Genie®
A TEREX BRAND

# Service Manual

Serial Number Range

## Z-80/60™

from Z8013-4592

Part No. 1258748
Rev A
November 2014

# Introduction

## Important

Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine before attempting any maintenance or repair procedure.

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

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

## Compliance

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

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

## Technical Publications

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

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

## Contact Us:

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

## Serial Number Information

Genie offers the following Service Manuals for these models:

| Title | Part No. |
|---|---|
| Genie Z-80 Service Manual (from serial number 101 to 4591) | 88619 |



1258748 Rev A November 2014
Second Edition, First Printing



♻ Printed on recycled paper

Printed in U.S.A.

# Revision History

| Revision | Date | Section | Procedure / Schematic Page / Description |
|---|---|---|---|
| A | 11/2014 | | Initial release |

**REFERENCE EXAMPLES:**

2-1_Section 2_Specifications Page #.
3-3_Section 3_Maintenance Procedure Page #.
4-48_Section 4_Repair Procedure Page #.
Fault Codes_Section 5.
6-5_Section 6_Schematic Page #.

**Electronic Version**

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

**REVISION HISTORY,** CONTINUED

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|---|---|---|---|
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6-5_Section 6_Schematic Page #.

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## Serial Number Legend

Genie®
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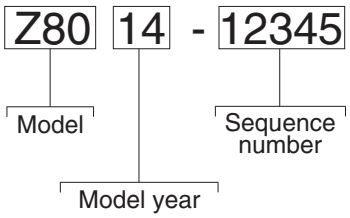
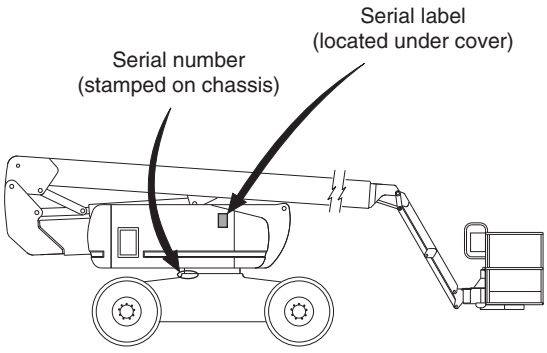
**Model:** Z-80/60
**Serial number:** Z8006-12345
**Model year:** 2014 **Manufacture date:** 01/05/14
**Electrical schematic number:** ES0508
**Machine unladen weight:**

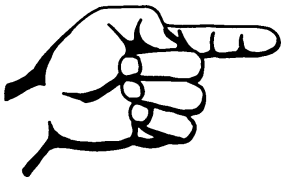
**Rated work load (including occupants):** 500 lb / 227 kg
**Maximum number of platfrm occupants:** 2
**Maximum allowable side force :** 150 lb / 670 N
**Maximum allowable inclination of the chassis:**
0 deg
**Maximum wind speed :** 28 mph/ 12.5 m/s
**Maximum platform height :** 86 ft/ 26.38 m
**Maximum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

**Terex South Dakota, Inc.**
**500 Oakwood Road**
**PO Box 1150**
**Watertown, SD 57201**
**USA**

PN - 77055





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# Safety Rules

## Danger

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

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

## Do Not Perform Maintenance Unless:

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

SAFETY RULES

## Personal Safety

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

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

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

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

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

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

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

Note: Used to indicate operation or maintenance information.

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

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

## Workplace Safety

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

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

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

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

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

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

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# Specifications

## Machine Specifications

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

| Fluid capacities | |
|---|---|
| Fuel tank | 35 gallons<br>132.5 liters |
| LPG tank | 33.5 lbs<br>15.2 kg |
| Hydraulic tank | 45 gallons<br>170 liters |
| Hydraulic system (including tank) | 80 gallons<br>303 liters |
| Drive hubs | 44 fl oz<br>1.3 liters |
| Turntable rotation drive hub | 40 fl oz<br>1.2 liters |
| Drive hub oil type: | EP 80-90W gear oil<br>API Service Classification GL5 |

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

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SPECIFICATIONS

## Performance Specifications

| **Drive speed, maximum (models with rough terrain tires)** | |
|---|---|
| Stowed position | 40 ft / 8.7-9.3 sec<br>12.2 m / 8.7-9.3 sec |
| Raised or extended position | 40 ft / 40-45 sec<br>12.2 m / 40-45 sec |
| **Drive speed, maximum (models with Hi-flotation tires)** | |
| Stowed position | 40 ft / 13.6-14.5 sec<br>12.2 m / 13.6-14.5 sec |
| Raised or extended position | 40 ft / 62-70 sec<br>12.2 m / 62-70 sec |
| **Gradeability** - Refer to Operator's Manual | |
| **Braking distance, maximum** | |
| High range on paved surface | 6 ft<br>1.83 m |

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

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# Hydraulic Oil Specifications

| Hydraulic 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, corrosion inhibition, seal conditioning, and foam and aeration suppression properties. | |
| Cleanliness level, minimum | 15/13 |
| Water content, maximum | 200 ppm |

| Recommended Hydraulic Fluid | |
|---|---|
| Hydraulic oil type | Chevron Rando HD Premium MV |
| Viscosity grade | 32 |
| Viscosity index | 200 |

| Optional Hydraulic Fluids | |
|---|---|
| Biodegradable | Petro Canada Environ MV46 |
| Fire resistant | UCON Hydrolube HP-5046 |
| Mineral based | Shell Tellus S2 V 32<br>Shell Tellus S2 V 46<br>Chevron 5606A |

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

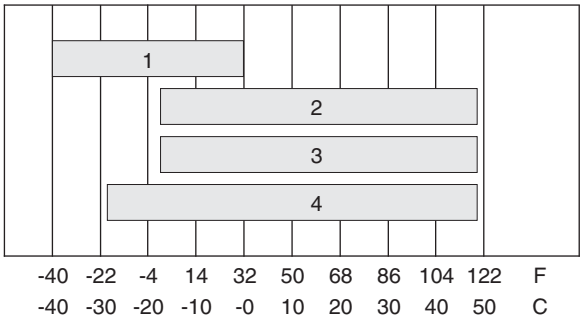
**NOTICE** Optional fluids may not have the same hydraulic lifespan and may result in component damage.

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 temperatue 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

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SPECIFICATIONS

| Chevron Rando HD Permium Oil MV Fluid Properties | |
|---|---|
| ISO Grade | 32 |
| Viscosity index | 200 |
| Kinematic Viscosity | |
| cSt @ 200°F / 100°C | 7.5 |
| cST @ 104°F / 40°C | 33.5 |
| Brookfield Viscosity | |
| cSt @ -4°F / -20°C | 1040 |
| cST @ -22°F / -30°C | 3310 |
| Flash point | 375°F / 190°C |
| Pour point | -58°F / -50°C |
| Maximum continuous operating temperature | 171°F / 77°C |

Note: An 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 temperatue is below -20°F / 29°C with Rando HD Premium MV.

| Petro-Canada Environ MV 46 Fluid Properties | |
|---|---|
| ISO Grade | 46 |
| Viscosity index | 154 |
| Kinematic Viscosity | |
| cSt @ 200°F / 100°C | 8 |
| cST @ 104°F / 40°C | 44.4 |
| Flash point | 482°F / 250°C |
| Pour point | -49°F / -45°C |
| Maximum continuous operating temperature | 180°F / 82°C |

| Chevron 5606A Hyraulic Oil Fluid Properties | |
|---|---|
| ISO Grade | 15 |
| Viscosity index | 300 |
| Kinematic Viscosity | |
| cSt @ 200°F / 100°C | 5.5 |
| cST @ 104°F / 40°C | 15 |
| cST @ -40°F / -40°C | 510 |
| Flash point | 180°F / 82°C |
| Pour point | -81°F / -63°C |
| Maximum continuous operating temperature | 124°F / 51°C |

Note: Use of Chevron 5606A hydraulic fluid, or equivalent, is required when the ambient temperature is consistently below 0°F / -18°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.

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

| UCON Hydrolube HP-5046 Fluid Properties | |
|---|---|
| ISO Grade | 46 |
| Viscosity index | 192 |
| Kinematic Viscosity | |
| cSt @ 149°F / 65°C | 22 |
| cST @ 104°F / 40°C | 46 |
| cST @ 0°F / -18°C | 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 | 2.81 cu in<br>46 cc |
| Flow rate @ 2300 rpm | 28 gpm<br>106 L/min |
| Drive pressure, maximum | 3625 psi<br>250 bar |

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

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

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

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

| **Oscillate manifold** | |
|---|---|
| Oscillate relief pressure (item BE or CH) | 800 psi<br>55.1 bar |

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SPECIFICATIONS

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

## Manifold Component Specifications

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

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## Valve Coil Resistance Specifications

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

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

SPECIFICATIONS

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

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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** | 59 @ 2500 rpm<br>44 kW @ 2500 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Compression ratio** | 8.2:1 |
| **Compression pressure**<br>Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder. | |
| **Low idle** - computer controlled<br>Frequency | 1600 rpm<br>53.33 Hz |
| **High idle** - computer controlled<br>Frequency | 2500 rpm<br>83.33 Hz |
| **Valve clearance, warm** | |
| Intake | 0.014 in<br>0.36 mm |
| Exhaust | 0.018 in<br>0.46 mm |
| **Lubrication system** | |
| Oil pressure | 40 to 60 psi<br>2.75 to 4.14 bar |
| Oil capacity<br>(including filter) | 7 quarts<br>6.65 liters |
| **Oil viscosity requirements** | |
| Units ship with 15W-40.<br>Extreme operating temperatures my require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine. | |

| | |
|---|---|
| **Fuel Requirement** | |
| For fuel requirements, refer to the engine Operator's Manual on your machine. | |
| **Electronic fuel pump** | |
| Fuel pressure, static | 55 psi<br>3.8 bar |
| Fuel flow rate | 0.42 gpm<br>1.59 L/min |
| **Batteries** | |
| Type | 12V DC |
| Group | 31 |
| Quantity | 2 |
| Cold cranking ampere | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |
| **Alternator output** | 65A @ 13.8V DC |
| **Fan belt deflection** | 1/2 inch<br>12 mm |

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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**<br>Net intermittent @ 2400 rpm | 74 / 55 kW |
| **Induction system** | turbocharged |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Low idle** | 1500 rpm<br>383 Hz |
| **High idle** | 2350 rpm<br>599 Hz |
| **Compression ratio** | 17.5:1 |
| **Compression pressure**<br>Pressure (psi or bar) of the lowest cylinder must be at least 75% of the highest cylinder. | |
| **Governor** | centrifugal mechanical |
| **Valve clearance, cold** | |
| Intake | 0.012 in<br>0.3 mm |
| Exhaust | 0.020 in<br>0.5 mm |
| **Lubrication system** | |
| Oil pressure, hot<br>(at 2000 rpm) | 40 to 60 psi<br>2.8 to 4.1 bar |
| Oil capacity<br>(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 |
| Units ship 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 |
| Oil temperature switch point | 275°F<br>135°C |
| **Oil pressure switch** | |
| Installation torque | 8-18 ft-lbs<br>11-24 Nm |
| Oil pressure switch point | 22 psi<br>1.5 bar |
| **Fuel injection system** | |
| Injection pump make | Motorpal |
| Injection pump pressure, maximum<br>15,000 psi<br>1034 bar | |
| Injector opening pressure | 3046 psi<br>210 bar |
| **Fuel requirement** | |
| For fuel requirements, refer to the engine Operator's Manual on your machine. | |
| **Starter motor** | |
| Current draw, normal load | 140-200A |
| Cranking speed | 250-350 rpm |

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SPECIFICATIONS

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

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SPECIFICATIONS

# Deutz TD 2.9 L4 Engine

| | |
|---|---|
| **Displacement** | 177 cu in<br>2.9 liters |
| **Number of cylinders** | 4 |
| **Bore and stroke** | 3.6 x 4.3 inches<br>92 x 110 mm |
| **Horsepower** | 74.2 @ 2600 rpm<br>55.3 kW @ 2600 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Standby idle** | 1000 rpm |
| **Low idle** | 1500 rpm |
| **High idle** | 2500 rpm |
| **Compression ratio** | 17.4:1 |
| **Compression pressure** | contact engine manufacturer |
| **Governor** | electronic |

**Lubrication system**

| | |
|---|---|
| Oil pressure<br>(@ 2000 rpm) | 40 to 60 psi<br>1.4 to 3 bar |
| Oil capacity<br>(including filter) | 9.4 quarts<br>9 liters |

**Oil viscosity requirements**

| | |
|---|---|
| -22° F to 86° F/ -30° C to 30° C<br>5W-30 | (synthetic) |
| -4° F to 90° F / -20° C to 32° C<br>10W-40 | |
| Above 23° F / -5° C | 20W-50 |

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

**Oil temperature switch**

| | |
|---|---|
| Temperature switch point | 257°F<br>125°C |

**Oil pressure switch**

| | |
|---|---|
| Oil pressure switch point | 20 psi<br>1.4 bar |

**Engine coolant**

| | |
|---|---|
| Capacity | ~11 quarts<br>~10.4 liters |

**Fuel injection system**

| | |
|---|---|
| Injection pump make | Bosch |
| Injection pump pressure, maximum<br>15000 psi<br>1034 bar | |
| Injector opening pressure | 3046 psi<br>210 bar |

**Fuel requirement**

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

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

SPECIFICATIONS

### Deutz TD 2.9 L4 Engine, continued

| | |
|---|---|
| **Starter motor** | |
| Current draw, normal load | 250A to 400A |
| Brush length, new | 0.72 in<br>18.5 mm |
| Brush length, minimum | 0.27 in<br>7 mm |
| **Battery** | |
| Type | 12V DC |
| Size | 13 x $6^{13}/_{16}$ x $9^{3}/_{8}$ inches<br>33 x 17.3 x 23.8 cm |
| Quantity | 1 |
| Cold cranking ampere | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |
| **Alternator output** | 95A @ 14V DC |
| **Fan belt deflection** | $^{3}/_{8}$ to $^{1}/_{2}$ inch<br>9 to 12 mm |

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

SPECIFICATIONS

## Perkins 804D-33 Engine

| | |
|---|---|
| **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 or bar) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder | |
| **Low idle**<br>Frequency | 1650 rpm<br>335.5 Hz |
| **Low idle** with generator<br>Frequency | 1400 rpm<br>284.7 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 @ 2000 rpm | 40-60 psi<br>2.8-4.1 bar |
| Oil capacity<br>(including filter) | 10.6 quarts<br>10 liters |

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

| | |
|---|---|
| **Injection system** | |
| Injection pump make | Zexel 10641-3932 |
| Injection pump pressure | 1707 to 1849 psi<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's Manual on your machine. | |
| **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 in<br>9 to 12 mm |

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

SPECIFICATIONS

## Perkins 404F-22T Engine

| | |
|---|---|
| **Displacement** | 134 cu in<br>2.2 liters |
| **Number of cylinders** | 4 |
| **Bore and stroke** | 3.31 x 3.94 inches<br>84 x 100 mm |
| **Horsepower** | 58 @ 2500 rpm<br>43.2 kW @ 2500 rpm |
| **Firing order** | 1 - 3 - 4 - 2 |
| **Standby idle** | 1100 rpm |
| **Low idle** | 1500 rpm |
| **High idle** | 2500 rpm |
| **Compression ratio** | 23.3:1 |
| **Compression pressure** | 426 psi<br>29.4 bar |
| Pressure (psi) of lowest cylinder must be within 50 psi / 3.45 bar of highest cylinder | |
| **Governor** | electronic |
| **Valve clearance, cold** | |
| Intake | 0.008 in<br>0.2 mm |
| Exhaust | 0.008 in<br>0.2 mm |

| | |
|---|---|
| **Lubrication system** | |
| Oil pressure<br>(@ 2000 rpm) | 40 to 60 psi<br>1.4 to 3 bar |
| Oil capacity<br>(including filter) | 9.4 - 11.2 quarts<br>8.9 - 10.6 liters |
| **Oil viscosity requirements** | |
| Below 86°F / 30°C | 5W-20 |
| -4°F to 104°F / -20°C to 40°C | 10W-30 |
| Above 14°F / -10°C | 15W-40 |
| Units ship with 15W-40; 5W-40 with Cold Start Options. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine. | |
| **Oil pressure sending unit** | |
| Oil pressure switch point | 14.2 psi<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's Manual on your machine. | |
| **Alternator output** | 85A @ 12V DC |
| **Fan belt deflection** | 3/8 in<br>10 mm |
| **Starter motor** | |
| Current draw, normal load | 140A - 200A |
| Brush length, new | 0.7480 in<br>19 mm |
| Brush length, minimum | 0.5 in<br>12.7 mm |

**Perkins 404F-22T Engine, continued**

| **Battery** | |
|---|---|
| Type | 12V DC |
| Size | 13 x $6^{13}/_{16}$ x $9^{3}/_{8}$ inches<br>33 x 17.3 x 23.8 cm |
| Quantity | 1 |
| Cold cranking ampere | 1000A |
| Reserve capacity @ 25A rate | 200 minutes |
| **Engine coolant** | |
| Capacity | ~14 quarts<br>~13.3 liters |
| **Coolant temperature sending unit** | |
| Temperature switch point | 221° F<br>105° C |

# Machine Torque Specifications

| **Platform rotator** | |
|---|---|
| 1-8 center bolt, GR 5, dry | 640 ft-lbs<br>867 Nm |
| $^{3}/_{8}$ -16 bolts, GR 8<br>*(use blue thread locking compound) | 35 ft-lbs*<br>47.5 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>108.4 Nm |
| Backlash plate mounting bolts, lubricated | 280 ft-lbs<br>379 Nm |
| **Drive motor and hubs** | |
| Drive hub mounting bolts, lubricated<br>*(use blue thread locking compound) | 160 ft-lbs*<br>217 Nm |
| Drive hub mounting bolts, dry | 210 ft-lbs<br>284 Nm |
| Drive motor mounting bolts, lubricated<br>*(use blue thread locking compound) | 80 ft-lbs*<br>108.4 Nm |
| Drive motor mounting bolts, dry | 110 ft-lbs<br>149 Nm |
| Drive hub oil plug, O-ring seal | 13 ft-lbs<br>18 Nm |

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

SPECIFICATIONS

# Hydraulic Hose and Fitting Torque Specifications

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

**Seal-Lok™ Fittings**
(hose end - ORFS)

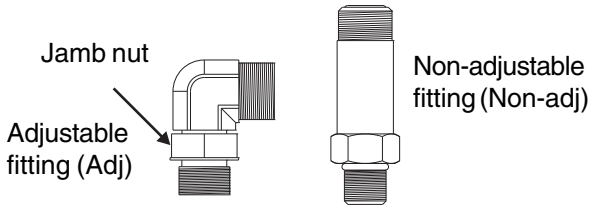
| SAE Dash size | Torque |
|---|---|
| -4 | 10 ft-lbs / 13.6 Nm |
| -6 | 30 ft-lbs / 40.7 Nm |
| -8 | 40 ft-lbs / 54.2 Nm |
| -10 | 60 ft-lbs / 81.3 Nm |
| -12 | 85 ft-lbs / 115 Nm |
| -16 | 110 ft-lbs / 150 Nm |
| -20 | 140 ft-lbs / 190 Nm |
| -24 | 180 ft-lbs / 245 Nm |

**JIC 37° Fittings**
(swivel nut or hose connection)

| SAE Dash size | Thread Size | Flats |
|---|---|---|
| -4 | 7/16-20 | 2 |
| -6 | 9/16-18 | 1 1/4 |
| -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 |




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

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

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

2 Lubricate the O-ring before installation.

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

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

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

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

**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 Make a reference mark on one of the flats of the hex nut, and continue it on to the body hex fitting with a permanent ink marker. Refer to Figure 1.

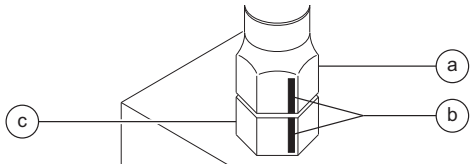



Figure 1

a hex nut
b reference mark
c 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 Figure 2.

Note: Use the *JIC 37° Fittings* table on the previous page to determine the correct number of flats for the proper tightening position.

Note: The marks indicate that 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.

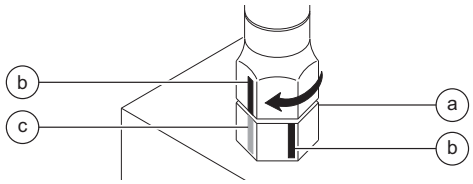



Figure 2

a body hex fitting
b reference mark
c 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 hoses and fittings and related components to confirm that there are no leaks.

SPECIFICATIONS

## SAE FASTENER TORQUE CHART

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

| SIZE | THREAD | Grade 5 | | | | Grade 8 | | | | A574 High Strength Black Oxide Bolts | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LUBED | | DRY | | LUBED | | DRY | | LUBED | |
| | | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm |
| 1/4 | 20 | 80 | 9 | 100 | 11.3 | 110 | 12.4 | 140 | 15.8 | 130 | 14.7 |
| | 28 | 90 | 10.1 | 120 | 13.5 | 120 | 13.5 | 160 | 18 | 140 | 15.8 |
| | | LUBED | | DRY | | LUBED | | DRY | | LUBED | |
| | | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm |
| 5/16 | 18 | 13 | 17.6 | 17 | 23 | 18 | 24 | 25 | 33.9 | 21 | 28.4 |
| | 24 | 14 | 19 | 19 | 25.7 | 20 | 27.1 | 27 | 36.6 | 24 | 32.5 |
| 3/8 | 16 | 23 | 31.2 | 31 | 42 | 33 | 44.7 | 44 | 59.6 | 38 | 51.5 |
| | 24 | 26 | 35.2 | 35 | 47.4 | 37 | 50.1 | 49 | 66.4 | 43 | 58.3 |
| 7/16 | 14 | 37 | 50.1 | 49 | 66.4 | 50 | 67.8 | 70 | 94.7 | 61 | 82.7 |
| | 20 | 41 | 55.5 | 55 | 74.5 | 60 | 81.3 | 80 | 108.4 | 68 | 92.1 |
| 1/2 | 13 | 57 | 77.3 | 75 | 101.6 | 80 | 108.4 | 110 | 149 | 93 | 126 |
| | 20 | 64 | 86.7 | 85 | 115 | 90 | 122 | 120 | 162 | 105 | 142 |
| 9/16 | 12 | 80 | 108.4 | 110 | 149 | 120 | 162 | 150 | 203 | 130 | 176 |
| | 18 | 90 | 122 | 120 | 162 | 130 | 176 | 170 | 230 | 140 | 189 |
| 5/8 | 11 | 110 | 149 | 150 | 203 | 160 | 217 | 210 | 284 | 180 | 244 |
| | 18 | 130 | 176 | 170 | 230 | 180 | 244 | 240 | 325 | 200 | 271 |
| 3/4 | 10 | 200 | 271 | 270 | 366 | 280 | 379 | 380 | 515 | 320 | 433 |
| | 16 | 220 | 298 | 300 | 406 | 310 | 420 | 420 | 569 | 350 | 474 |
| 7/8 | 9 | 320 | 433 | 430 | 583 | 450 | 610 | 610 | 827 | 510 | 691 |
| | 14 | 350 | 474 | 470 | 637 | 500 | 678 | 670 | 908 | 560 | 759 |
| 1 | 8 | 480 | 650 | 640 | 867 | 680 | 922 | 910 | 1233 | 770 | 1044 |
| | 12 | 530 | 718 | 710 | 962 | 750 | 1016 | 990 | 1342 | 840 | 1139 |
| 1 1/8 | 7 | 590 | 800 | 790 | 1071 | 970 | 1315 | 1290 | 1749 | 1090 | 1477 |
| | 12 | 670 | 908 | 890 | 1206 | 1080 | 1464 | 1440 | 1952 | 1220 | 1654 |
| 1 1/4 | 7 | 840 | 1138 | 1120 | 1518 | 1360 | 1844 | 1820 | 2467 | 1530 | 2074 |
| | 12 | 930 | 1260 | 1240 | 1681 | 1510 | 2047 | 2010 | 2725 | 1700 | 2304 |
| 1 1/2 | 6 | 1460 | 1979 | 1950 | 2643 | 2370 | 3213 | 3160 | 4284 | 2670 | 3620 |
| | 12 | 1640 | 2223 | 2190 | 2969 | 2670 | 3620 | 3560 | 4826 | 3000 | 4067 |

## METRIC FASTENER TORQUE CHART

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

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

# Scheduled Maintenance Procedures

## Observe and Obey:

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

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

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

## About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

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

**Symbols Legend**

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

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

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

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

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

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

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

# SCHEDULED MAINTENANCE PROCEDURES

## Maintenance Symbols Legend

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

Indicates that tools will be required to perform this procedure.

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

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

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

Indicates that dealer service is required to perform this procedure.

## Pre-delivery Preparation Report

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

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

## Maintenance Schedule

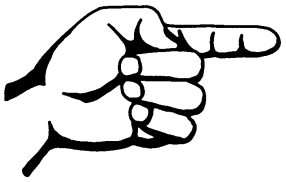
There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, six months, annual, and two years. The *Scheduled Maintenance Procedures Section* and the *Maintenance Inspection Report* have been divided into five subsections—A, B, C, D and E. Use the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

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

## Maintenance Inspection Report

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

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



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# Pre-Delivery Preparation

## Fundamentals

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

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

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

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

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

## Instructions

Use the operator's manual on your machine.

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

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

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

**Legend**

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

**Comments**

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

**Model**

**Serial number**

**Date**

**Machine owner**

**Inspected by (print)**

**Inspector signature**

**Inspector title**

**Inspector company**

Genie
A TEREX BRAND

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

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


Rev B

# Maintenance Inspection Report

**Model**

**Serial number**

**Date**

**Hour meter**

**Machine owner**

**Inspected by (print)**

**Inspector signature**

**Inspector title**

**Inspector company**

**Instructions**

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

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

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

**Legend**

Y = yes, acceptable

N = no, remove from service

R = repaired

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

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

**Comments**

## MAINTENANCE INSPECTION REPORT

**Model**

**Serial number**

**Date**

**Hour meter**

**Machine owner**

**Inspected by (print)**

**Inspector signature**

**Inspector title**

**Inspector company**

**Instructions**

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

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

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

**Legend**

Y = yes, acceptable

N = no, remove from service

R = repaired

| Checklist C | Y | N | R |
|---|---|---|---|
| C-1 Engine maintenance-Continental models | | | |
| C-2 Engine maintenance-Deutz models | | | |
| C-3 Engine maintenance-Perkins models | | | |
| C-4 Engine air filter | | | |
| C-5 Adjust engine RPM | | | |
| C-6 Grease platform overload (if equipped) | | | |
| C-7 Test the platform overload (if equipped) | | | |

| Checklist D | Y | N | R |
|---|---|---|---|
| D-1 Boom wear pads | | | |
| D-2 Free-wheel configuration | | | |
| D-3 Turntable rotation bolts | | | |
| D-4 Turntable bearing wear | | | |
| D-5 Drive hub oil | | | |
| D-6 Replace hydraulic filter elements | | | |
| D-7 Engine maintenance-Continental models | | | |
| D-8 Engine maintenance-Deutz models | | | |
| D-9 Engine maintenance-Perkins models | | | |

| Checklist E | Y | N | R |
|---|---|---|---|
| E-1 Replace hydraulic oil | | | |
| E-2 Engine maintenance-Perkins models | | | |
| E-3 Engine maintenance-Deutz models | | | |
| **Perform every 3000 hours:** | | | |
| E-4 Engine maintenance-Perkins models | | | |
| **Perform at various intervals:** | | | |
| E-5 Cooling system-Perkins 404F models | | | |

**Comments**

# Checklist A Procedures

## A-1
## Inspect the Manuals and Decals

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

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

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

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

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

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

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

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

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

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

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

CHECKLIST A PROCEDURES

## A-2
## Perform Pre-operation Inspection

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

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

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

## A-3
## Perform Function Tests

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

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

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

CHECKLIST A PROCEDURES

## A-4
## Perform Engine Maintenance - Continental Models

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

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

- Oil level- check
- Coolant level- check
- Oil, fuel and coolant systems- check for leaks
- PCV system- check
- Air filter discharge valve- clean

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

| **Continental TME27 Owner's Manual** | |
|---|---|
| Genie part number | 111901 |

## A-5
## Perform Engine Maintenance - Deutz Models

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

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

- Oil level- check
- Coolant level- check
- Oil, fuel and coolant systems- check for leaks
- Fuel pre-filter- drain water
- Air filter discharge valve- clean
- Fuel filter / separator- check/drain
- Exhaust system- inspect

Required maintenance procedures and additional engine information are available in the *Deutz 2011 Series Operation Manual* (Deutz part number 0312-3547) OR the *Deutz 2.9 L4 Series Operation Manual* (Deutz part number 0312-3893)

| **Deutz 2011 Series Operation Manual** | |
|---|---|
| Genie part number | 139320 |

| **Deutz 2.9 L4 Series Operation Manual** | |
|---|---|
| Genie part number | 1251561 |

CHECKLIST A PROCEDURES

## A-6
## Perform Engine Maintenance - Perkins Models

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

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

- Oil level- check
- Coolant level- check
- Oil, fuel and coolant systems- check for leaks
- Fuel pre-filter- drain water
- Air filter discharge valve- clean

*Perkins 800D Series Operation Manual* (Perkins part number SEBU8324)OR the *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| | |
|---|---|
| **Perkins 800D Series Operation Manual** | |
| Genie part number | 111332 |
| **Perkins 404F Series Operation Manual** | |
| Genie part number | 1251562 |

## A-7
## Check the Hydraulic Filter Condition Indicators

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

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

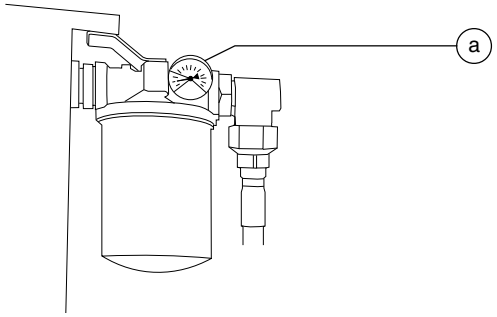
1 Start the engine from the ground controls.

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

**Tank return filter:**

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

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

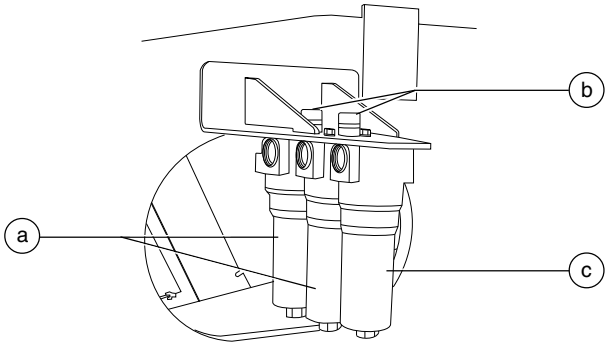



a filter condition indicator gauge

**Medium and high pressure filters:**

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

4 Inspect the filter condition indicators.




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

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

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

## A-8
## Perform 30 Day Service

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

1 Perform the following maintenance procedures:

- A-8 Grease the Turntable Rotation Bearing and Rotate Gear
- B-7 Check the Tires, Wheels and Lug Nut Torque
- B-9 Check the Drive Hub Oil Level and Fastener Torque
- D-3 Check the Turntable Rotation Bearing Bolts
- D-7 Replace the Hydraulic Filter Elements

CHECKLIST A PROCEDURES

## A-9
## Perform Engine Maintenance - Continental Models


Engine specifications require that this procedure be performed every 50 hours or weekly.

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

- Fan belt tension- check
- Battery- check

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

| **Continental TME27 Owner's Manual** | |
|---|---|
| Genie part number | 111901 |

## A-10
## Grease the Turntable Rotation Bearing and Rotate Gear


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

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

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

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

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

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

## A-11
## Perform Engine Maintenance - Continental Models

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

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

- Engine oil- replace
- Oil filter- replace

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

| **Continental TME27 Owner's Manual** | |
|---|---|
| Genie part number | 111901 |

## A-12
## Replace the Drive Hub Oil

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

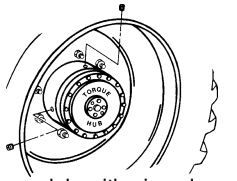
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil after the first 150 hours of use may cause the machine to perform poorly and continued use may cause component damage.

**Drive Hubs:**

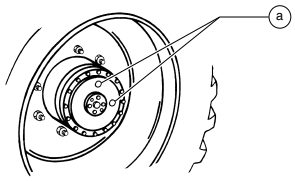
1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.

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

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



models with pipe plugs



models with o-ring plugs

CHECKLIST A PROCEDURES

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

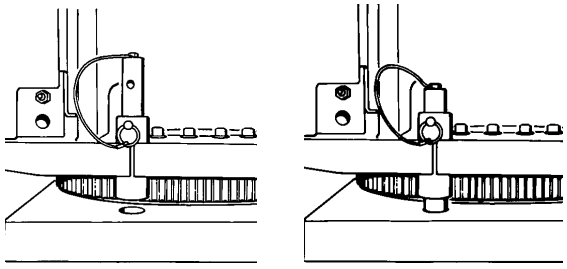
5 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.

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

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

**Turntable Rotate Drive Hub:**

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



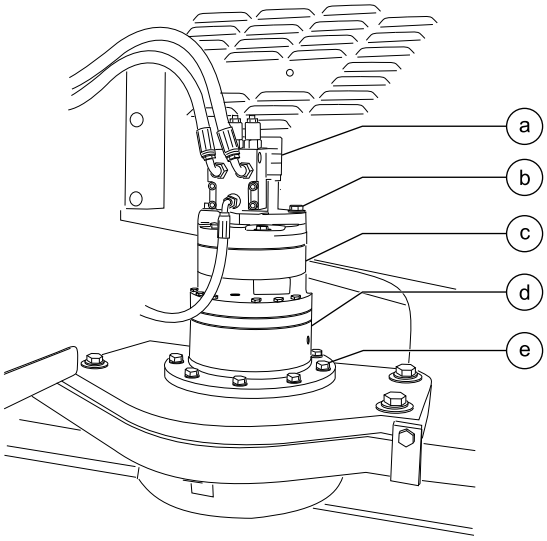
unlocked locked

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

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

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

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




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

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

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

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

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

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

# A-13
# Perform Engine Maintenance - Perkins Models


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

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

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

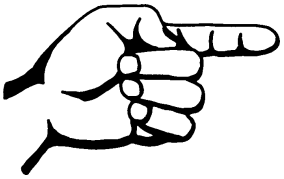
**Perkins 804D-33 Operation and Maintenance Manual**
Genie part number

**To access the engine:**

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

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

CHECKLIST A PROCEDURES



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# Checklist B Procedures

## B-1
## Inspect the Batteries

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

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

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

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

1 Put on protective clothing and eye wear.

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

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

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

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

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

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

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

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

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

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

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

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

CHECKLIST B PROCEDURES

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

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

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

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

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

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

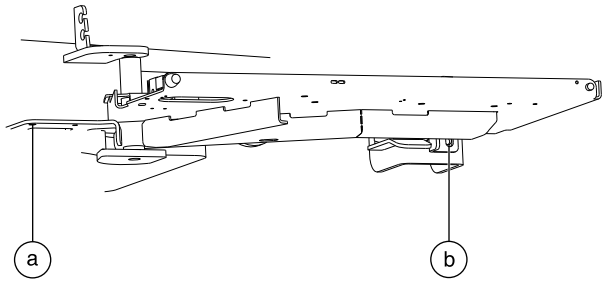
## B-2
## Inspect the Electrical Wiring

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

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

1 Open the engine side turntable cover.

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




a engine tray anchor hole
b engine tray retaining fastener

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

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

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

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

- Engine wiring harness
- Battery area wiring

6 Open the ground controls side turntable cover.

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

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

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

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

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

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

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

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

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

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

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

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

15 Swing the engine tray in towards the machine.

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

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

CHECKLIST B PROCEDURES

## B-3
## Test the Key Switch

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

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

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

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

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

4 Turn the key switch to ground control.

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

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

6 Turn the key switch to the off position.

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

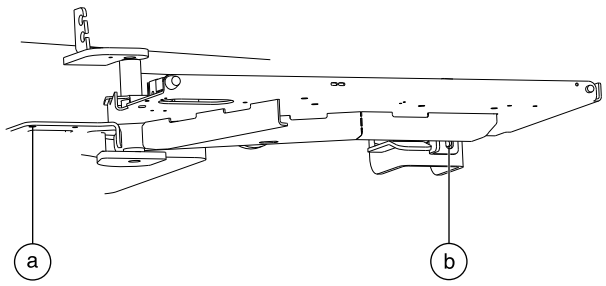
## B-4
## Check the Exhaust System

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

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

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

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




a engine tray anchor hole
b engine tray retaining fastener

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

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

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

4 Be sure that all nuts and bolts are tight.

5 Inspect all welds for cracks.

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

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

8 Swing the engine tray in towards the machine.

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

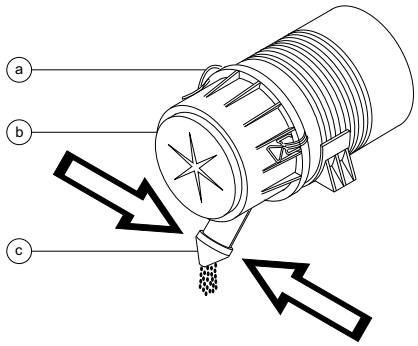
**⚠DANGER** Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

## B-5
## Inspect the Engine Air Filter

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

Note: Perform this procedure with the engine off.

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




a retaining clamp
b canister end cap
c dust discharge valve

2 Disconnect the retaining clamp from the air cleaner canister.

3 Remove the filter element.

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

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

6 Install the filter element.

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

CHECKLIST B PROCEDURES

## B-6
## Perform Engine Maintenance - Continental Models

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

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

- Harness connections- check
- Cooling system- check

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

| **Continental TME27 Owner's Manual** | |
|---|---|
| Genie part number | 111901 |

## B-7
## Perform Engine Maintenance - Perkins Models

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

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

- Alternator and Fan belts- inspect/adjust

*Perkins 800D Series Operation Manual* (Perkins part number SEBU8324)OR the *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| **Perkins 800D Series Operation Manual** | |
|---|---|
| Genie part number | 111332 |

| **Perkins 404F Series Operation Manual** | |
|---|---|
| Genie part number | 1251562 |

## B-8
## Check the Tires, Wheels and Lug Nut Torque

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

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

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

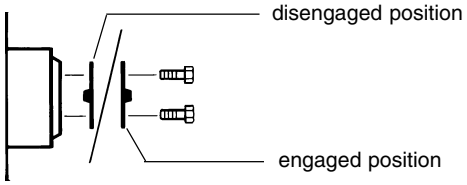
2 Check each wheel for damage, bends and cracked welds.

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

## B-9
## Confirm the Proper Brake Configuration

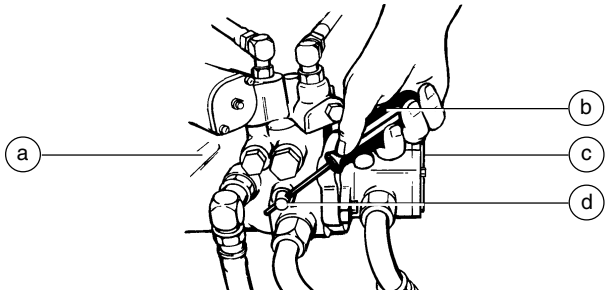
Proper brake configuration is essential to safe operation and good machine performance. Hydrostatic brakes and hydraulically-released, spring-applied individual wheel brakes can appear to operate normally when they are actually not fully operational.

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




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

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




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

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

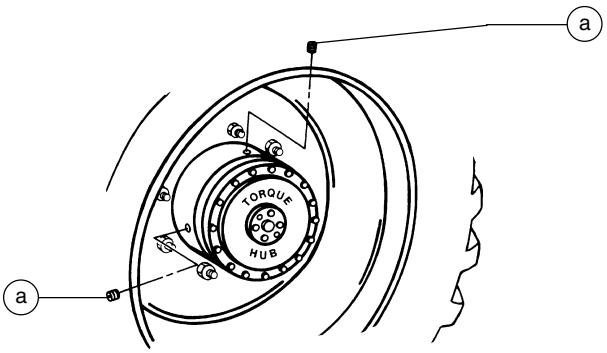
CHECKLIST B PROCEDURES

## B-10
## Check the Drive Hub Oil Level and Fastener Torque

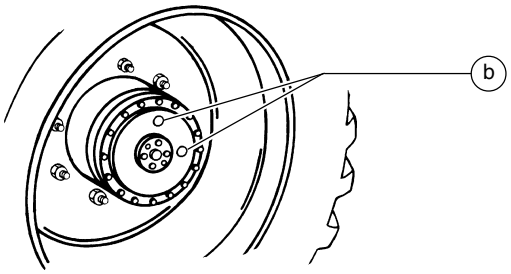
Failure to maintain proper drive hub oil levels may cause the machine to perform poorly and continued use may cause component damage.

**Drive hubs:**

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




a. models with pipe plugs




b. models with o-ring plugs

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

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

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

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

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

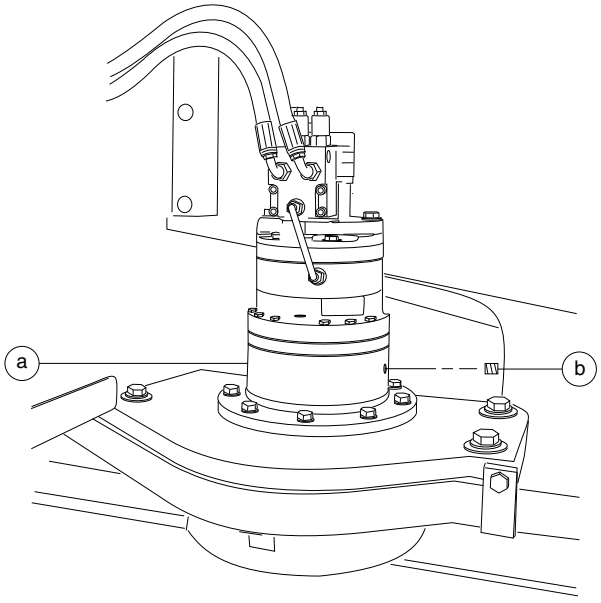
5 Check the torque of the drive hub mounting fasteners. Refer to Section 2, *Specifications*.

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

**Turntable rotate drive hub:**

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

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




a drive hub
b plug

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

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

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

## B-11
## Test the Ground Control Override

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

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

2 Start the engine from the ground controls.

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

⊙ Result: All boom functions should operate.

CHECKLIST B PROCEDURES

## B-12
## Test the Platform Self-leveling

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

1 Start the engine from the ground controls.

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

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

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

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

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

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

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

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

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

## B-13
## Test the Engine Idle Select Operation

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

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

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

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

1 Turn the key switch to ground controls.

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

3 Start the engine from the ground controls.

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

⊙ Result: The engine should change to high idle.

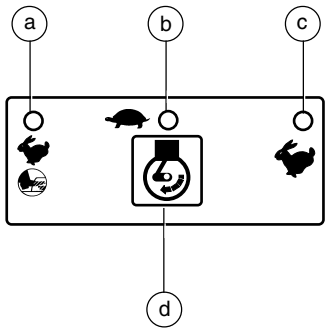
5 Push and release the rpm select button until low rpm is selected (turtle symbol).

⊙ Result: The engine should return to low idle.

6 Turn the key switch to platform controls.

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

⊙ Result: The engine should change to high idle.




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

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

⊙ Result: The engine should change to low idle.

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

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

10 Press down the foot switch.

⊙ Result: The engine should change to high idle.

CHECKLIST B PROCEDURES

## B-14
## Test the Fuel Select Operation - Gasoline/LPG Models

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

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

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

2 Press the fuel select button to gasoline mode.

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

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

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

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

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

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

8 Press the fuel select button to LPG mode.

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

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

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

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

## B-15
## Test the Drive Brakes

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

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

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

1 Mark a test line on the ground for reference.

2 Start the engine from the platform controls.

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

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

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

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

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

## B-16
## Test the Drive Speed - Stowed Position

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

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

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

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

2 Start the engine from the platform controls.

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

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

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

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

CHECKLIST B PROCEDURES

## B-17
## Test the Drive Speed - Raised or Extended Position

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

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

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

2 Start the engine from the platform controls.

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

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

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

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

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

8 Lower the boom to the stowed position.

9 Extend the boom 4 feet / 1.2 m.

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

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

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

## B-18
## Test the Alarm and Optional Flashing Beacon

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

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

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

## B-19
## Perform Hydraulic Oil Analysis

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

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

CHECKLIST B PROCEDURES

## B-20
## Test the Safety Envelope and Circuits

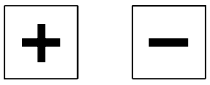
Testing the machine safety envelope is critical to safe machine operation. If the boom is allowed to operate when a safety switch is not functioning correctly, the machine stability is compromised and may tip over. Refer to Section 6 for limit switch and angle sensor information.

