

2008 ENGINE PERFORMANCE

Fuel Charging & Controls - 4.0L Single Overhead Camshaft (SOHC) - Mustang

SPECIFICATIONS

Material

Item	Specification	Fill Capacity
Motorcraft SAE 5W-30 Premium Synthetic Blend Motor Oil XO-5W30-QSP (US); Motorcraft SAE 5W-30 Super Premium Motor Oil CXO-5W30-LSP12 (Canada); or equivalent	WSS-M2C929-A	-

TORQUE SPECIFICATIONS

Description	Nm	lb-ft	lb-in
Fuel rail bolts	23	17	-
Fuel pump driver module (FPDM) bolt	10	-	89
Fuel rail supply tube bolts	6	-	53
Lower fuel rail supply tube bracket bolt	10	-	89
Throttle body (TB) bolts	10	-	89
Upper fuel rail supply tube bracket bolt	6	-	53

DESCRIPTION AND OPERATION

FUEL CHARGING AND CONTROLS

Sequential Multiport Fuel Injection (SFI)

WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

The fuel charging and controls system consists of the:

- electronic throttle body (TB).
- fuel injectors.
- fuel rail.
- fuel rail pressure and temperature sensor.
- fuel pump driver module.

The fuel charging and controls system is:

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- a sequential multiport fuel injection (SFI) system.
- pulse-width modulated (PWM).
- mass air flow (MAF)-controlled.

Fuel is metered into each intake port in a sequential firing order. Fuel injectors pulse to follow engine firing order, in accordance with engine demand on a tuned intake manifold.

The PCM controls the fuel injection system. Injector pulse width is varied to control the amount of fuel flow. Varying fuel pump output controls fuel pressure. The PCM commands the fuel pump driver module, which directly controls the fuel pump. The TB is electronically controlled by the engine management system (EMS). Throttle plate angle is changed electronically in response to throttle pedal movements initiated by the driver.

Throttle Body

CAUTION: Do not hold the throttle plate open with any object that may scratch the bore or plate while servicing or cleaning the throttle body (TB).

The TB:

- controls air supply to the intake manifold by electronically positioning the throttle plate.
- is not adjustable.
- must be removed from the vehicle to be cleaned.

Refer to **Throttle Body**.

Fuel Injectors

The fuel injectors:

- are electronically operated by the PCM.
- atomize the fuel as the fuel is delivered.
- each have an internal solenoid that opens a needle valve, which injects fuel into the intake port in the cylinder head.
- are deposit resistant.

For removal and installation, refer to **Fuel Rail and Fuel Injector - Exploded View** and **Fuel Rail**.

Fuel Rail

CAUTION: The fuel injectors and the fuel rail must be handled with extreme care to prevent damage to sealing areas and sensitive fuel-metering orifices.

The fuel rail:

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- receives fuel from the fuel supply tube.
- delivers fuel to the fuel injectors.

For removal and installation, refer to **Fuel Rail and Fuel Injector - Exploded View** and **Fuel Rail**.

Fuel Rail Pressure and Temperature Sensor

The fuel rail pressure and temperature sensor:

- measures the pressure and temperature of the fuel rail and sends these signals to the PCM.
- uses intake manifold vacuum as a pressure reference.

For removal and installation, refer to **ELECTRONIC ENGINE CONTROLS** article.

Fuel Pump Driver Module (FPDM)

The fuel pump driver module (FPDM):

- receives signals from the PCM.
- duty cycles the fuel pump.

For removal and installation, refer to **Fuel Pump Driver Module (FPDM)**.

DIAGNOSTIC TESTS

FUEL CHARGING AND CONTROLS

Refer to the **Introduction - Gasoline Engines** article.

