



SERVICE MANUAL (ANSI/CSA)

ROUGH TERRAIN SCISSORS

MODELS **SJ8831 RT** **SJ8841 RT**

157945AE March 2018

SKYJACK

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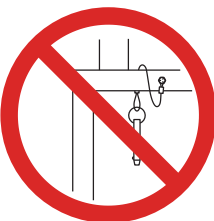
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Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

- **DO NOT** use the aerial platform without guardrails, locking pins and the entry gate(s) in place.



- **DO NOT** attempt to free a snagged platform with lower controls until personnel are removed from the platform.

- **DO NOT** use under influence of alcohol or drugs.



- **DO NOT** position the aerial platform against another object to steady the platform.

- **DO NOT** place materials on the guardrails or materials that exceed the confines of the guardrails unless approved by Skyjack.

- **STUNT** driving and horseplay are prohibited.

- **DO NOT** exceed the rated capacity of the aerial platform.



- **DO NOT** distribute load unevenly.

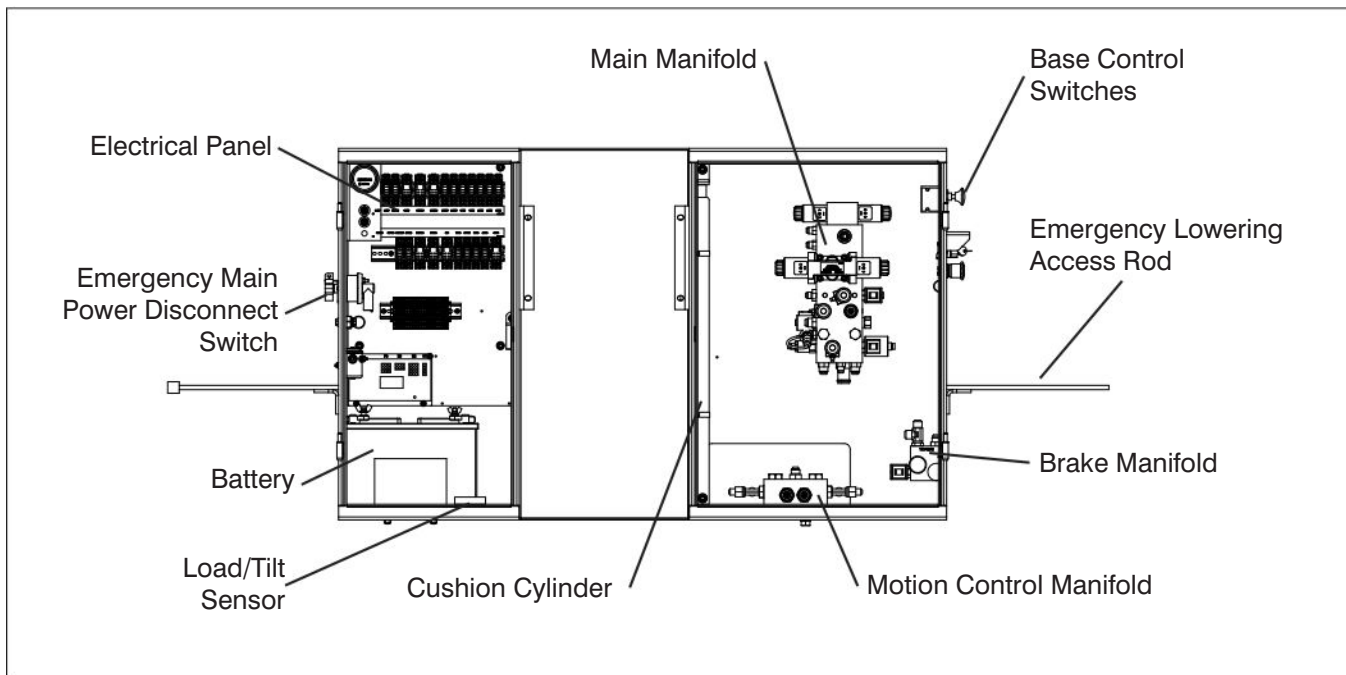


- **DO NOT** operate if aerial platform is not working properly or if any parts are damaged or worn.

