2004 6.6L Duramax Diesel (LB7) C/K-truck
ENGINE DIAGNOSTIC PARAMETERS

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMINATION
Camshaft Position [CMP] Sensor Correlation	P0016	CAM edges in one crank revolution =3	0 < CAM edges in one crank revolution < 3	Ignition On Not in powerdown mode In Syncro_Mode Powerup time>=0.5sec	15 failures out of 35 samples	Check number of CAM edges	B
Variable Nozzle Turbo(VNT) Solenoid Circuit Fault	P0045	ECM reports no faults on the output driver or 10 a/d counts < measured current < 1000 a/d counts	ECM reports faults on the output driver or measured current <10 a/d counts measured current > 1000 a/d counts	Engine Run Time > 30 sec	Diagnostic set conditions true for for 2 seconds Test performed continuously	VNT Solenoid	B
Variable Nozzle Turbo(VNT) Open/Close Performancet	P0046	Value for VNT Position sensor when vanes are open: 67 < ad counts < 366 Value for VNT Position sensor when vanes are closed: 571 < ad counts < 980	Value for VNT Position sensor when vanes are open: ad counts < 67 or ad counts > 366 Value for VNT Position sensor when vanes are closed: ad counts <571 or ad counts > 980	Ignition is on and VNT open/close position learning complete and Device control=Not active and P2563,P2564,P2565 are not set.	Diagnostic set conditions true for for .016 seconds Once per ignition cycle	VNT Position when ECM is commanding vanes open or vanes closed.	B
Fuel Rail Pressure [FRP] Too Low	P0087	Rail pressure should be higher than minimum commanded rail pressure minus possible transitional undershoot	rp < 0.0MPa :0-400rpm 22.5MPa:600-4000RPM 30.0MPa :over 4000RPM	No related malfunction (RPS_LOP0192, RPS_HIP0193, 5VB1_circuit_LOP0642, 5VB1_circuit_HIP0643) Rail Pressure Feedback Mode Key_on_time>0.125 Sec. Fuel_Mode Rail Pressure>0MPa Device control=Not active	99 Failure out of 100 sample	Rail Pressure sensor	A
Fuel Rail Pressure [FRP] Too High	P0088	Rail pressure should be higher than minimum commanded rail pressure minus possible transitional undershoot	Case.1 rp > 167MPa Case.2 rp > 190MPa	No related malfunction (RPS_LOP0192, RPS_HIP0193, 5VB1_circuit_LOP0642, 5VB1_circuit_HIP0643) not in Power_Down_Mode Rail Pressure Feedback Mode Key_on_time>0.125 Sec. Device control=Not active	Case.1 49 Failure out of 50 sample Case.2 49 Failure out of 50 sample	Rail Pressure sensor	A
Fuel Pressure Regulator Performance	P0089	Positive rail pressure error should be within 20MPa, Commande pump fuel flow>100mm3/sec	rp -Drp > 20MPa and cmdpumpflow <= 100mm3/sec	No related malfunction (RPS_LOP0192, RPS_HIP0193, 5VB1_circuit_LOP0642, 5VB1_circuit_HIP0643, ~~RPCV~~) Rail Pressure Feedback Mode Key_on_time>0.125 Sec. Fuel_Mode Not in Bankshutoff Mode Device control=Not active	110 Failure out of 120 sample	Rail Pressure sensor and Commanded Pump Fuel Flow	A

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Fuel Pressure Regulator Control Circuit	P0090	50mA<RPCV_Current<1600mA	|rpcv_current_error| > 500 mA Counts or rpcv_current > 480 AD Counts or rpcv_current < 13 AD Counts	IGNITION ON EDU/RPCV Relay on Not in Powerdown_Mode Key_on_time>0.125 Sec. Cmd_RPCV_Current<=1500mA Cmd_RPCV_Current>=400mA	49 Failure out of 50 sample	RPCV current	A
Fuel Rail Pressure Low During Power Enrichment	P1093	Negative rail pressure error should be within 20MPa Commanded pump flow should be lower than pump capability	Drp - rp > 20MPa:0-2200rpm 30MPa:2400rpm-5000rpm and cmdpumpflow >= 10000:0-400rpm 11030:400rpm 15000:600rpm 19200:800rpm 23400:1000rpm 27600:1200rpm 31800:1400rpm 36000:1600rpm 40200:1800rpm 44400:2000rpm 48600:2200rpm 54000:2400rpm 54000	No related malfunction (RPS_LOP0192,RPS_HIP0193, 5VB1_circuit_LOP0642, 5VB1_circuit_HIP0643) Rail pressure Feedback Mode Key_on_time>0.125Sec. Fuel_Mode Device control=Not active	49 Failure out of 50 sample	Rail Pressure sensor and Commanded Fuel flow to pump	A
Fuel Rail Pressure [FRP] Sensor Circuit Low Voltage	P0192	0.1 Volt to 4.9 Volt	rp_ad <= 42 AD Counts	No related malfunction (5VB1_circuit_LOP0642, 5VB1_circuit_HIP0643) IGNITION is ON not in Power_Down_Mode Key_on_time>0.125 Sec.	19 Failure out of 20 sample	Piezo Pressure Sensor	A

