



Service Manual

Serial Number Range

ZTM-30/20N

from Z30N-5934 to
Z30N08-11499

ZTM-30/20N RJ

Part No. 106373

Rev C

June 2008

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the *Genie Z-30/20N Operator's Manual* before attempting any maintenance or repair procedure.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting fault codes 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.

Technical Publications

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

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

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Serial Number Information

Genie Industries offers the following Service Manuals for these models:

| Title | Part No. |
|--|----------|
| Z-30/20N Service Manual (before serial number 5934) | 35532 |
| Z-30/20N Service Manual (after serial number 11499) | 139378 |

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Safety Rules



Danger

Failure to obey the instructions and safety rules in this manual and the *Genie Z-30/20N Operator's Manual* will result in death or serious injury.

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

Do Not Perform Maintenance Unless:

- You are trained and qualified to perform maintenance on this machine.
- You read, understand and obey:
 - manufacturer's instructions and safety rules
 - employer's safety rules and worksite regulations
 - applicable governmental regulations
- You have the appropriate tools, lifting equipment and a suitable workshop.

SAFETY RULES

Personal Safety

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



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 an 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

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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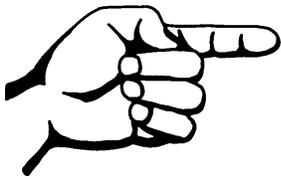
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Specifications

REV E

Machine Specifications

Tires and wheels

| | |
|--------------------------|-------------------------------------|
| Tire size (solid rubber) | 22 x 7 x 18.4 in 56 x 18 x 47 cm |
| Load range | 7600 lbs 3447 kg |
| Overall tire diameter | 22 in 56 cm |
| Wheel diameter | 18.4 in 47 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 | 94 ft-lbs 127.4 Nm |

Fluid Capacities

| | |
|--|-----------------------------|
| Hydraulic tank capacity | 4 gallons 15.1 liters |
| Hydraulic system capacity (including tank) | 6 gallons 22.7 liters |
| Drive hubs | |
| 61:1 | 23 ounces 0.68 liter |
| 62.5:1 | 25.6 ounces 0.76 liter |
| Drive hub oil type: | |
| SAE 90 multipurpose hypoid gear oil API service classification GL5 | |

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

Performance Specifications

Drive speed, maximum

| | |
|-------------------------|--|
| Stowed position | 3.3 mph 5.3 km/h 40 ft / 8.2 sec 12.2 m / 8.2 sec |
| Boom raised or extended | 0.6 mph 1 km/h 40 ft / 44 sec 12.2 m / 44 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 | 26 to 32 seconds |
| Jib boom down | 23 to 29 seconds |
| Jib boom rotate, 200° (before serial number 8333) | 12 to 18 seconds |
| Jib boom rotate, 180° (after serial number 8332) | 12 to 18 seconds |
| Primary boom up | 14 to 22 seconds |
| Primary boom down | 12 to 20 seconds |
| Primary boom extend (models with rotating jib boom) | 14 to 24 seconds |
| (models without rotating jib boom) | 9 to 15 seconds |
| Primary boom retract | 12 to 18 seconds |
| Secondary boom up | 11 to 18 seconds |
| Secondary boom down | 7 to 15 seconds |
| Turntable rotate, 355° | 62 to 68 seconds |
| Platform rotate, 160° | 5 to 11 seconds |
| Platform level up | 14 to 19 seconds |
| Platform level down | 13 to 18 seconds |



SPECIFICATIONS

REV E

Hydraulic Oil Specifications

Hydraulic Oil Specifications

| | |
|----------------------------|-----------------------------|
| Hydraulic oil type | Chevron Rykon MV equivalent |
| Viscosity grade | Multi-viscosity |
| Viscosity index | 200 |
| Cleanliness level, minimum | 15/13 |
| Water content, maximum | 200 ppm |

Chevron Rykon MV oil is fully compatible and mixable with Shell Donax TG (Dexron III) oils.

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, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

Optional fluids

| | |
|----------------|--|
| Biodegradable | Petro Canada Environ MV46 Statoil Hydra Way Bio Pa 32 BP Biohyd SE-S |
| Fire resistant | UCON Hydrolube HP-5046 Quintolubric 822 |
| Mineral based | Shell Tellus T32 Shell Tellus T46 Chevron Aviation A |

NOTICE

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

Note: Use Chevron Aviation A hydraulic fluid when ambient temperatures are consistently below 0°F / -18°C.

Note: Use Shell Tellus T46 hydraulic oil when oil temperatures consistently exceed 205°F / 96°C.

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

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REV E

SPECIFICATIONS

Hydraulic Component Specifications

Function pump

| | |
|-----------------------------------|---|
| Type: | Fixed displacement gear pump |
| Displacement | 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 | 2800 psi 193 bar |
| Primary boom down relief 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 | 0.3 gpm 1.14 L/min |

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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, 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 |

SPECIFICATIONS

REV E

Machine Torque Specifications

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

| | |
|---|----------------------|
| 1-8 center bolt, GR 5, lubricated (Jib boom rotator) | 480 ft-lbs 650 Nm |
| 3/4 -10 bolt, GR 8, lubricated (Platform rotator) | 280 ft-lbs 379 Nm |
| 3/8 -16 bolts, GR 5, lubricated (Platform rotator) | 23 ft-lbs 31 Nm |
| 1/2 -13 bolts, GR 5, lubricated (Jib boom rotator) | 57 ft-lbs 77 Nm |

Platform rotator (Z-30/20N)

| | |
|---------------------------------|----------------------|
| 3/4 -10 bolt, GR 8, lubricated | 280 ft-lbs 379 Nm |
| 3/8 -16 bolts, GR 5, lubricated | 23 ft-lbs 31 Nm |

Turntable rotate bearing

| | |
|---|----------------------|
| Rotate bearing mounting bolts, lubricated | 180 ft-lbs 244 Nm |
|---|----------------------|

Drive hubs, brakes and motors

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

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REV E

SPECIFICATIONS

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® 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.

SAE O-ring Boss Port

(tube fitting - installed into Aluminum)

| SAE Dash size | Torque |
|---------------|-----------------------|
| -4 | 11 ft-lbs / 14.9 Nm |
| -6 | 23 ft-lbs / 31.2 Nm |
| -8 | 40 ft-lbs / 54.2 Nm |
| -10 | 69 ft-lbs / 93.6 Nm |
| -12 | 93 ft-lbs / 126.1 Nm |
| -16 | 139 ft-lbs / 188.5 Nm |
| -20 | 172 ft-lbs / 233.2 Nm |
| -24 | 208 ft-lbs / 282 Nm |

SAE O-ring Boss Port

(tube fitting - installed into Steel)

| SAE Dash size | Torque |
|---------------|-----------------------|
| -4 | 16 ft-lbs / 21.7 Nm |
| -6 | 35 ft-lbs / 47.5 Nm |
| -8 | 60 ft-lbs / 81.3 Nm |
| -10 | 105 ft-lbs / 142.4 Nm |
| -12 | 140 ft-lbs / 190 Nm |
| -16 | 210 ft-lbs / 284.7 Nm |
| -20 | 260 ft-lbs / 352.5 Nm |
| -24 | 315 ft-lbs / 427.1 Nm |

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-rings used in the Parker Seal Lok® fittings and hose ends are custom-size O-rings. They are not standard SAE 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 that the face seal O-ring 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 per given size as shown in the table.
- 6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.

Seal-Lok® Fittings

(hose end)

| SAE Dash size | Torque |
|---------------|-----------------------|
| -4 | 18 ft-lbs / 24.4 Nm |
| -6 | 27 ft-lbs / 36.6 Nm |
| -8 | 40 ft-lbs / 54.2 Nm |
| -10 | 63 ft-lbs / 85.4 Nm |
| -12 | 90 ft-lbs / 122 Nm |
| -16 | 120 ft-lbs / 162.7 Nm |
| -20 | 140 ft-lbs / 190 Nm |
| -24 | 165 ft-lbs / 223.7 Nm |

SPECIFICATIONS

REV E

| SAE FASTENER TORQUE CHART | | | | | | | | | | | |
|--|--------|---|-------|--------|-------|---|-------|--------|-------|--------------------------------------|------|
| • This chart is to be used as a guide only unless noted elsewhere in this manual • | | | | | | | | | | | |
| SIZE | THREAD | Grade 5  | | | | Grade 8  | | | | A574 High Strength Black Oxide Bolts | |
| | | LUBED | | DRY | | LUBED | | DRY | | LUBED | |
| | | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm |
| 1/4 | 20 | 80 | 9 | 100 | 11.3 | 110 | 12.4 | 140 | 15.8 | 130 | 14.7 |
| | 28 | 90 | 10.1 | 120 | 13.5 | 120 | 13.5 | 160 | 18 | 140 | 15.8 |
| | | LUBED | | DRY | | LUBED | | DRY | | LUBED | |
| | | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm |
| 5/16 | 18 | 13 | 17.6 | 17 | 23 | 18 | 24 | 25 | 33.9 | 21 | 28.4 |
| | 24 | 14 | 19 | 19 | 25.7 | 20 | 27.1 | 27 | 36.6 | 24 | 32.5 |
| 3/8 | 16 | 23 | 31.2 | 31 | 42 | 33 | 44.7 | 44 | 59.6 | 38 | 51.5 |
| | 24 | 26 | 35.2 | 35 | 47.4 | 37 | 50.1 | 49 | 66.4 | 43 | 58.3 |
| 7/16 | 14 | 37 | 50.1 | 49 | 66.4 | 50 | 67.8 | 70 | 94.7 | 61 | 82.7 |
| | 20 | 41 | 55.5 | 55 | 74.5 | 60 | 81.3 | 80 | 108.4 | 68 | 92.1 |
| 1/2 | 13 | 57 | 77.3 | 75 | 101.6 | 80 | 108.4 | 110 | 149 | 93 | 126 |
| | 20 | 64 | 86.7 | 85 | 115 | 90 | 122 | 120 | 162 | 105 | 142 |
| 9/16 | 12 | 80 | 108.4 | 110 | 149 | 120 | 162 | 150 | 203 | 130 | 176 |
| | 18 | 90 | 122 | 120 | 162 | 130 | 176 | 170 | 230 | 140 | 189 |
| 5/8 | 11 | 110 | 149 | 150 | 203 | 160 | 217 | 210 | 284 | 180 | 244 |
| | 18 | 130 | 176 | 170 | 230 | 180 | 244 | 240 | 325 | 200 | 271 |
| 3/4 | 10 | 200 | 271 | 270 | 366 | 280 | 379 | 380 | 515 | 320 | 433 |
| | 16 | 220 | 298 | 300 | 406 | 310 | 420 | 420 | 569 | 350 | 474 |
| 7/8 | 9 | 320 | 433 | 430 | 583 | 450 | 610 | 610 | 827 | 510 | 691 |
| | 14 | 350 | 474 | 470 | 637 | 500 | 678 | 670 | 908 | 560 | 759 |
| 1 | 8 | 480 | 650 | 640 | 867 | 680 | 922 | 910 | 1233 | 770 | 1044 |
| | 12 | 530 | 718 | 710 | 962 | 750 | 1016 | 990 | 1342 | 840 | 1139 |
| 1 1/8 | 7 | 590 | 800 | 790 | 1071 | 970 | 1315 | 1290 | 1749 | 1090 | 1477 |
| | 12 | 670 | 908 | 890 | 1206 | 1080 | 1464 | 1440 | 1952 | 1220 | 1654 |
| 1 1/4 | 7 | 840 | 1138 | 1120 | 1518 | 1360 | 1844 | 1820 | 2467 | 1530 | 2074 |
| | 12 | 930 | 1260 | 1240 | 1681 | 1510 | 2047 | 2010 | 2725 | 1700 | 2304 |
| 1 1/2 | 6 | 1460 | 1979 | 1950 | 2643 | 2370 | 3213 | 3160 | 4284 | 2670 | 3620 |
| | 12 | 1640 | 2223 | 2190 | 2969 | 2670 | 3620 | 3560 | 4826 | 3000 | 4067 |

| METRIC FASTENER TORQUE CHART | | | | | | | | | | | | | | | | |
|--|---|------|--------|------|---|------|--------|------|--|------|--------|------|--|------|--------|------|
| • This chart is to be used as a guide only unless noted elsewhere in this manual • | | | | | | | | | | | | | | | | |
| Size (mm) | Class 4.6  | | | | Class 8.8  | | | | Class 10.9  | | | | Class 12.9  | | | |
| | LUBED | | DRY | | LUBED | | DRY | | LUBED | | DRY | | LUBED | | DRY | |
| | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm |
| 5 | 16 | 1.8 | 21 | 2.4 | 41 | 4.63 | 54 | 6.18 | 58 | 6.63 | 78 | 8.84 | 68 | 7.75 | 91 | 10.3 |
| 6 | 19 | 3.05 | 36 | 4.07 | 69 | 7.87 | 93 | 10.5 | 100 | 11.3 | 132 | 15 | 116 | 13.2 | 155 | 17.6 |
| 7 | 45 | 5.12 | 60 | 6.83 | 116 | 13.2 | 155 | 17.6 | 167 | 18.9 | 223 | 25.2 | 1.95 | 22.1 | 260 | 29.4 |
| | LUBED | | DRY | | LUBED | | DRY | | LUBED | | DRY | | LUBED | | DRY | |
| | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm | ft-lbs | Nm |
| 8 | 5.4 | 7.41 | 7.2 | 9.88 | 14 | 19.1 | 18.8 | 25.5 | 20.1 | 27.3 | 26.9 | 36.5 | 23.6 | 32 | 31.4 | 42.6 |
| 10 | 10.8 | 14.7 | 14.4 | 19.6 | 27.9 | 37.8 | 37.2 | 50.5 | 39.9 | 54.1 | 53.2 | 72.2 | 46.7 | 63.3 | 62.3 | 84.4 |
| 12 | 18.9 | 25.6 | 25.1 | 34.1 | 48.6 | 66 | 64.9 | 88 | 69.7 | 94.5 | 92.2 | 125 | 81 | 110 | 108 | 147 |
| 14 | 30.1 | 40.8 | 40 | 54.3 | 77.4 | 105 | 103 | 140 | 110 | 150 | 147 | 200 | 129 | 175 | 172 | 234 |
| 16 | 46.9 | 63.6 | 62.5 | 84.8 | 125 | 170 | 166 | 226 | 173 | 235 | 230 | 313 | 202 | 274 | 269 | 365 |
| 18 | 64.5 | 87.5 | 86.2 | 117 | 171 | 233 | 229 | 311 | 238 | 323 | 317 | 430 | 278 | 377 | 371 | 503 |
| 20 | 91 | 124 | 121 | 165 | 243 | 330 | 325 | 441 | 337 | 458 | 450 | 610 | 394 | 535 | 525 | 713 |
| 22 | 124 | 169 | 166 | 225 | 331 | 450 | 442 | 600 | 458 | 622 | 612 | 830 | 536 | 727 | 715 | 970 |
| 24 | 157 | 214 | 210 | 285 | 420 | 570 | 562 | 762 | 583 | 791 | 778 | 1055 | 682 | 925 | 909 | 1233 |



Scheduled Maintenance Procedures



Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly, six months, annually and every 2 years as specified on the *Maintenance Inspection Report*.

⚠ WARNING Failure to properly complete each inspection when required could result in death, serious injury or substantial machine damage.

- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating machine.
- ☑ Use only Genie approved replacement parts.
- ☑ Unless otherwise specified, perform each procedure with the machine in the following configuration:
 - Machine parked on a firm, level surface
 - Boom in the stowed position
 - Turntable rotated with the boom between the non-steer wheels
 - Key switch in the off position with the key removed
 - Wheels chocked
 - All external AC power supply disconnected from the machine

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

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

Symbols Legend



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



Indicates an 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.

SCHEDULED MAINTENANCE PROCEDURES

Maintenance Symbols Legend

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



Indicates that tools will be required to perform this procedure.



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



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



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

Maintenance Schedule

There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, six months, annual, and two year. The *Scheduled Maintenance Procedures Section* and the *Maintenance Inspection Report* have been divided into five subsections—A, B, C, D and E. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

| Inspection | Checklist |
|-------------------------------|-------------------|
| Daily or every 8 hours | A |
| Quarterly or every 250 hours | A + B |
| Six months or every 500 hours | A + B + C |
| Annual or every 1000 hours | A + B + C + D |
| Two year or every 2000 hours | A + B + C + D + E |

Maintenance Inspection Report

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

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

Pre-Delivery Preparation

Fundamentals

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

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

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

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

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

Instructions

Use the operator's manual on your machine.

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

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

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

Legend

Y = yes, completed

N = no, unable to complete

R = repaired

Comments

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

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company



Genie Industries USA
18340 NE 76th Street
PO Box 97030
Redmond, WA 98073-9730
(425) 881-1800

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



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Maintenance Inspection Report

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

Instructions

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

| | | |
|--------------------------|--|------------------|
| <input type="checkbox"/> | Daily or 8 hour Inspection: | A |
| <input type="checkbox"/> | Quarterly or 250 hour Inspection: | A+B |
| <input type="checkbox"/> | Six Month or 500 hour Inspection: | A+B+C |
| <input type="checkbox"/> | Annual or 1000 hours Inspection: | A+B+C+D |
| <input type="checkbox"/> | 2 Year or 2000 hour Inspection: | A+B+C+D+E |

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

Legend

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

| Checklist A - Rev D | Y | N | R |
|------------------------------|----------|----------|----------|
| A-1 Manuals and decals | | | |
| A-2 Pre-operation inspection | | | |
| A-3 Function tests | | | |

Perform after 40 hours:

| | | | |
|--------------------|--|--|--|
| A-4 30 Day Service | | | |
|--------------------|--|--|--|

Perform every 100 hours:

| | | | |
|-----------------------------|--|--|--|
| A-5 Grease rotation bearing | | | |
|-----------------------------|--|--|--|

Perform after 150 hours:

| | | | |
|---------------------------|--|--|--|
| A-6 Replace drive hub oil | | | |
|---------------------------|--|--|--|

| Checklist B - Rev E | Y | N | R |
|----------------------------------|----------|----------|----------|
| B-1 Batteries | | | |
| B-2 Electrical wiring | | | |
| B-3 Key switch | | | |
| B-4 Tires and Wheels | | | |
| B-5 Brake configuration | | | |
| B-6 Drive hub oil level | | | |
| B-7 Ground control override | | | |
| B-8 Platform leveling | | | |
| B-9 Drive brakes | | | |
| B-10 Drive speed-stowed | | | |
| B-11 Drive speed-raised | | | |
| B-12 Alarm package (if equipped) | | | |
| B-13 Turntable rotation stop | | | |
| B-14 Electrical contactors | | | |
| B-15 Hydraulic oil analysis | | | |

| Checklist C - Rev D | Y | N | R |
|--|----------|----------|----------|
| C-1 Grease platform overload (if equipped) | | | |
| C-2 Test platform overload (if equipped) | | | |

| Checklist D - Rev D | Y | N | R |
|------------------------------|----------|----------|----------|
| D-1 Boom wear pads | | | |
| D-2 Free-wheel configuration | | | |
| D-3 Turntable bearing bolts | | | |
| D-4 Drive hub oil | | | |
| D-5 Hydraulic return filter | | | |
| D-6 Turntable bearing wear | | | |

| Checklist E - Rev D | Y | N | R |
|----------------------------|----------|----------|----------|
| E-1 Hydraulic oil | | | |
| E-2 Wheel bearings | | | |

Comments

Checklist A Procedures

REV D

A-1 Inspect the Manuals and Decals

Note: Genie specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Maintaining the operator's and safety manuals in good condition is essential to safe machine operation. Manuals are included with each machine and should be stored in the container provided in the platform. An illegible or missing manual will not provide safety and operational information necessary for a safe operating condition.

In addition, maintaining all of the safety and instructional decals in good condition is mandatory for safe machine operation. Decals alert operators and personnel to the many possible hazards associated with using this machine. They also provide users with operation and maintenance information. An illegible decal will fail to alert personnel of a procedure or hazard and could result in unsafe operating conditions.

- 1 Check to make sure that the operator's and safety manuals are present and complete in the storage container on the platform.
 - 2 Examine the pages of each manual to be sure that they are legible and in good condition.
- ⦿ Result: The operator's manual is appropriate for the machine and all manuals are legible and in good condition.
 - ✗ Result: The operator's manual is not appropriate for the machine or all manuals are not in good condition or are illegible. Remove the machine from service until the manual is replaced.

- 3 Open the operator's manual to the decals inspection section. Carefully and thoroughly inspect all decals on the machine for legibility and damage.
- ⦿ Result: The machine is equipped with all required decals, and all decals are legible and in good condition.
 - ✗ Result: The machine is not equipped with all required decals, or one or more decals are illegible or in poor condition. Remove the machine from service until the decals are replaced.
- 4 Always return the manuals to the storage container after use.

Note: Contact your authorized Genie distributor or Genie Industries if replacement manuals or decals are needed.

REV D

CHECKLIST A PROCEDURES

A-2 Perform Pre-operation Inspection

Note: Genie specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Completing a pre-operation inspection is essential to safe machine operation. The pre-operation inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The pre-operation inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the appropriate *Genie Z-30/20N Operator's Manual*. Refer to the Operator's Manual on your machine.

A-3 Perform Function Tests

Note: Genie specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the appropriate *Genie Z-30/20N Operator's Manual*. Refer to the Operator's Manual on your machine.

CHECKLIST A PROCEDURES

REV D

A-4 Perform 30 Day Service



The 30 day maintenance procedure is a one-time sequence of procedures to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

1 Perform the following maintenance procedures:

- A-5 Grease the Turntable Rotation Bearing and Worm Drive Gear
- B-4 Check the Tires, Wheels and Lug Nut Torque
- D-3 Check the Turntable Rotation Bearing Bolts
- D-5 Replace the Hydraulic Tank Return Filter Element

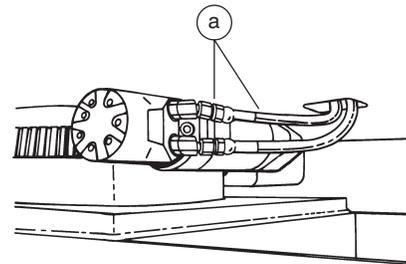
A-5 Grease the Turntable Rotation Bearing and Worm Drive Gear



Note: Genie specifications require that this procedure be performed every 100 hours.

Frequent application of lubrication to the turntable bearing and worm drive gear is essential to good machine performance and service life. Continued use of an insufficiently greased gear will result in component damage.

- 1 Locate the grease fitting on the tank side turntable cover bulkhead.
- 2 Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches / 10 to 13 cm at a time and repeat this step until the entire bearing has been greased.
- 3 Locate the 2 grease fittings on top of the worm drive housing.



a grease fittings

- 4 Pump grease into the gear until you see it coming out of the side of the gear housing.
- 5 Grease each tooth on the outside of the turntable rotation bearing.

Grease Specification

Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

REV D

CHECKLIST A PROCEDURES

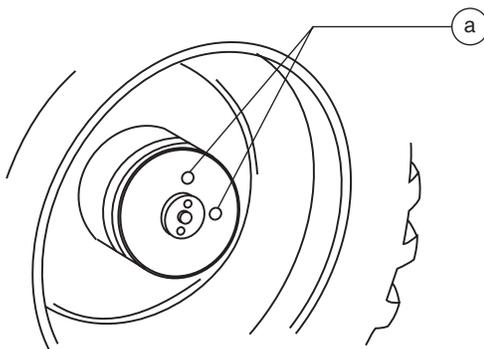
A-6 Replace the Drive Hub Oil



Note: Manufacturer drive hub specifications require that this one-time procedure be performed after the first 150 hours.

Replacing the drive hub oil is essential for good machine performance and service life. Failure to replace the drive hub oil after the first 150 hours of use may cause the machine to perform poorly and continued use may cause component damage.

- 1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.
- 2 Remove both plugs and drain the oil into a suitable container.
- 3 Drive the machine until one plug is at the top and the other is at 90 degrees.



a drive hub plugs

- 4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side plug hole. Refer to Section 2, *Specifications*.
- 5 Install the plugs into the drive hub.
- 6 Repeat this procedure for the other drive hub.

Checklist B Procedures

REV E

B-1

Check the Batteries



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

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

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

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

- 1 Disconnect each battery pack from the machine.
- 2 Release the battery pack latches and rotate each battery pack out and away from the chassis.
- 3 Remove the cover from each battery box.
- 4 Be sure that the battery cable connections are free of corrosion.

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

- 5 Be sure that the battery retainers and cable connections are tight.
- 6 Fully charge the batteries. Allow the batteries to rest 24 hours before continuing this procedure to allow the battery cells to equalize.
- 7 Put on protective clothing and eye wear.
- 8 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.
- 9 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:
 - Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
 - Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.
- ⊙ Result: All battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to step 13.
- ⊗ Result: One or more battery cells display a specific gravity of 1.217 or below. Proceed to step 10.
- 10 Perform an equalizing charge OR fully charge the batteries and allow the batteries to rest at least 6 hours.
- 11 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.

REV E

CHECKLIST B PROCEDURES

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

- Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
- Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.
- ⦿ Result: All battery cells display a specific gravity of 1.277 or greater. The battery is fully charged. Proceed to step 13.
- ⊗ Result: The difference in specific gravity readings between cells is greater than 0.1 OR the specific gravity of one or more cells is less than 1.217. Replace the battery.

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

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

B-2 Inspect the Electrical Wiring



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

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

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

- 1 Remove the drive chassis cover from the non-steer end of the machine.
- 2 Inspect the following areas for burnt, chafed, corroded and loose wires:
 - Electrical power panel
 - Electrical relay panel
 - Ground control panel
 - Function manifold wiring

CHECKLIST B PROCEDURES

REV E

- 3 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 4 Raise the secondary boom until the mid-pivot is approximately 10 feet / 3 m off the ground.
- 5 Inspect the turntable center area for burnt, chafed and pinched cables.
- 6 Lower the boom to the stowed position and turn the machine off.
- 7 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
 - Cable track on the primary boom
 - Primary boom to platform cable harness
 - Inside of the platform control box
- 8 Inspect for a liberal coating of dielectric grease at the following location:
 - All wire harness connectors to the platform control box
 - All wire harness connectors located under the ground control side turntable cover
 - Harness connector to the drive motor controller located in the non-steer end of the drive chassis

B-3 Test the Key Switch

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

Proper key switch action and response is essential to safe machine operation. The machine can be operated from the ground or platform controls and the activation of one or the other is accomplished with the key switch. Failure of the key switch to activate the appropriate control panel could result in a hazardous operating situation.

- 1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Turn the key switch to **platform controls**.
- 3 Check the machine functions from the **ground controls**.
 - ⊙ Result: The machine functions should **not** operate.
- 4 Turn the key switch to **ground controls**.
- 5 Check the machine functions from the **platform controls**.
 - ⊙ Result: The machine functions should **not** operate.
- 6 Turn the key switch to the off position.
 - ⊙ Result: No function should operate.

REV E

CHECKLIST B PROCEDURES

B-4 Check the Tires, Wheels and Lug Nut Torque



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

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

- 1 Check the tire surface and sidewalls for cuts, cracks and unusual wear.
- 2 Check each wheel for damage, bends and cracks.
- 3 Check each lug nut for proper torque. Refer to Section 2, *Specifications*.

