



Service and Repair Manual

Serial Number Range

Z[®]-30/20N

from Z30NF-22000
from Z30ND-1400

Z[®]-30/20N RJ

Z[®]-34/22

from Z34F-14000
from Z34NF-17000
from Z34ND-1900

Z[®]-34/22N

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. 1312293GT

Rev A1

December 2022

Introduction

Important

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

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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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1312293GT Rev A, September 2021

Second Edition, First Printing

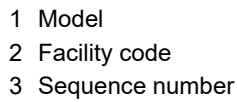
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Revision History

[illegible]

Serial Number Legend



- 1 Serial number (stamped on chassis)
- 2 Serial label (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.



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



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



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



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, Z-30/20N, Z-30/20N RJ and Z-34/22N

Tire size (solid rubber)	22 x 7 x 17.5 in 56 x 18 x 44 cm
Load range	7600 lbs 3447 kg
Overall tire diameter	22 in 56 cm
Wheel diameter	17.5 in 44 cm
Wheel width	7 in 18 cm

Tires and wheels, Z-34/22

Tire size	9-14.5 LT
Tire ply rating	12
Tire weight, new foam-filled (minimum)	175 lbs 79 kg
Overall tire diameter	28 in 71 cm
Wheel diameter	14.5 in 37 cm
Wheel width	7 in 18 cm

Wheel lugs

Front	8 @ 5/8 -18
Rear	9 @ 5/8 -18
Lug nut torque, dry	125 ft-lbs 169.5 Nm
Lug nut torque, lubricated	95 ft-lbs 129 Nm

Fuel capacities

Hydraulic tank	4 gallons 15.1 liters
Hydraulic system (including tank)	6 gallons 22.7 liters

Drive hubs

48:1	24.5 fl oz/725 cc
57:1	24.5 fl oz/725 cc
Drive hub oil type: SAE 90 multipurpose hypoid gear oil API service classification GL5	

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

Specifications

Machine Component Weights Z-30/20N and Z-30/20N RJ

Drive motor	45 lbs 20 kg
Torque hub	89 lbs 40 kg
Primary boom assembly (including extension boom)	541 lbs 226 kg
Primary boom lift cylinder	59 lbs 27 kg
Primary boom extend cylinder	66 lbs 30 kg
Secondary boom linkage	1200 lbs 544 kg
Secondary boom lift cylinder	48 lbs 22 kg
Jib boom assembly	63lbs 29kg
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

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 Z-30/20N and Z-30/20N RJ

Drive speed, maximum

Stowed position	3.0 mph 4.8 km/h 40 ft / 9.0 sec 12.2 m / 9.0 sec
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Boom raised or extended	0.6 mph 1 km/h 40 ft / 40 sec 12.2 m / 40 sec
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Braking distance, maximum

High range on paved surface	2 to 4 ft 0.6 to 1.2m
-----------------------------	--------------------------

Gradeability	See Operator's Manual
---------------------	--------------------------

Boom function speeds, maximum from platform controls (with rated load secured to platform)

Jib boom up	19 to 23 seconds
Jib boom down	17 to 21 seconds
Jib boom rotate, 180°	13 to 17 seconds
Primary boom up	14 to 22 seconds
Primary boom down	12 to 20 seconds
Primary boom extend	15 to 19 seconds
Primary boom retract	10 to 14 seconds
Secondary boom up	11 to 18 seconds
Secondary boom down	7 to 15 seconds
Turntable rotate, 355°	62 to 68 seconds
Platform rotate, 180°	5 to 11 seconds
Platform level up	14 to 19 seconds
Platform level down	13 to 18 seconds

Performance Specifications Z-34/22 and Z-34/22N

Drive speed, maximum

Stowed position	4.0 mph 6.4 km/h 40 ft / 6.8 sec 12.2 m / 6.8 sec
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Boom raised or extended	0.6 mph 1 km/h 40 ft / 40 sec 12.2 m / 40 sec
-------------------------	--

Braking distance, maximum

High range on paved surface	2 to 4 ft 0.6 to 1.2m
-----------------------------	--------------------------

Gradeability	See Operator's Manual
---------------------	--------------------------

Boom function speeds, maximum from platform controls (with rated load secured to platform)

Jib boom up	20 to 24 seconds
Jib boom down	18 to 22 seconds
Primary boom up	16 to 22 seconds
Primary boom down	13 to 20 seconds
Primary boom extend	11 to 15 seconds
Primary boom retract	13 to 17 seconds
Secondary boom up	15 to 22 seconds
Secondary boom down	11 to 18 seconds
Turntable rotate, 355°	62 to 68 seconds
Platform rotate, 180°	5 to 11 seconds
Platform level up	14 to 19 seconds
Platform level down	13 to 18 seconds

Specifications

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
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Water content, maximum	250 ppm
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Recommended Hydraulic Fluid

Hydraulic oil type	Chevron Rando HD Premium
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Viscosity grade	32
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Viscosity index	200
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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
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Biodegradable	Petro Canada Environ MV 46
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Fire resistant	UCON Hydrolube HP-5046
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Note: Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult Genie Product Support before use.

NOTICE

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

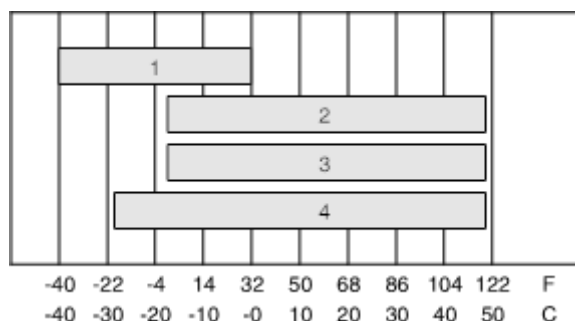
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond its maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

NOTICE

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

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

Hydraulic Fluid Temperature Range



Ambient air temperature

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

Specifications

Chevron Rando HD Premium Oil MV Fluid Properties

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

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

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

Chevron 5606A Hydraulic Oil Fluid Properties

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

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

NOTICE

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

Specifications

Petro-Canada Environ MV 46 Fluid Properties

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

Shell Tellus S4 VX Fluid Properties

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

UCON Hydrolube HP-5046 Fluid Properties

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

Specifications

Hydraulic Component Specifications

Function Pump

Type	Fixed displacement gear pump
Displacement per revolution	0.183 cu in 3 cc
Flow rate @2800 psi / 172 bar	2.1 gpm 7.9 L/min
Hydraulic tank return filter	10 micron with 25 psi / 1.7 bar bypass

Function manifold

System relief valve pressure, maximum, Z-30/20N and Z-30/20N RJ	2800 psi 193 bar
System relief valve pressure, maximum, Z-34/22 and Z-34/22N	3200 psi 221 bar
Primary boom down relief valve pressure	1600 psi 110 bar
Secondary boom down relief pressure	1600 psi 110 bar
Primary boom extend relief pressure Models with rotating jib	1800 psi 124 bar
Turntable rotate relief pressure	1100 psi 76 bar

Auxiliary Pump

Type	Fixed displacement gear pump
Displacement per revolution	0.3 gpm 1.14 L/min

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

Valve Coil Resistance

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

Valve Coil Resistance Specification

Description	Specification
Solenoid valve, 3 position 4 way, 20V DC (schematic items A, J, K, U, V, Y, AA, AB and CC)	22 Ω
Proportional solenoid valve, 24V DC (schematic item H)	19.5 Ω
Solenoid valve, N.C. poppet, 20V DC (schematic item M)	23.5 Ω
Solenoid valve, N.O. poppet, 20V DC (schematic item P)	23.5 Ω

Specifications

Machine Torque Specifications

Note: All torque values are shown lubricated unless otherwise noted.

Platform rotator and jib boom rotator (Z-30/20N RJ)

1-8 center bolt, GR 5 (Jib boom rotator)	480 ft-lbs 650 Nm
3/4 -10 bolt, GR 8 (Platform rotator)	280 ft-lbs 379 Nm
3/8 -16 bolts, GR 8 (Platform rotator)	35 ft-lbs 47 Nm
1/2 -13 bolts, GR 5 (Jib boom rotator)	85 ft-lbs 115 Nm

Platform Rotator (Z-30/20N, Z-34/22 and Z-34/22N)

3/4 -10 bolt, GR 8	280 ft-lbs 379 Nm
3/8 -16 bolts, GR 8	35 ft-lbs 47 Nm

Turntable Rotate Bearing

Rotate bearing mounting bolts	160 ft-lbs 217 Nm
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Drive hubs, brakes and motors

Drive hub mounting bolts	180 ft-lbs 244 Nm
Brake mounting bolts	93 ft-lbs 126 Nm
Drive motor mounting bolts	31 ft-lbs 42 Nm

Specifications

Hydraulic Hose and Fitting Torque Specifications

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

Seal-Lok™ Fittings

(hose end - ORFS)

SAE Dash Size	Torque
-4	18 ft-lbs / 25 Nm
-6	30 ft-lbs / 41 Nm
-8	40 ft-lbs / 55 Nm
-10	60 ft-lbs / 81 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	150 ft-lbs / 205 Nm
-24	230 ft-lbs / 315 Nm

JIC 37° Fittings

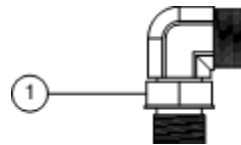
(swivel nut or hose connection)

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

SAE O-ring Boss Port

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

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



Adjustable Fitting

1 jam nut



Non-adjustable fitting

SAE O-ring Boss Port

(tube fitting - installed into Steel)

SAE Dash Size	Torque
-4 ORFS / 37° (Adj)	15 ft-lbs / 20,3 Nm
ORFS (Non-adj)	26 ft-lbs / 35,3 Nm
37° (Non-adj)	22 ft-lbs / 30 Nm
-6 ORFS (Adj / Non-adj)	35 ft-lbs / 47,5 Nm
37° (Adj / Non-adj)	29 ft-lbs / 39,3 Nm
-8 ORFS (Adj / Non-adj)	60 ft-lbs / 81,3 Nm
37° (Adj / Non-adj)	52 ft-lbs / 70,5 Nm
-10 ORFS (Adj / Non-adj)	100 ft-lbs / 135,6 Nm
37° (Adj / Non-adj)	85 ft-lbs / 115,3 Nm
-12 (All types)	135 ft-lbs / 183 Nm
-16 (All types)	200 ft-lbs / 271,2 Nm
-20 (All types)	250 ft-lbs / 339 Nm
-24 (All types)	305 ft-lbs / 413,5 Nm

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.

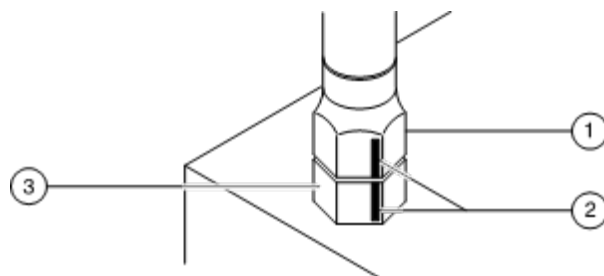


Illustration 1

- 1 hex nut
- 2 reference mark
- 3 body hex fitting

Specifications

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

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

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

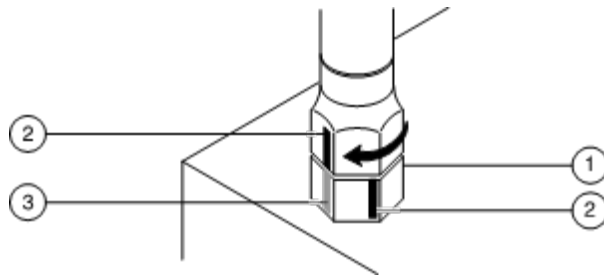


Illustration 2

- 1 body hex fitting
 - 2 reference mark
 - 3 second mark
- 4 Tighten the hex nut until the mark on the hex nut is aligned with the second mark on the body hex fitting.
 - 5 Operate all machine functions and inspect the hose, fittings and related components to confirm there are no leaks.

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.



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



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



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



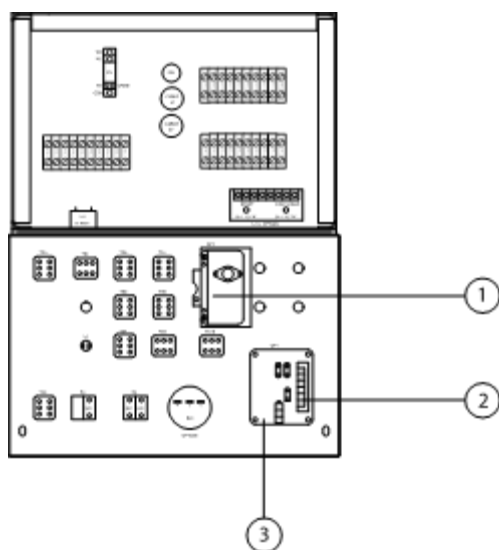
Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

- ⦿ 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

The drive joystick is connected to the drive motor controller, located under the drive chassis cover at the non-steer end of the machine. Maintaining the boom function speed controller at the proper settings is essential to safe machine operation. The boom function speed controller should operate smoothly and provide proportional speed control through its entire range of motion. For further information or assistance, contact the Genie Product Support.



- 1 boom function speed controller
- 2 drive and brake printed circuit board
- 3 drive joystick

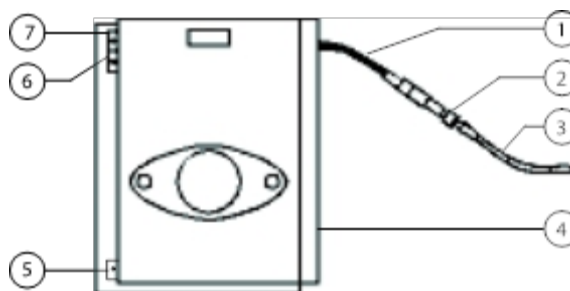
Boom Function Speed Controller Adjustments

⚠ 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 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

Platform Controls

- 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 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 Tag and disconnect the hydraulic hoses to the slave cylinder at the union and connect them together with a connector. Cap the fittings on the cylinder 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.

- 4 Remove the external snap rings from the rod-end pivot pin. Do not remove the pin.
- 5 Remove the external snap rings from the barrel-end pivot pin.
- 6 Place a block of wood under the barrel of the slave cylinder for support.
- 7 Use a soft metal drift to remove the rod-end pivot pin.

WARNING

Crushing hazard. The platform could fall if not properly supported.

- 8 Use a soft metal drift to remove the barrel-end pivot pin.
- 9 Carefully pull the cylinder with hydraulic hoses out of the boom.

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.

Platform Components

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. 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 Support the jib boom, jib boom cylinder and leveling links with an overhead crane.
- 8 Use a soft metal drift to drive both pins out, then remove the platform rotator from the machine.

⚠ WARNING

Crushing hazard. The platform rotator could fall when removed from the machine if not properly supported.

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

How to Bleed the Platform Rotator

Note: Two people will be required to perform this procedure.

- 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.

Platform Components

- 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 oil that may have spilled. Properly discard the used oil.
- 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 Turn the key switch to platform control.
- 2 Determine the maximum platform capacity. Refer to the machine serial plate.
- 3 Remove all weight, tools and accessories from the platform.

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

- 4 Using a suitable lifting device, place a test weight equal to the maximum platform capacity at the center of the platform floor.

Platform Components

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

⦿ Result: The overload indicator lights are off and the alarm does not sound. Proceed to step 6.

✗ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Slowly tighten the load spring adjustment nut in a clockwise direction in 10° increments until the overload indicator light turns off, and the alarm does not sound. Proceed to step 8.

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

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

- 6 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⦿ Result: The overload indicator lights are off at the platform and ground controls, and the alarm does not sound. Slowly loosen the load spring adjustment nut in a counterclockwise direction in 10° increments until the overload indicator light flashes at both the platform and ground controls, and the alarm sounds. Proceed to step 7.

✗ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Repeat this procedure beginning with step 5.

