



Technical Service Information

JEEP/NAG1 TRANSMISSION OVERHEAT

COMPLAINT: Jeep Grand Cherokee with a NAG1 transmission develops an illuminating transmission over-temperature light on the dash. The temperature sensor is part of the conductor plate inside the transmission (Figure 1).

This sensor is wired in series with the transmission Park/Neutral switch. The Transmission Control Module (TCM) expects to see a valid voltage level from the sensor when the shifter is in Reverse or any forward Drive position. The TCM also expects to see an open circuit condition when the shifter is in the Park or Neutral position.

As an attempt to resolve the problem the conductor plate was exchanged with a new one yet the overheat problem persists and the light continues to come on.

The instrument cluster will turn this dot matrix Organic Light Emitting Diode (OLED) light on in the dash once a command to do so is received from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

This command will be given any time the fluid temperature is 135 °C (275 °F) or higher at which time the transmission over-temperature indicator will be illuminated and a single chime tone is sounded. The indicator remains illuminated until the cluster receives a lamp-OFF message from the PCM, or until the ignition switch is turned to the OFF position, whichever occurs first. The chime tone feature will only repeat during the same ignition cycle if the indicator is cycled OFF and then ON again by the appropriate lamp-ON and lamp-OFF messages from the PCM.

The PCM continually monitors the transmission temperature sensor to determine the transmission operating condition. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC). If the instrument cluster illuminates the transmission over-temperature indicator due to a high transmission oil temperature condition, it may indicate that the transmission or the transmission cooling system are being overloaded or that they require service.

CAUSE: One cause may be a malfunctioning thermal by-pass valve assembly located in the cooling lines between the transmission and cooler (See Figure 2). This thermal-bypass valve prevents transmission fluid from reaching the cooler when temperatures are below 160 °F. Once temperature rises above 160 °F the thermal valve changes position causing the fluid to be directed to the cooler (See Figure 3).

When this thermal valve malfunctions, it no longer directs the fluid to the cooler causing the fluid temperature to rise above normal triggering the transmission over-temperature message to be displayed in the dash.

CORRECTION: Replace the Thermal By-Pass Valve Assembly

SERVICE INFORMATION:

