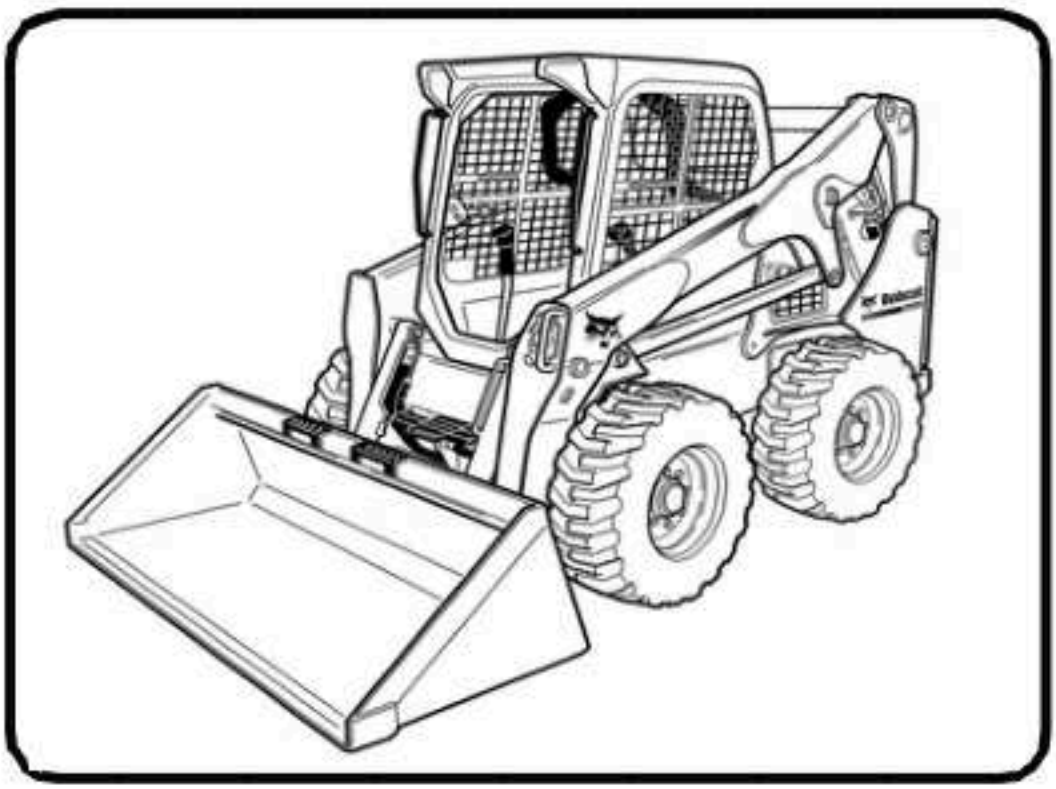
Bobcat®

Service Manual
S650 Skid-Steer Loader

S/N A3NV11001 & Above
S/N A3NW11001 & Above



EQUIPPED WITH BOBCAT INTERLOCK CONTROL SYSTEM (BICS™)

6987168 (10-10)

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Remote Start Procedure (Cont'd)

