Genie
A TEREX BRAND

Service Manual

Serial Number Range

GRC™-12

from GRC11-1000
to GRC16P-2369

from GRC16P-2370
to GRC16P-4599

from GRCP-4600
to GRCP-5999

Original Instructions
Part No. 1314708GT
Rev A
February 2022

Introduction

Important

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

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

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

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Third Edition, First Printing

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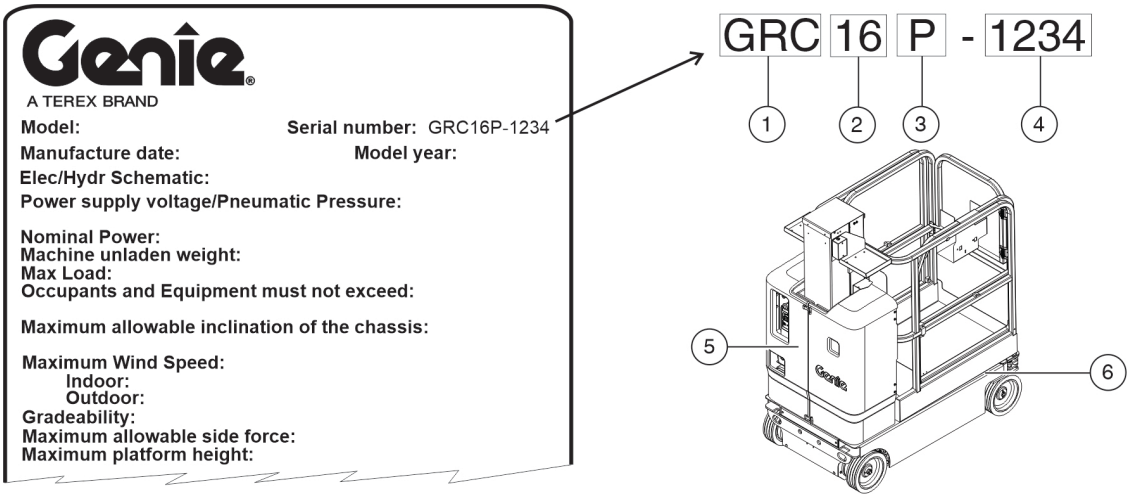
Revision History

Revision	Date	Section	Procedure / Page / Description
A	2/2022		Initial Release
Reference Examples:			
Section – Maintenance, B-3			**Electronic Version** Click on any content or procedure in the Table of Contents to view the update.
Section – Repair Procedure, 4-2			
Section – Fault Codes, All charts			
Section – Schematics, Legends and schematics			

Safety Rules

Serial Number Legend

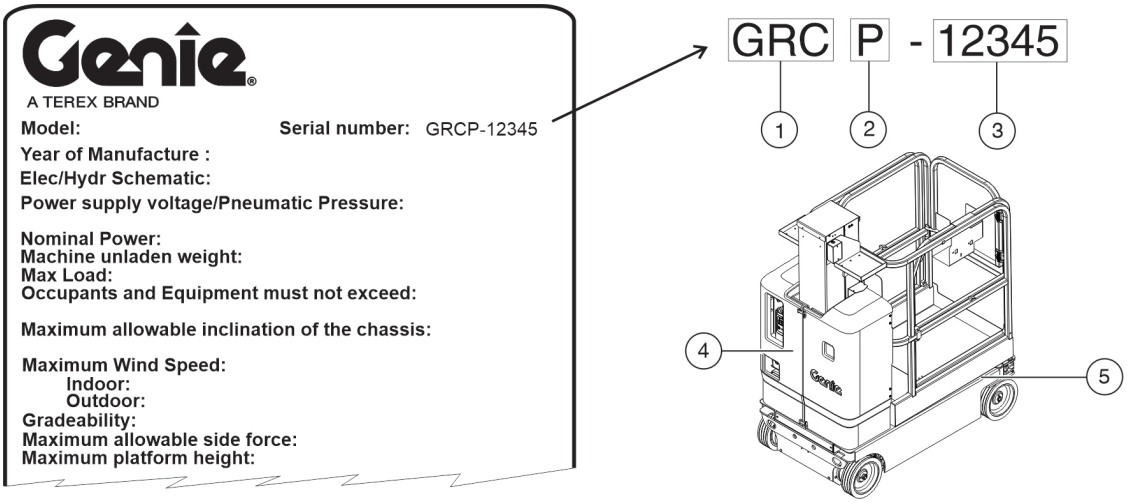
To August 31, 2016



1 Model
2 Model year
3 Facility code
4 Sequence number

5 Serial label (behind covers)
6 Serial number stamped on chassis

From September 1, 2016



1 Model
2 Facility code
3 Sequence number

4 Serial label (behind covers)
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 modify or alter a MEWP without prior written permission from the manufacturer.

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	225AH
Reserve capacity @ 25A rate	447 minutes
Weight, each	62 lbs 28 kg
Batteries, Maintenance-free (option)	
Voltage	6V DC
Group	GC2
Type	6V-AGM
Quantity	4
Battery capacity, maximum	200AH
Reserve capacity @ 25A rate	385 minutes
Weight, each	65 lbs 29 kg
DC Motor	
Voltage	24V
Horsepower	4.5 HP @ 2950 rpm
Kilowatts	3.3 kW @ 2950 rpm
Fluid capacities	
Hydraulic tank	1.5 gallons 5,7 liters
Hydraulic system (including tank)	2.2 gallons 8,3 liters
Tires and wheels	
Tire size (solid rubber)	10 x 3 in 25,4 x 7,62 cm
Castle nut torque, lubricated	150 ft-lbs 203 Nm

Performance Specifications

Drive speed, maximum	
Platform stowed, fast	2.5 mph 40 ft / 10.9 sec 4 km/h 12,2 m / 10,9 sec
Platform stowed, slow	1.1 mph 40 ft / 24.8 sec 1,8 km/h 12,2 m / 24,8 sec
Platform raised	0.5 mph 40 ft / 55 sec 0,8 km/h 12,2 m / 55 sec
Braking distance, maximum	
High range on paved surface	19 in ± 6 in 48 cm ± 15 cm
Gradeability	**See Operator's Manual**
Function speed, maximum from platform controls (with 1 person in platform)	
Platform up (fast mode)	10 to 14 seconds
Platform up (slow mode)	34 to 36 seconds
Platform down	14 to 18 seconds
Rated work load at full height, maximum	
Platform	500 lbs 227 kg

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

Specifications

Hydraulic Component Specifications

Function Pump	
Type	gear pump
Displacement per revolution	0.244 cu in 4 cc
Flow rate @ 2500 psi / 172 bar	4 gpm 15 L/min
Hydraulic tank return filter	10 micron with 25 psi / 1,7 bar bypass
Function manifold	
System relief valve pressure, maximum	3500 psi 241 bar
Lift relief valve pressure	1800 to 3500 psi 124 to 241 bar
Steer relief valve pressure	1500 psi 103 bar

Manifold Component Specifications

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

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

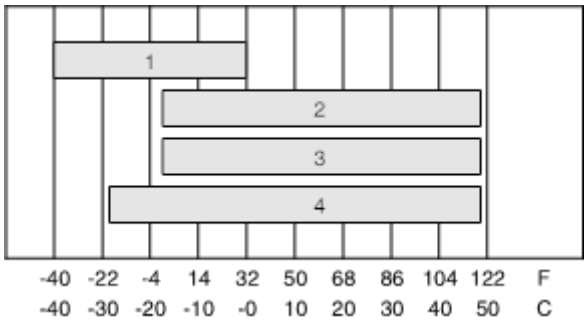
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond its maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

NOTICE

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

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

Hydraulic Fluid Temperature Range



Ambient air temperature

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

Specifications

Chevron Rando HD Premium Oil MV Fluid Properties

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

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

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

Chevron 5606A Hydraulic Oil Fluid Properties

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

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

NOTICE

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

Petro-Canada Environ MV 46 Fluid Properties

ISO Grade	46
Viscosity index	154
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C	 8.0 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 cSt @ 104°F / 40°C	 9 33.8
Brookfield Viscosity cSt @ -4°F / -20°C cSt @ -13°F / -25°C cSt @ -40°F / -40°C	 481 702.4 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 cSt @ 104°F / 40°C cSt @ 0°F / -18°C	 22 46 1300
Flash point	None
Pour point	-81°F / -63°C
Maximum continuous operating temperature	189°F / 87°C

Specifications

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	18 ft-lbs / 25 Nm
-6	30 ft-lbs / 41 Nm
-8	40 ft-lbs / 55 Nm
-10	60 ft-lbs / 81 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	150 ft-lbs / 205 Nm
-24	230 ft-lbs / 315 Nm

JIC 37° Fittings

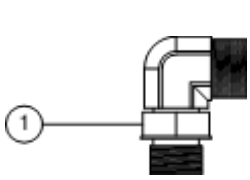
(swivel nut or hose connection)

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

SAE O-ring Boss Port

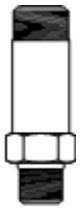
(tube fitting - installed into Aluminum)
(all types)

SAE Dash Size	Torque
-4	14 ft-lbs / 19 Nm
-6	23 ft-lbs / 31,2 Nm
-8	36 ft-lbs / 49 Nm
-10	62 ft-lbs / 84 Nm
-12	84 ft-lbs / 114 Nm
-16	125 ft-lbs / 169,5 Nm
-20	151 ft-lbs / 204,7 Nm
-24	184 ft-lbs / 249,5 Nm



Adjustable Fitting

1 jam nut



Non-adjustable fitting

SAE O-ring Boss Port

(tube fitting - installed into Steel)

SAE Dash Size		Torque
-4	ORFS / 37° (Adj) ORFS (Non-adj) 37° (Non-adj)	15 ft-lbs / 20,3 Nm 26 ft-lbs / 35,3 Nm 22 ft-lbs / 30 Nm
-6	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	35 ft-lbs / 47,5 Nm 29 ft-lbs / 39,3 Nm
-8	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	60 ft-lbs / 81,3 Nm 52 ft-lbs / 70,5 Nm
-10	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	100 ft-lbs / 135,6 Nm 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.

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.

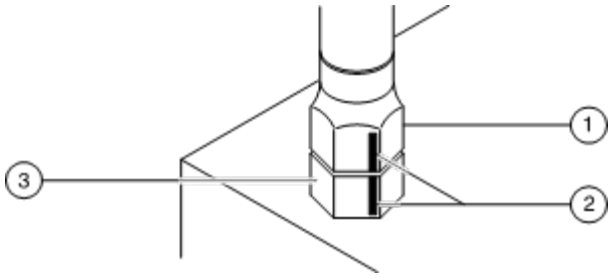


Illustration 1

1 hex nut
2 reference mark
3 body hex fitting

Specifications

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.

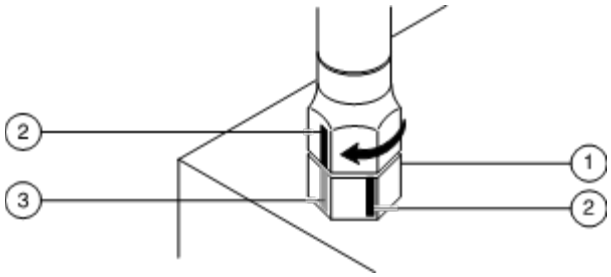


Illustration 2

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.

Scheduled Maintenance Procedures



Observe and Obey:

☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.

☑ Scheduled maintenance inspections shall be completed daily, quarterly, semi-annually, annually and every 2 years as specified of the *Maintenance inspection Report*. The frequency and extent of periodic examinations and tests may also depend on national regulations.

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

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

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

☑ Use only Genie approved replacement parts.

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

Machine Configuration:

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

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

Scheduled Maintenance Procedures

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

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

Symbols Legend



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

⚠ DANGER 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.

Maintenance Symbols Legend

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



Indicates that tools will be required to perform this procedure.



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



Indicates that dealer service will be required to perform this procedure.



Indicates that a cold motor or pump will be required to perform this procedure.

Scheduled Maintenance Procedures

Pre-delivery Preparation Report

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

Make copies for each inspection. Store completed forms as required.

Maintenance Schedule

The *Scheduled Maintenance Procedures* section and the *Maintenance Inspection Report* have been divided into subsections. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	Checklist
Daily or every 8 hours	A
Quarterly or every 250 hours	A + B
Semi-annually or every 500 hours	A + B + C
Annually or every 1000 hours	A + B + C + D
Two-year or every 2000 hours	A + B + C + D + E

Maintenance Inspection Report

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

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

Pre-Delivery Preparation Report

Fundamentals

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

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

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

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

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

Instructions

Use the operator's manual on your machine.

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

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

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

Legend

Y = yes, acceptable
N = no, remove from service
R = repaired

Comments

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

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Genie
A TEREX BRAND

Terex South Dakota, Inc USA
500 Oak Wood Road
PO Box 1150
Watertown, SD 57201-6150
(605) 882-4000

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

Maintenance Inspection Report

Model	
Serial number	
Date	
Hour meter	
Machine owner	
Inspected by (print)	
Inspector signature	
Inspector title	
Inspector company	

Instructions

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

☐	**Daily or every 8 hours**	**A**
☐	**Quarterly or every 250 hours**	**A + B**
☐	**Semi-annually or every 500 hours**	**A + B + C**
☐	**Annually or every 1000 hours**	**A + B + C + D**
☐	**Two-year or every 2000 hours**	**A + B + C + D + E**

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

Legend

Y = yes, acceptable
N = no, remove from service
R = repaired

Checklist A		**Y**	**N**	**R**
Perform after 50 hours:				
A-1	50 Hour Service			
Perform after 100 hours:				
A-2	Grease steer yokes			

Checklist B		**Y**	**N**	**R**
B-1	Batteries			
B-2	Electrical wiring			
B-3	Electrical contactor			
B-4	Inverter (if equipped)			
B-5	Flashing beacon			
B-6	Alarm package			
B-7	Tires and wheels			
B-8	Drive brakes			
B-9	Drive speed - stowed			
B-10	Drive speed - raised			
B-11	Hydraulic oil analysis			
B-12	Breather cap			

Checklist C		**Y**	**N**	**R**
C-1	Breather cap - models with optional oil			

Checklist D		**Y**	**N**	**R**
D-1	Hydraulic tank return filter			

Checklist E		**Y**	**N**	**R**
E-1	Hydraulic oil			

Comments

Checklist A Procedures

A-1
Perform 50 Hour Service



The 50 hour maintenance procedure is a one time sequence of procedures to be performed after the first 50 hours of usage. After this interval, refer to the maintenance tables for continued scheduled maintenance.

1 Perform the following maintenance procedures:

- B-3 Inspect the Tires, Wheels and Castle Nut Torque
- D-1 Replace the Hydraulic Return Filter

A-2
Grease the Steer Yokes



Genie specifications require that this procedure be performed every 100 hours of operation.

Regular application of lubrication to the steer yokes is essential to good machine performance and service life. Continued use of an insufficiently greased steer yoke will result in component damage.

1 Locate the grease fitting on the top of the steer yoke.

2 Pump multipurpose grease into the steer yoke until the steer yoke is full and grease is being forced past the bearings. Repeat this step for the other steer yoke.

Grease Specification
Chevron Ultra-duty grease, EP NLGI 1 (lithium based) or equivalent

Checklist B Procedures

B-1
Inspect the Batteries

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

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

⚠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. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

1 Raise the platform to approximately 3 ft / 1 m.

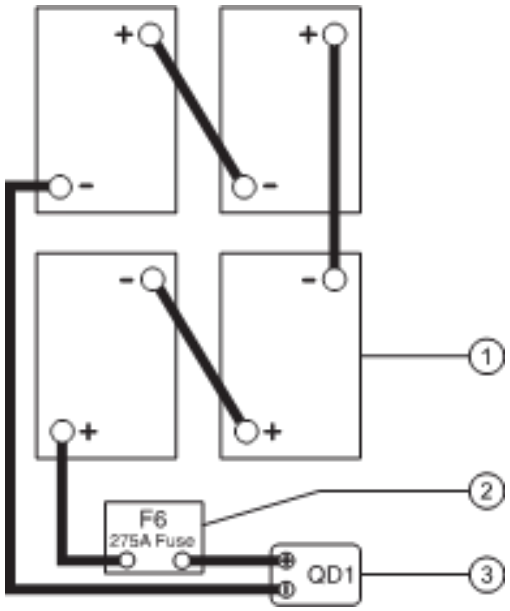
2 Open the battery cover. Rest the cover against the chassis.

3 Lower the platform until the mast just contacts the battery cover.

⚠WARNING Crushing hazard. Keep hands clear of the battery cover when lowering the platform.

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

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



1 batteries B5
2 275A fuse F6
3 quick disconnect QD1

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

6 Be sure that the battery separator wire connections are tight (if equipped).

7 Fully charge the batteries. Allow the batteries to rest 24 hours before performing this procedure to allow the battery cells to equalize.

8 Put on protective clothing and eye wear.

Checklist B Procedures

Models without maintenance-free or sealed batteries:

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

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

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

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

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

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

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

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

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

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

⊠ Result: One or more battery cells display a specific gravity from 1.218 to 1.269. The battery is still usable, but at a lower performance. The battery will need to be recharged more often. Proceed to step 11.

⊠ Result: One or more battery cells display a specific gravity from 1.217 to 1.173. The battery is approaching the end of it's life. Proceed to step 11.

⊠ Result: The difference in specific gravity readings between cells is greater than 0.1 OR the specific gravity of one or more cells is 1.172 or less. Replace the battery.

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

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

Checklist B Procedures

All models:

16 Check each battery pack and verify that the batteries are wired correctly.

17 Inspect the battery charger plug and pigtail for damage or excessive insulation wear. Replace as required.

18 Connect the battery charger to a properly grounded 115V/60Hz or, 230V/60Hz or 50Hz single phase AC power supply.

⊙ Result: The charger should operate and begin charging the batteries.

☒ If, simultaneously, the charger alarm sounds and the LEDs blink **one time**, correct the charger connections at the fuse and battery. The charger will then operate correctly and begin charging the batteries.

☒ If, simultaneously, the charger alarm sounds and the LEDs blink **two times**, the input voltage is too low or too high. Correct the voltage issue. The charger will then operate correctly and begin charging the batteries.

☒ If, simultaneously, the charger alarm sounds and the LEDs blink **three times**, the charger is overheated. Allow the charger to cool. The charger will then operate correctly and begin charging the batteries.

Note: For best results, use an extension cord of adequate size with a length no longer than 50 feet / 15 m.

Checklist B Procedures

B-2
Inspect the Electrical Wiring



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

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

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

1 Inspect the underside of the chassis for damaged or missing ground straps.

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

- All wire harness connectors to ground control box
- Ground control panel
- Hydraulic power unit
- All wire harness connectors to platform control box
- Platform controls
- Power to platform wiring
- Harness connections
- Hydraulic manifold wiring
- Contactor
- Limit switches

3 Inspect for a lite, even coating of dielectric grease on all harness connections.

Note: Do not apply excessive amounts of dielectric grease to harness connectors, pins or sockets.

B-3
Inspect the Electrical Contactor



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

Maintaining the electrical contactor in good condition is essential to safe machine performance. Failure to locate a worn or damaged contactor could result in unsafe operating conditions and may cause 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 At the ground controls, turn the key switch to the off position and push in the red Emergency Stop button to the off position.

2 At the non-steer end of the machine, open the cover to access the electrical tray.

3 Disconnect the battery pack from the machine.

4 Locate the electrical contactor mounted on the fuse bracket.

5 Visually inspect the contact points of the contactor for the following items:

- Excessive burns
- Excessive arcs
- Excessive pitting

Note: Replace the contactor if any damage is found.

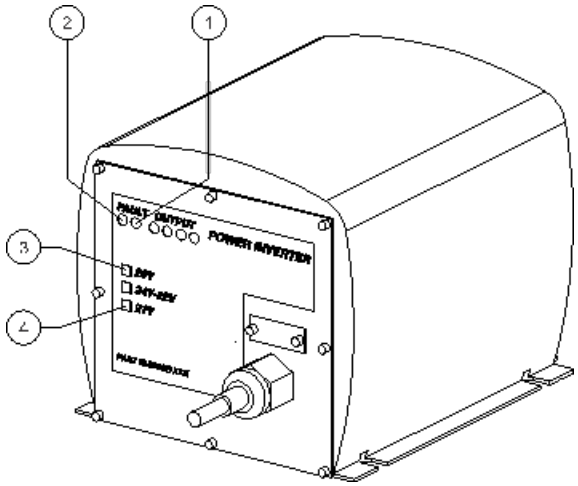
B-4
Inspect the Voltage Inverter (if equipped)

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

Perform this procedure more often if dusty conditions exist.

1 Inspect the inverter plug and pigtail for damage or excessive insulation wear. Replace as required.

2 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.



1 right fault LED
2 left fault LED
3 25V LED
4 21V LED

3 Connect an appropriate power tool to the inverter. Activate the tool.

⊙ Result: The power tool should operate. There may be a brief (0.5 second) delay if the power tool has not been used in the previous 10 minutes.

☒ If the left fault LED (REV_POL) is illuminated, the inverter is connected to batteries with the incorrect polarity. Correct the polarity issue with the red wire to battery positive and the black wire to battery negative. The inverter will then operate correctly and begin supplying AC power.

☒ If the right fault LED (123) blinks one time, the power draw is too high. The tool being used requires too much power to operate or is being used at or near the limit of the inverter for an extended period of time. Reduce the power draw. The inverter will then operate correctly and begin supplying AC power.

☒ If the right fault LED (123) blinks two times, the Ground Fault Interrupt (GFI) has been activated. A short circuit or partial short exists between the AC hot and ground in the tool or outlet. Check the tool for burnt, chafed, corroded and loose wires, and inspect the tool for internal moisture. Correct the short circuit or moisture issue OR inspect the wiring in the power-to-platform box. The inverter will then operate correctly and begin supplying AC power.

☒ If right fault LED (123) blinks three times, the inverter is overheated. Allow the inverter to cool. The inverter will then operate correctly and begin supplying AC power.

☒ If the battery 25 volt fault LED (25V) blinks one time, the battery voltage is over 30V. Operate the machine to lower the voltage level. The inverter will then operate correctly and begin supplying AC power.

