521F
Tier 4B (final)
Wheel Loader

SERVICE MANUAL

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CASE CONSTRUCTION

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Powershift transmission - Special tools

P/N	Description
380001577	Transmission valve adjustment tool set
CAS2232	Clutch pack assembly set
CAS2797	Lifting eyebolt set

Powershift transmission - Torque

Oil pipes	
Studs	9 N·m (80 lb in)
Socket head bolt	23 N·m (17 lb ft)
Screw plug	51 N·m (38 lb ft)
Clutch K1, K2, K3, K4 Stud	17 N·m (150 lb in)
Plugs	25 N·m (18 lb ft)
Output shaft	
Output shaft bolts (apply LOCTITE® 243™ to threads)	23 N·m (17 lb ft)
Housing cover bolts (apply LOCTITE® 574™ to threads)	46 N·m (34 lb ft)
Output flange bolts	34 N·m (25 lb ft)
Oil feed housing and transmission pump	
Transmission pump bolts	46 N·m (34 lb ft)
Oil feed housing bolts	25 N·m (18 lb ft)
Engine connection and converter	
Input shaft bolts	115 N·m (85 lb ft)
Converter housing bolts	68 N·m (50 lb ft)
Cover	23 N·m (17 lb ft)
Converter cover	46 N·m (34 lb ft)
Input flange	34 N·m (25 lb ft)
Duct plate	
Bolts	25 N·m (18 lb ft)
Bolt plug	30 N·m (22 lb ft)
Hydraulic control unit	9.5 N·m (84 lb in)
Filter	
Filter head bolts	25 N·m (18 lb ft)
Oil distribution cover bolts	25 N·m (18 lb ft)
Speed sensor and inductive transmitter	
Speed sensor bolt	23 N·m (17 lb ft)
Inductive transmitter	30 N·m (22 lb ft)
Cover plate	23 N·m (17 lb ft)
Screw plug	140 N·m (103 lb ft)

Powershift transmission - General specification Pressures

Main pressure and clutch pressure	16 - 18 bar (232 - 261 psi)
Converter in pressure	11 bar (159.5 psi)
Pressure reduction for solenoids	9 bar (131 psi)
Converter out pressure	4.3 bar (62.35 psi) minimum
Lubrication pressure	0.2 - 1.2 bar (3 - 18 psi)

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From	To	Value
Connector EDC17 pin 63	Chassis ground	There should be no voltage

A. If there is voltage there is a short circuit in the key switch wiring.Locate and repair the shorted conductor.

B. If there is no voltage, continue to Step **5**.

5. Replace the key switch.

   Use the EST to verify the status of this fault.

   A. If the fault has been resolved, return the machine to service.

   B. If the fault has not been resolved, check the ECU for the appropriate software and re-flash, as necessary.

6. Visually inspect the relevant harnesses and connectors for damage, bent or dislocated pins, corroded terminals, or broken wires. Verify that the connectors are fully installed. Flex the harnesses involved to reveal intermittent breaks or shorts in the wiring concerned. Operate the machine while you monitor the display.

   A. If you find damage or the display indicates other than normal display readings, then repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

   B. If you do not find damage and the display indicates only normal readings, then erase the fault code and continue operation.

Harnesses and connectors - Electrical schematic sheet 04 (55.100)

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4338-Configuration error

Cause:

1. Failed transmission electronic control module.

Solution:

1. Verify that the fault code is still active, refer to the **0000-Retrieving fault codes, Wheel Loaders (55.408)**.
   Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Turn the key switch to RUN position.

   (2) Clear all the fault codes.

   (3) To check for fault code: start and operate the machine.

   A. NOT OK – Fault code 4338 is recorded again. Go to the Step **2**.

   B. OK – Fault is not recorded again. OK for return to the service.
2. **(1)** Reprogram the correct configuration for the vehicle.

