Class III
SPX Series
Patriot Sprayers

Troubleshooting Manual

87265690

CASE III

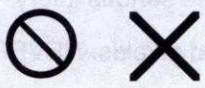
TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

O-Ring Face Seal End				
Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton Metres
-4	1/4 inch 6.4mm	9/16-18	120 to 144	14 to 16
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54
-10	5/8 inch 15.9mm	1-14	552 to 672	62 to 76
Nom. SAE Dash Size	Tube OD Hose ID	Thread Size	Pound-Feet	Newton Metres
-12	3/4 inch 19.0mm	1-3/16-12	65 to 80	90 to 110
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 to 140	170 to 190
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254

O-Ring Boss End Fitting or Lock Nut		
Size	Pounds-Inches	Newton Metres
7/16-20	204 to 240	23 to 27
9/16-18	300 to 360	34 to 41
3/4-16	540 to 600	61 to 68
Size	Pounds-Inches	Newton Metres
7/8-14	60 to 65	81 to 88
1-1/16-12	85 to 90	115 to 122
1-3/16-12	95 to 100	129 to 136
1-5/16-12	115 to 125	156 to 169
1-5/8-12	150 to 160	203 to 217
1-7/8-12	190 to 200	258 to 271

NOTE: *Case, LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.*

⚠ Personal Safety ⚠

- Throughout this manual and on the machine's safety decals, you will find precautionary statements: **DANGER**, **WARNING**, or **CAUTION** followed by specific instructions or ISO two panel safety pictorial symbols. These precautions are intended for your personal safety.
- Failure to follow the **DANGER**, **WARNING,** or **CAUTION** instructions may result in serious bodily injury or death.
- **DANGER:** Indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.
- **WARNING:** Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.
- **CAUTION:** Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.
- ISO two panel **pictorial symbol decals** are defined as follows:
- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as  and 

if used, are RED.

⚠ Safety Rules ⚠

- DO NOT operate or service this machine unless you have read and understood the Operators Manual and have been properly trained in the machine's operation.
- Before starting the engine, be sure all operating controls are in neutral or park position. This will eliminate accidental movement of the machine or start up of power driven equipment.
- This machine requires an operator at all times. Never leave the machine running and unattended.
- ALWAYS be sure the work area is clear of persons before operating the machine. NEVER allow anyone in the work area during machine operation. DO NOT allow inexperienced persons to operate this machine.
- Securely fasten your seat belt. The seat belt can help insure your safety if it is used and maintained. Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.
- Sound horn before operating the machine.
- **No Riders** - Riders falling off could be run over and injured or killed. DO NOT permit others to ride. Only one person - the operator - should be on the machine when it is in operation.
- Ladder must be in the "up" position when operating.
- For road travel, use flashing warning lamps unless prohibited by law and keep SMV visible.
- ALWAYS put the controls in neutral, shut the engine off, apply the parking brake, and remove the key BEFORE exiting the machine.
- DO NOT exceed maximum transport speed of 30 mph (48km/h) or you may loose control of the machine, causing serious injury or death to you or others.
- **Important:** Road transport with loaded product tank is not recommended.
- Road transport with product in the product tank may result in premature wear, failure, or personal injury. Failure to comply with this recommendation may void manufacturer's warranty.

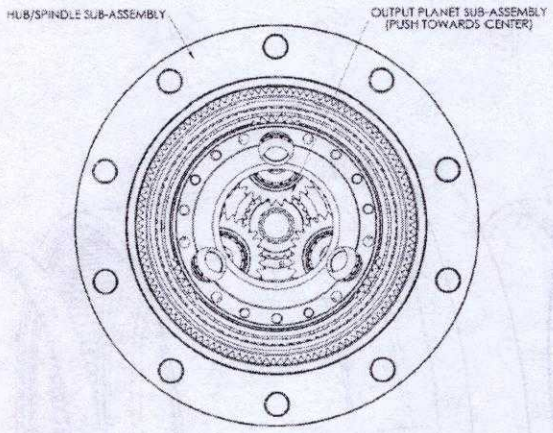
Section 1003

FINAL DRIVES / PLANETARIES

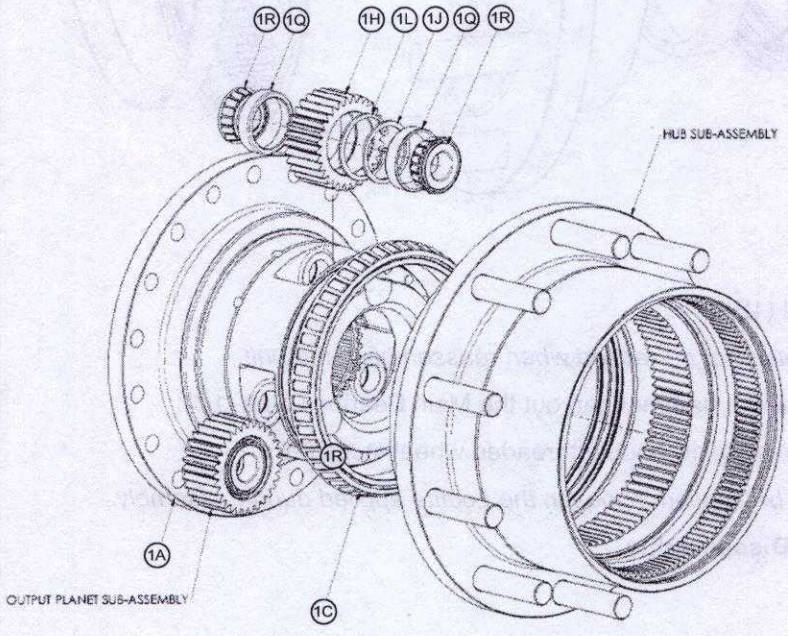
CNH America LLC
700 State Street
Racine, WI 53404 U.S.A

Class III SPX Series Sprayer Troubleshooting Manual
Issued 8-05 Printed in U.S.A.

C014 Main Disassembly (Cont'd)



25. Push the Output Planet Sub-Assemblies towards the center of the Hub/Spindle Sub-Assembly.



26. Pull the Hub Sub-Assembly off the spindle.

NOTE: *This may require a hoist to break the seal (1B) loose.*

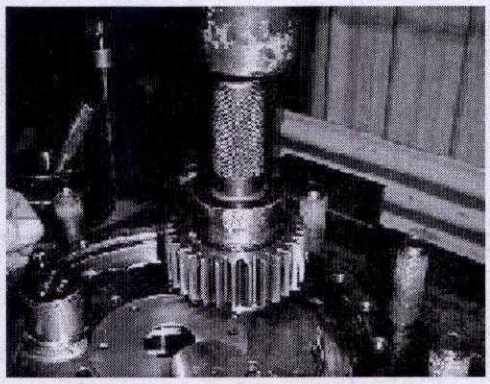
27. Slide each Output Planet Sub-Assembly out of the spindle window. Place each sub-assembly with its respective Planet Shaft (1N) and Shim Set (1K) so that they are matched for re-assembly.
28. Remove the Output Planet Bearing Cones (1R).
29. Use a soft steel rod to tap out the Output Planet Bearing Cups (1Q).
30. Remove the Cup Spacer (1J) and the retaining Ring (1L).
31. Repeat for the other two Output Planet Sub-Assemblies.
32. Using a means of prying, remove the Main Bearing Cone (C) from the Spindle.

This completes the Main Disassembly section of this manual.

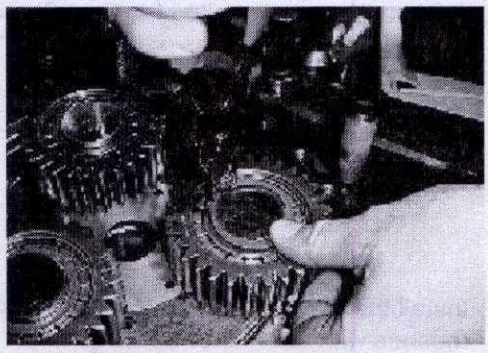
TORQUE-HUB®

Assembly-Disassembly Manual for the CW 12

22. Press the Roller Bearing (3B) and the planet Gear (3A) assembly onto a planet post of the Spindle (1A) using a pressing tool or a large socket that fits into the inner race and over the post.

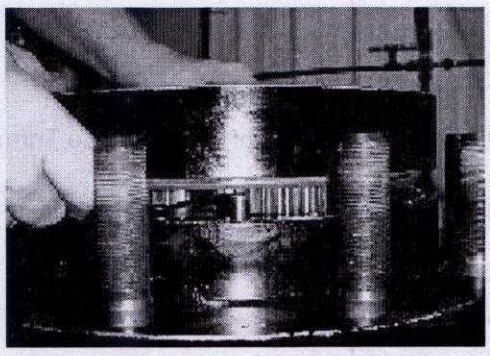


23. Using a snap-ring pliers, install the External Retaining Ring (3C) on the planet shaft to hold the planet gear / bearing assembly into place.



24. Repeat steps 19 through 21 as required, to install the remaining two Planet Gears (3A) and the Roller Bearings (3B) assemblies.

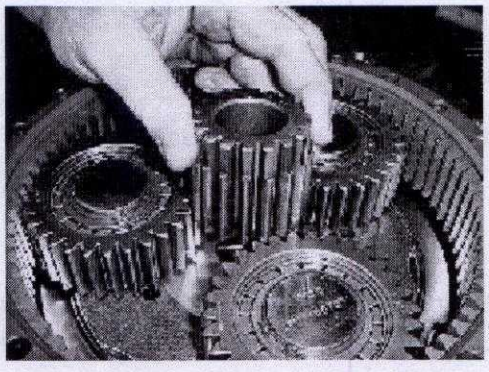
25. Insert two Dowel Pins (4) into the dowel pin holes in the Housing (1G).