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

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

- 7 Move the platform up and down by hand, so it bounces approximately 2.5 to 5 cm / 1 to 2 inches. Allow the platform to settle.

⦿ Result: The overload indicator lights are off and the alarm does not sound. Proceed to step 8.

✗ Result: The overload indicator lights are flashing at the platform and ground controls, and the alarm is sounding. Repeat this procedure beginning with step 5.

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

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

⦿ Result: The overload indicator light is flashing at both the ground and platform controls, and the alarm is sounding. Proceed to step 9.

✗ Result: The overload indicator light is off at both the ground and platform controls, and the alarm does not sound. Remove the additional 10 lb / 4.5 kg test weight. Repeat this procedure beginning with step 6.

Note: There may be a 2 second delay before the platform overload indicator light and alarm responds.

Platform Components

- 9 Test all machine functions from the platform controls.
 - ⦿ Result: All platform control functions should not operate.
- 10 Turn the key switch to ground control.
- 11 Test all machine functions from the ground controls.
 - ⦿ Result: All ground control functions should not operate.
- 12 Using a suitable lifting device, lift the test weight off the platform floor.
 - ⦿ Result: The platform overload indicator light should be off at both the ground and platform controls and the alarm should not sound.

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

- 13 Test all machine functions from the ground controls.
 - ⦿ Result: All ground control functions should operate normally.
- 14 Turn the key switch to platform control.
- 15 Test all machine functions from the platform controls.
 - ⦿ Result: All platform control functions should operate normally.

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. See 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.
- 4 Remove the cable cover from the side of the jib boom.
- 5 Remove the mounting fasteners from the jib boom/platform rotate manifold and lay the manifold to the side. Do not remove the hoses or disconnect the wiring.

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

- 6 **Models with rotating jib boom:** Tag, disconnect and plug the hydraulic hoses from the jib boom rotator. Cap the fittings on the rotator 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.

- 7 Attach a lifting strap from an overhead crane to the jib boom.
- 8 **Models without rotating jib boom:** Remove the pin retaining fastener from the jib boom pivot pin at the jib boom bellcrank. Use a soft metal drift to remove the pin, then 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 overhead crane.

Models with rotating jib boom: Remove the pin retaining fastener from the jib boom pivot pin at the jib boom rotator. Use a soft metal drift to remove the pin, then remove the jib boom from the jib boom rotator.

⚠ WARNING

Crushing hazard. The jib boom could fall when the pin is removed if not properly supported by the overhead crane.

Jib Boom Components

- 9 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.
- 10 **Models without rotating jib boom:** Remove both of the jib boom leveling links from the bell crank.
Models with rotating jib boom: Remove both of the jib boom leveling links from the jib boom rotator.
- 11 Attach a lifting strap from an overhead crane to the rod-end of the jib boom lift cylinder.
- 12 **Models without rotating jib boom:** Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the bell crank.
Models with rotating jib boom: 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 rotator.

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 lifting device.

3-2

Jib Boom Bell Crank (models without rotating jib boom)

How to Remove the Jib Boom Bellcrank

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.

Jib Boom Components

3-3

Jib Boom Rotator (models with rotating jib boom)

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 160 degrees.

How to Remove the Jib Boom 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 jib boom. Refer to Repair Procedure, *How to Remove the Jib Boom*.
- 2 Support and secure the jib boom rotator to an appropriate lifting device.
- 3 Remove the eight mounting bolts from the jib boom rotator mount.
- 4 Remove the center bolt. Carefully remove the jib boom rotator from the machine.

▲ WARNING

Crushing hazard. The jib boom rotator could become unbalanced and fall when removed from the machine if not properly supported and secured to the lifting device.

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

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

- 6 Remove the pin retaining fasteners from the slave cylinder rod-end pivot pin. Do not remove the pin.
- 7 Place a block of wood under the platform leveling slave cylinder for support. Protect the cylinder rod from damage.
- 8 Remove the pin retaining fasteners from the jib boom bell crank at the extension boom. Use a soft metal drift to remove the pin.
- 9 Use a soft metal drift to remove the slave cylinder rod-end pivot pin.
- 10 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.

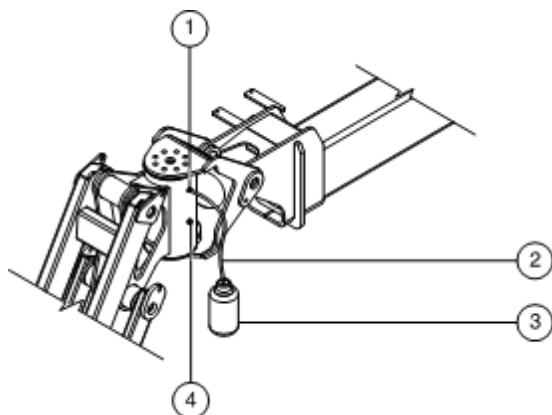
How to Bleed the Jib Boom Rotator

Note: Two people will be required to perform this procedure.

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

Jib Boom Components

- 2 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any drainage. Open the top bleed valve, but do not remove it.



- 1 top bleed valve
- 2 clear hose
- 3 container
- 4 bottom bleed valve

- 3 Move and hold the function enable toggle switch to either side and move and hold the jib boom rotate toggle switch to the right for approximately 5 seconds, then release it. Repeat three times.

⚠ WARNING

Crushing hazard. Keep hands and head clear of the platform pivot weldment during rotation.

- 4 Move and hold the function enable switch to either side and move and hold the jib boom rotate toggle switch to the left for approximately 5 seconds, then release it. Repeat three times.

- 5 Fully rotate the jib boom to the left and continue holding the jib boom rotate toggle switch until air stops coming out of the bleed valve. Immediately release the platform rotate toggle switch and close the bleed valve.

⚠ WARNING

Crushing hazard. Keep hands and head clear of the platform pivot weldment during rotation.

- 6 Rotate the jib boom to the right until the jib boom is centered.
- 7 Connect the clear hose to the bottom bleed valve and open the valve.
- 8 Rotate the jib boom to the right and continue holding the platform rotate toggle switch until air stops coming out of the bleed valve.

⚠ WARNING

Crushing hazard. Keep hands and head clear of the jib boom during rotation.

- 9 Close the bleed valve and remove the hose.
- 10 Rotate the jib boom full left and right and inspect the bleed valves for leaks.

⚠ WARNING

Crushing hazard. Keep hands and head clear of the platform pivot weldment during rotation.

- 11 Turn the key switch to the off position and clean up any hydraulic oil that may have spilled.

Jib Boom Components

3-4

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.
- 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 overhead crane 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 lifting device.

Primary Boom Components

4-1 Cable Track

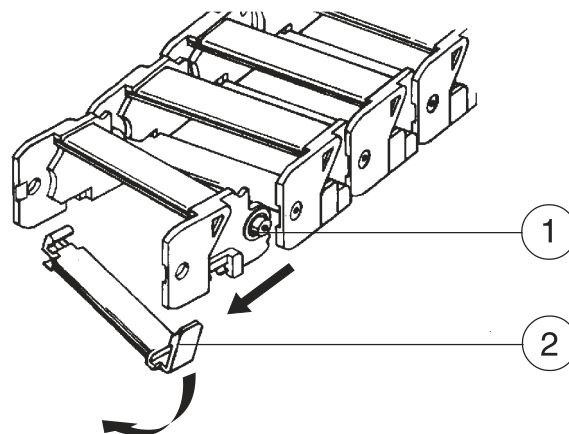
The primary boom cable track guides the cables and hoses running up the boom. It can be repaired link by link without removing the cables and hoses that run through it. Removing the entire primary boom cable track is only necessary when performing major repairs that involve removing the primary boom.

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.

Primary Boom Components

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: 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 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 **Models without rotating jib boom:** Remove the jib boom bellcrank. Refer to Repair Procedure, *How to Remove the Jib Boom Bellcrank*.

Models with rotating jib boom: Remove the jib boom rotator. Refer to Repair Procedure, *How to Remove the Jib Boom Rotator*.

Primary Boom Components

- 5 Tag, disconnect and cap the slave cylinder hydraulic hoses at the union. Plug the 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.

- 6 Remove the upper cable track mounting fasteners from the platform end of the boom.
- 7 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. The boom cable track can be damaged if it is twisted.

NOTICE

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

- 8 Raise the secondary boom until the primary boom lift cylinder rod-end pivot pin is accessible above the mid-pivot weldment. Turn the machine off.
- 9 Disconnect the battery packs from the machine.
- 10 Remove all the hose and cable clamps from the underside of the primary boom and at the pivot end of the primary boom.
- 11 Attach a lifting strap of ample capacity from an overhead 5 ton / 5000 kg crane to the primary boom for support.

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

- 13 Open the platform control box.
- 14 Tag and disconnect each wire from the cables in the platform control box.
- 15 Pull all the cables out of the platform control box.
- 16 Remove the front counterweight cover.
- 17 Remove the extension boom drive limit switch from the side of the primary boom at the pivot end. Do not disconnect the wiring.
- 18 Tag, disconnect and plug the hydraulic hoses from the jib boom/platform rotate manifold.
- 19 Pull all the electrical cables and hydraulic hoses out of the plastic cable track. Then pull all the electrical cables and hydraulic hoses out through the boom rest pad.

NOTICE

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

- 20 Remove the pin retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pivot pin. Pull the cylinder back and secure it from moving.
- 21 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.

Primary Boom Components

- 22 Attach a lifting strap from an overhead crane to the primary boom lift cylinder.
- 23 Place 2 x 4 x 18 inch / 5 x 10 x 46 cm support blocks under the cylinder, across the secondary boom.
- 24 Remove the pin retaining fastener from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠ WARNING

Crushing hazard. The primary boom lift cylinder could become unbalanced and fall if not properly supported by the lifting device.

- 25 Lower the rod end of the primary boom lift cylinder onto support blocks. Protect the cylinder rod from damage.
- 26 Remove the pin retaining fastener from the primary boom pivot pin.
- 27 Remove the primary boom pivot pin with a soft metal drift. Carefully remove the primary boom assembly from the machine.

⚠ 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.

How to Disassemble the Primary Boom

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

- 1 Remove the primary 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 Remove and label the location of the wear pads from the top side of the boom tube at the platform end of the boom.

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

- 5 Support the extension tube with an overhead crane at the platform end of the boom.

⚠ WARNING

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

Primary Boom Components

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

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

- 7 Remove the external snap rings from the slave cylinder barrel-end pivot pin.
- 8 Use a soft metal drift and drive the slave cylinder barrel-end pivot pin out.
- 9 Remove the slave cylinder from the primary extension boom tube.
- 10 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.
- 11 Support and slide the extension cylinder out of the pivot end of the boom extension tube. Place the extension cylinder on blocks for support.

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

4-3

Primary Boom Lift Cylinder

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

How to Remove the Primary Boom Lift Cylinder

⚠ WARNING

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

Note: When removing a hose assembly or fitting, the O-ring (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 secondary boom enough to access the primary boom lift cylinder barrel-end pivot pin.
- 2 Raise the primary boom enough to access the primary boom lift cylinder rod-end pivot pin.

Primary Boom Components

- 3 Support the primary boom lift cylinder with a suitable lifting device. Place a block of wood across the upper secondary boom to support the cylinder when the rod-end pin is removed.
- 4 Attach an overhead crane to the primary boom at the platform end for support. Raise the primary boom using the overhead crane just enough to relieve the pressure on the primary boom lift cylinder rod-end pivot pin.
- 5 Remove the counterweight cover fasteners. Remove the counterweight cover from the machine.
- 6 Place a block of wood between the counterweight plate on the leveling link 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 onto the block.

- 7 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

Crushing hazard. The primary boom lift cylinder could become unbalanced and fall if not properly supported by the lifting device.

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

- 9 Remove the pin retaining fastener from the ground control side upper secondary leveling link pivot pin at the upper pivot (same side of machine as the primary boom lift cylinder barrel-end pivot pin retainer).
- 10 Place a rod through the upper secondary leveling link pivot pin at the upper pivot and twist to remove the pin.
- 11 Swing the leveling link up out of the way and secure it from moving.
- 12 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.

- 13 Support the barrel end of the primary boom lift cylinder with straps or ropes to restrict it from swinging freely.
- 14 Remove the pin retaining fastener from the primary boom lift cylinder barrel-end pivot pin. Do not remove the pivot pin.

Primary Boom Components

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

⚠ WARNING

Crushing hazard. The primary boom lift cylinder could become unbalanced and fall if not properly supported by the lifting device.

- 16 Attach an overhead crane or similar lifting device to the lug on the rod-end of the primary boom lift cylinder. Carefully loosen the straps and allow the primary boom lift cylinder to slowly swing down.
- 17 Carefully remove the cylinder from the machine.

⚠ WARNING

Crushing hazard. The primary boom lift cylinder could become unbalanced and fall if not properly supported by the lifting device.

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.
- 2 Extend the primary boom until the primary boom extension cylinder rod-end pivot pin is accessible in the primary boom extension tube.

Primary Boom Components

- 3 Remove the external snap rings from the extension cylinder rod-end pivot pins. Use a soft metal drift to remove the pins.
 - 4 Remove the counterweight cover fasteners. Remove the counterweight cover from the machine.
 - 5 Raise the secondary boom until the master cylinder rod-end pivot pin is accessible.
 - 6 Remove the primary boom extend drive limit switch from the pivot end of the primary boom. Do not disconnect the wiring.
 - 7 Remove the retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
 - 8 Manually retract the master cylinder and push it toward the platform end of the boom to obtain enough clearance for extension cylinder removal.
 - 9 Tag, disconnect and plug the primary boom extension cylinder hydraulic hoses. Cap the fittings on the cylinder.
- ⚠ WARNING** Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.
- 10 Remove the retaining fastener from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

- 11 Carefully pull out and properly support the extension cylinder from the primary boom with a lifting strap from an overhead crane.

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

Primary Boom Components

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*.

- 1 Raise the secondary boom until both the rod end and barrel-end pivot pins of the master cylinder are accessible.

- 2 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.

- 3 Attach an overhead crane or similar lifting device to the master cylinder.
- 4 Remove the pin retaining fasteners from the master cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

⚠ WARNING

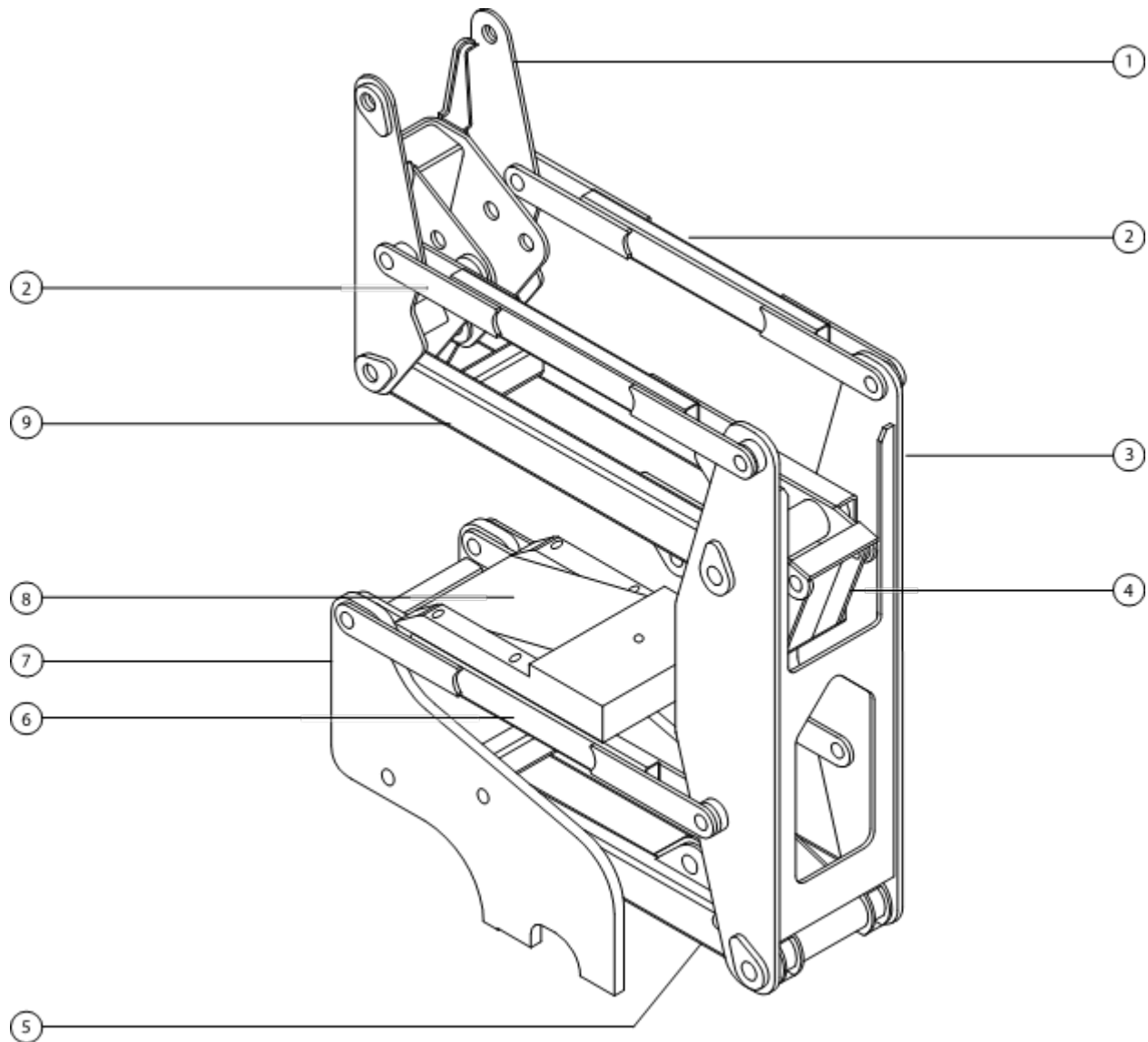
Crushing hazard. The master cylinder could become unbalanced and fall if not properly attached to the lifting device.