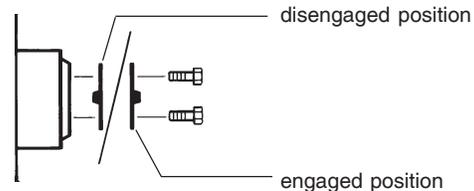
B-5 Confirm the Proper Brake Configuration



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

Proper brake configuration is essential to safe operation and good machine performance. Hydraulically-released, spring-applied individual wheel brakes can appear to operate normally when they are actually not fully operational.

- 1 Check each drive hub disconnect cap to be sure it is in the engaged position.



CHECKLIST B PROCEDURES

REV E

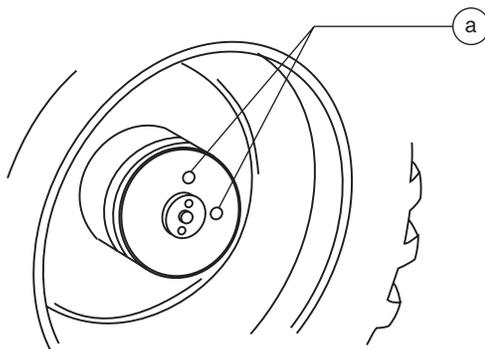
B-6 Check the Oil Level in the Drive Hubs and Mounting Bolt Torque



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

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

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



a drive hub plugs

- 2 Remove the plug located at 90 degrees and check the oil level.
 - ⊙ Result: The oil level should be even with the bottom of the side plug hole.
- 3 If necessary, remove the top plug and add oil until the oil level is even with the bottom of the side plug hole. Refer to Section 2, *Specifications*.
- 4 Install the plugs into the drive hub.
- 5 Check the torque of the drive hub bolts. Refer to Section 2, *Specifications*.
- 6 Repeat this procedure for each drive hub.

B-7 Test the Ground Control Override

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

A properly functioning ground control override is essential to safe machine operation. The ground control override function is intended to allow ground personnel to operate the machine from the ground controls whether the red Emergency Stop button on the platform controls is in the on or off position. This function is particularly useful if the operator at the platform controls cannot return the boom to the stowed position.

- 1 Push in the red Emergency Stop button at the platform controls to the off position.
 - 2 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position.
 - 3 Operate each boom function through a partial cycle at the ground controls.
- ⊙ Result: All boom functions should operate.

REV E

CHECKLIST B PROCEDURES

B-8 Test the Platform Self-leveling



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

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

- 1 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
 - 2 Lower the boom to the stowed position.
 - 3 Adjust the platform to a level position using the platform leveling toggle switch.
 - 4 Raise and lower the primary boom through a full cycle.
- ⊙ Result: The platform should remain level at all times to within ± 5 degrees.

B-9 Test the Drive Brakes



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

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

⚠ WARNING Collision hazard. Be sure that the machine is not in free-wheel or partial free-wheel configuration. Refer to B-5, *Confirm the Proper Brake Configuration*.

- 1 Select a test area that is firm, level and free of obstructions.
- 2 Mark a test line on the ground for reference.
- 3 Lower the boom to the stowed position.
- 4 Turn the key switch to platform controls.
- 5 Choose a reference point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the test line.
- 6 Bring the machine to top drive speed before reaching the test line. Release the drive joystick when your reference point on the machine crosses the test line.
- 7 Measure the distance between the test line and your machine reference point. Refer to Section 2, *Specifications*.

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

CHECKLIST B PROCEDURES

REV E

B-10 Test the Drive Speed - Stowed Position



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

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

- 1 Select a test area that is firm, level and free of obstructions.
- 2 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.
- 3 Turn the key switch to platform control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 4 Choose a reference point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.
- 5 Bring the machine to maximum drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 6 Continue at full speed and note the time when your machine reference point passes over the finish line. Refer to Section 2, *Specifications*.

B-11 Test the Drive Speed - Raised or Extended Position



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

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

- 1 Select a test area that is firm, level and free of obstructions.
- 2 Create start and finish lines by marking two lines on the ground 40 feet / 12.2 m apart.
- 3 Turn the key switch to platform control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 4 Raise the primary boom more than 5 feet / 1.5 m.
- 5 Choose a reference point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.
- 6 Bring the machine to maximum drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.
- 7 Continue at full speed and note the time when your machine reference point passes over the finish line. Refer to Section 2, *Specifications*.

REV E

CHECKLIST B PROCEDURES

B-12 Test the Alarm Package (if equipped)

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

The alarm package includes:

- Travel alarm
- Descent alarm
- Flashing beacon

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

- 1 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both ground and platform controls.
 - ⦿ Result: The flashing beacon should be on and flashing.
- 2 Hold the function enable toggle switch to either side, then move the primary boom toggle switch to the down position, hold for a moment then release it.
- 3 Hold the function enable toggle switch to either side, then move the secondary boom toggle switch to the down position, hold for a moment then release it.
- 4 Hold the function enable toggle switch to either side, then move the jib boom toggle switch to the down position, hold for a moment then release it.
 - ⦿ Result: The descent alarm should sound when each control toggle switch is held down.
- 5 Turn the key switch to platform controls.
 - ⦿ Result: The flashing beacon should be on and flashing.
- 6 Press down the foot switch.
- 7 Move the primary boom toggle switch to the down position, hold for a moment then release it.
- 8 Move the secondary boom toggle switch to the down position, hold for a moment then release it.
- 9 Move the jib boom toggle switch to the down position, hold for a moment then release it.
 - ⦿ Result: The descent alarm should sound when each control toggle switch is held down.
- 10 Move the drive joystick off center, hold for a moment then release it. Move the drive joystick off center in the opposite direction, hold for a moment then release it.
 - ⦿ Result: The travel alarm should sound when the drive joystick is moved off center in either direction.

B-13 Test the Turntable Rotation Stop

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

The turntable is capable of rotating the boom 359 degrees and is stopped midpoint between the steer wheels by the rotation stop. Detecting a rotation stop malfunction is essential to safe operation and good machine performance. If the turntable rotates past the rotation stop, component damage may result.

- 1 Turn the key switch to platform controls and pull out the red Emergency Stop buttons to the on position at both ground and platform controls.
- 2 Rotate the turntable to the left as far as it will go.
- ⦿ Result: Movement should stop when the primary boom reaches midpoint between the steer tires.
- 3 Rotate the turntable to the right as far as it will go.
- ⦿ Result: Movement should stop when the primary boom reaches mid-point between the steer tires.

B-14 Check the Electrical Contactors



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

Maintaining the electrical contactors in good condition is essential to safe machine operation. Failure to locate a worn or damaged contactor could result in an unsafe working condition and component damage.

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

- 1 Remove the drive chassis cover from the non-steer end of the machine and locate the electrical contactors mounted on the electrical component mounting panel.
- 2 Visually inspect the contact points of each contactor for the following items:
 - Excessive burns
 - Excessive pitting

Note: Replace the contactors if any damage is found.

REV E

CHECKLIST B PROCEDURES

B-15 Perform Hydraulic Oil Analysis



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

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

Note: Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.** See E-1, *Test or Replace the Hydraulic Oil*.

Checklist C Procedures

REV D

C-1 Grease the Platform Overload Mechanism (if equipped)



Note: Genie specifications require that this procedure be performed every 500 hours or 6 months, whichever comes first. Perform this procedure more often if dusty conditions exist.

Application of lubrication to the platform overload mechanism is essential to safe machine operation. Continued use of an improperly greased platform overload mechanism could result in the system not sensing an overloaded platform condition and will result in component damage.

- 1 Locate the grease fittings on each pivot pin of the platform overload assembly.
- 2 Thoroughly pump grease into each grease fitting using a multi-purpose grease.

Grease Specification

Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

C-2 Test the Platform Overload System (if equipped)



Note: Genie specifications require that this procedure be performed every 500 hours or six months, whichever comes first.

Testing the platform overload system regularly is essential to safe machine operation. Continued use of an improperly operating platform overload system could result in the system not sensing an overloaded platform condition. Machine stability could be compromised resulting in the machine tipping over.

The platform overload system is designed to detect an overloaded platform and prevent machine operation anytime the machine is turned on. When activated, the system halts all normal boom operation, giving visual and audible warning to the operator.

Models equipped with the platform overload option are provided with additional machine components: an adjustable spring-loaded platform support subassembly, a limit switch, an electronic module which receives the overload signal and interrupts power, and an audio/visual warning indication to alert the operator of the overload.

REV D

CHECKLIST C PROCEDURES

The platform support subassembly utilizes two load support arms that are opposed in a full parallelogram link. This isolates platform loads into a shear or vertical state, which translates into a compressive load. A spring in the parallelogram link supports this purely compressive load regardless of where the load is placed in the platform.

As weight is added to the platform, the spring will compress until, when the platform is overloaded, the lower arm contacts a limit switch and thereby activating the overload signal. When adjusted correctly, the platform overload system will deactivate normal boom operation at platform capacity.

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

- 1 Turn the key switch to platform control. Start the engine and level the platform.
- 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 inaccurate test.

- 4 Using a suitable lifting device, place a test weight equal to that of the available capacity one of the locations shown. Refer to Illustration 1.
- ⊙ Result: The platform overload indicator lights should be off at both the ground and platform controls and the alarm should not sound.
 - ⊗ Result: The platform overload indicator lights are on and the alarm is sounding. Calibrate the platform overload system. Refer to Repair Procedure 2-3, *How to Calibrate the Platform Overload System (if equipped)*.

- 5 Carefully move the test weight to each remaining location. Refer to Illustration 1.
- ⊙ Result: The platform overload indicator lights should be off at both the ground and platform controls and the alarm should not sound.
 - ⊗ Result: The platform overload indicator lights are on and the alarm is sounding. Calibrate the platform overload system. Refer to Repair Procedure 2-3, *How to Calibrate the Platform Overload System (if equipped)*.

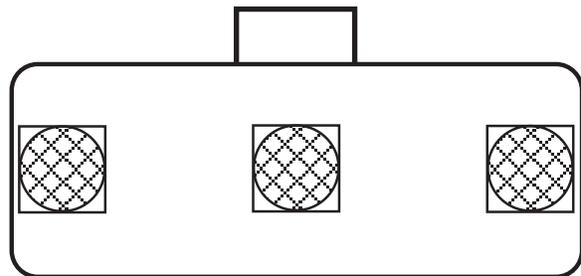


Illustration 1

- 6 Using a suitable lifting device, place an additional 10 lbs / 4.5 kg of weight onto the platform.
- ⊙ Result: The alarm should sound. The platform overload indicator lights should be flashing at both the ground and platform controls.
 - ⊗ Result: The alarm does not sound and the platform overload indicator lights are not flashing. Calibrate the platform overload system. Refer to Repair Procedure 2-3, *How to Calibrate the Platform Overload System (if equipped)*.

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

CHECKLIST C PROCEDURES

REV D

7 Carefully move the test weights to each remaining location on the platform. Refer to Illustration 1.

- ⦿ Result: The alarm should sound. The platform overload indicator lights should be flashing at both the ground and platform controls.

✗ Result: The alarm does not sound and the platform overload indicator lights are not flashing. Calibrate the platform overload system. Refer to Repair Procedure 2-3, *How to Calibrate the Platform Overload System (if equipped)*.

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

8 Test all machine functions from the platform controls.

- ⦿ Result: All platform control functions should not operate.

9 Turn the key switch to ground control.

10 Test all machine functions from the ground controls.

- ⦿ Result: All ground control functions should not operate.

11 Using auxiliary power, test all machine functions from the ground controls.

- ⦿ Result: All ground control functions should operate.

12 Using a suitable lifting device, lift the additional test weight from the platform.

- ⦿ Result: The platform overload indicator lights should turn 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 Start the engine and 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.

Note: If the platform overload system is not operating properly, Refer to Repair Procedure 2-3, *How to Calibrate the Platform Overload System (if equipped)*.

16 Using a suitable lifting device, remove the remaining test weights from the platform.

Checklist D Procedures

REV D

D-1 Check the Primary Boom Wear Pads



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

Maintaining the primary boom wear pads in good condition is essential to safe machine operation. Wear pads are placed on boom tube surfaces to provide a low friction, replaceable wear pad between moving parts. Improperly shimmed wear pads or continued use of worn out wear pads may result in component damage and unsafe operating conditions.

- 1 Measure each wear pad. Replace the wear pad once it reaches the minimum allowable thickness. If the wear pad is still within specifications, shim as necessary to obtain minimum clearance with zero binding.
- 2 Extend and retract the primary boom through the entire range of motion to check for tight spots that could cause binding or scraping.

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

Models without rotating jib boom:

| Primary boom wear pad specifications | Minimum |
|--|-------------------------------|
| Top and side wear pads (extension end of boom) | $\frac{5}{8}$ inch 15.9 mm |
| Bottom wear pads (extension end of boom) | $\frac{5}{8}$ inch 15.9 mm |
| Bottom and side wear pads (pivot end of boom) | $\frac{5}{8}$ inch 15.9 mm |
| Top wear pads (pivot end of boom) | $\frac{3}{8}$ inch 9.5 mm |

Models with rotating jib boom:

| Primary boom wear pad specifications | Minimum |
|--------------------------------------|------------------------------|
| All wear pads | $\frac{3}{8}$ inch 9.5 mm |

CHECKLIST D PROCEDURES

REV D

D-2

Check the Free-wheel Configuration



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

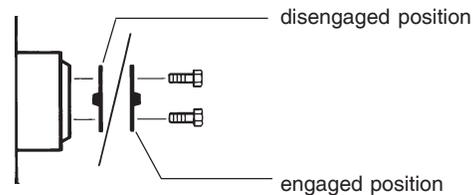
Proper use of the free-wheel configuration is essential to safe machine operation. The free-wheel configuration is used primarily for towing. A machine configured to free-wheel without operator knowledge may cause death or serious injury and property damage.

WARNING Collision hazard. Select a work site that is firm and level.

NOTICE Component damage hazard. If the machine must be towed, do not exceed 2 mph / 3.2 km/h.

- 1 Chock the steer wheels to prevent the machine from rolling.
- 2 Center a lifting jack of ample capacity (15,000 lbs / 7000 kg) under the drive chassis between the non-steer wheels.
- 3 Lift the wheels off the ground and then place blocks under the drive chassis for support.

- 4 Disengage the drive hubs by turning over the drive hub disconnect caps on each non-steer wheel hub.



- 5 Manually rotate each non-steer wheel.
 - ⦿ Result: Each non-steer wheel should rotate with minimum effort.
- 6 Engage the drive hubs by turning over the drive hub disconnect caps.
- 7 Carefully remove the blocks, lower the machine and remove the jack.

WARNING Collision hazard. Failure to engage the drive hubs could result in death or serious injury and property damage.

REV D

CHECKLIST D PROCEDURES

D-3 Check the Turntable Rotation Bearing Bolts



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

Maintaining proper torque on the turntable bearing bolts is essential to safe machine operation. Improper bolt torque could result in an unsafe operating condition and component damage.

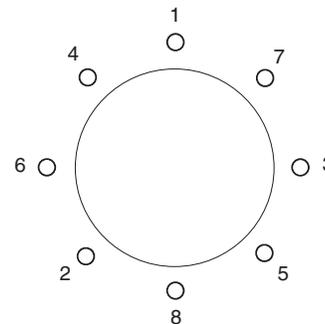
- 1 Raise the secondary boom and place a safety chock on the secondary boom lift cylinder. Carefully lower the secondary boom onto the lift cylinder safety chock.

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

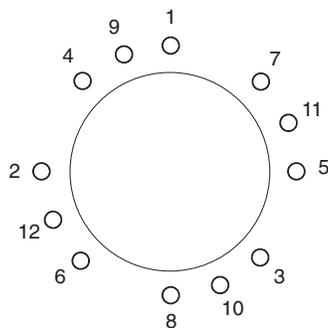
Note: A lift cylinder safety chock is available through Genie Service Parts (Genie part no. 36555).

- 2 Confirm that each turntable mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.

- 3 Raise the secondary boom and remove the safety chock. Lower the secondary boom to the stowed position.
- 4 Open the latch on the battery packs and swing them out to expose the turntable bearing bolt access hole.
- 5 Confirm that each turntable bearing mounting bolt is torqued in sequence to specification. Refer to Section 2, *Specifications*.



Bolt torque sequence



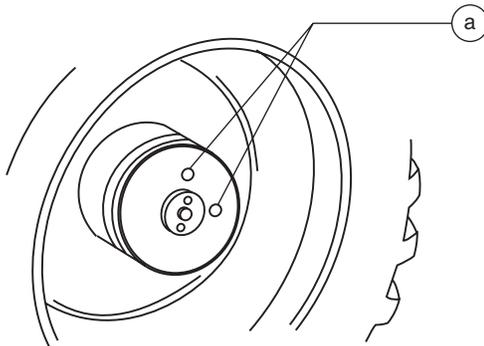
Bolt torque sequence

D-4**Replace the Drive Hub Oil**

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

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

- 1 Select the drive hub to be serviced. Drive the machine until one of the two plugs is at the lowest point.
- 2 Remove both plugs and drain the oil into a suitable container.
- 3 Drive the machine until one plug is at the top and the other is at 90 degrees.



a drive hub plugs

- 4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side plug hole. Refer to Section 2, *Specifications*.
- 5 Install the plugs into the drive hub.
- 6 Repeat this procedure for the other drive hub.

D-5**Replace the Hydraulic Tank Return Filter Element**

Note: Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first. Perform this procedure more often if dusty conditions exist.

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

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

- 1 Locate the hydraulic return filter housing on top of the hydraulic tank.
- 2 Clean the area around the oil filter housing cap located on top of the reservoir.
- 3 Remove the cap from the housing.
- 4 Lift the handle on the filter element and rotate the element counterclockwise to release the element from the housing.
- 5 Remove the filter element from the filter housing.

REV D

CHECKLIST D PROCEDURES

- 6 Install the new oil filter element into the filter housing.
- 7 Push the filter element down to be sure the o-ring on the element is fully seated into the housing.
- 8 Rotate the filter element clockwise to lock it in place.
- 9 Install the filter housing cap.
- 10 Clean up any oil that may have spilled during the replacement procedure.
- 11 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter housing.
- 12 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position.
- 13 Move and hold the function enable toggle switch to either side and move and hold the primary boom toggle switch in the up direction.
- 14 Inspect the filter housing and related components to be sure that there are no leaks.

D-6 Inspect for Turntable Bearing Wear



Note: Genie requires that this procedure be performed every 1000 hours or annually, whichever comes first.

Periodic inspection of turntable bearing wear is essential to safe machine operation, good machine performance and service life. Continued use of a worn turntable bearing could create an unsafe operating condition, resulting in death or serious injury and component damage.

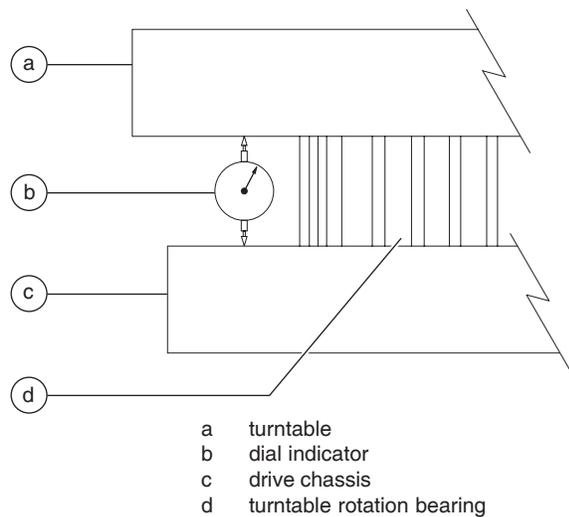
- 1 Grease the turntable bearing. See A-5, *Grease the Turntable Bearing and Rotate Gear*.
- 2 Torque the turntable bearing bolts to specification. See D-3, *Check the Turntable Rotation Bearing Bolts*.
- 3 Raise the primary and secondary booms to full height using the ground controls. Do not extend the primary boom.

CHECKLIST D PROCEDURES

REV D

- 4 Place a dial indicator between the drive chassis and the turntable at a point that is directly under, or in line with, the boom and no more than 1 inch / 2.5 cm from the bearing.

Note: To obtain an accurate measurement, place the dial indicator no more than 1 inch / 2.5 cm from the turntable rotation bearing.



- 5 Adjust the dial indicator to "0".
- 6 Lower the secondary boom to the stowed position and lower the primary boom to a horizontal position. Fully extend the primary boom.

- 7 Note the reading on the dial indicator.

☉ Result: The measurement is less than 0.055 inch / 1.4 mm. The bearing is good.

☒ Result: The measurement is more than 0.055 inch / 1.4 mm. The bearing is worn and needs to be replaced.

- 8 Fully retract the primary boom. Raise the primary and secondary booms to full height. Visually inspect the dial indicator to be sure the needle returns to the "0" position.

- 9 Remove the dial indicator and rotate the turntable 90°.

- 10 Repeat steps 4 through 9 until the rotation bearing has been checked in at least four equally spaced areas 90° apart.

- 11 Lower the primary and secondary booms to the stowed position and turn the machine off.

- 12 Remove the dial indicator from the machine.

Checklist E Procedures

REV D

E-1 Test or Replace the Hydraulic Oil



Note: Genie specifications require that this procedure be performed every 2000 hours or every two years, whichever comes first. Perform this procedure more often if dusty conditions exist.

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the oil be changed more often.

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

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

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

NOTICE

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

- 2 Place a suitable container under the hydraulic tank. Refer to Section 2, *Specifications*.
- 3 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.

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

CAUTION

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

CHECKLIST E PROCEDURES

REV D

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

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

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

- 6 Remove the hydraulic tank mounting fasteners. Remove the hydraulic tank from the machine.
- 7 Remove the tank lid retaining fasteners and remove the lid and return filter assembly from the tank.
- 8 Remove the suction strainer from the hydraulic tank and clean it using a mild solvent.
- 9 Rinse out the inside of the tank with a mild solvent.
- 10 Install the suction strainer into the tank.
- 11 Install the lid and return filter assembly onto the hydraulic tank.
- 12 Install the hydraulic tank on the machine. Install the hydraulic tank mounting fasteners and torque them to 8 ft-lbs / 10.8 Nm.
- 13 Install the hydraulic hoses.
- 14 Fill the tank with hydraulic oil until the fluid is within the FULL and ADD marks on the hydraulic tank. Do not overfill. Refer to Section 2, *Specifications*.
- 15 Clean up any oil that may have spilled. Properly discard of used oil.
- 16 Open the hydraulic tank shutoff valve.

NOTICE Component damage hazard. Be sure to open the hydraulic tank shutoff valve after installing the hydraulic tank.

NOTICE Component damage hazard. The hydraulic tank is plastic and may become damaged if the tank mounting fasteners are over tightened.

REV D

CHECKLIST E PROCEDURES

E-2 Grease the Steer Axle Wheel Bearings



Note: Genie requires that this procedure be performed every 2000 hours or every two years, whichever comes first.

Maintaining the steer axle wheel bearings is essential for safe machine operation and service life. Operating the machine with loose or worn wheel bearings may cause an unsafe operating condition and continued use may result in component damage. Extremely wet or dirty conditions or regular steam cleaning and pressure washing of the machine may require that this procedure be performed more often.

- 1 Loosen the wheel lug nuts. Do not remove them.
- 2 Block the non-steer wheels and center a lifting jack under the steer axle.
- 3 Raise the machine 6 inches / 15 cm and place blocks under the drive chassis for support.
- 4 Remove the lug nuts. Remove the tire and wheel assembly.
- 5 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.
 - ⦿ Result: There should be no side to side or up and down movement.

Skip to step 10 if there is no movement.

- 6 Remove the dust cap from the hub. Remove the cotter pin from the castle nut.
- 7 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.

- 8 Loosen the castle nut one full turn and then torque to 35 ft-lbs / 47 Nm.
- 9 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.
 - ⦿ Result: If there is no side to side or up and down movement, continue with step 10 to grease the wheel bearings.
 - ✗ Result: If there is side to side or up and down movement, continue to step 10 and replace the wheel bearings with new ones.

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

- 10 Remove the castle nut.
- 11 Pull the hub off of the spindle. The washer and outer bearing should fall loose from the hub.
- 12 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.
- 13 Pack both bearings with clean, fresh grease.

Grease Specification

Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

CHECKLIST E PROCEDURES

REV D

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

15 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 the hub has been removed.

16 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.

17 Fill the hub cavity with clean, fresh grease.

18 Place the outer bearing into the hub.

19 Install the washer and castle nut.

20 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.

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

22 Install a new cotter pin. Bend the cotter pin to lock it in.

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

23 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to specification. Refer to Section 2, *Specifications*.

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 *Genie Z-30/20N Operator's Manual* on your machine.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
 - Machine parked on a firm, level surface
 - Boom in stowed position
 - Turntable rotated with the boom between the non-steer wheels
 - Key switch in the off position with the key removed
 - Wheels chocked
 - All external AC power supply disconnected from the machine

About This Section

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

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

Symbols Legend



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

▲ DANGER

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

▲ WARNING

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

▲ CAUTION

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

NOTICE

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

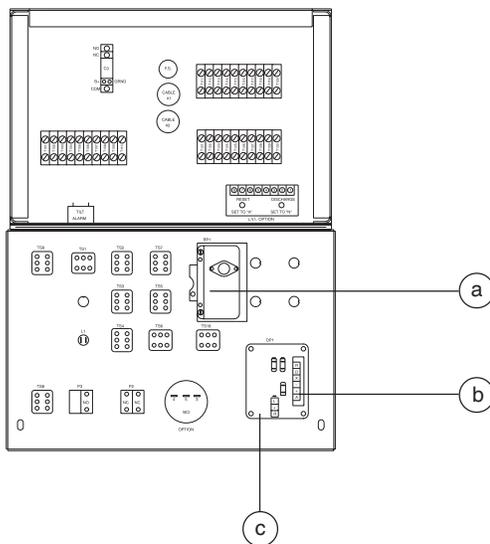
- ◎ Indicates that a specific result is expected after performing a series of steps.
- ☒ Indicates that an incorrect result has occurred after performing a series of steps.

Platform Controls

REV B

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 Industries Service Department.



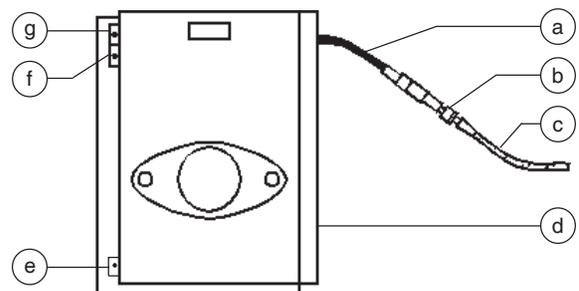
- a boom function speed controller
- b drive and brake printed circuit board
- c drive joystick

Boom Function Speed Controller Adjustments

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

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

- 1 Turn the key switch to platform controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 2 Open the platform control box lid and locate the boom function speed controller.



- a black/red wire
- b diode
- c white/red wire
- d boom function speed controller
- e ramp rate trimpot
- f threshold trimpot
- g max out trimpot

REV B

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 multi-meter set to measure amperage to the wire connector of the white/red wire. Connect the positive lead of the multi-meter 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 multi-meter 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

REV C

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 primary boom motion. It operates in a closed loop hydraulic circuit with the master cylinder. The slave cylinder is equipped with counterbalance valves to prevent platform movement in the event of a hydraulic line failure.

