

Date	Group	No.	Page
11.98	370	06	1(16)

This Service Bulletin is to be inserted into the VN Group 37 Electrical Schematic Binder, Vol. 4 ('98 model year).

Engine ECU Interface Quick Reference Update VN

Engine ECU/Vehicle Interface Quick Reference

This bulletin provides a detailed listing of the electrical connections for the engine ECU on VN Series vehicles. Engines covered are Volvo D12B and D7C (and Vehicle ECU), Caterpillar 3406E, Cummins M11/N14 Plus and ISM/ISX, and Detroit Diesel Series 60 11.1/12.7.

The information in this bulletin covers ONLY the ECU-vehicle interface for the VNL and VNM. It does not provide details on the entire ECU. For more information, refer to the specific Electrical Schematic or the engine manufacturer's service literature. See , "Caterpillar 3406E ECU Connector Pinouts" page 8, "Cummins M11/N14 CELECT Plus ECU Connector Pinout" page 9, "Cummins ISX ECU Connector Pinout" page 13, "Cummins ISM ECU Connector Pinout" page 11, "Detroit Diesel Series 60 DDEC III 11.1/12.7 ECU Connector Pinout" page 15.

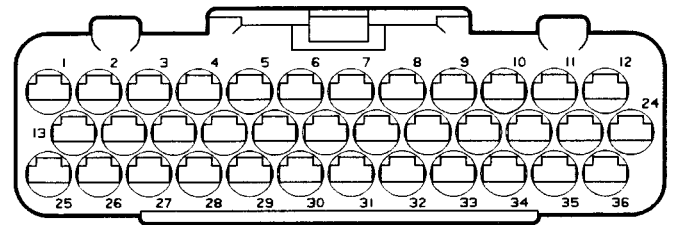
A diagram of a 36-key keyboard layout, arranged in two rows of 18 keys each. The keys are numbered 1 through 36. The top row contains keys 1 through 12, and the bottom row contains keys 13 through 24. The layout is symmetrical, with a central column of keys (1, 13, 25, 29) and a rightmost column of keys (12, 24, 36). The keys are represented by circles with internal rectangular shapes indicating the key mechanism.

Wire Colors:	BL	BLUE	R	RED
	BN	BROWN	SB	SOLID BLACK
	GN	GREEN	VO	VIOLET
	GR	GRAY	W	WHITE
	OR	ORANGE	Y	YELLOW
	P	PINK		

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	GN	GREEN	VO	VIOLET
	GR	GRAY	W	WHITE
	OR	ORANGE	Y	YELLOW
	P	PINK		



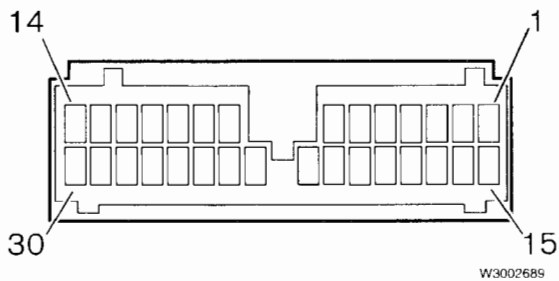
VOLVO D7C ECU/EB Connector		
Cavity	Color	Description
1	Y	DATA LINK J1939 CAN HI
2	GN	DATA LINK J1939 CAN LO
3	BL/Y	AMBIENT AIR TEMPERATURE
4	P	BUFFERED IDLE VALIDATION SWITCH
5	R	PREHEAT SENSE 1
6		NOT USED
7	BL/SB	COOLANT LEVEL WARNING
8	GR/W	AIR FILTER, COOL LVL COMMON
9	W	GROUND
10	W	GROUND
11	R/SB	POWER SUPPLY
12	R/SB	POWER SUPPLY
13	VO/W	AMBIENT AIR TEMP COMMON
14-16		NOT USED
17	BL/R	AIR FILTER INDICATOR
18-23		NOT USED
24	Y/SB	FACTORY PROGRAMMING (NOT USED)
25	GR	DATA LINK J1708/1587+
26	OR	DATA LINK J1708/1587-
27-30		NOT USED
31	BL/R	PREHEAT RELAY
32-33		NOT USED
34	Y/BN	SHUTDOWN ON/OFF
35	GR	EPG1
36	GN/W	EPG2 (NOT USED)



