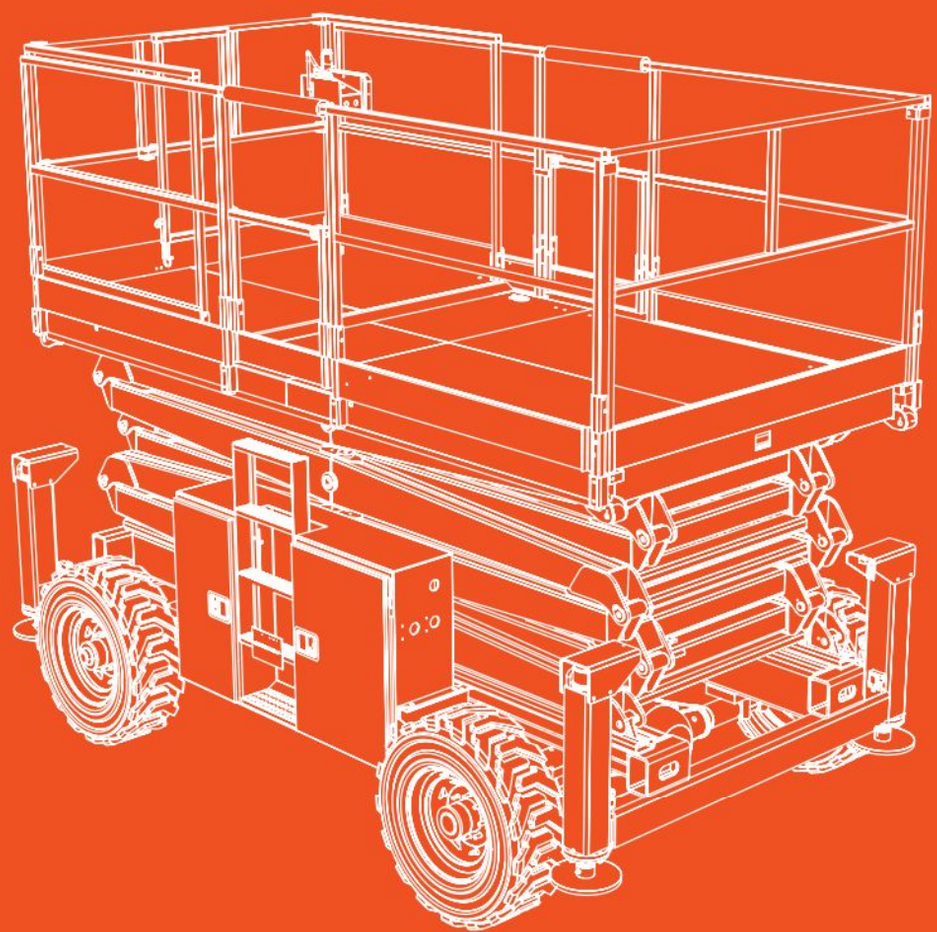
SKYJACK

SERVICE MANUAL

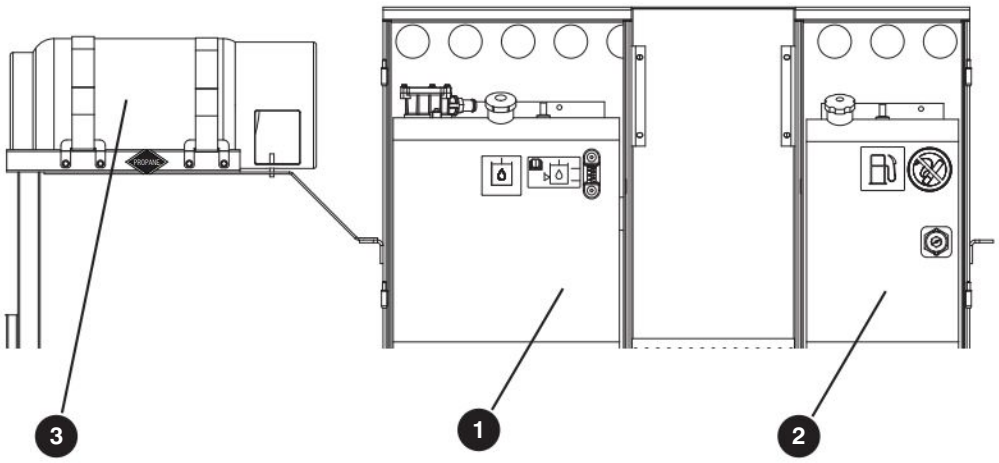
SJ8831 RT SJ8841 RT

ROUGH TERRAIN SCISSORS



163762AHA
January 2019
ANSI/CSA

Notes



1.6-9 Fuel and Hydraulic Compartment

- Ensure all compartment latches are secure and in proper working order.
- ❶ Hydraulic Tank (B)
  - Ensure hydraulic filler cap is secure.
  - Ensure tank shows no visible damage and no evidence of hydraulic leakage.
- Hydraulic Oil (B,C)
  - Ensure platform is fully lowered, and outriggers retracted, and then visually inspect the sight gauge located on the side of the hydraulic oil tank. Check oil level against label that indicates minimum and maximum oil levels.
  - C - Annual Inspection
  - Refer to Section 1 - Hydraulic System & Component Maintenance and Repair.
- ❷ Fuel Tank (B)

IMPORTANT

Before using your aerial platform ensure there is enough fuel for expected use.

- Ensure fuel filler cap is secure.
- Ensure tank shows no visible damage and no evidence of fuel leakage.
- Fuel Leaks (B)
  - Ensure there are no fuel leaks.

⚠ DANGER

Engine fuels are combustible. Inspect the aerial platform in an open, well-ventilated area away from heaters, sparks and flames. Always have an approved fire extinguisher within easy reach.