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Fuel Rail Pressure [FRP] Sensor Circuit High Voltage	P0193	0.1 Volt to 4.9 Volt	rp_ad >= 963 AD Counts	No related malfunction (5VB1_circuit_LOP0642, 5VB1_circuit_HP0643I) IGNITION is ON not in Power_Down_Mode Key_on_time>0.125 Sec.	19 Failure out of 20 sample	Piezo Pressure Sensor	A
Injector 1 Control Circuit	P0201	No Error Message from EDU	"#1 Load Drop" or "#1 HSD Over current" or "#1 LSD Overcurrent" or "Bank1 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 2 Control Circuit	P0202	No Error Message from EDU	"#2 Load Drop" or "#2 HSD Over current" or "#2 LSD Overcurrent" or "Bank2 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 3 Control Circuit	P0203	No Error Message from EDU	"#3 Load Drop" or "#3 HSD Over current" or "#3 LSD Overcurrent" or "Bank2 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 4 Control Circuit	P0204	No Error Message from EDU	"#4 Load Drop" or "#4 HSD Over current" or "#4 LSD Overcurrent" or Bank1 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 5 Control Circuit	P0205	No Error Message from EDU	"#5 Load Drop" or "#5 HSD Over current" or "#5 LSD Overcurrent" or "Bank2 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 6 Control Circuit	P0206	No Error Message from EDU	"#6 Load Drop" or "#6 HSD Over current" or "#6 LSD Overcurrent" or "Bank1 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 7 Control Circuit	P0207	No Error Message from EDU	"#7 Load Drop" or "#7 HSD Over current" or "#7 LSD Overcurrent" or "Bank1 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A

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Injector 8 Control Circuit	P0208	No Error Message from EDU	"#8 Load Drop" or "#8 HSD over current" or "#8 LSD Overcurrent" or "Bank2 Booster Low"	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector 1 Output Circuit (R/C)	P1223	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B
		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 2 Output Circuit (R/C)	P1226	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B
		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 3 Output Circuit (R/C)	P1229	No Error Message from EDU	Short High Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B
		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 4 Output Circuit (R/C)	P1232	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B

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		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 5 Output Circuit (R/C)	P1235	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B
		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 6 Output Circuit (R/C)	P1238	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B
		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 7 Output Circuit (R/C)	P1241	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B
		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector 8 Output Circuit (R/C)	P1244	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	OUTD Mornitoring in ECM	B

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		1<=Number of injection pulses<=2 when ECM request injection to EDU	"Illegal Req.(too long/short/close)" or "wrong segment Req. " or "simultaneous Req. " or "number of pulse > 2 or < 1 if rpm> 300rpm and bp>5mm3/st and bpw>60us and blankshot not active	IGN on Poweruptime>0.5sec CAN MSG from EDU is valid Not in Poweroff Mode rpm>300rpm	130 out of 150 (Every 32ms)	Mornitoring in EDU and message transferred via CAN	
Injector Positive Voltage Control Circuit Group 1	P2146	No Error Message from EDU	"HSOC #1 or #4 or #6 or #7" or "LSOC #1 or #4 or #6 or #7" or "Boost low EDU Bank 1" or "load drop #1 or #4 or #6 or #7"	CAN MSG from EDU is valid IGN on Power up time>0.5sec Not in Power off Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Injector Positive Voltage Control Circuit Group 2	P2149	No Error Message from EDU	"HSOC #2 or #3 or #5 or #8" or "LSOC #2 or #3 or #5 or #8" or "Boost low EDU Bank 2" or "load drop #2 or #3 or #5 or #8"	CAN MSG from EDU is valid IGN on Power up time>0.5sec Not in Power off Mode	20 out of 40 (32ms)	Mornitoring in EDU and message transferred via CAN	A
Engine Misfire Detected	P0300	# of detected misfire cylinders =< 1	Number of detected misfire cylinders > 1	Misfire Test Completed=TRUE	once per ignition cycle	Cylinder engine speed and cylinder fuel rate	B
Cylinder 1 Misfire Detected	P0301	Cylinder #1 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #1 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition cycle\\	Cylinder engine speed and cylinder fuel rate	B
Cylinder 2 Misfire Detected	P0302	Cylinder #2 fuel rate adjustment < 14.5 mm3/stroke	Cylinder 2 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition cycle\\	Cylinder engine speed and cylinder fuel rate	B

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Cylinder 3 Misfire Detected	P0303	Cylinder #3 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #3 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition	Cylinder engine speed and cylinder fuel rate	B
Cylinder 4 Misfire Detected	P0304	Cylinder #4 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #4 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition cycle\\	Cylinder engine speed and cylinder fuel rate	B
Cylinder 5 Misfire Detected	P0305	Cylinder #5 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #5 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition	Cylinder engine speed and cylinder fuel rate	B
Cylinder 6 Misfire Detected	P0306	Cylinder #6 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #6 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition cycle\\	Cylinder engine speed and cylinder fuel rate	B