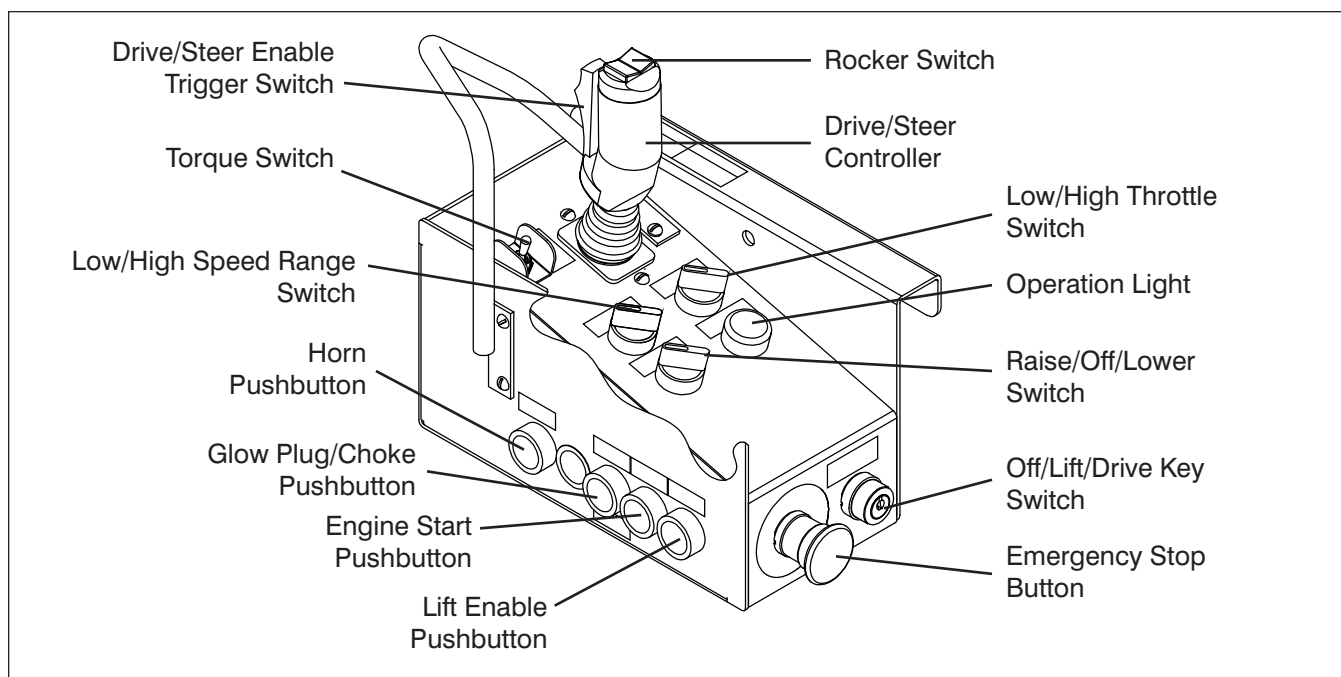


- **DO NOT** leave aerial platform unattended with key in key switch.





- **Manifolds**
 - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
 - Ensure there are no loose wires or missing fasteners.
- **Electrical Panel**
 - Ensure panel is properly secured and there is no visible damage.
 - Ensure there are no loose wires or missing fasteners.
- **Tilt Sensor**
 - Ensure tilt sensor is properly secured and there is no visible damage.



1.2 Function Tests

Function tests are designed to discover any malfunctions before aerial platform is put into service. The operator must understand and follow step-by-step instructions to test all aerial platform functions.



WARNING

Never use a malfunctioning aerial platform. If malfunctions are discovered, aerial platform must be tagged and placed out of service. Repairs to aerial platform may only be made by a qualified service technician.

After repairs are completed, operator must perform a pre-operation inspection and a series of function tests again before putting aerial platform into service.

Prior to performing function tests, be sure to read and understand Section 3 - Start Operation of the operating manual.

1.2-1 Platform Control Console

1. Turn main power disconnect switch to "I" on position.
2. On base control console, pull out "E" emergency stop button.
3. On engine control console, select off/on/start switch to "I" on position.

4. For dual fuel engine, select fuel supply by moving fuel switch to either "G" gasoline or "LPG" liquid propane gas position.



