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SPECIAL TORQUE CHART (REFERENCE ONLY)

Note: All torque specs are ±10% unless stated otherwise.

COMPONENT	STANDARD	METRIC
Bedplate mounting bolts (crankcase bolts)	Figure C	Figure C
Camshaft follower guide bolt/washer	114 lbf/in	13 Nm
Camshaft position (CMP) sensor	114 lbf/in	13 Nm
Camshaft thrust plate mounting bolts	23 lbf/ft	31 Nm
Connecting rod bolt (Initial)	33 lbf/ft	45 Nm
Connecting rod bolt (Final)	50 lbf/ft	68 Nm
Coolant (block) heater	30 lbf/ft	41 Nm
Coolant pump mounting bolts	23 lbf/ft	31 Nm
Coolant pump pulley mounting bolts	23 lbf/ft	31 Nm
Crankcase breather to valve cover	114 lbf/in	13 Nm
Crankcase breather drain fitting to crankcase	18 lbf/ft	25 Nm
Crankcase breather tube clip bolt	23 lbf/ft	31 Nm
Crankcase coolant drain plug (M16)	180 lbf/in	20 Nm
Crankshaft position (CKP) sensor	114 lbf/in	13 Nm
Cylinder head bolts (only use new bolts, note 3)	Figure A	Figure A
EGR cooler inlet temperature sensor (EGRT Inlet)	32 lbf/ft	44 Nm
EGR coolant system hose clamps	31 lbf/in	3.5 Nm
EGR cooler outlet temperature sensor (EGRT Outlet)	28 lbf/ft	38 Nm
EGR DOC tube to RB up-tube bolts & nuts	23 lbf/ft	31 Nm
EGR DOC tube to EGR cooler horizontal bolts	23 lbf/ft	31 Nm
EGR cooler band clamps	Figure K	Figure K
EGR cooler vertical to EGR valve housing bolts	23 lbf/ft	31 Nm
EGR cooler vertical bracket mounting bolts	23 lbf/ft	31 Nm
EGR cooler horizontal to EGR cooler vertical flange	23 lbf/ft	31 Nm
EGR throttle body to EGR valve housing	88 lbf/in	10 Nm
EGR valve housing to intake manifold	88 lbf/in	10 Nm
EGR valve to EGR valve housing	88 lbf/in	10 Nm
Engine coolant temperature sensor (ECT)	159 lbf/in	18 Nm
Engine oil pressure switch (EOP)	124 lbf/in	14 Nm
Engine oil temperature sensor (EOT)	159 lbf/in	18 Nm
Exhaust backpressure (EP) connector to DOC tube	20 lbf/ft	27 Nm
Exhaust backpressure (EP) tube bracket nut	80 lbf/in	9 Nm
Exhaust backpressure (EP) tube nut to EP sensor	180 lbf/in	20 Nm
Exhaust backpressure (EP) tube nut to exhaust connector	180 lbf/in	20 Nm
Exhaust manifold flange studs	159 lbf/in	18 Nm
Exhaust manifold heat shield mounting bolts & nut	88 lbf/in	10 Nm
Exhaust manifold heat shield spacers to stud bolts	88 lbf/in	10 Nm
Exhaust manifold mounting bolts and stud bolts (note 4)	Figure F	Figure F
Exhaust up-tube to exhaust manifold nuts	23 lbf/ft	31 Nm
Exhaust up-tube to turbo bolts	18 lbf/ft	24 Nm
Flywheel/flexplate bolts (only use new bolts, note 3)	Figure B	Figure B
Front cover mounting bolts	23 lbf/ft	31 Nm
Fuel cooler reservoir mounting bolts	114 lbf/in	13 Nm
Fuel filter cap	20 lbf/ft	27 Nm
Fuel fitting banjo bolt with copper washer (M12)	28 lbf/ft	38 Nm
Fuel fitting banjo bolt with steel washer w/viton insert (M12)	18 lbf/ft	25 Nm
Fuel fitting banjo bolt (M14)	35 lbf/ft	47 Nm
Fuel injector hold down clamp bolts	28 lbf/ft	38 Nm
Fuel injector return tube nut to check valve	28 lbf/ft	38 Nm
Fuel return passage plug (rear of cylinder head)	20 lbf/ft	27 Nm
Fuel rail pressure sensor (FRP)	Figure L	Figure L
Fuel supply and return tube clamp to upper oil pan	23 lbf/ft	31 Nm

SPECIAL TORQUE CHART (REFERENCE ONLY)

COMPONENT	STANDARD	METRIC
Glow plug	124 lbf/in	14 Nm
Glow plug control module bolts and nuts (GPCM)	114 lbf/in	13 Nm
High pressure common rail (HPCR) mounting bolts	23 lbf/ft	31 Nm
High pressure common rail (HPCR) to fuel injector tubes	Figure G, I	Figure G, I
High pressure fuel injection pump & pump-to-rail tube installation	Figure H	Figure H
High pressure fuel injection pump cover mounting bolts	114 lbf/in	13 Nm
High pressure fuel injection pump drive gear bolt	57 lbf/ft	78 Nm
High pressure fuel injection pump mounting bolts	45 lbf/ft	62 Nm
High pressure fuel tube nuts (all)	144 lbf/in	30 Nm
Intake manifold pressure sensor (MAP)	106 lbf/in	12 Nm
Intake air temperature 2 (IAT2) sensor	124 lbf/in	14 Nm
Intake manifold bolts and stud bolts	Figure D	Figure D
Lifting eye bolts	45 lbf/ft	62 Nm
Oil cooler to crankcase mounting bolts (M8)	23 lbf/ft	31 Nm
Oil filter base to cooler cover screws (M6 thread forming)	89 lbf/in	10 Nm
Oil filter cap	18 lbf/ft	25 Nm
Oil filter housing to filter base bolts	16 lbf/ft	22 Nm
Oil filter stand pipe bolt (M5 thread forming) W/new oil cooler	61 lbf/in	7 Nm
Oil filter stand pipe bolt (M5 thread forming) reusing existing oil cooler	30 lbf/in	3 Nm
Oil pan bolt - lower pan	114 lbf/in	13 Nm
Oil pan bolt - upper pan	114 lbf/in	13 Nm
Oil pan drain plug (see note 1)	32 lbf/ft	44 Nm
Oil pickup tube bolts	114 lbf/in	13 Nm
Oil pump housing bolts	16 lbf/ft	22 Nm
Oil pressure regulator plug	26 lbf/ft	35 Nm
Piston cooling jet mounting bolts (see note 2)	114 lbf/in	13 Nm
Rocker arm assembly bolts	Figure J	Figure J
Rear cover M10 (manual only)	45 lbf/ft	62 Nm
Rear cover M8 (man & auto)	23 lbf/ft	31 Nm
Thermostat housing hold down plate bolts	114 lbf/in	13 Nm
Turbocharger actuator mounting bolt	168 lbf/in	19 Nm
Turbocharger air inlet duct clamp	44lbf/in	5 Nm
Turbocharger pedestal bolts	45 lbf/ft	62 Nm
Turbocharger to pedestal bolts	148 lbf/ft	201 Nm
Turbocharger crossover tube support mounting	79 lbf/in	9 Nm
Turbocharger heat shield bolts	96 lbf/in	11 Nm
Turbocharger oil supply banjo bolts (M12)	28 lbf/ft	38 Nm
Turbocharger oil supply standoff fittings to center housings	35 lbf/ft	47 Nm
Turbocharger oil supply tube retaining bolt to oil cooler	114 lbf/in	13 Nm
Valve cover base bolts	114 lbf/in	13 Nm
Valve cover bolts and studs	80 lbf/in	9 Nm
Vibration damper bolts (note 3) (only use new bolts)	Figure E	Figure E

STANDARD TORQUE CHART
Hex Flange Head

Thread Diameter	Torque	Torque Nm	Wrench Size (mm)
M6 x 1	114 lbf/in	13	8
M8 x 1.25	23 lbf/ft	31	10
M10 x 1.5	45 lbf/ft	62	13
M12 x 1.75	79 lbf/ft	107	15
M14 x 2	127 lbf/ft	172	
M15 x 2	159 lbf/ft	216	
M16 x 2	196 lbf/ft	266	21

Torque Chart Notes

1) Lightly coat o-ring with clean engine prior to install.

2) Apply threadlock 262 to bolt threads prior to install.

3) Do not reuse. These bolts are one time stretch to yield.

4) Do not reuse exhaust manifold bolts and studbolts.

SPECIAL TORQUE CHART (REFERENCE ONLY)

FIGURE A: Cylinder Head Bolts

Step 1: Lightly lubricate M16 head bolt threads and washer faces with clean engine oil prior to assembly.

Step 2: Torque M16 head bolts (labeled 1-10) to 70 lb/ft (95 Nm) in numerrical sequence shown.

Step 3: Back out M16 head bolts and retorque to 115 lb/ft (156 Nm) one at a time in numerical sequence shown.

Step 4: Tighten M16 head bolts and additional 90 degrees in numerical sequence shown.

Step 5: Tighten M16 head bolts an additional 90 degrees (2nd time) in numerical sequence shown.

Step 6: Torque M8 head bolts (labeled 11-15) to 18 lb/ft (24 Nm) in numerical sequence shown.

Step 7: Torque M8 head bolts to 23 lb/ft (31 Nm) in numerical sequence shown.

Note: Head bolts may not be reused once torqued.

Note: If bolt chatter occurs during step 4, repeat step 3 and continue.

