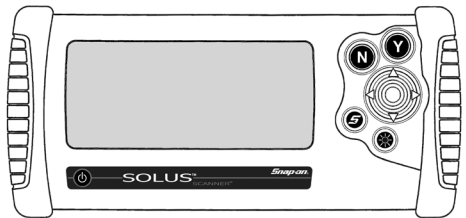
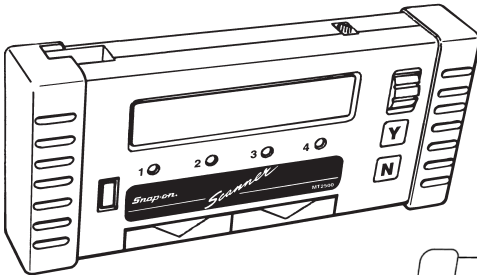
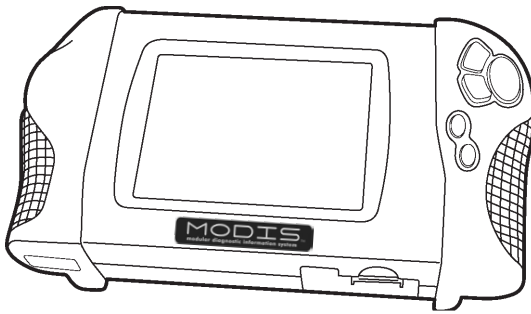


# Australian Data Parameter Manual including Abbreviations Used listing

July 2011



**Snap-on**®

Use in conjunction with the applicable Scanner User Reference Manual.

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# **Australian Data Parameter Manual**

## **including Abbreviations Used listing**

**11.2 Release  
July 2011**

**BEFORE OPERATING ANY DIAGNOSTIC EQUIPMENT,  
PLEASE READ ALL MANUALS CAREFULLY.  
ALSO PAY PARTICULAR ATTENTION TO THE SAFETY  
PRECAUTIONS IN THE APPLICABLE MANUALS.**

***Snap-on***®

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## Abbreviation Glossary

18X	crankshaft sensor, 18 segments
3X	crankshaft sensor, 3 segments
4EAT	4-speed electronic automatic transmission
A/B	airbag
ABS	antilock brake system
A/C	air conditioning
ACM	audio control module
ACON	air conditioning on
ACT	actual
ACT	air charge temperature
A/F	air fuel ratio
AIR	secondary air injection (formerly “thermactor”)
AIRB	secondary air injection bypass
AIRD	secondary air injection diverter
AMB	ambient (as in temperature)
AOD	automatic overdrive
APP	accelerator pedal position
ARC	automatic ride control
ASARC	air suspension automatic ride control
ATX	automatic transaxle
AXOD	automatic overdrive transaxle
AXOD-E	automatic transaxle overdrive, electronically controlled
AYC	active yaw control
B1	(engine) bank 1
B2	(engine) bank 2
BARO	barometric
BCM	body control module
BEM	body electronics module
BMAP	barometric and manifold absolute pressure
BOO	brake on-off
BPA	bypass air
BPP	brake pedal position
CAC	charge air cooler
CAL	calibration
CALC	calculated
CAN	controller area network
CANP	canister purge
CARB or MC	carburetor, or mixture control
C/C	cruise Control
CC	cruise control
CCS	coast clutch solenoid
CEL	check engine light

CFI	central fuel injection
CHT	cylinder head temperature
CKP	crankshaft position sensor sensor
CKT	circuit
CLC	converter lockup clutch
CL, EC, or PCM	closed loop, engine control, or powertrain control module
CMP	camshaft position sensor
CYL	cylinder
DCEL	deceleration
DDL	dynamic distortion level (Holden)
DES	desired
DI	distributor ignition
DIS	direct (distributorless) ignition system
DIST	distributor
DLC	data link connector
DPI	dual plug inhibit
DRIV	driver
DRL	daytime running lights
DRVR	driver
DSS	downshift solenoid
DTC	diagnostic trouble code
DTM	diagnostic test mode
DVOM	digital volt-ohmmeter
E4OD	electronic 4-speed overdrive
EAIR	electronic secondary air injection
EBD	electronic Brake Distribution
EC	engine Control
ECA	electronic control assembly
ECC	electronic climate control
ECT	engine coolant temperature
EDIS	electronic direct (distributorless) ignition system
EEC	electronic engine control
EFE	early fuel evaporation
EFF	efficiency
EFI	electronic fuel injection (port injection)
EGO	exhaust gas oxygen
EGOG	EGO ground
EGRC	exhaust gas recirculation control
EGRT	exhaust gas recirculation
EGRV	exhaust gas recirculation vent
EGTS	exhaust gas temperature switch
EI system or ICM	electronic ignition system or ignition control module
EMI	electromagnetic interference
EPC	electronic pressure control
EPT	exhaust (or EGR) pressure transducer
ESP	electronic stability program

## Abbreviation Glossary

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EST	electronic spark timing
EVP	EGR valve position
EVR	EGR vacuum regulator
EXH	exhaust
FBC	feedback carburetor
FBK	feedback
FC	fan control
FF	flexible fuel
FIPL	fuel injection pump lever
FMEM	failure mode effects management
FPRC	fuel pressure regulator circuit
FRP	fuel rail pressure
F/T	fuel trim
HEGO	heated EGO
HEGOG	heated EGO ground
HFC	high fan control
HI	high
HIM	heater, ventilation, air conditioner integration module
HLA	hydraulic launch assist (Ford)
HO2S	heated oxygen sensor
HO2S	heated oxygen sensor ground ground
HSC	high-swirl combustion
IAC	idle air control
IAT	intake air temperature
ICM	instrument cluster module
IDM	ignition diagnostic monitor
IFS	inertia fuel shutoff
IMRC	inlet manifold runner control
IMS	integrated memory system (Hyundai/Kia)
IMS	internal mode switch
INJ	injector
INT	intake
ISC	idle speed control
ISO	isolation (valve)
ITS	idle tracking switch
IVSC	integrated vehicle speed control
KAM	keep alive memory
KOEO	key on, engine off
KOER	key on, engine running
KS	knock sensor
LF	left front
LHF	left hand front
LHR	left hand rear
LO	low
LR	left rear
LT	long term
LTFT	long term fuel trim



MAF	mass airflow
MAP	manifold absolute pressure
MC	measuring core
MCU	microprocessor control unit
MECS	Mazda electronic control system
MEM	memory
MEMCAL	memory calibration
MFI	multiport fuel injection
MIL	malfunction indicator light
MISS	misfire
NAAO	North American Automotive Operations
O2S	oxygen sensor
OC	oxidation catalytic converter
OCC	occupant climate control
OCV	oil control valve
PASS	passenger
PCM	powertrain control module
PCS	pressure control solenoid
PDL	pedal
PFE	pressure feedback EGR
PIM	pressure in manifold
PIP	profile ignition pickup
PPS	pedal position sensor
PSPS	power steering pressure switch
PWM	pulse width modulation
REF	reference
REQ	required or requested
RF	radiofrequency
RF	right front
RFA	remote function access
RFI	radiofrequency interference
RHF	right hand front
RHR	right hand rear
RR	right rear
RTD	retard
S1	sensor 1
S2	sensor 2
SAW	spark angle word
SBS	supercharger bypass solenoid
SDM	sensing diagnostic module (for airbags)
SDV	spark delay valve
SEFI	sequential electronic fuel injection
SFI	sequential multiport fuel injection
SHO	super high output
SIG	signal
SIGRTN	signal return
SIL	shift indicator lamp

SNEF	signal noise enhancement filter (knock sensor)
SPC	speed control (cruise control – Ford)
SPD	speed
SPOUT	spark out
SQUIB	airbag triggering mechanism
SS	shift solenoid
ST	short term
STFT	short term fuel trim
STI	self-test input
STO	self-test output
TAB	thermactor air bypass
TAC	throttle actuator control
TAD	thermactor air divert
TBI	throttle body fuel injection
TC	traction control
TCC	torque converter clutch
TCIL	transmission control indicator lamp
TCM	transmission control module
TCS	traction Control System
TFI	thick-film integrated (ignition system)
TFP	transmission fluid pressure
TOT	transmission oil temperature
TP	throttle position
TPS	throttle position sensor
TRAC	traction Control
TSS	transmission speed sensor
TVS	throttle valve sensor
TWC	three way catalyst
VAC	vacuum
VAF	vane (or volume) airflow
VAT	vane air temperature
VCRM	variable control relay module
VCT	variable camshaft timing
VDC	vehicle dynamic control
V/F	voltage feedback (fuel trim)
VICS	variable induction control system
VIN	vehicle identification number
VOTM	vacuum-operated throttle modulator
VPWR	vehicle power
VREF	reference voltage
VRIS	variable resonance induction system
VSS	vehicle speed sensor
VVT	variable valve timing
WOT	wide-open throttle

# Data Parameters

## Introduction

In the DATA menu selections, the Scanner displays operating parameters available from the vehicle electronic control units (ECU).

These modules and controllers provide two basic kinds of parameters: Digital (or discrete) and analog:

- **Digital (Discrete)** parameters are those that can be in only one of two states, such as on or off, open or closed, high or low, yes or no. Switches and solenoids provide discrete parameters on the ECU data list. The Scanner displays discrete parameters as ON/OFF, YES/NO, OPEN/CLSD, RICH/LEAN, or some other readings that indicate alternate states.
- **Analog** parameters are displayed as a measured value in the appropriate units. Voltage, pressure, temperature, time and speed parameters are examples of analog values. The Scanner displays them as number that vary through a range of values in specific units, such as pounds per square inch (psi), kilopascals (kPa), degrees Celsius (°C), degrees Fahrenheit (°F), or miles per hour (mph).

The Scanner can display some parameters in numbers that range from 0 to 255, 0 to 999, or 0 to 1800. These ranges are used because in each case, it is the maximum number range that the ECU can transmit for a given parameter. Some parameter reads, however, will never reach the highest possible number. For example, you will never see a vehicle speed parameter reading of 255 mph.

Parameters also can be identified as input signals or output commands:

- **Input** parameters are signals from various sensors and switches to the ECU. They may be displayed as analog or discrete values.
- **Output** parameters are commands from the ECU to various actuators, such as solenoids and fuel injectors. Most are discrete parameters, but some may be displayed as analog values.

The following sections explain the data parameters displayed by the Snap-on Scanner. Because the vehicle ECU determines the parameter data list, not all parameters listed here are displayed for every vehicle.

Each parameter description lists the parameter title and value as displayed on the Scanner. This is followed by the full title and a description of the states of the parameters or a description of the measurement units and ranges for analog parameters.

## General Note

### CKT STATUS or Circuit Status

These parameters display the status of various circuits from the ECU. These parameters may indicate a Fault if the particular circuit is not being energised. For example Fan Relay CKT Status may show Fault until the engine fan has actually been switched on then it will change to OK. If the relay has been switched on and the status is still fault then a fault may exist in the circuit or relay.

## Data Parameters Descriptions

**1-2 BATT SHORT (range: YES/NO)**

**1-2 SOL BATT SHRT**

**2-3 BATT SHORT**

**4-5 BATT SHORT**

**3-2 BATT SHRT**

These parameters indicate whether the vehicle control module (VCM) feedback signals from the 1-2, 2-3, and 3-2 shift solenoid valves are shorted to battery voltage. These parameters read as follows:

- YES if a short is detected.
- NO under normal operation.

Readings are only valid when 1-2, 2-3, or 3-2 shift solenoids are on.

**1-2 OPEN/SHRT (range: YES/NO)**

**2-3 OPEN/SHRT**

**4-5 OPEN/SHRT**

This parameter indicates if an open or short to ground exists in the 1-2, 2-3 or 4-5 shift solenoid valve feedback signals to the PCM. The reading is valid only when the 1-2, 2-3 or 4-5 shift solenoid valve is commanded off.

**1-2 SHIFT (SEC) (range: 0 to 6.38)**

**2-3 SHIFT (SEC)**

**3-4 SHIFT (SEC)**

This parameter shows the time in seconds of the last shift for each of the shifts, 1-2, 2-3, 3-4. It begins when the TCM/PCM commands the shift and finishes when the TCM/PCM recognises a ratio change.

1-2 SHIFT ADAPT (Kpa) \_\_\_\_\_XXX  
 LT 1-2 S. ADAPT (Kpa)  
 2-3 SHIFT ADAPT (Kpa) \_\_\_\_\_XXX  
 LT 2-3 S. ADAPT (Kpa)  
 ST SHIFT ADAPT (Kpa)

These parameter indicate modified line pressure correction.

1-2 SOLENOID \_\_\_\_XXX (range: ON/OFF)  
 1-2 SHIFT SOL A \_\_\_\_XXX  
 1-2 SOL FDBK \_\_\_\_XXX  
 1-2 S.SOL A FDBK \_\_\_\_XXX  
 2-3 SOLENOID \_\_\_\_XXX  
 2-3 SHIFT SOL B \_\_\_\_XXX  
 2-3 SOL FDBK \_\_\_\_XXX  
 2-3 S. SOL B FDBK \_\_\_\_XXX

For Holden Commodore the 1-2 and 2-3 solenoid parameters indicate the PCM commanded valve state, while the feedback (FDBK) parameters indicate the actual valve state. For example, during normal operation, these parameters should read:

GEAR	1-2 Solenoid	1-2 Feedback	2-3 Solenoid	2-3 Feedback
1st	ON	ON	ON	ON
2nd	OFF	OFF	ON	ON
3rd	OFF	OFF	OFF	OFF
4th	ON	ON	OFF	OFF

These parameters display the ON/OFF status of the two solenoids used to activate the transmission shift valves. Solenoid A activates the 1-2 and 3-4 shift valves, while solenoid B activates the 2-3 shift valve.

1-2 SHIFT (SEC) \_\_\_\_X.XX (range: 0.00 to 7.97 seconds)  
 2-3 SHIFT (SEC) \_\_\_\_X.XX  
 3-4 SHIFT (SEC) \_\_\_\_X.XX

These analog parameters indicate the time it takes the transmission to automatically shift from 1st gear to 2nd gear, 2nd gear to 3rd gear, and 3rd gear to 4th gear.

1 POS SWITCH (range: ON/OFF)  
 LOW SELECTED

This discrete parameter indicates whether the contacts to the first position switch are closed or open. On a properly functioning vehicle, ON means the switch contacts are closed and the vehicle is in first.

**2-4 BRAKE TM (range: ON/OFF)**

This discrete parameter indicates the transmission ECU command to the 2-4 Brake Timing solenoid. ON indicates the solenoid is being energised by the trans ECU and OFF indicates it is not being energised.

**2ND SOL DUTY(%) (range: 0 to 100)**

This analog parameter displays the duty cycle on time for the second brake solenoid. In a correctly operating transmission this solenoid will show 0% in 2nd and 4th gears, and up to 100% in 1st, 3rd and reverse.

**2 POS SWITCH (range: ON/OFF)  
2ND SELECTED**

This discrete parameter indicates whether the contacts to the second position switch are closed or open. On a properly functioning vehicle, ON means the switch contacts are closed and the vehicle is in second.

**3-2 CONTROL SOL\_\_\_\_XXX (range: ON/OFF)**

This represents the state of the 3-2 Control Solenoid.

**3-2 DWNSHFT SOL (range: ON/OFF)**

This parameter displays the commanded status of the 3-2 downshift solenoid. This should read OFF unless a 3-2 downshift is occurring then it will display ON.

**3-2 DWNSHFT ENBL (range: YES/NO)**

This parameter displays whether the 3-2 control solenoid has been enabled for a 3-2 downshift. This should read NO unless a 3-2 downshift is occurring then it will display YES.

**3-2 SOLENOID FDBK\_\_\_\_XXX (range: ON/OFF)**

This parameter is the electrical state of the solenoid and circuit.

**3-2 PWMSOL(%)\_\_\_\_XXX (range: 0 to 100%)**

**3-2 CONT SOL(%)\_\_\_\_XXX**

This parameter displays the pulse-width-modulated (PWM)/duty cycle signal to the 3-2 control solenoid. Zero (0%) indicates that the valve is not energized, while 100% indicates that the valve is continuously energized. During normal operation, this parameter should range from 0 to 60%. The duty cycle is usually about 90% but during a downshift drops.

**3/2 SHIFT SOL\_XXX** (range: ON/OFF)

**4/3 SHIFT SOL\_XXX**

These digital parameters display the ON/OFF status of the two solenoids used to activate the 3-2 and 4-3 downshift valves during deceleration.

**3X SIGNAL** (range: YES/NO)

**18X SIGNAL**

These discrete parameters show whether the ECM/PCM is receiving a signal from the crankshaft 3X sensor and 18X sensor. These sensors are used to measure engine speed (18X) and to time injection and ignition (3X).

**4-3 DOWNSHIFT\_\_XXX** (range: YES/NO)

This parameter on some late-model fuel-injected vehicles indicates that the ECU has recognized the 4-3 downshift and should unlock the torque converter clutch. When 4-3 DOWNSHIFT reads YES, TCC COMMAND should read OFF.

**4LOW SWITCH** (range: ON/OFF)

This parameter indicates the status of the 4 wheel drive low (4LOW) switch. ON indicates the switch contacts are closed and the transmission is operating in 4WD low range, OFF indicates the switch is open and the transmission is not in 4WD low range.

**4WD ACTIVE\_\_\_\_\_XXX** (range: YES/NO)

This parameter displays the operating status of the 4WD system. When the display reads YES, the 4WD drive system operating in four-wheel drive mode.

**4WDClutch(%)\_XXX** (range: 0 to 100%)

This parameter indicates the amount of transfer case clutch lockup commanded by the GEM module. When the front and rear axles rotate at the same speed, 4WDClutch(%) should display 0 to 2%.

**4WDClutchPWM\_XXX** (range: ON/OFF)

This discrete parameter indicates whether the GEM module is controlling the transfer case clutch using pulse width modulation (PWM). ON means that the GEM is using PWM.

**4WD\_FrShftSp\_XXX** (range: 0 to 255 mph)

**4WD\_RrShftSp\_XXX**

These parameters display the speeds in mph of the front and rear transfer case drive shafts. Using the speeds of these two shafts, the GEM module calculates the amount of wheel slippage between the front and rear axles. The amount of wheel slippage determines how much the GEM module applies the 4WD clutch.

**4WDHigh\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status to run the transfer case in 4WD High Mode. When the system functions properly, ON means the transfer case is running in 4WD High Mode.

**4WDLow\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status to run the transfer case in 4WD Low Mode. When the system functions properly, ON means the transfer case is running in 4WD Low Mode.

**4WD LOW SW\_\_\_\_\_XXX** (range: ON/OFF)

This parameter indicates the status of the driver selectable four-wheel drive switch.

**4WDPlate\_A**

**4WDPlate\_C**

**4WDPlate\_B**

**4WDPlate\_D**

(range: ON/OFF)

These parameters indicate the status of each transfer case clutch plate.

**4WDPlatePwr\_XXX** (range: ON/OFF)

This parameter indicates whether the transfer case clutch plates are being supplied power.

**4WD\_Switch\_XXXX** (range: AUTO/4HI/4LOW)

This parameter displays the status of the driver-operated 4WD switch. This switch is an input to the GEM module, which controls transfer case operation.

**4X4Low\_XXX** (range: ON/OFF)

This parameter reads ON when the instrument panel selector switch for 4-wheel drive low is closed and OFF when the switch is open. The switch sends a ground signal to the PCM when 4x4 low is ON. This is used to adjust the transmission shift schedule.



**5V REF (V)\_\_\_\_\_X.XX (range: 0 to 5.12)**

On some vehicles, the Scanner will display the reference voltage on which system sensors operate. The ECU monitors this voltage and provides the parameter on the data stream. The nominal reference voltage is 5.0 volts, but it may vary by a few tenths of a volt, depending on system calibration and charging system voltage.

**A/C BLOWER SW \_\_XX (range: ON/OFF)**

This parameter displays the status of the air conditioner blower fan switch.

**A/C CLUTCH \_\_\_XXX (range: ON/OFF)**

**A/C RELAY \_\_\_XXX**

**A/C CLUTCH RELAY \_\_\_XXX**

**A/CclutchSw\_XXX**

This parameter is a feedback signal from the A/C compressor clutch or relay. When it is ON, the clutch is engaged; when it is OFF, the clutch is disengaged. Some vehicles provide both the A/C REQUEST and the A/C CLUTCH parameters. They should cycle together (both ON or both OFF) unless the ECU is overriding the instrument panel control. Some vehicles provide the A/C REQUEST parameter but do not monitor the A/C CLUTCH feedback signal.

**A/C INDICATOR \_\_XX (range: ON/OFF)**

This parameter displays the On or OFF status of the air conditioner LED indicator.

**A/C PHASE PNT (range: 0 to 255)**

This analog parameter indicates the current learning for the air conditioning idle correction.

**A/C PRESS (PSI) \_\_\_XXX**

**A/C PRESS (kPa) \_XXXX**

This parameter displays in pounds per square inch or kilopascals the air conditioner refrigerant pressure, it is calculated by the ECM/PCM from the A/C pressure sensor voltage. With a too high or low reading the air conditioning compressor clutch will not be activated.

**A/C PRESS (V)\_\_\_X.XX (range: 0 to 5.12 volts)**

A sensor in the A/C system monitors the high-side system pressure. The sensor sends an analog voltage signal to the PCM that is proportional to A/C pressure. High voltage equals high pressure; low voltage equals low pressure. A/C PRESS(V) is this sensor signal displayed on the Scanner. Refer to A/C PRESS(PSI) or (kPa) for information on the calculated pressure measurements.

**A/C Refrigerant Monitor**

OBD monitor information, A/C Refrigerant Monitor is either supported or not supported, or ready or not ready.

**A/C RELAY \_\_\_XXX (range: ON/OFF)**

This discrete parameter is a feedback signal from the A/C compressor clutch. When it is ON, the clutch is engaged; when it is OFF, the clutch is disengaged.

Some vehicles provide both the A/C REQUEST and the A/C CLUTCH parameters. They should cycle together (both ON or both OFF) unless the ECU is overriding the instrument panel control. Some vehicles provide the A/C REQUEST parameter but do not monitor the A/C CLUTCH feedback signal.

**A/C REQUEST \_\_\_XXX (range: YES/NO)**

**A/C REQUEST SW \_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the position of the air conditioning switch. YES means that the A/C switch has been turned on or that the ECU has commanded the A/C system to turn on. In some cases, the A/C compressor may not turn on even though the switch is closed. Several other switch or sensor signals may prevent the ECU from engaging the A/C compressor clutch. The A/C REQUEST parameter simply means that the switch is closed or the ECU has been commanded to turn on the A/C when all other conditions permit. Refer to the A/C CLUTCH parameter description for information on the feedback signal from the A/C compressor clutch.

**A/C RUN (range: ON/OFF)**

This discrete parameter indicates when the air conditioner is running. This is determined by the A/C switch position and whether or not the PCM has enabled the A/C to operate.

**A/C SET \_\_\_XXXXXX (range: MANUAL/AUTO)**

This discrete parameter indicates the ECC control status of the air conditioning system. MANUAL indicates the air conditioner is under manual or the drivers control and AUTO indicates it is under ECC module automatic control.

**A/C SOLENOID (range: ON/OFF)**

This discrete parameter indicates when the air conditioner solenoid is being energised by the ECM/PCM.

**A/C SW XX (range: ON/OFF)**

This parameter displays the status of the air conditioner switch.

**ABS \_\_\_XXX (range: ON/OFF)**

This parameter displays whether the LCD warning should be ON or OFF for the ABS / Traction Control system.

**ABS BATT(V) \_X.XX (range: 0 to 13.50 volts)**

**ABS IGN(V) \_X.XX**

These analog parameter displays the switched (ABS IGN) and unswitched voltages (ABS BATT) to the antilock brake system.

**ABS LAMP \_XXXX (range: ON/OFF/FLSH)**

This parameter appears on the right side of the top line in the ABS CODES & DATA display. It indicates what the current status of the ANTILOCK lamp on the instrument panel should be:

1. If this parameter is OFF, the lamp should be off; and the system is fully operational.
2. If the parameter reads FLSH, the lamp should be flashing. This means that a fault has been detected that does not affect current ABS operation but which should be fixed to avoid additional ABS problems.
3. If the parameter reads ON, the lamp should be lit continuously. This means that a fault has been detected that *does* affect current ABS operation. If the fault affects the front ABS, the rear ABS will operate with the front brakes in a non-ABS condition. (The front brakes may lock.) If the fault affects the rear ABS or other critical parts of the system, ABS is completely disabled. Brakes at all four wheels will operate in a basic non-ABS mode.

If the ABS LAMP parameter reading does not match the condition of the ANTILOCK lamp on the car, a fault may exist in the lamp circuit.

**ABSLF\_I \_\_\_\_\_ OFF**

**ABSLF\_O \_\_\_\_\_ OFF**

**ABSRF\_I \_\_\_\_\_ OFF**

**ABSRF\_O \_\_\_\_\_ OFF**

**ABSLR\_I \_\_\_\_\_ OFF**

**ABSLR\_O \_\_\_\_\_ OFF**

**ABSRR\_I \_\_\_\_\_ OFF**

**ABSRR\_O \_\_\_\_\_ OFF**

**ABSR\_I \_\_\_\_\_ OFF**

**ABSR\_O \_\_\_\_\_ OFF**

**(range: ON/OFF)**

These parameters display the status of the Inlet (I) and Outlet (O) solenoid valves in the ABS hydraulic modulator. The show OFF in a non ABS mode and ON when the ABS is active. Some ABS systems are disabled during scan tool communication.

**ABS SIG**

**(range: ON/OFF)**

This parameter indicates whether the transmission is receiving an “ABS active” signal from the ABS system.

**ABSOL PRESS(V)**

**(range: 0 to 5.00 volts)**

The ABSOL PRESS(V) readings are based on either manifold vacuum or barometric (atmospheric) pressure, depending upon the MAP/BARO SOLENOID status. If MAP is displayed, the ABSOL PRESS(V) parameter shows MAP voltage; when BARO is displayed, the ABSOL PRESS(V) parameter shows BARO voltage. The MAP/BARO solenoid-controlled valve applies intake manifold vacuum or barometric (atmospheric) pressure to the sensing port of the absolute pressure sensor.

**ABS STOP\_XXX**

**(range: YES/NO)**

This parameter indicates YES when ABS is activated during braking and NO at all other times.

**ACCEL ENRICH\_XXX**

**(range: YES/NO)**

On some fuel-injected engines, the ECU provides a richer mixture during acceleration. It does this by momentarily increasing injector pulse width. ACCEL ENRICH should read YES when the ECU is enriching the mixture during acceleration. Injector pulse width should increase at the same time. ACCEL ENRICH should read NO under all other conditions.

**ACCEL POS (%) (range: 0 to 100)**

This analog parameter displays the accelerator pedal position in degrees. 0% being shut and 100% being fully open. In reality the accelerator position will never read fully shut 0%, or fully open 100%.

**ACCEL SW (range: ON/OFF)**

This discrete parameter indicates the position of the accelerator pedal. OFF indicates the pedal is in the idle position. ON indicates the accelerator pedal is being depressed.

**AccessoryDly\_XX (range: ON/OFF)**

This discrete parameter indicates the status of the retained accessory power relay. In a properly functioning system, ON means the relay contacts are closed, allowing some accessories to be turned on after the ignition key has been turned to the OFF position.

**ACCEL SWITCH\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the position of the accelerator pedal. The transaxle controller uses this parameter to determine gear engagement when the vehicle is stopped. When the vehicle is stopped and the pedal is completely released, this parameter reads ON and the transaxle controller engages 2nd gear ("creep" mode). When the vehicle is stopped and the pedal is depressed, this parameter reads OFF and the transaxle controller engages 1st gear.

**ACC\_Pos\_XX (range: YES/NO)**

**RUN\_Pos\_XX START\_Pos\_XX  
OFF/LOCK\_Pos\_XX**

These discrete parameters indicate the current position of the ignition switch. ACC\_Pos\_ON means the switch is in the accessory position: START\_Pos\_ON means the switch is in the cranking position: and RUN\_Pos\_ON means the switch is in the run position. OFF/LOCK\_Pos\_YES means the ignition switch is on the LOCK position, while NO means the ignition switch is in the OFF position.

**AC HI-SIDE (V)\_\_X.XX (range: 0.00 to 5.00)**

This refrigerant pressure parameter indicates the amount of load placed on the engine by the A/C compressor. The voltage is the input from the pressure sensor. The PCM uses it to adjust idle and control the cooling fans.

**AC HI-SIDE (kPa)\_\_\_X.XX (range: 0.00 to 5.00)**

This parameter displays refrigerant pressure which indicates the load placed on the engine by the A/C compressor. The pressure reading is calculated by the PCM based on the voltage signal of the pressure sensor. The PCM uses it to adjust idle and control the cooling fans.

**AcIPedl(V)\_X.XX (range: 0 to 5.0 volts)**

The accelerator pedal (AP) sensor is a potentiometer that sends an analog signal 0- to 5-volt signal to the PCM, it is similar to the throttle position sensor signal on a petrol engine. The PCM uses AP sensor signal to calculate fuel injection quantity and to control the exhaust backpressure regulator. The MIL lights if the AP sensor signal does not match the IVS signal at idle. A faulty AP sensor will only let the engine run at low idle speed.

**AcIPedIMAX(V)\_X.XX (range: 0 to 5.0 volts)**

This analog parameter displays the current maximum reading of the accelerator pedal sensor voltage.

**AcIPedIREL(V)\_X.XX (range: 0 to 5.0 volts)**

This analog parameter displays the relative voltage reading of the accelerator pedal sensor.

**AC POST EVP (°C)\_\_\_XXX (range: unknown)**

This analog parameter indicates the temperature of the air after it has passed through the air con evaporator.

**ACT TIMING (°)\_\_\_XX.X (range: 0 to 25.5°)**

This desired injection timing parameter indicates the actual injection timing in degrees before top dead center. This is for diesel engine vehicles. The PCM monitors and controls this parameter based on the crankshaft and camshaft sensor signals, as well as TDC offset. See DES TIMING(°).

**ACTUAL CMP\_\_\_XXX (range: 0 to 255)**

This parameter displays the signal being sent to the PCM by the camshaft position (CMP) sensor. The count changes constantly as the engine runs.

**ACP(V) \_X.XX** (range: 0 to 5.0 volts)

This analog parameter displays the current voltage reading of the Air Conditioner Pressure sensor. The voltage should increase as the air conditioner refrigerant pressure increases, and decrease as air conditioner refrigerant pressure decreases.

**ACP(kPa) \_X.XX** (range: 0 to 5.0 volts)

This analog parameter displays the current pressure reading of the Air Conditioner Pressure sensor. The reading should increase as the air conditioner refrigerant pressure increases, and decrease as air conditioner refrigerant pressure decreases.

**ACT EXH CMP B1°** (range: 0 - 40)

This parameter displays the degrees of advance for the Bank1 exhaust camshaft angle related to crankshaft position as determined by the control module based on input from the exhaust CMP (camshaft) sensors. The scan tool will display a higher value for more advanced exhaust camshaft position. The scan tool will display a lower value when the exhaust camshaft is not being advanced, such as at idle.

**ACT EXH CMP B2°** (range: 0 - 40)

This parameter displays the degrees of advance for the Bank2 exhaust camshaft angle related to crankshaft position as determined by the control module based on input from the exhaust CMP (camshaft) sensors. The scan tool will display a higher value for more advanced exhaust camshaft position. The scan tool will display a lower value when the exhaust camshaft is not being advanced, such as at idle.

**ACT IAC POS** (range: 0 to 255steps)

ACT IAC POS indicates the actual position of the idle air control motor pintle. This is fed back to the ECM/PCM to ensure correct idle control is maintained. The readings of this parameter should closely follow the DES IAC POS parameter.

**ACT INJ(°)** (range: -95 to 31°)

This actual injection timing parameter indicates the actual injection timing in degrees before top dead center. This is for diesel engine vehicles. The PCM monitors and controls this parameter based on engine sensor input signals.

**ACT INT CMP B1°** (range: 0 - 40)

This parameter displays the degrees of advance for the Bank1 intake camshaft angle related to crankshaft position as determined by the control module based on input from the exhaust CMP (camshaft) sensors. The scan tool will display a higher value for more advanced inlet camshaft position. The scan tool will display a lower value when the inlet camshaft is not being advanced, such as at idle.

**ACT INT CMP B2°** (range: 0 - 40)

This parameter displays the degrees of advance for the Bank2 intake camshaft angle related to crankshaft position as determined by the control module based on input from the exhaust CMP (camshaft) sensors. The scan tool will display a higher value for more advanced inlet camshaft position. The scan tool will display a lower value when the inlet camshaft is not being advanced, such as at idle.

**ACT TORQUE (Nm)** (range: 0 to 215)

This analog parameter displays the engine torque actual response to the ABS/Traction Control module request, if fitted. This parameter will be displayed even if traction control is not fitted to the vehicle.

**ACTUAL PCS (A)** (range: 0 to 4.98)

This parameter shows the actual amperage reading of the pressure control solenoid (PCS). It is used by the TCM/PCM to ensure correct operation of the pressure control solenoid. A 0.00 reading (no current flow) would indicate full line pressure and a 4.98 (high current flow) would indicate a lower line pressure.

**ACTUAL TORQUE (Nm)\_XX** (range: unknown)

This parameter indicates the calibrated torque output of the engine, it is calculated internally by the PCM and ABS ECU based on engine inputs.

**ADAPT ADD (%)** (range: 0 to 200)

These parameters represent the operation and short-term correction to the fuel mixture. ADD means adding or subtracting equal amounts of fuel to every fuel block cell regardless of the pre-programmed base injection pulse values. It works very effectively for idle mixture related problems, but its effect is minimal at the higher engine speeds. For example, vacuum leaks greatly affect fuel mixture at idle but become less severe at higher RPM. The important distinction here is that the amount of fuel correction is not dependant upon the original base in each fuel memory cell.



**ADAPT CELL (range: 0 to 3)**

This parameter indicates which adapt cell the TCM/PCM is operating in. This affects transmission shift quality and timing.

**ADAPTED TPS(°) (range: 0 to 120)**

This analog parameter displays the amount of adaptation applied to the throttle position sensor in degrees.

**ADAPT MODIFIER (Kpa)\_\_\_\_\_XXX (range: -200 Kpa to +200 Kpa)**

This parameter is used by the PCM to control the shift times by changing line pressure. This can range from -35 Kpa to +70 Kpa.

**ADAPT MUL (%) (range: 0 to 200)**

These parameters represent the operation and short-term correction to the fuel mixture. MUL means multiplying or taking the pre-programmed cell base value and multiplying that number by either a correction factor or percent. Here, the correction amount increased or decreased in each memory block cell is dependent on each cell's base injection pulse. This form of adaptation is required to compensate for fuel control type problems that get worse with increased engine speed.

**ADAPT PRESS (PSI) (range: 0 to 255)**

This parameter shows the amount of pressure added to base line pressure to adjust holding effort of a clutch or band for a given shift. This reading increases with normal wear in the transmission.

**ADAPT SHIFT\_\_\_\_\_XXX (range: ACTIVE/INACTIVE)  
(range: ENABLED/DISABLED)**

This parameter indicates if the current shift will update the 1-2 adapt table which will modify line pressure.

**ADPT1 FM\_\_\_\_\_XXX (range: ON/OFF)**

**ADPT2 FM\_\_\_\_\_XXX**

These parameters represent the failure mode operation status of the fuel adaptation within the PCM.

**ADV IGN (°) (range: -90° to +90°)**

Analog output parameters from the ECU that indicate the total spark advance or retard being commanded by the ECU, *including* base timing.

**A/F 1 (Amps)** (range: see text)

**A/F 2 (Amps)**

**A/F #1 (mA)**

**A/F #2 (mA)**

Some Subaru vehicles use Air/Fuel Ratio Sensors in place of conventional oxygen sensors. The sensor maintains the Lambda signal 0.45 volts above its reference voltage, this is done with an oxygen cell that pumps oxygen to the sensor. The current required to add/remove oxygen is the current measured by this parameter. Generally 0 amperage is a correct A/F ratio, negative values indicate a rich mixture and positive values indicate a lean mixture. Due to the slower refresh rate of the Subaru live data this reading may appear to be 0 amps most of the time. A/F1 is for bank one and A/F2 is for bank two on vehicle that support two separate banks for engine control.

**A/F #1 (Ohms)** (range: unknown)

**A/F #2 (Ohms)**

At time of printing this supplement no information was available for this parameter.

**A/F-AIR(us)** (range: -254 to 254)

This analog parameter is the learnt amount of injection correction at idle, it is measured in microseconds.

**A/F CLOSE A/F CLOSE B1**

**A/F CLOSE B2**

(range: ON/OFF)

These discrete parameters indicate whether the engine ECU is working in a closed or open loop strategy. ON is closed loop, OFF is open loop.

**A/F CORR 1 (%)**

(range: -100 to 100)

**A/F CORR 2 (%)**

**A/F CORR 3 (%)**

These parameters display the air fuel correction for bank 1 (CORR 1) and bank 2 (CORR 2) and overall correction CORR 3. See A/F CORRECT (%) for more information.

**A/F-CORRECT(%)**

(range 0 to 200)

This analog parameter is a measure of the ECU overall fuel delivery correction. It's maximum range is 0 to %200 with %100 as the mid point, it should not vary by more than +/-%12, a reading lower than 100 indicates the ECU is commanding a lean condition and a reading above 100 indicates the ECU is commanding rich condition.

