Genie®
A TEREX BRAND

# Service and Repair Manual

Serial Number Range

## GS-2646AV
from GS4612A-110000
from GS4616P-138362 to
GS4616P-141799

## GS-2646AV 35
from GS46P-141800

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

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

Part No. 1272218
Rev A2
September 2016

# Introduction

## Important

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

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

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

## Compliance

### Machine Classification

Group A/Type 3 as defined by ISO 16368

### Machine Design Life

Unrestricted with proper operation, inspection and scheduled maintenance.

## Technical Publications

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

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

## Contact Us:

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

## Find a Manual for this Model

Go to http://www.genielift.com

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



1272218 Rev A, March 2016

First Edition, First Printing

## Revision History

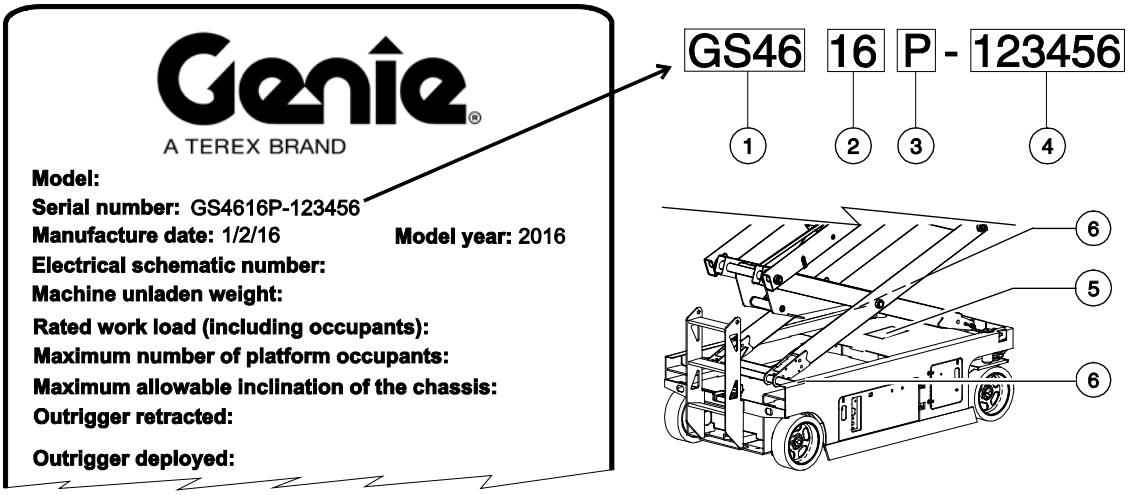
| Revision | Date | Section | Procedure / Page / Description |
|---|---|---|---|
| A | 3/2016 | | Initial Release |
| A1 | 5/2016 | Repair | Procedures 2-3, 2-4, 2-5, 2-6 |
| | | Diagnostics | H067 fault |
| A2 | 9/2016 | Introduction | Serial Number Legend |

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

# Introduction

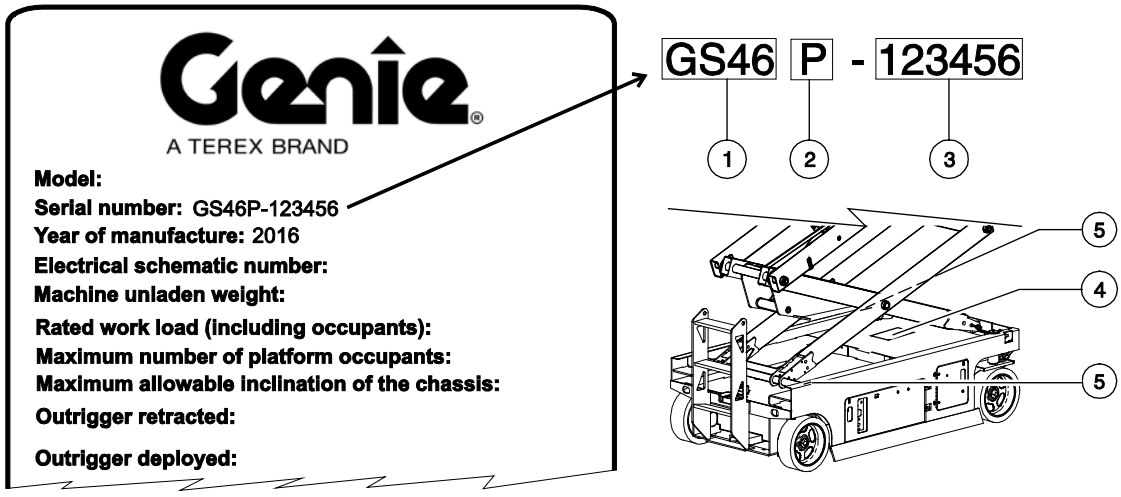
## Serial Number Legend

**To August 31, 2016**




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

**From September 1, 2016**




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

# Safety Rules

## Danger

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

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

## Do Not Perform Maintenance Unless:

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

☑ You read, understand and obey:

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

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

# Safety Rules

## Personal Safety

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

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

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

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

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

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

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

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

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

## Workplace Safety

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

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

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

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

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

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

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

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# Specifications

## Machine Specifications

| Batteries, Standard | |
|---|---|
| Voltage | 6V DC |
| Group | GC2 |
| Type | T-105 |
| Quantity | 4 |
| Battery capacity, maximum | C20 = 225AH |
| Reserve capacity @ 25A rate | 447 minutes |
| Weight, each | 62 lbs<br>28 kg |

| Batteries, Maintenance-free (option) | |
|---|---|
| Voltage | 6V DC |
| Group | GC2 |
| Type | 6V-AGM |
| Quantity | 4 |
| Battery capacity, maximum | C20 = 200AH |
| Reserve capacity @ 25A rate | 380 minutes |
| Weight, each | 62 lbs<br>28 kg |

| **Fluid capacities** | |
|---|---|
| Hydraulic tank | 3.75 gallons<br>14.2 liters |
| Hydraulic system (including tank) | 5 gallons<br>19 liters |

| **Tires and Wheels** | |
|---|---|
| Tire size (solid rubber) | 15 x 5 in<br>38.1 x 12.7 cm |
| Tire contact area | 15 sq in<br>96.7 $cm^2$ |
| Castle nut torque, dry | 300 ft-lbs<br>406.7 Nm |
| Castle nut torque, lubricated | 225 ft-lbs<br>305 Nm |

# Specifications

## Performance Specifications

| Drive speed, maximum | |
|---|---|
| Platform stowed, fast | 2.2 mph<br>40 ft / 12.4 sec<br>3.5 km/h<br>12.2 m / 12.4 sec |
| Platform stowed, slow | 1.1 mph<br>40 ft / 24.8 sec<br>1.8 km/h<br>12.2 m / 24.8 sec |
| Platform raised | 0.5 mph<br>40 ft / 55 sec<br>0.8 km/h<br>12.2 m / 55 sec |

| Braking distance, maximum | |
|---|---|
| High range on paved surface | 24 in ± 12 in<br>61 cm ± 30 cm |

| Gradeability | |
|---|---|
| GS-2646 AV | 25% |
| GS-2646 AV35 | 20% |

| Airborne noise emissions | |
|---|---|
| Sound pressure level at ground workstation | < 70 dBA |
| Sound pressure level at platform workstation | < 70 dBA |

| Function speed, maximum from platform controls (with 1 person in platform) | |
|---|---|
| Platform up (fast mode) | 28 to 32 seconds |
| Platform up (slow mode) | 58 to 62 seconds |
| Platform down | 32 to 36 seconds |

| Function speed, powered extension deck from platform controls or ground controls (if equipped) | |
|---|---|
| Extend | 28 to 32 seconds |
| Retract | 31 to 35 seconds |

| Rated work load at full height, maximum | |
|---|---|
| Platform Capacity | 900 lbs<br>408 kg |

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

## Hydraulic Oil Specifications

| Hydraulic Fluid Specifications | |
|---|---|
| Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and the viscosity index should exceed 140. They should provide excellent antiwear, oxidation prevention, corrosion inhibition, seal conditioning, and foam and aeration suppression properties. | |
| Cleanliness level, minimum | ISO 15/13 |
| Water content, maximum | 250 ppm |
| **Recommended Hydraulic Fluid** | |
| Hydraulic oil type | Chevron Rando HD Premium |
| Viscosity grade | 32 |
| Viscosity index | 200 |
| **Optional Hydraulic Fluids** | |
| Mineral based | Shell Tellus S2 V 32<br>Shell Tellus S2 V 46<br>Shell Tellus S4 VX 32 Shell<br>Shell Donax TG (Dexron III)<br>Chevron 5606A |
| Biodegradable | Petro Canada Environ MV 46 |
| Fire resistant | UCON Hydrolube HP-5046 |

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

**NOTICE**

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

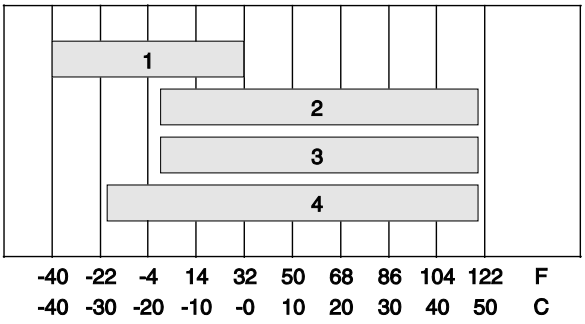
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond it's maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

**NOTICE**

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

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

## Hydraulic Fluid Temperature Range




Ambient air temperature

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

# Specifications

## Chevron Rando HD Premium Oil MV Fluid Properties

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

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

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

## Chevron 5606A Hydraulic Oil Fluid Properties

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

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

**NOTICE**

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

# Specifications

## Petro-Canada Environ MV 46 Fluid Properties

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

## Shell Tellus S4 VX Fluid Properties

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

## UCON Hydrolube HP-5046 Fluid Properties

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

# Specifications

## Hydraulic Component Specifications

| | |
|---|---|
| **Function pump** | |
| Type | Gear |
| Displacement per revolution | 0.244 cu in<br>4 cc |
| Flow rate @ 2500 psi / 172 bar | 3 gpm<br>11.3 L/min |
| Hydraulic tank return filter | 10 micron with<br>25 psi / 1.7 bar<br>bypass |
| **Function manifold** | |
| System relief valve pressure, maximum | 3700 psi<br>255 bar |
| Lift relief valve pressure | 1800 to 3700 psi<br>142 to 241 bar |
| Steer relief valve pressure | 1500 psi<br>103 bar |
| **Powered extension deck manifold** | |
| Relief valve pressure, maximum | 750 psi<br>52 bar |

## Manifold Component Specifications

| | |
|---|---|
| **Plug torque** | |
| SAE No. 2 | 50 in-lbs / 6 Nm |
| SAE No. 4 | 13 ft-lbs / 18 Nm |
| SAE No. 6 | 18 ft-lbs / 24 Nm |
| SAE No. 8 | 50 ft-lbs / 68 Nm |
| SAE No. 10 | 55 ft-lbs / 75 Nm |
| SAE No. 12 | 75 ft-lbs / 102 Nm |

## Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok™ ORFS or 37° JIC fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

### Seal-Lok™ Fittings

(hose end - ORFS)

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

### JIC 37° Fittings

(swivel nut or hose connection)

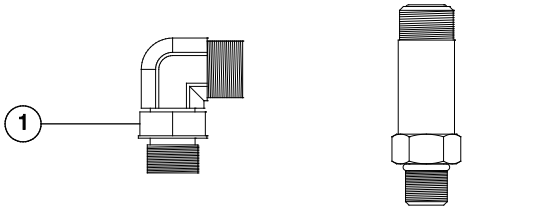
| SAE Dash Size | Thread Size | Flats |
|---|---|---|
| -4 | 7/16-20 | 2 |
| -6 | 9/16-18 | 1 ¼ |
| -8 | 3/4-16 | 1 |
| -10 | 7/8-14 | 1 |
| -12 | 1 1/16-12 | 1 |
| -16 | 1 5/16-12 | 1 |
| -20 | 1 5/8-12 | 1 |
| -24 | 1 7/8-12 | 1 |

# Specifications

## SAE O-ring Boss Port

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

| SAE Dash Size | Torque |
|---|---|
| -4 | 14 ft-lbs / 19 Nm |
| -6 | 23 ft-lbs / 31.2 Nm |
| -8 | 36 ft-lbs / 54.2 Nm |
| -10 | 62 ft-lbs / 84 Nm |
| -12 | 84 ft-lbs / 114 Nm |
| -16 | 125 ft-lbs / 169.5 Nm |
| -20 | 151 ft-lbs / 204.7 Nm |
| -24 | 184 ft-lbs / 249.5 Nm |




Adjustable Fitting

Non-adjustable fitting

1 jam nut

## SAE O-ring Boss Port

(tube fitting - installed into Steel)

| SAE Dash Size | | Torque |
|---|---|---|
| -4 | ORFS / 37° (Adj)<br>ORFS (Non-adj)<br>37° (Non-adj) | 15 ft-lbs / 20.3 Nm<br>26 ft-lbs / 35.3 Nm<br>22 ft-lbs / 30 Nm |
| -6 | ORFS (Adj / Non-adj)<br>37° (Adj / Non-adj) | 35 ft-lbs / 47.5 Nm<br>29 ft-lbs / 39.3 Nm |
| -8 | ORFS (Adj / Non-adj)<br>37° (Adj / Non-adj) | 60 ft-lbs / 81.3 Nm<br>52 ft-lbs / 70.5 Nm |
| -10 | ORFS (Adj / Non-adj)<br>37° (Adj / Non-adj) | 100 ft-lbs / 135.6 Nm<br>85 ft-lbs / 115.3 Nm |
| -12 | (All types) | 135 ft-lbs / 183 Nm |
| -16 | (All types) | 200 ft-lbs / 271.2 Nm |
| -20 | (All types) | 250 ft-lbs / 339 Nm |
| -24 | (All types) | 305 ft-lbs / 413.5 Nm |

## Torque Procedure

### Seal-Lok™ fittings

1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

Note: The O-ring in Parker Seal Lok™ fittings and hose end are custom-size O-rings. They are not standard size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

2 Lubricate the O-ring before installation.

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

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

5 Tighten the nut or fitting to the appropriate torque. Refer to the appropriate torque chart in this section.

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

# Specifications

### JIC 37° fittings

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

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

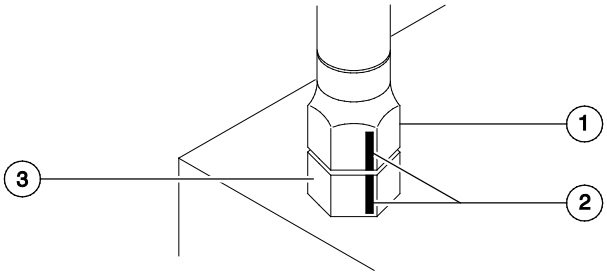



Illustration 1

1 hex nut
2 reference mark
3 body hex fitting

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

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

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

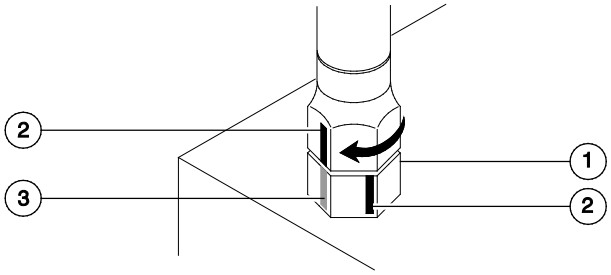



Illustration 2

1 body hex fitting
2 reference mark
3 second mark

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

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

# Repair Procedures

## Observe and Obey:

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

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

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

## Before Repairs Start:

☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.

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

☑ Use only Genie approved replacement parts.

☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.

## Machine Configuration:

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

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

# Repair Procedures

## About This Section

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

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

### Symbols Legend

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

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

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

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

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

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

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

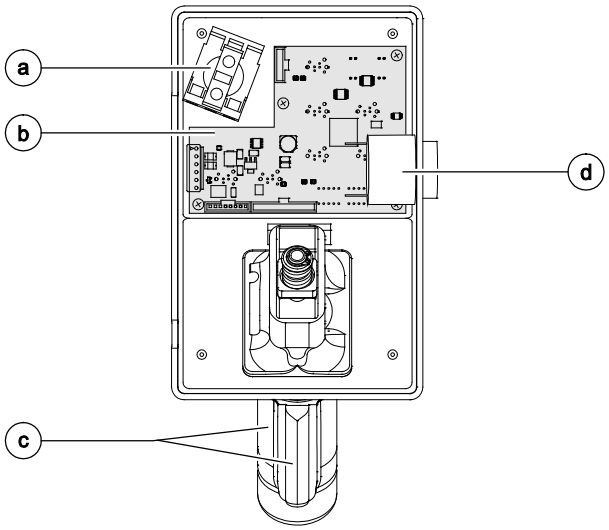
# Platform Controls

The platform controls are used to operate the machine from the platform.

Activating a function button sends a signal to the Electronic Control Module (ECM). When the ECM is in the function mode, the platform controls are used to operate the various machine functions.

The platform controls consist of an Emergency Stop button, electronic circuit board, proportional control handle, drive/steer enable switch, alarm, function buttons and LED display.

For further information or assistance, contact Genie Product Support.

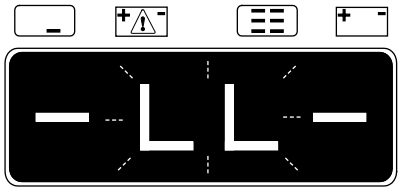



a red Emergency Stop button P2
b platform controls circuit board U3
c proportional control handle and drive/steer enable switch JC9
d alarm H1

## Operational Indicator Codes

These codes are generated by the electrical system to indicate machine operating status. During normal operation, a code will appear in the platform controls LED readout if a condition such as off-level, overload cutout, chassis mode operation or pothole guard stuck occurs.

If the platform controls LED readout displays an operational indicator code such as LL, the fault condition must be repaired or removed before resuming machine operation. Push in and pull out the red Emergency Stop button to reset the system.




Platform Controls LED Readout

| Code | Condition |
|---|---|
| LL | Off-level |
| OL | Platform Overload (CE and Australia) |
| CH | Chassis Mode Operation |
| PHS | Pothole Guard Stuck |
| nd | No Drive (option) |
| dE | Deck Extended (PED only)<br>(lift and drive disabled) |
| Fd | Function Disabled (all functions) |

Note: A code and a description of a code can also be viewed at the ground controls LCD display.

# Platform Controls

## 1-1
## Circuit Board

### How to Remove the Platform Controls Circuit Board

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

2 Disconnect the platform controls from the control cable at the platform.

3 Remove the fasteners securing the platform control box to the platform control bracket.

4 Remove the fasteners securing the bottom cover to the platform control box. Open the control box.

5 Remove the ties securing the wire harness.

6 Disconnect the red and black wires from the alarm.

7 Carefully remove the alarm from the platform control box.

8 Carefully disconnect all wire harness connectors from the platform controls circuit board.

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

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

9 Carefully remove the platform controls circuit board fasteners.

10 Carefully remove the platform controls circuit board from the platform control box.

11 Remove the transparent caps from the platform controls circuit board and save.

| Circuit board fastener torque specifications | |
|---|---|
| Hand tighten until screws seat | < 5 in-lbs<br>< 0.6 Nm |

Note: Before installing a circuit board, place the transparent caps removed in step 11, over the circuit board buttons.

Note: After installing the circuit board, check for proper button operation. Excessive torque of the circuit board fasteners will cause the buttons to bind. Moderate torque of the circuit board fasteners will not allow the buttons to engage.

# 1-2 Joystick

## How to Remove the Joystick

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

2 Disconnect the platform controls from the control cable at the platform.

3 Remove the fasteners securing the platform control box to the platform control bracket.

4 Remove the fasteners securing the bottom cover to the platform control box. Open the control box.

5 Remove the ties securing the joystick wire harness.

6 Carefully disconnect the joystick wire harness from the platform controls circuit board.

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

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

7 Carefully remove the joystick fasteners.

8 Carefully remove the joystick from the platform control box.

| Torque specifications | |
|---|---|
| Joystick fasteners | 9 in-lbs<br>1 Nm |

# 1-3 Platform Controls Alarm

## How to Remove the Platform Controls Alarm

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

2 Disconnect the platform controls from the control cable at the platform.

3 Remove the fasteners securing the platform control box to the platform control bracket.

4 Remove the fasteners securing the bottom cover to the platform control box. Open the control box.

5 Disconnect the red and black wires from the alarm.

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

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

6 Carefully remove the alarm from the platform control box.

# Platform Controls

## 1-4 Platform Emergency Stop Button

### How to Remove the Platform Controls Emergency Stop Button

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

2 Disconnect the platform controls from the control cable at the platform.

3 Remove the fasteners securing the platform control box to the platform control bracket.

4 Remove the fasteners securing the bottom cover to the platform control box. Open the control box.

5 Disconnect the white wires from the Emergency Stop base.

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

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

6 Carefully remove the Emergency Stop base from the Emergency Stop button.

7 Carefully remove the retaining ring from the Emergency Stop button.

8 Carefully remove the Emergency Stop button from the platform control box.

# Ground Controls

The ground controls, used to operate the machine from the ground, can also be used to tune the performance of the machine.

The ground controls consist of an Electronic Control Module (ECM), emergency stop button, selector/key switch and circuit breaker.

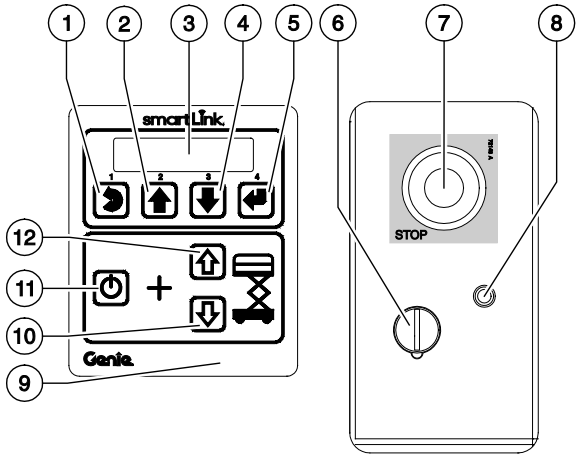
Activating the function enable button and the up

or down at the same time, sends a signal to the (ECM). This allows the platform to be raised or lowered at the ground controls.

Note: Steer and drive functions are not available at the ground controls.

When the ECM is in the set up mode, the ground controls are used to adjust the function speed parameters, machine models, or machine options.

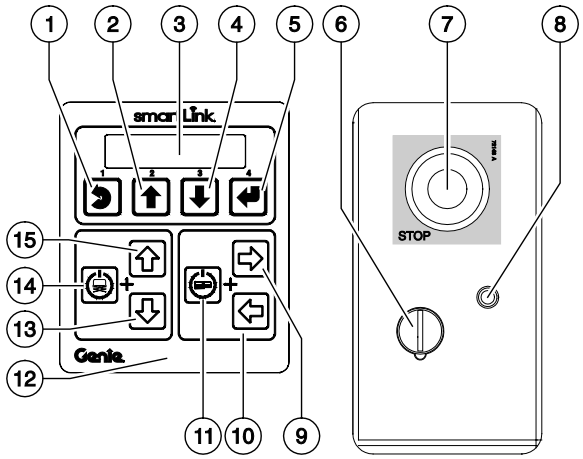
For further information or assistance, contact Genie Product Support.




Ground Controls with Manual Extension Deck

1 machine setup, escape button
2 machine setup, scroll up button
3 LCD readout
4 machine setup, scroll down button
5 machine setup, enter button
6 selector switch KS1
7 red Emergency Stop P1
8 circuit breaker CB2
9 ECM U5
10 platform down button
11 lift function enable button
12 platform up button

# Ground Controls




Ground Controls with Powered Extension Deck

13 machine setup, escape button
14 machine setup, scroll up button
15 LCD readout
16 machine setup, scroll down button
17 machine setup, enter button
18 selector switch KS1
19 red Emergency Stop P1
20 circuit breaker CB2
21 powered extension deck extend button
22 powered extension deck retract button
23 powered extension deck enable button
24 ECM U5
25 platform down button
26 lift function enable button
27 platform up button

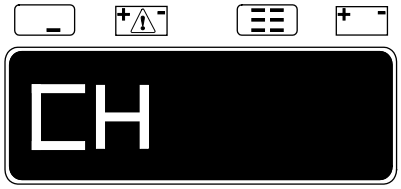
## 2-1 Software Revision Level

### How to Determine the Software Revision Level

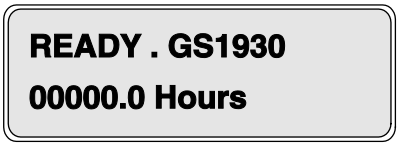
The machine software revision level is displayed at the ground controls LCD display.

1 Turn the selector/key switch to the ground controls or platform controls position. Pull out the red Emergency Stop button to the on position at both ground and platform controls.

⊙ Result: The display at the platform controls will show "CH". See example below.



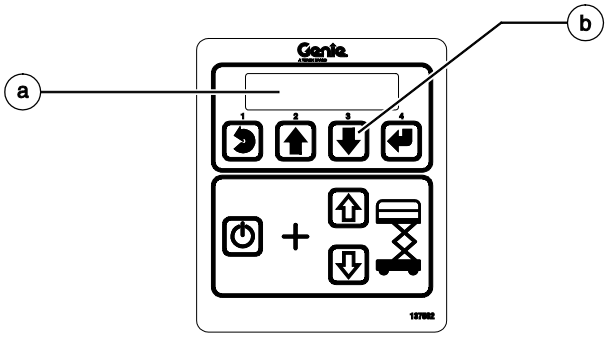

⊙ Result: The display at the ground controls will show the machine model and hour meter information. After 3 seconds, the machine model will not show on the display. See example below.



2 Press the ground control scroll down button.

⊙ Result: The ground control LCD display will indicate the software revision and hour meter information. After 5 seconds, the ground controls LCD display will display machine model and hour meter information again. See example below.

3 Push in the red Emergency Stop button to the off position at both the ground and platform controls and turn the selector/key switch to the off position.




a ground control LCD display
b ground control scroll down button

## 2-2 Machine Setup

### How to Setup the Machine from Ground Controls

The ground controls can be used to setup the machine parameters from the ground. Features that can be adjusted from the ground controls include machine Model, Options and Speed setup. This menu can only be entered from ground controls with the selector/key switch in the ground controls position.

**⚠ DANGER** Tip-over hazard. Do not adjust function speeds higher than specified in this procedure. Setting the function speeds greater than specifications could cause the machine to tip over resulting in death or serious injury.

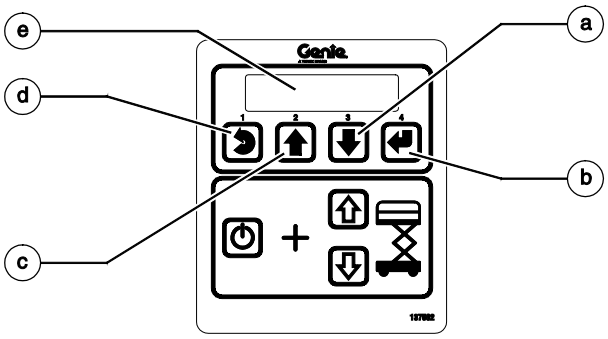
**⚠ DANGER** Tip-over hazard. Do not adjust function speeds higher than specified in this procedure. Setting the function speeds greater than specifications could cause the machine to tip over resulting in death or serious injury.

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

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

# Ground Controls

2 Press and hold the ground control scroll up and scroll down buttons.

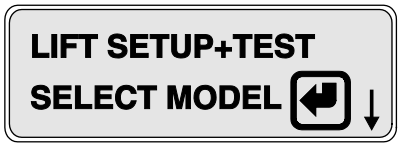



Ground Control Menu Buttons

a scroll down button
b enter button
c scroll up button
d escape button
e LCD display

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

⊙ Result: The ground controls LCD display will show the following:




4 Use the ground control menu buttons to select machine Model, Options and Speed Setup parameters. Follow the menu structure indicated on the ground control LCD display.

