

**FORD 6F35****TRANSMISSION OVERTEMP CONDITION**

**COMPLAINT:** A Ford vehicle equipped with the 6F35 transmission comes back with a complaint of the transmission operating in an over temperature condition. This is verified by the repair shop by reading the transmission temperature on the scan tool and verifying that reading by the use of an infra red temperature sensing tool. At the time of transmission repairs, the cooler was flushed and seemed to have adequate flow, however a current check of cooler flow indicates it is not adequate.

**CAUSE:** The 6F35 transmission cooling system is complicated both by design and variations among the various models that use this transmission. Using the Ford Fusion as an example, figure 1 shows the 1.5 liter Eco-Boost 6F35 cooling system. There are two heat exchangers as well as a cooler bypass valve any of which could restrict cooler flow.

Figure 2 shows the 2.0 liter Eco-Boost 6F35 cooling system which contains a heat exchanger, a cooler bypass valve and an oil to air cooler, once again anyone of these components have the ability to restrict cooler flow when not operating properly.

The 6F35 cooling system shown in figure 3 is used with the 2.5 liter Eco-Boost and contains a heat exchanger and a cooler bypass valve.

Notice with the 1.5L Eco-Boost, the Heat Exchanger mounted on a bracket that bolts down to the transmission is the first to receive the fluid coming out of the transmission to be cooled. This means, it will be the first component in the cooling circuit to be compromised with contaminated fluid. All types of particulates will get trapped in the tightly mesh webbing as seen in the cutaway provided in figure 4. If this is not "properly flushed" or replaced, overheating of the fluid will certainly occur along with a lack of cooler flow lubricating the internal components of the transmission. And as you can see with the 1.5L Eco Boost in figure 1, there are two of these heat exchangers in the cooling circuit.

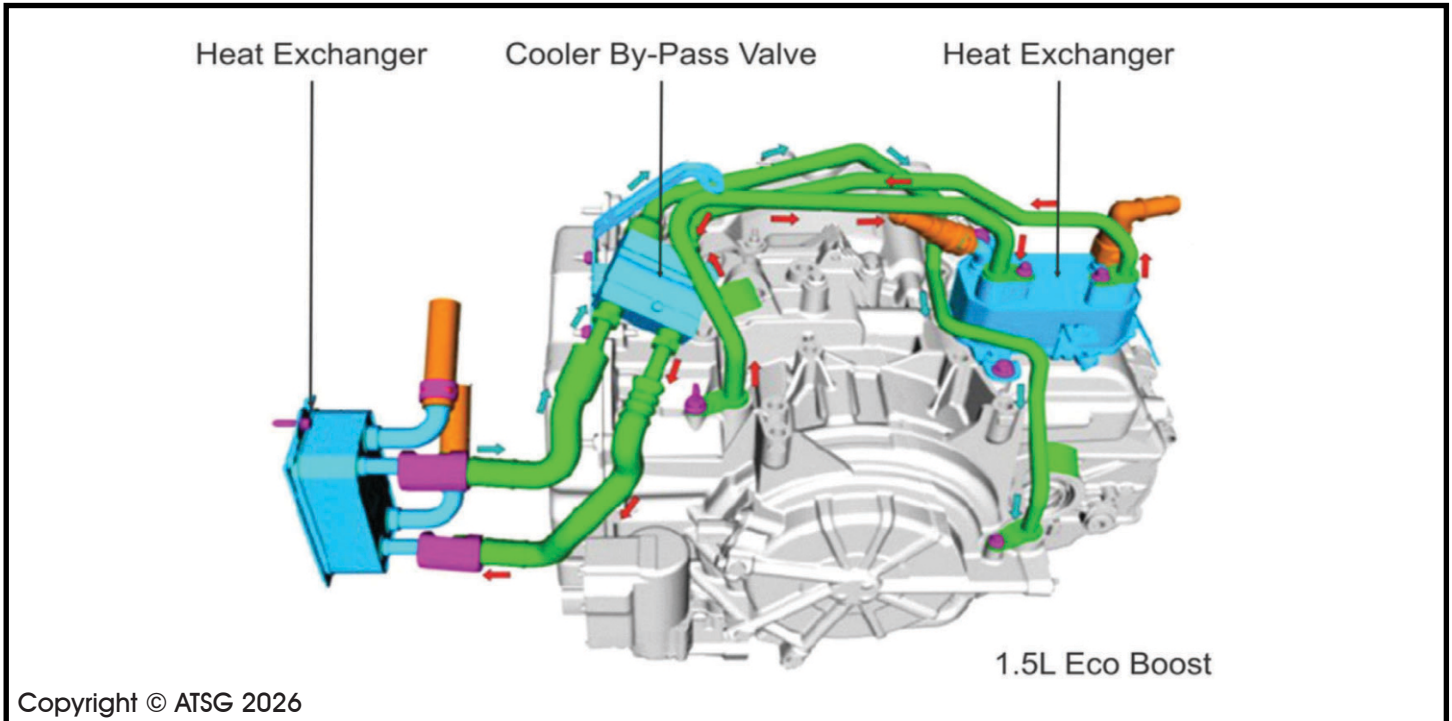
The other component for concern is the cooler bypass valve fitted to all second generation transmissions. This assembly is mounted within the cooling lines and its location varies with model of vehicle. This cooler bypass assembly fails miserably and should always be replaced during an overhaul. They are inexpensive to replace saving you from expensive warranty work. Figure 5 shows the thermal bypass valve pulled out of its aluminum housing. If this valve fails to open when it reaches 140°F (60°C) the transmission fluid will not be allowed to flow through the cooler resulting in catastrophic damage. Notice how dark the fluid is that poured out of this bypass assembly. This is what you will find yet locate nothing wrong with the torque converter or frictions. The fluid quickly deteriorates due to it not being cooled correctly which will lead to shifting issues and eventual transmission failure

