Genie®
A TEREX BRAND

# Service and Repair Manual

Serial Number Range

## S®-80
## S®-85
## S®-80X

from S8015-12264
to S8016H-13642

from S8515-12264
to S8516H-13642

from S80X15-12264
to S80X16H-13642

includes S8516H-13685
and S8516H-13711

from S8015D-101
to S8016D-339
from S80X15D-101
to S80X16D-339
from S80D-340
from S85D-340
from S80XD-340

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. 1269074GT
Rev A4
March 2018

# Introduction

## Important

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

This manual provides troubleshooting and repair procedures for qualified service professionals.

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

## Compliance

### Machine Classification

Group B/Type 3 as defined by ISO 16368

### Machine Design Life

Unrestricted with proper operation, inspection and scheduled maintenance.

## Technical Publications

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

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

## Contact Us:

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

## Find a Manual for this Model

Go to http://www.genielift.com

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

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## Revision History

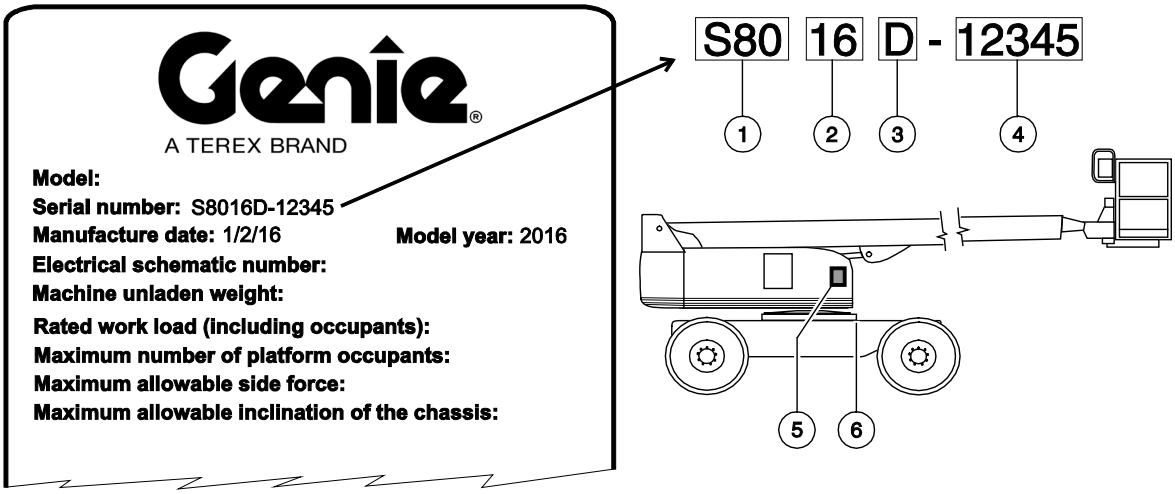
| Revision | Date | Section | Procedure / Page / Description |
|---|---|---|---|
| A | 9/2015 | | Initial Release |
| A1 | 7/2016 | Repair Procedures | Added 4-7, Primary Boom Angle Sensor, S80X |
| A2 | 9/2016 | Introduction | Serial Number Legend |
| A3 | 10/2016 | Repair; Schematics | Hydraulic Drive Manifolds, Valve Coil resistance, Hydraulic Schematics |
| A4 | 3/2018 | Schematics | Update Electrical Schematics<br>AddSerial Breaks |
| | | | |

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

# Introduction

## Serial Number Legend

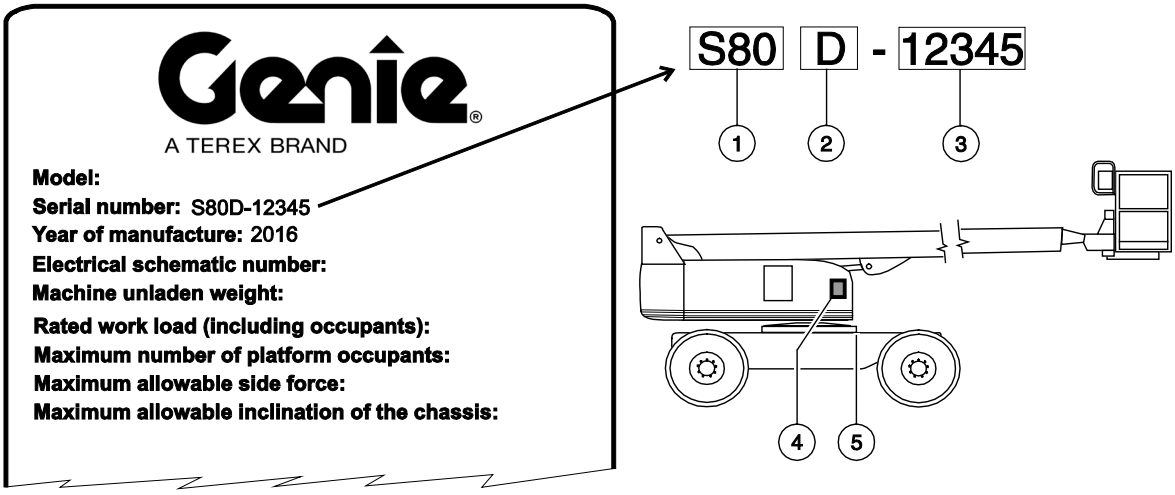
**To August 31, 2016**




1 Model
2 Model year
3 Facility code

1 Sequence number
2 Serial label (located under cover)
3 Serial number (stamped on chassis)

**From September 1, 2016**




1 Model
2 Facility code
3 Sequence number

1 Serial label (located under cover)
2 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**<br>**Rough Terrain and Non Marking** | |
|---|---|
| Tire size | 18-625 FF |
| Tire ply rating | 16 ply |
| Overall tire diameter | 40.7 in<br>103.3 cm |
| Tire pressure | Foam filled |
| Wheel diameter | 24.5 in<br>62.2 cm |
| Wheel width | 15 in<br>38.1 cm |
| Tire weight, new foam filled (minimum) | 622 lbs<br>282 kg |

Tires and wheels High Flotation

| | |
|---|---|
| Tire size | 41/18LLx22.5 |
| Tire ply rating | 14 ply |
| Tire pressure | 70 psi<br>4.8 bar |
| Wheel diameter | 22.5 in<br>57 cm |
| Wheel width | 14 in<br>35.6 cm |

| **Lugs and Lug Nut Torque** | |
|---|---|
| Wheel lugs | 11 @ 3/4 - 16 |
| Lug nut torque, dry | 420 ft-lbs<br>569 Nm |
| Lug nut torque, lubricated | 320 ft-lbs<br>434 Nm |

| **Fluid capacities** | |
|---|---|
| Fuel tank,<br>Deutz and Perkins models | 35 gallons<br>132.5 liters |
| Fuel tank,<br>Continental model | 30 gallons<br>113.5 liters |
| LPG tank | 33.5 lbs<br>15.2 kg |
| Hydraulic tank | 40 gallons<br>151.4 liters |
| Hydraulic system (including tank) | 50 gallons<br>189.3 liters |
| Turntable rotation drive hub (single fill port) | 40 fl oz<br>1183 cc |
| Turntable rotation drive hub (dual fill port) | 43 fl oz<br>1262 cc |
| Drive hubs<br>four wheel drive | 30.5 fl oz<br>902 cc |
| Drive hubs<br>two wheel drive | 23 fl oz<br>680 cc |

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

# Specifications

## Performance Specifications

| | |
|---|---|
| **Drive speed, maximum** | |
| Stowed position, RT tires | 40 ft / 7.9 - 8.5 sec<br>12.2 m / 7.9 - 8.5 sec |
| Stowed position, High Flotation tires | 40 ft / 11 - 13 sec<br>12.2 m / 11 - 13 sec |
| Raised or Extended | 40 ft / 40 - 45 sec<br>12.2 m / 40 - 45 sec |
| **Braking distance, maximum** | |
| High range on paved surface | 6 ft / 1.8 m |
| **Gradeability** | Refer to Operator's Manual |
| **Boom function speeds, maximum from platform controls** | |
| Jib Boom up (S-85) | 25 - 35 sec |
| Jib Boom down (S-85) | 15 - 25 sec |
| Boom up (ANSI, CSA, models) | 57 - 65 sec |
| Boom up (CE, AS models) | 75 - 83 sec |
| Boom down (ANSI, CSA, models) | 61 - 69 sec |
| Boom down (CE, AS models) | 75 - 83 sec |
| Boom extend | 59 - 67 sec |
| Boom retract | 57 - 65 sec |
| Turntable rotate, (360°) fully stowed | 95 - 103 sec |
| Turntable rotate, (360°) boom raised or extended | 210 - 250 sec |
| Platform rotate, 160° | 8 - 12 sec |
| Platform level (10° range of motion) ANSI, CSA | 3 - 5 sec |
| Platform level (10° range of motion) CE, AS | 20 - 22 sec |

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.

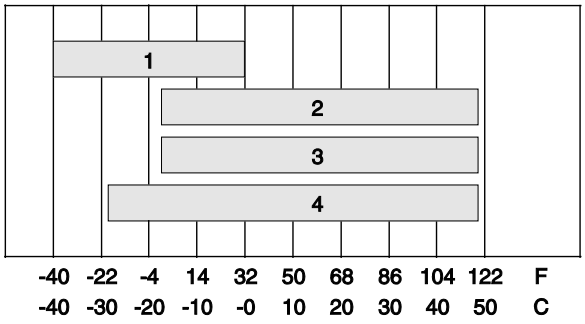
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond it's maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

**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

## Chevron Rando HD Premium Oil MV Fluid Properties

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

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

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

# Specifications

## Chevron 5606A Hydraulic Oil Fluid Properties

| | |
|---|---|
| ISO Grade | 15 |
| Viscosity index | 300 |
| Kinematic Viscosity<br>cSt @ 200°F / 100°C<br>cSt @ 104°F / 40°C<br>cSt @ -40°F / -40°C | <br>5.5<br>15.0<br>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 |

# Specifications

## 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 |

## Hydraulic Component Specifications

| | |
|---|---|
| **Drive Pump** | |
| Type: bi-directional variable displacement piston pump | |
| Displacement per revolution | 0 to 2.8 cu in<br>0 to 46 cc |
| Flow rate @ 2300 rpm | 30.3 gpm<br>114.7 L/min |
| Drive pressure, maximum | 3750 psi<br>259 bar |
| **Charge Pump** | |
| Type | gerotor |
| Displacement per revolution | 0.85 cu in<br>13.9 cc |
| Flow rate @ 2300 rpm | 9 gpm<br>34 L/min |
| Charge pressure @ 2300 rpm<br>Neutral position | 310 psi<br>21.4 bar |
| **Function pump** | |
| Type: variable displacement piston pump | |
| Displacement per revolution | 0 to 2.3 cu in<br>0 to 38 cc |
| Flow rate @ 2300 rpm | 0 to 23 gpm<br>0 to 87 L/min |
| Pressure, maximum | 2900 psi<br>200 bar |
| Pressure compensator | 2900 psi<br>200 bar |
| Standby pressure | 250 psi<br>17.3 bar |
| **Auxiliary Pump** | |
| Type: fixed displacement gear pump | |
| Displacement per revolution | 0.15 cu in<br>2.47 cc |

# Specifications

| | |
|---|---|
| **Function manifold** | |
| System relief valve pressure, maximum | 3200 psi<br>221 bar |
| Primary boom extend relief pressure (measured at PTEST port) | 2400 psi<br>165 bar |
| **Platform Manifold and Oscillate Valve** | |
| Platform level flow regulator | 0.6 gpm<br>2.3 L/min |
| Platform rotate flow regulator | 0.3 gpm<br>1.1 L/min |
| Oscillate relief pressure | 950 psi<br>65.5 bar |
| **Traction Manifold** | |
| Hot oil relief pressure | 280 psi<br>19.3 bar |
| **Brakes** | |
| Brake release pressure, Wheel drive hubs | 240 psi<br>16.5 bar |
| **Drive Motors** | |
| Displacement per revolution high speed: | 0.9 cu in<br>14.7 cc |
| Displacement per revolution low speed | 2.7 cu in<br>45 cc |
| **Hydraulic Filters** | |
| High pressure filter: | Beta 3 ≥ 200 |
| High pressure filter bypass pressure | 102 psi<br>7 bar |
| Medium pressure filter | Beta 3 ≥ 200 |
| Medium pressure filter bypass pressure | 51 psi<br>3.5 bar |
| Hydraulic tank return filter | 10 micron with<br>25 psi / 1.7 bar<br>bypass |
| Drive motor case drain return filter | Beta 10 ≥ 2 |

## 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 |

# Specifications

## Continental TME27 Engine

| | |
|---|---|
| **Displacement** | 164 cu. in<br>2.68 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.58 x 4.06 inches<br>91 x 103.2 mm |
| **Horsepower, continuous @ 2500 rpm** | 59 hp / 43.9 kW |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Standby idle-computer controlled Frequency** | 1000 rpm |
| **Low function idle-computer controlled Frequency** | 1500 rpm<br>53.33 rpm |
| **High function idle-computer controlled Frequency** | 2500 rpm<br>83.33 Hz |
| **Compression ratio** | 8.2:1 |
| **Compression pressure pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder** | |
| **Governor** | electronic |
| **Valve clearance, warm** | |
| Intake | 0.014 in<br>0.36 mm |
| Exhaust | 0.018 in<br>0.45 mm |
| **Lubrication system** | |
| Oil pressure, hot | 40 to 60 psi<br>2.8 to 4.1 bar |
| Oil capacity (including filter) | 7 quarts<br>6.6 liters |
| **Oil viscosity requirements** | |
| -22°F to 86°F / -30°C to 30°C | 5W-20 |
| -4°F to 104°F / -20°C to 40°C | 10W-40 |
| Above 5°F / -15°C | 15W-40 |
| Unit ships with 15W-40.<br>Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine. | |

| | |
|---|---|
| **Oil Pressure switch** | |
| Installation torque | 8 - 18 ft-lbs<br>11 - 24 Nm |
| Pressure switch point | 7 psi<br>0.55 bar |
| **Fuel Pump** | |
| Fuel pressure | 39-40 psi<br>2.7 bar |
| Fuel flow rate | 0.42 gpm<br>1.59 L/min |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |
| **Starter motor** | |
| Current draw, normal load | 150-345A |
| Cranking speed | 200 - 250 rpm |
| **Battery – Engine starting and control system** | |
| Type | 12V DC, Group 31 |
| Quantity | 2 |
| Battery capacity, maximum | 1000A |
| Reserve capacity @ 25A rate | 200 Minutes |
| **Engine coolant** | |
| Capacity<br>(engine only) | 10.7 quarts<br>10.1 liters |
| **Coolant temperature switch** | |
| Installation torque | 8 - 18 ft-lbs<br>11 - 24 Nm |
| Temperature switch point | 230°F<br>110°C |
| **Alternator output** | 65A @ 13.8V DC |
| **Fan belt deflection** | 1/2 inch<br>12 mm |

# Specifications

## 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 net intermittent @ 2400 rpm** | 74 hp<br>55 kW |
| **Induction system** | turbocharged |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1300 rpm |
| **Low idle w/ belt driven generator** | 1500 rpm |
| **High idle** | 2350 rpm |
| **Compression ratio** | 17.5:1 |
| Compression pressure pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder | |
| **Governor** | centrifugal<br>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 (@ 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<br>(synthetic) |
| -4°F to 104°F / -20°C to 40°C | 10W-40 |
| Above 5°F / -15°C | 15W-40 |
| Unit ships with 15W-40.<br>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 |
| Temperature switch point | 275°F<br>135°C |
| **Oil Pressure switch** | |
| Installation torque | 8 - 18 ft-lbs<br>11 - 24 Nm |
| Pressure switch point | 22 psi<br>1.5 bar |
| **Fuel injection system** | 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 Manual for your engine. | |
| Starter motor | |
| Current draw, normal load | 140 - 200A |
| Cranking speed | 250 - 350 rpm |
| **Battery – Engine starting and control system** | |
| Type | 12V DC, Group 31 |
| Quantity | 2 |
| Battery capacity, maximum | 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 TD 2.9 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 net intermittent @ 2600 rpm** | 74.2 hp<br>55 kW |
| **Induction system** | turbocharged |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 900 rpm |
| **Low idle w/ belt driven generator** | 1500 rpm |
| **High idle** | 2500 rpm |
| **Compression ratio** | 17.4:1 |
| Compression pressure pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder | |
| **Governor** | electronic |
| **Valve Clearance, cold** | |
| Intake | 0.012 in<br>0.3 mm |
| Exhaust | 0.020 in<br>0.5 mm |
| **Lubrication system** | |
| Oil pressure, hot (@ 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<br>(synthetic) |
| -4°F to 104°F / -20°C to 40°C | 10W-40 |
| Above 5°F / -15°C | 15W-40 |
| Unit ships with 15W-40.<br>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 |
| Temperature switch point | 275°F<br>135°C |
| **Oil Pressure switch** | |
| Installation torque | 8 - 18 ft-lbs<br>11 - 24 Nm |
| Pressure switch point | 22 psi<br>1.5 bar |
| **Fuel injection system** | 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 Manual for your engine. | |
| Starter motor | |
| Current draw, normal load | 140 - 200A |
| Cranking speed | 250 - 350 rpm |
| **Battery – Engine starting and control system** | |
| Type | 12V DC, Group 31 |
| Quantity | 2 |
| Battery capacity, maximum | 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 804D-33

| | |
|---|---|
| **Displacement** | 201 cu. in<br>3.3 liters |
| **Number of cylinders** | 4 |
| **Bore and Stroke** | 3.70 x 4.72 inches<br>94 x 120 mm |
| **Horsepower** | 63 @ 2600 rpm<br>47 KW @ 2600 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Compression ratio** | 22:1 |
| **Compression pressure** | 300 to 500 psi<br>20.7 to 34.5 bar |
| **Pressure (psi) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder** | |
| **Low idle**<br>**Frequency** | 1650 rpm<br>335.5 Hz |
| **High idle**<br>**Frequency** | 2300 rpm<br>467.7 Hz |
| **Governor** | mechanical all speed |
| **Valve Clearance, cold** | |
| Intake | 0.0098 in<br>0.25 mm |
| Exhaust | 0.0098 in<br>0.25 mm |
| **Lubrication system** | |
| Oil pressure, hot (@ 2000 rpm) | 40 to 60 psi<br>2.8 to 4.1 bar |
| Oil capacity (including filter) | 10.6 quarts<br>10 liters |
| **Oil viscosity requirements** | |
| Unit ships with 15W-40.<br>Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine. | |

| | |
|---|---|
| **Injection system** | |
| Injection pump make | Zexel |
| Injection pump pressure | 1707 to 1849 psi<br>117.7 to 127.5 bar |
| Injector opening pressure | ~2000 psi<br>~138 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator Manual for your engine. | |
| **Engine coolant** | |
| Capacity | 12.5 quarts<br>11.8 liters |
| **Batteries** | |
| Type | 12V DC |
| Group | 31 |
| Quantity | 2 |
| Cold cranking ampere | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |
| **Alternator output** | 90A @ 12V DC |
| **Fan belt deflection** | 3/8 to 1/2 inch<br>9 to 12 mm |

# Specifications

## Perkins 404F-22T

| | |
|---|---|
| **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 net intermittent @ 2800 rpm** | 55 hp / 41.1 kW |
| **Horsepower continuous @ 2800 rpm** | 52 hp / 38.8 kW |
| **Induction system** | turbocharged |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Standby idle** | 1000 rpm |
| **Low function idle** | 1500 rpm |
| **High function idle** | 2500 rpm |
| **Compression ratio** | 23.3:1 |
| **Compression pressure pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder** | |
| **Governor** | electronicl |
| **Valve Clearance, cold** | |
| Intake | 0.008 in<br>0.2 mm |
| Exhaust | 0.018 in<br>0.45 mm |
| **Lubrication system** | |
| Oil pressure, hot (@ 2000 rpm) | 40 to 60 psi<br>2.8 to 4.1 bar |
| Oil capacity (including filter) | 9.4 - 11.2 quarts<br>8.9 - 10.6 liters |
| **Oil viscosity requirements** | |
| -22°F to 86°F / -30°C to 30°C | 5W-20 CJ4 |
| -4°F to 104°F / -20°C to 40°C | 10W-40 CJ4 |
| Above 5°F / -15°C | 15W-40 CJ4 |

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

| | |
|---|---|
| **Oil Pressure switch** | |
| Installation torque | 8 - 18 ft-lbs<br>11 - 24 Nm |
| 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. | |
| **Starter motor** | |
| Current draw, normal load | 140A - 200A |
| Cranking speed | 200 - 250 rpm |
| **Battery – Engine starting and control system** | |
| Type | 12V DC, Group 31 |
| Quantity | 2 |
| Battery capacity, maximum | 1000A |
| Reserve capacity @ 25A rate | 200 Minutes |
| **Engine coolant** | |
| Capacity<br>(engine only) | 13.3 quarts<br>12.6 liters |
| **Coolant temperature switch** | |
| Installation torque | 8 - 18 ft-lbs<br>11 - 24 Nm |
| Temperature switch point | 221°F<br>105°C |
| **Alternator output** | 85A @ 12V DC |
| **Fan belt deflection** | 3/8 to 1/2 inch<br>9 to 12 mm |

# Specifications

## Machine Torque Specifications

| | |
|---|---|
| **Platform Rotator** | |
| 1-8 center bolt, GR 5, lubricated<br>(before SN 15-12988) | 480 ft-lbs<br>651 Nm |
| 3/8-16 bolts, GR 8<br>(before SN 15-12988)<br>*(use blue thread locking compound) | 35 ft-lbs*<br>47 Nm* |
| 1-8 center bolt, GR 5, dull gray<br>(from SN 15-12988) | 615 ft-lbs<br>834 Nm |
| 3/8-16 bolts, GR 8<br>(from SN 15-12988) dull gray<br>*(use blue thread locking compound) | 35 ft-lbs*<br>47 Nm* |
| **Turntable rotate assembly** | |
| Rotate bearing mounting bolts, lubricated | 180 ft-lbs<br>244 Nm |
| Rotate drive hub mounting bolts, lubricated | 80 ft-lbs<br>108 Nm |
| Backlash plate mounting bolts, lubricated | 280 ft-lbs<br>379 Nm |
| **Drive motors and hubs** | |
| Drive hub mounting bolts, lubricated | 180 ft-lbs<br>217 Nm |
| Drive motor mounting bolts, dry | 110 ft-lbs<br>149 Nm |
| Drive motor mounting bolts, lubricated<br>*(use blue thread locking compound) | 80 ft-lbs*<br>108 Nm |
| **Engine vibration isolators** | |
| Compressed height | 0.50 in<br>12.7 mm |

## 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

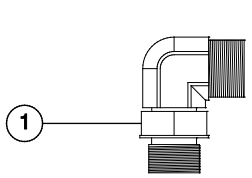
(swivel nut or hose connection)

| 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

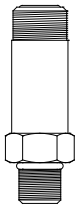
(tube fitting - installed into Aluminum)
(all types)

| 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.

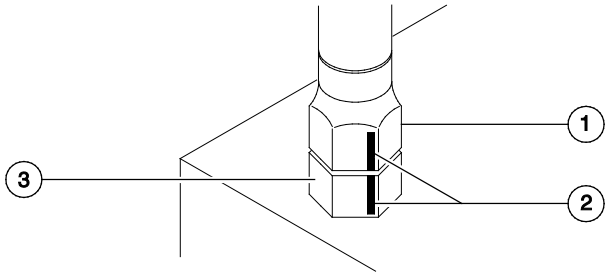



Illustration 1

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.

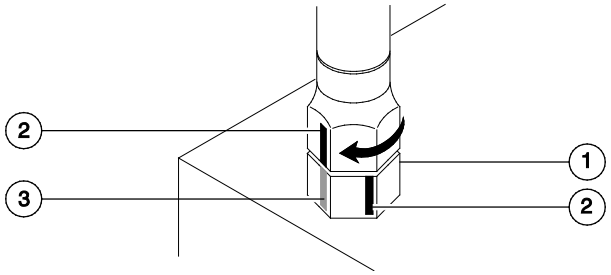



Illustration 2

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

# Repair Procedures

## About This Section

Most of the procedures in this section should only be performed by trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. Then to re-assemble, perform the disassembly steps in reverse order.

### Symbols Legend



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

**⚠ DANGER** Indicates a imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

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

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

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

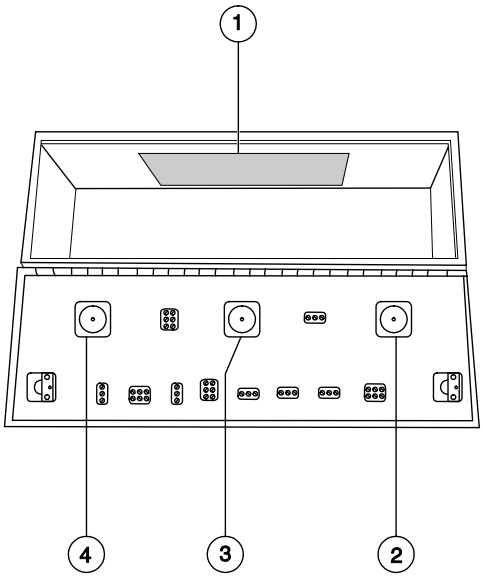
☒ Indicates that an incorrect result has occurred after performing a series of steps.

# Platform Controls

## Platform Controls

The platform control box contains one printed circuit board. The ALC-500 circuit board inside the platform control box controls all proportional machine functions from the platform. The joystick controllers at the platform controls utilize Hall Effect technology and require no adjustment. The operating parameters of the joysticks are stored in memory at the ECM circuit board at the platform controls. If a joystick error occurs or if a joystick is replaced, it will need to be calibrated before that particular machine function will operate. Refer to Repair Procedure, *How to Calibrate a Joystick*.

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




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

## 1-1 ALC-500 Circuit Board

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

## How to Remove the ALC-500 Circuit Board

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

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

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

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

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

5 Carefully disconnect the wire connectors from the circuit board.

6 Remove the ALC-500 circuit board mounting fasteners.

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

# 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 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 controls. Do not start the engine.

3 Push in the platform 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.

# Platform Controls

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.

| **Function speeds (factory settings)** | |
|---|---|
| Boom up | 89 to 93 seconds |
| Boom down | 90 to 94 seconds |
| Boom extend | 73 to 79 seconds |
| Boom retract | 79 to 84 seconds |
| Turntable rotate, 360°boom fully stowed | 95 to 103 seconds |
| **Drive speeds (factory settings)** | |
| Stowed- high speed | 7.9 to 8.5 seconds |
| Non-stowed | 40 to 45 seconds |

## How to Adjust the Joystick Ramp Rate Setting

The ramp rate setting of a joystick controls the time at which it takes for the joystick to reach maximum output, when moved out of the neutral position. The ramp rate settings of a joystick can be changed to compensate for hydraulic pump wear to maintain peak performance from the machine.

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

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

2 Turn the key switch to platform controls. Do not start the engine.

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

4 Do not press down the foot switch.

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

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

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

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

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

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

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

11 Release the foot switch.

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

Note: Each time the drive enable toggle switch is momentarily moved, the time will change in 10% increments.

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.

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** | |
| accelerate | 3 seconds |
| decelerate | 1 second |
| **Boom extend/retract** | |
| accelerate | 2.5 seconds |
| decelerate | 1 second |
| **Turntable rotate** | |
| accelerate | 3 seconds |
| decelerate | 2 second |
| **Drive** | |
| accelerate | 4 seconds |
| decelerate to neutral | 0.5 second |
| decelerate, change of direction | 0.75 second |
| decelerate, coasting | 1 second |
| decelerate, braking | 1 second |
| decelerate, shift from low to high speed | 1 seconds |
| decelerate, shift from high to low speed | 4 seconds |

# Platform Controls

## 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 controls. Do not start the engine.

3 Push in the platform 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.

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 Calibrate the Boom Angle Sensor

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

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

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 in the right position 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

### How to Remove the Platform

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

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

3 Remove the foot switch mounting fasteners.

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

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

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

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

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

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

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

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

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

## 2-2
## Platform Leveling Cylinder

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

### How to Remove the Platform Leveling Cylinder

Note: Before cylinder removal is considered, bleed the 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 primary boom until the slave cylinder barrel-end pivot pin is accessible.

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

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

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

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

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

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

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

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

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

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

### How to Bleed the Slave Cylinder

Note: Do not start the engine. Use auxiliary power for all machine functions in this procedure.

1 Raise the boom to a horizontal position.

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

# Platform Components

## 2-3 Platform Rotator

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

## How to Remove the Platform Rotator

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

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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. Refer to Repair Procedure, *How to Remove the Platform.*

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

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

3 S-85: Support the jib boom leveling arms and the platform mounting weldment with an appropriate lifting device. Do not apply any lifting pressure.

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

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

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

**S-80:**

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

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

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

**⚠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-85:**

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

10 Support the jib boom leveling arms.

11 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.

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

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

# Platform Components

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

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

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

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

7 Clean up any hydraulic oil that may have spilled.

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

## 2-4 Platform Overload System (if equipped)

### How to Calibrate the Platform Overload System (if equipped)

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

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

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

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

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

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

4 Using a suitable lifting device, place an appropriate test weight equal to that of 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 in between adjustments.

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

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 in between adjustments.

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

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 overload indicator lights flash and the alarm sounds.

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 overload indicator lights flash and the alarm sounds.

# Platform Components

9 Test all machine functions from the platform controls.

- Result: All platform control functions should not operate.

10 Turn the key switch to ground controls.

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 controls.

15 Test all machine functions from the platform controls.

- Result: All platform control functions should operate normally.

# 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. Refer to Repair Procedure, *How to Remove the Platform.*

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

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

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

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

**NOTICE** Component damage hazard. Cables and hoses 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.

# Jib Boom Components

## 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.

## 4-1
## Cable Track

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

## How to Remove the Cable Track

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

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

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

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

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

6 **S-80**: Tag, disconnect and plug the hydraulic hoses from the counterbalance valve manifold located on the platform rotator. Cap the fittings on the manifold.

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

7 Tag, disconnect and plug the hydraulic hoses from the platform leveling slave cylinder at the platform manifold and cap the fittings.

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

8 Remove the timing link/timing link cam pin and gently rest the timing link against the counterweight.

9 **S-85**:Remove the hose and cable cover from the side of the jib boom.

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

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

# Boom Components

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

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

All models:

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

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

15 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.

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

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

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

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

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

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

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

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

## How to Repair the Cable Track

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

Note: A cable track repair kit is available through Genie Service Parts, part no. 77896. The kit includes a 4-link section of cable track.

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

2 Carefully remove the snap rings from each end of the damaged section of cable track.

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

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

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

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

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

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

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

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

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

# 4-2 Boom

## How to Shim the Boom

1 Measure each wear pad.

| Boom wear pad specifications | |
|---|---|
| **Boom number one** | **Minimum** |
| Bottom wear pads (extension end of boom) | 0.50 inch 12.7 mm |
| Top and side wear pads (extension end of boom) | 0.625 inch 15.9 mm |
| **Boom number two** | |
| Top, bottom and side wear pads (extension end of boom) | 0.50 inch 12.7 mm |
| Bottom wear pads (pivot end of boom) | 0.50 inch 12.7 mm |
| Top and side wear pads (pivot end of boom) | 0.625 inch 15.9 mm |
| **Boom number three** | |
| Top, bottom and side wear pads (pivot end of boom) | 0.50 inch 12.7 mm |

Note: Replace the pad if thickness is less than minimum specification. If thickness is more than minimum specification, perform the following procedure.

2 Extend the boom until the wear pads are accessible.

3 Loosen the wear pad mounting fasteners.

4 Install the new shims under the wear pad to obtain zero clearance and zero drag.

5 Tighten the mounting fasteners.

6 Extend and retract the boom through an entire cycle. Check for tight spots that could cause binding or scraping.

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

# Boom Components

## 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.

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

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

3 Raise the 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.

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 Remove the boom end cover retaining fasteners and remove the cover.

17 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.

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

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

# Boom Components

20 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.

21 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.

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

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

24 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.

**⚠WARNING** Crushing hazard. The boom could fall if not properly supported by the overhead crane when each boom pivot pin is removed.

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

## 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.

# Boom Components

## 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.*

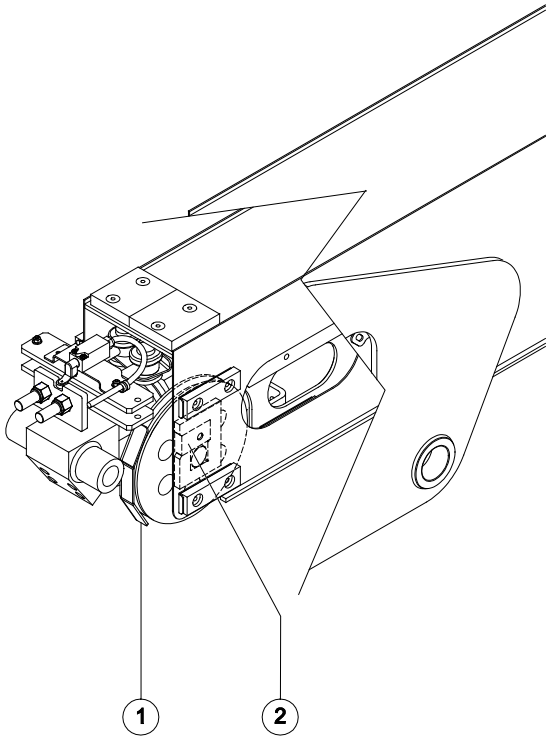
Note: Perform this procedure with the boom fully retracted.

1 Raise the boom to a horizontal position.

2 Remove the boom end cover retaining fasteners and remove the cover.

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

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




1 cable guard
2 retaining block

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

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

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

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

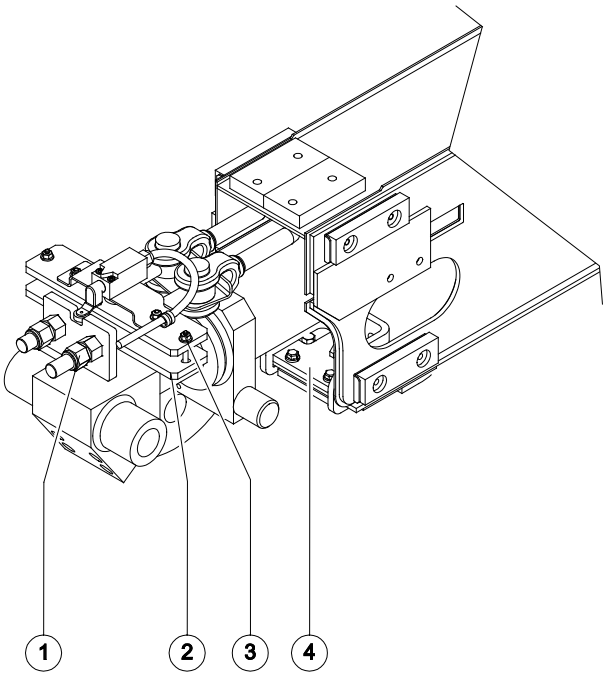
# Boom Components

9 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.

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

11 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

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

13 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.

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

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

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

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

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

19 Use a soft metal drift to remove the pin.

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

# Boom Components

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

23 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.

## 4-5
## Boom Extend and 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 Start the engine from the ground controls.

2 Raise the boom to a horizontal position.

3 Fully retract the boom.

4 Stop the engine.

5 Remove the boom end cover retaining fasteners and remove the cover.

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

7 Locate the retract cable adjustment nut on the bottom of the number 1 boom tube at the platform end of the boom. Loosen the nut, but do not remove the nut.

# Boom Components

8 Locate the extend cable adjustment nuts on the counterweight end of boom tube #1. Refer to Illustration 1. Loosen the nylock nuts and jam nuts on the cable tension equalizer bracket. Do not remove the nuts.

9 Adjust the extend cable adjustment nut to obtain 6 3/8 inches/16.2 cm to 6 1/2 inches/16.5 cm between the platform end of boom tube #2 and boom tube #3. Refer to illustration 2. There should be approximately 1/2 inch of exposed threads on the adjustment bolts. Refer to Illustration 1.

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

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

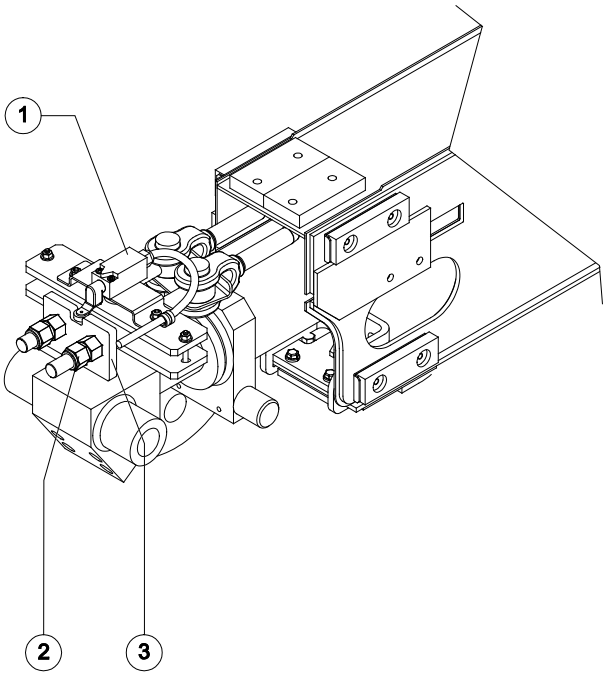



Illustration 1

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

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

12 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.

13 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.

14 Repeat steps 12 and 13 two to three times.

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

16 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.

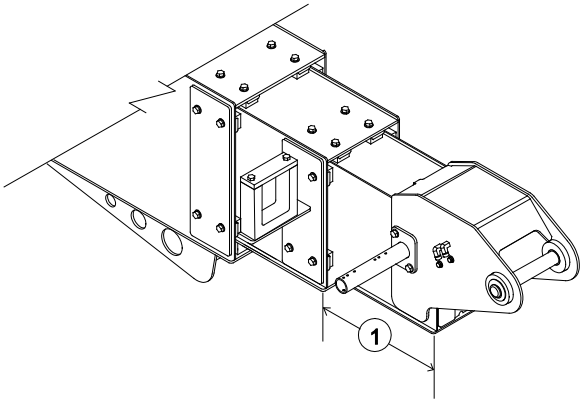



Illustration 2

1 6.375 inches / 16.2 cm

# Boom Components

17 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.

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

19 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 retract cables**:

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

11 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)

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

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

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

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

16 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.

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

18 At the platform end of the boom, install the retract cables, clevis pins and rue rings to the adjustment plate.

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

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

21 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.

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

# Boom Components

## 4-6 Platform Leveling Master Cylinder

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

## How to Remove the Platform Leveling Master Cylinder

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

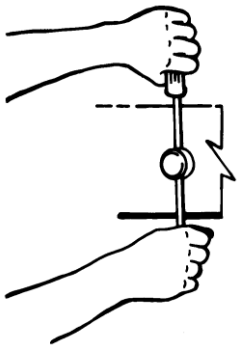
2 Remove the turntable end cover to access the master cylinder.

3 Tag, disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

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

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



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

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

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

9 Remove the master cylinder from the machine.

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

## 4-7
## Primary Boom Angle Sensor

The primary boom angle sensor works in conjunction with the boom extend limit switches, maintaining the working envelope. The primary boom angle sensor is located underneath the swing chassis between the timing link arms.

## How to Replace the Primary Boom Angle Sensor

1 From the ground controls lower the primary boom to the stowed position and then rotate the swing chassis so that it is perpendicular to the drive chassis.

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

3 Locate the primary boom angle sensor under the swing chassis, between the timing link. Remove the cover to gain access to the sensor.

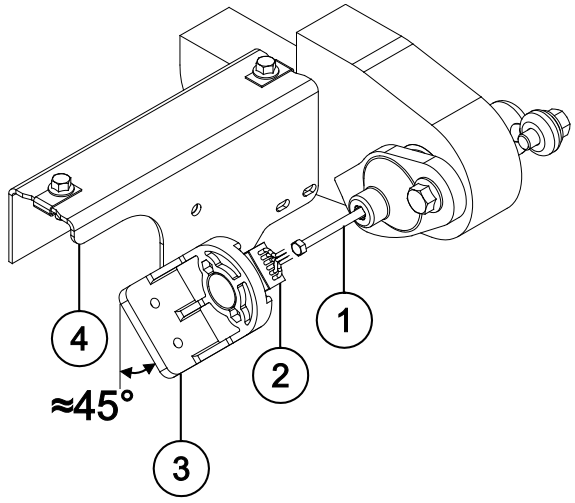
4 Locate and disconnect the angle sensor harness connector.

5 Remove the angle sensor mounting bracket retaining fasteners and set aside to be reused. Remove the angle sensor and bracket assembly.

6 Remove the angle sensor from the mounting bracket and install the new angle sensor using the same fasteners.

7 Referring to the illustration, hold the angle sensor/bracket assembly at an angle away from the mounting plate and match up the hex shaft to the sensor. Rotate the assembly towards the mounting plate and install the angle sensor assembly to the mounting plate using the fasteners removed in step 5. Do not completely tighten at this time.

Note: This will index the sensor to obtain the required voltage to allow calibration.



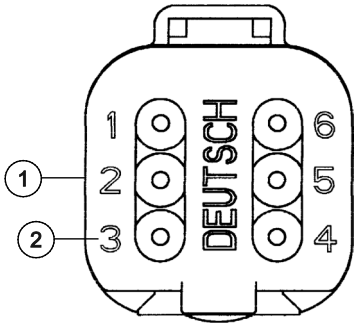

1 hex key
2 boom angle sensor
3 angle sensor mounting bracket.
4 mounting plate

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

# Boom Components

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

10 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.




1 terminal 2
2 terminal 3

11 The volt meter should read 2.16V dc to 2.2V dc.

⊙ If the voltage reading is correct, tighten the mounting bracket fasteners and re-install the cover removed in step 3.

⊠ If the voltage is not between 2.16V dc and 2.2V dc, remove the mounting bracket assembly, remove the sensor from the hex key and rotate the assembly to index the sensor and obtain the correct voltage. If the voltage was less then 2.16V dc, rotate the assembly approximately 60° from the mounting plate. If the voltage was more than 2.2V dc rotate the assembly approximately 30° from the mounting plate. Insert the sensor onto the hex key and attach the mounting bracket. Confirm the voltage is between 2.16V dc to 2.2V dc.

12 Tighten the fasteners securing the sensor mounting bracket and re-install the cover.

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

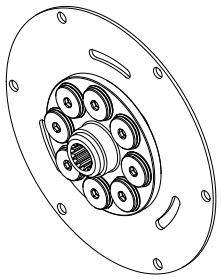
## 5-1
## RPM Adjustment

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

## 5-2
## Flex Plate

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

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



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

### How to Remove the Flex Plate

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

1 Open the engine side turntable cover.

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

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

3 Tag and disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.

# Engines

**Deutz TD2011L04i models:**

1 Tag and disconnect the wiring from the bell housing.

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

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

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

4 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine 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, and remove the flex plate from the engine flywheel.

**Deutz TD 2.9 models:**

1 Tag and disconnect the wiring from the bell housing.

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

3 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.

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

**Perkins 804D models:**

1 Tag and disconnect the wiring from the bell housing.

2 Remove the exhaust pipe clamp at the muffler.

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

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

4 Remove the hose clamps from the air cleaner elbow and the engine intake manifold.

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

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

7 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.

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

**Perkins 404F-22T models:**

1 Tag and disconnect the wiring from the bell housing.

2 Remove the fasteners supporting the muffler assembly from the bell housing.

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

3 Support the drive pump with an appropriate lifting device. Remove all of the remaining bell housing engine 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, and remove the flex plate from the engine flywheel.

**Continental model:**

1 Tag and disconnect the wire harness from the oxygen sensor.

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

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

3 Remove the muffler retainer bracket fasteners.

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

5 Remove the relay housing from the muffler mount. Do not disconnect the relays.

6 Disconnect and remove the ECM from the muffler mount.

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

8 Unbolt the EPR valve from the muffler mount. Leave the hoses attached to the EPR valve.

9 Remove the muffler mount.

10 Support the drive pump with an appropriate lifting device. Remove all of pump plate mounting fasteners.

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

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

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

# Engines

## How to Install the Flex Plate

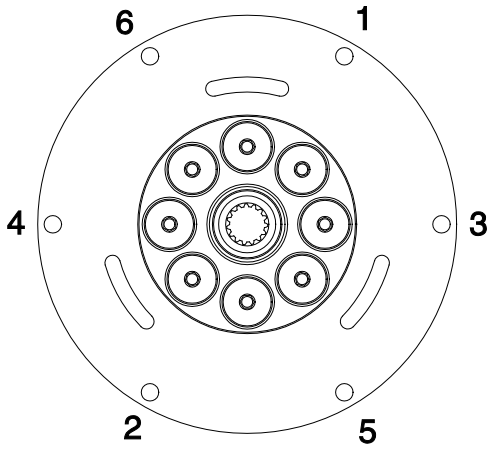
1 Install the flex plate onto the engine flywheel with the raised spline towards the pump. Apply Loctite® removable thread sealant to the mounting screws.

Note: Torque the flex plate mounting bolts in two stages.

**Continental models**: Torque the flex plate mounting bolts in sequence to 20.8 ft-lbs / 28 Nm.

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




Deutz, Perkins and Continental Flex Plate

2 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.

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

4 Install the pump onto the pump mounting plate. Apply Loctite® removable thread sealant to the pump retaining fasteners. Torque the pump retaining fasteners to 57 ft-lbs / 77 Nm.

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

5 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.

6 Install the pump and pump mounting plate assembly onto the engine. Apply Loctite® removable thread sealant to the mounting screws.

## 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.

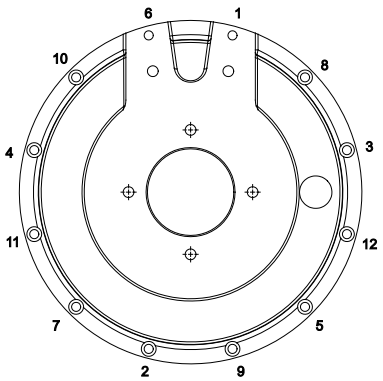
**Perkins 804D models**: Torque the bell housing mounting bolts in sequence to 28 ft-lbs / 38 Nm and then to 49 ft-lbs / 66 Nm.

**Perkins 404F models:**Torque the bell housing mounting bolts labeled "B" in sequence to 28 ft-lbs / 38 Nm and the mounting bolts labeled "A" to 49 ft-lbs / 66 Nm. Then torque the bell housing mounting bolts labeled "B" in sequence to 40 ft-lbs / 54 Nm and the mounting bolts labeled "A" to 70 ft-lbs / 95 Nm.

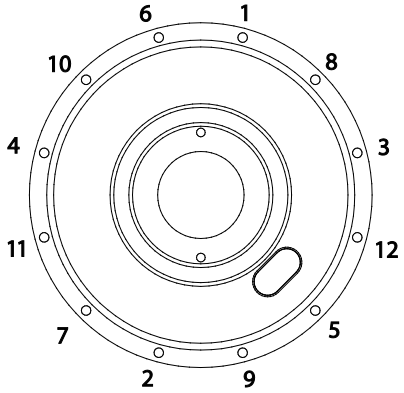
**Continental model:**Torque the pump mounting plate fasteners in sequence to 23 ft-lbs / 31.2 Nm.

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

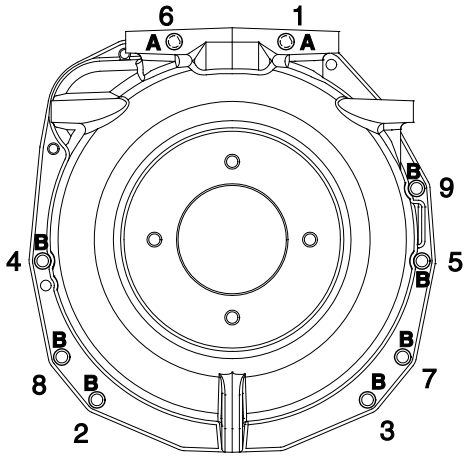
**NOTICE** Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



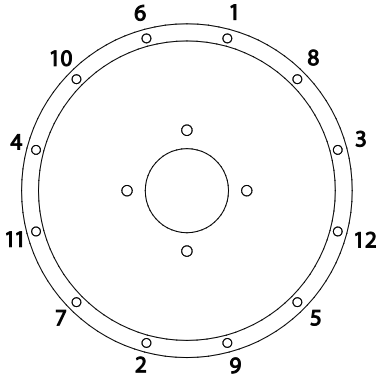

Deutz Pump Mounting Plate




Perkins 804D Pump Mounting Plate




Perkins 404F-22T Pump Mounting Plate




Continental Pump Mounting Plate

# Ground Controls

## 6-1 Control Relays

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

## How to Test a Single Pole Double Throw Relay

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

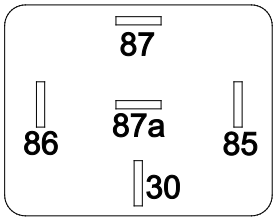
1 Tag and disconnect all the wiring from the relay to be tested.

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

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

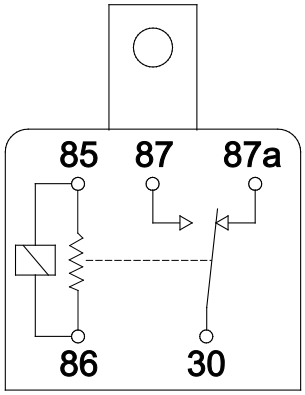
3 Connect 12V DC to terminal 85 and a ground wire to terminal 86, then test the following terminal combinations.

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




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

**Control Relay Schematic**



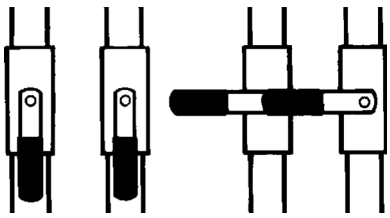
# 7-1 Function Pump

## How to Remove the Function Pump

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

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

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



open closed

2 Tag, disconnect and plug the function pump hydraulic hoses. Cap the fittings on the pump.

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

3 Support the pump with a suitable lifting device.

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

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

# Hydraulic Pumps

## 7-2 Drive Pump

The drive pump is a bi-directional variable displacement piston pump. The pump output is controlled by the electronic displacement controller (EDC), located on the pump. The only adjustment that can be made to the pump is the neutral or null adjustment. Any internal service to the pump should be performed at an authorized Sauer-Danfoss service center. Contact Genie Product Support to locate your local authorized service center.

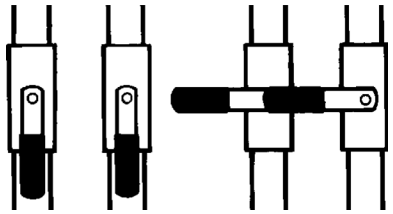
### How to Remove the Drive Pump

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

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

1 Disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.

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



open closed

**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.

3 Tag, disconnect and plug the hydraulic hoses from the drive and function pumps. Cap the fittings on the pumps.

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

4 Support the pumps with a suitable lifting device and remove the two drive pump mounting fasteners.

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

6 Remove the drive pump from the machine.

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

**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.

## How to Prime the Drive Pump

**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.

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

2 **Continental models:** If equipped, close the valve on the LPG tank, then disconnect the hose from the tank. Move the fuel select toggle switch to the LPG position.

**Deutz and Perkins models**: Disconnect the engine wiring harness from the fuel solenoid at the injector pump.

3 Crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 300 psi / 20.7 bar.

4 **Continental models**: If equipped, connect the LPG hose to the LPG tank and open the valve on the tank.

**Deutz and Perkins models**: Connect the engine wiring harness to the fuel solenoid.

5 Start the engine from the ground controls. Check for hydraulic leaks.

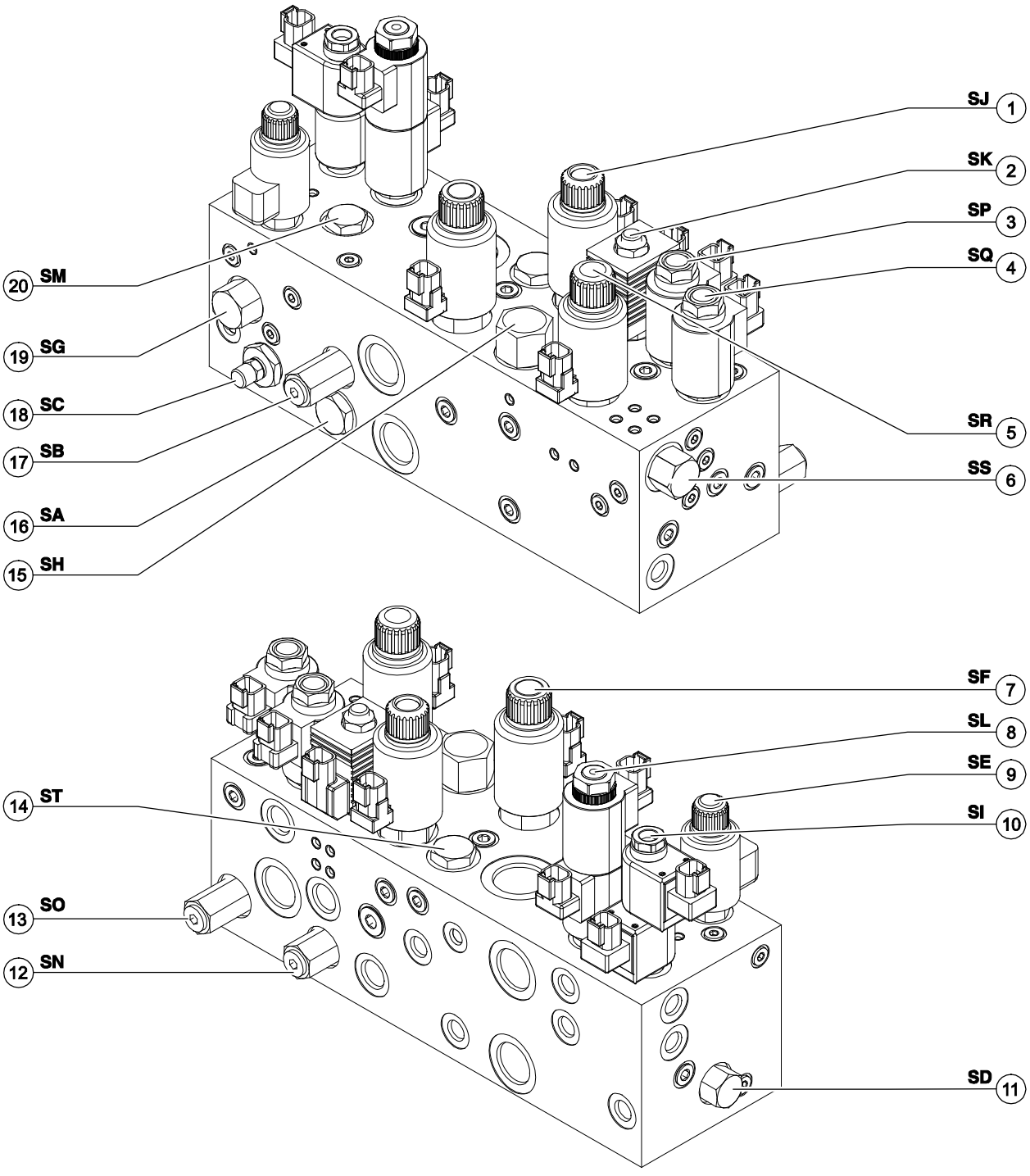
# Manifolds

## 8-1
## Function Manifold Components

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

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid Valve, 2 position 3 way | SJ | Boom up | 50-55 ft-lbs / 68-75 Nm |
| 2 | Solenoid Valve, 2 position 3 way | SK | Boom down | 30-35 ft-lbs / 41-47 Nm |
| 3 | Solenoid Valve, NO, Poppet | SP | Extend | 33-37 ft-lbs / 45-50 Nm |
| 4 | Solenoid Valve, NO, Poppet | SQ | Retract | 33-37 ft-lbs / 45-50 Nm |
| 5 | Proportional solenoid valve | SR | Extend proportional | 20-25 ft-lbs / 27-34 Nm |
| 6 | Differential sensing valve | SS | Boom extend | 30-35 ft-lbs / 41-47 Nm |
| 7 | Proportional solenoid valve | SF | Boom up/down proportional | 33-37 ft-lbs / 45-50 Nm |
| 8 | Solenoid valve, 3 position 4 way | SL | Steering directional | 20-25 ft-lbs / 27-34 Nm |
| 9 | Proportional solenoid valve | SE | Swing proportional | 20-25 ft-lbs / 27-34 Nm |
| 10 | Solenoid valve, 3 position 4 way | SI | Swing directional | 26-30 ft-lbs / 35-41 Nm |
| 11 | Flow regulator valve | SD | Oscillate flow control | 20-25 ft-lbs / 27-34 Nm |
| 12 | Relief valve, 2400 psi / 165 bar | SN | Boom down relief | 20-25 ft-lbs / 27-34 Nm |
| 13 | Relief valve, 2400 psi / 165 bar | SO | Boom extend relief | 20-25 ft-lbs / 27-34 Nm |
| 14 | Check valve, 30 psi / 2.1 bar | ST | Return check valve | 30-35 ft-lbs / 41-47 Nm |
| 15 | Differential sensing valve | SH | Primary lift | 30-35 ft-lbs / 41-47 Nm |
| 16 | Check valve | SA | Back flow / check function pump | 30-35 ft-lbs / 41-47 Nm |
| 17 | Relief valve, 3200 psi / 221 bar | SB | System relief | 20-25 ft-lbs / 27-34 Nm |
| 18 | Pressure reducing valve | SC | Oscillate pressure control | 30-35 ft-lbs / 41-47 Nm |
| 19 | Differential sensing valve | SG | Differential sensing/turntable rotate | 30-35 ft-lbs / 41-47 Nm |
| 20 | Flow regulator valve | SM | Steering flow control | 20-25 ft-lbs / 27-34 Nm |

# Manifolds


SJ 1
SK 2
SP 3
SQ 4
SR 5
SS 6
SF 7
SL 8
SE 9
SI 10
SD 11
SN 12
SO 13
ST 14
SH 15
SA 16
SB 17
SC 18
SG 19
SM 20

# Manifolds

## 8-2 Valve Adjustments - Function Manifold

### How to Adjust the System Relief Valve

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

Note: Refer to Function Manifold Component list to locate the system relief valve.

Note: Auxiliary power will be used to perform this procedure. Do not start the engine.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the diagnostic nipple (ptest) located next to the auxiliary pump.

2 Simultaneously activate and hold the auxiliary power toggle switch and the primary boom retract toggle switch with the primary boom fully retracted. Observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Specifications*.

3 Locate the system relief valve on the function manifold. Use a wrench to hold the relief valve and remove the cap.

4 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.

5 Repeat step 2 to confirm relief valve pressure.

6 Remove the pressure gauge.

### How to Adjust the Boom Down Relief Valve

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

Note: Refer to Function Manifold Component list to locate the boom down relief valve.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the diagnostic nipple located next to the auxiliary pump.

2 Start the engine from the ground controls.

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

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

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

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

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

7 Remove the pressure gauge.

## How to Adjust the Boom Extend Relief Valve

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

Note: Refer to Function Manifold Component list to locate the boom extend relief valve.

1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the diagnostic nipple located next to the auxiliary pump.

2 Start the engine from the ground controls.

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

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

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

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

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

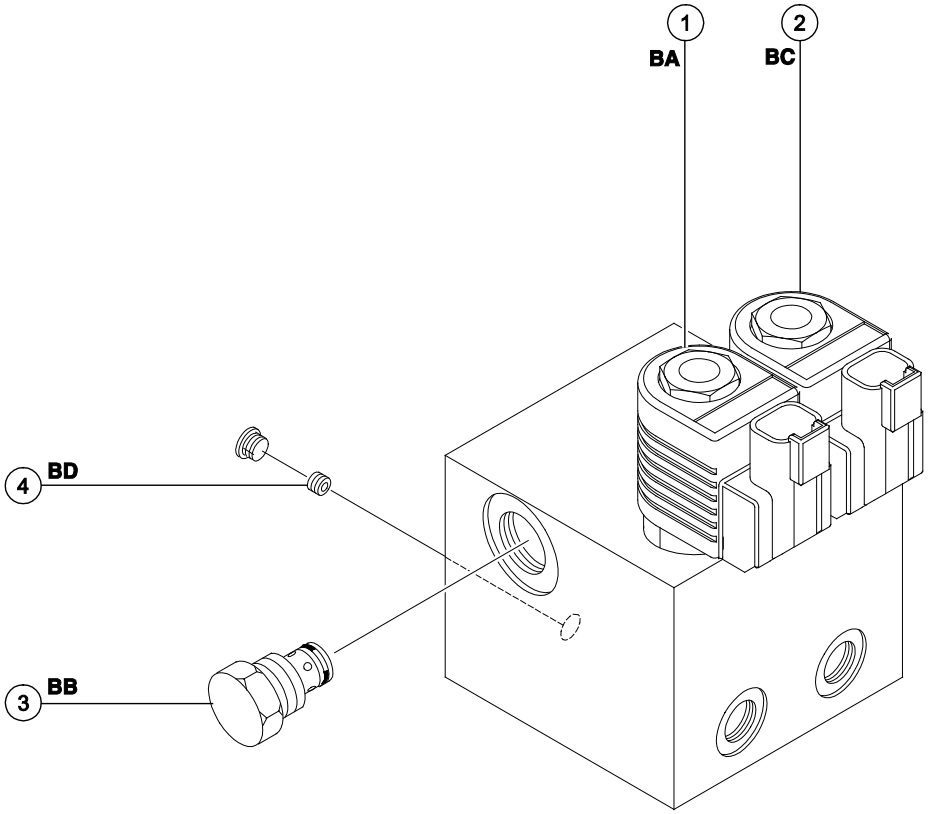
7 Remove the pressure gauge.