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Cylinder 7 Misfire Detected	P0307	Cylinder #7 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #7 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition cycle\\	Cylinder engine speed and cylinder fuel rate	B
Cylinder 8 Misfire Detected	P0308	Cylinder #8 fuel rate adjustment < 14.5 mm3/stroke	Cylinder #8 fuel rate greater than desired fuel rate by >= 14.5 mm3/stroke	P0335,P0336,P0116,P0117,P0118 are not set. Coolant temperature >= 55.5degC Engine mode =Idle mode (rpm<=930rpm and vhecle speed<=100MPH) Cylinder Balancing=Enable. (104degC>Coolant temp>=-30degC and APS <1% and 200rpm< =rpm <=1000rpm and vhecle speed <=1MPH and fuel >=3 mm^3/st) Device control=Not act	Each Test performed for10 seconds if pending fail counter>=2 Report Diagnostic Failed if Pending Passed Counter>=2 ReportDiagnostic Passed Max thtee test performed per ignition cycle\\	Cylinder engine speed and cylinder fuel rate	B
Crankshaft Position [CKP] Sensor Circuit	P0335	Hall Effect Sensor	No Crank Edge counter >=5	CAM is rotating Ignition ON Key_on_time>0.5sec Not in powerdown mode	60 failures out of 80 samples. Samples are taken every 31.6 ms	Checks the number of Crank pulses every 7.8 ms	B
Crankshaft Position [CKP] Sensor Performance	P0336	Hall Effect Sensor 57 pulses and gap per 1 crank revolution	Number of teeth between gap and gap is not equal to 57 but not equal to 0	Ignition ON Key_on_time>0.5sec Not in powerdown mode As soon as a synch tooth is detected	15 failures out of 20 samples	Checks the number of Crank pulses between the last synch event and the	B
Camshaft Position [CMP] Sensor Circuit	P0340	Hall Effect Sensor	No CAM interrupts received in 2 seconds.	Engine speed > 60rpm Ignition ON Not in Power down mode Key_on_time>0.5sec	60 failures out of 80 samples. Samples are taken every 31.6 ms.	Checks CAM interrupts every 7.8 ms	A
Camshaft Position [CMP] Sensor Performance	P0341	10 <= Crank tooth at CAM edge <= 14	14 < Crank tooth at CAM edge or Crank tooth at CAM edge < 10	Ignition On Not in powerdown mode Keyontime>0.5sec Engine speed > 60rpm No related malfunction In Syncro_Mode	15 failures out of 20 samples Every crank revolution	Check crank tooth number at CAM edge	B
High Resolution Circuit	P0370	Buffered Signal of Hall Effect Sensor	Message has the 'No crank signal' bit on.	Engine speed >= 60rpm Ignition ON Key_on_time>0.5sec Not in Power down mode	100 failures out of 120 samples. Samples are taken every 31.6 ms.	Monitored by EDU and message transferred by CAN	A
High Resolution System Performance	P0374	Buffered Signal of Hall Effect Sensor	Message has the '57X Signal Implausible' bit on.	Engine speed >= 60rpm Ignition ON Key_on_time>0.5sec Not in Power down mode	100 failures out of 120 samples. Samples are taken every 31.6 ms.	Monitored by EDU and message transferred by CAN	A

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Wait to Start Lamp (WTS) Control Circuit	P0381	Ignition voltage between 6 and 18 volts	WTS Output WTS fail counter incremented if WTS output driver indicates a fault condition (open/short ckt)	Ignition on Ignition voltage between 6 and 18 volts	Greater than or equal to 5 fail counts WTS Output monitored at least every 500 msec		B
Fuel Injector Control Module Performance	P0611	No Error Message from EDU	Micro.C or MM defective" or "A/D conversion SRC violation" or Monitoring HW defect. if 10 <= battery voltage <= 18 or "A/D conversion Timeout Error"	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode CAN MSG is Valid Engine Speed >= 0rpm	30 out of 50 (Every 125ms)	Monitored by EDU and message transferred by CAN	B
Fuel Injector Control Module Relay Control Circuit	P0612	No ODM faulure flag flom hardware I/O	OUTD state and F/B voltage does not match	IGNITION ON J1939 Initialization is done Not in Powerdown_Mode Key_on_time>0.5 sec.	30 out of 50 (Every 125ms)	Discrete flag from hardware I/O	B
Glow Plug ControlModule(GPCM) Performance	P0670	No Error Message from GPCM	KI 30 Battery line not connected or Any of the 8 glow plug switches is defective or System is in standby because of overvoltage.	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #1 Glow Plug Control Circuit	P0671	No Error Message from GPCM on status of Cyl #1 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #2 Glow Plug Control Circuit	P0672	No Error Message from GPCM on status of Cyl #2 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #3 Glow Plug Control Circuit	P0673	No Error Message from GPCM on status of Cyl #3 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B

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SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMINATION
Cylinder #4 Glow Plug Control Circuit	P0674	No Error Message from GPCM on status of Cyl #4 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #5 Glow Plug Control Circuit	P0675	No Error Message from GPCM on status of Cyl #5 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #6 Glow Plug Control Circuit	P0676	No Error Message from GPCM on status of Cyl #6 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #7 Glow Plug Control Circuit	P0677	No Error Message from GPCM on status of Cyl #7 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
Cylinder #8 Glow Plug Control Circuit	P0678	No Error Message from GPCM on status of Cyl #8 Glow Plug	Glow Plug line is open or Glow Plug line is shorted	Ignition on J1939 Initialization is done Not in Poweroff Mode CAN MSG is Valid Code U0073 or U0106 not set	50 out of 100 (Every 125ms)	Monitored by GPCM and message transferred by CAN	B
EDU Booster Current Fail A, Bank1	P1293	No Error Message from EDU	Any cylinder of "Current decrease ~~Error~~ Error" (-100us < Injector duration time <100us)	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode CAN MSG is Valid	30 out of 50 (Every 125ms)	Monitored by EDU and message transferred by CAN	A
EDU Booster Current Fail A, Bank2	P1294	No Error Message from EDU	Any cylinder of "Current decrease Error" (-100us < Injector duration time <100us)	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode CAN MSG is Valid	30 out of 50 (Every 125ms)	Monitored by EDU and message transferred by CAN	A