**A/F-FUEL(%) (range 0 to 200)**

This analog parameter is a measure of the ECU short term fuel delivery correction learnt value during part throttle operation. It's maximum range is 0 to %200 with %100 as the mid point, it should not vary by more than +/-%12, a reading lower than 100 indicates a lean condition and a reading above 100 indicates a rich condition.

**A/F HTR-1 (A) (range 0 to 25)**

**A/F HTR-2 (A)**

This analog parameter displays the ECU command amperage to the left or rear air/fuel ratio sensor heater.

**A/F LEARN (%) (range: -100 to 100)**

**A/F-LRN 2 (%)**

This analog parameter displays the ECU learnt long term air/fuel ratio correction. 0 is the midway point, negative readings indicate rich running compensation and positive readings indicate lean running compensation.

**A/F LEARNED \_\_\_XXX (range: YES/NO)**

On some vehicles, the ECU provides a discrete parameter that indicates whether the block learn multiplier (BLM) is responding to the fuel integrator corrections. You can use this reading to double-check the block learn response. If A/F LEARNED is YES, block learn is responding, or will respond, to integrator corrections. If A/F LEARNED is NO, block learn is not responding to the integrator. In most cases, A/F LEARNED should be YES when the engine is in closed loop, NO when it is in open loop. This may vary, however, with a few engine calibrations. If the fuel integrator reaches its limit and block learn is not enabled (A/F LEARNED \_\_\_NO), the vehicle may have a driveability problem or it may return to open loop. Refer to the INTEGRATR and BLM descriptions for more information.

**A/F LEFT(V)\_X.XX**

**(range: see below)**

**A/F RIGHT(V)\_X.XX**

**TARGET A/F(V)\_X.XX**

These parameters indicate the amount of correction necessary to the basic injection duration to maintain the air-fuel ratio. A/F LEFT and A/F RIGHT provide air-fuel correction information for vehicles with two separate banks of injectors (V-type engines). TARGET A/F provides air-fuel correction information for vehicles with a single bank of injectors (in-line type engines). The ECU responds to this correction information according to five preprogrammed routines:

<b>ECU DATA</b>	<b>COMPENSATION</b>	<b>ENGINE CONDITION</b>
0.00V	Go leaner 10-20%	Rich
1.25V	Go leaner 4-10%	Normal
2.50V	Lean/rich +3%	Normal
3.75V	Go richer 4-10%	Normal
5.00V	Go richer 10-20%	Lean

**A/F-PURGE(%)**

**(range: 0 TO 200)**

This analog parameter represents the learnt value of fuel delivery during canister purge operation. It's maximum range is 0 to %200 with %100 as the mid point, it should not vary by more than +- %12, a reading lower than 100 indicates a lean condition and a reading above 100 indicates a rich condition.

**A/F RATIO \_\_\_XX.X**

**(range: 0 to 99.9)**

On some vehicles, the ECU calculates the desired air-fuel ratio during closed loop operation. This is not a measured value, but the calculated value that the ECU wants to be delivered based on its sensor input signals. Although the measurement range is from 0 to 99.9, the actual value should be near 14.7 in most cases. A lower number indicates a rich air-fuel ratio commanded for engine startup. A higher number indicates a leaner ratio.

**A/F REG LOOP**

**(range: 0 to 255)**

This parameter displays the current closed loop regulation of air/fuel mixture represented as a value between 0 and 255. 125 is the middle value, a lower value represents less fuel added (compensating for rich mixture) and a higher value represents more fuel added (compensating for lean mixture).

**A/F SNSR #1** (range: unknown)

**A/F SNSR #2**

Some Subaru vehicles use Air/Fuel Ratio Sensors in place of conventional oxygen sensors. The sensor maintains the Lambda signal 0.45 volts above its reference voltage, this is done with an oxygen cell that pumps oxygen to the sensor. This parameter indicates the status of the Lambda value, 1 represents the ideal ratio, values above indicate lean running, values below indicate rich running.

**AFS RESET** (range: ON/OFF)

This discrete parameter indicates the airflow sensor reset status. In a vehicle that is at operating temperature this parameter should read ON at idle and OFF above idle.

**AGC CTRL REQ** (range: ON/OFF)

This discrete parameter indicates whether AC generator (alternator) control is required. This determined by the battery voltage and controlled by the PCM.

**AIR** (range: UPSTREAM/DOWNSTREAM/ ATMOSPHERE)

This parameter displays the status of the air injection system.

**AIR CONTRL SOL\_\_XXXX** (range: NORM/DIV

**AIR DIVERT SOL\_\_XXXX** or PORT/DIV)

These discrete parameters indicate the ECU output command to the air injection control, or diverter, valve solenoid. This command is shown as AIR CONTRL SOL or AIR DIVERT SOL depending on vehicle and control system. When the reading is NORM, the solenoid is commanded to move the valve to direct air downstream to the exhaust ports or to the air switching solenoid. When the reading is DIV, the solenoid is commanded to move the valve to divert air to the atmosphere.

AIR CONTRL SOL is displayed on vehicles with only a single air injection control solenoid. AIR DIVERT SOL is always displayed in conjunction with the AIR SWITCH SOL parameter on vehicles with two solenoids.

**AIRFLOW(g/s)\_\_\_XXX**

**AIRFLOW(m3h)\_\_\_XXX**

**AIRFLOW(Kg/H)\_\_\_XXX**

This parameter displays a PCM calculated value in grams-per-second, cubic-meters-per-hour, or kilograms-per-hour based on the MAF sensor output. The MAF sensor is located between the air cleaner and the throttle body. The MAF sensor measures the mass air flowing to the engine. The PCM uses this value to calculate the injector pulse width needed for stoichiometry (air/fuel). MAF sensor readings should be low at idle and should increase as the throttle opens.

**AIRFLOW (MG/STK)\_\_\_\_\_XX**

**(range: unknown)**

This PCM calculated analog parameter indicates the quantity of air that is used every stroke. The reading is in milligrams per stroke.

**AIRFLOW RESET \_\_\_XXX**

**(range: ON/OFF)**

Some turbocharged vehicles have an airflow reset function that resets the airflow sensor when there is a change from high-speed, heavy-load driving to sudden deceleration. This parameter reads ON when airflow reset is activated.

**AIRFLOW(g/s)\_\_\_XXX**

**AIRFLOW(m3h)\_\_\_XXX**

**AIRFLOW(Kg/H)\_\_\_XXX**

This parameter displays a PCM calculated value in grams-per-second, cubic-meters-per-hour, or kilograms-per-hour based on the MAF sensor output. The MAF sensor is located between the air cleaner and the throttle body. The MAF sensor measures the mass air flowing to the engine. The PCM uses this value to calculate the injector pulse width needed for stoichiometry (air/fuel). MAF sensor readings should be low at idle and should increase as the throttle opens.

**AIRFLOW(Hz)\_\_\_XXXX**

**(range: 0 to 1600 hertz)**

**AIRFLOW(mS)\_\_\_XXX**

**(range: 0 to 625 milliseconds)**

The AIRFLOW(Hz) parameter indicates the volume of intake air. At idle (700 rpm) this parameter should read 25 to 50 Hz. At 2000 rpm, this parameter should read 70 to 100 Hz, depending on engine displacement. The engine controller uses the AIRFLOW(Hz) parameter to determine fuel-injection pulse duration.

The AIRFLOW(mS) parameter indicates the volume of intake air. The engine controller uses the AIRFLOW(mS) parameter to determine fuel injection volume and ignition advance angle.

For either parameter, airflow is measured with a *Karman vortex* type sensor. This type of sensor has a triangular column in the airflow path and monitors the pressure increases from the resulting vortices. Each time a vortex is generated by the flowing air, a pressure increase occurs. As airflow increases, the number of vortices increases, resulting in an increase in pressure fluctuation speed. As airflow decreases, the number of vortices decreases, resulting in a decrease in pressure fluctuation speed. These pressure pulses are detected by the airflow sensor.

**AIRFLOW(V)\_\_\_X.XX** (range: 0 to 5.00 volts)  
**AIRFLOW(mV)\_\_\_XXX**

This analog parameter indicates the volume of intake air. Airflow is measured by a potentiometer that detects the airflow and converts it to a voltage output. The ECU supplies a constant 5-volt control signal to the potentiometer. As air volume increases, the voltage output decreases. 5.0-volts indicate no airflow, while 0 indicates maximum airflow.

**AIR INTAKE SOL\_\_\_XXX** (range: ON/OFF)

This discrete parameter indicates whether the ECU has commanded the secondary air intake valve to open. AIR INTAKE SOL\_\_\_OFF indicates that the ECU has not energized the solenoid to open the secondary valve.

The engine is operating on the primary intake runners. AIR INTAKE SOL\_\_\_ON indicates that the ECU has commanded the solenoid to open the secondary valve. The engine must be warmed up, in closed loop, and operating with certain combinations of speed, throttle opening, and load before AIR INTAKE SOL will read ON.

This parameter is an output signal from the ECU only. It does not indicate whether the solenoid has responded or whether the secondary air valve has opened.

**AIR PUMP RELAY** (range: ON/OFF)

This discrete parameter indicates that the air pump relay is ON or OFF. When the relay is ON the secondary air pump is active.

**AIR SWITCH SOL\_\_XXXX (range: PORT/CONV)**

This discrete parameter on some vehicles indicates the ECU command to the air injection switching solenoid. When AIR SWITCH SOL reads PORT, the solenoid has been commanded to move the valve to direct air to the exhaust ports or manifold. When the reading is CONV, the solenoid has been commanded to move the valve to direct air downstream to the catalytic converter.

**AIR TEMP(°C)\_\_XXX (range: -50 to 185)**

**AIR TEMP(°F)\_\_XXX (range: -58 to 360)**

**INTAKE AIR(°)\_\_XXX**

**IAT(°F)\_\_\_\_\_XXX**

**IAT(°C)\_\_\_\_\_XXX**

**IAT(V)\_\_X.XX (range: 0 to 5 volts)**

These analog parameters indicate the temperature of the intake air. The intake air temperature sensor is a thermistor, typically installed in the air cleaner. A 5-volt reference signal is applied to the sensor. As temperature increases, sensor resistance decreases, providing the voltage signal to the PCM. The PCM converts the sensor voltage readings to temperature readings.

The engine controller uses the temperature parameter to control the amount of injected fuel, based on the density of the incoming air. You can change the measurement units on the Scanner from degrees Celsius (°C) to degrees Fahrenheit (°F). The preset measurement is °C.

**ALT DUTY (%) (range: 0 to 255)**

This analog parameter displays the ECU control of the alternator and charging system. 0% indicates no charging and 100% indicates full charging.

**ALTERNATOR\_\_XXX (range: ON/OFF)**

This parameter displays whether the LCD warning should be ON or OFF for the Alternator.



**ALTERNATOR(%)** (range: 0 to 100)

This analog parameter displays the commanded output of the alternator by the PCM. This is in response to battery voltage and electrical load being sensed by the PCM.

**AMBIENT (V)\_\_\_X.XX** (range: 0 to 3.5)

**AMBIENT (°C)\_\_\_X.XX** (range: -40 to 88)

The AMBIENT (V) parameter displays the voltage signal from the outside temperature sensor for the ECC (Electronic Climate Control). The AMBIENT (°C) parameter displays the outside temperature in Celsius calculated by the ECC based on the above voltage reading.

**ANT REC SIG\_\_\_\_\_XXXXXX** (range: unknown)

This parameter, ANTenna RECEPTION SIGNAL, displays the reception signal strength to the audio system.

**APC (V)\_X.XX** (range: 0 to 5.00)

This PCM input indicates air conditioner pressure sensor voltage. The voltage will increase and decrease with the pressure of the a/c gas.

**AP(V)\_X.XX** (range: 0 to 5.00)

This PCM input indicates the accelerator pedal position on a diesel engine. The Accelerator Position (AP) sensor is a 3-wire potentiometer.

**APP(%)\_\_\_\_\_XXX** (range: 0 to 100%)

This parameter is calculated by the PCM from the accelerator pedal position sensor voltages. It should display 0% at idle and 100% at wide open throttle (WOT).

**APP AT IDLE\_\_\_\_\_XXX** (range: ON/OFF)

This parameter indicates whether the accelerator is at idle. The PCM calculates this from APP sensor inputs.

**APP1 (V)\_\_\_X.XX APP2 (V)\_\_\_X.XX**

**APP3 (V)\_\_\_X.XX**

**(range: see below)**

**APP1 (%)\_\_\_XXX APP2 (%)\_\_\_XXX**

**APP3 (%)\_\_\_XXX**

**(range: see below)**

These parameters are accelerator pedal positions (APP) sensor inputs that are used by the PCM to control fuel delivery as requested by the driver. An APP sensor module is located at the base of the accelerator pedal. During normal operation, the PCM only uses the APP1 sensor input, the other two serve as fail sensor.

For the voltage parameters, normal readings are:

**APP1** – 0.35 to 0.95 volts at idle, 4.00 to 5.00 at WOT.

**APP2** – About 4.50 volts at idle and steadily decrease to about 1.0 volts at WOT.

**APP3** – About 4.00 volts at idle and steadily decrease to about 2.5 volts at WOT.

For the percentage parameters, normal readings range from zero for a fully released accelerator to 100 percent at wide-open throttle (WOT). The displayed value should increase as smoothly as the accelerator is moved from closed to WOT.

**APS MAIN (mV)\_\_\_X.XX**

**APS SUB (mV)\_\_\_X.XX**

**(range: unknown)**

**APS MAIN (%)\_\_\_XXX**

**APS SUB (%)\_\_\_XXX**

**(range: unknown)**

These parameters are accelerator pedal sensor (APS) inputs that are used by the PCM to control fuel delivery as requested by the driver. During normal operation, the PCM only uses the APS MAIN sensor input, APS SUB serves as a backup.

**APS (V)**

**(range: 0 to 5.1 volts)**

The Accelerator Pedal Sensor (APS) is a potentiometer that sends an analog signal 0- to 5-volt signal to the PCM. As the accelerator is depressed the signal voltage increases. The PCM uses AP sensor signal to calculate fuel injection quantity.

**ARPMDES\_XXXX**

**(range: unknown)**

This analog parameter displays the ancillary engine speed desired of any ancillaries that may be fitted to the vehicle.

**ASCD CRUISE** (range: ON/OFF)

This discrete parameter indicates whether the automatic speed control device (cruise) has been activated. When the system is functioning properly ON means that the cruise control is affecting vehicle speed.

**ASCD OD CUT  
O/D CUT1** (range: ON/OFF)

This discrete parameter indicates whether the transmission has been commanded to shift from overdrive into a lower gear while operating in the cruise control mode. Depending on the vehicle, this command may be initiated by the driver pressing the acceleration switch on the Cruise Control Console, or by the PCM, after sensing a loaded engine condition caused by up-hill acceleration. ON means the transmission is shifting from overdrive into a lower gear while operating in the cruise mode.

**ASD RELAY\_\_XXX** (range: ON/OFF)

This discrete parameter indicates whether or not the PCM has ordered the auto shutdown relay to turn on. The auto shutdown relay provides power to the fuel pump, the ignition coil, and the fuel injectors. ASD RELAY should read ON whenever the engine is running.

**ASYNCH PULSE\_\_XXX** (range: YES/NO)

The asynchronous pulse to the fuel injectors provides extra fuel when engine load and speed require it. Because these pulses are not synchronized with the regular injector pulses, they are called asynchronous. The asynchronous pulse function is similar to an accelerator pump in a carburetor. The ASYNCH PULSE is YES when the function is active and NO when it is not.

**ATF (°C)** (range: see text)

This analog parameter indicates the temperature of the automatic transmission fluid in degrees. This is calculated by the transmission ECU based on input from the fluid temperature sensor.

**ATF LAMP** (range: ON/OFF)

These parameters indicate the status of the auto trans fluid temperature (ATF) indicator lamp in the instrument panel. ON indicates a high ATF temperature and OFF indicates normal operating temperatures.

**AUDIO MENU SW\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the audio system menu switch input to the audio system.

## Alphabetical List of Parameters

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**AUDIO VOL(%)\_\_\_\_\_XXX** (range: 0 to 100)

This parameter displays the percentage level volume of the audio system.

**AUTO LOCK ENABL\_\_\_\_\_XXX** (range: YES/NO)

This parameter displays the status of the BCM or Alarm module auto door lock Feature.

**AUTOLMP INP(%)\_\_\_\_\_XXX** (range: 0 to 100)

This parameter displays the input of the auto lamp sensor to the BEM. This is usually from the sunload sensor.

**AUTOLMP ON DRV\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the auto lamp driver commanded by the BEM.

**AUTO SW\_\_\_\_\_XXX** (range: ON/OFF)

This discrete parameter indicates the status of the auto switch. When the switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**AUTO TRANS** (range: YES/NO)

This discrete parameter indicates whether the vehicle is fitted with an automatic transmission or not. Ensure that this is showing YES for vehicles with an auto trans and NO for vehicles with a manual trans.

**AVG EC (L/100km)\_\_\_\_\_X.X** (range: see text)

This parameter displays the average fuel economy reading from the trip computer. The reading should be consistent with the trip computer reading.

**AVG VSS (KPH)\_\_\_\_\_X.X** (range: see text)

This parameter displays the average speed reading from the trip computer. The reading should be consistent with the trip computer reading.

**AXLE\_\_X.XX** (range: varies)

This analog parameter displays the axle ratio set in the PCM for the vehicle being tested. Check with vehicle manufacturer for specific axle ratio for the model being tested.

**B1S1 L-R(SEC)** (range: 0 to 1.000 sec)

**B2S1 L-R(SEC)**

**B1S1 R-L(SEC)**

**B2S1 R-L(SEC)**

These analog parameters indicate the lean-to-rich (L-R) and rich-to-lean (RL) oxygen sensor switching times for bank1 (B1) and bank2 (B2). The PCM monitors for fluctuations in the voltage ranging from greater than 0.600 volts to less than 0.400 volts. The quicker the switching time the better the condition of the O2S (oxygen sensor).

**BAG & PRET DPLD \_\_\_XXX** (range: YES/NO)

This parameter displays whether the seatbelt pretensioners and the airbag (single or dual) have been deployed or not. If this parameter displays YES the SRS module must be replaced, this parameter cannot be cleared to read NO any other way.

**BARO (Hz)\_XXX** (range: 125 to 160 Hz)

This parameter indicates barometric pressure in cycles per second, or Hertz. At 160Hz the vehicle should be at sea level, at 125hz, the vehicle should be at an elevation of 3050 meters (10000 feet).

**BARO(kPa)\_XXX** (range: 10 to 125 kPa)

**BARO("Hg)\_XX.X** (range: 0 to 37.0 "Hg)

The ECU calculates a barometric pressure reading from the BARO sensor voltage signal. Although the measurement range is 10 to 205 kPa or 0 to 60 "Hg, typical readings range from 100 kPa (29.6 "Hg) at sea level to about 60 kPa (17.8 "Hg) at 14,000 feet. Compare the BARO voltage and BARO pressure readings on the Scanner. Voltage should be high when pressure is high, low when pressure is low. If either, or both, of the readings appears abnormal for the expected local barometric pressure, the sensor signal to the ECU is inaccurate or the ECU calculations are incorrect for some reason.

**BARO(V)\_X.XX** (range: 0 to 5.12 volts)

The barometric pressure (BARO) sensor provides an analog voltage parameter that varies directly with atmospheric (barometric) pressure. The voltage signal can range from 0 to 5.12 volts. It should be high when barometric pressure is near atmospheric pressure at sea level. It should drop as barometric pressure drops. The ECU uses the BARO sensor voltage along with the manifold absolute pressure (MAP) sensor voltage to calculate manifold vacuum and true absolute pressure.

Some systems do not have a BARO sensor, but the ECU provides a BARO reading by sampling the MAP sensor reading with the key on and the engine off, just before cranking. At this point, manifold pressure should equal, or be very close to, atmospheric pressure. The ECU also updates these BARO estimates when the engine is running by sampling MAP voltage when the engine is at wide-open throttle.

### **BASE FUEL (mS)**

This analog parameter is the measure of the base fuel to be injected as calculated by the engine ECU. This base fuel is “added” to depending operating conditions and feedback from sensors.

### **BATTERY(V)\_XX.X**

**(range: 0 to 25.5 volts)**

### **BATT(V)\_\_\_XX.X**

### **BAT (V)\_\_\_XX.X**

The engine control system has no specific sensor to measure battery voltage, but some ECU’s calculate this analog parameter from a sensing circuit across the supply voltage circuit. Although the measurement range is 0 to 25.5 volts, the reading should be close to normal charging system regulated voltage with the engine running. This is typically 13.5 to 14.5 volts at idle. Check the reading against actual voltage measured at the battery or alternator. Check vehicle specifications for exact values. The battery voltage parameter is used principally for ECU self-diagnostics.

### **BattSaver\_XXX**

**(range: ON/OFF)**

This discrete parameter indicates the GEM command status for the battery saver relay solenoid. When the system functions properly, ON means the contacts of the relay are closed. When the battery saver relay contacts are closed, all the accessories operate. If an accessory is left on with the ignition key in the off position, eventually the battery saver contacts will open, shutting off the accessory.

### **BLEND DR-ACT%\_\_\_XXX**

### **BLEND DR-TGT%\_\_\_X.XX**

These parameters display the target position and actual position for the drivers and passengers air mix blend door positions. The air mix blend doors are used to mix cold and warm air to achieve a desired temperature.

**BLM\_\_\_\_\_XXX****(range: 0 to 255)****BLOCK LEARN\_\_XXX**

The block learn multiplier (BLM) number represents the operation and longterm correction of the fuel metering of some fuel-injected engines. The block learn number indicates whether the ECU is commanding a rich or a lean mixture. Like the integrator, the BLM number can range from 0 to 255. The midpoint is 128. A BLM number higher than 128 indicates that the ECU has commanded a long-term rich mixture correction. A BLM number lower than 128 indicates that the ECU is commanding a lean mixture. The BLM number follows the integrator number and makes long-term corrections to fuel metering in response to short-term integrator changes. For example, integrator and block learn may both start at 128. The integrator number may move up toward or above 130. At that point, the BLM number may move up to 129. The integrator then will return to 128 to indicate that it is controlling fuel metering at the midpoint of an overall richer operating condition. A similar action occurs when the ECU commands a leaner mixture and the numbers move downward. Refer to the INTEGRATR description for more information.

You can compare BLM numbers to injector on-time. A number above 128 indicates increased on-time. A number below 128 indicates decreased ontime. BLM corrections operate only in closed loop. In open loop, the number goes to a fixed value, usually 128. Depending on the vehicle, block learn may be stored in volatile or nonvolatile ECU memory. If BLM is stored in volatile memory, the values are erased when the engine is turned off and returned to 128 when the engine is restarted. If BLM is stored in nonvolatile memory, the values are retained when the engine is turned off and returned to the stored values when the engine is restarted. Disconnecting the battery or removing the ECU fuse erases nonvolatile memory and returns the BLM value to 128.

The block learn multiplier parameter may appear as BLM or as BLOCK LEARN on various display lines for different engines.

**BLM CELL\_\_\_\_\_XX****(range: 0 to 15)**

Block learn multiplier (BLM) is divided into 16 cells, numbered from 0 to 15. The cells are arranged in a theoretical grid, four or five high and four or five wide. Height represents engine load from low to high. Width represents engine speed from low to high. Any combination of engine load and speed will fit into one of the 16 cells in the theoretical grid. The BLM CELL parameter indicates which cell the engine is operating in at the moment. Some fuel control programs do not use all 16 cells.

**BLM CELL CONT** (range: 0 to 145)

The 02 Block Learn Mode Cell Control carries out mixture correction at idle or part load conditions, but only if the 02 Integrator has deviated for an extended period of time from the ideal air/fuel ratio and full load enrichment is ON.

**BLM PART REF** (range: 0 to 128)

This analog parameter shows the long term condition of the block learn multiplier (BLM). It should be compared to the 02 BLM CELL CONT parameter, they should not vary from each other by more than %15.

**BLOWER FAN (%)\_\_XXXX** (range: 0 to 100)

This parameter indicates the ECC command to the variable speed blower motor. 0% is off and 100% is full speed for the blower fan.

**BLOWER SET\_\_XXXXXX** (range: MANUAL/AUTO)

This discrete parameter indicates whether the blower fan is operating under manual control from the fan switch or under automatic control by the ECC module.

**BLOWER SW** (range: ON/OFF)

This discrete parameter displays the input status for the interior fan (blower) switch to the engine ECU. ON indicates the switch is on and OFF indicates the switch is off.

**BLOWER (V)\_\_XX.X** (range: unknown)

This parameter indicates the voltage at the blower motor. 0V is off and the voltage will increase with fan speed.

**BLWR-ACT (%)\_\_XXX** (range: 0 to 100)

This parameter indicates the actual blower fan speed as a percentage. 0% is off and 100% is full speed for the blower fan.

**BLWR KNOB POS(%)\_\_XXX** (range: 0 to 100)

This parameter displays the percentage position of the blower control knob. 0% is off and 100% is full on.

**BLWR-TGT (%)\_\_XXX** (range: 0 to 100)

This parameter indicates the target blower fan speed as a percentage. 0% is off and 100% is full speed for the blower fan.



**BONNET SW\_\_\_\_\_XXX (range: OPEN/CLSD)**

This parameter displays the open or closed state of the bonnet. When the bonnet is closed the parameter displays CLSD (although the actual switch contacts are open), when the bonnet is open the display shows OPEN (although the actual switch contacts are now closed). The BCM is responding to the actual input state of the switch.

**BOO ABS\_XXX (range: ON/OFF)**

This parameter reads OFF when the brakes are not applied and ON when the brakes are applied. The readings for this parameter are the same as the readings for the BOO=BRAKE SW parameter.

**BOO=BRAKE SW\_XXX (range: ON/OFF)**

**BrakeOnOff\_XXX**

This digital parameter is activated when the brake pedal is depressed. Whenever the brake pedal is pressed, the brake on/off (BOO) switch sends a battery voltage signal to the PCM. This parameter should read ON when the pedal is pressed, and OFF at all other times. Depending on the vehicle, the PCM may adjust engine idle speed with the brakes applied and the A/C turned on, or may turn the A/C off after a preset time. On vehicles with locking torque converters, the PCM may unlock the torque converter when the brakes are applied.

**BOO\_GEM\_XXX (range: ON/OFF)**

This discrete parameter indicates the status of the brake on/off (BOO) pedal switch signal to the GEM module. ON means the switch contacts are closed.

**BOOST (range: unknown)**

This parameter indicates turbocharger boost pressure inside the intake manifold. At idle boost pressure readings will be low. As turbocharger boost increases the reading will increase.

**BOOST(%)\_\_XXX (range: 0 to 100%)**

This analog parameter, available on 3800 supercharged vehicles only, indicates the percentage of the supercharger boost control duty cycle (wastegate solenoid). Zero percent (0%) indicates no boost, while 100% indicates full boost.

**BOOST SENSOR (range: 0 to 5.00 volts)**

This parameter indicates turbocharger boost pressure inside the intake manifold. At idle boost pressure readings should be close to barometric pressure. If the engine is fully loaded at WOT, boost pressure should be high, on decel with the throttle closed, boost pressure should be zero.

**BOOT SOL DRV \_\_XX (range: ON/OFF)**

This parameter shows whether the BCM is commanding the boot release solenoid to activate to open the boot. The BCM will trigger the solenoid in response to either the remote key signal or the glove box mounted boot switch.

**BOOT SW \_\_\_\_\_XXX (range: OPEN/CLSD)**

This parameter displays the open or closed state of the boot. When the boot is closed the parameter displays CLSD (although the actual switch contacts are open), when the boot is open the display shows OPEN (although the actual switch contacts are now closed). The BCM is responding to the actual input state of the switch.

**BOOT SW \_\_XX (range: ON/OFF)**

This parameter shows the status of the glovebox mounted boot switch. ON indicates the switch is depressed and OFF indicates it is not being pressed.

**Bracket(^)\_XX.X (range: 0 to 25.5)**

This parameter displays the resistance of the airbag mounting bracket to ground.

**BRAKE LAMP \_\_XXX (range: ON/OFF/CKT OPEN)**

**BRKLAMP\_XXX**

This parameter indicates the status of the brake lamp. For diagnostic purposes, this parameter can be compared to the BRAKE LAMP CMD parameter.

**BRAKE LAMP CMD \_\_XXX (range: ON/OFF)**

This parameter indicates the present state of the ABS controller output signal to the brake lamp.

**BrakePrsApply\_XXX (range: 0 to 12 volts)**

This parameter indicates the command status to the brake pressure applied switch. The SCANNER displays 0 volts when the switch is ON and 12 volts when the switch is OFF.

**BRAKE SW \_\_\_XXX** (range: ON/OFF)

**BRAKE SW \_XXXXXXXX** (range: ON/OFF/CKT OPEN)

On most vehicles, this parameter indicates the status of the brake switch. When the system functions properly, ON means the brake switch contacts are closed, lighting the brake lamps.

On some vehicles, this parameter indicates the current position of the brake switch *and the condition of the circuit in three states*:

1. BRAKE SW must be ON, or closed, for the antilock system to operate. The brake switch circuit should close when the pedal is depressed.
2. Brake SW should read OFF when the pedal is not depressed.
3. If the BRAKE SW reading is CKT OPEN under any condition, the ABS module has detected a fault in the brake switch circuit. Antilock functions may be fully or partially disabled.

**BRAKE SWITCH \_\_\_XXX** (range: ON/OFF)

This parameter shows the state of the ABS brake switch. When the brake pedal is at rest the display should indicate OFF and when the pedal is depressed the display should change to ON.

**BRK PDL SIG START** (range: ON/OFF)

This parameter displays the state of the start signal brake switch.

**C/SLEEV POS (V)** (range: 0 to 5.1 volts)

This parameter displays the input signal from the control sleeve position sensor in the diesel injection pump. The control module uses this feedback information to determine the control sleeve position.

**C1 REV (RPM)**

This parameter displays the speed in rpm of the number 1 clutch drum, which is driven by the transmission input shaft; it is transmitted to the TCM from the C1 revolution sensor.

**CALC B1 TWC (C°)** (range: varies)

**CALC B2 TWC (C°)**

These parameters indicate the calculated temperature of the catalytic converter. This is useful for determining if the Catalyst Monitor Test has run.

**CALC PRES (BAR)** (range: 0 to 55)

This analog parameter displays the calculated pressure of the transmission fluid controlled by the pressure control solenoid. The pressure is calculated by the transmission ECU and is based on the pressure control solenoid current draw. NOTE: 1BAR is equal to atmospheric pressure, 1 BAR = 100 kPa = 14.5 psi.

**CAMDC\_1** (range: unavailable)  
**CAMDC\_2**

These parameters indicate the PCM-commanded duty cycle of the variable cam timing solenoids. CAMDC\_1 refers to bank 1 cylinders, and CAMDC\_2 refers to bank 2- cylinders.

**CAMERR\_1** (range: unavailable)  
**CAMERR\_2**

These parameters indicate the variable cam timing error in crankshaft degrees. CAMERR\_1 refers to cylinders on bank 1, and CAMERR\_2 refers to cylinders on bank 2.

**CAM LO TO HI \_\_\_XXXXX** (range 0 to 65535)

This parameter is a counter that records the number of camshaft position (CMP) sensor signal changes as voltage goes from low to high.

**CAM REF MISSED \_\_\_X**

See CRANK REF MISSED below.

**CAM RETARD (°) \_\_\_XX** (range 0 to 360)

This parameter indicates the difference between the camshaft position (CMP) and crankshaft position (CKP) sensor in degrees.

**CAM SIGNAL** (range: ON/OFF)

This discrete parameter indicates ON when the crank angle sensor signal is detected. Typically it will flicker between ON and OFF during normal engine running.

**CAN PURGE SOL** (range: ON/OFF)

This discrete parameter indicates when the canister purge solenoid is being energised by the ECM/PCM.

**CASeGND(V)\_XX.XXX** (range: -16.000 to 16.000 volts)

This parameter displays the voltage difference between the PCM case ground and the signal return. A value above 0.050 volts indicates that the ground circuit has excessive resistance.

**Catalyst Efficiency Monitor (CAT)** — Determines when the catalytic converter has fallen below a minimum level of effectiveness. Inputs from the ECT, IAT, and TP sensors are required to enable this monitor. Some vehicles may also require CKP and VSS inputs. When this monitor is READY, it relies mainly on inputs from the oxygen sensors.

**CCP COMMAND\_\_XXX** (range: ON/OFF)

The charcoal canister purge (CCP) valve is controlled by a solenoid that is energized to block vacuum and cut off purging when the engine is cold or running at idle. The solenoid is de-energized to open the vacuum line and allow purging on a warm engine running above idle. Solenoid operation is controlled by ECU output commands.

The CCP COMMAND indicates the command for the actual canister purge flow. The CCP COMMAND parameter is ON when the ECU has deenergized the solenoid to turn on the purging function. It is OFF when the ECU has energized the solenoid to turn off the purging function.

**CCSA\_XXX** (range: ON/OFF)

This parameter stands for coast clutch solenoid – actual state. It represents a feedback signal to the PCM indicating the status of the coast clutch solenoid. When the system functions properly, both the CoastCISol and CCSA parameters should simultaneously display ON or OFF. When the solenoid is activated, the engine can brake in third gear when the fourth gear is disabled by the transmission control switch.

**CCSFault\_XXX** (range: YES/NO)

This parameter indicates the presence of a fault in the coast clutch solenoid circuit. YES means a fault is present.

**CCW\_Shift\_Mtr\_XXX** (range: ON/OFF)

**CW\_Shift\_Mtr\_XXX**

These discrete parameters indicate the GEM command status for the counterclockwise (CCW) and clockwise (CW) shift motor relays. When the system functions properly, ON means the solenoid of the relay is energized, closing the relay contacts. These relays control the directional rotation of the shift motor inside the transfer case.

**CENTRL DR LOCKD\_\_\_\_XXX (range: YES/NO)**

This parameter displays the status of the central door locking system whether they are locked or unlocked.

**CENTRAL LOCK\_\_\_\_XXX (range: YES/NO)**

This parameter displays the command from the BCM to the central locking. When either locking or unlocking the doors the parameter changes from NO to YES to NO. When operating the deadlock the parameter also changes from NO to YES to NO.

**CHECK LIGHT (range: ON/OFF)**

This discrete parameter indicates the check engine light, or MIL Malfunction Indicator Lamp, is ON. When the ECU detects a fault the light is turned ON and the ECU may substitute some data parameters for default values.

**CHECK PCM\_\_\_\_XXX (range: ON/OFF)**

This parameter displays whether the LCD warning should be ON or OFF for the PCM, Powertrain Control Module.

**ChimeReq\_XXX (range: ON/OFF)**

This discrete parameter indicates the GEM command status for the warning chime. In a properly functioning system, the SCANNER displays ON when the chimes sound. The GEM module relies on inputs from the door switches, door key cylinder, headlight switch and seatbelt buckle to determine when to ring the chime alarm.

**CHTIL\_XXX (range: ON/OFF)**

**CHTILFault\_XXX (range: YES/NO)**

The CHTIL parameter indicates the status of the Cylinder Head Temperature Indicator Lamp. CHTILFault indicates whether or not a fault has occurred in the circuit.

**CHT FailMode\_\_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the Cylinder Head Temperature sensor Failure Mode status. ON indicates that the PCM has detected a problem with the CHT and is operating in CHT Failure Mode.

**CKP-AT HI (range: unknown)**

**CKP-AT LO**

These parameters are measurements of the crankshaft position sensor (CKP) they are used to confirm a correct signal from the CKP.

**CKPS-RPM (POS)**

This analog parameter displays the RPM from the crankshaft position sensor. The RPM is calculated by the engine ECU from the crankshaft sensor signal.

**CLEAR FLOOD \_\_\_XXX (range: YES/NO)**

On many fuel-injected engines, the ECU responds to engine cranking with a wide-open throttle by commanding a clear flood mode. This mode provides a very lean air-fuel mixture to help clear a flooded engine. On the Scanner, CLEAR FLOOD should read YES under these cranking conditions. If it does not, the ECU may not be getting an accurate TPS signal, or there may be a problem with the clear flood program in the ECU.

**CLM ACT MODE \_\_\_XXXX (range: see text)**

This parameter indicates the actuator mode of the climate control.

<u>Display</u>	<u>Vent Door Position</u>
MOVE	Vent doors moving
SCRN	Windscreen
SC/FL	Windscreen & Floor
FLOOR	Floor
FC/FL	Face & Floor
FACE	Face
AUTO	Automatic (determined by module)
PARK	Vents in Park position
INVLD	May indicate this while vents moving or if fault exists.

**CLOSED THROT (range: ON/OFF)**

This discrete parameter indicates YES when the throttle is closed.

**CLSD LOOP ADD (range: 0 to 255)**

This parameter represents the operation and short-term correction to the fuel mixture. ADD means adding or subtracting equal amounts of fuel to every fuel block cell regardless of the pre-programmed base injection pulse values. It works very effectively for idle mixture related problems, but its effect is minimal at the higher engine speeds. For example, vacuum leaks greatly affect fuel mixture at idle but become less severe at higher RPM. The important distinction here is that the amount of fuel correction is not dependant upon the original base in each fuel memory cell.

**CLSD LOOP MUL (range: 0 to 255)**

This parameter represents the operation and short-term correction to the fuel mixture. MUL means multiplying or taking the pre-programmed cell base value and multiplying that number by either a correction factor or percent. Here, the correction amount increased or decreased in each memory block cell is dependent on each cell's base injection pulse. This form of adaptation is required to compensate for fuel control type problems that get worse with increased engine speed.