WARNING

Ensure that you maintain three points of contact when using the ladder to mount/dismount platform.

5. Use the ladder of aerial platform to access platform.
6. Close the gate.
7. Insert key into off/lift/drive key switch and select "L" lift position.
8. On platform control console, pull out "E" emergency stop button. A beeping sound should be audible and light should come on.



WARNING

If beeping sound is not audible and light does not come on, aerial platform must be tagged and placed out of service.

9. Select low/high throttle switch to "L" low throttle position.

Section 2

MAINTENANCE TABLES AND DIAGRAMS

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Section 3

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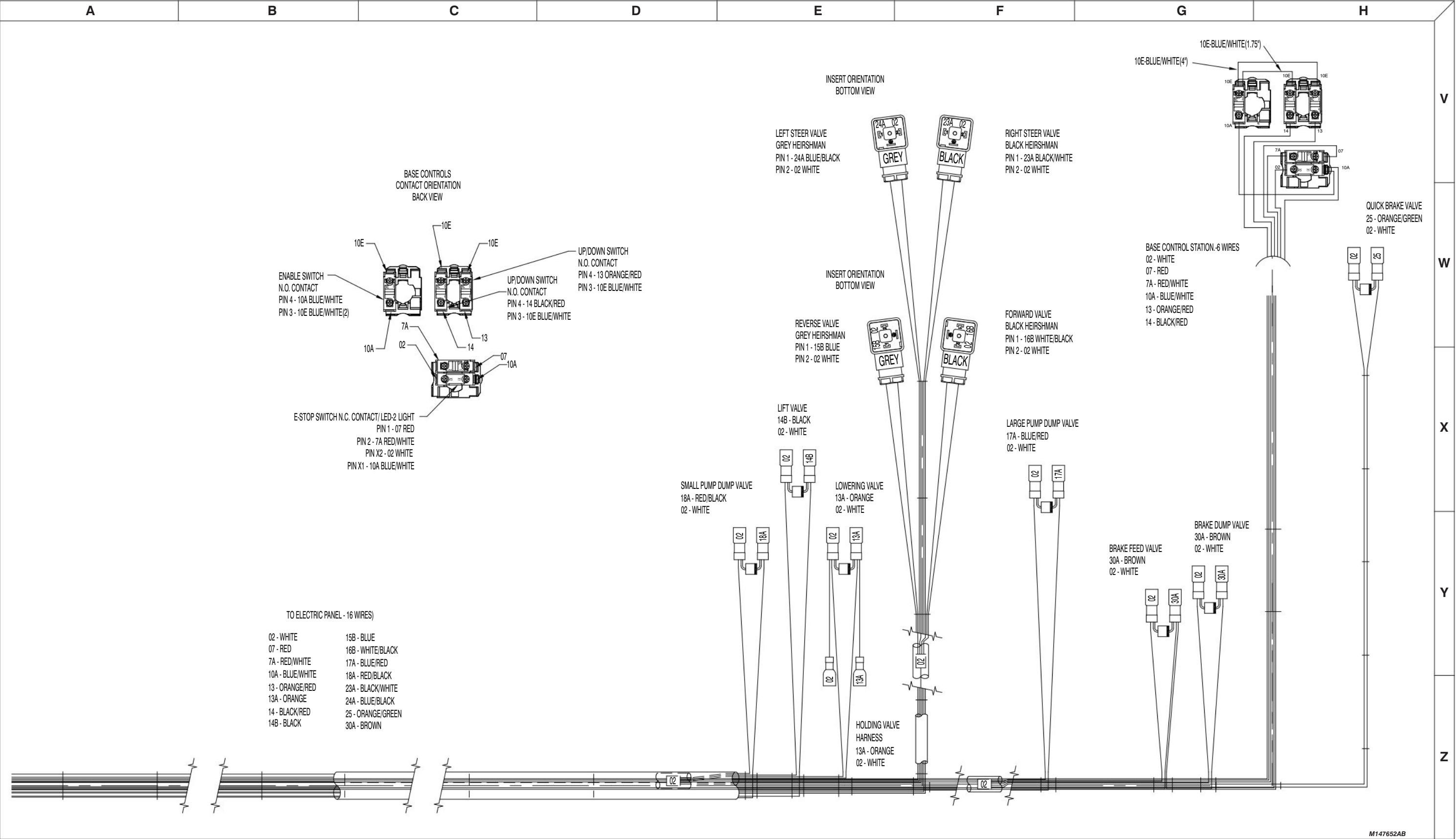
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3.4 Electrical Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
Parts list continued from the previous page.			
LS4	115658	1	LIMIT SWITCH (End-of-stroke)
LS5	119296	1	LIMIT SWITCH (High drive cut-out/tilt-override)
LS61	115658	1	LIMIT SWITCH (Left front outrigger extend)
LS62	115658	1	LIMIT SWITCH (Right front outrigger extend)
LS63	115658	1	LIMIT SWITCH (Right rear outrigger extend)
LS64	115658	1	LIMIT SWITCH (Left rear outrigger extend)
LS65	115658	1	LIMIT SWITCH (Left front outrigger retract)
LS66	115658	1	LIMIT SWITCH (Right front outrigger retract)
LS67	115658	1	LIMIT SWITCH (Right rear outrigger retract)
LS68	115658	1	LIMIT SWITCH (Left rear outrigger retract)
M	142308	1	MOTOR, Engine starter (Dual fuel engine)