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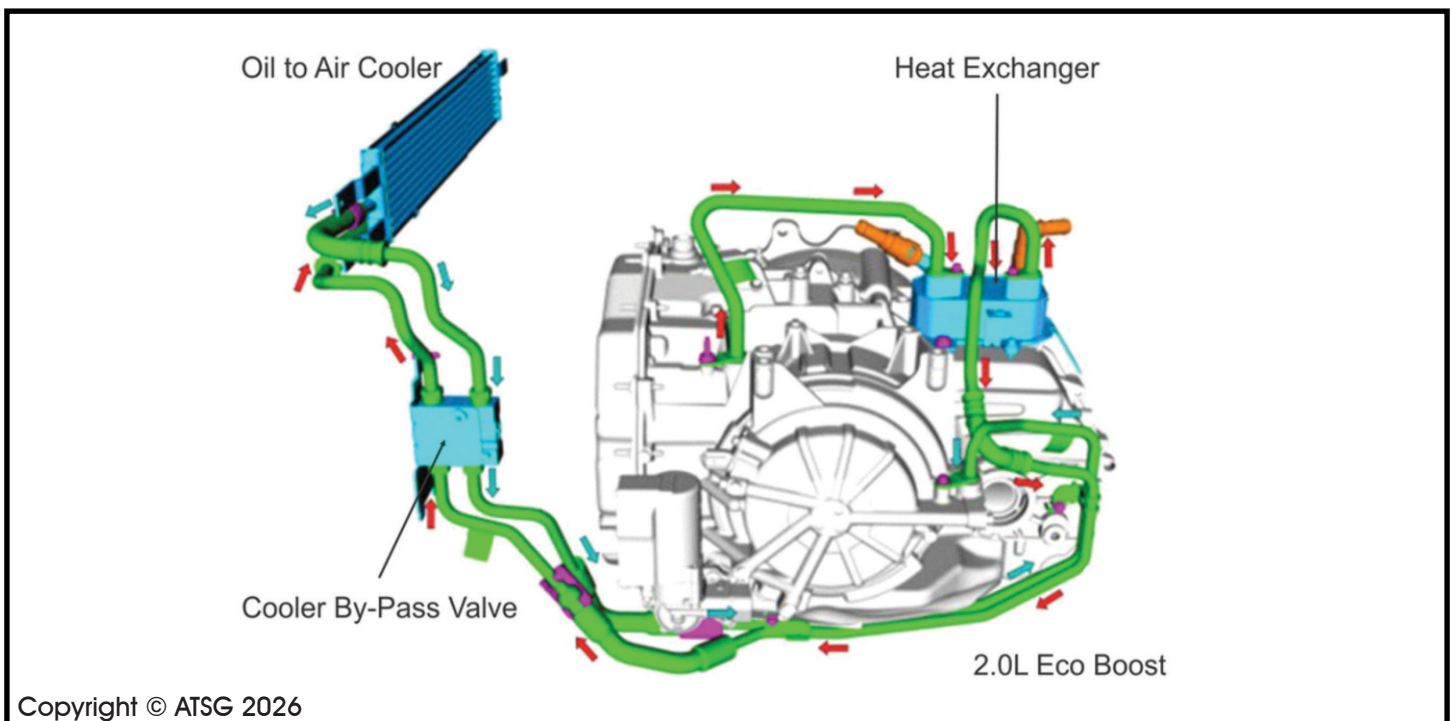
**CAUSE**  
**CONTINUED:** Some applications use a transmission fluid cooler “coolant” control valve and a fluid heater “coolant” control valve as seen in figure 6. Notice that the word “coolant” is in quotation marks. That is to catch your attention purposely. These control valves regulate the flow of engine coolant to the heat exchanger. If these valves malfunction, they will compromise the cooling of the transmission fluid by not allowing proper flow of coolant to pass through the heat exchanger.