**ClutchLock\_XXXXXX (range: ACTIVE/INACTV)**

This discrete parameter indicates the status of the normally open driver operated clutch pedal switch. ACTIVE means the switch contacts have closed.

**CLUTCH SW 1 (range: ON/OFF)**

This discrete parameter displays the input status of the clutch switch to the ECU.

**CMP FailMode\_XXX (range: ON/OFF)**

**CAM FAIL\_XXX**

This discrete parameter indicates the CaMshaft Position sensor Failure or CAM FAIL Mode status. ON indicates that the PCM has detected a problem with the CMP and is operating in CMP Failure Mode. This parameter is only applicable to vehicles that have Variable Camshaft Timing (VCT).

**CMPS-RPM \_\_\_\_\_XXXX (range: see below)**

This parameter displays the RPM, as calculated by the PCM, of the diesel injection pump. The speed of the injection pump is half that of engine RPM which is the same as the camshaft (CMPS) RPM.

**CNTL DR DEADLCKD\_\_\_\_\_XXX (range: YES/NO)**

This parameter displays the status of the central door lock deadlock feature.

**COAST ACTL\_XXX**

This parameter indicates the status of the coast clutch solenoid to the TCM/PCM.



**CoastCISol\_XXX** (range: ON/OFF)

**COAST CLTCH\_\_XXX**

This parameter indicates the PCM command status for the coast clutch solenoid. ON means the coast clutch solenoid is activated. The activated solenoid allows engine braking in third gear when fourth gear is disabled by the transmission control switch.

**CoastCISol(mA)\_XXXX** (range: 0 to 1000 mA)

**CoastCISol(%)\_XXX** (range: 0 to 100%)

These parameters display the analog signal being sent to the coast clutch solenoid. CoastCISol(mA) displays the amount of current, and CoastCISol(%) indicates the duty cycle of the pulse width modulated signal. The activated solenoid allows engine braking in third gear when fourth gear is disabled by the transmission control switch.

**ColdAdvSol\_XXX** (range: ON/OFF)

This parameter displays the PCM command status to the cold advance solenoid. This solenoid is activated when the engine is cold to compensate for cold weather operation.

**COMMANDED GEAR\_\_XX** (range: 1 to 4)

**GEAR\_\_XX**

This parameter indicates the gear the transmission is commanded to be in by the TCM/PCM.

**COMMANDED PCS(ma)\_\_XXXX** (range: 0.00 to 1100 m/amperes)

**ACTUAL PCS(ma)\_\_\_\_\_XXXX**

The **COMMANDED PCS** parameter indicates the PCM commanded current of the pressure control solenoid (PCS) circuit, while the **ACTUAL PCS** parameter is a feedback signal to the PCM indicating the actual PCS circuit current. A reading of 0.00 amperes indicates high line pressure, while a reading of 1.10 amperes indicates low line pressure.

**Comprehensive Component Monitor (COMPONENTS)** — Determines when a malfunction occurs in any PCM input or output circuit that is not exclusively monitored by another monitor system. A malfunction can be a short, an open, or an out-of-range value. This monitor is enabled shortly after the engine is started. However, some individual components may not immediately be available for monitoring.

**CONV OVERTEMP** (range: YES/NO)

This discrete parameter indicates YES when the automatic transmission torque converter is in an overheated (overtemp) situation.

**COOLANT \_\_\_XX** (range: -40 to 215°C)

This parameter displays engine coolant temperature calculated by the instrument panel using a signal from the ECC module.

**COOLANT (°C) \_\_\_XXX** (range: -40 to 199)

**COOLANT (°F) \_\_\_XXX** (range: -40 to 389)

**ECT(°C) \_\_\_XXX** (range: -40 to 120)

**ECT(°F) \_\_\_XXX** (range: -40 to 248)

The coolant temperature is an analog parameter, supplied to the ECU by the coolant temperature sensor (CTS) or engine coolant sensor (ECT). The CTS is a thermistor installed in the engine coolant passages. The ECU converts CTS voltage signals to temperature readings. You can change the measurement units on the Scanner from degrees Celsius (°C) to degrees Fahrenheit (°F). The preset measurement is °C. Typical readings with a fully warmed engine running at idle are 85° to 105°C (185° to 220° F). A reading of -40° C or -40° F may indicate an open in the sensor or the sensor circuit. A reading above 185° C or 366° F on CTS's may indicate a short in the sensor or the sensor circuit.

**COOLANT SW** (range: ON/OFF)

This discrete parameter indicates ON when the engine coolant switch is closed due to engine temperature. If it is closed the ECM/PCM will enable different running strategies.

**COOLANT(V) \_\_\_X.X** (range: 0 to 5.1 volts)

The Scanner displays the voltage signal from the coolant temperature sensor. Sensor voltage and temperature are inversely related. Low temperature produces a high voltage signal; high temperature produces low voltage.

**COOL FAN RELAY** (range: ON/OFF)

COOL FAN RELAY is a discrete parameter that that indicates whether or not the engine electric cooling fan relay has been switched on by the ECM/PCM.

**COOLING FAN**

**(range: OFF/LOW/HIGH)**

**(range: ON/OFF)**

This discrete parameter indicates ON when the cooling fan has been commanded on by the ECM/PCM by energising the cooling fan relay. Or indicates what speed the fan is commanded to LOW or HIGH.

**CPP/PNP\_XXX**

**(range: ON/OFF)**

This discrete parameter indicates the status of Clutch Pedal Position switch (for vehicles with a manual transmission) or the Park Neutral Position switch (for vehicles with an automatic transmission). The Clutch Pedal Position switch displays ON when the clutch pedal is released and OFF when the clutch pedal is depressed.

**CPC DUTY (%)**

**(range: 0 to 100)**

This analog parameter displays the engine ECU control of the canister purge solenoid. 0% is no purging and 100% is maximum purge.

**CPC SOL VLV**

**(range: ON/OFF)**

This discrete parameter displays the ECU command to the canister purge control (CPC) valve. ON indicates the canister should be in purge mode and OFF indicates purging should be prevented.

**CPP/PNP SW \_\_\_XXX**

**(range: ON/OFF)**

This discrete parameter indicates whether the Clutch Pedal Position Switch or the Park Neutral Position switch is closed or not. The CPP will read On when the clutch pedal is depressed. The PNP will read ON when the selector lever is in Park or Neutral positions.

**CRANK A SENSOR**

**(range: 0 to engine maximum)**

RPM is the measurement of engine speed and is always shown at the left of the top line on the Scanner display. RPM is computed internally by the ECU, based on reference pulses from the ignition system or a crankshaft sensor.

**CRANK #2 RPM**

**CRANK SIGNAL**

**CRANK A S 2**

These parameters let you look at the status of the crank and cam sensor signals used in direct ignition systems (DIS). CRANK #2 RPM is the cam sensor signal, and CRANK SIGNAL is the starter signal.

**CRANK\_\_\_XXX (range: YES/NO)**

This discrete parameter indicates whether or not the ignition switch cranking circuit is closed through the starter solenoid. The CRANK reading is YES when the cranking circuit is closed and the engine is cranking. The reading is NO when the circuit is open. The CRANK signal tells the ECU to shut down temporarily as the engine cranks because power cannot be ensured with the high current draw of the starter.

**CRANKING RPM\_\_\_XXX (range: 0 to 800)**

Some vehicles provide engine rpm signals while cranking. The ECU uses this information to calculate fuel metering for the best air-fuel ratio at starting. You can use CRANKING RPM to check cranking performance or troubleshoot starting problems.

**CRANKING\_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the position of the ignition switch. This parameter reads ON when the ignition switch is in the crank (start) position, and OFF at all other times. The engine controller uses this signal to control fuel injection, idle speed, and ignition timing during engine cranking.

**CRANK REF MISSED\_\_\_X (range: 0 to 8 counts)**

The crankshaft (CRANK) reference (REF) missed parameter is the number of crankshaft sensor pulses not recorded by the PCM. The camshaft (CAM) reference (REF) missed parameter displays the number of injection pump sensor pulses not recorded by the PCM.

At idle both parameters should read zero. The PCM uses the crank signal parameter to determine crankshaft position and the cam signal to determine injection pump cam position.

If a fault occurs in either circuit the vehicle goes into backup fuel mode and the fuel system runs on a calculated injection rate based on the last fuel injection pulse. The engine starts and continues to run but in the fuel backup with either of these faults present. Also since the PCM calculates RPM based on crank pulses the RPM parameter reads zero if a fault is detected in the crankshaft circuit.

**CRANK SIGNAL** (range: ON/OFF)

This discrete parameter indicates ON when the crank angle sensor signal is detected. Typically it will flicker between ON and OFF during normal engine running.

**CRaSHSN1(^)\_XX.X** (range: 0 to 25.5)

**CRaSHSN2(^)\_XX.X**

These parameters indicate the resistances of the crash sensors.

CRaSHSN1 refers to sensor number 1, and CRaSHSN2 refers to sensor 2.

**CRUISE CNTL SW \_\_\_\_\_XXX**

**CC INPUT SIG**

(range: ON/OFF)

This parameter displays the state of the cruise control switch. When the switch is off the parameter displays OFF, when the switch is held in the display shows ON. The cruise control switch is a momentary switch, when it is released the display will return to OFF. The BCM is responding to the actual input state of the switch.

**CRUISE DRIVER \_\_\_\_\_XXX**

(range: ON/OFF)

This parameter displays the state of the cruise control driver. The cruise control driver enables the cruise control system, if the parameter is displaying OFF and the cruise control switch is toggled the display will switch to ON and the on cruise control lamp on the dash should light up. If the display is showing ON and the cruise control switch is toggled the display should change to OFF and the dash lamp will extinguish.

**CRUISE ON \_\_\_\_\_XXX**

(range: ON/OFF)

**CC ENGAGED \_\_\_\_\_XXX**

**CRUISE ACTV \_\_\_\_\_XXX**

**CC ENABLED \_\_\_\_\_XXX**

For vehicles fitted with Cruise Control. These parameters display the status of the cruise control (CC) system. CRUISE ON indicates the input from the CC ECU that the system has been turned ON and is reading for use. CC ENGAGED and CRUISE ACTV indicates whether the system is engaged and is actively controlling vehicle speed.

**CRUISE SIG**

(range: ON/OFF)

This parameter indicates whether the transmission is receiving a "Cruise control active" signal from the Cruise Control system.

### **CTP** (range: ON/OFF)

This discrete parameter indicates whether the throttle is in the closed position. The PCM uses this parameter to cut fuel delivery during deceleration within certain rpm ranges. This parameter may be PCMcalculated based on throttle (TP) sensor, or it may rely on a closed throttle (CTP) switch integral to the TP sensor. ON means the PCM senses a closed throttle.

### **CURRENT CODES** (range: 0 to 255)

This analog parameter indicates how many engine and/or automatic transmission codes are currently set. (Note:255 is only a figure used by the PCM and would not be seen in a real situation.)

### **CUR INJ BEGIN \_\_\_X.X** (range: unknown)

This analog parameter indicates the amount of diesel fuel injection advance currently applied by the PCM, in crankshaft degrees.

### **CURRENT ERROR** (range: 0 to 4.98)

This parameter shows the difference in the amperage reading between the CURRENT PCS and the ACTUAL PCS parameters. It is used by the TCM/ PCM to ensure correct operation of the pressure control solenoid.

### **CURRENT GEAR \_\_\_XXXX** (range: see below)

These parameters display the gear the transaxle is currently operating in. For a description of CREEP see the ACCEL SWITCH parameter above. CURRENT GEAR displays question marks (???) between gears or when the signal is invalid. When the GEAR parameter displays "1" the vehicle can be in reverse, drive, or first gear.

### **CURRENT PCS (A)** (range: 0 to 4.98)

This parameter shows the commanded amperage of the pressure control solenoid (PCS) by the TCM/PCM. It is used by the TCM/PCM to control line pressure in the transmission. As amperage increases line pressure will decrease. A 0.00 reading (no current flow) would indicate full line pressure and a 4.98 (high current flow) would indicate a lower line pressure.

### **CURRNT TAP CELL** (range: 4 to 16)

This parameter displays the current torque cell that is being used for fluid line pressure adaptation.

**CYL HEAD (°)\_XXX** (range: unknown)

**CHT (°)\_XXX**

This parameter displays the Cylinder Head Temperature this reading is calculated by the PCM based on the cylinder head temperature sensor input. It is used by the PCM for fuel metering and also during engine over temperature situations to use alternative engine cooling strategies.

**CylHdTemp(V)\_X.XX** (range 0 to 5.00V)

This parameter indicates cylinder head temperature in voltage. The higher the voltage, the lower the temperature.

**CylHdTemp(°F)\_\_\_XX** (range: not available)

**CylHdTemp(°C)\_\_\_XX**

This parameter indicates the converted voltage reading of the cylinder head temperature sensor by the PCM.

**CYL x MISFIRES** (range: 0 to 100%)

NOTE: The “x” in CYL x MISFIRES is a variable from 1 to 8, depending on the cylinder being monitored. This parameter indicates the misfire rate detected in each cylinder. Expressed as a percentage, the misfire rate only include the previous 1000 crankshaft revolutions. A 0% reading means no misfires occurred during the past 1000 crankshaft revolutions.

**D\_Airbag(^)\_XX.X** (range: 0 to 25.5)

**P\_Airbag(^)\_XX.X**

These parameters display the resistance between the two contacts of the airbag. D\_Airbag refers to the driver-side airbag, and P\_Airbag refers to the passenger-side airbag.

**DASH LAMPS(%)\_\_\_XX** (range: 40% to 100%)

This analogue parameter displays the percentage of dimming that has been selected for the dash lamps. This parameter will increase or decrease as the dimmer switch is toggled up or down. This will display a reading wit the ignition ON or OFF but can only be adjusted with the ignition ON.

**DCC SOL DUTY(%)** (range: 0 to 100)

This analog parameter displays the duty cycle percentage for the damper clutch control solenoid (or torque converter clutch control solenoid). In a correctly operating and warmed up transmission this solenoid will show 70% to 90% in 4th gear at a constant 70 km/h.

**DCCSV SLIP (RPM)\_\_\_XXX**

**(range: 0 to 510 rpm)**

**DCCSV DC(%)\_\_\_XXX.X**

**(range: 0 to 100.0%)**

**DCC RPM SLIP**

**LOCK UP SOL**

The damper clutch control solenoid valve (DCCSV) slip parameter displays the rpm difference between the input and output vanes of the torque converter. Domestic automakers refer to this as TCC slip. The DCCSV DC(%) parameter displays the duty cycle (DC) of the pulse-widthmodulated (PWM) signal to the solenoid, indicating valve position. This solenoid applies hydraulic pressure to the torque converter.

**DEADLOCK SW\_\_\_\_\_XXX**

**(range: ON/OFF)**

This parameter displays the state of the deadlock switch in the right hand front door. The parameter displays OFF when the deadlock switch is off and ON when the deadlock switch is on. The BCM is responding to the actual input state of the switch.

**DECEL ENLEAN\_\_\_XXX**

**(range: YES/NO)**

During deceleration of a fuel-injected engine, the ECU reduces the injector pulse width to create a lean air-fuel mixture. DECEL ENLEAN is a discrete output parameter from the ECU. It is based on sensor inputs and ECU calculations of throttle position, manifold absolute pressure (MAP) rpm, and coolant temperature. DECEL ENLEAN usually should read YES during deceleration to indicate that the ECU is reducing injector pulse width. It should read NO during all conditions other than deceleration.

**DECEL F/CUT**

**(range: ON/OFF)**

This discrete parameter indicates whether the control module is commanding fuel cut off during deceleration.

**DECEL FUEL C/OFF\_\_\_XXX**

**(range: YES/NO)**

**FC AIRFLOW**

DECEL FUEL C/OFF is the extreme limit of DECEL ENLEAN. When throttle position, MAP or MAF, and rpm reach minimum values, the ECU shuts off fuel completely during deceleration. DECEL FUEL C/OFF should read YES and FC AIRFLOW should read ON when the ECU issues this cutoff command; NO at all other times.

Lean mixtures, or fuel cutoff, on deceleration help to prevent high HC emissions and allow the engine to return to a 14.7:1 idle air-fuel ratio more quickly. Reduced fuel flow also helps to prevent stalling at idle from an overly rich mixture.



**DECEL(G)** (range: unknown)

**DECEL 2(G)**

These analog parameters display the deceleration rate of the vehicle as calculated by the ABS ECU during braking deceleration. It's input is used when to control the rate of ABS assistance.

**DEPLOYMENTS \_\_\_X** (range: 0 or 1)

**DEPLOYMENTS #1**

This discrete parameter indicates the number of times the airbags have been deployed.

**DES B1S1 LAMBDA** (range: 0 to 2.0)

**DES B2S1 LAMBDA**

These parameters indicate the desired or target lambda required for Bank1 and Bank2.

**DES ENG RPM** (range: 0 to 3187)

This parameter indicates the desired engine rpm set by the ECM/PCM. This parameter usually displays similar to the desired idle speed.

**DES EXH CMP B1 %** (range: 0 – 100)

This parameter displays the desired position of the Bank1 variable exhaust camshaft as a duty cycle. The higher the reading the more advance is desired.

**DES EXH CMP B2 %** (range: 0 – 100)

This parameter displays the desired position of the Bank2 variable exhaust camshaft as a duty cycle. The higher the reading the more advance is desired.

**DES EXH CMP B1°** (range: 0 - 40)

This parameter displays the desired exhaust camshaft position for Bank1 as determined by the control module. The scan tool will display a higher value for more advanced exhaust valve timing, such as at high load or speed conditions. The scan tool will display a lower value for a less advanced exhaust valve timing, such as at idle.

**DES EXH CMP B2° (range: 0 - 40)**

This parameter displays the desired exhaust camshaft position for Bank2 as determined by the control module. The scan tool will display a higher value for more advanced exhaust valve timing, such as at high load or speed conditions. The scan tool will display a lower value for a less advanced exhaust valve timing, such as at idle.

**DES INT CMP B1 % (range: 0 – 100)**

This parameter displays the desired position of the Bank1 variable inlet camshaft as a duty cycle. The higher the reading the more advance is desired.

**DES INT CMP B2 % (range: 0 – 100)**

This parameter displays the desired position of the Bank2 variable inlet camshaft as a duty cycle. The higher the reading the more advance is desired.

**DES INT CMP B1° (range: 0 - 40)**

This parameter displays the desired inlet camshaft position for Bank1 as determined by the control module. The scan tool will display a higher value for more advanced inlet valve timing, such as at high load or speed conditions. The scan tool will display a lower value for a less advanced inlet valve timing, such as at idle.

**DES INT CMP B2° (range: 0 - 40)**

This parameter displays the desired exhaust camshaft position for Bank2 as determined by the control module. The scan tool will display a higher value for more advanced exhaust valve timing, such as at high load or speed conditions. The scan tool will display a lower value for a less advanced inlet valve timing, such as at idle.

**DESIRED FUEL RAIL PRESSURE (MPA)**

Indicates Desired Fuel rail pressure in Mega Pascals by the engine ECU.

**DESIRED IDLE\_XXXX (range: 0 to engine maximum)**

DESIRED IDLE is the measurement of idle speed that the PCM is trying to maintain. On some vehicles, DESIRED IDLE does not become active until the engine has run for 5 seconds. If there is a large difference between actual idle and DESIRED IDLE rpm readings, the PCM may have reached its control limit without being able to control the idle speed. This may be due to a basic mechanical or electrical problem with the engine.

**DESIRED INJECTION QUANTITY (mm3)**

This parameter indicates the amount of fuel to be injected in cubic millimeters of the main injection.

**DESIRED INTAKE THROTTLE POSITION (%) (range: 0 to 100%)**

Displays the desired position of the Intake Throttle Position Sensor as a percentage.

**DES IAC g/sec \_\_\_XXX (range: 0 to 64)**

This parameter displays the calculated airflow in the IAC passage.

**DES IAC POS (range: 0 to 255 steps)**

**DES IAC \_\_\_XXX**

DES IAC POS indicates the commanded position of the idle air control motor pintle by the ECM/PCM in maintaining the desired idle speed. This parameter is monitored by the ACT IAC POS parameter.

**DES LINE (PSI) \_\_\_X.XX (range: unknown)**

This parameter shows the commanded pressure of the pressure control solenoid by the TCM/PCM. It is used by the TCM/PCM to control line pressure in the transmission.

**DES THROT POS (%) (range: 0 to 100)**

This analog parameter displays the desired accelerator pedal position in degrees. 0% being shut and 100% being fully open.

**DES TIMING(°) \_\_\_XX.X (range: 0 to 25.5°)**

This desired injection timing parameter indicates the PCM requested injection timing in degrees before top dead center. This is for diesel engine vehicles. The PCM monitors and controls this parameter based on the crankshaft and camshaft sensor signals, as well as TDC offset. See ACT TIMING(°).

**DIAG LAMP**

See HOLD LAMP.

**DIAG REQUEST \_\_\_XXX (range: YES/NO)**

This discrete parameter displays status of the glow plug diagnostic system. YES indicates it is enabled and NO indicates it is not enabled.

**DIFF IDLE SPEED (range: unknown)**

This parameter displays the rpm value of the difference in speed of the desired idle rpm and the actual idle rpm.

### **D/M MUFFLER SW \_\_\_XXX (range: ON/OFF)**

The Mitsubishi 3000GT Turbo and the Dodge Stealth turbo have a dual-mode (D/M) muffler. A valve in the main muffler inlet switches between two different inlet apertures, a large aperture (sport mode) for improved fuel consumption and driveability, and a smaller aperture (tour mode) for quieter operation at lower engine rpm. The muffler mode changeover switch on the dash selects the desired mode. When the switch is in the TOUR position, the D/M MUFFLER SW parameter reads ON; when the switch is in the SPORT position, this parameter reads OFF.

### **DOME LAMP DRV \_\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the state of the interior dome lamp delay driver. The parameter is ON when the interior lamp is on and OFF when the lamp is off. The interior lamp is on a delay so after the doors are shut the lamp will remain in for 30 seconds or until the ignition switch is turned on. It will also display ON when the doors are unlocked with the remote key.

### **DoorAjarLamp\_XXX (range: ON/OFF)**

This discrete parameter indicates the GEM command status for the door ajar lamps. When the system functions properly, ON means the door ajar lamps are lit.

### **DOOR LOCK SW \_\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the input state of the door lock switch.

### **DoorsUnlock\_XXX (range: ON/OFF)**

This discrete parameter indicates the GEM command status for the door unlock solenoids. ON means the GEM has commanded the solenoids to energise.

### **DOWN SW Range: On/Off**

Indicates the mode of the transmission Down switch in the automatic transmission lever.

### **DPFE(V)\_X.XX (range: zero to 5.00 volts)**

#### **PFE(V)\_X.XX**

These analog parameters indicate exhaust pressure. The pressure feedback EGR (PFE) and differential pressure feedback EGR (DPFE) sensors convert a varying exhaust pressure signal into a proportional analog voltage signal to the PCM. The PCM uses this signal to compute optimum EGR flow.

**D POS SWITCH**

(range: ON/OFF)

This discrete parameter indicates whether the contacts to the drive position switch are closed or open. On a properly functioning vehicle, ON means the switch contacts are closed and the vehicle is in drive.

**D\_Preten(^)\_XX.X**

(range: 0 to 25.5)

**P\_Preten(^)\_XX.X**

These parameters display the resistance of the shoulder belt pretensioner circuit. D\_Preten refers to the driver side pre-tensioner, and P\_Preten refers to the passenger side pre-tensioner.

**DRIVER AIRBAG LOOP: CAPACITANCE(nF)\_\_\_XXX**

**PASS. AIRBAG LOOP: CAPACITANCE(nF)\_\_\_XXX**

**RH SIDE AIRBAG LOOP CAPACITANCE(nF)\_\_\_XXX**

**LH SIDE AIRBAG LOOP CAPACITANCE(nF)\_\_\_XXX**

(range: see text)

This parameter displays the capacitance of the driver's and front passenger's airbag wiring loops. A typical reading would be about 470 nF, a variation of more than  $\pm 10\%$  indicates a problem and may set a DTC. Capacitance should be read with resistance, when they are both within specification the wiring is OK.

**DRIVER AIRBAG LOOP: RESISTANCE(OHM)\_\_\_XXX**

**PASS. AIRBAG LOOP: RESISTANCE(OHM)\_\_\_XXX**

**RH SIDE AIRBAG LOOP RESISTANCE (OHM)\_\_\_XXX**

**LH SIDE AIRBAG LOOP RESISTANCE (OHM)\_\_\_XXX**

(range: see text)

These parameters display the resistance of the driver's and front passenger's airbag wiring loop. A typical reading should be a low resistance value, about 2.1 Ohms. A reading of 6.3 Ohms or more may indicate an open circuit in the wiring loop and may set a DTC.

**DRIVER PRETEN LOOP: CAPACITANCE(nF)\_\_\_XXX**

**PASS. PRETEN LOOP: CAPACITANCE(nF)\_\_\_XXX**

(range: see text)

This parameter displays the capacitance of the driver's and front passenger's seatbelt pretensioner wiring loops. A typical reading would be about 470 nF, a variation of more than  $\pm 10\%$  indicates a problem and may set a DTC. Capacitance should be read with resistance, when they are both within specification the wiring is OK.

**DRIVER PRETEN LOOP: RESISTANCE(OHM)\_\_\_XXX**

**PASS. PRETEN LOOP: RESISTANCE(OHM)\_\_\_XXX**

**(range: see text)**

These parameters display the resistance of the driver's and front passenger's seatbelt pretensioner wiring loop. A typical reading should be a low resistance value, about 2.1 Ohms. A reading of 6.3 Ohms or more may indicate an open circuit in the wiring loop and may set a DTC.

**DRM STATUS**

**(range: On/Off)**

No information available.

**DRV AIR MIX\_\_\_X.XX**

**PASS AIR MIX\_\_\_X.XX**

**DR MIX FBK\_\_\_X.XX**

**PS MIX FBK\_\_\_X.XX**

**(range: 0 to 3.5 volts)**

These parameters display the feedback voltage from the drivers (DR or RH) and passengers (PS or LH) air mix doors position sensors. The ECC uses this voltage to determine the air mix doors current positions. The air mix doors are used to mix cold and warm air to achieve a desired temperature.

**DRV AIRMIX DES%\_\_\_X.XX**

**DRV AIRMIX FBK%\_\_\_X.XX**

**PASS AIRMIX DES%\_\_\_X.XX**

**PASS AIRMIX FBK%\_\_\_X.XX**

**(range: 0 to 100)**

These parameters display the desired position and feedback position for the drivers and passengers air mix doors positions. The air mix doors are used to mix cold and warm air to achieve a desired temperature.

**DRV PRET LP ENBL\_\_\_XXX**

**PAS PRET LP ENBL\_\_\_XXX**

**(range: YES/NO)**

These parameters display whether the loop for the drivers seatbelt pretensioner or the front passengers seatbelt pretensioner are enabled (parameter shows YES) or disabled (parameter shows NO).

**DRVR DOOR\_\_\_\_\_XXX**

**(range: OPEN/CLSD)**

This parameter displays the state of the drivers door. The parameter is OPEN when the door is open (although the actual switch is closed) and CLSD when the door is closed (although the actual switch is open). The BCM is responding to the actual input state of the switch.

**DRVR DOOR UNLOCK\_\_\_\_\_XXX (range: ON/OFF)**

This parameter shows the status of the drivers door lock switch, it should display OFF when the drivers door is locked and ON when the drivers door is unlocked.

**DRV SET (°C)\_\_\_XXX**

**PAS SET (°C)\_\_\_XXX**

These analog parameters display the temperature currently set by the driver or passenger input. Some models may have only driver input available.

**DRV SRS LP ENBL\_\_\_XXX**

**PAS SRS LP ENBL\_\_\_XXX**

**RH SIDE LP ENBL**

**LH SIDE LP ENBL**

**(range: YES/NO)**

These parameters display whether the loop for the drivers airbag or the front passengers airbag are enabled (parameter shows YES) or disabled (parameter shows NO).

**DTC CNT\_XXX**

**(range: see below)**

This parameter displays the number of memory codes that have been set in the module. The number changes each time a new code is set.

**DTC CNT2\_XX**

**(range: unknown)**

This parameter indicates the number diagnostic trouble codes set during KOEO or KOER tests during the current ignition cycle.

**DTC'S\_\_\_\_\_XXX**

**(range: YES/NO)**

YES indicates the control module has Diagnostic Trouble Codes set. NO indicates no DTC's have been set.

**DTC'S STATUS\_\_\_\_\_XXX**

**(range: YES/NO)**

YES indicates the PCM has set Diagnostic Trouble Codes. NO indicates no DTC's have been set.

**EC IGN RLY CKT STATUS**

**(range: OK, Indeterminate, Fault)**

Status of the engine control ignition relay circuit.

### **EC IGN RLY FDBK (V)**

Voltage signal sent to the control module from the engine control ignition relay. The scan tool will display battery voltage when the engine is running. The scan tool will display no voltage when the relay is OFF.

### **ECONOMY SW \_\_\_XXXX (range: ON/OFF)**

This parameter shows if the Economy Power switch is ON/OFF.

### **ECON/PWR SW \_XXX (range: ON/OFF)**

This discrete parameter indicates the status of the economy or power mode as selected by the driver. Some XR6 or XR8 series vehicles may display this parameter although they do not have the ECON/PWR SW fitted.

### **EFE COMMAND \_\_\_XXX (range: ON/OFF)**

This parameter indicates whether or not the ECU has commanded the early fuel evaporation (EFE) system to turn on. The EFE system is used on carbureted engines to preheat the incoming air-fuel mixture for a cold engine. The EFE system may be a vacuum-operated manifold heat control valve or an electric grid heater under the carburetor.

When EFE COMMAND is ON, the EFE system has received a signal to energize. When EFE COMMAND is OFF, the system has been deenergized to remove heat from the air-fuel mixture. This parameter is an output signal from the ECU only. It does not indicate whether the EFE system has responded.

### **EGR COMMAND \_\_\_XXX (range: ON/OFF)**

### **EGR SOLENOID \_\_\_XXX (range: ON/OFF)**

This parameter indicates whether or not the ECU has commanded the EGR vacuum solenoid or vacuum switching valve (VSV) to open. When EGR COMMAND (SOLENOID or SYS) is ON, the solenoid has received a signal to energize, open the vacuum line, and apply vacuum to the EGR valve. When EGR COMMAND (SOLENOID or SYS) is OFF, the solenoid has been de-energized to cut off EGR vacuum. This parameter is usually OFF in park or neutral, at idle, or in open loop. It is usually ON at cruising speed in closed loop.

This parameter is an output signal from the PCM only. It does not indicate whether the solenoid or valve has responded or whether the EGR valve has actually opened.



**EGR COMMAND(%)** (range: 0 to 100)

**EGR FDBACK(%)**

**EGR PINTLE(V)**

**EGR (%)**

These analog parameters display the duty cycle for the Exhaust Gas Recirculating valve. EGR valve open/close rate depends on operating conditions of the engine.

**EGRC SOL/V A** (range: ON/OFF)

**EGRC SOL/V B**

These discrete parameters indicate the control module command to the EGR control solenoids A and B.

**EGRDtyCycle(%)\_XXX** (range: 0 to 100)

This parameter indicates the commanded opening of the EGR valve by the PCM, measured as a duty cycle.

**EGR PINTLE(V)** (range: 0 to 5.00)

This parameter displays the voltage feedback used to determine the position of the EGR valve pintle. 0 volts is fully closed and 5 volts would be fully open.

**EGR STEPS** (range: 0 to 255)

This analog parameter indicates the ECU command to the EGR valve. 0 steps is fully closed and 255 would be fully open.

**EGR TEMP(°C)\_\_XXX** (range: -50 to 320° C)

**EGR TEMP(°F)\_\_XXX** (range: -58 to 600° F)

EGR gas temperature is detected by a sensor slightly downstream from the EGR control valve. A decrease in EGR temperature indicates restricted EGR flow or a system malfunction.

**EGR TEMP(V)\_\_X.XX** (range 0 to 5.12 volts)

This parameter is a feedback signal from a thermistor in the EGR passage. The voltage indicates the amount of EGR flowing. High voltage means a high flow rate; low voltage means low or no EGR flow. EGR (V) B2 refers to cylinder bank 2 which would have separate EGR system to bank 1. EGR TEMP(V) refers to bank1 when there are two cylinder banks.

### **EGR VOL CON/V**

This analog parameter displays the EGR volume control as commanded by the engine ECU.

### **EGR VOLUME STEPS**

**(range: unknown)**

This parameter indicates the position of the EGR volume control valve stepper-motor. The valve regulates the amount of flow through the EGR system. As the stepper-motor count increases, flow increases.

### **ELC RELAY(V)**

**(range: 0 to 14)**

This analog parameter displays the output voltage of the control relay. It should display system voltage for a correctly operating system.

### **ELEC LOAD (A)**

**(range : 0 to 37)**

This analog parameter displays the reading in amperage of the electrical load that is being sensed by the PCM. This reading is used by the PCM to control the alternator charging rate.

### **ELEC LOAD SW LOAD SIGNAL**

**(range: ON/OFF)**

This discrete parameter indicates electrical load on the charging system (such as headlamps, brake lamps, rear defogger). When certain combinations of accessories are on, this parameter displays ON. When certain combinations of accessories are off, this parameter displays OFF. The engine controller uses this parameter to compensate for electrical loading during idle.

### **ENABLE RELAY\_\_XXX**

**(range: ON/OFF)**

This parameter indicates the state of the ABS controller output signal to the enable relay. This relay provides battery voltage and current to the ABS controller and the electromagnetic brakes (EMB's).

### **ENERGY RESERVE\_\_OFF**

**(range: ON/OFF)**

This parameter displays the status of the SRS energy reserve. This reserve would become active if the SRS system lost power from the battery, it enables the SRS to function if this situation occurs.

### **ENG CRANK(SEC)**

**(range: unknown)**

This analog parameter displays the time in seconds of the cranking time before the engine started. It displays the engine cranking time for the current ignition cycle.

**ENG ENABLE\_XXX** (range: ON/OFF)

This parameter indicates the status of the theft deterrent system as to whether the engine is enabled to start and run. ON indicates it is enabled to run and OFF indicates it is not enabled.

**ENGINE CHECK LAMP** (range: ON/OFF)

This discrete parameter indicates the PCM command to the engine check lamp in the instrument cluster. ON indicates the lamp is being commanded on and OFF indicates the lamp should be off.

**ENGINE LOAD(%)\_XXX** (range: 0 to 160%)

ENGINE LOAD(%) is an analog parameter calculated by the engine controller. It is based on engine speed (rpm), number of cylinders, and manifold airflow. ENGINE LOAD(%) indicates relative engine load. A high number indicates a heavy load; a low number, a light load.

**ENGINE RPM\_\_\_\_\_XXX**

**INPUT RPM\_\_\_\_\_XXX**

**OUTPUT RPM\_\_\_\_\_XXX**

**TURBINE RPM\_\_\_\_\_XXX**

**OUTPUT SPEED (KPH)\_XXX** (range: 0 to engine or trans. max.)

On vehicles with electronic transmissions, three sensors provide engine speed, input shaft speed, and output shaft speed data to the transmission module. The ENGINE RPM parameter is from the ignition system. The module uses engine speed to calculate the overdrive ratio. Input speed is used to determine actual turbine speed and to control line pressure. Output speed is used to control TCC, line pressure, shift timing, and torque. Turbine speed is taken directly from the input speed sensor when the transmission is in 1st, 2nd, and 3rd gear. However, when the transmission is in 4th gear the forward clutch drum is overrunning which makes direct turbine speed reading inaccurate. Therefore, the transmission module calculates the turbine speed in 4th gear by multiplying input speed by a calibrated value.

**ENG DTC SET** (range YES/NO)

This discrete parameter shows whether any engine diagnostic trouble codes have been set in the ECM/PCM.

**ENG LOAD (mS) (range: 0 to 99.9)**

This parameter is calculated by the ECU from a number of signals. These signals are usually from the airflow meter, air temperature and engine RPM. The ECU uses this parameter as a base for calculating injection timing.

**ENG OIL TEMP (range: -40 to +327°)**

This parameter displays engine oil temperature in degrees, which the PCM uses to control the cooling fans.

**EngOilTemp(°)\_XXX (range: unknown)**

This parameter displays the temperature of the engine oil, this reading is calculated by the PCM based on the oil temperature sensor input.

**EngOilTemp(V)\_XXX (range: 0 to 5.00 volts)**

This parameter displays the voltage output of the oil temperature sensor.

**ENG OIL TEMP SW (range: ON/OFF)**

This discrete parameter indicates the current state of the engine oil temperature switch. ON indicates that the switch is returning a high oil temperature reading.

**ENG RPM\_\_XXXX (range: 0 to engine maximum)**

The transaxle controller internally calculates this parameter by directly monitoring the pulses off the ignition coil.

**ENG RPM LIMIT (range: ON/OFF)**

This discrete parameter indicates the that the ECU is operating with the engine rev limiter active. This will limit the engine rpm to about 4000 rpm and could indicate that the ECU is running in a limited operation strategy (los or limp home mode) this enables the ECU to automatically supply substitute values when sensor failure occurs, so that a sensor can fail and not necessarily affect driveability. Reading should normally be NO.

**ENG STATUS (range: ON/OFF)**

This analog parameter indicates whether the engine is running or not.

**ENG STOPPED (range: YES/NO)**

This discrete parameter indicates the whether the engine is running or stopped.