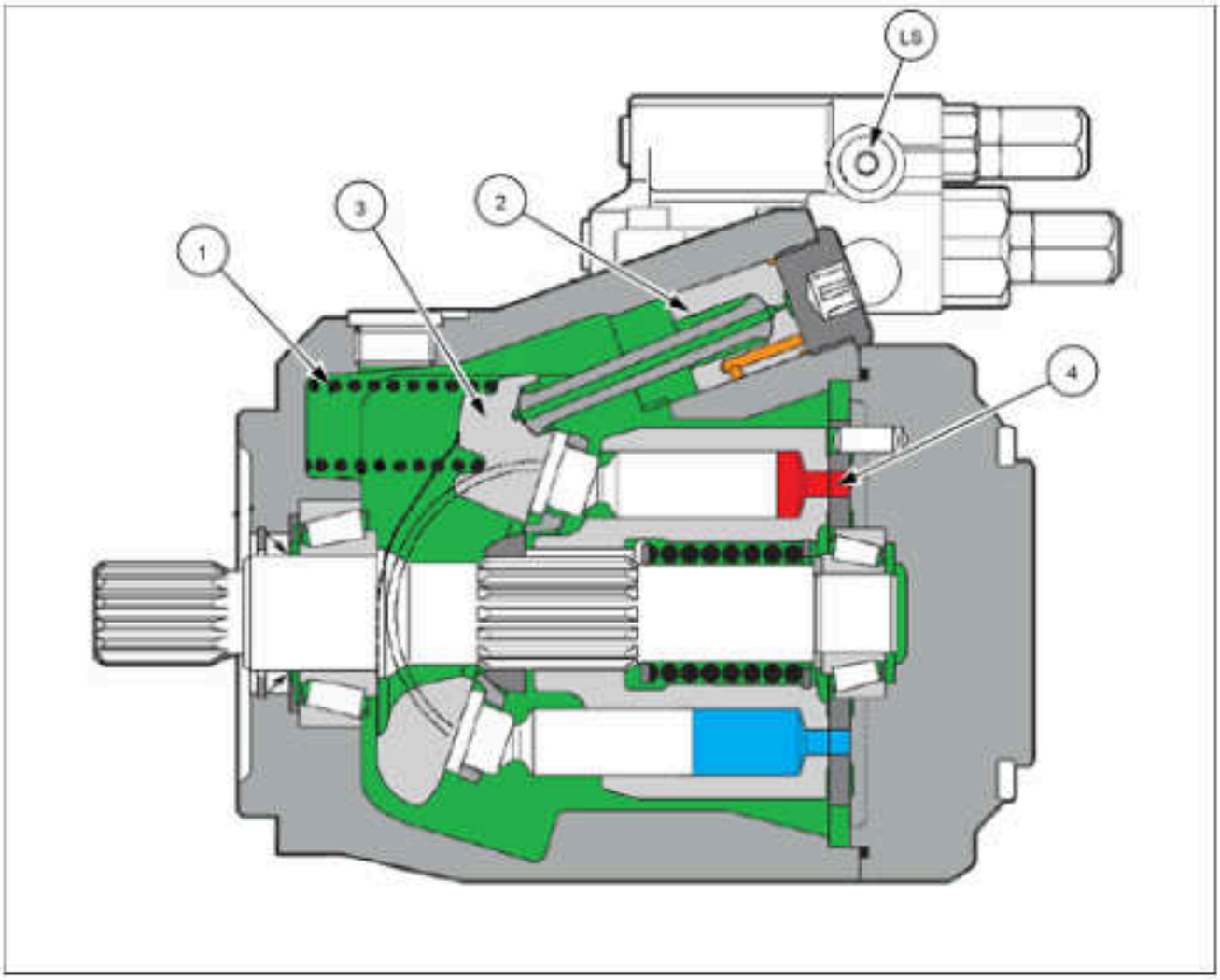
   A. Return to the Step **1** to confirm elimination of fault.