Figure 10-60-8

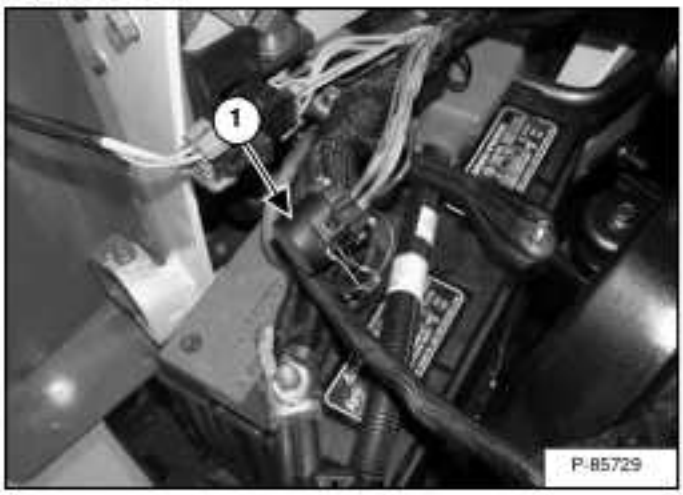
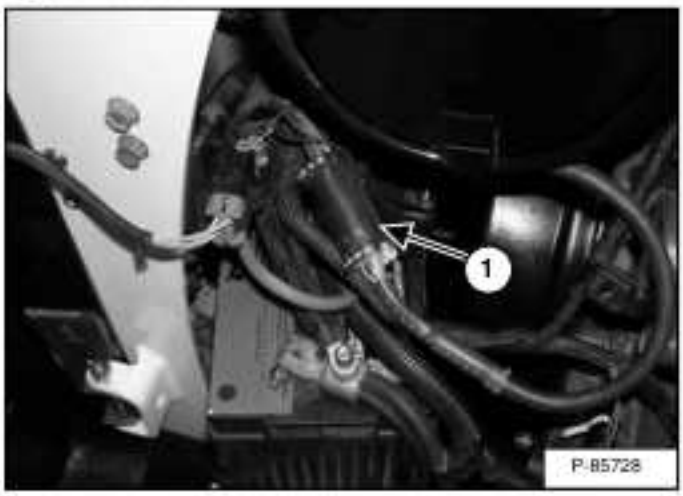


Figure 10-60-9



Remove the cap (Item 1) **[Figure 10-60-8]**.

OR

Disconnect the attachment control harness (Item 1) **[Figure 10-60-9]** (If equipped).

Figure 10-60-10

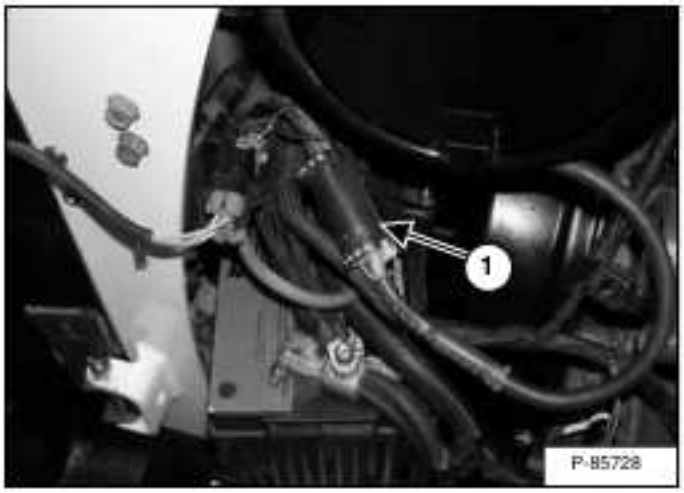
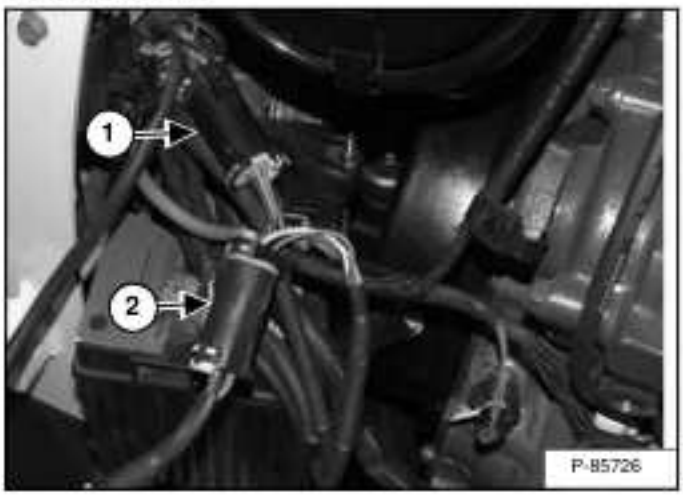


Figure 10-60-11



Connect the remote start tool to the engine harness connector (Item 1) **[Figure 10-60-10]**.

