From: FHEGGIE [dcpmsgbd@ford.com]

Sent: Wednesday, November 24, 2010 9:03 AM

To: Heggie, Forest (F.); Eeley, Scott (A.)

Subject: fheggie@ford.com has forwarded you an FMCDealer Discussion Board topic

Author	Parts & Service Discussion Board : Diesel Tech-to-Tech : 6.4 high pressure fuel pumps blow up
Matthew Kraft Timbrook Ford Mercury Keyser, WV (304) 788-7900	**Posted: November 20, 2010 7:14:34 PM** just wondering if anybody is noticing a increase in this problem. ive had 2 this month and think i may have 2 more just wondering if any body else is noticing this . the pumps are blowing apart.
Joaquin pasillas McAuley Ford-Mercury Patterson, CA (209) 892-3341	**Posted: November 21, 2010 4:44:56 PM** yea it seems like they got out two or three at a time. last summer i did thre back to back, this summer i did tworight after each other, now just this week our other diesel tech has two to do before thanks giving.
JOE THOMPSON Ron DuPratt Ford Dixon, CA (707) 678-5555	**Posted: November 21, 2010 9:20:33 PM** I have never seen one physically blown apart. Is it the ITP on the back of the pump? Is there rust/corrosion inside the ITP?
JOE PAVELCIK John Meegan Ford, Inc. Mount Pleasant, PA (724) 547-3552	**Posted: November 22, 2010 3:00:11 PM** What did the fuel look like in those vehicles Matthew??? The one pump I had that blew apart had water in the fuel, It doesnt take much either.
Matthew Kraft Timbrook Ford Mercury Keyser, WV (304) 788-7900	**Posted: November 22, 2010 3:39:33 PM** THE FIRST ON WAS CLEAR, BUT SMELLS LIKE DIESEL FUEL, THE SECOND ON IS A YELLOW BUT FOGGY, NO RUST AT THE FRP SENSOR, AND THE HEADS ARE BLOWING OFF THEY ARE SNAPING THE 4 BOLTS RIGHT OFF . THE FIRST ON WAS 1 OF THE TOP HEADS THE SECOND ON WAS THE BOTTOM HEAD, I THINK ITS A ADDITIVE THERE USING, THIS ONE SMELLS LIKE IT HAS SOMETHING IN IT. WHEN THIS HAPPENS IT CAN CAUSE A NO CRANK ISSUE TO.

From: Heggie, Forest (F.)
Sent: Wednesday, September 08, 2010 1:02 PM
To: Eeley, Scott (A.)
Subject: FW: Tsb water /gas ect in fuel

fyi

Forest Heggie
BaSc. MaSc. P.Eng
OPD Diesel
313-618-5054

From: Lusardi, Tony (T.K.)
Sent: Wednesday, September 08, 2010 1:01 PM
To: Heggie, Forest (F.)
Subject: RE: Tsb water /gas ect in fuel

Print Friendly Version (TSB)

*** DRAFT ***

Message Request

Article Type:	TSB
Title:	6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Category:	Service Tip - Long Term (10 years)
Request Type:	Non-QSF
Author:	TLUSARDI
Would this make a good cost save business case?	No
Author Tracking Number:	103-2010-0041
TWAS Tracking Number:	070-2010-1624
Activity Code:	070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-250	2011	2011			6.7L 4V V8 TC DIESEL			
F-350	2008	2010			6.4L TC DIESEL V8			
F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2008	2010			6.4L TC DIESEL V8			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2008	2010			6.4L TC DIESEL V8			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:

Changes Needed in Other Pubs:

TSBs to Supersede:

SSMs to Supersede: 21410

ISMs to Supersede:

Other application Articles:

Select the reason for republication: Replace Awareness/Interim Message

TSB Issue:
This informational TSB provides the recommended repair directions when vehicle operators inadvertently add gasoline, other fluids or non-diesel fuel to the fuel tank.

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel or other non-diesel fuels can damage the fuel system components, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.

TSB Service Procedure:
1. If the vehicle has been filled with gasoline or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

6. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

7. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the

Procedure verified by CDSID:	cdavis6
Describe How The Procedure Was Verified:	field reports
Do you have access to a vehicle for time study?	N/A
If Yes, contact for vehicle CDSID:	
Labor Operations:	
Are Illustrations Required?	No
If Yes, Contact information for illustrations:	
CDSID(Ford only):	
Full Name:	
Phone:	
Illustration Notes:	
Trustmarks affected:	Ford
Additional Trustmarks To Notify:	
Article Distribution:	WDMO, Canada, Mexico, United States
DTC Codes and OASIS Service Codes:	, 400000, 403000, 404000, 497000, 600000, 601000, 602300, 603300, 606000, 606000, 607000, 608000, 609000, 610000, 611000, 612000, 613000, 614000, 615000, 623000, 698298
Causal Basic Part # or Finis Code:	
Calibrations List:	
White Paper Numbers:	

Parts Request Information

Are Parts Required? No

Approver/Editor Information

Article Number:

BCM Number:

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Heggie, Forest (F.)
Sent: Wednesday, September 08, 2010 12:09 PM
To: Lusardi, Tony (T.K.)
Subject: Tsb water /gas ect in fuel

Tony could you send me what you already have put together for water/gas ect in fuel damage to fuel system,

I am also interested of anything for 6.7 replication of wif work that you may have.

Thank You,

Forest Heggie
BaSc. MaSc. P.Eng
OPD Diesel
313-618-5054

From: Fulton, Brien (B.L.)
Sent: Wednesday, March 02, 2011 2:32 PM
To: Lusardi, Tony (T.K.); Heggie, Forest (F.); Rauch, Jim (J.R.); Billings, Thomas (T.P.)
Cc: Curtis, Andrew (A.); Mahoney, Mark (M.M.); Rivera, Santos (S.); Montgomery, Kerry (K.P.); Klump, Robert (R.F.); Dobbs, Dan (K.D.); Armesto, Carlos (.); Davis, Craig (C.B.); Hale, Curt (B.C.); Corlew, Randall (R.L.); Hazel, Jeff (J.D.); Myers, Dan (D.P.); Malik, Wesley (W.K.); Doss, Jacob (J.E.); Trifilio, Mike (M.J.); Pumford, Ken (K.G.); Dixon, Mark (M.R.); Bandoske, Pete (P.F.); Jones, Keith (K.); Johnson, Seth (S.); Bird, Kevin (M.); Currie, David (J.)
Subject: RE: 6.7L Fuel Contamination Communication

Attachments: Picture (Metafile); 6.7L Fuel System Contamination Diagnosis & Service Procedure Job Aid.pdf

It looks pretty good,

My only suggestions would be:

Consider including comparable pictures of non-corroded versions of the following components like you did with the PCV in figure 3:

- VCV (figure 4)
- Pump outlet (figure 5)
- Overflow valve (figure 7)

Also, to move the part inside the fuel quality verification / indicators between steps 4 and 5 to a location closer to the pictures, you are referencing it from Step 4, I found that I was flipping back and forth just confirming the names and text:

a. Refer to Figures 1 and 2 for key component locations
- 1-Pressure Control Valve (PCV)
- 2-Volume Control Valve (VCV)
- 3-High Pressure Pump Outlet Ports
- 4-High Pressure Pump Overflow Valve

b. Figure 3 PCV
- A - PCV valve non-warrantable corrosion
- B - normal appearance of PCV condition with no corrosion

c. Figure 4 VCV
- A - VCV with rust particle contamination
- B – Corrosion and rust on VCV outlet ring

d. Figure 5 High Pressure Pump Outlet Ports
- Corrosion on high pressure pump outlet port bore

e. Figures 6 & 7 High Pressure Pump Overflow Valve
- Corrosion on high pressure pump overflow valve ports

Brien Fulton
Diesel Powertrain Systems Technical Specialist
bfulton1@ford.com ***Cell:*** (313)-805-9342 ☎ (313)-59-43365

"Vehicle Programs are like a roll of toilet paper, the closer you get to the end the faster they go."

From: Lusardi, Tony (T.K.)

Sent: Wednesday, March 02, 2011 2:02 PM
To: Heggie, Forest (F.); Rauch, Jim (J.R.); Billings, Thomas (T.P.)
Cc: Curtis, Andrew (A.); Mahoney, Mark (M.M.); Rivera, Santos (S.); Montgomery, Kerry (K.P.); Klump, Robert (R.F.); Dobbs, Dan (K.D.); Armesto, Carlos (.); Fulton, Brien (B.L.); Davis, Craig (C.B.); Hale, Curt (B.C.); Corlew, Randall (R.L.); Hazel, Jeff (J.D.); Myers, Dan (D.P.); Malik, Wesley (W.K.); Doss, Jacob (J.E.); Trifilio, Mike (M.J.); Pumford, Ken (K.G.); Dixon, Mark (M.R.); Bandoske, Pete (P.F.); Jones, Keith (K.); Johnson, Seth (S.)
Subject: 6.7L Fuel Contamination Communication
Importance: High

We are changing direction from a previously proposed TSB to now issuing a SSM and a Job Aid.

Please review the proposed SSM for 6.7L Fuel Contamination and the attached Job Aid that will be posted to the PTS website under service tips and respond with any comments by COB Friday 3/4.

Proposed SSM text:

2011 Super Duty vehicles equipped with the 6.7L diesel engine that have experienced fuel system contamination can damage the fuel system components, including the High Pressure (HP) Pump and fuel injectors. Operation on fuels and additives that do not meet the lubrication, ~~cooling~~ and anti-corrosion properties required by the high pressure fuel system components, may cause symptoms including, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build. A Job Aid has been developed and is now available under the Service Tips tab, located on the PTS website, to help aid in diagnosis and repair direction.

6.7L Fuel System Contamination...

Thank you for your input

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Rauch, Jim (J.R.)
Sent: Thursday, March 03, 2011 10:40 AM
To: Lusardi, Tony (T.K.)
Cc: Heggie, Forest (F.)
Subject: RE: 6.7L Fuel Contamination Communication

Attachments: Fuel Contamination Table JR.doc; Fuel Contamination Table JR2.doc

Tony,
I understand on the PCED issue. Enclosed are two versions. One is just correcting a few items specific to 6.7L, the other, which I prefer, has the added symptom column. I really think the issues and factors columns in the current version are redundant. The added symptom column would be even better with P codes added or reference to pin point test M but I left those out for now. I will call you to discuss.


Fuel Contamination Table JR.do...


Fuel Contamination Table JR2.d...

From: Lusardi, Tony (T.K.)
Sent: Thursday, March 03, 2011 8:32 AM
To: Rauch, Jim (J.R.)
Subject: RE: 6.7L Fuel Contamination Communication

Jim, here is the table. Go ahead and mark it up and lets see what you are thinking. If it will have value add, I am for it. I do have some reservation that it might cross into the world of PCED diagnostics though?

<< File: Fuel Contamination Table.doc >>

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Rauch, Jim (J.R.)
Sent: Wednesday, March 02, 2011 4:21 PM
To: Lusardi, Tony (T.K.)
Subject: RE: 6.7L Fuel Contamination Communication

I want to make a proposal for change. I think the issue and factors column are saying the same thing and that we could combine them and add a symptom column to help the techs (i.e. a P008A code with a damaged fuel system could indicate lack of filter maintenance). There are also some 6.4L items still referenced. If you think this is too much tear-up call me tomorrow and we can discuss.

From: Lusardi, Tony (T.K.)
Sent: Wednesday, March 02, 2011 3:49 PM
To: Rauch, Jim (J.R.)
Subject: RE: 6.7L Fuel Contamination Communication

Are there some changes you would like to make or do you want to copy it for some other application?

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Rauch, Jim (J.R.)
Sent: Wednesday, March 02, 2011 3:43 PM
To: Lusardi, Tony (T.K.)
Subject: RE: 6.7L Fuel Contamination Communication

Tony,
Can you send me the table in its native format?

From: Rauch, Jim (J.R.)
Sent: Wednesday, March 02, 2011 3:24 PM
To: Lusardi, Tony (T.K.); Heggie, Forest (F.); Billings, Thomas (T.P.)
Cc: Curtis, Andrew (A.); Mahoney, Mark (M.M.); Rivera, Santos (S.); Montgomery, Kerry (K.P.); Klump, Robert (R.F.); Dobbs, Dan (K.D.); Armesto, Carlos (.); Fulton, Brien (B.L.); Davis, Craig (C.B.); Hale, Curt (B.C.); Corlew, Randall (R.L.); Hazel, Jeff (J.D.); Myers, Dan (D.P.); Malik, Wesley (W.K.); Doss, Jacob (J.E.); Trifilio, Mike (M.J.); Pumford, Ken (K.G.); Dixon, Mark (M.R.); Bandoske, Pete (P.F.); Jones, Keith (K.); Johnson, Seth (S.)
Subject: RE: 6.7L Fuel Contamination Communication

Tony,
I concur with Keith and Brien's comments. If you do not want to add photos at this point as Brien suggests I would recommend changes in red below. I do have the parts available to take the good part photos if we want to go that route. Lastly with this approach to the documents I think we can make the contaminant reference table more useful and specific to 6.7L. I will send a proposal for the table in a separate e-mail.

Refer to Figures 1 and 2 for key component locations
• 1-Pressure Control Valve (PCV)
• 2-Volume Control Valve (VCV)
• 3-High Pressure Pump Outlet Ports
• 4-High Pressure Pump Overflow Valve

b. Figure 3 PCV
• A - PCV valve non-warrantable corrosion example
• B - normal appearance of PCV condition with no corrosion

c. Figure 4 VCV
• A - VCV with rust particle contamination
• B – Corrosion and rust on VCV outlet ring - non-warrantable corrosion example

d. Figure 5 High Pressure Pump Outlet Ports
• Corrosion on high pressure pump outlet port bore - non-warrantable corrosion example
e. Figures 6 & 7 High Pressure Pump Overflow Valve
• Corrosion on high pressure pump overflow valve ports - non-warrantable corrosion example

6. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, all engine mounted high pressure fuel lines, both high high pressure fuel rails, ALL 8 injectors, the low pressure injector return hose assembly, and the low pressure fuel delivery pressure switch located near the secondary fuel filter.

From: Lusardi, Tony (T.K.)
Sent: Wednesday, March 02, 2011 2:02 PM
To: Heggie, Forest (F.); Rauch, Jim (J.R.); Billings, Thomas (T.P.)
Cc: Curtis, Andrew (A.); Mahoney, Mark (M.M.); Rivera, Santos (S.); Montgomery, Kerry (K.P.); Klump, Robert (R.F.); Dobbs, Dan (K.D.); Armesto, Carlos (.); Fulton, Brien (B.L.); Davis, Craig (C.B.); Hale, Curt (B.C.); Corlew, Randall (R.L.); Hazel, Jeff (J.D.); Myers, Dan (D.P.); Malik, Wesley (W.K.); Doss, Jacob (J.E.); Trifilio, Mike (M.J.); Pumford, Ken (K.G.); Dixon, Mark (M.R.); Bandoske, Pete (P.F.); Jones, Keith (K.); Johnson, Seth (S.)
Subject: 6.7L Fuel Contamination Communication
Importance: High

We are changing direction from a previously proposed TSB to now issuing a SSM and a Job Aid.

Please review the proposed SSM for 6.7L Fuel Contamination and the attached Job Aid that will be posted to the PTS website under service tips and respond with any comments by COB Friday 3/4.

Proposed SSM text:

2011 Super Duty vehicles equipped with the 6.7L diesel engine that have experienced fuel system contamination can damage the fuel system components, including the High Pressure (HP) Pump and fuel injectors. Operation on fuels and additives that do not meet the lubrication, cooling and anti-corrosion properties required by the high pressure fuel system components, may cause symptoms including, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build. A Job Aid has been developed and is now available under the Service Tips tab, located on the PTS website, to help aid in diagnosis and repair direction.

<< File: 6.7L Fuel System Contamination Diagnosis & Service Procedure Job Aid.pdf >>

Thank you for your input

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

Contamination Reference Table

NOTE: Fuel contamination can be, but is not limited to dirt/debris, water, excessive % biodiesel, incorrect fuel additives, gasoline, kerosene, DEF etc.

NOTE: Current fuel samples obtained from the vehicle may not be reflective of the vehicles previous fuel quality levels and should not be used as a 'sole' indicator of fuel quality.

Contaminant	Issue	Factors	Indicator
Gasoline/Ethanol/Kerosene/Alternative Fuels	Lubricity, cooling, aggressive chemical attack of materials in fuel system	Premature HP pump and injector wear, debris, NO rust/corrosion, distortion of materials	Smell, fuel sample: fuel aeration, Note: The elastomer valves in the tank Diesel fuel Delivery Module (DDM) can distort with aggressive fuels (aggressive biodiesel, gasoline or ethanol blends) and result in increased air in fuel and poor low fuel level system performance.
Water	Lubricity, cooling, corrosion/rust	Premature HP pump and injector wear, debris, rust/corrosion	Fuel sample, corrosion as shown in Figures 3-7 (can have water damage throughout system if large enough quantities are ingested)
Excessive Biodiesel	Lubricity, cooling, bacterial/fungus growth/corrosion/rust	Premature HP pump and injector wear, debris, rust/corrosion, bacterial/ fungus growth	Rust/corrosion as shown in Figures 3-7 due to increased water content (excessive biodiesel decreases water separation capability), bacterial/fungus growth, aeration, Note: The elastomer valves in the tank DDM can distort with aggressive fuels (aggressive biodiesel, gasoline or ethanol blends) and result in increased air in fuel and poor low fuel level system performance.
Incorrect Fuel Additives	Lubricity, cooling, corrosion/rust depends on additive content (alcohol)	Premature HP pump and injector wear, may have rust/corrosion, or only debris	Rust/Corrosion if water emulsifies/prevents water separation
Lack of Sufficient Fuel Filters Maintenance	Decreased water separation, lubricity, cooling, corrosion/rust/particulate	Premature HP pump and injector wear, debris, may have rust/corrosion, decreased efficiency of water separation/plugged filters/ collapsed filters	Rust/corrosion as shown in Figures 3-7 due to increased water content, HP pump damage due to debris, factory filters installed beyond service interval (factory secondary filter is a 3 port type), collapsed or water laden primary filter
DEF	Lubricity, cooling, aggressive chemical attack of materials in fuel system	Premature HP pump and injector wear, debris, pitting/corrosion, distortion of materials	Smell, white crystals on components when dried, fuel sample
Foreign Materials (sand, dirt, metallic particles, etc)	Crank no start, fuel pump noise	Low fuel pressure, HP or LP pump failure	Noise from DFCM, debris on VCV inlet screen or inside HP pump

Contamination Reference Table

NOTE: Fuel contamination can be, but is not limited to dirt/debris, water, excessive % biodiesel, incorrect fuel additives, gasoline, kerosene, DEF etc.

NOTE: Current fuel samples obtained from the vehicle may not be reflective of the vehicles previous fuel quality levels and should not be used as a 'sole' indicator of fuel quality.

Contaminant	Symptom	Effect	Indicator
Gasoline/Ethanol/Kerosene/Alternative Fuels	Crank no start, poor driveability, low fuel pressure on HP and/or LP side	Premature HP pump and injector wear, debris, NO rust/corrosion, distortion of materials	Smell, fuel sample: fuel aeration, Note: The elastomer valves in the tank Diesel fuel Delivery Module (DDM) can distort with aggressive fuels (aggressive biodiesel, gasoline or ethanol blends) and result in increased air in fuel and poor low fuel level system performance.
Water	Crank no start, reduced power mode, poor driveability	Premature HP pump and injector wear, debris, rust/corrosion	Fuel sample, corrosion as shown in Figures 3-7 (can have water damage throughout system if large enough quantities are ingested)
Excessive Biodiesel	Low fuel pressure on HP and/or LP side, poor driveability	Premature HP pump and injector wear, debris, rust/corrosion, bacterial/ fungus growth	Rust/corrosion as shown in Figures 3-7 due to increased water content (excessive biodiesel decreases water separation capability), bacterial/fungus growth, aeration, Note: The elastomer valves in the tank DDM can distort with aggressive fuels (aggressive biodiesel, gasoline or ethanol blends) and result in increased air in fuel and poor low fuel level system performance.
Incorrect Fuel Additives (alcohol based and other)	Low fuel pressure on HP and/or LP side, poor driveability	Premature HP pump and injector wear, may have rust/corrosion, or only debris	Rust/Corrosion if water emulsifies/prevents water separation
Lack of Sufficient Fuel Filters Maintenance	Crank no start, reduced power mode, poor driveability, low fuel pressure on HP and/or LP side, poor driveability	Premature HP pump and injector wear, HP or LP Pump noise or failure, debris, may have rust/corrosion, decreased efficiency of water separation/plugged filters/ collapsed filters	Rust/corrosion as shown in Figures 3-7 due to increased water content, HP pump damage due to debris, factory filters installed beyond service interval (factory secondary filter is a 3 port type), collapsed or water laden primary filter
DEF	Crank no start, reduced power mode, poor driveability	Premature HP pump and injector wear, debris, pitting/corrosion, distortion of materials, plugged fuel injector return line	Smell, white crystals on components when dried, fuel sample
Foreign Materials (sand, dirt, metallic particles, etc)	Crank no start, fuel pump noise	Low fuel pressure, HP or LP pump failure	Noise from DFCM, debris on VCV inlet screen or inside HP pump

From: Fulton, Brien (B.L.)
Sent: Monday, February 28, 2011 12:56 PM
To: Mahoney, Mark (M.M.); Heggie, Forest (F.)
Subject: RE: Diesel fuel contamination

Attachments: Mahoney TSB.doc

Sorry,
I was late by a weekend
Easy question for the table, we want to include any Pcodes with the table?

Some recommendation for the TSB>??

Mahoney TSB.doc

Brien Fulton
Diesel Powertrain Systems Technical Specialist
bfulton1@ford.com ***Cell:*** (313)-805-9342 ☎ (313)-59-43365

"Vehicle Programs are like a roll of toilet paper, the closer you get to the end the faster they go."

From: Mahoney, Mark (M.M.)
Sent: Thursday, February 24, 2011 9:02 AM
To: Rauch, Jim (J.R.); Armesto, Carlos (.); Pumford, Ken (K.G.); Raney-Pablo, Beth (H.E.); Misangyi, Pete (P.W.); Fulton, Brien (B.L.)
Cc: Heggie, Forest (F.); Lusardi, Tony (T.K.); Rivera, Santos (S.); Klump, Robert (R.F.)
Subject: Diesel fuel contamination

Please review these documents. We would like to use them in our service information for 6.7L diesel. With some minor tweaks they would also be placed in the 6.4 information. Please make your comments using Adobe's commenting feature. This issue is time sensitive, please make it a priority.

<< File: Fuel Contamination Table.2.pdf >> << File: 070 2010 1624 Contamination Photos.doc >> << File: Print Friendly Version (TSB).htm >>

Best Regards,

Mark Mahoney
Diesel Technical Information Specialist
1555 Fairlane Dr. cube 210A
Allen Park, MI 48101
mmahon14@ford.com

Print Friendly Version (TSB)

*** DRAFT ***

Message Request

Article Type: TSB
Title: 2011 F-Super Duty Equipped with 6.7L Diesel Engine – Poor Quality Diesel Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Category: Service Tip - Long Term (10 years)
Request Type: Non-QSF
Author: TLUSARDI
Is this a Pre-Defined Repair (PDR) Candidate? No
Author Tracking Number: 103-2010-0041
TWAS Tracking Number: 070-2010-1624
Activity Code: 070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2011	2011			6.7L 4V V8 TC DIESEL			
F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:
Changes Needed in Other Pubs:
TSBs to Supersede:
SSMs to Supersede: 21410
ISMs to Supersede:
Other application Articles:
Select the reason for republication: Replace Awareness/Interim Message

TSB Issue:
This informational TSB provides the recommended repair directions when the fuel system is contaminated. Fuel contamination can be, but is not limited to poor quality diesel fuel, dirt/ debris, gasoline, Diesel Exhaust Fluid (DEF), incorrect or non-recommended fuels and additives and other non-diesel fuels or water that enter into the high pressure fuel system either through improper service/maintenance or during re-fueling.

2011 Super Duty vehicles equipped with the 6.7L diesel engine that have experienced fuel system contamination can damage the fuel system components, including the High Pressure (HP) ~~Injection~~ Pump and fuel injectors. Operation on fuels and additives that do not meet the lubrication, cooling and anti-corrosion properties required by the high pressure fuel system components, may cause symptoms including, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to the use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.

TSB Service Procedure:
NOTE: The most typical sources of contaminated fuel are: (i.e. auxiliary vehicle mounted tanks, local storage tanks, other infrequently used fuel sources and refueling errors). The best action that can be taken to avoid issues outlined in this TSB is to

ensure vehicles are fueled from sources with known quality diesel fuel and verified to be free from water and other contaminants.

1. Obtain a fuel sample from Diesel Fuel Conditioning Module (DFCM) water drain and place in an appropriate container. Refer to the vehicles Owner Guide for additional information if necessary.

2. Let fuel sample sit for 10-15 minutes.

3. Visually inspect the fuel sample to help determine contamination type.

NOTE: Removal of fuel system components may be required to further define contamination type and extent of system damage.

NOTE: To aid in fuel contamination determination, refer to the Fuel Contamination Table and reference photos.

(Insert Fuel Contamination Table and photos here)

4. If the vehicle has been filled with gasoline, DEF, or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline, DEF, or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

NOTE: Leave original fuel filters, HP injection pump, fuel lines, fuel rails and injectors in place until flushing procedure is completed to prevent replacement components from becoming contaminated.

3. Drain DFCM of any residual liquids into an appropriate container.

4. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

NOTE: Inspection of the DFCM must be performed during filter replacement to validate no low pressure system damage.

5. Replace the fuel filters (primary and secondary filters).

6. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, all engine mounted high pressure fuel lines, both high pressure fuel rails, ALL 8 injectors, the low pressure injector return hose assembly , and the low pressure line that has the fuel delivery pressure switch and fuel temperature sensor located near the secondary fuel filter.

NOTE: All other low pressure fuel lines can be reused if no physical damage is present.

7. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

8. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Drain DFCM of any residual liquids into an appropriate container.

NOTE: Inspection of the DFCM must be performed during filter replacement to validate no low pressure system damage.

4. Replace the fuel filters (primary and secondary filters). (Why would we replace filters before the flush?)

5. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

Procedure C - Fuel system flush:

1) Remove the rear Fuel Cooler Line that returns to the fuel tank at the fuel cooler.

2) Install a 3' length of 3/8" rubber hose over the fuel cooler nipple.

3) Place the hose into a suitable container.

4) Use Scan Tool Active Commands or Cycle the key to allow the low pressure fuel pump to flush the lines.

From: Heggie, Forest (F.)
Sent: Thursday, April 15, 2010 3:27 PM
To: Heggie, Forest (F.); Armesto, Carlos (.); Fulton, Brien (B.L.); Kromberg, Arnold (A.W.); Bld-1 11F094 (10); Espinoza, Bob (R.J.); Eeley, Scott (A.); McAllister, Derek (D.); Bergeron, Leon (F.L.); Stroia, Kathy (K.); Curtis, Andrew (A.); Bandoske, Pete (P.F.); Goebel, Ken (K.M.)
Subject: RE: Team review draft recommendations for rust inspection.

Attachments: Study Rust Inspection 4-15-2010.pdf

Discussion

- currently suspending FCSD fuel sampling for the purposes of warranty determination but it will be continued for the purpose of the requested study

-In regards to request for 2 week study :
a) technician via hotline has determined a pump is required to fix a customer concern (ie multiple injector lead to debris check then pump,no start no frp….
use standard process existing currently to determine a pump is required to be replaced)
b) Entry conditions to check ITP for rust are "If there is a Stored 2269 code and Rust In On Engine Filter/Bowl"
then the HP Pump will be removed and check the ITP and VCV for Rust
then take fuel sample from Tank following same procedure used previously (do not want a data shift)

-agreement to remove ITP cover from HPP for this study/all other diagnostic procedures are as per published/current standards.

Assignments

McAllister: fuel sample: how much cost/time to test for oxides in the fuel sample (is there adequate volume for a sample) or measurement of TAN (total acid number)

Heggie : email updated inspection document

Study Rust
nspection 4-15-201.

attached:

Heggie: Schedule a follow up conference call for next Wed.