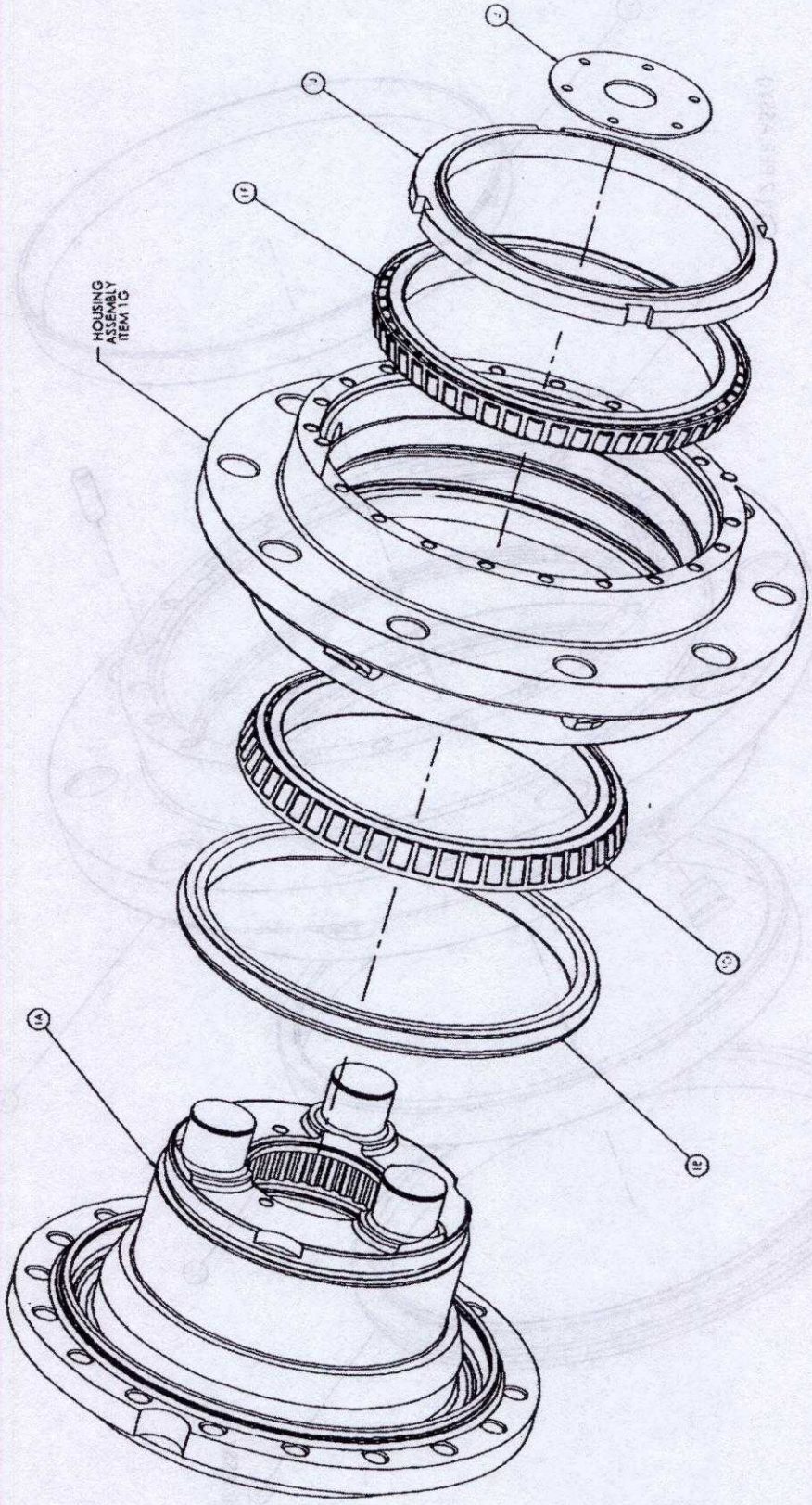


26. Place Ring Gear (6) on the Housing (1G), aligning the dowel pins holes on the Ring Gear (6) with the Dowel Pins (4) on the Housing (1G). Ensure a proper mesh with the Planet Gears (3A).

27. Apply a light coat of oil to the Second Stage Sun Gear (7).

28. Install the Second Stage Sun Gear (7), meshing it with the Planet Gears (3A) on the spindle.




HOUSING ASSEMBLY ITEM 1G

Section 3000

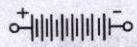
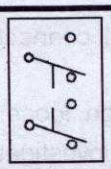
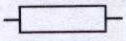
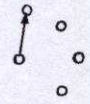
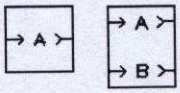
FUEL SYSTEM

CNH America LLC
700 State Street
Racine, WI 53404 U.S.A

Class III SPX Series Sprayer Troubleshooting Manual
Issued 8-05 Printed in U.S.A.

ELECTRICAL SYMBOLS

Quick Reference Guide

	Battery		Switch N.O. SPST
	Fuse		Switch N.O. SPST Momentary On
	Junction Point		
	Circuit Ground		Switch SPDT
	Earth Ground		
	Auto Reset Circuit Breaker		Switch DPDT
	Terminal Block		
	Relay Coil		Switch, Temp, N.O.
	Relay Contact N.O.		Switch, Level, N.C.
	Relay Contact N.C.		Switch, Pressure, N.C.
	Resistor		Switch, Foot, SPDT
	Variable Resistor		Single Filament Lamp
	Solenoid		Multiple Filament Lamp
	Speaker		Diode
	Rotary Switch 3 Position		Flasher
			Connector
	Rotary Switch 4 Position		Connector

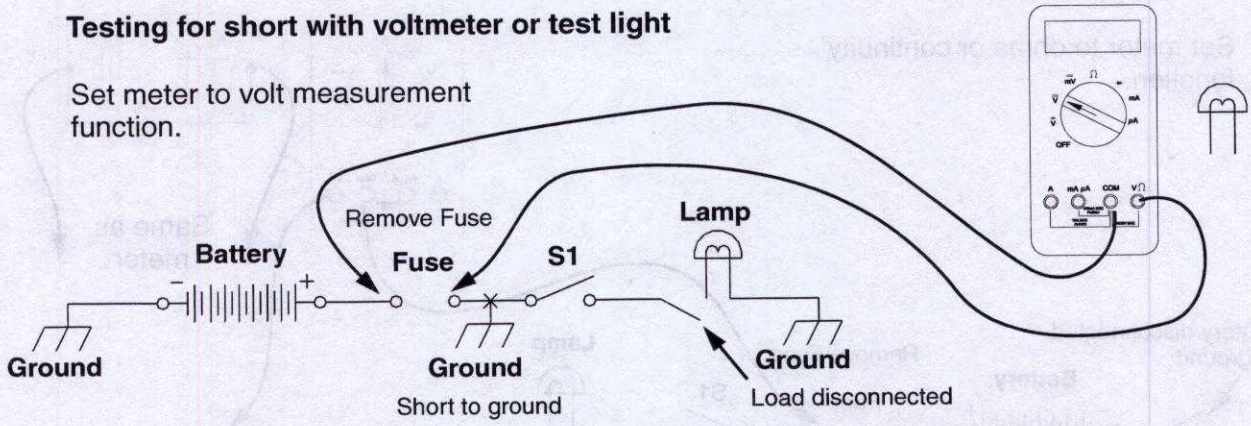
Testing for short to ground

Use a test light or voltmeter.

A test light works very well for the following procedure:

1. Remove the blown fuse and disconnect the load.
2. Connect a test light or voltmeter across the fuse terminals (be sure there is power at the fuse).
3. Beginning near the fuse block, wiggle the harness from side to side. Continue this at convenient points (about 6 inches apart would be ideal) while watching the test light or voltmeter.
4. When the test light glows, or the voltmeter registers, there is a short to ground in the wiring near that point.

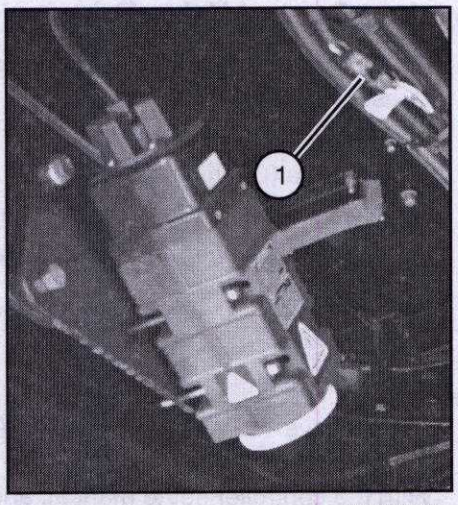
Testing for short with voltmeter or test light



Item	Section-Page No.	Symptom	Probable Cause	Corrective Action
Tail / Brake Lights	4001-9, 14	Tail / Brake lights not operating.	Faulty relay.	Replace relay.
			Faulty fuse.	Replace fuse.
			Faulty bulb.	Replace bulb.
Horn	4001-9, 14	Horn not operating.	Faulty fuse.	Replace fuse.
			Faulty horn.	Replace horn.
			Faulty or corroded wiring.	Check wiring, repair or replace as needed.
Radar	4001-9, 15	Controller not operating/ no registered speed.	Loose connection at the controller.	Tighten connection.
			Faulty radar.	Replace radar.
Reverse Alarm	4001-9, 14	Alarm not operating.	Faulty reverse switch.	Replace switch.
			Reverse switch out of adjustment.	Adjust switch.
			Faulty alarm.	Replace alarm.
			Faulty or corroded wiring.	Check wiring, repair or replace as needed.
Hydraulic Filter Restriction	4001-9, 15	High pressure light in cab is on.	Faulty wiring.	Check wiring.
			Faulty switch.	Replace switch.
Hydraulic Oil Level / Temp	4001-9,15	Hydraulic Oil Level light comes "ON".	System low on fluid.	Stop engine! Check the oil level at sight gauge in the tank. If the oil level is low: Check for oil leaks and repair area leaking. Fill oil tank to proper level.
			Faulty sender.	Replace sender.
		Hydraulic Oil Temp light comes "ON".	Fluid temperature too high.	Check the temperature of the oil at the sight gauge. If the temperature of the oil is above 200° F, determine cause.
			Faulty sender.	Replace sender.

Radar

1. Radar (P111) contains 1 Green wire (Circuit I.D. # 533), 1 White wire with a Red Stripe (Circuit I.D. # 534), 1 Black wire (Circuit I.D. # 021) and 1 White wire with a Red Stripe (Circuit I.D. # 146). (See page 55).



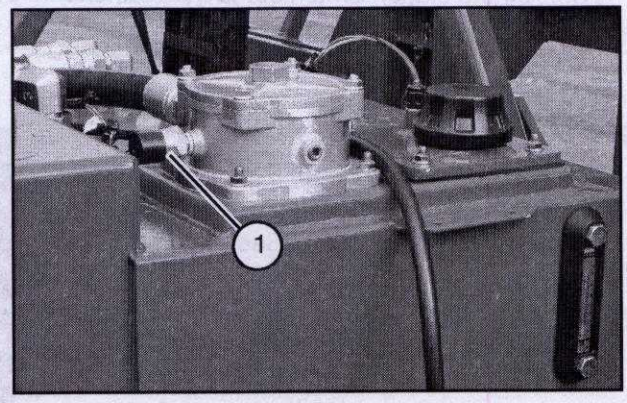
P0006745

Testing

- Should have +12V on C and D with black lead on A.
- B is required to have an Hz measurement, which indicates movement.

Hydraulic Oil Filter Restriction Switch

1. Hydraulic Oil Filter Restriction Switch (P206) contains 1 White wire with a Red Stripe (Circuit I.D. # 141) and 1 Green wire (Circuit I.D. # 413). (See page 53).