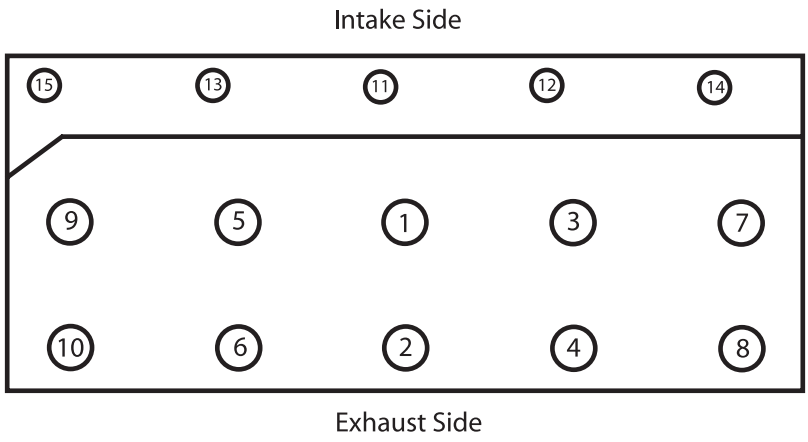


FIGURE B: Flywheel Bolts

Step 1: Torque the bolts to 44 lbf/in (5 Nm) in the numerical sequence shown.

Step 2: Torque the bolts to 69 lbf/ft (94 Nm) in the numerical sequence shown above.

Note: Flywheel bolts may not be reused once torqued.

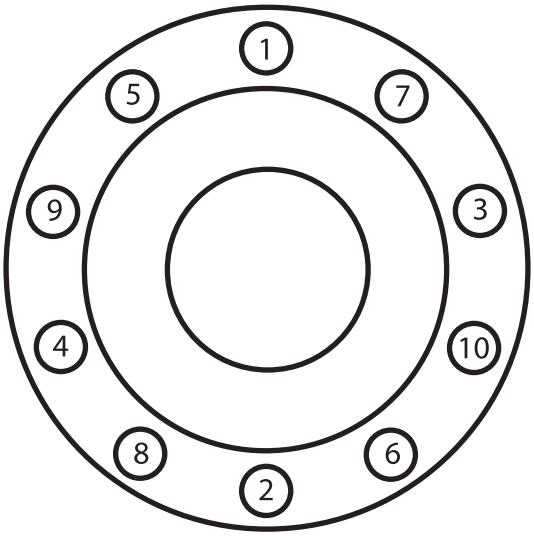
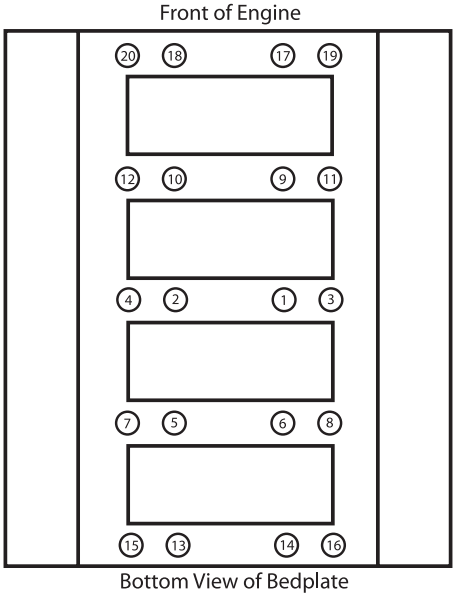


FIGURE C: Bedplate Bolts (main bearing bolts)

Step 1: Torque the bolts to 110 lbf/ft (149 Nm) in the numerical sequence shown.

Step 2: Torque the bolts to 130 lbf/ft (176 Nm) in the numerical sequence shown.

Step 3: Torque the bolts to 170 lbf/ft (231 Nm) in the numerical sequence shown.



SPECIAL TORQUE CHART (REFERENCE ONLY)

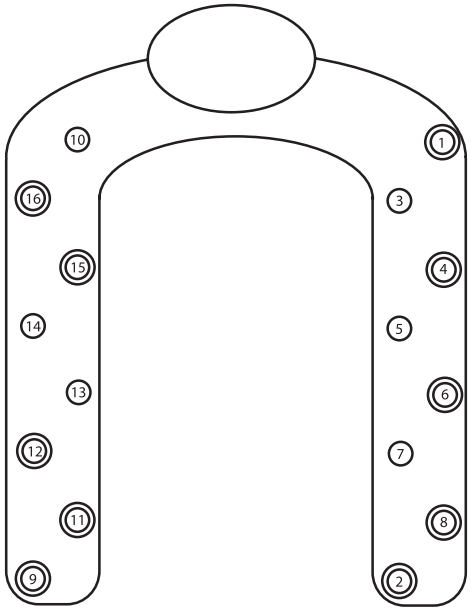


FIGURE D: Intake Manifold Bolts

Step 1: Loosely install all bolts in the numerical sequence shown.

Step 2: Torque bolts to 100 lb/in (11Nm) in the numerical sequence shown.

Note: Bolt locations with double circles represent stud bolts.

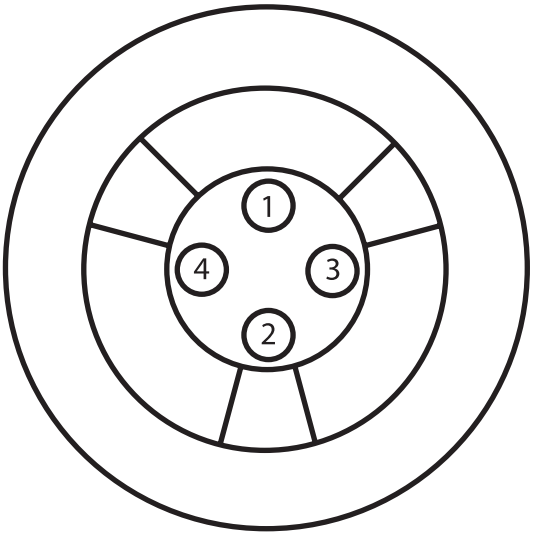


FIGURE E: Vibration Damper Bolts

Step 1: Torque each bolt to 50 lb/ft (68 Nm) in the numerical sequence shown.

Step 2: Tighten each bolt 90 degrees clockwise in the numerical sequence shown.

Note: Damper bolts may not be reused once torqued.

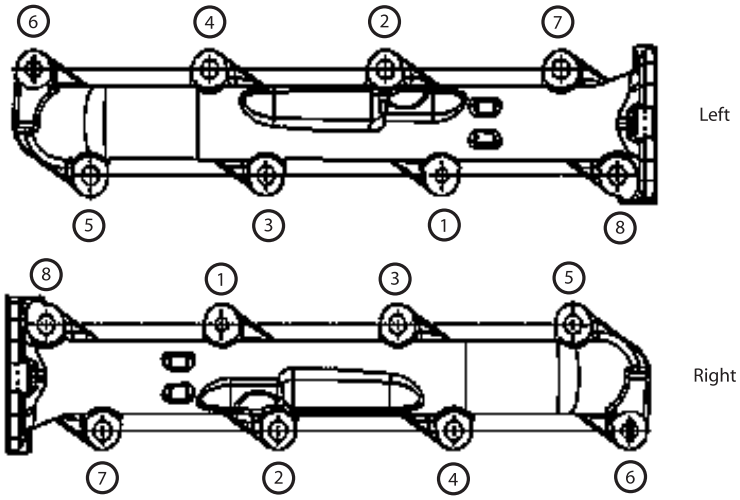


FIGURE F: Exhaust Manifold Bolts

Step 1: Torque bolts to 18 lb/ft (25Nm) in the numerical sequence shown.

Step 2: Repeat the sequence using the same torque.

Note: Exhaust manifold bolts and studbolts may not be reused once torqued.

FIGURE G: HPCR Fuel Components Assembly Procedure

Hand start and hand snug tube nuts.

Step 1: Install injectors, clamps and bolts and hand start the clamp bolts.

Step 2: Rundown the injector clamp bolts to a torque of 1.5 lb/ft (2 Nm). Injectors will seat while torquing the bolts.
Note: The injectors must be fully seated and snugged, but moveable for high pressure connector and HP tube alignment.

Step 3: Install the HP rail and hand start two rail mounting bolts.
Note: Rail must be moveable, but not loose.

Step 4: Remove the four plastic caps from the rail high pressure connectors (HPC's) and four plastic caps from the injector HPC's.

Step 5: Obtain four "rail to injector" jumper tubes from the packaging.

Step 6: Position the four (one at a time) between the rail and injectors and fully hand start and seat the tube nuts onto the mating rail and injector HPC's. Snug the rail and injector tube nuts using the inside-out step sequence (i.e. two inside nuts then two outside nuts) with a tube nut click wrench set to 1.5 lb/ft (2 Nm).

Step 7: Final torque the injector clamp bolts to 28 lb/ft (38 Nm).

Step 8: Final torque the two M8 rail bolts to 23 lb/ft (31 Nm).

Step 9: Torque the rail and injector tube nuts to 106 lb/in (12 Nm +2 / -0).

Step 10: Place a visible mark with a permanent marker on the tube nut and the high pressure fuel rail and fuel injector threaded connection. Turn the tube nuts one flat of the nut which is equal to 60 degrees.

FIGURE H: High Pressure Pump and Pump-to-Rail HP Tubes Installation Procedure

Step 1: Install and final torque the high pressure fuel injetion pump to 45 lb/ft (61 Nm).

Step 2: Install the pump cover gasket and make electrical connections between the pump and gasket. Install the pump cover and fasten the bolts.

Step 3: Remove the four plastic caps covering the supply, return, and high pressure rail connectors.

Step 4: Obtain left and right "pump-to-rail" high pressure tubes from the packaging.

Step 5: Position the high pressure tubes between the pump and the rails and fully hand start and seat the tube nuts onto the mating pump and rails high pressure connections.
Note: Support the tubes while hand snugging the nuts to assure proper assembly of the joints.

Step 6: Snug the tube nuts to 1.5 lb/ft (2 Nm).

Step 7: Torque the pump and rail tube nuts to 106 lb/in (12 Nm +2 / -0).

Step 8: Place a visible mark with a permanent marker on the tube nut and the high pressure fuel rail and the high pressure fuel injection pump threaded connection. Turn the tube nuts one flat of the nut which is equal to 60 degrees.