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EDU Booster Current Fail B, Bank1	P1295	No Error Message from EDU	Any cylinder of "Current decrease Error" (-100us < Injector duration time <100us)	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode CAN MSG is Valid	30 out of 50 (Every 125ms)	Monitored by EDU and message transferred by CAN	A
EDU Booster Current Fail B, Bank2	P1296	No Error Message from EDU	Any cylinder of "Current decrease Error" (-100us < Injector duration time <100us)	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode CAN MSG is Valid	30 out of 50 (Every 125ms)	Monitored by EDU and message transferred by CAN	A
Fuel Injector control Module Driver Stuck On	P1687	No Error Message from EDU	Any cylinder of "Current permanently Error"	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode CAN MSG is Valid	30 out of 50 (Every 125ms)	Monitored by EDU and message transferred by CAN	A
Control Module Ignition Off Timer Performance	P2610	ignition off time delta = 1sec AND ignition off timer >= 0 sec AND ignition off timer <= 10 sec AND timer is incrementing Detects a faulty Ignition off Timer circuit.	Ignition off timer reads < 0 sec OR Ignition off timer reads >10 sec OR timer unchanged for 60 sec OR timer increment not equal 1 sec	Ignition off timer is running diagnostic has not yet run to completion	Test performed continuously	Ignition off timer	B
Lost Communications with Fuel Injector Control Module	U0105	Toggring bit should be inverted every 20msec	Can Message is not updated for 3 count (By refering Toggling bit every 15.6ms)	Ignition on J1939 Initialization is done Key_on_time > 0.5sec Not in Poweroff Mode Divece contorl is not active	30 out of 50 (Every 125ms)	Message from EDU via CAN (Monitor the status of Message B7, toggring bit)	B
Mass Air Flow (MAF) Sensor Performance	P0101	1.014v to 4.670 v 11 kg/hr to 1620 kg/hr Detects an in range sensor fault It can also detect an open circuit running engine rational stability = .15625 sec	The delta between expected MAF and measured MAF > 2d look-up see chart 1.	P0102,P0103,P2227,P2228,P2229,P0116,P0117,P0118,P0112,P0113,P0234,P0299,P0237,P0238, P0335,P0336,P0016,P0340,P0341,P0370,P0374 are not set. 9v < IGN volts <18 Engine rom<=3500rpm Idelta Engie rpmI<=50rpm Idelta desierd QI<=10mm3/st Air temp>-20.25degC Coolant temp>-20.25degC stable time>=01.5sec	Diagnostic set conditions true for 12 seconds Test performed continuously	EGR Control Pressure Sensor Mass Air Flow Sensor	B
Mass Air Flow (MAF) Sensor Circuit Low Voltage	P0102	1.014v to 4.670 v 11 kg/hr to 1620 kg/hr Detects a sensor circuit low voltage	Mass Air Flow Input Voltage<0.42 volts -same as- Mass Air Flow<36 kg/hr	Engine Run Time > 2 sec Engine Speed > 500 RPM Ignition Voltage >~~7v~~ 9v Above conditions have been met for >~~3secs~~ 3.125secs	Diagnostic set conditions true for for6 seconds Test performed continuously	Mass Air Flow Sensor	B

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Mass Air Flow (MAF) Sensor Circuit High Voltage	P0103	1.014v to 4.670 v 11 kg/hr to 1620 kg/hr Detects a sensor circuit High voltage	Mass Air Flow Input Voltage>4.5 volts -same as- Mass Air Flow>1600kg/hr	Engine Run Time > 2 sec 2500rpm>=Engine Speed > 500 RPM Ignition Voltage >9v Inlet Air Temp > -6.75 degC None of the following codes are set;P0112 andP0113 Above conditions have been met for >3secs	Diagnostic set conditions true for for6 seconds Test performed continuously	Mass Air Flow Sensor	B
Barometric Pressure Sensor Performance	P2227	0.78v to 4.86v 40kPa to 202kPa Detects in range fault of Baro sensor Baro diff =Barometric Pressure - MAP pressure.	Baro diff =Barometric Pressure- MAP pressure -15 kpa < Baro diff < 15 kpa	None of the following codes are set: P0101,P0102,P0103,P2228,P2229,P0116 P0117,P0118,P0299,P0237,P0238,P0335 P0336, P0500 Engine runtime>8 sec 580 < Engine Speed < 900 aps < 69% MAF < 50 grams/sec mph < 25 Coolant temp>20.25DegC PTO is not Active Stable time>=5sec	Diagnostic set conditions true for 6 seconds Test performed continuously	Baro Pressure Sensor	B
Barometric Pressure Circuit Low Input	P2228	0.78v to 4.86v 40kPa to 202kPa Detects baro sensor shorted to ground or open.	Baro Pressure < 0.114 v - same as - Baro Pressure < 40kPa	Engine runtime>1 sec Ignition voltage > 7v	Diagnostic set conditions true for for 10 seconds Test performed continuously	Baro Pressure Sensor	B
Barometric Pressure Circuit High Input	P2229	0.78v to 4.86v 40kPa to 202kPa Detects baro sensor circuit short to high voltage	Baro Pressure >4.65 v - same as - Baro Pressure >110KPa	Engine runtime>1 sec	Diagnostic set conditions true for for 10 seconds Test performed continuously	Baro Pressure Sensor	B
Intake Air Temperature Circuit Low Input	P0112	0.24volt to 4.86 volts -40degCto152 degC Detects a sensor circuit short to ground	Air temperature sensor voltage<0.24 volt -same as- Air temperature>160degC	Coolant temperature<50.25deg C Coolant min temperature = 20.25 degC Ignition voltage > 7v P0116,P0117,and,P0118 are not set.	Diagnostic set conditions true for for10 seconds Test performed continuously	Air temperature sensor	B
Intake Air Temperature Circuit High Input	P0113	0.24volt to 4.86 volts -40degCto152degC Detects a sensor circuit short high voltage or a sensor circuit open	Air temperature sensor voltage>4.86 volt -same as- Air temperature<-40degC	Engine runtime > ~~17~~ 15 minutes	Diagnostic set conditions true for10 seconds Test performed continuously	Air temperature sensor	B

