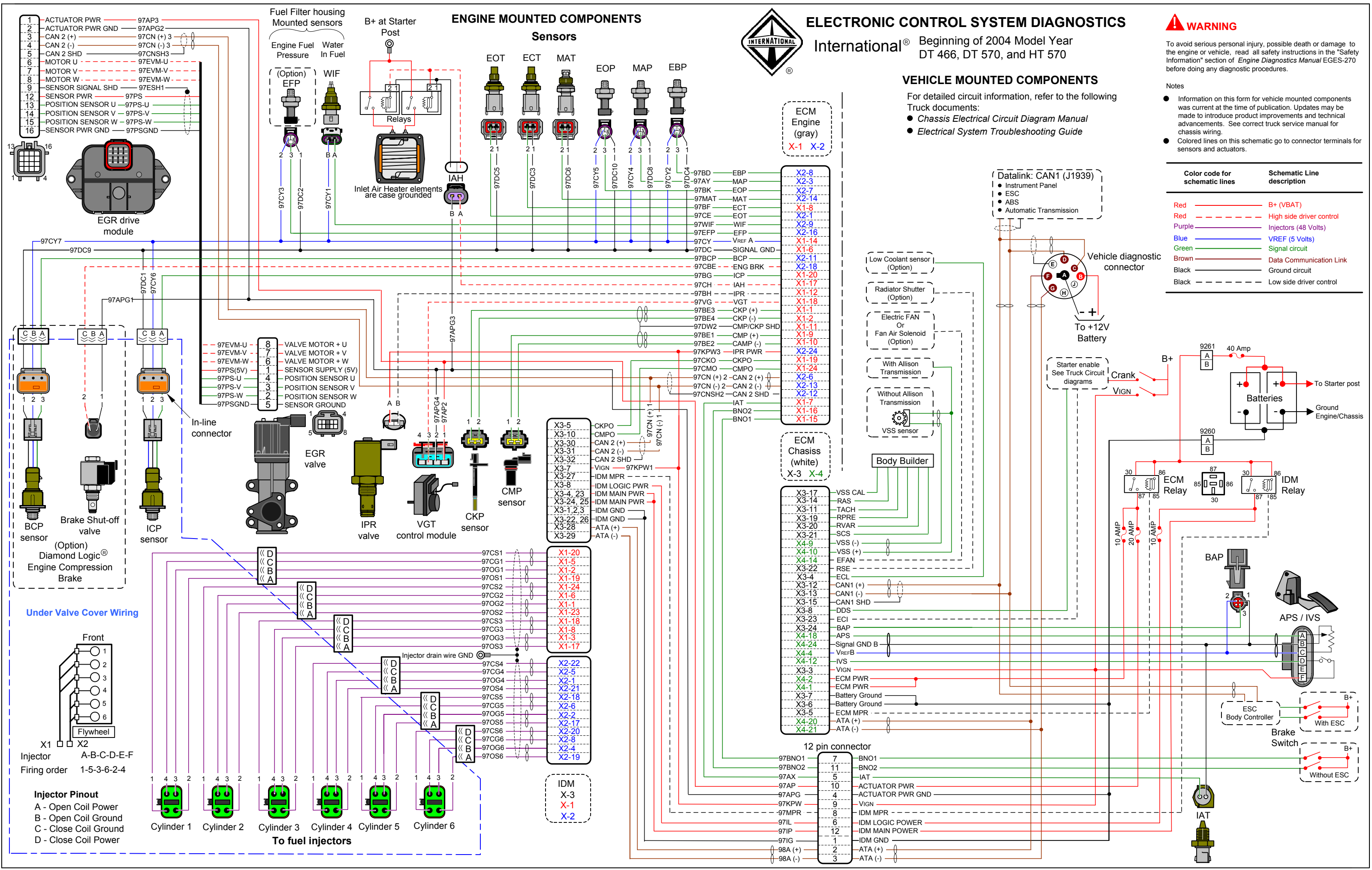




ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

International® Beginning of 2004 Model Year
DT 466, DT 570, and HT 570



WARNING
To avoid serious personal injury, possible death or damage to the engine or vehicle, read all safety instructions in the "Safety Information" section of *Engine Diagnostics Manual* EGES-270 before doing any diagnostic procedures.

