2003 6.6L Duramax Diesel (LB7))   C/K-truck   ENGINE DIAGNOSTIC PARAMETERS

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FAULT CODE	MONITORING METHOD	SENSED PARAMETER	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	FAULT CODE STORAGE AND MIL ILLUMINATION
P0087	Rail Pressure sensor	Fuel Rail Pressure [FRP] Too Low	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_LO, RPS_HI, 5VB_A, RPCV) Rail Pressure Feedback Mode Key_on_time>0.125 Sec. Fuel_Mode Rail Pressure>0MPa	99 Failure out of 100 sample	A
P0088	Rail Pressure sensor	Fuel Rail Pressure [FRP] Too High	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_LO, RPS_HI, 5VB_A) not in Power_Down_Mode Rail Pressure Feedback Mode Key_on_time>0.125 Sec.	Case.1 49 Failure out of 50 sample Case.2 49 Failure out of 50 sample	A
P0089	Rail Pressure sensor and Commanded Pump Fuel Flow	Fuel Pressure Regulator Performance	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_LO, RPS_HI, 5VB_A, RPCV) Rail Pressure Feedback Mode Key_on_time>0.125 Sec. Fuel_Mode Not in Bankshutoff Mode	110 Failure out of 120 sample	A
P0090	RPCV current	Fuel Pressure Regulator Control Circuit	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	A
P0101	EGR Control Pressure Sensor Mass Air Flow Sensor	Mass Air Flow (MAF) Sensor Performance	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	The delta between expected MAF and measured MAF > 2d look-up see chart 1.	P0102,P0103,P2227,P2228,P2229,P0116,P0117 ,P0118P0112,P0113,P0234,P0236,P0237,P0238 , P0335,P0336,P1345 are not set. 9v < IGN volts >18	Diagnostic set conditions true for 12 seconds Test performed continuously	B
P0102	Mass Air Flow Sensor	Mass Air Flow (MAF) Sensor Circuit Low Voltage Rev.Date 11/27/01	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 Above conditions have been met for >3secs	Diagnostic set conditions true for for6 seconds Test performed continuously	B
P0103	Mass Air Flow Sensor	Mass Air Flow (MAF) Sensor Circuit High Voltage	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 Engine Speed > 500 RPM Ignition Voltage > 7v Inlet Air Temp > -7 degC	Diagnostic set conditions true for for6 seconds Test performed continuously	B
P0112	Air temperature sensor	Intake Air Temperature Circuit Low Input	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 Ignition voltage > 7v	Diagnostic set conditions true for for10 seconds Test performed continuously	B
P0113	Air temperature sensor	Intake Air Temperature Circuit High Input	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 minutes	Diagnostic set conditions true for10 seconds Test performed continuously	B
P0116	Coolant temperature sensor Intake Air temperature sensor	Engine Coolant Temperature Performance	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.	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.	B
P0117	Coolant temperature sensor	Engine Coolant Temperature Circuit Low Input	0.24volt to 4.76 volts -40degCto152degC Detects a sensor circuit short to ground	Coolant temperature sensor voltage<0.24volt - same as- Coolant temperature>160degC	None	Diagnostic set conditions true for for10 seconds Test performed continuously	B