☒ If the battery 21 volt fault LED (21V) blinks one time, the battery voltage is less than 20V DC. The inverter will continue to operate until the battery voltage falls to 17.8V DC.

Checklist B Procedures

B-5
Test the Flashing Beacons (if equipped)

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

Flashing beacons are used to alert operators and ground personnel of machine proximity and motion. The flashing beacons are located on both sides of the machine.

1 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: The beacons should flash.

2 Turn the key switch to platform controls.

⊙ Result: The beacons should flash.

B-6
Test the Alarm Package (if equipped)

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

Alarms are used to alert operators and ground personnel of machine proximity and motion. The motion alarm is located in the ground control box and, when activated, will sound at 60 beeps per minute.

1 Perform the following functions from the ground and platform controls to verify the motion alarm is functioning properly.

Ground controls

- Platform raise/lower

Platform controls

- Platform raise/lower
- Drive forward/reverse
- Steer right/left

Checklist B Procedures

B-7
Inspect the Tires, Wheels and Castle Nut Torque



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

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

1 Check the tire surface and sidewalls for cuts, cracks, punctures and unusual wear.

2 Check each wheel for damage, bends and cracks.

3 Remove the cotter pin and check the castle nut for proper torque. Refer to Specifications, *Machine Specifications.*

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

4 Install a new cotter pin. Bend the cotter pin to lock in place.

B-8
Test the Drive Brakes

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

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

Note: Perform this procedure with the machine on a firm, level surface that is free of obstructions.

Note: The platform extension deck must be fully retracted and the platform in the stowed position.

1 Mark a test line on the ground for reference.

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

Note: Perform this procedure in high drive mode. Verify the low speed drive light is off.

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

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

5 Measure the distance between the test line and your machine reference point. Refer to Specifications, *Performance Specifications*.

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

Checklist B Procedures

B-9
Test the Drive Speed – Stowed Position

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

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

Note: Perform this procedure with the machine on a firm, level surface that is free of obstructions.

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

Note: Perform this procedure in high drive mode. Verify the low speed drive light is off.

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

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

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

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

B-10
Test the Drive Speed - Raised Position



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

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

Note: Perform this procedure with the machine on a firm, level surface that is free of obstructions.

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

2 Raise the platform approximately 4 feet / 1,2 m.

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

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

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

B-11
Visual Inspection of the Hydraulic Oil



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

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

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. Replace the oil when it fails the test. Refer to Maintenance Procedure, *Test or Replace the Hydraulic Oil*.

1 Collect a sample of hydraulic oil and place in a clear container. Visually inspect the hydraulic oil for the following:

- Color: oil should be a clear, light-honey colored
- Appearance, oil should be clear and not cloudy or visibly distorts the view through the sight glass or container
- Contains no particles, foreign objects, or other contamination
- The hydraulic oil can be inspected by smell (can smell “hot” but not “burnt”) or rubbing between fingers (should feel viscous and free of any rough feel due to particles)

⊙ If the hydraulic oil passes all of the above inspections, continue the scheduled maintenance intervals.

☒ If the hydraulic oil fails any of the above inspections, the hydraulic oil must be tested by an oil distributor or replaced.

Note: If the hydraulic oil was not replaced at or before the 2000 hour maintenance interval, the oil must be tested every quarter by an oil distributor until the oil fails the test and is replaced. After the oil has been replaced, continue the scheduled quarterly maintenance inspection.

Note: When replacing the hydraulic oil, it is recommended that all hydraulic filters be replaced at the same time.

Checklist B Procedures

B-12
Inspect the Breather Cap

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Perform this procedure more often if dusty conditions exist.

A free-breathing hydraulic tank cap is essential for good machine performance and service life. A dirty or clogged cap may cause the machine to perform poorly. Extremely dirty conditions may require that the cap be inspected more often.

1 Remove the breather cap from the hydraulic tank.

2 Check for proper venting.

⊙ Result: Air passes through the breather cap.

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

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

3 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air.

4 Install the breather cap onto the hydraulic tank.

Checklist C Procedures

C-1
Replace the Hydraulic Tank Breather Cap - Models with Optional Hydraulic Oil



Remove and discard the hydraulic tank breather cap.Genie specifications require that this procedure be performed every 500 hours or six months, whichever comes first OR when the machine fails to lift the maximum rated load.

The hydraulic tank is a vented-type tank. The breather cap has an internal air filter that can become clogged or, over time, can deteriorate. If the breather cap is faulty or improperly installed, impurities can enter the hydraulic system which may cause component damage. Extremely dirty conditions may require that the cap be inspected more often.

1 Remove and discard the hydraulic tank breather cap.

2 Install a new cap onto the tank.

Checklist D Procedures

D-1
Replace the Hydraulic Return Filter



Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

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

⚠ CAUTION Beware of hot oil. Contact with hot oil may cause severe burns.

Note: The hydraulic tank return filter is mounted next to the hydraulic tank.

1 Clean the area around the return filter.

2 Remove the filter element from the housing.

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

4 Install the new filter element and hand tighten the housing onto the filter head.

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

6 Raise the platform to approximately 3 ft / 1 m.

7 Inspect the filter for leaks.

8 Clean up and properly dispose of any oil that may have spilled during the installation procedure.

E-1
Test or Replace the Hydraulic Oil



Genie specifications require that this procedure be performed every 2000 hours or every two years, whichever comes first.

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

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. If the hydraulic oil is not replaced at the 2000 hour inspection, test the oil quarterly. Replace the oil when it fails the test.

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

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

Testing the oil:

1 Complete the hydraulic oil testing with an oil distributor.

⊙ If the hydraulic oil passes testing at the 2000 hour maintenance interval, the oil must be tested every quarter by an oil distributor until the oil fails the test and is replaced.

☒ If the hydraulic oil fails testing at the 2000 hour maintenance interval, the oil must be replaced. After the oil has been replaced, continue the scheduled quarterly maintenance inspection.

Replacing the hydraulic oil:

1 Tag and disconnect the hydraulic tank return hard line from the hydraulic filter head and remove the hard line from the tank. Cap the fitting on the filter head.

⚠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 Tag and disconnect the hydraulic pump inlet hard line and remove the hard line from the tank. Cap the fitting on the pump.

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

4 Drain all of the oil into a suitable container. Refer to *Machine Specifications*, for capacity information.

Note: When replacing the hydraulic oil, it is recommended that the hydraulic tank be cleaned using a mild solvent and all hydraulic filters and strainers be replaced.

5 Clean up any oil that may have spilled. Properly discard the used oil.

6 Clean the inside of the hydraulic tank using a mild solvent. Allow the tank to dry completely.

Checklist E Procedures

7 Install the hydraulic tank and install and tighten the hydraulic tank retaining fasteners. Torque to specification.

Torque specifications

Hydraulic retaining fasteners, dry	35 in-lbs 4 Nm
Hydraulic retaining fasteners, lubricated	26 in-lbs 2,9 Nm

8 Install the hydraulic pump inlet hard line into the tank. Install the fitting onto the pump and torque to specification. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications*.

9 Install the hydraulic pump return hard line into the tank. Install the fitting onto the hydraulic filter head and torque to specification. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications*.

10 Fill the tank with the proper hydraulic oil for your machine. Refer to Specifications, *Hydraulic Specifications*.

11 Activate the pump to fill the hydraulic system with oil and bleed the system of air.

NOTICE

Component damage hazard. The pump can be damaged if operated without oil. Be careful not to empty the hydraulic tank while in the process of filling the hydraulic system. Do not allow the pump to cavitate.

12 Repeat steps 10 and 11 until the hydraulic system and tank are both full.

Note: After the oil has been replaced, continue the scheduled quarterly maintenance inspection.

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.

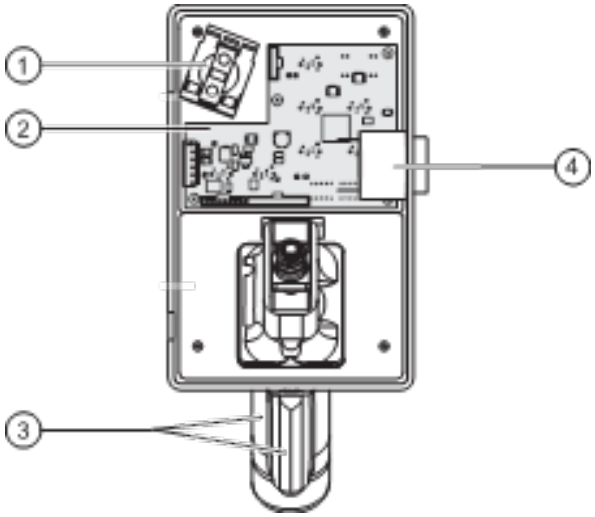
Platform Controls

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.



1 red Emergency Stop button P2
2 platform controls circuit board U3
3 proportional control handle and drive/steer enable switch JC9
4 alarm H1

Platform Controls

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
CH	Chassis Mode Operation
PHS	Pothole Guard Stuck
Nd	No Drive (option)
CHrg	Charger Interlock (option)

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

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 < 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 1 Nm

Platform Controls

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.

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.

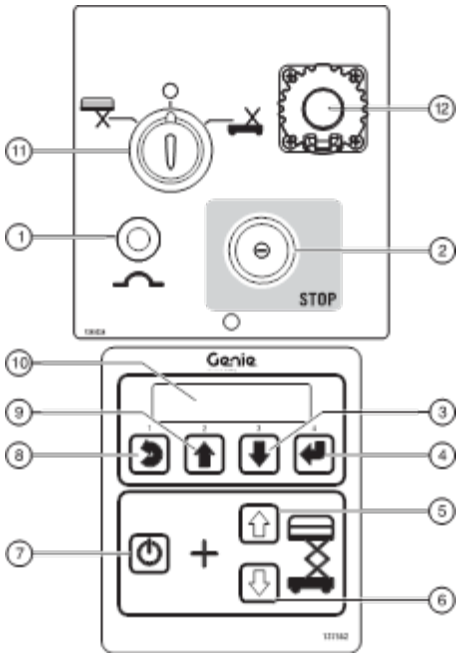
The ground controls consist of an Electronic Control Module (ECM), emergency stop button, key switch and circuit breaker.

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.



1 Circuit breaker
2 Red Emergency Stop button
3 Scroll down button
4 Enter button
5 Platform up button
6 Platform down button
7 Lift function enable button
8 Escape button
9 Scroll up button
10 LCD display
11 Key switch
12 Tech Pro Link Connector

Ground Controls

2-1
Software Revision Level

How to Determine the Revision Level

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

1 Turn the 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.

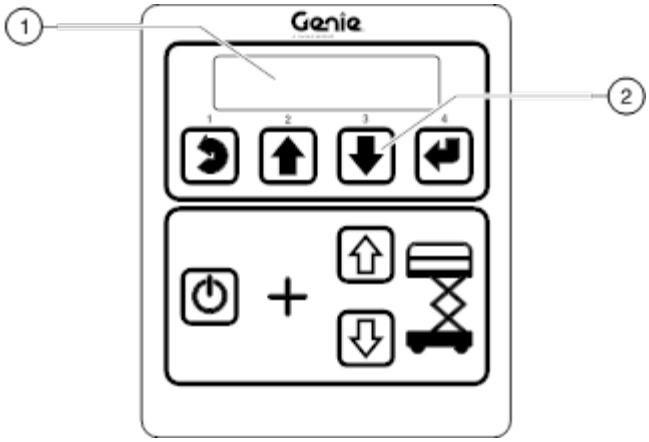


2 Press the ground control scroll down button.

⊙ 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.



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



1 LCD display
2 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 key switch in the ground controls position.

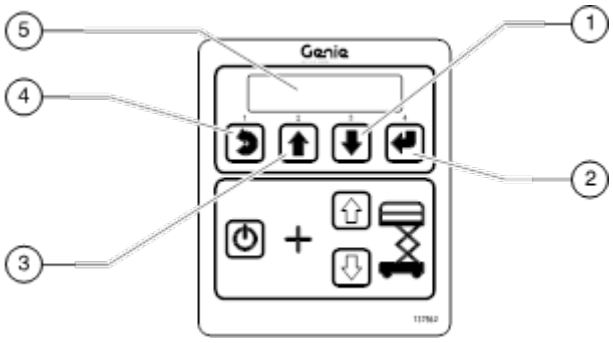
⚠ DANGER Tip-over hazard. Do not adjust function speeds higher than specified in this procedure. Setting the function speeds greater than specifications could cause the machine to tip over resulting in death or serious injury.

⚠ DANGER Tip-over hazard. This procedure must only be performed by a trained service professional. Attempting this procedure without the necessary skills could result in death or serious injury.

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

1 Turn the key switch to ground controls.

2 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

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.

Ground Controls

2-3 Level Sensor

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.

How to Install and Calibrate the Level Sensor

⚠ 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.

Note: Perform this procedure with the machine on a firm, level surface that is free of obstructions.

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

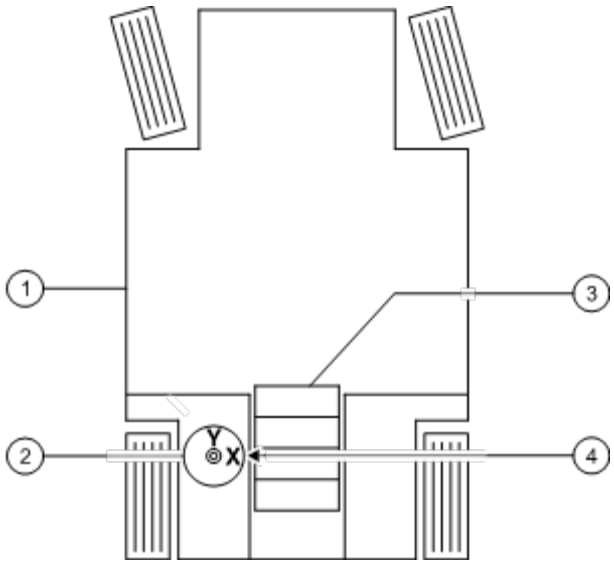
If you are not installing a new level sensor, proceed to step 6.

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

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

3 Place the level sensor onto the level sensor base with the "X" on the level sensor closest to the mast of the machine and the "Y" on the level sensor closest to the steer end of the machine.

⚠ DANGER Tip-over hazard. The level sensor must be installed with the "X" on the level sensor base closest to the mast of the machine. Failure to install the level sensor as instructed could result in the machine tipping over causing death or serious injury.



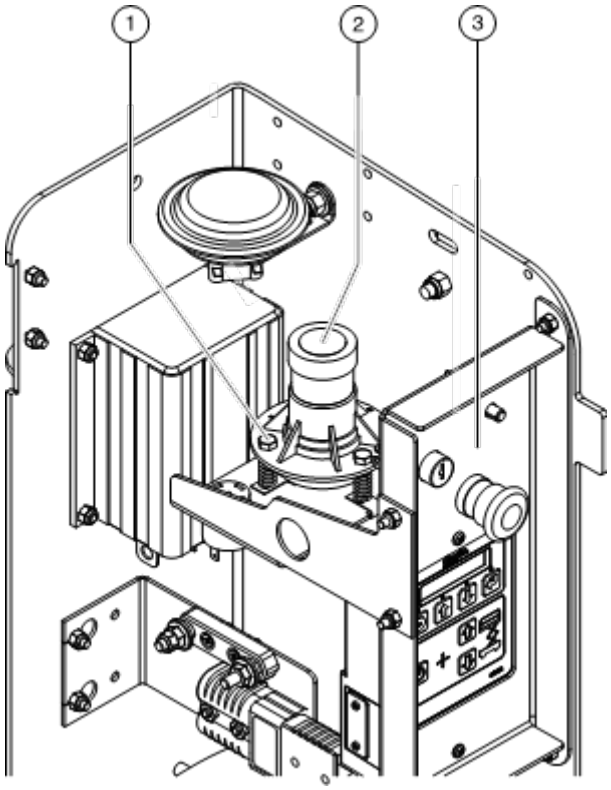
1 chassis
2 level sensor
3 mast
4 "X" indicator

4 Install the level sensor adjusting fasteners through the level sensor and springs, and into the mount. Tighten the fasteners and measure the distance between the level sensor and the level sensor mount.

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

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

6 Tighten the level sensor adjusting fasteners until the bubble in the top of the level sensor is centered in the circles.



1 adjustment fastener
2 calibration circle
3 ground controls

7 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: The tilt sensor alarm should not sound.

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

9 Raise the machine approximately 2 inches / 5 cm.

10 Place a 0.65 x 6 x 6 inch / 1.65 x 15 x 15 cm thick steel block under both wheels at the ground controls side of the machine.

11 Lower the machine onto the blocks.

12 Raise the platform to approximately 1 ft / 30 cm.

⊙ 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.

13 Lower the platform to the stowed position.

14 Raise the machine slightly.

15 Remove the blocks from under both wheels.

16 Lower the machine and remove the jack.

17 Center a lifting jack under the drive chassis at the tank side of the machine.

18 Raise the machine approximately 2 inches / 5 cm.

19 Place a 0.79 x 6 x 6 inch / 2 x 15 x 15 cm thick steel block under both wheels at the tank side of the machine.

20 Lower the machine onto the blocks.

Ground Controls

21 Raise the platform to approximately 1 ft / 30 cm.

⊙ 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.

22 Lower the platform to the stowed position.

23 Raise the machine slightly.

24 Remove the blocks from under both wheels.

25 Lower the machine and remove the jack.

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

27 Raise the machine approximately 2 inches / 5 cm.

28 Place a 2.18 x 6 x 6 inch / 5.54 x 15 x 15 cm thick steel block under both wheels at the steer end of the machine.

29 Lower the machine onto the blocks.

30 Raise the platform to approximately 1 ft / 30 cm.

⊙ Result: The level sensor alarm should not sound.

⊠ Result: The level sensor alarm does sound. The level sensor must be replaced.

31 Raise the machine slightly.

32 Remove the blocks from under both wheels.

33 Lower the machine and remove the jack.

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

35 Raise the machine approximately 2 inches / 5 cm.

36 Place a 2.4 x 6 x 6 inch / 6.1 x 15 x 15 cm thick steel block under both wheels at the non-steer end of the machine.

37 Raise the platform to approximately 1 ft / 30 cm.

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

⊠ Result: The platform does not stop raising and the tilt alarm does not sound. The level sensor must be replaced.

38 Lower the platform to the stowed position.

39 Raise the machine slightly.

40 Remove the blocks from under both wheels.

41 Lower the machine and remove the jack.

3-1
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.*

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 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 in one second intervals from the ground controls until the pressure gauge reaches 3200 psi / 221 bar.

⊙ 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.

Hydraulic Pump

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

2 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.

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

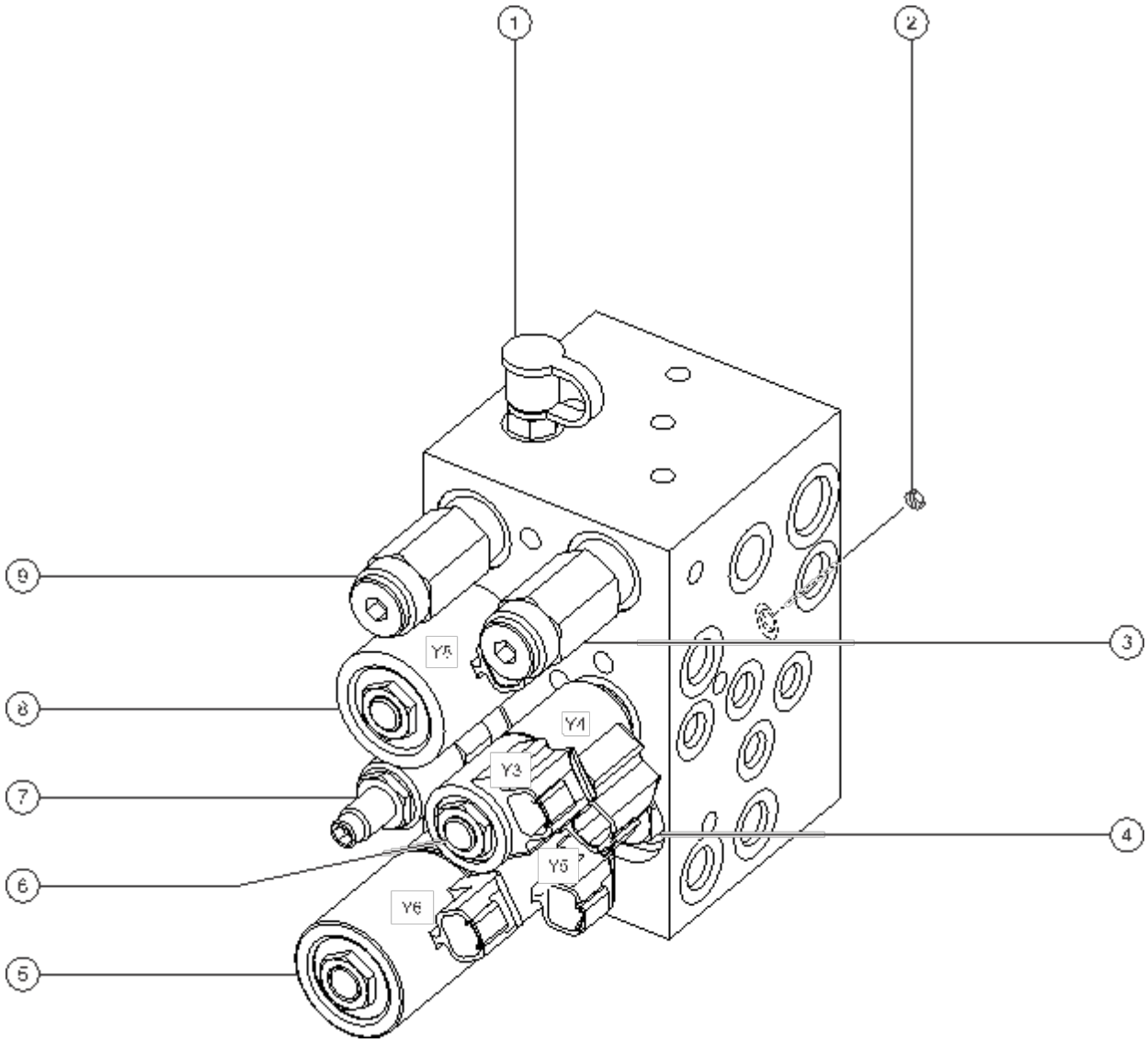
⚠ DANGER Tip-over hazard. After replacing the hydraulic pump, it is critical to return the function speed settings to original factory specifications. Failure to restore the machine to original factory specifications could cause the machine to tip over resulting in death or serious injury.

