Important

Read, understand and obey the safety rules and operating instructions in the Genie S-40 Operator's Manual before attempting any maintenance or repair procedure.

This service manual covers the Genie S-40 2WD and 4WD models introduced in 1994.

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

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

Genie Industries 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 other manuals. Please write to the technical publications team in care of Genie Industries, P O Box 69, Redmond WA 98073-0069 U.S.A.

If you have any questions, call Genie Industries.

Genie North America
Telephone (206) 881-1800
Toll Free 800 536-1800
Fax (206) 883-3475

Genie Europe
Telephone (44) 0636-813943
Fax (44) 0636-815270

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Patents Pending
Printed in U.S.A.
Safety Rules

Danger

Failure to obey the instructions and safety rules in this manual, and the *Genie S-40 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.

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

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.

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

**DANGER** Indicates the presence of a hazard that **will** cause death or serious injury.

**WARNING** Indicates the presence of a hazard that **may** cause death or serious injury.

**CAUTION** Indicates the presence of a hazard that **will** or **may** cause serious injury or damage to the machine.

**NOTICE** Indicates special 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, and lifting or placing loads. Always wear approved steel-toed shoes.
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Machine Specifications

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<th>Stowed dimensions</th>
<th>2WD/RT</th>
<th>4WD/RT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>23 ft 11 in</td>
<td>23 ft 11 in</td>
</tr>
<tr>
<td></td>
<td>7.28 m</td>
<td>7.28 m</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>7 ft 6 in</td>
<td>7 ft 6 in</td>
</tr>
<tr>
<td></td>
<td>2.29 m</td>
<td>2.29 m</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>8 ft 2 in</td>
<td>8 ft 2 in</td>
</tr>
<tr>
<td></td>
<td>2.48 m</td>
<td>2.48 m</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>11,650 lbs</td>
<td>11,650 lbs</td>
</tr>
<tr>
<td></td>
<td>5,284 kg</td>
<td>5,284 kg</td>
</tr>
<tr>
<td><strong>Ground clearance</strong></td>
<td>12 1/2 in</td>
<td>12 1/2 in</td>
</tr>
<tr>
<td></td>
<td>31.8 cm</td>
<td>31.8 cm</td>
</tr>
</tbody>
</table>

Operational dimensions

| Maximum platform height   | 40 ft | 40 ft |
|                          | 12.2 m | 12.2 m |
| Maximum horizontal reach  | 31 ft 8 in | 31 ft 8 in |
|                          | 9.64 m | 9.64 m |
| Maximum turntable tailswing | 34 in | 34 in |
|                           | 86.4 cm | 86.4 cm |
| **Wheelbase**             | 7 ft 3 in | 7 ft 3 in |
|                           | 2.2 m  | 2.2 m |
| Minimum turning circle, outside | 15 ft 8 in | 15 ft 8 in |
|                           | 4.77 m  | 4.77 m |
| Minimum turning circle, inside | 6 ft 8 in | 6 ft 8 in |
|                            | 2.02 m  | 2.02 m |
| Turntable rotation         | continuous | continuous |
| Platform rotation          | 160° | 160° |

Platform dimensions

| Platform dimensions        | 6 ft | 8 ft |
|                           | (Standard) | (Optional) |
| Length                    | 6 ft | 8 ft |
|                           | 1.83 m | 2.44 m |
| Width                     | 30 in | 36 in |
|                           | 76.2 cm | 91.4 cm |
| Maximum capacity          | 500 lbs | 500 lbs |
|                           | 227 kg  | 227 kg |

Tires and wheels

| Tires and wheels         | 2WD Front | 2WD Rear |
|                         | Tires Only | & Rear   |
| Tire size               | 12.5L-16SL | 12-16.5 NHS |
| Tire ply rating         | 12         | 8        |
| Tire contact area       | 88 sq in  | 57 sq in |
|                         | 568 sq cm | 368 sq cm |
| Overall tire diameter   | 33.7 in    | 33.2 in |
|                         | 85.6 cm    | 84.3 cm |
| Tire pressure           | 45 psi     | 45 psi |
|                         | 3.10 bar   | 3.10 bar |
| Wheel diameter          | 16 in      | 16 1/2 in |
|                         | 40.6 cm    | 41.9 cm |
| Wheel width             | 10 in      | 9.75 in |
|                         | 25.4 cm    | 24.7 cm |
| Wheel lugs              | 8 @ 5/8 -18 | 9 @ 5/8 -18 |
| Lug nut torque          | 125 ft-lbs | 125 ft-lbs |
|                         | 169.5 Nm   | 169.5 Nm |

Fluid capacities

| Fluid capacities         |          |          |
| Fuel tank                | 30 gallons | 114 liters |
| LPG tank                 | 33.5 pounds | 15.2 kg |
| Hydraulic tank           | 45 gallons | 170 liters |
| (including tank)         | 50 gallons | 189 liters |
| Drive torque hub         | 17 fl oz | 0.51 liters |
| Turntable rotation torque hub | 8 fl oz | 0.24 liters |

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

Performance Specifications

<table>
<thead>
<tr>
<th>Drive speeds, maximum</th>
<th>2WD</th>
<th>4WD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boom stowed</td>
<td>4.0 mph</td>
<td>3.5 mph</td>
</tr>
<tr>
<td>Gasoline/LPG models</td>
<td>6.4 km/h</td>
<td>5.6 km/h</td>
</tr>
<tr>
<td></td>
<td>40 ft/6.8 sec</td>
<td>40 ft/7.8 sec</td>
</tr>
<tr>
<td></td>
<td>12.2 m/6.8 sec</td>
<td>12.2 m/7.8 sec</td>
</tr>
<tr>
<td>Boom stowed</td>
<td>3.5 mph</td>
<td>3 mph</td>
</tr>
<tr>
<td>Deutz diesel models</td>
<td>5.6 km/h</td>
<td>4.8 km/h</td>
</tr>
<tr>
<td></td>
<td>40 ft/7.8 sec</td>
<td>40 ft/9.1 sec</td>
</tr>
<tr>
<td></td>
<td>12.2 m/7.8 sec</td>
<td>12.2 m/9.1 sec</td>
</tr>
<tr>
<td>Boom raised or extended</td>
<td>0.68 mph</td>
<td>0.68 mph</td>
</tr>
<tr>
<td>All models</td>
<td>1.1 km/h</td>
<td>1.1 km/h</td>
</tr>
<tr>
<td></td>
<td>40 ft/40 sec</td>
<td>40 ft/40 sec</td>
</tr>
<tr>
<td></td>
<td>12.2 m/40 sec</td>
<td>12.2 m/40 sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gradeability (boom stowed)</th>
<th>2WD</th>
<th>4WD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough terrain</td>
<td>30%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Boom function speeds, maximum from platform controls

| Boom up                | 40 to 60 seconds |
| Boom down              | 50 to 80 seconds |
| Boom extend            | 35 to 65 seconds |
| Boom retract           | 40 to 70 seconds |
| Turntable rotate - 360° | 70 to 110 seconds |
| Platform rotate - 160° | 8 to 20 seconds |
| Platform level up      | 25 to 50 seconds |
| Platform level down    | 15 to 35 seconds |
## Hydraulic Specifications

### Hydraulic fluid
- **Dexron II equivalent**

### Drive pump
- **Type:** bi-directional variable displacement piston pump
- **Displacement - 2500 rpm:**
  - 0 to 31.6 gallons per minute (0 to 119.6 liters per minute)
- **Maximum drive pressure:** 3500 psi (241.3 bar)
- **Charge pressure**
  - Neutral position: 360 psi (25 bar)
  - Drive position: 250 psi (17 bar)
- **Medium pressure filter:** 3 micron
- **Medium pressure filter bypass pressure:** 50 psi (3.4 bar)

### Drive manifold
- **Brake relief pressure:** 250 psi (17.2 bar)
- **4WD front motor flow regulators:**
  - 2.5 to 8 gallons per minute (9.4 to 30.2 liters per minute)
- **4WD rear motor flow regulators:**
  - 5 to 15 gallons per minute (18.9 to 56.7 liters per minute)
- **2WD rear motor flow regulators:**
  - 8 to 22 gallons per minute (30.2 to 83.2 liters per minute)

### Front drive motors (4WD models)
- **Displacement per revolution:** 1.52 cu in (25 cc)

### Rear drive motors
- **Displacement per revolution:** 2.13 cu in (35 cc)

### Function pump
- **Type:** pressure balanced gear
- **Displacement - static:**
  - 0.98 cu in (16 cc)
- **Displacement - 2550 rpm:**
  - 10.8 gallons per minute (40.8 liters per minute)
- **Hydraulic tank circuit return line filter:** 10 micron with 25 psi (1.7 bar) bypass

### Function manifold
- **Function relief valve pressure:** 2600 psi (179 bar)
- **Boom down relief valve pressure:** 2200 psi (152 bar)
- **Boom extend relief valve pressure:** 1950 psi (134 bar)
- **Steer/oscillate flow regulator:**
  - 3.5 gallons per minute (13.2 liters per minute)
- **Steer regulator:**
  - 2 gallons per minute (7.6 liters per minute)
- **Boom retract pressure:** 2600 psi (179 bar)
- **Oscillate cylinder pressure:** 900 psi (62 bar)

### Auxiliary pump
- **Type:** fixed displacement gear pump
- **Displacement - static:**
  - 0.152 cu in (2.5 cc)
- **Displacement:**
  - 1.4 gallons per minute (5.3 liters per minute)
- **Auxiliary pump relief pressure:** 2500 psi (176 bar)
BOLT TORQUE SPECIFICATIONS

Bolt Torque Specifications

<table>
<thead>
<tr>
<th>Size</th>
<th>Threads</th>
<th>SAE Grade 5 Bolts</th>
<th>SAE Grade 8 Bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Torque - Dry</td>
<td>Torque - Dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>inch-pounds</td>
<td>foot-pounds</td>
</tr>
<tr>
<td>No. 10</td>
<td>24</td>
<td>43</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>49</td>
<td>6</td>
</tr>
<tr>
<td>1/4 inch</td>
<td>20</td>
<td>96</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>120</td>
<td>14</td>
</tr>
<tr>
<td>5/16 inch</td>
<td>18</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>3/8 inch</td>
<td>16</td>
<td>30</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>35</td>
<td>48</td>
</tr>
<tr>
<td>7/16 inch</td>
<td>14</td>
<td>50</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>55</td>
<td>75</td>
</tr>
<tr>
<td>1/2 inch</td>
<td>13</td>
<td>75</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>90</td>
<td>122</td>
</tr>
<tr>
<td>9/16 inch</td>
<td>12</td>
<td>110</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>120</td>
<td>163</td>
</tr>
<tr>
<td>5/8 inch</td>
<td>11</td>
<td>150</td>
<td>204</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>170</td>
<td>231</td>
</tr>
<tr>
<td>7/8 inch</td>
<td>10</td>
<td>260</td>
<td>353</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>300</td>
<td>407</td>
</tr>
<tr>
<td>1 inch</td>
<td>9</td>
<td>430</td>
<td>583</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>470</td>
<td>637</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
<td>640</td>
<td>868</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>700</td>
<td>949</td>
</tr>
</tbody>
</table>

Torque specification for lubricated bolts is 25% less than dry torque specification for bolt size.
# Ford Engine LSG-423 Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Displacement</strong></td>
<td>140 cu in (2.3 liters)</td>
</tr>
<tr>
<td><strong>Number of cylinders</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Bore &amp; stroke</strong></td>
<td>3.780 x 3.126 inches (96 x 79.4 mm)</td>
</tr>
<tr>
<td><strong>Horsepower</strong></td>
<td>63 @ 4000 rpm</td>
</tr>
<tr>
<td><strong>Firing order</strong></td>
<td>1 - 3 - 4 - 2</td>
</tr>
<tr>
<td><strong>Low idle</strong></td>
<td>1600 rpm</td>
</tr>
<tr>
<td><strong>High idle</strong></td>
<td>2500 rpm</td>
</tr>
<tr>
<td><strong>Governor</strong></td>
<td>electronic</td>
</tr>
<tr>
<td><strong>Compression ratio</strong></td>
<td>9.5:1</td>
</tr>
<tr>
<td><strong>Compression pressure (approx.)</strong></td>
<td>150 to 175 psi (10 to 12 bar)</td>
</tr>
<tr>
<td><strong>Valve clearances</strong></td>
<td>0.040 to 0.050 inches (1.0 to 1.3 mm)</td>
</tr>
</tbody>
</table>

**Lubrication system**
- **Oil pressure** (operating temp. @ 2600 rpm): 40 to 60 psi (2.75 to 4.1 bar)
- **Oil capacity** (including filter): 5 quarts (4.7 liters)

**Oil viscosity requirements**
- Temperature below 60°F / 15.5°C: 5W-30
- Temperature between -10°F to 90°F / -23°C to 32°C: 10W-30
- Temperature between -10°F / -23°C: 10W-40 to 10W-50
- Temperature above 25°F / -4°C: 20W-40 or 20W-50

**Starter motor**
- Normal engine cranking speed: 110 rpm
- Current draw, normal load: 150A
- Current draw, maximum load: 460A
- Current draw, no load: 70A
- Maximum circuit voltage drop while starting (normal temperature): 0.5V DC
- Brush length, new: 0.50 in (12.7 mm)
- Brush length wear limit: 0.25 in (6.35 mm)
- Brush spring tension: 40 ounces (11 Newtons)
- Bolt torque through brush: 55 to 75 inch-pounds (6 to 8.5 Nm)
- Brush mounting bolt torque: 15 to 20 foot-pounds (20 to 27 Nm)
- Maximum commutator run-out: 0.005 inches (0.127 mm)

**Battery**
- Type: 12V, Group 31
- Quantity: 1
- Cold cranking ampere: 1000A
- Reserve capacity @ 25A rate: 200 minutes

**Fuel pump**
- Static pressure: 5 to 7 psi (0.34 to 0.48 bar)
- Minimum volume flow (in 25 seconds): 1 pint (473 cc)

Use oils meeting API classification SF (labeled SF/CC or SF/CD) as they offer improved wear protection.
## FORD ENGINE LSG-423 SPECIFICATIONS

### Ignition System

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition spark advance</td>
<td>10° BTDC</td>
</tr>
<tr>
<td>Ignition coil primary resistance</td>
<td>1.13 to 1.25Ω @ 75°F / 24°C</td>
</tr>
<tr>
<td>Ignition coil secondary resistance</td>
<td>7700 to 9300Ω @ 75°F / 24°C</td>
</tr>
<tr>
<td>Spark plug type</td>
<td>Motorcraft AWSF-52</td>
</tr>
<tr>
<td>Spark plug gap</td>
<td>0.042 to 0.046 inches</td>
</tr>
<tr>
<td></td>
<td>1.07 to 1.18 mm</td>
</tr>
</tbody>
</table>

### Engine coolant

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>11.5 quarts</td>
</tr>
<tr>
<td></td>
<td>10.9 liters</td>
</tr>
</tbody>
</table>

### Alternator

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>35A, 14.5V</td>
</tr>
</tbody>
</table>

### Fan belt deflection

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3/8 to 1/2 inch</td>
</tr>
<tr>
<td></td>
<td>9 to 12 mm</td>
</tr>
</tbody>
</table>

### Bolt torque specifications

<table>
<thead>
<tr>
<th>Bolt description (size)</th>
<th>Torque ft-lbs</th>
<th>Torque Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary shaft gear bolt (M-10)</td>
<td>28 to 40</td>
<td>38 to 54</td>
</tr>
<tr>
<td>Auxiliary shaft thrust plate bolt (M-6)</td>
<td>6 to 9</td>
<td>8 to 12</td>
</tr>
<tr>
<td>Timing belt tensioner pivot bolt (M-10)</td>
<td>28 to 40</td>
<td>38 to 54</td>
</tr>
<tr>
<td>Timing belt tensioner adjusting bolt (M-8)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Camshaft gear bolt (M-12)</td>
<td>50 to 71</td>
<td>68 to 96</td>
</tr>
<tr>
<td>Camshaft thrust plate bolt (M-6)</td>
<td>6 to 9</td>
<td>8 to 12</td>
</tr>
<tr>
<td>Carburetor to spacer stud (M-8)</td>
<td>7.5 to 15</td>
<td>10 to 20</td>
</tr>
<tr>
<td>Carburetor spacer to manifold bolt (M-8)</td>
<td>10 to 14</td>
<td>14 to 19</td>
</tr>
<tr>
<td>Crankshaft damper bolt (M-14)</td>
<td>103 to 133</td>
<td>140 to 180</td>
</tr>
<tr>
<td>Cylinder head bolt (M-12): first step</td>
<td>50 to 60</td>
<td>68 to 81</td>
</tr>
<tr>
<td></td>
<td>second step</td>
<td>80 to 90</td>
</tr>
<tr>
<td>Distributor clamp bolt (M-10)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Distributor vacuum tube to manifold adaptor</td>
<td>5 to 8</td>
<td>7 to 11</td>
</tr>
<tr>
<td>Exhaust manifold to cylinder head bolt or nut (M-10): first step</td>
<td>14 to 19</td>
<td>19 to 26</td>
</tr>
<tr>
<td></td>
<td>second step</td>
<td>20 to 30</td>
</tr>
<tr>
<td>Flywheel to crankshaft bolt (M-10)</td>
<td>56 to 64</td>
<td>76 to 87</td>
</tr>
<tr>
<td>Fuel pump to cylinder block (M-8)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Intake manifold to cylinder head bolt or nut (M-8)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Oil pressure sending unit to block</td>
<td>8 to 18</td>
<td>11 to 24</td>
</tr>
<tr>
<td>Oil pan drain plug to pan (M-14)</td>
<td>15 to 25</td>
<td>20 to 34</td>
</tr>
<tr>
<td>Oil pan to block (M-6)</td>
<td>10 to 13.5</td>
<td>14 to 18</td>
</tr>
<tr>
<td>Oil filter insert to block</td>
<td>20 to 35</td>
<td>27 to 47</td>
</tr>
<tr>
<td>Rocker arm cover to cylinder head (M-6)</td>
<td>5 to 8</td>
<td>7 to 11</td>
</tr>
<tr>
<td>Spark plug to cylinder head (M-14)</td>
<td>5 to 10</td>
<td>7 to 14</td>
</tr>
<tr>
<td>Temperature sending unit to block (M-14)</td>
<td>8 to 18</td>
<td>11 to 24</td>
</tr>
<tr>
<td>Water jacket drain plug to block</td>
<td>23 to 28</td>
<td>31 to 38</td>
</tr>
<tr>
<td>Water pump to block bolt (M-8)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Auxiliary shaft cover bolt (M-8)</td>
<td>6 to 9</td>
<td>8 to 12</td>
</tr>
<tr>
<td>Water outlet connection bolt (M-8)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Cylinder front cover bolt (M-6)</td>
<td>6 to 9</td>
<td>8 to 12</td>
</tr>
<tr>
<td>Inner timing belt cover stud (M-8)</td>
<td>14 to 21</td>
<td>19 to 28</td>
</tr>
<tr>
<td>Outer timing belt cover bolt (M-6)</td>
<td>6 to 9</td>
<td>8 to 12</td>
</tr>
</tbody>
</table>
### Deutz Engine F3L 1011 Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Displacement</strong></td>
<td>125.02 cu in (2.049 liters)</td>
</tr>
<tr>
<td><strong>Number of cylinders</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Bore and stroke</strong></td>
<td>3.58 x 4.13 inches (91 x 105 mm)</td>
</tr>
<tr>
<td><strong>Horsepower</strong></td>
<td>36 @ 2300 rpm</td>
</tr>
<tr>
<td><strong>Firing order</strong></td>
<td>1 - 2 - 3</td>
</tr>
<tr>
<td><strong>Compression ratio</strong></td>
<td>18.5:1</td>
</tr>
<tr>
<td><strong>Compression pressure</strong></td>
<td>362 to 435 psi (25 to 30 bar)</td>
</tr>
<tr>
<td>Pressure (psi) of lowest cylinder must be at least 85% of highest cylinder</td>
<td></td>
</tr>
<tr>
<td><strong>Low idle</strong></td>
<td>1300 rpm</td>
</tr>
<tr>
<td><strong>High idle</strong></td>
<td>2300 rpm</td>
</tr>
<tr>
<td><strong>Governor</strong></td>
<td>Centrifugal mechanical</td>
</tr>
<tr>
<td><strong>Valve clearance, cold</strong></td>
<td></td>
</tr>
<tr>
<td>Intake</td>
<td>0.012 in (0.3 mm)</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.020 in (0.5 mm)</td>
</tr>
<tr>
<td><strong>Lubrication system</strong></td>
<td></td>
</tr>
<tr>
<td>Oil pressure</td>
<td>26 to 87 psi (1.8 to 6.0 bar)</td>
</tr>
<tr>
<td>Oil capacity (including filter)</td>
<td>8.5 quarts (8 liters)</td>
</tr>
<tr>
<td><strong>Oil viscosity requirements</strong></td>
<td></td>
</tr>
<tr>
<td>Temperature below 60°F / 15.5°C (synthetic)</td>
<td>5W-30</td>
</tr>
<tr>
<td>-10°F to 90°F / -23°C to 32°C</td>
<td>10W-40</td>
</tr>
<tr>
<td>Temperature above -4°F / -34°C</td>
<td>15W-40</td>
</tr>
<tr>
<td>Engine oil should have properties of API classification CC/SE, CD/SE, CC/SF or CD/SF grades.</td>
<td></td>
</tr>
<tr>
<td><strong>Injection system</strong></td>
<td></td>
</tr>
<tr>
<td>Injection pump make</td>
<td>OMAP</td>
</tr>
<tr>
<td>Injection pump pressure</td>
<td>4351 psi (300 bar)</td>
</tr>
<tr>
<td>Injector opening pressure</td>
<td>3626 psi (250 bar)</td>
</tr>
<tr>
<td>Fuel requirement</td>
<td>Diesel number 2-D</td>
</tr>
<tr>
<td><strong>Alternator output</strong></td>
<td>55A, 14V</td>
</tr>
<tr>
<td><strong>Starter motor</strong></td>
<td></td>
</tr>
<tr>
<td>Current draw, no load</td>
<td>90A</td>
</tr>
<tr>
<td>Brush length, new</td>
<td>0.7480 in (19 mm)</td>
</tr>
<tr>
<td>Brush length, minimum</td>
<td>0.5 in (12.7 mm)</td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>12V, Group 31</td>
</tr>
<tr>
<td>Quantity</td>
<td>1</td>
</tr>
<tr>
<td>Cold cranking ampere</td>
<td>1000A</td>
</tr>
<tr>
<td>Reserve capacity @ 25A rate</td>
<td>200 minutes</td>
</tr>
<tr>
<td><strong>Fan belt deflection</strong></td>
<td>3/8 to 1/2 inch (9 to 12 mm)</td>
</tr>
<tr>
<td><strong>Bolt tightening specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Bolt description (size, grade)</td>
<td></td>
</tr>
<tr>
<td>Camshaft/thrust bearing bolt (M-8 x 35, 8.8)</td>
<td>15 to 18 (20 to 24)</td>
</tr>
<tr>
<td>Rocker arm bolts (M-8 x 45, 8.8)</td>
<td>15 to 18 (20 to 24)</td>
</tr>
<tr>
<td>Rocker arm set screw nut</td>
<td>15 to 18 (20 to 24)</td>
</tr>
<tr>
<td>Cylinder head cover</td>
<td>6 to 7 (8 to 10)</td>
</tr>
<tr>
<td>Blower rotor nut (M-17 Valeo or M-18 Bosch)</td>
<td>33 to 41 (45 to 55)</td>
</tr>
<tr>
<td>Blower carrier bolts (M-8 x 50 Torx, 8.8)</td>
<td>15 to 18 (20 to 24)</td>
</tr>
<tr>
<td>V-belt pulley bolts (M-10 x 16, 8.8)</td>
<td>28 to 34 (38 to 46)</td>
</tr>
<tr>
<td>Bolt tightening specifications, continued</td>
<td>torque ft-lbs</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Bolt description (size, grade)</td>
<td></td>
</tr>
<tr>
<td>Idler pulley/V-belt pulley bolt</td>
<td>27 to 32</td>
</tr>
<tr>
<td>(M-10 x 25, 8.8)</td>
<td></td>
</tr>
<tr>
<td>Idler pulley for toothed belt</td>
<td>30 to 36</td>
</tr>
<tr>
<td>(M-10 x 50, 8.8)</td>
<td></td>
</tr>
<tr>
<td>Oil pump bolts (M-8 x 35 Torx)</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Oil filter bracket bolts (M-8 x 20 Torx, 8.8)</td>
<td>7 to 8</td>
</tr>
<tr>
<td>Oil intake housing bolts (M-8 x 75 Torx)</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Fuel pump bolts</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Injection pump bolts</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Injector cap nut</td>
<td>30 to 37</td>
</tr>
<tr>
<td>Injector fastening bolt</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Injection line</td>
<td>10 to 12</td>
</tr>
<tr>
<td>Air intake manifold bolts (M-8 x 8, 8.8)</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Air intake manifold, 3-hole flange bolts (M-8 x 35 Torx, 8.8)</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Exhaust manifold bolts (M-10 x 30 Torx, 10.9)</td>
<td>27 to 32</td>
</tr>
<tr>
<td>Starter fastening bolts (M-10 x 28, 8.8)</td>
<td>28 to 34</td>
</tr>
<tr>
<td>Starter carrier bolts (M-12 x 28, 8.8)</td>
<td>50 to 60</td>
</tr>
<tr>
<td>Oil pan bolts (M-8 x 16 Torx, 8.8)</td>
<td>15 to 18</td>
</tr>
<tr>
<td>Oil drain bolts</td>
<td>37 to 44</td>
</tr>
</tbody>
</table>

| Oil thermostat housing screw plug (M-38 x 1.5) | 37 to 44 | 50 to 60 |
| Oil thermostat housing bolts (M-6 x 35 Torx, 8.8) | 5.5 to 7 | 7.5 to 9 |
| Oil thermostat housing bolts (M-6 x 80 Torx, 8.8) | 5.5 to 7 | 7.5 to 9 |
| Oil thermostat housing bolts (M-6 x 105 Torx, 8.8) | 14 to 16 | 19 to 22 |
| Valve plunger housing bolts (M-8 x 30 Torx, 8.8) | 14 to 16 | 19 to 22 |
| Alternator nuts (M-5)                        | 3          | 4         |
| Fuel bracket bolts (M-8 x 20, 8.8)           | 15         | 20        |
| Adapter housing bolts (M-12 x 35, 10.9 or M-12 x 75, 10.9) | 70 to 77 | 95 to 105 |

| Main bearing bolts                          | 37         | 50        | 60° 45° |
| Big end bolts                               | 22         | 30        | 60° 60° |
| Flywheel bolts                              | 22         | 30        | 60° 30° |
| Cylinder head studs                         | 22         | 30        | 59     |
| step 2                                      | 59         | 80        |
| step 3                                      | 118        | 160       | 120° NA |
| Camshaft/central bolt                       | 22         | 30        | 150° NA |
| Crankshaft/central bolt                     | 96         | 130       | 210° NA |
Scheduled Maintenance Inspections

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, annually and every 2 years as specified on the Maintenance Inspection Report.

