Genie®
A TEREX BRAND

Service and Repair Manual

Serial Number Range

Z®-34/22

from Z3414-9686 to
Z3416F-11999
from Z34F-12000

Bi-Energy Power

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

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

Part No. 1268515GT
Rev B
October 2021

Introduction

Important

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

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

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

Compliance

Machine Classification

Group B/Type 3 as defined by ISO 16368

Machine Design Life

Unrestricted with proper operation, inspection and scheduled maintenance.

Technical Publications

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

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

Contact Us:

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

Find a Manual for this Model

Go to http://www.genielift.com

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

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1268515GTRev B, October 2021

First Edition, Second Printing

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Revision History

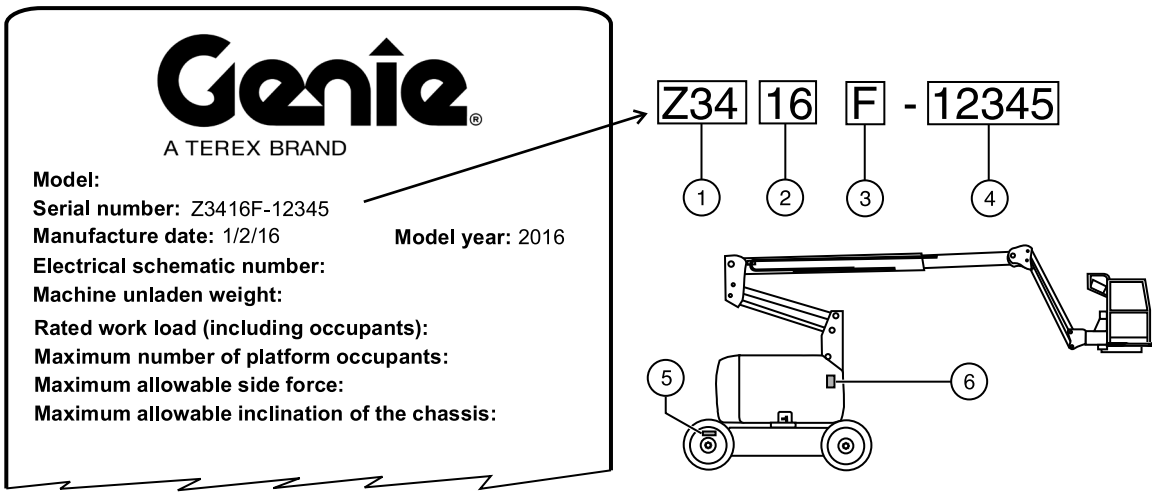
Revision	Date	Section	Procedure / Page / Description
A	9/2015		Release
A1	5/2016	Schematics	Update, added Charger interlock option
A2	9/2016	Introduction	Serial Number Legend
B	10/2021	Schematics	Electrical, Hydraulic Schematics

Reference Examples:	**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	

Introduction

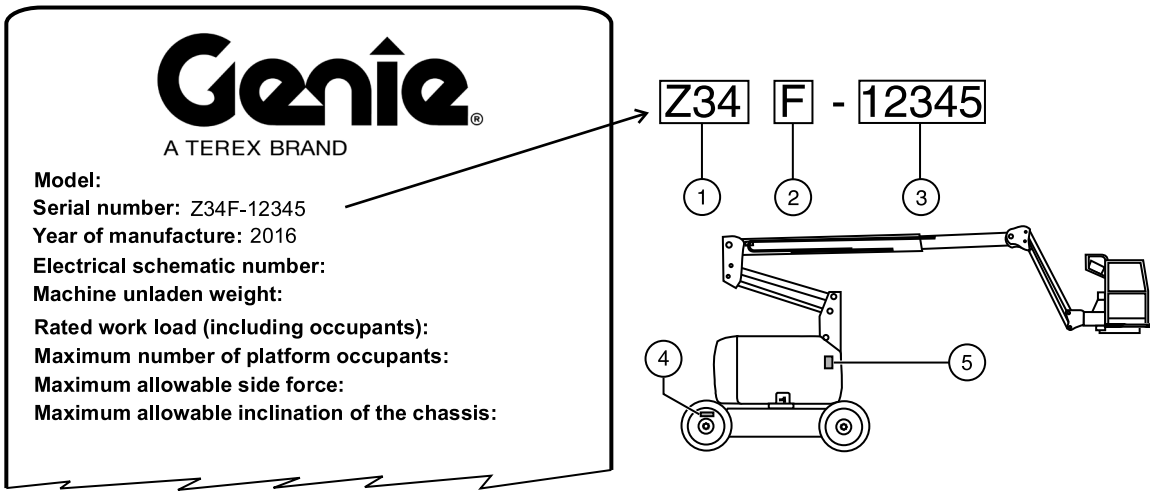
Serial Number Legend

To August 31, 2016



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

From September 1, 2016



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

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

Tires and wheels	Industrial
Tire size	9-14.5 LT
Tire ply rating	Tread 6 Sidewall 6
Tire weight, new foam-filled (minimum) (Rough terrain)	175 lbs 79 kg
Overall tire diameter	28 in 71.1 cm
Wheel diameter	14.5 in 36.8 cm
Wheel width	7 in 17.8 cm
Wheel lugs Front Rear	 8 @ 5/8 -18 9 @ 5/8 -18
Lug nut torque, dry	125 ft-lbs 170 Nm
Lug nut torque, lubricated	95 ft-lbs 129 Nm
Tire pressure	100 psi 6.89 bar
Fuel capacities	
Fuel tank	9.3 gallons 35.2 liters
Hydraulic tank	4 gallons 15.1 liters
Hydraulic system (including tank)	6 gallons 22.7 liters
Drive hubs	17 fl oz 503 cc
Drive hub oil type: SAE 90 multipurpose hypoid gear oil API service classification GL5	

Machine Component Weights Z-34/22DC and Z-34/22N

Drive motor	64 lbs 29 kg
Torque hub	113 lbs 51 kg
Primary boom assembly (including extension boom)	647 lbs 293 kg
Primary boom lift cylinder	59 lbs 27 kg
Primary boom extend cylinder	75 lbs 34 kg
Secondary boom linkage	832 lbs 377 kg
Secondary boom lift cylinder	54 lbs 24 kg
Jib boom assembly	53lbs 24kg
Jib boom cylinder	34 lbs 15 kg
4 ft / 1.5 m platform	99 lbs 45 kg
5 ft / 2.4 m platform	105 lbs 48 kg
Battery 6 volt (wet)	88 lbs 48 kg
Battery 6 volt (maintenance free)	105 lbs 48 kg

Specifications

Performance Specifications

Drive speed, maximum	
Stowed position	3.7 mph 5.9 km/h 40 ft / 7.5 sec 12.2 m / 7.5 sec
Raised or extended	0.6 mph 0.98 km/h 40 ft / 45 sec 12.2 m / 45 sec
Gradeability	See Operator's Manual
Braking distance, maximum	
High range on paved surface	3 to 4 ft 0.9 to 1.2 m
Joystick function speeds, maximum from platform controls	
Primary boom up	15 to 21 seconds
Primary boom down	12 to 18 seconds
Primary boom extend	12 to 18 seconds
Primary boom retract	12 to 18 seconds
Secondary boom up	15 to 21 seconds
Secondary boom down	12 to 18 seconds
Jib boom up	23 - 29 seconds
Jib boom down	20 to 26 seconds
Turntable rotate, 355°	57 to 63 seconds
Platform rotate, 180°	6 - 11 seconds
Platform level up	10 to 20 seconds
Platform level down	10 to 20 seconds

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

Hydraulic Oil Specifications

Hydraulic Fluid Specifications	
Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and the viscosity index should exceed 140. They should provide excellent antiwear, oxidation prevention, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.	
Cleanliness level, minimum	ISO 15/13
Water content, maximum	250 ppm
Recommended Hydraulic Fluid	
Hydraulic oil type	Chevron Rando HD Premium
Viscosity grade	32
Viscosity index	200
Optional Hydraulic Fluids	
Mineral based	Shell Tellus S2 V 32 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.

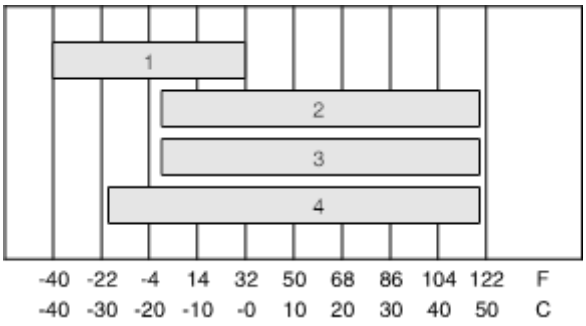
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond its maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

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

Chevron Rando HD Premium Oil MV Fluid Properties

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

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

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

Specifications

Chevron 5606A Hydraulic Oil Fluid Properties

ISO Grade	15
Viscosity index	300
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C cSt @ -40°F / -40°C	 5.5 15.0 510
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

Specifications

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

Hydraulic Component Specifications

Function Pump	
Type: fixed displacement gear pump	
Displacement per revolution	0.183 cu in 3 cc
Auxiliary Pump	
Type: fixed displacement gear pump	
Displacement	0.75 gpm 2.8 L/min
Function manifold	
Function relief valve pressure	3200 psi 220.6 bar
Primary boom down relief function relief	1600 psi 110.3 bar
Secondary boom down relief valve pressure	1600 psi 110.3 bar
Hydraulic Filters	
Hydraulic tank return filter	10 micron with 25 psi / 1.7 bar bypass

Specifications

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

Machine Torque Specifications

Platform Rotator	
3/4-10 center bolt, GR 8, dry	380 ft-lbs
3/4-10 center bolt, GR 8, lubricated	515 Nm 280 ft-lbs 379 Nm
3/8-16 outer bolts, GR 8, dry	44 ft-lbs
3/8-16 outer bolts, GR 8, lubricated	60 Nm 33 ft-lbs 45 Nm
Turntable rotate assembly	
Rotate bearing mounting bolts, lubricated	180 ft-lbs 244 Nm
Rotate bearing motor mounting bolts, lubricated	93 ft-lbs 126 Nm
Drive motors and hubs	
Drive hub mounting bolts, lubricated	180 ft-lbs 244 Nm
Drive motor mounting bolts, lubricated	
3/8-16, GR5	23 ft-lbs
7/16-14, GR5	31 Nm 37 ft-lbs 50 Nm

Specifications

Kubota Z482-E Engine

Displacement	29.23 cu in 0.48 liters
Number of cylinders	2
Bore and Stroke	2.64 x 2.68 inches 67 x 68 mm
Horsepower	13.3 @ 3600 rpm 9.9 kW
Firing order	1 - 2
Low idle	2000 rpm
High idle	3000 rpm
Governor	centrifugal mechanical
Valve clearance, cold	0.0057 to 0.0072 in 0.145 to 0.185 mm
Compression ratio	23:1
Compression pressure	412 to 469 psi 28.4 to 32.3 bar
Lubrication system	
Oil pressure	36 to 64 psi 2.48 to 4.41 bar
Oil capacity (including filter)	2.6 quarts 2.5 liters

Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.

Fuel requirement	
For fuel requirements, refer to the engine Operator Manual for your engine.	
Injection system	
Injection pump make	Bosch MD
Injection timing	21° BTDC
Injection pump pressure	1991 psi 137 bar
Starter motor	
Brush length, new	0.5188 in 13 mm
Brush length, minimum	0.3346 in 8.5 mm
Alternator	
Alternator output	12V DC, 150 watts
Fan belt deflection	1/4 to 3/8 inch 7 to 9 mm
Battery	
Type	12V DC, Group 70
Quantity	1
Cold cranking ampere	450A
Reserve capacity @ 25A rate	125 minutes

Specifications

Generator

Generator output with engine @ 3000 rpm	54V DC, 100A
Generator pulley to engine pulley offset, maximum	1/16 inch 1.6 mm
Belt deflection, maximum	1/4 inch 6.5 mm

Generator Torque Specifications

Generator pulley retaining nut torque	80-90 ft-lbs 108-122 Nm
Engine pulley retaining bolts	108 in-lbs 12.2 Nm
#10 screw	25 in-lbs 2.8 Nm
#10 nut	25 in-lbs 2.8 Nm
#4 nut	8-10 in-lbs 0.9-1.1 Nm
Voltage regulator mounting fasteners	25 in-lbs 2.8 Nm

Hydraulic Hose and Fitting Torque Specifications

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

Seal-Lok™ Fittings

(hose end - ORFS)

SAE Dash Size	Torque
-4	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

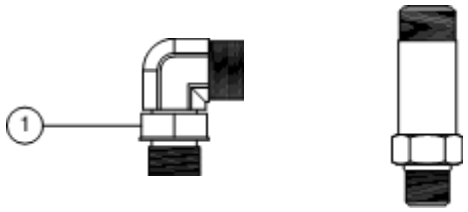
(swivel nut or hose connection)

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

Specifications

Torque Procedure

Seal-Lok™ fittings

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

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

2 Lubricate the O-ring before installation.

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

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

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

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

JIC 37° fittings

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

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

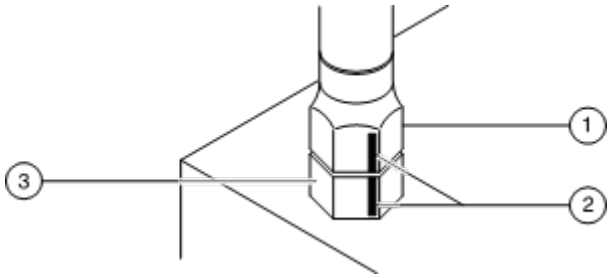


Illustration 1

1 hex nut
2 reference mark
3 body hex fitting

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

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

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

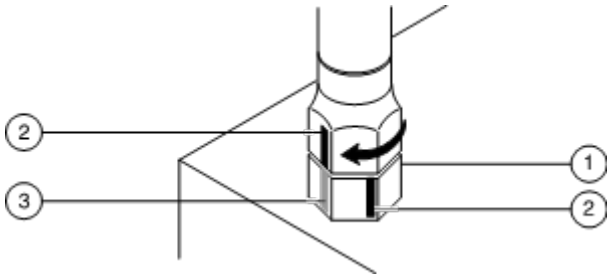


Illustration 2

1 body hex fitting
2 reference mark
3 second mark

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

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

Repair Procedures



Observe and Obey:

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

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

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

Before Repairs Start:

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

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

☑ Use only Genie approved replacement parts.

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

Machine Configuration:

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

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

Repair Procedures

About This Section

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

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

Symbols Legend



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

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

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

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

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

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

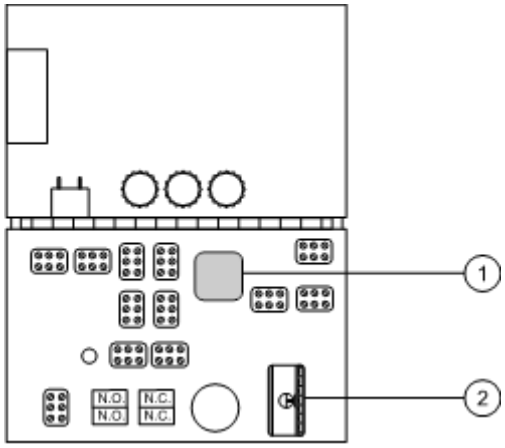
☒ Indicates that an incorrect result has occurred after performing a series of steps.

Platform Controls

1-1 Controllers

Platform Controls

The drive joystick is connected to the drive motor controller located under the non-steer end drive chassis cover. The drive motor controller can also recognize machine drive malfunctions and display controller fault codes by flashing a LED at the ground controls. See the Troubleshooting section of this manual for a list of fault codes and additional information. There are no adjustments needed on the drive joystick controller. For further information or assistance, contact the Genie Product Support.



1 boom function speed controller
2 drive joystick

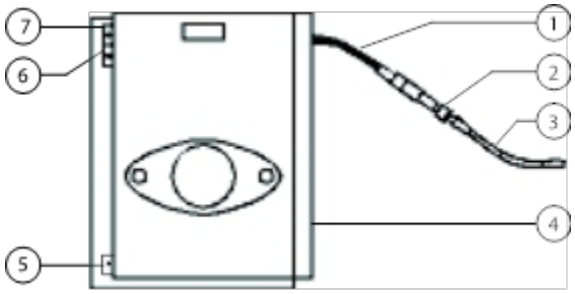
Boom Function Speed Controller Adjustments

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

Note: Do not adjust the boom function speed controller unless the static battery supply voltage is above 24V DC.

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

2 Open the platform control box lid and locate the boom function speed controller.



1 black/red wire
2 diode
3 white/red wire
4 boom function speed controller
5 ramp rate trimpot
6 threshold trimpot
7 max-out trimpot

3 Locate the diode between the black/red wire from the boom function speed controller and the white/red wire. Disconnect the white/red wire from the diode on the black/red wire.

4 Connect the negative lead from a multimeter set to measure amperage to the wire connector of the white/red wire. Connect the positive lead of the multimeter to the diode on the black/red wire.

5 Turn the boom function speed controller to the creep position.

6 Set the threshold: Press down the foot switch and move the primary boom toggle switch to the up position. Adjust the amperage to 0.28A. Turn the threshold trimpot adjustment screw clockwise to increase the amperage or counterclockwise to decrease the amperage.

7 Turn the boom function speed controller to the 9 position.

8 Set the max out: Press down the foot switch and move the primary boom toggle switch to the down position. Adjust the amperage to 0.65A. Turn the max out trimpot adjustment screw clockwise to increase the amperage or counterclockwise to decrease the amperage.

9 Start a timer and simultaneously press down the foot switch and move the primary boom toggle switch in the down direction. Note how long it takes to reach 0.65A.

10 Set the ramp rate: Turn the ramp rate trimpot to obtain a 2 second delay from 0 to 0.65A. Turn the trimpot clockwise to increase the time or counterclockwise to decrease the time.

11 Disconnect the leads from the multimeter and connect the white/red wire to the diode on the black/red wire.

Boom function speed controller specifications	
Threshold (controller turned to creep)	0.28A
Max out (controller turned to 9)	0.65A
Ramp rate	2 seconds

Platform Controls

1-2 Diodes

How to Test a Diode

1 Connect the leads from an ohmmeter to each end of the diode.

2 Re-connect the leads from the ohmmeter to the opposite ends (from step 1) of the diode. The diode should have resistance in one direction and not the other.

1-3 Foot Switch

How to Test the Foot Switch

1 Turn the key switch to the off position. Remove the fasteners securing the foot switch to the platform and remove the bottom cover from the foot switch.

2 Do not press down the foot switch. Connect the leads from an ohmmeter or continuity tester to each wire combination listed on the next page and check for continuity.

Test	Desired result
red to black	continuity (zero Ω)
red to white	no continuity (infinite Ω)
black to white	no continuity

Note: Do not use the color of the connector as a guide for these tests. Use the actual wire color to identify which connector to use for testing.

3 Press down the foot switch. Connect the leads from an ohmmeter or continuity tester to each wire combination listed below and check for continuity.

Test	Desired result
red to black	no continuity (infinite Ω)
red to white	no continuity
black to white	continuity (zero Ω)

1-4 Toggle Switches

Toggle switches used for single function switching are single pole double throw (SPDT) switches. Dual function switching requires a double pole double throw (DPDT) switch.

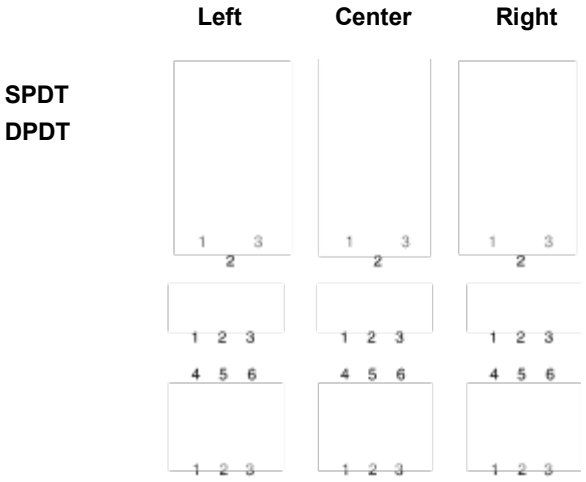
How to Test a Toggle Switch

Note: Continuity is the equivalent of 0 to 3 ohms. A simple continuity tester may not accurately test the switch.

This procedure covers fundamental switch testing and does not specifically apply to all varieties of toggle switches.

1 Turn the key switch to the off position. Tag and disconnect all wiring from the toggle switch to be tested.

2 Connect the leads of an ohmmeter to the switch terminals in the following combinations listed below to check for continuity.



Note: Single pole double throw (SPDT), Double pole double throw (DPDT)

Test	Desired result
Left position	
terminal 1 to 2, 3, 4, 5 & 6	no continuity (infinite Ω)
terminal 2 to 3	continuity (zero Ω)
terminal 2 to 4, 5 & 6	no continuity
terminal 3 to 4, 5 & 6	no continuity
terminal 4 to 5 & 6	no continuity
terminal 5 to 6	continuity
Center position	There are no terminal combinations that will produce continuity (infinite Ω)
Right position	
terminal 1 to 2	continuity(zero Ω)
terminal 1 to 3, 4, 5 & 6	no continuity(infinite Ω)
terminal 2 to 3, 4, 5 & 6	no continuity
terminal 3 to 4, 5 & 6	no continuity
terminal 4 to 5	continuity
terminal 4 to 6	no continuity
terminal 5 to 6	no continuity

Platform Components

2-1 Platform Leveling Slave Cylinder

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

How to Remove the Platform Leveling Slave Cylinder

Note: Before cylinder removal is considered, bleed the slave cylinder to be sure there is no air in the closed loop.

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

1 Extend the boom until the slave cylinder barrel-end pivot pin is accessible.

2 Raise the boom slightly and place blocks under the platform for support. Lower the boom until the platform is resting on the blocks.

3 Remove the pin retainer fastener from the rod-end pivot pin.

4 Remove the external snap ring from the barrel-end pivot pin.

5 Use a soft metal drift to remove the rod-end pivot pin.

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

7 Carefully pull the cylinder out of the boom.

8 Tag and disconnect the hydraulic hoses from the slave cylinder and connect them togetherwith a connector. Cap the fittings on the cylinder.

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

How to Bleed the Slave Cylinder

1 Raise the jib boom to a horizontal position.

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

2-2
Platform Rotator

How to Remove the Platform Rotator

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

1 Remove the platform.

2 Tag, disconnect and plug the hydraulic hoses from the platform rotate manifold.

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

3 Support the platform mounting weldment with a suitable lifting device. Do not apply any lifting pressure.

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

5 Support the platform rotator with a suitable lifting device. Do not apply any lifting pressure.

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

7 Use a soft metal drift to remove the leveling link pivot pin. Lower the leveling links to the ground.

8 Support the jib boom and jib boom lift cylinder with an overhead crane.

9 Use a soft metal drift to drive both pins out and remove the platform rotator from the machine.

⚠WARNING Crushing hazard. The jib boom and jib boom lift cylinder could fall when when the platform rotator is removed if not properly supported by the overhead crane.

Note: When installing the platform rotator, be sure to torque the fasteners to specification. Refer to Specifications, *Machine Torque Specifications.*

Platform Components

How to Bleed the Platform Rotator

Note: This procedure will require two people.

1 Move the function enable toggle switch to either side and activate the platform rotate toggle switch to the right and then to the left through two platform rotation cycles. Then hold the switch to the right position until the platform is fully rotated to the right.

2 Place a suitable container underneath the platform rotator.

3 Open the top bleed screw on the rotator, but do not remove it.

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

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

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

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

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

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

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

7 Clean up any hydraulic oil that may have spilled.

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

2-3 Platform Overload System

How to Calibrate the Platform Overload System

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

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

1 Level the platform.

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

3 Using a suitable lifting device, place an appropriate test weight equal to that of the maximum platform capacity at the center of the platform floor.

