

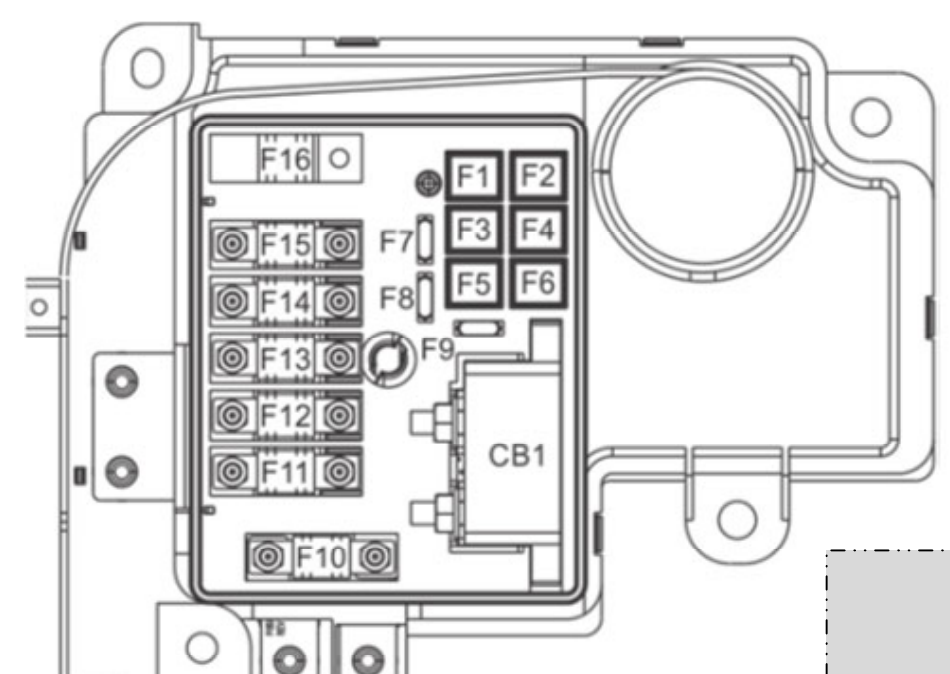
VPDM Part #: A66-19162-000/001



Run Smart™

VPDM

(Vehicle Power Distribution Module)



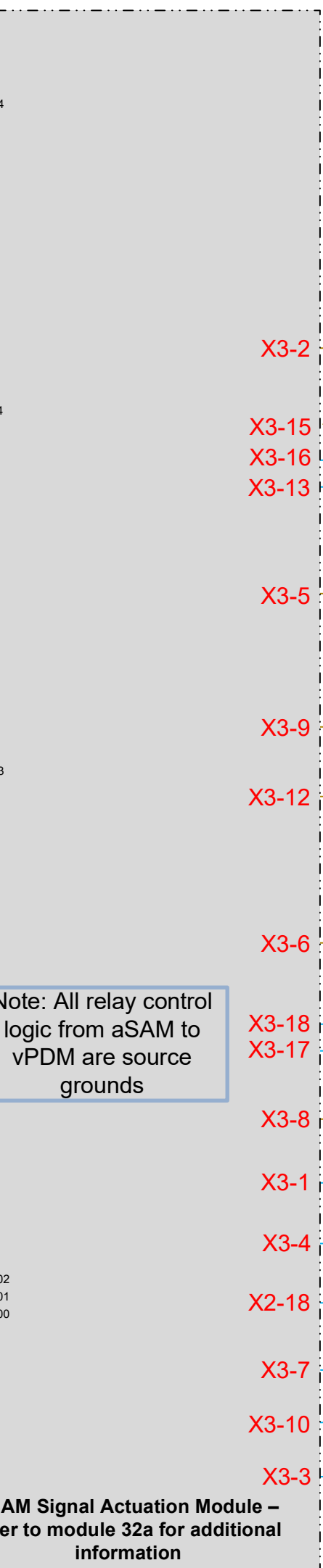
BCA

(Battery Cable Access)

* For all Keep alive circuits, ECU must adhere to Iq < 300microA.

