General Service Bulletin (GSB):	**6.4L Oil Cooler Service Tips**
This GSB will assist in diagnosing the root cause of an oil cooler performance concern.	Some 6.4L oil coolers become restricted after replacement due to improper inspection prior to replacement and/or improper flushing of the cooling system.
NOTE: This information is not intended to replace or supersede any warranty, parts and service policy, Work Shop Manual (WSM) procedures or technical training or wiring diagram information.	

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Issue: Oil cooler restriction due to debris, rust, or scale in the cooling system: *(Figure 1)*

- Typically the result of issues within the:
  - EGR cooler
  - Radiator
  - Heater core
  - Engine block
- Buildup within the components can break free and migrate to the oil cooler causing it to become restricted. (*Figure 2)*
- If accumulated buildup is severe, the Cooling System Flushing procedure may not completely remove the buildup.
- Each of the components listed above must be inspected to ensure cleanliness.

Figure 1. Restricted internal oil cooler passages

Figure 2. Scale buildup inside oil cooler

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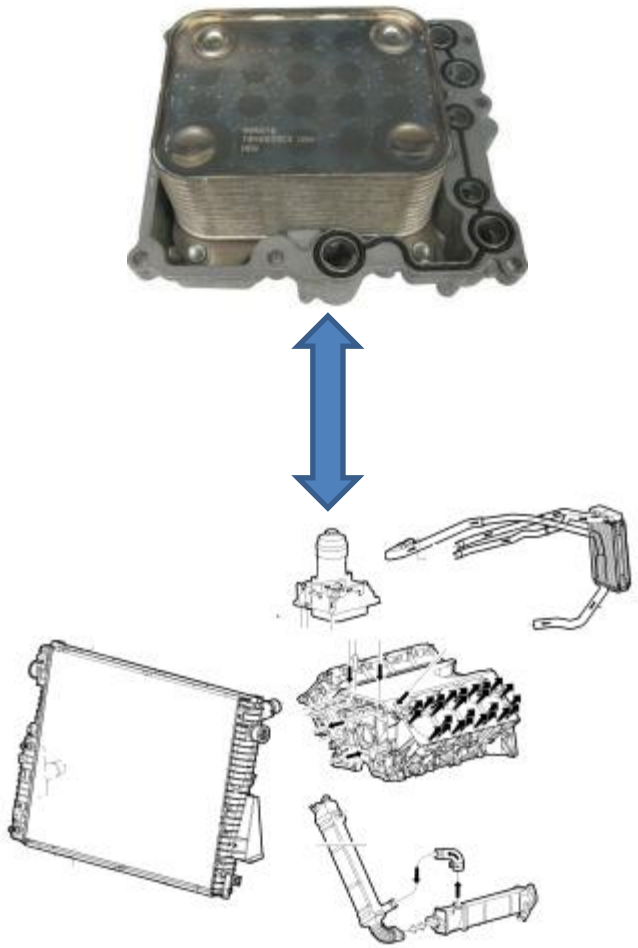
Additional information:

- Evaluation of returned 6.4L oil coolers indicates that internal restrictions due to debris, scale, or rust are a major contributor to repeat oil cooler failures, and DTC P012F (Engine Coolant Temperature/Engine Oil Temperature Correlation) occurrences.
- As coolant circulates through the engine and heat exchangers (EGR coolers, radiator, heater core, etc.), any debris, scale, rust, or contamination can become lodged in the oil cooler. As the oil cooler becomes restricted, the coolant flow through the cooler will be reduced, resulting in a drop in efficiency and an increase in the oil temperature, causing DTC P012F to set.
- When a repeat oil cooler failure is identified, it is likely one of the remaining heat exchangers, or the engine block has harbored debris, rust, or scale allowing it to circulate through the cooling system. Since the coolant passages are significantly smaller in the oil cooler than other coolers, debris more easily becomes lodged within the oil cooler.



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Diagnostics: If the oil cooler exhibits repeat concerns after flushing the cooling system, and/or replacement of the cooler, additional inspections should be made of the EGR coolers, engine block, radiator, and heater core.

- Inspect the internal coolant passages of the block. This can be performed when the block plugs are removed during the Cooling System Flushing procedure. Refer to WSM, Section 303-03. Note: This step may require the use of a borescope. *(Figure 3)*

- When performing the flush procedures, capture a sample of the flush drain water in a clear jar and inspect for any rust, scale, sediment, or debris.

- Once flushing is completed, re-inspect the block. If the block appears clear and contamination is still identified during flushing, the remaining cooling system components will require inspection using similar methods to the block inspection.

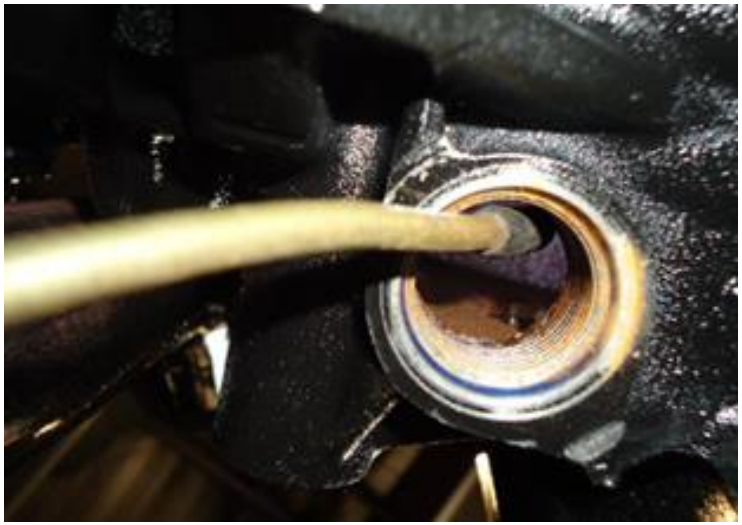

Figure 3: Inspection through block drain using flexible borescope.

- If contamination is identified within the coolers and flushing procedures are unsuccessful, it will be necessary to replace the affected component(s).

- All contaminants within the cooling system must be removed prior to proceeding with installation of a new oil cooler.

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Helpful Tips:

- To achieve the best results in removal of any cooling system rust, scale, dirt, or debris, it is critical the flushing procedures in WSM, Section 303-03 are performed as directed. The procedures have been optimized to ensure the system contents are drained completely. Many dealerships utilize an aftermarket flushing machine which may not completely remove the original coolant, or contamination from the cooling system.

- If a visual inspection of the coolers does not indicate evidence of rust, scale, or debris, completely drain the coolers and allow them to dry overnight. Then tap the coolers over a clean surface while monitoring for any materials to fall out. If an issue is identified, the affected cooler(s) will require replacement.

- The quality of water and coolant used is crucial to cooling system health. Subpar water, coolant, or an incorrect mixture may result in additional issues within the cooling system. For more information, please review the 6.0L & 6.4L Diesel Coolant Health video located under the Service Tips tab on PTS.

- When refilling the cooling system with new coolant, verify that Motorcraft® Gold Antifreeze/Coolant Concentrated VC-7-B (US); CVC-7-B2 (Canada) is used. Not all coolants contain a nitrite additive package. Failure to have nitrite in the cooling system may result in major corrosive damage to the engine cooling system components.

- Fill the cooling system with low hardness, low chlorine water. Tap water which is verified with Rotunda Water Test Strip 5 Pack 328-00007, or equivalent, is acceptable. Alternatively, water that is de-ionized, distilled, or treated by reverse osmosis, may also be used.