# Manifolds

## 8-3
## Brake / Two Speed Manifold Components

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

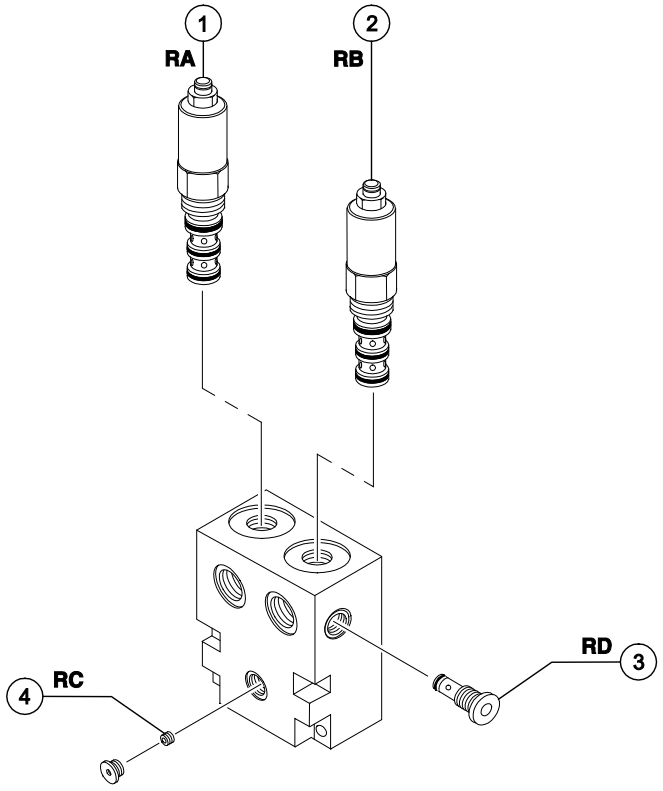
| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid Valve, 2 position 3 way | BA | Brake release | 20-25 ft-lbs / 27-34 Nm |
| 2 | Solenoid Valve, 2 position 3 way | BC | Two-speed motor shift | 20-25 ft-lbs / 27-34 Nm |
| 3 | Check valve | BB | Brake release circuit | 20-25 ft-lbs / 27-34 Nm |
| 4 | Orifice, 0.025 inch / 0.63 mm | BD | Turntable rotation brake release | |



## 8-4
## Turntable Rotation Manifold Components

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

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Counterbalance valve, 1000 psi | RA | Turntable rotate left | 25-30 ft-lbs / 34-41 Nm |
| 2 | Counterbalance valve, 1000 psi | RB | Turntable rotate right | 25-30 ft-lbs / 34-41 Nm |
| 3 | Shuttle valve, 2 position 3 way | RD | Turntable rotation brake release | 8-10 ft-lbs / 10-15 Nm |
| 4 | Orifice, 0.030 inch / 0.8 mm | RC | Brake release circuit | |

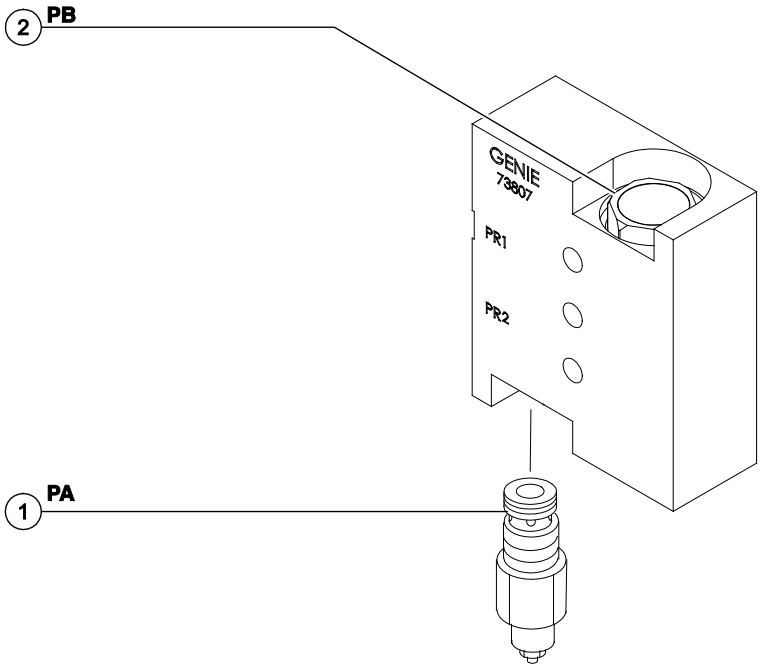


# Manifolds

## 8-5
## Platform Rotate Manifold Components

The platform rotate manifold is mounted on the platform rotator.

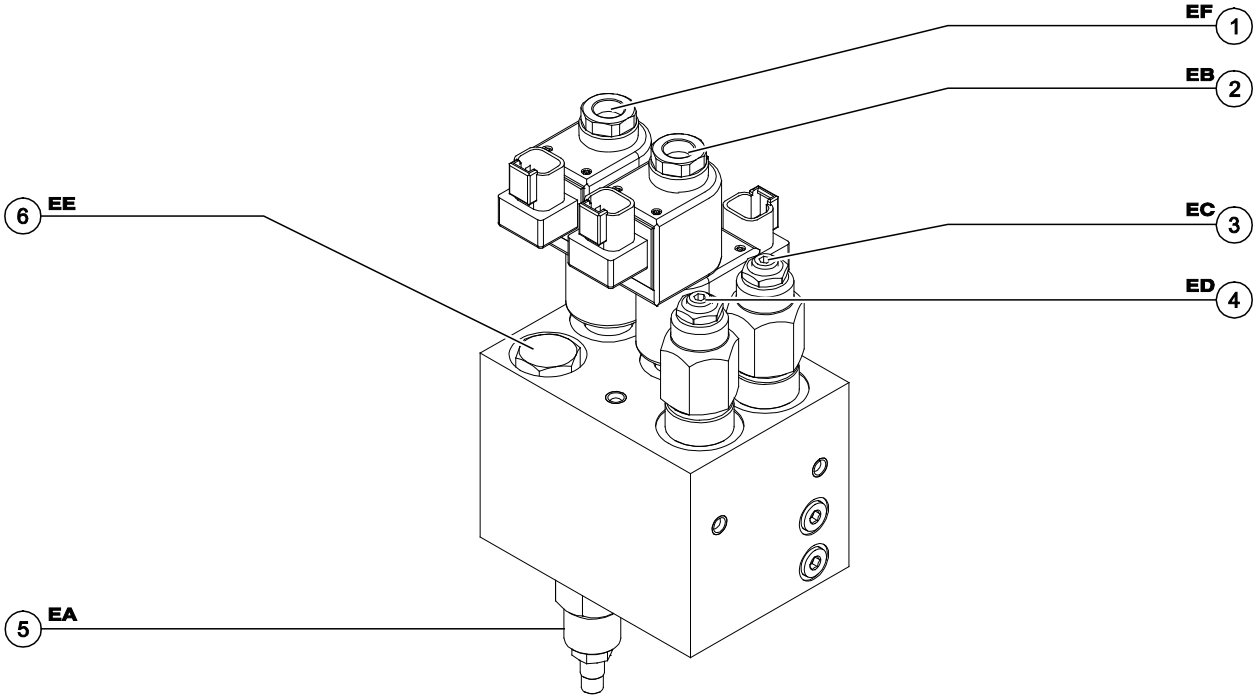
| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Counterbalance valve, 3300 psi | PA | Platform rotate right | 37-44 ft-lbs / 50-60 Nm |
| 2 | Counterbalance valve, 3300 psi | PB | Platform rotate left | 37-44 ft-lbs / 50-60 Nm |



## 8-6
## Platform Manifold Components, S-80

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

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid valve, 3 position 4 way | EF | Platform rotate CW/CCW | 30-35 ft-lbs / 41-47 Nm |
| 2 | Solenoid valve, 3 position 4 way | EB | Platform level up/down | 30-35 ft-lbs / 41-47 Nm |
| 3 | Counterbalance valve, 3500 psi | EC | Platform level CB valve | 26-30 ft-lbs / 35-41 Nm |
| 4 | Counterbalance valve, 3500 psi | ED | Platform level CB valve | 26-30 ft-lbs / 35-41 Nm |
| 5 | Needle valve | EA | Platform level | 20-25 ft-lbs / 27-34 Nm |
| 6 | Pressure comp., flow control valve | EE | Platform rotate flow control | 33-37 ft-lbs / 45-50 Nm |

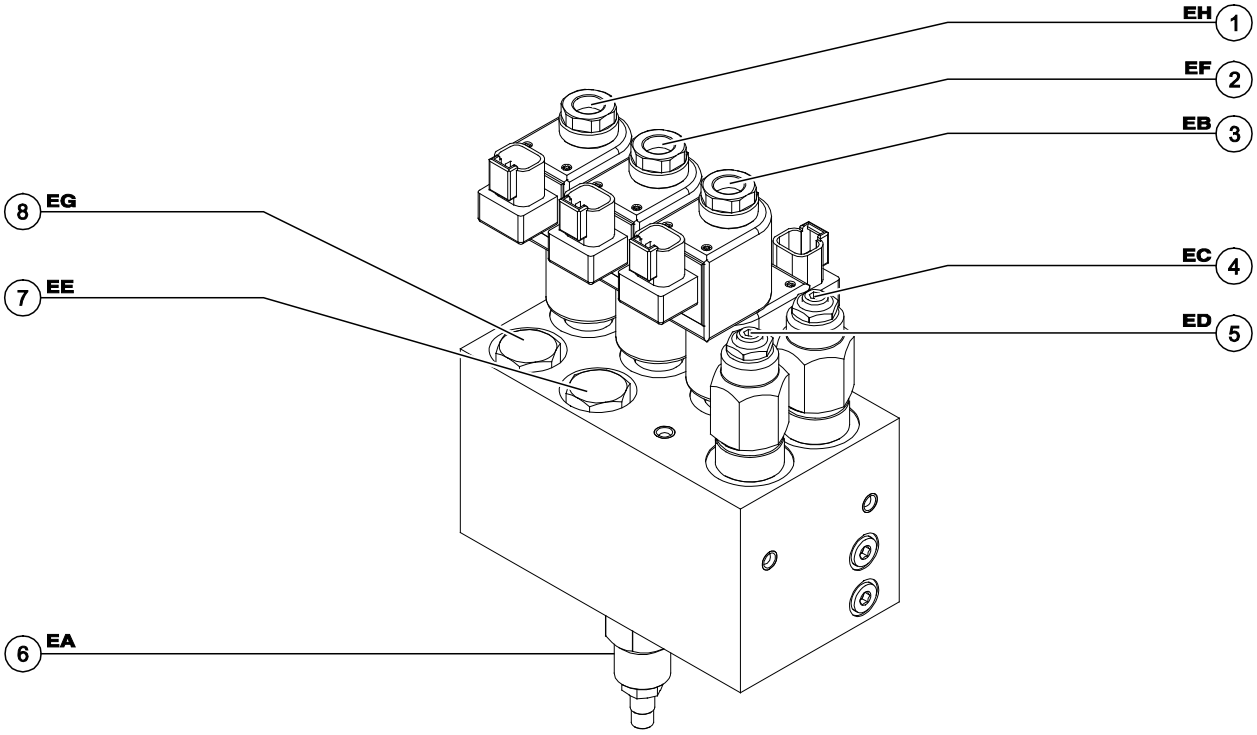


# Manifolds

## 8-7
## Platform Manifold Components, S-85

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

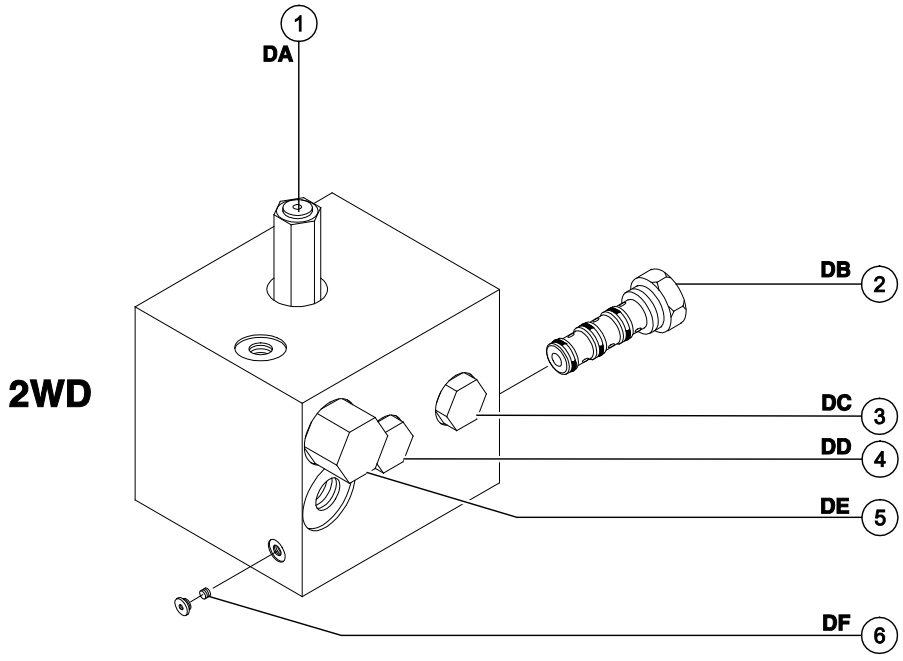
| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid valve, 3 position 4 way | EF | Platform rotate CW/CCW | 30-35 ft-lbs / 41-47 Nm |
| 2 | Solenoid valve, 3 position 4 way | EB | Platform level up/down | 30-35 ft-lbs / 41-47 Nm |
| 3 | Solenoid valve, 3 position 4 way | EH | Jib boom up/down | 30-35 ft-lbs / 41-47 Nm |
| 4 | Counterbalance valve, 3500 psi | EC | Platform level CB valve | 26-30 ft-lbs / 35-41 Nm |
| 5 | Counterbalance valve, 3500 psi | ED | Platform level CB valve | 26-30 ft-lbs / 35-41 Nm |
| 6 | Needle valve | EA | Platform level | 20-25 ft-lbs / 27-34 Nm |
| 7 | Pressure comp., flow control valve | EE | Platform rotate flow control | 33-37 ft-lbs / 45-50 Nm |
| 8 | Pressure comp., flow control valve | EG | Platform rotate flow control | 33-37 ft-lbs / 45-50 Nm |



## 8-8
## Traction Manifold Components, 2WD

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

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Relief valve, 280 psi / 19.3 bar | DE | Charge pressure circuit | 30-35 ft-lbs / 41-47 Nm |
| 2 | Flow divider/combiner valve | DB | Controls flow to drive motors in forward and reverse | 90-100 ft-lbs / 120-133 Nm |
| 3 | Check valve | DC | Drive circuit | 30-35 ft-lbs / 41-47 Nm |
| 4 | Check valve | DD | Drive circuit | 30-35 ft-lbs / 41-47 Nm |
| 5 | Shuttle Valve, 3 position 3 way | DF | Controls flow to drive motors in forward and reverse | 50-55 ft-lbs / 67-73 Nm |
| 6 | Orifice Plug, 0.070 inch / 1.8 mm | DA | Equalizes flow across flow divider/combiner valve BY | |



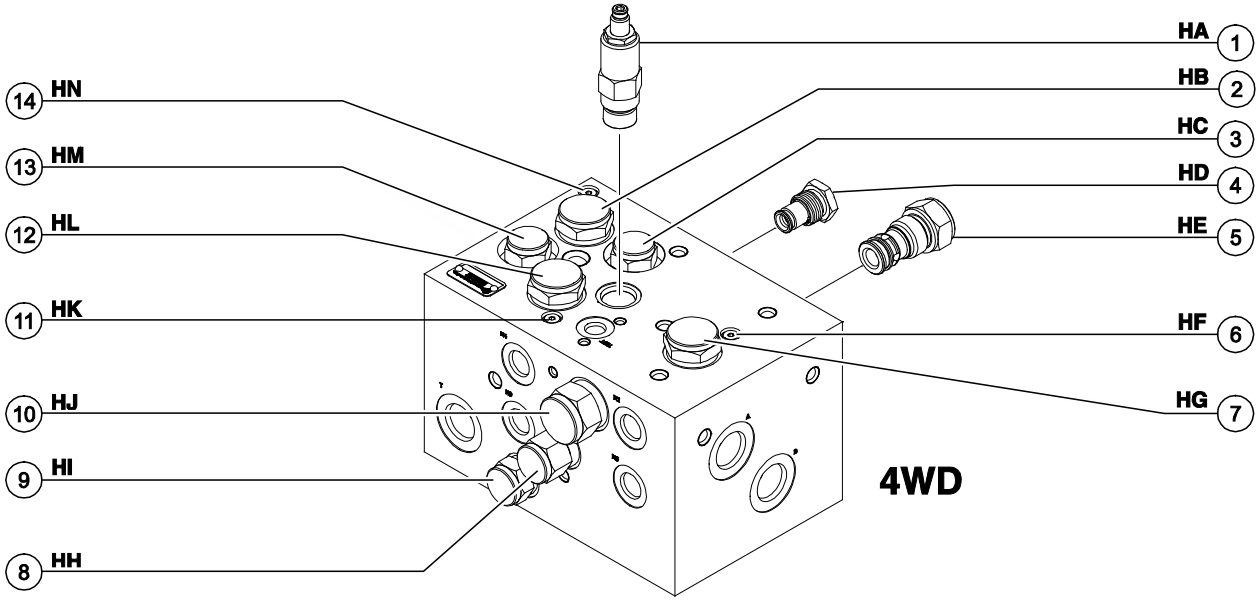
# Manifolds

## 8-9
## Traction Manifold Components, 4WD

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

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Relief valve, 280 psi / 19.3 bar | DE | Charge pressure circuit | 35-40 ft-lbs / 48-54 Nm |
| 2 | Flow divider/combiner valve | DB | Controls flow to non-steer end drive motors in forward and reverse | 80-90 ft-lbs / 108-122 Nm |
| 3 | Check valve | DF | Steer end drive motor circuit | 35-40 ft-lbs / 48-54 Nm |
| 4 | Check valve | DC | Non-steer end drive motor circuit | 35-40 ft-lbs / 48-54 Nm |
| 5 | Flow divider/combiner valve | CK | Controls flow to flow divider/combiner valves 2 and 13 | 80-90 ft-lbs / 108-122 Nm |
| 6 | Check valve | DD | Non-steer end drive motor circuit | 60-70 ft-lbs / 81-95 Nm |
| 7 | Orifice, 0.040 inch / 1 mm | DL | Equalizes pressure on both sides of flow divider/combiner valve 5 | |
| 8 | Orifice, 0.040 inch / 1 mm | DA | Equalizes pressure on both sides of flow divider/combiner valve 2 | |
| 9 | Orifice, 0.040 inch / 1 mm | DN | Equalizes pressure on both sides of flow divider/combiner valve 13 | |
| 10 | Check valve | DG | Steer end drive motor circuit | 60-70 ft-lbs / 81-95 Nm |
| 11 | Check valve | DH | Steer end drive motor circuit | 35-40 ft-lbs / 48-54 Nm |
| 12 | Shuttle Valve, 3 position 3 way | DJ | 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 | DM | Controls flow to steer end drive motors in forward and reverse | 80-90 ft-lbs / 108-122 Nm |
| 14 | Check valve | DP | Non-steer end drive motor circuit | 35-40 ft-lbs / 48-54 Nm |

# Manifolds

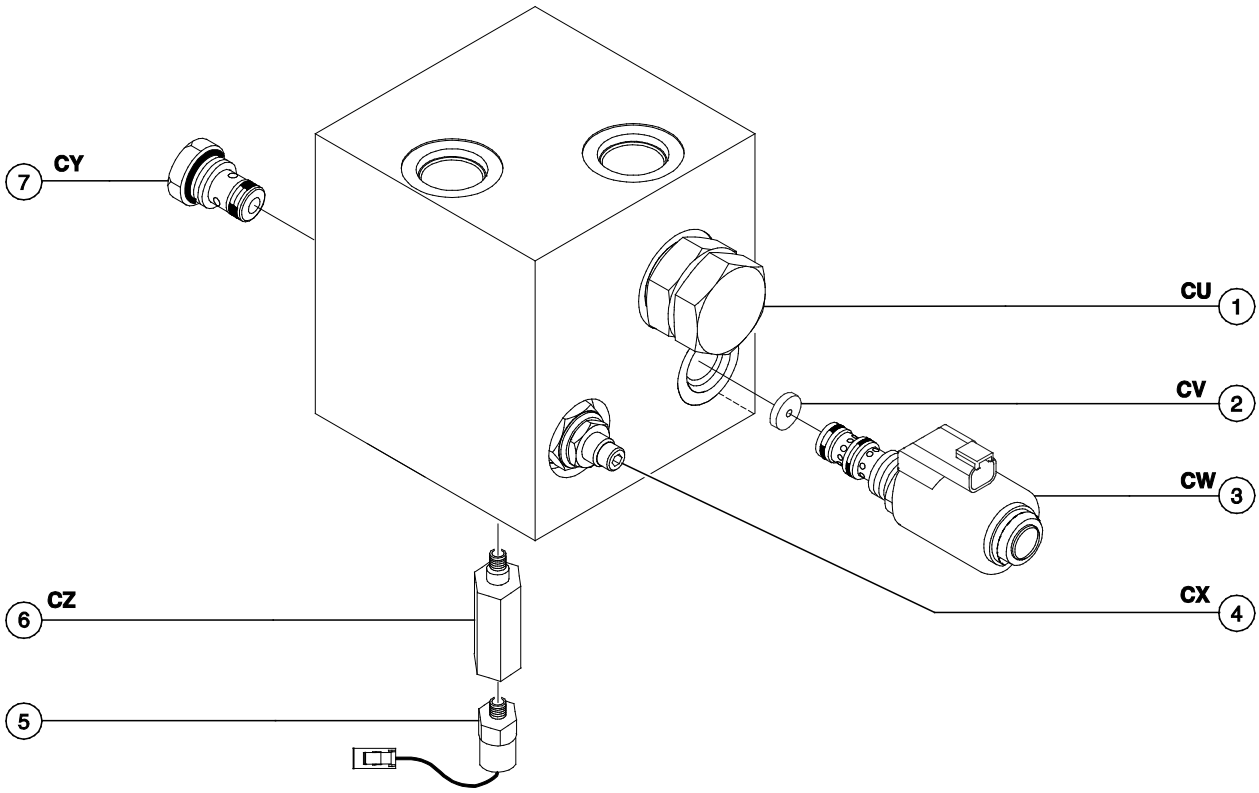

HA
1
HB
2
HC
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HD
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HE
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HF
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HG
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14
HN
13
HM
12
HL
11
HK
10
HJ
9
HI
8
HH
4WD

# Manifolds

## 8-10
## 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, 0.031 inch / 0.8 mm | 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 | CZ | Power to relay | 16 ft-lbs / 22 Nm |
| 6 | Connector | --- | For pressure switch | 11 ft-lbs / 15 Nm |
| 7 | Check valve | CY | Prevents oil to generator | 35-40 ft-lbs / 47-54 Nm |



# 8-11
# Valve Adjustments - Traction Manifold

## How to Adjust the Hot Oil Relief Valve

Note: The pressure differential between the charge pump relief valve (located in the drive pump) and the hot oil shuttle relief valve (located in the traction manifold) is necessary to return hot oil from the closed loop drive circuit to the hydraulic tank for cooling. This pressure differential must be maintained at 40 psi / 3 bar.

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

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

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

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

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

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

6 Repeat steps 4 and 5 until a pressure differential (between the charge pump reading and the hot oil shuttle relief valve) of 40 psi / 3 bar is obtained.

# Manifolds

## 8-12
## Valve Coils

### How to Test a Coil

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

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

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

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

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

2 Test the coil resistance.

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

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

### Valve Coil Resistance Specification

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 10°C that your air temperature increases or decreases from 68°F / 20°C.

| Valve Coil Resistance Specification | |
|---|---|
| Proportional solenoid valve (schematic items SE, SF and SR) | 4.8Ω |
| 2 position 3 way solenoid valve (schematic items SJ and SK) | 6.3Ω |
| 2 position 2 way solenoid valve (schematic items SP and SQ) | 5.9Ω |
| 3 position 4 way solenoid valve (schematic items EB, EF, EH, SI and SL) | 6.3Ω |

## How to Test a Coil Diode

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

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

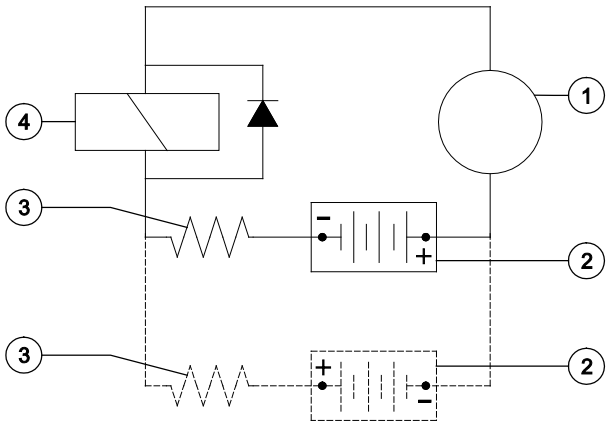
1 Test the coil for resistance. Refer to Repair Procedure, *How to Test a Coil*.

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

**Resistor 10Ω**

Genie part number 27287

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




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

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

3 Set a multimeter to read DC current.

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

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

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

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

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

☒ 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.

# Fuel and Hydraulic Tanks

## 9-1
## Fuel Tank

### How to Remove the Fuel Tank

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

**⚠ DANGER** Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

**⚠ DANGER** Explosion and fire hazard. Never drain or store fuel in an open container due to the possibility of fire.

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

2 Remove the fuel filler cap from the tank.

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

**⚠ DANGER** Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

Note: Be sure to only use a hand operated pump suitable for use with gasoline and diesel fuel.

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

5 Remove the fuel tank retaining fasteners.

6 Remove the fuel tank from the machine.

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

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

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

## 9-2 Hydraulic Tank

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

## How to Remove the Hydraulic Tank

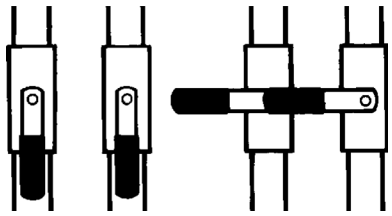
**NOTICE** Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

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

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

**NOTICE** Component damage hazard. The engine must not be started with the hydraulic tank 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 Remove the drain plug from the hydraulic tank and completely drain the tank into a container of suitable capacity. Refer to Specifications, *Machine Specifications*.

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

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

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

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

8 Remove the four fasteners securing the tank to the chassis bulkhead.

9 Remove the hydraulic tank from the machine.

# Fuel and Hydraulic Tanks

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

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

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

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

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

14 Install the hydraulic tank onto the machine.

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

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

17 Clean up any oil that may have spilled.

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

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

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

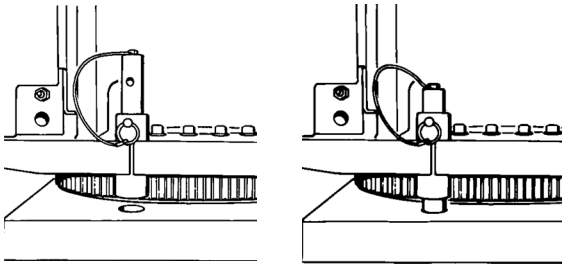
# Turntable Rotation Components

## 10-1
## Turntable Rotation Drive Hub Assembly

### How to Remove the Turntable Rotation Drive Hub Assembly

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

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



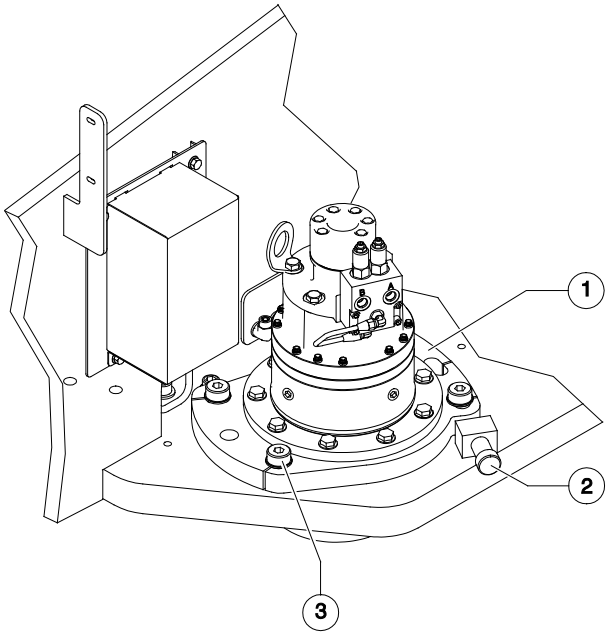
unlocked locked

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

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

3 Loosen the backlash pivot plate and adjustment bolts.

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




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

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

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

**When installing the drive hub assembly:**

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

7 Install the brake and then the motor onto the drive hub. Apply removable thread locking compound to fastener threads.Torque the motor/brake mounting fasteners to

# Turntable Rotation Components

specification. Refer to Specifications, *Machine Torque Specifications*.

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

## How to Remove the Turntable Rotation Hydraulic Motor

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

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

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

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

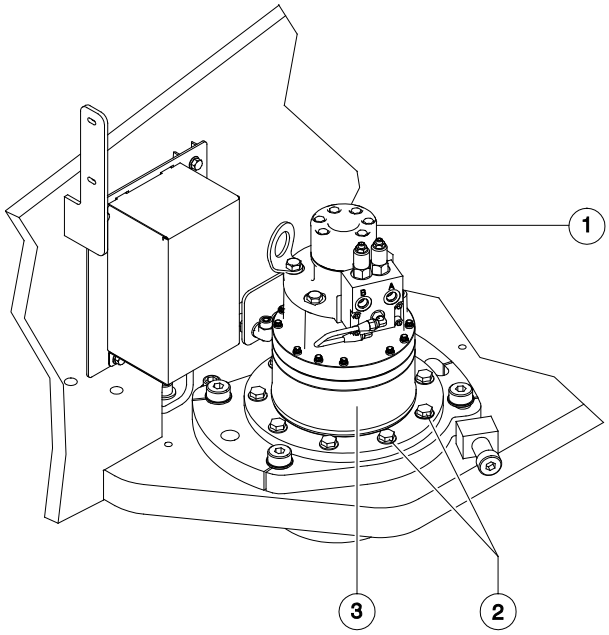
3 Remove the hydraulic tube that connects from the counterbalance manifold to the brake. Cap the fittings on the brake and manifold.

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

4 Remove the motor/brake mounting fasteners. Carefully remove the motor from the brake.

# Turntable Rotation Components

5 Clean up any oil that may have spilled.




1 motor
2 drive hub mounting bolts
3 drive hub with brake

## How to Adjust the Turntable Rotation Gear Backlash

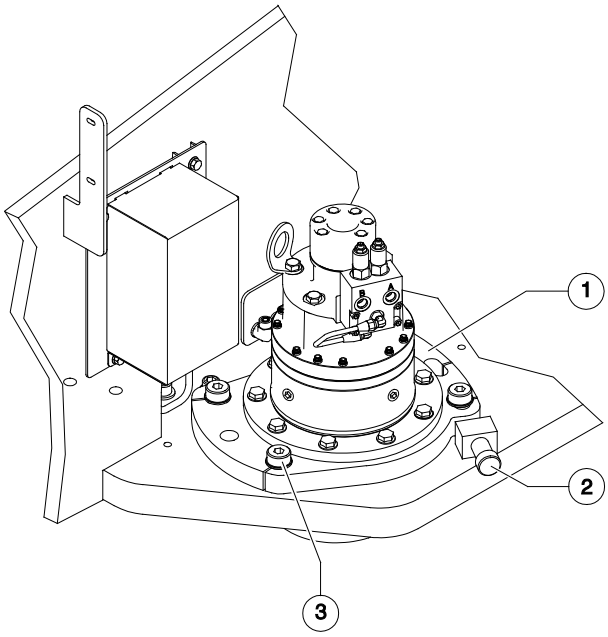
The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

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 one half turn counterclockwise. Tighten the lock nut on the adjustment bolt.

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

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

# 11-1
# Yoke and Drive Hub

## How to Remove the Yoke and Drive Hub Assembly

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 pin retaining fasteners from both the steer cylinder and the tie rod cylinder pivot pins. Remove the pins.

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

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

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

4 Block the non-steer wheels, and center a lifting jack of ample capacity under the steer axle.

5 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

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

7 Remove the hydraulic hose clamp retaining fastener from the top of the yoke pivot pin.

8 Remove the drive motor mounting fasteners.

9 Slide the drive motor shaft out of the drive hub and remove the drive motor from the machine.

10 Remove the pin retaining fasteners from the upper and lower yoke pivot pins.

11 Support and secure the yoke and drive hub assembly to a lifting jack.

12 Use a slide hammer to remove the upper yoke pivot pin. Use a soft metal drift to drive the lower yoke pivot pin down and out.

**⚠WARNING** Crushing hazard. The yoke and drive hub assembly could become unbalanced and fall when the yoke pivot pins are removed if not properly supported and secured to the lifting jack.

13 Place the yoke and drive hub assembly on a flat surface with the drive hub facing down.

14 Remove the drive hub mounting fasteners that attach the drive hub to the yoke. Remove the yoke from the drive hub. Refer to Specifications, *Machine Torque Specifications*.

Note: Replace the thrust washer when installing the yoke and drive hub assembly onto the axle.

# Steer Axle Components

## 11-2 Drive Motors

### How to Remove a Drive Motor

**NOTICE** Component damage hazard. Repairs to the motor should only be performed by an authorized dealer.

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

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 drive motor access covers from both sides of the inner axle.

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

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

3 Remove the drive motor mounting fasteners.

4 Slide the drive motor shaft out of the drive hub, and remove the drive motor from the machine.

## 11-3 Drive Hub

### How to Remove a Drive Hub

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or 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 drive motor. Refer to Repair Procedure, *How to Remove a Drive Motor.*

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

3 Center a lifting jack of ample capacity under the non-steer axle.

4 Raise the machine approximately 6 inches / 15 cm and place blocks under the chassis for support.

5 Remove the wheel lug nuts, then the tire and wheel assembly.

6 Place a second lifting jack under the drive hub for support and secure the drive hub to the lifting jack.

7 Remove the drive hub mounting fasteners that attach the drive hub to the axle. Remove the drive hub.

**⚠WARNING** Crushing hazard. The drive hub could become unbalanced and fall if not properly supported by an overhead crane or lifting device when removed from the machine.

Note: Do not re-use the drive hub mounting fasteners. Genie specifications require the use of new fasteners.

# 11-4
# Steer Cylinders

## How to Remove a Steer Cylinder

There are two identical steer cylinders that work in parallel. They are part of the same hydraulic circuit, but move in opposite directions. The tie rod cylinder maintains equal movement of the tires.

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

1 Tag, disconnect and plug the hydraulic hoses from the steer cylinder. Cap the fittings on the cylinder.

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

2 Remove the hose bracket mounting fastener on the steer cylinder barrel-end pivot pin.

3 Remove the pin retaining fasteners from the steer cylinder pivot pins. Remove the pivot pin from each end of the steer cylinder.

4 Remove the steering cylinder from the machine.

# Non-steer Axle Components

## 12-1 Drive Motors

### How to Remove a Drive Motor

This procedure is the same as the steer axle procedure. Refer to Repair Procedure, *How to Remove a Drive Motor*.

## 12-2 Drive Hub

### How to Remove a Drive Hub

This procedure is the same as the steer axle procedure. Refer to Repair Procedure, *How to Remove a Drive Hub*.

# Oscillating Axle Components

## 13-1 Oscillating Axle Cylinders

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

### How to Remove an Oscillating Axle Cylinder

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

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

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

2 Remove the fasteners from the drive chassis cover at the steer end. Remove the cover.

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

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

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

5 Attach a lifting strap from an overhead crane to the barrel end of the oscillating cylinder.

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

7 Remove the cylinder from the machine.

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

# Oscillating Axle Components

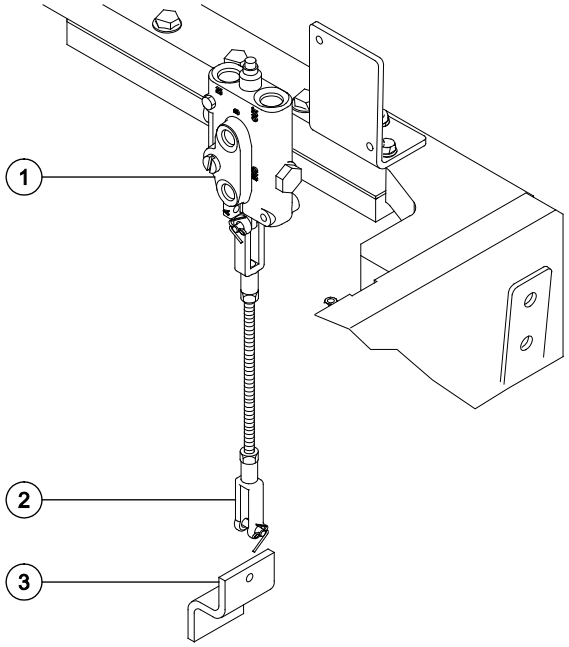
## 13-2
## Oscillate Directional Valve

### How to Adjust the Oscillate Relief Valve

1 Connect a 0 to 2000 psi / 0 to 150 bar pressure gauge to the diagnostic nipple located on the function manifold.

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

3 Disconnect the directional valve linkage, by removing the clevis yoke from the drive chassis.




1 oscillate valve
2 clevis yoke
3 drive chassis

4 Start the engine from the ground controls.

5 With the engine running, manually activate the valve and observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Component Specifications*.

6 Turn the engine off.

7 Locate the relief valve on the function manifold (item SC).

8 Loosen the jam nut on the relief valve.

9 Turn the valve clockwise to increase the pressure or counterclockwise to decrease the pressure.

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

10 Tighten the jam nut.

11 Repeat steps 4 through 10 to confirm the oscillate relief valve pressure.

Note: The oscillate pressure required is while the oscillate cylinders are in motion. Do not dead head the cylinders to either side.

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

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

# Oscillating Axle Components

## How to Set Up the Directional Valve Linkage

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

1 Lower the boom to the stowed position.

2 Use a "bubble type" level to be sure the surface the machine is on is completely level.

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

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

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

5 Disconnect the linkage clevis yoke from the axle.

6 Place a "bubble type" level on the turntable rotate bearing plate at the non-steer end. Confirm whether the drive chassis is completely level.

7 If the drive chassis is not level, start the engine and push up or pull down on the linkage adjustment rod until the machine is completely level.

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

9 Loosen the jamb nuts and adjust the length of the rod by turning the clevis yoke until the clevis yoke can be pinned to the axle.

10 Install the cotter pin and tighten the jamb nuts.

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

⊙ Result: The measurements should be equal.

Note: The gap on both sides should be between 0.150 inch / 0.381 cm and 0.170 inch / 0.432 cm.

12 Add or remove shims between the oscillation stop bar and the drive chassis to achieve the proper gap.

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# 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 | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | Joystick Speed and Direction frozen at zero and neutral. | Calibrate Joystick. |
| 22 | Primary Up / Down Directional Valves | 21 | Fault | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| 23 | Primary Up / Down Flow Valve | 12 | Value Too High | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 15 | Value Too Low | | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 24 | Angle sensor | 11 | Value at 5.0 V | Reduced function speed. | Retract before lowering required. Dual capacity models. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | Power up controller with problem corrected. |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | | Calibrate angle sensor. |
| | | 31 | Invalid setup | Initiate 1 -second beep of Alarm. | Retract before lowering required. Dual capacity models. |
| | | | | | Calibrate angle sensor. |
| 26 | Angle sensor cross check | 19 | Out of Range | Reduced function speed. | Retract before lowering required. Dual capacity models. |
| | | | | | Power up controller with problem corrected. |
| 31 | Secondary Up / Down. Joystick | 11 | Value at 5.0 V | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | Joystick Speed and Direction frozen at zero and neutral. | Calibrate Joystick. |

# Control System Fault Codes

| Error Source | | Error Type | | Condition | Solution |
|---|---|---|---|---|---|
| ID | Name | ID | Name | | |
| 32 | Secondary Up / Down. Directional Valves | 21 | Fault | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| 33 | Secondary Up / Down Flow Valve | 12 | Value Too High | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 15 | Value Too Low | | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 34 | primary Boom Extend / Retract Limit Switches | 31 | Invalid setup | Initiate 1 -second beep of Alarm.<br>1000lb. Mode: Required retract into FULLY RETRACTED state before lowering.<br>500lb. Mode: Operates normally.<br>Dual capacity models. | Fully retract, then lower boom.<br>Check and service ext/ret and fully stowed switches. |
| 41 | Turntable Rotate Joystick | 11 | Value at 5.0 V | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | Initiate 1 -second beep of Alarm. | Calibrate Joystick. |
| 42 | Turntable Rotate Directional Valves | 21 | Fault | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 43 | Turntable Rotate Flow Valve | 12 | Value Too High | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 15 | Value Too Low | | |
| | | 17 | Not calibrated | Normal function except threshold for one or the other direction is zero. Display message on LCD. | Calibrate valve threshold. |
| 44 | Drive Enable Override Switch | 21 | Fault | Drive enable override direction is frozen at neutral. | Power up controller with problem corrected. |
| 45 | Platform Level Switch | 21 | Fault | Platform level frozen at neutral. | Power up controller with problem corrected. |
| 46 | Primary Extend / Retract Switch | 21 | Fault | Platform Extend / Retract frozen at neutral. | Power up controller with problem corrected. |

# Control System Fault Codes

| Error Source | | Error Type | | Condition | Solution |
|---|---|---|---|---|---|
| ID | Name | ID | Name | | |
| 51 | Drive Joystick | 11 | Value at 5.0 V | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | Joystick Speed and Direction frozen at zero and neutral. | Calibrate Joystick. |
| 53 | Drive Flow Valve (EDC) | 12 | Value Too High | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 15 | Value Too Low | | |
| | | 17 | Not calibrated | Normal function except threshold for one or both directions is zero. | Calibrate valve threshold. |
| 54 | Propel Brake Valve | 21 | Fault | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| 55 | Propel High Motor Speed Valve | 21 | Fault | Motor speed frozen in the low state. | Power up controller with problem corrected. |
| 56 | Platform Level Valve | 21 | Fault | Direction frozen at zero and neutral. | Power up controller with problem corrected. |
| 57 | Foot switch / ECU Power Crosscheck | 12 | Value Too High | Direction frozen at zero and neutral. | Power up controller with problem corrected. |
| | | 15 | Value Too Low | | |
| 61 | Steer Joystick | 11 | Value at 5.0 V | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| | | 12 | Value Too High | | |
| | | 15 | Value Too Low | | |
| | | 16 | Value at 0 V | | |
| | | 17 | Not calibrated | Joystick Speed and Direction frozen at zero and neutral. | Calibrate Joystick. |
| 62 | Steer Direction Valves | 21 | Fault | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Power up controller with problem corrected. |
| 81 | Platform Load Sense Overload | 21 | Fault | Limited Speed and Direction frozen at zero and neutral, Alarm sounds. | Self-clearing (transient) |

# Fault Code Display - Deutz and Perkins Models

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

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instantaneous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor. One or more fault LED's will illuminate on the display located at the ground control box. The active fault code will also be displayed on the LCD screen.

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

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

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

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

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

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

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

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

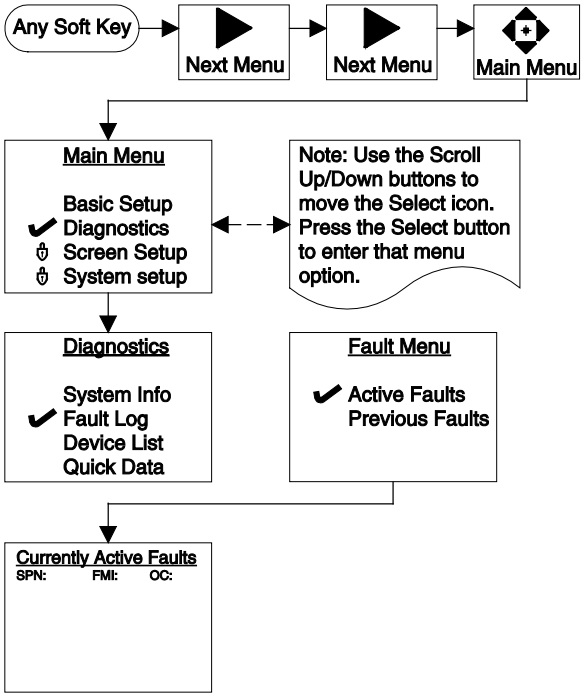
2 Press any soft key below the display.

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

**With the engine not running:**

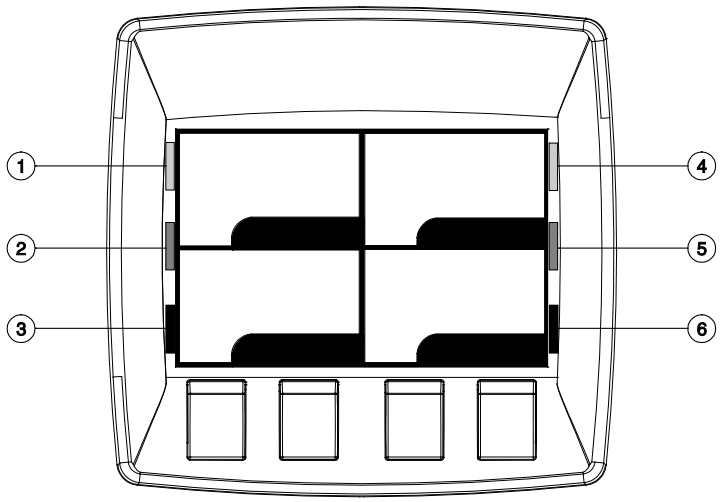
1 At the ground controls, turn the key switch to ground controls and pull out the red Emergency Stop button.

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



# Fault Code Display - Deutz and Perkins Models

## 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.

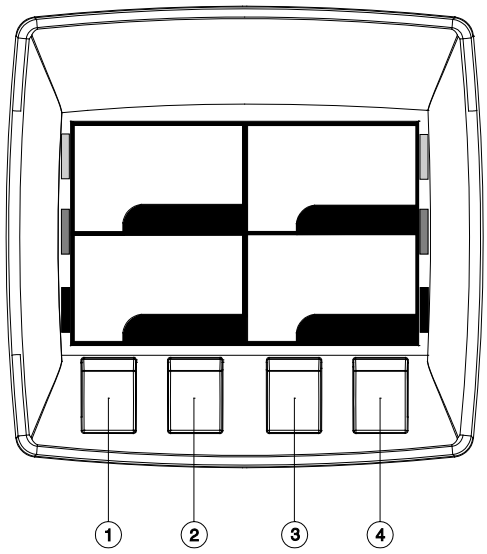
6 Right red LED:

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 (-)

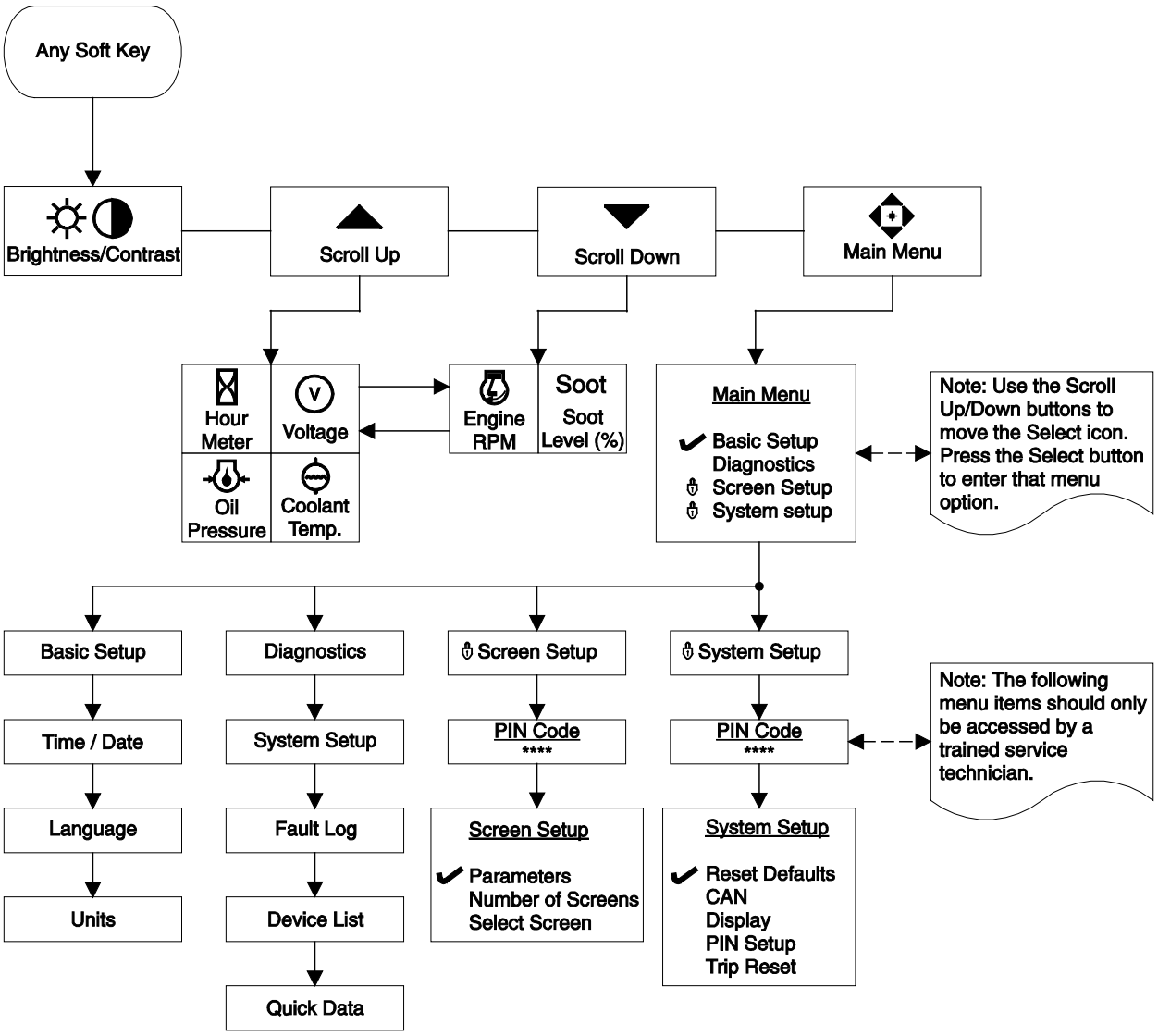
4 Regeneration inhibited • Select / Next • Main menu • Increase contarst (+)

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

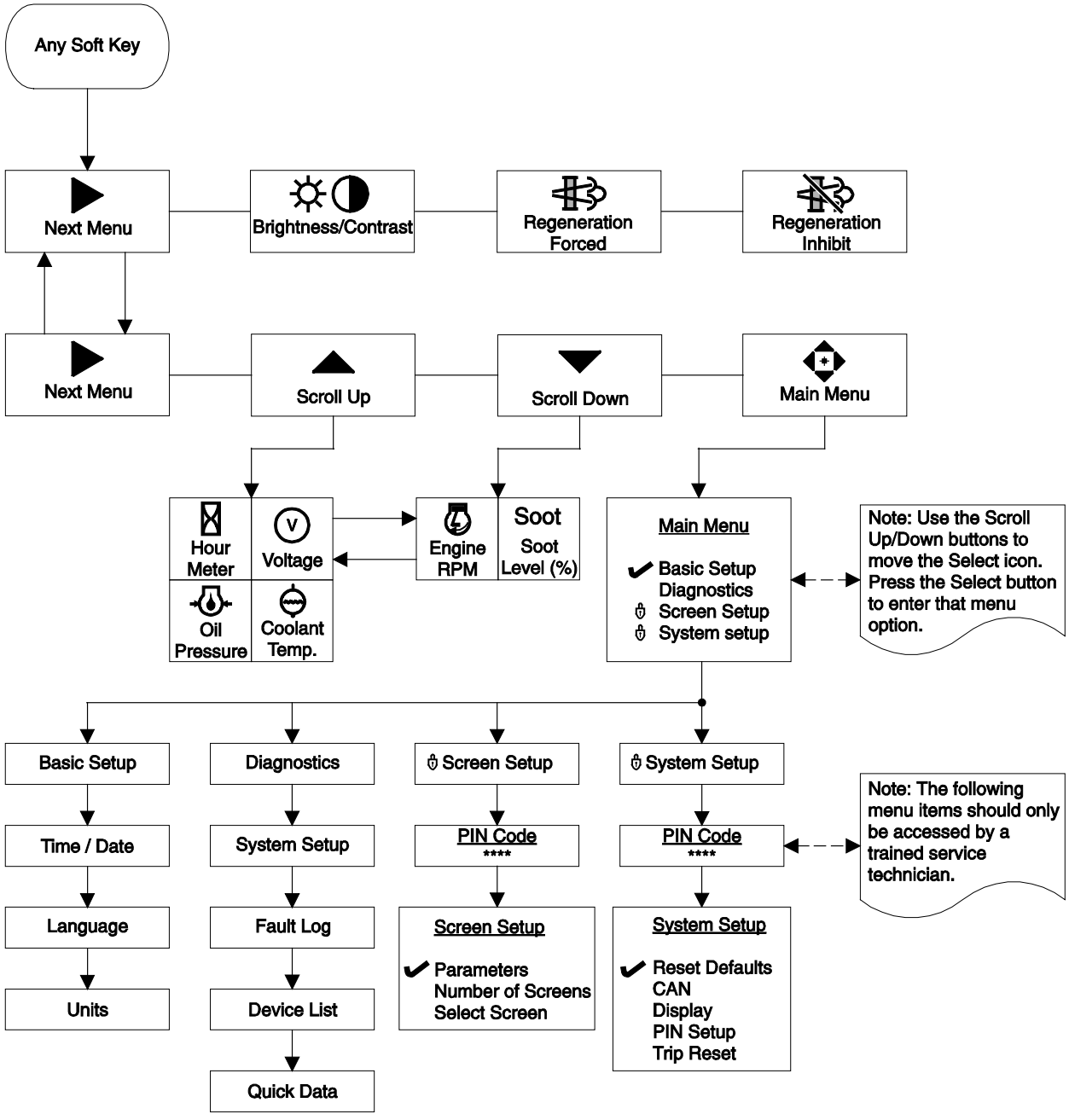
# Fault Code Display - Deutz and Perkins Models

## Main Menu Structure - Deutz D 2.9 L4 Models



# Fault Code Display - Deutz and Perkins Models

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



# 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
FMI = Failure Mode Identifier
KWP = Keyword Protocol

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

# Deutz D 2.9 L4 Engine Fault Codes

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

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

# Deutz D 2.9 L4 Engine Fault Codes

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

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

# Deutz D 2.9 L4 Engine Fault Codes

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

| 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
FMI = Failure Mode Identifier
KWP = Keyword Protocol

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

# Deutz D 2.9 L4 Engine Fault Codes

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

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

# Deutz D 2.9 L4 Engine Fault Codes

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

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

# Deutz D 2.9 L4 Engine Fault Codes

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

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

# Perkins 404F-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 |

# Continental TME27 Engine Fault Codes

## How to Retrieve Active Engine Fault Codes - Continental 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 and will turn on the Check Engine Light.

Note: Perform this procedure with the key switch in the off position.

1 Open the ground controls side cover and locate the run/test toggle switch on the side of the ground control box.

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

3 Quickly activate and release the start toggle switch/button. Do not start the engine.

4 Move and hold the run/test toggle switch to the test position.

⊙ Result: The check engine light should turn on. The check engine light should begin to blink.

5 Continue to hold the run/test toggle switch in the test position and count the blinks.

Note: Before the fault codes are displayed, the check engine light will blink a code 1654 three times. After the fault codes, the check engine light will blink a code 1654 three times again indicating the end of the stored codes.

Note: If any fault codes are present, the ECM will blink a three or four 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, blink the third digit, then pause and possibly a fourth 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 *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.