**CORRECTION:** It is of the utmost importance that cooler flow is checked when the transmission is at normal operating temperature and that transmission temperature remains normal. Utilize the necessary equipment to verify this such as flow meters, infra red temperature sensing devices and the scan tool. Some of these systems coolers and heat exchangers do not flush well especially when there was a great deal of contamination. The decision should be made at this time as to whether the cooler or heat exchanger should be replaced. Cooler bypass valves should be replaced with new thermal elements or employ the use of one of the aftermarket solutions that eliminate the original equipment valve. Ensure that the engine cooling system is functioning properly and that the coolant control valve is operating normally. The cooling system seen in figure 7 for the Transit Connect with 2.5 Liter engine has two coolant control valves and is designed with an active transmission warm up function. Transmission fluid continuously flows through the oil-to-water heat exchanger. Two engine coolant control valves direct engine coolant to the transmission fluid heat exchanger. When the transmission fluid is below operating temperature, the transmission fluid heater coolant control valve will direct coolant from the engine to the heat exchanger to warm the transmission fluid. When the transmission fluid is above operating temperature, the transmission fluid cooler coolant control valve will direct coolant from the radiator to the heat exchanger to cool the transmission fluid. These two operating states maintain the transmission fluid at operating temperature.

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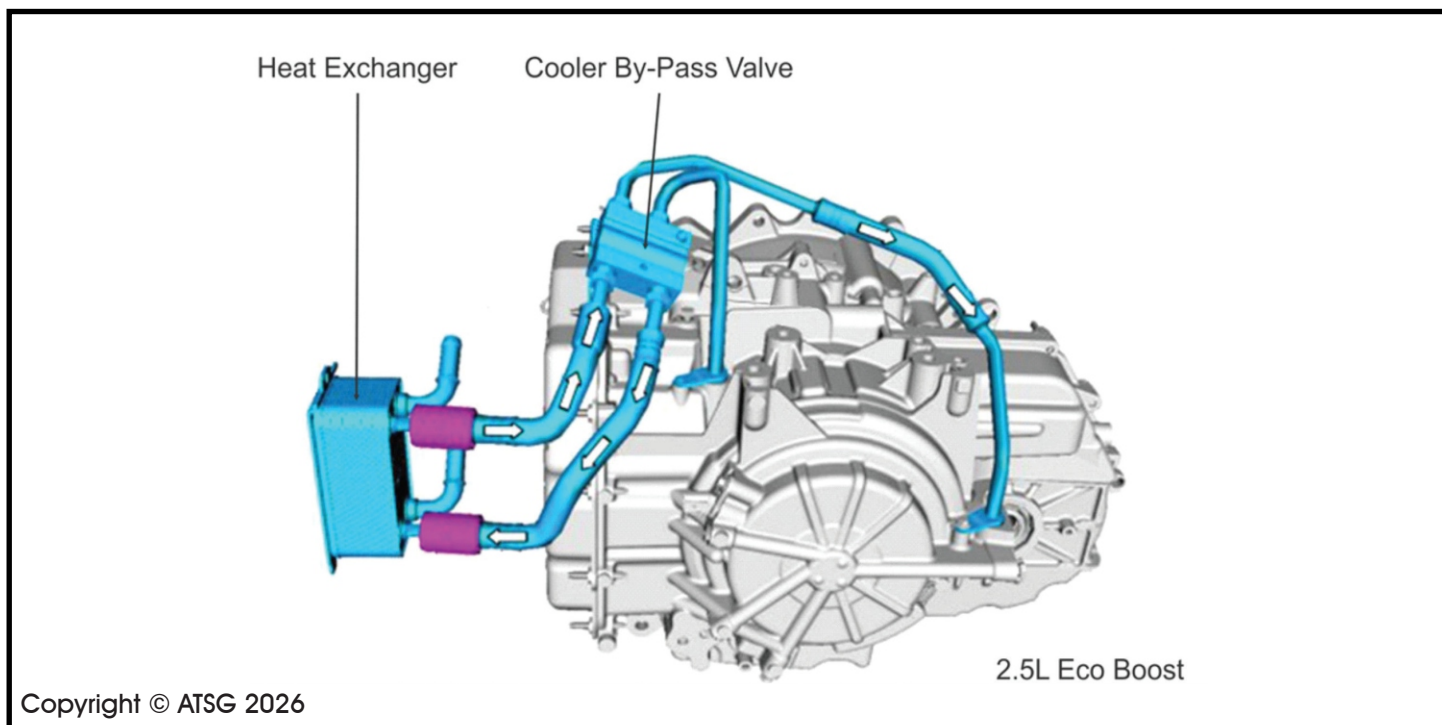