Determine the limit switch trigger point:

4 Gently move the platform up and down by hand, so it bounces approximately 1 to 2 inches / 2.5 to 5 cm. Allow the platform to settle.

⊙ Result: **The overload indicator light and the alarm is on**. Slowly tighten the load spring adjustment nut by turning it clockwise just until the overload indicator light and alarm turns off.

Note: The platform will need to be moved up and down and allowed to settle between adjustments.

Note: There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

⊙ Result: **The overload indicator light and alarm is off**. Slowly loosen the load spring adjustment nut by turning it counterclockwise just until the overload indicator light and alarm turn on.

Note: There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

Note: The platform will need to be moved up and down and allowed to settle between adjustments.

Confirm the setting:

5 Turn the key switch to platform control.

6 Lift the test weight off the platform floor using a suitable lifting device.

7 Place the test weight back onto the center of the platform floor using a suitable lifting device.

⊙ Result: The alarm should be off. The platform overload indicator light should be off at both the ground and platform controls.

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

8 Add an additional 10 lb / 4.5 kg test weight to the original test weight to overload the platform.

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

Note: There may be an approximate 2 second delay before the overload indicator light turns on and the alarm sounds.

9 Test all machine functions from the platform controls.

⊙ Result: All platform control functions should not operate.

10 Turn the key switch to ground control.

11 Test all machine functions from the ground controls.

⊙ Result: All ground control functions should not operate.

Note: If the platform overload system is not operating properly, repeat steps 1 through 4.

Jib Boom Components

3-1
Jib Boom

How to Remove the Jib Boom

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

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

1 Remove the platform.

2 Remove the platform mounting weldment and the platform rotator. Refer to Repair Procedure, *How to Remove the Platform Rotator*.

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

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

4 Remove the cable cover from the side of the jib boom.

5 Tag, disconnect and plug the hydraulic hoses from ports "T" and "P" of the jib boom manifold. Cap the fittings on the manifold.

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

6 Tag and disconnect the electrical wiring from the jib boom manifold.

7 Attach a lifting strap from an suitable lifting device to the jib boom.

8 Remove the pin retaining fasteners from the jib boom pivot pin at the jib boom bellcrank.

9 Use a soft metal drift to remove the jib boom pivot pin. Remove the jib boom from the jib boom bellcrank.

⚠ WARNING Crushing hazard. The jib boom could fall when the pin is removed if not properly supported by the suitable lifting device.

10 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

11 Remove both of the jib boom leveling links from the bellcrank.

12 Attach a lifting strap from an suitable lifting device to the rod-end of the jib boom lift cylinder.

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

⚠ WARNING Crushing hazard. The jib boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly supported by the suitable lifting device.

3-2 Jib Boom Bell Crank

How to Remove the Jib Boom Bell Crank

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

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

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

2 Support and secure the jib boom bell crank to an appropriate lifting device.

3 Remove the pin retaining fasteners from the slave cylinder rod-end pivot pin. Do not remove the pin.

4 Place a block of wood under the platform leveling slave cylinder for support. Protect the cylinder rod from damage.

5 Remove the pin retaining fasteners from the jib boom bell crank at the extension boom. Use a soft metal drift to remove the pin.

6 Use a soft metal drift to remove the slave cylinder rod-end pivot pin.

7 Remove the jib boom bell crank from the extension boom.

⚠WARNING Crushing hazard. The jib boom bellcrank may become unbalanced and fall if it is not properly supported when it is removed from the machine.

3-3 Jib Boom Lift Cylinder

How to Remove the Jib Boom Lift Cylinder

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

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

1 Raise the jib boom slightly and place blocks under the platform mounting weldment. Then lower the jib boom until the platform is resting on the blocks just enough to support the platform.

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

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

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

3 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

Jib Boom Components

4 Use a soft metal drift to tap the rod-end pivot pin half way out and lower one of the leveling links to the ground. Tap the pin the other direction and lower the opposite leveling link. Do not remove the pin.

5 Attach a lifting strap from an suitable lifting device to the rod end of the jib boom lift cylinder.

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

7 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the machine.

⚠WARNING Crushing hazard. The jib boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly supported by the suitable lifting device.

Primary Boom Components

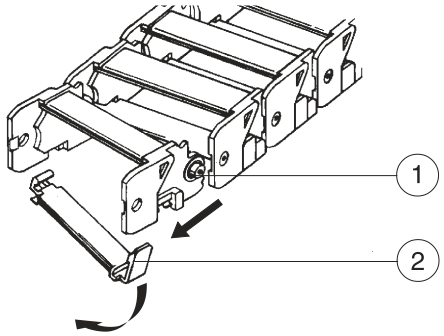
4-1 Cable Track

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

How to Repair the Primary Boom Cable Track

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

Note: A 7 link repair section of cable track is available through the Genie Service Parts Department.



1 link separation point
2 lower clip

1 Use a slotted screwdriver to pry down on the lower clip.

2 To remove a single link, open the lower clip and then use a screw driver to pry the link to the side.

3 Repeat steps 1 and 2 for each link.

4-2 Primary Boom

How to Shim the Primary Boom

1 Extend the boom until the wear pads are accessible.

2 Loosen the wear pad mounting fasteners.

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

4 Tighten the mounting fasteners.

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

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

How to Remove the Primary Boom

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

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

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

1 Remove the platform.

Primary Boom Components

2 Remove the platform rotator. Refer to Repair Procedure, How to Remove the Platform Rotator.

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

4 Locate the 4 cables from the primary boom cable track to the platform control box. Number each cable and its entry location at the platform control box.

5 Open the platform control box.

6 Label and disconnect each wire of the 4 cables in the platform control box.

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

7 Pull all of the cables out of the platform control box.

8 Tag, disconnect and plug the hydraulic hoses from the slave 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.

9 Tag, disconnect and plug the hydraulic hoses from the jib/rotate manifold.

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

10 Remove the upper cable track mounting fasteners from the platform end of the boom.

11 Remove the cable track mounting fasteners, then remove the cable track from the boom and lay it flat on the ground.

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

12 Remove all of the hose and cable clamps from the underside of the primary boom.

13 Remove the turntable end cover.

14 Remove the extension boom drive limit switch from the side of the primary boom at the pivot end. Do not disconnect the wiring.

15 Pull all of the electrical cables and hydraulic hoses out of the plastic cable track.

16 Remove the pin retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin. Pull the cylinder back and secure it from moving.

Primary Boom Components

17 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

18 Attach an overhead 5 ton / 5000 kg crane to the center point of the boom.

19 Attach a similar lifting device to the lift cylinder.

20 Place support blocks under the cylinder, across the secondary boom.

21 Remove the pin retaining fastener from the boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The boom lift cylinder will fall unless it is properly supported.

22 Lower the rod end of the lift cylinder onto support blocks.

23 Remove the pin retaining fastener from the primary boom pivot pin.

24 Remove the primary boom pivot pin with a soft metal drift, then carefully remove the boom from the machine.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the boom could become unbalanced and fall when it is removed from the machine.

How to Disassemble the Primary Boom

Note: Complete disassembly of the boom is only necessary if the outer or inner boom tubes must be replaced. The extension cylinder can be removed without completely disassembling the boom. Refer to Repair Procedure, *How to Remove the Extension Cylinder.*

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

2 Place blocks under the extension cylinder for support.

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

4 Label the location of all wear pads from the outer boom tube at the platform end. Remove all wear pads, including shims, from the platform end of the boom.

Note: Pay careful attention to the location and amount of shims used with each wear pad.

5 Carefully rotate the barrel end of the extension cylinder until the pin mounting bore is in a vertical position.

6 Attach a lifting strap from an suitable lifting device to the extension tube at the platform end.

Primary Boom Components

7 Support and slide the extension tube out of the outer primary boom tube. Place the extension boom tube on blocks for support.

⚠WARNING Crushing hazard. The boom tubes could become unbalanced and fall if not properly supported by the suitable lifting device.

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

8 Remove the external snap rings from the extension cylinder rod-end pivot pins at the platform end of the extension tube. Use a soft metal drift to remove the pins.

9 Support and slide the extension cylinder out of the base end of the extension tube. Place the extension cylinder on blocks for support.

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

10 Remove and label the wear pads from the extension cylinder.

Note: Pay careful attention to the location of each wear pad.

4-3 Primary Boom Lift Cylinder

The primary boom lift cylinder raises and lowers the primary boom. The primary boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Lift Cylinder

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

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

1 Raise the primary boom enough to access the primary boom lift cylinder rod-end pivot pin.

2 Raise the secondary boom enough to access the primary boom lift cylinder barrel-end pivot pin.

3 Attach a lifting strap from an suitable lifting device to the primary boom for support. Do not apply any lifting pressure.

4 Place a block of wood across the upper secondary boom to support the cylinder when the rod-end pivot pin is removed.

Primary Boom Components

5 Attach a lifting strap from an suitable lifting device to the primary boom lift cylinder.

6 Remove the rear turntable cover.

7 Place a 4x4 inch / 10 x 10 cm block between the lower compression arms and the cross member of the upper secondary boom. Carefully lower the secondary boom onto the block.

⚠WARNING Crushing hazard. Keep hands away from the block and all moving parts when lowering the secondary boom.

8 Remove the pin retaining fasteners from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠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.

9 Lower the rod end of the cylinder onto the blocks that were placed on the upper secondary boom.

10 Remove the pin retaining fasteners from the upper compression arm pivot pin (same side of machine as the primary boom lift cylinder barrel-end pivot pin retaining fasteners).

11 Place a rod through the compression arm pivot pin and twist to remove the pin.

12 Swing the compression arm up out of the way and secure it from moving.

13 Tag, disconnect and plug the primary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

14 Support the primary boom lift cylinder with straps or ropes to restrict it from swinging freely when the barrel-end pivot pin is removed.

15 Remove the pin retaining fasteners from the lift cylinder barrel-end pivot pin. Do not remove the pivot pin.

16 Use the suitable lifting device to raise the primary boom 1 inch / 2.5 cm. This will relieve pressure on the barrel-end pivot pin.

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

⚠WARNING Crushing hazard. The primary boom could become unbalanced and fall when removed from the machine if not properly attached to the suitable lifting device.

18 Attach a lifting strap from an suitable lifting device to the rod end of the primary boom lift cylinder. Carefully loosen the straps and allow the barrel end of the primary boom lift cylinder to slowly swing down.

19 Carefully remove the cylinder from the machine.

Primary Boom Components

4-4
Primary Boom Extension Cylinder

The primary boom extension cylinder extends and retracts the primary boom extension tube. The primary boom extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Extension Cylinder

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

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

1 Raise the primary boom to a horizontal position. Then extend the boom approximately 3 to 4 feet / 1 m until the extension cylinder rod-end pivot pins are accessible.

2 Remove the external snap rings from the extension cylinder rod-end pivot pins. Use a soft metal drift to remove the pins.

3 Remove the rear turntable cover.

4 Raise the secondary boom until the master cylinder rod-end pivot pin is accessible.

5 Remove the drive speed limit switch from the pivot end of the primary boom. Do not disconnect the wiring.

6 Remove the pin retaining fasteners from the master cylinder rod end pivot pin. Use a soft metal drift to remove the pin.

7 Manually retract the master cylinder and push it toward the platform end of the boom to obtain enough clearance for the extension cylinder removal.

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

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

9 Remove the pin retaining fasteners from the extension cylinder pivot pin. Use a soft metal drift to remove the pin.

Primary Boom Components

10 Carefully pull out and properly support the extension cylinder from the primary boom using a lifting strap from an suitable lifting device.

⚠WARNING Crushing hazard. The extension cylinder could fall when removed from the extension boom if not properly supported.

NOTICE Component damage hazard. Be careful not to damage the counterbalance valves on the primary boom extension cylinder when removing the cylinder from the primary boom.

NOTICE Component damage hazard. Hoses and cables can be damaged if the primary boom extension cylinder is dragged across them.

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

Note: Note the length of the cylinder after removal. The cylinder must be at the same length for installation.

4-5 Platform Leveling Master Cylinder

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

How to Remove the Platform Leveling Master Cylinder

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

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

Note: Before cylinder removal is considered, bleed the cylinder to be sure that there is no air in the closed loop. Refer to Repair Procedure, *How to Bleed the Slave Cylinder*.

Primary Boom Components

1 Remove the rear turntable cover.

2 Raise the secondary boom until the master cylinder barrel-end pivot pin is above the turntable counterweights.

3 Raise the primary boom until the master cylinder rod-end pivot pin is accessible.

4 Attach a lifting strap from an overhead crane to the upper pivot for support. Do not apply any lifting pressure.

5 Secure the upper secondary boom to the pivot end of the primary boom with a strap.

Note: Securing the upper secondary boom to the pivot will prevent the upper secondary boom from falling when the master cylinder barrel-end pivot pin is removed from the cylinder.

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

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

7 Tie a strap around the lug on the rod end of the master cylinder and secure the strap to the primary boom.

Note: The strap will be used to lower the cylinder out of the upper pivot.

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

9 Remove the pin retaining fasteners from the master cylinder barrel-end pivot pin.

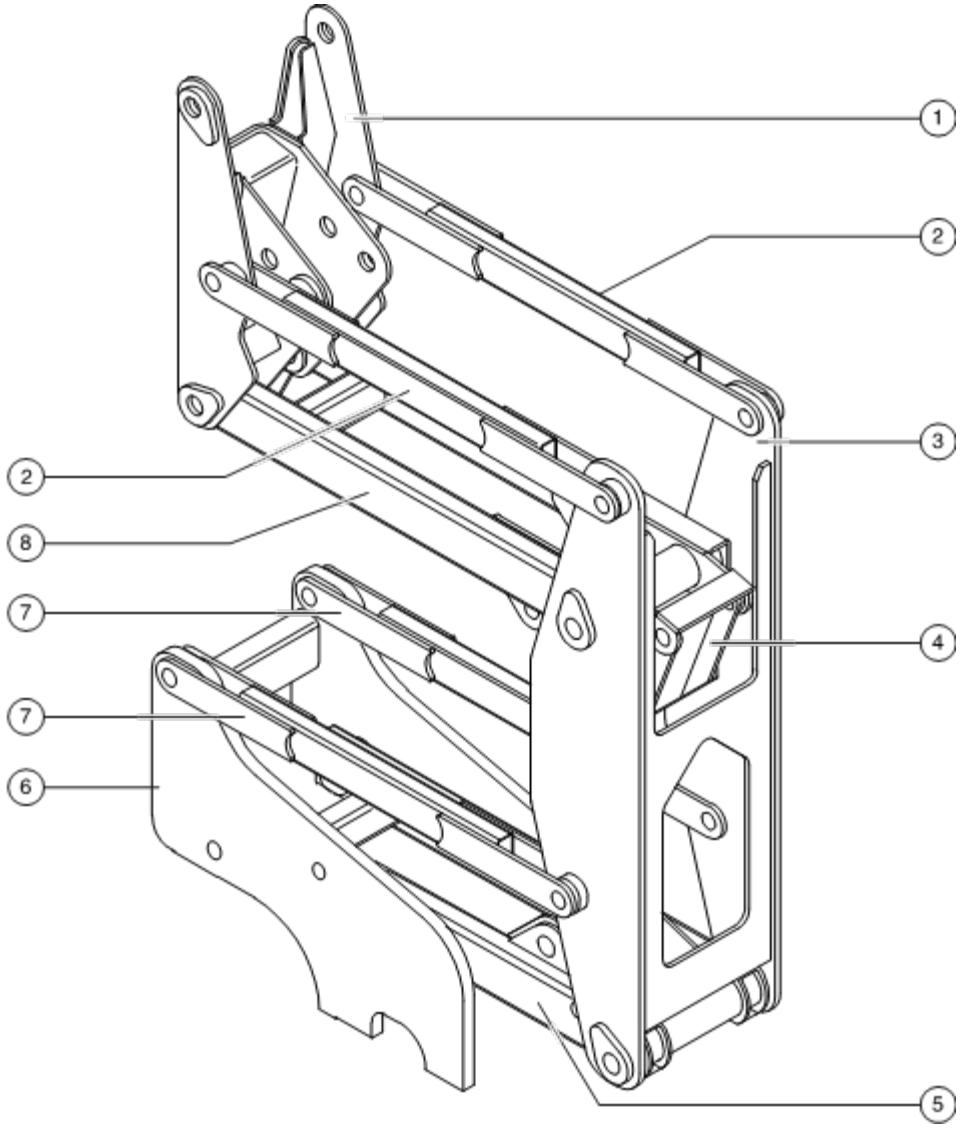
10 Use a soft metal drift to remove the pin from the cylinder. Do not remove the pin from the upper mid-pivot. Push the pin to one side, only far enough to remove the cylinder.

⚠WARNING Crushing hazard. The upper secondary boom and the upper pivot may fall if the pivot pin is completely removed.

Note: The pin should remain in one side of the upper secondary boom and upper mid-pivot.

11 Use the strap around the rod-end lug to lower the cylinder out of the machine.

Secondary Boom Components



Secondary Boom components

1 upper pivot
2 upper compression arm
3 mid-pivot
4 compression link
5 lower secondary boom
6 turntable pivot
7 lower compression arm
8 upper secondary boom

Secondary Boom Components

5-1
Secondary Boom

How to Disassemble the Secondary Boom

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

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

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 Lower the boom to the stowed position.

2 Place a lifting device under the front of the platform.

3 Remove the rear turntable cover.

4 Remove the cable cover from the side of the jib boom.

5 Remove the wire loom from the cables at the platform control box.

6 Locate the four cables from the primary boom cable track to the platform control box. Number each cable and its entry location at the platform control box.

7 Open the platform control box.

8 Label and disconnect each wire of the four cables in the platform control box.

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

9 Pull the cables out of the platform control box.

10 Pull all of the electrical cables out of the plastic cable track. Do not pull out the hydraulic hoses.

11 Remove the hose clamps from the bottom side of the primary boom.

12 Tag, disconnect and plug the platform rotator hydraulic hoses at the union, located on the bottom side of the primary boom.

⚠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.

13 Remove the hose clamp from the side of the primary boom at the pivot end.

14 Remove the drive speed limit switch mounted on the side of the pivot end of the primary boom. Do not disconnect the wiring.

15 Attach a strap from an overhead crane to the pivot end of the primary boom.

Secondary Boom Components

16 Carefully lift the secondary and primary boom assembly until the master and primary lift cylinder hydraulic hoses are accessible.

17 Remove the cable covers from the top of the upper secondary boom.

18 Tag, disconnect and plug the primary boom lift cylinder and master cylinder hydraulic hoses.

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

19 Lower the booms to the stowed position.

20 Pull all the cables and hoses through the upper mid-pivot.

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

21 Position the strap from the overhead crane approximately two feet from the platform end of the primary boom. Measure from the end of the primary boom tube.

22 Remove the pin retaining fasteners from the upper pivot to upper compression arm pivot pins. Use a soft metal drift to remove the pins.

23 Swing the compression arms down and out of the way. Secure them from moving.

24 Remove the pin retainers from the upper pivot to upper secondary boom pivot pin. Use a soft metal drift to remove the pin.

25 Carefully remove the entire primary boom assembly from the machine (primary boom assembly, jib boom assembly, platform, master cylinder, primary lift cylinder and upper pivot).

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the primary boom assembly could become unbalanced and fall when it is removed from the machine. Do not remove the assembly from machine until it is properly balanced.

26 Place the entire assembly onto a structure capable of supporting it.

27 Remove the pin retaining fasteners from the upper compression arm pivot pins. Do not remove the pins.

28 Position the lifting strap from an overhead crane at the center of the control box side upper compression arm, then remove it from the machine. Repeat this step for the engine side upper compression arm.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the upper compression arm could become unbalanced and fall when it is removed from the machine.

29 Remove the pin retaining fastener from the rod end of the secondary boom lift cylinder. Use a soft metal drift to remove the pin. Secure the cylinder from moving.

30 Remove the pin retaining fastener from the lower pivot pin on the compression link. Use a soft metal drift to remove the pin.

31 Attach the strap from an overhead crane to the upper secondary boom.

Secondary Boom Components

32 Remove the pin retaining fastener from the upper secondary boom to mid-pivot pivot pin. Use a soft metal drift to remove the pin.

33 Remove the upper secondary boom with compression link from the machine.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the upper secondary boom with compression link may become unbalanced and fall when it is removed from the machine.

34 Remove the drive speed limit switch mounted on the inside of the mid-pivot. Do not disconnect the wiring.

35 Remove the cable covers from the top of the lower secondary boom. Pull all the cables and hoses to the back of the turntable.

36 Remove the retaining fasteners from the secondary boom lift cylinder barrel-end pivot pins.

37 Attach the strap from the crane to the lug on the rod end of the secondary boom lift cylinder.

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

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

39 Use a slide hammer to remove the barrel-end pins (access the pins from the access holes in the bulkheads, one on each side). Then remove the cylinder from the machine.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the secondary boom lift cylinder may become unbalanced and fall when it is removed from the machine.

40 Attach the strap from the crane to the mid-pivot.

41 Remove the pin retainers from the mid-pivot to lower compression arm pivot pins. Use a slide hammer and remove the pin.

42 Remove the pin retainers from the mid-pivot to lower secondary boom pivot pins. Use a soft metal drift to remove the pin.

43 Remove the mid-pivot from the machine.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the mid-pivot could become unbalanced and fall when it is removed from the machine.

44 Attach the strap from the crane to the control box side lower compression arm.

45 Remove the pin retainer from the lower compression arm to turntable pivot pin. Use a slide hammer and remove the pin. Remove the arm from the machine. Repeat for the engine side lower compression arm.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the lower compression arms could become unbalanced and fall when it is removed from the machine.

46 Attach the strap from the crane to the lower secondary boom.

47 Remove the pin retainer from the lower secondary boom to turntable pivot pin. Use a soft metal drift to remove the pin.

48 Remove the lower secondary boom from the machine.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the lower secondary boom could become unbalanced and fall when it is removed from the machine.

5-2 Secondary Boom Lift Cylinder

The secondary boom lift cylinder raises and lowers the secondary boom. The secondary boom lift cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Secondary Boom Lift Cylinder

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

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

1 Rotate the turntable to the side until the boom is centered between the steer and non-steer tires.

2 Raise the primary boom to full height. Do not extend it.

3 Attach the strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.

Secondary Boom Components

4 From the bottom side of the cylinder, remove the retaining fasteners from the secondary boom lift cylinder barrel-end pivot pins.

5 Use a slide hammer to remove the barrel-end pins (access the pins from the access holes in the bulkheads, one on each side).

6 Remove the pin retaining fastener from the secondary boom lift cylinder rod-end pivot pin. Then use a soft metal drift to remove the pin.

7 Carefully lower the cylinder down through the secondary boom, enough to access the hydraulic hoses. Do not pinch the hoses.

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

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

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

9 Carefully remove the cylinder by raising it through the top of the secondary boom using the overhead crane.

⚠WARNING Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

6-1
Timing Adjustment

Complete information to perform this procedure is available in the Kubota Z482-E.

Kubota Z482-E3B Operator's Manual	
Genie part number	139420

6-2
RPM Adjustment

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

6-3
Engine Drive Pulley

How to Remove the Engine Drive Pulley

1 Remove the engine pivot plate latch retainer.

2 Open the engine pivot plate latch and swing the engine out away from the machine to access the engine drive pulley.

3 Loosen the tension adjustment bolt on the generator.

4 Pull the generator away from the machine and remove the belts from the generator pulley.

5 Remove the 3 bolts that attach the engine drive pulley to the shaft bushing.

6 Install the same 3 bolts that were removed in step 5 into the threaded holes of the engine drive pulley.

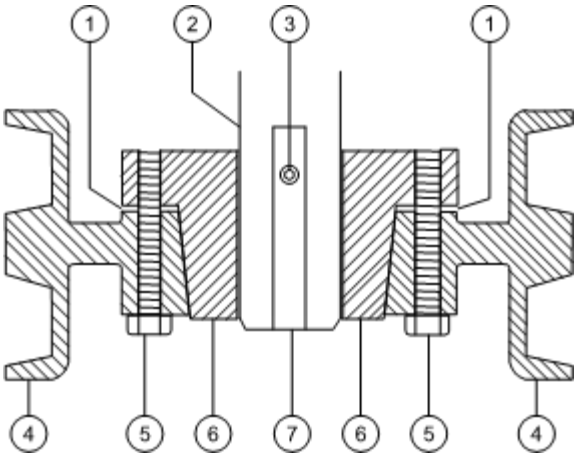
Engines

7 Carefully tighten each bolt evenly until the engine drive pulley slides off the shaft.

NOTICE

Component damage hazard. The engine drive pulley and/or shaft can be damaged if the bolts are not tightened evenly.