4-1
Function Manifold Components

The function manifold is mounted next to the hydraulic power unit.

Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (items E, F, and H)	—	—	5 ft-lbs / 7 Nm
1	Diagnostic port	A	Test port	—
2	Check disc	B	Steer circuit	18 ft-lbs / 24 Nm
3	Relief valve, 1800 to 3500 psi / 124 to 241 bar	C	Lift relief	20 ft-lbs / 27 Nm
4	Check valve, 10 psi / 0,7 bar	D	Drive circuit	20 ft-lbs / 27 Nm
5	Solenoid valve, 3 position 4 way	E	Drive forward/reverse	25 ft-lbs / 34 Nm
6	Solenoid valve, 3 position 4 way	F	Steer left/right	25 ft-lbs / 34 Nm
7	Flow regulator and relief valve, 0.75 gpm / 2,8 L/min 1500 psi / 103 bar	G	Steer circuit	26 ft-lbs / 35 Nm
8	Solenoid valve, 2 position 4 way	H	Platform up	25 ft-lbs / 34 Nm
9	Relief valve, 3500 psi / 241 bar maximum	I	System relief	20 ft-lbs / 27 Nm

Function Manifold



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

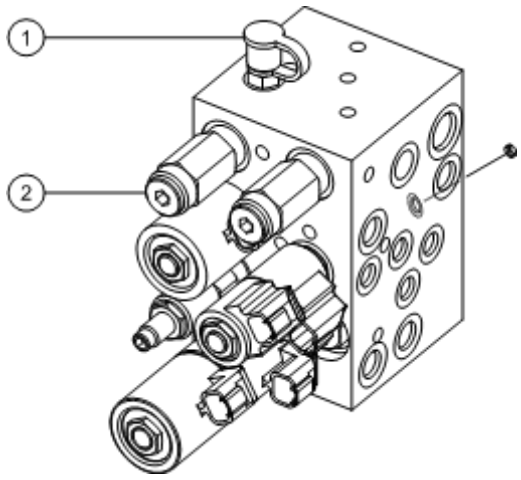
4-2
Valve Adjustments - Function Manifold

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.



1 test port
2 system relief valve

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

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 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.

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

9 Install the relief valve cap.

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

Function Manifold

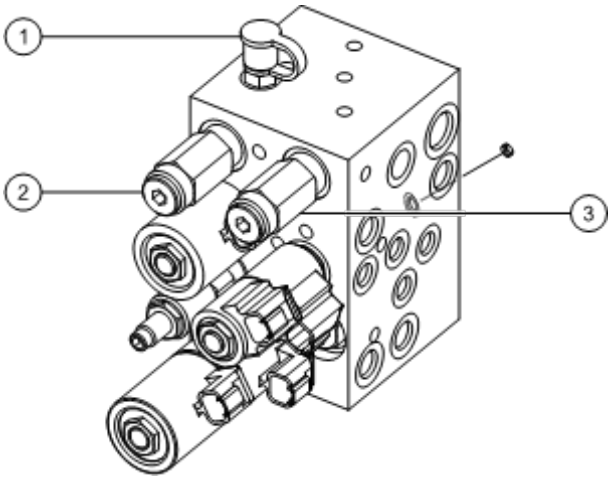
How to Adjust the Platform Lift Relief Valve

Note: Verify the system relief is adjusted correctly before performing this procedure.

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 lift relief valve on the function manifold.



1 test port
2 system relief valve
3 lift relief valve

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

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

4 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.

5 Remove the platform controls from the platform.

6 Hold the lift relief valve with a wrench and remove the cap (schematic item

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

8 Fully lower the platform to the stowed position.

9 Add an additional 50 pounds / 22,7 kg to the platform. Secure the additional weight.

10 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.

11 Install the relief valve cap.

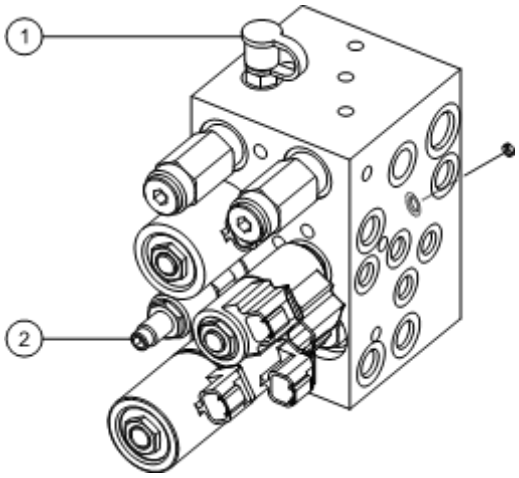
12 Remove the weight from the platform.

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.



1 test port
2 steer relief valve

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

3 Remove the platform controls from the platform.

4 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.

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.

7 Turn the machine off. Hold the steer relief valve with a wrench and remove the cap.

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.

Function Manifold

4-3 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 Specification

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

Description	Specification
Solenoid valve, 3 position 4 way, 20V DC with diode (schematic item E)	27.2Ω
Solenoid valve, 3 position 4 way, 20V DC with diode (schematic item F)	19Ω
Solenoid valve, 2 position 4 way, 20V DC with diode (schematic item H)	25Ω
Solenoid valve, 2 position 2 way, N.C. 20V DC with diode (schematic item N)	6.25Ω

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.

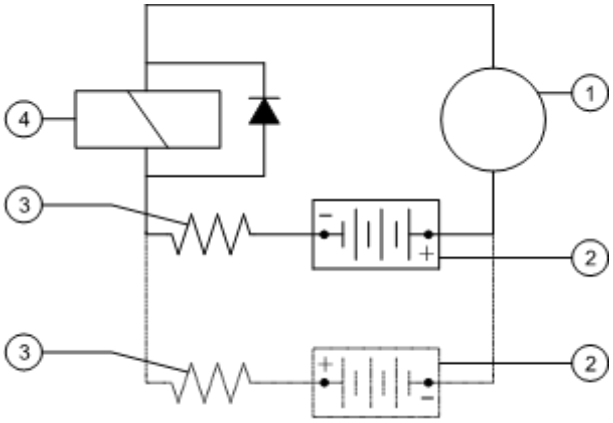
Resistor, 10Ω	
Genie part number	27287

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.

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.

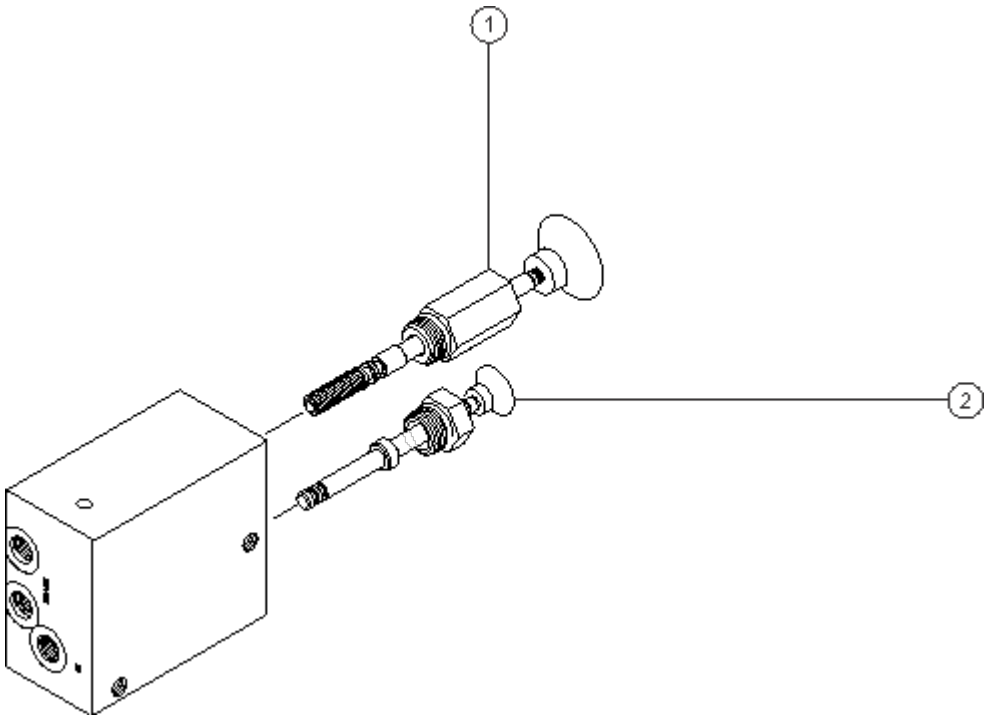
⊠ Result: if one or both current readings are greater than 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Brake Release Hand Pump Components

5-1
Brake Release Hand Pump Components

The brake release hand pump manifold is mounted behind the the hydraulic power unit.

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



6-1 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 Tag, disconnect and plug the hydraulic supply hard line at the pump. Cap the fitting on the pump. Remove the hard line from the tank.

⚠ 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 Tag, disconnect and plug the return hard line at the hydraulic filter. Cap the fitting on the filter. Remove the hard line from the tank.

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

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

Torque specifications	
Hydraulic retaining fasteners, dry	35 in-lbs 4 Nm
Hydraulic retaining fasteners, lubricated	26 in-lbs 2.9 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 Block the steer wheels.

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 non-steer end of the machine.

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 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.

8 Place a lifting jack under the brake for support.

9 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 102 Nm
Brake mounting fasteners, lubricated	56 ft-lbs 76 Nm

8-1
Yoke and Drive Motor

How to Remove the Yoke and Drive Motor

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

1 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 assembly may fall if not properly supported when it is removed from the machine.

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 101,7 Nm
Drive motor mounting fasteners, lubricated	56 ft-lbs 76,3 Nm

8-2 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 steer cylinder hose guard bracket from the machine.

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

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.

8-3
Tie Rod

How to Remove the Tie Rod

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

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

3 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.

4 Fully turn the yokes in either direction.

5 Remove the fasteners securing the tie rod to the steer yoke.

Note: Note the quantity and location of the spacers between the tie rod and the steer links.

6 Fully turn the yokes in the opposite direction.

7 Remove the fasteners securing the tie rod to the steer yoke.

Note: Note the quantity and location of the spacers between the tie rod and the steer links.

8 Remove the tie rod from the machine.

Note: Apply removable thread locker to the retaining fasteners.

Torque = 31 ft-lbs / 42 Nm.

Platform Components

9-1 Platform

How to Remove the Platform

Perform this procedure with the platform extension fully retracted and locked in position.

1 Raise the platform to approximately 1 ft / 30 cm.

2 Place support blocks between the platform and the drive chassis. Lower the platform onto the blocks.

⚠WARNING Crushing hazard. Keep hands clear when lowering the platform.

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

4 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.

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

6 Remove the platform controls from the platform.

7 Cut and discard the cable ties securing the control cable to the platform.

NOTICE Component damage hazard. The control cable can be damaged if cut while removing the cable ties.

8 Remove the fasteners securing the junction box bracket to the mast. Set the bracket and fasteners to the side.

9 Attach a lifting strap of suitable capacity from an overhead supporting device and center it around the platform railing. Support the platform. Do not apply any lifting pressure.

10 Remove the fasteners securing the platform mount to the mast and set the fasteners to the side. Remove the platform and mount from the machine.

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

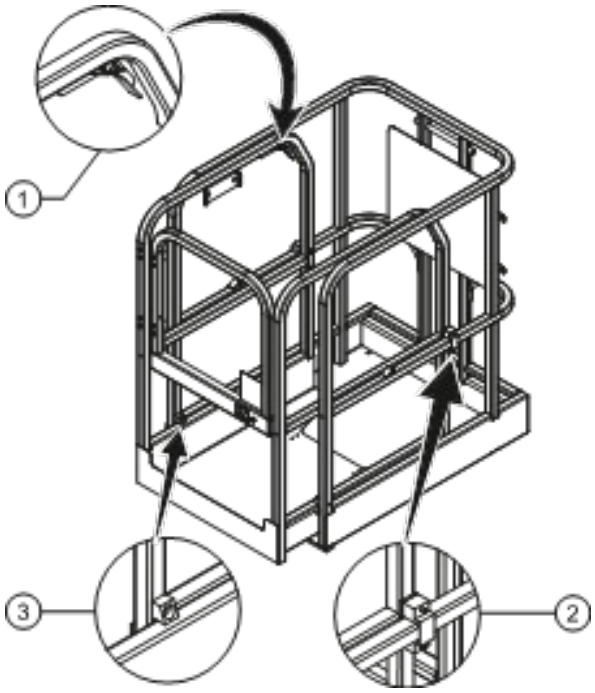
9-2
Platform Extension Deck

How to Remove the Platform Extension Deck

1 Remove the fasteners and spring securing the extension deck latch to the extension deck. Set the fasteners, spring and the latch to the side.

2 Remove the fasteners securing the platform wear pads to the main deck at the steer end of the machine. Set the fasteners and the wear pads to the side.

3 Remove the fasteners securing the extension deck guide blocks to the extension deck and main deck. Set the fasteners and the guide blocks to the side.



1 extension deck latch
2 platform wear pad
3 extension deck guide block

4 Attach a lifting strap from an overhead supporting device and center it around the extension deck railing. Remove the extension deck from the machine.

⚠WARNING Crushing hazard. The extension deck could become unbalanced and fall when removed from the machine. A properly centered lifting strap is essential when removing the extension deck from the machine.

Note: During removal, the strap will need to be carefully adjusted for proper balancing.

Mast Components

10-1 Mast

How to Remove the Mast Assembly

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

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

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

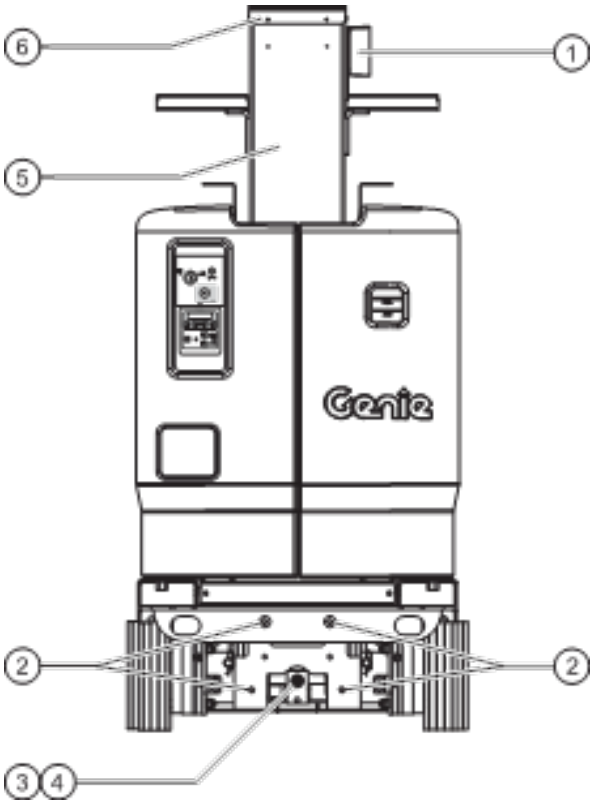
1 Remove the platform. Refer to Repair Procedure, *How to Remove the Platform.*

2 Tag and disconnect the power to platform wire harness at the quick disconnect near the Electronic Control Module (ECM).

3 Tag and disconnect the up limit switch cable near the Electronic Control Module (ECM).

4 Tag, disconnect and plug the lift cylinder hose at the function manifold. Cap the fitting.

⚠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.



1 AC outlet box junction box
2 mast retaining fasteners
3 lift cylinder coil
4 lift cylinder solenoid valve
5 mast
6 mast cover

Mast Components

5 Remove the fasteners securing the lower rear access cover to the chassis and remove the cover. Set the cover and the fasteners to the side.

6 Tag and disconnect the wire harness from the platform down valve coil at the base of the lift cylinder.

7 Remove the retaining nut securing the platform down coil to the platform down solenoid valve and remove the coil. Set the coil and retaining nut to the side.

8 Remove the platform down solenoid valve from the lift cylinder. Set the valve to the side and plug the cylinder port.

9 Remove the fasteners securing the top mast cover to the top of the mast. Set the cover and fasteners to the side.

⚠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 Using an overhead supporting device, attach a sling equipped with the appropriate sized hooks to the lifting eyes located inside the mast assembly. Support the mast. Do not apply any lifting pressure.

Note: Mast weight is 500 lbs / 227 kg.

11 Working at the non-steer end of the lower chassis, remove the mast retaining fasteners and set the fasteners to the side.

12 Carefully pull the cables and hydraulic hoses free while removing the mast from the machine.

⚠WARNING Crushing hazard. The mast will fall unless it is properly supported when it is removed from the base.

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

13 Place the mast assembly on a suitable structure capable of supporting it.

Mast Components

How to Disassemble the Mast

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

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

2 Remove the mast. Refer to Repair Procedure, *How to Remove the Mast Assembly.*

3 Remove the lift cylinder. Refer to Repair Procedure, *How to Remove the Lift Cylinder.*

4 Remove the mast coil cord. Refer to Repair Procedure, *How to Remove the Mast Coil Cord.*

5 Remove the fasteners securing the AC outlet junction box to the upper half of the mast and remove the junction box. Set the junction box and the fasteners to the side.

6 Remove the fasteners securing the work trays to the upper half of the mast and remove the work trays. Set the trays and the fasteners to the side.

7 Remove the fasteners securing the down limit switch assembly to the limit switch bracket and remove the limit switch assembly. Set the limit switch assembly and the fasteners to the side.

8 With the chassis mount side up, stagger the mast assembly to gain access to the rivets securing the inner wear pads, to the bottom half of the number 2, number 3 and number 4 mast sections.

9 Using a drill, carefully drill out the rivets securing the number 2 inner wear pads to the bottom half of the number 2 mast section, the number 3 inner wear pads to the bottom half of the number 3 mast section and the number 4 inner wear pads to the bottom half of the number 4 mast section. Refer to Illustration 1.

Note: While drilling the rivets out, be careful not drill into the opposing mast section.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

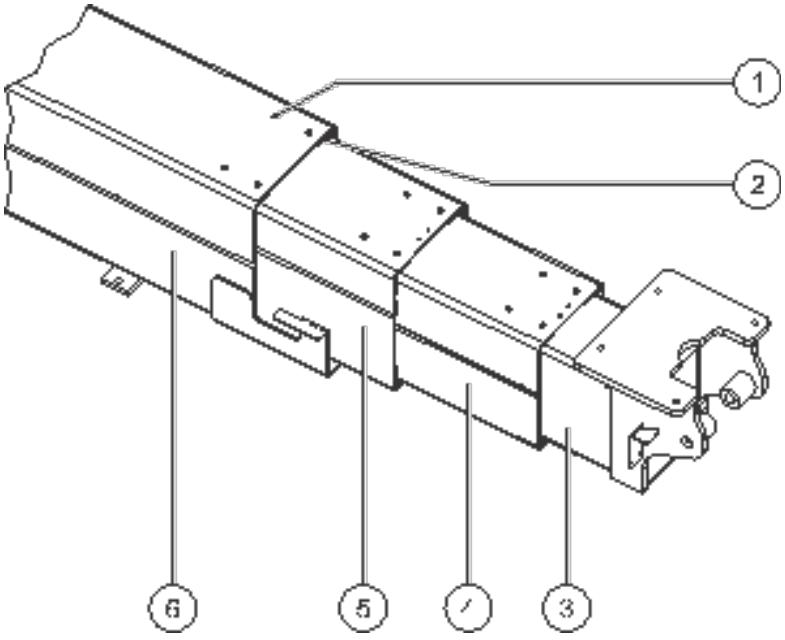


Illustration 1

1 rivet
2 wear pads
3 mast number 1
4 mast number 2
5 mast number 3
6 mast number 4

Mast Components

10 Attach a lifting strap from an overhead supporting device to the mast assembly and carefully rotate the mast 180°. Set the mast assembly onto the work table and secure the mast to the table.

Note: During removal, the lifting strap will need to be adjusted for proper balancing.

⚠WARNING Crushing hazard. The mast assembly will fall if it is not properly supported by an overhead supporting device.

11 Slide the number 4 mast towards the bottom of the number 3 mast and align the upper and lower number 4 mast access holes to the upper and lower rivets on the number 3 mast. Refer to Illustration 2.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

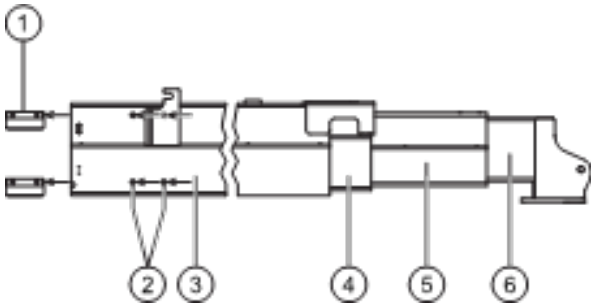


Illustration 2

1 wear pads
2 rivet
3 mast number 4
4 mast number 3
5 mast number 2
6 mast number 1

12 Using a drill, carefully drill out the rivets securing the number 3 outer wear pads to the top half of the number 3 mast section. Refer to Illustration 2.

Note: While drilling the rivets out, be careful not drill into the number 2 mast section.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

13 Using a drill, carefully drill out the rivets securing the number 4 inner wear pads to the bottom half of the number 4 mast section. Refer to Illustration 3

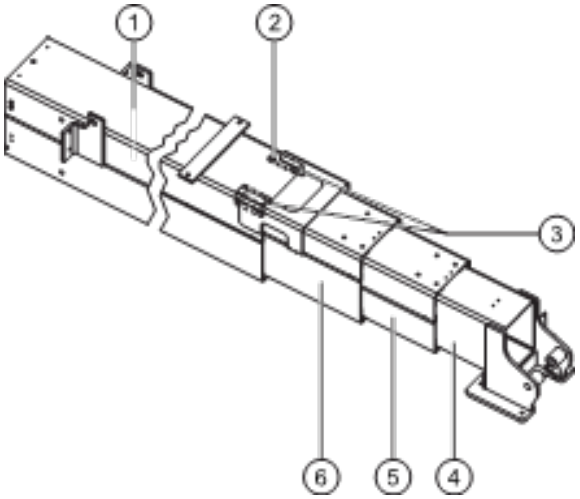


Illustration 3

1 mast number 4
2 rivet
3 wear pads
4 mast number 1
5 mast number 2
6 mast number 3

Note: While drilling the rivets out, be careful not drill into the number 3 mast section.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

Mast Components

14 Attach a lifting strap from an overhead supporting device to the number 4 mast section and carefully remove the number 4 mast.