**Secondary Boom #1 Angle Safety Limit Switch, LSS2AS**

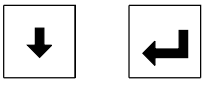
1 Turn the key switch to ground control and pull out the red Emergency Stop buttons out to the on position at both the ground and platform controls.

2 Start the engine from the ground controls.

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



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



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

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

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

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

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

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

⊙ Result: The display should show = 0FT.

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

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

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

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

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

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

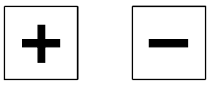
14 Fully raise the secondary boom and extend the secondary boom approximately 1 foot / 30.5 cm.

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

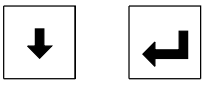
16 Re-connect the Deutsch connector from the secondary safety retract switch (LSS1RS) removed in step 7.

**Secondary Boom #1 Retracted Safety Limit Switch, LSS1RS**

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



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



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

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

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

CHECKLIST B PROCEDURES

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

⊙ Result: The display should show AT 65 DEGREES.

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

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

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

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

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

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

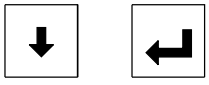
## B-21
## Test the Primary Boom Self-leveling

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

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

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

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



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

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

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

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

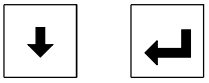
## B-22
## Test the Primary Boom Angle Sensor

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

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

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

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



CHECKLIST B PROCEDURES

3 Start the engine from the ground controls.

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

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

⊙ Result: The primary boom should stop.

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

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

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

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

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

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

Note: Perform this procedure with the engine off.

1 Remove the cap from the fuel tank.

2 Check for proper venting.

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

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

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

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

4 Install the fuel tank cap onto the fuel tank.

5 Remove the breather cap from the hydraulic tank.

6 Check for proper venting.

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

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

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

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

8 Install the breather cap onto the hydraulic tank.

# Checklist C Procedures

## C-1
## Perform Engine Maintenance - Continental Models

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

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

- Valve tappet clearance- adjust
- Fuel pump- check
- Fuel filter- replace
- PCV valve- check

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

| **Continental TME27 Owner's Manual** | |
|---|---|
| Genie part number | 111901 |

## C-2
## Perform Engine Maintenance - Deutz Models

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

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

- Engine oil- replace
- Oil filter- replace
- Primary fuel filter- replace
- V-belts- check
- Intake air pipes- check
- Cooling system- check

Required maintenance procedures and additional engine information are available in the *Deutz 2011 Series Operation Manual* (Deutz part number 0312-3547) OR the *Deutz 2.9 L4 Series Operation Manual* (Deutz part number 0312-3893)

| **Deutz 2011 Series Operation Manual** | |
|---|---|
| Genie part number | 139320 |

| **Deutz 2.9 L4 Series Operation Manual** | |
|---|---|
| Genie part number | 1251561 |

## C-3
## Perform Engine Maintenance - Perkins Models

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

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

- Engine oil- replace
- Oil filter- replace
- Fuel filter- replace
- Secondary Fuel filter- replace
- Fan clearance- check
- Cooling system- test/add
- Hoses and clamps- inspect/replace
- Radiator- clean

Required maintenance procedures and additional engine information are available in the: *Perkins 800D Series Operation Manual* (Perkins part number SEBU8324)OR the *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| | |
|---|---|
| **Perkins 800D Series Operation Manual** | |
| Genie part number | 111332 |
| **Perkins 404F Series Operation Manual** | |
| Genie part number | 1251562 |

## C-4
## Replace the Engine Air Filter Element

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

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

Note: Perform this procedure with the engine off.

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

2 Remove the filter element.

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

4 Check new filter element gasket for damage before installing.

5 Install the new filter element.

6 Install the end cap on the canister and secure.

Note: Be sure the discharge slot is pointing down.

CHECKLIST C PROCEDURES

# C-5
# Check and Adjust the Engine RPM

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

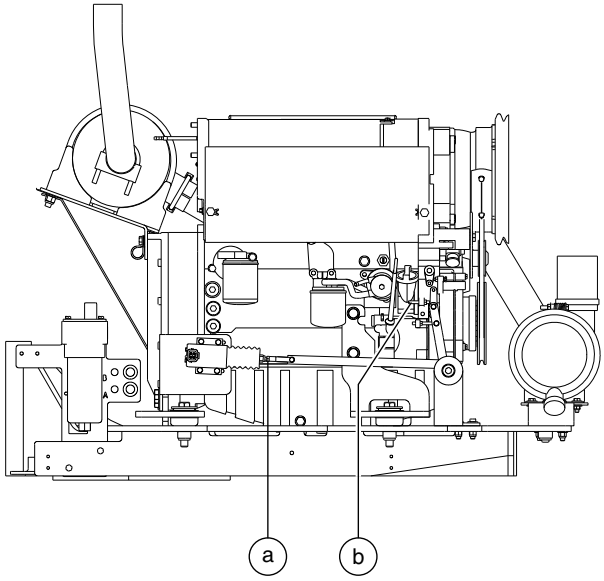
Not applicable to these models:

**Continental TME27**
**Deutz TD 2.9 L4 Models**
**Perkins 404F-22T Models**

Note: The engine rpm is controlled by the ECM and can only be adjusted by re-programming the ECM. If rpm adjustment or service is required, please contact Genie Product Support.

**Deutz TD2011L04i models:**

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




Deutz models
a high idle adjustment
b low idle adjustment

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

2 Loosen the locknut on the low idle adjustment screw.

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

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

**If the high idle is correct, disregard adjustment step 5.**

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

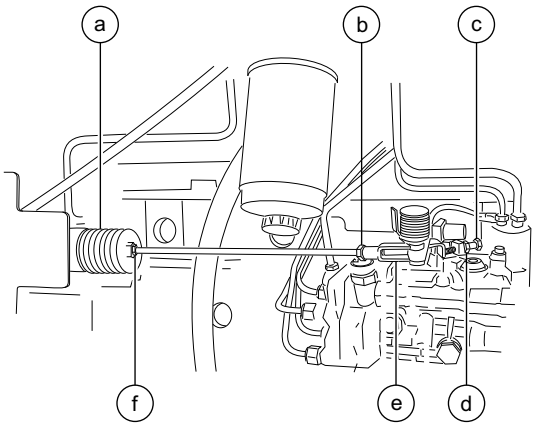
Note: Be sure the solenoid fully retracts when activating high idle.

**Perkins 804D models:**

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

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

2 Loosen the low idle lock nut. Turn the low idle adjustment screw clockwise to increase the rpm or counterclockwise to decrease the rpm. Tighten the low idle lock nut and confirm the rpm.




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

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

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

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

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

CHECKLIST C PROCEDURES

## C-6
## Grease the Platform Overload Mechanism (if equipped)

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

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

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

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

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

## C-7
## Test the Platform Overload System (if equipped)

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

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

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

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

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

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

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

CHECKLIST C PROCEDURES

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

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

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

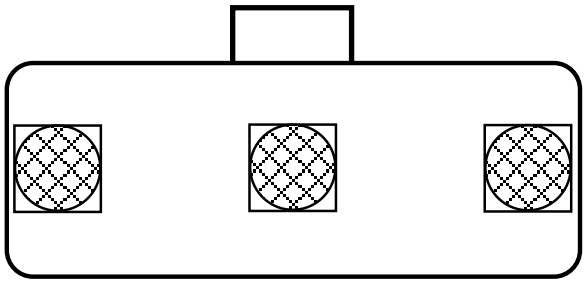


Illustration 1

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

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

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

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

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

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

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

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

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

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

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

8 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

CHECKLIST C PROCEDURES

9 Turn the key switch to ground control.

10 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

11 Press and hold the auxiliary power button.

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

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

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

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

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

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

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

⊙ Result: All ground control functions should operate normally.

15 Turn the key switch to platform control.

16 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should operate.

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

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

# Checklist D Procedures

## D-1
## Check the Boom Wear Pads

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

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

1 Start the engine from the ground controls.

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

3 Measure each wear pad.

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

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

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

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

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

CHECKLIST D PROCEDURES

## D-2
## Check the Free-wheel Configuration

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

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

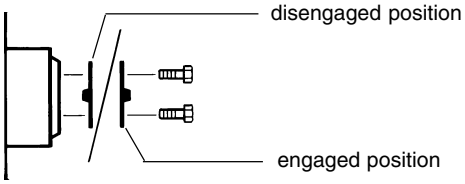
**NOTICE** Component damage hazard. If the machine must be towed, do not exceed 2 mph / 3.2 km/h.

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

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

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

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




5 Manually rotate each non-steer wheel.

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

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

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

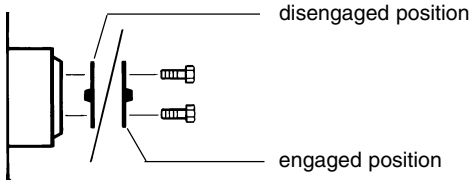
**4WD models:**

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

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

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

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



11 Manually rotate each steer wheel.

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

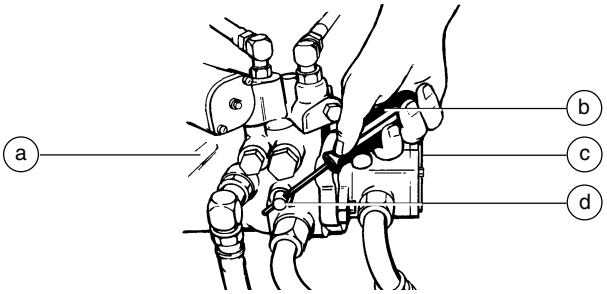
12 Re-engage the drive hubs by turning over the drive hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the blocks.

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

**All models:**

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

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



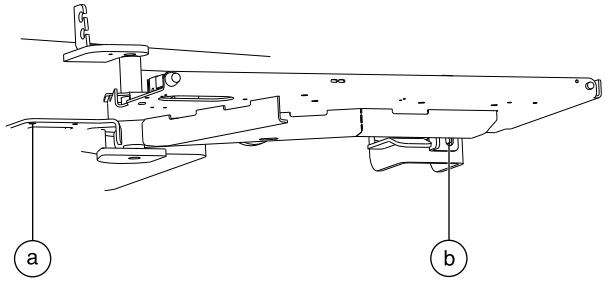

a drive pump
b screwdriver
c lift pump
d free-wheel valve

## D-3
## Check the Turntable Rotation Bearing Bolts

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

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

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




a engine tray anchor hole
b engine tray retaining fastener

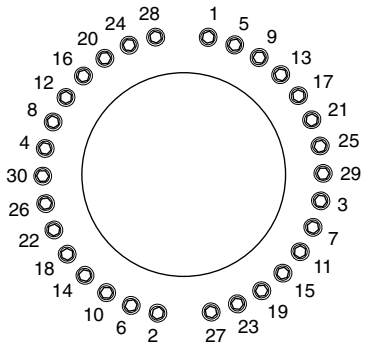
3 Locate the engine tray anchor hole at the pivot end of the engine tray.

CHECKLIST D PROCEDURES

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

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

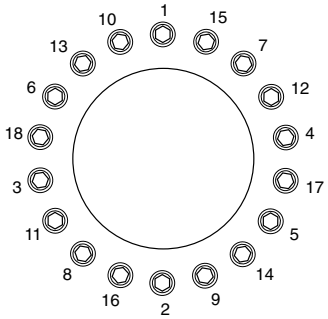
5 Confirm that each turntable mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.




Bolt torque sequence
(from above turntable)

6 Lower the boom to the stowed position.

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




Bolt torque sequence
(from below chassis)

8 Lower the secondary boom to the stowed position.

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

10 Swing the engine tray in towards the machine.

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

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

## D-4
## Inspect for Turntable Bearing Wear

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

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

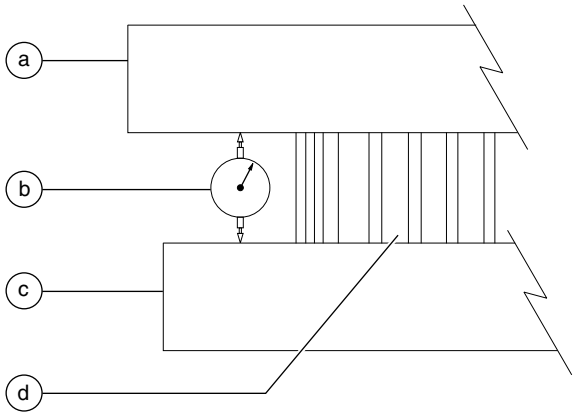
1 Grease the turntable bearing. See A-10, *Grease the Turntable Bearing and Rotate Gear.*

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

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

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

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




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

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

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

7 Note the reading on the dial indicator.

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

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

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

CHECKLIST D PROCEDURES

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

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

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

12 Remove the dial indicator from the machine.

## D-5
## Replace the Drive Hub Oil

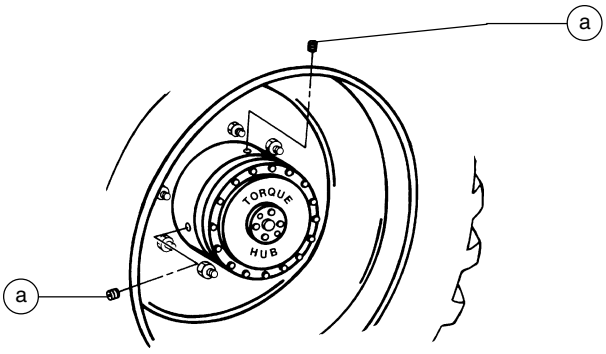
Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

**Drive Hubs:**

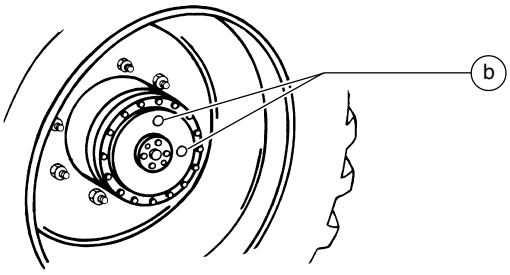
1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.

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

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




a models with pipe plugs




b models with o-ring plugs

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

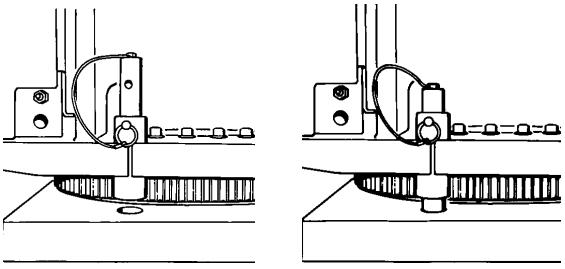
5 **Models with pipe plugs:** Apply pipe thread sealant to the plugs and install the plugs.

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

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

**Turntable Rotate Drive Hub:**

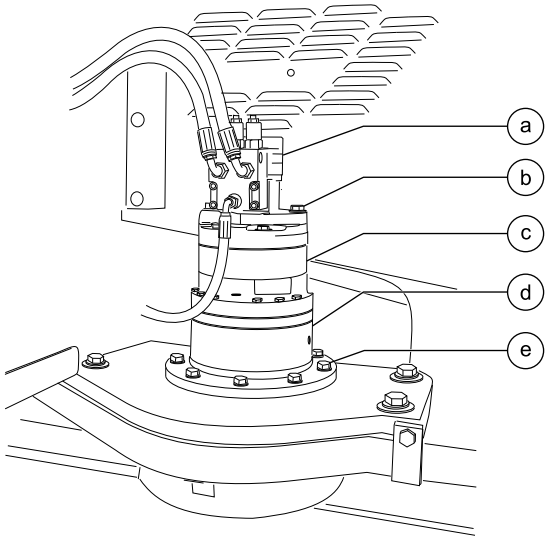
1 Secure the turntable from rotating with the turntable rotation lock pin.



unlocked locked

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

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




a motor
b motor/brake mounting bolts
c brake

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

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

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

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

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

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

CHECKLIST D PROCEDURES

# D-6
# Replace the Hydraulic Filter Elements

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

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

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

Note: Perform this procedure with the engine off.

**Hydraulic return filter:**

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

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

3 Remove the filter with an oil filter wrench.

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

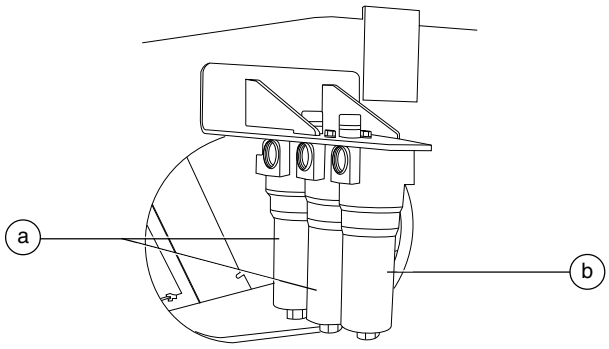
5 Install the new hydraulic return filter element and tighten it securely by hand. Clean up any oil that may have spilled during the installation procedure.

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

**Medium and high pressure filters:**

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

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




a high pressure filters
b medium pressure filter

8 Place a suitable container under the filters.

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

10 Remove the filter element from the housing.

11 Inspect the housing seal and replace it if necessary.

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

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

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

15 Start the engine from the ground controls.

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

## D-7
## Perform Engine Maintenance - Continental Models

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

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

- Spark plugs- replace
- O2 sensors- replace

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

| **Continental TME27 Owner's Manual** | |
|---|---|
| Genie part number | 111901 |

CHECKLIST D PROCEDURES

## D-8
## Perform Engine Maintenance - Deutz Models

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

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

**All models:**

- Fuel filter/water separator- replace
- V-belts- replace
- Charge air cooler- drain lube oil/condensate
- Cold starting device (if equipped)- check
- Hoses and clamps- inspect/replace
- Engine mounts- inspect/tighten

Required maintenance procedures and additional engine information are available in the *Deutz 2011 Series Operation Manual* (Deutz part number 0312-3547) OR the *Deutz 2.9 L4 Series Operation Manual* (Deutz part number 0312-3893)

| | |
|---|---|
| **Deutz 2011 Series Operation Manual** | |
| Genie part number | 139320 |
| **Deutz 2.9 L4 Series Operation Manual** | |
| Genie part number | 1251561 |

## D-9
## Perform Engine Maintenance - Perkins Models

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

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

**804D Models**

- Alternator- check
- Engine valve lash- inspect/adjust
- Starter- check
- Turbocharger- check

**404F Models**

- Alternator and fan belts- replace
- Crankcase breather (canister)- replace
- Engine valve lash- check
- Turbocharger- inspect

Required maintenance procedures and additional engine information are available in the: *Perkins 800D Series Operation Manual* (Perkins part number SEBU8324)OR the *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| | |
|---|---|
| **Perkins 800D Series Operation Manual** | |
| Genie part number | 111332 |
| **Perkins 404F Series Operation Manual** | |
| Genie part number | 1251562 |

# Checklist E Procedures

## E-1
## Test or Replace the Hydraulic Oil

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

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

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

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

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

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

4 Place a suitable container underneath the hydraulic tank.

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

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

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

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

8 Remove the ground controls side turntable cover.

9 Support the hydraulic tank with an appropriate lifting device.

10 Remove the hydraulic tank mounting fasteners.

11 Remove the hydraulic tank from the machine.

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

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

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

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

CHECKLIST E PROCEDURES

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

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

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

18 Install the hydraulic tank onto the machine.

19 Install the two suction hoses to the suction strainers.

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

**Models with hydraulic tank shut-off valves:**

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

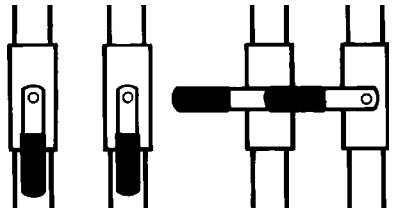
22 Fill the tank with hydraulic oil until the level is within the top 2 inches / 5 cm of the sight gauge. Do not overfill.

23 Clean up any oil that may have spilled.

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

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

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



CHECKLIST E PROCEDURES

## E-2
## Perform Engine Maintenance - Perkins Models

Engine specifications require that this procedure be every 2000 hours.

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

**804D Models**

- Cooling system coolant- replace
- Engine mounts- check

**404F Models**

- Alternator- check
- Engine mounts- check
- Starter- check

Required maintenance procedures and additional engine information are available in the: *Perkins 800D Series Operation Manual* (Perkins part number SEBU8324)OR the *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| | |
|---|---|
| **Perkins 800D Series Operation Manual** | |
| Genie part number | 111332 |
| **Perkins 404F Series Operation Manual** | |
| Genie part number | 1251562 |

## E-3
## Perform Engine Maintenance - Deutz Models

Engine specifications require that this procedure be performed every 2 years.

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

**All models:**

- Cooling system coolant- replace

Required maintenance procedures and additional engine information are available in the: *Deutz 2011 Series Operation Manual* (Deutz part number 0312-3547) OR the *Deutz 2.9 L4 Series Operation Manual* (Deutz part number 0312-3893)

| | |
|---|---|
| **Deutz 2011 Series Operation Manual** | |
| Genie part number | 139320 |
| **Deutz 2.9 L4 Series Operation Manual** | |
| Genie part number | 1251561 |

CHECKLIST E PROCEDURES

## E-4
## Perform Engine Maintenance - Perkins Models


Engine specifications require that this procedure be performed every 3000 hours.

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

**804D Models**

- Water pump- inspect

**404F Models**

- Thermostat- replace
- Diesel particulate filter- clean
- Fuel injectors- test/replace
- Flow plugs (ARD combustion)- replace
- Radiator cap- replace
- Water pump- inspect

Required maintenance procedures and additional engine information are available in the: *Perkins 800D Series Operation Manual* (Perkins part number SEBU8324)OR the *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| | |
|---|---|
| **Perkins 800D Series Operation Manual** | |
| Genie part number | 111332 |
| **Perkins 404F Series Operation Manual** | |
| Genie part number | 1251562 |

## E-5
## Perform Cooling Sytem Maintenance - Perkins 404F Models


Engine specifications require that this procedure be performed at various intervals.

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

**Every 3000 hours or 2 years**

- Heavy duty coolant- replace

**Every 12000 hours or 6 years**

- Extended life coolant- replace

Required maintenance procedures and additional engine information are available in the: *Perkins 404F Series Operation Manual* (Perkins part number SEBU8609).

| | |
|---|---|
| **Perkins 404F Series Operation Manual** | |
| Genie part number | 1251562 |

# Repair Procedures

## Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

## Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Use only Genie approved replacement parts.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Turntable rotated with the boom between the circle-end (yellow arrow) wheels
  - Turntable secured with the turntable rotation lock pin
  - Key switch in the off position with the key removed
  - Wheels chocked
  - All external AC power supply disconnected from the machine

## About This Section

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

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

**Symbols Legend**

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

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

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

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

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

Note: Used to indicate operation or maintenance information.

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

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

# Display Module

This table lists the various screens and menu options of the operating software. Some display menus are for informational purpose only, while others can be used to change the machine operating parameters. The key switch must be in the off position before entering the programming mode.
**Always exit the programming mode before turning the red Emergency Stop button to the off position.**

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| | Power on, configuration message | Boom Type(Z80,4WS,ETC.), Engine Type, Software Version | |
| Operator | Default | Hour meter (On power up)<br>Engine Speed &<br>Engine Oil Pressure PSI (English) &<br>Engine Oil Pressure kPa (metric) &<br>Engine Temperature F (English) @<br>Engine Temperature C (metric) @<br>Primary Boom Angle Sensor<br>TT Level Sensor X<br>TT Level Sensor Y<br>Platform Angle<br>Battery Volts | Engine temperature is not displayed until engine is above 100°F / 38°C |
| Status | With the key switch on, press the +⌋ and −⌋ at the same time | Hydraulic Pressure PSI<br>Hydraulic Pressure kPa<br>DPF Soot<br>Force DPF Regeneration<br>Inhibit DPF Regeneration<br>Primary Boom Zone<br>Primary Boom Length<br>Secondary Boom Length<br>Secondary Boom Angle | 0-4500 PSI<br>0-31000 kPa<br>0-150%<br>(No/Yes)<br>(No/Yes)<br><=0 DEG, >0 DEG, =65 DEG<br>= 0', >0', >22'<br>= 0 FT, > 0 FT<br>= 0 DEG, .>0 DEG, = 65 DEG |

DISPLAY MODULE

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| Unit/ Language | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ −↵ −↵ +↵. | Metric/English (measurement units) | Use +/- buttons to change |
| | | Display Language | English, German, French, Spanish, Portuguese, Italian, Dutch, and Swedish. Check new translations. Check scrolling of messages in Spanish with more than 75 characters. |
| Drive Functions | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the↵ button and press +↵ +↵ ↵↵ ↵↵. | Forward Not Stowed Drive Speed pct | 120% (default) 50% min |
| | | Forward Low Drive Speed pct | 120% (default) 50% min |
| | | Forward High Drive Speed pct | 120% max and 50% min, 100%(default) |
| | | Reverse Not Stowed Drive Speed pct | 120% max and 50% min, 100% (default) |
| | | Reverse Low Drive Speed pct | 120% max and 50% min, 100% (default) |
| | | Reverse High Drive Speed pct | 120% max and 50% min, 100% (default) |
| | | Drive Accel pct | 125% max and 25% min, 100% (default) |
| | | Drive Decel pct | 125% max and 25% min, 100% (default) |
| | | Speed limit on steer angle | 100% max and 0% min, 75% (default) |

DISPLAY MODULE

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| Boom Functions Speeds | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press + + – –. | Primary Boom Up speed Stowed | 120% max and 50% min, 100% (default) |
| | | Primary Boom Up speed not Stowed | 120% max and 50% min, 100% (default) |
| | | Primary Boom Down speed Stowed | 120% max and 50% min, 100% (default) |
| | | Primary Boom Down speed not Stowed | 120% max and 50% min, 100% (default) |
| | | Primary Boom Extend Speed | 120% max and 50% min, 100% (default) |
| | | Primary Boom Retract Speed | 120% max and 50% min, 100% (default) |
| | | Secondary Boom Up Speed Stowed | 120% max and 50% min, 100% (default) |
| | | Secondary Boom Up Speed Not Stowed | 120% max and 50% min, 100% (default) |
| | | Secondary Boom Down Speed Stowed | 120% max and 50% min, 100% (default) |
| | | Secondary Boom Down Speed Not Stowed | 120% max and 50% min, 100% (default) |
| | | Secondary Boom Ext Speed | 120% max and 50% min, 100% (default) |
| | | Secondary Boom Ret Speed | 120% max and 50% min, 100% (default) |
| | | TT-Rotate speed Retracted | 120% max and 50% min, 100% (default) |
| | | TT-Rotate speed Not Retracted | 120% max and 50% min, 100% (default) |
| | | Jib Up/Down speed | 120% max and 75% min, 100% (default) |

DISPLAY MODULE

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| Lift Functions Ramps | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ +↵ ↓↵ ↓↵. | Primary Boom Up/Down ramp accel % | 150% max and 50% min, 100% (default) 5% increment |
| | | Primary Boom Up/Down ramp decel % | 150% max and 50% min, 100% (default) 5% increment |
| | | Primary Boom Extend/Retract ramp accel % | 150% max and 50% min, 100% (default) 5% increment |
| | | Primary Boom Extend/Retract ramp decel % | 150% max and 50% min, 100% (default) 5% increment |
| | | Secondary Boom ramp accel % | 150% max and 50% min, 100% (default) 5% increment |
| | | Secondary Boom ramp decel % | 150% max and 50% min, 100% (default) 5% increment |
| | | TT-Rotate ramp accel % | 150% max and 50% min, 100% (default) 5% increment |
| | | TT-Rotate ramp decel % | 150% max and 50% min, 100% (default) 5% increment |
| | | Jib Up/Down ramp decel % | 150% max and 50% min, 100% (default) 5% increment |

DISPLAY MODULE

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| Valve calibration | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press –┘ –┘ ↵┘ ↵┘. | Reset Drive valve defaults (YES/NO)<br>Reset Primary Boom Up/Down valve defaults (YES/NO)<br>Reset Primary Boom Ext/Ret defaults (YES/NO)<br>Reset Secondary Boom valve defaults (YES/NO)<br>Reset TT Rotate valve defaults (YES/NO)<br>Allow Primary Boom Up/Down speed calibration (YES/NO)<br>Allow Primary Boom Ext/Ret speed calibration (YES/NO)<br>Allow Secondary Boom Up/Down speed calibration (YES/NO)<br>Allow TT Rotate speed calibration (YES/NO)<br>Reset Drive joystick defaults (YES/NO)<br>Reset Pri. Boom Up/Down joystick defaults (YES/NO)<br>Reset Pri. Boom Ext/Ret joystick defaults (YES/NO)<br>Reset Secondary Boom joystick defaults (YES/NO)<br>Reset TT Rotate joystick defaults (YES/NO)<br>Reset Steer joystick defaults (YES/NO) | |

DISPLAY MODULE

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| Sensor calibration | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press +↵ ↵↵ +↵. | Set Unit levels to gravity<br>Unit Level Y-axis Millivolts per degree<br>Unit Level X-axis Millivolts per degree<br>Set Platform level to gravity<br>Platform Level Sensor Millivolts per degree<br>Reset Blue End Blue Side Steer Sensor (YES/NO)<br>Reset Yellow End Blue Side Steer Sensor (YES/NO)<br>Reset Blue End Yellow Side Steer Sensor (YES/NO)<br>Reset Yellow End Yellow Side Steer Sensor (YES/NO)<br>Reset All Steer Sensors (YES/NO)<br>Reset Primary Boom Angle Sensor (YES/NO)<br>Primary Boom angle = 40deg (YES/NO)<br>Primary Boom angle = 70deg (YES/NO) | |
| Default Reset | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press −↵ −↵ ↓↵ ↓↵. | Reset Drive Functions (YES/NO)<br>Reset Boom Function Speeds (YES/NO)<br>Reset Lift Function Ramps (YES/NO)<br>Reset All (Machine Require Calibration) (YES/NO)<br>Clear All Safety Switch Faults (YES/NO) | |

DISPLAY MODULE

| Screen | To Enter | Information Displayed | Range |
|---|---|---|---|
| Options | With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button and press −, −, +, +. | Boom Length Limit: No Limit (NO LT), Secondary Extend disabled (EXT LT), Secondary Function disabled (SEC LT) | |
| | | AC Generator Options: (NONE, BELT, HI_LO, HYDRL, GHG10) | |
| | | Alarm: No, Motion (MO AL), Travel (TR AL), Descent (DE AL), Travel and Decent (TD AL) | |
| | | Lift/Drive OPT: No (NO CO), Drive cut out while not stowed (DCONS), Lifting or Driving (LORDR) | |
| | | Aux Drive OPT: (YES/NO) | |
| | | Proximity Kill Switch (NONE/PROX) | |
| | | Platform Overload (NONE PLFTS) | |
| | | Work Light: (YES/NO) | |
| | | Flashing Beacon: (YES/NO) | |
| | | Drive Lights: (YES/NO) | |
| | | Disable Steer Mode Change while Driving: (YES/NO) | 30.0 max and 0.0 min, 10.0 (default) |
| | | Rocker Joystick Steering (YES/NO) | 0 to 30 minutes |
| | | Chassis Tilt Cutout (YES/NO) | 0 to 10 minutes, 10 is the default Only shown when Hydraulic gen is selected. |
| | | Foot Switch Lockout 0 to 30 minutes | Holding + or - button will cause display to scroll through options or increment number settings automatically. 0.2 min inc/dec |

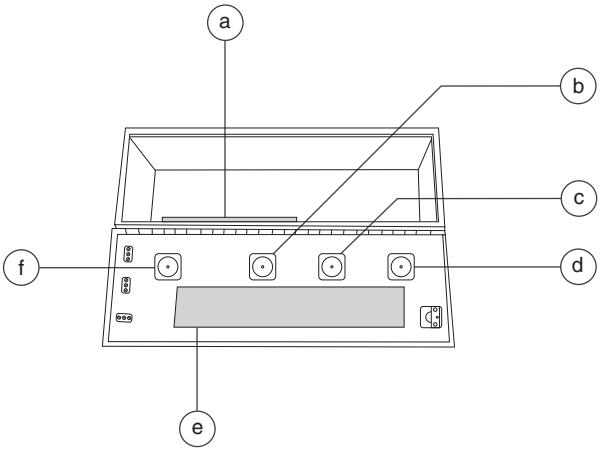
# Platform Controls

The platform controls contains two printed circuit boards:

The **LED circuit board** is mounted to the underside of the control box lid which contains the LED's. The LED circuit board sends the input from the operator to the platform controls ECM circuit board (PCON). The ECM circuit board (PCON) sends the data to the turntable control box (TCON) for processing.

The **platform controls ECM circuit board (ALC-1000)** communicates with the turntable controls. The joystick controllers at the platform controls utilize Hall Effect technology and require no adjustment. The operating parameters of the joysticks are stored in memory at the turntable controls. If a joystick controller error occurs or if a joystick is replaced, it will need to be calibrated before that particular machine function will operate. See 1-3, *How to Calibrate a Joystick.*

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




a platform controls ALC-1000 circuit board
b primary boom extend/retract joystick
c secondary boom up/extend and down/retract joystick
d drive/steer joystick controller
e LED circuit board
f primary boom up/down and turntable rotate left/right joystick

PLATFORM CONTROLS

# 1-1

# ALC-1000 Circuit Board

Note: When the ALC-1000 circuit board is replaced, the joystick controllers will need to be calibrated. See 1-3, *How to Calibrate a Joystick.*

## How to Remove the ALC-1000 Circuit Board

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

2 Locate the cables that connect to the bottom of the control box. Tag each cable and its location at the control box.

3 Tag and disconnect the cables from the bottom of the platform control box.

4 Remove the control cable plug retaining fasteners from the bottom of the platform control box.

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

6 Locate the ALC-1000 circuit board mounted to the inside of the platform control box.

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

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

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

8 Carefully disconnect the wire connectors from the circuit board.

9 Remove the ALC-1000 circuit board mounting fasteners.

10 Carefully remove the ALC-1000 circuit board from the platform control box.

## How to Remove the LED Circuit Board

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

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

3 Locate the LED circuit board mounted to the inside of the platform control box lid.

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

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

4 Carefully tag and disconnect the connectors from the LED circuit board.

5 Remove the LED circuit board retaining fasteners.

6 Carefully remove the LED circuit board from the platform control box lid.

4 Close the control box lid.

# 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: After each joystick is calibrated, check the display at the ground control box. There should be no calibration faults shown on the display. If calibration faults exist, repeat steps 1 through 8 for that joystick controlled function.

Note: Perform this procedure with the engine off.

**Drive functions:**

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET DRIVE JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

PLATFORM CONTROLS

5 Do not start the engine.

6 Locate the drive/steer joystick.

7 Move the drive/steer joystick full stroke in the forward direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the drive/steer joystick full stroke in the reverse direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

**Steer functions:**

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET STEER JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the drive/steer joystick.

7 Move the drive/steer joystick or thumb rocker switch (if equipped) full stroke in the left direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the drive/steer joystick or thumb rocker switch (if equipped) full stroke in the right direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊗ Result: If the alarm does not sound, repeat calibration procedure.

**Primary boom extend/retract functions:**

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET PRIMARY BOOM EXTEND/RETRACT JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the primary boom extend/retract joystick.

7 Move the primary boom extend/retract joystick full stroke in the extend direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the primary boom extend/retract joystick full stroke in the retract direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

**Secondary boom up/down and extend/retract functions:**

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET SECONDARY BOOM JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the secondary boom up/down and extend/retract joystick.

7 Move the secondary boom up/down and extend/retract joystick full stroke in the up/extend direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the secondary boom up/down and extend/retract joystick full stroke in the down/retract direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

**Primary boom up/down functions:**

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET PRIMARY BOOM UP/DOWN JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the primary boom/turntable rotate joystick.

7 Move the boom/turntable rotate joystick full stroke in the up direction and hold for 5 seconds, then return to the center or neutral position.

PLATFORM CONTROLS

8 Move the boom/turntable rotate joystick full stroke in the down direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

**Turntable rotate functions:**

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until RESET TURNTABLE ROTATE LEFT/RIGHT JOYSTICK DEFAULTS is displayed. Press the [+] button to select YES, then press the [↵] button.

5 Do not start the engine.

6 Locate the primary boom/turntable rotate joystick.

7 Move the boom/turntable joystick full stroke in the left direction and hold for 5 seconds, then return to the center or neutral position.

8 Move the boom/turntable joystick full stroke in the right direction and hold for 5 seconds, then return to the center or neutral position.

⊙ Result: The alarm at the ground controls should sound for a successful calibration.

⊠ Result: If the alarm does not sound, repeat calibration procedure.

## How to Reset a Proportional Valve Coil Default

Note: This procedure only needs to be performed if a proportional valve has been replaced.

Note: After the valve coil defaults have been set, each machine function threshold and default function speed must be set. See *How to Set the Function Thresholds and Default Function Speeds.*

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to platform controls.

3 Press the minus button [−] twice, then press the enter button [↵] twice.

4 Use the scroll button [↓] to scroll through the menu until the function valve that needs to be reset is displayed. Press the [+] button to select YES, then press the [↵] button.

## How to Set the Function Thresholds and Default Functions Speeds

Note: Before the threshold and default function speeds can be set, the boom function proportional valve coil defaults must be set first.
See *How to Reset a Proportional Valve Coil Default.*

Note: If a boom function proportional valve coil has not been replaced and just want to reset the function speed to original factory settings, begin with step 10.

Note: Perform this procedure with the machine parked on a firm, level surface which is free of obstructions.

1 Start the engine from the platform controls.

2 Press down the foot switch.

Note: Be sure the engine rpm is set to foot switch activated high idle.

**Function threshold:**

3 Select a joystick controlled function that needs to have the threshold set.

4 Slowly move the joystick off center in either direction just until the machine function starts to move, then move the joystick very slowly towards the neutral or center position just before the machine function stops.
Do not let go of the joystick.

5 While holding the joystick in position, press the engine start button at the platform controls to set the joystick controller threshold.

6 Repeat steps 3 through 5 for each joystick controlled machine function (primary boom up/down and turntable rotate left/right, primary boom extend/retract, secondary up/down and extend/retract, drive forward/reverse and steer left/right).

7 Once the threshold has been set, press and hold the engine start button until the engine shuts off. Do not press the red Emergency Stop button.

Note: Approximately 3 seconds after the engine shuts off, the alarm at the ground controls will sound to indicate the threshold settings are being saved in memory. Release the button.

8 At the ground controls, turn the key switch to the off position, wait a moment and then turn the key switch to platform controls.

9 Check the display at the ground controls to be sure there are no calibration faults.

⊙ Result: There should be no calibration faults shown on the display. If calibration faults exist, repeat this procedure.

**Function speeds:**

Note: Be sure the machine is in the stowed position and the platform is rotated between the round end tires.

10 Start the engine from the platform controls.

11 Select a boom function that needs the function speed set.

PLATFORM CONTROLS

12 **Boom up/down functions:** Move the joystick full stroke in the up direction. When the alarm sounds, move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

**Boom extend/retract functions:** Raise the primary boom until it no longer rests on the boom cradle. Then move the joystick full stroke in the extend direction. When the alarm sounds, move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

**Turntable rotate functions:** Raise the primary boom until it no longer rests on the boom cradle. Move the joystick full stroke in either the left or right direction until a drive enable zone is reached. Move the joystick in the opposite direction full stroke until the alarm sounds. Now move the joystick in the opposite direction full stroke until the alarm sounds again. Return the joystick to center.

13 Once the function speeds have been set, press and hold the engine start button until the engine shuts off. Do not press the red Emergency Stop button.

Note: Approximately 3 seconds after the engine shuts off, the alarm at the ground controls will sound to indicate the speed settings are being saved in memory. Release the button.

14 At the ground controls, turn the key switch to the off position, wait three seconds and then turn the key switch to platform controls.

15 Inspect the display at the ground controls to be sure there are no calibration faults.

Note: There should be no calibration faults shown on the display. If calibration faults exist, repeat this procedure.

## How to Adjust the Function Speeds

Note: Perform this procedure with the boom in the stowed position. Refer to Section 2, *Specifications.*

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

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to ground controls.

3 Press the plus button [+] twice, then press the minus button [−] twice.

4 Press the scroll button [↓] until the function to be adjusted is displayed.

5 Press the plus button [+] to increase the speed or press the minus button [−] to decrease the speed.

6 Press the enter button [↵] to save the setting in memory.

7 Perform this procedure until the machine function speed meets specification.

## How to Adjust the Function Ramp Rate Setting

The ramp rate setting of a joystick controls the time at which it takes for the joystick to reach maximum output, when moved out of the neutral position. The ramp rate settings of a joystick can be changed to compensate for hydraulic pump wear to maintain peak performance from the machine. Refer to Section 2, *Specifications.*

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

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

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to ground controls.

3 Press the plus button [+] twice, then press the scroll button [↓] twice.

4 Press the scroll button [↓] until the function to be adjusted is displayed.

5 Press the plus button [+] to increase the ramp rate or press the minus button [−] to decrease the ramp rate.

6 Press the enter button [↵] to save the setting in memory.

7 Perform this procedure until the machine function speed meets specification.

## Ramp Rate Specifications

| Ramp rate (factory settings) | |
|---|---|
| **Turntable rotate** | |
| accelerate | 4 seconds |
| decelerate | 1.0 second |
| **Primary boom up/down** | |
| accelerate | 3 seconds |
| decelerate | 0.25 second |
| **Primary boom extend/retract** | |
| accelerate | 3 seconds |
| decelerate | 0.75 second |
| **Secondary boom up/down** | |
| accelerate | 7 seconds |
| decelerate | 0.75 second |
| **Secondary boom extend/retract** | |
| accelerate | 7 seconds |
| decelerate | 0.75 second |
| **Drive** | |
| accelerate | 1.5 seconds |
| decelerate to neutral | 0.5 second |
| decelerate, change of direction | 0.5 second |
| decelerate, coasting | 0.75 second |
| decelerate, braking | 2 seconds |
| decelerate, shift from low to high speed | 1 second |
| decelerate, shift from high to low speed | 4 seconds |

# Platform Components

## 2-1 Platform

### How to Remove the Platform

1 Separate the foot switch quick disconnect plug.

2 Support the platform with an appropriate lifting device.

3 Locate the cables that connect to the bottom of the control box. Number each cable and its location at the platform control box.

4 Disconnect the cables from the bottom of the platform control box.

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

6 Remove the air line to platform bracket retaining fasteners (if equipped).

7 Remove the weld cables from the platform (if equipped).

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

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

## 2-2 Platform Leveling Cylinder

The platform leveling cylinder maintains platform leveling through the entire range of boom motion. This allows the platform to be level with the turntable. The ECM at the ground controls compares the difference in readings between the platform angle sensor and the turntable level sensor. The ECM at the ground controls sends a signal to the platform controls to open or close the appropriate platform level proportional valve on the platform manifold to maintain a level platform. The platform leveling cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

### How to Remove the Platform Leveling Cylinder

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

1 Extend the boom until the platform leveling cylinder barrel-end pivot pin is accessible.

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

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

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

4 Tag, disconnect and plug the hydraulic hoses from the platform leveling cylinder at the bulkhead fittings located inside the boom tube at the platform end. Cap the bulkhead fittings on the boom tube.

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

5 Remove the pin retaining fasteners from the platform leveling cylinder rod-end pivot pin. Do not remove the pin.

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

7 Support and secure the jib boom cylinder to the jib boom with a strap or other suitable device. Protect the cylinder rod from damage.

**⚠CAUTION** Crushing hazard. The jib boom cylinder will fall if not properly supported when the platform level cylinder rod-end pivot pin is removed.

8 Use a soft metal drift to remove the barrel-end pivot pin.

**⚠WARNING** Crushing hazard. The platform and jib boom will fall when the platform leveling cylinder barrel-end pivot pin is removed if not properly supported.

9 Support the rod end of the platform level cylinder.

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

11 Use a soft metal drift to remove the platform level cylinder rod-end pivot pin.

12 Carefully pull the platform leveling cylinder out of the boom.

**⚠CAUTION** Crushing hazard. The jib boom cylinder will fall if not properly supported when the platform level cylinder rod-end pivot pin is removed.

