

# **HEMI 6.1 Into 49 Hudson Wiring and Electronics**

By Frank Choco Munday

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## Acronyms

<b>Table 1. Acronyms</b>	
<b>Acronym</b>	<b>Definition</b>
Acc	Accessories
APPS	Accelerator Pedal Position Sensor
Batt	Battery Power (can be fused or unfused +12v constant)
BIM	Dakota Digital CAN BUS Interface BIM-02-01
BTSI	Brake Transmission Shift Interlock
CKP	Crankshaft Position Sensor
COP	Coil On Plug
CMP	Camshaft Position Sensor
DD	Dakota Digital
DD CP	Dakota Digital Connector Panel
ECT	Engine Coolant Temperature
ETC	Electronic Throttle Control
FCM	Front Control Module
Ign	Ignition
M/C	Master Cylinder
NGC	Next Gen Controller
PCM	Powertrain Control Module
PCS	Powertrain Control Solutions (using TCM2800).
RHS/LHS	Right Hand Side/Left Hand Side (facing forward). References to Driver's Side and Passenger's side are usually consistent with left hand drive cars only.
SLA	Shift Lever Assembly
TCM	Transmission Control Module

## Wire Colour Codes

<b>Table 2. Wire Colour Code</b>	
<b>COLOR CODE</b>	<b>COLOR</b>
BL	BLUE
BK	BLACK
BR	BROWN
DB	DARK BLUE
DG	DARK GREEN
GY	GRAY
LB	LIGHT BLUE
LG	LIGHT GREEN
OR	ORANGE
PK	PINK
RD	RED
TN	TAN
VT	VIOLET
WT	WHITE
YL	YELLOW
WT/LG	TRACER. In this example, White with Light Green tracer.



## Hudson SRT-8 Wiring

This document describes the electrical and electronic systems installed in a 1949 Hudson powered by a 2007 Chrysler 300C SRT-8 6.1L Hemi and NAG1 Transmission. It uses the factory Engine Management System, the factory engine wiring harness, various electronic modules and a universal 20 circuit wiring kit.

The engine wiring harness terminates at the three NGC connectors on the factory PCM (the fourth is blank, only used for TCM of RLE trans) and the Chassis Interface Connector (C100 connector). See Figure 4 - PCM Connectors.

### Factory Harness Preparation

The Front Control Module and the Power Distribution Module are not used, so the wiring to these modules has been stripped out. The unused circuits that branch from the three PCM connector and the C100 connector have been removed, leaving only the essential circuits to run the engine and trans, including the following:

- The CAN C BUS twisted pairs (WT/LG, WT/LB) are retained.
- The factory Drive by Wire system is retained, including the Accelerator Pedal Position Sensor (APPS) wiring and the Electronic Throttle Control (ETC) wiring. A third-party cruise control system is wired into these circuits.
- The Heated O2 sensor circuits for the front (before the catalytic converters) are retained (designated 1/1 = LHS, and 2/1 = RHS). The rear O2 sensors are not required.

### Engine Management System Wiring

The Engine Management System wiring comprises the factory PCM connectors C1, C2 and C3 and the interconnector C100. The engine side of the harness runs through the firewall and comprises the injector, coil, and sensor wiring (Crank Position, Engine Coolant Temperature Sensor, Oil Pressure, Alternator, etc).

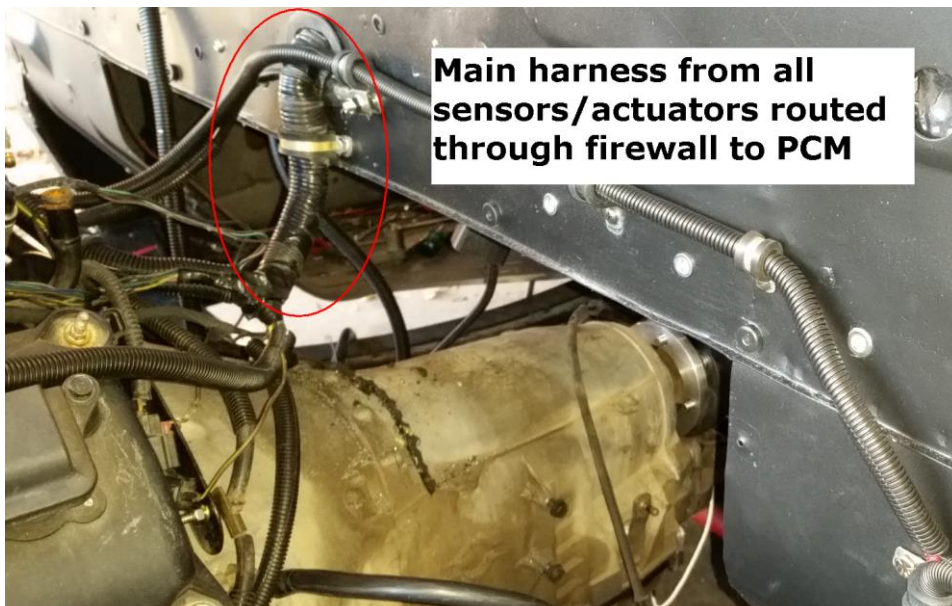
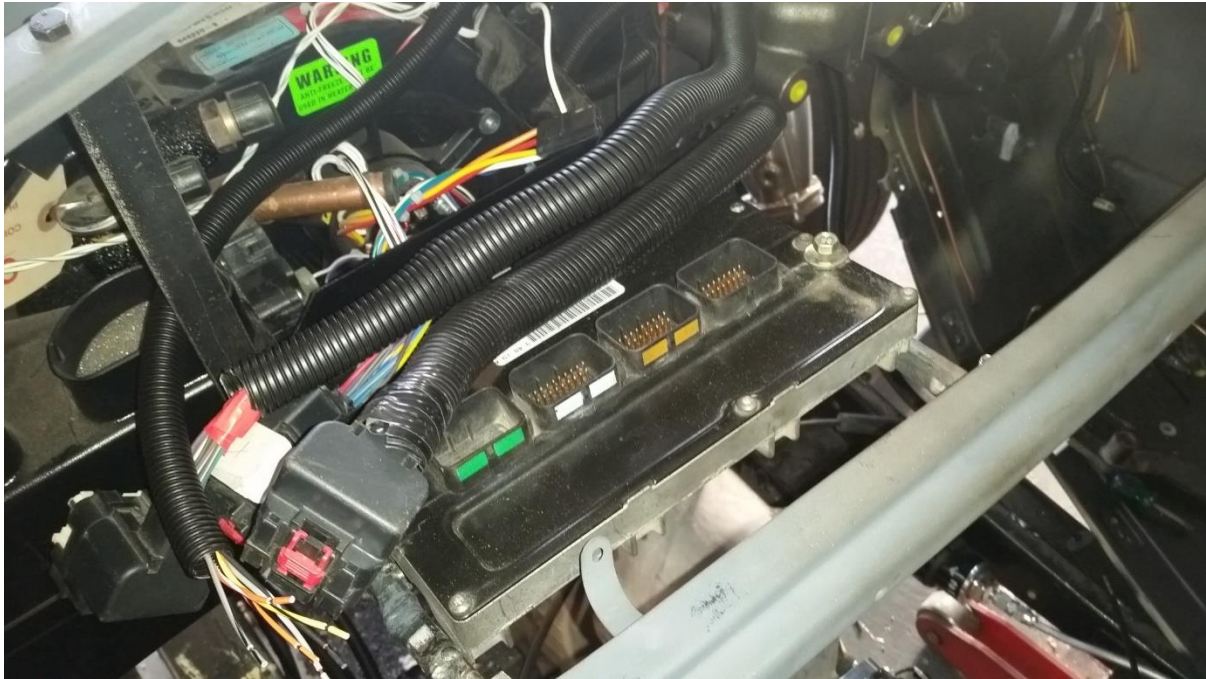


Figure 1 - Engine Side of PCM Harness

In this project, the rest of the harness is routed through the firewall to the PCM, which is located under the dash. The PCM connectors (C1, C2 and C3) and the Chassis Interface Connector (C100) contain all the required circuits for full operation of the PCM.



*Figure 2 - PCM Location*

The following tables describe the pinouts and circuits.

C100 Connector

A number of circuits from the C100 connector will go to relays and the fuse panel.

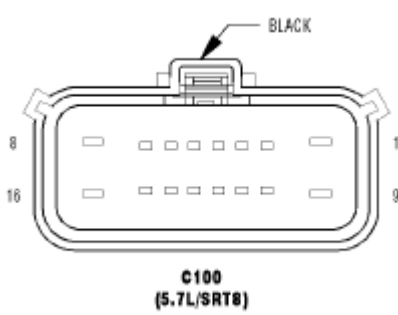
<b>Table 3. C100 (5.7L/SRT8) - BLACK</b>		
 <p style="text-align: center;"><b>C100 (5.7L/SRT8)</b></p>		<p><b>Engine Side</b></p> <ul style="list-style-type: none"> <li>1 T750 16YL/GY (SRT8) Starter Relay Output</li> <li>2 -</li> <li>3 G6 20VT/GY Oil Press Signal</li> <li>4 K26 20BR/YL Inj Control #7</li> <li>5 K28 20BR/LB Inj Control #8</li> <li>6 K97 16DB/YL Coil Control #7</li> <li>7 K451 20BR/LB (5.7L)</li> <li>8 K98 16DB/YL Coil Control #8</li> <li>9 K343 16BR/YL ASD Relay Output 2</li> <li>10 K452 20BR/LB (5.7L)</li> <li>11 K454 20BR/OR (5.7L)</li> <li>12 F855 20PK/YL 5V Supply</li> <li>13 F856 20YL/PK 5v Supply</li> <li>14 C3 18DB/YL</li> <li>15 G224 20VT/YL Oil Temp Signal</li> <li>16 Z904 16BK/BR Ground Circuit</li> </ul>
1	T750 16 LG (5.7L) T750 16 YL/GY (SRT8)	Starter Relay Output (starter wire to starter solenoid). See Starter Interlock on Page 28.
2	Not Used	
3	G6 20 VT/GY	Oil pressure signal to PCM black connector C1
4	K26 20 BR/YL	inj #7 to PCM black connector C1
5	K28 20 BR/LB	inj #8 to PCM black connector C1
6	K97 16 DB/YL	coil # 7 to PCM black connector C1
7	K451 20 BR/LB (5.7L)	#1 mds activation. Not Used
8	K98 16 DB/YL	coil # 8 to PCM black connector C1
9	K343 16 BR/YL	12 volts fused constant. Supplied by ASD Relay.
10	K452 20 BR/LB (5.7L)	#4 mds activation. Not Used
11	K454 20 BR/OR (5.7L)	#7 mds activation. Not Used
12	F855 20 PK/YL	5v Supply
13	F856 20 YL/PK	5v Supply
14	C3 18 DB/YL	A/C clutch engage from A/C relay. Connect to A/C Compressor Relay output. See Air Con Relay on page 30.
15	G224 20 VT/YL	Oil temp signal to PCM white connector C3
16	Z904 16 BK/BR	Alt ground to ground.

Figure 3 C100 Connector

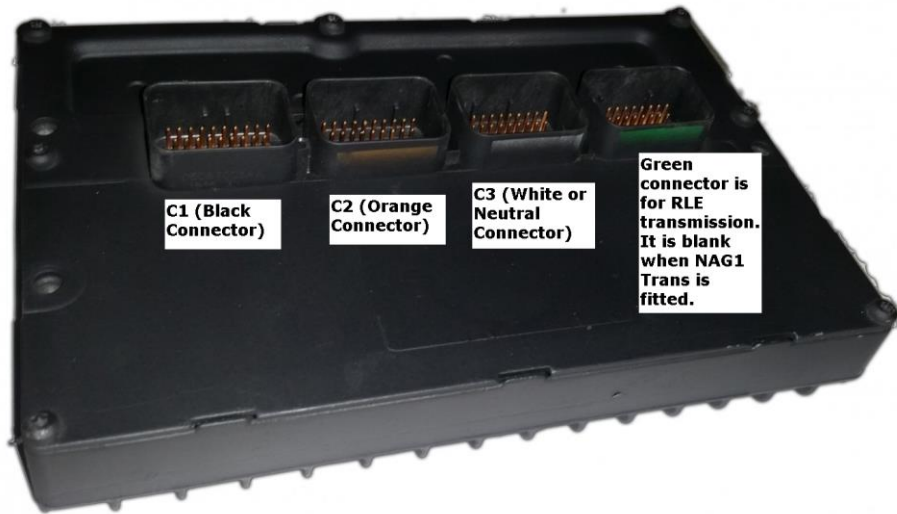


Figure 4 - PCM Connectors

*C1 (Black Connector)*

C1 supplies the PCM with power. It also enables comms with OBD2 and operates Cylinder 7 and 8 coil and injectors.

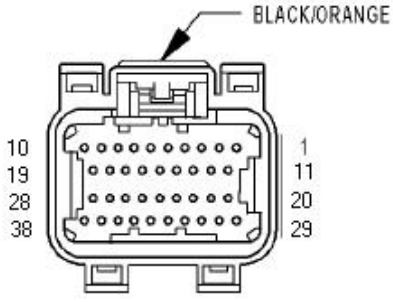
<b>Table 4. 2006 LX C1 (Black Connector)</b>			
PIN #	Function	Color	Notes
1	Coil #8	DB/YL	C100 pin 8
2			
3	Coil #7	DB/YL	C100 Pin 6
4	Injector #8	BN/LB	C100 Pin 5
5	Injector #7	BN/YL	C100 Pin 4. Connects Tach signal for Trans Controller VT/WT wire.
6			
7			
8			

9	Ground (-)	BK/BR	
10			
11	Fused Ignition sw output	PK/GY	+12v Start/Run from main fuse panel. Joins Start/Run (PK) at LHS kick panel.
12	Ignition unlock-run-start	PK	+12v Start and Run (RLE only)
13			
14			
15			
16	SRV Control	DB/LG	
17			
18	Ground (-)	BK/BR	
19			
20	Oil Press Signal	VT/GY	C100 Pin 3
21			
22			
23			
24			
25	(SCI) Receive "PCM"	WT/LG	OBD2 Pin 12. Not Used
26	(SCI) Receive "TCM"	WT/OR	OBD2 Pin 9. Not Used
27	5 Volt Supply (+)	YL/PK	Pin 1 on gas pedal conn
28	MDS Sol control NO.4	BN/LB	N/A
29	Fused Battery (+) 12v	RD	
30	Fused IGN SWTCH output	YL	12v during Start. Connect to VT Start wire from Ign Switch at Pin 85 Start Relay.
31	Driver rear O2 signal	DB/YL	Cct Removed
32	O2 Downstream Return	DB/DG	Cct Removed
33	Passenger rear O2 signal	BR	Cct Removed
34	Can C Bus (+)	WT/LG	OBD2 Pin 6
35	Can C Bus (-)	WT/LB	OBD2 Pin 14
36	(SCI)Transmit "PCM"	WT/BR	OBD2 Pin 7. Not present
37	(SCI) Transmit "TCM"	WT/DG	OBD2 Pin 15. Not present
38			

C2 (Orange Connector)

C2 Operates the majority of the engine sensors and actuators (injectors, coils, MDS, oil pressure, oil temp, etc).

**Table 5. 2005-2006 LX C2 (Orange Connector)**

			
<b>MODULE- POWERTRAIN CONTROL C2</b>			
PIN #	Function	Color	Notes
1	Coil #6	DB/OR	
2	Coil #5	DB/YL	
3	Coil #4	DB/GY	
4	Injector #6	BN/VT	
5	Injector #5	BN/OR	
6	Electronic Throttle C. Motor +	DB/GY	
7	Coil #3	DB/LG	
8	EGR Solenoid control	DB/VT	Cct Removed
9	Coil #2	DB/TN	
10	Coil #1	DB/DG	
11	Injector #4	BN/TN	
12	Injector #3	BN/LB	
13	Injector #2	BN/DB	
14	Injector #1	BN/YL	
15	Throttle Position Sensor GRND	BN/DB	
16	MDS Solenoid Control	BR/DG	N/A
17	Passenger Front O2 Heater	BN/VT	O2 2/1 Heater Control
18	Driver Front O2 Heater	BN/LG	Changed to Brn/Gy O2 1/1 Heater Control
19	Generator FLD (ALT CONTROL)	BN/GY	
20	ECT	VT/OR	ECT Signal K2
21	TPS #1 Signal	BN/OR	
22	EGR Sensor Signal	DB/LG	N/A
23	MAP Sensor Signal	VT/BR	
24	Knock Sensor #1 "Return"	BN/LG	
25	Knock Sensor #1 "Signal"	DB/YL	

26			
27	Sensor Ground (-)	DB/DG	
28	TPS #2 signal	BN/DG	
29	5 volt supply (+)	PK/YL	
30	Inlet Air Temp Signal	DB/LG	
31	Driver front O2 signal	DB/LB	Bn
32	O2 Return Upstream	BN/DG	Changed – check wire colours
33	Passenger Front O2 signal	DB/LG	
34	Camshaft Position Signal	DB/GY	
35	Crank Position Signal	DB/WT	
36	Knock Sensor #2 Signal	BN/WT	
37	Knock Sensor #2 Return	WT/BR	
38	Electronic Throttle Motor (-)	DG/LG	ETC

C3 (White Connector)

C3 controls auxiliary functions (A/C, Fuel Pump, etc).

**Table 6. 2005-2006 LX C3 (White Connector)**

<p style="text-align: center;"><b>MODULE- POWERTRAIN CONTROL C3</b></p>			
PIN #	Function	Color	Notes
1			
2			
3	ASD Relay Control	BN/WT	Ground to ASD relay
4			
5	MDS SOL Control No.7	BR/OR	N/A
6	MDS SOL Control No.1	BR/WT	N/A
7			
8	NVLD (Vac Leak Detection)	VT/GY	(POLICE/SRT8 EXCEPT EXPORT)
9	Driver rear O2 heater	BN/WT	Cct Removed
10	Passenger rear O2 Heater	BN/GY	Cct Removed

11	Air Conditioner Clutch Control	LB/OR	Grounds A/C Relay
12			
13			
14	Brake Switch #2 Signal	LB/DG	Brake Switch
15			
16	APPS #1 return	BN/YL	Gas Pedal Pin 4
17	APPS #2 return	BN/VT	Gas pedal Pin 3
18			
19	ASD Relay output	BN/WT	12v from ASD relay
20	EVAP Purge Control	DB/OR	Connect to purge solenoid.
21			
22			
23	Brake Switch Signal	DG/WT	Brake Switch to Ground. See. <i>This is TCC lockup for 545RFE.</i>
24			
25	APPS #1 Signal	BN/WT	Gas Pedal Pin 5
26			
27			
28	ASD Relay output	BN/WT	12v from ASD Relay Output
29	Evap Purge Return	DB/BR	Connect to Purge solenoid.
30			
31			
32			
33	Engine Oil Temp	VT/YL	C100 Pin 15
34			
35	NVLD (Vac Leak Detection)	VT/WT	Not used
36	APPS #2 Signal	WT/BR	Gas pedal Pin 2
37	Fuel Pump Relay Control	BN	Fuel Pump Relay Activate, Pin 86 FP Relay.
38	Starter Relay Control	DG/OR	Activate Start, Pin 86 Start Relay.



### Main Wiring System

The main wiring system comprises the fuse panel and associated circuits. The fuse panel is mounted in the upper right kick panel. Additional circuits are on the LHS kick panel, supplying fused BATT and IGN supplies to various modules.

The following information describes the fuse panel, the circuits and their distribution.

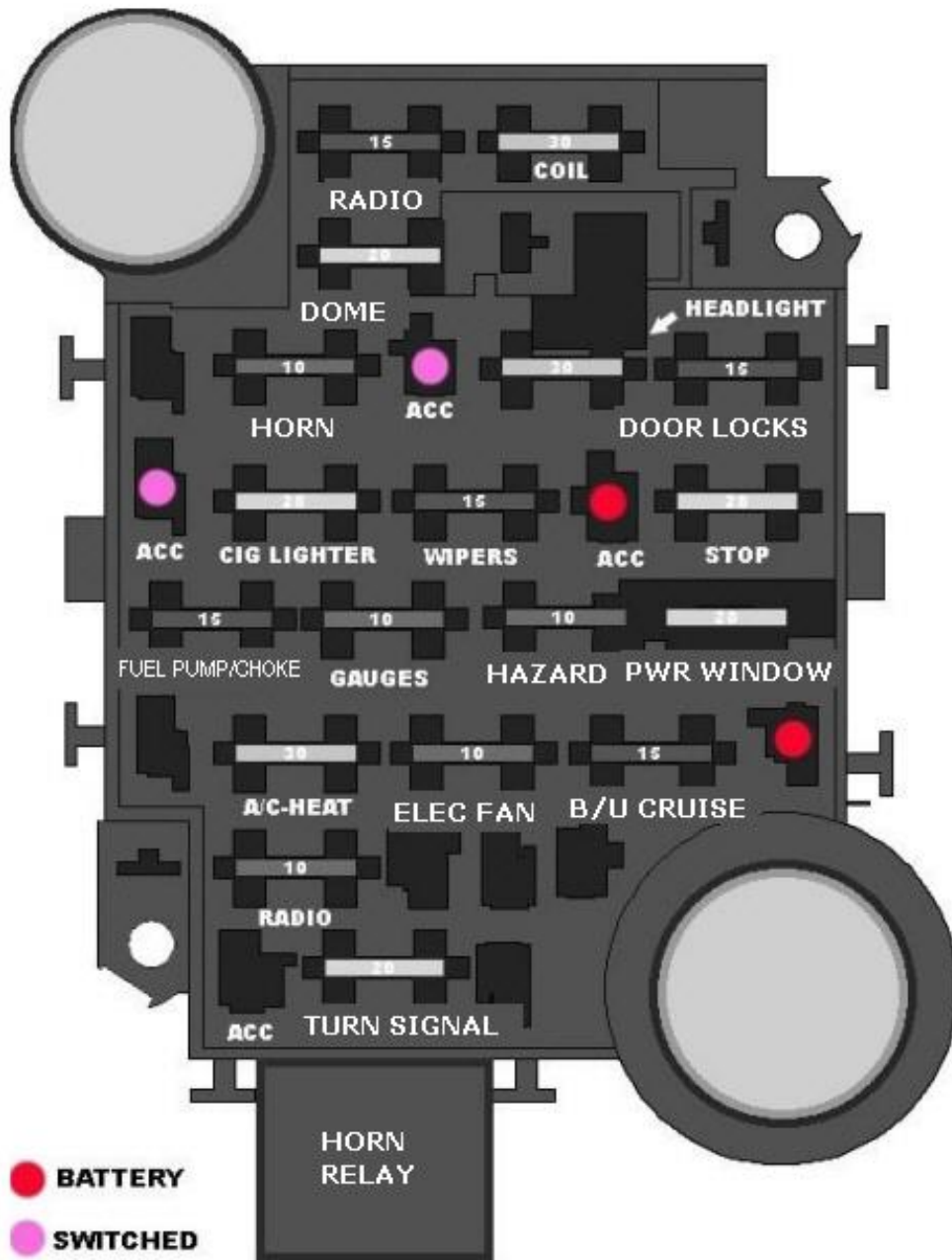


Figure 5 - Fuse Panel

Fuse Information

<b>Table 7. Fuse Ratings</b>			
<b>Circuit</b>	<b>Amps</b>	<b>Circuit</b>	<b>Amps</b>
Radio	15	FP/Choke	15
Coil	30	Gauges	10
Dome	20	Hazard	10
Horn	10	Power Window	20
Headlight	30	AC/Heat	20
Door Locks	15	Elec Fan	10
Cig Lighter	20	B/U Cruise	10
Wipers	15	Radio	10
Stop	20	Turn Signal	20

<b>1amp Black</b>	
<b>2amp Grey</b>	
<b>3amp Violet</b>	
<b>4amp Pink</b>	
<b>5amp Biege</b>	
<b>7.5amp Brown</b>	
<b>10amp Red</b>	
<b>15amp Blue</b>	
<b>20amp Yellow</b>	
<b>25amp Clear</b>	
<b>30amp Green</b>	
<b>40amp Amber</b>	

Figure 6 - Fuse Colours

Wiring Table

<b>Table 8. Main Wiring Table</b>			
<b>Color</b>	<b>Connect to</b>	<b>Wire Starting Point</b>	<b>Destination</b>
	<b>Cooling Fan</b>		
GY	Elec Fan	Fuse Panel	Pin 86, Fan Relays
BK then VT	AC/Heat	Fuse Panel	Vintage Air DCC-2200 Climate Control Ign. source
	<b>Fuel Pump</b>		
PK	FP Relay Power	Fuse Panel	FP Relay <b>PK</b>
BN/WT	FP Out	FP Relay	FP
	<b>Tow Pro</b>		

<b>Table 8. Main Wiring Table</b>			
<b>Color</b>	<b>Connect to</b>	<b>Wire Starting Point</b>	<b>Destination</b>
TN	Cigarette Lighter B+	Fuse Panel	Tow Pro Power (BK).
	<b>Wiper</b>		
BL	Wiper Switch +12v	Fuse Panel	Wiper Switch
	<b>DIMMER SWITCH SECTION</b>		
BL	Dimmer Switch	Headlight Switch	Dimmer Switch
GN	Dimmer Switch High Beam	Dimmer Switch	Headlights
TN	Dimmer Switch Low Beam	Dimmer Switch	Headlights
	<b>LHS DOOR SECTION</b>		
YL	Door Lock +12v	Fuse Panel, 30A	LHS door lock power. Connects to Pin 86 and 30, LHS Door Lock Relay.
YL	Power Window +12v	Fuse Panel	Power Windows. LHS power window power is YL/BK and labelled <i>Right Door Lock</i> .
BL/WT	Left Door Lock trigger	Remote Door Lock module	Pin 85 LHS Door Lock Opener relay.
YL/BL	Boot Lock	Boot Lock Switch	Supplied by Left Door Lock power. Also connects to Pin 86 and 30 of Trunk Lock Relay (in door).
	<b>RHS DOOR SECTION</b>		
YL	Door Lock +12v	Fuse Panel	Door Locks. Connects to Pin 86 and 30, RHS Door Lock Relay.
YL	Power Window +12v	Fuse Panel	RHS Power Window power.
GN/WT	Door Lock trigger	Remote Door Lock module	Pin 85 RHS Door Lock Opener relay.
	<b>Brake Switch</b>		
OR	Brake Switch B+	Fuse Panel	Brake Switch.
WT RD LB/DG DG/WT OR	Brake Switch Brake Switch Brake Switch Brake Switch Brake Switch	Brake Switch Brake Switch Brake Switch Brake Switch Brake Switch	Rear Section Brake Lights Tow Pro Brake Brake Switch #2 Signal, C3/14 Brake Switch Signal, C3/23 Shifter
	<b>ENGINE SECTION</b>		
WT	Alternator Exciter	Fuse Panel	Unfused Ign/Acc Source not used

