

Introduction

Description -This guide will assist the installer in setting up their BP wiring harness. It is also applicable to customers purchasing PCM programming services.

Disclaimer

- i. This document and the use of any Novak products assumes a safe and adequate working knowledge of the automotive systems involved. We do not know and there is no way for Novak to determine the skill level of the customer and/or the installer of Novak products, or for Novak to publish all of the information on fundamentals that an individual should know before attempting these advanced procedures. Vehicular conversion work can be among the most difficult of automotive mechanical and electrical tasks and it is upon the customer to ascertain whether they are working within their expertise or whether they should acquire assistance.
- ii. This guide is not intended to replace the service manual specific to your vehicle. It is not possible to document the wiring, routing and specific system details of every Jeep and the installer should obtain and use both their vehicle's manual and the engines donor vehicle's manual in conjunction with these instructions.
- iii. Novak products and procedures are intended and recommended for off-road use only.

Your Local Legal Requirements

- i. This guide is not meant to explain, interpret or notify the installer of local or national laws concerning vehicle changes, engine conversions and the emissions systems surrounding them. It is the installer's responsibility to know and understand their local legal requirements and regulations and to make their installation conform to demands of the jurisdictions in which they live. Novak does not recommend nor condone the disabling or modification of the vehicle or any system within it that could render it out of conformance with any laws in which the vehicle may be licensed or operate. Neither Novak Conversions nor its directors, principles or employees are responsible for any changes made to your vehicle.
- ii. We recommend you consult and know your own city, county, state or national laws. If your vehicle requires referee inspection, you may wish to establish a rapport with a referee and discuss your plans and seek advice and approval from them.



Who can do this

Your BP harness and computer have left our facility very carefully completed and reliable as possible.

However, installation of a BP wiring harness requires basic knowledge of automotive 12v electrical systems, relays, and switches. It is up to the Jeep owner to determine if they can competently do the install, or if they should hire a qualified technician to do the work. However, few people do better work than the customer and Jeep owner himself. If you don't truly know if your auto technician will do impeccable work, you may be better off patiently working your own way through it yourself.



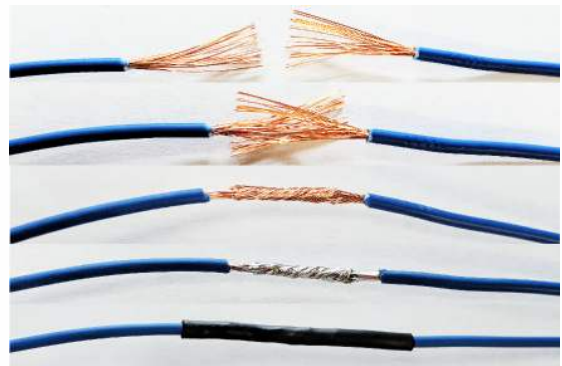
Installation requirements

Electrical Soldering

Example of a bad solder joint.

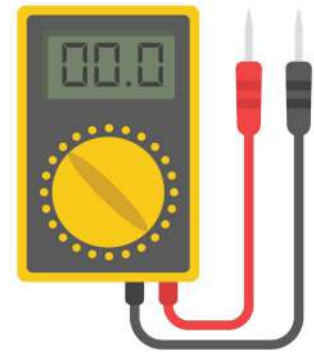


Example of a good solder joint



Be sure to heat the copper wire enough that the solder flows into the joint.

Be sure to finish off each joint with proper insulation such as the heat shrink shown above.



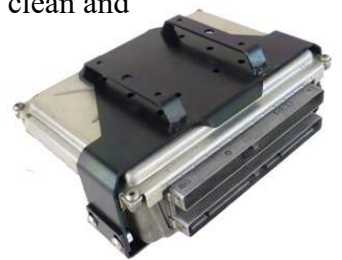
Test light/multimeter

A simple 12v test light, or multimeter will be necessary to identify and confirm certain 12v sources from the Jeep.