Study Tasks

McAllister/Curtis: to send Forest reports as they occur for the 2 week study
Heggie: 700 tag parts from study vehicles

Items

Bandoske: send to Carlos Armesto pictures of FF fuel filters

Forest Heggie BaSc. MaSc. P.Eng

1-313-6185054

LGDEE Diesel OPD

From: Heggie, Forest (F.)
Sent: Tuesday, April 13, 2010 12:00 PM
To: Heggie, Forest (F.); Armesto, Carlos (.); Fulton, Brien (B.L.); Kromberg, Arnold (A.W.); Bld-1 11F094 (10); Espinoza, Bob (R.J.); Eeley, Scott (A.); McAllister, Derek (D.); Bergeron, Leon (F.L.); Stroia, Kathy (K.); Curtis, Andrew (A.)
Cc: Goebel, Ken (K.M.)
Subject: Team review draft recommendations for rust inspection.
When: Thursday, April 15, 2010 12:30 PM-1:00 PM (GMT-05:00) Eastern Time (US & Canada).
Where: bld-1 , 11F094

Team review draft recommendations for rust inspection
<< File: DRAFT Recommended to check 3 locations for Rust 4-13-2010.doc >>
It is very difficult to find a good time for all personnel schedules,

Forest Heggie

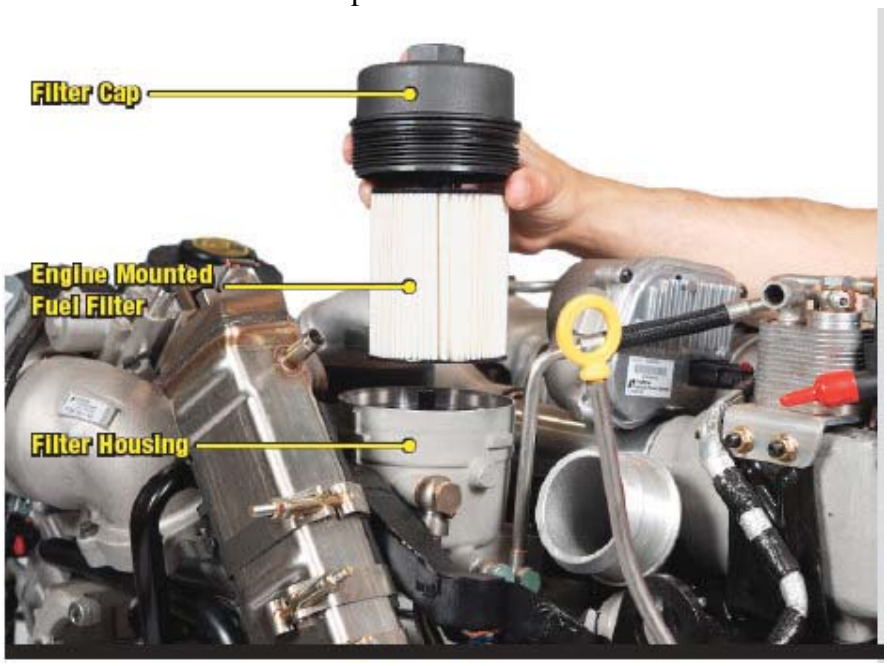
Rust Inspection for Special Study

The following set of instructions is for a Special Study: Beginning 4/15/2010 and Ending 5/15/2010
Criteria Technician with the Hotline has determined a HP Pump is required to resolve a customer concern via the prior approval process. The vehicle has a P2269 code and rust in the On Engine Filter Bowl;

The following illustrates outline rust inspection for

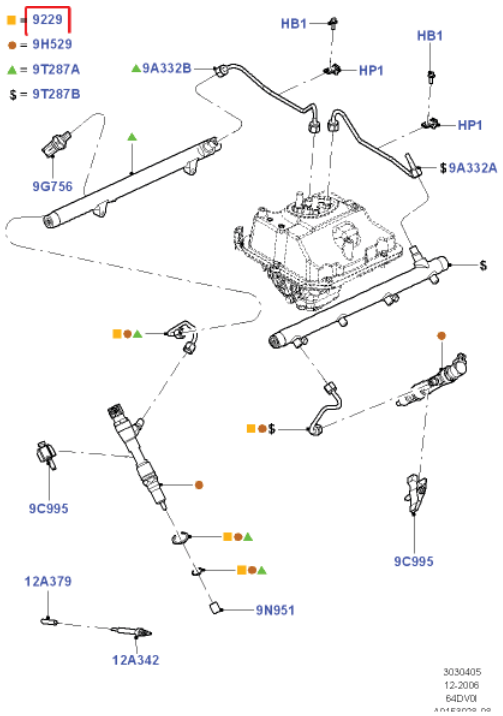
1) **On Engine fuel filter bowl & filter inspection**
2) **HPP ITP inspection**
3) **HPP VCV valve inspection**

1) **On Engine Fuel filter bowl & filter**
   a. Do not wipe filter before inspecting – is there rust on the filter?
      i. take picture



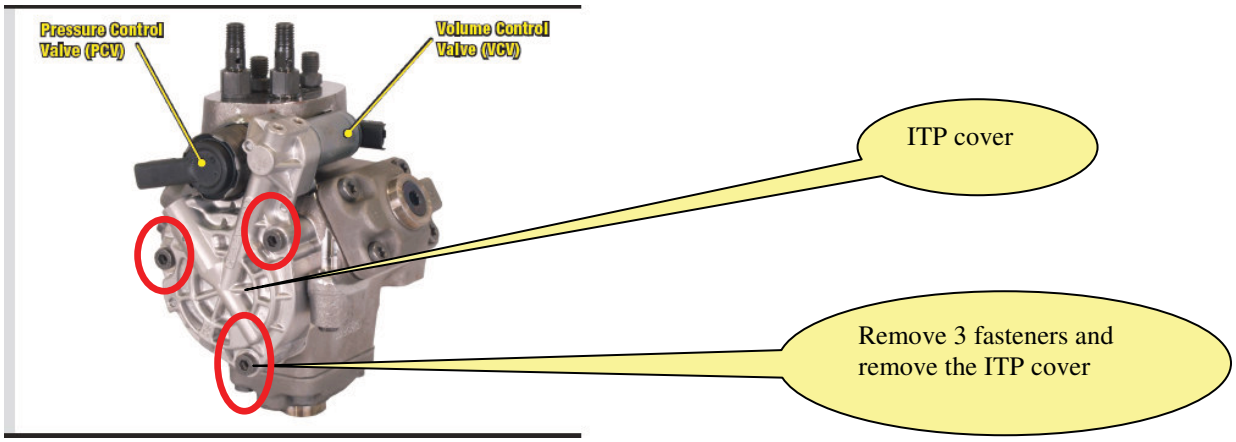
   b. Is there rust inside the fuel filter bowl or on the fasteners inside the filter bowl?
      i. take picture

4) HPP ITP – a) remove the HPP following the workshop manual instructions



b) Place the HPP flat ITP cover facing up

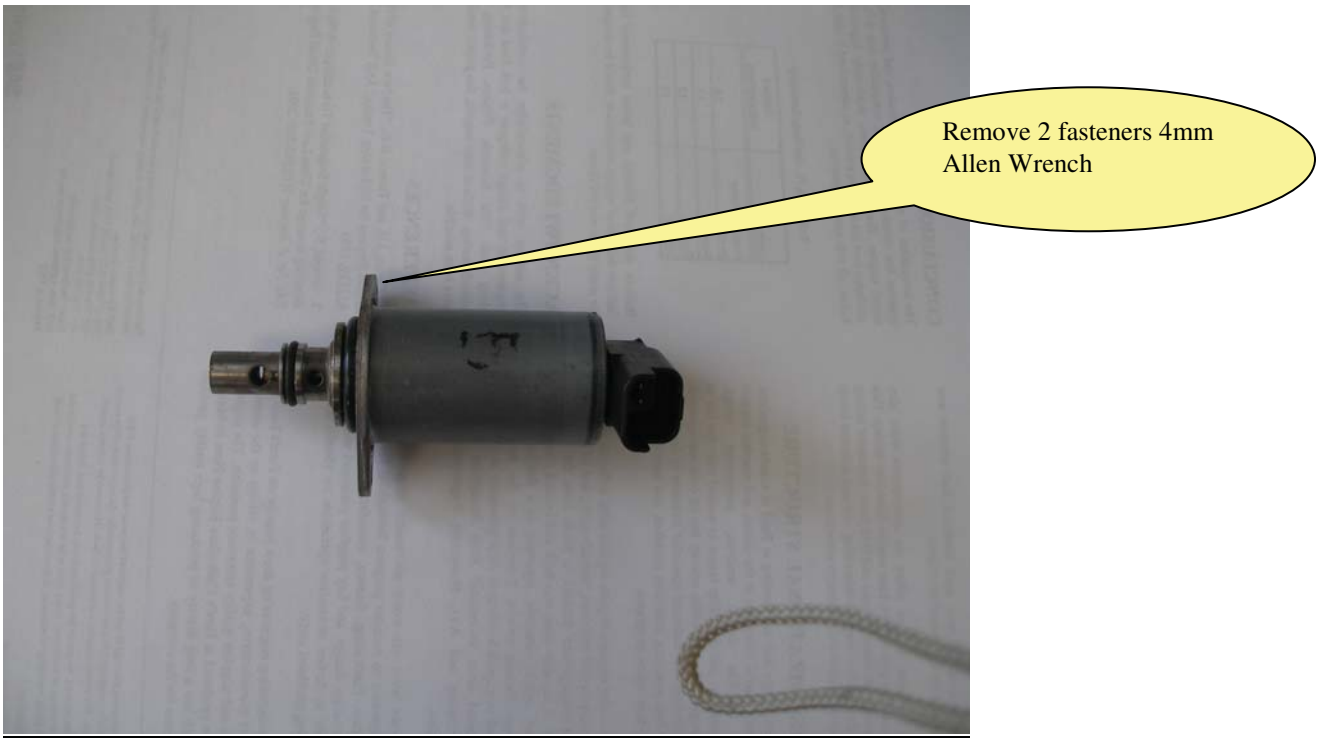
i) Remove the 3 fasteners with a 6mm Allen wrench and remove the ITP cover

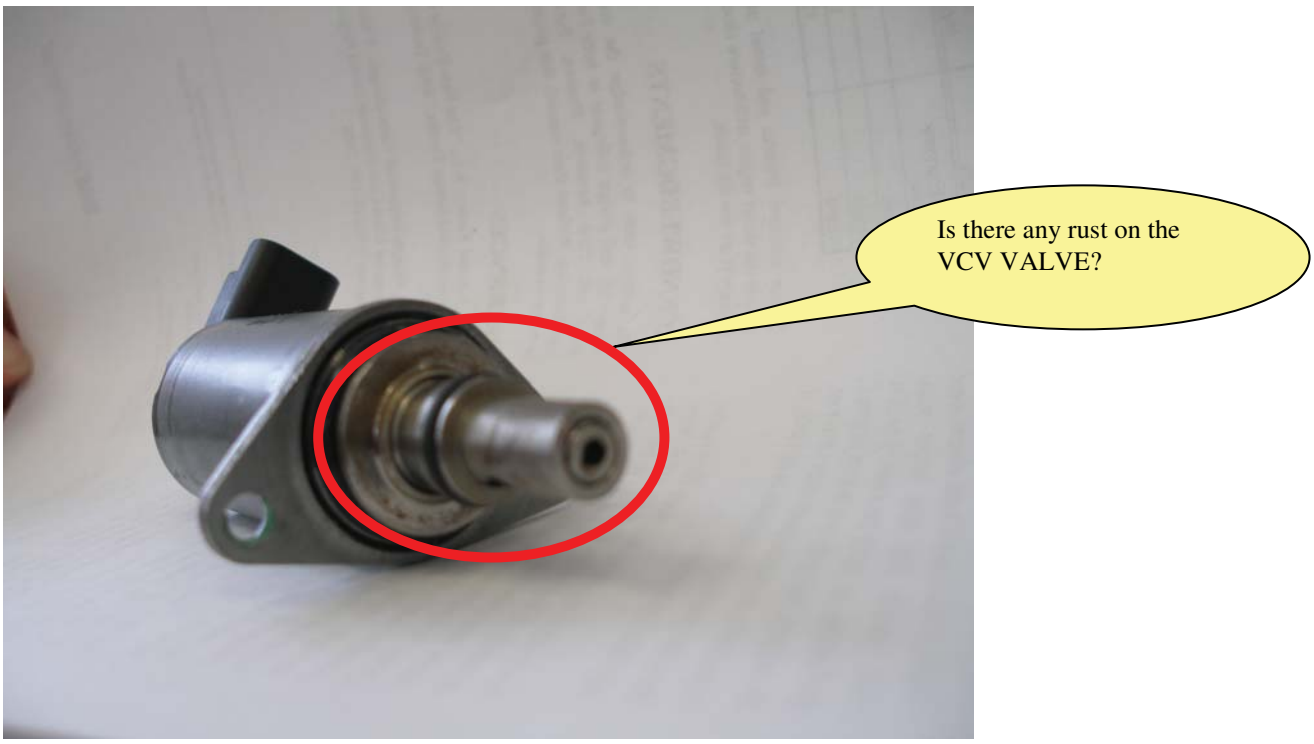


c) Inspect for rust – Is there any rust present?

i. Take picture

5) Remove the - HPP VCV valve- 2 fasteners 4mm Allen Wrench
   i. Is there any rust on the VCV valve? – take picture





After inspecting reassemble the VCV and ITP snuggly but do not torque down tightly.

From: Stendardo, David (D.)
Sent: Wednesday, January 26, 2011 3:24 PM
To: Heggie, Forest (F.); Johnson, Seth (S.); Curtis, Andrew (A.)
Subject: RE: Technical determination of water in fuel damage and repair process 1-21-11 .doc

Attachments: Technical determination of water in fuel damage and repair process 1-21-11 (2).doc

Forest,
Couple suggestions shown as comments in the document on first page.

Technical
etermination of wat.

From: Heggie, Forest (F.)
Sent: Friday, January 21, 2011 10:23 AM
To: Johnson, Seth (S.); Stendardo, David (D.); Curtis, Andrew (A.)
Subject: Technical determination of water in fuel damage and repair process 1-21-11 .doc

Small update: I added a specific call out under the parts to be inspected for the check valve on the fuel return -

<< File: Technical determination of water in fuel damage and repair process 1-21-11 .doc >>

DRAFT JOB AID

Issue:
When directed to perform a fuel system repair where corrosion exists on fuel facing surfaces: the fuel system replacement is not a Ford warrantable repair provided the water in fuel indicator system is operating properly

Ford Motor Company Warranty Policy - "What is not covered":

- Using contaminated or improper fuels/fluids. (Water in fuel.)
- Failures due to abuse, neglect, or improper maintenance, unapproved modification. (Fuel filters maintenance.)
- Using fuel types not covered under warranty. (Bio-diesel exceeding specified rating.)
- Using aftermarket products not cover by warranty. Using additives that do not meet or exceed Ford specifications. (Water in fuel dispersants such as alcohol based products.)

Comment [d1]: Can we state that the specified bio-diesel rating is no more than 5%

Comment [d2]: Should there be a mention regarding SSM 21410 about alcohol and gasoline

Action
For a F250-550 6.4L equipped Super duty when the PCED/hotline directs the technician to perform Step 28 in the PCED and as a result replace the whole high pressure fuel system. The high pressure fuel system components are required to be inspected for damage by water in fuel to determine warranty coverage.

If Debris is found in the High Pressure Fuel System and any one of the following criteria are meet

i) Corrosion is found in Secondary Fuel Housing
ii) Suspect Fuel Quality: Standing Water in Fuel Tank/Secondary Housing
iii) Poor filter maintenance/FF (Factory Fit) Filters

Indicator for 6.4L
There is an opportunity before accessing the high pressure pump on the 6.4L to notify the customer the repair may not be covered by warranty by examining the secondary on engine fuel filter housing for corrosion.

- If there is corrosion in the secondary fuel filter housing there is a high probability of corrosion being present in the high pressure fuel pump.
- If there is no corrosion in the secondary housing it does not preclude corrosion being present in the high pressure pump.

Service Procedure for Determining if Water in Fuel caused Fuel System Damage

1) Notify customer repair may not be covered by warranty

2) Record PID INFORMATION

3) Validate the fuel filters have been changed per the operating conditions required maintenance schedule hours and mileage.

- Fuel filters separate the water.
- Incorrect maintenance will prevent water from separating

1-3-2011 F.HEGGIE

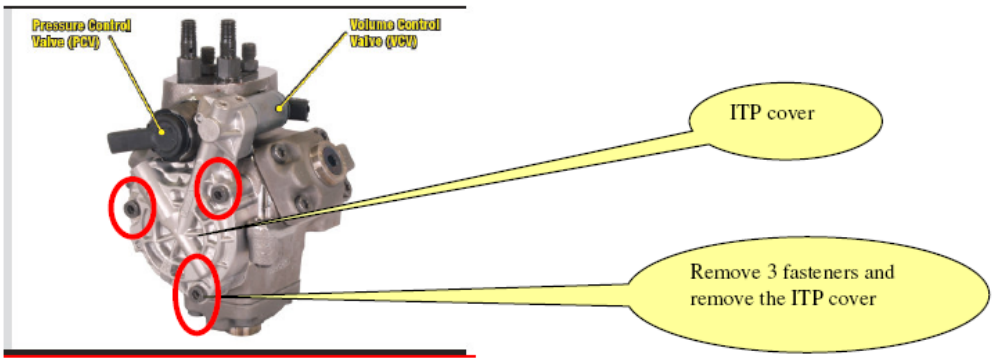
DRAFT JOB AID

4) Validate the water in fuel indicator system is operating properly

- Perform Pinpoint test O2:
  - Is the system operating properly?
  - Is there sufficient clean fuel

5) Access the high pressure fuel system and remove the Internal transfer pump (ITP) cover from the high pressure fuel pump to determine if water in fuel has damaged the high pressure fuel system.

i) Remove the HPP following the workshop manual instructions
ii) Place the HPP flat ITP (internal transfer pump) cover facing up
iii) Remove the 3 fasteners with a 6mm Allen wrench and remove the ITP cover



iv) Inspect for rust where the steering disk mates with the distance ring on the ITP cover

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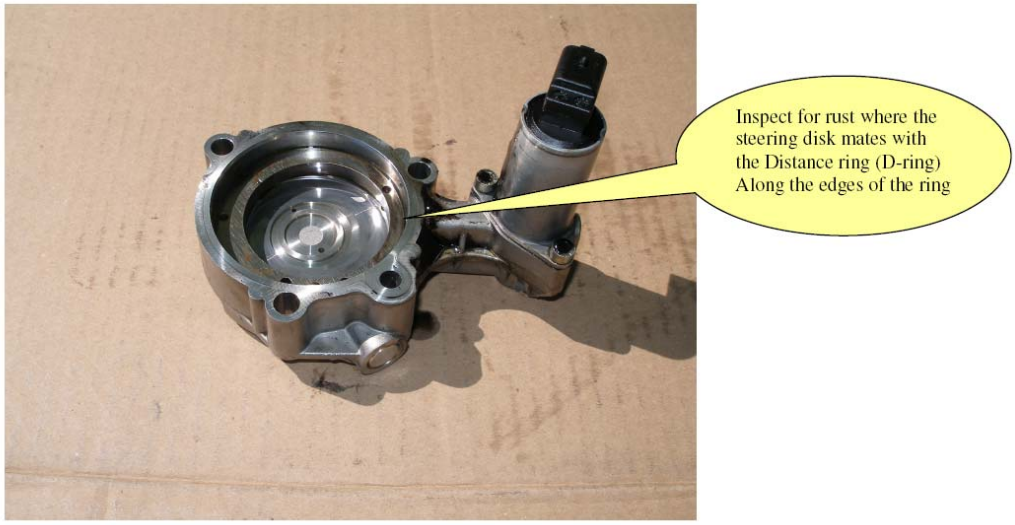
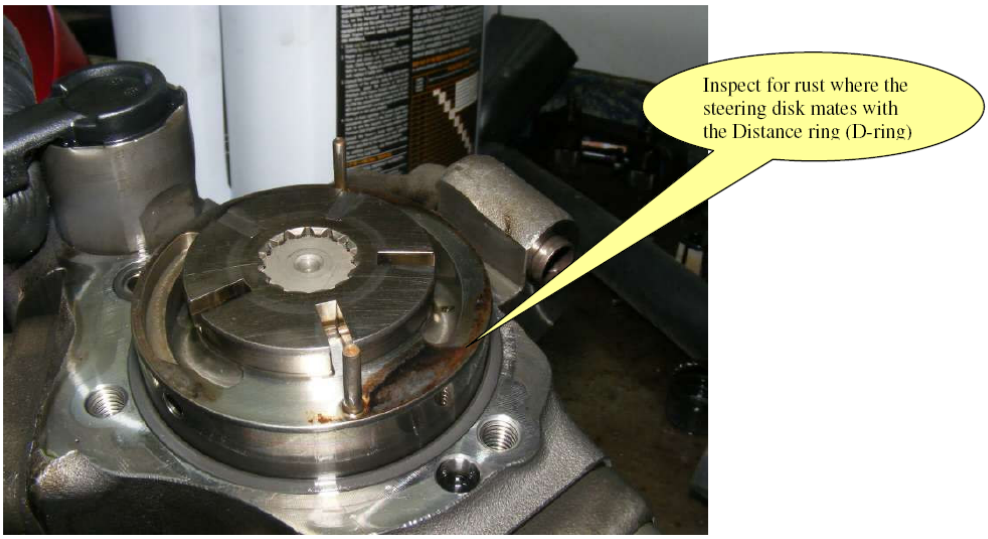


v) Inspect for rust where the steering disk mates with the distance ring on the HPP side of the mating surface.



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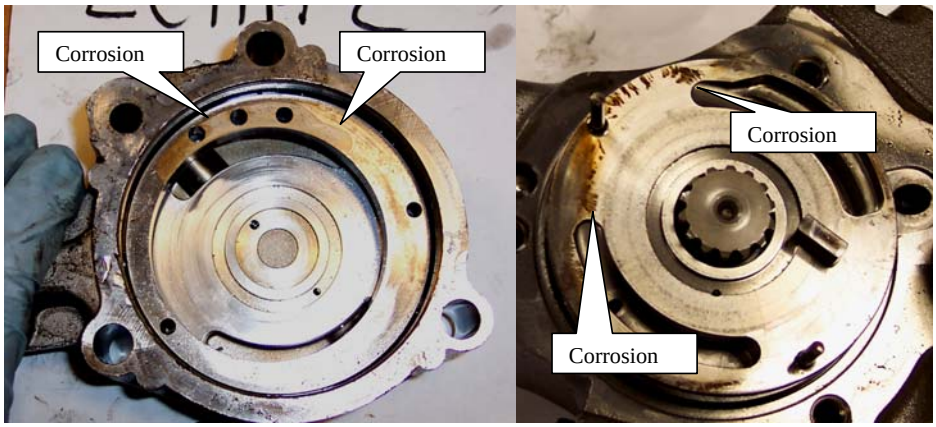
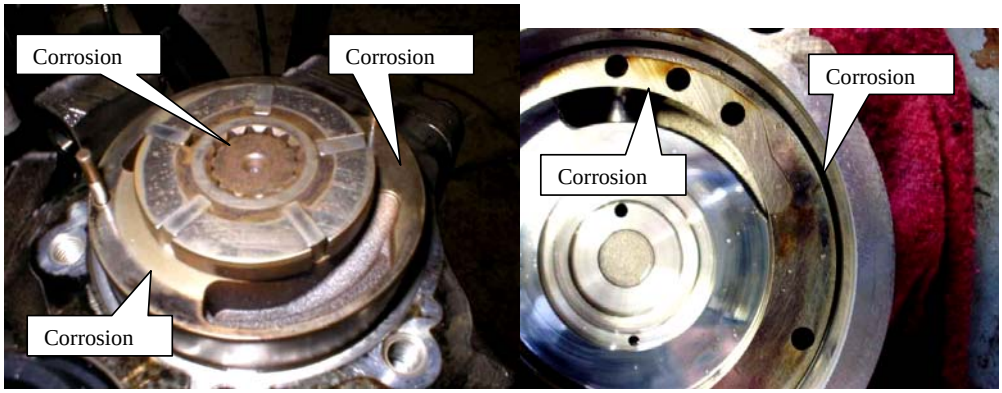
Examples of Corrosion on Fuel Facing Surfaces

Examples of Corrosion under the Internal Transfer Pump Cover





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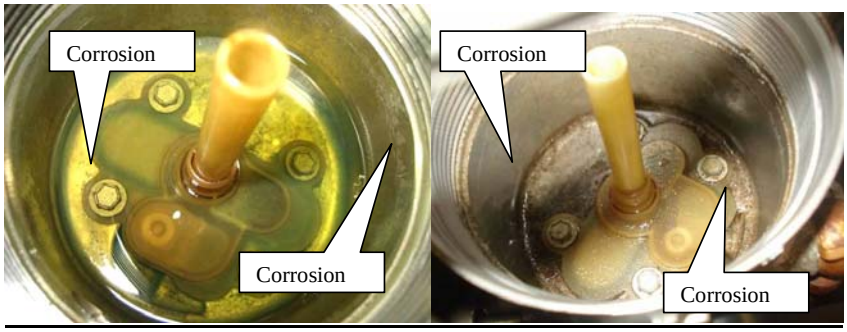
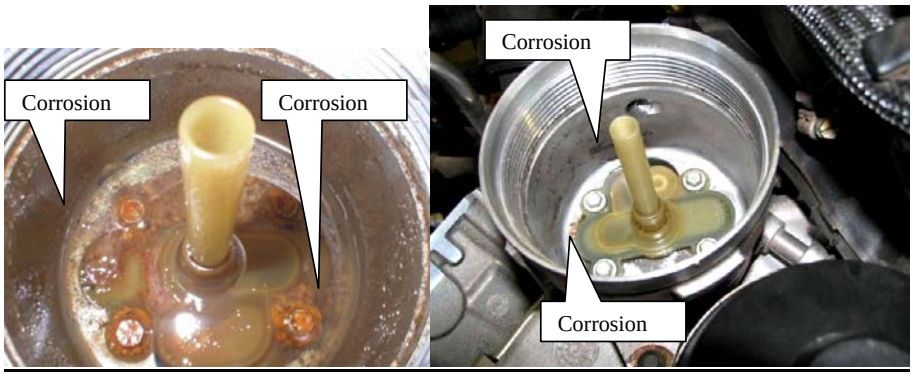
Examples of Corrosion in Secondary Fuel filter housing





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Repair Instructions :

Replace the following components when metallic debris is found at the fuel injectors tubes when performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics and water in fuel or non approved fuel caused the fuel system damage.

If there is shiny metallic material in the fuel at the fuel injector jumper tubes after performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics, and water in fuel or non approved fuel caused the fuel system damage.

The following components are to be Replaced:

Part Number	Part Common Name	Includes
9A543 (qt 1)	High Pressure Pump	
9G805 (qt 1)	High Pressure Pump Gasket Kit	High pressure pump gaskets 6619A and 6619B, fuel lines from high pressure pump to fuel rail manifold 9A332A/B, washer
9N103 (qt 1)	Fuel cooler	
9H529 (qt 8)	Fuel injector kit	Fuel injector, jumper tubes, fuel injector gaskets
8C3Z- 9T287-CA	LH and RH fuel rail manifold	*Left and right hand fuel rail manifold
9N184	Fuel Filter	
9G756	Fuel Pressure sensor	
9C330	Fuel supply line	
9G282	HFCM	
9C148	Housing – Fuel filter	

Note: HFCM required to be replaced due to water in fuel. Not all fuel system replacements require the HFCM to be replaced.

The following components are to be Inspected for corrosion. If there is no corrosion Flush and Reused:

Part Number	Part Common Name	
9B337 A/B	Low pressure return lines	
9N104	Low pressure return lines	
9C273	Low pressure return lines	
9192	Valve assembly – Fuel shut off	
10884	Sender Assy – Temperature on Fuel Housing	
Fuel Tank	Inspect interior of tank, if dual inspect both tanks	
Fuel pick up boot	Inspect non approved fuels can cause damage	

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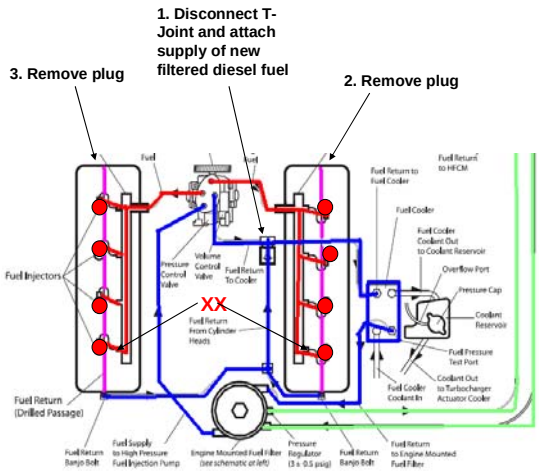
Flush Recommendation



- Flush **cylinder heads** individually by removing one plug at a time.
- Use only new clean filtered diesel fuel.
- Do not exceed 8 PSI during flush.
- .Leave original injectors in cylinder head until flushing is complete.
- **Replace fuel filters after flushing is complete.**

54

Request Type: Non-QSF

Would this make a good cost save business case? No

Activity Code: 070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-350	2008	2010			6.4L TC DIESEL V8			
F-450	2008	2010			6.4L TC DIESEL V8			
F-550	2008	2010			6.4L TC DIESEL			

DRAFT JOB AID

					V8			

1-3-2011 F.HEGGIE

From: Lusardi, Tony (T.K.)
Sent: Wednesday, December 08, 2010 12:28 PM
To: Heggie, Forest (F.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine 3

Thanks Forest, I tried to incorporate your suggestions into the text through notes and some verbiage changes.