## How to Bleed the Platform Leveling Cylinder

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

1 Raise the jib boom to a horizontal position.

2 Push the platform level up and down buttons through two complete platform leveling cycles to remove any air that might be in the system.

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 on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

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

2 Disconnect the wire harness from the platform angle sensor.

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

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

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

5 Remove the platform manifold mounting fasteners. Lay the platform manifold to the side.

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

6 Remove the power to platform electrical outlet box bracket mounting fasteners.

7 Remove the power to platform electrical outlet box from the platform and lay it to the side.

8 Remove the weld cable from the platform (if equipped).

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

9 Support the platform mounting weldment. Do not apply any lifting pressure.

10 Remove the eight mounting bolts from the platform mounting weldment.

11 Remove the center bolt and slide the platform mounting weldment off of the platform rotator.

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

12 Support the platform rotator. Do not apply any lifting pressure.

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

14 Support the jib boom leveling arms with a suitable lifting device.

15 Use a soft metal drift to remove both pins and remove the platform rotator from the machine.

**⚠WARNING** Crushing hazard. The jib boom leveling arms may fall if they are not properly supported when the jib boom leveling arm pivot pin is removed.

**NOTICE** Component damage hazard. The platform angle sensor is a very sensitive instrument. It can be damaged internally if the platform rotator is dropped or sustains any physical shock, even if the damage is not visible.

## How to Bleed the Platform Rotator

**Before serial number 229:**

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

1 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any drainage. Secure the container to the boom.

2 Move the platform rotate switch to the left and then to the right through two platform rotation cycles, continue holding the switch to the right until the platform is fully rotated to the right.

3 Open the top bleed valve, but do not remove it.

4 Move the platform rotate switch to the left until the platform is fully rotated to the left. Continue holding the switch until air stops coming out of the bleed valve. Close the bleed valve.

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

5 Connect the clear hose to the bottom bleed valve. Open the bottom bleed valve, but do not remove it.

6 Hold the platform rotate switch to the right until the platform is fully rotated to the right. Continue holding the switch until air stops coming out of the bleed valve. Close the bleed valve.

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

7 Remove the hose from the bleed valve and clean up any hydraulic oil that may have spilled.

8 Rotate the platform full right, then full left and inspect the bleed valves for leaks.

**After serial number 228:**

1 Rotate the platform full right, then full left until air is completely out of the rotator. Bleeding the valve is not necessary.

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

PLATFORM COMPONENTS

## 2-4 Platform Overload System

The platform overload system is designed to prevent the machine from continuing to operate when the load in the platform exceeds maximum rated capacity. Refer to the machine serial label for maximum capacity information.

If maximum platform capacity is exceeded, the alarm will sound and the platform overload indicator lights will flash at the platform control and "PLATFORM OVERLOAD" will display on the LCD screen at the ground control. The ground and platform controls will become disabled. Before normal machine operation can continue, the excess load will need to be removed from the platform.

If the excess load cannot be removed or if the operator at the platform controls is unable to correct the overloaded condition, another person at the ground controls can operate the machine using auxiliary power. There will be limited control of boom functions from the ground controls when using auxiliary power. Auxiliary power can be used to correct the overloaded platform condition in order to resume normal, safe operation of the machine.

Note: The engine must be turned off to use auxiliary power.

Note: ***Software versions 1.03 and lower.*** All ground control functions will not operate with auxiliary control. Refer to Repair Procedure 6-1, *How to Determine the Revision Level.*

Note: Recovery mode must be used. Refer to Repair Procedure 6-1*, Service Bypass / Recovery Keyswitch.*

Note: ***Software versions 1.04 and higher.*** All ground control functions will operate from auxiliary control. Refer to Repair Procedure 6-1, *How to Determine the Revision Level.*

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

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

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

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

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

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

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

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

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

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Proceed to step 6.

⊠ Result: The alarm is sounding. The platform overload indicator light is flashing at the platform controls and “PLATFORM OVERLOAD” should is displayed on the LCD screen at the ground controls. Slowly tighten the load spring adjustment nut in a clockwise direction in 10° increments until the overload indicator light turns off, and the alarm does not sound. Proceed to step 8.

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

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

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

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Slowly loosen the load spring adjustment nut in a counterclockwise direction in 10° increments until the overload indicator light flashes at both the platform and ground controls, and the alarm sounds. Proceed to step 7.

⊠ Result: The alarm should be sounding. The platform overload indicator light should be flashing at the platform controls and “PLATFORM OVERLOAD” should be displayed on the LCD screen at the ground controls. Repeat this procedure beginning with step 5.

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

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

PLATFORM COMPONENTS

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

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Proceed to step 8.

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

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

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

⊙ Result: The alarm should be sounding. The platform overload indicator light should be flashing at the platform controls and "PLATFORM OVERLOAD" should be displayed on the LCD screen at the ground controls. Proceed to step 9.

⊠ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls. Remove the additional 10 lb / 4.5 kg test weight. Repeat this procedure beginning with step 6.

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

9 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

10 Turn the key switch to ground control.

11 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

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

⊙ Result: The alarm should be off. The platform overload indicator light should be off at the platform controls and there should be no error message on the LCD display at the ground controls.

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

13 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should operate normally.

14 Turn the key switch to platform control.

15 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should operate normally.

# 2-5 Platform Overload Recovery Message (software V2.04 and later)

If the ground controls LCD screen displays OVERLOAD RECOVERY, the emergency lowering system has been used while the platform was overloaded.

## How to Clear the Platform Overload Recovery Message

Note: This message shall be cleared by a person trained and qualified on the troubleshooting and repair of this machine.

1 Turn the key switch to the off position.

2 Press and hold the enter button [↵] on the ground control panel while turning the key switch to ground controls. Hold the enter button [↵] for approximately 5 seconds.

3 Press the buttons on the ground controls in the following sequence: (plus [+])(minus [−])(minus [−])(plus [+]).

4 Press the enter [↵] or previous [↓] button on the LCD screen until CLEAR OVERLOAD RECOVERY is displayed.

5 Press the plus button [+] or the minus [−] button to select YES. Then press the buttons in the following sequence: (plus [+])(plus [+])(plus [+])(minus [−]) and press the enter button [↵] to accept.

Note: The passcode buttons (plus [+])(plus [+])(plus [+])(minus [−]) must be entered in the proper sequence before the enter button [↵] is pressed.

6 Press the enter [↵] or previous button [↓] on the LCD screen until EXIT is displayed.

7 Press the plus button [+] or minus button [−] to select YES and then press the enter button [↵].

8 Turn the key swith to the off position.

# Jib Boom Components

## 3-1
## Jib Boom

### How to Remove the Jib Boom

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

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

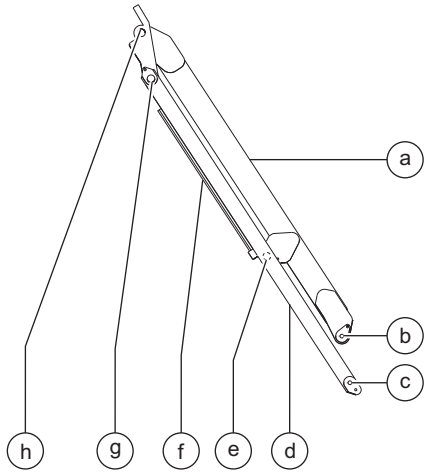
1 Remove the platform mounting weldment and the platform rotator. See 2-3, *How to Remove the Platform Rotator*.

2 Remove the hose and cable cover retaining fasteners from the jib boom. Remove the hose and cable cover from the machine.

3 Attach a lifting strap from an overhead crane to the jib boom for support. Do not apply lifitng pressure.

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

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




a jib boom
b platform rotator upper pivot pin
c platform rotator lower pivot pin
d jib boom leveling arm
e jib cylinder pivot pin
f jib boom cylinder
g primary boom lower pivot pin
h primary boom upper pivot pin

5 Support the barrel end of the jib boom cylinder with another suitable lifting device.

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

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

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

8 Secure the jib boom bellcrank to prevent it from moving.

9 Remove the hose and cable clamp from the jib boom pivot pin.

10 Remove the pin retaining fastener from the jib boom pivot pin. Do not remove the pin.

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

12 Use a soft metal drift to remove the pin. Carefully remove the jib boom from the primary boom.

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

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

14 Slide both of the jib boom leveling arms off of the jib boom cylinder rod-end pivot pin and lay them off to the side.

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

16 Attach a lifting strap from a second overhead crane to the jib boom bellcrank.

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

**⚠WARNING** Crushing hazard. The jib boom lift cylinder and jib boom bellcrank could become unbalanced and fall if not properly supported when they are removed from the machine.

**⚠CAUTION** Crushing hazard. The platform leveling cylinder may fall if not supported when the rod-end pivot pin is removed.

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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the jib boom slightly and place blocks under the platform mounting weldment. Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

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

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

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

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

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

**⚠CAUTION** Crushing hazard. The jib boom lift cylinder may fall if not supported when the rod-end pivot pin is removed.

5 Support the jib boom lift cylinder with a suitable lifting device.

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

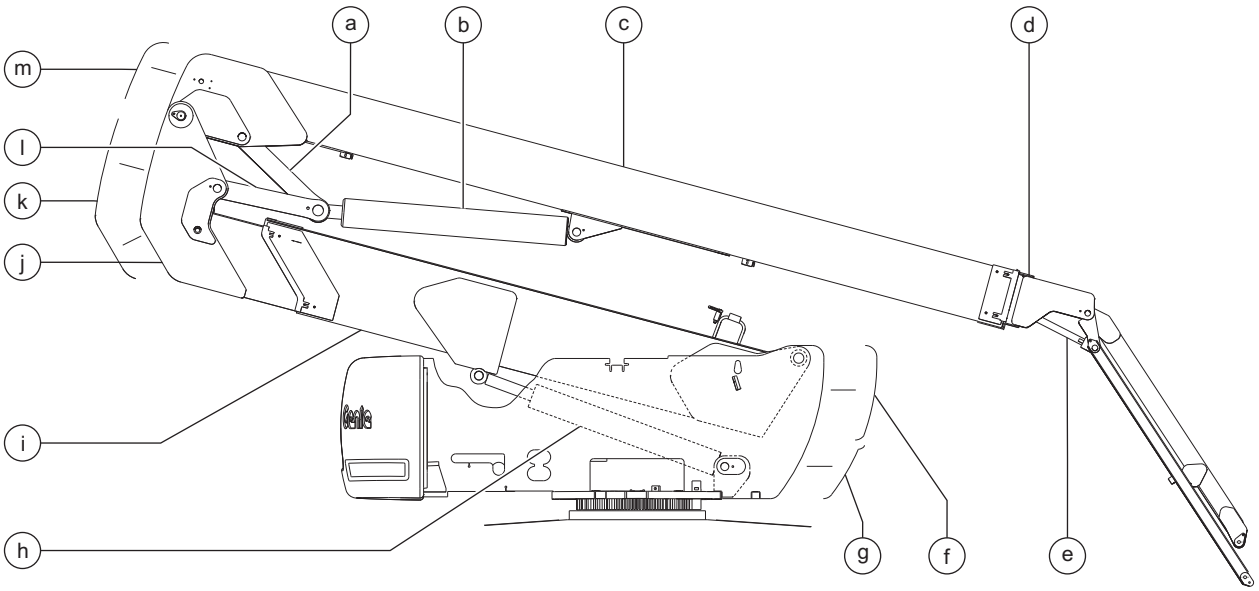
**⚠WARNING** Crushing hazard. The platform and jib boom lift cylinder could become unbalanced and fall if not properly supported when the jib boom lift cylinder barrel-end lift pivot pin is removed.

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

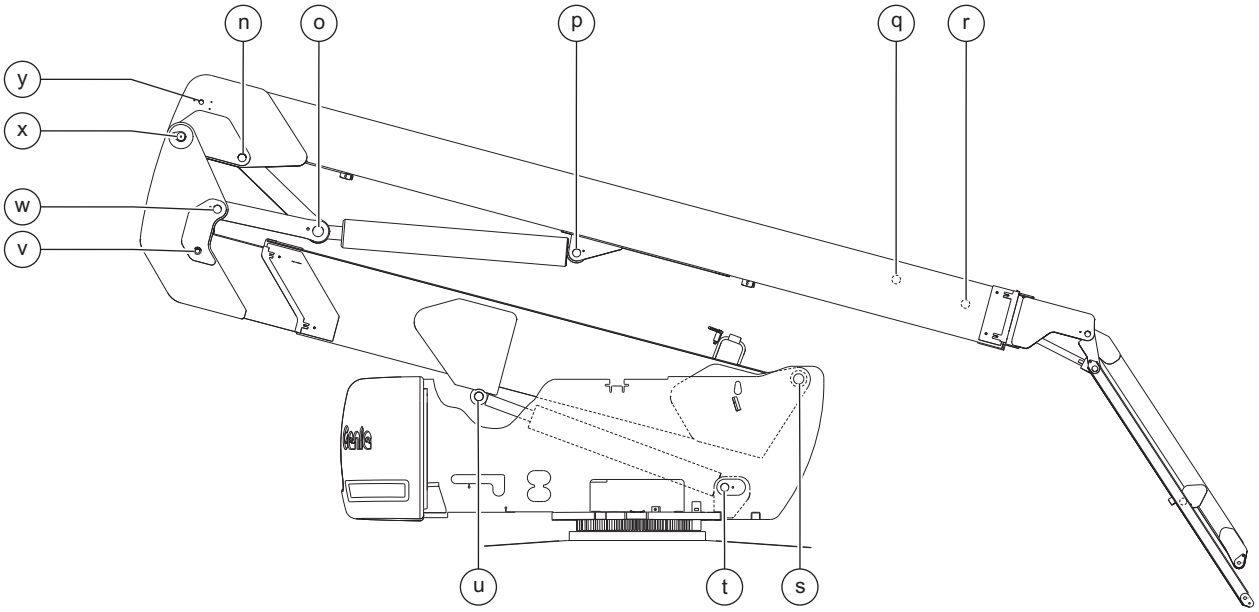
8 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the machine.

**⚠WARNING** Crushing hazard. The jib boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

# Boom Components




a primary boom lift cylinder link arm
b primary boom lift cylinder
c primary boom
d primary extension boom
e platform leveling cylinder
f upper turntable cover
g lower turntable cover
h secondary boom lift cylinder
i secondary boom
j secondary extension boom
k secondary boom hose cover
l primary boom lift cylinder lever arm
m primary boom hose cover
n primary boom link arm pivot pin
o primary lift cylinder pivot pin - rod end
p primary lift cylinder pivot pin - barrel end
q primary extend cylinder pivot pin - rod end
r platform level cylinder pivot pin - barrel end
s secondary boom pivot pin
t secondary lift cylinder pivot pin - barrel end
u secondary lift cylinder pivot pin - rod end
v secondary extend cylinder pivot pin - rod end
w secondary boom lever arm pivot pin
x primary boom pivot pin
y primary extend cylinder pivot pins - barrel end



BOOM COMPONENTS

# 4-1
# Primary Boom Cable Track

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

## How to Remove the Cable Track

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

1 Tag and disconnect the wire connectors from the platform control box.

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

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

3 Remove the mounting fasteners from the power to platform outlet box. Remove the outlet box and lay to the side.

4 Remove the hose clamp from the platform support.

5 Tag and disconnect the electrical connector from the platform angle sensor.

Note: The platform angle sensor is mounted to the platform rotator.

6 Tag and disconnect the electrical connectors for the foot switch and jib boom limit switch.

7 Remove the platform manifold mounting fasteners. Remove the manifold and lay to the side.

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

8 Remove the hose and cable cover retaining fasteners from the jib boom. Remove the hose and cable cover from the machine.

9 Remove the hose and cable clamp from the jib boom pivot pin.

**⚠CAUTION** Crushing hazard. The jib boom may fall if not supported when the jib boom pivot pin is removed.

10 Tag, disconnect and plug the slave cylinder hydraulic hoses from the bulkhead fittings at the platform end of the primary boom. Cap the bulkhead fittings.

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

11 Tag, disconnect and plug the jib boom cylinder hydraulic hoses. Cap the fittings.

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

12 Remove the cotter pin from the platform end of the cable track tube.

Note: Always replace the cotter pin with a new one when installing the cable track.

13 Remove the fasteners from the cable track guide at the platform end of the primary boom. Remove the cable track guide from the machine.

14 Tag and disconnect the electrical connector from the limit switch at the pivot end of the primary boom.

15 Remove all hose clamps for the primary boom lift cylinder hydraulic hoses.

Note: The primary boom lift cylinder hydraulic hose clamps are located behind the cable track.

16 Support the end cover from the secondary boom at the pivot end of the primary boom.

17 Remove the cover retaining fasteners and remove the cover from the machine.

**⚠WARNING** Crushing hazard. The secondary boom hose cover could become unbalanced and fall if not properly supported when removed from the machine.

18 Tag, disconnect and plug each hydraulic hose from the bulkhead fittings that lead to the cable track. Cap the fittings.

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

19 Tag and disconnect each electrical connector to wiring that leads to the cable track.

20 Pull all hoses and electrical cables through the opening in the primary boom at the pivot end.

21 Secure the upper and lower cable tracks together.

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

23 Remove all cable track mounting fasteners.

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

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

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

BOOM COMPONENTS

## How to Repair the Cable Track

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

Note: A cable track repair kit is available through the Genie Industries Service Parts Department.

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

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

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

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

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

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

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

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

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

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

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

# 4-2
# Primary Boom

## How to Shim the Boom

1 Measure each wear pad.

⊙ Result: Each wear pad meets minimum specification. Proceed to step 2.

⊠ Result: Each wear pad does not meet minimum specification. Replace any wear pad that does not meet minimum specification. Proceed to step 2.

2 Extend the boom until the wear pads are accessible.

3 Loosen the wear pad mounting fasteners.

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

5 Tighten the mounting fasteners.

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

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

## Wear Pad Specifications

| **Primary boom wear pad specifications** | **Minimum** |
|---|---|
| Top, bottom and side wear pads (platform end of boom) | 5/8 inch 15.9 mm |
| Side and bottom wear pads (pivot end of boom) | 1/2 inch 12.7 mm |
| Top wear pads (pivot end of boom) | 5/8 inch 15.9 mm |
| **Secondary boom wear pad specifications** | **Minimum** |
| Top, and side wear pads (extension end of boom) | 5/8 inch 15.9 mm |
| Bottom wear pads (extension end of boom) | 1/2 inch 12.7 mm |
| Top wear pads (pivot end of boom) | 1/2 inch 12.7 mm |
| Bottom and side wear pads (pivot end of boom) | 7/8 inch 22.2 mm |

BOOM COMPONENTS

## How to Remove the Primary Boom

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

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

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

1 Remove the jib boom. See 3-1, *How to Remove the Jib Boom.*

2 Remove the fasteners securing the limit switch to the primary boom at the pivot end of the boom. Do not disconnect the wiring. Move the limit switch to a safe location.

3 Tag and disconnect the wire harness from the primary boom angle sensor (PBAS).

Note: The primary boom angle sensor is located inside the primary boom at the pivot end.

4 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder. Tag, disconnect and plug the hydraulic hoses routed through the primary boom at the union.

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

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

6 Remove the pin retaining fasteners from the primary boom lift cylinder barrel-end pivot pin.

7 Place blocks under both ends of the primary boom lift cylinder for support.

8 Use a soft metal drift to remove the barrel-end pivot pin. Rest the barrel end of the primary boom cylinder on the blocks.

**⚠WARNING** Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

9 Attach a lifting strap from an overhead crane to the primary boom lift cylinder linkage arm. Support the arm.

10 Remove the pin retaining fasteners from the primary boom lift cylinder linkage arm where it connects to the primary boom.

11 Use a soft metal drift to remove the upper primary boom lift cylinder linkage arm pivot pin. Using a suitable lifting device remove the linkage arm from the machine.

**⚠CAUTION** Crushing hazard. The upper primary boom lift cylinder linkage arm will fall if not properly supported when the pivot pin is removed.

12 Attach a 5 ton / 5000 kg overhead crane to the center point of the primary boom.

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

14 Use a soft metal drift to remove the primary boom pivot pin.

**⚠WARNING** Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

15 Carefully remove the primary boom from the machine and place it on a structure capable of supporting it.

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

Note: When the primary boom is installed, the primary boom angle sensor will need to be calibrated.

## How to Disassemble the Primary Boom

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

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

2 Place blocks under the barrel end of the primary boom extension cylinder for support.

3 Remove the pin retaining fastener from the extension cylinder barrel-end pivot pin at the pivot end of the primary boom.

4 Use a soft metal drift to remove the pin.

**⚠WARNING** Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

5 Remove and label the location of the wear pads from the platform end of the primary boom.

Note: Pay careful attention to the location and number of shims used with each wear pad.

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

7 Support and slide the extension boom assembly out of the primary boom tube and place it on a structure capable of supporting it.

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

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

8 Remove the external snap rings from the extension cylinder rod-end pivot pin at the platform end of the extension tube.

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

9 Use a soft metal drift to remove the pin.

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

10 Attach a lifting strap from an overhead crane to the extension cylinder.

11 Working at the end of the extension boom tube opposite the jib boom mount, support and slide the extension cylinder out of the extension boom tube.

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

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

# 4-3
# Primary Boom Lift Cylinder

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

## How to Remove the Primary Boom Lift Cylinder

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

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

1 Raise the primary boom to a horizontal position.

2 Raise the secondary boom until the primary boom lift cylinder rod-end pivot pin is above the counterweight.

3 Attach a 5 ton / 5000 kg overhead crane to the platform end of the primary boom. Support the boom. Do not apply any lifting pressure.

4 Support both ends of the primary boom lift cylinder with a second overhead crane or similar lifting device.

5 Place blocks under the primary boom lift cylinder linkage arms for support.

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

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

7 Remove the pin retaining fastener from the primary boom lift cylinder rod-end pivot pin.

8 Use a soft metal drift to remove the pin.

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

**⚠DANGER** Crushing hazard. The lift cylinder will fall if not properly supported when the pivot pin is removed.

**⚠CAUTION** Crushing hazard. The primary boom lift cylinder linkage arms may fall if not properly supported when the pivot pin is removed.

9 Remove the primary boom lift cylinder barrel-end pivot pin retaining fasteners.

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

**⚠DANGER** Crushing hazard. The lift cylinder will become unbalanced and fall if not properly supported when the pin is removed.

BOOM COMPONENTS

# 4-4 Primary Boom Extension Cylinder

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

## How to Remove the Primary Boom Extension Cylinder

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

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

1 Raise the primary boom to a horizontal position.

2 Extend the primary boom until the primary boom extension cylinder rod-end pivot pin is accessible.

3 Remove the access cover from the pivot end of the primary boom.

4 Place blocks under the barrel end of the primary boom extension cylinder for support.

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

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

6 Working at the platform end of the boom, remove the external snap rings from the extension cylinder rod-end pivot pin.

7 Use a soft metal drift to remove the pin.

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

8 Remove the barrel-end pivot pin retaining fasteners.

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

10 Working at the pivot end of the boom, support and slide the extension cylinder out of the boom extension.

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

**NOTICE** Component damage hazard. Be careful not to damage the primary boom angle sensor (PBAS) when removing the cylinder from the primary boom.

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

Note: Note the length of the cylinder after removal. For ease of installation, the cylinder must be at the same length for reinstallation.

# 4-5 Primary Boom Angle Sensor

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

## How to Replace the Primary Boom Angle Sensor

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

1 Remove the retaining fasteners from the boom end cover at the pivot end of the primary boom. Remove the cover from the machine.

2 Locate the primary boom angle sensor inside the primary boom at the boom pivot pin.

3 Tag and disconnect the electrical connector from the sensor.

4 Remove the angle sensor mounting bracket retaining fasteners.

5 Remove the wing nut from the threaded rod. Do not disconnect the threaded rod from the clevis yoke.

BOOM COMPONENTS

6 Remove the angle sensor and bracket assembly.

7 Remove the sensor retaining fasteners from the sensor bracket. Remove the angle sensor.

8 Install the new angle sensor onto the mounting bracket.

9 Install the angle sensor and bracket assembly.

Note: The sensor should be installed rotated in a fully counter clock-wise position.

10 Insert the threaded rod through the threaded rod adjustment bracket.

11 Move the threaded rod to the top of the slotted hole. Tighten the wing nut and hex nut towards each other.

12 Connect the electrical connector to the angle sensor.

13 Calibrate the primary boom angle sensor. See *How to Calibrate the Primary Boom Angle Sensor.*

**⚠DANGER** Tip-over hazard. Failure to calibrate the primary boom sensor could result in the machine tipping over resulting in death or serious injury.

## How to Calibrate the Primary Boom Angle Sensor

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

Note: A digital level will be required to perform this procedure.

1 Pull out the red Emergency Stop button at the platform controls. From the ground control box, turn the key switch to ground control and pull out the red Emergency Stop button while holding the enter button [↵] (3 or 4 seconds) until the engine symbol appears on the display at the ground control box, then release.

2 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

3 Press the scroll button [↓] until RESET PRIMARY BOOM ANGLE SENSOR is shown on the display.

4 Press the plus button [+] to select yes, then press and hold the enter button [↵] to accept.

5 Press the scroll button [↓] until EXIT is shown on the display. Press the plus button [+] to select yes, then press and hold the enter button [↵] to accept.

⊙ Result: The alarm should sound.

⊠ Result: The alarm does not sound. Repeat this procedure beginning with step 1.

6 Loosen the Primary Boom Angle Sensor (PBAS) assembly bracket fasteners attached to the primary boom. Loosen the wing nut and hex nut on the threaded rod to allow the threaded rod to move upward. Tighten the fasteners.

7 Set a digital level on top of the primary boom mast on a level part of the tube so it is viewable from the ground controls.

8 Start the engine.

9 Raise the boom until the digital level displays 70°.

10 Loosen the wing nut from threaded rod and move the threaded rod down until the engine turns off.

11 Screw threaded rod into clevis yoke. Tighten the wing nut to welded bracket. Tighten the jam nut to welded bracket. Tighten the PBAS fasteners to boom.

⊙ Result: The ground control box display should read P9B & P11 FAULT.

12 Push in the red Emergency Stop button to the off position. Wait until display turns off before proceeding.

13 Pull out the red Emergency Stop button while holding the enter button [↵] (3 or 4 seconds) until the endgine symbol appears on the display at the ground control box, then release.

14 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

15 Press the scroll button [↓] until PRIMARY BOOM ANGLE = 70° is shown on the display.

16 Press the plus button [+] to select yes, then press the enter button [↵] to accept.

17 Press the scroll button [↓] until EXIT is shown on the display. Press the plus button [+] to select yes, then press the enter button [↵] to accept.

18 At the ground controls, use auxiliary power and lower the boom until the faults are no longer shown on the display.

⊙ Result: The flashing arrow in the display at the ground controls will turn off.

⊠ Result: The flashing arrow in the display at the ground controls does not turn off. Repeat this procedure beginning with step 1.

19 Start the engine and activate the primary boom down function. Release the function enable button when the digital level displays 40°. Push in the red Emergency Stop button to the off position.

20 Pull out the red Emergency Stop button while holding the enter button [↵] (3 or 4 seconds) until the engine symbol appears on the display at the ground control box, then release.

21 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

22 Press the scroll button [↓] until PRIMARY BOOM ANGLE = 40° is shown on the display.

23 Press the plus button [+] to select yes, then press the enter button [↵] to accept.

⊙ Result: The alarm should not sound.

⊠ Result: The alarm does sound. Repeat this procedure beginning with step 1.

24 Press the scroll button until EXIT is shown on the display. Press the plus button [+] to select yes, then press the enter button [↵] to accept.

25 Start the engine.

26 Activate the boom up function until the digital level reads 65°.

⊙ Result: The primary boom should stop.

⊠ Result: The primary boom does not stop. Immediately release the function enable button and lower the boom. Repeat this procedure beginning with step 1.

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

# 4-6 Secondary Boom Cable Track

The secondary boom cable track guides the cables and hoses running up through the inside of the secondary boom. It can be repaired link by link without removing the cables and hoses that run through it. Removal of the secondary boom cable track is required to repair it.

## How to Remove the Cable Track

Note: The secondary boom cable track must be removed with the secondary boom extension cylinder. See 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

## How to Repair the Cable Track

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

**NOTICE** A cable track repair kit is available through the Genie Industries Service Parts Department.

1 Remove the secondary boom extension cylinder.

Note: The secondary boom extension cylinder must be removed as an assembly with the cable tracks, cable track trays and cable track support tubes from the platform end of the secondary boom. See 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

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

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

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

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

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

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

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

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

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

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

10 Re-assemble and install the extension cylinder assembly into the secondary extension boom.

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

# 4-7
# Secondary Boom

## How to Disassemble the Secondary Boom

Note: Complete disassembly of the secondary boom is only necessary if the outer or inner secondary boom tube must be replaced. The secondary extension boom tube can be removed with the secondary boom tube on the machine.

Note: The extension cylinder can be removed without completely disassembling the boom. See 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

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

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

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

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

BOOM COMPONENTS

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

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

3 Attach a lifting strap from an overhead crane to the lug on the barrel end of the primary boom lift cylinder. Use the overhead crane to raise the primary boom lift cylinder to a vertical position.

4 Remove the pin retaining fastener from the primary boom rod end pivot pin.

5 Use a slide hammer to remove the pin. Remove the primary boom lift cylinder and linkage arms from the machine.

**⚠WARNING** Crushing hazard. The primary boom lift cylinder and linkage arms could become unbalanced and fall if not properly supported when the pin is removed.

6 At the platform end, remove the secondary boom access cover.

7 Tag, disconnect and plug the hydraulic hoses from the turntable. Cap the fittings.

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

8 Tag and disconnect the electrical cables from the turntable.

9 Remove the hose protector bracket.

10 Working at the platform end, place blocks under the barrel end of the secondary boom extension cylinder for support.

11 Remove the barrel-end retaining fasteners.

12 Using a suitable lifting device, lift the extension cylinder to clear the saddle blocks

13 Attach a lifting strap from an overhead crane to the secondary extension boom assembly.

14 Slide the secondary extension boom assembly out of the secondary boom tube approximately two feet and remove the wear pads from the secondary boom tube.

15 Support and slide the extension boom assembly out of the secondary boom tube and place it on a structure capable of supporting it.

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

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

16 To remove the secondary boom extension cylinder, see 4-9, *How to Remove the Secondary Boom Extension Cylinder*.

# 4-8
# Secondary Boom Lift Cylinder

## How to Remove the Secondary Boom Lift Cylinder

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

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

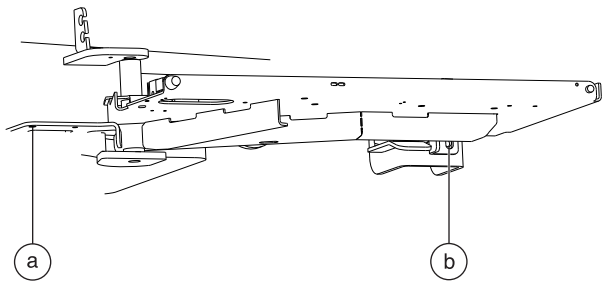
1 Lower the secondary boom to the stowed position.

2 Tag, disconnect, secure and remove the battery cables connecting the batteries. Remove battery fasteners and hooks from battery tray. Remove the batteries and store them in a safe and secure location away from the machine.

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

3 Remove the retaining fasteners securing the upper and lower turntable covers from the turntable at the platform end. Remove the covers.

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




a engine tray anchor hole
b engine tray retaining fastener

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

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

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

7 Remove the fuel tank filler cap.

BOOM COMPONENTS

8 Using an approved hand-operated pump, drain the fuel tank into a suitable container. *Refer to Section 2, Specifications.*

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

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

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

9 Tag and disconnect the wire harness from the fuel level sending unit.

10 Tag, disconnect and plug the fuel hoses from the fuel tank.

11 Clean up any fuel that may have spilled.

12 Remove the fuel tank mounting fasteners. Carefully remove the fuel tank from the machine.

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

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

13 Tag, disconnect and plug the hydraulic hoses from the secondary boom lift cylinder. Cap the fitings on the cylinder.

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

14 Place blocks under each end of the secondary boom lift cylinder for support.

15 Remove the pin retaining fasteners from the secondary boom lift cylinder rod-end pivot pin.

16 Use a soft metal drift to remove the pin.

17 Remove the pin retaining fastener from the secondary boom lift cylinder barrel-end pivot pin.

18 Use a soft metal drift to remove the pin.

19 Remove the secondary boom lift cylinder from the machine by pulling it through the platform end of the secondary boom.

**⚠WARNING** Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall if not properly supported when removed from the machine.

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

**NOTICE** Component damage hazard. Cables and hoses can be damaged if the cylinder is pulled across them.

# 4-9 Secondary Boom Extension Cylinder

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

## How to Remove the Secondary Boom Extension Cylinder

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

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

Note: The secondary boom extension cylinder must be removed as an assembly with the cable tracks, cable track trays and cable track support tubes from the platform end of the secondary boom.

1 Raise the primary boom to a horizontal position.

2 Remove the access cover from the counterweight end of the secondary boom.

BOOM COMPONENTS

3 Remove the fasteners securing the cable track trays and cable track clamps to the secondary extension boom.

4 Remove the external snap rings from the extension cylinder rod-end pivot pin.

5 Use a soft metal drift to remove the pin.

6 Remove the access cover from the platform end of the secondary boom.

7 Working at the platform end, place blocks under the barrel end of the secondary boom extension cylinder for support.

8 Remove the barrel-end retaining fasteners.

9 Using a suitable lifting device, lift the extension cylinder to clear the saddle blocks

10 Support and slide the extension cylinder out of the boom extension and place it on a structure capable of supporting it.

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

**NOTICE** Component damage hazard. When removing the secondary boom extension cylinder from the machine, be careful not to damage the counterbalance valves at the barrel end of the cylinder.

**NOTICE** Component damage hazard. Cables and hoses can be damaged if the cylinder is pulled across them.

11 Tag, disconnect and plug the secondary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

12 Remove the cable track fasteners and cable track support tubes from the extension cylinder.

**NOTICE** Component damage hazard. Be careful not to damage the secondary boom retract limit switch when installing the cylinder assembly into the secondary boom. Secure the roller arm to the switch body during assembly.

# Engines

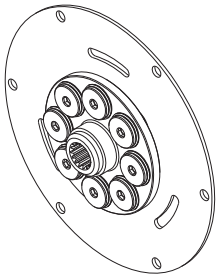
## 5-1 RPM Adjustment

Refer to Maintenance Procedure C-5, *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)

ENGINES

## 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.

**Deutz TD2011L04i models:**

4 Tag and disconnect the wiring from the bell housing.

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

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

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

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

8 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

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

**Deutz TD 2.9 models:**

10 Tag and disconnect the wiring from the bell housing.

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

ENGINES

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

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

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

**Perkins 804D models:**

14 Tag and disconnect the wiring from the bell housing.

15 Remove the exhaust pipe clamp at the muffler.

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

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

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

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

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

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

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

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

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

22 Tag and disconnect the wiring from the bell housing.

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

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

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

25 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

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

ENGINES

**Continental model:**

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

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

**⚠CAUTION** Burn Hazard. Hot engine parts can cause severe burns.

29 Remove the muffler retainer bracket fasteners.

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

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

32 Disconnect and remove the ECM from the muffler mount.

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

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

35 Remove the muffler mount.

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

37 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.

38 Remove the flex plate mounting fasteners. Remove the flex plate from the engine flywheel.

## How to Install the Flex Plate

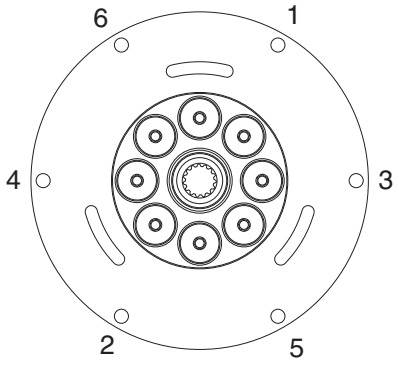
1 Install the flex plate onto the engine flywheel with the raised spline towards the pump. Apply Loctite® removable thread sealant to the mounting screws.

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

**Continental model:** 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. Then torque the flex plate mounting bolts in sequence to 40 ft-lbs / 54 Nm.

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




Perkins, Deutz 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.

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.

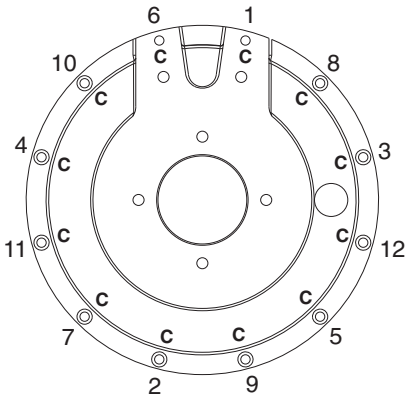
**Continental model:**
Torque the pump mounting plate fasteners in sequence to 23 ft-lbs / 31.2 Nm.

**NOTICE**

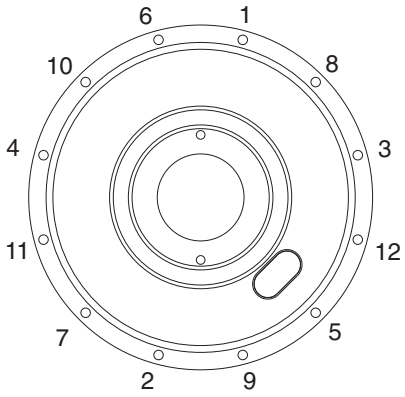
Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

**NOTICE**

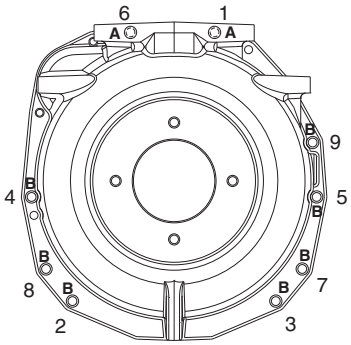
Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



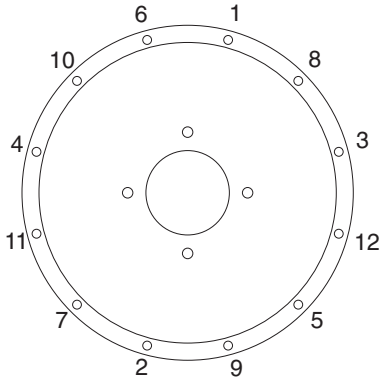

Deutz Pump Mounting Plate




Perkins 804D
Pump Mounting Plate




Perkins 404F-22T
Pump Mounting Plate




Continental Pump Mounting Plate

## 5-3
## Engine Fault Codes

Refer to Repair Section 5, *Fault Codes*.

## 5-4
## How to Access Perkins 404F Engine Regeneration Service

Machines equipped with Perkins 404F-22T Diesel engines will have a regeneration mode that should run automatically when soot levels in the Diesel Particulate Filter (DPF) reach specified levels.

### How to Check the DPF Soot Percentage

1 Turn the key switch to the on position.

2 Press the plus button [+] and the minus button [−] at the same time to access the Operator Status menu.

3 Press the enter button [↵] twice to display DPF SOOT PCT (0-150%).

### How to Force or Inhibit DPF Regeneration

There are three modes available for DPF regeneration.

The default, AUTOMATIC MODE, allows for ECU controlled regeneration. The machine powers up in this mode.

INHIBIT DPF REGENERATION will disable regeneration. In this mode the exhaust temperatures will not raise due to regeneration. The mode will remain active until an ignition key cycle (power cycle) or FORCE DPF REGENERATION is selected. This mode will be indication by an LCD message while active.

ENGINES

FORCE DPF REGENERATION allow the operator to force active regeneration of the DPF. When Force mode is active the engine will enter regeneration once the engine reaches specific levels of DPF soot loading, exhaust temperature, and other constraints defined by the engine manufacturer. This mode will be indicated by an LCD message while active.

4 Turn the key switch to the on position.

5 Press the plus button [+] and the minus button [−] at the same time to access the Operator Status menu.

6 Press the enter button [↵] until FORCE DPF REGENERATION or INHIBIT DPF REGENERATION is displayed.

7 Press the plus button [+] or the minus button [−] to select YES to change the regeneration mode from the default automatic mode. The selection will automatically return to NO. The LCD will display the current mode while it is Inhibited or Forced.

Note: The LCD messages REGEN FORCED and WARNING HIGH EXHAUST SYSTEM TEMP will be displayed while a regeneration mode is running. No service is required.

Note: The LCD message REGEN INHIBITED is displayed while in the Inhibit Regeneration mode is active. To exit this mode, push in the Red emergency stop button. Restart the engine.

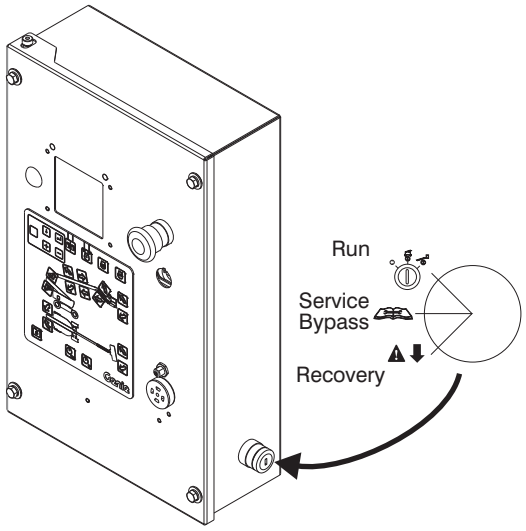
# Ground Controls

## 6-1 Service Bypass/Recovery Key Switch

The ground control box contains two key switches. The main key switch towards the top of the control box is for selection of ground or platform controls. The key switch at the bottom of the control box is the Service Bypass/Recovery key switch. Service Bypass and Recovery modes are only intended for certain circumstances and are not part of normal machine operation. If either the Service Bypass or the Recovery function is required, this indicates there may be faults with the machine. Contact trained personnel immediately.

**Service Bypass** is used for a platform out-of-envelope condition and certain service situations.

**Recovery** is only to be used as a last attempt to lower the platform when the operator in the platform is unable to do so, system failure or in emergency situations.




Service Bypass/
Recovery Key Switch

## How to Use the Service Bypass Mode

**⚠ DANGER** Tip-over hazard. Operating the machine outside of the operating envelope while in Service Bypass mode will result in death or serious injury if proper operating procedures and safety precautions are not followed. Do not use this mode if you are not trained and familiar with the operating envelope of the machine.

Note: Before using the Service Bypass mode, make sure you understand the fault code or issue affecting the operation of the machine to be sure the use of service bypass is required.

The Service Bypass mode will allow the platform to be manually leveled when an out-of-envelope condition exists. In the event that the platform angle is greater than 10° from level, the boom angle and platform level functions are disabled. Use of the Service Bypass mode will allow the platform to be manually adjusted to within the normal operating envelope, ±4.5°. Only auxiliary power can be used to correct an out of level platform fault.

1 Turn the engine off.

2 Turn the main key switch to ground controls. Remove the key from the main key switch and insert the key into the service bypass/recovery key switch.

Note: The main key switch must remain in the ground control position.

3 Turn the service bypass/recovery key switch to the service bypass position.

GROUND CONTROLS

4 Using auxiliary power, operate the platform level toggle switch to level the platform.

Note: Only the auxiliary power unit can be used to correct an out of level platform fault.

5 Turn the service bypass/recovery key switch to the run position.

6 Remove the key from the service bypass/ recovery key switch and insert the key into the main key switch.

Note: If the Service Bypass function has been used, there may be faults with the machine. Check the LCD screen on the ground control box for machine faults, then contact trained service personnel.

## How to Use the Recovery Mode

**Recovery** is only to be used as a last attempt to lower the platform when the operator in the platform is unable to do so, system failure or in emergency situations.

**⚠WARNING** Bodily injury hazard. When using recovery mode, the platform may not fully lower to the ground when the recovery mode is completed. Failure to use only suitable equipment and/or practices to allow the operator to safely exit the platform could result in death or serious injury.

**⚠WARNING** Bodily injury hazard. Platform leveling is not active when using recovery mode. The platform could reach high out-of-level conditions when using this mode. The operator will need to secure themself to the platform to prevent falling injury.

The Recovery mode allows the platform to be lowered in the event the operator in the platform is unable to lower the platform using the platform controls, system failure or emergency situations. The recovery sequence will automatically retract the primary boom and then lower the primary boom using the auxiliary power unit to allow the operator at the platform controls to exit the platform.

1 Turn the main key switch to the off position. Remove the key from the main key switch and insert the key into the service bypass/recovery key switch.

2 Turn and hold the service bypass/recovery key switch to the recovery position. The switch must be held in the recovery position.

⊙ Result: The auxiliary power unit will turn on and the boom will begin the following recovery sequence.