- Notes
- Information on this form for vehicle mounted components was current at the time of publication. Updates may be made to introduce product improvements and technical advancements. See correct truck service manual for chassis wiring.
 - Colored lines on this schematic go to connector terminals for sensors and actuators.

Color code for schematic lines	Schematic Line description
Red	B+ (VBAT)
Red - - - - -	High side driver control
Purple	Injectors (48 Volts)
Blue	VREF (5 Volts)
Green	Signal circuit
Brown	Data Communication Link
Black	Ground circuit
Black - - - - -	Low side driver control

VEHICLE MOUNTED COMPONENTS

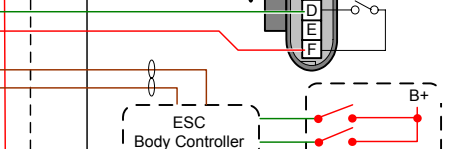
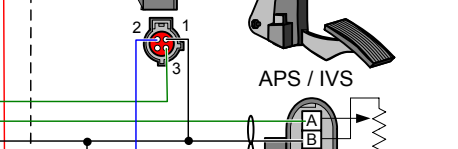
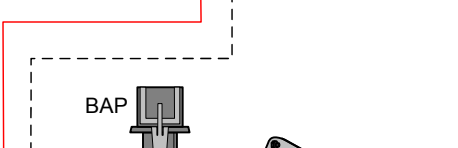
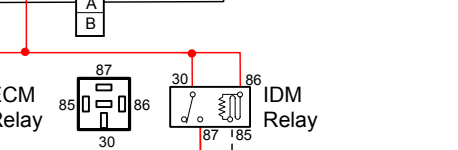
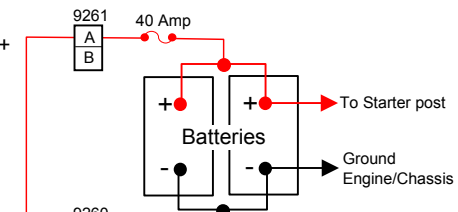
For detailed circuit information, refer to the following Truck documents:
● *Chassis Electrical Circuit Diagram Manual*
● *Electrical System Troubleshooting Guide*

Datalink: CAN1 (J1939)
● Instrument Panel
● ESC
● ABS
● Automatic Transmission

Vehicle diagnostic connector

To +12V Battery

Starter enable
See Truck Circuit diagrams



ECM Engine (gray)
X-1 X-2

- 97BD EBP
- 97AY MAP
- 97BK EOP
- 97MAT MAT
- 97BF ECT
- 97CE EOT
- 97WIF WIF
- 97EFP EFP
- 97CY VREF A
- 97DC SIGNAL GND
- 97BCP BCP
- 97CBE ENG BRK
- 97BG ICP
- 97CH IAH
- 97BH IPR
- 97VG VGT
- 97BE3 CKP (+)
- 97BE4 CKP (-)
- 97DW2 CMP/CKP SHD
- 97BE1 CMP (+)
- 97BE2 CAMP (-)
- 97KPW3 IPR PWR
- 97CKO CKPO
- 97CMO CMPO
- 97CN (+) 2 CAN 2 (+)
- 97CN (-) 2 CAN 2 (-)
- 97CNSH2 CAN 2 SHD
- 97BNO2 BNO2
- 97BNO1 BNO1