# Continental TME27 Engine Fault Codes

| System | Code | Fault Name | 1 | 2 | 3 | 4 | 5 | 6 | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| MAP | 108 | MAP Pressure High | | Y | Y | | | | MAP pressure > 16 psi and TPS < 10% and RPM > 1800 To Unlatch, MAP pressure must be < 10 psi |
| | 107 | MAP Voltage Low | | Y | Y | | | | MAP voltage < 0.05 vdc and TPS > 2% and RPM < 7000 To Unlatch, MAP voltage must be > 0.5 vdc |
| ECT/ CHT | 118 | ECT Voltage High | | Y | | | | | ECT voltage > 4.95 vdc |
| | 117 | ECT Voltage Low | | Y | | | | | ECT voltage < 0.05 vdc |
| | 116 | ECT higher than expected 1 | | Y | Y | Y | | | ECT > 210° F and RPM > 600 |
| | 217 | ECT higher than expected 2 | Y | | | | | | ECT > 230° F and RPM > 600 |
| IAT | 113 | IAT Voltage High | | Y | | | | | IAT voltage > 4.95 vdc |
| | 112 | IAT Voltage Low | | Y | | | | | IAT voltage < 0.05 vdc |
| | 111 | IAT higher than expected 1 | | Y | | Y | | | IAT > 200° F and RPM > 1000 |
| | 127 | IAT higher than expected 2 | Y | | | | | | IAT > 210° F and RPM > 1000 |
| BP | 2229 | BP Pressure High | | Y | Y | | | | BP pressure > 16 psi |
| | 129 | BP Pressure Low | | Y | Y | | | | BP pressure < 8.3 psi |
| Battery Voltage | 563 | Voltage High | | Y | Y | | | | Voltage > 18 vdc |
| | 562 | Voltage Low | | Y | Y | | | | Voltage < 9.5 vdc and RPM > 1500 |
| 5V External | 643 | 5VE1 High Voltage | | Y | | | | | 5VE1 > 5.4 vdc |
| | 642 | 5VE1 Low Voltage | | Y | | | | | 5VE1 < 4.6 vdc |
| TPS | 123 | TPS1 High Voltage | Y | | | | | | TPS1 voltage > 4.8 vdc |
| | 122 | TPS1 Low Voltage | Y | | | | | | TPS1 voltage < 0.2 vdc |
| | 223 | TPS2 High Voltage | Y | | | | | | TPS2 voltage > 4.8 vdc |
| | 222 | TPS2 Low Voltage | Y | | | | | | TPS2 voltage < 0.2 vdc |
| | 221 | TPS1 > than TPS2 | Y | | | | | | (TPS1 percent - TPS2 percent) > 20% |
| | 121 | TPS1 < than TPS2 | Y | | | | | | (TPS1 percent - TPS2 percent) < -20% |
| | 2112 | Unable to reach > TPS | Y | | | | | | (target TPS - actual TPS) > 20% |
| | 2111 | Unable to reach < TPS | Y | | | | | | (target TPS - actual TPS) < -20% |
| | 2135 | TPS1/2 simultaneous voltages out of range | Y | | | | | | Uses same parameters as individual TPS1/2 voltage fault detection above |

1 = Shutdown 2 = AL disable 3 = AL disable key-cycle 4 = Power derate 1 5 = Power derate 2 6 = Low rev limit

# Continental TME27 Engine Fault Codes

| System | Code | Fault Name | 1 | 2 | 3 | 4 | 5 | 6 | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| FPP | 2122 | FPP1 High Voltage | | | | | | Y | FPP1 voltage > 4.8 vdc |
| | 2123 | FPP1 Low Voltage | | | | | | Y | FPP1 voltage < 0.2 vdc |
| Engine Speed | 219 | Max Govern Speed Override | | | | | | | RPM > 3400 |
| | 1111 | Rev Fuel Limit | | | | | | | RPM > 3600 |
| | 1112 | Spark Rev Limit | Y | | | | | | RPM > 3800 |
| Oil Pressure | 524 | Oil Pressure Low | Y | | | | | | Oil pressure pulled-up input with a threshold voltage of 2.5 vdc and RPM > 500 and run-time > 30 s |
| Adaptive Learn | 171 | AL High Gasoline Bank 1 | | | | | | | AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi |
| | 172 | AL Low Gasoline Bank 1 | | | | | | | AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1161 | AL High LPG | | | | | | | AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1162 | AL Low LPG | | | | | | | AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi |
| Closed Loop | 1155 | CL High Gasoline Bank 1 | | | | | | | CL_BM > 40% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1156 | CL Low Gasoline Bank 1 | | | | | | | CL_BM <-40% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1151 | CL High LPG | | | | | | | CL_BM > 35% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1152 | CL Low LPG | | | | | | | CL_BM < -35% and RPM between 0-9999 and MAP between 0-99 psi |
| Catalyst Monitor | 420 | Gasoline Cat Monitor | | Y | Y | | | | EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50% |
| | 1165 | LPG Cat Monitor | | Y | Y | | | | EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50% |

1 = Shutdown 2 = AL disable 3 = AL disable key-cycle 4 = Power derate 1 5 = Power derate 2 6 = Low rev limit

# Continental TME27 Engine Fault Codes

| System | Code | Fault Name | 1 | 2 | 3 | 4 | 5 | 6 | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| FPP | 2122 | FPP1 High Voltage | | | | | | Y | FPP1 voltage > 4.8 vdc |
| | 2123 | FPP1 Low Voltage | | | | | | Y | FPP1 voltage < 0.2 vdc |
| Engine Speed | 219 | Max Govern Speed Override | | | | | | | RPM > 3400 |
| | 1111 | Rev Fuel Limit | | | | | | | RPM > 3600 |
| | 1112 | Spark Rev Limit | Y | | | | | | RPM > 3800 |
| Oil Pressure | 524 | Oil Pressure Low | Y | | | | | | Oil pressure pulled-up input with a threshold voltage of 2.5 vdc and RPM > 500 and run-time > 30 s |
| Adaptive Learn | 171 | AL High Gasoline Bank 1 | | | | | | | AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi |
| | 172 | AL Low Gasoline Bank 1 | | | | | | | AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1161 | AL High LPG | | | | | | | AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1162 | AL Low LPG | | | | | | | AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi |
| Closed Loop | 1155 | CL High Gasoline Bank 1 | | | | | | | CL_BM > 40% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1156 | CL Low Gasoline Bank 1 | | | | | | | CL_BM <-40% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1151 | CL High LPG | | | | | | | CL_BM > 35% and RPM between 0-9999 and MAP between 0-99 psi |
| | 1152 | CL Low LPG | | | | | | | CL_BM < -35% and RPM between 0-9999 and MAP between 0-99 psi |
| Catalyst Monitor | 420 | Gasoline Cat Monitor | | Y | Y | | | | EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50% |
| | 1165 | LPG Cat Monitor | | Y | Y | | | | EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50% |

1 = Shutdown 2 = AL disable 3 = AL disable key-cycle 4 = Power derate 1 5 = Power derate 2 6 = Low rev limit

# Continental TME27 Engine Fault Codes

| System | Code | Fault Name | 1 | 2 | 3 | 4 | 5 | 6 | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| EGO Sensors | 134 | EGO Open/Lazy Pre-cat 1 | | Y | Y | | | | EGO cold persistently > 120 seconds |
| | 154 | EGO Open/Lazy Post-cat 1 | | Y | Y | | | | EGO cold persistently > 120 seconds |
| Injectors | 261 | Injector Loop Open or Low-Side Short to Ground | n | Y | Y | Y | | | Injector off-state low-side < 4 vdc and battery voltage > 9 vdc |
| | 262 | Injector Coil Shorted | | Y | Y | Y | | | Injector on-state low-side > 4 vdc and battery voltage < 16 vdc |
| Power Relay Control Coil | 686 | Relay Control Ground Short | | | | | | | |
| | 685 | Relay Coil Short | | | | | | | |
| | 687 | Relay Coil Short to Pwr | | | | | | | |
| Tach Output | 2618 | Tach Output Ground Short | | | | | | | Does not turn on MIL |
| | 2619 | Tach Output Short to Pwr | | | | | | | Does not turn on MIL |
| EPR Diagnostics LPG | 1171 | EPR Delivery Pressure > than expected | | Y | | | Y | | MJ actual-commanded press > 4 in. H20 |
| | 1172 | EPR Delivery Pressure < than expected | | Y | | | Y | | MJ actual-commanded press < 4 in. H20 |
| | 1173 | EPR Comm Lost | | Y | | | Y | | No MJ packets received within 500 ms |
| | 1174 | EPR Voltage Supply High | | Y | | | Y | | |
| | 1175 | EPR Voltage Supply Low | | Y | | | Y | | |
| | 1176 | EPR Internal Actuator | | Y | | | Y | | |
| | | fault detection | | | | | | | |
| | 1177 | EPR Internal Circuitry fault detection | n | Y | | | Y | | |
| | 1178 | EPR Internal Comm fault detection | n | Y | | | Y | | |

1 = Shutdown 2 = AL disable 3 = AL disable key-cycle 4 = Power derate 1 5 = Power derate 2 6 = Low rev limit

# Continental TME27 Engine Fault Codes

| System | Code | Fault Name | 1 | 2 | 3 | 4 | 5 | 6 | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| Cam Crank Sensors | 342 | Cam Loss | | Y | Y | | | | No cam pulse in 4 cycles and RPM > 1000 |
| | 337 | Crank Loss | | | | | | | Cam pulses without crank activity > 6 cam pulses |
| | 341 | Cam Sync Noise | | Y | Y | | | | Number of invalid cam re-syncs = 1 within a time window of <= 700 ms |
| | 336 | Crank Sync Noise | | Y | Y | | | | Number of invalid crank re-syncs = 1 within a time window of <= 800 ms |
| | 16 | Never Crank Synced at Start | | | | | | | Cranking revs without sync < 4 revs and RPM > 90 rpm |
| Internal Process or Diagnostics | 606 | COP Failure | | | Y | | Y | | |
| | 1612 | RTI 1 Loss | | | Y | | Y | | |
| | 1613 | RTI 2 Loss | | | Y | | Y | | |
| | 1614 | RTI 3 Loss | | | Y | | Y | | |
| | 1615 | A/D Loss | | | Y | | Y | | |
| | 1616 | Invalid Interrupt | | | Y | | Y | | |
| | 601 | Flash Checksum Invalid | | | Y | | Y | | |
| | 604 | RAM Failure | | | Y | | Y | | |
| J1939 Network | 1625 | Shutdown Request | | | | | | | Number of shutdown requests >= 1 |
| | 1626 | CAN Tx Failure | | | | | | | TX error counter > 100 |
| | 1627 | CAN Rx Failure | | | | | | | Rx error counter > 100 |
| | 1628 | CAN Address Conflict Failure | | | | | | | Address conflict counter > 5 |

1 = Shutdown 2 = AL disable 3 = AL disable key-cycle 4 = Power derate 1 5 = Power derate 2 6 = Low rev limit

# 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.

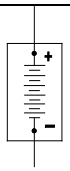
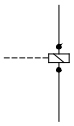
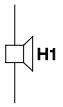
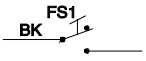
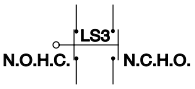
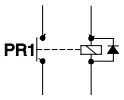
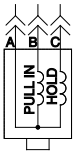
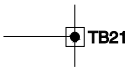
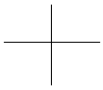
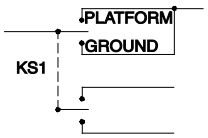
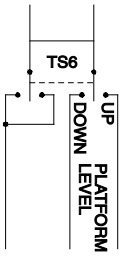
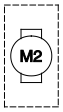
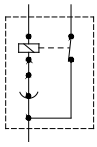
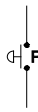
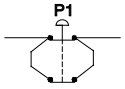
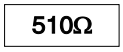
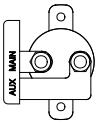
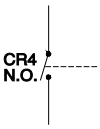
### Electrical Schematics

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

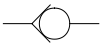
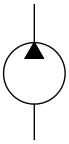
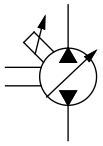
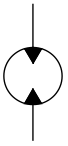
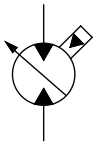
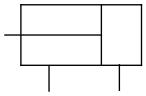
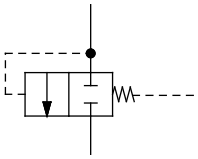
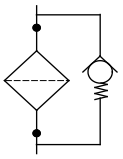
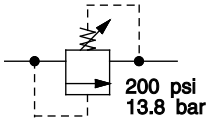
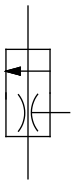
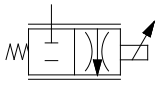
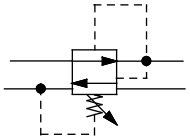
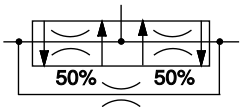
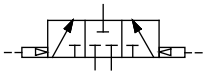
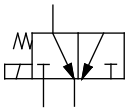
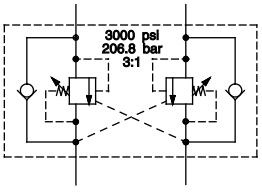
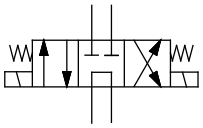
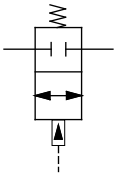
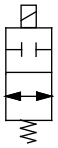
### Hydraulic Schematics

**⚠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.

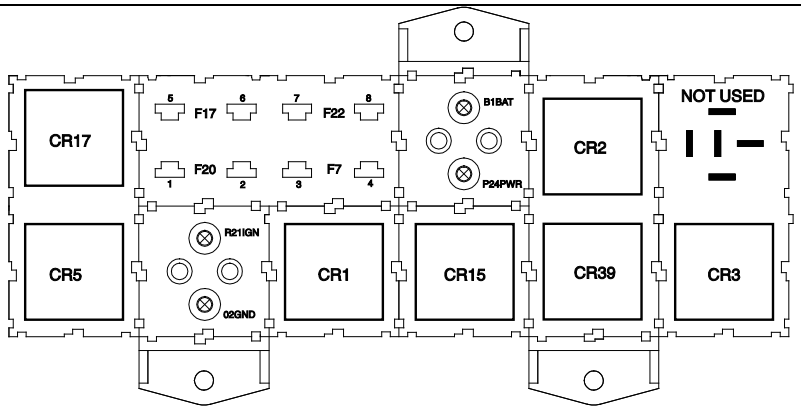
# Electrical Symbol Legend

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

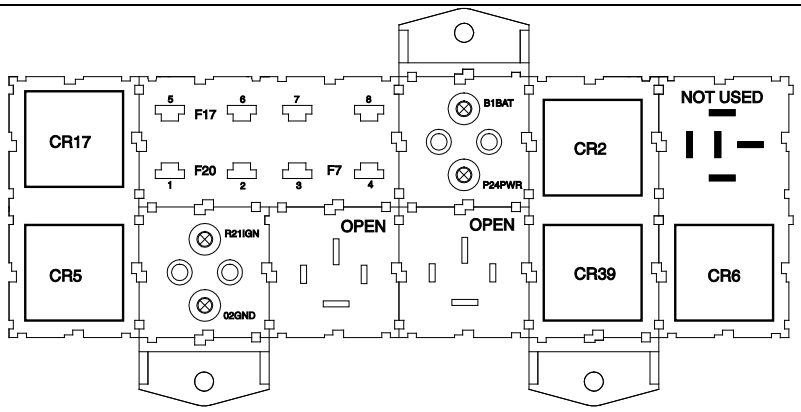
| | | | |
|---|---|---|---|
|  Orifice with size |  Check valve |  Shut off valve |  Brake |
|  Pump, fixed displacement |  Pump, bi-directional variable displacement |  Motor, bi-directional |  Motor, 2 speed bi-directional |
|  Cylinder, double acting |  Pump, prime mover (engine or motor) |  Shuttle valve. 2 position, 3 way |  Differential sensing valve |
|  Filter with bypass relief valve |  Relief valve with pressure setting |  Priority flow regulator |  Solenoid operated proportional valve |
|  Pressure reducing valve |  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 |  Pilot operated 2 position, 2 way directional valve |  2 position, 2 way solenoid valve |

# Relay and Fuse Panel Legend - Deutz TD2011L04i



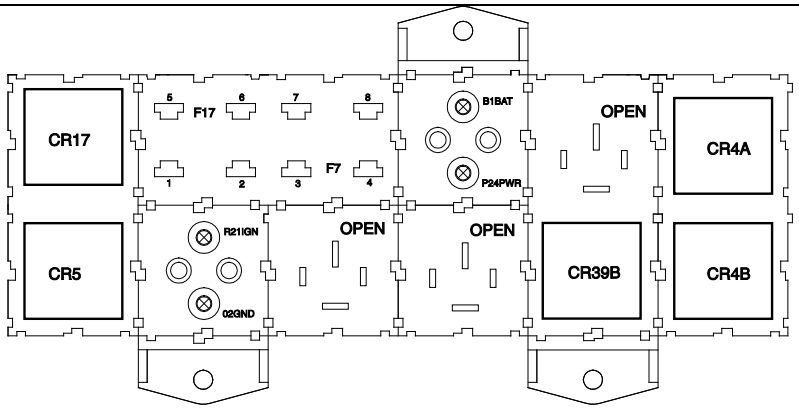

**Deutz TD2011L04i**

| Label | Description |
|---|---|
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR3 | HIGH IDLE RELAY |
| CR5 | HORN RELAY |
| CR15 | GLOW PLUG RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY |
| CR39 | AUXILIARY PUMP RELAY |
| F7 | FUSE, 30A, OIL COOLER FAN / HORN |
| F17 | FUSE, 30A, ENGINE / AUXILIARY PUMP |
| F20 | FUSE, 20A, ENGINE RPM SOLENOID |
| F22 | FUSE, 60A, GLOW PLUGS |




**Deutz TD2.9 L4**

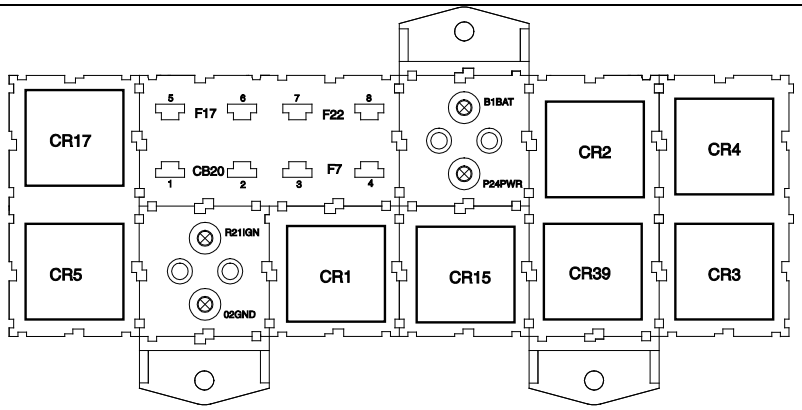
| Label | Description |
|---|---|
| CR2 | ENGINE / IGNITION RELAY |
| CR5 | HORN RELAY |
| CR6 | FUEL PUMP RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY |
| CR39 | VDROP RELAY |
| F7 | FUSE, 20A, B1BAT, P116PWR |
| F17 | FUSE, 20A, B1BAT, P24PWR |
| F20 | FUSE, 20A, B1BAT, P35PWR |




**Perkins 404F-22T**

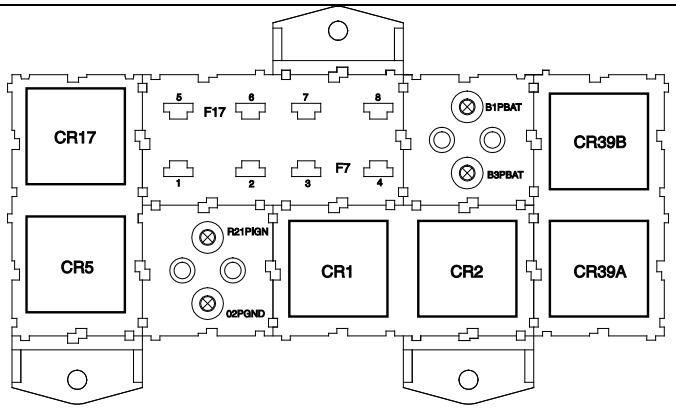
| Label | Description |
|---|---|
| CR4A | LOW RPM RELAY |
| CR4B | HIGH RPM RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY |
| CR39 | AUXILIARY PUMP RELAY |
| F7 | FUSE, 20A, B1BAT, P116PWR |
| F17 | FUSE, 20A, B1BAT, P24PWR |

# Relay and Fuse Panel Legend - Perkins 804D-33




**Perkins 804D-33**

| Label | Description |
|---|---|
| CB20 | CIRCUIT BREAKER, 10A, ENGINE RPM SOLENOID |
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR3 | HIGH IDLE RELAY |
| CR4 | ENGINE RPM SOLENOID RELAY |
| CR5 | HORN RELAY |
| CR15 | GLOW PLUG RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY |
| CR39 | AUXILIARY PUMP RELAY |
| F7 | FUSE, 30A, OIL COOLER FAN / HORN |
| F17 | FUSE, 30A, ENGINE / AUXILIARY PUMP |
| F20 | FUSE, 60A, GLOW PLUGS |




**Continental TME27**

| LABEL | DESCRIPTION |
|---|---|
| CR1 | START RELAY |
| CR2 | IGNITION / FUEL RELAY |
| CR5 | HORN RELAY |
| CR17 | HYDRAULIC OIL COOLER RELAY |
| CR39A | AUXILIARY PUMP RELAY |
| CR39B | AUXILIARY PUMP ENGINE CUTOUT RELAY |
| F7 | FUSE, 30A, OIL COOLER FAN / HORN |
| F17 | FUSE, 30A, ENGINE / AUXILIARY PUMP |

# Connector Pin Legends

**C1 DT06-12SA (Gray)**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C27AUX | RD |
| 2 | C28TTA | RD/BK |
| 3 | C29MS | RD/WH |
| 4 | C30EDC+ | WH |
| 5 | C31EDC- | WH/BK |
| 6 | C32BRK | WH/RD |
| 7 | C33STR | BK |
| 8 | C34SA | BK/WH |
| 9 | C35RPM | BK/RD |
| 10 | C36STC | BL |
| 11 | C37STCC | BL/BK |
| 12 | C132PLI1 | BL/WH (CE) |
| 12 | C177LS | BL/WH (S-80X) |

**C2 DT06-12SB (Black)**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C39LP | BL/RD |
| 2 | C40LS | OR |
| 3 | C41RPM | OR/BK |
| 4 | C42LS | OR/RD |
| 5 | C46HRN | GR |
| 6 | P134PWR | GR/BK |
| 7 | C45GEN | GR/WH |
| 8 | C123PBS | GR/RD |
| 9 | P109ANG | OR/WH |
| 10 | SNSR GND | LT BR |
| 11 | PLUG | |
| 12 | PLUG | |

**C3 DT06-12SC (Green)**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C1PBU | RD |
| 2 | C2PBD | RD/BK |
| 3 | C3PBF | RD/WH |
| 4 | C4TRL | WH |
| 5 | C5TRR | WH/BK |
| 6 | C6TRF | WH/RD |
| 7 | C7PBE | BK |
| 8 | C8PBR | BK/WH |
| 9 | C9PERF | BK/RD |
| 10 | C132PLI2 | BL (CE) |
| 11 | C59CNK | BL/BK |
| 12 | C133PLA | BL/WH (CE) |
| 12 | P109LS | BL/WH (S-80X) |

**C4 DT06-12SD (Brown)**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C13DRE | BL/RD |
| 2 | C14PLU | OR |
| 3 | C15PLD | OR/BK |
| 4 | V155PCE | OR/RD |
| 5 | C17PRL | GR |
| 6 | C18PRR | GR/BK |
| 7 | C43JU | GR/WH |
| 8 | C44JD | RD/OR |
| 9 | C49DLITE | OR/GR |
| 10 | SPARE | LT BR |
| 11 | PLUG | |
| 12 | PLUG | |

# Connector Pin Legends

**C6 Function Manifold**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C1PBU | RD |
| 2 | C2PBD | RD/BK |
| 3 | C3PBF | RD/WH |
| 4 | C4TRL | WH |
| 5 | C5TRR | WH/BK |
| 6 | C6TRF | WH/RD |
| 7 | C7PBE | BK |
| 8 | C8PBR | BK/WH |
| 9 | C9PERF | BK/RD |
| 10 | | |
| 11 | C59CNK | BL/BK |
| 12 | P210PWR | BK (S-80X) |
| 13 | C13DRE | BL/RD |
| 14 | | |
| 15 | | |
| 16 | C109LS | GR/WH (S-80X) |
| 17 | | |
| 18 | | |
| 19 | | |
| 20 | | |
| 21 | C177LS | BL/RD (S-80X) |
| 22 | C42LS | OR/RD |
| 23 | P134PWR(A) | RD |
| 24 | P134PWR(B) | RD |
| 25 | P134PWR(C) | RD |
| 26 | | |
| 27 | | |
| 28 | C28TTA | RD/BK |
| 29 | | |
| 30 | C211LO | BL/BK (S-80X) |
| 31 | C118LSR | OR |
| 32 | | |
| 33 | C123PBS | RD/BK |
| 34 | SNSR GND | BR |
| 35 | P109ANG | GR/WH |
| 36 | C36STC | BL |
| 37 | C37STCC | BL/BK |
| 38 | C212LO | GR/BK (S-80X) |
| 39 | C45GEN | GR/WH |
| 40 | C40LS | OR |

**C7 DTP06-4S, 12V Power to Platform**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | P22PWR | BK |
| 2 | P23PWR | WH |
| 3 | BATGND | BR |
| 4 | PLUG | |

**C9 FS DT04-4P, Footswitch**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | P26ESTP | BK |
| 2 | P24FS | WH |
| 3 | P25FS | RD |
| 4 | PLUG | |

**J22 Platform Manifold**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | GND | BR |
| 2 | GND | BR |
| 3 | C18PRR | GR/BK |
| 4 | C17PRL | GR |
| 5 | C43JU | GR |
| 6 | C44JD | GR/BK |
| 7 | C14PLU | OR |
| 8 | C15PLD | OR/BK |
| 9 | GND | BR |
| 10 | GND | BR |
| 11 | GND | BR |
| 12 | GND | BR |

**J3 ALC500 Power/Valve Input**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | GND | BR |
| 2 | P24FS | WH |
| 3 | P26ESTP | BK |
| 4 | P24FS | WH |

# Connector Pin Legends

**J1 ALC500 Input**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C165TRS | WH/RD |
| 2 | C164PES | RD/WH |
| 3 | C163PLS | WH/BK |
| 4 | C160JPL | WH/RD |
| 5 | C159STC | BL/WH |
| 6 | C144DER | BL/WH |
| 7 | C143DEL | BL/BK |
| 8 | C29MS | RD/WH |
| 9 | P109ANG | GR/WH |
| 10 | SNSR GND | BR |
| 11 | P162JPW2 | OR |
| 12 | JSGND2 | BR |
| 13 | P162JPW1 | OR |
| 14 | JSGND1 | BR |
| 15 | C28TTA | RD/BK |
| 16 | C13DRE(A) | BL/RD |

**J2 ALC500 Output**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C40LS | OR |
| 2 | C123PBS | RD/BK |
| 3 | C13DRE | BL/RD |
| 4 | C42LS | OR/RD |
| 5 | C41RPM | OR/BK |
| 6 | C1PBU | RD |
| 7 | C2PBD | RD/BK |
| 8 | C3PBF | RD/WH |
| 9 | C4TRL | WH |
| 10 | C5TRR | WH/BK |
| 11 | C6TRF | WH/RD |
| 12 | C7PBE | BK |
| 13 | C8PBR | BK/WH |
| 14 | C9PERF | BK/RD |
| 15 | C30EDC+ | WH |
| 16 | C31EDC- | WH/BK |
| 17 | C36STC | BL |
| 18 | C37STCC | BL/BK |
| 19 | C32BRK | WH/RD |
| 20 | C29MS | RD/WH |

**J8 S-80X Model**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | P109LS | GR/WH |
| 2 | C184PL | WH |
| 3 | NC | |
| 4 | NC | |
| 5 | C169LED2 | BL |
| 6 | P109LS | GR/WH |
| 7 | C177LS | BL/RD |
| 8 | SNSR GND | BR |
| 9 | NC | |
| 10 | C169LED1 | GR |

**J144 Engine Plug - Deutz 2011L04i**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | C41RPM | OR/BK |
| 2 | C107AF | WH |
| 3 | C26TSR | WH/RD |
| 4 | C24TS | WH |
| 5 | C25PSR | WH/BK |
| 6 | C24PS | WH |
| 7 | R21IGN | WH(14) |
| 8 | GND | BR |
| 9 | | |
| 10 | | |

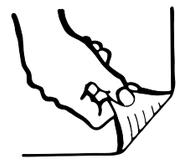
**Engine Plug - Continental TME27**

| Pin # | Circuit # | Color |
|---|---|---|
| 1 | R23PWR | WH |
| 2 | C21RET | WH |
| 3 | C38RET | BL |
| 4 | C38FP | BL/WH |
| 5 | R33STR | BK(14) |
| 6 | C41RPM | OR/BK |
| 7 | R21IGN | WH |
| 8 | C35RPM | BK/RD |
| 9 | C108ESL | BL/WH |
| 10 | C127TSW | GN |
| 11 | C39LP | BL/RD |
| 12 | C26TSR | WH/RD |
| | | Gauge Option |

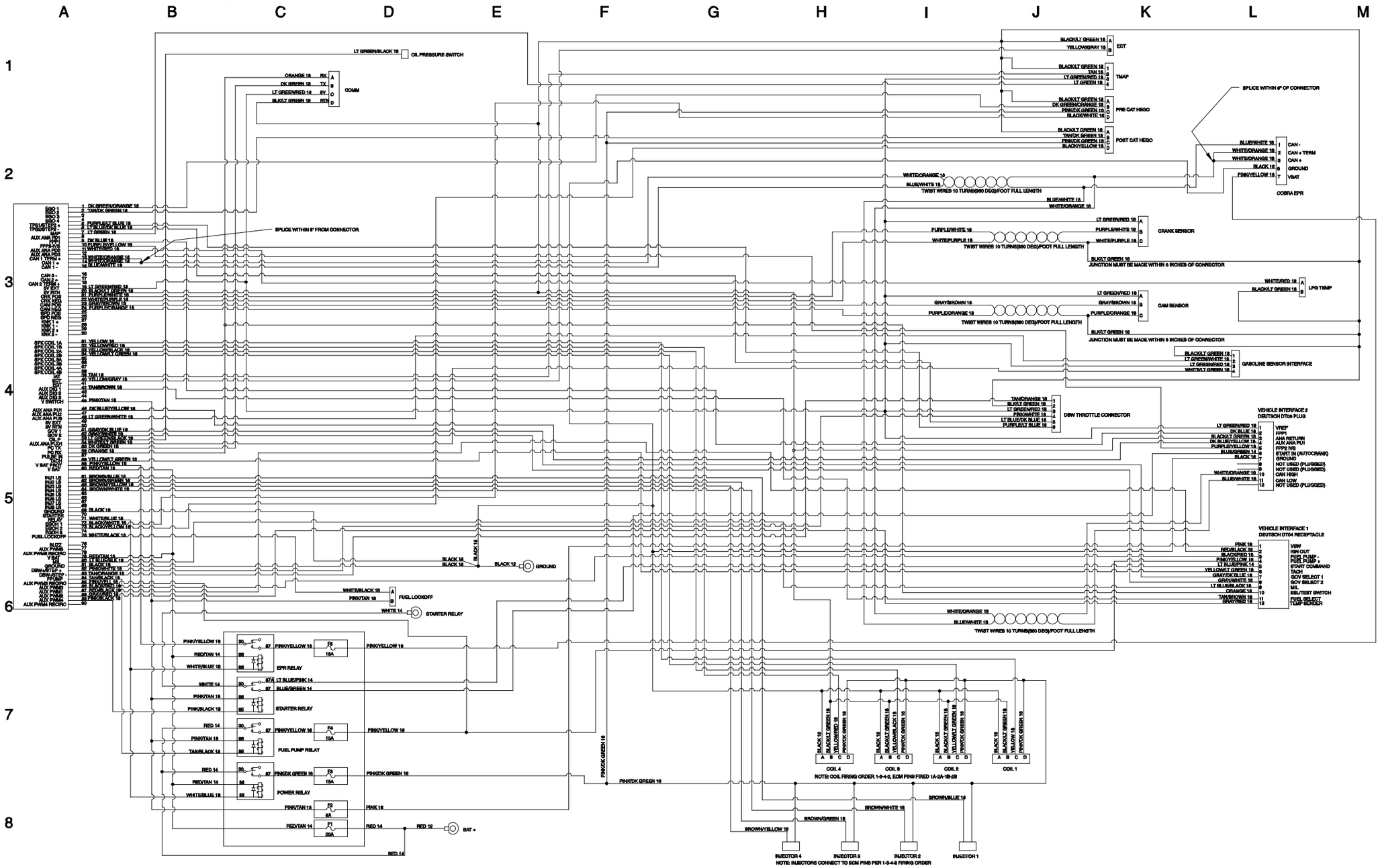
# Connector Pin Legends

| | Deutz 2011L04i | | Perkins 804 | | Continental TME27 | |
|---|---|---|---|---|---|---|
| **Pin #** | **Circuit #** | **Color** | **Circuit #** | **Color** | **Circuit #** | **Color** |
| 1 | P24PWR | RD | P24PWR | RD | P23PWR | RD |
| 2 | C41RPM | OR/BK | C41RPM | OR/BK | C41RPM | OR/BK |
| 3 | C21IGN | WH | C21IGN | WH | | |
| 4 | | | | | | |
| 5 | C33STR | BK | C33STR | BK | C33STR | BK |
| 6 | C27AUX | RD | C27AUX | RD | C27AUX | RD |
| 7 | C46HRN | GR | C46HRN | GR | C46HRN | GR |
| 8 | | | | | C127TSW | GR |
| 9 | | | | | C35RPM | BK/RD |
| 10 | | | | | C39LP | BL/RD |
| 11 | R21IGN | WH(14) | R21IGN | WH(14) | R21IGN | WH(14) |
| 12 | | | | | | |
| 13 | | | | | C108ESL | BL/WH |
| 14 | | | | | | |
| 15 | C24TSPS | WH | C24TSPS | WH | P24PWR | RD |
| 16 | | | | | | |
| 17 | | | | | R24PWR | RD |
| 18 | C35RPM | BK/RD | C35RPM | BK/RD | | |
| 19 | V155PCE | OR/RD | V155PCE | OR/RD | V155PCE | OR/RD |
| 20 | C31EDC- | WH/BK | C31EDC- | WH/BK | C31EDC- | WH/BK |
| 21 | C30EDC+ | WH | C30EDC+ | WH | C30EDC+ | WH |
| 22 | C34SA | BK/WH | C34SA | BK/WH | | |
| 23 | C32BRK | WH/RD | C32BRK | WH/RD | C32BRK | WH/RD |
| 24 | C29MS | RD/WH | C29MS | RD/WH | C29MS | RD/WH |

# Continental TME27 Engine Harness

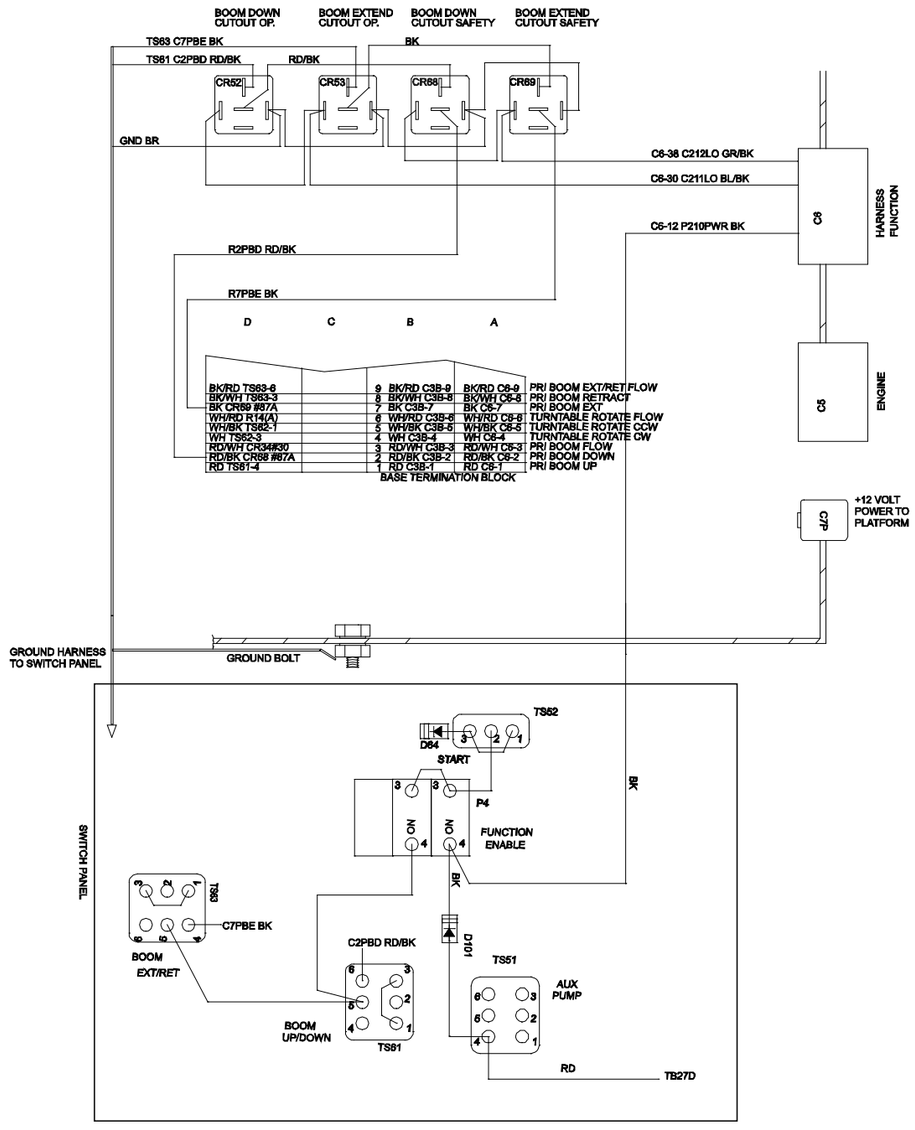


# Continental TME27 Engine Harness



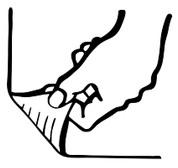
# S-80X Ground Control Box Wiring Diagram

**Use this wiring diagram with each S-80X Ground Control Box Schematic**

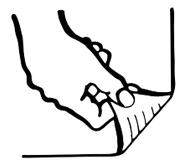



**ES0503P**
**ES0504R**
**ES0505P**

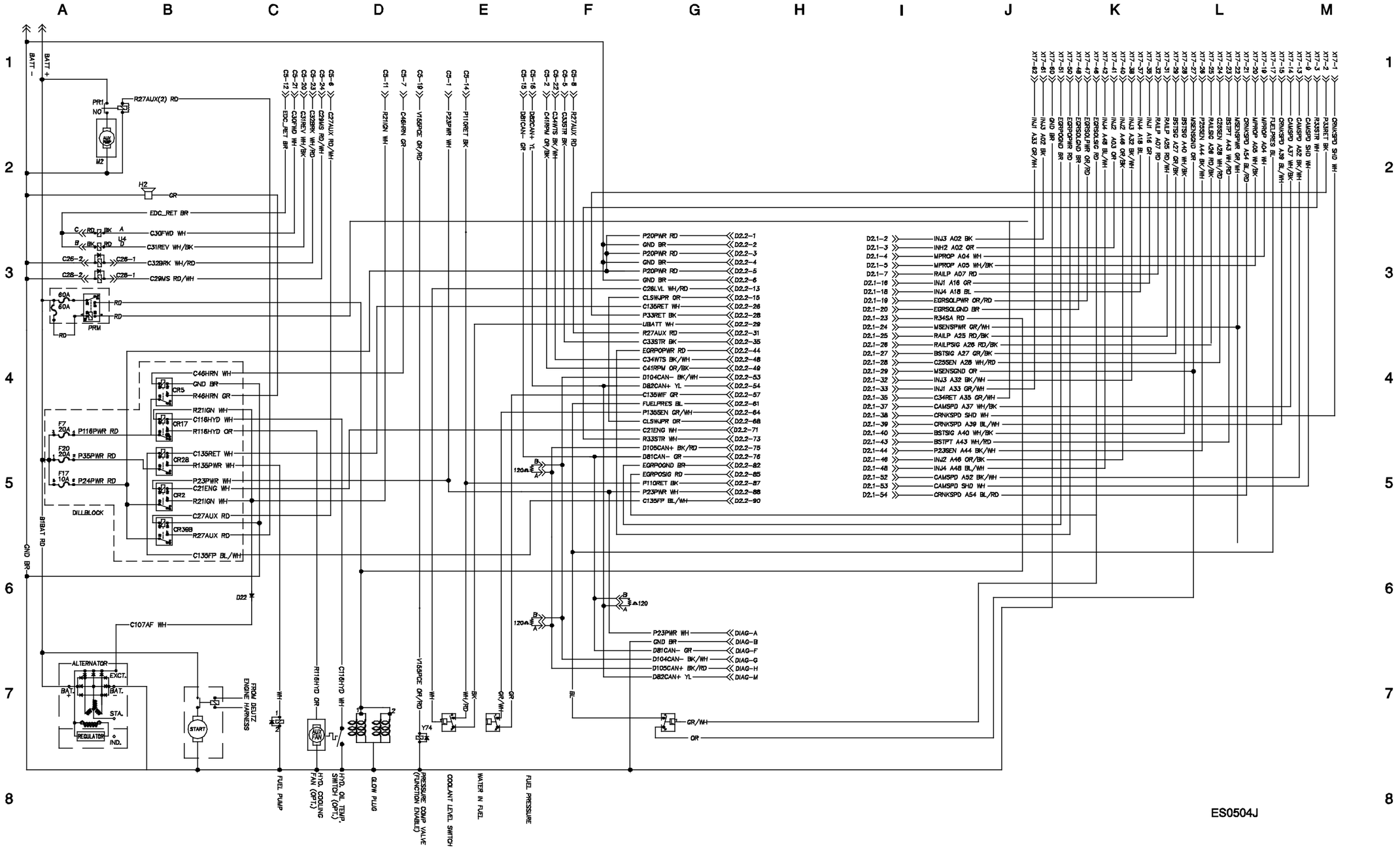
# S-80X Ground Control Box Wiring Diagram



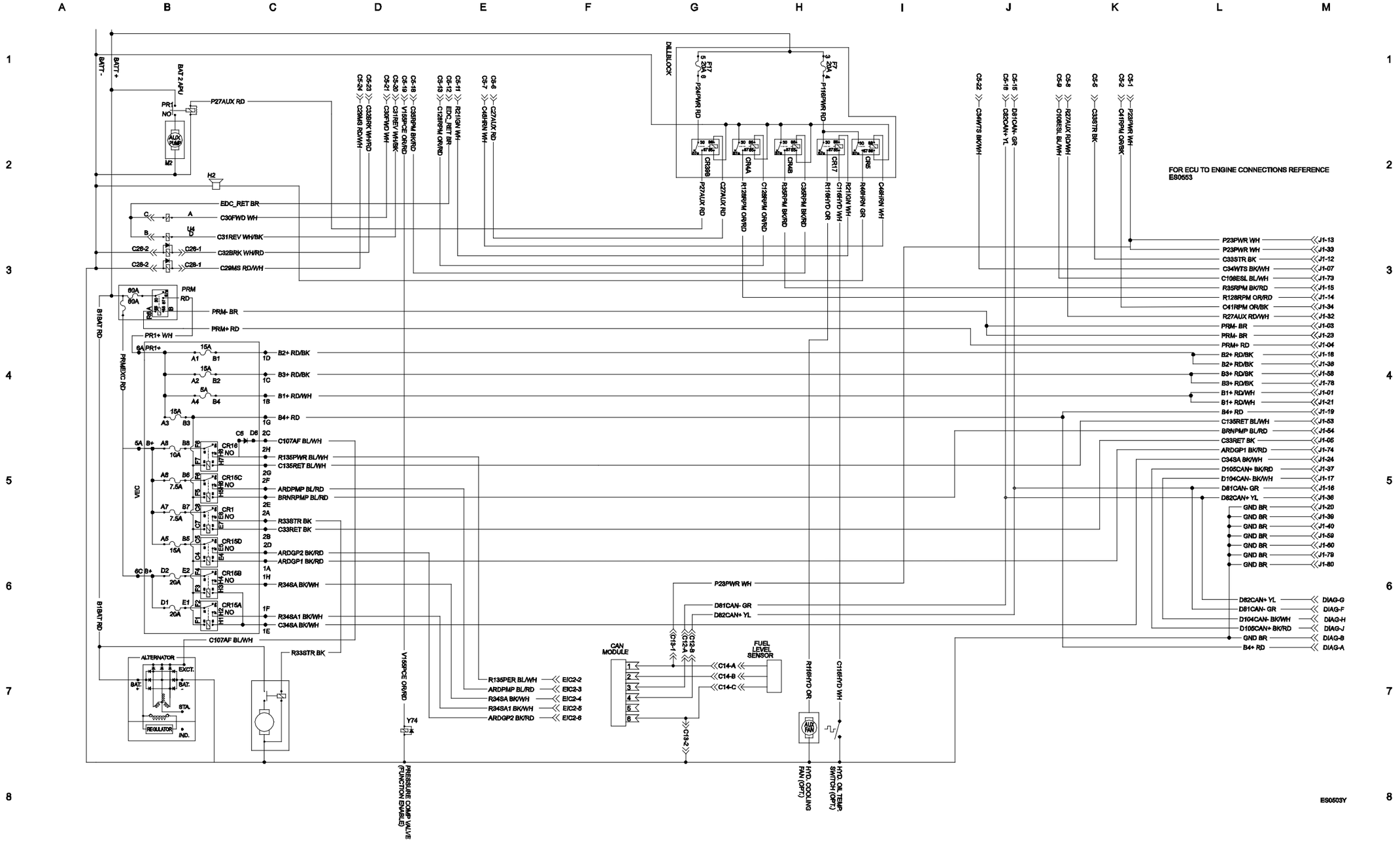
# Deutz TD2.9 L4 Engine Harness



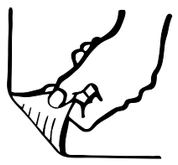
# Deutz TD2.9 L4 Engine Harness



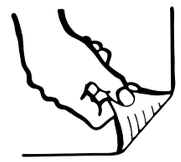
# Perkins 404F-22T Engine Harness



# Perkins 404F-22T Engine Harness

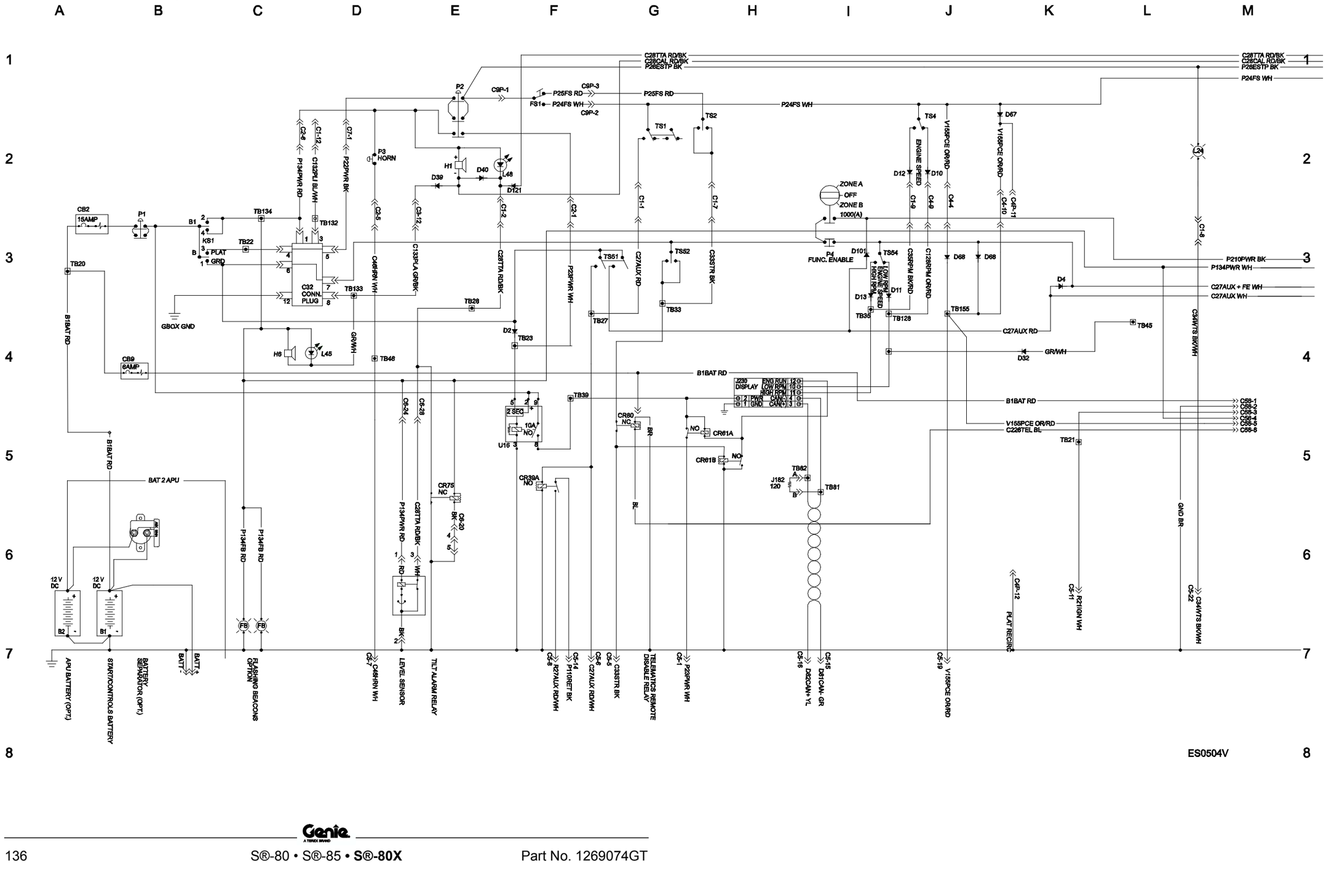


# Electrical Schematic, S-80X - Deutz TD2.9 L4 Models (ANSI / CSA)



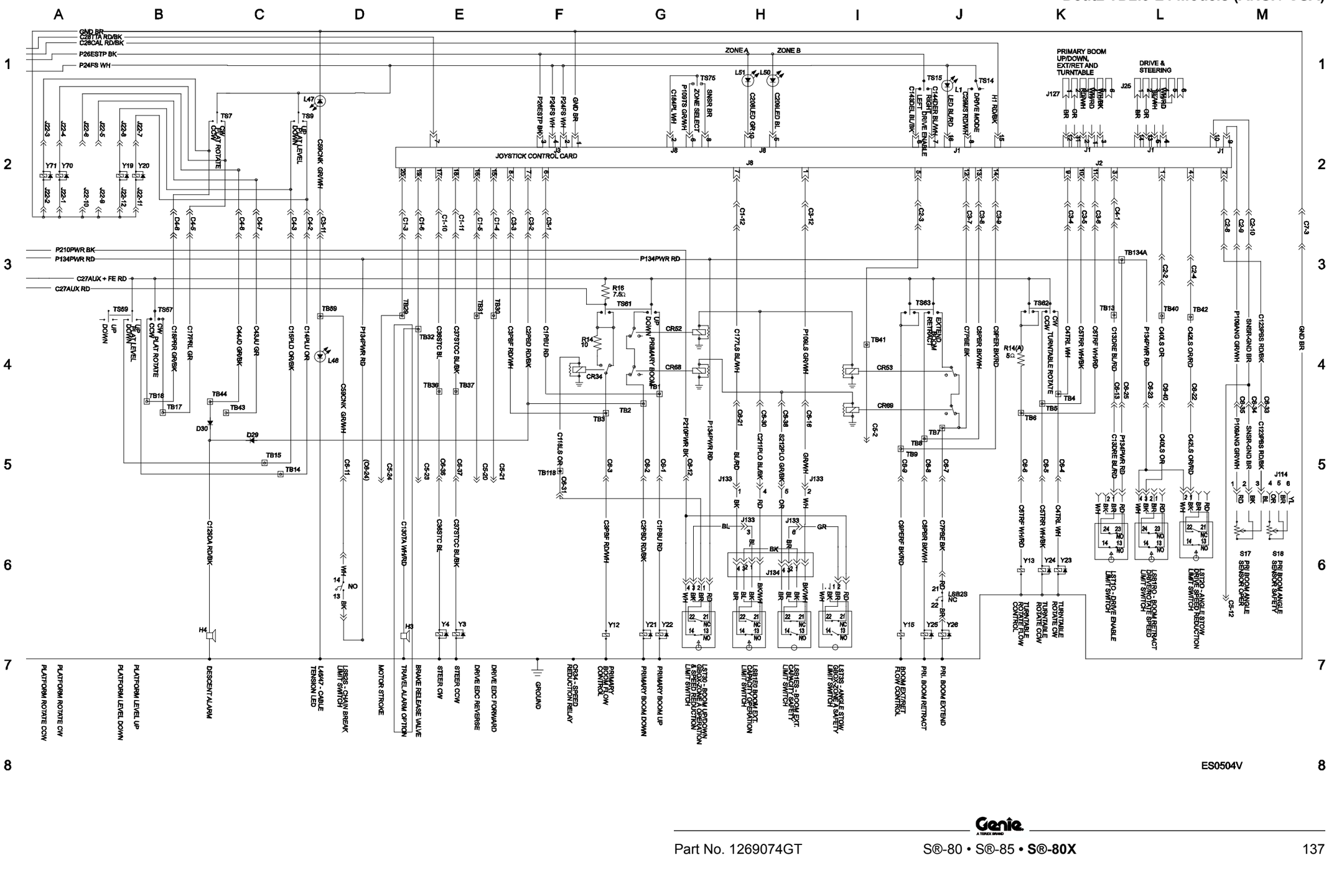
# Electrical Schematic, S-80X

## Deutz TD2.9 L4 Models (ANSI / CSA)

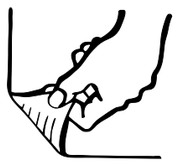


# Electrical Schematic, S-80X

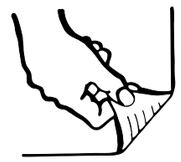
## Deutz TD2.9 L4 Models (ANSI / CSA)



# Electrical Schematic, S-80X - Deutz TD2.9 L4 Models (ANSI / CSA)



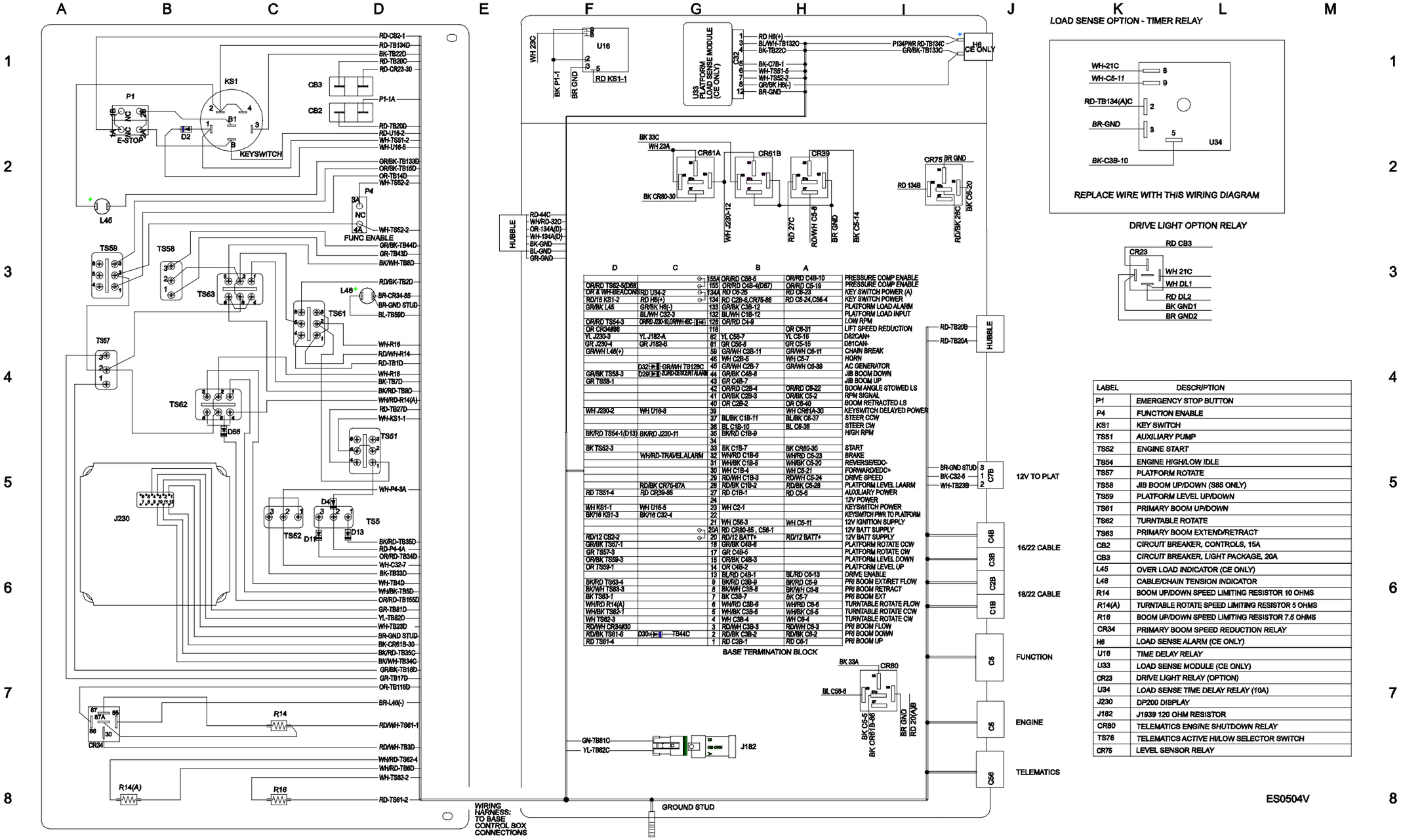
# Ground Control Box, S-80X - Deutz TD2.9 L4 Models (ANSI / CSA)



# Ground Control Box, S-80X

## Deutz TD2.9 L4 Models (ANSI / CSA)

Refer to S-80X Ground Control Box Wiring Diagram for additional wiring.