ASAM

(Signal Actuation Module)



Note: All relay control logic from aSAM to vPDM are source grounds

aSAM Signal Actuation Module – refer to module 32a for additional information

- Lane Departure/Guidance, GND J6-A10
- Camera/Video/Imaging System, GND J7-B7
- Collision Avoidance/Obstacle Detection System, GND J7-B9
- 3PC (third party connector), GND J6-A11
- SODS/SGA, GND J4-D2
- Driver Facing Camera, GND J4-D3
- ABS Power Return 1, GND DE J6-B11
- Instrument Cluster, GND DE J6-B7
- Diagnostics Connector, GND1 J6-D8
- ECU Power Return 1, GND J6-E8
- CGW, GND J6-B8
- SRS Airbag, GND J6-E10
- Fleet Management System, GND J6-A9
- Tire Pressure Monitoring, GND J7-B11
- Air Suspension (ECAS), GND J7-B6
- Bi-Stable Relay 1 (House), Feedback J4-K8

- VPDM Cab Loads BAT, Feedback J4-C5
- Bi-Stable Relay, House Control, Close J4-C8
- Bi-Stable Relay, House Control, Open J4-C7
- Bi-Stable Relay 2 (House), Feedback J4-H1
- VPDM Power Supply 1, Feedback J4-A7
- VPDM Power Supply 2, Feedback J4-C6
- Bi-Stable Relay 3 (Basic), Feedback J4-H4
- Bi-Stable Relay, Basic Control, Close J4-A4
- Bi-Stable Relay, Basic Control, Open J4-A5
- Bi-Stable Relay 4 (Basic), Feedback J4-H3
- D+/CTRL Relay Control J4-A3
- Ignition (IGN_1), Relay Control J4-A8
- PT Early WakeUp J4-A6
- Spare Relay R11, Relay Control J4-C1
- Retained Accessory, Relay Control J4-C3
- Spare Relay R09, Relay Control J4-C2