**Figure 1**



**Figure 2**

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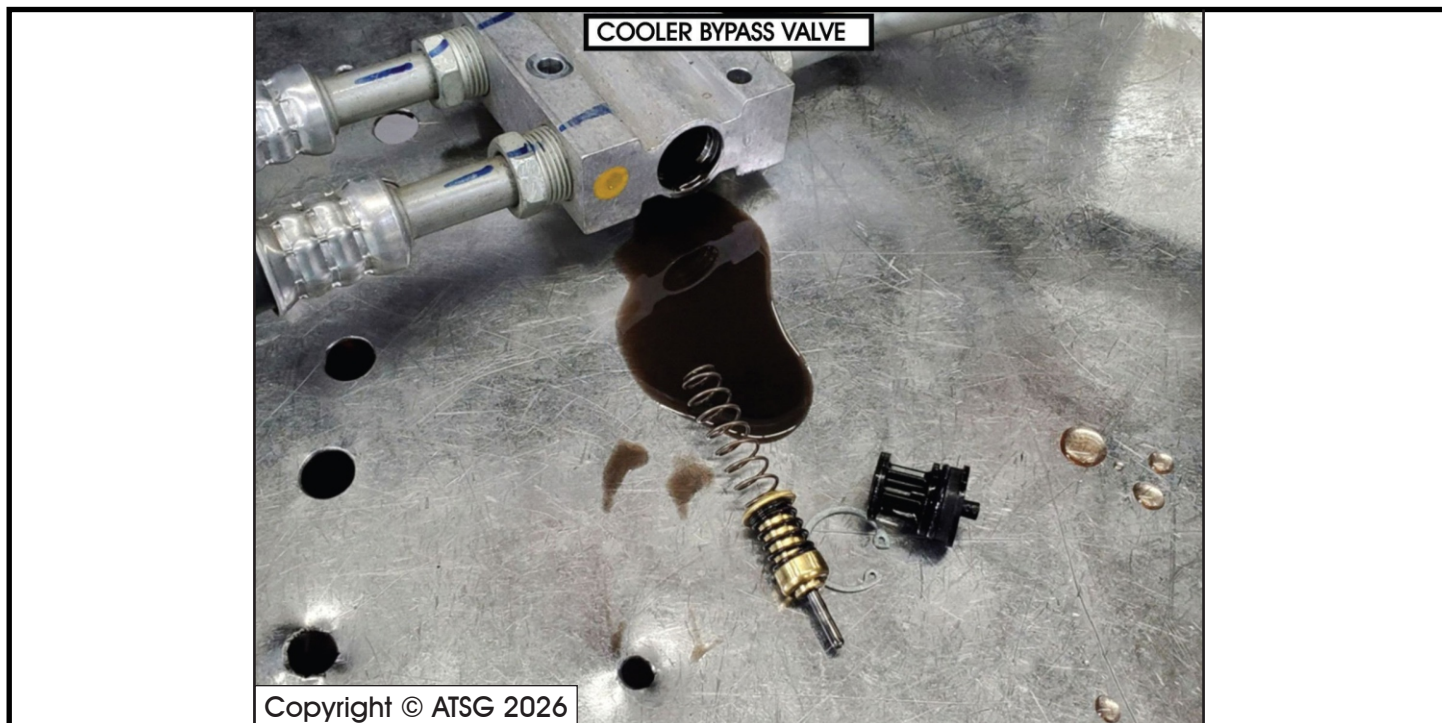
**Figure 3**