## 2-3 Loading or Updating Machine Software

Note: Before updating the machine software, open a web browser and navigate to the following location for the Genie Machine Software Download portal, http://firmware.genielift.com. Perform a search by applying the appropriate filters and download the machine software.

Note: There are two procedures available to update the machine software. These are **Bootloader Mode** and **Machine Application Mode**.

**Bootloader Mode:** The Bootloader mode is only available with the key switch in the GCON position. It allows the user to update or reinstall the machine software by directing the system into the Bootloader.

Choose this mode if the GCON ECM is not opertaing correctly.

**Machine Application Mode:** The machine Application mode is available with the key switch in the GCON or PCON position. This mode of machine software update requires the user to enter the Machine Service Tool.

Choose this mode if the machine is operating correctly and you are updating the machine software.

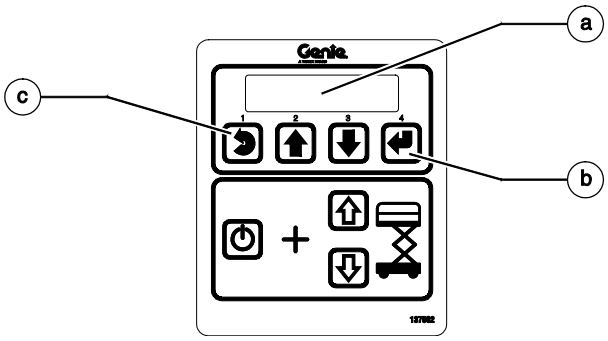
## Bootloader Mode

1 Open the GCON compartment.

Note: Some models will require opening the ground control box to access the GCON.

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

3 At the ground controls, press and hold the Enter and Escape buttons.



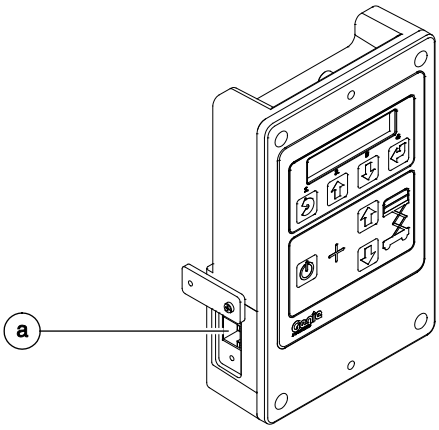

a LCD display
b enter button
c escape button

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

⊙ Result: The ground controls LCD display will show the following:

**SOFTWARE UPDATE**
**CONNECT ETHERNET**

5 Locate the diagnostic port on the side of the GCON. Remove one of the fasteners securing the cover and set aside. Loosen the other fastener. Do not remove it.




a diagnostic port

6 Connect one end of a CAT5 Ethernet cable into the diagnostic port. Connect the other end into a PC or laptop.

⊙ Result: The ground controls LCD display will show the following:

**OPEN WEB BROWSER**
**<IP ADDRESS>**

7 Read and record the IP address.

# Ground Controls

8 Launch a web browser such as Internet Explorer ®, Chrome ® or Firefox ® on your PC or laptop. Type the IP address from step 7 into the web browser address bar and press enter.

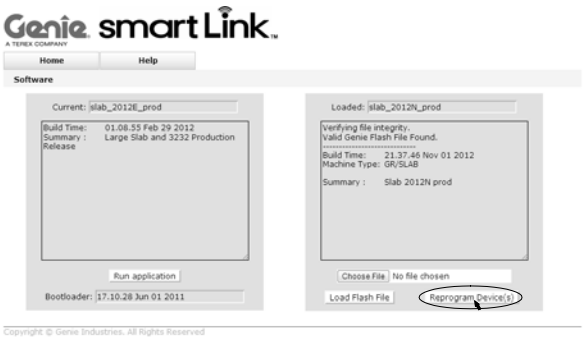
⊙ Result: The following screen will be displayed.


9 Select the **Choose File** button and navigate to the downloaded Genie Flash file (.gff).

Note: Verify it is the correct flash file.

10 Select the **Load Flash File** button to verify the file is a .gff file.

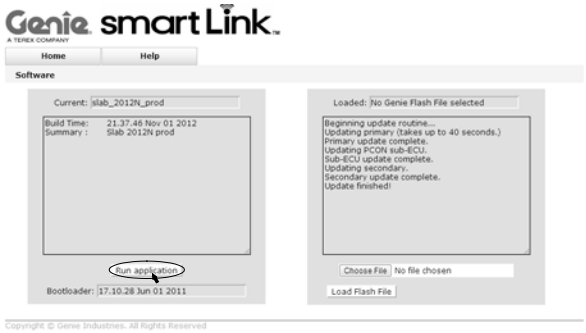
⊙ Result: The following screen will be displayed.




11 Select the **Reprogram Device**(s) button to start the ECM software update.

⊙ Result: The following screen will be displayed after the software update is complete.

Note: Do not turn off power while the ECM is being reprogrammed.




12 Select the **Run Application** button to exit the software update mode.

13 Push in the red Emergency Stop button and disconnect the CAT5 cable from the GCON.

14 Secure the diagnostic port cover using the retaining fasteners removed in step 5. Do not over tighten.

Note: Machines equipped with AGM batteries will need to select the AGM battery type using the GCON set parameters screen. Refer to the *Machine Setup* procedure in the Service and Repair manual that is appropriate for your machine.

**⚠WARNING**

Tip over hazard. Updating the SmartLink software may have impacted the machines default drive speeds. Tipping over the machine will result in death or serious injury.

Perform drive speed test. Refer to the *Maintenance Manual* that is appropriate for your machine.

15 Perform a function test. Refer to the Operator's Manual on your machine.

16 Return the machine to service.

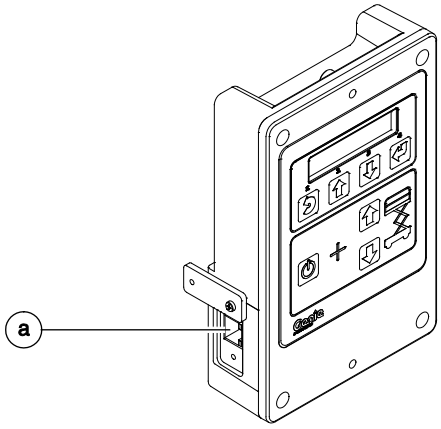
## Machine Application Mode

1 Open the GCON compartment.

Note: Some models will require opening the ground control box to access the GCON.

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

3 Locate the diagnostic port on the side of the GCON. Remove one of the fasteners securing the cover and set aside. Loosen the other fastener. Do not remove it.




a diagnostic port

4 Connect one end of a CAT5 Ethernet cable into the diagnostic port. Connect the other end into a PC or laptop.

⊙ Result: The ground controls LCD display will show the following:

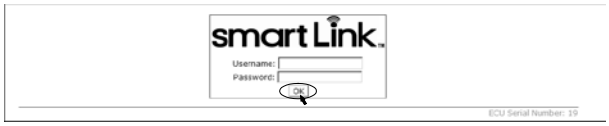
**OPEN WEB BROWSER**
**<IP ADDRESS>**

5 Read and record the IP address.

Note: The display wil only show the IP address for 3 seconds. Press the scroll up button to display the IP address for another 3 seconds.

6 Launch a web browser such as Internet Explorer ®, Chrome ® or Firefox ® on your PC or laptop. Type the IP address from step 5 into the web browser address bar and press enter.

⊙ Result: The following screen will be displayed.




7 Enter the following username and password then select **OK**.

**Username: smart.link**
**Password: SL1000**

Note: The username and password are case sensitive.

⊙ Result: The following screen will be displayed.

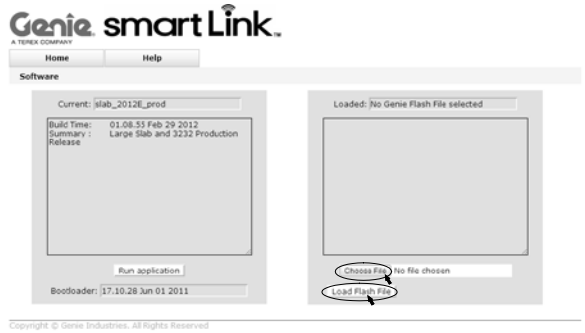
# Ground Controls

8 Select the **Software** tab at the header bar.

⊙ Result: The following screen will be displayed.


9 Select the **Update Machine Software** button.

⊙ Result: The following screen will be displayed.

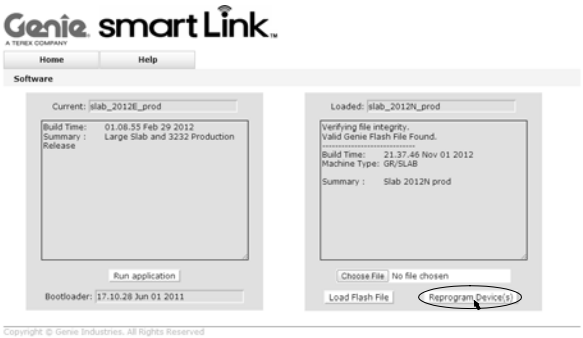



10 Select the **Choose File** button and navigate to the downloaded Genie Flash file (.gff).

Note: Verify it is the correct flash file.

11 Select the **Load Flash File** button to verify the file is a .gff file.

⊙ Result: The following screen will be displayed.




12 Select the **Reprogram Device**(s) button to start the ECM software update.

⊙ Result: The following screen will be displayed after the software update is complete.

Note: Do not turn off power while the ECM is being reprogrammed.


13 Select the **Run Application** button to exit the software update mode.

14 Push in the red Emergency Stop button and disconnect the CAT5 cable from the GCON.

15 Secure the diagnostic port cover using the retaining fasteners removed in step 5. Do not over tighten.

Note: Machines equipped with AGM batteries will need to select the AGM battery type using the GCON set parameters screen. Refer to the *Machine Setup* procedure in the Service and Repair manual that is appropriate for your machine.

**⚠WARNING** Tip over hazard. Updating the SmartLink software may have impacted the machines default drive speeds. Tipping over the machine will result in death or serious injury.

Perform drive speed test. Refer to the *Maintenance Manual* that is appropriate for your machine.

16 Perform a function test. Refer to the Operator's Manual on your machine.

17 Return the machine to service.

## 2-4 Using a Wi-Fi Router to Connect to the SmartLink Web Service Tool

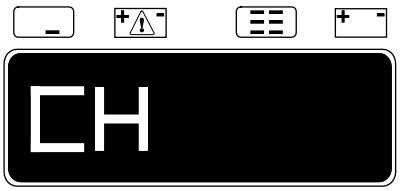
Note: Before using a portable wireless router to connect to the Smart Link Service Tool web site, the router must be configured to the type of connection desired. Refer to the portable wireless router users manual for set-up and configuration instructions.

1 Open the GCON compartment.

Note: Some models will require opening the ground control box to access the GCON.

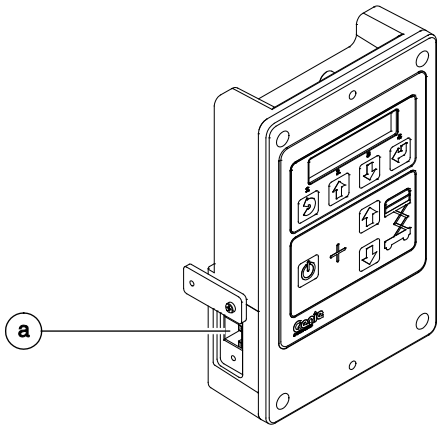
2 Turn the key switch to ground controls or platform controls and pull out the red Emergency Stop button to the on position at both ground and platform controls.

⊙ Result: The display at the platform controls will show "CH". See example below.



# Ground Controls

3 Locate the diagnostic port on the side of the GCON. Remove one of the fasteners securing the cover and set aside. Loosen the other fastener. Do not remove it.




a diagnostic port

4 Connect one end of a CAT5 Ethernet cable into the diagnostic port. Connect the other end into the ethernet port of the portable wireless router.

⊙ Result: The ground controls LCD display will show the following:


5 Read and record the IP address.

Note: The display wil only show the IP address for 3 seconds. Press the scroll up button to display the IP address for another 3 seconds.

6 On a PC, laptop or mobile device, set up a wireless network for the portable router.

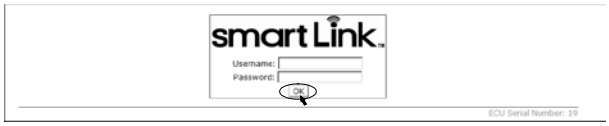
Note: Refer to the Operating System's procedure for connecting to a wireless network.

7 After establishing a new wireless network, select the appropriate network your portable wireless router.

Note: Refer to the Operating System's procedure for connecting to a wireless network.

8 Launch a web browser such as Internet Explorer ®, Chrome ® or Firefox ® on your PC, laptop or mobile device. Type the IP address from step 5 into the web browser address bar and press enter.

⊙ Result: The following screen will be displayed.



9 Enter the following username and password then select **OK**.

**Username: smart.link**

**Password: SL1000**

Note: The username and password are case sensitive.

⊙ Result: The following screen will be displayed.


10 After using the Smart Link Service Tool web site, push in the red Emergency Stop button and disconnect the CAT5 cable from the GCON.

11 Secure the diagnostic port cover using the retaining fasteners removed in step 3. Do not over tighten.

Note: Machines equipped with AGM batteries will need to select the AGM battery type using the GCON set parameters screen. Refer to the *Machine Setup* procedure in the Service and Repair manual that is appropriate for your machine.

**⚠WARNING** Tip over hazard. Updating the SmartLink software may have impacted the machines default drive speeds. Tipping over the machine will result in death or serious injury.

Perform drive speed test. Refer to the *Maintenance Manual* that is appropriate for your machine.

12 Perform a function test. Refer to the Operator's Manual on your machine.

## 2-5 Service Override Mode

The Electronic Control Module (ECM) is programmed with a Service Override mode. Service Override mode is only indented for certain circumstances and is not part of the normal machine operation. Service Override mode should only be accessed by trained personal to repair faults and/ or a malfunctioning machine.

Note: Service Override mode can only be entered at the ground controls and is intended to allow the platform to be raised or lowered. Once the platform has reached the maximum allowable height, the system will exit Service Override mode. Repeat this procedure to lower the platform.

Note: When in Service Override mode, an audible alarm will sound.

Note: Before entering Service Override mode, fault codes or the malfunction affecting the operation of the machine should be fully understood to ensure Service Override mode is required.

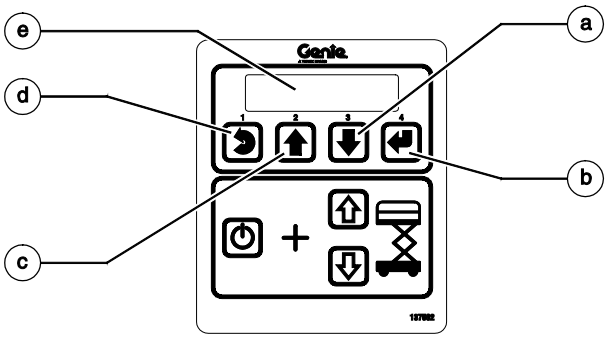
Note: Perform this operation on a firm, level surface and if equipped, with the outriggers auto leveled or fully retracted.

**⚠DANGER** Tip-over hazard. Operating the machine on a surface that is not level while in Service Override mode will result in death or serious injury. Follow proper operating procedures and safety precautions. Do not use Service Override mode if you are not trained and familiar with the operation of the machine.

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

# Ground Controls

2 Press and hold the ground control scroll up and scroll down buttons.

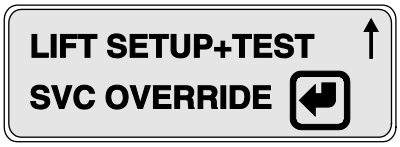



Ground Control Menu Buttons

a scroll down button
b enter button
c scroll up button
d escape button
e LCD display

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

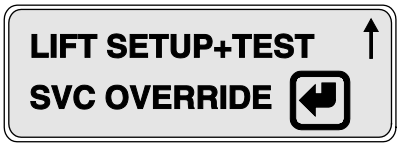
⊙ Result: The ground controls LCD display will show the following:




4 Release the Scroll Up and Scroll Down buttons after the ground controller powers up.

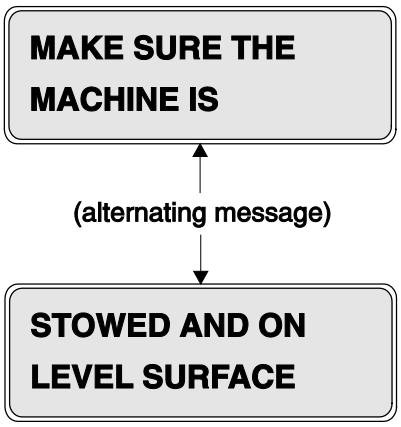
5 At the ground controls, use the Scroll Down button to scroll to **SVC Override**.

⊙ Result: The ground controls LCD display will show the following:




6 Press the Enter button.

⊙ Result: The ground controls LCD display will show an alternating message every 1.5 seconds.




7 Press the Enter button.

⊙ Result: The ground controls LCD display will show the following:


8 Press the Enter button.

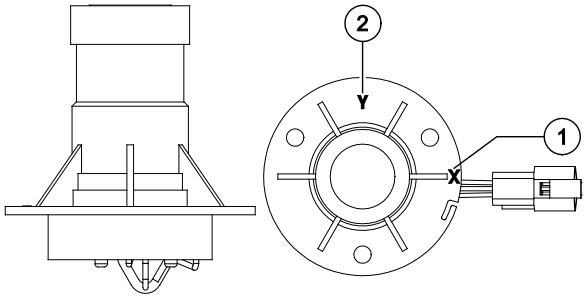
⊙ Result: The ground controls LCD display will show the following:

## 2-6
## Level Sensors

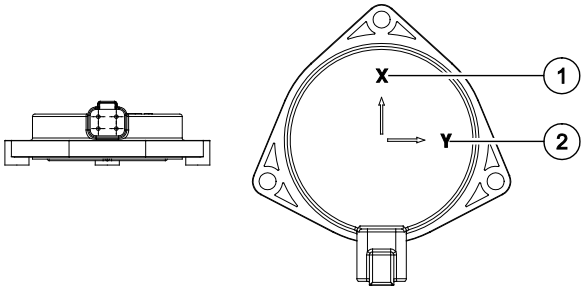
The Electronic Control Module (ECM) is programmed to deactivate the lift and drive functions and activate an alarm when a signal is received from the level sensor.

The tilt alarm sounds when the incline of the chassis exceeds 1.5° to the side and 3° to the front or rear.

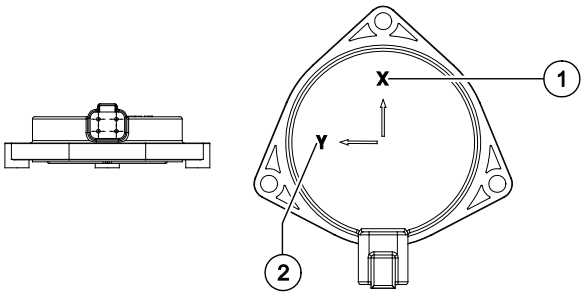
Use the illustrations to verify which type of level sensor is installed and perform the procedure that is appropriate for your machine.




Procedure 1




Procedure 2




Procedure 3

1 X axis
2 Y axis

# Ground Controls

## How to Install and Calibrate the Level Sensor - Procedure 1

**⚠ DANGER** Tip-over hazard. Failure to install or calibrate the level sensor as instructed will compromise machine stability and cause the machine to tip over, resulting in death or serious injury. Do not install or calibrate the level sensor other than specified in this procedure.

1 Move the machine to an area that has a firm, level surface and is free of obstructions.

Note: The surface must be 0° +/- 0.5°.

2 Remove the platform controls from the platform.

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

4 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

5 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

6 Lower the platform onto the safety arm.

**⚠ WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

If you are not installing a new level sensor, proceed to step 15.

7 Turn the key switch to the off position and push in the red Emergency Stop button to the off position at the ground controls.

8 Tag and disconnect the level sensor wire harness from the chassis wire harness.

Note: The wire harness connection is located next to the level sensor, on top of the chassis at the steer end of the machine.

9 Remove the level sensor retaining fasteners and remove the level sensor from the machine.

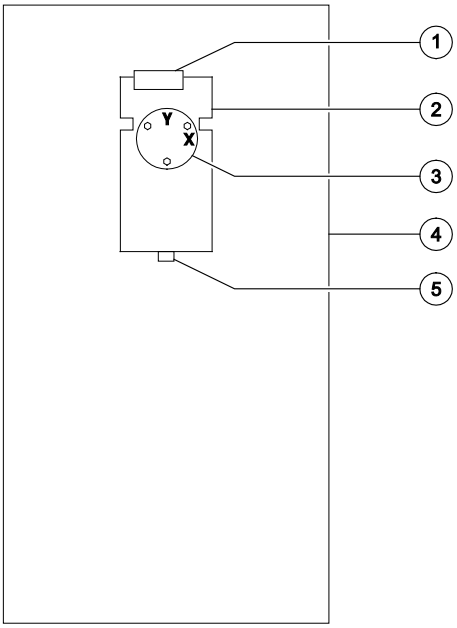
10 Tag and disconnect the level sensor wires from the level sensor connector plug.

11 Securely install the wires of the new level sensor into the level sensor connector plug.

12 Place the new level sensor onto the level sensor mount bracket with the "X" on the level sensor base closest to the long side of the level sensor mount, and the "Y" on the level sensor base closest to the short side of the level sensor mount.

**⚠ DANGER** Tip-over hazard. Failure to install the level sensor as instructed, could result in the machine tipping over, causing death or serious injury.

**Steer End**




**Non-steer End**

1 limit switch
2 level sensor mount bracket
3 level sensor S7
4 scissor chassis
5 alarm H5

13 Install the level sensor retaining fasteners through the level sensor and springs, and into the mount bracket. Tighten the fasteners and measure the distance between the level sensor and the level sensor mount bracket.

⊙ Result: The measurement should be approximately 0.375 inch / 10 mm.

14 Connect the chassis wire harness to the level sensor wire harness.

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

16 Adjust the level sensor retaining fasteners until the bubble at the top of the level sensor is centered in the circles.

⊙ Result: The tilt sensor alarm should not sound.

17 Raise the platform slightly.

18 Return the safety arm to the stowed position.

19 Lower the platform to the stowed position.

20 Center a lifting jack under the drive chassis at the ground controls side of the machine.

21 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

# Ground Controls

22 **GS-1530 and GS-1930:** Place a 0.64 x 6 x 6 inch / 16.2 mm x 15 cm x 15 cm thick steel block under both wheels at the ground controls side of the machine.

**GS-1532 and GS-1932:** Place a 0.68 x 6 x 6 inch / 17.2 mm x 15 cm x 15 cm thick steel block under both wheels at the ground controls side of the machine.

**GS-2032, GS-2632 and GS-3232:** Place a 0.66 x 6 x 6 inch / 16.8 mm x 15 cm x 15 cm thick steel block under both wheels at the ground controls side of the machine.

**GS-2046, GS-2646, GS-3246 and GS-4047:** Place a 1 x 6 x 6 inch / 25.4 mm x 15 cm x 15 cm thick steel block under both wheels at the ground controls side of the machine.

23 Lower the machine onto the blocks.

24 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The level sensor alarm should not sound.

⊠ Result: The level sensor alarm does sound and fault code LL appears in the diagnostic display. Adjust the level sensor retaining fasteners just until the level sensor alarm does not sound.

25 Lower the platform to the stowed position.

26 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

27 Remove the blocks from under both wheels.

28 Lower the machine and remove the blocks.

29 Center a lifting jack under the drive chassis at the battery pack side of the machine.

30 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

31 **GS-1530 and GS-1930:** Place a 0.77 x 6 x 6 inch / 19.6 mm x 15 cm x 15 cm thick steel block under both wheels at the battery pack side of the machine.

**GS-1532 and GS-1932:** Place a 0.83 x 6 x 6 inch / 21.1 mm x 15 cm x 15 cm thick steel block under both wheels at the battery pack side of the machine.

**GS-2032, GS-2632 and GS-3232:** Place a 0.8 x 6 x 6 inch / 20.3 mm x 15 cm x 15 cm thick steel block under both wheels at the battery pack side of the machine.

**GS-2046, GS-2646, GS-3246 and GS-4047:** Place a 1.22 x 6 x 6 inch / 31 mm x 15 cm x 15 cm thick steel block under both wheels at the battery pack side of the machine.

32 Lower the machine onto the blocks.

33 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Adjust the level sensor until the alarm just begins to sound OR the down limit switch may need to be adjusted.

34 Lower the platform to the stowed position.

35 Raise the machine approximately 2 inches / 5 cm.

36 Remove the blocks from under both wheels.

37 Lower the machine and remove the jack.

## How to Install and Calibrate the Level Sensor - Procedure 2

**⚠ DANGER** Tip-over hazard. Failure to install the level sensor as instructed will compromise machine stability and cause the machine to tip over, resulting in death or serious injury. Do not install the level sensor other than specified in this procedure.

Note: If you are **not** installing a new level sensor, proceed to step 14.

1 Move the machine to an area that has a firm, level surface and is free of obstructions.

Note: Use a digital level to verify the surface is level.

2 Remove the platform controls from the platform.

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

4 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

5 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

6 Lower the platform onto the safety arm.

**⚠ WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

7 Turn the key switch to the off position and push in the red Emergency Stop button to the off position at the ground controls.

8 Tag and disconnect the level sensor wire harness from the chassis wire harness.

Note: The wire harness connection is located on the level sensor, on top of the chassis at the steer end of the machine.

9 Remove the level sensor retaining fasteners and remove the level sensor from the machine.

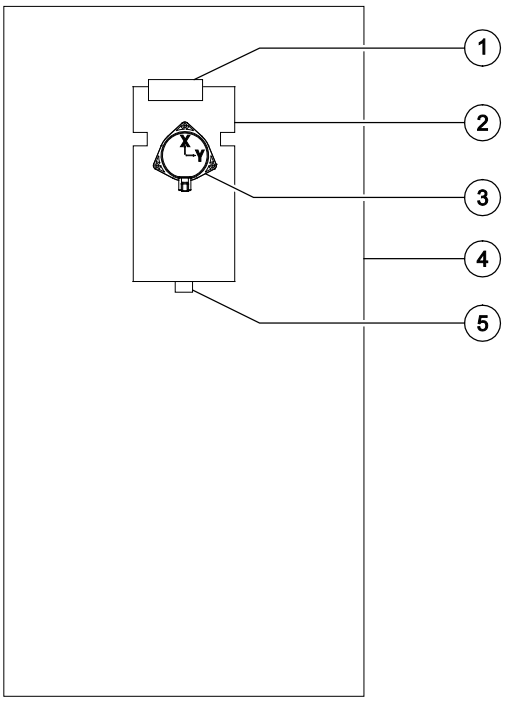
10 Securely install the wires of the new level sensor into the level sensor connector plug.

# Ground Controls

11 Place the new level sensor on to the level sensor bracket with the "Y" on the level sensor closest to the ground controls of the machine and the "X" on the level sensor closest to the steer end of the machine.

**⚠ DANGER** Tip-over hazard. Failure to install the level sensor as instructed, could result in the machine tipping over, causing death or serious injury.