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Engine Coolant Temperature Performance	P0116	Coolant temp delta =(Startup coolant temperature - Startup Intake Air temperature). Acceptable, if Coolant Temp Delta < 5.25degC. Detects delta temp. due to block heater effect or faulty in-range coolant temp.sensor. Engine speed >= 600RPM	Coolant temp delta = (Start-up coolant temperature - Start-up Intake Air temperature) Coolant temp delta > 5.25degC uneffected by block heater	P0112, P0113, P0117, P0118, P2610, P0500 not set, @Start-up IAT > 15degC, Engine off timer>36000 sec, VSS>15MPH for>400sec., Calculate diff air temp= (startup air temp - intake air temp). If diff air temp > 5.25 deg C, abort test do to block heater infl	Performed once just after engine start and conditions are met.	Coolant temperature sensor Intake Air temperature sensor	B
Engine Coolant Temperature Circuit Low Input	P0117	0.24volt to 4.76 volts -40degCto152degC Detects a sensor circuit short to ground Coolant temp high >= 56.25 degC	Coolant temperature sensor voltage<0.24volt -same as- Coolant temperature>160degC	None	Diagnostic set conditions true for for10 seconds Test performed continuously	Coolant temperature sensor	B
Engine Coolant Temperature Circuit High Input	P0118	0.24volt to 4.76 volts -40deg Cto152deg C Detects a sensor circuit short to high voltage or a sensor circuit open	Coolant temperature sensor voltage>4.76volt -same as- Coolant temperature<-40deg C	Engine run timer>8 minutes	Diagnostic set conditions true for for10seconds Test performed continuously	coolant temperature sensor	B
Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature Rev.Date Mar/24/03	P0128	Acceptable if Engine Temperature > 72degC. Detects engine not warm enough for stable operation due to faulty thermostat.	Low Coolant temp range: Engine run time >= 925 secs, engine coolant temperature <72degC , Fuel burned since start >= 8.5million cu.mm., Total idle time since start < 300 sec.	Ambient air temperature < f(eng. startup temp); Ambient air temp > -7degC; -40degC < Engine start-up temp < 51degC; Engine is running; P0128 not yet passed; P0112, P0113,P0116,P0117,P0118,P0201,P0202,P0203,P0204,P0205,P0206,P0207,P0208,P0611,P0612,P1223,P1226,P1229,P1232,P1235,P1238,P1241,and P1244 not set. * See Chart 2	Test performed once from start-up until a pass/fail/disable condition exists.	Engine coolant temperature sensor.	B
			High coolant temp range: Engine run time >= 500sec., engine coolant temperature <72degC , Fuel burned since start >=5 million cu.mm., Total idle time since start < 150sec.	*Ambient air temperature >= f(eng. startup temp); Ambient air temp > -7degC; 51degC < Engine start-up temp < 65degC; Engine is running;P0128 not yet passed; P0112, P0113,P0116,P0117,P0118,,P0201,P0202,P0203,P0204,P0205,P0206,P0207,P0208,P0611,P0612,P1223,P1226,P1229,P1232,P1235,P1238,P1241,and P1244 not set. * See Chart 2	Test performed once from start-up until a pass/fail/disable condition exists.		
Fuel Circuit Sensor Performance	P0181	Fuel temp delta = (Start-up fuel temperature - Start-up coolant temperature); If -9.75degC< fuel temp delta < 9.75degC. Detects delta temp. due to block heater effect or faulty in-range fuel temp.sensor.	Fuel temp delta = (Start-up fuel temperature - Start-up coolant temperature) If -9.75degC> Fuel temp delta > 9.75degC uneffected by block heater.	P0112, P0113, P0182, P0183, P0500, P2610 not set. @Start-up IAT > 15degC, Engine off timer>36000 sec, VSS>15MPH for>400sec, diff air temp= (startup air temp - intake air temp). If diff air temp > 5degC abort test do to block heater influence.	Performed once after engine start and conditions are met.	Fuel temperature sensor Intake Air temperature sensor.	B