Note: During removal, the lifting strap will need to be adjusted for proper balancing.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

15 Slide the number 3 mast towards the bottom of the number 2 mast and align the upper and lower number 3 mast access holes to the upper and lower rivets on the number 2 mast. Refer to Illustration 4.

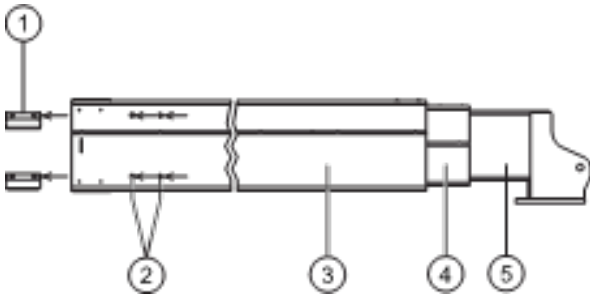


Illustration 4

1 wear pads
2 rivet
3 mast number 3
4 mast number 2
5 mast number 1

16 Using a drill, carefully drill out the rivets securing the number 2 outer wear pads to the top half of the number 2 mast section. Refer to Illustration 2.

Note: While drilling the rivets out, be careful not drill into the number 2 mast section.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

17 Using a drill, carefully drill out the rivets securing the number 3 inner wear pads to the bottom half of the number 3 mast section. Refer to Illustration 5.

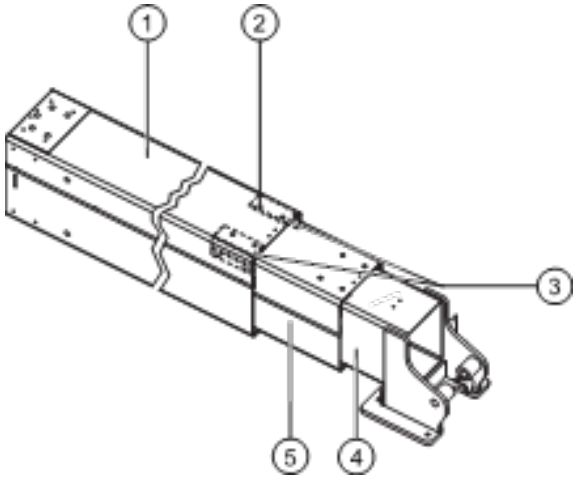


Illustration 5

1 mast number 3
2 rivet
3 wear pads
4 mast number 1
5 mast number 2

Note: While drilling the rivets out, be careful not drill into the number 2 mast section.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

18 Attach a lifting strap from an overhead supporting device to the number 3 mast section and carefully remove the number 3 mast.

Note: During removal, the lifting strap will need to be adjusted for proper balancing.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

19 Slide the number 2 mast towards the bottom of the number 1 mast and align the upper and lower number 2 mast access holes to the upper and lower rivets on the number 1 mast. Refer to Illustration 6.

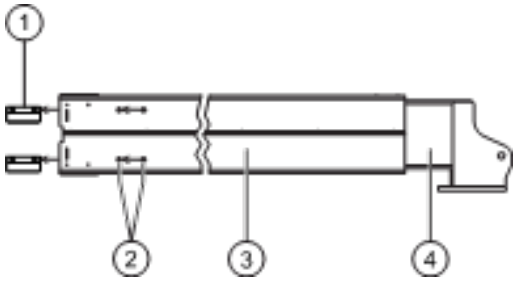


Illustration 6

1 wear pads
2 rivet
3 mast number 2
4 mast number 1

20 Using a drill, carefully drill out the rivets securing the number 1 outer wear pads to the top half of the number 1 mast section. Refer to Illustration 2

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

21 Using a drill, carefully drill out the rivets securing the number 2 inner wear pads to the bottom half of the number 2 mast section. Refer to Illustration 7.

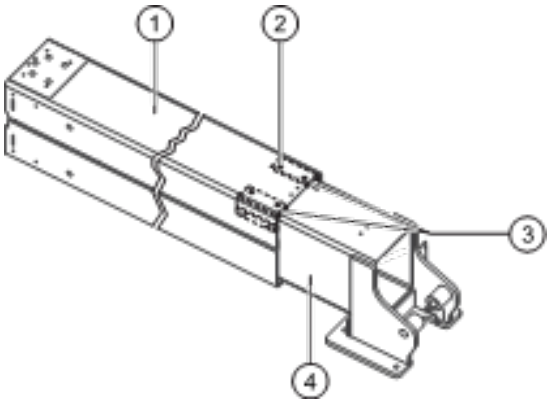


Illustration 7

1 mast number 3
2 rivet
3 wear pads
4 mast number 1
5 mast number 2

Note: While drilling the rivets out, be careful not drill into the number 1 mast section.

Note: While drilling the rivets out, be careful not enlarge the wear pad mounting holes.

22 Attach a lifting strap from an overhead supporting device to the number 2 mast section and carefully remove the number 2 mast.

Note: During removal, the lifting strap will need to be adjusted for proper balancing.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

Mast Components

How to Assemble the Mast

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

1 Thoroughly clean all mast sections.

2 Attach a lifting strap from an overhead supporting device to the number 1 mast, and place the number 1 mast onto a work table capable of supporting a complete mast assembly.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

Note: During installation, the lifting strap will need to be adjusted for proper balancing.

3 Secure the number 1 mast to the work table.

4 Using the appropriate rivets, install the upper corner wear pads, to the upper half of the number 1 mast.

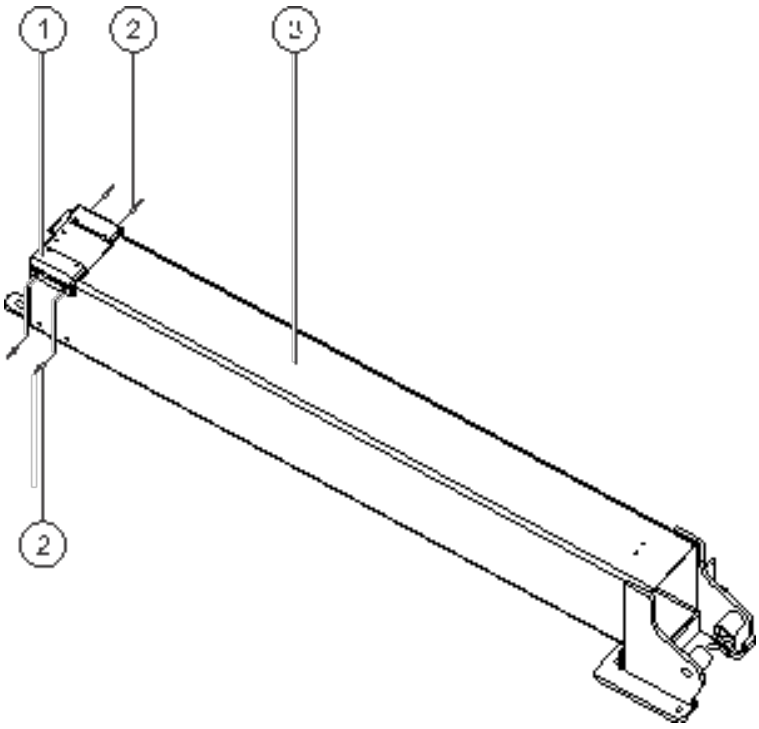


Illustration 1

1 wear pads
2 rivet
3 mast number 1

Mast Components

5 Attach a lifting strap from an overhead supporting device to the number 2 mast and carefully slide the number 2 mast onto the number 1 mast, with the cylinder mount brackets facing the work table.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

Note: During installation, the lifting strap will need to be adjusted for proper balancing.

6 Slide the lower, inner corner wear pads between the number 2 mast and the number 1 mast. Align the holes on the wear pads to the rivet holes on the lower half of the number 2 mast and secure into place using the appropriate rivets.

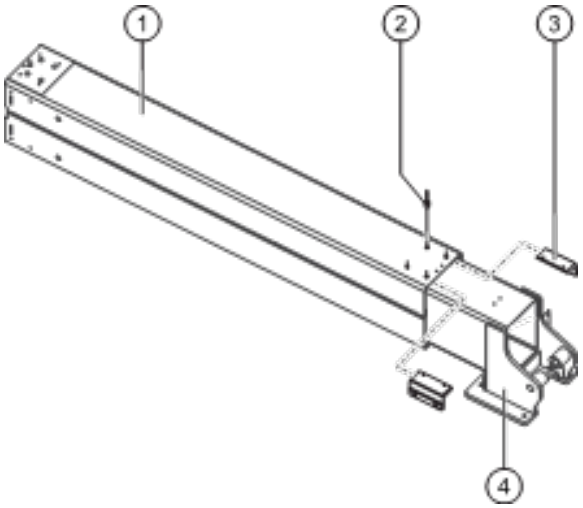


Illustration 2

1 mast number 2
2 rivet
3 wear pads
4 mast number 1

7 Slide the number 2 mast towards the bottom of the number 1 mast and align the lower number 2 mast access holes to the lower number 1 rivet holes. Refer to Illustration 3.

8 Working at the top of the number 2 mast, carefully slide the lower corner wear pads between the number 2 mast and the number 1 mast. Refer to Illustration 3.

9 Align the rivet holes on the wear pads to the number 2 mast access holes and to the number 1 mast rivet holes. Refer to Illustration 3.

10 Using the appropriate rivets, install the lower corner wear pads, to the lower half of the number 1 mast. Refer to Illustration 3.

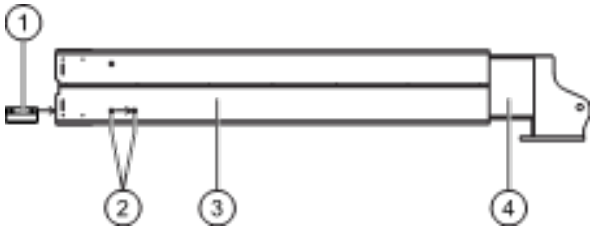


Illustration 3

1 wear pads
2 rivet
3 mast number 1
4 mast number 2

Mast Components

11 Using the appropriate rivets, install the upper corner wear pads, to the upper half of the number 2 mast.

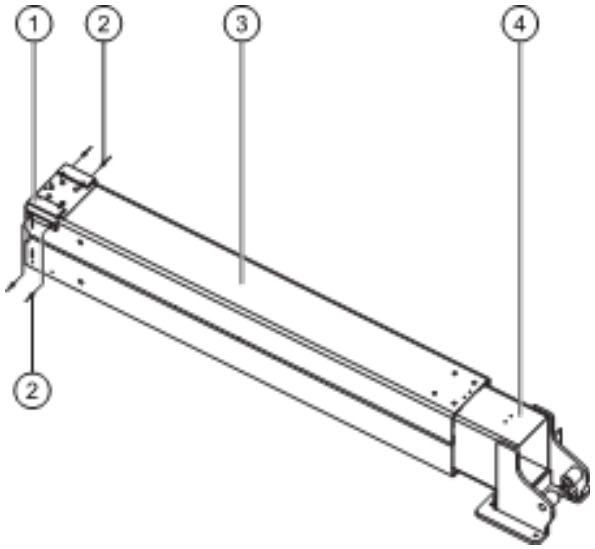


Illustration 4

1 wear pads
2 rivet
3 mast number 2
4 mast number 1

12 Attach a lifting strap from an overhead supporting device to the number 3 mast and carefully slide the number 3 mast onto the number 2 mast, with the cylinder mount brackets facing the work table.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

Note: During installation, the lifting strap will need to be adjusted for proper balancing.

13 Slide the lower, inner corner wear pads between the number 3 mast and the number 2 mast. Align the holes on the wear pads to the rivet holes on the lower half of the number 3 mast and secure into place using the appropriate rivets.

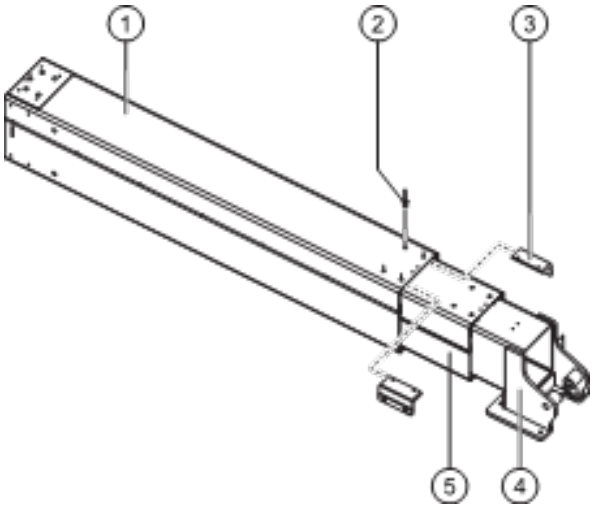


Illustration 5

1 mast number 3
2 rivet
3 wear pads
4 mast number 1
5 mast number 2

Mast Components

14 Slide the number 3 mast towards the bottom of the number 2 mast and align the lower number 3 mast access holes to the lower number 2 rivet holes. Refer to Illustration 6.

15 Working at the top of the number 3 mast, carefully slide the lower corner wear pads between the number 3 mast and the number 2 mast. Refer to Illustration 6.

16 Align the rivet holes on the wear pads to the number 3 mast access holes and to the number 2 mast rivet holes. Refer to Illustration 6.

17 Using the appropriate rivets, install the lower corner wear pads, to the lower half of the number 2 mast. Refer to Illustration 6.

Note: After installing the first rivet, move and align the number 3 mast access hole to the second hole on the wear pad and install the second rivet.

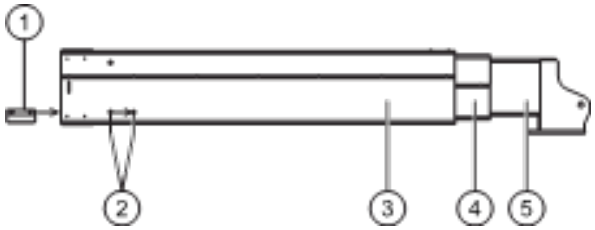


Illustration 6

1 wear pads
2 rivet
3 mast number 3
4 mast number 2
5 mast number 1

18 Using the appropriate rivets, install the upper corner wear pads, to the upper half of the number 3 mast.

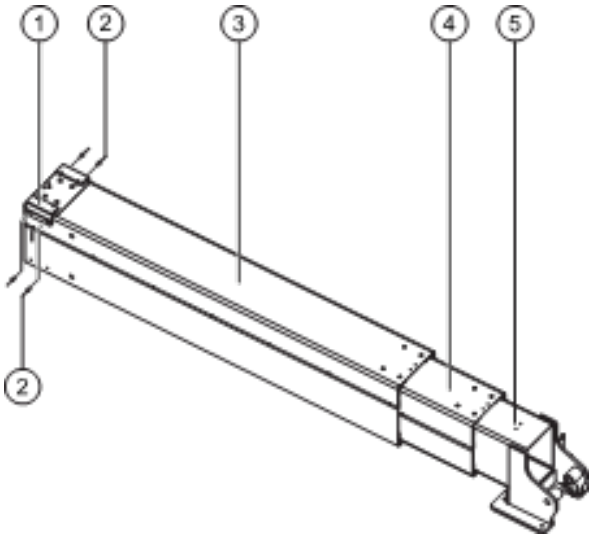


Illustration 7

1 wear pads
2 rivet
3 mast number 3
4 mast number 2
5 mast number 1

19 Attach a lifting strap from an overhead supporting device to the number 4 mast and carefully slide the number 4 mast onto the number 3 mast, with the cylinder mount brackets facing the work table.

⚠WARNING Crushing hazard. The mast section could become unbalanced and fall if not properly supported.

Note: During installation, the lifting strap will need to be adjusted for proper balancing.

Mast Components

20 Slide the lower, inner corner wear pads between the number 4 mast and the number 3 mast. Align the hol*es on* the wear pads to the rivet holes on the lower half of the number 4 mast and secure into place using the appropriate rivets.

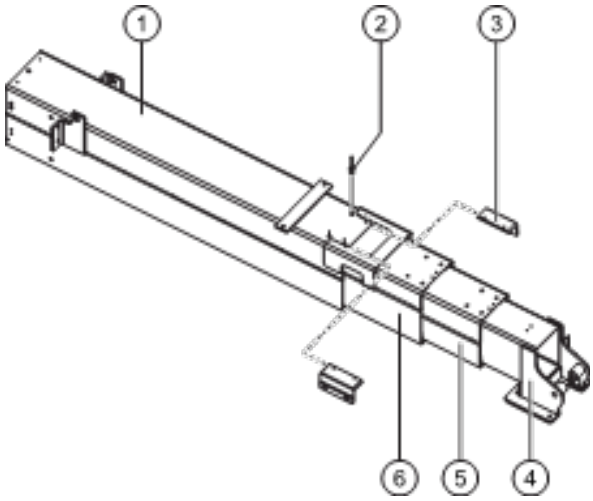


Illustration 8

1 mast number 4
2 rivet
3 wear pads
4 mast number 1
5 mast number 2
6 mast number 3

21 Slide the number 4 mast towards the bottom of the number 3 mast and align the lower number 4 mast access holes to the lower number 3 rivet holes. Refer to Illustration 9.

22 Working at the top of the number 4 mast, carefully slide the lower corner wear pads between the number 4 mast and the number 3 mast. Refer to Illustration 9.

23 Align the rivet holes on the wear pads to the number 4 mast access holes and to the number 3 mast rivet holes. Refer to Illustration 6.

24 Using the appropriate rivets, install the lower corner wear pads, to the lower half of the number 3 mast. Refer to Illustration 9.

Note: After installing the first rivet, move and align the number 4 mast access hole to the second hole on the wear pad and install the second rivet. Refer to Illustration 9.

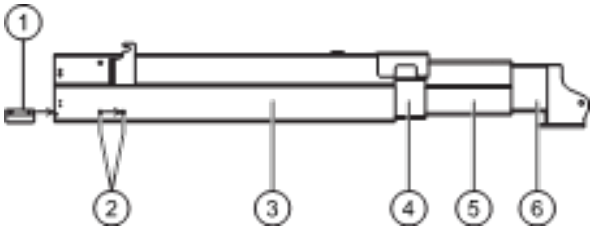


Illustration 9

1 wear pads
2 rivet
3 mast number 4
4 mast number 3
5 mast number 2
6 mast number 1

25 Attach a lifting strap from an overhead supporting device to the mast assembly and carefully rotate the mast 180°. Set the mast assembly onto the work table and secure the mast to the table.

⚠WARNING Crushing hazard. The mast assembly will fall if it is not properly supported by an overhead supporting device.

Note: During installation, the lifting strap will need to be adjusted for proper balancing.

26 Using Illustration 10 as a guide, stagger the mast assembly.

27 Slide the lower, inner corner wear pads between mast sections 1 and 2, 2 and 3, and, 3 and 4. Align the holes on the wear pads to the rivet holes on the lower half of mast sections 2, 3 and 4. Secure the wear pads into place using the appropriate rivets.

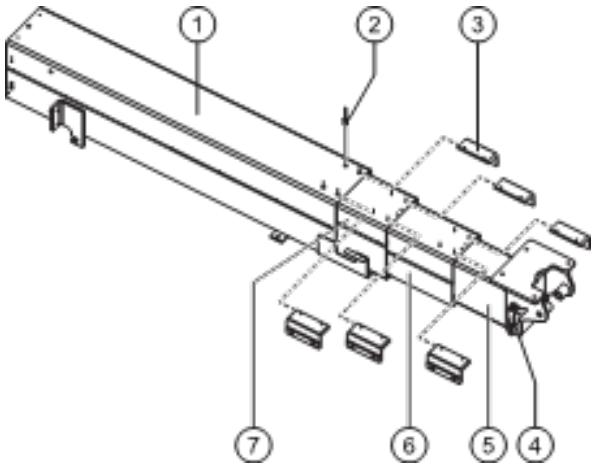


Illustration 10

1 mast number 4
2 rivet
3 wear pads
4 limit switch
5 mast number 1
6 mast number 2
7 mast number 3

28 Carefully collapse the mast assembly.

29 Attach a lifting strap from an overhead supporting device to the lift cylinder. Working from the lower half of the mast assembly, carefully slide the lift cylinder into the mast assembly, aligning the rod ends of the cylinder, to the cylinder mast mounting brackets at the upper half of the mast assembly.

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

Note: During installation, the lifting strap will need to be adjusted for proper balancing.

30 Working at the upper half of the mast assembly, install the lift cylinder nylock nuts onto the lift cylinder. Torque to 300 ft-lbs / 406 Nm.

31 Working from the lower half of the mast assembly, install the mast cylinder pin into the mounting holes of the number 1 mast and the lift cylinder.

32 Install the hair pin clips onto each side of the mast cylinder pin.

33 Install the lift cylinder retaining bolt onto the lower cylinder block. Do not over tighten the bolt.

34 Using the appropriate fasteners, install the limit switch assembly onto the lower half of the mast assembly. Do not over tighten the fasteners. Refer to Illustration 10.

35 Connect the hydraulic hose to the lift 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.*

Mast Components

10-2 Wear Pads

Wear pads on the GRC are used to provide a uniform fit between the mast sections, as the mast assembly extends and retracts. Over time, it may be necessary to replace the wear pads to ensure good machine performance.

How to Adjust the Wear Pads

1 Refer to Repair Procedure, *How to Remove the Mast Assembly.*

2 Refer to Repair Procedure, *How to Disassemble the Mast*.

3 Refer to Repair Procedure, *How to Assemble the Mast*.

10-3 Lift Cylinders

The lift cylinder is equipped with a normally closed solenoid valve to prevent movement in the event of a hydraulic line failure.