cTP (common Telematic Platform), GND J6-B10

Fuse/ Circuit Breaker Type & Description

FU/CB POS	FU/CB TYPE	RATING (Amps)	Standard (S) Optional (O)	FUSE LABEL DESCRIPTION
F01	FU,T2,T3	5A	S	READING LAMP FRONT, BAT
F02	FU,T2,T3	15A	S	EXPANSION FUSE 33, BAT
F03	FU	5A	S	IPPC/EDGE/CLOCK/TELEMATICS, PWR
F04	FU	10A	S	METHANE DET/PCP/DEF PUMP, PWR
F05	FU,T2,T3	15A	O	EXPANSION FUSE 32, BAT
F06	FU,T2,T3	30A	O	EXPANSION FUSE 1, BAT
F07	FU,T2,T3	30A	O	EXPANSION FUSE 2, BAT
F08	FU,T2,T3	15A	O	EXPANSION FUSE 11, BAT
F09	FU	3A	S	FCU/ACU HVAC CTRLR, BAT
F10	FU,T2,T3	20A	O	EXPANSION FUSE 51, CTRL
F11	FU	3A	O	AUX CAB/AUX COLINT HTR, ENABLE/BAT
F12	FU,T2,T3	10A	O	EXPANSION FUSE 38, PWR
F13	FU,T2,T3	10A	O	EXPANSION FUSE 12, PWR
F14	JCASE	30A	S	CAB HVAC FAN MOTOR, BAT
F15	FU,T2,T3	20A	O	EXPANSION FUSE 35, BAT
F16	FU	20A	O	RADIO/CONNECT-S/MMI, BAT/PWR
F17	FU,T2,T3	25A	O	EXPANSION FUSE 45, BAT/PWR
F18	FU,T2,T3	25A	O	EXPANSION FUSE 46, BAT/PWR
F19	JCASE	30A	S	EXPANSION FUSE 13, BAT
F20	FU,T2,T3	20A	O	EXPANSION FUSE 41, BAT
F21	FU,T2,T3	20A	S	AUX CAB/AUX COLINT HTR, BAT1
F22	FU,T2,T3	30A	O	EXPANSION FUSE 52, BAT
F23	FU,T2,T3	30A	O	EXPANSION FUSE 42, BAT
F24	FU,T2,T3	10A	S	DASH SPLICEPACK, BAT1
F25	FU,T2,T3	20A	O	EXPANSION FUSE 34, BAT
F26	FU,T2,T3	25A	O	EXPANSION FUSE 53, BAT
F27	FU	5A	S	RADIO, ACC
F28	FU,T2,T3	30A	O	EXPANSION FUSE 5/6, ACC
F29	FU,T2,T3	30A	O	EXPANSION FUSE 14, ACC
F30	FU,T2,T3	30A	O	EXPANSION FUSE 15, BAT
F31	FU,T2,T3	20A	O	EXPANSION FUSE 16, BAT
F32	FU,T2,T3	10A	O	EXPANSION FUSE 40, BAT
F33	FU	5A	S	CGW/INST CLUSTER, BAT
F34	FU,T2,T3	20A	O	EXPANSION FUSE 17, BAT
F35	FU,T2,T3	25A	O	EXPANSION FUSE 3, BAT
F36	FU,T2,T3	30A	O	EXPANSION FUSE 18, BAT
F37	FU,T2	10A	S	OBD J1939, BAT1
F38	FU,T2,T3	20A	O	EXPANSION FUSE 19, CTRL/BAT
F39	FU,T2,T3	15A	O	EXPANSION FUSE 31, CTRL
F40	FU,T2,T3	30A	O	DEF LINE HEATER #1/#2/#3 CTRL
F41	JCASE	50A	S	BASIC LOAD 2, BAT
F42	JCASE	50A	S	HOUSE LOAD 1, BAT
F43	FU,T2,T3	30A	S	FUEL WATER SEP HTR, IGN
F44	FU,T2,T3	20A	O	EXPANSION FUSE 44, CTRL
F45	FU,T2,T3	20A	O	EXPANSION FUSE 47, CTRL
F46	JCASE	50A	S	HOUSE LOAD 2, BAT
F47	JCASE	50A	S	BASIC LOAD 1, BAT
F48	FU,T2,T3	20A	O	EXPANSION FUSE 20, BAT
F49	FU	5A	S	VPDM,RELAY COIL, BAT
F50	FU	20A	O	EXPANSION FUSE 21, BAT
F51	FU,T2,T3	20A	O	EXPANSION FUSE 22, BAT
F52	FU,T2,T3	20A	O	EXPANSION FUSE 23, BAT
F53	FU	10A	O	EXPANSION FUSE 37, IGN
F54	FU,T2,T3	10A	S	DASH SWITCH/SPLICEPACK, IGN
F55	FU,T2,T3	5A	O	EXPANSION FUSE 39, IGN
F56	FU,T2,T3	5A	O	EXPANSION FUSE 4, IGN
F57	FU	10A	S	COLL AVOID/OBSTACLE DET SYS, IGN
F58	FU,T2,T3	20A	O	EXPANSION FUSE 24, BAT
F59	FU,T2,T3	30A	O	EXPANSION FUSE 25, BAT
F60	FU,T2,T3	30A	O	EXPANSION FUSE 7, BAT
F61	FU,T2,T3	30A	O	EXPANSION FUSE 8, BAT
F62	FU,T2,T3	30A	O	ABS POWER FEED 1 PLC/NO PLC, BAT
F63	FU,T2,T3	25A	O	EXPANSION FUSE 48, BAT/IGN
F64	FU,T2,T3	20A	O	12V PWR RCPT1, DASH/CIGAR, BAT1/IGN
F65	FU,T2,T3	15A	O	EXPANSION FUSE 49, BAT/PWR
F66	FU,T2,T3	30A	S	TRAILER ABS CONN (7) & ABS PLC, IGN
F67	FU,T2	5A	S	CPC / MCM / ACM / TCM / ECM, IGN
F68	FU,T2,T3	25A	O	EXPANSION FUSE 26, IGN
F69	FU	20A	O	EXPANSION FUSE 27, IGN
F70	FU	5A	S	COLLAVOID/OBSTACLE DET SYS, BAT
F71	FU	5A	S	INST CLSTR/SRS/CAB HVAC CTRLR, IGN
F72	FU	10A	O	EXPANSION FUSE 28, IGN
F73	FU	15A	O	EXPANSION FUSE 29, IGN
F74	FU	20A	O	EXPANSION FUSE 30, IGN
F75	FU	10A	O	EXPANSION FUSE 10, IGN
F76	FU	15A	O	EXPANSION FUSE 36, IGN
F77	FU	15A	O	EXPANSION FUSE 9, IGN
F78	FU	20A	O	EXPANSION FUSE 50, CTRL