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Heggie, Forest (F.)
Sent: Monday, December 06, 2010 8:06 AM
To: Lusardi, Tony (T.K.); Davis, Craig (C.B.); Jones, Keith (K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Ives, David (D.C.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.); Stendardo, David (D.)
Cc: Eeley, Scott (A.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

1. I agree we need the added statement for water

2. Repair Procedures 6.4L

Procedure A.

- Recommend flush low pressure fuel lines between pump to cooler, cooler to secondary filter on 6.4L, flush cylinder head fuel return lines, all other fuel return lines, fuel cooler is the only component required to be replaced after the injectors.
- If water or other non lubricating fuels ingested into the fuel system, the HFCM should be inspected, pinpoint test O and check for debris if issue found then replace, otherwise flush the low pressure pump.

Procedure B. suggest add an inspection for HFCM to validate no low pressure system damage - validate not started, if damage present then addition inspection required.

Forest Heggie
BaSc. MaSc. P.Eng
Certified Six Sigma Black Belt
OPD Diesel
313-618-5054

From: Lusardi, Tony (T.K.)
Sent: Friday, December 03, 2010 2:54 PM
To: Davis, Craig (C.B.); Jones, Keith (K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.); Stendardo, David (D.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel, other non-diesel fuels **or water that enters into the fuel system either through improper or incomplete service/maintenance or during re-fueling can damage the fuel system components**, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Davis, Craig (C.B.)
Sent: Friday, December 03, 2010 1:42 PM
To: Jones, Keith (K.); Lusardi, Tony (T.K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.); Stendardo, David (D.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

I agree, we need to advise that water in the fuel system either through improper or incomplete service/maintenance or during re-fueling will also contribute to this.

From: Jones, Keith (K.)
Sent: Friday, December 03, 2010 1:32 PM
To: Lusardi, Tony (T.K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.); Stendardo, David (D.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

Can we add the word water?

Keith Jones
6.7 Engine SME
Diesel Drivability
Ford Technical Hotline
DSC1 Cube 308
313-248-7923

KJone286@ford.com

From: Lusardi, Tony (T.K.)
Sent: Friday, December 03, 2010 1:29 PM
To: Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Jones, Keith (K.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.)
Subject: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

TSB Request for Input

***** NOTE: The system generated the email. *****

This message is being sent on behalf of TLUSARDI.
Please provide review and feedback for the article below. The person requesting this feedback may have provided further direction in the comment section below. Forward/Send any comments via email to the person who sent this email.

General Information

Last action taken (as of 12/3/2010 6:29:11 PM GMT):	Send for engineering input
Comment:	
Author:	TLUSARDI
Tracking Number:	070-2010-1624
Author Tracking Number:	103-2010-0041
Title:	6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Article Type:	TSB

TSB Issue:
This informational TSB provides the recommended repair directions when vehicle operators inadvertently add gasoline, other fluids or non-diesel fuel to the fuel tank.

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel or other non-diesel fuels can damage the fuel system components, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.
TSB Service Procedure:
1. If the vehicle has been filled with gasoline or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

6. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

7. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Replace the fuel filters (primary and secondary filters).

4. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

Procedure C - Fuel system flush:

1) Remove the rear Fuel Cooler Line that comes from the High Pressure Pump at the Fuel Cooler.

2) Cut a 1/2" length of 3/8" rubber hose to seal the banjo bolt when re-installing into the Fuel Cooler without the fuel line attached.

3) Place a larger hose over the return fuel line in order to direct the fuel into a suitable container.

4) Use Active Commands or Cycle the key to allow the fuel pump to flush the lines.

5) Plugging the Fuel Cooler during this process will prevent air from being introduced into the High Pressure Fuel System causing a no start.

Category: Service Tip - Long Term (10 years)
Request Type: Non-QSF
Would this make a good cost save business case? No
Activity Code: 070 F-Series >8500#
Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-250	2011	2011			6.7L 4V V8 TC DIESEL			
F-350	2008	2010			6.4L TC DIESEL V8			
F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2008	2010			6.4L TC DIESEL V8			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2008	2010			6.4L TC DIESEL V8			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:
Changes Needed in Other Pubs:
TSBs to Supersede:
SSMs to Supersede: 21410
ISMs to Supersede:
Other application Articles:
Select the reason for republication: Replace Awareness/Interim Message

Procedure verified by CDSID: cdavis6
Describe How The Procedure Was Verified: field reports
Do you have access to a vehicle for time study? N/A
If Yes, contact for vehicle CDSID:
Labor Operations:

Are Illustrations Required? No
If Yes, Contact information for illustrations:
CDSID(Ford only):
Full Name:
Phone:
Illustration Notes:

Trustmarks affected: Ford
Additional Trustmarks To Notify:
Article Distribution: WDMO, Canada, Mexico, United States
DTC Codes and OASIS Service Codes: , 400000, 403000, 404000, 497000, 600000, 601000, 602300, 603300, 606000, 606000, 607000, 608000, 609000, 610000, 611000, 612000, 613000, 614000, 615000, 623000, 698298
Causal Basic Part # or Finis Code:

Calibrations List:

White Paper Numbers:

Parts Request Information

Are Parts Required? No

Article Number:
BCM Number:

(End automated email)

From: Heggie, Forest (F.)
Sent: Tuesday, December 07, 2010 3:37 PM
To: Lusardi, Tony (T.K.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine 4

had one other thought but I am not sure if it is applicable here,

is comments on stored biodiesel or degraded diesel fuel,
I think the 6.4 supplement says bio stored no more than 3 months, the 6.7 supplement 1 month

Forest Heggie
BaSc. MaSc. P.Eng
Certified Six Sigma Black Belt
OPD Diesel
313-618-5054

From: Lusardi, Tony (T.K.)
Sent: Friday, December 03, 2010 2:54 PM
To: Davis, Craig (C.B.); Jones, Keith (K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.); Stendardo, David (D.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel, other non-diesel fuels **or water that enters into the fuel system either through improper or incomplete service/maintenance or during re-fueling can damage the fuel system components**, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Davis, Craig (C.B.)
Sent: Friday, December 03, 2010 1:42 PM
To: Jones, Keith (K.); Lusardi, Tony (T.K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.);

Baker, Zachary (Z.); Stendardo, David (D.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

I agree, we need to advise that water in the fuel system either through improper or incomplete service/maintenance or during re-fueling will also contribute to this.

From: Jones, Keith (K.)
Sent: Friday, December 03, 2010 1:32 PM
To: Lusardi, Tony (T.K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.); Stendardo, David (D.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

Can we add the word water?

Keith Jones
6.7 Engine SME
Diesel Drivability
Ford Technical Hotline
DSC1 Cube 308
313-248-7923
KJone286@ford.com

From: Lusardi, Tony (T.K.)
Sent: Friday, December 03, 2010 1:29 PM
To: Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Jones, Keith (K.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.)
Subject: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

TSB Request for Input

***** NOTE: The system generated the email. *****

This message is being sent on behalf of TLUSARDI.
Please provide review and feedback for the article below. The person requesting this feedback may have provided further direction in the comment section below. Forward/Send any comments via email to the person who sent this email.

General Information

Last action taken (as of 12/3/2010 6:29:11 PM GMT):	Send for engineering input
Comment:	
Author:	TLUSARDI
Tracking Number:	070-2010-1624
Author Tracking Number:	103-2010-0041
Title:	6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Article Type:	TSB

TSB Issue:
This informational TSB provides the recommended repair directions when vehicle operators inadvertently add gasoline, other fluids or non-diesel fuel to the fuel tank.

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel or other non-diesel

fuels can damage the fuel system components, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.

TSB Service Procedure:
1. If the vehicle has been filled with gasoline or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

6. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

7. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Replace the fuel filters (primary and secondary filters).

4. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

Procedure C - Fuel system flush:

1) Remove the rear Fuel Cooler Line that comes from the High Pressure Pump at the Fuel Cooler.

2) Cut a 1/2" length of 3/8" rubber hose to seal the banjo bolt when re-installing into the Fuel Cooler without the fuel line attached.

3) Place a larger hose over the return fuel line in order to direct the fuel into a suitable container.

4) Use Active Commands or Cycle the key to allow the fuel pump to flush the lines.

5) Plugging the Fuel Cooler during this process will prevent air from being introduced into the High Pressure Fuel System causing a no start.

Category:	Service Tip - Long Term (10 years)
Request Type:	Non-QSF

Would this make a good cost save business case? No
Activity Code: 070 F-Series >8500#
Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-250	2011	2011			6.7L 4V V8 TC DIESEL			
F-350	2008	2010			6.4L TC DIESEL V8			
F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2008	2010			6.4L TC DIESEL V8			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2008	2010			6.4L TC DIESEL V8			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:
Changes Needed in Other Pubs:
TSBs to Supersede:
SSMs to Supersede: 21410
ISMs to Supersede:
Other application Articles:
Select the reason for republication: Replace Awareness/Interim Message
Procedure verified by CDSID: cdavis6
Describe How The Procedure Was Verified: field reports
Do you have access to a vehicle for time study? N/A
If Yes, contact for vehicle CDSID:
Labor Operations:

Are Illustrations Required? No
If Yes, Contact information for illustrations:
CDSID(Ford only):
Full Name:
Phone:
Illustration Notes:

Trustmarks affected: Ford
Additional Trustmarks To Notify:
Article Distribution: WDMO, Canada, Mexico, United States
DTC Codes and OASIS Service Codes: , 400000, 403000, 404000, 497000, 600000, 601000, 602300, 603300, 606000, 606000, 607000, 608000, 609000, 610000, 611000, 612000, 613000, 614000, 615000, 623000, 698298

Causal Basic Part # or Finis Code:

Calibrations List:

White Paper Numbers:

Parts Request Information

Are Parts Required? No

Article Number:
BCM Number:

(End automated email)

From: Fulton, Brien (B.L.)
Sent: Thursday, January 20, 2011 12:02 PM
To: Armesto, Carlos (.); Heggie, Forest (F.)
Cc: Lusardi, Tony (T.K.); Pumford, Ken (K.G.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.7L Diesel Engine

Need to include leak off rail in the changeable items and the 6.7L does not need to have the air bleeded from the system for start. Fuel system flush needs to be revised as the fuel cooler is in a different location on the 6.7L.

Brien Fulton
Diesel Powertrain Systems Technical Specialist
bfulton1@ford.com ***Cell:*** (313)-805-9342 ☎ (313)-59-43365

"Vehicle Programs are like a roll of toilet paper, the closer you get to the end the faster they go."

From: Armesto, Carlos (.)
Sent: Thursday, January 20, 2011 11:52 AM
To: Heggie, Forest (F.); Fulton, Brien (B.L.)
Cc: Lusardi, Tony (T.K.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

There appears to be some confusion between the 6.4l and 6.7L. This TSB as written addresses the 6.4L not the 6.7L. The 6.7L does not have banjo bolts and the cooler is on the frame not the engine (not part of the HP system).

I think we need to revise.

Thanks,

Carlos Armesto
Ford Motor Company
Core Diesel System Engineer
(313) 805-5789 BLD2 4N29
<<mailto:carmesto@ford.com>>

From: Heggie, Forest (F.)
Sent: Thursday, January 20, 2011 8:55 AM
To: Armesto, Carlos (.); Fulton, Brien (B.L.)
Subject: FW: TSB Request for Input: 070-2010-1624: 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

fyi

Forest Heggie

BaSc. MaSc. P.Eng
Certified Six Sigma Black Belt
OPD Diesel
313-618-5054

From: Lusardi, Tony (T.K.)
Sent: Wednesday, January 19, 2011 3:10 PM
To: Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Hazel, Jeff (J.D.); Rauch, Jim (J.R.); Dobbs, Dan (K.D.); Jones, Keith (K.); Pumford, Ken (K.G.); Corlew, Randall (R.L.); McDonagh, Scot (S.M.); Lusardi, Tony (T.K.)
Subject: TSB Request for Input: 070-2010-1624: 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

TSB Request for Input

***** NOTE: The system generated the email. *****

This message is being sent on behalf of TLUSARDI.
Please provide review and feedback for the article below. The person requesting this feedback may have provided further direction in the comment section below. Forward/Send any comments via email to the person who sent this email.

General Information

Last action taken (as of 1/19/2011 8:09:47 PM GMT):	Send for engineering input
Comment:	Final review of TSB for 6.7L only. Please respond with comments prior to COB 1/21/2011. Will send Fuel Contamination Table in separate e-mail.
Author:	TLUSARDI
Tracking Number:	070-2010-1624
Author Tracking Number:	103-2010-0041
Title:	6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Article Type:	TSB

TSB Issue:
This informational TSB provides the recommended repair directions when the fuel system is contaminated. Fuel contamination can be, but is not limited to dirt/ debris, gasoline, Diesel Exhaust Fluid (DEF), incorrect diesel fuel, other non-diesel fuels or water that enters into the fuel system either through improper service/maintenance or during re-fueling.

2011 Super Duty, equipped with the 6.7L diesel engine that exhibits fuel contamination can damage the fuel system components, including the High Pressure (HP) Injection Pump and fuel injectors. Non-recommended fuels and additives that do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components, may cause symptoms including, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.
TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.
TSB Service Procedure:
1. If the vehicle has been filled with gasoline, DEF, or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline, DEF, or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Note: To aid in fuel contamination determination, refer to the Fuel Contamination Table for reference.

(Insert Fuel Contamination Table here)

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

NOTE: Leave original fuel filters, HP injection pump, fuel lines, fuel rails and injectors in place until flushing procedure is completed to prevent replacement components from becoming contaminated.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

NOTE: Inspection of the Horizontal Fuel Conditioning Module (HFCM) / Diesel Fuel Conditioning Module (DFCM) must be performed during filter replacement to validate no low pressure system damage.

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

6. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

7. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

NOTE: Inspection of the HFCM / DFCM must be performed during filter replacement to validate no low pressure system damage.

3. Replace the fuel filters (primary and secondary filters).

4. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

Procedure C - Fuel system flush:

1) Remove the rear Fuel Cooler Line that comes from the engine at the Fuel Cooler.

2) Cut a 1/2" length of 3/8" rubber hose to seal the banjo bolt when re-installing into the Fuel Cooler without the fuel line attached.

3) Place a larger hose over the return fuel line in order to direct the fuel into a suitable container.

4) Use Scan Tool Active Commands or Cycle the key to allow the low pressure fuel pump to flush the lines.

5) Plugging the Fuel Cooler during this process will prevent air from being introduced into the High Pressure Fuel System causing a no start.

Category: Service Tip - Long Term (10 years)
Request Type: Non-QSF
Would this make a good cost save business case? No
Activity Code: 070 F-Series >8500#
Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2011	2011			6.7L 4V V8 TC DIESEL			

F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:
Changes Needed in Other Pubs:
TSBs to Supersede:
SSMs to Supersede: 21410
ISMs to Supersede:
Other application Articles:
Select the reason for republication: Replace Awareness/Interim Message
Procedure verified by CDSID: cdavis6
Describe How The Procedure Was Verified: field reports
Do you have access to a vehicle for time study? N/A
If Yes, contact for vehicle CDSID:
Labor Operations:

Are Illustrations Required? Yes
If Yes, Contact information for illustrations:
CDSID(Ford only): tlusardi
Full Name: Tony Lusardi
Phone: 313-248-9543
Illustration Notes:

Trustmarks affected: Ford
Additional Trustmarks To Notify:
Article Distribution: WDMO, Canada, Mexico, United States
DTC Codes and OASIS Service Codes: , 400000, 403000, 404000, 497000, 600000, 601000, 602300, 603300, 606000, 606000, 607000, 608000, 609000, 610000, 611000, 612000, 613000, 614000, 615000, 623000, 698298
Causal Basic Part # or Finis Code:

Calibrations List:

White Paper Numbers:

Parts Request Information

Are Parts Required? No

Article Number:
BCM Number:

(End automated email)

From: Pumford, Ken (K.G.)
Sent: Friday, December 03, 2010 3:51 PM
To: Lusardi, Tony (T.K.); Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Jones, Keith (K.); McDonagh, Scot (S.M.); Baker, Zachary (Z.)
Subject: RE: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine 1

Tony,

I've made a few modifications, shown in blue in the body of the proposed text, explicitly addressing DEF, as several vehicles have had DEF added to the fuel tank. I've suggested a few other modifications to the TSB too.

Regards,

Ken Pumford
Engine Design

Ford Motor Company
Dearborn, Michigan
Ph. +1.313.805.5741 mobile

From: Lusardi, Tony (T.K.)
Sent: Friday, December 03, 2010 1:29 PM
To: Curtis, Andrew (A.); Hale, Curt (B.C.); Burkeen, Doran (D.C.); Davis, Craig (C.B.); Ives, David (D.C.); Heggie, Forest (F.); Dobbs, Dan (K.D.); Jones, Keith (K.); Pumford, Ken (K.G.); McDonagh, Scot (S.M.); Baker, Zachary (Z.)
Subject: TSB Request for Input: 070-2010-1624: 6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

TSB Request for Input

***** NOTE: The system generated the email. *****

This message is being sent on behalf of TLUSARDI.
Please provide review and feedback for the article below. The person requesting this feedback may have provided further direction in the comment section below. Forward/Send any comments via email to the person who sent this email.

General Information

Last action taken (as of 12/3/2010 6:29:11 PM GMT):	Send for engineering input
Comment:	
Author:	TLUSARDI
Tracking Number:	070-2010-1624
Author Tracking Number:	103-2010-0041
Title:	6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Article Type:	TSB

TSB Issue:
This informational TSB provides the recommended repair directions when vehicle operators inadvertently add gasoline, other fluids or non-diesel fuel to the fuel tank.

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with

gasoline, DEF, incorrect diesel fuel or other non-diesel fuels can damage the fuel system components, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms including , but not limited to , the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.

TSB Service Procedure:
1. If the vehicle has been filled with gasoline , DEF, or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline , DEF or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

6. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

7. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Replace the fuel filters (primary and secondary filters).

4. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

Procedure C - Fuel system flush:

1) Remove the rear Fuel Cooler Line that comes from the engine at the Fuel Cooler.

2) Cut a 1/2" length of 3/8" rubber hose to seal the banjo bolt when re-installing into the Fuel Cooler without the fuel line attached.

3) Place a larger hose over the return fuel line in order to direct the fuel into a suitable container.

4) Use Active Commands or Cycle the key to allow the low pressure fuel pump to flush the lines.

5) Plugging the Fuel Cooler during this process will prevent air from being introduced into the High Pressure Fuel System causing a no start.

Category: Service Tip - Long Term (10 years)
Request Type: Non-QSF
Would this make a good cost save business case? No
Activity Code: 070 F-Series >8500#
Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-250	2011	2011			6.7L 4V V8 TC DIESEL			
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F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2008	2010			6.4L TC DIESEL V8			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2008	2010			6.4L TC DIESEL V8			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:
Changes Needed in Other Pubs:
TSBs to Supersede:
SSMs to Supersede: 21410
ISMs to Supersede:
Other application Articles:
Select the reason for republication: Replace Awareness/Interim Message
Procedure verified by CDSID: cdavis6
Describe How The Procedure Was Verified: field reports
Do you have access to a vehicle for time study? N/A
If Yes, contact for vehicle CDSID:
Labor Operations:

Are Illustrations Required? No
If Yes, Contact information for illustrations:
CDSID(Ford only):
Full Name:
Phone:
Illustration Notes:

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Causal Basic Part # or Finis Code:

Calibrations List:

White Paper Numbers:

Parts Request Information

Are Parts Required? No

Article Number:
BCM Number:

(End automated email)

From: Lusardi, Tony (T.K.)
Sent: Wednesday, September 08, 2010 1:16 PM
To: Heggie, Forest (F.)
Subject: RE: Tsb water /gas ect in fuel

That would be very helpful. Pictures say a thousand words.

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Heggie, Forest (F.)
Sent: Wednesday, September 08, 2010 1:14 PM
To: Lusardi, Tony (T.K.)
Subject: RE: Tsb water /gas ect in fuel

Thank you, I am just putting together the p&qs of our package so there will be some changes -

Were you looking at having the TSB include the telltale criteria to determin if water in fuel caused the damage?

Forest Heggie
BaSc. MaSc. P.Eng
OPD Diesel
313-618-5054

From: Lusardi, Tony (T.K.)
Sent: Wednesday, September 08, 2010 1:01 PM
To: Heggie, Forest (F.)
Subject: RE: Tsb water /gas ect in fuel

Print Friendly Version (TSB)

*** DRAFT ***

Message Request

Article Type: TSB

Title:	6.4L & 6.7L Diesel Engine - Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Category:	Service Tip - Long Term (10 years)
Request Type:	Non-QSF
Author:	TLUSARDI
Would this make a good cost save business case?	No
Author Tracking Number:	103-2010-0041
TWAS Tracking Number:	070-2010-1624
Activity Code:	070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-250	2011	2011			6.7L 4V V8 TC DIESEL			
F-350	2008	2010			6.4L TC DIESEL V8			
F-350	2011	2011			6.7L 4V V8 TC DIESEL			
F-450	2008	2010			6.4L TC DIESEL V8			
F-450	2011	2011			6.7L 4V V8 TC DIESEL			
F-550	2008	2010			6.4L TC DIESEL V8			
F-550	2011	2011			6.7L 4V V8 TC DIESEL			

If SPECS Case, Select all Other Affected Publications:

Changes Needed in Other Pubs:	
TSBs to Supersede:	
SSMs to Supersede:	21410
ISMs to Supersede:	
Other application Articles:	
Select the reason for republication:	Replace Awareness/Interim Message

TSB Issue:
This informational TSB provides the recommended repair directions when vehicle operators inadvertently add gasoline, other fluids or non-diesel fuel to the fuel tank.

2008 - 2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel or other non-diesel fuels can damage the fuel system components, including the High Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components. This may cause symptoms, but not limited to the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build.

TSB Action:
Follow the appropriate service procedure depending on if the engine has been started with the contaminated fuel system or not.

NOTE: Failure to follow these procedures may result in fuel system and or engine damage and may require vehicle warranty cancellation submission. Repairs required due to use of improper fluids and fuel, are not covered by the New Vehicle Limited Warranty. See Warranty and Policy Manual and Customer Information Guide for details.

TSB Service Procedure:
1. If the vehicle has been filled with gasoline or other than the correct diesel fuel, and the engine has been started, it is recommended to proceed to procedure 'A'. If the fuel tank was filled with gasoline or other non-diesel fuels and the truck has NOT been run, proceed to procedure 'B'.

Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

6. Bleed the fuel system as per WSM section 312-00 procedures in order to get the vehicle started.

7. Change Oil and Filter and perform the High Pressure Fuel System test to verify for leaks, repair as necessary.

Procedure B

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the

Procedure verified by CDSID:	cdavis6
Describe How The Procedure Was Verified:	field reports
Do you have access to a vehicle for time study?	N/A
If Yes, contact for vehicle CDSID:	
Labor Operations:	
Are Illustrations Required?	No
If Yes, Contact information for illustrations:	
CDSID(Ford only):	
Full Name:	
Phone:	
Illustration Notes:	
Trustmarks affected:	Ford
Additional Trustmarks To Notify:	
Article Distribution:	WDMO, Canada, Mexico, United States
DTC Codes and OASIS Service Codes:	, 400000, 403000, 404000, 497000, 600000, 601000, 602300, 603300, 606000, 606000, 607000, 608000, 609000, 610000, 611000, 612000, 613000, 614000, 615000, 623000, 698298
Causal Basic Part # or Finis Code:	
Calibrations List:	
White Paper Numbers:	

Parts Request Information

Are Parts Required? No

Approver/Editor Information

Article Number:

BCM Number:

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Heggie, Forest (F.)
Sent: Wednesday, September 08, 2010 12:09 PM
To: Lusardi, Tony (T.K.)
Subject: Tsb water /gas ect in fuel

Tony could you send me what you already have put together for water/gas ect in fuel damage to fuel system,

I am also interested of anything for 6.7 replication of wif work that you may have.

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Procedure A

1. Drain the fuel tank completely by removing the tank and cleaning to prevent the possibility of reintroducing contamination. (Dispose of the contaminated diesel fuel in an appropriate manner in conjunction with local laws and regulations)

2. Fill with fresh clean good quality diesel fuel.

3. Use the Low Pressure Fuel Pump to flush fresh clean diesel into the fuel system. (Refer to procedure 'C' as necessary)

4. Replace the fuel filters (primary and secondary filters).

5. Replace ALL High Pressure fuel system components; High Pressure Fuel Pump, fuel lines (from fuel cooler to pump and also from fuel rails to injectors), fuel rails and ALL 8 injectors.

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Describe How The Procedure Was Verified:	field reports
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From: Armesto, Carlos (.)
Sent: Tuesday, December 07, 2010 12:55 PM
To: Heggie, Forest (F.)
Subject: RE: water in fuel communication draft 11-24 Point form format.doc

Attachments: water in fuel communciation carmesto.doc

Forest here is my 2 cents ….

water in fuel communciation ca...

From: Heggie, Forest (F.)
Sent: Tuesday, December 07, 2010 10:41 AM
To: Armesto, Carlos (.)
Subject: water in fuel communication draft 11-24 Point form format.doc

Could you review for content about HFCM key items highlighted in red,

We are still working out a format but tyring to look at key content first.

<< File: water in fuel communciation draft 11-24 Point form format.doc >>

How To Take Care of your 6.4L Fuel System so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel. Other types of fuels and excessive water can cause the pump to fail due to lack of lubricity/cooling or aggressive chemical attack to fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

- Water and impurities can enter your tank with the fuel.
- Water does not burn, water carries oxygen and is Corrosive and it freezes.
- Water does not have the lubricant properties of diesel fuel and will corrode the high pressure fuel pump.
- Water also acts as a host to bacterial formation .

How can you prevent excessive amounts of water?

Your horizontal fuel condition module (HFCM) removes water and impurities from the fuel before it enters the high pressure pump.

- The water separated accumulates in the HFCM reservoir. The water separation capability decreases as the filter becomes restricted with debris. The reservoir can hold approximately 100 ml of water with a WIF indication at 60 ml. If the reservoir holding capacity is exceeded the water will be passed to the Engine High Pressure System.
- The HFCM must be drained once a month or when the water in fuel light illuminates.
- Fuel filters must be changed by the recommended service interval. If your filters are not changed regularly it can:
    - decrease the water separation ability
    - cause the filters to become plugged or collapsed
    - allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system

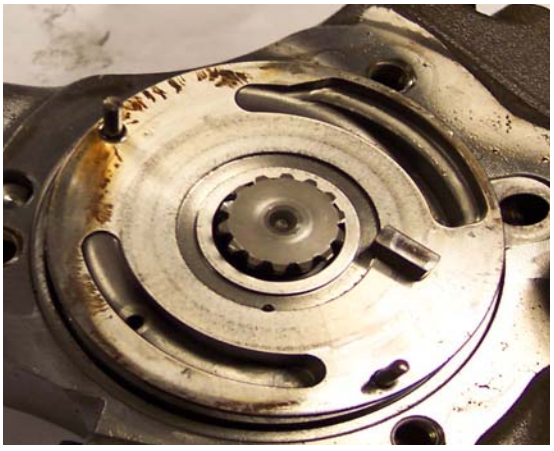
  which can ultimately cause high pressure pump failure
- Your vehicle is equipped with two fuel filters; one is mounted on top of the engine while the other is inside the HFCM.
- When draining your water separator wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.
- When draining the HFCM. If No fluid (fuel or water) drains from your HFCM take it to the dealer for inspection.
- ~~Separate the water from the fuel.~~

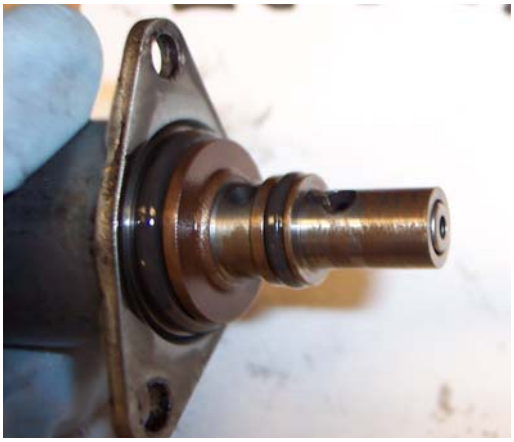
~~It's easier and much cheaper to replace the filters than replace the high pressure fuel system. If the water is not drained and the HFCM container is filled it has no where else to go but to the high pressure pump~~.