8 Loosen the set screw on the pulley bushing, then slide the pulley bushing off of the engine shaft.



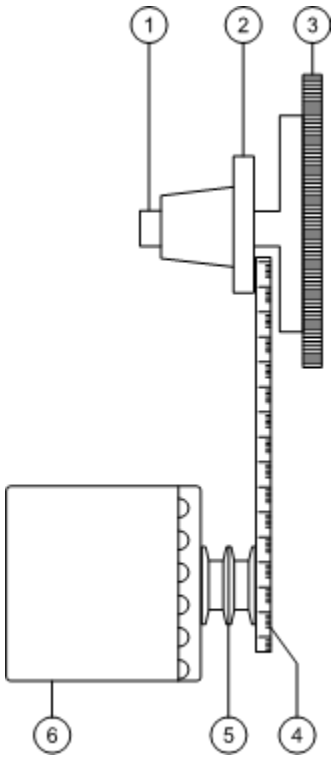
1 gap
2 shaft
3 set screw
4 engine drive pulley
5 engine drive pulley bolt
6 shaft bushing
7 woodruff key

How to Install the Engine Drive Pulley

Note: The generator pulley must already be installed before performing this procedure. Refer to Repair Procedure, *How to Install the Generator Pulley.*

1 Align the woodruff key on the engine shaft with the slot in the pulley bushing and slide the pulley bushing onto the engine shaft. Do not tighten the set screw.

2 Align the flywheel side of the pulley bushing on the engine shaft with the outer face of the generator pulley using a straightedge.



1 pulley shaft
2 pulley bushing
3 engine flywheel
4 straightedge
5 generator pulley
6 generator

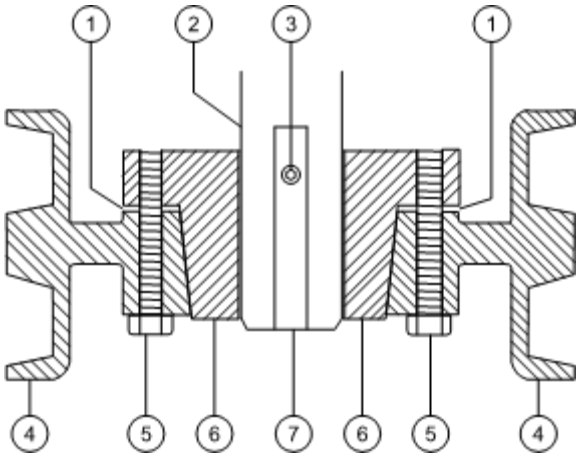
3 Tighten the set screw on the pulley bushing hand tight.

4 Slide the engine pulley onto the pulley bushing.

5 Install the pulley mounting bolts and tighten them to specification. Refer to Specifications, *Generator Specifications*.

NOTICE

Component damage hazard. Do not overtighten the pulley mounting bolts. There must be a gap visible between the engine drive pulley and the pulley bushing.



1 gap
2 shaft
3 set screw
4 engine drive pulley
5 engine drive pulley bolt
6 shaft bushing
7 woodruff key

6 Check the alignment between the engine drive pulley and the generator pulley using a straightedge. Refer to Specifications, *Generator.*

Note: If the pulley alignment is not within specification, remove the engine pulley and repeat steps 2 through 6. Refer to Repair Procedure, *How to Remove the Engine Drive Pulley.*

Coolant Temperature and Oil Pressure Switches

The engine coolant temperature switch is a normally open switch. The switch contacts close at approximately 225°F / 107°C. If the coolant temperature rises above the switch point, the switch contacts close and the engine will shut off to prevent damage. The engine will not start until the temperature drops below the switch point. An over- temperature indicator light at the ground controls should turn on when the switch closes.

NOTICE

Component damage hazard.Do not crank the engine with the over-temperature light on.

The engine oil switch is a normally closed switch. The switch contacts open at approximately 7 psi / 0.48 bar. If the oil pressure drops below the switch point, the contacts open and the engine will shut off to prevent damage. A low oil pressure indicator light at the ground controls should turn on when the switch opens.

NOTICE

Component damage hazard.Do not crank the engine with the low oil pressure light on.

Generator

7-1 Generator Pulley

How to Remove the Generator Pulley

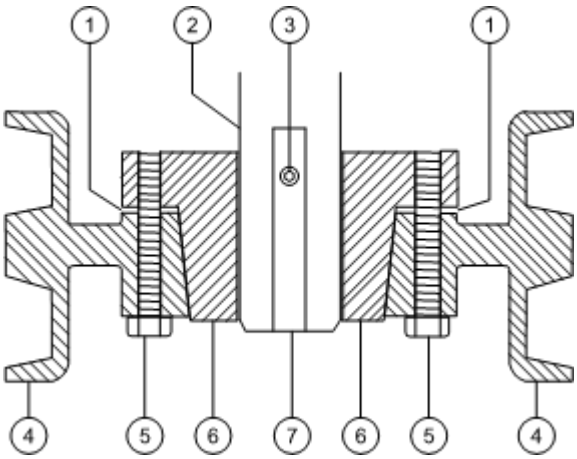
1 Loosen the tension adjustment bolt on the generator.

2 Push the generator towards the machine and remove the belts from the generator pulley.

3 Remove the generator pulley retaining nut from the generator shaft.

4 Slide the pulley off of the generator shaft.

5 Loosen the set screw on the pulley bushing, then slide the pulley bushing off of the generator shaft.



1 gap
2 shaft
3 set screw
4 engine drive pulley
5 engine drive pulley bolt
6 shaft bushing
7 woodruff key

How to Install the Generator Pulley

Note: The pulley on the generator must be installed before installing the engine drive pulley.

1 Align the woodruff key on the generator shaft with the slot in the pulley and slide the pulley all the way onto the generator shaft.

2 Install the flat washer and pulley retaining nut onto the generator shaft, then torque the nut to specification. Refer to Specifications, *Generator.*

3 Adjust the tension of the generator belts. Refer to Repair Procedure, *How to Adjust the Generator Belts.*

7-2 Generator Belts

How to Adjust the Generator Belts

1 Disconnect the battery packs.

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

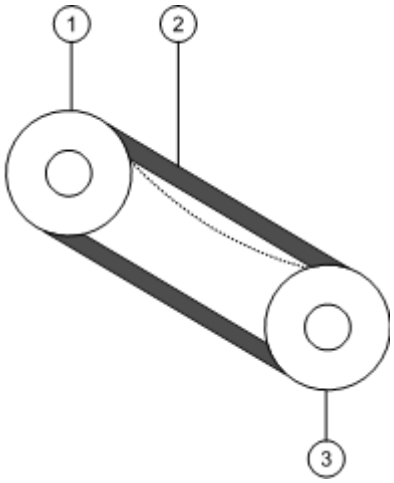
2 Remove the engine pivot plate latch retainer.

3 Open the engine pivot plate latch and swing the engine out away from the machine to access the generator belts.

4 Loosen the tension adjustment bolt on the generator.

5 Pull the generator away from the machine and tighten the adjustment bolt.

6 Check the generator belts for proper tension. If the belt deflection is not within specification, perform steps 4 and 5 and re-check the belt tension.



1 engine pulley
2 generator belts
3 generator pulley

Belt deflection, maximum allowable	0.25 inch 6.5 mm

Generator

7-3 Generator Voltage Regulator

How to Adjust the Generator Voltage Regulator

The voltage regulator regulates the output voltage of the generator. A properly adjusted voltage regulator is essential to good generator performance and service life. A defective or improperly adjusted voltage regulator could result in component damage.

Note: Be sure the batteries are fully charged before performing this procedure.

1 Remove the engine pivot plate latch retainer.

2 Open the engine pivot plate latch and swing the engine out away from the machine to access the generator.

3 Connect the positive lead of a voltmeter to the pos terminal on the generator and the negative lead of the voltmeter to the neg terminal on the generator.

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

4 Start the engine from the ground controls and move the rpm select toggle switch to the maintained high idle position. Check the voltage on the generator.

⊙ Result: The voltage should be 54V DC.

5 If the voltage reading is not 54V DC, insert a small flat blade screwdriver into the potentiometer located inside of the generator. Use the access hole on the back of the generator labeled volt adj.

NOTICE Component damage hazard. Be sure that the screwdriver is properly inserted into the potentiometer or the generator and/or voltage regulator may become damaged.

6 Carefully adjust the potentiometer to obtain a 54V DC voltage reading. Turn the potentiometer clockwise to increase the voltage or counterclockwise to decrease the voltage. Do not rotate the potentiometer past the internal stops.

NOTICE Component damage hazard. The voltage regulator inside the generator will become damaged if the potentiometer is rotated past the internal stops.

Note: The maximum range of motion of the potentiometer on the voltage regulator is 280° and the maximum allowed torque is 5 oz-in / 0.035 Nm.

How to Replace the Voltage Regulator

1 Disconnect the battery packs from the machine.

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

2 Remove the engine pivot plate latch retainer.

3 Open the engine pivot plate latch and swing the engine out away from the machine to access the generator.

4 Tag and disconnect the positive and negative battery cables from the generator.

5 Loosen the tension adjustment bolt on the generator.

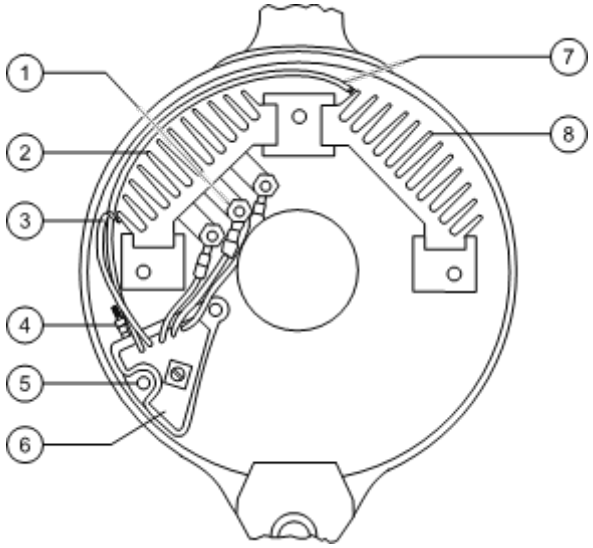
6 Pull the generator away from the machine and remove the belts from the generator pulley.

7 Remove the generator mounting fasteners then remove the generator from the machine.

8 Remove the 3 nuts from the battery cable terminal posts.

9 Remove the 3 screws that hold the plastic cover onto the generator. Carefully remove the cover.

10 Locate the 3 white wires that lead from the voltage regulator to the negative rectifier assembly.



1 white wires (#10 nuts)
2 negative rectifier assembly
3 black wire (#10 screw)
4 black wire (#4 nut)
5 voltage regulator mounting fastener (#8 screw)
6 voltage regulator
7 red wire (#10 screw)
8 positive rectifier assembly

11 Remove the nuts on those 3 wires from the negative rectifier assembly, then remove the wires.

Note: Do not remove the spacers from the underneath the wires on the negative rectifier assembly.

Generator

12 Locate the red wire that leads from the voltage regulator to the positive rectifier assembly.

13 Remove the screw that attaches the red wire to the positive rectifier assembly.

14 Remove the #4 nut that attaches the black wire to the voltage regulator.

15 Remove the voltage regulator mounting screws.

16 Remove the voltage regulator while carefully guiding the red and black wires from underneath the bottom support of the positive and negative rectifier assembly.

17 Install the new voltage regulator by following the previous steps in reverse order.

18 Apply Loctite® removable thread sealant onto the voltage regulator mounting fasteners and torque to specification. Refer to Specifications, *Machine Torque Specifications*.

19 Torque all other fasteners to specification. Refer to Specifications, *Machine Torque Specifications.*

20 Install the plastic cover onto the generator then install the generator onto the machine.

21 Adjust the generator belts. Refer to repair procedure, *How to Adjust the Generator Belts*.

22 Adjust the voltage regulator. See How to Adjust the Voltage Regulator.

NOTICE

Component damage hazard. The voltage regulator and/or generator may become damaged if the voltage regulator is not properly adjusted after replacement

8-1 Auxiliary Pump

How to Test the Auxiliary 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 auxiliary 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 the ground and platform controls.

4 Activate any function using auxiliary power.

⊙ Result: The pressure gauge reads 2800 psi /193 bar, immediately stop. The pump is good.

⊠ Result: The pressure fails to reach 2800 psi /193 bar, the pump is faulty and will need to be serviced or replaced.

5 Remove the pressure gauge and install the hydraulic hose.

How to Remove the Auxiliary 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 hoses from 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.

2 Remove the pump mounting fasteners. Carefully remove the pump.

Hydraulic Pumps

8-2
Function Pump

How to Test the Function Pump

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

1 Tag, disconnect and plug the high pressure hydraulic hose from the function 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 the ground and platform controls.

4 Hold the function enable switch to either side and activate any boom function from the ground controls.

⊙ Result: The pressure gauge reads 3000 psi / 206 bar, immediately stop. The pump is good.

☒ Result: The pressure fails to reach 3000 psi / 206 bar, the pump is faulty and will need to be serviced or replaced.

NOTICE Component damage hazard. Hydraulic pressure in excess of 3000 psi / 206 bar may result in severe component damage.

5 Remove the pressure gauge and install the hydraulic hose.

How to Remove the Function Pump

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

1 Tag, disconnect and plug the hydraulic hoses from 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.

Remove the pump mounting fasteners. Carefully remove the pump.

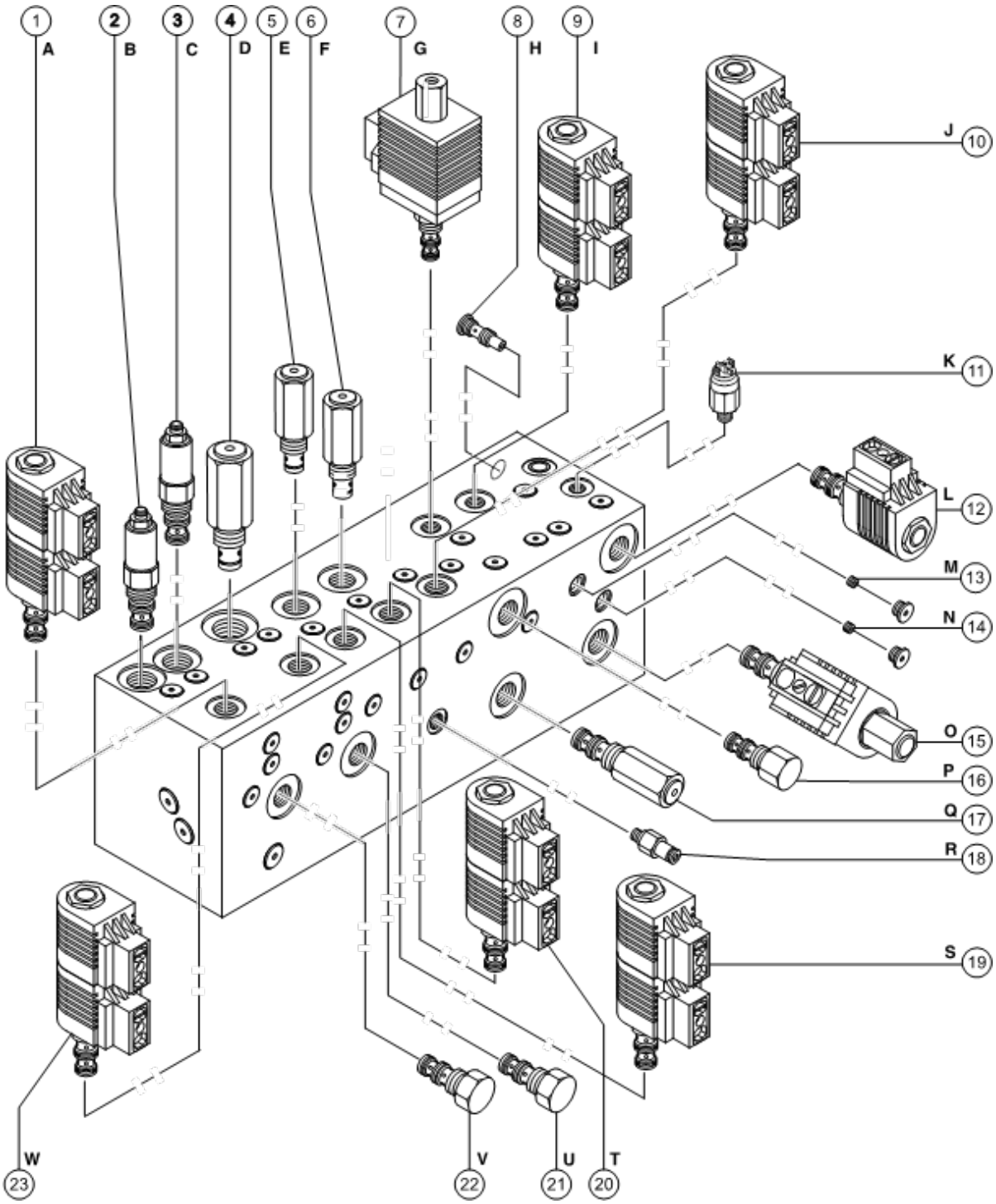
Manifolds

9-1 Function Manifold Components

The function manifold is mounted to the turntable under the ground control box.

Index No.	Description	Schematic Item	Function	Torque
1	3 position 4 way spool valve	A	Platform level up/down	10-12 ft-lbs / 14-16 Nm
2	Counterbalance valve	B	Platform level down	35-40 ft-lbs / 47-54 Nm
3	Counterbalance valve	C	Platform level up	35-40 ft-lbs / 47-54 Nm
4	Relief valve, 1100 psi / 75.8 bar	D	Turntable rotate left/right	25-30 ft-lbs / 34-41 Nm
5	Relief valve, 1600 psi / 110 bar	E	Secondary boom down	25-30 ft-lbs / 34-41 Nm
6	Relief valve, 1600 psi / 96.5 bar	F	Primary boom down	25-30 ft-lbs / 34-41 Nm
7	Proportional solenoid valve	G	System flow regulating circuit	10-12 ft-lbs / 14-16 Nm
8	Check valve	H	Brake circuit	25-30 ft-lbs / 34-41 Nm
9	Solenoid valve, 3 position 4 way	I	Steer left/right	10-12 ft-lbs / 14-16 Nm
10	3 position 4 way spool valve	J	Primary boom extend/retract	10-12 ft-lbs / 14-16 Nm
11	Pressure switch	K	Brake circuit	
12	Solenoid valve, N.C. poppet	L	Brake circuit	25-30 ft-lbs / 34-41 Nm
13	Orifice, 0.045 in / 1.02 mm	M	Steer circuit	
14	Orifice, 0.045 in / 1.02 mm	N	Brake circuit	
15	Solenoid valve, N.O. poppet	O	Brake circuit	25-30 ft-lbs / 34-41 Nm
16	Differential sensing valve	P	Differential sensing circuit	10-12 ft-lbs / 14-16 Nm
17	Relief valve, 3200 psi / 220.6 bar	Q	System relief	25-30 ft-lbs / 34-41 Nm
18	Diagnostic fitting	R	Testing	
19	3 position 4 way spool valve	S	Secondary boom up/down	10-12 ft-lbs / 14-16 Nm
20	3 position 4 way spool valve	T	Primary boom up/down	10-12 ft-lbs / 14-16 Nm
21	Flow regulator valve, 1.8 gpm / 6.8 L/min	U	Turntable rotate circuit	10-12 ft-lbs / 14-16 Nm
22	Flow regulator valve, 0.8 gpm / 3 L/min	V	Jib boom/platform rotate circuit	10-12 ft-lbs / 14-16 Nm
23	3 position 4 way spool valve	W	Turntable rotate left/right	10-12 ft-lbs / 14-16 Nm

Manifolds


1
A
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B
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C
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F
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G
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H
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U
21
V
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W
23

Manifolds

9-2 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

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

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

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

2 Move and hold the function enable toggle switch to either side and hold the primary boom extend/retract toggle switch in the retract direction with the primary boom fully retracted.

3 Observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Component Specifications*.

4 Turn the machine off. Hold the system relief valve with a wrench and remove the cap.

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

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

6 Repeat steps 2 and 3 to verify the relief valve pressure.

7 Remove the pressure gauge.

How to Adjust the Primary Boom Down Relief Valve

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

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

1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the test port on the function manifold.

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

3 Move and hold the function enable toggle switch to either side and move and hold the primary boom up/down toggle switch in the down direction with the primary boom fully lowered. Observe the pressure reading on the pressure gauge. Refer to Specifications, *Manifold Component Specifications.*

4 Turn the machine off. Hold the primary down relief valve with a wrench and remove the cap.

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

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

6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

7 Remove the pressure gauge.

How to Adjust the Secondary Boom Down Relief Valve

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

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

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

2 Move and hold the function enable toggle switch to either side and hold the secondary boom up/down toggle switch in the down direction with the secondary boom fully lowered.

3 Observe the pressure reading on the pressure gauge. Refer to Specifications, *Hydraulic Specifications*.

4 Turn the machine off. Hold the secondary boom down relief valve with a wrench and remove the cap.

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

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

6 Repeat steps 2 through 4 and recheck relief valve pressure.

7 Remove the pressure gauge.

How to Adjust the Turntable Rotate Relief Valve

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

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

1 Connect a 0 to 3000 psi / 0 to 200 bar pressure gauge to the test port on the function manifold.

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

3 Move and hold the function enable toggle switch to either side and move and hold the turntable rotate toggle switch in the right direction (until turntable stops against the rotation stop). Observe the pressure reading on the pressure gauge. Refer to Specifications, *Manifold Component Specifications.*

4 Turn the machine off. Hold the turntable relief valve(s) with a wrench and remove the cap.

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

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

6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

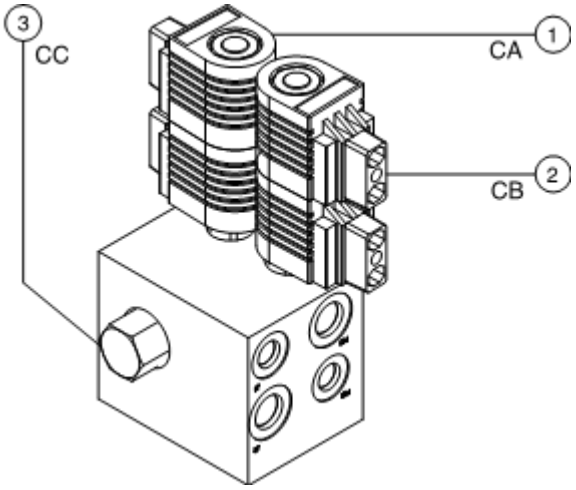
7 Remove the pressure gauge.

Manifolds

9-3
Jib Boom / Platform Rotate Manifold Components.

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

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 3 way	CA	Jib boom circuit	25-30 ft-lbs / 34-41 Nm
2	Solenoid valve, 2 position 3 way	CB	Platform rotate circuit	25-30 ft-lbs / 34-41 Nm
3	Flow regulator, 0.3 gpm / 1.2 L/min	CC	Platform rotate circuit	25-30 ft-lbs / 34-41 Nm



9-4 Valve Coils

How to Test a Coil

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

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

2 Test the coil resistance.

Coils with 2 terminals: Connect the leads from the ohmmeter to the valve coil terminals.