⚠️ Failure to properly complete each inspection when required may cause death, serious injury or substantial damage.

☑ Immediately tag and remove from service a damaged or malfunctioning machine.

☑ Repair any machine damage or malfunction before operating machine.

☑ Keep records on all inspections for three years.

☑ Machines that have been out of service for a period longer than 3 months must complete the quarterly inspection.

About This Section

The Schedule

There are four types of maintenance inspections that must be performed according to a schedule—daily, quarterly, annual, two year. To account for repeated procedures, the Maintenance Tables and the Maintenance Inspection Report have been divided into four subsections—A, B, C, D. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Table or Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>A</td>
</tr>
<tr>
<td>Quarterly</td>
<td>A + B</td>
</tr>
<tr>
<td>Annual</td>
<td>A + B + C</td>
</tr>
<tr>
<td>Two year</td>
<td>A + B + C + D</td>
</tr>
</tbody>
</table>

Maintenance Tables

The maintenance tables contained in this section provide summary information on the specific physical requirements for each inspection.

Complete step-by-step instructions for each scheduled maintenance procedure are provided in section 4, Scheduled Maintenance Procedures.

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. Store completed forms for three years.
## Maintenance Tables

<table>
<thead>
<tr>
<th>Table A</th>
<th>Tools are required</th>
<th>New parts required</th>
<th>Warm engine required</th>
<th>Cold engine required</th>
<th>Dealer service suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>Inspect the Manuals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-2</td>
<td>Inspect the Decals and Placards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-3</td>
<td>Inspect for Damage, Loose or Missing Parts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-4</td>
<td>Check the Engine Oil Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-5</td>
<td>Check the Engine Coolant Level - Gasoline/LPG Models</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-6</td>
<td>Check for Fuel Leaks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-7</td>
<td>Check the Hydraulic Oil Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-8</td>
<td>Check for Hydraulic Leaks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-9</td>
<td>Check the Tire Pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-10</td>
<td>Test the Platform and Ground Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-11</td>
<td>Test the Auxiliary Power Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-12</td>
<td>Test the Tilt Sensor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-13</td>
<td>Test the Limit Switches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-14</td>
<td>Test the Oscillate Axle (oscillating axle equipped models)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Every 100 hours, perform the following two engine maintenance procedures.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-15 Replace the Engine Oil and Filter - Gasoline/LPG Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-16 Replace the Engine Air Filter</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Table B**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-1 Check the Engine Belt(s)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-2 Check the Radiator - Gasoline/LPG Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-3 Check the Oil Cooler and Cooling Fins - Deutz Diesel Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-4 Check the Exhaust System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-5 Check the Battery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-6 Check the Hydraulic Tank Filter Condition Indicator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-7 Inspect the Electrical Wiring</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-8 Inspect the Tires and Wheels (including lug nut torque)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-9 Confirm the Proper Brake Configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-10 Check the Oil Level in the Torque Hubs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-11 Check and Adjust the Engine Idle Mixture - Gasoline/LPG Models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-12 Check and Adjust the Engine RPM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### MAINTENANCE TABLES

#### Table B, continued

<table>
<thead>
<tr>
<th>B-13</th>
<th>Test the Key Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-14</td>
<td>Test the Emergency Stop Buttons</td>
</tr>
<tr>
<td>B-15</td>
<td>Test the Ground Control Override</td>
</tr>
<tr>
<td>B-16</td>
<td>Check the Directional Valve Linkage</td>
</tr>
<tr>
<td>B-17</td>
<td>Test the Platform Self-leveling</td>
</tr>
<tr>
<td>B-18</td>
<td>Test the Service Horn</td>
</tr>
<tr>
<td>B-19</td>
<td>Test the Foot Switch</td>
</tr>
<tr>
<td>B-20</td>
<td>Test the Engine Idle Select</td>
</tr>
<tr>
<td>B-21</td>
<td>Test the Fuel Select Operation - Gasoline/LPG Models</td>
</tr>
<tr>
<td>B-22</td>
<td>Test the Drive Enable System</td>
</tr>
<tr>
<td>B-23</td>
<td>Test the Drive Brakes</td>
</tr>
<tr>
<td>B-24</td>
<td>Test the Drive Speed - Stowed Position</td>
</tr>
<tr>
<td>B-25</td>
<td>Test the Alarm Package - Optional Equipment</td>
</tr>
<tr>
<td>B-26</td>
<td>Perform Hydraulic Oil Analysis See D-1 Test or Replace the Hydraulic Oil</td>
</tr>
</tbody>
</table>

**Every 500 hours, perform the following engine maintenance procedure.**

| B-27 | Replace the Engine Oil and Filter - Deutz Diesel Models |

- Tools are required
- New parts required
- Warm engine required
- Cold engine required
- Dealer service suggested
### MAINTENANCE TABLES

#### Table C

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Tools required</th>
<th>New parts required</th>
<th>Warm engine required</th>
<th>Cold engine required</th>
<th>Dealer service suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>Check the Boom Wear Pads</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-2</td>
<td>Check the Turntable Rotation Bearing Bolts</td>
<td></td>
<td></td>
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<tr>
<td>C-3</td>
<td>Check the Free-wheel Configuration</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-4</td>
<td>Grease the Turntable Rotation Bearing and Rotate Gear</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-5</td>
<td>Replace the Torque Hub Oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-6</td>
<td>Replace the Hydraulic Tank Filter</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-7</td>
<td>Replace the Drive Loop Hydraulic Filter</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C-8</td>
<td>Replace the Diesel Fuel Filter - Deutz Diesel Models</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-9</td>
<td>Replace the Gasoline Fuel Filter - Gasoline/LPG Models</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-10</td>
<td>Replace the PCV Valve - Gasoline/LPG Models</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C-11</td>
<td>Clean or Replace the Distributor Cap and Rotor - Gasoline/LPG Models</td>
<td></td>
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</tr>
<tr>
<td>C-12</td>
<td>Replace the Spark Plugs - Gasoline/LPG Models</td>
<td></td>
<td></td>
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<tr>
<td>C-13</td>
<td>Check and Adjust the Air/LPG Mixture - Gasoline/LPG Models</td>
<td></td>
<td></td>
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<tr>
<td>C-14</td>
<td>Check and Adjust the Ignition Timing - Gasoline/LPG Models</td>
<td></td>
<td></td>
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<tr>
<td>C-15</td>
<td>Check the Engine Valve Clearances - Deutz Diesel Models</td>
<td></td>
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</tbody>
</table>

Part No. 32222          Genie S-40   3 - 5
### MAINTENANCE TABLES

#### Table D

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Tools are required</th>
<th>New parts required</th>
<th>Warm engine required</th>
<th>Cold engine required</th>
<th>Dealer service suggested</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1</td>
<td>Test or Replace the Hydraulic Oil</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-2</td>
<td>Change or Recondition the Engine Coolant - Gasoline/LPG Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-3</td>
<td>Change the Fuel Lines</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-4</td>
<td>Check the Engine Valve Clearance - Gasoline/LPG Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-5</td>
<td>Check the Engine Cylinder Compression - Gasoline/LPG Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-6</td>
<td>Clean the PCV Hoses and Fittings - Gasoline/LPG Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-7</td>
<td>Check the Fuel Injection Pumps and Injectors - Deutz Diesel Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
<td></td>
</tr>
<tr>
<td>D-8</td>
<td>Check the Toothed Belt - Deutz Diesel Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
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<tr>
<td>D-9</td>
<td>Replace the Timing Belt - Gasoline/LPG Models</td>
<td>![Tool Icon]</td>
<td>![Part Icon]</td>
<td>![Engine Icon]</td>
<td>![Service Icon]</td>
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</tr>
</tbody>
</table>
# Maintenance Inspection Report

<table>
<thead>
<tr>
<th>Model</th>
<th>Serial number</th>
<th>Date</th>
<th>Hour meter</th>
<th>Machine owner</th>
<th>Inspected by (print)</th>
<th>Inspector signature</th>
<th>Inspector title</th>
<th>Inspector company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Daily Inspection:** A
**Quarterly Inspection:** A+B
**Annual Inspection:** A+B+C
**2 Year Inspection:** A+B+C+D

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the maintenance tables in this section and the step-by-step procedures in section 4 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

<table>
<thead>
<tr>
<th>(Y)</th>
<th>(N)</th>
<th>(R)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to Table A

- A-1 Manuals
- A-2 Decals and placards
- A-3 Damage, loose or missing parts
- A-4 Engine oil level
- A-5 Engine coolant-gasoline
- A-6 Fuel leaks
- A-7 Hydraulic oil level
- A-8 Hydraulic leaks
- A-9 Tire pressure
- A-10 Platform and ground controls
- A-11 Auxiliary power
- A-12 Tilt sensor
- A-13 Limit switches
- A-14 Oscillate Axle

**Perform every 100 hours:**

- A-15 Replace engine oil and filter-gasoline
- A-16 Replace air filter

## Checklist B

<table>
<thead>
<tr>
<th>(Y)</th>
<th>(N)</th>
<th>(R)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to Table B

- B-1 Engine belt(s)
- B-2 Engine radiator
- B-3 Oil cooler and fins-Deutz
- B-4 Exhaust system
- B-5 Battery
- B-6 Hydraulic tank filter
- B-7 Electrical wiring
- B-8 Tires and wheels
- B-9 Brake configuration
- B-10 Torque hub oil level
- B-11 Idle mixture-gasoline
- B-12 Engine RPM
- B-13 Key Switch
- B-14 Emergency Stop
- B-15 Ground control override
- B-16 Valve linkage
- B-17 Platform leveling

## Checklist C

<table>
<thead>
<tr>
<th>(Y)</th>
<th>(N)</th>
<th>(R)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to Table C

- C-1 Boom wear pads
- C-2 Turntable bearing bolts
- C-3 Free-wheel configuration
- C-4 Grease rotation bearing
- C-5 Torque hub oil
- C-6 Hydraulic tank filter
- C-7 Drive loop hydraulic filter
- C-8 Fuel filter-diesel
- C-9 Fuel filter-gasoline
- C-10 PCV valve-gasoline
- C-11 Distributor cap-gasoline
- C-12 Spark plugs-gasoline
- C-13 Air/LPG mixture
- C-14 Ignition timing-gasoline
- C-15 Valves-Deutz

## Checklist D

<table>
<thead>
<tr>
<th>(Y)</th>
<th>(N)</th>
<th>(R)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to Table D

- D-1 Hydraulic oil
- D-2 Engine coolant-gasoline
- D-3 Change fuel lines
- D-4 Valves-gasoline
- D-5 Compression-gasoline
- D-6 PCV hoses-gasoline
- D-7 Fuel injection-Deutz
- D-8 Toothed belt-Deutz
- D-9 Timing belt-Ford
Scheduled Maintenance Procedures

About This Section
This section contains detailed procedures for each scheduled maintenance inspection. Each procedure includes a description, safety information and step-by-step instructions.

Symbols Legend

⚠️ DANGER Indicates the presence of a hazard that will cause death or serious injury.

⚠️ WARNING Indicates the presence of a hazard that may cause death or serious injury.

⚠️ CAUTION Indicates the presence of a hazard that will or may cause serious injury or damage to the machine.

⚠️ NOTICE Indicates special operation or maintenance information.

⚠️ Indicates that a specific result is expected after performing a step.

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, annually and every 2 years as specified on the Maintenance Inspection Report.

⚠️ Failure to perform each procedure as presented and scheduled may cause death, serious injury or substantial damage.

✔️ Immediately tag and remove from service a damaged or malfunctioning machine.

✔️ Repair any machine damage or malfunction before operating machine.

✔️ Keep records on all inspections for three years.

✔️ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  · machine parked on a flat, level surface
  · boom in stowed position
  · turntable rotated with the boom between the non-steering wheels
  · turntable secured with the turntable rotation lock pin
  · key switch in the off position with the key removed
  · wheels chocked
Table A Procedures

A-1
Inspect the Manuals

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.

1 Check to be sure that the storage container is present and in good condition.
2 Check to make sure that the operator’s, responsibilities and safety manual are present and complete in the storage container in the platform.
3 Examine the pages of each manual to be sure that they are legible and in good condition.
4 Always return the manuals to the storage container after use.

NOTICE Contact your authorized Genie distributor or Genie Industries if replacement manuals are needed.

A-2
Inspect the Decals and Placards

Maintaining all of the safety and instructional decals and placards 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 Refer to the Decals section in the Genie S-40 Operator’s Manual and use the decal list and illustrations to determine that all decals and placards are in place.

2 Inspect all decals for legibility and damage. Replace any damaged or illegible decal immediately.

NOTICE Contact your authorized Genie distributor or Genie Industries if replacement decals are needed.

A-3
Inspect for Damage, Loose or Missing Parts

Daily machine condition inspections are essential to safe machine operation and good machine performance. Failure to locate and repair damage, and discover loose or missing parts may result in an unsafe operating condition.

1 Inspect the entire machine for damage and improperly installed or missing parts including:
   - electrical components, wiring and electrical cables
   - hydraulic hoses, fittings, cylinders and manifolds
   - fuel and hydraulic tanks
   - drive and turntable rotation motors and torque hubs
   - boom components and wear pads
   - dents or damage to machine
   - tires and wheels
   - engine and related components
   - limit switches, alarms, horn and beacon
   - nuts, bolts and other fasteners
   - platform entry mid-rail or gate
   - cracks in welds or structural components
   - compartment covers and latches
A-4 Check the Engine Oil Level

Maintaining the proper engine oil level is essential to good engine performance and service life. Operating the machine with an improper oil level can damage engine components.

**NOTICE**

Check the oil level with the engine off.

1. Check the oil level dipstick. Add oil as needed.

Result: The oil level should be in the “safe” zone.

<table>
<thead>
<tr>
<th>Pharo Engine LSG-423</th>
<th>5 quarts</th>
<th>4.7 liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil capacity (including filter)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pharo Engine LSG-423 Oil viscosity requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 60°F / 15.5°C</td>
</tr>
<tr>
<td>-10°F to 90°F / -23°C to 32°C</td>
</tr>
<tr>
<td>above -10°F / -23°C</td>
</tr>
<tr>
<td>above 25°F / -4°C</td>
</tr>
</tbody>
</table>

Use oils meeting API classification SF (labeled SF/CC or SF/CD) as they offer improved wear protection.

<table>
<thead>
<tr>
<th>Deutz Engine F3L 1011</th>
<th>8.5 quarts</th>
<th>8 liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil capacity (including filter)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deutz Engine F3L 1011 Oil viscosity requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>below 60°F / 15.5°C (synthetic)</td>
</tr>
<tr>
<td>-10°F to 90°F / -23°C to 32°C</td>
</tr>
<tr>
<td>above -4°F / -34°C</td>
</tr>
</tbody>
</table>

Engine oil should have properties of API classification CC/SE, CD/SE, CC/SF or CD/SF grades.

A-5 Check the Engine Coolant Level - Gasoline/LPG Models

Maintaining the engine coolant at the proper level is essential to engine service life. Improper coolant level will affect the engine's cooling capability and damage engine components. Daily checks will allow the inspector to identify changes in coolant level that might indicate cooling system problems.

1. Check the fluid level in the coolant recovery tank. Add fluid as needed.

Result: The fluid level should be in the NORMAL range.

A-6 Check for Fuel Leaks

Failure to detect and correct fuel leaks will result in an unsafe condition. An explosion or fuel fire may cause death or serious injury.

**DANGER**

Engine fuels are combustible. Inspect the machine in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

1. Open the shutoff valve on the liquid petroleum gas (LPG) tank by turning it counterclockwise.


### TABLE A PROCEDURES

2 Perform a visual inspection around the following areas. (An LPG detector may be necessary to locate LPG leaks.)

**Gasoline/LPG models:**
- LPG tank, hoses and fittings, solenoid shutoff valve, LPG regulator and carburetor
- gasoline tank, shutoff valve, solenoid shutoff valve, hoses and fittings, fuel pump and carburetor

**Deutz Diesel models:**
- fuel tank, shutoff valve, hoses and fittings, fuel pump, fuel filter, fuel injection pumps and fuel injectors

![DANGER] If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

---

#### Hydraulic oil specifications

<table>
<thead>
<tr>
<th></th>
<th>Dexron II equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank capacity</td>
<td>45 gallons</td>
</tr>
<tr>
<td></td>
<td>170 liters</td>
</tr>
<tr>
<td>Hydraulic system</td>
<td>50 gallons</td>
</tr>
<tr>
<td>(including tank)</td>
<td>189 liters</td>
</tr>
</tbody>
</table>

---

### A-8 Check for Hydraulic Leaks

Detecting hydraulic fluid leaks is essential to operational safety and good machine performance. Undiscovered leaks can develop into hazardous situations, impair machine functions and damage machine components.

1 Inspect for hydraulic oil puddles, dripping or residue on or around the following areas:
- hydraulic tank–filter, fittings, hoses, auxiliary power unit and turntable surface
- engine compartment–fittings, hoses, main pump, filter and turntable surface
- all hydraulic cylinders
- all hydraulic manifolds
- boom
- the underside of the turntable
- the underside of the drive chassis
- ground area under the machine

---

### A-7 Check the Hydraulic Oil Level

Maintaining the hydraulic oil at the proper level is essential to machine operation. Improper hydraulic oil levels can damage hydraulic components. Daily checks allow the inspector to identify changes in oil level that might indicate the presence of hydraulic system problems.

1 Be sure that the boom is in the stowed position, then visually inspect the sight gauge located on the side of the hydraulic oil tank.

Result: The hydraulic oil level should be within the top 2 inches (5 cm) of the sight gauge.
A-10
Check the Tire Pressure

This procedure does not need to be performed on machines equipped with the foam-filled tire option.

WARNING
An over-inflated tire can explode and may cause death or serious injury.

To safeguard maximum stability, achieve optimum machine handling and minimize tire wear, it is essential to maintain proper pressure in all air-filled tires.

1. Check each tire with an air pressure gauge and add air as needed.

<table>
<thead>
<tr>
<th>Tire specifications</th>
<th>2WD front</th>
<th>2WD rear</th>
<th>4WD front &amp; rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire size</td>
<td>12.5L-16SL</td>
<td>12-16.5NHS</td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>45 psi</td>
<td>45 psi</td>
<td>3.10 bar</td>
</tr>
</tbody>
</table>

A-10
Test the Platform and Ground Controls

Testing the machine functions and the Emergency Stop buttons for malfunctions is essential for safe machine operation. An unsafe working condition exists if any function fails to operate properly or either Emergency Stop button fails to stop all the machine functions and shut off the engine. Each function should activate, operate smoothly and be free of hesitation, jerking and unusual noise.

1. Start the engine from the ground controls, and then operate each machine function through a full cycle.

○ Result: All machine functions should operate smoothly.

2. Push in the Emergency Stop button to the OFF position.

○ Result: No function should operate, the engine should stop.

Deutz Diesel models:

All functions should stop immediately. The engine will shut off after 2 to 3 seconds.

3. Start the engine from the platform controls, and then operate each machine function through a full cycle.

○ Result: All machine functions should operate smoothly.

4. Push in the Emergency Stop button to the OFF position.

○ Result: No function should operate, the engine should stop.

NOTICE
As a safety feature, selecting and operating the ground controls will override the platform controls, including the Emergency Stop button.

Part No. 32222
Genie S-40

4 - 5
TABLE A PROCEDURES

A-11 Test the Auxiliary Power Operation

Detection of auxiliary power system malfunctions is essential for safe machine operation. An unsafe working condition exists if the auxiliary powered functions do not operate in the event of a main power loss. When operating the machine on engine power, selecting auxiliary power will stop the engine immediately. Auxiliary power is designed for short term emergency use only, and excessive use will result in battery drain and component damage.

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

2. Simultaneously hold the auxiliary power switch ON while activating the following functions through a partial cycle:
   · boom up/down
   · extend and retract
   · turntable rotate right/left

3. Turn the key switch to platform control.

4. At the platform controls, pull out the Emergency Stop button to the ON position, then press down the foot switch.

5. Simultaneously hold the auxiliary power switch ON while activating the following functions through a partial cycle:
   · boom up/down
   · extend and retract
   · turntable rotate right/left
   · steer right/left

Result: Each function should operate smoothly.
A-12
Test the Tilt Sensor

The tilt sensor sounds an alarm in the platform when the incline of the drive chassis exceeds 5 degrees.

**NOTICE** Select a level test area. The tilt alarm should not be sounding prior to test.

1. Start the engine from the platform controls.
2. Open the tank side cover and press down on one side of the tilt sensor.

**Result:** After a 1 second delay, the alarm in the platform should sound.

A-13
Test the Limit Switches

**Drive Limit Switches**

Detecting limit switch malfunctions is essential to safe machine operation. The drive limit switches are used to restrict drive speed when the boom is raised or extended. An improperly functioning drive limit switch will allow the machine to operate in an unsafe position.

1. Start the engine from the ground controls. Raise the boom 10 ft. (3 m) off the ground. Turn the engine off.
2. Visually inspect the drive limit switch located next to the boom lift cylinder for the following:
   - broken or missing actuator arm
   - missing fasteners
   - loose wiring
TABLE A PROCEDURES

3. Remove the turntable end cover to access the limit switch mounted inside the boom.

4. Visually inspect the drive limit switch located in the pivot end of the boom. Inspect for the following:
   - broken or missing actuator arm
   - missing fasteners
   - loose wiring

9. Lower the boom to the stowed position, then extend the boom 1 foot (30 cm).

10. Slowly move the drive control handle off center.

   - Result: The machine should move at a reduced drive speed.

Drive speed, maximum, raised or extended

<table>
<thead>
<tr>
<th>All models</th>
<th>1 foot per second</th>
<th>0.3 meter per second</th>
</tr>
</thead>
</table>

Drive Enable Limit Switch

1. With the engine off and the boom in the stowed position, visually inspect the drive enable limit switch for the following:
   - broken or missing rollers or arms
   - missing fasteners
   - loose wiring

5. Lower the boom to the stowed position.

6. Start the engine from the platform controls. Then slowly move the drive control handle off center.

   - Result: The machine should move at normal drive speeds.

7. Raise the boom above the drive limit switch.

8. Slowly move the drive control handle off center.

   - Result: The machine should move at a reduced drive speed.
2 Manually activate the drive enable limit switch.
○ Result: The drive enable limit switch roller should move freely and spring return to center. A distinct click should be felt and heard.

3 Start the engine from the platform controls.

4 Rotate the turntable to the left until the boom is past the left non-steer wheel.
○ Result: The drive enable indicator light should be on. Drive function should not operate until the drive enable switch is activated.

5 Rotate the turntable to the right until the boom is past the right non-steer wheel.
○ Result: The drive enable indicator light should be on. Drive function should not operate until the drive enable switch is activated.

A-14
Test the Oscillate Axle (oscillating axle-equipped models)
Proper axle oscillation is essential to safe machine operation. If the axle oscillation system is not operating correctly, the stability of the machine is compromised and it may tip over.

1 Start the engine from the platform controls.

2 Drive the right steer tire up onto a 6 inch (15.2 cm) block or curb.
○ Result: The three remaining tires should stay in firm contact with the ground.

3 Drive the left steer tire up onto a 6 inch (15.2 cm) block or curb.
○ Result: The three remaining tires should stay in firm contact with the ground.

4 Drive both steer tires up onto a 6 inch (15.2 cm) block or curb.
○ Result: The non-steer tires should stay in firm contact with the ground.
Table A Procedures

A-15
Replace the Engine Oil and Filter - Gasoline/LPG Models

**NOTICE**
Ford engine specifications require that this procedure be performed every 100 hours. Perform this procedure more often if dusty conditions exist or the machine is subjected to extended low idle operation.

Periodic replacement of the engine oil and filter is essential to good engine performance. Operating the machine with an improper oil level or neglecting periodic oil and filter changes can damage engine components. A daily check of elapsed machine hours against the hours noted on the oil filter will allow the inspector to anticipate and perform oil and filter changes at the 100 hour interval.

**NOTICE**
Perform this procedure after warming the engine to normal operating temperature.

**CAUTION**
Beware of hot engine parts and oil. Contact with hot engine oil and/or engine parts may cause severe burns.

1. Remove the oil filler cap located on the valve cover.

2. Pull the end of the oil drain hose out from under the engine.

3. Remove the plug from the end of the drain hose and allow all of the oil from the engine to drain into a suitable container.

4. Install the plug into the drain hose.

5. Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the oil filter.

6. Use an oil filter wrench and remove the filter.

7. Apply a thin layer of oil to the new oil filter gasket (filter part no. 28656). Then install the filter and tighten it securely by hand.
8 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter.

9 Fill the engine with new oil per specifications and install the filler cap.

10 Start the engine from the ground controls. Allow the engine to run for 30 seconds, then turn the engine off.

11 Check the oil filter and the oil drain hose for leaks.

12 Swing the engine pivot plate back to its original position and replace the two retaining bolts.

13 Check the engine oil level dipstick. Add oil if needed.

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

9 Fill the engine with new oil per specifications and install the filler cap.

10 Start the engine from the ground controls. Allow the engine to run for 30 seconds, then turn the engine off.

11 Check the oil filter and the oil drain hose for leaks.

12 Swing the engine pivot plate back to its original position and replace the two retaining bolts.

13 Check the engine oil level dipstick. Add oil if needed.

### TABLE A PROCEDURES

<table>
<thead>
<tr>
<th>A-16 Replace the Engine Air Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTICE</strong> Engine specifications require that this procedure be performed every 100 hours. Perform this procedure more often if dusty conditions exist.</td>
</tr>
</tbody>
</table>

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.

**NOTICE** Perform this procedure with the engine off.

1 Remove the end cap from the air cleaner canister.
2 Remove the mounting fastener from the air filter, then remove the filter.
3 Clean the inside of the canister and the gasket with a dry cloth.
4 Insert the new filter and replace the mounting fastener.
5 Replace the end cap on the canister.