Use of good quality diesel fuel along with regular fuel filter maintenance and water draining avoids expensive Fuel Injection Equipment Damage and repair.

What happens if water gets into the high pressure fuel system?

Should excessive water enter the fuel system, corrosion and damage are not far behind. In many case, the entire high pressure fuel system will have to be replaced.





Excessive water in the fuel led to this corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve

This corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing developed from excessive water in fuel

What about fuel additives?

Many aftermarket fuel additives are not acceptable for use in Power Stroke Diesel engines.

- Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. Alcohol also decreases the lubricity of the fuel which can cause damage to the high pressure fuel pump. Do not use alcohol based additives to correct fuel gelling.
- The purpose of the filters is to be able to remove the water, but if chemicals are holding the water in the fuel it can not be separated.
- Dispersing/emusifying the water carries the water through the fuel filters and water separators and right into your fuel system, exactly where you do not want it to be.

If you want to use fuel additives, only use Motorcraft additives as they are the only recommended additives and meet Ford specifications.

Ford approved additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet Ford specifications.

BIODIESEL

For any vehicle purchased before the 2011 model year, only a 5% biofuel concentration may be used. Vehicles in the 2011 model year and newer accept up to a 20% concentration. Higher than recommended concentrations can cause fuel filter restrictions that may result in a lack of power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures.

- Biodiesel should not be stored in the fuel tank for more than three months.
- Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.
-

Vehicle Parked for a long period of time: Fuel Storage

Biodiesel fuels degrade more easily than fuels not containing biodiesel and should not be stored in the fuel tank for more than 1 month &6.7) 3 months (6.4)
Diesel fuel must not be sotred in a galvanized container.

Corrosive fungus, algae and bacterial growth in secondary fuel filter housing and high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, poor quality biofuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

- The tank pick up boot can distort from non approved fuel, and cause air ingestion.
- Do not use raw or refined vegetable oil, animal fat, cooking oil or recycled greases
- Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use.
- Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper fuel is used.
- Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any circumstances.
    - Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

From: Goering, Dan (D.L.)
Sent: Wednesday, June 15, 2011 3:34 PM
To: Eeley, Scott (A.); Heggie, Forest (F.)
Cc: Goering, Dan (D.L.); Bremerkamp, Alan
Subject: REVIEW REQUEST by 6/20
Importance: High
Follow Up Flag: Follow up
Due By: Monday, June 20, 2011 2:00 PM
Flag Status: Flagged
Attachments: 2445_TheUnfilteredTruthR3.pdf

Scott / Forest,
Here is the advisor sheet to use with customers on the perils of not performing maintenance. We need your suggestions by Monday, 6/20.

The Unfiltered Truth
About Diesel Fuel System Maintenance

Hard-working Ford Power Stroke diesel engines are built tough to get the job done. Keep yours in top shape with on-time maintenance to prevent damage to precision internal parts. Saturated fuel filters and undrained water separators allow contaminants into fuel intake areas where they can cause expensive damage that's not covered by the factory warranty. The solutions are simple: Install genuine Ford and Motorcraft replacement fuel filters and drain the water separator on time, every time.

Choose One: ☐ Drain Your Water Separator ☐ Drain Your Wallet

Fuel Filter: Fresh, genuine Ford and Motorcraft fuel filters, installed on time, are the first line of defense for your fuel system. A dirty, waterlogged fuel filter (pictured) and even some new filters that don't meet or exceed Ford Motor Company specifications can affect the fuel system's ability to separate water from fuel and result in damage that's not covered by warranty.

Secondary Fuel Filter Housing Damage: An undrained water separator allows standing water from contaminated fuel to corrode the secondary fuel filter housing and pass damaging water and metal contaminants to the injector pump. **Protect your factory warranty and avoid expensive fuel system repairs by draining the water separator at every oil change or at least once monthly.**

Internal Transfer Pump Corrosion: Located inside the High Pressure Fuel Injection Pump, the Internal Transfer Pump is susceptible to rust or corrosion beneath its cover when the fuel system is neglected. This condition isn't covered under warranty, but is simple to prevent with genuine Ford or Motorcraft fuel filter changes and water separator servicing, on time, every time.

Water Leaves You High and Dry

If the Water in Fuel (WIF) warning light/message illuminates, act immediately to protect your warranty.

While you may not be able to control what's coming through the filling station hose, you can control the proper maintenance of your engine's capable defenses against water and metal debris. Water in the fuel reduces operating efficiency and decreases fuel economy, so be certain to keep filters changed and water separators drained consistently. This keeps the engine operating at peak power and protects you from non-warranted, out-of-pocket repairs.

Choose the Right Maintenance Schedule

How do you know which maintenance schedule is correct? Evaluate your operating parameters below, then consult specific maintenance intervals on the flip side of this piece:

Normal Operating Conditions: "General" vehicle usage for most on-highway operation in moderate temperatures, hauling moderate loads. This maintenance schedule works well for most vehicles. If in doubt, choose the Special Operating Conditions schedule and you won't go wrong.

Special Operating Conditions: Specified for drivers who regularly give their trucks a workout. Extended idling, towing and dusty conditions on unpaved roads/off-road all qualify a vehicle for this schedule.

GENUINE **POWER.** GENUINE **PERFORMANCE.** GENUINE **PARTS.**

Ford GENUINE PARTS

Ford Motorcraft

PARTNUMBER 00 XXM

EA11-003 000602

Power Stroke® Diesel Maintenance Intervals

F-250 - F-550 & E-Series Diesel Vehicles

	7.3L Engine	6.0L Engine	6.4L Engine	6.7L Engine
Oil & Oil Filter				
Normal Operating Conditions	5,000 miles (8,000 km)	7,500 miles (12,000 km)	10,000 Miles (16,000 km)	Check Message Center
Special Operating Conditions	3,000 miles (5,000 km) or 3 months	5,000 miles (8,000 km), 200 engine hours, or 3 months	5,000 miles (8,000 km), 200 engine hours, or 3 months	Check Message Center
Fuel Filter(s)				
Normal Operating Conditions	15,000 miles (24,000 km)	15,000 miles (24,000 km) (Every other oil change)	20,000 Miles (32,000 km) (Every other oil change)	22,500 miles (36,000 km) (Every 3rd oil change)
Special Operating Conditions	15,000 miles (24,000 km)	10,000 miles (16,000 km), 400 engine hours, or 6 months	10,000 miles (16,000 km), 400 engine hours, or 6 months	15,000 miles (24,000 km), or 600 engine hours
Air Filter Inspection				
Normal Operating Conditions	5,000 miles (8,000 km) Replace as needed	7,500 miles (12,000 km) Replace as needed	10,000 Miles (16,000 km) Replace as needed	Check air restriction gauge at every oil change. Replace as needed.
Special Operating Conditions	3,000 miles (5,000 km) Replace as needed	5,000 miles (8,000 km), Replace as needed	5,000 miles (8,000 km), Replace as needed	Check air restriction gauge at 7,500 miles (12,000 km). Replace as needed.
Coolant Check/Change				
Normal Operating Conditions	15,000 miles (24,000 km)	Initial: 6 months / 105,000 miles (168,000 km)	Initial: 6 months / 100,000 miles (160,000 km)	Initial: 72 months or 105,000 (168,000 km) / Subsequent: 45,000 miles (72,000 km)
Special Operating Conditions	15,000 miles (24,000 km)	45,000 miles (72,000 km) or 1,800 engine hours	60,000 miles (96,000 km), or 2,400 engine hours	Initial: 60,000 miles (96,000 km) or 2,400 engine hours / Subsequent: 45,000 miles (72,000 km) or 1,800 engine hours
Coolant Nitrite Strength Check				
Normal Operating Conditions	15,000 miles (24,000 km)	15,000 miles (24,000 km) or 600 engine hours	20,000 Miles (32,000 km) or 800 engine hours	15,000 miles (24,000 km) or 600 engine hours
Special Operating Conditions	15,000 miles (24,000 km)	15,000 miles (24,000 km)	20,000 miles (32,000 km)	15,000 miles (24,000 km) or 600 engine hours
Diesel Exhaust Fluid (DEF)				
Normal Operating Conditions	Not Applicable			DEF tank to be refilled every oil change or as required
Special Operating Conditions	Not Applicable			DEF usage will increase

A complete maintenance schedule specific to your vehicle can be found in the diesel supplement of your owner's guide or at www.FordOwner.com.

www.PowerStrokeDiesel.com

Ford GENUINE PARTS

GENUINE **POWER.** GENUINE **PERFORMANCE.** GENUINE **PARTS.**

Ford Motorcraft

EA11-003 000603

From: Lusardi, Tony (T.K.)

Sent: Tuesday, March 29, 2011 4:08 PM

To: Jones, Keith (K.); Heggie, Forest (F.); Rauch, Jim (J.R.); Hale, Curt (B.C.); Dobbs, Dan (K.D.); Bandoske, Pete (P.F.); McDonagh, Scot (S.M.); Dixon, Mark (M.R.); Pumford, Ken (K.G.); Billings, Thomas (T.P.)

Cc: Corlew, Randall (R.L.); Malik, Wesley (W.K.); Davis, Craig (C.B.); Hazel, Jeff (J.D.); Doss, Jacob (J.E.); Myers, Dan (D.P.); Fass, Alan (A.L.); Cunningham, Ed (E.); King, Robert (R.F.); Gour, Simon (S.); Curtis, Andrew (A.); Ricks, Kevin (K.J.)

Subject: SSM 21820 Approved and Released: 070-2011-1284: 2011

FYI....SSM 21820 released. Dealers will be able to view tomorrow 3/30.

"Customer Service is an Attitude, Not a Department"

Tony Lusardi
Product Concern Engineer - 6.7L Diesel
1700 Fairlane Drive
Allen Park, MI 48101
tlusardi@ford.com
313-248-9543 office
313-337-5696 fax

From: Siplus, G (G.)
Sent: Tuesday, March 29, 2011 4:02 PM
To: aghiurau@visteon.com; Lentini, Craig (C.A.); Joe.Busdieker@vftis.spx.com; Sroka, Joseph (J.); Klump, Robert (R.F.); Hill, Teresa (T.L.); Lusardi, Tony (T.K.)
Subject: SSM Approved and Released: 070-2011-1284: 2011 F-Super Duty Equipped with 6.7L Diesel Engine - Poor Quality Diesel, Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip

SSM Approved and Released

***** NOTE: The system generated the email. Do not reply to this email *****
***** To be removed from this distribution list, please email Robert Klump at rklump@ford.com *****

This message is being sent on behalf of GSMITH53.
This is a courtesy copy of the following article to advise you this article has been approved and released.

General Information

Last action taken (as of 3/29/2011 8:02:17 PM GMT):	Final/Complete
Comment:	
Author:	TLUSARDI
Tracking Number:	070-2011-1284
Author Tracking Number:	103-2011-0041
Title:	2011 F-Super Duty Equipped with 6.7L Diesel Engine - Poor Quality Diesel, Gasoline Or Other Non-Diesel Fuels Added To The Fuel Tank - Service Tip
Article Type:	SSM

SSM Text:
2011 F-Super Duty vehicles equipped with a 6.7L diesel engine which have experienced fuel system contamination may have damaged fuel system components including the High Pressure (HP) Pump and fuel injectors. Fuel and additives which do not meet the minimum lubrication, cooling and anti-corrosion properties required by the high pressure fuel system components may cause symptoms including, but not limited to, the following: Crank/No Start, Long Crank/Hard Start, Rough Run, Low Power, Engine Knocking, Exhaust Smoke and/or Fuel Rail Pressure (FRP) slow to build. To help with the diagnosis and repair of concerns due to fuel contamination, a Job Aid has been developed and is now available on the PTS website under the Service Tips tab.

Category: Service Tip - Long Term (10 years)
Request Type: Non-QSF
Activity Code: 070 F-Series >8500#
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Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
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ISMs to Supersede:
Other application Articles:
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Causal Basic Part # or Finis Code:

Calibrations List:

White Paper Numbers:

Parts Request Information

Are Parts Required? No

Article Number: 21820
BCM Number: 3087

(End automated email)

DRAFT JOB AID

Issue:
When directed to perform a fuel system repair where corrosion exists on fuel facing surfaces: the fuel system replacement is not a Ford warrantable repair provided the water in fuel indicator system is operating properly

Ford Motor Company Warranty Policy - "What is not covered":

- Using contaminated or improper fuels/fluids. (Water in fuel.)
- Failures due to abuse, neglect, or improper maintenance, unapproved modification. (Fuel filters maintenance.)
- Using fuel types not covered under warranty. (Bio-diesel exceeding specified rating.)
- Using aftermarket products not cover by warranty. Using additives that do not meet or exceed Ford specifications. (Water in fuel dispersants such as alcohol based products.)

Action
For a F250-550 6.4L equipped Super duty when the PCED/hotline directs the technician to perform Step 28 in the PCED and as a result replace the whole high pressure fuel system. The high pressure fuel system components are required to be inspected for damage by water in fuel to determine warranty coverage.

If Debris is found in the High Pressure Fuel System and any one of the following criteria are meet

i) Corrosion is found in Secondary Fuel Housing
ii) Suspect Fuel Quality: Standing Water in Fuel Tank/Secondary Housing
iii) Poor filter maintenance/FF (Factory Fit) Filters

Indicator for 6.4L
There is an opportunity before accessing the high pressure pump on the 6.4L to notify the customer the repair may not be covered by warranty by examining the secondary on engine fuel filter housing for corrosion.

- If there is corrosion in the secondary fuel filter housing there is a high probability of corrosion being present in the high pressure fuel pump.
- If there is no corrosion in the secondary housing it does not preclude corrosion being present in the high pressure pump.

Service Procedure for Determining if Water in Fuel caused Fuel System Damage

1) Notify customer repair may not be covered by warranty

2) Record PID INFORMATION

3) Validate the fuel filters have been changed per the operating conditions required maintenance schedule hours and mileage.

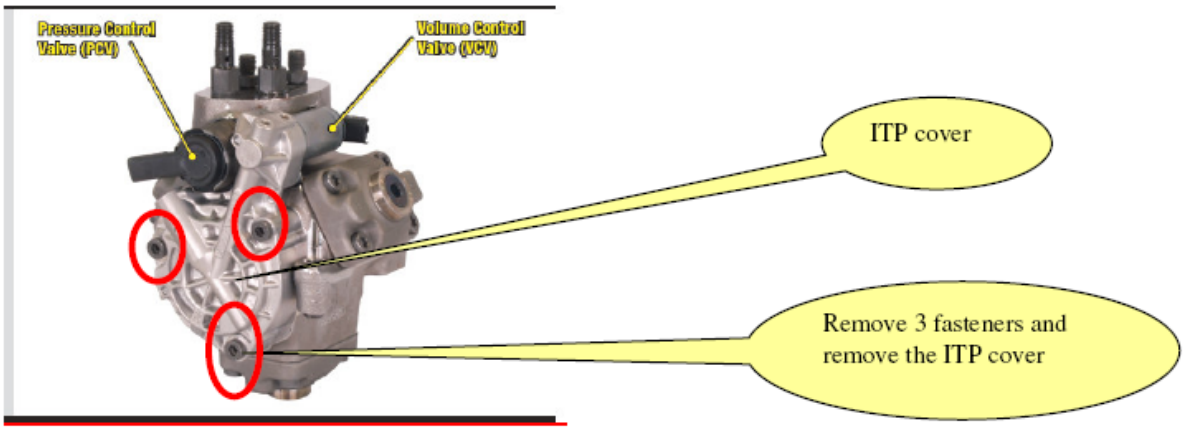
- Fuel filters separate the water.
- Incorrect maintenance will prevent water from separating

4) Validate the water in fuel indicator system is operating properly

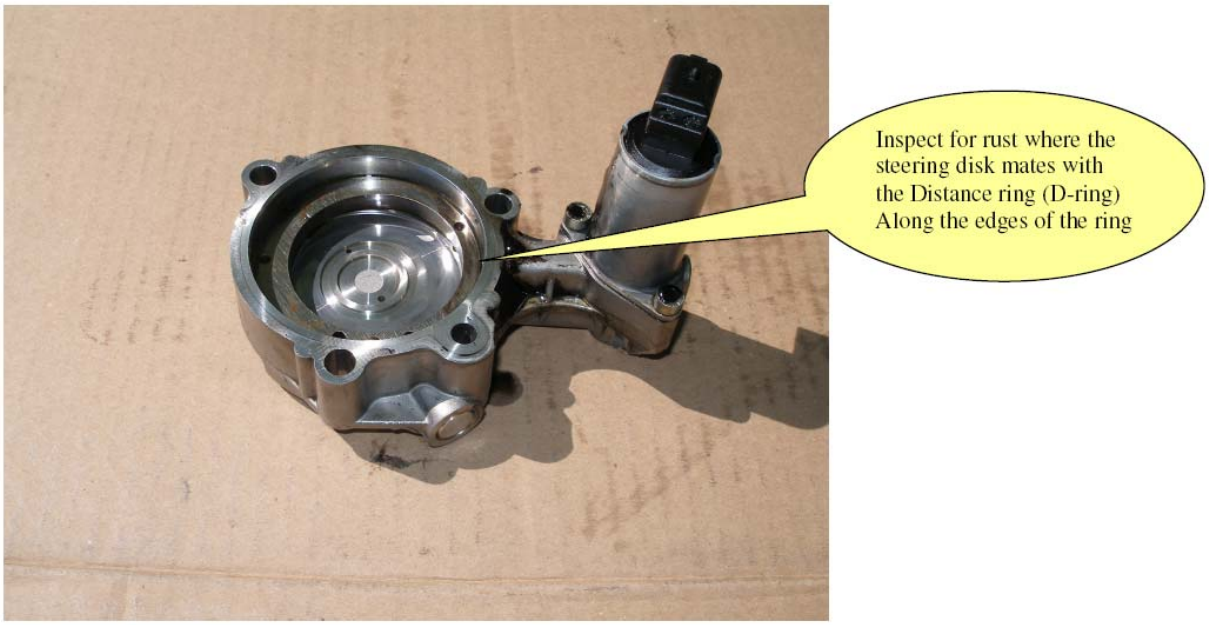
- Perform PinPoint test O2:
  - Is the system operating properly?
  - Is there sufficient clean fuel

5) Access the high pressure fuel system and remove the Internal transfer pump (ITP) cover from the high pressure fuel pump to determine if water in fuel has damaged the high pressure fuel system.

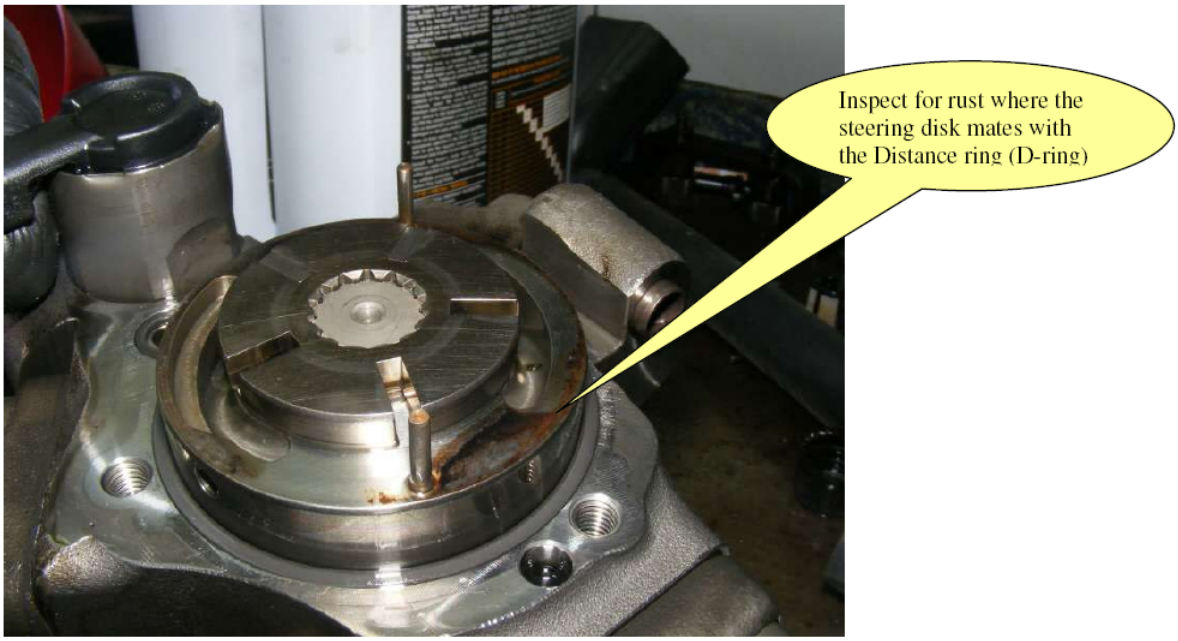
i) Remove the HPP following the workshop manual instructions
ii) Place the HPP flat ITP (internal transfer pump) cover facing up
iii) Remove the 3 fasteners with a 6mm Allen wrench and remove the ITP cover



iv) Inspect for rust where the steering disk mates with the distance ring on the ITP cover



v) Inspect for rust where the steering disk mates with the distance ring on the HPP side of the mating surface.



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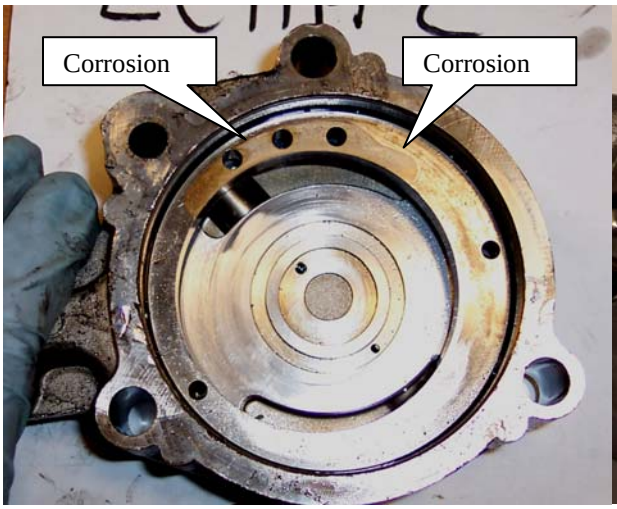
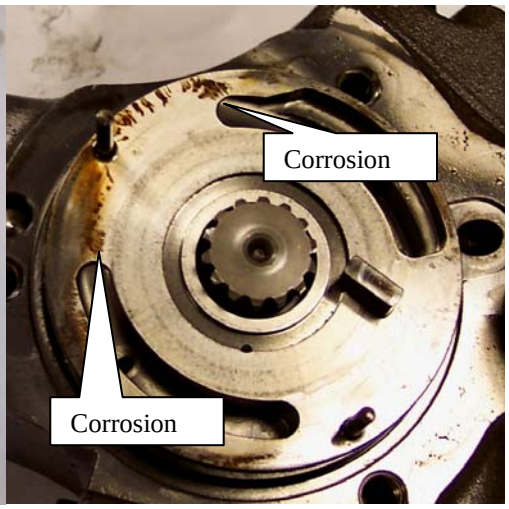
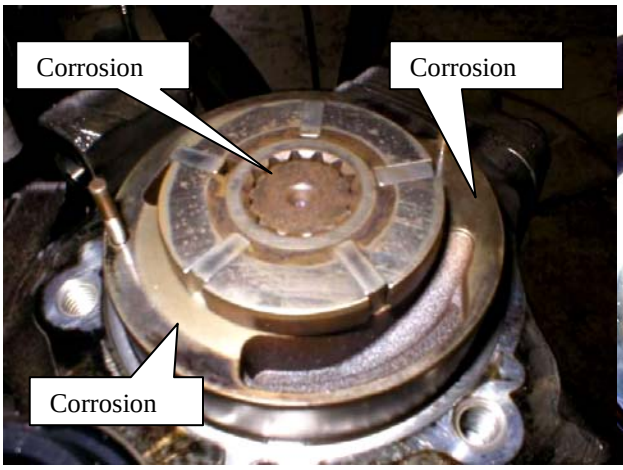
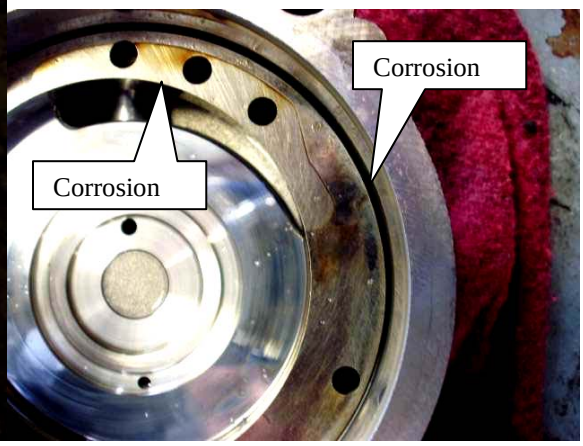
Examples of Corrosion on Fuel Facing Surfaces

Examples of Corrosion under the Internal Transfer Pump Cover









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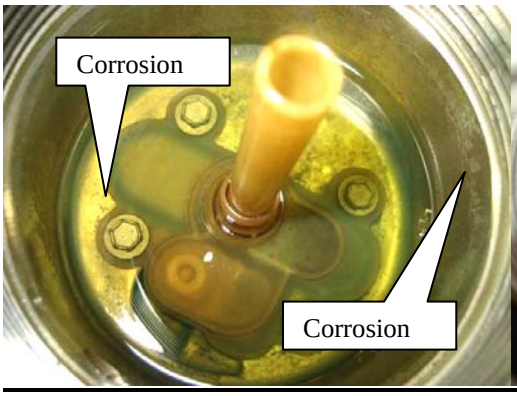
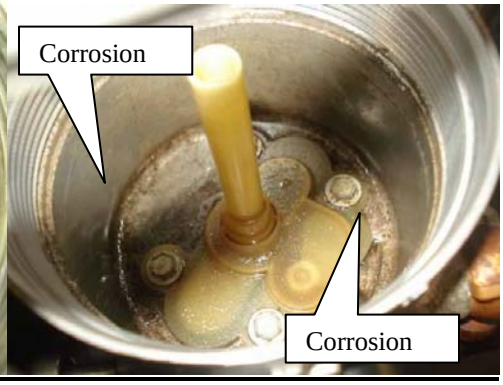
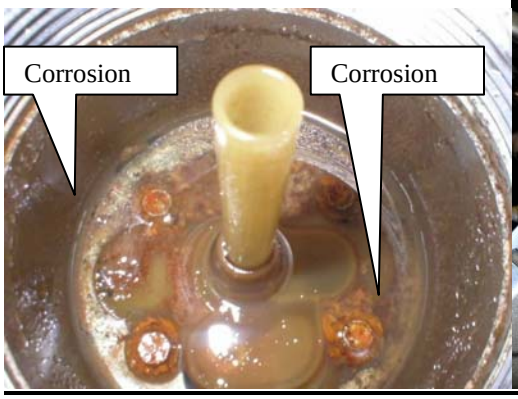
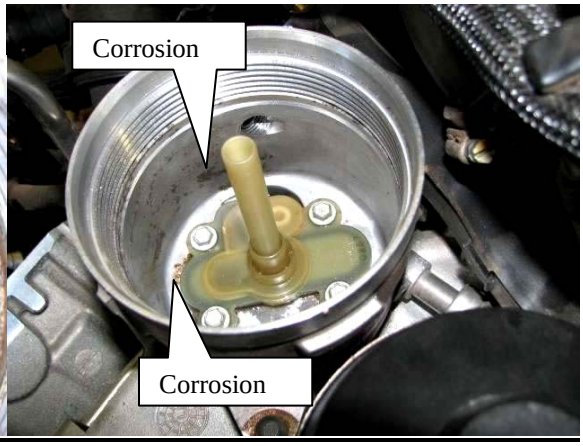
Examples of Corrosion in Secondary Fuel filter housing









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Repair Instructions :

Replace the following components when metallic debris is found at the fuel injectors tubes when performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics and water in fuel or non approved fuel caused the fuel system damage.

If there is shiny metallic material in the fuel at the fuel injector jumper tubes after performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics, and water in fuel or non approved fuel caused the fuel system damage.

The following components are to be Replaced:

Part Number	Part Common Name	Includes
9A543 (qt 1)	High Pressure Pump	
9G805 (qt 1)	High Pressure Pump Gasket Kit	High pressure pump gaskets 6619A and 6619B, fuel lines from high pressure pump to fuel rail manifold 9A332A/B, washer
9N103 (qt 1)	Fuel cooler	
9H529 (qt 8)	Fuel injector kit	Fuel injector, jumper tubes, fuel injector gaskets
8C3Z- 9T287-CA	LH and RH fuel rail manifold	*Left and right hand fuel rail manifold
9N184	Fuel Filter	
9G756	Fuel Pressure sensor	
9C330	Fuel supply line	
9G282	HFCM	
9C148	Housing – Fuel filter	

Note: HFCM required to be replaced due to water in fuel. Not all fuel system replacements require the HFCM to be replaced.