<b>Table 8. Main Wiring Table</b>			
<b>Color</b>	<b>Connect to</b>	<b>Wire Starting Point</b>	<b>Destination</b>
RD	Alternator B+	Starter Solenoid	Alternator
RD/WT	Battery Positive at Starter Solenoid (Large Terminal)	Starter Solenoid	100A Circuit Breaker on Firewall.
RD	Main Battery Supply	100A Cct Breaker	Fuse Panel
LG	Temperature Sending Unit	Temp Sender	Temp Gauge. Not used with BIM.
LB/BK	Oil Pressure Sending Unit	Oil Pressure Gauge	Oil Press. Not used with BIM.
VT/WT	Tachometer Source from Injector #7	Inj #7	PCS Trans Control (not required if using CAN BUS)
	<b>Misc</b>		
RD	Choke Power.	Fuse Panel	Ign/Acc Source. Same circuit as Fuel Pump Power.
RD	Alt Power	Fuse Panel	Unfused Batt Power. Used for Relay Source via 4-Way Fuse Panel.
GN	Backup Lights Power	Fuse Panel	Not used. Terminates in a 2 pin W/P under centre dash. Paired with GY/WT to Tail Section (see Reversing Camera, Tail Section).
PK	Dash Cam Power	Ignition/Fuse Panel	Terminates at a 3 pin W/P for Ign Power Dash Cam/Mirror. Connects the 12V to 5V power supply for DashCam Mirror. LHS glove box lid.
	<b>HEADLIGHT SECTION</b>		
GN	Horn B+	Horn Relay	Fuse Panel
BL	Right Front Turn Signal	Turn Signal Switch	RF Turn
LB	Left Front Turn Signal	Turn Signal Switch	LF Turn
BN	Taillights	Headlight Switch	Rear Taillights
BN	DRL	DRL in Headlights	Reverse Light Power (GN) under dash at 2 pin W/P.
LG	High Beam	Dimmer Switch	Headlights
TN	Low Beam	Dimmer Switch	Headlights

<b>Table 8. Main Wiring Table</b>			
<b>Color</b>	<b>Connect to</b>	<b>Wire Starting Point</b>	<b>Destination</b>
RD	Headlight Switch B+	Fuse Panel	Headlight Switch
BN	Headlight Switch Instr Panel Lighting	Headlight Switch	Instrument Panel Lights
	<b>IGNITION SWITCH SECTION</b>		
PK	Ignition Switch	Fuse Panel	Ign Source (On, Start)
BN	Ignition Switch Accessory	Ign Switch	Fuse Panel (Acc, On)
OR	Ignition Switch Accessory	Ign Switch	Fuse Panel (Acc, On)
RD	Ignition Switch B+	Fuse Panel	Ign Switch BATT +12v
VT	Ignition Switch Start	Ign Switch	Start Relay pwr (Start)
	<b>INSTRUMENT PANEL SECTION</b>		
RD	Voltmeter Source & Gauges B+	Fuse Panel	DD CP Acc Power
GN	High Beam Indicator	Dimmer Switch	Idiot Light, DD CP
LB	Left Turn Indicator	Turn Signal Switch	Left Front Turn Sig. DD CP Left Turn
BL	Right Turn Indicator	Turn Signal Switch	Right Front Turn Sig. DD CP Right Turn
BN	Instrument Panel Lighting	Headlight Switch	DD CP Dash Lights
PK	Fuel Gauge	Fuel Sending Unit	DD CP Fuel Gauge
LG	Temperature Gauge	Temp. Sending Unit	Not Used with BIM
LB	Oil Pressure Gauge	Oil Pres. Sending Unit	Engine Section
VT/WT	Tachometer.	Inj #7	Engine Section
	<b>RADIO SECTION</b>		

<b>Table 8. Main Wiring Table</b>			
<b>Color</b>	<b>Connect to</b>	<b>Wire Starting Point</b>	<b>Destination</b>
RD	Radio B+ Unswitched (Constant)	Fuse Panel	Radio Section
RD	Radio B+ Switched	Fuse Panel	Radio Section
	<b>TAIL SECTION</b>		
LB	Trunk Accessory Light B+	Fuse Panel	Trunk (not used)
BN/WT	Fuel Pump B+ (changes to Gn)	FP Relay	Fuel Pump
GN	Right Rear Turn Signal	Turn Signal Switch	Rear Turn Signal Section. Connect to RD wire of indicator.
YL	Left Rear Turn Signal	Turn Signal Switch	Rear Turn Signal Section. Connect to RD wire of indicator.
PK	Fuel Sending Unit	Fuel Gauge	Instrument Panel Section
BN	Tail Lights	Headlight Switch	Taillights. Connect to BK wire of taillights.
OR	Brake Light	Brake Light Switch	Tail Section. Starts off WT at switch. Connect to RD wire of taillights.
LG	Trailer Lights	Tow Pro	Tail Section Backup Light circuit used for Tow Pro.
YL/BL	Trunk Lock Solenoid	LHS Door Trunk Opener Switch	Pin 87 Trunk Relay.
TN	Trunk Lock Control	Remote Door Lock Ctrl Unit	Starts as BN/BK, then TN/GN then TN. Pin 85
GY/WT, GY/RD	Reversing Lights/Camera	Gear Shift Ind.	From Backup pin on GSS-3000 Decoder (RHS Dash). WT/BL goes to 2 Pin W/P terminal centre dash. Connects to GY/WT then GY/RD to trunk. Reverse power for reverse camera.
	<b>eStopp Handbrake</b>		
WT	Dome Lights B+	Fuse Panel	eStopp Batt Power (RD)
GN	Gauges B+	Fuse Panel	DD Gauges CP. This is the safety Ign connection for the eStopp.
	<b>TURN SIGNAL SECTION</b>		
BN, Ididit BN	Emergency Flasher Switch B+	Emer. Flasher Relay	Fuse Panel

<b>Table 8. Main Wiring Table</b>			
<b>Color</b>	<b>Connect to</b>	<b>Wire Starting Point</b>	<b>Destination</b>
VT Ididit VT	Turn Signal Switch Flasher B+	Turn Flasher Relay	Fuse Panel
BK Ididit GN	Horn Switch	Horn Relay	Fuse Panel
GN Ididit GN	Turn Signal Switch	Right Rear Turn Signal	Tail Section
YL Ididit YL	Turn Signal Switch	Left Rear Turn Signal	Tail Section
BL Ididit Royal BL	Turn Signal Switch	Right Front Turn Signal	Headlight Section
WT	Turn Signal Switch	Terminated at steering column plug	Not Used
LB Ididit LB	Turn Signal Switch	Left Front Turn Signal	Headlight Section
	<b>CRUISE CONTROL SECTION</b>		
PK	Cruise Power	Fuse Panel	Under dash, Backup/Cruise fuse, supplies Ign power for AP900 Cruise Control. Spare outlet under RHS of dash.
	<b>TCM PCS 2800</b>		
RD	Batt Connection on Fuse Panel (see Figure 5 - Fuse Panel)	Batt	PCS 2800
YL	Ign (Start/Run) Connection	From Coil circuit (PK) in fuse panel.	PCS 2800
	<b>GSS-3000 Gear Position</b>		
PK	Start/Run power	From TCM Ign (Start/Run) supply.	GSS-3000 Ign terminal. Must be Start/Run power so that Start Relay control is grounded when starting via the Safety terminal.

## Relays and Fuse Panels

In addition to the general wiring fuse panel are the additional circuits supplying power and switching services to a variety of modules. These are on the LHS kick panel, supplying fused BATT and IGN supplies to various modules.

### 4 Way Fuse Panels

There are two 4 way fuse panel is mounted under the left side kick panel.

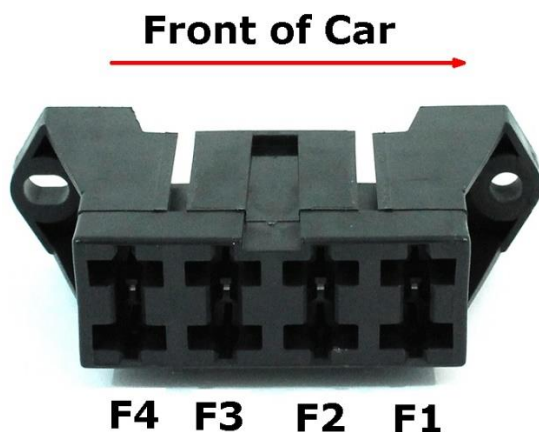
- FP1: This fuse bus is fed from the Alt Power supply from the main fuse panel.
- FP2: This is a 4 way fuse panel with two relays mounted on top.

#### *FP1 Fuses*

The four fuses in FP1 are allocated as follows:

- F1: Pin 30 Fused Power for ASD Relay Power and Pin 30 FP Relay Power.
- F2: Pin 30 Fused Power for Start Relay Power/Park Lights Flasher Relay Power.
- F3: Pin 30 Fused Power for A/C Relay Power.

F4: +12V Fused Batt supply for PAC-2750 Cooling Fan Module (5A recommended), Batt supply for the DCC 2200 Climate Control Module (Fan Control Module) and the BIM 01-2 OBD2 J1850/CAN Interface Module.



*Figure 7 - 4 Way Fuse Panel FP1*

#### **4 Way Fuse and Relay Panel FP2**

Under the 4 Way Fuse panel is a 4 Way Fuse and Relay Panel designated FP2. The fuses are numbered F5, F6, F7 and F8 in the same manner as the first one. The two relays are the Cooling Fan Hi and Cooling Fan Lo relays.

#### *FP2 Fuses*

- F5: FAN HI Relay Power (RD, 30A).
- F6: FAN LO Relay Power (RD, 30A).
- F7: Batt power to the DLC plug (WT, 5A)
- F8: Batt power to the PCM (RD, C1, 29) and TCM (RD/WT to PCS TCM-2800, 5A).



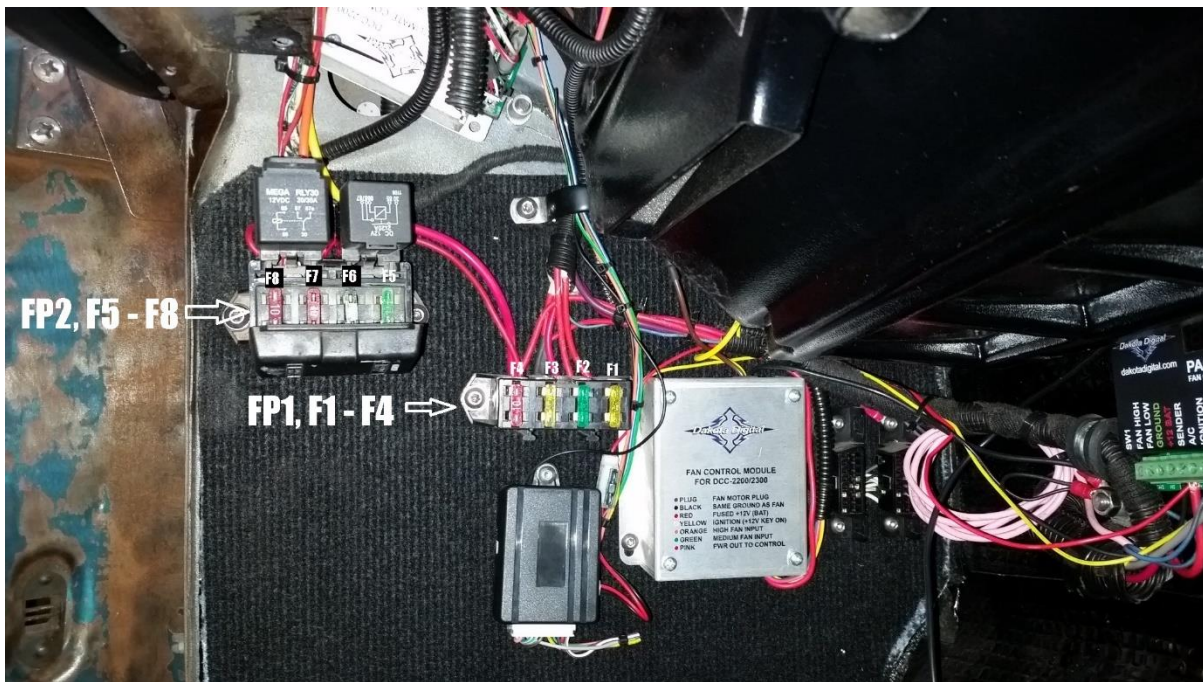


Figure 8 - Fuse Panels, Port Side

### Relays

The relays are all wired in accordance with the following diagram:

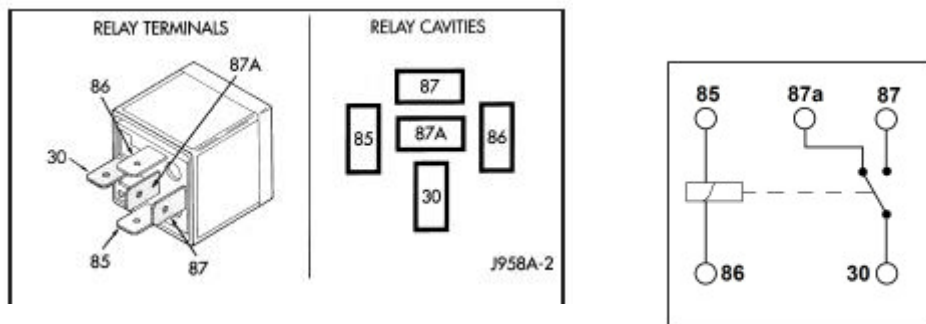


Figure 9 - Relay Cavities (from factory manual)

- Pin 30 – High Power Feed (fused)
- Pin 85 – Relay Coil
- Pin 86 – Relay Coil
- Pin 87 – High Power Out, Normally Closed contact (NC)
- Pin 87a – High Power Out, Normally Open contact (NO)

The following relays are mounted left to right under the left-hand side of the dash:

- Cruise Control Brake Switch
- Fuel Pump
- Auto Shut Down (ASD)
- Starter
- A/C
- Spare

- Brake Light Switch Relay

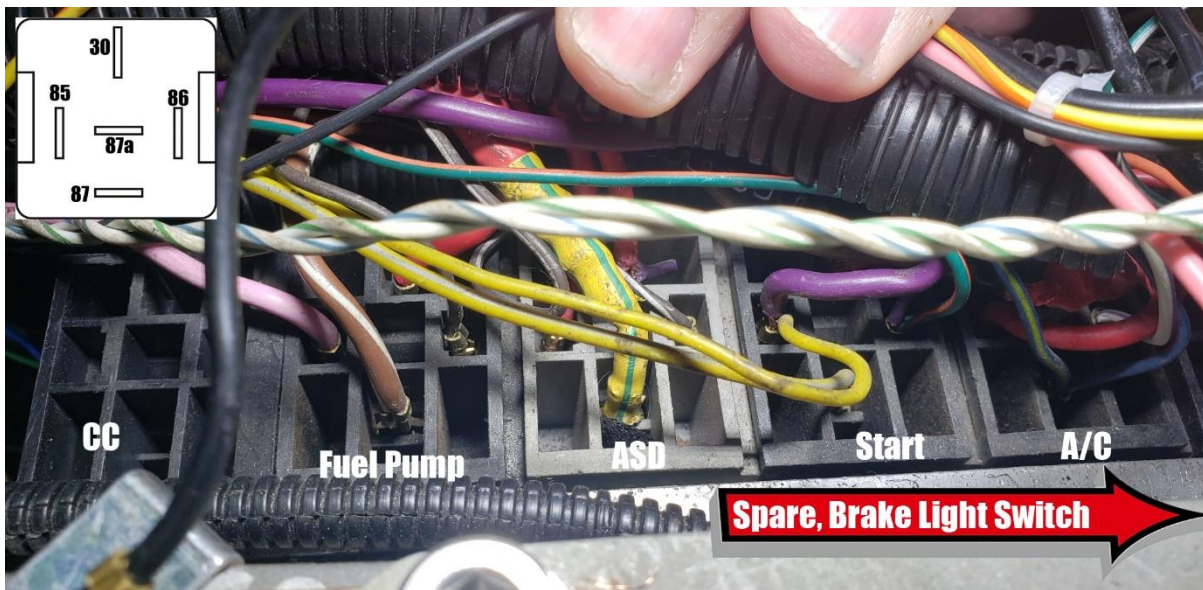


Figure 10 - Main Relays, showing pinouts from the top. Last two relays, Park Lights and Brake Switch Relay, not in picture.

Other relays mounted elsewhere include:

- Horn Relay. Mounted under the RHS of the dash.
- Cooling Fan Relays. On left kick panel.

*Cruise Control Brake Relay*

The BN/WT wire reads ground through the brake light bulbs when the brake pedal is released and 12 volts when the brake pedal is pushed. With the use of LED brake lights, this is not possible, so a 5 pin relay is used.

Table 1.	Table 2. Cruise Control Brake Relay			
	Pin		Circuit	Function
	30	BN/WT	BN/WT Wire from CC	Gnd Signal when brake switch OFF. 12V when Brake Switch ON
	85	OR	Brake Switch Out	From Pin 85 Brake Switch Relay
	86	BK	Ground	Ground
	87	PK	Brake Switch Supply	Any Ign Source
	87A	BK	Ground	Ground

*Fuel Pump Relay*

The fuel pump is energized through the fuel pump relay by the PCM. The fuel pump will operate for approximately three seconds when the ignition is ON, then only operates when the engine is operating, or the starter motor is engaged.

Table 3. Fuel Pump Relay			
	Pin	Circuit	Function
	30	FP Relay Power	RD from ASD Fuse F1 (FP1 Fuses).
	85	FP Relay Coil	Start/Run (PK) from Coil+ Main Fuse Panel (labelled Coil).
	86	Control	Control ground from FP Control (BR).
	87	Fuel Pump	BN/WT FP Power to FP (changes to Green unlabelled wire halfway along)

*ASD Relay*

The Automatic Shutdown Relay, (ASD relay) is responsible for supplying switched 12-volt power to the injectors and ignition coils. Also supplies power to pins 11 and 12 of C1, PCM.

Table 4. Auto Shut Down (ASD) Relay			
	Pin	Circuit	Function
	30	Batt +12v	Fused Batt +12v from F1, FP1 Fuses.
	85	Control power	Batt +12v (link to Pin 30).
	86	ASD Relay Command	from Pin 3 C3 (BN/WT).
	87	ASD Out	To C100 Pin 9 (BN/YL, injector and coil power) and C3 Pin 19 and Pin 28 (BN/WT).

**Note: ASD control will switch on for a few seconds at key on, then turn off until it sees a crank signal.**

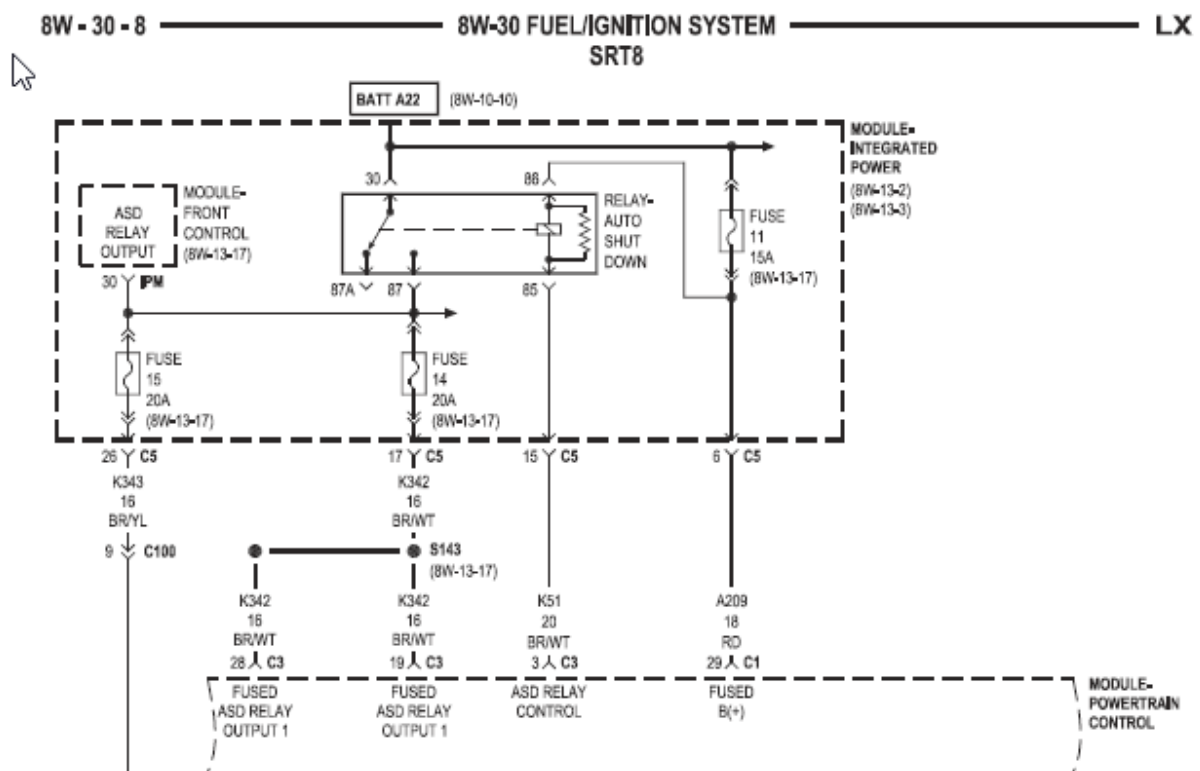


Figure 11 - ASD Relay Cct Diagram

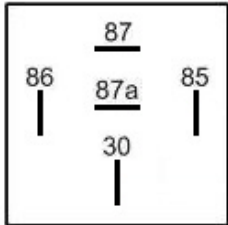
*Starter Interlock*

The Starter Relay Control signal goes to ground when conditions are right to start the car. Conditions are:

- **Auto Trans in Park or Neutral.** The TCM monitors a contact switch wired in series with the transmission temperature sensor to determine PARK and NEUTRAL positions. The contact switch is open in PARK and NEUTRAL. The TCM senses transmission temperature as high (switch supply voltage), confirming switch status as open.
- **Near zero engine speed (RPM).**

The TCM then broadcasts a message over CAN bus to confirm switch status. The PCM receives this information and allows operation of the starter circuit.

**NOTE: The Start signal is processed by the FCM. If the FCM is not fitted, the CAN BUS Start cannot be used. Disable the CAN BUS Start with HP Tuners.**

<b>Table 5. Starter Relay</b>			
	<b>Pin</b>	<b>Circuit</b>	<b>Function</b>
	30	Relay Power	Battery +12v constant from F2 (FP1 Fuses).
	85	Start Power	Purple wire from Start on Ignition Switch, and YL wire to Pin 30, C1.
	86	Control	Starter Relay Control, <del>C3 Pin 38</del> , DG/OR from Safety connection on GSS-3000. <b>NOTE:</b> Can use DIG IN 10 of TCM 2800 instead. See <b>Spare Assignments</b> on 83.
	87	Start	Starter Solenoid YL/GY

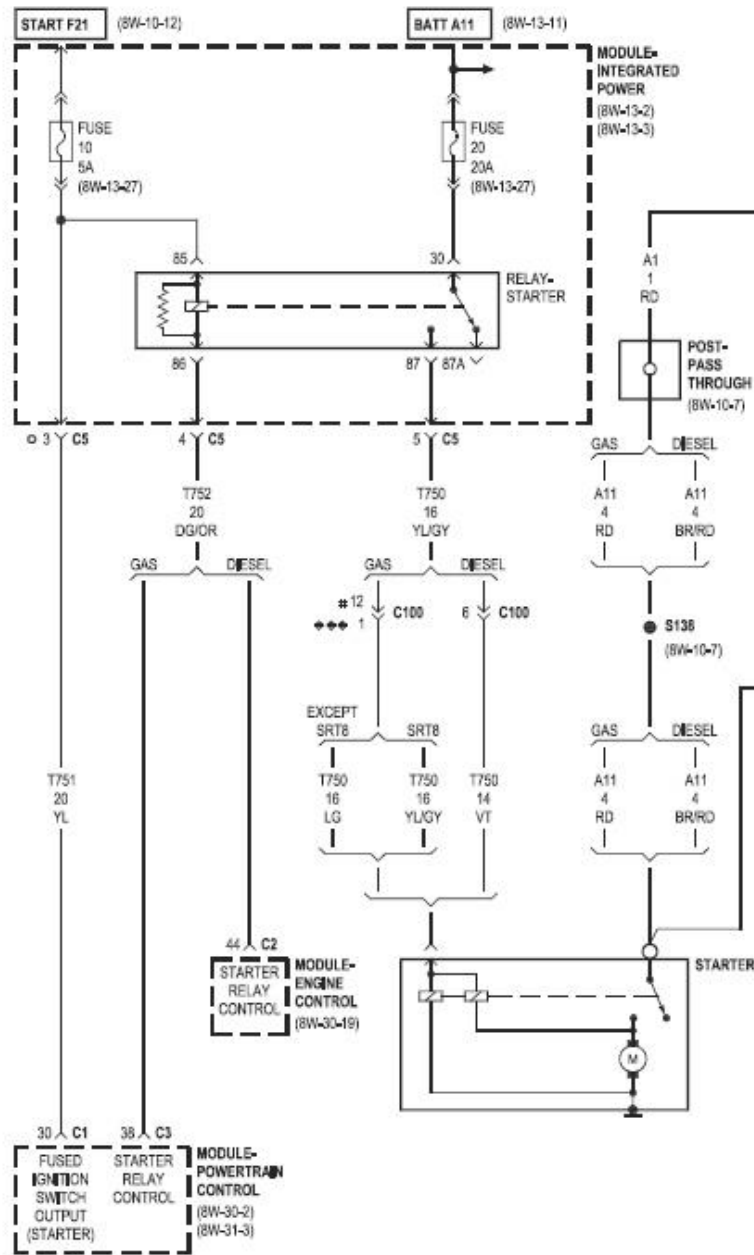


Figure 12 - Start Relay Factory Wiring

*Air Con Relay*

See wiring diagram for Dakota Digital Climate Control DCC-2200.