- The primary boom will retract
- The primary boom will lower

Note: The key switch must be held in the recovery position until the recovery sequence is complete or until the operator in the platform can safely exit the platform.

Note: If any boom safety limit switches are faulty, the boom will only retract and not lower and the operator will need to be recovered from that point.

Note: If the Recovery function has been used, this may indicate there may be faults with the machine. Tag and remove the machine from service until the fault has been corrected by trained personnel.

# 6-2 Circuit Boards

The ground control box (TCON) is the communication and operations center for the machine. The ground control box contains two key switches. The key switch towards the top of the control box is for selection of ground or platform controls. The key switch at the bottom of the control box is the Service Bypass key switch. It is used to correct an out-of-level platform. If the machine trips an envelope safety switch, the operator at the ground controls can turn and hold the Service Bypass key switch in the RECOVER position, which will automatically retract the boom and lower the platform to the ground.

The ground control box contains a replaceable membrane decal with touch sensitive buttons for various machine functions. The ground control box also contains two printed circuit boards:

The **LCD (Liquid Crystal Display) circuit board** is mounted to the inside of the control box lid which controls the LCD display screen or CAN Gateway if equipped with a Tier IV engine.

The **TCON circuit board** is the main circuit board for the machine. There are relays on the ECM circuit board that can be replaced. All operating parameters and configuration of options for the machine are stored in the ECM memory.

Note: The ECM circuit board inside the ground control box (TCON) cannot be replaced by itself. If the ECM circuit board is faulty and needs to be replaced, contact the Genie Industries Service Department.

Note: When an ECM circuit board is replaced, the proportional valves will need to be calibrated. See 1-3, *How to Calibrate a Joystick.*

## How to Determine the Revision Level

1 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both platform and ground controls.

⊙ Result: The revision level of the TCON will appear in the LCD display window.

## How to Remove the LCD Display Screen Circuit Board

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Remove the ground control box lid fasteners. Open the control box lid.

**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**NOTICE** Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

3 Carefully disconnect the ribbon cable from the LCD display circuit board.

4 Remove the LCD display circuit board retaining fasteners.

5 Carefully remove the LCD display circuit board from the ground control box lid.

GROUND CONTROLS

# 6-3 Membrane Decal

The membrane decal is a special decal that consists of a decal with an electronic membrane on the backside. The membrane contains touch sensitive areas that, when pushed, activates the machine functions. The membrane buttons activate machine functions similar to toggle switches, but do not have any moving parts.

## How to Replace the Membrane Decal

1 Turn the key switch at to the off position.

2 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

3 Remove the ground control box lid fasteners. Open the control box lid.

4 Tag and disconnect the two ribbon cables from the membrane decal at the ECM circuit board.

**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**NOTICE** Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

5 Carefully remove the membrane decal from the control box lid while guiding the ribbon cables out of the control box lid.

6 Remove any decal adhesive from the control box lid with a mild solvent.

**NOTICE** Component damage hazard. Certain solvents can damage LCD display. Do not allow any solvent to come in contact with the LCD display screen.

7 Install the new membrane decal onto the control box lid while guiding the ribbon cables through the control box lid.

8 Connect the ribbon cables to the ECM circuit board.

9 Close the control box lid and install the retaining fasteners.

# Hydraulic Pumps

## 7-1 Function Pump

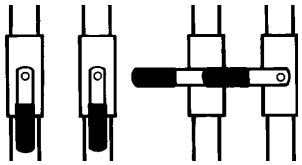
### How to Remove the Function Pump

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 **Models without hydraulic tank shutoff valves:** Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

**Models with hydraulic tank shutoff valves:** Close the two hydraulic tank valves located at the hydraulic tank.

**NOTICE** Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



open closed

2 Tag, disconnect and plug the hydraulic hoses at the function pump. Cap the fittings on the pump.

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pump mounting fasteners. Carefully remove the pump.

**NOTICE** Component damage hazard. Be sure to open the two hydraulic tank valves (if equipped) and prime the pump after installing the pump. See 7-2, *How to Prime the Pump*.

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. Any internal service to the pump should only be performed at an authorized Sauer-Danfoss service center. Contact the Genie Industries Service Department to locate your local authorized service center.

## How to Remove the Drive Pump

**NOTICE** Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

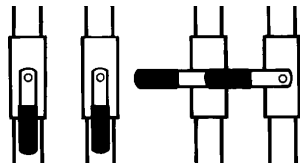
Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Disconnect the wire harness at the electronic displacement controller (EDC), located on the drive pump.

2 **Models without hydraulic tank shutoff valves:** Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Section 2, *Specifications*.

**Models with hydraulic tank shutoff valves:** Close the two hydraulic tank valves located at the hydraulic tank.

**NOTICE** Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.



open closed

3 Tag, disconnect and plug the hydraulic hoses at the drive and function pumps. Cap the fittings on the pumps.

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Support the pumps with a suitable lifting device and remove the two drive pump mounting fasteners.

5 Carefully pull the drive pump out until the pump coupler separates from the flex plate.

6 Remove the drive pump assembly from the machine.

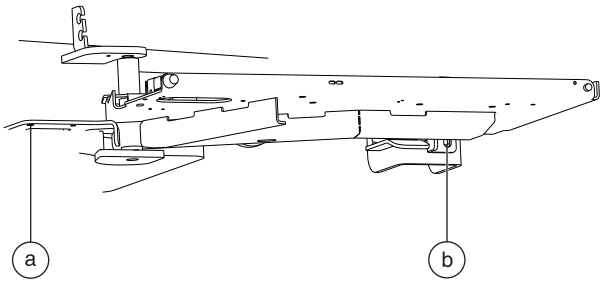
**NOTICE** Component damage hazard. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

Note: Before installing the pump, verify proper pump coupler spacing. See 5-2, *Flex Plate.*

## How to Prime the Pump

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 Remove the engine tray retaining fastener. Swing the engine tray out away from the machine.




a engine tray anchor hole
b engine tray retaining fastener

3 Locate the engine tray anchor hole at the pivot end of the engine tray.

4 Install the bolt removed in step 4 into the anchor hole to secure the engine tray from moving.

**⚠WARNING** Crushing hazard. Failure to install the bolt into the engine tray to secure it from moving could result in death or serious injury.

5 **Deutz and Perkins models:** Tag and disconnect the engine wiring harness from the fuel shutoff solenoid at the injector pump.

**GM and Ford models:** Close the valve on the LPG tank. Disconnect the hose from the tank. Move the fuel select switch to the LPG position.

6 Have another person crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi / 22 bar.

7 **Deutz and Perkins models:** Connect the engine wiring harness to the fuel solenoid.

**GM, Ford and Continental models:** Connect the LPG hose to the LPG tank and open the valve on the tank.

8 Start the engine from the ground controls and check for hydraulic leaks.

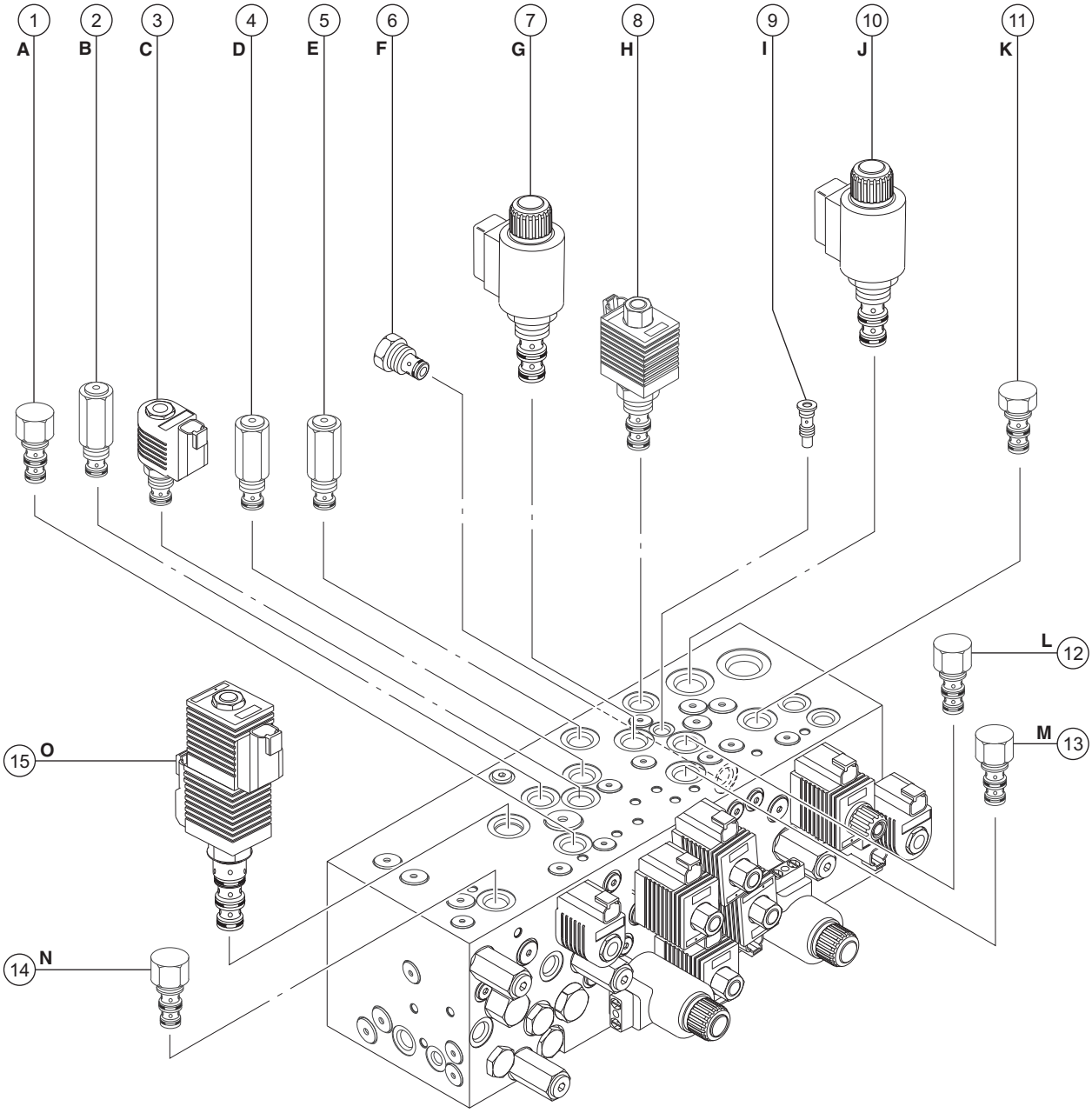
# Manifolds

## 8-1
## Function Manifold - View 1

The function manifold is located next to the ground control box.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Differential sensing valve | A | Secondary boom up/extend and down/retract | 30-35 ft-lbs / 41-47 Nm |
| 2 | Relief valve, 2500 psi / 172 bar | B | Secondary boom up | 20-25 ft-lbs / 27-34 Nm |
| 3 | Solenoid valve, 2 position 2 way | C | Secondary boom up circuit | 20-25 ft-lbs / 27-34 Nm |
| 4 | Relief valve, 2500 psi / 172 bar | D | Secondary boom down | 20-25 ft-lbs / 27-34 Nm |
| 5 | Relief valve, 1300 psi / 89.6 bar | E | Primary boom down | 20-25 ft-lbs / 27-34 Nm |
| 6 | Flow regulator valve, 0.1 gpm / 0.38 L/min | F | Bleeds off check valves in differential sensing circuits to tank | 20-25 ft-lbs / 27-34 Nm |
| 7 | Proportional solenoid valve | G | Primary boom up/down | 30-35 ft-lbs / 41-47 Nm |
| 8 | Solenoid valve, 2 position 3 way | H | Primary boom retract | 33-37 ft-lbs / 45-50 Nm |
| 9 | Check valve | I | Differential sensing circuit, primary boom extend/retract | 8-10 ft-lbs / 11-14 Nm |
| 10 | Solenoid valve, 2 position 3 way | J | Primary boom extend | 50-55 ft-lbs / 68-75 Nm |
| 11 | Differential sensing valve | K | Turntable rotate left/right | 30-35 ft-lbs / 41-47 Nm |
| 12 | Differential sensing valve | L | Primary boom extend/retract | 30-35 ft-lbs / 41-47 Nm |
| 13 | Differential sensing valve | M | Primary boom up/down | 30-35 ft-lbs / 41-47 Nm |
| 14 | Priority flow regulator valve, 3 gpm / 11.4 L/min | N | Controls flow to the oscillate and platform manifolds | 30-35 ft-lbs / 41-47 Nm |
| 15 | Solenoid valve, 3 position 4 way | O | Secondary boom extend/retract | 33-37 ft-lbs / 45-50 Nm |

MANIFOLDS

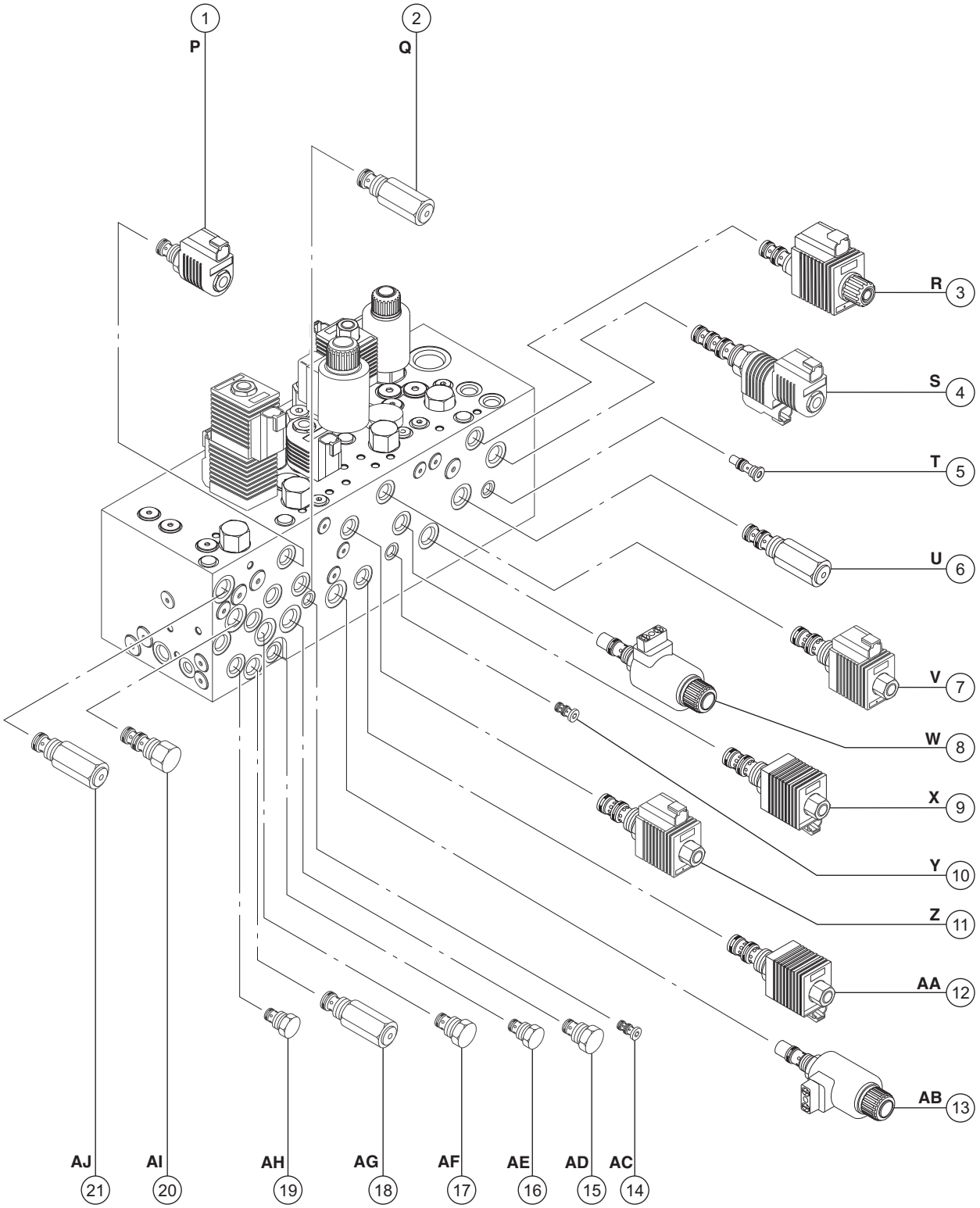


MANIFOLDS

# 8-2
# Function Manifold - View 2

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid valve, 2 position 2 way | P | Secondary boom extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 2 | Relief valve, 2600 psi / 179 bar | Q | Secondary boom extend | 20-25 ft-lbs / 27-34 Nm |
| 3 | Proportional solenoid valve | R | Turntable rotate left/right | 20-25 ft-lbs / 27-34 Nm |
| 4 | Solenoid valve, 3 position 4 way | S | Turntable rotate left/right | 26-30 ft-lbs / 35-41 Nm |
| 5 | Check valve | T | Differential sensing circuit, turntable rotate | 8-10 ft-lbs / 11-14 Nm |
| 6 | Relief valve, 1300 psi / 89.6 bar | U | Primary boom extend | 30-35 ft-lbs / 41-47 Nm |
| 7 | Solenoid valve, 2 position 3 way | V | Primary boom up | 33-37 ft-lbs / 45-50 Nm |
| 8 | Proportional solenoid valve | W | Primary boom extend/retract | 30-35 ft-lbs / 41-47 Nm |
| 9 | Solenoid valve, 2 position 3 way | X | Primary boom down | 33-37 ft-lbs / 45-50 Nm |
| 10 | Check valve | Y | Differential sensing circuit, primary boom up/down | 8-10 ft-lbs / 11-14 Nm |
| 11 | Solenoid valve, 2 position 3 way | Z | Secondary boom up | 33-37 ft-lbs / 45-50 Nm |
| 12 | Solenoid valve, 2 position 3 way | AA | Secondary boom down | 33-37 ft-lbs / 45-50 Nm |
| 13 | Proportional solenoid valve | AB | Secondary boom extend/retract | 30-35 ft-lbs / 41-47 Nm |
| 14 | Check valve | AC | Differential sensing circuit, secondary boom extend/retract | 8-10 ft-lbs / 11-14 Nm |
| 15 | Check valve, 5 psi / 0.34 bar | AD | Blocks flow from auxiliary pump #1 to function pump #1 | 30-35 ft-lbs / 41-47 Nm |
| 16 | Check valve, 5 psi / 0.34 bar | AE | Blocks flow from function pump #1 to auxiliary pump #1 | 20-25 ft-lbs / 27-34 Nm |
| 17 | Check valve, 5 psi / 0.34 bar | AF | Blocks flow from auxiliary pump #2 to function pump #2 | 20-25 ft-lbs / 27-34 Nm |
| 18 | Relief valve, 3000 psi / 207 bar | AG | Oscillate and platform manifold system relief | 20-25 ft-lbs / 27-34 Nm |
| 19 | Check valve, 5 psi / 0.34 bar | AH | Blocks flow from function pump #2 to auxiliary pump #2 | 20-25 ft-lbs / 27-34 Nm |
| 20 | Differential sensing valve, 150 psi / 10.3 bar | AI | Meters flow to functions | 30-35 ft-lbs / 41-47 Nm |
| 21 | Relief valve, 3200 psi / 220.6 bar | AJ | Boom functions system relief | 30-35 ft-lbs / 41-47 Nm |

MANIFOLDS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MANIFOLDS

# 8-3 Valve Adjustments - Function Manifold

## How to Adjust the System Relief Valve

Note: Perform this procedure with the boom in the stowed position.

1 Locate the boom retracted limit switch (LSP1RO) limit switch on the outside of the primary boom at the pivot end of the primary boom.

2 Tag and disconnect the wire harness from the limit switch, and install a wire jumper between pins 1 and 2 of the limit switch connector. Place another wire jumper between pins 3 and 4 of the limit switch connector.

3 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the PTEST port on the function manifold.

4 Start the engine from the ground controls.

5 Press and release the rpm select button until the engine changes to high idle.

6 Simultaneously push and hold the function enable/high speed button and the primary boom retract button with the primary boom fully retracted. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AJ).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

9 Repeat steps 4 through 8 confirm the relief valve pressure.

10 Remove the pressure gauge.

11 Remove the wire jumpers from the limit switch connector.

12 Securely install the LSP1RO pig tail into the wire harness.

## How to Adjust the Primary Boom Down Relief Valve

Note: Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Press and release the rpm select button until the engine changes to high idle.

4 Raise the primary boom approximately 5 feet / 1.5 m.

5 Place a 4 x 4 inch / 10 x 10 cm block on the primary boom rest pad. Lower the primary boom onto the block.

**⚠WARNING** Crushing hazard. Keep hands clear of the block when lowering the primary boom.

6 Simultaneously push and hold the function enable/high speed button and the primary boom down button. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications.*

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item E).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

9 Start the engine and repeat steps 6 through 8 to confirm the relief valve pressure.

10 Start the engine and raise the primary boom approximately 12 inches / 30 cm. Remove the block and lower the primary boom to the stowed position.

11 Turn the engine off and remove the pressure gauge.

## How to Adjust the Primary Boom Extend Relief Valve

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Raise the boom to a horizontal position. Turn the engine off.

4 Locate the boom extended limit switch (LSP1EO) on the outside of the primary boom.

5 Remove the limit switch mounting bracket retaining fasteners.

6 Pull the limit switch and bracket assembly out of the boom tube and let it hang down.

7 Start the engine from the ground controls and press and release the rpm select button until the engine changes to high idle.

8 Simultaneously push and hold the function enable/high speed button and the primary boom extend button with the primary boom fully extended. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

9 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item U).

MANIFOLDS

10 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

11 Repeat steps 7 through 8 to confirm relief valve pressure.

12 Start the engine and fully retract the primary boom. Turn the engine off.

13 Install the limit switch and bracket assembly to the primary boom.

14 Remove the pressure gauge.

## How to Adjust the Secondary Boom Up Relief Valve

1 Remove the cover retaining fasteners from the secondary boom end cover. Remove the cover from the machine.

2 Locate the wire connector for secondary boom limit switch LSS2AO. Disconnect the connector.

Note: The secondary boom limit switch LSS2AO is the upper limit switch located on the inside of the riser plate at the engine side of the machine.

3 Install a jumper wire between pins 3 and 4 of the LSS2AO Deutsch connector on the wire harness end.

4 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

5 Start the engine from the ground controls.

6 Simultaneously push and hold the function enable/high speed button and the secondary boom up/extend button and fully raise the secondary boom.

7 Continue holding the function enable/high speed button and the secondary boom up/extend button while observing the reading on the pressure gauge. Refer to Section 2, *Specifications.*

8 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item B).

9 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

10 Repeat steps 5 through 7 to confirm relief valve pressure.

11 Remove the pressure gauge.

12 Remove the jumper wire from LSS2AO limit switch connector. Connect the limit switch to the wire harness.

13 Install the secondary boom end cover and tighten the retaining fasteners.

## How to Adjust the Secondary Boom Down Relief Valve

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Press and release the rpm select button until the engine changes to high idle.

4 Raise the secondary boom approximately 12 inches / 30 cm.

5 Place a 4 x 4 inch / 10 x 10 cm block on the secondary boom rest pad. Lower the secondary boom onto the block.

**⚠WARNING** Crushing hazard. Keep hands clear of the block when lowering the secondary boom.

6 Simultaneously push and hold the function enable/high speed button and the secondary boom down button. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

7 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item D).

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

9 Start the engine and repeat step to confirm relief valve pressure.

10 Start the engine and raise the secondary boom approximately 12 inches / 30 cm. Remove the block and lower the secondary boom to the stowed position.

11 Turn the engine off and remove the pressure gauge.

## How to Adjust the Secondary Boom Extend Relief Valve

Note: Perform this procedure with the secondary boom fully raised.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the LS port on the function manifold.

2 Start the engine from the ground controls.

3 Simultaneously push and hold the function enable/high speed button and the secondary boom up/extend button with the secondary boom fully raised and extended. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications.*

MANIFOLDS

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item Q).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 5 to confirm relief valve pressure.

7 Remove the pressure gauge.

## How to Adjust the Platform Manifold Relief Valve

Note: Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the PTEST 2 port on the function manifold.

2 Start the engine from the ground controls.

3 Simultaneously push and hold the function enable/high speed button and the jib boom down button with the jib boom fully lowered. Observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

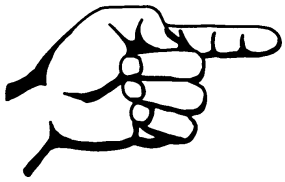
4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AG).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 3 to confirm relief valve pressure.

7 Remove the pressure gauge.



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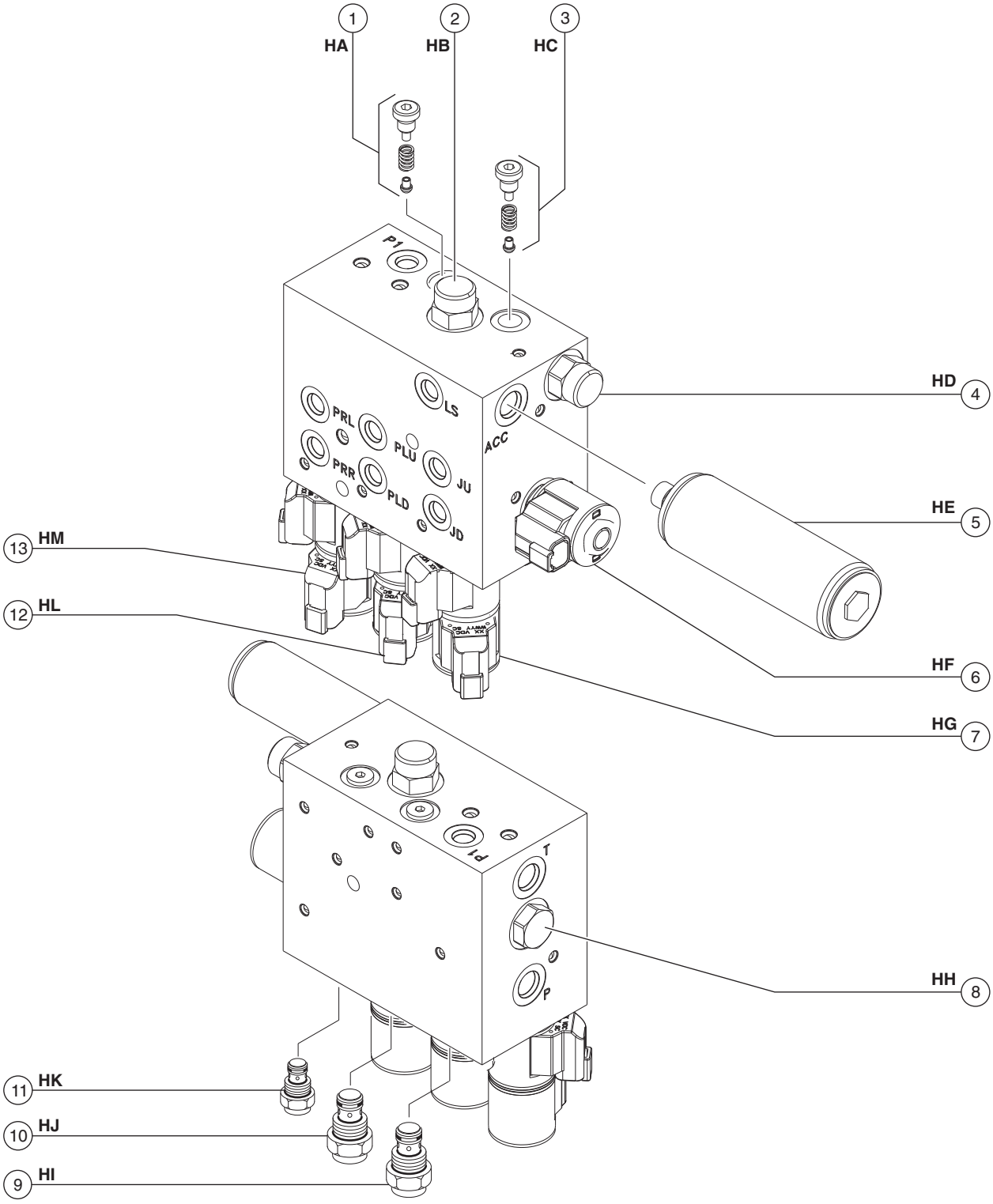
MANIFOLDS

# 8-4
# Platform Manifold

The platform Manifold is mounted to the platform mounting weldment.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Check valve, 5 psi | HA | Platform load sense/level circuit | 12-14 ft-lbs / 16-19 Nm |
| 2 | Differential sensing valve, N.C. | HB | Directs flow to functions | 19-21 ft-lbs / 26-29 Nm |
| 3 | Check valve, 5 psi | HC | Jib load sense/up/down circuit | 12-14 ft-lbs / 16-19 Nm |
| 4 | Flow control valve | HD | Bleeds off differential valve to tank | 19-21 ft-lbs / 26-29 Nm |
| 5 | Accumulator, 500 psi / 34.5 bar | HE | Hydraulic dampening | 23 ft-lbs / 31 Nm |
| 6 | Proportional solenoid valve, 2 position 2 way | HF | | 19-21 ft-lbs / 26-29 Nm |
| 7 | Proportional solenoid valve 3 position 5 way | HG | Jib up/down circuit | 19-21 ft-lbs / 26-29 Nm |
| 8 | Check valve, 10 psi | HH | | 19-21 ft-lbs / 26-29 Nm |
| 9 | Compensator valve | HI | Jib boom differential sensing circuit | 33-37 ft-lbs / 45-50 Nm |
| 10 | Compensator valve | HJ | Platform level diff. sensing circuit | 33-37 ft-lbs / 45-50 Nm |
| 11 | Pressure compensation valve | HK | Platform rotate diff. sensing circuit | 19-21 ft-lbs / 26-29 Nm |
| 12 | Proportional solenoid valve 3 position 5 way | HL | Platform level up/down circuit | 19-21 ft-lbs / 26-29 Nm |
| 13 | Proportional solenoid valve 3 position 5 way | HM | Platform rotate left/right circuit | 19-21 ft-lbs / 26-29 Nm |

MANIFOLDS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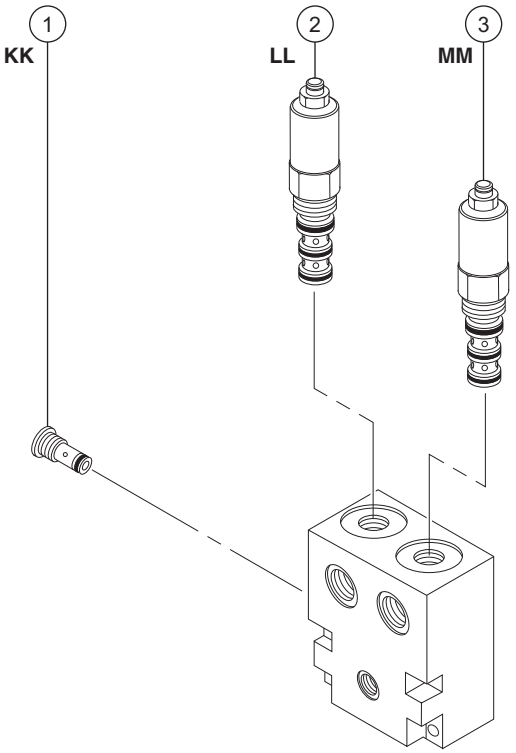
MANIFOLDS

# 8-5
# Turntable Rotation Manifold

The turntable rotation manifold is mounted to the turntable rotation motor located in the boom storage compartment.

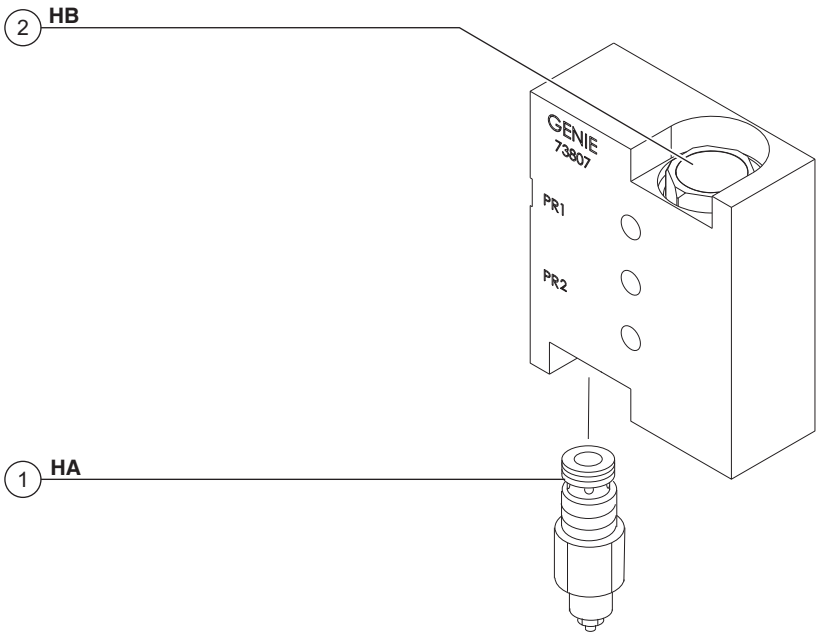
| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Shuttle valve, 2 position 3 way | KK | Turntable rotation brake release | 10-13 ft-lbs / 14-18 Nm |
| 2 | Counterbalance valve | LL | Turntable rotate right | 35-40 ft-lbs / 47-54 Nm |
| 3 | Counterbalance valve | MM | Turntable rotate left | 35-40 ft-lbs / 47-54 Nm |



# 8-6
# Platform Rotate Manifold

The platform rotate manifold is mounted on the platform rotator.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Counterbalance valve | HA | Turntable rotation brake release | 35-40 ft-lbs / 47-54 Nm |
| 2 | Counterbalance valve | HB | Turntable rotate left | 35-40 ft-lbs / 47-54 Nm |



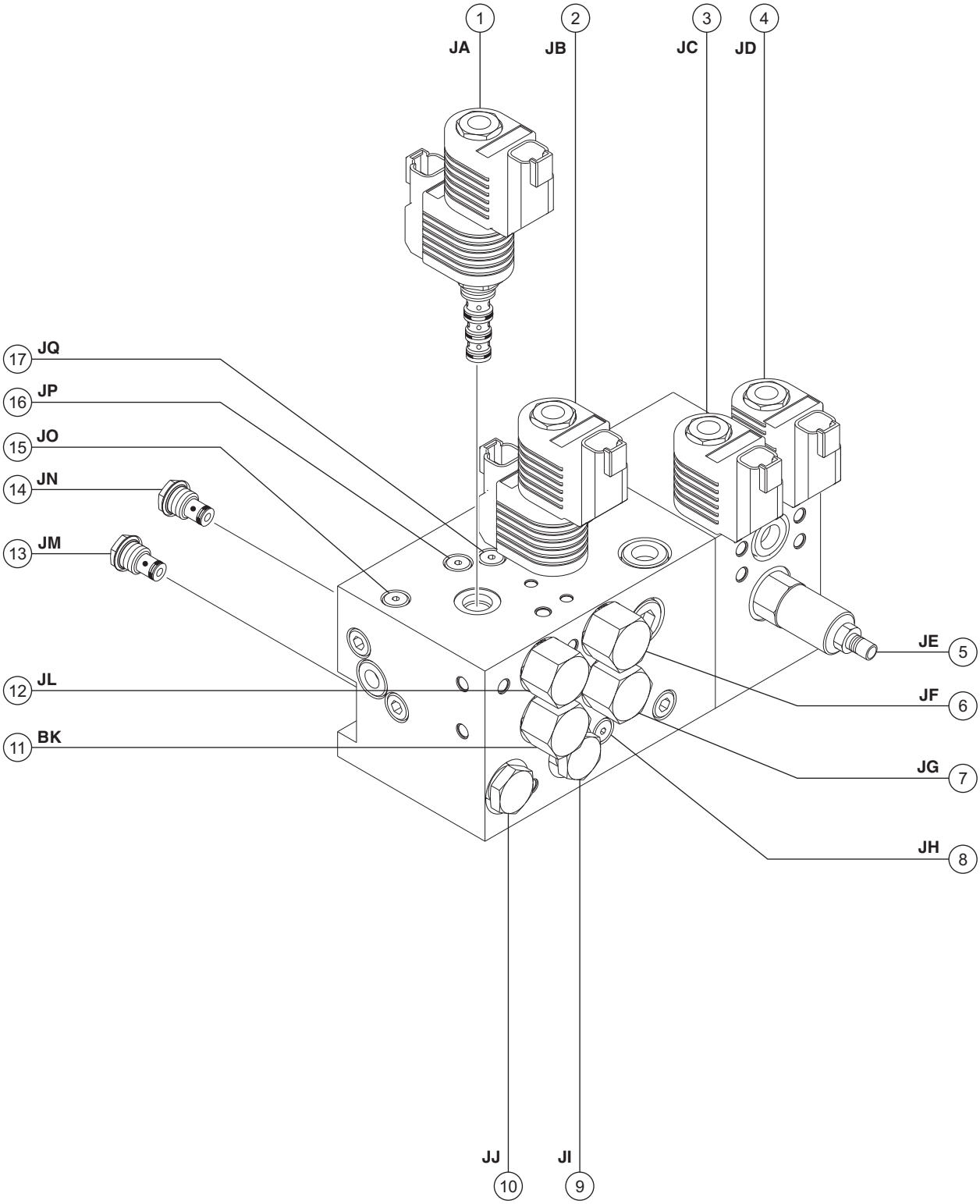
MANIFOLDS

# 8-7
# Two Wheel Steer and Oscillate Manifold

The Two Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid valve, 3 position 4 way | JA | Steer left/right, yellow side steer cylinder | 26-30 ft-lbs / 35-41 Nm |
| 2 | Solenoid valve, 3 position 4 way | JB | Steer left/right, blue side steer cylinder | 26-30 ft-lbs / 35-41 Nm |
| 3 | Solenoid valve, 2 position 3 way | JC | Oscillate cylinder, blue side | 26-30 ft-lbs / 35-41 Nm |
| 4 | Solenoid valve, 2 position 3 way | JD | Oscillate cylinder, yellow side | 26-30 ft-lbs / 35-41 Nm |
| 5 | Relief valve, 750 to 860 psi / 51.71 to 59.3 bar | JE | Oscillate circuit | 20-25 ft-lbs / 27-34 Nm |
| 6 | Flow regulator valve, 1.5 gpm / 5.7 L/min | JF | Blue side steer cylinder extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 7 | Flow regulator valve, 1.0 gpm / 3.8 L/min | JG | Blue side steer cylinder retract circuit | 20-25 ft-lbs / 27-34 Nm |
| 8 | Check valve | JH | Load sensing circuit, blue side steer cylinder retract | 8-10 ft-lbs / 11-14 Nm |
| 9 | Check valve | JI | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 10 | Check valve | JJ | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |

MANIFOLDS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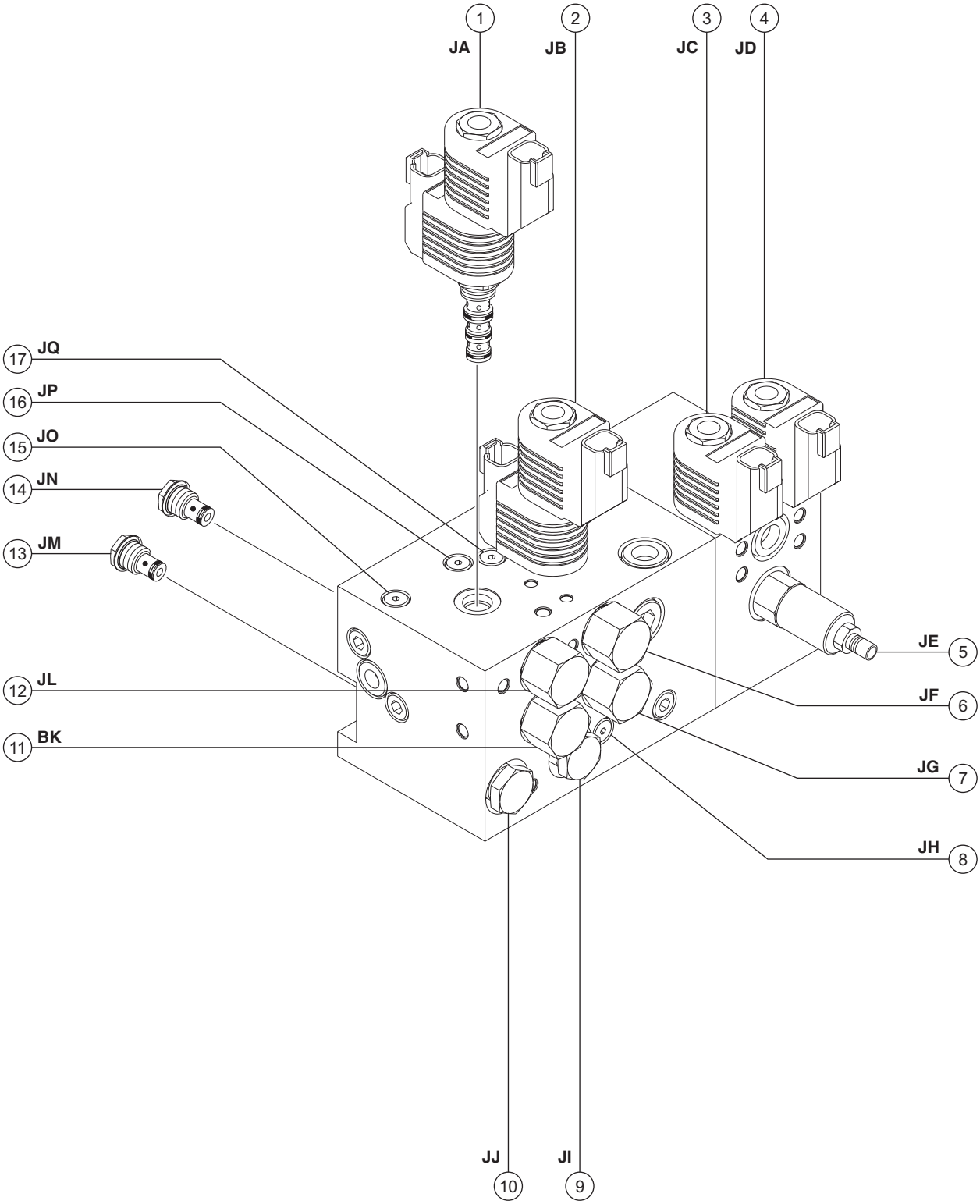
MANIFOLDS

**This list continues on the next page.**

## Two Wheel Steer and Oscillate Manifold, continued

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 11 | Flow regulator valve, 1.5 gpm / 5.7 L/min | JK | Yellow side steer cylinder extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 12 | Flow regulator valve, 1.0 gpm / 3.8 L/min | JL | Yellow side steer cylinder retract circuit | 20-25 ft-lbs / 27-34 Nm |
| 13 | Check valve, 65 psi / 4.5 bar | JM | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 14 | Check valve, 65 psi / 4.5 bar | JN | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 15 | Check valve | JO | Load sensing circuit, yellow side steer cylinder retract | 8-10 ft-lbs / 11-14 Nm |
| 16 | Check valve | JP | Load sensing circuit, yellow side steer cylinder extend | 8-10 ft-lbs / 11-14 Nm |
| 17 | Check valve | JQ | Load sensing circuit, blue side steer cylinder extend | 8-10 ft-lbs / 11-14 Nm |

MANIFOLDS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MANIFOLDS

## How to Adjust the Oscillate Relief Valve

Note: Perform this procedure with the boom in the stowed position.

Note: Perform this procedure with the engine running at high RPM.

Note: This procedure will require two people.

1 Remove the drive chassis cover from the square-end of the machine.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the two wheel steer and oscillate manifold.

3 Start the engine from the platform controls.

4 Press down the foot switch and manually activate one of the oscillate limit switches. Hold the switch in the activated position and observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

5 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item BE, before SN 1291 or JE, after SN 1290).