- 5 Remove the pin retaining fastener from the rodend pivot pin.
- 6 Place a rod through the rod-end pivot pin and twist to remove the pin.
- 7 Remove the master cylinder from the machine.

⚠ WARNING

Crushing hazard. The master cylinder could become unbalanced and fall if not properly attached to the lifting device.

Secondary Boom Components



Secondary Boom components

- | | |
|-------------------------|------------------------------------|
| 1 upper pivot | 6 lower compression arm |
| 2 upper compression arm | 7 turntable pivot |
| 3 mid-pivot | 8 counterweight (Z-30N / Z-30N RJ) |
| 4 compression link | 9 upper secondary boom |
| 5 lower 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 Remove the counterweight cover.
- 2 Place a suitable lifting device under the platform for support.
- 3 Disconnect the battery packs from the machine.
- 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 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 Tag and disconnect each wire from the cables in the platform control box.

⚠ WARNING Electrocuting/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 hydraulic hoses from the "P" and "T" ports at the jib boom/rotate 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.

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

Secondary Boom Components

- 14 Remove the primary boom extend drive speed limit switch (LS1) mounted on the side of the primary boom at the pivot end. Do not disconnect the wiring.
- 15 Attach a lifting strap from an overhead crane to the pivot end of the primary boom.
- 16 Carefully lift the secondary and primary boom assembly with the overhead crane until the master cylinder and primary boom 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. Cap the fittings on the cylinders.
- 22 Remove the pin retaining fasteners from the upper pivot to upper secondary 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 retaining fasteners from the upper pivot to the 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

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.

⚠ WARNING

Crushing hazard. The primary boom assembly could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane. Do not remove the assembly from the machine until it is properly balanced.

- 19 Lower the secondary boom to the fully stowed position.
- 20 Pull all the cables and hoses through the upper pivot.

NOTICE

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

- 21 Position a lifting strap from the overhead crane approximately 2 feet / 60 cm from the platform end of the primary boom. Measure from the platform end of the primary boom tube.

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

- 26 Place the entire assembly onto a structure capable of supporting it.
- 27 Remove the pin retaining fasteners from the upper secondary compression arm pivot pins. Do not remove the pins.
- 28 Position a lifting strap from an overhead crane at the center of the control box side upper secondary compression arm.

Secondary Boom Components

- 29 Use a soft metal drift to remove the upper secondary boom compression arm pivot pins and remove the compression arm from the machine. Repeat this step for the hydraulic tank side upper secondary compression arm.

⚠ WARNING

Crushing hazard. The upper secondary compression arm could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

- 30 Close the hydraulic tank shutoff valve. Tag, 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.

- 31 Open the valve on the hydraulic tank and drain the oil into a container of suitable capacity. Refer to Section 2, Specifications.

⚠ CAUTION

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

- 32 Tag, disconnect and plug the hydraulic hose from the hydraulic tank return filter housing. Cap the fitting on the filter housing.

⚠ 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.

- 33 Remove the hydraulic tank mounting fasteners. Remove the hydraulic tank from the machine.
- 34 Open the ground controls side turntable cover.
- 35 Remove the terminal strip cover retaining fasteners. Remove the cover.
- 36 Remove the terminal strip retaining fasteners. Do not disconnect the wiring.
- 37 Remove the plastic plug in the bulkhead to access the secondary boom lift cylinder rod-end pivot pin.
- 38 Remove the pin retaining fastener from the rod end of the secondary boom lift cylinder. Use a soft metal drift to remove the pin through the access holes in the bulkheads. Secure the cylinder from moving.
- 39 Remove the pin retaining fastener from the lower pivot pin on the compression link. Use a soft metal drift to remove the pin.

Secondary Boom Components

- 40 Attach a lifting strap from an overhead crane to the upper secondary boom.
- 41 Remove the pin retaining fastener from the mid-pivot to upper secondary boom pivot pin. Use a soft metal drift to remove the pin.
- 42 Remove the upper secondary boom with compression link from the machine.

⚠ CAUTION Crushing hazard. The upper secondary boom with compression link could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

- 43 **Z-30N and Z-30N RJ:** Remove the mounting fasteners from the counterweight attached to the lower leveling link.
- 44 **Z-30N and Z-30N RJ:** Attach a lifting strap from an overhead crane to the counterweight. Remove the counterweight from the lower leveling link.

⚠ DANGER Tip-over hazard. The counterweight is critical to machine stability. If the counterweight is not installed during reassembly of the machine, the machine will become unstable and tip over.

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

- 45 Remove the mounting fasteners from the function manifold and slide the function manifold to the side. This will allow access to the secondary boom lift cylinder barrel-end pivot pin.
- 46 Remove the mounting fasteners from the auxiliary power unit. Do not disconnect the electrical cables or hydraulic hoses.
- 47 Slide the auxiliary power unit to the side to access the other secondary boom lift cylinder barrel-end pivot pin.
- 48 Remove the retaining fasteners from the secondary boom lift cylinder barrel-end pivot pins.
- 49 Attach a lifting strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.
- 50 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.

Secondary Boom Components

- 51 Use a slide hammer to remove the barrel-end pivot pins (access the pins from the access holes in the bulkheads, one on each side). Remove the secondary boom lift cylinder from the machine.

⚠ WARNING

Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly attached to the suitable lifting device.

- 52 Attach a lifting strap from an overhead crane to the mid-pivot for support.
- 53 Remove the pin retaining fasteners from the mid-pivot to the lower secondary compression arm pivot pins. Use a slide hammer and remove the pins. Lower the compression arms down.
- 54 Remove the pin retaining fasteners from the mid-pivot to the lower secondary boom pivot pin. Use a soft metal drift to remove the pins.
- 55 Remove the mid-pivot from the machine.

⚠ WARNING

Crushing hazard. The mid-pivot could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

- 56 Remove the secondary boom drive speed limit switch (LS4) mounted to the turntable riser on the ground controls side. Do not disconnect the wiring.

- 57 Attach a lifting strap from an overhead crane to the ground control side lower secondary boom compression arm.
- 58 Remove the pin retaining fastener from the lower secondary boom compression arm to turntable riser pivot pin.
- 59 Use a slide hammer and remove the pin. Remove the compression arm from the machine. Repeat for the hydraulic tank side lower secondary boom compression arm.

⚠ WARNING

Crushing hazard. The lower secondary compression arm could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

- 60 Attach a lifting strap from an overhead crane to the lower secondary boom.
- 61 Remove the pin retaining fastener from the lower secondary boom to turntable riser pivot pin. Use a soft metal drift to remove the pin.
- 62 Remove the lower secondary boom from the machine.

⚠ WARNING

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

Secondary Boom Components

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 either 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 Swing out the battery pack that is directly below the secondary boom lift cylinder.

- 4 Disconnect the battery packs from the machine.
- 5 Open the hydraulic tank side turntable cover.
- 6 Tag and disconnect the power cables on the auxiliary power unit.

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

- 7 Close the hydraulic tank shutoff valve. 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.

- 8 Open the valve on the hydraulic tank and drain the oil into a container of suitable capacity. Refer to Specifications., *Machine Specifications*.

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

Secondary Boom Components

- 9 Tag, disconnect and plug the hydraulic hose from the hydraulic tank return filter housing. Cap the fitting on the filter housing.

⚠ 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.

- 10 Remove the hydraulic tank mounting fasteners. Remove the hydraulic tank from the machine.
- 11 Open the ground controls side turntable cover.
- 12 Remove the terminal strip cover retaining fasteners. Remove the cover.
- 13 Remove the terminal strip retaining fasteners. Do not disconnect the wiring.
- 14 Remove the plastic plug in the bulkhead to access the secondary boom lift cylinder rod-end pivot pin.
- 15 Remove the mounting fasteners from the function manifold and slide the manifold to the side. This will allow access to the hydraulic tank side barrel-end pivot pin.
- 16 Attach a lifting strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.
- 17 From the bottom side of the cylinder, remove the retaining fasteners from the secondary boom lift cylinder barrel-end pivot pins.

- 18 Remove the hose clamp under the lower secondary boom.
- 19 Use a slide hammer to remove both barrel-end pivot pins (access the pins from the access holes in the bulkheads, one on each side).
- 20 Remove the pin retaining fastener from the secondary boom lift cylinder rod-end pivot pin.
- 21 Use a soft metal drift to remove the secondary boom rod-end pivot pin.

⚠ WARNING

Crushing hazard. The secondary boom lift cylinder may fall when the rod-end pivot pin is removed if not properly supported by the overhead crane.

- 22 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.

- 23 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.

- 24 Remove the cylinder through the top of the secondary boom.

⚠ WARNING

Crushing hazard. The secondary boom lift cylinder could become unbalanced and fall when removed from the machine if not properly attached to the suitable lifting device.

Hydraulic Pump

6-1 Auxiliary and Function Pump

How to Remove the Auxiliary Pump or 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 and disconnect the cables from the auxiliary pump.

⚠ WARNING

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

- 2 Close the hydraulic shutoff valve located at the hydraulic tank.

NOTICE

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

- 3 Tag, disconnect and plug the hydraulic hoses from the pump. Cap the fittings on the pump.

⚠ WARNING

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

- 4 Remove the pump mounting bolts from the pump. Carefully remove the pump from the electric motor.

NOTICE

Component damage hazard. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

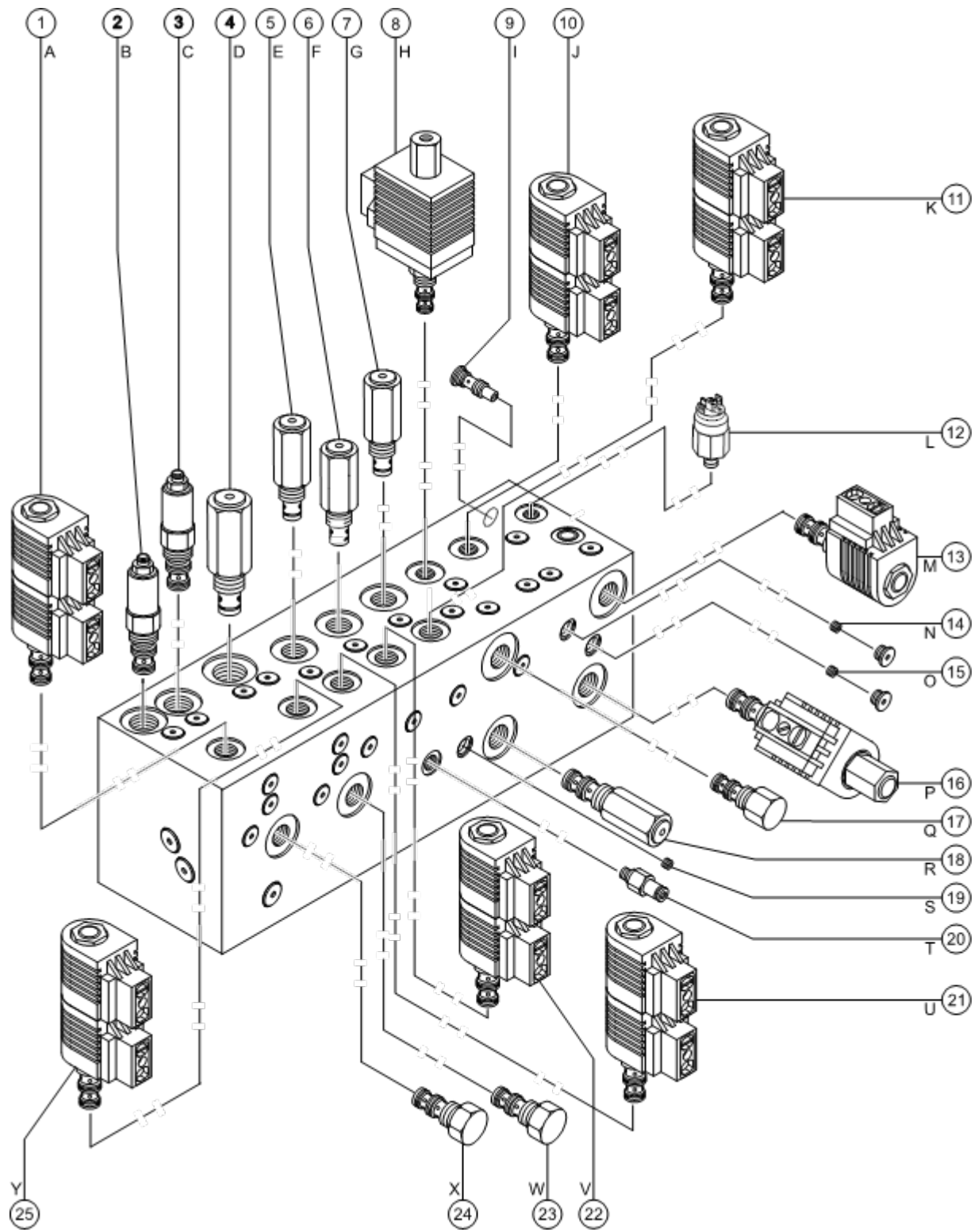
Manifolds

7-1 Function Manifold Components

The function manifold is located behind the ground controls turntable cover.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	A	Platform level up/down	20-25 ft-lbs / 27-34 Nm
2	Counterbalance valve	B	Platform level down	20-25 ft-lbs / 27-34 Nm
3	Counterbalance valve	C	Platform level up	20-25 ft-lbs / 27-34 Nm
4	Relief valve, 1100 psi / 75.8 bar	D	Turntable rotate left/right	30-35 ft-lbs / 41-47 Nm
5	Relief valve, 1600 psi / 110 bar	E	Secondary boom down	20-25 ft-lbs / 27-34 Nm
6	Relief valve, 1600 psi / 110 bar	F	Primary boom down	20-25 ft-lbs / 27-34 Nm
7	Relief valve, 1800 psi / 124 bar (Z-30 N RJ)r	G	Primary boom extend	20-25 ft-lbs / 27-34 Nm
8	Proportional solenoid valve	H	System flow regulating circuit	30-35 ft-lbs / 41-47 Nm
9	Check valve	I	Brake circuit	10-12 ft-lbs / 14-16 Nm
10	Solenoid valve, 3 position 4 way	J	Steer left/right	20-25 ft-lbs / 27-34 Nm
11	Solenoid valve, 3 position 4 way	K	Primary boom extend/retract	20-25 ft-lbs / 27-34 Nm
12	Pressure switch	L	Brake circuit	
13	Solenoid Valve, N.C. poppet	M	Brake circuit	20-25 ft-lbs / 27-34 Nm
14	Orifice, 0.045 inch / 1.14 mm	N	Brake circuit	