Installation

Layout harness on engine

1. Place the PCM connectors in the front driver side of the engine bay. Route the main trunk up the engine and lay the main trunk down the engine, towards the firewall.
2. Connect the driver side fuel injectors and ignition coil.
3. Route the main trunk across the rear of the engine to the passenger side.
4. Connect the passenger side injectors and ignition coil.
5. Connect the MAF (mass air flow) and any throttle body connectors.
6. Connect the MAP (manifold absolute pressure) and Knock sensor.
7. Connect the CMP (camshaft position) near the rear middle of the block.
8. Connect the main harness ground to the rear of the block. Be sure that the surface is clean and free of paint and rust.
9. Connect the starter solenoid post and CKP (crankshaft position).
10. Connect any remaining pigtails



Mounting the computer

Where to mount - The computer should be located away from the exhaust system or direct sunlight. Even though it is considered water and weather proof, it should be mounted out of the elements and protected from mud and water that might splash up from the wheels.

How to mount - Novak's #MP59 PCM bracket mounts the GEN III computer. The standoff bracket design allows it to easily be mounted to curved surfaces such as wheel wells, fire walls, or fenders.

Computer programming

The GM PCM has certain security measures and settings that prevent it from running as a standalone unit. Novak’s computer programming disables the Vehicle Anti Theft Security or “VATS”. This is also where Novak will adjust the tire size and gear ratio for proper speedometer and transmission fuction. Fan control is adjusted to command the **fans to turn on at 210°F and off at 200°F**. A few other param-eters are adjusted to help the engine run as optimal as possible. However, we recommend every cus-tomer do a performance dyno tune with a local certified engine tuner to get the best power and/or fuel economy.

Routing inside cab

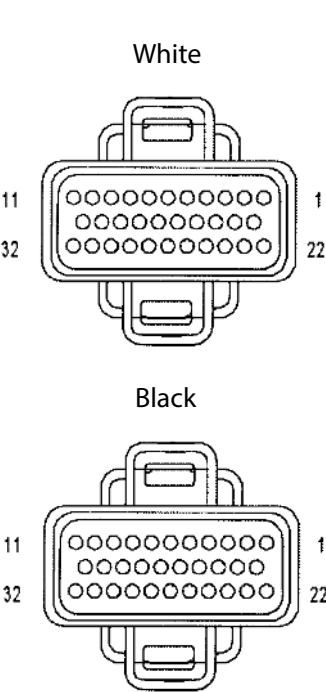
MIL (Malfunction Indicator Lamp) - Supplied with your harness is a red MIL bulb that needs to be mounted somewhere in the cab where it is visible in case of GM error. It will splice onto the pink wire and tan wire labeled “MIL”.

OBD II (On Board Diagnostics) - This is a diagnostic port for your GM PCM. This should be mounted under the dash for troubleshooting and diagnostic purposes.

Throttle Pedal (DBW) - The Throttle Actuator Control Mod-ule, or TACM, can be mounted in the engine bay or inside the cab. A second jumper harness will connect the TACM to your GM throttle pedal inside the cab. This jumper harness is usu-ally supplied by the donor vehicle and not by Novak.



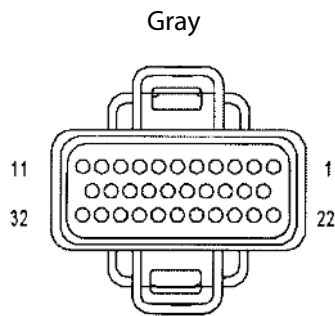
So you can better understand the Jeep’s electrical architecture, we have provided the fol-lowing diagrams and tables with the relevant connections.