**ENG TORQ(lb/ft)** (range: 0 to 9999 lb./ft.)  
**ENG TORQ(N-M)** (range: 0 to 65025 Nm)  
**TORQ DELIV(Nm)**

These parameters display engine torque, which is PCM calculated value based on engine load, throttle position, mass airflow, and other engine and transmission inputs. This parameter is accurate to within 15 ft-lb of actual measured engine torque.

**ENG TQI (%)** (range: 0 to 100)

This analog parameter displays the engine “torque index” or engine load as calculated by the transmission ECU. This is used for determining shift timings and patterns.

**ENG WARMUP** (range: YES/NO)

This discrete parameter indicates the whether the engine is warmed up or not.

**EPC(Psi)\_XXX** (range: 0 to 100 psi)  
**ElecPrsCtrl\_XXX**

Electronic pressure control (EPC) controls fluid pressure in the transmission.

**EPC(V)\_XX.XX** (range: 2 volts to battery voltage)

This parameter displays the average operating voltage of the pulsewidth-modulated electronic pressure control (EPC) solenoid. A low average voltage reading indicates higher transmission line pressure; a higher reading indicates lower line pressure.

**EPR(%)\_XXX** (range: 0 to 100%)

This analog parameter shows the PCM command to the exhaust pressure regulator valve. It is measured in percentage where 0% is closed and 100% is fully open.

**ERASE CYCLES** (range: 0 to 250)

This analog parameter displays the number of times faults have been cleared by a scan tool. This is useful for intermittent faults when combined with FAULT #1 & FAULT #2 parameters.

**ESC ACTIVE** \_\_\_\_\_ **XXX** (range: YES/NO)

**ESC FAILURE** \_\_\_\_\_ **XXX**

On vehicles with electronic spark control (ESC), the ESC ACTIVE parameter indicates whether or not the ECU is controlling spark advance. When the engine is cranking, the ignition module controls timing, electronic spark timing is disabled, and this parameter reads NO. After the engine starts, the ECU controls timing and this parameter reads YES.

On these vehicles, the detonation sensor and ESC module send the ECU information on knock and pinging. If any of these ESC components fail, the ECU may indicate ESC FAILURE\_\_YES. This is usually accompanied by trouble code 43. ESC FAILURE should read NO if the system is working properly.

**ESC COUNTER**\_\_ **XXX** (range: 0 to 255)

ESC COUNTER is a signal from the detonation sensor on engines with electronic spark control (ESC). This parameter is a counter that indicates the relative duration and magnitude of spark knock. The range from 0 to 255 does not indicate actual time. Any number greater than 0 indicates that knock occurred. A low number means short duration; a higher number indicates longer duration and magnitude.

**ETC ACT**°\_\_ **XXX** (range: 0 to 100)

**ETC DSD**°\_\_ **XXX**

This analog parameter displays the Electronic Throttle Control desired opening angle (DSD) and the actual opening angle (ACT).

**ETC SWITCH**\_\_\_\_\_ **XX** (range: ON/OFF)

This discrete parameter shows the current position of the Traction Control Switch. The TRAC switch is a momentary switch and will ON only when the switch is being held in, otherwise it will indicate OFF.

**EV(%)** (range: 0 to 159)

This parameter displays the volumetric efficiency, or engine load, as calculated by the PCM. It is used to determine shift timings and patterns.

**EVAP DUTY(%)** (range: 0 to 100)

This parameter indicates the amount of evaporative canister purge regulation as a percentage. 0 is no idle speed regulation and 100 is maximum regulation.

**Evaporative Emission System Monitor (EVAP SYS)** — Checks the function of EVAP components and the ability to flow fuel vapor (hydrocarbons) to the engine. The sequence-of-events required to enable this monitor vary, depending on the EVAP system components.

**EVAPCPFault\_XXX** (range: YES/NO)

This parameter indicates if the PCM detects a fault in the canister purge solenoid circuit. YES means a fault is present.

**EVAPCVFault\_XXX** (range: YES/NO)

This parameter indicates if the PCM detects a fault in the canister vent solenoid circuit. YES means a fault is present.

**EVAP PRES(V)** (range: 0 to 5.00 volts)

This parameter indicates the pressure in the EVAP purge line. As EVAP pressure increases, sensor voltage increases. The PCM uses this signal to detect leaks and faulty components.

**EVAP(V)\_\_\_X.XX** (range: 0 to 3.5)

**EVAP (°C)\_\_\_X.XX** (range: -40 to 88)

The EVAP (V) parameter displays the voltage signal from the evaporator temperature sensor for the ECC (Electronic Climate Control). The EVAP (°C) parameter displays the evaporator temperature in Celsius calculated by the ECC based on the above voltage reading.

**EXH/GAS REG V** (range: ON/OFF)

This parameter displays the control module command to the turbocharger exhaust gas regulator valve.

**ExhBackPrs\_XXX** (range: 0 to 2368 psi)

This parameter relies on a variable capacitor exhaust back pressure sensor in the right exhaust manifold to indicate pressure.

**Exhaust Gas Recirculation System Monitor (EGR SYS)** — Tests the integrity and flow characteristics of the EGR system. This monitor is enabled during EGR system operation, after certain base engine operating conditions are satisfied. Inputs from the ECT, IAT, TP, and CKP sensors are required to enable the EGR monitor.

**EXHAUST OXYGEN\_\_XXXX** (range: RICH/LEAN)  
**REAR O2\_\_XXXX**  
**LEFT O2\_\_XXXX**  
**RIGHT O2\_\_XXXX**  
**O2S #1 STATUS\_XXXXXX** (range: RICH/CENTER/LEAN)  
**O2S #2 STATUS\_XXXXXX**  
**REAR O2 STATUS\_XXXXXX**

These parameters indicate the general rich or lean condition of the exhaust as measured by the O2 sensor. Exhaust oxygen content is related to oxygen content in the intake air-fuel mixture and thus indicates intake airfuel ratio. The exhaust gas oxygen sensor (O2) sensor is the primary sensor that indicates whether the engine is running rich or lean. The O2 sensor must be hot (above 500°F), and the ECU must be in closed loop before the ECU will respond to the sensor signal. RICH or LEAN indicates the general condition of the exhaust. The O2 voltage indicates the exact sensor signal. Refer to the O2(mV) explanation for more information.

Some early-model vehicles have separate O2 sensors for the left and right banks. Exhaust conditions from these sensors are shown as LEFT O2 and RIGHT O2, or EXHAUST OXYGEN and REAR O2. Late-model vehicles that have two sensors display them as O2S #1 and O2S #2, with #1 indicating the bank that contains cylinder number 1.

**EXH CMP B1 VAR°** (range: unknown)  
This parameter displays the difference in the desired position and actual position of the Bank1 exhaust camshaft when variable valve timing is active.

**EXH CMP B2 VAR°** (range: unknown)  
This parameter displays the difference in the desired position and actual position of the Bank2 exhaust camshaft when variable valve timing is active.

**EXT BRAKE TRVL** (range: ON/OFF)  
This parameter displays the extended brake travel switch contact states of the torque management brake switch and reads as follows:

- ON when the pedal is 40% applied.
- OFF when the brake pedal is released.



**F/PUMP CMD**

(range: ON/OFF)

This parameter displays the PCM command of the fuel pump relay driver circuit.

**F AMOUNT (MG/STK)\_\_\_X.X**

(range: unknown)

This parameter displays the Fuel Amount that has been injected under current operating conditions. The reading is in milligrams per stroke.

**FAN Monitor\_XXX**

(range: ON/OFF)

The PCM monitors the fan side of the CCRM (or IRCM) to determine whether the fan has been successfully commanded on or off by the PCM. ON indicates high input voltage; OFF indicates low input voltage.

**FAN 1 RELAY**

(range: ON/OFF)

**FAN 2 RELAY**

This discrete parameter displays the ECU command to the indicated fan relay. Some vehicles may only be equipped with one relay.

**FAN RELAY 1 CKT STATUS**

This parameter indicates the status of the fan relay circuit. When the fan is off it may read Fault and when the fan relay is on it should read OK.

**FAN RELAY 2 & 3 CKT STATUS**

This parameter indicates the status of the fan relay circuit. When the fan is off it may read Fault and when the fan relay is on it should read OK.

**FAN REQUEST**

(range: YES/NO)

FAN REQUEST is a discrete parameter that that indicates whether or not the PCM has commanded the engine electric cooling fan to turn on.

**FAN SPD CNTL\_\_\_XXX**

(range: unknown)

**DES FAN SPD\_\_\_XXX**

**FAN SPD FBK(V)**

These discrete parameters indicate the status of the blower fan speed determined by either the ECU or from operator input. FAN SPD FBK V shows the feedback voltage from the fan motor.

**FAN UP \_\_\_XXX** (range: ON/OFF)

**FAN DOWN \_\_\_XXX**

These discrete parameters indicate the status of the blower fan FAN UP and FAN DOWN setting switches. When a switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**FAULT #1** (range: 0 to 9999)

**FAULT #2**

This analog parameter displays how long, in minutes, the fault has occurred for. This is useful for intermittent faults when combined with the ERASE CYCLES parameter.

**F BNK UP \_\_\_XXXXXX** (range: RICH/LEAN/CENTER)

**R BNK UP \_\_\_XXXXXX**

These parameters indicate the general rich or lean condition of the exhaust as measured by the O2 sensors. Exhaust oxygen content is related to oxygen content in the intake air-fuel mixture and thus indicates intake air-fuel ratio. The exhaust gas oxygen sensor (O2S) is the primary sensor that indicates whether the engine is running rich or lean. The O2 sensors must be hot (above 500° F), and the PCM must be in closed loop before the PCM will respond to the sensor input. Transverse-mounted V6 engines have separate sensors for front and rear.

**FC CTP**

During closed throttle (CTP) decel, the PCM can command fuel cut (FC). This parameter displays the status of that command. ON means that the PCM has commanded a fuel cut after sensing a closed throttle.

**F.ECON(L/100km) \_\_\_X.X** (range: see text)

This parameter displays the fuel economy reading from the trip computer. The reading should be consistent with the trip computer reading.

**FIELD SERV MD** (range: YES/NO)

This discrete parameter indicates when the engine ECM/PCM has been placed into Field Service Mode by the technician.

**FLInput(V)\_XX.XXX (range: 0 to 32.000 volts)**

This parameter displays the fuel level in the fuel tank as a voltage value. A voltage at the high end of the sensor's range indicates a high fuel level. The PCM must wait until this parameter displays a voltage value representing a tank 25 to 75 percent filled with fuel before beginning the Evaporative Emission Monitor Test.

**FLUID TEMP(V) (range: 0 to 5.00 volts)**

This parameter displays the output value in volts of the transmission fluid temperature sensor. As the oil temperature increases the voltage decreases.

**FOOT 1 SOL\_\_\_\_XXX**

**FOOT 2 SOL\_\_\_\_XXX**

**FACE 1 SOL\_\_\_\_XXX**

**FACE 2 SOL\_\_\_\_XXX**

**(range: OFF/ON)**

These parameters indicate whether the individual solenoids have been energised or not. The solenoids are connected to vacuum operated flaps that direct air flow to the occupants face or feet.

**FPFault\_XXX (range: YES/NO)**

This parameter indicates whether the PCM has detected a fault in the fuel pump circuit. YES means a fault is present.

**FPMode\_XXX**

**(range: ON/OFF)**

**FPMonitor\_XXX**

These parameters indicate whether the fuel pump has turned on or off in response to a command from the PCM.

**F/PUMP(%)\_XXX**

**(range: 0 to 100)**

This parameter indicates the PCM commanded speed to the fuel pump.

**FR O2S(mV)**

**(range: 0 to 1250)**

This parameter indicates the front oxygen sensor voltage, displayed as millivolts.

**FR O2S RICH**

**(range: ON/OFF)**

This parameter indicates the rich or lean status of the front oxygen sensor. ON indicates a rich mixture and OFF indicates a lean mixture.

**FRONT DEMIST \_\_\_XXX** (range: ON/OFF)

**REAR DEMIST \_\_\_XXX**

These discrete parameters indicate the status of the front demist switch and the rear demist switch. When a switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**FRP REGULATOR COMMAND** (Range: 0 to 100%)

Indicates the current commanded duty cycle of the fuel rail pressure regulator.

**FRP REGULATOR FEEDBACK (mA)** (Range: not available)

Current (mA) feedback signal of the fuel rail pressure regulator.

**FRT DWELL(SECS)\_\_\_XX.X** (range: unknown)

This analogue parameter displays the dwell, or off time ,of the windscreen wiper when set on intermittent. The dwell time is adjustable by the operator via the wiper controls, as the dwell time is adjusted the parameter will increase or decrease to whatever is selected by the operator. The parameter will be displayed with the ignition switch in the ACC and IGN positions.

**FRT WPR INT SW \_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the windscreen wiper intermittent switch. The parameter is OFF when the switch is not in the intermittent position and is ON when the switch is closed in the intermittent position. The BCM is responding to the actual input state of the switch.

**FRT WSH PMP SW \_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the windscreen washer motor switch. The parameter is OFF when the switch is open and the washers are not operating and is ON when the switch is closed and the washers are operating. The BCM is responding to the actual input state of the switch.

**FR WHEEL** (range: see text)

This automatic transmission parameter indicates the vehicle speed in km/h. It uses a front (FR) ABS wheel speed sensor as input to the auto trans ECU.

**FrWiperMd\_XXXXX** (range: see below)

**RearWiperMd\_XXXXX**

These parameters indicate the position of the driver operated front or rear windshield wiper switch. The GEM module uses this information to control the wiper and washer relays.

The possible ranges include:

POS1 POS2 POS3 POS4 POS5 POS6 POS7 WASH

INT LOW HIGH OPEN CKT

**FUEL(%) FRONT \_\_\_XXX** (range: -25 to +25%)

**FUEL(%) REAR \_\_\_XXX**

OBD-II vehicles with separate front and rear bank O2 sensors have separate PCM-controlled adaptive and injector strategies. The FUEL(%) FRONT and FUEL(%) REAR parameters indicate the adaptive adjustment made to fuel injector pulse width at idle. A negative percentage means that the logic module is decreasing the pulse width from its programmed value. A positive percentage means that the logic module is increasing the pulse width from its programmed value.

**FUEL ADAPTION IDLE LOAD X**

Indicates the Long-term fuel adaption learnt by the ECU for idle load. Where X can be 1 or 2 bank.

**FUEL ADAPTION PARTIAL LOAD X**

Indicates the Long-term fuel adaption learnt by the ECU for partial load. Where X can be 1 or 2 bank.

**FUEL COMPENSATION CYL (1)**

**FUEL COMPENSATION CYL (2)**

**FUEL COMPENSATION CYL (3)**

**FUEL COMPENSATION CYL (4)**

This parameter indicates the amount of fuel injected compensated for by each injector.

**FUEL CONSUMP(%)** (range: 0 to 100)

This analog parameter displays the calculated fuel usage in percent.

**FUEL CUTOFF** (range: YES/NO)

This discrete parameter indicates whether the ECM/PCM is commanding fuel cut off during deceleration.

**FUEL CUTOFF SOL\_XXX** (range: ON/OFF)

Many carbureted engines have a solenoid that cuts off fuel delivery during deceleration. The ECU energizes the solenoid (FUEL CUTOFF SOL\_ON) to open the fuel line for normal delivery. The ECU de-energizes the solenoid (FUEL CUTOFF SOL\_OFF) to close the fuel line during deceleration. FUEL CUTOFF SOL indicates the state of the ECU output command. It is not a feedback signal to indicate solenoid operation.

**FUEL CUT VLV** (range: ON/OFF)

This parameter displays the control module command to the fuel cut solenoid switching valve.

**FUEL GAUGE (%)\_XXX** (range: 0 to 100)

**FUEL LEVEL (%)\_XXX**

This parameter indicates the fuel gauge reading on the instrument panel.

0 percent is an empty tank and 100 percent is a full tank. The percentage reading should be consistent with the instrument panel fuel gauge display.

**FUEL PRESS** (range: 0 to 768 kPa or 0 to 111psi)

This parameter displays the actual pressure in the fuel rail. You can change the measurement units on the SCANNER from kPa to psi.

**FUEL PRESS SOL** (range: ON/OFF)

This discrete parameter displays the PCM command to the fuel pressure regulator control solenoid valve. ON means the solenoid has been commanded on.

**FuelPumpA\_XXX** (range: ON/OFF)

This parameter indicates the actual state of the commanded output to the fuel pump. It should be the same as the fuel pump monitor and fuel pump command output displays; that is, all three should display ON or OFF at the same time.

**FUEL PUMP** (range: YES/NO)

This discrete parameter indicates when the fuel pump is running. YES indicates the PCM senses a running fuel pump.

### **FUEL PUMP RELAY CKT STATUS**

This parameter indicates the status of the fuel relay circuit. When the fuel pump relay is off it may read Fault and when the fuel pump relay is on it should read OK.

**FUELPW1(mS)\_XX.X** (range: 0 to 99.9)

**FUELPW2(mS)\_XX.X**

These parameters display the current commanded pulse width of the injectors affected by O2S1 and O2S2. The displayed value is the pulse width that was commanded at the time of the last update. On some vehicles, updating may occur only when a PIP signal is being received, and the last updated value will be retained after the PIP signal stops. In these cases, a pulse width greater than zero may be displayed during KOEO.

### **FUEL RAIL PRESSURE**

This parameter indicates the actual fuel pressure in bar.

### **FUEL RAIL PRESSURE SENSOR (MPA)**

Fuel rail pressure calculated from sensor voltage in Mega Pascals.

### **FUEL RAIL PRESSURE SENSOR (V)**

Indicates the Fuel Rail pressure sensor voltage.

**FUEL RATE (mm3)\_\_\_X.X** (range: 0 to 80 mm)

This analog parameter indicates the volume of fuel that the PCM is commanding based on .

**FUEL SENDER(V)\_\_\_XXX** (range: 0 to 12 volts)

**FUEL LEVEL\_\_\_XXX**

These parameters indicate the fuel level in the fuel tank.

**FUEL SNDR RES\_\_\_X.X** (range: unknown)

**FUEL SNDR (OHM)\_\_\_X.X**

This parameter indicates the resistance of the fuel tank level sensor. The instrument panel uses this signal to display the fuel tank level on the fuel gauge.

**FUEL STATUS\_XXX** (range: See below)

This parameter indicates whether the vehicle is operating in open or closed loop. It is similar to the OPEN/CLSD LOOP but provides more information about the cause of the open- or closed-loop condition. The parameter indications are as follows:

CL — normal closed loop

CL FLT — One O2S is not switching and the PCM is using the other one for feedback

OL — normal open loop

OL DRV — Open loop because of driver action or other special circumstances

OL FLT — Open loop with O2S problem or primary side coil failure

**FUEL SYS1\_\_\_XXXX** (range: OL/CL or OPEN/CLSD)

**FUEL SYS2\_\_\_XXXX**

**FUELSYS\_\_\_XXXX**

These parameters display the operating status of fuel banks 1 and 2. The status can be OL or OPEN for open loop, or CL or CLSD for closed loop. When a fuel bank status is OL or OPEN, the PCM ignores the main O2 sensor signal. When a fuel bank status is CL or CLSD, the PCM uses main O2 sensor feedback to correct fuel injection duration. With the engine fully warm at idle, these parameters should indicate closed loop. At 2500 rpm with no load, these parameters should also indicate closed loop. Deceleration could cause these parameters to indicate open loop during fuel cutoff. Some vehicles will display only FUEL SYS1, while others will display the status of both fuel banks.

**FUEL TANK CAP(L)** (range: 0 to 98L or 0 to 128L)

This parameter displays the capacity of the fuel tank in litres.

**FUEL TEMP (°C)\_\_\_XXX** (range: -40 to 151°C)

**FUEL TEMP (°F)\_\_\_XXX** (range: -40 to 304°F)

This parameter indicates the diesel fuel temperature. The PCM converts voltage signals from a thermistor-type sensor to temperature.

**FUEL TRIM(%)\_\_\_XXX**

See LT TRIM.



**FuelTankPrs(V)\_X.X** (range: 0 to 5.0 V)

This parameter displays signal voltage from the fuel tank pressure sensor. The Evaporative Emissions Monitor requires input from this sensor. With the gas cap removed, signal voltage should be between 2.4 and 2.8 volts. During the evaporative emissions test, expect voltage to decrease while the PCM applies vacuum to the fuel tank.

**Fuel System Monitor (FUEL SYS)** — Monitors the adaptive fuel control system and determines when a learned value exceeds a specified threshold. Inputs from the ECT, IAT, and MAF or MAP sensors are required to enable this monitor.

**FUEL TEMP(°C)** (range: -30° to 224°C)

**FUEL TEMP(°F)** (range: -22° to 435°C)

This parameter indicates the fuel temperature within the intake manifold fuel rail. The PCM uses this parameter to fine-tune engine management.

**FULL ACCEL SW** (range: ON/OFF)

This discrete parameter indicates the position of the throttle pedal full acceleration switch. ON indicates that the throttle is held fully open. OFF indicates the throttle is either at idle or partially open position.

**FULL LOAD** (range: YES/NO)

This discrete parameter indicates the whether the throttle is at full load.

**FULL POS SW** (range: CLSD/OPEN)

This discrete parameter indicates the position of the throttle switch for full load. CLSD indicates that the throttle is held fully open, OPEN indicates the throttle is either at idle or partially open position.

**FWD SWITCH** (range: ON/OFF)

**FWD LAMP**

This discrete parameter indicates whether or not the front wheel drive enable switch is on or off. If the FWD switch is enabled the FWD lamp will be illuminated. The switch is located under the bonnet on 4WD vehicles and is used only for service procedures and during normal driving. A fuse is used to short the switch and disable 4WD.

**G-SENSOR(V)\_X.XX** (range: 0 to 5.00 volts)

This analog parameter displays the centrifugal force sensor output as the vehicle decelerates.

**GEAR** (range: see text)

This parameter displays the current gear the ECU is commanding the transmission to be in.

**GEAR RATIO** (range: X.XX to 1)

This parameter displays the gear ratio that the transmission is in as calculated by the TCM/PCM. The TCM/PCM uses the input and output rpm to determine the gear ratio.

**GE DUTY (%) — No description available.**

**GEN. FIELD\_\_XXX** (range: ON/OFF)

This discrete parameter indicates the status of the charging system.

**GEN F TERMINAL(%)** (range: 0 to 100%)

**GEN F-TERM(%)**

These parameters display the PCM commanded state of generator “F” terminal.

- A high value indicates a high charging command.
- A low value indicates a low charging command.

**GEN LAMP** (range: ON/OFF)

This parameter reads ON when the PCM is commanding the generator lamp on the instrument panel on.

**GEN L TERMINAL** (range: ON/OFF)

**GEN L TERM**

**GEN L-TERM**

These parameters display the state of the generator “L” terminal and read as follows:

- ON under normal operating conditions
- OFF if the PCM detects incorrect voltage in the L terminal circuit.

**GLOW LIGHT\_\_\_\_\_XXX** (range: ON/OFF)

This parameter indicates the PCM control command to the dash mounted glow plug lamp.

**GLOW RELAY\_\_\_\_\_XXX** (range: ON/OFF)

This parameter indicates the PCM control command to the glow plug relay. YES indicates the relay is powered and NO indicates it is not powered.

**GLOW PLUG SYS\_\_\_\_\_XXX** (range: ON/OFF)

This parameter indicates the PCM control command to the glow plugs.

**GLOW PLUG RLY (V)\_\_\_\_\_XX.X** (range: 0 to 25.5 volts)

**GLOW PLUG (V)\_\_\_\_\_XX.X**

This relay (RLY) parameter indicates the voltage requested by the PCM to the glow plug relay. The PCM cycles this voltage on and off. Cycling time is longest on a cold engine and decreases as the engine warms up. The voltage parameter is the feedback signal to the PCM indicating the actual voltage delivered to the glow plugs. Normally, this is lower than requested voltage due to the high resistance of the glow plugs.

**GlowPlugCoil(%)\_XXX** (range: 0 to 100%)

This analog parameter shows the duty cycle percentage on time of the glow plug coils. The coils are cycled to prevent damage to them at times of high battery voltage. 0% is off and 100% is constantly on.

**GLW PLUG RELAY** (range: ON/OFF)

This parameter displays the control module command to the glow plug relay.

**HallPwr\_XXX** (range: ON/OFF)

This parameter indicates whether the GEM module is sending the transfer case Hall effect switches reference voltage.

**HALL SENSOR** (range: ON/OFF)

The hall sensor (or phase or camshaft sensor) is for cylinder #1 TDC recognition. It tells the ECU that cylinder 1 is at top TDC ready for injection, the ECU can then accurately determine injection for the other cylinders. A hall sensor malfunction can cause cold start problems and high exhaust gas emissions during open loop running.

**HatchUnlkSw\_XXX** (range: ON/OFF)

**LF\_UnlockSw\_XXX**

**RF\_UnlockSw\_XXX**

These parameters display the status of the driver operated door unlock switches. ON means the switch contacts are closed.

**HEADLAMP DRIVE\_\_\_\_\_XXX** (range: ON/OFF)

This parameter shows the state of the headlamp drive as commanded by the BCM. This is controlled by input from the headlamp switch and on some models the sunload sensor.

**HEADLAMP SW** (range: ON/OFF)

This discrete parameter indicates the status of the vehicles headlight switch.

**HEATER FAN \_\_\_XXX** (range: ON/OFF)

This parameter indicates the input from the heater fan switch to the PCM.

**Heated Catalyst Monitor — No description available.**

**HI A/C PRESS** (range: YES/NO)

This discrete parameter indicates whether there is a high pressure in the air conditioner system. It will indicate YES if a high pressure is detected.

**HI ECT TEMP \_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the high coolant temperature warning lamp or LCD warning. The high coolant temperature warning lamp is activated by the instrument panel when high coolant temperature is detected via a signal from the PCM. This parameter applies to Berlina, Calais, Statesman and Monaro vehicles.

**HIGH ALTITUDE \_\_\_XXX** (range: YES/NO)

On some vehicles, the ECU uses a separate barometric pressure switch signal to determine if the vehicle is at high altitude. HIGH ALTITUDE \_\_\_YES indicates that the ECU is controlling the engine for high altitude operation with low barometric pressure. On some fuel-injected vehicles, the ECU provides an internal parameter to indicate whether it is operating in a high-altitude mode. The ECU compares the throttle position, mass airflow, and rpm readings to determine engine load. If the throttle is open more than expected for a given load, the ECU assumes it is at high altitude and adjusts fuel metering accordingly. HIGH ALTITUDE then should read YES.

**HighFanCtrl\_XXX** (range: ON/OFF)

This parameter displays the state of the high-speed fan control on vehicles with multiple fan speed control.

**HIGH GEAR\_\_\_\_\_XXX (range: YES/NO)**

For all vehicles except OBD-II-equipped Toyota and Lexus models, this discrete parameter indicates whether the HIGH GEAR contacts in the transmission are open or closed. YES means the switch contacts are closed.

At the time of printing, no information is available for this parameter on OBDII-equipped Toyota and Lexus models.

**HI PS PRESSURE (range: YES/NO)**

This discrete parameter indicates the ECU is receiving a signal from the power steering pressure switch. YES indicates the steering is being turned and the power steering hydraulic pressure is high, NO indicates there is no signal from the switch. The ECU compensates for increased engine load during power steering operation at idle.

**HI SPEED FAN (range: ON/OFF)**

This discrete parameter indicates the ECU command status to the vehicles high speed cooling fan relay.

**HIGH BATTERY\_\_\_\_XXX (range: YES/NO)**  
**LOW BATTERY\_\_\_\_XXX**

Some ECU's calculate these discrete parameters from a sensing circuit across the supply voltage circuit. HIGH BATTERY is YES when battery voltage is high, NO when it is normal. LOW BATTERY is YES when battery voltage is low, NO when it is normal. On most vehicles, a HIGH BATTERY \_\_YES condition causes the ECU to disable the output solenoids to protect the ECU from high current.

**HFCFault\_XXX (range: YES/NO)**

This parameter indicates if the PCM detects a fault with the high speed cooling fan circuit.

**HFCA\_XXX (range: ON/OFF)**

This parameter indicates the actual state of the commanded output to the fan. It should be the same as the fan monitor and fan command output displays; that is, all three should display ON or OFF at the same time.

**HO2S11(V)\_\_\_XXX**

**HO2S21(V)\_\_\_XXX**

The exhaust gas oxygen (O<sub>2</sub>) sensor is the primary sensor that indicates whether the engine is running rich or lean. The O<sub>2</sub> sensor generates a voltage signal that ranges from 0 volt to 1 volt or a little over 1 volt (0 to 1000 millivolts – mV). A high millivolt signal indicates a rich exhaust; a low signal indicates a lean exhaust. In normal operation, the O<sub>2</sub> sensor voltage ranges from 100 to 1000 mV. The O<sub>2</sub> sensor must be hot (above 500°F), and the ECU must be in closed loop before the ECU will respond to the sensor signal. Some PCM's modify the voltage value to above 1000 mV, some may fluctuate between 0 and 5000mV.

**HOLD LAMP**

**(range: ON/OFF)**

**HOLD SWITCH**

**DIAG LAMP**

These parameters indicate the status of the HOLD switch and HOLD indicator lamp in the instrument panel. ON indicates the HOLD switch contacts are closed and the HOLD lamp is illuminated, OFF indicates the HOLD switch is open and the HOLD lamp is off. The HOLD lamp can also be used as the transmission diagnostic lamp. On some vehicles the DIAG LAMP will indicate ON when the HOLD lamp is illuminated. To determine if the diagnostic lamp is ON make sure the HOLD switch is in the OFF position, if the DIAG LAMP is still ON then the trans ECU is commanding it on.

**HOLD SWITCH**

**(range: ON/OFF)**

**HOLD SW**

This discrete parameter indicates whether the contacts in the HOLD switch are closed or open. On a properly functioning vehicle, ON means the switch contacts are closed.

**HTR11Fault\_XXX** (range: YES/NO)

**HTR12Fault\_XXX**

**HTR21Fault\_XXX**

**HTR22Fault\_XXX**

These parameters indicate whether the PCM detects a fault in the O2S heater circuit. YES means a fault is present. The two-digit numbers following HTR in the parameter name refer to the following heater positions:

11 Bank 1, Upstream O2S

12 Bank 1, Downstream O2S

21 Bank 2, Upstream O2S

22 Bank 2, Downstream O2S

**HTRX1\_XXX** (range: ON/OFF)

**HTRX2\_XXX**

These parameters indicate the PCM-command status for the bank 1 or bank 2 upstream O2S heater. ON means the PCM is commanding the heater ON.

**HTR11A\_XXX** (range: ON/OFF)

**HTR11\_XXX**

These parameters indicate the state of the heater for the bank 1 upstream O2S. The state should be the same for the HTRX1 data parameter; that is, both should display ON or OFF at the same time.

**HTR12A\_XXX** (range: ON/OFF)

**HTR12\_XXX**

These parameters indicate the state of the heater for the bank 1 downstream O2S. The state should be the same for the HTRX2 data parameter; that is, both should display ON or OFF at the same time.

**HTR21A\_XXX** (range: ON/OFF)

**HTR21\_XXX**

These parameters indicate the state of the heater for the bank 2 upstream O2S. The state should be the same for the HTRX1 data parameter; that is, both should display ON or OFF at the same time.

**HTR22A\_XXX** (range: ON/OFF)

**HTR22\_XXX**

These parameters indicate the state of the heater for the bank 2 downstream O2S. The state should be the same for the HTRX2 data parameter; that is, both should display ON or OFF at the same time.

**HT REAR WDW SW \_\_\_\_\_XXX (range: ON/OFF)**

This parameter shows the state of the rear window heater switch. The rear window switch is a momentary switch so the display will only show CLSD while switch is being depressed. It should display OFF when the switch is not depressed. The BCM is responding to the actual input state of the switch.

**HT RR WDW DRV \_\_\_\_\_XXX (range: ON/OFF)**  
**HT BCKLITE DRV**

This parameter shows the BCM or BEM command to the rear window heater drive. ON means the heater should be functioning and OFF means the heater is not functioning. This parameter should respond when the rear window heater switch is toggled.

**I/C FAN RELAY (range: ON/OFF)**

This parameter displays the control module command to the intercooler fan relay.

**I/C TMP V (range: 0 to 5.1 volts)**

This parameter displays the input signal voltage from the intercooler temperature sensor.

**IAC ADAPT SLOPE (range: 0 to 255)**

This analog parameter indicates what the ECU wants the idle air control (IAC) motor position to be. The IAC INTEGRATOR or IDLE AIR CNTRL reading shows what the IAC motor position is. The IAC ADAPT SLOPE reading shows what it should be.

Compare the actual and desired IAC readings they should be equal or very close to each other. If the ECU detects a sudden change in engine conditions, such as A/C engagement or cooling fan operation, it may command a new desired IAC position. The IAC actual position reading may take a few seconds to respond.

**IAC BLOCK LEARN (range: 0 to 255)**

This analog parameter indicates the minimum idle air control (IAC) motor position that the ECU has learned. The IAC BLOCK LEARN counts represents the minimum IAC position stored in ECU memory.



**IAC COIL A** (range: ON/OFF)

**IAC COIL B**

This discrete parameter indicates ON when the idle air control motor coil A or B is commanded on move the IAC pintle forward or backward.

**IAC DIRECTION\_\_XXX** (range: FWD/REV)

This discrete parameter indicates the direction in which the ECU has commanded the idle air control (IAC) motor to move. IAC DIRECTION\_\_FWD means that the ECU has commanded the IAC motor outward to reduce idle airflow. IAC DIRECTION\_\_REV means that the ECU has commanded the IAC motor inward to increase idle airflow.

**IACFault\_\_XXX** (range: YES/NO)

This parameter indicates whether a fault exists in the idle air control system.

**IACKAM0\_\_XXX IACKAM1\_\_XXX**

**IACKAM2\_\_XXX IACKAM3\_\_XXX**

(range: -8 to 8)

These parameters display the idle airflow trim learned for various engine conditions as follows:

IACKAM0 = A/Trans in DRIVE, Air Conditioner OFF

IACKAM1 = A/Trans in DRIVE, Air Conditioner ON

IACKAM2 = Transmission in NEUTRAL, Air Conditioner ON

IACKAM3 = Transmission in NEUTRAL, Air Conditioner OFF

IACKAM = Idle Air Control Keep Alive Memory

**IAC MODE\_\_XXX** (range: unknown)

This parameter displays what mode the PCM is commanding the Idle Air Control is operate in.

**IAC MOTR RESET** (range: YES/NO)

This discrete parameter indicates YES when the idle air control motor position has been reset by the ECM/PCM.

**IAC MOTOR RUN** (range: YES/NO)

This discrete parameter indicates YES when the ECM/PCM commands the idle air control motor to move position.

**IAC RESET RQST** (range: YES/NO)

This discrete parameter indicates YES when there is a request to reset the idle air control motor position.

**IAC TRIM\_XXX** (range: -8 to 8)

This parameter displays the overall idle airflow trim learned for various engine conditions before the Keep Alive Memory is learned.

**IAT FailMode\_XXX** (range: ON/OFF)

This discrete parameter indicates the Intake Air Temperature Failure Mode status. ON indicates that the PCM has detected a problem with the IAT and is operating in IAT Failure Mode.

**IC FAULT CYL1** (range: YES/NO)

**IC FAULT CYL2**

**IC FAULT CYL3**

**IC FAULT CYL4**

**IC FAULT CYL5**

**IC FAULT CYL6**

**IC FAULT CYL7**

**IC FAULT CYL8**

Some vehicles have an ignition coil (IC) for each cylinder. These parameters indicate whether or not a fault has been detected in one of the ignition coils or driver circuits.

**ID\_\_XX**

This parameter display the internal software identification number of the ABS control module.

<b>IDLE AIR CONTRL</b> ___XXX	<b>(range: 0 to 255)</b>
<b>ISC STEP</b> ___XXX	<b>(range: 0 to 125)</b>
<b>ISC(%)</b> ___XXX	<b>(range: 0 to 100%)</b>
<b>IAC(%)</b> ___XXX	<b>(range: 0 to 100%)</b>
<b>IAC STEPS</b> ___XXX	<b>(range: 0 to 125)</b>
<b>IAC/AAC(%)</b> ___XXX	<b>(range: 0 to 100%)</b>
<b>IAC/AAC STEPS</b> ___XXX	<b>(range: 0 to 255)</b>

The idle air control (IAC) parameter indicates the position of the IAC valve in the throttle body of a fuel-injected engine, either throttle body or port injected. The IAC valve controls the amount of air that bypasses the throttle at idle and thus the idle speed. In general, two types of valves are used, the stepper-motor type and the rotary solenoid type.

Stepper-motor type IAC valves may have 125 or 255 positions, and IAC readings can vary from 0 to 125 or 255. A reading of 0 indicates that the motor has moved to its outer position and closed the IAC valve to cut off air. A high number indicates that the motor has moved inward to open the IAC valve and allow more idle air.

Some valves are controlled by a pulse-width-modulated (PWM) signal. By varying the signal's duty ratio (on time versus off time) the valve shaft is manipulated. The ISC(%) and IAC/AAC(%) parameters indicate the percent of signal on time. As the duty ratio exceeds 50%, the valve shaft moves in a direction that opens the air bypass passage. At a duty ratio less than 50%, the shaft moves in a direction that closes the air bypass passage.

<b>IDLE CONDITION</b>	<b>(range: YES/NO)</b>
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This discrete parameter indicates when the engine is in an idle condition.