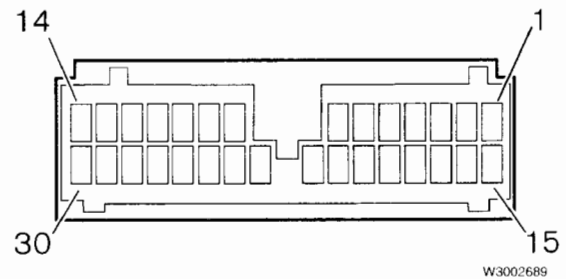
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Wire Colors:	BL BLUE	R RED
	BN BROWN	SB SOLID BLACK
	GN GREEN	VO VIOLET
	GR GRAY	W WHITE
	OR ORANGE	Y YELLOW
	P PINK	

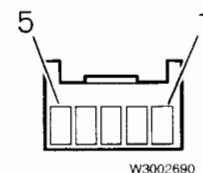
Vehicle ECU Connector A		
Cavity	Circuit	Description
1	564A	CC/PTO SWITCH SET(-) INPUT
2	563A	CC/PTO SWITCH SET(+) INPUT
3	562A	CC/PTO SWITCH ON INPUT
4		NOT USED
5	567B	SERVICE BRAKE SWITCH INPUT
6	284-A	12V STARTER CONTROL SOLENOID FEED
7	245	ENGINE PREHEAT CIRCUIT PROTECTION FEED
8	571	CLUTCH SWITCH INPUT
9	385-A	PARK CONTROL WIPER MOTOR
10	388	INTERMITTENT WIPER INPUT
11	387-C	SWITCH TO WASHER MOTOR
12	0XE	ELECTRONIC GROUND
13	18V	ELECTRONIC ENGINE SWITCHED BATTERY FEED
14	196V	IGNITION SWITCH DR FEED
15-18		NOT USED
19	300D	MANUAL FAN SWITCH INPUT
20	629	ENGINE BRAKE MEDIUM FEED
21	628	ENGINE BRAKE LOW FEED
22		NOT USED
23	555	IDLE VALIDATION INPUT
24	682	HIGH REFRIGERANT PRESSURE SWITCH FEED
25-28		NOT USED
29	573	PTO SWITCH ON INPUT
30	565A	CC/PTO SWITCH RESUME INPUT



Vehicle ECU Connector B		
Cavity	Circuit	Description
1		NOT USED
2	312A	TRANSMISSION AREA INHIBITOR VALVE RETURN
3-4		NOT USED
5	597	ECU COMMON 12V OUTPUT
6	550	VEHICLE SPEED INPUT
7		NOT USED
8	553	THROTTLE POSITION SENSOR INPUT
9		NOT USED
10	552	THROTTLE POSITION SENSOR SUPPLY
11	581	PARKING BRAKE SWITCH INPUT
12-14		NOT USED
15	583	POWER CONTROL FROM ENGINE ECU
16	389B	INTERMITTENT WIPER RELAY COIL RETURN
17	555A	IDLE VALIDATION FROM ENGINE ECU
18	312C	RANGE INHIBITOR VALVE RETURN
19	558	ECU COMMON +12V OUTPUT
20	551	VEHICLE SPEED RETURN FROM ECU
21	317B	TRANSMISSION LOW RANGE INDICATOR SIGNAL
22	554	THROTTLE POSITION SENSOR RETURN
23-26		NOT USED
27	567A	SERVICE BRAKE SWITCH INPUT
28-30		NOT USED