Manifolds

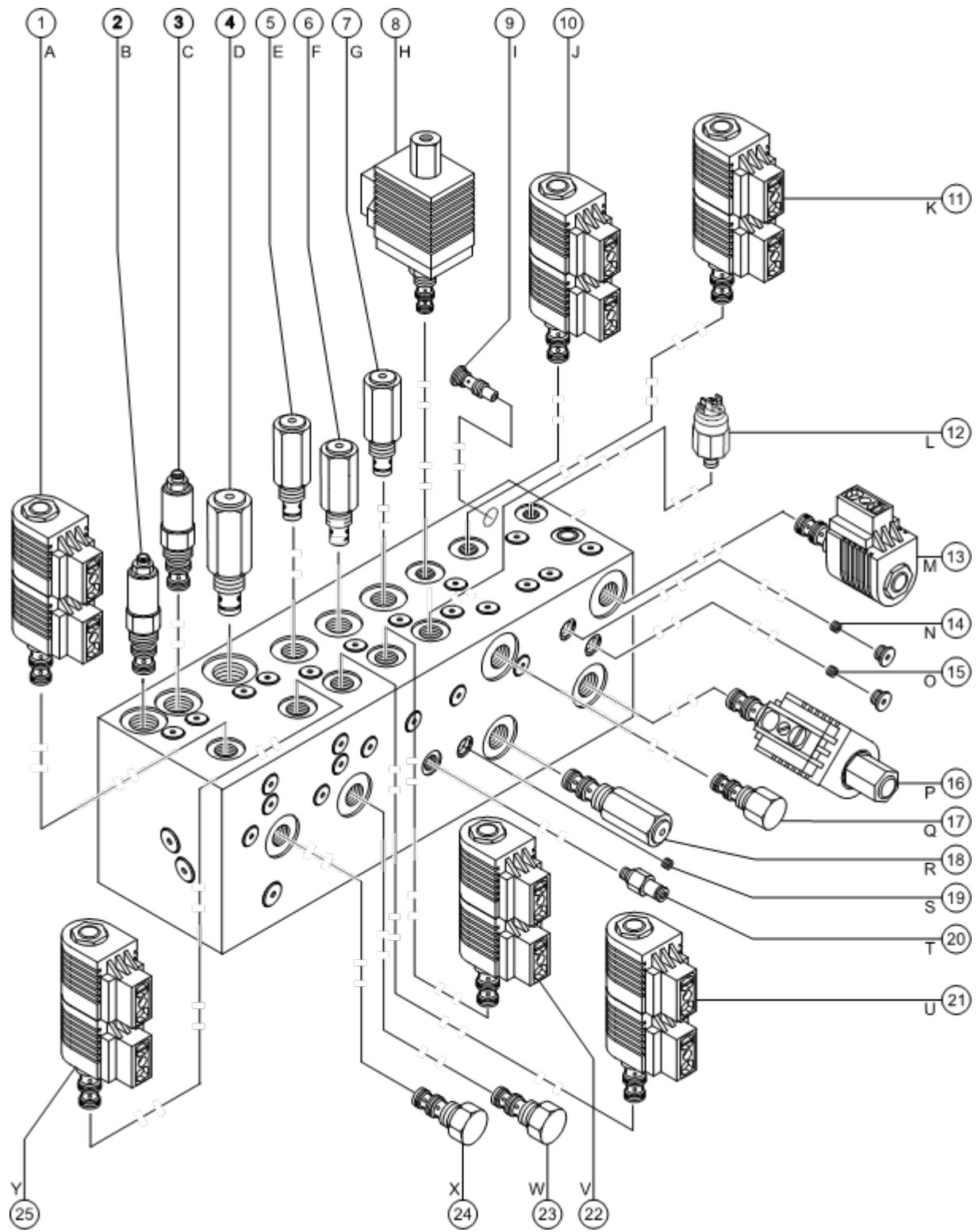


Manifolds

Function Manifold Components, continued

Index No.	Description	Schematic Item	Function	Torque
15	Orifice, 0.045 inch / 1.14 mm	O	Brake and steer circuit	
16	Solenoid Valve, N.O. poppet	P	Brake circuit	20-25 ft-lbs / 27-34 Nm
17	Differential sensing valve	Q	Differential sensing circuit	30-35 ft-lbs / 41-47 Nm
18	Relief valve, 2800 psi / 193 bar (Z-30N and Z-30N RJ) 3200 psi / 221 bar (Z-34N and Z-34DC)	R	System relief	20-25 ft-lbs / 27-34 Nm
19	Orifice, 0.035 inch / 0.89 mm	S	Tank return circuit	
20	Diagnostic port	T	Testing	
21	Solenoid valve, 3 position 4 way	U	Secondary boom up/down	20-25 ft-lbs / 27-34 Nm
22	Solenoid valve, 3 position 4 way	V	Primary boom up/down	20-25 ft-lbs / 27-34 Nm
23	Flow regulator valve, 1.8 gpm / 6.8 L/min	W	Turntable rotate circuit	20-25 ft-lbs / 27-34 Nm
24	Flow regulator valve, 0.8 gpm / 3 L/min	X	Jib boom/platform rotate circuit	20-25 ft-lbs / 27-34 Nm
25	Solenoid valve, 3 position 4 way	Y	Turntable rotate left/right	20-25 ft-lbs / 27-34 Nm

Manifolds



Manifolds

7-2 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

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

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the 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 extend/retract toggle switch in the retract direction with the primary boom fully retracted. Observe the pressure reading on the pressure gauge. Refer to Specifications, *Manifold Component Specifications*.
- 4 Turn the machine off. Hold the system relief valve with a wrench and remove the cap (item R).
- 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 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.

Manifolds

How to Adjust the Secondary Boom Down Relief Valve

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

- 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 secondary boom up/down toggle switch in the down direction with the secondary boom fully lowered. Observe the pressure reading on the pressure gauge. Refer to Specifications, *Manifold Component Specifications*.
- 4 Turn the machine off. Hold the secondary boom down relief valve with a wrench and remove the cap (item E).
- 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 Primary Boom Extend Relief Valve

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

- 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 extend/retract toggle switch in the extend direction with the primary boom fully extended. Observe the pressure reading on the pressure gauge. Refer to Specifications, *Manifold Component Specifications*.
- 4 Turn the machine off. Hold the primary boom extend relief valve with a wrench and remove the cap (item G).
- 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

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.

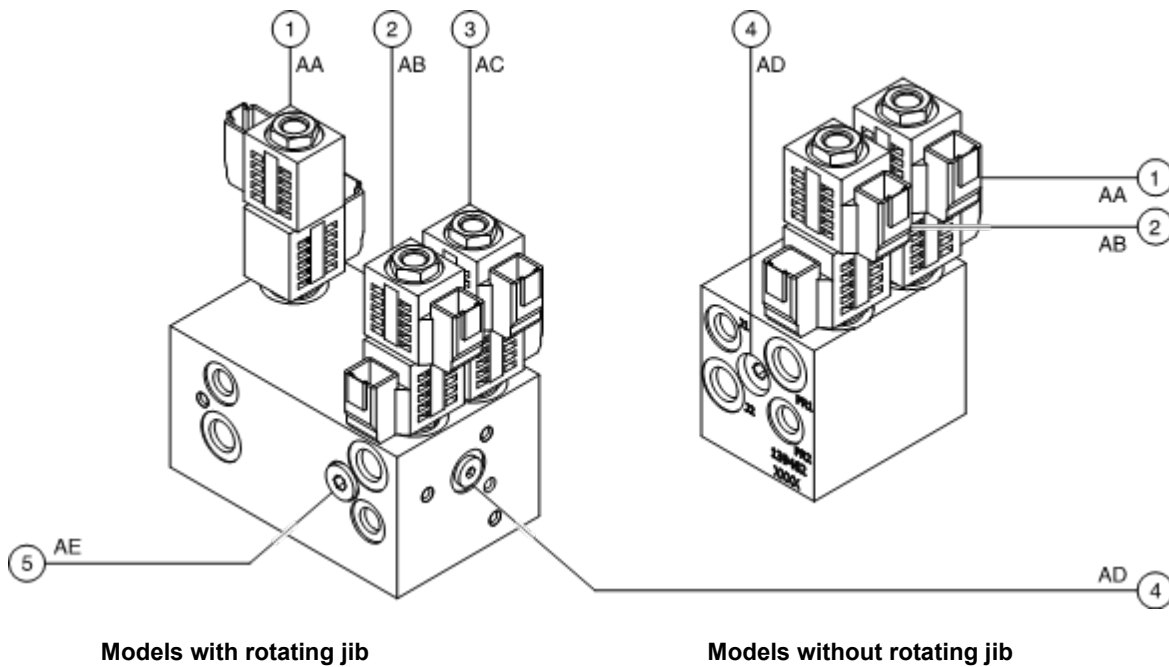
- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.
- 7 Remove the pressure gauge.

Manifolds

Jib Boom and Platform / Jib Boom 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, 3 position 4 way	AA	Jib boom up/down	20-25 ft-lbs / 27-34 Nm
2	Solenoid valve, 3 position 4 way	AB	Platform rotate left/right	20-25 ft-lbs / 27-34 Nm
3	Solenoid valve, 3 position 4 way	AC	Jib boom rotate left/right	20-25 ft-lbs / 27-34 Nm
4	Flow regulator valve, 0.3 gpm / 1.14 L/min	AD	Platform rotate circuit	20-25 ft-lbs / 27-34 Nm
5	Orifice plug, 0.025 inch / 0.64 mm (located under plug)	AE	Jib boom rotate circuit	



Manifolds

7-4 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 that provides this force field.

⚠ 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 Specification

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

Valve Coil Resistance Specification

Description	Specification
Solenoid valve, 3 position 4 way, 20V DC (schematic items A, J, K, U, V, Y, AA, BB and CC)	22 Ω
Proportional solenoid valve, 24V DC (schematic item H)	19.5 Ω
Solenoid valve, N.C. poppet, 20V DC (schematic item M)	23.5 Ω
Solenoid valve, N.O. poppet, 20V DC (schematic item P)	23.5 Ω

Manifolds

How to Test a Coil Diode

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

⚠ WARNING

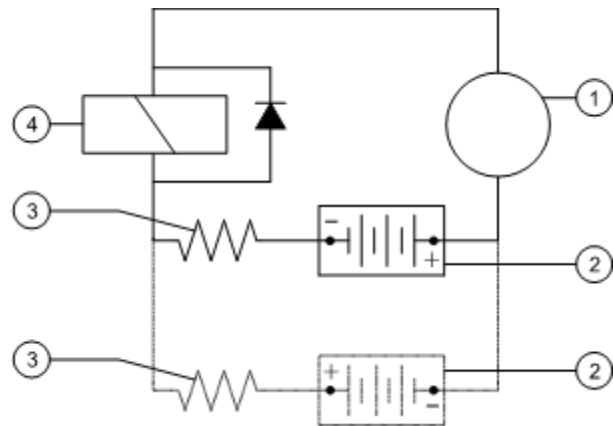
Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Test the coil for resistance. Refer to Repair Procedure, *How to Test a Coil*.
- 2 Connect a 10W 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.

Turntable Rotation Components

8-1

Turntable Rotation Hydraulic Motor

The turntable rotation hydraulic motor is the only serviceable component of the turntable rotation assembly. The worm gear must not be removed from the housing. In order to remove the housing, the turntable has to be removed.

How to Remove the Turntable Rotation Hydraulic Motor

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

- 1 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.

Steer Axle Components

9-1 Hub and Bearings, 2WD Models

How to Remove the Hub and Bearings

- 1 Loosen the wheel lug nuts. Do not remove them.
- 2 Block the non-steer wheels and place a lifting jack under the steer axle.
- 3 Raise the machine. Place blocks under the drive chassis for support.
- 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 yoke spindle. The washer and outer bearing should fall loose from the hub.
- 7 Place the hub on a flat surface and gently pry the grease seal out of the hub. Remove the inner bearing.

Note: When removing a bearing, always use a new inner bearing seal.

How to Install the Hub and Bearings

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.

Steer Axle Components

- 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 lock it in place.

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

- 11 Install the dust cap, then the tire and wheel assembly.
- 12 Lower the machine and remove the blocks.
- 13 Torque the wheel lug nuts to specification. Refer to Specifications, *Machine Specifications*.

Non-steer Axle Components

10-1

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 Customer Support 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



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.

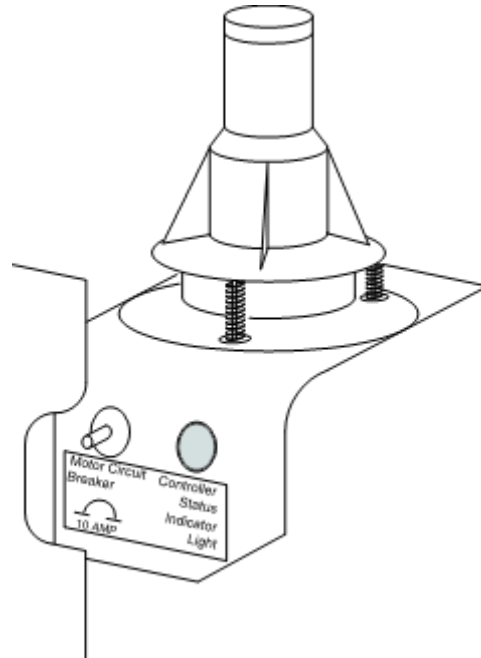
Note: Additional troubleshooting of the fault codes may be accomplished by using the hand-held pendant motor controller programmer (Genie part number 128551).

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.

The controller status indicator light will flash a fault code to aid in troubleshooting. This indicator light is mounted on the tilt level sensor mounting bracket, located behind the cover on the ground controls side.

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 Codes

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 a 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 Codes

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

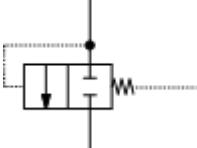
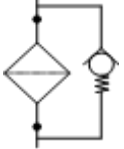
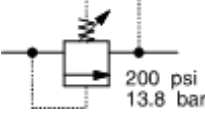
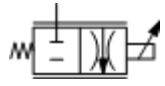
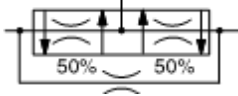
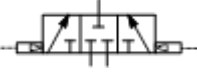
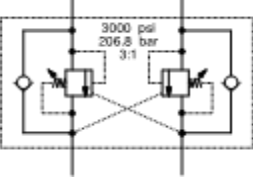
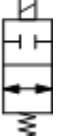
⚠ WARNING

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.