<b>IDLE PHASE PNT</b>	<b>(range: 0 to 255)</b>
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This analog parameter indicates the current learning for the idle fuel injection correction.

<b>IDLE REG (%)</b>	<b>(range: 0 to 100)</b>
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This parameter indicates the amount of idle regulation as a percentage. 0 is no idle speed regulation and 100 is maximum regulation.

**IDLE SWITCH\_\_XXX** (range: ON/OFF)

**IDLE POS SW**

This discrete parameter indicates whether the throttle is in the closed position. The PCM uses this signal to control idle speed. This parameter reads ON when the throttle is fully released, and OFF when the throttle is moved off idle.

**IDLE SW\_\_\_\_\_XXXX** (range: CLSD/OPEN)

**CALC CLSD THRT\_\_XXXX**

These discrete parameters indicate the position of the idle switch. CLSD indicates an engine with a closed throttle, typical of a stationary, idling engine. OPEN indicates an engine whose throttle is off idle. Idle speed control on engines using the IDLE SW parameter are not regulated by the PCM. CALC CLSD THRT represents a PCM-calculated value based on throttle position sensor position.

**IDLE UP VSV** (range: ON/OFF)

A vacuum switching valve (VSV) is used to actuate the idle up valve. This parameter displays the PCM command to the VSV. When this parameter reads ON, the VSV actuates the idle up valve. This allows air to bleed into the intake manifold, raising engine rpm.

**IDLE VARIATION\_\_XXXX** (range: 0 - engine maximum)

This parameter is the variation (RPM) of various samplings of the engine speed.

**IGN 0**

These parameters display the status of the ignition 0 (ACC) input circuit to the PCM.

**IGN 1**

These parameters display the status of the ignition 1 (ON) input circuit to the PCM.

**IGN ADJ TERM\_\_XXX** (range: ON/OFF)

This discrete parameter allows you to monitor the state of the ignition timing adjustment terminal. When you short this terminal to ground, ignition timing and idle speed are placed in the adjustment mode, and this parameter reads ON. This parameter reads OFF when the ignition adjustment terminal is not shorted.

**IGN ADVANCE(°)\_\_\_XXX**

**SPK ADV(°)\_\_\_XXX**

**SPK ADV(°BTDC)\_\_\_XXX**

Analog output parameters from the ECU that indicate the total spark advance or retard being commanded by the ECU, *including* base timing.

**IGN ADV #X (°) (range: 0 to 261)**

This analog parameter displays the ignition spark advance for a particular cylinder, X can be 1 to 8.

**IGN BELOW 9V (range: YES/NO)**

This discrete parameter indicates YES when the voltage to the ECM/PCM has fallen below 9 volts. It will display NO while the voltage is above 9 volts. When power to the ECM/PCM falls below 9 volts its operation can be unreliable.

**IGN CMD RELY**

No information is currently available for this parameter.

**IGN COIL #X (mS) (range: 0 to 261)**

This analog parameter displays the time taken, in milliseconds, to charge the ignition coil prior to letting the spark ignite. It is displayed for a particular cylinder, X can be 1 to 8.

**IGN CYCLE DTC \_\_\_XXX (range: YES/NO)**

This parameter indicates whether a Diagnostic Trouble Code has been set in the current ignition cycle. It only indicates that a DTC has been set, not what the DTC actually is.

**IGN CYCLES (range: varies)**

This parameter displays the number of times the ignition has been cycled on and off since the first airbag diagnostic code was set.

**IGNITION 1 (V)\_\_\_XX.X (range: 0 to 25.5 volts)**

This parameter displays the voltage at the PCM ignition input.

**IGNITION 1 SW \_\_\_XX.X (range: 0 to 25.5 volts)**

This parameter displays the condition of the ignition input to the body control module (BCM).

**IGNITION SW \_\_\_\_\_XXX (range: ON/OFF)**

This parameter DISPLAYS the state off the ignition switch. The BCM will communicate with the SCANNER even when the ignition is off. The parameter displays OFF with the ignition switch in the OFF and ACC position and will be ON with the ignition switch in the IGN or START position. The BCM is responding to the actual input state of the switch.

**IGNITION (V) (range: 0 to 26.7)**

**IGN (V)**

This parameter shows the ignition voltage at the TCM/PCM. Low voltage can affect TCM operation.

**IGN RELY FDBK**

No information is currently available for this parameter.

**IGN SWITCH (range: ON/OFF)**

This discrete parameter indicates whether the ignition switch is ON or OFF. It will indicate OFF in any position other than the run position.

**IGN VOLT OK (range: ON/OFF)**

This discrete parameter indicates whether the voltage being sensed by the ABS ECU is too high or too low. An abnormally high or low voltage will affect ABS operation.

**ILL DRVR OPEN \_\_\_\_\_XXX (range: ON/OFF)**

**ILL DRVR HIGH \_\_\_\_\_XXX**

**ILL DRVR LOW \_\_\_\_\_XXX**

These parameters display the status of the interior illumination entry driver.

ILL DRVR OPEN It should show ON when the circuit is open and OFF when the circuit is closed.

ILL DRVR HIGH It should show ON when the circuit voltage is high and OFF when the circuit is not high.

ILL DRVR LOW It should show ON when the circuit voltage is low and OFF when the circuit is not low.

**ILL ENTRY DRVR \_\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the status of the interior illumination entry driver. It should show ON when the BEM commands it ON and OFF at other times. This controls the interior illumination of the vehicle. The precise operation varies from model to model.

**IllumEnrty\_XXX** (range: ON/OFF)

This discrete parameter indicates the presence of a request to turn on the illuminated entry lamps. A request to light the entry lamps may come from any one of the door ajar switches and a special driver door handle switch whose contacts close when the handle is lifted.

**ILLUM PWM(%)\_XXX** (range: 0 to 100)

This parameter indicates the duty cycle level of illumination of the instrument control display when the park-lamp switch is switched ON. 100 percent is full brightness, as the percentage decreases so should the brightness of the instrument panel backlights. This reading will remain fixed on models not using the variable illumination.

**IMMO FUNCTION** (range: YES/NO)

This discrete parameter indicates the status of the on-board immobiliser system. When the ignition is switched on and engine off, the SCANNER should display YES. If the immobiliser function is not programmed into the ECU the SCANNER will display NO.

**IMMO SIG RCVD** (range: YES/NO)

This discrete parameter indicates whether the on-board immobiliser system has received a signal to disarm. When the ignition is switched on and engine off, the SCANNER should display YES. If the immobiliser does not receive any signal the SCANNER will display NO.

**IMS RANGE A** (range: HI/LO)

**IMS RANGE B**

**IMS RANGE C**

**IMS RANGE P**

These parameters display the high or low status of the four inputs (IMS RANGE A/B/C/P) from the internal mode switch (IMS) to the PCM.

- HI indicates ignition voltage.
- LO indicates no voltage.

## Alphabetical List of Parameters

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The PCM detects the selected gear range by deciphering the combination of the voltage signals. The PCM compares the actual voltage combination of the switch signals to an IMS switch combination table stored in memory.

GEAR SELECTOR POSITION	IMS RANGE	IMS RANGE B	IMS RANGE C	IMS RANGE P
Park	LOW	HI	HI	LOW
Park/Reverse	LOW	LOW	HI	LOW
Reverse	LOW	LOW	HI	HI
Reverse/Neutral	HI	LOW	HI	HI
Neutral	HI	LOW	HI	LOW
Neutral/Drive 4	HI	LOW	LOW	LOW
Drive 4	HI	LOW	LOW	HI
Drive 4/Drive 3	LOW	LOW	LOW	HI
Drive 3	LOW	LOW	LOW	LOW
Drive 3/Drive 2	LOW	HI	LOW	LOW
Drive 2	LOW	HI	LOW	HI
Drive 2/Drive 1	HI	HI	LOW	HI
Drive 1	HI	HI	LOW	LOW
Invalid	HI	HI	HI	HI
	LOW	HI	HI	HI
	HI	HI	HI	LOW

HI = Ignition voltage

LOW = 0 voltage

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**IN CAR (V) \_\_\_X.XX (range: 0 to 3.5)**

**IN CAR (°C) \_\_\_X.XX (range: -40 to 88)**

The IN CAR (V) parameter displays the voltage signal from the in-car temperature sensor for the ECC (Electronic Climate Control). The IN CAR (°C) parameter displays the in-car temperature in Celsius calculated by the ECC based on the above voltage reading.

**INDICATORS \_\_\_XX (range: ON/OFF)**

This parameter displays the status of the indicator lamps when they are controlled by the theft deterrent system. OFF means the indicators are off and ON means the indicators are ON. The indicators may switch from off to on quite quickly and may not always register on the SCANNER screen.



**INIT BRAKE APPLY**

No information is currently available for this parameter.

**INJ ADV#1 (V) — No description available.**

**INJ ADV#2 (V) — No description available.**

**INJ ADV#3 (V) — No description available.**

**INJ ADV#4 (V) — No description available.**

**INJ PW(mS)\_\_\_XX.X (range: 0 to 65.3 milliseconds)**

**INJ #1 PW(mS)\_\_\_XX.X**

**INJ #2 PW(mS)\_\_\_XX.X INJ PT(mS)\_\_\_XX.X**

**INJ PULSE (mS)**

The SCANNER displays the injection pulse width in milliseconds as INJ PW(mS)\_\_\_XX.X. The pulse width is the length of time that the PCM commands the fuel injectors to turn on.

A high pulse width indicates more on-time and a richer mixture. A low pulse width indicates less on-time and a leaner mixture. There are no definite specifications for injector pulse width, but the reading should change as engine speed and load change.

**INJECTOR VOLTAGE (V)\_\_\_XX.X (range: 0-25 volts)**

This parameter is the voltage of the injector circuit.

**INJECTOR A FDBK\_\_\_XXXXX (range: OPEN/CLOSED)**

This parameter indicates if INJECTOR A circuit FEEDBACK is OPEN or CLOSED.

**INJECTOR B FDBK\_\_\_XXXXX (range: OPEN/CLOSED)**

This parameter indicates if INJECTOR B circuit FEEDBACK is OPEN or CLOSED.

**IMRCFault\_XXX (range: YES/NO)**

This parameter indicates whether the PCM detected a fault in the intake manifold runner control system. YES means a fault is present.

**InManRunCtrl\_XXX (range: ON/OFF)**

**IMRC\_\_\_XY**

This parameter indicates the status of the intake manifold runner control valve. ON means the valve is open. Normally this valve is closed when the engine speed is below 3000 rpm. AU Falcons show ON at idle and OFF at higher RPM.

**INJ-ADD(mS) (range: -131 to 131)**

This parameter represents the operation and short-term correction to the fuel mixture. ADD means adding or subtracting equal amounts of fuel to every fuel block cell regardless of the pre-programmed base injection pulse values. It works very effectively for idle mixture related problems, but its effect is minimal at the higher engine speeds. For example, vacuum leaks greatly affect fuel mixture at idle but become less severe at higher RPM. The important distinction here is that the amount of fuel correction is not dependant upon the original base in each fuel memory cell.

**INJ-FAC (mS) (range: -50 to 50)**

This parameter represents the operation and short-term correction to the fuel mixture. MUL means multiplying or taking the pre-programmed cell base value and multiplying that number by either a correction factor or percent. Here, the correction amount increased or decreased in each memory block cell is dependent on each cell's base injection pulse. This form of adaptation is required to compensate for fuel control type problems that get worse with increased engine speed.

**INJ 1 CMD (range: 0 to 999 mS )**  
**INJ 2 CMD**  
**INJ 3 CMD**  
**INJ 4 CMD**  
**INJ 5 CMD**  
**INJ 6 CMD**

These parameters indicate the commanded state of the fuel injectors in milliseconds.

**INJ C/V % (range: 0 to 100)**

This parameter displays the control module command to control diesel injection. It is displayed as a percentage, the higher the percentage the more fuel is injected.

**INJ PHASE PNT (range: 0 to 255)**

This analog parameter indicates the current learning for the fuel injection correction.

**INJ PW(mS)\_\_\_XX.X** (range: 0 to 65.3)

**INJ #1 PW(mS)\_\_\_XX.X**

**INJ #1(mS)\_\_\_XX.X**

**INJ #2 PW(mS)\_\_\_XX.X**

**INJ #2(mS)\_\_\_X.XX**

**INJ(mS)\_\_\_X.XX**

**INJ B2(mS)\_\_\_X.XX**

**INJ #x(mS)\_\_\_XX.X** (range: 0 to 32.6)

The Scanner displays the injection pulse width in milliseconds as INJ PW(mS)\_\_\_XX.X. The pulse width is the length of time that the ECU commands the fuel injectors to turn on.

A high pulse width indicates more on-time and a richer mixture. A low pulse width indicates less on-time and a leaner mixture. There are no definite specifications for injector pulse width, but the reading should change as engine speed and load change.

The fuel-injection systems on Mitsubishi built 3.0-litre V-6 turbo engines calculate two sets of injector times, one for the front bank (INJ #2 PW), and one for the rear bank (INJ #1 PW).

**INJ TIME (°)** (range: unknown)

This analog parameter displays the injection timing calculated by the diesel ECU. This is the start of injection in degrees before top dead centre.

**INJ VOL (mm3)** (range: unknown)

This analog parameter displays the injection volume calculated by the diesel ECU. This is the volume of diesel in cubic millimetres delivered per stroke.

**INLET AIR TEMP\_XXXX** (range: HOT/COOL)

This parameter appears on some vehicles. A temperature switch in the intake airflow opens and closes to send a high- or low-voltage signal to the ECU, which then determines whether the intake air is HOT or COOL. The reading should be HOT when air temperature is approximately 15°C (60°F) or more. It should read COOL when air temperature is approximately 4°C (40°F) or less.

**INLET MAN (P/S)** (range: 10 to 104)

This analog parameter is the Inlet Manifold Pressure Sensor that monitors manifold absolute pressure, it shows readings in kilopascals (kPa). Maximum pressure is at key on engine off and minimum pressure would be should at maximum engine load. See MAP sensor.

**INLET MAN (V)** (range: 0 to 5 volts)

This analog parameter is the Inlet Manifold Pressure Sensor it shows readings in volts. The voltage reading is high at high manifold pressure and reduces as manifold pressure drops.

**INTAKE THROTTLE POS SENSOR (%)** (range: 0 to 100%)

Displays the actual position of the Intake Throttle Position Sensor as a percentage.

**INTAKE THROTTLE POS SENSOR (V)** (range: 0 to 5volts)

Intake Throttle Pos Sensor(V) displays the voltage returned from the Intake Throttle Position Sensor.

**INTAKE THROTTLE SOL COMMAND (%)** (range: 0 to 100%)

Displays the commanded position of the Intake Throttle Solenoid as a percentage.

**INTAKE VSV** (range: ON/OFF)

A vacuum switching valve (VSV) actuates the intake tuning valve inside the intake manifold runner. This parameter displays the PCM command to the VSV. When the parameter reads ON the VSV opens the valve.

**INT CMP B1 VAR°** (range: unknown)

This parameter displays the difference in the desired position and actual position of the Bank1 inlet camshaft when variable valve timing is active.

**INT CMP B2 VAR°** (range: unknown)

This parameter displays the difference in the desired position and actual position of the Bank2 inlet camshaft when variable valve timing is active.

**INTEGRTR RESET** (range: YES/NO)

This discrete parameter indicates when the integrator has been reset.

**INTEGRATR\_XXX** (range: 0 to 255)

The fuel integrator (INTEGRATR) number represents the operation and a short-term correction to the fuel metering of some fuel-injected engines. The integrator number is similar to the duty cycle of an MC solenoid on a carbureted engine. It indicates whether the ECU is commanding a rich or a lean mixture.

The integrator number can range from 0 to 255. The midpoint – 128 – is similar to a 50-percent duty cycle (30° dwell) from an MC solenoid. An integrator number higher than 128 indicates that the ECU is commanding a short-term rich mixture. An integrator number lower than 128 indicates that the ECU is commanding a short-term lean mixture. You can compare integrator numbers to injector on-time. A number above 128 indicates increased on-time. A number below 128 indicates decreased on-time. Integrator corrections operate only in closed loop. In open loop, the integrator number goes to a fixed value, usually 128. The block learn multiplier (BLM) is a long-term fuel metering correction factor. BLM is derived from the integrator correction. Block learn and integrator indicate the same directions of fuel metering correction. High numbers indicate rich mixtures; low numbers indicate lean mixtures. Refer to the BLM description for more information.

**INJ PW1(mS)\_XX.X** (range: 0 to 99.9)

**INJ PW2(mS)\_XX.X**

The injector pulse width is the length of time in milliseconds (mS) that the PCM commands the fuel injectors to turn on. These analog parameters are displayed for multi-port fuel injection systems. On Electronic Fuel Injection (EFI) systems, the PCM simultaneously pulses half of the fuel injectors at a time. INJ PW1(mS) refers to those injectors installed in bank #1, and INJ PW2(mS) refers to those injectors installed in bank #2.

Depending on the engine, banks #1 and #2 may be staggered. A high pulse width indicates more on-time and a richer mixture. A low pulse width indicates less on-time and a leaner mixture. There are no definite specifications for injector pulse width, but the reading should change as engine speed and load change. On EFI systems, typical readings range from 1 to 4 mS at idle, up to about 12 mS at wide open throttle (a little higher for some engines).

Since the PCM on SEFI systems pulses each injector individually, the readings represent, at best, the “average” injector pulse width for each bank. SEFI systems use these parameters to allow the PCM to conduct a rationality test on fuel delivery, the MAF sensor, and the TP sensor.

**INJxFault\_XXX** (range: YES/NO)

NOTE: The “x” in INJxFault is a variable from 1 to 8, depending on the cylinder. These parameters indicate whether the PCM has detected a fault, such as an open or short, in the injector circuit. YES means a fault is present.

**INSTR. ILLU.(%)\_\_\_\_\_XXX** (range: 0 to 100)

This parameter displays percentage of illumination of the instruments, This is preset on some models and driver adjustable on others.

**INSTR. LMPS(%)\_\_\_\_\_XXX** (range: 0 to 100)

**INSTR. ILLU.(%)**

This parameter indicates the level of illumination of the instrument backlighting when the park-lamp switch is switched ON. 100 percent is full brightness, as the percentage decreases so should the brightness of the instrument panel backlights. This reading will remain fixed on models not using the variable dimming backlights.

**INTERIOR (°C)\_\_\_X.XX** (range: unknown)

This parameter displays the temperature from the in-car temperature sensor.

**INT ILLUM RLY \_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the interior illumination relay. It should show ON when the BCM commands it ON and OFF at other times.

**INT WPR DRV \_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the intermittent wiper drive. It should show ON with the wiper switch in the INT mode, and should show OFF in all other positions.

**INT WPR RELAY \_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the windscreen wiper intermittent relay. The parameter is OFF when the relay is not energised and is ON when the relay is energised.

**ISA DUTY(%)** (range: 0 to 100)

This analog parameter displays the idle speed control operation as commanded by the ECU. 0 is no idle speed compensation and 100 is maximum compensation.

**ISC A/C CORR (%) (range: 0 to 100)**

This analog parameter displays the idle speed correction applied during air conditioner operation.

**K/D SERVO SW\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the position of the piston that controls the kickdown band. When this parameter reads OFF, the kickdown band is applied; when it reads ON the kickdown band is not applied.

**K/D SW\_\_\_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the PCM command status for a downshift during acceleration. ON means the PCM has commanded a downshift during acceleration.

**KeyInIgn\_XX (range: ON/OFF)**

This discrete parameter indicates if the key is in the ignition switch.

**KICKDOWN SW (range: ON/OFF)**

This discrete parameter indicates the position of the kickdown switch, when the throttle is depressed to full throttle it will indicate ON, at all other times it should indicate OFF.

**KNOCK CONTROL (range: ON/OFF)**

This discrete parameter indicates whether the ECU's knock control is active or not, ON indicates knock control is active and OFF indicates normal operation.

**KNOCK\_\_\_\_\_XXX (range: YES/NO)**

On vehicles with electronic spark control (ESC), the discrete KNOCK parameter is displayed along with ESC COUNTER or KNOCK RETARD (°). KNOCK will read YES if the detonation sensor senses knock and NO if the system does not sense engine knock.

**KNOCK CELL (range: 0 to 200)**

This parameter displays the request preset of the knock control, as in the O2BLM CELL parameter, the knock control is designated a cell, usually halfway, about cell 10, but if a different grade of fuel or incorrect heat range spark plugs are fitted and the engine knocks, the knock cell position (number) will alter to compensate for the change. On hard acceleration the value should change between 0 and 16.

**KNOCK CORRECT (°) (range: -127 to 127)**

This parameter displays the amount of ignition timing retard that is being applied when is knock is detected. This the amount that is retarded from the ignition timing advance.

**KNOCK CYL 1(°) (range: YES/NO)**

**KNOCK CYL 2(°)**

**KNOCK CYL 3(°)**

**KNOCK CYL 4(°)**

**KNOCK CYL 5(°)**

**KNOCK CYL 6(°)**

**KNOCK CYL 7(°)**

**KNOCK CYL 8(°)**

These discrete parameters display the whether knock has been detected in the specified cylinder.

**KNOCK PRESENT \_\_\_XXX (range: YES/NO)**

This parameter indicates the presence of engine knock. The display reads YES when sensed knock exceeds a PCM-stored value.

**KNOCK RETARD (°)\_\_\_XX (range: 0 to 90 degrees)**

On vehicles with electronic spark control (ESC), KNOCK RETARD (°) indicates the amount of spark advance *removed* by the ECU when the ESC detonation sensor senses knock. Timing is retarded from the optimum advance for existing speed and load. KNOCK RETARD does not indicate that timing is retarded after top dead center. It indicates the amount of advance that has been taken away.

**KNOCK RTD 1(°) (range: 0 to 90)**

**KNOCK RTD 2(°)**

**KNOCK RTD 3(°)**

**KNOCK RTD 4(°)**

**KNOCK RTD 5(°)**

**KNOCK RTD 6(°)**

**KNOCK RTD 7(°)**

**KNOCK RTD 8(°)**

On vehicles with electronic spark control, KNOCK RTD X(°) indicates the amount of spark advance removed by the ECU when the knock, or detonation, sensor senses knock. Knock retard is displayed for each cylinder on some engines but not all. Timing is retarded by the amount displayed from the optimum advance for the existing engine speed and load, KNOCK RETARD does not indicate that timing is retarded after top dead centre.



**KS NOISE(V)\_\_\_\_X.XX (range: 0 to 4.98)**

This parameter indicates the amount of normal engine mechanical noise in voltage. The PCM uses this feedback signal to diagnose the knock sensor (KS) module and the KS sensor. Also, the PCM detects knock by comparing this signal with the KS circuit signal. As engine speed and load increase, so does engine noise, which causes a higher voltage to display.

**LAMP\_\_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the PCM command status of the dashmounted AIRBAG lamp. The AIRBAG lamp may be lit during scan tool communication although this parameter may display OFF. This is normal operation. This parameter would display ON if the airbag system detected a fault.

**LAMP CHECK\_\_\_\_XXX (range: ON/OFF)**

This parameter indicates the status of the SRS lamp check. The lamp check is carried out by the SRS module to ensure the SRS lamp on the dash is functioning correctly.

**LAMP DELAY DRV\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the state of the lamp delay driver ?

**LATERAL G (m/s<sup>2</sup>) Range: min: -25.11 m/s<sup>2</sup> to max: 24.91 m/s<sup>2</sup>**

Indicates the lateral G force.

**LATERAL G SNSR (V) Range: min: 0.00 to 5.1volts**

Indicates the voltage output of the lateral G sensor.

**LAST SHFT(SEC) (range: 0 to 6.38 sec)**

This parameter displays the actual shift time of the last upshift.

**LEFT SOURCE BUTTON**

This parameter indicates whether the steering wheel left hand scroll wheel is being turned or not.

**LEVER POS (range: 1, 2, 3, 4, P/N, R)**

This parameter shows the position of the gear lever as determined by the TCM/PCM using the pressure switch assembly in the transmission valve body. With the ignition on but the engine not running this parameter will show ??? as there is no trans fluid pressurise acting on the pressure switch assembly.

**LFBeltFstnd\_XX** (range: ON/OFF)

This discrete parameter indicates if the left front seat belt buckle is latched.

**LFC=LO FAN\_XXX** (range: ON/OFF)

**HFC=HI FAN\_XXX**

Some engines have a two-speed electro-drive fan. The PCM controls the fan speeds through LFC and HFC outputs to the fan relays.

**LFDoorAjar\_XXX** (range: ON/OFF)

**LR/SlidDr\_Ajar\_XXX**

**RFDoorAjar\_XXX**

**RRDoorAjar\_XXX**

**Trunk/Htch\_Ajar\_XXX**

These discrete parameters indicates whether various door and trunk switch contacts are open or closed. NO means the door is shut and the contacts of the switch are closed.

**LF MOTOR AMPS\_XX** (range: 0 to 20 amperes)

**RF MOTOR AMPS\_XX**

**REAR MOTOR AMPS\_XX**

These parameters indicate the current output by the ABS controller to the motors. When the motors are driven in reverse, these parameters will display a minus (-) sign. During motor operation, the motor current will be higher than the current displayed by the MOTOR FBK parameters.

**LF MOTOR FBK\_XX** (range: 0 to 20 amperes)

**RF MOTOR FBK\_XX**

**REAR MOTOR FBK\_XX**

These parameters indicate the actual motor current measured by the ABS controller. During motor operation, the feedback current will be lower than the current displayed by the MOTOR AMPS parameters.

**L-FRONT EMB\_XXX** (range: ON/OFF)

**R-FRONT EMB\_XXX**

This parameter indicates the present state of the ABS controller output signal to the left and right front electromagnetic brakes (EMB's). The EMB's are turned ON during front wheel ABS operation.

**L-FRONT SOL\_\_XXX** (range: ON/OFF)

**R-FRONT SOL\_\_XXX**

This parameter indicates the present state of the ABS controller output signal to the left and right front solenoids. The solenoids are turned on during front wheel ABS operation.

**LF WHEEL(MPH)\_\_XXX** (range: 0 to vehicle maximum)

**RF WHEEL(MPH)\_\_XXX**

**LR WHEEL(MPH)\_\_XXX**

**RR WHEEL(MPH)\_\_XXX**

These parameters indicate the speed signals being sent by each wheel speed sensor to the PCM. Wheel speeds should be equal to each other and to vehicle speed as the car is driven in a straight line without braking. Wheel speeds will vary as the car turns a corner, and they can vary during braking without antilock operations. During antilock braking, wheel speeds should remain close to equal. You can change the measurement units on the scanner from miles per hour (MPH) to kilometers per hour (KPH) by using the ENGLISH/METRIC selection on the CUSTOM SETUP menu.

**LF WNDW AUTO DN\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the Auto Down state for the left hand front door window whether it is.

**LF WNDW UP SW\_\_\_\_\_XXX** (range: ON/OFF)

**LF WNDW DN SW**

This parameter shows the state of the power window switch for the left hand front door whether it is in the UP or DOWN position.

**LH SET TMP UP\_\_XXX**

**LH SET TMP DWN\_\_XXX**

**RH SET TMP UP\_\_XXX**

**RH SET TMP DWN\_\_XXX** (range: ON/OFF)

These discrete parameters indicate the status of the left and right temperature up or down setting switches. When a switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**LIFT PUMP SYS\_\_XXX** (range: ON/OFF)

This parameter indicates the PCM control signal to the lift pump.

### **LIFT PUMP (V)\_\_\_XX.X** (range: 00.0 to 25.5 volts)

This parameter indicates the voltage the lift pump system is drawing. Use it as a check of the lift pump relay and oil pressure switch.

### **LIGHT SW** (range: ON/OFF)

This discrete parameter displays the input status for the vehicles headlight switch to the engine ECU. ON indicates the switch is in the PARK position or HEADLAMP position and OFF indicates the switch is off position.

### **LINE PRESS(%)** (range: 0 to 100 %)

This parameter indicates the PCM commanded duty cycle of the line pressure control solenoid. The PCM relies on the throttle position sensor to raise or lower line pressure. When the systems functions correctly the larger the throttle opening the higher the percentage (solenoid on-time) and the greater the line pressure.

### **LINE PRESS (A)\_\_\_X.XX** (range: unknown)

This parameter shows the commanded amperage of the pressure control solenoid by the TCM/PCM. It is used by the TCM/PCM to control line pressure in the transmission.

### **LINE PRESSURE IN: PND2L (KG/CM2)** (range: N/A)

This parameter displays the main line pressure in the indicated lever ranges, Park, Neutral, Drive, 2 and Low (**not reverse**). It is calculated by the TCM from the amperage of the linear solenoid valve signal.

### **LINE PRESSURE IN: REVERSE(KG/CM2)** (range: N/A)

This parameter displays the main line pressure in the indicated lever range of Reverse only. It is calculated by the TCM from the amperage of the linear solenoid valve signal. This parameter will display when other gear lever ranges are selected **but the reading is only valid when Reverse is selected.**

### **LITRES/100KM\_\_\_XX.X** (range: 0-100)

This parameter indicates litres of fuel used each 100km.

### **LOAD(%)\_\_\_XXX** (range: 0 to 100%)

This analog parameter indicates the relative engine load. The PCM calculates this value by dividing the actual manifold airflow volume by the maximum possible manifold airflow volume. A high number indicates a heavy load, a low number a lighter load.

**LOCK SW\_\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the state of the lock switch. The lock switch is ON when the doors are locked and OFF when the doors are unlocked. The signal is taken from the right front door lock actuator. The BCM is responding to the actual input state of the switch.

**LOCKUP (%) (range: 0 to 100)**

This parameter displays the transmission ECU command to the torque converter lock up clutch control solenoid. It is duty cycle type control where 0% is full pressure and 100% is lowest pressure.

**LOCKUP STATUS (range: ON/OFF)**

This discrete parameter indicates the status of the torque converter lock up clutch as determined by the TCM.

**LO CLUTCH TM (range: ON/OFF)**

This discrete parameter indicates the transmission ECU command to the LO Clutch Timing solenoid. ON indicates the solenoid is being energised by the trans ECU and OFF indicates it is not being energised.

**LO ECT LEVEL\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the status of the low coolant level warning lamp or LCD warning. The low coolant level warning lamp is activated by the instrument panel when a low coolant level is detected via a signal from the PCM. This parameter applies to Berlina, Calais, Statesman and Monaro vehicles.

**LOW ENGINE FAN\_\_\_\_\_XXX (range: ON/OFF)**

With vehicles displaying this parameter the low speed of the engine fan is controlled by the BCM. This parameter displays whether the BCM has switched the fan ON or OFF. Typically the BCM will switch the low fan on when the air conditioning has been switched on and the air conditioning compressor is engaged. This parameter applies only to VR & VS 3.8L V6 engine.

**LOW FAN (range: ON/OFF)**

This discrete parameter indicates when the low fan is being commanded on by the ECM/PCM.

**LowFanCtrl\_XXX (range: ON/OFF)**

This parameter displays the state of the low-speed fan control on vehicles with multiple fan speed control.

**LowFanCA\_XXX (range: ON/OFF)**

This parameter indicates the actual state of the commanded output to the fan. It should be the same as the fan monitor and fan command output displays; that is, all three should display ON or OFF at the same time.

**LOW FUEL\_\_XXX (range: ON/OFF)**

**V LOW FUEL\_\_XXX**

**LOW LPG\_\_XXX (range: ON/OFF)**

**V LOW LPG\_\_XXX**

This parameter displays the status of the low fuel or low LPG warning lamp or LCD warning. The low fuel warning lamp is activated by the instrument panel when a certain voltage level from the LPG or PETROL level sensor is reached. V LOW = very low.

**LOW TRAC\_\_XXX (range: ON/OFF)**

This parameter displays whether the LCD warning should be ON or OFF for the ABS / Traction Control System.

**LO WASHER LVL\_\_XXX (range: ON/OFF)**

This parameter displays the state of the low washer level input switch.

**LPG IN USE\_\_XXX (range: ON/OFF)**

For vehicles fitted with LPG systems. This parameter displays the status of the LPG lamp or LCD warning. This lamp should be ON when the vehicle is switched to LPG mode. It is controlled by a signal from the PCM to the instruments indicating that LPG is in use.

**LPG SENDER (V)\_\_X.X (range: 0 to 25.5)**

On vehicles fitted with LPG this parameter indicates the voltage input to the instrument panel from the LPG tank gas level sensor. The instrument panel uses this signal to display the gas tank level on the fuel gauge. This parameter will be displayed for vehicles not fitted with LPG, any value displayed will be a default value.

**LPG SNDR RESIS\_\_XX (range: unknown)**

On vehicles fitted with LPG this parameter indicates the resistance of the LPG tank gas level sensor. The instrument panel uses this signal to display the gas tank level on the fuel gauge. This parameter will be displayed for vehicles not fitted with LPG, any value displayed will be a default value.

**LPG STEP**

Indicates the position of LPG stepper motor for fuel control.

**LR SOL DUTY(%) (range: 0 to 100)**

This analog parameter displays the duty cycle on time for the low reverse solenoid. In a correctly operating transmission this solenoid will show 0% in 1st and reverse gears, and up to 100% in 2nd, 3rd and 4th.

**LT ALPHA(%) (range: 0 to 200%)**

**LT ALPHA B1 (%) LT ALPHA B2 (%)**

The LT ALPHA (%) percentages represent the operation and long term correction of the fuel-metering for a fuel injected engine. The LT ALPHA parameter changes in response to changing patterns of the ST ALPHA fuel trim corrections. These percentages also indicate whether the PCM is commanding a rich or lean mixture. The LT ALPHA(%) numbers range form %0 to %200 with %100 as the midpoint. At %100 the PCM is not adjusting the injector pulse width or the engine is running in fail-safe mode. At a percentage above 100, the engine is running lean while the PCM is commanding a long-term rich mixture correction. At a percentage below 100, the engine is running rich while the PCM is commanding a long-term lean mixture correction.

**LTFT ENABLED \_\_\_XXX (range: YES/NO)**

This parameter indicates if the long-term fuel trim is enabled.

**LTFT IDLE(%)\_\_\_XXX (range: -100 to 99)**

This parameter displays the long term fuel trim as calculated by the PCM for when the engine is at idle.

**LT TRIM B1(%)\_\_\_XXX**

**LT TRIM B2(%)\_\_\_XXX**

**LONGFT1 \_\_\_XXX**

**LONGFT2 \_\_\_XXX (range: -100% to +100% or range:-25% to +25%)**

The long-term fuel trim (LT TRIM) numbers represent the operation and long-term correction of the fuel-metering for a fuel-injected engine.

The LT TRIM numbers indicate whether the PCM is commanding a rich or a lean mixture. Similar to short-term fuel trim (ST TRIM), the LT TRIM number can range from -100% to +100% or from -25% to +25%, depending on the vehicle. Zero percent serves as the midpoint. A number above zero percent indicates that the PCM has commanded a long-term rich mixture correction. A number below zero percent indicates that the PCM is commanding a lean mixture.

## Alphabetical List of Parameters

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The LT TRIM numbers follow the short-term trim (ST TRIM) numbers to make long-term fuel metering corrections, in response to a pattern of short term corrections.

You can compare LT TRIM numbers to injector on-time. Numbers above zero indicate increased on-time, while numbers below zero indicate decreased on-time. LT TRIM corrections operate only in closed loop. In open loop they revert to a fixed value.

**LT TRM AVG1 % \_\_\_\_\_XXX (range: 0 to 100)**

**LT TRM AVG2 % \_\_\_\_\_XXX**

These parameters indicate the average of the Long Term fuel trim cells. The cells are rated for the amount they are used, values around idle are worth more than extreme values, eg full rich during acceleration. So malfunctions in the idle range will affect the average more than malfunctions in the extreme ranges.

A negative percentage indicates that O2S feedback shows a rich condition so the PCM is commanding a lean mixture. A positive percentage indicates that O2S feedback shows a lean condition so the PCM is commanding a rich mixture.

The numbers indicate cylinder bank 1 or cylinder bank 2. When the average of the cells reaches a predetermined high or low value a DTC will be set.

**MAF-CRSE(kg/h) (range 0 to 400)**

This analog parameter is a measure of intake air mass that is actually being drawn into the engine, it is measured in kilograms per hour and is based on MAF sensor output.

**MAF/CYL(MG/S) (range: 0 to 1000)**

This analog parameter displays in milligrams per second the calculated airflow per cylinder.

**MAF-FINE(kg/h) (range 0 to 51)**

This analog parameter is a measure of the maximum amount of intake air mass that is required by the engine under present conditions. It is measured in kilograms per hour and is calculated by the ECU.



**MAF (G/S)** (range: see text)

**MAF(gm/S)\_XXX**

This analog parameter displays the amount of air being drawn in by the engine measured in grams per second. This reading is calculated internally by the ECU based on input from the mass airflow meter (MAF). The more air is drawn in the higher the reading.

**MAF (Kg/h)** (range: see text)

This analog parameter displays the amount of air being drawn in by the engine measured in kilograms per hour. This reading is calculated internally by the ECU based on input from the mass airflow meter (MAF). The more air is drawn in the higher the reading.

**MAF (mg/T)** (range: see text)

This analog parameter displays the amount of air being drawn in by the engine measured in milligrams over time. This reading is calculated internally by the ECU based on input from the mass airflow meter (MAF). The more air is drawn in the higher the reading.