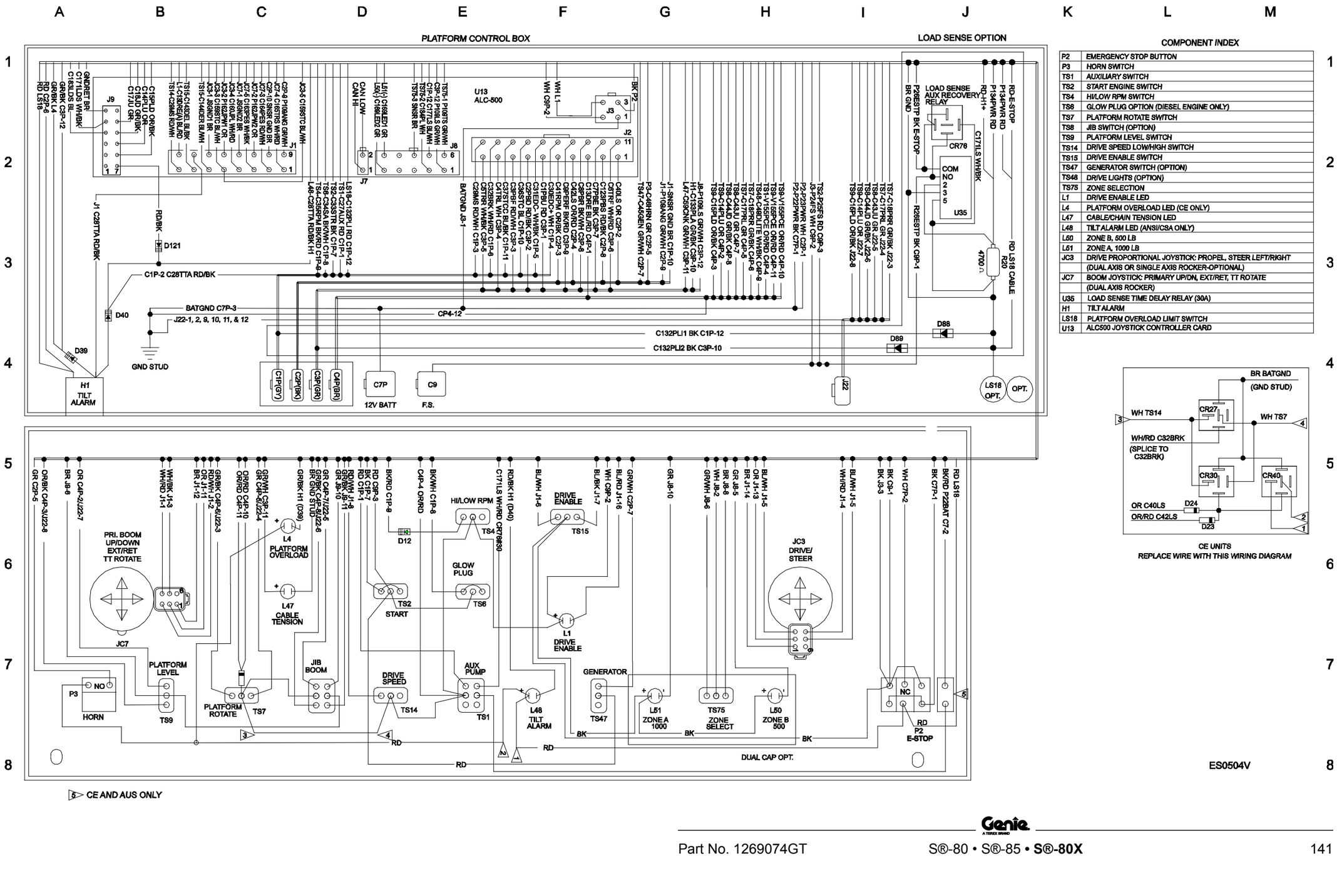



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH/LOW IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| CB3 | CIRCUIT BREAKER, LIGHT PACKAGE, 20A |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H8 | LOAD SENSE ALARM (CE ONLY) |
| U16 | TIME DELAY RELAY |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| J230 | DP200 DISPLAY |
| J182 | J1939 120 OHM RESISTOR |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |
| TS76 | TELEMATICS ACTIVE HI/LOW SELECTOR SWITCH |
| CR75 | LEVEL SENSOR RELAY |

ES0504V

# Platform Control Box, S-80X

## Deutz TD2.9 L4 Models (ANSI / CSA)




### COMPONENT INDEX

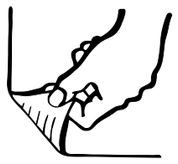
| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |



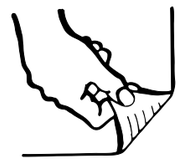

CE UNITS
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0504V

# Platform Control Box, S-80X - Deutz TD2.9 L4 Models (ANSI / CSA)

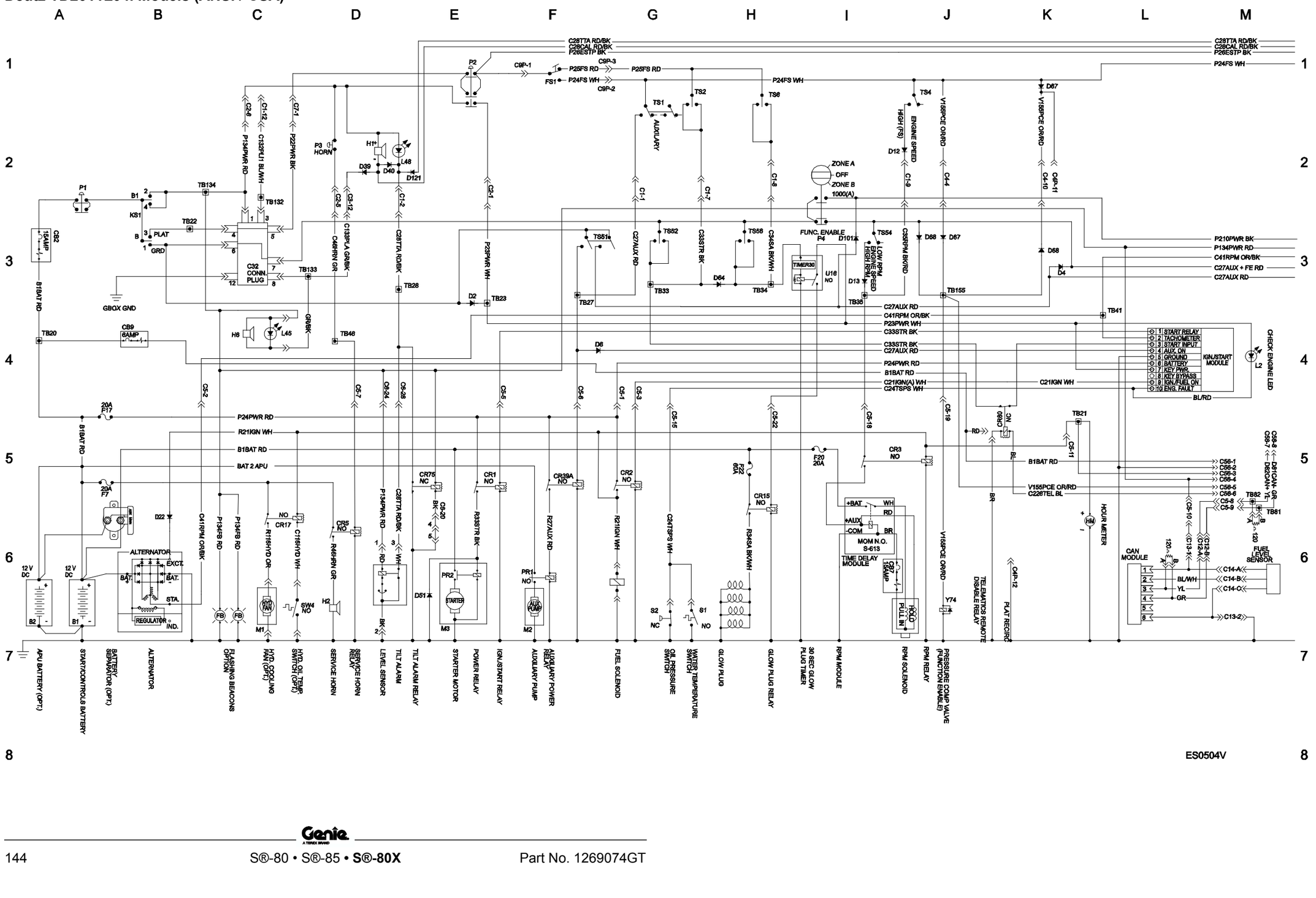


# Electrical Schematic, S-80X - Deutz TD2011L04i Models (ANSI / CSA)



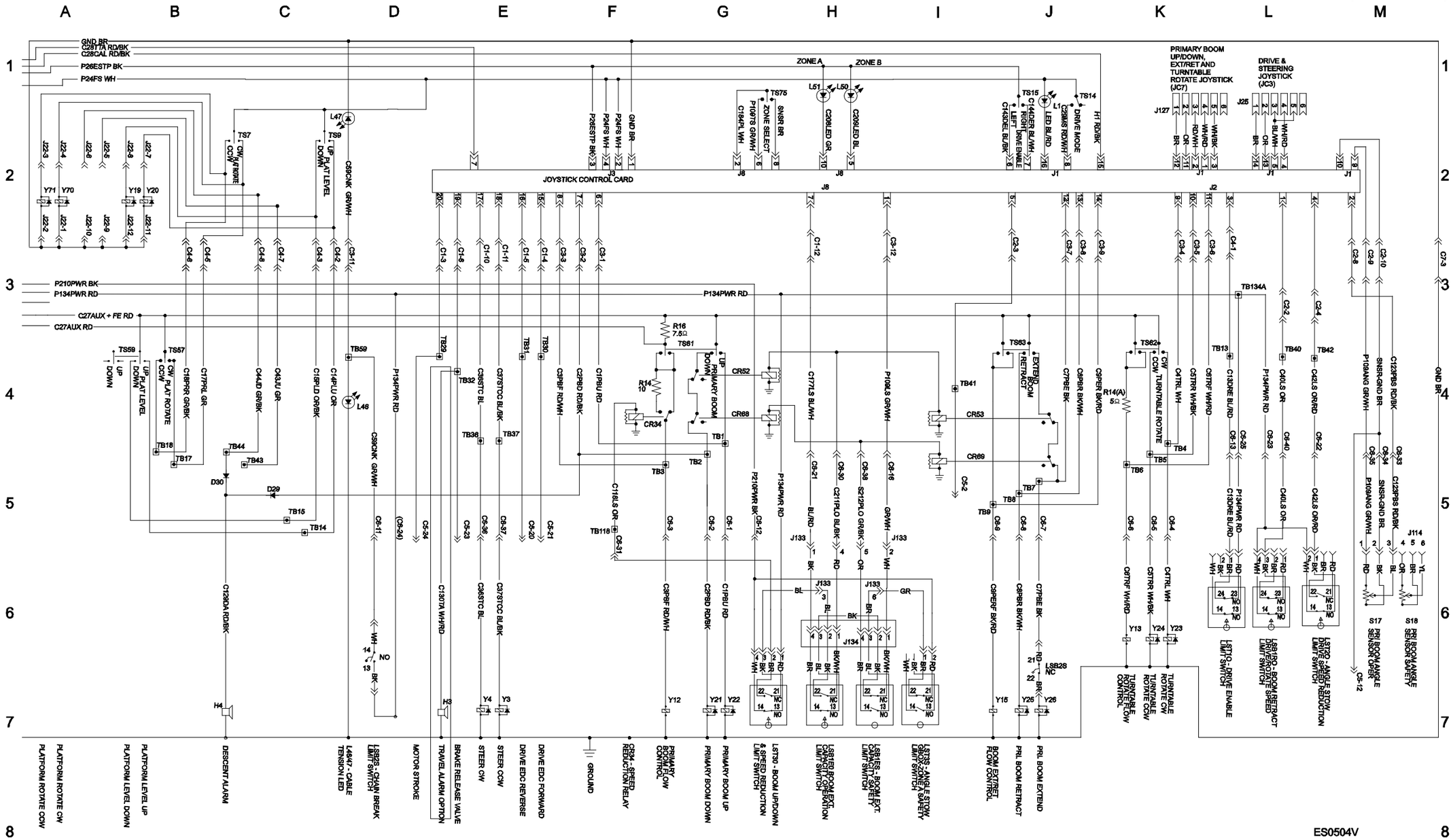
# Electrical Schematic, S-80X

## Deutz TD2011L04i Models (ANSI / CSA)

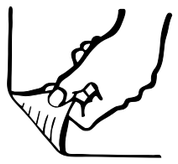


# Electrical Schematic, S-80X

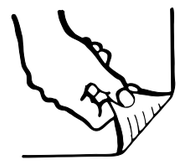
## Deutz TD2011L04i Models (ANSI / CSA)



# Electrical Schematic, S-80X - Deutz TD2011L04i Models (ANSI / CSA)



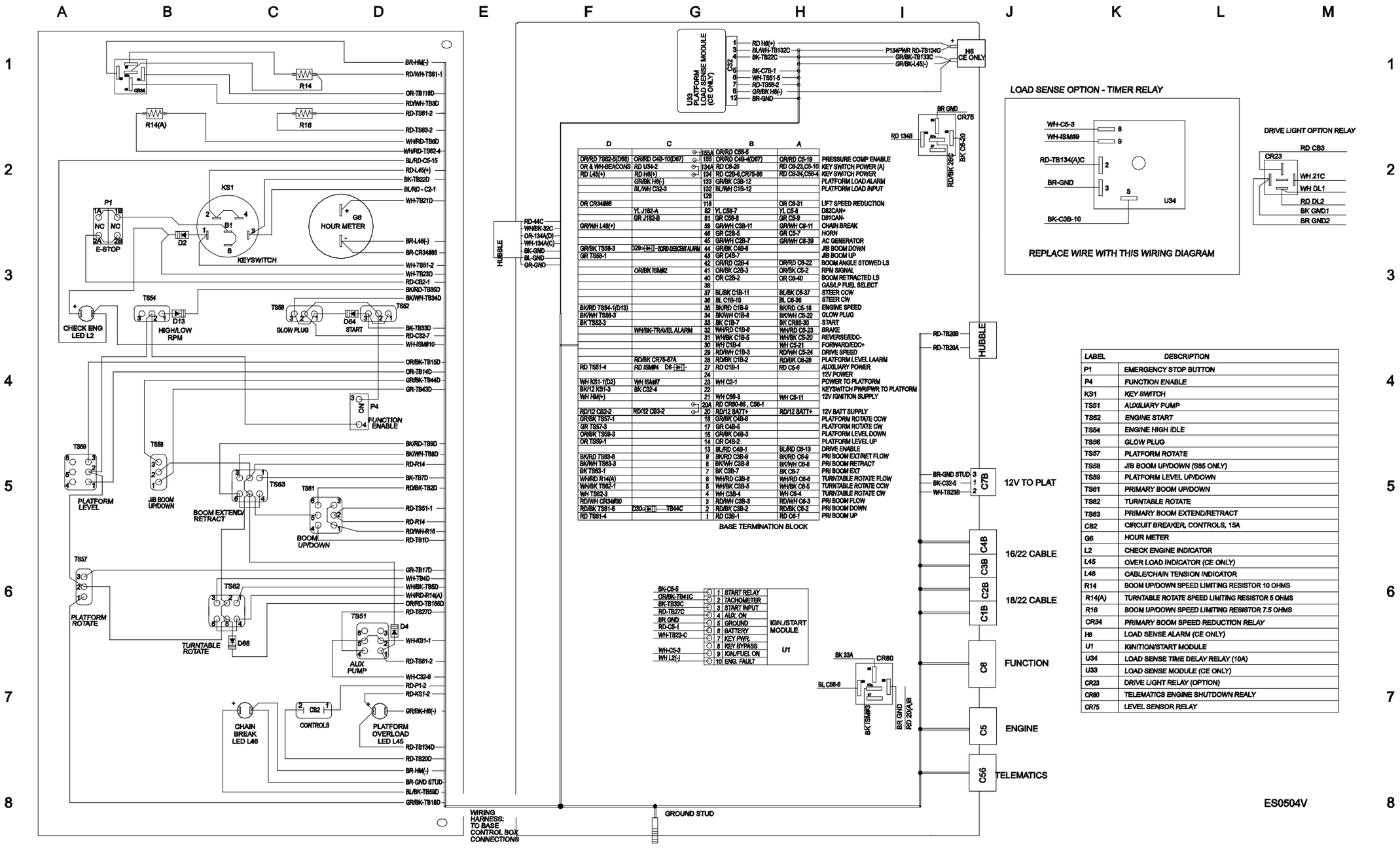
# Ground Control Box, S-80X - Deutz TD2011L04i Models (ANSI / CSA)



# Ground Control Box, S-80X

## Deutz TD2011L04i Models (ANSI / CSA)

Refer to S-80X Ground Control Box Wiring Diagram for additional wiring.




| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| K31 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH IDLE |
| TS56 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U1 | IGNITION/START MODULE |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

ES0504V

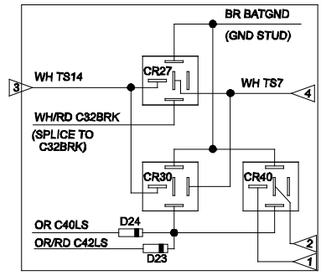
# Platform Control Box, S-80X

## Deutz TD2011L04i Models (ANSI / CSA)




### COMPONENT INDEX

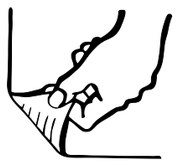
| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |



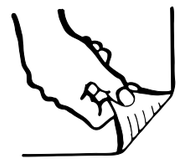

CE UNITS
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0504V

# Platform Control Box, S-80X - Deutz TD2011L04i Models (ANSI / CSA)

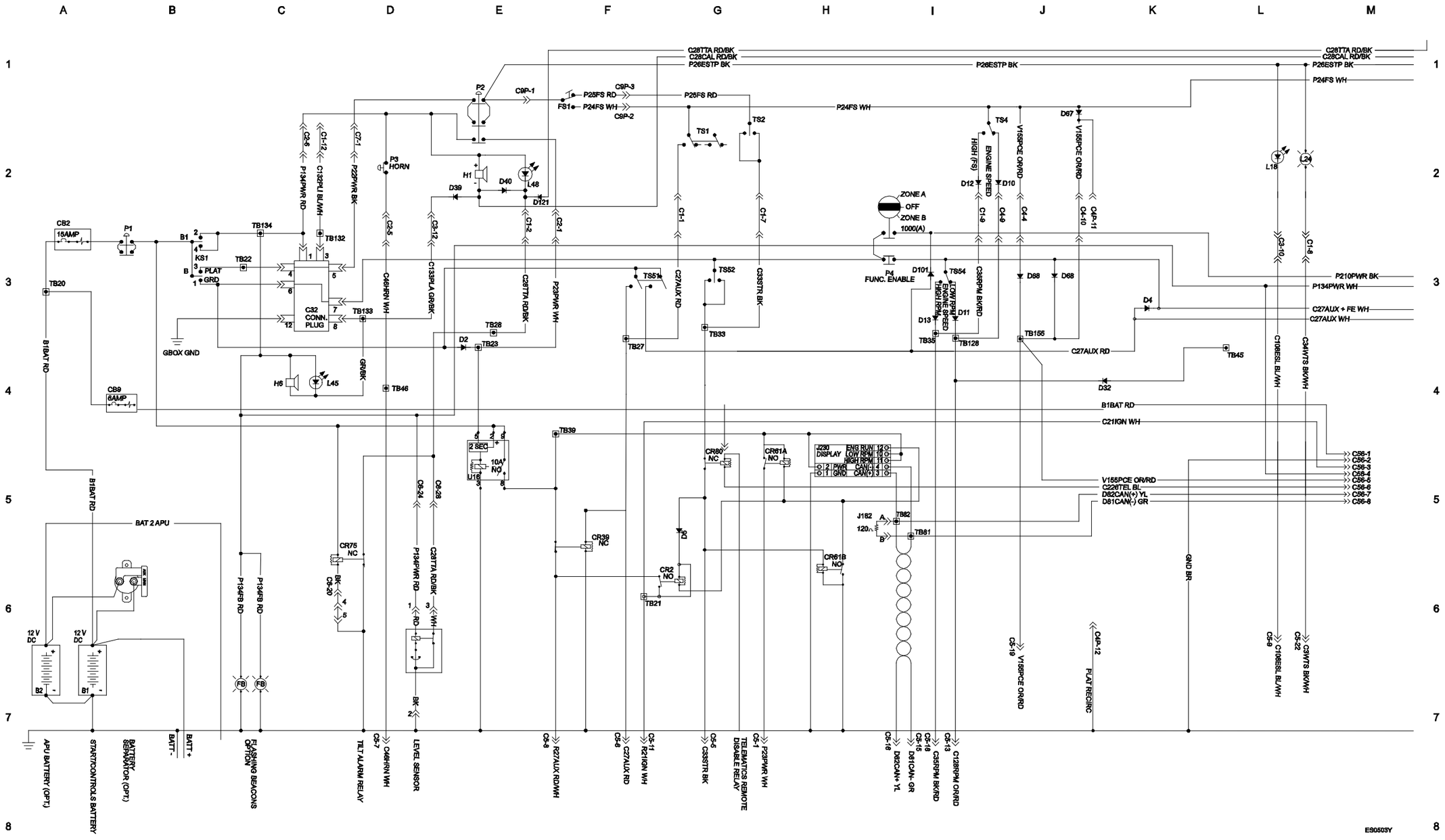


# Electrical Schematic, S-80X - Perkins 404F-22T Models (ANSI / CSA)



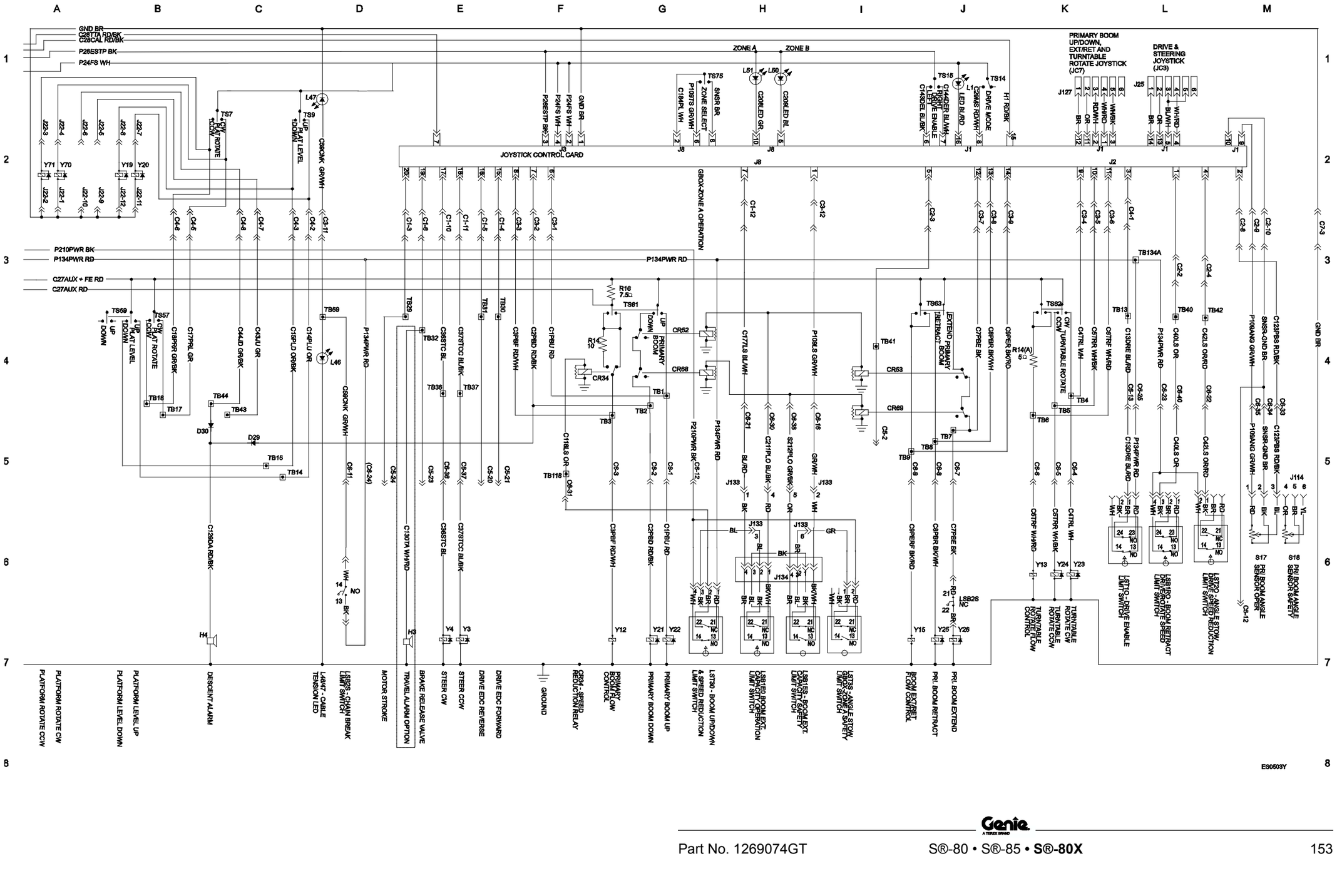
# Electrical Schematic, S-80X

## Perkins 404F-22T Models (ANSI / CSA)

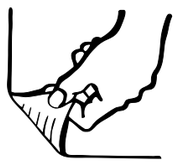


# Electrical Schematic, S-80X

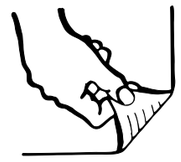
## Perkins 404F-22T Models (ANSI / CSA)



# Electrical Schematic, S-80X - Perkins 404F-22T Models (ANSI / CSA)



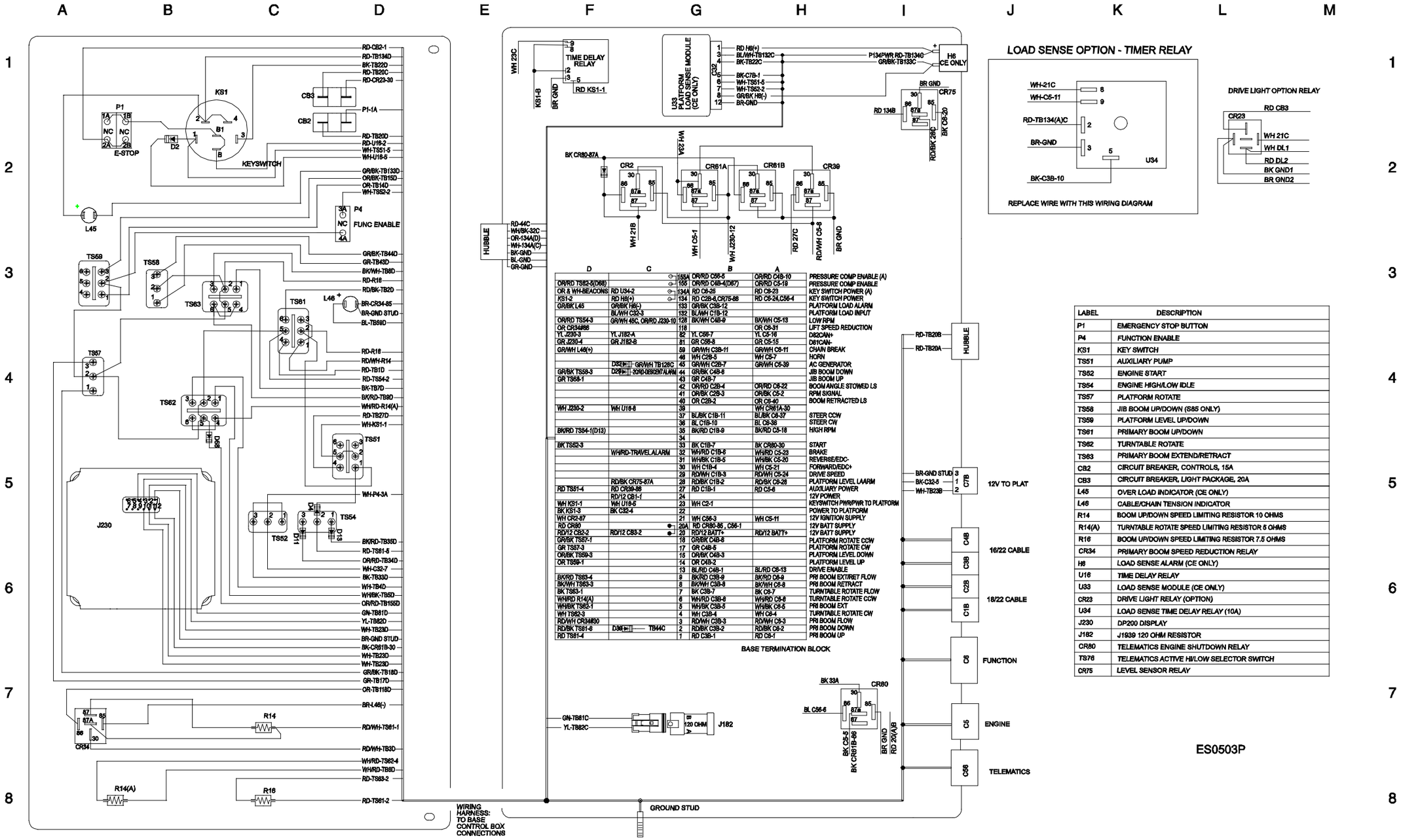
# Ground Control Box, S-80X - Perkins 404F-22T Models (ANSI / CSA)



# Ground Control Box, S-80X

## Perkins 404F-22T Models (ANSI / CSA)

Refer to S-80X Ground Control Box Wiring Diagram for additional wiring.




| D | C | B | A | |
|---|---|---|---|---|
| | | 155A | OR/RD C56-5 | OR/RD C4B-10 | PRESSURE COMP ENABLE (A) |
| OR/RD TS62-5(D68) | | 155 | OR/RD C4B-4(D67) | OR/RD C5-19 | PRESSURE COMP ENABLE |
| OR & WH-BEACONS | RD U34-2 | 134A | RD C6-26 | RD C6-23 | KEY SWITCH POWER (A) |
| KS1-2 | RD H8(+) | 134 | RD C2B-8,CR75-86 | RD C6-24,C56-4 | KEY SWITCH POWER |
| GR/BK L45 | GR/BK H8(-) | 133 | GR/BK C3B-12 | | PLATFORM LOAD ALARM |
| | BL/WH C32-3 | 132 | BL/WH C1B-12 | | PLATFORM LOAD INPUT |
| OR/RD TS54-3 | GR/WH 45C, OR/RD J230-10 | 128 | BK/WH C4B-9 | BK/WH C5-13 | LOW RPM |
| OR CR34#86 | | 118 | | OR C5-51 | LIFT SPEED REDUCTION |
| YL J230-3 | YL J182-A | 82 | YL C56-7 | YL C5-16 | D82CAN+ |
| GR J230-4 | GR J182-B | 81 | GR C56-8 | GR C5-15 | D81CAN- |
| GR/WH L46(+) | | 59 | GR/WH C3B-11 | GR/WH C6-11 | CHAIN BREAK |
| | | 46 | WH C2B-5 | WH C5-7 | HORN |
| | D82 GR/WH TB128C | 45 | GR/WH C2B-7 | GR/WH C6-39 | AC GENERATOR |
| GR/BK TS59-3 | D29 20/40-DESCENT ALARM | 44 | GR/BK C4B-8 | | JIB BOOM DOWN |
| GR TS58-1 | | 43 | GR C4B-7 | | JIB BOOM UP |
| | | 42 | OR/RD C2B-4 | OR/RD C6-22 | BOOM ANGLE STOWED LS |
| | | 41 | OR/BK C2B-3 | OR/BK C5-2 | RPM SIGNAL |
| | | 40 | OR C2B-2 | OR C6-40 | BOOM RETRACTED LS |
| WH J230-2 | WH U16-8 | 39 | | WH CR61A-30 | |
| | | 37 | BL/BK C1B-11 | BL/BK C4-37 | STEER CCW |
| | | 36 | BL C1B-10 | BL C6-36 | STEER CW |
| BK/RD TS54-1(D13) | | 35 | BK/RD C1B-9 | BK/RD C5-18 | HIGH RPM |
| | | 34 | | | |
| BK TS52-3 | | 33 | BK C1B-7 | BK CR80-30 | START |
| | WH/RD-TRAVEL ALARM | 32 | WH/RD C1B-6 | WH/RD C5-23 | BRAKE |
| | | 31 | WH/BK C1B-5 | WH/BK C5-20 | REVERSE/EDC- |
| | | 30 | WH C1B-4 | WH C5-21 | FORWARD/EDC+ |
| | | 29 | RD/WH C1B-3 | RD/WH C5-24 | DRIVE SPEED |
| | RD/BK CR75-87A | 28 | RD/BK C1B-2 | RD/BK C6-28 | PLATFORM LEVEL LAARM |
| RD TS51-4 | RD CR39-86 | 27 | RD C1B-1 | RD C5-6 | AUXILIARY POWER |
| | RD/12 CB1-1 | 24 | | | 12V POWER |
| WH KS1-1 | WH U16-5 | 23 | WH C2-1 | | KEYSWITCH PWR/PWR TO PLATFORM |
| BK KS1-3 | BK C32-4 | 22 | | | POWER TO PLATFORM |
| WH CR2-87 | | 21 | WH C56-3 | WH C5-11 | 12V IGNITION SUPPLY |
| RD CR80 | | 20A | RD CR80-85 , C56-1 | | 12V BATT SUPPLY |
| RD/12 CB2-2 | RD/12 CB3-2 | 20 | RD/12 BATT+ | RD/12 BATT+ | 12V BATT SUPPLY |
| GR/BK TS57-1 | | 18 | GR/BK C4B-8 | | PLATFORM ROTATE CCW |
| GR TS57-3 | | 17 | GR C4B-5 | | PLATFORM ROTATE CW |
| OR/BK TS59-3 | | 15 | OR/BK C4B-3 | | PLATFORM LEVEL DOWN |
| OR TS59-1 | | 14 | OR C4B-2 | | PLATFORM LEVEL UP |
| | | 13 | BL/RD C4B-1 | BL/RD C6-13 | DRIVE ENABLE |
| BK/RD TS63-4 | | 9 | BK/RD C3B-9 | BK/RD C6-9 | PRI BOOM EXT/RET FLOW |
| BK/WH TS63-3 | | 8 | BK/WH C3B-8 | BK/WH C6-8 | PRI BOOM RETRACT |
| BK TS63-1 | | 7 | BK C3B-7 | BK C6-7 | TURNTABLE ROTATE FLOW |
| WH/RD R14(A) | | 6 | WH/RD C3B-6 | WH/RD C6-6 | TURNTABLE ROTATE CCW |
| WH/BK TS63-1 | | 5 | WH/BK C3B-5 | WH/BK C6-5 | PRI BOOM EXT |
| WH TS52-3 | | 4 | WH C3B-4 | WH C6-4 | TURNTABLE ROTATE CW |
| RD/WH CR34#30 | | 3 | RD/WH C3B-3 | RD/WH C6-3 | PRI BOOM FLOW |
| RD/BK TS81-6 | D30 TB44C | 2 | RD/BK C3B-2 | RD/BK C6-2 | PRI BOOM DOWN |
| RD TS81-4 | | 1 | RD C3B-1 | RD C6-1 | PRI BOOM UP |

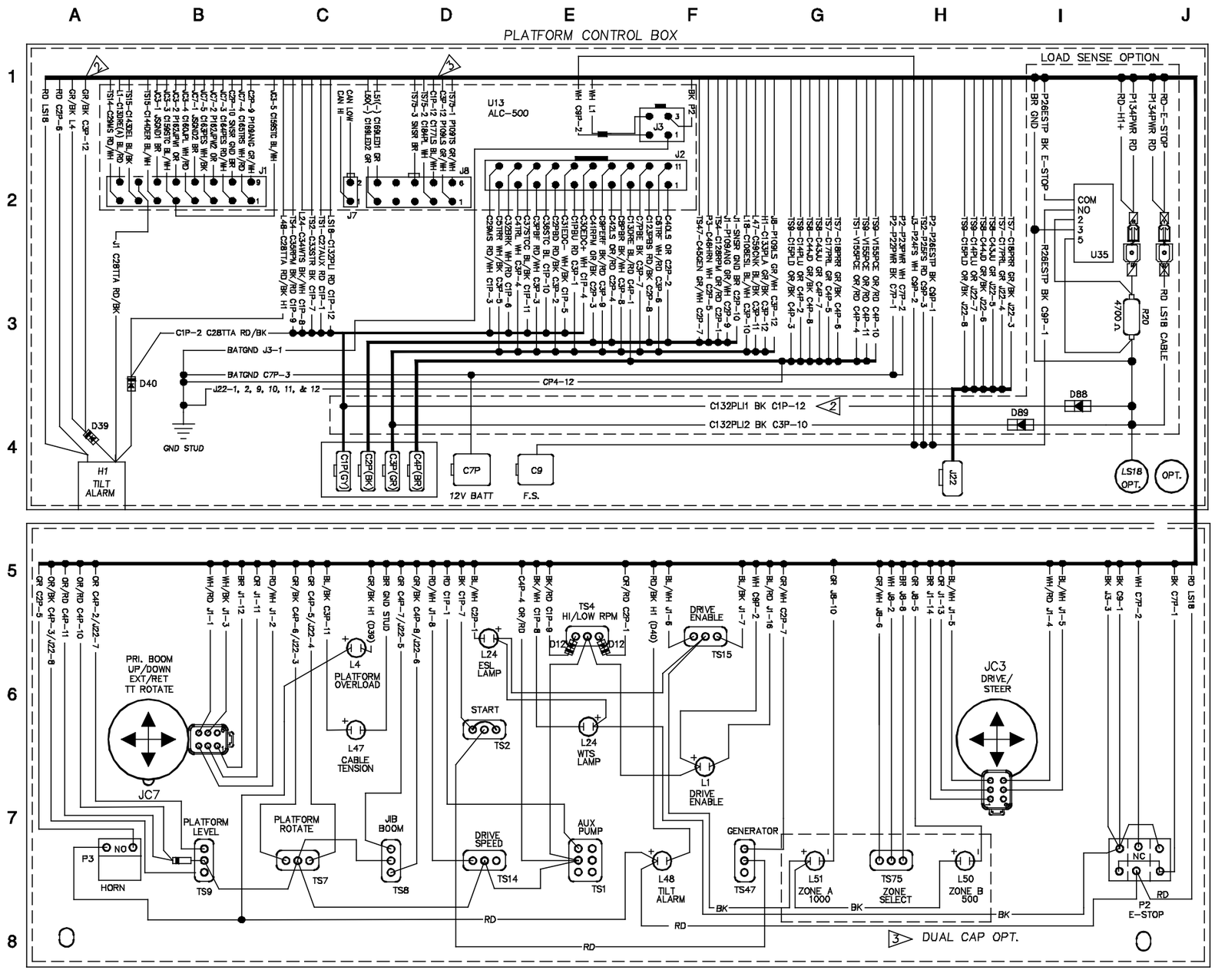
BASE TERMINATION BLOCK

| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH/LOW IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| CB3 | CIRCUIT BREAKER, LIGHT PACKAGE, 20A |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U16 | TIME DELAY RELAY |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| J230 | DP200 DISPLAY |
| J182 | J1939 120 OHM RESISTOR |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |
| TS76 | TELEMATICS ACTIVE HI/LOW SELECTOR SWITCH |
| CR75 | LEVEL SENSOR RELAY |

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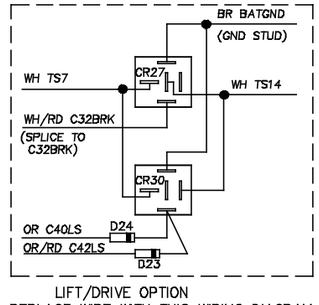
# Platform Control Box, S-80X

## Perkins 404F-22T Models (ANSI / CSA)




### COMPONENT INDEX

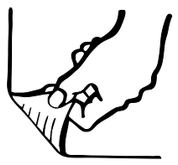
| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| 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) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |



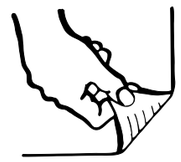

LIFT/DRIVE OPTION
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0503J

# Platform Control Box, S-80X - Perkins 404F-22T Models (ANSI / CSA)

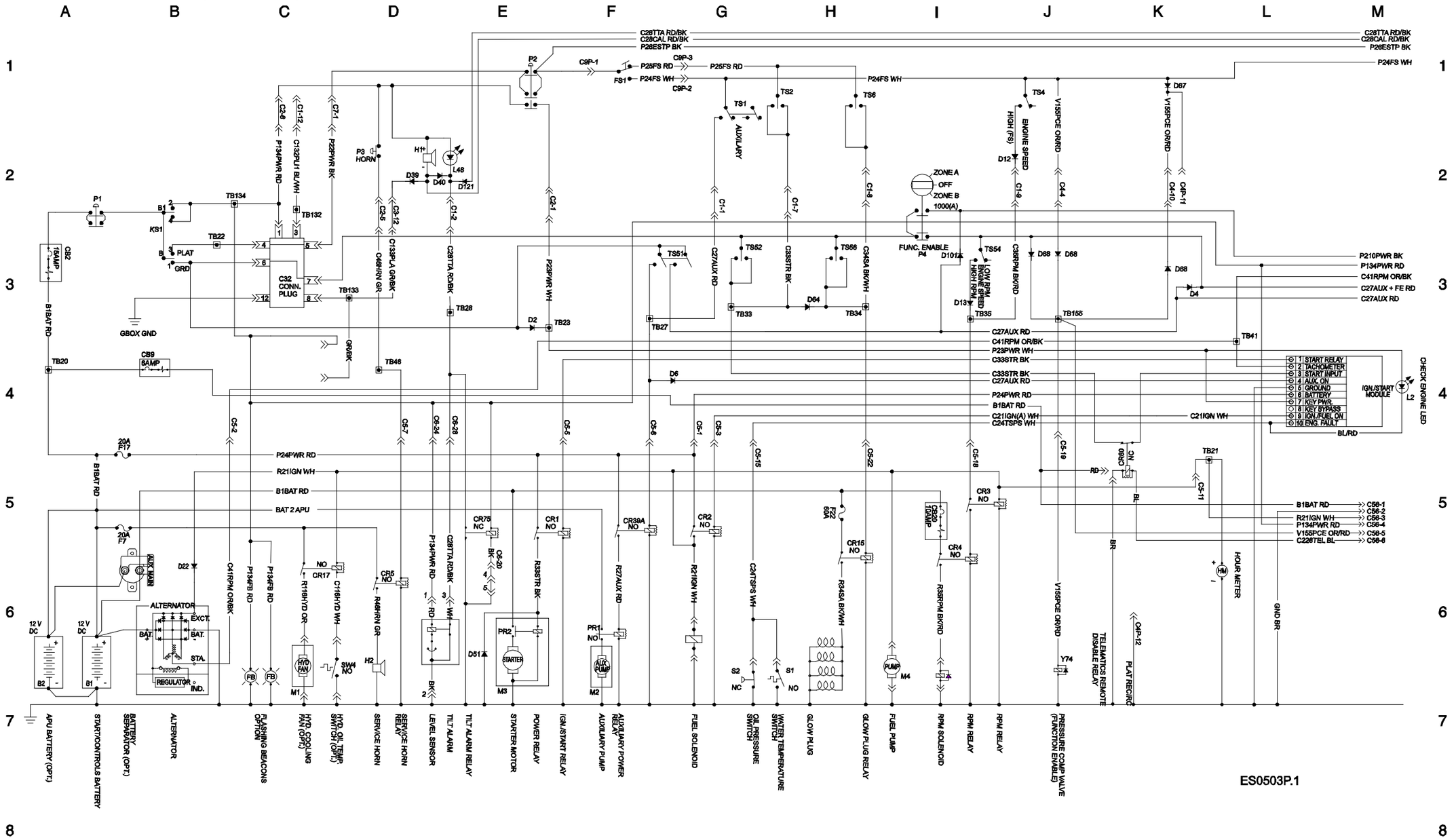


# Electrical Schematic, S-80X - Perkins 804D-33 Models (ANSI / CSA)



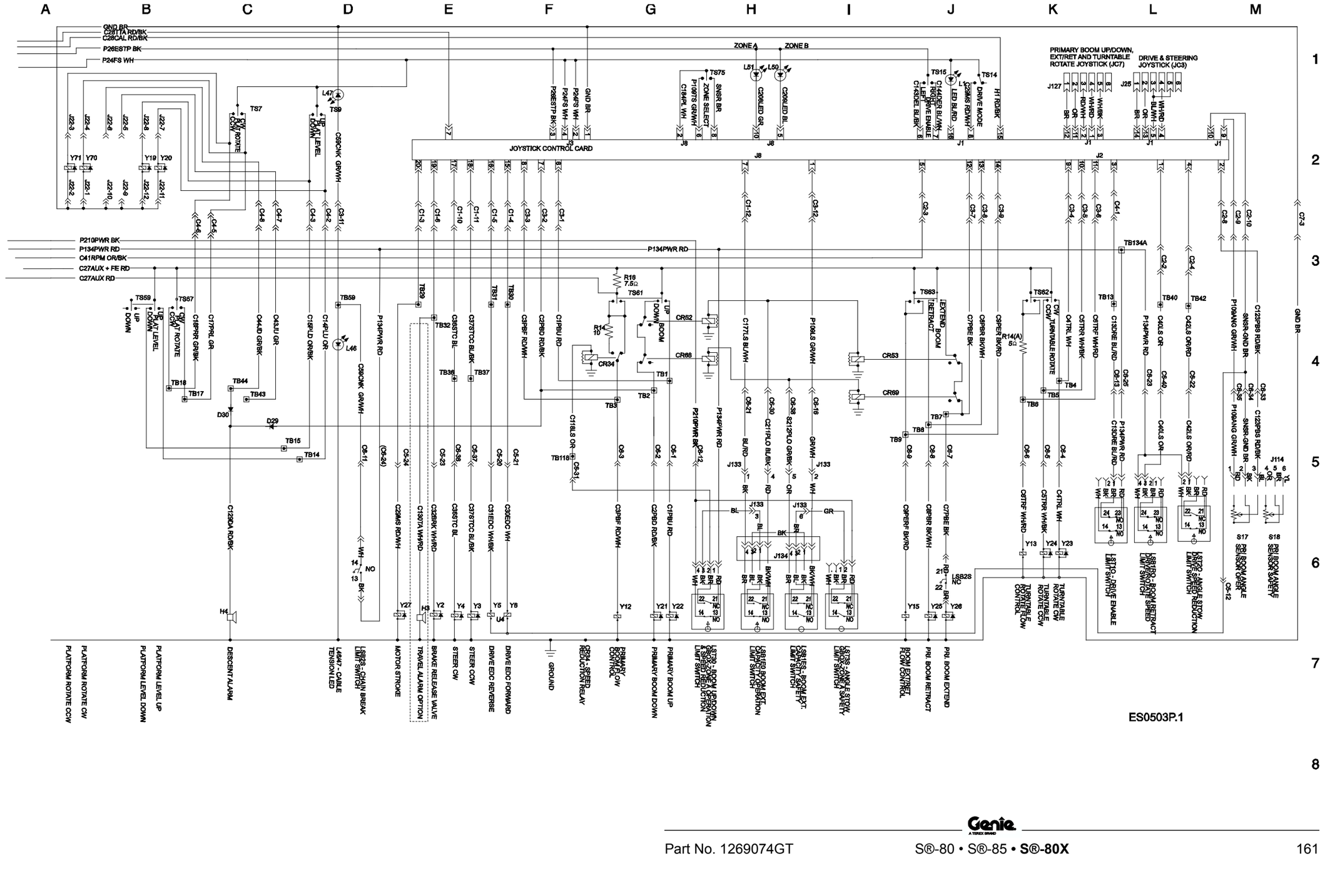
# Electrical Schematic, S-80X

## Perkins 804D-33 Models (ANSI / CSA)

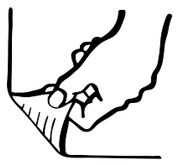


# Electrical Schematic, S-80X

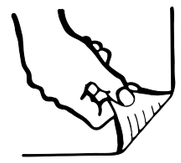
## Perkins 804D-33 Models (ANSI / CSA)



# Electrical Schematic, S-80X - Perkins 804D-33 Models (ANSI / CSA)



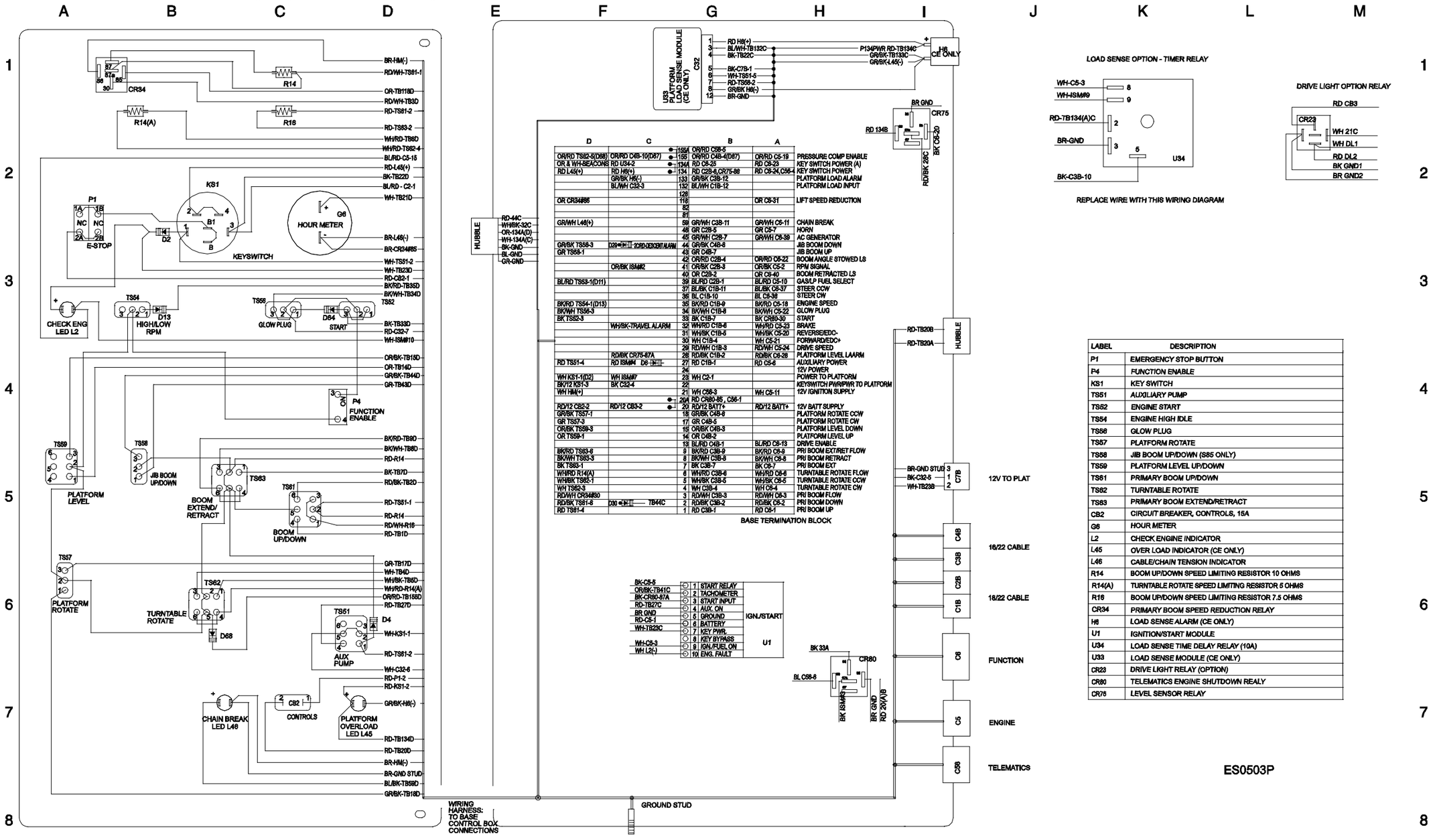
# Ground Control Box, S-80X - Perkins 804D-33 Models (ANSI / CSA)



# Ground Control Box, S-80X

## Perkins 804D-33 Models (ANSI / CSA)

Refer to S-80X Ground Control Box Wiring Diagram for additional wiring.

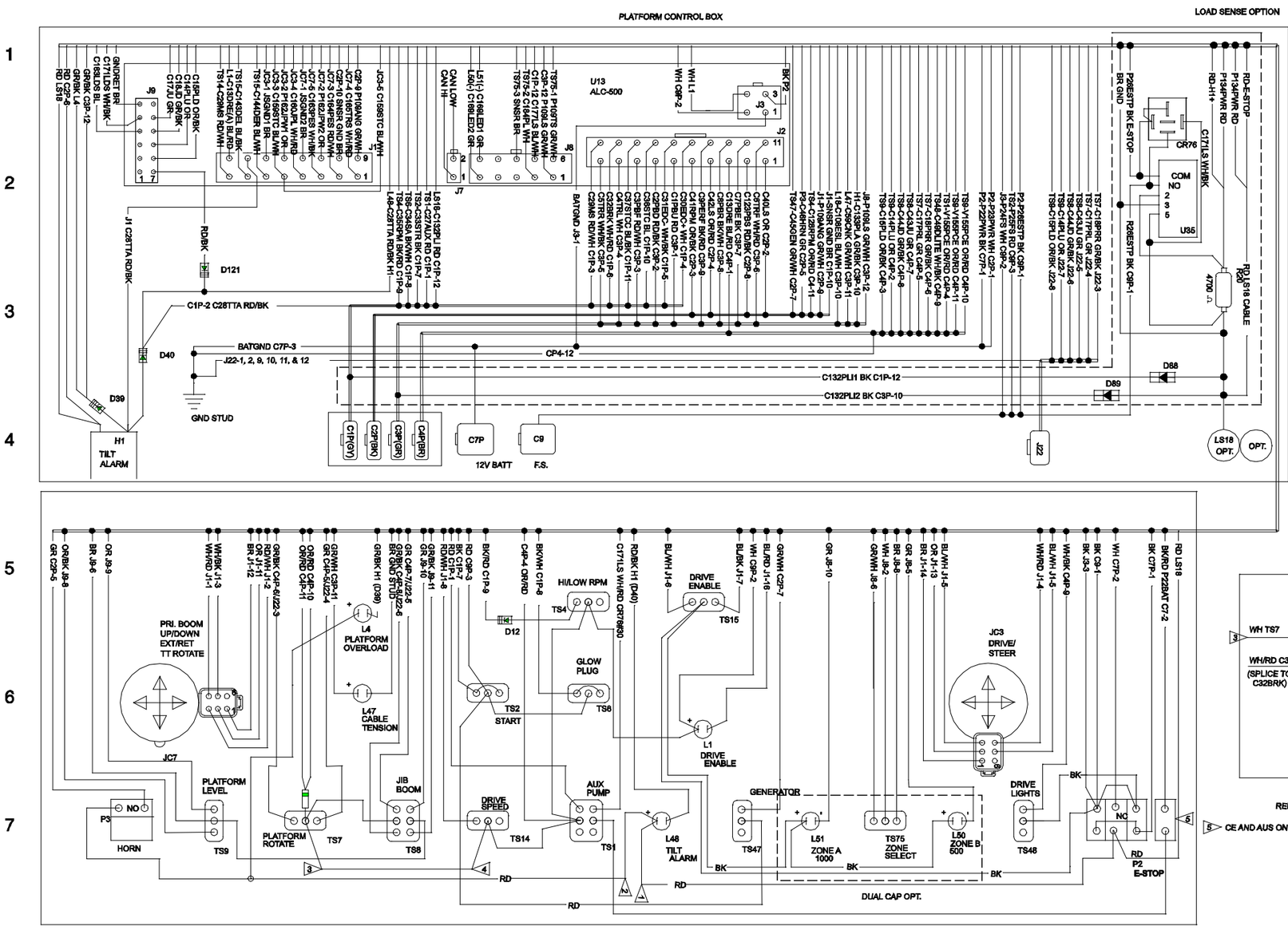



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH IDLE |
| TS56 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U1 | IGNITION/START MODULE |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

ES0503P

# Platform Control Box, S-80X

## Perkins 804D-33 Models (ANSI / CSA)

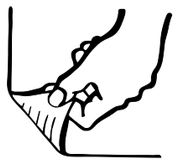



### COMPONENT INDEX

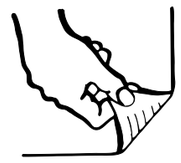
| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| CR27 | LIFT/DRIVE SELECT RELAY |
| CR30 | MACHINE STOWED BYPASS RELAY |
| CR40 | CE TILT LED OUT OF STOWED RELAY |
| CR76 | LOAD SENSE RECOVERY RELAY |

ES0503P

# Platform Control Box, S-80X - Perkins 804D-33 Models (ANSI / CSA)

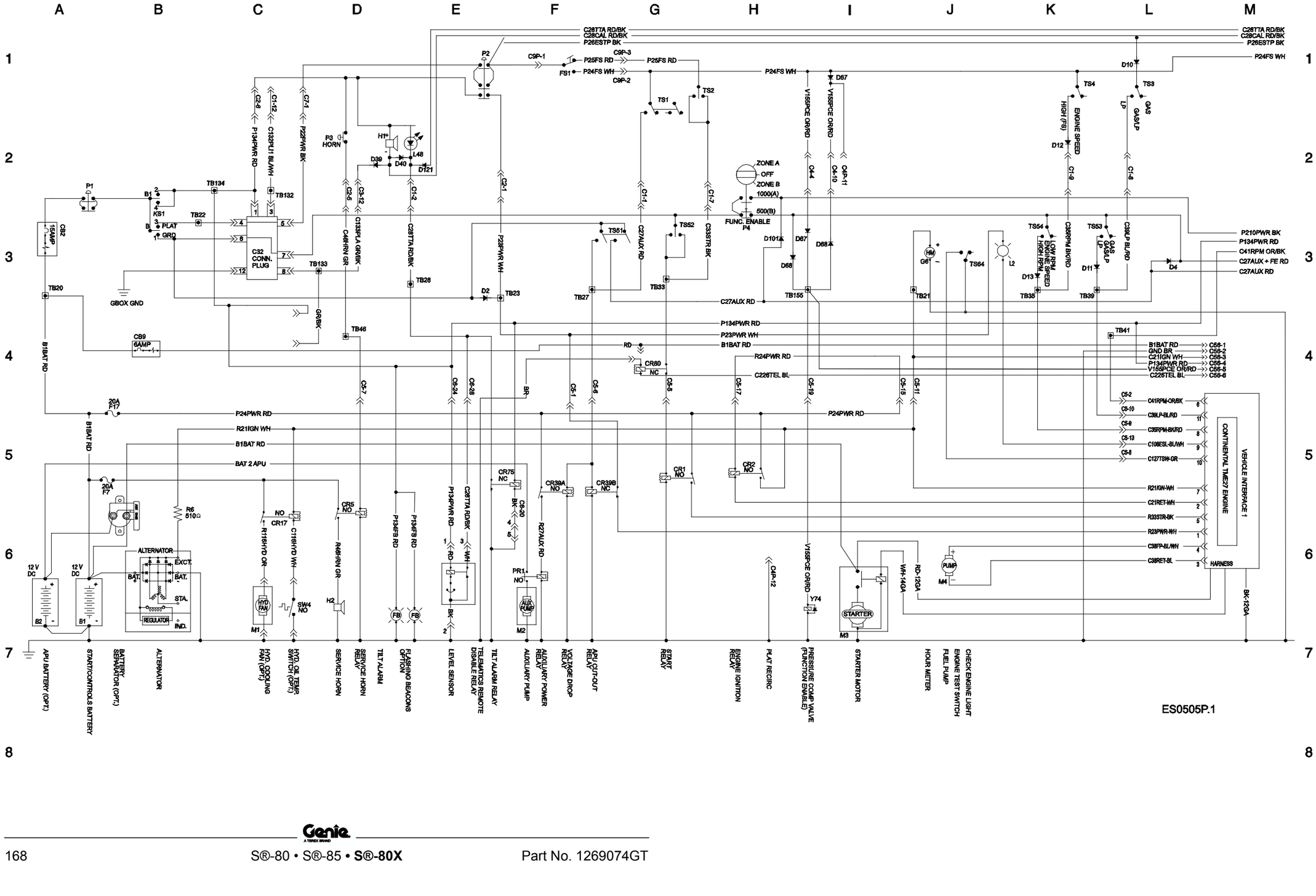


# Electrical Schematic, S-80X - Continental TME27 Models (ANSI / CSA)



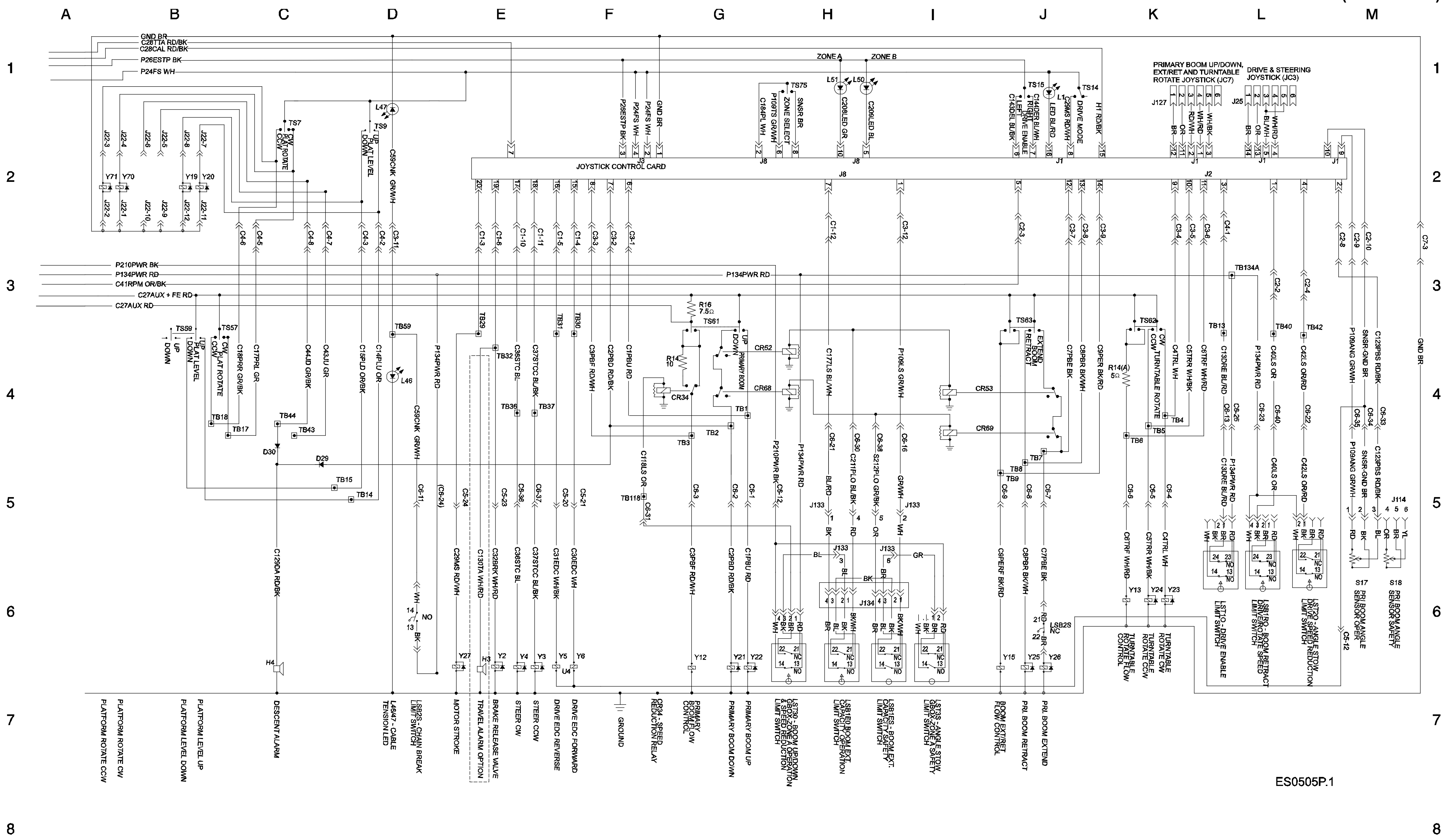
# Electrical Schematic, S-80X

## Continental TME27 Models (ANSI / CSA)

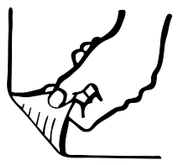


# Electrical Schematic, S-80X

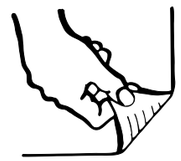
## Continental TME27 Models (ANSI / CSA)



# Electrical Schematic, S-80X - Continental TME27 Models (ANSI / CSA)



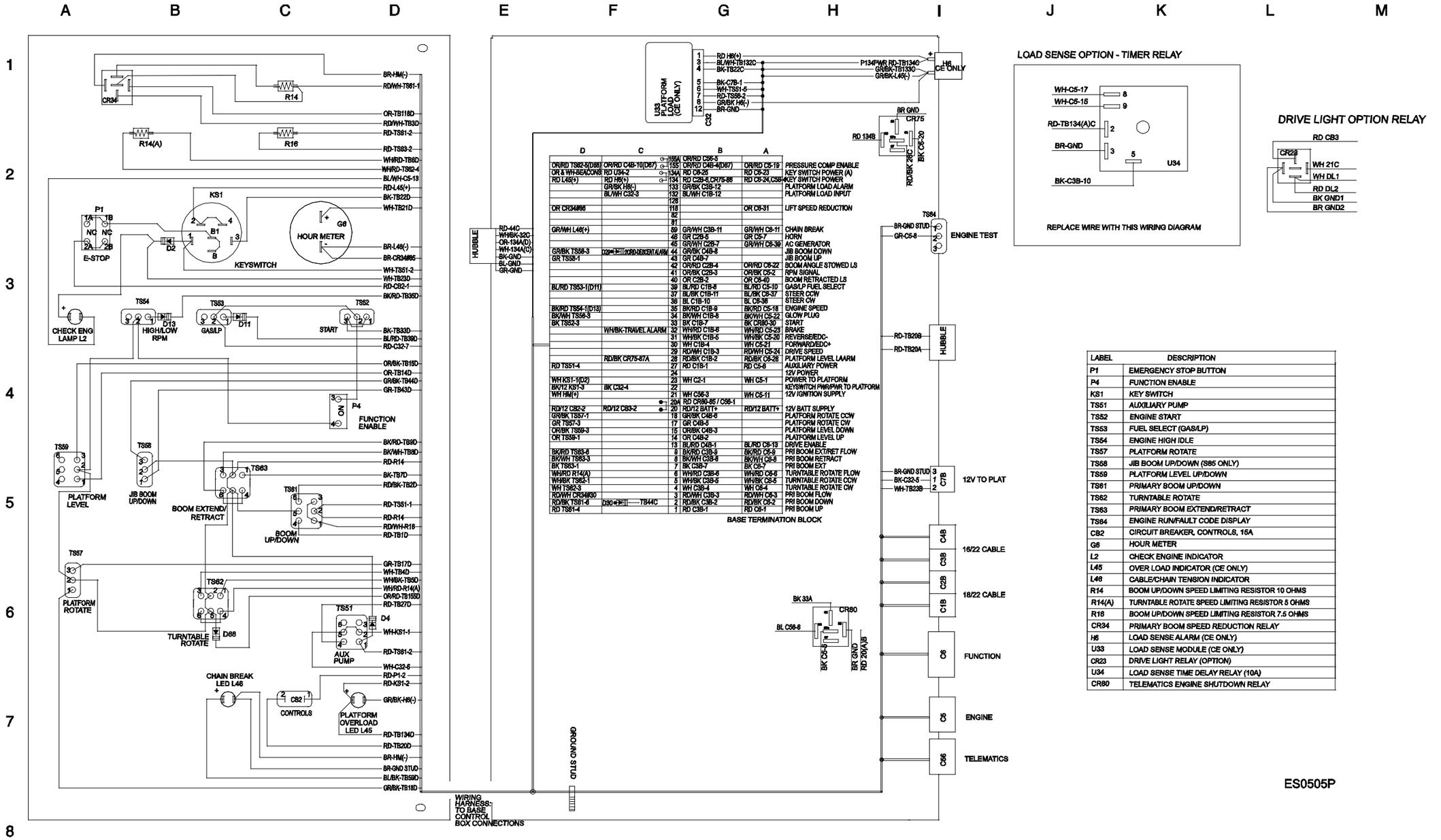
# Ground Control Box, S-80X - Continental TME27 Models (ANSI / CSA)



# Ground Control Box, S-80X

## Continental TME27 Models (ANSI / CSA)

Refer to S-80X Ground Control Box Wiring Diagram for additional wiring.