6 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

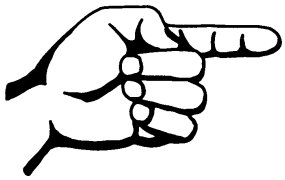
**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

7 Repeat steps 3 through 4 to confirm relief valve pressure.

8 Remove the pressure gauge.

9 Install the drive chassis cover.

MANIFOLDS



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MANIFOLDS

# 8-8
# Four Wheel Steer and Oscillate Manifold

The Four Wheel Steer and Oscillate manifold is mounted inside the drive chassis at the square-end of the machine.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Solenoid valve, 3 position 4 way | KA | Steer left/right, square end yellow side steer cylinder | 26-30 ft-lbs / 35-41 Nm |
| 2 | Solenoid valve, 3 position 4 way | KB | Steer left/right, square end blue side steer cylinder | 26-30 ft-lbs / 35-41 Nm |
| 3 | Check valve | KC | Load sensing circuit, circle end yellow side steer cylinder retract | 8-10 ft-lbs / 11-14 Nm |
| 4 | Check valve, 65 psi / 4.5 bar | KD | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 5 | Solenoid valve, 2 position 3 way | KE | Oscillate cylinder, blue side | 26-30 ft-lbs / 35-41 Nm |
| 6 | Solenoid valve, 2 position 3 way | KF | Oscillate cylinder, yellow side | 26-30 ft-lbs / 35-41 Nm |
| 7 | Check valve, 65 psi / 4.5 bar | KG | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 8 | Relief valve, 750 to 860 psi / 51.71 to 59.3 bar | KH | Oscillate circuit | 20-25 ft-lbs / 27-34 Nm |
| 9 | Flow regulator valve, 1.5 gpm / 5.7 L/min | KI | Circle end, blue side steer cylinder extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 10 | Flow regulator valve, 1.0 gpm / 3.8 L/min | KJ | Circle end, blue side steer cylinder retract circuit | 20-25 ft-lbs / 27-34 Nm |
| 11 | Flow regulator valve, 1.0 gpm / 3.8 L/min | KK | Circle end, yellow side steer cylinder retract circuit | 20-25 ft-lbs / 27-34 Nm |
| 12 | Flow regulator valve, 1.5 gpm / 5.7 L/min | KL | Circle end, yellow side steer cylinder extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 13 | Check valve | KM | Load sensing circuit, circle end blue side steer cylinder retract | 8-10 ft-lbs / 11-14 Nm |
| 14 | Check valve | KN | Load sensing circuit, circle end blue side steer cylinder extend | 8-10 ft-lbs / 11-14 Nm |
| 15 | Check valve | KO | Load sensing circuit, circle end yellow side steer cylinder extend | 8-10 ft-lbs / 11-14 Nm |

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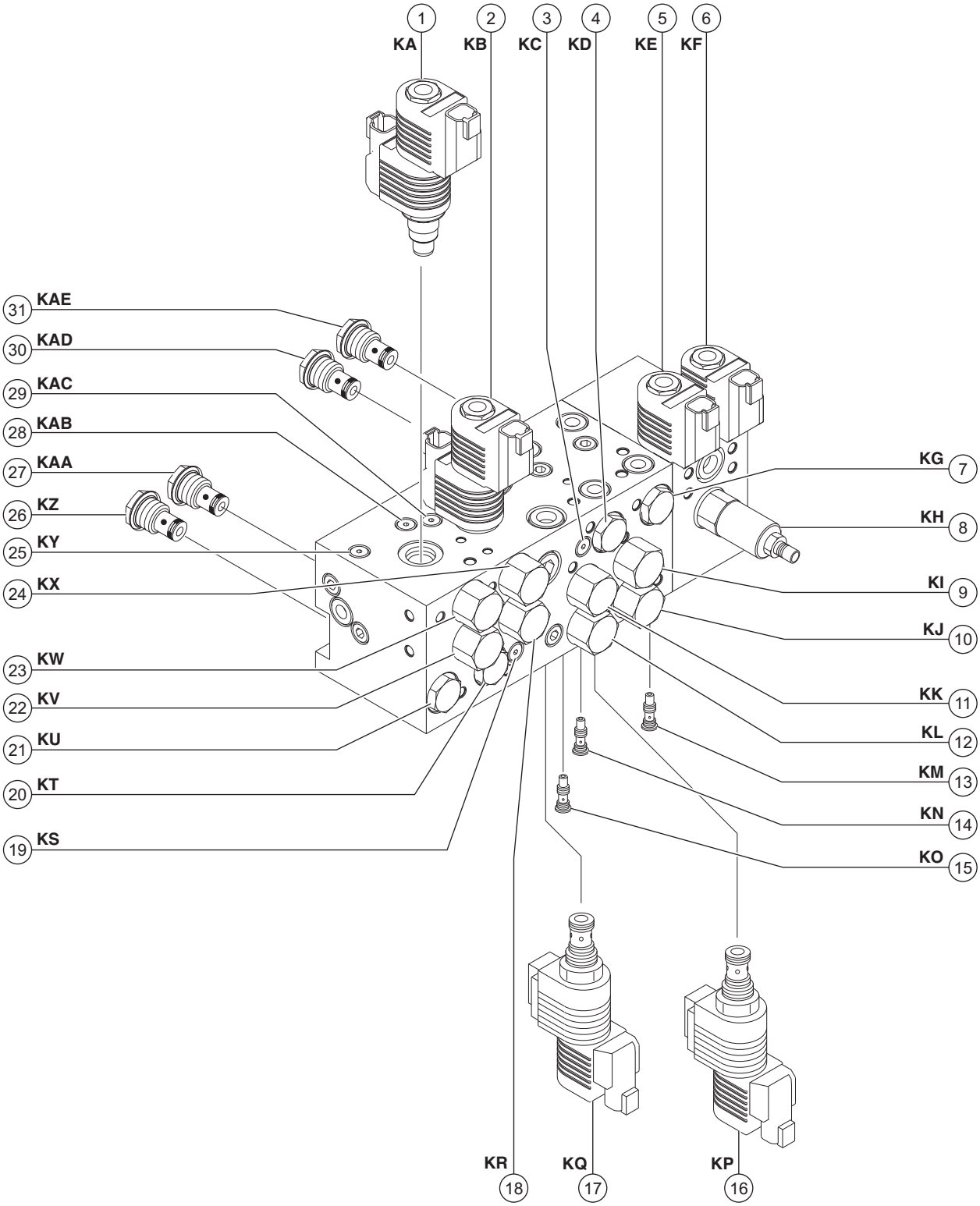
MANIFOLDS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19 KS
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8 KH
9 KI
10 KJ
11 KK
12 KL
13 KM
14 KN
15 KO
18 KR
17 KQ
16 KP

MANIFOLDS

## Four Wheel Steer and Oscillate Manifold, continued

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 16 | Solenoid valve, 3 position 4 way | KP | Steer left/right, circle end blue side steer cylinder | 26-30 ft-lbs / 35-41 Nm |
| 17 | Solenoid valve, 3 position 4 way | KQ | Steer left/right, circle end yellow side steer cylinder | 26-30 ft-lbs / 35-41 Nm |
| 18 | Flow regulator valve, 1.0 gpm / 3.8 L/min | KR | Square end, left side steer cylinder retract circuit | 20-25 ft-lbs / 27-34 Nm |
| 19 | Check valve | KS | Load sensing circuit, square end blue side steer cylinder retract | 20-25 ft-lbs / 27-34 Nm |
| 20 | Check valve, 65 psi / 4.5 bar | KT | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 21 | Check valve, 65 psi / 4.5 bar | KU | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 22 | Flow regulator valve, 1.5 gpm / 5.7 L/min | KV | Square end, yellow side steer cylinder extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 23 | Flow regulator valve, 1.0 gpm / 3.8 L/min | KW | Square end, yellow side steer cylinder retract circuit | 26-30 ft-lbs / 35-41 Nm |
| 24 | Flow regulator valve, 1.5 gpm / 5.7 L/min | KX | Square end, blue side steer cylinder extend circuit | 20-25 ft-lbs / 27-34 Nm |
| 25 | Check valve | KY | Load sensing circuit, square end yellow side steer cylinder retract | 8-10 ft-lbs / 11-14 Nm |
| 26 | Check valve, 65 psi / 4.5 bar | KZ | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 27 | Check valve, 65 psi / 4.5 bar | KAA | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 28 | Check valve | KAB | Load sensing circuit, square end yellow side steer cylinder extend | 8-10 ft-lbs / 11-14 Nm |
| 29 | Check valve | KAC | Load sensing circuit, square end blue side steer cylinder extend | 8-10 ft-lbs / 11-14 Nm |
| 30 | Check valve, 65 psi / 4.5 bar | KAD | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |
| 31 | Check valve, 65 psi / 4.5 bar | KAE | Prevents steer cylinder from moving when not steering | 20-25 ft-lbs / 27-34 Nm |

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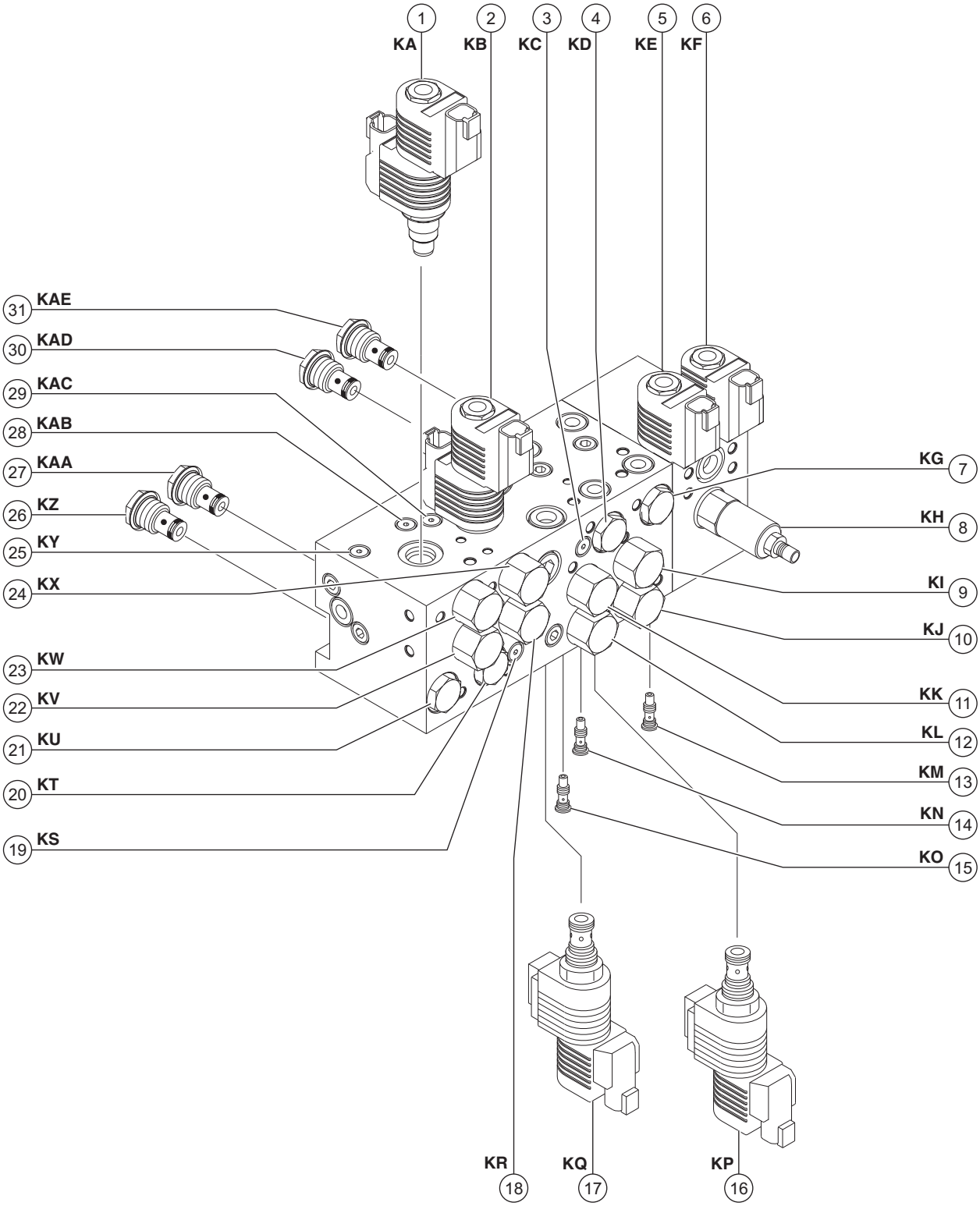
MANIFOLDS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19 KS
KG 7
KH 8
KI 9
KJ 10
KK 11
KL 12
KM 13
KN 14
KO 15
KR 18
KQ 17
KP 16

MANIFOLDS

## How to Adjust the Oscillate Relief Valve

Note: Perform this procedure with the boom in the stowed position.

Note: This procedure will require two people.

1 Remove the drive chassis cover from the square-end of the machine.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the steer/oscillate manifold.

3 Start the engine from the platform controls.

4 Press down the foot switch and manually activate one of the oscillate limit switches. Hold the switch in the activated position and observe the reading on the pressure gauge. Refer to Section 2, *Specifications.*

5 Turn the engine off. Use a wrench to hold the relief valve and loosen the jam nut. (item CH, before SN 1301 or item KH, after SN 1300).

6 Adjust the stud with a hex wrench. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

**⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.

7 Repeat steps 3 through 4 to confirm relief valve pressure.

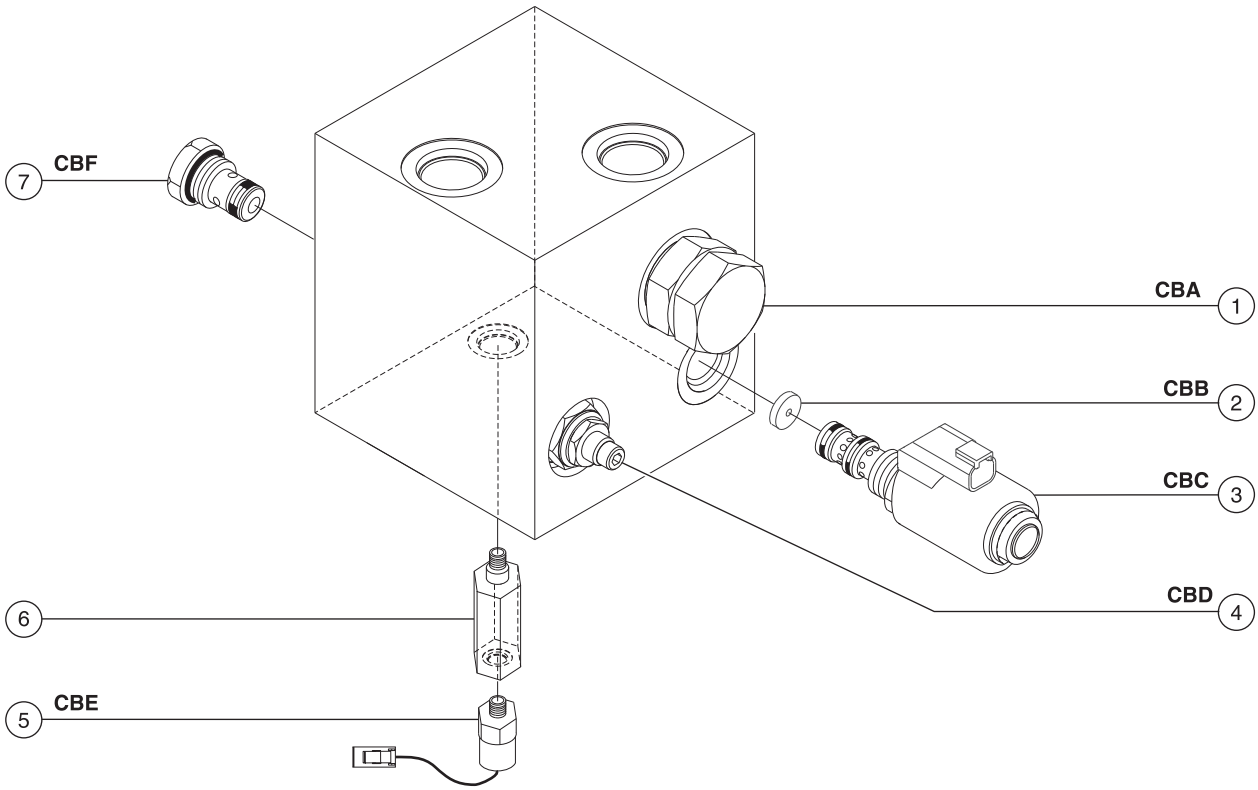
8 Remove the pressure gauge.

9 Install the drive chassis cover.

# 8-9
# Oil Diverter Manifold Components (welder option)

The oil diverter manifold is mounted to the hydraulic generator located in the engine compartment.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Pilot Operated Directional valve, 2 position 3 way | CBA | Activates generator | 80-90 ft-lbs / 108-122 Nm |
| 2 | Orifice disc, 0.031 inch / 0.79 mm | CBB | Delays shift to drive | 35-40 ft-lbs / 47-54 Nm |
| 3 | Solenoid valve, 2 position 3 way | CBC | Pilot valve to diverter | 35-40 ft-lbs / 47-54 Nm |
| 4 | Relief valve, 280 psi @ 3.5 gpm / 19.3 bar @ 13.2 L/min | CBD | Charge pressure circuit | 35-40 ft-lbs / 47-54 Nm |
| 5 | Pressure switch 200 psi / 18.6 bar | CBE | Generator relay switch | 16 ft-lbs / 22 Nm |
| 6 | Connector fitting | | | 11 ft-lbs / 15 Nm |
| 7 | Check valve | CBF | Prevents oil flowing into generator | 35-40 ft-lbs / 47-54 Nm |



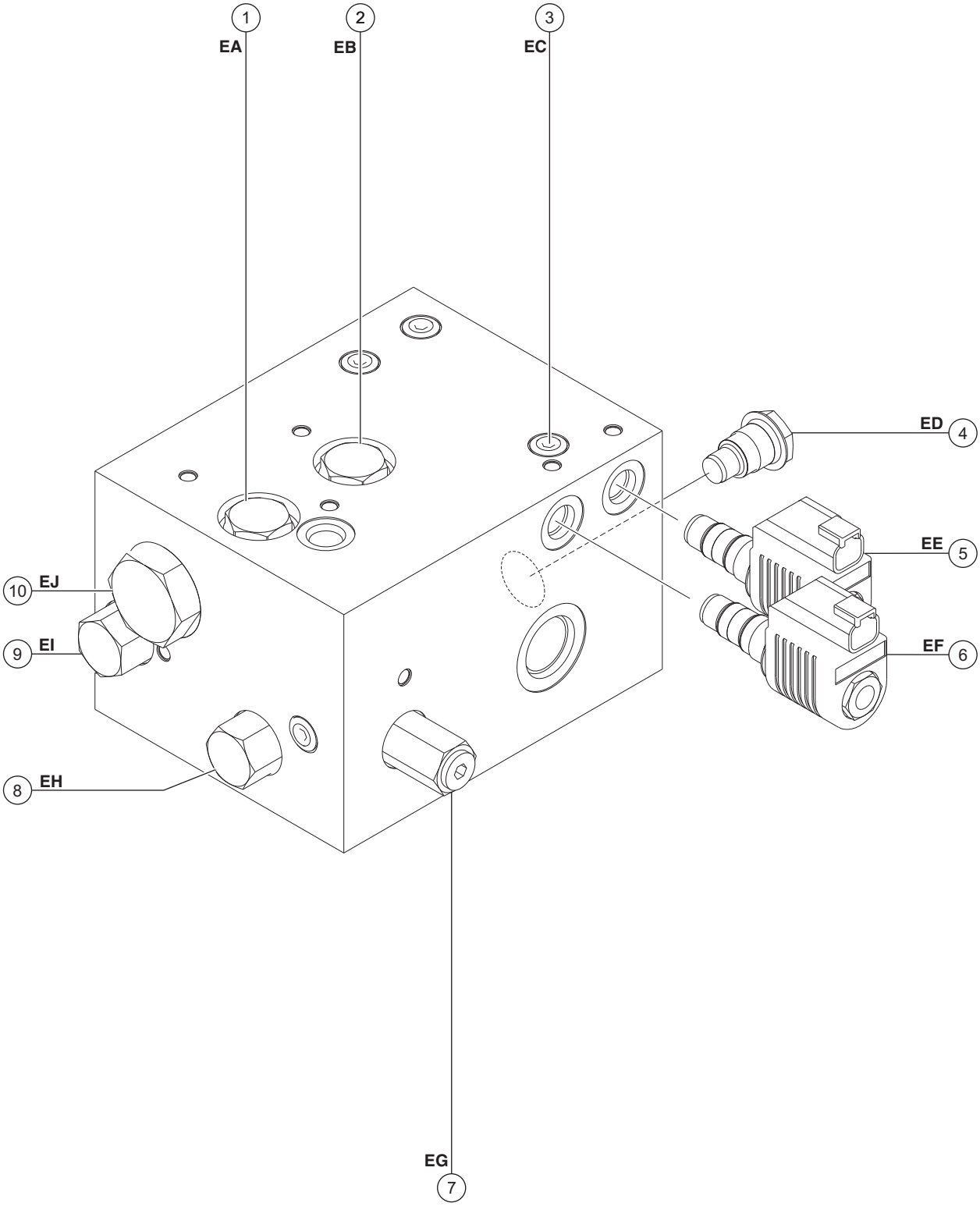
MANIFOLDS

# 8-10
# Traction Manifold, 2WD

The 2WD traction manifold is mounted inside the drive chassis at the circle-end of the machine.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Check valve, 5 psi / 0.34 bar | EA | Drive motor anti-cavitation | 30-35 ft-lbs / 41-47 Nm |
| 2 | Check valve, 5 psi / 0.34 bar | EB | Drive motor anti-cavitation | 30-35 ft-lbs / 41-47 Nm |
| 3 | Orifice, 0.031 in / 0.79 mm | EC | Brake and 2-speed circuit | |
| 4 | Check valve | ED | Keeps brakes released in case of temporary loss of charge pressure | 20-25 ft-lbs / 27-34 Nm |
| 5 | Solenoid valve, 2 position 3 way | EE | Brake release | 26-30 ft-lbs / 35-41 Nm |
| 6 | Solenoid valve, 2 position 3 way | EF | 2-speed drive motor shift | 26-30 ft-lbs / 35-41 Nm |
| 7 | Relief valve, 280 psi / 19.3 bar | EG | Charge pressure circuit | 20-25 ft-lbs / 27-34 Nm |
| 8 | Shuttle valve, 3 position 3 way | EH | Charge pressure circuit that directs hot oil out of low pressure side of drive pump | 30-35 ft-lbs / 41-47 Nm |
| 9 | Bi-directional flow control valve, 4.5 gpm / 17 L/min | EI | Equalizes pressure on both sides of divider/combiner valve EJ | 30-35 ft-lbs / 41-47 Nm |
| 10 | Flow divider/combiner valve | EJ | Controls flow to drive motors in forward and reverse | 90-100 ft-lbs / 122-136 Nm |

MANIFOLDS



MANIFOLDS

# 8-11
# Valve Adjustments, 2WD Traction Manifold

## How to Adjust the Charge Pressure Relief Valve

Note: Perform this procedure with the hydraulic oil temperature at 100°F to 150°F / 38°C to 65.5°C.

Note: This will take two people to perform this procedure.

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 Start the engine from the ground controls.

3 Press the function enable/high rpm select button (rabbit symbol) position. Note the reading on the pressure gauge.

4 Turn the engine off.

5 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the drive manifold.

6 Use a wrench to hold the charge pressure relief valve and remove the cap (item EG).

7 Start the engine from the platform controls.

8 Move rpm select switch to high rpm (rabbit symbol).

9 Begin driving the machine forward at a medium speed while one person monitors the pressure gauge. Continue driving until the pressure stabilizes.

Note: The pressure reading should be approximately 40 psi / 2.8 bar less than the pressure reading taken in step 3.

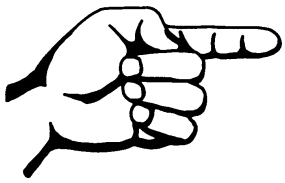
10 If it is not, stop the machine and adjust the internal hex socket on the pressure relief valve (item EG) either up or down.Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

11 Drive the machine forward and check the pressure.

12 Continue making small adjustments until the pressure reading on the gauge is approximately 40 psi / 2.8 bar less than the pressure reading taken in step 3.

13 Turn the engine off and remove the pressure gauge.

MANIFOLDS



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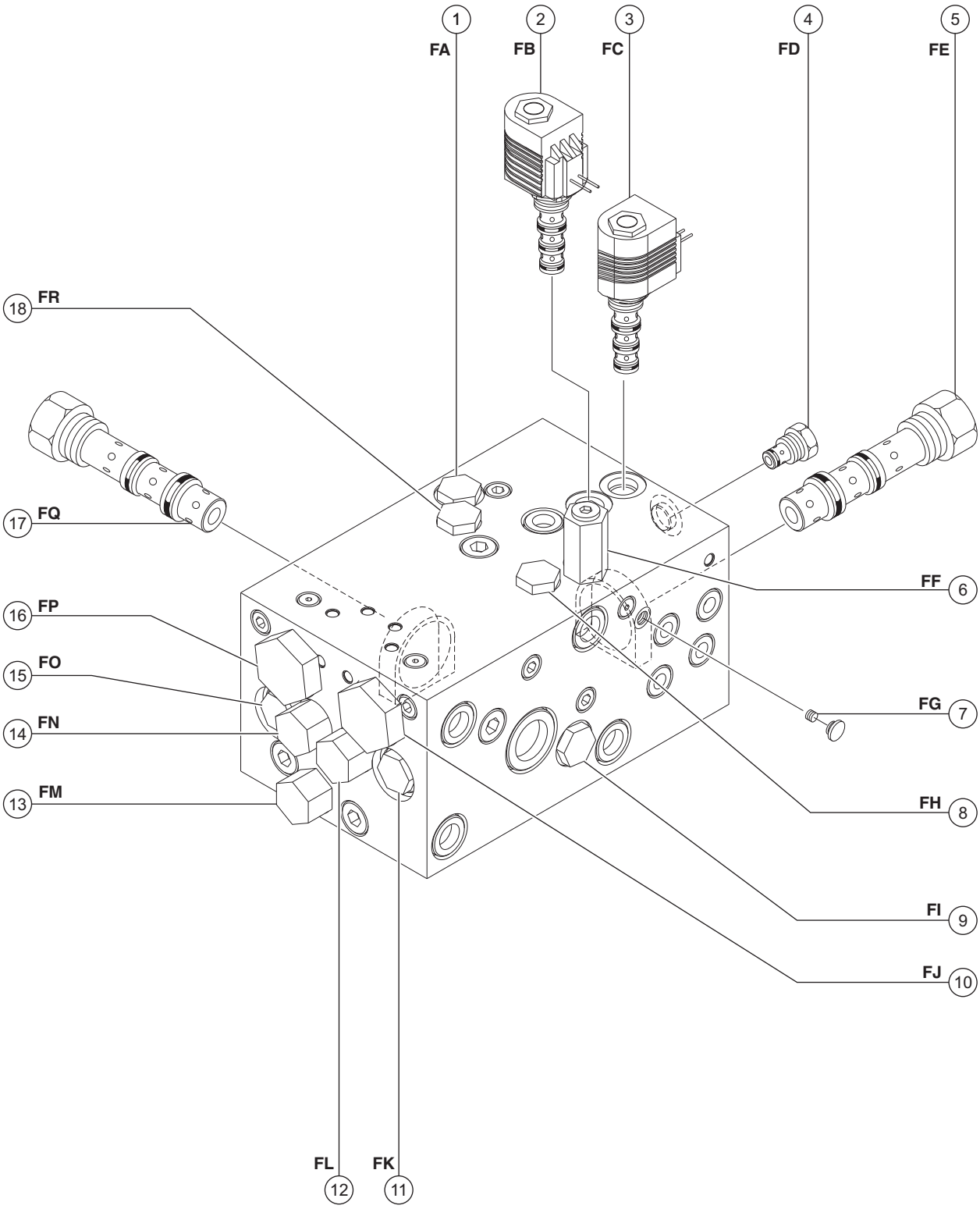
MANIFOLDS

# 8-12
# Traction Manifold, 4WD

The 4WD traction manifold is mounted inside the drive chassis at the circle-end of the machine.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Check valve, 5 psi / 0.34 bar | FA | Drive motor anti-cavitation | 30-35 ft-lbs / 41-47 Nm |
| 2 | Solenoid valve, 2 position 3 way | FB | 2-speed drive motor shift | 26-30 ft-lbs / 35-41 Nm |
| 3 | Solenoid valve, 2 position 3 way | FC | Brake release | 26-30 ft-lbs / 35-41 Nm |
| 4 | Check valve | FD | Keeps brakes released in case of temporary loss of charge pressure | 20-25 ft-lbs / 27-34 Nm |
| 5 | Shuttle valve, 3 position 3 way | FE | Charge pressure circuit that directs hot oil out of low pressure side of drive pump | 30-35 ft-lbs / 41-47 Nm |
| 6 | Relief valve, 280 psi / 19.3 bar | FF | Charge pressure circuit | 20-25 ft-lbs / 27-34 Nm |
| 7 | Orifice, 0.030 in / 0.76 mm | FG | Brake and 2-speed circuit | |
| 8 | Check valve | FH | Drive motor anti-cavitation | 20-25 ft-lbs / 27-34 Nm |
| 9 | Check valve | FI | Drive motor anti-cavitation | 30-35 ft-lbs / 41-47 Nm |
| 10 | Flow divider/combiner valve | FJ | Controls flow to square end drive motors in forward and reverse | 90-100 ft-lbs / 122-136 Nm |
| 11 | Check valve, 5 psi / 0.34 bar | FK | Drive motor anti-cavitation | 20-25 ft-lbs / 27-34 Nm |
| 12 | Bi-directional flow control valve, 2 gpm / 7.6 L/min | FL | Equalizes pressure on both sides of divider/combiner valve FJ | 30-35 ft-lbs / 41-47 Nm |
| 13 | Bi-directional flow control valve, 2 gpm / 7.6 L/min | FM | Equalizes pressure on both sides of divider/combiner valve FQ | 30-35 ft-lbs / 41-47 Nm |
| 14 | Bi-directional flow control valve, 2 gpm / 7.6 L/min | FN | Equalizes pressure on both sides of divider/combiner valve FP | 30-35 ft-lbs / 41-47 Nm |
| 15 | Check valve | FO | Drive motor anti-cavitation | 20-25 ft-lbs / 27-34 Nm |
| 16 | Flow divider/combiner valve | FP | Controls flow to circle end drive motors in forward and reverse | 90-100 ft-lbs / 122-136 Nm |
| 17 | Flow divider/combiner valve | FQ | Controls flow to divider/ combiner valves FJ and FP | 90-100 ft-lbs / 122-136 Nm |
| 18 | Check valve | FR | Drive motor anti-cavitation | 20-25 ft-lbs / 27-34 Nm |

MANIFOLDS


1
FA
2
FB
3
FC
4
FD
5
FE
18
FR
17
FQ
16
FP
15
FO
14
FN
13
FM
FF
6
FG
7
FH
8
FI
9
FJ
10
FL
12
FK
11

MANIFOLDS

# 8-13
# Valve Adjustments, 4WD Traction Manifold

## How to Adjust the Charge Pressure Relief Valve

Note: Perform this procedure with the hydraulic oil temperature at 100°F to 150°F / 38°C to 65.5°C.

Note: This will take two people to perform this procedure.

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to the test port on the drive pump.

2 Start the engine from the ground controls.

3 Press the function enable/high rpm select button (rabbit symbol) position. Note the reading on the pressure gauge.

4 Turn the engine off.

5 Remove the pressure gauge from the drive pump. Connect the gauge to the test port located on the drive manifold.

6 Use a wrench to hold the charge pressure relief valve and remove the cap (item FF).

7 Start the engine from the platform controls.

8 Move rpm select switch to high rpm (rabbit symbol).

9 Begin driving the machine forward at a medium speed while one person monitors the pressure gauge. Continue driving until the pressure stabilizes.

Note: The pressure reading should be approximately 40 psi / 2.8 bar less than the pressure reading taken in step 3.

10 If it is not, stop the machine and adjust the internal hex socket on the pressure relief valve (item FF) either up or down.Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

11 Drive the machine forward and check the pressure.

12 Continue making small adjustments until the pressure reading on the gauge is approximately 40 psi / 2.8 bar less than the pressure reading taken in step 3.

13 Turn the engine off and remove the pressure gauge.

# 8-14
# Valve Coils

## How to Test a Coil

A properly functioning coil provides an electromagnetic force which operates the solenoid valve. Critical to normal operation is continuity within the coil. Zero resistance or infinite resistance indicates the coil has failed.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Note: If the machine has been in operation, allow the coil to cool at least 3 hours before performing this test.

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance using a multimeter set to resistance (Ω). Refer to the Valve Coil Resistance Specification table.

☒ Result: If the resistance is not within the adjusted specification, plus or minus 10%, replace the coil.

## Valve Coil Resistance Specifications

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 20°C that your air temperature increases or decreases from 68°F / 20°C.

| Valve coil resistance specifications | |
|---|---|
| Proportional solenoid valve, 12V DC (schematic items G, W and AB) | 4.8 Ω |
| Proportional solenoid valve, 12V DC (schematic items R) | 9 Ω |
| 3 position 4 way solenoid valve, 12V DC (schematic items BA, BB, CA, CB, CP, CQ, GB, GP and GQ) | 9 Ω |
| 3 position 4 way solenoid valve, 10V DC (schematic items O and S) | 6.3 Ω |
| 2 position 2 way solenoid valve, 10V DC (schematic items J) | 3.3 Ω |
| 2 position 2 way solenoid valve, 10V DC (schematic items C and P) | 6.3 Ω |
| 2 position 3 way solenoid valve, 10V DC (schematic items H, V, X, Z, AA, EE and EF) | 6.3 Ω |
| 2 position 3 way solenoid valve, 12V DC (schematic items BC, BD, CE, CF, FB and FC) | 9 Ω |

MANIFOLDS

## How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

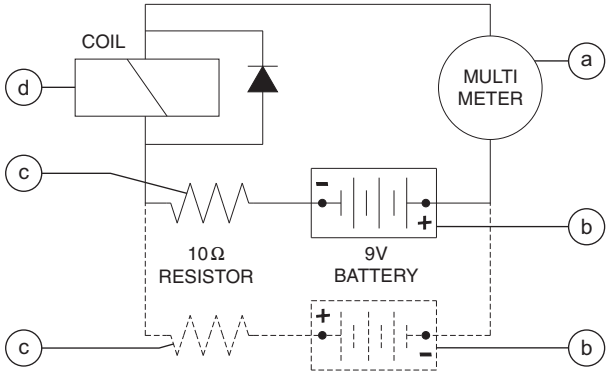
**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Test the coil for resistance. See 8-14, *How to Test a Coil.*

2 Connect a 10Ω resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

| **Resistor, 10Ω** | |
|---|---|
| Genie part number | 27287 |

Note: The battery should read 9V DC or more when measured across the terminals.




a multimeter
b 9V DC battery
c 10Ω resistor
d coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

⊠ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

# Turntable Rotation Components

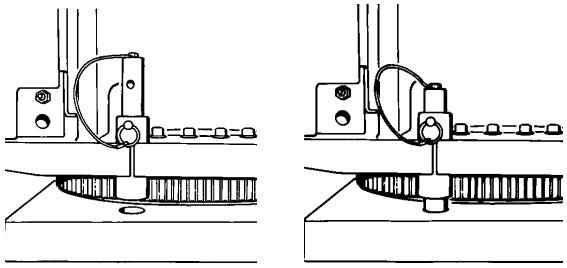
## 9-1
## Turntable Rotation Assembly

### How to Remove a Turntable Rotation Assembly

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

Note: Perform this procedure with the platform between the circle-end tires and with the machine on a firm, level surface.

1 Secure the turntable from rotating with the turntable rotation lock pin.



unlocked locked

2 Remove the ground controls side fixed turntable cover.

3 Tag, disconnect the hydraulic hoses from the turntable rotation motor. Cap the fittings on the motor.

4 Attach a lifting strap from an overhead crane or other suitable lifting device to the lifting eye on the turntable rotation assembly.

5 Remove the turntable rotator mounting bolts and remove the turntable rotation assembly from the machine.

6 Repeat steps 3 through 5 for the other turntable rotation assembly.

**⚠DANGER** Tip-over hazard. If the turntable rotation lock pin is not properly installed, machine stability is compromised and the machine could tip over when the drive hub is removed from the machine, which will result in death or serious injury.

**⚠WARNING** Crushing hazard. The drive hub could become unbalanced and fall if not properly supported by the overhead crane or lifting device when removed from the machine.

Note: When installing a turntable rotation assembly, the rotation gear backlash must be adjusted. See 9-1, *Adjust the Turntable Rotation Gear Backlash*.

TURNTABLE ROTATION COMPONENTS

## How to Adjust the Turntable Rotation Gear Backlash

The turntable rotation drive hub is mounted on an adjustable plate that controls the gap between the rotation motor pinion gear and the turntable bearing ring gear.

Note: Perform this procedure with the platform between the circle-end tires and with the machine on a firm, level surface.

1 Secure the turntable from rotating with the turntable rotation lock pin.

2 Loosen the backlash pivot plate mounting fasteners.

3 Push the backlash pivot plate towards the turntable as far as possible (this will push the rotation gear into the turntable bearing ring gear).

4 Loosen the lock nut on the adjustment bolt.

5 Turn the adjustment bolt clockwise until it contacts the backlash pivot plate.

6 Turn the adjustment bolt 1/2 turn counterclockwise. Tighten the lock nut on the adjustment bolt.

7 Rotate the backlash pivot plate away from the turntable until it contacts the adjustment bolt. Torque the mounting fasteners on the backlash pivot plate to specification. Refer to Section 2, *Specifications.*

8 Rotate the turntable through an entire rotation. Check for tight spots that could cause binding. Readjust if necessary.

# Axle Components

## 10-1 Steer Sensors

The steer sensor measures steer angle and communicates that information to the ground controls ECM. The steer sensor on the ground controls side of the machine at the square end acts as the lead sensor. The other three sensors follow the position, or steer angle, of the lead sensor. There is a steer sensor mounted to the top of each upper yoke pivot pin.

Note: If the square-end steering function becomes inoperative, switch to circle-end steer mode and the ground controls side circle-end steer sensor will become the lead sensor.

Note: This procedure will require a minimum of two people.

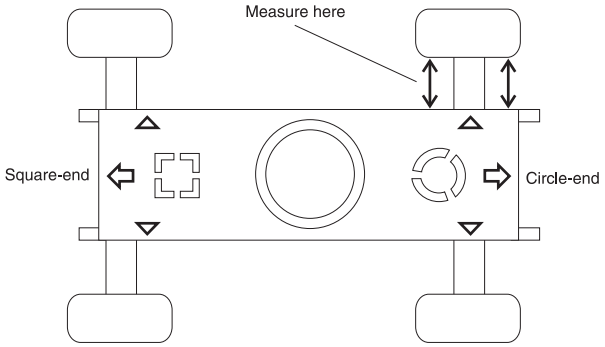
### How to Measure the Tire Alignment

1 Start the engine from the platform controls.

2 Press down the foot switch.

**Measure the circle-end tires:**

3 Press the square-end steer mode button.




4 Measure the distance between the inside of one circle-end tire and the chassis side plate on both sides of the axle.

⊙ Result: Both measurements should be the same to indicate that the tires are parallel with the chassis.

Note: If the measurements are different or if a tire is not parallel with the chassis, the steer sensor of that tire will need to be adjusted. See *How to Adjust a Steer Sensor*.

5 Repeat step 4 for the other circle-end tire.

**Measure the square-end tires:**

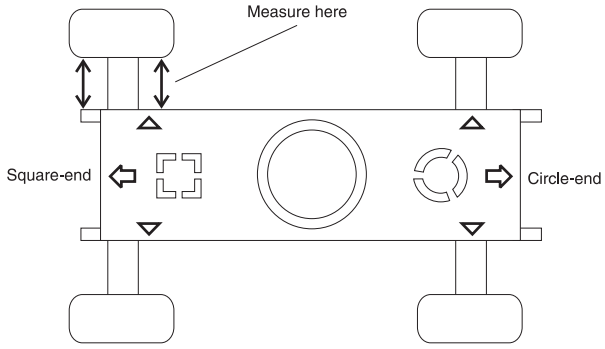
6 Press the circle-end steer mode button.

7 Measure the distance between the inside of one square-end tire and the chassis side plate on both sides of the axle.

⊙ Result: Both measurements should be the same to indicate that the tires are parallel with the chassis.

Note: If the measurements are different or if a tire is not parallel with the chassis, the steer sensor of that tire will need to be adjusted. See *How to Adjust a Steer Sensor*.

8 Repeat step 4 for the other square-end tire.



AXLE COMPONENTS

## How to Adjust a Steer Sensor

1 Start the engine from the platform controls.

2 Press down the foot switch and push the engine idle select button until the engine switches to high rpm.

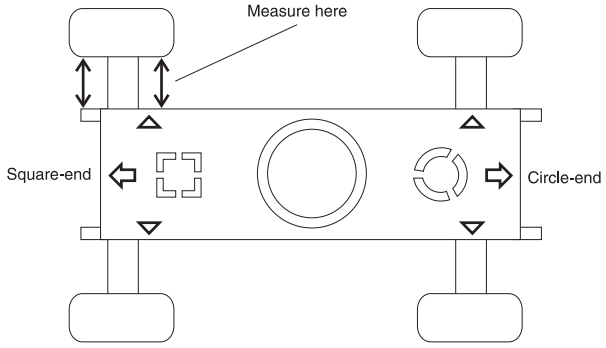
**Square-end steer sensors:**

3 At the platform controls, press the circle-end steer mode button.

4 Locate the steer sensor on top of the yoke pivot pin.

5 Loosen the steer sensor cover retaining fasteners. Do not remove them.

6 Rotate the steer sensor cover either clockwise or counterclockwise. Measure the distance between the inside of tire and the chassis side plate on both sides of the axle.




7 Repeat step 4 until the tire is parallel with the chassis.

8 Tighten the steer sensor cover fasteners.

9 Repeat steps 2 through 6 for the other square-end steer sensor.

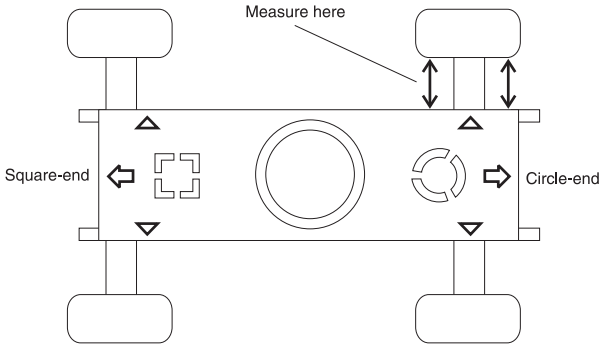
**Circle-end steer sensors:**

10 At the platform controls, press the square-end steer mode button.

11 Locate the steer sensor on top of the yoke pivot pin.

12 Loosen the steer sensor cover retaining fasteners. Do not remove them.

13 Rotate the steer sensor cover either clockwise or counterclockwise. Measure the distance between the inside of tire and the chassis side plate on both sides of the axle.




14 Repeat step 4 until the tire is parallel with the chassis.

15 Tighten the steer sensor cover fasteners.

16 Repeat steps 9 through 13 for the other circle-end steer sensor.

17 At the platform controls, press the four-wheel steer mode button. Measure the distance between the inside of the tire and the chassis side plate on both sides of the axle on each tire.

18 If any tire is not parallel, repeat the process beginning with step 3.

## How to Calibrate the Steer Sensors

If a steer sensor reaches the limit of travel before a tire is adjusted parallel to the chassis, the steer sensor must be calibrated. This procedure will re-establish a center position on the steer sensor.

Note: Perform this procedure with the machine in the stowed position.

Note: This procedure will require two people.

1 Start the engine from the platform controls.

2 Press down the foot switch.

3 Choose a steer mode based on the tire that needs alignment.

Note: If a circle-end tire cannot be aligned, press the square-end steer mode button. If a square-end tire cannot be aligned, press the circle-end steer mode button.

4 Loosen the steer sensor cover retaining fasteners. Do not remove them.

5 Rotate the steer sensor cover either clockwise or counterclockwise to bring the tire as close to alignment as possible.

6 Turn off the engine.

7 Press and hold the enter button [↵] on the ground control panel while pulling out the ground controls red Emergency Stop button to the on position. Hold the enter button for approximately 5 seconds and then release it.

8 Enter sensor calibration mode by pressing the buttons at the ground controls in the following sequence: [+] [↵] [↵] [+].

9 Use the [↓] button to scroll through the menu until the appropriate steer sensor is displayed. Choose from:
RESET BLUE END BLUE SIDE STEER SENSOR
RESET YELLOW END BLUE SIDE STEER SENSOR
RESET YELLOW END YELLOW SIDE STEER SENSOR,
RESET BLUE END YELLOW SIDE STEER SENSOR.
Press the [↓] button to select YES, then press the [↵] button.