	147125	1	MOTOR, Engine starter (Diesel fuel engine)
MS1	143518	1	SENSOR, Manifold absolute pressure (GM)
OCM1	132804	1	MODULE, Auto-level control (Outrigger)
OL1	133133	1	LIGHT, Indicator (Outrigger)
OPS1	102838	1	SWITCH, Oil pressure (Diesel fuel engine)
	143803	1	SWITCH, Oil pressure (GM)
OXS1	142315	1	SENSOR, Heated exhaust oxygen (GM)
OXS2	142299	1	SENSOR, Oxygen post-cat (GM)
PRV1	142340	1	PROPANE REGULATOR/VAPORIZER (GM)
RA1	--	-	ACTUATOR, Throttle body (Dual fuel engine)
RL-22	107098	1	LIGHT, Rotating amber beacon (Option)
RL-29	107098	1	BEACON, Rotating Amber (Option)
S1	119726	1	SWITCH, Main power disconnect
S2	147054	2	N.O. CONTACT (Base - up/off/down switch)
S3	147054	1	N.O. CONTACT (Platform - off/lift/drive select key switch)
	147053	2	N.C. CONTACT (Platform - off/lift/drive select key switch)
S4	147053	1	N.C. CONTACT (Platform - emergency stop switch)
S5	147054	2	N.O. CONTACT (Platform - up/down switch)
S6	147053	1	N.C. CONTACT (Base - emergency stop switch)
S7	132537	1	DRIVE/STEER CONTROLLER ASSEMBLY
S7-1	122869	1	• SWITCH (2nd speed)
S7-2	122877	1	• SWITCH (Right steer)
S7-3	122877	1	• SWITCH (Left steer)
S7-4	122869	1	• SWITCH (Reverse drive)
S7-5	122869	1	• SWITCH (Forward drive)
S7-6	122869	1	• SWITCH (3rd speed)
S7-7	122872	1	• SWITCH (Enable pushbutton)
S8	147054	1	N.O. CONTACT (Platform - Horn pushbutton)
S9	147054	1	N.O. CONTACT (Platform - Lift enable switch)
S9A	102853	1	SWITCH, Toggle (Outrigger enable)
S9B	127132	1	SWITCH, Toggle (Outrigger enable)
Parts list continued on the following page.			