FIGURE I: Injector-Pipe-Rail Sub-Assembly Process

Step 1: Place the fuel injectors w/clamps in the head and snug the bolts.

Step 2: Place and snug the fuel rail (leave one thread loose).

Step 3: Place four fuel jumper tubes to injector/fuel rail and start 1-2 threads.

Step 4: Snug injector side tube nuts to 1.5 lb/ft (2 Nm). (Special torque sequence is used, see note below).

Step 5: Snug fuel rail side tube nuts to 1.5 lb/ft (2 Nm). (Special torque sequence is used, see note below).

Step 6: Final torque the fuel rail mounting bolts.

Step 7: Final torque the injector bolts. (Special torque sequence is used, see note below).

Step 8: Final torque the injector side tube nuts to 106 lb/in (12 Nm +2 / -0). (Special torque sequence is used, see note below).

Step 9: Final torque the fuel rail side tube nuts to 106 lb/in (12 Nm +2 / -0). (Special torque sequence is used, see note below).

Step 10: Place a visible mark with a permanent marker on the tube nut and the fuel injector threaded connection. Turn the tube nuts one flat of the nut which is equal to 60 degrees. (Special torque sequence is used, see note below).

Step 11: Place a visible mark with a permanent marker on the tube nut and the high pressure fuel rail threaded connection. Turn the tube nuts one flat of the nut which is equal to 60 degrees. (Special torque sequence is used, see note below).

NOTE: Torque the components in the center two cylinders first, then torque the components in the outer two cylinders last.

FIGURE J: Fulcrum Plate / Rocker Arm Support Assembly

Step 1: Position crankshaft at approximate #1 & #4 cylinder TDC by observing damper dowel pin and clocking it to the 10:30 position (as viewed from the front of the engine)

Step 2: Determine which cylinder is actually in the firing position by installing pushrods, and observing #3 intake and #8 intake.

Step 3: If #3 intake pushrod shows cam lift, this is the #1 firing position. Torque only fulcrum plates #1,2,7,8 per steps 4-6.

If #8 intake pushrod shows cam lift, this is the #4 firing position. Torque only fulcrum plates #3,4,5,6 per steps 4-6.

Step 4: Partially run down both M10 bolts until they just contact the fulcrum plate.

Step 5: Fully run down and torque inboard (upper) bolt to 45 lb/ft (62 Nm).

Step 6: Fully run down and torque outboard (lower) bolt to 45 lb/ft (62 Nm).

Step 7: Rotate crankshafft 360 degrees to position it at the alternate cylinder TDC (dowel pin at 10:30 position).

Step 8: Identify remaining group of fulcrum plates per step 3, and torque per steps 4-6.

FIGURE K: EGR Cooler Mounting Clamps

Horizontal Cooler

Step 1: Pre-torque EGR clamps to 88lb/in (10 Nm).

Step 2: Loosen clamp nuts two full turns.

Step 3: Final torque to 69 lb/in (8 Nm)

Vertical Cooler

Step 1: Pre-torque EGR clamps to 75 lb/in (8.5 Nm).

Step 2: Loosen clamp nuts two full turns.

Step 3: Final torque to 57 lb/in (6.5 Nm).

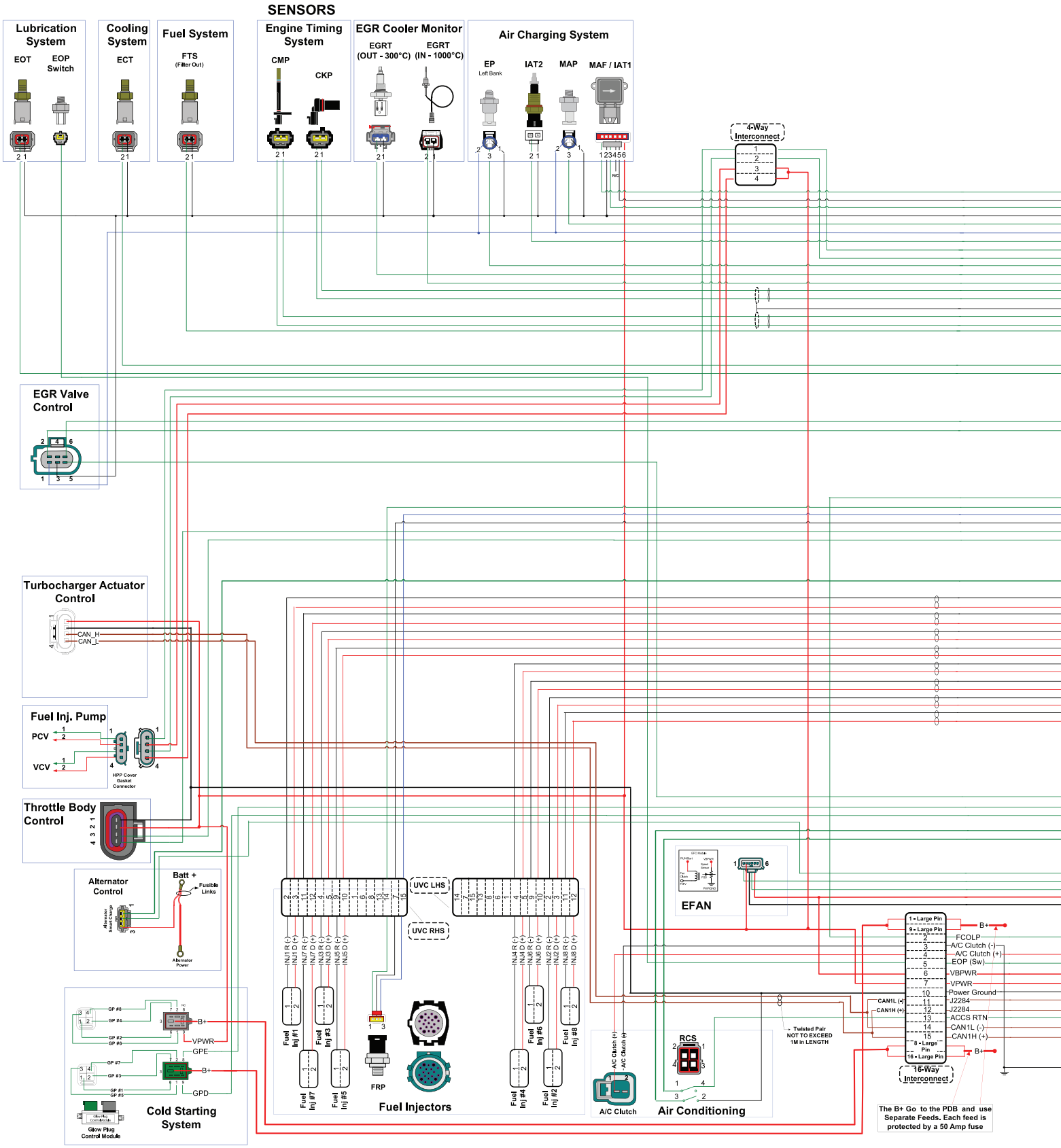
FIGURE L: Fuel Rail Pressure Sensor (FRP)

Step 1: Snug the sensor hand tight to 1.5 lb/ft (2 Nm)

Step 2: Place a visible mark with a permanent marker on the sensor and the high pressure fuel rail connection. Turn the sensor one flat of the sensor base which is equal to 60 degrees.

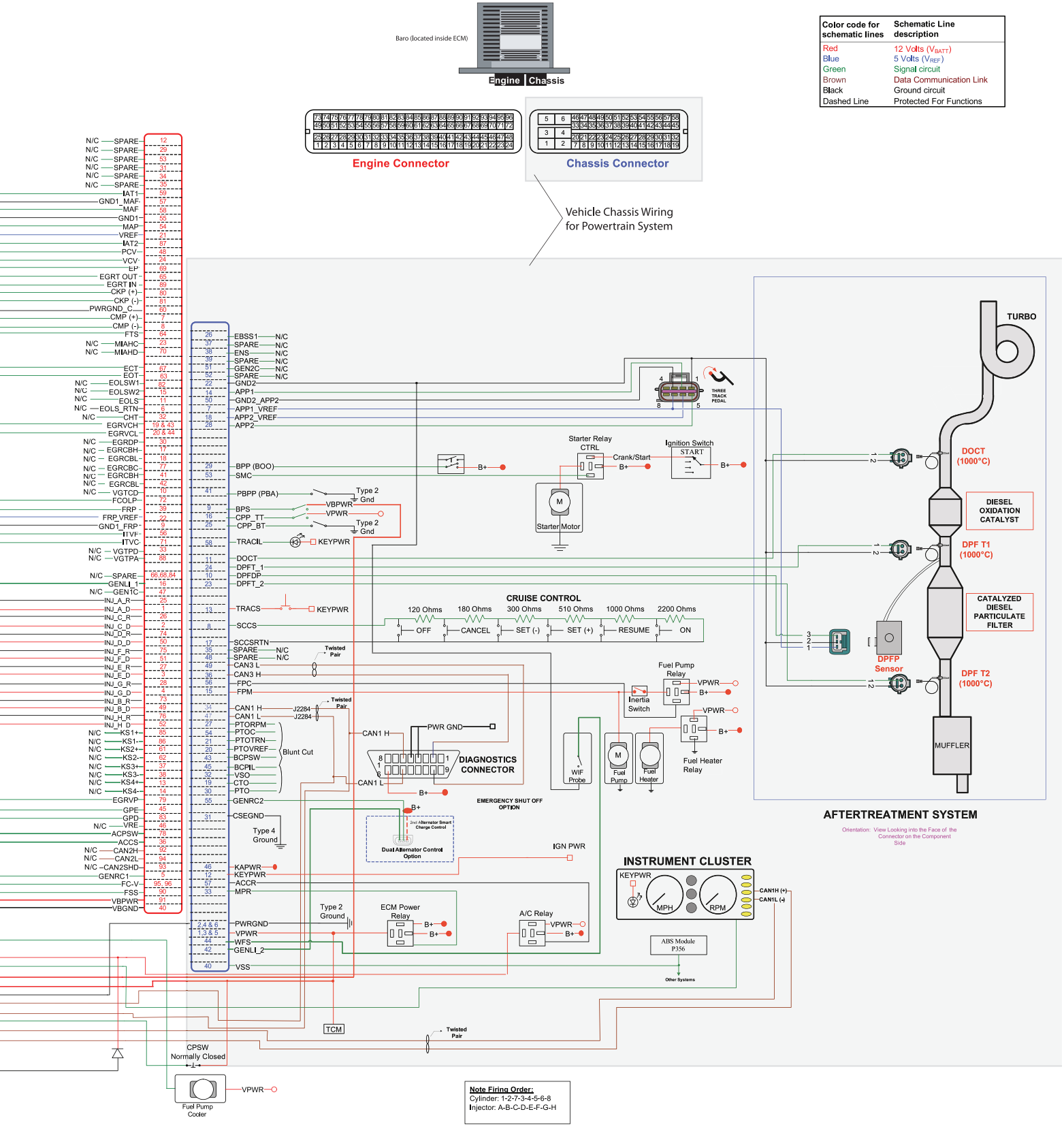
WIRING DIAGRAM (SINGLE ALT.) REFERENCE ONLY