<table>
<thead>
<tr>
<th>Ford Engine LSG-423 Oil capacity (including filter)</th>
<th>5 quarts</th>
<th>4.7 liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ford Engine LSG-423 Oil viscosity requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>below 60F / 15.5C</td>
<td>5W-30</td>
<td></td>
</tr>
<tr>
<td>-10 to 90F / -23 to 32C</td>
<td>10W-30</td>
<td></td>
</tr>
<tr>
<td>above -10F / -23C</td>
<td>10W-40 or 10W-50</td>
<td></td>
</tr>
<tr>
<td>above 25F / -4C</td>
<td>20W-40 or 20W-50</td>
<td></td>
</tr>
</tbody>
</table>

Use oils meeting API classification SF (labeled SF/CC or SF/CD) as they offer improved wear protection.

<table>
<thead>
<tr>
<th>Air filters - Genie part numbers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ford LSG-423 Engine</td>
<td>27916</td>
</tr>
<tr>
<td>Deutz F3L 1011</td>
<td>29553</td>
</tr>
</tbody>
</table>
Table B Procedures

B-1  
Check the Engine Belt(s)

Maintaining the engine belt(s) is essential to good engine performance and service life. The machine will not operate properly with a loose or defective belt and continued use may cause component damage.

Do not inspect while the engine is running. Remove the key to secure from operation.

Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 Deutz Diesel models: Remove front engine cover to access belt.
2 All models: Inspect the engine belt(s) for:
   · cracking
   · glazing
   · separation
   · breaks
3 Check the engine belt(s) for proper tension.

B-2  
Check the Radiator  
- Gasoline/LPG Models

Maintaining the radiator in good condition is essential for good engine performance. Operating a machine with a damaged or leaking radiator may result in engine damage. Also, restricting air flow through the radiator (i.e., dirt or debris) will affect the performance of the cooling system. A frequent check allows the inspector to identify changes in the condition of the radiator that might indicate cooling system problems.

Do not inspect while the engine is running. Remove the key to secure from operation.

Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 Inspect the radiator for leaks and physical damage.
2 Clean the radiator fins of debris and foreign materials.

B-3  
Check the Oil Cooler and Cooling Fins - Deutz Diesel Models

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

Do not inspect while the engine is running. Remove the key to secure from operation.

Beware of hot engine components. Contact with hot engine components may cause severe burns.

| Belt deflection - all models | 3/8 inch to 1/2 inch  
|                            | 9 mm to 12 mm |
Oil Cooler

1. Remove the cover from the side of the engine, then remove the oil cooler top cover.
2. Inspect the oil cooler for leaks and physical damage.
3. Clean the oil cooler of debris and foreign material.

Cooling and Blower Fins

4. Inspect the blower fins for physical damage.
5. Clean the blower fins of debris and foreign material.
6. Inspect the head cooling passages and fins for physical damage or foreign material, using a flashlight.
7. Clean the cylinder head cooling passages of debris and foreign material.

**B-4 Check the Exhaust System**

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

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

**CAUTION**
Beware of hot engine components. Contact with hot engine components may cause severe burns.

1. **Deutz Diesel models:** Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the exhaust system.
TABLE  B  PROCEDURES

2  Be sure that all nuts and bolts are tight.
3  Inspect all welds for cracks.
4  Inspect for exhaust leaks; i.e., carbon buildup around seams and joints.

B-5  Check the Battery

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**

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.
3  Be sure that the battery hold downs and cable connections are tight.
4  Remove the battery vent caps and check the specific gravity with a hydrometer.
5  Check the battery acid level. If needed, replenish with water to the bottom of the battery fill tube. Do not overfill.
6  Install the vent caps.

B-6  Check the Hydraulic Tank Filter Condition Indicator

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

1  Start the engine from the platform controls.
2  Move the engine speed control switch to high idle (rabbit symbol).
3  Inspect the filter condition indicator.

![Filter Diagram]

Result: The filter should be operating with the plunger in the green area. If the display shows the plunger in the red area, this indicates that the hydraulic filter is being bypassed and the filter should be replaced. See C-6, Replace the Hydraulic Tank Filter.
B-8
Inspect the Tires and Wheels (including lug nut torque)

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

**WARNING** An over-inflated tire can explode and may cause death or serious injury.

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.
4. Check the pressure in each air-filled tire.

### TABLE B PROCEDURES

#### Inspect the Tires and Wheels

<table>
<thead>
<tr>
<th>Tires and wheels</th>
<th>2WD front</th>
<th>2WD rear 4WD front &amp; rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire size</td>
<td>12.5L-16SL</td>
<td>12-16.5NHS</td>
</tr>
<tr>
<td>Tire ply rating</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Overall tire diameter</td>
<td>33.7 in 85.6 cm</td>
<td>33.2 in 84.3 cm</td>
</tr>
<tr>
<td>Tire pressure</td>
<td>45 psi 3.10 bar</td>
<td>45 psi 3.10 bar</td>
</tr>
<tr>
<td>Wheel diameter</td>
<td>16 in 40.6 cm</td>
<td>16.5 in 41.9 cm</td>
</tr>
<tr>
<td>Wheel width</td>
<td>10 in 25.4 cm</td>
<td>9.75 in 24.7 cm</td>
</tr>
<tr>
<td>Wheel lugs</td>
<td>8 @ 5/8-18</td>
<td>9 @ 5/8-18</td>
</tr>
<tr>
<td>Lug nut torque</td>
<td>125 ft-lbs 169.5 Nm</td>
<td>125 ft-lbs 169.5 Nm</td>
</tr>
</tbody>
</table>

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

1. Inspect the following areas for burnt, chafed, corroded and loose wires:
   - engine compartment electrical panel
   - engine wiring harness
   - inside of the ground control box
   - turntable manifold wiring
2. Start the engine from the ground controls, then raise the boom above the turntable covers.
3. Inspect the turntable area for burnt, chafed and pinched cables.
4. Lower the boom into the stowed position and turn the engine off.
5. Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
   - cable track on the boom
   - boom to platform cable harness
   - inside of the platform control box
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 torque 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).

Check the Oil Level in the Torque Hubs

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

Drive Torque Hubs

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

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 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. Apply pipe thread sealant to the plug, and then install it in the torque hub.

5. Repeat this procedure for each drive torque hub.

**Drive torque hub oil**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>17 fluid ounces 0.51 liters</th>
</tr>
</thead>
</table>

Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5

**NOTICE**
The free-wheel valve should always remain closed.
Turntable Rotate Torque 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.

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

3. Apply pipe thread sealant to the plug, and then install it in the torque hub.

### Turntable rotate torque hub oil

| Capacity | 8 fluid ounces  
|          | 0.24 liters |

Type SAE 90 multipurpose hypoid gear oil - API service classification GL5

---

**B-11**

Check and Adjust the Engine Idle Mixture - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LSG-423 2.3 Liter Industrial Engine Service Manual* (Ford number: 194-216). Genie part number 29586.

**B-12**

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.

**Gasoline/LPG Models**

**NOTICE** Perform this procedure in gasoline mode with the engine at normal operating temperature.

1. Disconnect the blue/black wire from the governor actuator.
TABLE B PROCEDURES

2 Connect an rpm gauge to the engine, then start the engine from the ground controls.

- Result: Carburetor low idle should be 900 rpm.

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

3 Turn the idle adjustment screw on the carburetor clockwise to increase rpm or counterclockwise to decrease rpm.

If low and high idle rpm’s are correct, disregard adjustment steps 8 and 9.

8 Remove the mounting fasteners from the electronic governor located on the engine side bulkhead, then remove the back panel from the governor.

9 Restart the engine, turn the low or high speed set screw clockwise to increase the rpm or counterclockwise to decrease the rpm.

If low and high idle rpm’s are correct, disregard adjustment steps 8 and 9.

10 Re-assemble the governor and recheck low and high idle.

Gasoline/LPG models

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low idle - carburetor</td>
<td>900 rpm</td>
</tr>
<tr>
<td>Low idle - electronic governor</td>
<td>1600 rpm</td>
</tr>
<tr>
<td>High idle</td>
<td>2500 rpm</td>
</tr>
</tbody>
</table>

Deutz Diesel models

1 Connect an rpm gauge to the engine, and then start the engine from the ground controls.

- Result: Low idle should be 1300 rpm.

Skip to step 3 if the low idle rpm is correct.
2. Loosen the lock nut, then turn the adjustment screw clockwise to increase the rpm or counterclockwise to decrease the rpm. Tighten the lock nut and recheck the rpm.

3. Move the engine idle control switch to high idle (rabbit symbol) from the ground controls.
   - Result: High idle should be 2300 rpm.
   - If high idle rpm is correct, disregard adjustment step 4.

4. Loosen the yoke lock nut, then turn the 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.

### Deutz Diesel models

<table>
<thead>
<tr>
<th>Function</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low idle</td>
<td>1300</td>
</tr>
<tr>
<td>High idle</td>
<td>2300</td>
</tr>
</tbody>
</table>

---

**B-13 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 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 any machine function from the **ground controls**.
   - Result: The machine functions should not operate.
4. Turn the key switch to ground control.
5. Check any machine function from the **platform controls**.
   - Result: The machine functions should not operate.
6. Turn the key switch to the OFF position.
   - Result: The engine should stop and no functions should operate.

**NOTICE** Deutz Diesel models: All functions should stop immediately. The engine will shut off after 2 to 3 seconds.
TABLE B PROCEDURES

B-14
Test the Emergency Stop Buttons

Properly functioning Emergency Stop buttons are essential for safe machine operation. An improperly operating Emergency Stop button will fail to shut off power and stop all machine functions, resulting in a hazardous situation for ground and platform personnel.

As a safety feature, selecting and operating the ground controls will override the platform controls, including the Emergency Stop button.

1 Start the engine from the ground controls.
2 Push down the Emergency Stop button to the OFF position.
3 Start the engine from the platform controls.
4 Push down the Emergency Stop button to the OFF position.

- Result: The engine should shut off and no machine functions should operate.

- Notice: As a safety feature, selecting and operating the ground controls will override the platform controls, including the Emergency Stop button.

Deutz Diesel models: All functions should stop immediately. The engine will shut off after 2 to 3 seconds.

B-15
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 Emergency Stop button to the OFF position.
2 Start the engine from the ground controls.
3 Operate each boom function through a partial cycle.

- Result: All boom functions should operate.

- Notice: The ground Emergency Stop button will stop all machine operation, even if the key switch is switched to platform control.
B-16
Check the Directional Valve Linkage

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

1. Remove the drive chassis cover from the non-steer end.
2. Inspect the linkage for the following:
   - lock nuts are tight against yokes
   - yoke clevis pins are installed
   - cotter pins are installed through clevis pins
   - linkage is properly attached to directional valve

B-17
Test the Platform Self-leveling

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

1. Start the engine from the ground controls, then lower the boom into the stowed position.
2. Adjust the platform to a level position using the platform leveling switch.
3. Raise and lower the boom through a full cycle.

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

B-18
Test the Service Horn

A functional service horn is essential to safe machine operation. The service horn is activated at the platform controls and sounds at the ground as a warning to ground personnel. An improperly functioning horn will prevent the operator from alerting ground personnel of hazards or unsafe conditions.

1. Turn the key switch to platform control and pull out the Emergency Stop button to the ON position at both the ground and platform controls.
2. Push down the service horn button at the platform controls.

   - Result: The service horn should sound.
TABLE B PROCEDURES

B-19
Test the Foot Switch

A properly functioning foot switch is essential to safe machine operation. Machine functions should activate and operate smoothly as long as the foot switch is pressed down, and promptly stop when the foot switch is released. The foot switch will also shift the engine into high idle if the idle select is switched to the rabbit and foot switch symbol. An improperly functioning foot switch can cause an unsafe working condition and endanger platform and ground personnel.

![NOTICE] The engine should not start if the foot switch is pressed down.

1. Start the engine from the platform controls.
2. Without pressing down the foot switch, check the machine functions.
   ○ Result: The machine functions should not operate.
3. Press down the foot switch and operate the machine functions.
   ○ Result: The machine functions should operate.

B-20
Test the Engine Idle Select

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

Low idle (turtle symbol) allows the operator to control individual boom functions only. Drive functions do not operate at 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 and is usually selected only when the generator option is being used.

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. Pull out the Emergency Stop button to the ON position at both the ground and platform controls.
2. Start the engine from the ground controls. Then move the engine idle control switch to high idle (rabbit symbol) and hold in the ON position.
   ○ Result: The engine should change to high idle.
3. Release the engine idle control switch.
   ○ Result: The engine should return to low idle.
4. Turn the key switch to platform controls.
5. At the platform controls, move the engine idle control switch to high idle (rabbit symbol).
   ○ Result: The engine should change to high idle.
6. Move the engine idle control switch to low idle (turtle symbol).
   ○ Result: The engine should change to low idle.
7. Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).
   ○ Result: The engine should not change to high idle.
8. Press down the foot switch.
   ○ Result: The engine should change to high idle.

Gasoline/LPG models

<table>
<thead>
<tr>
<th>Setting</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low idle</td>
<td>1600</td>
</tr>
<tr>
<td>High idle</td>
<td>2500</td>
</tr>
</tbody>
</table>

Deutz Diesel models

<table>
<thead>
<tr>
<th>Setting</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low idle</td>
<td>1300</td>
</tr>
<tr>
<td>High idle</td>
<td>2300</td>
</tr>
</tbody>
</table>
**B-21**

**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 when 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.

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

1. Move the fuel select switch to gasoline and then move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).
2. Start the engine from the platform controls and allow it to run at low idle.
3. Press down the foot switch to allow the engine to run at high idle.
   - **Result:** The engine should start promptly and operate smoothly in low and high idle.
4. Release the foot switch and stop the engine.
5. Move the fuel select switch to LPG.
6. Restart the engine and allow it to run at low idle.
7. Press down the foot switch to allow the engine to run at high idle.
   - **Result:** The engine should start promptly and operate smoothly in low and high idle.

**NOTICE** 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-22**

**Test the Drive Enable System**

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

1. Start the engine from the platform controls.
2. Rotate the turntable to the right until the boom is past the right non-steering wheel.
   - **Result:** The drive enable indicator light should turn on.
3. Slowly move the drive control handle off center.
   - **Result:** The drive function should not operate.
4. Hold the drive enable toggle switch to either side and slowly move the drive control handle off center.
   - **CAUTION** Always use the color-coded direction arrows on the platform control panel and the drive chassis to identify which direction the machine will travel.
   - **Result:** The drive function should operate.
5. Rotate the turntable to the left until the boom is past the left non-steering wheel.
   - **Result:** The drive enable indicator light should come on.
6. Repeat steps 3 and 4.
B-23

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. Hydrostatic brakes and hydraulically-released individual wheel brakes can appear to operate normally when they are actually not fully operational.

**WARNING**  Be sure that the machine is not in free-wheel or partial free-wheel configuration. Refer to B-9 in this section, Confirm the Proper Brake Configuration.

**NOTICE**  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. Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch), 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 joystick when your reference point on the machine crosses the test line.
6. Measure the distance between the test line and your machine reference point.

**Braking:**

<table>
<thead>
<tr>
<th>Pavement surface</th>
<th>Stopping distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paved surface</td>
<td>2 to 4 ft</td>
</tr>
<tr>
<td></td>
<td>0.60 to 1.21 m</td>
</tr>
</tbody>
</table>

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

B-24

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.

**NOTICE**  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. Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch), 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 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.

**Drive speed:**

<table>
<thead>
<tr>
<th>Stowed position</th>
<th>2WD</th>
<th>4WD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline/LPG models</td>
<td>40 ft/6.8 sec</td>
<td>40 ft/7.8 sec</td>
</tr>
<tr>
<td></td>
<td>12.2 m/6.8 sec</td>
<td>12.2 m/7.8 sec</td>
</tr>
<tr>
<td>Deutz Diesel models</td>
<td>40 ft/7.8 sec</td>
<td>40 ft/9.1 sec</td>
</tr>
<tr>
<td></td>
<td>12.2 m/7.8 sec</td>
<td>12.2 m/9.1 sec</td>
</tr>
</tbody>
</table>
B-25
Test the Alarm Package
- Optional Equipment

The alarm package includes:
- travel alarm
- descent alarm
- flashing beacon

Alarms and a beacon are installed to alert operators and ground personnel of machine proximity and motion. The alarm package is installed on the turntable covers.

**NOTICE**
The alarms and beacon will operate with the engine running or not running.

1. At the ground controls, pull out the Emergency Stop button to the ON position and turn the key switch to ground control.
   - Result: The flashing beacon should be on and flashing.

2. Move the boom switch to the DOWN position, hold for a moment and then release it.
   - Result: The descent alarm should sound when the switch is held down.

3. Turn the key switch to platform control.

4. At the platform controls pull out the Emergency Stop button to the ON position.
   - Result: The flashing beacon should be on and flashing.

5. Press down the foot switch. Move the boom control handle to the DOWN position, hold for a moment and then release it.
   - Result: The descent alarm should sound when the control handle is held down.

6. Press down the foot switch. Move the drive control handle off center, hold for a moment and then release it. Move the drive control handle off center in the opposite direction, hold for a moment and then release it.
   - Result: The travel alarm should sound when the drive control handle is moved off center in either direction.

B-26
Perform Hydraulic Oil Analysis

See D-1, *Test or Replace the Hydraulic Oil*. 
B-27
Replace the Engine Oil and Filter - Deutz Diesel Models

**NOTICE** Engine specifications require that this procedure be performed every 500 hours. Perform this procedure more often if dusty conditions exist.

Periodic replacement of the engine oil and filter is essential to good engine performance. Operating the machine with an improper oil level or neglecting periodic oil and filter changes can damage engine components. A frequent check of elapsed machine hours against the hours noted on the oil filter will allow the inspector to anticipate and perform oil and filter changes at the 500 hour interval.

**NOTICE** Perform this procedure after warming the engine to normal operating temperature.

**CAUTION** Beware of hot engine parts and oil. Contact with hot engine oil and/or engine parts may cause severe burns.

1. Remove the oil filler cap located on the valve cover.
2. Pull the end of the drain hose out from under the engine.
3. Remove the plug from the end of the drain hose and allow all of the oil from the engine to drain into a suitable container.
4. Install the plug into the drain hose.
5. Use an oil wrench and remove the oil filter.

6. Apply a thin layer of oil to the new filter gasket (filter part no. 29561). Then install the filter and tighten it securely by hand.

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

8. Fill the engine with new oil per specifications and replace the oil filler cap.

9. Start the engine from the ground controls. Allow the engine to run for 30 seconds then turn the engine off.

10. Check the oil filter and oil pan for leaks.

11. Check the engine oil level dipstick. Add oil if needed.

**Deutz Engine F3L 1011**

| Oil capacity (including filter) | 8 liters |

**Deutz Engine F3L 1011 Oil viscosity requirements**

| Temperature below 60°F / 15.5°C (synthetic) | 5W-30 |
| -10°F to 90°F / -23°C to 32°C | 10W-40 |
| Temperature above -4°F / -34°C | 15W-40 |

Engine oil should have properties of API classification CC/SE, CD/SE, CC/SF or CD/SF grades.
C-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 worn out wear pads may result in component damage and unsafe operating conditions.

1. Start the engine from the ground controls.
2. Raise the end of the boom to a comfortable working height (chest high), then extend the boom 1 foot (30 cm).
3. Measure each wear pad. Replace the wear pad if it is less than 7/16 inch (11 mm) thick. If the wear pad is more than 7/16 inch (11 mm) thick, shim as necessary to obtain zero clearance and zero drag.
4. Extend and retract the boom through the entire range of motion to check for tight spots that could cause binding or scraping.

**NOTICE** Always maintain squareness between the boom outer and inner tubes.

C-2

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 boom approximately 7 to 8 feet (2.1 to 2.4 m).
2. Be sure that each turntable mounting bolt is torqued in sequence to 210 foot-pounds (285 Newton meters).
3. Lower the boom to the stowed position.
4. Check to ensure that each bearing mounting bolt under the drive chassis is torqued in sequence to 210 foot-pounds (285 Newton meters).
TABLE C PROCEDURES

C-3
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.

**Non-steering wheels: All models**

1. Chock the steer wheels to prevent the machine from rolling.
2. Center a lifting jack of ample capacity (15,000 lbs/6,804 kg) under the drive chassis between the non-steering wheels.
3. Lift the wheels off the ground and then place jack stands under the drive chassis for support.
4. Disengage the torque hubs by turning over the torque hub disconnect caps on each non-steering wheel hub.
5. Manually rotate each non-steering wheel.

○ Result: Each non-steering wheel should rotate with minimum effort.

6. Re-engage the torque hubs by turning over the hub disconnect caps. Carefully remove the jack stands, lower the machine and remove the jack.

**WARNING** Collision hazard. Failure to re-engage the torque hubs may cause death or serious injury and property damage.

**Steer wheels: 4WD models**

7. Chock the non-steering wheels to prevent the machine from rolling.
8. Position the lifting jack under the steering axle and center it between the steering wheels.
9. Lift the wheels off the ground and then place jack stands under the drive chassis for support.
10. Disengage the torque hubs by turning over the torque 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 torque hubs by turning over the hub disconnect caps. Carefully remove the jack stands, lower the machine and remove the jack.

**WARNING** Collision hazard. Failure to re-engage the torque hubs may cause death or serious injury and property damage.
C-4

Grease the Turntable Rotation Bearing and Rotate Gear

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

1. Locate the grease fitting on the platform end of the tank side bulkhead.

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

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

<table>
<thead>
<tr>
<th>Oil type</th>
<th>Multipurpose grease</th>
</tr>
</thead>
</table>

C-5

Replace the Torque Hub Oil

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

Drive Torque Hubs:

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

2. Remove both plugs and drain the oil.
TABLE C PROCEDURES

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

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, and then install the plugs.

5 Repeat steps 1 through 4 for all the other drive torque hubs.

<table>
<thead>
<tr>
<th>Oil capacity per hub</th>
<th>17 fluid ounces</th>
<th>0.51 liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Turntable Rotate Torque Hub

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

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

3 Remove the torque hub mounting bolts, and then remove the torque hub from the machine.

4 Remove the plug from the side of the torque hub. Then drain the oil from the hub.

5 Install the torque hub. Torque the hub mounting bolts to 180 foot-pounds (244 Newton meters).

6 Install the brake and motor onto the torque hub.

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 plugs, and then install the plugs.

<table>
<thead>
<tr>
<th>Capacity</th>
<th>8 fluid ounces</th>
<th>0.24 liters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C-6  
**Replace the Hydraulic Tank Filter**

Replacement of the hydraulic tank filter 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** Beware of hot oil. Contact with hot oil may cause severe burns.
- **NOTICE** Perform this procedure with the engine off.

1. Remove the filter with an oil filter wrench.
2. Apply a thin layer of oil to the new oil filter gasket.
3. Install the new filter (part no. 20293) and tighten it securely by hand. Clean up any oil that may have spilled during the installation procedure.
4. Start the engine from the ground controls.
5. Inspect the filter and related components to be sure that there are no leaks.

C-7  
**Replace the Drive Loop Hydraulic Filter**

Replacing the drive loop hydraulic filter is essential to 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** Beware of hot oil. Contact with hot oil may cause severe burns.
- **NOTICE** Perform this procedure with the engine off.

1. Open the engine side turntable cover and locate the drive loop hydraulic filter mounted on the engine near the main pump.
2. Rotate the filter housing counterclockwise and remove the housing.
3. Remove the filter element from the housing.
4. Inspect the housing seal and replace it if necessary.
5. Install the new filter (part no. 20880) and hand tighten the housing onto the filter head. Clean up any oil that may have spilled during the installation procedure.
6. Start the engine from the ground controls.
7. Inspect the filter assembly to be sure that there are no leaks.
C-8
Replace the Diesel Fuel Filter - Deutz Diesel Models

Replacing the diesel fuel filter is essential to good engine performance and service life. A dirty or clogged filter may cause the engine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

Replace the fuel filter in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

DANGER
Perform this procedure with the engine off.

1. Turn the manual fuel shutoff valve, located at the fuel tank, to the CLOSED position.
2. Remove the fuel filter with a filter wrench.
3. Apply a thin layer of oil or diesel fuel to the new fuel filter gasket.
4. Install the new filter (part no. 29560) and tighten it securely by hand. Clean up any diesel fuel that might have spilled during the procedure.
5. Turn the manual fuel shutoff valve, located at the fuel tank, to the OPEN position.
6. Start the engine from the ground controls, then inspect the fuel filter for leaks.

If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

C-9
Replace the Gasoline Fuel Filter - Gasoline/LPG Models

Replacing the gasoline fuel filter is essential to good engine performance and service life. A dirty or clogged filter may cause the engine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

DANGER
Engine fuels are combustible. Replace the fuel filter in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

Perform this procedure with the engine off.
1. Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the fuel filter, located near the carburetor.

2. Loosen the filter bracket mounting bolt. Disconnect the fuel hoses from the filter, then slide the filter out of the bracket.

3. Install the new fuel filter in the bracket with the flow direction arrow on the filter, pointing toward the carburetor. Tighten the bracket mounting bolt, then connect the fuel hoses to the filter.

4. Clean up any fuel that may have spilled during the installation procedure.

5. Start the machine from the ground controls, then inspect the fuel filter and hoses for leaks.

   **DANGER** If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

6. Swing the engine pivot plate back to its original position and replace the two retaining bolts.
C-10
Replace the PCV Valve
- Gasoline/LPG Models

Yearly replacement of the PCV valve is essential to good engine performance. A malfunctioning valve can impair crankcase ventilation and may cause engine damage.

**NOTICE** Perform this procedure with the engine off.

1. Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the PCV valve.
2. Remove the hoses from the PCV valve, then remove the valve.
3. Install the new PCV valve. Connect the hoses.
4. Swing the engine pivot plate back to its original position and replace the two retaining bolts.

C-11
Clean or Replace the Distributor Cap and Rotor
- Gasoline/LPG Models

A distributor cap and rotor that are clean and free of damage, wear and corrosion are essential to good engine performance and service life. A dirty or worn cap and rotor may cause the engine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the cap and rotor be replaced more often.

**NOTICE** Perform this procedure with the engine off.
1. Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the distributor.