Notes:

- When replacing fuse, circuit breaker or relay, replace with similar value and type
- Highlighted Label Descriptions "Expansion Fuse XX, XXX" or "Spare Relay XX" are flexible outputs driven by SMARTPARTS and dependent on vehicle configurations. Reference 49-00306 and SMARTPART Functional Assignment Spec 49-00329 for more information.

NOTE: For all fuses with multiple positions, this document shows their primary (A) position, with the secondary (B) position shown as open.

Key Position Legend

PWR => Keep Alive Powered

BAT => Powered During Key-Off

IGN => Powered During Key-On/Crank

ACC => Powered During Key-On

GND => See 28G GND Architecture

Relay Legend

bR => Bi-stable Relay

HCR => High Current Relay

Mini => ISO Mini Relay

Micro => ISO Micro Relay

uMicro => ISO Ultra Micro Relay

Spare Relay Trace Sizing

uMicro => 20A

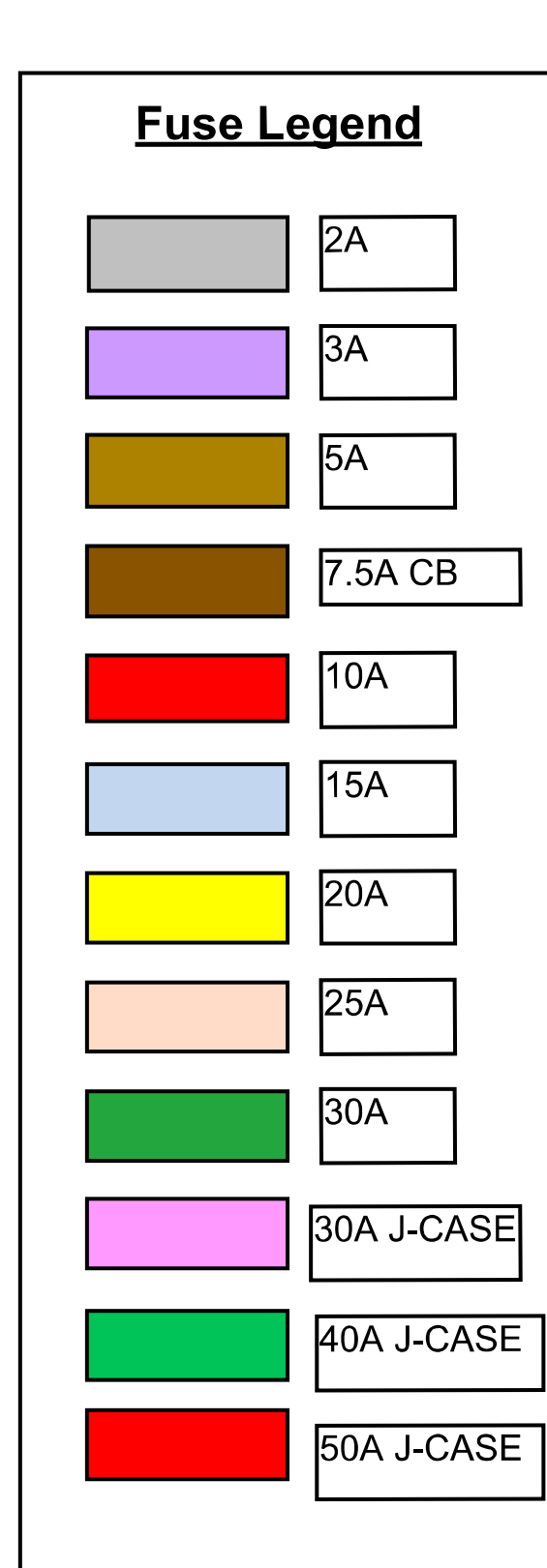
Micro => 30A

Mini => 50A

HCR => 70A

Control => 5A for all relays

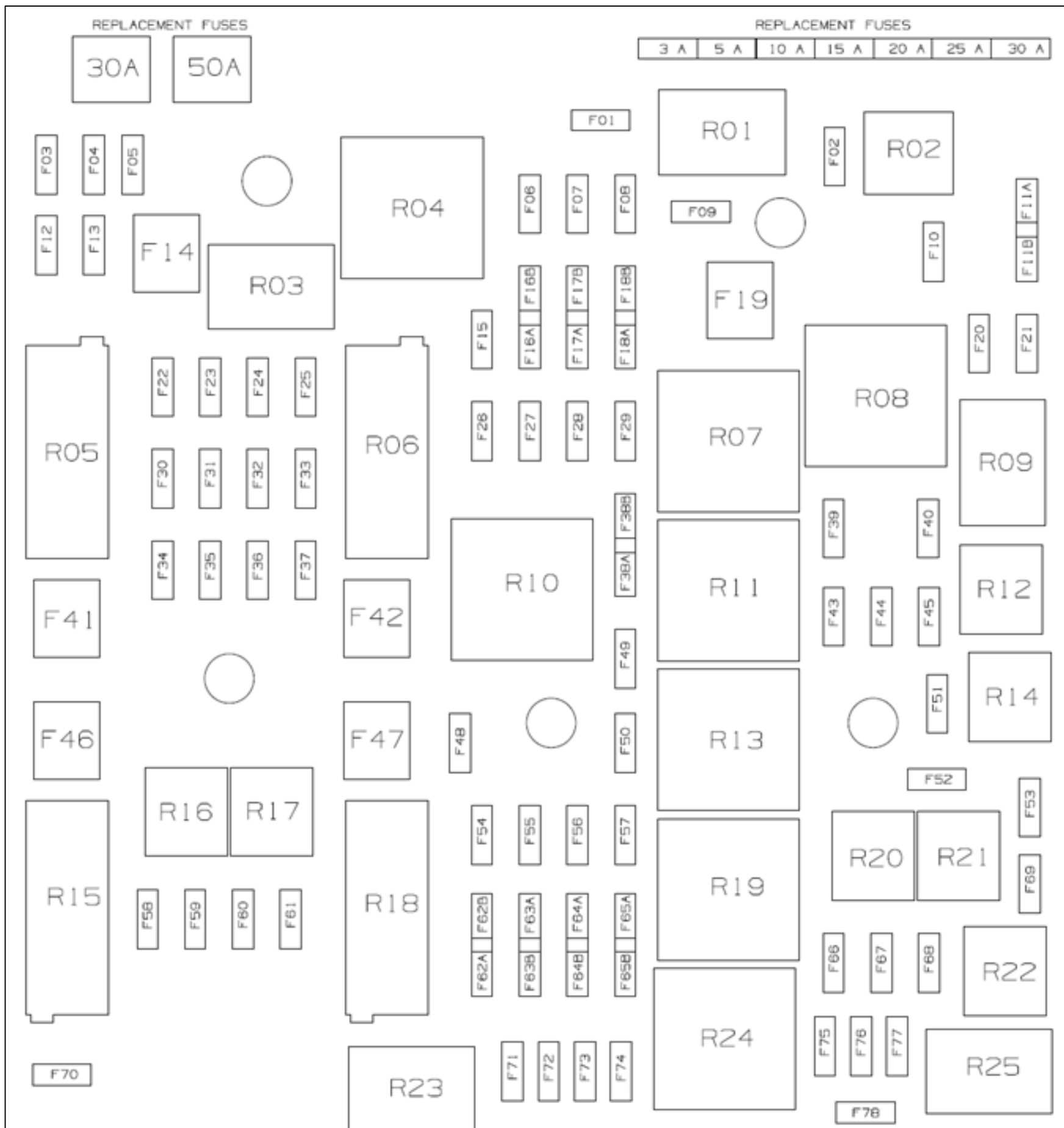
NOTE: Bistable relays magnetically latch in either the open or closed state with a pulse from the SAM as battery charge levels are reached. SAM will check the state of the relay on ignition transition. The ignition switch should be cycled after replacing a bistable relay.



