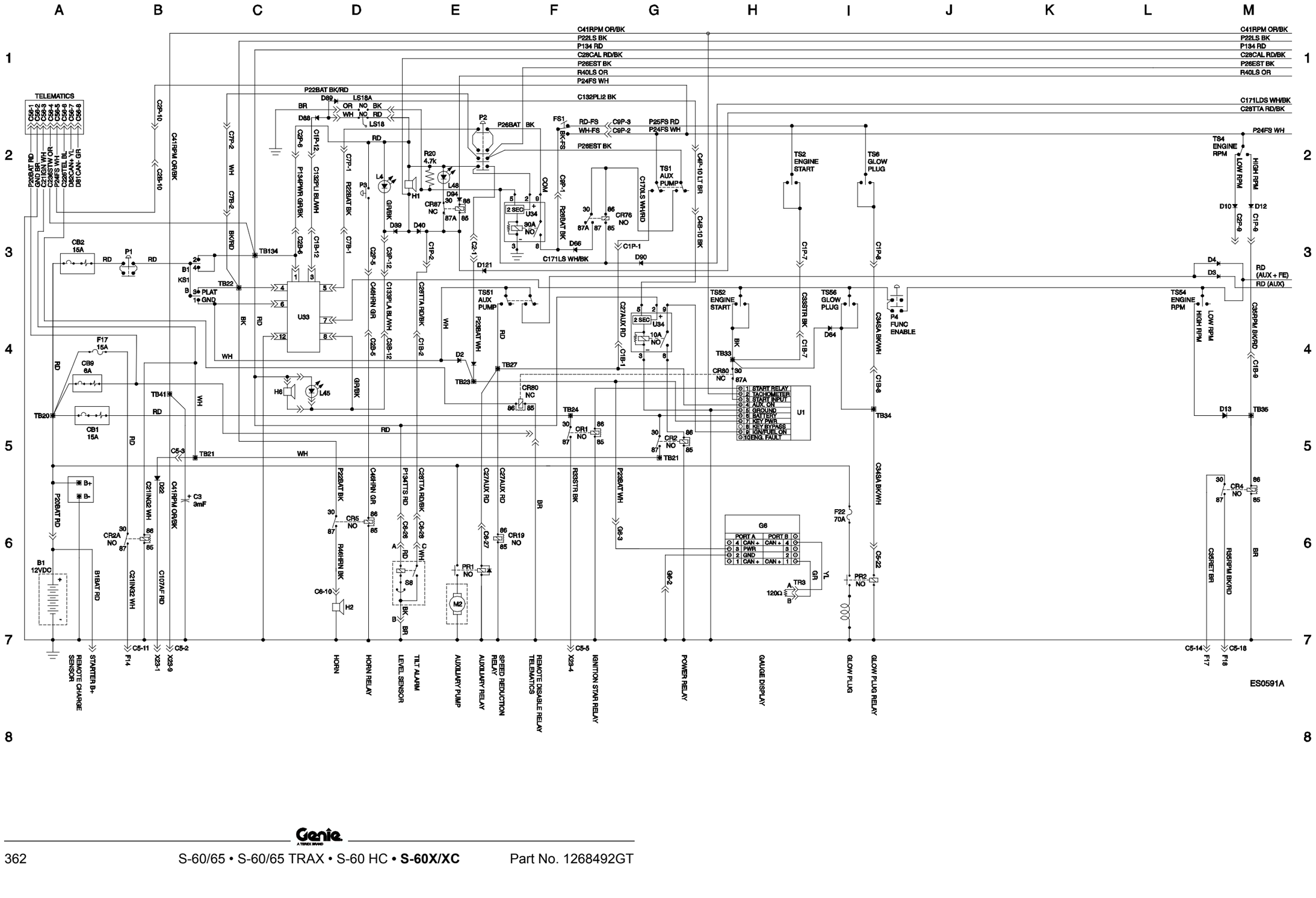
# Platform Control Box Switch Panel Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (CE)



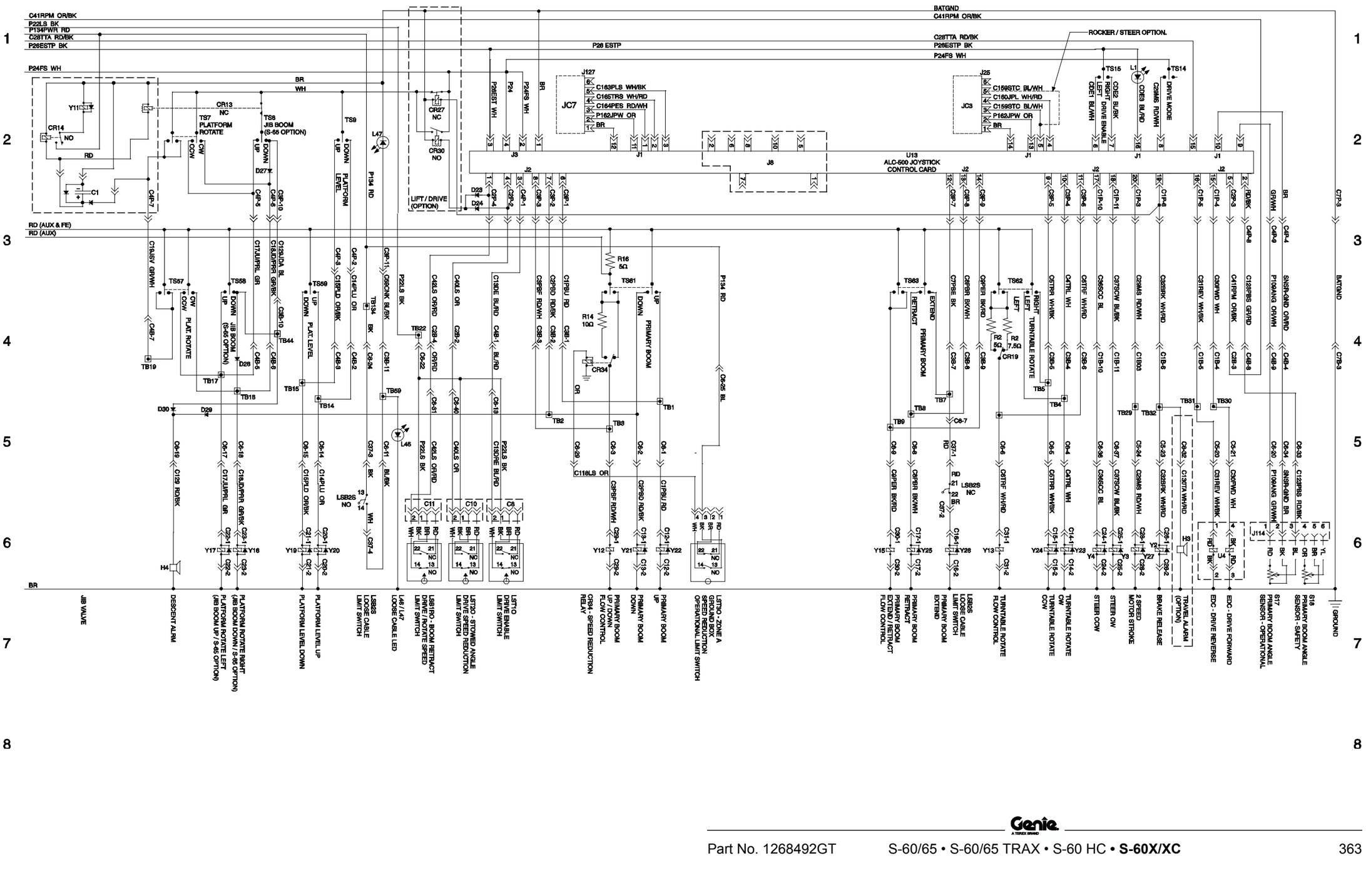
# Electrical Schematic, Deutz D436 L3i Models (CE)



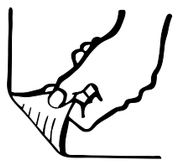
## Electrical Schematic, Deutz D436 L3i Models (CE)



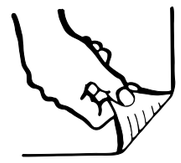
# Electrical Schematic, Deutz D436 L3i Models (CE)



# Electrical Schematic, Deutz D436 L3i Models (CE)

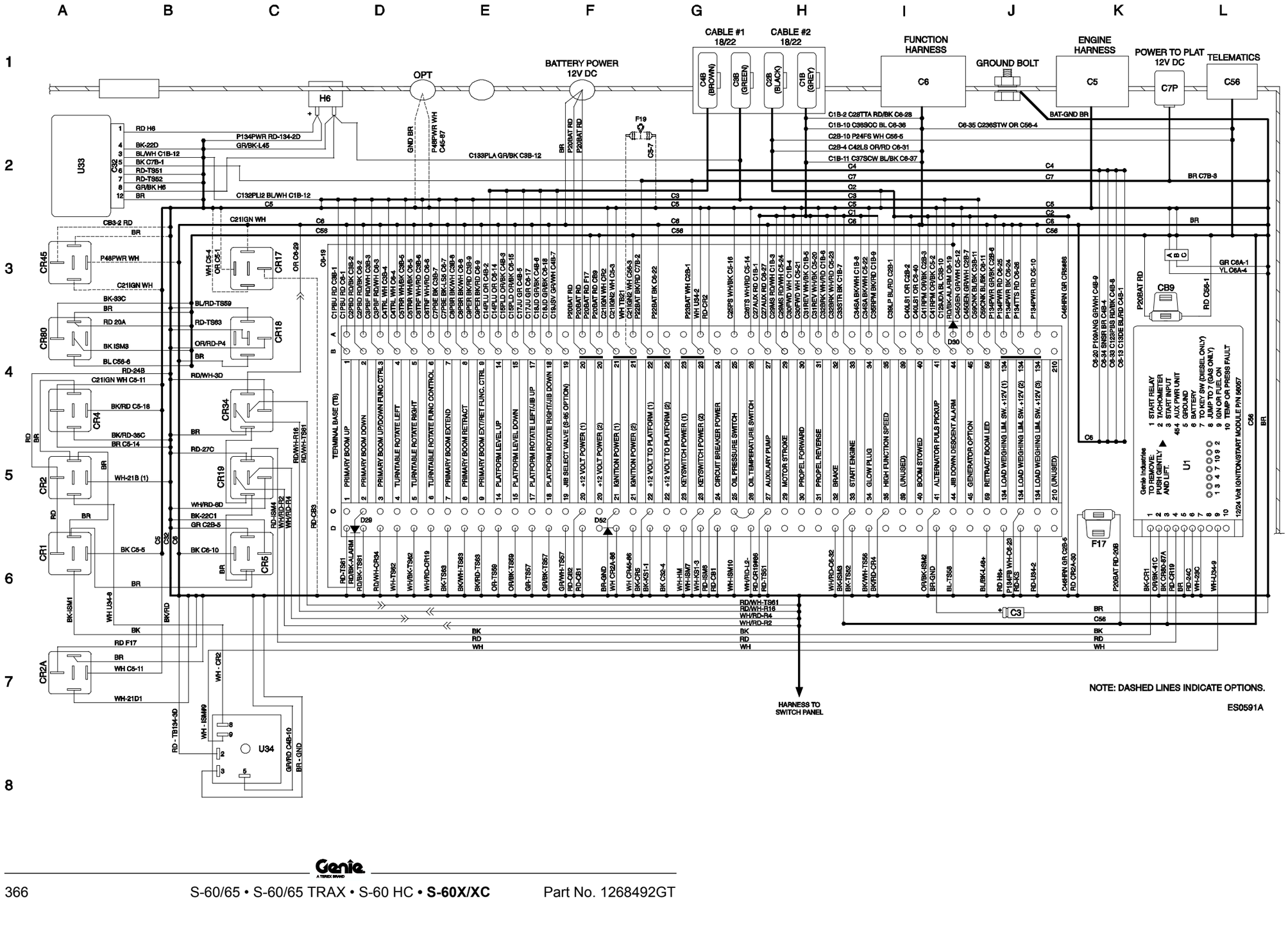


# Ground Control Box Terminal Strip Wiring Diagram, Deutz D436 L3i Models (CE)



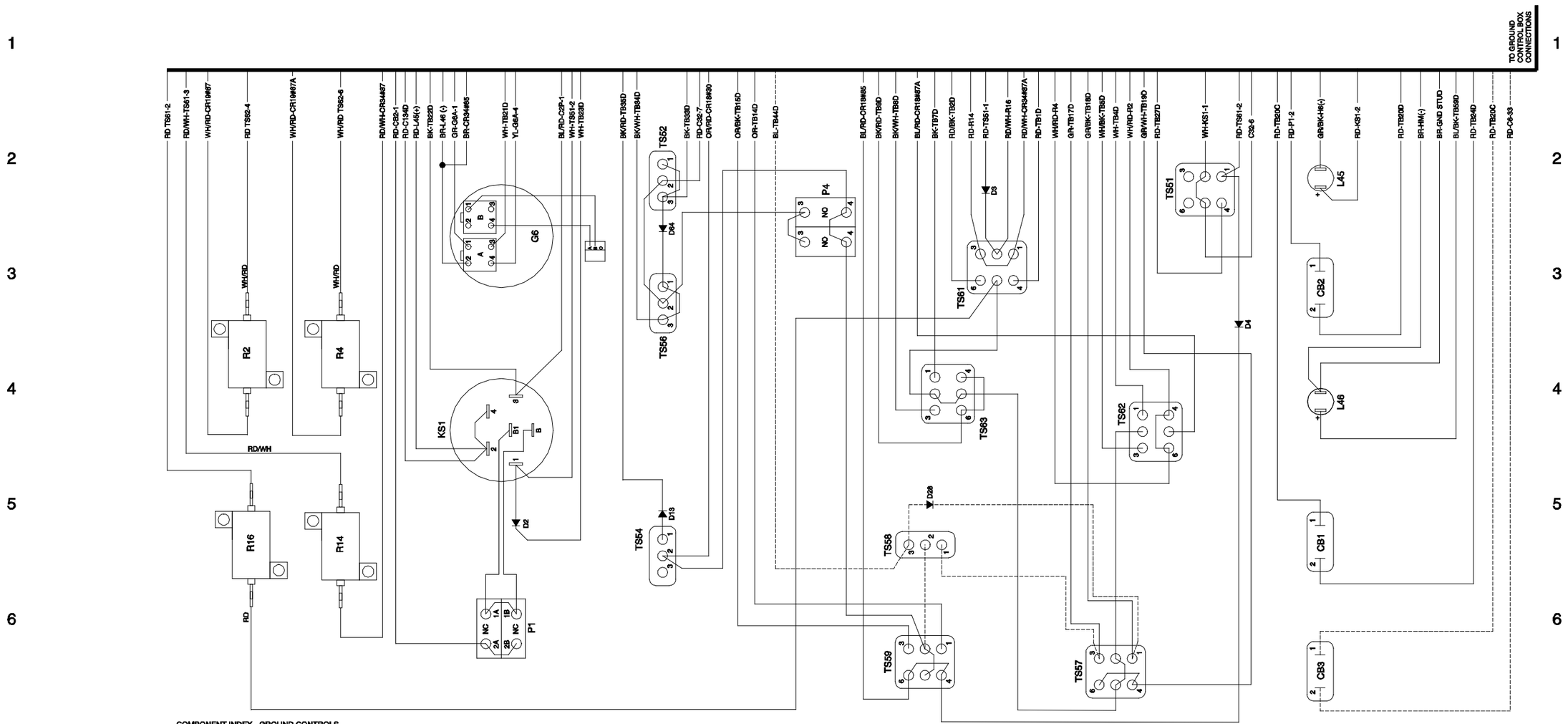
# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D436 L3i Models (CE)



# Ground Control Box Switch Panel Wiring Diagram,

## Deutz D436 L3i Models (CE)




| | COMPONENT INDEX - GROUND CONTROLS |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

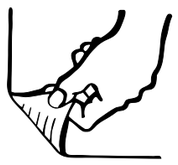
| | |
|---|---|
| KS1 | KEY SWITCH |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |

| | |
|---|---|
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

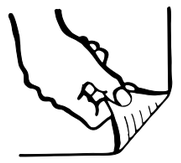
NOTE: DASHED LINES INDICATE OPTIONS.

ES0591A

# Ground Control Box Switch Panel Wiring Diagram, Deutz D436 L3i Models (CE)

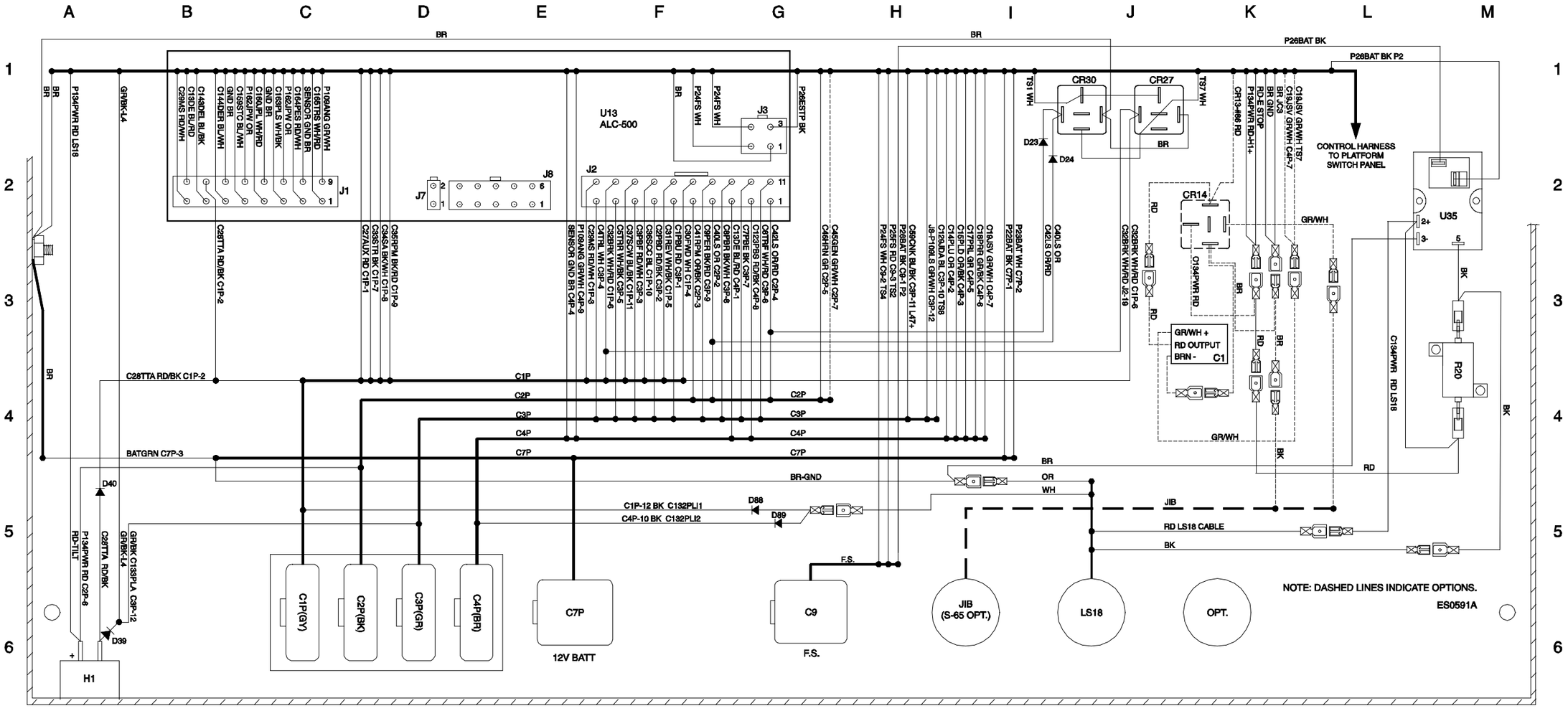


# Platform Control Box Wiring Diagram, Deutz D436 L3i Models (CE)



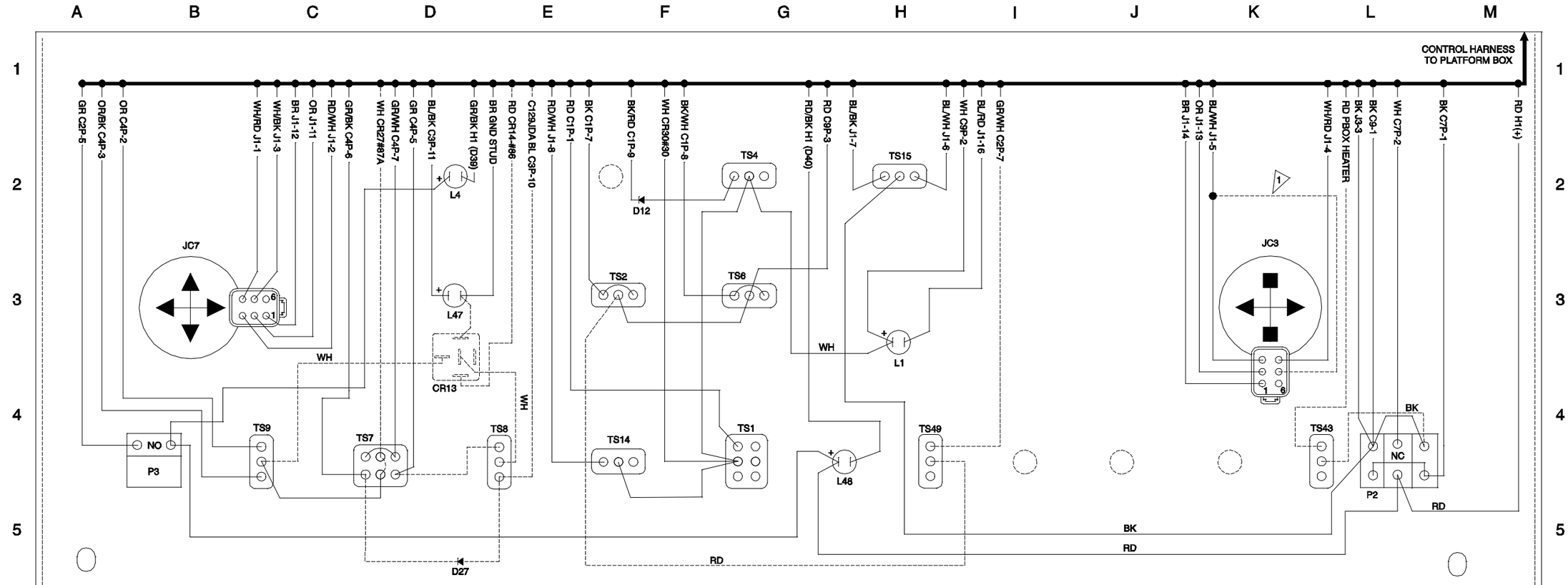
# Platform Control Box Wiring Diagram,

## Deutz D436 L3i Models (CE)



# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D436 L3i Models (CE)




### COMPONENT INDEX

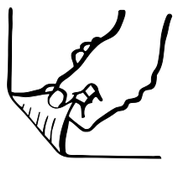
| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

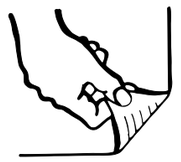
1 ROCKER / STEER OPTION.