10 Exit the sensor calibration mode and turn the keyswitch to the off position.

11 Rotate the steer sensor to the opposite limit of travel.

12 Using a voltmeter set to DC voltage, probe the back of the steer sensor electrical connector at pins B and C.

13 Turn the keyswitch on at the ground controls. Rotate the sensor slowly until the voltage reading is between 2.4 to 2.5V DC. The alarm at the ground control box should sound.

14 Turn the keyswitch to platform controls. Start the engine from the platform controls.

15 Press down the foot switch.

16 Rotate the steer sensor cover to adjust the tire alignment. Measure the distance between the inside of the tire and the chassis side plate on both sides of the axle.

17 Repeat step 14 until the tire is parallel with the chassis.

18 Tighten the steer sensor cover fasteners.

AXLE COMPONENTS

## How to Adjust the Oscillate Limit Switches

**⚠ DANGER** Tip-over hazard. Failure to perform this procedure on a firm, level surface could compromise the stability of the machine and could cause the machine to tip over which will result in death or serious injury.

Note: Perform this procedure with the machine on a firm, level surface that is free of obstructions. Use a digital level to confirm.

Note: This procedure will require two people.

1 Lower the boom to the stowed position.

2 Remove the drive chassis cover from the circle-end of the machine.

3 Remove the oscillate axle limit switch mounting fasteners. Remove the limit switches.

Note: The oscillate axle limit switches are located inside the drive chassis above the axle.

4 Place a digital level on the turntable rotate bearing plate.

5 Start the engine and level the drive chassis. Press down the foot switch and manually activate the oscillate limit switches until the machine is completely level.

6 Loosely install the limit switches. Using a feeler gauge, establish a gap of 0.015 - 0.030 inches / 0.381 - 0.762 mm between the limit switch plunger and the top of the axle.

7 Carefully hold the position of each limit switch and tighten the limit switch mounting fasteners.

8 Verify the gap is 0.015 - 0.030 inches / 0.381 - 0.762 mm between the limit switch plunger and the top of the axle.

9 Measure the distance between the drive chassis and the axle on both sides (from the inside of the drive chassis).

⊙ Result: The measurements should be equal.

Note: If the distance is not equal and the adjustment to the limit switches was completed with the ground and drive chassis level, consult Genie Industries Service Department.

# 10-2
# Oscillating Axle Cylinders

The oscillating axle cylinders extend and retract between the drive chassis and the oscillating axle. The cylinders are equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure. The valves are not adjustable.

## How to Remove an Oscillating Axle Cylinder

Note: Perform this procedure on a firm, level surface with the boom in the stowed position.

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications.*

1 Rotate the boom until the turntable counterweight is between the circle-end and square-end tires.

2 Tag, disconnect and plug the oscillating axle cylinder hydraulic hoses. Cap the fittings on the oscillate cylinder.

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pin retaining fasteners from the oscillate cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

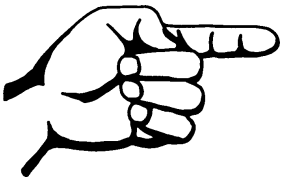
4 Attach a lifting strap from an overhead crane to the barrel end of the oscillating cylinder.

5 Remove the pin retaining fasteners from the oscillate cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

**⚠CAUTION** Crushing hazard. The oscillate cylinder may become unbalanced and fall if not properly supported when removed from the machine.

6 Remove the oscillate cylinder from the machine.

AXLE COMPONENTS



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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 repair procedure with the machine in the following configuration:
  - · Machine parked on a firm, level surface
  - · Boom in stowed position
  - · Turntable rotated with the boom between the circle-end (yellow arrow) wheels.
  - · Turntable secured with the turntable rotation lock pin
  - · Key switch in the off position with the key removed
  - · Welder disconnected from the machine (if equipped with the weld cable to platform option)
  - · Wheels chocked
  - · All external AC power supply disconnected from the machine

## Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropriate fault code thoroughly. Attempting shortcuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

**⚠DANGER** Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Note: Two persons will be required to safely perform some troubleshooting procedures.

# Fault Diagnostics - Control System

## How to Read Control System Fault Codes

Note: Initial fault testing occurs at power-up.

Faults are abnormal conditions that exist due to component failure or System misuse. CPU, memory, LCD, LED, limited joystick and limited operator switch testing is done on power-up. If an operator switch is depressed on power-up, the display should show and error and not allow any machine functions.

Releasing the switch will clear the error and allow all machine functions. The joystick operates similarly.

All other fault testing is done continuously.

1 When a fualt is diagnosed, the PCON fault indicator will flash and a fault message will be displayed on the TCON LCD. The message will contain the fault source and type.

2 Additional information, including the occurrence counter and a time-stamp is available with a PC, connected to one of the RS232 ports. Up to 30 unique fault messages can be saved. Each fault is saved with the device identity, fault type, engine hour time-stamp and an 8-bit occurrence counter.

3 The fault code table on the following pages lists the functions or components monitored by the system and recovery actions.

REV C CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| PRIMARY BOOM EXT/RET FLOW VALVE | Not calibrated | Normal function except threshold for one or the other direction is zero. Display message on LCD. | Calibrate thresholds. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds.. | Power up controller with the problem corrected. |
| | Value Too High | | |
| | Value Too Low | | |
| | Value at 0 V | | |
| PRI BOOM EXT VALVE | Fault check | Limited speed and direction frozen at zero and neutral, alarm sounds.. | Power up controller with the problem corrected. |
| PRI BOOM RET VALVE | | | |
| PRI BOOM UP VALVE | | | |
| PRI BOOM DOWN VALVE | | | |
| SEC BOOM LENGTH | Fault check (unknown length) | Stop all secondary boom functions, allow only secondary boom retract. Display message on LCD. | Power up controller with the problem corrected. |
| SEC BOOM ANGLE | Fault check (unknown angle) | Stop all secondary boom functions, allow only secondary boom retract. Once the boom is retracted allow secondary boom down. Display message on LCD. | Power up controller with the problem corrected. |
| SEC BOOM UP/DOWN SPEED | Not calibrated | Display message on LCD and allow operation at default speed. | Perform auto calibrate procedure. |
| SEC BOOM UP/DOWN/EXT/RET FLOW VALVE | Not calibrated | Normal function except threshold for one or the other direction is zero. Display message on LCD. | Calibrate thresholds. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds.. | Power up controller with the problem corrected. |
| | Value Too High | | |
| | Value Too Low | | |
| | Value at 0 V | | |
| SEC BOOM EXT VALVE | Fault check | Limited speed and direction frozen at zero and neutral, alarm sounds.. | Power up controller with the problem corrected. |
| SEC BOOM RET VALVE | | | |
| SEC BOOM UP VALVE | | | |
| SEC BOOM DOWN VALVE | | | |
| SEC EXT SEQ VALVE | | | |
| SEC DWN SEQ VALVE | | | |

Continued on next page

CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| ENGINE SPEED | Range check (underspeed) | Display message on LCD. | Power up controller with the problem corrected. |
| OIL PRESSURE | Range check (low oil pressure) | | |
| WATER/OIL TEMP | Range check (high temperature) | | |
| OIL PRESSURE SENSOR | Fault check | Display message on LCD. | Power up controller with the problem corrected. |
| WATER/OIL TEMP SENSOR | | | |
| AXLE EXT/RET BUTTONS | | Axle extend/retract disabled, display message on LCD. | Power up controller with the problem corrected. |
| CAN BUS | Fault check | Display message on LCD. | Power up controller with the problem corrected. |
| PRIMARY BOOM UP/DOWN JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick Speed and Direction frozen at zero and neutral | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| SECONDARY BOOM JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick speed and direction frozen at zero and neutral. | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| PRIMARY EXTEND/RETRACT JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick speed and direction frozen at zero and neutral. | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |

CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| STEER JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick speed and direction frozen at zero and neutral. | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| PRIMARY BOOM UP/DOWN SWITCHES ON TCON | Fault Check, (both buttons pressed) | Primary boom up/down disabled, display message on LCD. | Power up controller with the problem corrected. |
| SEC BOOM UP/EXT/DWN/RET SWITCHES ON TCON | Fault Check, (both buttons pressed) | Secondary boom up/extend and down/retract disabled, display message on LCD. | Power up controller with the problem corrected |
| PRIMARY BOOM EXT/RET SWITCHES ON TCON | Fault Check, (both buttons pressed) | Primary boom extend/retract disabled, display message on LCD. | Power up controller with the problem corrected. |
| PRIMARY BOOM LENGTH | Fault check (unknown length) | Display message on LCD. | Power up controller with the problem corrected. |
| PRIMARY BOOM ANGLE | Fault check (unknown angle) | Allow only primary boom retract and down. Display message on LCD. | Power up controller with the problem corrected. |
| PRIMARY UP/DOWN SPEED | Not calibrated | Display message on LCD and allow operation at default speed. | Perform auto calibrate procedure. |
| PRIMARY EXTEND/RETRACT SPEED | Not calibrated | Display message on LCD and allow operation at default speed. | Perform auto calibrate procedure. |
| PRIMARY BOOM UP/DOWN FLOW VALVE | Not calibrated | Normal function except threshold for one or the other direction is zero. Display message on LCD. | Calibrate thresholds. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds.. | Power up controller with the problem corrected. |
| | Value Too High | | |
| | Value Too Low | | |
| | Value at 0 V | | |

Continued on next page

CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| SAFETY SWITCH P3 | Fault check | Display message on LCD. P3 SAFETY SWITCH FAULT | Power up controller with the problem corrected. |
| SAFETY SWITCH P6R1 | | Display message on LCD. P6R1 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P6R2 | | Display message on LCD. P6R2 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P7 | | Display message on LCD. P7 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P7R | | Display message on LCD. P7R SAFETY SWITCH FAULT | |
| SAFETY SWITCH P9A | | Display message on LCD. P9A SAFETY SWITCH FAULT | |
| SAFETY SWITCH P9B | | Display message on LCD. P9B SAFETY SWITCH FAULT | |
| SAFETY SWITCH P10 | | Display message on LCD. P10 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P11 | | Display message on LCD. P11 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P12 | | Display message on LCD. P12 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P14 | | Display message on LCD. P14 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P18 | | Display message on LCD. P18 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P22 | | Display message on LCD. P22 SAFETY SWITCH FAULT | |
| SAFETY SWITCH P22R | | Display message on LCD. P22R SAFETY SWITCH FAULT | |
| SAFETY SWITCH P30 | | Display message on LCD. P30 SAFETY SWITCH FAULT | |
| PLATFORM OVERLOAD SENSOR | Fault check (if active) | Display message on LCD. | Power up controller with the problem corrected. |
| BOOM UP OVERLOAD | | | |
| BOOM DOWN OVERLOAD | | | |
| SHUT DOWN MODE | | | |

CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| TURNTABLE ROTATE JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick speed and direction frozen at zero and neutral. | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| TURNTABLE ROTATE BUTTONS | Fault Check, (both buttons pressed) | Turntable rotate disabled, display message on LCD. | Power up controller with the problem corrected. |
| TURNTABLE ROTATE SPEED | Not calibrated | Display message on LCD and allow operation at default speed. | Perform auto calibrate procedure. |
| TURNTABLE ROTATE FLOW VALVE | Not calibrated | Normal function except threshold for one or the other direction is zero. Display message on LCD. | Calibrate thresholds. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with the problem corrected. |
| | Value Too High | | |
| | Value Too Low | | |
| | Value at 0 V | | |
| TURNTABLE ROTATE CW VALVE | Fault check | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with the problem corrected. |
| TURNTABLE ROTATE CCW VALVE | | | |
| TURNTABLE LEVEL SENSOR X-DIRECTION | Fault check | Display message on LCD and sound audible alarm. | Correct problem. |
| TURNTABLE LEVEL SENSOR Y-DIRECTION | | | |
| PLATFORM LEVEL SENSOR Y-DIRECTION | | | |

Continued on next page

CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| PRIMARY BOOM ANGLE SENSOR | Value at 5.0 V | Sound audible warning and flash primary boom down LED at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR SHORTED HIGH. Primary boom up inhibited. Primary boom velocity limited to 50% of default value. | Correct problem. |
| | Value at 0 V | Sound audible warning and flash primary boom down LED at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR SHORTED LOW. Primary boom up inhibited. Primary boom velocity limited to 50% of default value. | Correct problem. |
| | Not calibrated | Sound audible warning at the medium rate and display message on LCD screen PRI BOOM ANG SENSOR NOT CALIBRATED, inhibit primary boom up from platform control. | Calibrate primary boom angle sensor. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| PROPEL JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick speed and direction frozen at zero and neutral. | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| PROPEL VALVES FWD<br>PROPEL VALVES REV<br>PROPEL EDC FWD<br>PROPEL EDC REV | Not calibrated | Normal function except threshold for one or the other direction is zero. Display message on LCD. | Calibrate thresholds. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing, (transient) |
| | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with the problem corrected. |
| | Value Too High | | |
| | Value Too Low | | |
| | Value at 0 V | | |

CONTROL SYSTEM FAULT CODES

| Error Source | Error Type | Effects | Recovery Actions |
|---|---|---|---|
| MOTOR SPEED VALVE | Fault check | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with the problem corrected. |
| BRAKE VALVE | | | |
| AUX PROPEL VALVE | | | |
| PLAT LEV UP VALVE | | | |
| PLAT LEV DN VALVE | | | |
| PLAT ROT CW VALVE | | | |
| PLAT ROT CCW VALVE | | | |
| JIB UP VALVE | | | |
| JIB DN VALVE | | | |
| JIB SWITCHES | Fault Check, (both contacts closed) | Affected functions disabled, display message on LCD. | Power up controller with the problem corrected. |
| PLAT ROT SWITCHES | | | |
| STEERING JOYSTICK | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| | Not calibrated | Joystick speed and direction frozen at zero and neutral. | Calibrate joystick. |
| | Just calibrated | Initiate one second beep of audible warning device. | Self-clearing (transient) |
| LF STR ANG SNSR | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| RF STR ANG SNSR | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| LR STR ANG SNSR | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| RR STR ANG SNSR | Value at 5.0 V | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with problem corrected. |
| | Value too high | | |
| | Value too low | | |
| | Value at 0 V | | |
| LF STEER VALVE | Fault check | Limited speed and direction frozen at zero and neutral, alarm sounds. | Power up controller with the problem corrected. |
| RF STEER VALVE | | | |
| LR STEER VALVE | | | |
| RR STEER VALVE | | | |
| FOOTSWITCH TIMEOUT | | Display message on LCD display. | Recycle power. |

Continued on next page

CONTROL SYSTEM FAULT CODES

# Control System Fault Codes

## How to Clear Secondary Boom Safety Switch Faults

Note: Beginning with software release 2.0, the secondary boom envelope switches will latch and faults must be reset in software or through the use of the TCON LCD. They will not clear by re-powering the machine.

Note: There are two methods to reset the faults, by using Web GPI or through the menu available on the TCON LCD.

### Using Web GPI

1 Connect the device containing the WEB GPI software to the TCON with an RS-232 cable.

2 Select the Secondary Boom, then the Safety Switch Status Flags screen.

3 Change any safety switch drop down menus displaying FAULT to OK. Press SEND.

4 Exit Web GPI.

### Using the TCON LCD

Note: Take care when using this method to avoid resetting threshold defaults.

1 With the key switch off, press and hold the ↵ button and turn the key switch to the on position. Release the ↵ button after five seconds and press the − − ↓ ↓ buttons.

2 Press the ↓ button until CLEAR ALL SAFETY SWITCH FAULTS appears.

3 Select YES, then press the ↵ button.

4 Press the ↓ button until EXIT appears.

5 Select YES, then press the ↵ button.

Note: This clears all latching faults, not standard faults.

CONTROL SYSTEM FAULT CODES

# Fault Code Display - Deutz TD 2.9 L4 and Perkins 404F-22T Models

## How to Retrieve Active Engine Fault Codes

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instantaneous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor. The active fault code will also be displayed on the LCD screen.

Note: The Perkins 404F-22T 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..

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.

Note: Software is available from the engine manufacturer to perform diagnosis through the engine diagnostic port. Contact the specific engine manufacturer.

# Deutz TD 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) |
| 51 | 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 redundancyswitch 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) |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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) |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 (> 145°C) |
| 1188 | 11 | 1417 | Wastegate actuator; over temperature (> 135°C) |
| 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" |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 TD 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 TD 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 open |
| 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 | Zerofuel calibration injector 1 (in firing order); maximum value exceeded |
| 523946 | 1 | 1164 | Zerofuel 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. |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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 |
| 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 |

DEUTZ TD 2.9 L4 ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier / KWP = Keyword Protocol**

| SPN | FMI | KWP | Description |
|---|---|---|---|
| 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-22T 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 |

PERKINS 404F-22T ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier**

| SPN | FMI | Description |
|---|---|---|
| 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 |
| 3241 | 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) |
| 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 Sensor 1: Voltage “Above Normal" |
| 3610 | 4 | DieselParticulate Filter Outlet Pressure Sensor 1: Voltage Below Normal |

Continued on next page

PERKINS 404F-22T ENGINE FAULT CODES

**SPN = Suspect Parameter Number / FMI - Failure Mode Identifier**

| SPN | FMI | Description |
|---|---|---|
| 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 #1 Diesel 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

## Engine Fault Codes - Continental Models

## How to Retrieve Continental Engine Fault Codes

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instantaneous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor and will turn on the Check Engine Light.

Note: Perform this procedure with the key switch in the off position.

1 Open the ground controls side cover and locate the run/test toggle switch on the side of the ground control box.

2 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

3 Quickly activate and release the start toggle switch/button. Do not start the engine.

4 Move and hold the run/test toggle switch to the test position.

⊙ Result: The check engine light should turn on. The check engine light should begin to blink.

5 Continue to hold the run/test toggle switch in the test position and count the blinks.

Note: Before the fault codes are displayed, the check engine light will blink a code 123 three times. After the fault codes, the check engine light will blink a code 123 three times again indicating the end of the stored codes.

Note: If any fault codes are present, the ECM will blink a three digit code three times for each code stored in memory. It will blink the first digit of a three digit code, pause, blink the second digit, pause, and then blink the third digit. For example: the check engine light blinks 5 consecutive times, blinks 3 times and then 1 time. That would indicate code 531.

Note: Once a fault code has been retrieved and the repair has been completed, the ECM memory must be reset to clear the fault code from the ECM. See *How to Clear Engine Fault Codes from the ECM.*

## How to Clear Engine Fault Codes from the ECM

Note: Perform this procedure with the engine off and the key switch in the off position.

1 Open the engine side turntable cover and locate the battery.

2 Disconnect the negative battery cable from the battery for a minimum of 5 minutes.

**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

3 Connect the negative battery cable to the battery.

## CONTINENTAL TME27 ENGINE FAULT CODES

| System | Code | Fault Name | Shutdown | Adaptive Learn | Adaptive Learn KC* | Power Derate 1 | Power Derate 2 | Low Rev Limit | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| MAP | **108** | MAP Pressure High | | Y | Y | | | | MAP pressure > 16 psi and TPS < 10% and RPM > 1800<br>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<br>To Unlatch, MAP voltage must be > 0.5 vdc |
| ECT/ CHT | **118** | ECT Voltage High | | Y | | | | | ECT voltage > 4.95 vdc |
| | **117** | ECT Voltage Low | | Y | | | | | ECT voltage < 0.05 vdc |
| | **116** | ECT higher than expected 1 | | Y | Y | Y | | | ECT > 210° F and RPM > 600 |
| | **217** | ECT higher than expected 2 | **Y** | | | | | | ECT > 230° F and RPM > 600 |
| IAT | **113** | IAT Voltage High | | Y | | | | | IAT voltage > 4.95 vdc |
| | **112** | IAT Voltage Low | | Y | | | | | IAT voltage < 0.05 vdc |
| | **111** | IAT higher than expected 1 | | Y | | Y | | | IAT > 200° F and RPM > 1000 |
| | **127** | IAT higher than expected 2 | **Y** | | | | | | IAT > 210° F and RPM > 1000 |
| BP | **2229** | BP Pressure High | | Y | Y | | | | BP pressure > 16 psi |
| | **129** | BP Pressure Low | | Y | Y | | | | BP pressure < 8.3 psi |
| Battery Voltage | **563** | Voltage High | | Y | Y | | | | Voltage > 18 vdc |
| | **562** | Voltage Low | | Y | Y | | | | Voltage < 9.5 vdc and RPM > 1500 |
| 5V External | **643** | 5VE1 High Voltage | | Y | | | | | 5VE1 > 5.4 vdc |
| | **642** | 5VE1 Low Voltage | | Y | | | | | 5VE1 < 4.6 vdc |
| TPS | **123** | TPS1 High Voltage | **Y** | | | | | | TPS1 voltage > 4.8 vdc |
| | **122** | TPS1 Low Voltage | **Y** | | | | | | TPS1 voltage < 0.2 vdc |
| | **223** | TPS2 High Voltage | **Y** | | | | | | TPS2 voltage > 4.8 vdc |
| | **222** | TPS2 Low Voltage | **Y** | | | | | | TPS2 voltage < 0.2 vdc |
| | **221** | TPS1 > than TPS2 | **Y** | | | | | | (TPS1 percent - TPS2 percent) > 20% |
| | **121** | TPS1 < than TPS2 | **Y** | | | | | | (TPS1 percent - TPS2 percent) < -20% |
| | **2112** | Unable to reach > TPS | **Y** | | | | | | (target TPS - actual TPS) > 20% |
| | **2111** | Unable to reach < TPS | **Y** | | | | | | (target TPS - actual TPS) < -20% |
| | **2135** | TPS1/2 simultaneous voltages out of range | **Y** | | | | | | Uses same parameters as individual TPS1/2 voltage fault detection above |

CONTINENTAL TME27 ENGINE FAULT CODES

| System | Code | Fault Name | Shutdown | Adaptive Learn | Adaptive Learn KC* | Power Derate 1 | Power Derate 2 | Low Rev Limit | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| FPP | **2122** | FPP1 High Voltage | | | | | | Y | FPP1 voltage > 4.8 vdc |
| | **2123** | FPP1 Low Voltage | | | | | | Y | FPP1 voltage < 0.2 vdc |
| Engine Speed | **219** | Max Govern Speed Override | | | | | | | RPM > 3400 |
| | **1111** | Rev Fuel Limit | | | | | | | RPM > 3600 |
| | **1112** | Spark Rev Limit | **Y** | | | | | | RPM > 3800 |
| Oil Pressure | **524** | Oil Pressure Low | **Y** | | | | | | Oil pressure pulled-up input with a threshold voltage of 2.5 vdc and RPM > 500 and run-time > 30 s |
| Adaptive Learn | **171** | AL High Gasoline Bank 1 | | | | | | | AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi |
| | **172** | AL Low Gasoline Bank 1 | | | | | | | AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi |
| | **1161** | AL High LPG | | | | | | | AL_BM > 30% and RPM between 0-9999 and MAP between 0-99 psi |
| | **1162** | AL Low LPG | | | | | | | AL_BM < -30% and RPM between 0-9999 and MAP between 0-99 psi |
| Closed Loop | **1155** | CL High Gasoline Bank 1 | | | | | | | CL_BM > 40% and RPM between 0-9999 and MAP between 0-99 psi |
| | **1156** | CL Low Gasoline Bank 1 | | | | | | | CL_BM <-40% and RPM between 0-9999 and MAP between 0-99 psi |
| | **1151** | CL High LPG | | | | | | | CL_BM > 35% and RPM between 0-9999 and MAP between 0-99 psi |
| | **1152** | CL Low LPG | | | | | | | CL_BM < -35% and RPM between 0-9999 and MAP between 0-99 psi |
| Catalyst Monitor | **420** | Gasoline Cat Monitor | | Y | Y | | | | EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50% |
| | **1165** | LPG Cat Monitor | | Y | Y | | | | EGO2 RMS > 0.005 phi and EGO2 RMS > EGO1 RMS* 50% and EGO2 RMS > CL waveform RMS* 50% |

* Adaptive Learn Key Cycle

## CONTINENTAL TME27 ENGINE FAULT CODES

| System | Code | Fault Name | Shutdown | Adaptive Learn | Adaptive Learn KC* | Power Derate 1 | Power Derate 2 | Low Rev Limit | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| EGO Sensors | **134** | EGO Open/Lazy Pre-cat 1 | | Y | Y | | | | EGO cold persistently > 120 seconds |
| | **154** | EGO Open/Lazy Post-cat 1 | | Y | Y | | | | EGO cold persistently > 120 seconds |
| Injectors | **261** | Injector Loop Open or Low-Side Short to Ground | | Y | Y | Y | | | Injector off-state low-side < 4 vdc and battery voltage > 9 vdc |
| | **262** | Injector Coil Shorted | | Y | Y | Y | | | Injector on-state low-side > 4 vdc and battery voltage < 16 vdc |
| Power Relay Control Coil | **686** | Relay Control Ground Short | | | | | | | |
| | **685** | Relay Coil Short | | | | | | | |
| | **687** | Relay Coil Short to Pwr | | | | | | | |
| | | | | | | | | | |
| Tach Output | **2618** | Tach Output Ground Short | | | | | | | Does not turn on MIL |
| | **2619** | Tach Output Short to Pwr | | | | | | | Does not turn on MIL |
| EPR Diagnostics LPG | **1171** | EPR Delivery Pressure > than expected | | Y | | | Y | | MJ actual-commanded press > 4 in. H20 |
| | **1172** | EPR Delivery Pressure < than expected | | Y | | | Y | | MJ actual-commanded press < 4 in. H20 |
| | **1173** | EPR Comm Lost | | Y | | | Y | | No MJ packets received within 500 ms |
| | **1174** | EPR Voltage Supply High | | Y | | | Y | | |
| | **1175** | EPR Voltage Supply Low | | Y | | | Y | | |
| | **1176** | EPR Internal Actuator | | Y | | | Y | | |
| | | fault detection | | | | | | | |
| | **1177** | EPR Internal Circuitry fault detection | | Y | | | Y | | |
| | **1178** | EPR Internal Comm fault detection | | Y | | | Y | | |

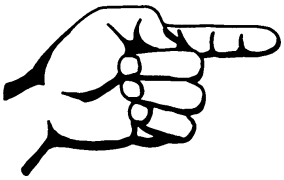
* Adaptive Learn Key Cycle

Continued on next page

## CONTINENTAL TME27 ENGINE FAULT CODES

| System | Code | Fault Name | Shutdown | Adaptive Learn | Adaptive Learn KC* | Power Derate 1 | Power Derate 2 | Low Rev Limit | Fault Conditions |
|---|---|---|---|---|---|---|---|---|---|
| Cam Crank Sensors | **342** | Cam Loss | | Y | Y | | | | No cam pulse in 4 cycles and RPM > 1000 |
| | **337** | Crank Loss | | | | | | | Cam pulses without crank activity > 6 cam pulses |
| | **341** | Cam Sync Noise | | Y | Y | | | | Number of invalid cam re-syncs = 1 within a time window of <= 700 ms |
| | **336** | Crank Sync Noise | | Y | Y | | | | Number of invalid crank re-syncs = 1 within a time window of <= 800 ms |
| | **16** | Never Crank Synced at Start | | | | | | | Cranking revs without sync < 4 revs and RPM > 90 rpm |
| Internal Processor Diagnostics | **606** | COP Failure | | | Y | | Y | | |
| | **1612** | RTI 1 Loss | | | Y | | Y | | |
| | **1613** | RTI 2 Loss | | | Y | | Y | | |
| | **1614** | RTI 3 Loss | | | Y | | Y | | |
| | **1615** | A/D Loss | | | Y | | Y | | |
| | **1616** | Invalid Interrupt | | | Y | | Y | | |
| | **601** | Flash Checksum Invalid | | | Y | | Y | | |
| | **604** | RAM Failure | | | Y | | Y | | |
| J1939 Network | **1625** | Shutdown Request | | | | | | | Number of shutdown requests >= 1 |
| | **1626** | CAN Tx Failure | | | | | | | TX error counter > 100 |
| | **1627** | CAN Rx Failure | | | | | | | Rx error counter > 100 |
| | **1628** | CAN Address Conflict Failure | | | | | | | Address conflict counter > 5 |

* Adaptive Learn Key Cycle



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# Schematics

## Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

## Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the Operator's Manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

## About This Section

There are two groups of schematics in this section.

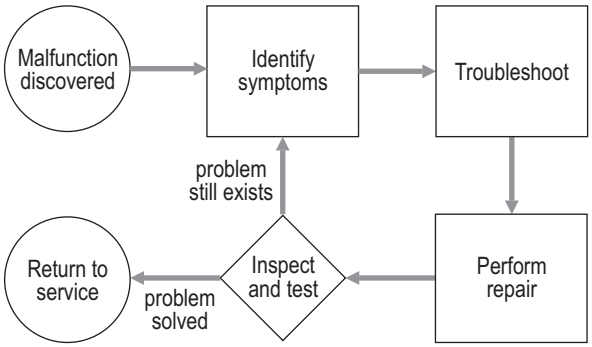
**Electrical Schematics**

**⚠WARNING** Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

**Hydraulic Schematics**

**⚠WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

**General Repair Process**



# Wire Circuit Legend

## Circuit numbering

1 Circuit numbers consist of three parts: the circuit prefix, circuit number and circuit suffix. The circuit prefix indicates the type of circuit. The circuit number describes the function of the circuit. The circuit suffix provides an abbreviation for the number or may be used to further define the function of this portion of the circuit. It also may be used to indicate the final end of the circuit, i.e., LS or limit sw.

2 The circuit number may be used more than once in a circuit.

**For Example:**

C 74 PL – This is the circuit for the lockout valve #1. C stands for control, 74 is the number of the circuit for the primary #1 lock out valve. PL stands for Primary Lockout.

S 62 BST – This is the circuit that communicates to the onboard computers of the machine that the boom is fully stowed. S stands for safety, 62 is the number of the circuit for boom stowed and BST stands for Boom Stowed.

P 48 LP – P stands for power. 48 is the circuit number for work lamps and LP stands for Lamp.

R 48 LP – R stands for relay. In this case it is the wire that feeds the relay coil for the work lamp. All other numbers remain the same.

## Circuit prefix

**C .....** Control

**D .....** Data

**E .....** Engine

**G .....** Gauges

**N .....** Neutral

**P .....** Power

**R .....** Relay Output

**S .....** Safety

**V .....** Valve

## Circuit suffix

| Definition | Suffix |
|---|---|
| AC Generator | GEN |
| Alternator Field | AF |
| Angle | ANG |
| Auxiliary Boom Valve | ABV |
| Auxiliary Forward Valve | AFV |
| Auxiliary Hydraulic Pump | AH |
| Auxiliary Platform Valve | APV |
| Auxiliary Reverse Valve | ARV |
| Auxiliary Steer/Drive Valve | ASV |
| Axle Extend Valve | AXE |
| Axle Oscillate | AXO |
| Axle Retract Valve | AXR |
| Axle Front Position | FAP |
| Axle Rear Position | RAP |
| Battery | BAT |
| Boom Extended | BEX |
| Boom Stowed | BST |
| Brake | BRK |
| Bypass Valves | BV |
| Calibrate | CAL |
| CAN Signal | CAN |
| CAN Shield | SHD |
| CATS Module | CAT |
| Chain Break | CNK |
| Data High | DTH |
| Data Low | DTL |
| Drive Chassis Controller | DCN |
| Drive Enable | DE |
| Drive Enable Left | DEL |
| Drive Enable Right | DER |
| Electrical Displacement Control | EDC |
| Envelope Light | ENV |
| Engine Speed Select | ESP |
| Engine Status Lamp | ESL |
| Envelope Lockout | ENL |
| Extend/retract Lockout | ERL |
| Filter Restricted | FLR |
| Filter Switch | FLT |
| Flashing Beacon | FB |
| Float Switch | FS |
| Footswitch Signal | FTS |
| Forward | FWD |
| Fuel Pump | FP |
| Fuel Select (gas/LP) | FL |
| Fuel Solenoid | FSL |

WIRE CIRCUIT LEGEND

| Definition | Suffix |
|---|---|
| Function Enable | FE |
| Ground Control | TCN |
| Ground | GND |
| Horn | HRN |
| High RPM | HS |
| Hydraulic Generator | HG |
| Ignition | IGN |
| Jib Bellcrank Down | JBD |
| Jib Bellcrank Up | JBU |
| Jib Sensor | JBS |
| Jib U/D Control | JUD |
| Jib Down | JD |
| Jib Up/Down Flow Control | JFC |
| Jib Select Valve | JSV |
| Jib Up | JU |
| Jib E/R Control | JER |
| Jib Ext | JBE |
| Jib Ret | JBR |
| Jib Rotate Left (CCW) | JRL |
| Jib Rotate Right (CW) | JRR |
| Joystick 5 VDC Power | JPW |
| Lamps | LPS |
| Left Front | LF |
| Left Front Steer Sensor | LFS |
| Left Rear | LR |
| Left Rear Steer Sensor | LRS |
| Limit Switch | LS |
| Lift Speed Reduction | LSR |
| Load Sensor | LDS |
| Lockout | LO |
| Low RPM | LS |
| Low fuel | LOF |
| Motor Shift (Speed) | MS |
| Multi Function Valve | MFV |
| Platform Control | PCN |
| Primary Ext/Ret Lockout | PEL |
| Platform Level Down | PLD |
| Platform Level Flow Control | PLF |
| Platform Level Up | PLU |
| Platform Rotate Flow Control | PRF |
| Platform Rotate Control | PRC |
| Platform Rotate Left (CCW) | PRL |
| Platform Rotate Right (CW) | PRR |
| Power | PWR |
| Power to Length Sensor | PSL |
| Platform Tilt Alarm | PTA |
| Platform Tilt Sensor | PTS |
| Pressure Comp Enable | PCE |
| Pressure Sender | PSR |
| Pressure Switches | PS |
| Primary Boom Angle Sensor | PBS |
| Primary Boom Down | PBD |
| Primary Boom Ext/Ret Lockout Valve | PBL |
| Primary Boom Extend | PBE |
| Primary Boom Extend/Retract Flow Control | PER |
| Primary Boom Retract | PBR |
| Primary Boom Angle Sensor | PBS |
| Primary Boom Down | PBD |
| Primary Boom Ext/Ret Lockout Valve | PBL |
| Primary Boom Extend | PBE |
| Primary Boom Extend/Retract Flow Control | PER |
| Primary Boom Retract | PBR |
| Primary Boom Up | PBU |
| Primary Boom Up/Dwn Flow Control | PUD |
| Primary Boom Extend/Retract Signal | PLS |
| Primary Boom Up/Down Signal | PES |
| Primary Lockout | PL |
| Primary Length Sensor | PSL |
| Propel Signal | JPL |
| Program Setup Enable | PSE |
| Propel Lockout | PLL |
| Proportional Valve | PRV |
| Proximity Sensor | PXS |
| Receptacle | REC |
| Recovery | RCV |
| Retract Lockout | RL |
| Return | RET |
| Reverse | REV |
| Right Front | RF |
| Right Front Steer Sensor | RFS |
| Right Rear | RR |
| Right Rear Steer Sensor | RRS |
| RPM | RPM |
| Secondary Boom Angle Sensor | SBS |
| Secondary Boom Elevated | SBL |
| Sec Boom Down | SBD |
| Sec Boom Extend | SBE |
| Sec Boom Extend/Retract Flow Control | SER |
| Sec Boom Retract | SBR |
| Sec Boom Up | SBU |
| Sec Boom Up/Dwn Flow Control | SUD |
| Secondary Boom | SB |

**This list continues on the next page.**

WIRE CIRCUIT LEGEND

| Definition | Suffix |
|---|---|
| Secondary Boom Lockout Valve (Extend) | SLE |
| Secondary Boom Lockout Valve (Riser Down) | SLD |
| Sensor | SEN |
| Spare | SP |
| Speed Sensor | SS |
| Start Aid (Glow Plug or choke) | SA |
| Starter | STR |
| Steer Control Signal | STC |
| Steering Valve Clockwise | SCW |
| Steering Valve Counter Clockwise | SCC |
| Temp Sender | TSR |
| Temp Switches | TS |
| Tether | TET |
| Tilt Alarm X axis | TAX |
| Tilt Alarm Y axis | TAY |
| Turntable or Ground Control Panel | TCN |
| Turntable Rotate Flow Control | TRF |
| Turntable Rotate Right (CW) | TRR |
| Turntable Rotate Signal | TRS |
| Turntable Tilt Alarm | TTA |
| Turntable Tilt Sensor | TTS |
| Test Switch | TSW |

## Wire Coloring

1 All cylinder extension colors are solid and all retract functions are striped black. When using black wire, the stripe shall be white.

2 All rotations that are LEFT or CW are solid, RIGHT or CCW are striped and black. When the wire is black, the stripe is white.

3 All proportional valve wiring is striped.

## Wire Color Legend

| | |
|---|---|
| BL | Blue |
| BL/BK | Blue/Black |
| BL/RD | Blue/Red |
| BL/WH | Blue/White |
| BK | Black |
| BK/RD | Black/Red |
| BK/WH | Black/White |
| BR | Brown |
| GR | Green |
| GR/BK | Green/Black |
| GR/WH | Green/White |
| RD | Red |
| RD/BK | Red/Black |
| RD/WH | Red/White |
| OR | Orange |
| OR/BL | Orange/Blue |
| OR/BK | Orange/Black |
| OR/RD | Orange/Red |
| WH | White |
| WH/BK | White/Black |
| WH/RD | White/Red |
| YL | Yellow |

WIRE CIRCUIT LEGEND

| Color | Circuit # | Primary function |
|---|---|---|
| RD | 1 | Primary boom up drive |
| RD/BK | 2 | Primary boom down drive |
| RD/WH | 3 | Primary boom up/dwn FC proportional valve drive |
| WH | 4 | Turntable rotate left valve drive |
| WH/BK | 5 | Turntable rotate right valve drive |
| WH/RD | 6 | Turntable rotate FC proportional valve drive |
| BK | 7 | Primary boom extend |
| BK/WH | 8 | Primary boom retract |
| BK/RD | 9 | Primary boom Extend/Retract proportional valve drive |
| BL | 10 | Secondary boom up valve drive |
| BL/BK | 11 | Secondary boom down valve drive |
| BL/WH | 12 | Secondary boom up/dwn FC proportional valve drive |
| BL/RD | 13 | Drive enable |
| OR | 14 | Platform level up valve |
| OR/BK | 15 | Platform level down valve |
| OR/RD | 16 | Platform up/dwn FC proportional valve drive |
| GR | 17 | Platform rotate left valve driver |
| GR/BK | 18 | Platform rotate right valve driver |
| GR/WH | 19 | Jib select valve driver circuit |
| RD | 20 | 12 battery supply |
| WH | 21 | 12 ignition supply |
| BK | 22 | Keyswitch power to platform ESTOP |
| WH | 23 | Power to platform |
| RD | 24 | Power to warning senders |
| WH/BK | 25 | Power to oil pressure sender |
| WH/RD | 26 | Power to temp sender |
| RD | 27 | Auxiliary power |
| RD/BK | 28 | Platform level alarm |
| RD/WH | 29 | Drive motor shift (speed) |
| WH | 30 | Forward/EDC-A |
| WH/BK | 31 | Reverse/EDC-B |
| WH/RD | 32 | Brake |
| BK | 33 | Start |
| BK/WH | 34 | Start aid (glow plug or choke) |
| BK/RD | 35 | High engine speed select |
| BL | 36 | Steer clockwise |
| BL/BK | 37 | Steer counterclockwise |
| BL/WH | 38 | Gas |
| BL/RD | 39 | LP |
| OR | 40 | Limit switch signal stowed |
| OR/BK | 41 | RPM signal |
| OR/RD | 42 | Boom retracted signal |
| GR | 43 | Jib up |
| GR/BK | 44 | Jib down |
| GR/WH | 45 | AC Generator |
| WH | 46 | Drive horn |
| WH/BK | 47 | Output power enable |
| WH/RD | 48 | Work lamp |
| WH/BK | 49 | Motion lamp |
| BL | 50 | Auxiliary boom |
| BL/WH | 51 | Auxiliary steer |
| BL/RD | 52 | Auxiliary platform |
| WH/BK | 53 | Boom envelope safety valve cutoff |
| BK/WH | 54 | Power to safety interlock switches (engine) |
| GR/BK | 55 | Axle oscillation |
| RD | 56 | Foot switch/TCON estop power |
| RD/WH | 57 | Boom down safety interlock |
| RD/BK | 58 | Safety interlock to engine |
| GR/WH | 59 | Chain break circuit |
| GR/WH | 60 | Axle extend |
| GR | 61 | Axle retract |
| OR | 62 | Boom stowed (safety) |
| OR/RD | 63 | Power to boom envelope safety switch |

**This list continues on the next page.**

WIRE CIRCUIT LEGEND

| Color, Circuit #, and Primary function | | |
|---|---|---|
| OR/BK | 64 | Power for operational switches |
| BL/WH | 65 | Low fuel indication |
| BL | 66 | Drive enable |
| BL | 67 | Secondary boom not stowed |
| RD | 68 | Primary boom lowered (operational) |
| BL | 69 | Primary boom #1 extended |
| BL/WH | 70 | Primary boom #2 retracted |
| BL/BK | 71 | Primary boom #2 extended |
| GN | 72 | Secondary boom extend |
| GN/BK | 73 | Secondary boom retract |
| RD | 74 | Primary #1 Lockout |
| RD/WH | 75 | Primary #2 Lockout |
| BL | 76 | Pri boom #3 extended |
| WH | 77 | Lower angle #1 operational |
| WH/BK | 78 | Upper angle #2 operational |
| BK | 79 | power from TCON ESTOP |
| N/A | 80 | Can 2.0/J1939 Shield |
| GR | 81 | Can 2.0/J1939 Low |
| YL | 82 | Can 2.0/J1939 High |
| GR/WH | 83 | Tilt signal x axis |
| GR/BK | 84 | Tilt signal y axis |
| GR | 85 | Tilt sensor power |
| OR | 86 | Hydraulic filter restricted |
| RD | 87 | Platform level safety power |
| RD/BK | 88 | Platform level safety output |
| BR | 89 | Platform level safety ground |
| RD/BK | 90 | Proximity kill |
| RD/WH | 91 | Gate Interlock |
| WH/BK | 92 | Motor speed (LO/HI) |
| WH/RD | 93 | Motor bypass |
| WH | 94 | Load sensor |
| OR | 95 | Tether ESTOP return |
| RD | 96 | Tether power |
| BK | 97 | Tether ESTOP power |
| WH | 98 | J1708 + (high) |

| Color, Circuit #, and Primary function | | |
|---|---|---|
| BK | 99 | J1708 - (low) |
| WH/RD | 100 | Outrigger lowered |
| WH/BK | 101 | Outrigger raised |
| OR | 102 | Pothole protector up |
| OR/RD | 103 | Pothole protector down |
| BK/WH | 104 | Proprietary data buss – (i.e. ITT or AP) |
| BK/RD | 105 | Proprietary data buss + (i.e. ITT or AP) |
| GR | 106 | Spare |
| RD | 107 | Alternator field |
| BL/WH | 108 | Engine status |
| GR/WH | 109 | Sensor pwr |
| BK | 110 | Sensor return |
| OR | 111 | Steer signal |
| RD | 112 | Steer signal to solenoid valve |
| OR/RD | 113 | Multi function valve |
| BK/RD | 114 | Load moment overweight |
| RD/BK | 115 | Load moment underweight |
| OR | 116 | Hydraulic oil cooler |
| RD | 117 | Flashing beacon |
| OR | 118 | Lift speed reduction |
| BL | 119 | Hydraulic pressure sensor output |
| OR | 120 | Oil cooler fan |
| GR | 121 | Axle oscillate LEFT |
| GR/BK | 122 | Axle oscillate RIGHT |
| RD/BK | 123 | Primary boom angle signal operational |
| RD/WH | 124 | Secondary boom angle signal operational |
| WH/RD | 125 | Secondary boomlockout (Ext Enable) |
| WH/BK | 126 | Secondary boom lockout (Riser Down Enable) |
| GR | 127 | ECU test switch |
| OR/RD | 128 | Low engine speed |

WIRE CIRCUIT LEGEND

| Color | Circuit # | Primary function |
|---|---|---|
| RD/BK | 129 | Descent alarm |
| WH/RD | 130 | Travel alarm |
| BL | 131 | Motion alarm |
| GR | 132 | Platform load input |
| GR/WH | 133 | Platform load alarm |
| GR/BK | 134 | Key switch power |
| BL/WH | 135 | Fuel pump |
| RD | 136 | Power to safety module |
| RD/WH | 137 | Propel power (P_38) |
| RD/BK | 138 | Pri boom up/sec boom dwn-Ext (P_11/30) |
| WH/RD | 139 | Turntable rot FC safety (P_39) |
| OR/RD | 140 | Boom envelope safety |
| RD | 141 | Primary boom angle signal safety |
| OR | 142 | Secondary boom angle signal safety |
| BL/RD | 143 | Drive enable left |
| BL/WH | 144 | Drive enable right |
| RD/WH | 145 | Calibrate |
| BL | 146 | Jib bellcrank up FC |
| BL/BK | 147 | Jib bellcrank down FC |
| BL/WH | 148 | Jib bellcrank sensor |
| GR/WH | 149 | Jib Up/Down FC |
| GR/BK | 150 | Hydraulic generator bypass |
| GR | 151 | Hydraulic EDCoutput |
| BK | 152 | Injector retard |
| BK | 153 | Jib extend |
| BK/WH | 154 | Jib retract |
| OR/RD | 155 | Pressure comp enable |
| GN/WH | 156 | Jib Up/Down |
| BK/RD | 157 | Jib Ext/Ret |
| BL/RD | 158 | Spare |
| BL/WH | 159 | Steer joystick signal |
| WH/RD | 160 | Propel joystick signal |
| WH/BK | 161 | Sec boom joystick signal |
| OR | 162 | Joystick 5 VDC power |

| Color | Circuit # | Primary function |
|---|---|---|
| BL/WH | 163 | Pri extend/retract signal |
| RD/WH | 164 | Pri up/down signal |
| WH/RD | 165 | TT Rotate signal |
| OR | 166 | Boom length signal safety |
| OR/BK | 167 | Boom length signal operational |
| BL/RD | 168 | Primary boom hydraulic valve lockout |
| GN | 169 | Envelope active LED |
| WH/RD | 170 | Load sense relay source |
| WH/BK | 171 | Load sense relay sink |
| BL | 172 | UP/DN flow control ground |
| BK | 173 | Ext/Ret flow control ground |
| WH | 174 | Key switch power, ground position |
| WH/BK | 175 | Load sensor signal operational |
| GN/WH | 176 | Secondary extend/retract FC |
| BL/RD | 177 | Extend/retract lockout |
| BK | 178 | Control module status light |
| GN | 179 | Drive power relay |
| BK | 180 | Lift power relay |
| OR | 181 | 48 Volt alternator field (or battery) |
| RD | 182 | 24 Volt battery |
| BL | 183 | Envelope or load sense recovery |
| WH | 184 | Program setup enable |
| WH | 185 | Encode A |
| BL | 186 | Encode B |
| BL | 187 | Bootstrap or program enable |
| GR | 188 | Safety cross check |
| BK | 189 | Data receive |
| BK/WH | 190 | Data transmit |
| WH/RD | 191 | Multi-Function pressure relief |
| WH/BK | 192 | Jib rotate left |
| WH/RD | 193 | Jib rotate right |
| WH/RD | 194 | Speed select input |
| OR/RD | 195 | Electric brake source |
| YL | 196 | 2.5V Sensor power |
| BR | N/A | Ground or return |

# Limit Switches and Angle Sensors

## Types of Limit Switches

There are two types of limit switches, found in various locations throughout the machine: mechanical-type **operational** or **safety** switches. As in aircraft, which features redundant safety systems, each mechanical operational switch is backed up with a separate, independently functioning safety switch.