REMOVAL AND INSTALLATION

THROTTLE BODY

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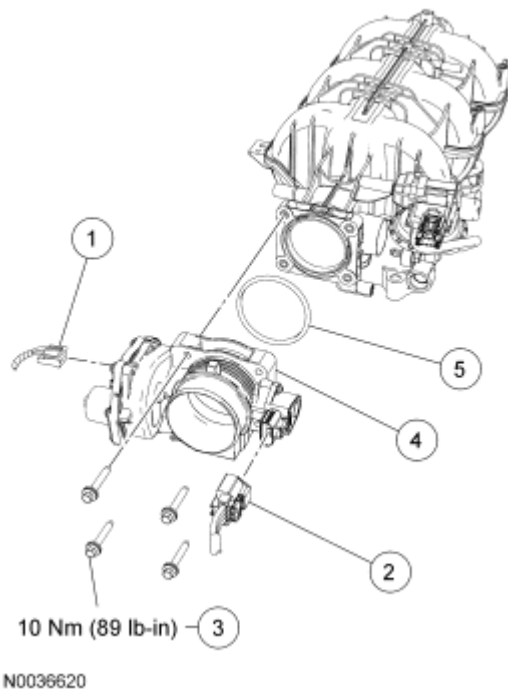


Fig. 1: Exploded View Of Throttle Body Components With Torque Specification
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	14A464	Throttle body (TB) electrical connector
2	14A464	Throttle position (TP) sensor electrical connector
3	W503280	TB bolt (4 required)
4	9F991	TB
5	-	TB gasket

REMOVAL AND INSTALLATION

CAUTION: The throttle body (TB) must be removed from the vehicle to be cleaned. Do not hold the throttle plate open with any object that may scratch the bore or plate while servicing or cleaning the TB.

1. Remove the air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION AND FILTERING** article.
2. Disconnect the 2 throttle body (TB) electrical connectors.

NOTE: Inspect and install a new TB gasket as necessary.

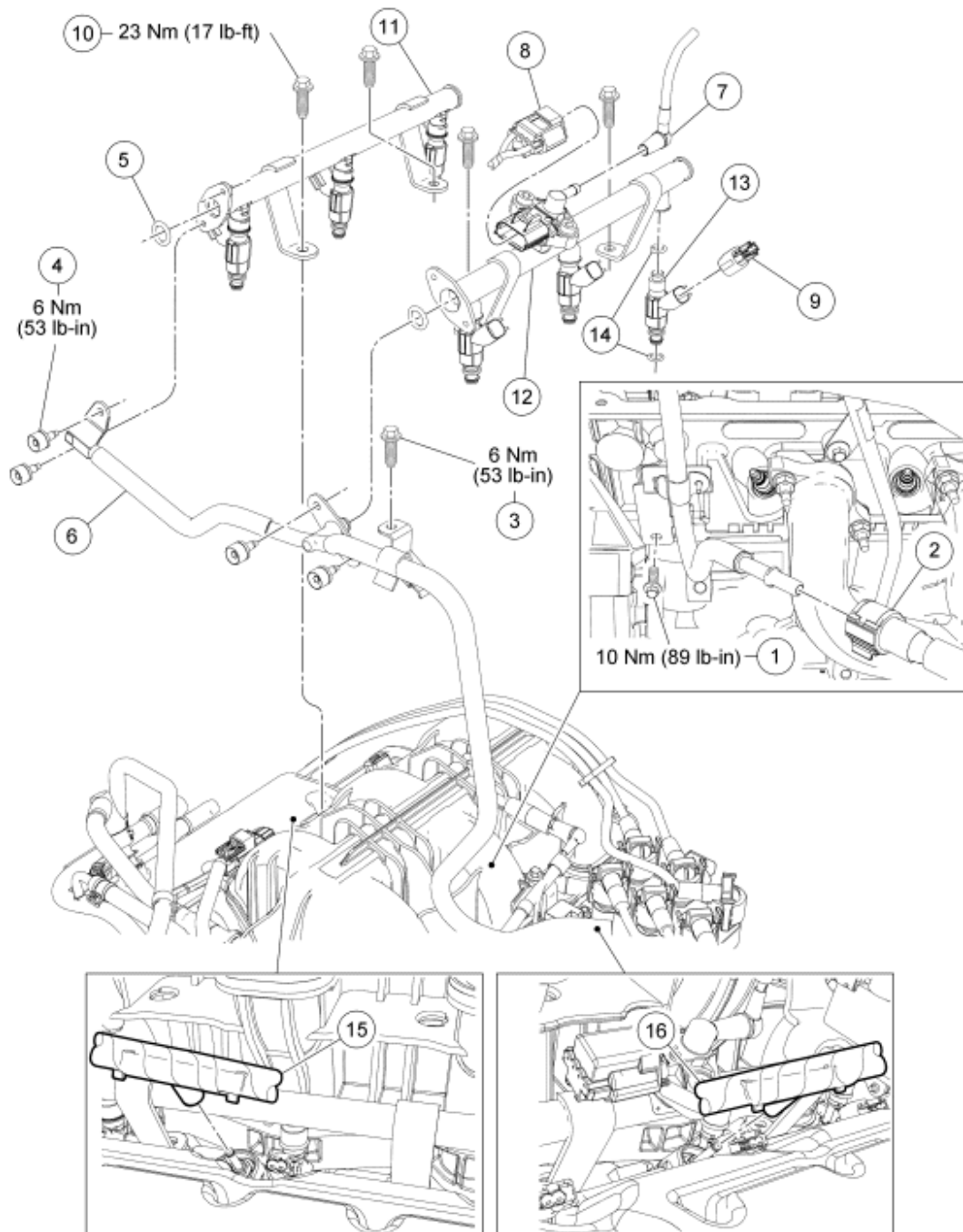
3. Remove the 4 bolts and the TB.