- Ensure fuel pump, fuel filter, hoses and fittings show no visible damage and no evidence of fuel leakage.
- ❸ Propane Tank (If Equipped) (B)
  - Ensure metal peg on compartment floor is inserted into propane tank rim.
  - Ensure propane tank straps are fastened tightly to brackets.
  - Ensure coupler to propane tank is tight.
- Propane Tank Leaks (If Equipped) (B)
  - Ensure there are no fuel leaks.
  - To check for leaks, close valve (turn clockwise) and apply soap water or neutral detergent to pipe connection and propane tank.
  - Open valve fully and check for any bubbles, indicating gas leaks.
  - Wipe off soap water or detergent after inspection is completed.

Section 2 – Maintenance Tables and Diagrams

Table 2.9 Torque Specifications for Hydraulic Couplings and Hoses

Hydraulic Coupling Torque Chart O-Ring Port Connectors				
SAE Size	Steel Ports		Non-ferrous Ports	
	ft-lb	Nm	ft-lb	Nm
4	14-16	20-22	9-10	12-13
6	24-26	33-35	15-16	20-21
8	50-60	68-78	30-36	41-47
10	72-80	98-110	43-48	60-66
12	125-135	170-183	75-81	102-110
16	200-220	270-300	120-132	162-180
20	210-280	285-380	126-168	171-228
24	270-360	370-490	162-216	222-294
32	-	-	-	-

Hose End Torque Chart for JIC									
Size		Steel				Brass			
Dash	Frac.	ft-lb		Nm		ft-lb		Nm	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
-4	1/4"	10	11	13	15	5	6	6.75	9
-6	3/8"	17	19	23	26	12	15	17	20
-8	1/2"	34	38	47	52	20	24	27.66	33
-10	5/8"	50	56	69	76	34	40	46.33	55
-12	3/4"	70	78	96	106	53	60	72.33	82
-16	1"	94	104	127	141	74	82	100.5	111
-20	1 1/4"	124	138	169	188	75	83	101.5	113
-24	1 1/2	156	173	212	235	79	87	107	118
-32	2"	219	243	296	329	158	175	214	237

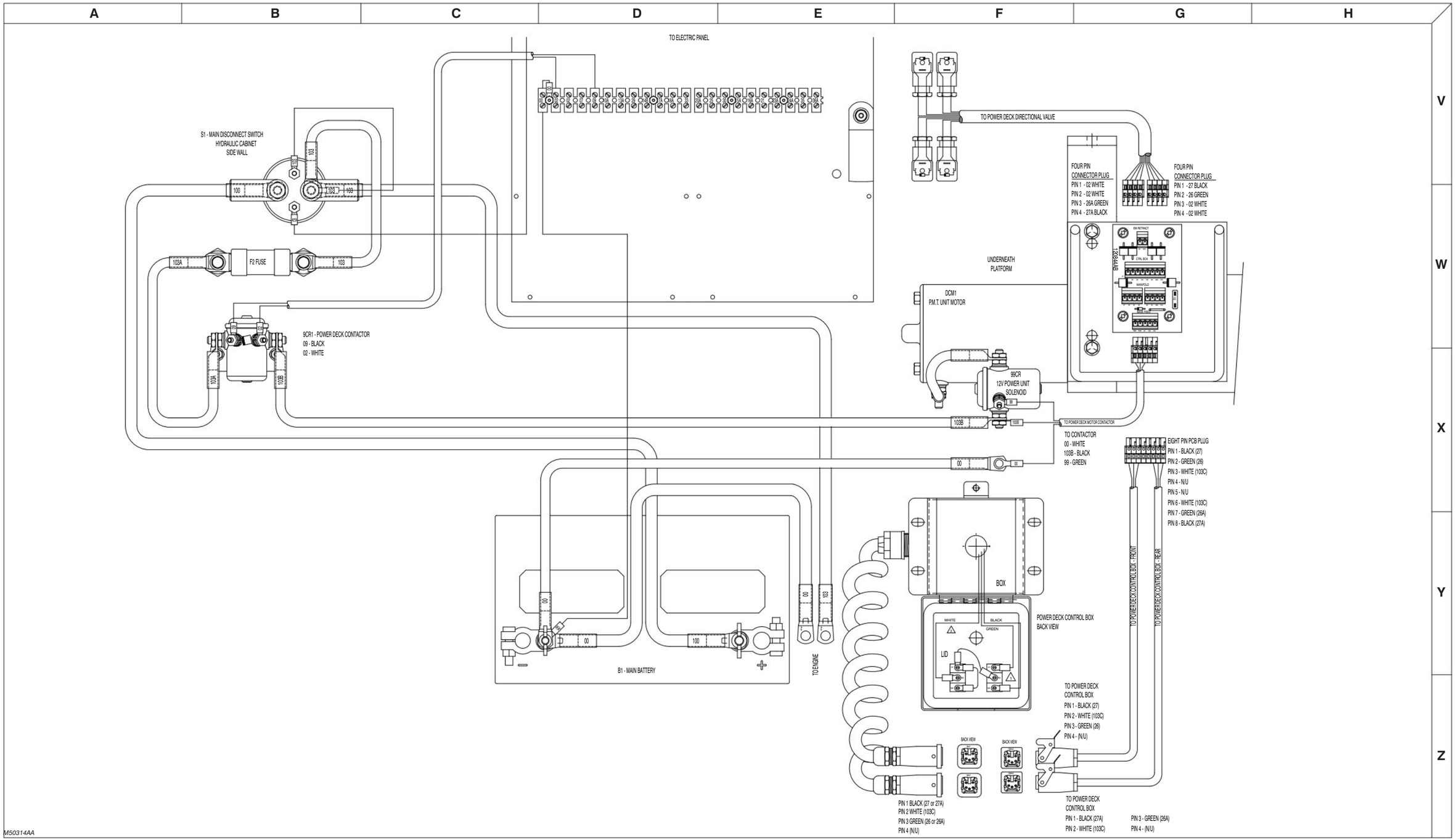
Hose End Torque Chart for Flat-Face O-Ring Seal (Steel)					
Size		Torque Specification			
Dash	Frac.	ft-lb		Nm	
		Min.	Max.	Min.	Max.
-4	1/4"	10	12	14	16
-6	3/8"	18	20	24	27
-8	1/2"	32	40	43	54
-10	5/8"	46	56	60	75
-12	3/4"	65	80	90	110
-14	1"	65	80	90	110
-16	1 1/4"	92	105	125	240
-20	1 1/2	125	140	170	190
-24	2"	150	180	200	245