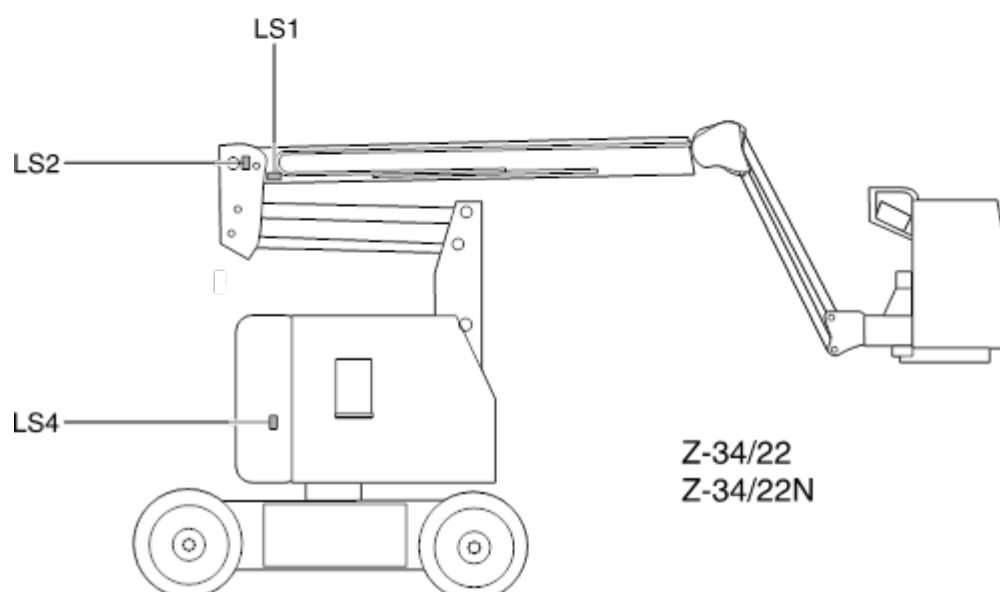
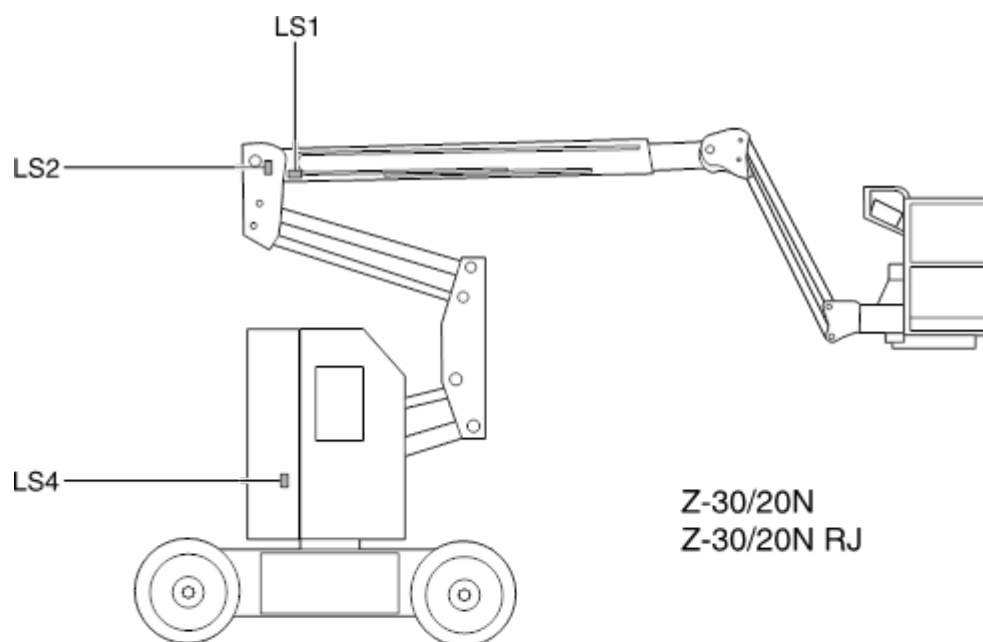
Electrical Symbol Legend

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

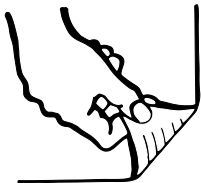
Hydraulic Symbols Legend

			
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 200 psi 13.8 bar	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 3000 psi 206.8 bar 3:1	Solenoid operated 3 position 4 way directional valve	Solenoid operated 3 position, 4 way proportional directional valve	Solenoid valve, 2 position 2 way

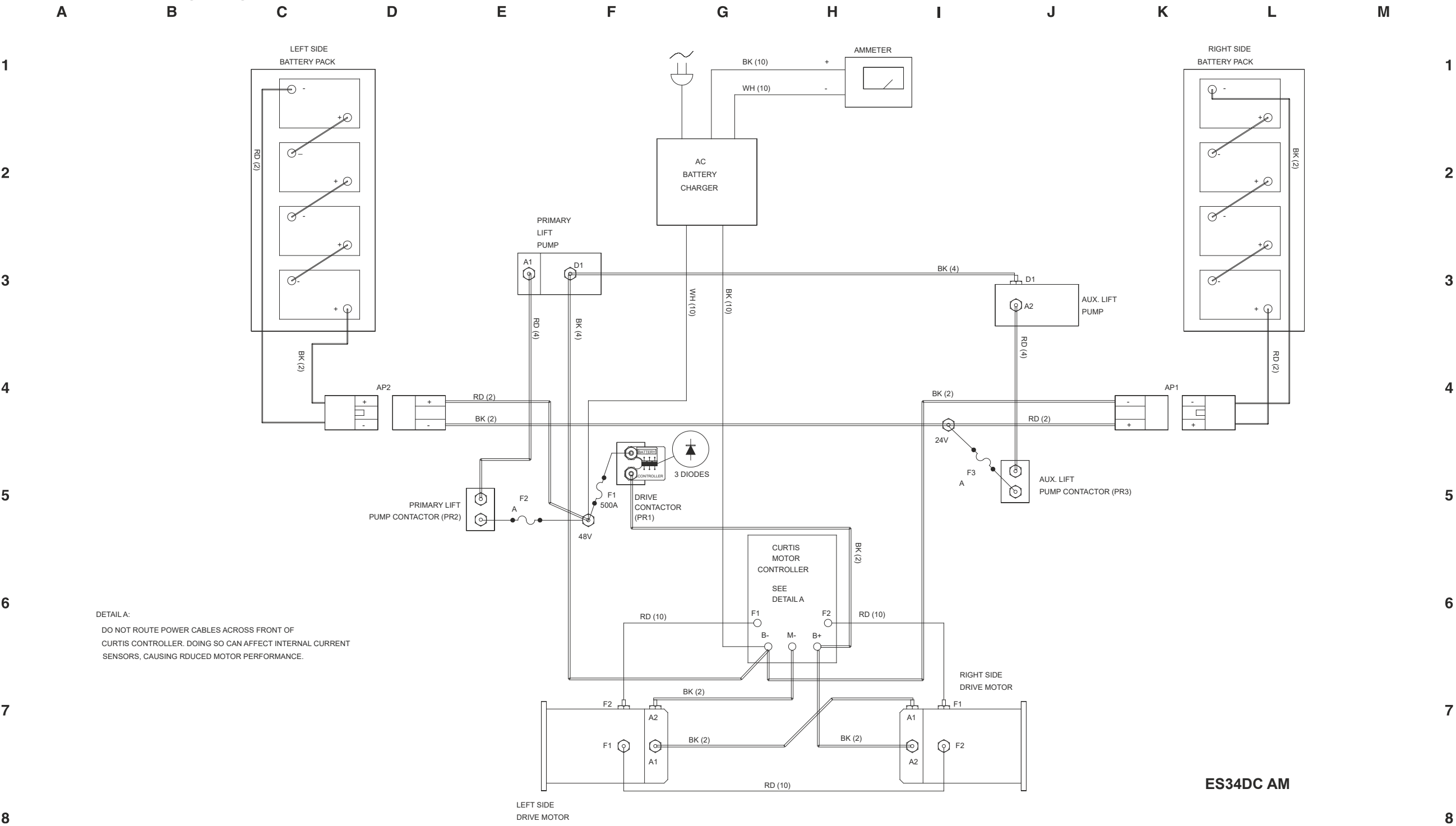
Limit Switch Location Legend



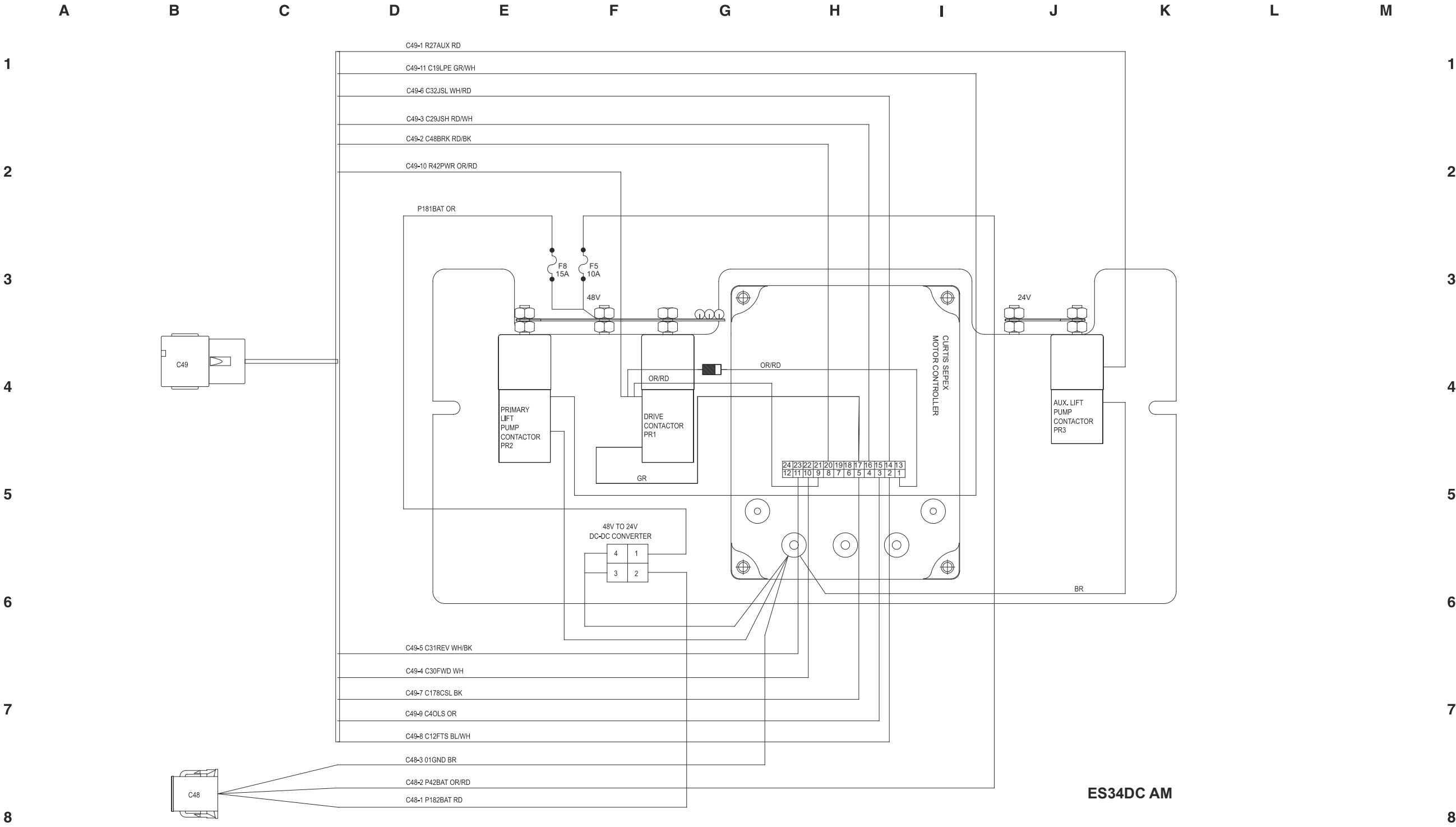
Power Cable Wiring Diagram



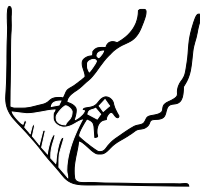
Power Cable Wiring Diagram



Drive Contactor Panel Wiring Diagram



Drive Contactor Panel Wiring Diagram



Manifold and Limit Switch Wiring Diagram

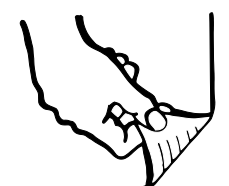


Diagram illustrating the wiring connections for the ES34DC AM system, showing the main manifold assembly and two jib manifold options.

Main Manifold Assembly:

- MANIFOLD HARNESS (MH) TO BASE CNTL. BOX
- Service Horn (A2) connected to BK/RD #CR4 (BR).
- Pressure Switch connected to the manifold.
- Brake Release N.C. and Brake Release N.O. connections.
- Wiring for various functions: PLATFORM LEVEL, TURNABLE ROTATE, SECONDARY BOOM, PRIMARY BOOM, BOOM EXTEND, PROP. FLOW CONTROL, STEER, and various limit switches (LS1, LS2, LS3, LS4).

Jib Manifold Options:

JIB MANIFOLD WITH JIB ROTATE OPTION (TOP VIEW):

- Wiring for BL-JIB (PLAT R), BK-JIB (JIB UP), OR-JIB (PLAT L), WH-JIB (JIB DOWN), RD-JIB (JIB R), YL-JIB (JIB L), and BR-JIB (GROUND).
- Wiring for C47 connector: PIN# 1 (OR, C17PRL), 2 (BL, C18PRR), 3 (BK, C43JU), 4 (WH, C44JD), 5 (YL, C46JRL), 6 (RD, C47JRR), 7 (NC, ---), 8 (BR, GND).

JIB MANIFOLD W/O JIB ROTATE OPTION (TOP VIEW):

- Wiring for BL-JIB (PLAT R), BK-JIB (JIB UP), OR-JIB (PLAT L), WH-JIB (JIB DOWN), and BR-JIB (GROUND).
- Wiring for C47 connector: PIN# 1 (OR, C17PRL), 2 (BL, C18PRR), 3 (BK, C43JU), 4 (WH, C44JD), 5 (NC, ---), 6 (NC, ---), 7 (NC, ---), 8 (BR, GND).

Limit Switches and Cables:

- LS1: EXTEND/RETRACT LIMIT SWITCH (SHOWN WITH BOOM EXTENDED). Wires: BK-7, WH-7, CABLE 7.
- LS2: PRIMARY LIFT LIMIT SWITCH. Wires: RD-6, BK-6, BR-6, WH-6, CABLE 6.
- LS3: DRIVE ENABLE LIMIT SWITCH (SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL). Wires: BK-5, WH-5, RD-5, BRN-5, CABLE 5.
- LS4: SECONDARY LIFT LIMIT SWITCH. Wires: WH-8, BK-8, CABLE 8.