**Steer End**




**Non-steer End**

1 limit switch
2 level sensor mount bracket
3 level sensor S7
4 scissor chassis
5 alarm H5

12 Install the level sensor retaining fasteners through the level sensor and into the mount bracket.

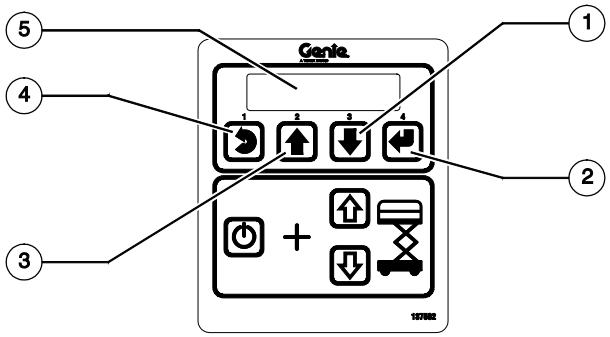
13 Connect the chassis wire harness to the level sensor.

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

⊙ Result: GCON will display a ‘C051: SYSTEMFAULT, TILT:NoCal fault.

15 Push in the red Emergency Stop button to the off position at the ground controls.

16 Press and hold the ground control scroll up and scroll down buttons.

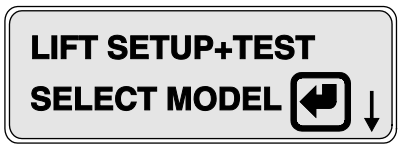



Ground Control Menu Buttons

1 scroll down button
2 enter button
3 scroll up button
4 escape button
5 LCD display

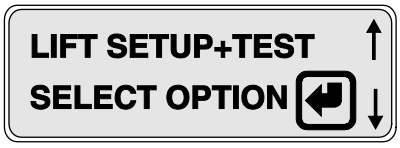
17 Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: The ground controls LCD display will show the following:



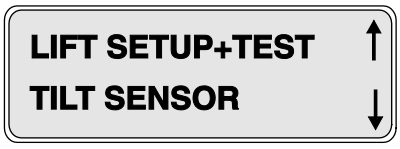

18 Release the Scroll Up and Scroll Down buttons after the ground controller powers up.

19 Use the Scroll Up or Scroll Down buttons to scroll to **Select Option**.




20 Press the Enter button.

21 Use the Scroll Up or Scroll Down buttons to scroll to Tilt Sensor.




22 Press the Enter button.

23 Press and hold the Enter button to start calibration.

⊙ Result: An audible alarm will sound when calibration is complete.

Note: The machine will not calibrate if it is on a slope of one degree or greater.

Note: If the level sensor has been replaced, continue with step 24. If the level sensor was not replaced skip to step 27.



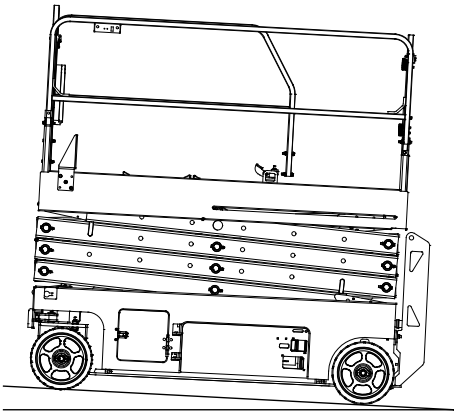
24 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

25 Return the safety arm to the stowed position.

26 Lower the platform to the stowed position.

27 Place a digital level on the ground control side of the drive chassis. Zero out the digital level.

28 Drive the steer end of the machine up a ramp until it is just under 3°.



# Ground Controls

29 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

30 Lower the platform to the stowed position.

31 Continue driving the machine up the ramp until it is just over 3°.

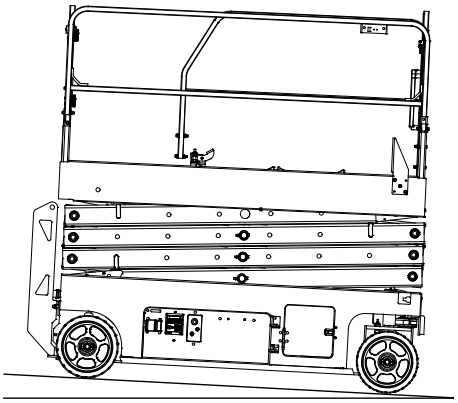
32 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

33 Lower the platform to the stowed position.

34 Drive the non-steer end of the machine up a ramp until it is just under 3°.



35 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

36 Lower the platform to the stowed position.

37 Continue driving the machine up the ramp until it is just over 3°.

38 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

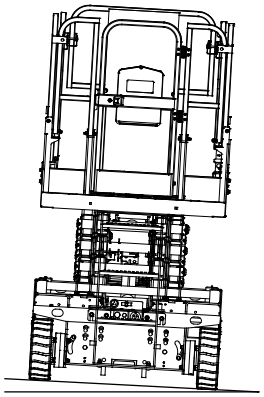
⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

39 Lower the platform to the stowed position.

40 Place a digital level on the steer end of the drive chassis. Zero out the digital level.

41 Drive the ground control side of the machine onto a ramp until it is just under 1.5°.



42 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

43 Lower the platform to the stowed position.

44 Continue driving the machine onto the ramp until it is just over 1.5°.

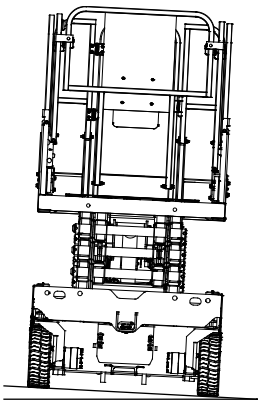
45 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

46 Lower the platform to the stowed position.

47 Drive the battery compartment side of the machine onto a ramp until it is just under 1.5°.



48 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

49 Lower the platform to the stowed position.

50 Continue driving the machine onto the ramp until it is just over 1.5°.

51 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

52 Lower the platform to the stowed position.

# Ground Controls

## How to Install and Calibrate the Level Sensor - Procedure 3

**⚠ DANGER** Tip-over hazard. Failure to install the level sensor as instructed will compromise machine stability and cause the machine to tip over, resulting in death or serious injury. Do not install the level sensor other than specified in this procedure.

Note: If you are **not** installing a new level sensor, proceed to step 14.

1 Move the machine to an area that has a firm, level surface and is free of obstructions.

Note: Use a digital level to verify the surface is level.

2 Remove the platform controls from the platform.

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

4 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

5 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

6 Lower the platform onto the safety arm.

**⚠ WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

7 Turn the key switch to the off position and push in the red Emergency Stop button to the off position at the ground controls.

8 Tag and disconnect the level sensor wire harness from the chassis wire harness.

Note: The wire harness connection is located on the level sensor, on top of the chassis at the steer end of the machine.

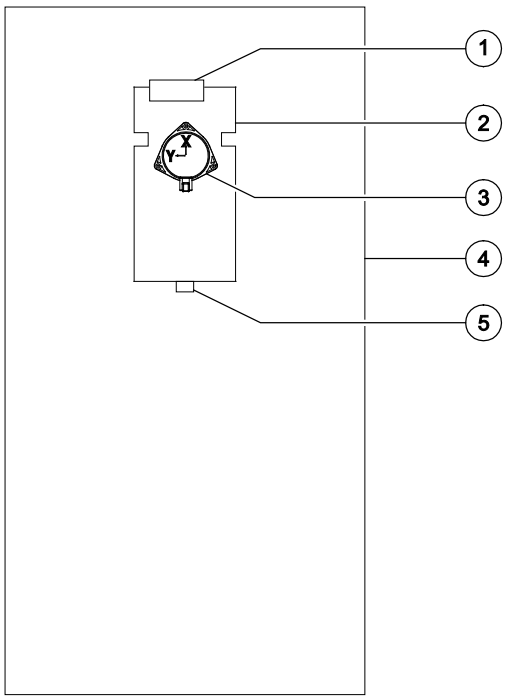
9 Remove the level sensor retaining fasteners and remove the level sensor from the machine.

10 Securely install the wires of the new level sensor into the level sensor connector plug.

11 Place the new level sensor on to the level sensor bracket with the "Y" on the level sensor away from the ground controls of the machine and the "X" on the level sensor closest to the steer end of the machine.

**⚠ DANGER** Tip-over hazard. Failure to install the level sensor as instructed, could result in the machine tipping over, causing death or serious injury.

**Steer End**




**Non-steer End**

1 limit switch
2 level sensor mount bracket
3 level sensor S7
4 scissor chassis
5 alarm H5

12 Install the level sensor retaining fasteners through the level sensor and into the mount bracket.

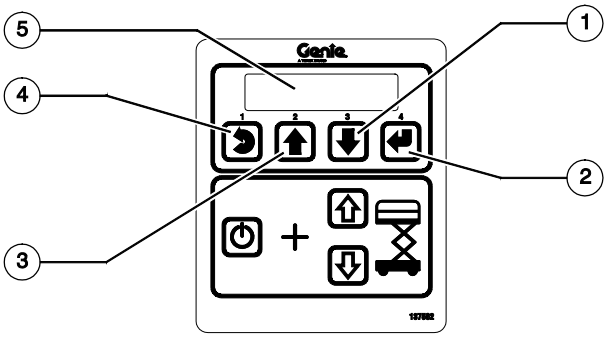
13 Connect the chassis wire harness to the level sensor.

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

⊙ Result: GCON will display a ‘C051: SYSTEMFAULT, TILT:NoCal fault.

15 Push in the red Emergency Stop button to the off position at the ground controls.

16 Press and hold the ground control scroll up and scroll down buttons.



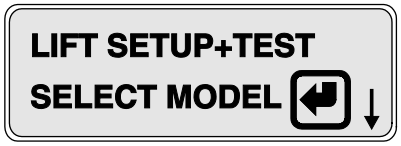

Ground Control Menu Buttons

1 scroll down button
2 enter button
3 scroll up button
4 escape button
5 LCD display

# Ground Controls

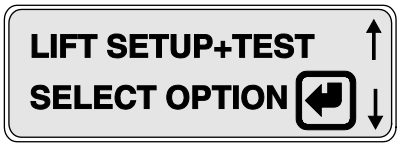
17 Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: The ground controls LCD display will show the following:



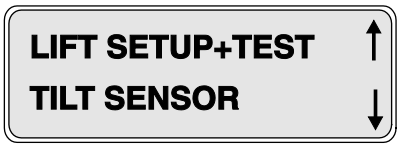

18 Release the Scroll Up and Scroll Down buttons after the ground controller powers up.

19 Use the Scroll Up or Scroll Down buttons to scroll to **Select Option**.




20 Press the Enter button.

21 Use the Scroll Up or Scroll Down buttons to scroll to Tilt Sensor.




22 Press the Enter button.

23 Press and hold the Enter button to start calibration.

⊙ Result: An audible alarm will sound when calibration is complete.

Note: The machine will not calibrate if it is on a slope of one degree or greater.

Note: If the level sensor has been replaced, continue with step 24. If the level sensor was not replaced skip to step 27.



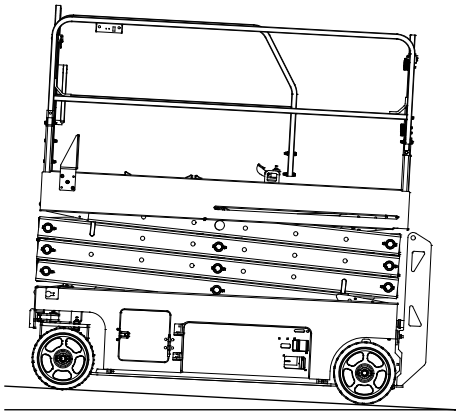
24 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

25 Return the safety arm to the stowed position.

26 Lower the platform to the stowed position.

27 Place a digital level on the ground control side of the drive chassis. Zero out the digital level.

28 Drive the steer end of the machine up a ramp until it is just under 3°.



29 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

30 Lower the platform to the stowed position.

31 Continue driving the machine up the ramp until it is just over 3°.

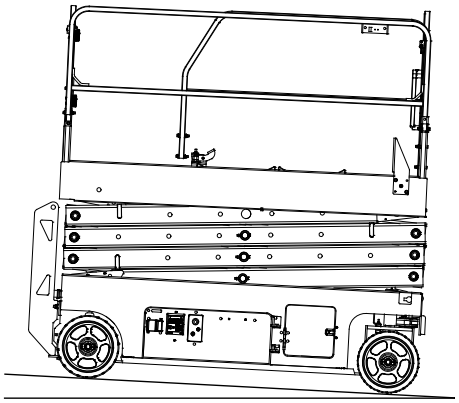
32 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

33 Lower the platform to the stowed position.

34 Drive the non-steer end of the machine up a ramp until it is just under 3°.



35 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

36 Lower the platform to the stowed position.

37 Continue driving the machine up the ramp until it is just over 3°.

38 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

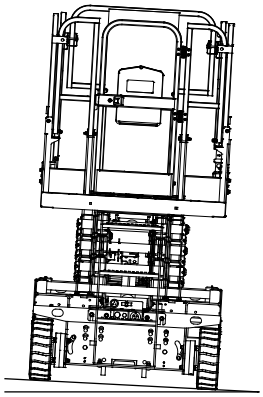
⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

39 Lower the platform to the stowed position.

40 Place a digital level on the steer end of the drive chassis. Zero out the digital level.

41 Drive the ground control side of the machine onto a ramp until it is just under 1.5°.



# Ground Controls

42 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

43 Lower the platform to the stowed position.

44 Continue driving the machine onto the ramp until it is just over 1.5°.

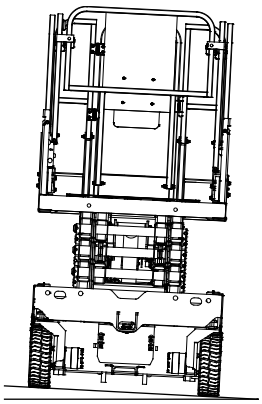
45 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

46 Lower the platform to the stowed position.

47 Drive the battery compartment side of the machine onto a ramp until it is just under 1.5°.



48 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: No audible alarm is heard.

⊠ Result: The platform stops, an audible alarm is heard and Fault LL is displayed. Repeat this procedure starting at step 15 on a firm level surface.

49 Lower the platform to the stowed position.

50 Continue driving the machine onto the ramp until it is just over 1.5°.

51 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

⊙ Result: The platform should stop, an alarm should sound and fault code LL appears in the diagnostic display.

⊠ Result: The platform does not stop or the level sensor alarm does not sound. Repeat this procedure starting at step 15 on a firm level surface.

52 Lower the platform to the stowed position.

## 2-7
## Manual Platform Lowering Cable

The manual platform lowering cable lowers the platform in the event of a main power failure. The manual platform lowering cable is attached to the barrel end of the lift cylinder and is activated next to the ground controls.

## How to Adjust the Manual Platform Lowering Cable

1 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

2 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

3 Lower the platform onto the safety arm.

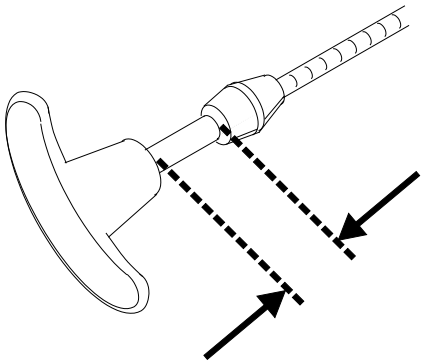
**⚠WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

4 Pull the handle of the manual platform lowering cable out until considerable resistance is felt. Release the handle.

5 Measure the distance between the base of the handle and cable mounting nut.

⊙ Result: The measurement should be no greater than 0.125 inch / 3 mm.

Note: Proceed to step 8 if measurement is correct.

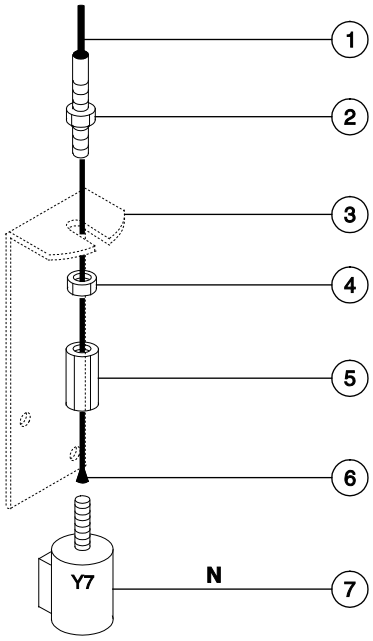


| Platform manual lowering cable specification | |
|---|---|
| Gap, lowering handle to mounting nut | 0 to 0.125 inch<br>0 to 3 mm |

# Ground Controls

**Skip to step 8 if the measurement is correct.**

6 To adjust, loosen the upper lock nut on the cable mounting bracket at the cylinder. Turn the lower lock nut clockwise to decrease the distance or counterclockwise to increase the distance. Tighten the upper lock nut.




a manual lowering cable sheath
b upper lock nut
c cable mounting bracket
d lower lock nut
e cable mounting nut
f end of lowering cable
g manual lowering valve (hydraulic schematic item N)

7 Repeat this procedure beginning with step 4.

8 Raise the platform and rotate the safety arm to the stowed position.

9 Pull the manual lowering handle at the ground controls 2 to 3 times to ensure it is functioning correctly.

# 3-1 Hydraulic Tank

The primary functions of the hydraulic tank are to cool and deaerate the hydraulic fluid during operation. It utilizes internal suction strainers for the pump supply lines and has an external return line filter.

## How to Remove the Hydraulic Tank

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

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

Perform this procedure with the platform in the stowed position.

1 Disconnect the battery pack from the machine.

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

2 Tag and disconnect the hydraulic tank return hard line from the filter. Remove the hard line from the machine. Cap the fitting on the filter head.

3 Tag and disconnect the hydraulic tank hard line from the pump. Remove the hard line from the machine. Cap the fitting on the pump.

4 Remove the hydraulic tank retaining fasteners and remove the hydraulic tank from the machine.

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

5 Remove the hydraulic tank cap and drain the tank into a suitable container.

| Torque specifications | |
|---|---|
| Hydraulic retaining fasteners, dry | 35 in-lbs<br>4 Nm |
| Hydraulic tank retaining fasteners, lubricated | 26 in-lbs<br>2.9 Nm |

# Hydraulic Pump

## 4-1
## Function Pump

The hydraulic pump is attached to the motor which makes up the hydraulic power unit.

## How to Test the Hydraulic Pump

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

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

1 Tag, disconnect and plug the high pressure hydraulic hose from the hydraulic pump.

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

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the high pressure port on the pump.

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

4 Activate the platform up function from the ground controls.

⊙ Result: If the pressure gauge reads 3200 psi / 221 bar, immediately stop. The pump is good.

☒ Result: If the pressure gauge fails to reach 3200 psi / 221 bar, the pump is bad and will need to be serviced or replaced.

**NOTICE** Component damage hazard. There is no relief valve in the hydraulic pump and the pump can be damaged if the pressure is allowed to exceed 3200 psi / 221 bar. When testing the pump, activate the pump in one second intervals until 3200 psi / 221 bar is confirmed. Do not over-pressurize the pump.

5 Remove the pressure gauge and reconnect the hydraulic hose. Torque to specifications.

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

## How to Remove the Hydraulic Pump

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

1 Disconnect the battery pack from the machine.

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

2 Tag and disconnect the hydraulic power unit cables at the motor controller.

3 Disconnect the filter head from the filter head mounting bracket. Rotate the filter out and away from the hydraulic power unit.

4 Remove the hydraulic power unit retaining fasteners.

5 Tag, disconnect and plug the hydraulic tank hard line from the pump. Cap the fitting on the pump.

6 Tag, disconnect and plug the high pressure hose from the pump. Cap the fitting on the pump.

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

7 Remove the hydraulic power unit from the machine.

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

**⚠DANGER** Tip-over hazard. After replacing the hydraulic pump, it is critical to return the function speed settings to original factory specifications. Failure to restore the machine to original factory specifications could cause the machine to tip over resulting in death or serious injury.

# Manifolds

## 5-1
## Function Manifold Components

The function manifold is mounted behind an inspection door, at the ground control side of the machine.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| — | Coil Nut (item AC) | — | — | 4-5 ft-lbs / 5-7 Nm |
| — | Coil Nut (items AE, AG and AI) | — | — | 5-7 ft-lbs / 7-9 Nm |
| 1 | Diagnostic nipple | AA | Testing | — |
| 2 | Relief Valve, 3700 psi / 255 bar maximum | AB | System relief | 20 ft-lbs / 27 Nm |
| 3 | Solenoid valve, 3 position 4 way | AC | Steer left/right | 25 ft-lbs / 34 Nm |
| 4 | Check disc | AD | Steer circuit | 18 ft-lbs / 24 Nm |
| 5 | Solenoid valve, 2 position 4 way | AE | Drive speed select circuit | 25 ft-lbs / 34 Nm |
| 6 | Relief valve | AF | Brake release | 20 ft-lbs / 27 Nm |
| 7 | Solenoid valve, 3 position 5 way | AG | Drive forward/reverse | 25 ft-lbs / 34 Nm |
| 8 | Flow regulator and relief valve, 0.75 gpm / 2.8 L/min, 1500 psi / 103 bar | AH | Steer circuit | 26 ft-lbs / 35 Nm |
| 9 | Solenoid valve, 2 position 4 way | AI | Platform up | 25 ft-lbs / 34 Nm |
| 10 | Relief valve | AJ | Lift relief | 20 ft-lbs / 27 Nm |

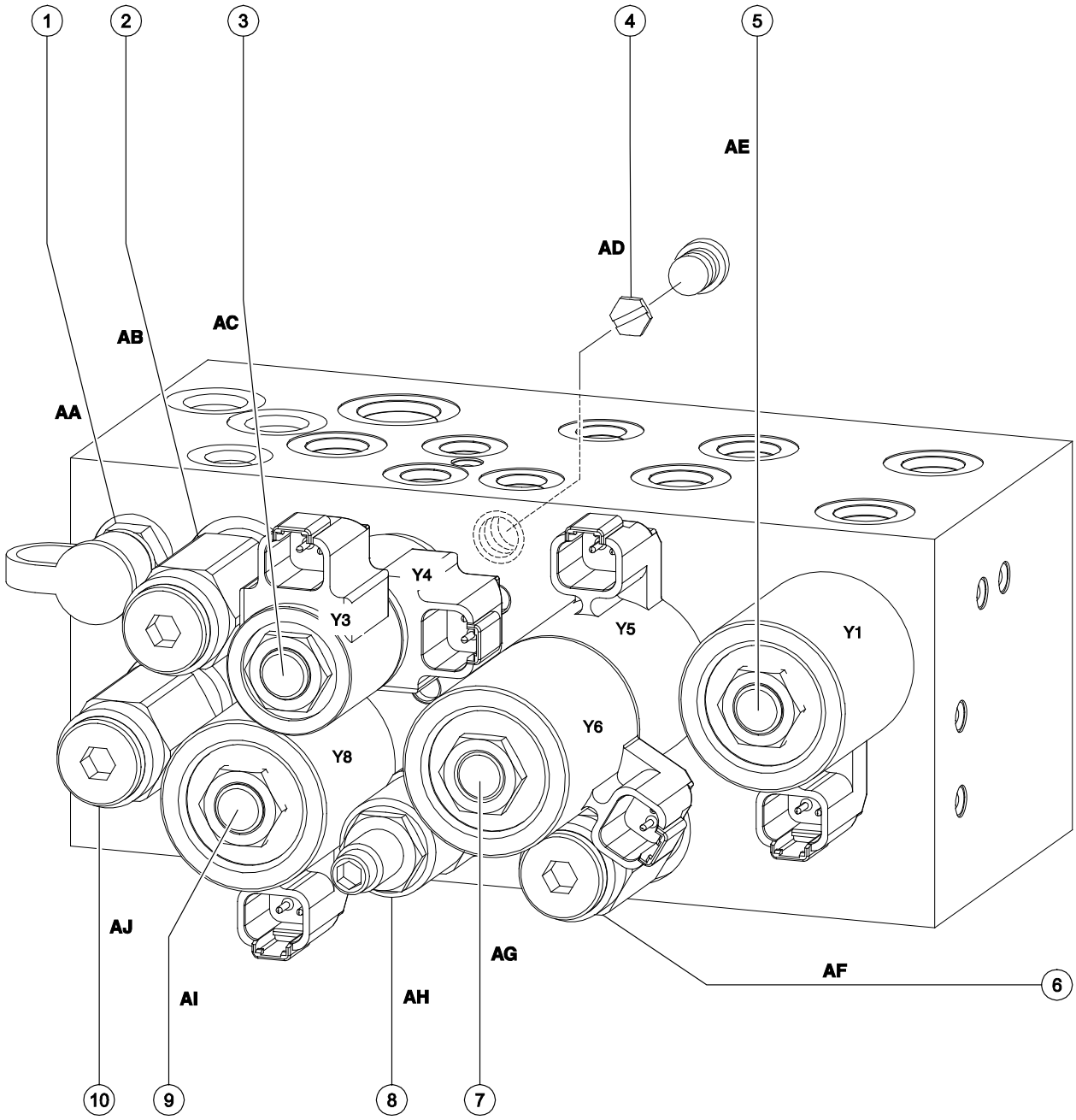
## How to Install a Valve Cartridge

1 Dip the cartridge in clean oil to lube the O-rings.

2 Screw the cartridge in by hand until the top O-ring is met, then torque to specifications.

3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specifications.

# Manifolds




Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic.

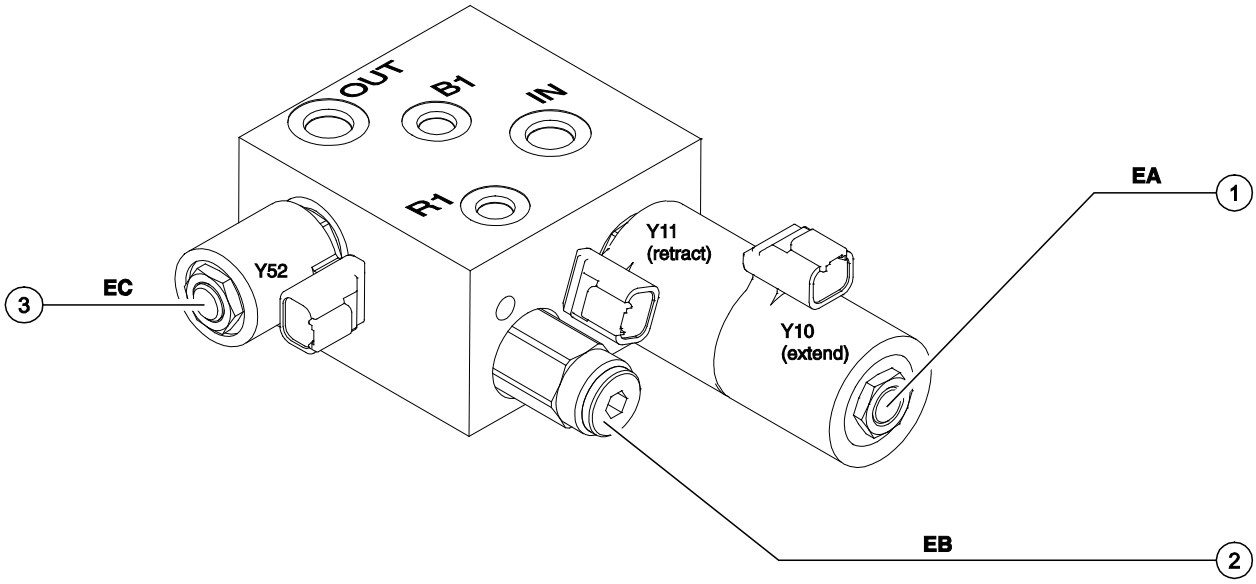
Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

# Manifolds

## 5-2
## Powered Extension Deck Function Manifold Components

The powered extension deck function manifold is mounted behind an inspection door, at the battery side of the machine.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| — | Coil nut (item EA and EC) | | | 4-5 ft-lbs / 5-7 Nm |
| 1 | Solenoid valve, 3 position 4 way | EA | PED extend/retract | 25 ft-lbs / 34 Nm |
| 2 | Relief valve, | | | |
| | 750 psi / 52 bar maximum | EB | PED relief | 20 ft-lbs / 27 Nm |
| 3 | Solenoid valve, 2 position 2 way | EC | PED speed select | 13 ft-lbs / 18 Nm |




Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic.

Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

## How to Install a Valve Cartridge

1 Dip the cartridge in clean oil to lube the O-rings.

2 Screw the cartridge in by hand until the top O-ring is met, then torque to specifications.

3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specifications.

## 5-3 Valve Adjustments – Function Manifold

Note: Perform this test from the ground with the platform controls. Do not stand in the platform.

Note: Verify the hydraulic oil level is at the FULL mark on the hydraulic tank.

## How to Adjust the System Relief Valve

1 Locate the system relief valve on the function manifold (schematic item I).

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold (schematic item AA).

3 Chock both sides of the wheels at the steer end of the machine.

4 Remove the platform controls from the platform.

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

6 Move and hold the joystick fully in either direction while observing the pressure reading on the pressure gauge. Note the pressure. Refer to Specifications, *Hydraulic Component Specifications.*

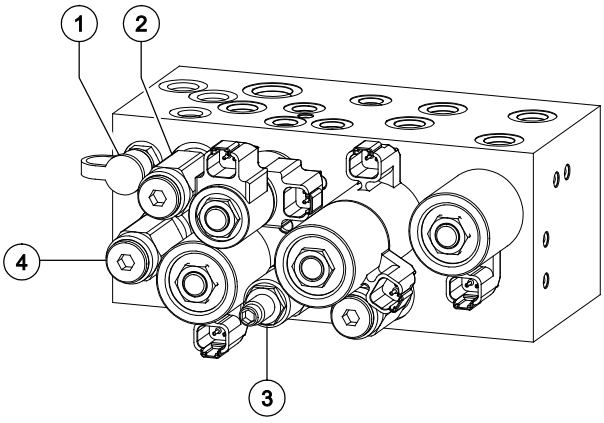
7 Turn the machine off. Hold the system relief valve with a wrench and remove the cap (schematic item AB).

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

**⚠ DANGER** Tip-over hazard. Failure to adjust the relief valves to specification could result in the machine tipping over, causing death or serious injury. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat steps 5 and 6 to confirm the relief valve pressure.




a test port
b system relief valve
c steer relief valve
d lift relief valve

# Manifolds

## How to Adjust the Platform Lift Relief Valve

Note: Perform this test from the ground with the platform controls. Do not stand in the platform.

Note: Verify the hydraulic oil level is at the FULL mark on the hydraulic tank.

1 Locate the system relief valve on the function manifold (schematic item I).

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold (schematic item AA).

3 Chock both sides of the wheels at the steer end of the machine.

4 Remove the platform controls from the platform.

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

6 Move and hold the joystick fully in either direction while observing the pressure reading on the pressure gauge. Note the pressure. Refer to Specifications, *Hydraulic Component Specifications.*

7 Turn the machine off. Hold the system relief valve with a wrench and remove the cap (schematic item AB).

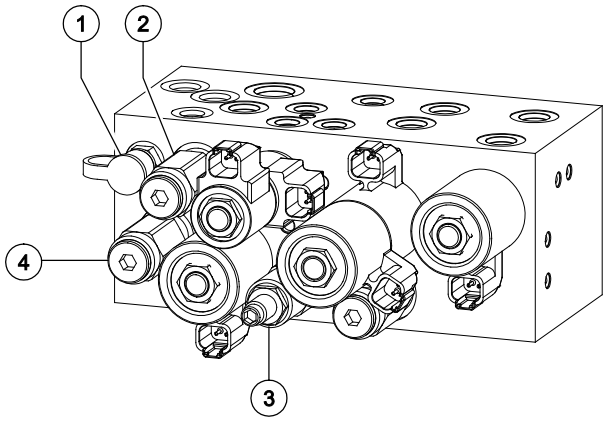
8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

**⚠ DANGER** Tip-over hazard. Failure to adjust the relief valves to specification could result in the machine tipping over, causing death or serious injury. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat steps 5 and 6 to confirm the relief valve pressure.

11 Place maximum rated load into the platform. Secure the load to the platform. Refer to Specifications, *Machine Specifications.*




a test port
b system relief valve
c steer relief valve
d lift relief valve

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

13 Hold the lift relief valve with a wrench and remove the cap (schematic item AJ).

14 While activating the platform up function, adjust the internal hex socket clockwise, just until the platform fully rises.

15 Fully lower the platform to the stowed position.

16 Add an additional 50 pounds / 22.7 kg to the platform. Secure the additional weight.

17 Attempt to raise the platform.

⊙ Result: The power unit should **not** be able to lift platform.

⊠ Result: If the power unit lifts the platform, adjust the internal hex nut socket counterclockwise until the platform will not rise.

18 Install the relief valve cap.

19 Remove the weight from the platform.

20 Bleed the hydraulic system by raising the platform to full height. If the pump cavitates or the platform fails to reach full height, add hydraulic oil until the pump is functioning correctly. Do not overfill the hydraulic tank.

## How to Adjust the Steer Relief Valve

Note: Perform this test from the ground with the platform controls. Do not stand in the platform.

Note: Verify the hydraulic oil level is at the FULL mark on the hydraulic tank.

1 Locate the steer relief valve on the function manifold (schematic item G).

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold (schematic item AA).

3 Remove the platform controls from the platform.

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

5 Activate the function enable switch and press and hold the steer thumb rocker switch to the right. Allow the wheels to completely turn to the right. Continue holding the switch while observing the pressure reading on the pressure gauge. Note the pressure. Refer to Specifications, *Hydraulic Component Specifications..*

6 Press and hold the steer thumb rocker switch to the left. Allow the wheels to completely turn to the left. Continue holding the switch while observing the pressure reading on the pressure gauge.

# Manifolds

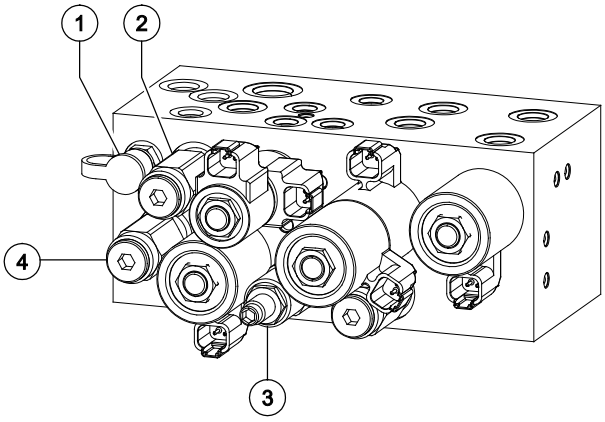
7 Turn the machine off. Hold the steer relief valve with a wrench and remove the cap (schematic item AH).

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

**NOTICE** Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat steps 5 and 6 to confirm the relief valve pressure.




a test port
b system relief valve
c steer relief valve
d lift relief valve

## 5-4 Valve Coils

### How to Test a Coil

A properly functioning coil provides an electromagnetic force which operates the solenoid valve. Critical to normal operation is continuity within the coil. Zero resistance or infinite resistance indicates the coil has failed.

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

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

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

Note: If the machine has been in operation, allow the coil to cool at least 3 hours before performing this test.

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

2 Test the coil resistance using a multimeter set to resistance (W). Refer to the Valve Coil Resistance Specification table.

⊙ Result: If the resistance is not within the adjusted specification, plus or minus 10%, replace the coil.

## Valve Coil Resistance Specifications

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / -7.7°C that your air temperature increases or decreases from 68°F / 20°C.

| Description | Specification |
|---|---|
| Solenoid valve, 3 position 4 way 20V DC with diode (schematic items AC) | 27.2Ω |
| Solenoid valve, 2 position 4 way 20V DC with diode (schematic item AI) | 19Ω |
| Solenoid valve, 2 position 2 way N.C. 20V DC with diode (schematic item N) | 25Ω |
| Solenoid valve, 2 position 4 way 20V DC with diode (schematic items AE) | 19Ω |
| Solenoid valve, 3 position 5 way 20V DC with diode (schematic item AG) | 19Ω |
| Solenoid valve, 3 position 4 way 20V DC with diode (schematic item EA) | 23.9Ω |
| Solenoid valve, 2 position 2 way 20V DC with diode (schematic item EC) | 23.9Ω |

## How to Test a Coil Diode

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

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

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

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

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

| **Resistor, 10Ω** | |
|---|---|
| Genie part number | 27287 |

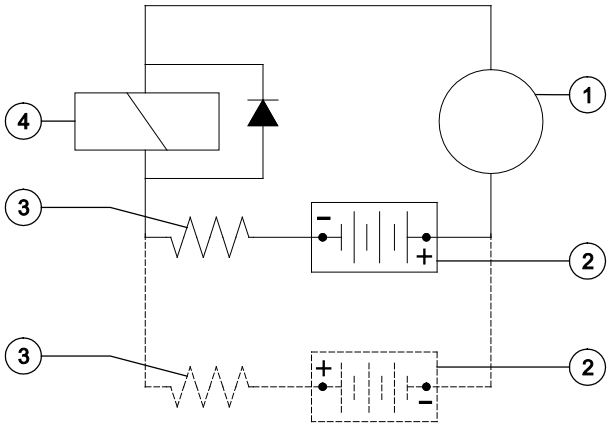
3 Set a multimeter to read DC amperage.

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

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

# Manifolds

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




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

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

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

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

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

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

# 6-1
# Yoke and Drive Motor

## How to Remove the Yoke and Drive Motor Assembly

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

1 Block the non-steer tires.

2 Remove the cotter pin from the wheel castle nut.

Note: Always replace the cotter pin with a new one when removing the castle nut.

3 Loosen the wheel castle nut. Do not remove it.

4 Center a lifting jack under the drive chassis at the steer end of the machine.

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

**⚠WARNING** Crushing hazard. The chassis will fall if not properly supported.

6 Remove the wheel castle nut. Remove the wheel.

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

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

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

8 Support and secure the yoke assembly to an appropriate lifting device.

9 Remove the retaining fastener from the steer link at the yoke assembly.

Note: While removing the retaining fasteners, take note of the quantity and location of the spacers when disconnecting the steer link from the yoke assembly.

10 Remove the retaining fastener from the top of the yoke pivot shaft.

Note: The pivot shaft retaining fastener is located above the main deck.

11 Lower the yoke assembly out of the chassis.

**⚠CAUTION** Bodily injury hazard. The yoke/motor assembly may fall if not properly supported when it is removed from the chassis.

# Steer Axle Components

## How to Remove a Drive Motor

1 Block the non-steer tires.

2 Remove the cotter pin from the wheel castle nut of the motor to be removed.

3 Note: Always replace the cotter pin with a new one when removing the castle nut.

4 Loosen the wheel castle nut. Do not remove it.

5 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

**⚠WARNING** Crushing hazard. The chassis will fall if not properly supported.

6 Remove the wheel castle nut. Remove the wheel.

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

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

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

8 Remove the drive motor mounting fasteners. Remove the motor.

| Torque specifications | |
|---|---|
| Drive motor mounting fasteners, dry | 75 ft-lbs<br>101.7 Nm |
| Drive motor mounting fasteners, lubricated | 56 ft-lbs<br>76.3 Nm |

# 6-2 Steer Cylinder

## How to Remove the Steer Cylinder

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

1 Block the non-steer tires.

2 Remove the pin retaining fasteners from the rod-end pivot pin. Remove the pivot pin.

Note: While removing the pin retaining fasteners, take note of the quantity and location of the spacers when removing the pivot pin.

3 Remove the pin retaining fasteners from the barrel-end pivot pin. Remove the pin.

Note: While removing the pin retaining fasteners, take note of the quantity and location of the spacers when removing the pivot pin.

4 Remove the steer cylinder from the machine.

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

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

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

## 6-3
## Steer Bellcrank

### How to Remove the Steer Bellcrank

1 Remove the steer cylinder. Refer to Repair Procedure, *How to Remove the Steer Cylinder.*

2 Remove the retaining fasteners from the steer links at each end of the bellcrank.

Note: While removing the retaining fasteners, take note of the quantity and location of the spacers between the bellcrank and the steer links.

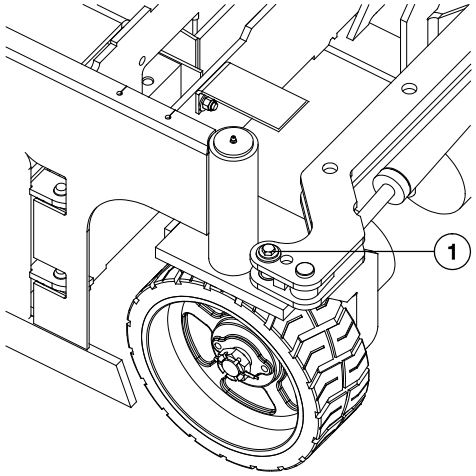
3 Center a lifting jack under the drive chassis at the steer end of the machine.

4 Raise the machine approximately 14 inches / 36 cm. Place blocks under the chassis for support.

**⚠WARNING** Crushing hazard. The chassis will fall if not properly supported.

5 Turn the yokes to the side so the bellcrank can be removed.

6 Remove the bellcrank from the machine.




1 apply removable thread lock to fastener threads

Note: While removing the bellcrank from the machine, take note of the quantity and location of the spacers between the bellcrank and the steer links.

Note: Before re-installing the steer bellcrank onto the machine, apply a small amount of removable thread lock onto the threads of the fasteners. Torque the fasteners to 31 ft-lbs / 42 Nm.

# Non-Steer Axle Components

## 7-1
## Drive Brake

### How to Remove the Drive Brake

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

1 Support and secure the entry ladder to an appropriate lifting device.

2 Remove the entry ladder mounting fasteners. Remove the entry ladder from the machine.

**⚠ CAUTION** Crushing hazard. The entry ladder will fall if not properly supported and secured to the lifting device.

3 Block the steer wheels.

4 Remove the cotter pin from the wheel castle nut.

Note: Always replace the cotter pin with a new one when removing the castle nut.

5 Loosen the wheel castle nut. Do not remove it.

6 Center a lifting jack under the drive chassis at the non-steer end of the machine.

7 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

**⚠ WARNING** Crushing hazard. The chassis will fall if not properly supported.

8 Remove the wheel castle nut. Remove the wheel.

9 Tag, disconnect and plug the hydraulic hose from the brake. Cap the fitting on the brake.

**⚠ 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.

10 Place a lifting jack under the brake for support.

11 Remove the fasteners that attach the brake to the drive chassis. Remove the brake.

**⚠ CAUTION** Crushing hazard. The brake will fall if not properly supported when the mounting fasteners are removed.

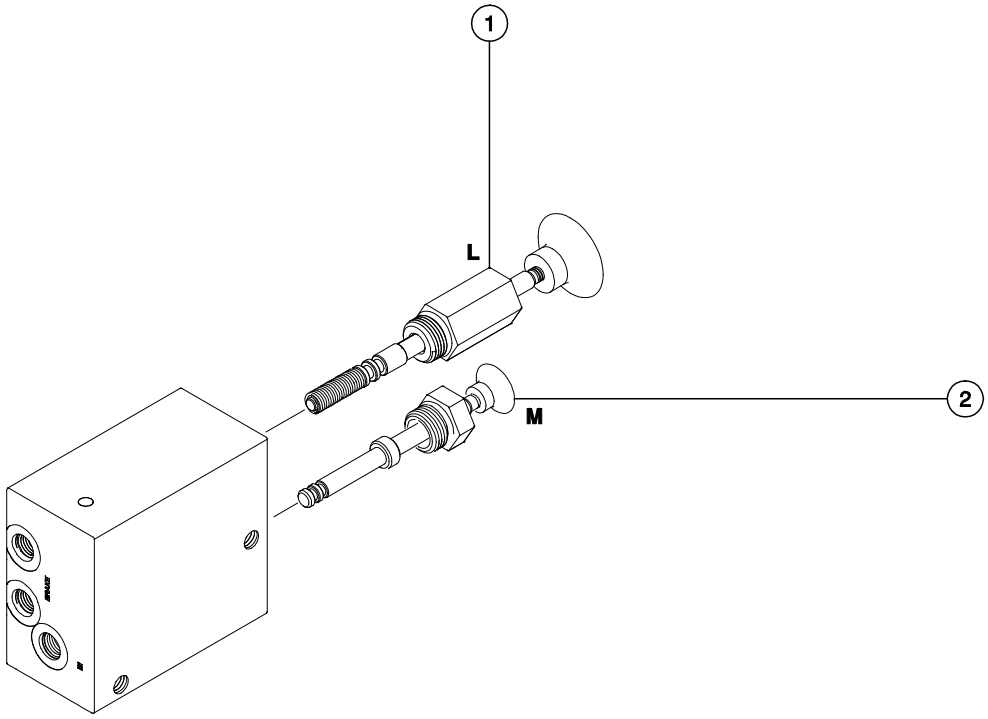
| Torque specifications | |
|---|---|
| Brake mounting fasteners, dry | 75 ft-lbs<br>102 Nm |
| Brake mounting fasteners, lubricated | 56 ft-lbs<br>76 Nm |

# Brake Release Hand Pump Components

## 8-1
## Brake Release Hand Pump Components

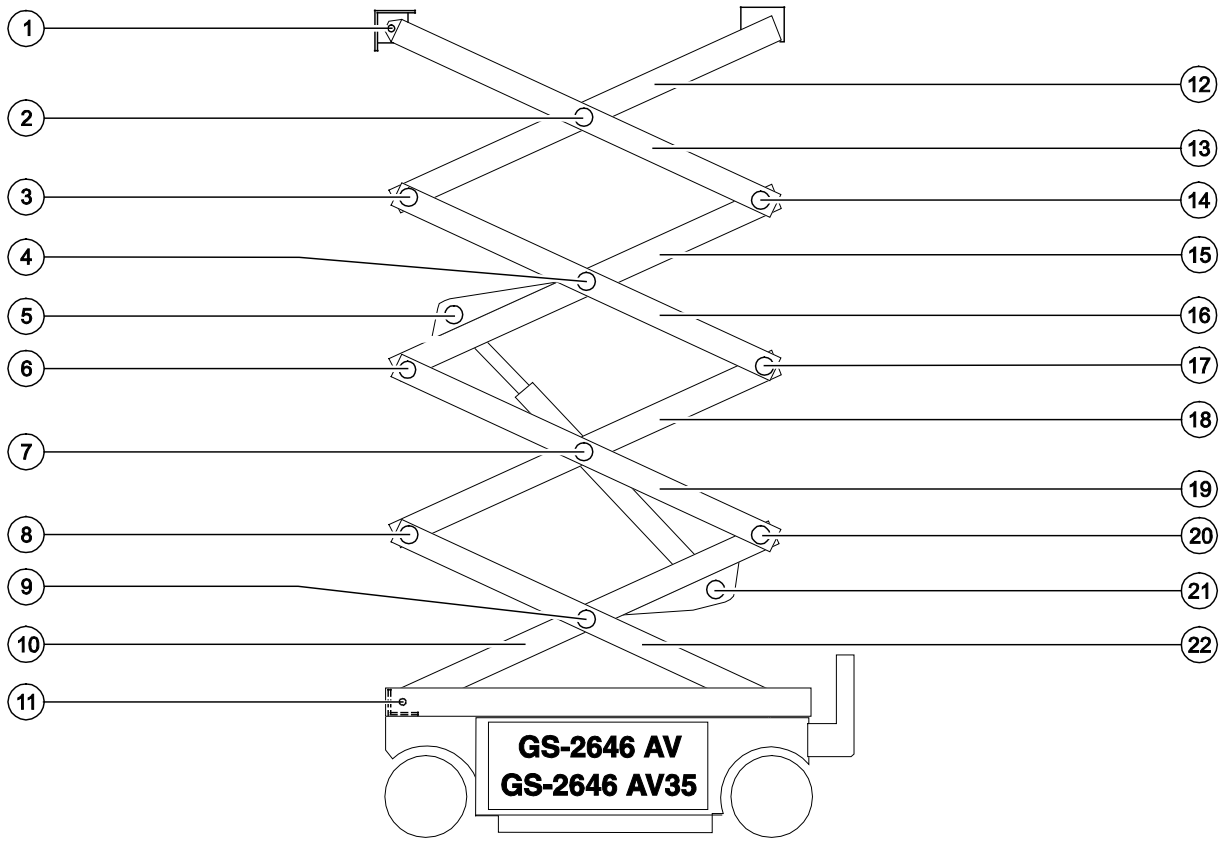
The brake release hand pump manifold is mounted behind the entry ladder.

| Index No. | Description | Schematic Item | Function | Torque |
|---|---|---|---|---|
| 1 | Hand pump | L | Manual brake release | 30 ft-lbs / 41 Nm |
| 2 | Needle valve | M | Manual brake release enable | 45-50 in-lbs / 5 Nm |




Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic.

# Scissor Components




| Steer End | Non-steer End |
|---|---|
| 1 - Number 5 pivot pin | 12 - Number 4 inner arm |
| 2 - Number 4 center pivot pin (2 pins) | 13 - Number 4 outer arm |
| 3 - Number 4 pivot pin (steer end) | 14 - Number 4 pivot pin (non-steer end) |
| 4 - Number 3 center pivot pin (2 pins) | 15 - Number 3 inner arm |
| 5 - Lift cylinder rod-end pivot pin | 16 - Number 3 outer arm |
| 6 - Number 3 pivot pin (steer end) | 17 - Number 3 pivot pin (non-steer end) |
| 7 - Number 2 center pivot pin (2 pins) | 18 - Number 2 inner arm |
| 8 - Number 2 pivot pin (steer end) | 19 - Number 2 outer arm |
| 9 - Number 1 center pivot pin (2 pins) | 20 - Number 2 pivot pin (non-steer end) |
| 10 - Number 1 inner arm | 21 - Lift cylinder barrel-end pivot pin |
| 11 - Number 1 pivot pin | 22 - Number 1 outer arm |

# 9-1
# Scissor Assembly

## How to Disassemble the Scissor Assembly

**⚠WARNING** Bodily injury hazard. The procedures in this section require specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

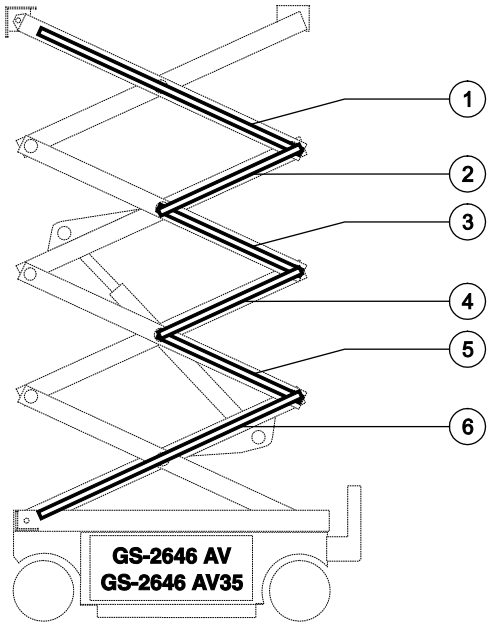
Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

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

2 Support and secure the entry ladder to an appropriate lifting device.

3 Remove the fasteners from the entry ladder and remove the entry ladder from the machine.

**⚠CAUTION** Crushing hazard. The entry ladder will fall if not properly supported and secured to the lifting device.




Cable bridge legend

1 cable bridge 4
2 cable bridge 3A
3 cable bridge 3B
4 cable bridge 2A
5 cable bridge 2B
6 cable bridge 1

4 Remove the cables from the number 4 cable bridge and lay them off to the side.

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

5 Disconnect the number 4 cable bridge from the number 4 outer arm (index #13) and remove the cable bridge from the machine.

6 Remove the retaining fasteners from the number 5 pivot pin (index #1).

# Scissor Components

7 Use a soft metal drift to remove the number 5 pivot pin (index #1). Remove the platform mount bracket from the machine.

8 Attach a lifting strap from an overhead crane to the number 4 outer arm at the ground control side (index #13).

9 Remove the retaining fasteners from the number 4 center pivot pin (index #2) at the ground control side.

10 Place a rod through the number 4 center pivot pin at the ground control side (index #2) and twist to remove the pin.

11 Remove the retaining fasteners from the number 4 pivot pin (index #15) at the non-steer end.

12 Use a soft metal drift to remove the number 4 pivot pin (index #14) from the non-steer end of the machine. Remove the number 4 outer arm at the ground control side (index #13) from the machine.

**⚠ CAUTION** Crushing hazard. The number 4 outer arm (index #13) may become unbalanced and fall if not properly supported when removed from the machine.

13 Attach a lifting strap from an overhead crane to the number 4 outer arm at the battery side (index #13).

14 Remove the retaining fasteners from the number 4 center pivot pin (index #2) at the battery side.

15 Place a rod through the number 4 center pivot pin at the battery side (index #2) and twist to remove the pin.

16 Remove the number 4 outer arm (index #13) from the machine.

**⚠ CAUTION** Crushing hazard. The number 4 outer arm (index #13) may become unbalanced and fall if not properly supported when removed from the machine.

17 Attach a lifting strap from an overhead crane to the number 4 inner arm (index #12). Raise the arm to a vertical position.

18 Remove the retaining fasteners from the number 4 pivot pin at the steer end of the machine (index #3).

19 Use a soft metal drift to remove the number 4 pivot pin (index #3) from the steer end of the machine. Remove the number 4 inner arm (index #12) from the machine.

**⚠ CAUTION** Crushing hazard. The number 4 inner arm (index #12) may become unbalanced and fall if not properly supported when removed from the machine.

20 Remove the cables from the number 3A and 3B cable bridge and lay them off to the side.

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

21 Disconnect the number 3A and 3B cable bridges from the scissor linkset and remove both cable bridges from the machine.

22 Attach a lifting strap from an overhead crane to the number 3 outer arm at the ground control side (index #16).

23 Remove the retaining fasteners from the number 3 center pivot pin (index #4) at the ground control side.

# Scissor Components

24 Place a rod through the number 3 center pivot pin at the ground control side (index #4) and twist to remove the pin.

25 Remove the retaining fasteners from the number 3 pivot pin (index #17) at the non-steer end.

26 Use a soft metal drift to remove the number 3 pivot pin (index #17) from the non-steer end of the machine. Remove the number 3 outer arm at the ground control side (index #16) from the machine.

**⚠ CAUTION** Crushing hazard. The number 3 outer arm at the ground control side (index #16) may become unbalanced and fall if not properly supported when removed from the machine.

27 Attach a lifting strap from an overhead crane to the number 3 outer arm at the battery side (index #16).

28 Remove the retaining fasteners from the number 3 center pivot pin (index #4) at the battery side.

29 Place a rod through the number 3 center pivot pin at the battery side (index #4) and twist to remove the pin.

30 Remove the number 3 outer arm (index #16) from the machine.

**⚠ CAUTION** Crushing hazard. The number 3 outer arm (index #16) may become unbalanced and fall if not properly supported when removed from the machine.

31 Attach a lifting strap from an overhead crane to the lug of the rod end of the lift cylinder.

32 Remove the retaining fasteners from the lift cylinder rod end pivot pin (index #5).

33 Use a soft metal drift to remove the lift cylinder rod end pivot pin (index #5) from the machine.

**⚠ CAUTION** Crushing hazard. The lift cylinder will fall if not properly supported when the pivot pin is removed.

34 Place a 4 x 4 x 10 inch / 10 x 10 x 25 cm block onto the number 1 inner arm cylinder plate (index #10).

35 Lower the cylinder onto the block.

**⚠ CAUTION** Bodily injury hazard. Keep hands clear of moving parts when lowering the cylinder.

36 Attach a lifting strap from an overhead crane to the number 3 inner arm (index #15). Raise the arm to a vertical position.