Refer to Ford Wiring Diagrams for Wiring



WIRING DIAGRAM (SINGLE ALT.) REFERENCE ONLY

Refer to Ford Wiring Diagrams for Wiring



Note Firing Order:
Cylinder: 1-2-7-3-4-5-6-8
Injector: A-B-C-D-E-F-G-H

DIAGNOSTIC CODES

O - Self Test - Key On Engine Off
R - Key On Engine Running
C - Continuous Operation
REGEN - Test Follows a REGEN CYCLE
SHUT DOWN - Test Follows Key Off
KO - Test Operates at Key On
1PC - Once Per Cycle

DATA Color Code	
	MIL For Both F250/F350 and F450/F550
	MIL For Only F250/F350
	MIL For F250/F350 and Wrench for F450/F550
	Wrench for Both F250/F350 and F450/F550
	No MIL or Wrench Light

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P1111	X	X	X	System Pass			PCM, connection to service tool
P000E		X	X	Fuel Volume Regulator Control Adaptive Learning at Limit	This error is set when the Pulse Width Modulated (PWM) signal for the Volume Control Valve (VCV) is either too low or too high for current operating modes.	+/- 8% error in VCV control	Low pressure fuel system, injector leakage
P0A09	X	X	X	DC/DC Converter Fault Circuit Low	The purpose is to diagnose the analog output voltage from the DCDC converter (voltage converter for injectors inside PCM). If the voltage from the converter is lower than a threshold, the fault is set.	Low: < 42 V High: >96 V	PCM
P0A10	X	X	X	DC/DC Converter Fault Circuit High	The purpose is to diagnose the analog output voltage from the DCDC converter (voltage converter for injectors inside PCM). If the voltage from the converter is higher than a threshold, the fault is set.	Low: < 42 V High: >96 V	PCM
P0001		X	X	Fuel Volume Regulator Control Circuit / Open	This error is recorded when an open circuit causes the Pulse Width Modulated (PWM) signal of the Volume Control Valve (VCV) to be abnormally high for an extended period of time.	For open load: Resistance > 500 Ohm	Wiring, VCV electrical system
P0003	X	X	X	Fuel Volume Regulator Control Circuit Low	During KOEO diagnostics, this error is set when the measured current through the system is greater than intended. During the KOER or Continuous Monitor modes, this code is a result of a short to ground, which causes the measured current in the system to be lower than expected.	Short to ground: 0 V > 3A	Wiring, VCV electrical system
P0004		X	X	Fuel Volume Regulator Control Circuit High	This error is set if there is short to ground, short to power, or an open load detected in the volume control circuit.	Short to plus: 12 V"	Wiring, VCV electrical system
P0069			X	MAP - Barometric Pressure Correlation	This error is set when the difference between Manifold Absolute Pressure (MAP) and Barometric Pressure (BP) is greater than the specified value for a predetermined period of time.	300 hPa < 2.5 sec	Wiring, MAP sensor, BP sensor (intergral part of PCM)
P006B	X		KO	MAP/EBP Correlation	This error is set when the difference between Maniforld Absolute Pressure (MAP) and Exhaust Pressure (EP) is greater than the threshold for a predetermined period of time.	Engine off time > 5.0s. 300 hPa > 5.0 sec	Wiring, EP tube plugged, EP Sensor, MAP sensor, PCM
P008C			X	Fuel Cooler Pump Control Circuit / Open	This diagnostic will detect if the relay for the fuel cooling pump has an open load error.		
P008D			X	Fuel Cooler Pump Control Circuit Low	This diagnostic will detect if the relay for the fuel cooling pump has grounded.		
P008E			X	Fuel Cooler Pump Control Circuit High	This diagnostic will detect if the relay for the fuel cooling pump has shorted to positive voltage.		
P008F	X	X	X / KO	Engine Coolant Temperature / Fuel Temperature Correlation	This error is set when the difference between Engine Coolant Temperature (ECT) and Fuel Temperature (FTS) is either greater than or less than a specified value depending on current operating modes.	Engine off time > 3600 sec no block heater detected 20 deg C or -20deg < 1 sec	Wiring, ECT or TFU sensor, unknown type block heating device, PCM
P0087		X	X	Fuel Rail/System Pressure - Too Low	This error will be set if the fuel pressure in the rail is too low and the controller cannot regulate it to the setpoint.	20 % "overposition" of the PCV or VCV [% PWM] 5% deviation of the fuel rail pressure to the fuel rail pressure setpoint.	Low pressure system, wiring to VCV and PCV, FUP sensor, pump
P0088		X	X	Fuel Rail/System Pressure - Too High	This error will be set if the fuel pressure in the rail is too high and the controller cannot regulate it to the setpoint.	20 % "overposition" of the PCV [% PWM] 3% deviation of the fuel rail pressure to the fuel rail pressure setpoint	Low pressure system, wiring to VCV and PCV, FUP sensor, pump
P0090	X	X	X	Fuel Pressure Regulator Control Circuit	This error occurs if a short to power is found in the fuel pressure regulator (PCV) circuit.	For open load: Resistance > 500 Ohm	Wiring to PCV, PCV electrical system
P0091	X	X	X	Fuel Pressure Regulator Control Circuit Low	This error occurs if a short to ground or, during the KOEO self test, a current that is excessively high is found in the fuel pressure regulator (PCV) circuit.	Short to ground: 0 V > 3A	Wiring to PCV, PCV electrical system
P0092	X	X	X	Fuel Pressure Regulator Control Circuit High	This error occurs if an open circuit is found in the fuel pressure regulator (PCV) circuit.	Short to plus: 12 V	Wiring to PCV, PCV electrical system

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P0096	X	X	X	Intake Air Temperature Sensor 2 Circuit Range/Performance	This error is set when the change in IAT2 is 5ºC less than specified over a predetermined period of time.	5 deg C ECT has to change from 40 deg C to 80 deg C to equal 1 drive cycle. 10 drive cycles required	Wiring, IAT2 sensor, PCM
P0097	X	X	X	Intake Air Temperature Sensor 2 Circuit Low Input	This error is set when the IAT2 sensor temperature output provides a value higher than a maximum probable temperature (lower voltage reading) for a predetermined period of time, which indicates a short to ground.	0.17v > 5sec.	Wiring, IAT2 sensor, PCM
P0098	X	X	X	Intake Air Temperature Sensor 2 Circuit High Input	This error is set when the IAT2 sensor temperature output provides a value lower than a minimum probable temperature (higher voltage reading) for a predetermined period of time, which indicates an open circuit or a short to power.	4.81v > 5sec.	Wiring, IAT2 sensor, PCM
P0101			X	Mass Air Flow A Circuit Range/Performance	This error occurs when the PCM detects a MAF sensor that is sending no signal.		Wiring, MAF assembly, PCM
P0102			X	Mass or Volume Air Flow A Circuit Low Input	This error occurs when the value of the mean period time per ms of the mass air flow sensor is less than a calibrateable value.		
P0103			X	Mass or Volume Air Flow A Circuit High Input	This error occurs when the value of the mean period time per ms of the mass air flow sensor is greater than a calibrateable value.		
P0104			X	Mass or Volume Air Flow A Circuit Intermittent/Erratic	This error occurs when the MAF senor change is too great over a predetermined period of time.		
P0106			X	Manifold Absolute Pressure/BARO Sensor Range/Performance	This diagnostic compares MAP and BP pessures at idle conditions, when they should be within a specified range. This error is set if the MAP sensor reading is above or below the thresholds for a predetermined period of time.	N > function of (ECT) Vehicle speed =0 ECT> 70 deg C 10% < EGRTP command <100% no DPF regen requested for > 10 seconds 300hPa or -300hPa >5sec	Wiring, MAP sensor, BP sensor (intergral part of PCM)
P0107			X	Manifold Absolute Pressure/ BARO Sensor Low Input	This diagnostic checks for a minimum intake manifold pressure, indicating an open circuit or a short to ground. This error occurs when the MAP signal voltage is lower than a specified value for a predetermined period of time.	0.15v > 5sec.	Wiring, MAP sensor, PCM
P0108			X	Manifold Absolute Pressure/ BARO Sensor High Input	This diagnostic checks for a maximum possible intake manifold pressure, indicating a short to power. This error sets when the MAP signal voltage is higher than a specified value for a predetermined amount of time.	4.90v > 5 sec.	Wiring, MAP sensor, PCM
P0112			X	Intake Air Temperature Sensor 1 Circuit Low Input	This error occurs if the input signal from the intake air temperature sensor falls below a minimum calibrateable threshold for a predetermined period of time.	0.15v > 5sec	
P0113			X	Intake Air Temperature Sensor 1 Circuit High Input	This error occurs if the input signal from the intake air temperature sensor rises above a maximum calibrateable threshold for a predetermined period of time.	4.6v > 5 sec	
P0114			X	Intake Air Temperature Sensor 1 Intermittent/Erratic	This error sets if the gradient of measured intake air temperature sensor outputs is outside of a threshold.		
P0117	X	X	X	Engine Coolant Temperature Sensor 1 Circuit Low Input	This error is set when the ECT sensor signal is lower than the minimum threshold for a predetermined period of time.	0.04v > 1sec.	Wiring, ECT sensor, PCM
P0118	X	X	X	Engine Coolant Temperature Sensor 1 Circuit High Input	This error sets when the ECT sensor signal is higher than a maximum threshold for a predetermined period of time.	4.67v > 1 sec.	Wiring, ECT sensor, PCM
P0128			X	Coolant Thermostat (Coolant Temp Below Thermostat Regulating Temperature)	This error occurs when the ECT sensor signal indicates a coolant temperature lower than the operating temperature of the thermostat for an extended period of time.		
P0148	X	X	X	Fuel Delivery Error	This error sets when injections are detected although they are not commanded.	N/A	PCM, check injectors
P0149		X		Fuel Timing Error			PCM
P0168		X	X	Engine Fuel Temperature Too High	This error occurs when fuel temperature exceeds a predetermined temperature.		
P0181	X		X	Fuel Temperature Sensor A Circuit Range/Performance	This error occurs when the difference of the minimum and maximum fuel temperature exceeds a threshold.		
P0182	X	X	X	Fuel Temperature Sensor A Circuit Low Input	This error occurs when the FTS temperature output is higher (lower voltage signal) than a maximum probable temperature, indicating a short to ground.	0.07v > 5sec.	Wiring, MAP sensor, PCM

