Xtreme-DI
GDI PERFORMANCE PARTS
DI Fuel Systems and Controls

Draft !!!

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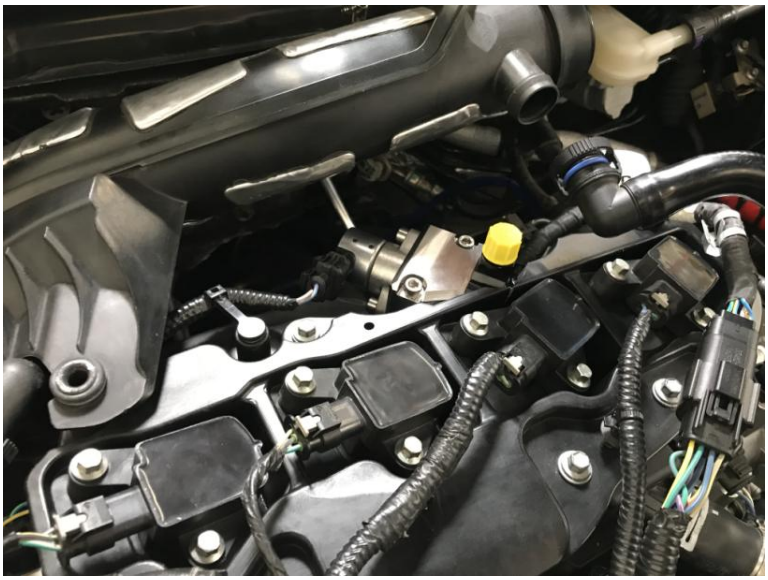
Installation instructions for the XDI-HPFP35 for 2018 Ford Fiesta ST

These instructions are a general guideline for installing our HPFP (high pressure fuel pump). Please reference a current Ford service publication for the most up to date installation information.
Our HPFP was developed to bolt on re-using the stock low pressure fuel system.
In case any of the other fuel system components are modified or exchanged, additional instructions do apply and can be found at the end of this document.

Read the entire installation instructions before starting.



Cleanliness is highest priority !!

Avoid dust and dirt anywhere around the HPFP mounting position while changing the pump.
Clean the area with break cleaner or similar if necessary.
Always keep all openings in engine, low pressure and high pressure fuel lines and pump covered.

We also included a link to a direct injected fuel pump install video produced by Bosch. It is not specific to this application but provides a general overview of a HPFP installation.

XDI-HPFP contents:

HPFP with baseplate, 2 sets of Allen-head bolts, Installation instructions.

Tools needed:

- long 10mm socket for OEM HPFP nuts
- TX socket for coil bolts
- E5-Tx for HPFP studs
- 5mm allen socket for new HPFP base plate bolts
- 3/16 allen socket for HPFP main bolts
- 18mm socket for crank pulley (to bring pump lobe to BDC)
- 17mm wrench for High Pressure Line Nut

Parts Recommended:

Clean engine oil (Motorcraft or Penzoil synthetic or synthetic blend , e.g. 5w-30)

Motorcraft HPFP Flat Tappet

General install video by Bosch:

https://www.youtube.com/watch?v=OmbN9bKx4Mo

<u>Removal of stock pump</u>

Relieving the low pressure fuel system

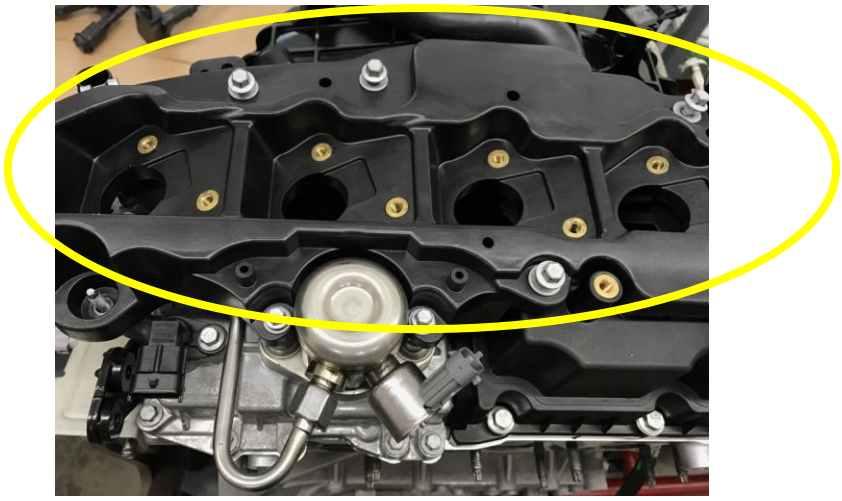
1. Clean area around the HPFP, no dust or dirt may ever enter the HPFP or the fuel lines.
2. Do not remove covers of pump inlet and outlet fittings yet.
3. Disconnect the (FPCM) Fuel Pump Control Module pigtail connector.
4. NOTE: The FPCM is usually located on the frame rail by the spare tire or the fuel tank.