**Figure 4**



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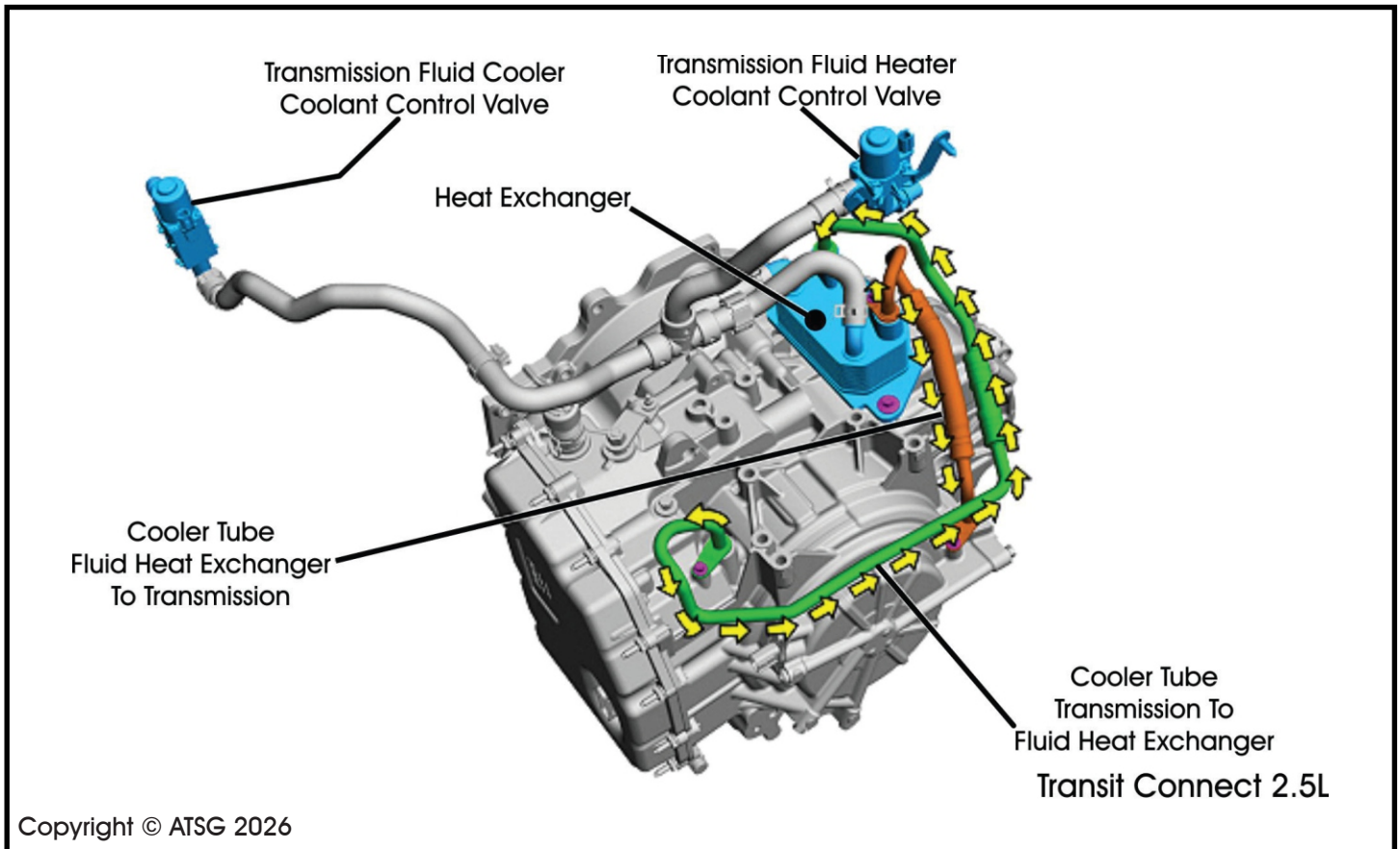


**Figure 5**



**Figure 6**

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**Figure 7**