How to Remove the Lift Cylinder

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

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

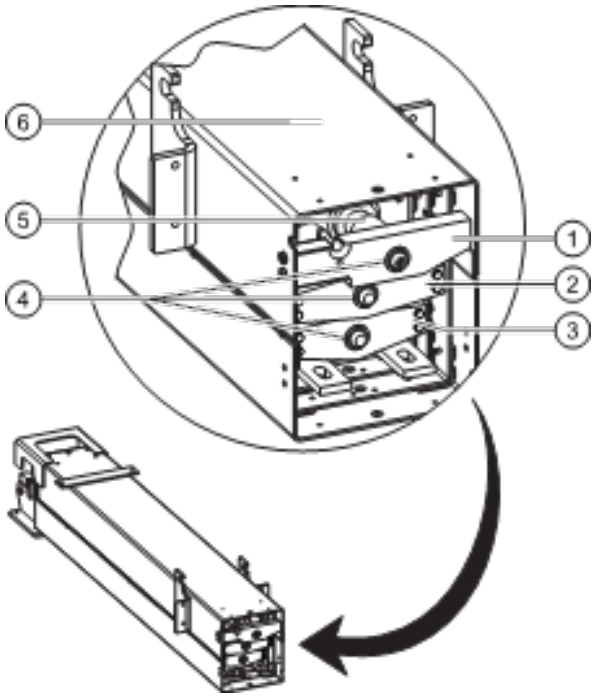
1 Refer to Repair Procedure, *How to Remove the Mast Assembly.*

2 Remove the nylock nuts securing the lift cylinder, to the cylinder mast mount brackets, located inside the top half of the mast assembly. Set the nylock nuts to the side.

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

4 Remove the lift cylinder retaining bolt from the lower cylinder block and set to the side.

Mast Components



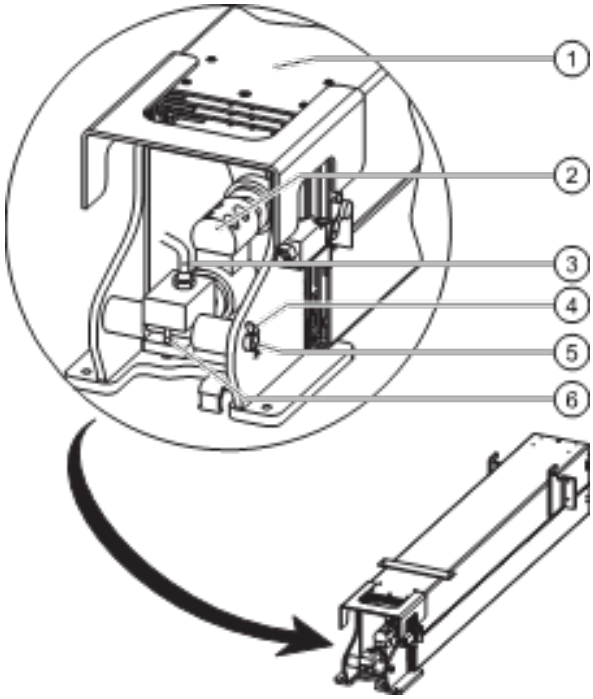
1 number 4 mast cylinder mount bracket
2 number 3 mast cylinder mount bracket
3 number 2 mast cylinder mount bracket
4 nylock nut
5 lift cylinder
6 mast assembly

5 Remove the hair pin clips securing the mast cylinder pin to the lower half of the mast assembly. Set the clips to the side.

6 Support the lift cylinder and use a soft metal drift to remove the mast cylinder pin from the lower mast assembly.

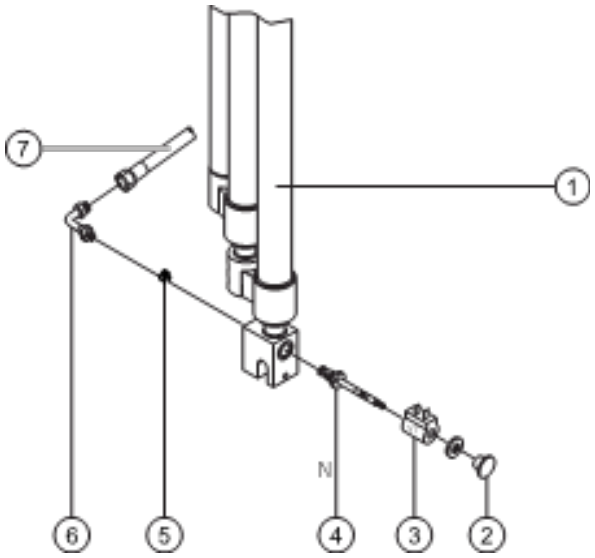
7 Attach a lifting strap from an overhead supporting device to the cylinder and carefully slide the lift cylinder out of the mast assembly.

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



1 lower mast assembly
2 lift cylinder
3 hydraulic hose assembly
4 hair pin clip
5 mast cylinder pin
6 cylinder retaining bolt

Mast Components



1 lift cylinder
2 manual lowering valve knob
3 coil
4 platform down solenoid valve
5 orifice
6 connector fitting
7 hydraulic hose assembly

10-4
Lift Cylinder Wear Block

How to Remove the Lift Cylinder Wear Block

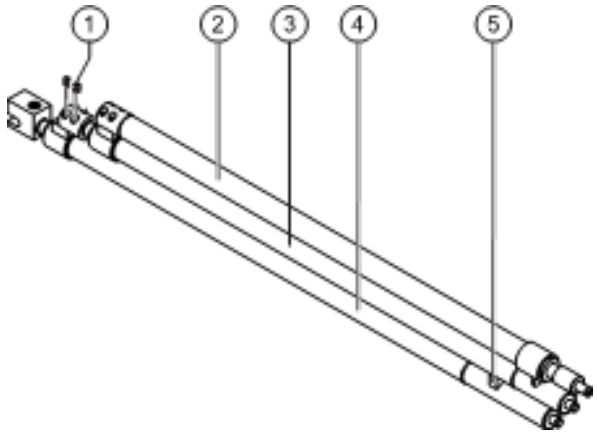
⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Refer to Repair Procedure, *How to Remove the Mast Assembly.*

2 Refer to Repair Procedure, *How to Remove the Lift Cylinder*.

3 Working at the barrel end of the cylinders, remove the fasteners securing cylinder number 2 to cylinder number 1.

4 Separate cylinder number 2 from cylinder number 1 and remove the cylinder wear block at the rod end of the cylinders.



1 cap screw
2 cylinder number 3
3 cylinder number 2
4 cylinder number 1
5 cylinder wear block

10-5
Mast Coil Cord

How to Remove the Mast Coil Cord

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

1 Refer to Repair Procedure, *How to Remove the Mast Assembly.*

2 Loosen the strain relief nut at the top of the AC outlet junction box.

3 Remove the cover from the AC outlet junction box. Tag and disconnect the coil cord wires from the control cable wires.

4 Cut the connectors from the coil cord wires and pull the coil cord from the strain relief.

5 Working at the rod end of the mast, cut the cable tie securing the coil cord and the spring to the number 4 cylinder mount bracket.

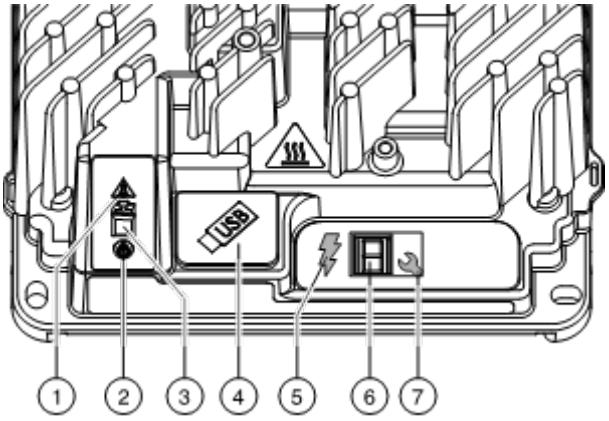
6 Working at the barrel end of the mast, cut the cable tie securing the coil cord and spring to the "L" bracket.

7 Remove the coil cord and the spring from the mast assembly.

Battery Charger

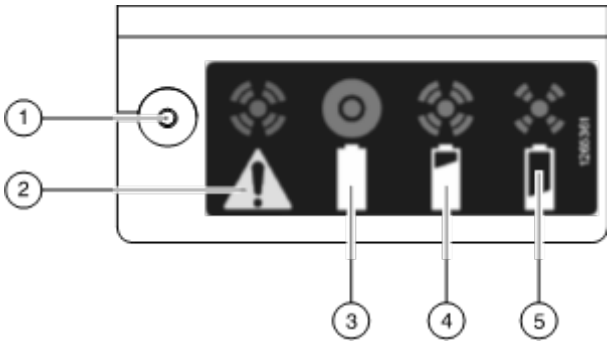
11-1
Battery Charger

The charger contains selectable charging profiles stored in its internal memory to charge batteries. These profiles are specific to each battery type. The charging profile must be programmed to match the specific battery type on the machine.



Charger status indicators

1 Error / Fault / USB indicator
2 AC power indicator
3 Battery charging indicator
4 USB port
5 Charging output indicator
6 Charger profile / Error display
7 Charge profile selection button



Remote charger status indicators

1 Error / Fault / USB indicator
2 Error / Fault
3 Charge complete
4 Charging, high state of charge
5 Charging, low state of charge

Selecting a Charge Profile

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

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

2 Open the battery compartment.

3 Press and hold the charge profile selection button and plug the battery charger into an AC power source. Continue to hold the button until the amber error indicator is on and the green charging indicator light is flashing. Release the button.

4 Press and release the charge profile selection button to navigate to the charge profile appropriate for your machine and battery type. Refer to the chart below.

Profile	Description
P001	Flooded lead acid batteries - Temperature compensated *
P003	Flooded lead acid batteries - Not temperature compensated **
P007	Flooded lead acid batteries - Not temperature compensated **
P043	AGM batteries - Temperature compensated *

* Temperature compensated: Battery temperature sensor has been installed on the machine.

** Not temperature compensated: Battery temperature sensor has not been installed on the machine.

5 Press and hold the charge profile selection button until the error indicator and charging indicator lights turn off and the AC status indicator light turns on to confirm selection and exit charge profile mode. Release the button.

Note: Charge profile mode will time out and exit if there is 15 seconds of inactivity, the charge profile number has been displayed three times or the AC power source had been disconnected.

6 Press and release the charge profile selection button to confirm the correct charge profile has been selected.

Batteries

12-1 How to Remove the Batteries

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

Models with working batteries:

1 Raise the platform to approximately 3 ft / 1 m.

2 Open the battery cover. Rest the cover against the chassis.

3 Lower the platform until the mast just contacts the battery cover.

⚠WARNING Crushing hazard. Keep hands clear of the battery cover when lowering the platform.

Models with non-working batteries:

4 Secure the platform to an overhead lifting device.

5 Carefully lift the platform approximately 3 feet / 1 m.

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

6 Open the battery cover. Rest the cover against the chassis.

7 Lower the platform until the mast just contacts the battery cover.

⚠WARNING Crushing hazard. Keep hands clear of the battery cover when lowering the platform.

All Models:

8 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.

9 Disconnect the battery cables and set aside.

10 Remove the batteries from the machine.

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 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

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.

⊙ 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.

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

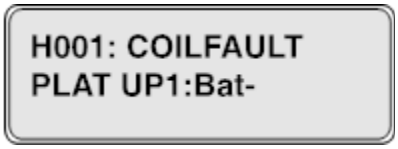
GCON – Ground Controls

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.

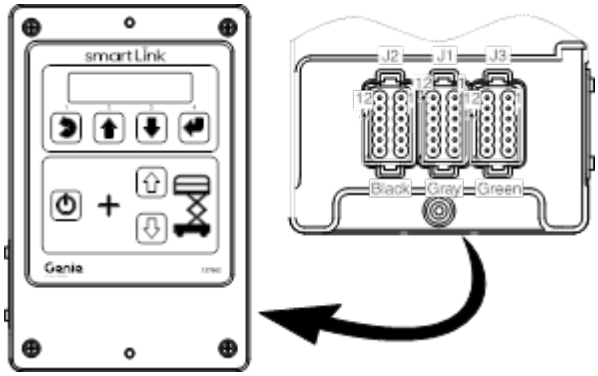
The codes listed in the Diagnostic Trouble Code Charts describe malfunctions and can aid in troubleshooting the machine by pinpointing the area or component affected.

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 ECM Connector Layout



Rear of Ground Controls

GCON I/O MAP			
Pin number	**Circuit function**	**I/O Type**	**Wire color**
J1 / QD31 Connector – Gray			
J1-1 / QD31-01	Power, ECM	Power Input	Red
J1-2 / QD31-02	Power, PCON	Power Output	Red
J1-3 / QD31-03	Emergency stop, PCON	Power Input	White
J1-4 / QD31-04	CAN High, PCON	Data Bus	Green
J1-5 / QD31-05	CAN Low, PCON	Data Bus	Orange
J1-6 / QD31-06	Ground, PCON	Ground Output	Brown
J1-7 / QD31-07	Ground, ECM	Ground Input	Brown
J1-8 / QD31-08	Key switch, PCON	Digital Input	Black
J1-9 / QD31-09	Key switch, GCON	Digital Input	White
J1-10 / QD31-10	Emergency stop, GCON	Digital Input	White / Black
J1-11 / QD31-11	Contact alarm (if equipped)	Digital Input	Black
J1-12 / QD31-12	Power, ECM Driver	Power Input	Red
J3 / QD32 Connector – Green			
J3-1 / QD32-01	Not used	---	---
J3-2 / QD32-02	Alarm, GCON	Digital Output	Blue
J3-3 / QD32-03	Sensor power	Digital Output	Red
J3-4 / QD32-04	Automotive horn	Digital Output	White
J3-5 / QD32-05	Pothole limit switch	Digital Input	Orange / Red
J3-6 / QD32-06	Machine ID	Digital Input	Red
J3-7 / QD32-07	Down limit switch	Digital Input	Orange
J3-8 / QD32-08	level sensor (to serial number GRC15-2343)	Digital Input	Red / Black
J3-9 / QD32-09	Ground	Ground Input	Brown
J3-10 / QD32-10	Ground	Ground Input	Brown
J3-11 / QD32-11	Not used	---	---
J3-12 / QD32-12	Not used	---	---
J2 / QD33 Connector – Black			
J2-1 / QD33-01	Platform up coil	Digital Output	Orange
J2-2 / QD33-02	Platform down coil	Digital Output	Orange / Black
J2-3 / QD33-03	Steer left coil	Digital Output	Blue / Black
J2-4 / QD33-04	Steer right coil	Digital Output	Blue
J2-5 / QD33-05	Not used	---	---
J2-6 / QD33-06	Drive forward coil	Digital Output	White
J2-7 / QD33-07	Not used	---	---
J2-8 / QD33-08	Motor controller enable	Digital Output	Green / White
J2-9 / QD33-09	Not used	---	---
J2-10 / QD33-10	Drive reverse coil	Digital Output	White / Black
J2-11 / QD33-11	Motor controller throttle	Analog Output	Green
J2-12 / QD33-12	Not used	---	---

Diagnostics

Operational Indicator Codes (OIC)

These codes are generated by the electrical system to indicate machine operating status such as Off-level, 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
CH	Chassis Mode Operation
PHS	Pothole Guard Stuck
ND	No Drive (option)
CHrg	Charger Interlock (option)

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

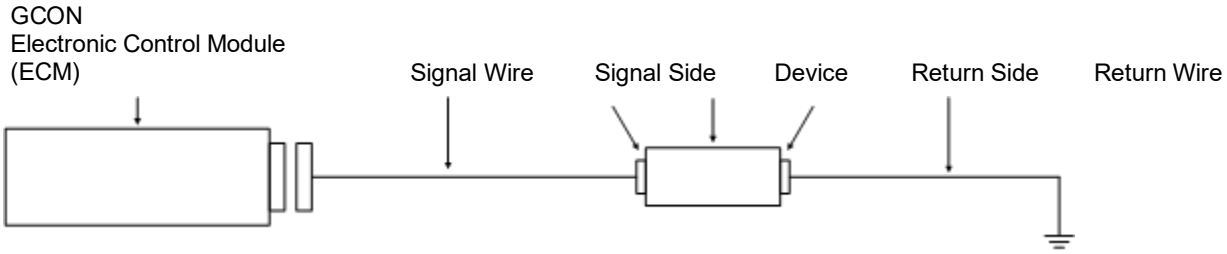
The procedure below illustrates typical steps for diagnosing and fixing faults of type "HXXX" and "PXXX".

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 ↓	**No Good**	
3	Check GCON Electronic Control Module (ECM).	➔	Replace ECM.

Wiring Diagram

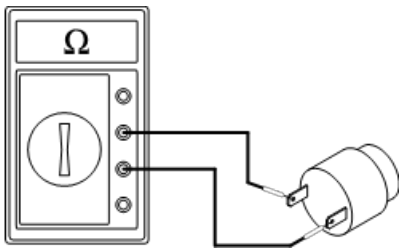
The wiring diagram shown below illustrates how fault type "HXXX" and "PXXX" devices are typically wired.
The signal of these types of devices originates at the Ground Controls and terminates at system ground.

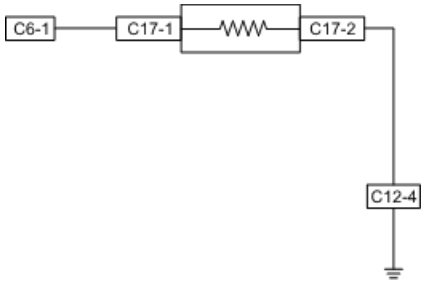


In order to successfully troubleshoot "HXXX" or "PXXX" type faults, the entire faulted out circuit must be investigated.

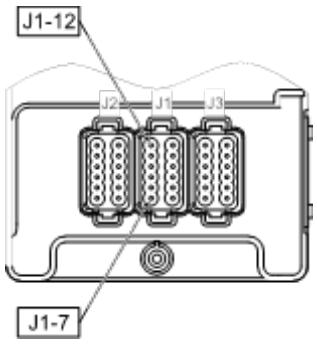
Diagnostics

Fault Inspection Procedure

1	Check the device associated with the faulted circuit		
	1 Disconnect the faulted device connector. 2 Using a multi-meter, measure resistance between the two terminals of the faulted device. 3 Resistance should be as follows. **Device** — **Typical Resistance** Solenoid Valve, Drive — 27.2 Ω Solenoid Valve, Steer — 19 Ω Solenoid Valve, Platform Up — 25 Ω Solenoid Valve, Platform Down — 6.25 Ω GCON and PCON Alarm — >1M Ω Automotive Horn — 1.0 Ω 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/QD31, J2/QD33 and J3/QD32. 2 Disconnect the faulted device connector. 3 Check the continuity between the GCON ECM connector and the signal side of the faulted device. ⊙ Result: Resistance should be close to 0 Ω. 4 Check the continuity between the return side of faulted device and system ground. ⊙ Result: Resistance should be close to 0 Ω. 5 Check resistance between return side and signal side of the harness plug of faulted device. ⊙ Result: Resistance should be 1M Ω or higher.		
OK	**Go to step 3**	No Good	**Replace or repair harness**

3	Check the GCON ECM



1 Disconnect the GCON ECM connectors, J1/QD31, J2/QD33 and J3/QD32.

2 For short to B- type faults, measure resistance between pins J1-7/QD31-7 (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.

3 Short to ground resistance should be greater than 5k Ω.

4 For short to B+ type faults, measure resistance between pins J1-12/QD31-12 (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.

5 Short to power resistance should be greater than 50k Ω.

No Good	**Replace GCON ECM**

Diagnostics

Type "HXXX" Faults

DTC Number	Message on GCON LCD	Description	Possible Causes	Failure Mode
H001:	H001:COILFAULT PLAT UP1:BAT-	Short circuit of the platform up #1 circuit to battery negative.	• Short circuit in platform up #1 harness. • Platform up #1 coil short circuit. • GCON ECM.	Platform up function inhibited.
H002:	H002:COILFAULT PLAT UP1:OPEN	Open circuit in the platform up #1 circuit.	• Short circuit in platform up #1 harness. • Platform up #1 coil open circuit. • GCON ECM.	Platform up function inhibited.
H003:	H003:COILFAULT PLAT UP1:BAT+	Short circuit of the platform up #1 circuit to battery positive.	• Short circuit in platform up #1 harness. • Platform up #1 coil short circuit. • GCON ECM.	All functions inhibited except platform down.
H009:	H009:COILFAULT PLAT DOWN1:BAT+	Short circuit of the platform down #1 circuit to battery positive.	• Short circuit in platform down #1 harness. • Platform down #1 coil short circuit. • GCON ECM.	All functions inhibited.
H013:	H013:COILFAULT DRIVE FWD1:BAT-	Short circuit of the drive forward #1 circuit to battery negative.	• Short circuit in drive forward #1 harness. • Drive forward #1 coil short circuit. • GCON ECM.	Drive forward function inhibited.
H014:	H014:COILFAULT DRIVE FWD1:OPEN	Open circuit in the drive forward #1 circuit.	• Open circuit in drive forward #1 harness. • Drive forward #1 coil open circuit. • GCON ECM.	Drive forward function inhibited.
H015:	H015:COILFAULT DRIVE FWD1:BAT+	Short circuit of the drive forward #1 circuit to battery positive.	• Short circuit in drive forward #1 harness. • Drive forward #1 coil short circuit. • GCON ECM.	All functions inhibited except platform down.
H019:	H019:COILFAULT DRIVE REV1:BAT-	Short circuit of the drive reverse #1 circuit to battery negative.	• Short circuit in drive reverse #1 harness. • Drive reverse #1 coil short circuit. • GCON ECM.	Drive reverse function inhibited.
H020:	H020:COILFAULT DRIVE REV1:OPEN	Open circuit in the drive reverse #1 circuit.	• Open circuit in drive reverse #1 harness. • Drive reverse #1 coil open circuit. • GCON ECM.	Drive reverse function inhibited.
H021:	H021:COILFAULT DRIVE REV1:BAT+	Short circuit of the drive reverse #1 circuit to battery positive.	• Short circuit in drive reverse #1 harness. • Drive reverse #1 coil short circuit. • GCON ECM.	All functions inhibited except platform down.
H027:	H027:COILFAULT DRIVE STEER RIGHT:BAT+	Short circuit of the steer right circuit to battery positive.	• Short circuit in steer right harness. • Steer right coil short circuit. • GCON ECM.	All functions inhibited except platform down.
H030:	H030:COILFAULT DRIVE STEER LEFT:BAT+	Short circuit of the steer left circuit to battery positive.	• Short circuit in steer left harness. • Steer left coil short circuit. • GCON ECM.	All functions inhibited except platform down.
H067:	H067:FAULT MC ENABLE:BAT-	Short circuit of the motor controller circuit to battery negative.	• Short circuit in motor controller enable wire. • Motor Controller. • Contactor coil shorted to battery negative. • GCON ECM.	All functions inhibited except platform down.
H069:	H069:FAULT MC ENABLE:BAT+	Short circuit of the motor controller circuit to battery positive.	• Short circuit in motor controller enable wire. • Motor Controller. • Contactor Coil. • GCON ECM.	All functions inhibited except platform down.
H070:	H070:FAULT MC THROTTLE:BAT-	Short circuit of the motor controller throttle circuit to battery negative.	• Short circuit in motor controller throttle wire. • Motor Controller. • GCON ECM.	All functions inhibited except platform down.
H072:	H072:FAULT MC THROTTLE:BAT+	Short circuit of the motor controller throttle circuit to battery positive.	• Short circuit in motor controller throttle wire. • Motor Controller. • GCON ECM.	All functions inhibited except platform down.
H078:	H078:COILFAULT 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. • Platform down #1 coil short or open circuit. • GCON ECM.	Platform down function inhibited.
H080:	H080:COILFAULT STEER LEFT	Short circuit of the steer left circuit to battery negative or open circuit.	• Short or open circuit in steer left harness. • Steer left coil short or open circuit. • GCON ECM.	Steer left function inhibited.
H081:	H081:COILFAULT STEER RIGHT	Short circuit of the steer right circuit to battery negative or open circuit.	• Short or open circuit in steer right harness. • Steer right coil short or open circuit. • GCON ECM.	All functions inhibited except platform down while above limit switch.