The mechanical-type **operational** or **safety** switches are used to sense a positive displacement or movement of the limit switch actuator, or arm, as the machine moves through its range of operational functions. Included in this group are envelope limit switches which sense the extended length and angle of the booms and rotational position of the turntable.

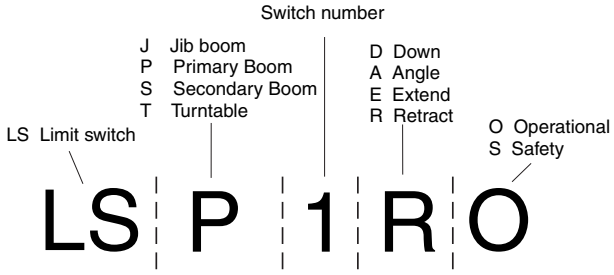
For example, when the secondary boom is fully raised and the operational switch is activated, it tells the ECM at the ground controls to start extending the secondary boom.

Another example is the drive enable limit switch, which disables the drive function anytime the boom is rotated past the rear axles, indicated by the 'circle' end of the drive chassis.
In some cases, the engine will be stopped if safety parameters are exceeded.

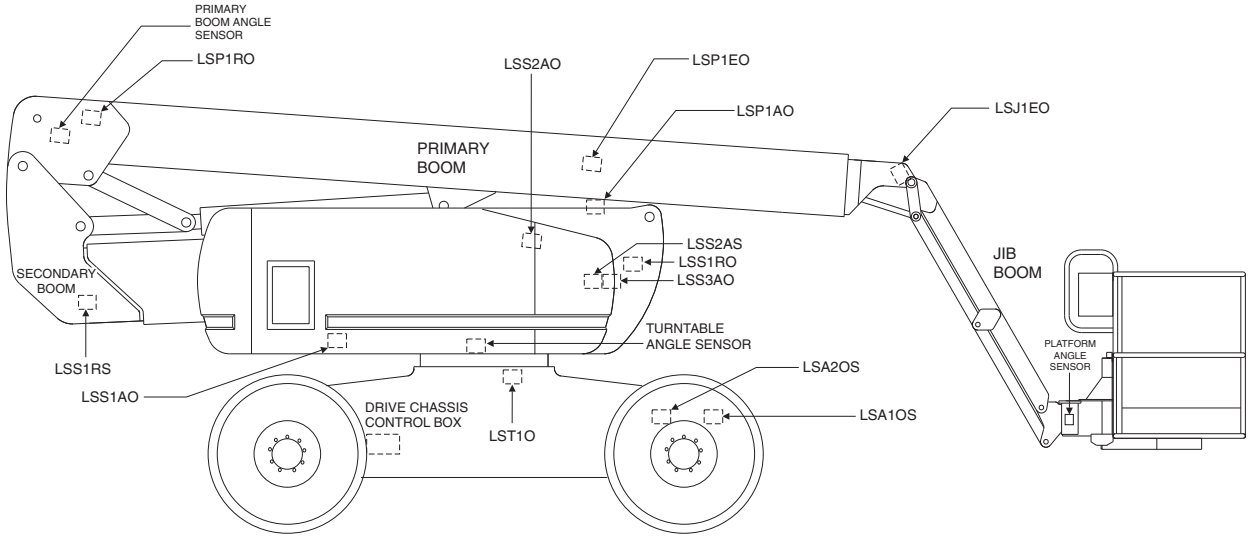
## Limit Switch Numbering

| | |
|---|---|
| LSP1AO | Primary boom angle stowed |
| LSP1RO | Primary boom length retracted |
| LSP1EO | Primary boom length fully extended |
| LSS1AO | Secondary boom angle, fully stowed |
| LSS2AO | Secondary boom angle, fully raised |
| LSS3AO | Secondary boom angle, 25° to 30° |
| LSS2AS | Secondary boom angle safety |
| LSS1RO | Secondary boom fully retracted |
| LSS1RS | Secondary boom fully retracted, safety |
| LSJ1EO | Platform level fully extended |
| LST1O | Drive enable mechanical |
| LSA1OS | Oscillate axle, right side |
| LSA2OS | Oscillate axle, left side |

### Numbering Legend



# Limit Switch and Angle Sensor Legend




**LSA1OS:** Limit switch, Axle #1 Oscillating Operational. Activates the axle oscillate circuit on the right side.

**LSA2OS:** Limit switch, Axle #2 Oscillating Operational. Activates the axle oscillate circuit on the left side.

**LST1O:** Limit switch, Operational. Activates the drive enable zone.

**Turntable Angle Sensor:** Measures the X axis and Y axis of the turntable. The alarm sounds at 4.5 degrees.

**Primary Boom Angle Sensor (PBS):** Measures the Y axis angle of the primary boom. The operational range shall be +33 degrees to +73 degrees. The safety cutouts are set at +70 degrees and will disable boom up and stop the engine.

**Platform Angle Sensor:** Measures the angle of the platform. The range of measurement is +/- 20 degrees. The safety cutout is set at +/- 10 degrees from gravity and will disable the primary and secondary boom up/down functions and the platform level up/down functions.

**LSS2AO:** Limit switch, Secondary Boom #2 Angle Operational Switch. Secondary boom angle full extension, angle up all the way (secondary boom extend allowed).

**LSS3AO:** Limit switch, Secondary Boom #3 Angle Operational Switch. Secondary boom elevated to 30-35 degrees. Used to switch platform/primary boom leveling parameters.

**LSS2AS:** Limit switch, Secondary Boom #2 Angle Safety Switch. Secondary boom angle full extension, angle up all the way (secondary boom extend allowed).
Backup switch for LSS2AO.

**LSS1RO:** Limit switch, Secondary Boom #1 Retract Operational Switch. Secondary boom fully retracted (secondary boom down allowed).

**LSS1RS:** Limit switch, Secondary Boom #1 Retract Safety Switch. Secondary boom fully retracted (secondary boom down allowed). Backup switch for LSS1RO.

**LSS1AO:** Limit switch, Secondary Boom #1 Angle Operational Switch. Open when the secondary boom is fully lowered, closes when the boom is raised out of the stowed position. This switch limits the drive speed and disables the drive motor destroke. The other contacts close when the boom is fully lowered allowing the platform to be tucked underneath the mast for transport.

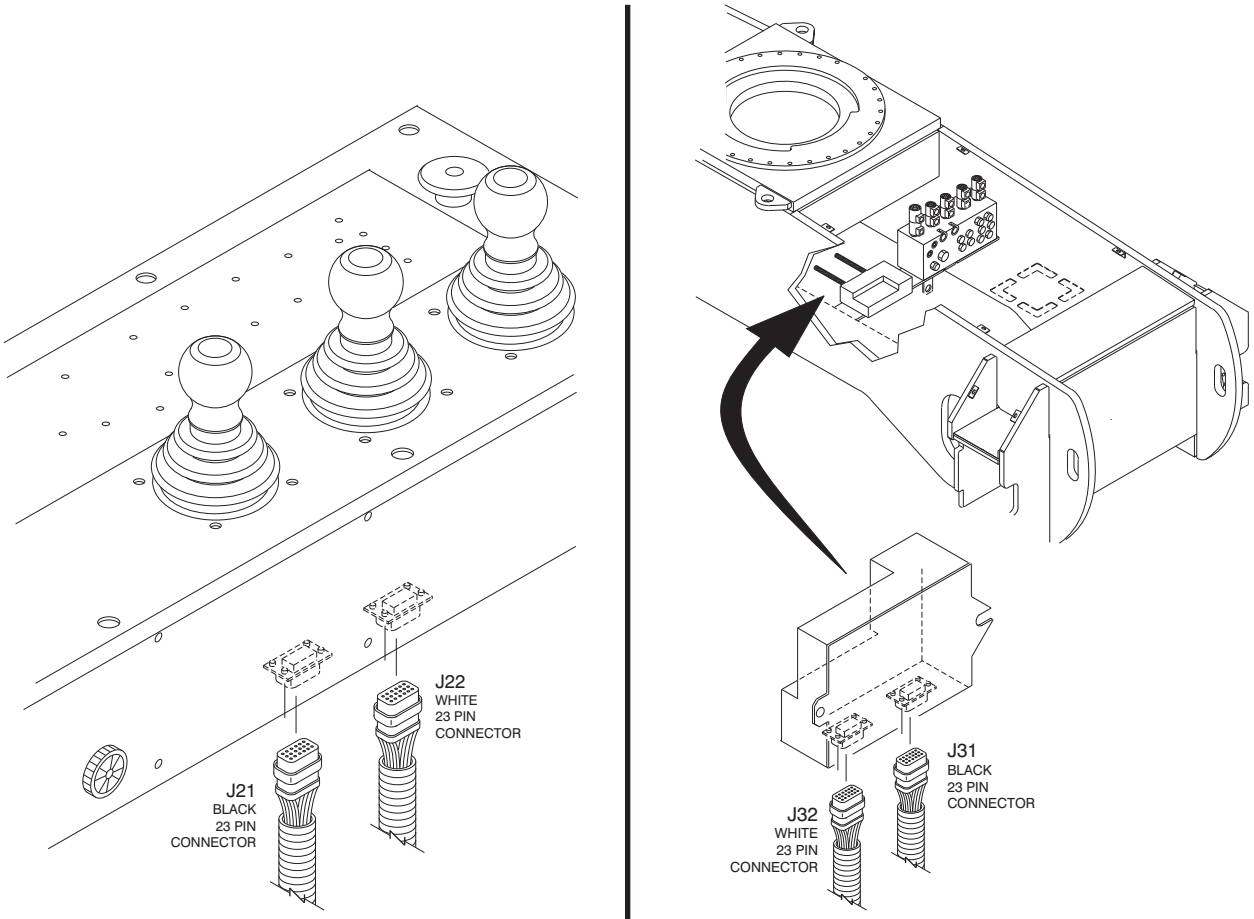
**LSP1AO:** Limit Switch, Primary Boom #1 Angle Operational. One side closes when the primary boom is raised from the stowed position, disabling the drive motor destroke and limiting the drive speed. The other side of the switch closes when the boom is fully lowered allowing the platform to be tucked underneath the mast for transport.

**LSJ1EO:** Limit Switch, Jib Boom #1. Closes when the platform leveling cylinder is fully extended, disabling the primary boom down function.

**LSP1EO:** Limit Switch, Primary Boom #1 Extend Operational. Switch closes as the primary boom extends the last 6 to 12 inches signaling the computer.

**LSP1RO:** Limit Switch, Primary Boom #1 Retract Operational. Switch closes when the primary boom is fully retracted.

# Drive Chassis and Platform Controller Pin Legend

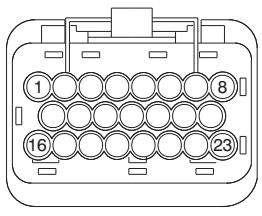



**PCON**
*PLATFORM CONTROLLER*
*J22*

1 = VLVRET7 - BR
2 = (UNUSED)
3 = C17PRL - GR
4 = C18PRR - GR/BK
5 = C43JU - GR
6 = C44JD - GR/BK
7 = C14PLU - OR
8 = C15PLD - OR/BK
9 = (UNUSED)
10 = R90PXS - RD/BK
11 = C90PXS - RD/BK
12 = (UNUSED)
13 = (UNUSED)
14 = (UNUSED)
15 = C88PTS - RD/BK
16 = R56PTS - RD
17 = C56PTS - RD
18 = S14PLU - RD
19 = PLATRET - BR
20 = C84TAY - GR/BK
21 = P85PTS - GR
22 = PTSRET - BR
23 = P87PTS - RD

**PCON**
*PLATFORM CONTROLLER*
*J21*

1 = GND PCON - BR
2 = P52PCON - BL/RD
3 = (UNUSED)
4 = S56PRV - RD
5 = (UNUSED)
6 = (UNUSED)
7 = P56PRV - RD
8 = (UNUSED)
9 = (UNUSED)
10 = D80SHIELD
11 = (UNUSED)
12 = (UNUSED)
13 = (UNUSED)
14 = (UNUSED)
15 = C47OUT - WH/BK
16 = C46HRN - WH
17 = D81CAN(-) - GR
18 = D82CAN(+) - YL
19 = (UNUSED)
20 = (UNUSED)
21 = (UNUSED)
22 = (UNUSED)
23 = P23PCON - BK




PIN NUMBERING FOR
23 PIN
CONNECTORS

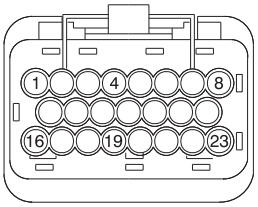
**DCON**
*DRIVE CHASSIS CONTROLLER*
*J32*

1 = VLVRET - BR
2 = V61AXRT - GR
3 = V60AXEX - GR/WH
4 = V29MS - RD/WH
5 = (UNUSED)
6 = V52AFV - BL/RD
7 = V52REV - BL/RD
8 = V36RRS - BL
9 = V37RRS - BL/BK
10 = C111RRS - OR
11 = C111LRS - OR
12 = C111RFS - OR
13 = C111LFS - OR
14 = VLVRET2 - BR
15 = V32BRK - WH/RD
16 = V36LRS - BL
17 = V37LRS - BL/BK
18 = V36RFS - BL
19 = P110RT - BK
20 = P109ANG - GR/WH
21 = V37RFS - BL/BK
22 = V36LFS - BL
23 = V37LFS - BL/BK

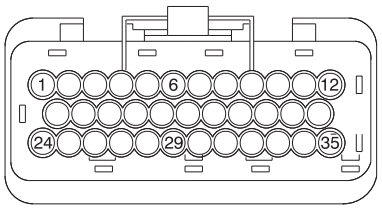
**DCON**
*DRIVE CHASSIS CONTROLLER*
*J31*

1 = GND-DCON - BR
2 = P21DCON - WH
3 = P53LS - RD
4 = (UNUSED)
5 = S56PRV - RD
6 = C61AXRT - GR
7 = (UNUSED)
8 = AXLE RET GND
9 = C61LS - GR
10 = D80SHLD
11 = RS232 RXD
12 = RS232 TXD
13 = BOOT
14 = (UNUSED)
15 = C61LS(A) - GR
16 = (UNUSED)
17 = D81CAN(-) - GR
18 = D82CAN(+) - YL
19 = RS232 GND
20 = (UNUSED)
21 = (UNUSED)
22 = (UNUSED)
23 = C61LS(A) - GR

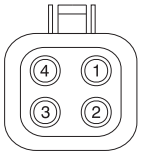
# Turntable Controller Pin Legend



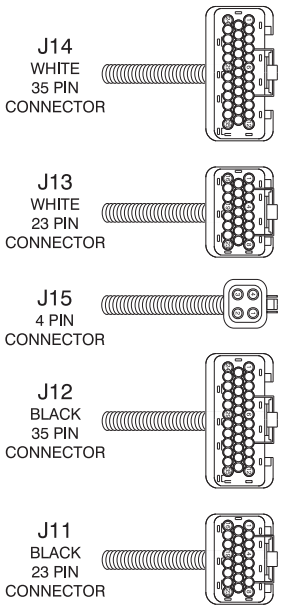

PIN NUMBERING FOR
23 PIN
CONNECTORS

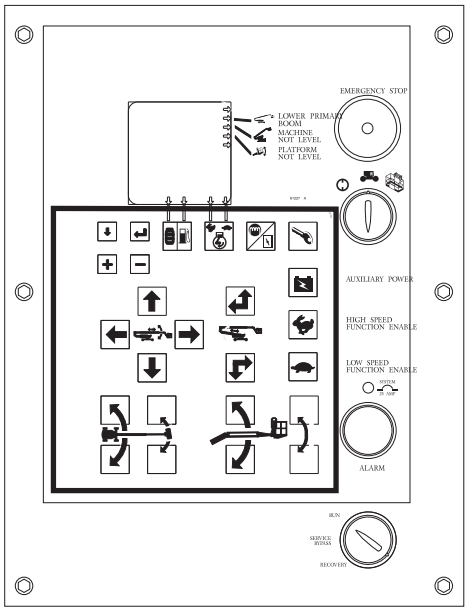



PIN NUMBERING FOR
35 PIN
CONNECTORS




PIN NUMBERING FOR
4 PIN
CONNECTOR




## TCON
*TURNTABLE CONTROLLER*
*J11*

1 = GNDPCON - BR
2 = P52PCON - BL/RD
3 = C46HN - WH
4 = C47OUT - WH/BK
5 = P23PCON - BK
6 = S56PRV - RD
7 = P56PRV - RD
8 = R48LP - WH/RD
9 = R49LP - WH/BK
10 = D80-SHIELD
11 = (UNUSED)
12 = (UNUSED)
13 = (UNUSED)
14 = S132LDS - BL/WH
15 = P97TET - BK
16 = (UNUSED)
17 = D81CAN(-) - GR
18 = D82CAN(+) - YL
19 = (UNUSED)
20 = TETFUNC - WH
21 = TETGND - BR
22 = P96TET - RD
23 = P95TET - OR

## TCON
*TURNTABLE CONTROLLER*
*J12*

1 = GNDDCON - BR
2 = P21DCON - RD
3 = P53LS - WH/BK
4 = P54ENG - BK/WH
5 = S56PRV - RD
6 = P21DCON - RD
7 = P58LS - RD/BK
8 = S59SBE - GR/WH
9 = S121PBU - GR
10 = P53LS - WH/BK
11 = P53LS - WH/BK
12 = S59SBE- GR/WH
13 = C64LS - OR/BL
14 = C65LOF - BL/WH
15 = C66DREN - BL
16 = C73SBR - BL/RD
17 = C68PBD - RD
18 = C64LS - OR/BL
19 = C70PBR - BL/WH
20 = C71PBE - BL/BK
21 = C67SBD - BL
22 = C77SBU - WH
23 = V74PRLO - RD
24 = V75PRLO - RD/WH
25 = SNSR GND - BR
26 = BOOM ANGLE PWR
27 = G119SR - BL
28 = C124SBL - RD/BK
29 = C77AS - WH
30 = C78PS - WH/BK
31 = P56PRV - RD
32 = PRIMARY ANGLE SENSOR INPUT
33 = SEC. ANGLE SENSOR INPUT
34 = P30
35 = VLVRET1 - BR

## TCON
*TURNTABLE CONTROLLER*
*J13*

1 = VLVRET1 - BR
2 = C35RPM - BK/RD
3 = C21IGN - WH
4 = C34SA - BK/WH
5 = V30FWD - WH
6 = V31REV - WH/BK
7 = C46HN - WH
8 = C39LP - BL/RD
9 = C33STR - BK
10 = C30EDC - WH
11 = C31EDC - WH/BK
12 = C25PSR - WH/BK
13 = C26TSR - WH/RD
14 = RET85TTSR - GR
15 = P85TTSR - GR
16 = VLVRET2 - BR
17 = (UNUSED)
18 = C41RPM - OR/BK
19 = (UNUSED)
20 = C83TAX - GR/WH
21 = C84TAY - GR/BK
22 = C45GEN - GR/WH
23 = VLVRET3 - BR

## TCON
*TURNTABLE CONTROLLER*
*J15*

1 = BATVLV - RD
2 = BATGND - BR
3 = BATGND - BR
4 = BATECU - RD

## TCON
*TURNTABLE CONTROLLER*
*J14*

1 = VLVRET4 - BR
2 = C03PBF - RD/WH
3 = C09PERF - BK/RD
4 = C06TRF - WH/RD
5 = C12FBFC - BL/WH
6 = C72SBE - BL/WH
7 = CO1PBU - RD
8 = C02PBD - RD/BK
9 = C07PBE - BK
10 = C08PBR - BK/WH
11 = (UNUSED)
12 = C115SD - BL/BK
13 = R49LP - WH/BK
14 = VLVRET5 - BR
15 = S73SLD - GR/BK
16 = (UNUSED)
17 = S10SLE - BL
18 = C114LS - BK/RD
19 = (UNUSED)
20 = C73SBR - BL/RD
21 = C72SBE - BL/WH
22 = (UNUSED)
23 = C113MFV - OR/RD
24 = (UNUSED)
25 = C04TRL - WH
26 = C05TRR - WH/BK
27 = VLVRTN7 - BR
28 = (UNUSED)
29 = (UNUSED)
30 = VLVRET6 - BR
31 = (UNUSED)
32 = C27AUX - RD
33 = P125SBLE - WH/RD
34 = P126SBLD - WH/BK
35 = (UNUSED)

# Engine Relay and Fuse Panel Legend

## Deutz TD2011L04i models

| | | | | |
|---|---|---|---|---|
| | CR23 Lights Option | | | |
| CR28 Eng. Run/ Alt. Field Relay | CR17 Oil Cooler Relay | F20 20A Hi/Lo RPM | F23 30A Eng/Str/Alt | B1 Battery |
| | | F22 60A Glow Plug | F7 20A Cooler | B2 Battery |
| | CR5 Horn Relay | R21 Ignition / Ground | CR1 Start Relay | CR15 Glow Plug |

## Deutz 2.9TF models

| | | | | |
|---|---|---|---|---|
| CR2 Eng. Run/ Alt. Field Relay | CR17 Oil Cooler Relay | F27 30A ECU Power | F23 30A Eng/Str/Alt | B1 Battery ● ● B2 Battery |
| | | F22 60A Glow plug | F7 30A Horn/Options | |
| CR28 Fuel Pump | CR5 Horn Relay | CR39 Engine Shutdown | CR23 Lights Relay Option | CR41 Flashing Beacons Option |
| | | R21 Ignition ● ● Ground | 70A | CR15 Glow Plug 70A |

## Continental models

| | | | |
|---|---|---|---|
| | CR23 Lights Option | | |
| CR17 Oil Cooler Relay | F17 30A Engine | | B1 Battery |
| | | F7 20A Oil Cooler | B2 Battery |
| CR5 Horn Relay | R21 Ignition / Ground | CR1 Start Relay | |

## Perkins 804D models

| | | | | |
|---|---|---|---|---|
| | CR23 Lights Option | | | |
| CR28 Eng. Run/ Alt. Field Relay | CR17 Oil Cooler Relay | CB20 10A Hi/Lo RPM | F23 30A Eng/Str/Alt | B1 Battery |
| | | F22 60A Glow plug | F7 20A Cooler | B2 Battery |
| CR4 RPM Relay | CR5 Horn Relay | R21 Ignition / Ground | CR1 Start Relay | CR15 Glow Plug |

## Perkins 404F-22T models

| | | | | |
|---|---|---|---|---|
| CR2 Eng. Run/ Alt. Field Relay | CR17 Oil Cooler Relay | F27 30A ECU Power | F23 30A Eng/Str/Alt | B1 Battery ● ● B2 Battery |
| | | F22 60A Glow plug | F7 30A Horn/Options | |
| CR28 Fuel Pump | CR5 Horn Relay | CR81 ECU Power Relay | CR23 Lights Relay Option | CR41 Flashing Beacons Option |
| CR15B ARD Glow Plug | CR79 Burner Air Pump | R21 Ignition ● ● Ground | CR1 Start Relay 70A | CR15 Glow Plug 70A |

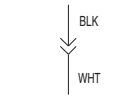
## Perkins Tier 4 Fuse Panel

B1 Battery

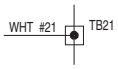
| | |
|---|---|
| F28 15A ARD Glow Plug | F26 7.5A Burner Air Pump |
| | |
| F29 5A ECU Batt #1 Linear SLND | F30 10A ECU Batt #2 ARD INJ1 |
| F32 10A ECU Batt #4 Lamp&Relay | F31 10A ECU Batt #3 ARD INJ2 |

ECU Power Relay

# Electrical Symbols Legend



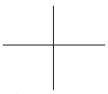
Quick disconnect terminal



T-circuits connect at terminal

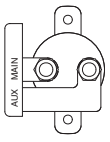

T-circuits connect


Connection no terminal


Circuits crossing no connection

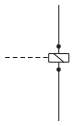

Diode


Battery



Battery separator

Circuit breaker with amperage


Coil solenoid or relay

Horn or alarm

Flashing beacon

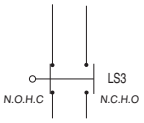
Gauge

Hour meter

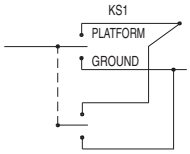
LED

Fuse with amperage

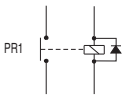

Starting aid: glow plug or flame ignitor



Limit switch

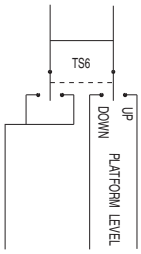


Key switch

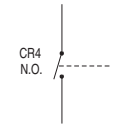


Power relay

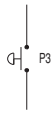
Toggle switch SPDT



Toggle switch DPDT



Control relay contact normally open



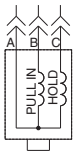
Horn button normally open

Oil temperature switch normally open

Coolant temperature switch normally open

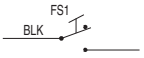
Oil pressure switch normally closed


Gauge sending unit

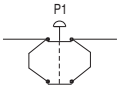


Fuel or RPM solenoid


Coil

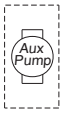


Foot switch

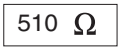


Emergency Stop button normally closed

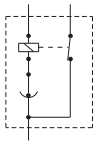
Hydraulic oil cooling fan



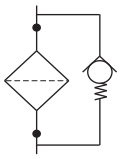
Auxiliary pump



Resistor with ohm value


Tilt sensor

# Hydraulic Symbols Legend




Filter with bypass valve relief setting

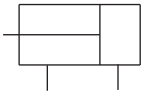
Pump fixed displacement

Pump bi-directional, variable displacement

Motor bi-directional

Motor 2-speed, bi-directional


Pump prime mover (engine or motor)



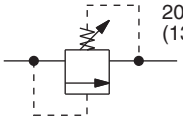
Double acting cylinder

Accumulator

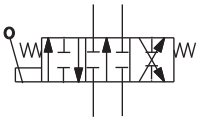

Orifice with size

Shut off valve

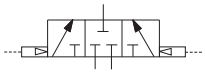
Check valve



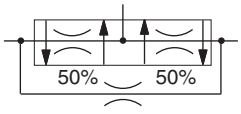

Relief valve with pressure setting



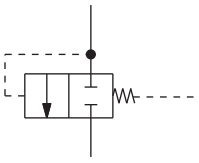
Directional valve (mechanically activated)



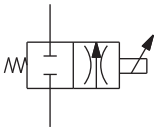
Pilot operated 3 position, 3 way, shuttle valve




Flow divider/combiner valve with pressure balancing orifice and flow percentages

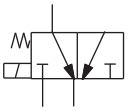


Differential sensing valve

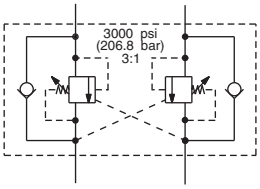


Solenoid operated proportional valve

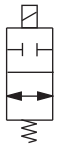
Priority flow regulator valve



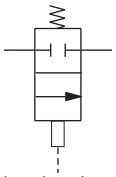
Solenoid operated 2 position, 3 way, directional valve



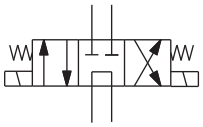

Counterbalance valve with pressure and pilot ratio



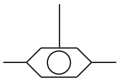
2 position, 2 way solenoid valve



Directional valve pilot operated 2 position, 2 way



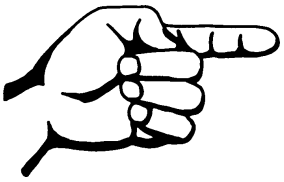
Solenoid operated 3 position, 4 way, directional valve



2 position, 3 way, shuttle valve

Hydraulic oil cooler

Brake



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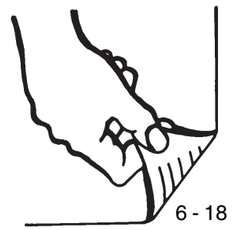
## Electrical Schematic - Engine Options