37 Remove the retaining fasteners from the number 3 pivot pin at the steer end of the machine (index #6).

38 Use a soft metal drift to remove the number 3 pivot pin (index #6) from the steer end of the machine. Remove the number 3 inner arm (index #15) from the machine.

**⚠ CAUTION** Crushing hazard. The number 3 inner arm (index #15) may become unbalanced and fall if not properly supported when the pivot pin is removed.

39 Remove the cables from the number 2A and 2B cable bridge and lay them off to the side.

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

# Scissor Components

40 Disconnect the number 2A and 2B cable bridges from the scissor linkset and remove both cable bridges from the machine.

41 Attach a lifting strap from an overhead crane to the number 2 outer arm at the ground control side (index #19).

42 Remove the retaining fasteners from the number 2 center pivot pin (index #7) at the ground control side.

43 Place a rod through the number 2 center pivot pin at the ground control side (index #7) and twist to remove the pin.

44 Remove the retaining fasteners from the number 2 pivot pin (index #20) at the non-steer end.

45 Use a soft metal drift to remove the number 2 pivot pin (index #20) from the non-steer end of the machine. Remove the number 2 outer arm at the ground control side (index #19) from the machine.

**⚠ CAUTION** The number 2 outer arm at the ground control side (index #19) may become unbalanced and fall if not properly supported when the pivot pin is removed.

46 Attach a lifting strap from an overhead crane to the number 2 outer arm at the battery side (index #19).

47 Remove the retaining fasteners from the number 2 center pivot pin (index #7) at the battery side.

48 Place a rod through the number 2 center pivot pin at the battery side (index #7) and twist to remove the pin.

**⚠ CAUTION** The number 2 outer arm at the ground control side (index #19) may become unbalanced and fall if not properly supported when the pivot pin is removed.

49 Remove the number 2 outer arm (index #19) from the machine.

**⚠ CAUTION** Crushing hazard. The number 2 outer arm (index #19) may become unbalanced and fall if not properly supported when removed from the machine.

50 Attach a lifting strap from an overhead crane to the number 2 inner arm (index #18). Raise the arm to a vertical position.

51 Remove the retaining fasteners from the number 2 pivot pin at the steer end of the machine (index #8).

52 Use a soft metal drift to remove the number 2 pivot pin (index #8) from the steer end of the machine. Remove the number 2 inner arm (index #18) from the machine.

**⚠ CAUTION** Crushing hazard. The number 2 inner arm (index #18) may become unbalanced and fall if not properly supported when the pivot pin is removed.

53 Attach a lifting strap from an overhead crane to the number 1 inner arm (index #10).

54 Raise the number 1 inner arm (index #10) approximately 2 feet / 60 cm.

55 Place a 4 x 4 x 48 inch / 10 cm x 10 cm x 1.2 m long block across both sides of the chassis under the number 1 center pivot pin (index #9).

# Scissor Components

56 Lower the scissor arms onto the block that was placed across the chassis.

**⚠ CAUTION** Bodily injury hazard. Keep hands clear of moving parts when lowering the scissor arms.

57 Attach a lifting strap from an overhead crane to the lug of the rod end of the lower lift cylinder.

58 Tag, disconnect and plug the hydraulic hose on the lower lift cylinder. Cap the fittings on the cylinder.

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

59 Tag and disconnect the wire harness from the solenoid valve on the cylinder.

60 Tag and disconnect the wires and manual lowering cable from the solenoid valve on the cylinder.

61 Raise the lift cylinder to a vertical position.

62 Remove the pin retaining fasteners from the lift cylinder barrel-end pivot pin (index #21). Use a soft metal drift to remove the pin. Remove the lift cylinder from the machine.

**⚠ CAUTION** Crushing hazard. The lift cylinder will fall if not properly supported when the pivot pin is removed.

**NOTICE** Component damage hazard. Be careful not to damage the valve or fittings on the cylinder while removing it from the machine.

63 Remove the cables from the number 1 cable bridge and lay them off to the side.

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

64 Disconnect the number 1 cable bridge from the number 1 outer arm (index #22) and remove the cable bridge from the machine.

65 Attach a lifting strap from an overhead crane to the number 1 inner arm (index #10).

66 Raise the arm slightly and remove the block.

67 Lower the arm to the stowed position.

**⚠ CAUTION** Bodily injury hazard. Keep hands clear of moving parts when lowering the scissor arms.

68 Secure the ends of the scissor arms together at the steer end of the machine with a strap or other suitable device.

69 Secure the ends of the scissor arms together at the non-steer end of the machine with a strap or other suitable device.

70 Remove the retaining fasteners securing the chassis mount bracket to the chassis.

71 Remove the linkset from the machine

**⚠ CAUTION** Bodily injury hazard. The number 1 outer arm may become unbalanced and fall if not properly supported when removed from the machine.

**NOTICE** Component damage hazard. Be sure not to damage the limit switch or level sensor components when the number 1 inner and outer arms (index #10 and #22) are removed from the machine.

# Scissor Components

## How to Replace the Scissor Arm Wear Pads

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

2 Support and secure the entry ladder to an appropriate lifting device.

3 Remove the fasteners from the entry ladder and remove the entry ladder from the machine.

**⚠ CAUTION** Crushing hazard. The entry ladder will fall if not properly supported and secured to the lifting device.

4 Secure the ends of the scissor arms together at the steer end of the machine with a strap or other suitable device.

5 Secure the ends of the scissor arms together at the non-steer end of the machine with a strap or other suitable device.

6 Remove the retaining fasteners securing the chassis mount bracket to the chassis at the steer end of the machine.

7 Attach a lifting strap from an overhead crane to the scissor arm assembly.

8 Raise the scissor arm assembly at the steer end with the overhead crane until the chassis mount bracket will clear the level sensor.

9 Remove the scissor assembly from the machine just enough to access both wear pads.

**⚠ DANGER** Crushing hazard. The scissor assembly will fall if not properly supported when removed from the drive chassis.

**NOTICE** Component damage hazard. Be careful not to damage the level sensor or limit switch while moving the scissor assembly.

10 Remove both old wear pads.

11 Install two new wear pads.

12 Slide the scissor assembly back into the drive chassis.

13 Lower the scissor assembly into position and install the chassis mount bracket onto the chassis. Securely install and tighten the fasteners. Do not over tighten.

**NOTICE** Component damage hazard. Be careful not to damage the level sensor or limit switch while moving the scissor assembly.

# 9-2 Lift Cylinder

## How to Remove the Lift Cylinder

**⚠WARNING** Bodily injury hazard. The procedures in this section require specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

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

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

2 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

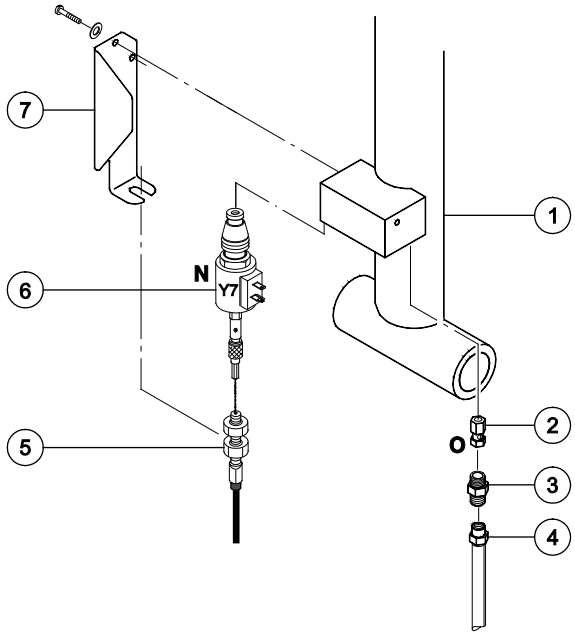
3 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

4 Lower the platform onto the safety arm.

**⚠WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

5 Using a suitable lifting device, support the link stack at the steer end of the machine.

6 At the ground controls, turn the selector/key switch to the off position and push in the red Emergency Stop button to the off position.




1 lift cylinder
2 orifice (schematic item O)
3 connector fitting
4 hydraulic hose
5 manual lowering cable
6 solenoid valve (schematic item N)
7 cable mount bracket

7 Disconnect the battery pack from the machine.

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

# Scissor Components

8 Tag and disconnect the wiring from the solenoid valve coil at the barrel end of the lift cylinder.

9 Loosen the adjustment nuts on the solenoid valve and disconnect the manual lowering cable from the valve.

Note: During assembly, the manual platform lowering cable needs to be properly adjusted. Refer to Repair Procedure, *How to Adjust the Manual Platform Lowering Cable.*

10 Remove the fasteners securing the manual lowering cable mount bracket to the cylinder. Remove the bracket from the cylinder.

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

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

12 Attach a lifting strap from an overhead crane to the rod end of the lift cylinder for support.

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

**⚠ CAUTION** Crushing hazard. The lift cylinder will fall if not properly supported when the pivot pin is removed.

14 Lower the cylinder onto the number 1 inner arm cylinder plate.

15 Attach a lifting strap from an overhead crane or similar lifting device to the barrel end of the lift cylinder for support.

16 Remove the fasteners from the lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

17 Support and secure the lift cylinder to an appropriate lifting device.

18 Remove the lift cylinder through the scissor arms at the steer end of the machine.

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

**NOTICE** Component damage hazard. Be careful not to damage the valve or fittings on the cylinder while removing it from the machine.

19 Install new cylinder, fittings, hoses and pressure transducer (if equipped).

| **Torque specifications** | |
|---|---|
| Solenoid valve, 2 position 2 way N.C. (schematic item N) | 20 ft-lbs<br>27 Nm |
| Coil Nut | 5 ft-lbs<br>7 Nm |
| Pressure transducer (if equipped) (schematic item R) | 27 ft-lbs<br>37 Nm |

20 Remove the lifting device supporting the link stack at the steer end of the machine.

21 Connect the battery pack to the machine.

22 Turn the selector/key switch to ground control.

23 Raise the platform and rotate the safety arm to the stowed position.

24 Fully lower the platform to the stowed position.

# 10-1 Platform

## How to Remove the Platform

**⚠WARNING** Bodily injury hazard. The procedures in this section require specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is required.

Note: This procedure will require an overhead lifting device capable of supporting 1000 lbs / 454 kg.

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

2 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

3 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

4 Lower the platform onto the safety arm.

**⚠WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

5 At the ground control, turn the selector/key switch to the off position and push in the red Emergency Stop button to the off position.

6 Disconnect the battery pack from the machine.

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

7 Place a ladder at the steer end of the raised platform a locate the limit switch cable.

8 Tag and disconnect the limit switch cable from the limit switch harness.

9 Disconnect the platform controls cable from the connector located under the platform.

10 **Machines equipped with powered extension deck option**: Remove the fasteners securing the powered extension deck hose clamps to the platform. Set the fasteners and the hose clamps to the side.

11 Tag, disconnect, plug and cap the powered extension deck hydraulic hoses.

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

12 Connect the battery pack to the machine.

13 At the ground control, turn the selector/key switch to the on position and pull out the red Emergency Stop button to the on position.

14 Raise the platform and return the safety arm to the stowed position.

15 Fully lower the platform to the stowed position.

# Platform Components

16 Remove the zip tie that secures the power to platform wiring to the bottom of the platform.

**NOTICE** Component damage hazard. Be sure not to cut the power to the platform wiring.

17 Remove the zip ties that secure the platform controls cable to the platform.

18 Remove the platform control box from the platform and lay it off to the side.

**NOTICE** Component damage hazard. The platform controls wiring can be damaged if it is kinked or pinched.

19 Remove the cover to the AC power to platform outlet. Tag and disconnect the wiring from the outlet.

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

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

20 Attach a sling chain from the overhead lifting device to the four lifting points on the platform.

21 Remove the two carriage bolts that secure the platform to the platform pivot at the steer end of the machine.

22 Carefully lift the platform enough to clear the platform pivot.

23 Slide the platform towards the non-steer end of the machine until the slider blocks are visible underneath the slider block channel.

24 Carefully lift the platform off of the machine and place it on a structure capable of supporting it.

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

Note: Note the position of the slider blocks before the platform is removed so that when the platform is installed they will be in the correct position.

## 10-2
## Platform Extension

### How to Remove the Manual Extension Deck

1 Remove the platform controls from the platform and set the platform controls to the side.

2 Extend the extension deck approximately 4 ft / 12 m.

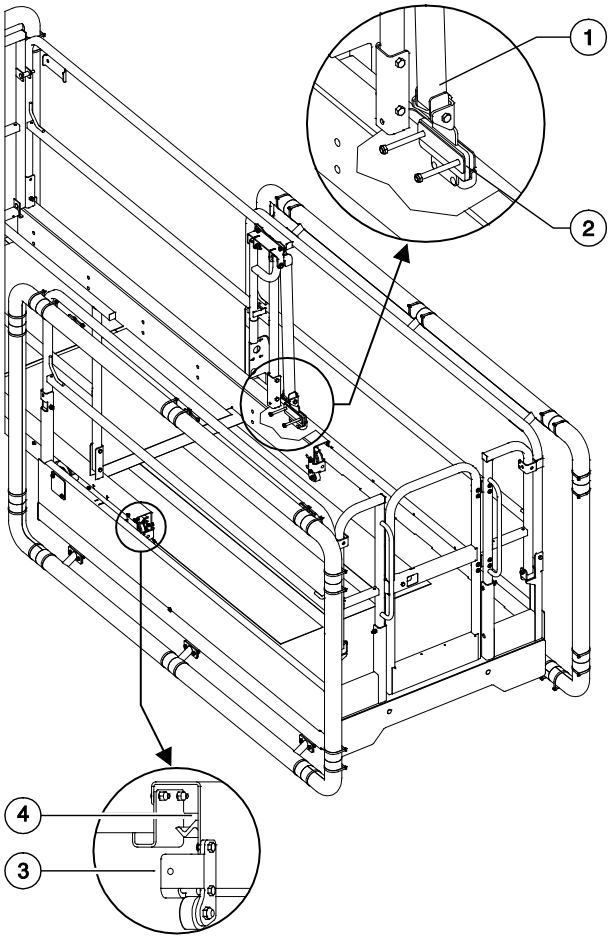
3 Working with the extension deck lock handle, remove the retaining fasteners from the lock handle assembly. Set the fasteners to the side.

4 Remove the retaining fasteners from the extension deck locking assembly. Set the fasteners and the locking assembly to the side.

5 Remove the retaining fasteners from the extension deck catch and remove the catch. Set the extension deck catch and fasteners to the side.

6 Remove the fasteners from the extension deck stop and remove the stop. Set the extension deck stop and the fasteners to the side.

7 Repeat steps 3 and 4 at the opposite side of the extension deck.




1 lock handle assembly
2 extension deck locking assembly
3 extension deck stop
4 extension deck catch

# Platform Components

8 At the steer end of the extension deck, locate, tag and disconnect the front gate proximity switch from the limit switch harness.

9 Position a forklift at the steer end of the machine with the forks even with the bottom of the platform extension deck.

10 Carefully slide the platform extension out until the platform extension deck makes contact with the carriage on the forklift.

11 Secure the platform extension deck railings to the carriage of the forklift to support the platform extension deck.

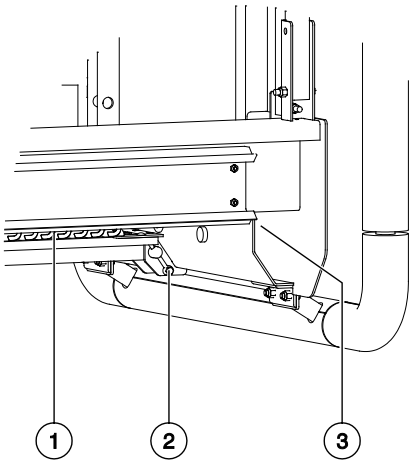
12 Carefully slide the platform extension out and away from the platform and place it on a structure capable of supporting it.

**⚠WARNING** Crushing hazard. The platform extension will become unbalanced and fall when removed from the machine if not properly supported and secured to the forklift.

## How to Remove the Powered Extension Deck (if equipped)

1 Remove the platform controls from the platform and set the platform controls to the side.

2 Working at the steer end of the platform, remove the fasteners securing the banjo bolt to the rod end of the extension deck cylinder. Set the banjo bolt and fasteners to the side.




1 cable track
2 banjo bolt
3 proximity switch harness (located behind toeboard)

3 Manually extend the extension deck approximately 4 ft / 12 m.

4 At the steer end of the extension deck, locate, tag and disconnect the front gate proximity switch from the limit switch harness.

5 Locate the cable track at the steer end of the extension deck and remove the fasteners. Set the fasteners to the side.

6 Carefully slide the cable track and the cable track mounting bracket into the main deck.

7 Remove the fasteners from the extension deck stop and remove the stop. Set the extension deck stop and the fasteners to the side.

8 Repeat steps 3 and 4 at the opposite side of the extension deck.

9 Position a forklift at the steer end of the machine with the forks even with the bottom of the platform extension.

10 Carefully slide the platform extension out until the platform extension makes contact with the carriage on the forklift.

11 Secure the platform extension deck railings to the carriage of the forklift to support the platform extension deck.

12 Carefully slide the platform extension out and away from the platform and place it on a structure capable of supporting it.

**⚠WARNING** Crushing hazard. The platform extension will become unbalanced and fall when removed from the machine if not properly supported and secured to the forklift.

## 10-3 Extension Deck Cylinder

### How to Remove the Extension Deck Cylinder (if equipped)

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

2 Raise the platform 7 to 8 feet / 2.1 to 2.4 m.

3 Lift the safety arm, move it to the center of the scissor arm and rotate down to a vertical position.

4 Lower the platform onto the safety arm.

**⚠WARNING** Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

5 At the ground control, turn the selector/key switch to the off position and push in the red Emergency Stop button to the off position.

6 Place a ladder at the steer end of the raised platform a locate the extension deck cylinder hydraulic hose connection.

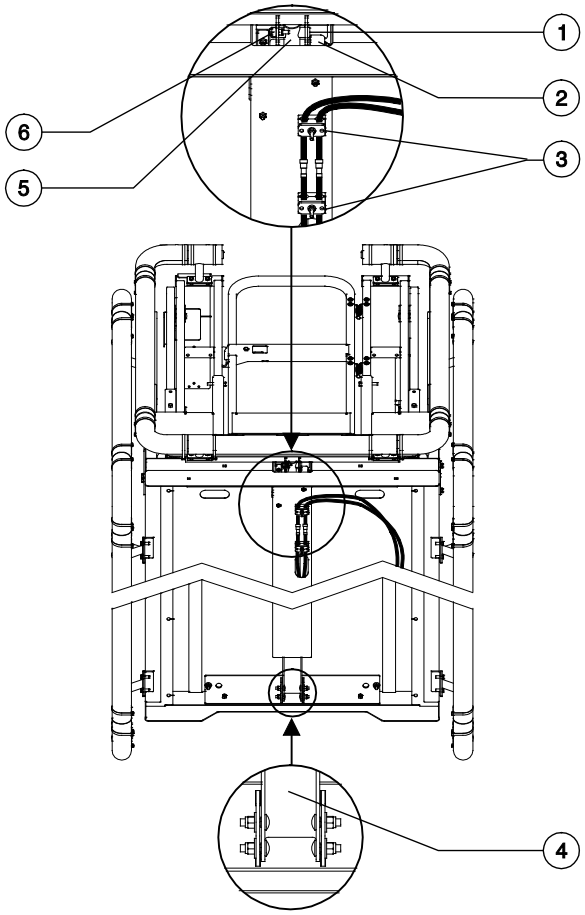
7 Remove the fasteners from the hydraulic hose clamps. Set the hose clamps and fasteners to the side.

8 Tag, disconnect, plug and cap the extension cylinder hydraulic hose lines.

**⚠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.

# Platform Components

9 Working with the PED limit switch, loosen the nut from the carriage bolt. Do not remove.




1 cylinder pin
2 PED limit switch
3 hydraulic hose clamps
4 PED cylinder mount bracket
5 extension deck cylinder (rod end)
6 banjo bolt

10 Remove the fasteners securing the banjo bolt to the extension deck cylinder pin. Set the banjo bolt and fasteners to the side.

11 Remove the extension deck cylinder pin and set to the side.

12 Move the extension deck away from the main deck to allow access to the PED limit switch.

13 Remove the fasteners from the PED limit switch assembly. Set the fasteners to the side.

14 Carefully move the PED limit switch assembly away from the main deck, allowing the assembly to rest outside of the main deck.

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

15 Working at the non-steer end of the machine, remove the fasteners from the PED cylinder mount bracket. Set the fasteners to the side.

16 At the ground control, turn the selector/key switch to the on position and pull out the red Emergency Stop button to the on position.

17 Raise the platform and return the safety arm to the stowed position.

18 Fully lower the platform to the stowed position.

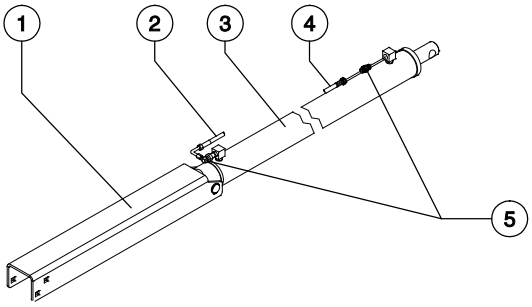
19 Fully extend the extension deck.

20 Carefully remove the extension deck cylinder from the main deck.

**NOTICE** Component damage hazard. Be careful not to damage the fittings on the cylinder while removing it from the machine.

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

21 Set the extension deck cylinder on a workbench and remove the fasteners from the cylinder mount bracket. Set the bracket and fasteners to the side.




1 PED cylinder mount bracket
2 hydraulic hose
3 extension deck cylinder
4 connector fittings

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# Diagnostics

## Observe and Obey:

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

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

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

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

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

## Before Troubleshooting:

☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.

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

☑ Read each appropriate fault code thoroughly. Attempting short cuts may produce hazardous conditions.

☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

**⚠ DANGER** Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement

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

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

## About This Section

When a malfunction is discovered, the fault code 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.

# Diagnostics

## Definitions

GSDS – Genie SmartLink™ Diagnostic System

ECM – Electronic Control Module

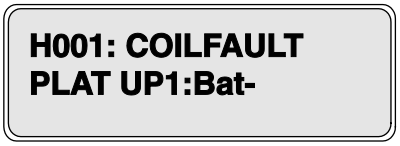
GCON – Ground Controls

PCON – Platform Controls

OIC – Operational Indicator Codes

DTC – Diagnostic Trouble Codes

## GCON LCD Diagnostic Readout




The diagnostic readout displays alpha numeric codes that provide information about the machine operating status and about malfunctions.

The codes listed in the Diagnostic Trouble Code Charts describe malfunctions and can aid in troubleshooting the machine by pinpointing the area or component affected.

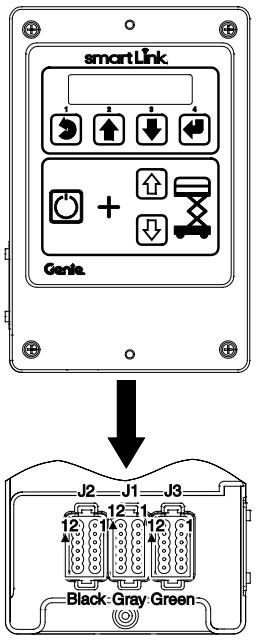
Models are listed below each code to assist in the troubleshooting codes for a specific model.

## Genie SmartLink Diagnostic System

This machine is equipped with the Genie SmartLink™ Diagnostic System (GSDS). The GSDS indicates a machine malfunction has happened by displaying Operational Indicator Codes (OIC) and Diagnostic Trouble Codes (DTC). These codes are displayed at the Platform Controls and the Ground Controls. The Ground Controls will display a brief description of the code at the LCD display as well. Refer to the GCON I/O Maps, Operational Indicator Codes (OIC) and Diagnostic Trouble Codes (DTC) in this section, to assist in troubleshooting faults.