How to Remove the Slave Cylinder

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

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *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.

▲WARNING Crushing hazard. The slave cylinder could fall if not properly supported.

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.

REV C

PLATFORM COMPONENTS

2-2 Platform Rotator

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 180 degrees.

How to Remove the Platform Rotator

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *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.

⚠ CAUTION Crushing hazard. The platform rotator may fall when the pins are removed if not properly supported.

Note: When installing the platform rotator, be sure to torque the fasteners to specification. Refer to Section 2, *Specifications*.

How to Bleed the Platform Rotator

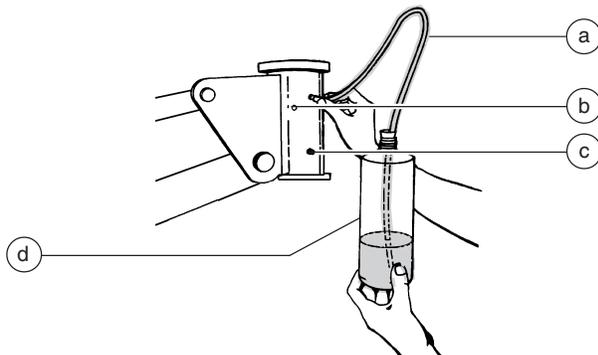
Note: This procedure will require two people.

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

PLATFORM COMPONENTS

REV C

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



- a clear hose
- b top bleed valve
- c bottom bleed valve
- d container

- 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 valve. Close the bleed valve.

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

- 5 Connect the clear hose to the bottom bleed valve and open the valve. Do not remove the bleed valve.
- 6 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 valve. Close the bleed valve.

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

- 7 Remove the hose from the bleed valve and clean up any hydraulic oil that may have spilled.
- 8 Rotate the platform fully in both directions and inspect the bleed valves for leaks.

REV C

PLATFORM COMPONENTS

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.

- 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.

PLATFORM COMPONENTS

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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.

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

REV B

3-1 Jib Boom

How to Remove the Jib Boom

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform.
- 2 Remove the platform mounting weldment and the platform rotator. See 2-2, *How to Remove the Platform Rotator*.
- 3 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the jib boom lift cylinder.

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

- 4 Remove the cable cover from the side of the jib boom.
- 5 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

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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 could fall when the pin is removed if not properly supported by the overhead crane.

3-2**Jib Boom Bell Crank
(models without rotating
jib boom)****How to Remove the Jib Boom
Bell Crank**

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

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the Jib Boom, See 3-1, *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 bell crank could become unbalanced and fall when the pins are removed if not properly supported and secured to the lifting device.

REV B

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 jib boom 160 degrees.

How to Remove the Jib Boom Rotator

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the jib boom, See 3-1, *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 Section 2, *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 bell crank could become unbalanced and fall when the pins are removed if not properly supported and secured to the lifting device.

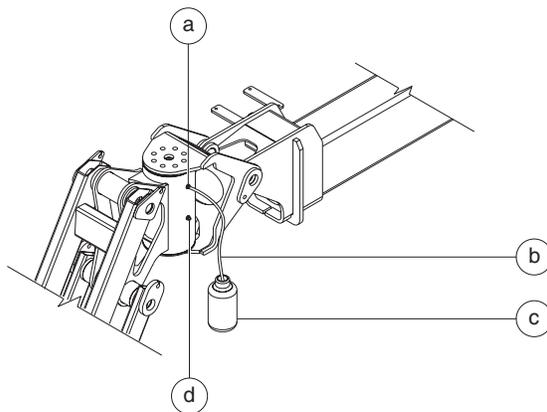
JIB BOOM COMPONENTS

REV B

How to Bleed the Jib Boom Rotator

Note: This procedure will require two people.

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



- a top bleed valve
b clear hose
c container
d 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.

REV B

JIB BOOM COMPONENTS

3-4 Jib Boom Lift Cylinder

How to Remove the Jib Boom Lift Cylinder

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the jib boom slightly and place blocks under the platform mounting weldment for support. Lower the jib boom until the platform is resting 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 could fall when the pins are removed if not properly supported by the overhead crane.

Primary Boom Components

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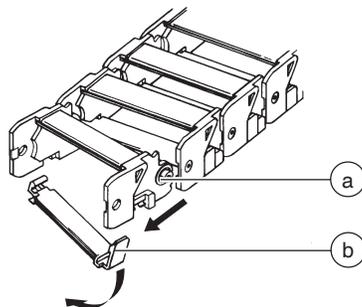
4-1 Cable Track

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 Plastic Cable Track

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

Note: A 7-link repair section of cable track is available through the Genie Industries Service Parts (Genie part no. 58919).



a link separation point
b lower clip

- 1 Use a slotted screwdriver to pry down on the lower clip.
- 2 Repeat step 1 for each link.
- 3 To remove a single link, open the lower clip. Use a screwdriver to pry the link to the side.

4-2 Primary Boom

How to Shim the Primary Boom

- 1 Extend the boom until the wear pads are accessible.
- 2 Loosen the wear pad mounting fasteners.
- 3 Install the new shims under the wear pad to obtain zero clearance and zero drag.
- 4 Tighten the mounting fasteners.
- 5 Extend and retract the boom through an entire cycle. Check for tight spots that could cause scraping or binding.

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

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PRIMARY BOOM COMPONENTS

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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform.
- 2 Remove the platform rotator. See 2-3, *How to Remove the Platform Rotator*.
- 3 Remove the jib boom. See 3-1, *How to Remove the Jib Boom*.
- 4 **Models without rotating jib boom:** Remove the jib boom bellcrank. See 3-2, *How to Remove the Jib Boom Bellcrank*.

Models with rotating jib boom: Remove the jib boom rotator. See 3-3, *How to Remove the Jib Boom Rotator*.

- 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 cable track can be damaged if it is twisted.

NOTICE Component damage hazard. Cables and hoses 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.

PRIMARY BOOM COMPONENTS

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- 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. Cables and hoses 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.

- 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 fall when it is removed from the machine if not properly supported.

- 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 assembly could become unbalanced and fall when removed from the machine if not properly supported by the overhead crane.

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PRIMARY BOOM COMPONENTS

How to Disassemble the Primary Boom

Note: Complete disassembly of the boom is only necessary if the outer or inner boom tubes must be replaced. The extension cylinder can be removed without completely disassembling the boom. See 4-4, *How to Remove the Extension Cylinder*.

- 1 Remove the primary boom. See 4-2, *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.

- 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 overhead crane strap will need to be carefully 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 overhead crane strap will need to be carefully adjusted for proper balancing.

PRIMARY BOOM COMPONENTS

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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 counterbalance valves 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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *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.
 - 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.
- ⚠ CAUTION** Crushing hazard. The primary boom lift cylinder may fall if not properly supported when the rod-end pivot pin is removed.
- 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.

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PRIMARY BOOM COMPONENTS

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

▲CAUTION Crushing hazard. The primary boom lift cylinder may fall when the barrel-end pivot pin is removed if not properly supported.

- 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 will fall if not properly supported when it is removed from the machine.

4-4 Extension Cylinder

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

How to Remove the Extension Cylinder

▲WARNING 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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the primary boom to the horizontal position. Extend the boom 3 to 4 feet / 1 m until the extension cylinder rod-end pivot pins are accessible.
- 2 Remove the external snap rings from the extension cylinder rod-end pivot pins. Use a soft metal drift to remove the pins.
- 3 Remove the counterweight cover fasteners. Remove the counterweight cover from the machine.
- 4 Raise the secondary boom until the master cylinder rod-end pivot pin is accessible.

PRIMARY BOOM COMPONENTS

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- 5 Remove the primary boom extend drive limit switch from the pivot end of the primary boom. Do not disconnect the wiring.
- 6 Remove the retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
- 7 Manually retract the master cylinder and push it toward the platform end of the boom to obtain enough clearance for extension cylinder removal.
- 8 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

- 9 Remove the retaining fastener from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.
- 10 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 cylinder could fall if not properly supported when it is pulled out of the extension tube.

Note: To make installation of the extension cylinder easier, be sure that the cylinder rod is extended 3 to 4 feet / 1 m.

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

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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

Note: Before cylinder removal is considered, bleed the cylinder to be sure that there is no air in the closed loop. See 2-2, *How to Bleed the Slave Cylinder*.

- 1 Remove the counterweight cover.
- 2 Raise the secondary boom until the master cylinder barrel-end pivot pin is above the turntable counterweights.
- 3 Raise the primary boom until the master cylinder rod-end pivot pin is accessible.

REV B

PRIMARY BOOM COMPONENTS

- 4 Attach an overhead crane to the pivot end of the primary boom for support. Do not lift it.
- 5 Secure the upper secondary boom to the pivot end of the primary boom with a strap (this will prevent the upper secondary boom from falling when the master cylinder barrel-end pivot pin is removed from the cylinder).
- 6 Tag, disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

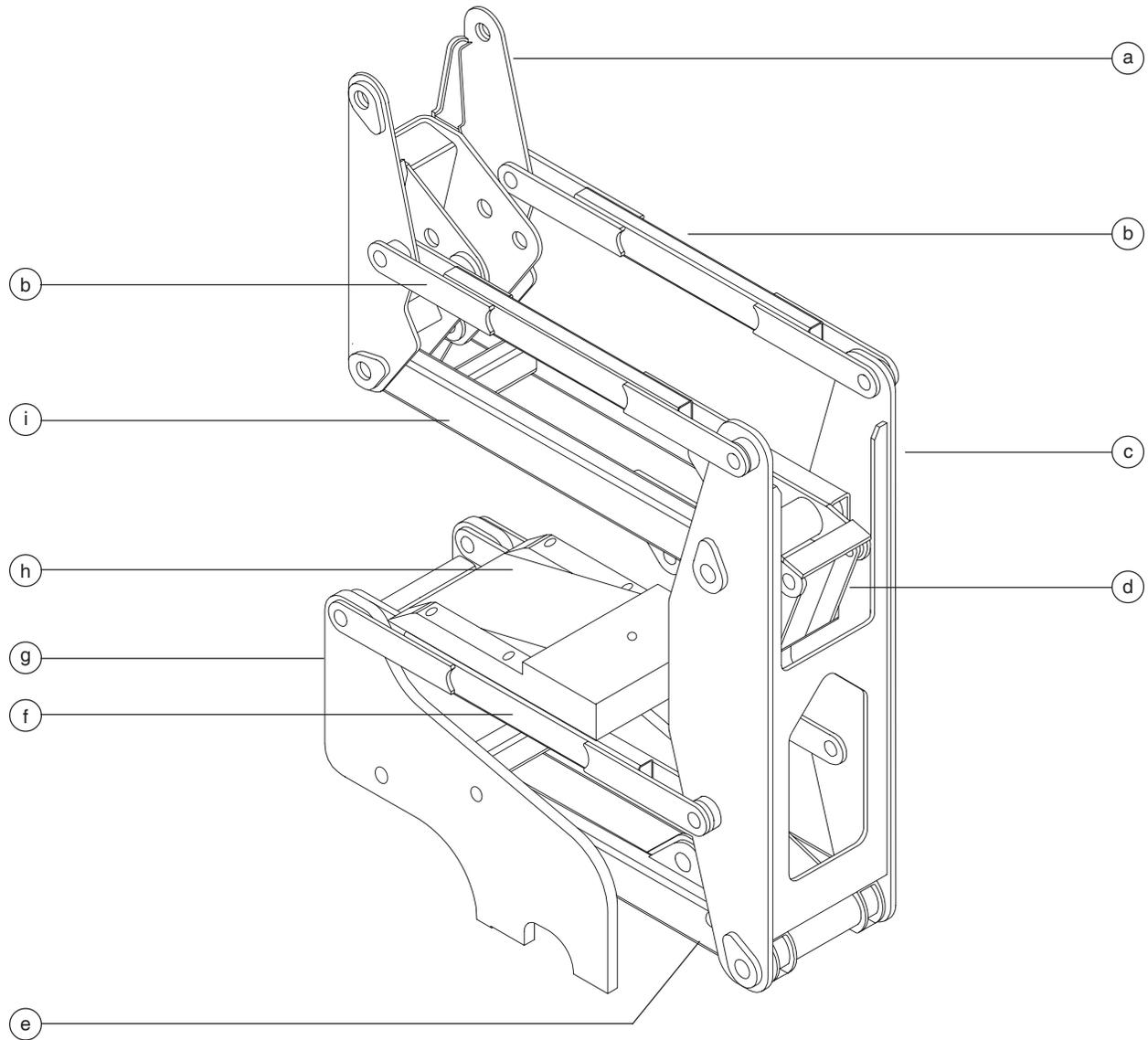
- 7 Attach a lifting strap from an overhead crane to the lug on the rod end of the master cylinder, then secure the strap to the primary boom (use this strap to lower the master cylinder out of the upper pivot).
- 8 Remove the pin retaining fastener from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.
- 9 Remove the pin retaining fastener from the master cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin from the cylinder. Do not remove the pin from the upper pivot. Push the pin to one side, only far enough to remove the cylinder. The pin should remain in one side of the upper secondary boom and upper pivot.

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

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

Secondary Boom Components

REV B



- Secondary Boom
- a upper pivot
 - b upper compression arm
 - c mid-pivot
 - d compression link
 - e lower secondary boom
 - f lower compression arm
 - g turntable pivot
 - h counterweight
 - i upper secondary boom

REV B

SECONDARY BOOM COMPONENTS

5-1 Secondary Boom

How to Disassemble the Secondary Boom

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

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *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 Electrocutation/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 **Before serial number 5945:** Tag, disconnect and plug the platform rotator hydraulic hoses at the union located on the bottom side of the primary boom. Cap the fittings on the union.

After serial number 5944: 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.

SECONDARY BOOM COMPONENTS

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

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

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

NOTICE Component damage hazard. Cables and hoses 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.
- 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 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.

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

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

REV B

SECONDARY BOOM COMPONENTS

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.

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

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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.

⚠ WARNING 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 Remove the mounting fasteners from the counterweight attached to the lower leveling link.

44 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 re-assembly 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.

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 supported by the overhead crane.

REV B

SECONDARY BOOM COMPONENTS

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

REV B

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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *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 Section 2, *Specifications*.

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

- 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.

REV B

SECONDARY BOOM COMPONENTS

- 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.
- CAUTION** 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 supported by the overhead crane.

Hydraulic Pumps

REV A

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 on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

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

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

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

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

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



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Manifolds

REV D

7-1

Function Manifold Components

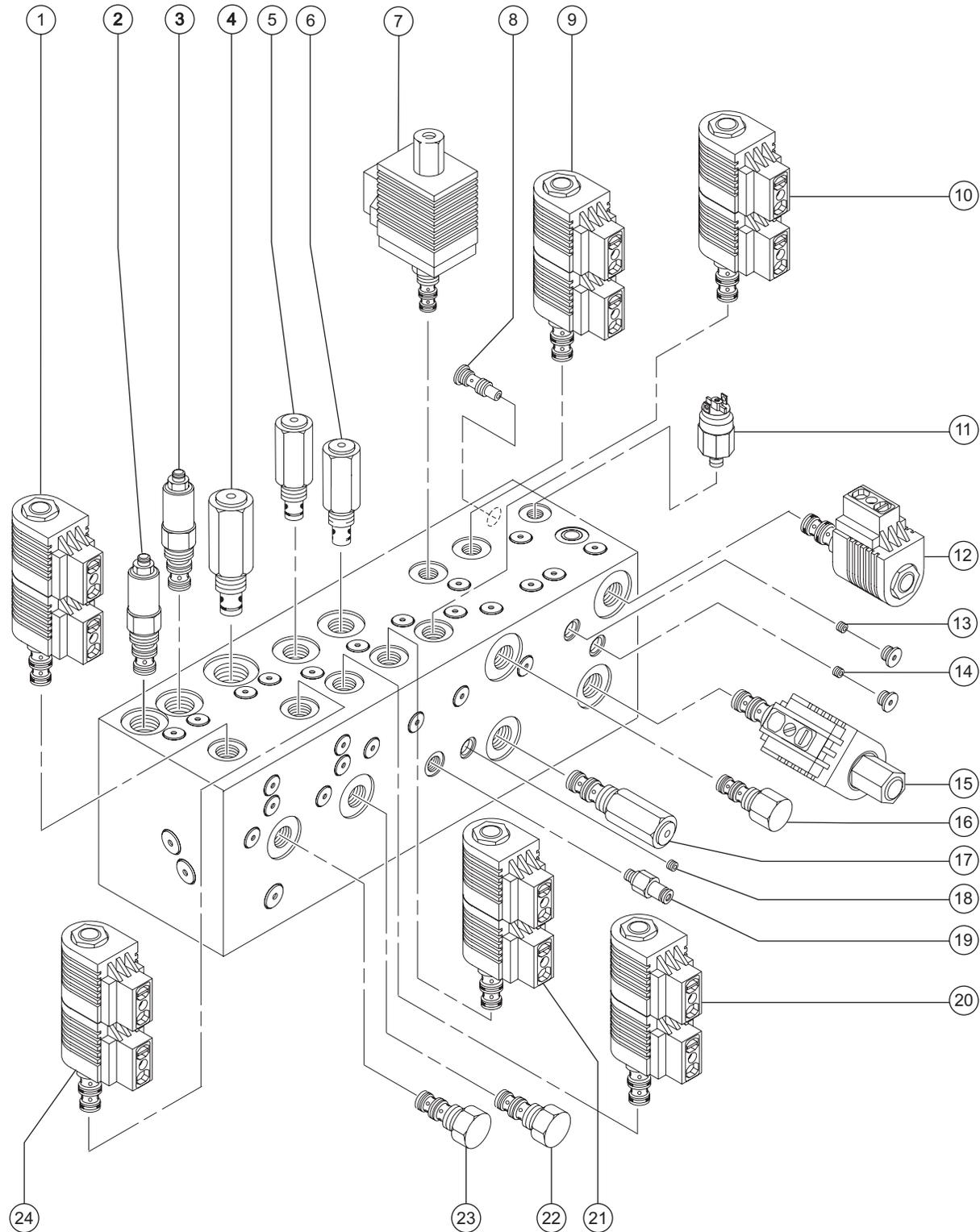
The function manifold is located behind the ground controls turntable cover.

| Index No. | Description | Schematic | | Torque |
|-----------|---|-----------|--------------------------------------|-------------------------|
| | | Item | Function | |
| 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 | Proportional solenoid valve | H | System flow regulating circuit | 30-35 ft-lbs / 41-47 Nm |
| 8 | Check valve | I | Brake circuit | 10-12 ft-lbs / 14-16 Nm |
| 9 | Solenoid valve, 3 position 4 way | J | Steer left/right | 20-25 ft-lbs / 27-34 Nm |
| 10 | Solenoid valve, 3 position 4 way | K | Primary boom extend/retract | 20-25 ft-lbs / 27-34 Nm |
| 11 | Pressure switch | L | Brake circuit | |
| 12 | Solenoid valve, N.C. poppet | M | Brake circuit | 20-25 ft-lbs / 27-34 Nm |
| 13 | Orifice, 0.045 inch / 1.14 mm | N | Brake circuit | |

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MANIFOLDS



MANIFOLDS

REV D

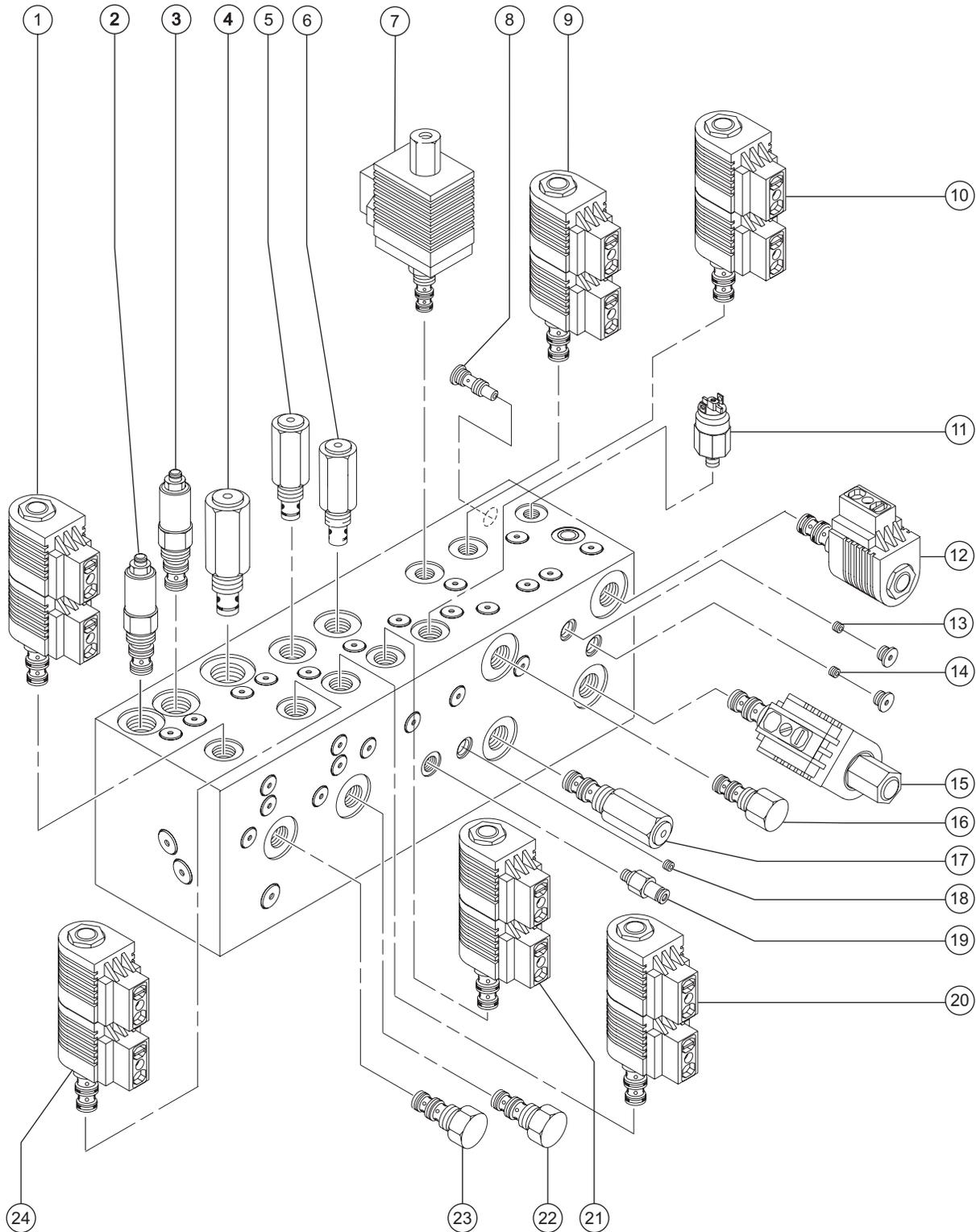
Function Manifold Components, continued

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

| Index No. | Description | Schematic | | Torque |
|-----------|---|-----------|----------------------------------|-------------------------|
| | | Item | Function | |
| 14 | Orifice, 0.045 inch / 1.14 mm | O | Brake and steer circuit | |
| 15 | Solenoid valve, N.O. poppet | P | Brake circuit | 20-25 ft-lbs / 27-34 Nm |
| 16 | Differential sensing valve | Q | Differential sensing circuit | 30-35 ft-lbs / 41-47 Nm |
| 17 | Relief valve, 2800 psi / 193 bar | R | System relief | 20-25 ft-lbs / 27-34 Nm |
| 18 | Orifice, 0.035 inch / 0.89 mm | S | Tank return circuit | |
| 19 | Diagnostic fitting | T | Testing | |
| 20 | Solenoid valve, 3 position 4 way | U | Secondary boom up/down | 20-25 ft-lbs / 27-34 Nm |
| 21 | Solenoid valve, 3 position 4 way | V | Primary boom up/down | 20-25 ft-lbs / 27-34 Nm |
| 22 | Flow regulator valve, 1.5 gpm / 5.7 L/min (before serial number 10808) Flow regulator valve, 1.8 gpm / 6.8 L/min (after serial number 10807) | W | Turntable rotate circuit | 20-25 ft-lbs / 27-34 Nm |
| 23 | Flow regulator valve, 0.8 gpm / 3 L/min | X | Jib boom/platform rotate circuit | 20-25 ft-lbs / 27-34 Nm |
| 24 | Solenoid valve, 3 position 4 way | Y | Turntable rotate left/right | 20-25 ft-lbs / 27-34 Nm |

REV D

MANIFOLDS



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7-2 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.
- 2 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 Section 2, *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.

How to Adjust 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 Section 2, *Specifications*.
 - 4 Turn the machine off. Hold the primary down relief valve with a wrench and remove the cap (item F).
 - 5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.
- ⚠WARNING** Tip-over hazard. Do not adjust the relief valve higher than specified.
- 6 Repeat steps 2 and 3 to confirm the relief valve pressure setting.

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How to Adjust the Secondary 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 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 Section 2, *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.

How to Adjust the Primary Boom Extend 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 extend/retract toggle switch in the extend direction with the primary boom fully extended. Observe the pressure reading on the pressure gauge. Refer to Section 2, *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 valves higher than specified.

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

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How to Adjust 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 Section 2, *Specifications*.
- 4 Turn the machine off. Hold the turntable relief valve(s) with a wrench and remove the cap (item D).
- 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.