2. Label and disconnect the coil and spark plug wires from the distributor cap.

3. Remove the cap and rotor from the distributor.

4. Clean the cap and rotor using electrical contact cleaner or a damp cloth.

5. Completely dry the cap and rotor.

6. Inspect the cap and rotor for corrosion, cracks and abrasion. Replace the cap and rotor if they are damaged.

7. Install the rotor and cap, then connect the coil and spark plug wires.

8. Swing the engine pivot plate back to its original position and replace the two retaining bolts.

9. Start the engine from the ground controls and check the engine for proper operation.

---

**C-12 Replace the Spark Plugs - Gasoline/LPG Models**

Periodic replacement of the spark plugs is essential to good engine performance and service life. Worn, loose or corroded spark plugs will cause the engine to perform poorly and may result in component damage.

**NOTICE** Perform this procedure with the engine off.

1. Label, then disconnect the plug wires from the spark plugs by grasping the molded boot. Do not pull on the plug wire.

2. Blow out any debris around spark plugs.

3. Remove all the spark plugs from the engine.

4. Adjust the gap on each new spark plug.

5. Install the new spark plugs, then connect the wires. Be sure that each spark plug wire is attached to the correct spark plug.

**Spark plug specifications**

<table>
<thead>
<tr>
<th>Spark plug type</th>
<th>Motorcraft AWSF-42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark plug gap</td>
<td>0.042 to 0.046 inches (1.07 to 1.18 mm)</td>
</tr>
<tr>
<td>Spark plug torque</td>
<td>5 to 10 foot-pounds (7 to 14 Nm)</td>
</tr>
</tbody>
</table>
TABLE C PROCEDURES

C-13 Check and Adjust the Air/LPG Mixture - Gasoline/LPG Models

Maintaining the proper air-to-fuel mixture during LPG operation is essential to good engine performance.

**DANGER** 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.

**NOTICE** The engine rpm needs to be preset for gasoline fuel operation before adjusting the LPG idle mixture. Refer to B-12, Check and Adjust the Engine RPM.

**NOTICE** The engine should be warmed to normal operating temperature before performing this procedure.

1. Move the fuel select switch to LPG fuel and start the engine from the ground controls.

2. Loosen the high idle mixture adjustment lock nut.

3. Load the system by pressing the boom retract switch, then move the engine idle control switch to high idle (rabbit symbol).

4. Adjust the high idle adjustment screw to obtain an air-to-fuel mixture ratio of 13.0:1 to 13.2:1, using an exhaust gas analyzer.

**NOTICE** If an exhaust gas analyzer is not available, adjust to obtain peak or optimum rpm.
5. Hold the adjustment screw and tighten the lock nut.

6. Move the engine idle control switch to low idle (turtle symbol) and adjust the low idle screw to obtain an air-to-fuel mixture ratio of 13.0:1 to 13.2:1.

C-14
Check and Adjust the Ignition Timing - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LSG-423 2.3 Liter Industrial Engine Service Manual* (Ford number: 194-216). Genie part number 29586.

C-15
Check the Engine Valve Clearances - Deutz Diesel Models

Complete information to perform this procedure is available in the *Deutz FL 1011 Workshop Manual* (Deutz Number 02611642). Genie part number 29789.
Section 4 - Scheduled Maintenance Procedures

Table D Procedures

D-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.

**NOTICE**
The machine uses Dexron II equivalent hydraulic oil. 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, quarterly testing (B-26) thereafter should be completed.

Perform this procedure with the boom in the stowed position.

1. Close the two hydraulic shutoff valves located at the hydraulic tank.

![Open vs Closed Valve Illustration]

**CAUTION**
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.

2. Remove the drain plug from the hydraulic tank.

3. Completely drain the tank into a suitable container. See capacity specifications listed below.

4. Disconnect and cap the two suction hoses that are attached to the hydraulic tank shutoff valves.

5. Remove the strainer assemblies from the tank.

6. Carefully clean any foreign material from the strainers. Clean the strainers from the inside out.

7. Apply pipe thread sealant to the strainer mounting threads, and then install them.

8. Apply pipe thread sealant to the drain plug, and then install it in the tank.

9. Install the two suction hoses.

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

11. Clean up any oil that may have spilled and open the hydraulic tank valves.

12. Prime the pump by doing the following:

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

   **Gasoline/LPG models:**

   Remove the high tension lead from the center of the ignition coil.

   **WARNING**

   Electrocution hazard. Contact with electrically charged circuits may cause death or serious injury. Remove all rings, watches and other jewelry.

The machine uses Dexron II equivalent hydraulic oil. 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, quarterly testing (B-26) thereafter should be completed.
Deutz Diesel models:
Hold the manual fuel shutoff valve counterclockwise to the CLOSED position.

All models:
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).

13 Connect the wiring and start the engine from the ground controls. Check the hydraulic tank for leaks.

### Hydraulic system

<table>
<thead>
<tr>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic tank capacity</td>
<td>45 gallons</td>
</tr>
<tr>
<td></td>
<td>170 liters</td>
</tr>
<tr>
<td>Hydraulic system capacity (including tank)</td>
<td>50 gallons</td>
</tr>
<tr>
<td></td>
<td>189 liters</td>
</tr>
<tr>
<td>Hydraulic fluid</td>
<td>Dexron II equivalent</td>
</tr>
</tbody>
</table>

D-2
Change or Recondition the Engine Coolant - Gasoline/LPG Models

Replacing or reconditioning the engine coolant is essential to good engine performance and service life. Old or dirty coolant may cause the engine to perform poorly and continued use may cause engine damage. Extremely dirty conditions may require coolant to be changed more frequently.

**CAUTION** Beware of hot engine parts and coolant. Contact with hot engine parts and/or coolant will cause severe burns.

**NOTICE** Perform this procedure with the engine off and cooled.

1 Put on protective clothing and eye wear.
2 Disconnect the coolant return hose at the radiator and drain the coolant return tank.
3 Remove the radiator cap from the radiator.
TABLE D PROCEDURES

4 Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the radiator petcock.

5 Open the petcock on the radiator and allow all the coolant to drain into a container.

6 After all the coolant has drained, close the petcock. Connect the coolant return hose to the radiator.

7 Open the petcock on the engine block and allow the coolant to drain into a container. After the fluid is drained, close the petcock.

8 Replace all coolant hoses and clamps.

9 Pour the proper coolant mixture (anti-freeze and water) for your climate into the radiator until it is full.

10 Disconnect hose A from hard line B and hold until coolant starts to pour out of the open hose. Then immediately reconnect the hose.

11 Fill the radiator and then fill the coolant recovery tank to the normal range.

12 Clean up any coolant spilled during this procedure.

13 Start the engine from the ground controls, run it for 30 seconds, and then turn it off.

14 Inspect for leaks and then check the fluid level in the coolant recovery tank. Add water if needed.

15 Start the engine from the ground controls and run it until reaching normal operating temperature.

16 Allow engine to cool and check the fluid level in the coolant recovery tank. Add water if needed.

<table>
<thead>
<tr>
<th>Ford Engine LSG-423</th>
<th>11.5 quarts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant capacity</td>
<td>10.9 liters</td>
</tr>
</tbody>
</table>
D-3
Change the Fuel Lines

Maintaining the fuel lines in good condition is essential to safe operation and good engine performance. Failure to detect a worn, cracked or leaking fuel line may cause an unsafe operating condition.

⚠️ DANGER ⚠️
Engine fuels are combustible. Replace the fuel lines in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

⚠️ NOTICE ⚠️
Perform this procedure with the engine off.

1. Close the manual fuel shutoff valve, located next to the fuel tank.
2. Remove and replace the fuel line hoses and clamps according to the following illustrations:

Fuel may be expelled under pressure. Wrap a cloth around fuel hoses to absorb leaking fuel before disconnecting them.

Deutz Diesel models:
- a: hose from the injector to the fuel tank
- b: hoses connecting injectors
- c: hose from the fuel shutoff valve to the fuel pump
- d: hose from the fuel pump to the fuel filter
- e: hose from the fuel filter to the injection pump
- f: hose from the injection pump to the injectors
### TABLE D PROCEDURES

#### D-4 Check the Engine Valve Clearance - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LSG-423 2.3 Liter Industrial Engine Service Manual* (Ford number: 194-216). Genie part number 29586.

#### D-5 Check the Engine Cylinder Compression - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LSG-423 2.3 Liter Industrial Engine Service Manual* (Ford number: 194-216). Genie part number 29586.

---

Gasoline/LPG models
a fuel filter
b hose from the fuel filter to the carburetor
c hose from the fuel pump to the fuel filter
d hose from the fuel shutoff valve to the fuel pump

3 Clean up any fuel that may have spilled during this procedure.

4 Start the engine from the ground controls, then inspect the fuel filter and hoses for leaks.

**DANGER** If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.
D-6
Clean the PCV Hoses and Fittings - Gasoline/LPG Models

Maintaining PCV hoses is essential to good engine performance. Improperly functioning PCV hoses will fail to ventilate the crankcase and continued use of neglected hoses could result in component damage.

NOTICE Perform this procedure with the engine off.

1. Remove the 2 bolts from the engine pivot plate. Swing the engine pivot plate away from the machine to access the PCV hoses.

2. Disconnect the hoses from the PCV valve, then disconnect the hoses from the engine.

3. Clean the hoses with a mild cleaning solvent.

4. Dry both hoses and inspect them for cracks and damage. Replace the hoses if they are damaged.

Shown with distributor cap removed
a PCV valve
b hose, PCV valve to carburetor
c hose, PCV valve to crankcase
TABLE D PROCEDURES

D-7
Check the Fuel Injection Pumps and Injectors
- Deutz Diesel Models

Complete information to perform this procedure is available in the Deutz FL 1011 Workshop Manual (Deutz number: 0291 1942). Genie part number 29789.

D-8
Check the Toothed Belt
- Deutz Diesel Models

Complete information to perform this procedure is available in the Deutz FL 1011 Operation Manual (Deutz number: 0297 4706 EN). Genie part number 29790.

D-9
Replace the Timing Belt
- Gasoline/LPG Models

Complete information to perform this procedure is available in the Ford LSG-423 2.3 Liter Industrial Engine Service Manual (Ford number: 194-216). Genie part number 29586.
Before Troubleshooting:

- Read, understand and obey the safety rules and operating instructions printed in the Genie S-40 Operator’s Manual.
- Be sure that all necessary tools and test equipment are available and ready for use.
- Read each appropriate flow chart 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.

⚠️ DANGER
Electrocution hazard. Contact with electrically charged circuits may 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.

⚠️ NOTICE
Perform all troubleshooting on a firm level surface.

⚠️ NOTICE
Two persons will be required to safely perform some troubleshooting procedures.
TROUBLESHOOTING FLOW CHARTS

About This Section

When a malfunction is discovered, the flow charts in this section will help a service professional pinpoint the cause of the problem. To use this section, basic hand tools and certain pieces of test equipment are required—voltmeter, ohmmeter, pressure gauges.

The location of terminals mentioned in this section can be found on the appropriate electrical or hydraulic schematics provided in Section 6, Schematics.

Since various degrees of a particular function loss may occur, selecting the appropriate flow chart may be troublesome. When a function will not operate with the same speed or power as a machine in good working condition, refer to the flow chart which most closely describes the problem.

General Repair Process

1. Malfunction discovered
2. Identify symptoms
3. Troubleshoot
4. Inspect and test
5. Problem solved
6. Perform repair
7. Return to service
8. Problem still exists
9. Service problem solved
Engine Will Not Crank Over

Be sure the key switch is in the appropriate position.

Be sure the emergency stop buttons are pulled up into the on position.

Be sure the circuit breaker(s) are not tripped.

Check battery voltage. less than 12V

Check battery condition OR check alternator OR check battery cables OR replace the battery.

Check voltage at center terminal on start switch.

12V

Trace circuit back through the key switch, emergency stop button and CB2, repair open.

Hold start switch and check voltage at either side terminal on start switch.

0V

Replace start toggle switch.

Hold start switch and check voltage at terminal TB33.

12V

Repair blk wire circuit from start switch to TB33.

Hold start switch and check voltage at terminal #5 on start lockout module.

0V

Repair blk wire circuit from TB33 to start lockout module terminal #5.

Hold start switch and check voltage at terminal #6 and 7 at start lockout module.

0V

Check/repair open in power supply wire to terminal #6 and 7 on start lockout module.

Hold start switch and check voltage at terminal #1 on start lockout module.

0V

Check ground wire to terminal #5 on start lockout module.

bad

Repair open in ground wire.

good

Consult Genie Industries Service Department.

Continued on the next page.
CHART 1

Continued from the previous page.

- Hold start switch and check voltage at terminal #85 on CR1.
  - 0V: Repair open in blk wire from terminal #1 on start lockout module to CR1.
  - 12V: Check voltage at terminal #30 on CR1.
    - 0V: Repair red wire circuit from battery to CB1 to CR1 terminal #30.
    - 12V: Hold start switch and check voltage at terminal #87 on CR1.
      - 0V: Replace CR1 relay.
      - 12V: Check voltage at initiate terminal starter solenoid.
        - 0V: Repair open in blk wire circuit from CR1 to starter solenoid.
        - 12V: Check, repair or replace starter or starter solenoid.

- Check voltage at terminal #86 on CR1.
  - bad: Repair open in ground to CR1.
  - good: Replace CR1 relay.
Engine Cranks Over But Will Not Start - Gasoline/LPG Models

Be sure to check the engine oil level and fill as needed.

Be sure to check fuel levels and engine coolant level.

Be sure the gasoline shut-off valve is in the on position.

Be sure that automatic choke is not sticking closed.

Perform following tests in gasoline mode only.

Hold start switch and check battery voltage while engine is cranking.

- less than 11V
  - Check battery condition OR check alternator OR check for short circuits OR check battery cables OR replace the battery.

- more than 11V
  - Check if engine coolant over-temperature sending signal post has continuity to ground.

  - continuity
    - Check if radiator and/or engine block feels excessively hot.
    - hot
      - Check engine coolant level OR check radiator fins for clogging OR check engine fan belts OR see Ford service manual for troubleshooting an overheating engine.
    - not hot
      - Remove whit wire from TB24. 
      - no continuity
        - Repair short in whit wire circuit from terminal #10 start lock out module to TB24 OR consult Genie Industries Service Department.
      - continuity
        - Replace temperature switch sender.
  - no continuity
    - Repair short in whit wire circuit from temperature sending unit, check continuity to ground.
    - no continuity
      - Remove #1 spark plug and ground spark plug body. Crank engine and observe spark.
      - good spark
        - Go to Chart 2A, page 5 - 8.
      - weak or no spark
        - Disable starter by removing blk wire at the starter solenoid, hold start switch and check voltage at positive terminal on ignition coil.
        - 12V
          - See Ford service manual for troubleshooting ignition system.
        - less than 12V
          - Continued on the next page.
Hold start switch and check voltage at wht #21 on terminal #67 of CR2.

- 12V: Repair open in wht #21 wire to ignition coil.
- 0V: Check voltage at red wire on terminal #30 of CR2.

- 0V: Repair open in red wire circuit from battery to CB1 to CR1 to CR2.
- 12V: Hold start switch and check voltage at terminal #86 of CR2.

- 0V: Repair open in blk wire from terminal #86 on CR2 to terminal #9 on start lockout module.
- 12V: Check ground to terminal #85 on CR2.

- no good: Check voltage at terminal #6 and 7 on start lockout module.
  - 0V: Repair open in power supply wires to terminal #6 and 7 on start lockout module.
  - 12V: Check ground wire, terminal #5 on start lockout module.
  - bad: Repair open in ground circuit to start lockout module.
  - good: Replace the start lockout module OR consult Genie Industries Service Department.

- good: Repair open in ground wire to CR2.

Continued on the next page.
Continue from the previous page.

Hold start switch and check voltage at wht on terminal #87 of CR8.

12V → Repair open in brn #R8 wire to ignition coil.

0V

Check voltage at wht wire on terminal #30 of CR8.

0V → Repair open in wht wire circuit from terminal #87 on CR1 to terminal #50 on CR8.

12V

Hold start switch and check voltage at terminal #86 of CR8.

0V → Repair open in blk wire from terminal #86 on CR1 to #86 on CR8.

12V

Check ground to terminal #85 on CR8.

no good → Repair open in ground wire to CR8.

good

If weak spark still exists, contact Genie Industries Service Department.
Chart 2A

Engine Cranks Over But Will Not Start - Gasoline/LPG Models

or

Engine Runs While Cranking Then Dies

Continuation of “good spark” fault path.

Perform these tests in gasoline mode only.

Crank engine and check voltage at automatic choke.

Repair open in white #21 wire circuit from ignition module to automatic choke.

Check automatic choke for proper adjustment or internal damage.

Adjust or replace automatic choke OR consult Genie Industries Service Department

With keyswitch on and both mushroom switches pulled out, check voltage at red/wht #36 wire on vacuum switch.

Repair open in red/wht #36 wire circuit from TB36 to vacuum switch.

Remove the blk wire with diode from terminal #86 on CR6, crank the engine over for 15 seconds and check voltage at red/blk wire on vacuum switch (reconnect blk wire after test).

Turn machine off. See Repair section for vacuum switch check.

Check vacuum line for restrictions.

Replace vacuum line.

See Ford service manual to troubleshoot low manifold vacuum.

Repair open in red/blk wire circuit from vacuum switch to CR6.

Continued on the next page.
With keyswitch on and both mushroom switches pulled out, check voltage at center terminal on fuel select switch in platform control box.

- If voltage is 0V, check ground wire on terminal #85 of CR6.
- If ground wire is good, replace CR6.
- If ground wire is no good, repair open in ground wire.

With keyswitch on and both mushroom switches pulled out, check voltage on gasoline side (blu/wht wire) of fuel select switch.

- If voltage is 0V, repair open in red power wire circuit with diode.
- If voltage is 12V, replace toggle switch.

With keyswitch on and both mushroom switches pulled out, check voltage at terminal TB38.

- If voltage is 0V, repair open in blu/wht wire circuit from toggle switch to TP38 to TB38.
- If voltage is 12V, repair open in blu/wht wire circuit from TB38 to terminal #30 on CR6.

With keyswitch on and both mushroom switches pulled out, check voltage at blu/wht wire at terminal #30 on CR6.

- If voltage is 0V, replace CR6.

Continued on the next page.
CHART 2A

Hold start switch and check voltage at blu/wht wire on anti-diesel valve (on engine carburetor).

- 0V: Repair open in blu/wht #38 wire circuit CR6 to anti-diesel valve.
- 12V: Hold start switch and check voltage at blu/wht #38 wire on gasoline solenoid (at gasoline tank).

- 0V: Repair open in blu/wht #38 wire circuit from anti-diesel valve to gasoline solenoid.
- 12V: Hold start switch, does engine fire?

- No: Reconnect the two wires to vacuum switch and check for fuel line blockage OR replace anti-diesel valve OR see Ford service manual for troubleshooting fuel pump and/or carburetor OR Consult Genie Industries Service Department.
- Yes: Go to chart 2B, page 5 - 11.
Engine Runs While Cranking Then Dies

1. **Crank engine and check voltage at terminal #2 on start lockout module.**
   - If voltage is 0V, go to next step.
   - If voltage is 6 to 7V, go to next step.

2. **While cranking engine for 15 seconds, check continuity to ground on terminal #10 start lockout module. Is continuity maintained?**
   - If yes, disconnect wht #24 wire from oil pressure sender and check continuity to ground on signal post of sender, while cranking the engine. Is continuity maintained?
     - If yes, check oil level or replace oil pressure sending unit or refer to Ford service manual for troubleshooting low oil pressure.
     - If no, go to next step.
   - If no, repair short to ground in wht #24 wire from sender to TB24 to start lockout module terminal #10.

3. **Check voltage at terminal #4 on start lockout module.**
   - If voltage is 12V, disconnect red wire from terminal #4 on start lockout module and check voltage at terminal #4.
     - If voltage is 0V, repair short to power in red wire circuit from TB27.
     - If voltage is 12V, replace start lockout module OR consult Genie Industries Service Department.
   - If voltage is 0V, replace start lockout module OR consult Genie Industries Service Department.

4. **Crank engine and check voltage at orgblk #41 wire on alternator.**
   - If voltage is 0V, repair or replace alternator OR contact Genie Industries Service Department.
   - If voltage is 6 to 7V, repair open in orgblk #41 wire circuit from alternator to TB41 to terminal #2 on start lockout module.

5. **Check voltage at terminal #4 on start lockout module.**
   - If voltage is 12V, disconnect red wire from terminal #4 on start lockout module and check voltage at terminal #4.
     - If voltage is 0V, repair short to power in red wire circuit from TB27.
     - If voltage is 12V, replace start lockout module OR consult Genie Industries Service Department.
Chart 3

Engine Cranks
Over But Will
Not Start -
Deutz Diesel
Models

Be sure to check the engine oil level and fill as needed.

Be sure to check fuel level.

Be sure the diesel shut-off valve is in the on position.

Hold start switch and check battery voltage while engine is cranking.

less than 11V

Check battery condition OR check alternator OR check for short circuits OR check battery cables OR replace the battery.

more than 11V

Check if engine coolant over-temperature sending signal post has continuity to ground.

continuity

Check if oil cooler and/or engine block feels excessively hot.

hot

Check engine coolant level OR oil cooler fins for clogging OR check engine fan belts OR see Deutz service manual for troubleshooting an overheating engine.

not hot

Remove white wire from temperature sending unit, check continuity to ground (on wire).

continuity

Replace temperature switch sender.

no continuity

Repair short in white wire circuit from TB24 to temperature sender.

no continuity

Repair short in white wire circuit from start lock out module to TB24 OR consult Genie Industries Service Department.

12V

Turn machine off and isolate the fuel solenoid. Check the resistance of the solenoid.

0 or infinite ohms

Replace the fuel solenoid.

3.50 ohms

See Deutz service manual for troubleshooting fuel system.

0V

Disabled starter by removing black wire at the starter solenoid, hold start switch and check voltage at positive terminal on fuel solenoid.

Continue on the next page.
Hold start switch and check voltage at wht #21 wire on terminal #87 of CR2.

12V

Repair open in wht #21 wire from CR2 to fuel solenoid.

0V

Check voltage at red wire on terminal #90 of CR2.

0V

Repair open in red wire circuit from battery to CB1 to CR1 to CR2.

12V

Hold start switch and check voltage at terminal #86 of CR2.

0V

Repair open in blk wire from terminal #86 on CR2 to terminal #9 on start lockout module.

12V

Hold start switch and check voltage at terminal #9 on start lockout module.

0V

Check voltage at terminal #6 and 7 on start lockout module.

0V

Repair open in power supply wires to terminal #6 and 7 on start lockout module.

12V

Check ground wire, terminal #5 on start lockout module.

bad

Repair open in ground circuit to terminal #5 on start lockout module.

good

Replace the start lockout module OR consult Genie Industries Service Department.

Check ground to terminal #85 on CR2.

no good

Repair open in ground wire to CR2.

Continued on the next page.
CHART 3

Continued from the previous page.

Crank engine and check voltage at terminal #2 on start lockout module.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0V</td>
<td>Repair or replace alternator OR contact Genie Industries Service Department.</td>
</tr>
<tr>
<td>6 to 7V</td>
<td>Repair open in org/bk #41 wire circuit from alternator to TB41 to terminal #2 on start lockout module.</td>
</tr>
</tbody>
</table>

While cranking engine for 15 seconds, check continuity to ground on terminal #10 on start lockout module. Is continuity maintained?

<table>
<thead>
<tr>
<th>Continuity Maintained?</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Disconnect wht #24 wire from oil pressure sender and check continuity to ground on signal post of sender, while cranking the engine. Is continuity maintained?</td>
</tr>
<tr>
<td>No</td>
<td>Repair short to ground wht #24 wire from sender to TB24 to start terminal #10 on lockout module.</td>
</tr>
</tbody>
</table>

Check voltage at terminal #4 on start lockout module.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0V</td>
<td>Replace start lockout module OR consult Genie Industries Service Department.</td>
</tr>
<tr>
<td>12V</td>
<td>Replace start lockout module OR consult Genie Industries Service Department.</td>
</tr>
</tbody>
</table>

Disconnect red wire from terminal #4 on start lockout module and check voltage at terminal #4.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0V</td>
<td>Repair positive short in red wire circuit from TB27.</td>
</tr>
<tr>
<td>12V</td>
<td>Replace start lockout module OR consult Genie Industries Service Department.</td>
</tr>
</tbody>
</table>

Disconnect red wire from terminal #4 on start lockout module and check voltage at terminal #4.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V</td>
<td>Replace start lockout module OR consult Genie Industries Service Department.</td>
</tr>
</tbody>
</table>

Check oil level OR replace oil pressure sending unit OR refer to Deutz service manual for troubleshooting low oil pressure.
Engine Will Not Start On LPG, But Will Start On Gasoline - Gasoline/LPG Models

Be sure fuel select switch is switched to LPG.

Be sure to check LPG fuel level.

Chart 4

Disconnect LPG supply line from LPG tank and bleed pressure from line.

With keyswitch on and both mushroom switches pulled out, check voltage at LPG side (blu/red wire) of fuel select switch.

0V
- Replace fuel select switch.

12V
- With keyswitch on and both mushroom switches pulled out, check voltage at TB39.

0V
- Repair open in blu/red wire circuit from fuel select switch to TP39 to TB39.

12V
- With keyswitch on and both mushroom switches pulled out, check voltage at terminal #30 on CR7.

0V
- Repair open in blu/red wire circuit from TB39 to terminal #30 on CR7.

12V
- Crank engine for 15 seconds and check voltage at terminal #86 on CR7.

0V
- Repair open in red/blk wire circuit from vacuum switch to CR6 to CR7.

12V
- Check ground wire to terminal #85 on CR7.

bad
- Repair open in ground to terminal #85 on CR7.

good
- Continued on the next page.
Continue from the previous page.

- **Hold start switch and check voltage at terminal #87 on CR7.**
  - **0V** → Replace CR7 relay.
  - **12V**
    - **Hold start switch and check voltage at blu/red wire on LPG solenoid.**
      - **0V** → Repair open in blu/red wire circuit from CR7 terminal #87 to LPG solenoid.
      - **12V**
        - **Check resistance of LPG solenoid.**
          - **0 or infinite ohms** → Replace LPG solenoid.
          - **9 to 10 ohms**
            - Reconnect LPG tank and starter then see Maintenance section for LPG adjustments OR consult Genie Industries Service Department.
Engine Will Not Start On Gasoline, But Will Start On LPG - Gasoline/LPG Models

Be sure fuel select switch is switched to gasoline.

Be sure to check gasoline fuel level.

Be sure that engine choke is operating properly.