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Fuel Temperature Sensor Circuit Low Input	P0182	0.24v -4.96v -30degC to 129.75degC Detects a sensor circuit short to ground line off tim.Date 5/2	Fuel temperature<0.24 volts - same as - Fuel temperature>~~120degC~~ 129.75degC	P0116, P0117, P0118, are not set Coolant Temp < 60degC Ignition voltage > 7v	Diagnostic set conditions true for for2 seconds Test performed continuously	Fuel temperature sensor	B
Fuel Temperature Sensor Circuit High Input	P0183	0.24 v to 4.96 v -30degC to 129.75degC Detects a sensor short to high voltage or sensor circuit open	Fuel temperature > 4.96 v - same as - Fuel temperature < -30degC	Engine running > 4 minutes	Diagnostic set conditions true for for2 seconds Test performed continuously	Fuel temperature sensor	B
Turbochager Engine Overboost	P0234	Detects an Overboost condition and a biased high boost sensor by measuring the delta between a 3D lookup expected Boost table and measured Boost.	The delta between a 3D lookup expected Boost table and measured Boost. > 35 kpa when the measured boost is greater than the expected.	P0237,P0238 not set Engine running 500 <RPM < 3600 Idelta rpmI<=50rpm IDesierdQI<=10mm3/st Intake air temp>=-20degC Coolant temp>=20degC stable timer>=5sec EDC Diag Bank1 is not OFF EDU Diag Bank2 is not OFF runtime = 10sec	Diagnostic set condition true for 12 second Test performed continuously	Boost Sensor	B
Turbochager Boost System Performance	P0299	Detects an underboost condition, a biased low sensor or an open circuit by measuring the delta between a 3D lookup expected Boost table and measured Boost.	The delta between a 3D lookup expected Boost table and measured Boost. > 35 kpa when the measured boost is less than the expected.	P2227, P2228, P2229, P0237 ,P0238not set Engine running 500< RPM < 3600 Idelta rpmI<=50rpm IDesierdQI<=10mm3/st Intake air temp>=-20degC Coolant temp>=20degC stable timer>=5sec EDC Diag Bank1 is not OFF EDU Diag Bank2 is not OFF runtime	Diagnostic set condition true for 12 second Test performed continuously	Boost Sensor	B
Turbochager Boost Sensor Circuit Low Input	P0237	1 volt to 4.75 volts 37kPa to 313kPa Detects boost sensor circuit open	Boost Sensor Signal <1.0 volts -same as- Boost Pressure <37kPa	Ignition voltage >7 volts Engine Run time>1sec	Diagnostic set condition true for 2 second Test performed continuously	Boost Sensor	B
Turbochager Boost Sensor Circuit High Input	P0238	1 volt to 4.75 volts 37kPa to 313kPa Detects boost sensor circuit short to high voltage	Boost Sensor Signal >4.75 volts -same as- Boost Pressure >313kPa	Engien Run time>1sec	Diagnostic set condition true for 2 second Test performed continuously	Boost Sensor	B

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CHART 1

RPM	Value
0	**10**
200	**10**
400	**10**
600	**10**
800	**20**
1000	**25**
1200	**30**
1400	**32**
1600	**34**
1800	**40**
2000	**45**
2200	**50**
2400	**55**
2600	**60**
2800	**65**
3000	**70**
3200	**70**
3400	**70**
3600	**70**
3800	**70**
4000	**70**
4200	**70**
4400	**70**
4600	**70**
4800	**70**
5000	**70**

*Tables

Chart 2

Start-up Engine Temperature	Ambient Air Temperature
-40 degrees C	150
-16 degrees C	150
8 degrees C	16
32 degrees C	-1
56 degrees C	-13
80 degrees C	-13
104 degrees C	-13
128 degrees C	-13
152 degrees C	-13

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Exhaust Gas Recirculation(EGR) Flow Insufficient	P0401	Detects reduction and increasing of EGR flow	Difference between No EGR and Full EGR at Idle MAFPCYL <= 0.22g/cyl	No MAF(P0101,P0102,P0103), Baro(P2227,P2228,P2229),IAT(P0112,P0113) ,Coolant Sensor(P0116,P0117,P0118),CrankCam Sensor(P0335,P0336,P0340,P0341,P0370,P0374),VSS(P0500),5VRef(P0642,P0643) DTC set IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode ~~10~~ 11V <= Battery Voltage <= 18V 0degC <= Intake Air Temp <=~~100~~ 150.75degC 60degC <= Coolant Temp <=100degC 72KPa <= Baro Vehicle speed <=0.25mph ~~610~~ 580rpm<= Engine Speed <= ~~820~~ 880rpm ~~2~~ 3mm3/st<= Qdesired <=25mm3/st TPS <= 1.17% Idle_feedback = TRUE dgegr_test_finish = TRUE PTO is not active. Device contorl is not active Not Limp home mode	10 seconds/sample 1 sample per key cycle.	Delta Manifold Air Flow and Software	B
Exhaust Gas Recirculation(EGR) Control Circuit	P0403	-100% <= DC Motor Duty Signal <= 99.99695%	Short to Battery: 7.5A to 12.1A Short to Ground: (IgnitionVoltage) - (0.8V to 1.2V)	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V <= Battery Voltage <= 18V -0degC <= Intake Air Temp <=150.75degC ~~60~~ 57degC <= Coolant Temp <=100 degC 72KPa <= Baro 0% < EGR Duty Cycle<100% RPCV_Relay is ON	78 Failure out of 80 samples. Samples are taken every 126.4ms. Continuous monitoring	DC Motor	B
Exhaust Gas Recirculation(EGR) Open Position Performance	P0404	Detects valve position error between desired and actual	Difference current position - desired position >=~~15~~ 6%	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V <= Battery Voltage <= 18V 0degC <= Intake Air Temp <= 150.75degC ~~60~~ 57degC <= Coolant Temp <=100degC 72KPa <= Baro Desired EGR Position > 0% Desired Delta EGR < =3% Codes P0642 or P0643 are not set	60 Failure out of 80 samples. Samples are taken every 126.4ms. Continuous monitoring	Position Sensor	B