1996-2004 TJ & XJ Jeeps

B10	K20, 18G, DG	Generator field
B23	G60, 18G, GY/TL	Engine oil pressure sensor signal
B27	G7, 18G, WT/OR	Vehicle Speed Sensor signal
B31	K6, 18G, VT/OR	5V supply

A2	F15, 18G, DB	Fused ignition switch output (Run-Start)
A4	K4, 18G, BK/LB	Sensor ground
A8	K24, 18G, GY/BK	Crankshaft position sensor signal
A16	K2, 18G, TN/BK	Engine coolant temperature sensor signal
A17	K7, 18G, OR	5V supply
A18	K44, 18G, TN/YL	Camshaft position sensor signal
A22	A4, 14G, RD/WT	Fused B(+)
A31	Z12, 14G, BK/TN	Ground
A32	Z12, 14G, BK/TN	Ground



C1	C13, 18G, DB/OR	A/C compressor clutch relay control
C4	V36, 18G, TN/RD	Speed (cruise) control vacuum solenoid control
C5	V35, 18G, LG/RD	Speed (cruise) control vent solenoid control
C11	V32, 18G, YL/RD	Speed (cruise) control on/of switch sense
C19	K31, 18G, BR	Fuel pump relay control
C20	K52, 18G, PK/BK	Evap/Purge solenoid control
C22	C21, 18G, DB/OR	A/C switch sense
C23	C90, 18G, LG	A/C select input
C24	K29, 18G, WT/PK	Brake lamp switch sense
C25	K125, 18G, WT/DB	Generator source
C26	K226, 18G, DB/LG	Fuel level sensor switch
C27	D21, 18G, PK	SCI transmit
C29	D32, 18G, LG	SCI receive
C30	D25, 18G, VT/YL	PCI Bus
C32	V37, 18G, RD/LG	Speed (cruise) control switch signal

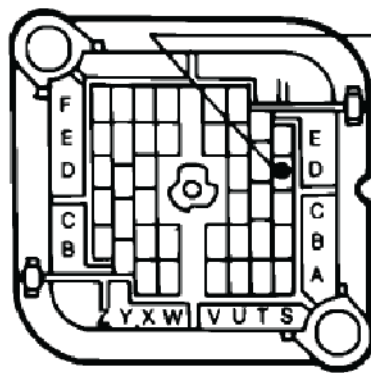
CJ8 1981 - 1985 Bulkhead Connector



CAV	ENGINE COMPARTMENT CIRCUITS		SHEET
A1	L7 18BK/YL	PARKING LAMPS	26,28,30
A2	V20 18BR/WT	REAR WASHER PUMP	37
A3	L60 18TN	RIGHT TURN SIGNAL LAMPS	25,27,34
A4	G19 20LG/BR	ABS WARNING LIGHT	58
A5	A22 18BK/OR	IGNITION FEED (RUN ONLY)	58
A6	L50 18WT/TN	STOP LAMP	51,58
A7	G9 20GY/BK	BRAKE WARNING SWITCH	9
B1	L20 16LG/WT	DAYTIME RUNNING LAMPS	28,29
B2	G5 18DB/WT	DAYTIME RUNNING LAMPS	28
B3	—	—	—
B4	G7 18WT/OR	VEHICLE SPEED SIGNAL	12,18
B5	Z1 14BK	GROUND	8,31
B6	G11 20WT/BK	BRAKE BULB CHECK	9
C1	G7 18WT/OR	VEHICLE SPEED SENSOR	12,18,28
C2	L61 18LG	LEFT TURN SIGNAL LAMPS	25,27,34
C3	—	—	—
C4	—	—	—
C5	G3 20BK/PK	HALF FUNCTION INDICATOR LAMP GROUND	16,22
C6	G5 18DB/WT	BACKUP LAMP SWITCH & A/C RELAY	7,48,49
D1	L39 16LB	FOG LAMP FEED	26,28,30
D2	—	—	—
D4	L9 18BK/WT	HAZARD FLASHER FEED	4,6
D5	G50 18WT/YL	IGNITION I-START AND RUN	10,13,19
E1	L3 16RD/OR	HIGH BEAM HEADLAMPS	25,27,29
E1	G34 18RD/GY	HIGH BEAM INDIC LP W/O DRL	25
E2	G34 18RD/GY	HIGH BEAM INDIC LP W/O DRL	26
E2	G34 18RD/GY	HIGH BEAM INDIC LP WITH DRL	28
E4	A3 12RD/OR	HEADLAMP SWITCH FEED	4,6,29
E5	—	—	—
F1	—	—	—
F2	—	—	—
F3	V10 18BR	WINDSHIELD WASHER PUMP FEED	38,39
F4	—	—	—
F5	—	—	—
F6	K54 20OR/BK	UPSHIFT SWITCH AND EMCC RELAY	13,19,56
G1	—	—	—
G2	—	—	—
G3	X2 18DG/RD	HORN	33
G4	A6 12RD/BK	FUSEBLOCK FEED	4,6,30
G5	A41 18YL	STARTER RELAY-CRANK	7
G6	X2 18DG/RD	HORN RELAY	33
H1	L4 16VT/WT	LOW BEAM HEADLAMPS	25,27,29
H2	—	—	—
H3	—	—	—
H4	M1 18PK	I.O.D. BATTERY FEED	8,35
H5	V40 18WT/PK	STOP LAMP SWITCH	16,22,34
H6	G21 20GY/LB	TACHOMETER SIGNAL	16,22