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DATA Color Code	
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	MIL For F250/F350 and Wrench for F450/F550
	Wrench for Both F250/F350 and F450/F550
	No MIL or Wrench Light

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P0183	X	X	X	Fuel Temperature Sensor A Circuit High Input	This error occurs when the FTS temperature output is lower (higher voltage signal) than a minimum probable temperature, indicating an open circuit or a short to power.	4.76v > 5 sec.	Wiring, MAP sensor, PCM
P0191	X	X	X	Fuel Rail Pressure Sensor A Circuit Range/Performance	This error occurs if the voltage signal of rail pressure sensor is not updated during a calibrated period of time.	checktime is 0.4 s maximum sensor voltage signal minus minimum voltage signal must be greater than 0.01 V	FUP sensor, HP system
P0192			X	Fuel Rail Pressure Sensor A Circuit Low Input	This error occurs if the voltage of the fuel pressure sensor falls below a calibratable threshold.	Low: < 0.20 V	Wiring to FUP sensor, FUP sensor
P0193	X			Fuel Rail Pressure Sensor A Circuit High Input	This error occurs if the voltage of the fuel pressure sensor exceeds a calibratable threshold.	High: >4.80 V	Wiring to FUP sensor, FUP sensor
P0194	X	X	X	Fuel Rail Pressure Sensor A Circuit Intermittent/Erratic	This error occurs if the rate of change of the measured fuel pressure exceeds a calibratable threshold.	max gradient: 40Mpa/10ms	Wiring to FUP sensor (especially for bad connections), FUP sensor, possibly HP system
P0196			X	Engine Oil Temperature Sensor Circuit Range/Performance	This error occurs if time required for EOT to warm up to 50º C is greater than the specified value or the EOT does not change by at least 2 degrees from the value stored in KAM, followed with the engine running off low idle.	EOT dependant 20minutes of engine running and EOT has not changed more than 5 deg C	Wiring, ECT sensor, PCM
P0197	X	X	X	Engine Oil Temperature Sensor Circuit Low Input	This error occurs if the EOT sensor output value is higher (lower voltage signal) than a maximum probable temperature, indicating a short to ground.	0.04v < 5sec.	Wiring, ECT sensor, PCM
P0198	X	X	X	Engine Oil Temperature Sensor Circuit High Input	This error occurs if the EOT sensor temperature output value is lower (higher voltage signal) than a minimum probable temperature, indicating an open circuit or a short to power.	4.76v < 5 sec.	Wiring, ECT sensor, PCM
P02CC		X	X	Cylinder 1 Minimum Fuel Mass Adaptive Learning at Min Limit	This error sets if the fuel mass estimated by the adaptation feature falls outside of a calibrated threshold.		Injector
P02CD		X	X	Cylinder 1 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of the fuel pressure dependent calibration threshold.		
P02CE		X	X	Cylinder 2 Minimum Fuel Mass Adaptive Learning at Min Limit	This error occurs when the fuel mass estimated by the adaptation feature falls outside of a calibration threshold.		Injector
P02CF		X	X	Cylinder 2 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of a fuel pressure dependent calibration threshold.		
P02D0		X	X	Cylinder 3 Minimum Fuel Mass Adaptive Learning at Min Limit	This error sets if the fuel mass estimated by the adaptation feature falls outside of a calibrated threshold.		Injector
P02D1		X	X	Cylinder 3 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of the fuel pressure dependent calibration threshold.		
P02D2		X	X	Cylinder 4 Minimum Fuel Mass Adaptive Learning at Min Limit	This error occurs when the fuel mass estimated by the adaptation feature falls outside of a calibration threshold.		Injector
P02D3		X	X	Cylinder 4 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of a fuel pressure dependent calibration threshold.		
P02D4		X	X	Cylinder 5 Minimum Fuel Mass Adaptive Learning at Min Limit	This error sets if the fuel mass estimated by the adaptation feature falls outside of a calibrated threshold.		Injector
P02D5		X	X	Cylinder 5 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of the fuel pressure dependent calibration threshold.		
P02D6		X	X	Cylinder 6 Minimum Fuel Mass Adaptive Learning at Min Limit	This error occurs when the fuel mass estimated by the adaptation feature falls outside of a calibration threshold.		Injector
P02D7		X	X	Cylinder 6 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of a fuel pressure dependent calibration threshold.		

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P02D8		X	X	Cylinder 7 Minimum Fuel Mass Adaptive Learning at Min Limit	This error sets if the fuel mass estimated by the adaptation feature falls outside of a calibrated threshold.		Injector
P02D9		X	X	Cylinder 7 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of the fuel pressure dependent calibration threshold.		
P02DA		X	X	Cylinder 8 Minimum Fuel Mass Adaptive Learning at Min Limit	This error occurs when the fuel mass estimated by the adaptation feature falls outside of a calibration threshold.		Injector
P02DB		X	X	Cylinder 8 Minimum Fuel Mass Adaptive Learning at Max Limit	This error occurs when the absolute fuel mass deviation of the available fuel mass estimate to the current set point falls outside of a fuel pressure dependent calibration threshold.		
P0201			X	Injector Circuit / Open - Cylinder 1	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0202			X	Injector Circuit / Open - Cylinder 2	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0203			X	Injector Circuit / Open - Cylinder 3	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0204			X	Injector Circuit / Open - Cylinder 4	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0205			X	Injector Circuit / Open - Cylinder 5	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0206			X	Injector Circuit / Open - Cylinder 6	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0207			X	Injector Circuit / Open - Cylinder 7	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0208			X	Injector Circuit / Open - Cylinder 8	This error occurs when the maximum current rise time is exceeded.		Wiring to injector, injector
P0216		X		Injector/Injection Timing Control Circuit	This error occurs if a post injection cycle is recognized without a main injection cycle.		PCM
P0219			X	Engine Overspeed Condition	This failure occurs when actual engine speed exceeds governed engine speed for a predetermined amount of time.	4000 rpm	
P0231			X	Fuel Pump Secondary Circuit Low			
P0232			X	Fuel Pump Secondary Circuit High			
P0234			X	Turbocharger/Supercharger Overboost Condition	This error occurs when the MAP sensor reading is above the threshold for a predetermined period of time.	4050hPa > 5 sec	System error, causes of overboost.
P0263		X	X	Cylinder 1 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.	Between 0.3 & 1.8	Injector, cylinder (compression)
P0266		X	X	Cylinder 2 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0269		X	X	Cylinder 3 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0272		X	X	Cylinder 4 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0275		X	X	Cylinder 5 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0278		X	X	Cylinder 6 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0281		X	X	Cylinder 7 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0284		X	X	Cylinder 8 Contribution/Balance	This error occurs when the cylinder balance controller output has exceeded its allowed minimum or maximum value.		Injector, cylinder (compression)
P0297			X	Vehicle Overspeed Condition	This error occurs when the vehicle speed exceeds the vehicle speed limiting.		
P0298			X	Engine Oil Overtemperature Condition	This error occurs when the time required for EOT to cool down to 110 deg. C is greater than the specified value.	time dependant on initial EOT temp could be >15minutes	System error, causes of EOT overtemperatue, sensor, PCM
P0300			X	Random Misfire Detected	This error occurs when cylinder deceleration is excessively large and persists long enough on more than one cylinder to set the code. Misfire monitor is calibrated to detect a complete loss of combustion in the cylinder; therefore, cylinder balance codes can be expected.		