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Exhaust Gas Recirculation(EGR) Position Sensor Circuit Low	P0405	0.25 volt to 4.75volts -12.38 % to 136.54% Detects a sensor circuit low voltage.	EGR Position <= 52RAW A/D counts	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode ~~10~~ 11V <= Battery Voltage <= 18V ~~-20~~ 0degC <= Intake Air Temp <=~~100~~ 150.75degC ~~-20~~ 57degC <= Coolant Temp <=100degC 72KPa <= Baro	78 Failure out of 80 samples. Samples are taken every 126.4ms. Continuous monitoring	Position Sensor	B
Exhaust Gas Recirculation(EGR) Position Sensor Circuit High	P0406	0.25 volt to 4.75 volts -12.38 % to 136.54% Detects a sensor circuit high voltage.	EGR Position >= 972RAW A/D counts	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V <= Battery Voltage <= 18V 0degC <= Intake Air Temp <= 150.75degC 57degC <= Coolant Temp <=100degC 72KPa <= Baro	78 Failure out of 80 samples. Samples are taken every 126.4ms. Continuous monitoring	Position Sensor	B
Exhaust Gas Recirculation(EGR) Closed Position Performance	P1404	Detects close position error When EGR Target Lift<=0% EGR Actual Lift Learned<6% EGR_Offset >0.18% EGR_Offset< 18.5%	When EGR Target Lift<=0% EGR Actual Lift Learned>=6% or EGR_Offset <=~~-12~~ -0.18% EGR_Offset>=~~37.5~~ 18.5%	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V <= Battery Voltage <= 18V 0degC <= Intake Air Temp <=150.75degC 57degC <= Coolant Temp <=100degC 72KPa <= Baro Desired EGR Position<=0% Codes P0642 or P0643 are not set	38 Failure out of 40 samples. Samples are taken every 126.4ms. Continuous monitoring	Position Sensor	B
Turbocharger Boost Control Position Sensor Performance	P2563	IActual Vane Position - Target Vane PositionValueI <=15%.	Actual Vane Position - Target Vane PositionValue >15%	Engine is running ECM is not commanding an open offset learn ECM is not commanding a closed offset learn Coolant temp >= 20 degC EGR is not commanding the VNT to open Codes P0045, P2564 or P2565 are not set IDelta DesieredQI<=10mm3/st IDelta rpmI<=50rpm	Diagnostic set conditions true for for 12 seconds Test performed continuously	VNT Position	B
Turbocharger Position Sensor Circuit Low Input	P2564	1 volt to3.5 volts Detects VNT sensor circuit open and shorted to ground	VNT Sensor Signal <1.0 volts	Engine Run time>3sec	Diagnostic set condition true for 6 seconds Test performed continuously	VNT Position	B

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Turbocharger Position Sensor Circuit High Input	P02565	1 volt to 3.5 volts Detects VNT sensor circuit open and shorted to ground	VNT Sensor Signal >3.9 volts	Engine Run time>3sec	Diagnostic set condition true for 6 seconds Test performed continuously	VNT Position	B
Vehicle Output Speed Sensor Circuit	P0500	Manual Transmission:	Manual Transmission: No detected vehicle speed pulses	Manual Trans: Engine speed > 1000 rpm and Engine Torque > 300 N-m Coolant Temperature > 25 degrees C. PTO is not Active P0116,P0117,P0118 are not set.	224 failures out of 240 (Every 125ms)	Monitor vehicle speed input signal.	B
		Automatic Transmission:	Automatic Transmission: Delta between ECM Vehicle Speed value and CAN Vehicle Speed value > 5 mph	Engine Running PTO is not Active U073,U0101 are not set.	32 failures out of 40 (Every 125ms)		
Control Module Read Only Memory Rev.Date 5/29/01	P0601		Calculated Checksum(s) not equal to imbedded Checksum(s)		Run one (1) time at powerup.		A
Control Module Not Programmed	P0602		K_Check_Service_Calibration = TRUE.		Run every 125 ms		A
Control Module Random Access Memory	P0604		Data read from RAM location not equal to data written to RAM location.		Run during ECM initialization.		A
Transmission Control Module (TCM) Requested MIL Illumination Rev.Date 5/29/01	P0700		MIL Request line active	Ignition 0 on time > 7 seconds P0802monitering is finished P0802 Fault not set	Active for 32 samples (Every 125 ms)	Monitor MIL Request input	A
Transmission Control Module (TCM) MIL Request Circuit	P0802	Ignition 0 on time > 0.125 second but < 7 seconds	MIL Request line inactive		Monitored for 6 seconds after Ignition 0 transitions from off to on (Every 125 ms)	Monitor MIL Request input	B
Malfunction Indicator Lamp (MIL) Control Circuit Rev.Date 5/29/01	P0650	Ignition voltage between 6 and 18 volts	MIL Output MIL fail counter incremented if MIL output driver indicates a fault condition (open/short ckt)	Ignition on Ignition voltage between 6 and 18 volts	Greater than or equal to 5 fail counts MIL Output monitored at least every 500 msec		A
CAN bus reset counter overrun	U0073	This test detects if the CAN (J1939) bus is off.	A CAN bus hardware error shall present for a calibrated amount of time. CAN bus is OFF >= 3 seconds.	Ignition on Ignition voltage <= 18 volts Ignition voltage >= 6 volts 200 RPM < Engine Speed < 7500 RPM for 5 seconds Components powered and 9 V < Ignition < 18 V	Monitor time is 3 seconds. Frequency is every 8msec. 3 sz 100 ms	Monitor CAN status register of CAN controller chip	B