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- To install, tighten to 10 Nm (89 lb-in).
4. To install, reverse the removal procedure.

FUEL RAIL AND FUEL INJECTOR - EXPLODED VIEW



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Fig. 2: Exploded View Of Fuel Rail & Fuel Injector With Torque Specifications
Courtesy of FORD MOTOR CO.

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Item	Part Number	Description
1	W500213	Lower fuel rail supply tube bracket bolt
2	834551	Fuel rail supply tube quick connect coupling
3	W500204	Upper fuel rail supply tube bracket bolt
4	W711782	Fuel rail supply tube bolt (4 required)
5	-	O-ring seal (2 required)
6	9E964	Fuel rail supply tube
7	9E498	Fuel rail pressure and temperature sensor vacuum hose
8	14A464	Fuel rail pressure and temperature sensor electrical connector
9	14A464	Fuel injector electrical connector (6 required)
10	W500023	Fuel rail bolt (4 required)
11	9D280	RH fuel rail
12	9D280	LH fuel rail
13	9F593	Fuel injector (6 required)
14	-	O-ring seals (12 required)
15	13A506	RH wiring harness retainer
16	13A506	LH wiring harness retainer

1. For additional information, refer to the procedures.

FUEL RAIL

Material

Item	Specification
Motorcraft SAE 5W-30 Premium Synthetic Blend Motor Oil XO-5W30-QSP (US); Motorcraft SAE 5W-30 Super Premium Motor Oil CXO-5W30-LSP12 (Canada); or equivalent	WSS-M2C929-A

REMOVAL AND INSTALLATION

WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

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Both Sides

1. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM - GENERAL INFORMATION** article.
2. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** article.

RH side

3. Remove the wiring harness retainer from the RH valve cover stud bolt and position it aside.
4. Disconnect the 3 fuel injector electrical connectors.
5. Remove the 2 fuel rail supply tube bolts from the RH side fuel rail.
 - To install, tighten to 6 Nm (53 lb-in).

CAUTION: Use O-ring seals that are made of special fuel-resistant material. The use of ordinary O-ring seals may cause the fuel system to leak. Do not reuse the O-ring seals.

6. Remove and discard the fuel rail supply tube O-ring seal.
7. Remove the 2 bolts and the RH side fuel rail.
 - To install, tighten to 23 Nm (17 lb-ft).
8. Remove the 3 fuel injectors from the fuel rail.

CAUTION: Use O-ring seals that are made of special fuel-resistant material. The use of ordinary O-ring seals may cause the fuel system to leak. Do not reuse the O-ring seals.

9. Remove and discard the fuel injector O-ring seals.

LH side

10. Disconnect the fuel rail pressure and temperature sensor vacuum hose.
11. Disconnect the fuel rail pressure and temperature sensor electrical connector.
12. Remove the wiring harness retainer from the LH valve cover stud bolt and position it aside.
13. Disconnect the 3 fuel injector electrical connectors.
14. Remove the 2 fuel rail supply tube bolts from the LH side fuel rail.
 - To install, tighten to 6 Nm (53 lb-in).