<b>Table 6. A/C Relay</b>			
	<b>Pin</b>	<b>Circuit</b>	<b>Function</b>
	30	Relay Power	A/C Relay Power in from F4 Batt fuse.
	85		Jumper to Pin 30
	86	Control	Control ground from A/C post of DCC-2200.
	87	A/C Engage	To compressor Safety Switch.

**DCC-2200 / DCC-2300  
CLIMATE CONTROL MODULE  
for Vintage Air Gen II Modules  
Wiring for Hudson SRT-8**

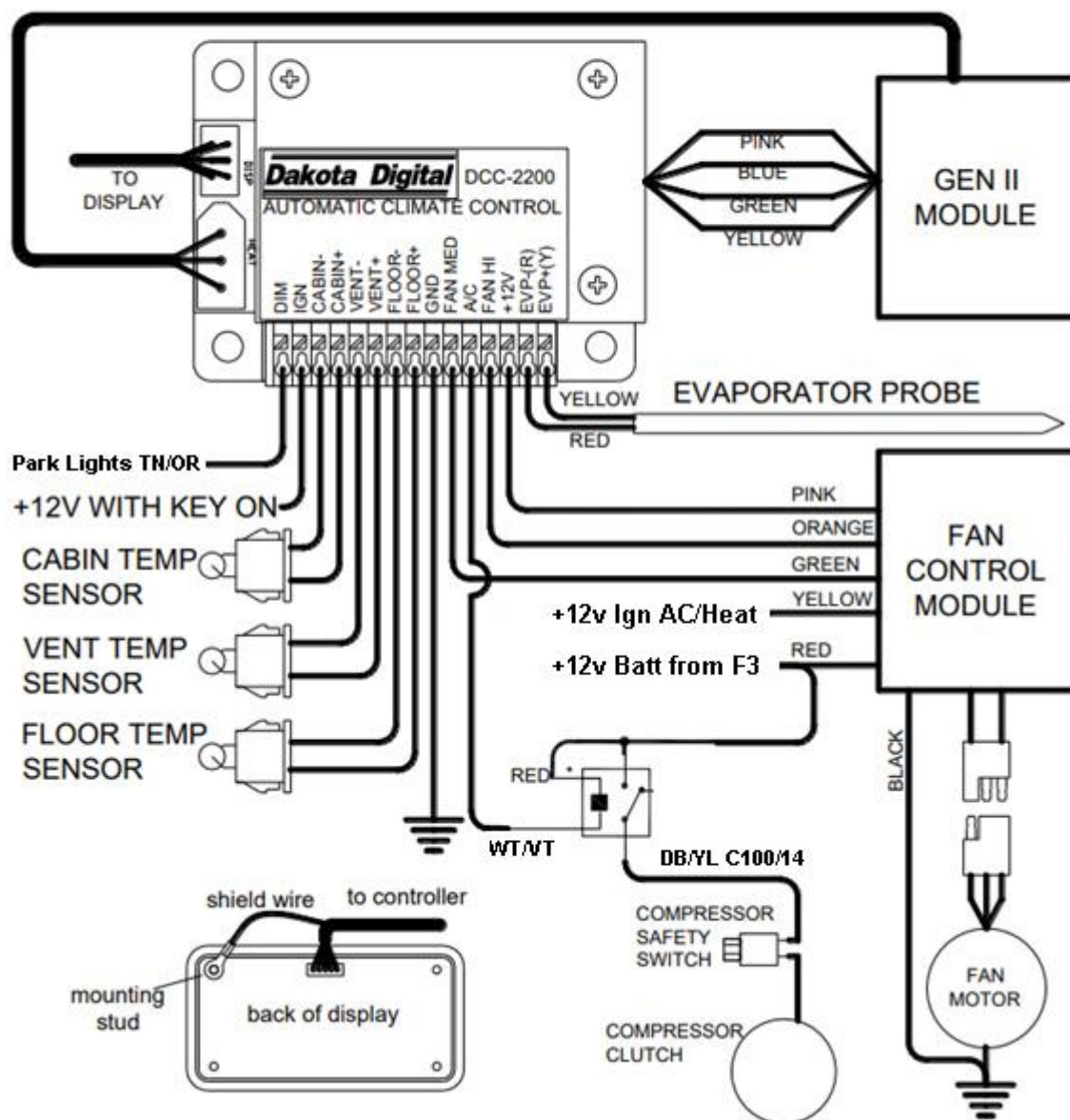
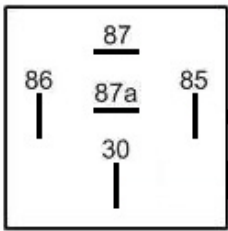


Figure 13 - Vintage Air DCC 2200 Climate Control

*Door Lock Safety Relay*

	Pin	Circuit		Function
	30	Batt +12v	RD	Fused Batt +12v from 4 way fuse F2 (Starter Relay Power)
	86	Ign +12v	PK	Control
	85	Gnd	BK	Gnd
	87			
	87a	Digitech Power	YL	NC Terminals open when Ign <b>ON</b>

The Door Lock Safety relay isolates power to the Digitech 4 Channel Wireless Relay when ignition is ON. This ensures the wireless door locks cannot be activated until ignition is OFF.

*Brake Switch Relay*

**The Brake Switch used is a Hydraulic Stop Light Switch 3/8" UNF Brake Light Imperial. Lucas Type SPB401 hydraulic brake light switch MG Mini Jaguar Triumph. JAGUAR E TYPE DAIMLER XK C16062.**

The Hydraulic Brake Switch screws directly into the front or rear brake line port in the master cylinder. In this project, the brake line ports are on both sides of the M/C.

Brake Switch power comes from +12V from the STOP fuse in the fuse panel. The switch supplies the BRAKE SWITCH SIGNAL to the following circuits:

- Brake Lights
- TCM
- PCM (Brake Switch #1 relay and Brake Switch #2)
- Shifter
- Tow Pro

**P0571-BRAKE SWITCH 1 PERFORMANCE**

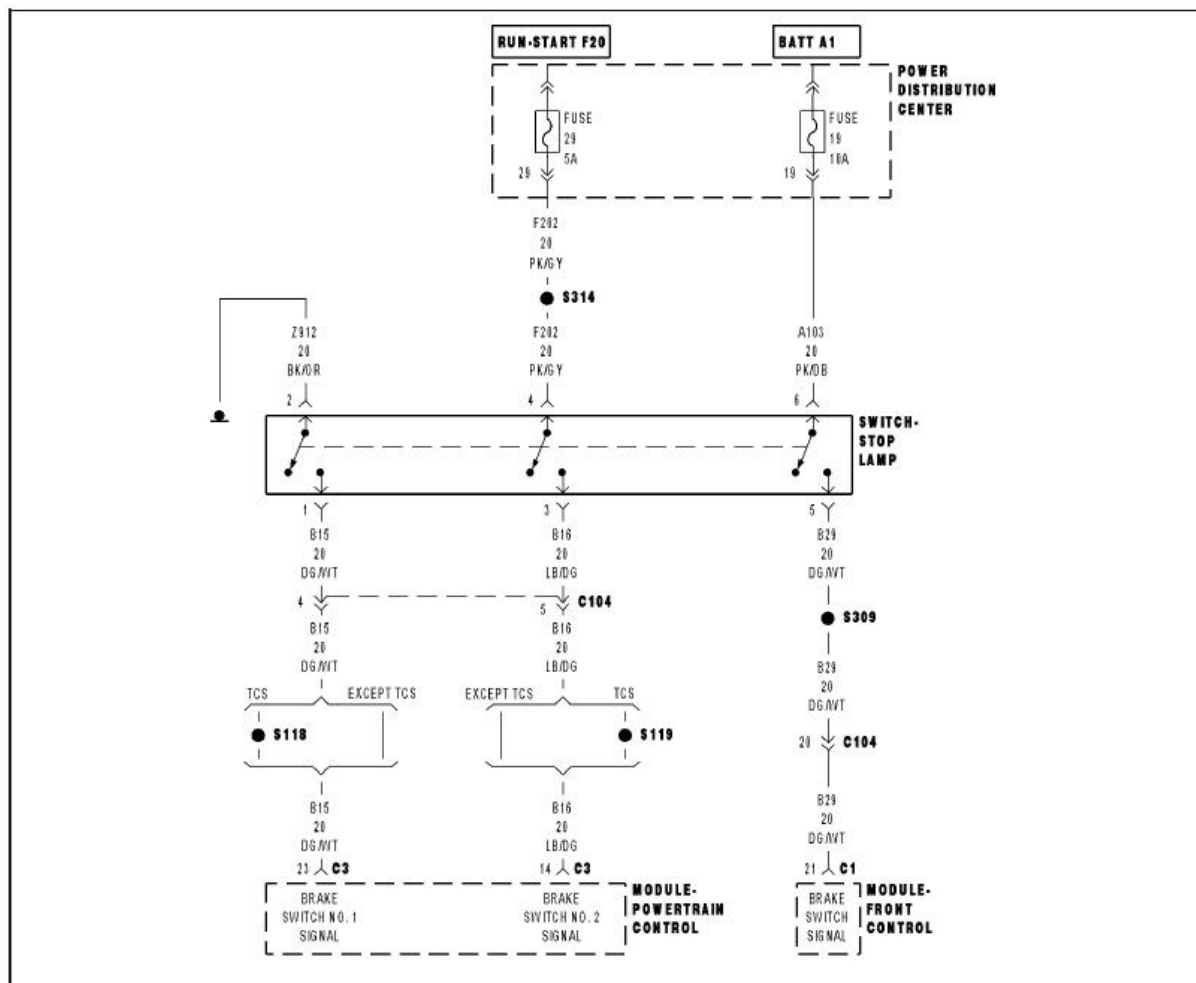


Figure 14 - Brake Switch 1 Circuit

**Note: Brake Switch #1 signal is a ground, and Brake Switch #2 signal is +12v.**

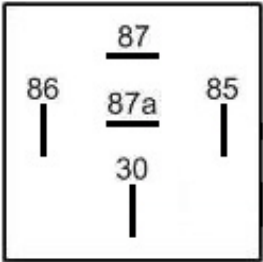
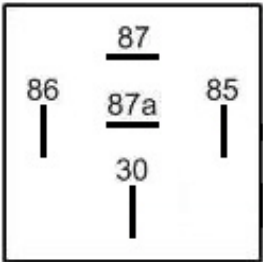
To provide a Ground signal for Brake Switch #1, a relay is used.

	Pin	Circuit	Colour	Function
	30	Ground	BK	Ground
	86	Ground	BK	Ground
	85	Brake Switch #1	OR/BK	Control. From Brake Switch
	87	Ground	DG/WT	Ground o/p to C3/23



### Cooling Fan Relays

The cooling fans are controlled with the Dakota Digital PAC-2750 Fan Controller (see page 41) via two relays located on the left kick panel.

Table 9. Cooling Fan Relays			
Fan 1	Pin	Circuit	Function
	30	Fan 1	Fan Power Out to Fan 1
	85	Fan Lo Ctrl	WHT to PAC-2750 Lo
	86	Batt Relay Power	Fused BATT from Fuse Panel
	87	Batt +12v	Fan Power In for Fan 1
Fan 2	Pin	Circuit	Function
	30	Fan 2	Fan Power Out to Fan 2
	85	Fan Hi Ctrl	WHT to PAC-2750 Hi
	86	Batt Relay Power	Fused BATT from Fuse Panel
	87	Batt +12v	Fan Power In for Fan 2

### Sensor Wiring

This section deals with the engine management sensors and actuators and their associated wiring.

#### Oxygen Sensors

Only the FRONT oxygen sensors are used.<sup>1</sup>

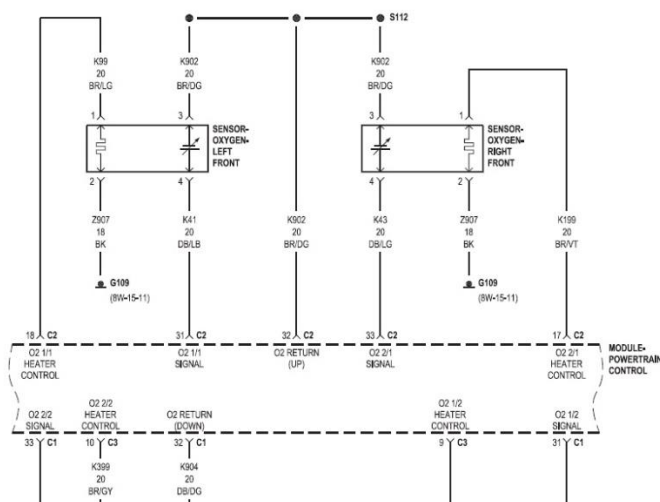
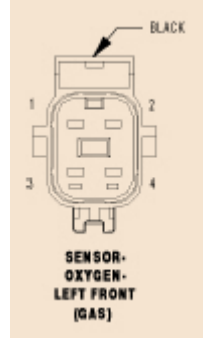

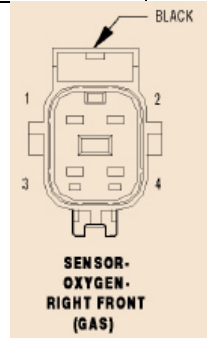


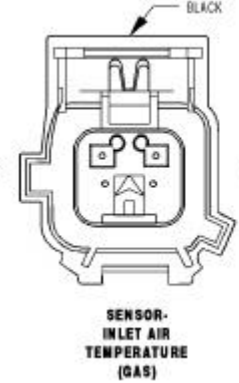
Figure 15 - O2 Sensors Circuit Diagram

<sup>1</sup> NTK/OEM O2 sensors are recommended. Bosch sensors are random Use the AEM X series, LSU 4.9.

<b>Table 10.</b>		<b>O2 Sensors</b>		
 <p>SENSOR-OXYGEN-LEFT FRONT (GAS)</p>				<p>These are O2 sensors for Dodge Chrysler Jeep SG1849 Upstream and Downstream. The factory connector was removed from the harness and the O2 sensors and replaced with 4 pin Weatherpacks (O2 sensor is female). The wires are as follows:</p> <p>Pin A WT (Heater)                      Pin B WT (Heater)                      Pin C GY (Gnd)                      Pin D BK (O2 Signal)</p>
O2 Pin	PCM Pin	Function	Colour	Notes
A	C2/18	O2 1/1 Heater Control	BR/LG	A
B		Gnd	BK	B
C	C2/32	O2 Return	BR/DG	C
D	C2/31	O2 1/1 Signal	DB/LB	D
 <p>SENSOR-OXYGEN-RIGHT FRONT (GAS)</p>				
A	C2/17	O2 2/1 Heater Control	BR/VT	A
B		Gnd	BK	B
C	C2/32	O2 Return	BR/DG	C
D	C2/31	O2 2/1 Signal	DB/LG	D

**Air Filter and IAT Sensor**

Because of the custom setup, a cold air intake is the most likely solution to fabricating an air filtration system. An IAT sensor must also be installed in the intake somewhere. The factory IAT is HEMI OEM IAT Sensor 4606487AB but it is not easy to adapt. A screw-in type would be much better, so a Dodge Caliber (p/n 56027872) seems like a good screw-in option (1/4 x 28 thread). The Connector Repair Kit part number is 5017119AA.

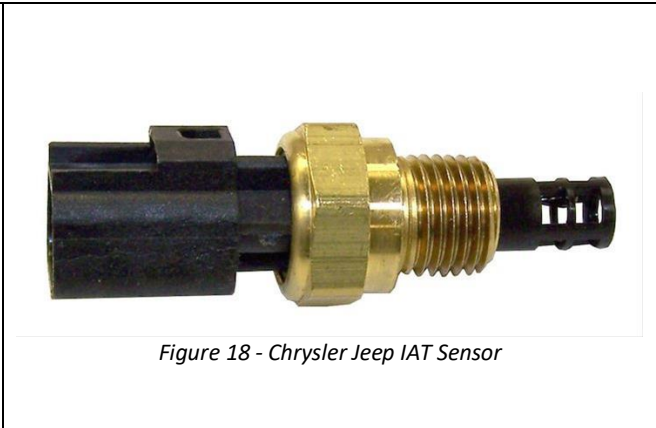
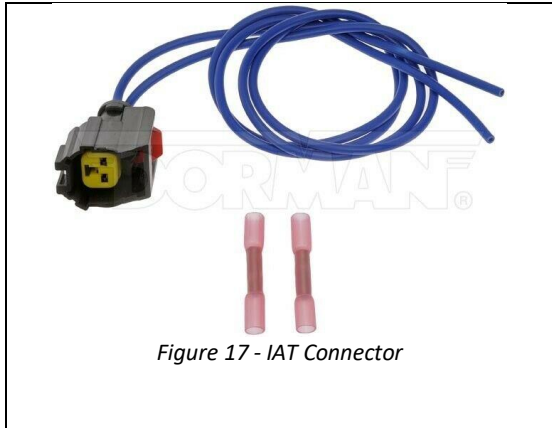


SENSOR-INLET AIR TEMPERATURE (GAS)

SENSOR-INLET AIR TEMPERATURE (GAS) - BLACK 2 WAY

CAV	CIRCUIT	FUNCTION
1	K21 20DB/LG	IAT SIGNAL
2	K900 20DB/DG	SENSOR GROUND

Figure 16 - IAT Pinouts



## Evap Purge Control

The fuel tank vent hose is routed from the fuel tank to the rear underside of the car, then along to where the activated charcoal-filled canister is mounted.



Figure 20 - Evap Purge Canister



Figure 21 - Canister Bracket

From the fuel tank, a 10mm fuel/vacuum hose runs along the chassis rail to the outer rail. It is secured every 10mm – 15mm with insulated P-clamps.

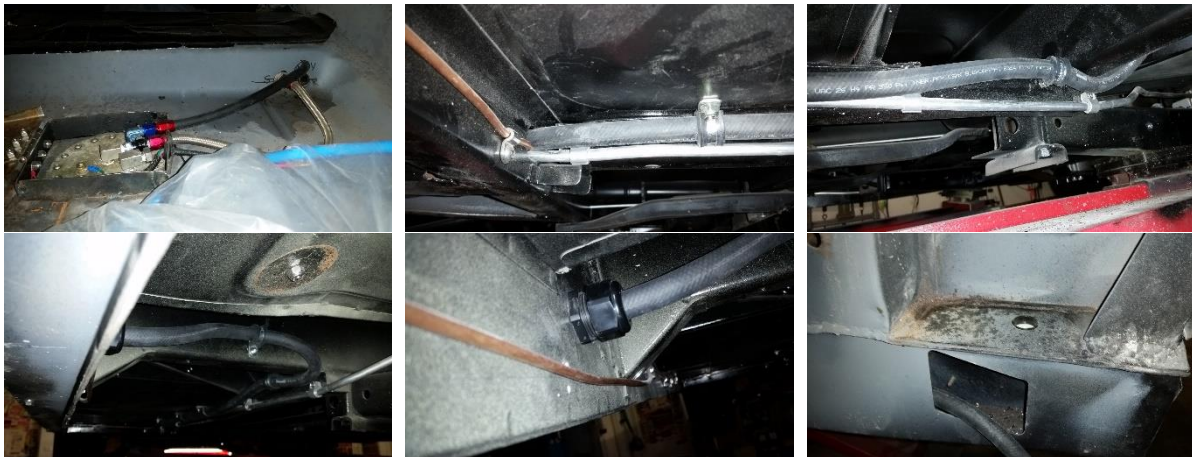


Figure 22 - EVAP Purge Line from Fuel Tank to Canister

The outlet from the canister connects to the Evap Purge Solenoid, which is activated by the PCM.



Figure 23 - Evap Purge Solenoid



Figure 24 - Purge Solenoid Mounted

The Purge Solenoid opens the connection to the engine vacuum, where fumes are then burnt in the engine instead of to the atmosphere.

This is a good emissions device because it ensures fuel vapours are kept to a minimum.

Components used:

- Mercedes Benz ML350 2010 W164 Fuel Vapor Carbon Canister A1644700659 J108
- Chrysler 300C SRT-8 2010 Fuel System Vapor Purge Valve 4891738AA J117

### Crankshaft Position Sensor

The crankshaft position sensor is located at the right rear of the engine block (US version is left rear under the starter motor). The sensor detects the crankshaft position via a hall effect sensor and tone wheel behind the flex plate. The PCM detects TDC position of cylinder 1 by means of the signal supplied by the sensor. Injection timing is synchronized by means of the camshaft signal and the crankshaft signal. This sensor is also used to detect engine speed.

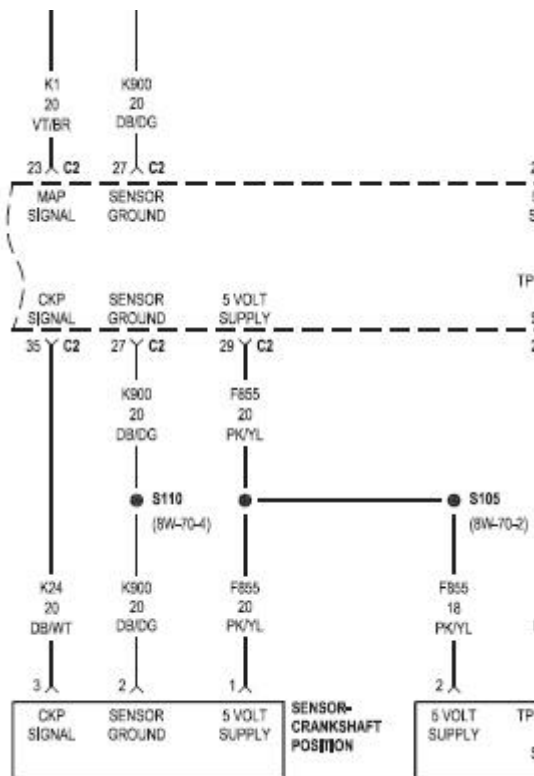


Figure 25 - Crankshaft Position Sensor Circuit Diagram

CKP Connector



SENSOR-CRANKSHAFT POSITION (GAS) - BLACK 3 WAY		
CAV	CIRCUIT	FUNCTION
1	F855 20PK/YL	5 VOLT SUPPLY
2	K900 20DB/DG	SENSOR GROUND
3	K24 20DB/WT	CKP SIGNAL

Figure 26 - Crankshaft Position Sensor Connector Pinout

Camshaft Position Sensor

The Camshaft Position Sensor (CMP) on the 6.1L V-8 engine (1) is bolted to the front/top of the timing chain cover (2).

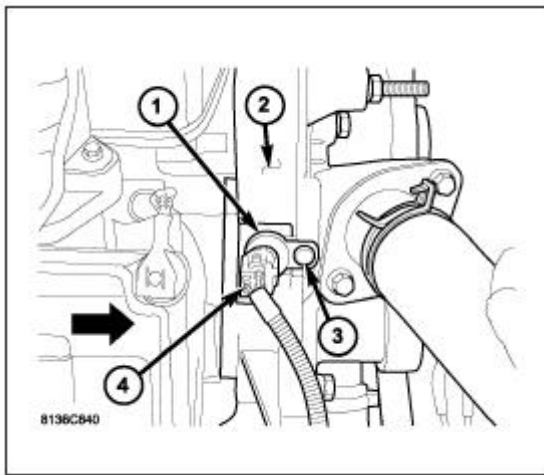
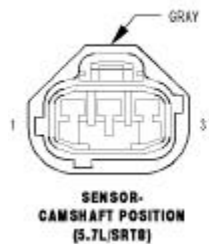


Figure 27 - Camshaft Position Sensor Location

Part Number: ~~MOP-56041584AF~~ – MOP-95019962AA Mopar Replacement Camshaft Position Sensors.

CMP Connector



SENSOR-CAMSHAFT POSITION (5.7L/SRT8) - GRAY 3 WAY		
CAV	CIRCUIT	FUNCTION
1	K44 20DB/GY	CMP SIGNAL
2	K900 20DB/DG	SENSOR GROUND
3	F856 20YL/PK	5 VOLT SUPPLY

Figure 28 Camshaft Position Sensor Connector Pinouts

## Modules

The following modules are a part of the Hudson digital integration:

- Dakota Digital Gauges Module
- PCS TCM-2800 Trans Controller
- Cooling Fan Control: Dakota Digital PAC-2750 Fan Controller
- Dakota Digital Climate Control Module DCC-2200 and Fan Control for DCC-2200
- BIM-01-02 OBD2/CAN Interface
- Electronic Throttle Control (Drive by Wire)
- Cruise Control and APPS Adapter
- eStopp Controller
- Tow Pro
- Remote Door Locks

### Dakota Digital Gauges

Dakota Digital VFD Series 3 Gauge System is the interface between the gauges and their sensors, either directly or via the CAN BUS. See the DD Quick Start Guide and the full Instruction Manual for more details and how to set up and configure the gauges.

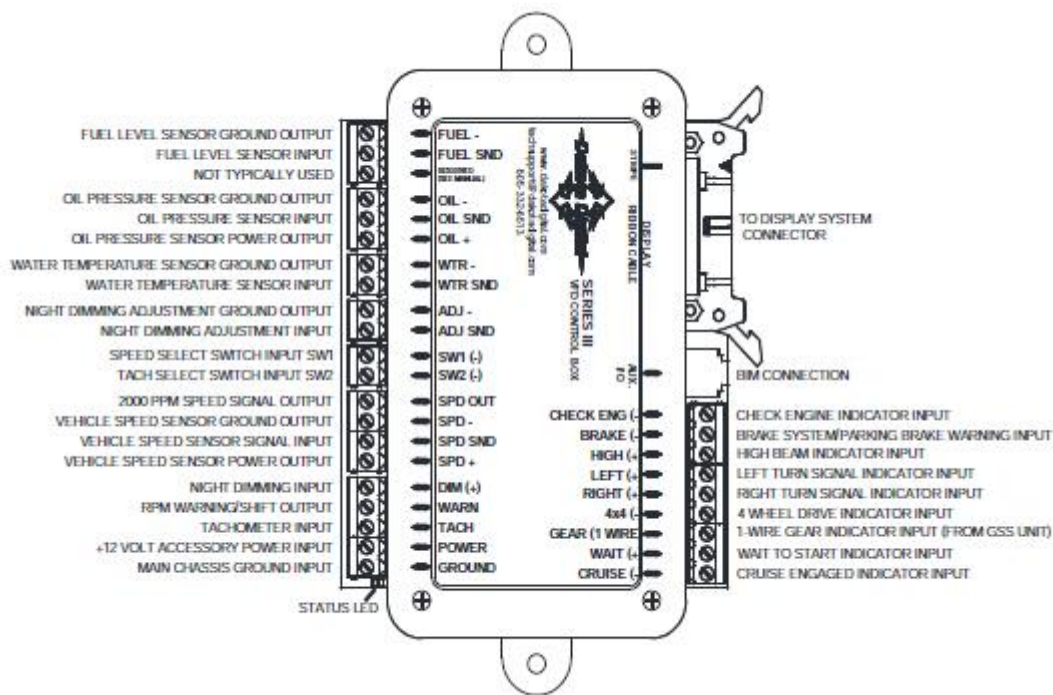


Figure 29 - Dakota Digital VFD Control Box

The wiring for the module is as follows:

<b>Table 11. DD Connector Panel Wiring</b>	
GROUND	Main ground for the display system
POWER	Gauges Power from the fuse panel. Start/Run Power
TACH	Not used. Tach signal comes from OBD2/CAN B US via BIM.
WARN	Not used. Maybe be implemented later. The WARN terminal is ground-activated.