1614

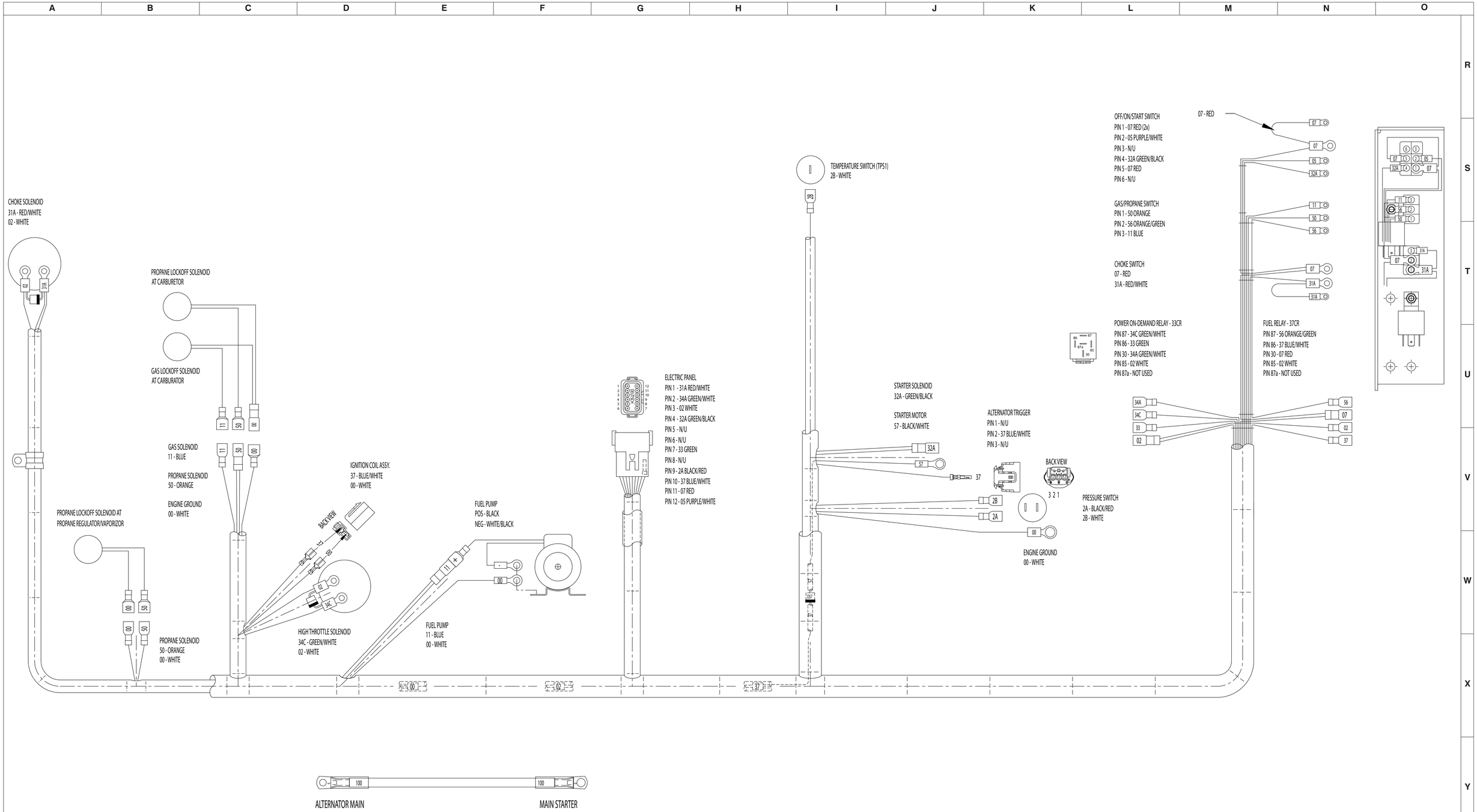
3.5 Electrical Parts List

Index No.	Skyjack Part No.	Description
F4	119469	FUSE (200 Amp) (Inverter option)
F5	120658	FUSE (10 Amp) (Powered extension platform)
FL-22	126677	FLASHING LIGHT (12 Volt)
FL-29	103743	FLASHER
G	136101	ALTERNATOR (Dual fuel engine)
	137138	ALTERNATOR (Diesel fuel engine)
GPL1	132884	LIGHT, Glow plug indicator (Diesel fuel engine)
GPT1	132883	TIMER, Glow plug (Diesel fuel engine)
H1	146652	HORN, 12 Volt
HTS-34A	106370	SOLENOID, High throttle (Diesel fuel engine)
INV1	123629	INVERTER, 1500 Watt
LED1	147229	POWER INDICATOR LIGHT (Platform control console)
LED2	147229	POWER INDICATOR LIGHT (Base control console)
LED3	147229	POWER INDICATOR LIGHT (Platform control console)
LS4	115658	LIMIT SWITCH (End-of-stroke)
LS5	119296	LIMIT SWITCH (High drive cut-out/tilt-override)
LS61	115658	LIMIT SWITCH (Left front outrigger extend)
LS62	115658	LIMIT SWITCH (Right front outrigger extend)
LS63	115658	LIMIT SWITCH (Right rear outrigger extend)
LS64	115658	LIMIT SWITCH (Left rear outrigger extend)
LS65	115658	LIMIT SWITCH (Left front outrigger retract)
LS66	115658	LIMIT SWITCH (Right front outrigger retract)
LS67	115658	LIMIT SWITCH (Right rear outrigger retract)
LS68	115658	LIMIT SWITCH (Left rear outrigger retract)