Coils with 1 terminal: Connect the positive lead from the ohmmeter to the valve coil terminal, then connect the negative lead from the ohmmeter to the internal ring of the valve coil.

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

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

Valve Coil Resistance Specifications

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

Valve Coil Resistance Specification	
3 position 4 way solenoid valve - 20V (schematic items A, I, J, S, T, W, CA and CB)	22Ω
Normally open poppet valve - 20V (schematic item O)	22Ω
Normally closed poppet valve - 20V (schematic item L)	23.5Ω
Proportional solenoid valve - 24V (schematic item G)	19Ω

Manifolds

How to Test a Coil Diode

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

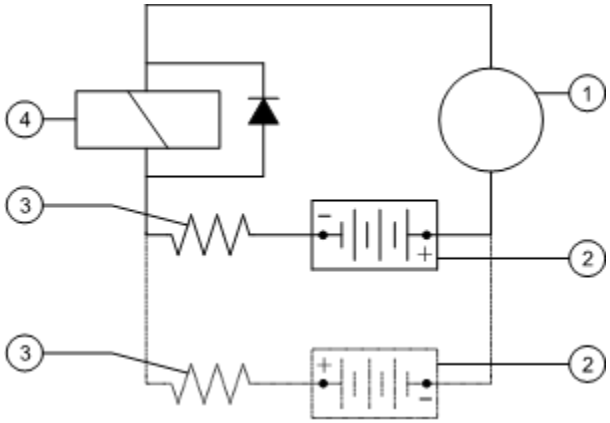
⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

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

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

Resistor, 10Ω	
Genie part number	27287

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



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

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

3 Set a multimeter to read DC current.

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

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

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

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

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

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

Fuel and Hydraulic Tanks

10-1 Fuel Tank

How to Remove the Fuel Tank

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

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

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

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

2 Remove the fuel tank retaining fastener located underneath the tank mounting tray at the bottom of the fuel tank.

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

NOTICE Component damage hazard. Do not overtighten the fuel tank mounting fasteners.

Note: Clean the fuel tank and inspect for cracks and other damage before installing.

10-2 Hydraulic Tank

The primary functions of the hydraulic tank are to cool, clean and deaereate the hydraulic fluid during operation. It utilizes internal suction strainers for the pump supply suction 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 and cause severe component damage. Dealer service is recommended.

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

1 Close the hydraulic shutoff valve located at the hydraulic tank.

NOTICE Component damage hazard. The machine must not be operated with the hydraulic tank shutoff valve in the closed position or component damage will occur. If the tank valve is closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

Fuel and Hydraulic Tanks

2 Place a suitable container under the hydraulic tank. Refer to Specifications, *Machine Specifications*.

3 Tag and disconnect and plug the hydraulic hose from the hydraulic tank shutoff valve.

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

4 Open the valve on the hydraulic tank and drain the oil into a suitable container.

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

5 Tag, disconnect and plug the hydraulic hoses from the hydraulic tank filter. Cap the fittings on the filter.

⚠ 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.

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

6 Remove the hydraulic tank mounting fasteners.

7 Remove the hydraulic tank from the machine.

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

11-1
Rotation Hydraulic Motor

How to Remove the Turntable Rotation 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.*

Note: Do not allow the turntable to rotate until the hydraulic motor is installed.

1 Tag, disconnect and plug the hydraulic hoses from the turntable rotation motor. Cap the fittings on the motor.

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

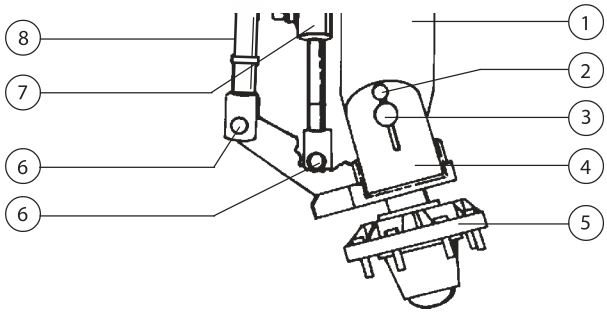
2 Remove the turntable rotation motor mounting bolts. Remove the motor from the machine.

Axle Components

12-1
Yoke and Hub

How to Remove the Yoke and Hub

1 Remove the pin retaining fastener and the clevis pin from both the steering cylinder and the tie rod.



1 axle
2 pin retaining fastener
3 king pin
4 yoke
5 hub
6 clevis pin
7 steering cylinder
8 tie rod

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

3 Block the non-steer wheels, and then center a lifting jack under the steering axle.

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

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

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

7 Support the yoke/hub assembly with a lifting device.

8 Place a rod through the yoke pivot pins and twist to remove the pins.

⚠ CAUTION Crushing hazard. The yoke/hub assembly may become unbalanced and fall when the yoke pivot pins are removed if it is not properly supported and secured to the lifting device.

How to Remove the Hub and Bearings, 2WD Models

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

2 Block the non-steer wheels and place a lifting jack of ample capacity under the steer axle.

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

⚠ CAUTION Crushing hazard. The machine may fall if not properly supported.

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

5 Remove the dust cap, cotter pin and castle nut.

Note: Always use a new cotter pin when installing a castle nut.

6 Pull the hub off the spindle. The washer and outer bearing should fall loose from the hub.

7 Place the hub on a flat surface and gently pry the bearing seal out of the hub.

8 Remove the rear bearing.

How to Install the Hub and Bearings, 2WD Models

Note: When replacing a wheel bearing, both the inner and outer bearings including the pressed-in races must be replaced.

1 Be sure that both bearings are packed with clean, fresh grease.

2 Place the large inner bearing into the rear of the hub.

3 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.

Note: Always replace the bearing grease seal when removing the hub.

4 Slide the hub onto the yoke spindle.

NOTICE Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

5 Fill the hub cavity with clean, fresh grease.

6 Place the outer bearing into the hub.

7 Install the washer and castle nut.

8 Tighten the castle nut to 158 ft-lbs / 214 Nm to seat the bearings.

Note: Rotate the hub by hand while torquing the castle nut to make sure the bearings seat properly.

9 Loosen the castle nut one full turn and then torque to 35 ft-lbs / 47 Nm.

10 Install a new cotter pin. Bend the cotter pin to secure the castle nut.

Note: Always use a new cotter pin when installing a castle nut.

11 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Specifications, *Machine Torque Specifications*.

12-2 Steer Cylinder

How to Remove a 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 Tag, disconnect and plug the hydraulic hoses from the steering cylinder. Cap the fittings.

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

2 Remove the pin retaining fastener, then remove the clevis pin from each end of the steer cylinder.

3 Remove the steer cylinder.

Non-steer Axle Components

13-1 Drive Motor

How to Remove a Drive Motor

1 1 Disconnect the battery packs.

2 Tag and disconnect the power cables and relay wiring from the drive motor.

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

3 Remove the drive motor mounting fasteners.

4 Guide the drive motor shaft out of the brake and then remove the drive motor.

13-2
Drive Hubs

How to Remove a Drive Hub

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

1 Remove the drive motor. Refer to Repair Procedure, *How to Remove a Drive Motor.*

2 Disconnect and plug the hydraulic hose from the brake. Remove the hydraulic fitting and the bleed valve.

⚠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 Chock the steer wheels.

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

5 Center a lifting jack under the non-steer axle. Raise the machine and place blocks under the chassis for support.

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

7 Place a second lifting jack under the drive hub for support. Secure the drive hub to the lifting jack.

8 Remove the bolts that attach the drive hub to the chassis, then remove the drive hub.

⚠WARNING Crushing hazard. The drive hub may become unbalanced and fall when the mounting fasteners are removed if it is not properly supported and secured to the lifting jack.

Motor Controller

14-1 Motor Controller

The drive motor controller is located under the non-steer end drive chassis cover. The drive motor controller can recognize machine drive malfunctions and display controller fault codes by flashing a LED at the ground controls and on the motor controller. See the Fault Code section of this manual for a list of fault codes and additional information. There are no adjustments needed on the drive joystick controller. For further information or assistance, consult the Genie Industries Service Department.

How to Test the Motor Controller

Note: Use the following procedure to test the motor controller. If the motor controller is found to be faulty, note which test failed and which fault code (if any) was present at the time of failure.

1 Turn the key switch to the off position and disconnect the battery packs from the machine.

2 Tag and disconnect all power cables from the motor controller.

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

3 Press the release tab on the motor controller harness connector and remove the motor controller harness connector from the motor controller.

4 Set an ohmmeter to diode test mode.

5 Connect the leads from an ohmmeter to test each motor controller terminal combination listed below and check the forward / reverse bias (diode test).

⊙ Result: All desired results must be within the specified range. If any test has a result not within the specified range, replace the motor controller.

Forward Bias:

Test		Desired result
Positive Lead	Negative Lead	
M-	B+	0.4 to 0.45
B-	M-	0.4 to 0.45
F1	B+	0.45 to 0.5
F2	B+	0.45 to 0.5
B-	F1	0.45 to 0.5
B-	F2	0.45 to 0.5

Reverse Bias:

Test		Desired result
Positive Lead	Negative Lead	
B+	M-	Rises to .0L V
M-	B-	Rises to .0L V
B+	F1	Rises to .0L V
B+	F2	Rises to .0L V
F1	B-	Rises to .0L V
F2	B-	Rises to .0L

Fault Codes



Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.
- ☑ Unless otherwise specified, perform each procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Key switch in the off position with the key removed
  - The red Emergency Stop button in the off position at both the ground and platform controls
  - Wheels chocked
  - All external AC power supply disconnected from the machine
  - Boom in the stowed position
  - Turntable secured with the turntable rotation lock
  - Welder disconnected from the machine (if equipped with the weld cable to platform option)

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropriate fault code thoroughly. Attempting short cuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

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

Note: Two persons will be required to safely perform some troubleshooting procedures.

Fault Codes

Fault Codes

Note: Additional troubleshooting of the fault codes may by accomplished by using the hand-held pendant motor controller programmer (Genie part number 56303).

For authorized service personnel only:

Note: When using the hand-held pendant motor controller programmer, the M1 MAX SPEED needs to be set to 33. If needed, adjust the M1 MAX SPEED higher or lower to achieve the maximum raised drive speed of 0.6 mph / 1Km/h or 40 feet / 45 seconds / 12.2 meters / 45 seconds.

⚠ DANGER Tip-over hazard. When adjusting the raised drive speed settings, the maximum raised drive speed must not exceed 0.6 mph / 1Km/h or 40 feet/45 seconds / 12.2 meters / 45 seconds. If the machine is allowed to drive faster than specification, the machine could become unstable and will tip over.

The controller status indicator light will flash a fault code to aid in troubleshooting. This indicator light is located on the front of the gound control box.

Fault codes are two digits. The controller status indicator light will blink the first digit of a two digit code, pause for 1 second, and then blink the second digit. There will be a 2 second pause between codes.

For example: the indicator light blinks 4 consecutive times, pauses for 1 second, and then blinks 1 time. That would indicate Fault Code 41.

Fault Code Chart

Fault Code	Programmer Diagnostic Display	Condition	Possible Causes	Solution
Fault code LED is off or is on, but not blinking	COMMUNICATION ERROR	Machine will not drive.	The key switch or Emergency Stop button(s) was cycled on and off faster than 5 seconds OR controller sensed an internal error during start up.	Push in the ground control red Emergency Stop button to the off position and wait for 5 seconds. Pull out the ground control red Emergency Stop button to the on position. If problem persists, replace the motor controller.
1		Normal operation.		
12	HW FAILSAFE 1-2-3	Machine will not drive.	The motor controller failed self test.	Replace the motor controller.
13	M- SHORTED	Machine will not drive.	The motor controller has an internal short between M- and B- terminals.	Test the motor controller. See Repair Section.
	FIELD OPEN	Machine will not drive.	Motor wiring is loose OR motor is defective OR motor controller has an internal short.	Check for loose or open connections at the drive motors and motor controller OR replace the defective drive motor OR test the motor controller. See Repair Section.
	ARM SENSOR	Machine will not drive.	Defective motor controller.	Replace the motor controller.
	FLD SENSOR	Machine will not drive.	Defective motor controller.	Replace the motor controller.

Fault Codes

Fault Code Chart

Fault Code	Programmer Diagnostic Display	Condition	Possible Causes	Solution
21	THROTTLE FAULT 1	Machine will not drive.	Open in wht/red wire #32 at pin 14 or red/wht wire #29 at pin 16 on the motor controller going from drive joystick to pins 14 and 16 at the motor controller OR pin 14 is internally shorted to power or ground OR the potentiometer on the drive joystick is defective.	Consult Genie Product Support.
	THROTTLE FAULT 2	Machine will not drive.	Pin 14 (wht/red #32) is shorted to power or ground OR the potentiometer on the drive joystick is defective.	Consult Genie Product Support.
31	CONT DRVR OC	Machine will not drive.	Main contactor (PR1) coil defective OR brake release relay CR5 defective.	Replace main contactor PR1 or brake release relay CR5 OR replace the motor controller.
32	MAIN CONT WELDED	Machine will not drive.	Main contactor (PR1) contacts stuck closed OR grn wire at pin 17 on motor controller shorted to ground OR open in motor armature wiring OR motor controller has an internal short to ground.	Consult Genie Product Support.
33	PRECHARGE FAULT	Machine will not drive.	External short between B+ terminal on motor controller and ground OR motor controller is defective.	Repair short between B+ terminal on motor controller and ground OR replace motor controller. Note: Short can be on any part of circuit connected to the B+ terminal on the motor controller.

Fault Code Chart

Fault Code	Programmer Diagnostic Display	Condition	Possible Causes	Solution
34	MISSING CONTACTOR	Machine will not drive.	Motor controller does not detect the main contactor PR1 or brake release relay CR5.	Consult Genie Product Support.
	MAIN CONT DNC	Machine will not drive.	Main contactor PR1 or brake release relay CR5 did not close OR open in org/red wire to PR1 and/or CR5 OR main contactor and/or brake release relay is defective.	Consult Genie Product Support.
41	LOW BATTERY	Machine will not drive.	Battery supply voltage to motor controller less than 32V DC.	Completely charge batteries OR check battery cable condition OR check for corrosion or loose connections at battery terminals and motor controller.
42	OVERVOLTAGE	Machine will not drive.	Battery supply voltage to motor controller more than 55V DC OR machine is being operated with the battery charger plugged in.	Be sure the battery charger is disconnected OR check for loose battery cables or poor connections.
43	THERMAL CUTBACK	Machine will not drive.	Machine being operated outside of temperature range of -13°F to 185°F / -25°C to 85°C OR machine being driven under excessive load OR motor controller is not being cooled sufficiently.	Operate machine within specified temperature limits OR check for debris around motor controller preventing proper cooling of the controller OR check for mechanical restrictions causing excessive load on the machine.

Schematics



Observe and Obey:

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

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section.

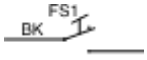
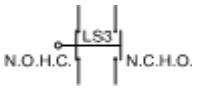
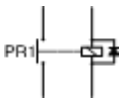
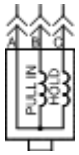
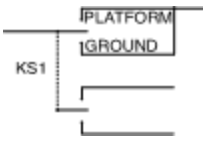
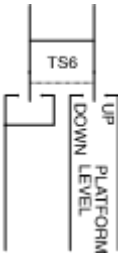
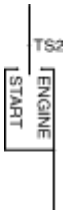
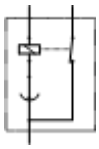
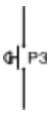
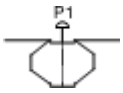
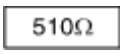
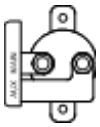
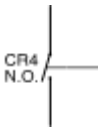
Electrical Schematics

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

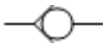
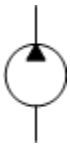
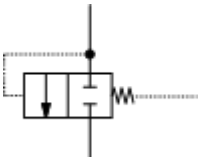
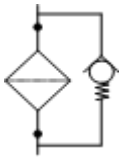
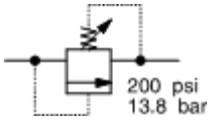
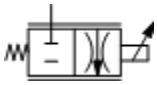
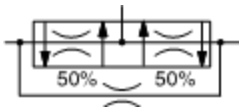
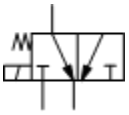
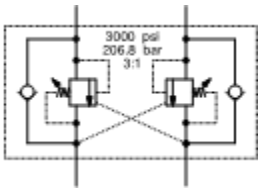
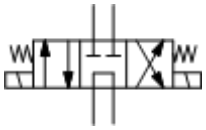
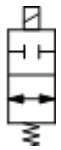
Hydraulic Schematics

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

Electrical Symbol Legend

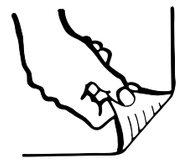
 Battery	 Coil, solenoid or relay	 Horn or alarm	 Flashing beacon	 Gauge
 Diode	 Hour meter	 LED	 Fuse with amperage	 Foot switch
 T-circuits connect	 Limit switch	 Power relay	 Coil with suppression	 Fuel or RPM solenoid
 Connection - no terminal	 T-circuits connect at terminal	 Circuits crossing no connection	 Quick disconnect terminal	 Circuit breaker with amperage
 Key switch	 Toggle Switch DPDT	 Toggle Switch SPDT	 Pump or Motor	 Tilt sensor
 Horn button - normally open	 Emergency Stop button - normally closed	 Resistor with ohm value	 Battery separator	 Gauge sending unit
 Oil temperature switch normally open	 Coolant temperature switch - normally open	 Oil pressure switch normally closed	 Control relay contact normally open	 Diode starting aid, glow plug or flame ignitor

Hydraulic Symbols Legend

 Orifice with size	 Check valve	 Shut off valve	 Brake
 Pump, fixed displacement	 Pump, bi-directional variable displacement	 Motor, bi-directional	 Motor, 2 speed bi-directional
 Cylinder, double acting	 Pump, prime mover (engine or motor)	 Shuttle valve. 2 position, 3 way	 Differential sensing valve
 Filter with bypass relief valve	 Relief valve with pressure setting	 Priority flow regulator valve	 Solenoid operated proportional valve
 Directional valve (mechanically activated)	 Flow divider/combiner valve	 Pilot operated 3 position, 3 way shuttle valve	 Solenoid operated 2 position, 3 way directional valve
 Counterbalance valve with pressure and pilot ratio	 Solenoid operated 3 position 4 way directional valve	 Solenoid operated 3 position, 4 way proportional directional valve	 Solenoid valve, 2 position 2 way

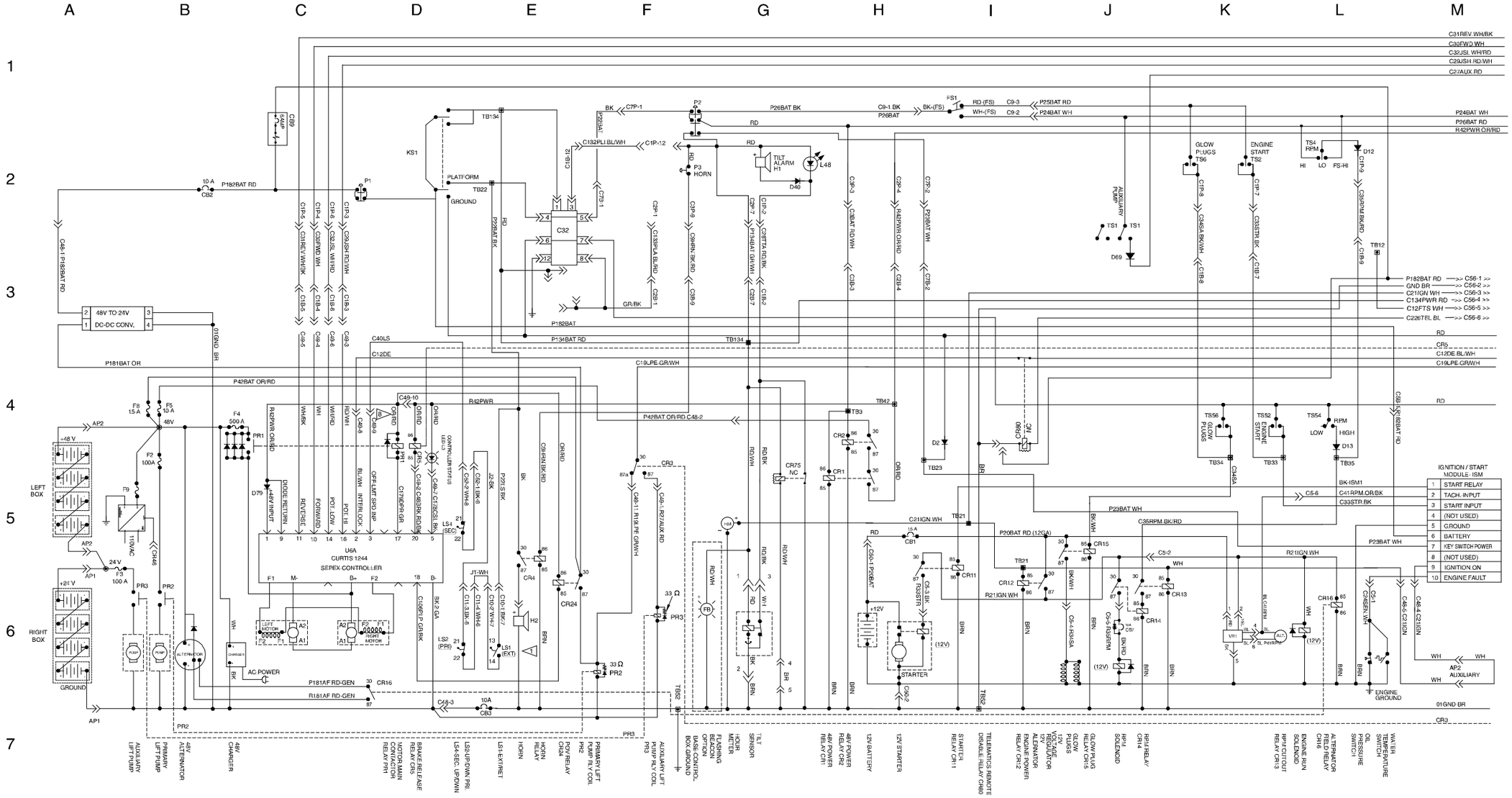
Electrical Schematic (ANSI / CSA)

[from SN Z3414-9686 to Z34F-12065]



Electrical Schematic (ANSI / CSA)

[from SN Z3414-9686 to Z34F-12065]



NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
2. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED.
3. WORK LIGHT & DRIVE LIGHT OPTION NOT FOR EE MACHINES