3. Start the engine and let it run until the engine stalls
4. When the engine stalls, crank the engine for an additional 5 seconds <u>to make sure the low side fuel pressure has been relieved.</u>
5. Switch the ignition off
6. Disconnect the negative terminal from the battery

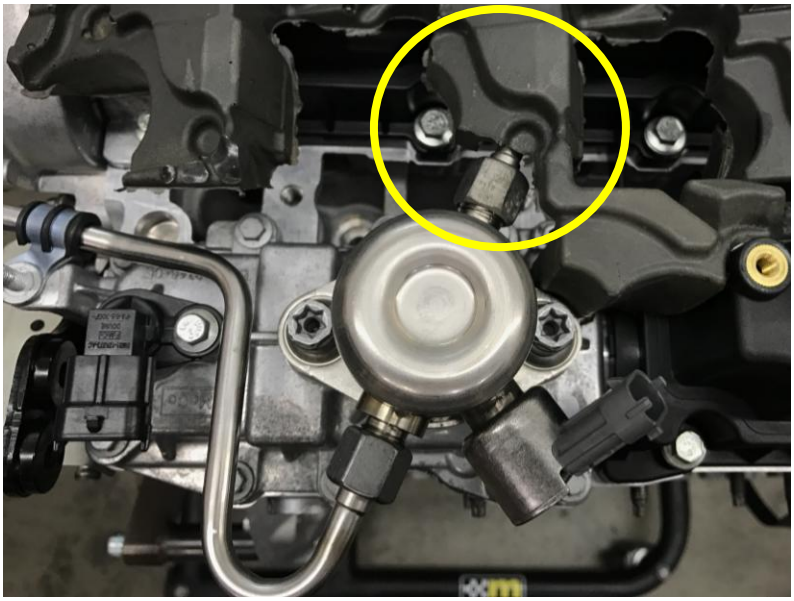
Relieving the high pressure fuel system

(*<u>USE CAUTION!</u>* Contents are under extreme pressure; please take all precautionary safety measures)

7. Remove the engine decorative cover. After removing the oil fill cap, the cover simply lifts up and unsnaps from its mounting posts.
8. Use compressed air or a vacuum to remove any debris that has accumulated near the HPFP.
9. Remove the ignition coils and the coil mounting plate.

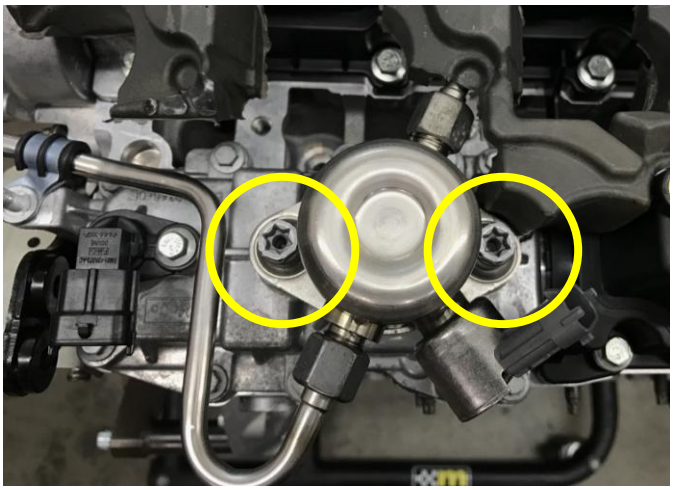


10. Wrap the HPFP flare nut with a shop rag. Loosen the tube to HPFP flare nut to relieve the pressure in between the pump and the fuel rail. Allow the shop rag to absorb any excess fuel.