With keyswitch on and both mushroom switches pulled out, check voltage at gasoline side (blu/wht wire) of fuel select switch.

- **0V**: Replace fuel select switch.
- **12V**: With keyswitch on and both mushroom switches pulled out, check voltage at TB38.
  - **0V**: Repair open in blu/wht wire circuit from fuel select switch to TP38 to TB38.
  - **12V**: With keyswitch on and both mushroom switches pulled out, check voltage at terminal #30 on CR6.
    - **0V**: Repair open in blu/wht wire circuit from CR6 terminal #87 to anti-diesel valve OR replace CR6.
    - **12V**: Crank engine for 15 seconds and check voltage at terminal #86 on CR6.
      - **0V**: Repair open in red/blk wire circuit from vacuum switch to CR6.
      - **12V**: Check ground wire to terminal #85 on CR6.
        - **bad**: Repair open in ground wire to terminal #85 on CR6.
        - **good**: Hold start switch and check voltage at blu/wht wire on anti-diesel valve (on carburetor).
          - **0V**: Repair open in blu/wht wire circuit from CR6 terminal #87 to anti-diesel valve OR replace CR6.

Continued on the next page.
CHART 5

Hold start switch and check voltage at blu/wht wire on gasoline solenoid (at fuel tank).

0V
Repair open in blu/wht wire circuit from CR6 to fuel solenoid.

12V
Check resistance of gasoline solenoid.

0 or infinite ohms
Replace gasoline solenoid.

18 to 19 ohms
Check ground wire to gas solenoid.

bad
Repair ground wire.

good
Check resistance of anti-diesel valve.

0 or infinite ohms
Replace anti-diesel valve.

24 to 25 ohms
Reconnect starter, check anti-diesel and fuel valve for defects OR see Ford service manual for carburetor troubleshooting.

Continued from the previous page.
**Engine High Idle Inoperative - Gasoline/LPG Models**

If high idle operates on LPG but not on gasoline, see Ford service manual for carburetor troubleshooting.

If high idle operates on gasoline but not on LPG, see Repair section for LPG regulator adjustments.

Be sure throttle linkage from governor to carburetor is not binding, see Repair section.

Be sure high idle can be achieved by grasping the governor actuator arm and momentarily pulling to throttle the carburetor.

---

**Chart 6**

- **Start engine and switch rpm select to high idle (rabbit symbol) for following checks. Check voltage at blk/red wire on rpm switch.**
- **Check voltage at center terminal on rpm select switch.**
- **Repair open in circuit supplying 12V to center terminal of switch.**
- **Check voltage at TB35.**
- **Check voltage at terminal #30 on CR3.**
- **Check voltage at terminal #66 on CR3.**
- **Check ground wire to terminal #65 on CR3.**
- **Check voltage to terminal #67 on CR3.**
- **Check voltage at terminal #86 (blk/red) of CR4.**
- **Check ground wire to terminal #65 on CR4.**

**Continued on the next page.**
Continued from the previous page.

1. **Check voltage at terminal 5 on electronic governor.**
   - 12V: Replace CR4 relay.
   - 0V: Proceed to next step.

2. **Check voltage at terminal 1 (red/wht wire) on electronic governor.**
   - 0V: Repair open in red/wht wire circuit from TB23 to electronic governor.
   - 12V: Proceed to next step.

3. **Check voltage at terminal 1 (red/wht wire) on governor actuator.**
   - 0V: Repair open in red/wht wire circuit from electronic governor to governor actuator.
   - 12V: Proceed to next step.

4. **Turn engine off, then turn machine on but do not start engine. Check voltage at terminal 4 on electronic governor.**
   - 0V: Repair open in blu/blk wire circuit from governor actuator to electronic governor OR check and/or replace governor actuator.
   - 12V: Proceed to next step.

5. **Turn machine off, remove both wires from governor actuator and check resistance across governor actuator terminals.**
   - 2 to 3 ohms: Proceed to next step.
   - 0 or infinite ohms: Replace governor actuator.

6. **Reconnect governor wires and restart engine and check voltage at electronic governor terminal 3 (brown wire).**
   - 0V: Repair open in brown wire circuit from ignition module to electronic governor.
   - 6 to 7V: Proceed to next step.

7. **See Maintenance section for governor adjustments OR replace electronic governor.**
**Engine Low Idle Inoperative - Gasoline/LPG Models**

If low idle operates on LPG but not on gasoline, see Ford service manual for carburetor troubleshooting. If low idle operates on gasoline but not on LPG, see Repair section for LPG regulator adjustments.

Be sure throttle linkage from governor to carburetor is not binding, see Repair section.

---

**Chart 7**

Start engine and switch rpm select to low idle (turtle symbol). Check voltage at terminal #30 (blk wire) on CR3.

- **12V**
  - Isolate the ground and platform rpm switches, check individually and replace defective switch.

- **0V**
  - Check voltage at terminal #30 on CR4.

- **12V**
  - Repair open in wht #21 wire circuit from TB21 to CR3 to CR4.

- **0V**
  - Replace CR4 relay.

- **12V**
  - Check voltage at terminal #5 on electronic governor.

- **0V**
  - Repair open in blk/red wire circuit from ignition module to electronic governor.

- **6 to 7V**
  - Turn machine off, remove blu/blk wire from terminal #4 on electronic governor and restart engine.

  - **engine goes to high idle**
    - Recheck throttle linkage (see Repair section) OR check and/or replace governor actuator OR see Ford service manual for carburetor troubleshooting.

  - **engine goes to low idle**
    - Recheck electronic governor adjustments OR replace electronic governor.

- **0V**
  - Check voltage at electronic governor terminal 3 (brown wire).

- **12V**
  - Check voltage at terminal #87A on CR4.

- **0V**
  - Replace CR4 relay.

- **12V**
  - Check voltage at terminal #30 on CR4.

- **0V**
  - Repair open in wht #21 wire circuit from TB21 to CR3 to CR4.
Engine High Idle Inoperative - Deutz Diesel Models

Be sure mechanical linkage is not binding or defective.

Be sure PR2 relay and 2-speed solenoid grounding wires are free of corrosion and have full continuity to ground.

Start engine, switch rpm select switch to high idle (rabbit symbol) and check if 2-speed solenoid pulls in.

Check voltage at blk/red wire on rpm select switch.

Check voltage at TB35.

Check voltage at terminal #30 on CR3.

Check voltage to terminal #66 on CR3.

Check ground wire to terminal #85 on CR3.

Check voltage to initiate terminal #86 on CR4.

Check voltage on center terminal of rpm select switch.

Check voltage on center terminal of switch.

Check voltage on center terminal of switch.

Repair open in circuit supplying 12V to center terminal of switch.

Replace toggle switch.

Repair open in blk/red wire circuit from toggle switch to TP35 to TB35.

Repair open in blk/red wire circuit from TB35 to terminal #30 on CR3.

Repair open in wht #21 wire circuit from TB21 to terminal #86 on CR3.

Repair open in ground wire to terminal #85 on CR3.

repair CR3 relay.

Repair open in blk/red wire circuit from CR3 to CR4.

Continued on the next page.
CHART 8

continued from the previous page.

Check ground wire to terminal #85 on CR4.

Bad

Repair ground wire to terminal #85 on CR4.

Good

Check voltage to terminal #30 on CR4.

0V

Repair open in wht #21 wire circuit from TB21 to CR3 to CR4.

12V

Check voltage at the blk/red wire on the 2-speed solenoid.

0V

Replace CR4 relay OR repair open in blk/red wire circuit from terminal #87 on CR4 to 2-speed solenoid.

12V

Check if 2-speed solenoid moves in and out freely.

Solenoid binds

Check linkage or replace solenoid.

moves freely

Replace 2-speed solenoid. Note: resistance across solenoid terminals should be approximately 0.3 ohms.
Chart 9

Engine
Low Idle
Inoperative - Deutz Diesel Models

Check if mechanical linkage from 2-speed solenoid to fuel injection system is binding or defective.

At platform controls, start engine and switch rpm select switch to maintained low idle (turtle symbol). Check volts at blk/red wire on rpm select switch.

- 12V: Isolate the platform and ground rpm switches, check individually and replace defective switch.
- 0V: Check voltage at the red wire on the 2-speed solenoid.

- 12V: Replace CR4 relay.
- 0V: Check if 2-speed solenoid moves in and out freely.

- Moves freely: Check adjustment of linkage and fuel injection system low idle. See Maintenance section.
- ok: See Deutz workshop manual to troubleshoot fuel injection system OR consult Genie Industries Service Department.

- solenoid binds: Check linkage or replace solenoid.
Chart 10

All Functions Inoperative, Engine Starts and Runs

1. Check hydraulic fluid level.
   - Low: Fill with Dexron II equivalent hydraulic fluid.
   - OK: Check pump suction line shutoff valves. Valve handles should be parallel with hose.

2. Open valves. If engine has been run with valves closed, it may have damaged one or both pumps.

3. Disconnect center coil wire from distributor cap and isolate from grounding (Deutz models, hold manual fuel shutoff lever counterclockwise).
   - Spline turns: Troubleshoot inoperative boom functions and inoperative drive functions separately.
   - Spline does not turn: Engine to pump flex plate coupling is defective. See Repair section.

4. Remove function pump from main pump but leave all hoses connected. Hold start switch and crank engine over while observing spline drive at rear of main pump.
Chart 11

All Lift and Steer Functions Inoperative, Drive Functions Operational

Be sure the hydraulic suction line shutoff valve for the lift/steer pump is in the open position.

Be sure all grounding wires for the hydraulic manifold valves are free of corrosion and have full continuity to ground.

Install a 0 to 3000 PSI pressure gauge on the function manifold. Start engine, hold the boom retract function and check the hydraulic pressure.

- less than 2400 psi
  - Adjust the function manifold relief valve (item AB) all the way in (clockwise) counting the number of turns. Hold the boom retract switch and recheck the pressure.
    - less than 2400 psi
      - Replace the function pump, see Repair section.
    - 2400 psi or more
      - Hold the boom retract switch and readjust the relief pressure to 2400 psi.
  - 2400 psi
    - Troubleshoot each function individually or consult Genie Industries Service Department.

ok

bad

Replace the pump.
Ground Controls Inoperative, Platform Controls Operate Normally

Be sure all other functions operate normally, including platform controls.

**Chart 12**

Does the engine start from the ground controls?  

- yes: Start the engine from the ground controls and check the voltage on the center pole (red wire) of the platform level switch.
  
  - 0V: Repair open in red wire circuit from key switch to function switches.
  
  - 12V: Troubleshoot the functions individually.

- no: Check voltage at red wire on ground controls contact of the key switch (the red wire checked should originate at the emergency stop button).
  
  - 0V: Repair open in red wire circuit from emergency stop button to the key switch.
  
  - 12V: Check voltage at red wire at ground controls contact on the key switch.
    
    - 0V: Check if key switch internal cam is activating ground contact.
      
      - yes: Replace key switch contact for ground controls.
      
      - no: Replace key switch.
    
    - 12V: Repair open in red wire circuit from key switch to function switches.
Chart 13

Platform Controls
Inoperative, Ground Controls Operate Normally

Be sure all cables are in good condition with no kinks or abrasions.

Does engine start from the platform controls? yes
Start engine from the platform, then press down the foot switch and check voltage at TP24.

no

Check voltage at TB22.

0V
Check voltage at TP22.

12V
Check voltage at blk wire on platform emergency stop button.

0V
Replace contact on emergency stop button.

12V
Check voltage at TP23.

12V
Repair open in blk wire circuit from TP23 to foot switch OR replace foot switch.

0V
Repair open in blk wire circuit from emergency stop button to TP23.

12V
Repair open in blk-2 wire circuit from TB22 TP22.

12V
Check for open in red wire circuit from key switch to TB22 OR Replace the key switch platform contacts.

12V
Test and replace foot switch OR repair open in wht wire circuit from foot switch to TP24.

0V
Boom Up Function Inoperative

Be sure all other functions operate normally.

If boom up function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section.

If boom up function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

Chart 14

Hold ground control function switch up and check volts at red/wht wire on boom function proportional valve.

0V

Repair open in red/wht wire circuit (with diode) from TB3 to proportional valve.

3 to 6V

Remove both wires from valve coil and check resistance across the coil terminals.

0 or infinite ohms

Replace coil.

4.5 to 5.5 ohms

Hold toggle switch up and manually override proportional valve (push in button on end of valve spool). Note: Overriding the valve will require two people. If a helper is not available, interchange the valve (item AA) with a like valve (item Z).

Function operates

Replace defective proportional valve.

Function inoperative

Hold ground control function switch up. Check volts at red wire on boom function directional valve.

0V

Repair open circuit in red wire from TB1 to boom function directional valve.

12V

Remove both wires from valve coil. Check resistance across coil terminals.

0 or infinite ohms

Replace coil.

4 to 5 ohms

Interchange flow regulator valve (item Y) with a like valve (item X).

Function operates

Replace defective flow regulator valve.

Function inoperative

Continued on the next page.
Hold toggle switch up and manually override directional valve (push in button on end of valve spool). Note: Overriding the valve will require two people. If a helper is not available, interchange the valve (item R) with a like valve (item S).

Check the resistance of the directional valve coils. 0 or infinite ohms
Replace the defective valve coil(s).

4 to 5 ohms
Replace the valve.

Function operates

Interchange check valve (item M) with a like valve (item K).

Function operates
Replace defective shuttle valve.

Function inoperative

Interchange check valve (item M) with a like valve (item K).

Function operates
Replace defective shuttle valve.

Function inoperative

Install a 0 to 3000 PSI pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.

2400 psi
Check for mechanical restrictions keeping boom from moving OR repair cylinder OR cylinder counterbalance valve.

Less than 2400 psi
Repair cylinder OR replace cylinder counterbalance valve OR manifold has internal defect; consult Genie Industries Service Department.
**Boom Down Function Inoperative**

Be sure all other functions operate normally including boom up function.

If boom down function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section.

If boom down function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

---

**Chart 15**

1. **Hold ground control function switch and check volts at red/blk wire on boom function directional valve.**
   - 0V: Repair open in red/blk wire circuit from TB2 to directional valve.
   - 12V: Hold toggle switch down and manually override the down directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item R) with a like valve (item S).

2. **Check the resistance of the down directional valve coil.**
   - 0 or infinite ohms: Replace the coil.
   - 4 to 5 ohms: Replace the valve.

3. **Install a 0 to 3000 PSI pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.**
   - 1800 psi: Counting the turns, adjust the boom down relief valve (item F) in all the way. Then operate the function down.
   - less than 1800 psi: Check for mechanical restrictions and/or a condition exists in which the cylinder counterbalance valve is not allowing the cylinder to retract or the cylinder has internal defects. Disconnecting hydraulic lines or adjusting the cylinder counterbalance valve in this situation can be very dangerous. Please consult Genie Industries Service Department.

Continued on the next page.
Adjust the boom down relief valve (item F) in one turn clockwise. Then, with pressure gauge still attached, operate the function down.

1800 psi or more

With boom fully lower, hold the function down switch. Adjust the relief valve to read 1800 psi.

less than 1800 psi

Remove the boom down high pressure line from the manifold and cap the port. Hold down function and recheck pressure.

1800 psi

Repair the boom lift cylinder.

less than 1800 psi

Internal defect in manifold OR one of the previous tests involving the pump or manifold components was possibly overlooked or diagnosed incorrectly. Recheck and/or consult Genie Industries Service Department.
Boom Extend Function Inoperative

Be sure all other functions operate normally.

If boom extend function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section.

If boom extend function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

- **0V**
  - Repair open in whit/red wire circuit from TB6 to proportional valve.

- **3 to 6V**
  - Remove both wires from valve coil and check resistance across the coil terminals.
    - **0 or infinite ohms**
      - Replace coil.
    - **4.5 to 5.5 ohms**
      - Hold toggle switch in extend position and manually override proportional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item Z) with a like valve (item AA).
      - Replace defective proportional valve.

- **Interchange flow regulator valve (item X) with a like valve (item Y).**
  - **Function inoperative**
    - **Function operates**
      - Replace defective flow regulator valve.

- **Hold toggle switch and manually override extend directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item S) with a like valve (item P).**
  - **Function inoperative**
    - **Function operates**
      - Check the resistance of the directional valve coil.
        - **0 or infinite ohms**
          - Replace the defective valve coil.
        - **4 to 5 ohms**
          - Replace the valve.
    - Continued on the next page.
Install a 0 to 3000 PSI pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.

1200 psi

Counting the turns, adjust the boom extend relief valve (item D) in all the way. Then operate the extend function.

With boom fully extended, hold the extend function switch. Adjust the relief valve to read 1200 PSI and replace the cylinder counterbalance valve.

less than 1200 psi

Check for mechanical restrictions and/or the cylinder has internal defects. Please consult Genie Industries Service Department.

less than 1200 psi

Adjust the boom extend relief valve (item D) in one turn clockwise. Then, with pressure gauge still attached, operate the function.

With boom fully extended, hold the extend function switch. Adjust the relief valve to read 1200 psi.

less than 1200 psi

Remove the extend function pressure line from the manifold and cap the port. Then, with pressure gauge still attached, operate the function.

Repair the cylinder and/or replace cylinder counterbalance valves.

less than 1200 psi

Internal defect in manifold OR one of the previous tests involving the pump or manifold components was possibly overlooked or diagnosed incorrectly. Recheck and/or consult Genie Industries Service Department.
Boom Retract Function Inoperative

Be sure all other functions operate normally including boom extend function. If boom retract function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section. If boom retract function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

- Hold ground control function switch and check volts at blk/wht wire on extend/retract function valve.
  - 0V: Repair open in blk/wht wire circuit from TB8 to directional valve.
  - 12V: Hold toggle switch down and manually override the retract directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item S) with a like valve (item P).
    - Check the resistance of the retract directional valve coil.
      - 0 or infinite ohms: Replace the coil.
      - 4 to 5 ohms: Replace the valve.

- Install a 0 to 3000 psi pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.
  - 2400 psi: Check for mechanical restrictions keeping boom from retracting OR repair cylinder OR replace cylinder counterbalance valve.
  - less than 2400 psi: Repair cylinder OR replace cylinder counterbalance valve OR manifold has internal defect, consult Genie Industries Service Department.
Chart 18

Turntable Rotate Function Inoperative

Be sure all other functions operate normally.

If turntable rotate function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section.

If turntable rotate function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

Hold ground control function switch and check volts at whit/rd wire on turntable rotate function proportional valve.

- 0V: Repair open in whit/red wire circuit from TB6 to proportional valve.

- 4 to 7V: Remove both wires from valve coil and check resistance across the coil terminals.
  - 0 or infinite ohms: Replace the coil.
  - 4.5 to 5.5 ohms: Hold toggle switch and manually override proportional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item Z) with a like valve (item AA).

Function inoperative:

Interchange rotation flow regulator valve (item X) with a like valve (item Y).

Function operates: Replace defective flow regulator valve.

Function inoperative:

Hold toggle switch to left and manually override rotate left directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item P) with a like valve (item S).

Function operates: Check the resistance of the directional valve coils.
  - 0 or infinite ohms: Replace the defective valve coil(s).
  - 4 to 5 ohms: Replace the valve.

Function inoperative:

Continued on the next page.
Interchange check valve (item K) with a like valve (item M).

If function operates, replace defective check valve.

If function is inoperative, install a 0 to 3000 psi pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.

If pressure is 2400 psi, check for mechanical restrictions keeping turntable from rotating or check rotation motor or check rotation brake or check rotation torque hub.

If pressure is less than 2400 psi, repair rotation motor or manifold has internal defect, consult Genie Industries Service Department.
Chart 19

Turntable
Rotate Left
Function
Inoperative

Be sure all other functions operate normally including turntable rotate right function.

If turntable rotate left function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section.

If turntable rotate left function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

Hold ground control function switch and check volts at wht/blk wire on rotate function directional valve.

0V → Repair open in wht/blk wire circuit from TBS to directional valve.

12V → Remove both wires from rotate left valve coil and check resistance across the coil terminals.

0 or infinite ohms → Replace the valve coil.

4 to 5 ohms → Hold toggle switch left and manually override rotate left directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item P) with a like valve (item S).

Function operates → Replace the rotate directional valve.

Function inoperative → Install a pressure gauge at the quick-disconnect coupling on the function manifold and hold the function switch.

2400 psi → Interchange the rotate left and right counterbalance valves (item M and item N on turntable rotation motor).

Function operates → Replace defective counterbalance valve.

Function inoperative → Check for mechanical restrictions keeping turntable from rotating left OR replace directional valve OR repair rotation motor.

2400 psi → Repair rotation motor.

Less than 2400 psi → Remove the rotate left function pressure line from the manifold and cap the port (S2). Then, with pressure gauge still attached, operate the function.

2400 psi → Replace the directional valve OR the manifold has internal defects OR Consult Genie Industries Service Department.
Turntable Rotate Right Function Inoperative

Be sure all other functions operate normally including turntable rotate right function.

If turntable rotate right function operates normally from the ground controls but not from the platform controls, troubleshoot the platform controller. See Repair section.

If turntable rotate right function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

**Chart 20**

- **Hold ground control function switch and check volts at wht wire on rotate function directional valve.**
  - **0V**
    - Repair open in wht wire circuit from TB4 to directional valve.
  - **12V**
    - Remove both wires from rotate right valve coil and check resistance across the coil terminals.
      - **0 or infinite ohms**
        - Replace the valve coil.
      - **4 to 5 ohms**
        - Hold toggle switch right and manually override rotate right directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item P) with a like valve (item S).
          - If function operates
            - Replace the rotate directional valve.
          - If function inoperative
            - Install a pressure gauge at the quick-disconnect coupling on the function manifold and hold the function switch.
              - **2400 psi**
                - Interchange the rotate right and left counterbalance valves (item M and item N on turntable rotation motor).
                  - If function operates
                    - Replace defective counterbalance valve.
                  - If function inoperative
                    - Check for mechanical restrictions keeping turntable from rotating right OR replace directional valve OR repair rotation motor.
                      - **less than 2400 psi**
                        - Repair rotation motor.
          - **less than 2400 psi**
            - Replace the directional valve OR the manifold has internal defects.

**Consult Genie Industries Service Department.**
Chart 21

All Platform Leveling Functions Inoperative

Be sure all other functions operate normally.

Be sure both automatic and manual platform leveling do not operate.

If automatic leveling operates but manual leveling does not, troubleshoot Platform Leveling Up Function Inoperative.

Hold ground control function switch and check voltage at org/red wire on platform level flow control valve.

0V

Repair org/red wire circuit from TB16 to flow control valve.

12V

Remove both hydraulic hoses from manifold (ports PL1 & PL2). Plug the hoses and cap the manifold fittings.

0 or infinite ohms

Replace the coil.

4 to 8 ohms

Replace the counterbalance valves, items B & C or valve block A.

no

Plumb a pressure gauge into the master cylinder barrel-end hydraulic hose using a tee fitting. Operate boom up function and check if platform levels.

2400 psi

Check for mechanical restrictions OR replace the slave cylinder counterbalance valves.

less than 2400 psi

Deadhead the pressure gauge into the barrel-end hydraulic hose from the master cylinder and raise the boom one inch at a time. Continually monitor the pressure gauge during boom up. Do not allow the pressure to exceed 2500 psi.

2400 psi or more

Repair or replace the slave cylinder.

2400 psi or more

Repair or replace the master cylinder.

less than 2400 psi

Repair or replace the collector cylinder.
**Platform Level Up Function Inoperative**

Be sure all other functions operate normally.

If platform level up function operates normally from the ground controls but not from the platform controls, troubleshoot the platform control toggle switch. See Repair section.

If platform level up function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

1. **Hold ground control function switch and check voltage at org wire on platform level up function directional valve.**
   - **0V**
     - Repair open in org wire circuit from TB14 to directional valve.
   - **12V**
     - Remove both wires from valve coil and check resistance across the coil terminals.
     - If infinite ohms:
       - Replace the coil.
     - If 4 to 5 ohms:
       - Hold toggle switch and manually override the level up directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (Item O) with a like valve (Item N).
       - Function operates:
         - Replace the platform leveling directional valve.
       - Function inoperative:
         - Interchange check valve (Item L) with like valve (Item K).
         - Function operates:
           - Replace defective check valve.
         - Function inoperative:
           - Install a pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.
             - **2400 psi or more**
               - Interchange the level up and down counterbalance valves (Items B & C).
               - Function operates:
                 - Replace defective counterbalance valve.
               - Function inoperative:
                 - Disconnecting hydraulic lines or adjusting the cylinder counterbalance valves in this situation can be very dangerous. Please consult Genie Industries Service Department.
             - **Less than 2400 psi**
               - Replace the directional valve OR the manifold has internal defects OR one of the previous tests was possibly overlooked or diagnosed incorrectly.
                 - Recheck and/or consult Genie Industries Service Department.
Chart 23

Platform Level Down Function Inoperative

Be sure all other functions operate normally.

If platform level down function operates normally from the ground controls but not from the platform controls, troubleshoot the platform control toggle switch. See Repair section.

If platform level down function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

- **Hold ground control function switch and check voltage at org/blk wire on platform level down function directional valve.**
  - **0V**
    - Repair open in org/blk wire circuit from TB15 to directional valve.
  - **12V**
    - Remove both wires from valve coil and check resistance across the coil terminals.
    - **0 or infinite ohms**
      - Replace the coil.
    - **4 to 5 ohms**
      - Hold toggle switch and manually override the level down directional valve (push in button on end of valve spool). Note: overriding the valve will require two people. If a helper is not available, interchange the valve (item O) with a like valve (item N).
      - **Function operates**
        - Replace the platform leveling directional valve.
      - **Function inoperative**
        - Interchange check valve (item L) with like valve (item K).
  - **Function operates**
    - Replace defective check valve.
  - **Function inoperative**
    - Install a pressure gauge at the quick disconnect coupling on the function manifold and hold the function switch.
    - **2400 psi or more**
      - Interchange the level up and down counterbalance valves (items B & C).
      - **Function operates**
        - Replace defective counterbalance valve.
    - **Less than 2400 psi**
      - Replace the directional valve OR the manifold has internal defects OR one of the previous tests was possibly overlooked or diagnosed incorrectly. Recheck and/or consult Genie Industries Service Department.

Disconnecting hydraulic lines or adjusting the cylinder counterbalance valves in this situation can be very dangerous. Please consult Genie Industries Service Department.
Platform Rotate Left Function Inoperative

Be sure all other functions operate normally.