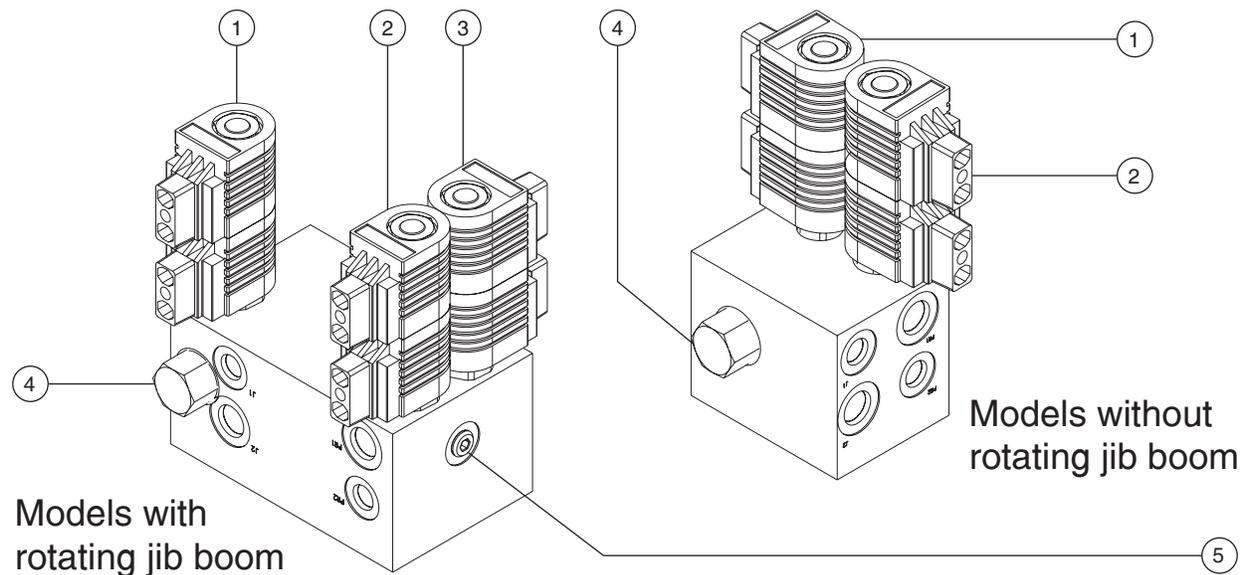
REV D

MANIFOLDS

7-3 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 | BB | Platform rotate left/right | 20-25 ft-lbs / 27-34 Nm |
| 3 | Solenoid valve, 3 position 4 way | CC | Jib boom rotate left/right | 20-25 ft-lbs / 27-34 Nm |
| 4 | Flow regulator valve, 0.3 gpm / 1.14 L/min | EE | Platform rotate circuit | 20-25 ft-lbs / 27-34 Nm |
| 5 | Orifice plug, 0.025 inch / 0.64 mm ... (located under plug) | DD | Jib boom rotate circuit | |



MANIFOLDS

REV D

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 Electrocutation/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 |

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How to Test a Coil Diode

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

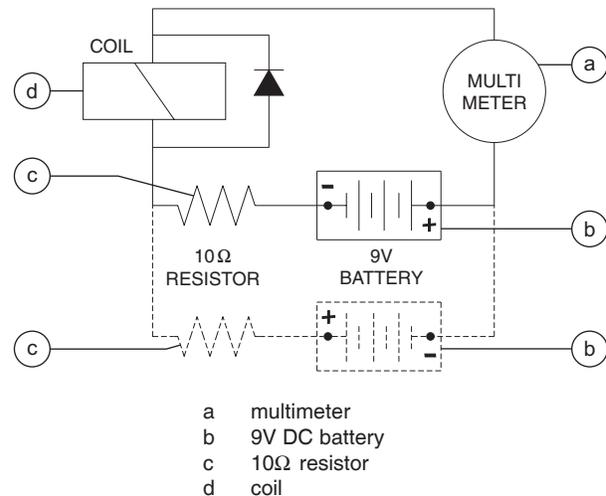
⚠ WARNING Electrocutation/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

- 1 Test the coil for resistance. See *How to Test a Coil*.
- 2 Connect a 10Ω resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

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

Resistor, 10Ω

| | |
|-------------------|-------|
| Genie part number | 27287 |
|-------------------|-------|



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.
- Note: If testing a single-terminal coil, connect the negative lead to the internal metallic ring at either end of the coil.
- 5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the amperage 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

REV B

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 Motor

Note: When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *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

REV C

9-1 Hub and Bearings

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.

- 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 Section 2, *Specifications*.

Motor Controller

REV B

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 Industries Service Department.

How to Test the Motor Controller

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

- 1 Turn the key switch to the off position and disconnect the battery packs from the machine.
- 2 Tag and disconnect all power cables from the motor controller.

⚠ WARNING Electrocutation/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 V |

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 repair procedure with the machine in the following configuration:
 - Machine parked on a firm, level surface
 - Boom in stowed position
 - Turntable rotated with the boom between the non-steer wheels
 - Key switch in the off position with the key removed
 - Wheels chocked
 - All external AC power supply disconnected from the machine

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the *Genie Z-30/20N Operator's Manual* on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

⚠ DANGER Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

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

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

Note: Perform all troubleshooting on a firm, level surface.

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

FAULT CODES

REV A

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

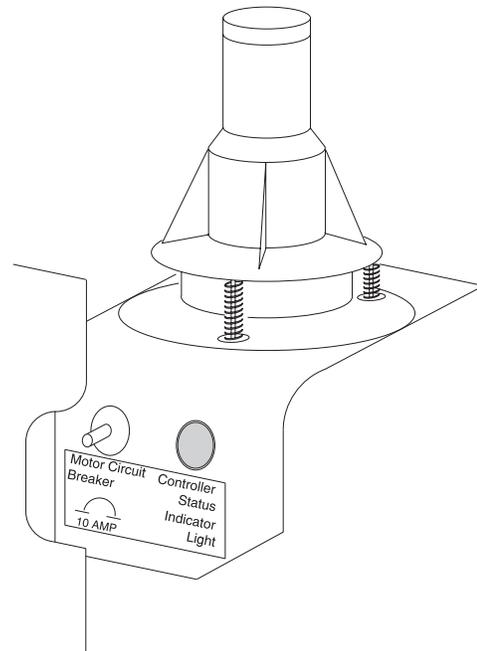
Note: Additional troubleshooting of the fault codes may be accomplished by using the hand-held pendant motor controller programmer (Genie part number 56303).

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 Code Chart

REV A

| 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. |
| 01 | | 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 CODE CHART

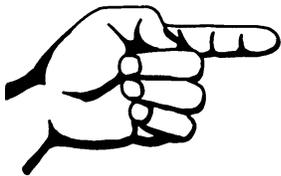
REV A

| 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 Industries Service Department. |
| | 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 Industries Service Department. |
| 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 Industries Service Department. |
| 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. |

REV A

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 Industries Service Department. |
| | 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 Industries Service Department. |
| 41 | LOW BATTERY VOLTAGE | 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. |



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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 printed in the *Genie Z-30/20N 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.

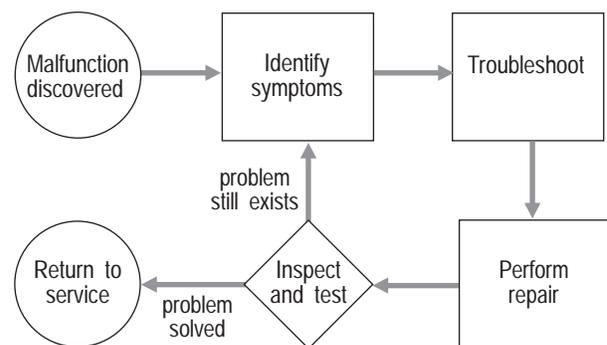
Electrical Schematics

⚠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

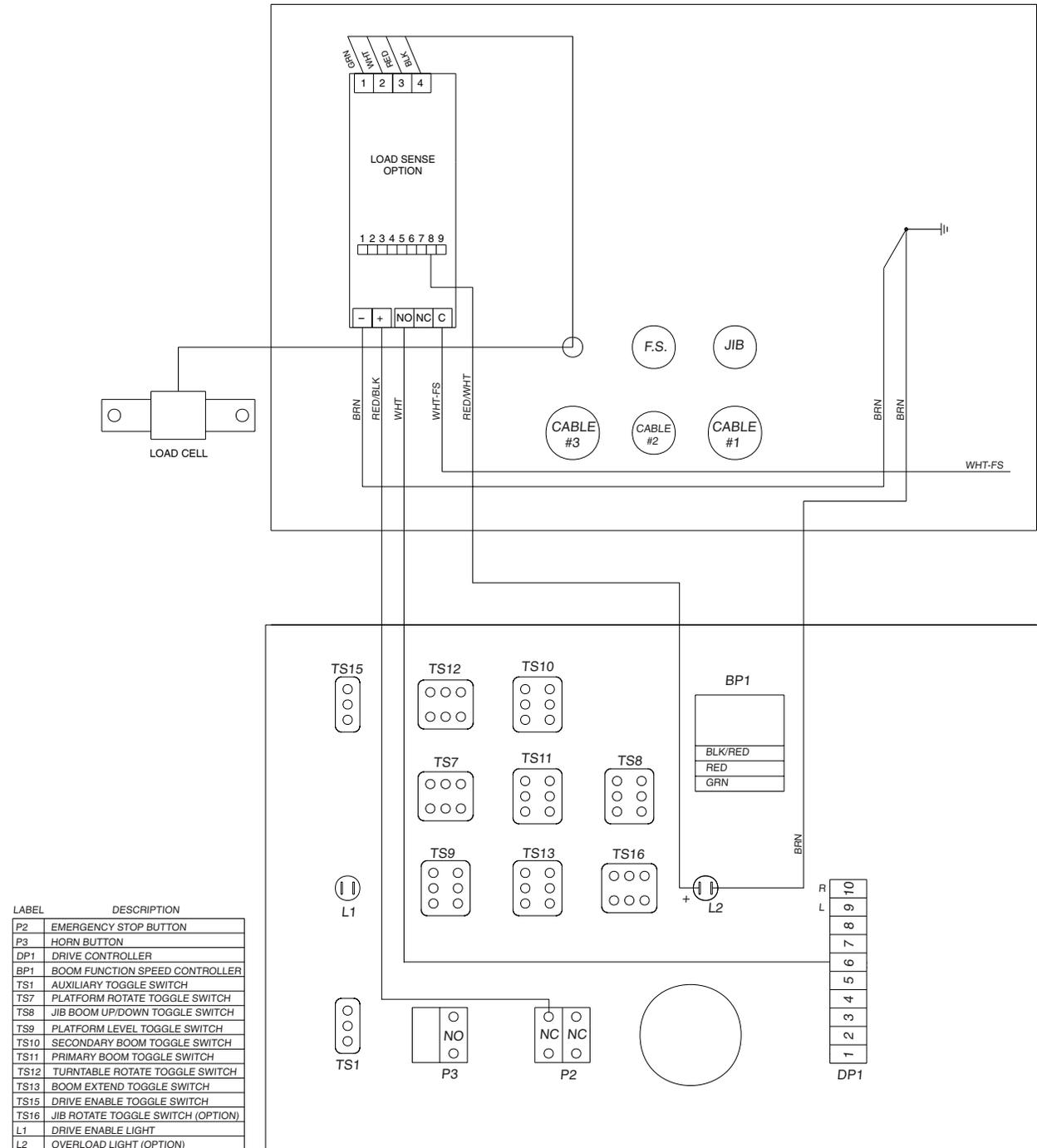
⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

General Repair Process



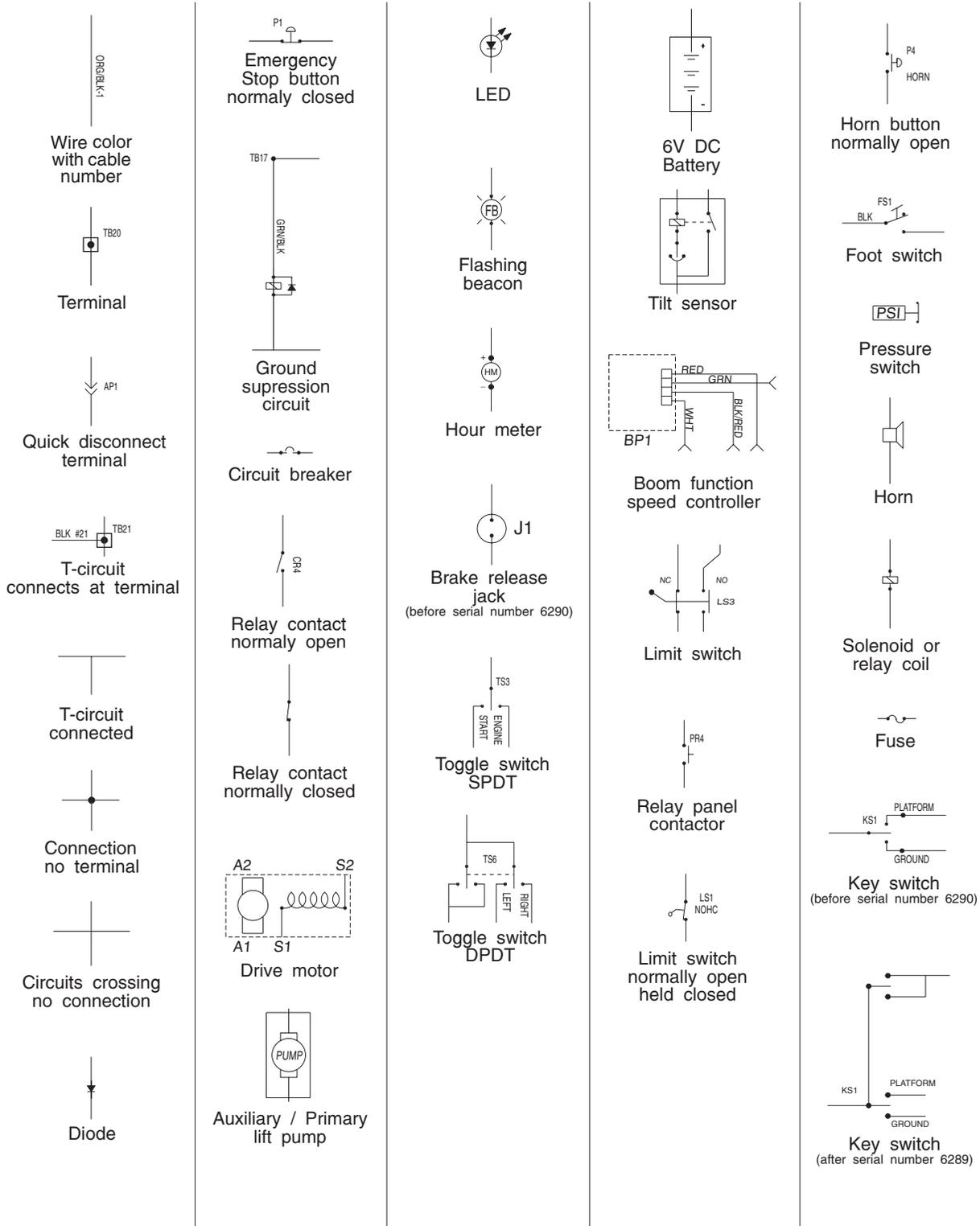
Load Sensor Option Diagram (before serial number 6290)

REV A



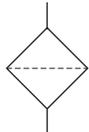
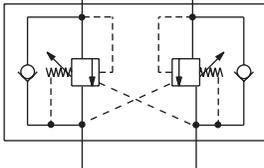
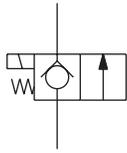
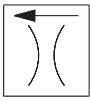
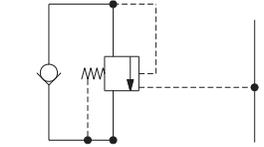
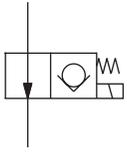
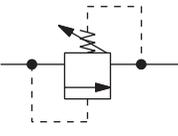
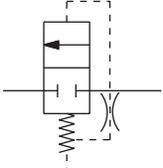
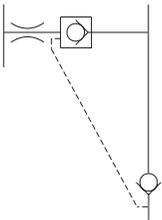
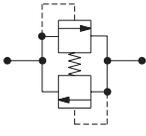
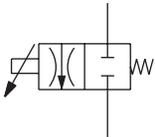
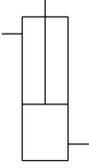
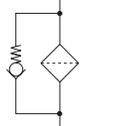
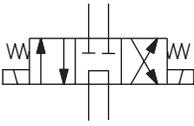
Electrical Symbols Legend

REV B



Hydraulic Symbols Legend

REV B

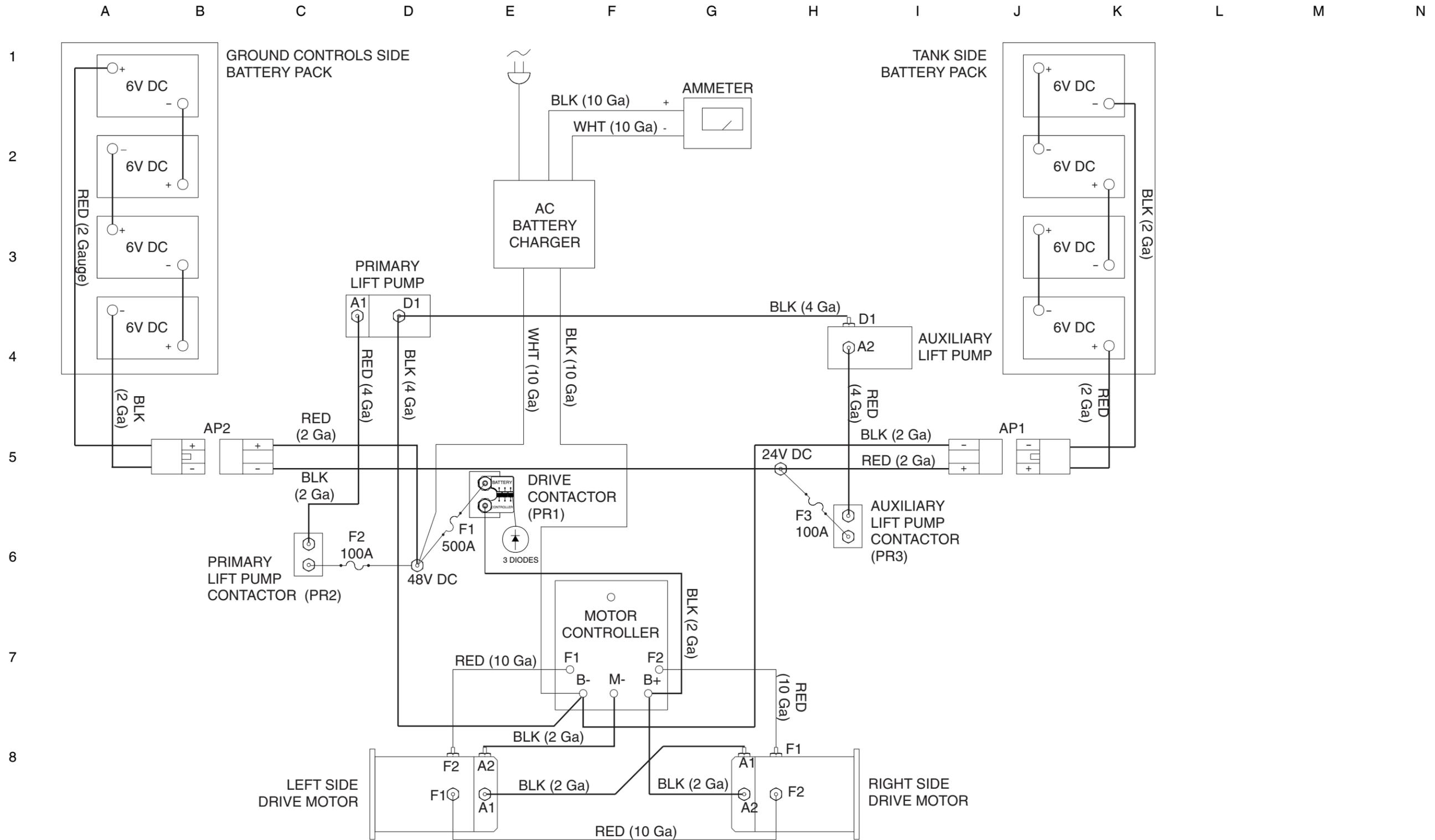
| | | | |
|---|---|---|---|
|  <p>Hydraulic filter</p> |  <p>Fixed displacement pump</p> |  <p>Counterbalance valve (dual)</p> |  <p>Normally closed poppet valve</p> |
|  <p>Check valve</p> |  <p>Flow regulator valve</p> |  <p>Counterbalance valve (single)</p> |  <p>Normally open poppet valve</p> |
|  <p>Orifice</p> |  <p>Relief valve</p> |  <p>Differential sensing valve</p> |  <p>Regen circuit</p> |
|  <p>Brake</p> |  <p>Dual relief valve</p> |  <p>Solenoid operated proportional valve</p> |  <p>Shutoff valve</p> |
|  <p>Double acting cylinder</p> |  <p>Filter with by-pass check valve</p> |  <p>Bi-directional motor</p> | |
|  <p>Pump prime mover (motor)</p> |  <p>Solenoid operated 3 position, 4 way, directional valve</p> | | |
|  <p>Pressure switch</p> | | | |

**Power Cable Diagram
(before serial number 6290)**



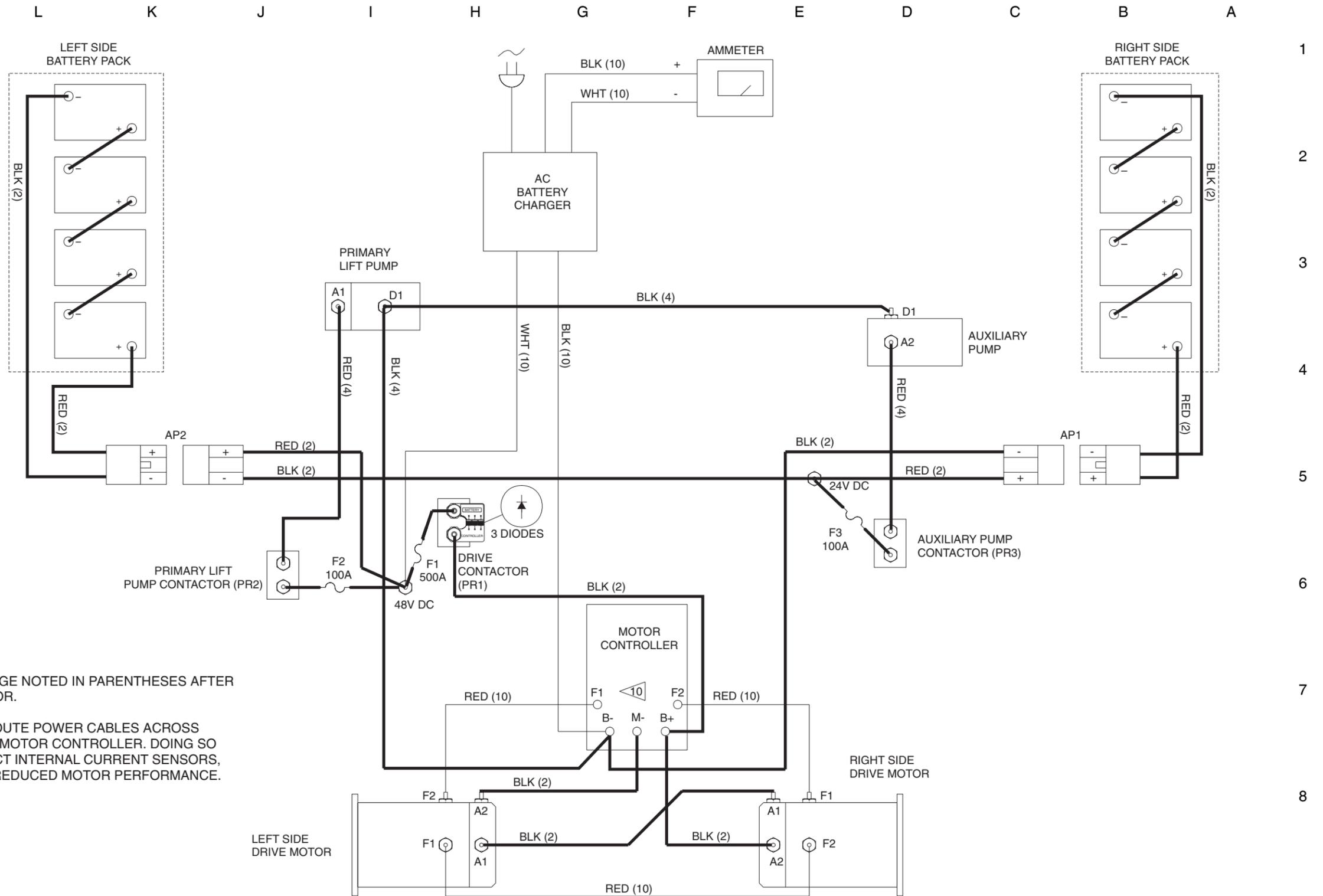
Power Cable Diagram (before serial number 6290)

REV A



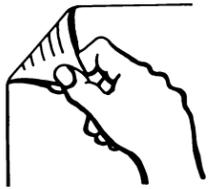
**Power Cable Diagram
(from serial number 6290 to 8354)**

REV B
N M

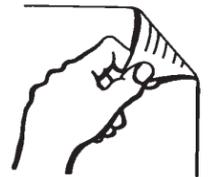


NOTES:
9. WIRE GAUGE NOTED IN PARENTHESES AFTER WIRE COLOR.
⚠ DO NOT ROUTE POWER CABLES ACROSS FRONT OF MOTOR CONTROLLER. DOING SO CAN AFFECT INTERNAL CURRENT SENSORS, CAUSING REDUCED MOTOR PERFORMANCE.