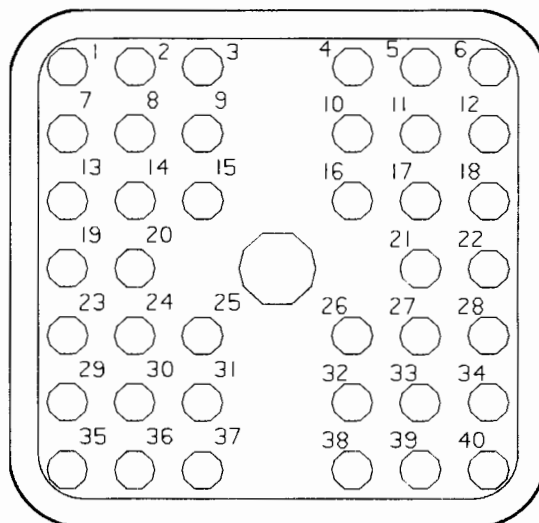


Vehicle ECU Connector C		
Cavity	Circuit	Description
1	401-D	DATA LINK J1708 (-)
2	400-D	DATA LINK J1708 (+)
3	408-B	DATA LINK J1939 SHIELD
4	406-B	DATA LINK J1939 CAN HI
5	407-B	DATA LINK J1939 CAN LOW



Caterpillar 3406E ECU Connector Pinouts

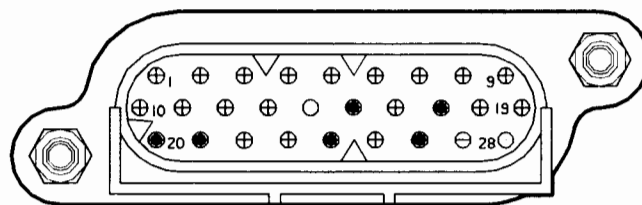
Caterpillar 3406E ECU/Vehicle Interface P/1-J/1 Connector		
Cavity	Circuit	Description
1	401	DATA LINK J1587-
2	620	COOLANT LEVEL NORMAL
3	405	DATA LINK J1922-
4	596	+V BATTERY UNSWITCHED
5	0X	-V BATTERY
6	196A	+V IGNITION SWITCHED
7	400	DATA LINK J1587+
8		NOT USED
9	404	DATA LINK J1922+
10-11		NOT USED
12	551	VEHICLE SPEED-
13	629	ENGINE BRAKE MEDIUM/HIGH
14	567	SERVICE BRAKE
15	565	CC/PTO RESUME
16-17		NOT USED
18	550	VEHICLE SPEED+
19	628	ENGINE BRAKE LOW/HIGH
20	562	CC/PTO ON/OFF
21		NOT USED
22	576	CAUTION or INFO LAMP
23	619	COOLANT LEVEL LOW
24	571	CLUTCH
25	563	CC/PTO SET
26		NOT USED
27	575	STOP ENGINE LAMP
28	300	FAN SOLENOID
29	559-A	SENSOR/SWITCH COMMON RETURN
30-34		NOT USED
35	552	THROTTLE POSITION SENSOR +8V
36	621	COOLANT LEVEL +5V
37	553	THROTTLE POSITION SENSOR SIGNAL
38	682-B	A/C SYSTEM HIGH PRESSURE
39-40		NOT USED



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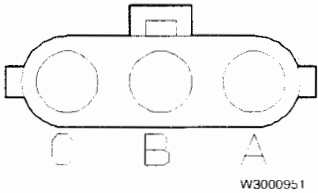
Cummins M11/N14 CELECT Plus ECU Connector Pinout

Cummins ECU/Vehicle Interface Connector (B)		
Cavity	Circuit	Description
1	577	ENGINE FLUIDS LAMP
2	562	CC/PTO ON/OFF
3	550	VEHICLE SPEED+
4	571	CLUTCH
5	628	ENGINE BRAKE SELECTION 1
6	555	IDLE VALIDATION SIGNAL
7	551	VEHICLE SPEED-
8	401	DATA LINK J1587-
9	556	IDLE VALIDATION OFF IDLE SIGNAL
10	559-A	SWITCH COMMON RETURN
11	553	THROTTLE POSITION SENSOR SIGNAL
12	563	CC/PTO SET
13	567	SERVICE BRAKES
14	560	IDLE/DIAGNOSTIC INCREMENT
15		NOT USED
16	575	STOP ENGINE LAMP
17		NOT USED
18	552	THROTTLE POSITION SENSOR +5V
19	554	THROTTLE POSITION SENSOR RETURN
20		NOT USED
21		NOT USED
22	565	CC/PTO RESUME
23	561	IDLE/DIAGNOSTIC DECREMENT
24		NOT USED
25	576	CAUTION or INFO LAMP
26		NOT USED
27	400	DATA LINK J1587+
28	629	ENGINE BRAKE SELECTION 2