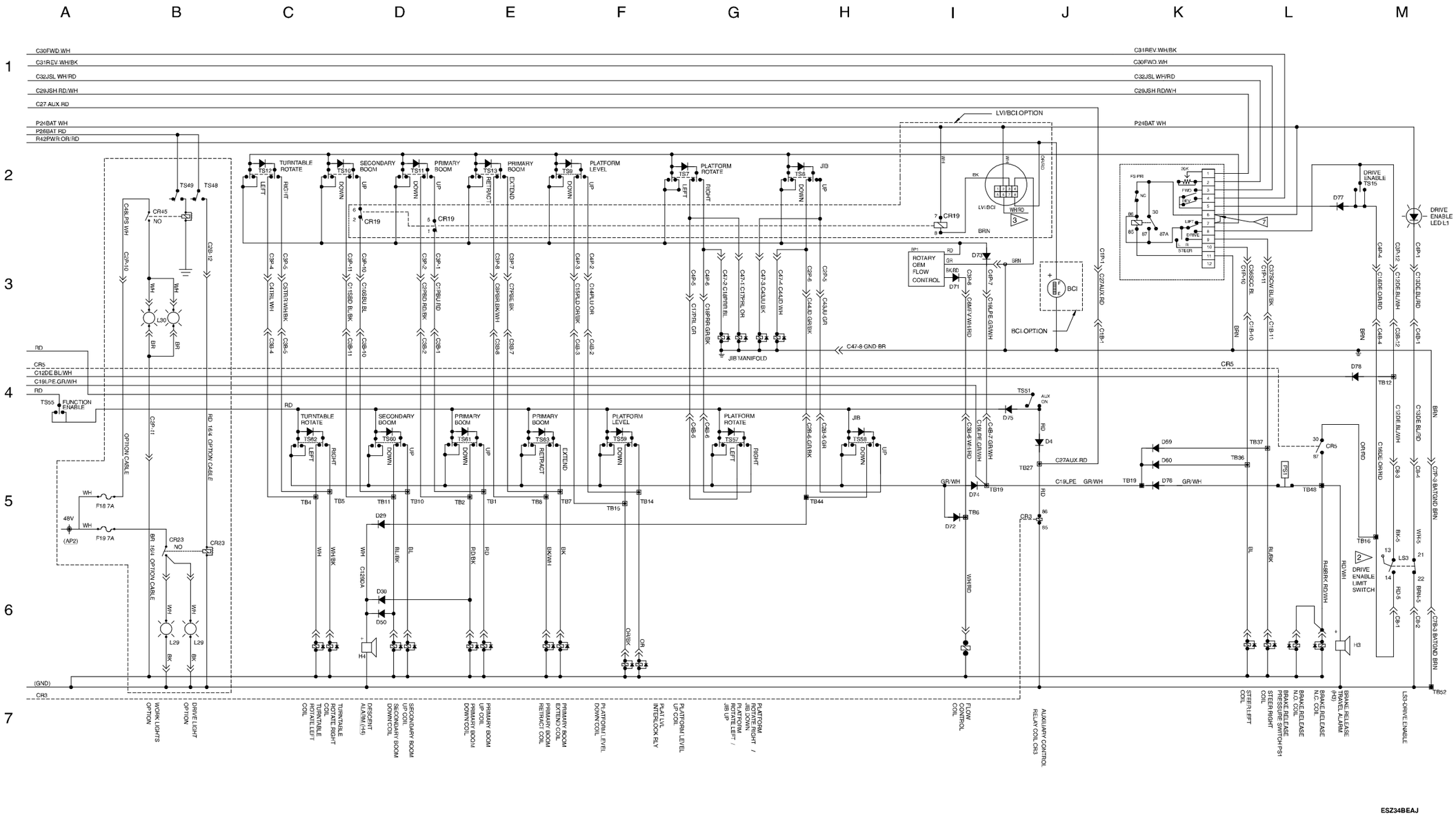
FLAG NOTES:

- SWITCH SHOWN WITH BOOM EXTENDED.
- SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
- SETUP ENABLE: SEE LVI/BCI OPTION.
- INSTALL JUMPERS AS INDICATED
- PLATFORM LOAD SENSE OPTION
- PLATFORM LOAD SENSE OPTION WITH RECOVERY
- FOR LIFT DRIVE CUTOUT OPTION REMOVE JUMPER BETWEEN 6 & 7
- SEE ES34BE SHEET 12 FOR CHARGER INTERLOCK OPTION.
- CR80-85 CONNECTED TO GND BY DEFAULT WITH WIRE CONFIGURATION OPTION TO CONNECT TO 12V
- CONNECT WIRES. ANSI/CSA/AUST ONLY

ESZ34BEAJ

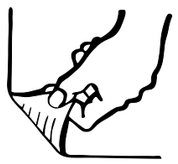
Electrical Schematic (ANSI / CSA)

[from SN Z3414-9686 to Z34F-12065]



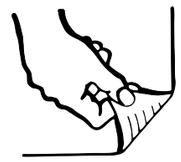
Electrical Schematic (ANSI / CSA)

[from SN Z3414-9686 to Z34F-12065]



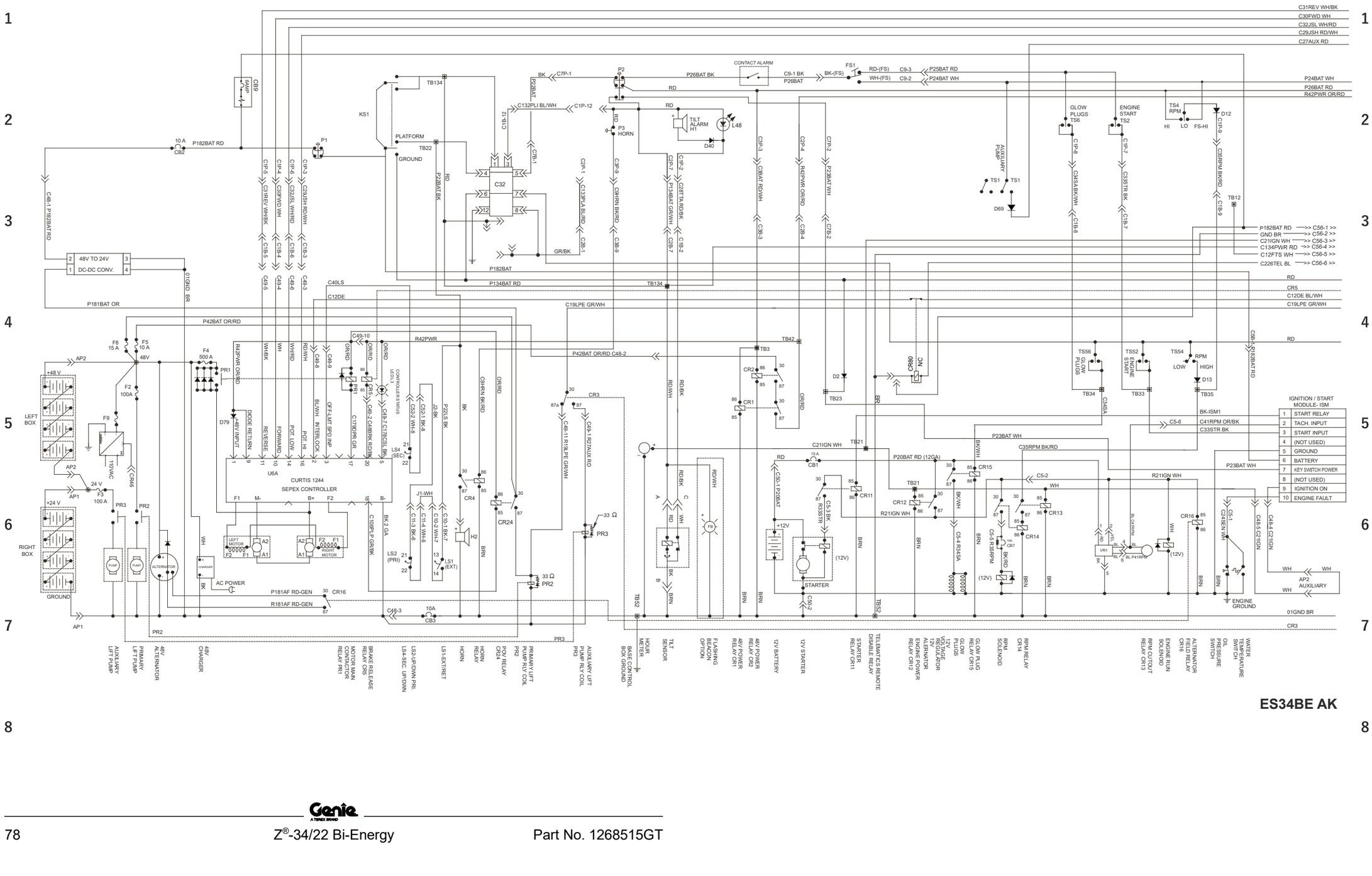
Electrical Schematic (ANSI / CSA)

[from SN Z34F-12066]



Electrical Schematic (ANSI / CSA)

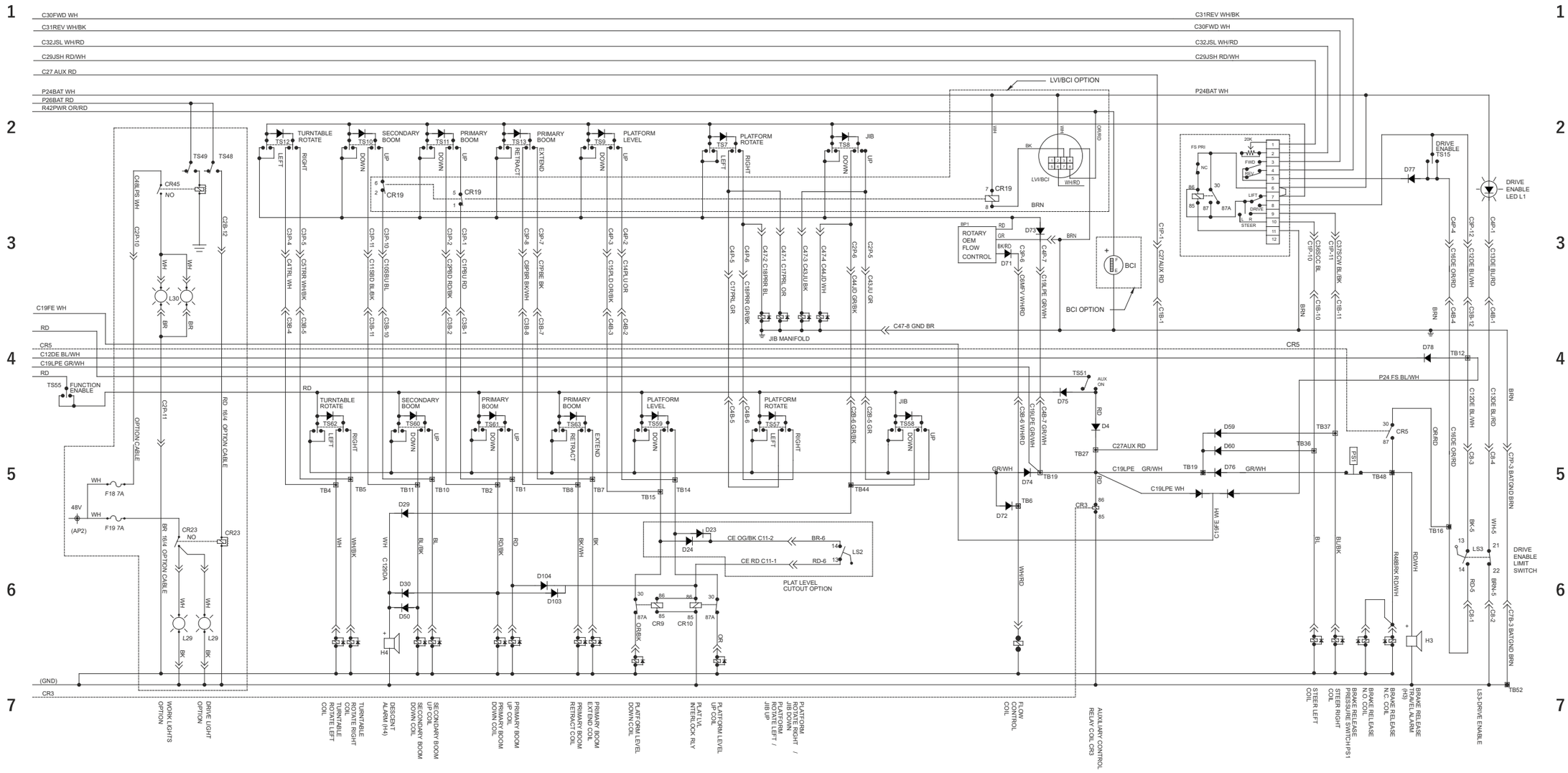
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ES34BE AK

Electrical Schematic (ANSI / CSA)

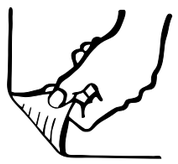
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ES34BE AL

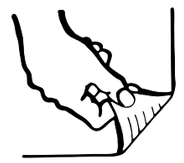
Electrical Schematic (ANSI / CSA)

[from SN Z34F-12066]



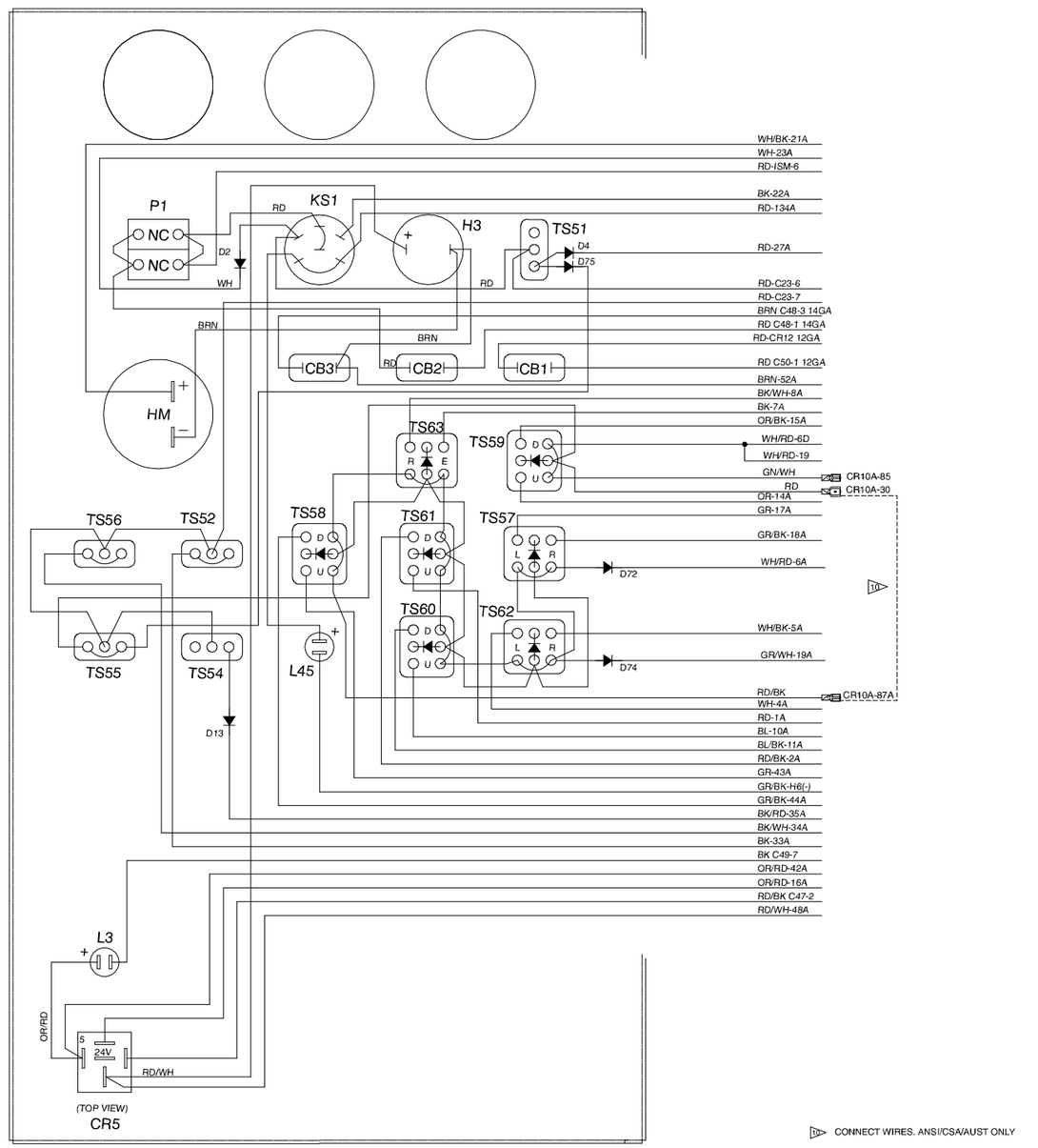
GBOX Switch Panel Wiring Diagram (ANSI / CSA)

[from SN Z3414-9686]



GBOX Switch Panel Wiring Diagram (ANSI / CSA)

[from SN Z3414-9686]



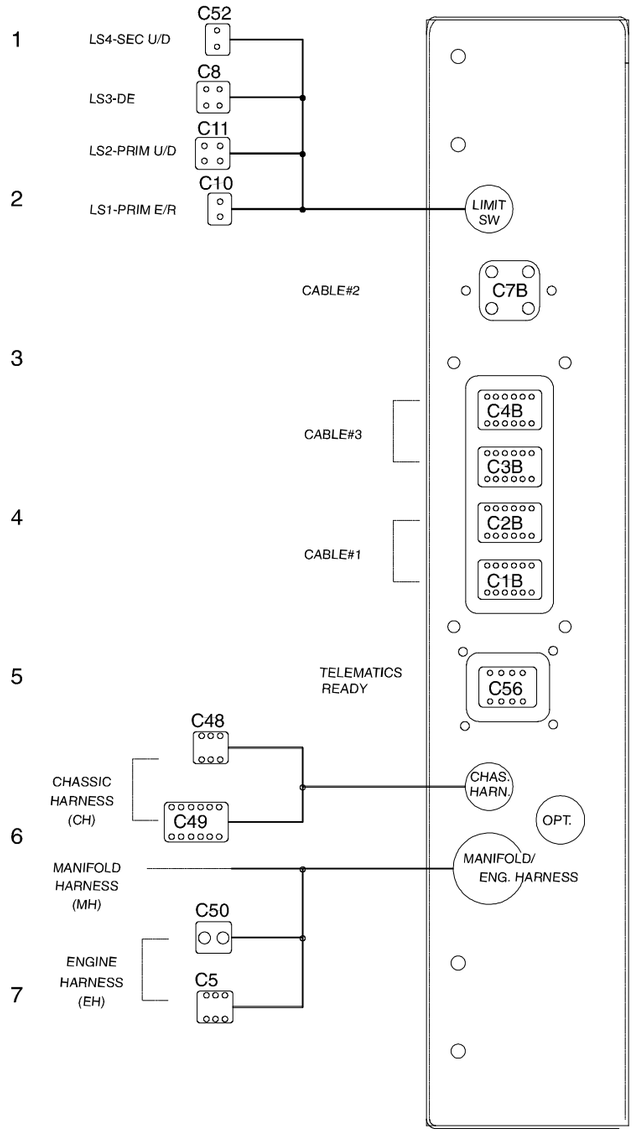
LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	ENGINE START SWITCH
TS54	ENGINE RPM SWITCH
TS55	FUNCTION ENABLE SWITCH
TS56	ENGINE GLOW PLUG SWITCH
TS57	PLATFORM ROTATE SWITCH
TS58	JIB UP/DOWN SWITCH
TS59	PLATFORM LEVEL SWITCH
TS60	SECONDARY BOOM UP/DOWN SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 10A
CB3	CIRCUIT BREAKER, CONTROLS RTRN,10A
L3	CONTROLLER STATUS LED
HM	HOUR METER
EH	ENGINE HARNESS
MH	MANIFOLD HARNESS
CH	CHASSIS HARNESS
SP	SWITCH PANEL
CR_	CONTROL RELAY
ISM	IGNITION/START MODULE
H3	BRK. REL./TRAVEL ALARM (OPT.)
H6	PLATFORM OVERLOAD ALRM
L45	PLATFORM OVERLOAD LED
CR5	BRAKE RELEASE RELAY

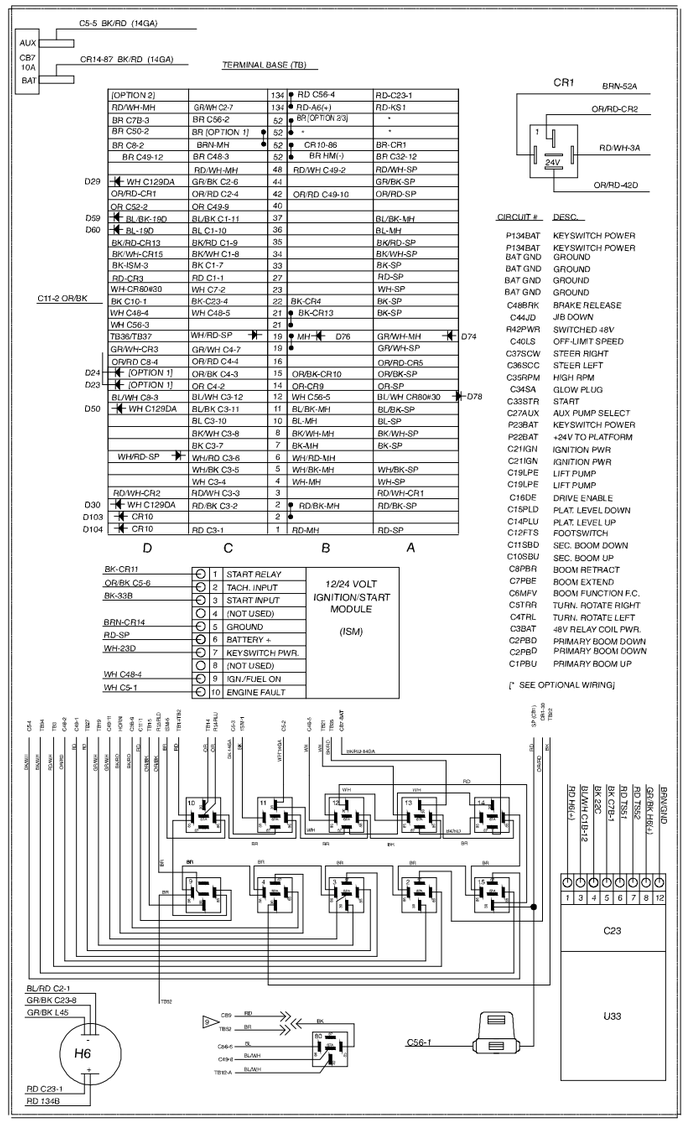
ESZ34BEAJ

10 CONNECT WIRES. ANSI/CSA/AUST ONLY

GBOX Terminal Strip Wiring Diagram (ANSI / CSA)

[from SN Z3414-9686]





WIRES FROM CONNECTOR TO CONNECTOR

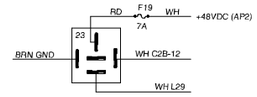
WIRES	CIRCUIT #	FROM	TO	DESC.
BL/RD	C133PLA	C2-1	H6(+)	PLAT LOAD INPUT
BL/WH	C132PLI	C1-12	C23-3	PLAT LOAD ALARM
BK	J2	C52-1	C11-3	LS2-LS4 JUNCTION
WH	J1	C10-2	C11-4	LS1-LS2 JUNCTION
GR-1	C43JU	C2-5	SP	JIB UP
WH/RD-1	C32JSL	C1-6	C49-6	JOYSTICK POT. LOW
WH/BK-1	C31REV	C1-5	C49-5	REVERSE
WH-1	C30FWD	C1-4	C49-4	FORWARD
RD/WH-1	C29JSH	C1-3	C49-3	2-WIRE POT.
RD/BK-1	C28TTA	C1-2	MH	TILT ALARM
GR/BK-3	C18PRR	C4-6	SP	PLAT. ROTATE RIGHT
GR-3	C17PRL	C4-5	SP	PLAT. ROTATE LEFT
BL/RD-3	C13DEL	C4-1	C8-1	DRIVE ENABLE LIGHT
BK/RD-3	C9HRN	C3-9	MH	HORN
OR-1	SPARE			
OR/BK-1	SPARE			

CONTROL RELAY I.D.