M	159216	MOTOR, Engine starter (Dual fuel engine)
	147125	MOTOR, Engine starter (Diesel fuel engine)
OCM1	132804	MODULE, Auto-level control (Outrigger)
OL1	133133	LIGHT, Indicator (Outrigger)
OPS1	102838	SWITCH, Oil pressure (Diesel fuel engine)
	102838	SWITCH, Oil pressure (Dual fuel engine)
RA1	--	ACTUATOR, Throttle body (Dual fuel engine)
RL-22	107098	LIGHT, Rotating amber beacon (Option)
RL-29	107098	BEACON, Rotating Amber (Option)
S1	119726	SWITCH, Main power disconnect
S2	147054	N.O. CONTACT (Base - up/off/down switch)
S3	147054	N.O. CONTACT (Platform - off/lift/drive select key switch)
	147053	N.C. CONTACT (Platform - off/lift/drive select key switch)
S4	147053	N.C. CONTACT (Platform - emergency stop switch)
S5	147054	N.O. CONTACT (Platform - up/down switch)
S6	147053	N.C. CONTACT (Base - emergency stop switch)
S7	132537	DRIVE/STEER CONTROLLER ASSEMBLY
S7-1	122869	• SWITCH (2nd speed)
S7-2	122877	• SWITCH (Right steer)
S7-3	122877	• SWITCH (Left steer)
S7-4	122869	• SWITCH (Reverse drive)
S7-5	122869	• SWITCH (Forward drive)

3.14 Powered Extension Platform - Electrical Connection Diagram



3.22 Engine Harness Wiring Diagram – Kubota Dual Fuel Engine



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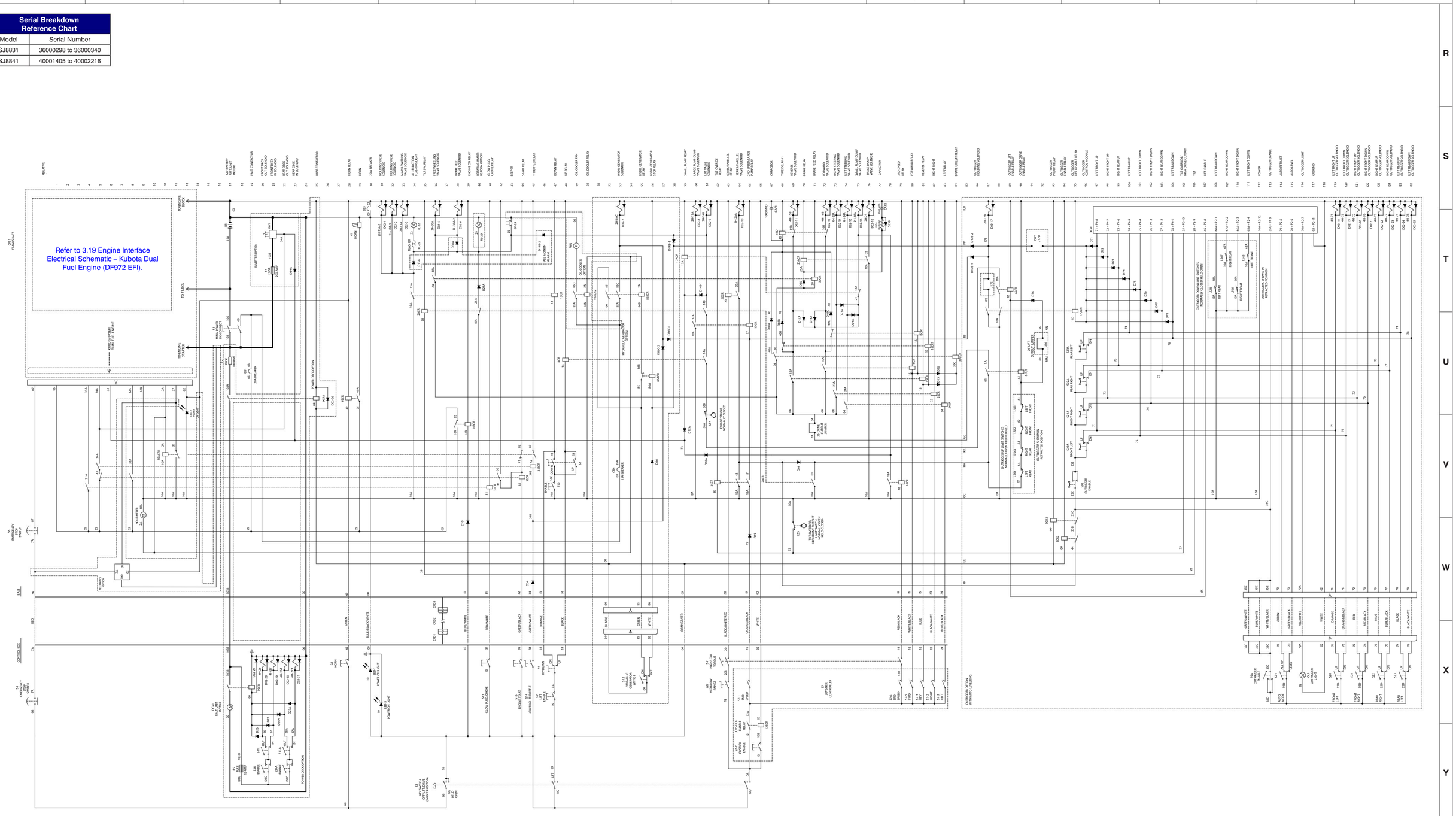
3.32 Electrical Schematic – Dual Fuel – All Options (ANSI/CSA)

