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Coding Information

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Title: A26 and S13 Fuel Gelling

Applies To: Vehicles equipped with A26 and S13 engines

CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

01/23/2024 - Added DTC and filter part number reference for S13
 10/23/2023 - Removed DTC 641-XX reference, added S13 to the title
 01/03/2020 - Added information on the possible cluster message to run winter fuel or additive
 09/27/2019 - Feedback response on the use of Bio Diesel
 05/17/2019 - Added link to Racor FWS conversion IK1500098

DESCRIPTION

This document will guide the user through the steps that need to be followed if a fuel gelling condition is experienced. One common place that gelling can occur (but not limited to), is the frame mounted Davco 382 or similar fuel water separator.

SYMPTOM(s)

Loss of power while driving, possible crank no start.

Possible Diagnostic Trouble Code(s) that may be present if gelling has occurred:

DTC/Light	Description
SPN 94 FMI 17	Fuel Delivery Pressure: Data Valid But Below Normal Operating Range (S13)
SPN 157 FMI 1	Engine Fuel 1 Injector Metering Rail 1 Pressure Most Severe
SPN 157 FMI 18	Engine Fuel 1 Injector Metering Rail 1 Pressure Moderate
SPN 2798 FMI 8	Engine Fuel 1 Injector Group 2 : Abnormal Frequency Or Pulse Width Or Period
SPN 6653 FMI 18	Engine Fuel 1 Injector Metering Rail 1 Cold Start Pressure : Data Valid But Below
SPN 132 FMI 21	Engine Intake Air Mass Flow Rate: Data Drifted Low.
SPN 3251 FMI 15	Aftertreatment 1 Diesel Particulate Filter Differential Pressure : Data Valid But Above Normal Operating Range - Least Severe Level.
SPN 3482 FMI 7	Aftertreatment 1 Fuel Enable Actuator : Mechanical System Not Responding Or Out Of Adjustment.

Possible Customer Observations or Concerns

- MIL Lamp
- Crank No Start
- Loss of Power
- High Soot Loading
- Frequent Regens

SERVICE PARTS INFORMATION

Description	Part Number	Quantity Required	Notes
A26 Davco 382 Primary Fuel Filter Element	FS19765	1	25 Micron Rating
A26 Racor Std Primary Fuel Filter Element (If Equipped)	2611236C1	1	30 Micron Rating
A26 Racor 6600 Primary Fuel Filter Element (If Equipped)	4040481C1	1	30 Micron Rating
A26 Secondary Engine Mounted Fuel Filter Kit	2517615C91	1	5 Micron Rating
S13 Secondary Engine Mounted Fuel Filter Kit	2523702C91	1	4 Micron Rating
S13 Racor 6600 Primary Fuel Filter Element (If Equipped)	4169395C1	1	7 Micron Rating
S13 Davco 388 Primary Fuel Filter Element	FS20194	1	10 Micron Rating
Diesel Fuel System De-Icer (Recommended)	Fleetrite FLTDG32	As Needed	32oz. bottle used for emergency thaw only . Treats up to 30 gallons when de-icing.
Diesel Fuel Anti-Gel (Recommended)	Fleetrite FLTDAG20	As Needed	20oz. bottle prevents gelling to -40° F. Treats up to 125 gallons of fuel.
PEAK Brand De-Icer (Optional)	PKET32C	As Needed	32oz. bottle used for emergency thaw only .
PEAK Brand Anti-Gel (Optional)	PKDAG32	As Needed	32oz. bottle treats up to 160 gallons of fuel.

CAUTION:

Always follow the De-Icer and Anti-Gel mixing instructions on the bottle EXACTLY as outlined by the manufacturer.

DIAGNOSTIC STEP(s)

WARNING! To prevent property damage, personal injury, and / or death, park vehicle on a hard, flat surface, turn the engine off, set the parking brake, and install wheel chocks to prevent the vehicle from moving in either direction.

WARNING! To prevent property damage, personal injury, and / or death, if the vehicle must be raised, do not work under the vehicle supported only by jacks. Jacks can slip or fall over.

WARNING! To prevent personal injury and / or death, always wear safe eye protection when performing vehicle maintenance.

WARNING! To prevent property damage, personal injury, and / or death, keep flames or sparks away from vehicle and do not smoke while servicing the vehicle's batteries. Batteries expel explosive gases.

WARNING! To prevent property damage, personal injury, and / or death, remove the ground cable from the negative terminal of the battery box before disconnecting any electrical components. Always connect the ground cable last.


FUEL TYPES

Below is a listing of the most common diesel fuels used in on-highway truck engines.