11. Disconnect the low pressure fuel feed and the electrical pigtail from the HPFP.

12. Alternate between the two fuel pump mounting bolts. Loosening each one half revolution at a time until tension is relieved.



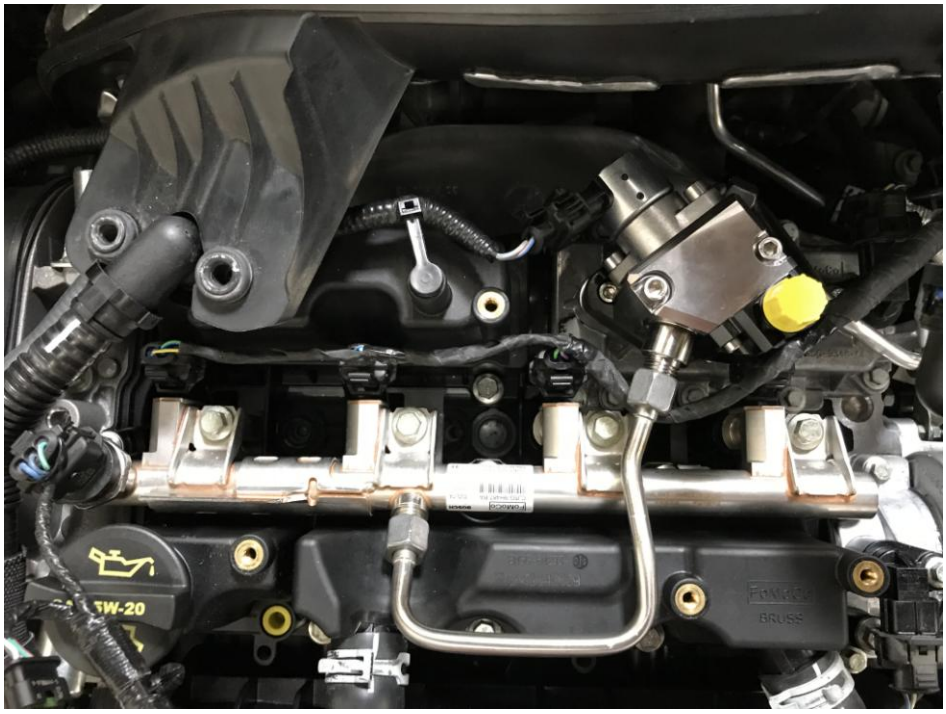
13. Remove the HPFP

14. Remove the flat tappet that rides on the camshaft and actuates the HPFP. It is recommend by XDI to install a new tappet when installing our pump and check it for wear and tear at every oil change. It is Ford Motorcraft part number : (tbc)

15. Turn engine by hand so that pump lobe is at BDC (especially if pump lobe is at highest position)

Installation

5. Mount XDI-HPFP with black bottom plate (do not take off bottom plate, o-ring underneath will get hurt at re-assembly)
    - Clock pump body on bottom plate so that mounting holes are accessible
    - Use supplied M6 Socket cap bolts to bolt bottom plate to valve cover, always go ¼ turn at a time, otherwise it will cog
    - Clock pump body so that long ¼-20 socket cap bolts snap into bottom plate
    - Tighten bolts down always ¼ turn at a time, it needs to compress the spring underneath and will cog very easily. Don't force it.
    - Bend OEM high pressure line so that it aligns perfectly with HPFP outlet fitting. It has to sit in place w/o pulling etc.
    - Nut of OEM-Line needs to go on with two fingers. If not, there is some tension or angle not aligned. Fix this before tightening the nut.