Serial Breakdown Reference Chart	
Model	Serial Number
SJ8831	36000298 to 36000340
SJ8841	40001405 to 40002216


Refer to 3.19 Engine Interface Electrical Schematic – Kubota Dual Fuel Engine (DF972 EFI).
KUBOTA EFI/EFI DUAL FUEL ENGINE
TO ENGINE BLOCK
TO ENGINE SYSTEM
TO J1 ECU
ECM CRANKSHAFT
NEGATIVE
MAIN SYSTEM DISCONNECT
INVERTER OPTION
POWER DECK OPTION
HYDRAULIC GENERATOR OPTION
OUTRIGGER OPTION WITH LEVELING
OUTRIGGER LIMIT SWITCHES NORMALLY CLOSED WHEN EXTENDED
OUTRIGGER LIMIT SWITCHES NORMALLY OPEN WHEN EXTENDED
OUTRIGGER SOLENOID ENABLE
OUTRIGGER ENABLE RELAY
OUTRIGGER LIFT/LOWER RELAY
OUTRIGGER INDICATOR MODULE
OUTRIGGER SOLENOID
OUTRIGGER LIFT/LOWER ENABLE RELAY
OUTRIGGER LIFT/LOWER SOLENOID
OUTRIGGER SOLENOID ENABLE
OUTRIGGER SOLENOID
OUTRIGGER SOLENOID
OUTRIGGER SOLENOID

15. Defective starter motor.	**Check motor. Repair or replace if defective.**

4.2-5 Engine Does Not Crank from Base Controls (Kubota diesel)

1. Loose or broken wire #05 from base terminal block to base engine switch S30.	**Check continuity. Replace if defective.**
2. Loose or broken jumper wire #05 on base engine switch S30.	**Check continuity. Replace if defective.**
3. Defective engine start switch S30.	**Check switch. Replace if defective.**
4. Loose or broken wire #32A from engine start switch S30 to starter contactor 32ACR.	**Check continuity. Replace if defective.**

4.2-6 Engine Cranks but Stops Cranking after a few seconds

1. Loose or broken jumper wire #41 on relay 32CR.	**Check continuity. Replace if defective.**
2. Loose or broken wire #02 from relay 32CR to base terminal block TB-1.	**Check continuity. Replace if defective**

4.2-7 Glow Plugs Inoperative from Engine Controls

1. Loose or broken wire #07 from engine start switch S30 to glow plug switch S31.	**Check continuity. Replace if defective.**
2. Defective glow plug switch S31.	**Check switch. Replace if defective.**
3. Loose or broken wire #31A from glow plug switch S31 to glow plug relay 31ACR.	**Check continuity. Replace if defective.**
4. Loose or broken wire #02 from glow plug relay 31ACR to base terminal block TB1.	**Check continuity. Replace if defective.**
5. Loose or broken wire #103 from starter solenoid 32ACR to relay 31ACR.	**Check continuity. Replace if defective.**
6. Loose or broken wire #91A from relay 31ACR to engine glow plugs EGP1.	**Check continuity. Replace if defective.**
7. Defective glow plug relay 31ACR.	**Check relay. Replace if defective.**
8. Defective glow plugs.	**Check glow plugs. Replace if defective.**

4.2-8 Glow Plugs Inoperative from Platform (Additional)

1. Loose or broken wire #10 from key selector switch S3 to glow plug switch S13.	**Check continuity. Replace if defective.**
2. Defective glow plug switch S13.	**Check switch. Replace if defective.**

16. Loose or broken wire #14B from base terminal block to lift valve solenoid 2H-14B.	**Check continuity. Replace if defective.**
17. Loose or broken wire #02 from lift valve solenoid 2H-14B to base terminal block.	**Check continuity. Replace if defective.**
18. Defective lift valve solenoid 2H-14B.	**Check solenoid. Replace if defective.**
19. Open diode D14B-1.	**Check diode. Replace if defective**

4.2-23 Up 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 #14 from base up/down switch S2 to base terminal block TB-1.	**Check continuity. Replace if defective.**

4.2-24 Platform Does Not Lift from Platform or Base Controls with Outriggers Retracted (Lift Operates Correctly with Outriggers Extended)

1. Outriggers not fully retracted.	**Fully retract outrigger cylinders.**
2. Loose or broken wire #1 from relay 28CR (ANSI/CSA) or 28CR1 (CE) to pin #7 on connector CN14 at the outrigger board.	**Check continuity. Replace if defective.**
3. Loose or broken wire #1 from outrigger board to outrigger limit switch LS64.	**Check continuity. Replace if defective.**
4. Defective outrigger limit switch LS64.	**Check switch. Replace if defective.**
5. Loose or broken wire #64 from outrigger limit switch LS64 to outrigger board.	**Check continuity. Replace if defective.**
6. Loose or broken wire #64 from outrigger board to outrigger limit switch LS63.	**Check continuity. Replace if defective.**
7. Defective outrigger limit switch LS63.	**Check continuity. Replace if defective.**
8. Loose or broken wire #63 from outrigger limit switch LS63 to outrigger board.	**Check continuity. Replace if defective.**
9. Loose or broken wire #63 from outrigger board to outrigger limit switch LS62.	**Check continuity. Replace if defective.**
10. Defective Limit Switch LS62.	**Check switch. Replace if defective.**
11. Loose or broken wire #62 from outrigger limit switch LS62 to outrigger board.	**Check continuity. Replace if defective.**