If platform rotate left function operates normally from the ground controls but not from the platform controls, troubleshoot the platform control toggle switch. See Repair section.

If platform rotate left function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

Hold ground control function switch and check voltage at grn/blk wire on platform rotate left function directional valve.

0V

Repair open in grn/blk wire circuit from TB18 to directional valve.

12V

Remove both wires from valve coil and check resistance across coil terminals.

0 or infinite ohms

Replace the coil.

4 to 5 ohms

Hold toggle switch left and manually override rotate left directional valve (push in button on end of valve spool). Note: overriding valve will require two people. If a helper is not available, interchange the valve (item N) with a like valve (item O).

function operates

Replace platform rotate directional valve.

function inoperative

Install a pressure gauge at quick disconnect coupling on rotate function manifold and hold function switch.

2400 psi or more

Check for mechanical restrictions OR hydraulic rotator or function manifold has internal defect. Consult Genie Industries Service Department.

2400 psi

Interchange check valve (item H) with like valve (item L).

function operates

Replace defective check valve.

function inoperative

Replace directional valve OR manifold has internal defects OR consult Genie Industries Service Department.
## Chart 25

### Platform Rotate Right Function Inoperative

Be sure all other functions operate normally.

If platform rotate right function operates normally from the ground controls but not from the platform controls, troubleshoot the platform control toggle switch. See Repair section.

If platform rotate right function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

1. **Hold ground control function switch and check voltage at grn wire on platform rotate right function directional valve.**
   - 0V: Repair open in grn wire circuit from TB17 to directional valve.
   - 12V: Remove both wires from valve coil and check resistance across coil terminals.
     - 0 or infinite ohms: Replace the coil.
     - 4 to 5 ohms: Hold toggle switch right and manually override rotate left directional valve (push in button on end of valve spool). Note: overriding valve will require two people. If a helper is not available, interchange the valve (item N) with a like valve (item O).
       - Function operates: Replace platform rotate directional valve.
       - Function inoperative: Install a pressure gauge at quick disconnect coupling on rotate function manifold and hold function switch.
         - 2400 psi or more: Check for mechanical restrictions OR hydraulic rotator or function manifold has internal defect. Consult Genie Industries Service Department.
         - 2400 psi: Interchange check valve (item I) with like valve (item L).
           - Function operates: Replace defective check valve.
           - Function inoperative: Replace directional valve OR manifold has internal defects OR consult Genie Industries Service Department.
Oscillate Function Inoperative

Be sure all other function operate normally.

Check for linkage damage or improper linkage set-up. See Repair section, 15-2 How to Set Up the Directional Valve Linkage.

bad

Re-adjust or replace linkage.

good

Install a pressure gauge at the quick disconnect coupling on the oscillate manifold. Disconnect linkage from drive chassis and manually activate directional valve while engine is running. Check the pressure.

less than 900 psi

Adjust the sequence valve. See Repair procedure 15-2, How to Adjust the Oscillate Sequence Valve Pressure OR consult Genie Industries Service Department.

900 psi

Consult Genie Industries Service Department.
Chart 27

Steer Left Function Inoperative

Be sure all other functions operate normally.

Start the engine from the platform, press down foot switch, hold the steer switch left and check voltage at terminal 8 on the drive controller (blu wire).

12V

Hold the steer switch left and check voltage at TB36.

12V

Hold the steer switch left and check voltage at blu wire on steer valve.

12V

Remove both wires from steer left coil and check resistance across coil terminals.

4 to 8 ohms

Replace steer valve OR consult Genie Industries Service Department.

0V

Repair or replace the steer microswitch in controller handle.

0V

Repair open in blu wire circuit from steer switch to TP36 to TB36.

0V

Repair open in blu wire circuit from TB36 to steer valve.

0 or infinite ohms

Replace steer left valve coil.
Steer Right Function Inoperative

Start the engine from the platform, press down foot switch, hold the steer switch right and check voltage at terminal 7 on the drive controller (blu/blk wire).

- **0V**: Repair or replace the steer microswitch in controller handle.

- **12V**: Hold the steer switch right and check voltage at TB37.
  - **0V**: Repair open in blu/blk wire circuit from steer switch to TP37 to TB37.
  - **12V**: Hold the steer switch right and check voltage at blu/blk wire on steer valve.
    - **0V**: Repair open in blu/blk wire circuit from TB37 to steer valve.
    - **12V**: Remove both wires from steer right coil and check resistance across coil terminals.
      - **0 or infinite ohms**: Replace steer right valve coil.
      - **4 to 8 ohms**: Replace steer valve OR consult Genie Industries Service Department.
Chart 29

All Drive Functions Inoperative, All Other Functions Operate Normally

Be sure the hydraulic suction line valve is in the open position.

Be sure machine is not in the free wheel configuration.

Start engine from ground controls and standing clear of the tires, momentarily move pump control override lever in each direction.

- If machine does not move: Repair or replace the drive pump.
- If machine moves: Proceed to next step.

Move to platform, press down foot switch, hold drive enable switch to either side and try to drive.

- If machine moves: Place a jumper wire between TB30 and TB12 and test drive without holding drive enable switch.
  - If machine drives: Replace drive enable limit switch OR repair open in wire circuits from terminal TB30 to limit switch and from limit switch to TB12.
  - If no drive: Repair open in wht wire circuit from TP30 to TB30.
- If no drive: Disconnect drive pump electronic displacement controller (EDC) wires.
  - If 0 or infinite ohms: Replace EDC.
  - If 20 to 24 ohms: Press down foot switch and check voltage at horsepower limiter board terminal 1.
    - If less than 12V: Correct insufficient voltage supply (alternator or battery) OR repair open in wht wire circuit supplying 12V to terminal 1.
    - If 12V or more: Continued on the next page.
Continued from the previous page.

Switch rpm select switch to rabbit with foot switch, press down foot switch and check voltage at terminal 3 on horsepower limiter.

- **6 to 7V**: Check voltage at TB41.
  - **6 to 7V**: Repair open in org/blk wire circuit from TB41 to horsepower limiter terminal 3.
  - **0V**: Check voltage at org/blk wire on engine alternator.
    - **6 to 7V**: Repair open in org/blk wire circuit from alternator to TB41.
    - **0V**: Repair or replace alternator.

- **0V**: Repair or replace alternator.

Press down foot switch and check voltage at terminal 10 on horsepower limiter.

- **9 to 12V**: Replace horsepower limiter board.

- **0V**: Replace horsepower limiter board.

Press down foot switch and check voltage at terminal 6 on drive controller.

- **9 to 12V**: Repair open in red wire circuit from horsepower limiter board to drive control terminal 6.

- **0V**: Repair open in red wire circuit from horsepower limiter board to drive control terminal 6.

Continued on the next page.
Disconnect drive pump EDC wires, press down foot switch, hold drive controller in full forward position and check voltage across terminals 4 and 5 on drive controller.

If voltage is 0V, repair or replace drive controller.

If voltage is 4 to 7V, press down foot switch, hold drive controller in full forward position and check voltage across terminals TP30 and TP31.

If voltage is 0V, repair open in either wht or wht/blk wire circuit from drive controller to TP30 and TP31 respectively.

If voltage is 4 to 7V, press down foot switch, hold drive controller in full forward position and check voltage across terminals TB30 and TB31.

If voltage is 0V, repair open in either wht or wht/blk wire circuit from TB30 and TB31 respectively.

If voltage is 4 to 7V, press down foot switch, hold drive controller in full forward position and check voltage across the two wires at EDC quick disconnect.

If voltage is 0V, repair open in wht/blk wire circuit from TB31 to EDC quick disconnect OR repair open in wht wire circuit from TB30 to EDC quick disconnect.

Replace drive pump EDC OR consult Genie Industries Service Department.
Drive Forward Or Reverse Function Inoperative

Be sure all other functions operate normally including drive in opposite direction of malfunction.

Disconnect the EDC wire connector from the drive pump, start engine, move the drive controller to full forward position and note the voltage across terminals TB30 and TB31. Reverse the volt meter leads and move the drive controller to full reverse position and note the voltage.

- Voltage readings different → Repair or replace the drive controller.
- Voltage readings same →
  - Symptoms improve → Check all drive speeds and monitor for recurring symptoms. Possible contamination in hydraulic system.
  - No improvement → Defective Sundstrand drive pump, contact Sundstrand authorized repair facility.
Chart 31

Traction Function Inoperative

Be sure all other functions operate normally.

Any type of traction problem, consult Genie Industries Service Department.
Machine Will Not Drive At Full Speed

Be sure all other functions operate normally.

Be sure the free-wheel valve is closed on the drive pump.

With boom fully stowed, check TB40 for continuity to ground.

- Full continuity
- No continuity

With boom fully stowed, check horsepower limiter board terminal 6 for continuity to ground.

- Full continuity
- No continuity

Re-adjust or replace horsepower limiter board. See Repair section OR consult Genie Industries Service Department.

Repair or replace boom lift drive limit switch or boom extend limit switch.

Orange wire shorted to ground, repair orange wire circuit from TB40 to horsepower limiter board.
Chart 33

**Machine Drives At Full Speed With Platform Raised or Extended**

Remove machine from service immediately.

Be sure boom lift drive limit switch or boom extend drive limit switch is not being held down or up.

Be sure wiring to limit switches is intact and shows no sign of tampering.

Be sure orange wire (cable 1) is properly attached to horsepower limiter.

- Raise boom off drive limit switch, turn machine off and check continuity between ground and terminal 6 on horsepower limiter board.
  - **full continuity**
  - **no continuity**

- Check continuity between ground and TB40.
  - **full continuity**
  - **no continuity**

- Repair limit switch wiring OR replace boom lift drive limit switch OR replace boom extend drive limit switch.

- Disconnect electronic displacement controller (EDC) wires on drive pump, move drive controller to full forward position and check voltage between terminals 4 and 5 on drive controller.
  - 0 to 3V
  - 4 to 7V

- Repair open in org wire circuit from TB40 to horsepower limiter board terminal 6.

- Replace horsepower limiter board.

- Repair limit switch wiring OR replace boom lift drive limit switch OR replace boom extend drive limit switch.

- Defective Sundstrand drive pump. Replace or repair at authorized Sundstrand repair facility.
Chart 34

Drive Enable System Is Malfunctioning

- Do not hold the drive enable switch and check if machine will drive in the stowed position with boom over non-steer wheels?
  - no
  - Will holding the drive enable switch allow boom to drive in stowed position over non-steer wheels?
    - no
      - Troubleshoot horsepower limit board, drive controller or drive pump. See chart 30.
    - yes
      - Repair or replace drive enable limit switch.
  - yes
    - Repair or replace drive enable limit switch.

- Will holding the drive enable switch allow boom to drive in stowed position over steer wheels?
  - no
    - Repair or replace drive enable toggle switch.
Auxiliary Functions Inoperative

Be sure all other functions operate normally.

Be sure key switch is in the appropriate position and the emergency stop buttons are pulled up into the on position.

Be sure engine is not running when using auxiliary power.

Note: Operating auxiliary power with the engine running should immediately kill the engine.

With engine not running lift switch cover, hold auxiliary switch and listen for sound of auxiliary pump running.

If pump runs, deadhead a pressure gauge into the pressure line of the auxiliary pump and hold the auxiliary power switch.

If less than 2000 psi, hold auxiliary switch and adjust pump relief valve or replace pump.

If pump does not run, hold auxiliary power switch and listen for sound of auxiliary pump running.

If pump runs, reconnect pressure line and check battery condition. There is possibly not enough battery capacity to operate both aux. pump and function valves.

If pump does not run, hold the auxiliary power switch and check the voltage at terminal TB27.

If 0V, replace defective auxiliary power toggle switch.

If 12V, hold the auxiliary power switch and check the voltage at initiate terminal (red wire) on PR1 motor start solenoid.

If 0V, repair open in red wire circuit from TB27 to PR1.

If 12V, hold the auxiliary power switch and check the voltage at positive power cable on auxiliary power unit.

If 0V, replace PR1 relay.

If 12V, check auxiliary power unit grounding cable OR repair or replace electric motor.
Observe and Obey:

☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine.

☑ Immediately tag and remove from service a damaged or malfunctioning machine.

☑ Repair any machine damage or malfunction before operating the machine.

Before Troubleshooting:

☑ Read, understand and obey the safety rules and operating instructions printed in the Genie S-40 Operator's Manual.

☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section. An illustration legend precedes each group of drawings.

Electrical Schematics

⚠️ WARNING ⚠️ Electrocutation hazard. Contact with electrically charged circuits may 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

1. Malfunction discovered
2. Identify symptoms
3. Troubleshoot
4. Inspect and test
5. Perform repair
6. Problem still exists
7. Problem solved
8. Return to service
Electrical Schematic - Diesel Models
2WD Hydraulic Schematic
- Non-Oscilating Axle
Hydraulic Symbols Legend

- **Pressure gauge**
- **Filter**
- **Fixed displacement pump**
- **Bi-directional, variable displacement pump**
- **Cylinder**
- **Accumulator**
- **Orifice with size**
- **Variable orifice or shut-off valve**
- **Check valve**
- **Relief valve**
- **Priority flow divider**
- **Sequencing valve**
- **Solenoid operated dump valve**
- **Differential sensing valve**
- **Flow regulator valve**
- **Solenoid operated 2 pos., 3 way, directional valve**
- **Solenoid operated 2 pos., 3 pos., 4 way, directional valve**
- **Solenoid operated 2 pos., 4 way, directional valve**
- **Solenoid operated 3 pos., 4 way, directional valve (DO1)**
- **2 pos., 3 way, shuttle valve**
- **3 pos., 4 way, directional valve**
- **Solenoid operated 2 pos., 4 way, directional valve**
- **Counterbalance valve**
- **Pilot operated flow control valve**
- **Unloader valve**
- **Pressure compensating valve**
2WD Hydraulic Schematic
- Oscilating Axle
4WD Hydraulic Schematic
Repair Procedures

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

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

General Repair Process

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

Before Repairs Start:
- Read, understand and obey the safety rules and operating instructions in the Genie S-40 Operator’s Manual.
- Be sure that all necessary tools and parts are available and ready for use.
- 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 flat, level surface
  - boom in stowed position
  - turntable rotated with the boom between the non-steering wheels
  - turntable secured with the turntable rotation lock pin
  - key switch in the OFF position with the key removed
  - wheels chocked

Symbols Legend
- Indicates the presence of a hazard that will cause death or serious injury.
- Indicates the presence of a hazard that may cause death or serious injury.
- Indicates the presence of a hazard that will or may cause serious personal injury or damage to the machine.
- Indicates special operation or maintenance information.
- Indicates that a specific result is expected after performing a series of steps.
Platform Controls

1-1 Joystick Controllers

Maintaining joystick controllers at the proper settings is essential to safe machine operation. Every joystick controller should operate smoothly and provide proportional speed control over its entire range of motion.

![Platform control box](image)

Platform control box

- a. horsepower limiter board
- b. quick disconnect terminal strip
- c. drive proportional controller
- d. boom proportional controller
- e. turntable rotate proportional controller

Boom Up/Down Controller Adjustments

1. Check the battery condition with a volt meter. The reading should be 12V DC or more to accurately adjust the controller.

2. Turn the key switch to platform control and pull out the Emergency Stop button to the on position at both the ground and platform controls. Do not start the engine.

3. Open the platform control box lid and locate the boom up/down controller.

![Boom up/down controller](image)

- a. ramp rate adjustable trimpot
- b. dual (lo) range adjustable trimpot
- c. terminal “R”, activates max-out range
- d. terminal unused
- e. terminal “X”, auxiliary
- f. terminal “-”, ground
- g. terminal “+”, battery, positive
- h. terminal “A”, proportional output
- i. threshold adjustable trimpot
- j. max-out adjustable trimpot

4. Set the preliminary ramp rate: Turn the trimpot adjustment screw clockwise 15 turns or until you hear a repeated click.

5. Connect the red(+) lead from a volt meter to the “A” terminal on the controller printed circuit board. Connect the black(-) lead to ground.

6. Set the threshold: Press down the foot switch, then slowly move the control handle off center until the moment a voltage reading appears. Adjust the voltage to 2.5V DC. Turn the threshold trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

![Platform control box](image)

- a. horsepower limiter board
- b. quick disconnect terminal strip
- c. drive proportional controller
- d. boom proportional controller
- e. turntable rotate proportional controller

Notice

Do not adjust the joystick controllers unless the static battery voltage is above 12V DC and the alternator is operating properly with 12.5 to 14.5V DC output.

Warning

Electrocution hazard. Contact with electrically charged circuits may result in death or serious injury. Remove all rings, watches and other jewelry.
7 Set the max-out: Press down the foot switch, then move the control handle all the way to the up position. Adjust the voltage to 5.9V DC. Turn the max-out trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

8 Set the dual (lo) range: Press down the foot switch, then move the control handle all the way to the down position. Adjust the voltage to 5.9V DC. Turn the dual range trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

9 Start the engine and move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol). Lower the boom to the stowed position.

**NOTICE** Engine should be at normal operating temperature.

10 Start a timer and record how long it takes for the boom to fully raise. Adjust the max-out trimpot to achieve a 40 to 60 second cycle time.

11 Start a timer and record how long it takes for the boom to fully lower. Adjust the dual range trimpot to achieve an 50 to 80 second cycle time.

**NOTICE** If the function cycle time is not achievable, check the relief valve pressure. See 9-2, Valve Adjustments - Function Manifold.

12 Turn the engine off and re-connect the volt meter.

13 Pull out the Emergency Stop button to the on position.

14 Press down the foot switch and then move the control handle all the way to the up position. Record the maximum voltage reading.

15 Start the engine.

16 Start a timer and simultaneously move the control handle all the way to the up position. Note how long it takes to reach the maximum voltage recorded in step 14. This is the ramp speed.

17 Set the ramp rate: turn the trimpot to obtain a 3 to 4 second ramp speed. Turn the trimpot clockwise to increase the time or counterclockwise to decrease the time.

### Boom up/down specifications

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</tr>
<tr>
<td>Cycle time</td>
<td>40 to 60 seconds</td>
</tr>
<tr>
<td>Boom down - Dual (lo) range</td>
<td>5.9V DC</td>
</tr>
<tr>
<td>Cycle time</td>
<td>50 to 80 seconds</td>
</tr>
<tr>
<td>Ramp rate</td>
<td>3 to 4 seconds</td>
</tr>
</tbody>
</table>

**Turntable Rotation Controller Adjustments**

**NOTICE** Do not adjust the joystick controllers unless the static battery voltage is above 12V DC and the alternator is operating properly with 12.5 to 14.5V DC output.

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

1 Check the battery condition with a volt meter. The reading should be 12V DC or more to accurately adjust the controller.

2 Turn the key switch to platform control and pull out the Emergency Stop button to the on position at both the ground and platform controls. Do not start the engine.
PLATFORM CONTROLS

3 Open the platform control box lid and locate the turntable rotation controller. Refer to the platform control box illustration, page 7-2.

4 Set the preliminary ramp rate: Turn the trimpot adjustment screw clockwise 15 turns or until you hear a repeated click.

5 Connect the red(+) lead from a volt meter to the “A” terminal on the controller printed circuit board. Connect the black(-) lead to ground.

6 Set the threshold: Press down the foot switch, then slowly move the control handle off center until the moment a voltage reading appears. Adjust the voltage to 2.5V DC. Turn the threshold trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

7 Set the dual (lo) range: Turn the trimpot adjustment screw clockwise 15 turns or until you hear a click. This is the only dual range adjustment for this controller.

8 Set the max-out: Press down the foot switch, then move the control handle all the way to the left or right. Adjust the voltage to 5.5V DC. Turn the max-out trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

9 Start the engine and move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).

10 Start a timer and record how long it takes the turntable to rotate through a complete circle. Adjust the max-out trimpot to achieve a 70 to 110 second cycle time.

11 Turn the engine off and re-connect the volt meter.

12 Pull out the Emergency Stop button to the on position.

13 Press down the foot switch and then move the control handle all the way to the left or right. Record the maximum voltage reading.

14 Start the engine.

15 Start a timer and simultaneously move the control handle all the way to the left or right. Note how long it takes to reach the maximum voltage recorded in step 13. This is the ramp rate.

16 Set the ramp rate: Turn the trimpot to obtain a 3 to 4 second ramp speed. Turn the trimpot clockwise to increase the time or counterclockwise to decrease the time.

**Turntable rotation specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold</td>
<td>2.5V DC</td>
</tr>
<tr>
<td>Turntable rotation - Max-out</td>
<td>5.5V DC</td>
</tr>
<tr>
<td>Cycle time</td>
<td>70 to 110 seconds</td>
</tr>
<tr>
<td>Ramp rate</td>
<td>3 to 4 seconds</td>
</tr>
</tbody>
</table>
1-2
Horsepower Limiter Board

The horsepower limiter board is responsible for governing drive pump output. It senses engine rpm from the alternator. The horsepower limiter board senses drops in rpm normally due to increased drive resistance (rough terrain or incline), and decreases voltage to the drive controller which in turn decreases voltage to the drive pump, thereby reducing pump output to maintain optimum engine rpm and horsepower. Three adjustments are required for optimum performance.

How to Adjust the Horsepower Limiter Board

**NOTICE** The engine rpm must be correct before performing this procedure. See Maintenance Procedure B-12, *Check and Adjust the Engine RPM.*

**NOTICE** Do not adjust the horsepower limiter board unless the static battery voltage is above 12V DC and the alternator is operating properly with 12.5 to 14.5V DC output.

**NOTICE** Gasoline/LPG models: Perform this procedure in gasoline mode.

1. Remove the fasteners from the platform control box lid.
2. Open the control box lid and locate the horsepower limiter board.
3. Connect the black(-) lead from a DC volt meter to the no. 2 terminal, and the red(+) lead to the no. 10 terminal.
4. Start the engine from the platform controls.
5. Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).

**Platform control box**
- a horsepower limiter board

**Horsepower limiter board**
- a "A" potentiometer—maximum voltage output to the controller in the stowed position
- b "B" potentiometer—maximum voltage output to the drive controller in the boom raised position
- c "C" potentiometer—reaction rate or how fast the voltage output reacts to the change in engine rpm
PLATFORM CONTROLS

6 Press down the foot switch and adjust the "A" potentiometer counterclockwise to increase voltage or clockwise to decrease voltage.

7 Move the engine idle control switch to low idle (turtle symbol).

8 Press down the foot switch and then adjust the "C" potentiometer to obtain a 0.01V DC to 0.03V DC voltage reading.

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

10 Press down the foot switch and re-adjust the "A" potentiometer to the previous voltage setting in step 6.

11 Be sure that the boom is in the stowed position, then drive the machine and observe how the engine rpm reacts to drive control handle movement. If the engine surges or hunts, adjust the "C" potentiometer counterclockwise until surging is minimized.

**NOTICE** Under an extreme load, an excessive counterclockwise adjustment to the "C" potentiometer will cause the engine to stall. The "C" potentiometer adjustment is a compromise between engine stability (surging) and engine rpm droop.

12 Disconnect the volt meter.

13 Raise the boom above the drive limit switch.

14 Drive the machine for 40 feet (12 m) and record the elapsed time. Repeat this step in the opposite drive direction.

15 Adjust the "B" potentiometer to obtain the correct raised drive speed of 1 foot per second (30.5 cm per second). Turn the "B" potentiometer counterclockwise to increase voltage or clockwise to decrease voltage.

16 Close the platform control box lid and install the fasteners.

**Drive speed specifications**

<table>
<thead>
<tr>
<th>Stowed position</th>
<th>distance: 40 ft / 12 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>2WD</td>
<td>40 ft / 6.8 sec</td>
</tr>
<tr>
<td>4WD</td>
<td>12.2 m / 6.8 sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gasoline/LPG models</th>
<th>40 ft / 7.8 sec</th>
<th>12.2 m / 7.8 sec</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Deutz Diesel models</th>
<th>40 ft / 7.8 sec</th>
<th>12.2 m / 7.8 sec</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Boom raised or extended</th>
<th>distance: 40 ft / 12 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>All models</td>
<td>30.5 cm per second</td>
</tr>
</tbody>
</table>
1-3 
**Foot Switch**

How to Test the Foot Switch

1. Turn the key switch to the **OFF** position and separate the wiring quick disconnect plug from the platform toe board.

2. Do not press down the foot switch. Connect the leads from an ohmmeter or continuity tester to each wire combination listed below and check for continuity.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>green to black</td>
<td>continuity (zero Ω)</td>
</tr>
<tr>
<td>green to white</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>black to white</td>
<td>no continuity</td>
</tr>
</tbody>
</table>

3. Press down the foot switch. Connect the leads from an ohmmeter or continuity tester to each wire combination listed below and check for continuity.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>green to black</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>green to white</td>
<td>no continuity</td>
</tr>
<tr>
<td>black to white</td>
<td>continuity (zero Ω)</td>
</tr>
</tbody>
</table>

1-4 
**Resistors**

The resistor is used to maintain proper control of boom extend/retract. The resistor is located in the platform control box.

**NOTICE** Refer to the schematic legends for resistor locations and values.

How to Test the Resistors

1. Turn the key switch to the **OFF** position.

2. Connect the leads from an ohmmeter to each end of the resistor being tested.

3. Compare the ohmmeter reading with the resistance rating printed on the resistor.
1-5
Toggle Switches

Toggle switches used for single function switching are single pole double throw (SPDT) switches. Dual function switching requires a double pole double throw (DPDT) switch.

How to Test a Toggle Switch

**NOTICE** Continuity is the equivalent of 0 to 3 ohms. A simple continuity tester may not accurately test the switch.

This procedure covers fundamental switch testing and does not specifically apply to all varieties of toggle switches.