ES0591A

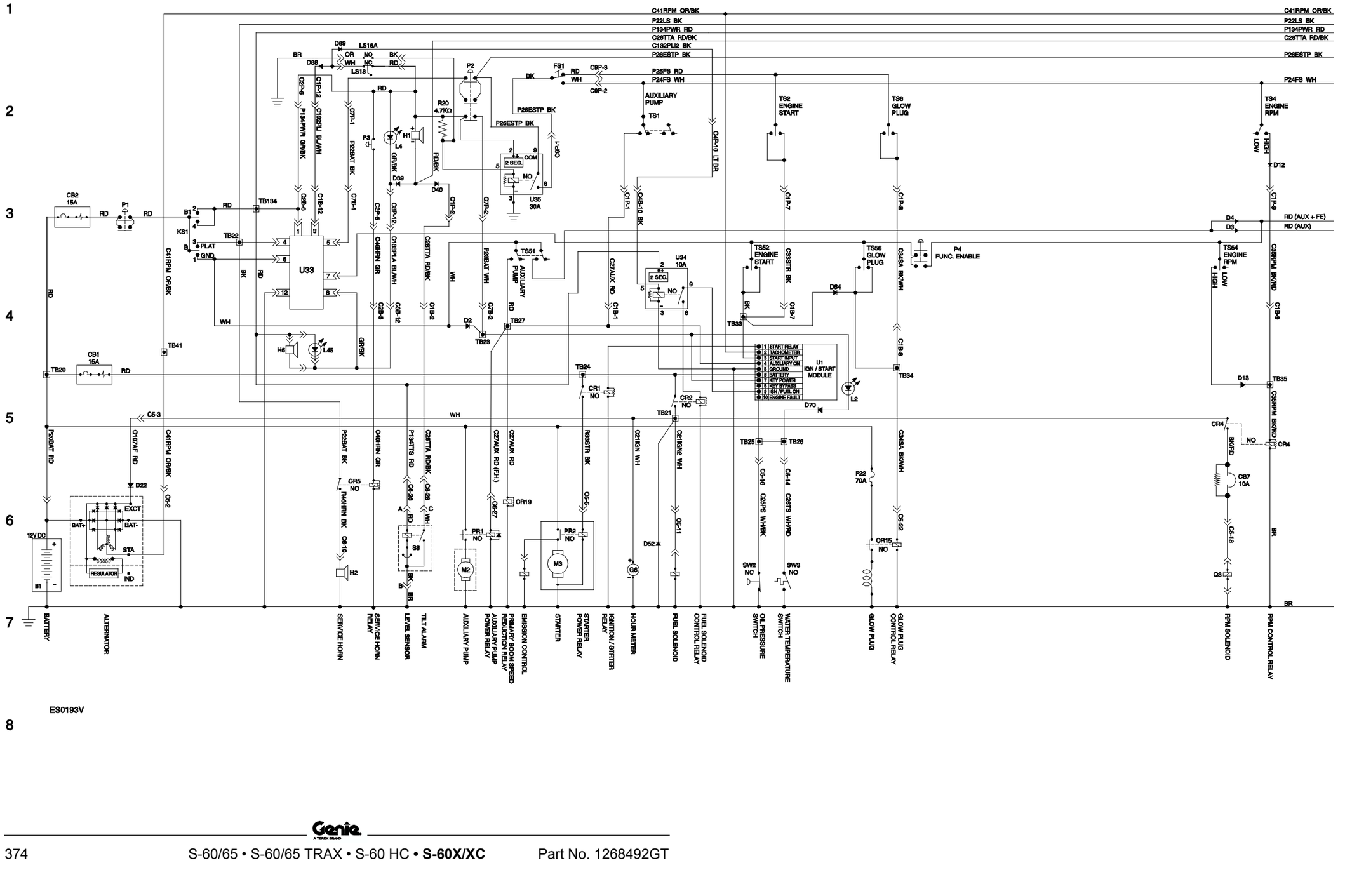
# Platform Control Box Switch Panel Wiring Diagram, Deutz D436 L3i Models (CE)



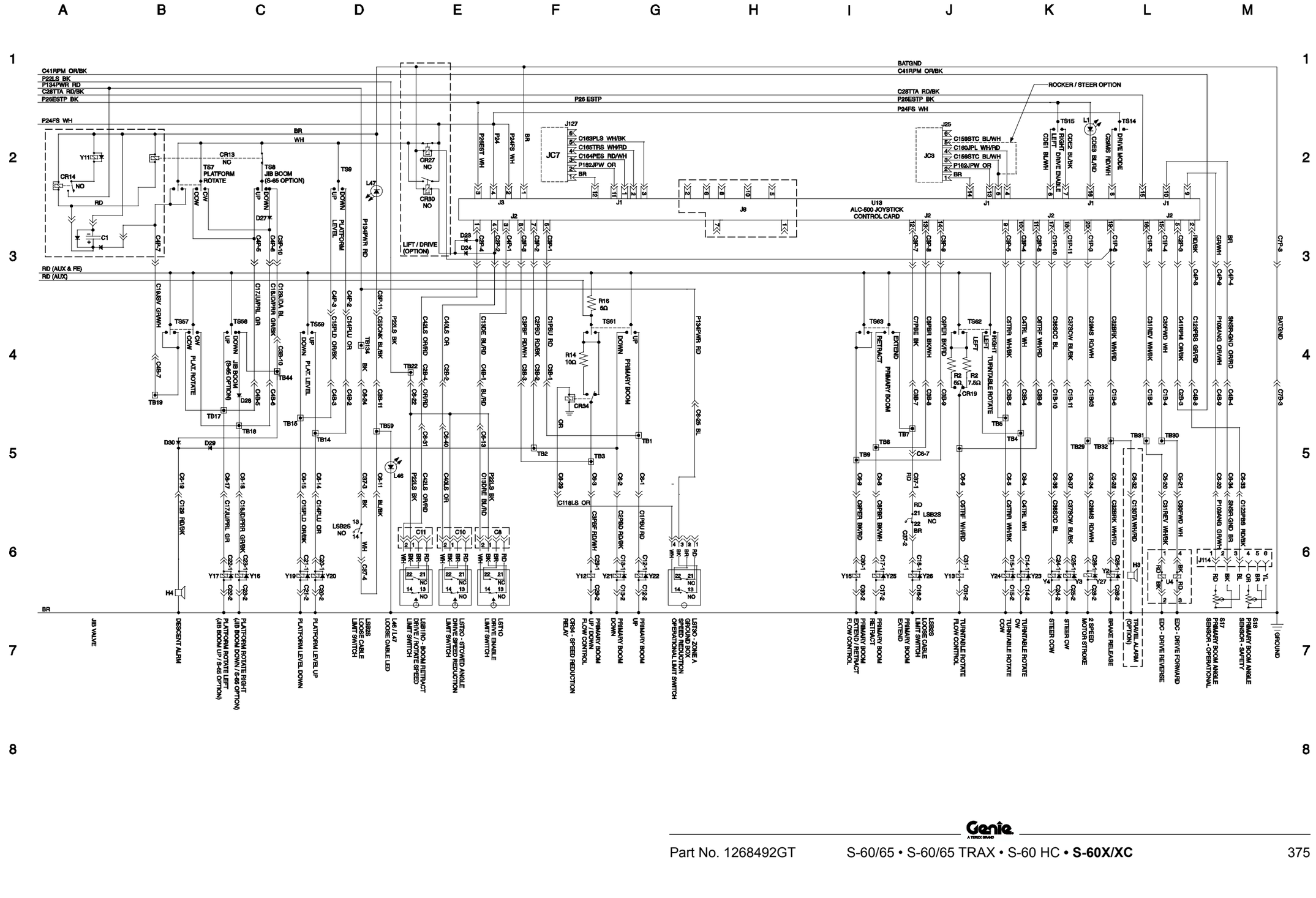
# Electrical Schematic, Perkins 404D-22 Models (CE)



# Electrical Schematic, Perkins 404D-22 Models (CE)



# Electrical Schematic, Perkins 404D-22 Models (CE)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134PWR RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BR
WH
RD
RD (AUX & FE)
RD (AUX)
BR
P26 ESTP
BATGND
ROCKER / STEER OPTION
LIFT / DRIVE (OPTION)
U13 ALC-500 JOYSTICK CONTROL CARD
JC7
JC3
J127
J25
J1
J2
J3
J8
Y11
CR13 NC
CR14 NO
CR27 NC
CR30 NO
CR34
CR19
L47
L46
L1
TS7 PLATFORM ROTATE
TS8 JIB BOOM (S-65 OPTION)
TS9
TS14
TS15
TS57
TS58
TS59
TS61
TS62
TS63
C1 D23 D24 D27 D28 D29 D30
R14 10Ω
R15 5Ω
R2 5Ω
R2 7.5Ω
TB1 TB2 TB3 TB4 TB5 TB6 TB7 TB8 TB9 TB14 TB15 TB16 TB17 TB18 TB19 TB22 TB29 TB32 TB44 TB59 TB80 TB81
LSB2S NO
LSB2S NC
H4
J4
J114
H3
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P182JPW OR
BR
C159STC BL/WH
C160JPL WH/RD
C159STC BL/WH
P182JPW OR
BR
CDE1 LEFT DRIVE ENABLE BL/WH
CDE2 RIGHT DRIVE ENABLE BL/BK
CDE3 BL/RD
C28M5 RD/WH
DRIVE MODE
C4P-1 C4P-2 C4P-3 C4P-4 C4P-5 C4P-6 C4P-7 C4P-8 C4P-9 C4P-10
C1P-1 C1P-2 C1P-3 C1P-4 C1P-5 C1P-6 C1P-7 C1P-8 C1P-9 C1P-10 C1P-11
C2P-1 C2P-2 C2P-3 C2P-4 C2P-5 C2P-6 C2P-7 C2P-8 C2P-9
C3P-1 C3P-2 C3P-3 C3P-4 C3P-5 C3P-6 C3P-7 C3P-8 C3P-9 C3P-10 C3P-11
C5-1 C5-2 C5-3 C5-4 C5-5 C5-6 C5-7 C5-8 C5-9 C5-10 C5-11 C5-12 C5-13 C5-14 C5-15 C5-16 C5-17 C5-18 C5-19 C5-20 C5-21 C5-22 C5-23 C5-24 C5-25 C5-26 C5-27 C5-28 C5-29 C5-30 C5-31 C5-32 C5-33 C5-34 C5-35 C5-36 C5-37 C5-38 C5-39 C5-40 C5-41
C6 C10 C11
C7P-3
C118LS OR
C119DRE BL/RD
C120DA BL
C121PBS RD/BK
C122PBS GR/RD
C123PBS RD/BK
C124PBS BL
C125PBS OR
C126PBS YL
C128PBS GR/RD
C129PBS BR
C130DA WH/RD
C131REV WH/BK
C132REV WH
C133FWD WH
C134FWD BK
C135FWD RD
C136SOC BL
C137SOW BL/BK
C138SOC BL
C139TRW WH/RD
C140TRW BK
C141TRW BR
C142TRW OR
C143TRW YL
C144TRW GN
C145TRW BL
C146TRW VI
C147TRW GY
C148TRW WH
C149TRW PK
C150TRW BK/WH
C151TRW BR/WH
C152TRW OR/WH
C153TRW YL/WH
C154TRW GN/WH
C155TRW BL/WH
C156TRW VI/WH
C157TRW GY/WH
C158TRW WH/BK
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C160TRW BR/RD
C161TRW OR/RD
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C164TRW BL/RD
C165TRW VI/RD
C166TRW GY/RD
C167TRW WH/RD
C168TRW PK/RD
C169TRW BK/YL
C170TRW BR/YL
C171TRW OR/YL
C172TRW YL
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C174TRW BL/YL
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C177TRW WH/YL
C178TRW PK/YL
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C180TRW BR/GN
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C216TRW GY
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C227TRW WH
C228TRW PK/WH
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C230TRW BR
C231TRW OR
C232TRW YL
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C234TRW BL
C235TRW VI
C236TRW GY
C237TRW WH/RD
C238TRW PK/RD
C239TRW BK/RD
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C245TRW VI/RD
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C247TRW WH/BK
C248TRW PK/BK
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C250TRW BR/YL
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C252TRW YL/YL
C253TRW GN/YL
C254TRW BL/YL
C255TRW VI/YL
C256TRW GY/YL
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C323TRW GN/YL
C324TRW BL/YL
C325TRW VI/YL
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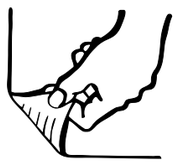
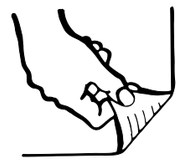
C1364TRW BL
C1365TRW VI
C1366TRW GY
C1367TRW WH
C1368TRW PK
C1369TRW BK/YL
C1370TRW BR/YL
C1371TRW OR/YL
C1372TRW YL/YL
C1373TRW GN/YL
C1374TRW BL/YL
C1375TRW VI/YL
C1376TRW GY/YL
C1377TRW WH/YL
C1378TRW PK/YL
C1379TRW BK/GN
C1380TRW BR/GN
C1381TRW OR/GN
C1382TRW YL/GN
C1383TRW GN/GN
C1384TRW BL/GN
C1385TRW VI/GN
C1386TRW GY/GN
C1387TRW WH/GN
C1388TRW PK/GN
C1389TRW BK/BL
C1390TRW BR/BL
C1391TRW OR/BL
C1392TRW YL/BL
C1393TRW GN/BL
C1394TRW BL/BL
C1395TRW VI/BL
C1396TRW GY/BL
C1397TRW WH/BL
C1398TRW PK/BL
C1399TRW BK/VI
C1400TRW BR/VI
C1401TRW OR/VI
C1402TRW YL/VI
C1403TRW GN/VI
C1404TRW BL/VI
C1405TRW VI
C1406TRW GY/VI
C1407TRW WH/VI
C1408TRW PK/VI
C1409TRW BK
C1410TRW BR
C1411TRW OR
C1412TRW YL
C1413TRW GN
C1414TRW BL
C1415TRW VI
C1416TRW GY
C1417TRW WH
C1418TRW PK
C1419TRW BK/YL
C1420TRW BR/YL
C1421TRW OR/YL
C1422TRW YL/YL
C1423TRW GN/YL
C1424TRW BL/YL
C1425TRW VI/YL
C1426TRW GY/YL
C1427TRW WH/YL
C1428TRW PK/YL
C1429TRW BK/GN
C1430TRW BR/GN
C1431TRW OR/GN
C1432TRW YL/GN
C1433TRW GN/GN
C1434TRW BL/GN
C1435TRW VI/GN
C1436TRW GY/GN
C1437TRW WH/GN
C1438TRW PK/GN
C1439TRW BK/BL
C1440TRW BR/BL
C1441TRW OR/BL
C1442TRW YL/BL
C1443TRW GN/BL
C1444TRW BL/BL
C1445TRW VI/BL
C1446TRW GY/BL
C1447TRW WH/BL
C1448TRW PK/BL
C1449TRW BK/VI
C1450TRW BR/VI
C1451TRW OR/VI
C1452TRW YL/VI
C1453TRW GN/VI
C1454TRW BL/VI
C1455TRW VI
C1456TRW GY/VI
C1457TRW WH/VI
C1458TRW PK/VI
C1459TRW BK
C1460TRW BR
C1461TRW OR
C1462TRW YL
C1463TRW GN
C1464TRW BL
C1465TRW VI
C1466TRW GY
C1467TRW WH
C1468TRW PK
C1469TRW BK/YL
C1470TRW BR/YL
C1471TRW OR/YL
C1472TRW YL/YL
C1473TRW GN/YL
C1474TRW BL/YL
C1475TRW VI/YL
C1476TRW GY/YL
C1477TRW WH/YL
C1478TRW PK/YL
C1479TRW BK/GN
C1480TRW BR/GN
C1481TRW OR/GN
C1482TRW YL/GN
C1483TRW GN/GN
C1484TRW BL/GN
C1485TRW VI/GN
C1486TRW GY/GN
C1487TRW WH/GN
C1488TRW PK/GN
C1489TRW BK/BL
C1490TRW BR/BL
C1491TRW OR/BL
C1492TRW YL/BL
C1493TRW G