3. Open diode D73 (retract) or D77 (extend) on outrigger board.	**Check diode. Replace if defective.**
4. Loose or broken wire #73 from pin #4 on connector CN21 at outrigger board to valve coil 4H-73 (retract), or wire #77 from pin #4 to 4H-77 (extend).	**Check continuity. Replace if defective.**
5. Loose or broken wire #02 from valve coil 4H-73 (retract) or 4H-77 (extend) to pin #2 on connector CN21 at the outrigger board.	**Check continuity. Replace if defective.**

4.2-41 Left Rear Outriggers Inoperative Manually

1. Defective left rear outrigger switch S23 at platform, or S23A at base.	**Check switch. Replace if defective.**
2. Loose or broken wire #74 from outrigger control console to pin #5 on connector CN20 at outrigger board (retract), or from wire #78 to pin #2 (extend).	**Check continuity. Replace if defective.**
3. Open diode D74 (retract) or D78 (extend) on outrigger board.	**Check diode. Replace if defective.**
4. Loose or broken wire #74 from pin #6 on connector CN21 at outrigger board to valve coil 4H-74 (retract), or wire #78 from pin #3 to 4H-78 (extend).	**Check continuity. Replace if defective.**
5. Loose or broken wire #02 from valve coil 4H-74 (retract) or 4H-78 (extend) to pin #2 on connector CN21 at the outrigger board.	**Check continuity. Replace if defective.**

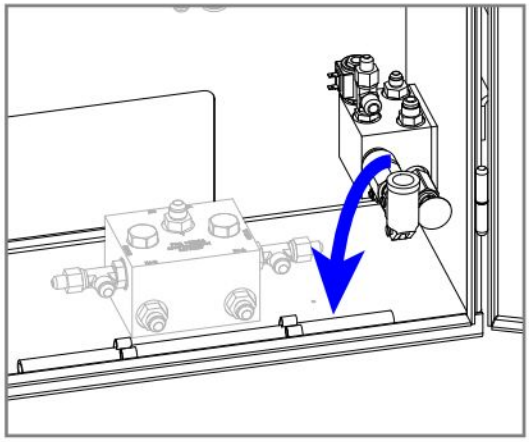
4.2-42 Individual Outrigger Functions Inoperative (auto-level)

1. Loose or broken wire #71- #75 (depending on function not working) at pins 1-8 of outrigger control module plug P4.	**Check connections of outrigger functions not working (refer to Section 5 for pin reference chart). Replace if defective.**
2. No output from outrigger control module OCM1 at pins 1-8 of outrigger control module plug P4.	**Turn off power to reset the outrigger control module. Turn power back on and retest. If problem persists, replace outrigger control module.**

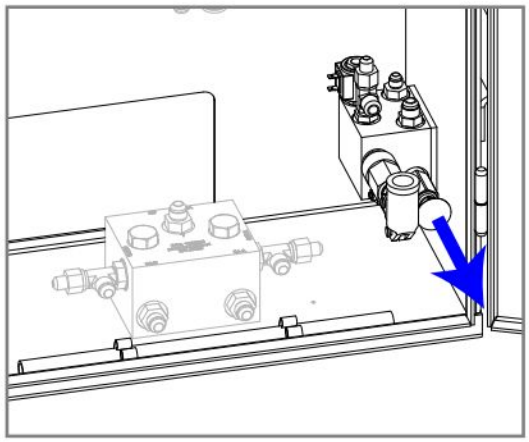
4.2-43 Auto-level Inoperative

1. Loose or broken wire #35D from outrigger enable switch S9A to auto mode outrigger switch S24.	**Check continuity. Replace if defective.**
2. Defective auto mode outrigger switch S24.	**Check switch. Replace if defective.**

10. Remove the manual brake pump handle, and place it back in the retaining clips.



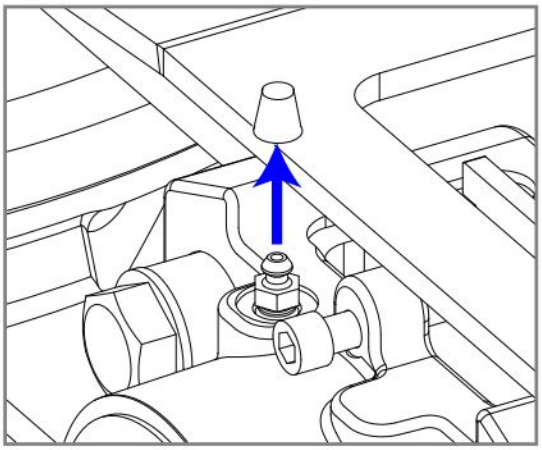
11. Pull out the black brake valve knob to reset the brake.



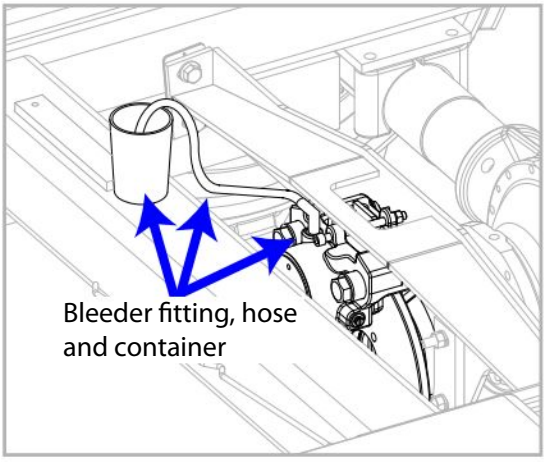
12. Start the engine, stow the maintenance stand, and lower the platform.
13. Shut off the engine.