1. Turn the key switch to the **OFF** position. Tag and disconnect all wiring from the toggle switch to be tested.

2. Connect the leads of an ohmmeter to the switch terminals in the following combinations listed below to check for continuity.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left position</strong></td>
<td></td>
</tr>
<tr>
<td>terminal 1 to 2, 3, 4, 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td></td>
<td>(infinite (\Omega))</td>
</tr>
<tr>
<td>terminal 2 to 3</td>
<td>continuity</td>
</tr>
<tr>
<td></td>
<td>(zero (\Omega))</td>
</tr>
<tr>
<td>terminal 2 to 4, 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 3 to 4, 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 4 to 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 5 to 6</td>
<td>continuity</td>
</tr>
<tr>
<td><strong>Center position</strong></td>
<td></td>
</tr>
<tr>
<td>There are no terminal combinations that</td>
<td></td>
</tr>
<tr>
<td>will produce continuity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(infinite (\Omega))</td>
</tr>
<tr>
<td><strong>Right position</strong></td>
<td></td>
</tr>
<tr>
<td>terminal 1 to 2</td>
<td>continuity</td>
</tr>
<tr>
<td></td>
<td>(zero (\Omega))</td>
</tr>
<tr>
<td>terminal 1 to 3, 4, 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td></td>
<td>(infinite (\Omega))</td>
</tr>
<tr>
<td>terminal 2 to 3, 4, 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 3 to 4, 5 &amp; 6</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 4 to 5</td>
<td>continuity</td>
</tr>
<tr>
<td>terminal 4 to 6</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 5 to 6</td>
<td>no continuity</td>
</tr>
</tbody>
</table>
How to Remove the Platform

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

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

3. Support the platform rotator, but do not apply any lifting pressure.

4. Remove the pin retainer fastener from both the barrel and rod-end pins.

5. Drive the rod-end pin out using a soft metal drift.

6. Manually pivot the rotator up and secure it to the boom.

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

8. Carefully pull the cylinder out of the boom.

9. Disconnect the hydraulic hoses from the slave cylinder and connect them together with a connector. Cap the fittings on the cylinder.

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

2-2
Platform Leveling Slave Cylinder

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

How to Remove the Slave Cylinder

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

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

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

3. Support the platform rotator, but do not apply any lifting pressure.
How to Bleed the Slave Cylinder

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

1. Raise the boom to a horizontal position.
2. Move the platform level switch up and down through two platform leveling cycles to remove any air that might be in the system.

---

**PLATFORM COMPONENTS**

**How to Remove the Platform Rotator**

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.

1. Remove the platform. See 2-1, *How to Remove the Platform*.
2. Disconnect and plug the hydraulic hoses from the platform rotator.

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

3. Support the platform mounting weldment, but do not apply any lifting pressure.
4. Remove the six mounting bolts from the platform mounting weldment, then remove the center bolt and slide the platform mounting weldment off of the platform rotator.
5. Support the platform rotator. Do not apply any lifting pressure.
6. Support the platform leveling slave cylinder.

7. Remove the pin retainer from the slave cylinder barrel-end pivot pin.

8. Use a soft metal drift to remove the barrel-end pin.

9. Disconnect and plug the hydraulic hoses from the slave cylinder. Pull the hoses up through the platform rotator.

**CAUTION**
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.

10. Remove the pin retainer from the slave cylinder rod-end pivot pin and the rotator pivot pin.

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

**How to Bleed the Platform Rotator**

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

1. Move the platform rotate switch to the right then the left through two platform rotation cycles, then hold the switch to the **RIGHT** position until the platform is fully rotated to the right.

2. 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.

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

4. Hold the platform rotate switch to the **LEFT** position until the platform is fully rotated. Continue holding the switch until air stops coming out of the bleed valve. Then close the bleed valve.

**CAUTION** Crushing hazard. Keep clear of the platform during rotation.

5. Connect the clear hose to the bottom bleed valve and open the valve. Do not remove the bleed valve.

6. Hold the platform rotate switch to the **RIGHT** position until the platform is fully rotated. Continue holding the switch until air stops coming out of the bleed valve. Then close the bleed valve.

**CAUTION** 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 left and inspect the bleed valves for leaks.
Boom Components

3-1 Plastic Cable Track

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

How to Repair the Plastic Cable Track

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

1 Use a screwdriver to pry down on the lower clip.
2 Repeat step 1 for each link.
3 To remove a single link, open the lower clip and then use a screwdriver to pry the link to the side.

3-2 Boom

How to Shim the Boom

**NOTICE** Measure each wear pad. Replace the pad if it is less than \( \frac{7}{16} \) inch (11 mm) thick. If the pad is more than \( \frac{7}{16} \) inch (11 mm) thick, perform the following procedure.

1 Extend the boom 10 inches (25 cm).
2 Remove the wear pad mounting fasteners.
3 Install the new shims under the wear pad to obtain zero clearance and zero drag.
4 Use a round punch to align the shim to the wear pad. Install the mounting fasteners.
5 Extend and retract the boom through an entire cycle. Check for tight spots that could cause scraping or binding.

**NOTICE** Always maintain squareness between the outer and inner boom tubes.

How to Remove the Boom

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

- Perform this procedure with the boom in the stowed position.

1 Remove the platform. See 2-1, How to Remove the Platform.
2 Remove the platform rotator and leveling slave cylinder. See 2-3, How to Remove the Platform Rotator.
3 Remove the mounting fasteners from the counterbalance valve manifold on the end of the boom. Then remove the manifold and set it aside.

4 Support the cable track with an overhead crane.

5 Remove the hose/cable cover from the pivot end of the boom.

6 Remove the cable track mounting bolts at the platform end of the boom.

7 Remove the side panel from the cable track to access the cable track mounting bolts.

8 Remove the cable track mounting fasteners, then remove the cable track from the boom and lay it off to the side.

\[\text{CAUTION}\] Component damage hazard. The boom cable track can be damaged if it is twisted.

9 Carefully raise the boom enough to access the master cylinder rod-end pivot pin.

10 Remove the turntable end cover.

11 Remove the retaining bolt from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin. Pull the cylinder back and secure it from moving.

12 Remove the drive speed limit switch mounted on the inside of the pivot end of the boom. Do not disconnect the wiring.

13 Disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

\[\text{CAUTION}\] 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 Attach an overhead crane to the center point of the boom.

15 Attach a similar lifting device to the lift cylinder.

16 Place support blocks under the cylinder, across the turntable.

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

\[\text{CAUTION}\] Crushing hazard. The boom lift cylinder will fall unless it is properly supported.

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

19 Use the crane to lift the boom to a horizontal position.

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

21 Remove the boom pivot pin with a soft metal drift, then carefully remove the boom from the machine.

\[\text{WARNING}\] Crushing hazard. If the overhead crane is not properly attached, the boom may become unbalanced and fall when it is removed from the machine.

### How to Disassemble the Boom

\[\text{NOTICE}\] Complete disassembly of the boom is only necessary if the outer or inner boom tubes must be replaced. The extension cylinder can be removed without completely disassembling of the boom. See 3-4, How to Remove the Extension Cylinder.

1 Remove the boom. See 3-2, How to Remove the Boom.

2 Place blocks under the extension cylinder for support.
BOOM COMPONENTS

3 Remove the retaining fastener from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

4 Remove and label the wear pads from the platform end of the boom.

**NOTICE** Pay careful attention to the location and amount of shims used with each wear pad.

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

**CAUTION** Crushing hazard. The extension tube will fall when it is removed from the boom if it is not properly supported.

6 Remove the snap rings from the extension cylinder rod-end pins. Use a soft metal drift to remove the pins.

7 Support and slide the extension cylinder out of the platform end of the extension boom.

8 Remove and label the wear pads from the extension boom.

**NOTICE** Pay careful attention to the location and amount of shims used with each wear pad.

---

3-3 Boom Lift Cylinder

**How to Remove the Boom Lift Cylinder**

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

1 Raise the boom until the boom lift cylinder rod-end pin is above the turntable covers.

2 Place blocks under the cylinder for support.

3 Support the boom with an overhead crane. Do not lift the boom.

4 Support the balance point of the boom lift cylinder with an overhead crane or similar lifting device.

**WARNING** Crushing hazard. If the overhead crane is not properly attached, the lift cylinder may become unbalanced and fall when it is disconnected from the machine.

5 Remove the pin retaining fastener from the lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin, then allow the lift cylinder to rest on the blocks. Protect the cylinder rod from damage.

**CAUTION** Crushing hazard. The lift cylinder will fall unless it is properly supported.

6 Use the crane to lift the boom to a horizontal position.

7 Remove the turntable end cover to access the lift cylinder mounting bracket (label and disconnect the alarm wiring, if equipped).
8 Disconnect and plug the boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

9 Remove the mounting fasteners from the lift cylinder mounting bracket.

10 With the lift cylinder being supported by the overhead crane, pull the cylinder toward the platform until it is out.

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

3-4 Extension Cylinder

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

How to Remove the Extension Cylinder

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

1 Raise the boom to a horizontal position.

2 Extend the boom until the extension cylinder rod-end mounting pins are accessible.

3 Remove the snap rings from the extension cylinder rod-end pins. Use a soft metal drift to remove the pins.

4 Remove the turntable end cover (label and disconnect the alarm wiring, if equipped).

5 Disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

6 Remove the pin retaining fasteners from both master cylinder pins.

7 Use a soft metal drift to remove the pins. Then remove the master cylinder from the machine.

8 Disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

9 Place a small block under the cylinder for support.

10 Remove the pin retaining fastener from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

11 Support and slide the extension cylinder out of the extension boom.

⚠️ CAUTION ⚠️ Crushing hazard. The extension cylinder will fall when it is removed from the extension boom if it is not properly supported.
BOOM COMPONENTS

3-5 Platform Leveling Master Cylinder

The master cylinder acts as a pump for the slave cylinder. It’s part of the closed circuit hydraulic loop that keeps the platform level through the entire range of boom motion. The master cylinder is attached to the lift cylinder and is located at the base of the boom.

How to Remove the Platform Leveling Master Cylinder

1. Raise the boom to a horizontal position.
2. Remove the turntable end cover to access the master cylinder.
3. Disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

4. Remove the pin retaining fasteners from both master cylinder pins.
5. Use a soft metal drift to remove the pins.
4-1
Turntable Covers

How to Remove a Turntable Cover

1. Raise the turntable cover. Support the open cover with an overhead crane or forklift. Do not lift it.

⚠️ CAUTION ⚠️ Crushing hazard. Due to its heavy weight, do not attempt to support the cover by hand.

2. Remove the upper and lower retaining clips from the gas strut.

3. Gently pry the strut pivot sockets off of the ball studs and remove the strut. Protect the strut cylinder rod from damage.

4. Remove the cover hinge bolts, that fasten the hinge support bracket to the bulkhead.

5. Carefully lift and remove the cover from the machine.

⚠️ WARNING ⚠️ If a turntable cover must be replaced, be sure that all appropriate safety and instructional decals are applied to the new cover.

⚠️ NOTICE ⚠️ Alignment adjustments may be necessary when a new cover is installed.
Deutz Engine F3L 1011

5-1 RPM Adjustment
Refer to Maintenance Procedures, B-12, 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.

How to Remove the Flex Plate
1. Disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.
2. Support the drive pump with an appropriate lifting device. Then remove all of the pump mounting plate to engine bell housing bolts.
3. Carefully pull the pump away from the engine and secure it from moving.
4. Remove the flex plate mounting fasteners, then remove the flex plate from the engine.

How to Install the Flex Plate
1. Install the flex plate onto the flywheel with the flat side of the spline against the flywheel. Torque the flex plate mounting bolts to 34 ft-lbs (46 Nm).
2. Install the coupler onto the pump shaft with the set screw toward the pump. Leave a \( \frac{1}{16} \) inch (4.7 mm) gap between the coupler and pump end plate.
3. Apply Loctite® removable thread sealant to the coupler set screw. Torque the set screw to 45 ft-lbs (61 Nm).

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

4. Assemble the engine and torque the pump mountint plate to 34 ft-lbs (46 Nm).

5-3 Oil Temperature and Pressure Gauges
The oil temperature gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will close at 300°F (147°C). When the contacts close, the engine will shut off to prevent damage and will not start until the temperature drops below the contact point. Temperature will be indicated when the key is on and the Emergency Stop Button is pulled out to the on position.

CAUTION Component damage hazard. Do not crank the engine with the over-temperature light on.

The oil pressure gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will close at 7 psi (0.48 bar). When the contacts close, the engine will shut off to prevent damage. Oil pressure will be indicated when the engine is running.

CAUTION Component damage hazard. Do not continue to run the engine with the low oil pressure light on.
6-1
Governor Actuator

How to Set Up the Governor Actuator and Linkage

**NOTICE** Adjustment of the governor actuator is only necessary when the governor actuator or the linkage has been replaced.

1. Connect the linkage rod to the throttle plate shaft, then tighten the lock nut.
2. Fasten the lock nut and clevis yoke to the linkage rod. Do not tighten the lock nut against the clevis yoke.
3. Loosen the fastener on the actuator arm. Rotate the actuator arm until it is at a 110 degree angle to the linkage rod.

4. Position the linkage rod so that the throttle is in the idle position. Then adjust the clevis yoke on the linkage rod to obtain the proper length. Install the yoke onto the actuator arm and tighten the lock nut.

5. With the throttle in the idle position and the actuator arm at a 110 degree angle to the linkage, rotate the actuator shaft slightly counterclockwise to pre-load the spring. Tighten the fastener on the actuator arm without releasing the shaft.
6 Manually pull the actuator arm through a full cycle to be sure that the linkage moves freely. Be sure that the linkage activates the throttle shaft to approximately half throttle.

**NOTICE**

The linkage must be free of friction and obstruction. Do not let it rub against the engine, brackets or hoses.

**CAUTION**

Component damage hazard. If the throttle linkage is improperly adjusted and allowed to reach full throttle, the engine will over-rev and cause component damage.

---

**6-2 Choke Adjustments**

This engine is equipped with an electrically heated automatic choke. The choke has a poppet valve to enhance cold starting ability on LPG fuel.

**NOTICE**

Choke adjustments are affected by climate. Richer adjustment will be necessary in colder climates, leaner adjustment in warmer climates.

### Automatic Choke with Poppet Valve

The choke functions in both gasoline and LPG mode. The choke butterfly may be adjusted to a fully closed (rich) position for colder climates and the poppet valve will provide a flow path during LPG fueled operation.
6-3 Timing Adjustment

Complete information to perform this procedure is available in the Ford LSG-423 2.3 Liter Industrial Engine Service Manual (Ford number: 194-216). Genie part number 29586.

6-4 Carburetor Adjustment

Complete information to perform this procedure is available in the Ford LSG-423 2.3 Liter Industrial Engine Service Manual (Ford number: 194-216). Genie part number 29586.

6-5 RPM Adjustment

Refer to Maintenance Procedures, B-12, Check and Adjust the Engine RPM.

6-6 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.

Flex Plate Removal

1. Disconnect and remove the hose between the carburetor venturi and the air cleaner.
2. Disconnect the linkage from the governor, then remove the governor linkage from the carburetor. Do not alter the length of the linkage.
3. Disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.
4. Remove the mounting fasteners from the regulator mounting bracket, then pull the bracket up past the bell housing. Secure the bracket before continuing.
5. Support the drive pump with an appropriate lifting device. Then remove all of the pump mounting plate to engine bell housing bolts.
6. Carefully pull the pump away from the engine and secure it from moving.
7. Remove the flex plate mounting fasteners, then remove the flex plate from the engine.

How to Install the Flex Plate

1. Install the flex plate onto the flywheel with the raised spline against the flywheel. Torque the flex plate mounting bolts to 34 ft-lbs (46 Nm).
2. Install the coupler onto the pump shaft with the set screw towards the pump. Leave a 3/16 inch (4.7 mm) gap between the coupler and pump end plate.
3. Apply Loctite® removable thread sealant to the coupler set screw. Torque the set screw to 45 ft-lbs (61 Nm).

⚠️ CAUTION ⚠️ Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.
4. Assemble the engine and torque the pumpmountint plate to 34 ft-lbs (46 Nm).
6-7 Water Temperature and Oil Pressure Gauges

The water temperature gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will close at 230°F (109°C). When the contacts close, the engine will shut off to prevent damage and will not start until the temperature drops below the contact point. Temperature will be indicated when the key is on and the Emergency Stop Button is pulled out to the ON position.

⚠️ CAUTION: Component damage hazard. Do not crank the engine with the over-temperature light on.

The oil pressure gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will close at 8 psi (0.55 bar). When the contacts close, the engine will shut off to prevent damage. Oil pressure will be indicated when the engine is running.

⚠️ CAUTION: Component damage hazard. Do not continue to run the engine with the low oil pressure light on.

6-8 Vacuum Switch

How to Test the Vacuum Switch

1. Connect the leads from an ohmmeter or continuity tester to the common and normally open terminals.

- Result: There should be no continuity (infinite Ω).

2. Apply mild suction to the vacuum port.

- Result: The switch should close and show full continuity (zero Ω).

⚠️ CAUTION: Component damage hazard. Do not short the vacuum switch terminals to ground.
Control Relays

Relays used for single function switching are single pole double throw (SPDT) relays. (There are two types of single pole double throw relays used for ground controls.) Dual function switching requires a double pole double throw (DPDT) relay.

How to Test a Double Pole Double Throw Relay

**WARNING**
Electrocution hazard. Contact with electrically charged circuits may cause death or serious injury. Remove all rings, watches and other jewelry.

This procedure covers fundamental relay testing and does not specifically apply to all varieties of relays.

1. Turn the key switch to the *OFF* position and remove the key.
2. Label and then disconnect all the wiring from the relay to be tested.
3. Connect the leads from an ohmmeter to each terminal combination and check for continuity. Terminals 13 and 14 represent the coil and should not be tested in any other combination.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>terminal 13 to 14</td>
<td>160 to 170Ω</td>
</tr>
<tr>
<td>terminal 8 to 5, 4, 1, 12 &amp; 9</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>terminal 5 to 4, 1, 12 &amp; 9</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 4 to 1 &amp; 9</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 1 to 12</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 4 to 12</td>
<td>continuity (zero Ω)</td>
</tr>
<tr>
<td>terminal 1 to 9</td>
<td>continuity</td>
</tr>
</tbody>
</table>

4. Connect 12V DC to terminal 14 and a ground wire to terminal 13, then test the following terminal combinations.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>terminal 8 to 1, 5, 9 &amp; 4</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>terminal 5 to 1, 4 &amp; 12</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 4 to 1, 9 &amp; 12</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 1 to 9 &amp; 12</td>
<td>no continuity</td>
</tr>
<tr>
<td>terminal 8 to 12</td>
<td>continuity (zero Ω)</td>
</tr>
<tr>
<td>terminal 5 to 9</td>
<td>continuity (zero Ω)</td>
</tr>
</tbody>
</table>
GROUND CONTROLS

How to Test a Single Pole Double Throw Relay

This procedure covers fundamental relay testing and does not specifically apply to all varieties of relays.

Socket Connection Relay

1. Turn the key switch to the **OFF** position and remove the key.
2. Label and then disconnect all the wiring from the relay to be tested.
3. Connect the leads from an ohmmeter or continuity tester to each terminal combination and check for continuity. Terminals 13 and 14 represent the coil and should not be tested in any other combination.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>terminal 13 to 14</td>
<td>190 to 200Ω</td>
</tr>
<tr>
<td>terminal 5 to 1 &amp; 9</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>terminal 1 to 9</td>
<td>continuity (zero Ω)</td>
</tr>
</tbody>
</table>

4. Connect 12V DC to terminal 14 and a ground wire to terminal 13, then test the following terminal combinations.

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>terminal 1 to 5 &amp; 9</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>terminal 5 to 9</td>
<td>continuity (zero Ω)</td>
</tr>
</tbody>
</table>
Direct Connection Relay

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

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>terminal 85 to 86</td>
<td>85 to 95Ω</td>
</tr>
<tr>
<td>terminal 87 to 87a &amp; 30</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>terminal 87a to 30</td>
<td>continuity (zero Ω)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>terminal 87 to 87a &amp; 30</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>terminal 87 to 30</td>
<td>continuity (zero Ω)</td>
</tr>
</tbody>
</table>

7-2

Toggle Switches

See 1-5, Toggle Switches.

7-3

Wago® Components

How to Remove a Wago® Component

**WARNING** Electrocution hazard. Contact with electrically charged circuits may cause death or serious injury. Remove all rings, watches and other jewelry.

**NOTICE** A small screwdriver is provided and should be used when removing a Wago® component. This screwdriver is located in the operator’s manual storage box in the platform.

1. Label the wiring from the component to be removed.
2. Use the provided screwdriver to push in and release the wire from the component.
3. Locate the removal tab on the bottom or top side of the component.
4. Use the provided screwdriver to gently pry up on the tab of the component and remove it.
GROUND CONTROLS

7-4
Resistors

How to Test the Resistor

The resistor is used to maintain proper control of boom function speeds. A 10 ohm resistor reduces voltage to all the boom function switches.

Notice: Turn the key switch to the OFF position and remove the key.

1 Disconnect either end of one of the wires connected to the resistor to be tested.
2 Connect the leads from an ohmmeter to each end or wiring of the resistor being tested.
3 Compare the ohmmeter reading with the resistance rating printed on the resistor.

7-5
Power Relay

Warning: Electrocution hazard. Contact with electrically charged circuits may result in death or serious injury. Remove all rings, watches and other jewelry.

How to Test the Power Relay

Warning: Electrocution hazard. Disconnect the ground cable from the battery before performing this procedure.

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

<table>
<thead>
<tr>
<th>Test</th>
<th>Desired result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 small posts</td>
<td>13 to 17Ω</td>
</tr>
<tr>
<td>2 large posts</td>
<td>no continuity (infinite Ω)</td>
</tr>
<tr>
<td>Any small post to any large post</td>
<td>no continuity (infinite Ω)</td>
</tr>
</tbody>
</table>
8-1 Lift/Steer Pump

How to Test the Lift/Steer Pump

1. Disconnect and plug the high pressure hydraulic hose from the lift/steer pump.

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

2. Connect a 0 to 5000 psi (0 to 350 bar) pressure gauge to the high pressure port.

3. **Gasoline/LPG models:** Remove the high tension lead from the center of the ignition coil.

   **WARNING** Electrocution hazard. Contact with electrically charged circuits may cause death or serious injury. Remove all rings, watches and other jewelry.

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

5. **Deutz Diesel models:** Hold the manual fuel shutoff valve counterclockwise to the **CLOSED** position.

   **CAUTION** Component damage hazard. Hydraulic pressure in excess of 3000 psi (206 bar) will cause damage to the machine.

   - **Result:** If the pressure gauge reads 3000 psi (206 bar), immediately stop cranking the engine. The pump is good.
   - **Result:** If the pressure fails to reach 3000 psi (206 bar), the pump is bad and will need to be serviced or replaced.

6. **Gasoline/LPG models:** Reconnect the high tension lead to the ignition coil.

   **All models:** Observe the pressure gauge while cranking the engine. Immediately stop cranking if the pressure reaches or exceeds 3000 psi (206 bar).
HYDRAULIC PUMPS

How to Remove the Lift/Steer Pump

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

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.

2. Disconnect and plug the lift/steer pump hydraulic hoses. Cap the fittings.

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

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

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

8-2

Drive Hydraulic Pump

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

How to Remove the Drive Hydraulic Pump

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.

1. Disconnect the electrical connection at the electronic displacement controller (EDC) located on the drive pump.

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

Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the CLOSED position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.
3 Disconnect the hydraulic hoses from the pumps and cap them.

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

4 Support the pump and remove the two drive pump mounting bolts. Carefully remove the pump.

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

**How to Prime the Pump**

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

2 **Gasoline/LPG models:** Remove the high tension lead from the center of the ignition coil.

**WARNING** Electrocution hazard. Contact with electrically charged circuits may cause death or serious injury. Remove all rings, watches and other jewelry.

**Deutz Diesel models:** Hold the manual fuel shutoff valve counterclockwise to the **CLOSED** position.

3 Crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi (22 bar).
## Function Manifold

### 9-1

**Function Manifold Components**

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
<th>Schematic Item</th>
<th>Function</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 position 4 way D03 valve</td>
<td>N</td>
<td>Platform rotate</td>
<td>30-35 in-lbs / 3-4 Nm</td>
</tr>
<tr>
<td>2</td>
<td>Counterbalance valve</td>
<td>B</td>
<td>Platform level up</td>
<td>35-40 ft-lbs / 47-54 Nm</td>
</tr>
<tr>
<td>3</td>
<td>Sandwich valve manifold</td>
<td>A</td>
<td>Platform level</td>
<td>\n</td>
</tr>
<tr>
<td>4</td>
<td>3 position 4 way D03 valve</td>
<td>O</td>
<td>Platform level</td>
<td>30-35 in-lbs / 3-4 Nm</td>
</tr>
<tr>
<td>5</td>
<td>3 position 4 way D03 valve</td>
<td>P</td>
<td>Turntable rotate</td>
<td>30-35 in-lbs / 3-4 Nm</td>
</tr>
<tr>
<td>6</td>
<td>Cover plate</td>
<td>Q</td>
<td>\n</td>
<td>30-35 in-lbs / 3-4 Nm</td>
</tr>
<tr>
<td>7</td>
<td>3 position 4 way D03 valve</td>
<td>R</td>
<td>Boom up/down</td>
<td>30-35 in-lbs / 3-4 Nm</td>
</tr>
<tr>
<td>8</td>
<td>3 position 4 way D03 valve</td>
<td>S</td>
<td>Boom extend/retract</td>
<td>30-35 in-lbs / 3-4 Nm</td>
</tr>
<tr>
<td>9</td>
<td>Counterbalance valve</td>
<td>C</td>
<td>Platform level down</td>
<td>35-40 ft-lbs / 47-54 Nm</td>
</tr>
<tr>
<td>10</td>
<td>Check valve</td>
<td>K</td>
<td>Turntable rotate differential sensing</td>
<td>11-13 ft-lbs / 15-18 Nm</td>
</tr>
<tr>
<td>11</td>
<td>Check valve</td>
<td>M</td>
<td>Boom up/down differential sensing</td>
<td>11-13 ft-lbs / 15-18 Nm</td>
</tr>
<tr>
<td>12</td>
<td>Flow regulator valve</td>
<td>Y</td>
<td>Boom up/down</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>13</td>
<td>Relief valve, 1950 psi (134 bar)</td>
<td>D</td>
<td>Boom extend</td>
<td>25-30 ft-lbs / 34-41 Nm</td>
</tr>
<tr>
<td>14</td>
<td>Relief valve, 2200 psi (152 bar)</td>
<td>F</td>
<td>Boom down</td>
<td>25-30 ft-lbs / 34-41 Nm</td>
</tr>
<tr>
<td>15</td>
<td>Proportional solenoid valve</td>
<td>AA</td>
<td>Boom</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>16</td>
<td>Flow regulator valve</td>
<td>X</td>
<td>Turntable rotate/boom extend/retract</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>17</td>
<td>Normally closed poppet valve</td>
<td>J</td>
<td>Platform level</td>
<td>25-30 ft-lbs / 34-41 Nm</td>
</tr>
<tr>
<td>18</td>
<td>Proportional solenoid valve</td>
<td>Z</td>
<td>Turntable rotate/boom extend/retract</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>19</td>
<td>Flow regulator valve</td>
<td>V</td>
<td>Platform level</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>20</td>
<td>Differential sensing valve</td>
<td>AC</td>
<td>All functions</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>21</td>
<td>Flow regulator valve</td>
<td>U</td>
<td>Platform rotate</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>22</td>
<td>Flow regulator valve</td>
<td>W</td>
<td>Differential sensing circuit</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>23</td>
<td>Diagnostic fitting</td>
<td>Testing</td>
<td>\n</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Relief valve, 2600 psi (179 bar)</td>
<td>AB</td>
<td>System relief</td>
<td>35-40 ft-lbs / 47-54 Nm</td>
</tr>
<tr>
<td>25</td>
<td>Priority flow regulator valve</td>
<td>T</td>
<td>Steering</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>26</td>
<td>Check valve</td>
<td>I</td>
<td>Platform rotate right - differential sensing</td>
<td>11-13 ft-lbs / 15-18 Nm</td>
</tr>
<tr>
<td>27</td>
<td>Check valve</td>
<td>H</td>
<td>Platform rotate left - differential sensing</td>
<td>11-13 ft-lbs / 15-18 Nm</td>
</tr>
<tr>
<td>28</td>
<td>Check valve</td>
<td>L</td>
<td>Platform level - differential sensing</td>
<td>11-13 ft-lbs / 15-18 Nm</td>
</tr>
</tbody>
</table>
9-2
Valve Adjustments -
Function Manifold

How to Adjust the Main
Relief Valve

Perform this procedure with the boom in the
stowed position.