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DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P0301			X	Cylinder 1 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0302			X	Cylinder 2 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0303			X	Cylinder 3 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0304			X	Cylinder 4 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0305			X	Cylinder 5 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0306			X	Cylinder 6 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0307			X	Cylinder 7 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0308			X	Cylinder 8 Misfire Detected	This error occurs if the case of a loss of combustion.		
P0336	X	X	X	Crankshaft Position Sensor A Circuit Range/Performance	This error occurs if the tooth count of the crankshaft trigger wheel reaches a threshold and the system is still not detecting sync between CKP and CMP circuits while a valid CMP sensor signal has been detected (intermittent CKP signal), when the number of missing or extra teeth exceed the threashold, or if spikes are detected in the CKP signal.	3 CAM edges <1sec	Wiring, CMP sensor, CKP sensor, PCM
P0337	X	X	X	Crankshaft Position Sensor A Circuit Low Input	This error occurs when a short or open fault in the CKP circuit is present causing the amplitude of the AC voltage to be excessive.	0.5v < 1sec	Wiring, CKP sensor, PCM
P0341	X	X	X	Camshaft Position Sensor A Circuit Range/Performance	This error occurs when either the number of CMP signals is too great to filter or the CMP signal is not properly aligned with the CKP signal.	Internal to the engine control module Once at key on < 1 sec	Wiring, CMP sensor, PCM
P0342	X	X	X	Camshaft Position Sensor A Circuit Low Input	This error occurs when the CMP signal is missing entirely.	Internal to the engine control module Once at key on < 1 sec	Wiring, CMP sensor, PCM
P0381			X	Glow Plug/Heater Indicator Circuit	The instrument cluster performs the diagnostic of the wait-to-start indicator once per driving cycle and transmits the result to the PCM. The PCM analyzes the message to check if the glow plug lamp circuit is operational.		
P040B	X	X	X	Exhaust Gas Recirculation Temperature Sensor A Circuit Range/Performance	This error occurs when the change in the EGR cooler inlet temperature is less than 40 deg C for a predetermined period of time.	Initial ECT < 30 deg C. ECT increase to > 80 deg C during drive cycle ECM on time > 3 seconds TEGR_IN has not changed more than 6 deg. C in 2 drive cycles	Wiring, Tegr_IN sensor, PCM
P040C	X	X	X	Exhaust Gas Recirculation Temperature Sensor A Circuit Low	This error occurs when the EGR cooler inlet sensor temperature output value is higher (lower voltage signal) than a maximum probable temperature, indicating a short to ground.	0.07v > 5sec.	Wiring, Tegr_IN sensor, PCM
P040D	X	X	X	Exhaust Gas Recirculation Temperature Sensor A Circuit High	This error occurs when the EGR cooler inlet sensor temperature output value is lower (higher voltage signal) than a minimum probable temperature, indicating an open circuit or short to power.	N > 650 rpm torque setpoint >53 N-m ECT > 60 deg C 4.65v >5sec	Wiring, Tegr_IN sensor, PCM
P0401			X	Exhaust Gas Recirculation Flow Insufficient Detected	This error is set when the estimated EGR percent is less than the minimum limit for the operating condition.	DPF regeneration not requested PTO not active Pressure ratio across EGR valve < 1 rate of change of engine speed < 0.05 rate of change of indicated torque setpoint < 0.05 600 rpm <engine speed< 800 rpm 45Nm <tqi_sp< 174Nm 12 sec to run test 2 low flow failures required to set fault (test runs 5 times per trip) 60 sec wait time between tests	EGR system error

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P0402			X	Exhaust Gas Recirculation Flow Excessive Detected	This error occurs when the estimated EGR percent is greater than the maximum limit for the operating condition.	DPF regeneration not requested PTO not active Pressure ratio across EGR valve < 1 rate of change of engine speed < 0.05 rate of change of indicated torque setpoint < 0.05 600 rpm <engine speed< 800 rpm 45Nm <tqi_sp< 174Nm 12 sec to run test 2 low flow failures required to set fault (test runs 5 times per trip) 60 sec wait time between tests	EGR system error
P0403			X	Exhaust Gas Recirculation Control Circuit	This error occurs when the current through the EGR control circuit is outside of a predetermined range.	Internal to the engine control module	Wiring, EGR valve assembly, PCM
P0404			X	Exhaust Gas Recirculation Control Circuit Range/ Performance	This error is set when the deviation in EGR position is outside the threshold.	10 percent of full range error >5 sec	System error, EGR valve, PCM
P0405	X	X	X	Exhaust Gas Recirculation Sensor A Circuit Low	This error occurs when the EGR position voltage is below the specified voltage for a predetermined amount of time. This error can indicate either a short to ground or an open circuit.	0.24v <3 sec	Wiring, EGR valve assembley, PCM
P0406	X	X	X	Exhaust Gas Recirculation Sensor A Circuit High	This error occurs when the EGR position voltage is above the specified voltage, for maximum position given the current operation, for a predetermined amount of time. This error can indicate a short to power.	4.84v <3 sec	Wiring, EGR valve assembley, PCM
P041B	X	X	X	Exhaust Gas Recirculation Temperature Sensor B Circuit Range/Performance	This error occurs when the change in the EGR cooler outlet temperature is less than the threshold for a predetermined period of time.	Initial ECT < 30 deg C ECT increase to > 80 deg C during drive cycle ECM on time > 3 seconds TEGR_IN has not changed more than 6 deg. C in 2 drive cycles	Wiring, Tegr_OUT sensor, PCM
P041C	X	X	X	Exhaust Gas Recirculation Temperature Sensor B Circuit Low	This error occurs when the EGR cooler outlet sensor temperature output value is lower than a minimum probable temperature for a predetermined amount of time, indicating an open circuit or short to power.	0.15v > 5sec.	Wiring, Tegr_OUT sensor, PCM
P041D	X	X	X	Exhaust Gas Recirculation Temperature Sensor B Circuit High	This error occurs when the EGR cooler outlet sensor temperature output value is higher than a maximum probable temperature for a predetermined period of time, indicating a short to ground.	N > 650 rpm torque setpoint >53 N-m ECT > 60 deg C 4.95v > 5 sec	Wiring, Tegr_OUT sensor, PCM
P0420	REGEN			Catalyst System Efficiency Below Threshold	This error occurs if the observed exothermic reaction (a reaction that produces heat) during a regeneration event falls below a threshold for a predetermined period of time.		
P042E	X	X	X	EGR Control Stuck Open	This error occurs when the EGR set point is less than a specified threshold, the actual EGR position is greater than a specified threshold, and the EGR control limit is less than a specified limit.	EGR Position > 30 % EGR Position desired < 15% > 4 sec	System error, EGR valve, PCM
P042F	X	X	X	EGR Control Stuck Closed	This error occurs when the EGR set point is greater than a specified threshold, the actual EGR position is less than a specified threshold, and the EGR control limit is greater than a specified limit.	EGR Position < 15 % EGR Position desired > 30% > 4 sec	System error, EGR valve, PCM
P0472			X	Exhaust Pressure Sensor A Circuit Low	This error occurs when the EP signal voltage is lower than a specified value for a predetermined period of time.	0.15v < 3 sec	Wiring, EP sensor, PCM
P0473			X	Exhaust Pressure Sensor A Circuit High	This error occurs when the EP signal voltage is higher than a specified value for a predetermined amount of time.	4.90v < 3 sec	Wiring, EP sensor, PCM
P0480			X	Fan 1 Control Circuit			
P0488			X	EGR Throttle Position Control Range/Performance	This error occurs when there is an error in throttle position vs. desired position, high temperature condition and throttle not returned to open position when commanded, faulty input signal detected, or broken return spring detected.	THR_STATE is low > 3 sec	Wiring, EGRTP, PCM
P0494		X		Fan Speed Low			
P0495		X		Fan Speed High			
P0500			X	Vehicle Speed Sensor A	This error occurs when either a faulty signal or a missing signal occurs from the vehicle speed sensor circuit.		
P0503			X	Vehicle Speed Sensor A Intermittent/Erratic/High	This error occurs when an intermittent error is detected in the vehicl speed sensor circuit.		

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	O	R	C				
P0528			X	Fan Speed Sensor Circuit No Signal			
P0529			X	Fan Speed Sensor Circuit Intermittent			
P0544			1PC	Exhaust Gas Temperature Sensor Circuit Bank 1 Sensor 1	This error occurs if the EGT1 temperature signal of the exhaust system does not rise sufficiently immediately after a cold-start following an 8-hour soak.		
P0545			X	Exhaust Gas Temperature Sensor Circuit Low - Bank 1 Sensor 1	This error occurs when the EGT1 sensor temperature signal is higher (lower voltage signal) than a maximum probable temperature, indicating a short to ground.		
P0546			X	Exhaust Gas Temperature Sensor Circuit High - Bank 1 Sensor 1	This error occurs when the EGT1 sensor temperature signal is lower (higher voltage signal) than a minimum probable temperature, indicating an open circuit or a short to power.		
P0560		X		System Voltage	This error occurs when battery voltage falls below a predetermined threshold.		
P0563			X	System Voltage High	This error occurs if the battery voltage increases above a predetermined threshold.		
P0565		X	X	Cruise Control ON Signal	This error occurs is the cruise control on switch is not pressed during the KOER or the cruise control on switch is stuck on during continuos operation.		
P0566		X	X	Cruise Control OFF Signal	This error occurs when the cruise control off switch is not depressed during the KOER self test or when the switch is stuck during continuous operation.		
P0567		X	X	Cruise Control RESUME Signal	This error occurs when the cruise control resume switch is not depressed during the KOER self test or is stuck during continuous operation.		
P0568		X	X	Cruise Control SET Signal	This error occurs when the cruise control set switch is not depressed during the KOER self test or is stuck during continuous operation.		
P0569		X	X	Cruise Control COAST Signal	This error occurs when the cruise control coast switch is not depressed during the KOER self test or is stuck during continuous operation.		
P0571		X		Brake Switch A Circuit	This error occurs when the brake switch is not depressed during the KOER self test.		
P0578			X	Cruise Control Multi-Function Input A Circuit Stuck	This error occurs if the voltage received by the PCM for the cruise control circuit is above the calibrated threshold.		
P0579			X	Cruise Control Multi-Function Input A Circuit Range/Performance	This error occurs when all cruise control circuit voltages are equal to zero.		
P060B	X	X	X	Internal Control Module A/D Processing Performance	This error occurs is the voltages for main controller and monitoring controller within the PCM are outside of a predetermined range.		ECU
P060C			X	Internal Control Module Monitoring Processor Performance	This error occurs if a fault occurs to the monitoring processor within the PCM.		Verify reprogramming files, reflash module, change ECU
P060D			X	Internal Control Module Accelerator Pedal Position Performance			Pedal, wiring to pedal, PCM
P0600	X			Serial Communication Link			PCM
P0602			1PC	Powertrain Control Module Program Error			VID Block program, PCM
P0603	X		1PC	Powertrain Control Module Keep Alive Memory (KAM) Error	This error occurs if a fault is detected in the keep alive memory circuit.	engine not longer running than 600 sec	PCM