5.1-2 Bleeding the Brake Caliper

1. Chock or block the wheels.
2. Start the engine, raise the platform, and deploy the maintenance stand.
3. Shut off the engine.
4. Locate the brake caliper in front of the rear axle, then locate the bleeder screw on the top of the brake caliper, and remove the cap.



5. Attach a piece of clear hose to a standard bleeder fitting, and attach the bleeder fitting to the bleeder screw. Place the other end of the hose into a container suitable for catching hydraulic oil.



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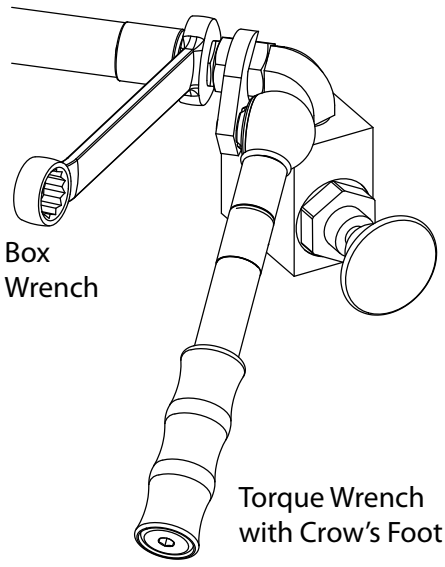
5.1-9 Tightening and Torque Recommendations for Hydraulic Couplings and Hoses

General Work Practices

1. All components must be free of damage or contamination. O-rings cannot be reused anytime the component has been installed beyond finger tight. Clean or replace components, as required.
2. Over-tightening a coupling may result in overstressing or cracking, and may lead to leaking or failure.
3. When tightening hose couplings, ensure the hose does not twist on the adapter. Twisting the hoses can shorten hose life and scar the sealing surfaces which can create leaks.
4. When tightening hose couplings, use a torque wrench (with crow's foot) on the hose end hex swivel nut, and a standard box wrench on the hose end stem hex to hold the hose from twisting.



5. Lubricate all O-ring surfaces with suitable hydraulic oil prior to installation in the flange head and O-ring seal grooves. The oil minimizes the possibility of damage to the O-ring when installed.
6. Install any 45° and 90° hydraulic hose ends first, then align direction and tighten. Adjust the swivel nut on the straight hose end before tightening to create the desired flow.

Torquing Using a Torque Wrench

1. This method is applicable for JIC (37°) and FFOR (Flat Face O-Ring) hose ends and fittings, wherever the components are accessible with torque wrench / crow's foot tools.
2. Align the hose end or fitting to the mating component.
3. Install the nut two or three turns by hand to assure proper alignment. Jiggle the hose while tightening to ensure the faces contact fully.
4. Using a properly calibrated torque wrench, tighten the coupling using a smooth, even motion until an indication (audible click) is heard and felt. Do NOT over tighten. For recommended torque values, refer to 2.9 Torque Specifications for Hydraulic Couplings and Hoses.
5. Apply a drop of torque seal to the connection.

Torquing Using the Flats From Wrench Resistance Method

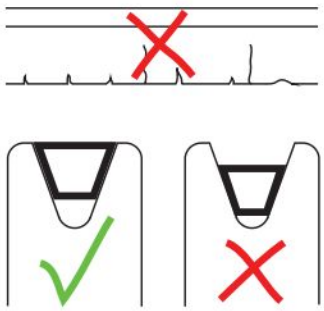
1. This method is applicable for JIC (37°) and FFOR (Flat Face O-Ring) hose ends only, wherever the components are inaccessible with torque wrench/crow's foot tools, or when a properly calibrated torque wrench is not available.
2. Align the hose end or fitting to the mating component.
3. Install the swivel hose end nut hand tight to the fitting to assure proper alignment. Jiggle the hose while tightening to ensure the faces contact fully.
4. Tighten the nut using a box wrench until minor resistance is felt.
5. Note the position of the nut relative to the fitting with a marking device (i.e. paint marker).

5.2-4 Fan Belt Replacement and Adjustment

Kubota recommends inspecting the fan belt every 100 hours, and replacing it every 500 hours.

Inspect the Fan Belt for Wear

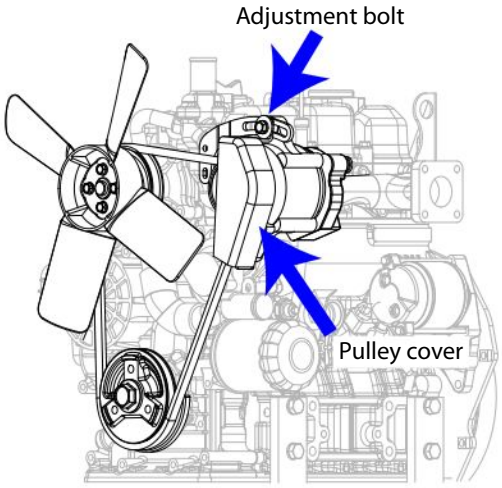
1. Inspect the fan belt for any signs of damage, such as cracks or tears. Inspect the fan belt for signs of wear, which may include the belt sinking into the pulley groove.