CAUTION: Use O-ring seals that are made of special fuel-resistant material. The use of ordinary O-ring seals may cause the fuel system to leak. Do not reuse the O-ring seals.

15. Remove and discard the fuel rail supply tube O-ring seal.

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16. Remove the 2 bolts and the LH side fuel rail.
 - To install, tighten to 23 Nm (17 lb-ft).
17. Remove the 3 fuel injectors from the fuel rail.

CAUTION: Use O-ring seals that are made of special fuel-resistant material. The use of ordinary O-ring seals may cause the fuel system to leak. Do not reuse the O-ring seals.

18. Remove and discard the fuel injector O-ring seals.

Both Sides

19. To install reverse the removal procedure.
 - Lubricate the new O-ring seals with clean engine oil prior to installation.

FUEL RAIL SUPPLY TUBE

Material

Item	Specification
Motorcraft SAE 5W-30 Premium Synthetic Blend Motor Oil XO-5W30-QSP (US); Motorcraft SAE 5W-30 Super Premium Motor Oil CXO-5W30-LSP12 (Canada); or equivalent	WSS-M2C929-A

REMOVAL AND INSTALLATION

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WARNING: Before working on or disconnecting any of the fuel tubes or fuel system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

1. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM - GENERAL INFORMATION** article.
2. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** article.
3. Disconnect the fuel rail supply tube quick connect coupling. For additional information, refer to **FUEL SYSTEM - GENERAL INFORMATION** article.

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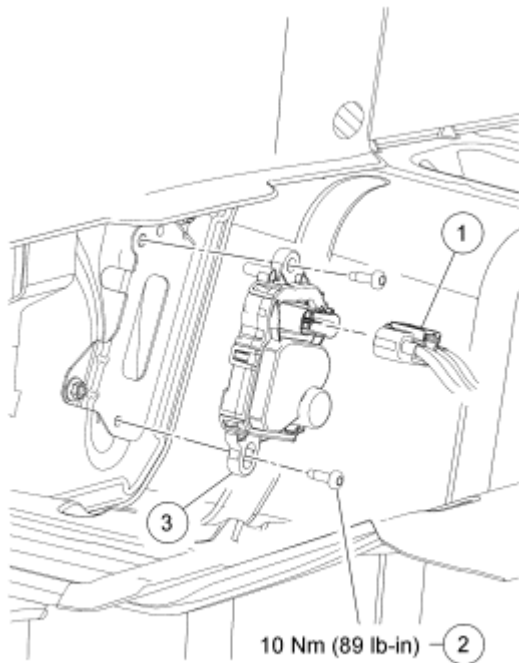
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4. Remove the lower fuel rail supply tube bracket bolt.
 - To install, tighten to 10 Nm (89 lb-in).
5. Remove the upper fuel rail supply tube bracket bolt.
 - To install, tighten to 6 Nm (53 lb-in).
6. Remove the 4 bolts and the fuel rail supply tube.
 - To install, tighten to 6 Nm (53 lb-in).

CAUTION: Use O-ring seals that are made of special fuel-resistant material. The use of ordinary O-ring seals may cause the fuel system to leak. Do not reuse the O-ring seals.

7. Remove and discard the fuel rail supply tube O-ring seals.
8. To install, reverse the removal procedure.
 - Lubricate the new O-ring seals with clean engine oil prior to installation.

FUEL PUMP DRIVER MODULE (FPDM)



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Fig. 3: Exploded View Of Fuel Pump Driver Module With Torque Specification (FPDM)
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	14A464	Fuel pump driver module (FPDM) electrical connector (part of 14A005)

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2	W504755	FPDM bolt (2 required)
3	9D370	FPDM

REMOVAL AND INSTALLATION

NOTE: **The fuel pump driver module (FPDM) is located in the spare tire stowage compartment.**

- 1. Disconnect the FPDM electrical connector.
- 2. Remove the 2 bolts and the FPDM.
 - To install, tighten to 10 Nm (89 lb-in).
- 3. To install, reverse the removal procedure.