OR

Connect the remote start tool to the engine harness connector (Item 1) and to the attachment control harness (Item 2) **[Figure 10-60-11]** (If equipped).

NOTE: The key switch on the right-hand side operator panel must be in the off position or the Remote Start Tool Kit will not operate.

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HYDRAULIC/HYDROSTATIC SCHEMATIC
SJC WITH NO OPTIONS
S650 (S/N A3NV11001 AND ABOVE)
(S/N A3NW11001 AND ABOVE)

(PRINTED JUNE 2009)

V-1350legend

LEGEND

1. RESERVOIR:
   Capacity at sight gauge . . 10.7 Qts. (10,2 L)
   System Capacity . . . . . 10.5 Gal. (39,7 L)
2. SIGHT GUAGE
3. DIFFERENTIAL PRESSURE SWITCH:
   15 PSI (1,07 bar)
   Normally Closed
4. FILTER - HYDRAULIC (CANISTER)
5. SPRING LOADED FILTER BY-PASS VALVE: 25 PSI (1,7 bar)
6. DIAGNOSTIC COUPLER
7. RELIEF VALVE - MAIN:
   3500 PSI (241 bar)
   at Front Quick Couplers
8. RELIEF/ANTICAVITATION VALVE - PORT 4000 PSI (276 bar)
9. RELIEF/ANTICAVITATION VALVE - PORT (OPTIONAL) 4000 PSI (276 bar)
10. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - AUXILIARY
11. LOAD CHECK VALVE
12. FRONT AUXILIARY MANUAL PRESSURE BLEED-OFF VALVE
13. ANTICAVITATION VALVE
14. LIFT CYLINDER SPOOL - MADE TO RESTRICT FLOW DURING BOOM DOWN BUT NOT DURING BOOM UP
15. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - TILT CONTROL
16. PILOTED ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT CONTROL
17. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE - BICS CONTROL
18. FILTER - BICS CONTROL VALVE (SCREEN)
19. CHECK VALVE - With 14.5 PSI (1,0 bar) Spring
20. RESTRICTION . . . . . 0.079 in. (2,0 mm)
21. PULL BUTTON ACTIVATED DIRECTIONAL CONTROL VALVE - LIFT ARM BY-PASS
22. SENSOR – HYD. TEMPERATURE
23. ANTICAVITATION VALVE
24. PROPORTIONAL RELIEF VALVE – (Fan Speed Regulator):
    1566 - 1784 PSI (108 - 123 bar)
25. SPRING LOADED FILTER BY-PASS VALVE: 75 - 83 PSI (5,2 - 5,7 bar)
26. FIXED CAPACITY DISPLACEMENT HYDRAULIC MOTOR
27. FILTER - HYDRAULIC (CANISTER)
28. SENSOR – CHARGE PRESSURE – Fan Filter
29. HYDRAULIC PUMP . . . . . Gear Type
    23.0 GPM (87,1 L/min.) at High Engine Idle
30. CHARGE PUMP -
    13.5 GPM (51,1 L/min) at High Engine Idle
31. VARIABLE CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC PUMP
32. RELIEF/REPLENISHING VALVE - HIGH PRESSURE: 5294 PSI (365 bar)
33. RELIEF VALVE - CHARGE INLET:
    385 PSI (26,5 bar) at High Engine Idle
    With 140 degrees F. (60 degrees C.) Fluid
34. SERVO PISTON – Swash Plate
35. SOLENOID ACTIVATED DIRECTIONAL CONTROL VALVE – FORWARD/REVERSE
36. FILTER
37. CHECK VALVE – COLD WEATHER BY-PASS
    With 50 PSI (3,45 bar) Spring
38. RESTRICTION - 0.06 inch (1,5 mm)
39. CHECK VALVE - With 200 PSI (13,8 bar) Spring
40. DRIVE MOTOR SHUTTLE VALVE
41. FIXED CAPACITY DISPLACEMENT BIDIRECTIONAL HYDROSTATIC MOTOR