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Lost communications with Transmission Control System	U0101		The ECM fails to receive PGN 0 or PGN 61,445 from the TCM	Ignition on Ignition voltage <= 18 volts Ignition voltage >= 6 volts	Monitor time is 1000msec. Frequency is every 8msec.	CAN Message from the TCM	B
Lost Communications with Glow Plug Control Module	U0106	ECM reports no loss of communication with the GPCM or the GPCM reports no loss of communication with the ECM	ECM reportsa loss of communication with the GPCM or the GPCM reports a loss of communication with the ECM	Ignition on J1939 Initialization is done Code U0073 is not set	50 out of 100 (Every 125ms)	Message from GPCM and ECM signal indicating loss of GPCM message	B
5 Volt Reference 1 Circuit	P0642	5.2v >5 Volt Reference > 4.7V	5V Reference V5B1 < 4.7V	Ign ON	Failure detected for 2 seconds	Checks the 5 Volt Reference 0utput (V5B1) of the A/D converter	~~B~~ A
5 Volt Reference 1 Circuit	P0643	5.2v >5 Volt Reference > 4.7V	5 V Reference V5B1 > 5.2V	Ign ON	Failure detected for 2 seconds	Checks the 5 Volt Reference 0utput (V5B1) of the A/D converter	~~B~~ A
5 Volt Reference 2 Circuit	P0652	5.2v >5 Volt Reference > 4.7V	5V Reference V5B2 < 4.7V	Ign ON	Failure detected for 2 seconds	Checks the 5 Volt Reference 0utput (V5B2) of the A/D converter	~~B~~ A
5 Volt Reference 2 Circuit	P0653	5.2v >5 Volt Reference > 4.7V	5 V Reference V5B2 > 5.2V	Ign ON	Failure detected for 2 seconds	Checks the 5 Volt Reference 0utput (V5B2) of the A/D converter	~~B~~ A
5 Volt Reference 3 Circuit	P0698	5.2v >5 Volt Reference > 4.7V	5V Reference V5B3 < 4.7V	Ign ON	Failure detected for 2 seconds	Checks the 5 Volt Reference 0utput (V5B3) of the A/D converter	~~B~~ A
5 Volt Reference 3 Circuit	P0699	5.2v >5 Volt Reference > 4.7V	5 V Reference V5B3 > 5.2V	Ign ON	Failure detected for 2 seconds	Checks the 5 Volt Reference 0utput (V5B3) of the A/D converter	~~B~~ A
Idle Speed Too Low	P0506	Target Idle Speed - Actual Idle Speed <= 100rpm	Target Idle Speed - Actual Idle Speed > 100rpm	No Related fault code set(P0016,P0112,P0113,P0116,P0117,P0118,P0335,P0336,P0340,P0341,P0500,P0700) Delta Engine Speed < 20 rpm Delta Fuel < 2.5 mm3/st Engine Coolant Temp > 50 degC Intake Air Temperature < 20 degC Vehicle Speed < 0.25 MPH Q Throttle < 2 mm3/st Idle time > 10 sec	190 out of 240(Every 126msec)	Monitoring Engine Speed	B

2004 6.6L Duramax Diesel (LB7) C/K-truck
ENGINE DIAGNOSTIC PARAMETERS

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MONITORING METHOD	FAULT CODE STORAGE AND MIL ILLUMINATION
Idle Speed Too High	P0507	Actual Idle Speed - Target Idle Speed <= 200rpm	Actual Idle Speed - Target Idle Speed > 200rpm	No Related fault code set(P0016,P0112,P0113,P0116,P0117,P0118,P0335,P0336,P0340,P0341,P0500,P0700) Delta Engine Speed < 20 rpm Delta Fuel < 2.5 mm3/st Engine Coolant Temp > 50 degC Intake Air Temperature < 20 degC Vehicle Speed < 0.25 MPH Q Throttle < 2 mm3/st Idle time > 10 sec	190 out of 240(Every 126msec)	Monitoring Engine Speed	B