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P0118	coolant temperature sensor	Engine Coolant Temperature Circuit High Input	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	B
P0128	Engine coolant temperature sensor.	Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature	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; -7degC < Engine start-up temp < 51degC; Engine is running; P0128 not yet passed; P0112, P0113, P0117 and P0118 not set. * See Chart 2	Test performed once from start-up until a pass/fail/disable condition exists.	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, P0117 and P0118 not set. * See Chart 2	Test performed once from start-up until a pass/fail/disable condition exists.	
P0181	Fuel temperature sensor Intake Air temperature sensor.	Fuel Circuit Sensor Performance	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.	B
P0182	Fuel temperature sensor	Fuel Temperature Sensor Circuit Low Input	0.24v -4.96v -30degC to 120degC Detects a sensor circuit short to groundine off tim.Date 5/2	Fuel temperature<0.24 volts - same as - Fuel temperature>120degC	P0116, P0117, P0118, P0126, P0128 are not set Coolant Temp < 60degC Ignition voltage > 7v	Diagnostic set conditions true for for2 seconds Test performed continuously	B
P0183	Fuel temperature sensor	Fuel Temperature Sensor Circuit High Input	0.24 v to 4.96 v -30degC to 120degC 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	B
P0192	Piezo Pressure Sensor	Fuel Rail Pressure [FRP] Sensor Circuit Low Voltage	0.1 Volt to 4.9 Volt	rp_ad <= 42 AD Counts	No related malfunction (5VB_A) IGNITION is ON not in Power_Down_Mode Key_on_time>0.125 Sec.	19 Failure out of 20 sample	A
P0193	Piezo Pressure Sensor	Fuel Rail Pressure [FRP] Sensor Circuit High Voltage	0.1 Volt to 4.9 Volt	rp_ad >= 963 AD Counts	No related malfunction (5VB_A) IGNITION is ON not in Power_Down_Mode Key_on_time>0.125 Sec.	19 Failure out of 20 sample	A
P0201	Mornitoring in EDU and message transferred via CAN	Injector 1 Control Circuit	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)	A
P0202	Mornitoring in EDU and message transferred via CAN	Injector 2 Control Circuit	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)	A
P0203	Mornitoring in EDU and message transferred via CAN	Injector 3 Control Circuit	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)	A

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P0204	Mornitoring in EDU and message transferred via CAN	Injector 4 Control Circuit	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)	A
P0205	Mornitoring in EDU and message transferred via CAN	Injector 5 Control Circuit	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)	A
P0206	Mornitoring in EDU and message transferred via CAN	Injector 6 Control Circuit	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)	A
P0207	Mornitoring in EDU and message transferred via CAN	Injector 7 Control Circuit	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)	A
P0208	Mornitoring in EDU and message transferred via CAN	Injector 8 Control Circuit	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)	A
P0234	Boost Sensor	Turbochager Engine Overboost	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.	P0238 not set Engine running 500 <RPM < 3600	Diagnostic set condition true for 12 second Test performed continuously	B
P0236	Boost Sensor	Turbochager Boost System Performance	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 not set Engine running 500< RPM < 3600	Diagnostic set condition true for 12 second Test performed continuously	B
P0237	Boost Sensor	Turbochager Boost Sensor Circuit Low Input	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	None	Diagnostic set condition true for 2 second Test performed continuously	B
P0238	Boost Sensor	Turbochager Boost Sensor Circuit High Input	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	None	Diagnostic set condition true for 2 second Test performed continuously	B
P0300	Cylinder engine speed and cylinder fuel rate	Engine Misfire Detected	# of detected misfire cylinders =< 1	Number of detected misfire cylinders > 1	P0335,P0336,P0116,P0117,P0118,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0301	Cylinder engine speed and cylinder fuel rate	Cylinder 1 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0302	Cylinder engine speed and cylinder fuel rate	Cylinder 2 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0303	Cylinder engine speed and cylinder fuel rate	Cylinder 3 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0304	Cylinder engine speed and cylinder fuel rate	Cylinder 4 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B