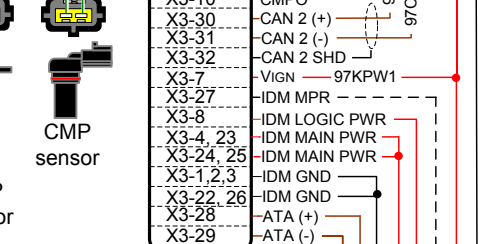
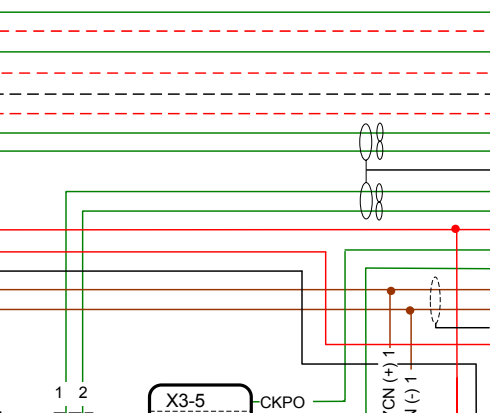
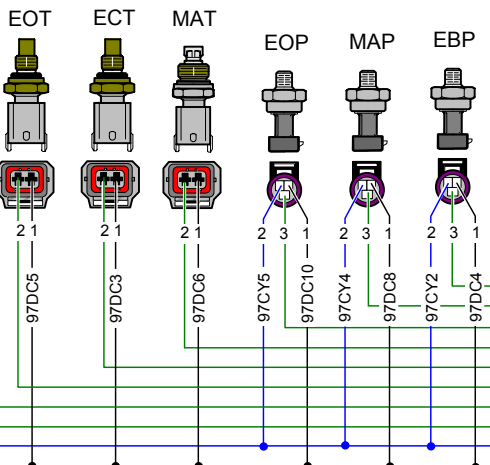
ECM Chassis (white)
X-3 X-4

- X3-17 VSS CAL
- X3-14 RAS
- X3-11 TACH
- X3-19 RPPE
- X3-20 RVAR
- X3-21 SCS
- X4-9 VSS (-)
- X4-10 VSS (+)
- X3-22 EFAN
- X3-4 RSE
- X3-12 ECL
- X3-23 ECI
- X3-24 BAP
- X4-18 APS
- X4-24 Signal GND B
- X4-4 VREFB
- X4-12 IVS
- X3-3 VIGN
- X4-2 ECM PWR
- X4-1 ECM PWR
- X3-7 Battery Ground
- X3-6 Battery Ground
- X3-5 ECM MPR
- X4-20 ATA (+)
- X4-21 ATA (-)

- 12 pin connector
- 7 BNO1
 - 11 BNO2
 - 5 IAT
 - 10 ACTUATOR PWR
 - 4 ACTUATOR PWR GND
 - 9 VIGN
 - 8 IDM MPR
 - 6 IDM LOGIC POWER
 - 12 IDM MAIN POWER
 - 1 IDM GND
 - 2 ATA (+)
 - 3 ATA (-)

ENGINE MOUNTED COMPONENTS

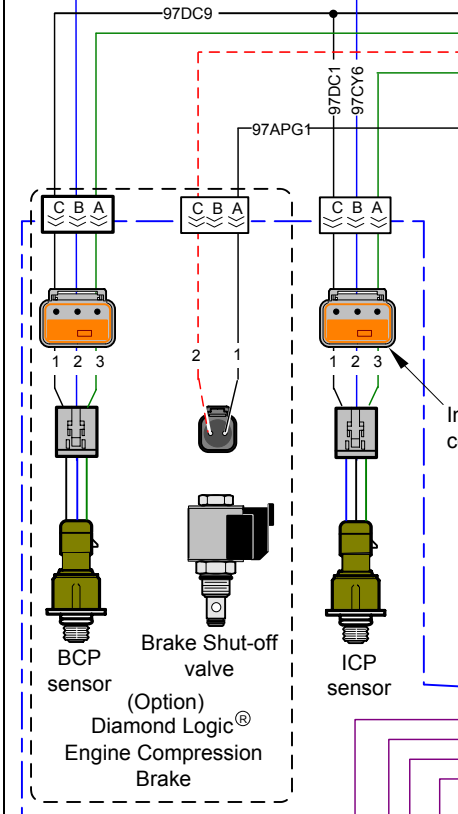
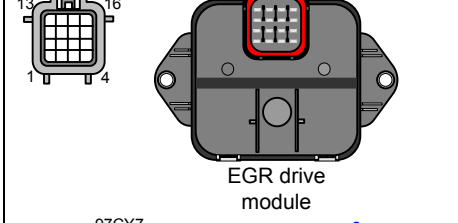
Sensors