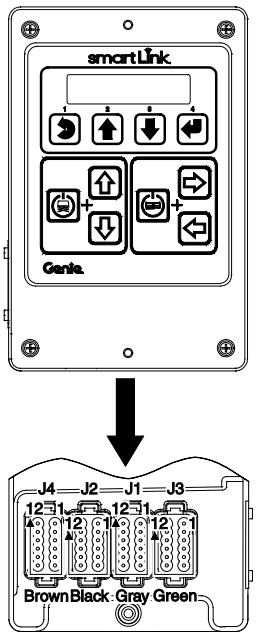
# GCON I/O Map (with manual extension deck)

| GCON Pin Number | Circuit Function | I/O Type | Wire Gauge and Color |
|---|---|---|---|
| **J1 Connector – Gray** | | | |
| J1-01 | ECM Power | Power Input | 14 RD |
| J1-02 | PCON, E-Stop Power | Power Output | 18 RD |
| J1-03 | PCON, E-Stop Return | Power Input | 18 WH |
| J1-04 | Link to PCON — CANH | Data Bus | 18GR |
| J1-05 | Link to PCON — CANL | Data Bus | 18 OR |
| J1-06 | PCON — Ground | Ground Output | 18 BR |
| J1-07 | GCON — Ground | Ground Input | 14 BR |
| J1-08 | Selector Switch — PCON Mode | Digital Input | 18 BK |
| J1-09 | Selector Switch — GCON Mode | Digital Input | 18 WH |
| J1-10 | GCON — Emergency Mode | Digital Input | 18 WH/BK |
| J1-11 | No Circuit | N/A | N/A |
| J1-12 | Driver Power | Power Input | 14 RD |
| **J-2 Connector – Black** | | | |
| J2-01 | Platform Up Coil | Digital Output | 18 OR |
| J2-02 | Platform Down Coil | Digital Output | 18 OR/BK |
| J2-03 | Steer Left Coil | Digital Output | 18 BL/BK |
| J2-04 | Steer Right Coil | Digital Output | 18 BL |
| J2-05 | Parallel Coil | Digital Output | 18 RD/WH |
| J2-06 | Drive Forward Coil | Digital Output | 18 WH |
| J2-07 | No Circuit | N/A | N/A |
| J2-08 | Motor Controller Enable | Digital Output | 18 GR/WH |
| J2-09 | No Circuit | N/A | N/A |
| J2-10 | Drive Reverse Coil | Digital Output | 18 WH/BK |
| J2-11 | Motor Controller Throttle | Analog Output | 18 GR |
| J2-12 | No Circuit | N/A | N/A |
| **J-3 Connector – Green** | | | |
| J3-01 | No Circuit | N/A | N/A |
| J3-02 | GCON — Alarm | Digital Output | 18 BL |
| J3-03 | Switch/Sensor Power | Digital Output | 14 RD |
| J3-04 | Automotive Horn | Digital Output | 18 WH |
| J3-05 | Pothole Limit Switch | Digital Input | 18 OR/RD |
| J3-06 | Ground | Ground Input | 18 BR |
| J3-07 | Down Limit Switch | Digital Input | 18 OR |
| J3-08 | Level Sensor | Digital Input | 18 RD/BK |
| J3-09 | Ground | Ground Input | 18 BK |
| J3-10 | Ground | Ground Input | 18 BK |
| J3-11 | Gate Proximity Sensor | Digital Input | 18 RD/WH |
| J3-12 | Load Sense — Ground | Ground Input | 18 BK |



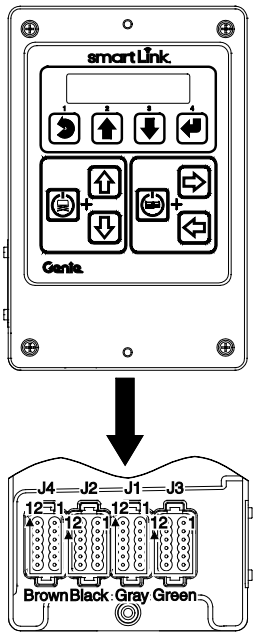
# GCON I/O Map (with powered extension deck)

| GCON Pin Number | Circuit Function | I/O Type | Wire Gauge and Color |
|---|---|---|---|
| **J1 Connector – Gray** | | | |
| J1-01 | ECM Power | Power Input | 14 RD |
| J1-02 | PCON, E-Stop Power | Power Output | 18 RD |
| J1-03 | PCON, E-Stop Return | Power Input | 18 WH |
| J1-04 | Link to PCON — CANH | Data Bus | 18GR |
| J1-05 | Link to PCON — CANL | Data Bus | 18 OR |
| J1-06 | PCON — Ground | Ground Output | 18 BR |
| J1-07 | GCON — Ground | Ground Input | 14 BR |
| J1-08 | Selector Switch — PCON Mode | Digital Input | 18 BK |
| J1-09 | Selector Switch — GCON Mode | Digital Input | 18 WH |
| J1-10 | GCON — Emergency Mode | Digital Input | 18 WH/BK |
| J1-11 | No Circuit | N/A | N/A |
| J1-12 | Driver Power | Power Input | 14 RD |
| **J-2 Connector – Black** | | | |
| J2-01 | Platform Up Coil | Digital Output | 18 OR |
| J2-02 | Platform Down Coil | Digital Output | 18 OR/BK |
| J2-03 | Steer Left Coil | Digital Output | 18 BL/BK |
| J2-04 | Steer Right Coil | Digital Output | 18 BL |
| J2-05 | Parallel Coil | Digital Output | 18 RD/WH |
| J2-06 | Drive Forward Coil | Digital Output | 18 WH |
| J2-07 | No Circuit | N/A | N/A |
| J2-08 | Motor Controller Enable | Digital Output | 18 GR/WH |
| J2-09 | No Circuit | N/A | N/A |
| J2-10 | Drive Reverse Coil | Digital Output | 18 WH/BK |
| J2-11 | Motor Controller Throttle | Analog Output | 18 GR |
| J2-12 | No Circuit | N/A | N/A |



# GCON I/O Map (with powered extension deck)

| GCON Pin Number | Circuit Function | I/O Type | Wire Gauge and Color |
|---|---|---|---|
| **J-3 Connector – Green** | | | |
| J3-01 | No Circuit | N/A | N/A |
| J3-02 | GCON — Alarm | Digital Output | 18 BL |
| J3-03 | Switch/Sensor Power | Digital Output | 14 RD |
| J3-04 | Automotive Horn | Digital Output | 18 WH |
| J3-05 | Pothole Limit Switch | Digital Input | 18 OR/RD |
| J3-06 | Ground | Ground Input | 18 BR |
| J3-07 | Down Limit Switch | Digital Input | 18 OR |
| J3-08 | Level Sensor | Digital Input | 18 RD/BK |
| J3-09 | Ground | Ground Input | 18 BK |
| J3-10 | Ground | Ground Input | 18 BK |
| J3-11 | Gate Proximity Sensor | Digital Input | 18 RD/WH |
| J3-12 | Load Sense — Ground | Ground Input | 18 BK |
| **J-4 Connector – Brown** | | | |
| J4-01 | Powered Extension Deck Limit Switch | Digital Output | 18 BL/BK |
| J4-02 | No Circuit | N/A | N/A |
| J4-03 | No Circuit | N/A | N/A |
| J4-04 | No Circuit | N/A | N/A |
| J4-05 | No Circuit | N/A | N/A |
| J4-06 | No Circuit | N/A | N/A |
| J4-07 | No Circuit | N/A | N/A |
| J4-08 | No Circuit | N/A | N/A |
| J4-09 | No Circuit | N/A | N/A |
| J4-10 | Powered Extension Deck Enable Deck Coil | Digital Output | 18 GR/WH |
| J4-11 | Powered Extension Deck Extend Coil | Digital Output | 18 GR |
| J4-12 | Powered Extension Deck Retract Coil | Digital Output | 18 GR/BK |



# Operation Indicator Codes (OIC)

## Operation Indicator Codes (OIC)

These codes are generated by the electrical system to indicate machine operating status such as Off-level, Overload Cutout, Chassis Mode Operation and Pothole Guard Stuck, during normal operation. These codes are not indicators of a device malfunction in the electrical system.

| Code | Condition |
|---|---|
| LL | Off-Level |
| OL | Platform Overloaded (CE and Australia) |
| CH | Chassis Mode Operation |
| PHS | Pothole Guard Stuck |
| nd | No Drive (option) |
| dE | Deck Extended (PED only)<br>(lift and drive disabled) |
| Fd | Function Disabled (all functions) |

## Diagnostic Trouble Codes (DTC)

These codes are generated by the system to indicate that a device or circuit malfunction has been detected in the electrical system.
The types of Diagnostic Trouble Codes that may occur are explained below.

Type "HXXX" – Indicate a malfunction associated with devices that control hydraulic functions in the electrical system. The "HXXX" faults are divided into short circuit battery negative, short circuit to battery positive, open circuit and generic shorts. Examples of these devices are solenoid controlled hydraulic valves and motor controller.

Type "PXXX" – Indicate a malfunction associated with power type devices in the electrical system. The "PXXX" faults are divided into short circuit to battery negative, short circuit to battery positive, open circuit and generic shorts. Examples of these devices are horns, sensor power and alarms.

Type "UXXX" – Indicate a malfunction associated with user interface devices in the electrical system. The "UXXX" faults are divided into short circuit to battery negative, short circuit to battery positive, open circuit and generic shorts. Examples of these devices are GCON up and down switches and PCON drive joystick.

Type "FXXX" – Indicate a malfunction associated with machine feedback devices in the electrical system. The "FXXX" faults are divided into short circuit to battery negative, short circuit to battery positive, open circuit and generic shorts. Examples of these devices are limit switches, height sensors and pressure transducers.

Type "CXXX" – Indicate a malfunction associated with controls devices in the electrical system. Examples of these devices are platform controls and ground controls ECM.

# Troubleshooting "HXXX" and "PXXX" Faults

## Troubleshooting "HXXX" and "PXXX" Faults

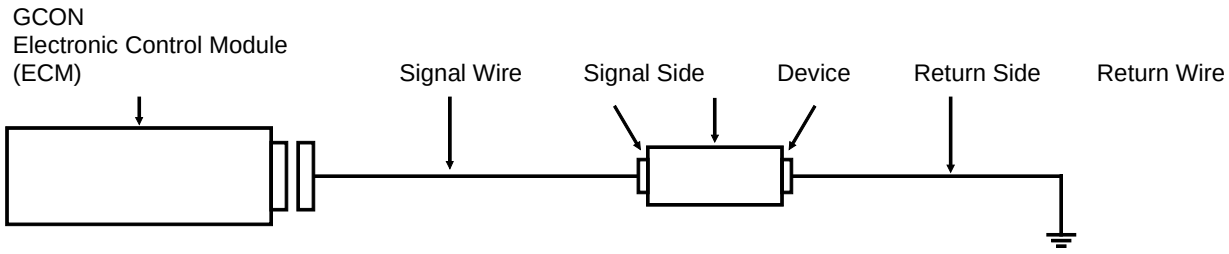
The procedure below illustrates typical steps for diagnosing and fixing faults of type "HXXX" and "PXXX".

### Diagnostic Chart

| | | | |
|---|---|---|---|
| 1 | Check the faulted device for a short or open circuit. | **No Good ➔** | Replace faulted device. |
| | **Good ↓** | | |
| 2 | Check short or open circuit of the harness or connector between Ground Controls and faulted device. | **No Good ➔** | Repair or replace harness an/or connector. |
| | **Good ↓** | | |
| 3 | Check GCON Electronic Control Module (ECM). | **No Good ➔** | Replace ECM. |

### Wiring Diagram

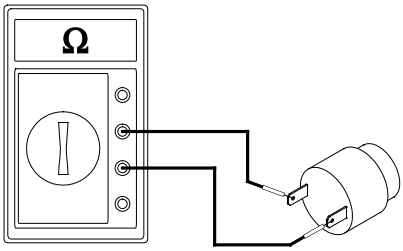
The wiring diagram shown below illustrates how fault type "HXXX" and "PXXX" devices are typically wired. The signal of these types of devices originates at the Ground Controls and terminates at system ground.

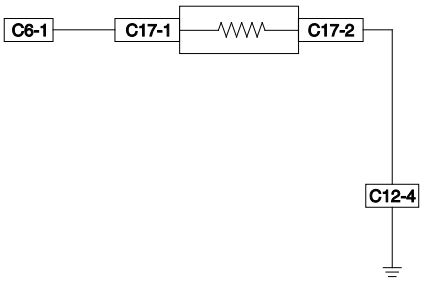



In order to successfully troubleshoot "HXXX" or "PXXX" type faults, the entire faulted out circuit must be investigated.

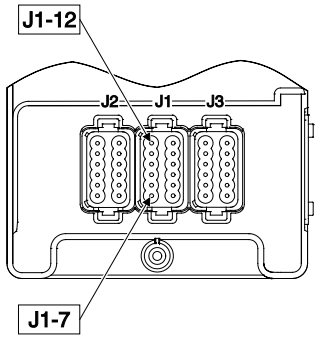
# Fault Inspection Procedure

## Fault Inspection Procedure

| 1 | Check the device associated with the faulted circuit | | |
|---|---|---|---|
|  | 1 Disconnect the faulted device connector.<br>2 Using a multi-meter, measure resistance between the two terminals of the faulted device.<br>3 Resistance should be as follows.<br>**Device** — **Typical Resistance**<br>Solenoid Valve, Drive — 27.2 Ω<br>Solenoid Valve, Steer — 19 Ω<br>Solenoid Valve, Platform Up — 25 Ω<br>Solenoid Valve, Platform Down — 6.25 Ω<br>GCON and PCON Alarm — >1M Ω<br>Automotive Horn — 1.0 Ω<br>Motor Controller – Enable — 5.7k Ω<br>Motor Controller – Throttle — 5.7k Ω<br>Contactor Coil — 47 Ω | | |
| **OK** | **Go to step 2** | **No Good** | **Replace faulted device** |

| 2 | Check the harness between the ground controls and the faulted device | | |
|---|---|---|---|
|  | 1 Disconnect the GCON ECM connectors, J1, J2 and J3.<br>2 Disconnect the faulted device connector.<br>3 Check the continuity between the GCON ECM connector and the signal side of the faulted device.<br>⊙ Result: Resistance should be close to 0 Ω<br>4 Check the continuity between the return side of faulted device and system ground.<br>⊙ Result: Resistance should be close to 0 Ω<br>5 Check resistance between return side and signal side of the harness plug of faulted device.<br>⊙ Result: Resistance should be 1M Ω or higher. | | |
| **OK** | **Go to step 3** | **No Good** | **Replace or repair harness** |

# Fault Inspection Procedure

| 3 | Check the GCON ECM | |
|---|---|---|
|  | 1 Disconnect the GCON ECM connectors, J1, J2 and J3.<br>2 For short to B- type faults, measure resistance between pins J1-7 (ground) and the GCON pin associated with the fault code. Refer to the GCON I/O Map in this section to identify the faulted out circuit pin.<br>3 Short to ground resistance should be greater than 5k Ω.<br>4 For short to B+ type faults, measure resistance between pins J1-12 (driver power) and the GCON pin associated with the fault code. Refer to the GCON I/O Map in this section to identify the faulted out circuit pin.<br>5 Short to power resistance should be greater than 50k Ω. | |
| | **No Good** | **Replace GCON ECM** |

# Type "HXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **H001** | H001:COILFAULT<br>PLAT UP1:BAT- | Short circuit of the platform up #1 circuit to battery negative. | • Short circuit in platform up #1 harness<br>• Platform up #1 coil short circuit<br>• GCON ECM | Platform up function inhibited. |
| **H002** | H002:COILFAULT<br>PLAT UP1:OPEN | Open circuit in the platform up #1 circuit. | • Short circuit in platform up #1 harness<br>• Platform up #1 coil open circuit<br>• GCON ECM | Platform up function inhibited. |
| **H003** | H003:COILFAULT<br>PLAT UP1:BAT+ | Short circuit of the platform up #1 circuit to battery positive. | • Short circuit in platform up #1 harness<br>• Platform up #1 coil short circuit<br>• GCON ECM | All functions inhibited except platform down. |
| **H009** | H009:COILFAULT<br>PLAT DOWN1:BAT+ | Short circuit of the platform down #1 circuit to battery positive. | • Short circuit in platform up #1 harness<br>• Platform up #1 coil short circuit<br>• GCON ECM | All functions inhibited. |
| **H013** | H013:COILFAULT<br>DRIVE FWD1:BAT- | Short circuit of the drive forward #1 circuit to battery negative. | • Short circuit in drive forward #1 harness<br>• Drive forward #1 coil short circuit<br>• GCON ECM | Drive forward function inhibited. |
| **H014** | H014:COILFAULT<br>DRIVE FWD1:OPEN | Open circuit in the drive forward #1 circuit. | • Open circuit in drive forward #1 harness<br>• Drive forward #1 coil open circuit<br>• GCON ECM | Drive forward function inhibited. |
| **H015** | H015:COILFAULT<br>DRIVE FWD1:BAT+ | Short circuit of the drive forward #1 circuit to battery positive. | • Short circuit in drive forward #1 harness<br>• Drive forward #1 coil short circuit<br>• GCON ECM | All functions inhibited except platform down. |
| **H019** | H019:COILFAULT<br>DRIVE REV1:BAT- | Short circuit of the drive forward #1 circuit to battery negative. | • Short circuit in drive reverse #1 harness<br>• Drive reverse #1 coil short circuit<br>• GCON ECM | Drive reverse function inhibited. |
| **H020** | H020:COILFAULT<br>DRIVE REV1:OPEN | Open circuit in the drive reverse #1 circuit. | • Short circuit in drive reverse #1 harness<br>• Drive reverse #1 coil open circuit<br>• GCON ECM | Drive reverse function inhibited. |
| **H021** | H021:COILFAULT<br>DRIVE REV1:BAT+ | Short circuit of the drive reverse #1 circuit to battery positive. | • Short circuit in drive reverse #1 harness<br>• Drive reverse #1 coil short circuit<br>• GCON ECM | All functions inhibited except platform down. |
| **H027** | H027:COILFAULT<br>DRIVE STEER RIGHT:BAT+ | Short circuit of the steer right circuit to battery positive. | • Short circuit in steer right harness<br>• Steer right coil short circuit<br>• GCON ECM | All functions inhibited except platform down. |
| **H030** | H030:COILFAULT<br>DRIVE STEER LEFT:BAT+ | Short circuit of the steer left circuit to battery positive. | • Short circuit in steer left harness<br>• Steer left coil short circuit<br>• GCON ECM | All functions inhibited except platform down. |
| **H033** | H033:COILFAULT<br>HI/LO SPEED:BAT+ | Short circuit of the hi/lo speed coil to battery positive. | • Short circuit in Hi/Lo speed coil harness<br>• Hi/Lo speed coil short circuit<br>• GCON ECM | Hi/Lo speed coil disabled. Machine will operate in low speed mode. |

# Type "HXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **H067** | H067:FAULT<br>MC ENABLE:BAT- | Short circuit of the motor controller circuit to battery negative. | • Short circuit in motor controller enable wire<br>• Motor Controller<br>• Contactor coil shorted to battery negative<br>• GCON ECM | All functions inhibited except platform down. |
| **H069** | H069:FAULT<br>MC ENABLE:BAT+ | Short circuit of the motor controller circuit to battery positive. | • Short circuit in motor controller enable wire<br>• Motor Controller<br>• GCON ECM<br>• Contactor Coil | All functions inhibited except platform down. |
| **H070** | H070:FAULT<br>MC THROTTLE:BAT- | Short circuit of the motor controller throttle circuit to battery negative. | • Short circuit in motor controller throttle wire<br>• Motor Controller<br>• GCON ECM | All functions inhibited except platform down. |
| **H072** | H072:FAULT<br>MC THROTTLE:BAT+ | Short circuit of the motor controller throttle circuit to battery positive. | • Short circuit in motor controller throttle wire<br>• Motor Controller<br>• GCON ECM | All functions inhibited except platform down. |
| **H078** | H078:COILFAULT<br>PLAT DOWN1 | Short circuit of the platform down #1 circuit to battery positive/negative or open circuit. | • Short or open circuit in platform down #1 harness<br>• Platform down #1 coil short or open circuit<br>• GCON ECM | Platform down function inhibited. |
| **H079** | H079:COILFAULT<br>HI/LO SPEED | Short circuit of the HI/LO speed circuit to battery positive/negative or open circuit. | • Short circuit in HI/LO speed harness<br>• HI/LO speed coil short or open circuit<br>• GCON ECM | Hi/Lo speed coil disabled. Machine will operate in high speed mode if open circuit or short with battery negative. Machine will operate in low speed mode if short with battery positive. |
| **H080** | H080:COILFAULT<br>STEER LEFT | Short circuit of the steer left circuit to battery negative or open circuit. | • Short or open circuit in steer left harness<br>• Steer left coil short or open circuit<br>• GCON ECM | Steer left function inhibited. |
| **H081** | H081:COILFAULT<br>STEER RIGHT | Short circuit of the steer right circuit to battery negative or open circuit. | • Short or open circuit in steer right harness<br>• Steer right coil short or open circuit<br>• GCON ECM | Steer right function inhibited. |
| **H106** | H106:COILFAULT<br>DECK EXTEND:BAT- | Short circuit of the platform extend circuit to battery negative. | • Short circuit in PED harness<br>• PED extend valve coil short circuit<br>• GCON ECM | All functions inhibited. |
| **H107** | H107:COILFAULT<br>DECK EXTEND:OPEN | Open circuit in the platform extend circuit. | • Open circuit in PED harness<br>• PED extend valve coil open circuit<br>• GCON ECM | All functions inhibited. |
| **H108** | H108:COILFAULT<br>DECK EXTEND:BAT+ | Short circuit of the platform extend circuit to battery positive. | • Short circuit in PED harness<br>• PED extend valve coil short circuit<br>• GCON ECM | All functions inhibited. |
| **H109** | H109:COILFAULT<br>DECK RETRACT:BAT- | Short circuit of the platform retract circuit to battery negative. | • Short circuit in PED harness<br>• PED retract valve coil short circuit<br>• GCON ECM | All functions inhibited. |
| **H110** | H110:COILFAULT<br>DECK RETRACT:OPEN | Open circuit in the platform retract circuit. | • Open circuit in PED harness<br>• PED retract valve coil open circuit<br>• GCON ECM | All functions inhibited. |
| **H111** | H111:COILFAULT<br>DECK RETRACT:BAT+ | Short circuit of the platform retract circuit to battery positive. | • Short circuit in PED harness<br>• PED retract valve coil short circuit<br>• GCON ECM | All functions inhibited. |
| **H114** | H114:COILFAULT<br>DECK ENABLE:BAT+ | Short circuit of the platform enable circuit to battery positive. | • Short circuit in PED harness<br>• PED enable valve coil short circuit<br>• GCON ECM | All functions inhibited. |
| **H115** | H115:COILFAULT<br>DECK ENABLE | Short circuit of the platform enable circuit. | • Short circuit in PED harness<br>• GCON ECM | All functions inhibited. |

# Type "PXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **P001** | P001:PWR FAULT<br>SW PWR1:BAT- | Short circuit of the switched power #1 circuit to battery negative. | • Short circuit in switched power #1, down limit switch, pothole limit switch, digital tilt switch harness<br>• GCON ECM | All functions inhibited. |
| **P003** | P003:PWR FAULT<br>SW PWR1:BAT+ | Short circuit of the switched power #1 circuit to battery positive. | • Short circuit in switched power #1, down limit switch, pothole limit switch, digital tilt switch harness<br>• GCON ECM | All functions inhibited. |
| **P004** | P004:DEVICEFAULT<br>HORN:BAT- | Short circuit of the automotive horn circuit to battery negative. | • Short circuit in automotive horn harness<br>• Automotive horn short circuit<br>• GCON ECM | Automotive horn inhibited. |
| **P005** | P005:DEVICEFAULT<br>HORN:OPEN | Open circuit of the automotive horn circuit. | • Open circuit in automotive horn harness<br>• Automotive horn open circuit<br>• GCON ECM | Automotive horn inhibited. |
| **P006** | P006:DEVICEFAULT<br>HORN:BAT+ | Short circuit of the automotive horn circuit to battery positive. | • Short circuit in automotive horn harness<br>• Automotive horn short circuit<br>• GCON ECM | Automotive horn inhibited. |
| **P007** | P007:DEVICEFAULT<br>GCON ALARM:BAT- | Short circuit of the GCON alarm circuit to battery negative. | • Short circuit in GCON alarm harness<br>• GCON alarm short circuit<br>• GCON ECM | GCON alarm inhibited. |
| **P009** | P009:DEVICEFAULT<br>GCON ALARM:BAT+ | Short circuit of the GCON alarm circuit to battery positive. | • Short circuit in GCON alarm harness<br>• GCON alarm short circuit<br>• GCON ECM | GCON alarm inhibited. |
| **P013** | P013:PWR FAULT<br>PCON PWRET:BAT- | Short circuit of the PCON power return circuit to battery negative. | • Short circuit in PCON power return harness<br>• GCON ECM | All functions inhibited. |
| **P015** | P015:PWR FAULT<br>PCON PWRET:BAT+ | Short circuit of the PCON power return circuit to battery positive. | • Short circuit in PCON power return harness<br>• GCON ECM | All functions inhibited. |
| **P018** | 018:PWR FAULT<br>PCON POWER:BAT- | Short circuit of the PCON power circuit to battery negative. | • Short circuit in PCON power harness<br>• GCON ECM | All functions inhibited. |
| **P019** | 018:PWR FAULT<br>PCON POWER:BAT+ | Short circuit of the PCON power circuit to battery positive. | • Short circuit in PCON power harness<br>• GCON ECM | All functions inhibited. |

# Type "UXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **U001** | U001:SWITCHFAULT GCON MAIN FTN EN | Short circuit of the GCON main function enable switch at system startup. | • Short circuit of the GCON main function enable switch<br>• GCON ECM | All GCON functions inhibited. |
| **U002** | U002:SWITCHFAULT GCON PLAT UP | Short circuit of the GCON up directional switch at system startup. | • Short circuit of the GCON up directional switch<br>• GCON ECM | All GCON functions inhibited except platform down. |
| **U003** | U003:SWITCHFAULT GCON PLAT DOWN | Short circuit of the GCON down directional switch at system startup. | • Short circuit of the GCON down directional switch<br>• GCON ECM | All GCON functions inhibited except platform up. |
| **U004** | U004:SWITCHFAULT GCON LCD UP | Short circuit of the GCON LCD scroll up switch at system startup. | • Short circuit of the GCON LCD scroll up switch<br>• GCON ECM | All GCON LCD menu functions inhibited. |
| **U005** | U005:SWITCHFAULT GCON LCD DOWN | Short circuit of the GCON LCD scroll down switch at system startup. | • Short circuit of the GCON LCD scroll down switch<br>• GCON ECM | All GCON LCD menu functions inhibited. |
| **U006** | U006:SWITCHFAULT GCON LCD ENTER | Short circuit of the GCON LCD enter switch at system startup. | • Short circuit of the GCON LCD enter switch<br>• GCON ECM | All GCON LCD menu functions inhibited. |
| **U007** | U007:SWITCHFAULT GCON LCD ESCAPE | Short circuit of the GCON LCD escape switch at system startup. | • Short circuit of the GCON LCD escape switch<br>• GCON ECM | All GCON LCD menu functions inhibited. |
| **U014** | U014:SWITCHFAULT PCON DRIVE EN | Short circuit of the PCON drive enable switch at system startup. | • Short circuit of the PCON drive enable switch<br>• GCON ECM | All PCON drive and steer functions inhibited. |
| **U015** | U015:SWITCHFAULT PCON STEER LEFT | Short circuit of the PCON steer left switch at system startup. | • Short circuit of the PCON steer left switch<br>• GCON ECM | All PCON drive and steer functions inhibited. |
| **U016** | U016:SWITCHFAULT PCON STEER RIGHT | Short circuit of the PCON steer right switch at system startup. | • Short circuit of the PCON steer right switch<br>• GCON ECM | All PCON drive and steer functions inhibited. |
| **U017** | U017:SWITCHFAULT PCON HORN | Short circuit of the PCON horn switch at system startup. | • Short circuit of the PCON horn switch<br>• GCON ECM | PCON horn switch function inhibited. |
| **U018** | U018:SWITCHFAULT PCON LO DRIV SPD | Short circuit of the PCON low drive speed switch at system startup. | • Short circuit of the PCON low drive speed switch<br>• GCON ECM | The machine is limited to low drive speed. |
| **U019** | U019:SWITCHFAULT PCON LO LIFT SPD | Short circuit of the PCON low lift speed switch at system startup. | • Short circuit of the PCON low lift speed switch<br>• GCON ECM | PCON platform up & down functions inhibited. |

# Type "UXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **U020** | U020:SWITCHFAULT PCON HI LIFT SPD | Short circuit of the PCON high lift speed switch at system startup. | • Short circuit of the PCON hi lift speed switch<br>• GCON ECM | PCON platform up & down functions inhibited. |
| **U021** | U021:SWITCHFAULT PCON UP | Short circuit of the PCON up directional switch at system startup. | • Short circuit of the PCON up directional switch<br>• GCON ECM | PCON platform up function inhibited. |
| **U022** | U022:SWITCHFAULT PCON DOWN | Short circuit of the PCON down directional switch at system startup. | • Short circuit of the PCON down directional switch<br>• GCON ECM | PCON platform down functions inhibited. |
| **U033** | U033:JSTICKFAULT OUT OF CAL RANGE | PCON drive joystick signal is outside acceptable calibration range at system startup. | • PCON drive joystick is not in neutral position at startup<br>• PCON joystick<br>• GCON ECM | All PCON drive and steer functions inhibited. |
| **U034** | U034:JSTICKFAULT OUT OF RANGE:HI | Short circuit of the PCON drive joystick signal to battery positive at system startup. | • Short circuit of PCON drive joystick signal circuit<br>• PCON joystick<br>• GCON ECM | All PCON drive and steer functions inhibited. |
| **U035** | U035:JSTICKFAULT OUT OF RANGE:LO | Short circuit of the PCON drive joystick signal to battery negative at system startup. | • Short circuit of PCON drive joystick signal circuit<br>• PCON joystick<br>• GCON ECM | All PCON drive and steer functions inhibited. |
| **U036** | U036:SWITCHFAULT GCON + PCON:ON | Mis-wiring or short circuit of GCON key switch. | • Short circuit of the PCON drive enable switch<br>• GCON ECM | All functions inhibited. |
| **U037** | U037:SWITCHFAULT FOOTSW PRESSED | Foot switch pressed at machine startup. | • Short circuit in the foot switch harness<br>• Foot switch<br>• GCON ECM | All functions inhibited. |
| **U038** | U038:SWITCHFAULT FOOTSWITCH:BAT+ | Mis-wiring or short circuit of foot switch to battery positive. | • Short circuit in the foot switch harness<br>• Foot switch<br>• GCON ECM | All functions inhibited. |
| **U039** | U039:SWITCHFAULT FOOTSW:OPEN/BAT- | Mis-wiring, open or short circuit of foot switch to battery negative. | • Short circuit in the foot switch harness<br>• Foot switch<br>• GCON ECM | All functions inhibited. |
| **U040** | U040:SWITCHFAULT FOOTSW:TIMEOUT | PCON deck switch pressed at machine startup. | • Short circuit in the foot switch harness<br>• Foot switch<br>• GCON ECM | All functions inhibited. |