**MAF(V)** (range:0 to 5.00 volts)

**MAF(V) B2**

This parameter indicates the rate of mass airflow in voltage. This signal is proportional to the density and volume of air flowing into the intake manifold. As the throttle opens wider, the signal increases. MAF(V) B2 refers to the MAF sensor for cylinder bank two if the engine has two separate MAF sensors for each cylinder bank.

**MAIN INJECTION QUANTITY (mm3)**

This parameter indicates the amount of fuel injected of the Main Injection in cubic millimeters.

**MAIN RELAY** (range: ON/OFF)

This discrete parameter display the commanded status of the main relay by the ECU.

**MANIFOLD VALVE** (range: ON/OFF)

This discrete parameter displays the ECU command to the manifold valve that varies the manifold length.

**MAN LEV POS\_XXXX**

**(range: see below)**

This parameter indicates the current position of the gear shift lever. Parameter states can be: PARK, REV, NEUT, O/D, DRIVE, MAN1, and MAN2.

**MAN LEV POS(V)\_X.XX**

**(range: see below)**

The manual lever position (MLP) sensor is a ratiometric sensor with six discrete resistors in series. The PCM looks at the different voltages produced in each of the shift lever positions. Typical readings for this parameter should be:

- Park = 4.41-volts
- Reverse = 3.60-volts
- Neutral = 2.83-volts
- Drive = 2.09-volts
- 2nd = 1.37-volts
- 1st = 0.68-volts.

**MAN VAC(kPa)\_\_\_XXX**

**(range: 0 to 205 kPa)**

**MAN VAC("Hg)\_\_\_XX.X**

**(range: 0 to 60.7 "Hg)**

The PCM calculates a manifold vacuum reading from the MAP sensor voltage signal. It does this by comparing the barometric (BARO) pressure reading taken from the MAP sensor before startup to the MAP voltage while the engine is running. The PCM converts the difference between the two voltages to a value that is equivalent to manifold vacuum. The reading should be approximately 0 "Hg or kPa with the engine off and the manifold close to atmospheric pressure at sea level. When the engine is running with high manifold vacuum, the reading will drop.

**MANUAL SW**

**(range: ON/OFF)**

This discrete parameter indicates the status of the automatic transmission manual switch. The manual switch is normally mounted on the gear lever.

**MAP(kPa)\_\_\_XXX** (range: 0 to 255 kPa)  
**MAP(“Hg)\_\_\_XX.X** (range: 0 to 75.3 “Hg)  
**MAP(mmHG)\_XX.X** (range: 0 to 1913 mmHG)

The ECU calculates a manifold absolute pressure (MAP) reading from the MAP sensor voltage signal. When MAP is displayed in kPa, the reading should be approximately 100 to 102 kPa with the engine off and the manifold close to atmospheric pressure at sea level. When the engine is running with high manifold vacuum, the kPa reading will drop. On a turbocharged engine, the kPa reading will rise above 100 as boost is applied. When MAP is displayed in “Hg, the reading should be about 29.9 “Hg with the engine off and the manifold close to atmospheric pressure at sea level. When the engine is running with high manifold vacuum, the MAP reading in “Hg will drop. On a turbocharged engine, the reading will rise above 30 as boost is applied.

<b>VOLTAGE</b>	<b>HIGH</b>							<b>LOW</b>
<b>MAP(kPa)</b>	<b>70</b>	<b>60</b>	<b>50</b>	<b>40</b>	<b>30</b>	<b>20</b>	<b>10</b>	
<b>MAP(“Hg)</b>	<b>21</b>	<b>18</b>	<b>15</b>	<b>12</b>	<b>9</b>	<b>6</b>	<b>3</b>	
<b>MAP(mmHG)</b>	<b>533</b>	<b>457</b>	<b>381</b>	<b>305</b>	<b>229</b>	<b>152</b>	<b>76</b>	

Compare the MAP voltage and MAP pressure readings on the Scanner. Pressure should be high when voltage is high, low when voltage is low. If

the readings appear abnormal for the apparent engine load, the sensor signal to the ECU may be inaccurate or the ECU calculations may be incorrect for some reason. It is not a measure of actual manifold vacuum. It cannot be used as a measure of manifold vacuum.

**MAP(V)\_\_\_\_\_X.XX** (range: 0 to 5.12 volts)

The manifold absolute pressure (MAP) sensor provides an analog voltage parameter that varies with manifold pressure. The voltage signal can range from 0 to 5.12 volts.

MAP is intake manifold pressure relative to zero. MAP and manifold vacuum are related inversely. For example:

- MAP voltage is low when absolute pressure is low (vacuum is high).
- MAP voltage is high when absolute pressure is high (vacuum is low).

The ECU uses the MAP sensor voltage along with the barometric pressure (BARO) sensor voltage to calculate manifold vacuum and true absolute pressure. The ECU also uses MAP voltage and engine speed to calculate engine load.

**MAP/BARO SOLENOID**

**(range: MAP/BARO)**

The ABSOL PRESS(V) readings are based on either manifold vacuum or barometric (atmospheric) pressure, depending upon the MAP/BARO SOLENOID status. If MAP is displayed, the ABSOL PRESS(V) parameter shows MAP voltage; when BARO is displayed, the ABSOL PRESS(V) parameter shows BARO voltage. The MAP/BARO solenoid-controlled valve applies intake manifold vacuum or barometric (atmospheric) pressure to the sensing port of the absolute pressure sensor.

**MAP Fail\_XXX**

**(range: ON/OFF)**

This discrete parameter indicates the whether the PCM has detected a fault with the Manifold Absolute Pressure sensor. ON indicates that the PCM has detected a problem with the MAP sensor.

**MASS AIR FLOW/CYL\_XXX**

**(range:0 - 1000mG/S)**

This parameter is the air flow per cylinder. For either parameter, airflow is measured with a *Karman vortex* type sensor. This type of sensor has a triangular column in the airflow path and monitors the pressure increases from the resulting vortices. Each time a vortex is generated by the flowing air, a pressure increase occurs. As airflow increases, the number of vortices increases, resulting in an increase in pressure fluctuation speed. As airflow decreases, the number of vortices decreases, resulting in a decrease in pressure fluctuation speed. These pressure pulses are detected by the airflow sensor.

**MAT(°C)\_\_\_\_\_XXX**

**(range: -40 to 199)**

**MAT(°F)\_\_\_\_\_XXX**

**(range: -40 to 389)**

These analog parameters for fuel-injected engines indicate the temperature of the intake air in the manifold. The Scanner will display manifold air temperature (MAT) for all vehicles on which this parameter is available. You can change the measurement units on the Scanner from degrees Celsius (°C) to degrees Fahrenheit (°F). The preset measurement is °C. A thermistor temperature sensor installed in the intake manifold is usually used to measure intake air temperature.

The ECU converts MAT sensor voltage signals to air temperature readings. MAT readings, along with MAP, are primary parameters used by the ECU to calculate the amount of air entering the engine. The MAT reading should be close to ambient air temperature when the engine is cold and should rise steadily as the engine warms. Hightemperature MAT readings may differ greatly from car to car because of underhood temperature variations and hot-soak conditions.

**MAX FAN RELAY \_\_\_XXX** (range: OFF/ON)

The blower fan is maximum speed is controlled by a relay, when maximum blower fan is required this parameter will read ON, otherwise it will read OFF.

**MAX O2S(V)** (range: 0 to 2.5 or 5)  
**MIN O2S(V)**

These analog parameters display the minimum or maximum voltage of the oxygen sensor. These are updated every few seconds or as new peaks are reached.

**MAX SPEED \_\_\_XXX** (range: 0 to 255)

This parameter displays the preset vehicle maximum speed set in the PCM. This may vary from vehicle to vehicle and model to model. The PCM will not allow the vehicle to go over the preset speed by limiting fuel to the engine.

**MCD/LCD ILL.(%) \_\_\_XXX** (range: 0 to 100)  
**LCD ILLUM(%) \_\_\_XXX**

This parameter indicates the level of illumination of the instrument control display when the park-lamp switch is switched ON. 100 percent is full brightness, as the percentage decreases so should the brightness of the instrument panel backlights. This reading will remain fixed on models not using the variable illumination.

**MC DWL(°) \_\_XX** (range: 0° to 60°)

Mixture control (MC) solenoid dwell indicates the duty cycle, or on-time, of the MC solenoid in the carburetor. This parameter is displayed for carbureted engines only. It usually is based on a 6-cylinder dwell scale of 0 to 60 degrees. MC DWL(°) is shown at the right of the top line.

A low dwell reading indicates that the ECU is commanding a rich mixture from the carburetor. A high dwell reading indicates that the ECU is commanding a lean mixture. On a 6-cylinder scale, the midpoint of the dwell range is 30°, which indicates a 50-percent duty cycle. A fully rich condition is 6°, and a fully lean condition is 54°. When the ECU is operating in open loop, the MC dwell is fixed, usually near 30°. When the ECU is operating in closed loop, the MC dwell should change as the O2 sensor voltage changes. On a 4-cylinder (90°) scale, the midpoint of the dwell range is 45°, which indicates a 50-percent duty cycle. To verify proper dwell scale, refer to published specifications in manufacturer's repair manuals.

**MC PRESS(MPa) (range: unknown)**

This analog parameter displays the master cylinder pressure measured in megapascals. This signal comes from the master cylinder pressure sensor.

**MILEAGE SINCE DTC SET (range: 0 to 999)**

This parameter displays the mileage accumulated since an emission diagnostic trouble code cleared as miles or kilometers. The PCM stores this mileage in the Freeze Frame and Failure Records buffers.

**MIL STATUS (range: ON/OFF)**

**MIL\_XXX**

**MILFault\_XXX**

This parameter indicates the state of the PCM command to the Malfunction Indicator Light, or MIL, on the dash. The operation of the MIL varies between vehicles and manufacturers.

On some vehicles ON indicates that the MIL should be lit, while on others it will only indicate ON when a fault code has been set and stored in the PCM. The MIL may be on when the key is on and the engine is off and the MIL STATUS will indicate OFF, this is normal and is a prove out that the MIL lamp is functioning and the globe is OK. Some vehicles do not have a MIL at all and MIL STATUS can indicate that a fault code has been set in the PCM. See also HOLD LAMP. See also Mazda Special Notes.

**MIN TPS(%) (range: 0 to 99)**

This analog reading displays the learned minimum or closed throttle percentage by the engine ECU. This parameter is calculated by the ECU based on throttle sensor voltage input. This reading is used by the ECU for closed throttle running conditions.

**MIN TPS (V) (range: 0 to 5 volts)**

This analog reading displays the learned minimum or closed throttle voltage by the engine ECU. This reading is used by the ECU for closed throttle running conditions.

**MISFire\_XXX (range: YES/NO)**

This parameter indicates whether or not a misfire has occurred. Crankshaft acceleration is measured for each cylinder firing event. If the acceleration drops below a specified threshold, a misfire is deemed to have occurred.

**MISFIRE CYCLES** \_\_\_XXX (range: 0 to 100)  
**MIS PER CYCLE** \_\_\_XXX

These parameters display engine cycles that were analysed for misfire data. This parameter counts misfire tests during 200 revolutions.

**MISFIRE CYL1**  
**MISFIRE CYL 2**  
**MISFIRE CYL3**  
**MISFIRE CYL 4**  
**MISFIRE CYL5**  
**MISFIRE CYL 6**  
**MISFIRE CYL7**  
**MISFIRE CYL 8** (range: 0 to 255)

These parameters indicate the number of possible misfires detected on each cylinder during the last 200 cylinder firing events. These readings normally display some activity, but the activity should be fairly equal for all cylinders.

**MISS HISTORY 1** \_\_\_XXXXX  
**MISS HISTORY 2** \_\_\_XXXXX  
**MISS HISTORY 3** \_\_\_XXXXX  
**MISS HISTORY 4** \_\_\_XXXXX  
**MISS HISTORY 5** \_\_\_XXXXX  
**MISS HISTORY 6** \_\_\_XXXXX  
**MISS HISTORY 7** \_\_\_XXXXX  
**MISS HISTORY 8** \_\_\_XXXXX (range: 0 to 65535)

These parameters display the total number of misfires detected on each cylinder. These parameters do not update or show any activity until a misfire DTC(P0300) becomes active. These parameters update every 200 cylinder misfiring events.

**Misfire Monitor (MISFIRE)** — Monitors engine misfire and designates by DTC the specific cylinder in which a misfire occurs. Misfire is a lack of combustion due to an absence of spark, poor fuel metering, poor compression, or any other cause. Typically, inputs from the ECT, MAF, and CKP sensors are required to enable this monitor.

**MISFIRE PASSES** \_\_\_XXX (range: 0 to 65535)  
**MISFIRE FAILS** \_\_\_XXX

These parameters display the number of crankshaft 200-revolution sample periods for which misfire diagnostics reported a failure or pass.

### **MODE SW \_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the status of the vent position mode switch. When the switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

### **MODULE DEPLOYED \_\_\_XXX (range: YES/NO)**

This parameter displays whether the seatbelt pretensioners have been deployed or not. If this parameter displays YES the SRS module must be replaced, this parameter cannot be cleared to read NO any other way.

### **MOTOR POS STEPS \_\_\_XXX (range: 0 to 255 steps)**

The MOTOR POS STEPS parameter indicates the position of the ISC valve in the throttle body of Mitsubishi-built, dual-overhead-cam engines. The ISC valve controls the amount of air that bypasses the throttle at idle and thus the idle speed. The motor that drives the ISC valve has 255 positions, and ISC readings can vary from zero to 255. A reading of 0 indicates that the motor has fully extended the ISC pintle to cut off bypass air. A high number indicates that the motor has retracted the ISC pintle to allow more bypass air.

### **MOTOR POS(V) \_\_\_X.XXX (range: 0 to 5.000 volts)**

This analog parameter is a feedback signal from a motor position sensor on the idle speed control servo. This sensor is found on vehicles with Mitsubishi-built, single-overhead-cam engines. The sensor is a variable resistor with a pin that rests on the idle speed control servo plunger. As the plunger extends, output voltage and idle speed increase. As the plunger retracts, output voltage and idle speed decrease.

### **MRP (kPa) (range: -136 to 135)**

This analog parameter is a measure of the inlet Manifold Relative Pressure. Relative pressure differs from absolute pressure in that 0 relative pressure is measured at sea level which is actually 101 kPa absolute pressure. At key on engine off relative pressure is 0 and at engine running the pressure drops to a negative value that varies on engine load and engine speed.

### **NC0 RPM (range: 0 to vehicle maximum) NC2 RPM**

These parameters indicate at what RPM the automatic transmission direct clutches engage. These clutches spin in forward gears and are held in reverse and overdrive.



**NEUT POS SW** (range: ON/OFF)

This discrete parameter displays the status of the neutral position switch. It is used in both vehicles with automatic and manual transmissions.

**NeuSafetySw\_XXXXXX** (range: ACTIVE/INACTV)

This parameter displays the status of the neutral safety switch. ACTIVE means the switch contacts are closed.

**NeuTowFcnLmp\_XXX** (range: ON/OFF)

This parameter indicates the GEM command status for the Neutral Tow Indicator Lamp. When the system functions properly, ON means the Lamp is lit.

**NeutTowFcn\_XXXXXX** (range: ENABLE/DISABLE)

This parameter indicates whether the transfer case has been placed into the Neutral Tow Mode by the GEM module. ENABLE means the Tow Mode is in effect. This Mode permits the vehicle to be towed without damaging the transfer case, transmission, or driveline.

**NEUTRAL SW** (range: YES/NO)

This discrete parameter indicates the position of the neutral switch. It will indicate YES when a manual transmission is in the neutral position or when an automatic transmission is in Park or Neutral. It will display NO at other times.

**NO ABS MSSG\_XXX** (range: ON/OFF)

**NO BEM MSSG\_XXX**

**NO HIM MSSG\_XXX**

**NO ICM MSSG\_XXX**

These discrete parameters indicate whether the indicated modules are not sending messages (MSSG) over the CAN bus. The various ECU's in some vehicles are connected together using a system called "Controller Area Network" or CAN. If there is no messages being passed along the CAN then the PCM will flag the fault and set the above parameter to ON. OFF indicates that no problems exist.

ABS = Anti-lock Brake System

BEM = Body Electronics Module

HIM = Heater Ventilation Air Conditioning Integrated Module

ICM = Instrument Cluster Module

**NOM. IDLE RPM**

**(range: 0 to 2040)**

This analog reading displays the desired idle speed of the engine in RPM.

**NOT USED**

**(range: not applicable)**

This parameter indicates a vacant “slot” or position in the data list for a parameter that is not supported for the vehicle being tested. It can be displayed in a normal data list as well as in a custom data list.

**N/P SWITCH**

**R SWITCH**

**D SWITCH**

**3RD SWITCH**

**2ND SWITCH**

**1ST SWITCH**

**1ST RANGE SW**

**2ND RANGE SW**

**3RD RANGE SW**

**D RANGE SW**

**R RANGE SW**

**N/P RANGE SW**

**(range: ON/OFF)**

These discrete parameters indicate the status of the automatic transmission gear lever position switches. Each switch should indicate ON as the gear lever is placed in each position.

**O2B1-S1(LAMBDA)**

**(range: 0.0 to 2.0 lambda)**

**O2B2-21(LAMBDA)**

These parameters display the lambda output from the heated oxygen sensor (HO2S) to the control module. A low reading below 1.0 indicates a rich exhaust; a high reading above 1.0 indicates a lean exhaust. It should fluctuate during closed loop operation.

**O2 B1S1(%)**

**(range 0 to 100)**

**O2 B1S1 HTR(%)**

**O2 B1S2 HTR(%)**

This analog parameter displays the ECU command to the oxygen sensor heater it is controlled by a duty cycle on/off percentage with 100 being maximum heating. O2S B1S1 is bank 1 sensor 1 and O2S B2S1 is bank 2 sensor 1.

**O2 BLM ENABLE** (range: ON/OFF)

This parameter indicates whether the ECU is learning the long term memory for O2 correction. If the reading is OFF the ECU is not able to carry out changes in the long term memory correction. This reading is also temperature dependant and will read OFF until normal operating conditions are met. If it continually reads OFF a malfunction is present.

**O2 CROSSCOUNTS \_\_\_XXX** (range: 0 to 255)

When the engine is warmed up and running in closed loop, the O2 sensor voltage changes constantly. CROSSCOUNTS indicates the number of times that the O2 sensor voltage crossed from the lean region (below 450 mV) to the rich region (above 450 mV). A counter in the ECU records the number of times the O2 sensor voltage crosses between rich and lean.

The CROSSCOUNT reading is the number of voltage crossovers within the last second. The CROSSCOUNT reading indicates how well the O2 sensor is responding to changes in fuel metering and exhaust oxygen content. The reading does not indicate how good or bad the sensor is. It simply shows that the sensor can vary its voltage in response to exhaust oxygen content.

On some engines, the O2 sensor may cool off at idle, and the system may go to open loop. In this case, the sensor will not provide a varying voltage to the ECU, and the CROSSCOUNT reading will be 0. Run the engine at fast idle for a few seconds to warm the sensor, return to closed loop, and restore the CROSSCOUNT reading.

**O2 HEATER** (range: ON/OFF)

This parameter indicates the command status of the oxygen sensor heater by the ECU.

**O2 HEATER B1-S2 O2 HEATER B2-S1**

**O2 HEATER B2-S2**

B1 and B2 refer to cylinder banks 1 and 2. Bank 1 is always the bank containing the number 1 cylinder. S1 indicates a pre-catalyst O2S, and S2 indicates a post-catalyst O2S. The parameter O2 HEATER refers to the O2S in the B1-S1 position.

**O2 MON**

**(range: RICH/LEAN)**

**O2 MON B1-S1**

**O2 MON B1-S2**

**O2 MON B2-S1**

**O2 MON B2-S2**

These parameters indicate whether a particular O2S senses a rich or lean condition while the engine runs in closed loop. RICH means that the PCM is shortening the fuel injector pulse width to lean the mixture. LEAN means that the PCM is lengthening the fuel injector pulse width to richen the mixture.

B1 and B2 refer to cylinder banks 1 and 2. Bank 1 is always the bank containing the number 1 cylinder. S1 indicates a pre-catalyst O2S, and S2 indicates a post-catalyst O2S. The parameter O2 MON refers to the O2S in the B1-S1 position.

**O2(mV)\_XXXX**

**(range: 0 to 1800)**

**FRONT O2(mV)\_XXXX**

**REAR O2(mV)\_XXXX**

**O2 #1(mV)\_XXXX**

**O2 #2(mV)\_XXXX**

**O2 B1-S1(mV)\_XXX**

**O2 B1-S2(mV)\_XXX**

**O2 B2-S1(mV)\_XXX**

**O2 B2-S2(mV)\_XXX**

The exhaust gas oxygen (O2) sensor is the primary sensor that indicates whether the engine is running rich or lean. The O2 sensor generates a voltage signal that ranges from 0 volt to 1 volt or a little over 1 volt (0 to 1000 millivolts – mV). A high millivolt signal indicates a rich exhaust; a low signal indicates a lean exhaust. In normal operation, the O2 sensor voltage ranges from 100 to 1000 mV. The O2 sensor must be hot (above 500°F), and the ECU must be in closed loop before the ECU will respond to the sensor signal. Some PCM's modify the voltage value to above 1000 mV, some may fluctuate between 0 and 5000mV.

Some engines have separate O2 sensors for the front and rear banks. The front O2 sensor voltage is displayed as O2 #2(mV)\_\_, and the rear O2 sensor voltage is shown as O2 #1(mV)\_\_.

O2 sensor prefixes B1 and B2 correlate to banks 1 and 2. Bank 1 is always the bank that contains the number 1 cylinder. O2 sensor suffix S1 indicates a pre-catalyst O2 sensor, while suffix S2 indicates a postcatalyst O2 sensor.

During closed loop operation O<sub>2</sub> sensors should range from 100mV to 900mV. A lean condition causes both sensors to read below 400 mV, while a rich condition causes readings above 600mV. At 2500 rpm readings should switch between high and low at least six-to-ten times every ten seconds.

**O<sub>2</sub> CROSSCNTS-1 \_\_\_XX** (range: see text)  
**O<sub>2</sub> CROSSCNTS-2 \_\_\_XX**  
**RIGHT CROSSCNTS \_\_\_XX**  
**LEFT CROSSCNTS \_\_\_XX**  
**LEAN/RICH TRANS \_\_\_XX**

See “O<sub>2</sub> CROSSCOUNTS” in Holden Reference Manual.

The -1 or -2 is for bank 1 or bank 2 of the engine and left and right are for the left and right banks of the engine. LEAN/RICH TRANS is the lean to rich transitions count.

**O<sub>2</sub>S B1-S1 READY \_\_\_XX**  
**O<sub>2</sub>S B2-S1 READY \_\_\_XX**  
**O<sub>2</sub>S B1-S2 READY \_\_\_XX**  
**O<sub>2</sub>S B2-S2 READY \_\_\_XX** (range: YES/NO)

These parameters indicate whether the oxygen sensors have reached operating temperature. NO indicates they are not ready and engine will be in open loop. YES indicates they are ready and the engine should be operating in closed loop.

**O<sub>2</sub> B1-S1 STAT \_\_\_XXX**  
**O<sub>2</sub> B2-S1 STAT \_\_\_XXX**  
**O<sub>2</sub> B1-S2 STAT \_\_\_XXX**  
**O<sub>2</sub> B2-S2 STAT \_\_\_XXX**  
**L/R SWITCH B1S1 \_\_\_XXX**  
**L/R SWITCH B2S1 \_\_\_XXX** (range: RICH/LEAN)

These parameters indicate whether the oxygen sensor (O<sub>2</sub>S) voltage is above bias voltage (RICH) or below bias voltage (LEAN). There should be constant activity, which indicates that the PCM is actively controlling the air/fuel mixture of banks 1 or 2.

**O2S11 FailMode\_XXX**

**O2S12 FailMode\_XXX**

**O2S21 FailMode\_XXX**

**O2S22 FailMode\_XXX**

**(range: ON/OFF)**

These discrete parameters indicate the Oxygen Sensor Failure Mode status for the indicated sensor. ON indicates that the PCM has detected a problem with that particular O2Sensor and is operating in O2S Failure Mode.

O2S11 = bank 1 sensor 1 (upstream of catalytic converter)

O2S12 = bank 1 sensor 2 (downstream of catalytic converter)

O2S21 = bank 2 sensor 1 (upstream of catalytic converter)

O2S22 = bank 2 sensor 2 (downstream of catalytic converter)

Note that vehicles with only one bank of cylinders will still display as O2S11 or O2S12.

**O2 READY**

**(range: YES/NO)**

This discrete parameter indicates when the oxygen (O2) sensor is ready for closed loop operation. It has warmed up and is cycling correctly.

**OBD-II READINESS MONITORS (range: READY/NOT DONE or N/A)**

**MISFIRE\_\_\_\_\_XXXXX**

**FUEL SYS\_\_\_\_XXXXX**

**COMPONENTS\_\_XXXXX**

**CATALYST\_\_\_\_XXXXX**

**HEATED CAT\_\_XXXXX**

**EVAP SYS\_\_\_\_XXXXX**

**AIR\_\_\_\_\_XXXXX**

**A/C REFRIG\_\_XXXXX**

**O2 SENSOR\_\_\_\_XXXXX**

**O2 HEATER\_\_\_\_XXXXX**

**EGR SYS\_\_\_\_\_XXXXX**

The PCM's in OBD-II vehicles monitor the function and operating efficiency of various emission-related circuits and components. When a monitored circuit or component is not operating properly, a diagnostic trouble code (DTC) is set.

Each monitor requires that a certain sequence of events occur before monitoring their assigned circuit. The events required to activate each monitor vary, depending on the circuit and components. The OBD-II Readiness Monitor parameters display the status of these monitors. When a Readiness Monitor parameter reads READY, the required sequence of events has completed and the monitor is ready to report problems and set DTC's. When a Readiness Monitor parameter reads NOT DONE, the required sequence of events has *not* completed and the monitor is therefore *not* ready to report problems or set DTC's. When a Readiness Monitor reads N/A, the vehicle is not equipped for that monitor. The paragraphs that follow give a brief description of each monitor.

**OCTANE VALUE** (range: unknown)

This discrete parameter indicates the setting of the octane plug. This is a manual adjustment and should be present correctly from the factory to run on the prescribed fuel.

**O/D CUT 2** (range: ON/OFF)

This discrete parameter indicates the status of the "overdrive off" switch mounted on the T-bar or dash. On a properly functioning system ON means the switch contacts are closed, the O/D OFF lamp is lit and the PCM is preventing the transmission from shifting into overdrive. OFF means the switch contacts are open, the lamp is not lit and the PCM is allowing the transmission to shift into overdrive.

**OD ENABLED \_\_\_XXX** (range: YES/NO)

**O/D SW \_\_\_XXX** (range: ON/OFF)

**OVERDRIVE SW**

These discrete parameters indicate the position of the overdrive control switch. When the switch is on, these parameters read YES or ON and the transaxle operates as a 4-speed automatic. When the switch is off, these parameters read NO and OFF and the transaxle operates as a 3-speed automatic.

**OD OFF SIG** (range: ON/OFF)

This discrete parameter displays the signal from the cruise control system, if fitted, that instructs the PCM to cancel the overdrive gear.

**ODO RESET SW \_\_\_\_\_XXX** (range: ON/OFF)

This parameter indicates the input status of the odometer reset switch on the instrument panel.

**OD SOL DUTY(%)** (range: 0 to 100)

**OD SOL (%)**

This analog parameter displays the duty cycle on time for the overdrive solenoid. In a correctly operating transmission this solenoid will show 0% in 3rd and 4th gears, and up to 100% in 1st, 2nd and reverse.

**O/D SOLENOID** (range: ON/OFF)

This parameter indicates whether the PCM senses that the overdrive solenoid is energised.

**OFF ACCEL SW** (range: ON/OFF)

This discrete parameter indicates the OFF position of the accelerator pedal. ON indicates the pedal is in the idle position. OFF indicates the accelerator pedal is being depressed. The control module uses this information to control the engine at idle and may be used for fuel cut operation.

**OFF SW \_\_\_XXX** (range: ON/OFF)

This discrete parameter indicates the status of the OFF switch. When the switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**OIL PRESS \_\_\_XXX** (range: YES/NO)

This discrete parameter displays whether oil pressure has been detected by the oil pressure sensor.

**OIL PRESS \_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the low oil pressure warning lamp or LCD warning. The low oil pressure warning lamp is activated by the instrument panel when low oil pressure is detected via a signal from the PCM.

**OIL PRESS (V) \_\_\_X.XX** (range: 0 to 5.00)

This parameter displays the engine oil pressure measured from the oil pressure sensor. As RPM and oil pressure increases from idle the voltage will increase. At a predetermined value the PCM will turn ON the low oil pressure warning light.

**OIL TEMP (V)** (range: 0 to 5)

This analog parameter displays the voltage signal returning from the transmission fluid temperature sensor.



**OPEN/CLSD LOOP\_XXXX** (range: OPEN/CLSD)  
**LOOP STATUS(L)\_XXXX LOOP STATUS(R)\_XXXX**  
**LOOP**  
**LOOP 1**  
**LOOP 2**  
**FUEL SYS 1**  
**FUEL SYS 2**

These discrete parameters indicate whether the ECU is operating the engine in open or closed loop. During warmup, the reading should be OPEN. When the engine reaches normal operating temperature and the ECU responds to O2 sensor voltage, the reading should be CLSD. Some vehicles display separate parameters for the left and right banks.

Some failure conditions (many associated with trouble codes) will cause the ECU to return to open-loop operation. Additionally, some vehicles may normally return to open-loop operation at idle. This is usually because the O2 sensor cools off at idle, and the ECU returns to open loop. You should be able to restore closed-loop operation by accelerating off idle to warm the sensor.

**OSS=TSS(rpm)\_XXX** (range: zero to vehicle maximum)  
**OutShftSp(RPM)\_XXX**  
**OSS\_\_\_\_\_XXXX**

This analog parameter is calculated by the PCM based on the voltage signal from the output shaft speed (OSS) sensor. The output shaft speed (OSS) sensor is a magnetic pickup located on the rear of the transmission case, on the driver's side.

**OUTLET SET\_\_\_\_\_XXXXX** (range: MANUAL/AUTO)  
**INLET SET\_\_\_\_\_XXXXX**

This discrete parameter indicates whether the inlet and outlet of the ECC system are under manual or the drivers control. MANUAL indicates the inlet and outlet are under manual or the drivers control and AUTO indicates they are under ECC module automatic control.

**OUTPUT RPM** (range: 0 to 8192)

This parameter shows the speed of the transmission output shaft from the output shaft speed sensor. It is used by the TCM/PCM to determine shift speeds and in determining what gear the transmission is currently in.

### **OUTSIDE TEMP \_\_\_XXX (range: ON/OFF)**

This discrete parameter indicates the status of the outside temperature switch. When the switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

### **OverSpdWarn\_XXXXXXX (range: ENABLED/DISABLED)**

This parameter indicates the presence of a higher-than-normal wheel speed sensor signal. ENABLE means one or more wheels have exceeded maximum vehicle speed or a sensor circuit has shorted.

### **OVERIDE STATUS \_\_\_XX (range: ON/OFF)**

This parameter displays the over ride status of the theft deterrent system. OFF means the theft deterrent system not being over ridden and is under the control of the BCM or Theft Deterrent Module (TDM). ON means the theft deterrent is being over ridden and the BCM or Theft Deterrent Module will allow the vehicle to be started even though the BCM or TDM have not received a signal from the remote coded key. Switching the ignition on and leaving it on for approximately half an hour will enable the over ride, this function is useful when a remote coded key is broken or lost. Some early model VR vehicles have a key that can be used to over ride the theft deterrent system.

### **OVERRUN CLUTCH (range: ON/OFF)**

This parameter shows the PCM command status for the overrun clutch solenoid valve. When functioning correctly ON means that the solenoid has opened the valve.

### **OVERRUN SOL (range: ON/OFF)**

These discrete parameters indicate the transmission ECU command to the overrun solenoid.

### **OVERSPEED \_\_\_XXX (range: ON/OFF)**

This parameter displays the status of the OVERSPEED warning lamp or LCD warning. The OVERSPEED warning lamp flashes a warning to the driver that a particular driver set vehicle speed has been reached or exceeded.

**Oxygen Sensor Monitors (O2 SENSOR & O2 HEATER)** — Monitors the O2 sensor switching frequency for degradation, and the heater circuit for proper operation (when equipped).

**PARK BRAKE \_\_\_XXX** (range: ON/OFF)  
**BRAKE FAIL \_\_\_XXX**

These two parameters display whether the brake warning lamp or LCD warning should be ON or OFF. The warning lamp is used to indicate whether the parking brake is applied and also to indicate if there is a problem with the hydraulic brake system. With the ignition ON, no problem detected in the hydraulic brake system and the park brake NOT applied the light will be OFF. If the park brakes are then applied the lamp will illuminate and the reading will be ON.

**PARK LAMP INPUT \_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the input from the headlight switch. When the switch is turned to park lamps the reading will indicate ON and will remain ON when the headlight switch is turned to full headlight operation. The instrument panel uses this input to warn the driver that the headlights are ON when the ignition has been turned OFF.

**PARK LAMP SW \_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the park lamp switch. When the switch is off the parameter displays OFF, when the switch is on the display shows ON. The BCM is responding to the actual input state of the switch.

**ParkLmpSw\_XXX** (range: ON/OFF)

This discrete parameter indicates the status of the driver-operated Park Lamp Switch. ON means the Park Lamp switch contacts are closed.

**PARK/NEU POS\_XX** (range: P-N—/-R-DL)

**ParkNeuPos\_XX**

The park/neutral switch (P/N SWITCH) is a discrete parameter that indicates whether an automatic transmission is in park or neutral or in one of the drive ranges. The display should read:

P-N— if the transmission is in either park or neutral.

-R-DL if the transmission is in any forward gear or reverse.

The park/neutral switch is a grounding switch that is closed in park or neutral and open in any forward gear or reverse.

**PART LOAD** (range: YES/NO or ON/OFF)

This discrete parameter indicates whether the throttle butterfly is at part throttle, which is between closed throttle and wide open throttle.

**PASS DOOR\_\_\_\_\_XXX (range: OPEN/CLSD)**

This parameter displays the state of the passenger door. The parameter is OPEN when the door is open (although the actual switch is closed) and CLSD when the door is closed (although the actual switch is open). The BCM is responding to the actual input state of the switch.

**PASS DR UNLOCK\_\_\_\_\_XXX (range: ON/OFF)**

This parameter shows the status of the front passenger door lock switch, it should display OFF when the passenger door is locked and ON when the passenger door is unlocked.

**PASSIVE MODE\_\_\_\_XX (range: ON/OFF)**

This parameter displays the passive mode status of the theft deterrent system OFF means passive mode is not active and ON means passive mode is active and the Security LED is flashing.

**PCM ID STAT STR\_\_\_\_XXX (range: YES/NO)**

This parameter "PCM IDentification STATus StoRed" displays the BEM status of the PCM identification.

**PCM REQ RECVD\_\_\_\_XXX (range: YES/NO)**

This parameter "PCM REQuSet RECeiveD" displays the BEM status of the PCM request to enabled for vehicle starting.

**PCM VERIFY OK\_\_\_\_XXX (range: YES/NO)**

This parameter displays the BEM verification status of the PCM with the BEM. The PCM must be verified for the BEM to allow the vehicle to be started. This parameter will indicate NO if the ignition is switched off and should indicate YES with the ignition on and the PCM verified.

**PCS COM BAR(Pa)\_\_\_\_X.XX (range: unknown)**

This parameter shows the commanded pressure of the pressure control solenoid by the TCM/PCM. It is used by the TCM/PCM to control line pressure in the transmission.

**PCS COM (mA)\_\_\_\_X.XX (range: unknown)**

This parameter shows the commanded amperage of the pressure control solenoid by the TCM/PCM. It is used by the TCM/PCM to control line pressure in the transmission.

**PCS DUTY%** (range 0 to 100)

This parameter shows the commanded duty cycle of the main pressure control solenoid.

**PCS ENABLED** (range YES/NO)

This discrete parameter shows whether the pressure control solenoid has been enabled by the TCM/PCM.

**PCS OVERRIDE** (range YES/NO)

This discrete parameter shows whether the pressure control solenoid has been overridden by the TCM/PCM from its normal operation. The TCM/PCM may override the PCS function if a fault is detected in the transmission.

**PCSV DC(%)\_\_XXX.X** (range: 0 to 100.0%)

A pressure control valve regulates hydraulic pressure to the various clutches during shifting. The pressure control solenoid valve (PCSV) actuates the pressure control valve. The PCSV DC(%) parameter displays the duty cycle (DC) of the pulse-width-modulated (pwm) signal to the solenoid.

**PCV SOL VLV** (range: ON/OFF)

This discrete parameter displays the ECU command to the crankcase positive ventilation valve control solenoid. ON indicates the solenoid has enabled the PCV to operate and OFF indicates PCV operation is prevented.

**PEDAL POS (%)** (range: 0 to 100)

The pedal position parameter displays the position of the throttle pedal as a percentage. This is derived from the pedal position sensor inputs.

**PETROL SENDER (V)\_\_X.X** (range: 0 to 25.5)

This parameter indicates the voltage input to the instrument panel from the fuel tank fuel level sensor. The instrument panel uses this signal to display the fuel tank level on the fuel gauge. Used on all models.

**P/N** (range: N/A)

This parameter displays the part number of the airbag control module, this may need to be used when replacing the airbag module.

**P/N SWITCH** (range: ON/OFF)

This discrete parameter displays whether the gear lever is in P/N or D2LR.