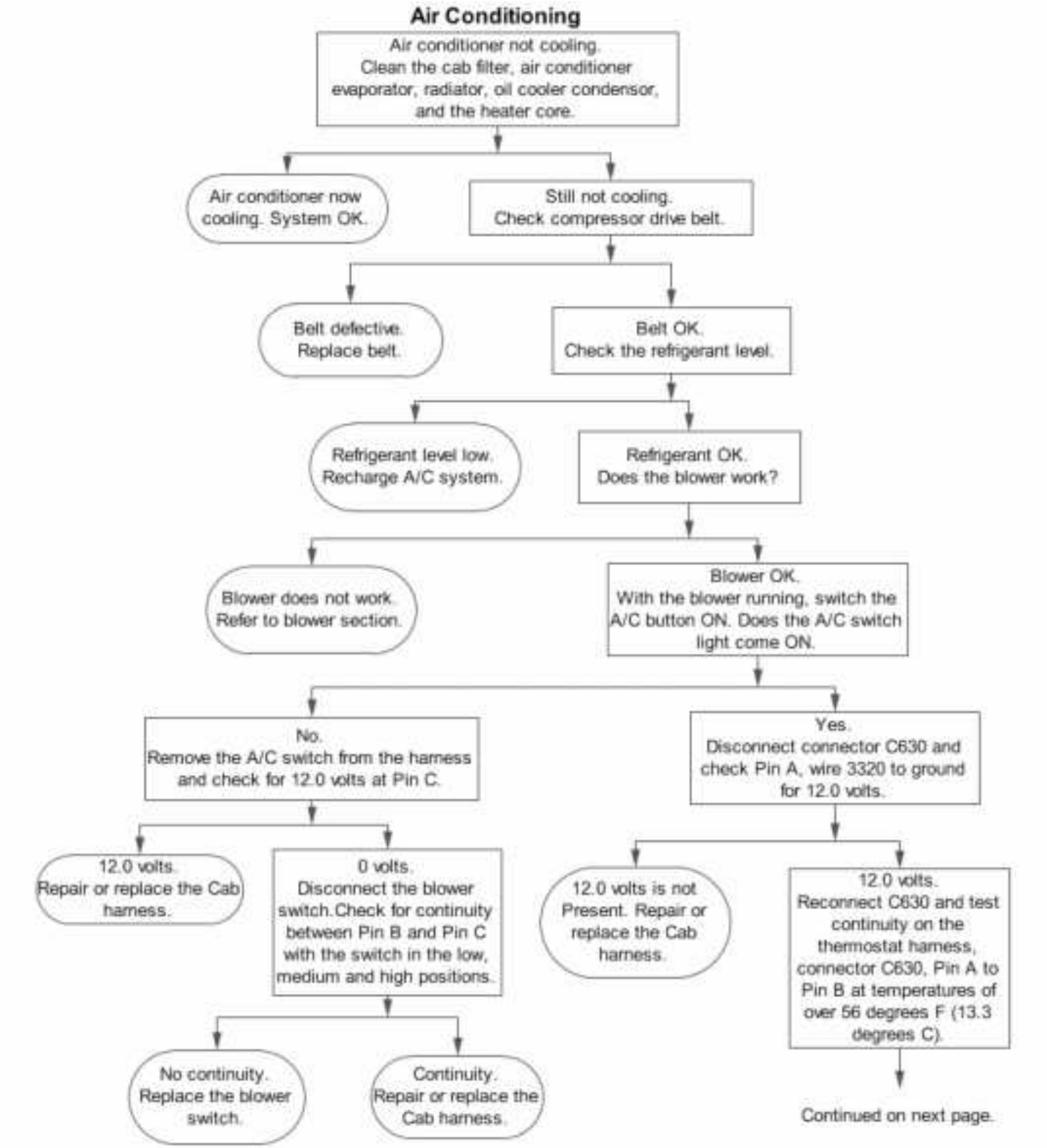
NOTE: Unless otherwise specified springs have NO significant pressure value.