- Diesel #2 (2-D) - Most common fuel used, also known as "summer fuel". It is a heavier distillate fuel than 1-D. Recommend treating with Anti-Gel at temperatures below freezing.
- Diesel #1 (1-D) - This is a kerosene like or lighter distillate fuel, and has a lower wax content. Used in applications running in extreme cold.
- BioDiesel - Typically a blend from 5 to 20% Bio (produced from organic materials such as vegetable oil) and conventional diesel fuel.
- Winter Blend - Typically a blend of #1 and #2 fuels to help reduce (not eliminate) the risk of gelling.

NOTE:

Fuel blends can vary wildly depending on geographic location. Consult with your fuel supplier for details on the fuel blend they are providing, and treat accordingly.

Step	Action	Decision
1	<p>DIAGNOSTIC: What is Gelling?</p> <p>The gel point is the temperature at which diesel or biodiesel fuel freezes solid and can no longer flow by gravity or be pumped through fuel lines. This phenomenon happens when a fuel reaches a low enough temperature whereby enough wax crystals have formed to prevent any flow of the fuel.</p> <p>Different stages of Gelling:</p> 	<p>Yes. Continue to Step 2</p> <hr/> <p>No. Return to fuel sytem diagnostics.</p>


	Does this vehicle exhibit this condition?	
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Step	Action	Decision
2	<p>DIAGNOSTIC: Visual Inspection</p> <p>To confirm the condition of the fuel in the tank, a sample will be needed to see its current state. Using the device of your choice, take a sample directly from the tank and put it in a clear container. Do not pull the sample from the bottom of the tank.</p> <p>What is the condition of the fuel?</p>	<p>1. Is the fuel frozen? Reference picture 2 and 3 above.</p> <p>Continue to step 3</p>
		<p>2. Is the fuel Cloudy? Reference right side picture 2 above.</p> <p>Continue to step 4</p>

Step	Action	Decision
3	<p>DIAGNOSTIC: Frozen Fuel</p> <p>To repair a frozen fuel condition, a De-Icer will need to be added to the fuel system and both fuel filters replaced. Follow the manufacturers guidelines of the De-Icer for correct procedure.</p> <p>Note: De-Icer seperates water from diesel fuel, this water will be trapped by the fuel water seperator. Its important to replace fuel filters and drain the separator daily to prevent water accumulation.</p>	<p>1. Continue to Step 5</p>

Step	Action	Decision
4	<p>DIAGNOSTIC: Cloudy Fuel</p> <p>Add Anti-Gel per the manufacturers guidelines, and replace both fuel filters.</p> <p>NOTE: Follow the Anti Gel manufacturers instructions closely for correct mixing with fuel. Do not over concentrate.</p>	<p>1. Continue to step 5</p>

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Step	Action	Decision
5	<p>DIAGNOSTIC: Options to Prevent Recurrence</p> <p>Depending on the operation conditions of the vehicle, different components and treatments are available to help prevent fuel from gelling. The following are some recommendations.</p> <p><u>Operating Temperatures at or below 32° F:</u></p> <ul style="list-style-type: none"> • Use an Anti-Gel additive (See service parts section). • Consider using a "winter blend" fuel (See fuel types section above). • Educate the driver to use the type of fuel that is correctly blended for the operating climate. • Drain water separator frequently. • If equipped, use the 120v block and fuel heaters when possible. • Install a primary Fuel Water Separator equipped with a thermostatically controlled fuel blending valve such as the Racor GreenMax** • At 16° F. or below some vehicles will display a message in the cluster advising to use a winter fuel or additive. Do not ignore this warning and see JK0800585 for more information on this message. <div style="text-align: center; margin: 10px 0;">  </div> <p><u>Operating Temperatures at or below 15° F:</u></p> <ul style="list-style-type: none"> • Use a "winter blend" fuel with Anti-Gel additive. • Winter Front - Recommended at 15° F or below, see JK1201009. • Install a primary Fuel Water Separator equipped with a thermostatically controlled fuel blending valve such as the Racor GreenMax** • Artic Fox Tank Heater. <p><u>Fuel System Treatment (See Service Parts Section):</u></p> <ul style="list-style-type: none"> • Anti Gel - Recommend treating fuel with Anti-Gel if operating below 32° F. • De-Icer - To be used ONLY in removing gelled fuel from systems already frozen. Not recommended to use as a routine additive. <p>**Instructions to convert the Davco 382 primary fuel water separator to the Racor GreenMax filter system with fuel blending valve can be found in JK1500098.</p>	<p>1. Continue to step 6</p>

Step	Action	Decision
6	<p>DIAGNOSTIC: Test After Repair</p> <p>Once the fuel system has been thawed or treated and repairs are complete, it is recommended to verify that no further concerns are present prior to releasing the truck back to service. This should be done by performing a stationary regen and reviewing the results with a service tool. Many times the ability to regen and engine performance are both effected by gelled fuel. Doing this procedure is the best way to determine if any further issues exist.</p> <p>If any DTC's are noted, follow the appropriate FCAP and make repairs as needed.</p>	

OTHER RESOURCES

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