# Electrical Schematic, Perkins 404D-22 Models (CE)

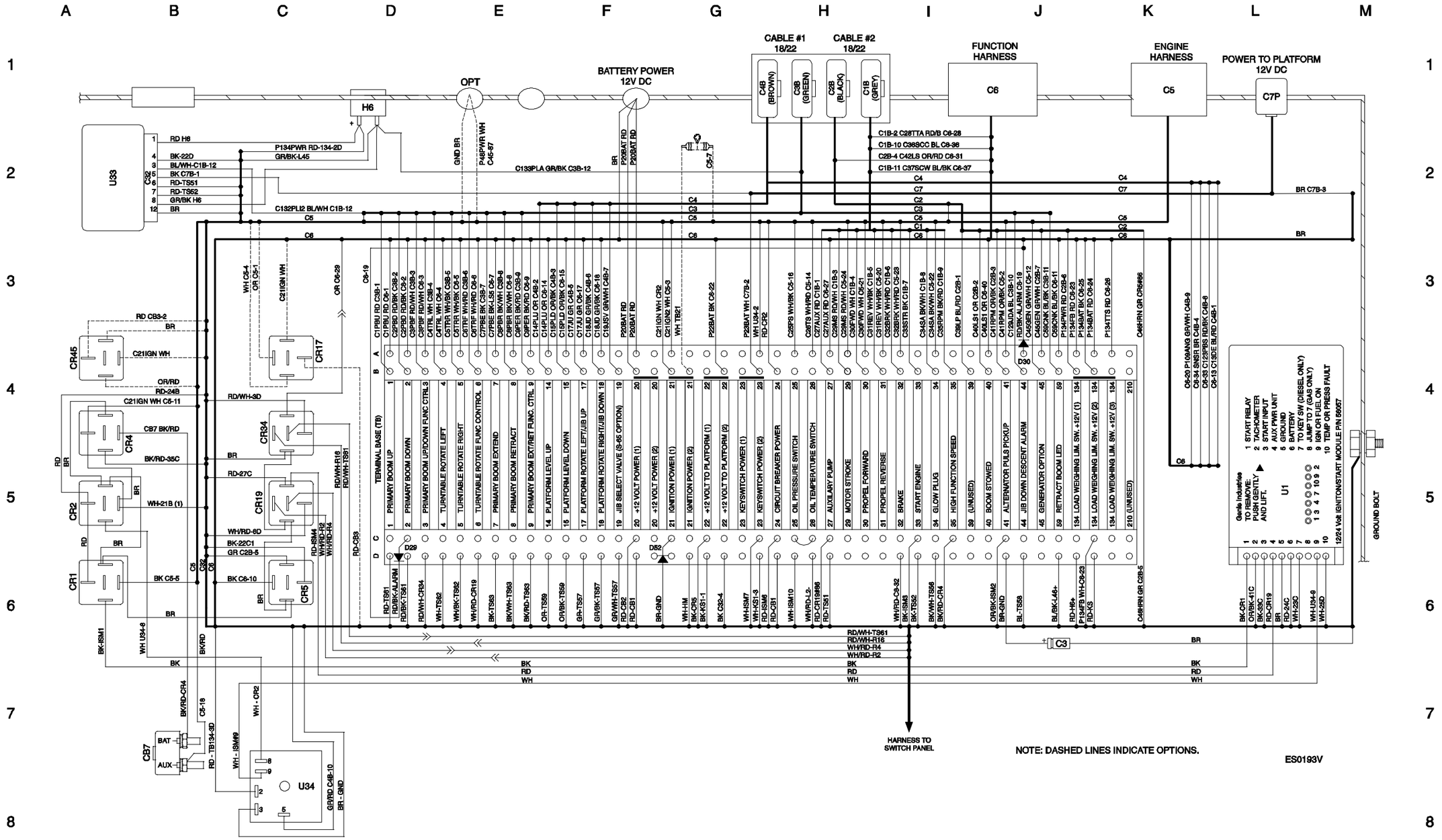


# Ground Control Box Terminal Strip Wiring Diagram, Perkins 404D-22 Models (CE)



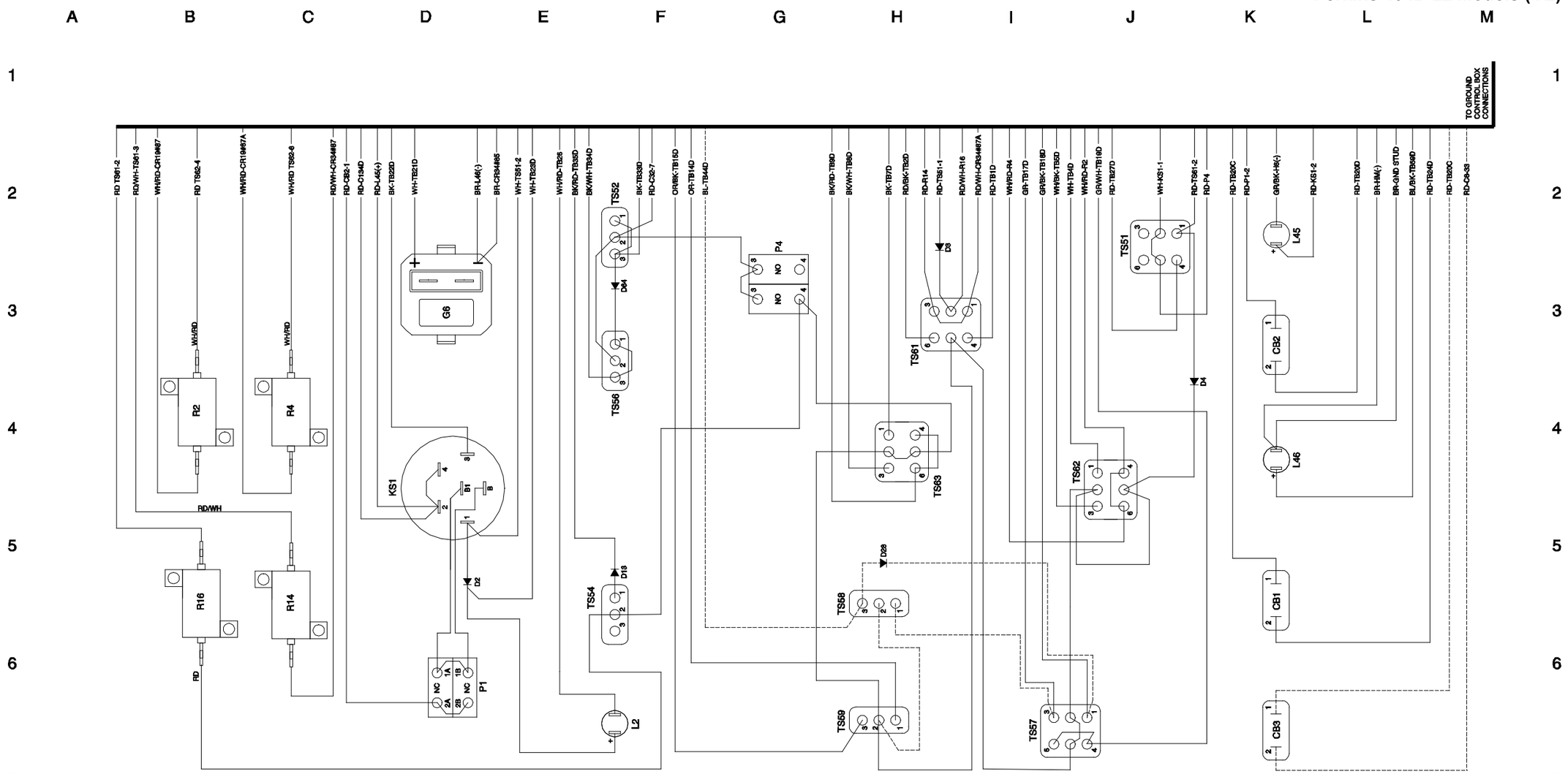
# Ground Control Box Terminal Strip Wiring Diagram,

## Perkins 404D-22 Models (CE)



# Ground Control Box Switch Panel Wiring Diagram,

## Perkins 404D-22 Models (CE)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L2 | LED - CHECK ENGINE |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |

| | |
|---|---|
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-85 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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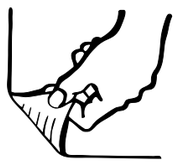
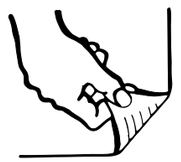
# Ground Control Box Switch Panel Wiring Diagram, Perkins 404D-22 Models (CE)

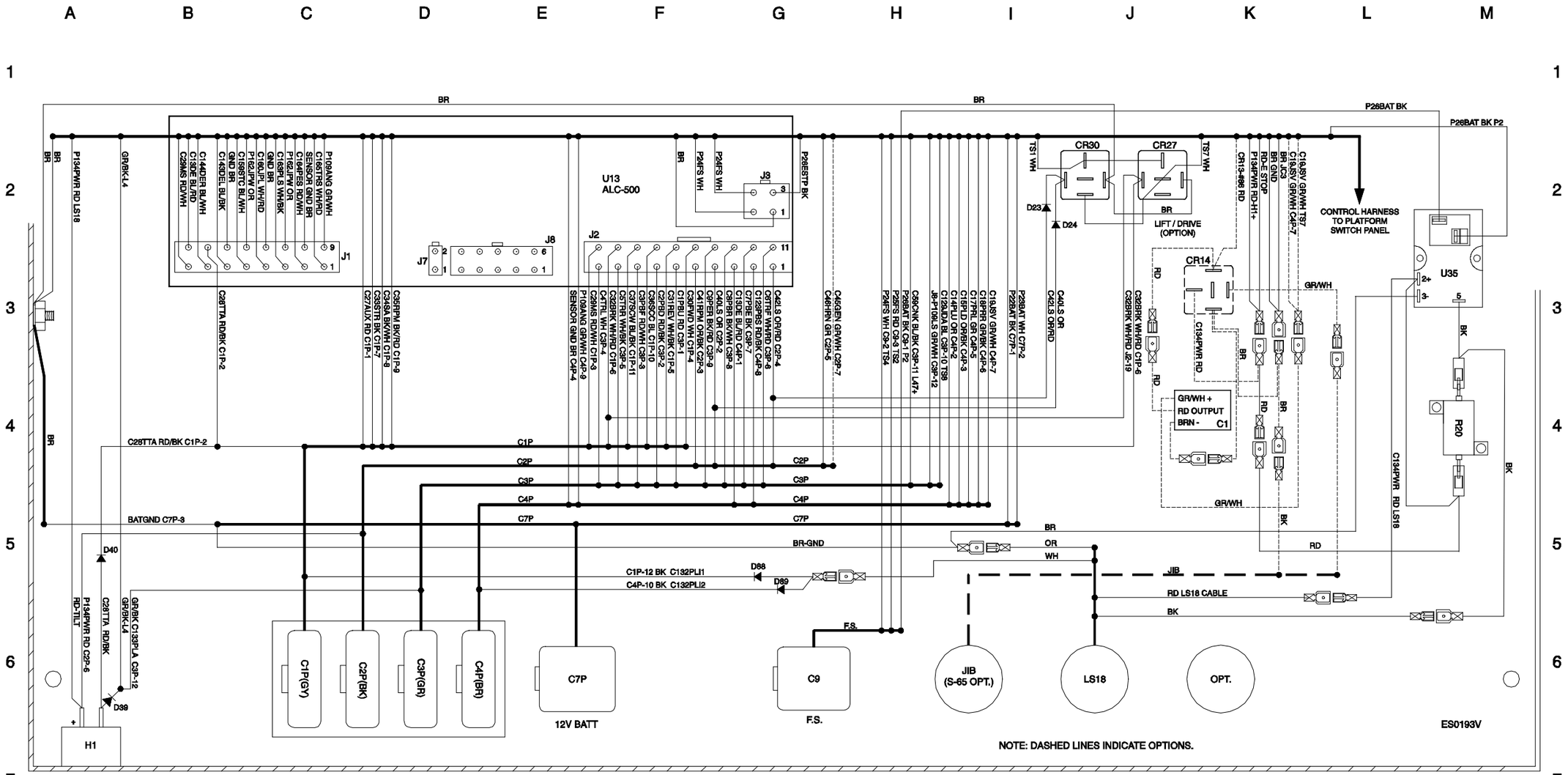


# Platform Control Box Wiring Diagram, Perkins 404D-22 Models (CE)



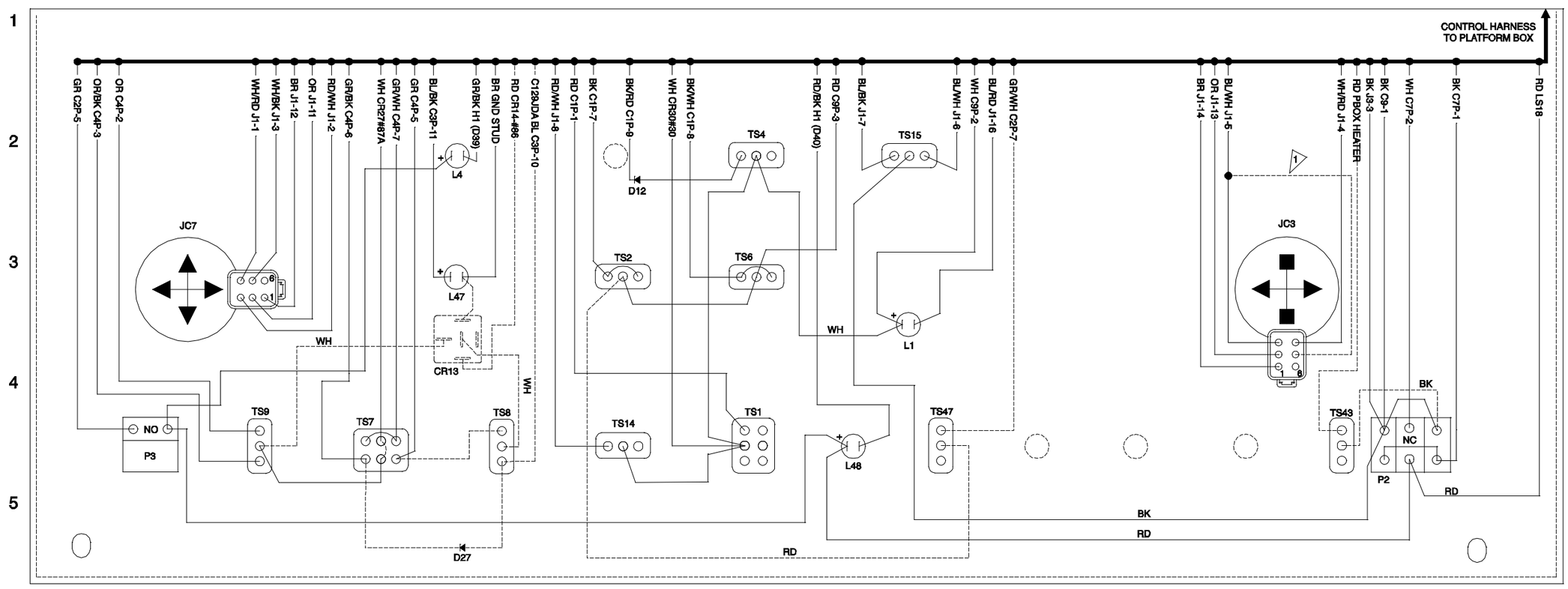
# Platform Control Box Wiring Diagram,

## Perkins 404D-22 Models (CE)



# Platform Control Box Switch Panel Wiring Diagram,

## Perkins 404D-22 Models (CE)




COMPONENT INDEX

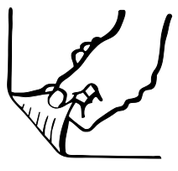
| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

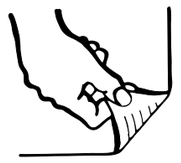
1 ROCKER / STEER OPTION.

ES0193V

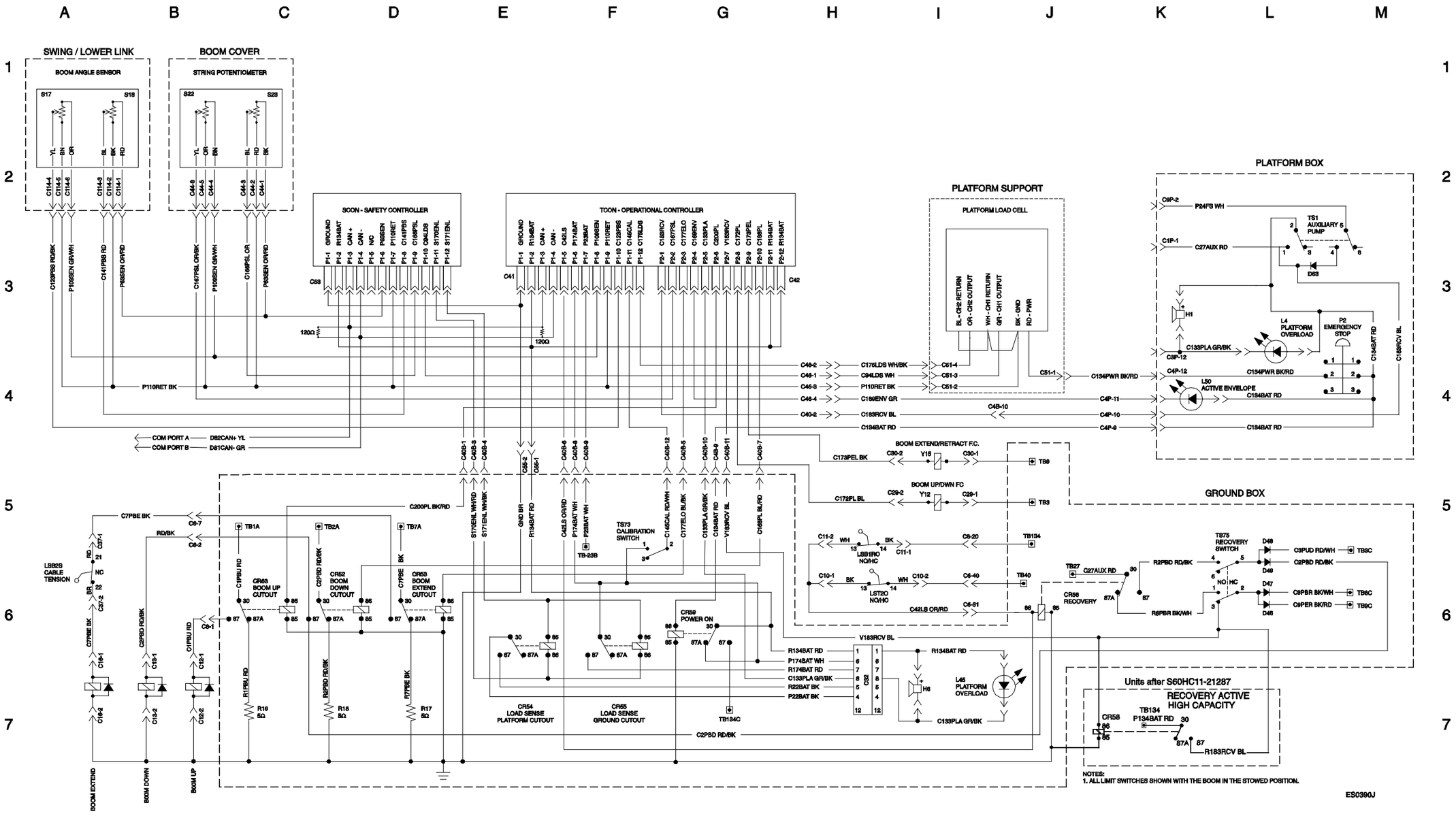
# Platform Control Box Switch Panel Wiring Diagram, Perkins 404D-22 Models (CE)



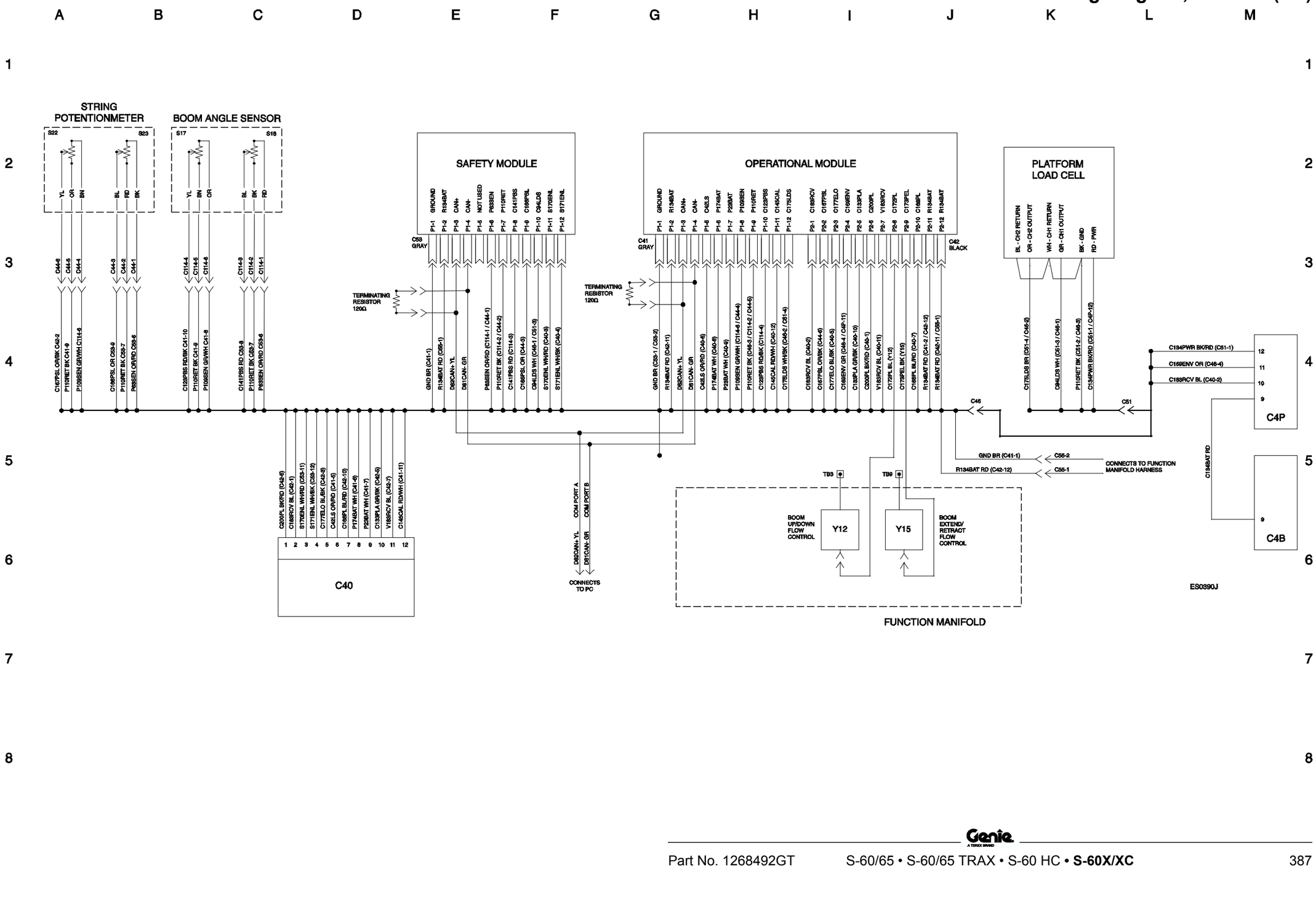
# Electrical Schematic, S-60 HC (CE)



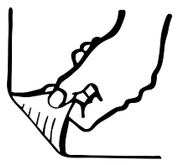
# Electrical Schematic, S-60 HC (CE)



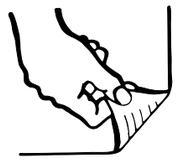
# Chassis Wiring Diagram, S-60 HC (CE)



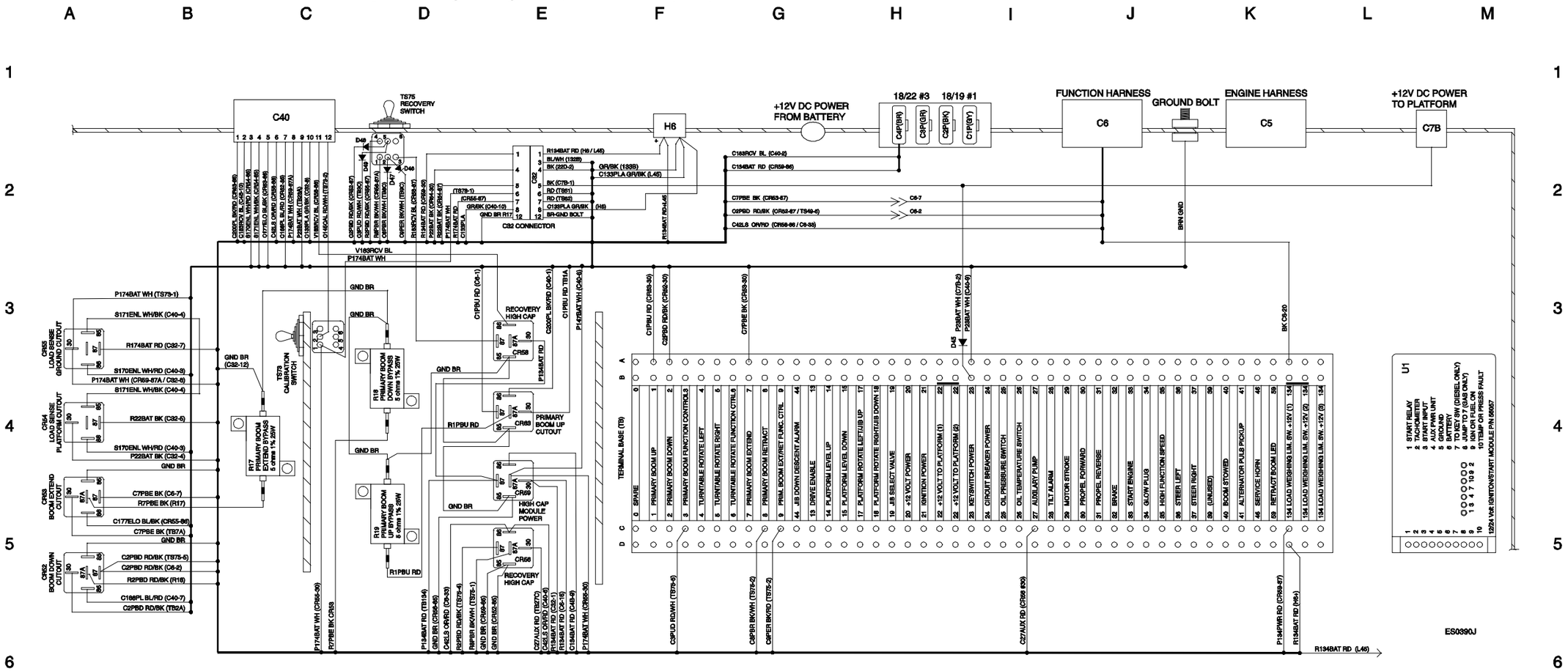
# Chassis Wiring Diagram, S-60 HC (CE)