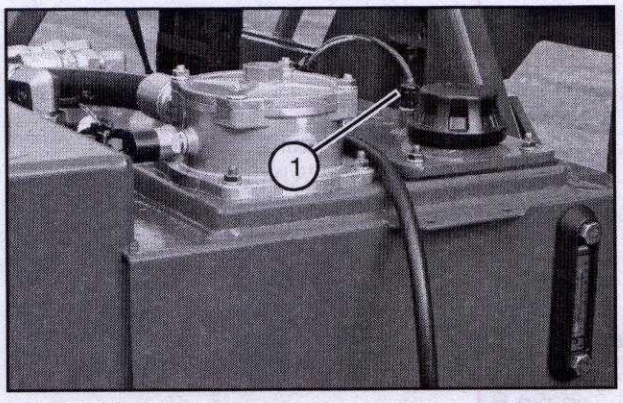
NOTE: *This switch is closed during normal operation. It is also part of the fail safe circuit.*

Testing

- Should have +12V at the connector, when key is on.
- When filter is clogged or restricted, switch opens and should read 0 Volts on pin B.

Hydraulic Oil Level/Temp

1. Hydraulic Oil Level/Temp. (J205) contains 1 White wire with a Red Stripe (Circuit I.D. # 141), 1 Green wire (Circuit I.D. # 403) and 1 Green wire (Circuit I.D. # 409). (See page 53).



Testing

- Should have +12V at pin A of the connector, when key is on.
- Once hydraulic oil temperature reaches 200° F, switch should open and 0 voltage reading should be on pin C.
- Under normal operating conditions, 0 voltage reading should be observed on pin B of the connector, once the oil level drops far enough to activate the switch, you should have +12 Volts.

Fuse and Relay Tables

FUSE TABLE		
FUSE NUMBER	CIRCUIT DESCRIPTION	PAGE
1	AUX1	15
2	RADIO MEM	19
3	UNSW AUX1	15
4	HAZARD	14
5		
6	CNTRL UNSW	32
7	HAZARD / DOME	15
8	LAMP TEST / CAN BUSS	11
9	SW AUX2	15
10	CNTRL SW PWR	32
11	ENGINE SW PWR	08
12	HORN	09
13	SENSOR PWR	12
14	CONTROL HANDLE	18
15	WIPER	17
16	RADIO	19
17	LOADSHARE / BRAKE	17
18	FRONT WORK LIGHTS	16
19	REAR WORK LIGHTS	16
20	AIR CONDITIONER	19
21	BOOM LEVEL PWR	22
22	RANGE SELECT	20
23	BOOM/SPARGE/AXLE	25
24	IND. LAMPS / RADAR	12
25	BOOM CNTRL	21
26	AUX2	15
27	FOAM MARKER	24
28	BOOM SECTIONS	26

CB	MAIN	07
CB1	INGITION	11
CB2	LIGHTS	13

F100	SECTION 1–3	26
F101	SECTION 4–6	26

F1	AIM CMD MAIN	35
F2	AIM CMD SLAVE	36

TABLE OF RELAYS		
RELAY NUMBER	FUNCTION DESCRIPTION	PAGE
RP1A	HEADLIGHTS	15/13
RP1B	FRONT WORK LIGHTS	16
RP1C	REAR WORK LIGHTS	16
RP1D	HORN	09
RP1E	NEUTRAL SAFTY	18/11
RP1F	REVERSE	18/20

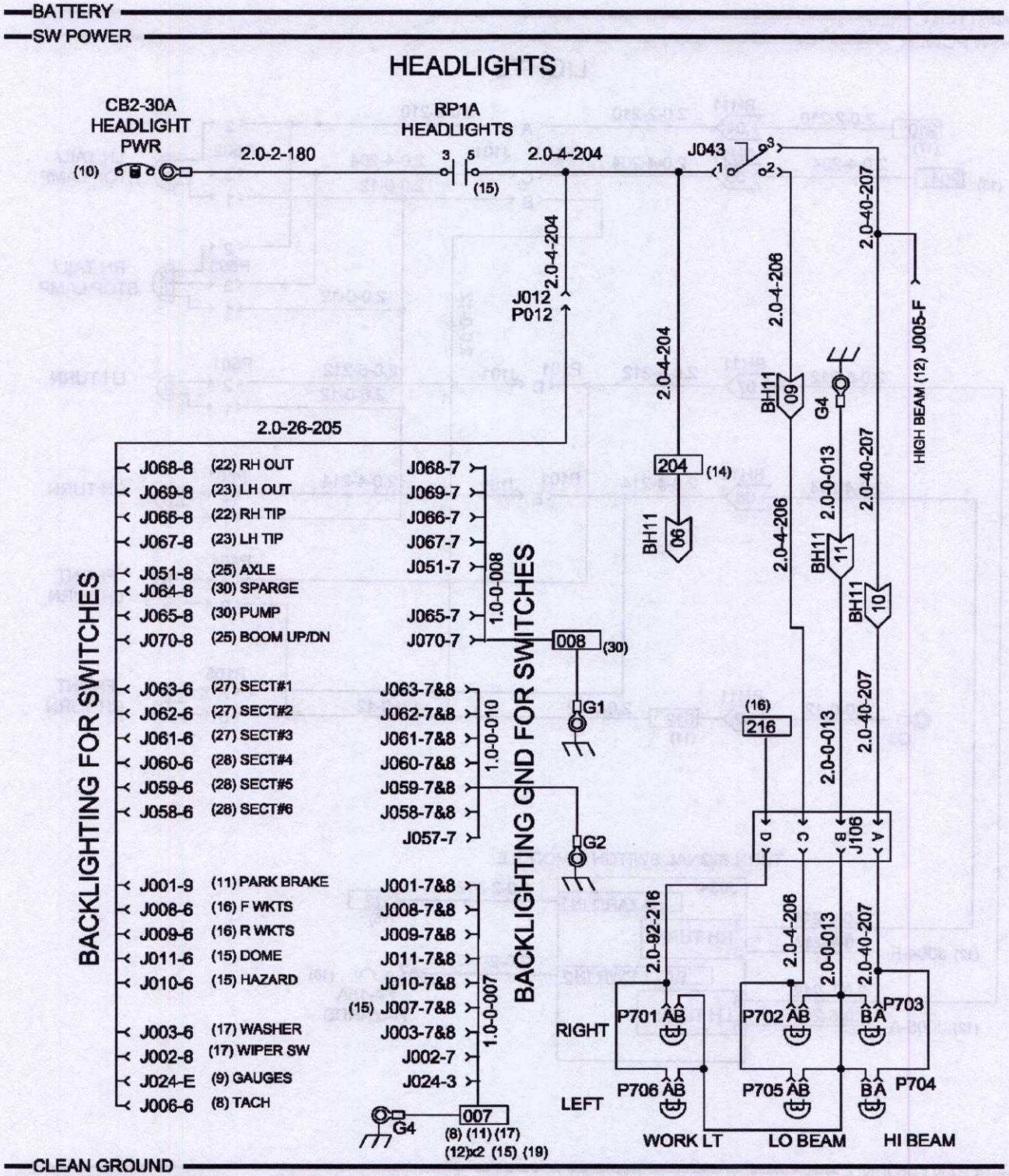
TABLE OF RELAYS		
RELAY NUMBER	FUNCTION DESCRIPTION	PAGE
RP2A	UNLOAD	18/22
RP2B	NEUTRAL(BOOM CNTRL)	18/21
RP2C	LH LEVEL UP	18/23
RP2D	LH LEVEL DN	18/23
RP2E	RH LEVEL UP	18/22
RP2F	RH LEVEL DN	18/22

TABLE OF RELAYS		
RELAY NUMBER	FUNCTION DESCRIPTION	PAGE
RP3A	HYD OIL TEMP LOGIC	31/12
RP3B	HYD OIL LEVEL LOGIC	31/12
RP3C	HYD OIL FILTER LOGIC	31/12
RP3D	CHARGE PSI LOGIC	31/12
RP3E	RANGE SELECT MED	20
RP3F	RANGE SELECT HIGH	20

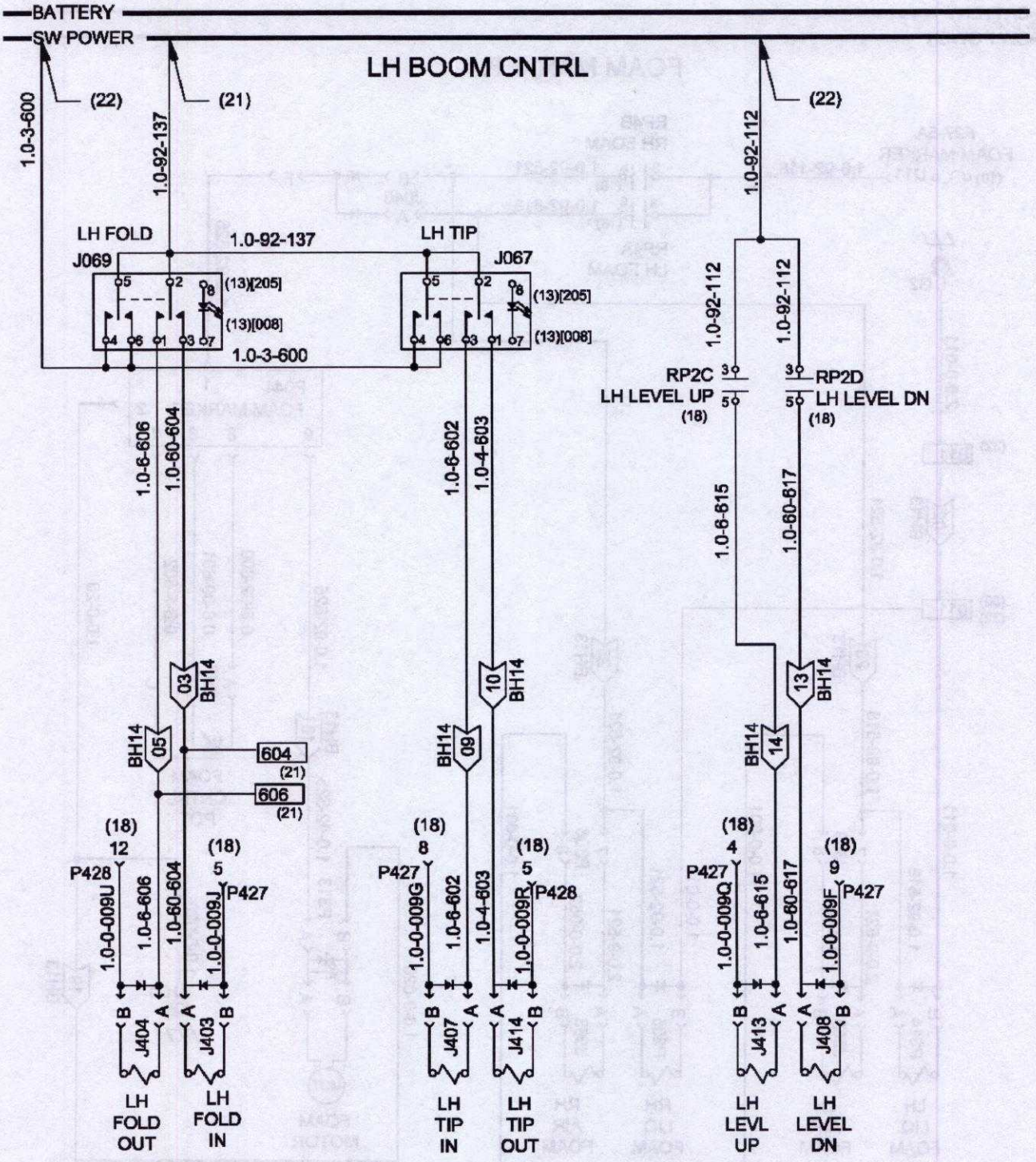
TABLE OF RELAYS		
RELAY NUMBER	FUNCTION DESCRIPTION	PAGE
RP4A	LH FOAM MARKER	18/24
RP4B	RH FOAM MARKER	18/24
RP4C		
RP4D		
RP4E		
RP4F		

TABLE OF RELAYS		
RELAY NUMBER	FUNCTION DESCRIPTION	PAGE
PR1	SW PWR RELAY	11/10
PR2	ACC1 PWR RELAY	11/10
PR3	ACC2 PWR RELAY	11/10
	INTERMEDIATE STARTER	08
	BOOM PWR RELAY	26

NOTE: The pages referenced on this table represent the page #'s at the bottom of the page in the Schematic Information section 4001.