Wiring Tables:

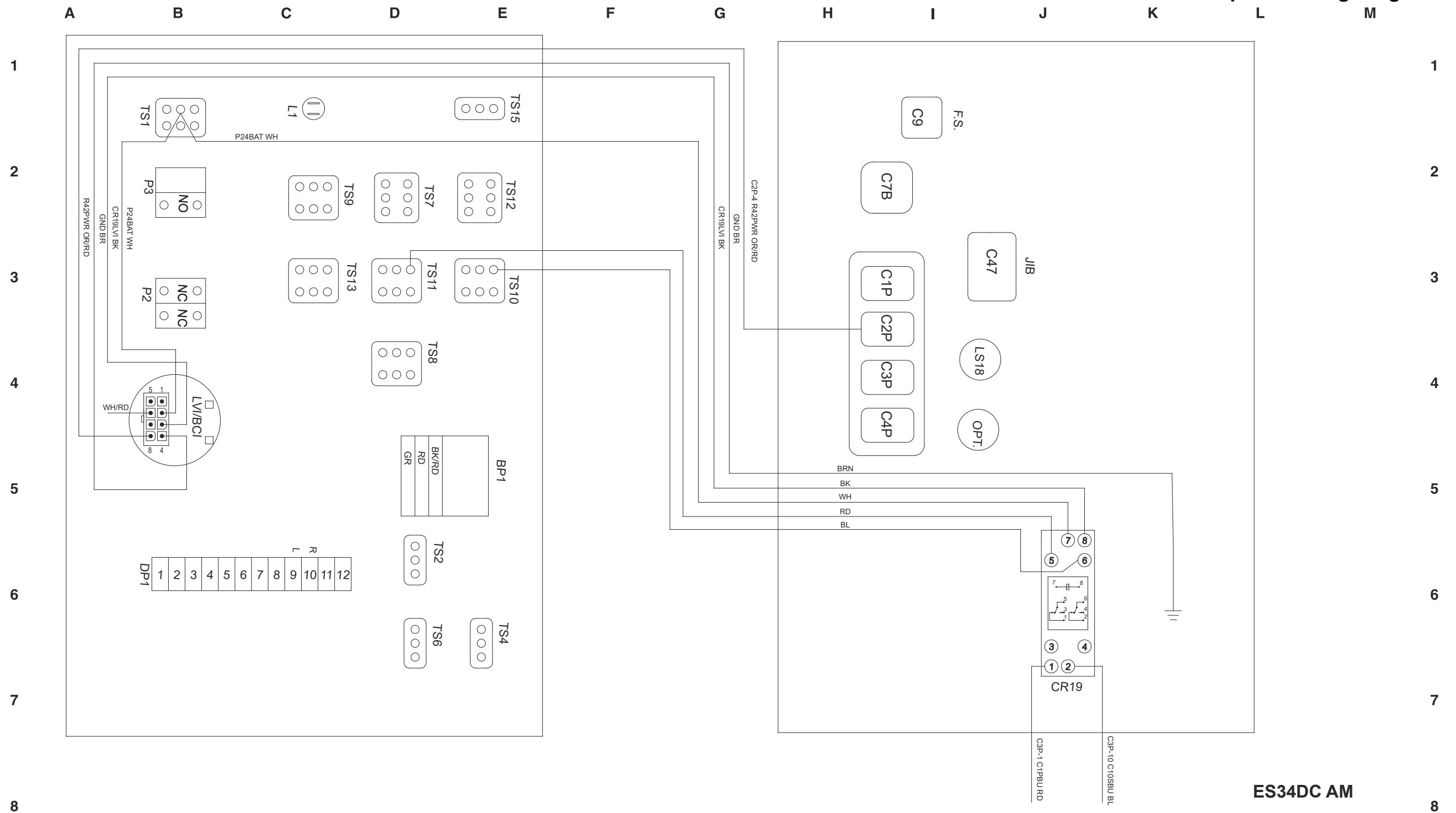
PIN#	WIRES
1	BK
2	WH

PIN#	WIRES
1	RD
2	BR
3	BK
4	WH

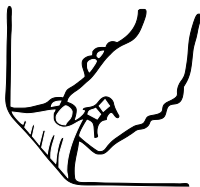
PIN#	WIRES
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2	BR
3	BK
4	WH

PIN#	WIRES
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2	WH

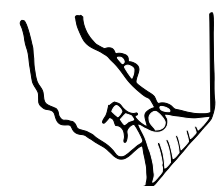
LVI/BCI Option Wiring Diagram



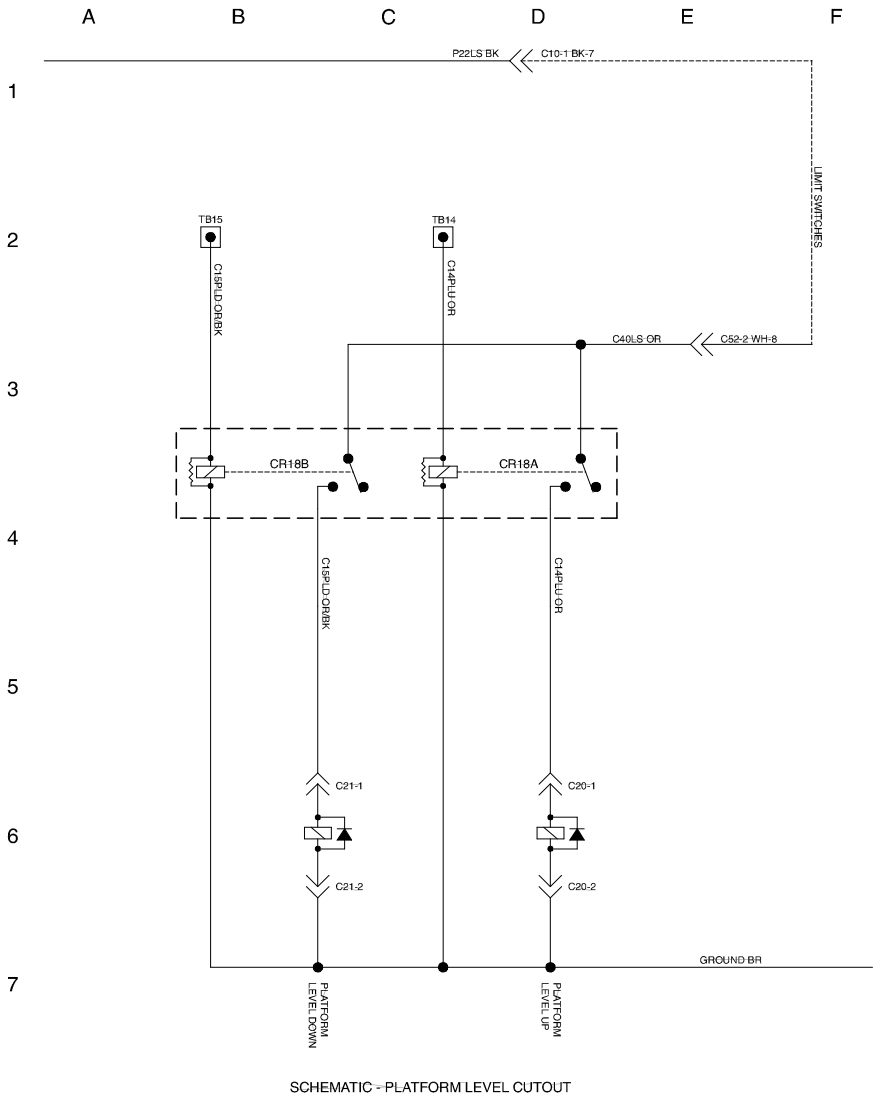
LVI/BCI Option Wiring Diagram



Charger Interlock Option

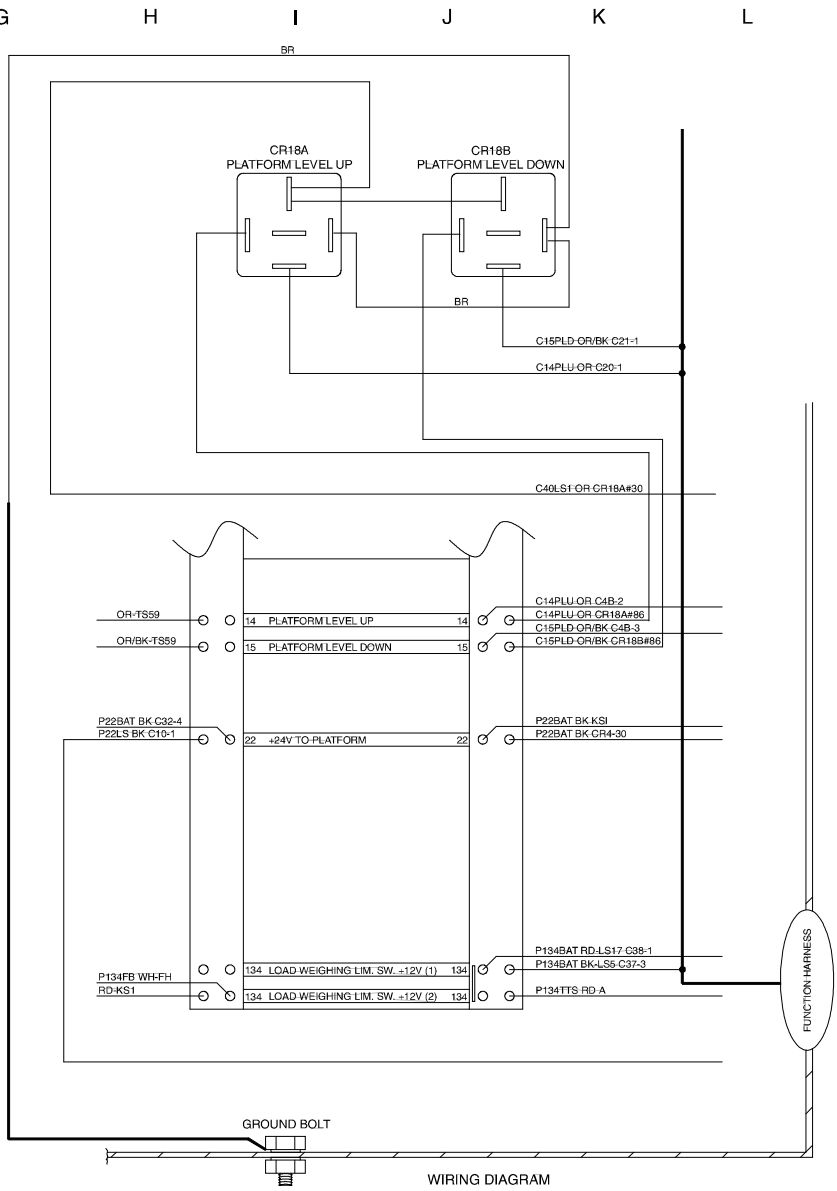


CTE Option, (CE Models)



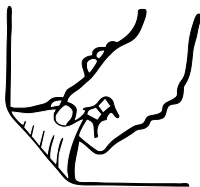
SCHEMATIC - PLATFORM LEVEL CUTOUT

ES0276N

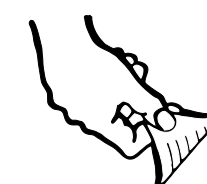


WIRING DIAGRAM

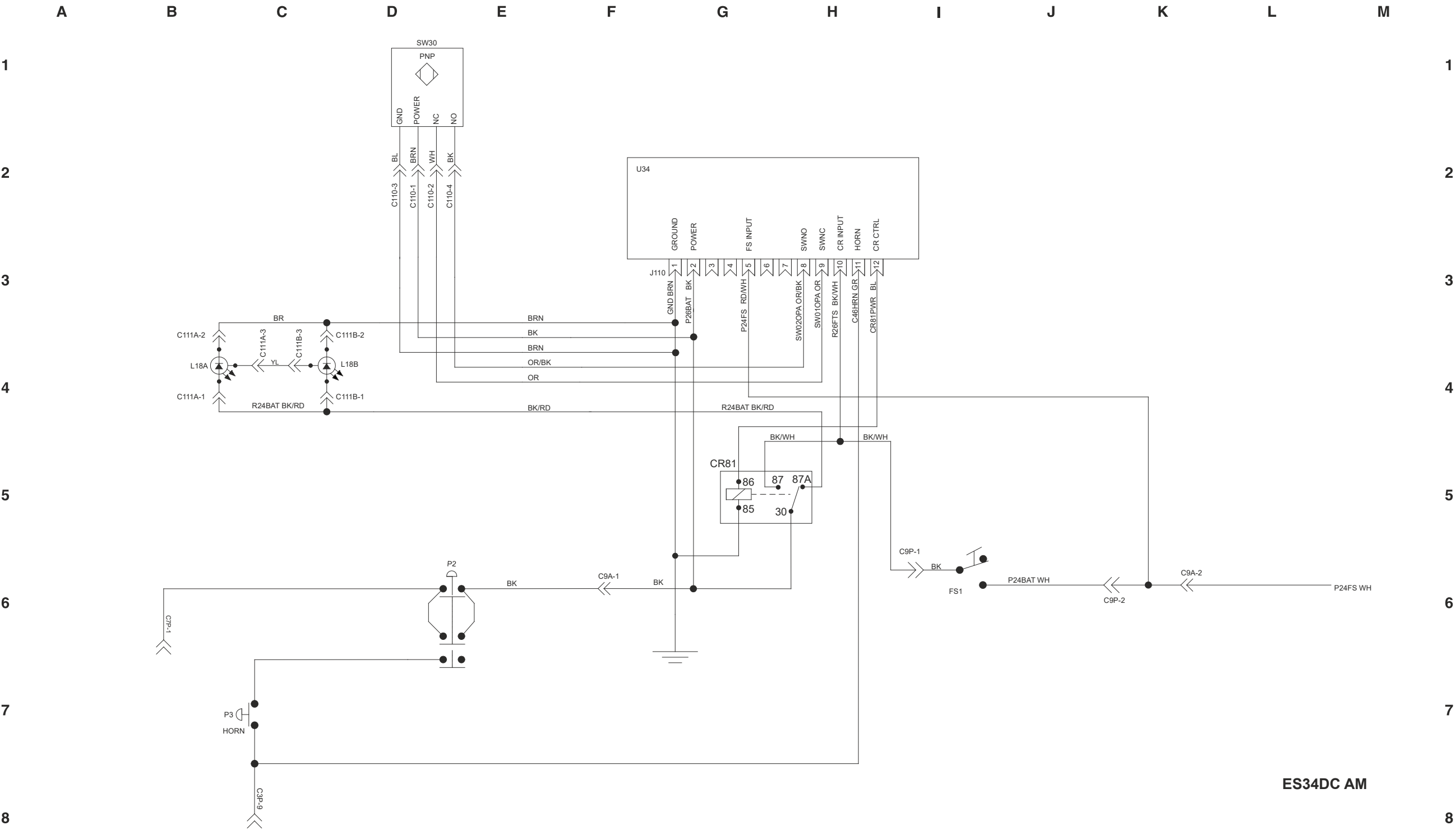
CTE Option, (CE Models)



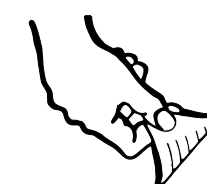
Contact Alarm Option



Contact Alarm Option



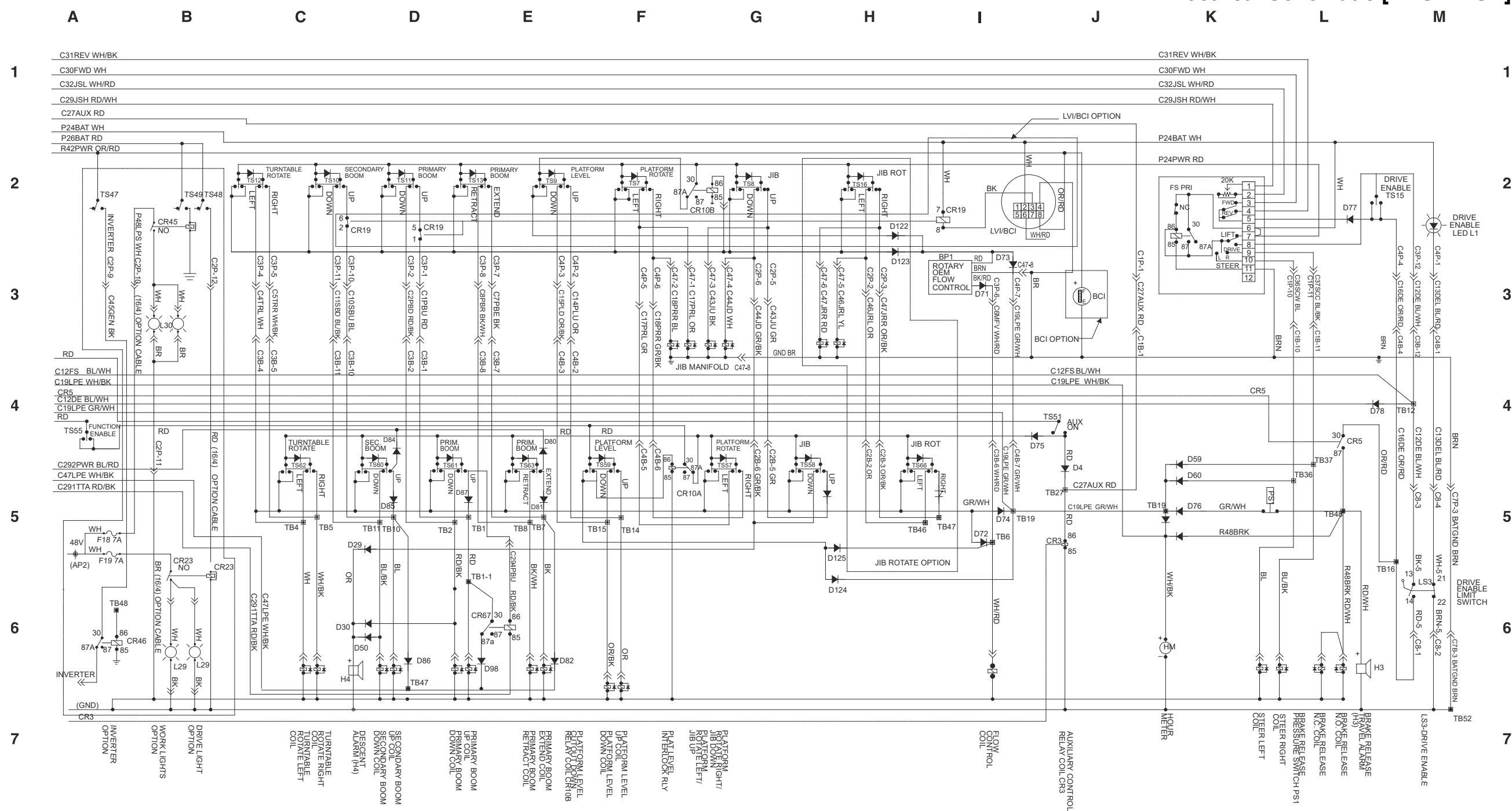
Electrical Schematic [ANSI / CSA]