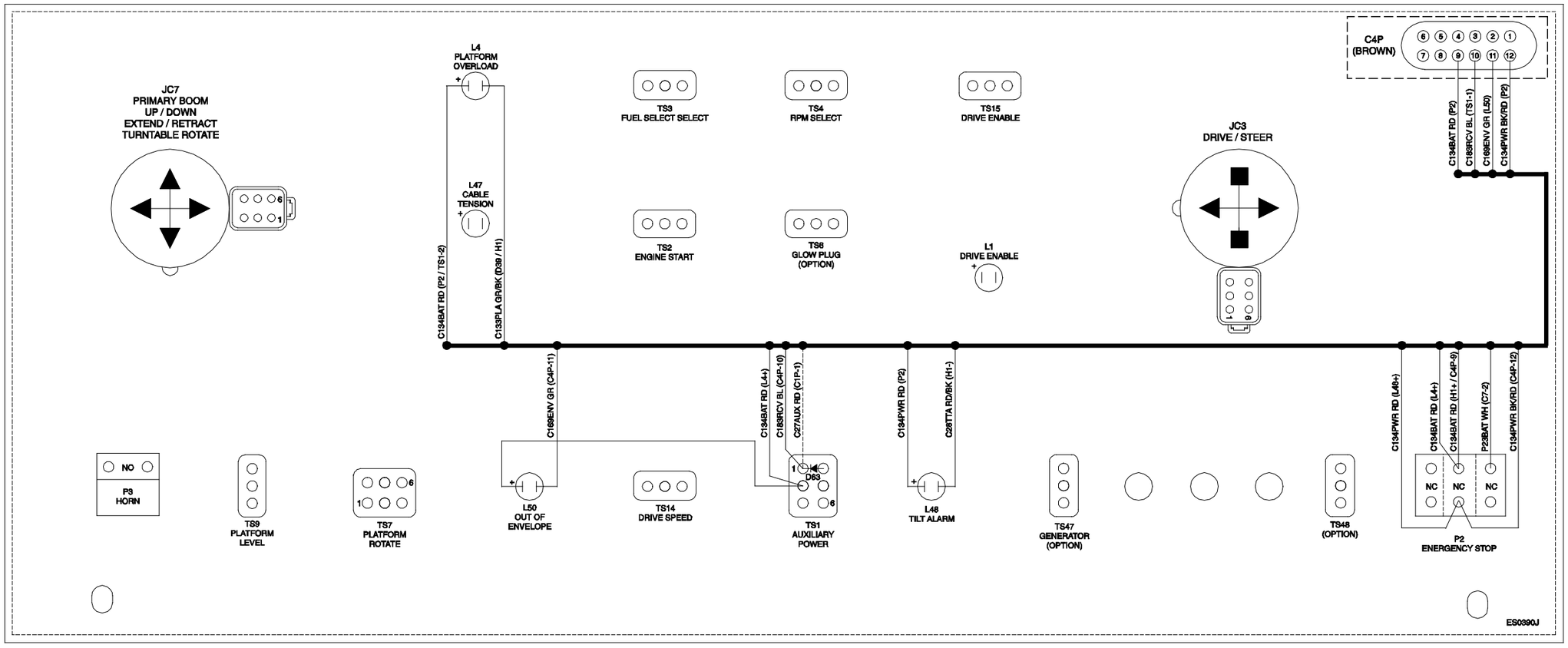
# Ground Control Box Terminal Strip Wiring Diagram, S-60 HC (CE)



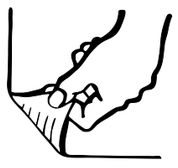
# Ground Control Box Terminal Strip Wiring Diagram, S-60 HC (CE)



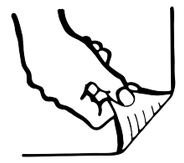
# Platform Control Box Wiring Diagram, S-60 HC (CE)



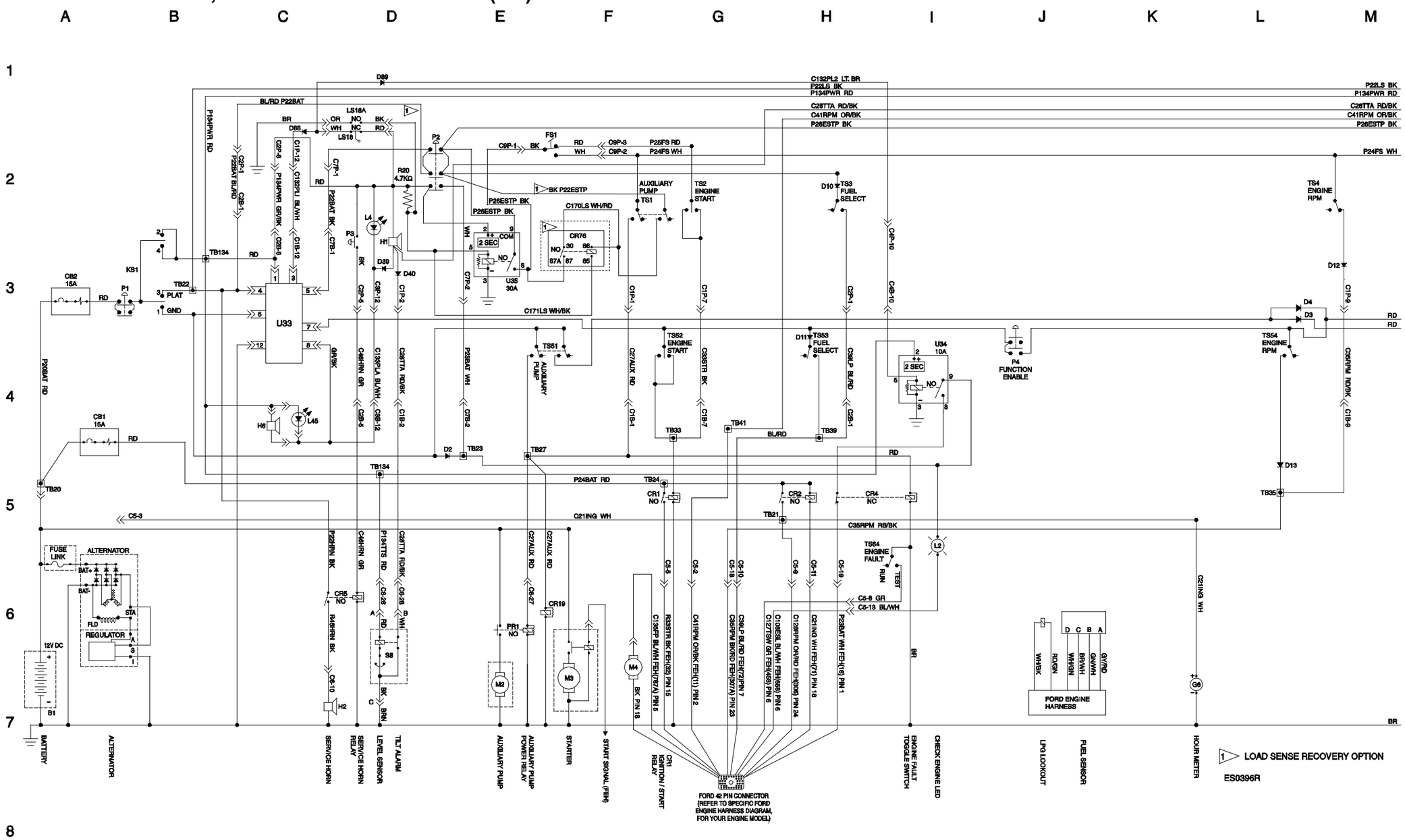
# Platform Control Box Wiring Diagram, S-60 HC (CE)



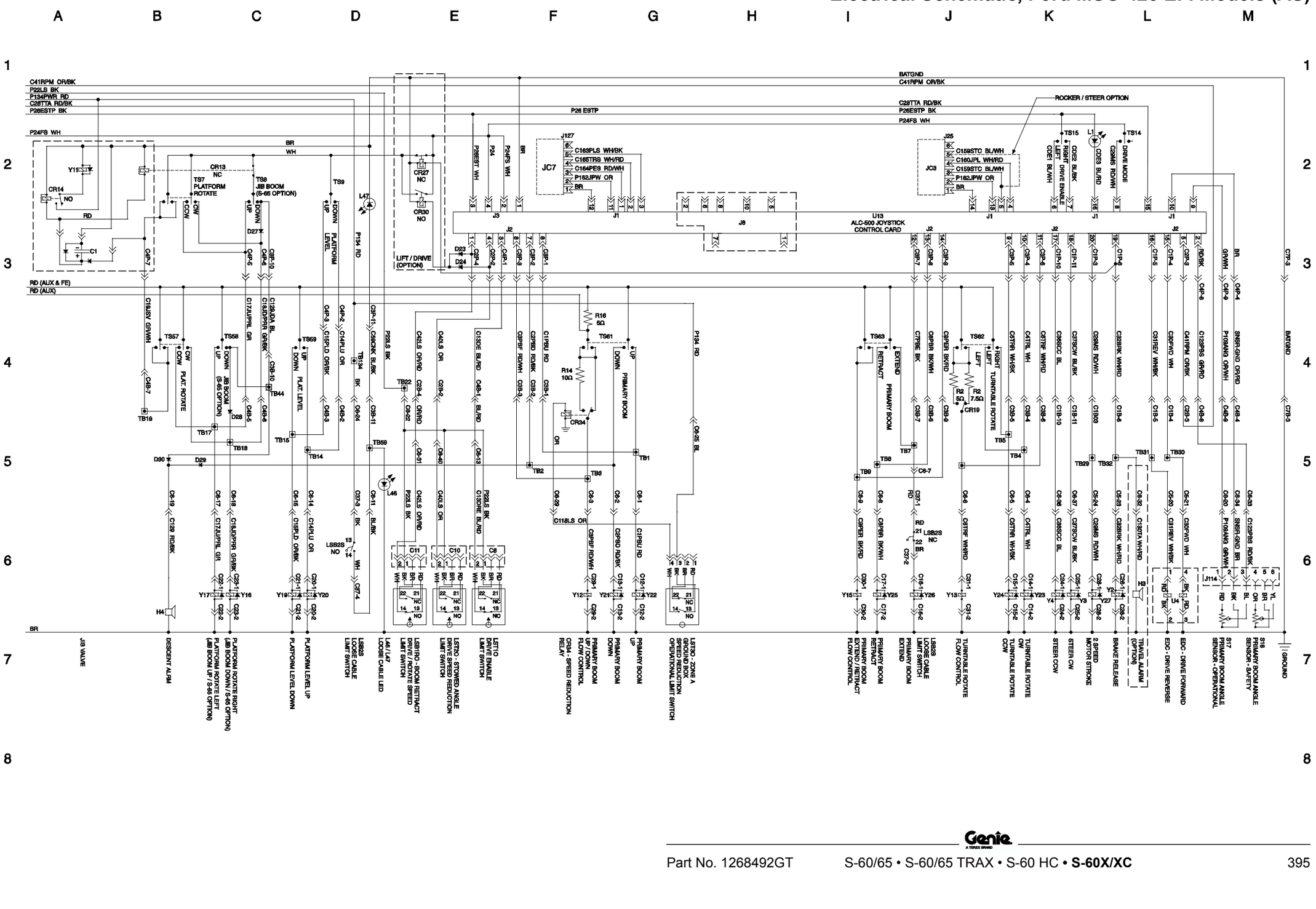
# Electrical Schematic, Ford MSG-425 EFI Models (AS)



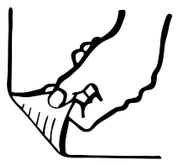
# Electrical Schematic, Ford MSG-425 EFI Models (AS)



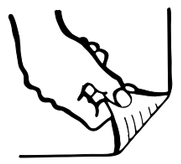
## Electrical Schematic, Ford MSG-425 EFI Models (AS)



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

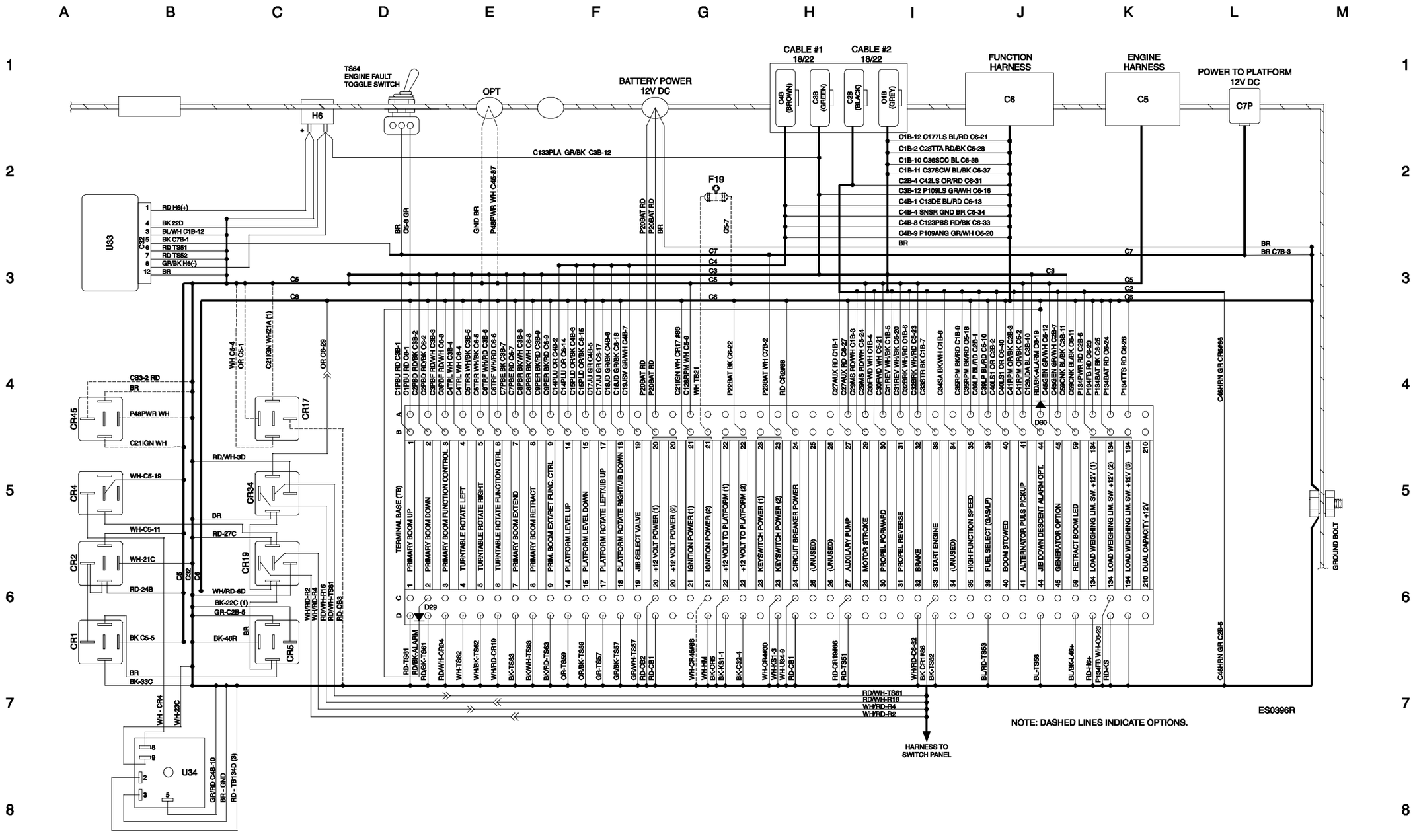


# Ground Control Box Terminal Strip Wiring Diagram, Ford MSG-425 EFI Models (AS)



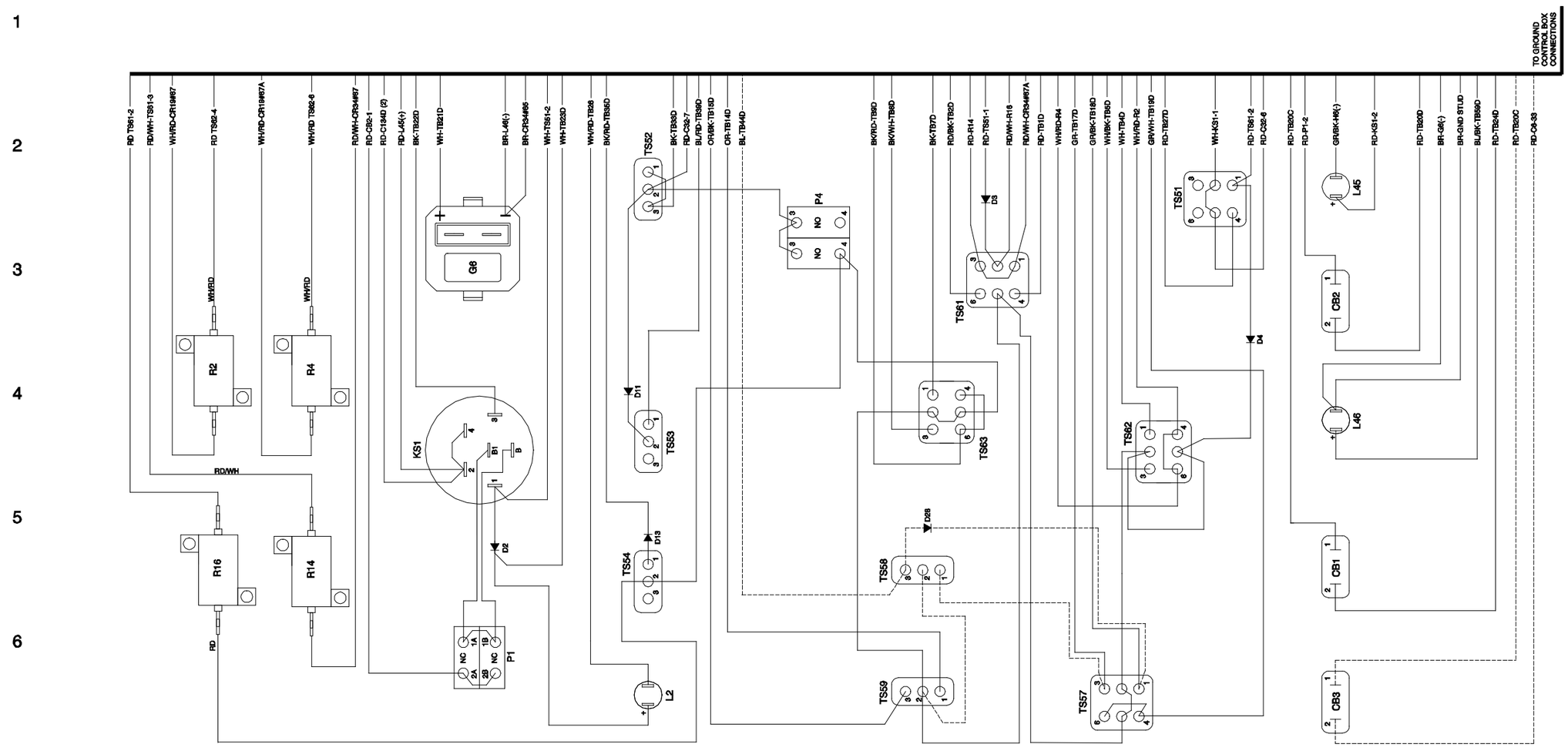
# Ground Control Box Terminal Strip Wiring Diagram,

## Ford MSG-425 EFI Models (AS)



# Ground Control Box Switch Panel Wiring Diagram,

## Ford MSG-425 EFI Models (AS)




### COMPONENT INDEX - GROUND CONTROLS

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L2 | LED - CHECK ENGINE |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS53 | FUEL SELECT TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |

| | |
|---|---|
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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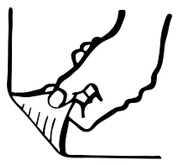
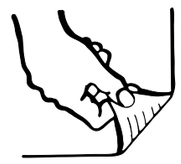
# Ground Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (AS)