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P0305	Cylinder engine speed and cylinder fuel rate	Cylinder 5 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0306	Cylinder engine speed and cylinder fuel rate	Cylinder 6 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0307	Cylinder engine speed and cylinder fuel rate	Cylinder 7 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0308	Cylinder engine speed and cylinder fuel rate	Cylinder 8 Misfire Detected	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,P0128 are not set. A)Coolant temperature >= 56degC	Test performed for 30 seconds once per ignition cycle	B
P0335	Checks the number of Crank pulses every 7.8 ms	Crankshaft Position [CKP] Sensor Circuit	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.	B
P0336	Checks the number of Crank pulses between the last synch event and the current	Crankshaft Position [CKP] Sensor Performance	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	B
P0340	Checks CAM interrupts every 7.8 ms	Camshaft Position [CMP] Sensor Circuit	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.	A
P0341	Check crank tooth number at CAM edge	Camshaft Position [CMP] Sensor Performance	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	B
P0370	Monitored by EDU and message transferred by CAN	High Resolution Circuit	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.	A
P0374	Monitored by EDU and message transferred by CAN	High Resolution System Performance	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.	A
P0380	A/D glowplug voltage input	Glow Plug Circuit Malfunction (CALIFORNIA)	Glowplugs commanded off & raw feedback < 2.0 v Glowplugs commanded on & 5.0 v < raw feedback < 6.2 v Detects a faulty glowplug relay circuit	Glowplugs commanded off & raw feedback >2.0 v -OR- Glowplugs commanded on & raw feedback > 6	Ignition Voltage > 9v Glow plug feedback stable for 1.25 sec.	Diagnostic set conditions true for 2 seconds Test performed continuously	B
P0381	ODM chip internal open/short detection circuit	Wait to Start Lamp Control Circuit	No ODM 'Open'Fault or 'short' faults Glowplug light output voltage at PCM follows S/W command	ODM'Open'or'Short'Fault Detected Glowplug light output voltage at PCM does not follow S/W command	None	Diagnostic set conditions true for 2 seconds	B
P0401	EGR Control Pressure Sensor Mass Air Flow Sensor	Exhaust Gas Recirculation(EGR) Flow Insufficient Rev.Date 1/22/01	Detects a reduction of EGR flow	Must fail test7,9and pass test8 of the EGR Diagnostic Tests	P0102,P0103,P2141,P2142,P0405 P0406,P0489,P0490,P2144,P2145 P0651 are not set. IGNITION is ON Engine Power Up Time>0.5sec Engine runtime>=5sec	118 Failure out of 120 samples. Samples are taken every 31.6ms. Test performed continuously	B
P0404	EGR Control Pressure Sensor Mass Air Flow Sensor	Exhaust Gas Recirculation(EGR) Open Position Performance Rev.Date 11/13/01	Detects a reduction of EGR flow caused by a reduction of vacuum flow	Must fail test 7,8,9 and pass test 1,2,5,6 of the EGR Diagnostic Tests	P0102,P0103,P2141,P2142,P0405 P0406,P0489,P0490,P2144,P2145 P0651 are not set. IGNITION is ON Engine Power Up Time>0.5sec Engine runtime>=5sec Baro>=7	248 Failure out of 250 samples. Samples are taken every 31.6ms.	B