Type "PXXX" Faults

DTC Number	Message on GCON LCD	Description	Possible Causes	Failure Mode
P001:	P001:PWR FAULT 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. • GCON ECM.	All functions inhibited.
P003:	P003:PWR FAULT 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. • GCON ECM.	All functions inhibited.
P004:	P004:DEVICEFAULT HORN:BAT-	Short circuit of the automotive horn circuit to battery negative.	• Short circuit in automotive horn harness. • Automotive horn short circuit. • GCON ECM.	Automotive horn inhibited.
P005:	P005:DEVICEFAULT HORN:OPEN	Open circuit of the automotive horn circuit.	• Open circuit in automotive horn harness. • Automotive horn open circuit. • GCON ECM.	Automotive horn inhibited.
P006:	P006:DEVICEFAULT HORN:BAT+	Short circuit of the automotive horn circuit to battery positive.	• Short circuit in automotive horn harness. • Automotive horn short circuit. • GCON ECM.	Automotive horn inhibited.
P007:	P007:DEVICEFAULT GCON ALARM:BAT-	Short circuit of the GCON alarm circuit to battery negative.	• Short circuit in GCON alarm harness. • GCON alarm short circuit. • GCON ECM.	GCON alarm inhibited.
P009:	P009:DEVICEFAULT GCON ALARM:BAT+	Short circuit of the GCON alarm circuit to battery positive.	• Short circuit in GCON alarm harness. • GCON alarm short circuit. • GCON ECM.	GCON alarm inhibited.
P013:	P013:PWR FAULT PCON PWRET:BAT-	Short circuit of the PCON power return circuit to battery negative.	• Short circuit in PCON power return harness. • GCON ECM.	All functions inhibited.
P015:	P015:PWR FAULT PCON PWRET:BAT+	Short circuit of the PCON power return circuit to battery positive.	• Short circuit in PCON power return harness. • GCON ECM.	All functions inhibited.
P018:	018:PWR FAULT PCON POWER:BAT-	Short circuit of the PCON power circuit to battery negative.	• Short circuit in PCON power harness. • GCON ECM.	All functions inhibited.
P019:	018:PWR FAULT PCON POWER:BAT+	Short circuit of the PCON power circuit to battery positive.	• Short circuit in PCON power harness. • GCON ECM.	All functions inhibited.

Diagnostics

Type "UXXX" Faults

DTC Number	Message on GCON LCD	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. • 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. • 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. • 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. • 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. • 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. • 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. • 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. • 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. • 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. • 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. • 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. • GCON ECM.	The machine is limited to low drive speed.
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. • PCON joystick. • 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 the PCON drive joystick signal circuit. • PCON joystick. • 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 the PCON drive joystick signal circuit. • PCON joystick. • 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. • GCON ECM.	All functions inhibited.
U042:	U042:SWITCHFAULT PCON DRIVE MODE	PCON drive mode switch stuck closed, or depressed prior to startup.	• Drive mode switch stuck closed. • Drive mode switch is depressed at system startup. • PCON ECM.	Drive functions inhibited.
U045:	U045:SWITCHFAULT PCON DRIVE EN	Short circuit of the PCON drive enable switch at system startup.	• Short circuit of the PCON drive enable switch. • PCON ECM. • GCON ECM.	All drive and steer functions inhibited.
U046:	U046:SWITCHFAULT PCON LIFT MODE	PCON function enable switch stuck closed, or depressed at system startup.	• PCON lift mode switch depressed at system startup. • PCON ECM.	All functions operate except platform up/down.

Type "FXXX" Faults

DTC Number	Message on GCON LCD	Description	Possible Causes	Failure Mode
F001:	F001:SWITCHFAULT UP LIMIT1:BAT+	Short circuit of the up limit #1 switch at system startup.	• Short circuit of the up limit switch circuit. • Up limit #1 switch short circuit. • GCON ECM.	Platform up function inhibited.
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. • Down limit #1 switch short circuit. • 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. • Pothole limit #1 switch short circuit. • 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. • Chassis digital tilt switch short circuit. • 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 sensing circuit to battery positive.	• Short circuit in the obstruction sensing harness. • GCON ECM.	All functions inhibited.
F032:	F032:SWITCHFAULT OVLD SWITCH:Bat+	Short circuit of pressure switch to battery positive.	• Short circuit in the limit switch harness. • GCON ECM.	All functions inhibited.
F033:	F033:SWITCHFAULT OVLD:Open/Bat-	Open or short circuit of pressure switch.	• Open or short circuit in the limit switch harness. • GCON ECM.	All functions inhibited.
F072:	F072:SENSORFAULT FUNCTION CUT B+	Function Cutout sensor B+ fault.	• Faulty extension deck limit switch. • Faulty gate proximity switch. • GCON ECM.	All functions inhibited.
F129:	F129:TILT SENSOR FAULT	UTS mismatch fault. Two accelerometers inside UTS mismatch.(universal tilt sensor)	• Faulty UTS.	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.

Diagnostics

Type "CXXX" Faults

DTC Number	Message on GCON LCD	Description	Possible Causes	Failure Mode
C001:	C001:GCON ECM FAULT TYPE 1	GCON ECM CRC check error.	• Incorrect software file. • 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. • GCON ECM.	All functions inhibited.
C005:	C005:GCOM ECM FAULT TYPE 5	GCON ECM safety switch error.	• Short circuit in the safety switch circuit. • GCON ECM.	All functions inhibited.
C006:	C006:GCON ECM FAULT TYPE 6	GCON input redundancy error.	• Input conditioning circuit failure. • GCON ECM.	All functions inhibited.
C007:	C007:GCON ECM FAULT TYPE 7	GCON ECM inter-processor communication error.	• Incorrectly programmed device. • Error in loading software on device. • GCON ECM.	All functions inhibited.
C009:	C009:GCON ECM FAULT TYPE 9	GCON ECM fault type 9.	• Contact Genie support.	All functions inhibited.
C010:	C010:SECONDARY NOT PROGRAMMED	GCON secondary processor not programmed.	• Incorrectly programmed device. • Error in loading software on device. • GCON ECM.	All functions inhibited.
C021:	C021:PCON NOT DETECTED	PCON not detected error.	• PCON disconnected. • CAN communication failure. • GCON or PCON ECM.	All functions inhibited.
C023:	C023:MACHINE MODEL FAULT	Discrepancy between model detected and model programmed.	• Incorrect machine model programmed. • 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. Platform can be elevated only once with the maximum elevate time of XX seconds. Elevate time XX depends on machine model.
C051:	C051:SYSTEMFAULT TILT:NoCal	UTS level sensor not calibrated.	• UTS level sensor calibration has not been performed. • New level sensor connected. • System parameters reset to default.	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.
C052:	C052:TILT SENSOR NOT DETECTED	No level sensor detected.	• UTS level sensor disconnected. • Open circuit in level sensor harness.	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.

Type “CXXX” Faults, (continued)

DTC Number	Message on GCON LCD	Description	Possible Causes	Failure Mode
C053:	C053:PCON-GCON SOFTWARE MISMATCH	Software revisions do not match between the PCON and GCON.	• C053 displayed at GCON, PCON with older software revision connected to GCON with newer software revision. • C053 displayed at PCON, PCON with newer software revision connected to GCON with older software revision.	All functions inhibited.
C054:	C054:GCON ECM FAULT TYPE 54	GCON ECM Fault: Type 54.	• Short or open circuit to GCOM ECM. • GCON ECM.	All functions inhibited.
C077:	C077:DISABLED BY OWNER	Telematics Remote Disable.	• Machine disabled.	All functions inhibited.
C078:	C078:TELEMATICS NOT DETECTED	Telematics device not detected by GCON.	• Telematics device not connected. • Telematics device not installed.	**Telematics is installed:** Connect the telematics device to the GCON. **Telematics is not installed:** Navigate to the options menu on the machine and disable telematics.

Diagnostics

Battery Charger

The charger continuously monitors internal and external conditions. Fault and Error codes are generated by the charger to indicate that an internal or external malfunction has been detected in the electrical system. The types of Diagnostic Trouble Codes that may occur are explained below.

Type "F" codes – Indicate an internal fault condition has occurred and caused charging to stop.

Type "E" codes - Indicate an external fault condition has occurred and caused charging to stop.

Type "P" code - Indicates charger programming mode is active. This will occur when the charger profile is being configured.

Type "USB" code - Indicates the USB interface is active, and the USB should not be removed. This will occur when the charger firmware is being updated.

 Solid red - Internal fault condition. Type "F" fault code.

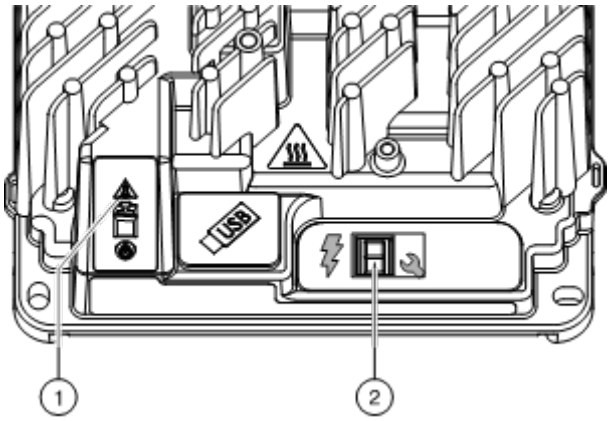
 Flashing amber - External fault condition. Type "E" error code.

 Flashing green - USB interface is active.

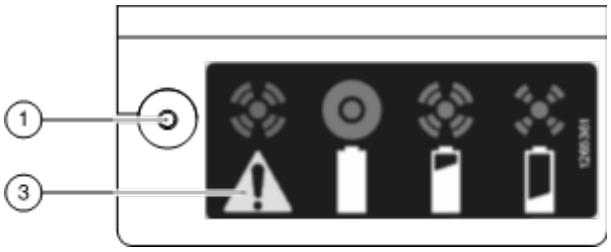
 Solid green - Firmware update is complete. Remove USB from charger.

Codes are displayed as F, E or P and followed by three numbers and a period (example: E-0-0-4). The charger can display multiple codes.

If the batteries are changed from one type to another, (example: flooded lead acid to AGM), the charger profile must be programmed. Refer to Repair Procedure, *Programming the Charger Profile*.



Charger status indicators



Remote charger status indicators

1 Error / Fault / USB indicator
2 Charger profile / Error display
3 Error / Fault

Charger Fault Codes

Fault Code	Description	Possible Causes	Solution
F-0-0-1	DC-DC failure: LLC excessive leakage fault.	Internal charger fault.	Disconnect AC input and battery pack for 30 seconds. If fault does not clear, contact Genie Product Support.
F-0-0-2	PFC failure: PFC excessive leakage fault.		
F-0-0-3	PFC taken too long to boost.		
F-0-0-4	Charger unable to calibrate current offset.		
F-0-0-5	Output relay voltage too high when closed.		

Diagnostics

Charger Error Codes

Error Code	Description	Condition	Possible Causes
E-0-0-1	High battery voltage	Battery voltage too high to charge.	Check battery voltage and cable connections. Self clearing when condition has been corrected.
E-0-0-2	Low battery voltage detected prior to starting charge cycle	Battery voltage too low to charge.	Check battery voltage and cable connections. Check battery condition. Self clearing when condition has been corrected.
E-0-0-3	Charge timeout	Charge timeout caused by battery pack not reaching required voltage within safe time limit.	Charge output reduced due to high temperature. Charge at lower temperature. Check battery condition. Replace damaged battery. Check battery connections. Battery pack deep discharge. Disconnect battery pack for 30 seconds to clear fault when condition has been corrected.
E-0-0-4	Defective battery	Battery pack could not be trickle charged up to the minimum voltage.	Check battery condition. Replace damaged battery. Check battery connections. Disconnect battery pack for 30 seconds to clear fault when condition has been corrected.
E-0-0-7	Amp hour limit exceeded	Safety limit exceeded.	Check battery condition. Replace damaged battery. Check battery connections. Battery pack deep discharge. High parasitic loads on battery pack while charging. Disconnect parasitic loads. Disconnect battery pack for 30 seconds to clear fault when condition has been corrected.

Charger Error Codes

Error Code	Description	Condition	Possible Causes
E-0-0-8	Battery temperature out of range	Battery temperature sensor.	Check temperature sensor and electrical connections. Rest charger. Disconnect AC power for 30 seconds. Self clearing when condition has been corrected.
E-0-1-1	Charger disabled by external command	Battery pack not being charged..	Power outage. AC power disconnected before charging complete.
E-0-1-2	Reverse polarity	Battery connected incorrectly.	Check battery connections. Self clearing when condition has been corrected.
E-0-1-3	Battery does not take current	Battery voltage is detected, but charger is unable to charge the battery pack..	Incorrect profile for battery type. Installed from a different machine with different battery type. Disconnect battery pack for 30 seconds to clear fault when condition has been corrected.
E-0-1-6	Software update failed	Software update failed.	Confirm USB Flash Drive is formatted with correct software. If software update continues to fail, contact Genie Product support.
E-0-1-7	USB error	USB not connected correctly.	Remove and re-insert USB Flash Drive. Disconnect AC input and battery pack for 30 seconds.
E-0-1-8	Slot CRC error	Software update failed.	Confirm USB Flash Drive is formatted with correct software. If software update continues to fail, contact Genie Product support.
E-0-1-9	Hardware does not support software	Charger hardware does not support software version being programmed.	Confirm USB Flash Drive is formatted with correct software. If software update continues to fail, contact Genie Product support.
E-0-2-0	No algorithm selected	Charger profile not programmed.	Program the charger for the proper battery profile.

Diagnostics

Charger Error Codes

Error Code	Description	Condition	Possible Causes
E-0-2-1	High battery voltage detected while charging	Battery voltage too high as detected by charger profile.	Check battery voltage and cable connections. Confirm charger profile is programmed for correct battery type. Self clearing when condition has been corrected.
E-0-2-2	Low battery voltage detected while charging	Battery voltage too low as detected by charger profile.	Check battery voltage and cable connections. Confirm charger profile is programmed for correct battery type. Self clearing when condition has been corrected.
E-0-2-3	High AC voltage	AC voltage greater than 270 VAC.	Connect to a stable AC source between 85 - 270 VAC / 45 - 65 Hz. Self clearing when condition has been corrected.
E-0-2-4	Failure to initialize	Charger failed to turn on correctly.	Disconnect AC input and battery pack for 30 seconds. Contact Genie Product Support.
E-0-2-5	Low AC voltage oscillation	AC voltage unstable.	Connect to a stable AC source between 85 - 270 VAC / 45 - 65 Hz. Using an undersized generator. Self clearing when condition has been corrected.
E-0-2-6	Script failure	Software update failed.	Confirm USB Flash Drive is formatted with correct software. If software update continues to fail, contact Genie Product support.
E-0-2-7	USB over current fault	USB over current protection has been tripped.	Remove and re-insert USB Flash Drive. Use different USB Flash drive.
E-0-2-8	Charge profile incompatibility	Selected charger profile is not compatible with charger software.	Update charger software. Confirm charger profile is programmed for correctly. Updating current firmware and error occurs, contact Genie Product Support.

Charger Error Codes

Error Code	Description	Condition	Possible Causes
E-0-2-9	CAN Bus error	CAN Bus network error.	Check CAN Bus connections. CAN modules not functioning correctly. Termination resistance is ~60 ohms.
E-0-3-0	COMM battery module error	CAN Bus battery module error.	CAN Buss battery module not functioning correctly.
E-0-3-1	Vref for ADC measurements triggered alarm	Internal charger error.	Disconnect AC input and battery pack for 30 seconds. Contact Genie Product Support.
E-0-3-2	CAN Bus heartbeat error	CAN Bus heartbeat error.	CAN Bus devices not functioning correctly.
E-0-3-6	Battery temperature sensor charge profile	Battery temperature sensor is required by charger profile but is not installed.	Check battery temperature sensor connections. Check charger profile and confirm battery temperature sensor is installed.
E-0-3-8	CAN Open Error	CAN Open reprogramming failed.	Download CAN Open software. Reprogram charger using USB Flash Drive.

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

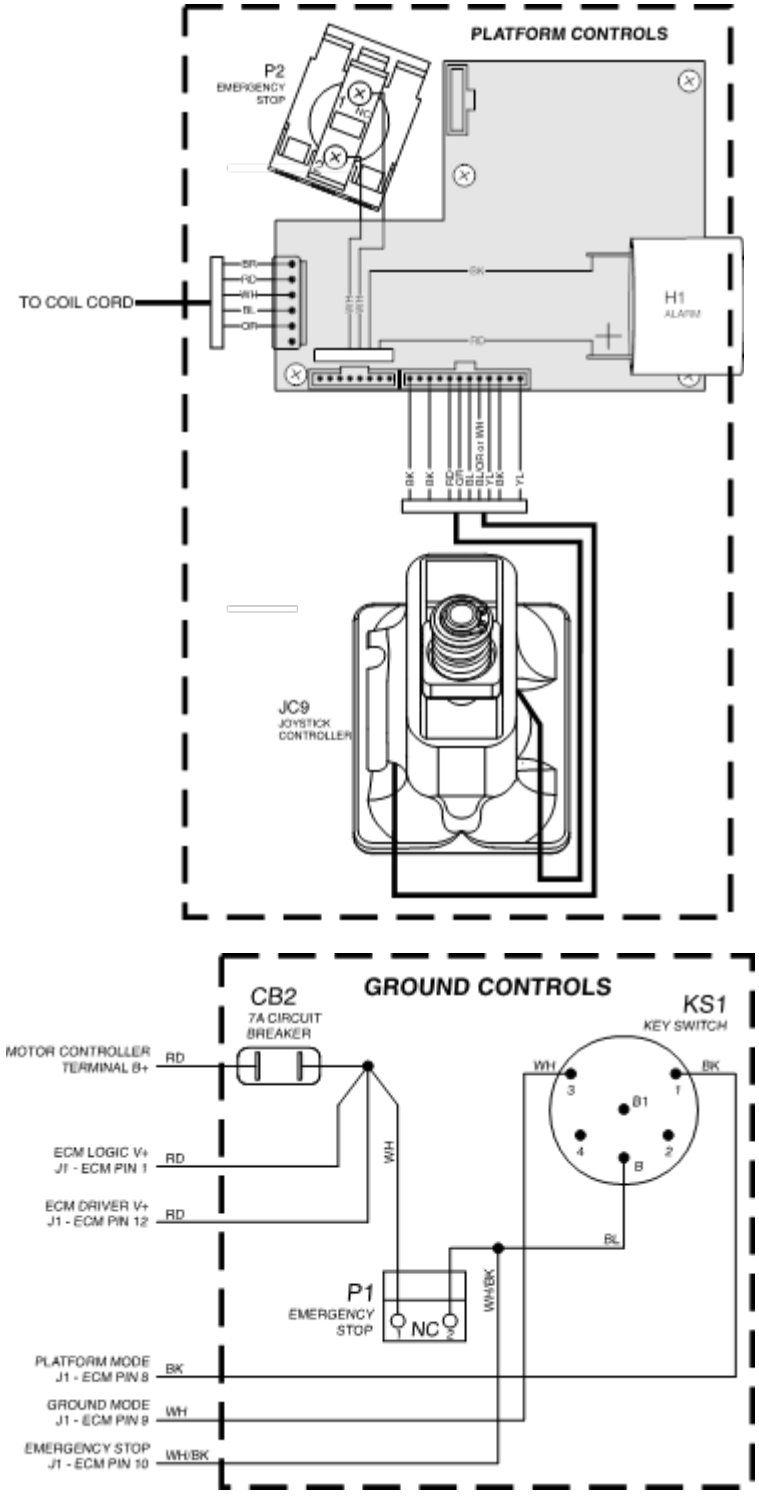
⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Electrical Component and Wire Color Legends

Electrical Component Legend	
Item	**Description**
B1 - B4	Battery, 6V DC
CB1	Circuit breaker, 7A
CON1	Contactor, Motor controller power
D	Diode D1 = Motor controller enable, 3A D2 = Motor controller, 3A
EN1	Enclosure, AC outlet box
F	Fuse F1 = 275A
FB1	Flashing beacon
GND	Ground
H	Horn or alarm H1 = Alarm, GCON H2 = Automotive style horn (option) H3 = Alarm, PCON
JC1	Joystick
KS1	Key switch
LS	Limit switch LS6 = Platform down LS7 = Pothole LS8 = Pothole LS18 = Load sense (option)
M1	Hydraulic power unit
NC	Normally closed
NCHO	Normally closed held open
NOHC	Normally open held closed
OSP	Obstruction sensing pads (QSR models)
P	Red emergency stop button P1 = At ground controls P2 = At platform controls

Electrical Component Legend, continued	
Item	**Description**
C, J, QD	Connector, Plug, Quick disconnect
	QD1 = Battery quick disconnect C8 / QD3 = Control cable to ground C4 / QD4 = Control cable to platform C6 / QD30 = AC plug J1 / QD31 = GCON ECM, ground and platform controls J3 / QD32 = GCON ECM, switches and sensors J2 / QD33 = GCON ECM, function manifold QD34 = Power buss, switches and sensors QD35 = Ground buss, switches and sensors QD36 = Pothole guard switches QD37 = Down limit switch C18 / QD38 = Level sensor QD39 = Ground buss, function manifold C40 / QD40 = Drive reverse coil C41 / QD41 = Drive forward coil C42 / QD42 = Steer right coil C43 / QD43 = Steer left coil C44 / QD44 = Platform up coil C63 = Platform down coil J23 / QD45 = Obstruction pads, power signal in/out J6 / QD47 = Platform controls PCB, power/signal in/out J5 / QD48 = Platform controls PCB, E-Stop and alarm J4 / QD49 = Platform controls PCB, joystick
R	Resistor R1 = 1k Ohm, 2W R2 = 200 Ohm, 10W R27 = 25 Ohm, 2W R30 = 200 Ohm, 10W
S7	Level sensor
U	Electronic component
	U1 = Electronic Control Module, GCON U2 = Printed Circuit Board, PCON U4 = AC/DC Inverter (option) U6 = Motor Controller U9 = Battery Charger U47A = Obstruction sensing pad (hydraulic tank side) U47B = Obstruction sensing pad (battery tray) U47C = Obstruction sensing pad (steer end) U47D = Obstruction sensing pad (ground control side)
Y	Valve coil
	Y3 = Steer right Y4 = Steer left Y5 = Drive reverse Y6 = Drive forward Y7 = Platform Down Y8 = Platform Up
Z1	Zener diode

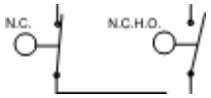
Wiring Diagram Ground and Platform Controls



Electrical Symbol Legend



Wire with description or color



Limit switch



Limit switch N.C.H.O



Limit switch N.O.H.C.