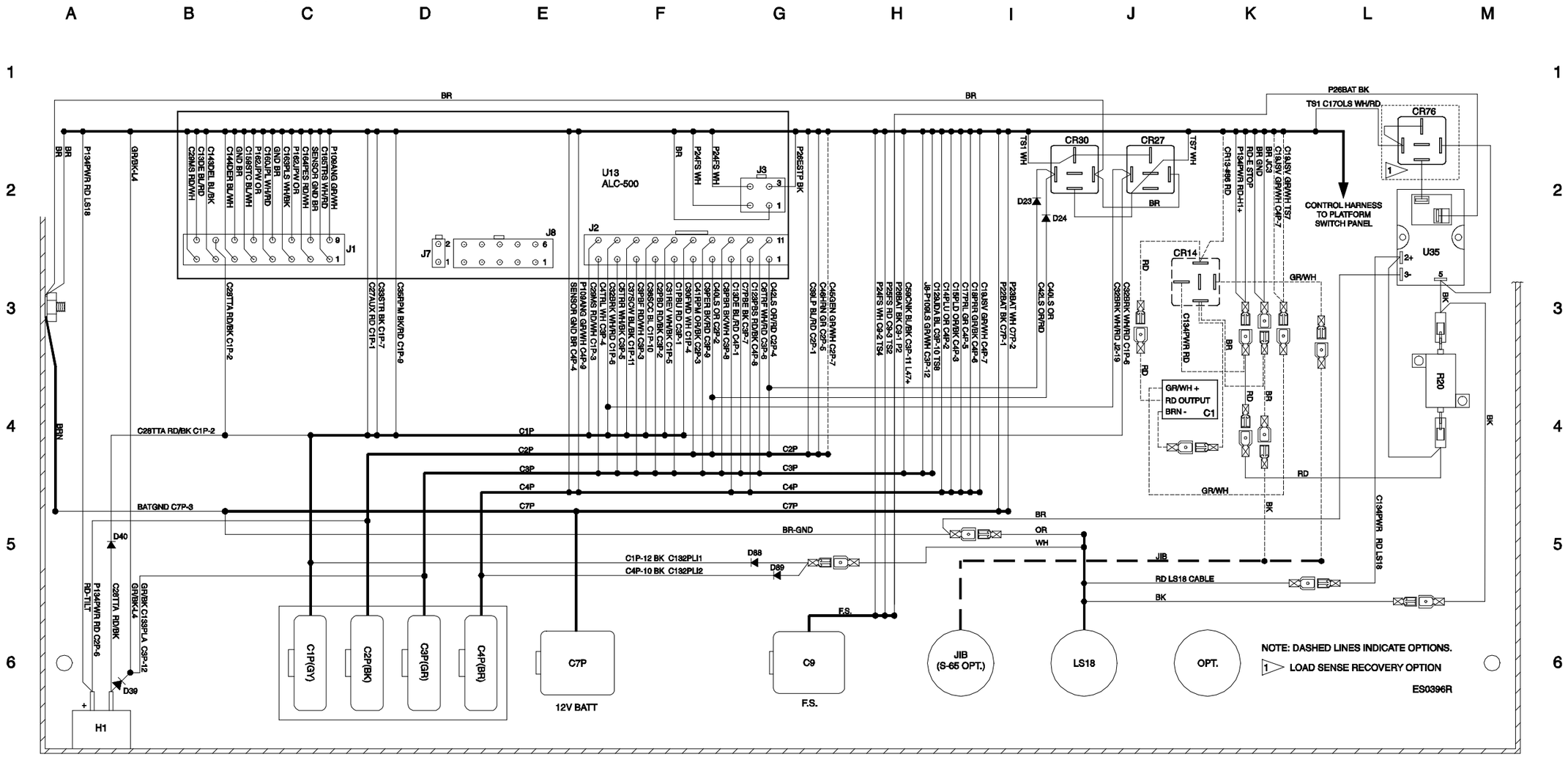


# Platform Control Box Wiring Diagram, Ford MSG-425 EFI Models (AS)



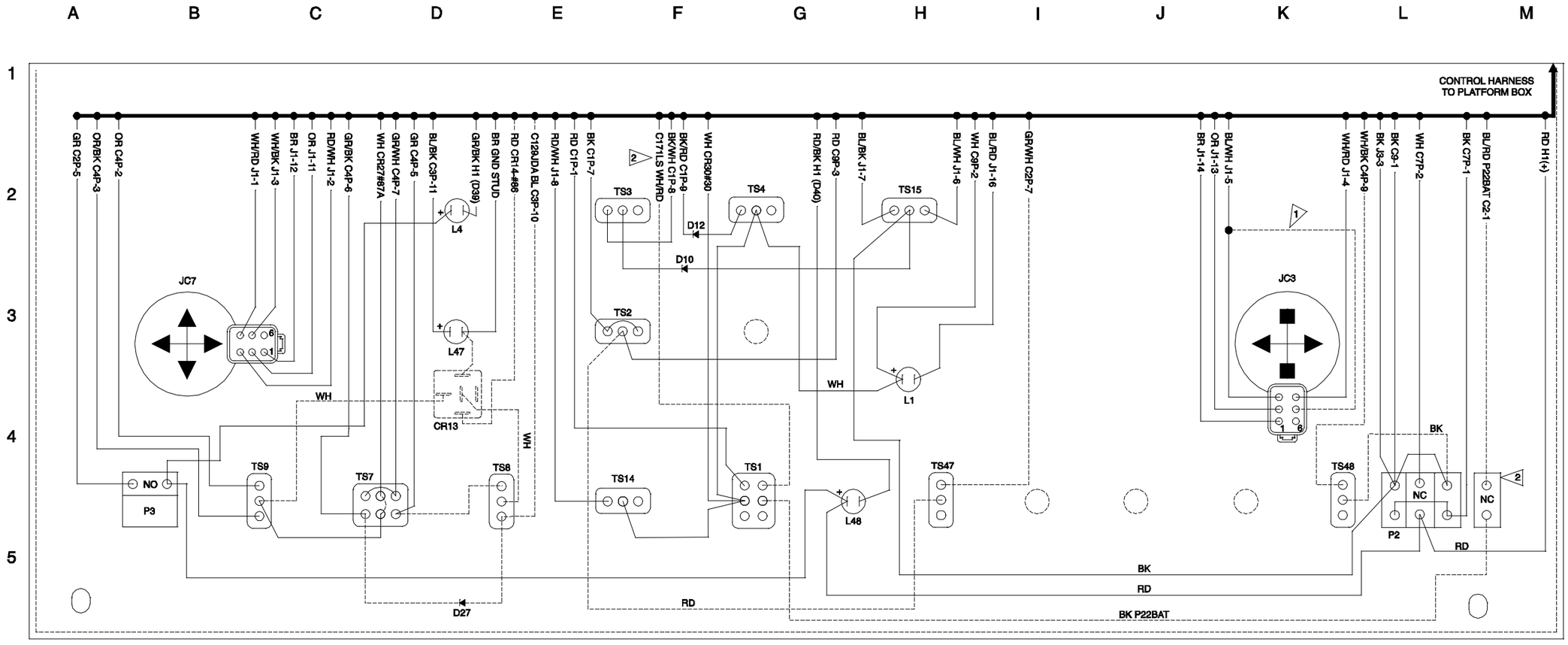
# Platform Control Box Wiring Diagram,

## Ford MSG-425 EFI Models (AS)



# Platform Control Box Switch Panel Wiring Diagram,

## Ford MSG-425 EFI Models (AS)




### COMPONENT INDEX

| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS3 | FUEL SELECT TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS47 | GENERATOR (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

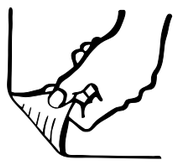
NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

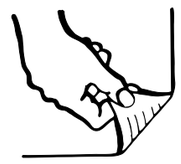
2 LOAD SENSE RECOVERY OPTION

ES0396R

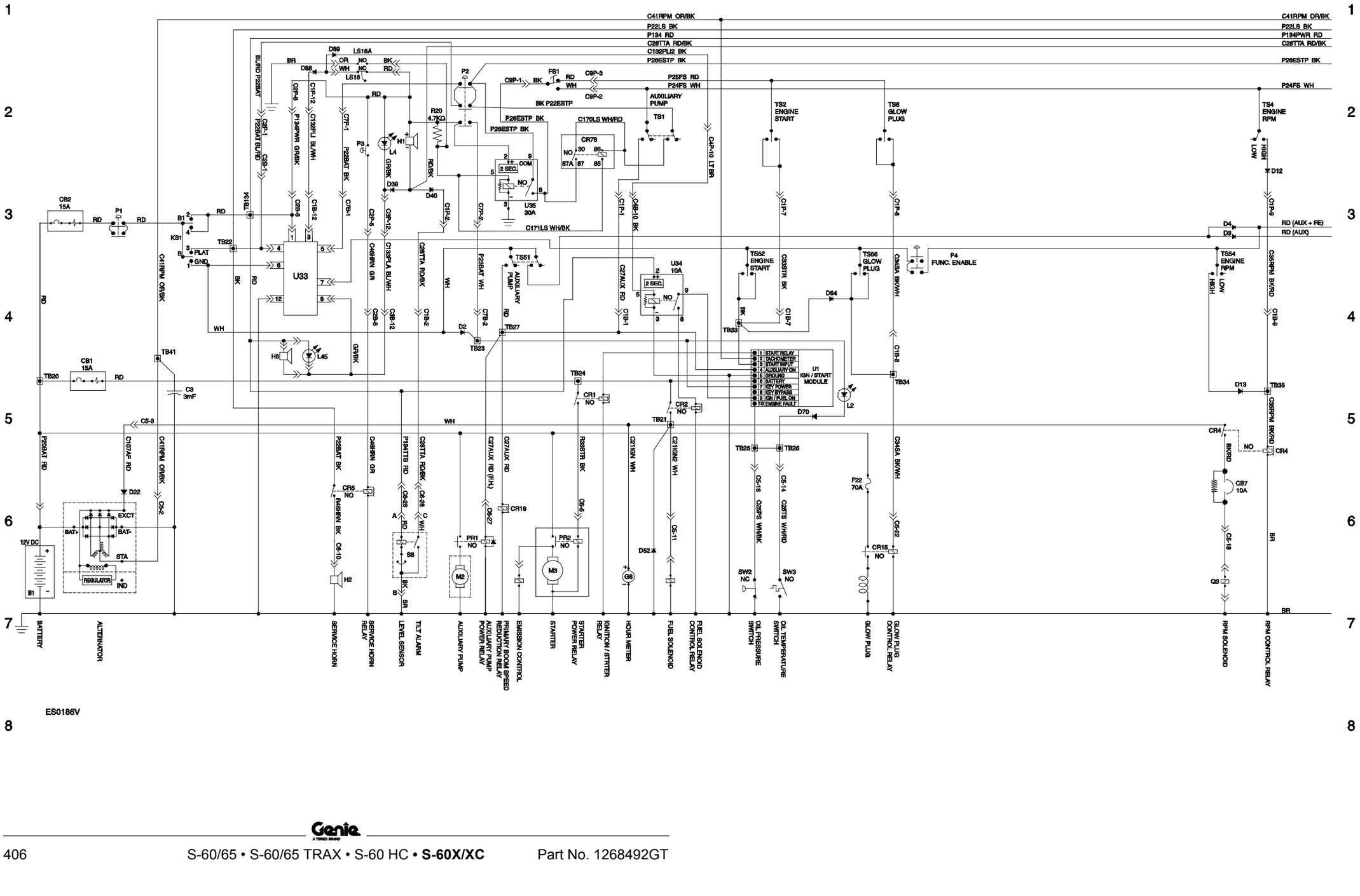
# Platform Control Box Switch Panel Wiring Diagram, Ford MSG-425 EFI Models (AS)



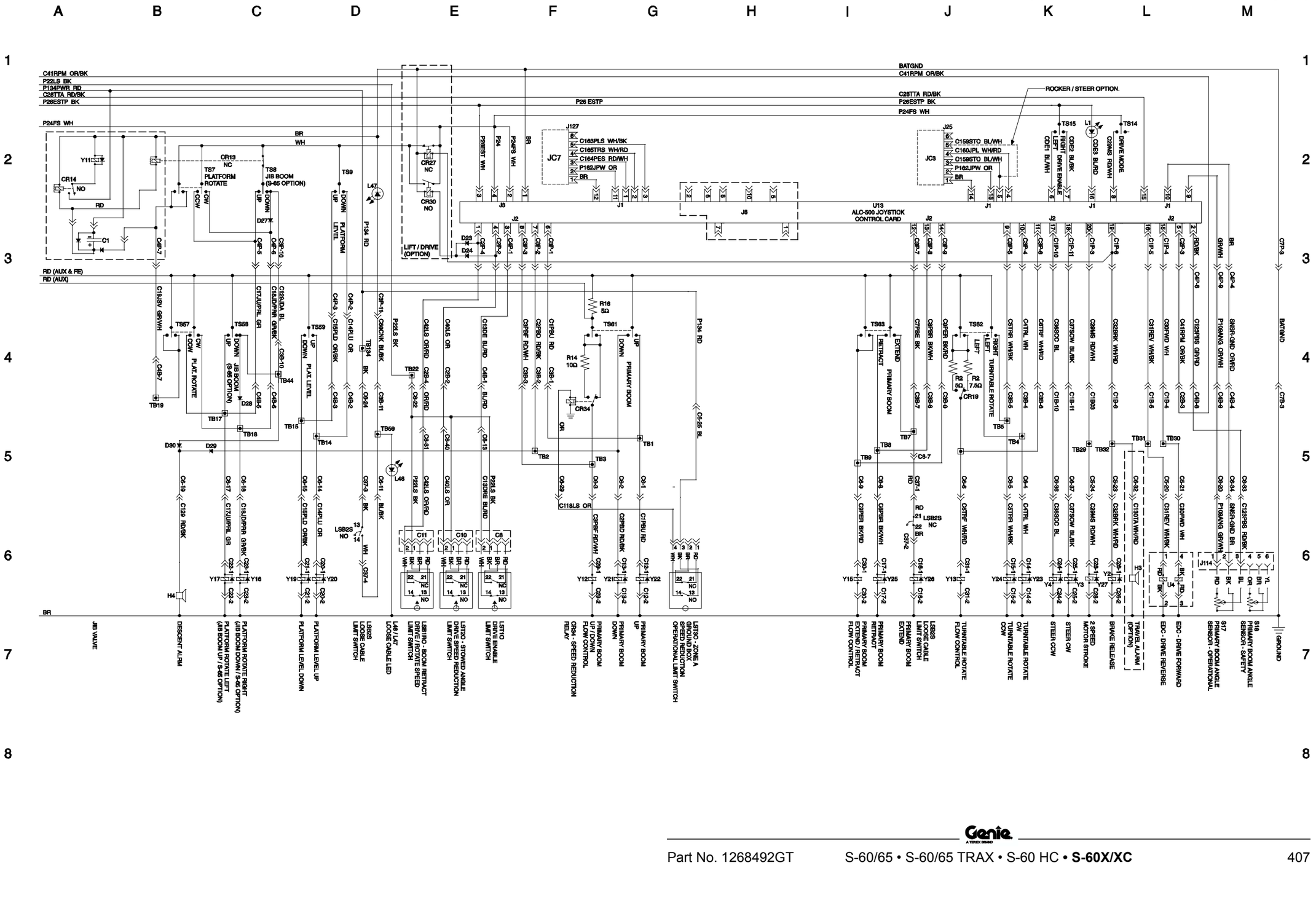
# Electrical Schematic, Deutz D2011L03i Models (AS)



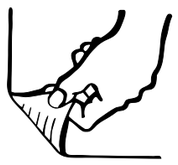
# Electrical Schematic, Deutz D2011L03i Models (AS)



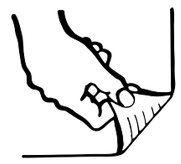
# Electrical Schematic, Deutz D2011L03i Models (AS)



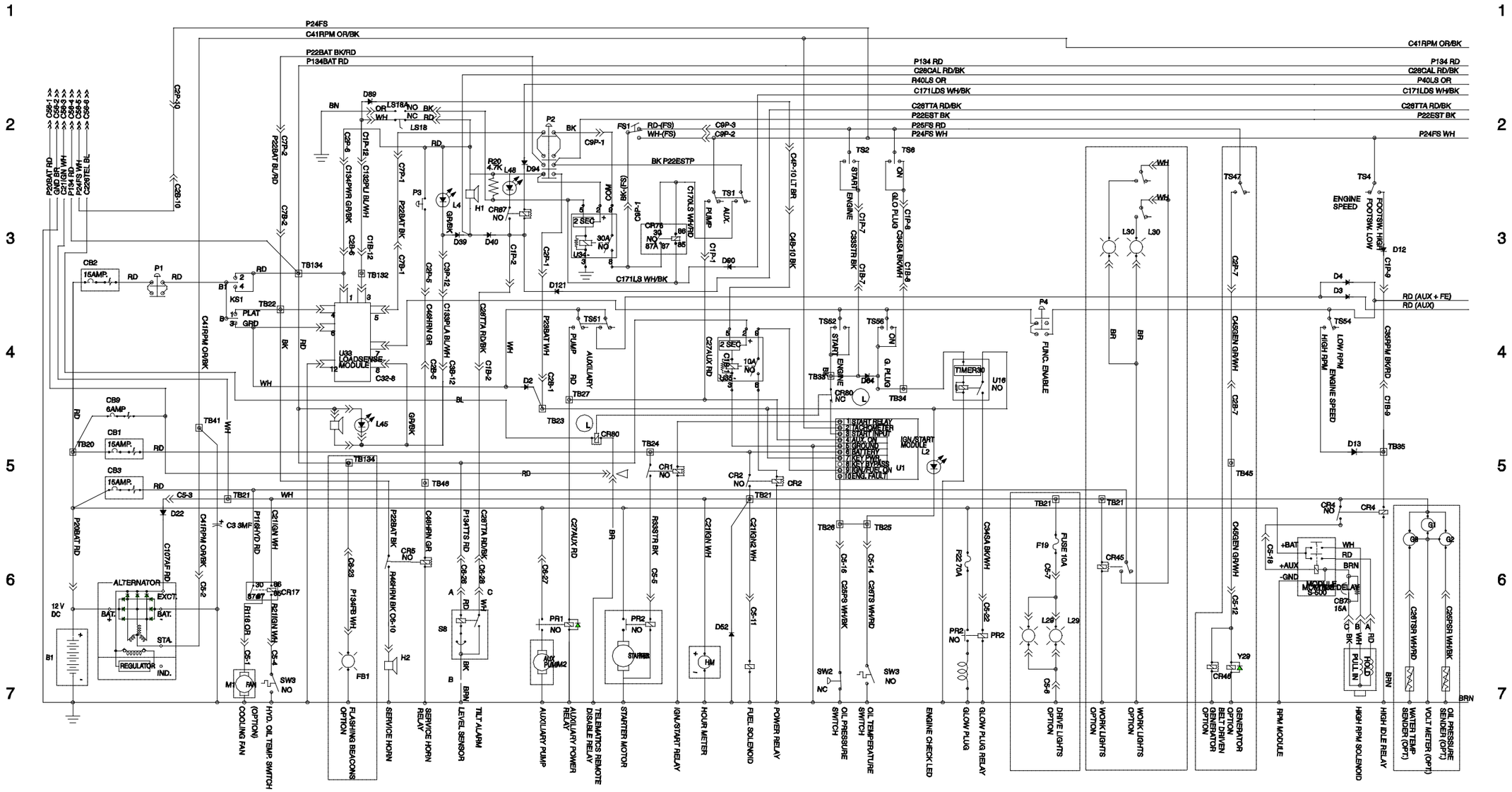
# Electrical Schematic, Deutz D2011L03i Models (AS)



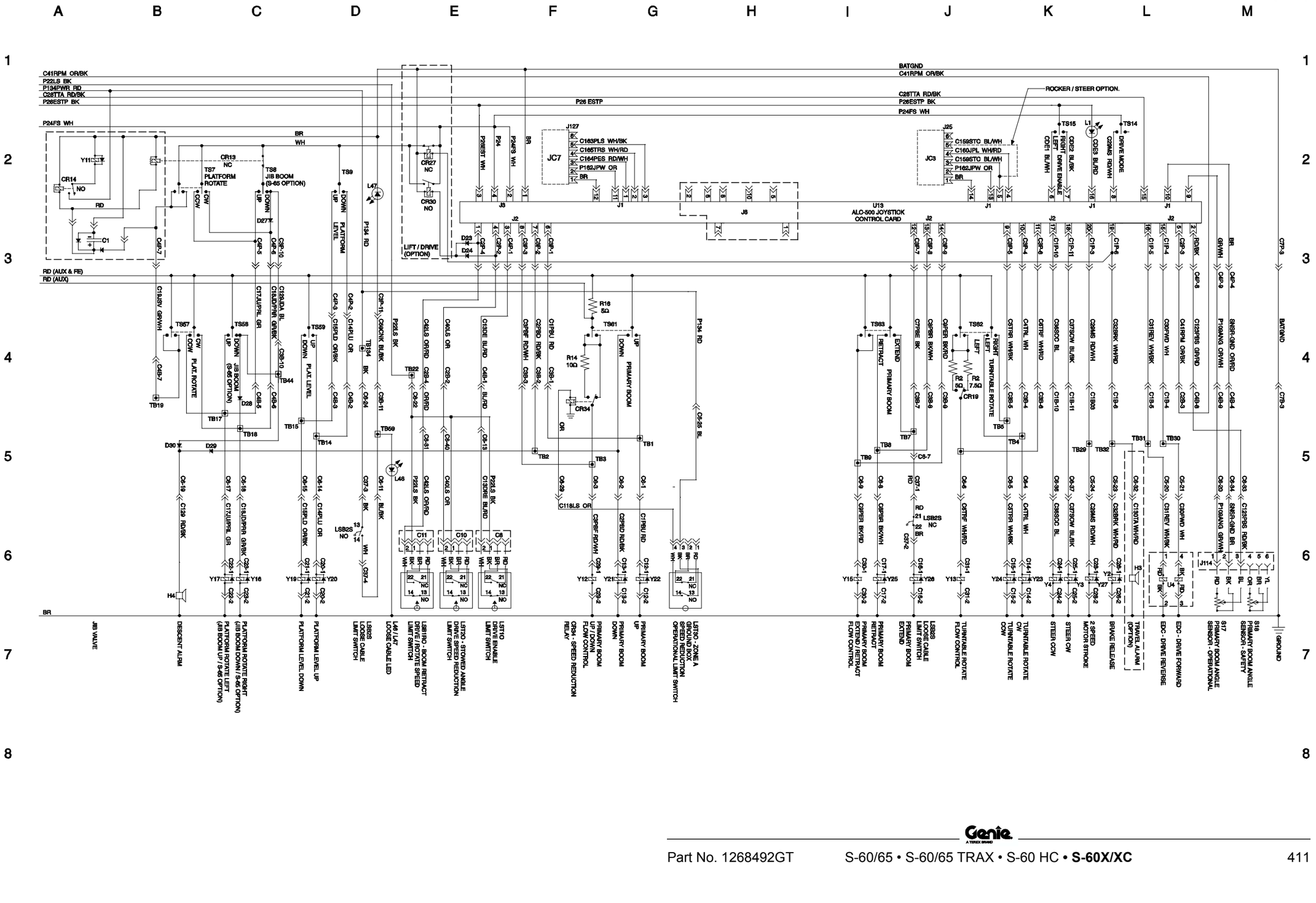
# Electrical Schematic, Deutz TD2011L04i Models (AS)