Power Cable Diagram
(from serial number 6290 to 8354)

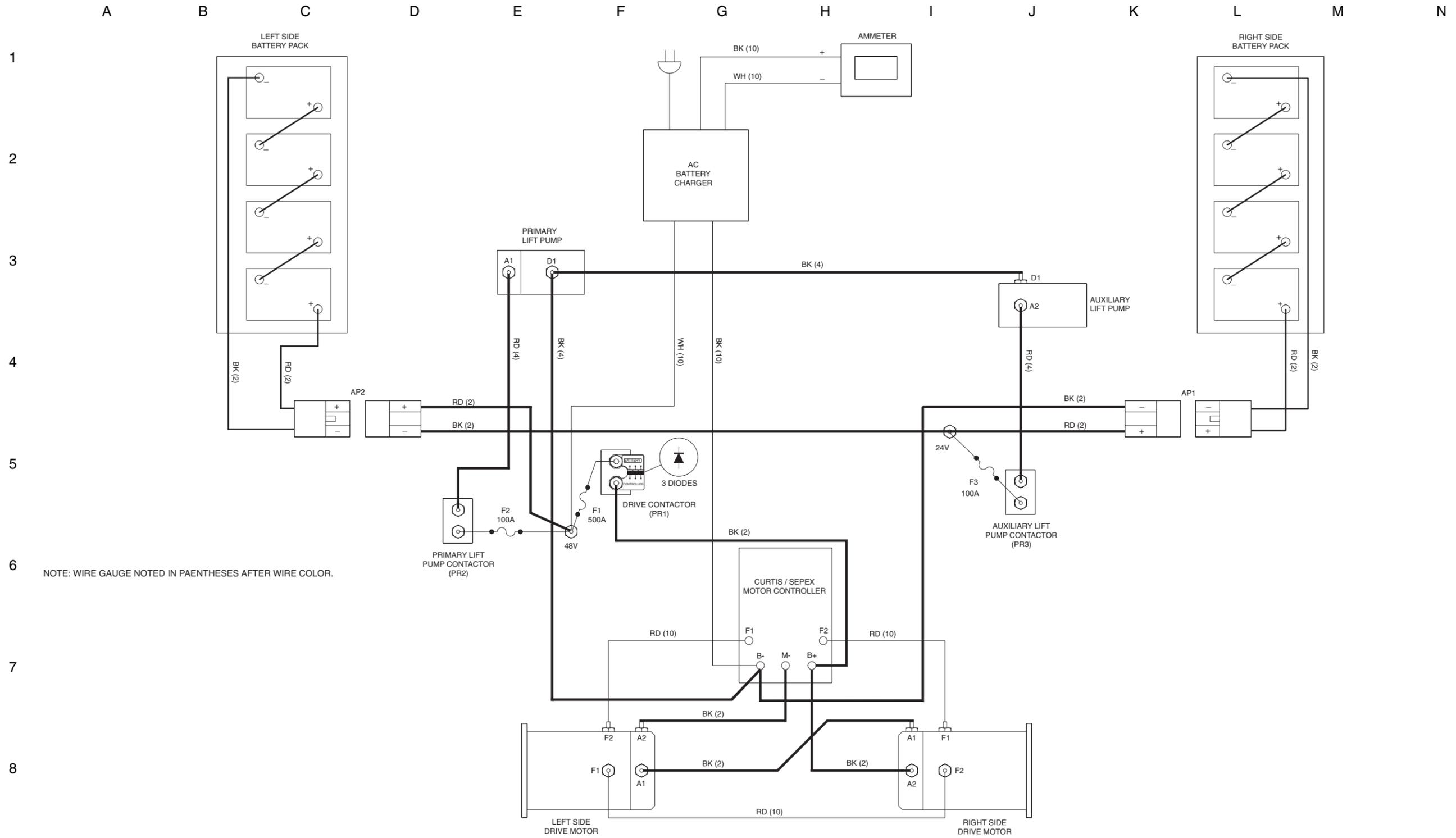


**Power Cable Diagram
(after serial number 8354)**



**Power Cable Diagram
(after serial number 8354)**

REV A



**Power Panel Diagram
(before serial number 6290)**

REV A

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L

K

J

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H

G

F

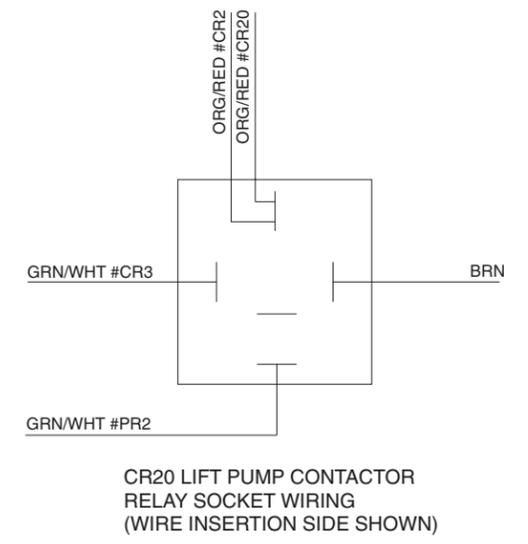
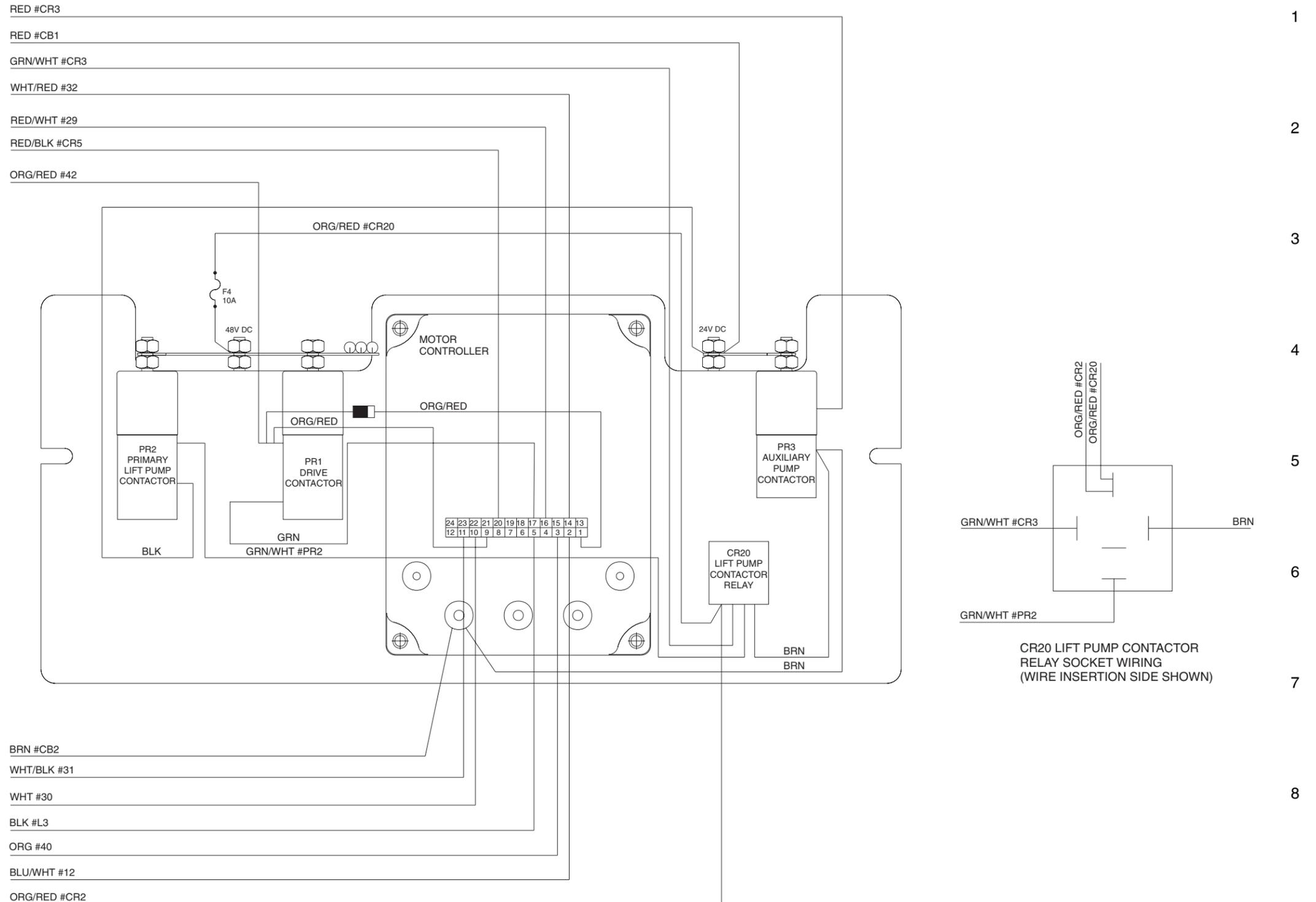
E

D

C

B

A



BRN #CB2
WHT/BLK #31
WHT #30
BLK #L3
ORG #40
BLU/WHT #12
ORG/RED #CR2

**Power Panel Diagram
(before serial number 6290)**

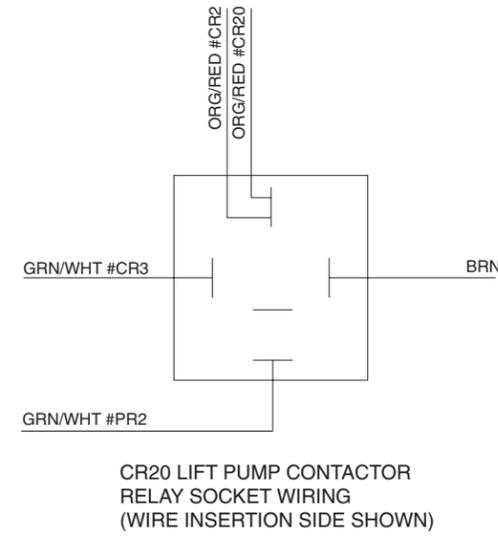
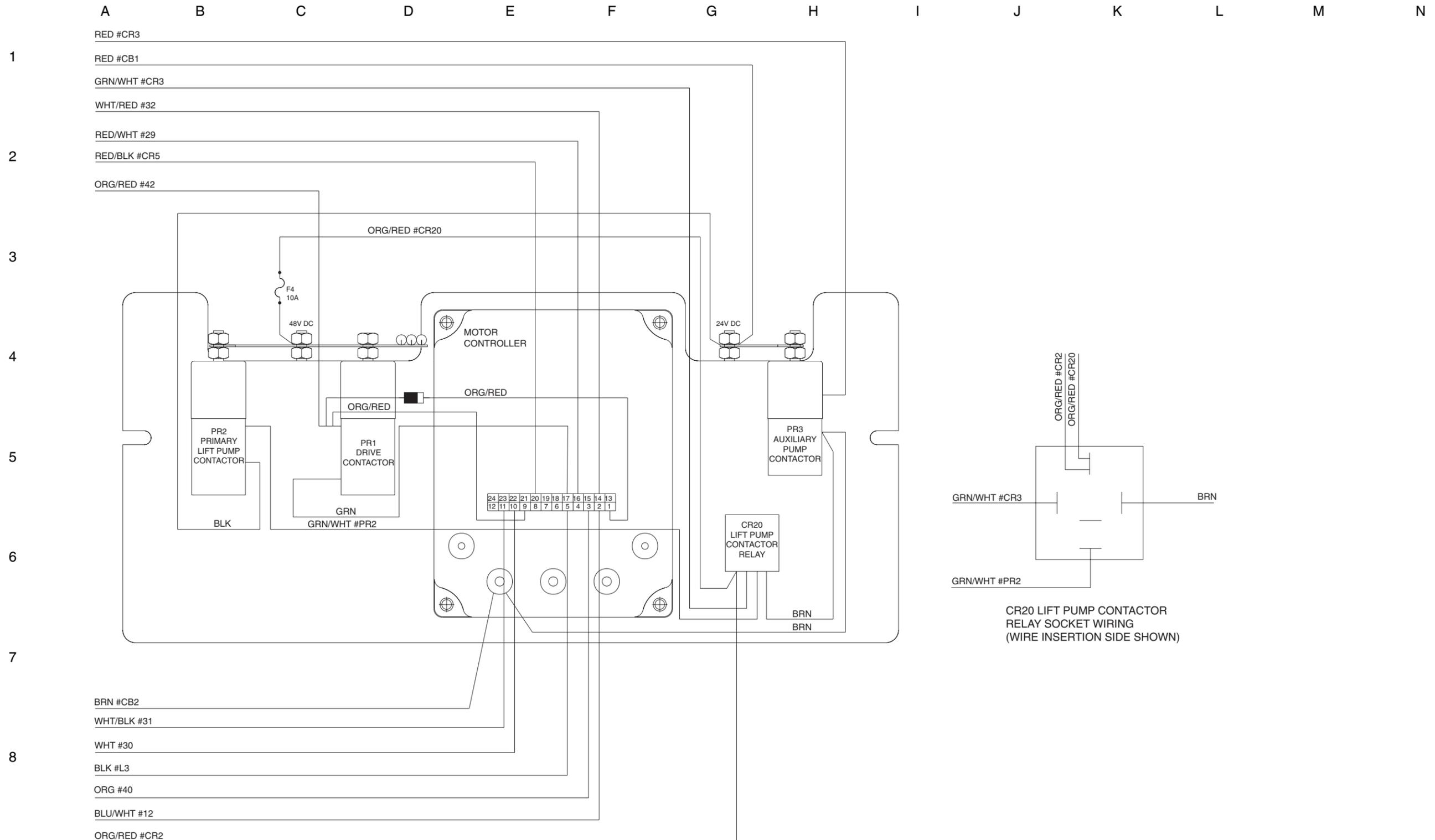


**Power Panel Diagram
(from serial number 6290 to 8354)**



**Power Panel Diagram
(from serial number 6290 to 8354)**

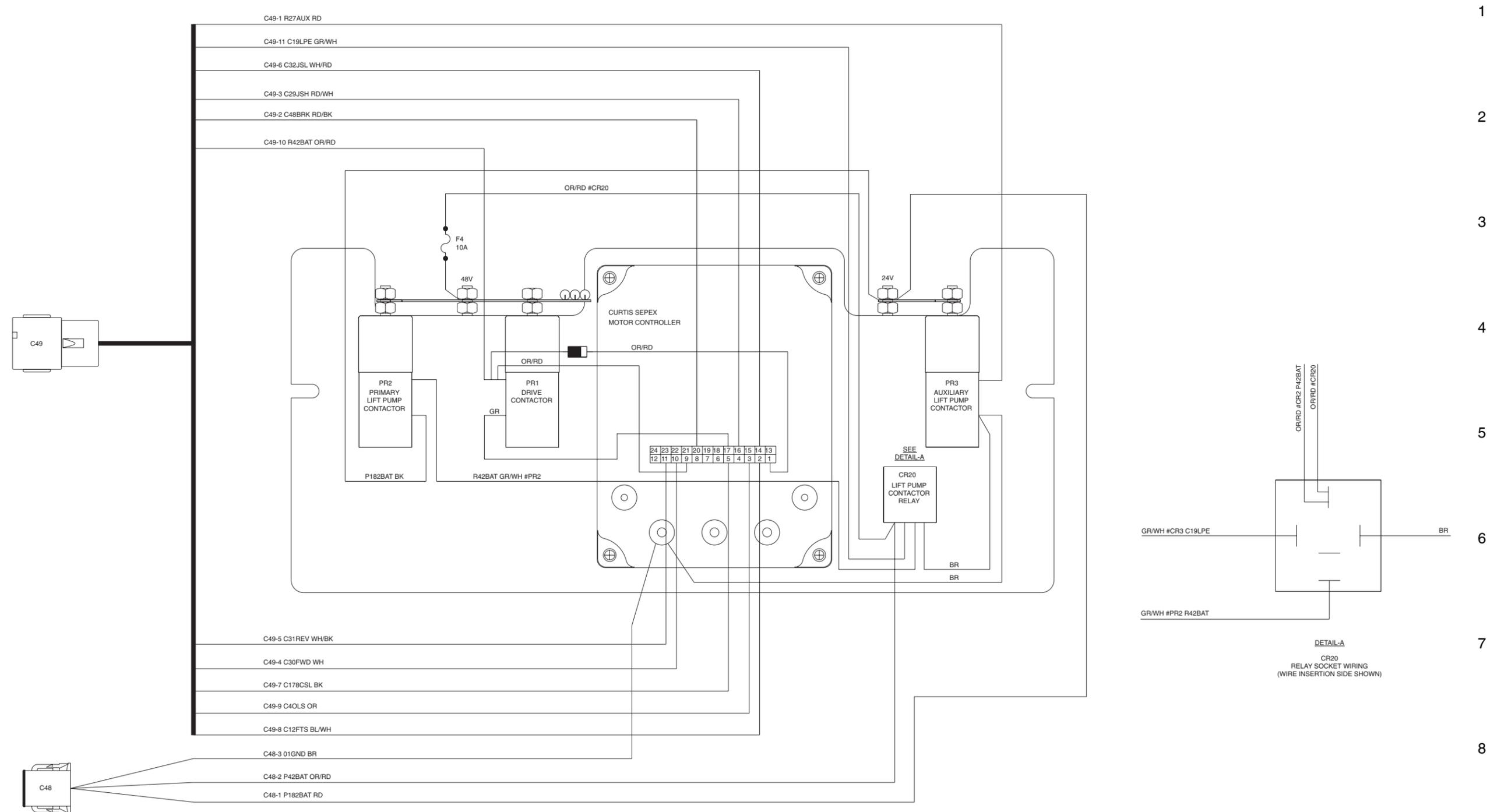
REV A



Power Panel Diagram (after serial number 8354)

REV A

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

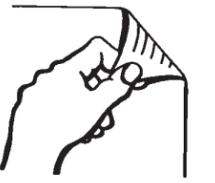


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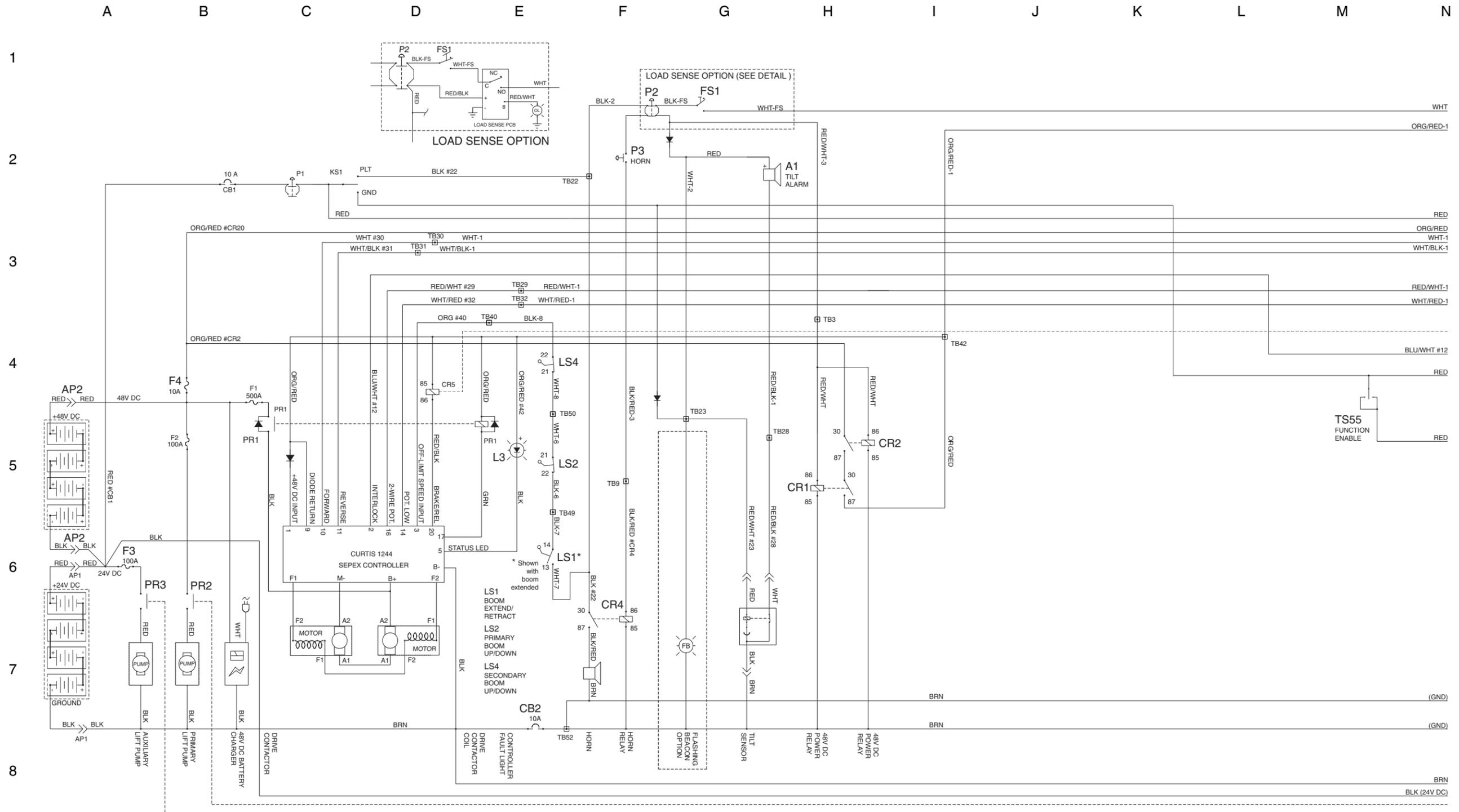
**Power Panel Diagram
(after serial number 8354)**





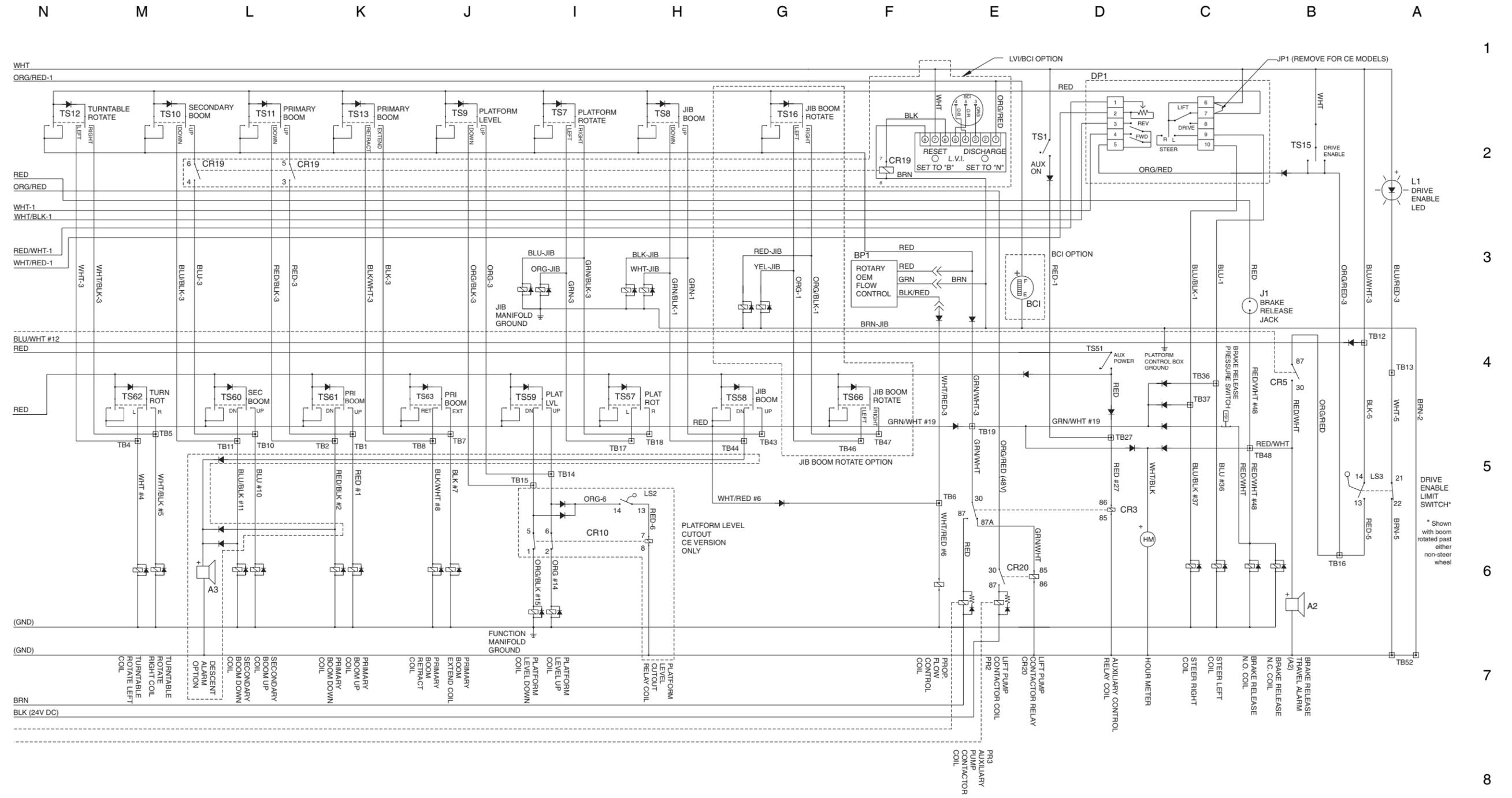
**Electrical Schematic
(before serial number 6290)**

REV B



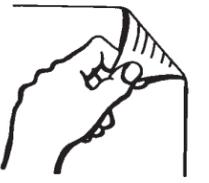
Electrical Schematic (before serial number 6290)

REV B



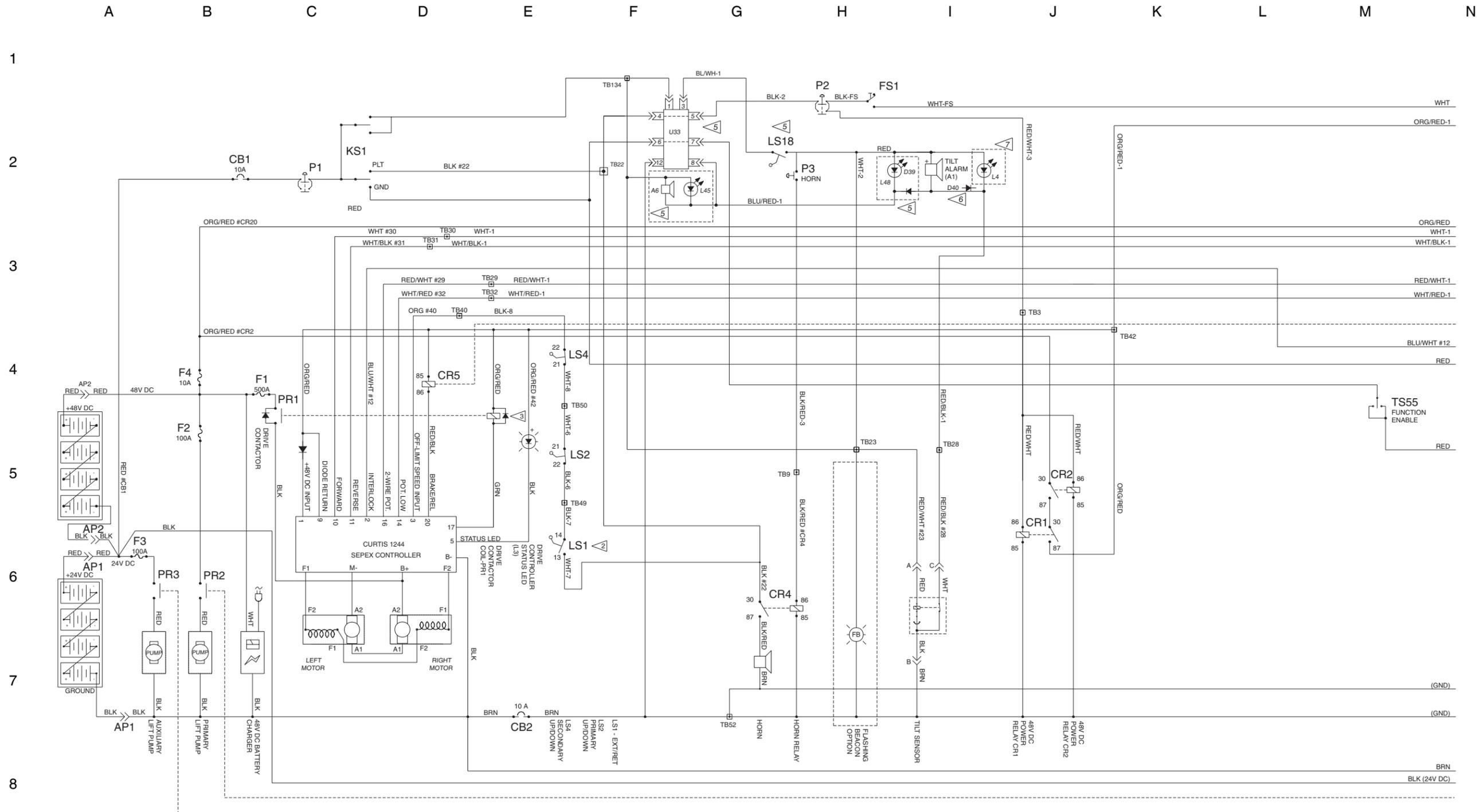
**Electrical Schematic
(before serial number 6290)**





Electrical Schematic (from serial number 6290 to 8354)

REV B



NOTES:

- 1. ALL LIMIT SWITCHES WITH BOOM IN STOWED POSITION EXCEPT AS NOTED
- 2. SWITCH SHOWN WITH BOOM EXTENDED
- 3. REDUNDANT COIL SUPPRESSION DIODE FOR PR1 IS INSIDE CONTROLLER BETWEEN J1-9 AND J1-17.
- 5. CE & PLATFORM LOAD SENSE OPTION.
- 6. ADD D40 ONLY IF UNIT HAS BOTH L4 & L48.
- 7. ANS/CSA ONLY