**P/N SWITCH\_\_XXXX (range: see below)**

This parameter displays the signal from the park/neutral switch. The characters displayed in the range depend on the vehicle. On most, the readings for this parameter are: PARK, REV, NEUT, DRIVE, 2ND, and LOW. Others use either P-N— for park and neutral or -R-DL for reverse and forward gears. When the range displays an integer, that number corresponds to the presently engaged gear. The Scanner displays question marks (????) between gears or when the signal is invalid.

**POINTER ILL.(%)\_\_\_\_XXX (range: 0 to 100)**

This parameter indicates the level of illumination of the instrument pointers when the park-lamp switch is switched ON. 100 percent is full brightness, as the percentage decreases so should the brightness of the instrument panel backlights. This reading will remain fixed on models not using the variable dimming pointers.

**POS COUNT (range 0 to 255)**

This discrete parameter indicates the number of cogs on the flywheel. The crankshaft position sensor is used to determine this value. An intact flywheel should have 180 cogs.

**POWER ENRICH\_\_XXX (range: YES/NO)**

This parameter is displayed on some fuel-injected engines. POWER ENRICH\_\_YES means that the ECU has commanded a rich mixture for high-power operation. It is equivalent to power valve operation in a carburetor. YES should be accompanied by increased injector pulse width readings. POWER ENRICH should read NO during idle, deceleration, and normal cruising.

**POWERSHIFT\_\_XXX (range: ON/OFF)**

This parameter displays the status of the automatic transmission POWERSHIFT warning lamp or LCD warning. The automatic transmission powershift is controlled by a driver input switch, when powershift mode is selected the lamp or warning will read ON, when powershift is disengaged the reading will be OFF. Only applicable to vehicles equipped with Automatic Transmissions.

**POWERSHIFT SW (range: ON/OFF)**

This discrete parameter indicates whether the vehicle is in Power or Economy mode. These modes affect when gear shifts occur as well as how smoothly the transmission shifts gears. When functioning correctly ON means that the vehicle is in the Power mode.

**POWER SW (range: ON/OFF)**

**POWER LAMP**

These two discrete parameters indicate the position of the power lamp and the power switch. The power switch will only display ON when it is held in. The power lamp will cycle ON and OFF each time the switch is depressed.

**POWERTRAIN LAMP (range: ON/OFF)**

This discrete parameters displays the status of the powertrain, or check engine lamp (also known as the MIL or malfunction indicator lamp). With the ignition on and the engine off it will indicate ON, with the engine running and with no faults detected by the ECM/PCM.

**PRE-DLVRY ENABL\_\_XX (range: YES/NO)**

This parameter displays the BCM or Alarm module Pre-Delivery status. The modules are in Pre-Delivery status when shipped from the factory.

**PRE INJECTION QUANTITY (mm3)**

Indicates the amount of fuel is injected or the volume of fuel injected during the pre-injection in cubic millimeters.

**PRESS CONTROL(%)\_\_\_\_XXX (range: zero to 100%)**

**PCS DUTY CYCLE(%)\_\_\_\_XXX**

This parameter displays the PCM commanded pulse-width-modulated (PWM)/ Duty cycle signal to the pressure control solenoid. Zero (0%) indicates that the valve is not energized, while 100% indicates that the valve is continuously energized.

**PRESS HIGH (range: ON/OFF)**

This discrete parameter indicates whether the pressure in the master cylinder is high. If the pressure is too high it will affect ABS operation.

**PRESS LOW (range: ON/OFF)**

This discrete parameter indicates whether the pressure in the master cylinder is low. If the pressure is too low it will affect ABS operation.

**PRESS SOL(mA)\_\_\_X.XX (range: unknown)**

This parameter shows the amperage of the pressure control solenoid by the TCM/PCM. It is used by the TCM/PCM to control line pressure in the transmission.

**PRET. DEPLOYED \_\_\_XXX (range: YES/NO)**

This parameter displays whether the seatbelt pretensioners have been deployed or not. If this parameter displays YES the SRS module must be replaced, this parameter cannot be cleared to read NO any other way.

**PRIMARY CTL (%) (range: 0 to 100)**

This analog parameter indicates the engine ECU control of the primary ignition system.

**PRNDL SW \_\_\_XXXX (range: see text below)**

**PRNDL SELECT \_\_\_XXXX**

On vehicles with electronic transmissions, this parameter displays the signal from the park/neutral switch. The parameter displays the gear presently engaged. The readings for this parameter are: LOW, 2ND, 3RD, 4TH, P/N and REV. The reading can be ??? between gears or when the signal is invalid.

**PROGRAM SW (range: ON/OFF)**

**SPORT LAMP**

These discrete parameters indicate the position of the program switch (located on top of the gear lever) and whether the transmission ECU is in SPORT mode. With the vehicle running and D selected the sport lamp should switch ON and OFF as the program switch is toggled. The program switch will only indicate ON while it is held down.

**NOTE:** While a scan tool is connected and communicating to the transmission ECU the SPORT lamp will flash and may not respond to operator inputs.

**PROG.TRNSMITRS \_\_\_XXX (range: see text)**

This parameter displays how many remote transmitters are programmed into the BEM.



**PROM ID \_\_\_\_\_XXXXX (range: 0 to 99999)**

This parameters gives the identification numbers of the programmable read only memory (PROM) installed in the ECU. The PROM is a replaceable electronic device that contains the operating program and calibration values for a specific vehicle, engine, and accessory combination. PROM's are often revised and new PROM's are issued to cure a driveability problem or otherwise improve operation. Because PROM's are interchangeable, it is possible for the wrong or outdated PROM to be installed. PROM ID may be a 2-, 3-, 4-, or 5-digit number, depending on vehicle year and model. Check the PROM ID against the carmaker's specifications to determine if the correct one is installed. Some service manuals for late-model vehicles refer to the PROM as the MEMCAL because it contains both memory and calibration functions.

**P/S PRESS SW\_\_XXX (range: ON/OFF)**

**HI PS PRESS\_\_XXX**

**PWR STEER SW\_\_XXX**

**PwrStrPrs SW\_\_XXX**

This discrete parameter indicates the status of the power steering pressure switch. This parameter reads OFF when the steering wheel directs the wheels straight ahead. This parameter reads ON when the steering wheel is turned or held turned in either direction. Turning the steering wheel builds pressure in the power steering system.

**PULSE GEN-A\_\_XXXX (range: 0 to engine maximum rpm)**

**PULSE GEN-B\_\_XXXX (range: 0 to 9690 rpm)**

Two pulse generators installed on the top of the transaxle send input and output shaft speed signals to the transaxle controller. PULSE GEN-A\_\_ represents the input shaft speed, while PULSE GEN-B represents the output shaft speed. The controller uses these two signals to control shift pattern and hydraulic pressure during shifting. Pulse generator A is activated by holes in the kickdown drum. Therefore, generator A will not pulse when the kickdown drum is held stationary (in 2nd gear or 4th gear).

**PUMP\_\_\_\_\_XXX (range: ON/OFF)**

This parameter shows the state of the ABS pump. The pump will remain inactive until the ABS is operated.

**PUMP MONITOR\_\_XX** (range: ON/OFF)

This parameter displays the status of the pump within the ABS hydraulic unit, whether it is on or off. This parameter is the feedback from the pump to indicate to the ABS module whether the pump is operating or not as required by the ABS module.

**PUMP RELAY** (range: ON/OFF)

This discrete parameter shows the ABS ECU command to the ABS hydraulic pump relay. ON means the relay is being energised on and OFF means the it is not being energised.

**PUMP RELAY** (range: ON/OFF)

**FUEL PUMP RELAY**

These parameters displays the PCM command to the fuel pump relay. ON means the PCM has commanded the relay contacts closed.

**PUMP RPM \_\_\_\_\_XXXX** (range: see below)

This parameter displays the RPM, as calculated by the PCM, of the diesel injection pump. The speed of the injection pump is half that of engine RPM.

**PUMP(V)\_\_XXX**

This analog parameter indicates the voltage signal to the ABS pump.

**PURGE DUTY(%)** (range 0 to 100)

This parameter indicates the duty cycle of the purge solenoid as commanded by the ECU. A reading of 0 indicates the solenoid is blocking any purging.

**PURGE PWM (%)\_\_XX.X** (range: 0 to 100%)

**FUEL VENT (%)**

A signal is used to control EVAP canister purge. 0% is fully closed, 100% is fully open.

**PURGE SOL** (range: ON/OFF)

This parameter displays the PCM command to the Vacuum Switching Valve (VSV) or solenoid that controls the evaporative emission (EVAP) purge valve. If the EVAP system operates properly, ON means the system is currently purging.

**PURGE VOL SOL(%)** (range: 0 to 100)

This parameter indicates at what percentage the purge volume control valve is purging. The valve regulates the amount of airflow through the evaporative emissions canister while purging.

**PURGE VOL(STPS)** (range: 0 to 65)

This parameter indicates the position of the purge volume control valve stepper-motor. The valve regulates the amount of airflow through the evaporative emissions canister while purging. As the stepper-motor count increases, canister airflow increases. During heavy load, expect a high stepper-motor count; during warm idle expect a low count.

**PURGE VSV** (range: ON/OFF)

**PURGE SOL EVAP SOLENOID**

These parameters indicate the PCM command status for the vacuum switching valve (VSV) or solenoid that controls the evaporative emission (EVAP) purge valve. If the EVAP system operates properly, ON means the system is currently purging.

**PWM #1(%)\_\_XXX** (range: 0 to 100)

**PWM #2(%)\_\_XXX**

These parameters indicate the duty cycle level of illumination of the instrument control displays when the park-lamp switch is switched ON. 100 percent is full brightness, as the percentage decreases so should the brightness of the instrument panel backlights. This reading will remain fixed on models not using the variable illumination.

**PWR/ECON SW\_\_XXXX** (range: PWR/ECON)

**P/E/HOLD SW\_\_XXXX** (range: PWR/ECON/HOLD)

The parameters indicate the position of the power economy shift pattern. The display should toggle to agree with the current switch position. When the switch is in the economy position, the transmission shift pattern is altered to economize fuel consumption.

**PWR STEER SW** (range: ON/OFF)

This discrete parameter displays the status of the power steering switch. In a correctly functioning system it will read ON while the steering wheel is being turned and the power steering pump is placing a load on the engine. It will read OFF at all other times.

**R AMOUNT (MG/STK)\_\_\_\_\_X.X (range: unknown)**

This parameter displays the amount of diesel fuel that has been requested under current operating conditions. The reading is in milligrams per stroke.

**RANGE A (VOLTS)\_\_\_\_\_XXXX (range: OPEN/CLSD)**

**RANGE B (VOLTS)\_\_\_\_\_XXXX (range: 12/0)**

**RANGE C (VOLTS)\_\_\_\_\_XXXX**

Five pressure switches are used to indicate the transmission valve range. Various fluid pressures are fed from the manual valve to five, normally open, pressure switches. These pressure switches determine the digital logic at electrical pins A, B and C (4L80E) or N, R, and P (4L60E) in the transmission module 3-pin connector. The module uses this information for line pressure, TCC, and solenoid control. For example, the switch states for the various gears are:

Range

<u>Gear</u>	<u>A or N</u>	<u>B or R</u>	<u>C or P</u>
PARK	OPEN	CLSD	OPEN
REV	CLSD	CLSD	OPEN
NEUT	OPEN	CLSD	OPEN
4TH	OPEN	CLSD	CLSD
3RD	OPEN	OPEN	CLSD
2ND	OPEN	OPEN	OPEN
1ST	CLSD	OPEN	OPEN
FAULT	CLSD	OPEN	CLSD
FAULT	CLSD	CLSD	CLSD

**REAR LAMP FAIL\_\_\_\_\_XXX (range: ON/OFF)**

This parameter applies to Berlina, Calais, Statesman and Monaro. It displays the status of the rear lamp fail warning lamp or LCD warning. The rear lamp fail warning lamp is activated by the instrument panel when a tail light or brake light globe failure has occurred.

**READ MEM SIG (range: ON/OFF)**

This discrete parameter indicates whether the read memory connectors have been connected together. During normal vehicle operation this should be OFF, if the connector is connected the parameter will indicate ON. The connector will place the ECU into a special test mode that will affect normal vehicle operation. See the Subaru section in this reference manual for further information.

**REAR DEFOG** (range: ON/OFF)

This discrete parameter displays the input status for the rear window defog switch to the engine ECU. ON indicates the switch is on and OFF indicates the switch is off.

**RearDefRly\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status for the rear window defroster relay. ON means the GEM is commanding the relay solenoid to energise, closing the relay contacts.

**RearDefSw\_XXX** (range: ON/OFF)

This discrete parameter indicates the status of the driver-operated rear window defroster switch. ON means the rear window defroster switch contacts are closed.

**REAR DEMIST\_\_\_XXX** (range: ON/OFF)

These discrete parameters indicate the status of the front demist switch and the rear demist switch. When a switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**REAR O2S** (range: 0 to 1.275)

This analog parameter displays the voltage output of the rear oxygen sensor. See O2S sensors in the main Hyundai etc reference manual for more information.

**RearPosSense\_XXX** (range: YES/NO)

This discrete parameter indicates whether the rear windshield wiper is the PARK position. YES means the wiper is in the PARK position.

**RearWasher\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status for the rear window washer. When the system functions properly, ON means the washer should be applying fluid to the rear window.

**RearWiper\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status for the rear window wiper. When the system functions properly, ON means the rear wiper should be moving.

**RearWiperDn\_XXX** (range: ON/OFF)

**RearWiperUp\_XXX**

These parameters indicate the GEM command status to move the rear wiper arm down or up. When the system functions properly, RearWiperDN\_ON means the rear wiper should be down to its home position and RearWiper\_UP\_ON means the rear wiper should be moving up.

**RECIRC SOL\_\_\_\_XXX** (range: OFF/ON)

This discrete parameter indicates whether the air re-circulation control solenoid is ON or OFF. When re-circulation mode is selected the parameter should read ON, otherwise it should read OFF.

**RECIRC SW\_\_\_\_XXX** (range: ON/OFF)

This discrete parameter indicates the status of the re-circulation switch. When the switch is held down the reading will change from OFF to ON and when the switch is released it will revert back to OFF.

**RECRC DR ACT\_\_\_\_XXX** (range: )

**RECRC DR TGT\_\_\_\_XXX**

This parameter indicates the commanded position of the re-circulation door.

<u>      </u>	<u>Display</u>	<u>Recirc Door Position</u>
	CLSD	closed
	OPEN	open
	MVNG	moving
	PARK	door in park position

**REDUCED POWER** (range: ACTIVE/INACTIVE)

This parameter indicates whether the PCM is receiving a signal from the TAC module that a throttle actuator control system fault is occurring.

REDUCED POWER reads as follows:

- ACTIVE if a fault occurs and the PCM limits the engine power.
- INACTIVE under normal conditions.

**REF (V)\_\_\_\_XX.X** (range: 0 to 25.5)

This parameter indicates battery voltage at the Air Conditioning module.

**REMOTE BOOT SIGNAL\_\_XX** (range: YES/NO)

This parameter shows whether the BCM has received a signal from the key remote requesting the boot to be unlocked. NO means no signal has been received and YES means the signal has been received.

**REMOTE KEY NUMBER\_\_XX** (range: 0 to 31)

This parameter shows the BCM number assigned to the remote key currently being used. It displays the number of the last key used and will change if another key assigned to the BCM is used. The BCM can have up to 31 keys assigned to it.

**RESTART CLSD LP\_\_XXX** (range: YES/NO)

This parameter indicates whether the system has gone into closed loop.

**REQ INJ BEGIN\_\_\_\_X.X** (range: unknown)

This analog parameter indicates the moment of diesel injection advance requested (REQ INJ BEGIN) by the PCM in crankshaft degrees.

**REQ TORQUE (Nm)** (range: 0 to 215)

This analog parameter displays the engine torque requested by the ABS/Traction Control module, if fitted. This parameter will be displayed even if traction control is not fitted to the vehicle.

**REQUESTED TORQUE (Nm)\_\_XX** (range: unknown)

This parameter indicates the delivery torque the ABS/ETC is requesting from the engine.

**REV** (range: N/A)

This analog parameter displays the revision number of the software in the airbag control module.

**REV POS SWITCH** (range: ON/OFF)

**REV SELECTED**

This discrete parameter indicates whether the contacts to the reverse position switch are closed or open. On a properly functioning vehicle, ON means the switch contacts are closed and the vehicle is in reverse.

**RevSel\_\_XXX** (range: ON/OFF)

This parameter indicates whether the gear selector is in reverse. ON means the gear selector is in reverse.

**RF HOL SOL** (range: ON/OFF)

**LF HOL SOL**

**RR HOL SOL**

**LR HOL SOL**

These discrete parameters display the commanded position of the hold solenoids for each of the four wheels hydraulic circuits. The hold solenoids hold pressure in the circuit allowing the wheel to rotate.

**RF\_PwrWdnw\_XXXX** (range: ENABLE/DISABLE)

The right front window has a one touch down feature. ENABLE means that this feature should be currently winding the window down.

**RF REL SOL** (range: ON/OFF)

**LF REL SOL RR REL SOL**

**LR REL SOL**

These discrete parameters display the commanded position of the release solenoids for each of the four wheels hydraulic circuits. The release solenoids release pressure from the circuit allowing the wheel to rotate.

**RF WNDW AUTO DN\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the Auto Down state for the left hand front door window whether it is.

**RFWindowDn\_XXX** (range: ON/OFF)

This parameter indicates the GEM command status for the right front window to wind down. If the system is functioning properly, YES means the window is winding down.

**RFWindowMotr(A)\_XX** (range: 0 to 64)

This parameter displays the amount of current flowing through the right front window motor during use.

**RFWindwPeak(A)\_XX** (range: 0 to 64)

This parameter displays the maximum amount of current drawn by the right front motor after use.

**RF WNDW UP SW\_\_\_\_\_XXX** (range: ON/OFF)

**RF WNDW DN SW**

This parameter shows the state of the power window switch for the left hand front door whether it is in the UP or DOWN position.



**RIGHT SOURCE BUTTON**

This parameter indicates whether the steering wheel right hand scroll wheel is being turned or not.

**RON CODING (V)** (range: 0 to 5.1)  
**OCTANE NO.** (range: 0 to 255)

This analog parameter displays the fuel type (RON) type it is set for. The voltage or number corresponds to a preset ECU value indicating what fuel type is selected. This is determined internally in the ECU or externally by a connector with a two way plug. The connector is usually located under the bonnet.

**RPM DSD\_XXXX** (range: unknown)

This parameter displays the desired engine idle RPM for the current conditions.

**RPM-F** (range: 0 to 2550)

This analog parameter is a measurement of the idle speed the engine is trying to maintain. “-F” notes that it is a “reFERENCE” RPM reading. If there is a large difference between actual RPM and RPM-F, the ECU may have reached its control limit without being able to control idle speed. This may be due to a basic mechanical or electrical problem with the engine.

**RPM\_XXXX** (range: 0 to engine maximum)

**ENGINE RPM\_XXXX**  
**ENG RPM\_\_XXXX**  
**CRANK A SENSOR**

RPM is the measurement of engine speed and is always shown at the left of the top line on the Scanner display. RPM is computed internally by the ECU, based on reference pulses from the ignition system or a crankshaft sensor.

**RR DMIST RLY\_\_\_XXX** (range: OFF/ON)

This parameter indicates the status of the rear window demister relay. ON indicates the relay is energised and the demister should be operating.

**RR O2 HTR (V)** (range 0 to 5.00)

This analog parameter displays the ECU command voltage to the rear oxygen sensor heater.

**RR O2S RICH**

**(range: ON/OFF)**

This parameter indicates the rich or lean status of the rear oxygen sensor. ON indicates a rich mixture and OFF indicates a lean mixture.

**RR WHEEL**

**(range: see text)**

This automatic transmission parameter indicates the vehicle speed in km/h. It uses the rear (RR) ABS wheel speed sensor as input to the auto trans ECU.

**RUN TIME(SEC)\_XXX**

**(range: 0 to 255)**

This parameter indicates the time in seconds that the engine has been running for since the last start-up. The timer runs from 0 to 255 seconds and then resets to 0, it does not measure total engine running time. The timer can be used to measure how long the engine took to reach closed loop status, or how quickly a certain temperature is reached. This parameter may not appear to count at a constant rate this is due to the vehicle rate of update of the information.

**S/C TARGET(MPH)\_\_XXX**

**(range: 0 to vehicle maximum)**

**S/C TARGET(KPH)\_\_XXX**

This parameter indicates the speed at which the cruise control is set by the driver. You can change measurement units on the Scanner from the CUSTOM SETUP menu.

**S/C VAC SOL\_\_XXXX**

**(range: OPEN/CLSD)**

**S/C VENT SOL\_\_XXXX**

The PCM sends output commands to the speed control (S/C) vacuum and vent solenoids to control the cruise control servo. The S/C VAC SOL and S/C VENT SOL readings should read ON whenever the solenoids are energized to increase or to vent vacuum. The S/C VAC SOL and S/C VENT SOL readings usually have the following relationships with throttle position control:

THROTTLE

S/C VAC SOL S/C VENT SOL POSITION

ON OFF Accelerate

ON or OFF ON Decelerate

OFF OFF Steady

**SCCS\_XXXXXX** (range: see below)

This parameter indicates the position of the driver-operated speed control switch (SCCS) mounted on the steering wheel. The SCCS parameter can display several range states according to which SCCS button is depressed:

OFF COAST ACCEL RESUME ON

Two hyphens (– –), the default range state, indicate that none of the speed control switch buttons are depressed.

**SCCS(V)\_XX.XX** (range: 0 to 10.00)

This parameter indicates speed control command switch (SCCS) voltage.

**SCSV-1** (range: ON/OFF)

**SCSV-2**

These parameters display the PCM/TCM command to the shift control solenoids 1 and 2. In a correctly operating transmission ON indicates the solenoid is on and OFF indicates the solenoid is off.

**SEAT BELT \_\_\_XXX** (range: ON/OFF)

**PASS BELT \_\_\_XXX**

This parameter displays the status of the seat belt warning lamp or LCD warning. It is controlled by the instrument panel and will flash when the ignition is first turned ON for a certain period of time.

**SeatBeltLamp\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status to the dash mounted seat belt lamp indicator. ON means the GEM has commanded the lamp to light.

**Secondary Air System Monitor (AIR)** — Monitors the function of the secondary air system, and tests the ability of the AIR system to inject air into the exhaust. This monitor relies on O2 sensor feedback to determine the presence of air flow. Inputs from the ECT, IAT, and CKP sensors, and the O2 sensor monitor are required to enable the AIR monitor.

**SECURITY LED \_\_\_XX** (range: ON/OFF)

This parameter displays the status of the dash mounted security LED. OFF means the LED is off and ON means the LED is ON. The LED may switch from off to on quite quickly and may not always register on the SCANNER screen.

**SELECTOR A**

**SELECTOR B**

**SELECTOR C**

**SELECTOR D**

(range: ON/OFF)

These discrete parameters indicate the ON/OFF condition of the selector switches. They are used to determine the position of the gear selector lever.

**SELF DIAG LAMP**

(range: ON/OFF)

On vehicles with a Powershift Lamp this parameter may indicate the presence of a transmission diagnostic trouble code and the status of the Powershift Lamp. ON means either a transmission DTC has set or the PowerShift Lamp is on or both. OFF means that no transmission codes have set and that the PowerShift Lamp is extinguished.

On vehicles equipped with an O/D OFF lamp this parameter may indicate the presence of a transmission diagnostic trouble code and the status of the O/D OFF lamp. ON means either a transmission DTC has set or the O/D OFF lamp is on or both. OFF means that no transmission codes have set and that the O/D OFF lamp is extinguished.

**SERV CHK SIG**

(range: OPEN/CLSD)

This discrete parameter indicates whether the PCM is sensing that the service check signal terminal has been shorted. The service check signal terminal is the 2-pin terminal that is shorted to produce manual code output from the PCM. OPEN indicates the terminal is not shorted and CLSD indicates that it has been shorted.

**SHIFT A(%)\_\_\_XXX**

(range: 0 to 100)

**SHIFT B(%)\_\_\_XXX**

**SHIFT C(%)\_\_\_XXX**

This analog parameter displays the duty cycle on time for the indicated shift solenoid.

**SHIFT LIGHT\_\_\_XXX**

(range: ON/OFF)

This parameter is displayed on some late-model vehicles with manual transmissions. It is an output command from the ECU to the instrument panel lamp. The ECU determines whether the lamp should light based on engine and vehicle speeds and engine load. SHIFT LIGHT\_\_\_ON means that the SHIFT lamp on the panel should be lit. If it is not, there is a problem in the lamp circuit or with the ECU command.

**SHIFT OVERRIDE**

(range YES/NO)

This discrete parameter shows whether the shift control solenoids have been overridden by the TCM/PCM from their normal operation. This usually occurs when the TCM/PCM detects a problem with shift solenoid operation.

**ShiftSol 1\_XXX**

(range: ON/OFF)

**ShiftSol 2\_XXX**

**ShiftSol 3\_XXX**

**ShiftSol 4\_XXX**

**ShiftSol 5\_XXX**

**ShiftSol 6\_XXX**

These parameters indicate the PCM command status for the indicated shift solenoids. ON means the PCM has commanded the shift solenoid to energize.

**ShiftSol 1A\_XXX**

(range: ON/OFF)

**ShiftSol 2A\_XXX**

**ShiftSol 3A\_XXX**

**Sol 1 ACTL\_XXX**

**Sol 2 ACTL\_XXX**

**Sol 3 ACTL\_XXX**

These parameters indicate the status of the indicated shift solenoids to the PCM. When the solenoid circuits and PCM function properly, the PCM command parameter, such as ShiftSol1, and the feedback parameter, such as ShiftSol1A, should simultaneously display ON or OFF.

**ShiftSol1Fault\_XXX**

(range: YES/NO)

**ShiftSol2Fault\_XXX**

**ShiftSol3Fault\_XXX**

These parameters indicate the presence of a fault in a shift solenoid circuit. YES means a fault is present.

**ShiftSol 6\_XXX**

(range: ON/OFF)

This parameter indicates the PCM command to the shift solenoid 6. ON means the PCM has commanded the solenoid to energise. Solenoid 6 is used to control high or low line pressure in vehicles equipped with the BTR automatic transmission.

**SHIFT SOL A** (range: ON/OFF)  
**SHIFT SOL B**  
**SHIFT SOL C**  
**SOL #1**  
**SOL #2**

These discrete parameters displays the ON/OFF state of the shift solenoids as commanded by the TCM/PCM.

Solenoid Application chart for Daewoo vehicles except Espero.

Gear	1	2	3	4
Solenoid A	ON	OFF	OFF	ON
Solenoid B	ON	ON	OFF	OFF

Solenoid application chart for Espero

Gear	1	2	3	4
Solenoid #1	OFF	ON	ON	OFF
Solenoid #2	ON	ON	OFF	OFF

**SIM IDLE POS SW** (range: ON/OFF)  
**SIM FULL POS SW**

The ECU uses the TPS signal to calculate a simulation for the throttle valve idle switch and throttle valve wide open switch. The ECU requires this information for idle air control (SIM IDLE POS SW) and for full load enrichment (SIM FULL POS SW).

**SIM PART POS SW** (range: ON/OFF)

This discrete parameter indicates whether the Simulated Partial Throttle Switch is ON or OFF. This value is calculated internally by the ECU based on throttle position input.

**SLIP RING ENBL\_\_\_\_XXX** (range: YES/NO)

This parameter displays the status of the ignition key slip ring, whether the theft deterrent has been disabled via the slip ring.

**SLN SOLENOID** (range: ON/OFF)

This parameter indicates the PCM command status for the modulated accumulator backpressure solenoid. This solenoid assures smooth shifting during normal shifts and lockup. If the system functions properly ON means the PCM has energised the SLN solenoid.

**SL SWITCH** (range: ON/OFF)

This parameter indicates the status of the stop light switch. ON indicates the switch contacts are closed and the brakes are applied, OFF indicates the switch is open and the brake pedal is not depressed.

**SLT SOLENOID** (range: ON/OFF)

This parameter indicates the PCM command status for the SLT solenoid. This solenoid modulates main line pressure. If the system functions properly ON means the PCM has energised the SLT solenoid.

**SMFR** (range: ON/OFF)

**SMFL SMR**

**SPFR SPFL**

**SRCF SRCR**

These discrete parameters display the solenoid state for the solenoids in the hydraulic brake booster. These solenoids control the brake line pressure in accordance to inputs to the ABS/traction control ECU's. ON indicates the solenoid has been commanded on and OFF indicates it is not being commanded on.

**SOL 1-2/3-4** (range: ON/OFF)

**SOL 2-3**

These discrete parameters indicate the whether the indicated solenoids are being commanded ON or OFF. They do not indicate the actual position of the solenoid valves.

Application table for Astra TR 1.6L

Gear:	1	2	3	4
Sol 1-2/3-4	OFF	ON	ON	OFF
Sol 2-3	ON	ON	OFF	OFF

**Sol 5(mA)\_XXX** (range: unknown)

This parameter indicates the PCM command to the variable Pressure Solenoid (VPS) 5. High mAmps readings indicate low line pressure and low mAmps readings indicate high line pressure. The readings on the Scanner may vary from the actual amperage if measured at the solenoid due to the PCM "boosting" the reading for the scan tool. The important part of the VPS operation is that it increases during gear shifts and when lower line pressures are desired.

**SOL LOCKUP** (range: ON/OFF)

This discrete parameter displays the ON/OFF state of the lockup solenoid, which controls the lock up of the torque converter clutch.

**SOL RELAY** (range: ON/OFF)

This discrete parameter shows the ABS ECU command to the ABS solenoid relay. ON means the relay is being energised on and OFF means the it is not being energised.

**SPARK ADV(°)\_XXX** (range: -90° to +90°)

**SPRKADV(°)**

SPARK ADV (°) is an analog output parameter from the PCM that indicates the total spark advance or retard being commanded by the PCM, *including* base timing.

**SPARK CTRL RET\_\_\_XXX** (range: YES/NO)

**SPARK CTRL ADV\_\_\_XXX**

This parameter indicates whether the vehicle control module (VCM) is commanding spark retard (RET) or advance (ADV).

**SPDO GAUGE (KPH)\_\_\_XX** (range: unknown)

This parameter displays vehicle speed as displayed by the instrument panel. It should read the same as the indicated speed on the speedometer.

**SpdSensWipr\_XXX** (range: ENABLE/DISABLE)

This discrete parameter indicates the status of the windshield wiper mode that makes wiper motion speed sensitive. When the system functions properly, ENABLE means the wiper motion speed increases and decreases with vehicle speed.

**SPILL V (°CA)** (range: 0 to 95)

This parameter displays the spill timing before top dead centre.

**SPORTS SEL** (range: ON/OFF)

This parameter indicates the whether the transmission gear lever is placed into the sports mode gate. ON indicates it is in “sports” mode position and should read OFF in all other positions.



**SPORTS UP**

(range: ON/OFF)

**SPORTS DN**

These two parameters indicate whether the transmission gear lever has been placed into up-shift (SPORTS UP) position or downshift (SPORTS DN) position.

**SRS\_\_\_\_\_XXX**

(range: ON/OFF)

This parameter displays the status of the SRS airbag warning lamp or LCD warning. The lamp will be ON for a short period when the ignition is first turned ON as a check to ensure the lamp is operating and while the airbag SDM (Sensing Diagnostic Module) is carrying out a system diagnostic. The lamp will illuminate when requested to by the airbag SDM or if communication with the airbag SDM is interrupted.

**SRS LAMP\_\_\_\_\_XXX**

(range: ON/OFF)

This parameter displays the current state of the SRS module's warning lamp internal driver. The lamp may not be illuminated on the dash but the SRS module is trying to switch it on if the parameter is displaying ON and the lamp is off. The warning lamp is usually located in the instrument panel. The warning lamp may be on while the SCANNER is communicating with the vehicle - this is normal for some SRS systems and does not indicate a fault is present.

**ST ALPHA(%)\_\_\_\_XXX**

(range: 0 to 200%)

**ST ALPHA B2(%)\_\_\_\_XXX**

The ST ALPHA(%) percentages represent the operation and short-term correction of the fuel-metering for a fuel-injected engine. These percentages also indicate whether the PCM is commanding a rich or a lean mixture. ST ALPHA(%) relies on the oxygen sensor (O2S) installed in bank 1, that bank where the number 1 cylinder is located. ST ALPHA B2(%) relies on the O2S installed in bank 2, that bank opposite to the bank where the number 1 cylinder is located. The ST ALPHA(%) number can range from 0% to 200% with 100% as the midpoint. At 100% the PCM is not adjusting the injector pulse width or the engine is running in a fail-safe mode. At a percentage above 100, the engine is running lean while the PCM is commanding a short-term rich mixture correction. At a percentage below 100, the engine is running rich while the PCM is commanding a short-term lean mixture correction.

**START CLNT (°C)\_\_\_\_XXX** (range: -40 to 199)

**START CLNT (°F)\_\_\_\_XXX** (range: -40 to 389)

On some vehicles, the ECU checks the coolant temperature sensor (CTS) reading at the moment the ECU is turned on. The ECU then stores this reading in memory until the next time the engine is stopped and restarted. If the engine has not run for several hours, the coolant temperature may be close to ambient air temperature. It will be much higher in the case of a hot restart.

Compare the START CLNT reading to the coolant temperature reading immediately after startup. With a cold engine the two readings should be equal. The coolant temperature reading should rise as the engine warms up. The START CLNT reading should not. If both readings stay the same, there is a problem in the sensor circuit.

**START ENABL\_XXX** (range: ON/OFF)

This parameter indicates the status of the theft deterrent system as to whether the engine is enabled to start. ON indicates it is enabled to start and OFF indicates it is not enabled. Note that this parameter will read OFF once the engine is running.

**START ENRICH** (range: ON/OFF)  
**WARMUP ENRICH**

These discreet parameters indicate the ECU control status (mode) of the fuel injection system. During either of these modes, the ECU monitors ignition, water and air temperature, airflow, TPS, and O2 sensor data to control injection pulse width, timing and idle speed.

**STARTER\_\_XXX** (range: ON/OFF)

**STA SIGNAL**

This parameter indicates when the starter is engaged (engine cranking). The ECU increases fuel-injection volume during engine cranking.

**STARTER RELAY\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the starter relay. OFF means the theft deterrent system has disabled the relay so the vehicle cannot be started, ON means the theft deterrent system has enabled the relay so the vehicle can be started.

**START SIGNAL** (range: ON/OFF)

This parameter indicates the status of the starter motor signal to the ECU, when it displays ON the ECU will modify the amount of fuel injected.

**STATUS B1\_XXXXXXXX** (range: see below)

This parameter indicates the operating status of fuel bank 1. Readings can be CL (closed-loop), OL (open-loop), OL DRIVE, OL FAULT, and CL FAULT.

**STD LAST ADAPT** (range: YES/NO)

This discrete parameter indicates whether the last gear change was an adaptive shift or standard. YES indicates that the adaptive function was active and NO indicated that the shift was standard.

**STFT DELTA (%)\_\_XXX** (range: 0 to 100%)

**LTFT DELTA (%)\_\_XXX**

This is the difference in % of STFT/LTFT counts for each bank.

**STOP LAMP (Ma)\_\_\_\_\_XXX** (range: see text)

This analogue parameter displays the amperage draw of the stop lamps when ever they are used (when the brakes are applied). When the brake lamps are off the reading should be 0 (milliamps), when the brake pedal is depressed and the lamps are on the reading should be approximately 2100 milliamps (2.1 Amps).

**STOP LMP FAIL\_\_XXX** (range: ON/OFF)

**STOP LMP FUSE\_\_XXX**

This parameter displays the status of the stop lamp fail warning. The stop lamp fail warning is activated by the instrument panel when a brake light globe or fuse failure has occurred.

**STOP SW\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the stop switch. When the switch is off the parameter displays OFF, when the switch is on the display shows ON. The BCM is responding to the actual input state of the switch.

**STR CLM VOL UP\_\_\_\_\_XXX** (range: ON/OFF)

**STR CLM VOL DN**

**STR CLM VOL MD**

These parameters display the input state of the steering column audio switches to the audio system.

STR CLM VOL UP will display ON when the steering column volume up switch is depressed and OFF at other times.

STR CLM VOL DN will display ON when the steering column volume down switch is depressed and OFF at other times.

STR CLM VOL MD will display ON when the steering column mode switch is depressed and OFF at other times.

**STS LAMP \_\_\_\_\_XXX (range: ON/OFF)**

This parameter indicates the command state of the service throttle soon (STS) lamp.

**ST TRIM B1(%)\_\_XXX (range: -20% to +20%)**

**ST TRIM B2(%)\_\_XXX ST TRIM(%)\_\_XXX**

The short-term fuel trim (ST TRIM) numbers represent the operation and short-term correction of the fuel-metering for a fuel-injected engine. The ST TRIM numbers indicate whether the PCM is commanding a rich or a lean mixture.

Similar to long-term fuel trim (LT TRIM), the ST TRIM number can range from -20% to +20% with 000% as the midpoint. A number above zero percent indicates that the PCM has commanded a short-term rich mixture correction. A number below zero percent indicates that the PCM is commanding a lean mixture.

The ST TRIM numbers lead the long-term trim (LT TRIM) numbers. When a pattern or trend of short-term corrections to fuel-metering occur, LT TRIM responds with a similar correction.