# Electrical Schematic, Deutz TD2011L04i Models (AS)



# Electrical Schematic, Deutz TD2011L04i Models (AS)


A B C D E F G H I J K L M
1 2 3 4 5 6 7 8
C41RPM OR/BK
P22LS BK
P134PWR RD
C28TTA RD/BK
P26ESTP BK
P24FS WH
BR
WH
Y11
CR14
NO
RD
C1
C4P-7
CR13
NC
TS7
PLATFORM ROTATE
TS8
JIB BOOM (S-65 OPTION)
CW
CCW
UP
DOWN
D27
C4P-5
C3P-10
C4P-6
TS9
UP
DOWN
PLATFORM LEVEL
L47
P134 RD
CR27
NC
CR30
NO
LIFT / DRIVE (OPTION)
P26 ESTP
P26EST WH
P24
P24FS WH
BR
J127
C163PLS WH/BK
C165TRS WH/RD
C164PES RD/WH
P162JPW OR
BR
JC7
J3
J1
J8
D23
D24
C2P-4
C2P-2
C3P-1
C4P-1
C3P-3
C2P-3
C3P-2
C4P-2
C1P-1
RD (AUX & FE)
RD (AUX)
C18JSV GR/WH
TS57
CW
CCW
FLAT. ROTATE
TB19
C17JU/FRL GR
TS58
DOWN
JIB BOOM (S-65 OPTION)
C3P-10
TB44
C4P-5
D28
TB17
TB16
C16PLD OR/BK
TS59
UP
DOWN
FLAT. LEVEL
TB15
TB14
C4P-3
C15PLU OR
C4P-2
C14PLU OR
TB134
BK
C3P-24
C3P-11
C59CNK BU/BK
TB59
L48
C57J-3
BK
C57J-4
BL/BK
LSB1S
LOOSE CABLE LIMIT SWITCH
P22LS BK
C4P-11
C59CNK BU/BK
TB22
C3P-22
C3P-4
C4P-4
C4P-13
C4P-14
C4P-15
C4P-16
C4P-17
C4P-18
C4P-19
C4P-20
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C4P-22
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C4P-34
C4P-35
C4P-36
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C4P-38
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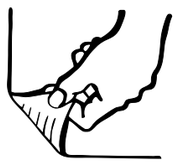
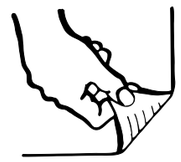
C4P-40
C4P-41
C4P-42
C4P-43
C4P-44
C4P-45
C4P-46
C4P-47
C4P-48
C4P-49
C4P-50
C4P-51
C4P-52

# Electrical Schematic, Deutz TD2011L04i Models (AS)

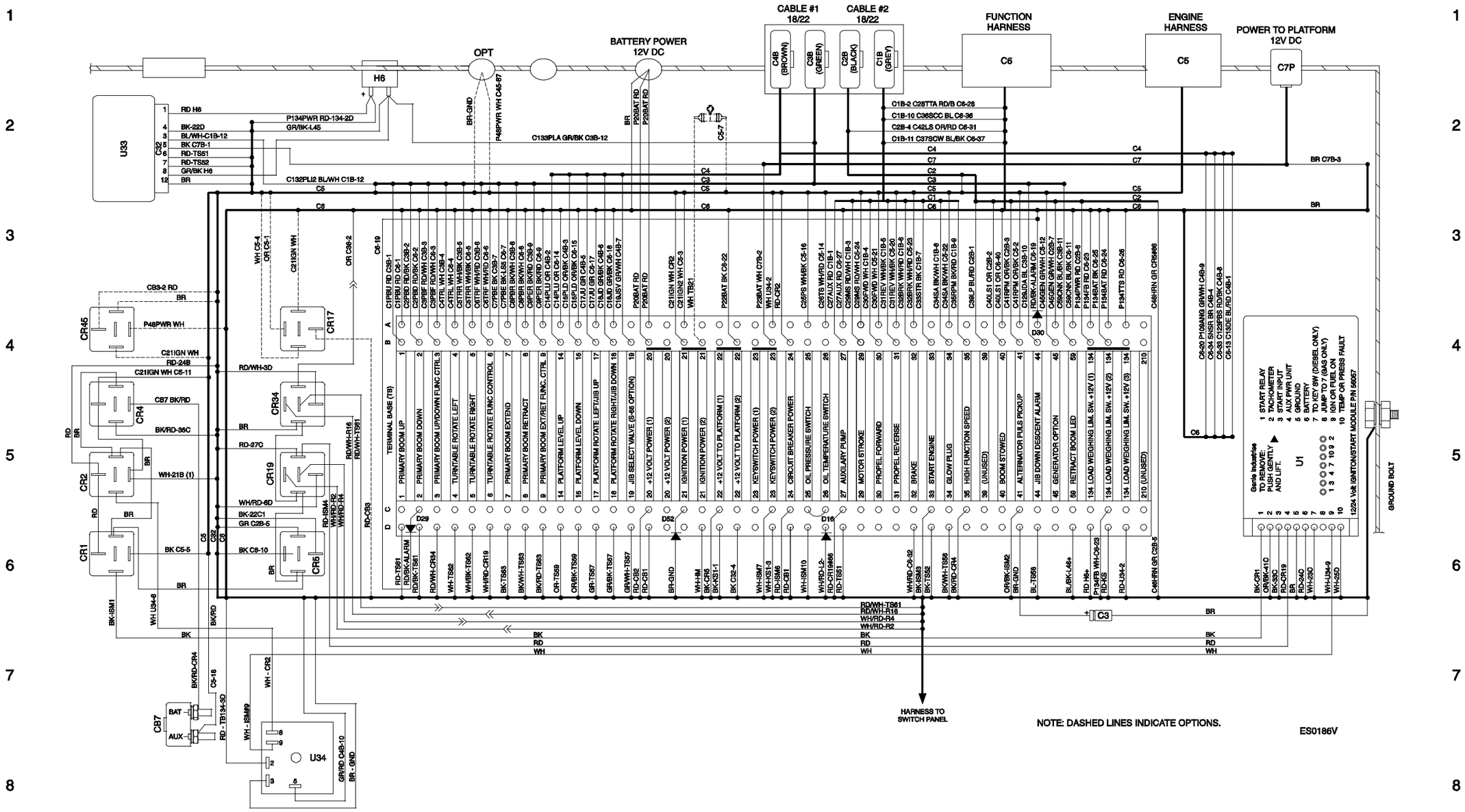


# Ground Control Box Terminal Strip Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (AS)



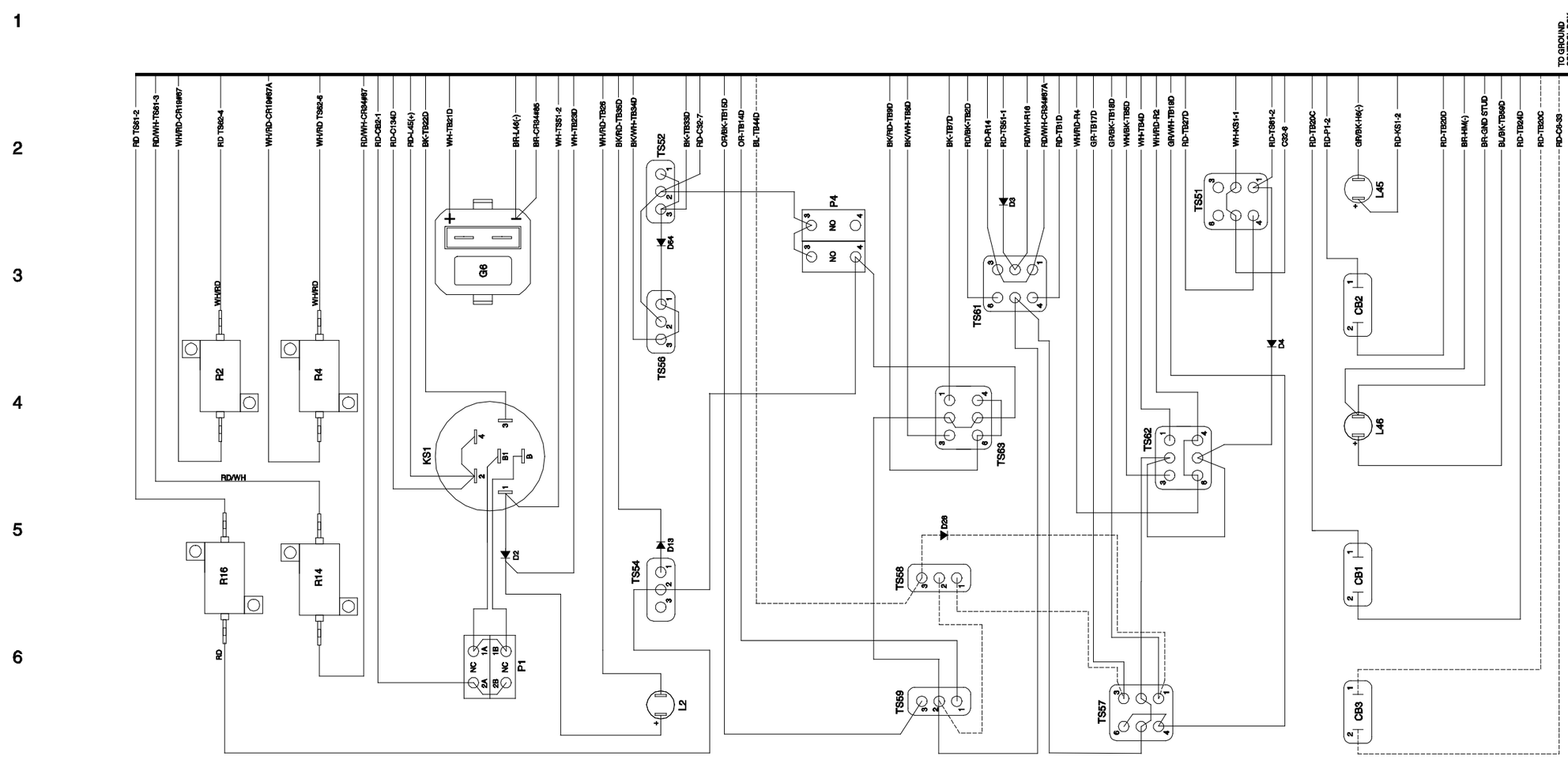
# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (AS)



# Ground Control Box Switch Panel Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (AS)




**COMPONENT INDEX - GROUND CONTROLS**

| | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L2 | LED - CHECK ENGINE |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |

| | |
|---|---|
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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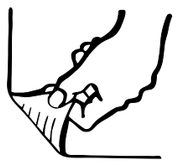
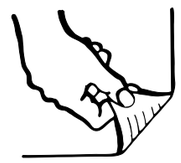
# Ground Control Box Switch Panel Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (AS)

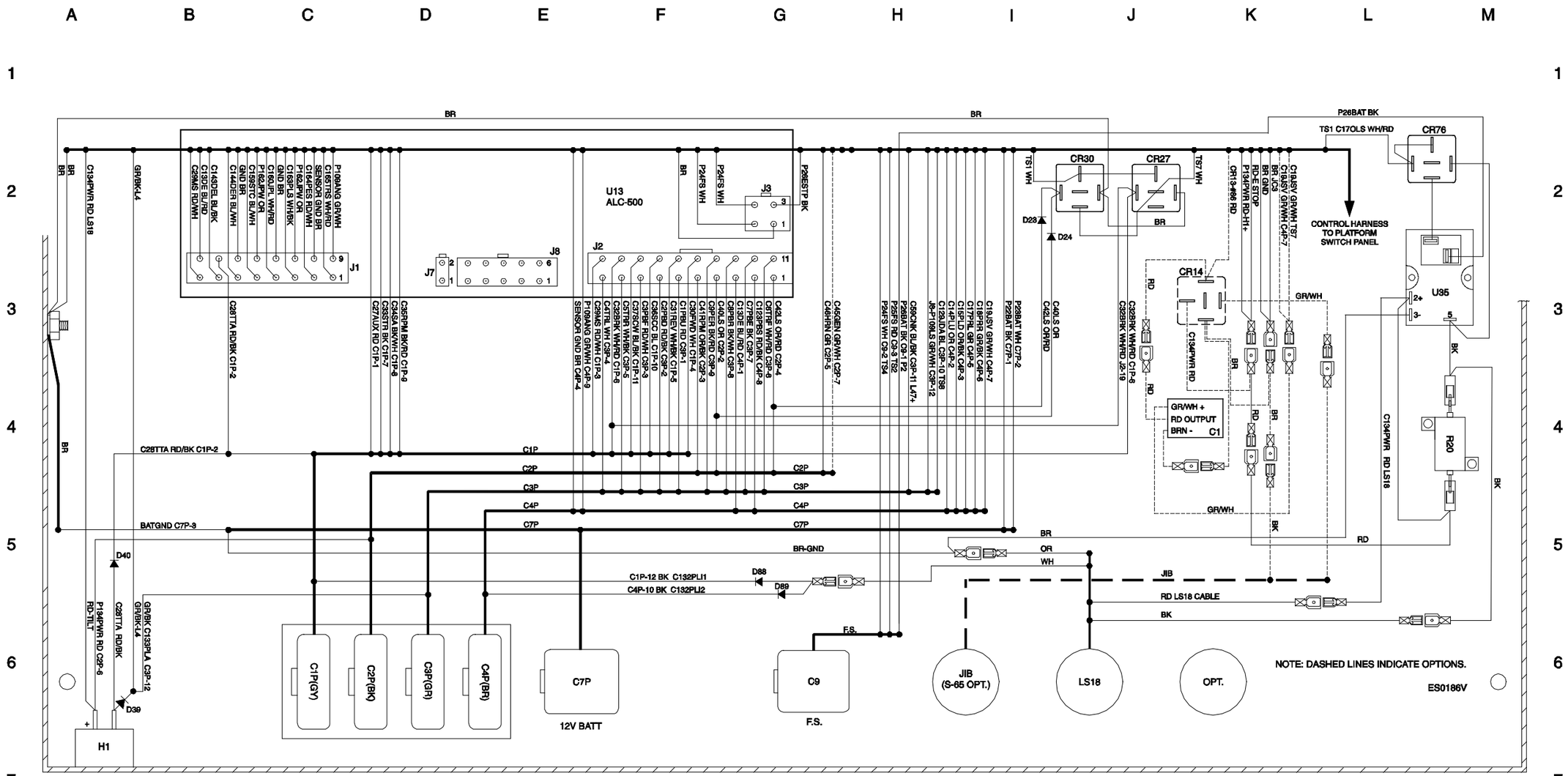


# Platform Control Box Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (AS)



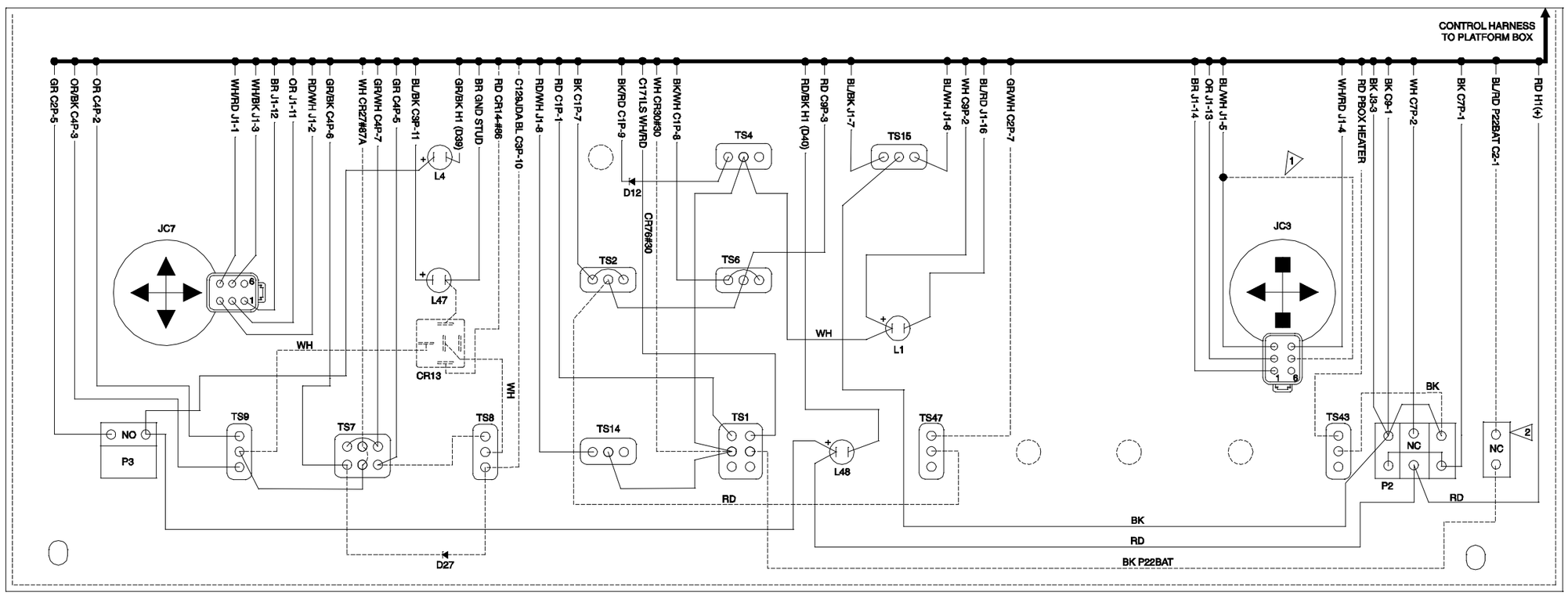
# Platform Control Box Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (AS)



# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D2011L03i • TD2011L04i Models (AS)




| | COMPONENT INDEX |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |

| | |
|---|---|
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

2 LOAD SENSE RECOVERY OPTION

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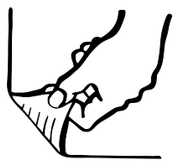
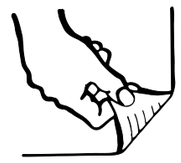
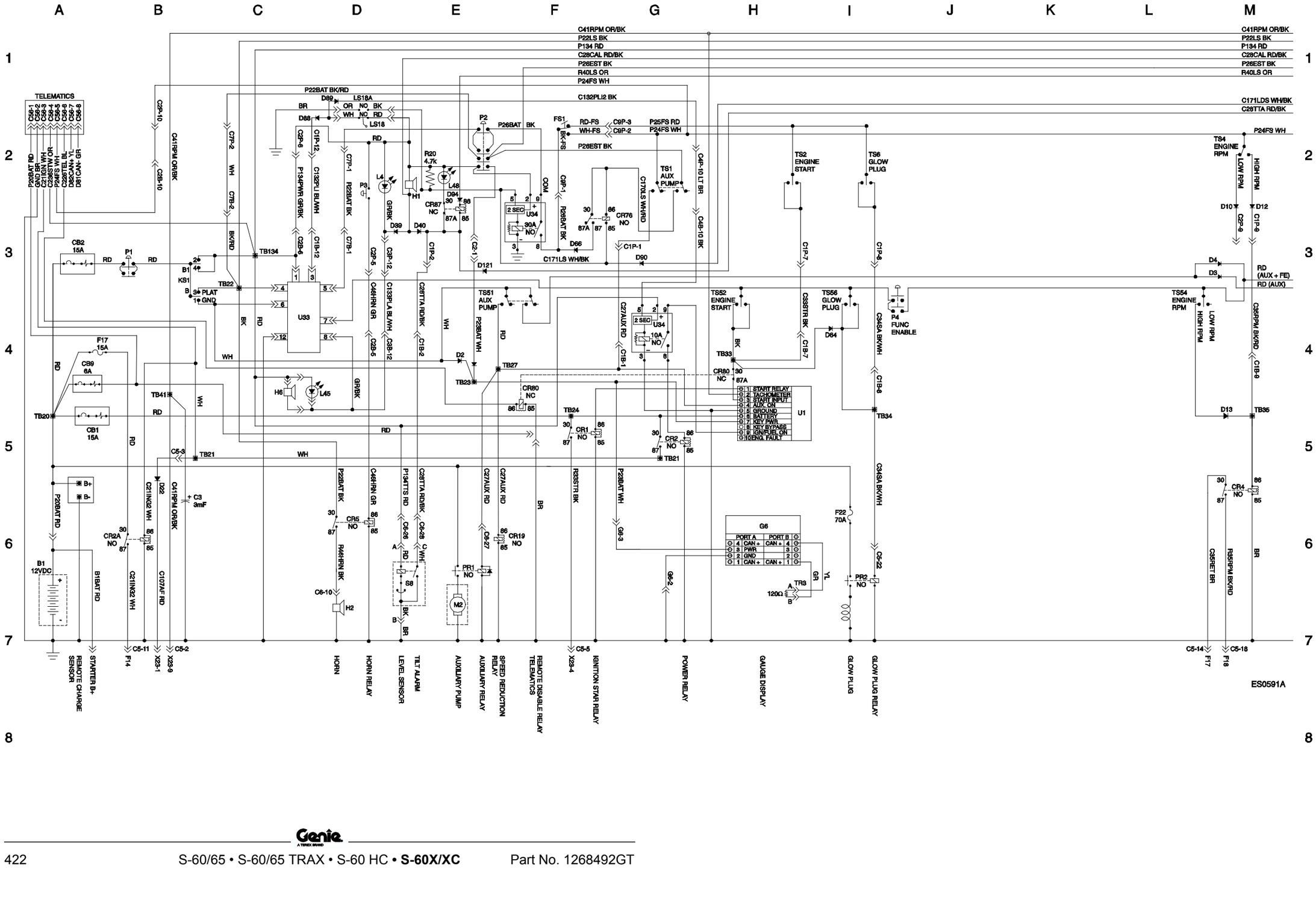
# Platform Control Box Switch Panel Wiring Diagram, Deutz D2011L03i • TD2011L04i Models (AS)