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P0405	EGR Control Pressure Sensor	Exhaust Gas Recirculation(EGR) Position Sensor Circuit Low Voltage	0.26 volt to 3.75 volts 18kPa to 158kPa Detects a sensor circuit low voltage.	EGR control pressure Input Voltage <=0.26 volts -same as- EGR control pressure<=18kPa	P0101,P0489,P0651 are not set. IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode	158 Failure out of 160 samples. Samples are taken every 31.6ms. Test performed continuously	B
P0406	EGR Control Pressure Sensor	Exhaust Gas Recirculation(EGR) Position Sensor Circuit High Voltage	0.26 volt to 3.75 volts 18kPa to 158kPa C4	EGR control pressure Input Voltage >=3.75 volts -same as- EGR control pressure>=158kPa	P0651 are not set. IGNITION is ON Engine Power Up Time > 0.5sec	158 Failure out of 160 samples. Samples are taken every 31.6ms. Test performed continuously	B
P0489	ODM chip internal open/short detection circuit	Exhaust Gas Recirculation(EGR) Solenoid Control Circuit Low Voltage	No ODM 'Open'Fault or 'short' faults EGR Solenoid output voltage at PCM follows S/W command	ODM'Open'or'Short to Ground'Fault Detected EGR Solenoid output voltage at PCM does not follow S/W command	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V<=Battery voltage<=18V EGR_Duty < 71%	Diagnostic set conditions true for 2 seconds Test performed continuously	B
P0490	ODM chip internal open/short detection circuit	Exhaust Gas Recirculation(EGR) Solenoid Control Circuit High Voltage	No ODM 'Open'Fault or 'short' faults EGR Solenoid output voltage at PCM follows S/W command	ODM 'Short to Battery' Fault Detected EGR Solenoid output voltage at PCM does not follow S/W command	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V<=Battery voltage<=18V EGR_Duty > 10%	Diagnostic set conditions true for 2 seconds Test performed continuously	B
P0500	Monitor vehicle speed input signal.	Vehicle Output Speed Sensor Circuit	Manual Transmission: Coolant Temperature > 25 degrees C. Automatic Transmission: Engine Running	Manual Transmission: No detected vehicle speed pulses Automatic Transmission: Delta between ECM Vehicle Speed value and CAN Vehicle Speed value > 5 mph	Manual Trans: Engine speed > 1000 rpm and Engine Torque > 300 N-m	32 failures out of 40 (Every 125ms)	B
P0540	Checks the voltage of heater line	Intake Heater System	Heater line voltage<3.8V @ relay off and Reference line voltage is low@relay off and Heater line voltage >=1.0V @ relay on and Reference line voltage is High @ relay on	CaseA: Heater line voltage>=8.1V@relay off CaseB: 3.8V<=Heater line voltage<8.1@relay off and Battery voltag	10V<=Battery voltage<=18V and IAT<=23degC or Coolant <=49.5deg C	Diagnostic condition true for 1 second relay off mode and on mode for 3 seconds (once per key cycle)	B
P0543	Checks the voltage of heater line	Intake Heater Open	Heater line voltage<3.8V @ relay off and Reference line voltage is low@relay off and Heater line voltage >=1.0V @ relay on and Reference line voltage is High @ relay on	3.8V<=Heater line voltage<8.1V @ relay off and Battery voltage - 0.5V<Heater line voltage @relay on	10V<=Battery voltage<=18V and IAT<=23degC or Coolant <=49.5deg C	Diagnostic condition true for 1 second relay off mode and on mode for 3 seconds (once per key cycle)	B
P0601		Control Module Read Only Memory	Calculated Checksum(s) not equal to imbedded Checksum(s)			Run one (1) time at powerup.	A
P0602		Control Module Not Programmed		K_Check_Service_Calibration = TRUE.		Run every 125 ms	A
P0604		Control Module Random Access Memory	Data read from RAM location not equal to data written to RAM location.			Run during ECM initialization.	A
P0611	Monitored by EDU and message transferred by CAN	Fuel Injector Control Module Performance	No Error Message from EDU	Micro.C or MM defective" or "A/D conversion SRC violation" 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)	B
P0612	Discrete flag from hardware I/O	Fuel Injector Control Module Relay Control Circuit	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)	B

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P0641	Checks the 5 Volt Reference 0utput (V5B1) of the A/D converter	5 Volt Reference 1 Circuit	5 Volt Reference V5B1 does not exceed 5v and does not fall below 4.4V	5 Volt Reference V5B1 > 5V 5 Volt Reference V5B1 < 4.4V	Ign ON	Failure detected for 2 seconds	A
P0650		Malfunction Indicator Lamp (MIL) Control Circuit	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
P0651	Checks the 5 Volt Reference 0utput (V5B2) of the A/D converter	5 Volt Reference 2 Circuit	5 Volt Reference V5B2 does not exceed 5v and does not fall below 4.4V	5 Volt Reference V5B2 > 5V 5 Volt Reference V5B2 < 4.4V	Ign ON	Failure detected for 2 seconds	B
P0700	Monitor MIL Request input	Transmission Control Module (TCM) Requested MIL Illumination		MIL Request line active	Ignition 0 on time > 7 seconds P0802 Fault not set	Active for 32 samples (Every 125 ms)	A
P0802	Monitor MIL Request input	Transmission Control Module (TCM) MIL Request Circuit	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)	B
P1093	Rail Pressure sensor and Commanded Fuel flow to pump	Fuel System Large Leakage Detected	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 14706:600rpm 18382:800rpm 22058:1000rpm 25736:1200rpm 29412:1400rpm 33088:1600rpm 36764:1800rpm 40442:2000rpm 44118:2200rpm 47700:2400rpm 49500:2600rpm 49500:	No related malfunction (RPS_LO,RPS_HI,5VB_A) Rail pressure Feedback Mode Key_on_time>0.125Sec. Fuel_Mode	49 Failure out of 50 sample	A
P1223	OUTD Mornitoring in ECM	Injector 1 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
P1226	OUTD Mornitoring in ECM	Injector 2 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
	Mornitoring in EDU and message transferred via CAN		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)	