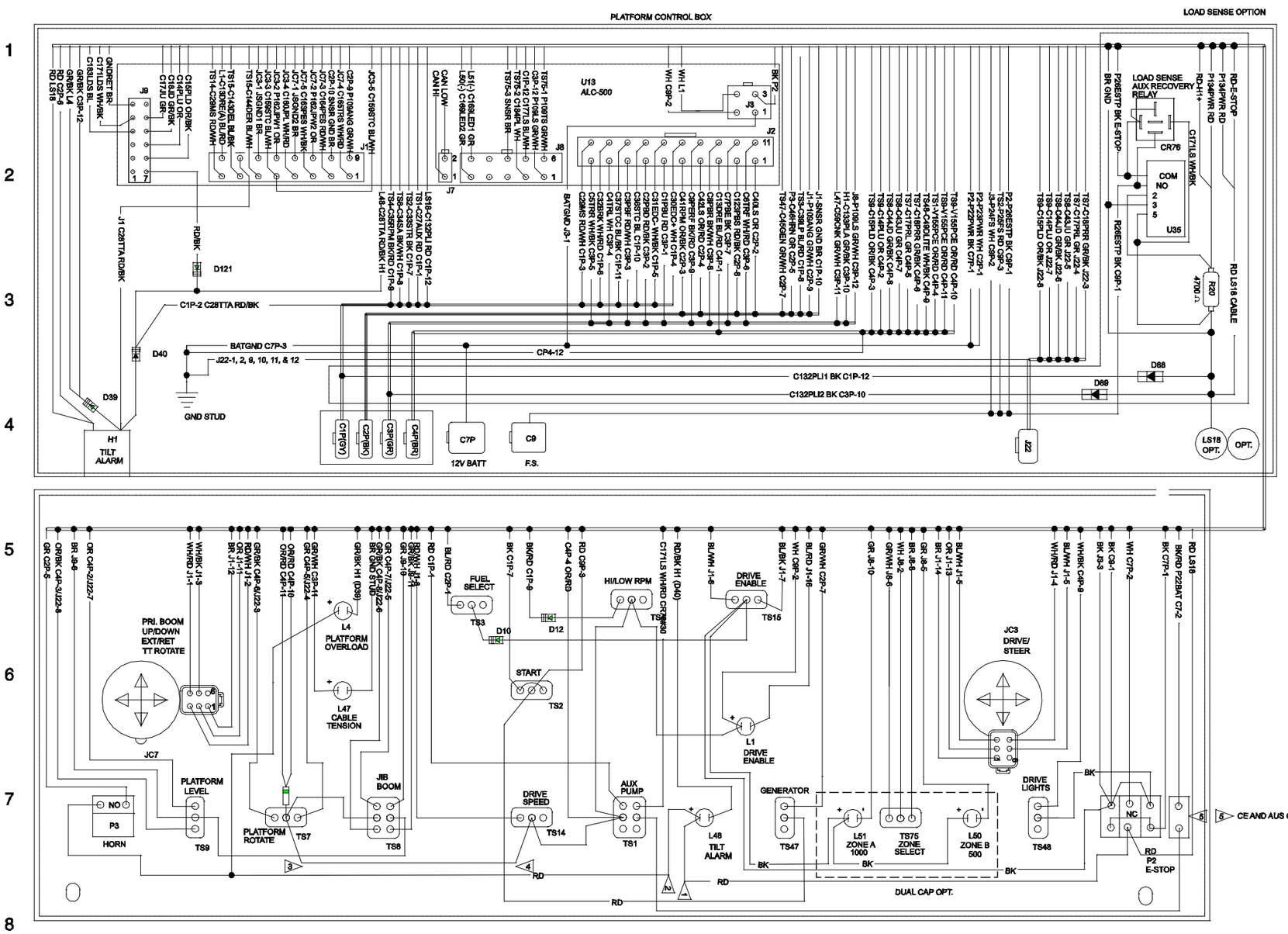



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS53 | FUEL SELECT (GAS/LP) |
| TS54 | ENGINE HIGH IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| TS64 | ENGINE RUN/FAULT CODE DISPLAY |
| CB2 | CIRCUIT BREAKER, CONTROL8, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |

ES0505P

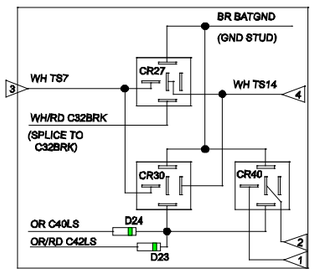
# Platform Control Box, S-80X

## Continental TME27 Models (ANSI / CSA)




### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

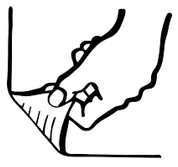



CE UNITS

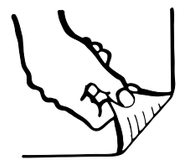
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0505P

# Platform Control Box, S-80X - Continental TME27 Models (ANSI / CSA)

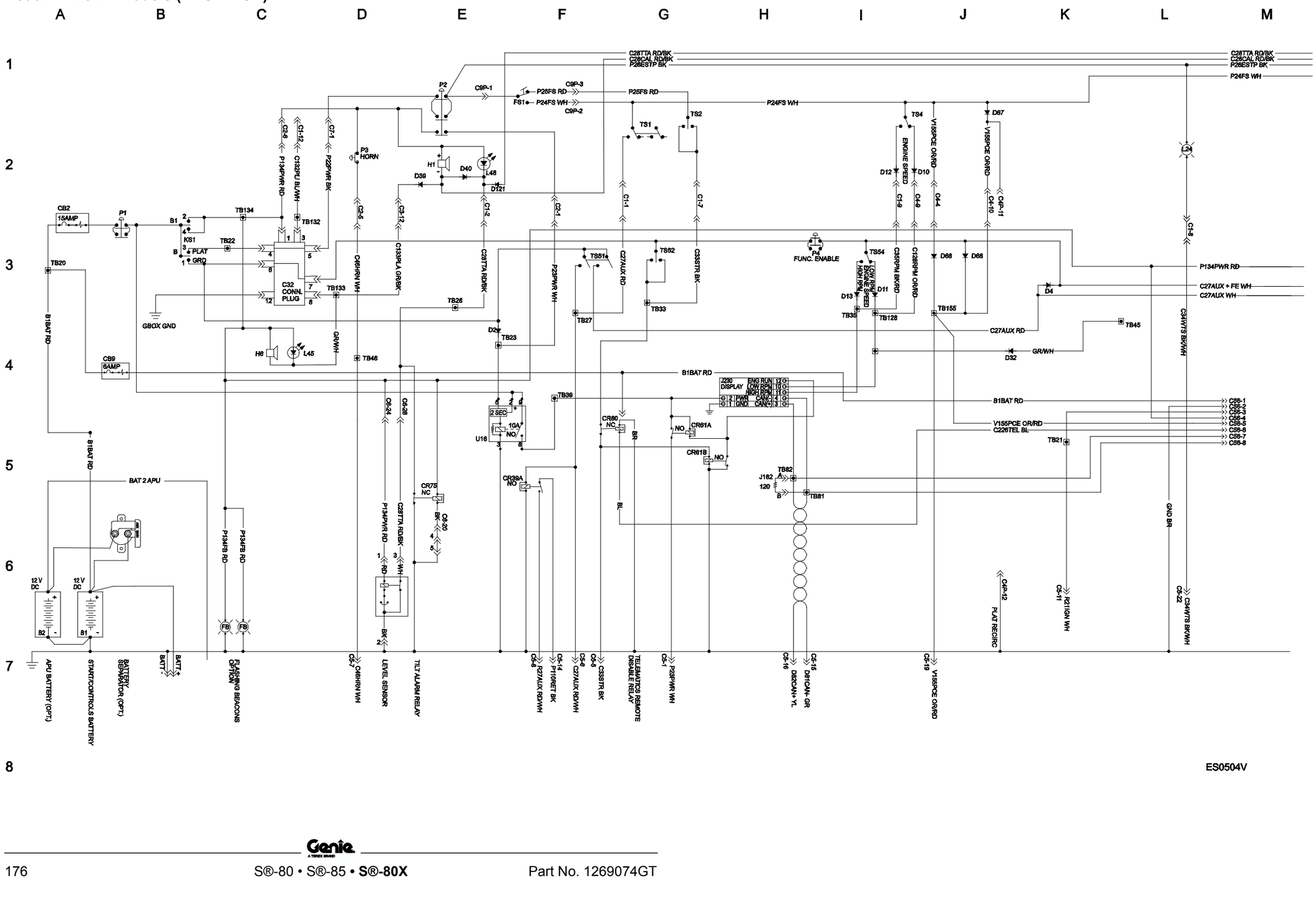


# Electrical Schematic, S-80 • S-85 - Deutz TD2.9 L4 Models (ANSI / CSA)



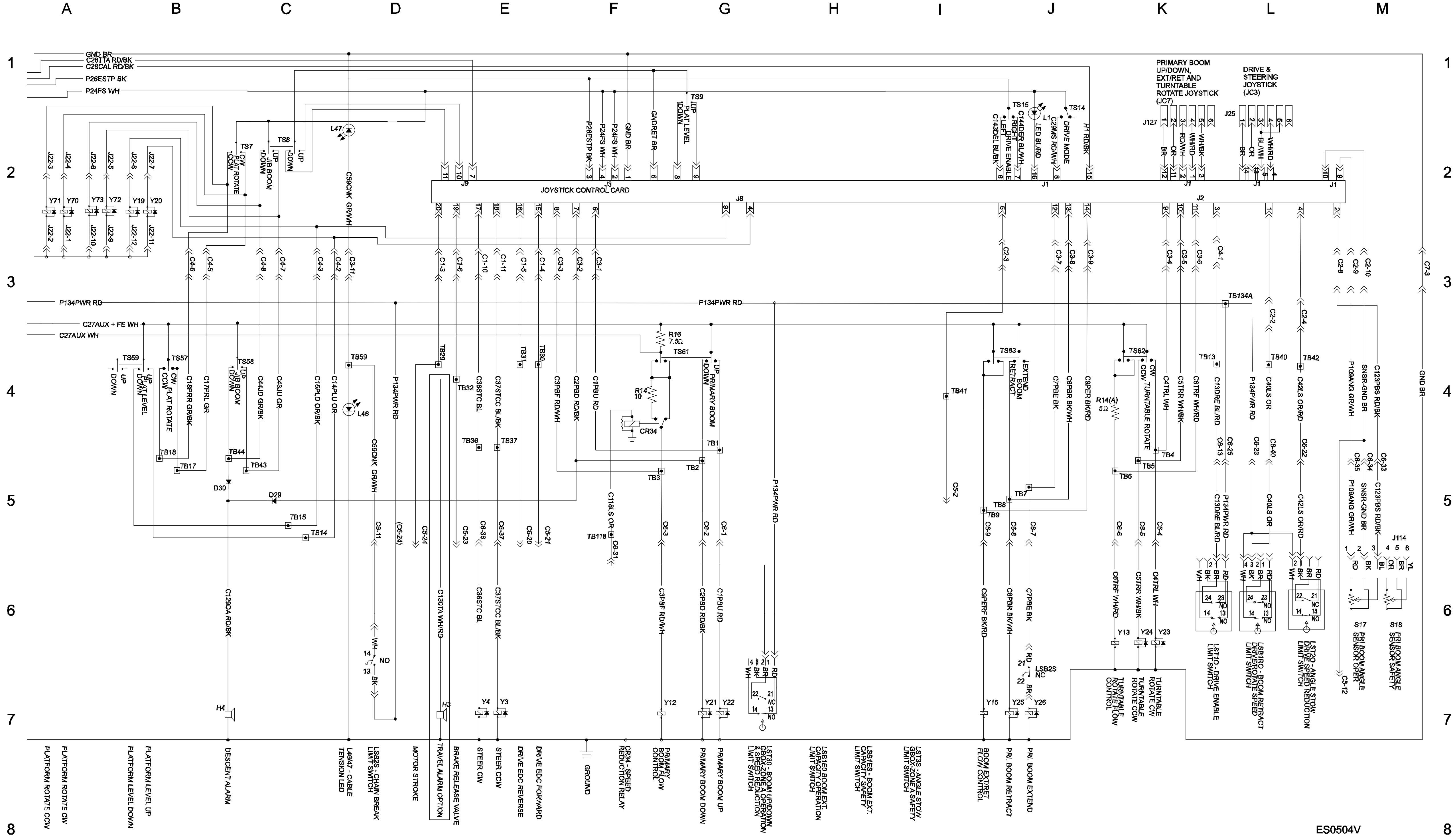
# Electrical Schematic, S-80 • S-85

## Deutz TD2.9 L4 Models (ANSI / CSA)

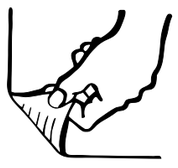


## Electrical Schematic, S-80 • S-85

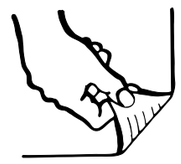
### Deutz TD2.9 L4 Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85 - Deutz TD2.9 L4 Models (ANSI / CSA)

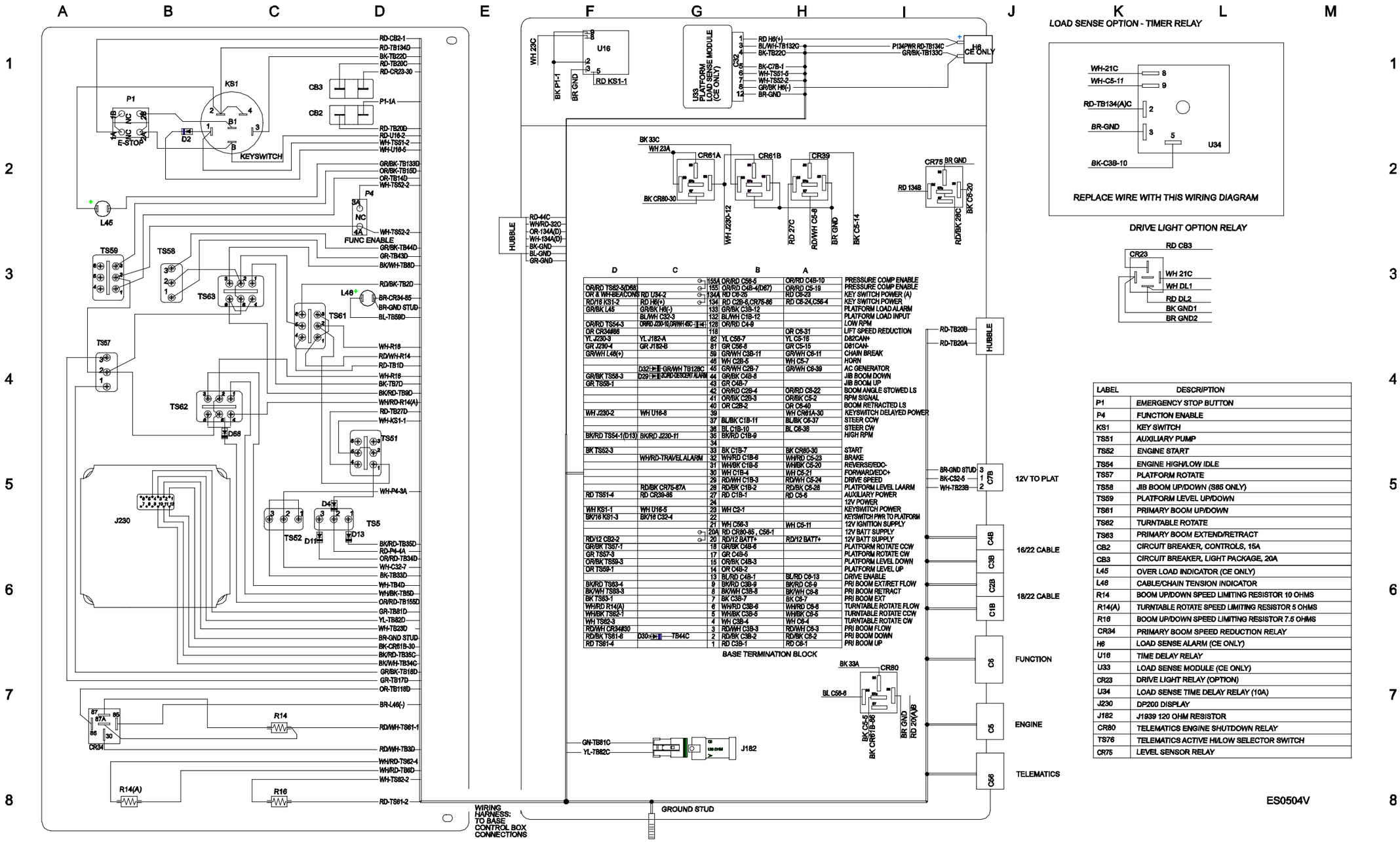


# Ground Control Box, S-80 • S-85 - Deutz TD2.9 L4 Models (ANSI / CSA)



# Ground Control Box, S-80 • S-85

## Deutz TD2.9 L4 Models (ANSI / CSA)

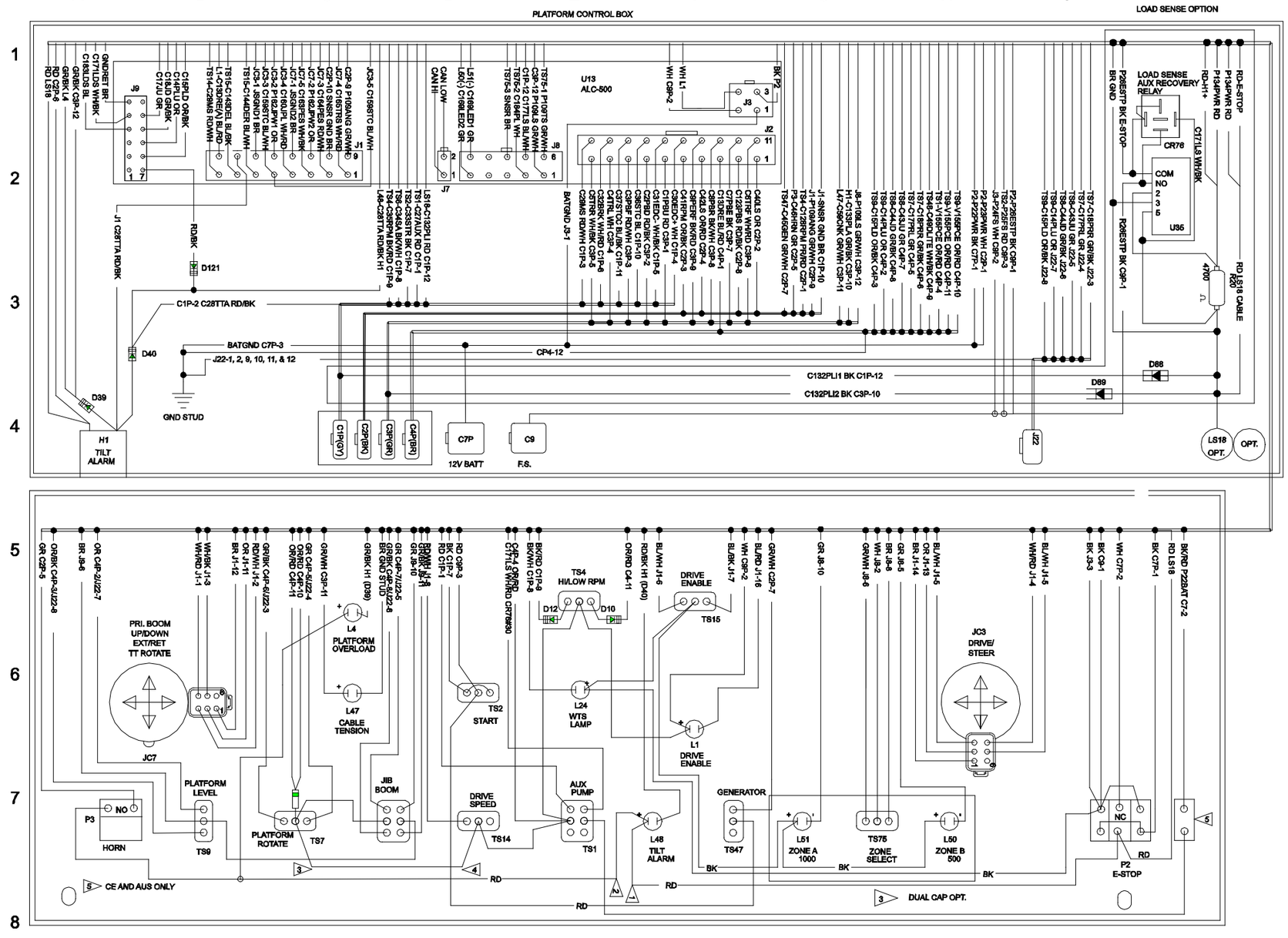



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH/LOW IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| CB3 | CIRCUIT BREAKER, LIGHT PACKAGE, 20A |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U16 | TIME DELAY RELAY |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| J230 | DP200 DISPLAY |
| J182 | J1939 120 OHM RESISTOR |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |
| TS76 | TELEMATICS ACTIVE HI/LOW SELECTOR SWITCH |
| CR75 | LEVEL SENSOR RELAY |

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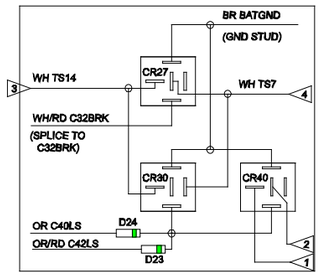
# Platform Control Box, S-80 • S-85

## Deutz TD2.9 L4 Models (ANSI / CSA)




### COMPONENT INDEX

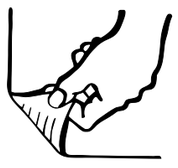
| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| TS76 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |



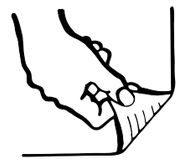

CE UNITS
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0504V

# Platform Control Box, S-80 • S-85 - Deutz TD2.9 L4 Models (ANSI / CSA)

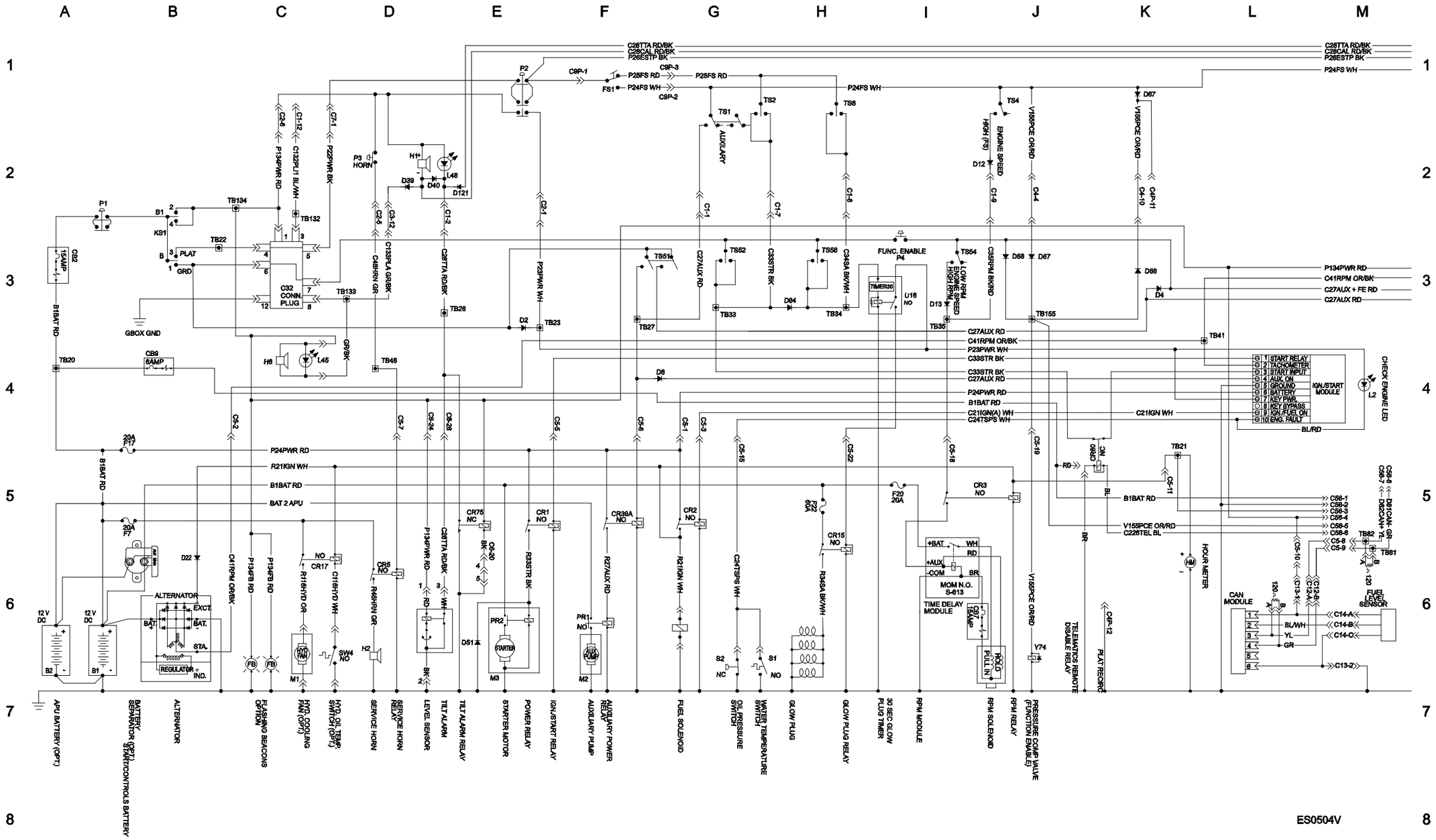


# Electrical Schematic, S-80 • S-85 - Deutz TD2011L04i Models (ANSI / CSA)



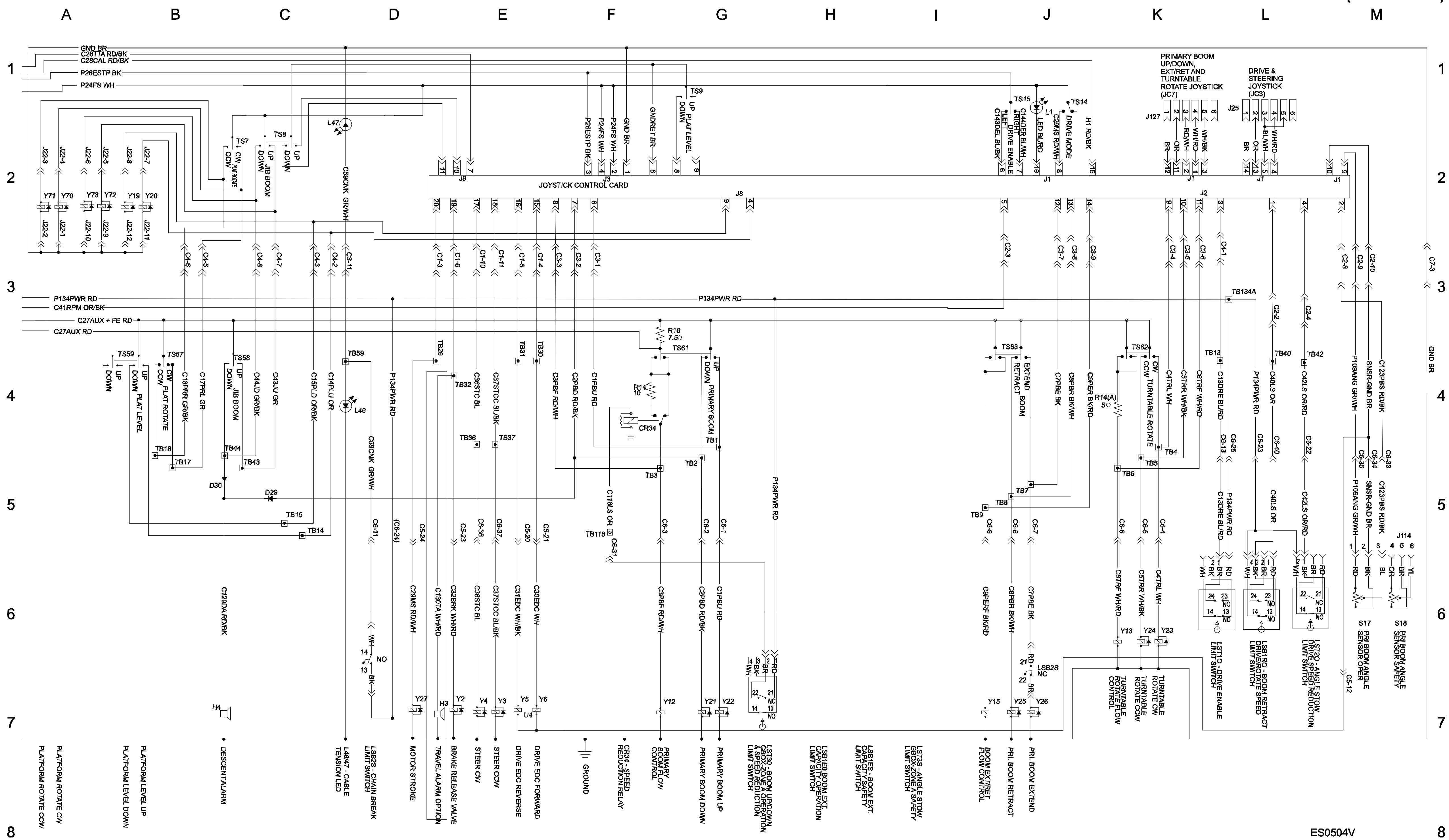
# Electrical Schematic, S-80 • S-85

## Deutz TD2011L04i Models (ANSI / CSA)

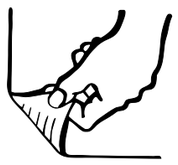


# Electrical Schematic, S-80 • S-85

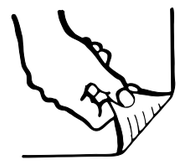
## Deutz TD2011L04i Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85 - Deutz TD2011L04i Models (ANSI / CSA)

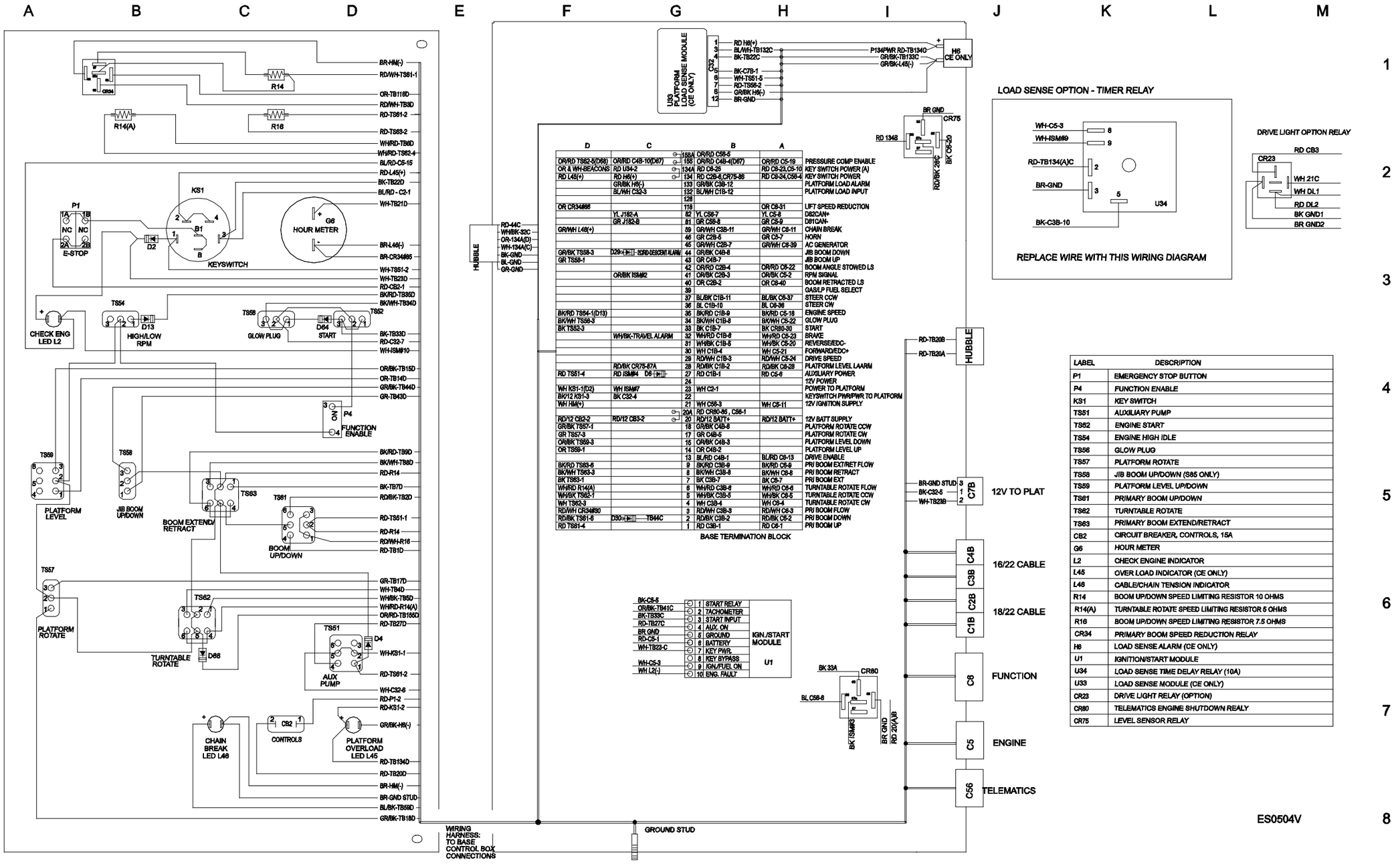


# Ground Control Box, S-80 • S-85 - Deutz TD2011L04i Models (ANSI / CSA)



# Ground Control Box, S-80 • S-85

## Deutz TD2011L04i Models (ANSI / CSA)

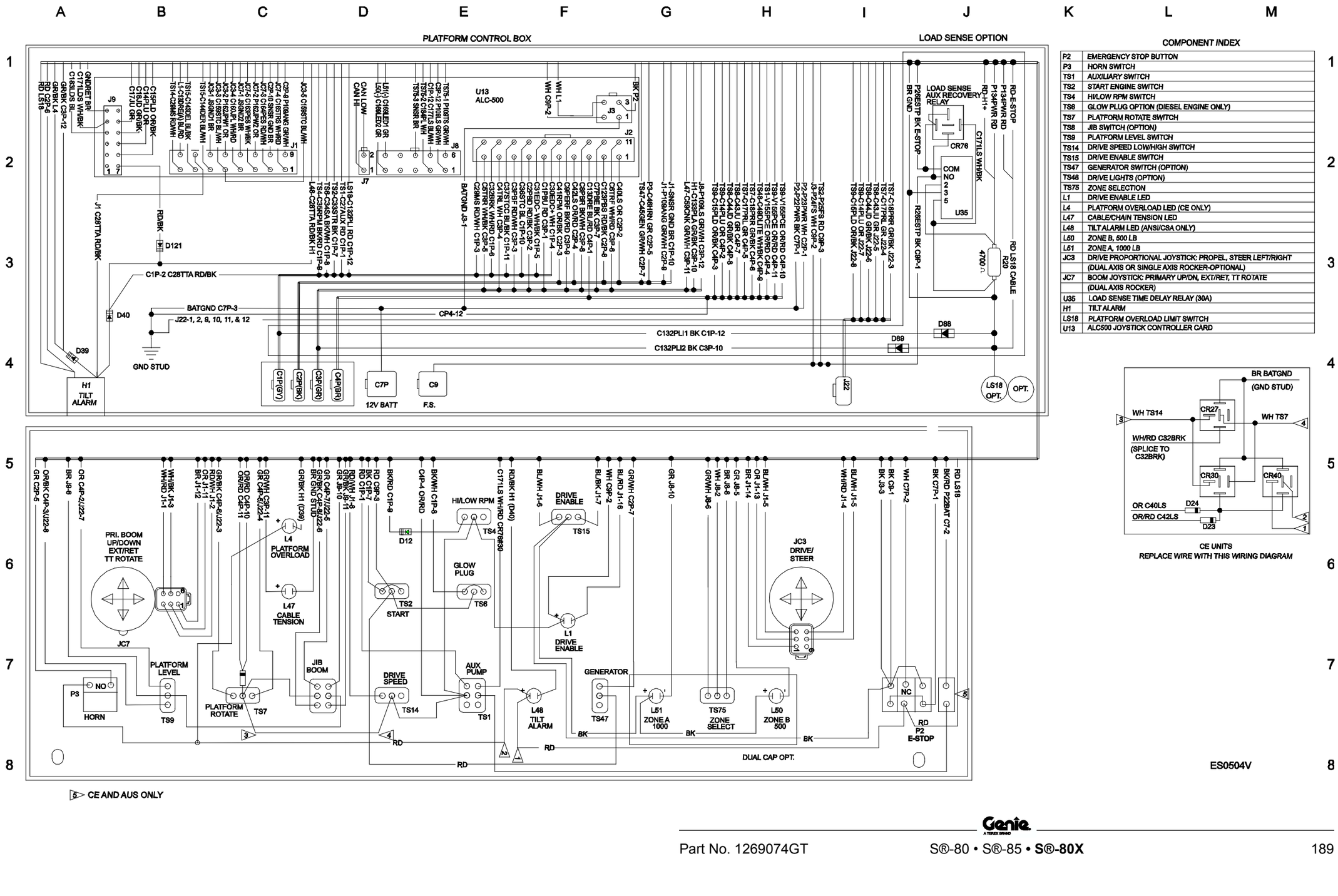



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH IDLE |
| TS56 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U1 | IGNITION/START MODULE |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

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# Platform Control Box, S-80 • S-85

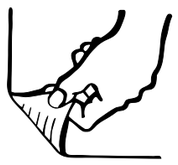
## Deutz TD2011L04i Models (ANSI / CSA)



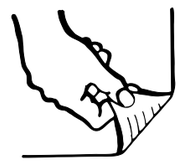

### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

# Platform Control Box, S-80 • S-85 - Deutz TD2011L04i Models (ANSI / CSA)

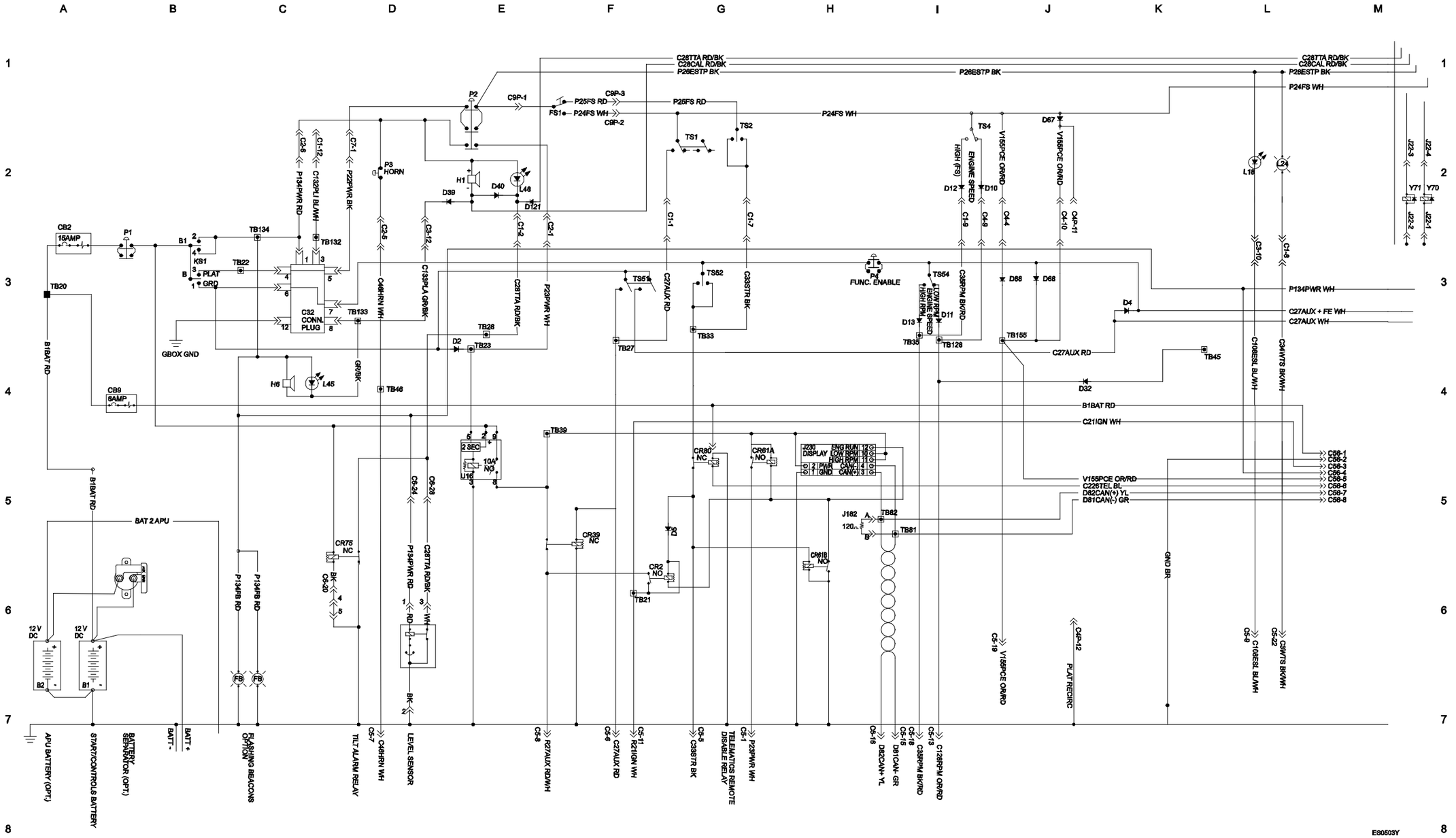


# Electrical Schematic, S-80 • S-85 - Perkins 404F-22T Models (ANSI / CSA)



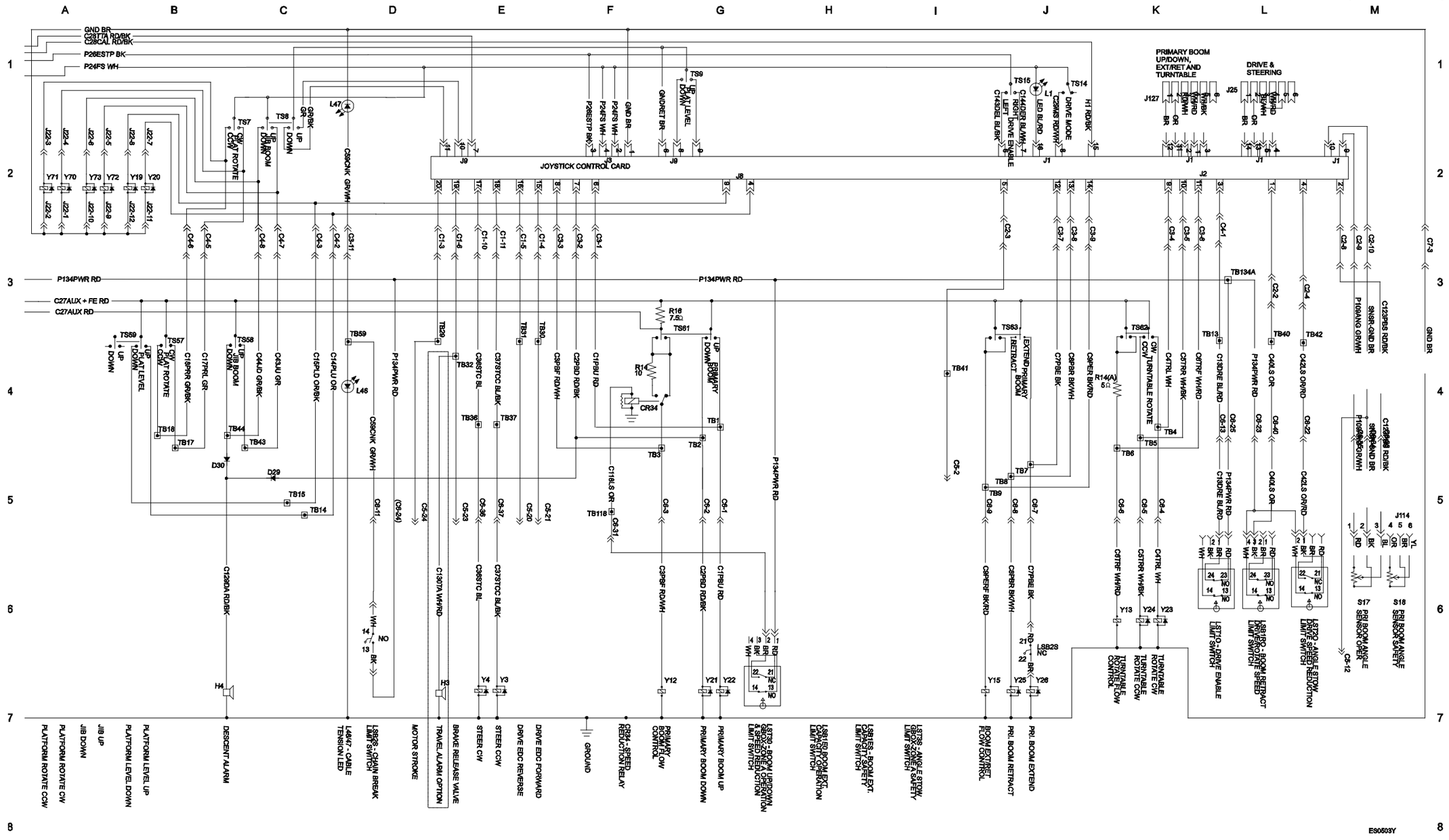
# Electrical Schematic, S-80 • S-85

## Perkins 404F-22T Models (ANSI / CSA)

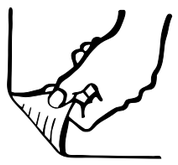


# Electrical Schematic, S-80 • S-85

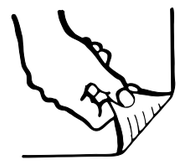
## Perkins 404F-22T Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85 - Perkins 404F-22T Models (ANSI / CSA)

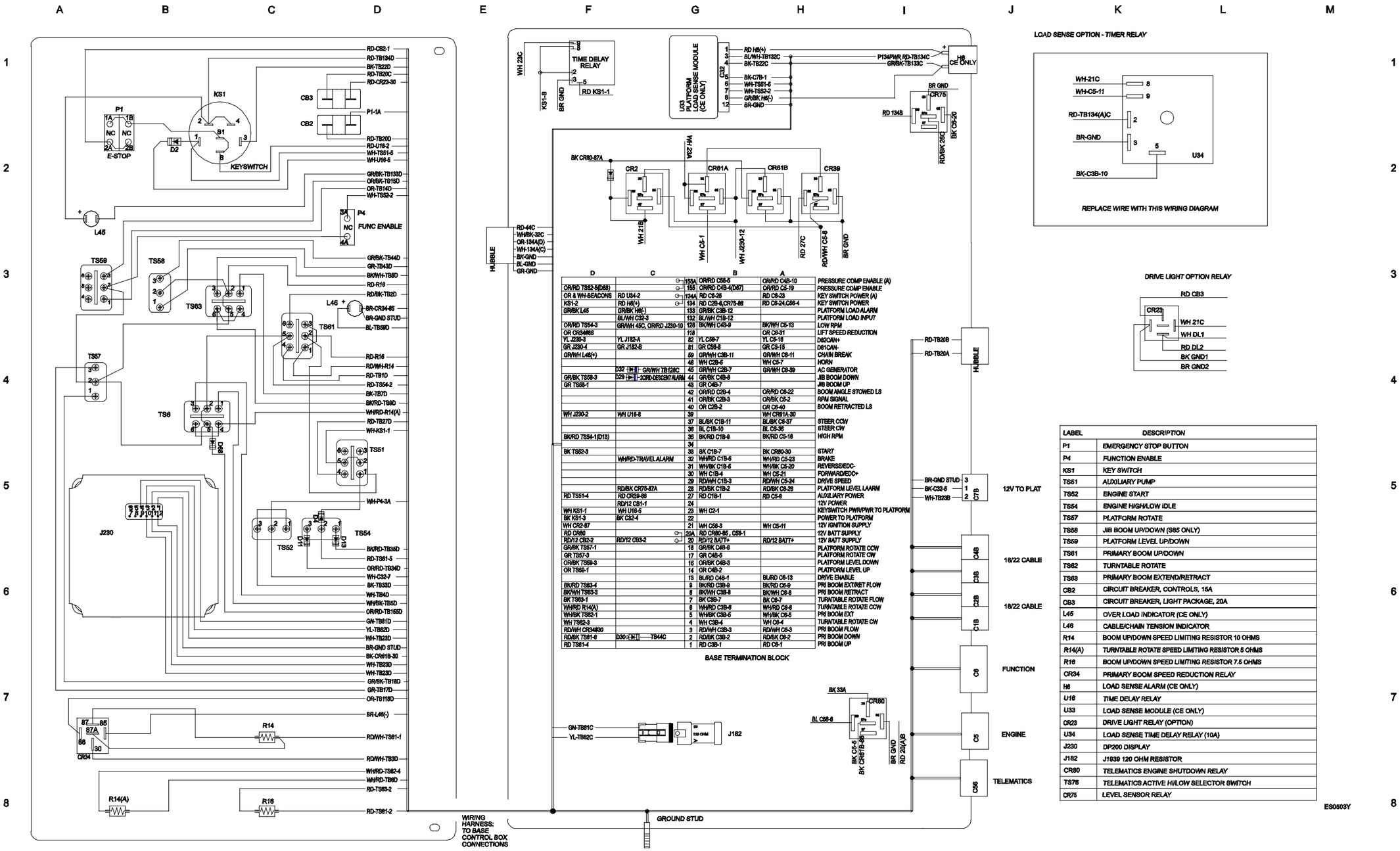


# Ground Control Box, S-80 • S-85 - Perkins 404F-22T Models (ANSI / CSA)



# Ground Control Box, S-80 • S-85

## Perkins 404F-22T Models (ANSI / CSA)




| D | C | | B | A | |
|---|---|---|---|---|---|
| | | 155A | OR/RD C55-5 | OR/RD C4B-10 | PRESSURE COMP ENABLE (A) |
| OR/RD TS62-5(D58) | | 155 | OR/RD C4B-4(D57) | OR/RD C5-19 | PRESSURE COMP ENABLE |
| OR & WH-BEACONS | RD U34-2 | 134A | RD C6-26 | RD C6-23 | KEY SWITCH POWER (A) |
| KS1-2 | RD H8(+) | 134 | RD C2B-6,CR75-86 | RD C6-24,C66-4 | KEY SWITCH POWER |
| GR/BK L45 | GR/BK H8(-) | 133 | GR/BK C2B-12 | | PLATFORM LOAD ALARM |
| | BL/WH C32-3 | 132 | BL/WH C1B-12 | | PLATFORM LOAD INPUT |
| OR/RD TS54-3 | GR/WH 45Ω, OR/RD J230-10 | 128 | BK/WH C4B-9 | BK/WH C5-13 | LOW RPM |
| OR CR34#66 | | 118 | | OR C5-31 | LIFT SPEED REDUCTION |
| YL J230-3 | YL J182-A | 82 | YL C5B-7 | YL C5-18 | DB2CAN+ |
| GR J230-4 | GR J182-B | 81 | GR C5B-8 | GR C5-15 | DB1CAN- |
| GR/WH L46(+) | | 59 | GR/WH C3B-11 | GR/WH C6-11 | CHAIN BREAK |
| | | 46 | WH C2B-6 | WH C5-7 | HORN |
| | D32 GR/WH TB128C | 45 | GR/WH C2B-7 | GR/WH C6-39 | AC GENERATOR |
| GR/BK TS58-3 | D29 20RD-DESCENTALARM | 44 | GR/BK C4B-8 | | JIB BOOM DOWN |
| GR TS58-1 | | 43 | GR C4B-7 | | JIB BOOM UP |
| | | 42 | OR/RD C2B-4 | OR/RD C5-22 | BOOM ANGLE STOWED LS |
| | | 41 | OR/BK C2B-3 | OR/BK C5-2 | RPM SIGNAL |
| | | 40 | OR C2B-2 | OR C5-40 | BOOM RETRACTED LS |
| WH J230-2 | WH U16-8 | 39 | | WH CR61A-30 | |
| | | 37 | BL/BK C1B-11 | BL/BK C6-37 | STEER CCW |
| | | 36 | BL C1B-10 | BL C5-36 | STEER CW |
| BK/RD TS54-1(D13) | | 35 | BK/RD C1B-9 | BK/RD C5-18 | HIGH RPM |
| | | 34 | | | |
| BK TS62-3 | | 33 | BK C1B-7 | BK CR80-30 | START |
| | WH/RD-TRAVELALARM | 32 | WH/RD C1B-6 | WH/RD C5-23 | BRAKE |
| | | 31 | WH/BK C1B-5 | WH/BK C5-20 | REVERSE/EDC- |
| | | 30 | WH C1B-4 | WH C5-21 | FORWARD/EDC+ |
| | | 29 | RD/WH C1B-3 | RD/WH C5-24 | DRIVE SPEED |
| | RD/BK CR75-87A | 28 | RD/BK C1B-2 | RD/BK C6-26 | PLATFORM LEVEL LAARM |
| RD TS51-4 | RD CR39-86 | 27 | RD C1B-1 | RD C5-9 | AUXILIARY POWER |
| | RD/12 C81-1 | 24 | | | 12V POWER |
| WH KS1-1 | WH U16-5 | 23 | WH C2-1 | | KEYSWITCH PWR/PWR TO PLATFORM |
| BK KS1-3 | BK C82-4 | 22 | | | POWER TO PLATFORM |
| WH CR2-87 | | 21 | WH C5B-3 | WH C5-11 | 12V IGNITION SUPPLY |
| RD CR80 | | 20A | RD CR80-85 , C5B-1 | | 12V BATT SUPPLY |
| RD/12 C82-2 | RD/12 C83-2 | 20 | RD/12 BATT+ | RD/12 BATT+ | 12V BATT SUPPLY |
| GR/BK TS57-1 | | 18 | GR/BK C4B-8 | | PLATFORM ROTATE CCW |
| GR TS57-3 | | 17 | GR C4B-5 | | PLATFORM ROTATE CW |
| OR/BK TS59-3 | | 16 | OR/BK C4B-3 | | PLATFORM LEVEL DOWN |
| OR TS59-1 | | 14 | OR C4B-2 | | PLATFORM LEVEL UP |
| | | 13 | BL/RD C4B-1 | BL/RD C6-13 | DRIVE ENABLE |
| BK/RD TS63-4 | | 9 | BK/RD C3B-9 | BK/RD C6-9 | PRI BOOM EXT/RET FLOW |
| BK/WH TS63-3 | | 8 | BK/WH C3B-8 | BK/WH C6-8 | PRI BOOM RETRACT |
| BK TS63-1 | | 7 | BK C3B-7 | BK C6-7 | TURNTABLE ROTATE FLOW |
| WH/RD R14(A) | | 6 | WH/RD C3B-6 | WH/RD C6-6 | TURNTABLE ROTATE CCW |
| WH/BK TS62-1 | | 5 | WH/BK C3B-5 | WH/BK C6-5 | PRI BOOM EXT |
| WH TS62-3 | | 4 | WH C3B-4 | WH C6-4 | TURNTABLE ROTATE CW |
| RD/WH CR34#30 | | 3 | RD/WH C3B-3 | RD/WH C6-3 | PRI BOOM FLOW |
| RD/BK TS61-6 | D30 TB44C | 2 | RD/BK C3B-2 | RD/BK C6-2 | PRI BOOM DOWN |
| RD TS61-4 | | 1 | RD C3B-1 | RD C6-1 | PRI BOOM UP |

BASE TERMINATION BLOCK

LOAD SENSE OPTION - TIMER RELAY




REPLACE WIRE WITH THIS WIRING DIAGRAM

DRIVE LIGHT OPTION RELAY

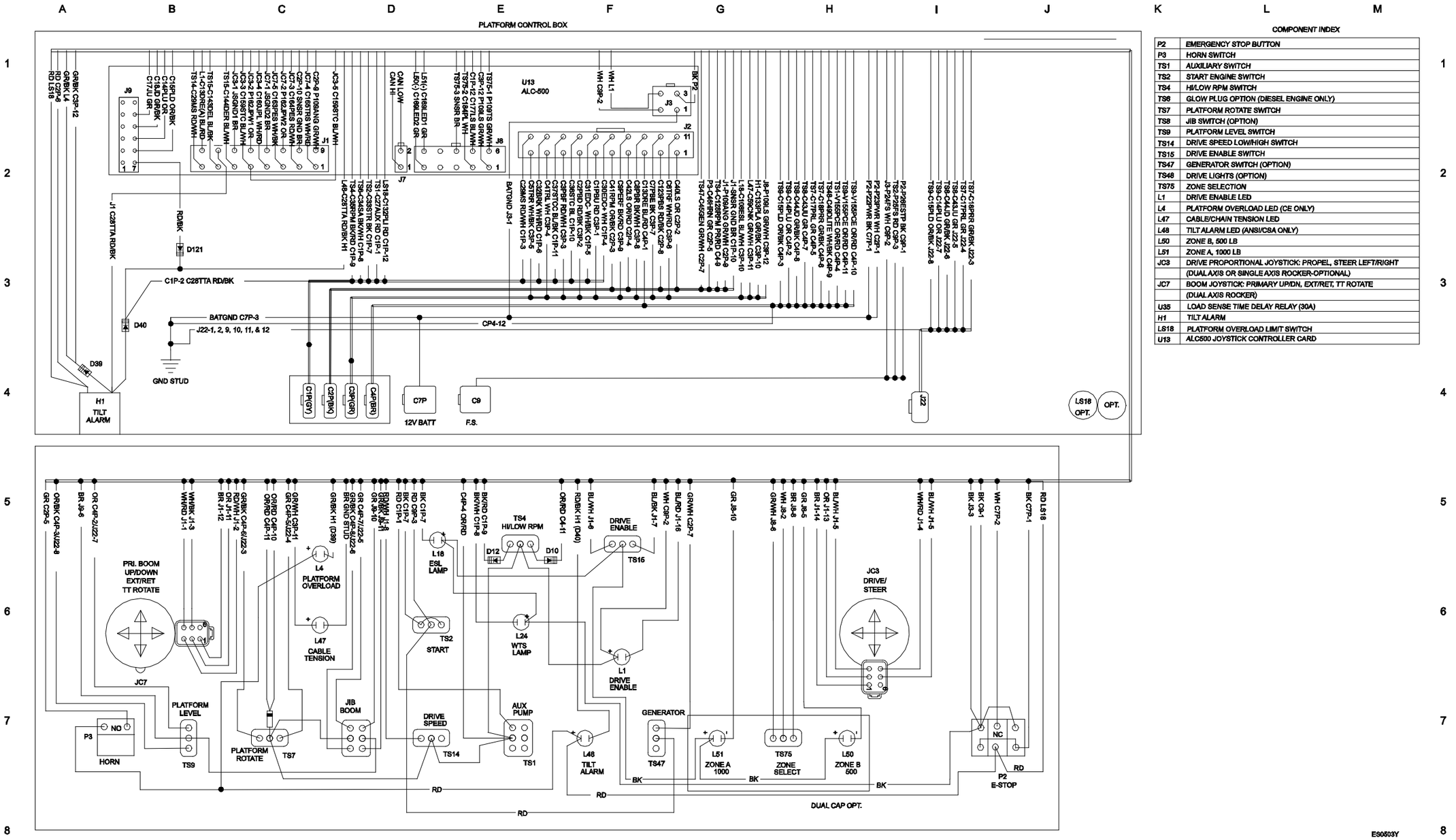



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH/LOW IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| CB3 | CIRCUIT BREAKER, LIGHT PACKAGE, 20A |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H8 | LOAD SENSE ALARM (CE ONLY) |
| U16 | TIME DELAY RELAY |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| J230 | DP200 DISPLAY |
| J182 | J1939 120 OHM RESISTOR |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |
| TS75 | TELEMATICS ACTIVE HI/LOW SELECTOR SWITCH |
| CR75 | LEVEL SENSOR RELAY |

ES0503Y

# Platform Control Box, S-80 • S-85

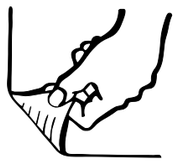
## Perkins 404F-22T Models (ANSI / CSA)



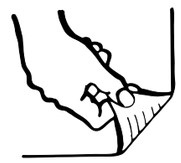

COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

# Platform Control Box, S-80X - Perkins 404F-22T Models (ANSI / CSA)

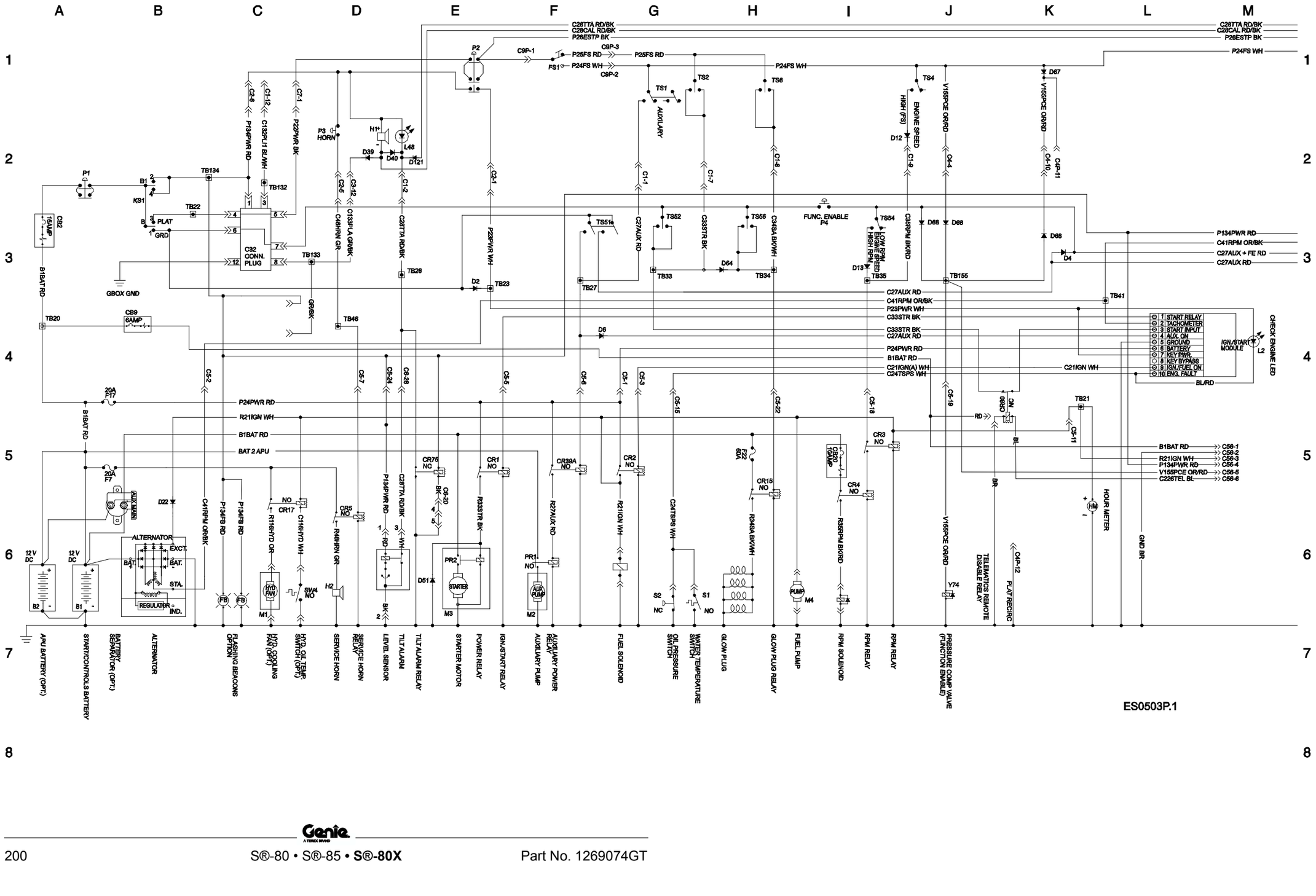


# Electrical Schematic, S-80 • S-85 - Perkins 804D-33 Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85

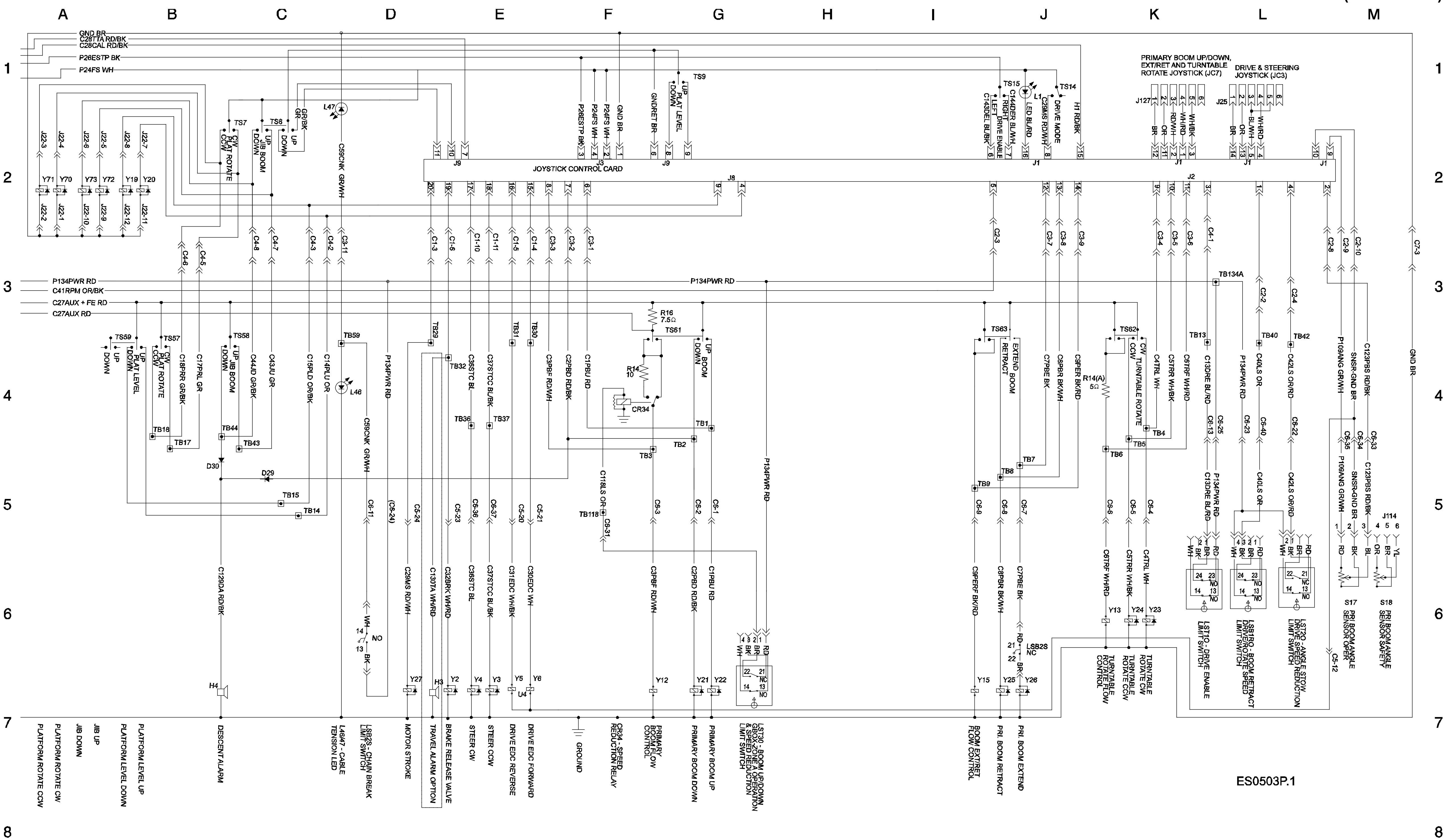
## Perkins 804D-33 Models (ANSI / CSA)