Relay Type & Description

RELAY POS	RELAY TYPE	Standard (S) Optional (O)	RELAY LABEL DESCRIPTION
RE01	Micro	O	AUX CAB / AUX COLINT HTR
RE02	U-Micro	O	SPARE RELAY 14
RE03	Micro	O	SPARE RELAY 3
RE04	Hi-Current	O	SPARE RELAY 6
RE05	Bi-Stable	S	BASIC LOAD 2
RE06	Bi-Stable	S	HOUSE LOAD 1
RE07	Hi-Current	S	ACCESSORY
RE08	Mini	O	DEF LINE HEATER
RE09	Micro	O	SPARE RELAY 10
RE10	Mini	O	SPARE RELAY 5
RE11	Mini	O	SPARE RELAY 11
RE12	U-Micro	O	SPARE RELAY 12
RE13	Hi-Current	S	D+ / ALT CHARGE/ CTRL
RE14	U-Micro	O	SPARE RELAY 7
RE15	Bi-Stable	S	HOUSE LOAD 2
RE16	U-Micro	O	SPARE RELAY 1
RE17	U-Micro	O	SPARE RELAY 2
RE18	Bi-Stable	S	BASIC LOAD 1
RE19	Hi-Current	S	IGNITION 1
RE20	U-Micro	O	SPARE RELAY 8
RE21	U-Micro	O	SPARE RELAY 9
RE22	U-Micro	S	IGN/PT EARLY WAKE UP
RE23	Micro	O	SPARE RELAY 4
RE24	Hi-Current	S	IGNITION 2
RE25	Micro	O	SPARE RELAY 13

Fuse/CB and Relay Map



Cummins Engine Controller

- DEF Line Heater, LS Control J7-B5
- Spare Relay R25, HC Control J7-C2
- Spare Relay R02, LS Control J7-B4

- Spare Relay 9, Terminal 30 J7-F3
- Spare Relay 9, Terminal 87 J7-E4
- Spare Relay 9, Terminal 85 J7-E3
- Spare Relay 1, Terminal 30 J5-C3
- Spare Relay 1, Terminal 87 J5-B4
- Spare Relay 1, Terminal 85 J5-B3
- Spare Relay 1, Terminal 86 J5-C4
- Spare Relay 2, Terminal 30 J5-E3
- Spare Relay 2, Terminal 87 J5-D4
- Spare Relay 2, Terminal 85 J5-D3
- Spare Relay 2, Terminal 86 J5-E4
- Spare Relay 3, Terminal 30 J5-A12
- Spare Relay 3, Terminal 87 J5-F11
- Spare Relay 3, Terminal 85 J5-E12
- Spare Relay 3, Terminal 86 J5-F9
- Spare Relay 3, Terminal 87 J5-F8
- Spare Relay 3, Terminal 85 J6-A2
- Spare Relay 4, Terminal 87 J6-C1
- Spare Relay 4, Terminal 85 J6-A1
- Spare Relay 4, Terminal 86 J5-F4
- Spare Relay 4, Terminal 86 J5-F5
- Spare Relay 5, Terminal 30 J6-D9
- Spare Relay 5, Terminal 87 J6-C9
- Spare Relay 5, Terminal 85 J6-B9
- Spare Relay 5, Terminal 86 J6-C8
- Spare Relay 5, Terminal 86 J6-C10
- Spare Relay 6, Terminal 30 J8-D1
- Spare Relay 6, Terminal 87 J8-C1
- Spare Relay 6, Terminal 85 J6-A5
- Spare Relay 6, Terminal 86 J6-A7