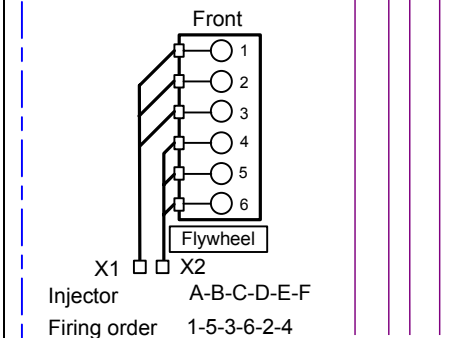
- 97CS1 97CG1 97OG1 97OS1 97CS2 97CG2 97OG2 97OS2 97CS3 97CG3 97OG3 97OS3 97CS4 97CG4 97OG4 97OS4 97CS5 97CG5 97OG5 97OS5 97CS6 97CG6 97OG6 97OS6
- X1-20 X1-5 X1-2 X1-19 X1-24 X1-6 X1-1 X1-23 X1-18 X1-8 X1-3 X1-17 X2-22 X2-5 X2-1 X2-21 X2-18 X2-6 X2-2 X2-17 X2-20 X2-8 X2-4 X2-19

- IDM X-3
X-1 X-2

- 1 ACTUATOR PWR 97AP3
- 2 ACTUATOR PWR GND 97APG2
- 3 CAN 2 (+) 97CN (+) 3
- 4 CAN 2 (-) 97CN (-) 3
- 5 CAN 2 SHD 97CNSH3
- 6 MOTOR U 97EVM-U
- 7 MOTOR V 97EVM-V
- 8 MOTOR W 97EVM-W
- 9 SENSOR SIGNAL SHD 97ESH1
- 12 SENSOR PWR 97PS
- 13 POSITION SENSOR U 97PS-U
- 14 POSITION SENSOR V 97PS-V
- 15 POSITION SENSOR W 97PS-W
- 16 SENSOR PWR GND 97PSGND



Under Valve Cover Wiring



- Injector Pinout
A - Open Coil Power
B - Open Coil Ground
C - Close Coil Ground
D - Close Coil Power
- Injector Firing order 1-5-3-6-2-4

To fuel injectors



ELECTRONIC CONTROL
SYSTEM DIAGNOSTICS

International® Beginning of 2004 Model Year DT 466, DT 570 and HT 570

SIGNAL VALUES (All values with the breakout box installed on the ECM and harness)

WARNING: Read Safety Instructions in EGES-270 *Diagnostic Manual*, before starting diagnostic procedures.