FAULT CODE	MONITORING METHOD	SENSED PARAMETER	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	FAULT CODE STORAGE AND MIL ILLUMINATION
P1229	OUTD Mornitoring in ECM	Injector 3 Output Circuit (R/C)	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)	B
	Mornitoring in EDU and message transferred via CAN	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)	
P1232	OUTD Mornitoring in ECM	Injector 4 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
	Mornitoring in EDU and message transferred via CAN	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)	
P1235	OUTD Mornitoring in ECM	Injector 5 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
	Mornitoring in EDU and message transferred via CAN	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)	
P1238	OUTD Mornitoring in ECM	Injector 6 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
	Mornitoring in EDU and message transferred via CAN	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)	
P1241	OUTD Mornitoring in ECM	Injector 7 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
	Mornitoring in EDU and message transferred via CAN	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)	

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FAULT CODE	MONITORING METHOD	SENSED PARAMETER	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	FAULT CODE STORAGE AND MIL ILLUMINATION
P1244	OUTD Mornitoring in ECM	Injector 8 Output Circuit (R/C)	No Error Message from EDU	Signal from TFD	IGN on Poweruptime>0.5sec rpm>300rpm Fuel Mode	130 out of 150 (Every 32ms)	B
	Mornitoring in EDU and message transferred via CAN		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)	
	EGR Control pressure Sensor and Mass Air Flow Sensor		Detects EVRV Solenoid Valve Open Stuck	Must fail test 12 of the EGR Diagnostic Tests	P0102,P0103,P2141,P2142,P0405 P0406,P0489,P0490,P2144,P2145 P0651 are not set. IGNITION is ON Engine Power Up Time>0.5sec Engine runtime>=5sec Baro>=72kPa TEST A,B,C are finished	118 Failure out of 120 samples. Samples are taken every 31.6ms.	B
	EGR Control pressure Sensor and Mass Air Flow Sensor		Detects VSV Solenoid Valve Close Stuck	Must fail test 13 of the EGR Diagnostic Tests	P0102,P0103,P2141,P2142,P0405 P0406,P0489,P0490,P2144,P2145 P0651 are not set. IGNITION is ON Engine Power Up Time>0.5sec Engine runtime>=5sec Baro>=72kPa TEST A,B,C are finished	118 Failure out of 120 samples. Samples are taken every 31.6ms.	B
P1261	Monitoring in EDU and message transferred via CAN	Injector Positive Voltage Control Circuit Group 1	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)	A
P1262	Monitoring in EDU and message transferred via CAN	Injector Positive Voltage Control Circuit Group 2	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)	A
P1404	EGR Control pressure Sensor and Mass Air Flow Sensor	Exhaust Gas Recirculation(EGR) Closed Position Performance Rev.Date 11/13/01	'Detects a increase of EGR flow	Must fail test 2,6,7 and pass test 1,5,8 of the EGR Diagnostic Tests	P0102,P0103,P2141,P2142,P0405 P0406,P0489,P0490,P2144,P2145 P0651 are not set. IGNITION is ON Engine Power Up Time>0.5sec Engine runtime>=5sec Baro>=72kPa TEST A,B,C are finished	118 Failure out of 120 samples. Samples are taken every 31.6ms.	B
P1550	CAN Message from EDU	Fuel Injector Control Module System Voltage		"'EDU battery voltage out of range"	Ignition on Initialization complete Poweruptime > 0 Not in Poweroff Mode CAN MSG is Valid Engine Speed > 60rpm 11 <= Battery voltage <= 16	30 out of 50 (Every 125ms)	C
P1635	Checks the 5 Volt Reference 0utput (V5B1) of the A/D converter	5 Volt Reference 1 Circuit	5 Volt Reference V5B1 does not exceed 5v and does not fall below 4.4V	5 Volt Reference V5B1 > 5V 5 Volt Reference V5B1 < 4.4V	Ign ON	Failure detected for 2 seconds	A
P1639	Checks the 5 Volt Reference 0utput (V5B2) of the A/D converter	5 Volt Reference 2 Circuit	5 Volt Reference V5B2 does not exceed 5v and does not fall below 4.4V	5 Volt Reference V5B2 > 5V 5 Volt Reference V5B2 < 4.4V	Ign ON	Failure detected for 2 seconds	B