BATTERY
SW POWER
HEADLIGHTS
CB2-30A
HEADLIGHT
PWR
(10)
2.0-2-180
RP1A
HEADLIGHTS
3
5
(15)
2.0-4-204
J043
1
2
3
2.0-40-207
HIGH BEAM (12) J005-F
2.0-4-204
J012
P012
2.0-4-206
BH11
09
G4
2.0-26-205
204
(14)
BH11
06
2.0-4-206
BH11
11
2.0-0-013
2.0-40-207
BH11
10
BACKLIGHTING FOR SWITCHES
J068-8 (22) RH OUT
J069-8 (23) LH OUT
J066-8 (22) RH TIP
J067-8 (23) LH TIP
J051-8 (25) AXLE
J064-8 (30) SPARGE
J065-8 (30) PUMP
J070-8 (25) BOOM UP/DN
J063-6 (27) SECT#1
J062-6 (27) SECT#2
J061-6 (27) SECT#3
J060-6 (28) SECT#4
J059-6 (28) SECT#5
J058-6 (28) SECT#6
J001-9 (11) PARK BRAKE
J008-6 (16) F WKTS
J009-6 (16) R WKTS
J011-6 (15) DOME
J010-6 (15) HAZARD
J003-6 (17) WASHER
J002-8 (17) WIPER SW
J024-E (9) GAUGES
J006-6 (8) TACH
J068-7
J069-7
J066-7
J067-7
J051-7
1.0-0-008
J065-7
J070-7
008
(30)
G1
J063-7&8
J062-7&8
J061-7&8
J060-7&8
J059-7&8
J058-7&8
J057-7
1.0-0-010
G2
BACKLIGHTING GND FOR SWITCHES
J001-7&8
J008-7&8
J009-7&8
J011-7&8
J010-7&8
(15) J007-7&8
J003-7&8
J002-7
J024-3
1.0-0-007
G4
007
(8) (11) (17)
(12)x2 (15) (19)
(16)
216
2.0-0-013
2.0-40-207
J106
D
C
B
A
2.0-92-216
2.0-4-206
2.0-0-013
2.0-40-207
RIGHT
P701 AB
P702 AB
BA
P703
LEFT
P706 AB
P705 AB
BA
P704
WORK LT
LO BEAM
HI BEAM
CLEAN GROUND
CHASSIS GROUND

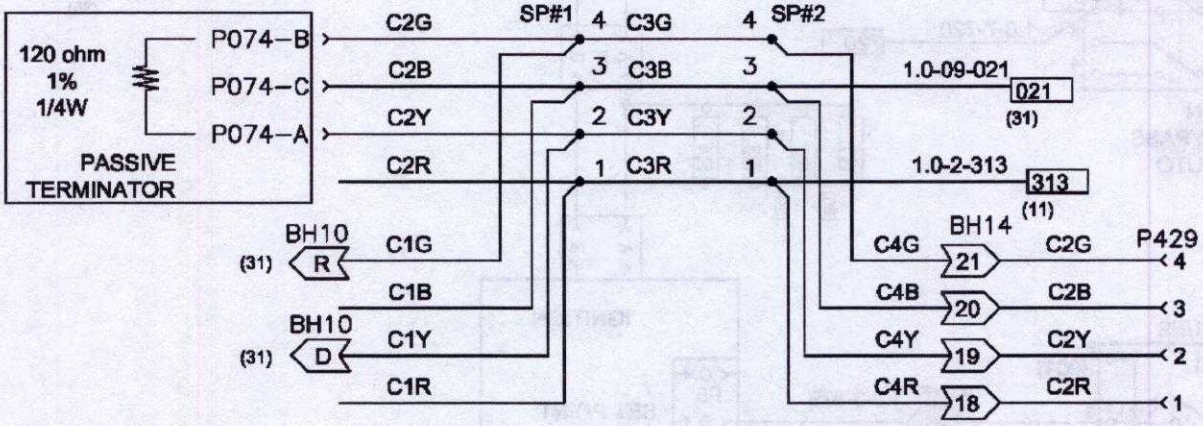
L H Boom Control

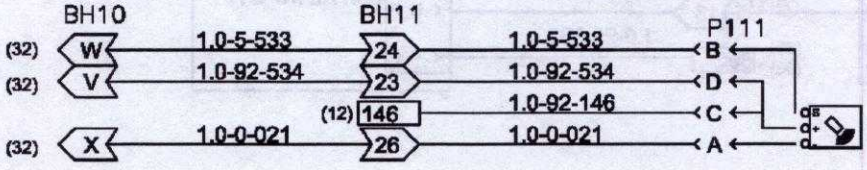


BATTERY

SW POWER

CONTROLLER CAN BUSS/ RADAR





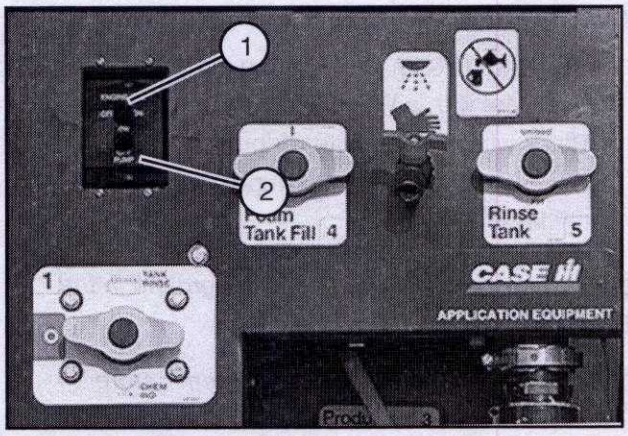
CLEAN GROUND

CHASSIS GROUND

Item	Section-Page No.	Symptom	Probable Cause	Corrective Action
Horn	4002-8, 13	Horn not operating.	Faulty fuse.	Replace fuse.
			Faulty horn.	Replace horn.
			Faulty or corroded wiring.	Check wiring, repair or replace as needed.
Radar	4002-8, 13	Controller not operating/ no registered speed.	Loose connection at the controller.	Tighten connection.
			Faulty radar.	Replace radar.
Reverse Alarm	4002-8, 13	Alarm not operating.	Faulty reverse switch.	Replace switch.
			Reverse switch out of adjustment.	Adjust switch.
			Faulty alarm.	Replace alarm.
			Faulty or corroded wiring.	Check wiring, repair or replace as needed.
Hydraulic Filter Restriction	4002-8, 14	High pressure light in cab is on.	Faulty wiring.	Check wiring.
			Faulty switch.	Replace switch.
Hydraulic Oil Level / Temp	4002-8,14	Hydraulic Oil Level light comes "ON".	System low on fluid.	Stop engine! Check the oil level at sight gauge in the tank. If the oil level is low: Check for oil leaks and repair area leaking. Fill oil tank to proper level.
			Faulty sender.	Replace sender.
		Hydraulic Oil Temp light comes "ON".	Fluid temperature too high.	Check the temperature of the oil at the sight gauge. If the temperature of the oil is above 200° F, determine cause.
			Faulty sender.	Replace sender.
Boom Section Valves	4002-8, 19	Boom controls do not work - other functions o.k.	Faulty wiring.	Check wiring.
			Controller faulty or setup improperly.	Check setup and replace if needed.
		No power to Pin A of connector.	Fuse blown or broken wire(s).	Replace fuse- check for broken wire(s), replace as needed.
			Faulty ball valve power relay.	Replace relay.
		No power to Pin C of connector.	Section switch in wrong position.	Place switch in correct position.
			Faulty spread hold switch.	Replace switch.

Remote Station

1. Engine Kill (C02) contains 1 White wire (Circuit I.D. # 130) and 1 Blue wire (Circuit I.D. # 419). (See page 51).



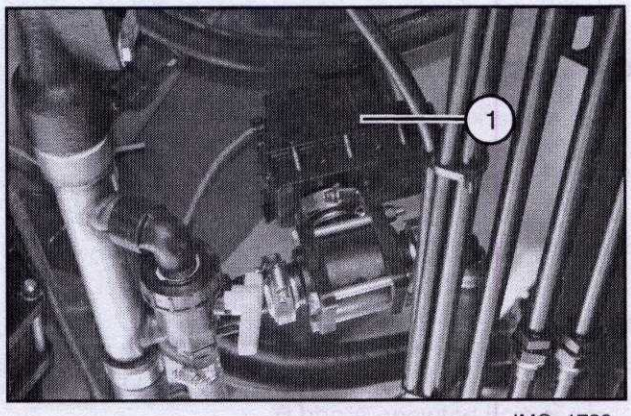
Testing

- To stop the engine (engine kill in the off position), you should see +12V on wire # 130A, but 0 Voltage on wire 130.
- In the run position (engine kill in the on position), you should see +12V on both wires.

2. Pump On/Off (J06) contains 1 Brown wire with a White Stripe (Circuit I.D. # 713), 1 Brown wire with a White Stripe (Circuit I.D. # 713A) and Acc power (C07) contains 1 Gray wire with a Red Stripe (Circuit I.D. # 136).

Sparge Valve

1. Sparge Valve (P03) contains 1 Gray wire (Circuit I.D. # 501), 1 Gray wire with a Blue Stripe (Circuit I.D. # 502). (See page 51).



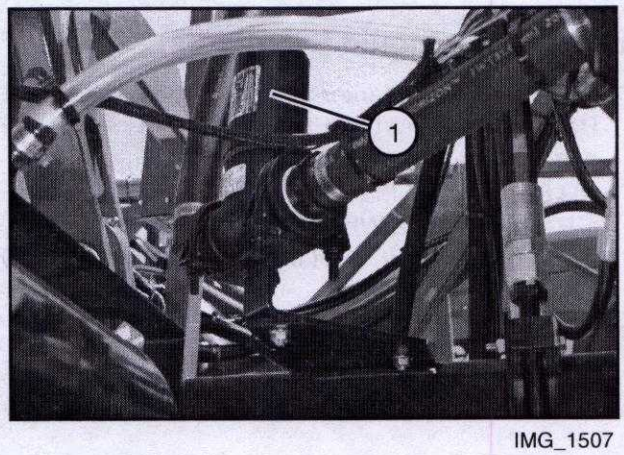
IMG_1739

Testing

- Should have ± 12V depending on position of INC / DEC switch on sparge adjustment.