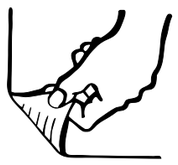

ES0503P.1

## Electrical Schematic, S-80 • S-85

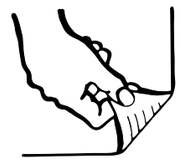
### Perkins 804D-33 Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85 - Perkins 804D-33 Models (ANSI / CSA)

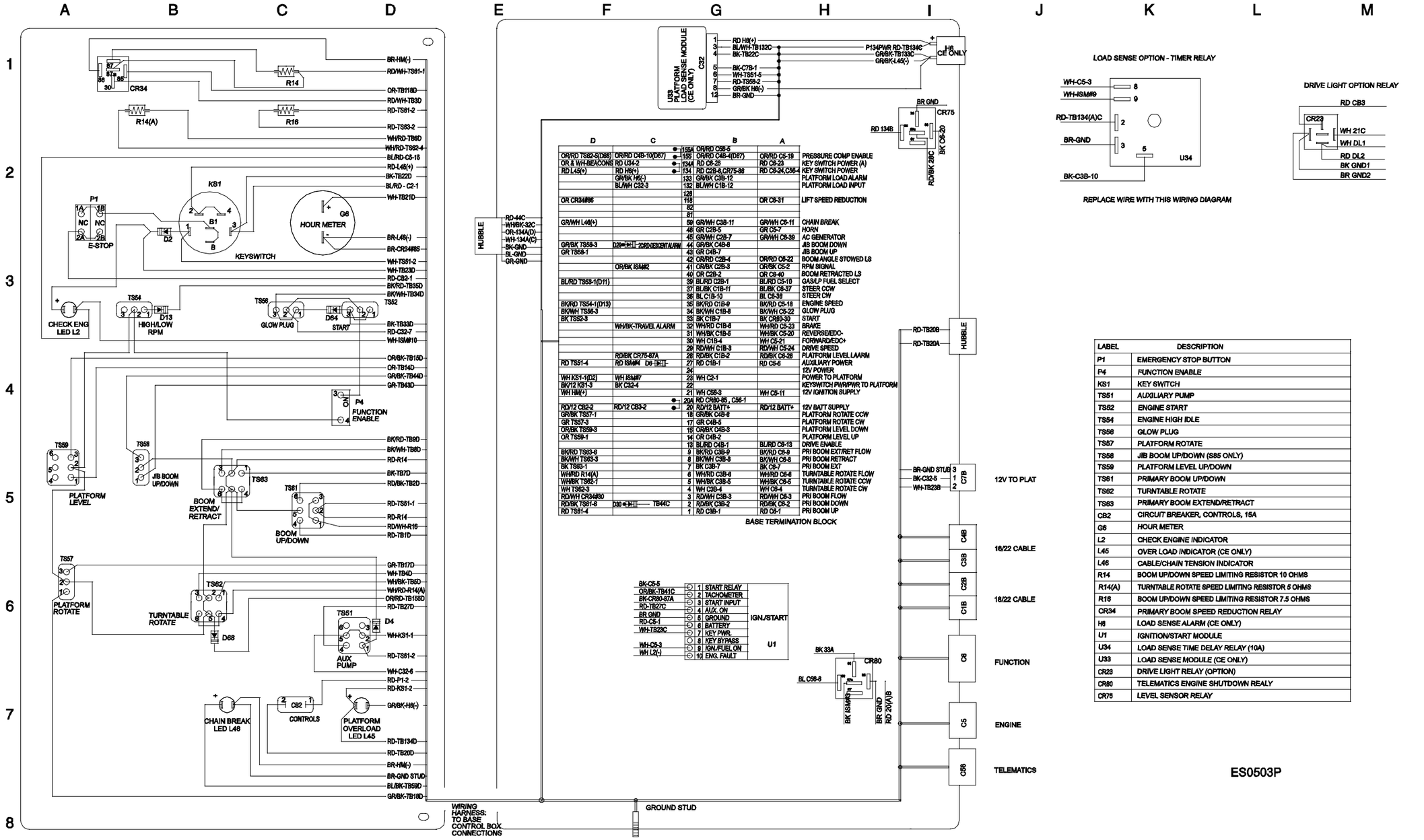


# Ground Control Box, S-80 • S-85 - Perkins 804D-33 Models (ANSI / CSA)



# Ground Control Box, S-80 • S-85

## Perkins 804D-33 Models (ANSI / CSA)







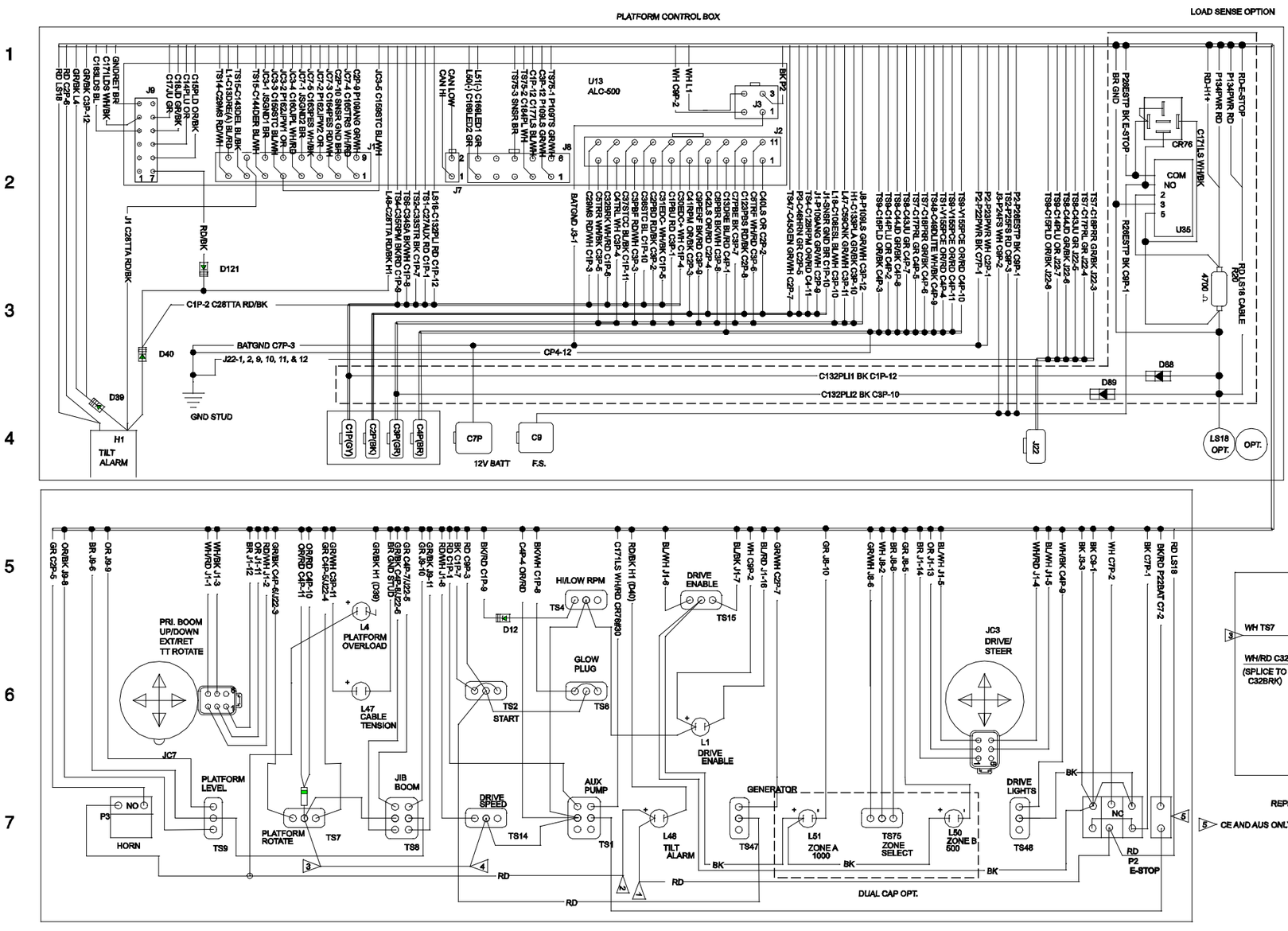



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH IDLE |
| TS58 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS56 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H8 | LOAD SENSE ALARM (CE ONLY) |
| U1 | IGNITION/START MODULE |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

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# Platform Control Box, S-80 • S-85

## Perkins 804D-33 Models (ANSI / CSA)





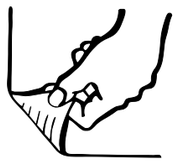


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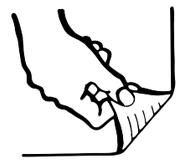
COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| CR27 | LIFT/DRIVE SELECT RELAY |
| CR30 | MACHINE STOWED BYPASS RELAY |
| CR40 | CE TILT LED OUT OF STOWED RELAY |
| CR76 | LOAD SENSE RECOVERY RELAY |

# Platform Control Box, S-80 • S-85 - Perkins 804D-33 Models (ANSI / CSA)

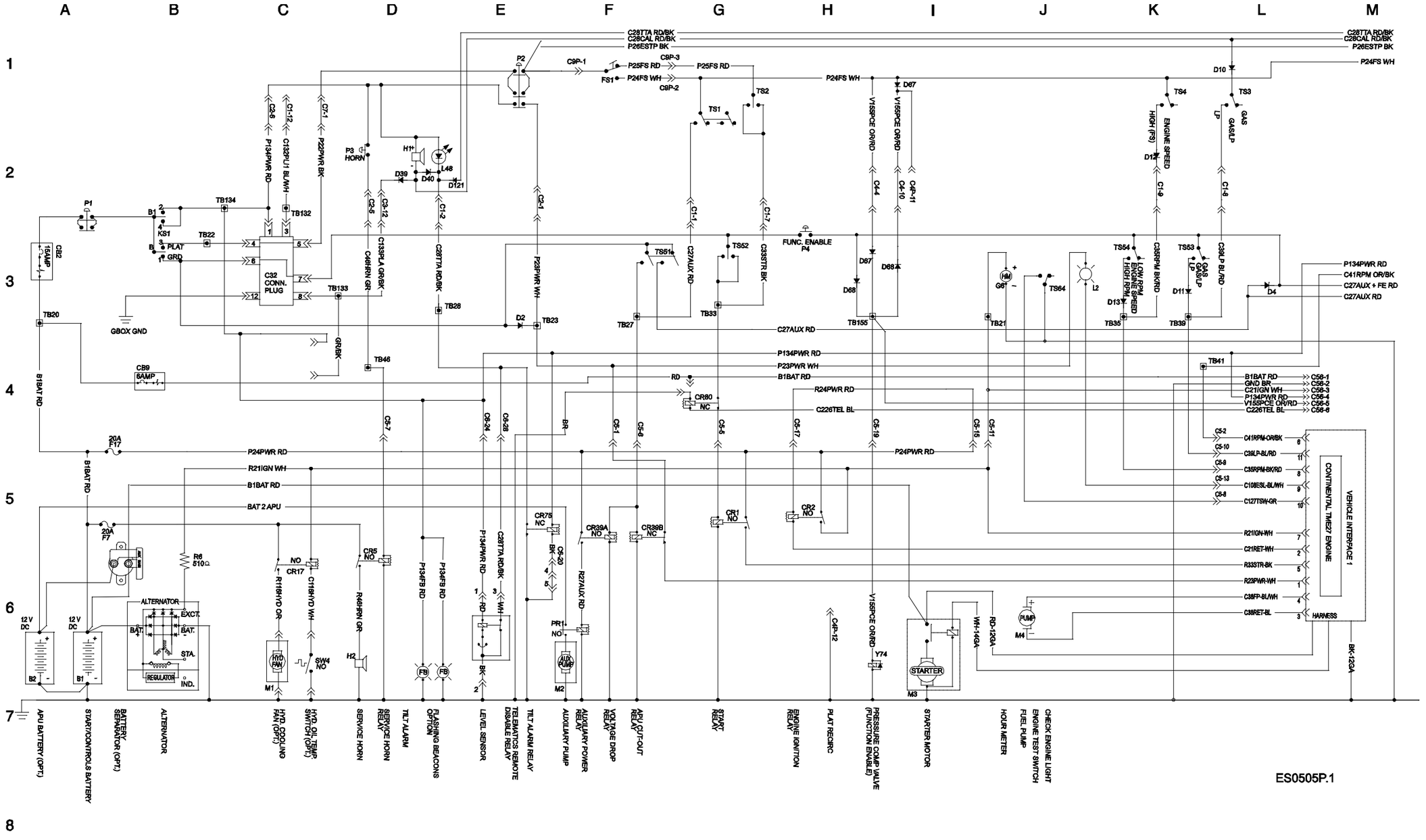


# Electrical Schematic, S-80 • S-85 - Continental TME27 Models (ANSI / CSA)



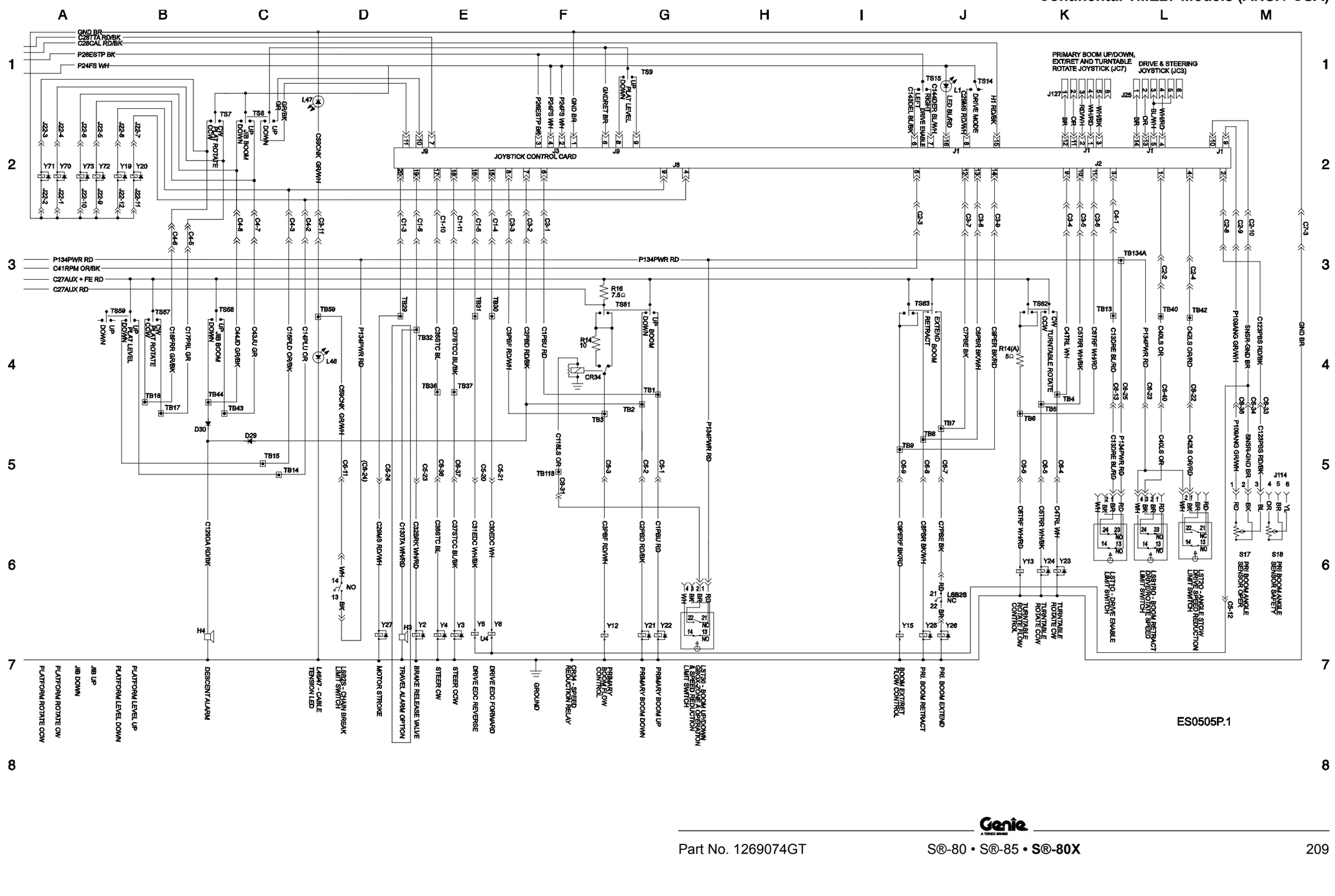
# Electrical Schematic, S-80 • S-85

## Continental TME27 Models (ANSI / CSA)

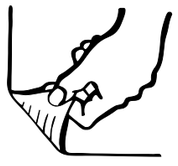


# Electrical Schematic, S-80 • S-85

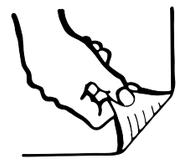
## Continental TME27 Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85 - Continental TME27 Models (ANSI / CSA)

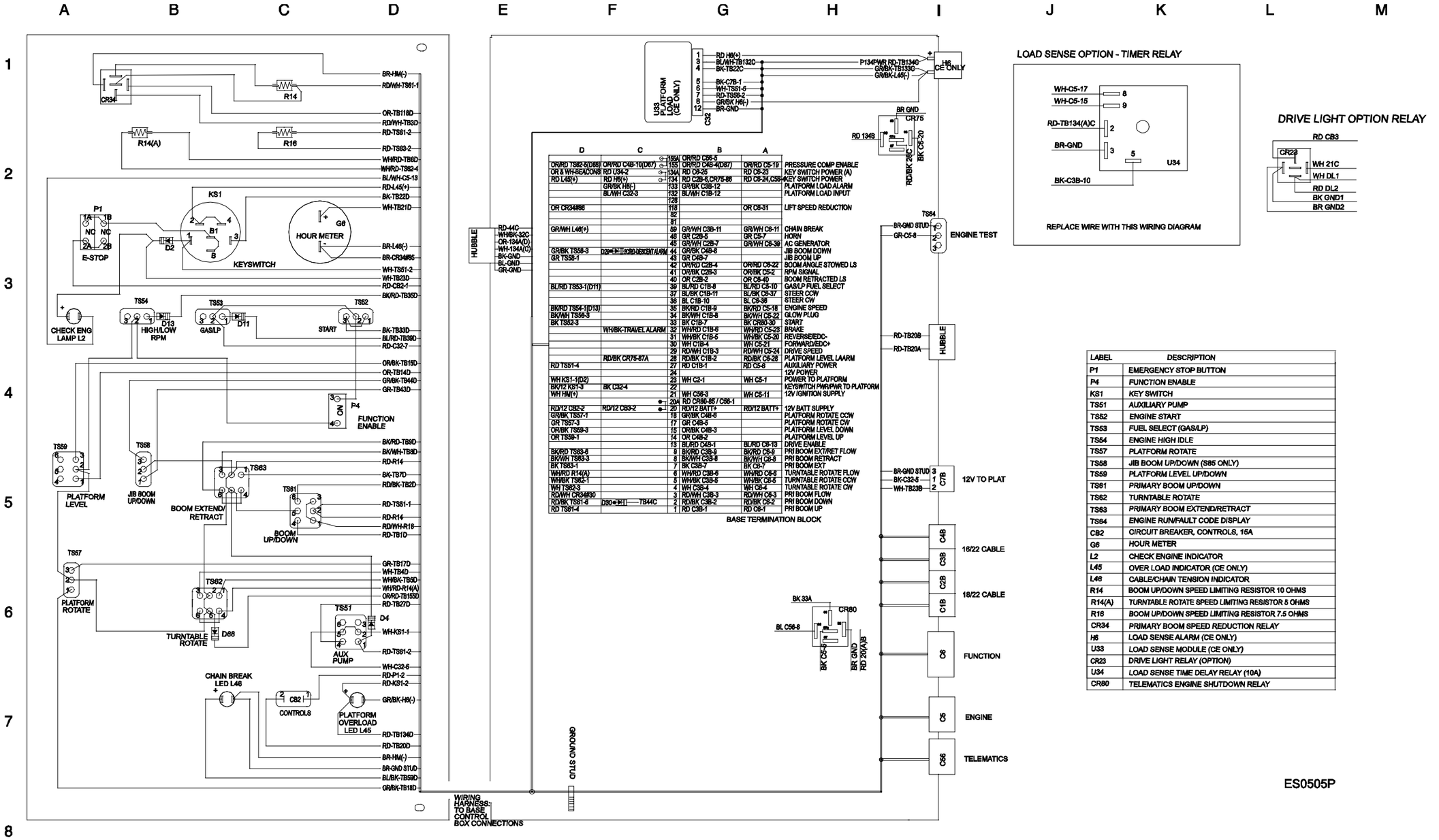


# Ground Control Box, S-80 • S-85 - Continental TME27 Models (ANSI / CSA)



# Ground Control Box, S-80 • S-85

## Continental TME27 Models (ANSI / CSA)

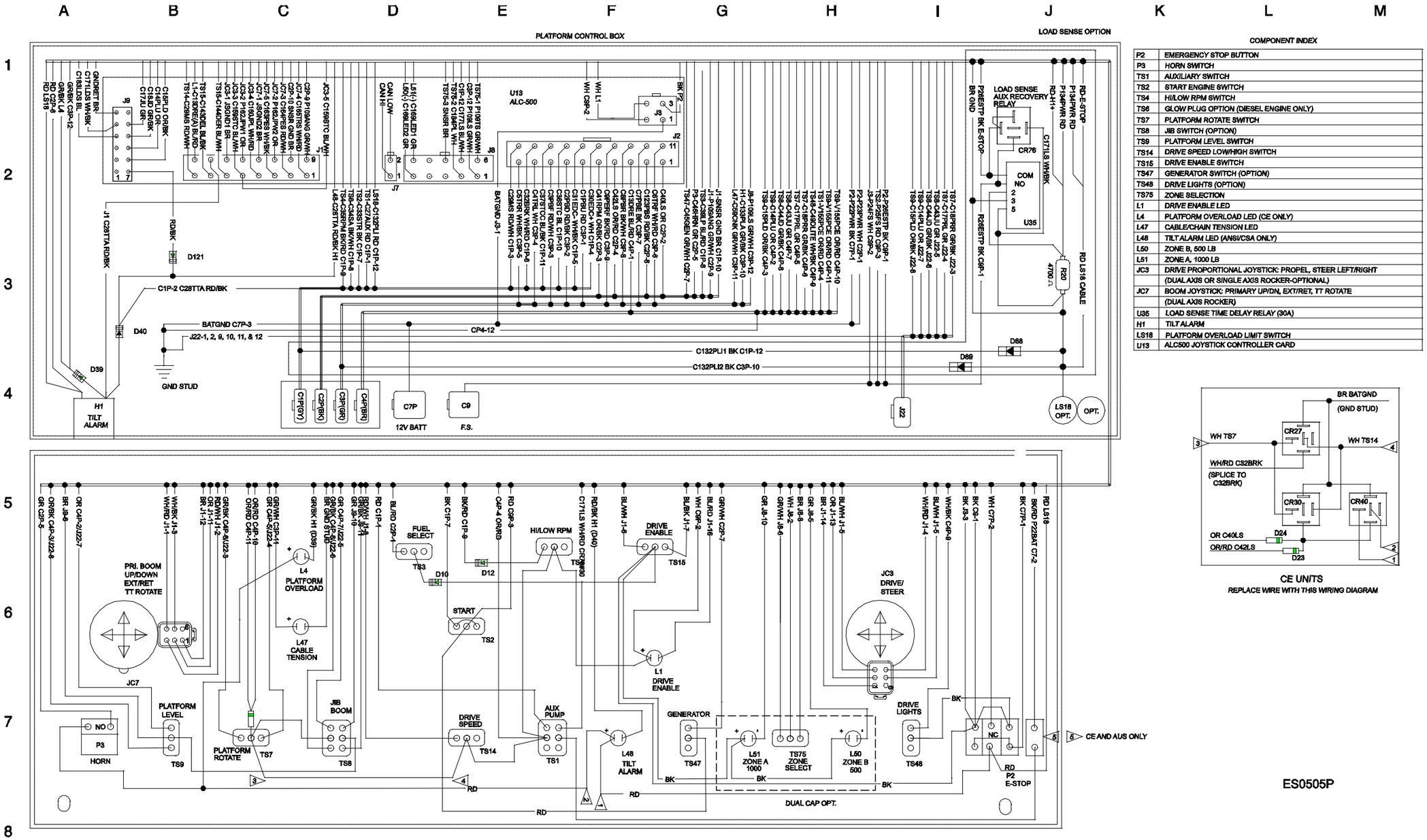



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS53 | FUEL SELECT (GAS/LP) |
| TS54 | ENGINE HIGH IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| TS64 | ENGINE RUN/FAULT CODE DISPLAY |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |

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# Platform Control Box, S-80 • S-85

## Continental TME27 Models (ANSI / CSA)







### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

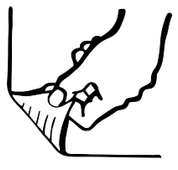



CE UNITS

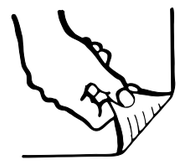
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0505P

# Platform Control Box, S-80 • S-85 - Continental TME27 Models (ANSI / CSA)



# Electrical Schematic, S-80 • S-85 - Deutz TD2.9 L4 Models (CE)

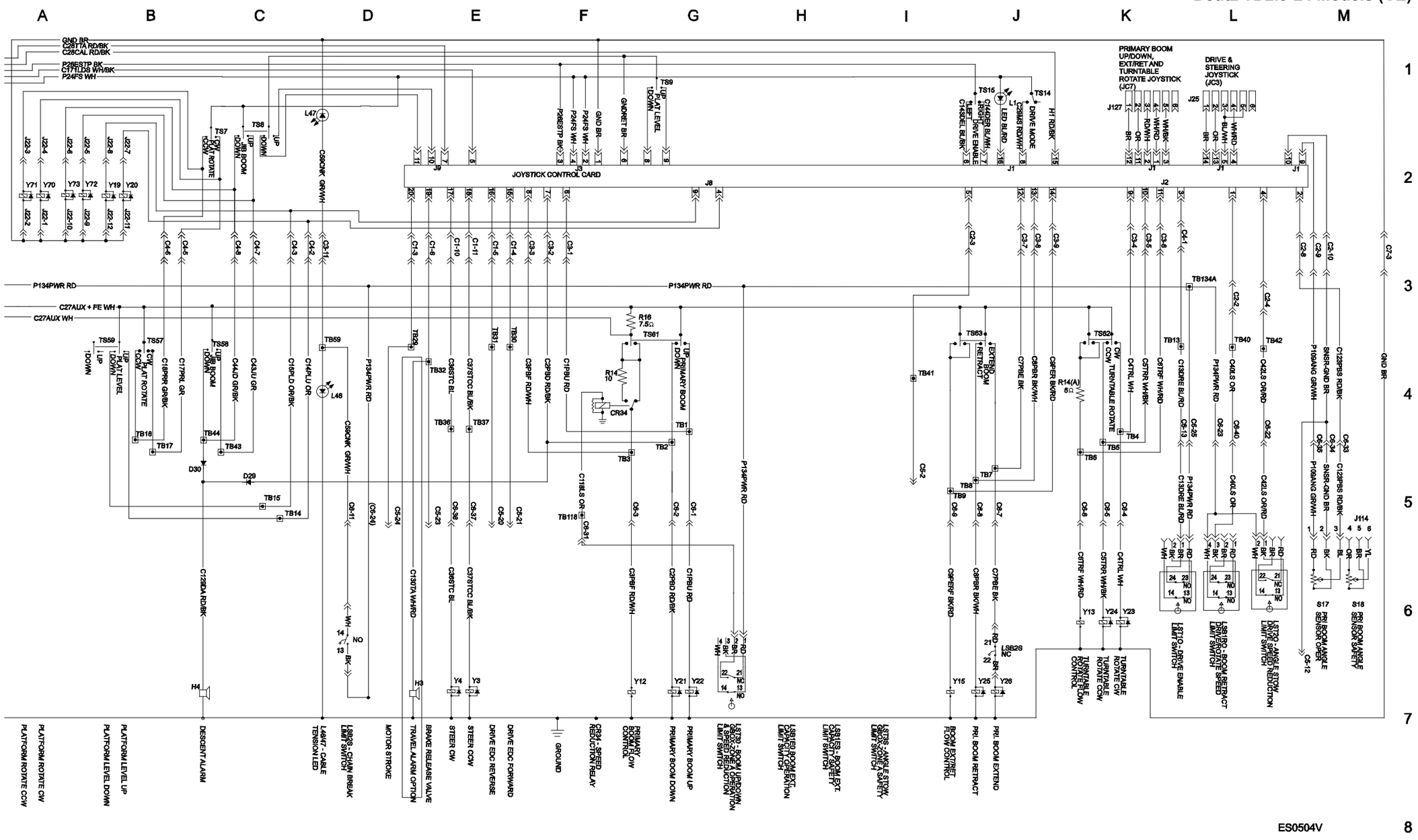


# Electrical Schematic, S-80 • S-85

## Deutz TD2.9 L4 Models (CE)

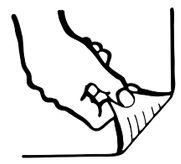
# Electrical Schematic, S-80 • S-85

## Deutz TD2.9 L4 Models (CE)



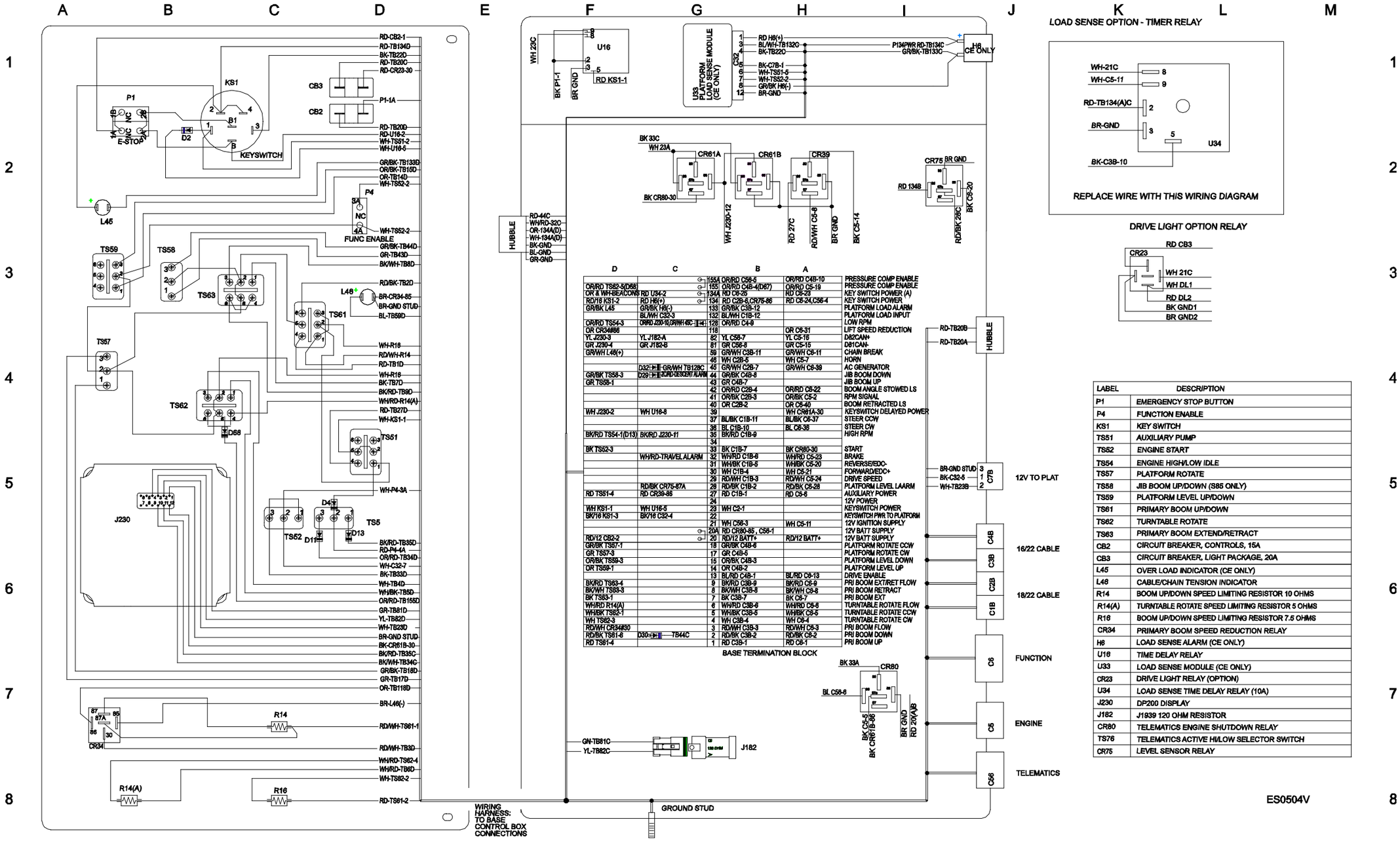
# Electrical Schematic, S-80 • S-85 - Deutz TD2.9 L4 Models (CE)

# Ground Control Box, S-80 • S-85 - Deutz TD2011L04i Models (CE)



# Ground Control Box, S-80 • S-85

## Deutz TD2.9 L4 Models (CE)

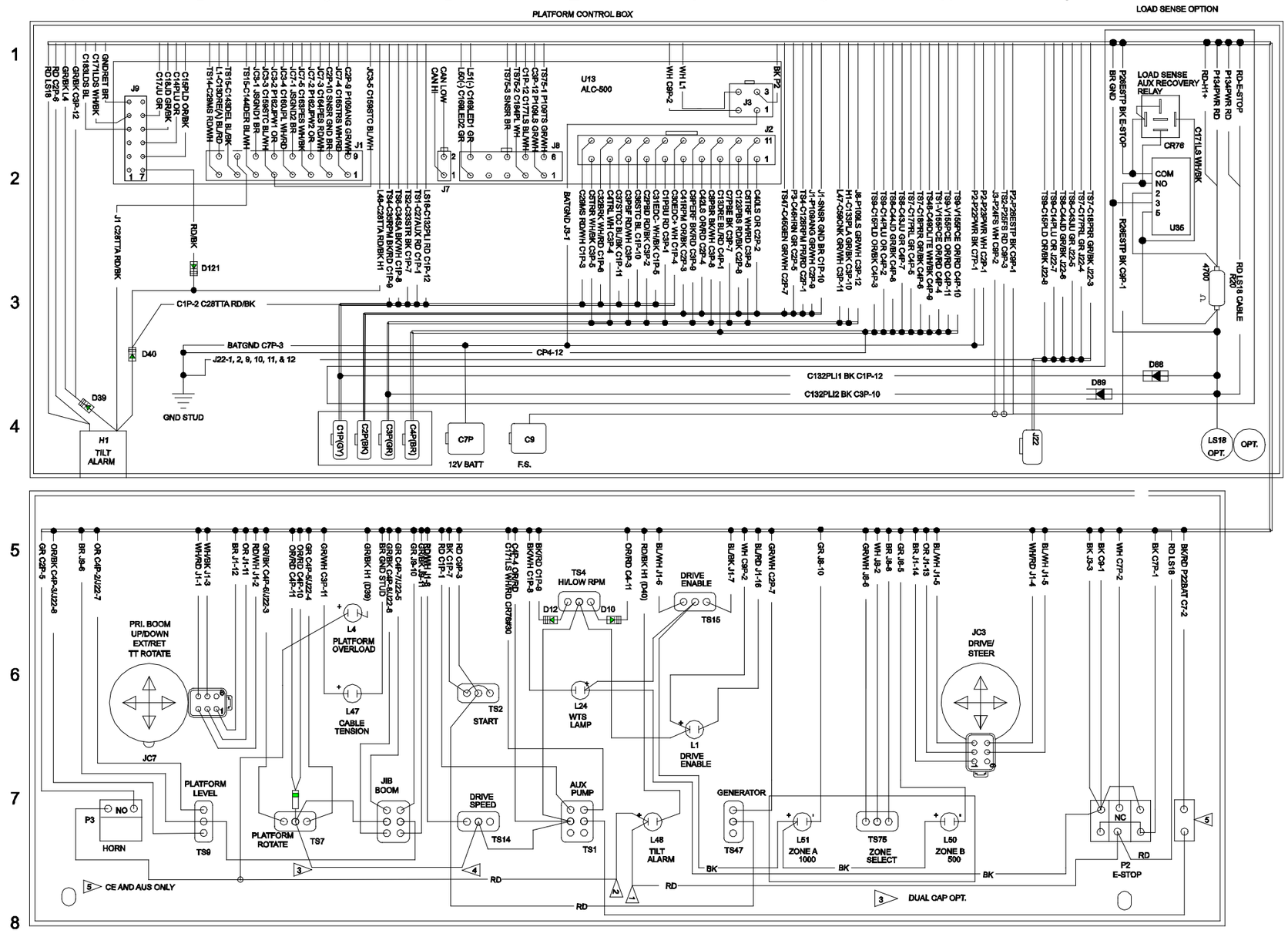



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH/LOW IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| CB3 | CIRCUIT BREAKER, LIGHT PACKAGE, 20A |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U16 | TIME DELAY RELAY |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| J230 | DP200 DISPLAY |
| J182 | J1939 120 OHM RESISTOR |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |
| TS76 | TELEMATICS ACTIVE HI/LOW SELECTOR SWITCH |
| CR75 | LEVEL SENSOR RELAY |

ES0504V

# Platform Control Box, S-80 • S-85

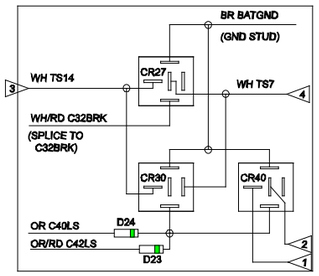
## Deutz TD2.9 L4 Models (CE)




### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS76 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

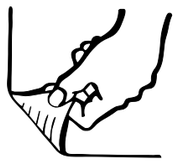


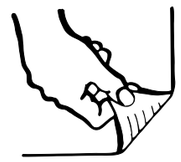

CE UNITS
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0504V

# Platform Control Box, S-80 • S-85 - Deutz TD2011L04i Models (CE)

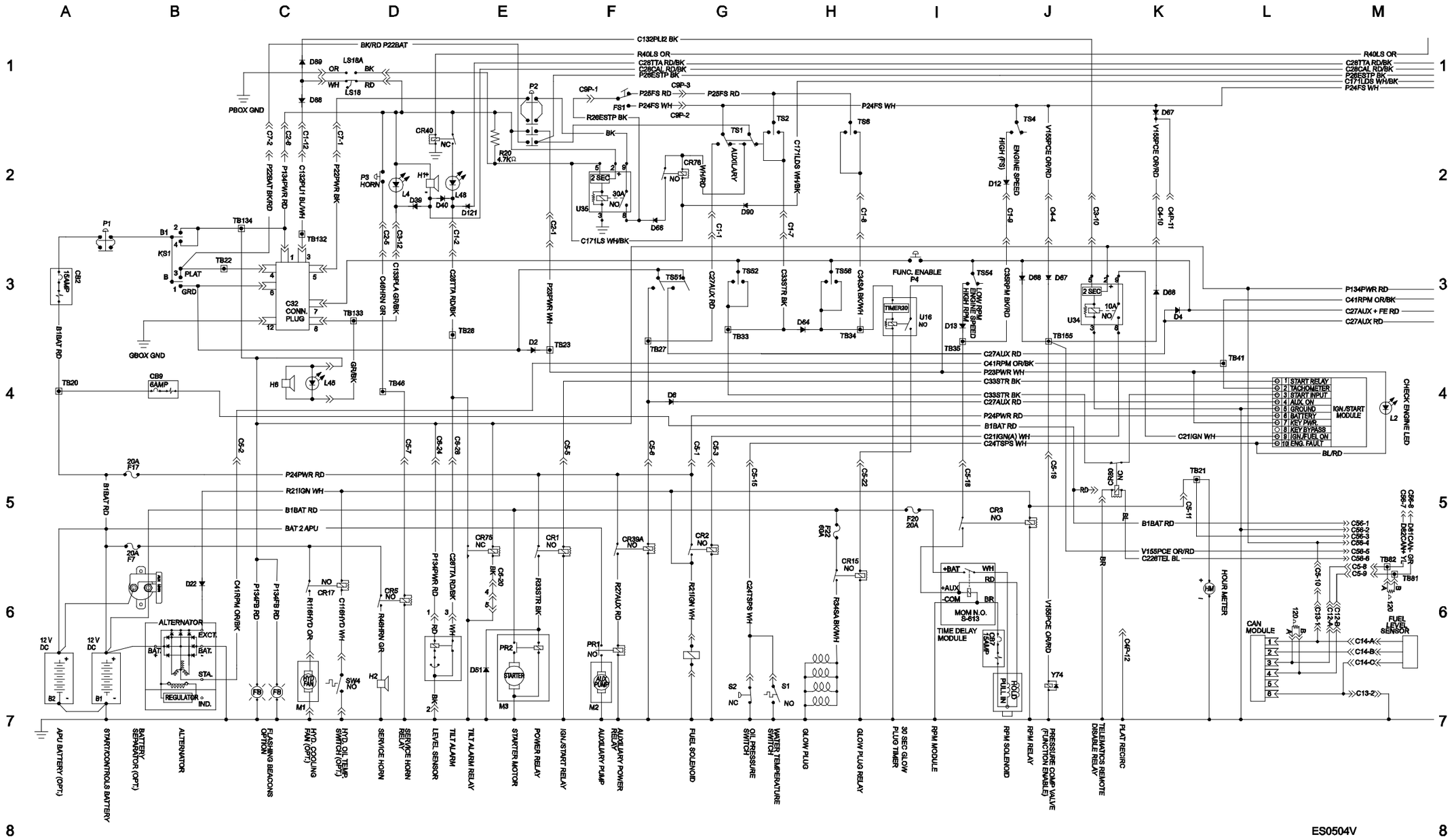


# Electrical Schematic, S-80 • S-85 - Deutz TD2011L04i Models (CE)



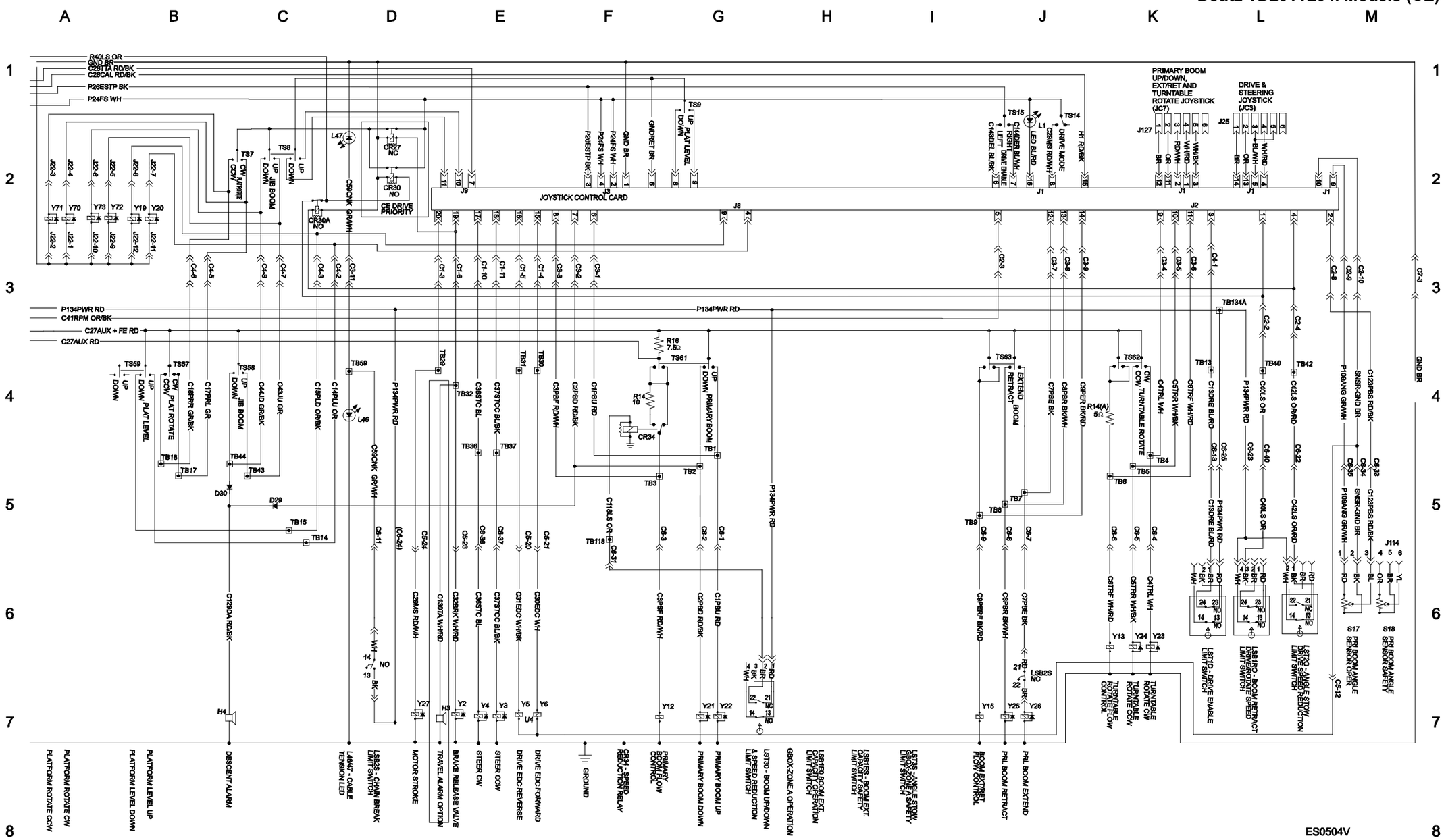
# Electrical Schematic, S-80 • S-85

## Deutz TD2011L04i Models (CE)

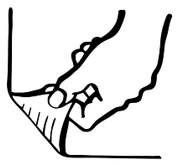


# Electrical Schematic, S-80 • S-85

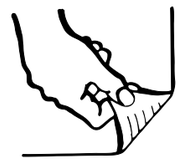
## Deutz TD2011L04i Models (CE)



# Electrical Schematic, S-80 • S-85 - Deutz TD2011L04i Models (CE)

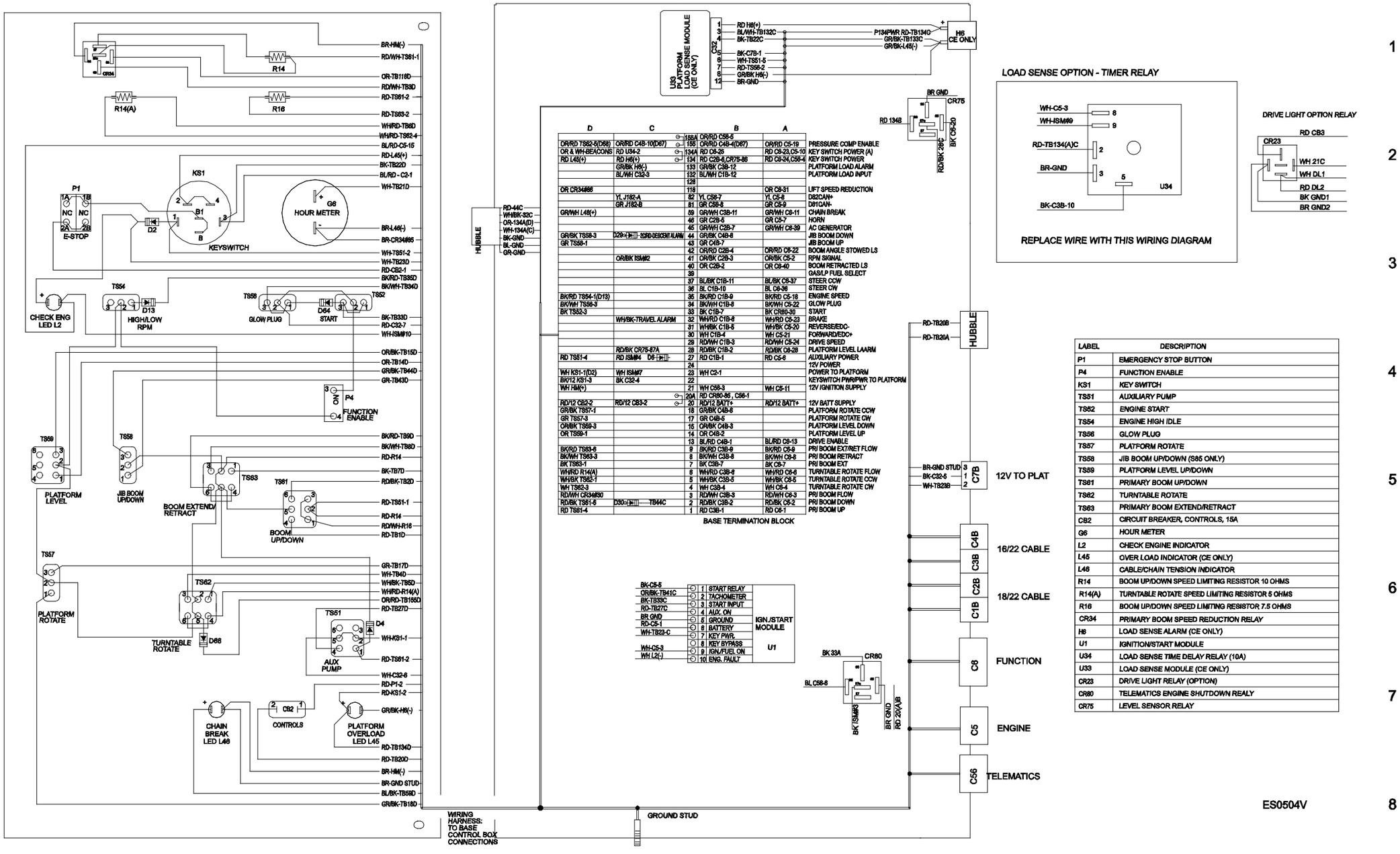


# Ground Control Box, S-80 • S-85 - Deutz TD2011L04i Models (CE)



# Ground Control Box, S-80 • S-85

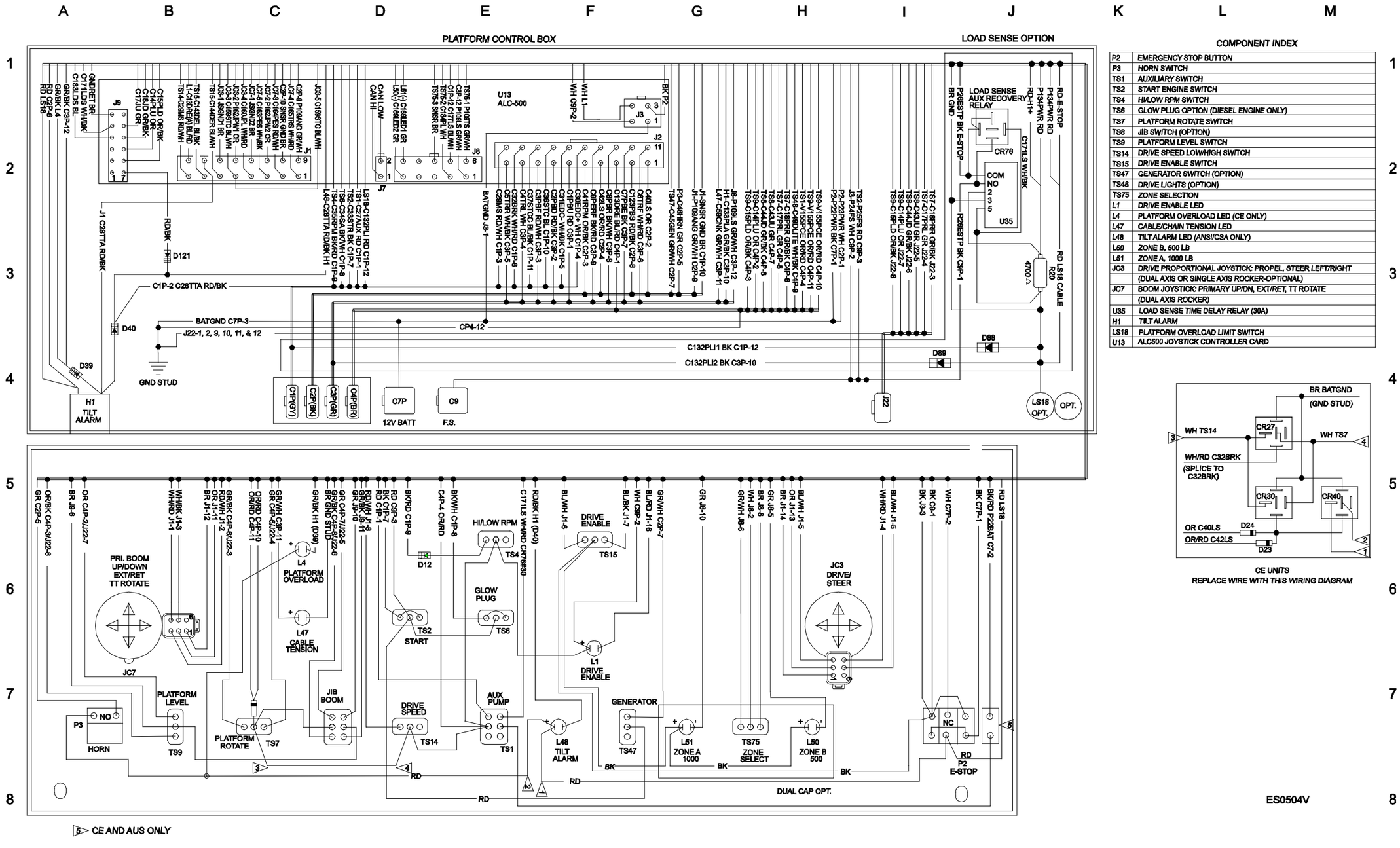
## Deutz TD2011L04i Models (CE)




| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH IDLE |
| TS56 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U1 | IGNITION/START MODULE |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

# Platform Control Box, S-80 • S-85

## Deutz TD2011L04i Models (CE)




### COMPONENT INDEX

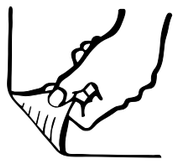
| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
| TS8 | JIB SWITCH (OPTION) |
| TS9 | PLATFORM LEVEL SWITCH |
| TS14 | DRIVE SPEED LOW/HIGH SWITCH |
| TS15 | DRIVE ENABLE SWITCH |
| TS47 | GENERATOR SWITCH (OPTION) |
| TS48 | DRIVE LIGHTS (OPTION) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |



