General Service Bulletin (GSB):	Gasoline Engine oil and coolant leaks at the turbocharger
GSB Overview:	This bulletin provides information on diagnosing gasoline engine oil and coolant leaks at the turbocharger
NOTE: This information is not intended to replace or supersede any warranty, parts and service policy. Work Shop Manual (WSM) procedures or technical	

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.

READ THIS TO HELP PREVENT NON-WARRANTABLE REPAIRS



BEFORE REPLACING GASOLINE ENGINE TURBOCHARGERS FOR OIL OR COOLANT LEAKS

 $\mbox{GSB}-\mbox{Gas}$ Engine Oil or Coolant Leak at the Turbocharger V 1.0

Ford Motor Company Printed Copies Uncontrolled June 2018 Page **1** of **6** This GSB includes information on the following topics:

- Diagnosing oil leaks where oil is observed on the external surfaces of the turbocharger.
- Diagnosing coolant leaks where coolant is observed on the external surfaces of the turbocharger.
- Acceptable locations for oil or coolant on the internal surfaces of the turbocharger.

Please reference the following sections within the Workshop Manual for complete information on oil and coolant leak diagnostics; (sections 303-03 and 303-04 are engine specific)

- 303-00 Engine System / General Information / Diagnosis and Testing
- 303-03 Engine Cooling / Diagnosis and Testing
- 303-04 Fuel Charging and Controls Turbocharger / Diagnosis and Testing

These are two key notes from the Workshop Manual that pertain to this topic.

NOTE: The turbocharger oil supply tube is located on the top of the turbocharger. Many leaks from the turbocharger oil supply tube will look like they are turbocharger oil leaks, as the oil will accumulate in the v-band and drip off the bottom of the turbocharger. After replacing the turbocharger oil supply tube, clean the outside of the turbocharger, to avoid false diagnosis of a leaking turbocharger.

NOTE: It is normal for a small amount of combustion gas to pass into the crankcase. This gas is scavenged into the air intake system through the PCV system, which incorporates a crankcase vent oil separator. Some engine oil, in the form of a vapor is carried into the air intake system with the blow-by gases (this engine oil also contributes to valve seat durability). This means that oil will collect inside the air intake components and the turbocharger. This is not an indication that the turbocharger oil seal has failed. The turbocharger oil seal will generally not fail unless the bearings fail first, which will cause the turbocharger to become noisy or seize. Do not install a new turbocharger due to oil inside the turbocharger or the air intake components. If a leak is detected in the oil supply or return tubes or connections, locate and rectify the source. Do not install a new turbocharger due to an oil leak.

Overview of observed oil / coolant on external surfaces of a gasoline engine turbocharger:

- Oil and coolant may be observed on the external surfaces of turbochargers. This is <u>NOT</u> an indication of a faulty turbocharger.
- Staining or wet oil / coolant dripping may be present on the lower point of the turbocharger v-band.



- Oil and coolant on the external surfaces of the turbocharger may come from several sources
 - o Turbo oil feed/drain line joints
 - o Turbo coolant drain/feed line joints
 - Engine oil fill port drips
 - o Other engine sealing leaks above the turbocharger

• Any oil / coolant leaks from turbo connections / areas higher on the engine can be funneled through the vband making it look like the turbo itself is leaking. This is <u>NOT</u> an indication of a faulty turbocharger.



(Oil/Coolant Catch Basin)





Oil/Coolant may fill the trough created by the inside of the V-Band (circled) from other sources and spill over at the lowest point. This can create the false appearance that the turbocharger is leaking (example of typical staining).

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Ford Motor Company Printed Copies Uncontrolled • Oil with dye in it may appear under black light on the turbocharger as a bright yellow mark. The photo below shows a typical indication of oil on the external surface of the turbocharger from an oil feed line leak. This is <u>NOT</u> an indication of a faulty turbocharger.



Same location on turbocharger under black light (upper left) and under normal light (lower right) circled in blue.



Actions:

• Do <u>NOT</u> replace gasoline engine turbochargers for oil or coolant leaks without first following the appropriate diagnostic procedures within the Workshop Manual.

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Overview of acceptable locations for oil or coolant on the internal surfaces of a gasoline engine turbocharger:

- A film of oil in the turbine or compressor housing is a normal byproduct of engine operation.
- Staining or wet oil / coolant drips may be present in the turbine outlet, compressor inlet, and compressor outlet.
- All these conditions are normal in a turbocharged engine and are **<u>NOT</u>** an indication of a faulty turbocharger.



Oil film / staining in turbine housing outlet to catalyst



Oil film / staining in compressor housing inlet from fresh air tube



Oil film / staining in compressor housing outlet to high pressure tube

Actions:

• Do <u>NOT</u> replace gasoline engine turbochargers for oil or coolant leaks without first following the appropriate diagnostic procedures within the Workshop Manual.

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