DIM	Connected to tail light circuit (BN). Gauges dim to about ½ brightness when DIM terminal gets +12V. See full instruction manual for more options.
SPD+, SPD-,	Speed Sensor power (5vDC) and Speed Sensor Gnd. Not used.
SPD OUT	Speed signal to auxiliary devices.
SPD SND	Connect VSS Wire (OR/WT) from TCM2800.
SW2 (-) or Tach Switch.	The GN SW2 terminal is used for selecting the various rpm, engine, and warning displays and also for entering the demonstration mode. The SW2 input is activated by a ground connection
SW1 (-) or Speed Switch.	The RD SW1 terminal is used for selecting the various speed, distance, and performance displays and also for entering the setup menu. The SW1 input is activated by a ground connection.
ADJ SND, ADJ -	Dim control. Not used.

### PCS TCM-2800 Trans Controller

The factory trans controller requires several inputs that will be difficult to replicate in a retrofit such as this 49 Hudson project. The Powertrain Control Systems (PCS) TCM-2800 Trans Controller was chosen. In addition, a Tone Ring was included to take the place of the Antilock Brake System (ABS) signal to the TCM.



Figure 30 - TCM Tone Ring

The TCM and Tone Ring were supplied by Sound German Automotive in Bellevue, Wa.

The trans controller requires 12V Battery Power, 12V Ignition and Ground. It is located on the upper right corner of the firewall. The required TCM signals are TPS, RPM, and Shift Position. You can use extra sensors for these signals, but the CAN BUS supplies them all. The TCM-2800 has several optional connectors, but all the CAN BUS inputs are interconnected in the harness. The option connector C2 with pigtail connects directly to the shifter.



### Cooling Fan Control: Dakota Digital PAC-2750 Fan Controller

The temperature signal from the ECT Sensor is connected to C2, Pin 20 (VT/OR) and the actuation of the cooling fan is via the CAN BUS. Control is via the Dakota Digital BIM-01-2 OBD-II (J1850/CAN) Interface BIM2 (see BIM-01-02 OBD2/CAN Interface) and the PAC-2750 Electronic Fan Controller 70 Amp.

The Fan Controller It is located on the firewall under the A/C unit on the left side of the car. +12V Battery Supply is from F4 of the 4-way fuse panel on the left kick panel. Ignition supply comes from the common ignition supply PK wire labelled *Coil*. Ignition Power and Ground for the BIM2 module is tapped into the PAC-2750 *Ign* and *Gnd* connections.

Initial temperature settings are as follows:

- Slow ON: 97° C.
- Slow OFF: 93° C.
- Fast ON: 110° C.
- Fast OFF: 104° C.

#### *Cooling Fans*

The Engine Coolant Temperature determines when the cooling fans start and stop. The factory ECT Sensor signal goes to the PCM on C2, Pin 20 (VT/OR) and is picked up on the CAN BUS for the factory fan control. Without using the CAN BUS, several options are available, all of which entail an extra sensor or just hooking them up to an Ignition source via a relay.

Instead, this project will use the ECT Signal on the CAN BUS via the DD BIM -01-02 OBD2 Interface (see BIM-01-02 OBD2/CAN Interface on Page 42) and the DD Fan Controller PAC-2750 (see Figure 31 - PAC 2750 Wiring). This will provide a dual fan operation and provide up-idle signal for the PCM when A/C is on. The twin cooling fans are energised via the cooling fan relays (see Cooling Fan Relays on Page 33).

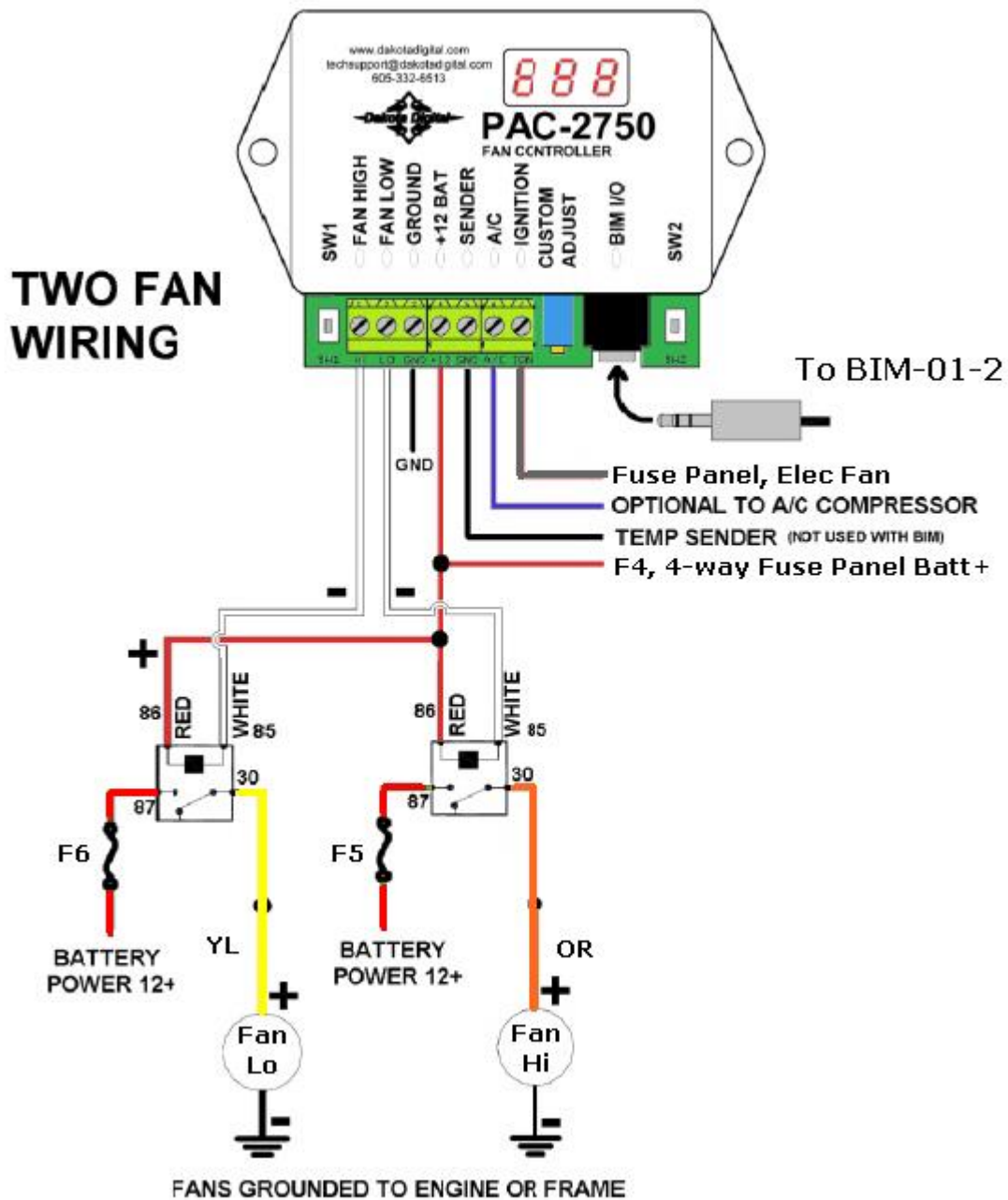


Figure 31 - PAC 2750 Wiring

### Dakota Digital Climate Control Module DCC-2200 and Fan Control for DCC-2200

These two modules require +12V Batt from F4 of the 4-way Fuse panel and Ignition from the common fused ignition supply labelled *Coil*. The associated Fan Control also requires the same supplies. See 4 Way Fuse Panel and 4 Way Fuse and Relay Panel.

### BIM-01-02 OBD2/CAN Interface

The Dakota Digital CAN interface is mounted on the port side kick panel. Power for BIM is via the VFD3 Control Box (see Dakota Digital Gauges on Page 39). The other connector goes to the PAC-2750. To hard wire the BIM-02-01 OBD2 connector, connect CAN HI (WT/LG) to GN wire and CAN LO (WT/LB) to WT wire. The other two wires are for the J1850 Bus.

## BIM-01-2 Bus Interface Module for OBD-II vehicle interface

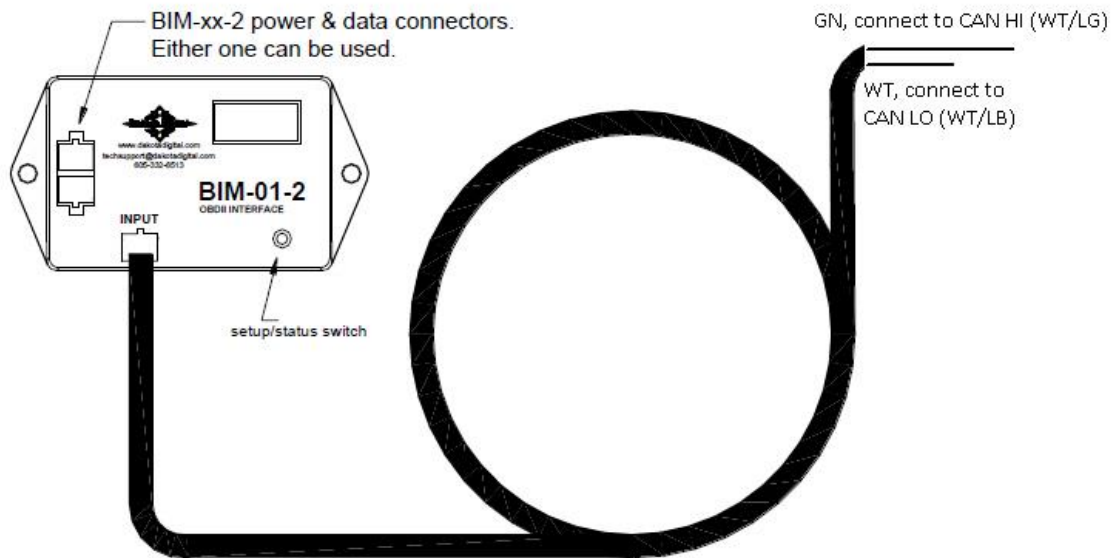


Figure 32 - Bus Interface Module

### Electronic Throttle Control (Drive by Wire)

The DBW system comprises the Accelerator Pedal Position Sensor (APPS) and the DBW Throttle Body.

When ignition is switched ON, the throttle body cycles.

#### DBW Throttle Body

The Throttle Body is 3.5 inches OD (close to 90mm).

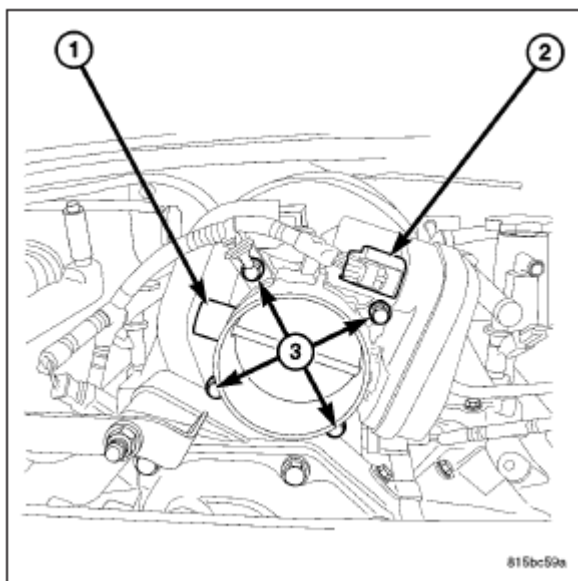


Figure 33 - 6.1L Throttle Body

A 6 pin connector (2) connects the TP Sensor and ETC Motor with the PCM.

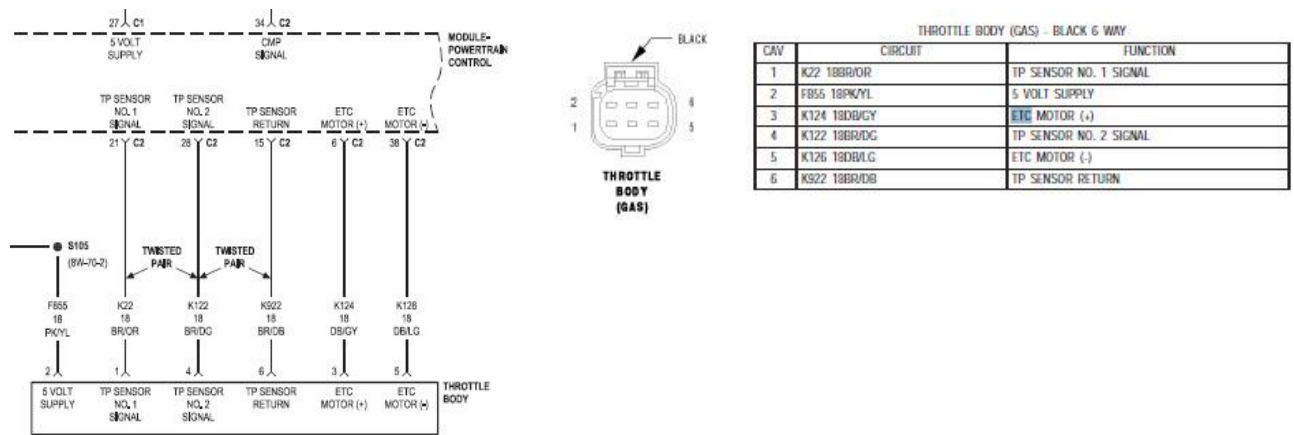


Figure 34 - Throttle Body Connector

*Throttle Learn*

If you don't have access to a good scanner, there is an alternate way of doing the relearn:

1. Disconnect battery for 5 minutes. Reconnect, or use a code reader to clear any stored codes in the computer. NOTE: If this is a new install, proceed to Step 2.
2. Turn ignition key to on position, do not start the engine.
3. Slowly depress the gas pedal to the floor, then slowly release it. Do this three (3) times. Turn key off.
4. Now start engine. The gas pedal is now in synch with the larger throttle body.

*Accelerator Pedal Position Sensor*

The Accelerator Pedal Position Sensor is connected to the PCM by a 6-pin plug. The Part Number for the donor engine 04861681AA, 2005 – 2007 Dodge Chrysler

The part number for a 2006 pedal is 53032753AC. Or 4861708AB or try 4726 005AB.

For 2005-2007 Chrysler 300 Accelerator Pedal, the Dorman part number is 34353YK 2006.

Full Repair Kit: 68040448AB

?

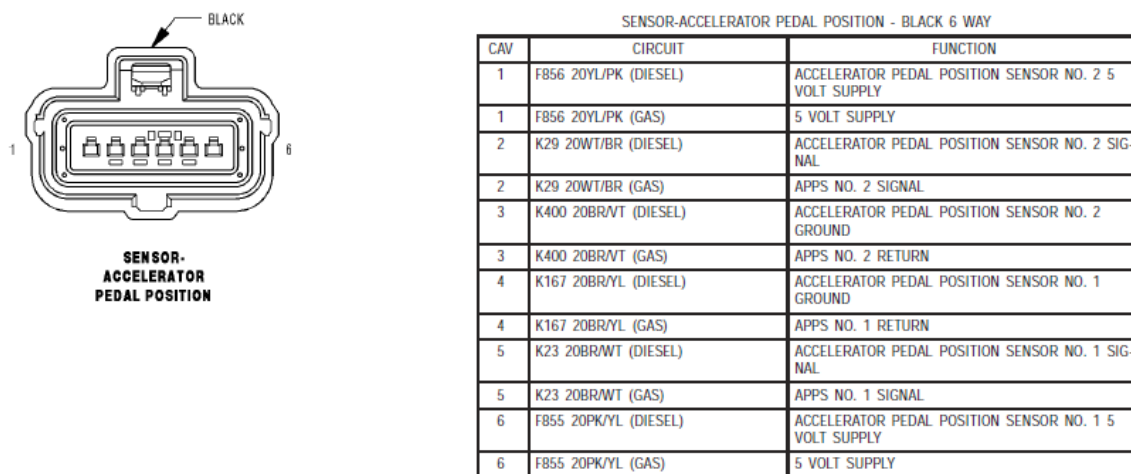


Figure 35 - APPS Connector Diagram

The factory circuit diagram illustrates the circuits and connections:

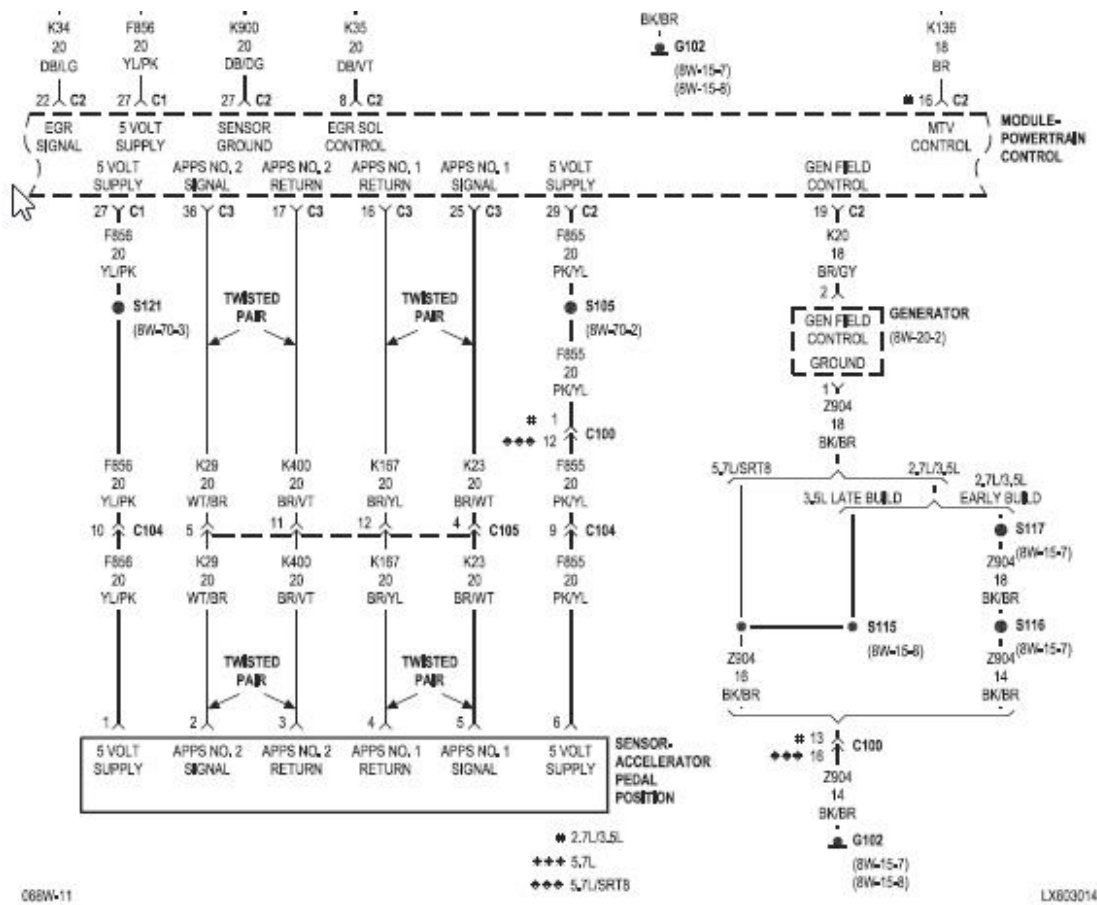


Figure 36 - APPS Factory Circuit Diagram

The APPS is connected the same way as the factory connections depict.

Full Repair Kit: 68040448AB

Function	6 Pin Weatherpack		Hotwire Conn		
	From PCM	To APPS Conn	APPS Conn	CC Conn	
5V Supply	YL/PK (C1, 27)	VT	1 (A)	RD/BK	YL
APPS 2	WT/BR (C3, 36)	BL	2 (B)	YL	GN
APPS 2 Rtn	BR/VT (C3, 17)	TN	3 (C)	RD/BK	WT
APPS 1 Rtn	BR/YL (C3, 16)	RD	4 (D)	GN	BN
Apps 1	BR/WT (C3, 25)	WT	5 (E)	WT	GN
5V Supply	PK/YL (C2, 29)	OR	6 (E)	RD/BK	RD

### Cruise Control and APPS Adapter

The AP900 Cruise Control system is located on the RHS kick panel below the main fuse panel. It comprises three main components:

- AP900 Cruise Control
- R-CM22 Smart Line Cruise Control switch (uses RF communication to operate cruise).
- APPS and Hotwire Harness



Figure 37 R-CM22 Smart Line Cruise Control Switch

The Hotwire harness and APPS adapter connects the APPS and Cruise Control to the PCM in accordance with the above table.



Figure 38 - Hotwire APPS Adapter Harness

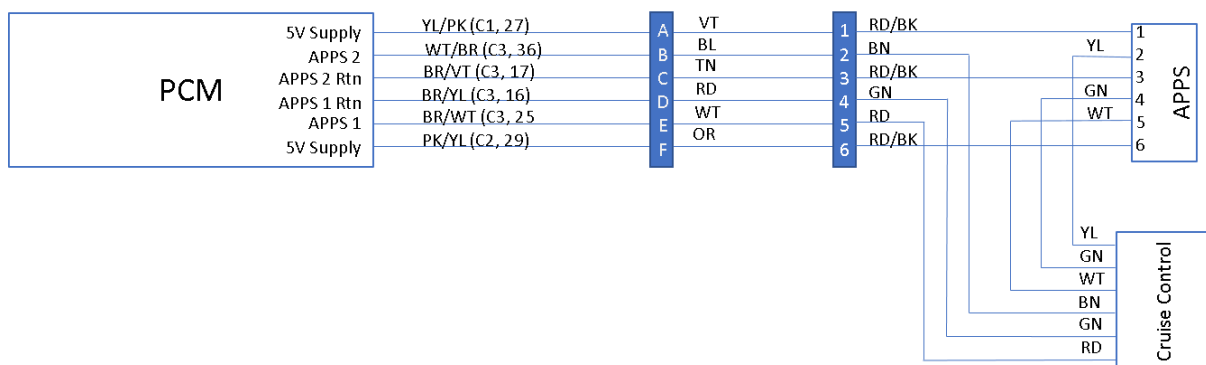


Figure 39 - APPS/Cruise Control Wiring

#### Cruise Control Wiring

The wiring is set up for non CAN BUS operation, as the CAN BUS connection appears to interfere with the BIM and Hotwire auto recommends it.

The wiring from the AP900 to the CC inputs is via a 6 pin Weatherpack as follows:

A	BN	Brake	Constant +12v
B	BN/WT	Brake	From Relay Pin 30
C	BL	Speed	VSS from TCM (OR/WT)
D	VT	Neutral	From SAFETY connection GSS-3000
E	YL	Tacho	VT/WT From Tachometer Source from Injector #7
F	GN/WT	Not used	

**eStopp Controller**

The eStopp actuator is bolted to the RHS chassis rail adjacent to the transmission. An adjustable cable coupler runs to the Jag rear handbrake cable. The controller is mounted inside the car on the firewall.

The +12v (GN) is supplied from the DOME light fuse. The Ignition Safety is connected to the GAUGES+ wire at the DD Connector Panel.

The Button Harness wires (RD, BK, WT, GY, VT) connect to the button in the dash.

The Actuator is connected via a 2 pin Weatherpack.

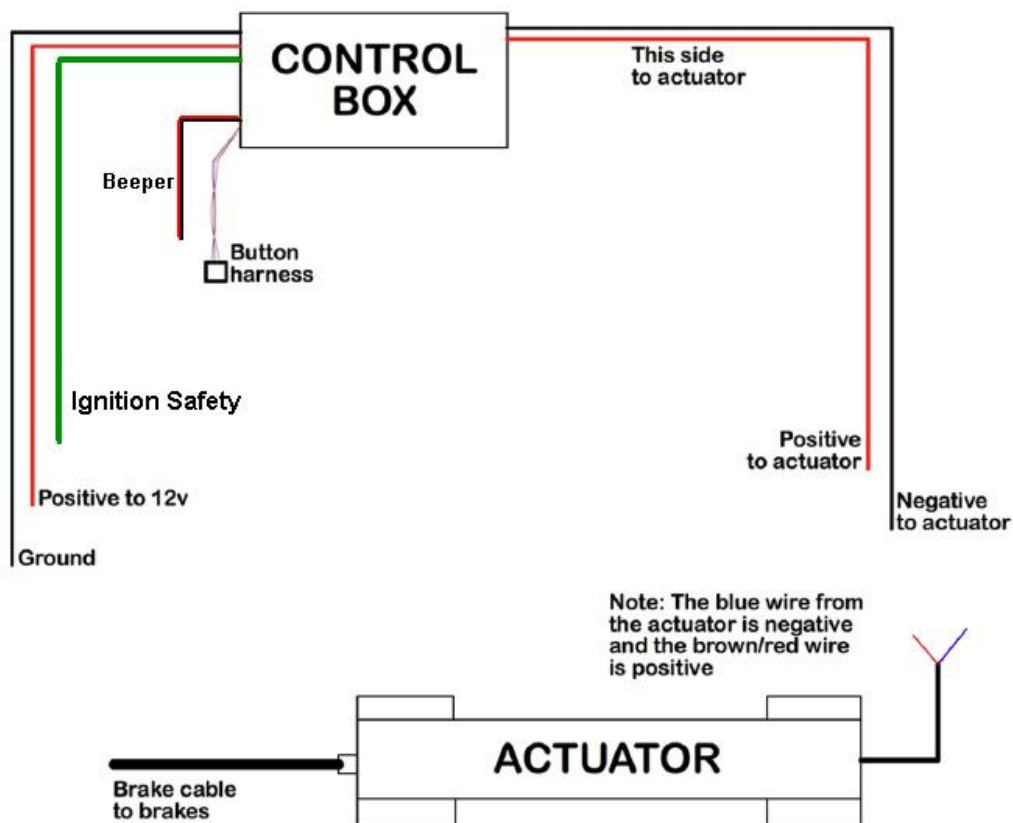


Figure 40 - eStopp Wiring

**Tow Pro**

The Redarc Tow Pro controller is mounted on the steering column to firewall brace, under the DD Control Panel. Power is supplied by the Cig Lighter Fuse and circuit. Trailer brakes use the Backup Lights circuit.