3.11 Main Manifold Wiring Diagram (ANSI/CSA)



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Electrical System (Continued)

4.1-16 Drive and Steer Inoperative (Machines without outriggers option)

1. Key switch S3 in lift position.
 - Turn switch to drive position.
2. Defective drive contacts in key switch S3.
 - Check contacts. Replace if defective.
3. Loose or broken wire #12 from key switch S3 to joystick enable switch S7-7.
 - Check continuity. Replace if defective.
4. Defective joystick enable switch S7-7.
 - Check switch. Replace if defective.
5. Loose or broken wire #12A from joystick enable relay 12BCR to speed, steer and direction switches S7-1 to S7-6.
 - Check continuity. Replace if defective.
6. Loose or broken wire #12B from joystick enable switch S7-7 to controller enable relay 12BCR.
 - Check continuity. Replace if defective.
7. Defective joystick enable relay 12BCR.
 - Check continuity. Replace if defective.
8. Loose or broken wire #02 from joystick enable relay 12BCR to joystick harness.
 - Check continuity. Replace if defective.
9. Loose or broken wire #10A from base terminal block to relay 28CR.
 - Check continuity. Replace if defective.
10. Defective relay 28CR.
 - Check relay. Replace if defective.
11. Loose or broken jumper wire from #1 on relay 28CR to #4 on relay 30CR.
 - Check continuity. Replace if defective.

4.1-17 Drive and Steer Inoperative (machines with outriggers option)

1. Outriggers not fully retracted
 - Fully retract outrigger cylinders
2. Key switch S3 in lift position.
 - Turn switch to drive position.
3. Defective drive contacts in key switch S3.
 - Check contacts. Replace if defective.
4. Loose or broken wire #12 from key switch S3 to joystick enable switch S7-7.
 - Check continuity. Replace if defective.
5. Defective joystick enable switch S7-7.
 - Check switch. Replace if defective.
6. Loose or broken wire #12A from joystick enable relay 12BCR to speed, steer and direction switches S7-1 to S7-6.
 - Check continuity. Replace if defective.
7. Loose or broken wire #12B from joystick enable switch S7-7 to joystick enable relay 12BCR.
 - Check continuity. Replace if defective.
8. Defective joystick enable relay 12BCR.
 - Check continuity. Replace if defective.
9. Loose or broken wire #02 from joystick enable relay 12BCR to controller harness.
 - Check continuity. Replace if defective.
10. Loose or broken wire #10A from base terminal block to relay 28CR.
 - Check continuity. Replace if defective.
11. Defective relay 28CR.
 - Check relay. Replace if defective.
12. Loose or broken wire #1 from relay 28CR to pin #7 on connector CN14 at the outrigger board.

Electrical System (Continued)**4.1-32 Down Circuit Inoperative from Base**

1. Loose or broken wire #10A from base terminal block to base enable switch S10.
 - Check continuity. Replace if defective.
2. Defective base enable switch S10.
 - Check switch. Replace if defective.
3. Loose or broken wire #10E from base enable switch S10 to base up/down switch S2.
 - Check continuity. Replace if defective.
4. Defective base up/down switch S2.
 - Check switch. Replace if defective.
5. Loose or broken wire #13 from base up/down switch S2 to base terminal block TB-1.
 - Check continuity. Replace if defective.

4.1-33 Powered Extension Platform Inoperative

1. Loose or broken battery cable from main power disconnect switch S1 to fuse F2 (100 Amp).
 - Check continuity. Replace if defective.
2. Open fuse F2.
 - Check fuse. Replace if open.
3. Loose or broken battery cable #103A from fuse F2 to contactor 9CR1.
 - Check continuity. Replace if defective.
4. Defective contactor 9CR1.
 - Check contactor. Replace if defective.
5. Loose or broken battery cable #103B from contactor 9CR1 to motor contactor 99CR.
 - Check continuity. Replace if defective.
6. Defective motor contactor 99CR.
 - Check contactor. Replace if defective.
7. Loose or broken wire #103B from battery cable #103B to fuse F5.
 - Check continuity. Replace if defective.
8. Defective fuse F5.
 - Check fuse. Replace if defective.
9. Loose or broken wire #103C from fuse F5 to powered platform enable switch S34 or S34A.
 - Check continuity. Replace if defective.
10. Loose or broken wire #103D from enable switch S34 or S34A to platform extend/retract switch S11 or S11A.
 - Check continuity. Replace if defective.
11. Defective platform extend/retract switch S11 or S11A.
 - Check switch. Replace if defective.
12. Defective platform enable switch S34 or S34A.
 - Check switch. Replace if defective.
13. Loose or broken battery cable #00 from platform power unit DCM1 to battery B1.
 - Check continuity. Replace if defective.
14. Defective platform power unit DCM1.
 - Check power unit. Repair or replace if defective.