A	B	C	D	E	F	G	H	I	J	K	L	M
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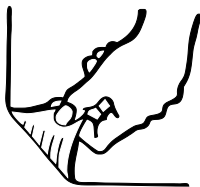


Electrical Schematic [ANSI / CSA]

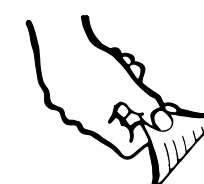


ES34DC AM

Electrical Schematic [ANSI / CSA]



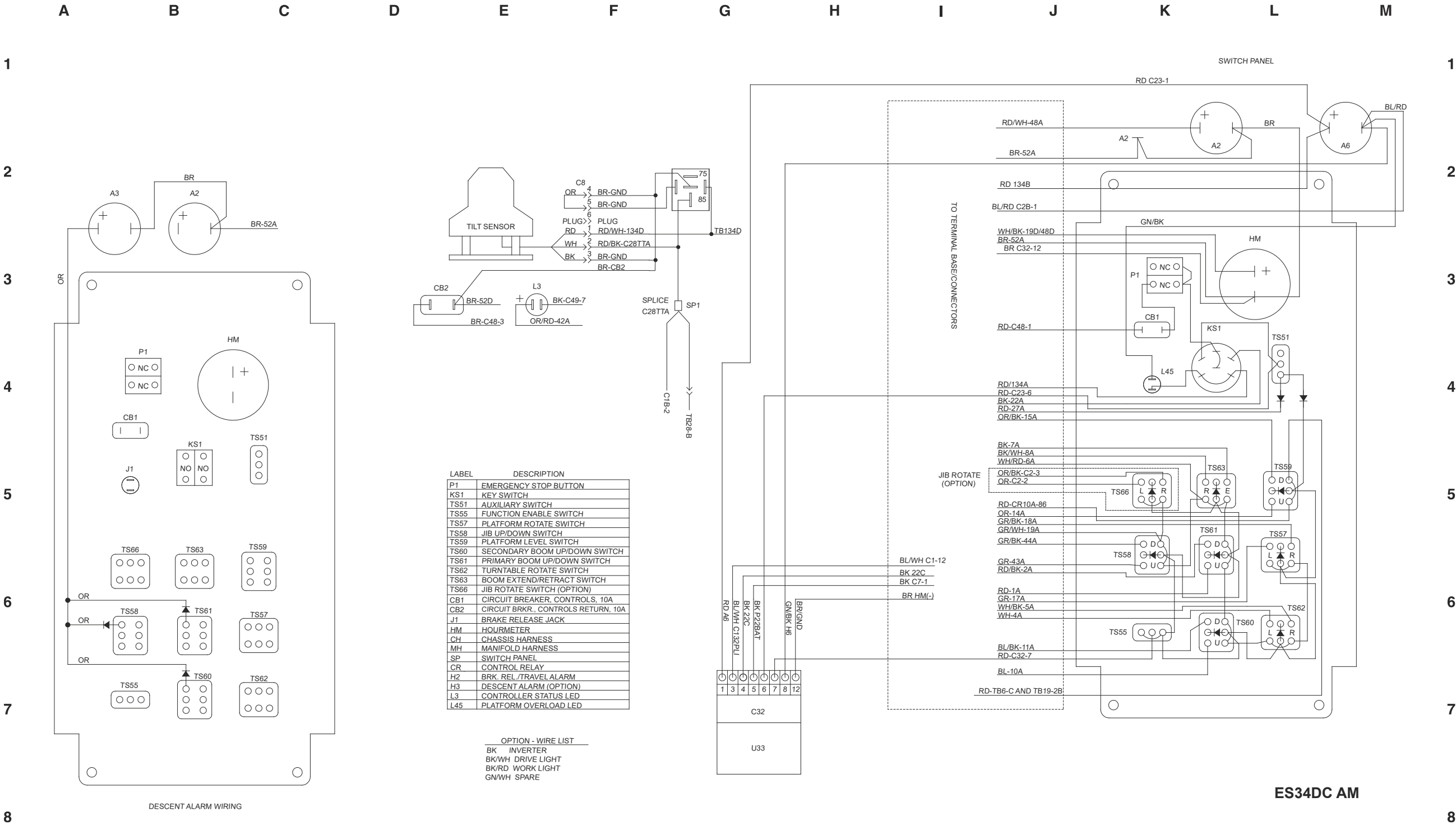
Ground Control Box Terminal Strip Wiring Diagram [ANSI / CSA]



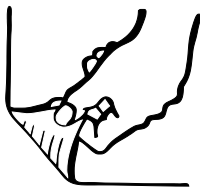
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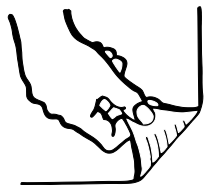
Ground Control Box Switch Panel Wiring Diagram [ANSI / CSA]



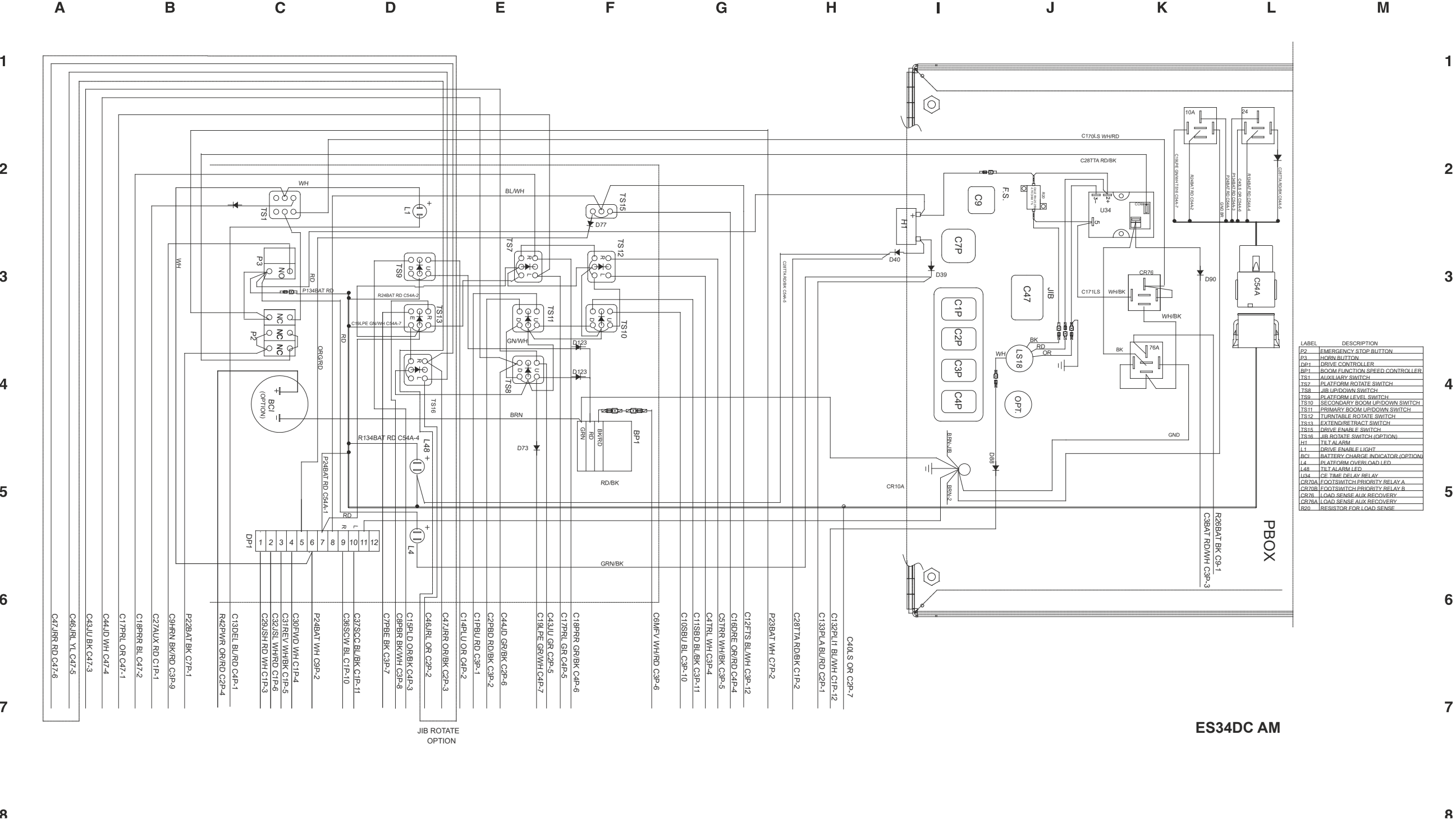
Ground Control Box Switch Panel Wiring Diagram [ANSI / CSA]



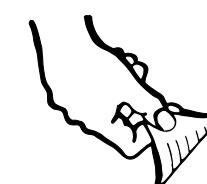
Platform Control Box Wiring Diagram [ANSI / CSA]



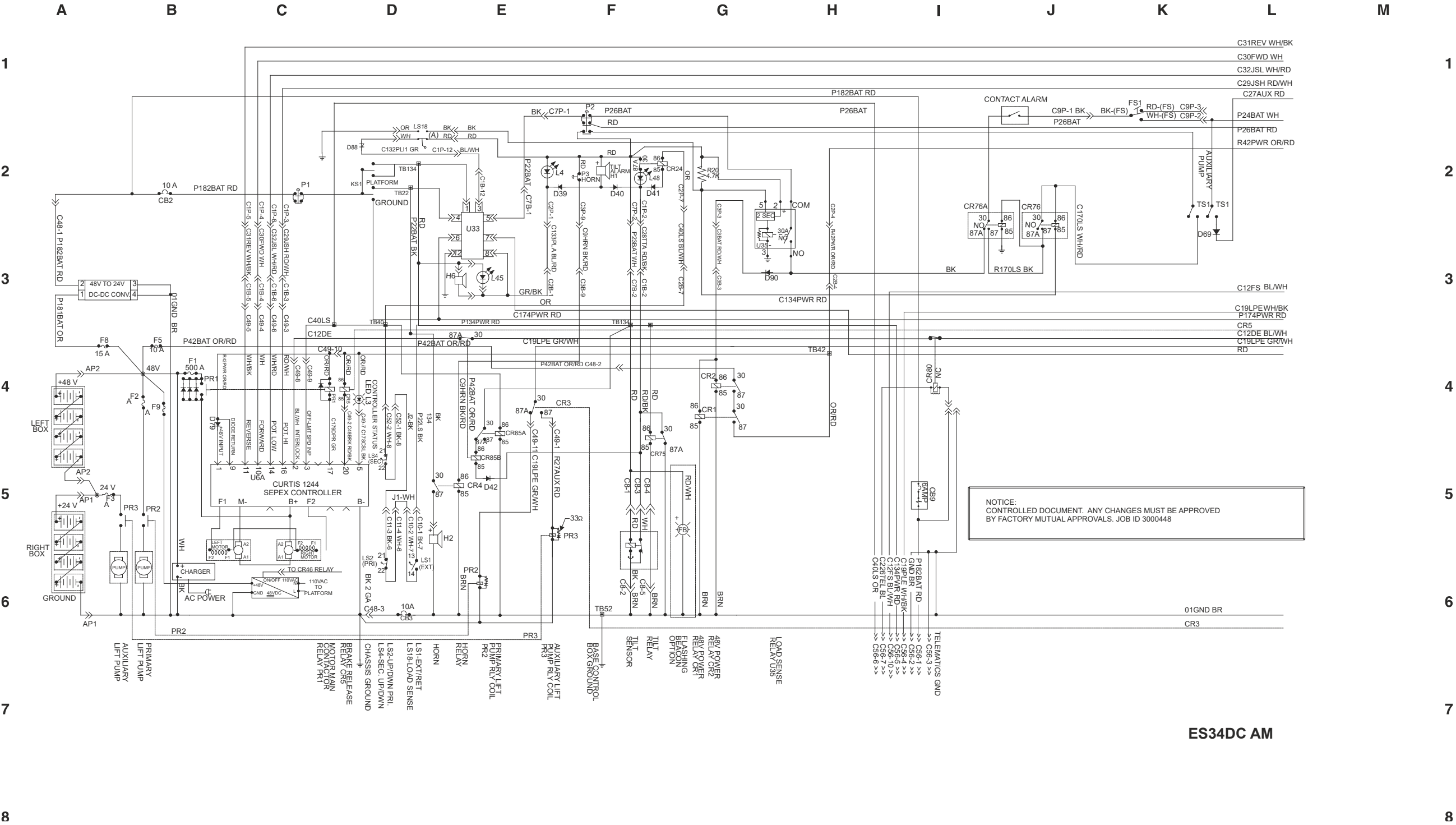
Platform Control Box Wiring Diagram, (ANSI / CSA)



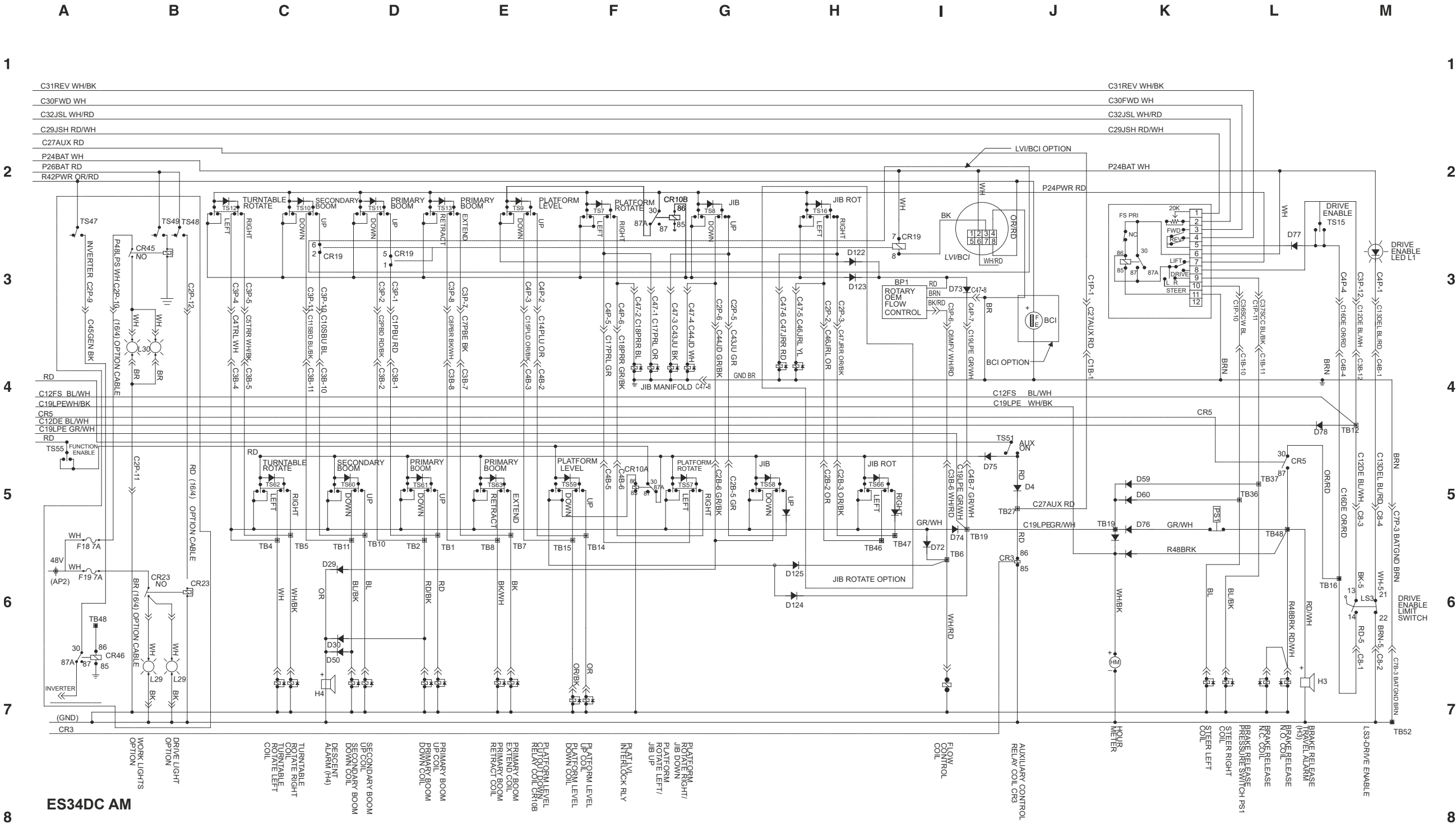
Electrical Schematic [CE / AS]