You can compare ST TRIM numbers to injector on-time. Numbers above zero indicate increased on-time, while numbers below zero indicate decreased on-time. LT TRIM corrections operate only in closed loop. In open loop they revert to a fixed value.

**ST TRM AVG1 % \_\_\_\_\_XXX (range: 0 to 100)**

**ST TRM AVG2 % \_\_\_\_\_XXX**

These parameters indicate the average of the Short Term fuel trim cells. The cells are rated for the amount they are used, values around idle are worth more than extreme values, eg full rich during acceleration. So malfunctions in the idle range will affect the average more than malfunctions in the extreme ranges.

A negative percentage indicates that O2S feedback shows a rich condition so the PCM is commanding a lean mixture. A positive percentage indicates that O2S feedback shows a lean condition so the PCM is commanding a rich mixture. The numbers indicate cylinder bank 1 or cylinder bank 2. When the average of the cells reaches a predetermined high or low value a DTC will be set.

**SUNLOAD \_\_\_XXX** (range: unknown)

This parameter displays in steps the current sunload as measured by the sunload sensor. The sunload sensor is usually located on top of the dash board.

**SUP. KEY CODES \_\_\_XXX** (range: see text)

This parameter displays how many remote keys are recognised by the BEM.

**SVS LAMP** (range: ON/OFF)

This discrete parameter displays the commanded status of the Service Vehicle Soon (SVS) lamp.

**SWRL CON S/V1** (range: ON/OFF)

This discrete parameter indicates the control module command to the swirl control solenoid valve.

**SYNC \_\_\_XXX** (range: YES/NO)

This discrete parameter indicates whether the CaMshaft Position (CMP) sensor and the Crankshaft Postion (CKP) sensor are synchronised.

**SYSTEM STAT \_\_\_XXX** (range: ON/OFF)

This discrete parameter indicates the operational status of the ECC system. ON indicates the system is on and operating, OFF indicates the system is off.

**SYSTEM (V) \_\_\_XX.X** (range: vehicle voltage)

This parameter displays the system input voltage to the SRS module. The input voltage needs to above 9 volts and below 17 volts or a DTC may be set.

**TAIL LAMP (Ma) \_\_\_XXX** (range: see text)

This analogue parameter displays the amperage draw of the tail lamps when ever they are used (when the lights are switched on). When the tail lamps are off the reading should be 0 (milliamps), when the tail lamps are on the reading should be approximately 320 milliamps (0.32 Amps).

**TANK TEMP(°C)** (range: -30° to 224°C)

**TANK TEMP(°F)** (range: -22° to 435°C)

This parameter indicates the fuel temperature within the fuel tank. The PCM uses this parameter to accurately test and monitor the evaporative emissions system.

### **TARG.MAF(mg/T)**

This analog parameter displays the target amount of air expected at idle. It is measured in milligrams over time.

### **TARGET SPD**

**(range: 0 to vehicle max)**

This parameter is for vehicles equipped with cruise control. The value shown is the current speed (in km/h or MPH) at which the cruise control has been set at.

### **TANK SNSR (V)**

**(range: 0 to 10)**

This parameter displays the voltage signal from the fuel tank sensor to the ECU.

### **TCCA\_XXX**

**(range: ON/OFF)**

This parameter stands for torque converter clutch —actual state. It represents a feedback signal to the PCM indicating the status of the torque converter clutch. When the system functions properly, both the TCC SOL and TCCA parameters should simultaneously display ON or OFF.

### **TCC BRAKE SW**

**(range: YES/NO)**

This discrete parameter indicates whether the brake switch is being pressed or released. The TCM/PCM uses this information to control the TCC application.

### **TCC COMMAND \_\_\_XXX**

**(range: ON/OFF)**

### **SLU SOLENOID**

### **TCC SOLENOID**

This discrete parameter indicates the state of the PCM signal to the torque converter clutch (TCC). ON indicates the ECU has commanded the TCC to engage. OFF indicates the opposite. TCC engagement (lockup) depends on gear selection, speed, engine temperature and throttle position. The ECU grounds one side of the circuit that energizes the TCC solenoid. The circuit also must be completed by various transmission, speed, and brake switches to open the transmission hydraulic line and engage the TCC. Refer to TCC GROUNDED for more information.

### **TCC DUTY (%)**

**(range 0 to 100)**

### **TCC SOL (%)**

### **TCC(%)\_XXX**

This parameter shows the commanded duty cycle of the torque converter lock up clutch pressure control solenoid.

**TCC ENABLED\_\_XXX** (range: YES/NO)

This parameter indicates whether the TCC solenoid has been enabled by the PCM.

**TCCFault\_XXX** (range: YES/NO)

This parameter indicates the presence of a fault in the torque converter clutch circuit. YES means a fault is present.

**TCC FDBK\_\_XXX** (range: OFF(OPEN)/ON(CLOSED))

The SCANNER may display the value as TCC FEEDBACK (FDBK) and this represents the true electrical state of the solenoid and circuit.

**TCC GROUNDED\_\_XXX** (range: YES/NO)

This parameter is available on vehicles that have TCC solenoid voltage available at pin F of the ALDL connector. Because this parameter is not part of the serial data list, it will not appear in a data movie. The Scanner interprets the voltage at pin F as follows: no voltage (circuit closed to ground) equals an ON signal, high voltage (circuit open) equals an OFF signal. If pin F is not present or is open, the parameter will continuously read ON. ON indicates that the ECU has grounded its side of the circuit; it does not indicate that the circuit is complete. The circuit is not complete until all other switches in series are closed. This parameter is most useful to ensure that the ECU is not at fault when the TCC solenoid does not energize.

**TCC OVERRIDE** (range YES/NO)

This discrete parameter shows whether the torque converter control solenoid has been overridden by the TCM/PCM from its normal operation. This is usually done when a problem has been detected with the TCC by the TCM/PCM.

**TCC PWM ENABLED\_\_XXX** (range: YES/NO)

This parameter is the commanded state of the TCC pulse width modulation solenoid. ON indicates the TCC PWM is being commanded ON and OFF when it is not ON.

**TCC PWM SOL(%)\_\_XXX** (range: 0 to 100 percent)

The TCC PWM SOL percentage should read 100% when the solenoid valve is fully open to vent TCC pressure (TCC fully unlocked). The reading should be 0% when the solenoid valve is fully closed to hold pressure on the TCC (no venting, TCC fully locked). The readings should change steadily between 100% and 0% as the TCC engages and disengages.

**TCC RELEASED** (range: YES/NO)

**TCC LOCKED ON**

These two discrete parameters indicate whether the torque converter clutch is released or locked on as commanded by the TCM/PCM.

**TCC SLIP(RPM)\_\_\_XXX** (range: +254 to -256 rpm)

**TRANS SLIP(RPM)\_\_\_XXX**

This analog parameter indicates the difference between engine rpm and converter turbine rpm as the torque converter clutch engages and disengages. Engine rpm is the speed of the TCC input (impeller) vanes; transmission rpm is the speed of the converter output turbine (input shaft).

**TCC SOL (%)** (range: 0 to 100)

This parameter indicates the amount the torque converter clutch is applied via the solenoid. 0 is no application and 100 is maximum application.

**TCILFault\_XXX** (range: YES/NO)

This parameter indicates whether or not a fault has occurred in the Transmission Control Indicator Lamp circuit.

**TCV CUTY (%) — No description available.**

**TDC OFFSET(°)\_\_\_X.XX** (range: -4.00° to 4.00°)

This indicates the amount of offset needed to bring the engine up to topdead-centre. It is used to calculate injection timing and delivery.

**TEMP GAUGE (%)\_\_\_XXX** (range: 0 to 100)

This parameter indicates the temperature gauge reading on the instrument panel 0 percent is an cold and 100 percent is hot. The percentage reading should be consistent with the instrument panel fuel gauge display.

**TEMP KNOB POS(%)\_\_\_XXX** (range: 0 to 100)

This parameter displays the percentage position of the temperature control knob. 0% is cold and 100% is hot.

**TEST MODE** (range: ON/OFF)

This discrete parameter indicates whether the test mode for the ABS has been activated or not. ON means it is activated and NO means it is in normal operating condition.



**TEST MODE SIG** (range: ON/OFF)

This discrete parameter indicates whether the test mode connectors have been connected together. During normal vehicle operation this should be OFF, if the connector is connected the parameter will indicate ON. This connector will place the ECU into a special test mode that will affect normal vehicle operation. See the Subaru section in this reference manual for further information.

**TFT=TOT(V)\_X.XX** (range: zero to 5.10 volts)

This analog parameter indicates the transmission fluid temperature (TFT), sometimes referred to by Ford as the transmission oil temperature (TOT). The transmission fluid temperature sensor is a thermistor that changes resistance in response to temperature changes. The sensor resistance decreases as the fluid temperature increases. The resistance variation is converted into a voltage signal to the PCM. Typical operating range is from 0.60-volts at 90° C (194° F) to 3.88-volts at 0° C (32° F).

**TGV DRIVE** (range: ON/OFF)

This discrete parameter indicates the whether the ECU has switched the tumble generated valves drive ON or OFF.

**TGV OUTPUT** (range: ON/OFF)

This discrete parameter indicates the whether the ECU has allowed the operation of the tumble generated valves.

**TGV POS-L (V)** (range: 0 to 5.1)

**TGV POS-R (V)**

These analog parameters display the position of the tumble generated valves for the left inlet manifold and the right inlet manifold. These valves are used to control the inlet mixture on some vehicles. They will read approx 5 volts at key on engine off; and a about 0 to 1 volt at idle. The readings will vary as the vehicle is driven at various speeds and loads.

**TGT EGR (%)**

This analog parameter displays the TarGeT EGR percentage opening commanded by the PCM.

**THEFT DET\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the theft deterrent system. OFF means the theft deterrent system is and has enabled the PCM to be able start the vehicle.

**THEFT DET. STATUS \_\_\_\_\_XXX (range: ON/OFF)**

This parameter indicates the status of the Theft Deterent System. ON is OK to Start. OFF is No Start.

**THEFT-NO START \_\_\_\_\_XXX (range: YES/NO)**

This parameter displays the status of the theft deterrent system. YES means the theft deterrent system has determined a theft situation and disabled the PCM and the vehicle cannot be started.

**THROT CNTL(V) (range: 0 to 5)**

This analog parameter displays the command signal issued by the ECU to the throttle position motor.

**THROT RLY A (range: ON/OFF)**

This discrete parameter indicates the control module command to the throttle relay A.

**THROT STEPS (range: 0 to 255)**

This analog parameter displays in steps the opening of the throttle by the diesel ECU. The throttle position step is determined by inputs to the diesel ECU, coolant temperature, accelerator pedal position, engine RPM, etc.

**THROTTLE (°) \_\_XX.X (range: -9.8° to 90.0°)**

**THROTTLE (%) \_\_XXX (range: 0% to 100%)**

These analog parameters are values calculated by the ECU from throttle position sensor (TPS) voltage. They are displayed on many vehicles to indicate the amount of throttle opening.

Some vehicles display these values as degrees. THROTTLE(°) \_\_82 or more indicates wide-open throttle. Closed-throttle readings will vary because of the idle speed control (ISC) motor position and throttle body adjustments.

All other vehicles that display this parameter show it as a percentage from 0 to 100. The THROTTLE(%) parameter usually appears on a car with an autoranging TPS. The ECU resets the 0 to 100 percent range in relation to TPS voltage as new minimum and maximum TPS voltages are sensed by the system.

**THROTTLE SW\_\_XXXX** (range: CLSD/OPEN)

This discrete parameter indicates the position of the throttle switch inside the idle speed control (ISC) motor. THROTTLE SW\_\_CLSD indicates that the throttle is closed and the engine should be at idle speed (TPS should be less than 20°). THROTTLE SW\_\_OPEN indicates that the engine is off idle (TPS should be more than 20°).

**TIME\_\_\_\_\_XXXX:XX** (range: 0 to 1092:15) [18 hrs]

**TIME ON\_\_XXXX:XX**

On some late-model vehicles, the ECU continuously records minutes and seconds of engine running time, and the Scanner displays this as TIME. TIME is zero whenever the engine is not running. The Scanner will display TIME up to 1092 minutes and 15 seconds (over 18 hours). This feature can help you to isolate intermittent driveability problems that may occur within a time period after vehicle startup or after reaching cruising speed, for example.

**TIMING (°BTDC)** (range: -90° to +90°)

**TIME ON (HOURS)\_\_\_XX.XX** (range: 0 to 21.25)

This discrete parameter indicates the length of time since the PCM set the first airbag diagnostic trouble code.

**TIPTRONIC MODE SW** Range: On/Off

Indicates the mode of the transmission Tiptronic mode switch in the automatic transmission lever.

**TORQUE CONTROL** (range: ON/OFF)

This discrete parameter shows the status of the torque control strategy used by the transmission ECU. During gear changes under hard acceleration this parameter should indicate ON, otherwise it will show OFF.

**TORQUE CONTROL** (range: ON/OFF)

If pre-ignition (knocking) occurs during a gear change, this parameter signals the ECU to decrease the engine torque by retarding timing.

**TORQ CNTL SIG #1** (range: ON/OFF)

This discrete parameter displays whether torque control strategies are being enabled by the ECU. It is based on inputs from other sensors or systems.

**TORQ PERM** (range: ON/OFF)

This discrete parameter indicates the status of torque control system, whether permission is given for engine torque control or not. ON indicates permission is given and OFF indicates permission denied.

**TOTAL ECT OVERTEMP EVENTS** (range: 0 to 255)

Displays the number of times the engine has been over temperature due to engine coolant temperature related events.

**TOTAL FUEL OVERSPEED EVENTS** (range: 0 to 255)

Displays the number of times the engine has been overspeed due to fueling related events.

**TOTAL FUEL OVERTEMP EVENTS** (range: 0 to 255)

Displays the number of times the engine has been over temperature due to engine fueling related events.

**TOTAL IAT OVERTEMP EVENTS** (range: 0 to 255)

Displays the number of times the engine has been over temperature due to engine intake air temperature related events.

**TP/SHFT DN REQ** (range: YES/NO)

This parameter displays the downshift request from the TAP Shift System and reads as follows:

- YES when the amount of voltage measured at the remote shift selector input is equivalent to the voltage defined as a downshift request.
- NO when downshift is not currently requested.

**TP/SHFT UP REQ** (range: YES/NO)

This parameter displays the upshift request from the TAP Shift System and displays as follows:

- YES when the amount of voltage measured at the remote shift selector input is equivalent to the voltage defined as an upshift request.
- NO when upshift is not currently requested.

**TP MODE\_XXX** (range: see below)

**ThrPosMODE\_XXX**

This parameter is internally calculated by the PCM, based on the throttle position sensor voltage signal. At idle or during deceleration this parameter should read C/T (closed throttle). At cruise or during moderate acceleration this parameter should read P/T (part throttle). At de-choke on crank, A/C cutout, or during maximum acceleration this parameter should read WOT (wide-open throttle).

**TPS %\_XX** (range: 0 to 100)

This analog parameter displays the position as a percentage of the throttle position sensor. 0% indicates it is closed and 100% is fully open.

**TPS (V)\_X.XX** (range: 0 to 5.1 volts)

**MIN. TPS(V)\_X.XX**

**TP 1 (V)\_X.XX**

**TP 2 (V)\_X.XX**

The throttle position sensor (TPS) produces a voltage signal proportional to the throttle position. The signal tells the ECU how wide the throttle is open: Low voltage at closed throttle, high voltage at wide-open throttle. The full range of the TPS voltage readings available to the ECU is 0 to approximately 5.1 volts. A typical TPS voltage range might be approximately 0.5 volt at idle to 4.5 volts at wide-open throttle. The MIN TPS voltage is the base throttle position value used at idle. TP 1 and TP 2 are two sensors that work in tandem to verify the exact throttle position. They are often used with electronic throttle systems.

**TPS(%)\_XXX**

These analog parameters are values calculated by the ECU from throttle position sensor (TPS) voltage. They are displayed on many vehicles to indicate the amount of throttle opening. Some vehicles display these values as degrees. THROTTLE(°) \_\_82 or more indicates wide-open throttle. Closed-throttle readings will vary because of the idle speed control (ISC) motor position and throttle body adjustments. All other vehicles that display this parameter show it as a percentage from 0 to 100. The THROTTLE(%) parameter usually appears on a car with an autoranging TPS. The ECU resets the 0 to 100 percent range in relation to TPS voltage as new minimum and maximum TPS voltages are sensed by the system.

**TPS1 LRN MIN V** (range: 0 – 5)

This parameter displays the learned minimum voltage for TP (Throttle Position) sensor 1 as determined by the control module this ignition cycle.

**TPS2 LRN MIN V** (range: 0 – 5)

This parameter displays the learned minimum voltage for TP (Throttle Position) sensor 2 as determined by the control module this ignition cycle.

**TPS/8** (range: 0 to 8)

This parameter can indicate throttle position angle in 1/8 increments. For example 8 means the throttle plate is fully open, 4 means it is half (4/8) open and 1 would mean it is 1/8 open. It can also indicate throttle voltage output from 0 to 5.00 volts where 0 is closed and 5.00 is fully open.

**TPS LOAD (%)** (range: 0 - 100)

The TPS LOAD parameter is a processed throttle valve potentiometer signal calculated by the airflow meter (or MAP). This parameter is only used for electronic automatic transmissions. The TPS LOAD signal is used in conjunction with the engine load signal.

**TPS POWER (V)** (range: 0 to 5.00)

This parameter displays the supplied voltage to the throttle position sensor.

**TPS(V)\_\_\_X.XX** (range: 0 to 5.00 volts)

The throttle position sensor produces a voltage signal proportional to the throttle position; low voltage at closed throttle, high voltage at wide-open throttle.

**TRAC CNTRL OFF \_\_\_XXX** (range: ON/OFF)

This parameter displays the status of the traction Control OFF lamp or LCD warning. The traction Control OFF lamp is activated by the instrument panel based on a signal from the ABS/TC (anti-lock brake/traction control) ECU. Only applicable to vehicles fitted with Traction Control.

**TRAIL. FC OFF** (range: YES/NO)

This discrete parameter indicates the whether the ECU has allowed fuel cut during trailing throttle conditions.

**TRAILING THROT**

(range: YES/NO)

This discrete parameter indicates the whether the engine is running in a trailing throttle condition.

**TRANS (ABC)**

(range: 0 or 1 for each)

This discrete parameter indicates the position of each of the 3 pressure switches, A, B, C, in the pressure switch assembly. When the display is 0 this indicates the switch is off and when the display indicates 1 the switch is on. The switch states are invalid if there is no fluid pressure in the transmission (eg engine is off).

**TRANSFER (%)**

(range: 0 to 100)

This parameter displays the transmission ECU command to the transfer case pressure control solenoid. It is duty cycle type control where 0% is full pressure and 100% is lowest pressure.

**TRANS FLUID(°C)\_\_\_XXX**

(range: -50 to 170° C or -58 to 340 ° F)

**TRANS FLUID(°F)\_\_\_XXX**

**TRANS TEMP(°C)\_\_\_XXX**

**TRANS TEMP(°F)\_\_\_XXX**

**OIL TEMP(°C)\_\_\_XXX**

(range: -40° to 199°C)

**OIL TEMP(°F)\_\_\_XXX**

(range: -40° to 389°F)

**TFT(°C)\_\_\_XXX**

This parameter indicates the temperature of the transmission oil. The transmission controller calculates the value based on an analog voltage signal from a temperature sensor. You can change the measurement units on the Scanner from degrees Celsius (°C) to degrees Fahrenheit (°F) in Custom Setup. The preset value is °C.

**TRANS FLUID TEMP(V)\_\_\_X.XX**

(range: 0 to 5.12 volts)

**TrnFluidTmp(V)\_X.X**

TRANS FLUID TEMP(V) is displayed on some 1987 and later vehicles. It is an analog signal to the PCM from a thermistor temperature sensor in the transmission. At normal operating temperature, TRANS TEMP(V) should read below 1 volt. If the reading rises above 2.00 volts, the transmission may be overheating. The PCM will modify transmission and engine operation to try to cool the transmission.

**TRANS OIL TEMP SW**

(range: ON/OFF)

This discrete parameter indicates the current state of the transmission oil temperature switch. ON indicates that the switch is returning a high oil temperature reading.

**TRANS SLIP (RPM)**

**(range: 0 to 8192)**

This indicates the amount of slippage in rpm of the torque converter lock up clutch. This parameter shows the difference in speed of engine rpm and the transmission input rpm.

**TRIM B1-S1(%)\_\_XXX**

**TRIM B1-S2(%)\_\_XXX**

**TRIM B2-S1(%)\_\_XXX**

**TRIM B2-S2(%)\_\_XXX**

**TRIM B1-S3(%)**

**TRIM B2-S3(%)**

**TRIM B1-S4(%)**

**TRIM B2-S4(%)**

**(range: -100% to +99.2%, or N/A)**

These fuel trim numbers represent the operation and short-term correction of the fuel-metering for a fuel-injected engine. The TRIM numbers indicate whether the PCM is commanding a rich or a lean mixture in response to inputs from O2 sensors B1-S1 and B2-S1. Trim number prefixes B1 and B2 correlate to banks 1 and 2. Bank 1 is always the bank that contains the number 1 cylinder. TRIM number suffix S1 indicates a pre-catalyst O2 sensor input, while suffix S2 indicates a post-catalyst O2 sensor input.

TRIM numbers typically range from -20% to +20% with 000% as the midpoint. A number above zero percent indicates that the PCM has commanded a short-term rich mixture correction. A number below zero percent indicates that the PCM is commanding a lean mixture. During closed-loop operation, these TRIM numbers should closely follow ST TRIM B1 and ST TRIM B2. When a TRIM parameter displays N/A, the PCM does not support that specific parameter.

**TR=GEAR\_XXXXXX**

**(range: see below)**

Readings for this parameter can be: PRND, DRIVE2, DRIVE3, and DRIVE4.

**TRIP CMP RNG(K)\_\_\_\_XXX**

**(range: see text)**

This parameter displays the vehicle range in kilometers as calculated by the trip computer. The reading should be consistent with the trip computer reading.

**TRIP SW\_\_\_\_\_XXX**

**(range: ON/OFF)**

This parameter indicates the input status of the odometer trip reset switch on the instrument panel.



**TrnCtrlIndLamp\_XXX** (range: ON/OFF)

This parameter reads ON and an indicator lamp is lit when “Overdrive Cancel” is requested.

**TrnRange\_X.XX** (range: 0.0 to 5.0 volts)

This parameter displays a voltage reading that indicates the position of the transmission shift lever. Each position has a typical range, as follows:

- L** 0.29 to 0.79 volts
- D2** 1.29 to 1.53 volts
- OD** 1.88 to 2.29 volts
- N** 2.53 to 3.04 volts
- R** 3.43 to 3.78 volts
- P** 4.30 to 4.73 volts

**TUNER INCRS SW\_\_\_\_\_XXX** (range: ON/OFF)

**TUNER DECRS SW\_\_\_\_\_XXX**

These parameters display the input state of the audio system tuning switches.

TUNER INCRS SW will display ON when the + TUNING switch is depressed and OFF at other times.

TUNER DECRS SW will display ON when the — TUNING switch is depressed and OFF at other times.

**TURBINE RPM\_\_\_\_\_XXXX** (range: 0 to 8160)

**TURBINE\_\_\_\_\_XXXX**

This analog parameter displays the torque converter turbine RPM, this is used to determine the input speed of the automatic transmission.

**TURBO KPA\_XXX** (range: 0 to 255)

This parameter indicates the pressure in the intake being applied by the turbocharger system. The PCM uses this information to control turbo boost and other related control systems, eg fuel injection.

**TURB SHFT SPD** (range: 0 to 8192)

**INPUT RPM** (range: 0 to 8192)

**TurbSpdS(RPM)\_XXXX**

This parameter shows the speed of the transmission input shaft from the input shaft speed sensor. It is used by the TCM/PCM to determine shift speeds and in determining what gear the transmission is currently in.

**UD SOL DUTY(%)** (range: 0 to 100)

This analog parameter displays the duty cycle on time for the underdrive solenoid. In a correctly operating transmission this solenoid will show 0% in 1st, 2nd and 3rd gears, and up to 100% in 4th and reverse.

**UP SW** Range: On/Off

Indicates the mode of the transmission Up switch in the automatic transmission lever.

**V/F LEARNED** (range: 0 to 5V)

This parameter displays the learnt ECM air fuel ratio correction as per the table below.

**Table. Interpreting learned value.**

Vf1 Signal	Engine Condition	Fuel Trim (ECM Compensation)
~ 0 V	Rich	Go leaner - 11-20 %
~ 1.25 V	Slight Rich	Go leaner - 4-10 %
~ 2.5 V	Normal	Lean/rich $\pm$ (0-3) %
~ 3.75 V	Slight Lean	Go richer + (4-10) %
~ 5 V	Lean	Go richer + (11-20) %

**VAC CUT BYPASS** (range: ON/OFF)

This discrete parameter displays the PCM command to the vacuum cut bypass valve. Opening this valve allows the entire EVAP system to be leak checked. ON means the PCM has commanded the valve open.

**VALVE RELAY \_\_XXX** (range: OPEN/CLSD)

This parameter shows whether the relay that supplies power to the ABS hydraulic actuator solenoids is open or closed. The parameter should indicate CLSD with the ignition whether the ABS is active or not. If the parameter indicates open there could be a possible fault in the relay or the circuit controlling the relay.

**VAPOUR PRES VSV** (range: ON/OFF)

A vacuum switching valve (VSV) is used to actuate the vapour pressure valve. The vapour pressure valve allows the EVAP system to detect and isolate leaks. This parameter displays the PCM command to the VSV. When this parameter reads ON, the VSV opens the valve.

**VARIABLE INTAKE (range: YES/NO)**

This discrete parameter indicates the whether the ECU has enable the variable valve in the inlet manifold.

**VBattGEM(V)\_XX.X (range: 0 to 25V)**

This parameter displays battery voltage being supplied to the GEM module.

**VBATT(V)\_XX (range: 0 to 25 V)**

This parameter displays the battery voltage being supplied to the airbag module.

**VCT ADV\_XXX (range: -10 to 50)**

**VCT ADV 2\_XXX**

These parameters display the advance in degree's of the camshafts in engines equipped with Variable Cam Timing (VCT). Zero represents camshaft base timing without any advance or retard applied.

**VCT ADV ERR\_XXX (range: unknown)**

**VCT ADV ERR2\_XXX**

These parameters display the error advance in degree's of the camshafts in engines equipped with Variable Cam Timing (VCT). The error is the difference between what the PCM is commanding and what the advance actually is.

**VCT DC %\_XXX (range: 0 to 100)**

**VCT DC 2 %\_XXX**

These parameters display the PCM command to the duty cycle controlled Variable Camshaft Timing (VCT) solenoids. Zero percent represents camshaft base timing. The PCM will not vary the camshaft timing until the engine has warmed up and it is not idling.

**VCT SYS\_XXX (range: ON/OFF)**

This discrete parameter indicates the status of the Variable Camshaft Timing System, ON indicates it is in "closed loop" and the variable camshaft timing is active, OFF indicates the system is in "open loop" and the variable camshaft timing is not active. The VCT is normally not active until the engine has warmed up to a certain temperature and the engine is not idling. When the VCT is in closed loop mode it may not be actively adjusting the timing but it is prepared to do so.

**VEH SPEED(MPH)\_XXX** (range: 0 to vehicle maximum)

**VEH SPEED(KPH)\_XXX**

**VehSpdSensr\_XXX**

VEH SPEED is the measurement provided by the vehicle speed sensor (VSS) pulses to the ECU. The ECU calculates the actual speed. You can change the measurement units on the Scanner from miles per hour (MPH) to kilometers per hour (KPH). The preset value is MPH.

**VEH SPEED\_XXX – SOME ABS SYSTEMS** (range: 0 to vehicle max)

Vehicle speed is computed by the ABS module from the signals received from the four wheel speed sensors. The VEH SPEED reading is not taken from the vehicle speed sensor (VSS) used by the PCM, and it may not be the same as the speedometer reading. Abnormally high, low, or erratic readings usually are due to wiring problems or faults in one or more wheel speed sensors.

**VEH SPD PULSE** (range: YES/NO)

This discrete parameter indicates YES when the ECU has received a signal from the vehicle speed sensor and NO when there is no sensor signal.

**VENT CONT VALVE** (range: ON/OFF)

This parameter displays the PCM command status to the EVAP charcoal canister control valve. ON means the PCM has commanded the valve closed, preventing the canister from venting.

**VENT SOL 1 (%)** (range: 0 to 100)

This parameter indicates the control module duty cycle command to the vent solenoid. 0 is closed and 100 would be fully open.

**VGIS ENABLED** (range: YES/NO)

This discrete parameter indicates when the VGIS, Variable Geometry Induction System vacuum valve has been commanded on by the ECM/PCM.

**VPS (mA)\_X.XX** (range: unknown)

This parameter shows the commanded amperage of the pressure control solenoid by the TCM/PCM. It is used by the TCM/PCM to control pressure in the transmission.

**VPWR=BATT(V)\_XX.X** (range: 0 to 25.5 volts)

**VPoWeR(V)\_XX.X**

**VBATT(V)\_XX**

The powertrain control system has no specific sensor to measure battery voltage, but some PCM's calculate this analog parameter from a sensing circuit across the supply voltage circuit. Although the measurement range is 0 to 25.5 volts, the reading should be close to normal charging system regulated voltage with the engine running. This is typically 13.5 to 14.5 volts at idle. Check the reading against actual voltage measured at the battery or alternator. Check vehicle specifications for exact values.

The battery voltage parameter is used principally for PCM self-diagnostics.

Some PCM functions will be modified if voltage falls too low or rises too high. For example, if voltage drops below a minimum value, the PCM will try to recharge the battery by running the engine at a higher idle speed. This may affect the idle speed control, fuel metering, and ignition timing parameters.

**VREF(V)\_X.XX** (range: 0 to 5.12)

On some vehicles, the SCANNER will display the reference voltage on which system sensors operate. The PCM monitors this voltage and provides the parameter on the data stream. The nominal reference voltage is 5.0 volts, but it may vary by a few tenths of a volt, depending on system calibration and charging system voltage.

**VSC/TRC SW** (range: ON/OFF)

This discrete parameter shows the input of the vehicle stability control or traction control switch to the ABS ECU. ON means the switch is on and OFF means the switch is off.

**VSS#1** (range: 0 to 255 or 510 km/h)

**VSS#2**

These parameters indicate the speed of the vehicle and are based on inputs from the two speed sensors.

**VS SET(KPH)\_XXX** (range: see below)

This analog parameter displays the speed setting for the cruise control when fitted to the vehicle. The range is dependant upon what speed has been set by the operator. This parameter may appear on the SCANNER even though the vehicle may not have cruise control.

**VSS\_GEM\_XXX** (range: 0 to 120 mph)

This parameter displays the vehicle speed sensor (VSS) signal being supplied to the GEM module in mph.

**VSS(KPH)** (range: 0 to vehicle maximum)

**VSS(MPH)**

This analog parameter indicates the vehicle speed in kilometres per hour or miles per hour. The reading is taken from the revolution or speed sensor mounted on the transmission.

**VSS(METER)(KPH)** (range: 0 to vehicle maximum)

**VSS(METER)(MPH)**

These analog parameters display the digital input from the VSS analog-todigital converter in the instrument meter.

**VSS(TRANS)(KPH)** (range: 0 to vehicle maximum)

**VSS(TRANS)(MPH)**

This analog parameter displays the vehicle road speed taken from the revolution sensor at the transmission and calculated by the PCM.

**VTD FUEL\_\_\_\_\_XXX** (range: YES/NO)

This parameter indicates that the PCM has not received the correct vehicle theft deterrent (VTD) system password from the BCM and has disabled the fuel system.

**VVT GAP ( )** Range: unknown

Indicates the amount of variable valve timing being applied.

**WAC=WOT A/C\_XXX** (range: ON/OFF)

This parameter indicates whether the PCM is preventing the A/C system from operating due to undesirable engine conditions. These conditions include operation during engine cranking and wide open throttle.

On almost all vehicles, OFF means the PCM senses undesirable conditions and is currently preventing the A/C clutch from energizing.

ON means the PCM is allowing the A/C clutch to energize.

**WARM UP SW** (range: YES/NO)

This discrete parameter indicates the position of the dash mounted warm up switch. If the driver controlled switch is turned on then YES will be displayed, if the switch is off then NO will be displayed.

**WASHER PMP DRV\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the windscreen washer motor driver. ON indicates the BEM is commanding it on switch, OFF indicates it is not.

**WASHER PMP SW\_\_\_\_\_XXX** (range: ON/OFF)

This parameter displays the state of the windscreen washer motor switch. ON indicates the switch is active, OFF indicates it is not.

**WasherPumpRly\_XXX** (range: ON/OFF)

This parameter indicates the GEM command status to the washer pump relay. When the system functions properly, ON means the GEM module has energised the relay solenoid, closing the relay contacts.

**WasherPumpSw\_XX** (range: ON/OFF)

This discrete parameter indicates the status of the driver operated washer pump switch. ON means the switch contacts are closed.

**WASTEGATE(%)\_\_\_\_\_XXX** (range: 0 to 100)

This parameter is used on turbocharged fuel-injected engines. A PCM operated solenoid directs manifold pressure to the wastegate diaphragm. The solenoid cycles on and off at a fixed frequency, but the PCM varies the duty cycle of the signal.

The duty cycle percentage is directly proportional to wastegate opening and the amount of excess manifold pressure vented to the atmosphere. This parameter indicates the output command from the PCM to the control solenoid. When the reading is low very little boost pressure is vented. When it is high, more boost pressure is vented.

**WATER VLV\_\_\_\_\_XXX** (range: OFF/ON)

This discrete parameter indicates whether the coolant valve control solenoid has been energised or not to allow coolant to flow through the heater core.

**WIDE OPEN THROT\_XXX** (range: YES/NO)

This discrete parameter on many engines indicates maximum throttle opening when WIDE OPEN THROT\_YES is displayed. The engine must be running for this parameter to change from NO to YES. With the key on and the engine off, a fully open throttle should produce a maximum TPS voltage indication; but WIDE OPEN THROT should read NO.

**WINDOW DOWN SW\_\_\_\_\_XXX (range: ON/OFF)**

This parameter shows the state of the right hand front power window switch. When the switch is the rest or in the up position the display shows OFF, when the power window switch is switched to the down position the display changes to ON. The BCM is responding to the actual input state of the switch.

**WINDOW UP SW\_\_\_\_\_XXX (range: ON/OFF)**

This parameter shows the state of the right hand front power window switch. When the switch is the rest or in the down position the display shows OFF, when the power window switch is switched to the up position the display changes to ON. The BCM is responding to the actual input state of the switch.

**WINTER SW (range: ON/OFF)  
WINTER LAMP**

These discrete parameters indicate the position of the winter switch (located on the base of the gear lever) and whether the transmission ECU is in winter mode. With the engine off and ignition on and P selected the winter lamp should switch ON and OFF as the winter switch is toggled. The winter switch will only indicate ON while it is held down.

**Wiper2SpdRly\_XXX (range: ON/OFF)**

This parameter indicates the status of the two-speed (high) wiper relay. When the system functions properly, ON means the relay contacts are closed, allowing the wipers to operate at high speed.

**WIPER IN PARK\_\_\_\_\_XXX (range: YES/NO)**

This parameter displays the state of the windscreen wiper motor, whether it is in PARK position or not.

**WIPER PARK SW\_\_\_\_\_XXX (range: ON/OFF)**

This parameter displays the state of the windscreen wiper motor park switch. The parameter is OFF when the switch is open and the wipers are operating and is ON when the switch is closed and the wipers are parked. The BCM is responding to the actual input state of the switch.

**WiperPk-Pk(ms)\_XXX (range: 0 to 255)**

This parameter displays the windshield intermittent delay.



**WiperRunRly\_XXX** (range: ON/OFF)

This discrete parameter indicates the GEM command status to the wiper run relay. When the system functions properly, ON means the GEM module has energised the relay solenoid closing the relay contacts.

**WIPR MTR ACTV\_\_\_\_\_XXX** (range: YES/NO)

This parameter displays the state of the windscreen wiper motor, whether it is active or not. This parameter may not appear to switch during wiper operation depending on the system.

**WIPR RUN DRV\_\_\_\_\_XXX** (range: YES/NO)

This parameter displays the state of the windscreen wiper motor driver.

**WOT SW** (range: ON/OFF)

This discrete parameter is calculated by the PCM. When functioning properly ON means that the throttle plate is wide open.

**YAW RATE(°)** (range: unknown)

**YAW ZERO(°)**

These parameters indicate in degrees the yaw rate as calculate by the ABS ECU from sensor inputs. Yaw is a measurement of the vehicles body movement during cornering. It is used to control vehicle stability and ABS operation.

**YAW RATE SEN** Range: NORM, OPEN

Indicates the yaw rate sensor open detection, NORMAL: Normal condition.

**YAW RATE SENS 1** Range: min: -128 deg/s; max: 127 deg/s

Indicates the yaw rate sensor 1, in degrees per second.

**YAW RATE SENS 2** Range: min: -128 deg/s; max: 127 deg/s

Indicates the yaw rate sensor 2, in degrees per second.

**YAW RATE VALUE** Range: min: -128 deg/s; max: 127 deg/s

Indicates the yaw rate value, in degrees per second.

**YAW ZERO VALUE** Range: min: -128 deg/s; max: 128 deg/s

Indicates the memorized zero value output, in degrees per second.

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**AUSTRALIAN DATA PARAMETERS MANUAL**

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