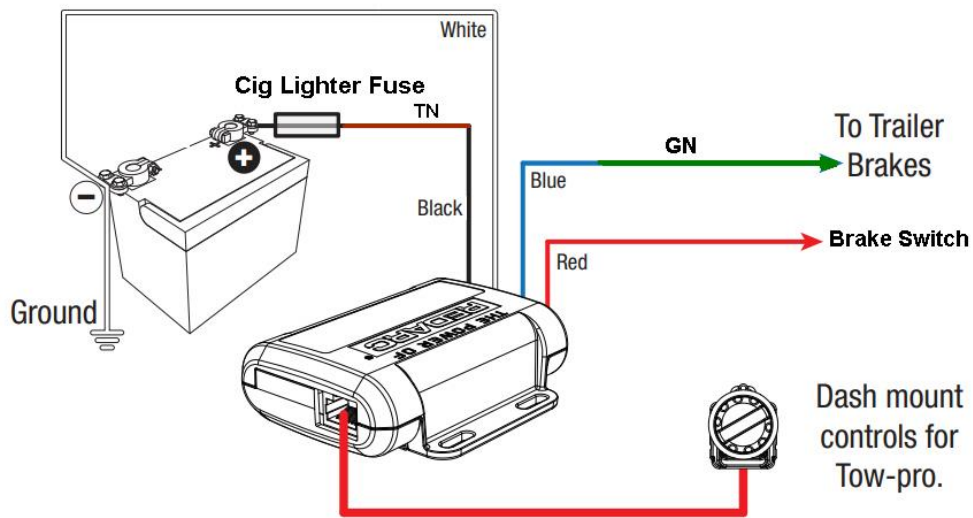


Figure 41 - Tow Pro Wiring

### Remote Door Locks - Digitech 4 Channel Wireless Relay

Door latches are actuated by solenoids. Remote control of the door locks is via a Digitech 4 Channel Wireless Relay controller and remote fobs.

<b>Table 14. Digitech 4 Channel Wiring</b>				
<b>Num</b>	<b>Colour</b>	<b>Function</b>	<b>Connect To</b>	<b>Function</b>
1	BL/WT	Relay 4 NC		
2	RD/YL	Relay 4 Com	Gnd	
3	LB	Relay 4 NO	BK	Horn
4	RD	+12v (Batt)	+12v (Batt)	Power
5	GN/YL	Relay 2 NC		
6	GN	Relay 2 Com	Gnd	
7	RD/WT	Relay 2 NO	GN/WT	Pass. Door
8	BK/WT	Relay 3 NC		
9	BN	Relay 3 Com	Gnd	
10	OR/WT	Relay 3 NO	BN/BK	Trunk
11	BK	Gnd	Gnd	
12	BK/YL	Relay 1 NC		
13	GY	Relay 1 Com	Gnd	
14	YL/WT	Relay 1 NO	BL/WT	Driver's Door



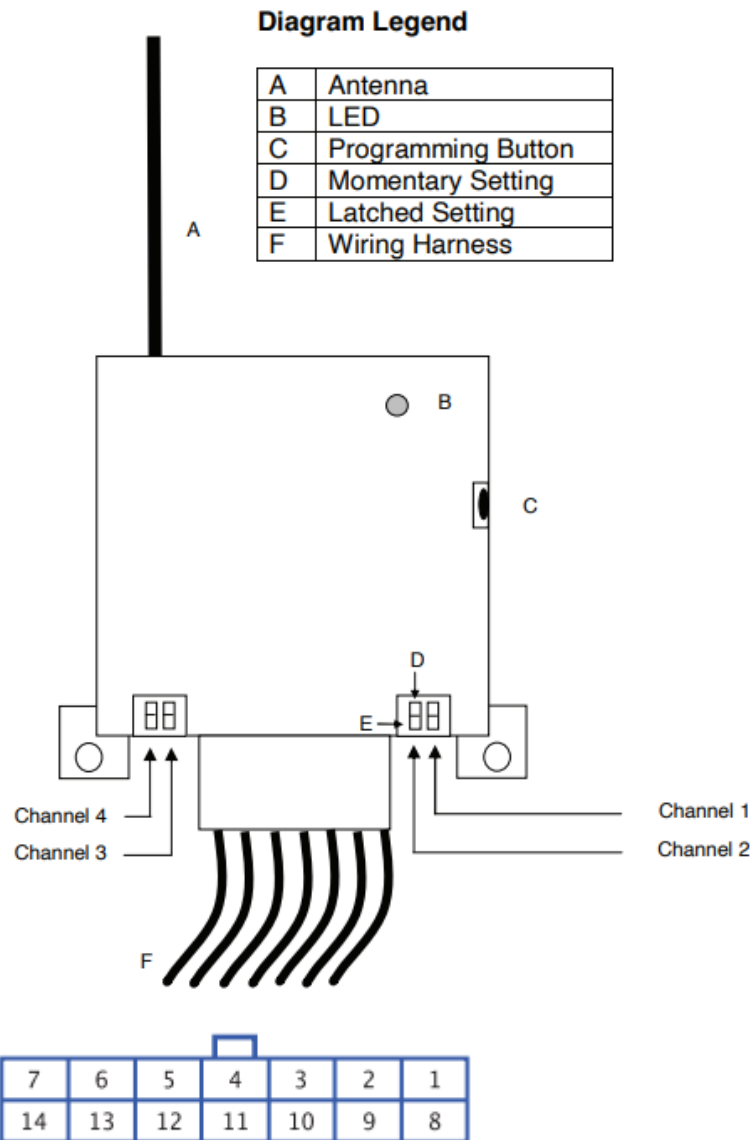


Figure 42 Digitech Layout

*Program Remote*

To program a new remote, proceed as follows:

1. Press Programming Button.
2. Press Remote fob button (any channel).

The LED will flash once to verify valid learning of fob.

**Push Button Start**

An Easyguard EC004 is used instead of an ignition key. This is the easiest solution to the slight delay between Ignition and Start when using a key switch.

Circuit	Colour	Destination	Easyguard
<b>4 Pin Ignition Plug</b>			
Start	VT	To Start Relay	YL
Start/Run	PK	Start/Run (Ign)	WT

Acc1	BN	Acc1	BN	Combine
Acc2	OR	Acc2	BL	
Batt	RD	Battery +12v	RD	
		Gnd	BK	

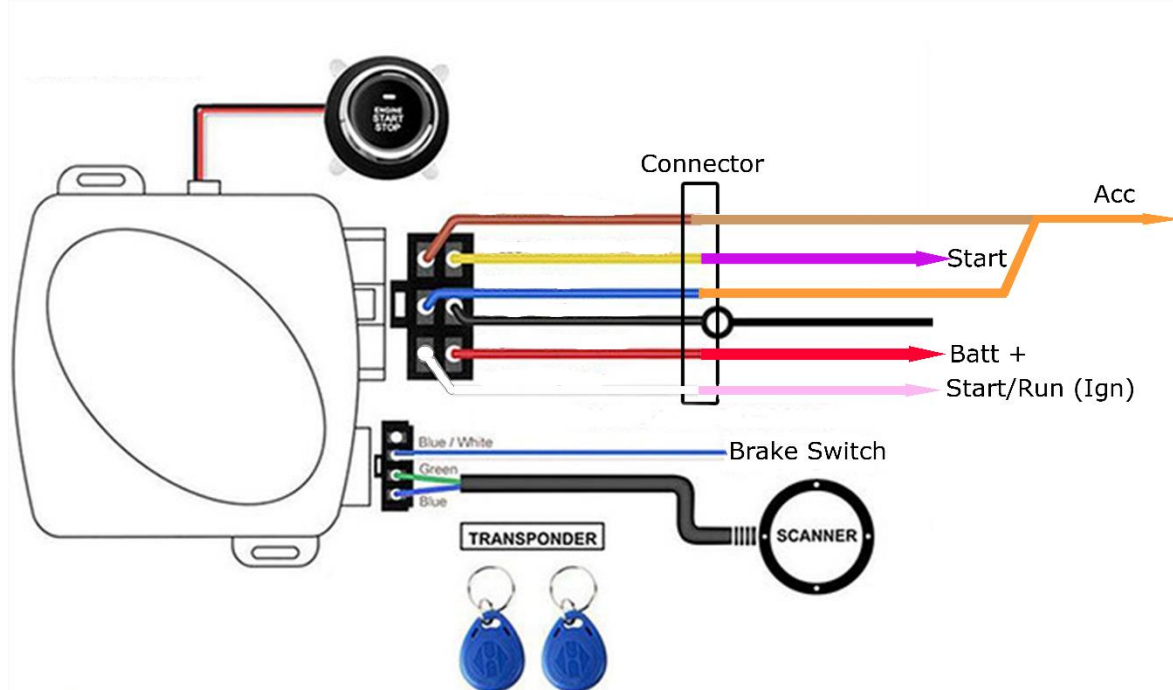


Figure 43 Push Button Start Wiring

### Arm/Disarm/Disable

The push button start controller includes RFID security/immobiliser. When it is **Armed**, the Start signal will not be available. It must be **Disarmed** to start the car, or you can Disable the security.

1. Bring the transponder close to the Scanner.
2. Two beeps means the system is now Disarmed. One beep means the system is Armed.
  1. If the system Arms, remove the transponder and then bring it close again.
  2. Two beeps means the system is Disarmed.
3. When the system is Disarmed, place your foot on the brakes and start the car.
4. To Disable the system, Disarm the system and keep the transponder close to the Scanner for 30 seconds until you hear a long Beep.

### Gear Shift Indicator

It is not yet known whether the Gear Position signal on the CAN BUS will be recognised by the BIM to display Gear Position on the gauges. This will be critical in Autostick mode. In addition, the Neutral Safety function has been disabled so that the engine can start without the CAN BUS signal that comes from the FCM. To ensure there is a Neutral/Safety start system and a reverse trigger (for reversing camera and reversing lights), a DD GSS-3000 was installed. It wires directly into the existing DD Instrument Control Box *Gear* terminal.

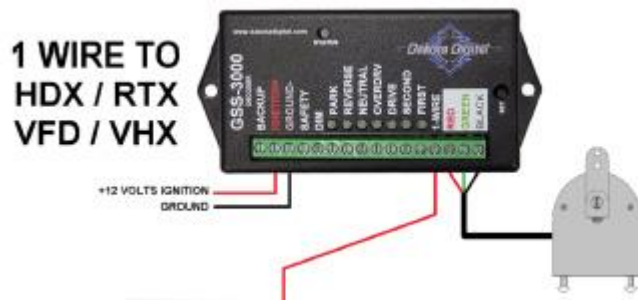
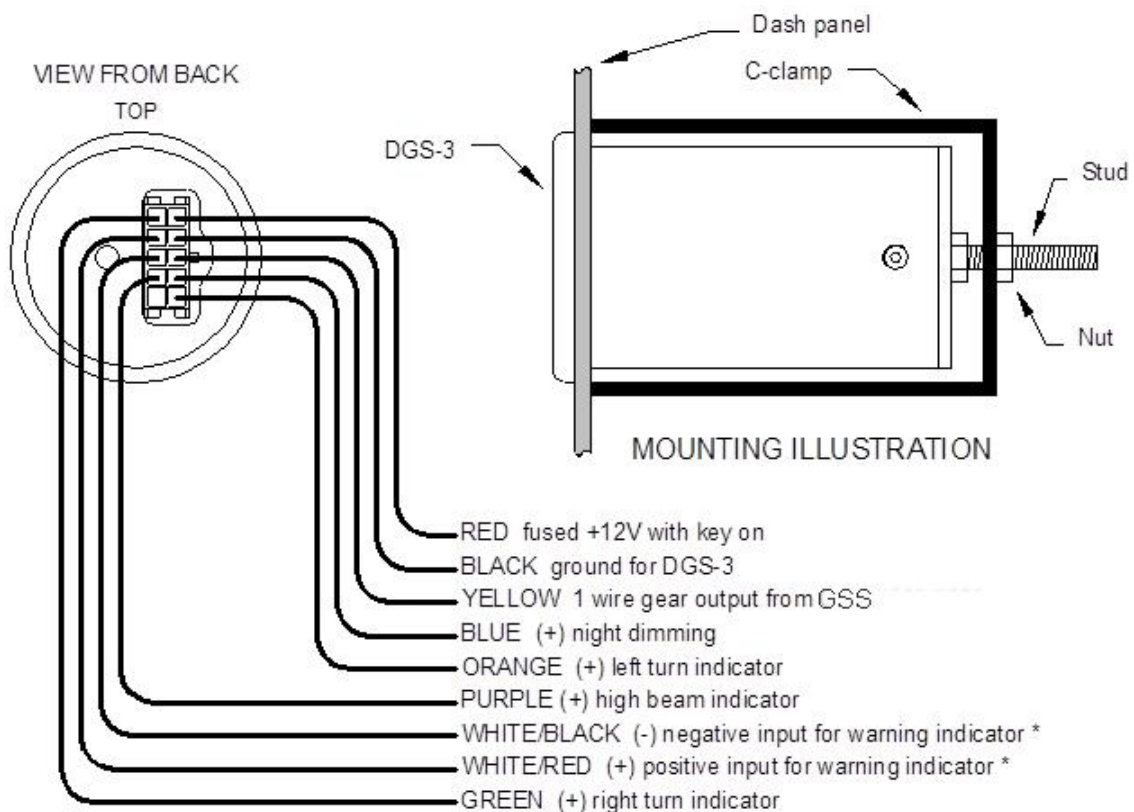


Figure 44 - Dakota Digital GSS-3000 Universal

This also supplies a PRND Gear Position to the gauges.

*DGS-3 LED Alphanumeric Gear Shift Indicator*

This indicator displays what gear your automatic transmission is in when used with Dakota Digital's GSS 3000.



\*NOTE: Both warning indicator inputs must be used.  
 For ground warning signals, connect WHITE/RED to +12v and WHITE/BLK to signal.  
 For 12V warning signals, connect WHITE/RED to signal and WHITE/BLK to ground.

Figure 45 DGS3 Shift Indicator

*Incorporating GSS-3000 with TCM 2800*

The sender for the GSS-3000 is attached to the transmission to give PRND indication in the gauges. A possible solution to seeing gears in Autostick is to use the TCM 2800 as the sender. See Spare Assignments on page 83.

<b>Table 15. GSS-3000 Wiring</b>			<b>TCM-2800</b>
Backup	GN/WT, GY/BL	To Reversing Camera	
Ignition	RD	From Gauges supply in main fuse panel	
Ground	BK	Ground	
Safety	GN/OR	Start Relay Control Pin 86	
Safety	VT	Neutral/Safety to Cruise Control Connector	
Dim	BN	From headlight switch	
1 Wire	PK	To Gear connection on VFD Control Unit	
	RD	I/P from GSS Sender	
Sig	GN		PK/RD PWM8
	BK		

This is achieved by using a spare PWM output set to *pwm vs gear*. This takes the place of GSS-3000 sensor.

You are going to have to bump the HZ up to at least around 200-250.

For Reverse and NS yes the PWM outputs are easiest. Just do it based off of gear or lever position. There is also a NS bit in digital outputs. It is labelled transmission in Reverse or drive.

Yes PWM outputs can be set for many things. So if you had that wired up it is a simple PWM value per gear to adjust the voltage for the GSS3000. Just add a wire for a PWM channel that is open. Set it to go to ground instead of 12vIts if it is not already. Then select PWM vs GEAR in the menu for this channel. Put it in park and adjust PWM till the GSS reads Park. And then Reverse and so on.

### PWM and Duty Cycle

A Pulse Width Modulation (PWM) Signal is a method for generating an analog signal using a digital source. A PWM signal consists of two main components that define its behaviour: a duty cycle and a frequency. The duty cycle describes the amount of time the signal is in a high (on) state as a percentage of the total time of it takes to complete one cycle. The frequency determines how fast the PWM completes a cycle (i.e. 1000 Hz would be 1000 cycles per second), and therefore how fast it switches between high and low states. By cycling a digital signal off and on at a fast enough rate, and with a certain duty cycle, the output will appear to behave like a constant voltage analog signal when providing power to devices.

### Duty Cycle

When the signal is high, we call this "on time". To describe the amount of "on time", we use the concept of duty cycle. Duty cycle is measured in percentage. The percentage duty cycle specifically describes the percentage of time a digital signal is on over an interval or period of time. This period is the inverse of the frequency of the waveform.

If a digital signal spends half of the time on and the other half off, we would say the digital signal has a duty cycle of 50% and resembles an ideal square wave. If the percentage is higher than 50%, the digital signal spends more time in the high state than the low state and vice versa if the duty cycle is less than 50%. Here is a graph that illustrates these three scenarios:

100% duty cycle would be the same as setting the voltage to 5 Volts (high). 0% duty cycle would be the same as grounding the signal.

*Hexadecimal Chart*

Shifter Position	Approximate Voltage at the TCM Connector Pin No.			
	25	26	27	28
P	10	10	10	0
R	0	10	10	10
N	10	0	10	10
D	0	0	10	0
4	0	0	0	10
3	0	10	0	0
2	10	0	0	0
1	10	10	0	10

Measured with the TCM connector unplugged and the ignition in the "ON" position.

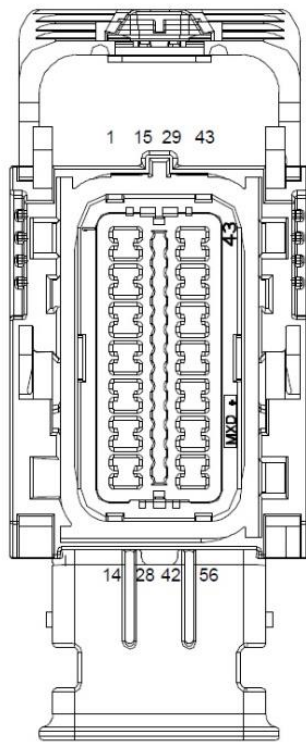


Figure 46 TCM 2800 Connector

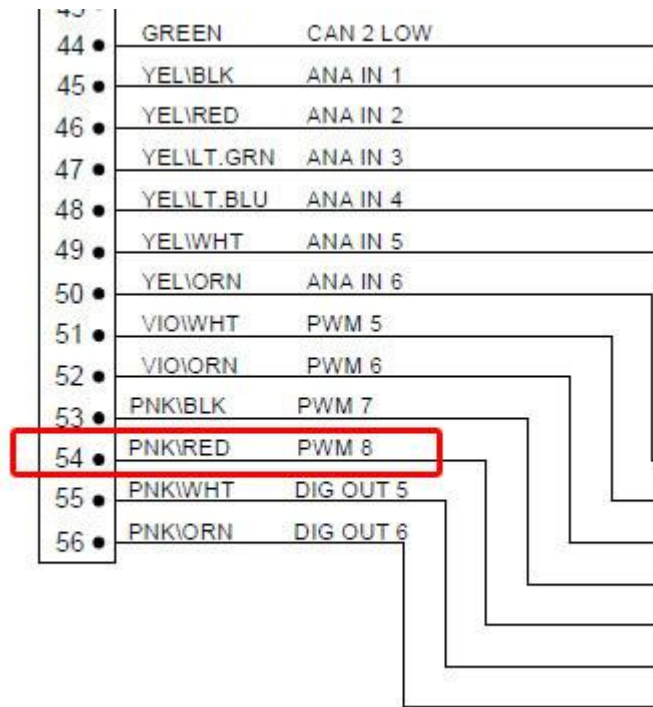
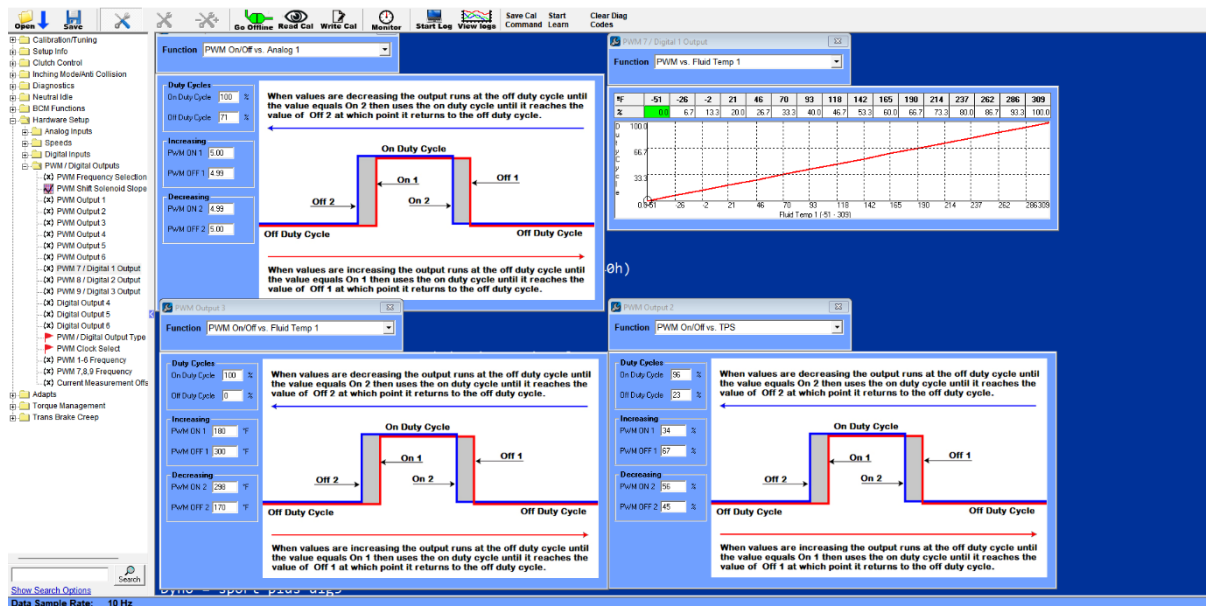


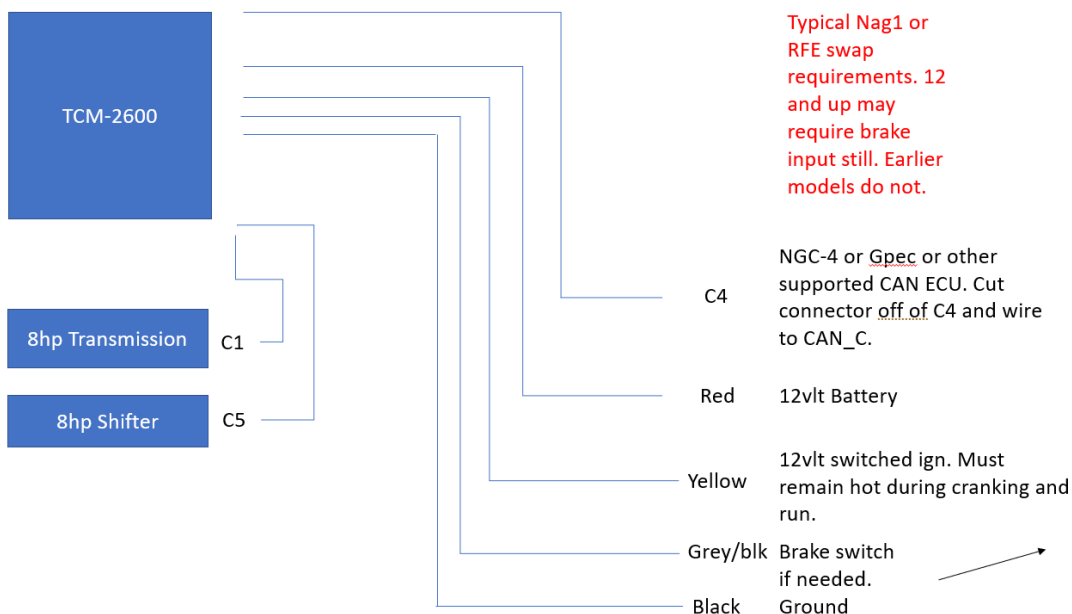
Figure 47 - Spare PWM Outputs

**Note:** PWM7 is a spare PWM as well. The colour changes to GY/PK where it is joined with a single pin Weatherpack connector. (use this for Neutra/Safety?).

This one was requested and I thought I would add some other PWM options as well. If you are not aware you must select Software Setup and Tuning mode then Advanced at the top of your screen to gain access to all folders. Then select Hardware Setup/PWM/Digital Outputs. Bottom left PWM 3 is an on/off based on fluid temp 1 which is transmission temp. This could be wired to a relay, pin 85, to control a fan for a cooler. Or a warning lamp if you wanted. IN this example you would have to add a wire to PWM 3 output channel, pin 13. But any PWM can be set for any of these functions. PWM 5,6 and Digital 5,6 are not available on the 2600. They are 2800 only. Any input available can be used for these. So TPS, RPM, Turbine Speed, Vehicle speed, etc. Analog input raw voltage if you wire up an analog channel.



Typical installation for Nag1 or RFE swap. Brake switch is not needed on pretty much anything from 2006 to 2011. Chargers and 300c in 2012 start a new CAN bus and brake switch input is required for these vehicles.



Relay wiring for Starter neutral safety and Reverse lights with 8hp and nag1 kits.

On Mopar Crate ecu kits the Starter relay is already in their kit and you wire to the wire labeled for clutch switch. It is the exact same concept though.