The following components are to be Inspected for corrosion. If there is no corrosion Flush and Reused:

Part Number	Part Common Name	
9B337 A/B	Low pressure return lines	
9N104	Low pressure return lines	
9C273	Low pressure return lines	
10884	Sender Assy – Temperature on Fuel Housing	
Fuel Tank	Inspect interior of tank, if dual inspect both tanks	
Fuel pick up boot	Inspect non approved fuels can cause damage	

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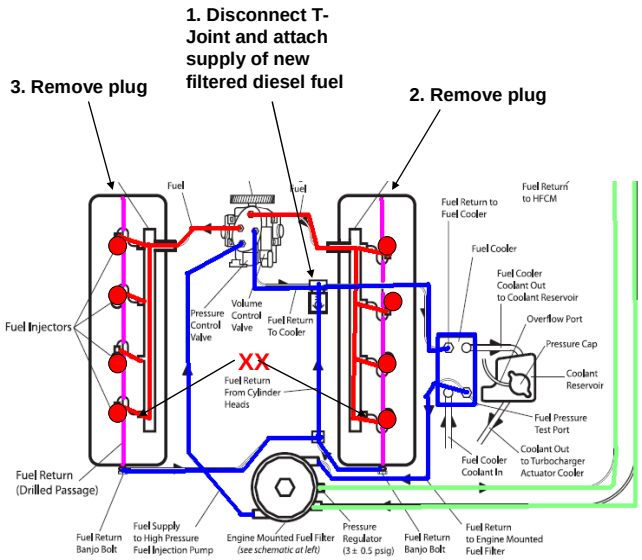
Flush Recommendation



- Flush **cylinder heads** individually by removing one plug at a time.
- Use only new clean filtered diesel fuel.
- Do not exceed 8 PSI during flush.
- .Leave original injectors in cylinder head until flushing is complete.
- **Replace fuel filters after flushing is complete.**

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Request Type: Non-QSF

Would this make a good cost save business case? No

Activity Code: 070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-350	2008	2010			6.4L TC DIESEL V8			
F-450	2008	2010			6.4L TC DIESEL V8			
F-550	2008	2010			6.4L TC DIESEL			

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Issue:
When directed to perform a fuel system repair where corrosion exists on fuel facing surfaces: the fuel system replacement is not a Ford warrantable repair provided the water in fuel indicator system is operating properly

Ford Motor Company Warranty Policy - "What is not covered":

- Using contaminated or improper fuels/fluids. (Water in fuel.)
- Failures due to abuse, neglect, or improper maintenance, unapproved modification. (Fuel filters maintenance.)
- Using fuel types not covered under warranty. (Bio-diesel exceeding specified rating.)
- Using aftermarket products not cover by warranty. Using additives that do not meet or exceed Ford specifications. (Water in fuel dispersants such as alcohol based products.)

Action
For a F250-550 6.4L equipped Super duty when the PCED/hotline directs the technician to perform Step 28 in the PCED and as a result replace the whole high pressure fuel system. The high pressure fuel system components are required to be inspected for damage by water in fuel to determine warranty coverage.

If Debris is found in the High Pressure Fuel System and any one of the following criteria are meet

i) Corrosion is found in Secondary Fuel Housing
ii) Suspect Fuel Quality: Standing Water in Fuel Tank/Secondary Housing
iii) Poor filter maintenance/FF (Factory Fit) Filters

Indicator for 6.4L
There is an opportunity before accessing the high pressure pump on the 6.4L to notify the customer the repair may not be covered by warranty by examining the secondary on engine fuel filter housing for corrosion.

- If there is corrosion in the secondary fuel filter housing there is a high probability of corrosion being present in the high pressure fuel pump.
- If there is no corrosion in the secondary housing it does not preclude corrosion being present in the high pressure pump.

Service Procedure for Determining if Water in Fuel caused Fuel System Damage

1) Notify customer repair may not be covered by warranty

2) Record PID INFORMATION

3) Validate the fuel filters have been changed per the operating conditions required maintenance schedule hours and mileage.

- Fuel filters separate the water.
- Incorrect maintenance will prevent water from separating

4) Validate the water in fuel indicator system is operating properly

- Perform PinPoint test O2:
  - Is the system operating properly?
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5) Access the high pressure fuel system and remove the Internal transfer pump (ITP) cover from the high pressure fuel pump to determine if water in fuel has damaged the high pressure fuel system.

i) Remove the HPP following the workshop manual instructions
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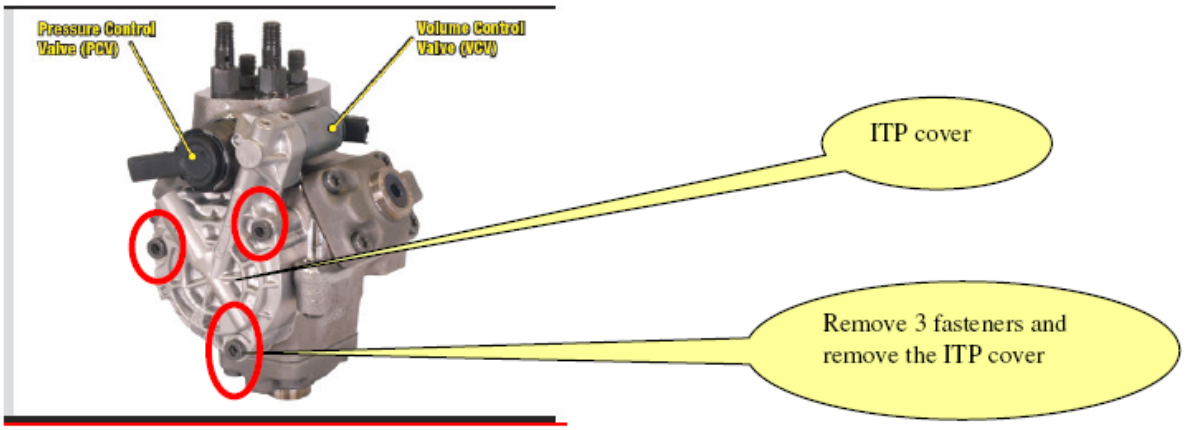
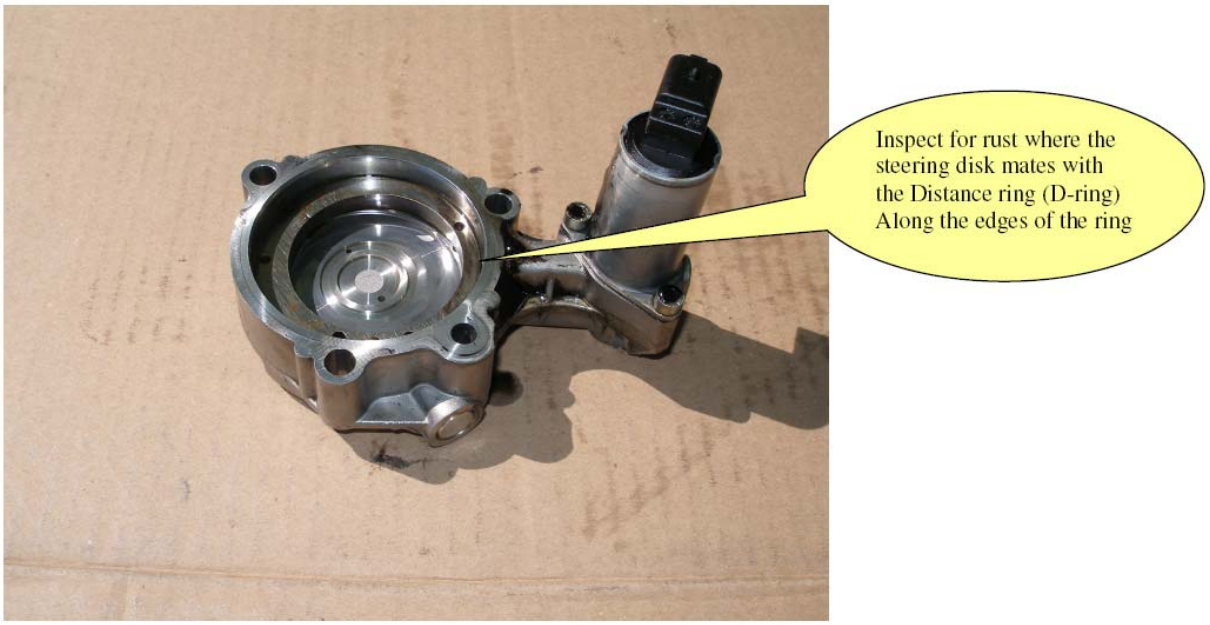
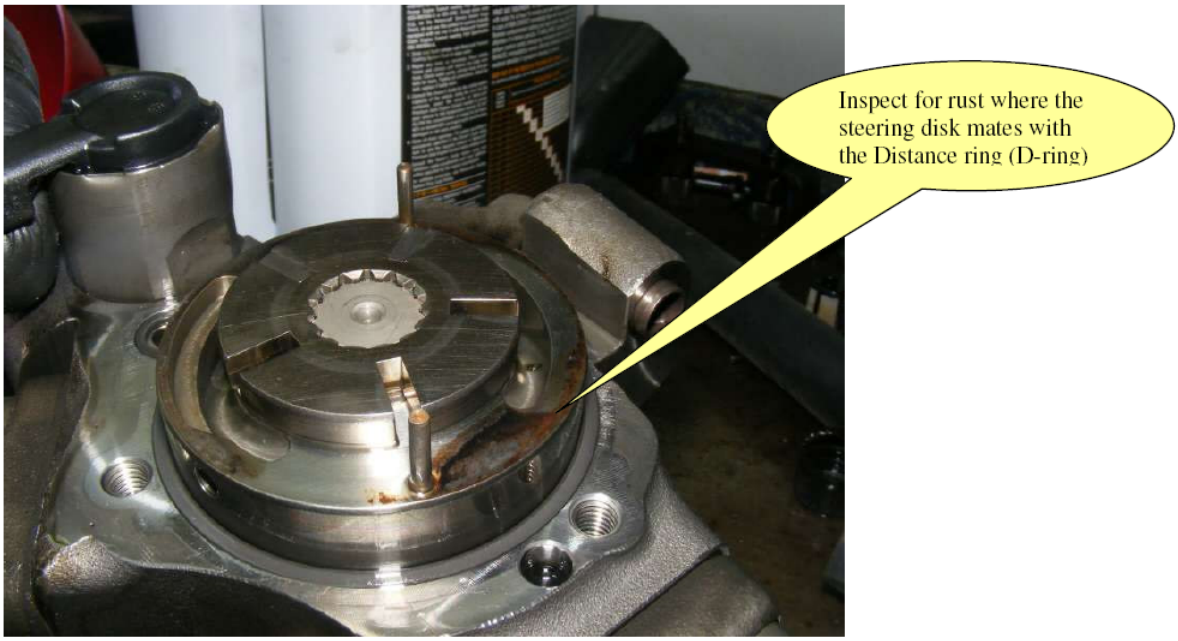
iii) Remove the 3 fasteners with a 6mm Allen wrench and remove the ITP cover



iv) Inspect for rust where the steering disk mates with the distance ring on the ITP cover



v) Inspect for rust where the steering disk mates with the distance ring on the HPP side of the mating surface.



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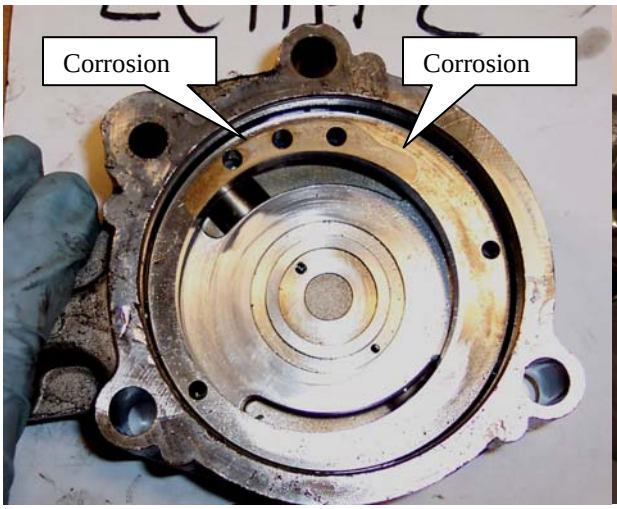
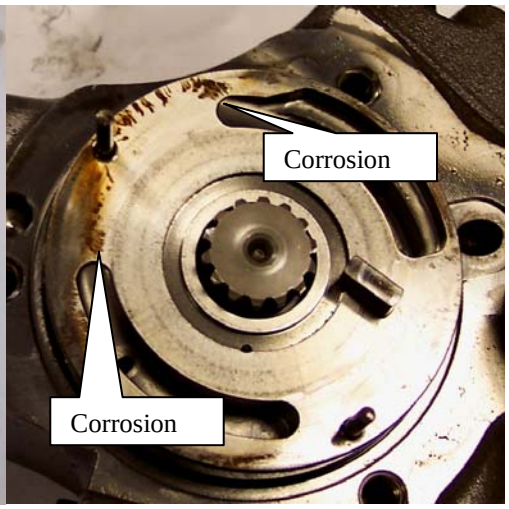
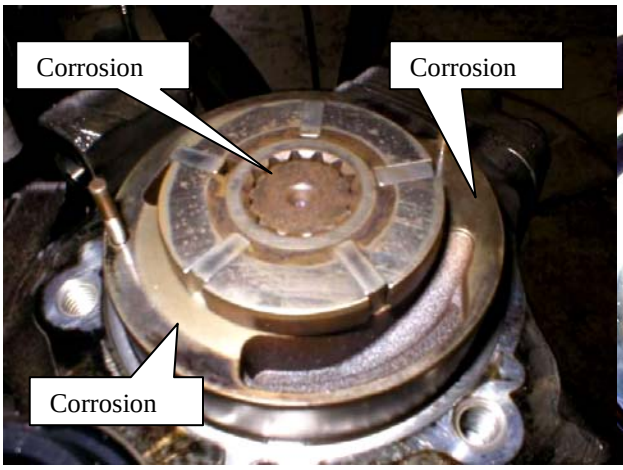
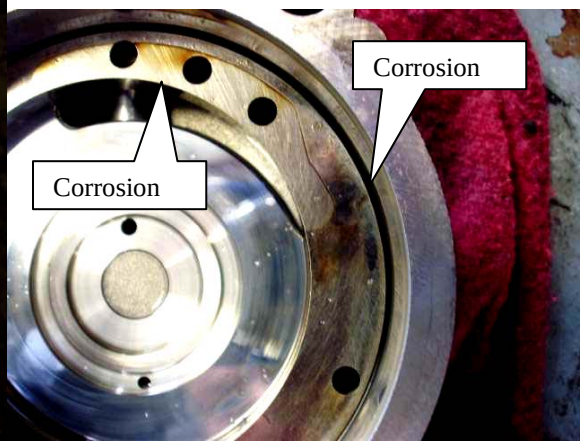
Examples of Corrosion on Fuel Facing Surfaces

Examples of Corrosion under the Internal Transfer Pump Cover









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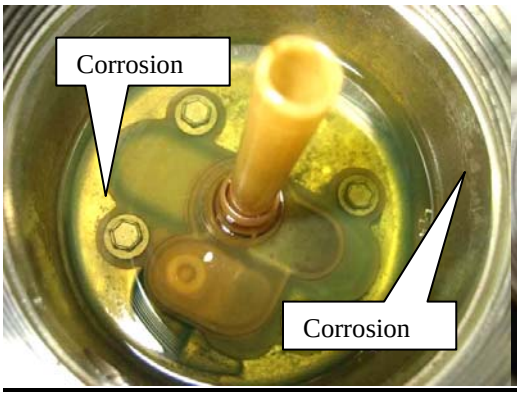
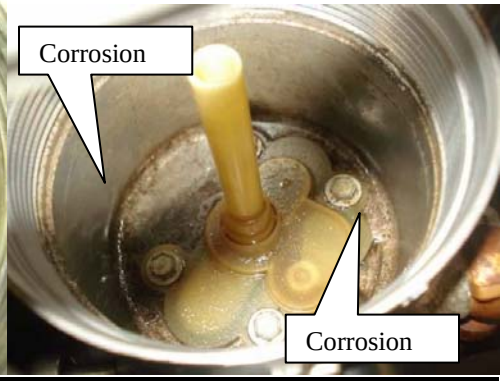
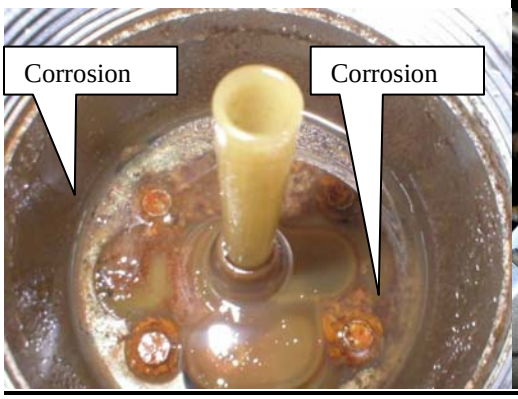
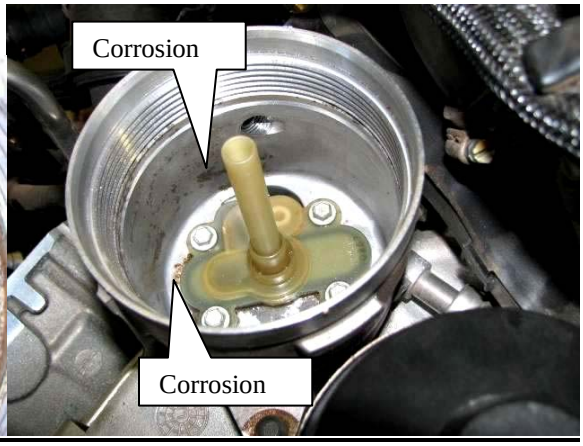
Examples of Corrosion in Secondary Fuel filter housing









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Repair Instructions :

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The following components are to be Replaced:

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9H529 (qt 8)	Fuel injector kit	Fuel injector, jumper tubes, fuel injector gaskets
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9N184	Fuel Filter	
9G756	Fuel Pressure sensor	
9C330	Fuel supply line	
9G282	HFCM	
9C148	Housing – Fuel filter	

Note: HFCM required to be replaced due to water in fuel. Not all fuel system replacements require the HFCM to be replaced.

The following components are to be Inspected for corrosion. If there is no corrosion Flush and Reused:

Part Number	Part Common Name	
9B337 A/B	Low pressure return lines	
9N104	Low pressure return lines	
9C273	Low pressure return lines	
9192	Valve assembly – Fuel shut off	
10884	Sender Assy – Temperature on Fuel Housing	
Fuel Tank	Inspect interior of tank, if dual inspect both tanks	
Fuel pick up boot	Inspect non approved fuels can cause damage	

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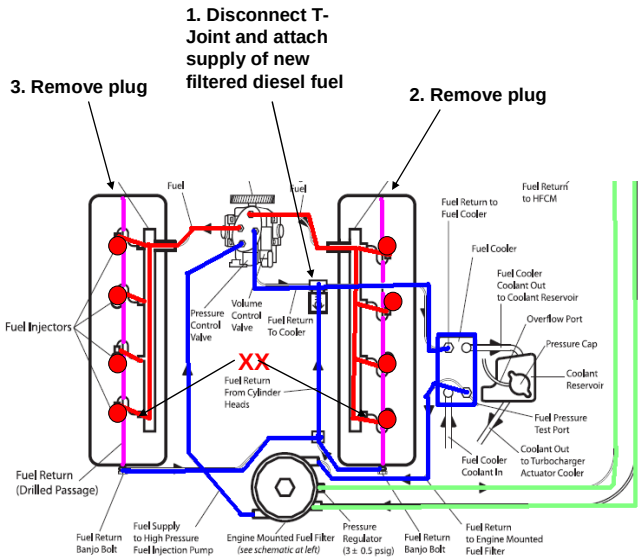
Flush Recommendation



- Flush **cylinder heads** individually by removing one plug at a time.
- Use only new clean filtered diesel fuel.
- Do not exceed 8 PSI during flush.
- .Leave original injectors in cylinder head until flushing is complete.
- **Replace fuel filters after flushing is complete.**

54

Request Type: Non-QSF

Would this make a good cost save business case? No

Activity Code: 070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-350	2008	2010			6.4L TC DIESEL V8			
F-450	2008	2010			6.4L TC DIESEL V8			
F-550	2008	2010			6.4L TC DIESEL			

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Issue:
When directed to perform a fuel system repair where corrosion exists on fuel facing surfaces: the fuel system replacement is not a Ford warrantable repair provided the water in fuel indicator system is operating properly

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Action
For a F250-550 6.4L equipped Super duty when the PCED/hotline directs the technician to perform Step 28 in the PCED and as a result replace the whole high pressure fuel system. The high pressure fuel system components are required to be inspected for damage by water in fuel to determine warranty coverage.

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Indicator for 6.4L
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- If there is no corrosion in the secondary housing it does not preclude corrosion being present in the high pressure pump.

Service Procedure for Determining if Water in Fuel caused Fuel System Damage

1) Notify customer at this time the repair is not covered by warranty

2) Record PID INFORMATION

3) Validate the fuel filters have been changed per the operating conditions required maintenance schedule hours and mileage.

- Fuel filters separate the water.
- Incorrect maintenance will prevent water from separating

4) Validate the water in fuel indicator system is operating properly

- Perform Pinpoint test O2:
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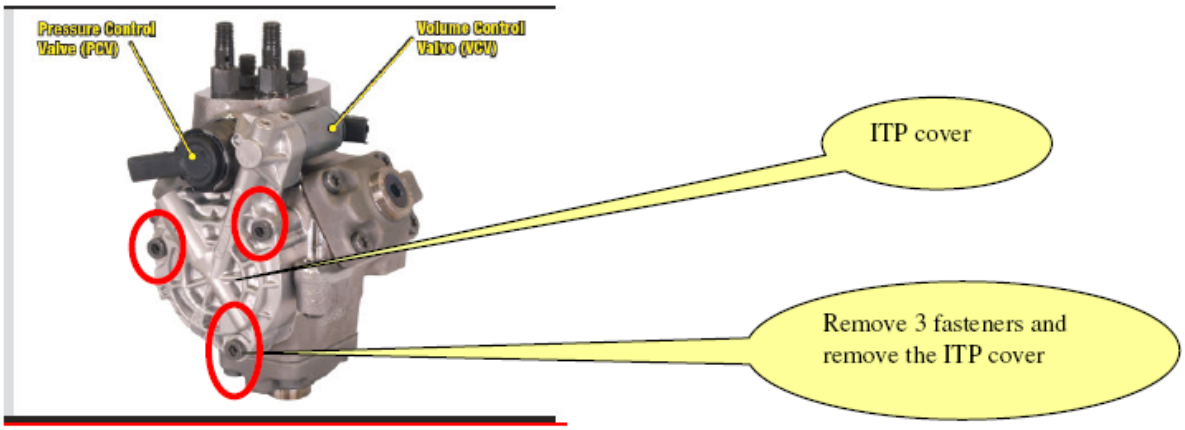
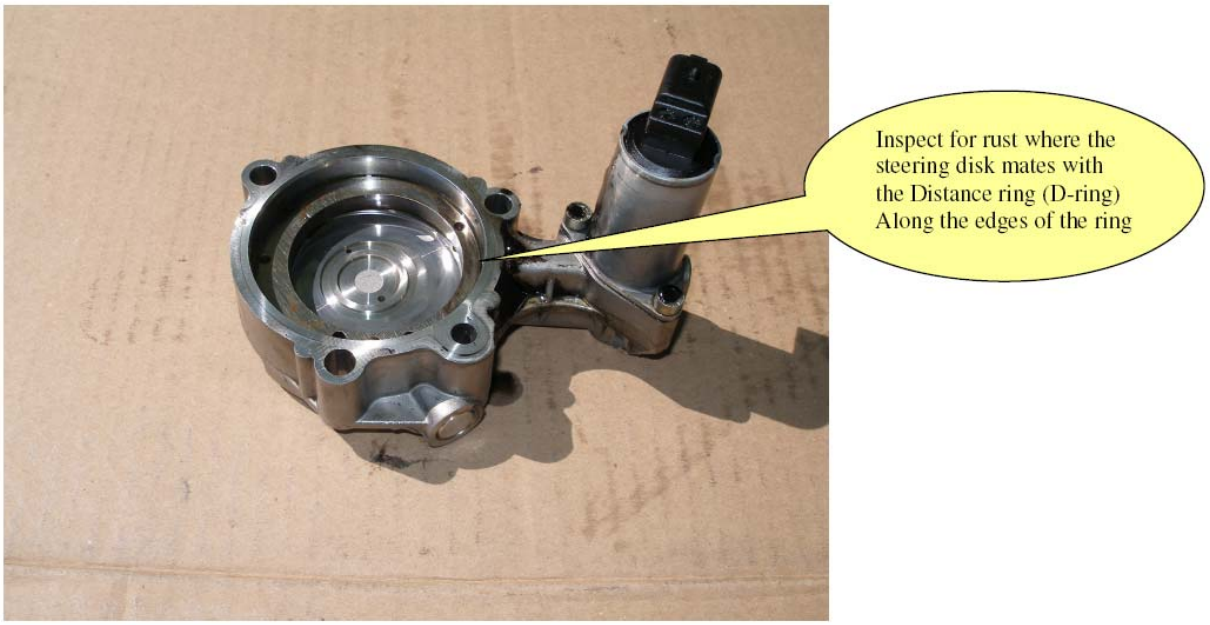
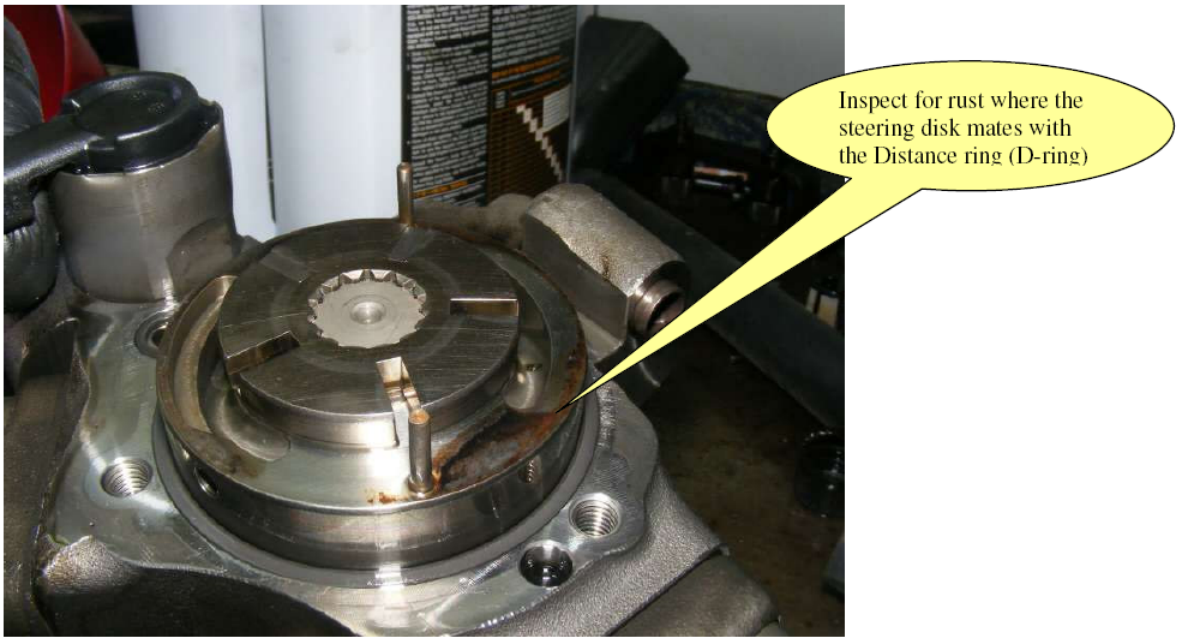


iv) Inspect for rust where the steering disk mates with the distance ring on the ITP cover



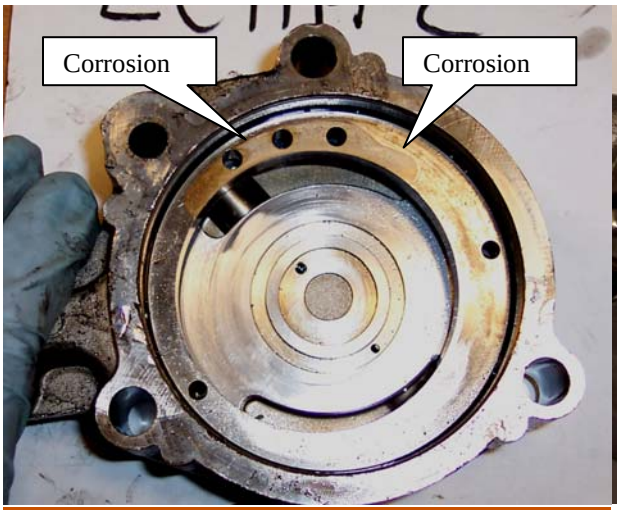
v) Inspect for rust where the steering disk mates with the distance ring on the HPP side of the mating surface.