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V-1350legend (6-8-09)

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Troubleshooting Tree



P-80410

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J1 CONNECTOR ASSIGNMENTS(GATEWAY CONTROLLER)			
PIN	FUNCTION	PIN	FUNCTION
A-1	HYDRAULIC LOCK RETURN	B-1	HYD CHARGE PRESS
A-2	LIFT SPOOL LOCK RETURN	B-2	UNSW BATT
A-3	FUEL PULL RELAY	B-3	UNSW BATT
A-4	SWITCHED POWER OUT RELAY	B-4	FUEL HOLD
A-5	LIGHT 1 RELAY	B-5	LIFT SPOOL LOCK
A-6	GLOW PLUG RELAY	B-6	TRACTION LOCK HOLD
A-7	STARTER RELAY	B-7	TILT SPOOL LOCK
A-8	TRACTION PULL RELAY	B-8	CAN LO 1
A-9	FAN 1 RELAY	B-9	CAN HI 1
A-10	TILT SPOOL LOCK RETURN	B-10	SPOOL LOCK SENSOR 2
A-11	SPARE DIGITAL, ECU SINKS	B-11	SEAT BAR
A-12	SPARE DIGITAL, ECU SOURCES	B-12	FUEL LEVEL
A-13	TRACTION PULL RELAY FDBK	B-13	BICS HYD LOCK HOLD
A-14	GLOW PLUG RELAY FDBK	B-14	CAN HI 2
A-15	ENGINE SPEED	B-15	GROUND P1
A-16	AIR FILTER SWITCH	B-16	GROUND P2
A-17	LIGHT 2 RELAY	B-17	GROUND P3, SENSOR
A-18	FAN 2 RELAY	B-18	ENGINE COOLANT TEMP
A-19	PTOL LED	B-19	FAN 2 OUTPUT
A-20	PTOL SWITCH	B-20	CAN LO 2
A-21	SWITCHED POWER OUT RELAY FDBK	B-21	REMOTE KEY
A-22	STATER RELAY FDBK	B-22	RUN/ENTER
A-23	HYD OIL FILTER SW2	B-23	SENSOR SUPPLY 8V
A-24	START ENGINE	B-24	SENSOR SUPPLY 5V
A-25	ENGINE OIL PRESS	B-25	TWO SPEED MAKEUP
A-26	SPARE	B-26	TWO SPEED COIL
A-27	SPARE		
A-28	LIGHT 2 RELAY FDBK		
A-29	FAN 1 RELAY FDBK		
A-30	FUEL PULL RELAY FDBK		
A-31	LIGHT 1 RELAY FDBK		
A-32	HYD OIL TEMP		
A-33	SPARE ANALOG		
A-34	HYD OIL FILTER SW1		

J2 CONNECTOR ASSIGNMENTS(AUXILLIARY CONTROLLER)			
PIN	FUNCTION	PIN	FUNCTION
A-1	FRONT AUX (F) RETURN	B-1	
A-2	REAR AUX (F) RETURN	B-2	UNSW BATT
A-3	LEFT BLINKER RELAY	B-3	UNSW BATT
A-4	RIGHT BLINKER RELAY	B-4	DIVERTED SOLENOID
A-5	HORN RELAY	B-5	REAR AUX (F)
A-6		B-6	RELIEF SOLENOID
A-7	OUTPUT SPARE	B-7	REAR AUX (M)
A-8		B-8	CAN LO 1
A-9		B-9	CAN HI 1
A-10	REAR AUX (M) RETURN	B-10	
A-11	LH PADDLE RIGHT	B-11	
A-12	LH PADDLE LEFT	B-12	
A-13	RH RIGHT BUTTON UP	B-13	FRONT AUX (F)
A-14	DIGITAL INPUT SPARE	B-14	CAN HI 2
A-15		B-15	GROUND
A-16		B-16	GROUND
A-17		B-17	HANDLE POT GND
A-18	FRONT AUX (M) RETURN	B-18	RH PVM POT SIGNAL
A-19		B-19	FRONT AUX (M)
A-20	LH FLOAT BUTTON	B-20	CAN LO 2
A-21	HYDRAULIC DETENT	B-21	RH TRIGGER
A-22	LH RIGHT BUTTON DOWN	B-22	SWITCHED POWER
A-23	RH CENTER BUTTON	B-23	HANDLE POT POWER
A-24	DIGITAL INPUT SPARE	B-24	
A-25		B-25	BUCKET POSITION (SPARE)
A-26	HIGH FLOW RETURN	B-26	HIGH FLOW
A-27	BUCKET POSITION(SPARE) RETURN		
A-28	LH RIGHT BUTTON		
A-29	RH RIGHT BUTTON DOWN		
A-30	RH LEFT UP		
A-31	RH LEFT DOWN		
A-32			
A-33			
A-34	DIGITAL INPUT SPARE		