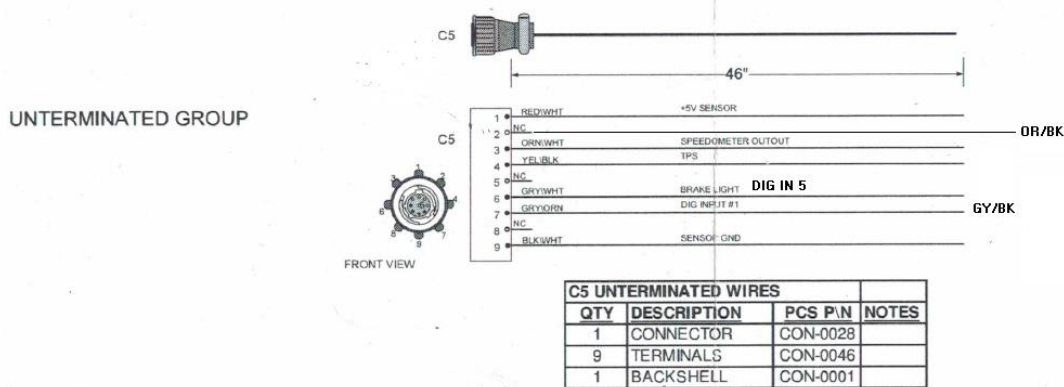
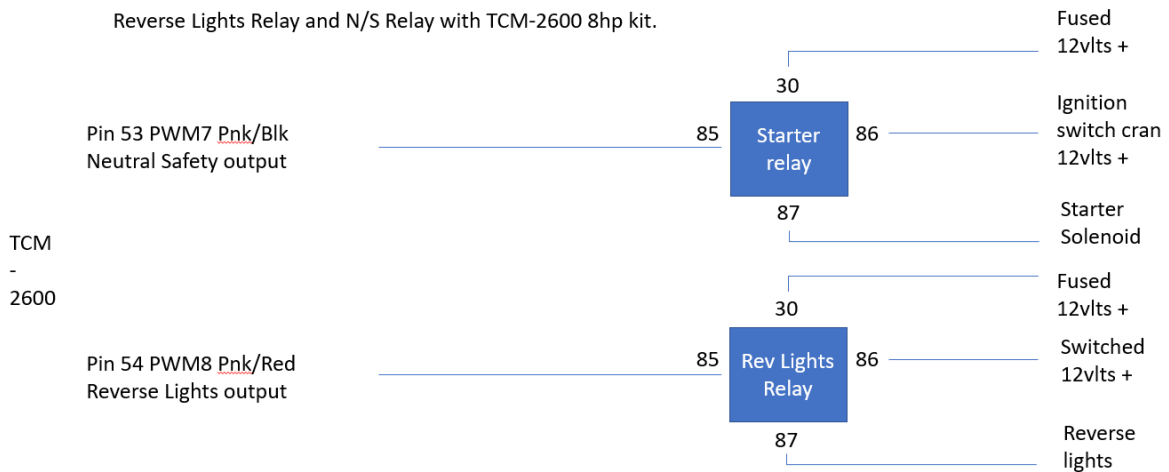


Figure 48 C5 Unterminated Harness Update

Gear should be 1 when you engage it to Drive. It is the gear you are in. Desired Gear should be 5th. If not then something is wrong

Receive VSS over CAN should not be set. It is speed 4 on the sensor on the rear of the transmission. If you have not you need to review the instructions and setup the module correctly. If I remember correctly you are tied to a factory ECU. You should be receiving TPS and RPM over CAN and Torque. And shifter Range. The module should have been set for this with the calibration I sent to you a long time ago. Speed 4 is also visible on the lightweight monitor as a raw value. It measures driveshaft speed. VSS is calculated from this using diff and tire size.



Yes speedo should work fine. Make sure the DD is set to accept speed via sensor and not the BIM if you are using the BIM module.

## Other Circuits

The following circuits are described in detail:

- Power Windows
- Data Terminal Connector
- Car Audio
- Turn Signal Switch Connector
- Lighting
- Wipers
- CAL B Switch.
- Electronic Throttle Control

### Power Windows

The two doors employ power windows. They are independently switched.

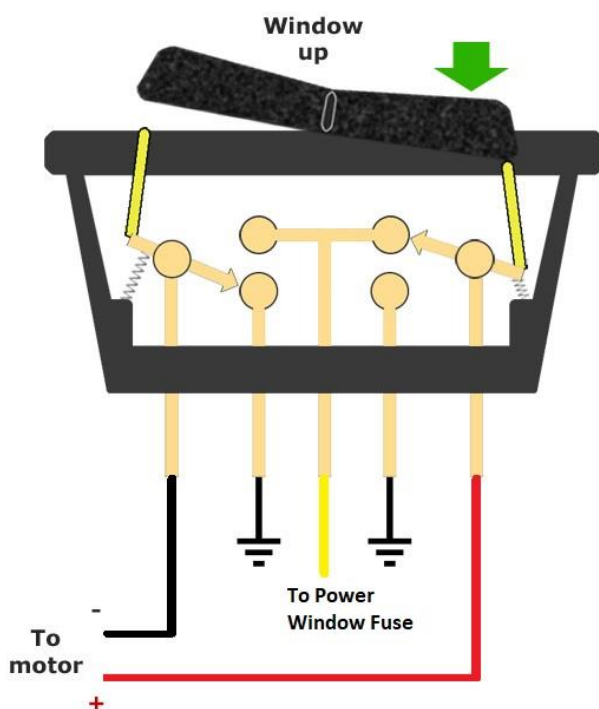
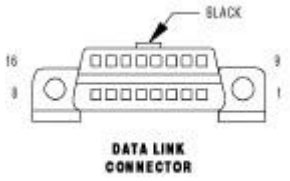


Figure 49 - Power Window Switch Wiring

### Data Terminal Connector

The Data Terminal Connector is the OBDII CAN (J1979) protocol link with which the PCM communicates data to and from various modules, such as the TCM, the shifter and the Dakota Digital BIM. It also facilitates the connection of a SCAN tool and/or the HP Tuners MPVI2 interface.

	Pin	Circuit	Notes
	4	Chassis Ground	
	5	Signal Ground –	Use C2, 27, Sensor Ground (-), DB/DG.
	6	CAN High (data)	
	14	CAN Low (data)	
	16	+12volts	Battery power (not for use as gauge power) from F4 of the 4-way fuse panel.

## Car Audio

The Head Unit chosen is a half-size single DIN SWM brand that has the following features:

- Two USB ports, one for music, one for fast charge
- Bluetooth with A2DP (Advanced Audio Distribution Profile) function
- FM Radio FM 87.5-107.9MHz
- SD Card Input
- Front Audio Aux-in
- Last Track Memory
- Universal single din in dash: Width 17.8CM X Height 5.8CM
- Max Output Power 4 X 60W
- Working Voltage: 12DC Car Battery
- Multiple EQ modes
- Three-band radio store (FM1-FM2-FM3)
- 18 Pre-set radio stations

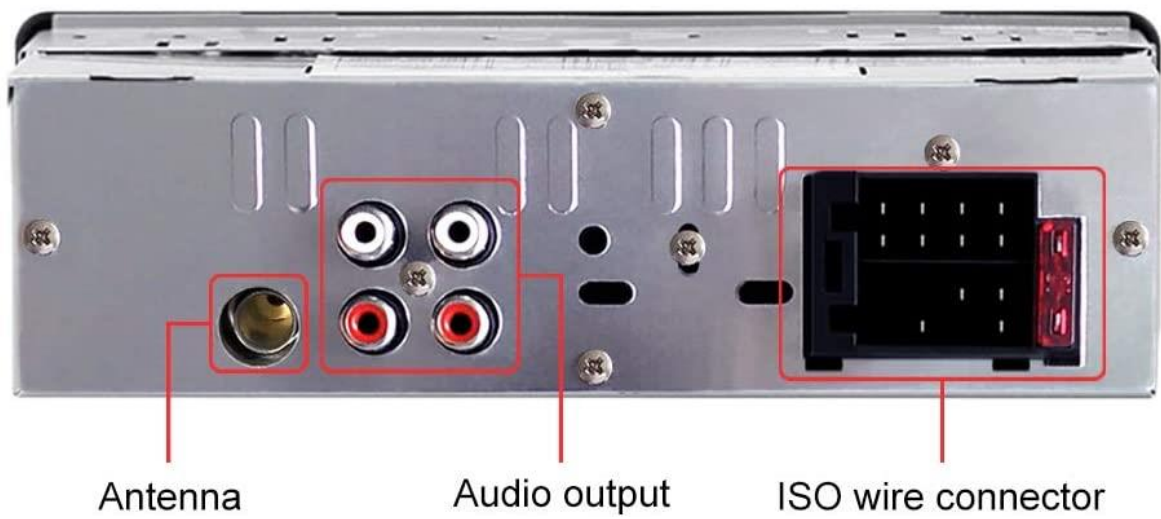


Figure 50 - Head Unit

This unit was chosen because it has half the depth of a regular single DIN head unit. A unit with full depth interferes with the dual voice coil speaker that is installed in the Hudson factory location in the centre of the dash. The connectors are standard ISO 10487.

ISO10487 connector (plug side view)

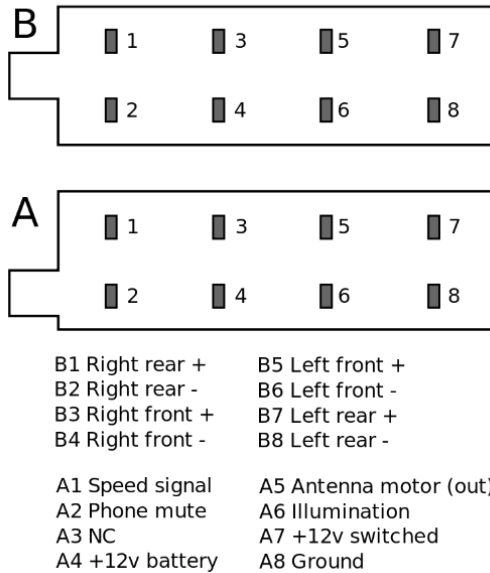


Figure 51 - ISO 10487 Connectors

In this installation, an amplifier was included, so the Speaker plug (B, above) is not used.

Table 17. Car Audio Head Unit Power Connector					
ISO	Cct	Colour	W/P	ISO	Amp
A4	+12v Batt (BK heat shrink)	RD	D	YL	YL
A5	Antenna	BL/WT			
A6	Illumination	Not Used	B	OR	OR/WT
A7	+12v Ign	RD	A	RD	RD
A8	Ground	BK	C	BK	BK

Amplifier

The Amplifier is an Alpine KTP-445U compact amplifier.

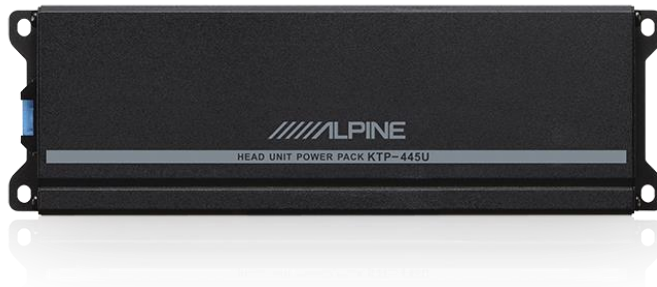
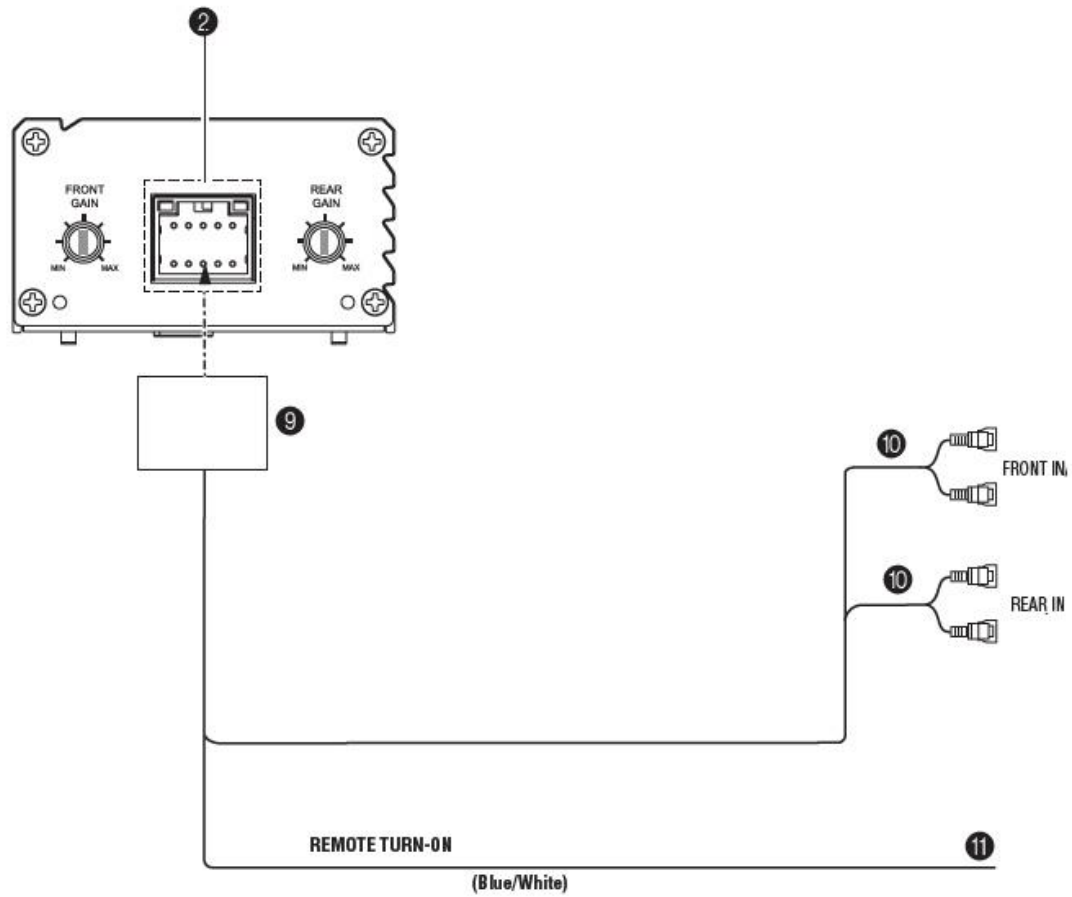


Figure 52 – Alpine KTP-445U Amplifier

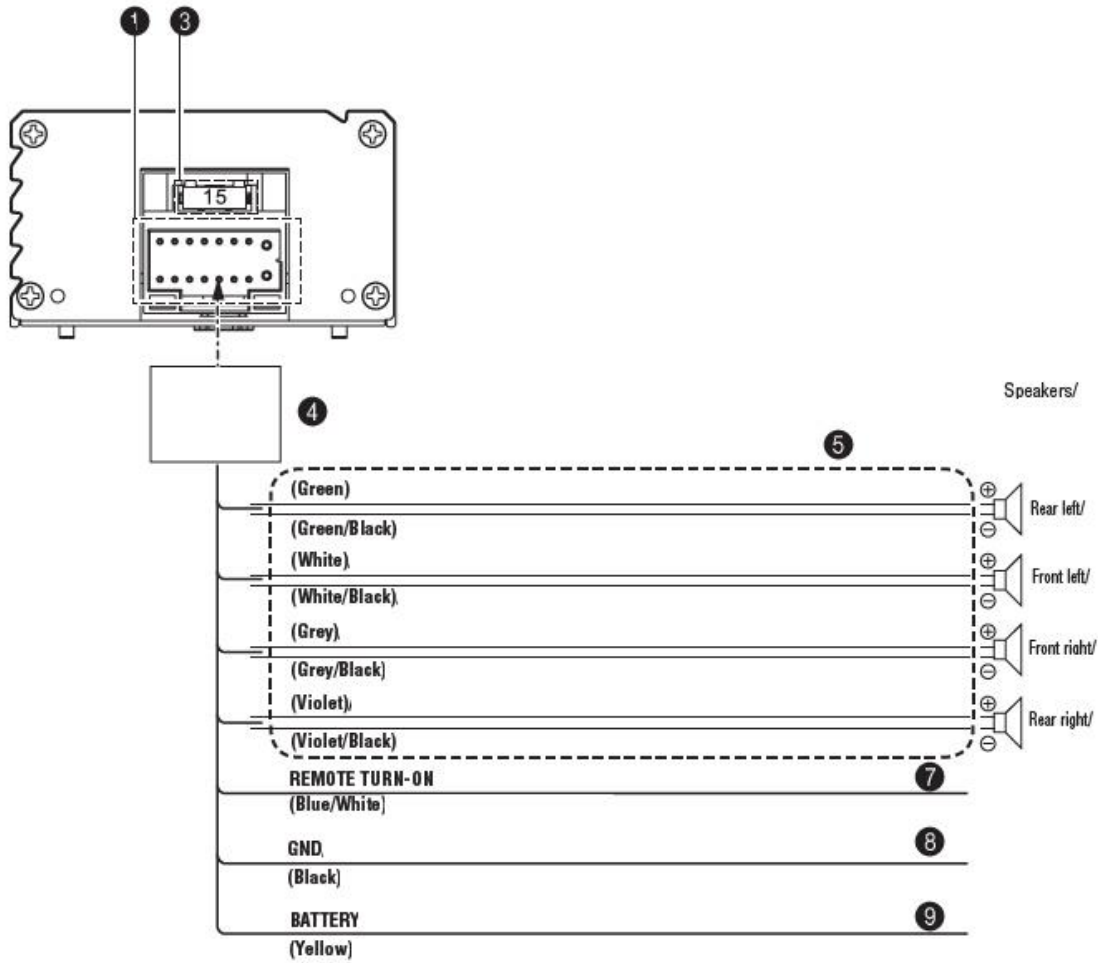
Refer to the instruction manuals for more info.



**KTP-445U Right end panel.**

*Figure 53 - KTP-445U Input Connections*

Input connections are directly from the speaker outputs of the head unit. The Remote Turn On is connected to a 2 pin Weatherpack which is hard wired to the radio circuit.



**KTP-445U Left end panel**

Figure 54 - KTP-445U Amplifier Output Connections

The Output connections are joined to the front and rear speakers by two 4-way Weatherpacks.

## Turn Signal Switch Connector

Uses a 6 pin weatherpack except for horn (single pin weatherpack).

CONN	COLOR	LABLE	FUNCTION
	BK	Horn Relay Ground	Horn button ground to the horn relay trigger
A	BN	Turn Sw-Hazard	4 way hazard power feed wire from the Hazard flasher "L" terminal
B	VT	Turn Switch Feed	Turn signal power feed wire from the Turn signal flasher "L" terminal
C	DG	Right Rear Turn	Feeds the right rear turn and brake lamp bulb high filament
D	YL	Left Rear Turn	Feeds the left rear turn and brake lamp bulb high filament
E	DB	Right Front Turn	Feeds the right front turn lamp bulb high filament and the right turn dash indicator lamp
F	LB	Left Front Turn	Feeds the left front turn lamp bulb high filament and the right turn dash indicator lamp
Terminated	WT	Brake Switch	Not Used.

## Lighting

All lighting is LED.

### Headlights

Typically, old headlights and indicators are below optimum compared to today's cars. Updating the old technology is relatively easy but going to the next step of LED headlights is even easier at this stage of the build.

Installing a modern LED Headlight also means including indicator and park lights, all LED and all contained in the headlight. One factory example is the Aaiwa brand seven-inch round LED Headlights for Toyota Land Cruisers, Jeeps, Hummers, etc. At around \$110 a pair, they are a bargain, and include Hi-Lo Beam, DRL (Parkers) and Turn Light.

Fitting the headlights into the original buckets won't be easy, so a set of universal headlamp buckets were purchased. The Narva seven-inch headlamp housing (part number 72192) was chosen. At \$72 (AU) a pair, it's worth the risk of modifying them to fit.



Figure 55 - Narva Headlight Bucket

*LED Headlight Wiring*

The headlights come with a few adapters. These are for converting H4 and H3 lamps to LED, but we will be using them to connect the LED headlights into our lighting circuits.

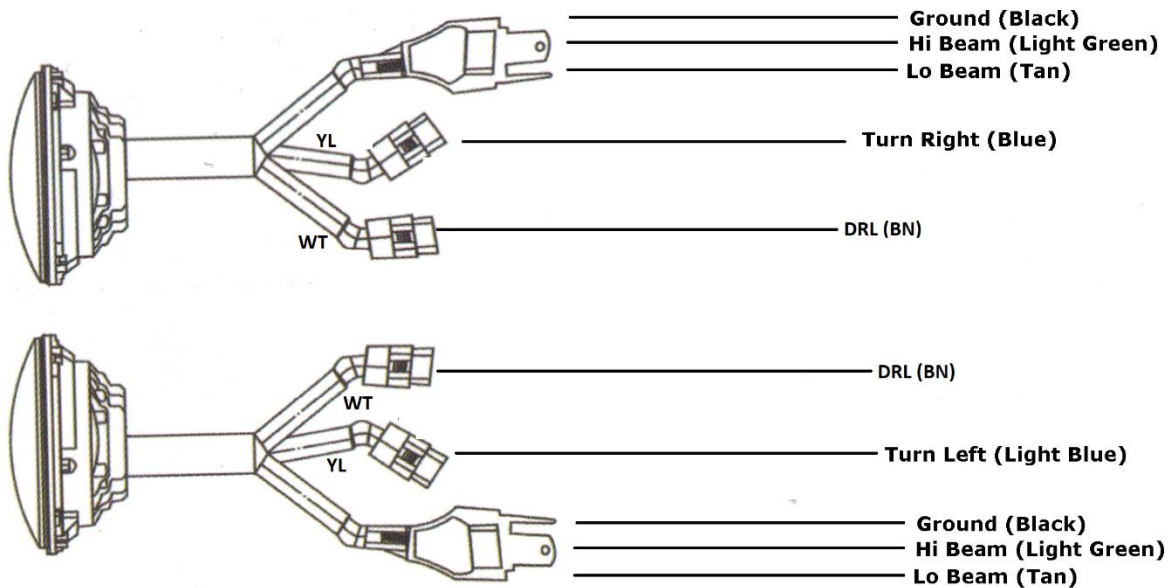
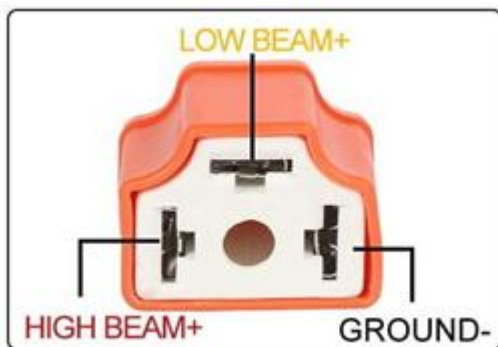


Figure 56 - LED Headlight Wiring

The Hi and Lo Beam headlamp connector is H4, which is the same as the old 3 pin headlamp connector **but the wiring is different!**



H4666, H4668 &  
 H6545 165MM  
 SEALED BEAMS

Figure 57 - H4 Socket Pinouts vs Sealed Beam Socket pinouts

The Turn Signal and DRL connectors are simple spade connectors.

See References on Page 87 for lighting modifications.

*Headlight Switch*

The Headlight Switch is an American Autowire switch, part number 500341, similar to Painless and Summit/Jeggs versions.



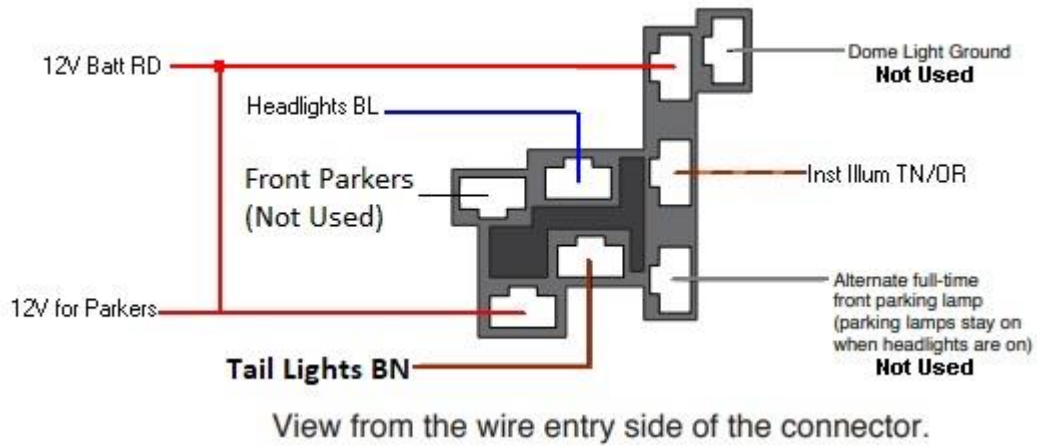


Figure 58 - Headlight Switch Connector

	Dome Light Ground	Not Used
	Alternate full-time front parking lamp (parking lights stay on with headlights)	Not Used
TN/OR	Dash Panel Lights	Illumination for DD Gauge Controller and DD Vintage Air Climate Control
RD	Headlight Power	From main fuse panel. Jumper to Parker +12v.
BN	Rear Tail Lamp	
BL	To Headlight Dimmer Switch	
RD	Fused Battery Feed	From 12v Headlight Power
	Front Parking Lamp (parking lights off when headlights are on)	Disconnected. See DRL.

### *Tail, Stop and Turn Lights*

The tail and stop lights are aftermarket LED 39 Lincoln Zephyr taillights, P/N 911-37003 from Speedway Motors.



Figure 59 - 39 Lincoln Zephyr Taillights

Function	Colour	Connect to...
Ground	Green	Ground BK
Tail	Black	Tail Section BN

Stop	Red (Pulses)	Tail Section OR
Turn	Yellow	Not Used
<b>Rear Indicators</b>	The Rear Indicators are Hella LED items from Resort Trailers.	
Ground	White	Ground BK
Left Turn	RD	Tail Section YL
Right Turn	RD	Tail Section GN

**Wipers**

The wiper motor is from a C4 Citroen. The wiper bezels are early 60s Ford Truck. The wiper mechanisms are made from 10mm steel rod and small spherical rod ends. The bell crank mounts on a bracket that is welded to the wiper motor frame.

*Wiper Motor Electrical Connections*

Pins are numbered 1 – 4 from L to R as you look at the wiper motor.