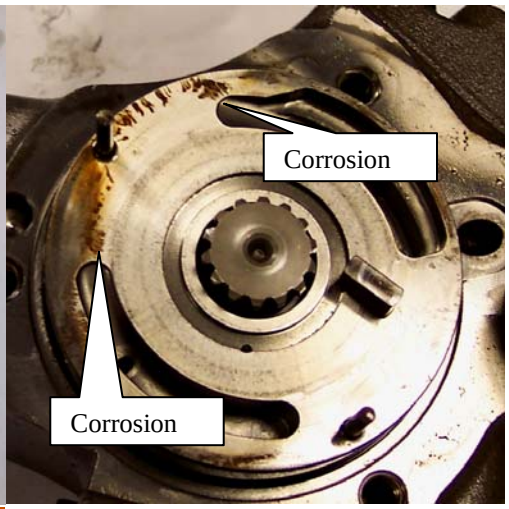


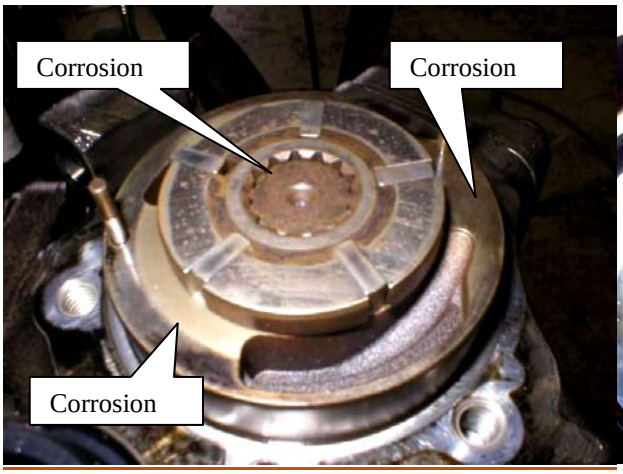
DRAFT JOB AID

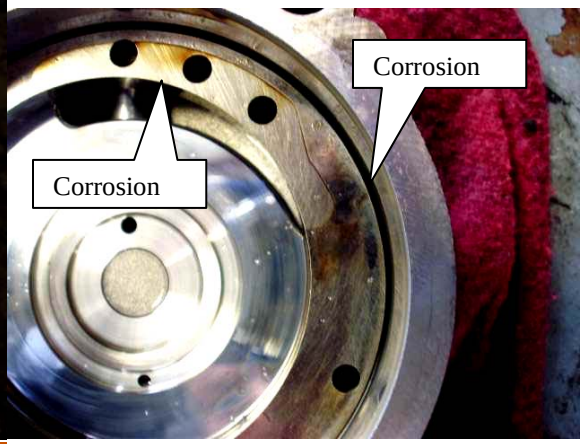
Examples of Corrosion on Fuel Facing Surfaces

Examples of Corrosion under the Internal Transfer Pump Cover









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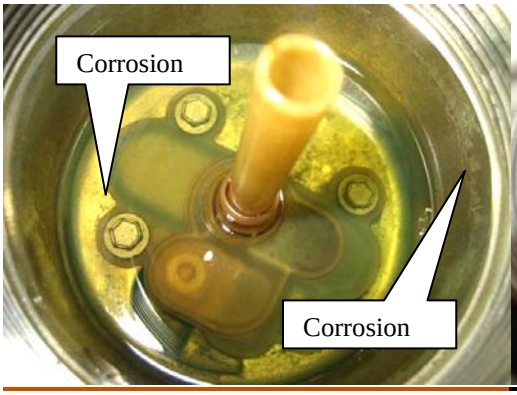
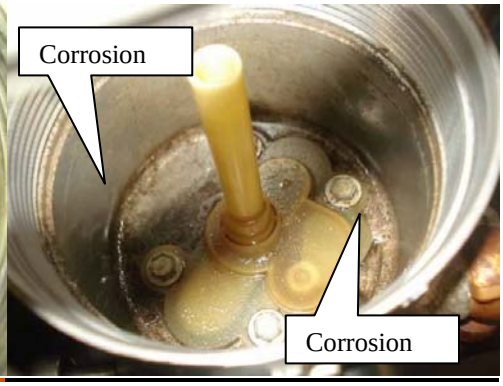
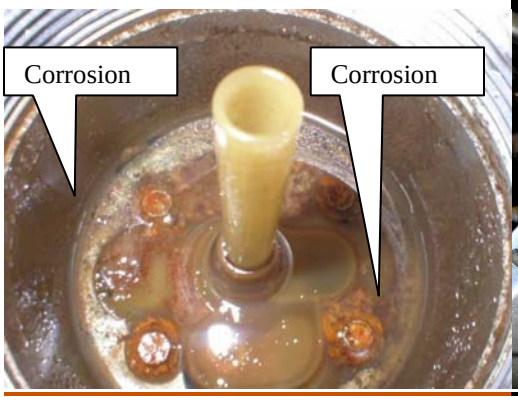
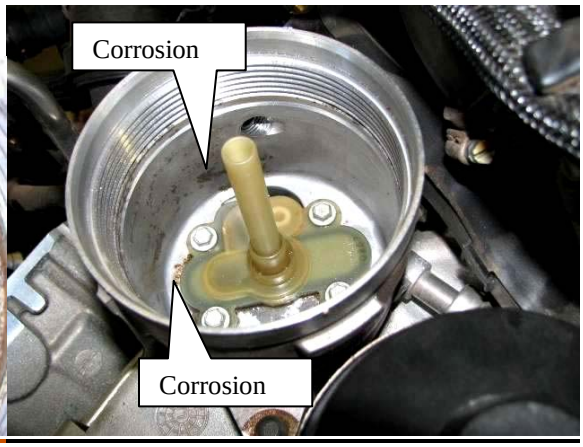
Examples of Corrosion in Secondary Fuel filter housing









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Repair Instructions :

Replace the following components when metallic debris is found at the fuel injectors tubes when performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics and water in fuel or non approved fuel caused the fuel system damage.

If there is shiny metallic material in the fuel at the fuel injector jumper tubes after performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics, and water in fuel or non approved fuel caused the fuel system damage.

The following components are to be Replaced:

Part Number	Part Common Name	Includes
9A543 (qt 1)	High Pressure Pump	
9G805 (qt 1)	High Pressure Pump Gasket Kit	High pressure pump gaskets 6619A and 6619B, fuel lines from high pressure pump to fuel rail manifold 9A332A/B, washer
9N103 (qt 1)	Fuel cooler	
9H529 (qt 8)	Fuel injector kit	Fuel injector, jumper tubes, fuel injector gaskets
8C3Z- 9T287-CA	LH and RH fuel rail manifold	*Left and right hand fuel rail manifold
9N184	Fuel Filter	
9G756	Fuel Pressure sensor	
9C330	Fuel supply line	
9G282	HFCM	
9C148	Housing – Fuel filter	

Note: HFCM required to be replaced due to water in fuel. Not all fuel system replacements require the HFCM to be replaced.

The following components are to be Inspected for corrosion. If there is no corrosion Flush and Reused:

Part Number	Part Common Name	
9B337 A/B	Low pressure return lines	
9N104	Low pressure return lines	
9C273	Low pressure return lines	
9192	Valve assembly – Fuel shut off	
10884	Sender Asy – Temperature on Fuel Housing	
Fuel Tank	Inspect interior of tank, if dual inspect both tanks	
Fuel pick up boot	Inspect non approved fuels can cause damage	

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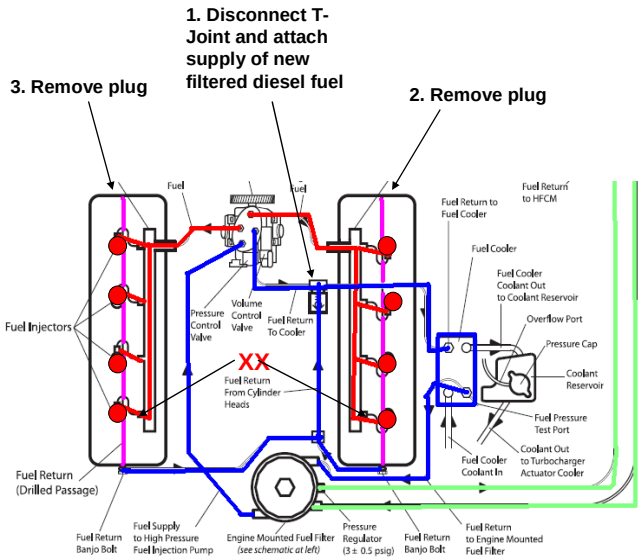
Flush Recommendation



- Flush **cylinder heads** individually by removing one plug at a time.
- Use only new clean filtered diesel fuel.
- Do not exceed 8 PSI during flush.
- .Leave original injectors in cylinder head until flushing is complete.
- **Replace fuel filters after flushing is complete.**

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Request Type: Non-QSF

Would this make a good cost save business case? No

Activity Code: 070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
F-250	2008	2010			6.4L TC DIESEL V8			
F-350	2008	2010			6.4L TC DIESEL V8			
F-450	2008	2010			6.4L TC DIESEL V8			
F-550	2008	2010			6.4L TC DIESEL			

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					V8			

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Issue:
When directed to perform a fuel system repair where corrosion exists on fuel facing surfaces: the fuel system replacement is not a Ford warrantable repair provided the water in fuel indicator system is operating properly

Ford Motor Company Warranty Policy - "What is not covered":

- Using contaminated or improper fuels/fluids. (Water in fuel.)
- Failures due to abuse, neglect, or improper maintenance, unapproved modification. (Fuel filters maintenance.)
- Using fuel types not covered under warranty. (Bio-diesel exceeding specified rating.)
- Using aftermarket products not cover by warranty. Using additives that do not meet or exceed Ford specifications. (Water in fuel dispersants such as alcohol based products.)

Action
For a F250-550 6.4L equipped Super duty when the PCED/hotline directs the technician to perform Step 28 in the PCED and as a result replace the whole high pressure fuel system. The high pressure fuel system components are required to be inspected for damage by water in fuel to determine warranty coverage.

Indicator for 6.4L
There is an opportunity before accessing the high pressure pump on the 6.4L to notify the customer the repair may not be covered by warranty by examining the secondary on engine fuel filter housing for corrosion.

- If there is corrosion in the secondary fuel filter housing there is a high probability of corrosion being present in the high pressure fuel pump.
- If there is no corrosion in the secondary housing it does not preclude corrosion being present in the high pressure pump.

Service Procedure for Determining if Water in Fuel caused Fuel System Damage

1) notify customer repair may not be covered by warranty

2) record PID INFORMATION

3) Validate the fuel filters have been changed per the operating conditions required maintenance schedule hours and mileage.

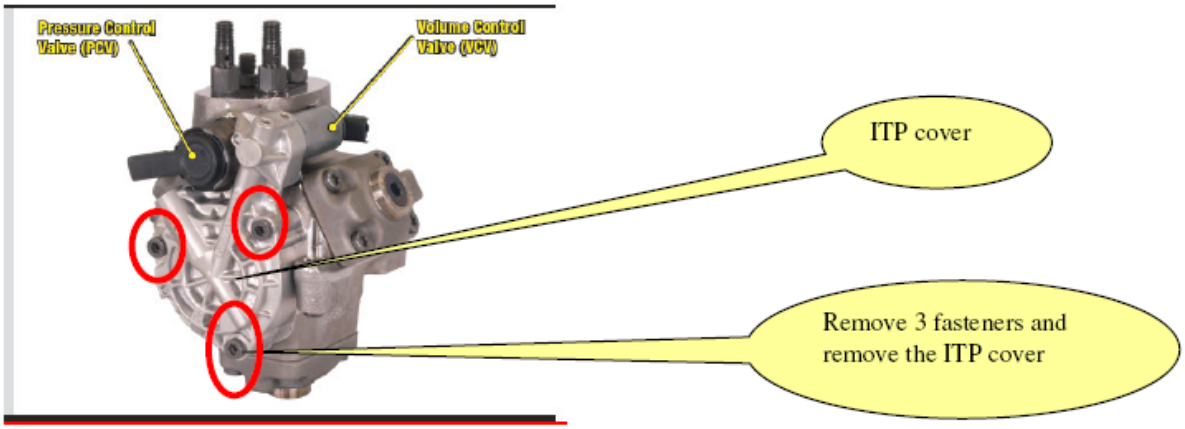
- Fuel filters separate the water.
- Incorrect maintenance will prevent water from separating

4) Validate the water in fuel indicator system is operating properly

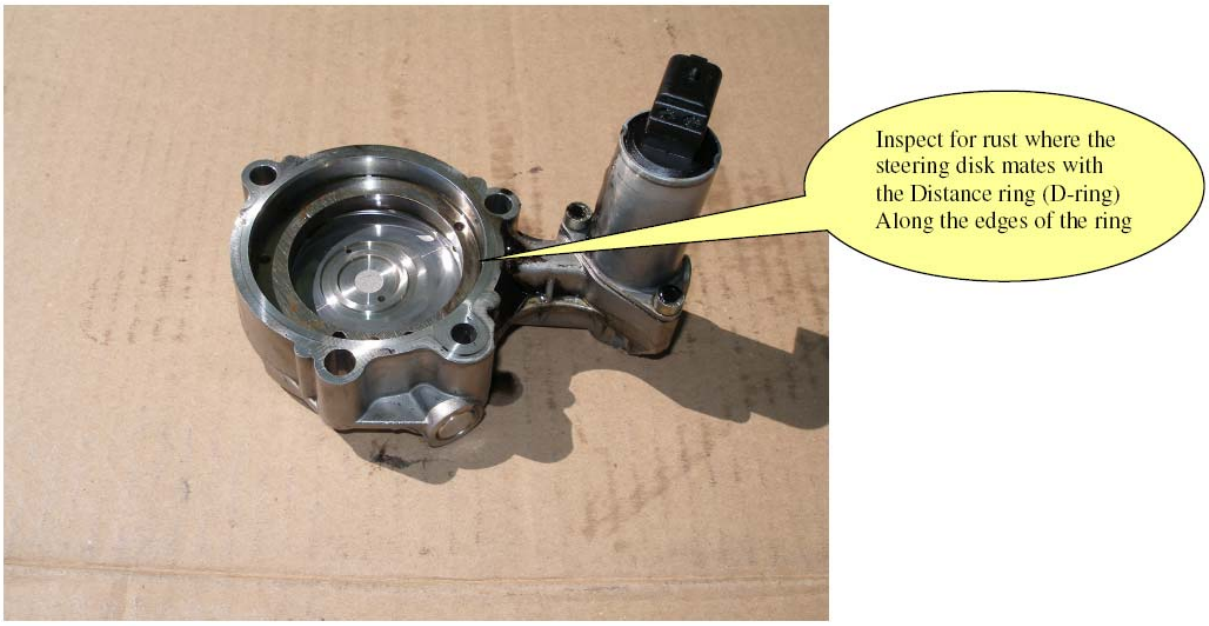
- Perform PinPoint test O2: NEED TO VALIDATE WITH NEW DIAG
  - Is the system operating properly?
  - Is there sufficient clean fuel

5) Access the high pressure fuel system and remove the Internal transfer pump (ITP) cover from the high pressure fuel pump.

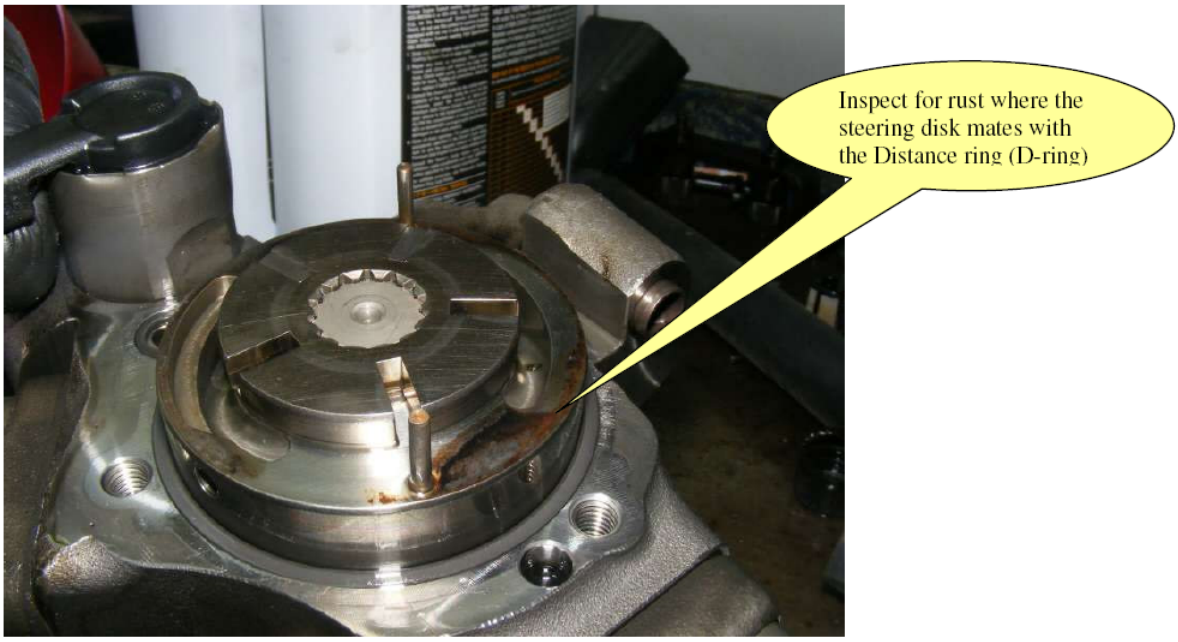
i) Remove the HPP following the workshop manual instructions
ii) Place the HPP flat ITP (internal transfer pump) cover facing up
iii) Remove the 3 fasteners with a 6mm Allen wrench and remove the ITP cover



iv) Inspect for rust where the steering disk mates with the distance ring on the ITP cover



v) Inspect for rust where the steering disk mates with the distance ring on the HPP side of the mating surface.



DRAFT JOB AID

Example of No corrosion on fuel facing surfaces: No water : 74,136 Miles

Debris but no corrosion in the secondary fuel filter housing, debris in housing is not corroded.

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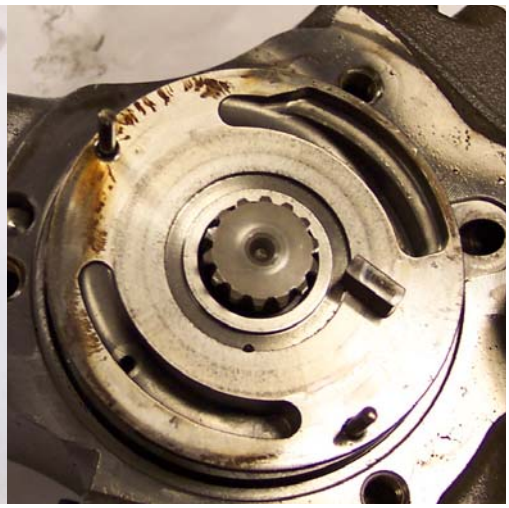
Examples of Corrosion on Fuel Facing Surfaces

Examples of Corrosion under the Internal Transfer Pump Cover



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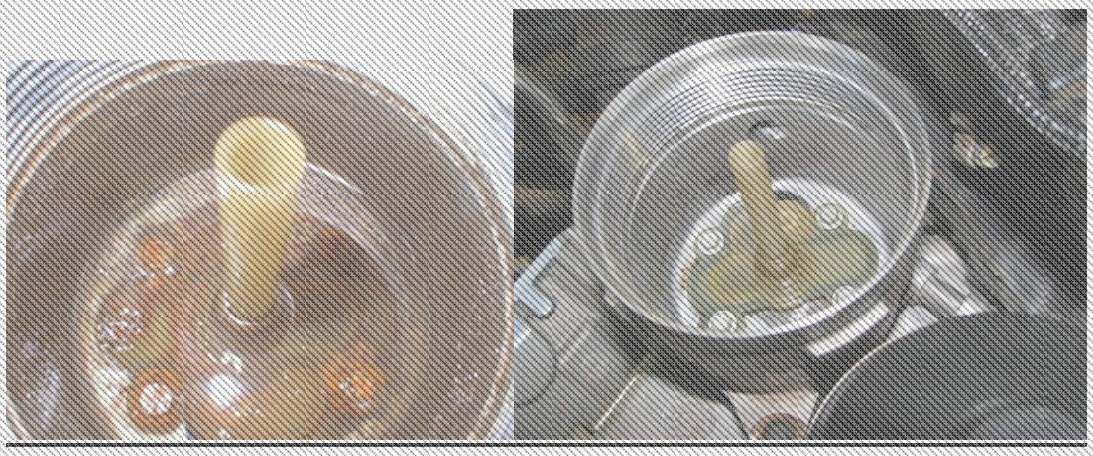

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If there is shiny metallic material in the fuel at the fuel injector jumper tubes after performing Step 28 Fuel System Debris Check in the PCED Hard Start No Start Diagnostics,

The following components are to be Replaced:

Part Number	Part Common Name	*If Kit contains
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**9H529 (qt 8)	Fuel injector kit	Fuel injector, jumper tubes, fuel injector gaskets
**8C3Z- 9T287-CA	LH and RH fuel rail manifold	*Left and right hand fuel rail manifold
9N184	Fuel filter	
9G756	Fuel Pressure sensor	
9C330	Fuel supply line	
9G282	HFCM	

The following components are to be Inspected/Flushed and Reused:

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9B337 A/B	Low pressure return lines	
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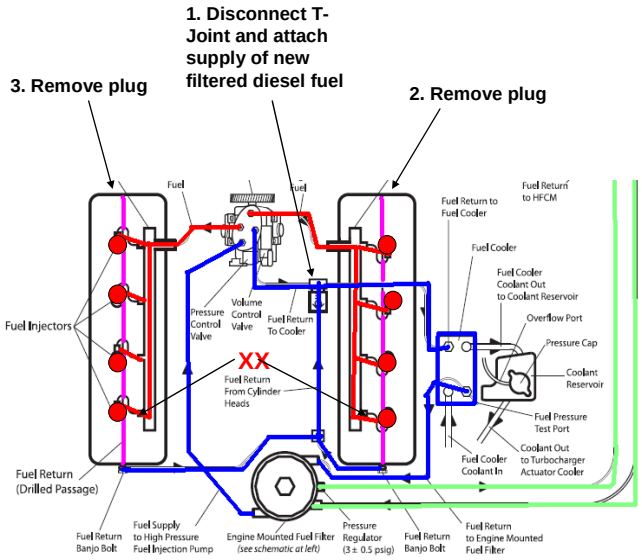

- Flush **cylinder heads** individually by removing one plug at a time.
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- Do not exceed 8 PSI during flush.
- .Leave original injectors in cylinder head until flushing is complete.
- **Replace fuel filters after flushing is complete.**

Request Type: Non-QSF

Would this make a good cost save business case? No

Activity Code: 070 F-Series >8500#

Vehicle Applications:

Vehicle Lines	Model Year Start	Model Year End	Assembly Plants	Body Styles	Engine	Trans Axles	Build From	Build To
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F-550	2008	2010			6.4L TC			

DRAFT JOB AID

					DIESEL V8			

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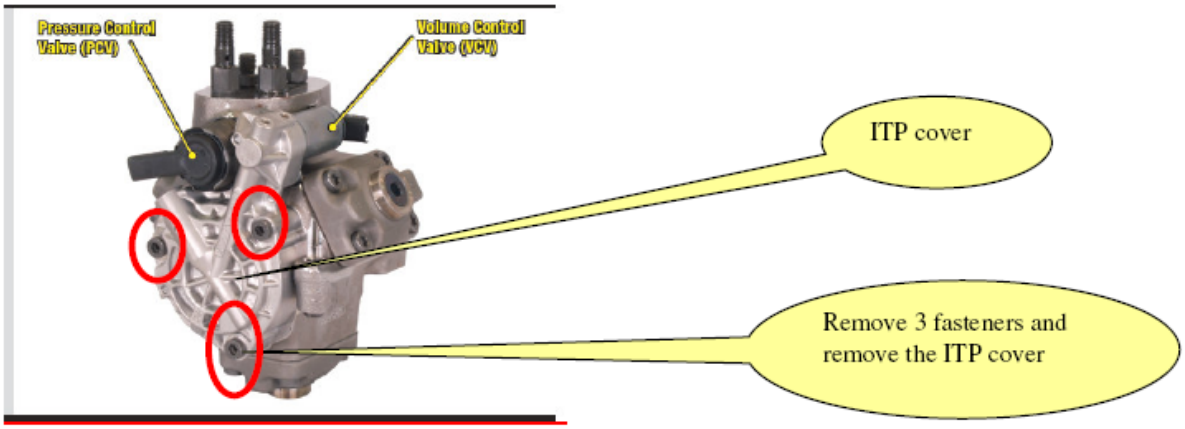

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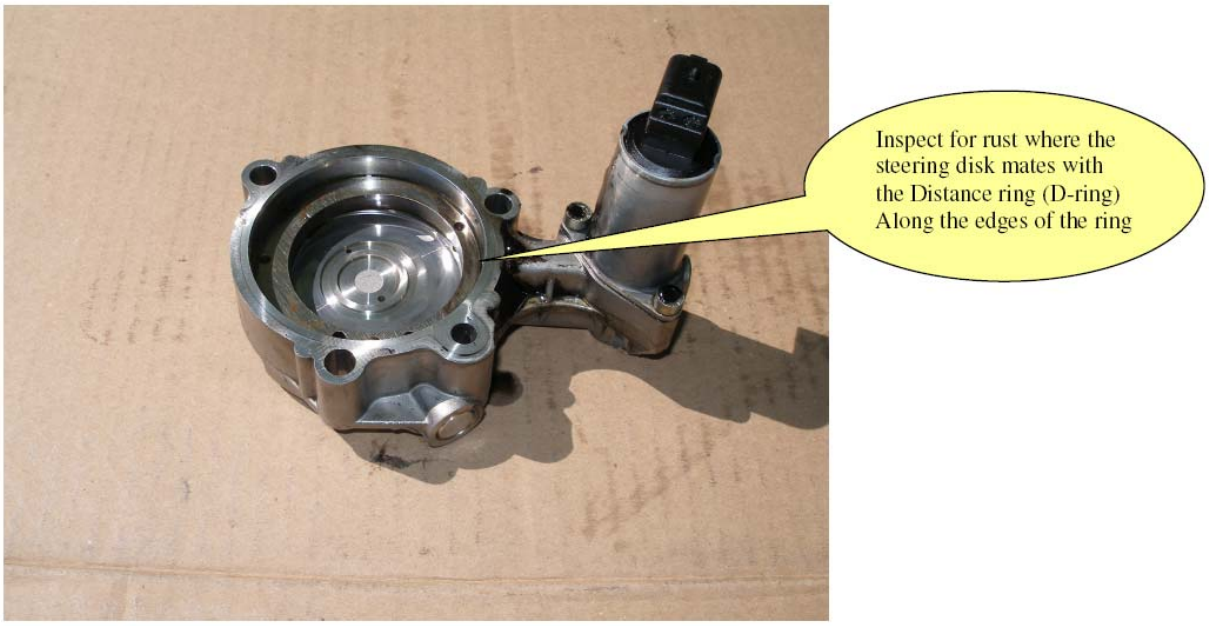

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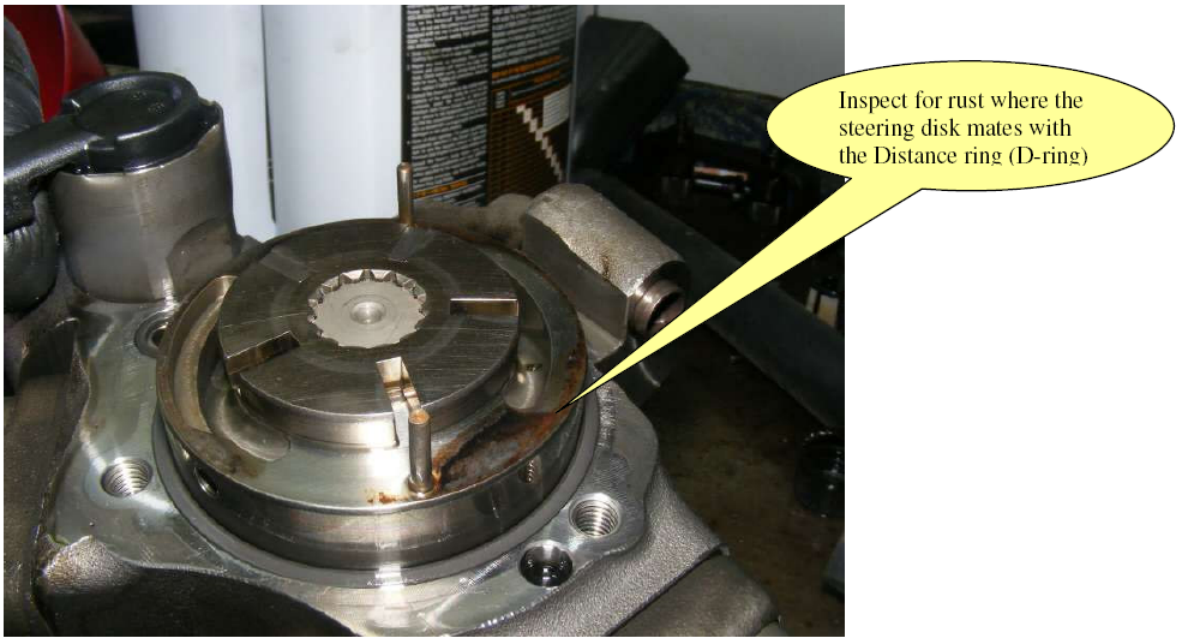

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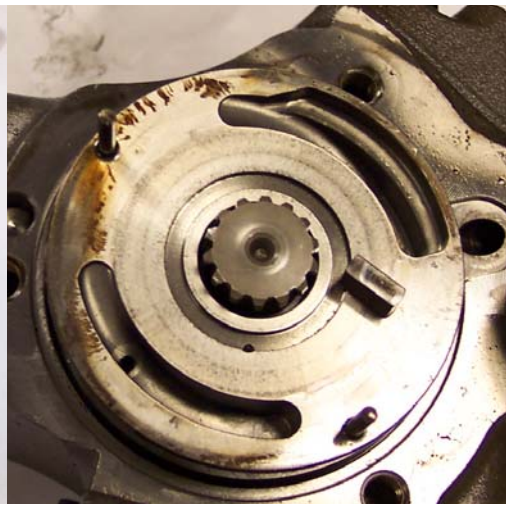

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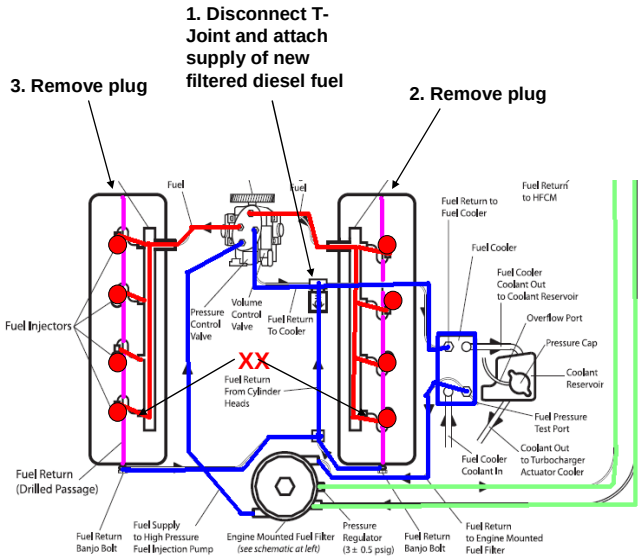

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- .Leave original injectors in cylinder head until flushing is complete.
- **Replace fuel filters after flushing is complete.**

54

Request Type: Non-QSF

Would this make a good cost save business case? No

Activity Code: 070 F-Series >8500#

Vehicle Applications:

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F-350	2008	2010			6.4L TC DIESEL V8			
F-450	2008	2010			6.4L TC DIESEL V8			
F-550	2008	2010			6.4L TC			

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					DIESEL V8			

TSB: items to consider

Fuel contamination can be, but is not limited to dirt/debris, water, excessive % biodiesel, incorrect fuel additives, gasoline, kerosene etc.