Circuits crossing no connection



Emergency Stop button



Motor



Solenoid valve with diode



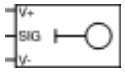
Diode



Circuit breaker



Battery charger



Level sensor



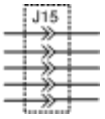
Circuit connection



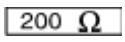
Fuse



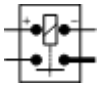
6V or 12V DC battery



Deutsch connector



Resistor



Contactor



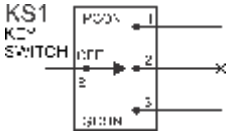
Horn or alarm



Flashing beacon

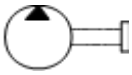
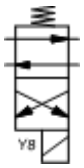
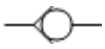
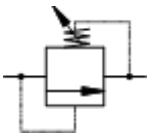
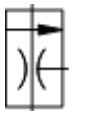
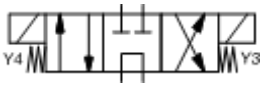
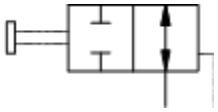


Motor controller

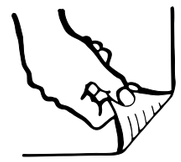


Key switch

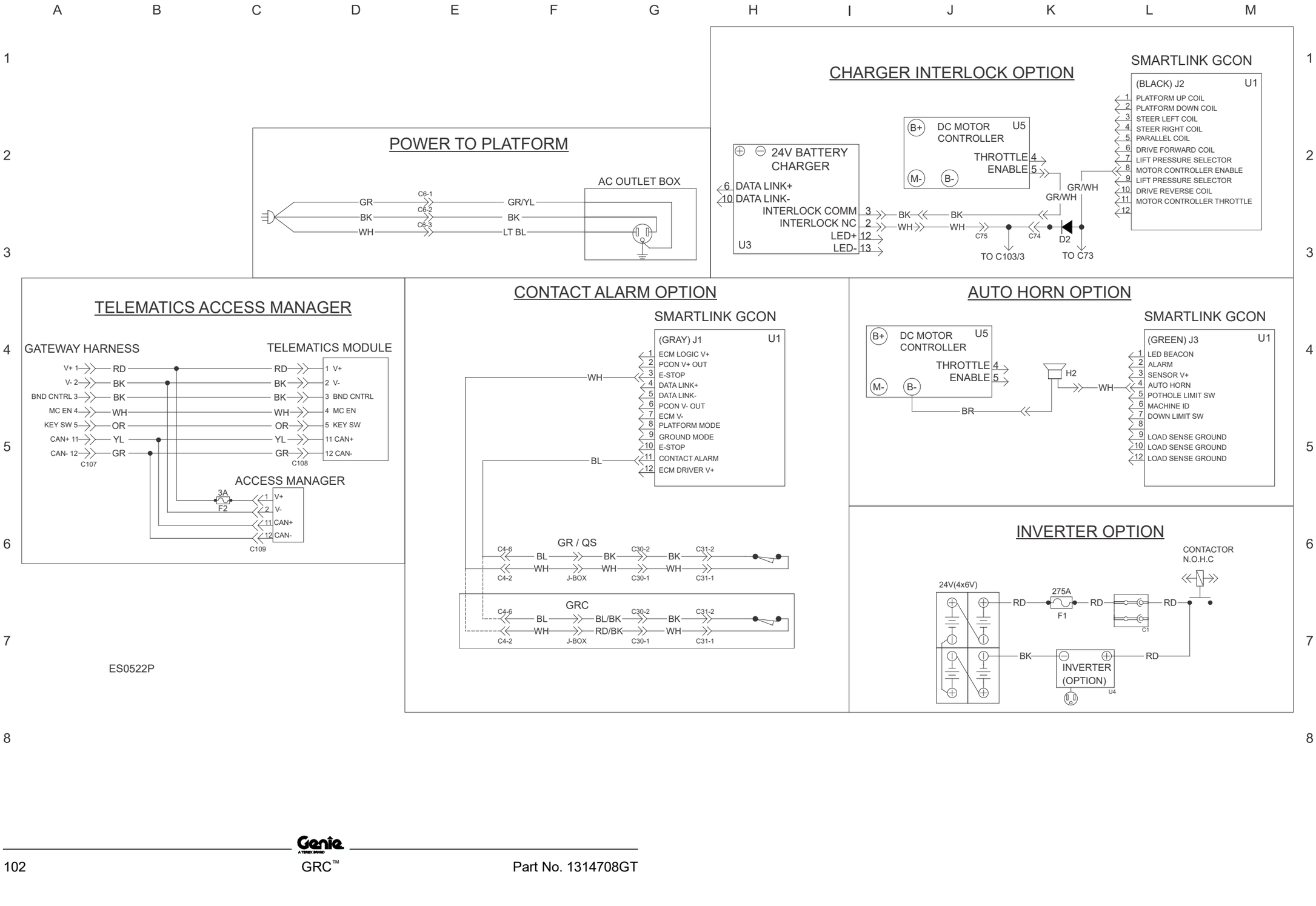
Hydraulic Symbols Legend

			
Orifice with size	Hydraulic hand pump	Hydraulic cylinder	Solenoid operated 2 position 4 way directional valve
			
Check valve	Fixed displacement pump	Relief valve	Solenoid operated 2 position 2 way directional valve, normally closed with manual override
			
Filter	Bi-directional motor	Priority flow regulator	Solenoid operated 3 position 4 way directional valve
			
Brake	Variable speed motor	Pilot operated needle valve	

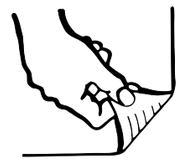
Electrical Schematic, GRC - Options



Electrical Schematic, GRC - Options

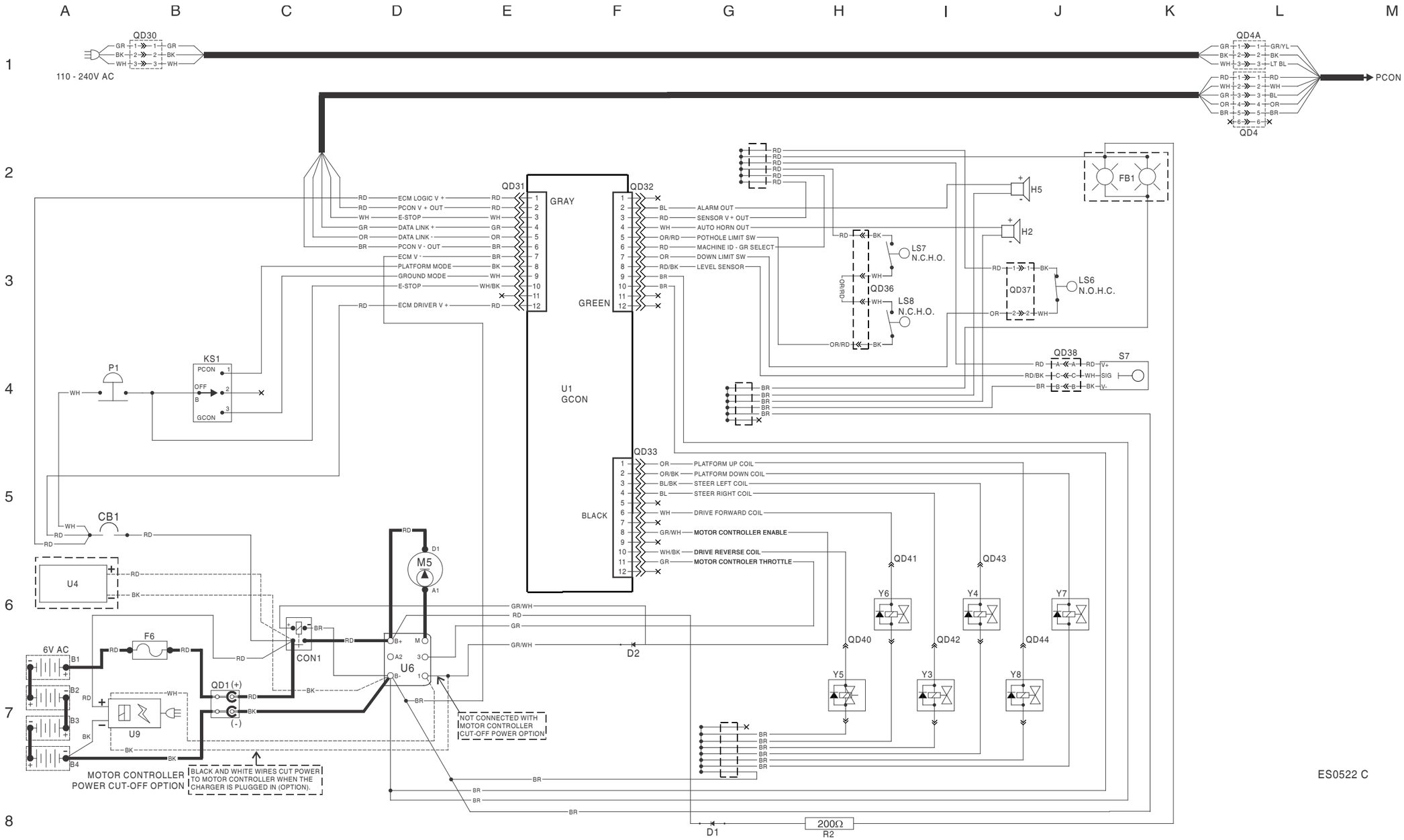


Electrical Schematic, GRC
(from GRC11-1000 to GRC11-1078)



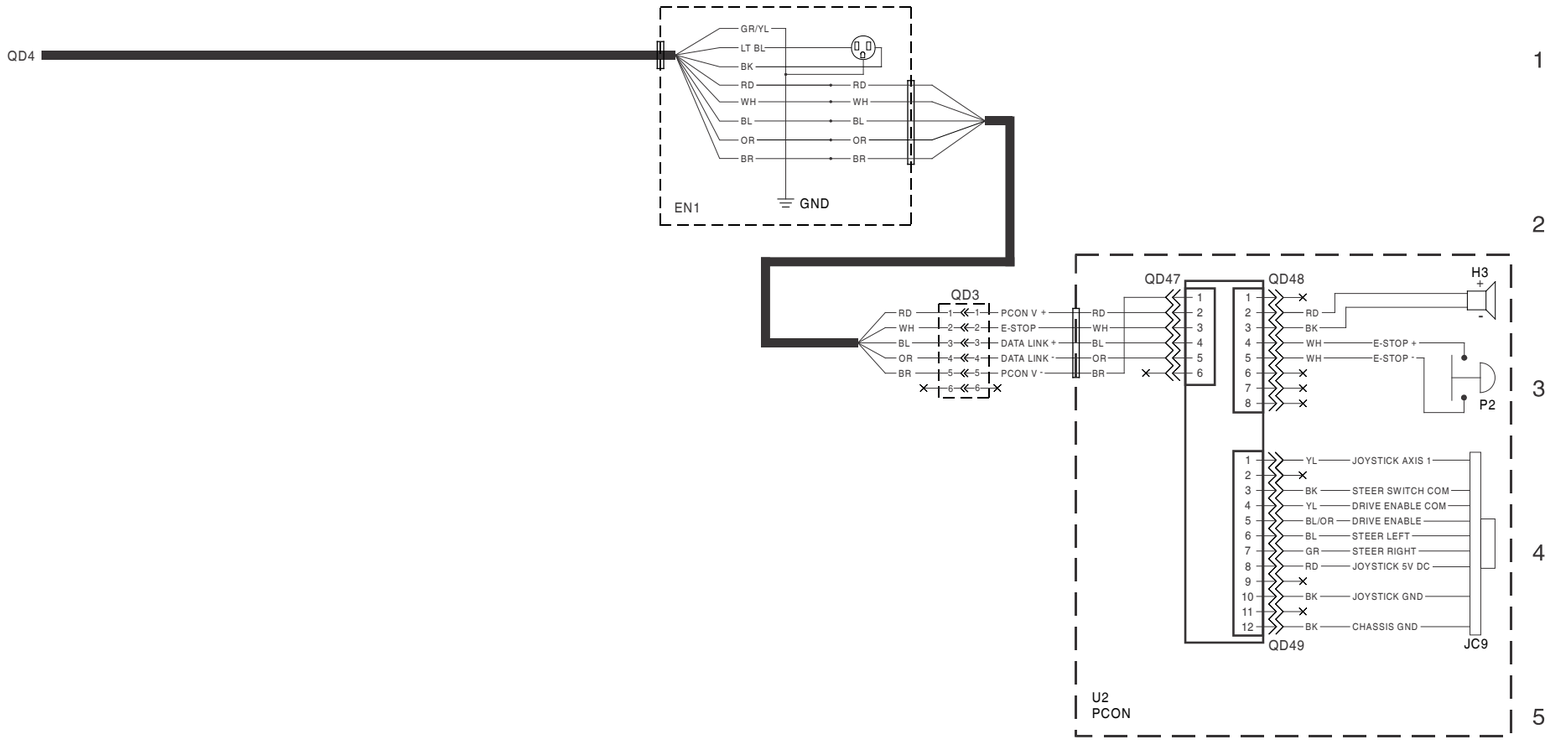
Electrical Schematic, GRC

(from GRC11-1000 to GRC11-1078)



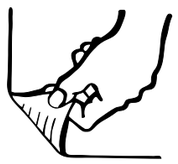
ES0522 C

Electrical Schematic, GRC
(from GRC11-1000 to GRC11-1078)

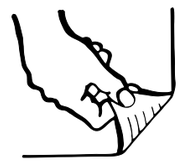


Electrical Schematic, GRC

(from GRC11-1000 to GRC11-1078)

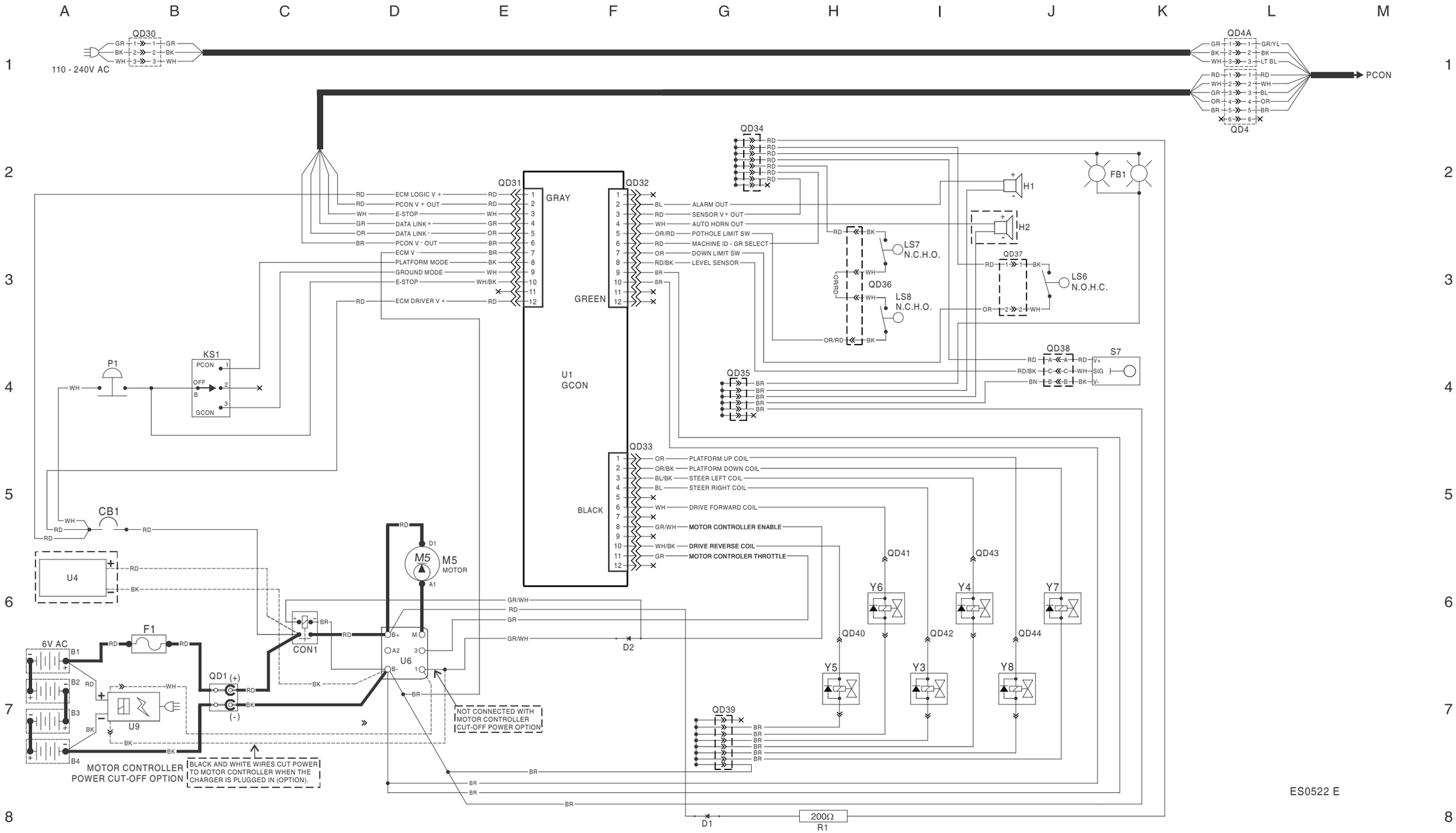


Electrical Schematic, GRC
(from GRC11-1079 to GRC14-1780)



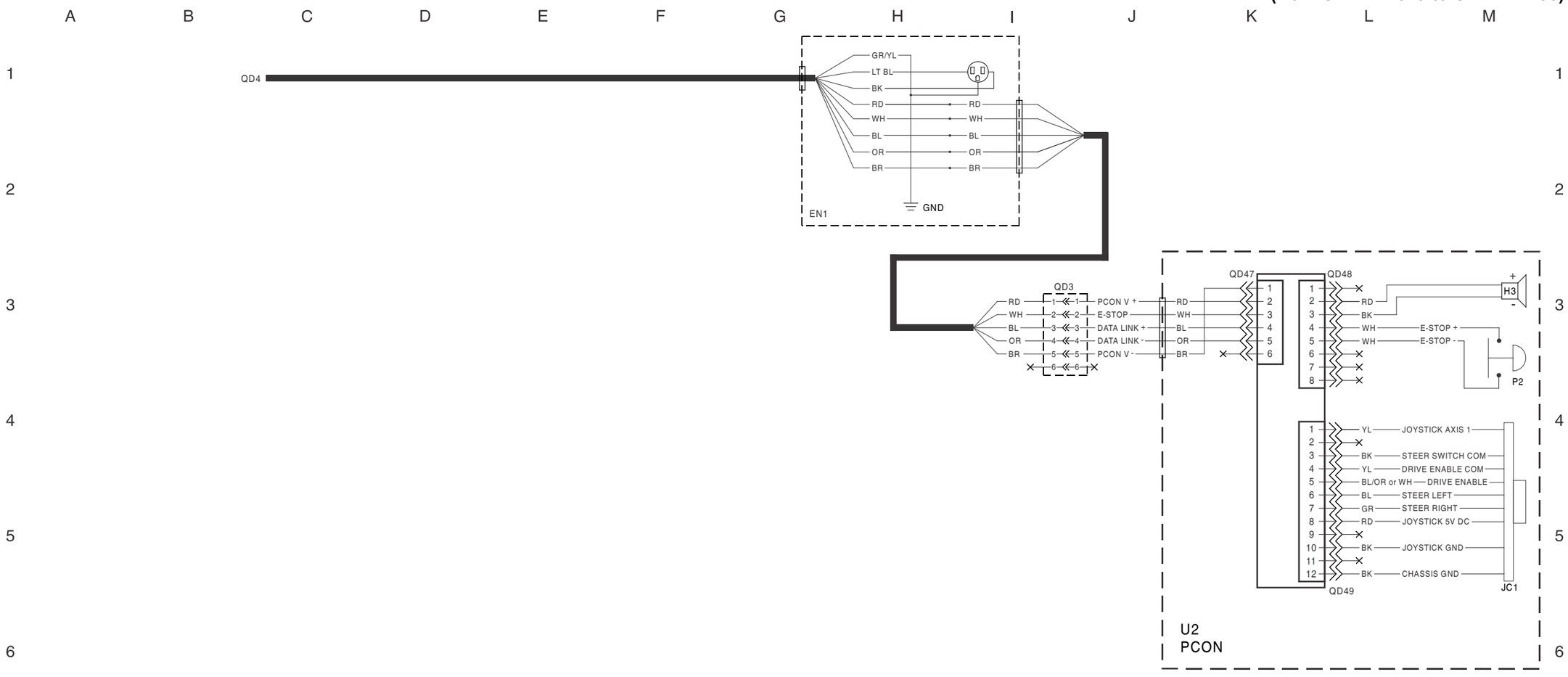
Electrical Schematic, GRC

(from GRC11-1079 to GRC14-1780)