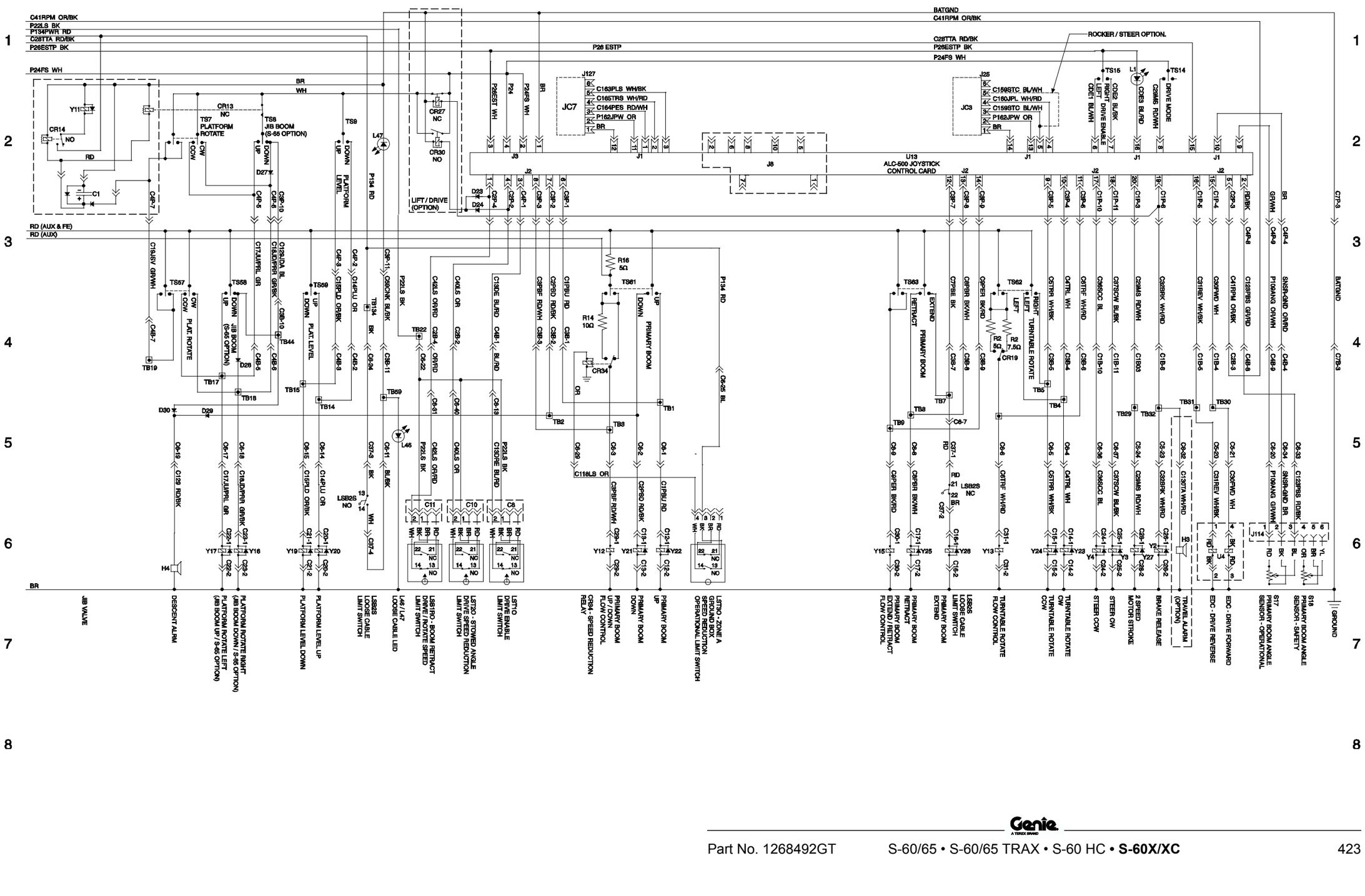
# Electrical Schematic, Deutz D436 L3i Models (AS)



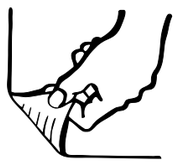
## Electrical Schematic, Deutz D436 L3i Models (AS)



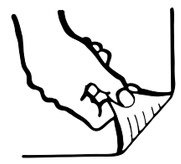
# Electrical Schematic, Deutz D436 L3i Models (AS)



# Electrical Schematic, Deutz D436 L3i Models (AS)

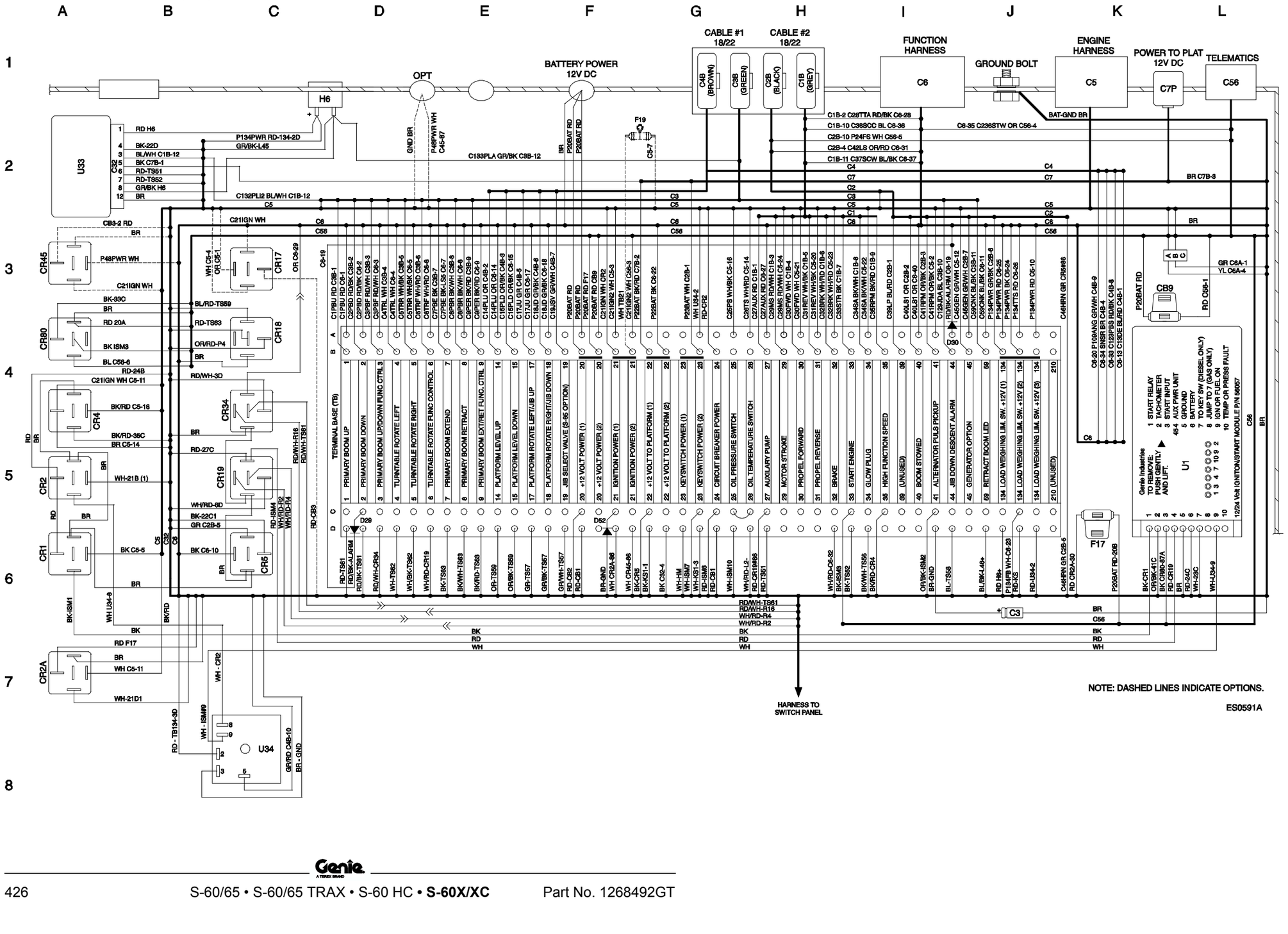


# Ground Control Box Terminal Strip Wiring Diagram, Deutz D436 L3i Models (AS)



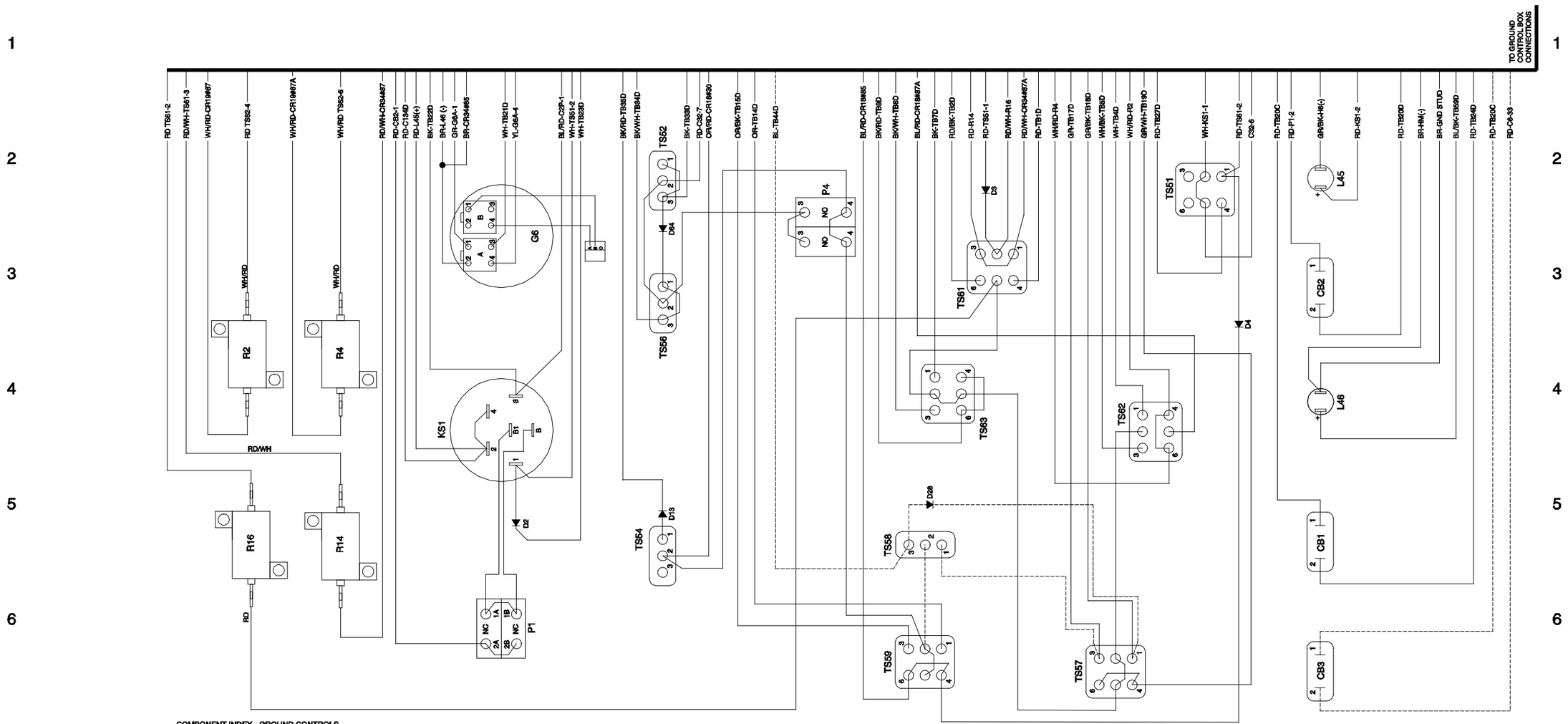
# Ground Control Box Terminal Strip Wiring Diagram,

## Deutz D436 L3i Models (AS)



# Ground Control Box Switch Panel Wiring Diagram,

## Deutz D436 L3i Models (AS)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |

| | |
|---|---|
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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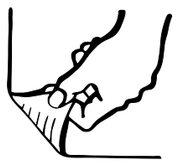
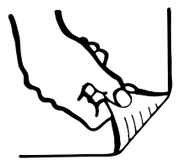
# Ground Control Box Switch Panel Wiring Diagram, Deutz D436 L3i Models (AS)

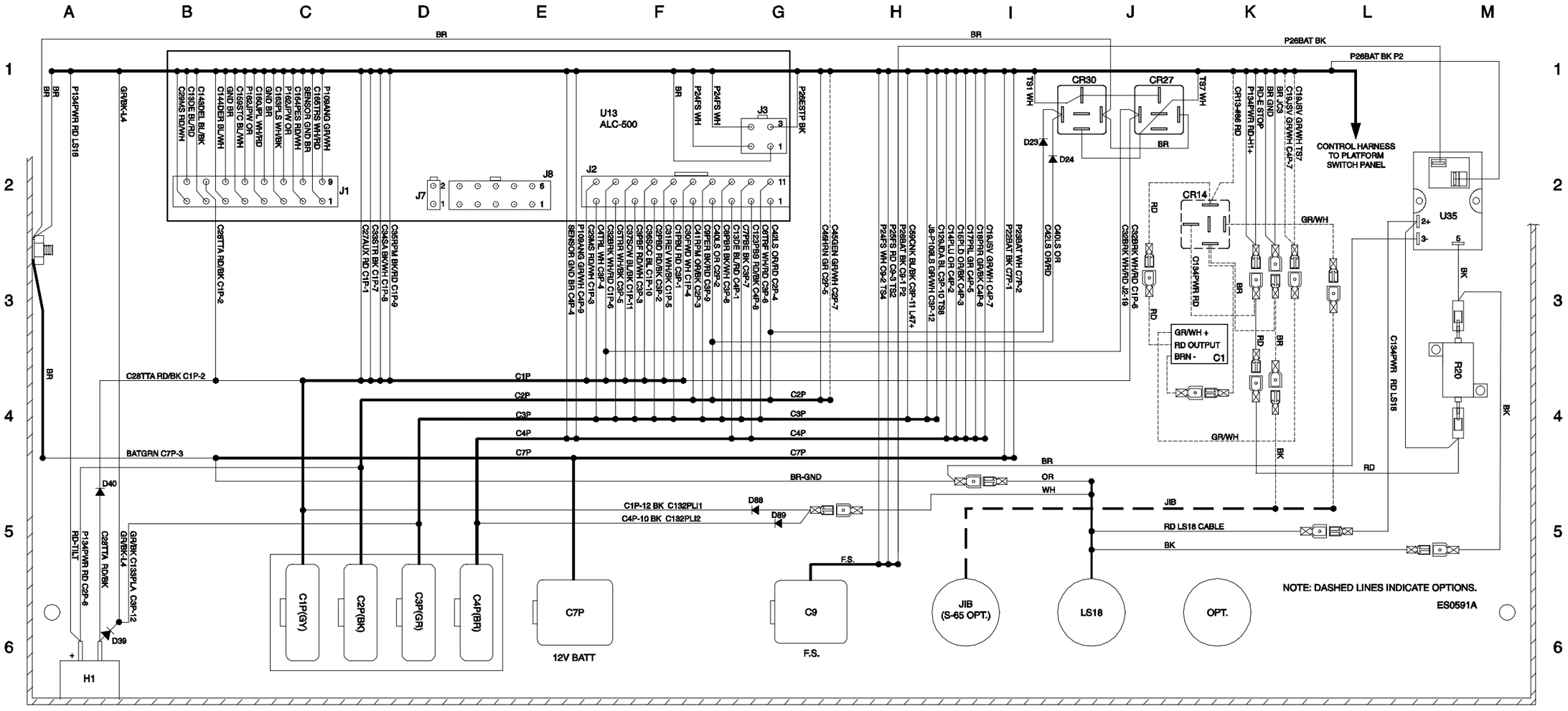


# Platform Control Box Wiring Diagram, Deutz D436 L3i Models (AS)



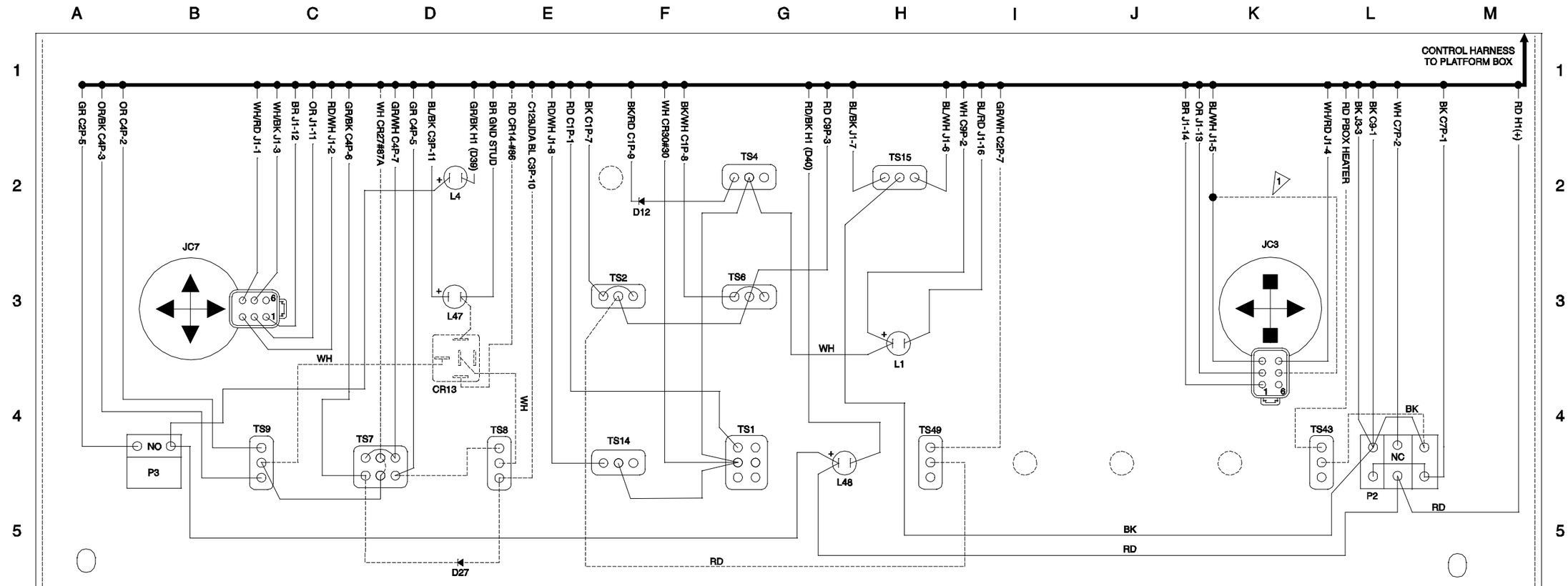
# Platform Control Box Wiring Diagram,

## Deutz D436 L3i Models (AS)



# Platform Control Box Switch Panel Wiring Diagram,

## Deutz D436 L3i Models (AS)



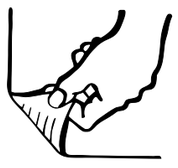

| | COMPONENT INDEX |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

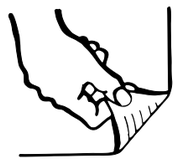
1 ROCKER / STEER OPTION.