CR1 - SEC. 48V POWER
CR2 - PRI. 48V POWER
CR3 - AUX PUMP
CR4 - HORN
CR5 - BRAKE RELEASE
CR9 - PLAT. LVL. CUTOUT
CR10 - PLAT. LVL. CUTOUT
CR11 - ENGINE START
CR12 - ENGINE RUN
CR13 - RPM CUTOUT
CR14 - HI RPM
CR15 - GLOW PLUG
CR23 - DRIVE LIGHT (OPTION)

OPTION NUMBERS

1 - PLATFORM LEVEL CUTOUT
2 - FLASHING BEACON

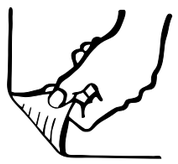


DRIVE LIGHT OPTION

ESZ34BEAJ

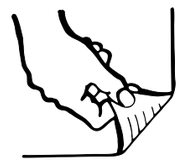
GBOX Terminal Strip Wiring Diagram (ANSI / CSA)

[from SN Z3414-9686]



PBOX Wiring Diagram (ANSI / CSA)

[from SN Z3414-9686]

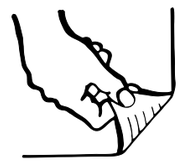


PBOX Wiring Diagram (ANSI / CSA)

[from SN Z3414-9686]

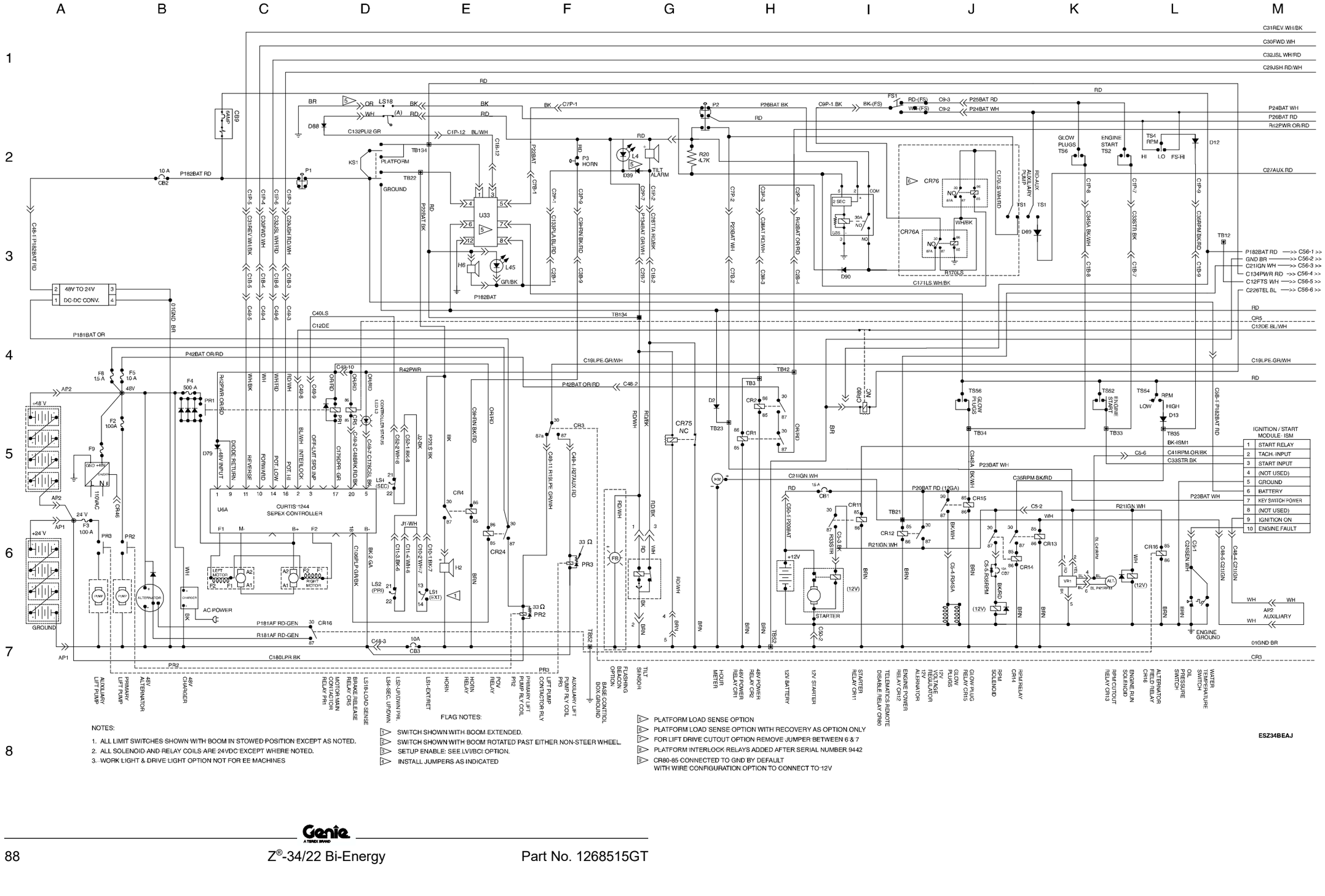
Electrical Schematic (CE / AS)

[from SN Z3414-9686 to Z34F-12065]



Electrical Schematic (CE / AS)

[from SN Z3414-9686 to Z34F-12065]



NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
2. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED.
3. WORK LIGHT & DRIVE LIGHT OPTION NOT FOR EE MACHINES

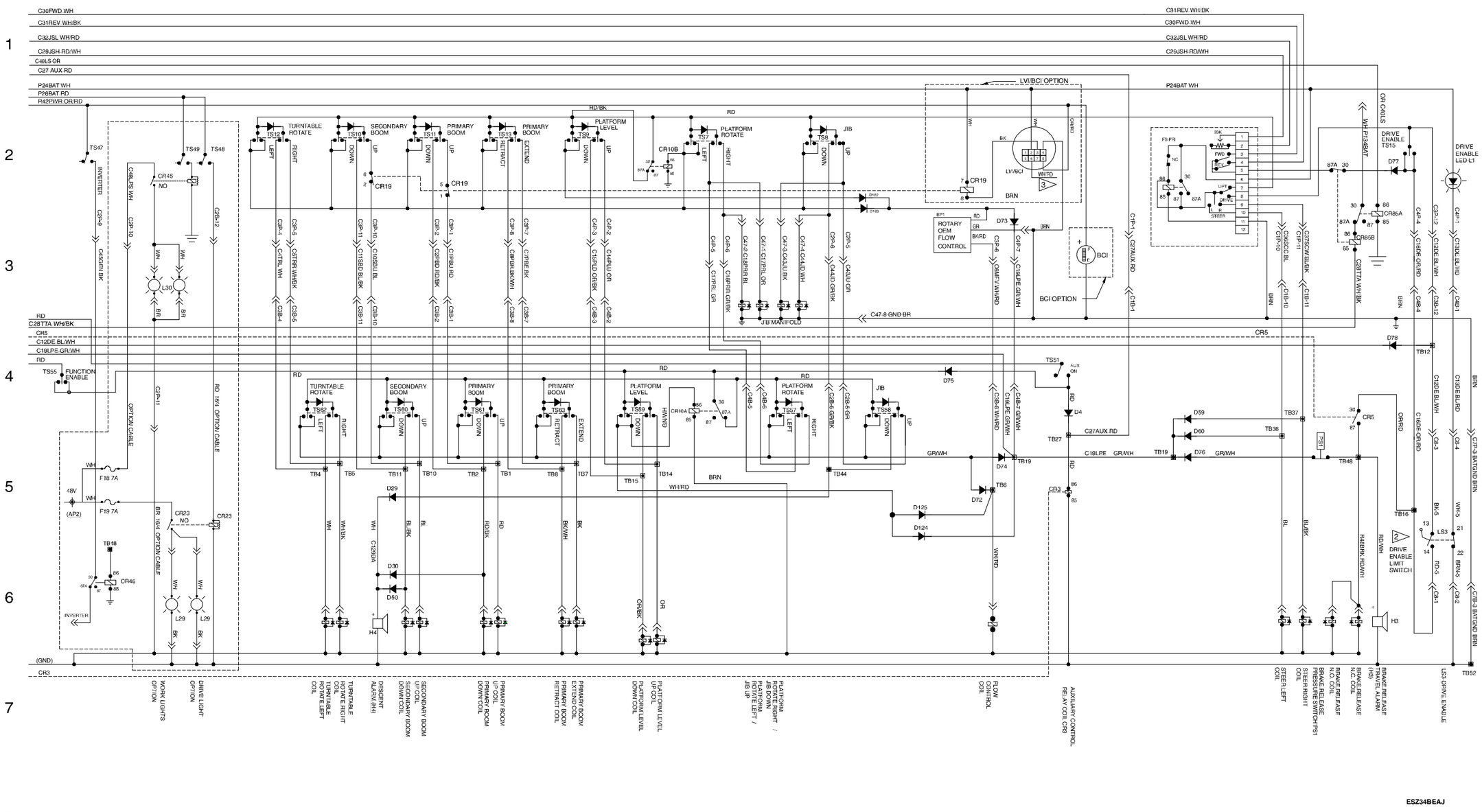
FLAG NOTES:

1. SWITCH SHOWN WITH BOOM EXTENDED.
2. SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
3. SETUP ENABLE: SEE LVI/BCI OPTION.
4. INSTALL JUMPERS AS INDICATED

1. PLATFORM LOAD SENSE OPTION
2. PLATFORM LOAD SENSE OPTION WITH RECOVERY AS OPTION ONLY
3. FOR LIFT DRIVE CUTOUT OPTION REMOVE JUMPER BETWEEN 6 & 7
4. PLATFORM INTERLOCK RELAYS ADDED AFTER SERIAL NUMBER 9442
5. CR80-85 CONNECTED TO GND BY DEFAULT WITH WIRE CONFIGURATION OPTION TO CONNECT TO 12V

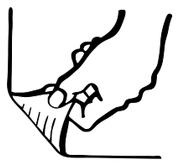
Electrical Schematic (CE / AS)

[from SN Z3414-9686 to Z34F-12065]



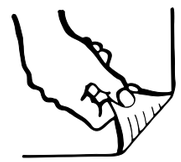
Electrical Schematic (CE / AS)

[from SN Z3414-9686 to Z34F-12065]



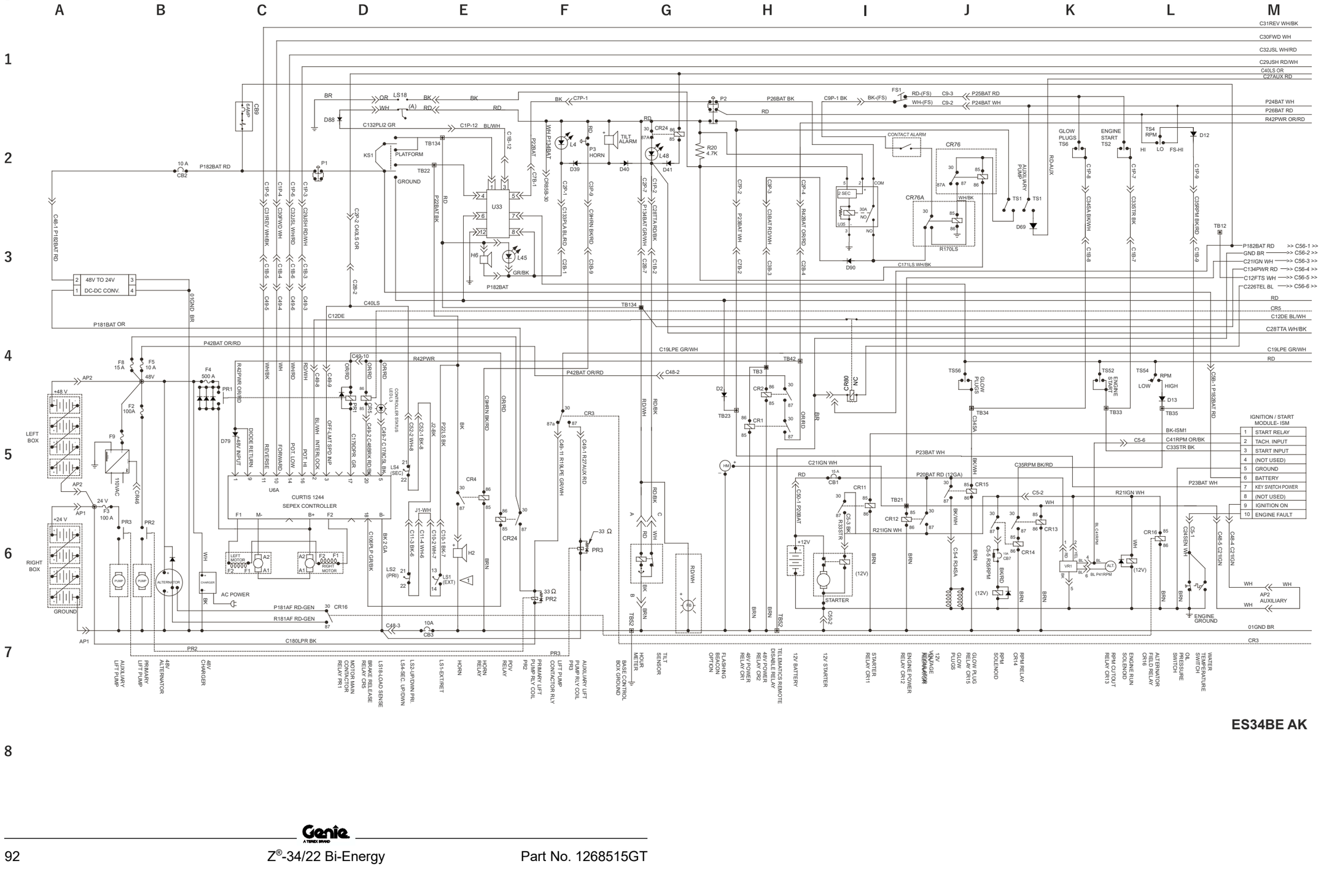
Electrical Schematic (CE / AS)

[from SN Z34F-12066]



Electrical Schematic (CE / AS)

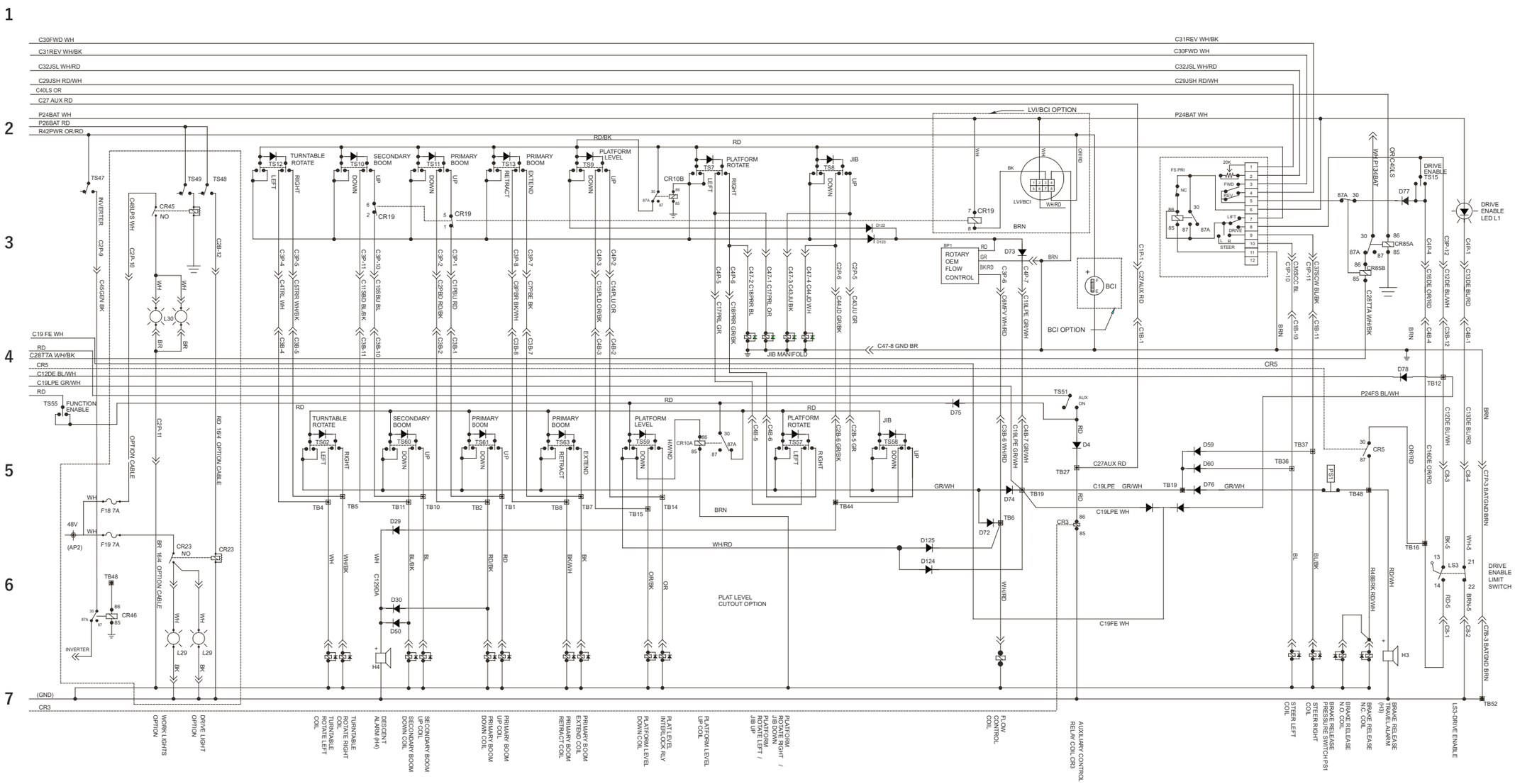
[from SN Z34F-12066]



ES34BE AK

Electrical Schematic (CE / AS)

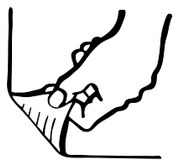
[from SN Z34F-12066]



ES34BE AL

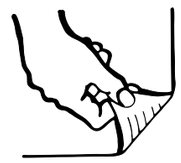
Electrical Schematic (CE / AS)

[from SN Z34F-12066]



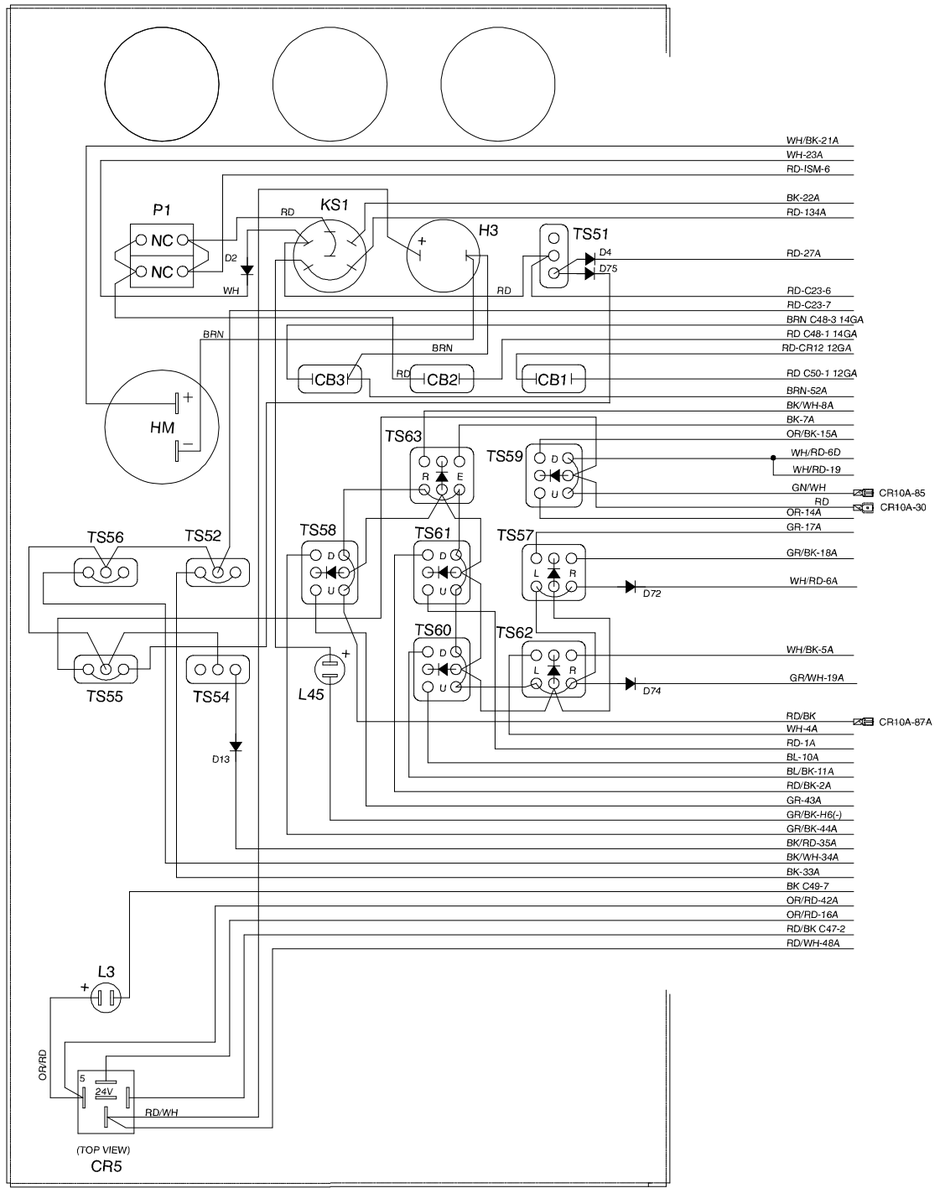
GBOX Switch Panel Wiring Diagram (CE / AS)

[from SN Z3414-9686]



GBOX Switch Panel Wiring Diagram (CE / AS)

[from SN Z3414-9686]