4.1-34 Powered Extension Platform will Not Extend

1. Defective platform extend/retract switch S11 or S11A.
 - Check switch. Replace if defective.
2. Loose or broken wire #26 or #26A from platform extend/retract switch S11 or S11A to platform extend valve coil 4H-26 or 4H-26A.
 - Check continuity. Replace if defective.

Hydraulic System (Continued)

3. Disc plates worn. (The thickness of the disc stack sets the torque level. A thin stack reduces torque.)
 - Check brake's holding torque is sufficient.
 - i) Make sure the machine is parked on level ground.
 - ii) Locate the brake feed valve (2H30A-2) on the main manifold. Disconnect the electrical connectors from this valve. This will prevent the hydraulic system from releasing the brake.
 - iii) With the engine running, machine in drive mode, engine on high idle, high torque selected and low speed range selected, hold the enable switch on the joystick and push the joystick forward as if you were to drive forward. This provides torque from the drive motor to the unreleased brake.
 - iv) If the brake slips and the machine starts to move in this condition, either the brake plates are worn or the springs have broken. Both the springs and the brake plates must be replaced to return the brake to its original holding torque.

4.2-11 Brake Drags or Runs Hot (Internal Brake)

1. Low brake pressure.
 - Place pressure gauge in brake line. Brakes use system pressure. (Minimum 335 psi required)
2. Bearing failure (If the bearing should fail, a large amount of drag can be generated)
 - Replace bearing

4.2-12 Up Circuit Inoperative

1. Stuck or defective lift valve 2H-14B.
 - Check valve. Repair or replace if defective.
2. Stuck check valve CV3.
 - Check valve. Replace if defective.
3. Misadjusted or defective lift relief valve R2.
 - Adjust valve. Replace if defective.
4. Stuck or defective lowering valve 2H-13A.
 - Check valve. Repair or replace if defective.
5. Stuck or defective manual lowering valve V1.
 - Check valve. Repair or replace if defective.
6. Open or defective brake feed valve 2H-30A-2.
 - Check valve. Repair or replace if defective.
7. Open manual override on holding valve 2H-13A-1 or 2H-13A-2.
 - Depress and turn manual override clockwise to close. Replace if defective.
8. Stuck holding valve 2H13A-1 or 2H13A-2.
 - Check valves. Repair or replace if defective.

5.1-6 Change Hydraulic Oil

Refer to Section 1 - Hydraulic System & Component Maintenance and Repair

1. Ensure aerial platform is on a firm level surface, fully lowered, and outriggers (if equipped) fully retracted.
2. Allow hydraulic oil to warm up.
3. Turn main power disconnect switch to off position.
4. Place suitable container under the hydraulic tank.
5. Remove oil drain plug and allow all hydraulic oil to drain into container.
6. Install oil drain plug with new seal ring and tighten firmly.
7. Refill hydraulic tank with new oil as per specifications. (Refer to section 2 of this manual)
8. Check for leakage.
9. Clean up any oil that may have spilled during this procedure.
10. Check hydraulic oil level. (The hydraulic oil level should be at or slightly above the top mark on the sight gauge)

NOTE

Refer to your national/local regulations on how to dispose of used filter and oil.

5.1-7 Wheel Bolt/Nut Inspection and Torquing Procedure

It is necessary to check the torque on all wheel nuts and wheel bolts at pre-delivery, after 8 hours of operation and at weekly intervals using the following procedure:

1. Confirm that each wheel fastener is torqued to 140 ft-lb. All fasteners must be torqued using the tightening sequence shown below.