Pin	Item	Circuit	Circuit No.	Key ON		Low Idle			High Idle			Operating Range	Comments	
				Signal	Actual value	Signal	Data List	Actual value	Signal	Data List	Actual value			
X1 ENGINE CONNECTOR (GRAY)														
1	CKP (+)	Crankshaft Position	97BE3	Min 130 Hz at crank		650 – 700Hz		700 RPM		2.55 – 3.0 kHz	2750 RPM		0 – Governed speed	DMM set to DCV – Hz (DCmV – Hz at crank)
2	CKP (–)	Crankshaft Position	97BE4											CKP Ground
6	SIGNAL GND	Signal ground	97DC	0V		0V				0V			0V	Ground for engine sensors
7	IAT	Intake Air Temperature	97AX	Temp depend		Temp depend				Temp depend			0V – 5V	DMM set to V , EST – Continuous Monitor Session
8	ECT	Engine Coolant Temperature	97BF	Temp depend		Temp depend				Temp depend			0V – 5V	DMM set to V , EST – Continuous Monitor Session
9	CMP (+)	Camshaft Position	97BE1	Min 130 RPM ② at crank		700 RPM ②		700 RPM		2750 RPM ②	2750 RPM		0 – Governed speed	DMM set to DCV – RPM ② , (DCmV – RPM② at crank)
10	CMP (–)	Camshaft Position	97BE2											CMP Ground
11	CMP/CKP SHD	CMP/CKP Shield	97DW2	0V		0V				0V			0V	Ground shield for CMP/CKP sensors
12	IPR	Injection Pressure Regulator	97BH										0V – B+	Duty cycle , duty controlled, low side driver
14	VREF A	Voltage Reference A	97CY	5V ± 0.5V		5V ± 0.5V				5V ± 0.5V			5V ± 0.5	VREF for engine sensors
15	BNO1	Brake Normally Off switch 1	97BNO1	0V Off / B+ On		0V Off / B+ On	Off / On			0V Off – B+ On	Off / On		0V / B+	0V = Off / B+ On. Applications without ESC module
16	BNO2	Brake Normally Off switch 2	97BNO2	0V Off / B+ On		0V Off / B+ On	Off / On			0V Off – B+ On	Off / On		0V / B+	0V = Off / B+ On. Applications without ESC module
17	IAH	Intake Air Heater	97CH	0V Off / B+ On		0V Off / B+ On	Off / On			0V Off / B+ On	Off / On		0V / B+	0V = IAH Off, B+ = IAH On, EST Output State Test.
18	VGT	Variable Geometry Turbo Control	97VG	Performance Specs									0 – 100% Duty Cycle	Duty Cycle controlled, High side driver
19	CKPO	Crankshaft Position Out	97CKO	Min 130 Hz at crank		650 – 700Hz		700 RPM		2.75 – 3.0 kHz	2750 RPM		0 – Governed speed	DMM set to DCV – Hz, EST – PID Engine Speed
20	ICP	Injection Control Pressure	97BG	0.2V		Performance Specs				Performance Specs			0 – 4061 PSI	1.0V = 625 PSI , EST – No Start session
24	CMPO	Camshaft Position Out	97CMO	Min 130 RPM ② at crank		700 RPM ②		700 RPM		2750 RPM②	2750 RPM		0 – Governed speed	DMM set to DCV – RPM ② , EST – PID Engine Speed
X2 ENGINE CONNECTOR (GRAY)														
1	EOT	Engine Oil Temperature	97CE	Temp depend		Temp depend				Temp depend			0V – 5V	DMM set to V , EST – Continuous Monitor Session
3	MAP	Manifold Absolute Pressure	97AY	Performance Specs		Performance Specs				Performance Specs			0 – 38 PSI	DMM set to V , EST – Continuous Monitor Session
6	CAN 2 (+)	CAN 2 (Private)	97CN + 2	1 – 4V		1 – 4V				1 – 4V			1 – 4V	Digital signal communications
7	EOP	Engine Oil Pressure	97BK	0.62V at 0 PSIG		Performance Specs				Performance Specs			0 – 100 PSI	0.62V = 0 PSI 3.61V = 60 PSI
8	EBP	Exhaust Back Pressure	97BD	Performance Specs		Performance Specs				Performance Specs			0 – 38 PSI	0.8 – 1.0V = 0 PSI 2.72V = 18 PSI
9	WIF	Water In Fuel	97WIF	0 – 2.5V		0V – 2.5V	No / Yes			0 – 2.5V	No / Yes		0V – 5V	0V = No water , 2.5V = water in fuel , EST – No/Yes
11	BCP	Engine Brake Control Pressure	97BCP	Performance Specs		Performance Specs				Performance Specs			4061 PSI	0.4 – 0.9V= 0% open 4.0 – 4.5V= 100% open
12	CAN 2 Shd	CAN 2 Shield	97CNSH2	0V		0V				0V			0V	Shield ground for CAN 2