Contamination	Issue / Failure	Causal Factors	Indicator
- Gasoline - Ethanol / Methanol - Kerosene - Un-approved fuel - Broken down diesel fuel - Bacteria -	- HP Pump failure - Injector failure - Fuel system leaks - Aggressive chemical attack of fuel system materials	- Debris w/wo rust / corrosion - Material distortion - Fuel bacteria / fungus growth - Corrosion	- Fuel smell - Styrofoam cup test - Fuel sample - Fuel aeration, Note: The tank pick up boot can distort with aggressive fuels (aggressive biodiesel, gasoline or ethanol blends) and result in the boot falling off or the "ice valve" falling out causing engine malfunction caused by air ingestion
- Water	- HP Pump failure - Injector failure - Electric Fuel Pump failure - Filter Life - Promotes algae and bacterial growth - Promotes acid formation	- Debris - Rust / corrosion	- HP Pump (inc. VCV valve) rust / corrosion - Injector rust / corrosion Note: components can have water damage without large quantities of water ingested -fuel tank is Not rusted
- Excessive Biodiesel Blends - Poor Biodiesel fuel	- HP Pump failure - Injector failure - Aggressive chemical attack of fuel system materials - Premature filter plugging and fuel starvation due to cold gelling, diesel varnish dissolved by biodiesel or degraded fuel - Decreased water separation efficiency resulting in water breakthrough to the HP system	- Debris - Rust / corrosion - Bacterial / fungus growth	- Rust/corrosion HP Pump due to increased water content decrease water separation - Bacterial / fungus growth - Fuel aeration (See note above)
- Incorrect Fuel Additives	- HP Pump failure - Injector failure - Aggressive chemical attack of fuel system materials	- Debris - Rust / corrosion - Material distortion	- HP Pump (inc. VCV valve) rust / corrosion - Injector rust / corrosion Note: components can have water damage if water emulsifies / disperses and prevents proper water separation
- Prolonged Fuel filter maintenance	- Fuel Starvation and reduced fuel flow leading to HP Pump failure due to low lubrication and	- Debris w/wo rust / corrosion - Decreased water separation ability - Plugged filters	- Rust/corrosion due to increased water content decrease water separation - FF filters - Collapsed filters

	cooling - Injector failure - Fuel system leaks - Decreased water separation efficiency resulting in water breakthrough to the HP system - Seal deterioration causing air ingestion/leaks	- Collapsed filters	- Low fuel pressure indication
- Acidic/Aggressive Fuels	- HP Pump failure - Injector failure - Aggressive chemical attack of fuel system materials	- Prolonged biodiesel storage - Poor quality biodiesel or diesel fuels - Water in Fuel - Presence of catalysts (cooper alloys, Zinc etc..) - Debris - Rust / Corrosion	- Fuel sample - Fuel tank rust - HP Pump (inc. VCV valve) rust / corrosion - Injector rust / corrosion Note: components can have water damage without large quantities of water ingested
- Particulate (dirt/debris, sand, etc) contamination	- HP pump failure - secondary failure of injectors	- Debris	- collapsed primary fuel filter - visible contaminants in HP pump inlet port mesh filter - low fuel pressure indication - non-metallic debris on primary fuel filter

Scenarios:

1. Customer does not want to pay after running on gas, water etc. requests flush of system and take chance for how long it takes for system damage
    a. put in warranty documentation no coverage until full system is replaced e x. case where gasoline had damage the sending unit valve and caused system aeration
    b. I believe that the engine warranty is already voided if run on gasoline

2. Possible causes of debris in high pressure fuel system failures
    a. Gasoline
    b. Water
    c. Acid
    d. Alcohol
    e. Ethanol / Methanol
    f. Contamination

3. Customer may end with tank of half water – may not get rust in the system (Did WIF minder come on?)
    a. This would be a fairly quick failure – lack of lubrication and cooling would be first failure mode
    b. Dealer would have first assessment
    c. May end up being ford pay, error to customers benefit

4. Customer had gasoline drains tank – debris in system
    a. Will not be able to differentiate unless present in a sample of fuel
    b. May have caused damage to low pressure system – resultant aeration
    c. Debris in system due to lack of lubrication / cooling

From: Heggie, Forest (F.)
Sent: Tuesday, September 28, 2010 9:17 AM
To: Curtis, Andrew (A.)
Subject: TSB water / other substances

Attachments: TSB.doc

Just a starter document I am gettting input from low pressure team, so we can put together a little table of variables and impact.

Would this be something of use?

TSB.doc

Forest Heggie
BaSc. MaSc. P.Eng
OPD Diesel
313-618-5054

TSB: items to consider

Fuel contamination can be, but is not limited to dirt/debris, water, excessive % biodiesel, incorrect fuel additives, gasoline, kerosene etc

Contaminant	Issue	Factors	Indicator
Gasoline/Ethanol/Kerosene/Alternative Fuels	Lubricity, cooling, aggressive chemical attack of materials in fuel system	Debris, NO rust/corrosion, distortion of materials	Smell, Styrofoam cup test, fuel sample: fuel aeration, Note: The pick up boot in the tank can distort with aggressive fuels (aggressive biodiesel, gasoline or ethanol blends) and result in the boot falling off or the "ice valve" falling out.
Water	Lubricity, cooling, corrosion/rust	Debris, rust/corrosion	-HP Pump Rust/corrosion, (can have water damage without if large enough quantities ingested)
Excessive Biodiesel	Lubricity, cooling, bacterial/fungus growth/corrosion/rust	Debris, rust/corrosion, bacterial/ fungus growth	-Rust/corrosion HP Pump due to increased water content decrease water separation -Bacterial/fungus growth -aeration boot falling off or the "ice valve
Incorrect Fuel Additives	Lubricity, cooling, corrosion/rust depends on additive content (alcohol)	May have Rust/corrosion, or only debris	-Rust/Corrosion if water emulsifies/prevents water separation
Fuel Filters/maintenance	-decreased water separation-> lubricity/cooling corrosion/rust/particulate	Debris, may have rust/corrosion decreased efficiency water separation/plugged filters/ collapsed filters	-Rust/corrosion due to increased water content decrease water separation -FF filters - collapsed filters
Acid	Corrosion/rust	Debris, rust/corrosion	Fuel tank rust

Scenarios:

1. Customer does not want to pay after running on gas, water ect requests flush of system and take chance for how long it takes for system damage
    a. put in warranty documentation no coverage until full system is replaced
    eg case where gasoline had damage the sending unit valve and caused system aeration

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4. Customer had gasoline drains tank – debris in system
    a.will not be able to differentiate unless have a sample of fuel
    b. may have caused damage to low pressure system – resultant aeration
    c. debris in system due to lack of lubrication

How To take care of your Fuel system so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel, other fuels and water can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

Water and impurities can enter your tank with the fuel. Water does not burn, water carries oxygen is Corrosive and it freezes. It robs the engine of B.T.U.'s, and can create deposit which are extremely harmful to the engine. Water also acts as a host to bacterial formation at the site where the water molecule interfaces with a fuel molecule.

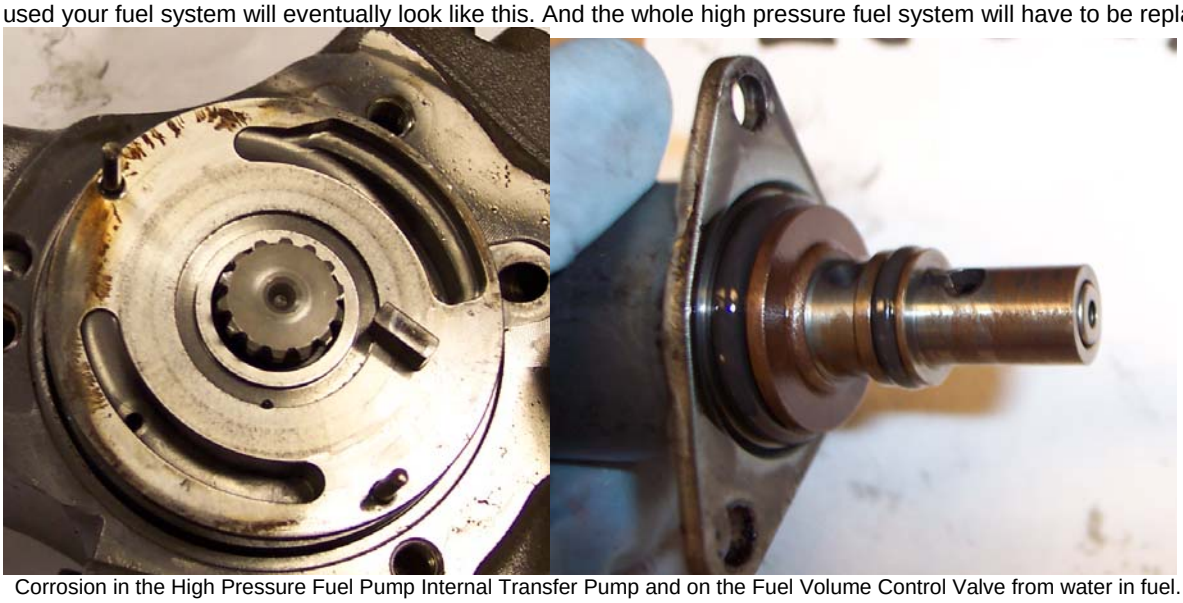
How do we get rid of water?

Your horizontal fuel condition module (HFCM) is there to remove water and impurities from the fuel before it goes to the high pressure pump. For your HFCM to remove the water from the fuel your filters need to be changed by the recommended service interval. If your filters are not changed it will decrease the water separation ability and or it can cause the filters to become plugged or collapsed and allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system causing high pressure pump failure due to low lubrication. Your vehicle is equipped with two fuel filters; one is mounted on top of the engine the other is inside the HFCM. Separate the water from the fuel. It's easier and much cheaper to replace the filters than replace the high pressure fuel system.

The HFCM needs to be drained once a month or when the water in fuel light illuminates. If the water is not drained when the HFCM container is filled it has no where else to go but to the high pressure pump. Water does not have the lubricant properties of diesel fuel and will corrode the pump. When draining your water separator do not have the engine running and wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.

What happens if water gets into the high pressure fuel system?

If the water is not drained or if the filters are not changed or if fuel additives with water dispersants or emulsifier are used your fuel system will eventually look like this. And the whole high pressure fuel system will have to be replaced.



Corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve from water in fuel.


Corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing from water in fuel

What about fuel additives?

Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. The purpose of the filters is to be able to remove the water if chemicals are holding the water in the fuel it can not be separated. Dispersing/emuslfying the water sends it to your fuel system, exactly where you do not want it to be, it tries to carry the water through the filters and water separators. Do not use alcohol based additives to correct fuel gelling.

It should not be necessary to add any aftermarket additives to your fuel tank if you use diesel fuel that meets the ASTM D 975 industry specification. If you want to use a fuel additive use only recommended fuel additives meeting ford specifications, Motorcraft parts are designed to meet Ford specifications. Alcohol and other fuels do not provide enough lubricant for the high pressure fuel pump and water will cause rust and corrosion to form in your high pressure fuel system this will cause the high pressure fuel system to fail and ultimately the whole system will need to be replace.

Additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet or exceed Ford specifications.

BIODIESEL

Concentrations greater than 5% can also cause fuel filter restrictions that may result in a lack of
power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures. Biodiesel should not be stored in the fuel tank for more than three months. Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.


Corrosion fungus and algae growth in secondary fuel filter housing, corrosion bacterial growth on high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, other fuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials. The tank pick up boot can distort with aggressive fuels/non approved, and cause air ingestion.
Do not use Raw or refined vegetable oil, animal fat, cooking oil or recycled greases should
Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use. Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper
fuel is used. Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any
circumstances. Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

Running out of Fuel

Do not run your diesel vehicle out of fuel as this will allow air to enter the fuel system which will make restarting difficult. The engine is designed to run roughly as the fuel tank nears Empty. This is a warning
to the driver to add fuel as soon as possible. Longer engine cranking time may be required once air is in the fuel system. If air enters the fuel system (either through running the fuel tank(s) empty or during a fuel
filter change), the engine will self-purge the trapped air once it starts running.

How To Take Care of your 6.4L Fuel System so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel, other fuels and water can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

- Water and impurities can enter your tank with the fuel.
- Water does not burn, water carries oxygen and is Corrosive and it freezes.
- Water does not have the lubricant properties of diesel fuel and will corrode the high pressure fuel pump.
- Water also acts as a host to bacterial formation at the site where the water molecule interfaces with a fuel molecule.

How do we get rid of water?

Your horizontal fuel condition module (HFCM) is there to remove water and impurities from the fuel before it goes to the high pressure pump.

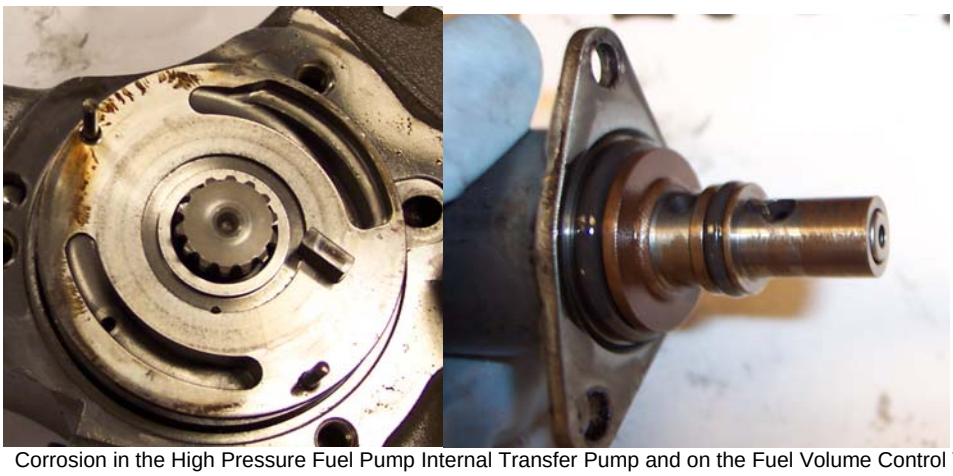
- The HFCM needs to be drained once a month or when the water in fuel light illuminates.
- For your HFCM to remove the water from the fuel your filters need to be changed by the recommended service interval.
- If your filters are not changed it will decrease the water separation ability and or it can cause the filters to become plugged or collapsed and allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system causing high pressure pump failure due to low lubrication.
- Your vehicle is equipped with two fuel filters; one is mounted on top of the engine the other is inside the HFCM.
- When draining your water separator do not have the engine running and wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.
- When draining the HFCM you should get approximately 750 ml of liquid (fuel and water) If No fluid (fuel or water) drain from your HFCM take it to the dealer for inspection.
- Separate the water from the fuel. It's easier and much cheaper to replace the filters than replace the high pressure fuel system.

If the water is not drained when the HFCM container is filled it has no where else to go but to the high pressure pump.

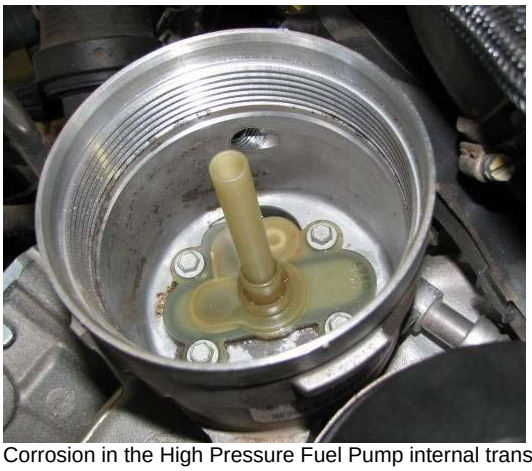
- Water does not have the lubricant properties of diesel fuel and will corrode the pump.

What happens if water gets into the high pressure fuel system?

If the water is not drained or if the filters are not changed or if fuel additives with water dispersants or emulsifier are used your fuel system will eventually look like this. And the whole high pressure fuel system will have to be replaced.



Corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve from water in fuel.



Corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing from water in fuel

What about fuel additives?

It should not be necessary to add any aftermarket additives to your fuel tank if you use diesel fuel that meets the ASTM D 975 industry specification.

- Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system.
- The purpose of the filters is to be able to remove the water if chemicals are holding the water in the fuel it can not be separated.
- Dispersing/emuslfying the water sends it to your fuel system, exactly where you do not want it to be, it tries to carry the water through the filters and water separators. Do not use alcohol based additives to correct fuel gelling.

If you want to use a fuel additive use only recommended fuel additives meeting ford specifications, Motorcraft parts are designed to meet Ford specifications.

Alcohol and other fuels do not provide enough lubricant for the high pressure fuel pump and water will cause rust and corrosion to form in your high pressure fuel system this will cause the high pressure fuel system to fail and ultimately the whole system will need to be replace.

Additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet or exceed Ford specifications.

BIODIESEL

Concentrations greater than 5% can also cause fuel filter restrictions that may result in a lack of power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures.

- Biodiesel should not be stored in the fuel tank for more than three months.
- Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.

Corrosion fungus and algae growth in secondary fuel filter housing, corrosion bacterial growth on high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, other fuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

- The tank pick up boot can distort with aggressive fuels/non approved, and cause air ingestion.
- Do not use Raw or refined vegetable oil, animal fat, cooking oil or recycled greases should
- Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use.
- Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper fuel is used.
- Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any circumstances.
- Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

Running out of Fuel

Do not run your diesel vehicle out of fuel as this will allow air to enter the fuel system which will make restarting difficult. The engine is designed to run roughly as the fuel tank nears Empty. This is a warning to the driver to add fuel as soon as possible. Longer engine cranking time may be required once air is in the fuel system. If air enters the fuel system (either through running the fuel tank(s) empty or during a fuel filter change), the engine will self-purge the trapped air once it starts running.

How To take care of your Fuel system so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel, other fuels and water can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

Water and impurities can enter your tank with the fuel. Water does not burn, water carries oxygen is Corrosive and it freezes. It robs the engine of B.T.U.'s, and can create deposit which are extremely harmful to the engine. Water also acts as a host to bacterial formation at the site where the water molecule interfaces with a fuel molecule.

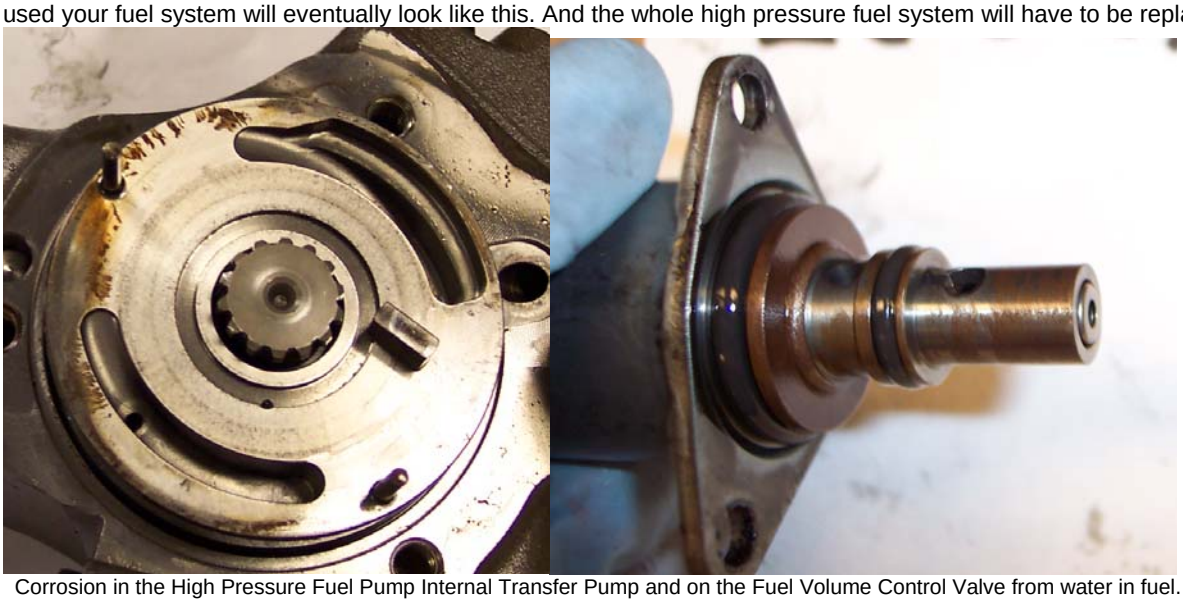
How do we get rid of water?

Your horizontal fuel condition module (HFCM) is there to remove water and impurities from the fuel before it goes to the high pressure pump. For your HFCM to remove the water from the fuel your filters need to be changed by the recommended service interval. If your filters are not changed it will decrease the water separation ability and or it can cause the filters to become plugged or collapsed and allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system causing high pressure pump failure due to low lubrication. Your vehicle is equipped with two fuel filters; one is mounted on top of the engine the other is inside the HFCM. Separate the water from the fuel. It's easier and much cheaper to replace the filters than replace the high pressure fuel system.

The HFCM needs to be drained once a month or when the water in fuel light illuminates. If the water is not drained when the HFCM container is filled it has no where else to go but to the high pressure pump. Water does not have the lubricant properties of diesel fuel and will corrode the pump. When draining your water separator do not have the engine running and wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain. When draining the HFCm you should get approximately 750 ml of liquid (fuel and water) If No fluid (fuel or water) drain from your HFCM take it to the dealer for inspection.

What happens if water gets into the high pressure fuel system?

If the water is not drained or if the filters are not changed or if fuel additives with water dispersants or emulsifier are used your fuel system will eventually look like this. And the whole high pressure fuel system will have to be replaced.



Corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve from water in fuel.


Corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing from water in fuel

What about fuel additives?

Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. The purpose of the filters is to be able to remove the water if chemicals are holding the water in the fuel it can not be separated. Dispersing/emuslfying the water sends it to your fuel system, exactly where you do not want it to be, it tries to carry the water through the filters and water separators. Do not use alcohol based additives to correct fuel gelling.

It should not be necessary to add any aftermarket additives to your fuel tank if you use diesel fuel that meets the ASTM D 975 industry specification. If you want to use a fuel additive use only recommended fuel additives meeting ford specifications, Motorcraft parts are designed to meet Ford specifications. Alcohol and other fuels do not provide enough lubricant for the high pressure fuel pump and water will cause rust and corrosion to form in your high pressure fuel system this will cause the high pressure fuel system to fail and ultimately the whole system will need to be replace.

Additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet or exceed Ford specifications.

BIODIESEL

Concentrations greater than 5% can also cause fuel filter restrictions that may result in a lack of
power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures. Biodiesel should not be stored in the fuel tank for more than three months. Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.


Corrosion fungus and algae growth in secondary fuel filter housing, corrosion bacterial growth on high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, other fuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials. The tank pick up boot can distort with aggressive fuels/non approved, and cause air ingestion.

Do not use Raw or refined vegetable oil, animal fat, cooking oil or recycled greases should

Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use. Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper

fuel is used. Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any

circumstances. Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

Running out of Fuel

Do not run your diesel vehicle out of fuel as this will allow air to enter the fuel system which will make restarting difficult. The engine is designed to run roughly as the fuel tank nears Empty. This is a warning

to the driver to add fuel as soon as possible. Longer engine cranking time may be required once air is in the fuel system. If air enters the fuel system (either through running the fuel tank(s) empty or during a fuel

filter change), the engine will self-purge the trapped air once it starts running.

How To Take Care of your 6.4L Fuel System so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel, other fuels and water can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

- Water and impurities can enter your tank with the fuel.
- Water does not burn, water carries oxygen and is Corrosive and it freezes.
- Water does not have the lubricant properties of diesel fuel and will corrode the high pressure fuel pump.
- Water also acts as a host to bacterial formation at the site where the water molecule interfaces with a fuel molecule.

How do we get rid of water?

Your horizontal fuel condition module (HFCM) is there to remove water and impurities from the fuel before it goes to the high pressure pump.