Product Valve Control

1. Product valve control (J04) contains 1 Brown wire with a Red Stripe (Circuit I.D. # 713A) and 1 White wire with a Black Stripe (Circuit I.D. # 714). (See page 51).



IMG_1507

Testing

- With the controller set to manual, and activating the INC switch you should see +12 V on pin C with black lead on D.

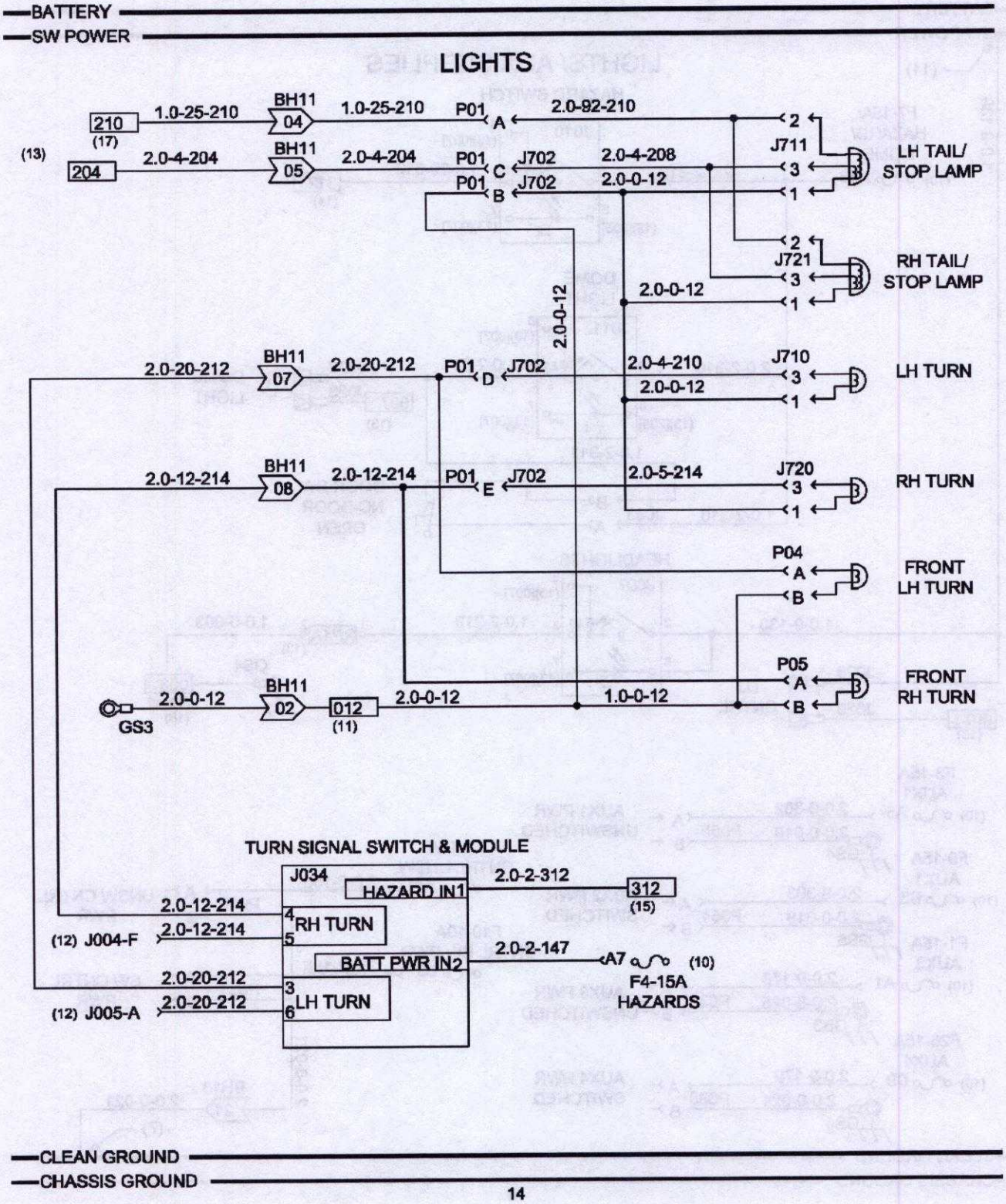
Component Location Chart

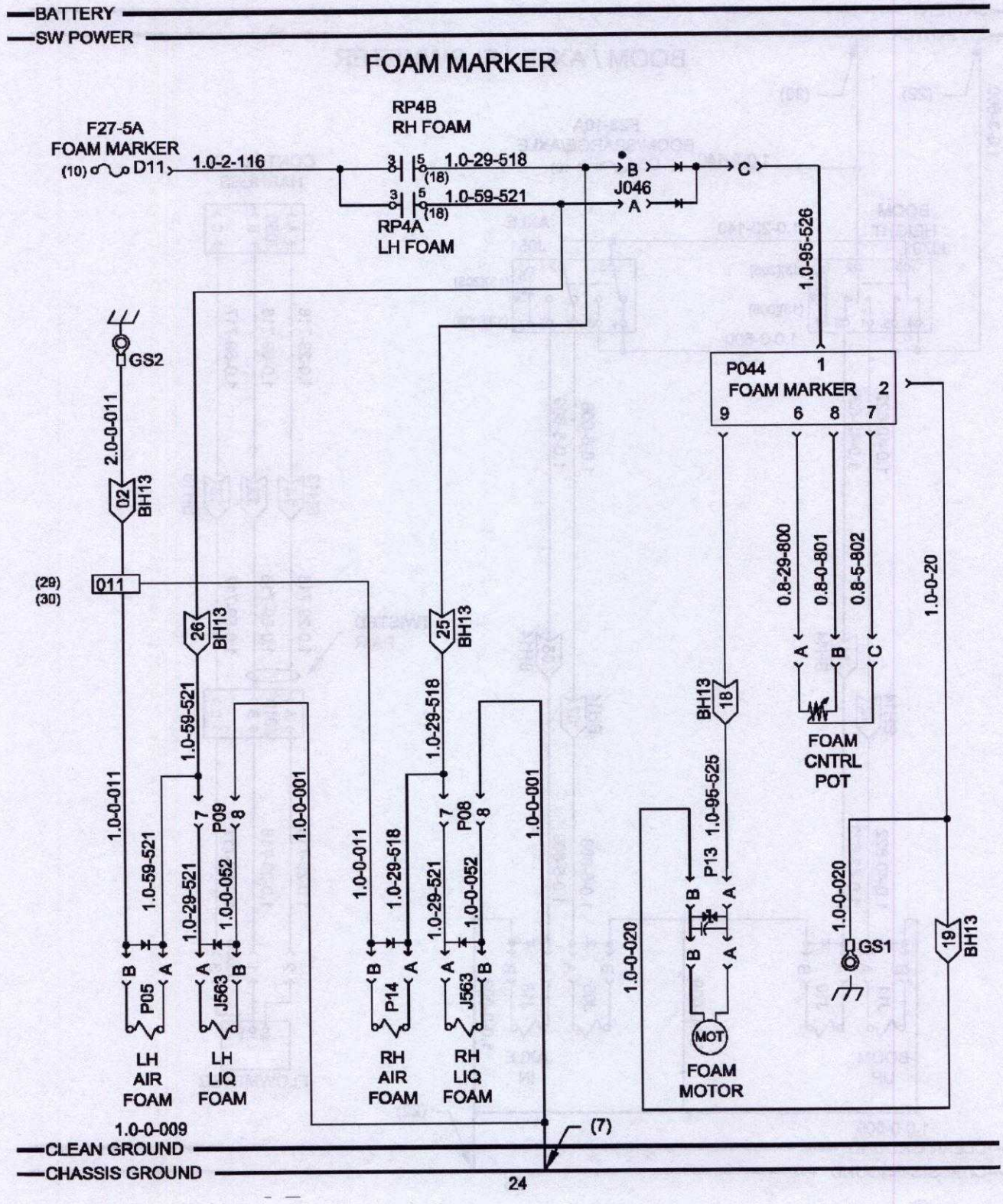
COMPONENT LOCATION CHART	
COMPONENT	PAGE
AIM CMD ALTERNATORS	36
AIM CMD BOOM SOLENOIDS	36
AIM CMD MAIN FLOW MODULE	35
AIM CMD MAN/BYP/AUTO SW	34
AIM CMD P1/P2 SW	34
AIM CMD PSI MODULE	34
AIM CMD PSI SW	34
AIM CMD SLAVE MODULE	36
AIR CONDITIONER	19
AIR CONDITIONER COMPRESSOR	19
ALTERNATOR	08
AUTO CENTERING CNTRL SW	21
AUTO CENTERING MODULE	21
AUX SUPPLY #1	15
AUX SUPPLY #2	15
AUX SUPPLY #3	15
AUX SUPPLY #4	15
AUX SUPPLY CNTRL DJ	15
AUX SUPPLY CNTRL SW	15
AUX SUPPLY CNTRL UNSW	15
BACKUP ALARM	18
GAUGE, FUEL SENDER	09
GAUGE, HOURMETER	06
GAUGE, OIL PRESSURE SENDER	09
GAUGE, TACHOMETER	08
GAUGE, VOLTMETER	09
GAUGE, WATER TEMP SENDER	09
HORN	09
INTIMIDATE START RELAY	08
LAMP, DOME LIGHT	15
LAMP, FRONT TURN SIGNAL	14
LAMP, FRONT WKLT	16
LAMP, HEADLIGHTS	13
LAMP, REAR TURN SIGNAL	14
LAMP, REAR WKLT	16
LAMP, STOP/TAIL	14
LAMPS, LH INDICATOR	12
LAMPS, RH INDICATOR	12
LIQUID PUMP	30
MODULE, FOAM MARKER	24
MODULE, REMOTE	30
PARK BRAKE ALARM	11
QUICK DISCONNECT	07
RADAR	31
RADIO	19
REVERSE SWITCH	18
SOLENOID, AXLE IN	25
SOLENOID, AXLE OUT	25
SOLENOID, BOOM DN	25
SOLENOID, BOOM UP	25
SOLENOID, LH FENCEROW	29