1983 CJ
Bulkhead

C100

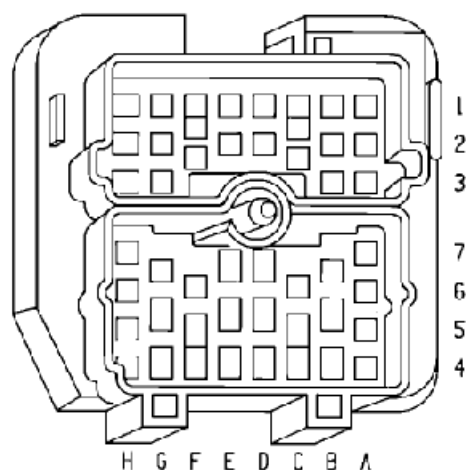


EXAMPLE
CAVITY "DS"

AS VIEWED FROM DASH PANEL

CAVITY	INST. PANEL	ENGINE	FUNCTION
AW AX	V10 W/TR LT BLU	V10 W/TR LT BLU	ENGINE TEMPERATURE START
BS BU BW BX BY BZ	BLACK BLACK RED W/TR BRN RED W/TR V10	BLACK BLACK RED W/TR BRN V10	BRAKE WARNING BRAKE WARNING IGNITION FEED A/C COMPRESSOR HEADLAMP ON ENGINE OIL PRESSURE
CS CX CY CZ	ORN RED LT BRN RED	ORN RED LT BRN RED	FOG LAMP FEED ELECTRONIC ENGINE CONTROL FEED HEATER BLOWER MOTOR FEED FUSED IGNITION ON FEED
DA DY DZ	YEL ORN WHT W/TR	YEL ORN WHT W/TR	WINDSHIELD WASHER PUMP FEED UNDERHOOD LAMP FEED BACKUP LAMP FEED
ES ET EU EV EY EZ	GRN W/TR GRY RED W/TR GRY W/TR RED ORN	GRN W/TR GRY RED W/TR GRY W/TR RED ORN	LH FRONT TURN LAMP FEED LH HEADLAMP LO BEAM FEED HORN FEED LH HEADLAMP HI BEAM FEED BATTERY FEED 4-WHEEL DR IND LAMP
FU FV FW FX	WHT GRN V10 ORN	WHT GRN DK GRN	PARK AND MARKER LAMP FEED RH FRONT TURN LAMP FEED TACHOMETER COIL SIGNAL EMISSION MAINT. LAMP