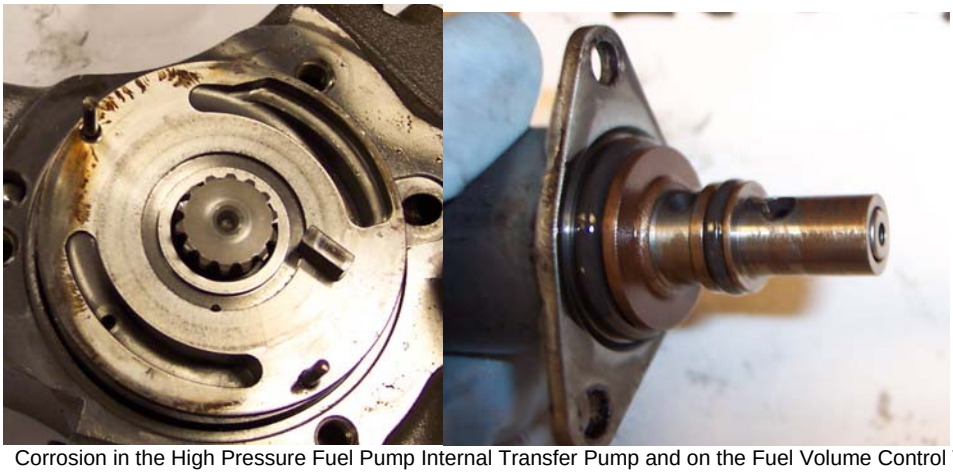
- The HFCM needs to be drained once a month or when the water in fuel light illuminates.
- For your HFCM to remove the water from the fuel your filters need to be changed by the recommended service interval.
- If your filters are not changed it will decrease the water separation ability and or it can cause the filters to become plugged or collapsed and allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system causing high pressure pump failure due to low lubrication.
- Your vehicle is equipped with two fuel filters; one is mounted on top of the engine the other is inside the HFCM.
- When draining your water separator do not have the engine running and wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.
- When draining the HFCM you should get approximately 750 ml of liquid (fuel and water) If No fluid (fuel or water) drain from your HFCM take it to the dealer for inspection.
- Separate the water from the fuel. It's easier and much cheaper to replace the filters than replace the high pressure fuel system.

If the water is not drained when the HFCM container is filled it has no where else to go but to the high pressure pump.

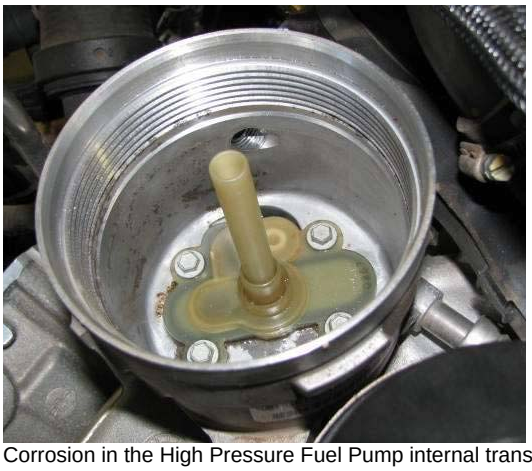
- Water does not have the lubricant properties of diesel fuel and will corrode the pump.

What happens if water gets into the high pressure fuel system?

If the water is not drained or if the filters are not changed or if fuel additives with water dispersants or emulsifier are used your fuel system will eventually look like this. And the whole high pressure fuel system will have to be replaced.



Corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve from water in fuel.



Corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing from water in fuel

What about fuel additives?

It should not be necessary to add any aftermarket additives to your fuel tank if you use diesel fuel that meets the ASTM D 975 industry specification.

- Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system.
- The purpose of the filters is to be able to remove the water if chemicals are holding the water in the fuel it can not be separated.
- Dispersing/emuslfying the water sends it to your fuel system, exactly where you do not want it to be, it tries to carry the water through the filters and water separators. Do not use alcohol based additives to correct fuel gelling.

If you want to use a fuel additive use only recommended fuel additives meeting ford specifications, Motorcraft parts are designed to meet Ford specifications.

Alcohol and other fuels do not provide enough lubricant for the high pressure fuel pump and water will cause rust and corrosion to form in your high pressure fuel system this will cause the high pressure fuel system to fail and ultimately the whole system will need to be replace.

Additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet or exceed Ford specifications.

BIODIESEL

Concentrations greater than 5% can also cause fuel filter restrictions that may result in a lack of power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures.

- Biodiesel should not be stored in the fuel tank for more than three months.
- Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.

Corrosion fungus and algae growth in secondary fuel filter housing, corrosion bacterial growth on high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, other fuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

- The tank pick up boot can distort with aggressive fuels/non approved, and cause air ingestion.
- Do not use Raw or refined vegetable oil, animal fat, cooking oil or recycled greases should
- Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use.
- Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper fuel is used.
- Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any circumstances.
- Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

Running out of Fuel

Do not run your diesel vehicle out of fuel as this will allow air to enter the fuel system which will make restarting difficult. The engine is designed to run roughly as the fuel tank nears Empty. This is a warning to the driver to add fuel as soon as possible. Longer engine cranking time may be required once air is in the fuel system. If air enters the fuel system (either through running the fuel tank(s) empty or during a fuel filter change), the engine will self-purge the trapped air once it starts running.

How To Take Care of your 6.4L Fuel System so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel. Other types of fuels and excessive water can cause the pump to fail due to lack of lubricity/cooling or aggressive chemical attack to fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

- Water and impurities can enter your tank with the fuel.
- Water does not burn, water carries oxygen and is Corrosive and it freezes.
- Water does not have the lubricant properties of diesel fuel and will corrode the high pressure fuel pump.
- Water also acts as a host to bacterial formation .

How can you prevent excessive amounts of water?

Your horizontal fuel condition module (HFCM) removes water and impurities from the fuel before it enters the high pressure pump.

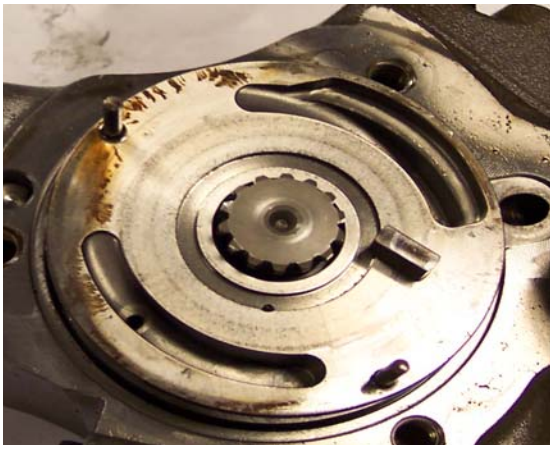
- The HFCM must be drained once a month or when the water in fuel light illuminates.
- The fuel filter removes impurities and separate water, due to different surface tensions of fuel and water , water droplets form on the filter element then collect in the water accumulation chamber.
- Fuel filters must be changed by the recommended service interval. If your filters are not changed regularly it can:
    - decrease the water separation ability
    - cause the filters to become plugged or collapsed
    - allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system

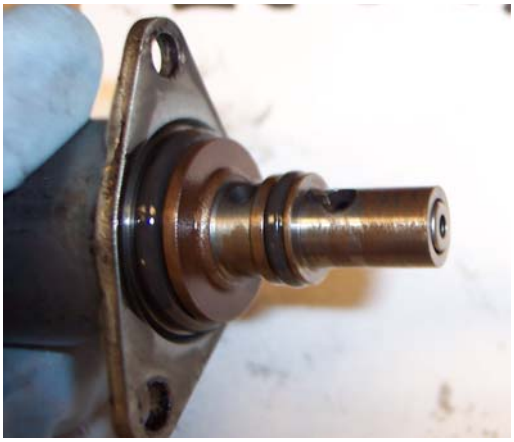
  which can ultimately cause high pressure pump failure
- Your vehicle is equipped with two fuel filters; one is mounted on top of the engine while the other is inside the HFCM.
- When draining your water separator wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.
- When draining the HFCM If No fluid (fuel or water) drain from your HFCM take it to the dealer for inspection.
- Separate the water from the fuel.

It's easier and much cheaper to replace the filters than replace the high pressure fuel system. If the water is not drained and the HFCM container is filled it has no where else to go but to the high pressure pump.

What happens if water gets into the high pressure fuel system?

Should excessive water enter the fuel system, corrosion and damage are not far behind. In many case, the entire high pressure fuel system will have to be replaced.





Excessive water in the fuel led to this corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve

This corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing developed from excessive water in fuel

What about fuel additives?

Many aftermarket fuel additives are not acceptable for use in Power Stroke Diesel engines.

- Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. Alcohol also decreases the lubricity of the fuel which can cause damage to the high pressure fuel pump. Do not use alcohol based additives to correct fuel gelling.
- The purpose of the filters is to be able to remove the water, but if chemicals are holding the water in the fuel it can not be separated.
- Dispersing/emuslfying the water carries the water through the fuel filters and water separators and right into your fuel system, exactly where you do not want it to be.

If you want to use fuel additives, only use Motorcraft additives as they are the only recommended additives and meet Ford specifications.

Ford approved additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet Ford specifications.

BIODIESEL

For any vehicle purchased before the 2011 model year, only a 5% biofuel concentration may be used. Vehicles in the 2011 model year and newer accept up to a 20% concentration. Higher than recommended concentrations can cause fuel filter restrictions that may result in a lack of power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures.

- Biodiesel should not be stored in the fuel tank for more than three months.
- Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.
-

Vehicle Parked for a long period of time: Fuel Storage

Biodiesel fuels degrade more easily than fuels not containing biodiesel and should not be stored in the fuel tank for more than 1 month &6.7) 3 months (6.4)
Diesel fuel must not be sotred in a galvanized container.

Corrosive fungus, algae and bacterial growth in secondary fuel filter housing and high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, poor quality biofuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

- The tank pick up boot can distort from non approved fuel, and cause air ingestion.
- Do not use raw or refined vegetable oil, animal fat, cooking oil or recycled greases
- Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use.
- Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper fuel is used.
- Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any circumstances.
    - Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

How To Take Care of your 6.4L Fuel System so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel. Other types of fuels and excessive water can cause the pump to fail due to lack of lubricity/cooling or aggressive chemical attack to fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

- Water and impurities can enter your tank with the fuel.
- Water does not burn, water carries oxygen and is Corrosive and it freezes.
- Water does not have the lubricant properties of diesel fuel and will corrode the high pressure fuel pump.
- Water also acts as a host to bacterial formation .

How can you prevent excessive amounts of water?

Your horizontal fuel condition module (HFCM) removes water and impurities from the fuel before it enters the high pressure pump.

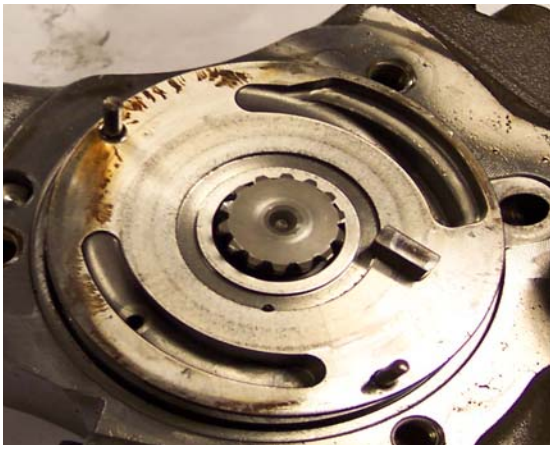
- The water separated accumulates in the HFCM reservoir. The water separation capability decreases as the filter becomes restricted with debris. The reservoir can hold approximately 100 ml of water with a WIF indication at 60 ml. If the reservoir holding capacity is exceeded, the HFCM is not drained, the water will be passed to the Engine High Pressure System.
- The HFCM must be drained once a month or when the water in fuel light illuminates.
- Fuel filters must be changed by the recommended service interval. If your filters are not changed regularly it can:
    - decrease the water separation ability
    - cause the filters to become plugged or collapsed
    - allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system

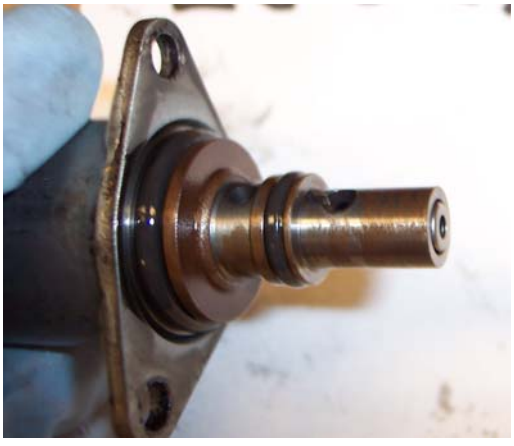
  which can ultimately cause high pressure pump failure
- Your vehicle is equipped with two fuel filters; one is mounted on top of the engine while the other is inside the HFCM.
- When draining your water separator wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.
- When draining the HFCM. If No fluid (fuel or water) drains from your HFCM take it to the dealer for inspection.

Use of good quality diesel fuel along with regular fuel filter maintenance and water draining avoids expensive Fuel Injection Equipment Damage and repair.

What happens if water gets into the high pressure fuel system?

Should excessive water enter the fuel system, corrosion and damage are not far behind. In many case, the entire high pressure fuel system will have to be replaced.





Excessive water in the fuel led to this corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve

This corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing developed from excessive water in fuel

What about fuel additives?

Many aftermarket fuel additives are not acceptable for use in Power Stroke Diesel engines.

- Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. Alcohol also decreases the lubricity of the fuel which can cause damage to the high pressure fuel pump. Do not use alcohol based additives to correct fuel gelling.
- The purpose of the filters is to be able to remove the water, but if chemicals are holding the water in the fuel it can not be separated.
- Dispersing/emulsifying the water carries the water through the fuel filters and water separators and right into your fuel system, exactly where you do not want it to be.

If you want to use fuel additives, only use Motorcraft additives as they are the only recommended additives and meet Ford specifications.

Ford approved additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet Ford specifications.

BIODIESEL

For any vehicle purchased before the 2011 model year, only a 5% biofuel concentration may be used. Vehicles in the 2011 model year and newer accept up to a 20% concentration. Higher than recommended concentrations can cause fuel filter restrictions that may result in a lack of power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures.

- Biodiesel should not be stored in the fuel tank for more than three months.
- Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.
-

Vehicle Parked for a long period of time / Fuel Storage

Biodiesel fuels degrade more easily than fuels not containing biodiesel and should not be stored in the fuel tank for more than 1 month &6.7) 3 months (6.4)
Diesel fuel must not be stored in a galvanized container.

Corrosive fungus, algae and bacterial growth in secondary fuel filter housing and high pressure pump volume control valve.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, poor quality biofuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

- The tank pick up boot can distort from non approved fuel, and cause air ingestion.
- Do not use raw or refined vegetable oil, animal fat, cooking oil or recycled greases
- Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use.
- Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper fuel is used.
- Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems and lubricity for the high pressure fuel pump. Do not blend used engine oil with diesel fuel under any circumstances.
    - Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

How To Take Care of your 6.4L Fuel System so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel. Other types of fuels and excessive water can cause the pump to fail due to lack of lubricity/cooling or aggressive chemical attack to fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

- Water and impurities can enter your tank with the fuel.
- Water does not burn, water carries oxygen and is Corrosive and it freezes.
- Water does not have the lubricant properties of diesel fuel and will corrode the high pressure fuel pump.
- Water also acts as a host to bacterial formation .

How can you prevent excessive amounts of water?

Your HFCM **fuel filter** removes water and impurities from the fuel before it enters the high pressure pump.

- The HFCM must be drained once a month and when the water in fuel light illuminates.
- Fuel filters must be changed by the recommended service interval. If your filters are not changed regularly it can:
    - decrease the water separation ability
    - cause the filters to become plugged or collapsed
    - allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system

  which can ultimately cause high pressure pump failure
- When draining the HFCM. If No fluid (fuel or water) drains from your HFCM take it to the dealer for inspection.

What about fuel additives?

Many aftermarket fuel additives are not acceptable for use in Power Stroke Diesel engines.

- Additives or alcohol/gasohol or other chemicals that cause water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. Alcohol also decreases the lubricity of the fuel which can cause damage to the high pressure fuel pump. Do not use alcohol based additives to correct fuel gelling.
- The purpose of the filters is to be able to remove the water, but if chemicals are holding the water in the fuel it can not be separated.
- Dispersing/emulsifying the water carries the water through the fuel filters and water separators and right into your fuel system, exactly where you do not want it to be.

If you want to use fuel additives, only use Motorcraft additives as they are the only recommended additives and meet Ford specifications.

The customer warranty may be void from using additives that do not meet Ford specifications.

BIODIESEL

For any vehicle purchased before the 2011 model year, only a 5% biofuel concentration may be used. Vehicles in the 2011 model year and newer accept up to a 20% concentration. Higher than recommended concentrations can cause fuel filter restrictions that may result in a lack of power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures.

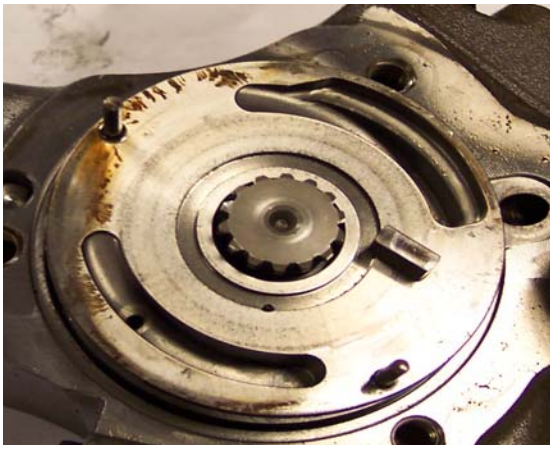
- Biodiesel should not be stored in the fuel tank for more than three months.
- Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.
-

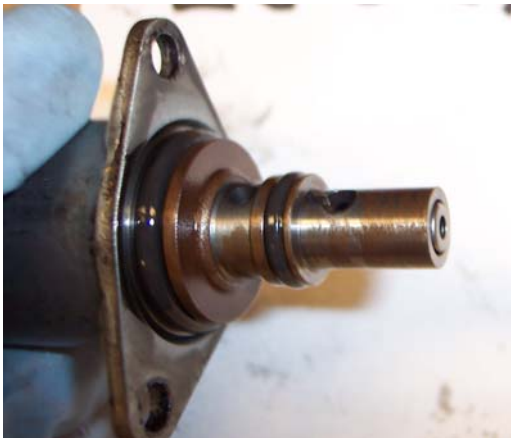
Vehicle Parked for a long period of time / Fuel Storage

Biodiesel fuels degrade more easily than fuels not containing biodiesel and should not be stored in the fuel tank for more than 1 month & 6.7) 3 months (6.4)
Diesel fuel must not be stored in a galvanized container.

What happens if water gets into the high pressure fuel system?

Should excessive water enter the fuel system, corrosion and damage are not far behind. In many case, the entire high pressure fuel system will have to be replaced.





Excessive water in the fuel led to this corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve

This corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing developed from excessive water in fuel

Corrosive fungus, algae and bacterial growth in secondary fuel filter housing and high pressure pump volume control valve.

From: Heggie, Forest (F.)
Sent: Tuesday, October 12, 2010 12:01 PM
To: Eeley, Scott (A.)
Subject: water in fuel communciation draft 10-12.doc

Attachments: water in fuel communciation draft 10-12.doc

1st draft to many words so far

water in fuel communciation dr...

How To take care of your Fuel system so It takes care of you.

Your high pressure fuel system uses diesel fuel for lubricity and cooling and is designed to use only Ultra Low Sulfur Diesel fuel containing no more than 5% biodiesel, other fuels and water can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials.

Where does water come from and What does it do to the high pressure fuel system?

Water and impurities can enter your tank with the fuel. Water does not burn, water carries oxygen is Corrosive and it freezes. It robs the engine of B.T.U.'s, and can create deposit which are extremely harmful to the engine. Water also acts as a host to bacterial formation at the site where the water molecule interfaces with a fuel molecule.

How do we get rid of water?

Your horizontal fuel condition module (HFCM) is there to remove water and impurities from the fuel before it goes to the high pressure pump. For your HFCM to remove the water from the fuel your filters need to be changed by the recommended service interval. If your filters are not changed it will decrease the water separation ability and or it can cause the filters to become plugged or collapsed and allow water/impurities to the fuel system or starve fuel flow to the high pressure fuel system causing high pressure pump falure due to low lubrication. Your vehicle is equipped with two fuel filters; one is mounted on top of the engine the other is inside the HFCM. Separate the water from the fuel. It's easier and much cheaper to replace the filters than replace the high pressure fuel system.

The HFCM needs to be drained once a month or when the water in fuel light illuminates. If the water is not drained when the HFCM container is filled it has no where else to go but to the high pressure pump. Water does not have the lubricant properties of diesel fuel and will corrode the pump. When draining your water separator do not have the engine running and wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain.

What happens if water gets into the high pressure fuel system?

If the water is not drained or if the filters are not changed or if fuel additives with water dispersants or emulsifier are used your fuel system will eventually look like this. And the whole high pressure fuel system will have to be replaced.

What about fuel additives?

Additives or alcohol/gasohol that causes water to disperse/emulsify or not be separated from the diesel fuel will damage your fuel system. The purpose of the filters is to be able to remove the water if chemicals are holding the water in the fuel it can not be separated. Dispersing/emuslfying the water sends it to your fuel system, exactly where you do not want it to be, it tries to carry the water through the filters and water separators. Do not use alcohol based additives to correct fuel gelling.

It should not be necessary to add any aftermarket additives to your fuel tank if you use diesel fuel that meets the ASTM D 975 industry specification. If you want to use a fuel additive use only recommended fuel additives meeting ford specifications, Motorcraft parts are designed to meet Ford specifications. Alcohol and other fuel do not provide enough lubricant for the high pressure fuel pump and water will cause rust and corrosion to form in your high pressure fuel system this will cause the high pressure fuel system to fail and ultimately the whole system will need to be replace.

Additives that will improve fuel cetane numbers may be used to verify/enhance fuel quality. Use Motorcraft Cetane Booster & Performance Improver, PM-22-A (U.S.) / PM-22-B (Canada) or
equivalent. The customer warranty may be void from using additives that do not meet or exceed Ford specifications.

BIODIESEL

Concentrations greater than 5% can also cause fuel filter restrictions that may result in a lack of
power and or damage to components such as fuel tank, fuel lines, fuel pump, fuel sender and fuel injectors fuel pump and fuel injector failures. Biodiesel should not be stored in the fuel tank for more than three months. Excessive Bio-diesel, poor bio-diesel fuel can cause bacterial/fungas growth, increased water content , aggressive chemical attack of fuel system material, premature fuel filter plugging and fuel starvation due to cold gelling.

What about other fuels besides Diesel or biodiesl 5%?

The high pressure fuel system uses diesel fuel for lubricity and cooling, other fuels can cause the pump to fail due to lack of lubricity/cooling aggressive chemical attack of fuel system materials. The tank pick up boot can distort with aggressive fuels, and cause air ingestion.

Do not use Raw or refined vegetable oil, animal fat, cooking oil or recycled greases should

Do not use home heating oil, agricultural fuel or any diesel fuel not intended for highway use. Damage to the fuel injection system, engine and exhaust catalyst can occur if an improper

fuel is used. Do not add gasoline, gasohol or alcohol to diesel fuel. This practice creates a serious fire hazard and engine performance problems. Do not blend used engine oil with diesel fuel under any

circumstances. Blending used oil with the fuel will significantly increase your vehicle's exhaust emissions and reduce engine life due to increased internal wear. The customer warranty may be void from using fuels that do not meet or exceed Ford specifications.

Running out of Fuel

Do not run your diesel vehicle out of fuel as this will allow air to enter the fuel system which will make restarting difficult. The engine is designed to run roughly as the fuel tank nears Empty. This is a warning

to the driver to add fuel as soon as possible. Longer engine cranking time may be required once air is in the fuel system. If air enters the fuel system (either through running the fuel tank(s) empty or during a fuel

filter change), the engine will self-purge the trapped air once it starts running.

From: Heggie, Forest (F.)
Sent: Tuesday, November 09, 2010 7:55 AM
To: Eeley, Scott (A.); Armesto, Carlos (.)
Subject: water in fuel communciation draft 11-09.doc

Attachments: water in fuel communciation draft 11-09.doc

Draft water in fuel communication.

Carlos I added a line I need you to validate - highlighted in red.

water in fuel communciation dr...

How To take care of your Fuel system so It takes care of you.

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The HFCM needs to be drained once a month or when the water in fuel light illuminates. If the water is not drained when the HFCM container is filled it has no where else to go but to the high pressure pump. Water does not have the lubricant properties of diesel fuel and will corrode the pump. When draining your water separator do not have the engine running and wait at least 10 minutes after shutting off the vehicle for the pressure to equalize in order for the water to drain. When draining the HFCm you should get approximately 1 liter (1 quart) of liquid (fuel and water) If No fluid (fuel or water) drain from your HFCM take it to the dealer for inspection.

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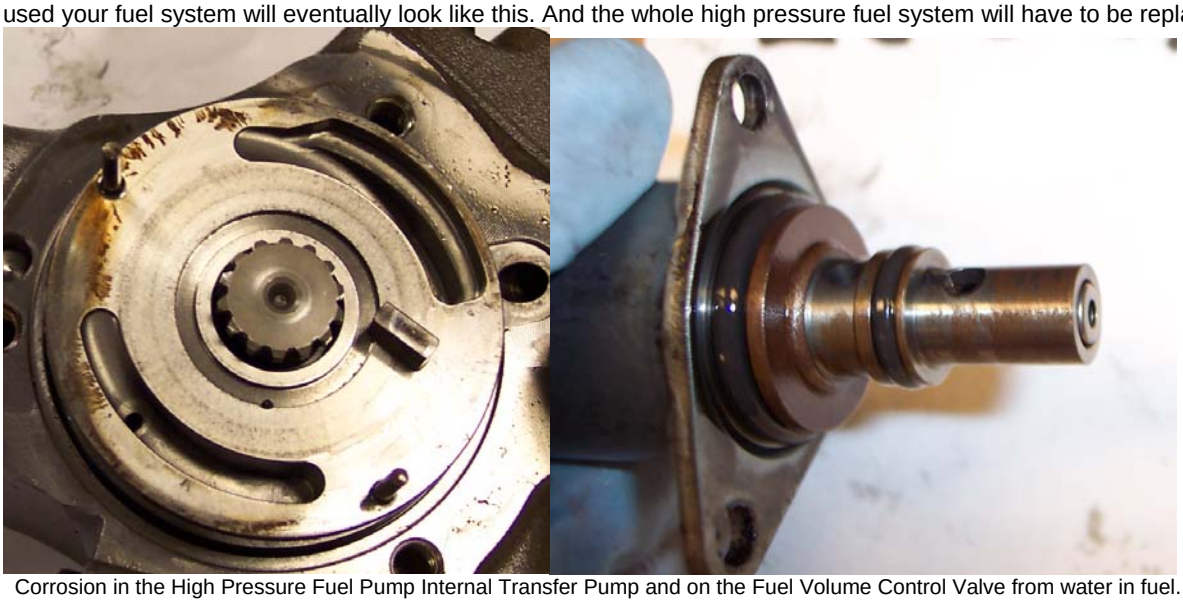

Corrosion in the High Pressure Fuel Pump Internal Transfer Pump and on the Fuel Volume Control Valve from water in fuel.


Corrosion in the High Pressure Fuel Pump internal transfer Pump and Secondary Fuel Filter Housing from water in fuel

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Corrosion fungus and algae growth in secondary fuel filter housing, corrosion bacterial growth on high pressure pump volume control valve.

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filter change), the engine will self-purge the trapped air once it starts running.

From: Eastman, David (D.L.)
Sent: Thursday, October 21, 2004 12:59 PM
To: Harrison, Mike (M.J.)
Cc: Fulton, Brien (B.L.)
Subject: Water in Fuel Effects Paper

Attachments: water in fuel.doc

Mike,

Sorry this is a day later than committed but here's what I came up with for your review and comments.

water in fuel.doc

Bosch may have some pictures to share with me but everyone's in Germany for the next two weeks so these may have to wait. If we feel these are needed I'll press them to send what they can.

Dave Eastman

Diesel Fuel Injection Systems
Rotunda Court 2, cube P49
deastman@ford.com
phone: 313 24-88870

WATER IN DIESEL FUEL – EFFECTS ON FUEL INJECTION EQUIPMENT

Effects of Water on FIE Components

- Corrosion on close tolerance steel injector and pump components, causing accelerated wear and potentially plugging of nozzle spray holes
- Water displaces surface fuel film used to lubricate sliding injector and pump components, causing accelerated wear
- In extreme cases water can collect in the nozzle sac and spray holes, cracking the nozzle tip if it freezes

Sources of Water in Diesel Fuel

- Water can be carried in a fuel supply either separated (fuel rises to the surface) or emulsified in the fuel (some natural content and/or mixing during fuel transfer)
- Water is commonly condensed out on partially filled diesel tank inner surfaces during temperature changes, and the water settles to the bottom of the tank
- Diesel fuel has hygroscopic properties; that is, it can absorb water vapor directly from the air

U.S. vs. European Diesel Fuel Handling

- U.S. diesel fuel standards (ASTM D975) allow up to 500 ppm water content in the fuel; European specifications (EN590) allow 200 ppm max.
- More variation in U.S. consumer fuel sources and fuel quality vs. European markets – high volume truck stops vs. low volume neighborhood gas stations equipped w/ diesel, use of off-road diesel fuel by some customers etc.

Warranty

- If corrosion was found to be failure mode in one component, entire system (all injectors, pump, rails and lines) would require replacement – major warranty expense as cost of FIE approaches 50% of the overall engine cost in general