# Type "FXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **F003** | F003:SWITCHFAULT DOWN LIMIT1:BAT+ | Short circuit of the down limit #1 switch at system startup. | • Short circuit of the down limit switch circuit.<br>• Down limit #1 switch short circuit<br>• GCON ECM | All functions inhibited except platform down. |
| **F005** | F005:SWITCHFAULT POTHOLE:BAT+ | Short circuit of the pothole limit #1 switch at system startup. | • Short circuit of the pothole switch circuit.<br>• Pothole limit #1 switch short circuit<br>• GCON ECM | All functions inhibited except platform down as long as machine is in the elevated position. If machine is in stowed position, all functionality is resumed. |
| **F007** | F007:SWITCHFAULT CHASSISTILT:BAT+ | Short circuit of the chassis digital tilt switch at system startup. | • Short circuit of the chassis digital tilt switch circuit.<br>• Chassis digital tilt switch short circuit<br>• GCON ECM | All functions inhibited except platform down as long as machine is in the elevated position. If machine is in stowed position, all functionality is resumed. |
| **F008** | F008:SENSORFAULT OVLD XDUCER:BAT+ | Short circuit of the Platform Overload Transducer circuit to battery positive. | • Short circuit in the transducer circuit.<br>• Faulty pressure transducer<br>• GCON ECM | All functions inhibited. |
| **F009** | F009:SENSORFAULT OVLD XDUCER:BAT- | Short circuit of the Platform Overload Transducer circuit to battery negative. | • Short circuit in the transducer circuit.<br>• Faulty pressure transducer<br>• GCON ECM | All functions inhibited. |
| **F010** | F010:SENSORFAULT PLAT HEIGHT:BAT+ | Short circuit of the Platform Height Sensor circuit to battery positive. | • Short circuit in the platform height circuit.<br>• Faulty platform height sensor<br>• GCON ECM | All functions inhibited except platform down as long as machine is in the elevated position. If machine is in stowed position, all functionality is resumed. |
| **F011** | F011:SENSORFAULT PLAT HEIGHT:BAT- | Short circuit of the Platform Height Sensor circuit to battery negative. | • Short circuit in the platform height circuit.<br>• Faulty platform height sensor<br>• GCON ECM | All functions inhibited except platform down as long as machine is in the elevated position. If machine is in stowed position, all functionality is resumed. |
| **F031** | F031:SWITCHFAULT OAC SWITCH:BAT+ | Short circuit of the obstruction above chassis switch to battery positive. | • Short circuit of the obstruction above chassis switch to battery positive.<br>• GCON | All functions inhibited. |
| **F034** | F034:SENSORFAULT OVLD:PLAT HEIGHT | Height Sensor settings are not calibrated correctly. | • Short circuit in the level roll sensor circuit.<br>• Faulty level sensor<br>• GCON ECM | All functions inhibited. |
| **F035** | F035:SENSORFAULT OVLD RANGE:LOW | Height Sensor setting is lower than calibrated stowed height. | • Short circuit in the level roll sensor circuit.<br>• Faulty level sensor<br>• GCON ECM | All functions inhibited. |
| **F036** | F036:SENSORFAULT OVLD RANGE:HI | Height Sensor setting is higher than calibrated maximum height. | • Short circuit in the left front outrigger sensor circuit.<br>• Faulty pressure transducer<br>• GCON ECM | All functions inhibited. |
| **F072** | F072:SENSORFAULT FUNCTION CUT B+ | Function Cutout sensor B+ fault. | • Short circuit in the left front outrigger sensor circuit.<br>• Faulty pressure transducer<br>• GCON ECM | All functions inhibited. |
| **F073** | F073:SENSORFAULT DECK SENSOR B+ | Power Deck sensor B+ fault. | • Short circuit in the right front outrigger sensor circuit.<br>• Faulty pressure transducer<br>• GCON ECM | All functions inhibited. |

# Type "CXXX" Faults

| DTC Number | Message on GCON LCD | Problem Description | Possible Causes | Failure Mode |
|---|---|---|---|---|
| **C001** | C001:GCON ECM FAULT TYPE 1 | GCON ECM CRC check error. | • Incorrect software file<br>• GCON ECM internal failure | All functions inhibited. |
| **C004** | C004:GCON ECM FAULT TYPE 4 | GCON ECM master switch error. | • Short circuit in the master switch circuit<br>• GCON ECM | All functions inhibited. |
| **C005** | C005:GCOM ECM FAULT TYPE 5 | GCON ECM safety switch error. | • Short circuit in the safety switch circuit<br>• GCON ECM | All functions inhibited. |
| **C006** | C006:GCON ECM FAULT TYPE 6 | GCON input redundancy error. | • Input conditioning circuit failure<br>• GCON ECM | All functions inhibited. |
| **C007** | C007:GCON ECM FAULT TYPE 7 | GCON ECM inter-processor communication error. | • Incorrectly programmed device<br>• Error in loading software device<br>• GCON ECM | All functions inhibited. |
| **C011** | C011:PCON ECM FAULT FAULT TYPE 11 | PCON ECM check failure. | • PCON ECM | All functions inhibited. |
| **C021** | C021:PCON NOT DETECTED | PCON not detected error. | • PCON is missing<br>• Communication bus failure<br>• GCON or PCON ECM | All functions inhibited. |
| **C023** | C023:MACHINE MODEL FAULT | Discrepancy between model detected and model programmed. | • Incorrect machine model programmed<br>• GCON or PCON ECM | All functions inhibited. |
| **C025** | C025:SYSTEMFAULT PLAT OVLD:NOCAL | Platform overload system not calibrated. | • Platform overload system not calibrated<br>• GCON or PCON ECM | All functions inhibited. |
| **C028** | C028: SERVICE OVERRIDE MODE ON | Machine is in service override mode. | • Machine programmed for use in service override mode. | All functions inhibited except for down function and up function. PI can be elevated once, with the maximum elevate time of X seconds. Elevate time X, depends on machinE model. |

# Schematics

## Observe and Obey:

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

## Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

## About This Section

There are two groups of schematics in this section.

### Electrical Schematics

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

### Hydraulic Schematics

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

# Electrical Component and Wire Color Legends

| ELECTRICAL COMPONENT LEGEND | |
|---|---|
| **Item** | **Description** |
| B5 | Batteries |
| | B5 = Battery Pack 24V DC, 4 each @ 6V DC |
| C | Connector |
| | C1 = Anderson Connector<br>C2 = PCON Cable Connector<br>C3 = PCON Coil Cord Connector<br>C4 = Power Control (J1)<br>C5 = Sensors & Switches (J3)<br>C6 = Function Manifold (J2)<br>C7 = Sensor Power Bus<br>C8 = Sensor Ground Bus<br>C9 = Pot Hole Limit Switch<br>C10 = Down Limit Switch<br>C11 = Level Sensor<br>C12 = Function Manifold Ground Bus<br>C13 = Drive Reverse Coil<br>C14 = Drive Forward Coil<br>C15 = Steer Right Coil<br>C16 = Steer Left Coil<br>C17 = Platform Up Coil<br>C18 = Platform Down Coil<br>C21 = Load Sense Ground Bus<br>C22 = Parallel Coil<br>C25 = Powered Extension Deck (J4) (option)<br>C41 = Platform Control Bus<br>C43 = Key Switch, Platform Mode<br>C44 = Key Switch, Emergency Stop<br>C45 = Automotive Style Horn + C46 = Emergency Stop<br>C47 = GCON Alarm +<br>C48 = Circuit Breaker, MTR V+<br>C49 = Emergency Stop, ECM Driver V+<br>C50 = Circuit Breaker, ECM Driver V+<br>C51 = Key Switch, Ground Mode<br>C52 = GCON Alarm –<br>C53 = Automotive Style Horn –, (option)<br>C77 = Selector Switch, Emergency Stop (option)<br>C86 = Extension Deck Sensors, V+<br>C87 = Powered Extension Deck Limit Switch (option)<br>C88 = Powered Extension Deck Manifold Ground Bus (option)<br>C89 = Powered Extension Deck Enable Coil (option)<br>C90 = Powered Extension Deck Extend Coil (option)<br>C91 = Powered Extension Deck Retract Coil (option)<br>C92 = Extension Deck Cable Connector<br>C93 = Front Entry Gate Proximity Switch<br>C95 = Rear Entry Gate Proximity Switch<br>C77 = Foot Switch Cable (option)<br>C102 = Foot Switch (option) |

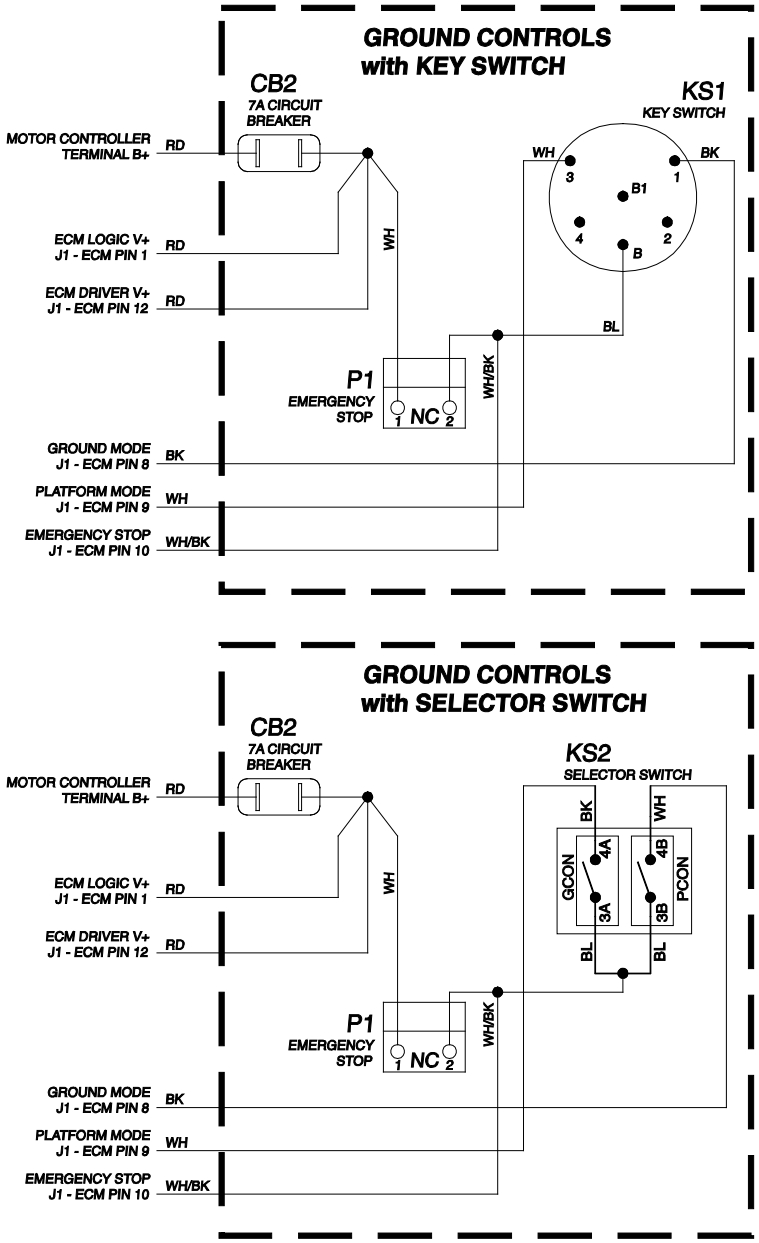
| ELECTRICAL COMPONENT LEGEND cont. | |
|---|---|
| **Item** | **Description** |
| CB2 | Circuit Breaker, 7A |
| D | Diode |
| | D1 = Motor Controller Enable -, 3A<br>D2 = Motor Controller Enable +, 3A |
| E | Enclosure |
| | EN1 = Platform Control Box<br>EN4 = AC Outlet Box |
| F6 | Fuse, 275A |
| FB | Flashing Beacon (option) |
| FS1 | Foot Switch (option) |
| GND | Ground Stud |
| H | Horn or Alarm |
| | H1 = Horn or Alarm<br>H2 = Automotive Style Horn (option)<br>H5 = Multifunction Alarm |
| J | Connector Plug |
| | J1 = Power Control (U5)<br>J2 = Function Manifold (U5)<br>J3 = Sensors & Switches (U5)<br>J4 = Outriggers (U5) GS-3232)<br>J5 = PCON Coil Cord to Platform Controls PC Board<br>J6 = PCON Emergency Stop & Alarm to Platform Controls PC Board<br>J7 = Joystick to Platform Controls PC Board |

# Electrical Component and Wire Color Legends

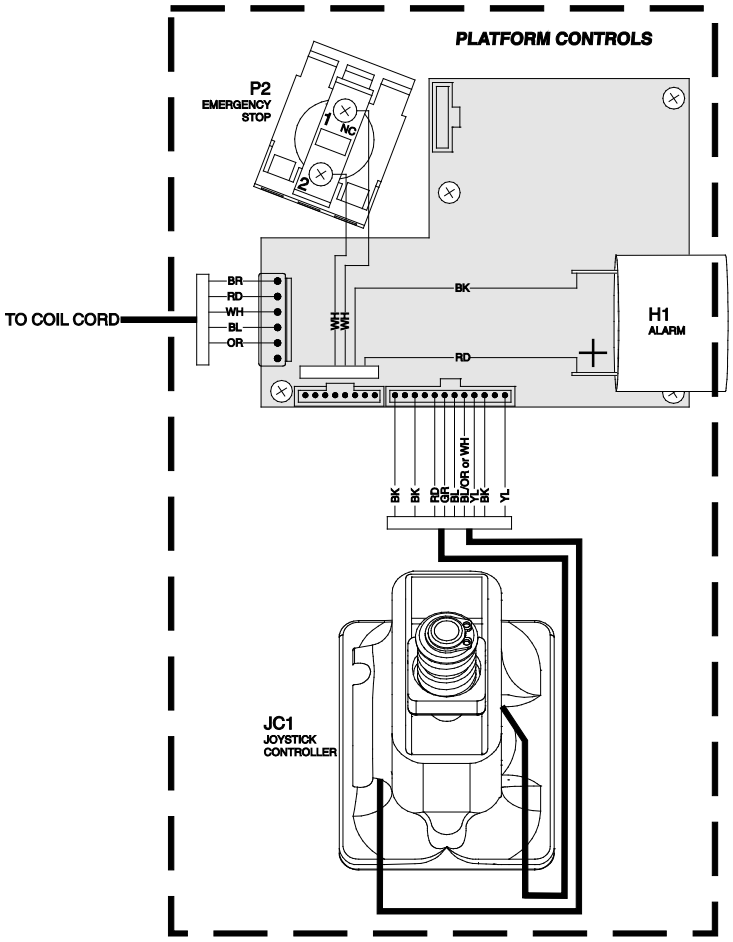
| ELECTRICAL COMPONENT LEGEND cont. | |
|---|---|
| **Item** | **Description** |
| JC9 | Joystick Controller |
| K1 | Contactor, Motor Controller Power, N.O.H.C. |
| KS1 | KS1 = Key Switch<br>KS2 = Keyless Selector Switch |
| LS | Limit Switch |
| | LS6 = Platform Down<br>LS7 = Pothole<br>LS8 = Pothole<br>LS29 = Extension Deck<br>LS30 = Quick disconnect (no charger option) |
| M5 | Hydraulic Power Unit |
| N.C. | Normally Closed |
| N.C.H.O | Normally Closed Held Open |
| N.O.H.C. | Normally Open Held Closed |
| P | Power Switch |
| | P1 = Emergency Stop Button at Ground Controls<br>P2 = Emergency Stop Button at Platform Controls |
| PX | Proximity Switch |
| | PX3 = Front Gate<br>PX4 = Rear Gate |
| Q21 | Quick disconnect (no charger option) |
| R30 | Resistor, 20 Ohm, 10W |
| S7 | Sensor |
| U | Electronic Component |
| | U3 = PCON Printed Circuit Board<br>U5 = Electronic Control Module<br>U6 = Motor Controller<br>U9 = Battery Charger<br>U13 = Voltage Inverter (option) |
| Y | Valve Coil |
| | Y1 = Parallel<br>Y3 = Steer Right<br>Y4 = Steer Left<br>Y5 = Drive Reverse<br>Y6 = Drive Forward<br>Y7 = Platform Down<br>Y8 = Platform Up<br>Y10 = Extend, Powered Extension Deck (option)<br>Y11 = Retract, Powered Extension Deck (option)<br>Y52 = Enable, Powered Extension Deck (option) |

| WIRE COLOR LEGEND | |
|---|---|
| **Color** | **Description** |
| BK | Black |
| BK/RD | Black/Red |
| BL | Blue |
| BL/BK | Blue/Black |
| BL/OR | Blue/Orange |
| BL/WH | Blue/White |
| BR | Brown |
| GR | Green |
| GR/BK | Green/Black |
| GR/WH | Green/White |
| GR/YL | Green/Yellow |
| LB | Light Blue |
| OR | Orange |
| OR/BK | Orange/Black |
| OR/RD | Orange/Red |
| OR/WH | Orange/White |
| RD | Red |
| RD/BK | Red/Black |
| RD/WH | Red/White |
| WH | White |
| WH/BK | White/Black |
| YL | Yellow |

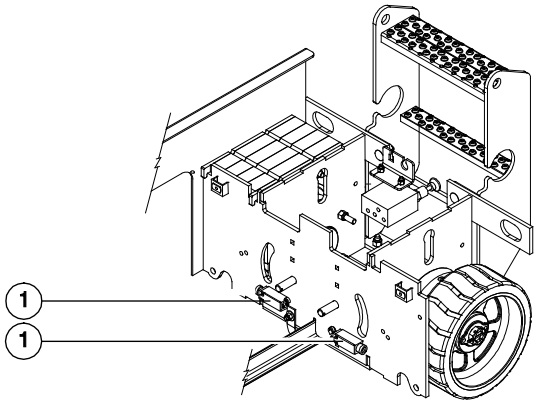
# Wiring Diagram Ground Controls

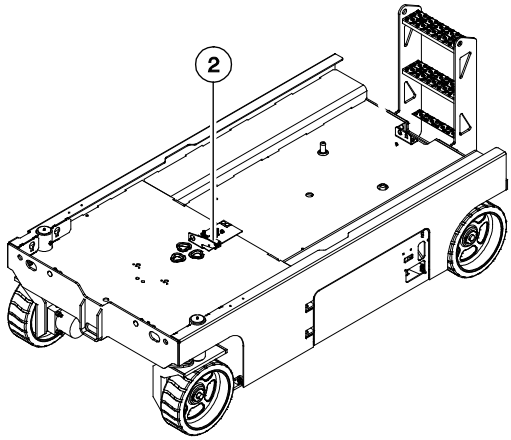


# Wiring Diagram Platform Controls



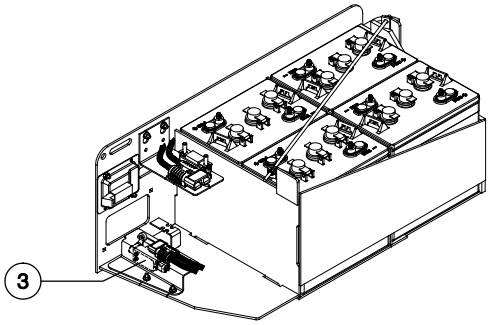
# Limit Switch Legend



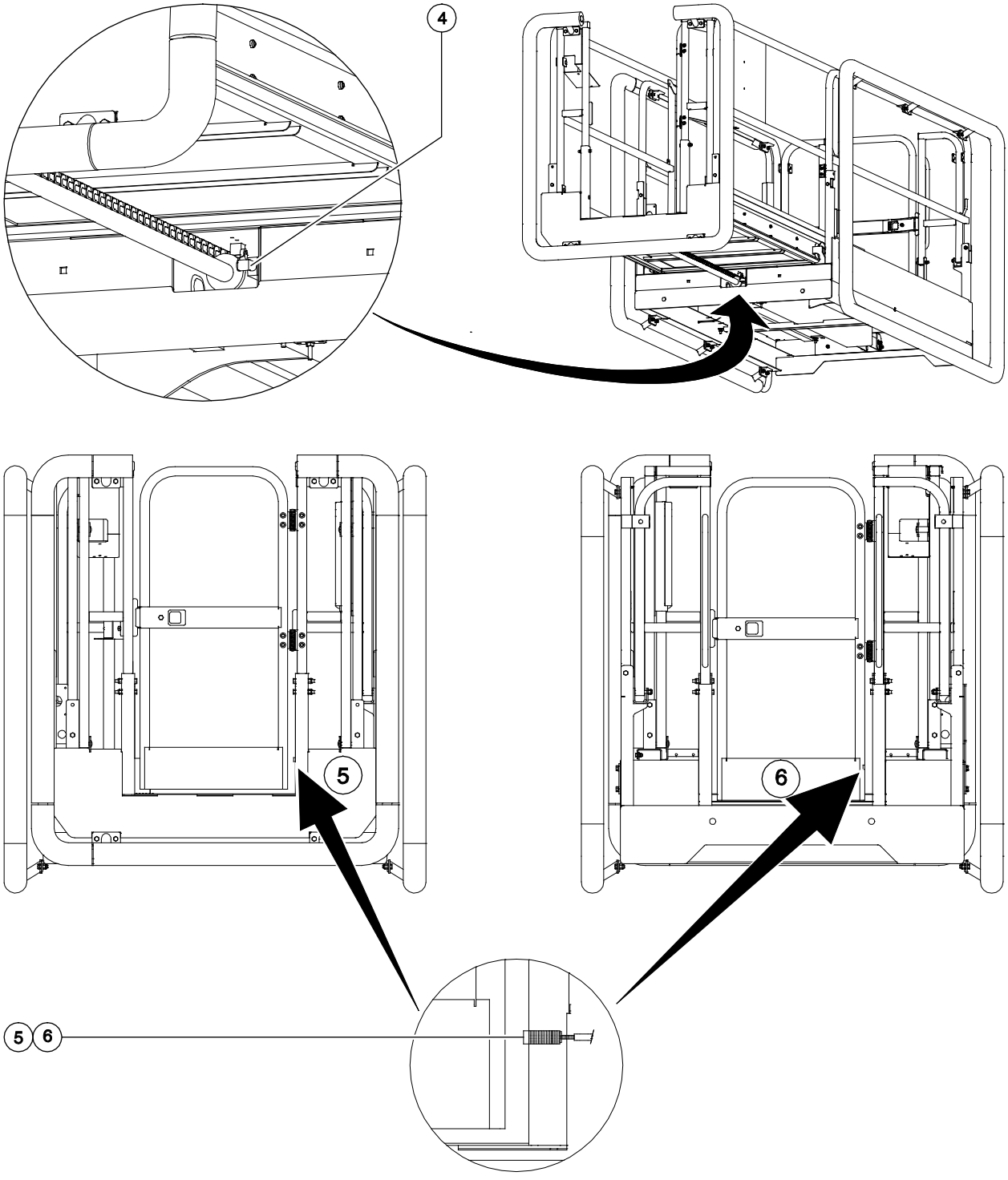




Limit Switch Legend

1 pothole switches LS7, LS8
2 down limit switch LS6
3 quick disconnect limit switch LS30 (no charger option)
4 powered extension deck LS29 (option)
5 front gate PX3 (steer end)
6 rear gate PX4 (non-steer end)

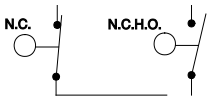


# Limit Switch Legend

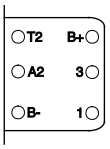


# Electrical Symbol Legend

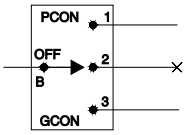

Wire with description or color



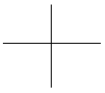

Limit Switch



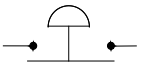

Motor controller



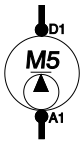

Key switch



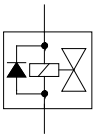
Circuits crossing no connection



Emergency Stop button



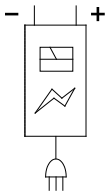

Motor



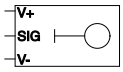
Solenoid valve with diode

Diode

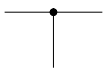
Circuit breaker




Battery charger



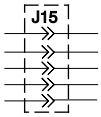

Level sensor



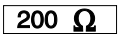
Circuit connection

Fuse

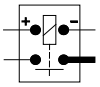

6V or 12V DC battery




Deutsch connector




Resistor




Contactor

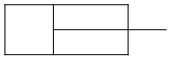
Horn or alarm

Flashing beacon


Platform height sensor


Pressure transducer

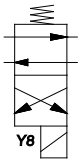
# Hydraulic Symbols Legend



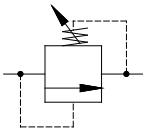
Hydraulic cylinder


Variable speed motor

Pressure transducer

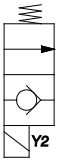



Solenoid operated
2 position 4 way
directional valve

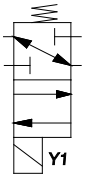


Relief valve

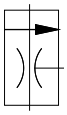
Bi-directional motor




Solenoid operated
2 position 2 way
blocking valve
normally open

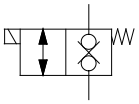



Solenoid operated
2 position 4 way
directional valve

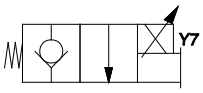


Priority flow regulator

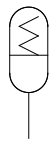
Brake



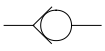
Solenoid operated
2 position 2 way valve
normally closed



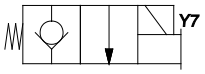

Proportional solenoid operated
2 position 2 way directional valve
normally closed