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FAULT CODE	MONITORING METHOD	SENSED PARAMETER	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALFUNCTION DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	MONITORING TIME LENGTH AND FREQUENCY OF CHECK	FAULT CODE STORAGE AND MIL ILLUMINATION
P1643	ODM chip internal open/short detection circuit	Wait to Start Lamp Control Circuit	No ODM 'Open'Fault or 'short' faults Glowplug light output voltage at PCM follows S/W command	ODM'Open'or'Short'Fault Detected Glowplug light output voltage at PCM does not follow S/W command	None	Diagnostic set conditions true for 2 seconds	B
P1658	Monitored by EDU and message transferred by CAN	Fuel Injector Control Module Driver Performance	No Error Message from EDU	Any cylinder of "Fast Current Decrease Errorr" (Injection Current is grater than 3A at 100usec from EOC)	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)	A
P1683	Ignition off timer	Control Module Ignition Off Timer Performance	((ignition off time delta >= min 0 sec) and (Ignition off time delta<= max 5 sec)) AND timer is incrementing AND timer increment < 2 delta sec Detects a faulty Ignition off Timer circuit.	Delta between Ignition off timer reads <= 0 sec OR Delta between Ignition off timer reads <= 5 sec OR timer unchanged for 60 sec OR timer increment > 2 delta sec	Ignition off timer is running diagnostic has not yet run to completion	Test performed continuously	B
P2141	ODM chip internal open/short detection circuit	Exhaust Gas Recirculation(EGR) Throttle Valve Solenoid Control Circuit Low Voltage	No ODM 'Open'Fault or 'short' faults EGR vent output voltage at PCM follows S/W command	ODM'Open'or'Short to Ground'Fault Detected EGR Vent Solenoid output voltage at PCM does not follow S/W command	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V<=Battery voltage<=18V EGR Throttle Valve Solenoid = OFF	Diagnostic set conditions true for 4 seconds Test performed continuously	B
P2142	ODM chip internal open/short detection circuit	Exhaust Gas Recirculation(EGR) Throttle Valve Solenoid Control Circuit High Voltage	No ODM 'Open'Fault or 'short' faults EGR vent output voltage at PCM follows S/W command	ODM 'Short to Battery' Fault Detected EGR Throttle Valve Solenoid output voltage at PCM does not follow S/W command	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V<=Battery voltage<=18V EGR Throttle Valve Solenoid = ON	Diagnostic set conditions true for 4 seconds Test performed continuously	B
P2144	ODM chip internal open/short detection circuit	Exhaust Gas Recirculation(EGR) Vent Solenoid Control Circuit Low Voltage	No ODM 'Open'Fault or 'short' faults EGR vent output voltage at PCM follows S/W command	ODM'Open'or'Short to Ground'Fault Detected EGR Vent Solenoid output voltage at PCM does not follow S/W command	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V<=Battery voltage<=18V EGR Vent Solenoid = OFF	Diagnostic set conditions true for 4 seconds Test performed continuously	B
P2145	ODM chip internal open/short detection circuit	Exhaust Gas Recirculation(EGR) Vent Solenoid Control Circuit High Voltage	No ODM 'Open'Fault or 'short' faults EGR vent output voltage at PCM follows S/W command	ODM 'Short to Battery' Fault Detected EGR Vent Solenoid output voltage at PCM does not follow S/W command	IGNITION is ON Engine Power Up Time > 0.5sec Not In Powerdown_Mode 11V<=Battery voltage<=18V EGR Vent Solenoid = ON	Diagnostic set conditions true for 4 seconds Test performed continuously	B
P2146	Mornitoring in EDU and message transferred via CAN	Injector Positive Voltage Control Circuit Group 1	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)	A
P2149	Mornitoring in EDU and message transferred via CAN	Injector Positive Voltage Control Circuit Group 2	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)	A
P2227	Baro Pressure Sensor	Barometric Pressure Sensor Performance	0.78v to 4.86v 40kPa to 202kPa Detects in range fault of Baro sensor Baro diff =Barometric Pressure -EGR Vacuum Pressure when EGR is disabled.	Baro diff =Barometric Pressure-EGR Vacuum Pressure. -10 kpa < Baro diff < 10 kpa	None of the following codes are set: P0101,P0102,P0103,P2228,P2229,P0116 P0117,P0118,P0236,P0237,P0238,P0335 P0336, P0404, P0405, P0406, P0500 Engine runtime>8 sec	Diagnostic set conditions true for for6 seconds Test performed continuously	B
P2228	Baro Pressure Sensor	Barometric Pressure Circuit Low Input	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	B