1 Connect a 0 to 3000 psi (0 to 206 bar) pressure
gauge to the test port on the function manifold.

2 Start the engine from the ground controls.

3 Hold the retract switch with the boom fully
retracted, and observe the pressure reading on
the pressure gauge.

4 Turn the engine off. Hold the relief valve and
remove the cap (item 24, function manifold).

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

**WARNING** Tip-over hazard. Do not adjust
the relief valves higher than recommended.

6 Restart the engine. Hold the retract switch with
the boom fully retracted, and recheck the valve
pressure.

**Main relief valve specifications**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>2600 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>179 bar</td>
</tr>
</tbody>
</table>

How to Adjust the Boom Down
Relief Valve

Perform this procedure with the boom in the
stowed position.

1 Connect a 0 to 3000 psi (0 to 206 bar) pressure
gauge to the test port on the function manifold.

2 Start the engine from the ground controls.

3 Hold the boom down switch with the boom fully
lowered, and observe the pressure reading on
the pressure gauge.

4 Turn the engine off. Hold the relief valve and
remove the cap (item 14, function manifold).

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

**WARNING** Tip-over hazard. Do not adjust
the relief valves higher than recommended.

6 Restart the engine. Hold the boom down switch
with the boom fully lowered and recheck the
valve pressure.

**Boom down relief valve specifications**

<table>
<thead>
<tr>
<th>Pressure 2200 psi</th>
<th>152 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How to Adjust the Boom Extend Relief Valve

Perform this procedure with the boom in the stowed position.

1. Connect a 0 to 3000 psi (0 to 206 bar) pressure gauge to the test port on the function manifold.
2. Start the engine from the ground controls.
3. Hold the extend switch with the boom fully extended, and observe the pressure reading on the pressure gauge.
4. Turn the engine off. Hold the relief valve and remove the cap (item 13, function manifold).
5. Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.
6. Restart the engine. Hold the extend switch with the boom fully extended, and recheck the valve pressure.

**Boom extend relief valve specifications**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>1950 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>134 bar</td>
</tr>
</tbody>
</table>

How to Override a Valve

A hydraulic valve may need to be manually overridden to troubleshoot a malfunction. The proportional boom functions (boom up/down and turntable rotate) use a variable position proportional valve and a three position directional valve. Example: one position for boom up, one position for neutral and one position for boom down. The platform rotate function uses a three position valve. The platform level uses a three position and a two position valve. The three position valves and the proportional valves can be manually overridden. To identify the manifold valves see 9-1, *Function Manifold*, in this section.

1. Push the button on the end of the valve in ¼ inch (6 mm).
2. Move the ground control function switch for the function being overridden to operate function.

**WARNING** Collision hazard. Impact with moving boom components may cause death or serious injury. Use extreme caution when overriding a machine function. Identify the direction of machine movement before overriding a valve.
How to Check the Resistance of a Valve Coil

1. Turn the key switch to the off position and disconnect the wires from the valve coil to be tested.
2. Connect the leads from an ohmmeter to the valve coil terminals.

Valve coil specifications

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportional solenoid valve</td>
<td>5Ω</td>
</tr>
<tr>
<td>3 position 4 way directional valve</td>
<td>4.5Ω</td>
</tr>
<tr>
<td>Normally closed poppet valve</td>
<td>7Ω</td>
</tr>
</tbody>
</table>
10-1
Hydraulic Tank

The primary functions of the hydraulic tank are to cool, clean and deaerate the hydraulic fluid during operation. This tank has a 45 gallon (170 liter) capacity and an oil level gauge with a temperature indicator. It utilizes internal suction strainers for the pump supply suction lines and has an external return line filter with a condition indicator.

How to Remove the Hydraulic Tank

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.

1 Remove the fuel tank. See 10-2, How to Remove the Fuel Tank.
2 Close the two hydraulic tank valves located at the hydraulic tank.
3 Completely drain the oil from the tank by removing the drain plug located in the bottom of the tank.

How to Prime the Pump

1 Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port on the drive pump.
2 Gasoline/LPG models: Remove the high tension lead from the center of the ignition coil.

Deutz Diesel models: Hold the manual fuel shutoff valve counterclockwise to the CLOSED position.

3 Crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi (22 bar).
FUEL AND HYDRAULIC TANKS

10-2 Fuel Tank

How to Remove the Fuel Tank

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

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

1 Turn the manual fuel shutoff valve to the CLOSED position.

2 **Gasoline/LPG models:** Disconnect, drain and plug the fuel hose.
   - **Deutz Diesel models:** Disconnect, drain and plug the supply and return fuel lines. Cap the fuel return fitting on the fuel tank.

3 Remove the mounting fasteners from the bottom of the tank.

4 Use an appropriate lifting device to remove the tank from the machine.

⚠️ NOTICE ⚠️ Clean the fuel tank and inspect for rust and corrosion before installing.
11-1
Rotation Hydraulic Motor

How to Remove the Rotation Hydraulic Motor

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

2. Disconnect the hydraulic hoses from the motor and manifold, and cap them.
   **CAUTION** 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 motor mounting bolts, then remove the motor from the brake.

How to Remove the Turntable Rotation Brake or Torque Hub

Refer to Maintenance Procedures, C-5, *How to Replace the Torque Hub Oil.*
11-2
Turntable Rotation Manifold Components

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
<th>Schematic Item</th>
<th>Function</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shuttle valve 2 position 3 way C Turntable rotation brake release</td>
<td></td>
<td>10-13 ft-lbs / 14-18 Nm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Counterbalance valve A Turntable rotate - right</td>
<td></td>
<td>35-40 ft-lbs / 47-54 Nm</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Counterbalance valve B Turntable rotate - left</td>
<td></td>
<td>35-40 ft-lbs / 47-54 Nm</td>
<td></td>
</tr>
</tbody>
</table>

Plug Torque Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE No. 2</td>
<td>1/8</td>
<td>50 in-lbs / 6 Nm</td>
</tr>
<tr>
<td>SAE No. 4</td>
<td>3/32</td>
<td>13 ft-lbs / 18 Nm</td>
</tr>
<tr>
<td>SAE No. 6</td>
<td>1/4</td>
<td>18 ft-lbs / 24 Nm</td>
</tr>
<tr>
<td>SAE No. 8</td>
<td>5/32</td>
<td>50 ft-lbs / 68 Nm</td>
</tr>
<tr>
<td>SAE No. 10</td>
<td>9/32</td>
<td>55 ft-lbs / 75 Nm</td>
</tr>
<tr>
<td>SAE No. 12</td>
<td>5/16</td>
<td>75 ft-lbs / 102 Nm</td>
</tr>
</tbody>
</table>
12-1
Yoke and Hub

How to Remove the Yoke and Hub

1. Remove the retaining bolt, then the pivot pin from both the steering cylinder and the tie rod.

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

3. Block the non-steering wheels, and then center a lifting jack under the steering axle.

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

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

6. Remove the retaining bolt from the king pin.

7. Attach a strap from a lifting device to the yoke/hub assembly for support.

8. Use a slide hammer to remove the upper king pin, then use a soft metal drift to drive the lower king pin down and out.

**WARNING** Crushing hazard. The yoke/hub assembly will fall when the king pins are removed if it is not properly supported.

**Torque specifications**

<table>
<thead>
<tr>
<th>Part</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lug nut</td>
<td>125 ft-lbs</td>
</tr>
<tr>
<td></td>
<td>169.5 Nm</td>
</tr>
</tbody>
</table>

**Diagram:**

- a tie rod
- b axle
- c king pin/retaining bolt
- d yoke
- e hub
- f pivot pin/retaining bolt
- g steering cylinder
How to Remove the Hub and Bearings

1. Loosen the wheel lug nuts. Do not remove them.
2. Block the non-steering wheels and place a lifting jack under the steering axle.
3. Raise the machine and place blocks under the chassis for support.
4. Remove the lug nuts. Then remove the tire and wheel assembly.
5. Remove the dust cap, cotter pin and slotted nut.
6. Pull the hub off the spindle. The washer and outer bearing should fall loose from the hub.
7. Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.

How to Install the Hub and Bearings

1. Be sure that both bearings are packed with grease.
2. Place the large inner bearing into the rear of the hub.
3. Press the bearing seal evenly into the hub until it is flush.
4. Slide the hub onto the yoke spindle.
5. Place the outer bearing into the hub.
6. Install the washer and slotted nut.
7. Tighten the slotted nut to 35 foot-pounds (47 Nm).
8. Loosen the slotted nut, then re-tighten to 8 foot-pounds (11 Nm).
9. Install a new cotter pin. Bend the cotter pin to lock it in.
10. Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to 125 foot-pounds (169.5 Nm).

12-2 Steering Cylinders

How to Remove a Steering Cylinder

There are two identical steering cylinders that work in parallel. They are part of the same hydraulic circuit, but move in opposite directions. The tie rod maintains equal movement of the tires. Bushings are used at both ends of each steering cylinder clevis.

1. Disconnect and plug the hydraulic hoses from the steering cylinder. Cap the fittings.

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

2. Remove the pin retaining fasteners. Then remove the pivot pin from each end of the steering cylinder.
3. Remove the steering cylinder.
12-3
Tie Rod

How to Remove the Tie Rod

1. Remove the pin retaining fasteners, then remove the pivot pin from each end of the tie rod.
2. Remove the tie rod.

How to Perform the Toe-in Adjustment

1. Straighten the steer wheels.
2. Measure the steer tires, front to front and back to back, using a measuring fixture.

3. Center a lifting jack under the steering axle, then raise the machine.
4. Loosen the jam nut on the adjustable end of the tie rod.
5. Remove the pin retaining fasteners, then remove the pivot pin from the adjustable end of the tie rod.
6. Slide the tie rod off the yoke and adjust it by turning the end.

**NOTICE**
One turn on the adjustable end equals approximately 1/8 inch (3.2 mm) change in the front and rear measurements.

7. Slide the tie rod onto the yoke. Install the pivot pin, then install the retaining bolt.
8. Tighten the jam nut against the tie rod.
9. Lower the machine and recheck the front and back measurements (step 2). If further adjustment is needed, repeat steps 3 through 8.

**Toe-in specification**

0 ± 1/8 inch (6.35 mm)
from the wheel motor. Cap the wheel motor hydraulic fittings.

**CAUTION** 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 Loosen the wheel lug nuts. Do not remove them.

5 Block the non-steering wheels, and then center a lifting jack under the steering axle.

6 Raise the machine 15 inches (38 cm) and place blocks under the chassis for support.

7 Remove the lug nuts, then remove the tire and wheel assembly.

8 Remove the hydraulic hose mounting bracket from the top of the yoke.

9 Remove the roll pin from the upper king pin.

10 Remove the retaining bolts from the upper and lower king pins.

11 Remove the drive motor mounting fasteners.

12 Slide the drive motor shaft out of the brake and then remove it.

13 Attach a strap from a lifting device to the yoke/torque hub assembly for support.

---

3 Disconnect and plug the hydraulic hoses
14 Use a slide hammer to remove the upper king pin, then use a soft metal drift to drive the lower king pin down and out.

**WARNING** Crushing hazard. The yoke/torque hub assembly will fall when the lower king pin is removed if it is not properly supported.

15 Place the yoke/torque hub assembly on a flat surface with the torque hub down. Remove the bolts that secure the yoke to the torque hub.

**Torque specifications**

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lug nut</td>
<td>125 ft-lbs / 169.5 Nm</td>
</tr>
<tr>
<td>Torque hub mounting bolts</td>
<td>120 ft-lbs / 163 Nm</td>
</tr>
<tr>
<td>Drive motor mounting bolts</td>
<td>75 ft-lbs / 102 Nm</td>
</tr>
</tbody>
</table>

13-2 Steering Cylinders

**How to Remove a Steering Cylinder**

This procedure is the same as the 2WD procedure. See repair procedure 12-2, How to Remove a Steering Cylinder.

13-3 Tie Rod

**How to Remove the Tie Rod**

This procedure is the same as the 2WD procedure. See Repair Procedure 12-3, How to Remove the Tie Rod.

**How to Perform the Toe-in Adjustment**

This procedure is the same as the 2WD procedure. See Repair Procedure 12-3, How to Perform the Toe-in Adjustment.
Oscillating Axle Components

14-1 Oscillating Axle Lock-out 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

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

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

1. Block the non-steering wheels, then center a lifting jack between the steering wheels under the axle pivot pin.
2. Raise the machine 6 inches (15 cm) and place blocks under the drive chassis.
3. Disconnect and plug the oscillating axle cylinder hydraulic hoses, and cap the cylinder fittings.

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

4. Remove the pin retaining fasteners from both pivot pins.
5. Attach a strap from a lifting device to the cylinder for support.
6. Use a soft metal drift to remove the pins.
15-1
Oscillate Manifold Components

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
<th>Schematic Item</th>
<th>Function</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diagnostic fitting</td>
<td></td>
<td>Testing</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Differential sensing valve</td>
<td>A</td>
<td>Differential sensing</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>3</td>
<td>Check valve</td>
<td>D</td>
<td>Oscillate check - left</td>
<td>35-40 ft-lbs / 47-54 Nm</td>
</tr>
<tr>
<td>4</td>
<td>Pilot operated unloader valve</td>
<td></td>
<td>Sequencing</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>5</td>
<td>Shuttle valve 2 position 3 way</td>
<td>C</td>
<td>Pilot</td>
<td>10-12 ft-lbs / 14-16 Nm</td>
</tr>
<tr>
<td>6</td>
<td>Piston</td>
<td>G</td>
<td>Check valve circuit</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Check valve</td>
<td>E</td>
<td>Oscillate check - right</td>
<td>35-40 ft-lbs / 47-54 Nm</td>
</tr>
<tr>
<td>8</td>
<td>Shuttle valve 2 position 3 way</td>
<td>F</td>
<td>Unloading</td>
<td>35-40 ft-lbs / 47-54 Nm</td>
</tr>
</tbody>
</table>

Steer and Oscillate Manifolds

Description | Hex size | Torque
------------|----------|--------
SAE No. 2    | 1/8      | 50 in-lbs / 6 Nm
SAE No. 4    | 3/16     | 13 ft-lbs / 18 Nm
SAE No. 6    | 1/4      | 18 ft-lbs / 24 Nm

Plug Torque Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE No. 2</td>
<td>1/8</td>
<td>50 ft-lbs / 68 Nm</td>
</tr>
<tr>
<td>SAE No. 4</td>
<td>3/16</td>
<td>55 ft-lbs / 75 Nm</td>
</tr>
<tr>
<td>SAE No. 6</td>
<td>1/4</td>
<td>75 ft-lbs / 102 Nm</td>
</tr>
</tbody>
</table>
15-2
Valve Adjustments

How to Adjust the Sequencing Valve Pressure

1 Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port located on the oscillate manifold.

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

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

3 Start the engine from the platform controls.

4 With the engine running, manually activate the valve and observe the pressure reading on the pressure gauge.

5 Turn the engine off. Hold the valve and remove the cap (index 4).

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

7 Restart the engine, manually activate the valve and recheck the valve pressure.

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

**Unloader valve specifications**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>1200 psi</th>
<th>82.7 bar</th>
</tr>
</thead>
</table>

STEER AND OSCILLATE MANIFOLDS
# STEER AND OSCILLATE MANIFOLDS

## 15-3 Directional Valve Manifold Components

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
<th>Schematic Item</th>
<th>Function</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cap</td>
<td></td>
<td>Breather</td>
<td>20-25 ft-lbs / 27-33 Nm</td>
</tr>
<tr>
<td>2</td>
<td>Spool valve</td>
<td></td>
<td>Directional control</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram of Directional Valve Manifold Components]

---

**Related Information**

- Service Manual - First Edition
- Section 7 - Repair Procedures
- Part No. 32222
- Genie S-40
STEER AND OSCILLATE MANIFOLDS

How to Set Up the Directional Valve Linkage

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

1. Lower the boom to the stowed position.
2. Use a "bubble type" level to be sure the floor is completely level.

Failure to perform this procedure on a level floor will compromise the stability of the machine and may result in the machine tipping over.

3. Remove the drive chassis cover from the non-steer end.
4. Disconnect the linkage clevis yoke from the drive chassis (if not already disconnected).
5. Place a "bubble type" level across the drive chassis non-steer end. Check to be sure the drive chassis is completely level.
6. To level the drive chassis, start the engine and push up or pull down on the linkage adjustment rod until the machine is completely level.
7. Verify that the ground and drive chassis are completely level.
8. Adjust the length of the rod by turning the clevis yoke until the clevis yoke can be pinned to the drive chassis.
9. Install the clevis yoke pin then the cotter pin. Be sure to bend the cotter pin.
10. Measure the distance between the drive chassis and the non-steer axle on both sides (from the inside of the drive chassis).

If the distance is not equal and the adjustment to the linkage was completed with the ground and drive chassis level, consult Genie Industries Service Department.
15-4
Steer Manifold Components

Index No. | Description                      | Schematic Item | Function       | Torque       |
--- | --------------------------------- | --------------- | --------------- | -------------|
1 | 3 position 4 way D03 valve        | 1               | Steering        | 30-35 in-lbs / 3-4 Nm |
2 | Priority flow regulator valve     | 2               | Oscillate       | 10-12 ft-lbs / 14-16 Nm |

Plug Torque Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE No. 2</td>
<td>1/8</td>
<td>50 in-lbs / 6 Nm</td>
</tr>
<tr>
<td>SAE No. 4</td>
<td>3/16</td>
<td>13 ft-lbs / 18 Nm</td>
</tr>
<tr>
<td>SAE No. 6</td>
<td>1/4</td>
<td>18 ft-lbs / 24 Nm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE No. 8</td>
<td>5/16</td>
<td>50 ft-lbs / 68 Nm</td>
</tr>
<tr>
<td>SAE No. 10</td>
<td>9/16</td>
<td>55 ft-lbs / 75 Nm</td>
</tr>
<tr>
<td>SAE No. 12</td>
<td>5/8</td>
<td>75 ft-lbs / 102 Nm</td>
</tr>
</tbody>
</table>
Non-steering Axle Components

16-1
Drive Motor

Component damage hazard. Repairs to the motor should only be performed by an authorized Sundstrand-Sauer dealer.

How to Remove a Drive Motor

A drive motor can only be removed from the inside of the chassis.

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.

1 Disconnect the hydraulic hoses from the drive motor and plug them.

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

2 Remove the drive motor mounting bolts.

3 Slide the drive motor shaft out of the brake and then remove it.

Torque specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lug nut</td>
<td>125 ft-lbs, 169.5 Nm</td>
</tr>
<tr>
<td>Drive motor mounting bolts</td>
<td>75 ft-lbs, 102 Nm</td>
</tr>
</tbody>
</table>

16-2
Torque Hub

How to Remove a Drive Torque Hub

1 Remove the drive motor. See 16-1, How to Remove a Drive Motor.

2 Disconnect the hydraulic hose from the brake and plug it. Then remove the hydraulic fitting and the bleed valve.

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

4 Center a lifting jack under the non-steering axle. Raise the machine and place blocks under the drive chassis to support it.

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

6 Place a second lifting jack under the torque hub for support.

7 Remove the bolts that attach the torque hub to the chassis, then remove the torque hub.

Crushing hazard. The torque hub will fall if it is not properly supported when the mounting bolts are removed.

Torque specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lug nut</td>
<td>125 ft-lbs, 169.5 Nm</td>
</tr>
<tr>
<td>Drive torque hub mounting bolts</td>
<td>120 ft-lbs, 163 Nm</td>
</tr>
<tr>
<td>Drive motor mounting bolts</td>
<td>75 ft-lbs, 102 Nm</td>
</tr>
</tbody>
</table>
## 2WD Drive Manifold

### 17-1
### 2WD Drive Manifold Components

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
<th>Schematic Item</th>
<th>Function</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relief valve, 250 psi (17 bar)</td>
<td>A</td>
<td>Charge pressure</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>2</td>
<td>Flow regulator valve</td>
<td>G</td>
<td>RR flow control in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>3</td>
<td>Flow regulator valve</td>
<td>K</td>
<td>RR flow control in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>4</td>
<td>Flow regulator valve</td>
<td>F</td>
<td>LR flow control in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>5</td>
<td>Flow regulator valve</td>
<td>J</td>
<td>LR flow control in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>6</td>
<td>Flow control valve</td>
<td>H</td>
<td>RR flow regulator in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>7</td>
<td>Flow control valve</td>
<td>E</td>
<td>LR flow regulator in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>8</td>
<td>Flow control valve</td>
<td>L</td>
<td>RR flow regulator in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>9</td>
<td>Flow control valve</td>
<td>I</td>
<td>LR flow regulator in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>10</td>
<td>Shuttle valve</td>
<td>B</td>
<td>Charge pressure circuit</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
</tbody>
</table>

### Plug Torque Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE No. 2</td>
<td>1/8</td>
<td>50 in-lbs / 6 Nm</td>
</tr>
<tr>
<td>SAE No. 4</td>
<td>3/16</td>
<td>13 ft-lbs / 18 Nm</td>
</tr>
<tr>
<td>SAE No. 6</td>
<td>1/4</td>
<td>18 ft-lbs / 24 Nm</td>
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<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
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<tbody>
<tr>
<td>SAE No. 8</td>
<td>5/16</td>
<td>50 ft-lbs / 68 Nm</td>
</tr>
<tr>
<td>SAE No. 10</td>
<td>9/16</td>
<td>55 ft-lbs / 75 Nm</td>
</tr>
<tr>
<td>SAE No. 12</td>
<td>5/8</td>
<td>75 ft-lbs / 102 Nm</td>
</tr>
</tbody>
</table>
Valve Adjustments

How to Adjust the Charge Pressure Relief Valve

1. Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port located on the drive manifold.

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

2. Start the engine from the platform controls.

3. Drive the machine slowly in either direction and observe the pressure reading on the pressure gauge.

4. Turn the engine off. Hold the relief valve and remove the cap (index 1).

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

6. Restart the engine. Drive the machine in either direction and recheck the valve pressure.

7. Turn the engine off, then remove the pressure gauge.

**Relief valve specifications**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>250 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 bar</td>
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# 4WD Drive Manifold Components

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
<th>Schematic Item</th>
<th>Function</th>
<th>Torque</th>
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<tbody>
<tr>
<td>1</td>
<td>Flow regulator valve</td>
<td>S</td>
<td>RF flow control in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>2</td>
<td>Flow regulator valve</td>
<td>R</td>
<td>RR flow control in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
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<tr>
<td>3</td>
<td>Flow regulator valve</td>
<td>O</td>
<td>RF flow control in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>4</td>
<td>Flow regulator valve</td>
<td>N</td>
<td>RR flow control in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>5</td>
<td>Flow regulator valve</td>
<td>K</td>
<td>LF flow control in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>6</td>
<td>Flow regulator valve</td>
<td>J</td>
<td>LR flow control in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>7</td>
<td>Flow regulator valve</td>
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<td>LF flow control in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>8</td>
<td>Flow regulator valve</td>
<td>F</td>
<td>LR flow control in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>9</td>
<td>Flow control valve</td>
<td>Q</td>
<td>RR flow regulator in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>10</td>
<td>Flow control valve</td>
<td>M</td>
<td>RR flow regulator in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>11</td>
<td>Flow control valve</td>
<td>I</td>
<td>LR flow regulator in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>12</td>
<td>Flow control valve</td>
<td>E</td>
<td>LR flow regulator in reverse</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
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<tr>
<td>13</td>
<td>Relief valve, 250 psi (17 bar)</td>
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<td>Charge pressure</td>
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<td>14</td>
<td>Shuttle valve 3 position 3 way</td>
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<td>Charge pressure circuit</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
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<td>15</td>
<td>Flow control valve</td>
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<td>15-18 ft-lbs / 20-24 Nm</td>
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<tr>
<td>16</td>
<td>Flow control valve</td>
<td>L</td>
<td>LF flow regulator in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
<tr>
<td>17</td>
<td>Flow control valve</td>
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<td>RF flow regulator in reverse</td>
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<tr>
<td>18</td>
<td>Flow control valve</td>
<td>T</td>
<td>RF flow regulator in forward</td>
<td>15-18 ft-lbs / 20-24 Nm</td>
</tr>
</tbody>
</table>
4WD DRIVE MANIFOLD

Plug Torque Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Hex size</th>
<th>Torque</th>
</tr>
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<tbody>
<tr>
<td>SAE No. 2</td>
<td>1/8</td>
<td>50 in-lbs / 6 Nm</td>
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<td>SAE No. 4</td>
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<td>13 ft-lbs / 18 Nm</td>
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18-2 Valve Adjustments

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3 Drive the machine slowly in either direction and observe the pressure reading on the pressure gauge.

4 Turn the engine off. Hold the relief valve and remove the cap (index 13).

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

6 Restart the engine. Drive the machine in either direction and recheck the valve pressure.

7 Turn the engine off, then remove the pressure gauge.

Relief valve specifications

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<th>Pressure</th>
<th>250 psi 17 bar</th>
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