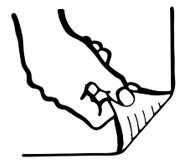

CE UNITS
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0504V

# Platform Control Box, S-80 • S-85 - Deutz TD2011L04i Models (CE)

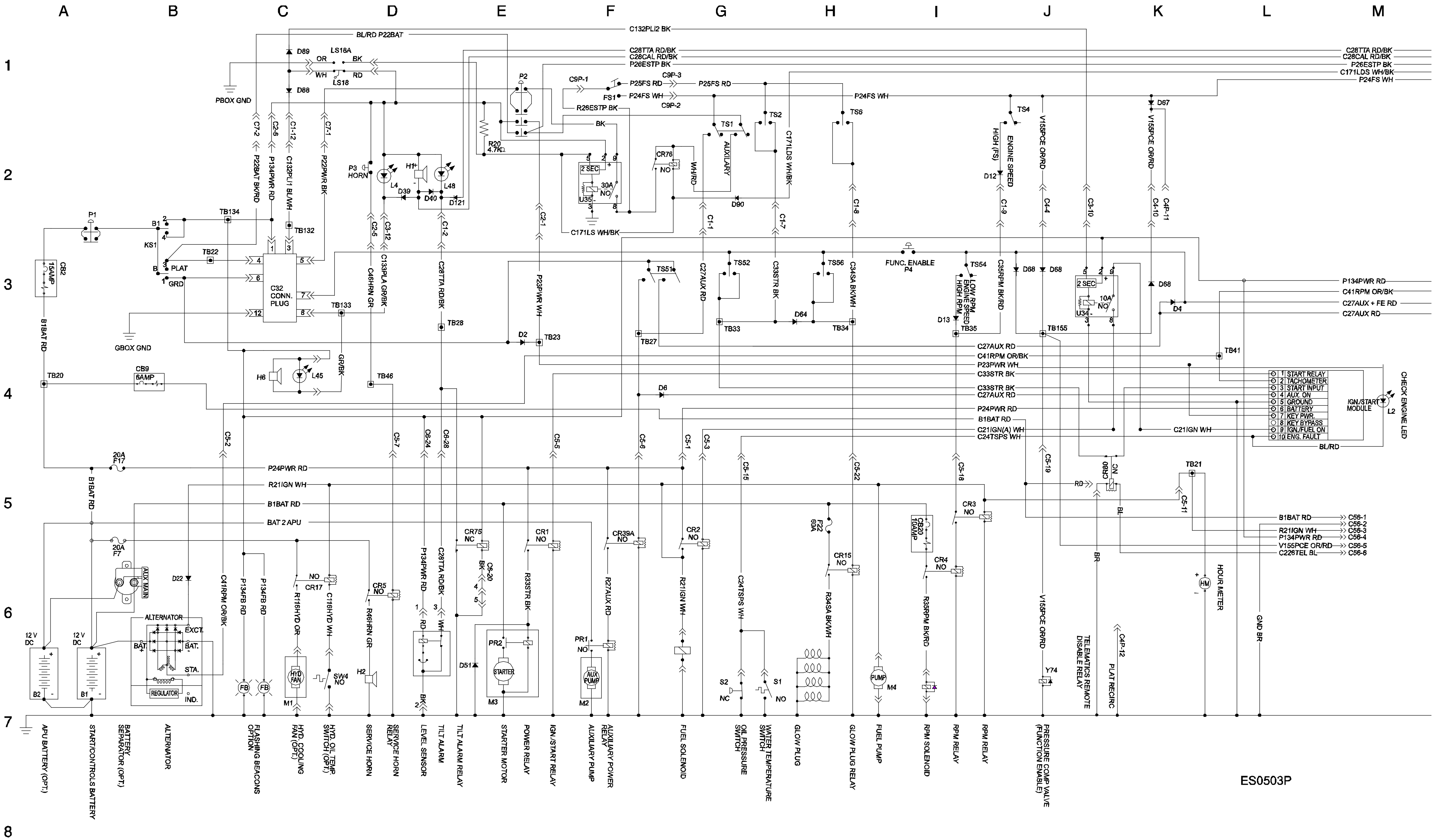


# Electrical Schematic, S-80 • S-85 - Perkins 804D-33 Models (CE)



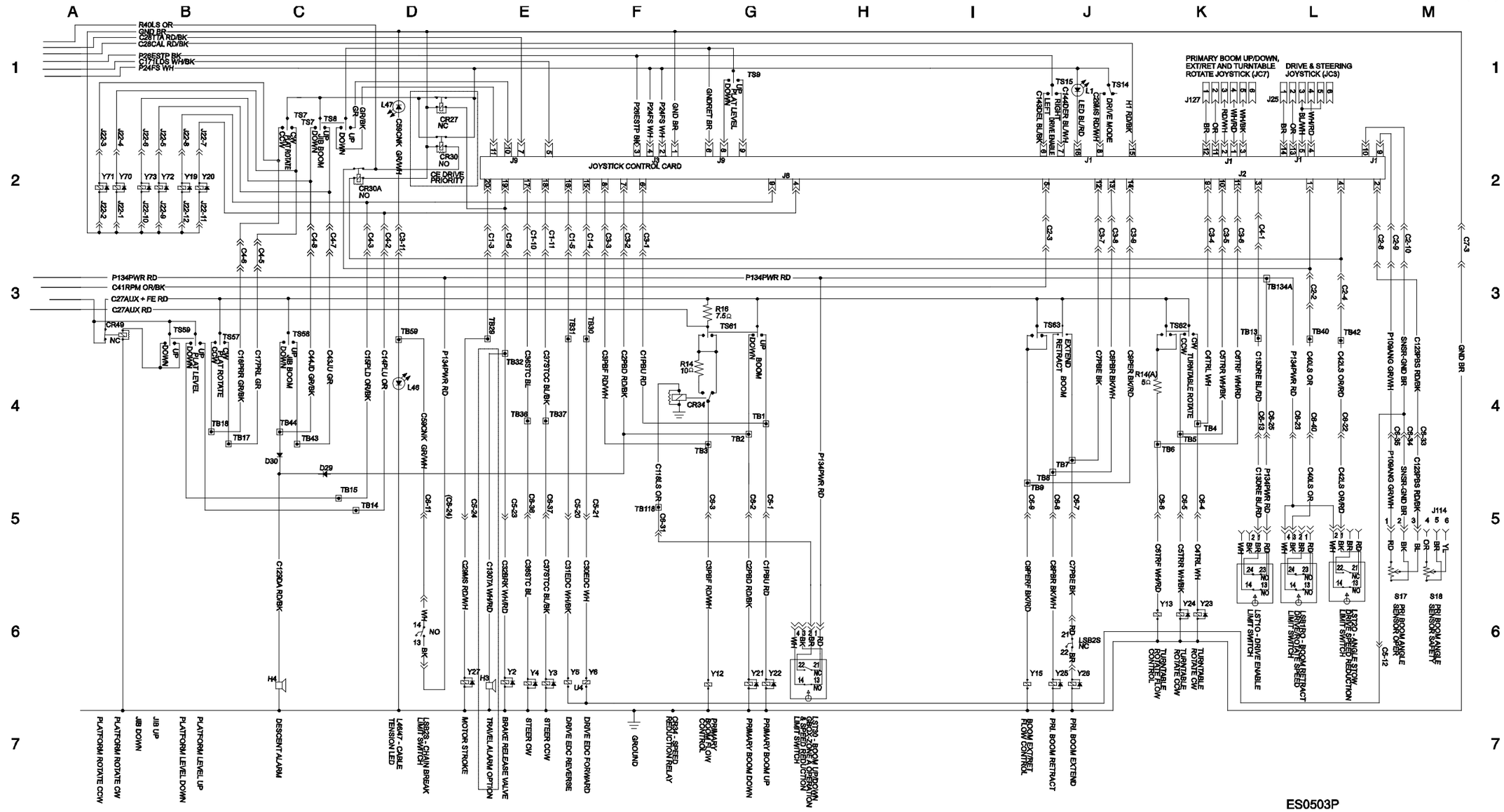
## Electrical Schematic, S-80 • S-85

### Perkins 804D-33 Models (CE)

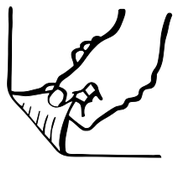


# Electrical Schematic, S-80 • S-85

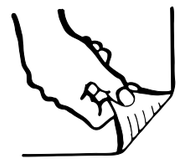
## Perkins 804D-33 Models (CE)



# Electrical Schematic, S-80 • S-85 - Perkins 804D-33 Models (CE)

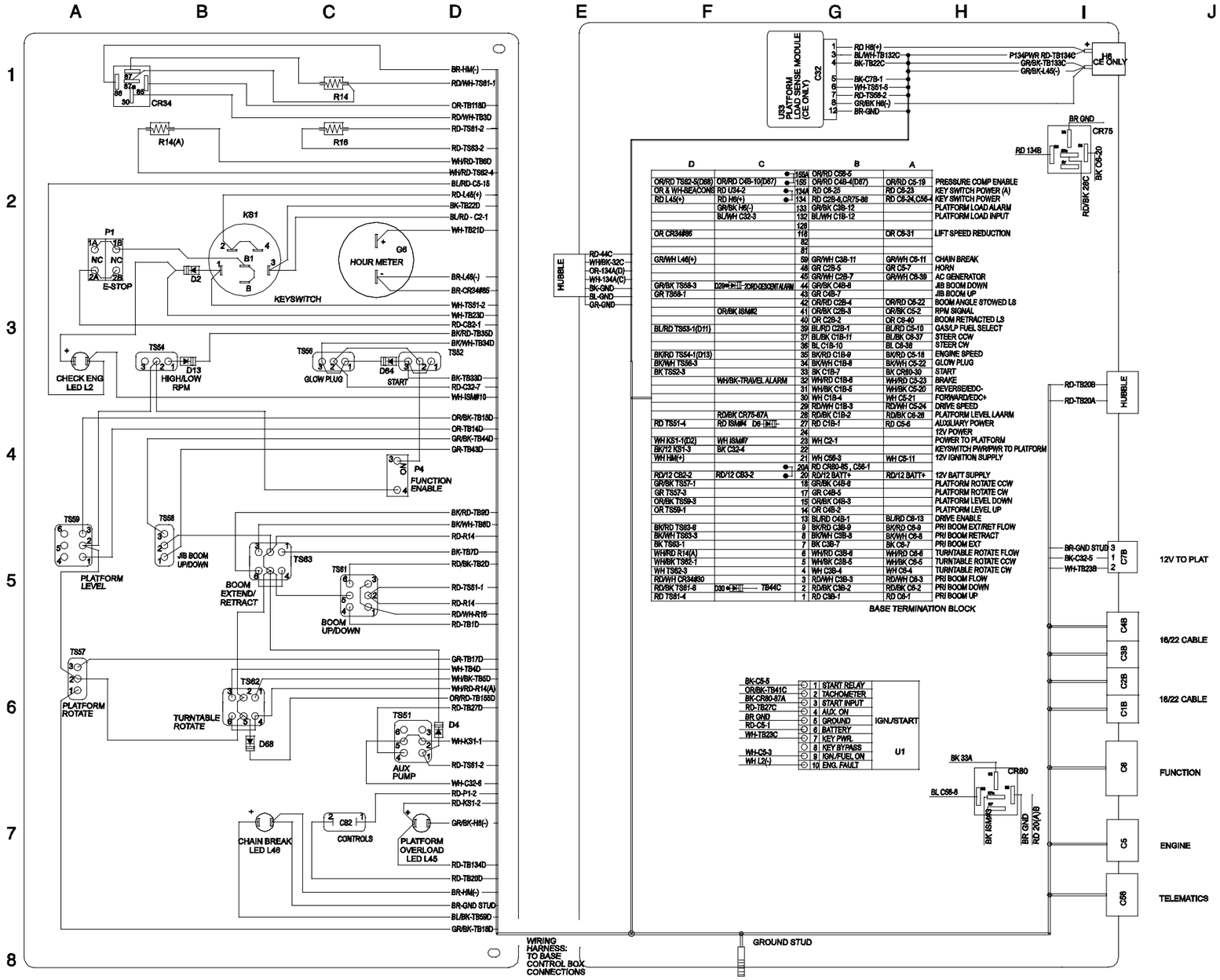


# Ground Control Box, S-80 • S-85 - Perkins 804D-33 Models (CE)

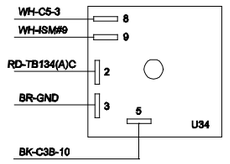


# Ground Control Box, S-80 • S-85

## Perkins 804D-33 Models (CE)

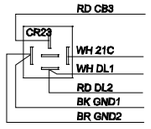



LOAD SENSE OPTION - TIMER RELAY




REPLACE WIRE WITH THIS WIRING DIAGRAM

DRIVE LIGHT OPTION RELAY

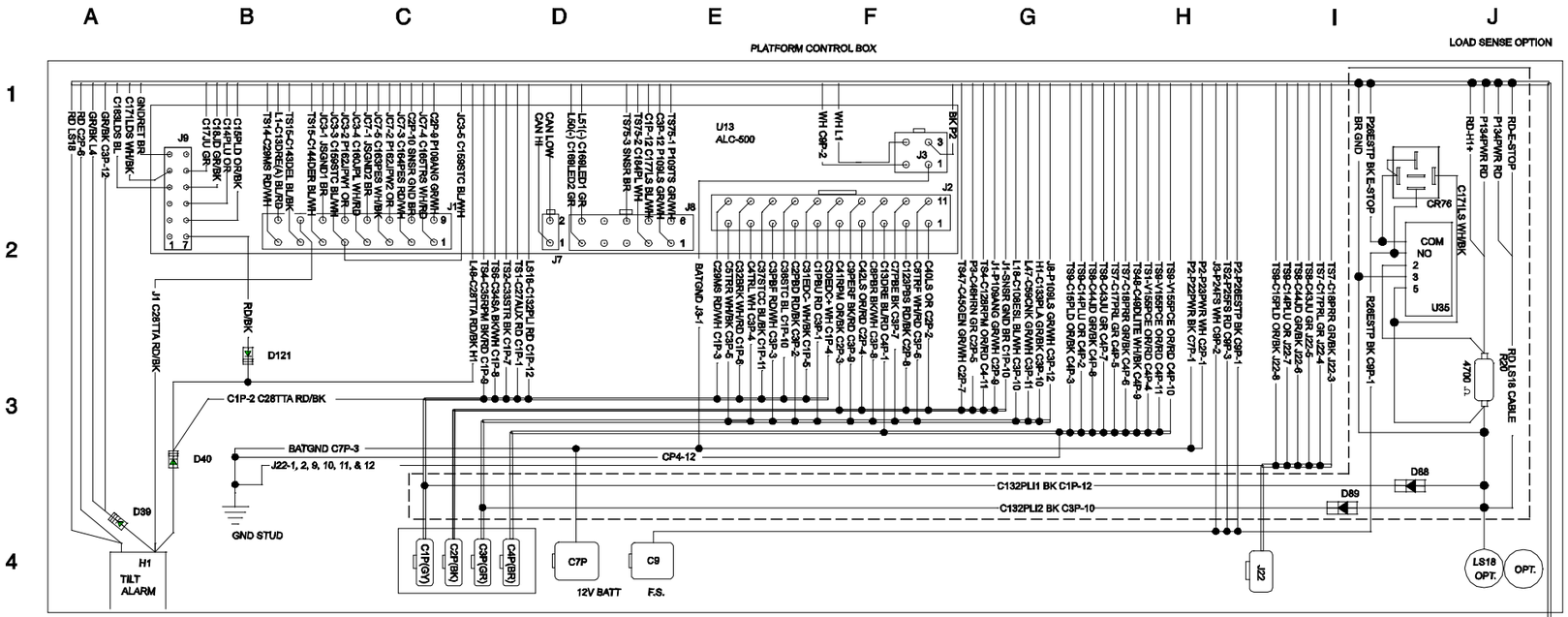



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS54 | ENGINE HIGH IDLE |
| TS58 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS56 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H8 | LOAD SENSE ALARM (CE ONLY) |
| U1 | IGNITION/START MODULE |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

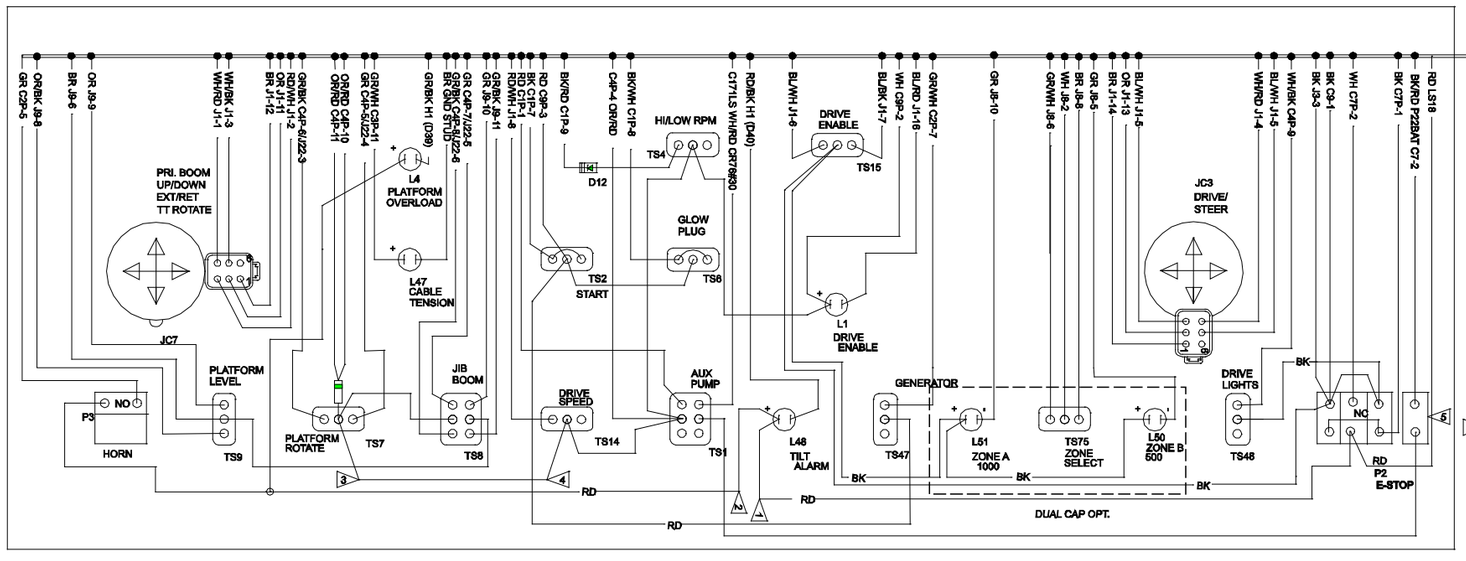
ES0503P

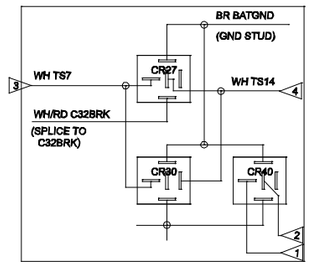
# Platform Control Box, S-80 • S-85

## Perkins 804D-33 Models (CE)




| COMPONENT INDEX | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT |
| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| CR27 | LIFT/DRIVE SELECT RELAY |
| CR30 | MACHINE STOWED BYPASS RELAY |
| CR40 | CE TILT LED OUT OF STOWED RELAY |
| CR76 | LOAD SENSE RECOVERY RELAY |



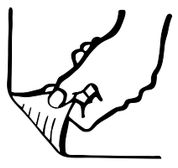




CE UNITS
REPLACE WIRE WITH THIS WIRING DIAGRAM

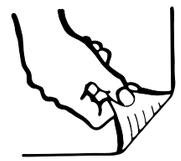
5 CE AND AUS ONLY

ES0503P

# Platform Control Box, S-80 • S-85 - Perkins 804D-33 Models (CE)

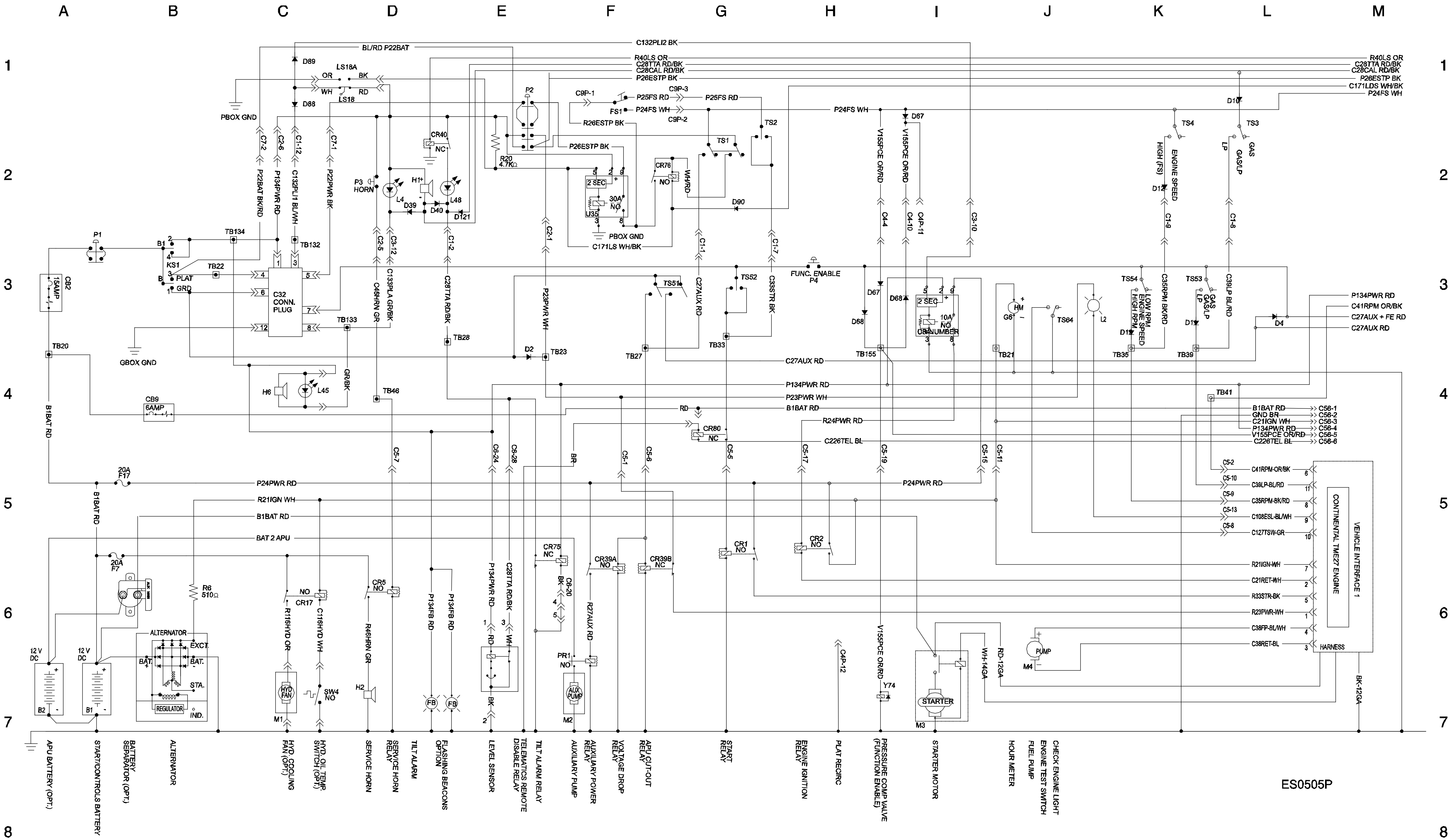


# Electrical Schematic, S-80 • S-85 - Continental TME27 Models (CE)



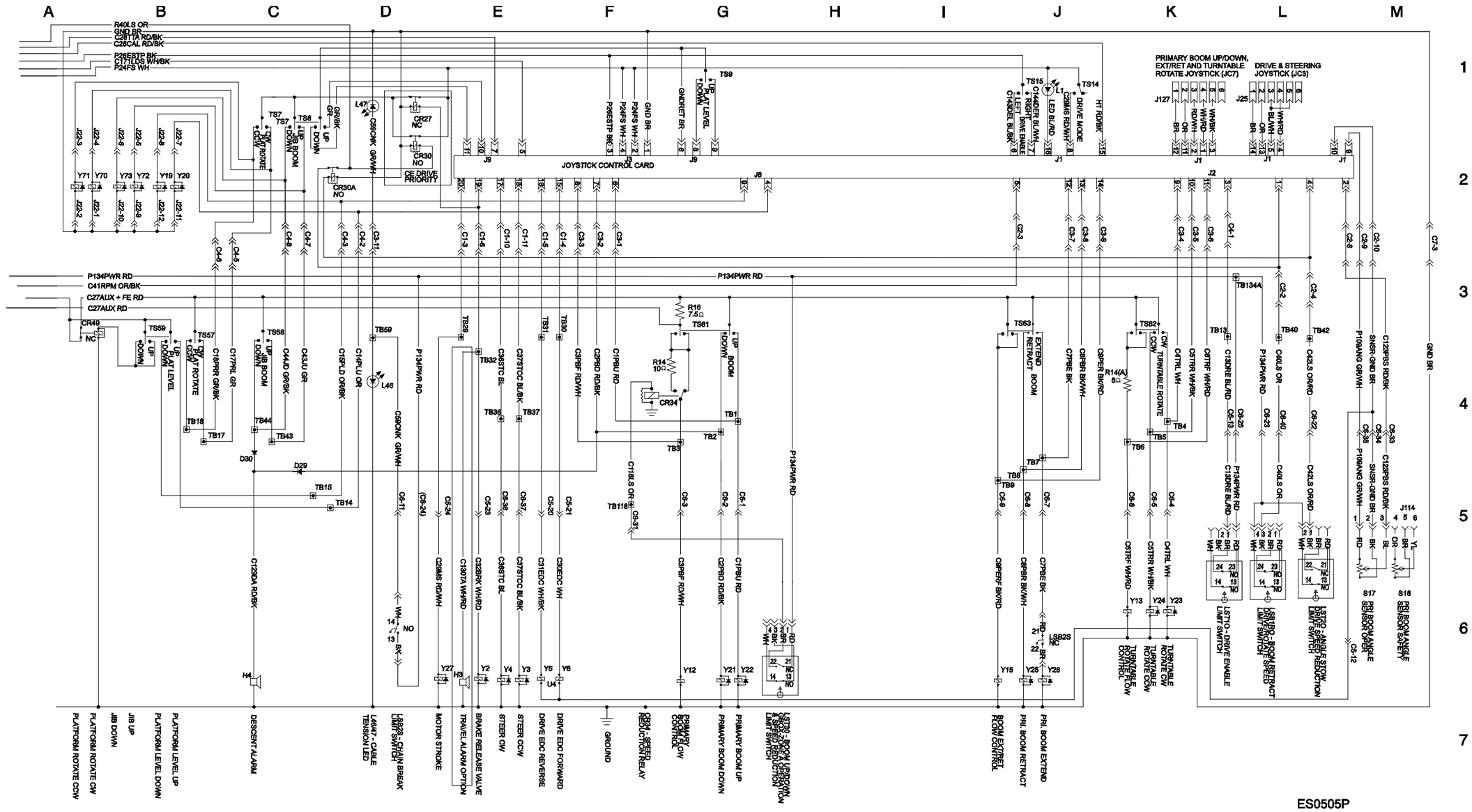
## Electrical Schematic, S-80 • S-85

### Continental TME27 Models (CE)

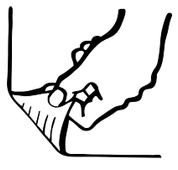


# Electrical Schematic, S-80 • S-85

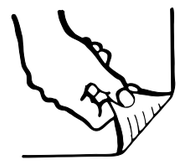
## Continental TME27 Models (CE)



# Electrical Schematic, S-80 • S-85 - Continental TME27 Models (CE)

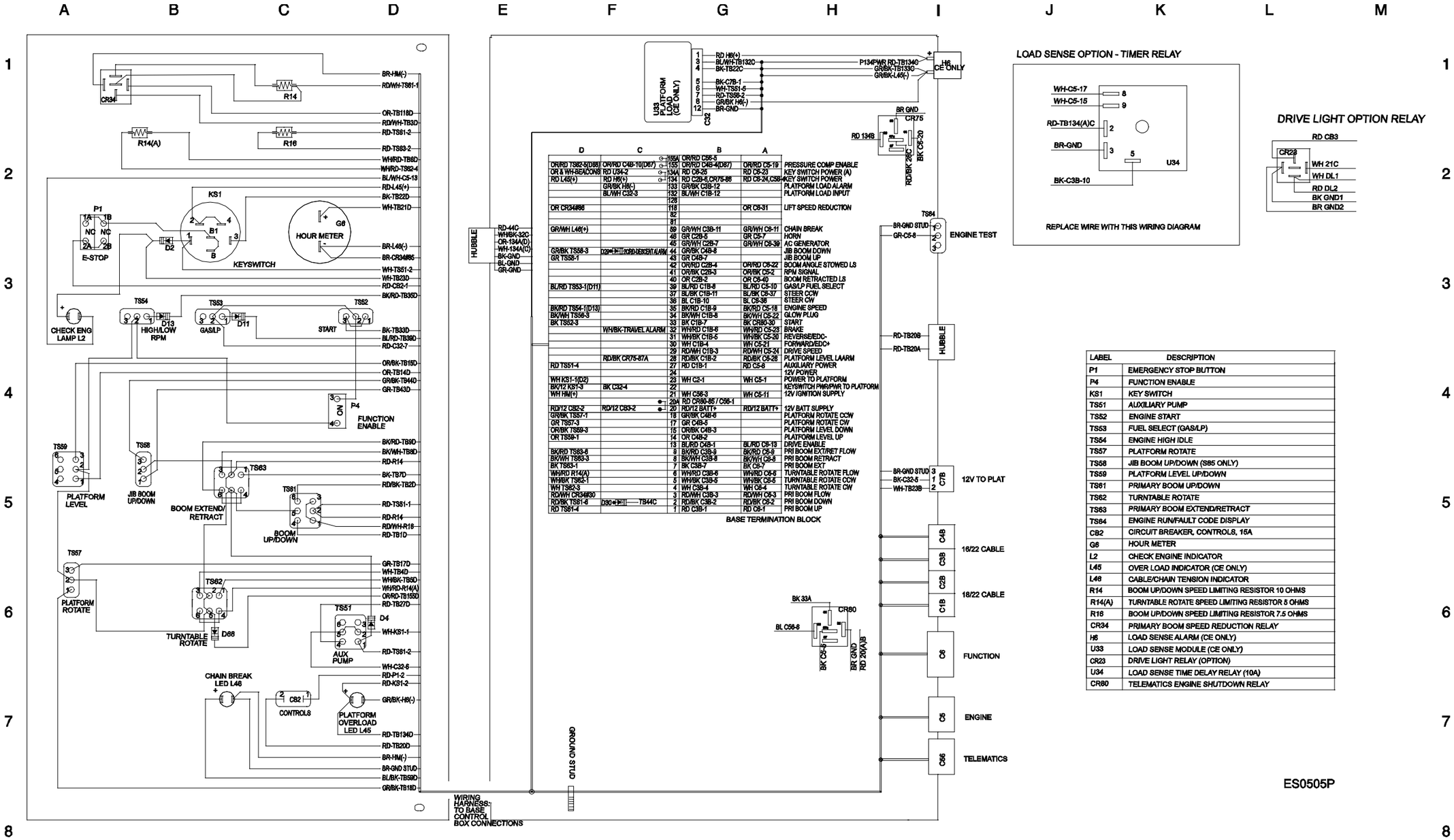


# Ground Control Box, S-80 • S-85 - Continental TME27 Models (CE)



# Ground Control Box, S-80 • S-85

## Continental TME27 Models (CE)

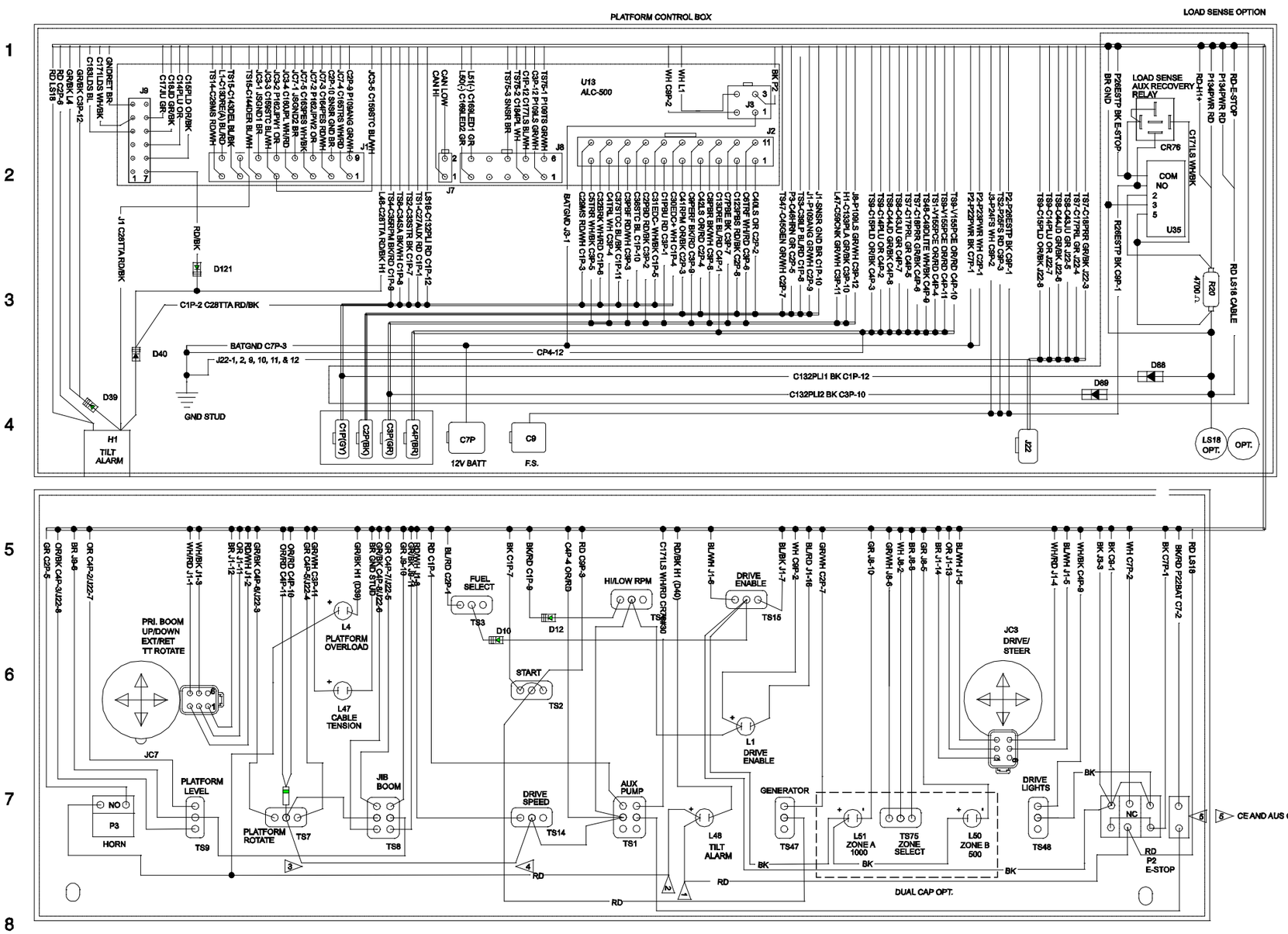



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS53 | FUEL SELECT (GAS/LP) |
| TS54 | ENGINE HIGH IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| TS64 | ENGINE RUN/FAULT CODE DISPLAY |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |

ES0505P

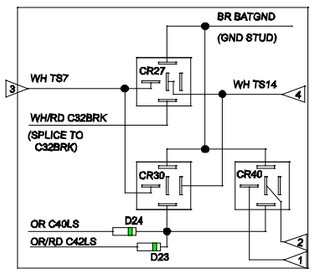
# Platform Control Box, S-80 • S-85

## Continental TME27 Models (CE)




### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

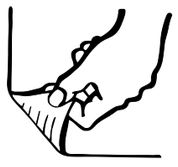



CE UNITS

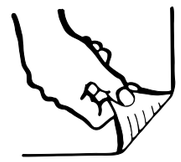
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0505P

# Platform Control Box, S-80 • S-85 - Continental TME27 Models (CE)

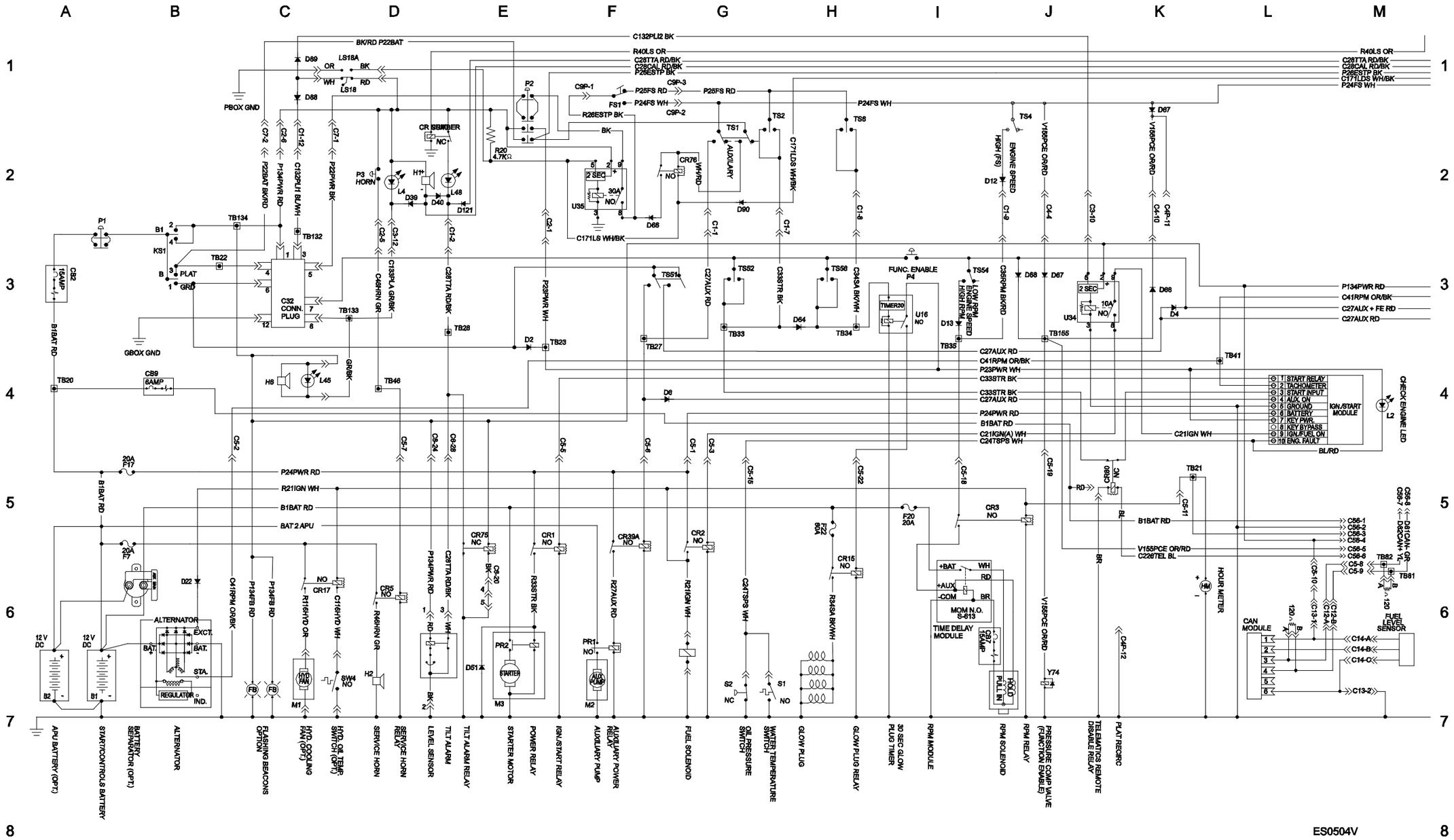


# Electrical Schematic, S-80 • S-85 - Deutz TD2011L04i Models (AS)



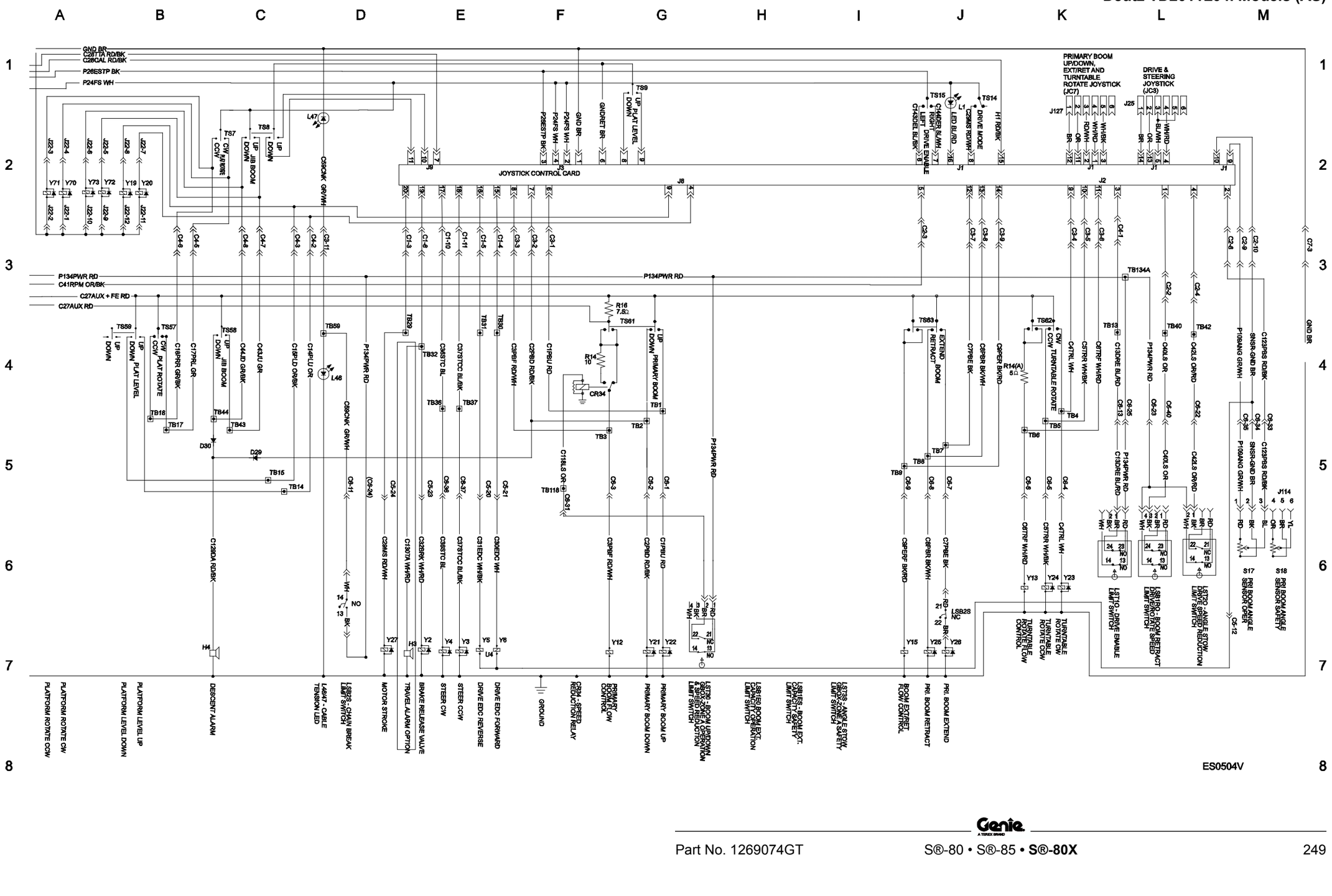
# Electrical Schematic, S-80 • S-85

## Deutz TD2011L04i Models (AS)



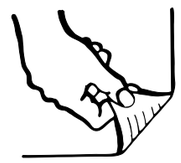
# Electrical Schematic, S-80 • S-85

## Deutz TD2011L04i Models (AS)



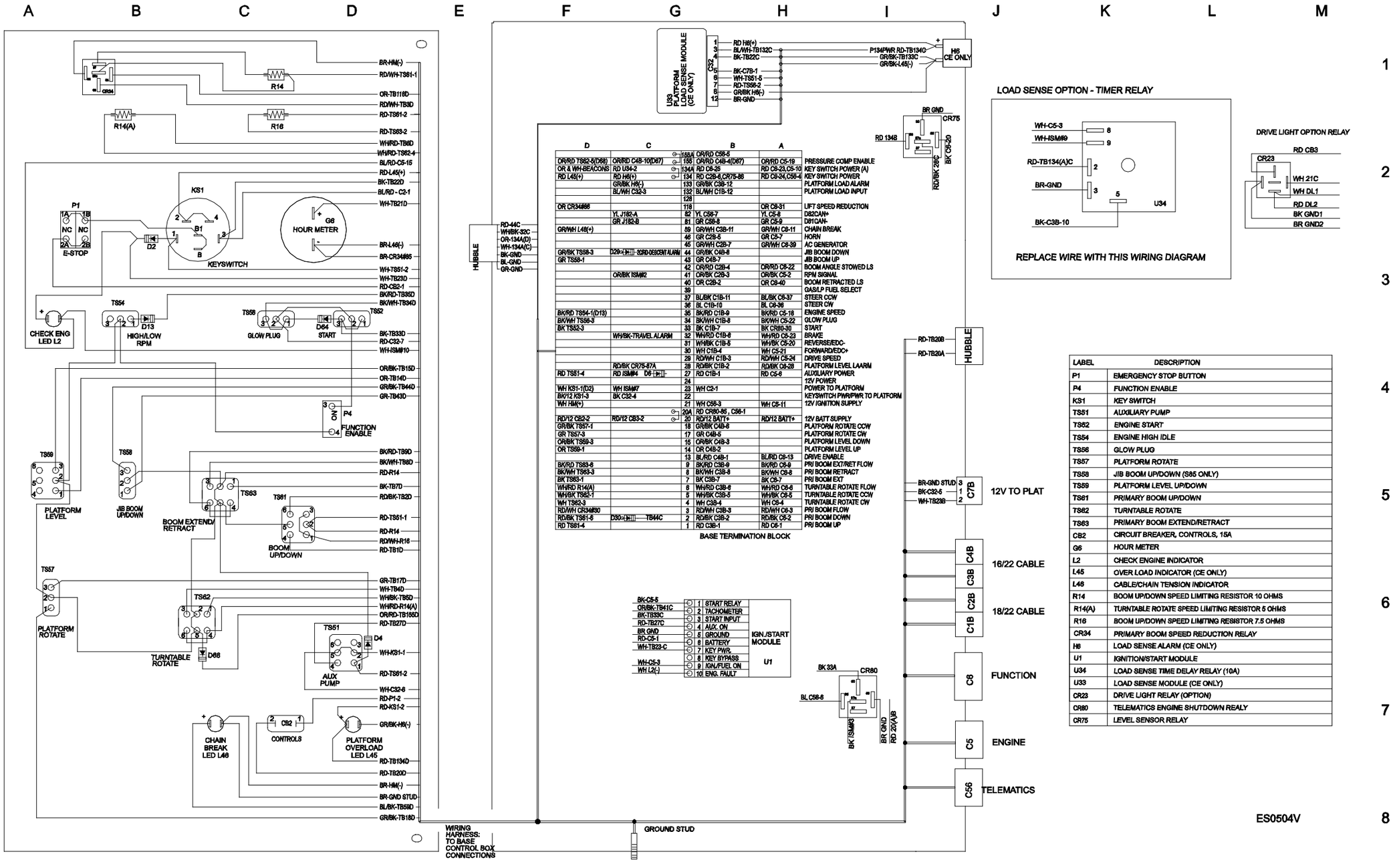
# Electrical Schematic, S-80 • S-85 - Deutz TD2011L04i Models (AS)

# Ground Control Box, S-80 • S-85 - Deutz TD2011L04i Models (AS)



# Ground Control Box, S-80 • S-85

## Deutz TD2011L04i Models (AS)

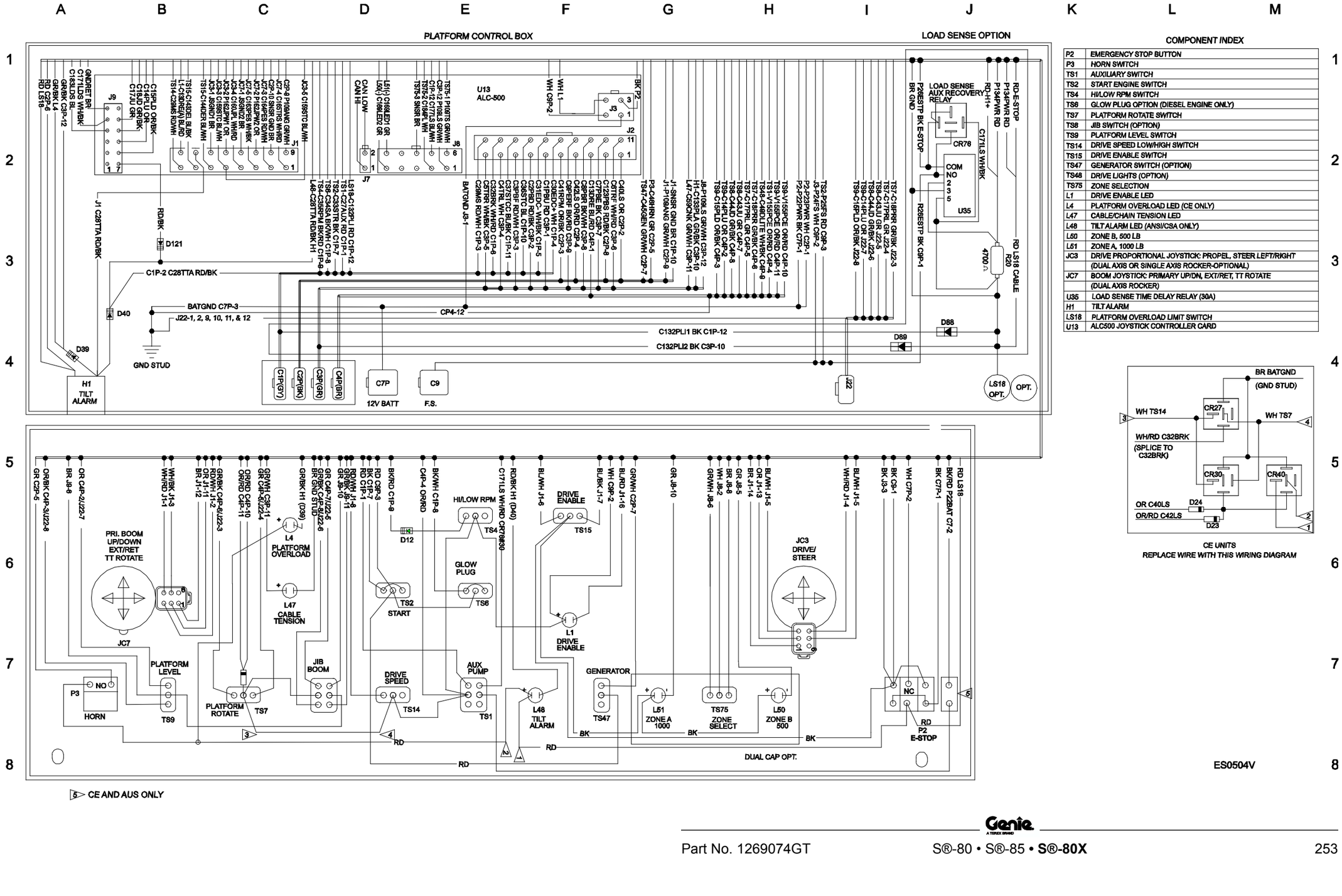



| LABEL | DESCRIPTION |
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| TS54 | ENGINE HIGH IDLE |
| TS56 | GLOW PLUG |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
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| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
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| U1 | IGNITION/START MODULE |
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| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| CR80 | TELEMATICS ENGINE SHUTDOWN REALY |
| CR75 | LEVEL SENSOR RELAY |

ES0504V

# Platform Control Box, S-80 • S-85

## Deutz TD2011L04i Models (AS)



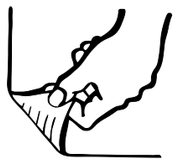

### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| TS1 | AUXILIARY SWITCH |
| TS2 | START ENGINE SWITCH |
| TS4 | HI/LOW RPM SWITCH |
| TS6 | GLOW PLUG OPTION (DIESEL ENGINE ONLY) |
| TS7 | PLATFORM ROTATE SWITCH |
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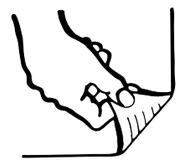



ES0504V

# Platform Control Box, S-80 • S-85 - Deutz TD2011L04i Models (AS)

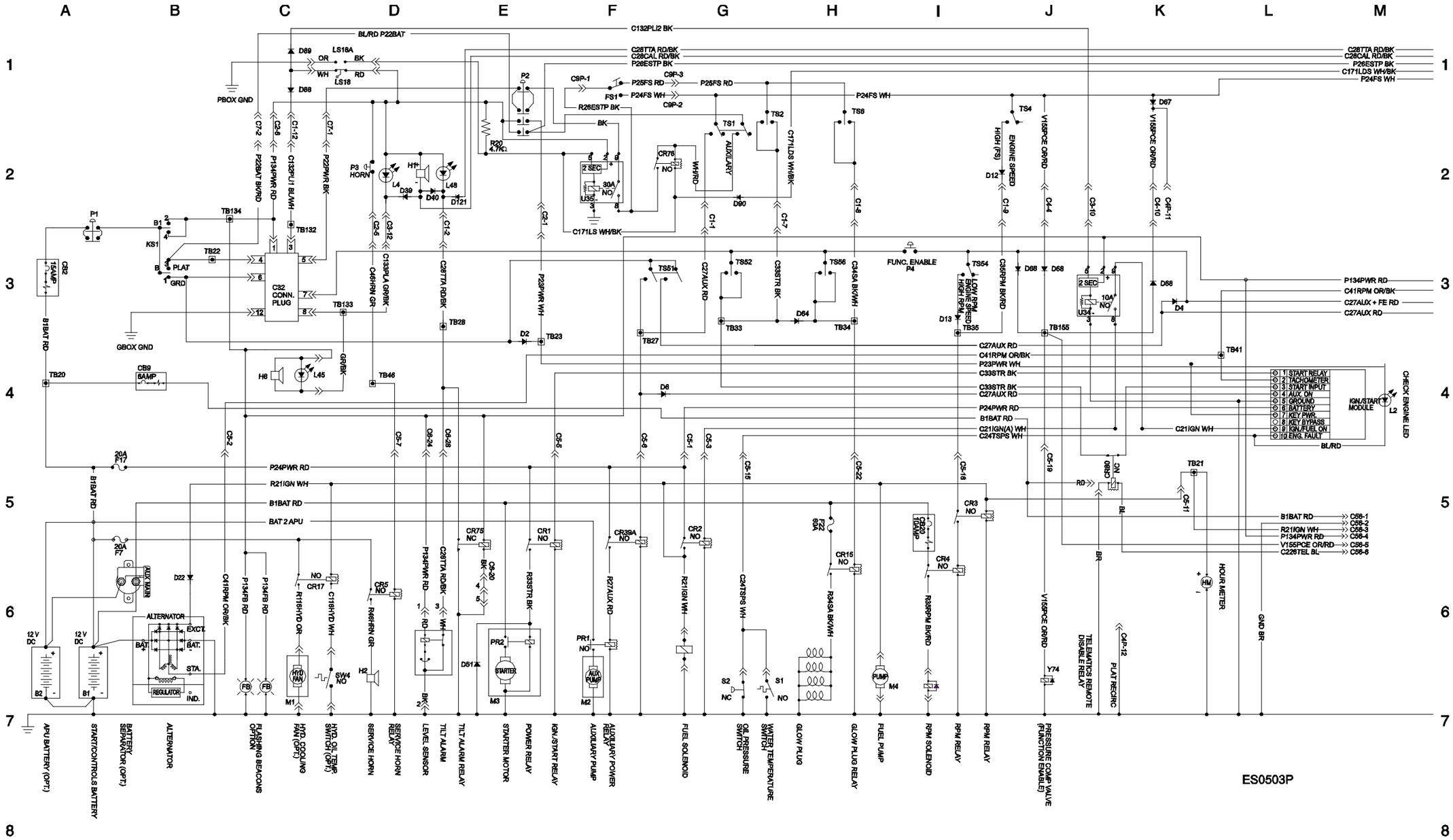


# Electrical Schematic, S-80 • S-85 - Perkins 804D-33 Models (AS)



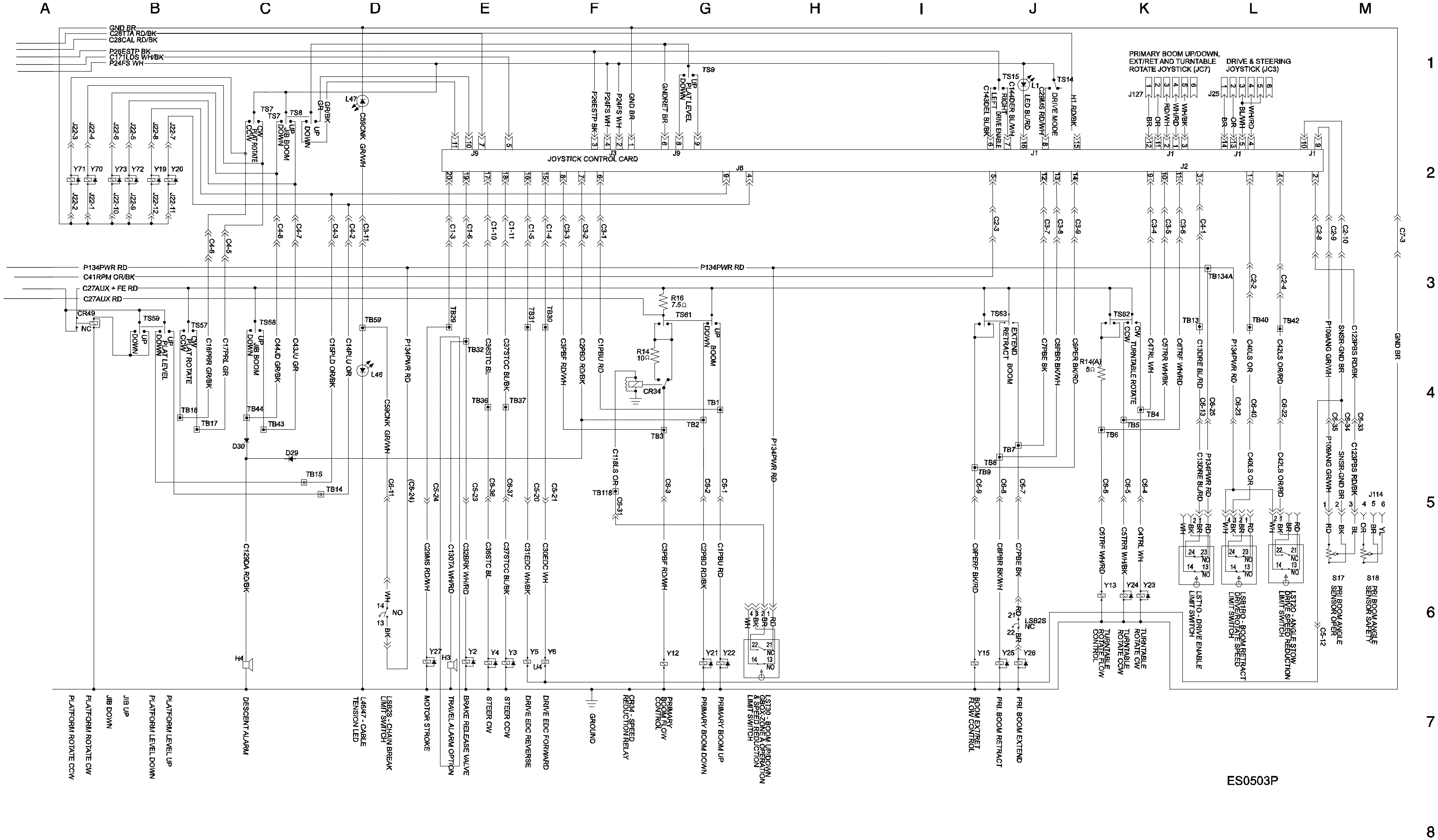
# Electrical Schematic, S-80 • S-85

## Perkins 804D-33 Models (AS)

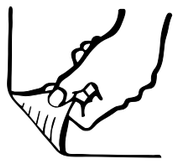


# Electrical Schematic, S-80 • S-85

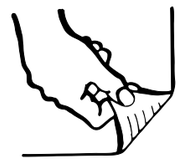
## Perkins 804D-33 Models (AS)