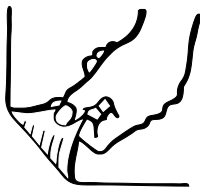
Electrical Schematic [CE / AS]



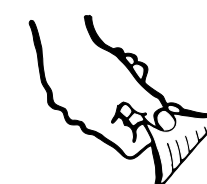
Electrical Schematic [CE / AS]



Electrical Schematic [CE / AS]



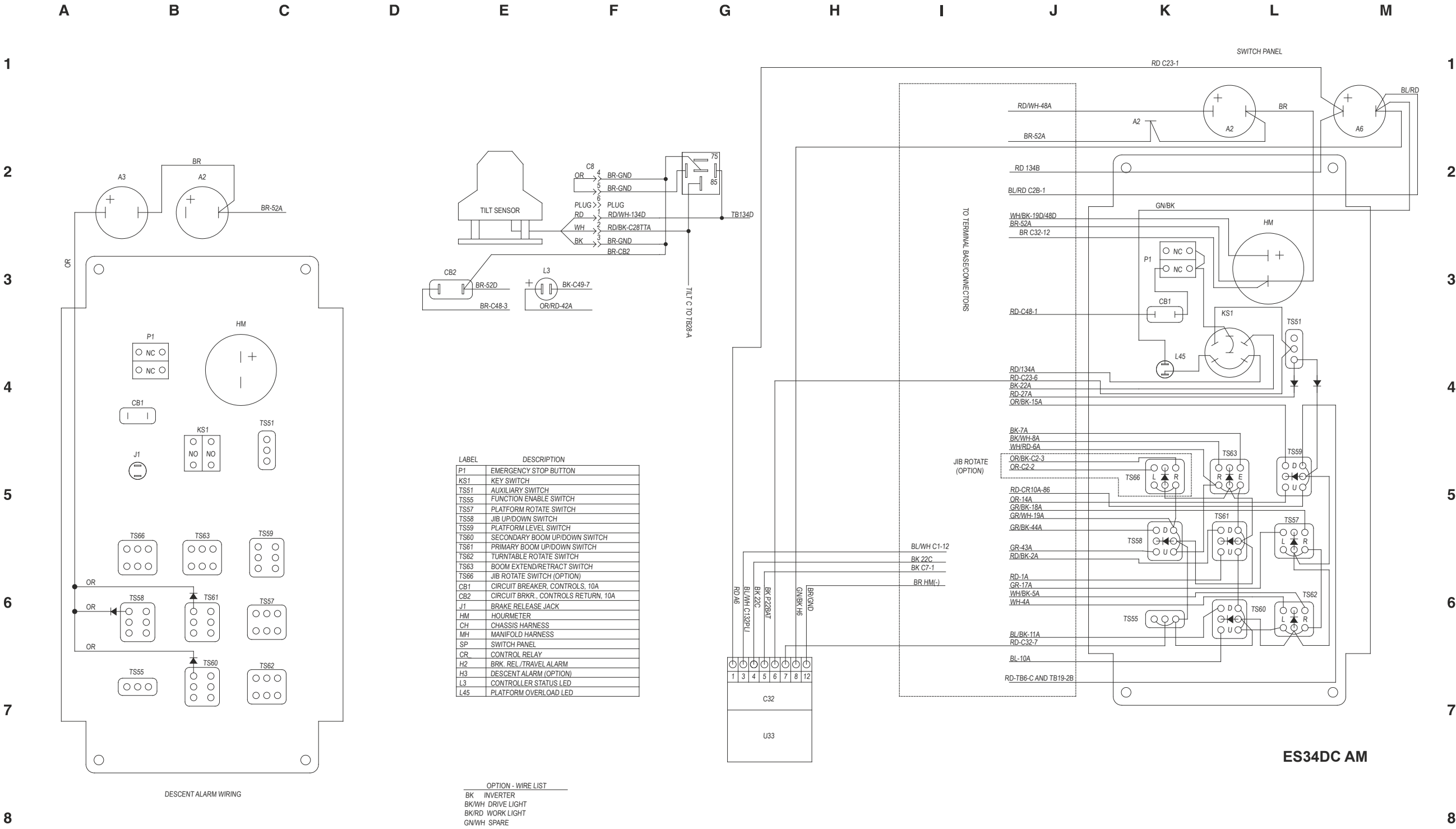
Ground Control Box Terminal Strip Wiring Diagram [CE / AS]



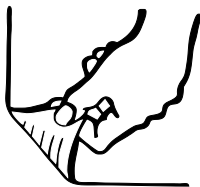
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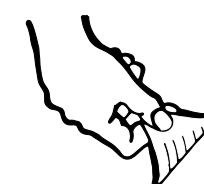


Ground Control Box Switch Panel Wiring Diagram [CE / AS]



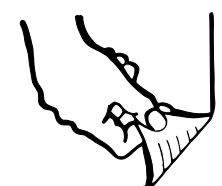
Ground Control Box Switch Panel Wiring Diagram [CE / AS]



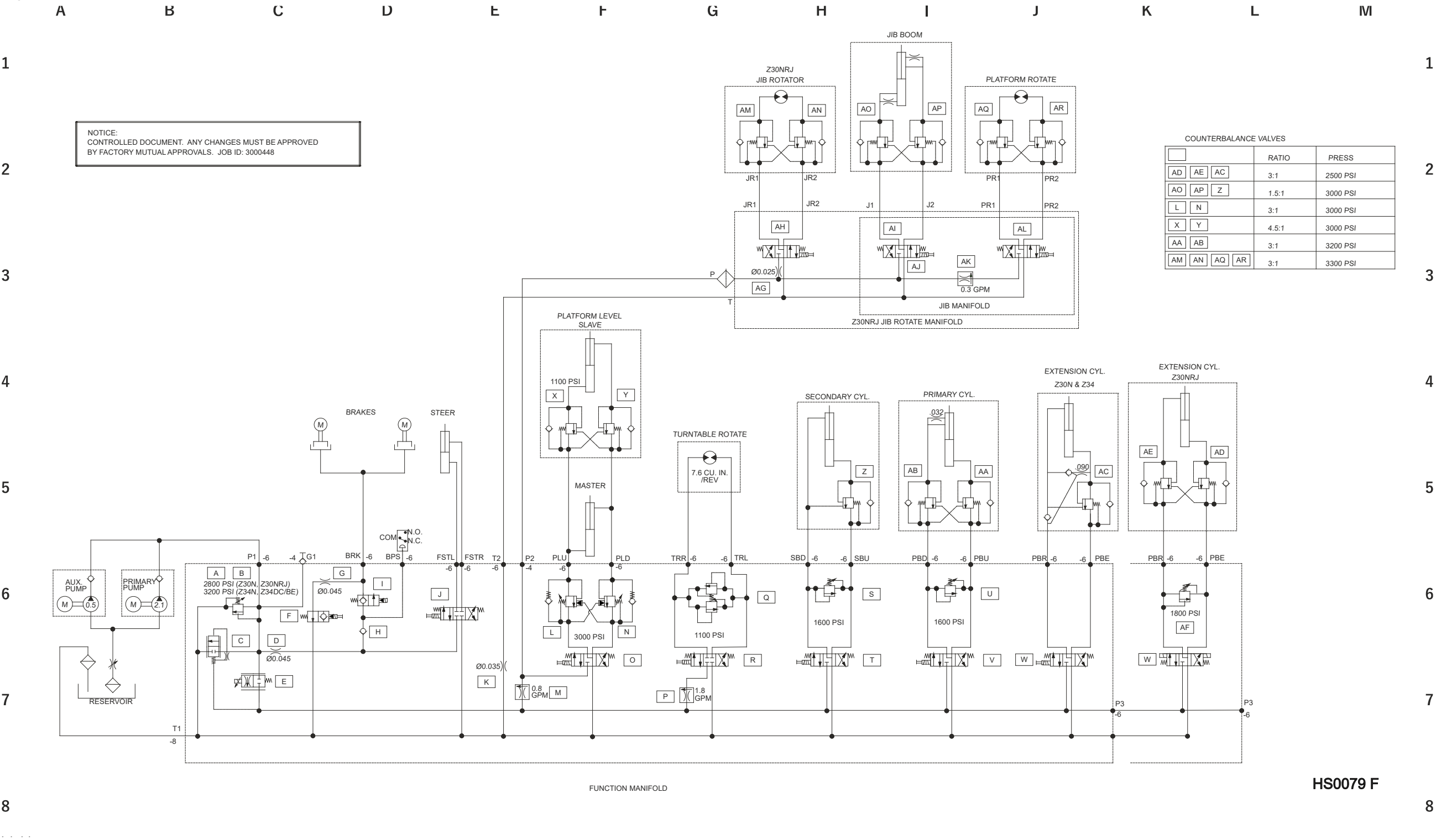
Platform Control Box Wiring Diagram [CE / AS]

Wiring diagram for ES34DC AM. The diagram shows a power distribution system with a terminal block (P1) at the bottom. Various components are connected to the terminal block, including switches (TS1, TS2, TS3, TS4, TS5, TS6, TS7, TS8, TS9, TS10, TS11, TS12, TS13, TS14, TS15, TS16), relays (CR7B, CR7A, CR7C, CR7D, CR7E, CR7F, CR7G, CR7H, CR7I, CR7J, CR7K, CR7L, CR7M, CR7N, CR7O, CR7P, CR7Q, CR7R, CR7S, CR7T, CR7U, CR7V, CR7W, CR7X, CR7Y, CR7Z), and other components like C1P, C2P, C3P, C4P, C5A, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133, C134, C135, C136, C137, C138, C139, C140, C141, C142, C143, C144, C145, C146, C147, C148, C149, C150, C151, C152, C153, C154, C155, C156, C157, C158, C159, C160, C161, C162, C163, C164, C165, C166, C167, C168, C169, C170, C171, C172, C173, C174, C175, C176, C177, C178, C179, C180, C181, C182, C183, C184, C185, C186, C187, C188, C189, C190, C191, C192, C193, C194, C195, C196, C197, C198, C199, C200, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C220, C221, C222, C223, C224, C225, C226, C227, C228, C229, C230, C231, C232, C233, C234, C235, C236, C237, C238, C239, C240, C241, C242, C243, C244, C245, C246, C247, C248, C249, C250, C251, C252, C253, C254, C255, C256, C257, C258, C259, C260, C261, C262, C263, C264, C265, C266, C267, C268, C269, C270, C271, C272, C273, C274, C275, C276, C277, C278, C279, C280, C281, C282, C283, C284, C285, C286, C287, C288, C289, C290, C291, C292, C293, C294, C295, C296, C297, C298, C299, C300, C301, C302, C303, C304, C305, C306, C307, C308, C309, C310, C311, C312, C313, C314, C315, C316, C317, C318, C319, C320, C321, C322, C323, C324, C325, C326, C327, C328, C329, C330, C331, C332, C333, C334, C335, C336, C337, C338, C339, C340, C341, C342, C343, C344, C345, C346, C347, C348, C349, C350, C351, C352, C353, C354, C355, C356, C357, C358, C359, C360, C361, C362, C363, C364, C365, C366, C367, C368, C369, C370, C371, C372, C373, C374, C375, C376, C377, C378, C379, C380, C381, C382, C383, C384, C385, C386, C387, C388, C389, C390, C391, C392, C393, C394, C395, C396, C397, C398, C399, C400, C401, C402, C403, C404, C405, C406, C407, C408, C409, C410, C411, C412, C413, C414, C415, C416, C417, C418, C419, C420, C421, C422, C423, C424, C425, C426, C427, C428, C429, C430, C431, C432, C433, C434, C435, C436, C437, C438, C439, C440, C441, C442, C443, C444, C445, C446, C447, C448, C449, C450, C451, C452, C453, C454, C455, C456, C457, C458, C459, C460, C461, C462, C463, C464, C465, C466, C467, C468, C469, C470, C471, C472, C473, C474, C475, C476, C477, C478, C479, C480, C481, C482, C483, C484, C485, C486, C487, C488, C489, C490, C491, C492, C493, C494, C495, C496, C497, C498, C499, C500, C501, C502, C503, C504, C505, C506, C507, C508, C509, C510, C511, C512, C513, C514, C515, C516, C517, C518, C519, C520, C521, C522, C523, C524, C525, C526, C527, C528, C529, C530, C531, C532, C533, C534, C535, C536, C537, C538, C539, C540, C541, C542, C543, C544, C545, C546, C547, C548, C549, C550, C551, C552, C553, C554, C555, C556, C557, C558, C559, C560, C561, C562, C563, C564, C565, C566, C567, C568, C569, C570, C571, C572, C573, C574, C575, C576, C577, C578, C579, C580, C581, C582, C583, C584, C585, C586, C587, C588, C589, C590, C591, C592, C593, C594, C595, C596, C597, C598, C599, C600, C601, C602, C603, C604, C605, C606, C607, C608, C609, C610, C611, C612, C613, C614, C615, C616, C617, C618, C619, C620, C621, C622, C623, C624, C625, C626, C627, C628, C629, C630, C631, C632, C633, C634, C635, C636, C637, C638, C639, C640, C641, C642, C643, C644, C645, C646, C647, C648, C649, C650, C651, C652, C653, C654, C655, C656, C657, C658, C659, C660, C661, C662, C663, C664, C665, C666, C667, C668, C669, C670, C671, C672, C673, C674, C675, C676, C677, C678, C679, C680, C681, C682, C683, C684, C685, C686, C687, C688, C689, C690, C691, C692, C693, C694, C695, C696, C697, C698, C699, C700, C701, C702, C703, C704, C705, C706, C707, C708, C709, C710, C711, C712, C713, C714, C715, C716, C717, C718, C719, C720, C721, C722, C723, C724, C725, C726, C727, C728, C729, C730, C731, C732, C733, C734, C735, C736, C737, C738, C739, C740, C741, C742, C743, C744, C745, C746, C747, C748, C749, C750, C751, C752, C753, C754, C755, C756, C757, C758, C759, C760, C761, C762, C763, C764, C765, C766, C767, C768, C769, C770, C771, C772, C773, C774, C775, C776, C777, C778, C779, C780, C781, C782, C783, C784, C785, C

Hydraulic Schematic



Hydraulic Schematic



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.