VPDM - Full Variant

- R21 uMicro
- R16 uMicro
- R17 uMicro
- R03 Micro
- R23 Micro
- R10 Mini
- R04 HCR

R13 HCR

R01 Micro

R19 HCR

R24 HCR

R11 Mini

R08 Mini

R22 uMicro

R25 Micro

R07 HCR

R09 Micro

R12 uMicro

R14 uMicro

R20 uMicro

R02 uMicro

- F05 (15A)
- F02 (15A)
- F12 (10A)
- F13 (10A)
- F50 (20A)
- F70 (5A)
- F04 (10A)
- F03 (5A)
- F06 (30A)
- F07 (30A)
- F01 (5A)
- F08 (15A)
- F58 (20A)
- F59 (30A)
- F60 (30A)
- F61 (30A)
- F16 (20A)
- F65 (15A)
- F64 (20A)
- F63 (25A)
- F48 (20A)
- F30 (30A)
- F32 (30A)
- F69 (20A)
- F26 (25A)
- F15 (20A)
- F38 (15A)
- F44 (20A)
- F45 (20A)
- F11 (3A)
- F57 (10A)
- F55 (5A)
- F62 (25A)
- F66 (30A)
- F54 (10A)
- F56 (5A)
- F53 (10)
- F71 (5A)
- F77 (15A)
- F75 (10A)
- F76 (15A)
- F74 (20A)
- F73 (15A)
- F72 (10A)
- F43 (30A)
- F51 (20A)
- F52 (20A)
- F38 (20A)
- F22 (30A)
- F23 (30A)
- F40 (30A)
- F37 (10A)
- F68 (25A)
- F67 (5A)
- F78 (20A)
- F17 (25A)
- F18 (25A)
- F28 (30A)
- F27 (5A)
- F29 (30A)
- F20 (20A)
- F10 (20A)