    - Connect OEM inlet line to XDI-HPFP inlet fitting
    - Connect wiring pigtail to pump and loom

6. Cut coil cover according to this picture until it fits over HPFP:

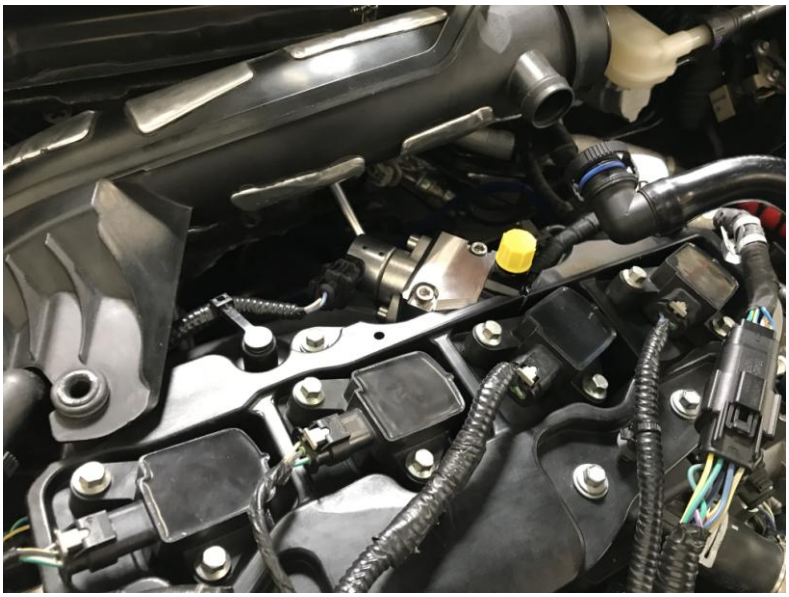
Before:

After:

7. Install coil cover according to this picture. If coil cover touches Pump outlet fitting, some more cutting or grinding might be needed. Do not force it down with the bolts, it will crack.

8. Install Ignition coils

Fully installed:



Other changes in Fuel System:

Depending on fuel used (e.g. E85) and calibration, it might be necessary to change other parts of the fuel system, e.g. in-tank pump, fuel filter, fuel lines, pressure regulator.

Please follow these recommendations to avoid fuel system failures like seized pistons in the HPFP:

- Fuel Filter
    1. mesh size <= 5 microns !!
    2. flow capacity should always exceed target power level
    3. we highly recommend using a primary 10-20micron fuel filter right after in-tank pump, and a secondary 5micron filter right before HP-Pump inlet
- Ensure fuel compatibility (e.g. E85) for all components of the fuel system.
- Avoid any burrs on metallic parts, avoid lose fibres or wires or similar with braided lines. Rinse the system after any change in the low pressure system. Therefore run the in-tank pump for a couple of minutes and bleed fuel from HPFP feed line into reservoir or container.
- After rinse, connect HP-Pump, keep plugs on HP-pump fittings until pump is mounted
- Ensure fuel pressure at HPFP-inlet of a minimum of 60psi at all times, better 75psi. Always log feed pressure if possible. If necessary add a fuel pressure sensor / gauge right before the HPFP.

Tuning Changes:

XDI will provide a base file or a value file with all required tuning changes.

The commanded fuel pressure can safely be increased to 2600psi from the stock setting of 2150psi.
At RPM >5000 pressure can be increased to 2900psi to maximize injector output.

Never exceed 3000psi of fuel pressure! The pump will suffer permanent damage and cannot be repaired. This fault is easy to detect in the pump. It is not covered by any warranties.

Pump capacity with stock cam lobe is ~35% over OEM. (1.02cc instead 0.75cc)
If pump is stretched to its flow limits (e.g on E85), tune target pressure to actual pump capability at low rpm (e.g. 1500psi), this avoids over or undershoots and helps the ECU control the pressure.

There are power gains already just from running more pressure than factory. Most gains are coming from more flow capacity which allows to maintain OEM pressure at higher boost levels and low stoic fuels like E85.

If also bigger injectors are added, it might make sense to lower the overall fuel pressure level to 2175psi again which helps pump efficiency and thus peak performance.

Please check http://www.xtreme-di.com/index_files/HPFP35.htm for updates related to additional tuning enhancements.