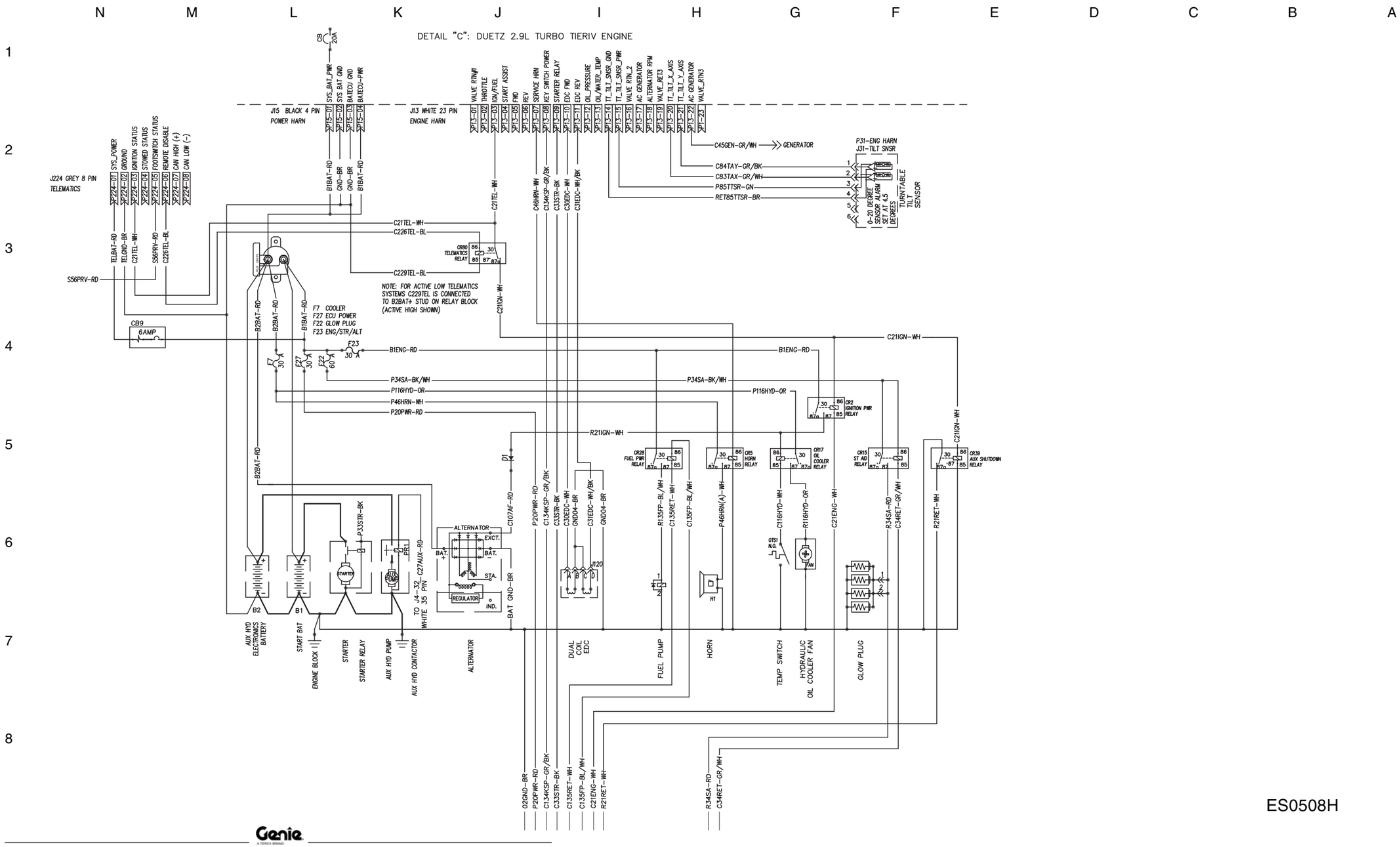
Deutz TD2.9 Engine





# Electrical Schematic - Engine Options

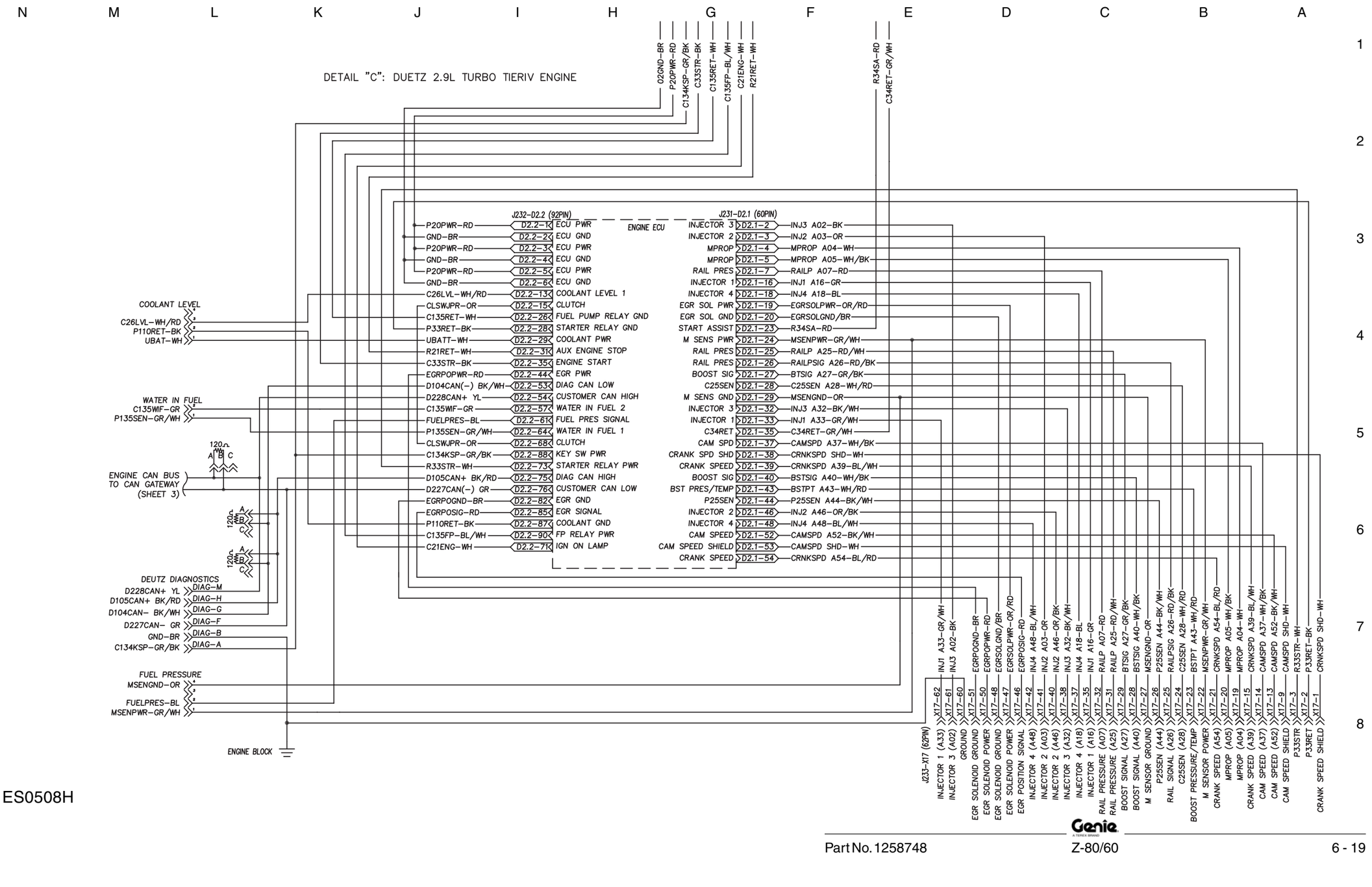
Deutz TD2.9 Engine




ES0508H

# Electrical Schematic - Engine Options

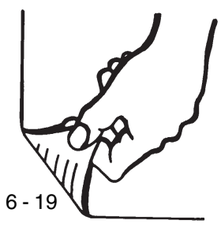
Deutz TD2.9 Engine Wiring




ES0508H

## Electrical Schematic - Engine Options

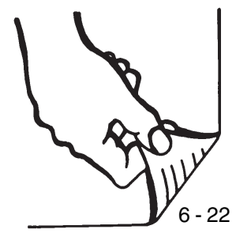
Deutz TD2.9 Engine Wiring





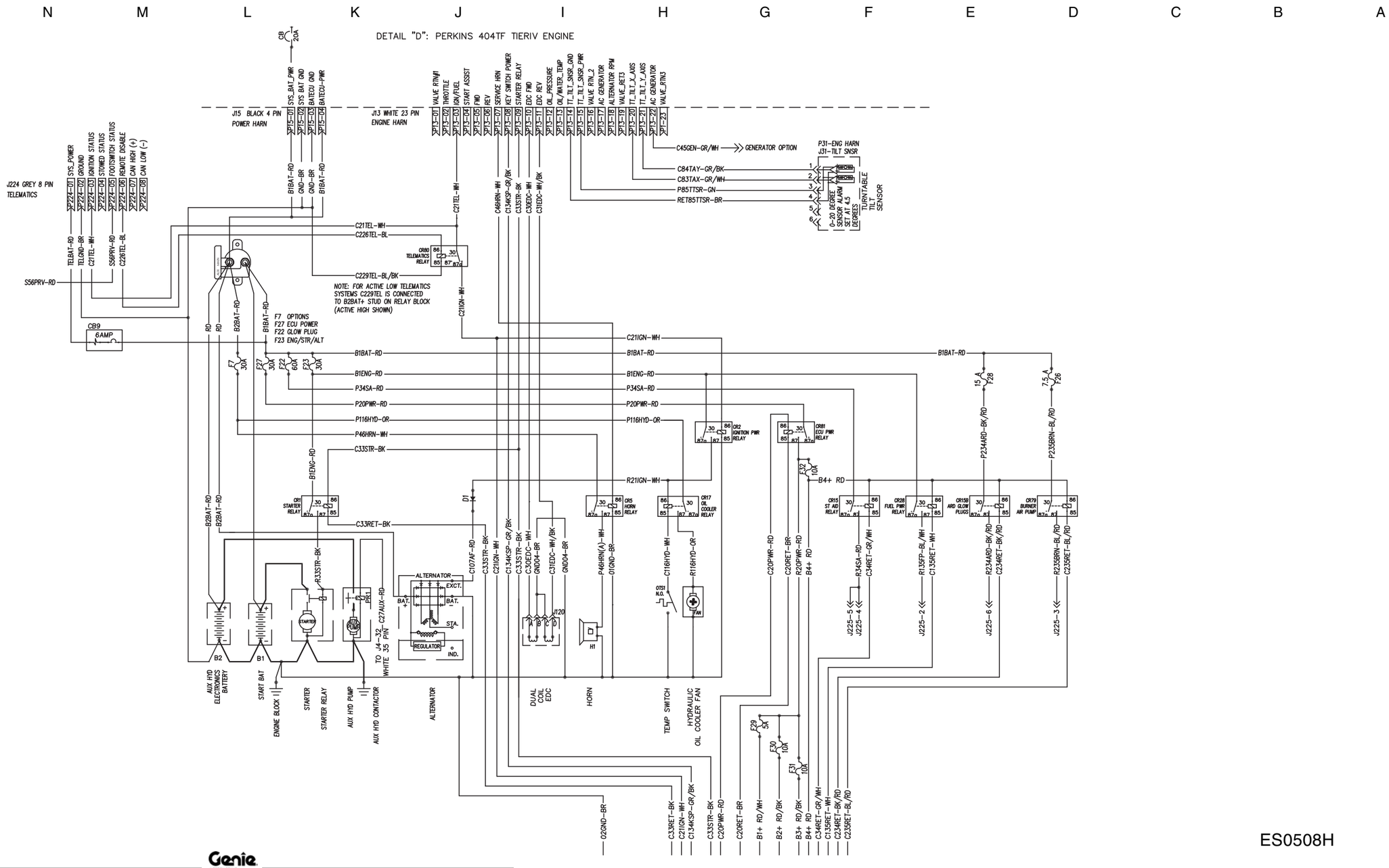


**Electrical Schematic - Engine Options**
Perkins 404F-22T Engine



# Electrical Schematic - Engine Options

Perkins 404F-22T Engine

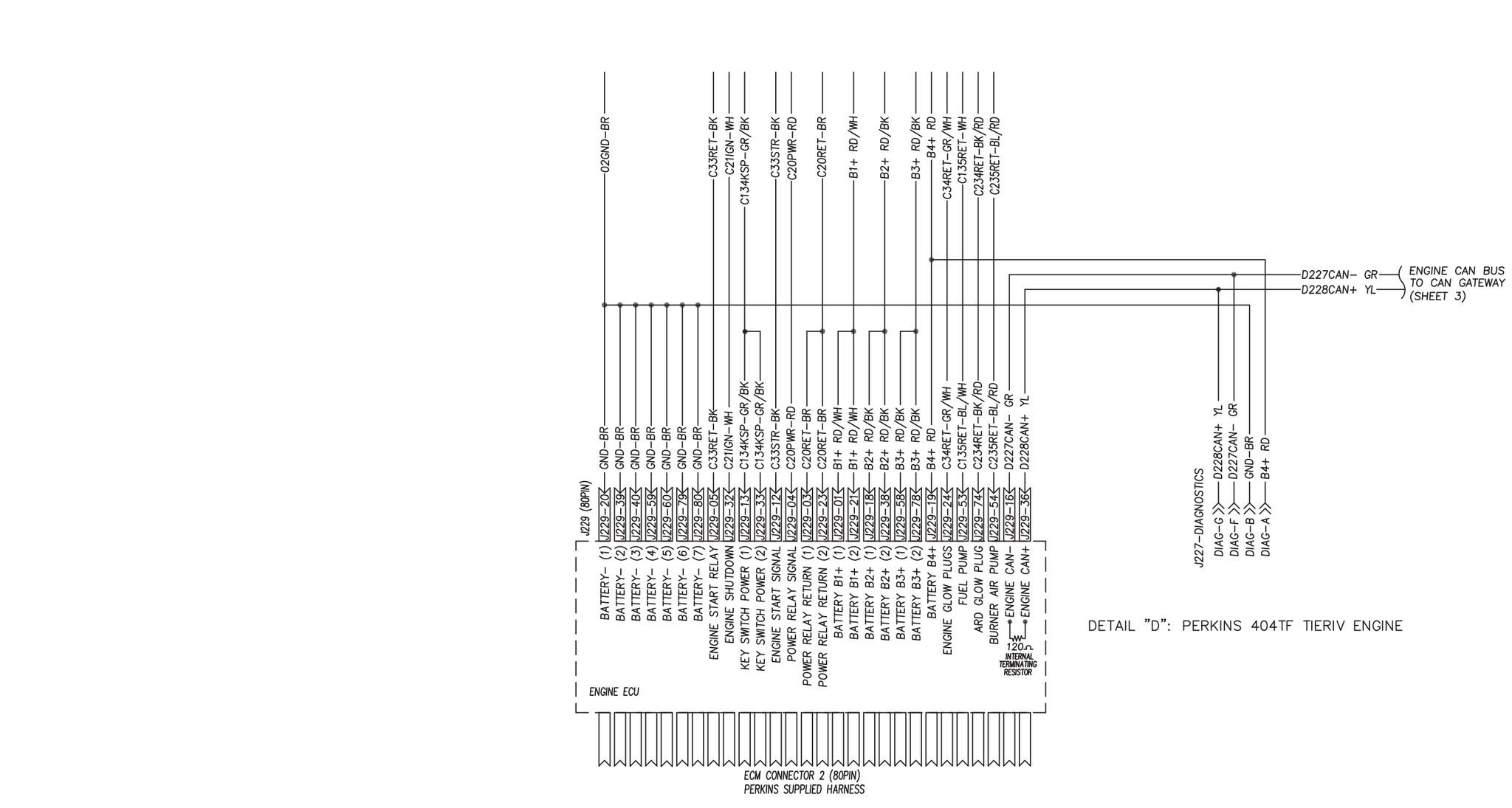





ES0508H

# Electrical Schematic - Engine Options

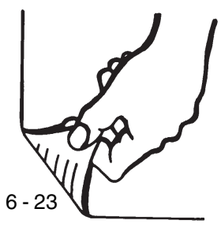
Perkins 404F-22T Engine Wiring




ES0508H

## Electrical Schematic - Engine Options

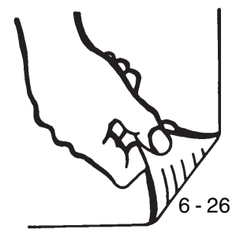
Perkins 404F-22T Engine Wiring





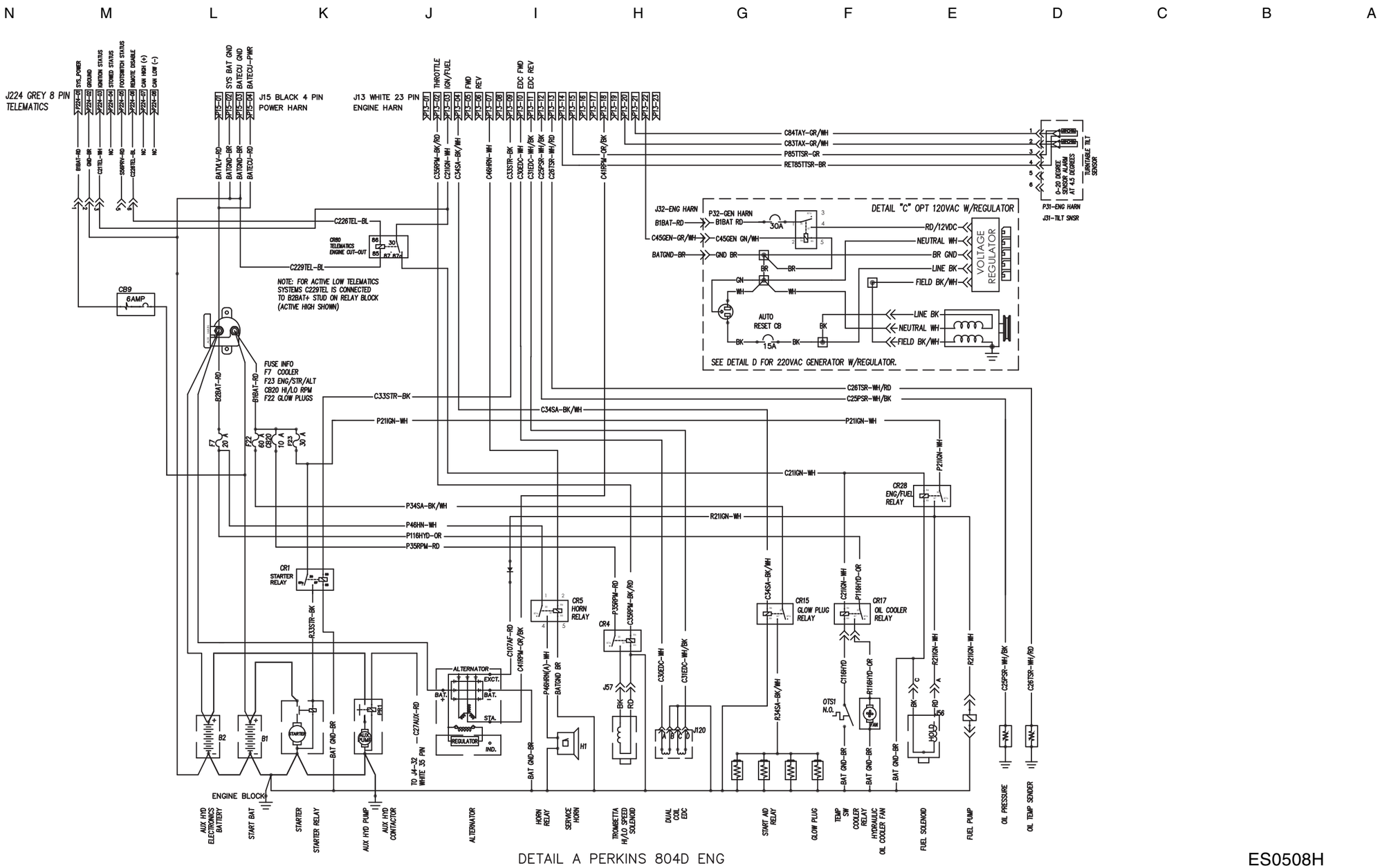


**Electrical Schematic - Engine Options**
Perkins 804D Engine



# Electrical Schematic - Engine Options

Perkins 804D Engine




DETAIL A PERKINS 804D ENG

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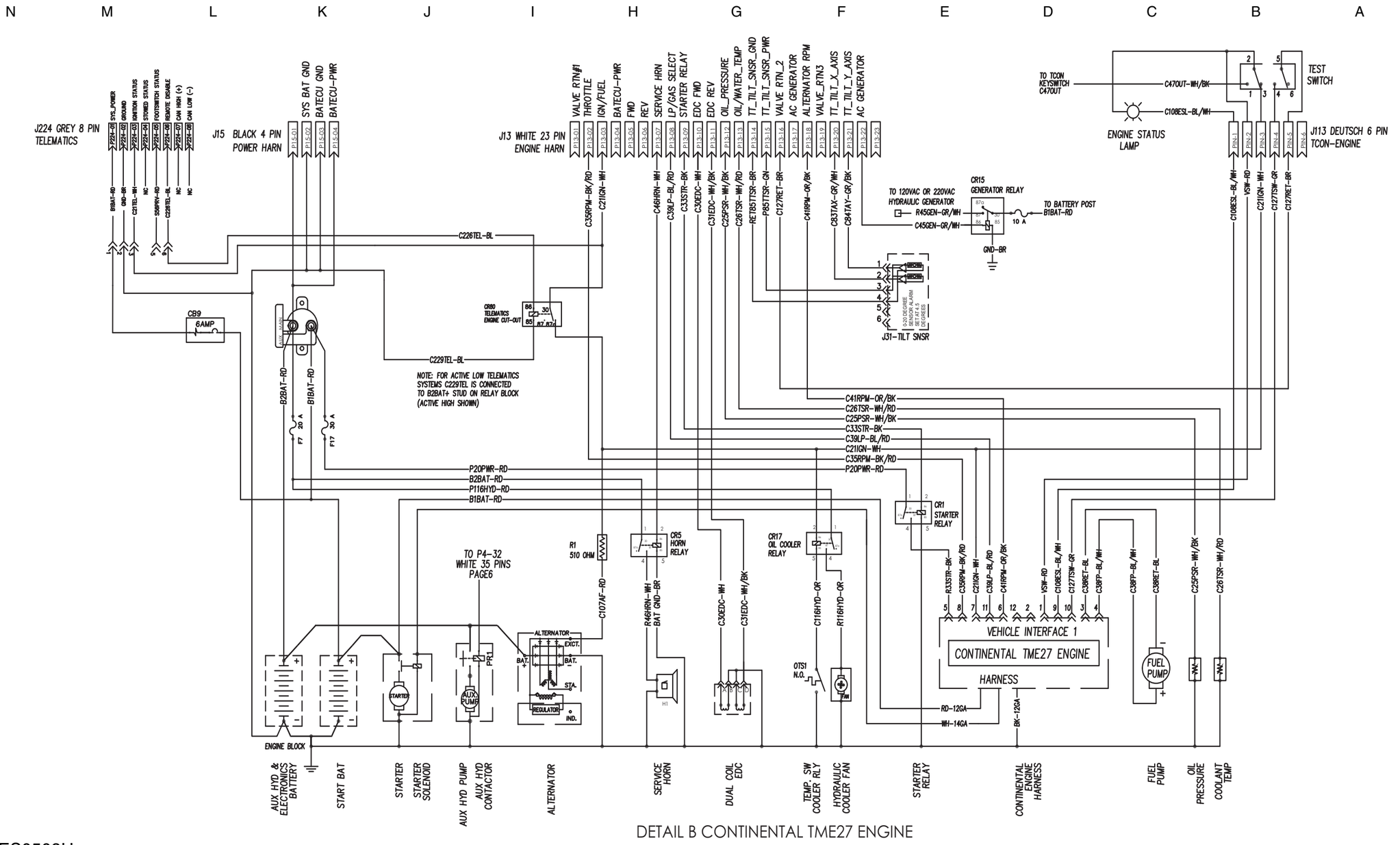
# Electrical Schematic - Engine Options

Continental TME27 Engine




DETAIL B CONTINENTAL TME27 ENGINE

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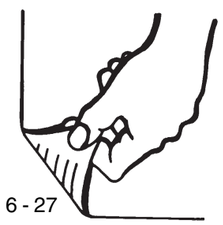
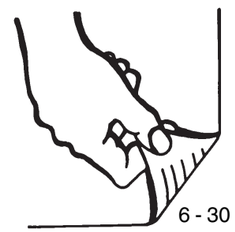
## Electrical Schematic - Engine Options

Continental TME27 Engine

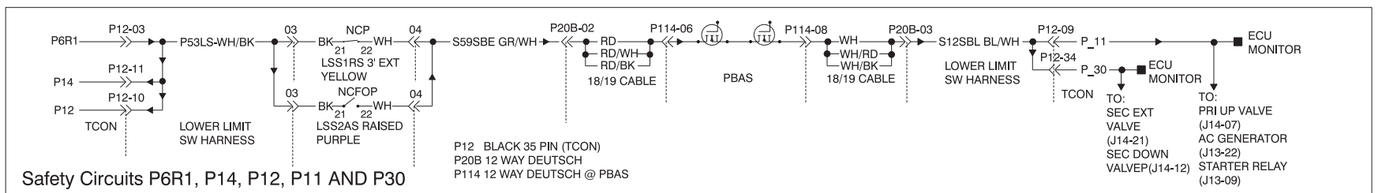


**Electrical Schematic**
Safety Circuits

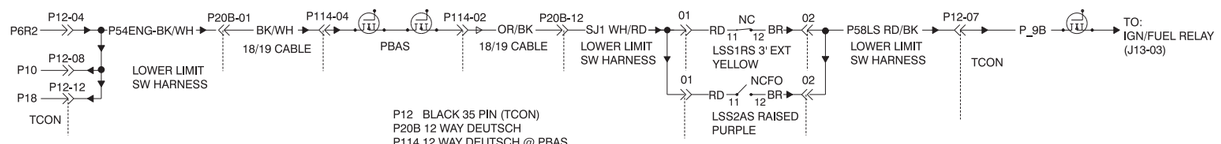


# Electrical Schematic

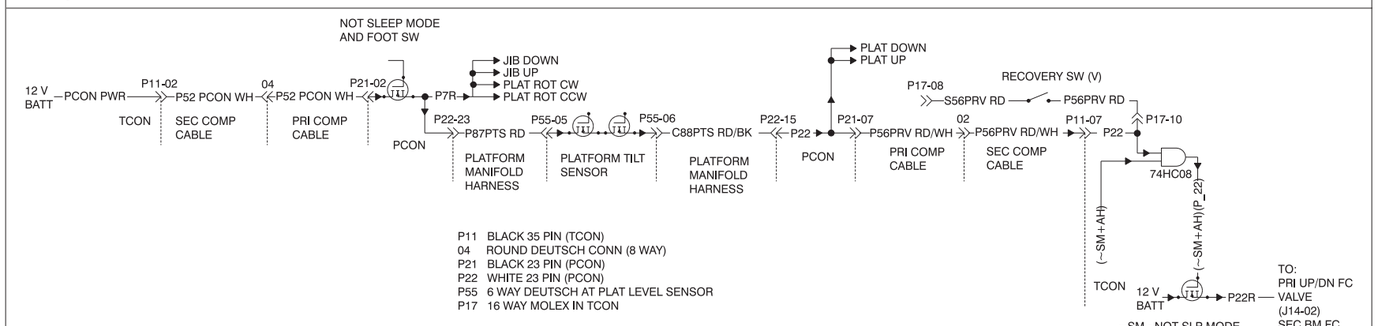
## Safety Circuits



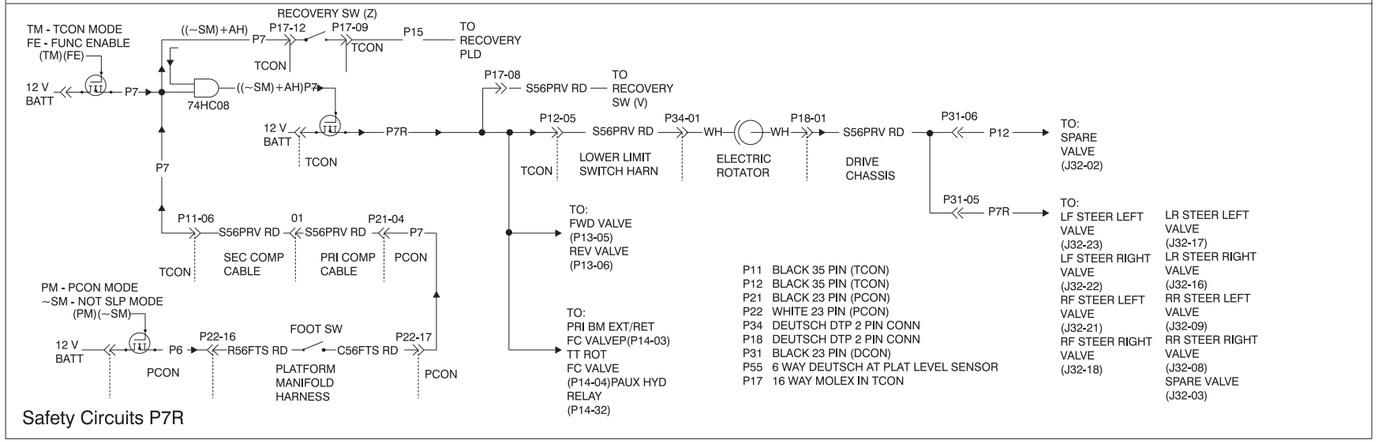

Safety Circuits P6R1, P14, P12, P11 AND P30




Safety Circuits P6R2, P10, P18, AND P9B




Safety Circuits P22 and P22R




Safety Circuits P7R

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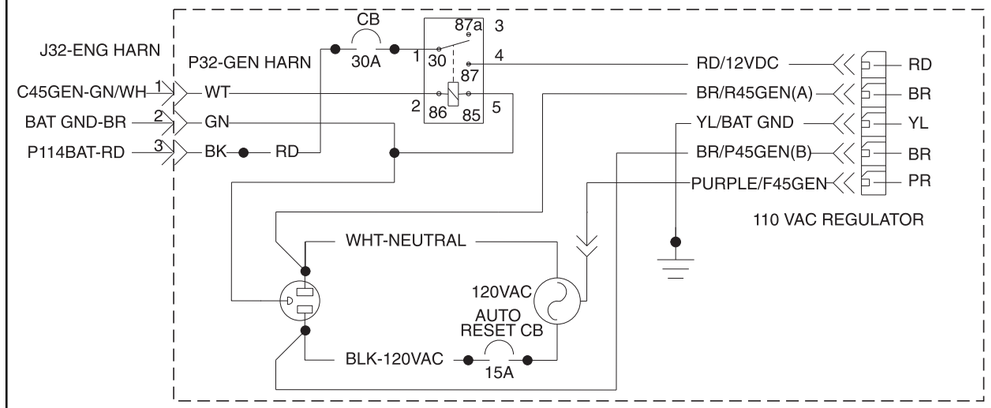
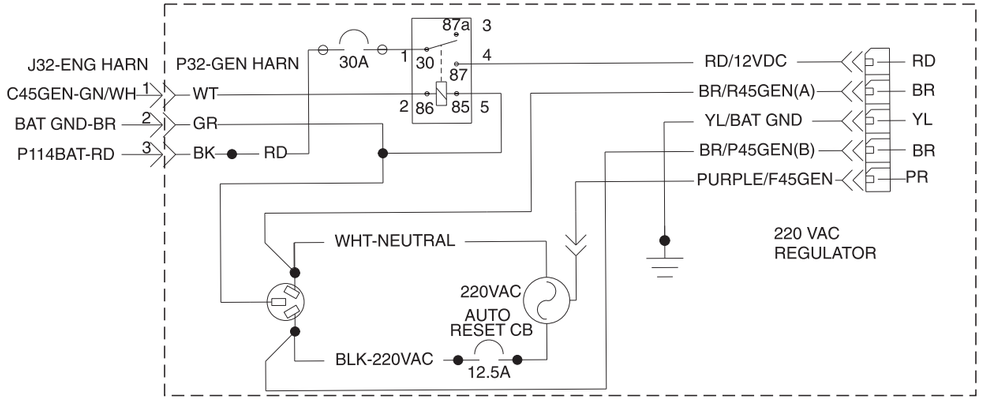
# Electrical Schematic - Generator Options

N M L K J I H G F E D C B A

## Belt Driven Generator Option

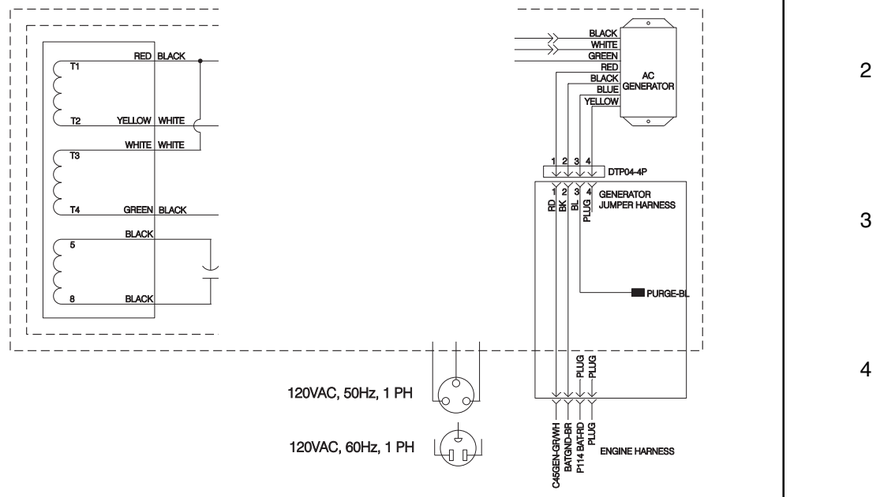


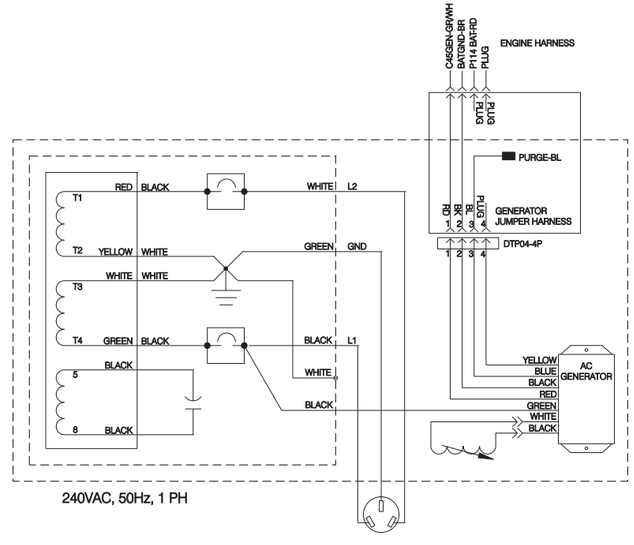

120VAC GENERATOR W/REGULATOR.




220VAC GENERATOR W/REGULATOR.

## MTE Hydraulic Generator Option

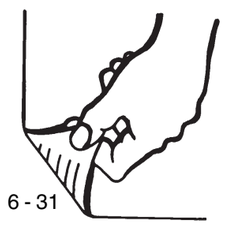


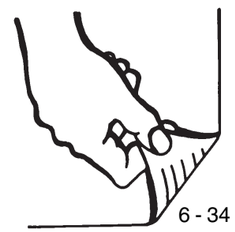

1 2 3 4 5 6 7 8

ES0508H

## Electrical Schematic - Generator Options



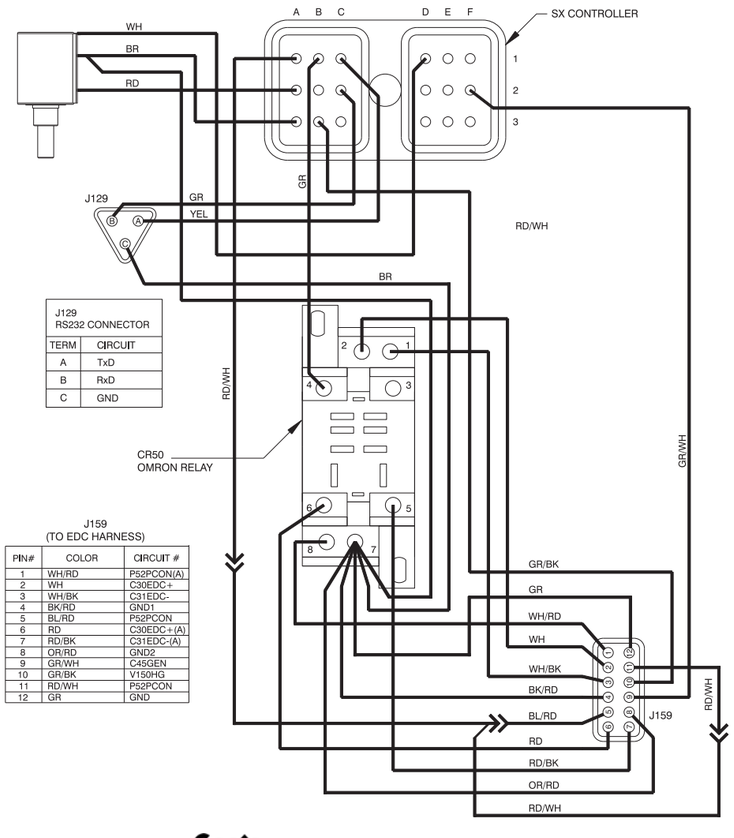
**Electrical Schematic**
Welder Generator Option



# Electrical Schematic

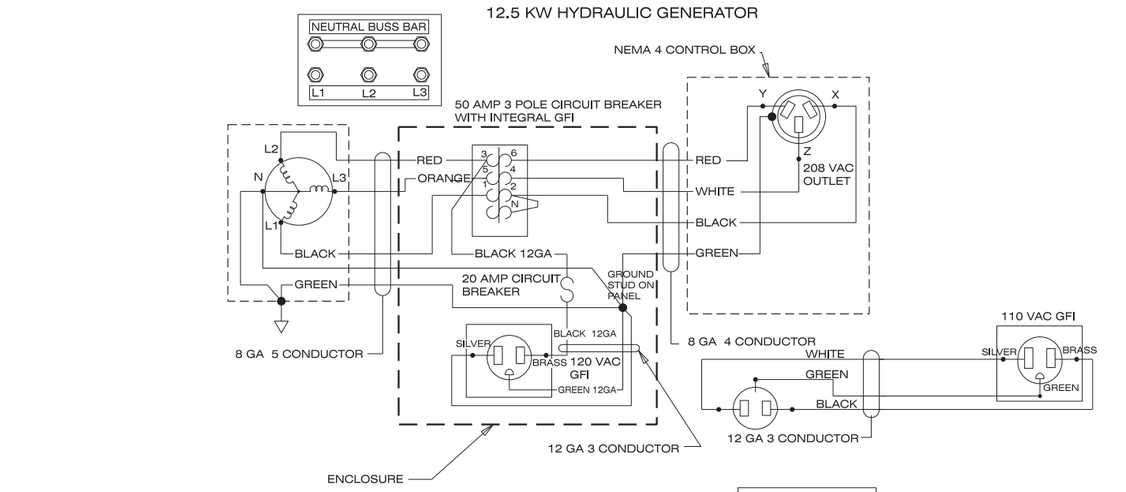
## Welder Generator Option

| SX CONTROLLER SAUER #K23334 | | |
|---|---|---|
| TERMINAL | CIRCUIT | COLOR |
| A1 | P52PCON | RD/WH |
| A2 | SENSOR POWER +5V | RD |
| A3 | BATTERY- | BR |
| B1 | V151HG | GR |
| B2 | NC | |
| B3 | V150HG | GR/BK |
| C1 | TxD | YEL |
| C2 | RxD | GR |
| C3 | /BOOT | |
| D1 | JOYSTICK | WH |
| D2 | NC | |
| D3 | NC | |
| E1 | NOT USED | |
| E2 | NOT USED | |
| E3 | NOT USED | |
| F1 | NOT USED | |
| F2 | C45GEN | GR/WH |
| F3 | NOT USED | |

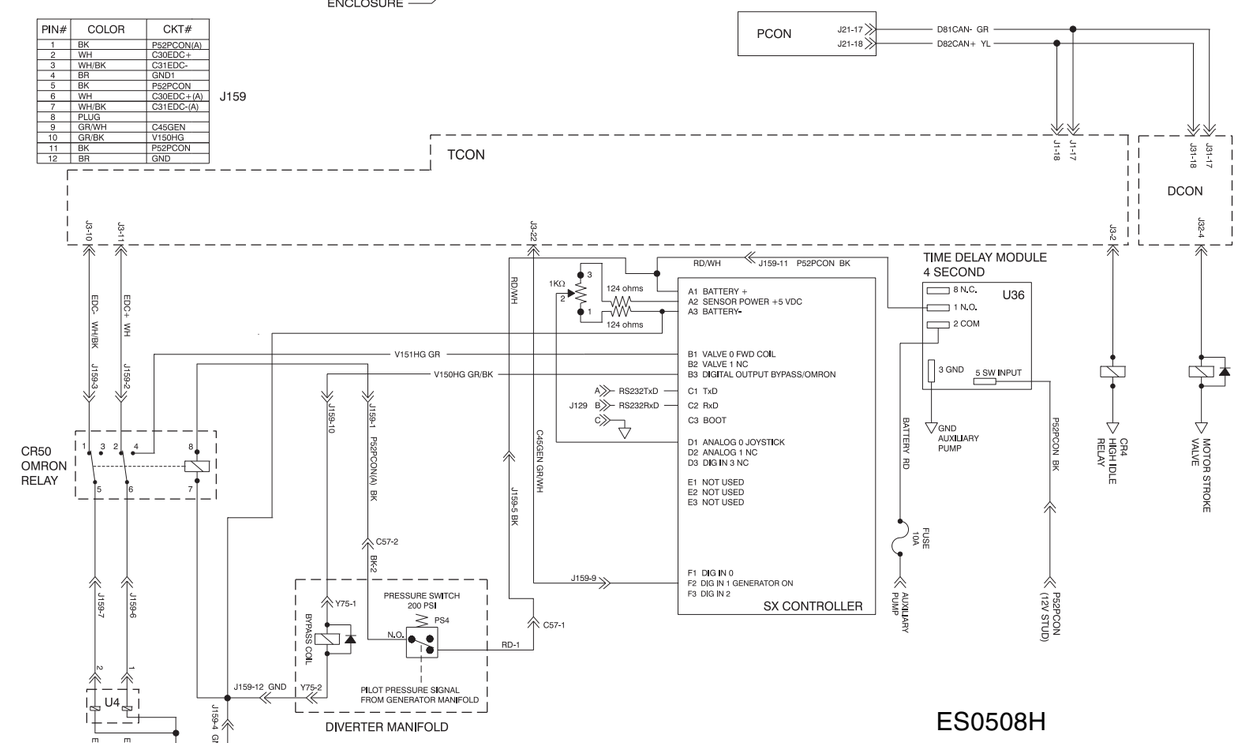



| J129 RS232 CONNECTOR | |
|---|---|
| TERM | CIRCUIT |
| A | TxD |
| B | RxD |
| C | GND |

| J159 (TO EDC HARNESS) | | |
|---|---|---|
| PIN# | COLOR | CIRCUIT # |
| 1 | WH/RD | P52PCON(A) |
| 2 | WH | C30EDC+ |
| 3 | WH/BK | C31EDC- |
| 4 | BK/RD | GND1 |
| 5 | BL/RD | P52PCON |
| 6 | RD | C30EDC+(A) |
| 7 | RD/BK | C31EDC-(A) |
| 8 | OR/RD | GND2 |
| 9 | GR/WH | C45GEN |
| 10 | GR/BK | V150HG |
| 11 | RD/WH | P52PCON |
| 12 | GR | GND |




| J159 | | |
|---|---|---|
| PIN# | COLOR | CKT# |
| 1 | BK | P52PCON(A) |
| 2 | WH | C30EDC+ |
| 3 | WH/BK | C31EDC- |
| 4 | BR | GND1 |
| 5 | BK | P52PCON |
| 6 | WH | C30EDC+(A) |
| 7 | WH/BK | C31EDC-(A) |
| 8 | PLUG | |
| 9 | GR/WH | C45GEN |
| 10 | GR/BK | V150HG |
| 11 | BK | P52PCON |
| 12 | BR | GND |



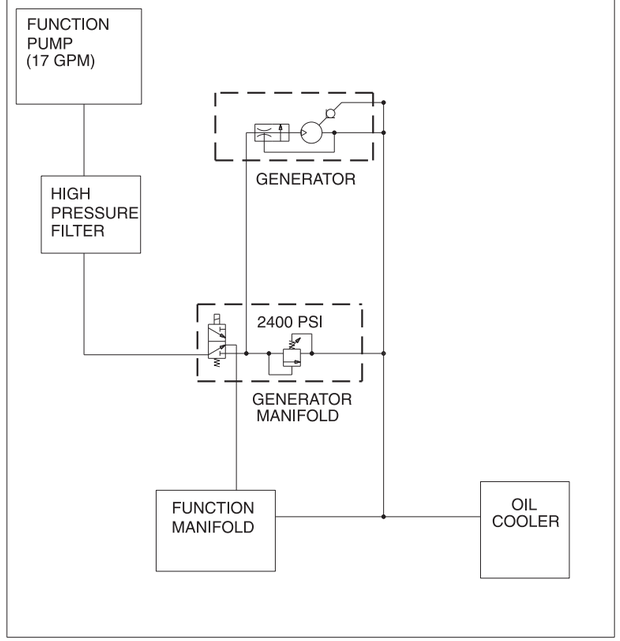

ES0508H

# Electrical Schematic
## Hydraulic Generator Options

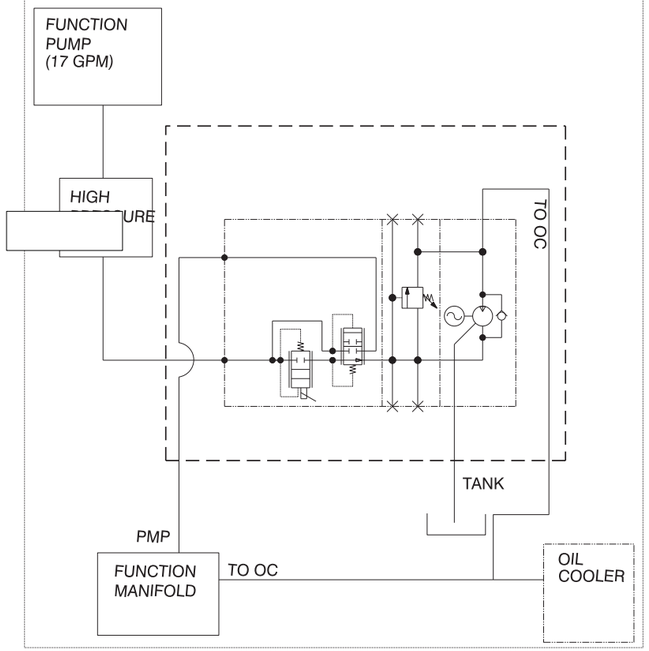
N M L K J I H G F E D C B A

1 2 3 4 5 6 7 8

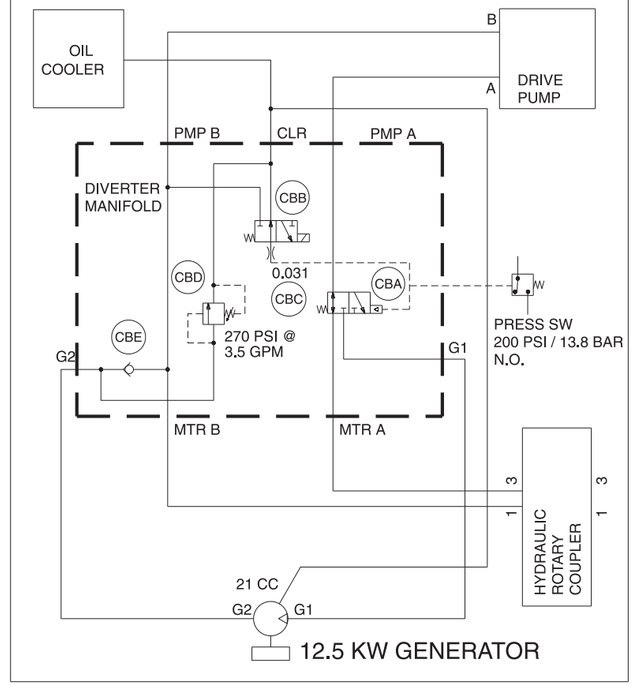
### HYDRAULIC GENERATOR OPTION




### *MTE HYDRAULIC GENERATOR OPTION*



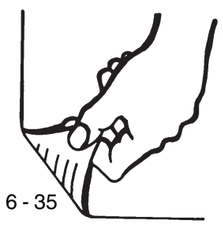

### HYDRAULIC WELDER OPTION



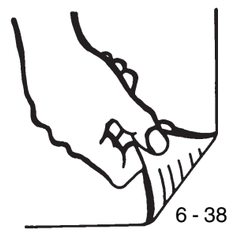

ES0508H

## Hydraulic Schematic

Hydraulic Generator Options

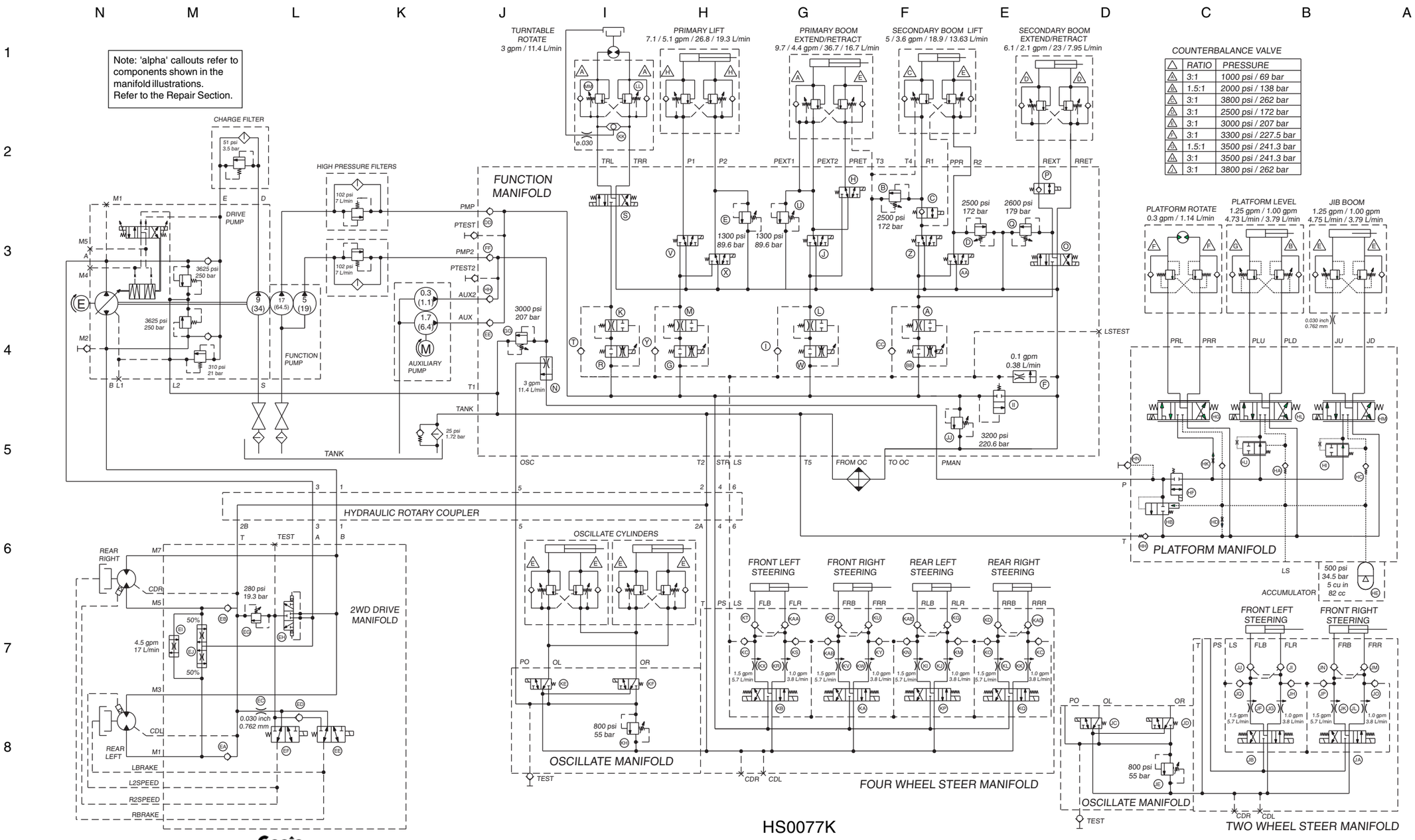


**Hydraulic Schematic**
2 Wheel Drive (2 and 4 Wheel Steer)



# Hydraulic Schematic

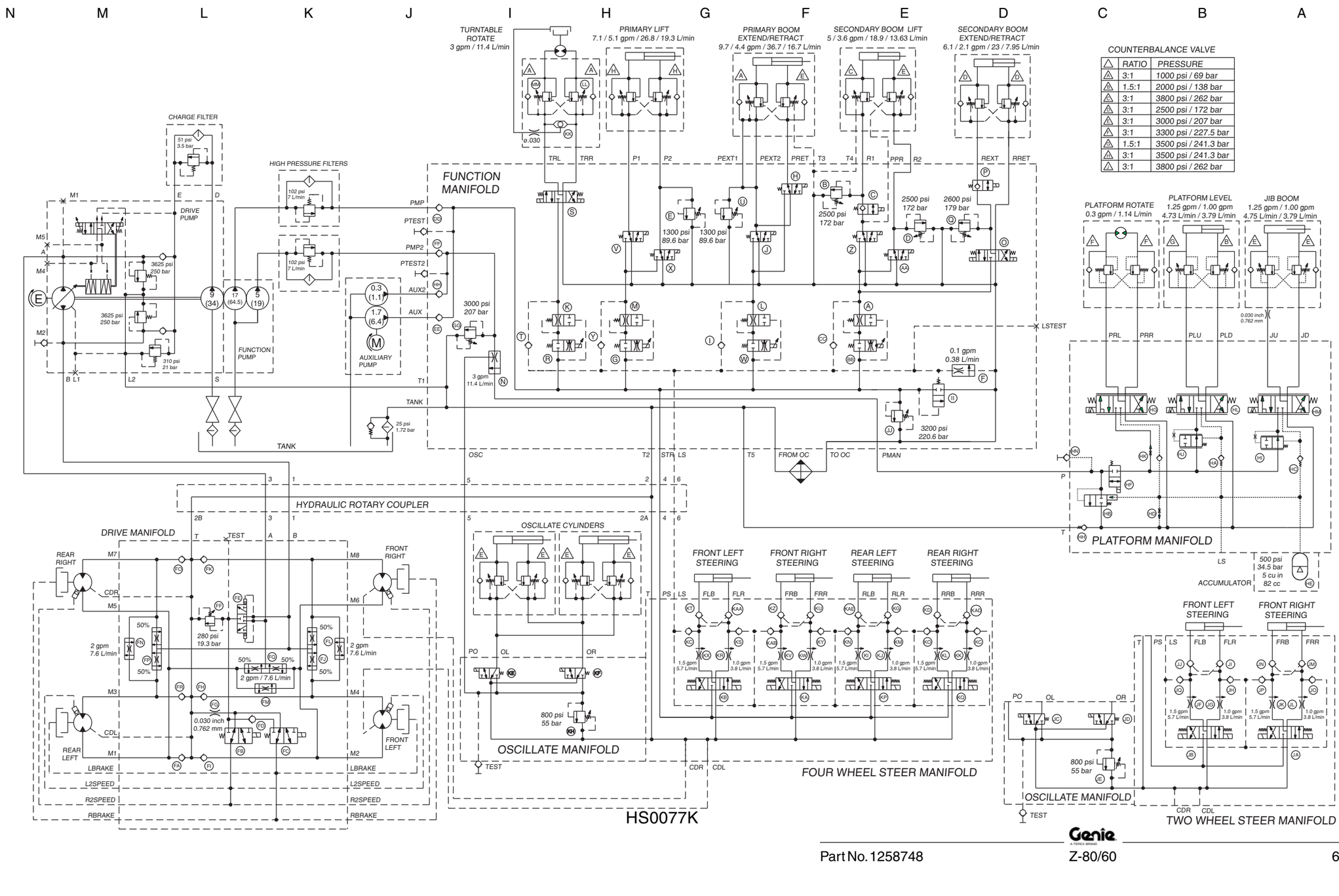
## 2 Wheel Drive (2 and 4 Wheel Steer)



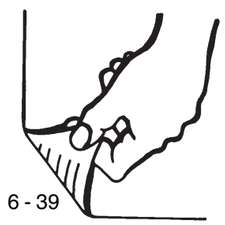

HS0077K

# Hydraulic Schematic

4 Wheel Drive (2 and 4 Wheel Steer)



## Hydraulic Schematic
4 Wheel Drive (2 and 4 Wheel Steer)



# Genie Z-80
(from S/N Z8013-4592)
## Electrical Schematic
ES0508 Rev H

DEUTZ TD2011L04i ENGINE SHOWN

DUETZ TD2011L04i ENGINE SHOWN
PERKINS 804D ENGINE- SEE ENGINE OPTION PAGE
CONTINENTAL TME27 ENGINE- SEE ENGINE OPTION PAGE
DEUTZ TD2.9 SEE ENGINE OPTION PAGE
PERKINS 404TF SEE ENGINE OPTION PAGE

DUETZ TD2011L04i ENGINE SHOWN

Genie Z-80 (from S/N Z8013-4592) ES0508H

California Proposition 65

**Warning**

The exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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# Service Manual
# Z-80/60

*(from serial number Z8013-4592)*

Part No. 1258748

Rev A

Genie