COMPONENT LOCATION CHART	
COMPONENT	PAGE
SOLENOID, LH FOAM MARKER	24
SOLENOID, LH LEVEL DN	23
SOLENOID, LH LEVEL UP	23
SOLENOID, LOADSHARE	17
SOLENOID, PARK BRAKE	11
SOLENOID, RH FENCEROW	29
SOLENOID, RH FOAM MARKER	24
SOLENOID, RH LEVEL DN	22
SOLENOID, RH LEVEL UP	22
SOLENOID, UNLOAD	22
SOLENOID, WHEEL	20
SPARGE VALVE	30
STARTER	08
SWITCH, A/C HIGH LIMIT	19
SWITCH, AUTO/MAN	30/11
SWITCH, AXLE IN/OUT	25
SWITCH, BOOM RAISE/LOWER	25
SWITCH, DOME	15
SWITCH, DOOR JAM	15
SWITCH, ENGINE KILL	20
SWITCH, FENCEROW	29
SWITCH, FRONT WKLT	16
SWITCH, HAZARD	15
SWITCH, IGNITION	11
SWITCH, LADDER DN	12
SWITCH, LOADSHARE	17
SWITCH, NEUTRAL SAFETY	18
SWITCH, PARK BRAKE	11
SWITCH, PRODUCT PUMP	30
SWITCH, RANGE SELECT	20
SWITCH, REAR WKLT	16
SWITCH, SECTION #1	27
SWITCH, SECTION #2	27
SWITCH, SECTION #3	27
SWITCH, SECTION #4	28
SWITCH, SECTION #5	28
SWITCH, SECTION #6	28
SWITCH, SERVICE BRAKE	17
SWITCH, SPARGE	30
SWITCH, SPREAD/HOLD	26
SWITCH, TURN SIGNAL	14
SWITCH, WIPER	17
SWITCHES, CONTROL HANDLE	18
WIPER MOTOR	17

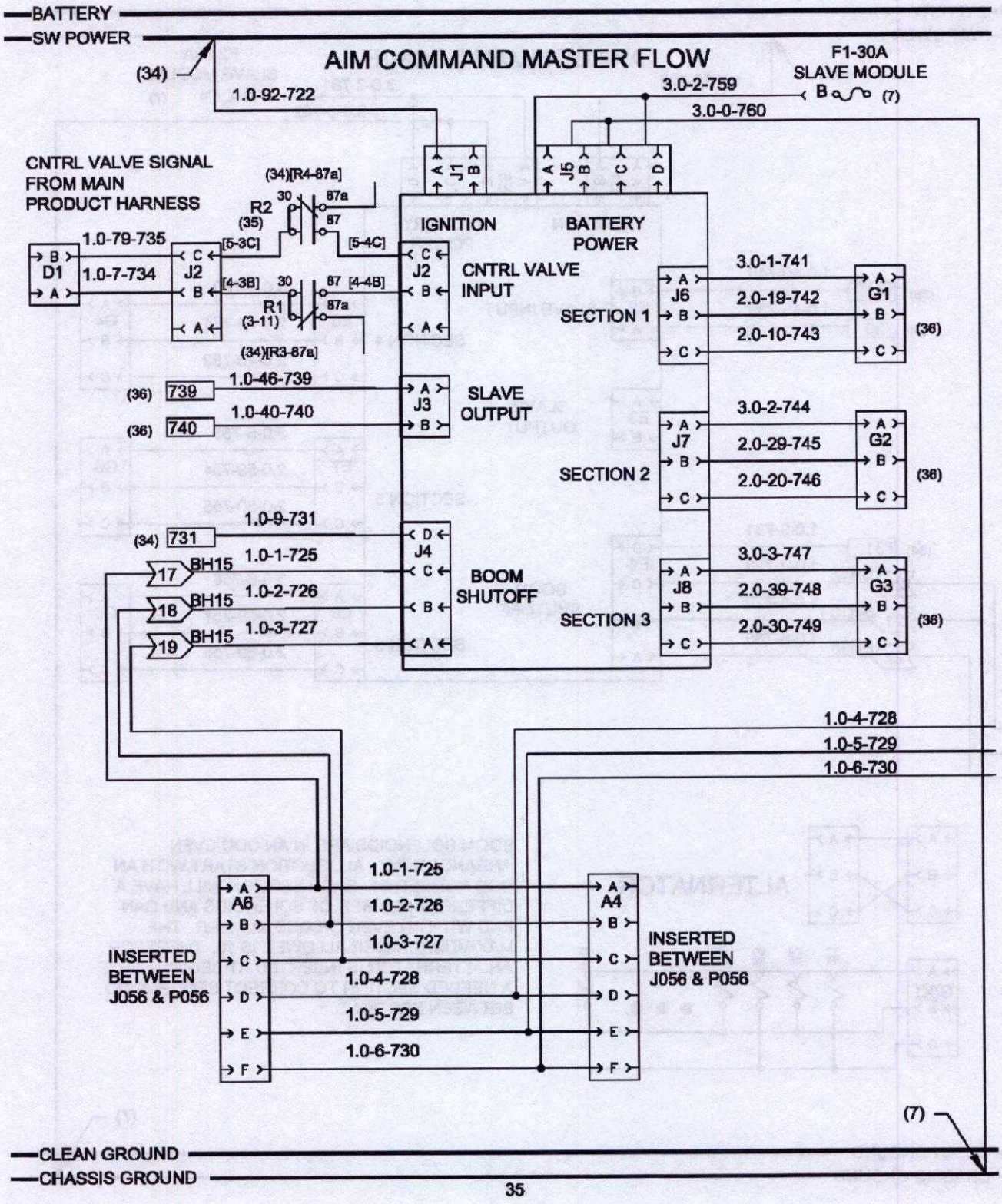
NOTE: The pages referenced on this table represent the page #'s at the bottom of the page in the Schematic Information section 4002.

4


BATTERY
SW POWER
LIGHTS
210
(17)
1.0-25-210
BH11
04
1.0-25-210
P01
A
2.0-92-210
(13)
204
2.0-4-204
BH11
05
2.0-4-204
P01
C
J702
2.0-4-208
P01
B
J702
2.0-0-12
J711
3
1
LH TAIL/
STOP LAMP
2
J721
3
1
RH TAIL/
STOP LAMP
2.0-0-12
2.0-0-12
2.0-20-212
BH11
07
2.0-20-212
P01
D
J702
2.0-4-210
2.0-0-12
J710
3
1
LH TURN
2.0-12-214
BH11
08
2.0-12-214
P01
E
J702
2.0-5-214
J720
3
1
RH TURN
P04
A
B
FRONT
LH TURN
P05
A
B
FRONT
RH TURN
GS3
2.0-0-12
BH11
02
012
(11)
2.0-0-12
1.0-0-12
TURN SIGNAL SWITCH & MODULE
J034
HAZARD IN1
2.0-2-312
312
(15)
2.0-12-214
4
RH TURN
(12) J004-F
2.0-12-214
5
BATT PWR IN2
2.0-2-147
A7
(10)
F4-15A
HAZARDS
2.0-20-212
3
LH TURN
(12) J005-A
2.0-20-212
6
CLEAN GROUND
CHASSIS GROUND


BATTERY
SW POWER
FOAM MARKER
F27-5A
FOAM MARKER
(10)
D11
1.0-2-116
RP4B
RH FOAM
1.0-29-518
(18)
1.0-59-521
(18)
RP4A
LH FOAM
B
C
J046
A
1.0-95-526
GS2
2.0-0-011
02
BH13
P044
FOAM MARKER
1
2
9
6
8
7
0.8-29-800
0.8-0-801
0.8-5-802
1.0-0-20
(29)
(30)
011
26
BH13
25
BH13
1.0-59-521
1.0-29-518
1.0-0-011
1.0-0-001
P09
P08
P05
J563
P14
J563
LH
AIR
FOAM
LH
LIQ
FOAM
RH
AIR
FOAM
RH
LIQ
FOAM
BH13
18
P13
1.0-95-525
FOAM
CNTRL
POT
1.0-0-020
GS1
19
BH13
MOT
FOAM
MOTOR
1.0-0-009
(7)
CLEAN GROUND
CHASSIS GROUND
24

Aim Command Master Flow



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CONTROLLER SETTINGS, CASE IH SCS 4600 AND CASE IH VIPER

Description	RFM 60	RFM 100	Aim Command RFM 60, 100	Notes
Units	US	US	US	
Application	Liquid	Liquid	Liquid	
Valve Type	PWM	PWM	Aim Command	
Speed Sensor	Radar	Radar	Radar	
Boom 1 Cal	5	5	5	(Left Fence Row)
Boom 2 Cal	Boom 1	Boom 1	Boom 1	(# Nozzles) x (spacing) for section
Boom 3 Cal	Boom 2	Boom 2	Boom 2	(# Nozzles) x (spacing) for section
Boom 4 Cal	Boom 3	Boom 3	Boom 3	(# Nozzles) x (spacing) for section
Boom 5 Cal	Boom 4	Boom 4	Boom 4	(# Nozzles) x (spacing) for section
Boom 6 Cal	Boom 5	Boom 5	Boom 5	(# Nozzles) x (spacing) for section
Boom 7 Cal	Boom 6	Boom 6	Boom 6	(# Nozzles) x (spacing) for section
Boom 8 Cal	0	0	0	
Boom 9 Cal	5	5	5	(Right Fence Row)
Boom 10 Cal	0	0	0	
Speed Cal	820	820	820	Calibrate
Valve Cal	10	10	63	
Meter Cal	1380	1380	1380	Must match tag on flowmeter
Rate Cal	20	20	20	
Self Test	0	0	0	
Product Data Menu				
Off Rate %	30	30	30	
PWM High Offset	200	200	200	Max PWM duty cycle of system 0-256
PWM Low Offset	60	60	60	Min PWM duty cycle of system 0-256
PWM Frequency	122	122	122	
Preset PWM Offset	150	150	150	Max PWM duty cycle in hold
Rate Bump Delta	2	2	2	
Low Flow Limit	0	0	0	
Low Tank	0	0	0	
Valve Delay	1	1	1	
Valve Cal 2	1976	1468	1976	See tuning chart for recommendations
Spreader Constant	0	0	0	
Fan Cal	0	0	0	
Dual Flow %	50	50	50	
Bin Level Alarm	OFF	OFF	OFF	
Flow Shaft alarm	OFF	OFF	OFF	
Pressure 1 Cal	0	0	0	Enter 0 to cal
Pressure 2 Cal	0	0	0	Enter 0 to cal
High PSI 1	100	100	100	
Console Data Menu				
Rate Alarm	ON	ON	ON	
Display Smoothing	ON	ON	ON	

Section 4004

STARTER MOTOR

CNH America LLC
700 State Street
Racine, WI 53404 U.S.A

Class III SPX Series Sprayer Troubleshooting Manual
Issued 8-05 Printed in U.S.A.