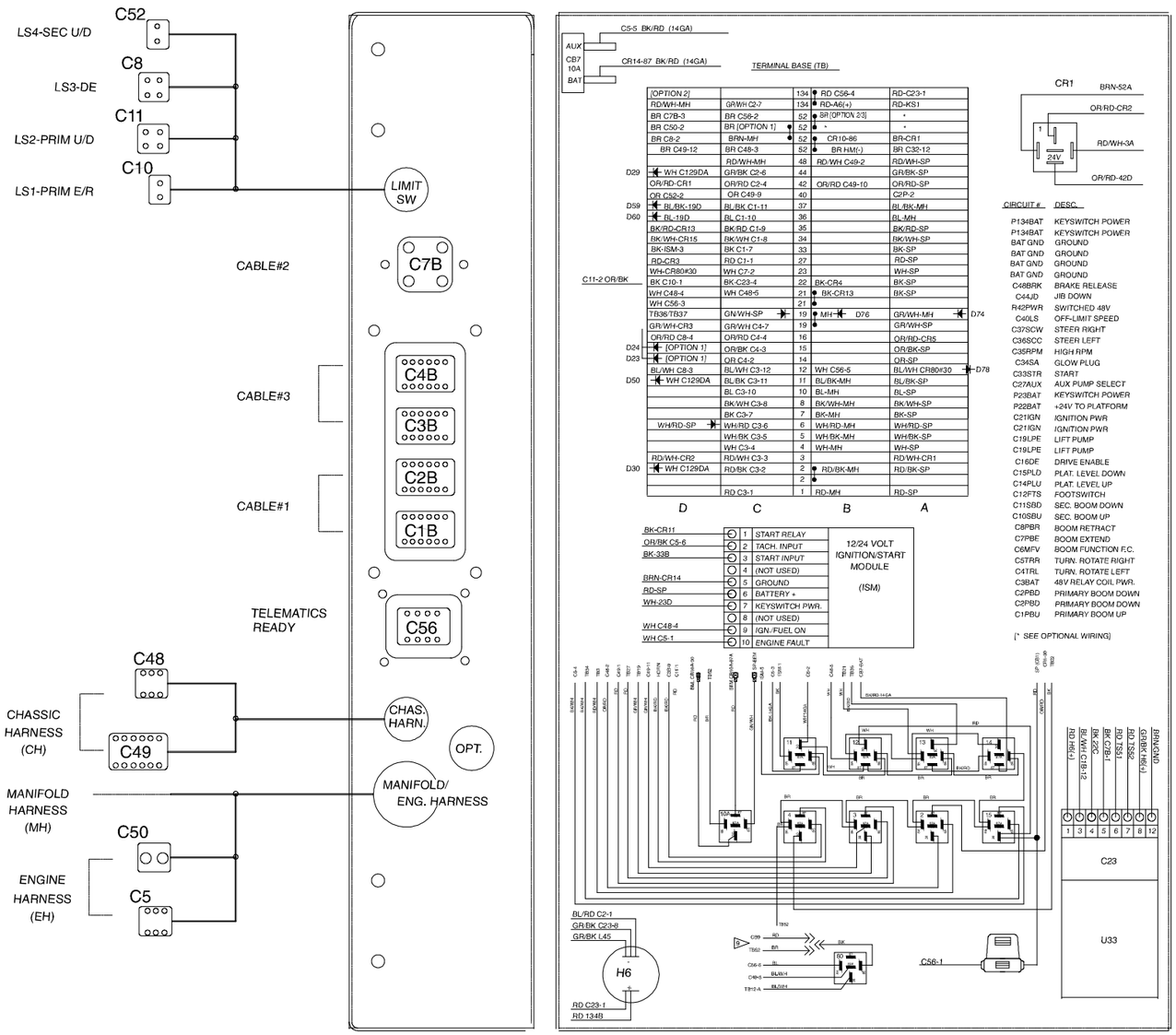


LABEL	DESCRIPTION
P1	EMERGENCY STOP BUTTON
KS1	KEY SWITCH
TS51	AUXILIARY SWITCH
TS52	ENGINE START SWITCH
TS54	ENGINE RPM SWITCH
TS55	FUNCTION ENABLE SWITCH
TS56	ENGINE GLOW PLUG SWITCH
TS57	PLATFORM ROTATE SWITCH
TS58	JIB UP/DOWN SWITCH
TS59	PLATFORM LEVEL SWITCH
TS60	SECONDARY BOOM UP/DOWN SWITCH
TS61	PRIMARY BOOM UP/DOWN SWITCH
TS62	TURNTABLE ROTATE SWITCH
TS63	BOOM EXTEND/RETRACT SWITCH
CB1	CIRCUIT BREAKER, ENGINE, 15A
CB2	CIRCUIT BREAKER, CONTROLS, 10A
CB3	CIRCUIT BREAKER, CONTROLS RTRN,10A
L3	CONTROLLER STATUS LED
HM	HOUR METER
EH	ENGINE HARNESS
MH	MANIFOLD HARNESS
CH	CHASSIS HARNESS
SP	SWITCH PANEL
CR_	CONTROL RELAY
ISM	IGNITION/START MODULE
H3	BRK. REL./TRAVEL ALARM (OPT.)
H6	PLATFORM OVERLOAD ALRM
L45	PLATFORM OVERLOAD LED
CR5	BRAKE RELEASE RELAY

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GBOX Terminal Strip Wiring Diagram (CE / AS)

[from SN Z3414-9686]



WIRES FROM CONNECTOR TO CONNECTOR

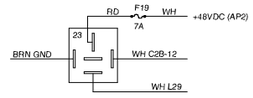
WIRES	CIRCUIT #	FROM	TO	DESC.
BL/RD	C133PLA	C2-1	H6(+)	PLAT LOAD INPUT
BL/WH	C132PLI	C1-12	C23-3	PLAT LOAD ALARM
BK	J2	C52-1	C11-3	LS2-LS4 JUNCTION
WH	J1	C10-2	C11-4	LS1-LS2 JUNCTION
GR-1	C43JU	C2-5	SP	JIB UP
WH/RD-1	C32JSL	C1-6	C49-6	JOYSTICK POT. LOW
WH/BK-1	C31REV	C1-5	C49-5	REVERSE
WH-1	C30FWD	C1-4	C49-4	FORWARD
RD/WH-1	C29JSH	C1-3	C49-3	2-WIRE POT.
RD/BK-1	C28TTA	C1-2	MH	TILT ALARM
GR/BK-3	C18PRR	C4-6	SP	PLAT. ROTATE RIGHT
GR-3	C17PRL	C4-5	SP	PLAT. ROTATE LEFT
BL/RD-3	C13DEL	C4-1	C8-1	DRIVE ENABLE LIGHT
BK/RD-3	C9HRN	C3-9	MH	HORN
OR-1	SPARE			
OR/BK-1	SPARE			

CONTROL RELAY I.D.

CR1 - SEC. 48V POWER
CR2 - PRI. 48V POWER
CR3 - AUX PUMP
CR4 - HORN
CR5 - BRAKE RELEASE
CR9 - PLAT. LVL. CUTOUT
CR10 - PLAT. LVL. CUTOUT
CR11 - ENGINE START
CR12 - ENGINE RUN
CR13 - RPM CUTOUT
CR14 - HI RPM
CR15 - GLOW PLUG
CR23 - DRIVE LIGHT (OPTION)

OPTION NUMBERS

1 - PLATFORM LEVEL CUTOUT
2 - FLASHING BEACON

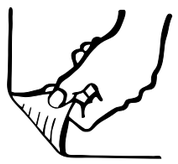


DRIVE LIGHT OPTION

ESZ34BEAJ

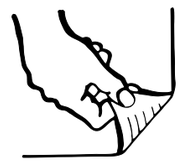
GBOX Terminal Strip Wiring Diagram (CE / AS)

[from SN Z3414-9686]



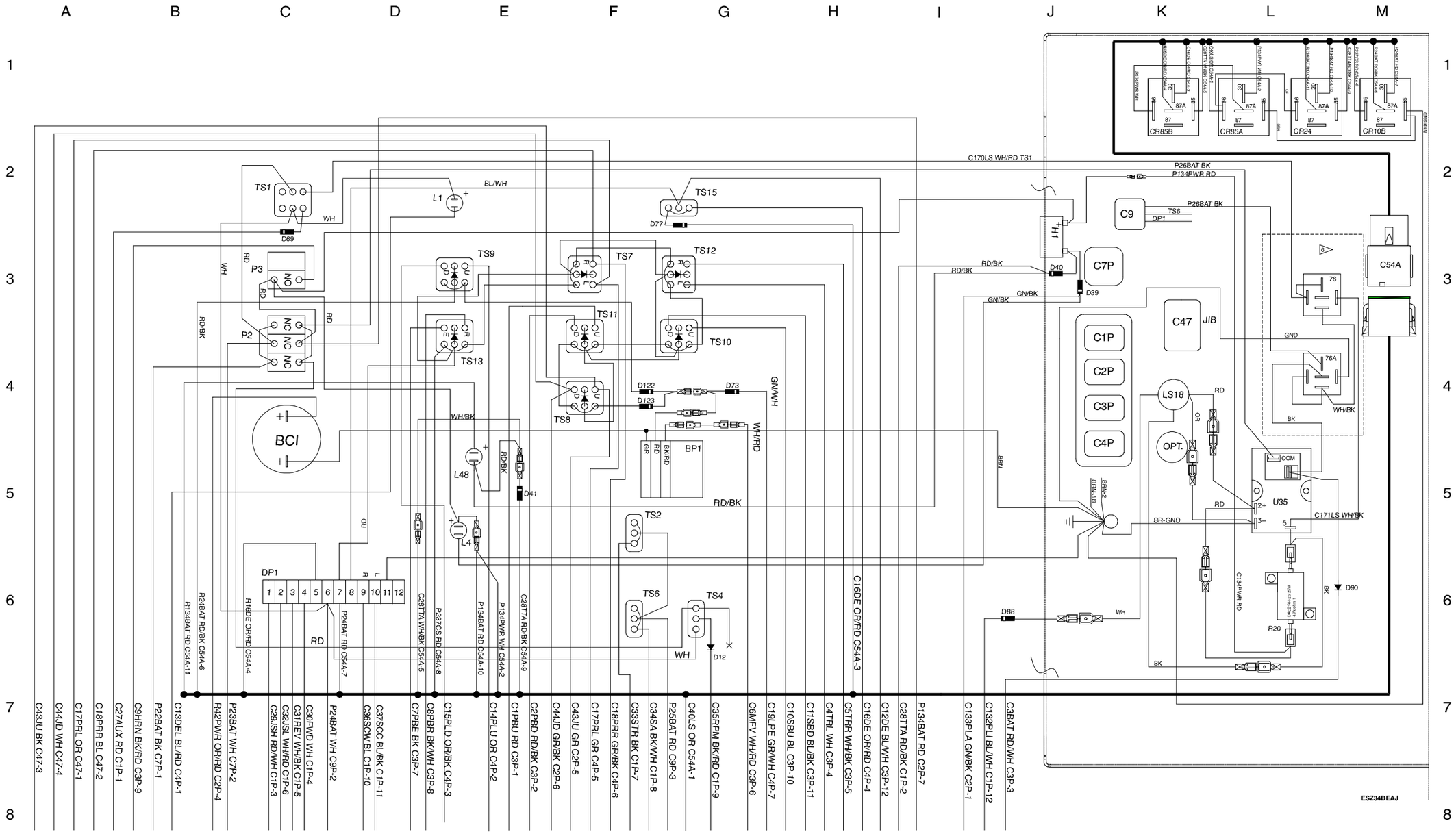
Platform Control Box Wiring Diagram (CE / AS)

[from SN Z3414-9686]

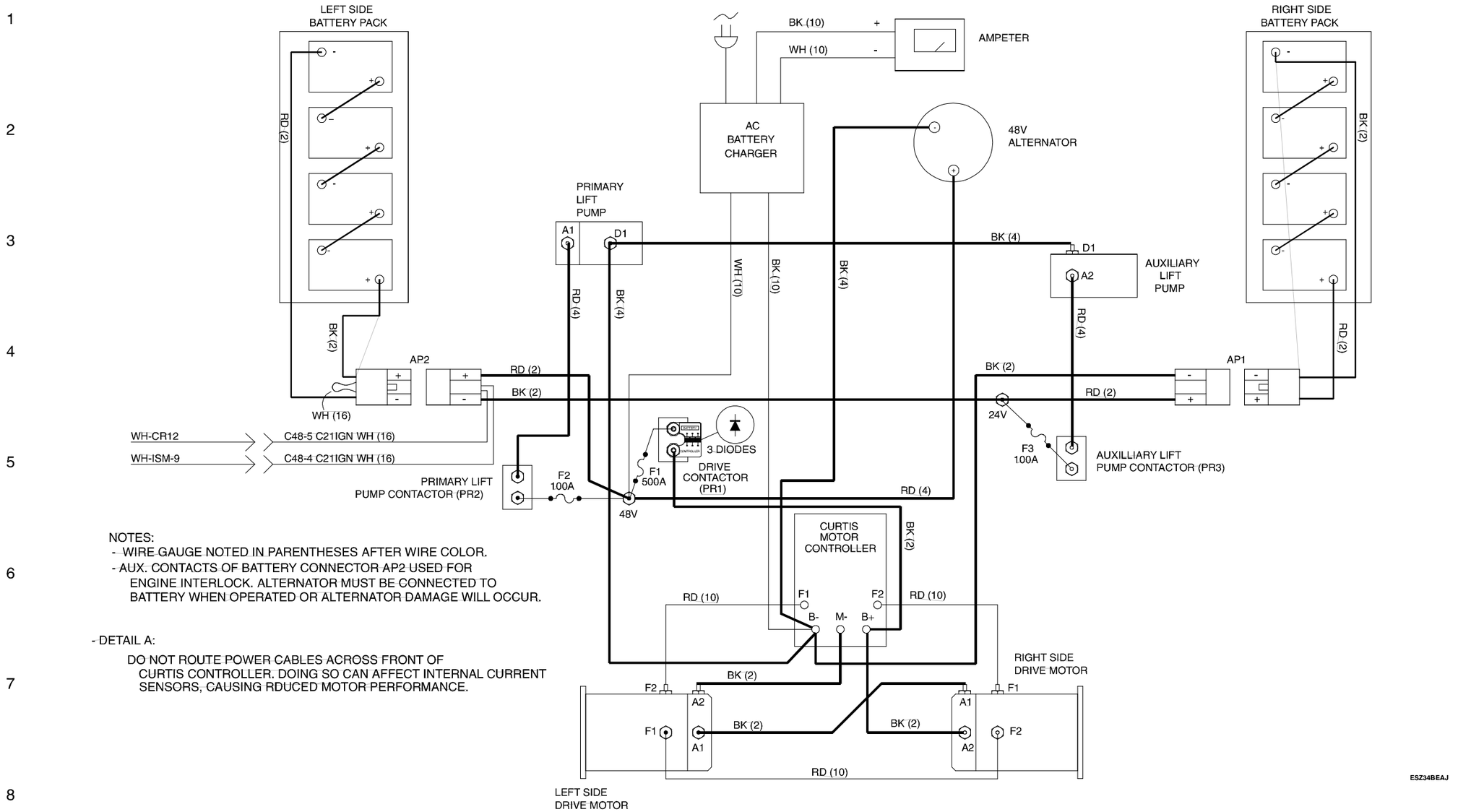


Platform Control Box Wiring Diagram (CE / AS)

[from SN Z3414-9686]



Power Cable Wiring Diagram
[from SN Z3414-9686]



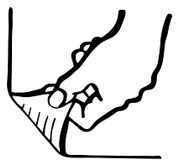
NOTES:
- WIRE GAUGE NOTED IN PARENTHESES AFTER WIRE COLOR.
- AUX. CONTACTS OF BATTERY CONNECTOR AP2 USED FOR ENGINE INTERLOCK. ALTERNATOR MUST BE CONNECTED TO BATTERY WHEN OPERATED OR ALTERNATOR DAMAGE WILL OCCUR.

- DETAIL A:

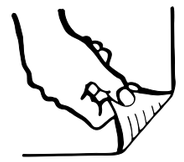
DO NOT ROUTE POWER CABLES ACROSS FRONT OF CURTIS CONTROLLER. DOING SO CAN AFFECT INTERNAL CURRENT SENSORS, CAUSING RDUCED MOTOR PERFORMANCE.

Power Cable Wiring Diagram

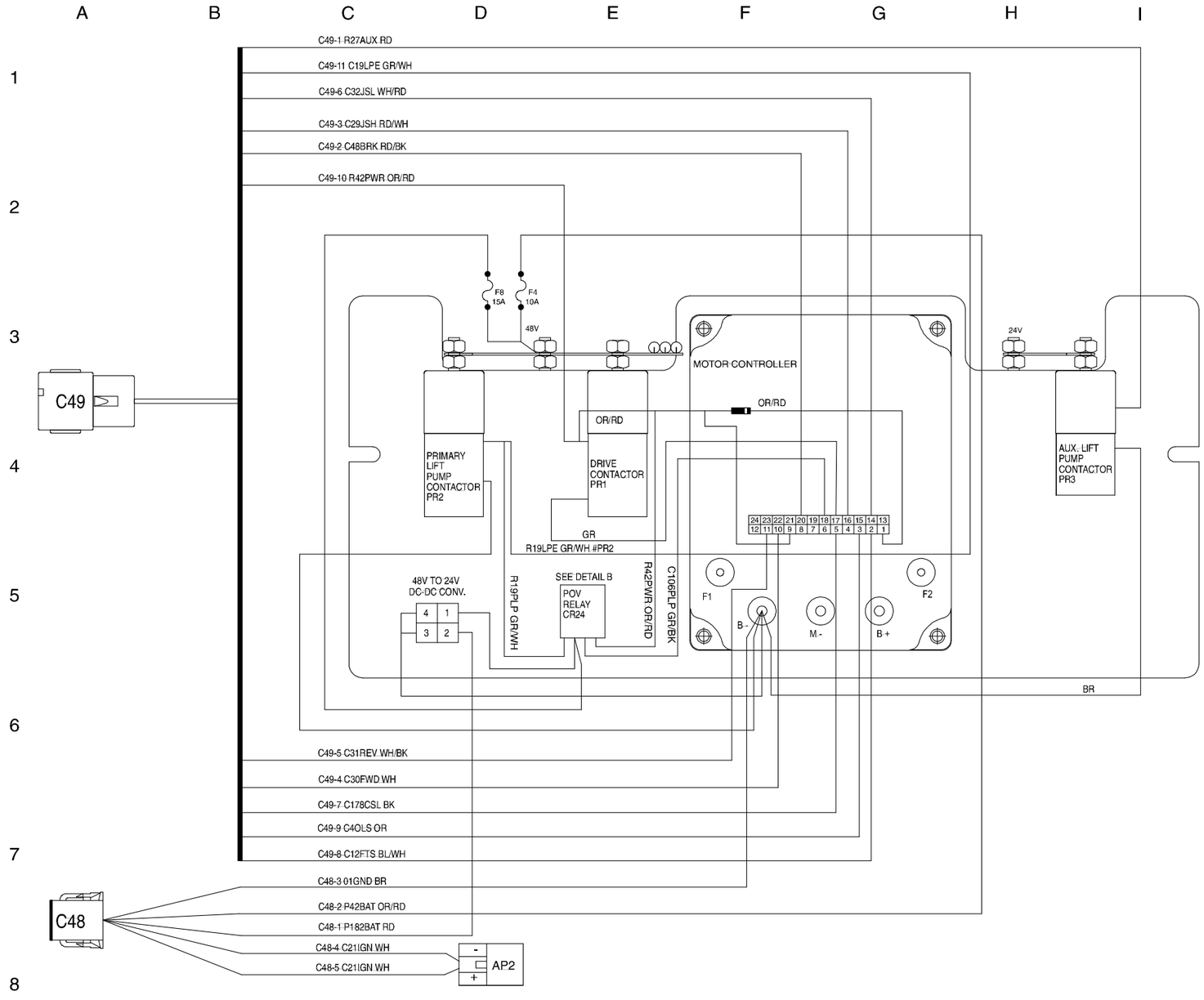
[from SN Z3414-9686]

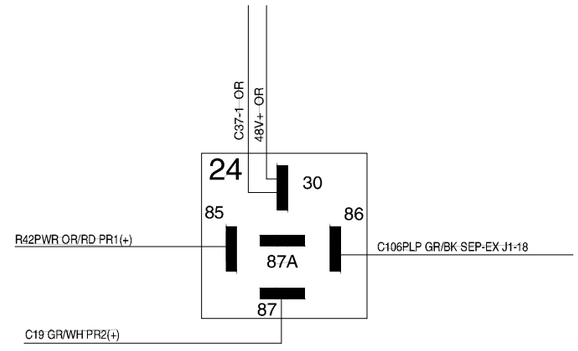


Drive Contactor Panel Wiring Diagram



Drive Contactor Panel Wiring Diagram



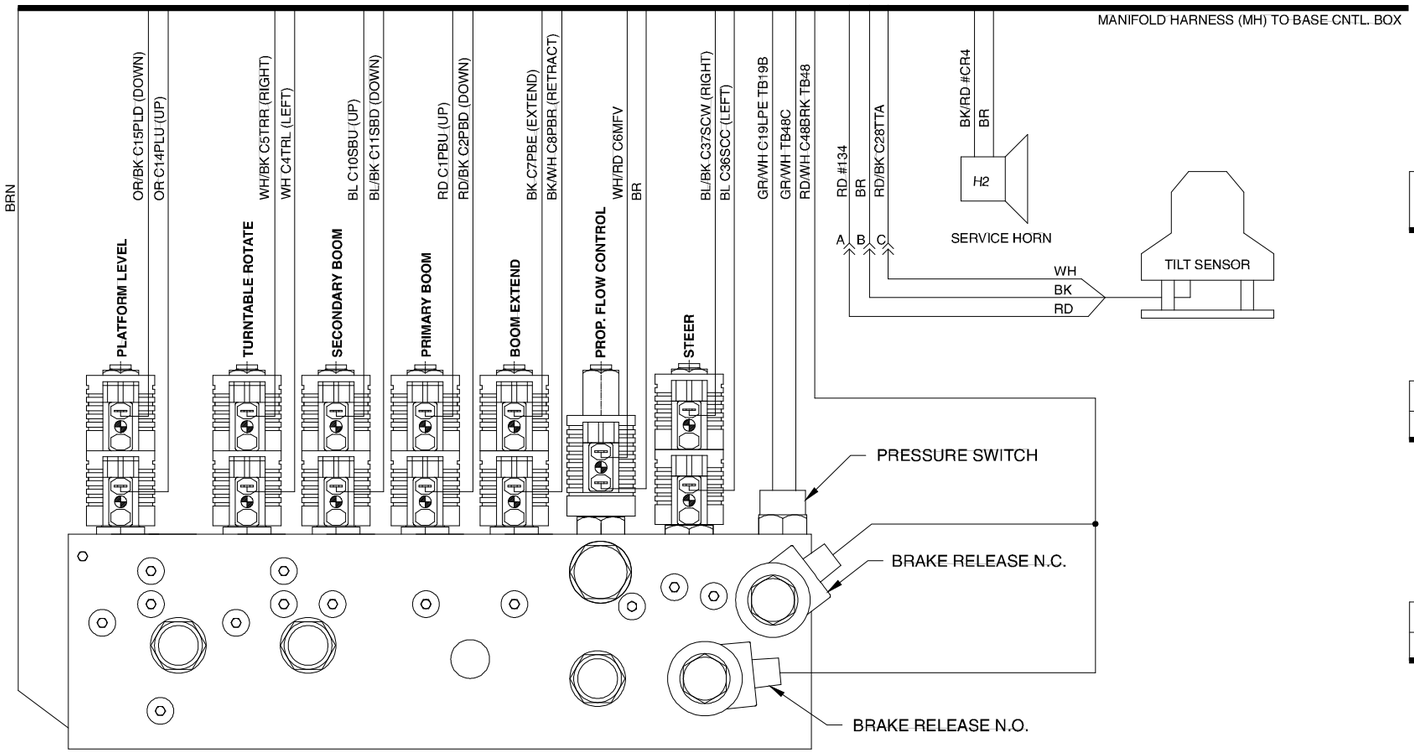


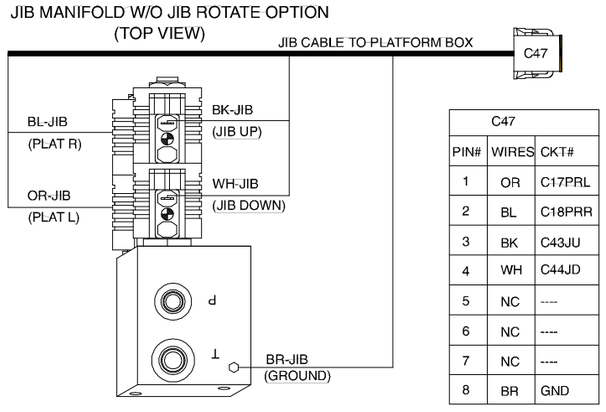
DETAIL B

PUMP ON VOLTAGE (POV)
RELAY SOCKET WIRING
(WIRE INSERTION SIDE SHOWN)

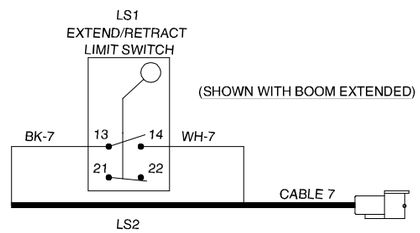
ESZ34BEAJ

Manifold and Limit Switch Wiring Diagram

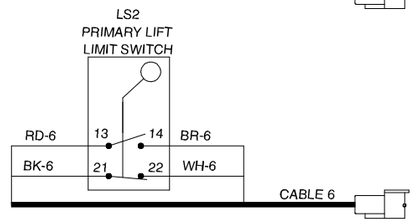




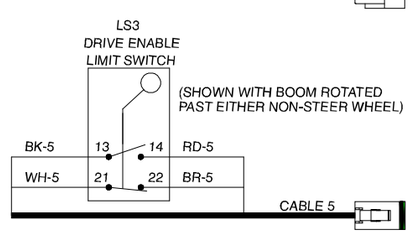
C47		
PIN#	WIRES	CKT#
1	OR	C17PRL
2	BL	C18PRR
3	BK	C43JU
4	WH	C44JD
5	NC	----
6	NC	----
7	NC	----
8	BR	GND



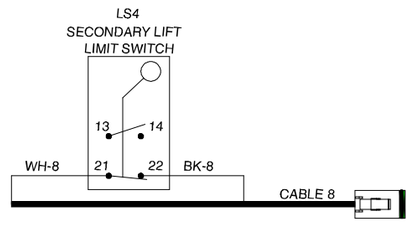
C10	
PIN#	WIRES
1	BK
2	WH



C11	
PIN#	WIRES
1	RD
2	BR
3	BK
4	WH



C8	
PIN#	WIRES
1	RD
2	BR
3	BK
4	WH

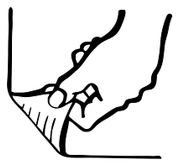


C52	
PIN#	WIRES
1	BK
2	WH

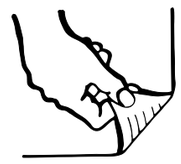
NOTE:
ALL LIMIT SWITCHES SHOWN WITH PLUNGER IN EXTENDED (RELAXED) POSITION. BOOM IS STOWED EXCEPT AS NOTED.