1990 YJ 4.2L



ENGINE COMPARTMENT CIRCUITS		CAV
72 18BL	PARKING LAMPS	A1
R10 18VT/OR	REAR WASHER PUMP	A2
79 18BR	RIGHT TURN SIGNAL LAMPS	A3
—	—	A4
62 14BR*	HEATED BACKLIGHT	A5
12 14OR	1-3 IGNITION (4.2L ONLY)	A6
58 20GY*	BRAKE WARNING SWITCH	A7
464 16BR/WT	DAYTIME RUNNING LIGHTS	B1
14 18WT/BK	DAYTIME RUNNING LIGHTS	B2
58 18GY/RD	DIODE	B3
F22 14OR	FUEL PUMP RELAY OUTPUT (2.5L ONLY)	B4
99 12BK	GROUND	B5
58 20GY*	BRAKE BULB CHECK	B6
—	—	C1
78 18GY*	LEFT TURN SIGNAL LAMPS	C2
—	—	C3
55 18VT	COOLANT TEMPERATURE SENSOR	C4
30 18GN *	TACHOMETER	C5
18 18YL*	BACKUP SWITCH-TRANSMISSION	C6
10 14RD	FOG LAMP RELAY-FEED	D1
—	—	D2
10 12RD	BATTERY	D4
11 14YL	J-1 IGNITION SWITCH	D5
76 16WT	HI BEAM HEADLAMPS	E1
76 18WT	W/O DAYTIME RUNNING LAMP	E1
76 18WT	W/O DAYTIME RUNNING LAMP	E2
465 18LB/BK	W/DAYTIME RUNNING LAMP	E2
10 12RD/WT	BATTERY	E4
463 14RD/WT	UNDERHOOD LAMP	E5
F5 18BL*	FOG LAMP RELAY-COIL FEED	F1
—	—	F2
44 18VT	WINDSHIELD WASHER PUMP FEED	F3
37 14OR/WT	BLOWER MOTOR	F4
54 18LG	OIL PRESSURE SENDER	F5
126 18BK/YL	UPSHIFT SWITCH	F6
—	—	G1
—	—	G2
31 14GY	HORN	G3
10 12RD	BATTERY	G4
33 14GN	STARTER RELAY-CRANK	G5
75 18BR*	BACKUP LAMPS	G6
77 16LG	LO BEAM HEADLAMPS	H1
—	—	H2
—	—	H3
138 16LG	A/C CLUTCH	H4
—	—	H5
106 18BK/YL	4 WHEEL DRIVE VACUUM SWITCH	H6

1998-2006 Jeep TJ Wiring Hookup Locations

PDC - Power Distribution Center BLS - Brake Lamp Switch C102/C103 - 14 Pin Connector at Rear of Engine
C104 - 10 Pin Connector at Rear of Engine C106 - 12 Pin Connector (LHD) Left Kick Panel, (RHD) Right Kick Panel

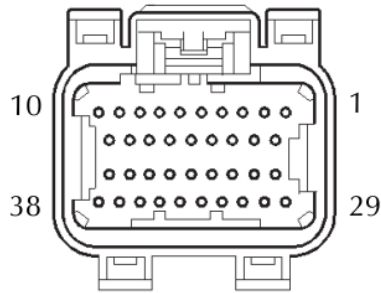
Wire Color	Red	White	Light Green/Black
Description	Main Power	Tach Output	12v A/C Supply
All Years	Battery Post	Novak E-TX Tach Emulator	Through Pressure switches, then A/C Clutch

Wire Color	Pink	Purple	Dark Green
Description	Ignition	Starter Solenoid Power	Fuel Pump
1998	DB/WT, 20 awg, C104, pin 8	YL/RD, 14 awg, Pin D11 of PDC	DG/WT, 18 awg, A7 of PDC
1999	DB/WT, 20 awg, C104, pin 8	YL/RD, 14 awg, Pin D11 of PDC	DG/WT, 18 awg, B17 of PDC
2000	DB/WT, 20 awg, C104, pin 8	PK/BK, 12 awg, B1 from PDC	DG/WT, 18 awg, C10 of PDC
2001	RD, 14 awg, C106, pin 5	PK/BK, 12 wg, B1 from PDC	DG/BK, 18 awg, C10 of PDC
2002	RD/PK, 12 awg, C106, pin 1	PK/BK, 12 wg, B1 from PDC	DG/BK, 18 awg, A61 from PDC
2003	RD, 18 awg, C106, pin B7	PK/BK, 14 wg, B1 from PDC	DG/BK, 18 awg, A61 from PDC
2004	RD, 18 awg, C106, pin B7	PK/BK, 14 awg, B1 from PDC	DG/BK, 18 awg, A61 from PDC
2005	RD, 14 awg, C103, pin D6	PK/BK, 14 wg, B1 from PDC	RD, 18 awg, A930 from PDC
2006	RD, 14 awg, C103, pin 1	PK/BK, 14 awg, B1 from PDC	RD(EXCEPT FED ABS) or RD/BK (FED ABS), 18 awg, A930 from PDC