<b>Table 20. Wiper Motor and Switch Connections</b>			
Motor	Colour	Func	Switch
1	VT/WT	Ground	
2	GY/WT	Park	P
3	Green	Slow	L
4	WT/OR	Fast +12V	H

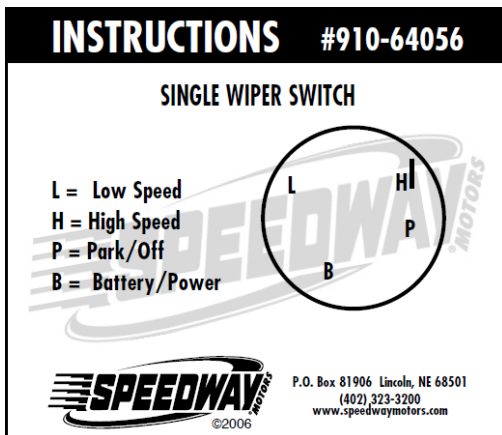


Figure 60- Wiper Switch

Rear View Mirror and Dashcam



Figure 61 - Dash Cam Mirror Connections

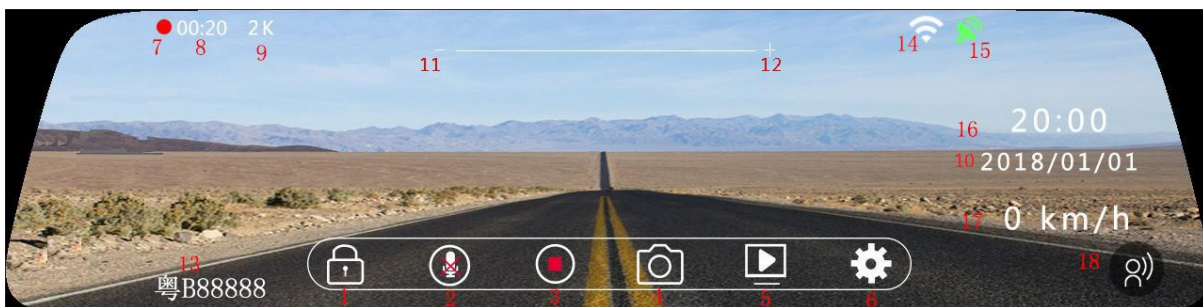




Figure 62 - Dash Cam Mirror Interface

Table 21. DashCam Operation			
1	Lock (EMR emergency):	<b>Tap</b> to lock the current video. Adds 20s to the video time and locks the file. <b>Tap</b> again to unlock.	
2	Audio switch:	<b>Tap</b> to turn audio recording from the microphone on or off. (The setting will be automatically saved).	
3	Dash Cam Recording:	The default icon in the video state is	
		The default icon in the non-video state is	
4	Camera	When recording, <b>Tap</b> to take photo of current image.	
5	Playback Mode	<b>Tap</b> to display the Playback Interface	
6	Settings	<b>Tap</b> to display Settings	
7	Recording icon	Flashing indicates normal recording	

8	Recording time	Displays Recording Time. Default is 1 minute. <b>Tap</b> Settings to change.	
9	Resolution	Displays the current video resolution. Default is 2K. <b>Tap</b> Settings to change.	
10	Time	Display current time resolution. <b>Tap</b> Settings to change.	
11, 12	Brightness	Swipe left to right to adjust Brightness.	
13	License plate	Set the license plate option in Settings.	
14	WIFI icon	Displays a WT icon when WiFi enabled. Displays GN icon when WiFi connected. Enable/Disable in Settings.	
15	GPS icon	Displays a WT icon when GPS enabled. Displays GN icon when GPS signal received. Enable/Disable in Settings.	
16	Date	Displays current Date. Change in Settings.	
17	GPS speed	When GPS signal is received, and the GPS icon is GN, the GPS speed is displayed. Units of speed (km/h mph) can be changed in Settings.	
18	Voice	Displayed when Voice is enabled. When activated, the voice command dialog box is displayed	

### Settings Menu

**Note:** Settings are saved when ignition is turned off.

**Resolution.** Changes the screen display resolution. Options are:

- 4K
- 2K (Default)
- 1080P
- 3840x2160
- 2560x1440
- 1440x1080

**Circulating video:** Video recording time is segmented into 1-, 2- and 3-minute segments. Default is 1 minute.

**Note:** When the SD card is full, the DashCam will overwrite the earliest videos.

**Short-time recording.** Shrink time recording: Compresses time by capturing a set of images or videos and concatenates them. The process of minutes, hours, or even days and years is compressed into a shorter time frame and played as a video. Options are:

- Off (Default)

- 5 hours
- 12 hours
- 24 hours

**Length time interval:** The time reduction interval options are:

- 0.5 seconds (0.5 frames per second) (Default): one minute can record 60 minutes of video;
- 1 second (1 frame per second): one minute can record 30 minutes of video;
- 5 seconds, (5 frames per second): one minute can record 6 minutes of video

**Parking mode:** The sensitivity of vibration monitoring in Parking Mode are:

- Off (Default)
- Low
- Medium
- High

Enabling **Parking Mode** displays *Entering parking monitoring mode'* dialog box when shutting down. While ignition is off, vibration of the car enables recording, which is automatically locked and cannot be overwritten. Recording ceases after 24 seconds.

Switching ignition on during the recording process does not affect the locking of the recording. It then switches to normal recording mode.

**Gravity induction:** The built in Collision Sensor (G-sensor) sensitivity options are:

- Off (Default)
- Low
- Medium
- High

Enable Gravity sensing to automatically lock the current video if the G Sensor experiences vibrations (such as collisions) during the recording process.

**Screen dormancy:** The screensaver options are:

- Off (Default)
- 10 seconds
- 30 seconds
- 3 minutes

Enable the screensaver to turn off the screen after the set interval. Press the Power button to re-open the screen.

**Note:** Recording continues after turning off the screen.

**Time zone selection:** Set up local time zone.

**The posterior mirror image.** Streaming media mirror is OFF by default. Open the streaming mirror to display the mirror head.

**Time setting:** Displays the time setting dialog box. Set the time and date, which will appear in DashCam video.

**License Plate Setting:** Open the license plate setting dialog to set the license plate, which will be display the license plate watermark on the interface.

**Recording switch:** Switch for recording the sound.

**Language:** Select the display language.

**Format:** Choose quick format (default) to format the TF card.

**Factory data reset:** Restores factory Settings. In the dialog box, tap confirm to recover factory Settings. Restores screen setting lens display and display screen position, playback interface display screen position and display mode.

**WIFI Switch (optional):** Enable/Disable WiFi.

**Speech recognition (optional):** Enable/Disable Speech Recognition.

**GPS:** Displayed if GPS is connected. Select time zone calibration, speed calibration and GPS information.

**WIFI two-dimension code.**

*Voltage Reduction Module*

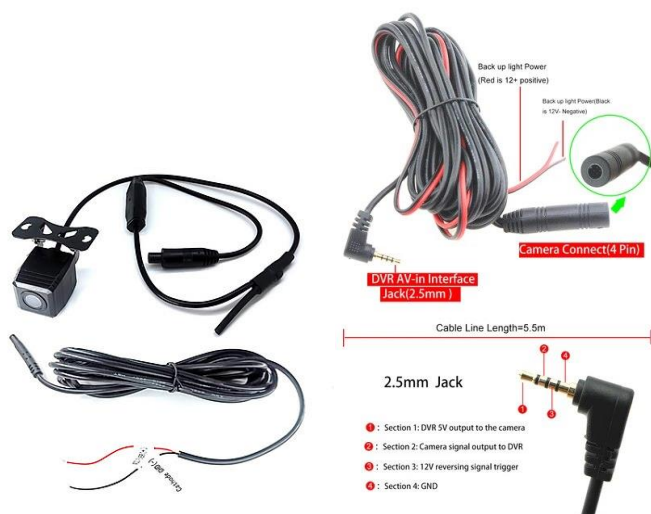
The DashCam requires 5v to operate. The Voltage Reduction Module connects the DashCam from Accessories voltage.

**Table 22. Mini USB 5Pin Connector**

Pin	Function
1	VCC 5V 3A
2	NC
3	NC
4	ACC 5V
5	GND

*Reversing Camera*

The Reversing Camera is a waterproof, night vision enabled camera. The connector is a 4 pin at the camera end and a double ring tip and sleeve plug at the mirror end. An extension cable is required to make up for the length of the Hudson.



## Transmission and Shifter

Some modifications have been made to the way the transmission operates.

### *Shift Lever Assembly (SLA)*

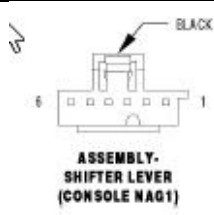
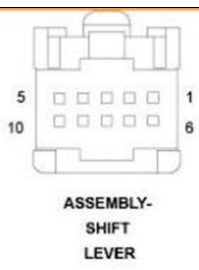
The Shifter Lever Assembly (SLA) Electronic Shift Module (ESM) receives two brake switch signals. The first signal is a CAN C Bus message sent to the shifter lever assembly. The second signal is a hard-wired brake switch signal to the shifter lever assembly. The CAN C Bus message is the primary brake switch signal, and the hard-wired signal serves as the backup brake switch signal.

### *Brake Transmission Shift Interlock (BTSI)*

The brake switch signal must be active before the shift lever can be moved out of the park position. The BTSI solenoid prevents shifting out of the PARK position until the ignition key is in the RUN position and the brake pedal is pressed. The TCM controls the ground while the ignition switch supplies power to the BTSI solenoid.

### *SLA Wiring*

Using the factory Chrysler 300C SRT-8 shifter requires a small 6 pin connector to interface with the TCM. The correct part and part number for the 6 pin connector is ASSEMBLY-SHIFT LEVER (CONSOLE NAG1) - BLACK (BODY) 6 WAY Full Repair Kit: 68137869AA.

	Pin	Factory Colour	TCM Colour	Function	10 Pin Conn	
 <p>ASSEMBLY-SHIFTER LEVER (CONSOLE NAG1)</p>	1	PK	YL	Ign Unlock/Run/Start	8	12v Start/Run
	2	BK/OR	BK	Gnd	1	Gnd
	3	DG/WT		Brake Switch Signal (OR) from brake switch.	5	Brake Switch Signal
 <p>ASSEMBLY-SHIFT LEVER</p>	4			Not used		
	5	WT/LG	WT/RD	CAN High (+)	7	CAN C +
	6	WT/LB	WT/BK	CAN Lo (-)	6	CAN C -
					2	Sensor Ground
					3	Autostick Up/Down Signal
					9	Panel Lamps Driver
					10	TRS Park Signal



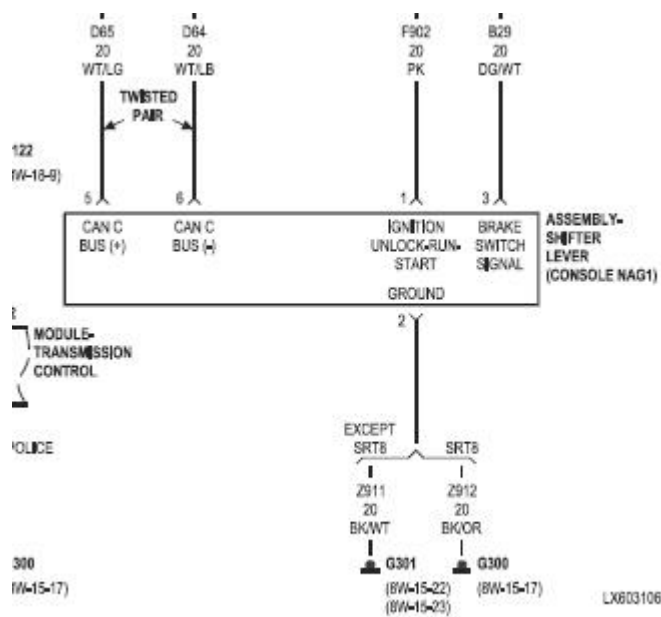


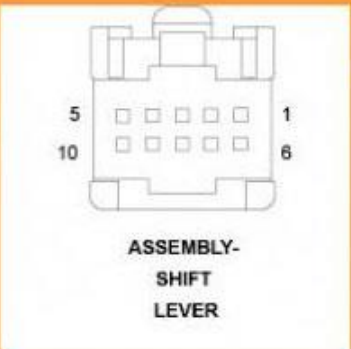
Figure 63 - Shifter Wiring Factory Manual

### B&M Shifter Replacement

A B&M Shifter was installed instead of the factory shifter from the donor vehicle. This required a different Gear Position Sensor than the one in the donor shifter. The correct GPS was removed from a 5.7 300C shifter and used in the B&M installation.

The 6 pin plug for the factory shifter is not compatible with the updated GPS. The following information comes from Russell Drake (Sound German Auto):

**Mopar Package #**  
**68068631AA**



**ASSEMBLY-SHIFTER LEVER**

**ASSEMBLY-SHIFTER LEVER - (INSTRUMENT PANEL) 10 WAY**

CAV	CIRCUIT	FUNCTION
1	Z907 20BK	GROUND
2	K900 20DB/DG (GAS)	SENSOR GROUND
3	T5 20DG/YL (GAS)	AUTOSTICK UP/DOWN (ERS) SIGNAL
4	Z907 20BK	GROUND
5	K321 20BR/YL	BRAKE SWITCH SIGNAL
6	D64 20WT/LB	CAN C BUS (-)
7	D65 20WT/LG	CAN C BUS (+)
8	F1 20PK/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
9	E2 20OR/BR	PANEL LAMPS DRIVER
10	T824 20YL/DB	TRS PARK SIGNAL

### Autostick

The AutoStick Switch is integrated into the Shifter Lever Assembly. The gear requested by the AutoStick selection is then sent over the CAN C bus to the TCM to engage the requested gear.

To conduct a preliminary test to check the operation of Autostick, proceed as follows:

1. Connect Laptop to TCM.
2. Turn ignition **ON** (do not start engine).
3. Start TCM Software and click **Go Online**.

Make sure you are now in Online Mode.

4. Open the Monitor to *TCM 2800 Datastream*.
5. Shift into Drive.
6. In the Monitor window, observe Lever at 5 and Gear at 1.
7. Downshift to 2 and back. This will take you to Manual mode and Gear 2, then back to Drive.

#### *Neutral Safety Start Signal*

The Start Relay requires a Ground signal at Pin 86 of the Starter Relay (see Starter Interlock on Page 28). The factory setup used a CAN BUS signal to achieve this, but without a FCM, it must be deleted (see CAN BUS start Disable on page 85).

There are a few possible solutions:

- Use the GSS 3000 Safety circuit.
- Use the Neutral/Safety Start Switch on the B&M Shifter.
- Assign a Digital Output set to *Transmission in Drive or Reverse*.

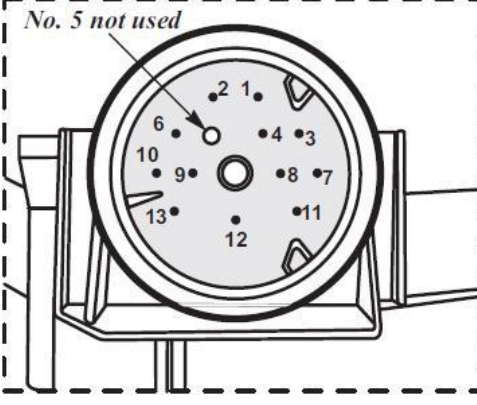
#### *CAL B Switch*

The TCM2800 has provision for two calibrations – CAL A and CAL B. The DIG IN input to the TCM2800 is used for this purpose. The switch on the dashboard grounds DIG IN, switching the TCM2800 to CAL B via a 2 pin Weatherpack connector under the dash.

<b>Table 1. CAL B Switch Wiring</b>			
<b>Dash Switch</b>	<b>Connector</b>	<b>C5 Unterminated</b>	<b>TCM 2800</b>
WT/GN	2 Pin Conn A	Pin 1 GY/BK	Pin 2 DIG IN 1 GY/BK
BK/WT	2 Pin Conn B	Ground	

*NAG 1 Transmission Connector*

<b>Table 2. NAG1 Transmission Connector – Pinouts</b>	
<b>Pin</b>	<b>Function</b>
1	N3 Input Speed Sensor Signal
2	Modulation Pressure Control Solenoid Ground Control
3	N2 Input Speed Sensor Signal
4	TFT Sensor and P/V Switch Signal
5	Not Used
6	Battery. Supply Voltage For All Solenoids
7	Sensor 51/ Supply Voltage
8	2-3 Shift Solenoid Ground Control
9	3-4 Shift Solenoid Ground Control
10	Shift Pressure Control Solenoid Ground Control
11	TCC Solenoid Ground Control
12	Sensor Ground
13	1-2/4-S Shift Solenoid Ground Control



*NAG1 Transmission Connector – Installation*

To install the connector, proceed as follows:

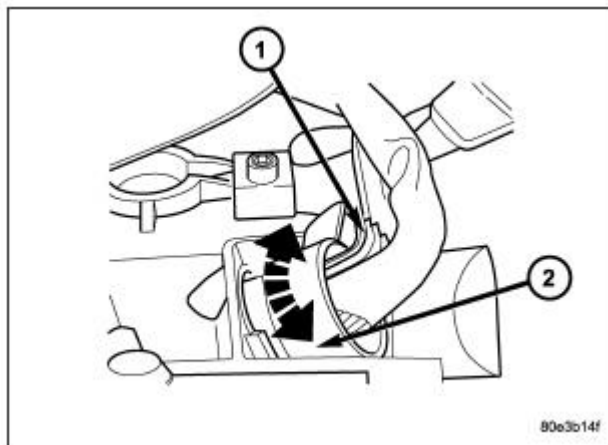


Figure 64 - NAG1 Transmission Connector

1. Check O-rings on plug connector (1) and replace if necessary.
2. Install the plug connector (1) into the adapter plug (2).
3. Turn bayonet lock of the adapter plug (2) clockwise to connect plug connector (1).

**CAN BUS**

From 2003, Chrysler introduced the NGC (Next Gen Controller) computer. This computer started out using the PCI bus and in 2005 started using the CAN bus for networking. The NGC computer can

control the latest electronic transmissions internally or working with an external transmission controller.

The 6.1 HEMI from a 2007 Chrysler 300C in this project uses the OBDII CAN (J1979 J1850) protocol.

### CAN Bus Termination

A CAN Bus network must have a terminating resistor between CAN High and CAN Low to prevent signal reflections. For maximum range over long distances, the ideal termination is one 120 Ohm resistor at each end of the bus, but this is not critical over short distances.

When you measure the resistance between CAN hi to CAN low on the wiring harness you should measure 60 ohms. This measurement should be conducted with power off. In some instances, the termination resistor is located inside the device and may be switched electronically. In the Hudson, the termination resistors are part of the PCS TCM-2800 Trans Control and cannot be detected by measuring resistance. In the PCS screen, go into the menu and verify the termination resistor option is enabled.

**If one of the termination resistors is missing communications may work temporarily but will be unreliable and eventually fail.**

### CAN Bus Voltage Levels

The CAN bus data Low and HI signals idle at 2.5VDC with respect to ground when there is no active data. When data is active CAN Hi switches between 2.5Vdc and 3.5Vdc and CAN Low switches between 2.5Vdc and 1.5Vdc. When these voltages are measured with a multimeter, only the average voltage is displayed. Typical voltage for CAN HI is 2.6Vdc-3Vdc and CAN Low are typically 2.4Vdc – 2Vdc. CAN Hi should be greater than 2.5Vdc and CAN Low less than 2.5Vdc. IMPORTANT: These measurements should be taken with power on and only one device on the network at a time. When multiple devices are connected on the network the CAN voltage measured is the average of all devices so you cannot determine if one of those is bad.

### CAN BUS Nodes

The Hudson uses the CAN BUS twisted pair from C3 Pin34 (Can Hi, WT/LG), and Pin 35 (Can Lo, WT/LB) provide data to the following nodes in order:

<b>Table 3. CAN BUS Nodes</b>			
<b>Node</b>	<b>Hi</b>	<b>Lo</b>	<b>Circuit Notes</b>
BIM	WT/LG	WT/LB	Provides Engine Data <del>and Gear Position Data</del> to the gauges and PAC-2750 Cooling Fan Controller.
Shifter Module	WT/RD	WT/BK	From Russell Drake (Sound German Auto): <i>Dakota Digital will not be able to read Gear Shift Position info from the BIM. It uses OBD PIDS and we do not support those.</i>
TCM Controller	WT/RD	WT/BK	Via DTC
Cruise Control	BL	BL/WT	Via TCM 2800
DTC	WT/LG	WT/LB	From PCM C1 34 and 35.

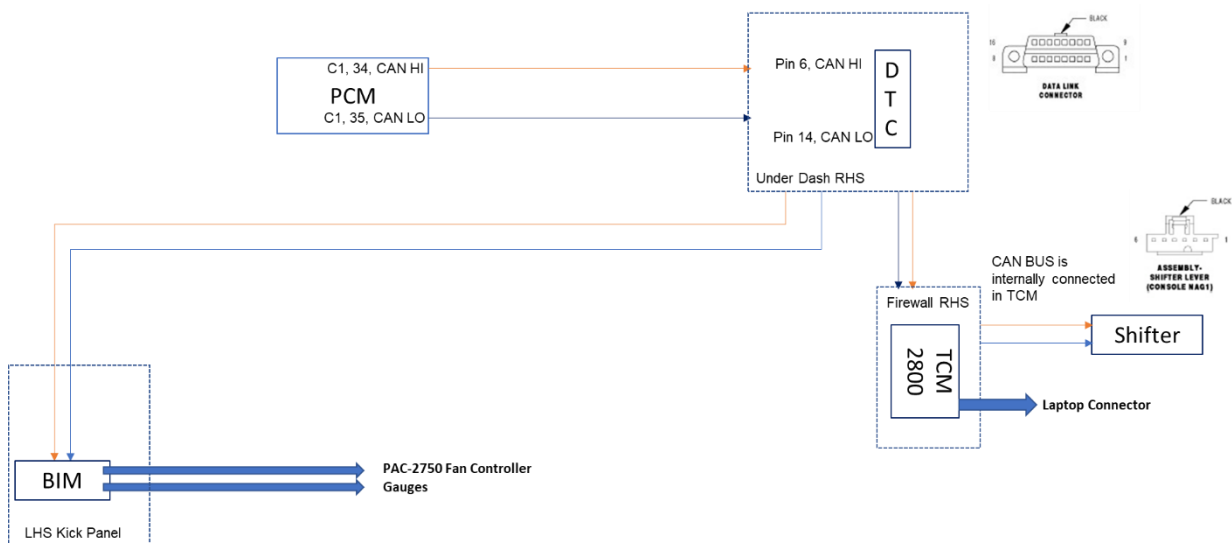


Figure 65 - Hudson SRT-8 CAN BUS Circuit

The CAN BUS wires from the PCM are connected to the Data Terminal Connector (DTC, or OBD2 Port). A male connector plugs the CAN BUS nodes to the DTC. This facilitates the connection with HP Tuners.

*From the factory manual:*

*The Transmission Control Module (TCM) receives information from the Engine, Anti-lock Brake System, and the Electronic Gear Shift control modules over the CAN C bus. The CAN C bus is a high-speed communication bus that allows real time control capability between various controllers. Most messages are sent every 20 mSec, this means critical information can be shared between controllers. The CAN C bus is a two-wire bus with a CAN (+) and a CAN (-) circuit. To reduce the potential of radio and other electrical noise interference, the CAN Bus circuit wiring is manufactured in a twisted pair within the electrical harness.*

*From Russell Drake (Sound German Auto):*

*Dakota Digital will not be able to read info from the control unit. It uses OBD PIDS and we do not support those. It might read it from the ECU and if so that might work.*

*You should only have 2 120ohm resistors. That is it. One on each end of your bus. It can be in two control units as well.*

*CAN BUS speeds are 500kb/s CANC (high speed) for powertrain and 125 kb/s low speed.*

## TCM 2800 Tuning

You will need to input the correct Final Drive Ratio and Driven Tire Diameter.

Series 3 Jag Rear should be 2.88 gears.