   B. NOT OK – Fault is recorded again, Go to Step **3**.
3. Replace the transmission electronic control module.

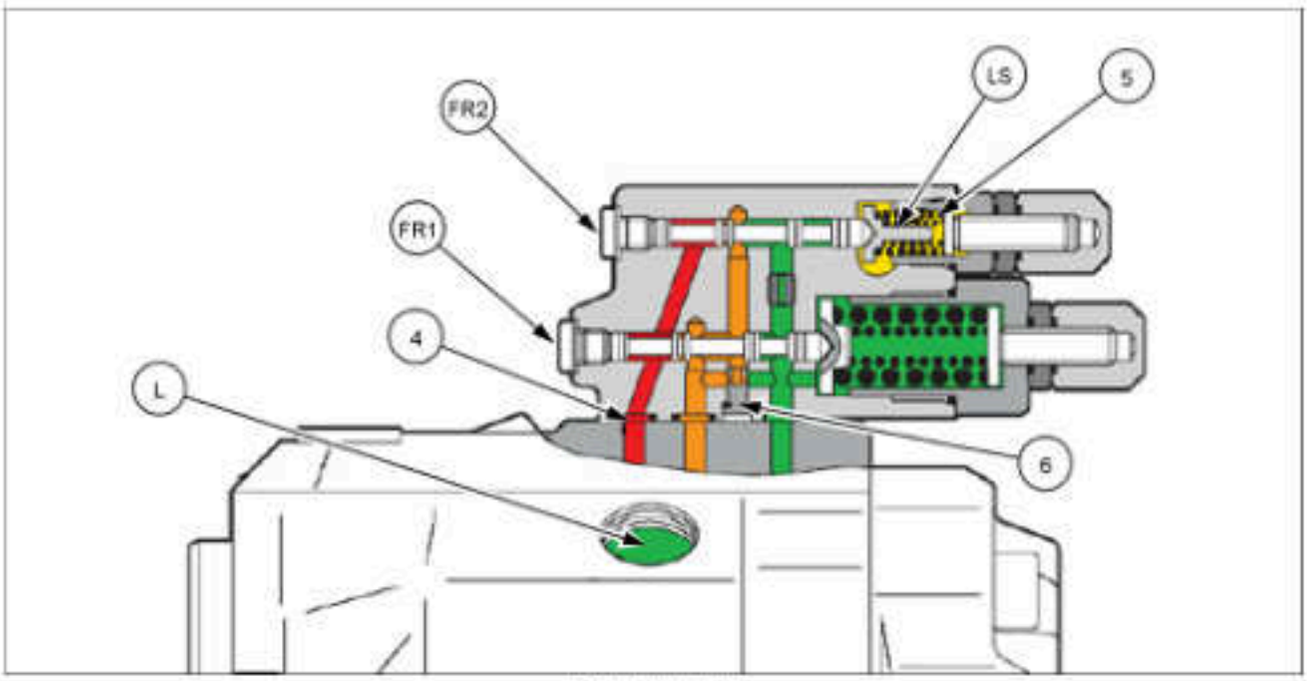
   A. Return to the Step **1** to confirm elimination of fault.

Harnesses and connectors - Electrical schematic sheet 08 (55.100)

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RCPH11WHL039EAN 4



RCPH11WHL039FAN 5

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DTLTSDEF_TANK_LEVEL_TEMP_SENSOR
CNH PN 84062586,VENDOR PN

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
1	DEF LEVEL SIG	388_A	UBAM	1
2	DEF SENSOR GND	G_TA	UBAM	2
3	DEF TEMP SIG	390_A	UBAM	3

DTSDOWNSTREAM TEMP SENS
CNH PN 87799793,VENDOR PN

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
2	SENSOR GND	0E_H	SPL_SW	A
1	EXHT TEMP DWN B+	389_A	SCR2	16
1	EXHT TEMP DWN B+	389_B	ECU	9
2	EXHT TEMP DWN GND	0E_F	SCR2	9

D_OR : DIODE OR
CNH PN 245485C1,VENDOR PN 12010717

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
B	PUSH LIGHTS SW PWR	417_C	SPL_PR	A
C	BACK LIGHT POWER	49	SPL_BCK_LGT	A
A	FNT WPR LTS FUSE PWR	42C_D	SPL_42C	A