ES0591A

# Platform Control Box Switch Panel Wiring Diagram, Deutz D436 L3i Models (AS)

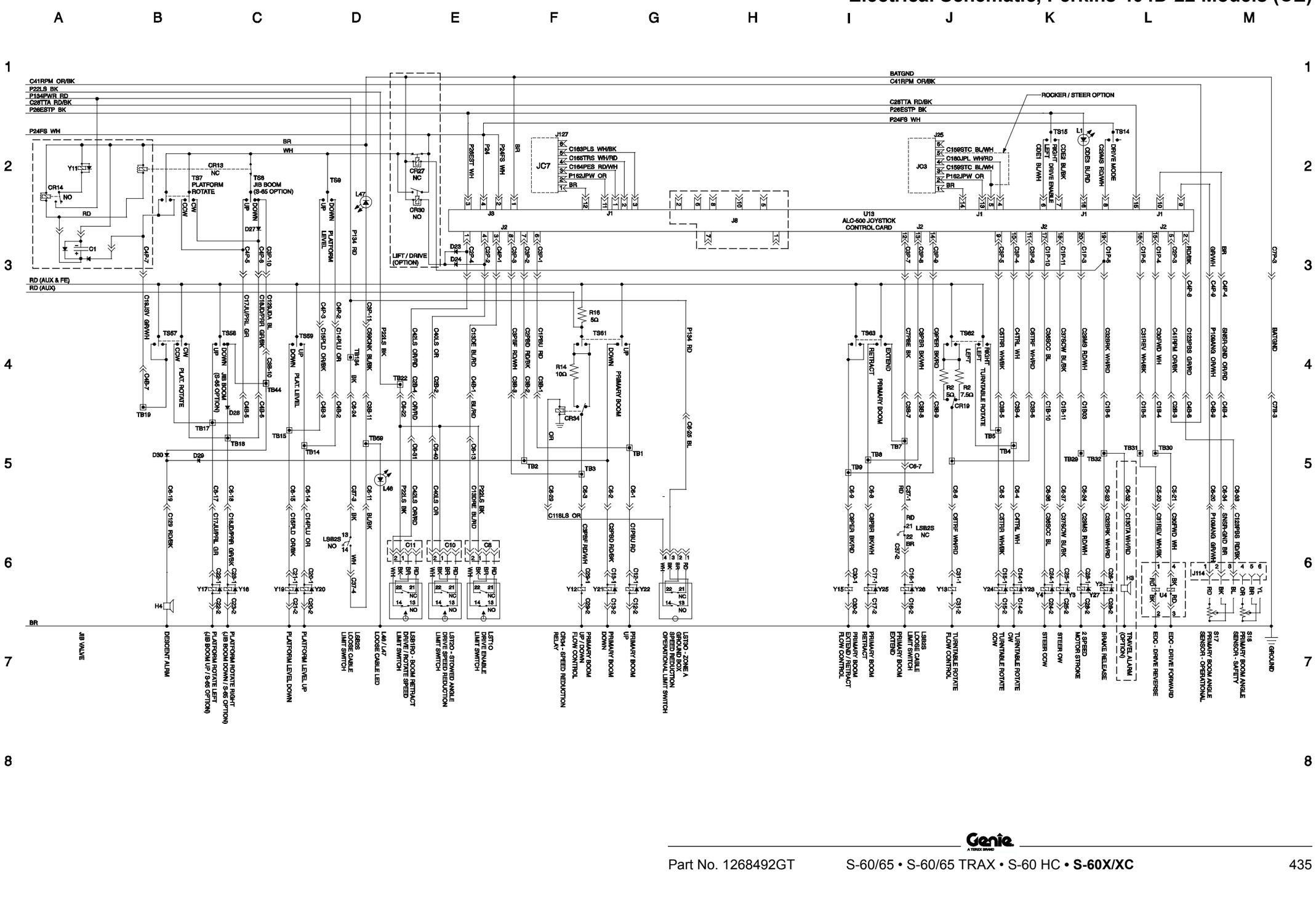


# Electrical Schematic, Perkins 404D-22 Models (AS)

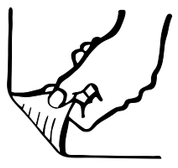


# Electrical Schematic, Perkins 404D-22 Models (AS)

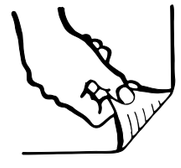
# Electrical Schematic, Perkins 404D-22 Models (CE)



# Electrical Schematic, Perkins 404D-22 Models (AS)

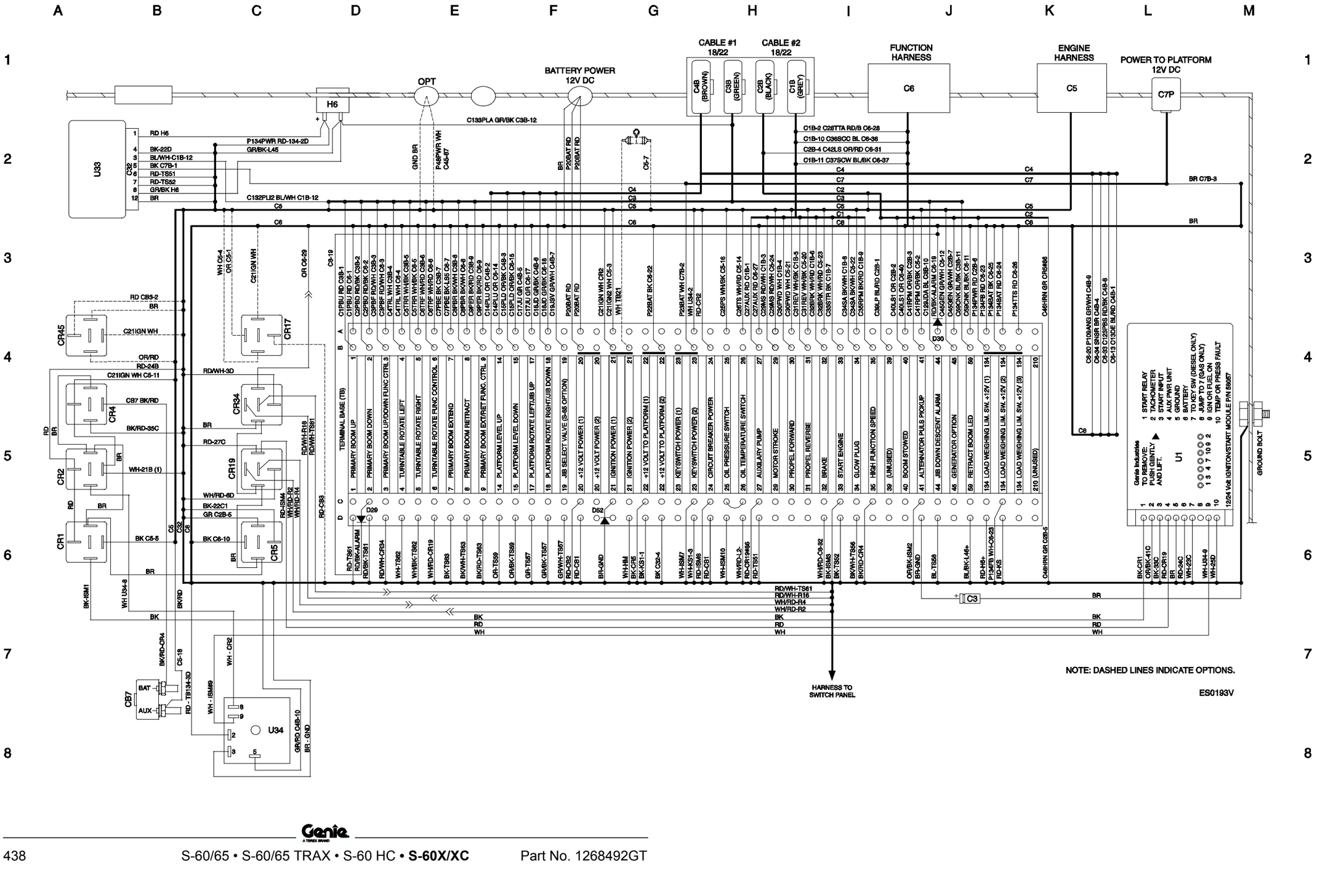


# Ground Control Box Terminal Strip Wiring Diagram, Perkins 404D-22 Models (AS)



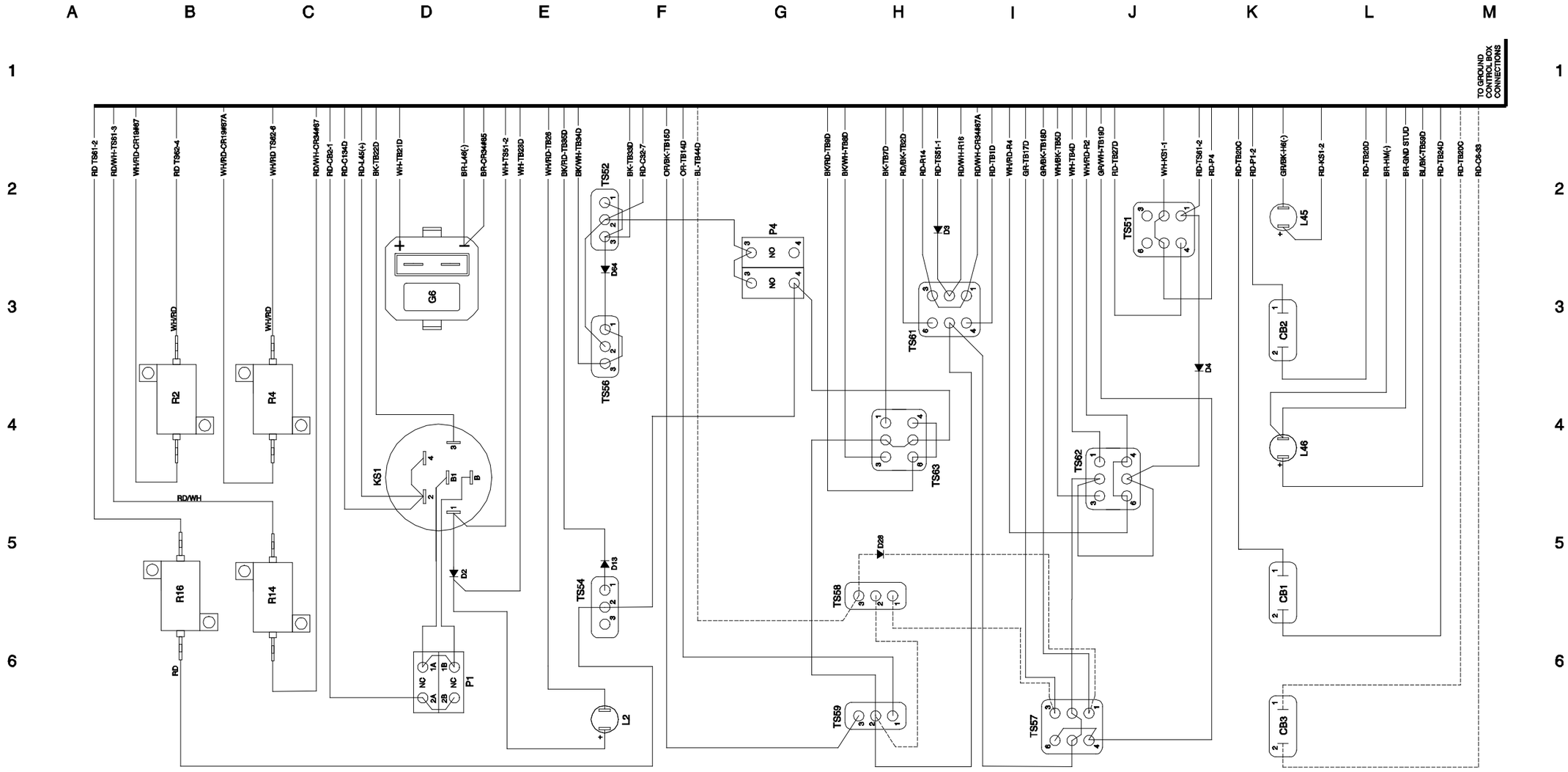
# Ground Control Box Terminal Strip Wiring Diagram,

## Perkins 404D-22 Models (AS)



# Ground Control Box Switch Panel Wiring Diagram,

## Perkins 404D-22 Models (AS)




| COMPONENT INDEX - GROUND CONTROLS | |
|---|---|
| CB1 | ENGINE CIRCUIT BREAKER, 15A |
| CB2 | CONTROLS CIRCUIT BREAKER, 15A |
| CB3 | CIRCUIT BREAKER, 15A (OPTION) |
| CB7 | HIGH IDLE CIRCUIT BREAKER |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR4 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY (OPTION) |
| CR19 | TURNTABLE SPEED REDUCTION RELAY |
| CR23 | DRIVE LIGHTS RELAY (OPTION) |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| G6 | HOUR METER |
| H6 | PLATFORM OVERLOAD ALARM |

| | |
|---|---|
| KS1 | KEY SWITCH |
| L2 | LED - CHECK ENGINE |
| L45 | LED - PLATFORM OVERLOAD |
| L46 | LED - CABLE TENSION |
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE SWITCH |
| R2 | RESISTOR, 5Ω, TURNTABLE ROTATE SPEED |
| R4 | RESISTOR, 7.5Ω, TURNTABLE ROTATE SPEED |
| R14 | RESISTOR, 10Ω, PRIMARY BOOM UPPER ZONE SPEED |
| R16 | RESISTOR, 5Ω, PRIMARY BOOM UP / DOWN SPEED |
| TS51 | AUXILIARY PUMP TOGGLE SWITCH |
| TS52 | ENGINE START TOGGLE SWITCH |
| TS54 | RPM SELECT TOGGLE SWITCH |
| TS56 | GLOW PLUG TOGGLE SWITCH |

| | |
|---|---|
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS59 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP / DOWN TOGGLE SWITCH |
| TS62 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS63 | PRIMARY BOOM EXTEND / RETRACT TOGGLE SWITCH |
| U1 | IGNITION START MODULE |
| U33 | LOAD SENSE MODULE |
| U34 | TIME DELAY RELAY - 2 SECONDS, 10A |

NOTE: DASHED LINES INDICATE OPTIONS.

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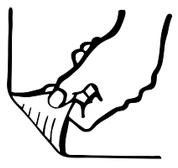
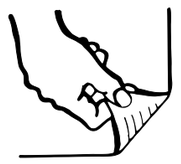
# Ground Control Box Switch Panel Wiring Diagram, Perkins 404D-22 Models (AS)

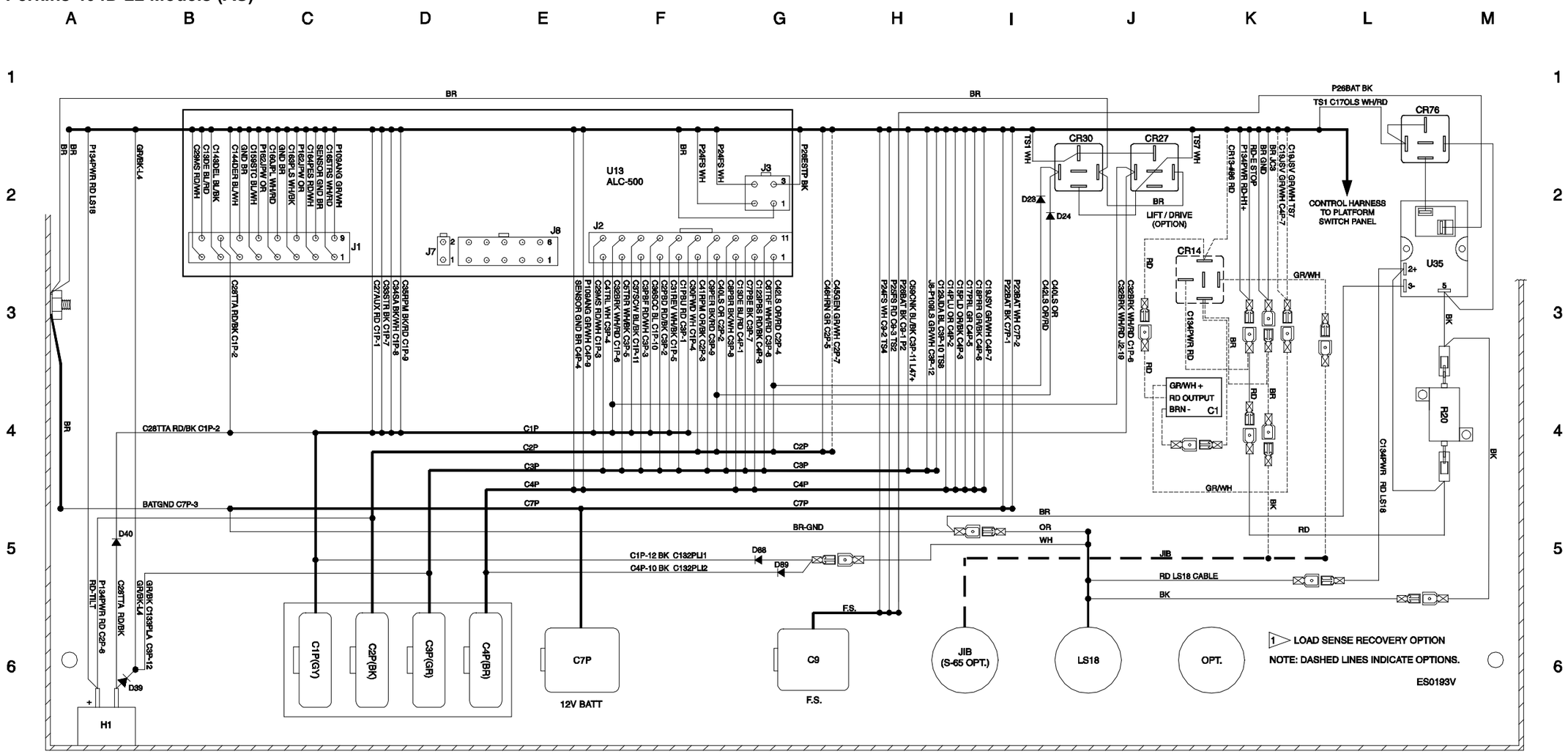


# Platform Control Box Wiring Diagram, Perkins 404D-22 Models (AS)



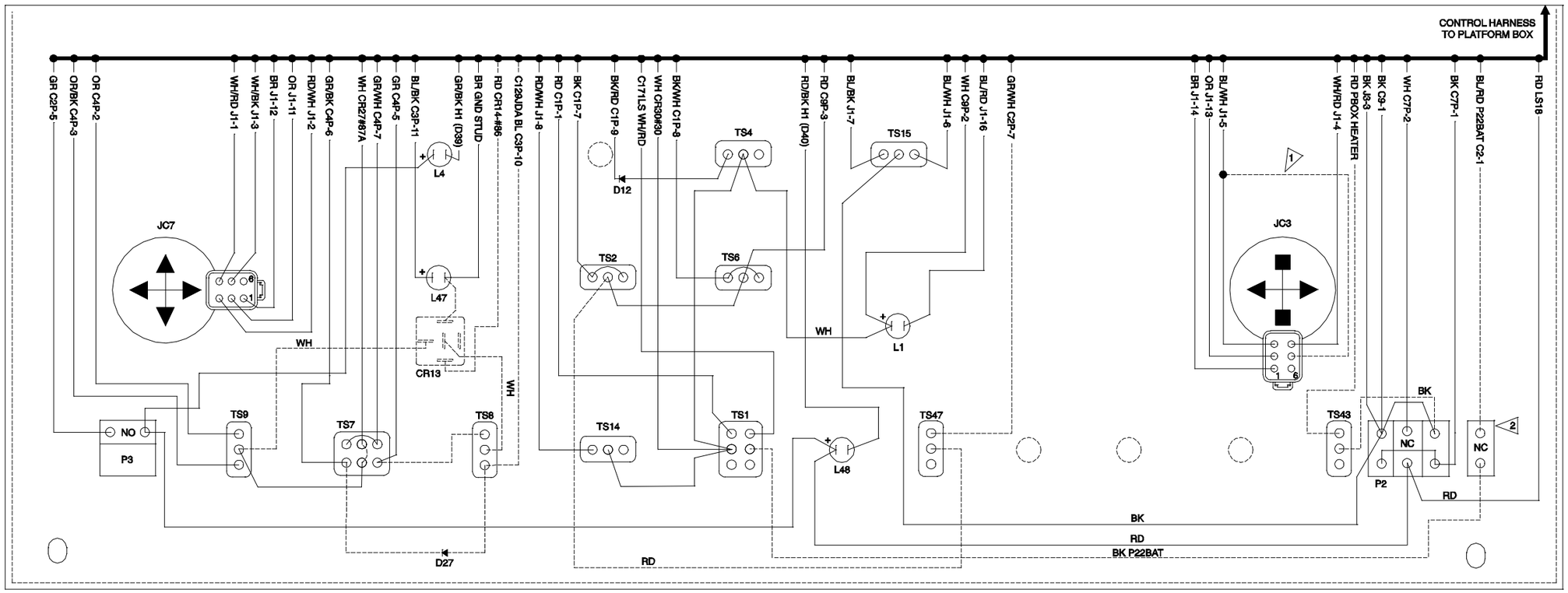
# Platform Control Box Wiring Diagram,

## Perkins 404D-22 Models (AS)



# Platform Control Box Switch Panel Wiring Diagram,

## Perkins 404D-22 Models (AS)




COMPONENT INDEX

| | |
|---|---|
| C1 | CAPACITOR, JIB CIRCUIT (S-65 OPTION) |
| CR13 | JIB SELECT RELAY (S-65 OPTION) |
| CR14 | JIB VALVE RELAY (S-65 OPTION) |
| CR27 | RELAY - BRAKE CIRCUIT (LIFT / DRIVE OPTION) |
| CR30 | RELAY - LIMIT SWITCH (LIFT / DRIVE OPTION) |
| CR76 | RELAY - LOAD SENSE AUX RECOVERY |
| H1 | TILT ALARM |
| JC3 | JOYSTICK - DRIVE / STEER |
| JC7 | JOYSTICK - PRIMARY BOOM UP / DOWN, EXTEND / RETRACT, TURNTABLE ROTATE |
| L1 | LED - DRIVE ENABLE |
| L4 | LED - PLATFORM OVERLOAD |
| L47 | LED - CABLE TENSION |
| L48 | LED - TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| R20 | RESISTOR - 4700Ω |
| TS1 | AUXILIARY PUMP TOGGLE SWITCH |
| TS2 | ENGINE START TOGGLE SWITCH |
| TS4 | RPM SELECT TOGGLE SWITCH |
| TS6 | GLOW PLUG TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP / DOWN TOGGLE SWITCH (S-65 OPTION) |
| TS9 | PLATFORM LEVEL UP / DOWN TOGGLE SWITCH |
| TS14 | DRIVE SPEED TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS43 | PLAT. BOX HEATER (OPTION) |
| TS47 | GENERATOR (OPTION) |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| U35 | TIME DELAY RELAY |

NOTE: DASHED LINES INDICATE OPTIONS.

1 ROCKER / STEER OPTION.

2 LOAD SENSE RECOVERY OPTION

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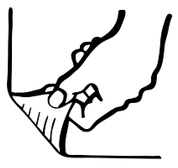
# Platform Control Box Switch Panel Wiring Diagram, Perkins 404D-22 Models (AS)



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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