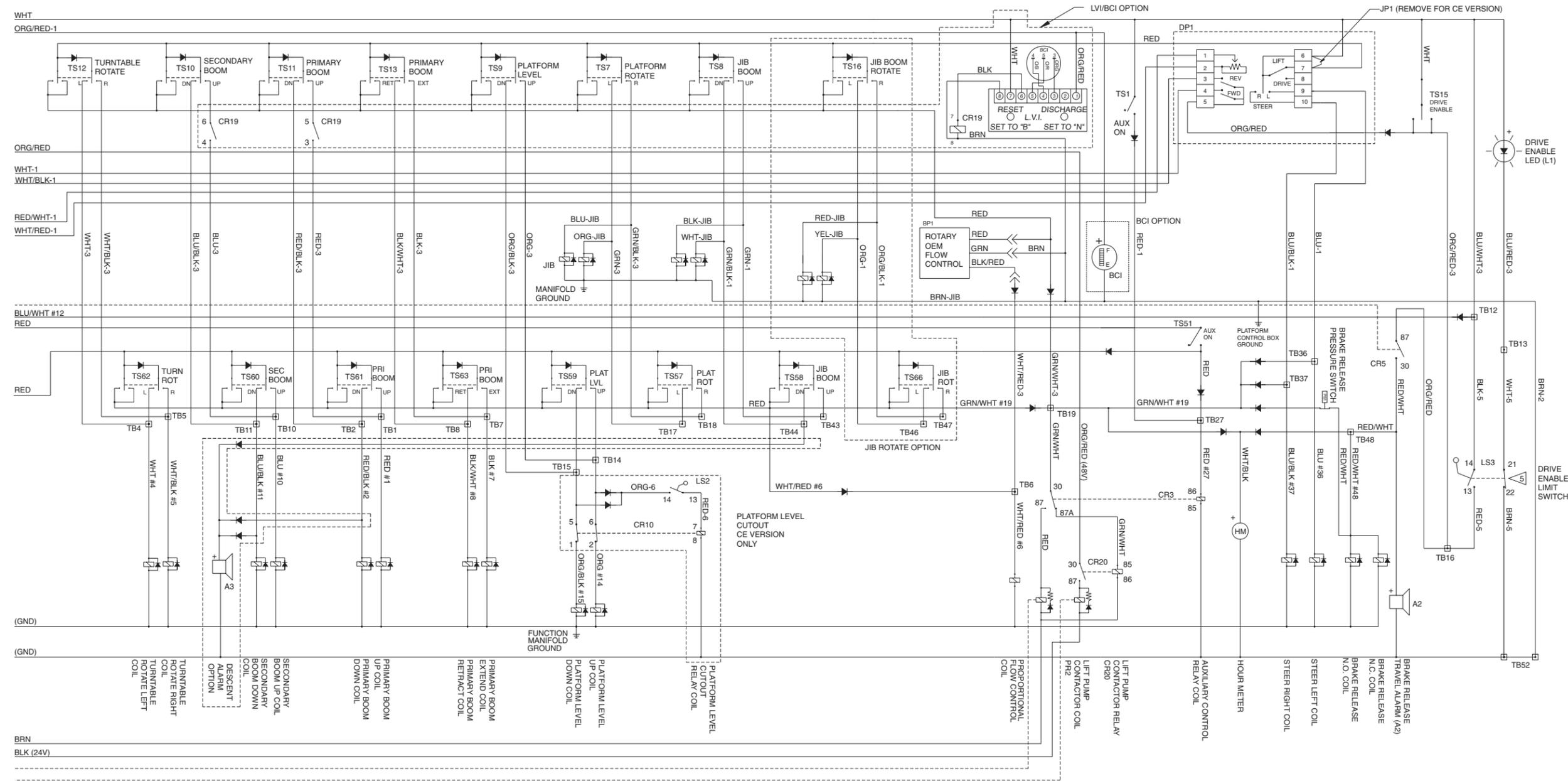


Electrical Schematic (from serial number 6290 to 8354)

REV B

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

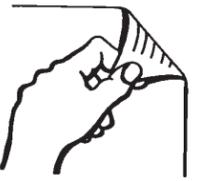
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NOTES:
SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL

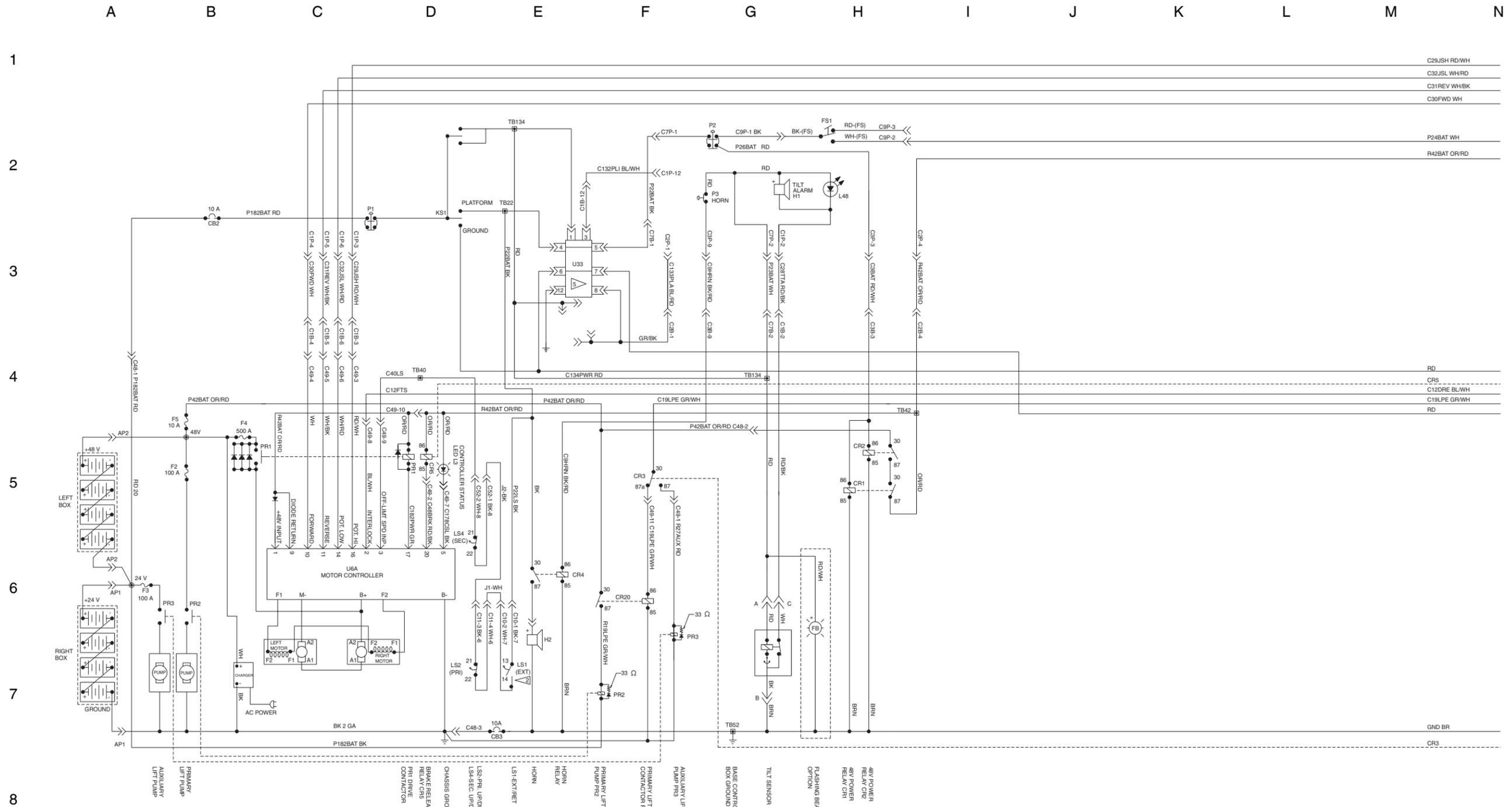
Electrical Schematic
(from serial number 6290 to 8354)





Electrical Schematic (from serial number 8355 to 9346)

REV A

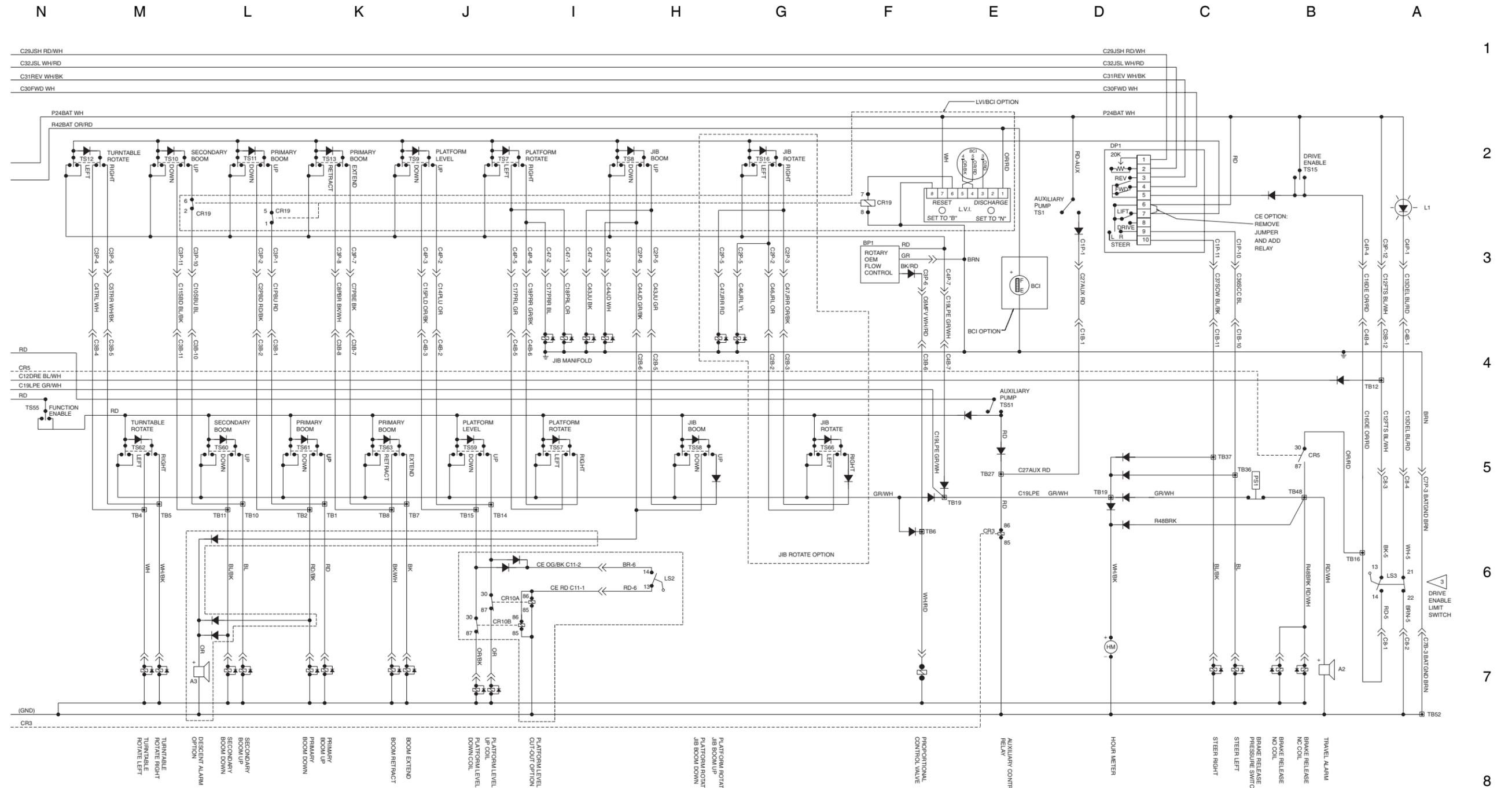


- NOTES:
1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
 2. SWITCH SHOWN WITH BOOM EXTENDED.
 3. SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
 4. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED.



Electrical Schematic (from serial number 8355 to 9346)

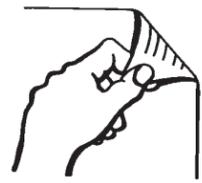
REV A



- NOTES:
- 1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
 - 2. SWITCH SHOWN WITH BOOM EXTENDED.
 - 3. SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
 - 4. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED.
 - 5. SETUP ENABLE: USE TO SET THE BATTERY INDICATOR PROFILES.

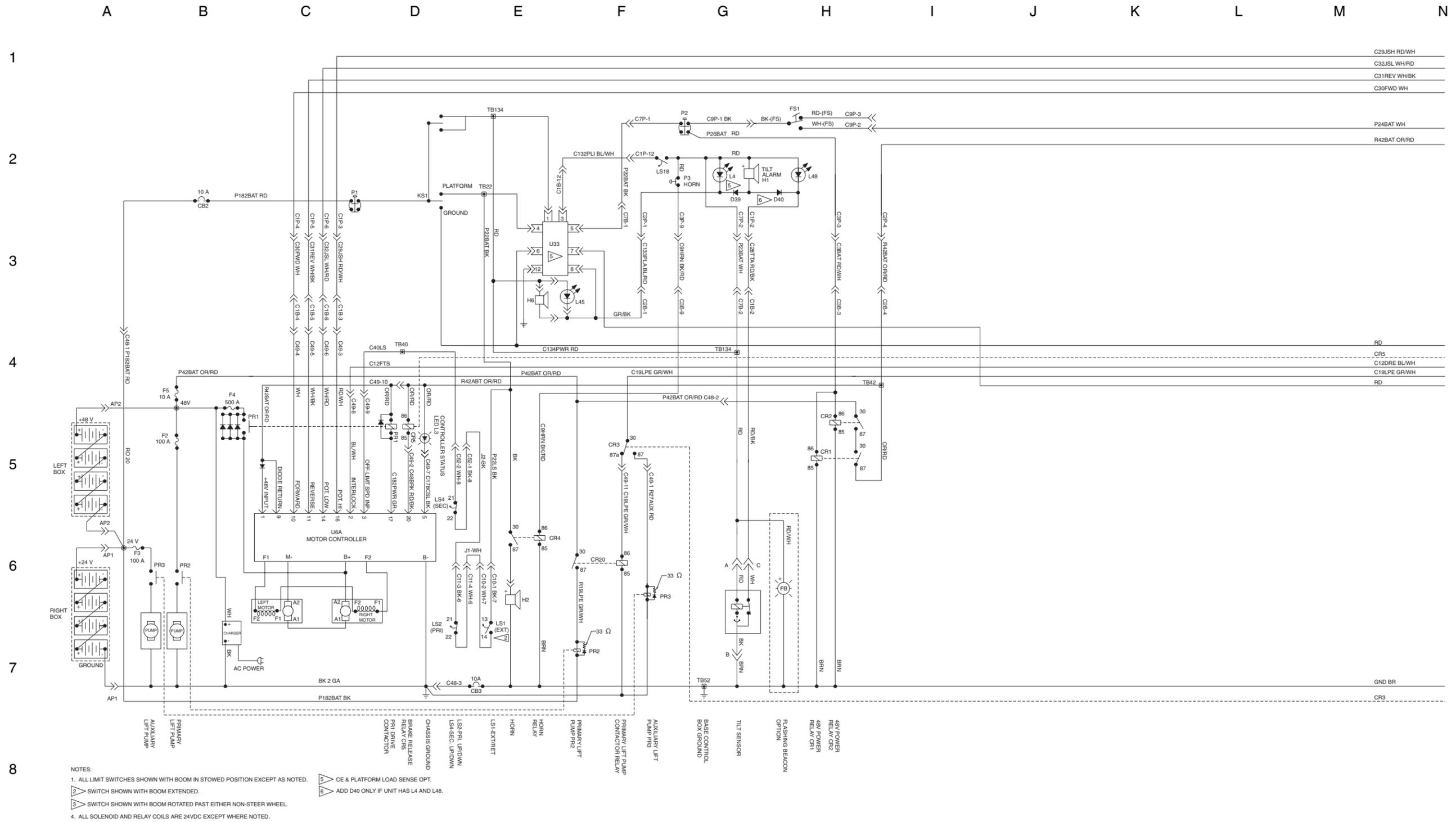
Electrical Schematic
(from serial number 8355 to 9346)





Electrical Schematic - CE Models (from serial number 8355 to 9346)

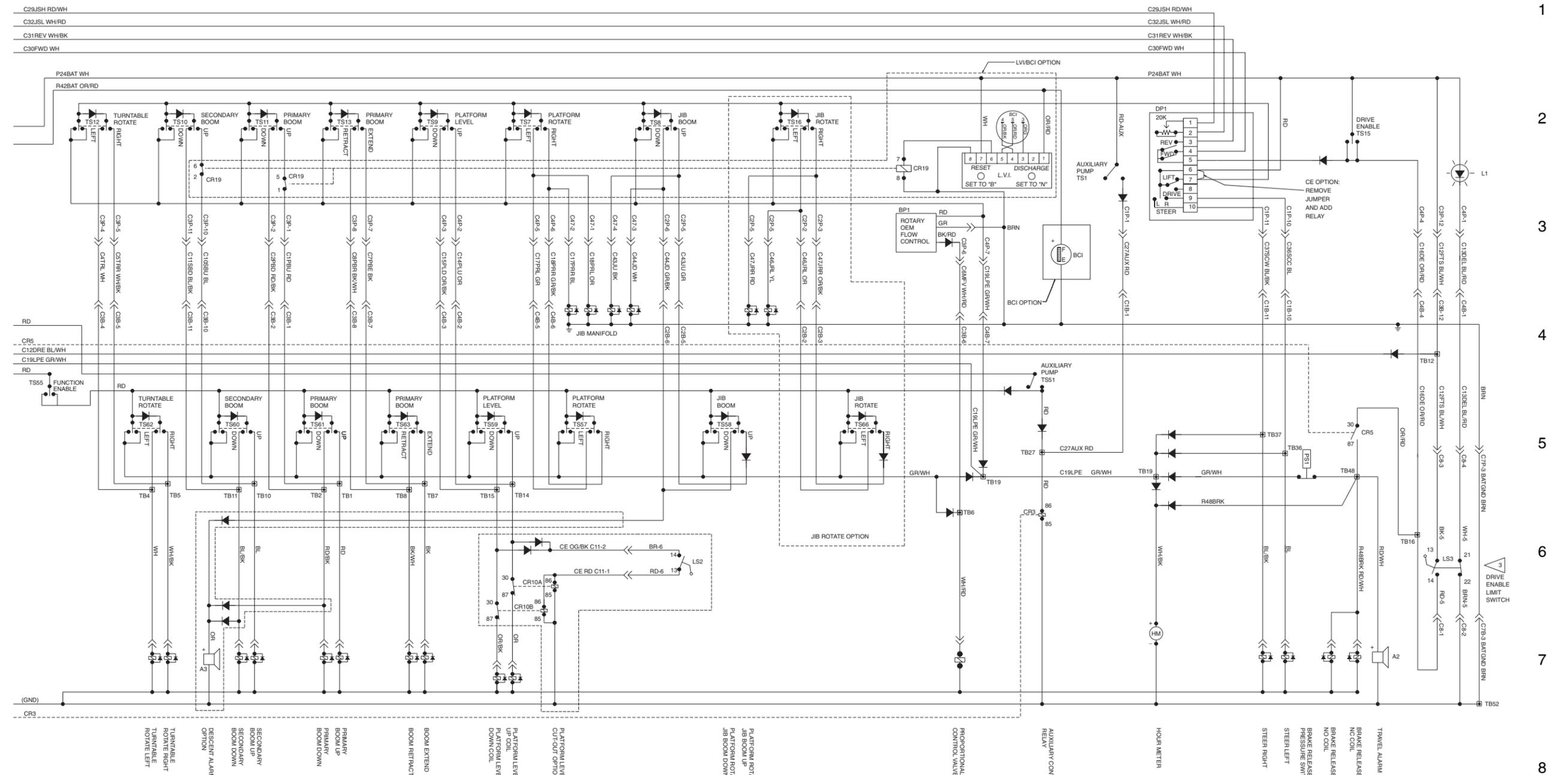
REV A



Electrical Schematic - CE Models (from serial number 8355 to 9346)

REV A

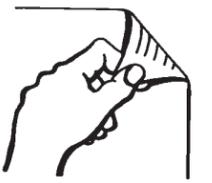
N M L K J I H G F E D C B A



- NOTES:
- 1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
 - 2. SWITCH SHOWN WITH BOOM EXTENDED.
 - 3. SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
 - 4. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED. SETUP ENABLE: USE TO SET THE BATTERY INDICATOR PROFILES.

**Electrical Schematic - CE Models
(from serial number 8355 to 9346)**

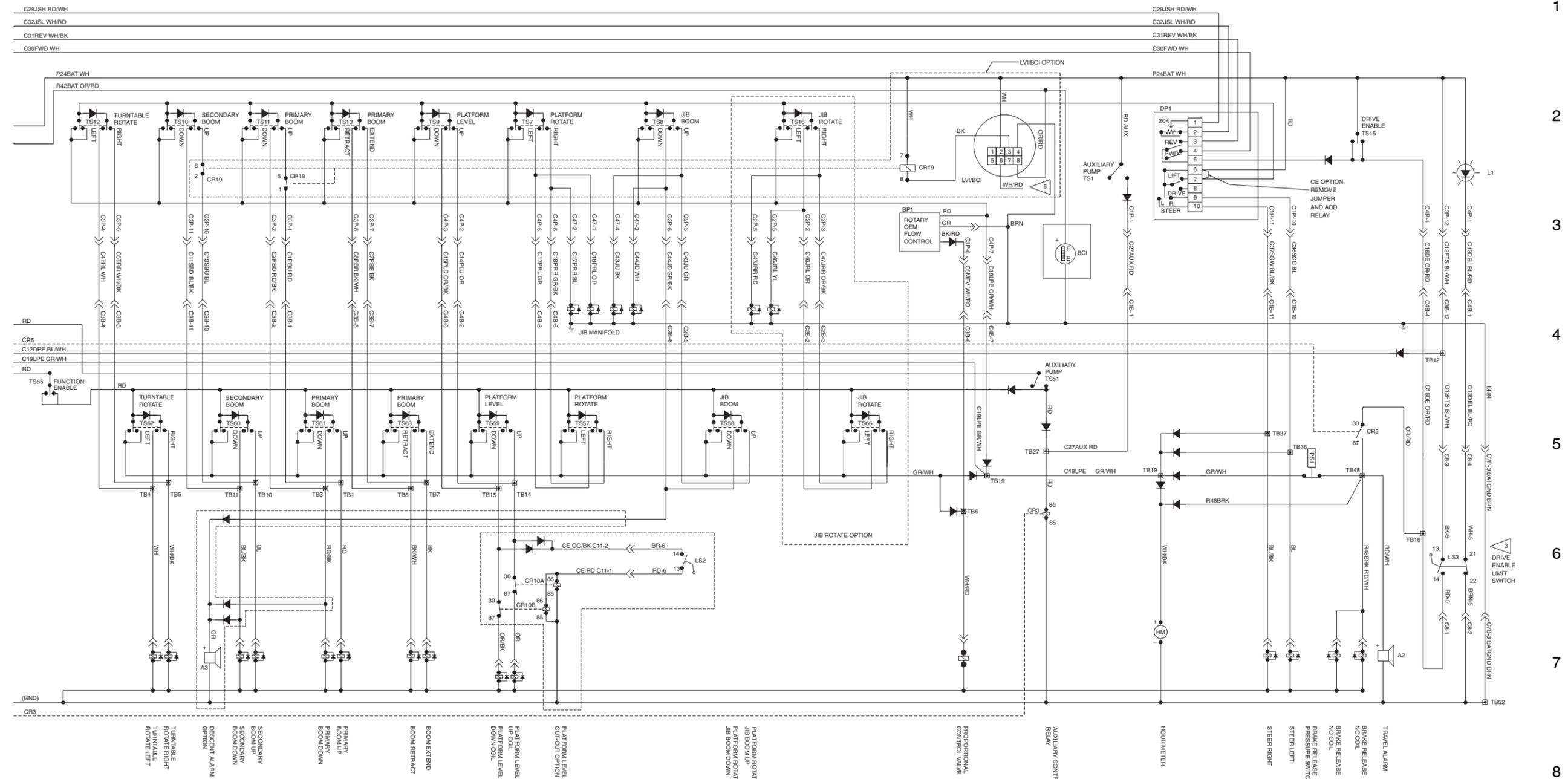




Electrical Schematic (after serial number 9346)

REV A

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

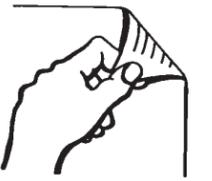


- NOTES:
- 1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
 - 2. SWITCH SHOWN WITH BOOM EXTENDED.
 - 3. SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
 - 4. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED.
 - 5. SETUP ENABLE: USE TO SET THE BATTERY INDICATOR PROFILES.