ECB , ELECT CNTR B
CNH PN 87312843, VENDOR PN BUSSMAN 15301-4-6-2-CNH-D

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
A1	PLUG 1 12V SW PWR	12V_D	SPL_12V	A
A2	PLUG 2 12V SW PWR	12V_E	SPL_12V	A
A3	HIGH BEAM LH PWR	41H_B	SPL_HB	A
A4	HIGH BEAM RH PWR	41H_C	SPL_HB	A
A5	LOW BEAM RH PWR	41L_C	SPL_LB	A
A6	LOW BEAM LH PWR	41L_B	SPL_LB	A
A7	PUSH LIGHTS LH SW PWR	417_B	SPL_PR	A
A8	PUSH LIGHTS RH SW PWR	417_A	SPL_PR	A
A9	RADIO 12V SW PWR	12V_F	SPL_12V	A
A10	2 WAY RADIO 12V SW PWR	12V_G	SPL_12V	A
AA1	12V PWR TO OUTLET 1	12V	PDI	A
AA2	12V PWR TO OUTLET 2	12V_A	PCD	A
AA3	LH HIGH BEAM FUSED PWR	18B_A	CAB_F	8
AA4	RH HIGH BEAM FUSED PWR	18C_A	CAB_F	16
AA5	RH LOW BEAM FUSED PWR	18E_A	CAB_F	15
AA6	LH LOW BEAM FUSED PWR	18D_A	CAB_F	14
AA7	LH PERIPHERAL FUSED PWR	18F_C	SPL_PDS_D	A
AA8	RH PERIPHERAL FUSED PWR	18G	SPL_PDS_B	A
AA9	12V FUSED PWR TO RADIO	12V_B	CAB_RF	N
B1	POWER RELAY GND	0_EW	GND_CAB_SPL2	E
B2	IGN LATCH GND	0_EV	SPL_SD1	A
B3	IGN SW START SIGNAL	21K_B	SPL_CRK	A
B4	NEUT START RLY CTRL GND	0_DR	GND_CAB_SPL2	G
B5	FNT WPR LS RLY OUT	53L_B	SPL_WLS	A
B6	WPR CUT OUT RLY CTRL	63HC_A	SPL_HC	A
B7	FAN REV RLY FSD PWR	18P_E	SPL_PIN	F
B8	FAN REVERSER LSD	53	AIC_1	23
B9	WORK BRK RLY FSD PWR	18D_C	SPL_PBS	A
B10	PARK BRAKE SOL LSD	52C	AIC_1	14
C2	PWR RELAY GND	0_EA	SPL_SD1	A
C6	FNT WPR PARK CTRL	63C3	ECD	B1
D1	IGN PWR LATCH B+	13K_B	SPL_SD2	A
D2	POWER RELAT GND	0_ET	SPL_SD1	A
D3	NEUTRAL SIGNAL	2ST	SPL_NEU	A
D4	NEUT START RLY OUTPUT	21C	CAB_E	15
D5	WPR CUT OUT RLY FSD PWR	18J_G	SPL_F26	A
D7	FAN REV RLY FSD PWR	18P_D	SPL_PIN	E
D8	FAN REVERSE RLY OUT	52A_A	CAB_E	22
D9	PARK BRK RLY FSD PWR	18D_B	SPL_PBS	A
D10	PARK BRK RLY OUT	52P_A	CAB_E	M

ECC , ELECT CNTR C
CNH PN 87315249 VENDOR PN BUSSMAN

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
A1	BEACON DOME LT FSD PWR	18U_B	SPL_LT	A
A2	WORK LIGHTS SW FSD PWR	42	SPL_WL	A
A3	DRIVING LTS SW FSD PWR	19Z	SPL_DR	A
A4	BRK LTS FLASHER BAT PWR	1_DV	SPL_FLSHR_PWR	A
A5	TIME DELAY IGN SW FSD PWR	1DM	S_KEY	I
A6	HORN RLY FSD PWR	18U	SPL_HRN	A
A7	SEC STR FSD PWR	19B2	CAB_T	26
A8	A/C DELAY FSD PWR	18S_B	SPL_DLY3	A
A9	DIAGNOSTIC FUSED PWR	18K_A	ESC	B
A10	FUSED BATT PWR	18T_C	SPL_BAT	A
B1	BRAKE LT RLY BAT PWR	1_DW	SPL_FLSHR_PWR	A
B2	BRK LTS RLY CTRL GND	0_EF	GND_CAB_SPL2	M
B3	POWER RELAY GND	0_EY	SPL_SD1	A
B4	POWER RELAY CONTROL	0_EZ	AIC_1	22
B6	GROUND	0_KB	GND_CAB_SPL2	O
B7	HORN RLY FSD PWR	18U_A	SPL_HRN	A
B8	HORN RLY CTRL	84C	SPARE1A	31b
D1	BRK LT CTRL PWR	44_A	CAB_B	J
D2	BRK LT RLY OUT	44A_A	CAB_E	3
D3	IGN PWR CONTROL B+	13K_A	SPL_SD2	A
D4	IGN PWR CONTROL GND	0_KA	GND_CAB_SPL2	B
D6	FNT WPR LTS FUSE PWR	42C_A	CAB_RF	H
D7	HORN RLY FSD PWR	18U_E	SPL_HRN	A
D8	HORN POWER	84_A	CAB_F	13
L1_1	BEACON DOME LT LSECC	ECC_L1	L1_ECC	1
L1_1	BEACON DOME LT WORK LTS	J2_ECC	ECC	L1_2
L1_2	WORK LTS DRIVING LTS	J3_ECC	ECC	L1_3
L1_3	DRIVING LTS BRK LTS	J4_ECC	ECC	L1_4
L1_4	BRK LTS DLY PWR	J5_ECC	ECC	L1_5
L1_5	DLY PWR HRN	J6_ECC	ECC	L1_6
L1_6	HRN HOD CTRL	J7_ECC	ECC	L1_7
L1_9	A/C POWER	J9_ECC	ECC	L1_9
L1_9	TRANS ECM PWR	J10_ECC	ECC	L1_10
B5	FNT WPR LTS FUSE PWR	42_C	SPL_WL	A
D5	FNT WPR LTS SIGNAL	42C_E	SPL_42C	A
L1_2	BEACON DOME LT WORK LTS	J2_ECC	ECC	L1_1
L1_3	WORK LTS DRIVING LTS	J3_ECC	ECC	L1_2
L1_4	DRIVING LTS BRK LTS	J4_ECC	ECC	L1_3
L1_5	BRK LTS DLY PWR	J5_ECC	ECC	L1_4
L1_6	DLY PWR HRN	J6_ECC	ECC	L1_5
L1_7	HRN HOD CTRL	J7_ECC	ECC	L1_6
L1_9	A/C POWER	J9_ECC	ECC	L1_8
L1_10	TRANS ECM PWR	J10_ECC	ECC	L1_9