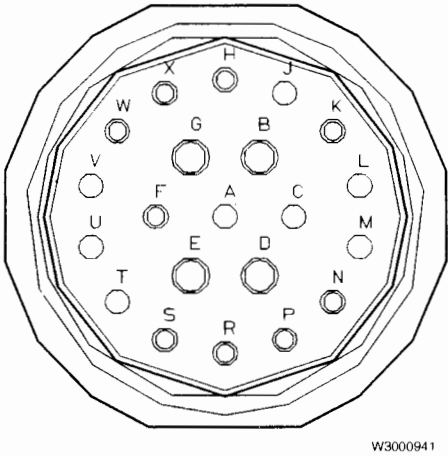


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Cummins ECU Power Supply Connector		
Cavity	Circuit	Description
A	17-B	+V BATTERY
B	0X	-V BATTERY
C	17-C	+V BATTERY



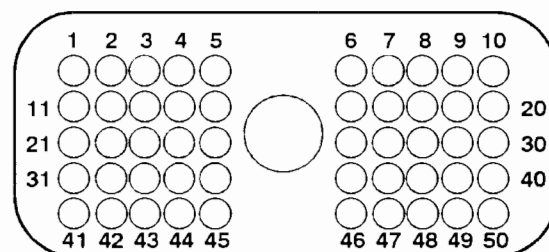
Cummins ECU/OEM Interface Connector (Option Connector)		
Cavity	Circuit	Description
A	196A	+V IGNITION SWITCHED
B		NOT USED
C	300	FAN SOLENOID
D		NOT USED
E		NOT USED
F		NOT USED
G		NOT USED
H		NOT USED
J	621	COOLANT LEVEL +5V
K		NOT USED
L	620	COOLANT LEVEL NORMAL
M	619	COOLANT LEVEL LOW
N	405	DATA LINK J1922-
P	404	DATA LINK J1922+
R		NOT USED
S		NOT USED
T	682-B	A/C SYSTEM HIGH PRESSURE
U	684	MANUAL FAN SWITCH FEED
V	574	DIAGNOSTIC REQUEST / ENGINE SHUTDOWN OVERRIDE
W		NOT USED
X		NOT USED