- J5-A10 Expansion Fuse 32, BAT
- J4-D1 Expansion Fuse 33, BAT
- J5-A8 Expansion Fuse 38, PWR
- J5-A5 Expansion Fuse 12, PWR
- J6-E6 Expansion Fuse 21, BAT
- J7-B2 Collision Avoidance/Obstacle Detection System, BAT
- J7-A11 Methane Detect / CPC/DEF PUMP, PWR
- J7-A9 Predictive Cruise Control (IPPC)/EDGE, PWR
- J5-A11 Clock / Telematics, PWR
- J4-J3 Expansion Fuse 1, BAT
- J4-J4 Expansion Fuse 2, Out1, BAT
- J4-J5 Expansion Fuse 2, Out2, BAT
- J4-H8 Reading Lamp Front, BAT
- J4-H6 Expansion Fuse 11_Out2, BAT
- J4-H7 Expansion Fuse 11_Out1, BAT
- J5-C1 LVD House Loads Control, Aux vPDM
- J5-B2 Expansion Fuse 24, BAT
- J5-C2 Expansion Fuse 25, BAT
- J5-D2 Expansion Fuse 7, BAT
- J5-E2 Expansion Fuse 8, BAT
- J6-A12 Radio/CS & Displays, BAT/PWR
- J6-E2 Expansion Fuse 49, BAT/PWR
- J6-D2 12V Power Receptacle 1 (Dash, Cigar), BAT
- J6-B2 Expansion Fuse 48_Out1, BAT/IGN
- J6-C2 Expansion Fuse 48_Out2, BAT/IGN
- J4-G1 Expansion Fuse 20, BAT
- J5-B11 Expansion Fuse 15, BAT
- J5-C11 Expansion Fuse 16, BAT
- J5-B9 Expansion Fuse 17, BAT
- J7-F2 Expansion Fuse 27, IGN
- J6-B12 Expansion Fuse 53, BAT
- J6-E11 Cabin HVAC Controller, BAT
- J4-H5 Sleeper HVAC Controller, BAT
- J6-B1 Cabin HVAC Fan Motor, BAT
- J4-F1 Expansion Fuse 13, BAT
- J7-F12 Auxiliary Coolant Heater, BAT
- J4-B3 Auxiliary Cab Heater, BAT
- J5-D11 Expansion Fuse 40_Out1, BAT
- J5-D10 Expansion Fuse 40_Out2, BAT
- J5-E11 Instrument Cluster, BAT
- J5-E10 Central Gateway (CGW), BAT
- J5-C9 Expansion Fuse 3, BAT
- J5-D9 Expansion Fuse 18, BAT
- J5-D12 Dash Splicepack, BAT
- J5-A9 Expansion Fuse 34, BAT
- J6-C11 Expansion Fuse 35, BAT
- J6-F12 Expansion Fuse 31_Out1, CTRL
- J6-F11 Expansion Fuse 31_Out2, CTRL
- J7-D9 Expansion Fuse 44, CTRL
- J7-E9 Expansion Fuse 47_Out1, CTRL
- J7-E10 Expansion Fuse 47_Out2, CTRL
- J4-G4 Auxiliary Coolant Heater, Enable
- J4-G5 Auxiliary Cab Heater, Enable
- J6-E5 Collision Avoidance/Obstacle Detection System, IGN
- J6-B3 ABS Power Feed 1B, NO PLC, BAT
- J5-E1 Expansion Fuse 39, IGN
- J5-D1 ABS Power Feed 1A, BAT
- J7-C1 Trailer ABS Connector (7), IGN
- J5-F1 ABS PLC Signal, IGN
- J6-B4 Dash Switch / Splicepack, IGN
- J6-D5 Expansion Fuse 4, IGN
- J7-F5 Expansion Fuse 37, IGN
- J6-D1 Cabin HVAC Controller, IGN
- J6-E1 Instrument Cluster, IGN
- J7-F1 SRS Airbag, IGN
- J7-E1 Expansion Fuse 9, IGN
- J7-B1 Expansion Fuse 10, IGN
- J7-D1 Expansion Fuse 36, IGN
- J7-A1 Expansion Fuse 30, IGN
- J6-F3 Expansion Fuse 29, IGN
- J6-F2 Expansion Fuse 28, IGN
- J7-C9 Fuel Water Separator Heater Element, IGN
- J7-A4 Ignition Ctrl, Aux VPDM
- J7-E8 Expansion Fuse 22, BAT
- J7-E5 Expansion Fuse 23, BAT
- J7-A10 Expansion Fuse 19, CTRL/BAT
- J5-B12 Expansion Fuse 52, BAT
- J5-C12 Expansion Fuse 42_Out1, BAT
- J5-F12 Expansion Fuse 42_Out2, BAT
- J7-D12 DEF Line Heater #1
- J7-A12 DEF Line Heater #2
- J7-B10 DEF Line Heater #3
- J5-E9 OBD J1939, BAT
- J7-E2 Expansion Fuse 26, IGN
- J7-D2 CPC/MCM/ACM/TCM/ECM, IGN
- J7-F1 Expansion Fuse 50, CTRL
- J4-J2 Expansion Fuse 45, BAT/PWR
- J4-J1 Expansion Fuse 46, BAT/PWR
- J6-D11 Expansion Fuse 5, ACC
- J6-D12 Expansion Fuse 6, ACC
- J6-E12 Expansion Fuse 14, ACC
- J7-E11 Expansion Fuse 41_Out1, CTRL
- J7-F11 Expansion Fuse 41_Out2, CTRL
- J7-F8 Spare Relay 12, Terminal 30
- J7-F10 Spare Relay 12, Terminal 87
- J7-F9 Spare Relay 12, Terminal 85
- J7-A2 Spare Relay 12, Terminal 86
- J7-F6 Spare Relay 7, Terminal 30
- J7-F7 Spare Relay 7, Terminal 87
- J7-E6 Spare Relay 7, Terminal 85
- J7-B3 Spare Relay 7, Terminal 86
- J7-D3 Spare Relay 8, Terminal 30
- J7-C4 Spare Relay 8, Terminal 87
- J7-C3 Spare Relay 8, Terminal 85
- J7-D4 Spare Relay 8, Terminal 86
- J7-E7 Expansion Fuse 51, CTRL