13	CAN 2 (–)	CAN 2 (Private)	97CN – 2	1 – 4V		1 – 4V				1 – 4V			1V – 4V	Digital signal communications
14	MAT	Manifold Air Temperature	97MAT	Temp depend		Temp depend				Temp depend			0V – 5V	DMM set to V , EST – Continuous Monitor Session
16	EFP	Engine Fuel Pressure	97EFP	0V ??		Performance Specs				Performance Specs			0V – 5V	DMM set to V , EST – Continuous Monitor Session
18	ENG BRK	Engine Brake (control)	97CBE	0V		0V				0V			0V / B+	0V = CBE Off, B+ = CBE On, EST Output State Test.
24	IPR PWR	IPR Power	97KPW3	B+		B+				B+			0V / B+	Switched ignition power , B+ = Key On, 0V = Key Off
X3 CHASSIS CONNECTOR (WHITE)														
3	VIGN	ECM Ignition Voltage		B+		B+				B+			0V / B+	Switched Ignition power B+ = Key On , 0V = Key Off
4	ECL	Engine Coolant Level		0V Low – 5V Full		0V Low – 5V Full				0V Low – 5V Full			0V – 5V	0V = Low coolant 5V = Full coolant
5	ECM MPR	ECM Main Power Relay Control		0.6 – 1.0V		0.6 - 1.0V				0.6 – 1.0V			0.6 – 1.0V / B+	0.6 – 1.0V = MPR on B+ = MPR off
6	Battery ground	Battery ground		0V		0V				0V			B+	ECM ground from B –
7	Battery ground	Battery ground		0V		0V				0V			0V	ECM ground from B –
8	DDS	Drive Line Disengagement Switch		0V – B+		B+				B+			0V / B+	0V = In gear , B+ = Park , Neutral or clutch pedal down
11	TACH	Tachometer output												Chassis body builder option only
12	CAN 1 (+)	CAN 1 (Public)		1 – 4V		1 – 4V				1 – 4V			1 – 4V	Digital signal communications
13	CAN 1 (–)	CAN 1 (Public)		0V		1 – 4V				1 – 4V			1 – 4V	Digital signal communications
14	RAS	Resume Accel Switch												Chassis body builder option only
15	CAN 1 SHD	CAN 1 Shield		0V		0V				0V			0V	Shield group for CAN 1
17	VSS CAL	Vehicle Speed Output												Chassis body builder option only
19	RPRE	Remote Preset PTO												Chassis body builder option only
20	RVAR	Remote Variable PTO												Chassis body builder option only
21	SCS	Speed Control Switch												Chassis body builder option only
22	RSE	Radiator Shutter Enable		0V / B+		0V / B+				0V / B+			0V / B+	0V = Shtr Closed, B+ = Shtr Open, Low side driver.
23	ECI	Engine Crank Inhibit		0V / 4 - 5V		4 – 5V				4 – 5V			0V / 4 – 5V	0V allows cranking 4 – 5V inhibits cranking
24	BAP	Barometric Pressure		Alt depend		Alt depend				Alt depend			2.55V – 4.8V	4.6V = Sea level 2.6V = 10,000 ft. (approx)
X4 CHASSIS CONNECTOR (WHITE)														
1	ECM PWR	ECM2 Power		B+		B+				B+			B+	B+ from ECM power relay
2	ECM PWR	ECM2 Power		B+		B+				B+			B+	B+ from ECM power relay
4	VREF B	Voltage Reference B		5V ± 0.5V		5V ± 0.5V				5V ± 0.5V			5V ± 0.5V	VREF for chassis sensors
9	VSS (–)	Vehicle Speed Signal				2 – 14 VAC		Mph (Km/hr)		2 – 14 VAC		Mph (Km/hr)	2 – 14 VAC	VSS (–) is used on applications without an Allison Trans
10	VSS (+)	Vehicle Speed Signal				2 – 14 VAC		Mph (Km/hr)		2 – 14 VAC		Mph (Km/hr)	2 – 14 VAC	VSS signal is an AC sine wave
12	IVS	Idle Validation Switch		0V		0V				B+			0V / B+	0V at normal state, B+ Accelerator pedal depressed
14	EFAN	Engine Fan		0V / B+		0V / B+				0V / B+			0V / B+	0V = Fan Off, B+ = Fan On, Low Side Driver
18	APS	Accelerator Position Sensor		0.65V		0.65V		0%		4V		102%	0 – 102%	0.64V = 0% 3.84V = 102%
20	ATA (+)	Communication Link		2.8 – 4.0V		2.8 – 4.0V				2.8 – 4.0V			0V – 5V	Diagnostic/programming
21	ATA (–)	Communication Link		0.2 – 1.8V		0.2 – 1.8V				0.2 – 1.8V			0V – 5V	Diagnostic/programming
24	SIGNAL GND	Signal ground		0V		0V				0V			0V	Signal ground for chassis mounted sensors