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P0604	X	X	X	Internal Control Module Read Only Memory (RAM) Error	This error occurs if a fault is detected in the read only memory circuit.		PCM
P0605	X	X	X	Internal Control Module Read Only Memory (ROM) Error	The checksum of the calibration ROM area is checked and compared against an expected value (calibration value) at startup.		Verify programming files, PCM
P061B	X	X	X	Internal Control Module Torque Calculation Performance	This error occurs if a fault is detected when monitoring the status of the injection of all cylinders compaired to the current engine speed.		PCM
P061C	X	X	X	Internal Control Module Engine RPM Performance	This error occurs when the engine RPM signal, derived from the CKP circuit, differs significantly from the expected engine RPM, developed by the PCM, for a predetermined amount of time		PCM, CRK sensor, CRK wiring
P062D	X	X		Fuel Injector Driver Circuit Performance Bank 1	This error occurs when the sum of the voltage signals for the main injection of all injectors on bank 1 or if the fuel injector driver circuit for bank 1 fails to initialize properly.	max = 229 V min = 93 V	Wiring to injectors, PCM
P062E	X	X		Fuel Injector Driver Circuit Performance Bank 2	This error occurs when the sum of the voltage signals for the main injection of all injectors on bank 2 or if the fuel injector driver circuit for bank 2 fails to initialize properly.	max = 229 V min = 93 V	Wiring to injectors, PCM
P0620			X	Generator Control Circuit			
P0625			X	Generator Field Terminal Circuit Low			
P0626			X	Generator Field Terminal Circuit High			
P0627			X	Fuel Pump A Control Circuit / Open	This error occurs if electrical errors from the fuel pump module result in an open circuit.		
P0628			X	Fuel Pump A Control Circuit Low	This error occurs if electrical errors from the fuel pump module result in a short to ground.		
P0629			X	Fuel Pump A Control Circuit High	This error occurs if electrical errors from the fuel pump module result in a short to power.		
P0642	X	X	X	Sensor Reference Voltage A Circuit Low	This error occurs when the sensor reference voltage falls below the minimum threshold.	Low: < 4.75V	Wiring, PCM
P0643	X	X	X	Sensor Reference Voltage A Circuit High	This error occurs when the sensor reference voltage falls above a maximum threshold.	High: >5.25 V	Wiring, PCM
P065B			X	Generator Control Circuit Range/Performance			
P0652	X	X	X	Sensor Reference Voltage B Circuit Low	This error occurs when the sensor reference voltage falls below a minimum threshold.	Low: < 4.75V	Wiring to sensors, PCM
P0653	X	X	X	Sensor Reference Voltage B Circuit High	This error occurs when the sensor reference votage is above a maximum threshold.	High: >5.25 V	Wiring to sensors, PCM
P0670	X	X	X	Glow Plug Control Module Control Circuit / Open	This error occurs if the glow plug enable circuit detects an open circuit, short to ground, or short to power.	Internal to Glow Plug Control Module (GPCM) > 5 sec	Wiring, GPCM, PCM
P0671	X	X	X	Cylinder 1 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0672	X	X	X	Cylinder 2 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0673	X	X	X	Cylinder 3 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0674	X	X	X	Cylinder 4 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0675	X	X	X	Cylinder 5 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM

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	MIL For Only F250/F350
	MIL For F250/F350 and Wrench for F450/F550
	Wrench for Both F250/F350 and F450/F550
	No MIL or Wrench Light

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P0676	X	X	X	Cylinder 6 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0677	X	X	X	Cylinder 7 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0678	X	X	X	Cylinder 8 Glow Plug Circuit	This error occurs if the current for an individual glowplug is either lower than the minimum current threshold or higher than the maximum current threshold.	An open is a current level less than 4 amps and a shorted current level is above 60 amps. Glow Plug on time > 8.5 sec	Wiring, Glow Plug, GPCM
P0684	X	X	X	Glow Plug Control Module to PCM Communication Circuit Range/Performance	This error occurs when the pass/fail status information signal, sent by the GPCM to the PCM, is consistantly high, consistantly low, or the period of the signal is out of range.	GP active >5 sec	Wiring, GPCM, PCM
P0691			X	Fan 1 Control Circuit Low			
P0692			X	Fan 1 Control Circuit High			
P0703		X		Brake Switch B Input Circuit	This error occurs when the brake switch is not activated during the KOER self test.		
P1000	RESET			OBD Systems Readiness Test Not Complete	This error occurs when all other DTC's have been erased from the system. This error will subside when all OBD monitors have been completed.		
P1102			X	Mass Air Flow Sensor In Range But Lower Than Expected	This error occurs when the measured value of mass air flow is lower than a threshold value for a predetermined period of time.	0%< EGR Position < 50% Engine speed >700 rpm < 2400 rpm based on a table > 30sec	Wiring, MAF assembly, PCM
P1103			X	Mass Air Flow Sensor In Range But Higher Than Expected	This error occurs when the measured value of mass air flow is higher than a threshold value for a predetermined period of time.	0%< EGR Position < 50% Engine speed >700 rpm < 2400 rpm based on a table > 30sec	Wiring, MAF assembly, PCM
P115A			X	Low Fuel Level - Forced Limited Power	This error occurs when the PCM recieves a signal indicating that the vehicle is critically low on fuel.		
P117B			X	Exhaust Gas Temperature Sensor Correlation	This error occurs when the three exhaust temperature sensor readings are not within a specified temperature range when compared to one another.		
P117F		X	X	Fuel Pressure Regulator Excessive Variation	This error occurs when any of the fuel pressure corrections either become less than a minimum threshold or more than a maximum threshold.		Low pressure fuel system, injector leakage
P1184		X		Engine Oil Temperature Sensor Out Of Self Test Range	This error occurs when the KOER self test is attempted but the engine has not reached an operating temperature of 60º C.	EOT < 60 >205deg C	NA
P120F			X	Fuel Pressure Regulator Excessive Variation	This error occurs when the difference between actual rail pressure and the PCM's calculated setpoint is large, and the actual fuel pressure crosses the setpoint too frequently.		Wiring to FUP sensor, FUP sensor, low pressure fuel system
P127A	X	X	X	Aborted KOER - Fuel Pressure Failure	This error occurs when fuel pressure does not rise sufficiently during the KOER self test.	Cannot achieve or return to 53 FUP_SP. Cannot achieve 139MPa	NA
P132A	X	X	X	Turbocharger Boost Control A Electrical	This error occurs if the turbocharger cannot perform a sweep/learn of the min/max position.		
P132B	X	X	X	Turbocharger/Supercharger Boost Control A Performance	This error occurs if a fault is detected within the turbocharger actuator.	Internal to the turbocharger control module	Wiring, SRA module,PCM
P132C	X	X	X	Turbocharger/Supercharger Boost Control A Voltage	This error occurs when the voltage to the turbocharger actuator is below the threshold for a predetermined period of time.	Internal to the turbocharger control module	Wiring, SRA module,PCM
P1335	X	X	X	EGR Position Sensor Minimum/ Maximum Stop Performance	This error occurs when voltage of the EGR valve falls below the minimum threshold.	1.3v >2.5sec	Wiring, EGR valve assembly,PCM
P1336	X	X	X	Crankshaft/Camshaft Sensor Range/Performance	This error occurs when the reference gap of the crankshaft trigger wheel is not detected at the correct position.	Internal to the engine control module	System error, electrical noise,…

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P138D	X	X	X	Turbocharger Boost Control A Temperature Too High	This error occurs when the internal operating temperature of the actuator exceeds the threshold for a predetermined period of time.	150 deg C	
P1397		X		System Voltage Out Of Self Test Range	This error occurs if the KOER self test is attempted but the vehicle battery voltage is too low.	< 9.0v prior to KOER start	NA
P1408		X		Exhaust Gas Recirculation Flow Out Of Self Test Range	This error occurs is the EGR valve position is not wihin test limits when the EGR valve is commanded open during the KOER self test.	> 1500hPa and <1500hPa (note numbers are valid only until D00 is released where these need to be in gauge pressure)	NA
P1501		X		Vehicle Speed Sensor Out Of Self Test Range	This error occurs if the KOER self test is attampted while vehicle is moving.	>5MPH (This entry condition condition is primarily used for the Manual Transmission applications that do not have a “in gear” message.)	NA
P1531		X		Invalid Test - Accelerator Pedal Movement	This error occurs when the accelerator pedal moves during the KOER self test.	>10%	NA
P1536		X		Parking Brake Switch Circuit	This error occurs if the parking brake switch is not active during the KOER self test.		
P1551	X	X		Injector Circuit Range/ Performance - Cylinder 1	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1552	X	X		Injector Circuit Range/ Performance - Cylinder 2	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1553	X	X		Injector Circuit Range/ Performance - Cylinder 3	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1554	X	X		Injector Circuit Range/ Performance - Cylinder 4	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1555	X	X		Injector Circuit Range/ Performance - Cylinder 5	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1556	X	X		Injector Circuit Range/ Performance - Cylinder 6	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1557	X	X		Injector Circuit Range/ Performance - Cylinder 7	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1558	X	X		Injector Circuit Range/ Performance - Cylinder 8	This error occurs when the minimum current rise time is outside the valid range.	max = 210 V min = 62 V	Wiring to injectors, injectors, HP system, coolant temp sensor
P1586	X	X	X	Electronic Throttle to PCM Communication Error	This error occurs when the digital feedback communication line of the EGR throttle plate is either unreadable by the PCM or missing.		
P1639		X	X	Vehicle ID Block Corrupted, Not Programmed	This error occurs when the VID block data are not programmed or programmed incorrectly.		
P1703		X		Brake Switch Out Of Self Test Range	This error occurs during the KOER self test if the break pedal switch is stuck in the closed position or the break pedal is depressed twice.		
P1725	X	X	X	Insufficient Engine Speed Increase During Self Test	This error occurs if the engine RPM drops below a minimum threshold during the KOER self test.	< 500RPM	NA
P1726		X		Insufficient Engine Speed Decrease During Self Test	This error occurs if the engine RPM increases above a maximum threshold during the KOER self test.	>1600 RPM	NA
P179A	X	X	X	CAN ECM/Turbocharger Boost Control & Actuator Circuit Malfunction	This error occurs is the CAN data communication is interrupted between the PCM and the turbocharger actuator.		
P2002	REGEN			Particulate Trap Efficiency Below Threshold	This error occurs if an expected pressure drop through the DPF is lower than the specified value following a regeneration cycle (based on the concept of normalized pressure differential).		
P2031			1PT	Exhaust Gas Temperature Sensor Circuit Bank 1 Sensor 2	This error occurs if the EGT2 temperature signal of the exhaust system does not rise sufficiently immediately after a cold-start following an 8-hour soak.		
P2032			X	Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 2	This error occurs when the EGT2 sensor temperature signal is higher (lower voltage signal) than a maximum probable temperature, indicating a short to ground.		
P2033			X	Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 2	This error occurs when the EGT2 sensor temperature signal is lower (higher voltage signal) than a minimum probable temperature, indicating an open circuit or a short to power.		