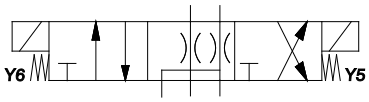
Accumulator



Check valve

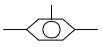



Solenoid operated
2 position 2 way
directional valve
normally closed

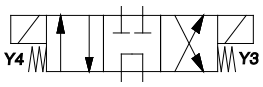



Solenoid operated
3 position 5 way
directional valve

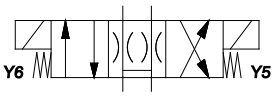
Fixed displacement
pump



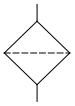
Shuttle valve




Solenoid operated 3 position
4 way directional valve



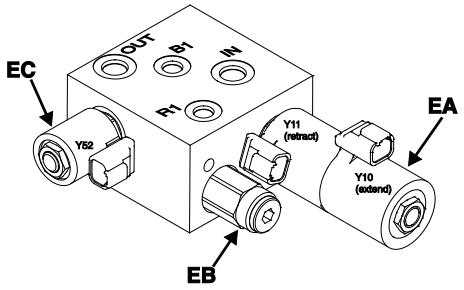

Solenoid operated 3 position 4 way
directional valve



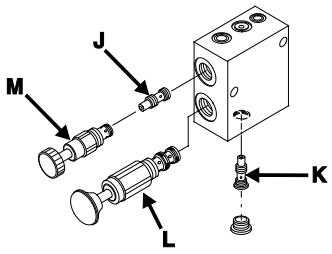
Filter


Orifice with size

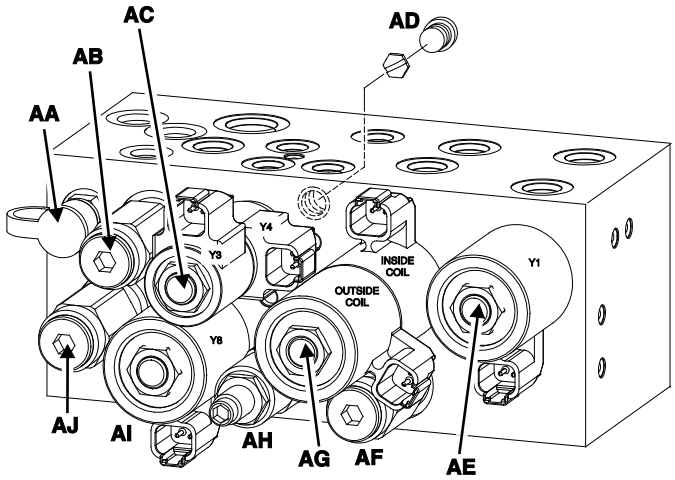
# Hydraulic Component Reference




**Powered extension deck manifold**



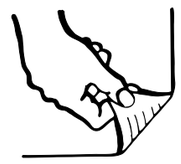

**Brake release manifold**




**Function manifold**

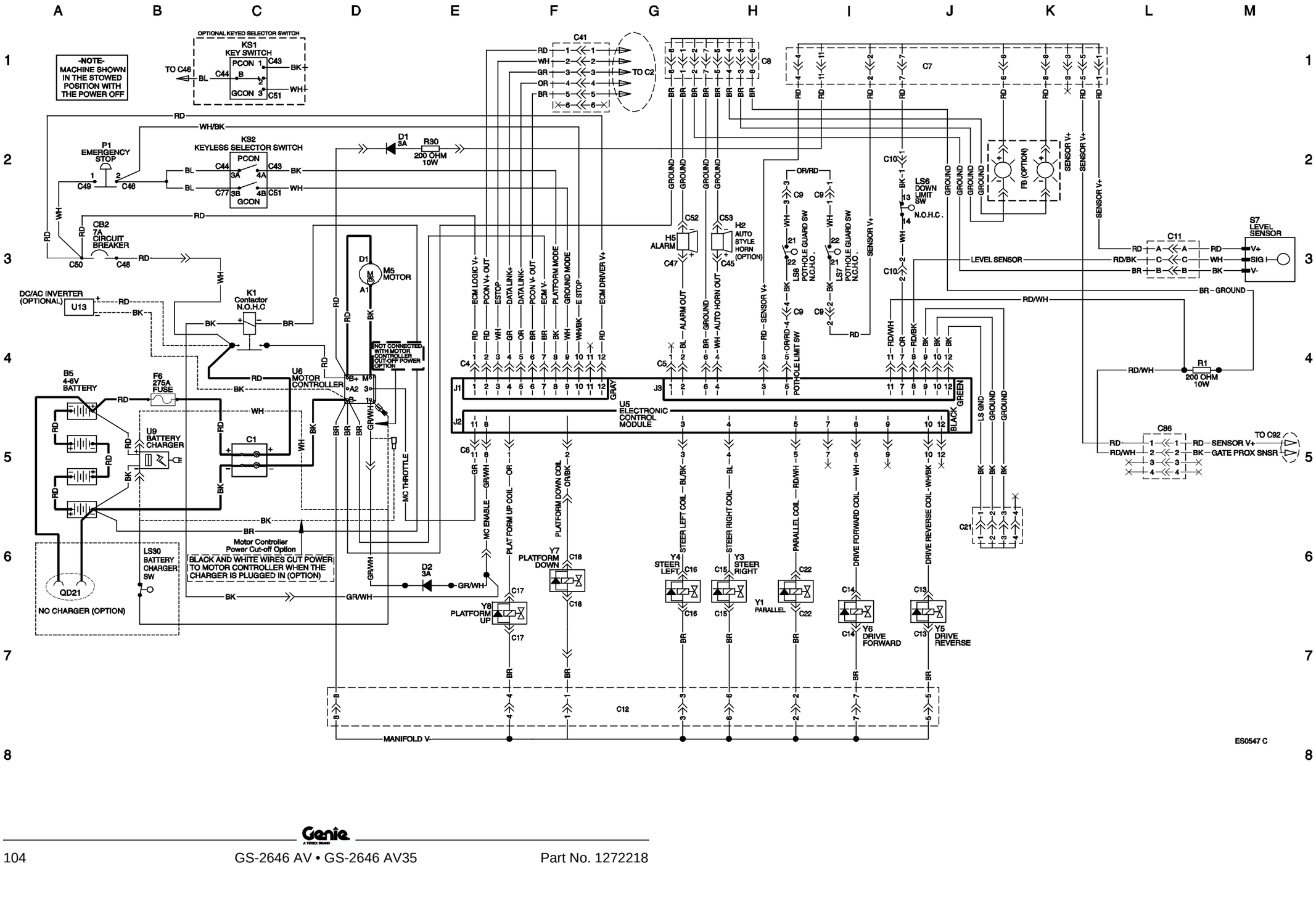
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

**(with manual extension deck) (from GS4612A-110000)**



# Electrical Schematic • GS-2646 AV and GS-2646 AV35

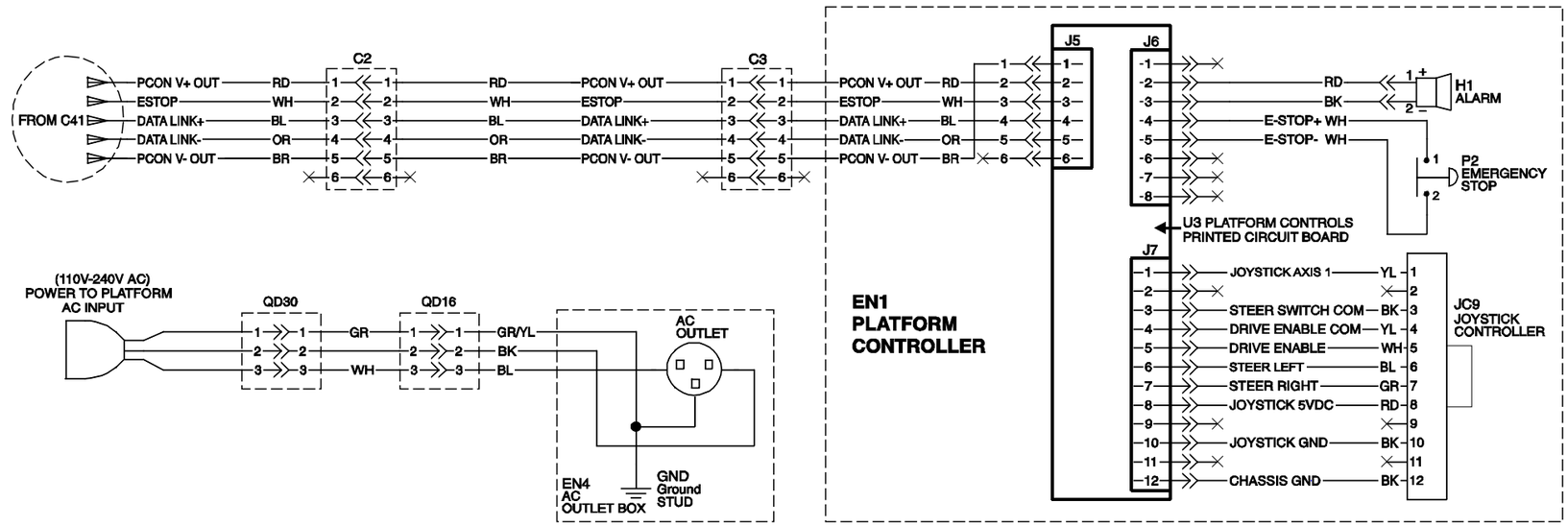
**(with manual extension deck) (from GS4612A-110000)**

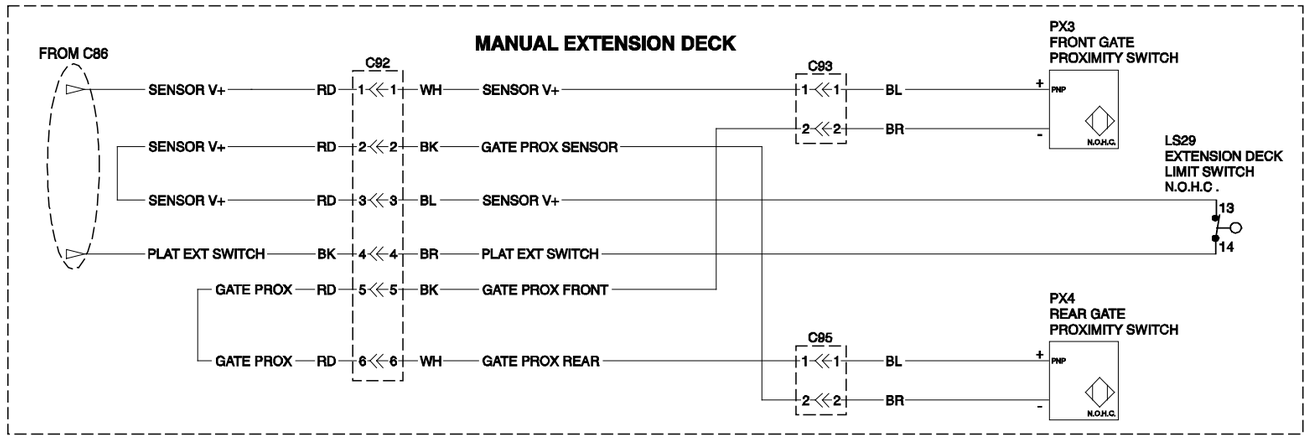


# Electrical Schematic • GS-2646 AV and GS-2646 AV35

## (with manual extension deck) (from GS4612A-110000)

**-NOTE-**
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

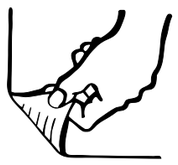



ES0547 C

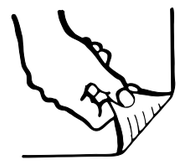
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

**(with manual extension deck) (from GS4612A-110000)**



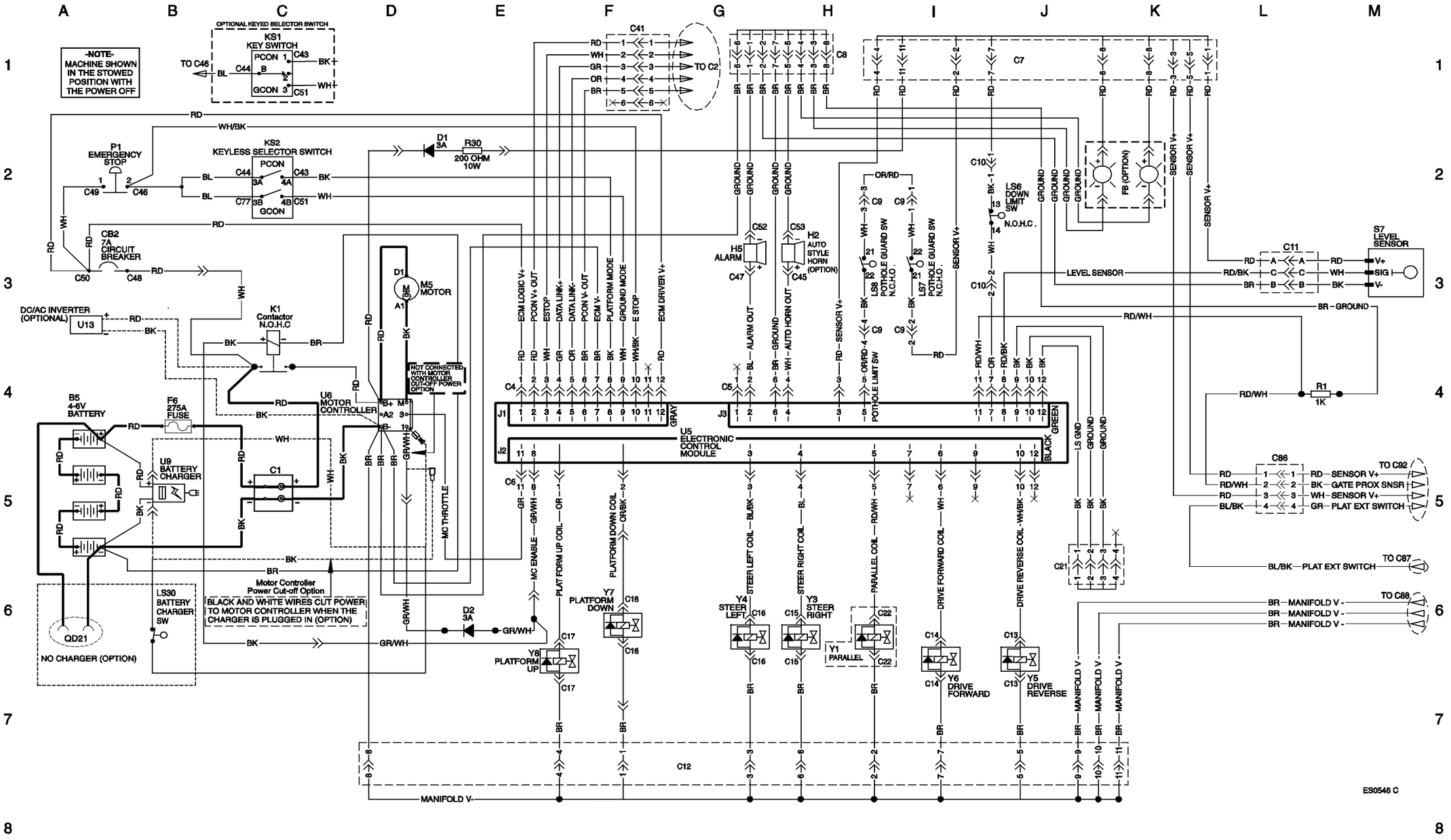
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

**(with powered extension deck) (from serial number GS4612A-110000)**



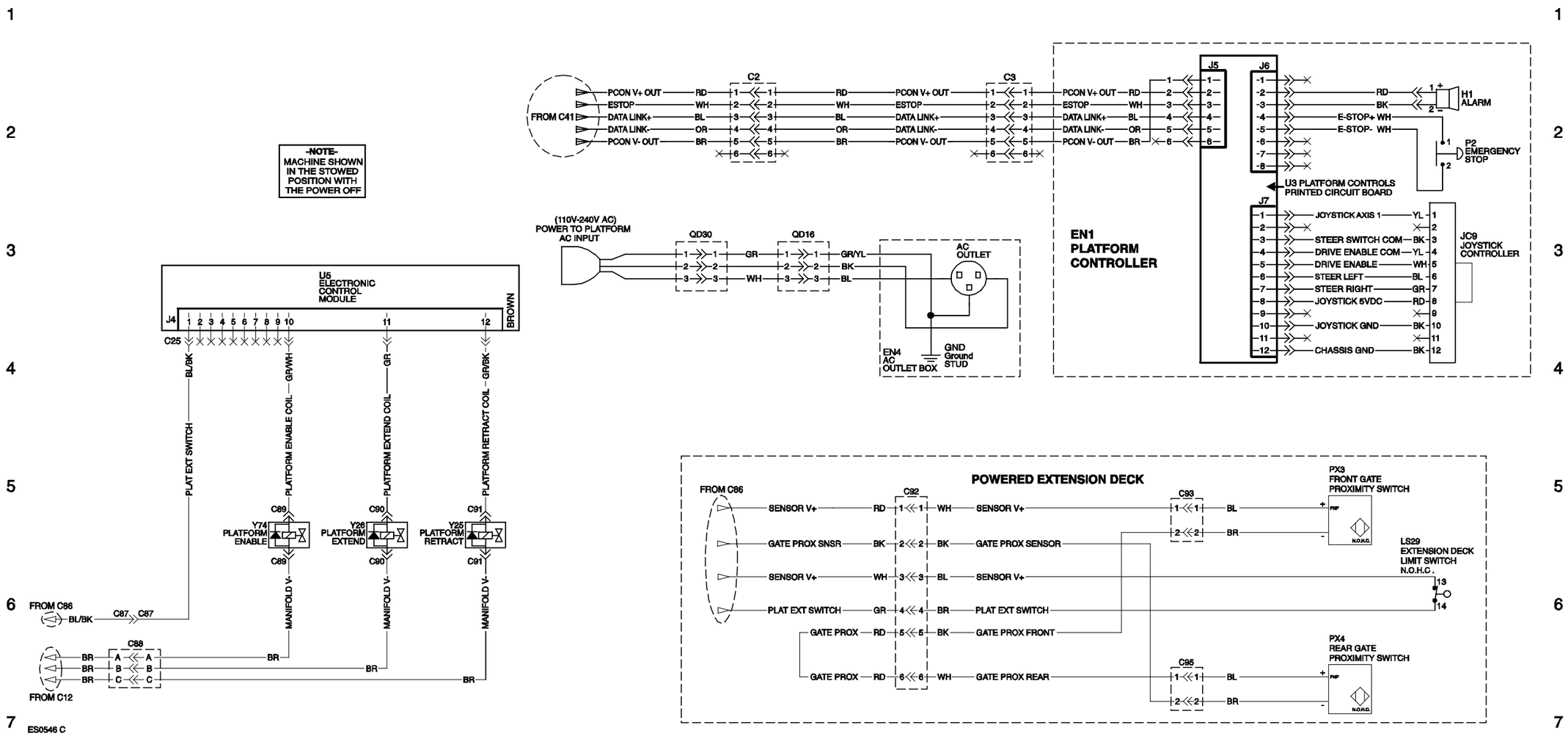
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

**(with powered extension deck) (from serial number GS4612A-110000)**



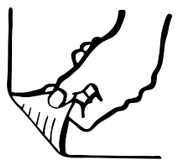
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

## (with powered extension deck) (from serial number GS4612A-110000)



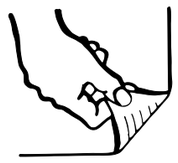
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

**(with powered extension deck) (from serial number GS4612A-110000)**



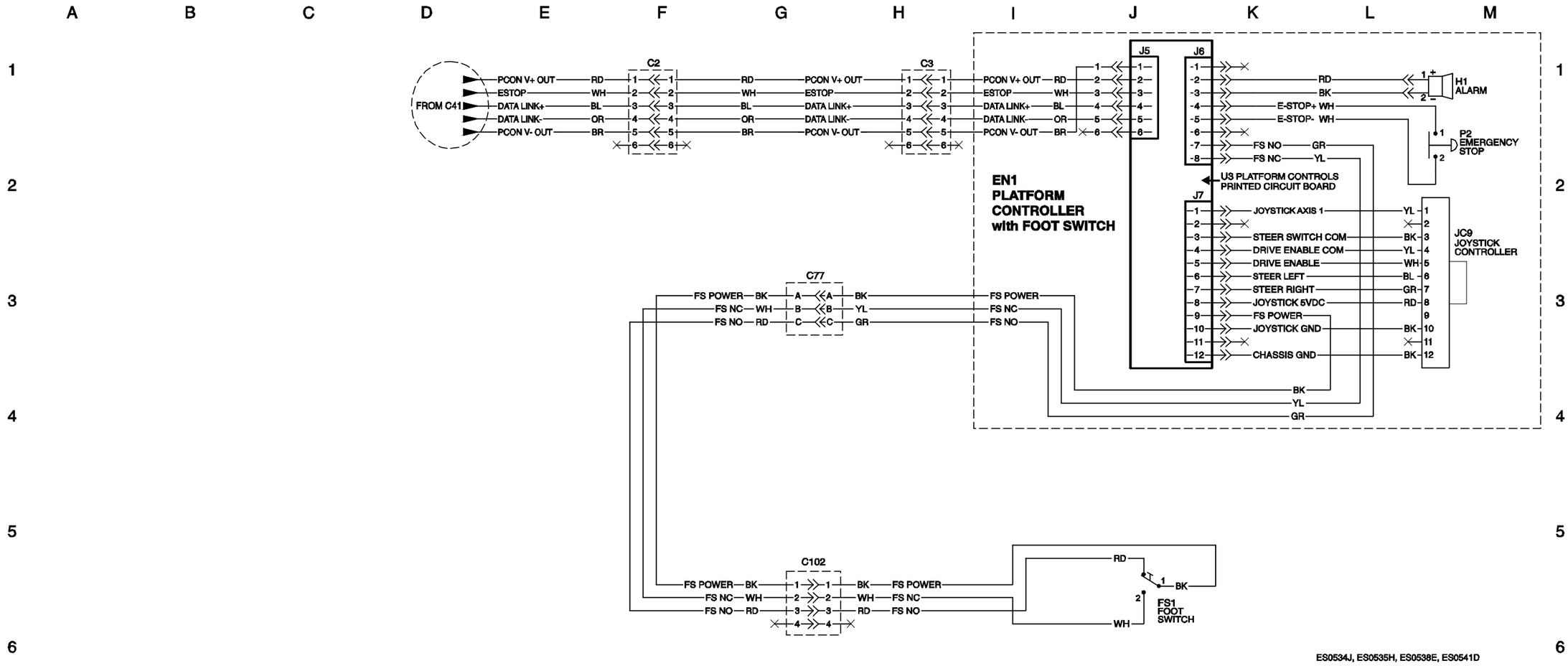
# Electrical Schematic • GS-2646 AV and GS-2646 AV35

**(foot switch option) (from serial number GS4612A-110000)**



# Electrical Schematic • GS-2646 AV and GS-2646 AV35

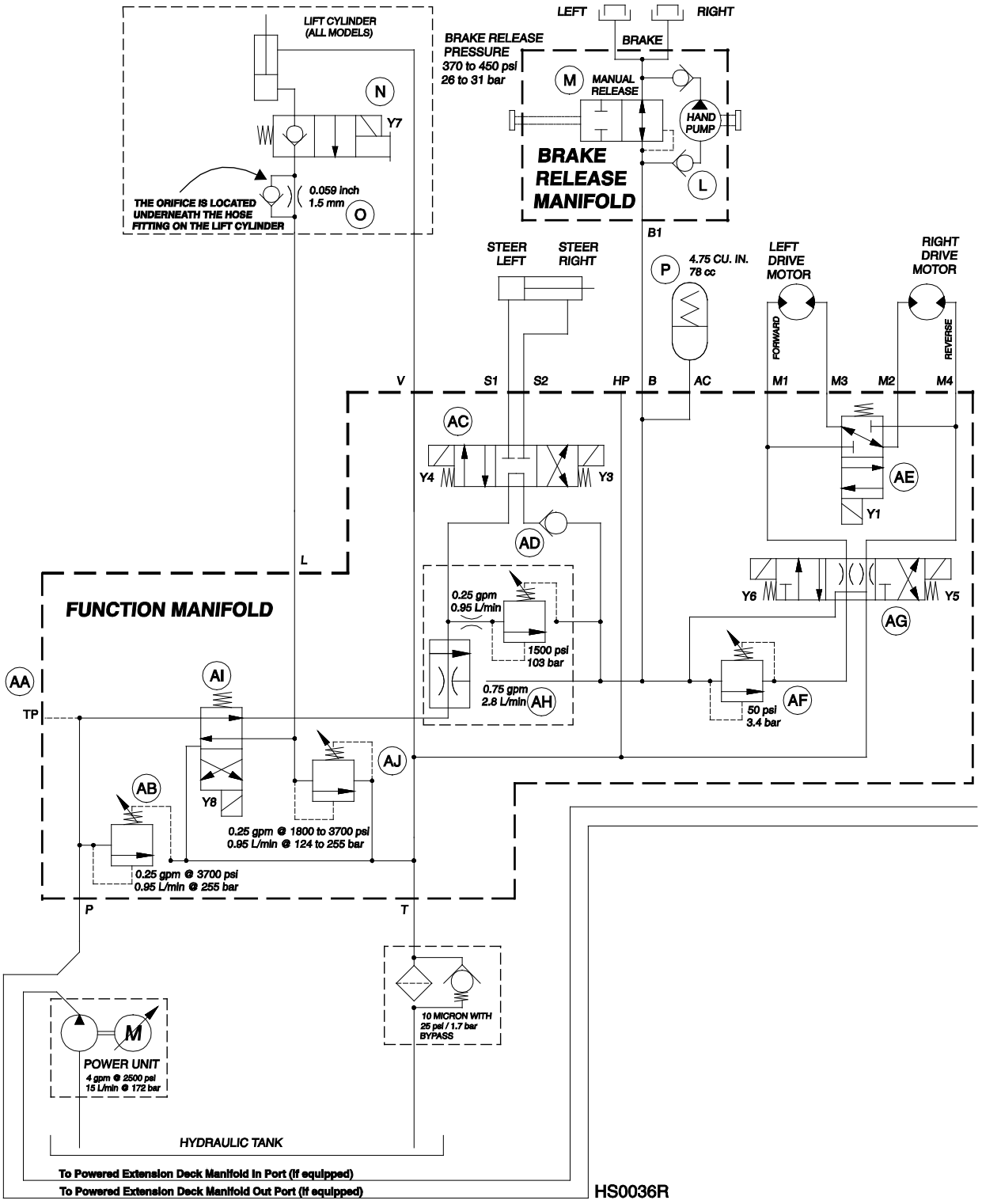
**(foot switch option) (from serial number GS4612A-110000)**




ES0534J, ES0535H, ES0538E, ES0541D

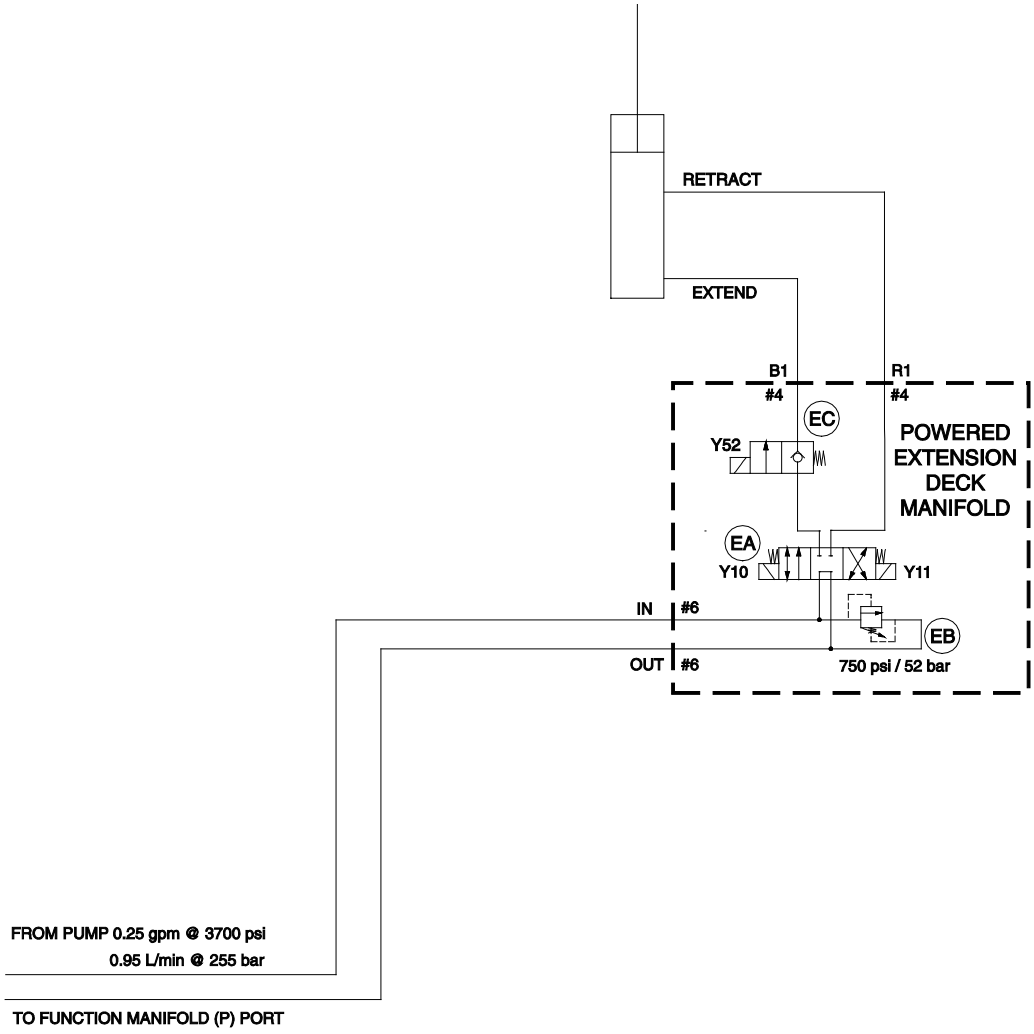
# Hydraulic Schematics

## Hydraulic Schematic



# Hydraulic Schematics

## Hydraulic Schematic, Powered Extension Deck Manifold



California Proposition 65

**WARNING**

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



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