Wire Color	Light Blue	Grey	Light Green
Description	Brake Input	Backup Lamp Power	A/C Relay Command
1998	WT/TN, 18 awg, Pin 6 of BLS	VT/BK 18 awg, C104 pin 9	LG, 20 awg, C104, pin 1
1999	WT/TN, 18 awg, Pin 6 of BLS	VT/BK 18 awg, C104 pin 9	LG, 20 awg, C104, pin 1
2000	PK/DB, 18 awg, Pin 5 of BLS	VT/WT, 20 awg, C104 pin 10	LG, 20 awg, C104, pin 1
2001	PK/DB, 18 awg, Pin 5 of BLS	VT/WT, 20 awg, C104 pin 10	LG, 20 awg, C104, pin 1
2002	PK/DB, 18 awg, Pin 5 of BLS	VT/WT, 20 awg, C104 pin 10	LG, 20 awg, C104, pin 1
2003	PK/DB, 18 awg, Pin 5 of BLS	VT/WT, 20 awg, C104 pin 10	LG, 20 awg, C103, pin 3
2004	PK/DB, 18 awg, Pin 5 of BLS	VT/WT, 20 awg, C104 pin 10	LG, 20 awg, C103, pin 3
2005	GY/RD, 18 awg, pin 5 from BLS	PK/DB, 20 awg, C104/C102, pin 10	LB/OR, 20 awg, C103, pin 3
2006	GY/RD, 18 awg, pin 5 from BLS	PK/DB, 20 awg, C104/C102, pin 10	LB/OR, 20 awg, C103, pin 3

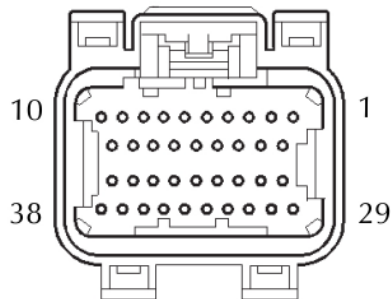
2005-2011 TJ, LJ & JK Jeeps

**Powertrain Control
Module #C2
(Black / Orange)**



19	18G, BR / LG	GEN Field Control
20	18G, BR / DG	Engine Coolant Temperature Signal
21	18G, BR / OR	Throttle Position 1 Signal
23	18G, VT / BR	Manifold Absolute Pressure Signal
26	18G, LG	Fused Sensor Ground (except Off-Road Package)
26	18G, BR / WT	Transfer Case Position Sensor (Off-Road Package)
27	18G, DB / DG	Sensor Ground
28	18G, BR / VT	Intake Air Control Signal
29	18G, PK / YL	5V Supply
30	18G, DB / LG	Intake Air Temperature Signal (2.4L)
30	18G, BK / RD	Intake Air Temperature Signal (4.0L)
31	18G, DB / LB	O2, Station 1 Bank 1
32	18G, DB / LG	O2 Downstream
33	18G, B / LG	O2, Station 2 Bank 1 (4.0L)
34	18G, DB / GY	Cam Position Signal
35	18G, BR / LB	Crank Position Signal

**Powertrain Control
Module #C1
(Black / Black)**



9	18G, BK / BR	Ground
10	20G, DB / YL	A/C Request Signal
11	18G, PK / WT	Fused Ignition Switch Output (Run-Start)
12	18G, PK / WT	Fused Ignition Switch Output (Run-Start)
13	18DB, OR	Vehicle Speed Sensor Signal
18	18G, BK / DG	Ground
20	18G, VT / GY	Oil Pressure Signal
25	18G, WT / LG	SCI Receive (PCM)
27	18G, PK / YL	5V Supply
29	18G, RD	Fused Battery +
30	16G, PK / OR	Ignition Switch Output (Start)
36	18G, WT / BR	SCI Transmit (PCM)
38	18G, WT / VT	PCI Bus

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