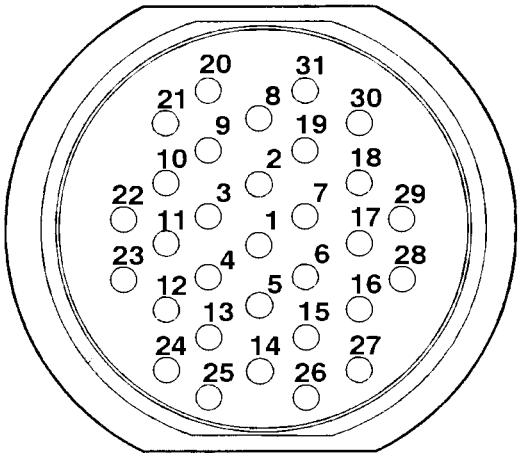
Cummins ISM ECU Connector Pinout

Cummins ISM Engine ECU 50-pin Connector		
Cavity	Circuit	Description
1	567	SERVICE BRAKE RELEASED
2	571	CLUTCH RELEASED
3	556	IDLE OFF
4		NOT USED
5	577	ENGINE FLUIDS LAMP ON (NOT USED)
6	575	STOP ENGINE LAMP ON
7	17AA-A	ENGINE ECU SUPPLY (+)
8	17AA-B	ENGINE ECU SUPPLY (+)
9	559Y	DASH SWITCH RETURN 2
10	559X	DASH SWITCH RETURN 1
11		NOT USED
12		NOT USED
13	555	IDLE ON
14	563	CC/PTO SET
15	684	MANUAL FAN OFF
16	576	CAUTION or INFO LAMP ON
17	17AA-C	ENGINE ECU SUPPLY (+)
18	17BB-A	ENGINE ECU SUPPLY (+)
19	559Z	CAB RETURN
20		NOT USED
21		NOT USED
22	628D	ENGINE BRAKE ISM1
23	562	CC/PTO ENABLE
24	565	CC/PTO RESUME
25		NOT USED
26	400	DATA LINK J1587+
27	401	DATA LINK J1587-
28	17BB-B	ENGINE ECU SUPPLY (+)

Cummins ISM Engine ECU 50-pin Connector		
Cavity	Circuit	Description
29	OX-A	ENGINE ECU GROUND
30	OX-B	ENGINE ECU GROUND
31	628E	ENGINE BRAKE ISM2
32		NOT USED
33		NOT USED
34		NOT USED
35		NOT USED
36	408-D	DATA LINK J1939 SHIELD
37	407-A	DATA LINK J1939 LOW
38	196DR	IGNITION KEY ON
39	OX-C	ENGINE ECU GROUND
40	OX-D	ENGINE ECU GROUND
41		NOT USED
42		NOT USED
43		NOT USED
44	560A	DIAGNOSTICS ENABLE
45		NOT USED
46	406-A	DATA LINK J1939 HI
47	553	CAB THROTTLE POSITION SENSOR
48	552	THROTTLE +5V SUPPLY
49	554	THROTTLE +5V RETURN
50	OX-E	ENGINE ECU GROUND



Cummins ISM Engine ECU 31-pin Connector		
Cavity	Circuit	Description
1		NOT USED
2		NOT USED
3		NOT USED
4		NOT USED
5	620	COOLANT LEVEL NORMAL
6	619	COOLANT LEVEL LOW
7	621	COOLANT LEVEL +5V SUPPLY
8		NOT USED
9		NOT USED
10		NOT USED
11		NOT USED
12	300	FAN SIGNAL RETURN
13	OR	FAN OFF SIGNAL
14		NOT USED
15		NOT USED
16		NOT USED
17	682-B	A/C SYSTEM HIGH PRESSURE
18	559S	A/C PRESSURE RETURN
19	559L	COOLANT LEVEL RETURN
20		NOT USED
21	550	VEHICLE SPEED (+)
22	551	VEHICLE SPEED (-)
23		NOT USED
24		NOT USED
25		NOT USED
26		NOT USED
27		NOT USED
28		NOT USED
29		NOT USED
30		NOT USED
31		NOT USED

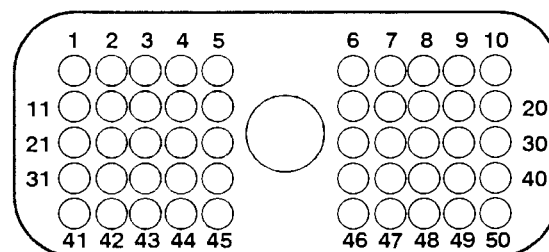


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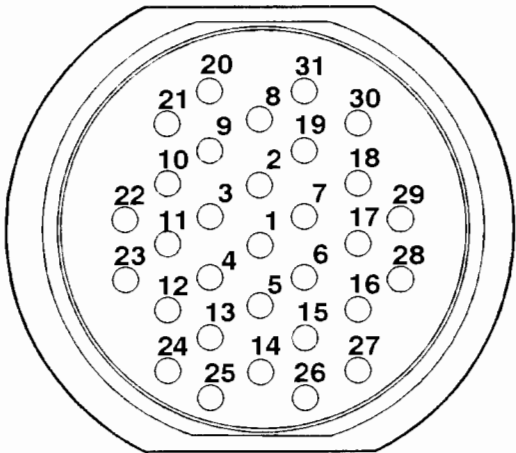
Cummins ISX ECU Connector Pinout