# Electrical Schematic, S-80 • S-85 - Perkins 804D-33 Models (AS)

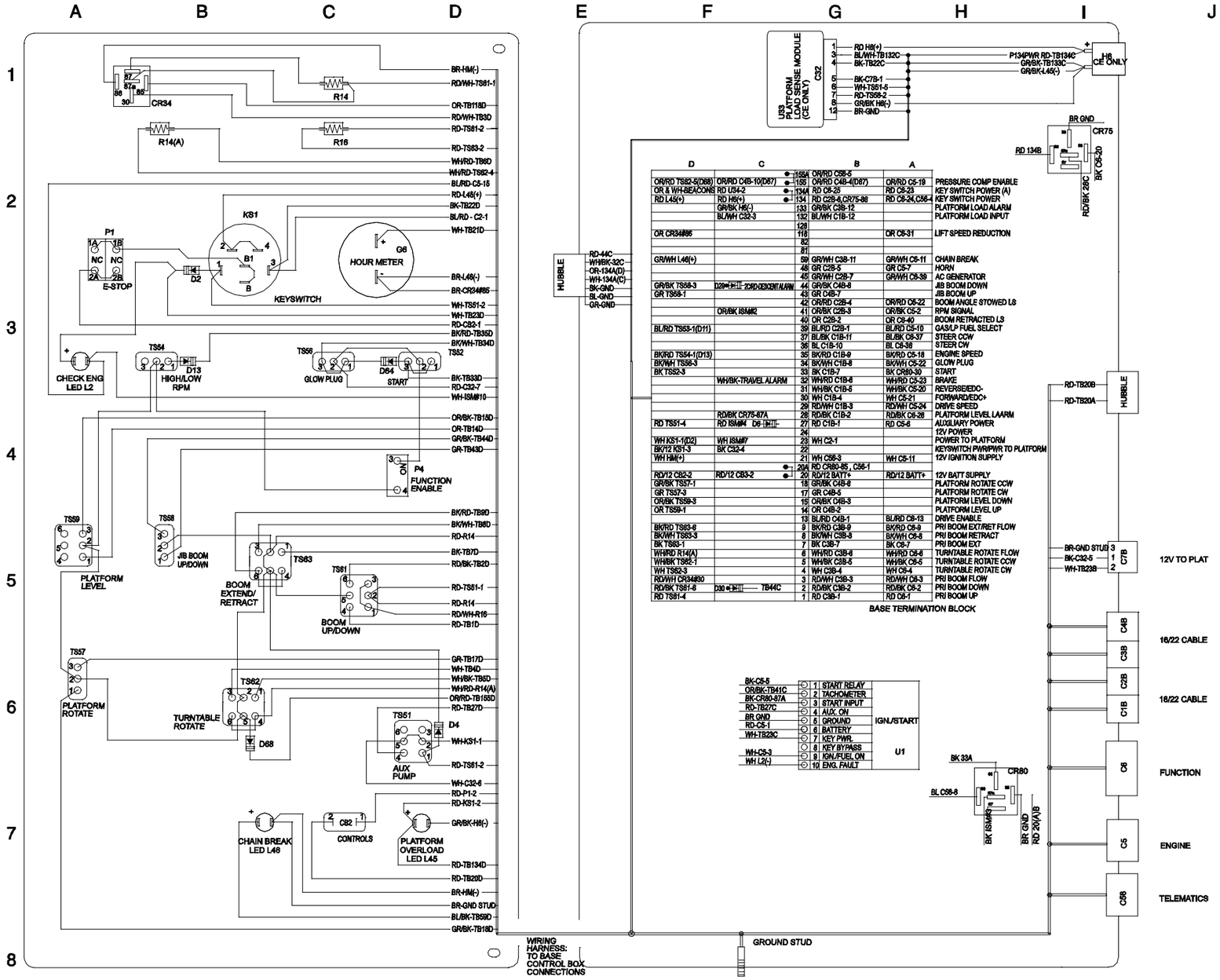


# Ground Control Box, S-80 • S-85 - Perkins 804D-33 Models (AS)



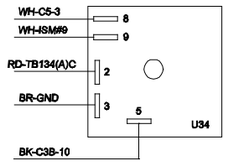
# Ground Control Box, S-80 • S-85

## Perkins 804D-33 Models (AS)



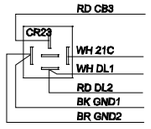

| D | C | | B | A | |
|---|---|---|---|---|---|
| | | 1654 | OR/RD C2B-5 | | |
| OR/RD TS82-5(D68) | OR/RD C4B-10(D87) | 155 | OR/RD C4B-4(D87) | OR/RD C5-19 | PRESSURE COMP ENABLE |
| OR & WH-BEACONS | RD U34-2 | 134A | RD C8-25 | RD C8-23 | KEY SWITCH POWER (A) |
| RD L45(+) | RD H8(+) | 134 | RD C2B-6,CR75-86 | RD C8-24,C66-4 | KEY SWITCH POWER |
| | GR/BK H8(-) | 133 | GR/BK C3B-12 | | PLATFORM LOAD ALARM |
| | BL/WH C32-3 | 132 | BL/WH C1B-12 | | PLATFORM LOAD INPUT |
| | | 128 | | | |
| OR CR34#86 | | 118 | | OR C6-31 | LIFT SPEED REDUCTION |
| | | 82 | | | |
| | | 81 | | | |
| GR/WH L46(+) | | 59 | GR/WH C3B-11 | GR/WH C6-11 | CHAIN BREAK |
| | | 46 | GR C2B-5 | GR C5-7 | HORN |
| | | 45 | GR/WH C2B-7 | GR/WH C6-39 | AC GENERATOR |
| GR/BK TS58-3 | D29 2(D)D-DIODE(ALARM) | 44 | GR/BK C4B-8 | | JIB BOOM DOWN |
| GR TS58-1 | | 43 | GR C4B-7 | | JIB BOOM UP |
| | | 42 | OR/RD C2B-4 | OR/RD C6-22 | BOOM ANGLE STOWED LS |
| | OR/BK ISM#2 | 41 | OR/BK C2B-3 | OR/BK C5-2 | RPM SIGNAL |
| | | 40 | OR C2B-2 | OR C8-40 | BOOM RETRACTED LS |
| BL/RD TS53-1(D11) | | 39 | BL/RD C2B-1 | BL/RD C5-10 | GAS/LP FUEL SELECT |
| | | 37 | BL/BK C1B-11 | BL/BK C5-37 | STEER CCW |
| | | 36 | BL C1B-10 | BL C8-36 | STEER CW |
| BK/RD TS54-1(D13) | | 35 | BK/RD C1B-9 | BK/RD C5-18 | ENGINE SPEED |
| BK/WH TS56-3 | | 34 | BK/WH C1B-8 | BK/WH C5-22 | GLOW PLUG |
| BK TS52-3 | | 33 | BK C1B-7 | BK CR80-30 | START |
| | WH/BK-TRAVEL ALARM | 32 | WH/RD C1B-6 | WH/RD C5-23 | BRAKE |
| | | 31 | WH/BK C1B-5 | WH/BK C5-20 | REVERSE/EDC- |
| | | 30 | WH C1B-4 | WH C5-21 | FORWARD/EDC+ |
| | | 29 | RD/WH C1B-3 | RD/WH C5-24 | DRIVE SPEED |
| | RD/BK CR75-87A | 28 | RD/BK C1B-2 | RD/BK C6-26 | PLATFORM LEVEL LAARM |
| RD TS51-4 | RD ISM#4 D6 | 27 | RD C1B-1 | RD C5-6 | AUXILIARY POWER |
| | | 24 | | | 12V POWER |
| WH KS1-1(D2) | WH ISM#7 | 23 | WH C2-1 | | POWER TO PLATFORM |
| BK/12 KS1-3 | BK C32-4 | 22 | | | KEYSWITCH PWR/PWR TO PLATFORM |
| WH H#(+) | | 21 | WH C66-3 | WH C6-11 | 12V IGNITION SUPPLY |
| | | 20A | RD CR80-85 , C66-1 | | |
| RD/12 C82-2 | RD/12 C83-2 | 20 | RD/12 BATT+ | RD/12 BATT+ | 12V BATT SUPPLY |
| GR/BK TS57-1 | | 18 | GR/BK C4B-8 | | PLATFORM ROTATE CCW |
| GR TS57-3 | | 17 | GR C4B-5 | | PLATFORM ROTATE CW |
| OR/BK TS59-3 | | 15 | OR/BK C4B-3 | | PLATFORM LEVEL DOWN |
| OR TS59-1 | | 14 | OR C4B-2 | | PLATFORM LEVEL UP |
| | | 13 | BL/RD C4B-1 | BL/RD C8-13 | DRIVE ENABLE |
| BK/RD TS63-6 | | 9 | BK/RD C3B-9 | BK/RD C6-9 | PRI BOOM EXT/RET FLOW |
| BK/WH TS63-3 | | 8 | BK/WH C3B-8 | BK/WH C6-8 | PRI BOOM RETRACT |
| BK TS63-1 | | 7 | BK C3B-7 | BK C8-7 | PRI BOOM EXT |
| WH/RD R14(A) | | 6 | WH/RD C3B-6 | WH/RD C6-6 | TURNTABLE ROTATE FLOW |
| WH/BK TS62-1 | | 5 | WH/BK C3B-5 | WH/BK C6-5 | TURNTABLE ROTATE CCW |
| WH TS62-3 | | 4 | WH C2B-4 | WH C6-4 | TURNTABLE ROTATE CW |
| RD/WH CR34#30 | | 3 | RD/WH C3B-3 | RD/WH C6-3 | PRI BOOM FLOW |
| RD/BK TS61-8 | D30 TB41C | 2 | RD/BK C3B-2 | RD/BK C8-2 | PRI BOOM DOWN |
| RD TS61-4 | | 1 | RD C3B-1 | RD C8-1 | PRI BOOM UP |

LOAD SENSE OPTION - TIMER RELAY




REPLACE WIRE WITH THIS WIRING DIAGRAM

DRIVE LIGHT OPTION RELAY

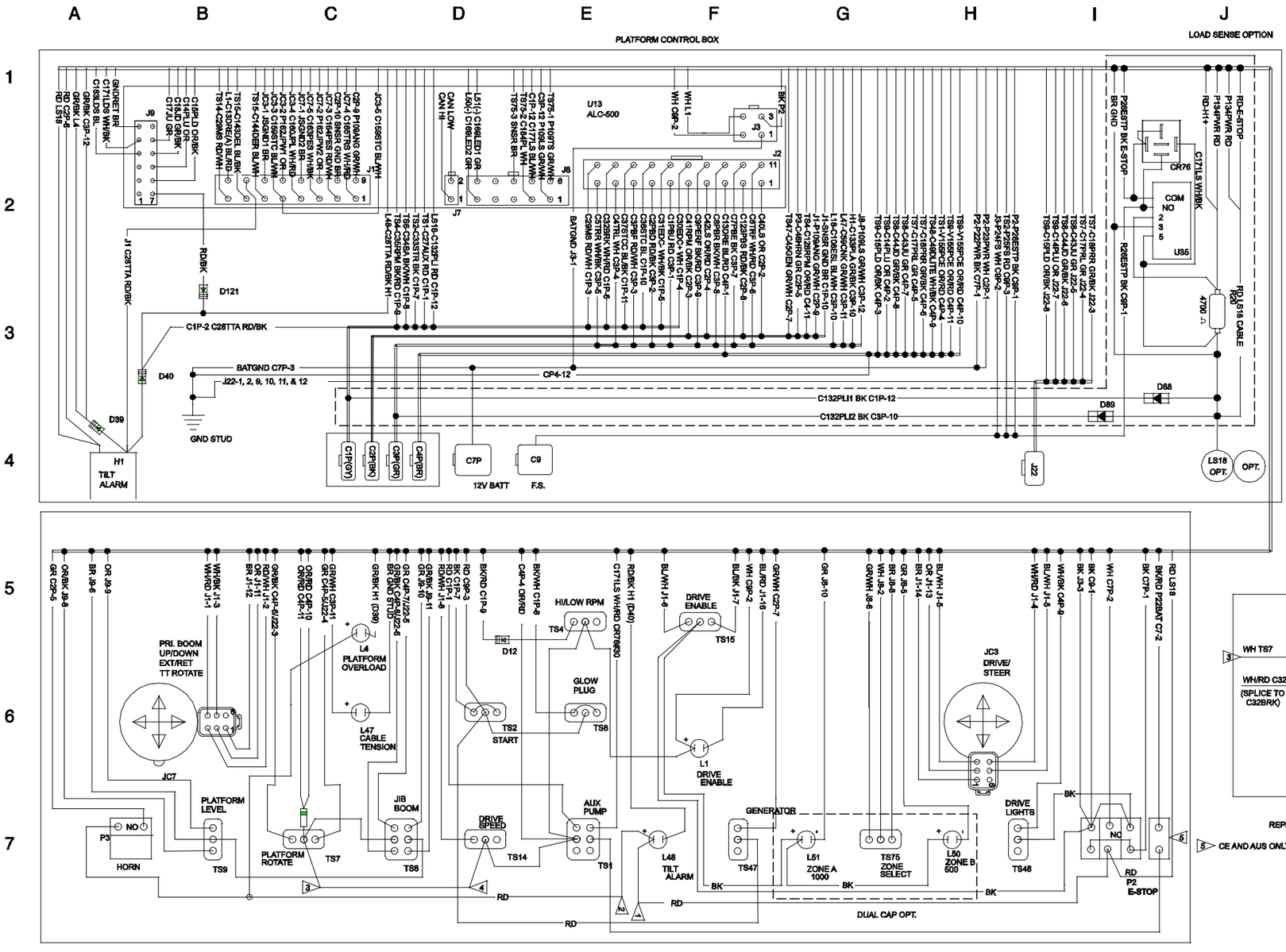



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ES0503P

# Platform Control Box, S-80 • S-85

## Perkins 804D-33 Models (AS)

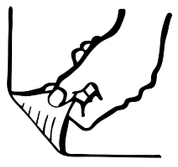



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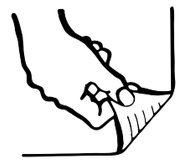
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| TS8 | JIB SWITCH (OPTION) |
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| | (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE |
| | (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |
| CR27 | LIFT/DRIVE SELECT RELAY |
| CR30 | MACHINE STOWED BYPASS RELAY |
| CR40 | CE TILT LED OUT OF STOWED RELAY |
| CR76 | LOAD SENSE RECOVERY RELAY |

ES0503P

# Platform Control Box, S-80 • S-85 - Perkins 804D-33 Models (AS)

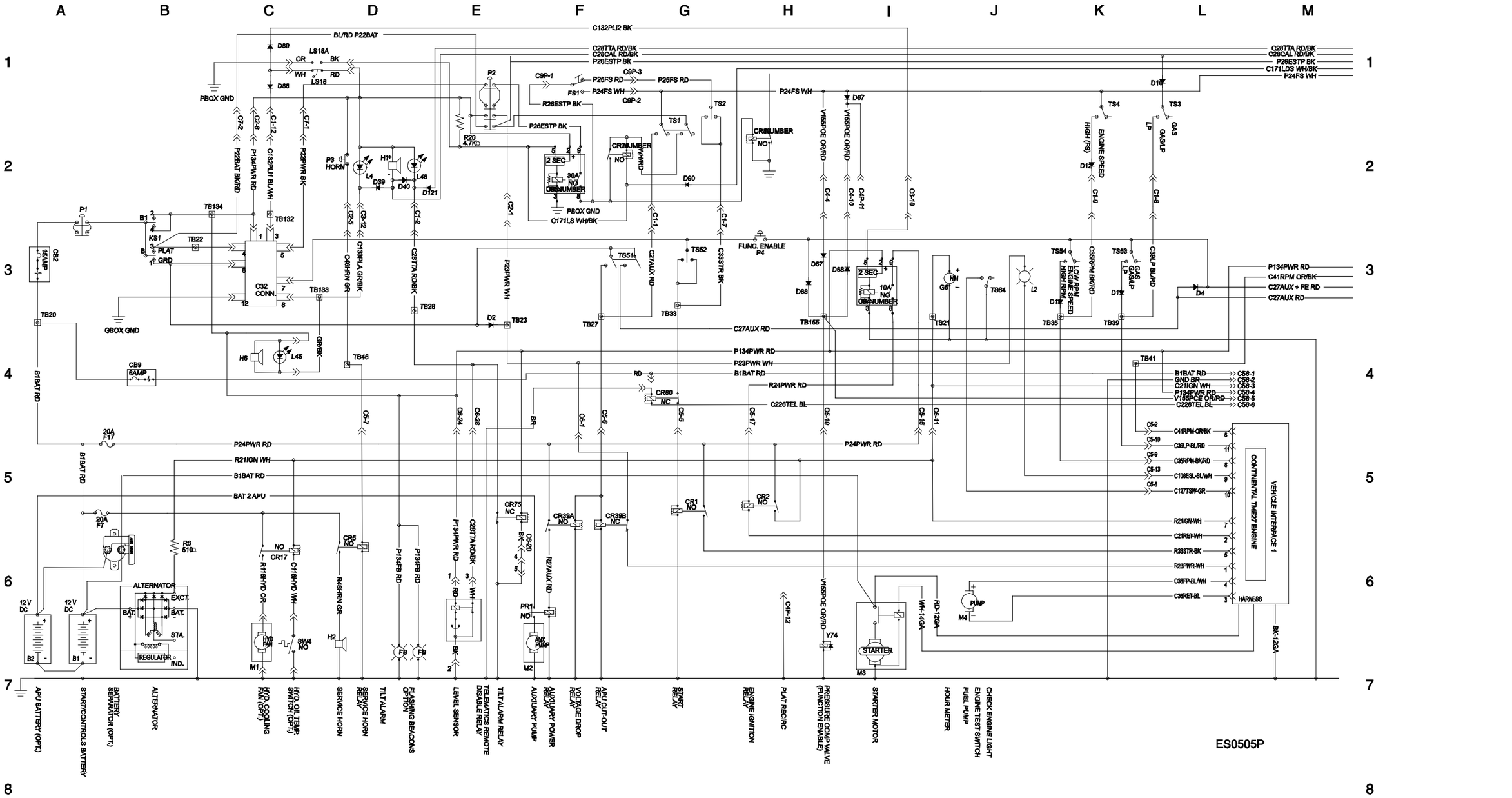


# Electrical Schematic, S-80 • S-85 - Continental TME27 Models (AS)



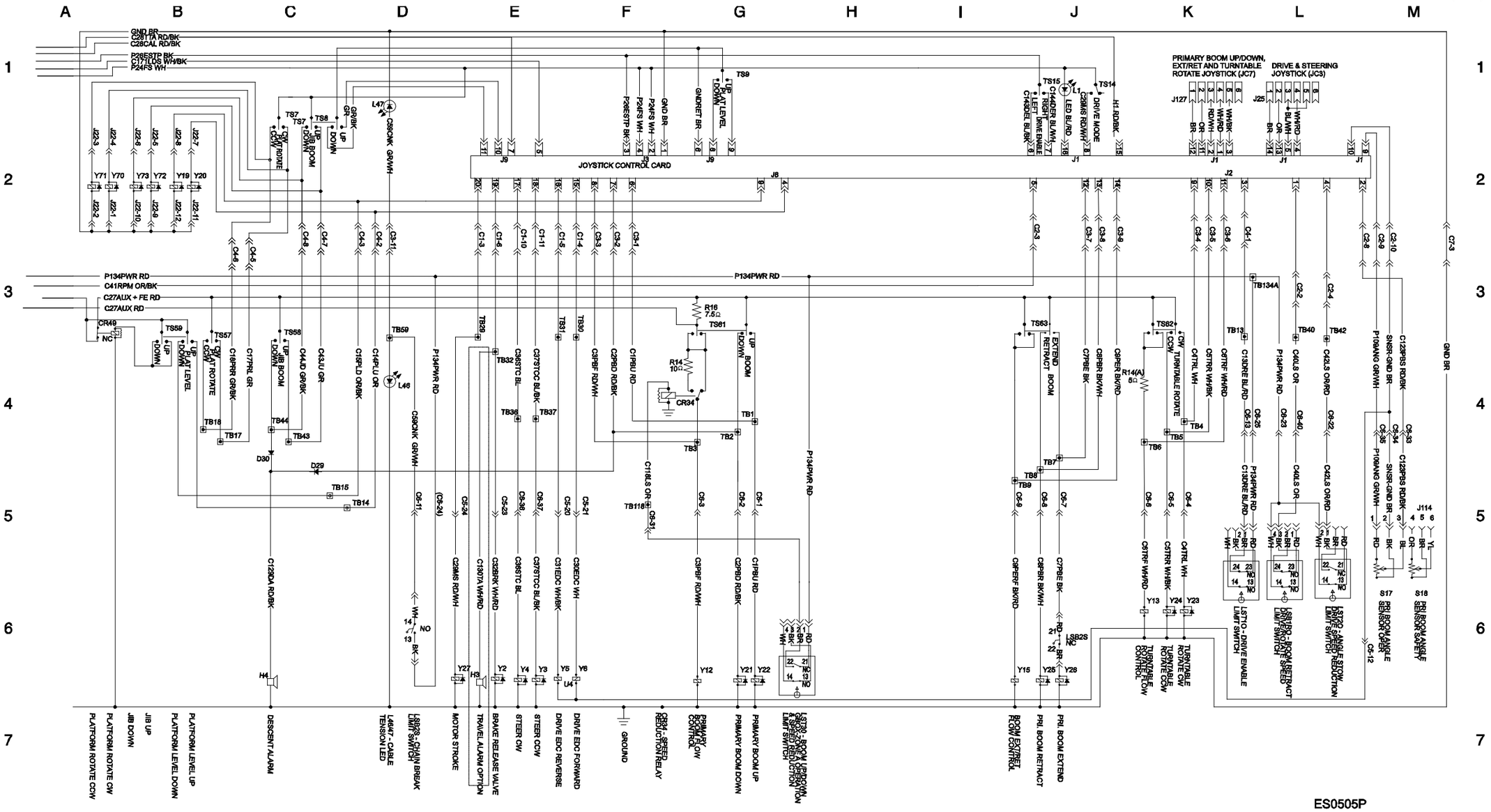
# Electrical Schematic, S-80 • S-85

## Continental TME27 Models (AS)

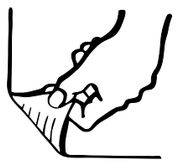


# Electrical Schematic, S-80 • S-85

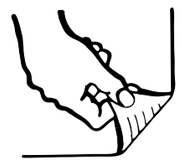
## Continental TME27 Models (AS)



# Electrical Schematic, S-80 • S-85 - Continental TME27 Models (AS)

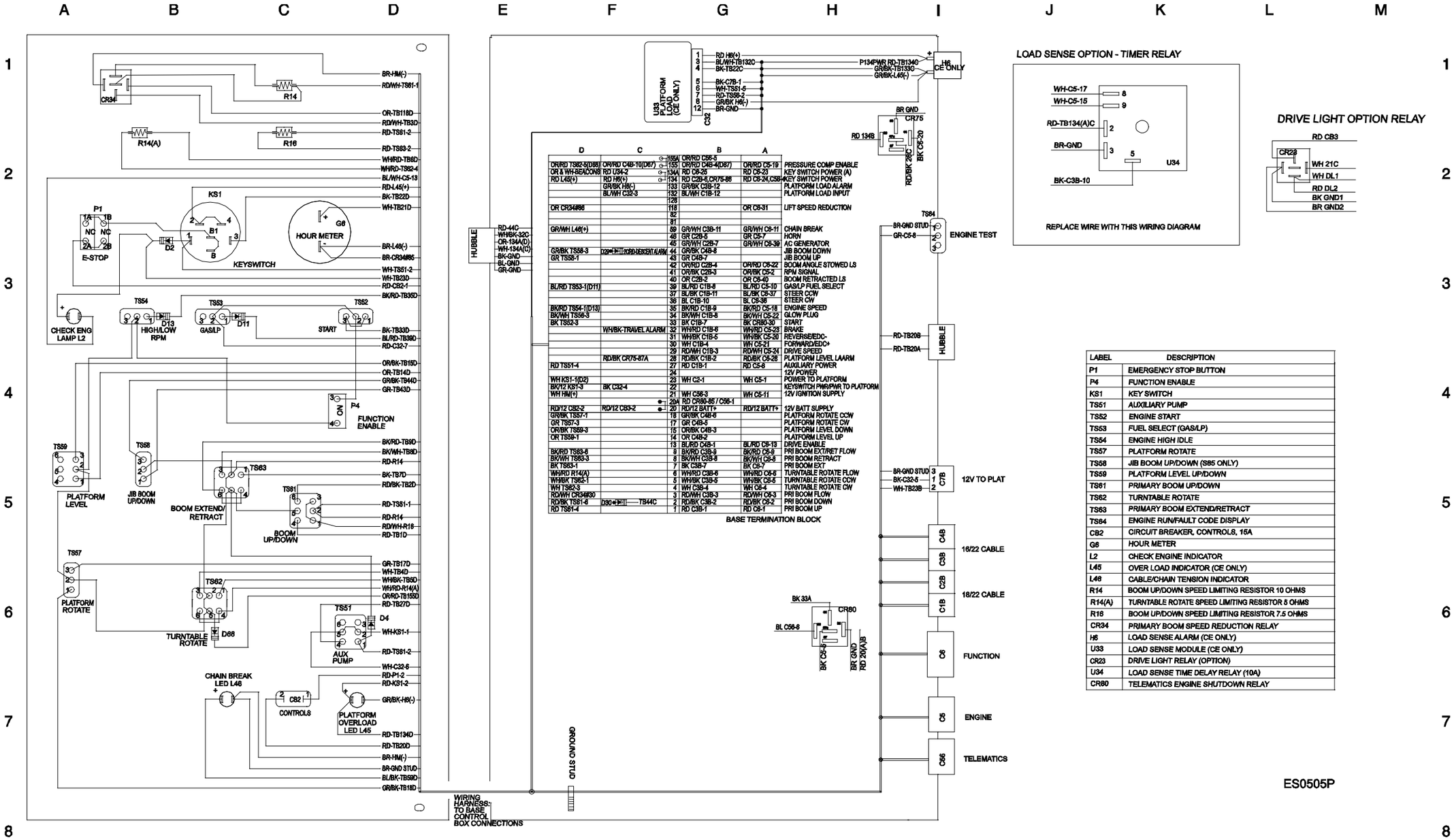


# Ground Control Box, S-80 • S-85 - Continental TME27 Models (AS)



# Ground Control Box, S-80 • S-85

## Continental TME27 Models (AS)

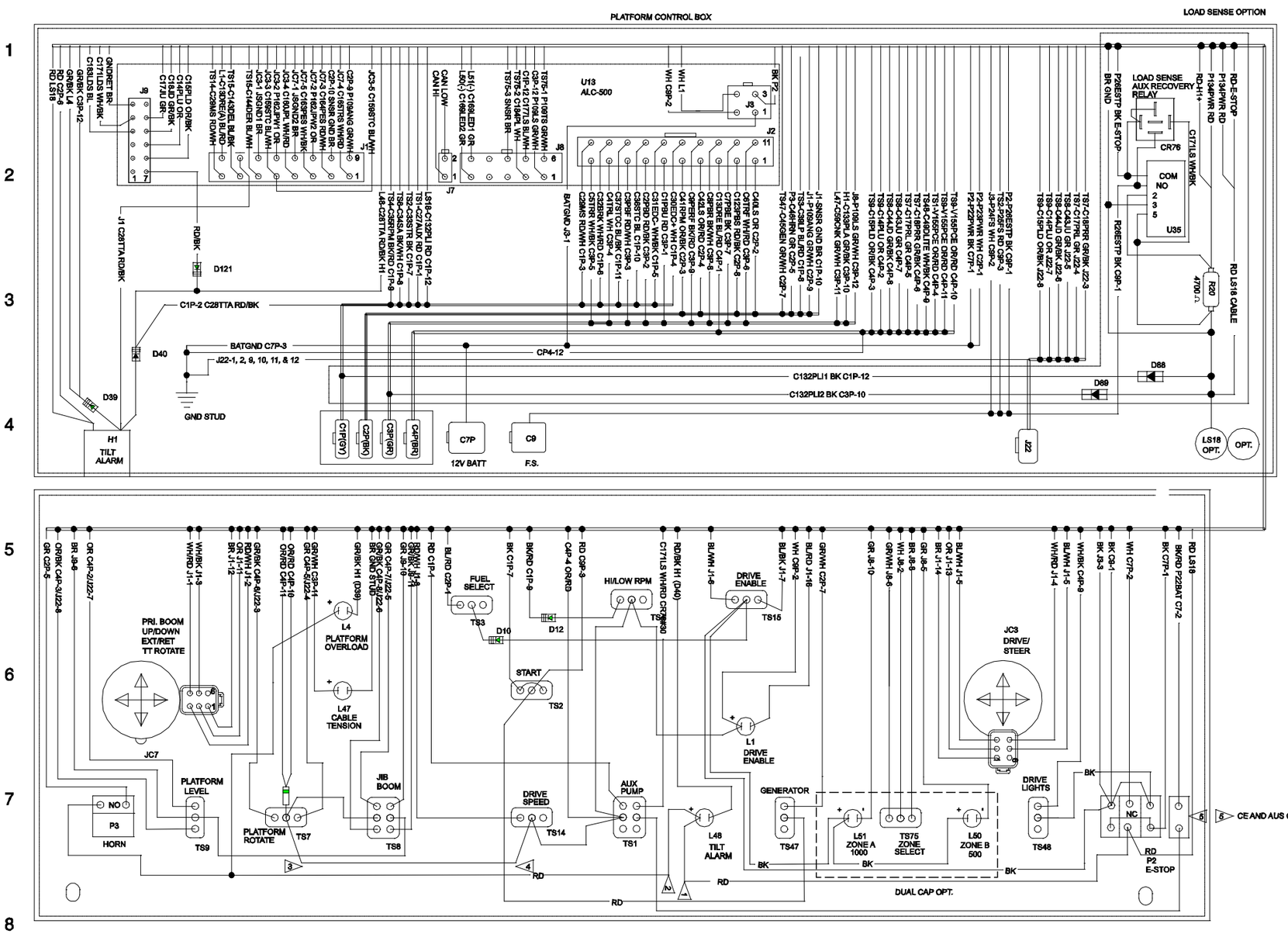



| LABEL | DESCRIPTION |
|---|---|
| P1 | EMERGENCY STOP BUTTON |
| P4 | FUNCTION ENABLE |
| KS1 | KEY SWITCH |
| TS51 | AUXILIARY PUMP |
| TS52 | ENGINE START |
| TS53 | FUEL SELECT (GAS/LP) |
| TS54 | ENGINE HIGH IDLE |
| TS57 | PLATFORM ROTATE |
| TS58 | JIB BOOM UP/DOWN (S85 ONLY) |
| TS59 | PLATFORM LEVEL UP/DOWN |
| TS61 | PRIMARY BOOM UP/DOWN |
| TS62 | TURNTABLE ROTATE |
| TS63 | PRIMARY BOOM EXTEND/RETRACT |
| TS64 | ENGINE RUN/FAULT CODE DISPLAY |
| CB2 | CIRCUIT BREAKER, CONTROLS, 15A |
| G6 | HOUR METER |
| L2 | CHECK ENGINE INDICATOR |
| L45 | OVER LOAD INDICATOR (CE ONLY) |
| L46 | CABLE/CHAIN TENSION INDICATOR |
| R14 | BOOM UP/DOWN SPEED LIMITING RESISTOR 10 OHMS |
| R14(A) | TURNTABLE ROTATE SPEED LIMITING RESISTOR 5 OHMS |
| R16 | BOOM UP/DOWN SPEED LIMITING RESISTOR 7.5 OHMS |
| CR34 | PRIMARY BOOM SPEED REDUCTION RELAY |
| H6 | LOAD SENSE ALARM (CE ONLY) |
| U33 | LOAD SENSE MODULE (CE ONLY) |
| CR23 | DRIVE LIGHT RELAY (OPTION) |
| U34 | LOAD SENSE TIME DELAY RELAY (10A) |
| CR80 | TELEMATICS ENGINE SHUTDOWN RELAY |

ES0505P

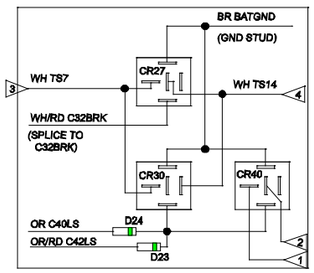
# Platform Control Box, S-80 • S-85

## Continental TME27 Models (AS)




### COMPONENT INDEX

| | |
|---|---|
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN SWITCH |
| 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) |
| TS75 | ZONE SELECTION |
| L1 | DRIVE ENABLE LED |
| L4 | PLATFORM OVERLOAD LED (CE ONLY) |
| L47 | CABLE/CHAIN TENSION LED |
| L48 | TILT ALARM LED (ANSI/CSA ONLY) |
| L50 | ZONE B, 500 LB |
| L51 | ZONE A, 1000 LB |
| JC3 | DRIVE PROPORTIONAL JOYSTICK: PROPEL, STEER LEFT/RIGHT (DUAL AXIS OR SINGLE AXIS ROCKER-OPTIONAL) |
| JC7 | BOOM JOYSTICK: PRIMARY UP/DN, EXT/RET, TT ROTATE (DUAL AXIS ROCKER) |
| U35 | LOAD SENSE TIME DELAY RELAY (30A) |
| H1 | TILT ALARM |
| LS18 | PLATFORM OVERLOAD LIMIT SWITCH |
| U13 | ALC500 JOYSTICK CONTROLLER CARD |

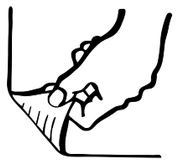



CE UNITS

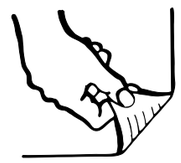
REPLACE WIRE WITH THIS WIRING DIAGRAM

ES0505P

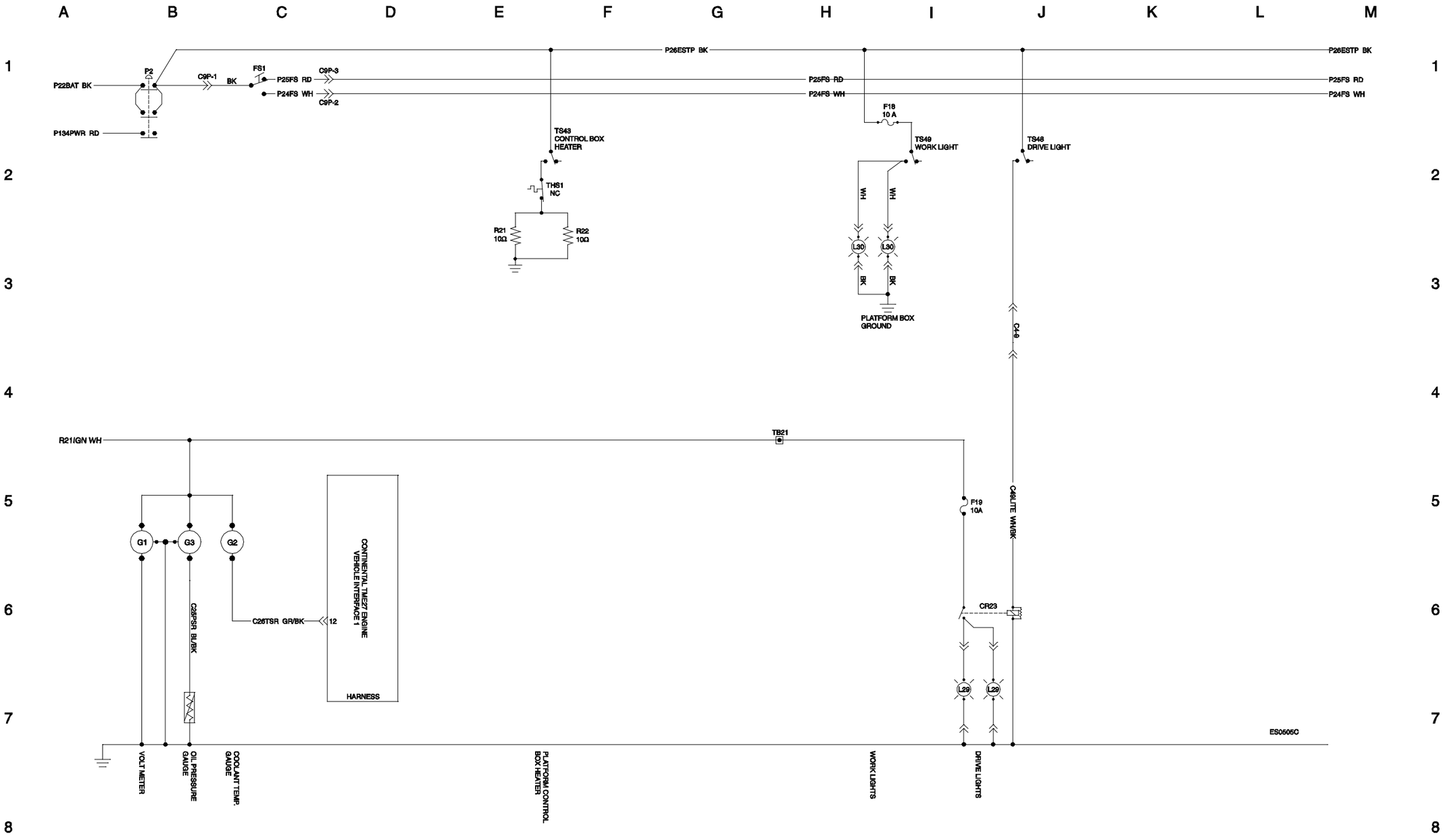
# Platform Control Box, S-80 • S-85 - Continental TME27 Models (AS)



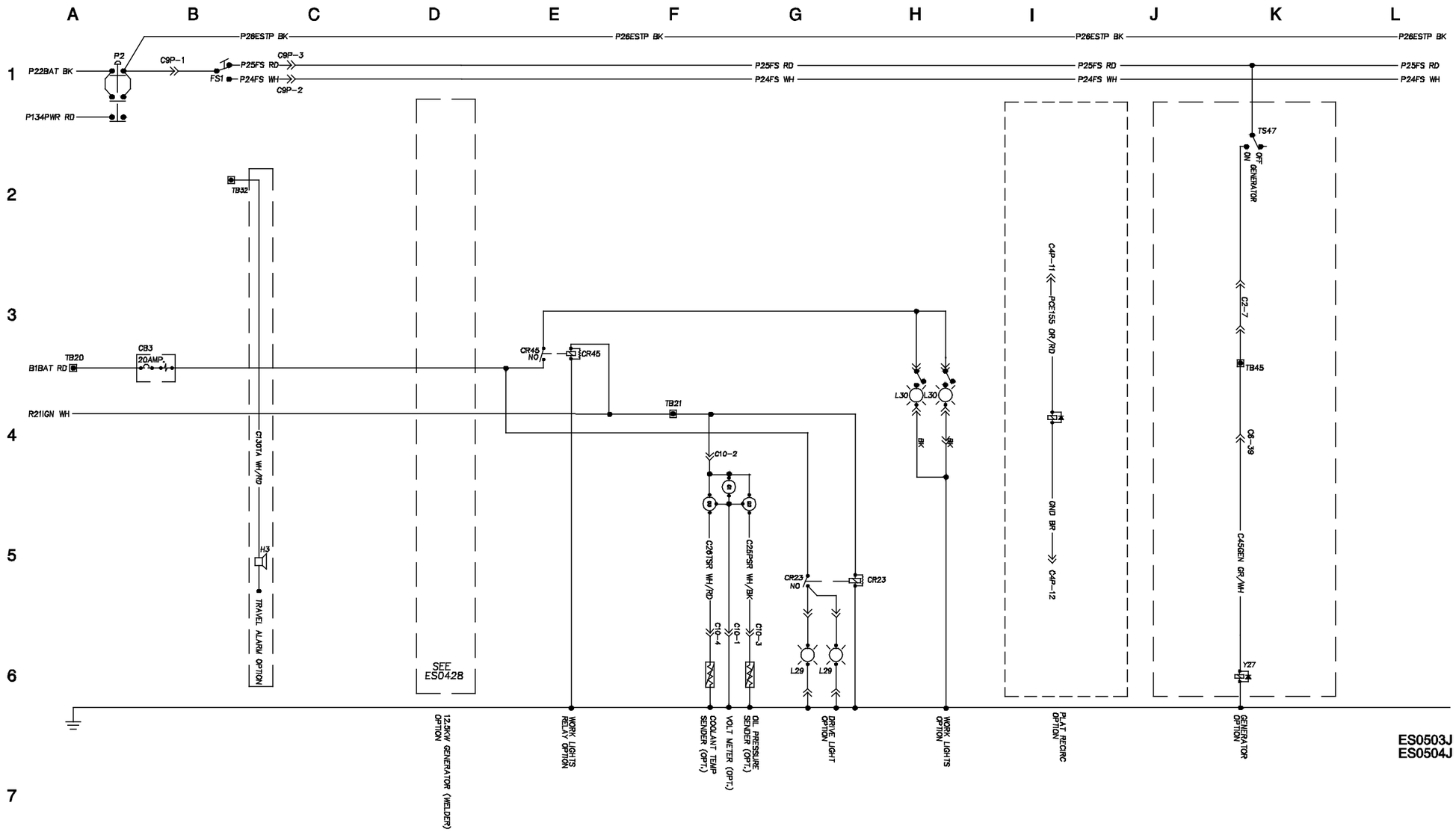
## Continental Options Schematic



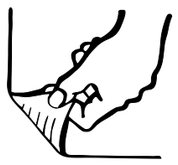
## Continental Options Schematic



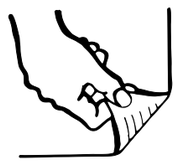
## Deutz and Perkins Options Schematic



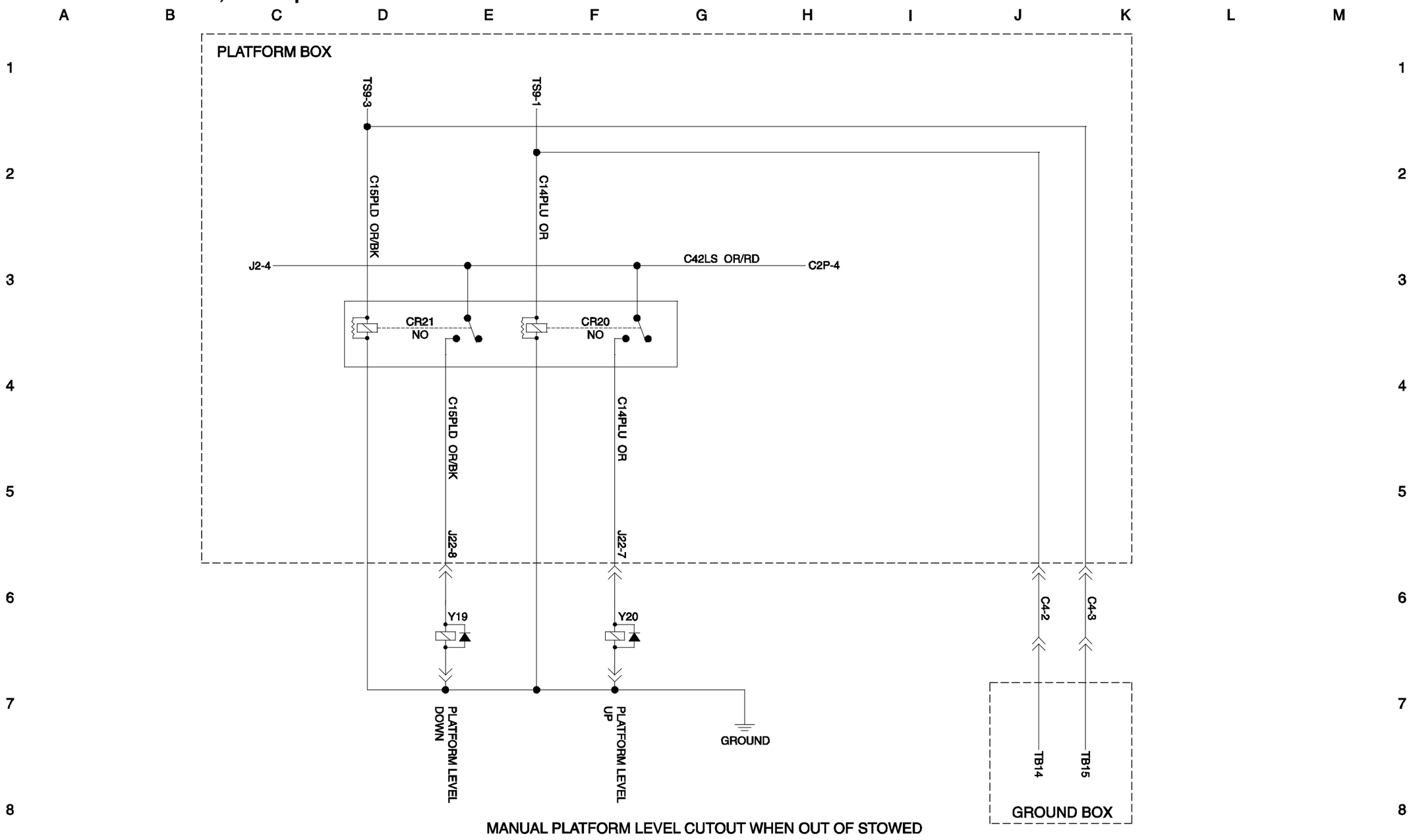
# Deutz and Perkins Options Schematic



## Platform Level Cutout, CTE Option

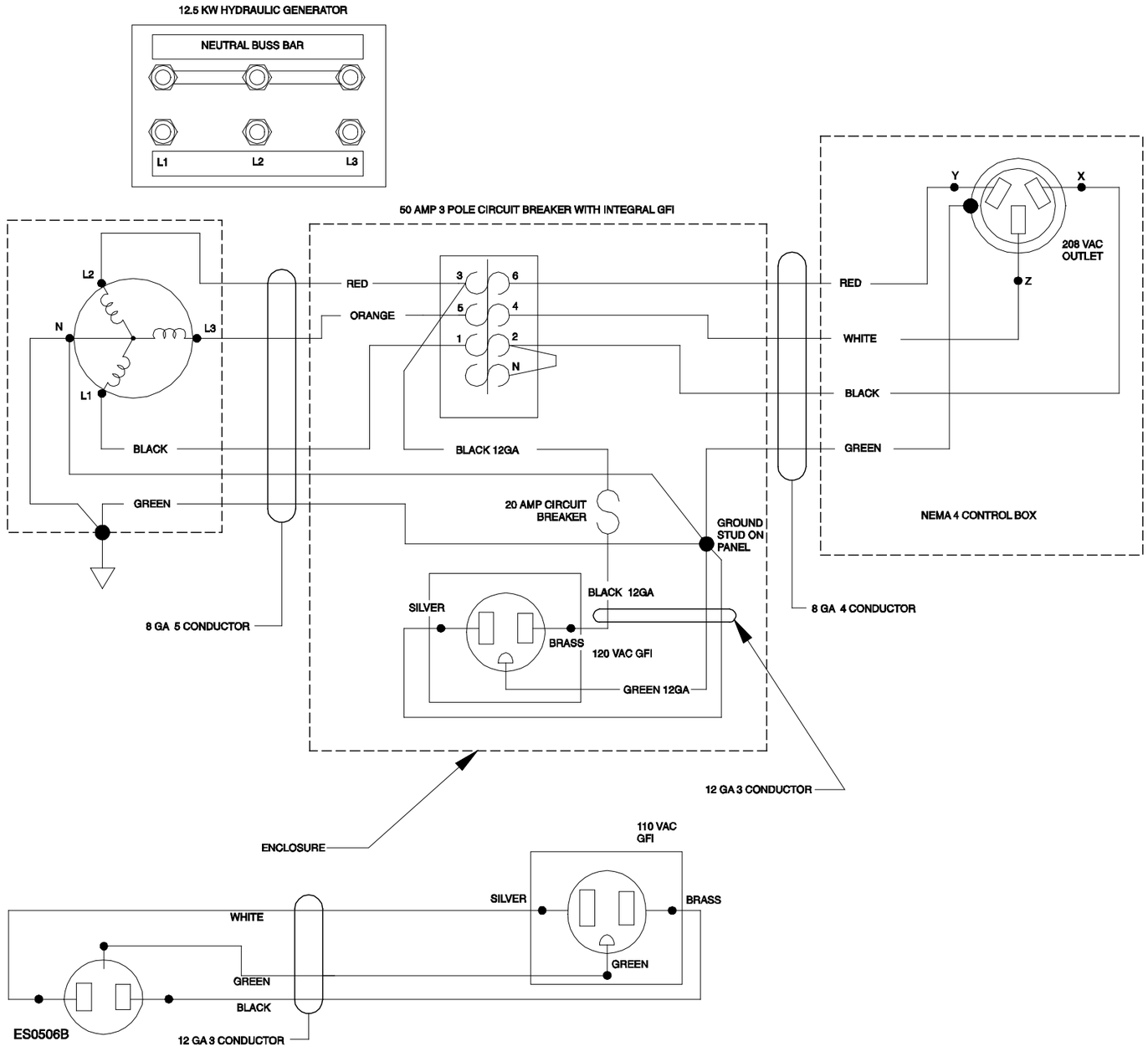


## Platform Level Cutout, CTE Option

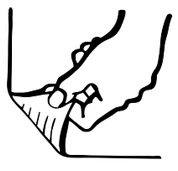



MANUAL PLATFORM LEVEL CUTOUT WHEN OUT OF STOWED

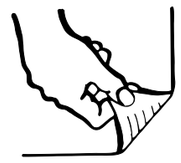
# 12 kW Hydraulic Generator Wiring Diagram



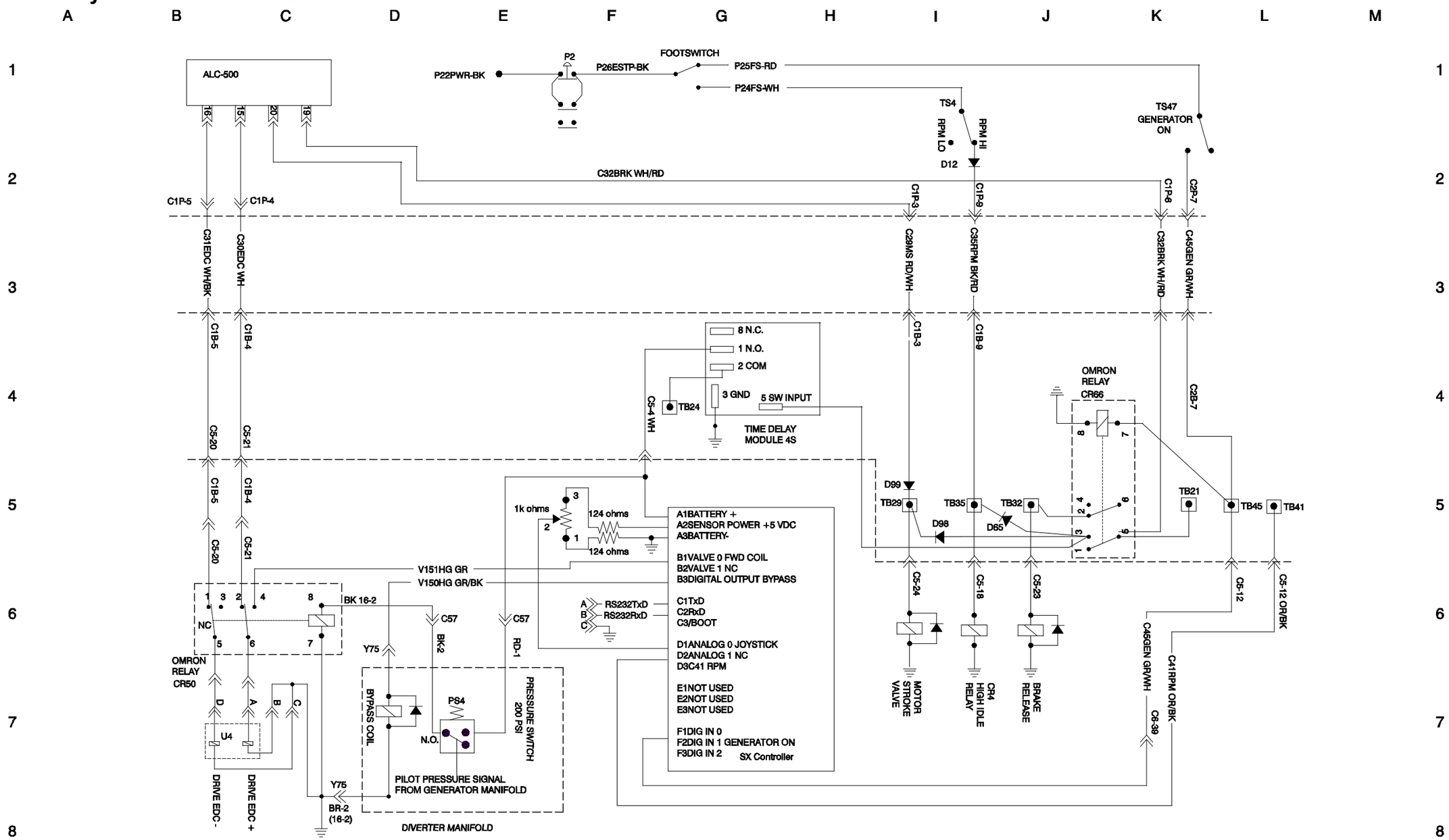
# 12 kW Hydraulic Generator Wiring Diagram



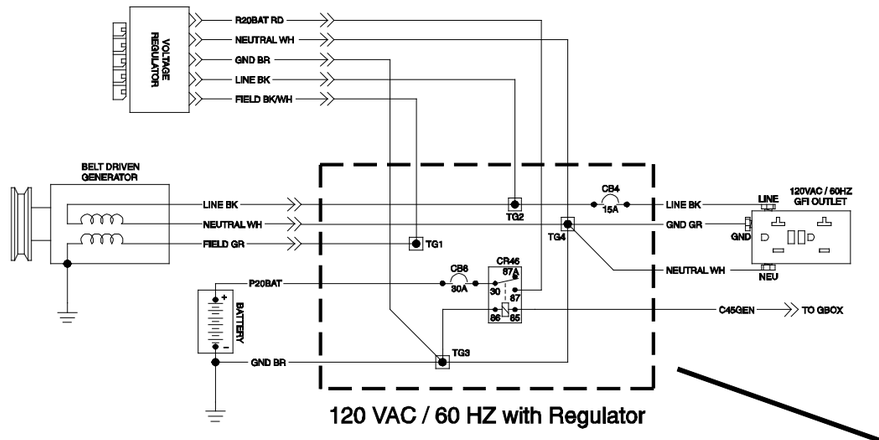
# 12 kW Hydraulic Generator Electrical Schematic

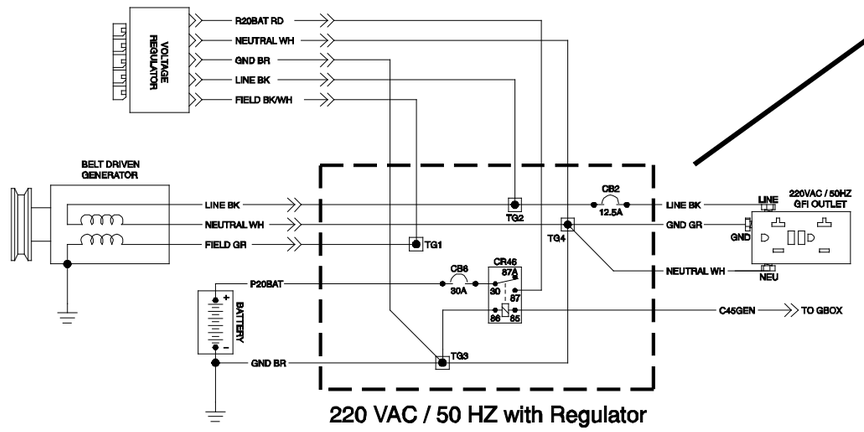


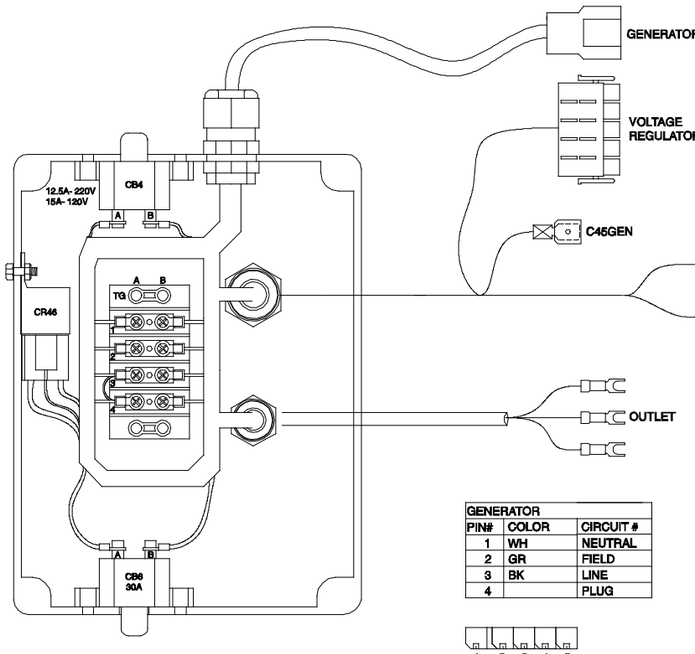
## 12 kW Hydraulic Generator Electrical Schematic



# Belt Driven Generator Option



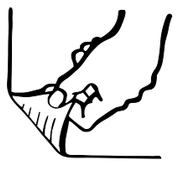




| GENERATOR | | |
|---|---|---|
| PIN# | COLOR | CIRCUIT # |
| 1 | WH | NEUTRAL |
| 2 | GR | FIELD |
| 3 | BK | LINE |
| 4 | | PLUG |

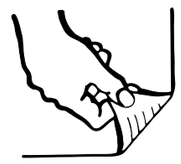
1 2 3 4 5

| VOLTAGE REGULATOR | | |
|---|---|---|
| PIN# | COLOR | CIRCUIT# |
| 1 | RD 12GA | R20BAT |
| 2 | WH 12GA | NEUTRAL |
| 3 | BR 12GA | GND |
| 4 | BK 12GA | LINE |
| 5 | BK/WH 14GA | FIELD |

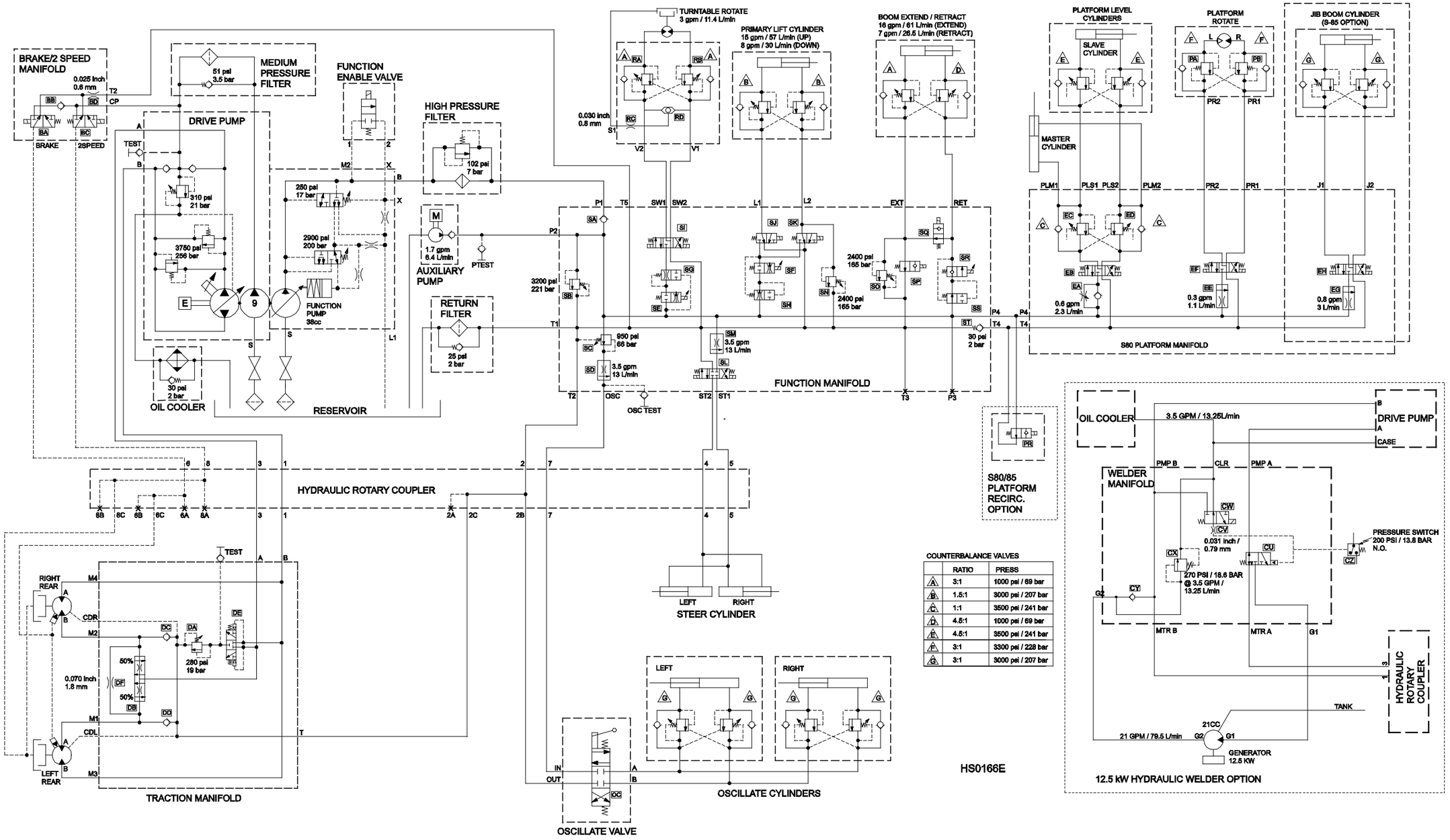
# Belt Driven Generator Option



## Hydraulic Schematic, 2WD Models



# Hydraulic Schematic, 2WD Models

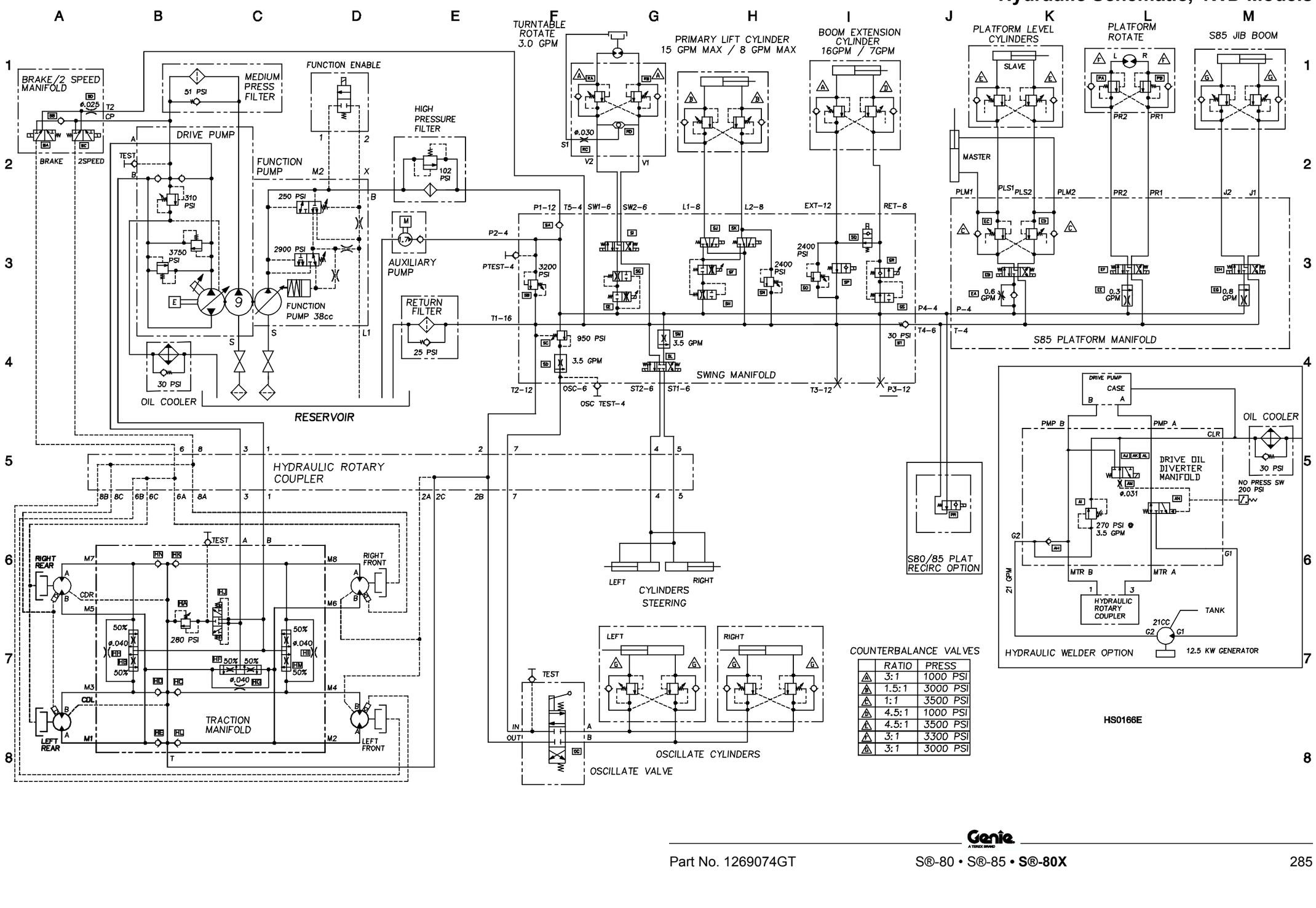



COUNTERBALANCE VALVES

| | RATIO | PRESS |
|---|---|---|
| A | 3:1 | 1000 psi / 69 bar |
| B | 1.5:1 | 3000 psi / 207 bar |
| C | 1:1 | 3500 psi / 241 bar |
| D | 4.5:1 | 1000 psi / 69 bar |
| E | 4.5:1 | 3500 psi / 241 bar |
| F | 3:1 | 3300 psi / 228 bar |
| G | 3:1 | 3000 psi / 207 bar |

HS0166E

# Hydraulic Schematic, 4WD Models



# Hydraulic Schematic, 4WD Models

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.



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