2. If damage or wear is found, replace the fan belt as described in the next section.

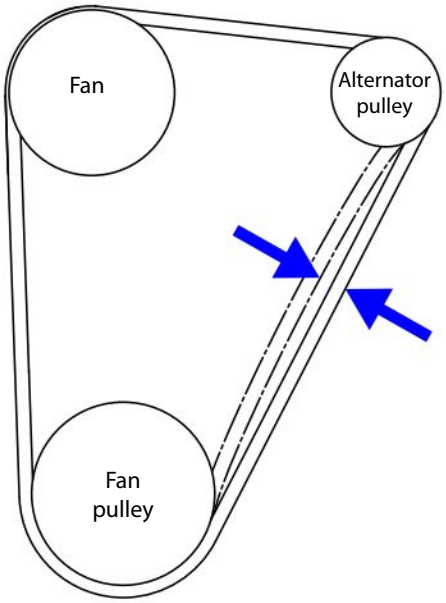
Replace the Fan Belt

3. Remove the alternator pulley cover, and loosen the alternator adjustment bolt.
4. Remove the old fan belt, and install a new one.
5. Replace the alternator pulley cover, and tighten the adjustment bolt.
6. Measure and adjust the fan belt deflection as described in the next section.



Test and Adjust the Deflection

7. Measure the fan belt deflection by depressing the belt halfway between the fan drive pulley and the alternator pulley, at about 22 lbf•ft (98 N•m) of force.



8. If the deflection is greater than 1/4–3/8 in (7–9 mm), adjust the position of the alternator. Loosen the alternator adjustment bolt and use a pry bar between the alternator and engine block. Tighten the bolt.

5.2-12a Kubota 972 and 2503 - DTC (continued)

DTC	(J1939) SPN	(J1939) FMI	Detected Item/Hardware	2503	972
1152	4236	1	• high fuel supply pressure to the gaseous fuel control or faulty pressure regulator • a non-responsive HEGO sensor	✓	✗
1153	4236	0	• exhaust leaks upstream or near the HEGO sensor • reduced fuel supply pressure to the gaseous fuel control system • a fuel supply or manifold leak • a non-responsive HEGO sensor	✓	✗
1154	4236	1	• high fuel supply pressure to the gaseous fuel control or faulty pressure regulator • a non-responsive HEGO sensor	✓	✗
1155	4236	0	• exhaust leaks upstream or near the HEGO sensor • reduced fuel supply pressure • an injector that is stuck closed	✓	✗
1156	4236	1	• high fuel supply pressure to the fuel injection system • a non-responsive HEGO sensor • an injector that is stuck open	✓	✗
1161	4237	0	• exhaust leaks upstream or near the HEGO sensor • reduced fuel supply pressure to the gaseous fuel control system • a fuel supply or manifold leak • a non-responsive HEGO sensor	✓	✗
1162	4237	1	• high fuel supply pressure to the gaseous fuel control or faulty pressure regulator • a non-responsive HEGO sensor	✓	✗
1163	4237	0	• exhaust leaks upstream or near the HEGO sensor • reduced fuel supply pressure to the gaseous fuel control system • a fuel supply or manifold leak • a non-responsive HEGO sensor	✓	✗
1164	4237	1	• high fuel supply pressure to the gaseous fuel control or faulty pressure regulator • a non-responsive HEGO sensor	✓	✗
1165	3050	11	n/a	✓	✗
1166	3050	11	n/a	✓	✗
1173	520620	31	n/a	✓	✗
1601	523710	2	• ETV malfunction	✗	✓
1602	523710	0	• ETV malfunction	✗	✓
1603	523710	1	• ETV malfunction	✗	✓
1604	523711	2	• ETV malfunction	✗	✓
1605	523712	2	• ETV malfunction	✗	✓
1606	523712	1	• ETV malfunction	✗	✓
1607	523712	7	• ETV malfunction	✗	✓
1608	523713	0	• ETV malfunction	✗	✓
1609	523714	2	• Sensor malfunction	✗	✓

IMPORTANT

Each phase must be completed before the next phase can be carried out.
All phases must be completed before the aerial platform can be operated.
Always follow the instructions of the Calibration instrument.

1. Ensure aerial platform is parked on a firm and level surface.

2. Elevate the scissors high enough to lay a level across the base tubes. Ensure there is no debris on the base and the level sits flat. Do not elevate aerial platform higher than the high speed/tilt override limit switch.

3. Manually operate the outriggers and level the machine in 4 places: left side, right side, front and rear. All 4 outriggers must be firmly placed and all 4 tires are off the ground.

4. Double check that the aerial platform is level at all 4 points.

5. Connect the EZcal tool to the P1 connector on the CONTROL MODULE.

6. The display shows Help: Press Enter.
   By using Left – Right buttons, select the **Access Level (3)** from the menu and press **ENTER**.

7. The display shows **Access Level: Code (0000)**.
   By using the Up – Down buttons, enter the **Access Level Code** (1 ➔1 ➔ 2 ➔ 2) followed by pressing the **ENTER**.

8. The display shows **Access Level 2**.
   By using Left – Right buttons, select the Setups from the menu and press the **ENTER** button.

9. The display shows Setups: **Change Defaults**.
   Select the **Change Defaults** from the menu and press **ENTER**.

10. The display shows **Defaults, 0 = Custom**.
    By using Up – Down buttons, select the **Defaults: Code Setting** for your Model (For Default Code Refer to Table 5-3) from the menu and press the **ENTER** followed by **ESCAPE**.

11. The display shows **Setups Change Defaults**.
    By using Left – Right buttons, select the **Calibrate Level** from the menu and press **ENTER**.

12. The display shows **Calibrate Level: Yes: Enter, No: ESC**.
    Select the **YES** from the menu by pressing **ENTER**.

13. The display shows **Calibrate Level: Tilt 0.0' , 0.0**'.
    Select the **ESCAPE** from the menu once.

14. The display shows **Setups Calibrate Level**.
    Select the **ESCAPE** from the menu once again.

15. The Calibration procedure is complete, unplug and remove the EZ-Cal.

16. Close the hydraulic/electric cabinet.