DIAGNOSTIC CODES

O - Self Test - Key On Engine Off
R - Key On Engine Running
C - Continuous Operation
REGEN - Test Follows a REGEN CYCLE
SHUT DOWN - Test Follows Key Off
KO - Test Operates at Key On
1PC - Once Per Cycle

DATA Color Code	
	MIL For Both F250/F350 and F450/F550
	MIL For Only F250/F350
	MIL For F250/F350 and Wrench for F450/F550
	Wrench for Both F250/F350 and F450/F550
	No MIL or Wrench Light

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P2080			1PC	Exhaust Gas Temperature Sensor Circuit Range/ Performance Bank 1 Sensor 1	This error occurs if the EGT1 temperature sensor signal in the exhaust at key on, following an 8-hour soak, is significantly different than ambient temperature.		
P2081			X	Exhaust Gas Temperature Sensor Circuit Intermittent Bank 1 Sensor 1	This error occurs if the temperature in the exhaust at key on, following an 8-hour soak, is significantly different than ambient temperature.		
P2084			X	Exhaust Gas Temperature Sensor Circuit Range/ Performance Bank 1 Sensor 2	This error occurs if the EGT2 temperature sensor signal in the exhaust at key on, following an 8-hour soak, is significantly different than ambient temperature.		
P2085			X	Exhaust Gas Temperature Sensor Circuit Intermittent Bank 1 Sensor 2	This error occurs if an intermittent signal from the exhaust gas temperature sensor is detected.		
P2122			X	Throttle/Pedal Position Sensor/ Switch D Circuit Low Input			
P2123			X	Throttle/Pedal Position Sensor/ Switch D Circuit High Input			
P2127			X	Throttle/Pedal Position Sensor/ Switch E Circuit Low Input			
P2128			X	Throttle/Pedal Position Sensor/ Switch E Circuit High Input			
P2138			X	Throttle/Pedal Position Sensor/ Switch D / E Voltage Correlation			
P2199	X	X	X	Intake Air Temperature 1/2 Correlation	This error occurs when the difference between IAT2 and IAT1 is greater than a specified value for a predetermined period of time.	>20 deg C 8 minutes	Wiring, IAT or IAT2 sensor, PCM
P2228	X			Barometric Pressure Circuit Low Input	This error occurs when the voltage signal from the barometric pressure circuit falls below a minimum threshold.	Low: < 2.22 V	PCM
P2229	X			Barometric Pressure Circuit High Input	This error occurs when the voltage signal from the barometric pressure circuit rises above a maximum threshold.	High: >4.36 V	PCM
P2230	X			Barometric Pressure Circuit Intermittent			PCM
P2262			X	Turbocharger/Supercharger Boost Pressure Not Detected - Mechanical	This error occurs if the MAP sensor readings are below a calibrated value for a predetermined amount of time.	engine speed and torque based table >30 sec	System error, CAC hose, MAP sensor plugged,…
P2263			X	Turbocharger/Supercharger Boost System Performance	This error occurs when the difference between the gage exhaust pressur and the set point is less than the minimum threshold or greater than the maximum threshold for a predetermined period of time.	Engine speed > 550 rpm Torque set point > 50 N-m, ECT > 81 deg C IAT > -50 deg C No DPF regeneration request EP setpoint is stable Based on a table on N and TQI >5sec	System error
P2269			X	Water in Fuel Condition	This error occurs when water is detected in the HFCM.		
P2289	SHUTDOWN			Injector Control Pressure Too High - Engine Off	This error occurs if excessive fuel pressure is present after a predetermined period of time following key off.	0.4 sec after engine switch-off fuel rail pressure (FUP) must be lower than 10MPa.	FUP sensor, wiring to FUP sensor, HP fuel system
P2291		X	X	Injector Control Pressure Too Low - Engine Cranking	This error occurs when enough injection control pressure to start the vehicle cannot be achieved during cranking.		Low pressure fuel system, HP fuel system, FUP sensor and wiring to sensor, battery voltage (crank speed)
P242A			1PC	Exhaust Gas Temperature Sensor Circuit Bank 1 Sensor 3	This error occurs if the EGT3 temperature signal of the exhaust system does not rise sufficiently immediately after a cold-start following an 8-hour soak.		
P242B			1PC	Exhaust Gas Temperature Sensor Circuit Range/ Performance Bank 1 Sensor 3	This error occurs if the EGT3 temperature sensor signal in the exhaust at key on, following an 8-hour soak, is significantly different than ambient temperature.		

DTC	How Set			Code Description	Brief Description	Software Parameters Required to Set Code	Service Instructions / Part Replaced
	O	R	C				
P242C			X	Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 3	This error occurs when the EGT3 sensor temperature signal is higher (lower voltage signal) than a maximum probable temperature, indicating a short to ground.		
P242D			X	Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 3	This error occurs when the EGT3 sensor temperature signal is lower (higher voltage signal) than a minimum probable temperature, indicating an open circuit or a short to power.		
P242E			X	Exhaust Gas Temperature Sensor Circuit Intermittent Bank 1 Sensor 3	This error occurs if an intermittent signal from the exhaust gas temperature sensor is detected.		
P242F	REGEN			Diesel Particulate Filter Restriction - Ash Accumulation	This error occurs if excessively high exhaust pressures are detected after a regen cycle.		
P244A	REGEN			Diesel Particulate Filter Differential Pressure Too Low	This error occurs if an expected pressure drop through the DPF is lower than the specified value following a regeneration cycle (based on the concept of observed pressure differential).		
P244C	X	X	X	Exhaust Temperature too low for Particulate Filter Regeneration	This error occurs if the exhaust temperature is too low to perform a regen cycle of the diesel particulate filter.		
P244D	REGEN			Exhaust Temperature too high for Particulate Filter Regeneration	This error occurs if exhaust temperatures are too high to perform a regen cycle of the diesel particulate filter.		
P2453	X		X / KO	Diesel Particulate Filter Differential Pressure Sensor Circuit Range/Performance	This error occurs if the differential pressure of the diesel particulate filter reads a constant value while the engine is running.		
P2454			X	Diesel Particulate Filter Differential Pressure Sensor Circuit Low	This error occurs if a short to ground is detected in the diesel particulate filter differential pressure sensor circuit.		
P2455			X	Diesel Particulate Filter Differential Pressure Sensor Circuit High	This error occurs if a short to power occurs in the diesel particulate filter differential pressure sensor circuit.		
P2456			X	Diesel Particulate Filter Differential Pressure Sensor Circuit Intermittent/Erratic	This error occurs if the signal from the diesel particulate filter differential pressure sensor to the PCM is unreadable.		
P2457		X	X	Exhaust Gas Recirculation Cooler System Performance	This error occurs if the EGR cooler temperature sensor reading is above a maximum threshold for a predetermined period of time.	EGR Position >= 0 600 rpm<Engine speed < 1300 rpm 50 N-m< Torque set point< 400 N-m >165 deg C >20sec	System error, TEGR_OUT sensor,…
P2458			X	Diesel Particulate Filter Regeneration Duration			
P2459			X	Diesel Particulate Filter Regeneration Frequency			
P2545		X		Torque Management Request Input Signal A Range/Performance			CAN wiring, change ECU
P2563	X	X	X	Turbocharger Boost Control Position Sensor A Circuit Range/Performance	This error occurs when the difference between the turbocharger actuator commanded duty cycle and the feed forward commanded duty cycle is less than the threshold value for the given engine speed and engine load for a predetermined period of time.	600 rpm <Engine speed< 1000 rpm Torque set point > 50 N-m ECT > 70 deg C IAT > -50 deg C No DPF regeneration request EP setpoint is stable -60 % of desired 7.5 sec	System error
P2610			X	ECM/PCM Internal Engine Off Timer Performance	This error occurs when the engine off timer does not correlate to the PCM's internal timer (compared while the engine is running), if the engine off time does not correspond with the measured ECT temperature variation between the last engine stop and the next engine start, or when the engine off timer is defective.		
U0073	X	X	X	Control Module Communication Bus A Off	This error occurs if a fault in the CAN communication is detected.		
U0101	X	X	X	Lost Communication with TCM	This error occurs is the CAN data communication is interrupted between the PCM and the TCM.		

6.4L Power Stroke® Diesel Engine

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