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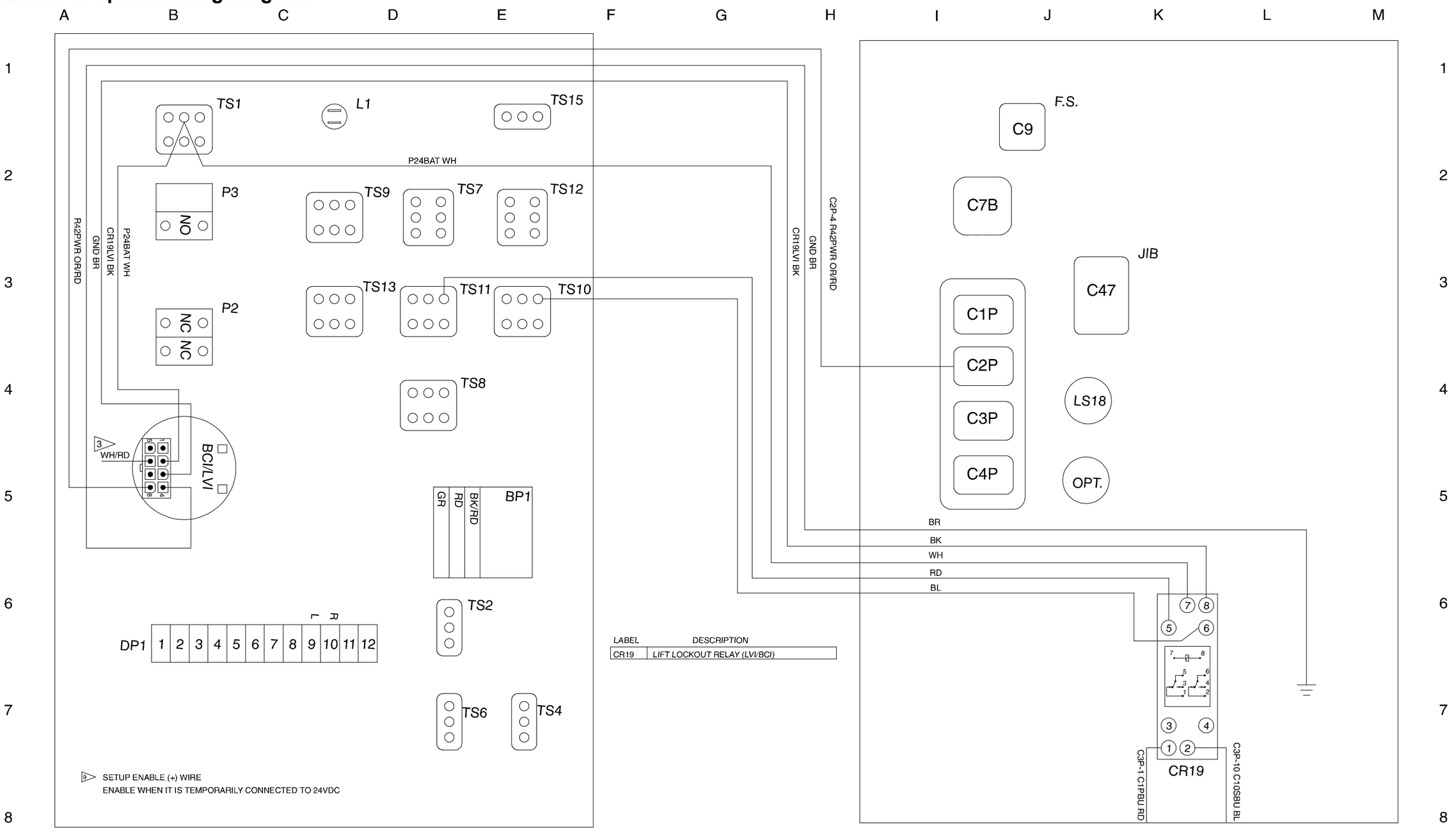
Manifold and Limit Switch Wiring Diagram



LVI / BCI Option Wiring Diagram

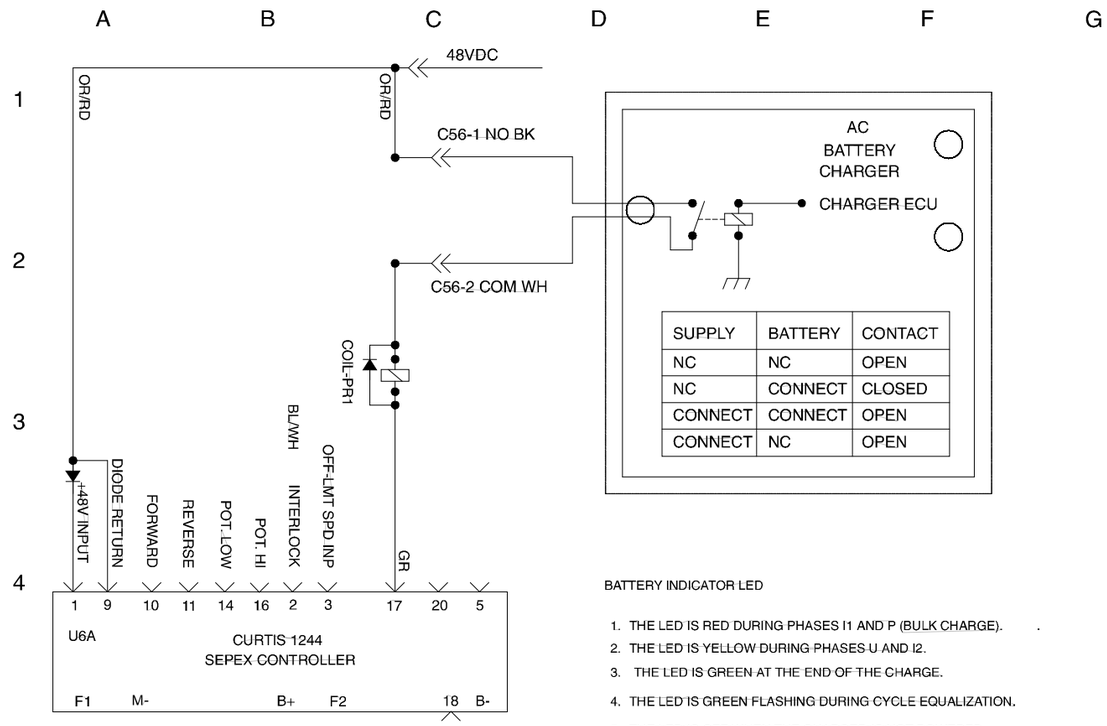


LVI / BCI Option Wiring Diagram



LABEL	DESCRIPTION
CR19	LIFT LOCKOUT RELAY (LVI/BCI)

Charger Interlock Option



SCHEMATIC

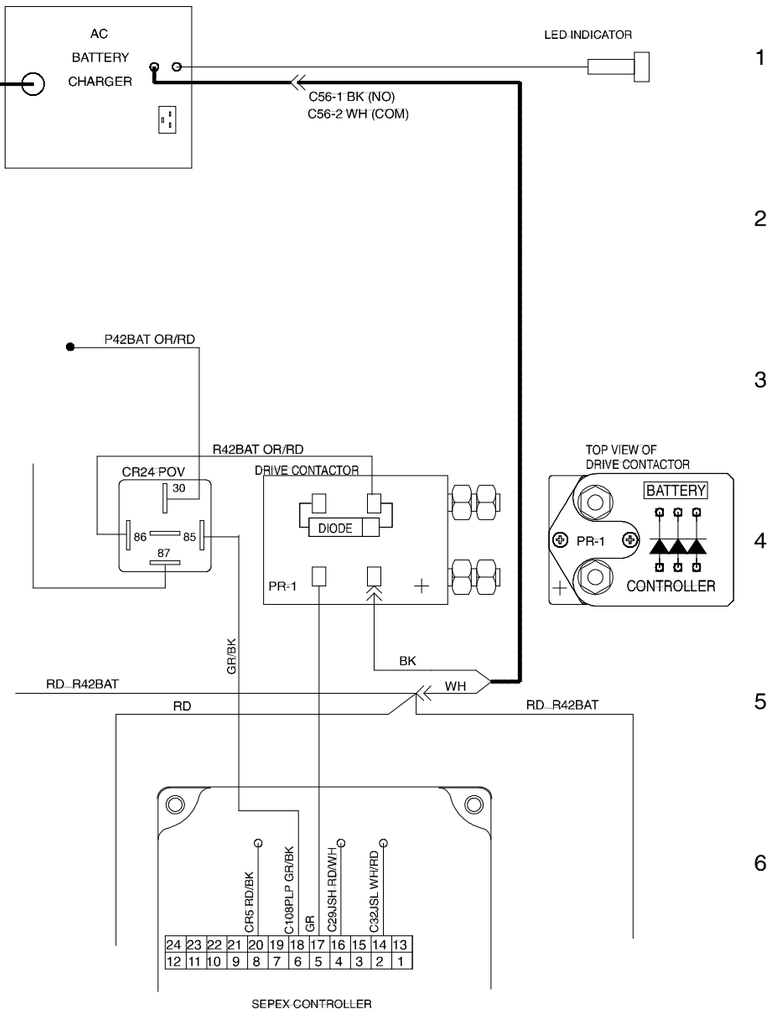
BATTERY INDICATOR LED

1. THE LED IS RED DURING PHASES I1 AND P (BULK CHARGE).
2. THE LED IS YELLOW DURING PHASES U AND I2.
3. THE LED IS GREEN AT THE END OF THE CHARGE.
4. THE LED IS GREEN FLASHING DURING CYCLE EQUALIZATION.
5. THE LED IS OFF WHEN THE CHARGER IS NOT POWERED.
6. DEFECT INDICATION: THE RED LED FLASHES.

RED (20 BATTERY CHARGED)
YELLOW (80 BATTERY CHARGED)
GREEN (100 CHARGED)

INTERLOCK RELAY 10A CONTACT

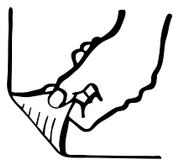
1. CHARGER IS NOT CONNECTED TO BATTERY OR MAIN SUPPLY, CONTACT OPEN.
2. CHARGER IS CONNECTED TO BATTERY, CONTACT CLOSE.
3. CHARGER IS CONNECTED TO BATTERY AND MAIN SUPPLY, CONTACT OPEN.



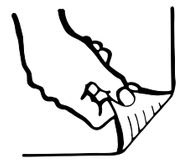
WIRING DIAGRAM

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Charger Interlock Option

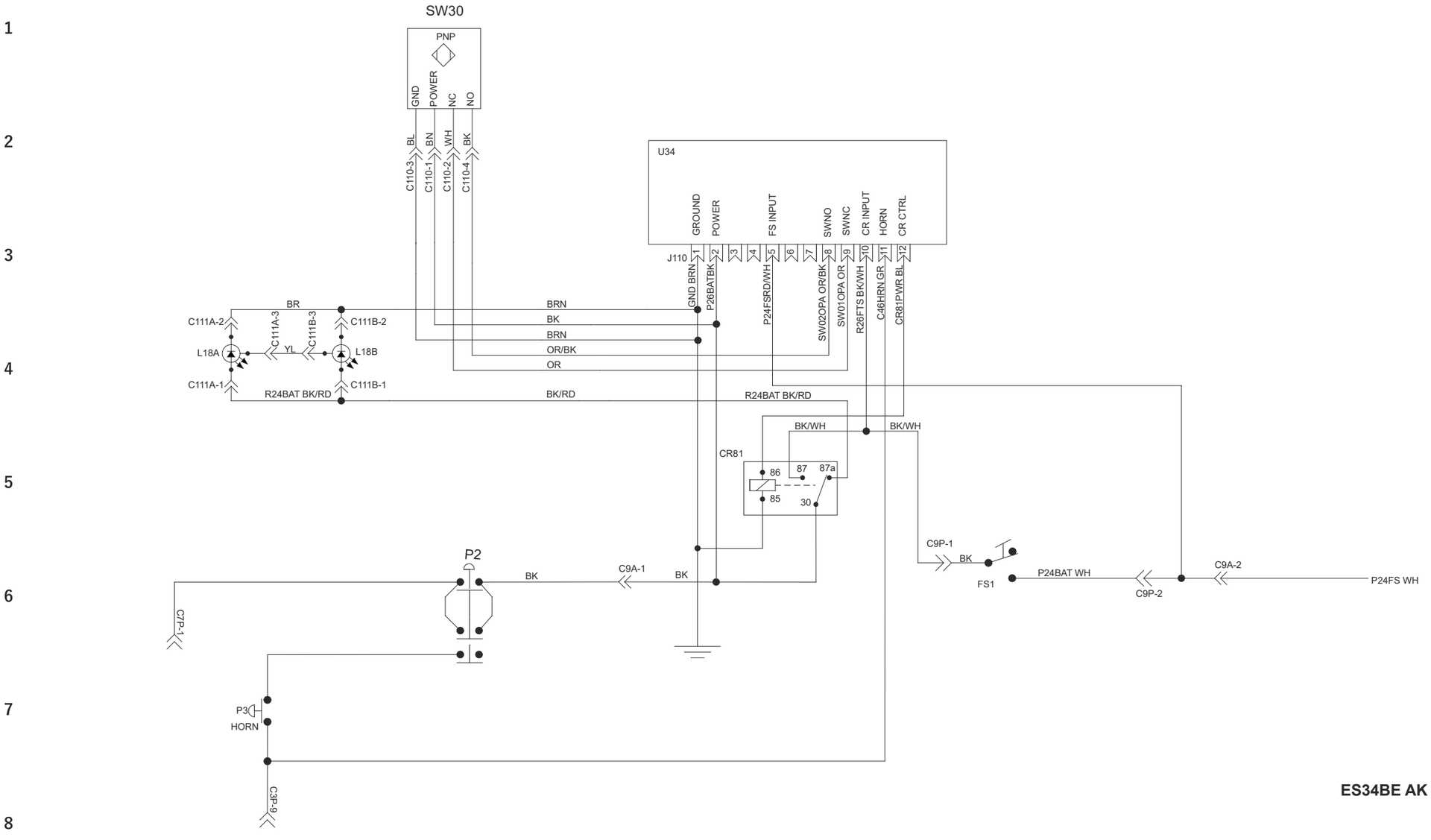


Engine Wiring Diagram



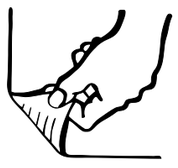
Engine Wiring Diagram

Contact Alarm, Option
[from SN Z34F-12066]

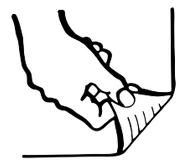


ES34BE AK

Contact Alarm, Option
[from SN Z34F-12066]

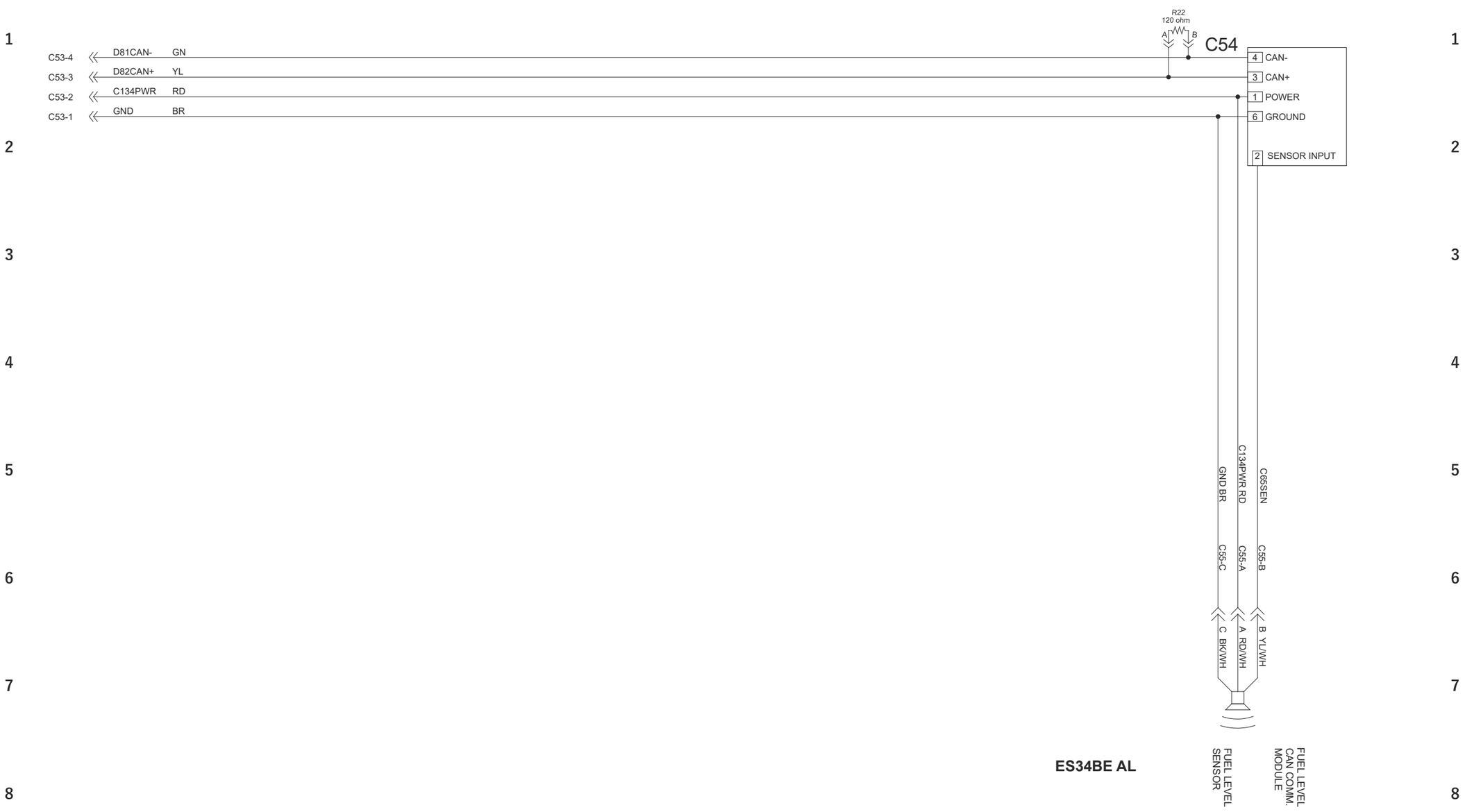


Fuel Level Sensor, Option
[from SN Z34F-12066]

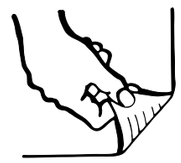


Fuel Level Sensor, Option

[from SN Z34F-12066]



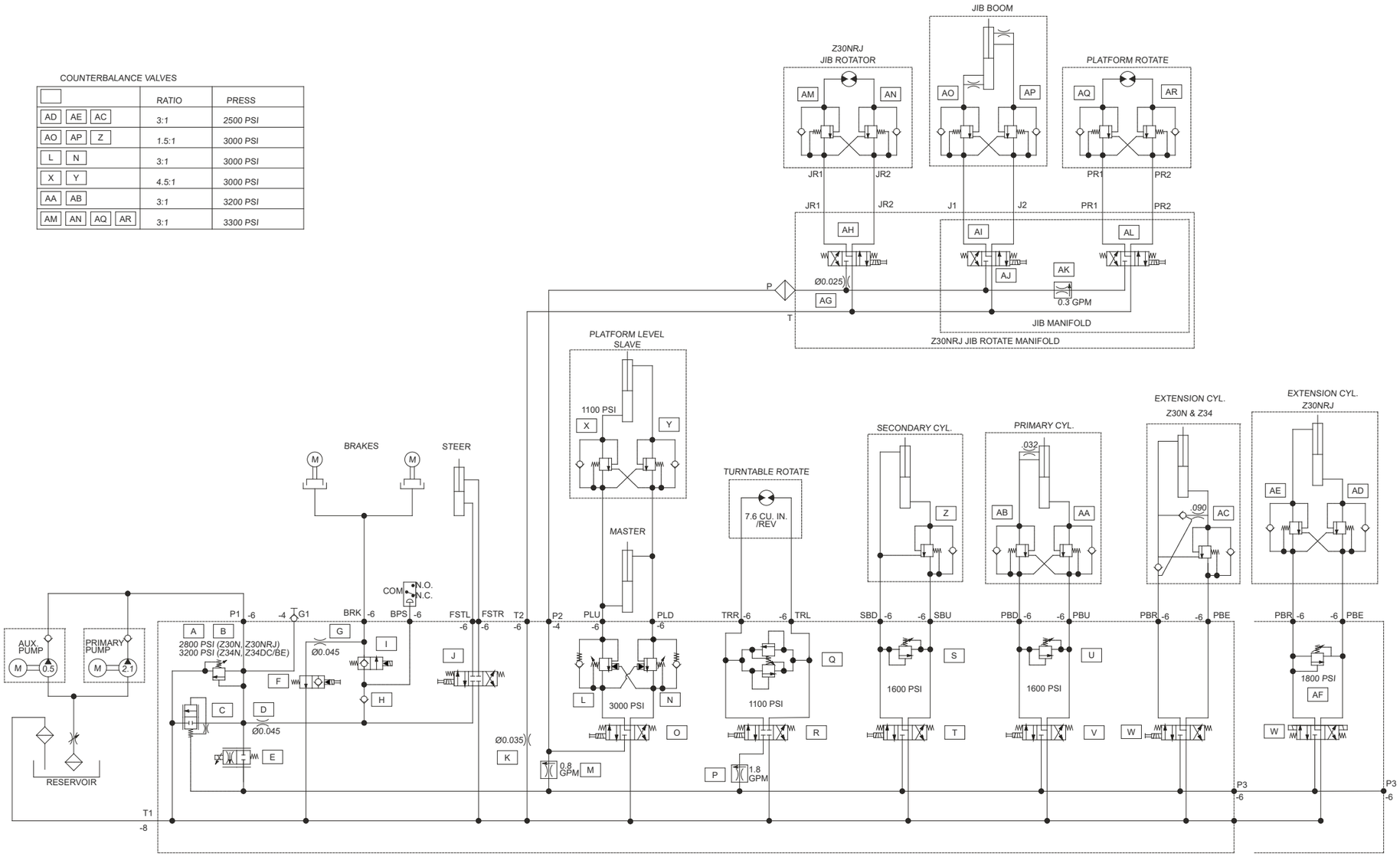
Hydraulic Schematic



Hydraulic Schematic

COUNTERBALANCE VALVES

	RATIO	PRESS
AD AE AC	3:1	2500 PSI
AO AP Z	1.5:1	3000 PSI
L N	3:1	3000 PSI
X Y	4.5:1	3000 PSI
AA AB	3:1	3200 PSI
AM AN AQ AR	3:1	3300 PSI



HS0079 F

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.

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

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