ECA , ELECT CNTR A
CNH PN 87315248,VENDOR PN BUSSMAN

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
A1	TRANS FUSE PWR	18A_N	SPL_TRNS_PWR	A
A2	B+ J05 FUSED	18S_A	SPL_J05_3	A
A3	A/C WAKE UP IGN	19E_A	SPL_WF	A
A4	SEC STR IGN FSD PWR	19RR	CIM	A
A5	PILOT CTRL RLY FSD PWR	19C_A	SPL_D24	A
A6	PARK BRK RLY FSD PWR	18D_A	SPL_PBS	A
A7	RH ENGINE/PAN FSD PWR	18F	SPL_PIN	B
A8	TURN SIGNAL FSD PWR	18E	SHHSTUA	48x
A9	ECU DISCONNECT IGNITION PWR	19M_E	CAB_E	21
D1	BLOWER MOTOR FUSED PWR	18N	SPL_BLWR	A
D3	FNT WPR FSD PWR	18J	SPL_PWI	A
D3	REAR WPR FSD PWR	18K	SPL_RWW	A
D5	HEATED MIRROR PWR	18V	SR1	A
D6	SEAT CRSW FSD PWR	19N	SC	A
D7	SEC STR ACCESSORY FSD PWR	19M	CAB_T	3
D8	CIGAR LIGHTER FSD PWR	19W	CL	1
D9	RR HARNESS PWR	86A	WDN	1
C10	PWR CONVERTER FSD PWR	19L	SPL_CNV	A
L1	ENG STR A/C PWR	J3	ECA	L1
L1	ENG STR A/C PWR	J4	ECA	L1
L1	ENG STRG PLT EM DTNTS	J5	ECA	L1
L1	PASHRVSR TURN SGNL	J6	ECA	L1
L1	PLTSN DTNTS PRK BRK SOL	J6	ECA	L1
L1	BRK BRK SOL HRN	J7	ECA	L1
L1	TRANS ECM PWR	J1	ECA_L1	ce81
L1	TRANS ECM PWR	J2	ECA	L1
L1	TURN SGNL ENG SHTDWN	J9	ECA	L1
L2	BKUP A/C	J10	ECA	L2
L2	BLWR MTR FRNT WPR WASH	J12	PRMB_L1	ce81
L2	CAMERA POWER	J18	ECA	L2
L2	CAMERA POWER	J20	ECA	L2
L2	DIAGNOSTIC PWR	J16	ECA	L2
L2	FRNT WPR RER WPR WSH	J13	ECA	L2
L2	HEATED MIRRORS	J19	ECA	L2
L2	RER WPR WSH BACKUP	J14	ECA	L2
L2	SEAT COMP EMG STRTR	J17	ECA	L2
D4	BACKUP ALARM B+	19H	ESCD	AA1
L1	ENG STR A/C PWR	J3	ECA	L1
L1	ENG STR A/C PWR	J4	ECA	L1
L1	ENG STRG PLT EM DTNTS	J5	ECA	L1
L1	PASHRVSR TURN SGNL	J6	ECA	L1
L1	PLTSN DTNTS PRK BRK SOL	J6	ECA	L1
L1	BRK BRK SOL HRN	J7	ECA	L1
L1	TRANS ECM PWR	J1	ECA_L1	ce81
L1	TRANS ECM PWR	J2	ECA	L1
L1	TURN SGNL ENG SHTDWN	J9	ECA	L1
L2	BKUP A/C	J10	ECA	L2
L2	BLWR MTR FRNT WPR WASH	J12	ECA	L2
L2	CAMERA POWER	J18	ECA	L2
L2	CAMERA POWER	J20	ECA	L2
L2	DIAGNOSTIC PWR	J16	ECA	L2
L2	FRNT WPR RER WPR WSH	J13	ECA	L2
L2	HEATED MIRRORS	J19	ECA	L2
L2	RER WPR WSH BACKUP	J14	ECA	L2
L2	SEAT COMP EMG STRTR	J17	ECA	L2