2003 6.6L Duramax Diesel (LB7))   C/K-truck   ENGINE DIAGNOSTIC PARAMETERS

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P2229	Baro Pressure Sensor	Barometric Pressure Circuit High Input	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	B
P2279	EGR Cotrol pressure Sensor and Mass Air Flow Sensor	Intake Air Duct Leak	Detects a reduction of EGR flow caused by a reduction of air flow	Must fail test 2,4,6 and pass test 1,5,8 of the EGR Diagnostic Tests	P0102,P0103,P2141,P2142,P0405 P0406,P0489,P0490,P2144,P2145 P0651 are not set. IGNITION is ON Engine Power Up Time>0.5sec Engine runtime>=5sec Baro>=72kPa TEST A,B,C are finished	118 Failure out of 120 samples. Samples are taken every 31.6ms. Test performed continuously	B
P2610	Ignition off timer	Control Module Ignition Off Timer Performance	((ignition off time delta >= min 0 sec) and (Ignition off time delta<= max 5 sec)) AND timer is incrementing AND timer increment < 2 delta sec Detects a faulty Ignition off Timer circuit.	Delta between Ignition off timer reads <= 0 sec OR Delta between Ignition off timer reads <= 5 sec OR timer unchanged for 60 sec OR timer increment > 2 delta sec	Ignition off timer is running diagnostic has not yet run to completion	Test performed continuously	B
U1800	Message from EDU via CAN (Monitor the status of Message B7, toggring bit)	Lost Communications with Fuel Injector Control Module	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	30 out of 50 (Every 125ms)	B
U2104	Monitor CAN status register of CAN controller chip	CAN bus reset counter overrun		A CAN bus hardware error shall present for a calibrated amount of time.	Ignition on Ignition voltage <= 18 volts Ignition voltage >= 6 volts	Monitor time is 3 seconds. Frequency is every 8msec.	B
U2104		CAN Bus Reset Counter Overrun	This test detects if the CAN (J1939) bus is off.	CAN bus is OFF >= 3 seconds.	200 RPM < Engine Speed < 7500 RPM for 5 seconds Components powered and 9 V < Ignition < 18 V	3 s 100 ms	B
U2105		CAN Bus Error ECU – State of health	This test detects CAN (J1939) bus message failures.	Messages absent >= 3 seconds.	200 RPM < Engine Speed < 7500 RPM for 5 seconds Components powered and 9 V < Ignition < 18 V	3 s 100 ms	B
U2106	CAN Message from the TCM	Lost communications with Transmission Control System		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.	B

*TABLES

CHART 1		
Value		**RPM**
10		0
10		200
10		400
10		600
20		800
25		1000
30		1200
32		1400
34		1600
40		1800
45		2000
50		2200
55		2400
60		2600
65		2800
70		3000
70		3200
70		3400
70		3600
70		3800
70		4000
70		4200
70		4400
70		4600
70		4800
70		5000

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	