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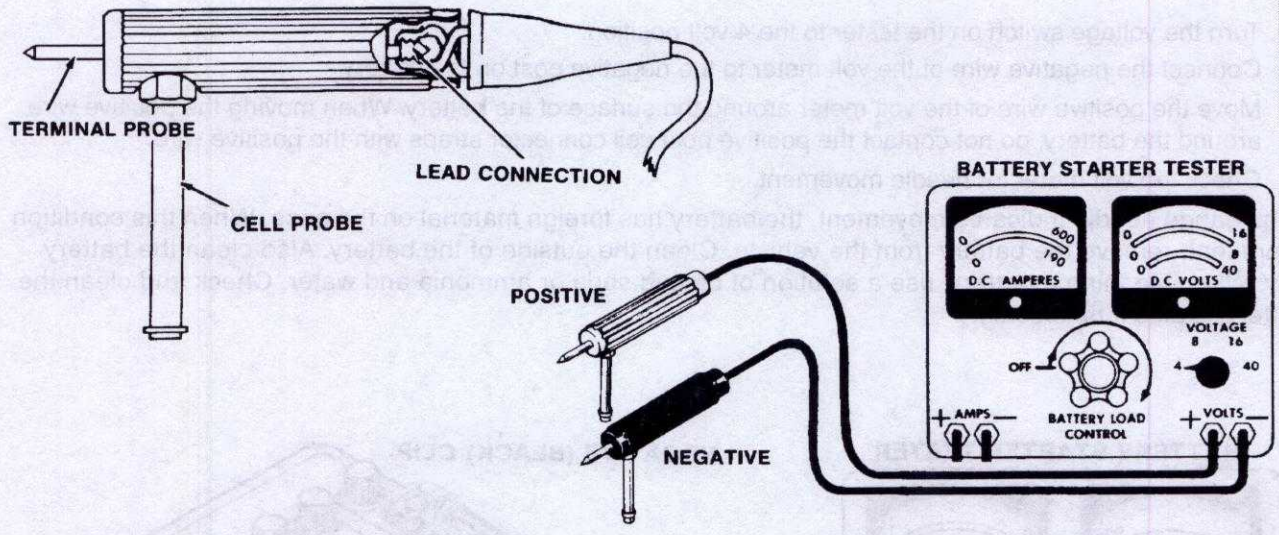
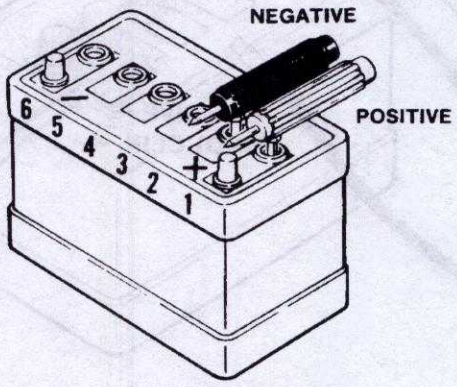
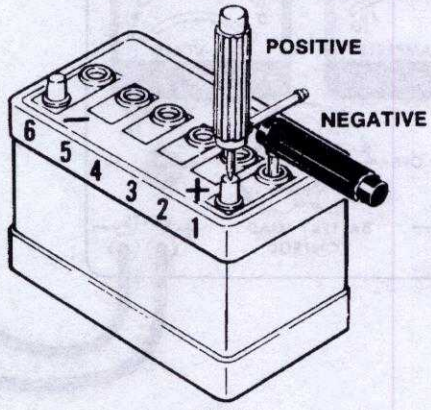
NOTE: CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

TEST PROCEDURE FOR 12 VOLT BATTERY

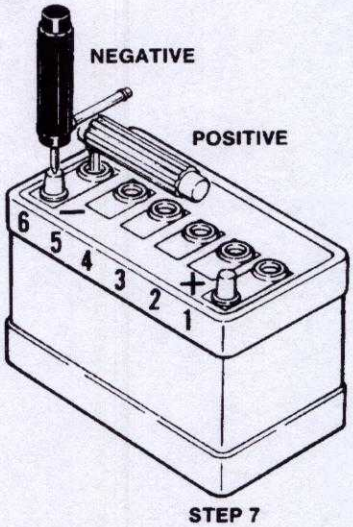




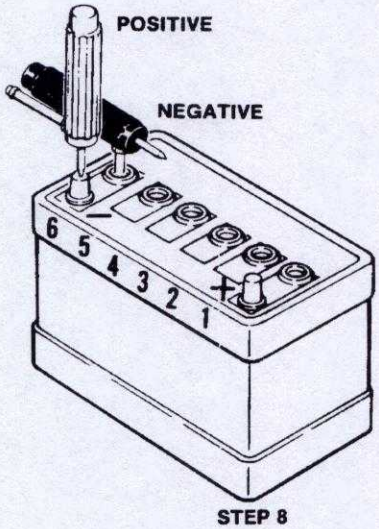
STEPS 1, 2, 3 4, 5



STEP 6



STEP 7



STEP 8

MS96B076

SAFE METHODS TO BE USED WHEN MAKING REPAIRS ON ALTERNATOR SYSTEM

Do not clean the alternator with a solvent or steam. This can cause damage to the internal parts of the alternator.

Do not let any oil enter into the ventilation openings of the alternator when doing service to the engine. This can prevent the alternator from charging.

Always turn the key switch to OFF position and disconnect the battery ground cables when working on the alternator or before arc welding on the tractor or connected implement.

Make an inspection of the terminals, connectors and wires at regular intervals. Check the terminals and the connectors for loose connections and corrosion. Make sure that there is no damage on the insulation of the alternator wires. These conditions can cause the voltage to be lower than the correct battery voltage and cause the alternator to generate more current than is correctly needed to charge the battery.

Make sure that the mounting bolts for the alternator are tight. Check the belt for correct alignment, correct tension and more than normal wear. These conditions can cause the belt to slide on the alternator pulley.

TEST PROCEDURES

For the best accuracy, test the alternator system with all of the system parts still installed on the tractor. Before testing the system, check the following:

1. Battery - The battery must be at least 75% fully charged and the battery voltage must be at least 12 volts.
2. Connections - Make sure that all the connections on the alternator system components are clean and do not have too much corrosion. Too much corrosion on terminals and connectors will cause a loss of battery voltage to the voltage regulator.
3. Drive Belts - Make sure that the drive belts are tight and do not have any grease or oil on the contact surfaces that can cause the belts to slip.

Model Code Sheet

A specific model can be designated by generating a modular Model Code. The Model Code must be designated in the sequence shown here.

LEGEND:
● = Standard
○ = Optional
- = Not Available

90			M	P	J	G	N	F	L	H	T	W	Y	Z	K

Frame Size

042	055	075	100	130	180	250

PRODUCT
90 = Series 90

DESIGN & ROTATION
L = Pump, Left Hand Rotation (CCW)
R = Pump, Right Hand (CW)

FRAME SIZE
042 = 42.0 cm³/rev (2.56 in³/rev)
055 = 55.0 cm³/rev (3.35 in³/rev)
075 = 75.0 cm³/rev (4.57 in³/rev)
100 = 100.0 cm³/rev (6.10 in³/rev)
130 = 130.0 cm³/rev (7.93 in³/rev)
180 = 180.0 cm³/rev (10.99 in³/rev)
250 = 250.0 cm³/rev (15.25 in³/rev)

M: CONTROLS
CB = Cover Plate w/ Feedback Link
DC = Electric 3-Position (FNR) Solenoid (12 VDC)
DD = Electric 3-Position (FNR) Solenoid (24 VDC)
HF = Hydraulic Displacement (HDC) 3-11 bar (44-160 psi)
HM = Hydraulic Displacement (HDC) 1.1-6.7 bar (16-97 psi)
HS = Hydraulic Displacement (HDC) 6-18 bar (87-261 psi)
KA = Electric Displacement (EDC) MS-Connector
KP = Electric Displacement (EDC) Packard-Connector
MA = Manual Displacement (MDC)
MB = Manual Displacement w/ Neutral Start Switch (NSS)
MD = Manual Displacement w/ NSS and DC Solenoid Override, 12V DC
MC = Manual Displacement w/DC Solenoid Override, 12V DC
MT = Manual Displacement w/ 12V DC Solenoid Override (2 Pole)
MV = Manual Displacement w/ NSS (Weather-Pack Connector)
NA = Non-Linear Manual Displacement

P: PRESSURE REGULATION
1 = Pressure Limiter (PL) in Port "A" and "B"
2 = High Pressure Relief Valve only - No Pressure Limiter

J: AUXILIARY MOUNTING PAD

AB	=	SAE A w/ Sealed Cover	(9 Teeth, 16/32 Pitch)
AD	=	SAE A w/ Sealed Cover	(9 Teeth, 16/32 Pitch)
BC	=	SAE B w/ Sealed Cover	(13 Teeth, 16/32 Pitch)
BG	=	SAE B w/ Sealed Cover	(13 Teeth, 16/32 Pitch)
CD	=	SAE C w/ Sealed Cover	(14 Teeth, 12/24 Pitch)
DE	=	SAE D w/ Sealed Cover	(13 Teeth, 8/16 Pitch)
EF	=	SAE E w/ Sealed Cover	(13 Teeth, 8/16 Pitch)
EG	=	SAE E w/ Sealed Cover	(27 Teeth, 16/32 Pitch)
BB	=	SAE B-B w/ Sealed Cover	(15 Teeth, 16/32 Pitch)
NN	=	No Auxiliary Mounting Pad	

G: ENDCAP PORTS (SAE J518C CODE 62)
60 = Side Ports
80 = Twin Ports, Radial

A-1

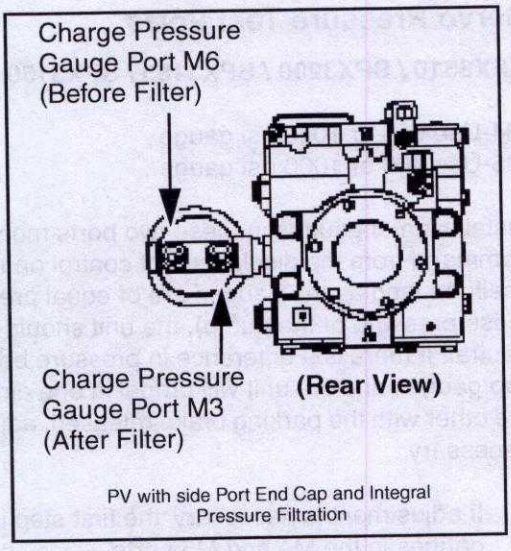
Charge Pressure Test Port

SPX3310 / SPX3200 / SPX3185 / SPX3150

M3-After pressure filter, Use 600 or 1000 psi gauge

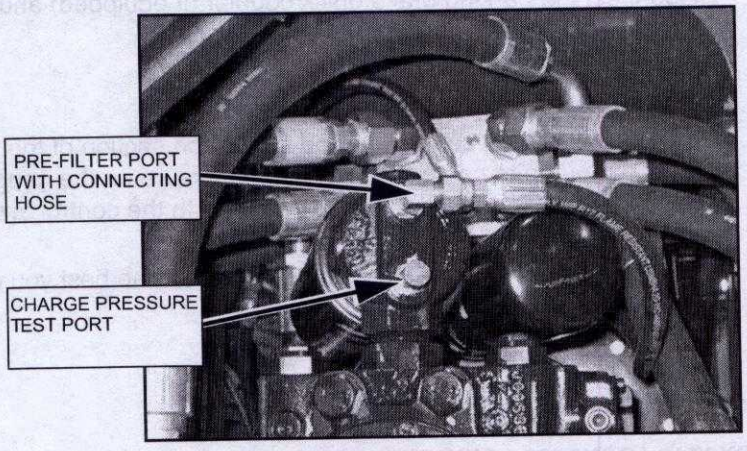
M6-Before pressure filter, Use 600 or 1000 psi gauge

- Charge pressure reading is taken using the M3 port. Pump rpm for this test is to be 1775. As the pump shaft is connected to the engine crankshaft, engine rpm should equal pump rpm. Hydraulic oil temperature should be 120 degrees F (49 degrees C) and the unit should be in neutral with the parking brake applied.