Cummins ISX Engine ECU 50-pin Connector		
Cavity	Circuit	Description
1	567	SERVICE BRAKE RELEASED
2	571	CLUTCH RELEASED
3	556	IDLE OFF
4		NOT USED
5	577	ENGINE FLUIDS LAMP ON (NOT USED)
6	575	STOP ENGINE LAMP ON
7	17AA-A	ENGINE ECU SUPPLY (+)
8	17AA-B	ENGINE ECU SUPPLY (+)
9	559Y	DASH SWITCH RETURN 2
10	559X	DASH SWITCH RETURN 1
11		NOT USED
12		NOT USED
13	555	IDLE ON
14	563	CC/PTO SET
15	684	MANUAL FAN OFF
16	576	CAUTION or INFO LAMP ON
17	17AA-C	ENGINE ECU SUPPLY (+)
18	17BB-A	ENGINE ECU SUPPLY (+)
19	559Z	CAB RETURN
20		NOT USED
21		NOT USED
22	628A	ENGINE BRAKE ISX1
23	562	CC/PTO ENABLE
24	565	CC/PTO RESUME
25		NOT USED
26	400	DATA LINK J1587+
27	401	DATA LINK J1587-
28	17BB-B	ENGINE ECU SUPPLY (+)

Cummins ISX Engine ECU 50-pin Connector		
Cavity	Circuit	Description
29	OX-A	ENGINE ECU GROUND
30	OX-B	ENGINE ECU GROUND
31	628B	ENGINE BRAKE ISX2
32	628C	ENGINE BRAKE ISX3
33		NOT USED
34		NOT USED
35		NOT USED
36	408-D	DATA LINK J1939 SHIELD
37	407-A	DATA LINK J1939 LOW
38	196DR	IGNITION KEY ON
39	OX-C	ENGINE ECU GROUND
40	OX-D	ENGINE ECU GROUND
41		NOT USED
42		NOT USED
43		NOT USED
44	560A	DIAGNOSTICS ENABLE
45		NOT USED
46	406-A	DATA LINK J1939 HI
47	553	CAB THROTTLE POSITION SENSOR
48	552	THROTTLE +5V SUPPLY
49	554	THROTTLE +5V RETURN
50	OX-E	ENGINE ECU GROUND



Cummins ISX Engine ECU 31-pin Connector		
Cavity	Circuit	Description
1		NOT USED
2		NOT USED
3		NOT USED
4		NOT USED
5	620	COOLANT LEVEL NORMAL
6	619	COOLANT LEVEL LOW
7	621	COOLANT LEVEL +5V SUPPLY
8		NOT USED
9		NOT USED
10		NOT USED
11		NOT USED
12	300	FAN SIGNAL RETURN
13	OR	FAN OFF SIGNAL
14		NOT USED
15		NOT USED
16		NOT USED
17	682-B	A/C SYSTEM HIGH PRESSURE
18	559S	A/C PRESSURE RETURN
19	559L	COOLANT LEVEL RETURN
20		NOT USED
21	550	VEHICLE SPEED (+)
22	551	VEHICLE SPEED (-)
23		NOT USED
24		NOT USED
25		NOT USED
26		NOT USED
27		NOT USED
28	284-B	START COMMAND
29		NOT USED
30		NOT USED
31		NOT USED

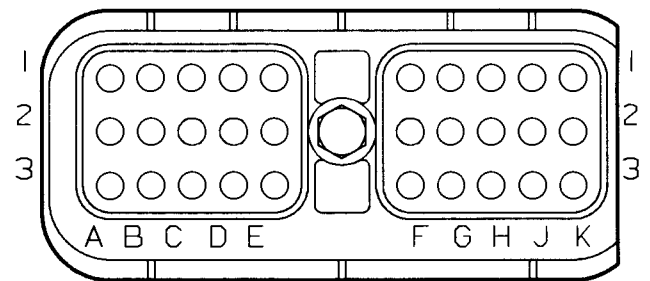


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Detroit Diesel Series 60 DDEC III 11.1/12.7 ECU Connector Pinout