J5 DRIVE CONTROLLER	
PIN	FUNCTION
1	SAFETY IN
2	TWO SPEED SWITCH
3	SPARE DIGITAL INPUT 2
4	H PAT SWITCH
5	ISO PAT SWITCH
6	ISO LITE
7	L SWASH PLATE ANGLE
8	R SWASH PLATE ANGLE
9	SPARE ANALOG 4
10	SPARE ANALOG 5
11	L FWD RETURN
12	CAN HIGH
13	LF ANGLE
14	RF ANGLE
15	LR ANGLE
16	H PAT LITE
17	RR ANGLE
18	L JOYSTICK X
19	L JOYSTICK Y
20	R JOYSTICK X
21	L FWD DRIVE
22	CAN LOW
23	R QUAD A DRIVE
24	R QUAD B DRIVE
25	TWO SPEED 1
26	BRAKE LIGHT OUTPUT
27	GROUND
28	GROUND
29	SENSOR GROUND
30	SENSOR SUPPLY 2 +5V
31	L REV DRIVE
32	CAN SHIELD
33	L QUAD A DRIVE
34	L QUAD B DRIVE
35	SAFETY OUT
36	BACKUP ALARM
37	R JOYSTICK Y
38	SPARE ANALOG 1
39	SPARE PWM COIL 7
40	SENSOR SUPPLY 1 +5V
41	L REV RETURN
42	R FWD RETURN
43	R FWD DRIVE
44	R REV DRIVE
45	R REV RETURN
46	TWO SPEED 2
47	UNSWITCHED BATTERY
48	UNSWITCHED BATTERY
49	SPARE PWN COIL 6
50	SWITCHED BATTERY

ACS CONTROLLER					
CONNECTOR J1-ACS		CONNECTOR J2-ACS		CONNECTOR J3-ACS	
PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
A	+5V TO SENSORS	A	LIFT CYLINDER SENSOR-SPARE	A	TILT MOTOR 1
B	SWITCHED POWER	B	FLOAT-SPARE	B	UNSWITCHED POWER
C	HAND/FOOT INPUT	C	RESPONSE SELECTOR-SPARE	C	UNSWITCHED POWER
D	CAN HIGH	D	TILT CYLINDER SENSOR-SPARE	D	LIFT MOTOR 2
E	CAN LOW	E	TILT ACTUATOR FEEDBACK	E	HANDLE ENABLE
F		F	LIFT HANDLE	F	LIFT MOTOR 1
G	GROUND	G	TILT HANDLE	G	PEDAL ENABLE
H	GROUND	H	LIFT ACTUATOR FEEDBACK	H	GROUND
		J	LIFT PEDAL	J	GROUND
		K	TILT PEDAL	K	TILT MOTOR 2

HARNESS PART NUMBER	
MAINFRAME	7175625
STD CAB	7165991
DLX CAB	7176098
DLX FUEL	7175293
STD FUEL	7149219
DOOR	7155024
S/R	6733370
TAILGATE DOM	7175271
TAILGATE EUR	7175287
2 SPD ADP	7159366
ACS	7164144
SJC WHEEL	7159325

HARNESS PART NUMBER	
SJC TRACK	7159458
A22 PUMP	7169309
SUSP JSTK	7163706
BACKUP ALARM	7175017
BRAKE ADAPTER	7165061



WIRING SCHEMATIC
(ACS & SJC MACHINE)
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