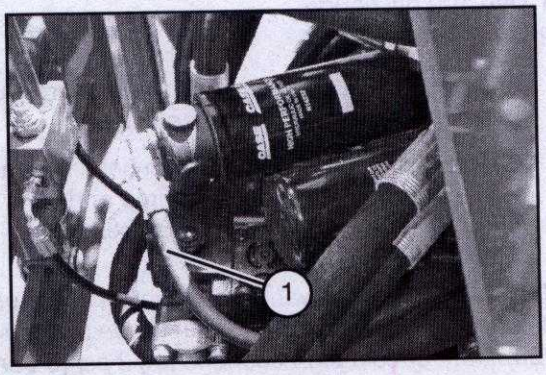


PV with side Port End Cap and Integral Pressure Filtration

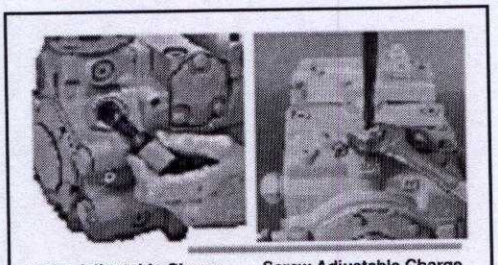
- Charge pressure setting for this unit should be 350 psi. The specified charge pressure setting is achieved by subtracting the case pressure port gauge reading from the actual charge pressure port reading.



- To truly set the charge pressure for each hydrostatic pump correctly, the hydraulic line (1) which connects the two M6 ports must be disconnected, and the fittings/hose ends capped and plugged.



- Adjustments can be made by loosening the lock nut and turning the charge pressure relief valve to achieve the desired settings. Tighten the lock nut when desired pressure reading is achieved.



Shim Adjustable Charge Pressure Relief Valve (Pump)

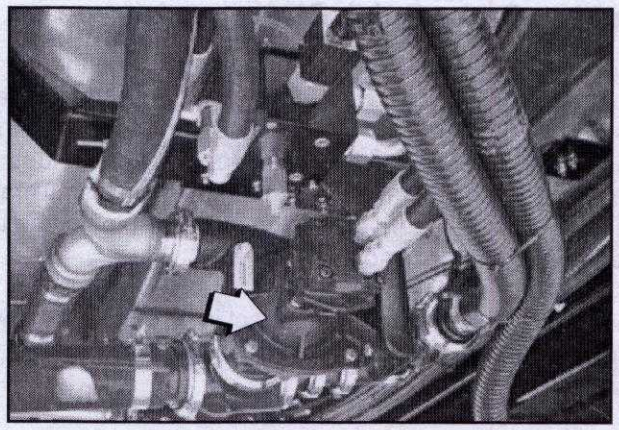
Screw Adjustable Charge Pressure Relief Valve (Pump)

Liquid Product Pump

SPX3310 / SPX3200

The product pump is a centrifugal style pump with a 2" inlet and 1 ½" outlet. It has a flow capability of 190 gpm of water.

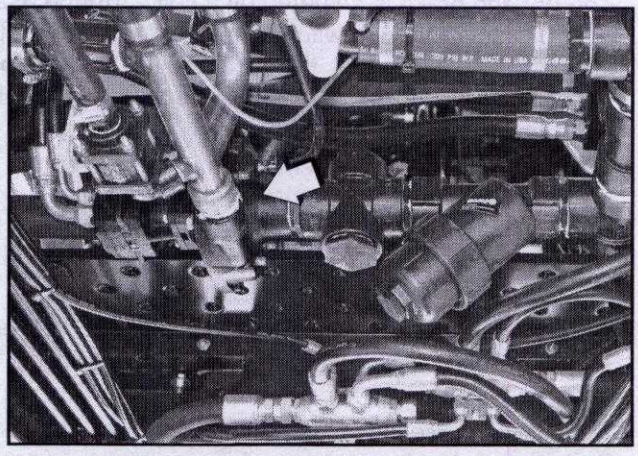
The hydraulic motor is a geroter style with a displacement of 0.625 CIR. It has an inlet pressure rating of 2400 psi continuous (3000 psi intermediate) and an outlet pressure rating of 150 psi continuous (300 psi intermediate).



IMG_0550

SPX3185 / SPX3150

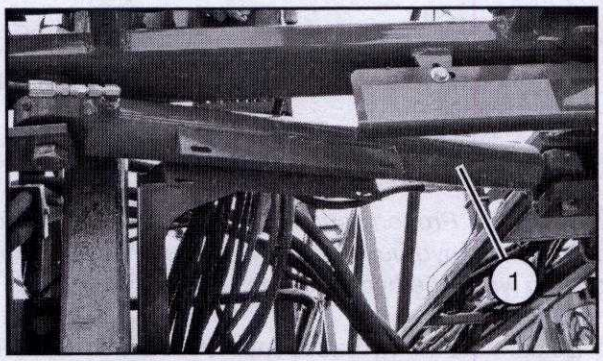
The product pump is a centrifugal style pump with a 1 ½" inlet and 1 ¼" outlet. It has a flow capability of 114 gpm of water.



IMG_1511

Testing

1. Start engine and warm the hydraulic oil to a minimum of 120 degrees F.
2. Fully extend or retract the cylinder (1) in question.



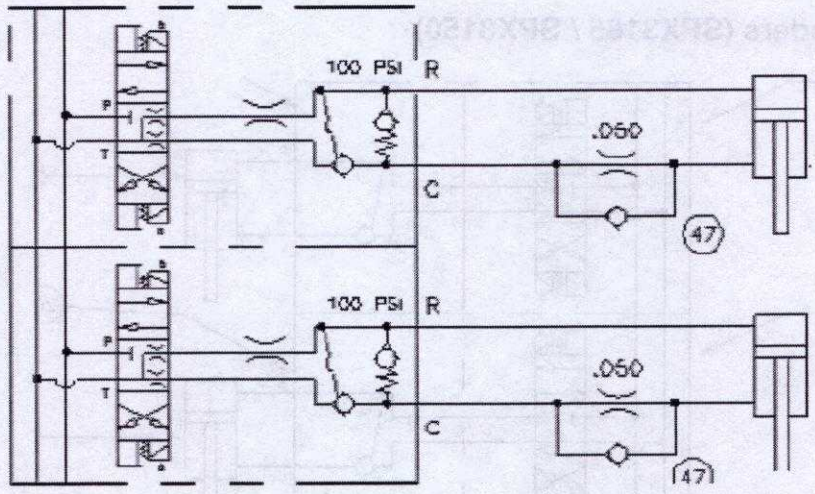
IMPORTANT: *Properly support the boom section before disconnecting hydraulic lines. This will prevent the boom from dropping when the hydraulic lines are disconnected.*

3. Disconnect the hydraulic line from the end of the cylinder with the least amount of available volume.

NOTE: *Disconnect the rod end if the cylinder is fully extended, or disconnect blind end if the cylinder is fully retracted.*

4. Place the disconnected hose in a collection container.
5. Activate the function so as to attempt to extend a fully extended or retract a fully retracted cylinder. If no oil is expelled, the seal is intact.

Boom Level Cylinders (SPX3310 / SPX3200)



The boom level circuit is somewhat different than the inner fold circuit, in that only one pilot operated check valve is present. Once the boom level cylinder is commanded to raise or retract, the pilot operated check valve is opened by the pressure needed to extend the cylinder. This allows the displaced oil from the rod end side of the cylinder to dump to the tank line in the manifold. Notice the check valve on the blind end or extend portion of the manifold. The check valve has a 100 psi spring and is responsible for providing protection on the extend function of the circuit, such as cradling the boom.

Section 6000

SPRAY SYSTEM

CNH America LLC
700 State Street
Racine, WI 53404 U.S.A

Class III SPX Series Sprayer Troubleshooting Manual
Issued 8-05 Printed in U.S.A.

Section 7000

A/C SYSTEM

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A/C COMPONENTS (CONT'D)

Hose Group A/C and Heater

CLAMP (5/8 HEATER HOSE)
CONN, 5/8 X 1/2 MPT 45
HOSEBARB 1/2MPT X5/8 BARB
SWITCH, HIGH PRESSURE (N.C.)
CLAMP, 25.4 MM"P" INSUL
M8-1.25,TLN,CL8
HOSE,HTR,5/8"IDX345",SUP
HOSE,HTR,5/8"IDX345",RET
HOSE ASSY,CAB TO DRYER
HOSE ASSY,CAB TO COMP
HOSE ASSY, COND TO DRYER
WASHER, 9X20X1.6 CST ZND
TAR TAPE 10"
HOSE-HTR,5/8"ID/6"SUPPLY
HOSEBARB 1/2MPTX3/8X90DEG
HOSE ASS'Y W/O-RING(A.C.)
  O-RING(5/16ID)HNBR(GREEN)
  O-RING(7/16ID)HNBR(GREEN)
  O-RING(9/16ID)HNBR(GREEN)
COVER-HOSE, W/HDWE
  3/8,FW,SS
  3/8-16X.5,HH,SS
  COVER
ENCLOSURE-HOSE,W/HDWE
  BLT,1/4-20X.5,STP
  ENCLOSURE
HOSE ASS'Y W/O-RING (A.C.)
  O-RING(9/16ID)HNBR(GREEN)
  O-RING(11/16ID)HNBR(GREEN)
HOSE-HTR,5/8"ID/18"RETURN
HOSE-HTR,5/8"ID/12"SUPPLY
HOSE ASS'Y W/O-RING(A.C.)
CLAMP, DOUBLE, DIA. 23.8

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NOTE: CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

MAINTENANCE

Check boom strainers on a regular basis to keep them clean and flowing correctly

Winterize the system before storing during freezing weather. RV anti-freeze or other non-toxic antifreeze is recommended.

Frequently wash the boom and valves with low pressure to remove dirt and fertilizer. This will help prevent corrosion of the valve housings. Do not wash the boom with high pressure spray, the high pressure spray forces fertilizer and other corrosive materials into connectors and housings, causing corrosion and failures.

Shut-Off the AIM Command system when shutting off the machine.

IMPORTANT: *Starting the machine, with the AIM Command in the "Auto" or the "Man" position can send voltage spikes through the system that can damage valve coils and modules.*

Disconnect the power wires before welding on the sprayer.

To service a valve, remove the nut from the top of the valve using a 9/16" wrench.

Remove the metal yoke and coil.

Remove the sealing o-ring and plastic fly nut.

Using a screwdriver and pliers, separate the valve stem and valve body.

NOTE: *Be careful not to lose the poppet and o-ring.*

Remove the debris and verify that the poppet moves freely in the stem. Reassemble the valve.

Section 10000

CLASS III SPX SERIES SPRAYERS

REQUIRED AND RECOMMENDED

TOOL LIST

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