ECA_L1 , B+ POWER
CNH PN RING_TERM_8MM,VENDOR PN

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
ce81	TRANS ECM PWR	J1	ECA	L1

ECD , ELEC CNTR D
CNH PN 87312843,VENDOR PN BUSSMAN

CAVITY	CIRCUIT REFERENCE	WIRE	TO CONNECTOR	CAVITY
A1	BACKUP ALARM RELAY	19A_P	SPL_TRNS_PWR	C
A2	BACKUP ALARM	35A_A	SPL_35A	6
AA1	BACKUP ALARM B+	19H	ECA	C4
AA2	BACK UP ALARM CNTL	35C	TECM	7
B1	FNT WPR RLY FSD PWR	18J_E	SPL_FW	A
B2	FNT WPR RLY HS	63HC_B	SPL_HC	A
B4	FNT WPR LS RLY CTRL	63LC	SPWW	3
B5	PILOT CTRL RLY FSD PWR	19C_B	SPL_D24	A
B6	PILOT CTRL SOL LSD	53C_A	AIC_1	28
B7	RIDE CTRL RLY SW PWR	58T	SRC	4
B8	RIDE CTRL RLY LSD	58L	TECM	57
B9	TRANSFR PRESS SW INPUT	61A_B	SPL_AC	A
B10	AC RELAY CONTROL GND	0_DJ	GND_CAB_SPL	A
C4	FNT WPR PARK CTRL	63C	PWM	D
C10	AC RELAY OUT	61C	CAB_E	2
D1	FNT WPR RLY FSD PWR	18J_D	SPL_PK3	L
D2	FNT WPR RLY HS	63H_B	SPL_WH3	A
D3	FNT WPR RLY LS CTRL FSD PWR	18J_F	SPL_PK3	M
D4	FNT WPR PARK CTRL	63C2	ECD	C2
D5	PILOT CTRL RLY FSD PWR	19C_C	SPL_D24	A
D6	PILOT CTRL RLY OUT	53P_C	SPL_D25	A
D7	POWER	58H_C	SPL_D19	A
D8	RIDE CTRL SOL PWR	58_B	SPL_D26	A
D9	AC RELAY CONTROL	61R_B	CAB_E	29
B3	FNT WPR PARK CTRL	63C3	ECB	D8
C2	FNT WPR PARK CTRL	63C2	ECD	D4

END ENGINE CAB

PIN	LOCATION
1	9.13F
2	14.8F
3	9.7E
4	9.7D
5	9.11F
6	9.7C
7	9.12F
8	10.12C
9	10.9E
10	10.9E
11	9.2C
12	9.7C
13	9.8E
14	9.9E
15	9.8E
16	9.11F
17	9.5C
18	9.2C
19	9.5C
20	9.5C
21	4.8E
22	10.12C
23	10.12C
24	11.3C
25	11.3C
26	4.8E
27	9.7C
28	9.13F
29	14.11C
30	14.11C
31	4.8E

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