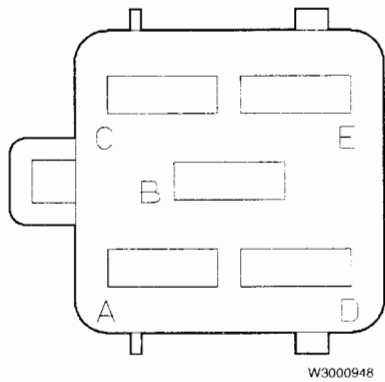
Detroit Diesel ECU/Vehicle Interface Connector		
Cavity	Circuit	Description
A-1	D564	OPTIMIZED IDLE INDICATOR LAMP GROUND TO ECU (NOT USED WHEN OPTIMIZED IDLE IS NOT INSTALLED)
A-2	594/D555	FAN SOLENOID
A-3	552/D916	THROTTLE POSITION SENSOR +5V
B-1	576/D419	CAUTION or INFO LAMP
B-2	575/D509	STOP ENGINE LAMP
B-3	196A-A /D439	+V IGNITION SWITCHED
C-1	401/D901	DATA LINK J1587-
C-2	400/D900	DATA LINK J1587+
C-3	554/D952	THROTTLE POSITION SENSOR RETURN
D-1	588/D510	REMOTE PTO SENSOR INPUT TO ECU
D-2	553/D417	THROTTLE POSITION SENSOR INPUT TO ECU
D-3		NOT USED
E-1	684/D451	MANUAL FAN SWITCH FEED
E-2	550/D556	VEHICLE SPEED+
E-3	551/D557	VEHICLE SPEED-
F-1	682-B /D542	A/C SYSTEM HIGH PRESSURE
F-2	562/D544	CC/PTO ON/OFF

Detroit Diesel ECU/Vehicle Interface Connector		
Cavity	Circuit	Description
F-3	583	POWER SHUTDOWN RELAY COIL GROUND TO ECU (NOT USED WHEN OPTIMIZED IDLE IS NOT INSTALLED)
G-1	574/D528	SHUTDOWN OVERRIDE
G-2	567/D543	SERVICE BRAKE
G-3	565/D545	CC/PTO RESUME
H-1		NOT USED
H-2	581-D /D524	PARK BRAKE SWITCH INPUT TO ECU
H-3	619/D115	COOLANT LEVEL
J-1	563/D541	CC/PTO SET
J-2	571/D531	CLUTCH SWITCH INPUT TO ECU
J-3		NOT USED
K-1		NOT USED
K-2	629/D583	ENGINE BRAKE MEDIUM
K-3	628/D979	ENGINE BRAKE LOW

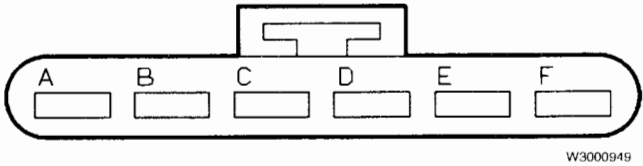


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Detroit Diesel ECU/Power Supply Connector		
Cavity	Circuit	Description
A	17-B /D240	+V BATTERY
B	559-B /D151	-V BATTERY
C	17-D /D241	+V BATTERY
D	559-C /D150	-V BATTERY
E	559-D /D150	-V BATTERY



Detroit Diesel ECU/Communication Connector		
Cavity	Circuit	Description
A	404/D800	DATA LINK J1922+
B	405/D801	DATA LINK J1922-
C	196C/D439	OPTIMIZED IDLE START RELAY COIL GROUND TO ECU
D		NOT USED
E		NOT USED
F		NOT USED



Detroit Diesel ECU Connector (with Optimized Idle only)		
Cavity	Circuit	Description
A	D909	ALARM GROUND TO ECU
B	D910	OPTIMIZED IDLE START RELAY COIL GROUND TO ECU
C		NOT USED
D	D958	SLEEPER CONTROL THERMOSTAT SIGNAL TO ECU
E		NOT USED
F		NOT USED