## TRANSMISSION GEAR RATIOS

The gear ratios for the NAG1 automatic transmission are as follows:

- 1st Gear: 3.59:1
- 2nd Gear 2.19:1
- 3rd Gear 1.41:1
- 4th Gear 1.00:1
- 5th Gear 0.83:1
- Reverse 3.16:1

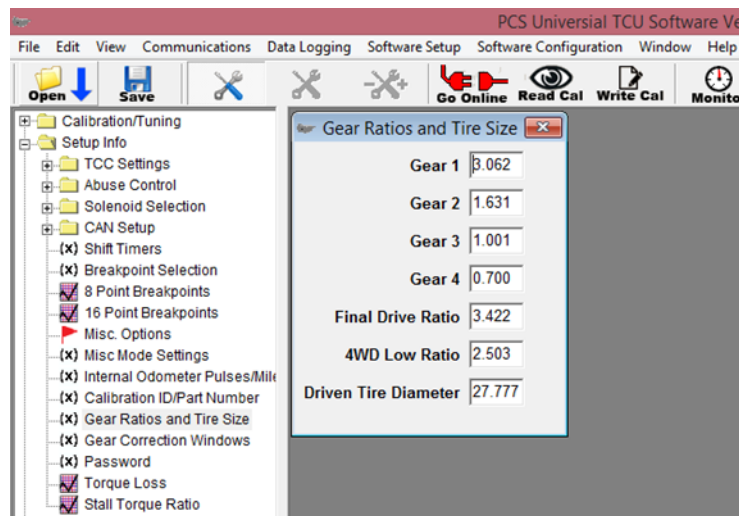


Figure 66 - Final Drive Ratio and Tyre Diameter Settings

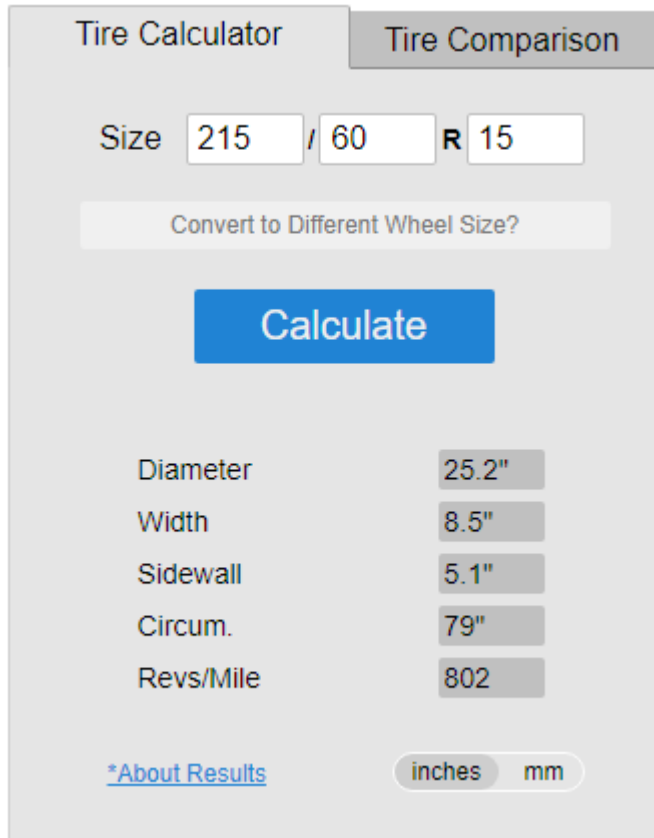
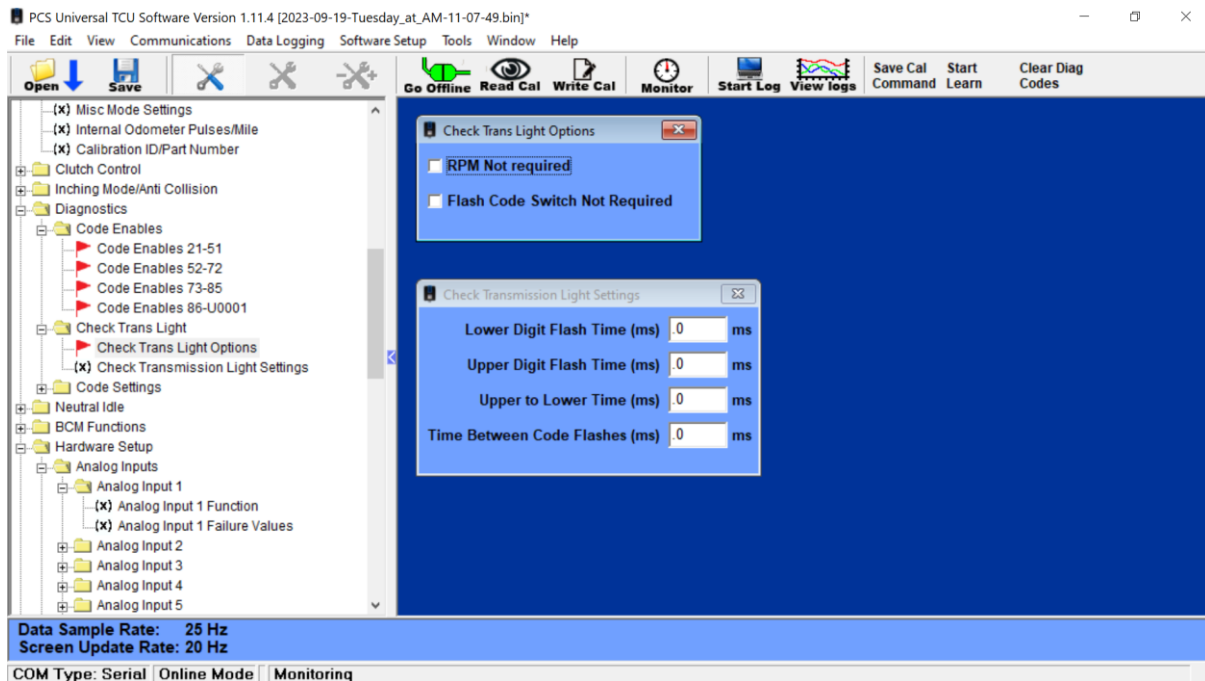
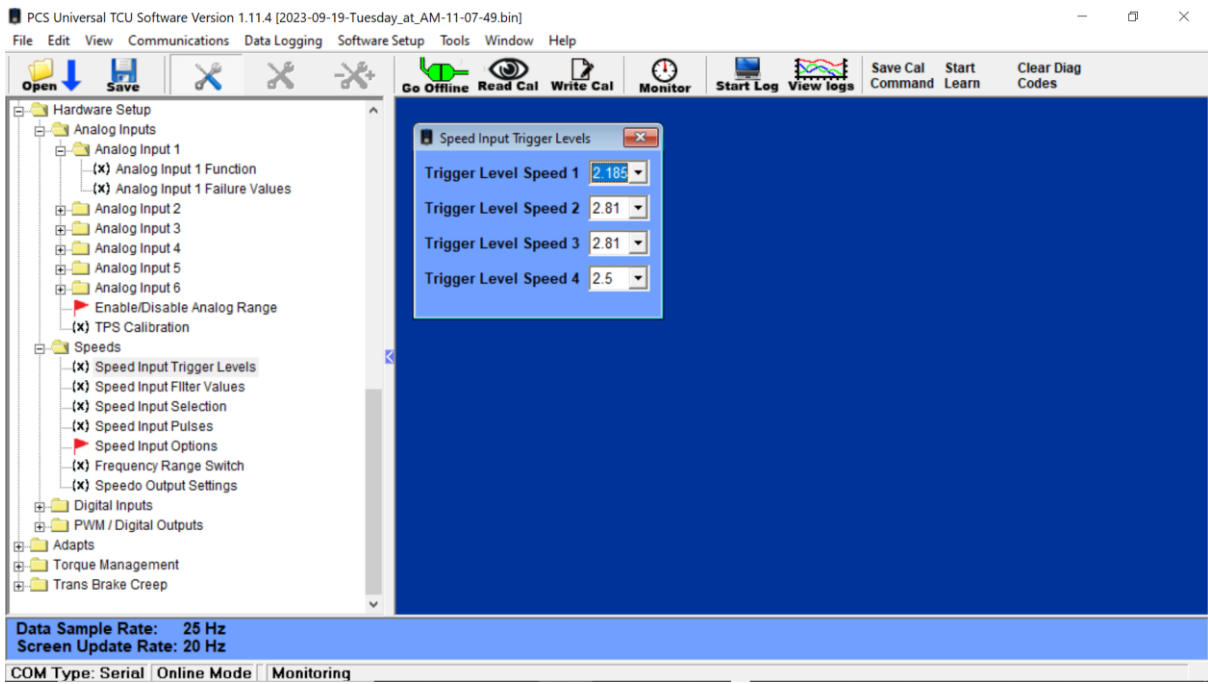
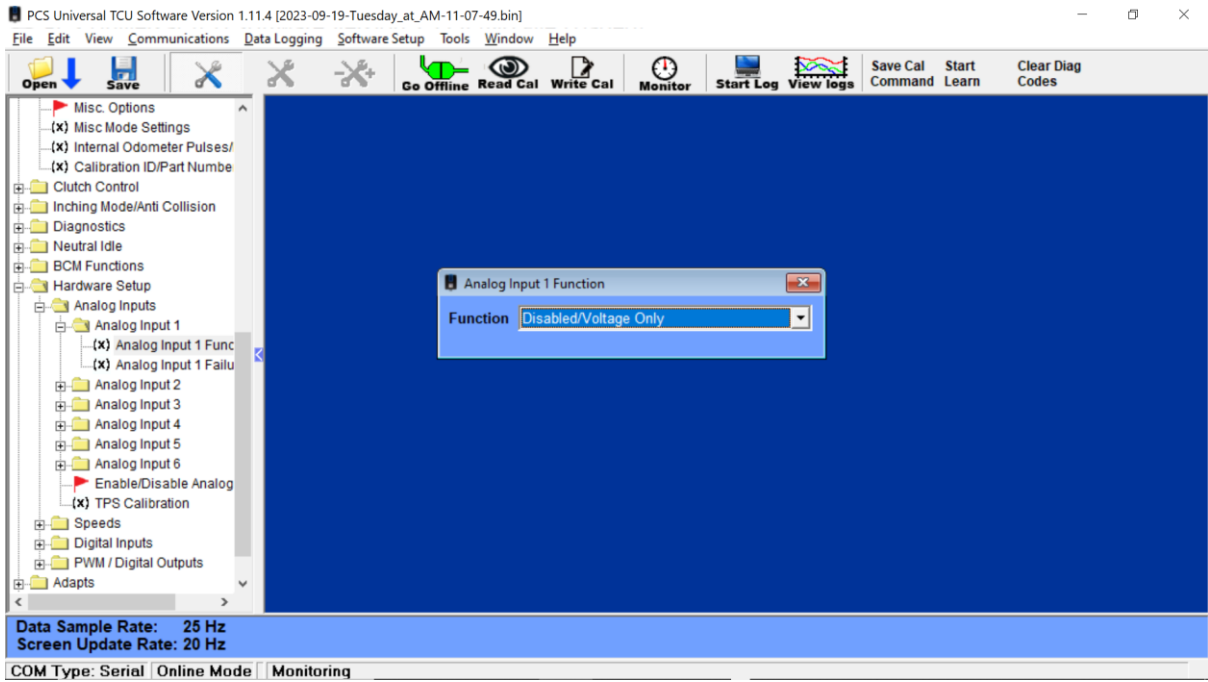


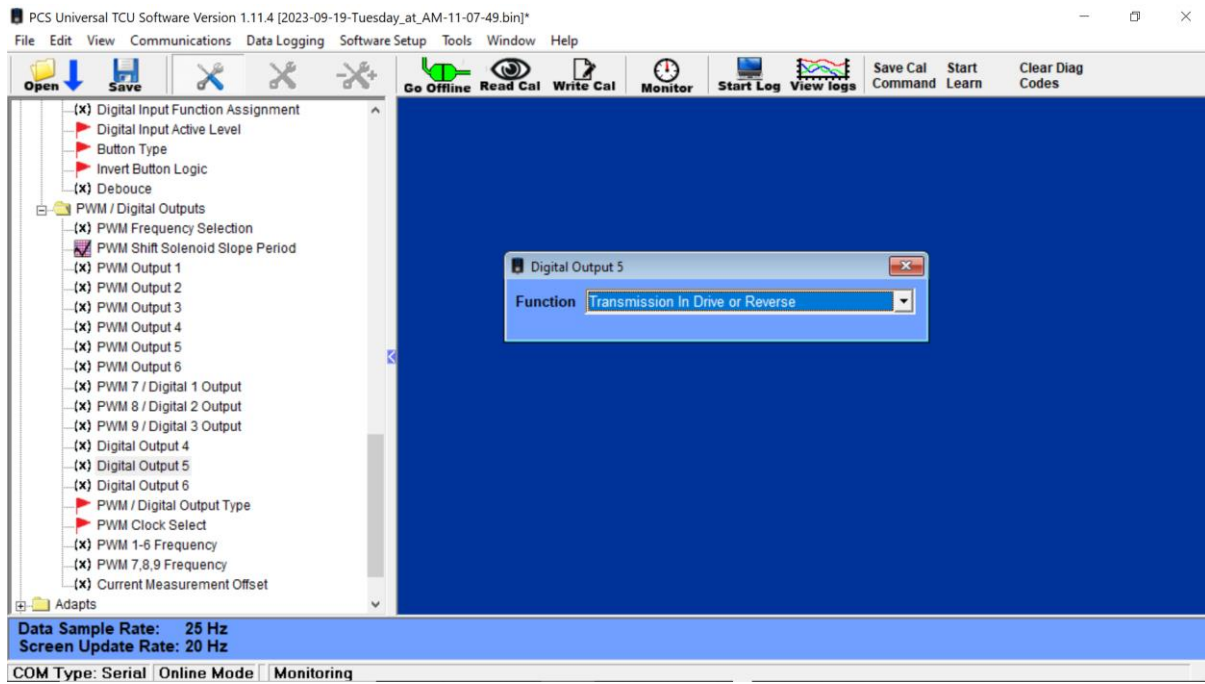
Figure 67 Tyre Size

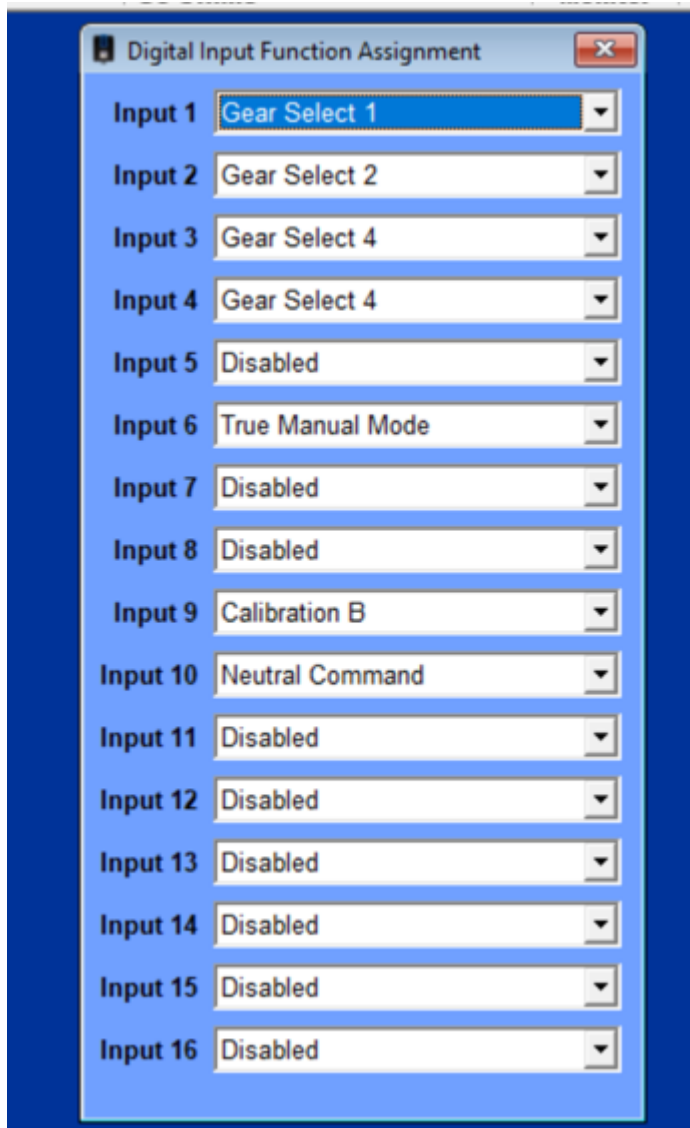
### Check Trans Light??????

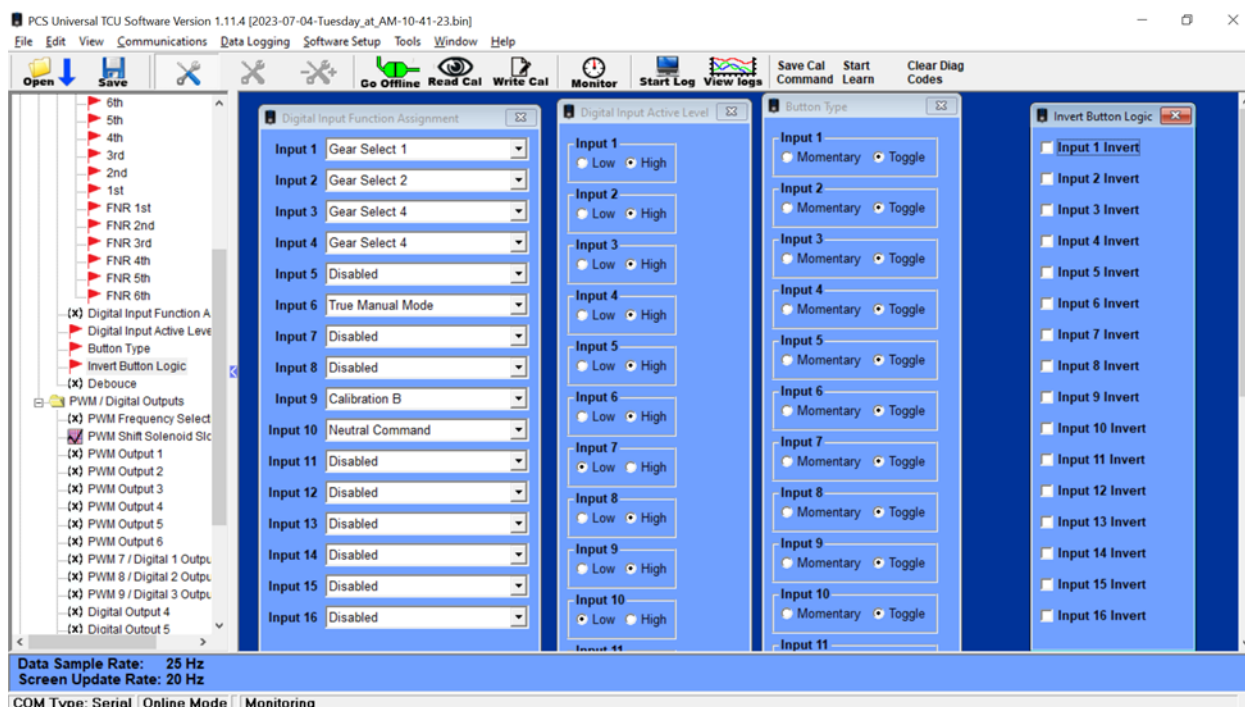












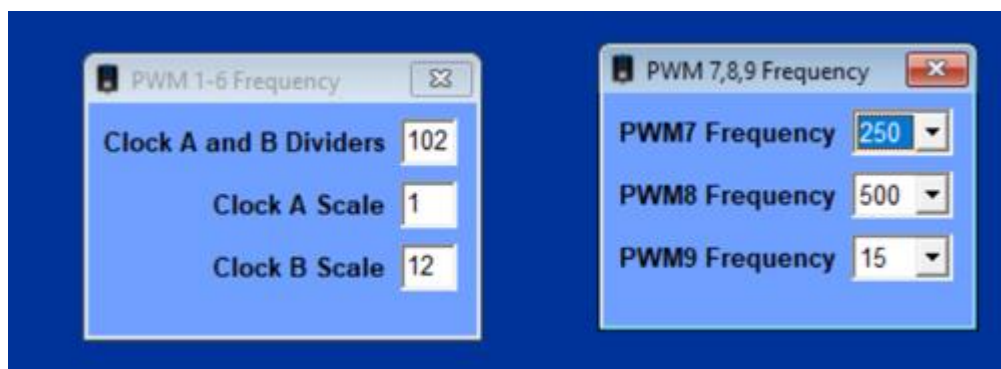
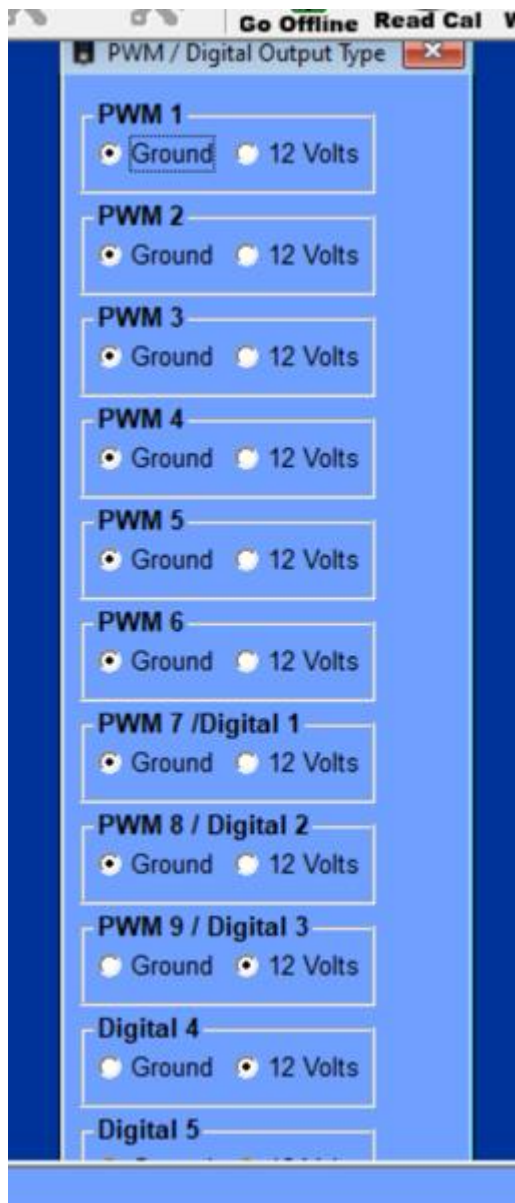
### Spare Assignments

Under the dash on the RHS (open the RHS glove box) is a set of spare terminals from the TCM 2800. They are assigned IAW the following table:

**NOTE: Record the assignments only after programming them.**

Table 4. Spare TCM 2800 Assignments			
Service	Use (from TCM)	Colour	Notes
PWM7/Dig1	Disabled	PK/BK	Joins WT/PK. Neutral Safety O/P – connect to pin 85 start relay.
PWM8/Dig2	PWM vs Current Gear	PK/RD	Gear Position.
PWM9/Dig 3	Manual Mode	PK/LG	Use 4 x 4 indicator on DD Control Unit.
Speed 1		OR/BK	
ANA IN 1	Disabled – Voltage Only	YL/BK	
Dig In 5	Disabled	GY/WT	
Dig In 9	CAL B	BN/BK	To CAL B Switch in dashboard (switches to Gnd).
Dig In 10	Neutral Command	BN/RD	
Dig In 11	Disabled	BN/GN	
DigOut 5	Trans in Drive or Reverse	PK/WT	
Dig Out 6	Cal B Indicator	PK/OR	Dashboard light. Output Type = GND.
Sig Gnd		BK/WT	
Speedo Out	Speedo Signal	OR/WT	To Speed In on DD Controller.

*From TCM 2800 Master Manual: Digital outputs may be used to light indicators for manual mode, snow mode, TCC lock/unlock, calibration B, etc.*



## Tuning, Flashing and Starting – HP Tuners

To retro-fit a factory PCM, some changes need to be made to the factory calibration. The obvious one is to disable the SKIM.

## SKIM Disable

This is done under the SYSTEM menu, and when it comes time to WRITE the calibration, you also need to write the calibration using the DISABLE SKIM for RETROFIT option in the WRITE window.



Figure 68 - HP Tuners MPVI2

## CAN BUS start Disable

The other issue with retrofitting this PCM is the START signal for the START relay. The START signal goes to ground when the Vehicle Speed is near zero and the shifter is in P or N, but this signal is developed in the BCM and the FCM. Without those modules, you must DISABLE the START relay in HP Tuners under the SYSTEM menu option and ground Pin 86 of the Start Relay.

~~Disable rear O2 sensors, O2 1/2, O2 2/2.~~

## Special Functions

Connect the ECM to the VCM Scanner and press the button for *Vehicle Controls & Special Functions*. (it looks like a green power button on the toolbar).

- Throttle Relearn: Will perform a throttle relearn for vehicles equipped with ETC.
- Reset All Adaptives: Resets all adaptives (fuel trims, etc.)
- Clear DTC: Chrysler Specific DTC Clear. Recommended to use along with the standard "Clear DTC" in "Diagnostics and Info"
- Gear/Tire Adjustment: Was in 3.0 as well. Change your tire size and/or adjust gear ratios using this special function.
- Traction Control Disable: Will disable Traction Control. Depending on the vehicle, you may need to do this after every key cycle. (Off-road use only).
- Traction Control Enable: Re-enables traction control after you have disabled it, if it doesn't re-enable on its own.

## References

<b>Vehicle Info (from SCAN Tool)</b>	
VIN	IC3H9E3W67Y511878
COM	CAN
ECM	OS PN 05030378AE
PCM Type	13 NGC4 ECM

VIN IC3H9E3W67Y511878:

- Make                      Manufactured by DaimlerChrysler Corporation
- ModelYear              2007 Model Year
- Manufacturer           Chrysler
- Division                 Passenger Car
- CarLine                 Restraint System Front NextGen With Side Air Bags
- CarLineSeries         300C/SRT8 (RWD)(RHD) BUX
- RestraintSystem       4DR - Sedan Tall Body Style - 48
- Engine                 6.1L Cyl SRT HEMI Gasoline SMPI
- Manufactured         2007
- Plant                    Chrysler Steyr Assembly
- Catalog                 07LE

### *DTC Codes*

The following codes are persistent:

- U0141 Lost communication with front control module. There is no FCM.
- U1403 Implausible fuel level signal. The factory fuel module is not fitted.
- U1411 Implausible fuel volume signal received. The factory fuel module is not fitted.
- U110C No fuel level bus message received. The factory fuel module is not fitted.
- U110F Lost fuel volume message. The factory fuel module is not fitted.
- U110E Lost ambient temperature. No FCM.
- P0058 O2 sensor 2/2 heater circuit high. Rear O2 Sensor deleted.
- P0038 O2 sensor 1/2 heater circuit high. Rear O2 Sensor deleted.

### *Vendor Info*

The following vendor references are used in this document:

- SRT Autoworks. 45 Enterprise circuit, Carrum Downs Victoria Web: <https://srtautoworks.com.au/>
- Sound German Automotive. Transmission control for NAG1 and tone ring.
- Painless Wiring. Wiring, switches, relays.
- Summit Racing.
- Dakota Digital. Gauges, CAN BUS interfaces, Vintage Air controller, Cooling Fan Controller.

- DIY Hemi. Factory GEN3 Hemi Wiring and harness modifications. <http://www.diyhemi.com/>
- Hotwire Auto. Gen 3 Hemi wiring harnesses, Cruise Control (AP900C), pedal adapter and cruise control switches.

## Excerpts from NATIONAL GUIDELINES FOR THE CONSTRUCTION AND MODIFICATION OF STREET RODS IN AUSTRALIA: Lighting:

### 8.1.3 Parking Lights

8.1.3.1 A pair of parking light must be fitted to the front of the Street Rod.

8.1.3.2 The parking lights must be positioned, with centres no more than 510mm inboard from the Street Rod extremity on both sides and at least 600mm apart, equidistant from the centre line of the Street Rod.

8.1.3.3 The parking lights must show white to the front.

8.1.3.4 The power must not exceed seven watts and they are to be visible at 200 metres.

8.1.3.5 The parking lights may be positioned in the headlight assembly.

### 8.1.5 Direction Indicator Lights

8.1.5.1 The Street Rod must have a pair of direction indicator lights fitted to both its front and rear.

8.1.5.2 The centre height of the lamps in the direction indicator lights must be between 350mm and 1500mm above ground level.

8.1.5.3 The centres of the direction indicator lights must be no less than 600mm apart and equidistant from the centre line of the Street Rod.

8.1.5.4 The direction indicator lights must display an amber colour.

8.1.5.5 Direction indicator lights indicators must flash at between 60 and 120 times per minute.

8.1.5.6 The direction indicator lights must be located so that other road users will have an indication of the directional change intended.

8.1.5.7 If flashing direction indicator lights are incorporated into the headlight assembly, the flashing indicator must be clearly visible when the headlight is illuminated; and in daylight from 30m for modified vehicles and from 200m for replicas.

8.1.5.8 A warning light visible from the normal driving position must illuminate whenever the flashing direction indicator lights are in operation.

8.1.5.9 Semaphore indicator lights must only be used in conjunction with standard direction indicator lights, and must only be capable of being raised when the indicators are operated.

## NGC Connector Pins

POWERTRAIN CONTROL MODULE C1 (2.0L NGC) - 38 WAY (An NGC connector plug, about 30 pins and outside cover).

Mopar Package #: 5083222AA

Old Part Number 5083222AA

New Part Number 5083222AB

Part Name WIRING 38 WAY

## Spark Plugs

NGK PLZTR5A-13 replacement spark plugs

- Champion 9403
- Champion OE167

- Champion RE14PLP5
- Denso 5349
- Denso ITL16
- Champion 7032 RE10PMPB5 Double Platinum Spark Plug