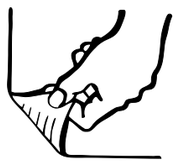


ES0522 E

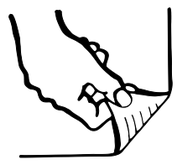
Electrical Schematic, GRC
(from GRC11-1079 to GRC14-1780)



Electrical Schematic, GRC
(from GRC11-1079 to GRC14-1780)

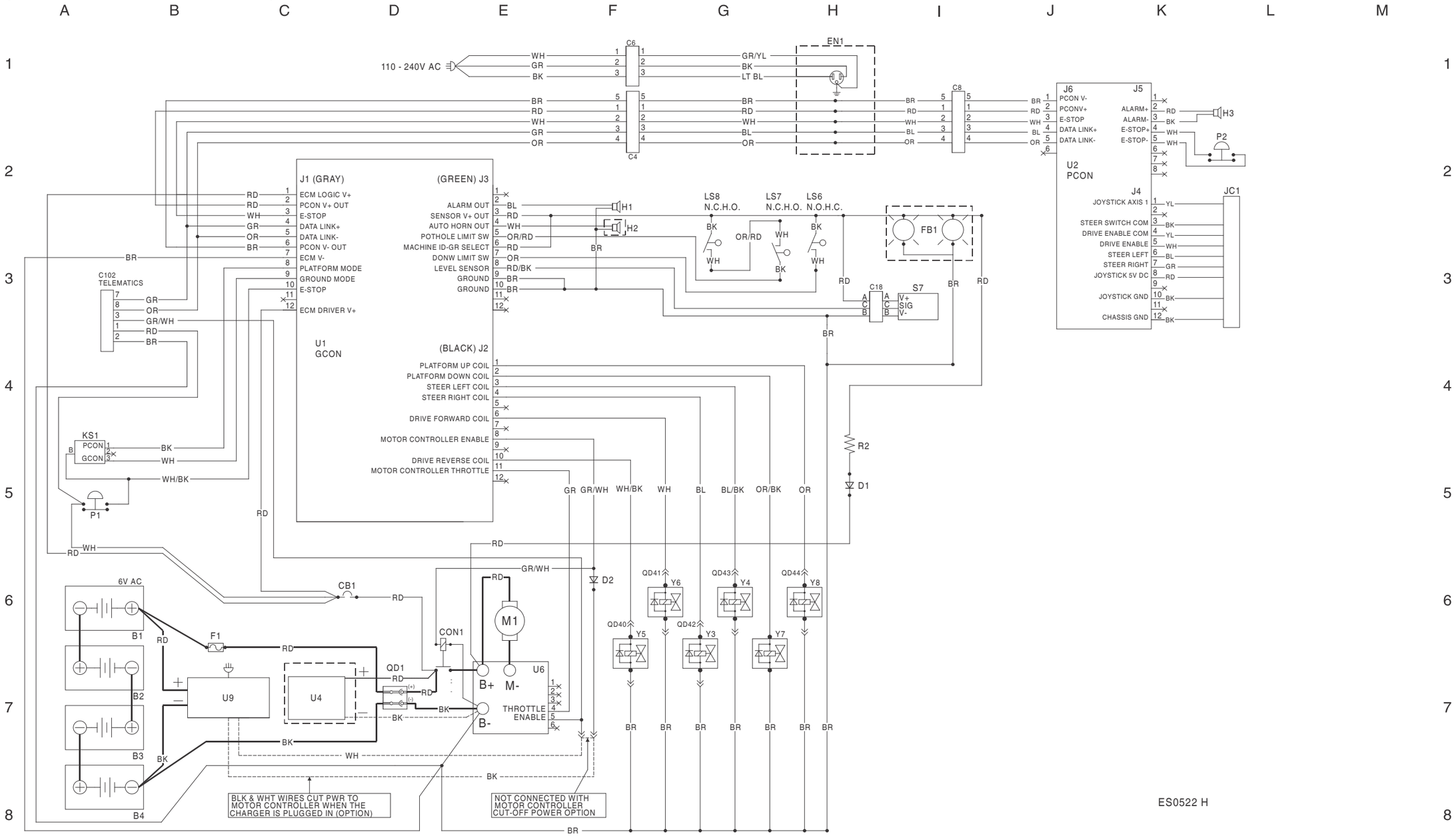


Electrical Schematic, GRC
(from GRC14-1781 to GRC15-2343)



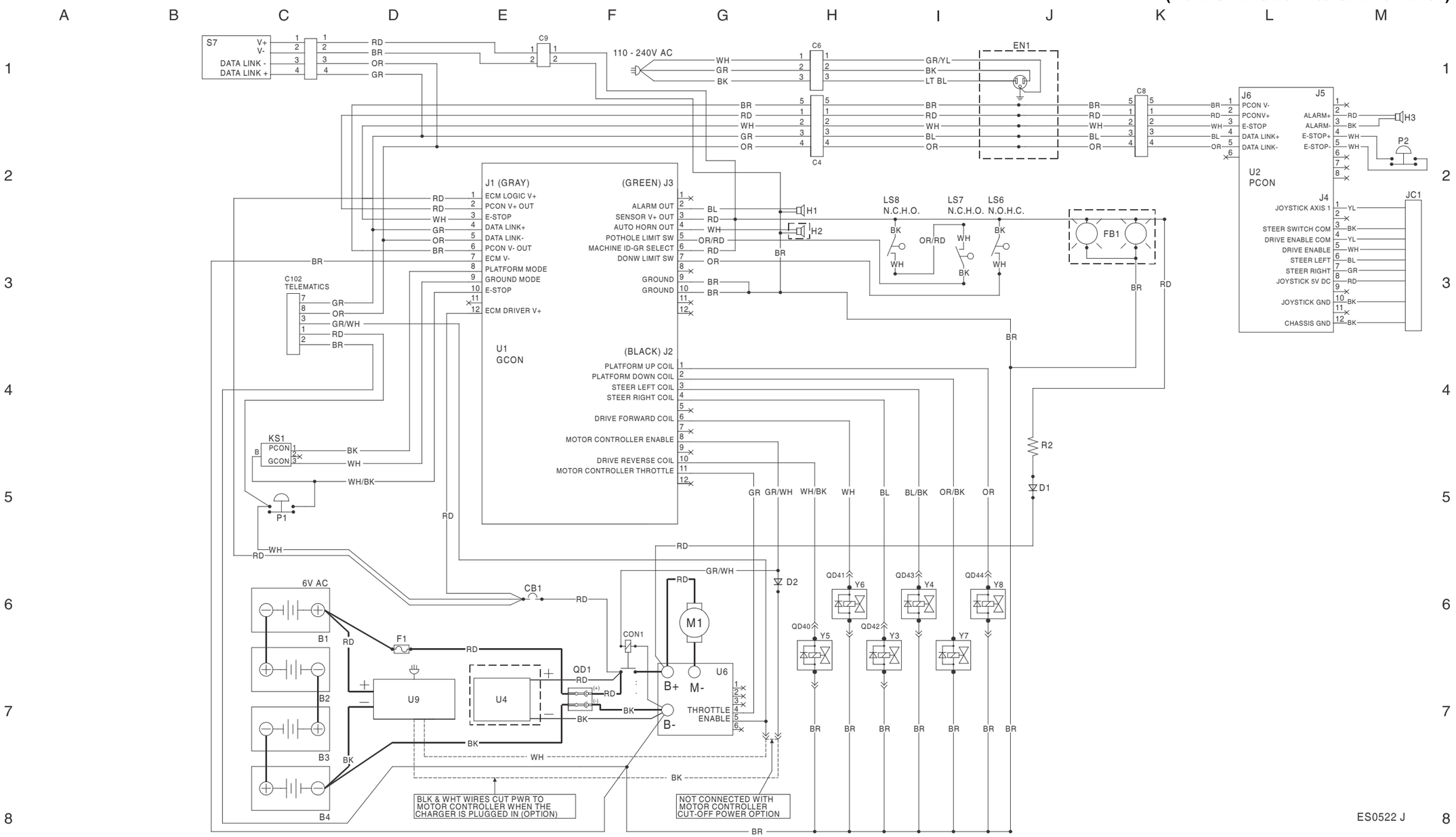
Electrical Schematic, GRC

(from GRC14-1781 to GRC15-2343)



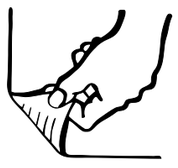
ES0522 H

Electrical Schematic, GRC
(from GRC15-2344 to GRC16P-2481)

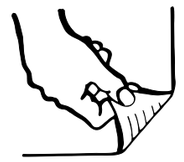


ES0522 J

Electrical Schematic, GRC
(from GRC15-2344 to GRC16P-2481)

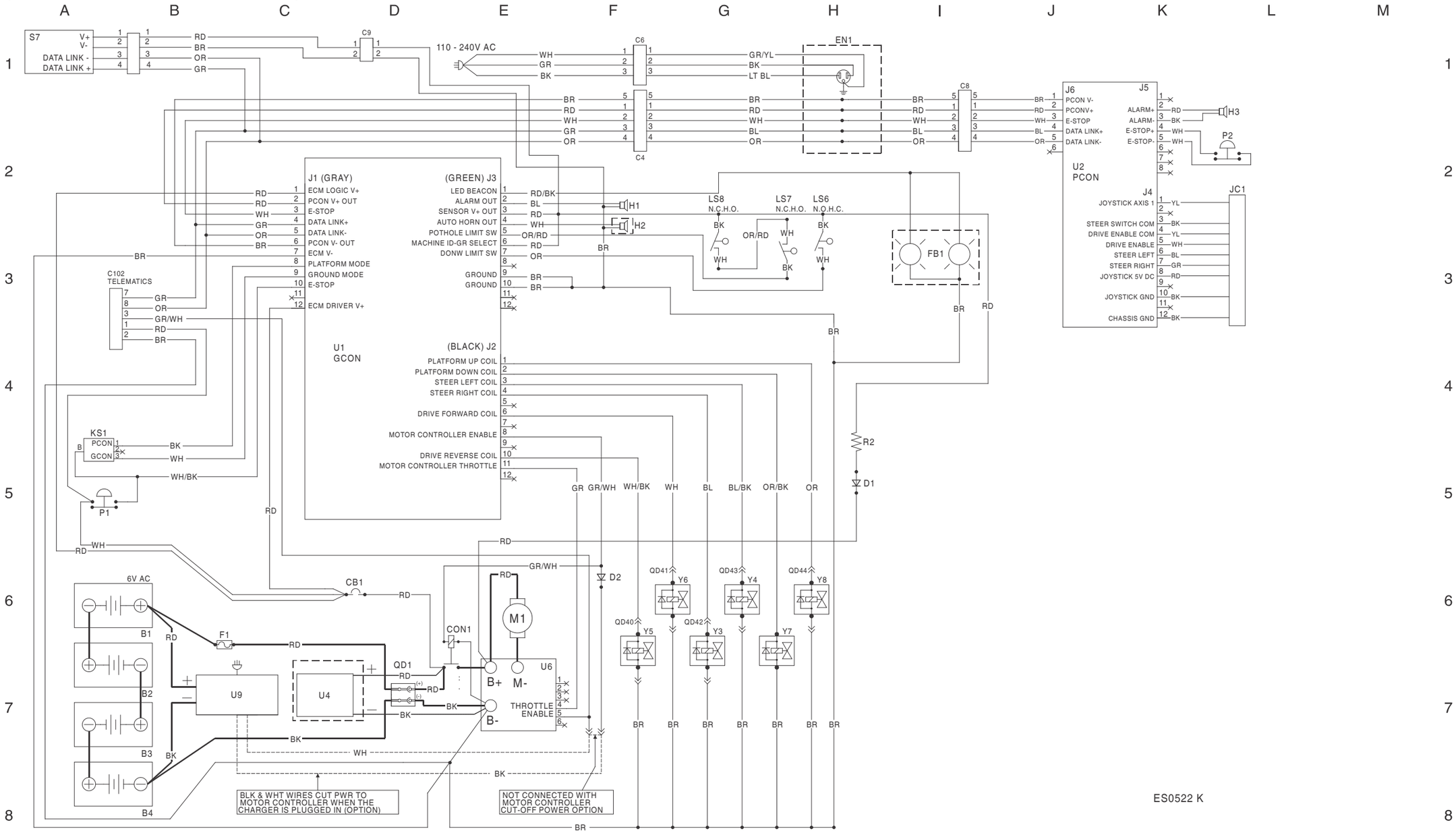


Electrical Schematic, GRC
(from GRC16P-2482 to GRC16P-2562)



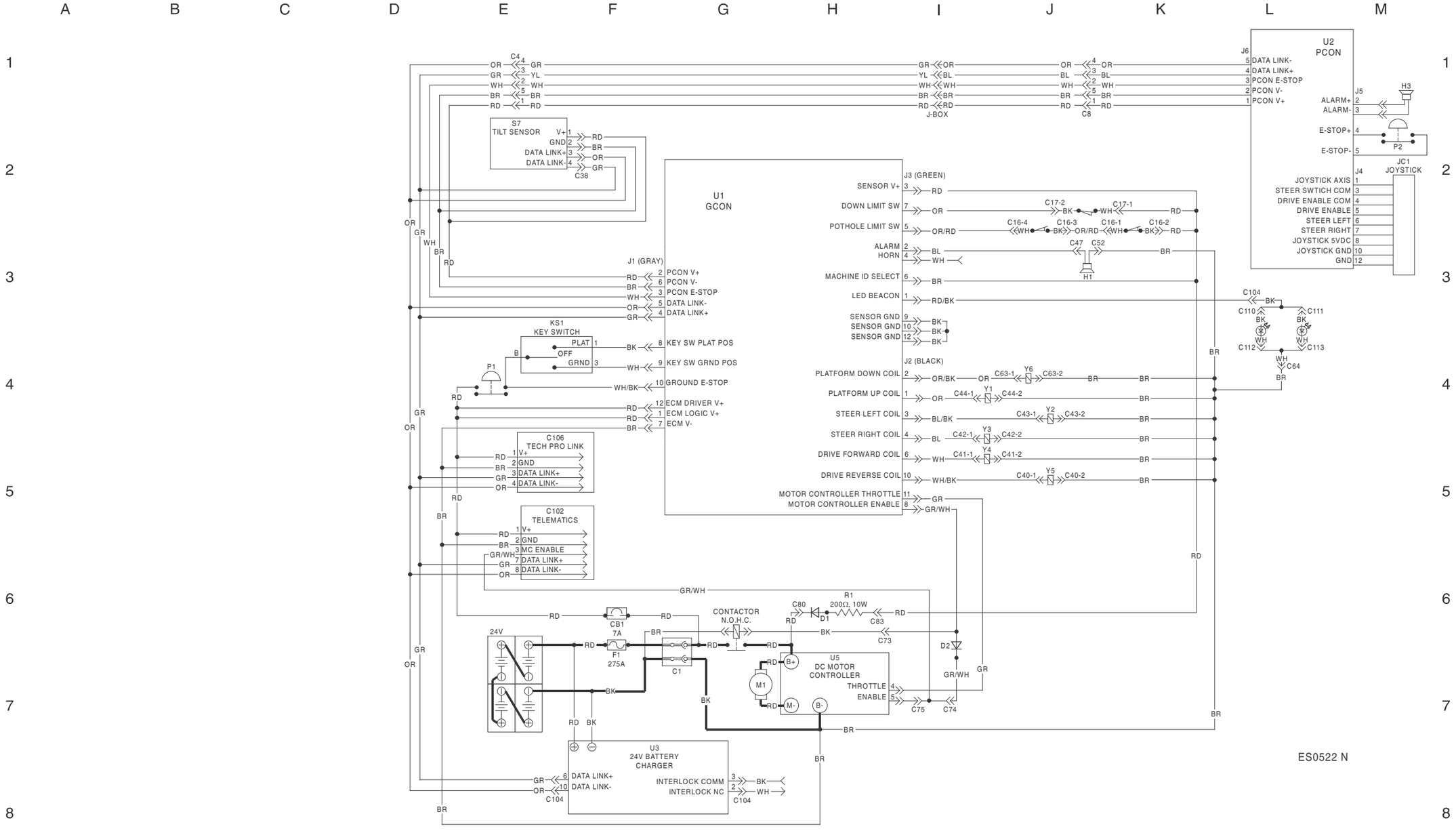
Electrical Schematic, GRC

(from GRC16P-2482 to GRC16P-2562)

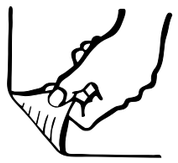


ES0522 K

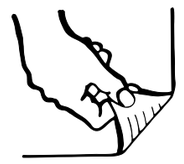
Electrical Schematic, GRC
(from GRC16P-2563 to GRCP-5999)



Electrical Schematic, GRC
(from GRC16P-2563 to GRCP-5999)



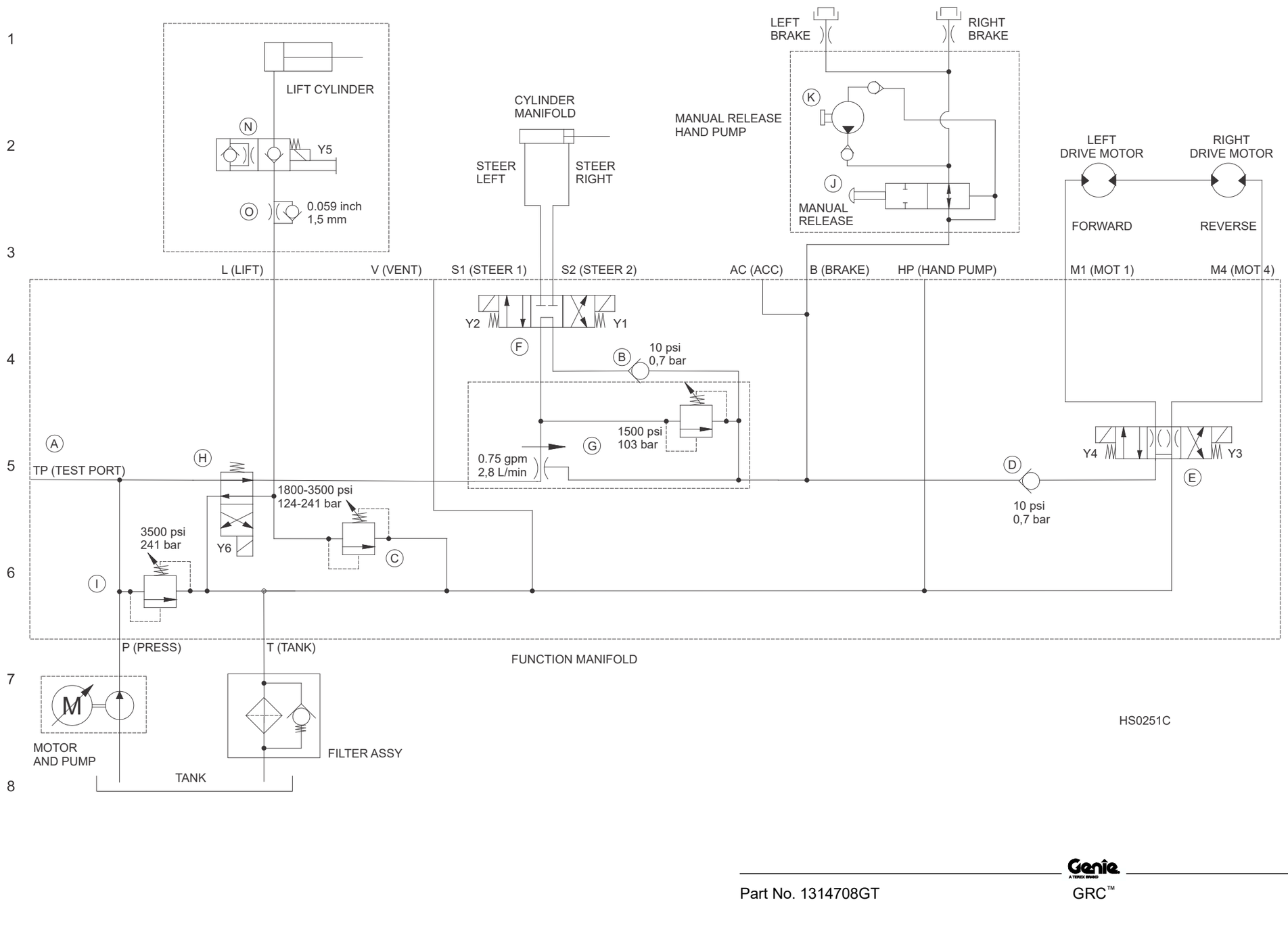
Hydraulic Schematic, GRC
(from GRC11-1000 to GRC12-1168)



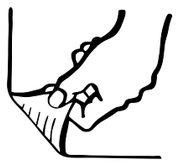
Hydraulic Schematic, GRC

(from GRC11-1000 to GRC12-1168)

Hydraulic Schematic, GRC
(from GRC12-1169 to GRCP-5999)



Electrical Schematic, GRC
(from GRC12-1169 to GRCP-5999)



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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