TURNABLE ROTATE RIGHT
TURNABLE ROTATE LEFT
SECONDARY BOOM UP
SECONDARY BOOM DOWN
DESCENT ALARM OPTION
PRIMARY BOOM UP
PRIMARY BOOM DOWN
BOOM EXTEND
BOOM RETRACT
PLATFORM LEVEL UP COIL
PLATFORM LEVEL DOWN COIL
PLATFORM LEVEL OUT-OPTION
PLATFORM ROTATE LEFT
PLATFORM ROTATE RIGHT
JIB BOOM UP
JIB BOOM DOWN
PROPORTIONAL CONTROL VALVE
AUXILIARY RELAY
AUXILIARY CONTROL
HOURMETER
STEER LEFT
STEER RIGHT
BRAKE RELEASE NO COIL
BRAKE RELEASE COIL
BRAKE RELEASE PRESSURE SWITCH
TRAVEL ALARM
DRIVE ENABLE LIMIT SWITCH

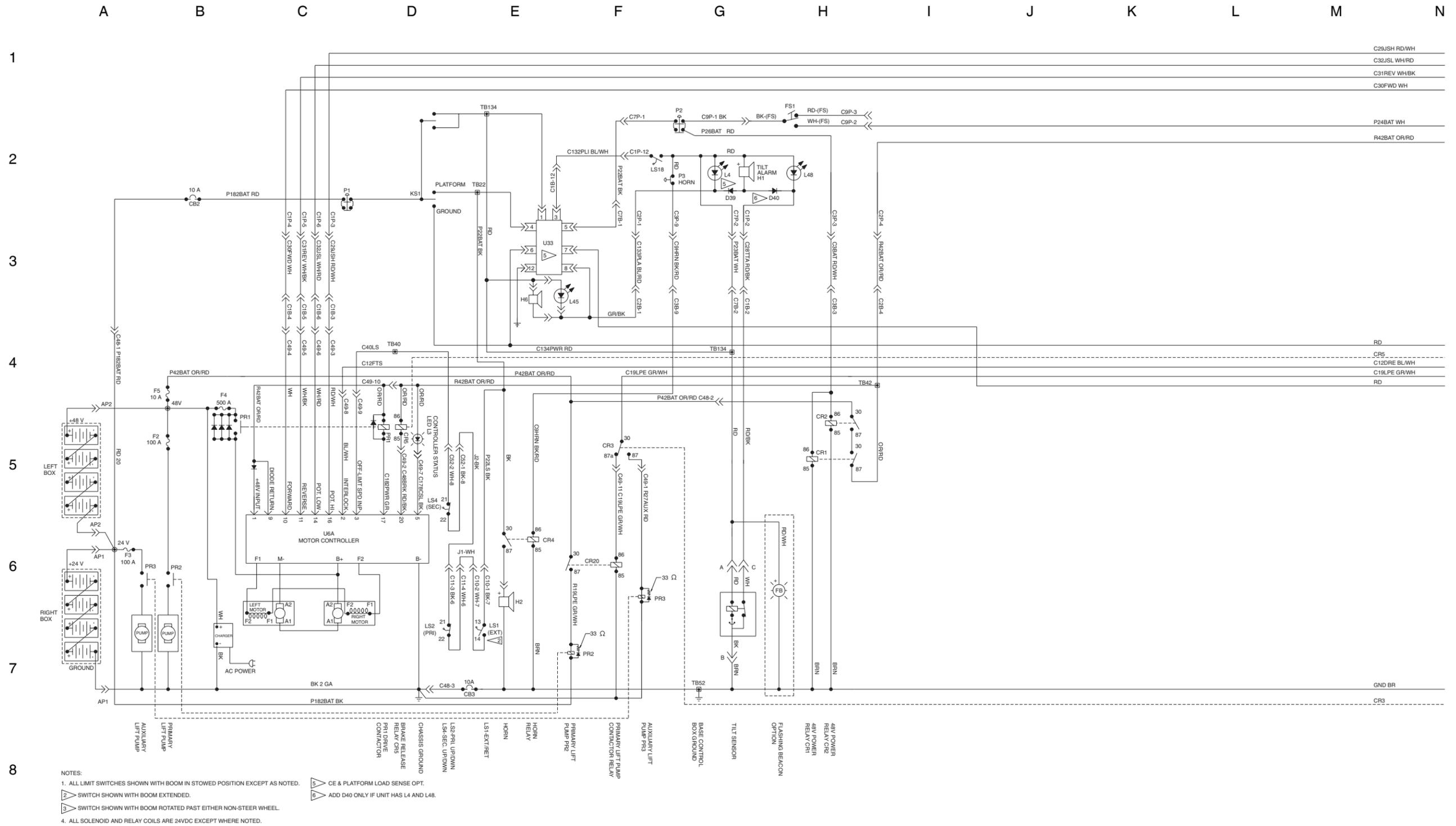
**Electrical Schematic
(after serial number 9346)**





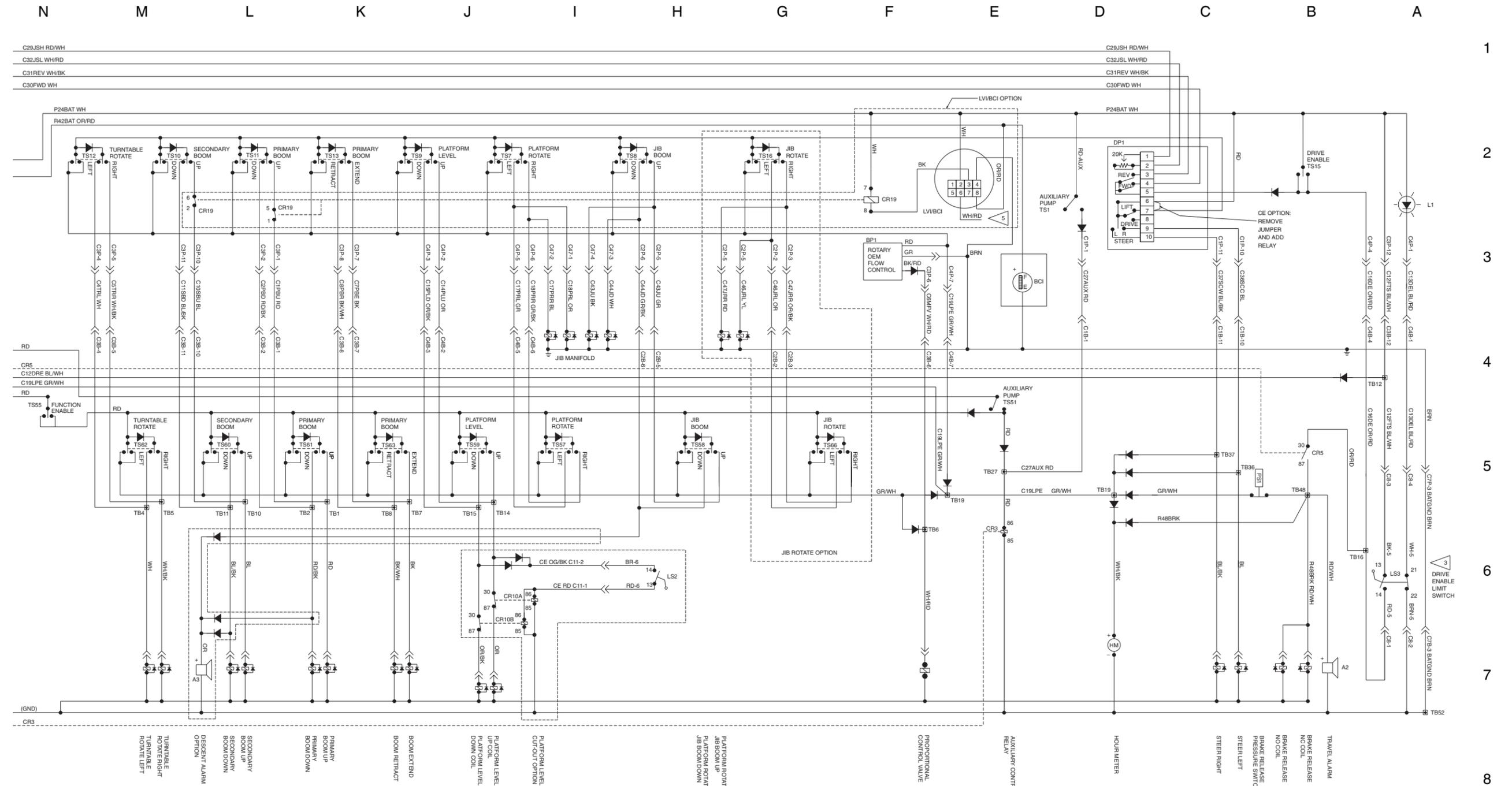
Electrical Schematic - CE Models (after serial number 9346)

REV A



Electrical Schematic - CE Models (after serial number 9346)

REV A



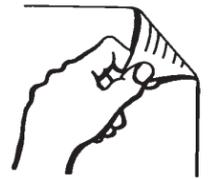
NOTES:

1. ALL LIMIT SWITCHES SHOWN WITH BOOM IN STOWED POSITION EXCEPT AS NOTED.
2. SWITCH SHOWN WITH BOOM EXTENDED.
3. SWITCH SHOWN WITH BOOM ROTATED PAST EITHER NON-STEER WHEEL.
4. ALL SOLENOID AND RELAY COILS ARE 24VDC EXCEPT WHERE NOTED. SETUP ENABLE: USE TO SET THE BATTERY INDICATOR PROFILES.

**Electrical Schematic - CE Models
(after serial number 9346)**

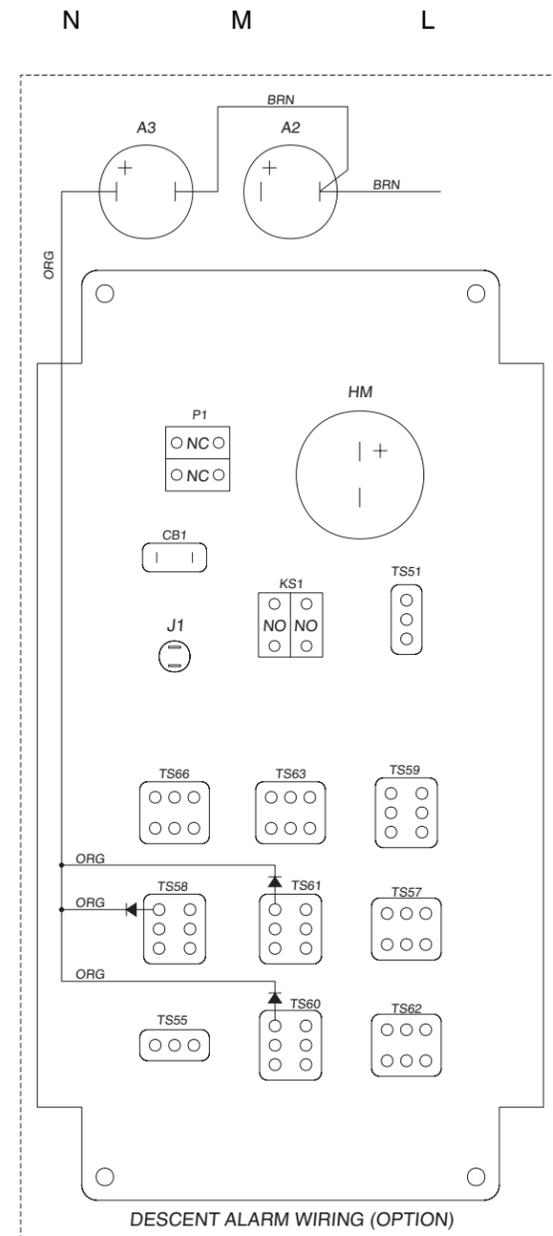


**Ground Control Panel Wiring Diagram
(before serial number 6290)**



Ground Control Panel Wiring Diagram (from serial number 6290 to 8354)

REV A



CONTROL RELAY I.D.
 CR1 - SECONDARY 48V DC POWER
 CR2 - PRIMARY 48V DC POWER
 CR3 - AUXILIARY PUMP
 CR4 - HORN
 CR5 - BRAKE RELEASE
 CR10A - PLATFORM LEVEL CUTOUT (CE ONLY)
 CR10B - PLATFORM LEVEL CUTOUT (CE ONLY)

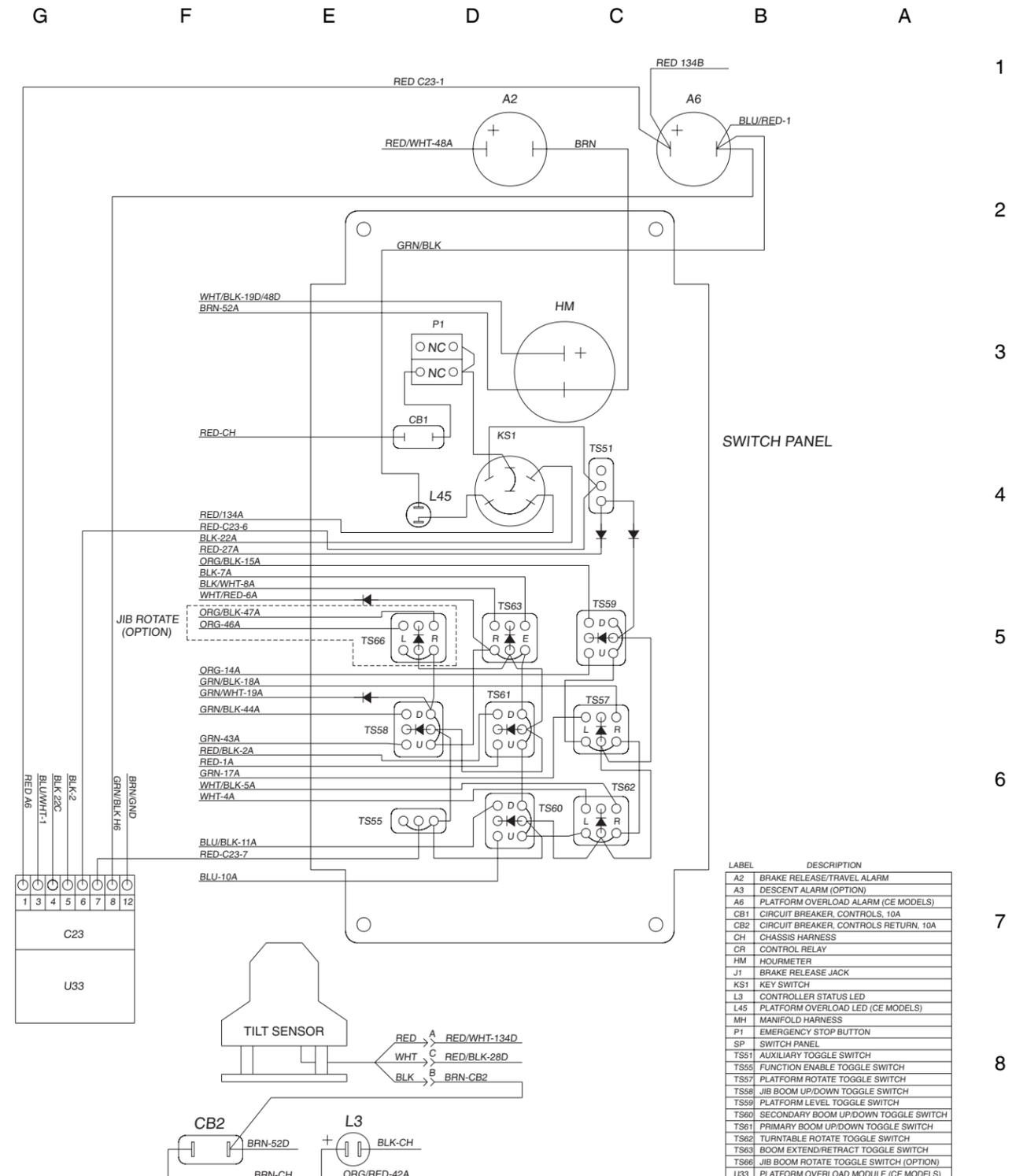
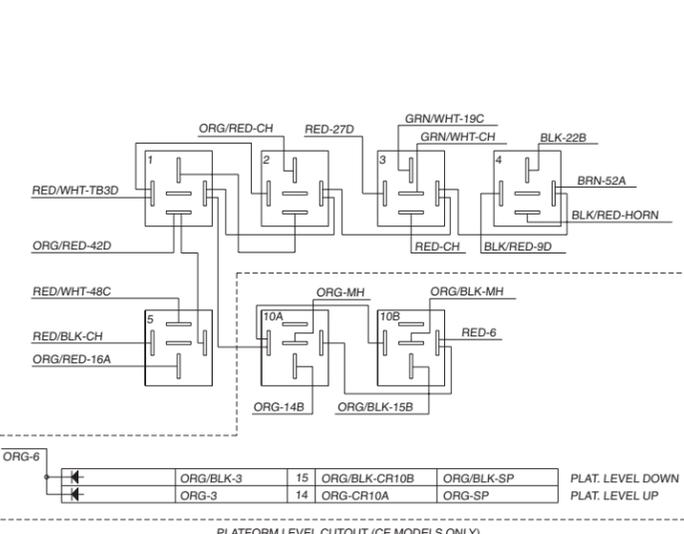
OPTION NUMBERS
 1 - PLATFORM LEVEL CUTOUT
 2 - FLASHING BEACON
 3 - DESCENT ALARM

SPARE WIRE LIST
 BLK-1
 BLK/WHT-1
 BLK/RED-1
 GRN/WHT-1

| OPTION 2] | | 134A | | |
|--------------|----------------|------|--------------|---------------|
| RED/WHT-TILT | WHT-2 | 134 | RED-A6 | RED-KS1 |
| BRN-CB2 | BLK [OPTION 2] | 52 | BRN-CH | BRN-CR4 |
| BRN-5 | BRN-2 | 52 | BRN-MH | BRN-SP |
| WHT-6 | WHT-8 | 50 | | |
| BLK-7 | BLK-6 | 49 | | |
| WHT/BLK-SP | RED/WHT-CR5 | 48 | RED/WHT-MH | RED/WHT-SP |
| | ORG/BLK-1 | 47 | | ORG/BLK-SP ** |
| | ORG-1 | 46 | | ORG-SP ** |
| | GRN/BLK-1 | 44 | | GRN/BLK-SP |
| | GRN-1 | 43 | | GRN-SP |
| ORG/RED-CR1 | ORG/RED-1 | 42 | ORG/RED-CH | ORG/RED-L3 |
| BLK-8 | | 40 | ORG-CH | |
| BLU/BLK-19D | BLU/BLK-1 | 37 | BLU/BLK-MH | |
| BLU-19D | BLU-1 | 36 | BLU-MH | |
| | WHT/RED-1 | 32 | WHT/RED-CH | |
| | WHT/BLK-1 | 31 | WHT/BLK-CH | |
| | WHT-1 | 30 | WHT-CH | |
| RED/BLK-TILT | RED/WHT-1 | 29 | RED/WHT-CH | |
| RED-CR3 | RED-1 | 27 | RED-SP | |
| | | 26 | | |
| | | 25 | | |
| | | 24 | | |
| | | 23 | | |
| WHT-7 | BLK-C23-4 | 22 | BLK-CR4 | BLK-SP |
| TB36/TB37 | GRN/WHT-CR3 | 19 | | GRN/WHT-MH |
| WHT/BLK-SP | GRN/WHT-3 | 19 | | GRN/WHT-SP |
| | GRN-3 | 18 | | GRN/BLK-SP |
| | GRN-3 | 17 | | GRN-SP |
| RED-5 | ORG/RED-3 | 16 | | ORG/RED-CR5 |
| | ORG/BLK-3 | 15 | ORG/BLK-MH * | ORG/BLK-SP |
| | ORG-3 | 14 | ORG-MH * | ORG-SP |
| WHT-5 | BLU/RED-3 | 13 | | |
| BLK-5 | BLU/WHT-3 | 12 | | BLU/WHT-CH |
| | BLU/BLK-3 | 11 | BLU/BLK-MH | BLU/BLK-SP |
| | BLU-3 | 10 | BLU-MH | BLU-SP |
| BLK/RED-CR4 | BLK/RED-3 | 9 | | |
| | BLK/WHT-3 | 8 | BLK/WHT-MH | BLK/WHT-SP |
| | BLK-3 | 7 | BLK-MH | BLK-SP |
| | WHT/RED-3 | 6 | WHT/RED-MH | WHT/RED-SP |
| | WHT/BLK-3 | 5 | WHT/BLK-MH | WHT/BLK-SP |
| | WHT-3 | 4 | WHT-MH | WHT-SP |
| RED/WHT-CR1 | RED/WHT-3 | 3 | | |
| | RED/BLK-3 | 2 | RED/BLK-MH | RED/BLK-SP |
| | RED-3 | 1 | RED-MH | RED-SP |

KEYSWITCH POWER
 KEYSWITCH POWER
 GROUND
 GROUND
 LS2-LS4 JUNCTION
 LS1-LS2 JUNCTION
 BRAKE RELEASE
 JIB RIGHT
 JIB LEFT
 JIB DOWN
 JIB UP
 SWITCHED 48V
 OFF-LIMIT SPEED
 STEER RIGHT
 STEER LEFT
 JOYSTICK POT. LOW
 REVERSE
 FORWARD
 2-WIRE POT.
 TILT ALARM
 AUXILIARY PUMP SELECT
 LIFT LOCKOUT
 BATTERY LIGHT
 TRACTION CONTROL

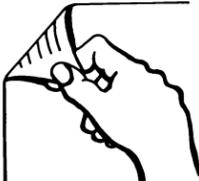
+24V TO PLATFORM
 LIFT PUMP
 LIFT PUMP
 PLAT. ROTATE RIGHT
 PLAT. ROTATE LEFT
 DRIVE ENABLE
 PLAT. LEVEL DOWN
 PLAT. LEVEL UP
 DRIVE ENABLE LIGHT
 FOOTSWITCH
 SEC. BOOM DOWN
 SEC. BOOM UP
 HORN
 BOOM RETRACT
 BOOM EXTEND
 BOOM FUNCTION F.C.
 TURN. ROTATE RIGHT
 TURN. ROTATE LEFT
 48V RELAY COIL PWR.
 PRIMARY BOOM DOWN
 PRIMARY BOOM UP



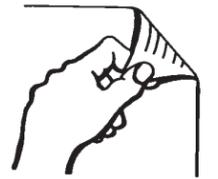
| LABEL | DESCRIPTION |
|-------|--|
| A2 | BRAKE RELEASE/TRAVEL ALARM |
| A3 | DESCENT ALARM (OPTION) |
| A6 | PLATFORM OVERLOAD ALARM (CE MODELS) |
| CB1 | CIRCUIT BREAKER, CONTROLS, 10A |
| CB2 | CIRCUIT BREAKER, CONTROLS RETURN, 10A |
| CH | CHASSIS HARNESS |
| CR | CONTROL RELAY |
| HM | HOURLY METER |
| J1 | BRAKE RELEASE JACK |
| KS1 | KEY SWITCH |
| L3 | CONTROLLER STATUS LED |
| L45 | PLATFORM OVERLOAD LED (CE MODELS) |
| MH | MANIFOLD HARNESS |
| P1 | EMERGENCY STOP BUTTON |
| SP | SWITCH PANEL |
| TS51 | AUXILIARY TOGGLE SWITCH |
| TS55 | FUNCTION ENABLE TOGGLE SWITCH |
| TS57 | PLATFORM ROTATE TOGGLE SWITCH |
| TS58 | JIB BOOM UP/DOWN TOGGLE SWITCH |
| TS59 | PLATFORM LEVEL TOGGLE SWITCH |
| TS60 | SECONDARY BOOM UP/DOWN TOGGLE SWITCH |
| TS61 | PRIMARY BOOM UP/DOWN TOGGLE SWITCH |
| TS62 | TURNABLE ROTATE TOGGLE SWITCH |
| TS63 | BOOM EXTEND/RETRACT TOGGLE SWITCH |
| TS66 | JIB BOOM ROTATE TOGGLE SWITCH (OPTION) |
| TS67 | PLATFORM OVERLOAD MODULE (CE MODELS) |



**Ground Control Panel Wiring Diagram
(from serial number 6290 to 8354)**

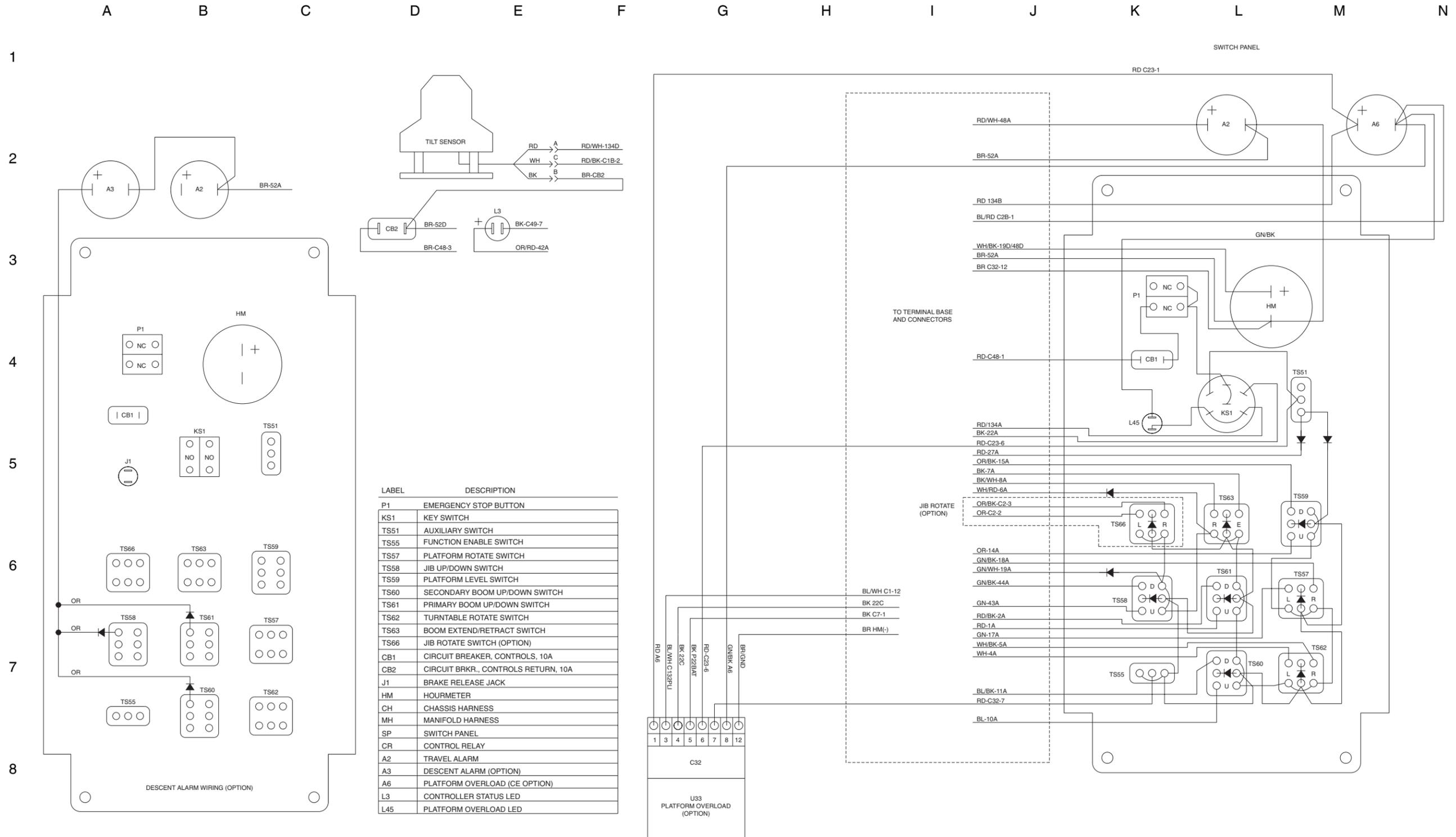


**Ground Control Panel Wiring Diagram
(after serial number 8354)**



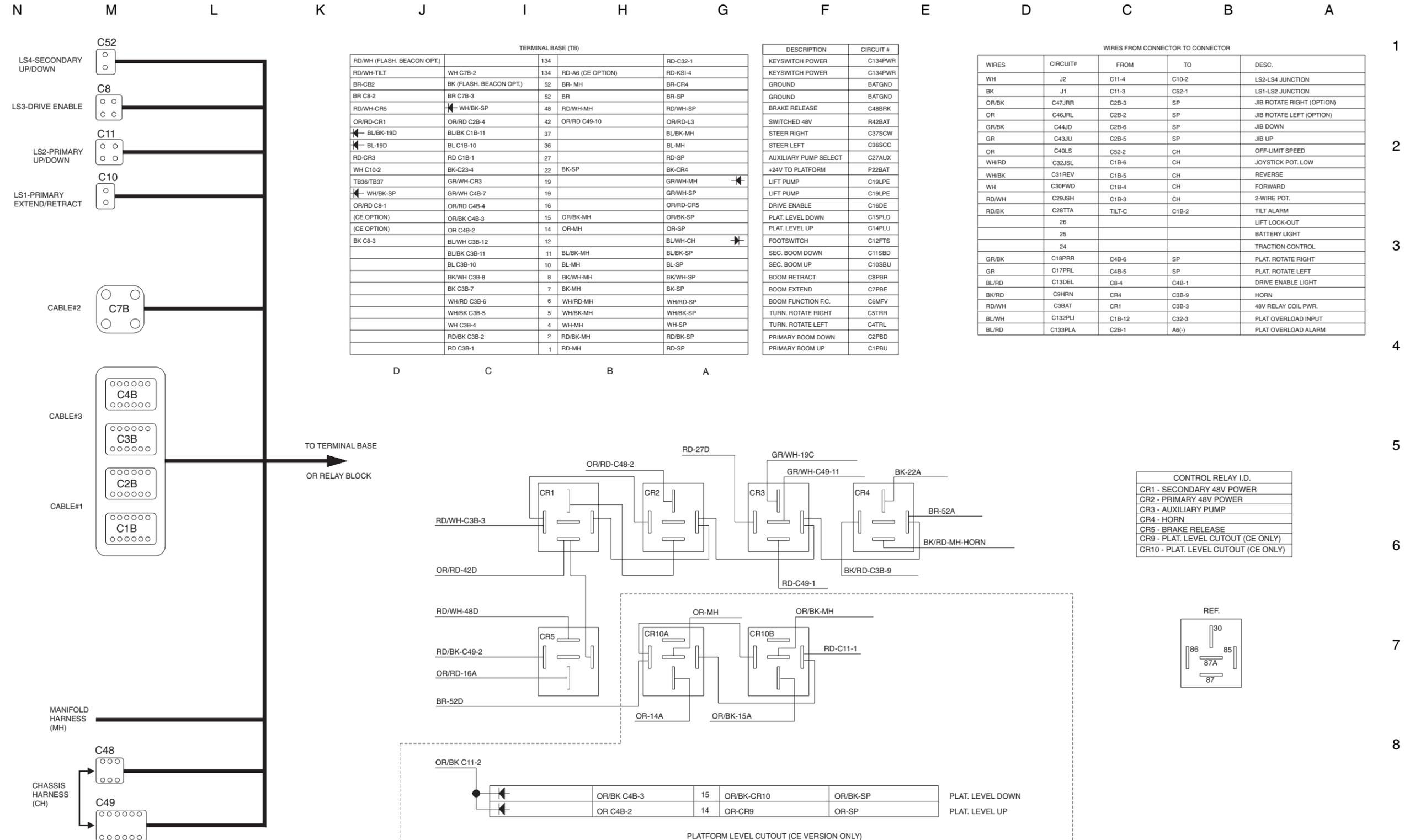
Ground Control Panel Wiring Diagram (after serial number 8354)

