If calling or emailing for tech support, please have a copy of your invoice on hand so that we can be familiar with your order and vehicle.

Recommended diagnostics related to possible injector issue.

1. (After initial start) Ensure the engine has adequate volume of oil in the pan, as well as good quality diesel fuel in the fuel tank, prior to test driving. Confirm adequate fuel pressure.
   a. Immediate injector damage can occur if fuel pressure is not a minimum of 50psi.
2. Ensure the under valve cover (UVC) gaskets and harnesses are genuine Ford Motorcraft.
3. Ensure the cam position sensor (CPS) is genuine Ford Motorcraft.
   a. Reasoning: known issues with aftermarket/NON-FoMoCo wiring and CPS affecting injection timing.
4. Ensure the provided injector installation instructions were diligently followed during the installation procedure, including driving the vehicle (30-50 miles in many cases) to ensure all air has been purged from the cylinder head (HPOil and fuel rail passages). Depending on the volume of oil that was evacuated from the cylinders (during the inj swap), it is common and expected to experience a heavy white smoke on initial and subsequent starts until the heat from the exhaust has burned off any residual fuel/oil in exhaust manifolds, as well as the exhaust system running to the rear of the vehicle.

Diagnostics related to misfire with NO/minimal white SMOKE present: see page 2
Diagnostics related to WHITE SMOKE (present after 40-50 miles): see pages 3-4
Diagnostics related to misfire with NO white SMOKE present:

1. If there is a constant CEL or SES illuminated on dash, this almost always indicates a lack of electrical continuity ‘to’ an injector(s).
   a. **No need to drive it**...there is almost certainly an electrical issue.
   b. If capable, perform an “Injector Buzz Test” to determine which injector(s) have an open circuit. “high to low side open” or “circuit” codes found after the injector buzz test indicate that the signal from the IDM is not reaching the injector solenoid. Check UVC wiring (connecting to injector solenoid), external wiring to gasket pass-through harness at valve cover, and/or replace IDM.
   c. Ohming the resistance to/from the IDM plug (to the UVC injector harnesses) can help isolate the open circuit, but in rare cases the high voltage signal itself may be needed to show a short (ie..not practical)
   d. In VERY rare cases the IDM (internally) may have an open circuit causing ‘an’ injector to not fire< this would NOT be very likely unless the vehicle had a constant CEL/SES light before AND after the installation.

2. If NO CEL/SES light is illuminated on the dash, then (electrically) things should be OK (ASSUMING FoMoCo UVC/CPS, see “3a” above), and you may be dealing with a lack of fuel pressure (or lack of drive time to clear air, if fuel pressure has been verified).
   a. Despite our rigorous testing procedures (every injector is flow tested a minimum of 5000 shots), it is possible that the injector is simply not firing in your vehicle.

3. If you have completed the previous diagnostics, and need to speak with a tech, please call us at the numbers listed above.
Diagnostics related to WHITE SMOKE:

1. Ensure that the vehicle has been driven long enough to burn off any residual oil/fuel in the exhaust system.
   a. During the injector change, the unique passages in the 7.3L cylinder heads allow for oil & fuel to leak into the cylinder (and subsequently the exhaust manifolds (up-pipes to turbo, out of turbo into the downpipe..allll the way to the rear of the vehicle). After an injector change, it is 100% normal for white smoke to occur for 20, 30, 40 miles...sometimes more depending on the volume of oil/fuel, and sometimes longer if the vehicle has a muffler (with packing) that can absorb these fluids). Hour upon hour of idling will NOT get all of the exhaust system components hot enough to burn off these fluids.
      i. If there is no “CEL/SES” light on the dash, drive it.

2. If the vehicle was smoking prior to the injector change, and is still white smoking, it is possible that the vehicle needed injectors as well as other parts.
   a. Low compression (piston/ring wear) can prevent the injected fuel from being completely & fully burned in the cylinder during the ‘power stroke’ of the engine cycle.
   b. Run a compression test on the engine to verify that the engine is mechanically sound. Particularly if there is excessive “blow by” through the oil fill cap, and/or excessive compressor wheel (turbo wheel) wear, which could indicate a history of poor air filtration, and/or a history of oil consumption.

3. Check the turbocharger (shaft) for excessive “end play”. Excessive end play can allow pressurized oil from the turbocharger (center section) to slip past a turbo seal and allow oil into the exhaust system, causing white smoke.

4. If the engine ran well for xxx hours/days/miles after the new injectors were installed and then LATER began white smoking, then it is possible that an injector was not fully seated into the injector cup (and combustion pressure in the cylinder lifted an injector off its’ seat in the injector cup).
   a. Do not continue to drive the vehicle if constant white smoke is present from tailpipe (at full operating temperature).
   b. The copper ‘crush washer’ on the end of each injector nozzle has to be crushed to prevent the combustion event in the cylinder(s) from burning the external o-rings on the injector(s).
   c. Once the external o-rings are burned, the fuel pump is capable of putting 50-60-70+psi of fuel pressure into a cylinder whether the injector is working properly or not.
      d. Remove the valve covers,
         i. Lay a straight edge across the top of each bank of 4 injectors
1. If an injector is noticeably ‘higher’ than the others, remove it, and jump to ‘f’ below. If no injectors are higher than the others, see “ii” below.

   ii. Disconnect the injector wiring from all 8 injectors.

   iii. Remove all 8 glow plugs from the cylinder head, and then cycle fuel pump (if electric) 8-10 times, 20 seconds each.

   e. Carefully standing clear of possible fluids being ejected from the glow plug holes, have someone crank the engine to determine which cylinder is full of fuel.

   f. Remove that injector, and expect to see black carbon on the nozzle as well up the (chrome) body of the injector, sometimes up to the lowest o-ring. (see sample image)

   g. Any injector that resembles the above picture with ANY carbon ABOVE the copper washer at the nozzle will need to be shipped back for non-warranty repair, or another single injector can be ordered for replacement.

5. If you have completed the previous diagnostics, and need to speak with a tech, please call us at the numbers listed above.
By purchasing injectors from Swamp’s Diesel, or through one of our dealers, you have made a long term investment in your vehicle.

While we are quite proficient at diagnostics and repair, it is sometimes very difficult to diagnose a ‘vehicle’, including all (mechanical and electrical) vehicle systems that can cause symptoms similar if not identical to a failed injector. More so when that vehicle is not readily accessible for evaluation.

We do our best to offer only the highest quality stock and performance parts for your vehicle.

Contact us:
866-595-8724
615-793-5573

tech@swamspsdiesel.com

Helpful diagnostic links can be found here:

http://swamspsdiesel.com/ford-diagnostics/