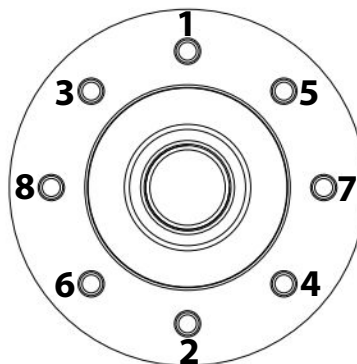
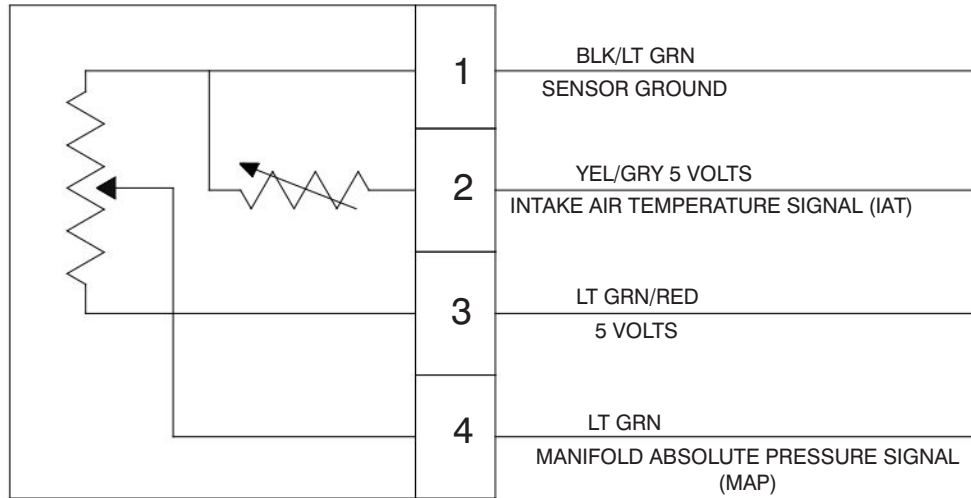


Diagram 5-4. Wheel Fastener Tightening Sequence

2. Again, confirm that each wheel fastener is torqued to the specified tolerance. Re-torque as necessary until all fasteners are properly torqued.

5.2-3 GM Map and IAT Sensor (GM)



IAT Sensor Resistance

TEMPERATURE ° F	TOLERANCE $\pm 10\%$ OHMS
248	110
239	125
221	162
203	214
185	284
167	383
149	522
131	721
104	1,200
77	2,063
50	3,791
23	7,419
-4	15,614
-22	26,854
-31	35,763
-40	48,153

60597AA

5.3-6 Outrigger Control Module Instructions

When EZcal hand-held device is connected to the OCM1 control module, a two line displays shows various menus and settings. At any time the top line of the display describes the currently selected menu and the bottom line shows the currently selected item in that menu.

Six buttons on **EZcal** allow easy navigation through the menus:

- ← and → change the selected item (the bottom line display)
- ENTER enters the selected new menu when available (top line display changes)
- ↑ and ↓ adjusts the selected item when available
- ESC exits the current menu back to the previous menu

TOP LEVEL MENU OPTIONS

HELP	Select this menu to see a description of current OCM1 status
DIAGNOSTICS	Select this menu to see switch input status & logged data
ACCESS LEVEL	Select this menu & enter correct code to enable adjustments and calibrations
ADJUSTMENTS	Select this menu to see and adjust OCM1 settings
	NOTE: this menu provides for adjustments which might be needed for different work activities
SETUPS	Select this menu to carry out initial set-up of the OCM1
	NOTE: this menu provides for set-ups which are needed to configure the OCM1 for a particular vehicle

HELP MENU OPTIONS

(help message)	A message displays current OCM1 status, indicating if everything is OK or if there is an error code (see LED Error Codes - Table 5.3)
----------------	---

DIAGNOSTIC MENU OPTIONS

SYSTEM	Select this menu to see general OCM1 system information
SWITCHES	Select this menu to see switch input status
OUTPUTS	Select this menu to see OCM1 output status
LOG	Select this menu to see logged information

DIAGNOSTIC / SYSTEM MENU OPTIONS

OUTRIGGERS	Displays various status during the auto-level function
TILT	Displays vehicle tilt in "X" and "Y" orientations measured by integral sensor
TILTED	Displays whether vehicle is tilted (YES or NO)
BATTERY	Displays battery supply voltage (on P2-12)

DIAGNOSTIC / SWITCHES MENU OPTIONS

LR/P2-1	High when the left rear outrigger is in contact with the ground
RR/P2-2	High when the right rear outrigger is in contact with the ground
RF/P2-3	High when the right front outrigger is in contact with the ground
LF/P2-4	High when the left front outrigger is in contact with the ground
EXTEND/P2-5	High to activate the auto-level function
RETRACT/P2-6	High to activate the auto-retract function
ELEV/P2-10	High when the scissor stack is stowed ("elevated" input indicates that the vehicle is stowed).

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