REV A



Ground Control Panel Terminal Strip Wiring Diagram (after serial number 8354)

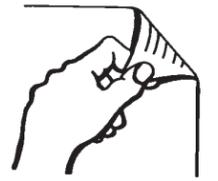
REV A



**Ground Control Panel Terminal Strip Wiring Diagram
(after serial number 8354)**

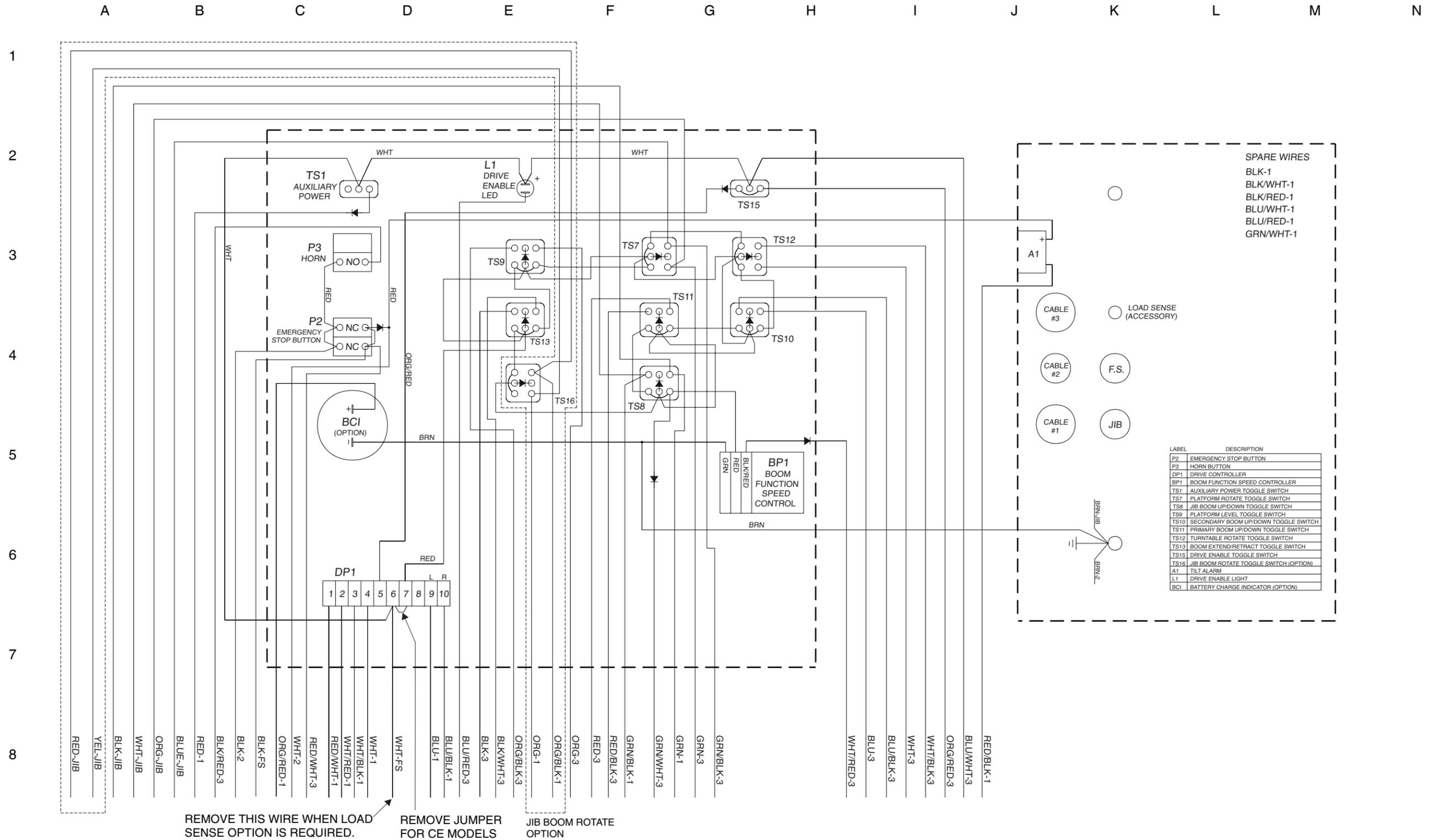


**Platform Control Box Wiring Diagram
(before serial number 6290)**



Platform Control Box Wiring Diagram (before serial number 6290)

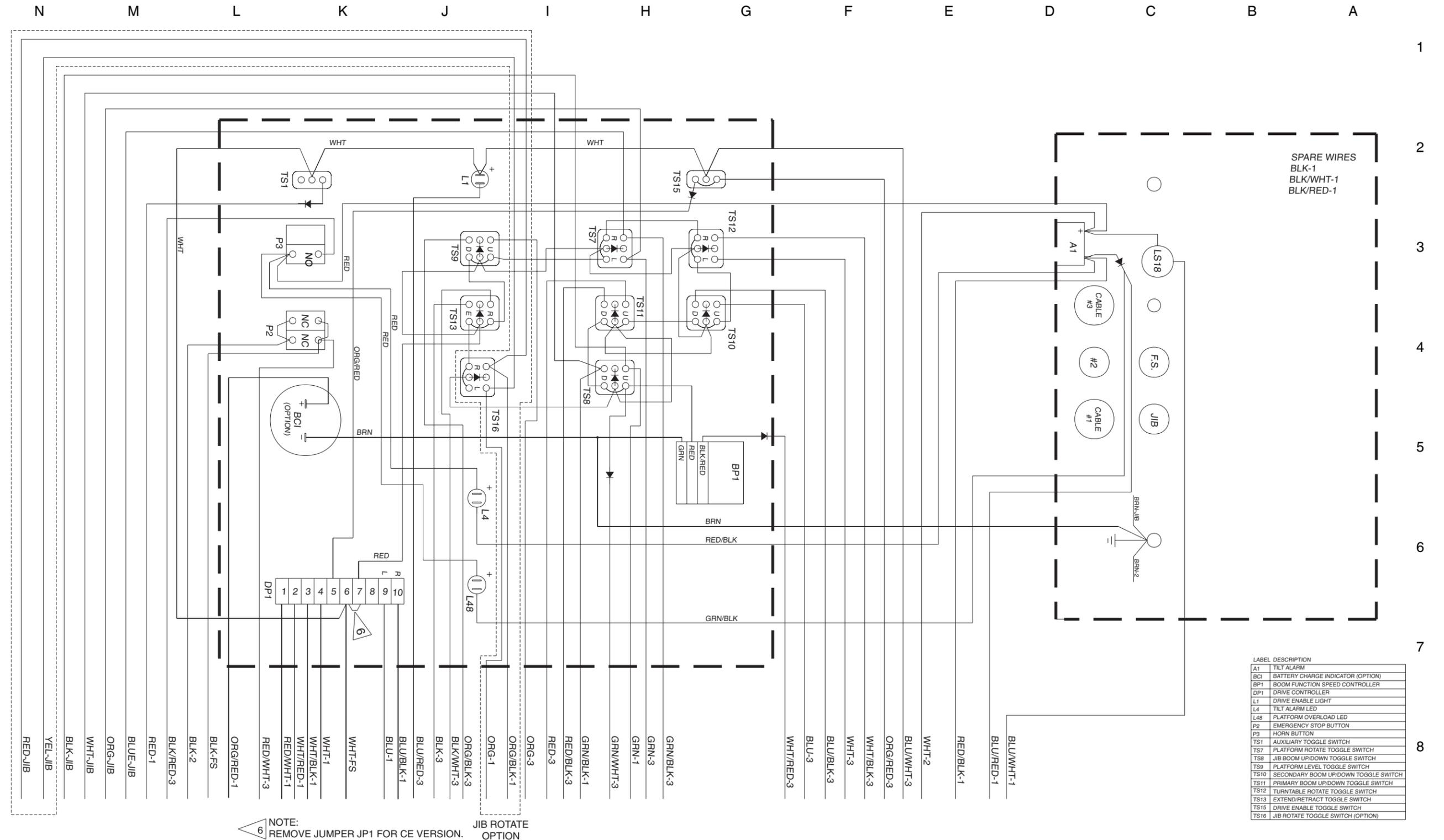
REV A



REMOVE THIS WIRE WHEN LOAD SENSE OPTION IS REQUIRED.
 REMOVE JUMPER FOR CE MODELS
 JIB BOOM ROTATE OPTION

Platform Control Box Wiring Diagram (from serial number 6290 to 8354)

REV A



NOTE: REMOVE JUMPER JP1 FOR CE VERSION. JIB ROTATE OPTION

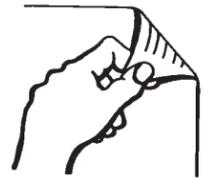
SPARE WIRES
BLK-WHT-1
BLK/RED-1

| LABEL | DESCRIPTION |
|-------|--------------------------------------|
| A1 | TILT ALARM |
| BCI | BATTERY CHARGE INDICATOR (OPTION) |
| BP1 | BOOM FUNCTION SPEED CONTROLLER |
| DP1 | DRIVE CONTROLLER |
| L1 | DRIVE ENABLE LIGHT |
| L4 | TILT ALARM LED |
| L48 | PLATFORM OVERLOAD LED |
| P2 | EMERGENCY STOP BUTTON |
| P3 | HORN BUTTON |
| TS1 | AUXILIARY TOGGLE SWITCH |
| TS7 | PLATFORM ROTATE TOGGLE SWITCH |
| TS8 | JIB BOOM UP/DOWN TOGGLE SWITCH |
| TS9 | PLATFORM LEVEL TOGGLE SWITCH |
| TS10 | SECONDARY BOOM UP/DOWN TOGGLE SWITCH |
| TS11 | PRIMARY BOOM UP/DOWN TOGGLE SWITCH |
| TS12 | TURNTABLE ROTATE TOGGLE SWITCH |
| TS13 | EXTEND/RETRACT TOGGLE SWITCH |
| TS15 | DRIVE ENABLE TOGGLE SWITCH |
| TS16 | JIB ROTATE TOGGLE SWITCH (OPTION) |

**Platform Control Box Wiring Diagram
(from serial number 6290 to 8354)**

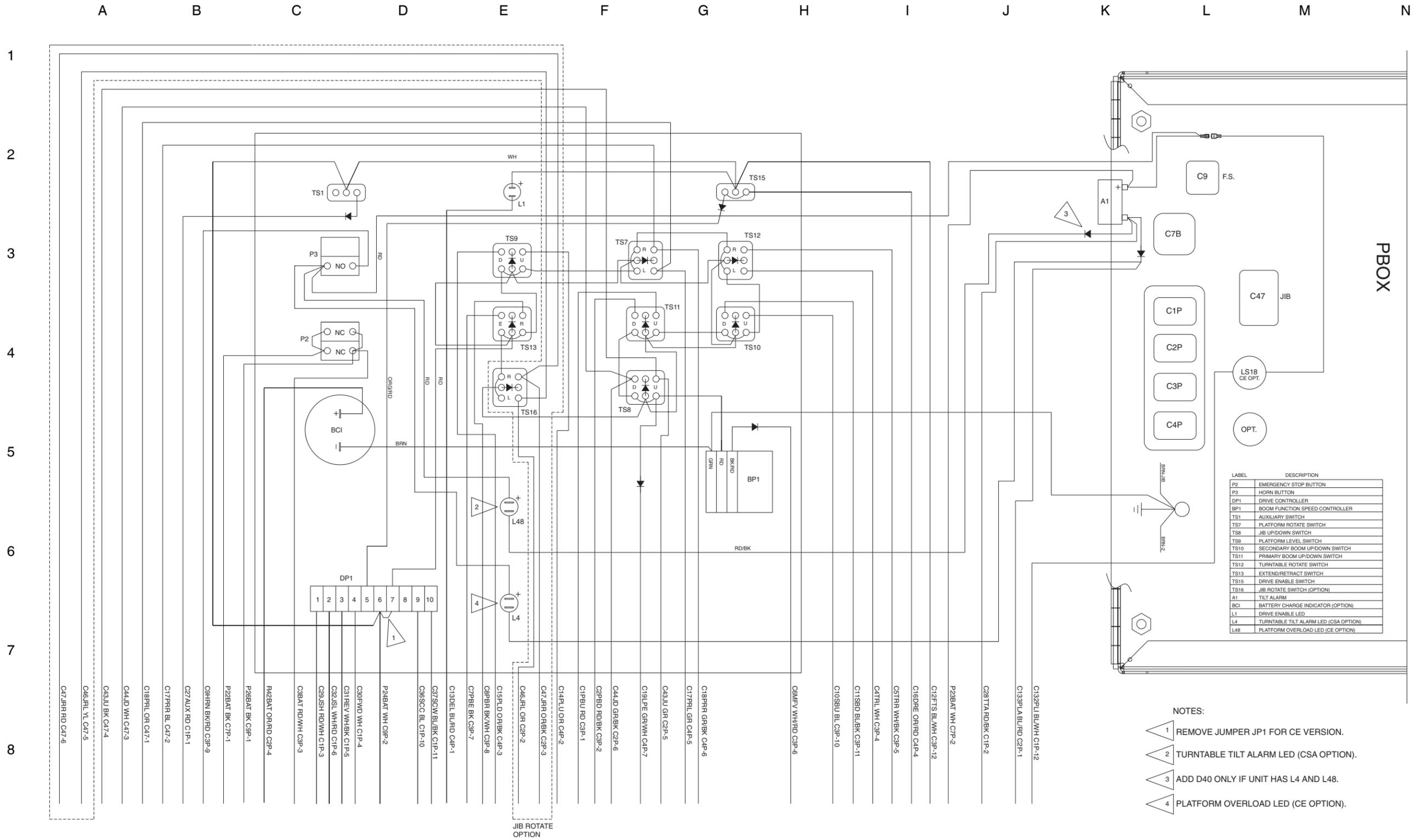


**Platform Control Box Wiring Diagram
(after serial number 8354)**



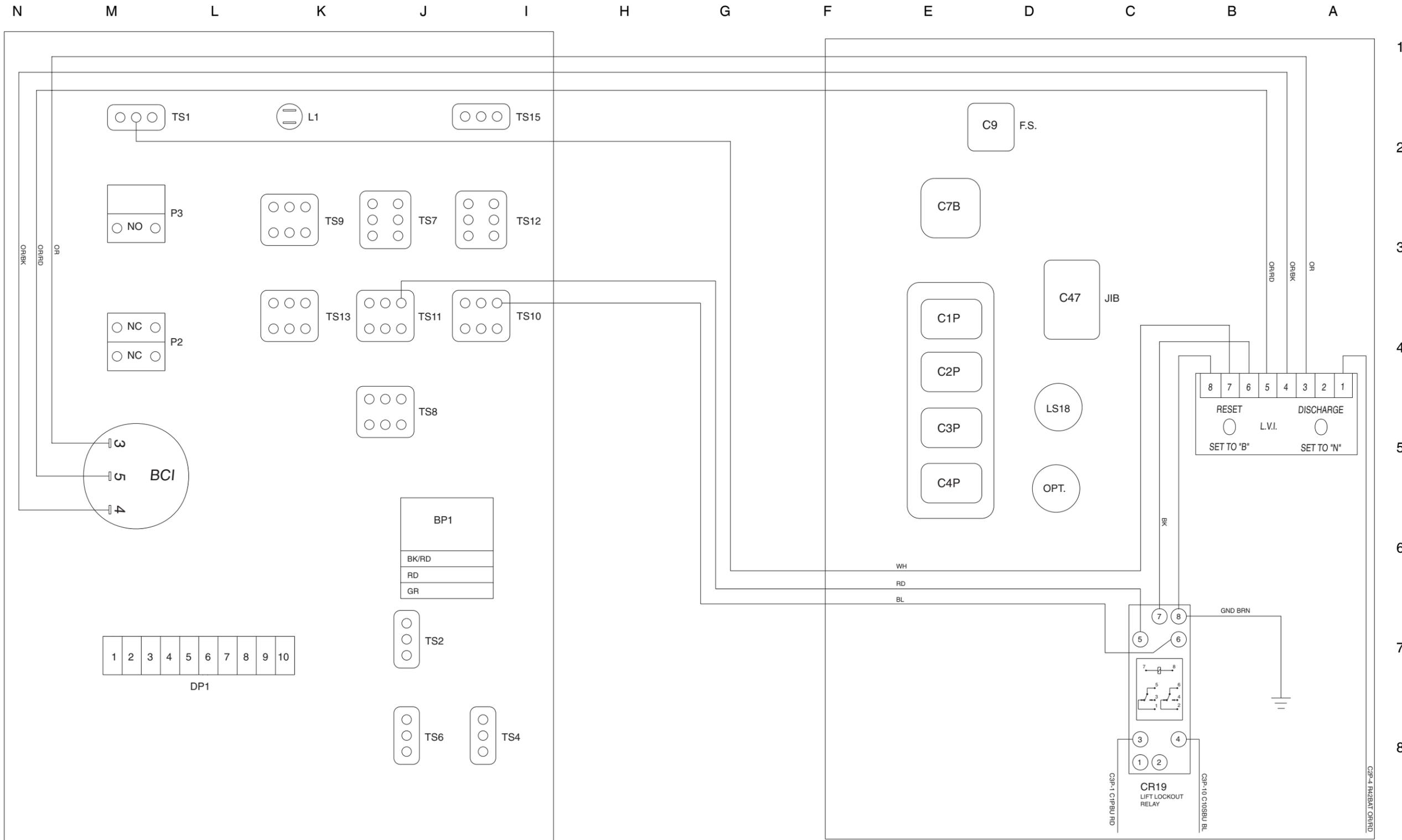
Platform Control Box Wiring Diagram (after serial number 8354)

REV A



LVI / BCI Option Wiring Diagram (from serial number 8355 to 9346)

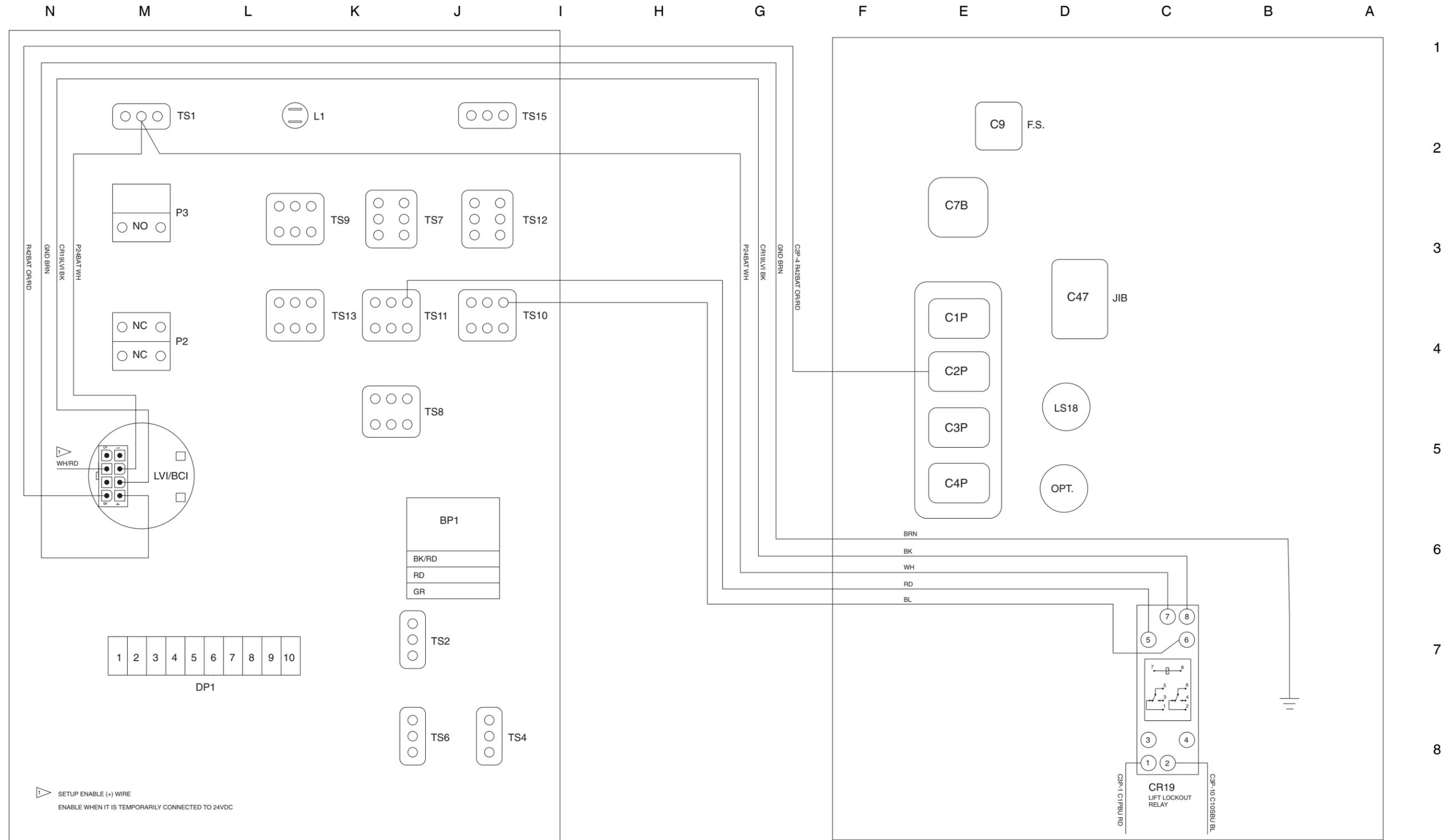
REV A



**LVI / BCI Option Wiring Diagram
(from serial number 8355 to 9346)**



LVI / BCI Option Wiring Diagram (after serial number 9346)



**LVI / BCI Option Wiring Diagram
(after serial number 9346)**



Hydraulic Schematic

REV C

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

1

2

3

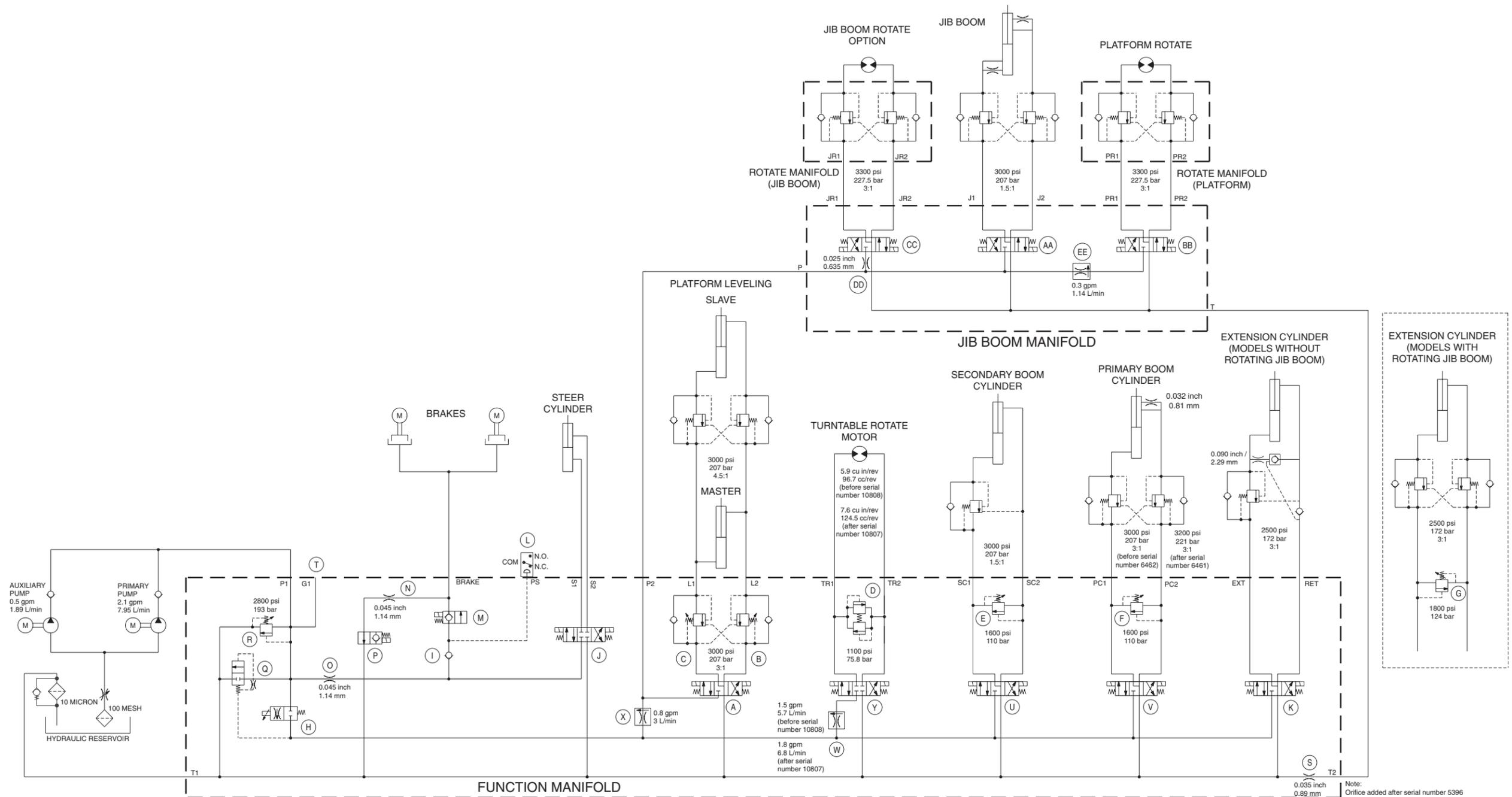
4

5

6

7

8



Hydraulic Schematic



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