Thermal By-Pass Valve Assembly.....1-55111005AC

Many thanks to Brad Toler from Dixie Motor Company

Technical Service Information

JEEP/NAG1

TRANSMISSION OVERHEAT

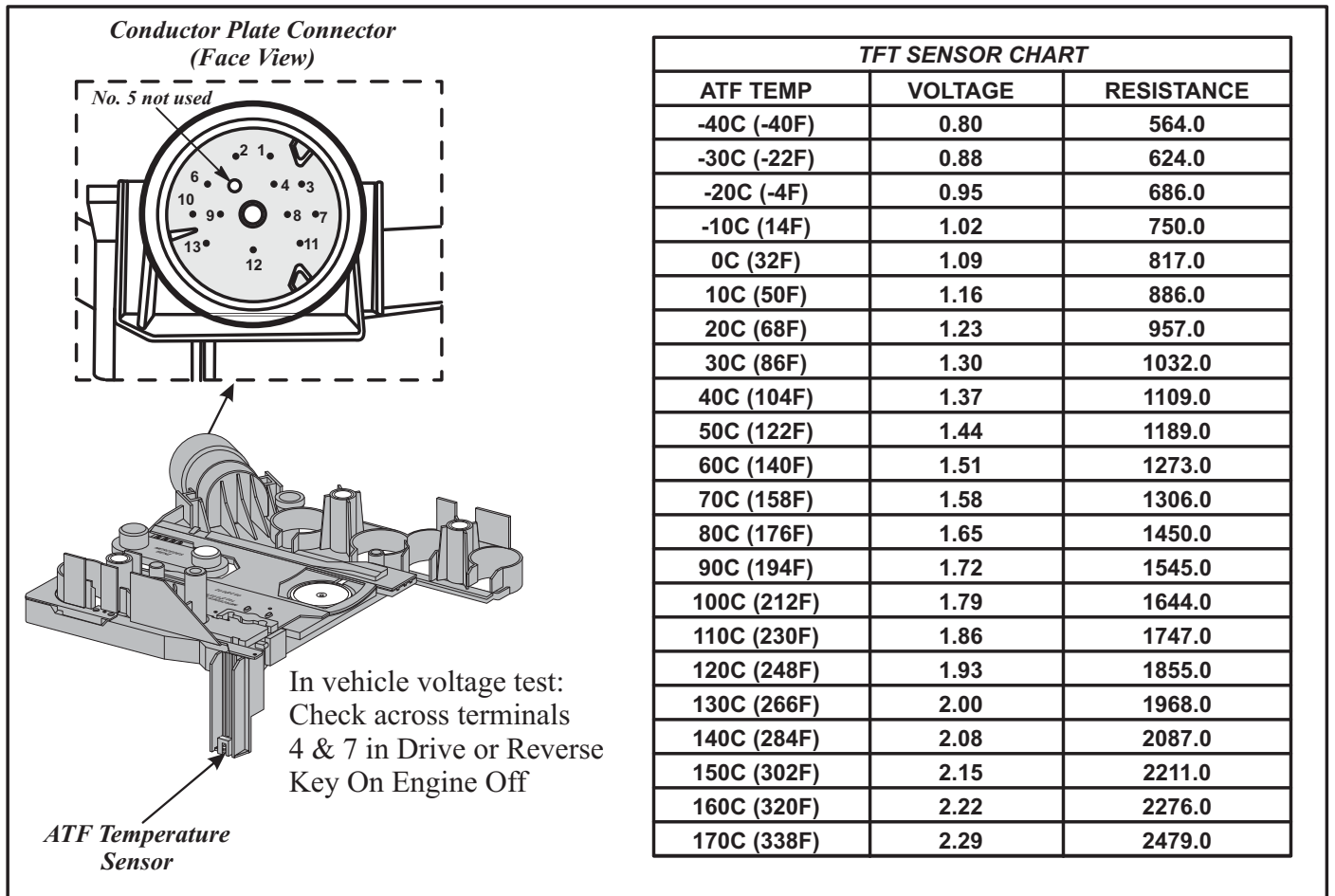


Figure 1

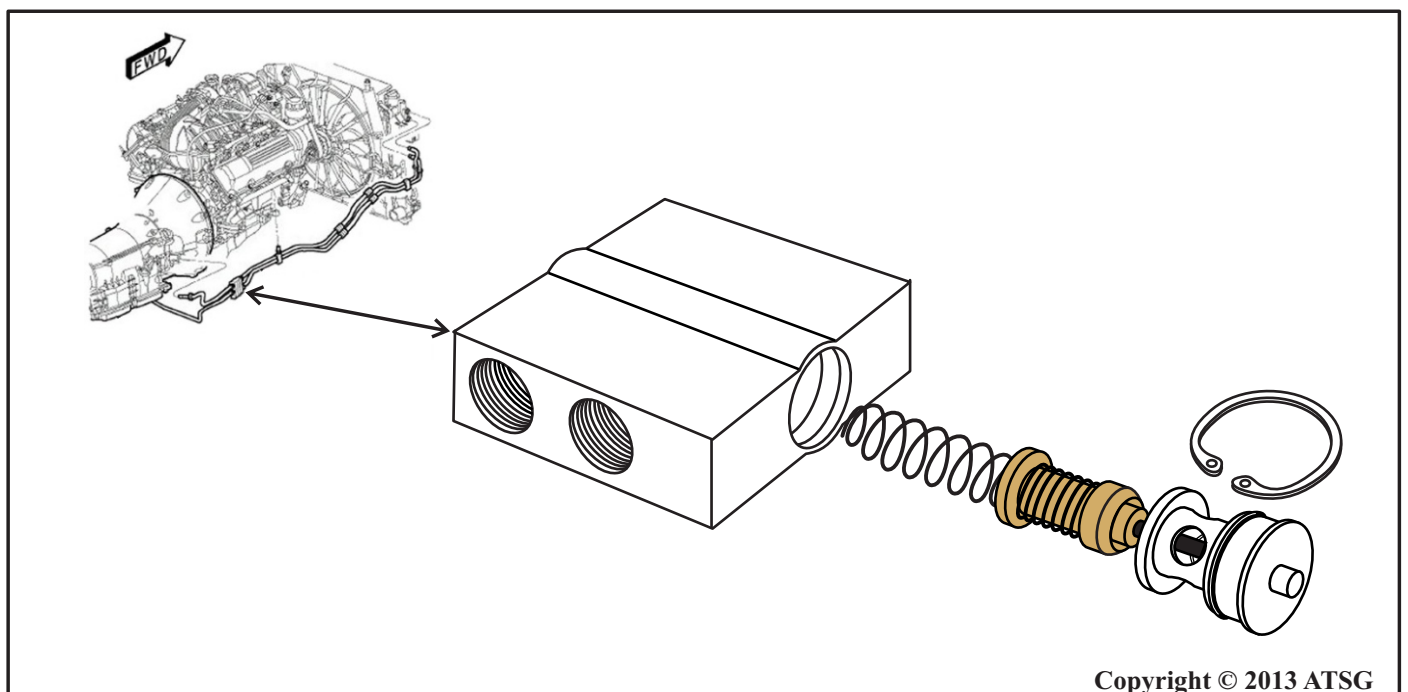
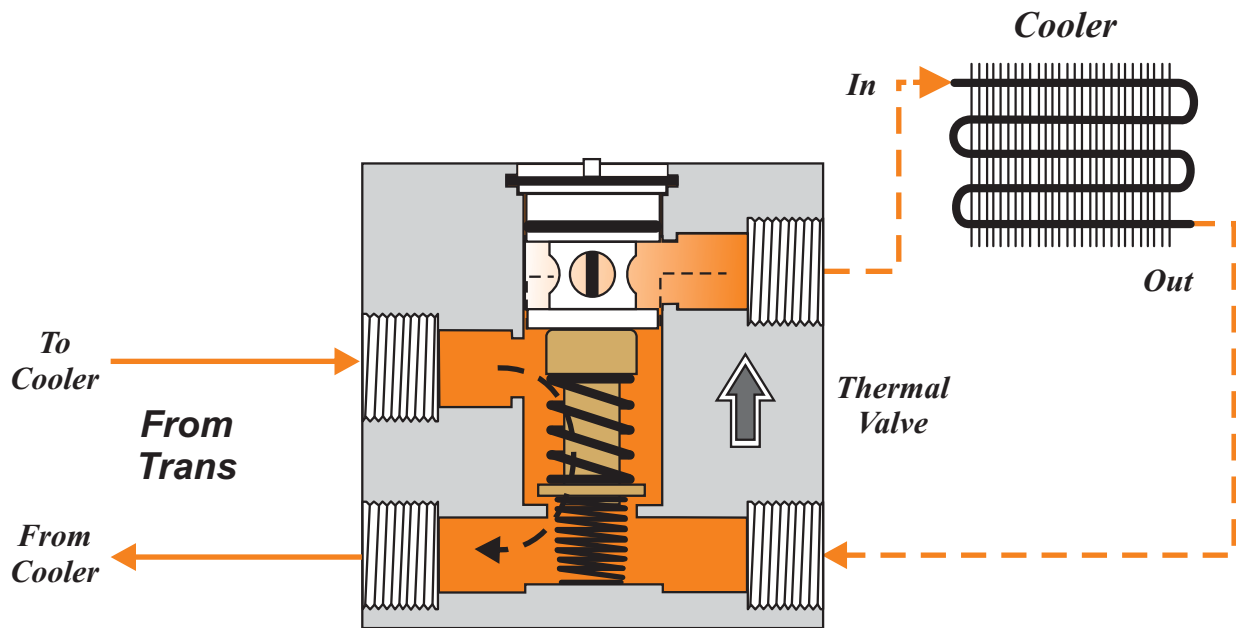


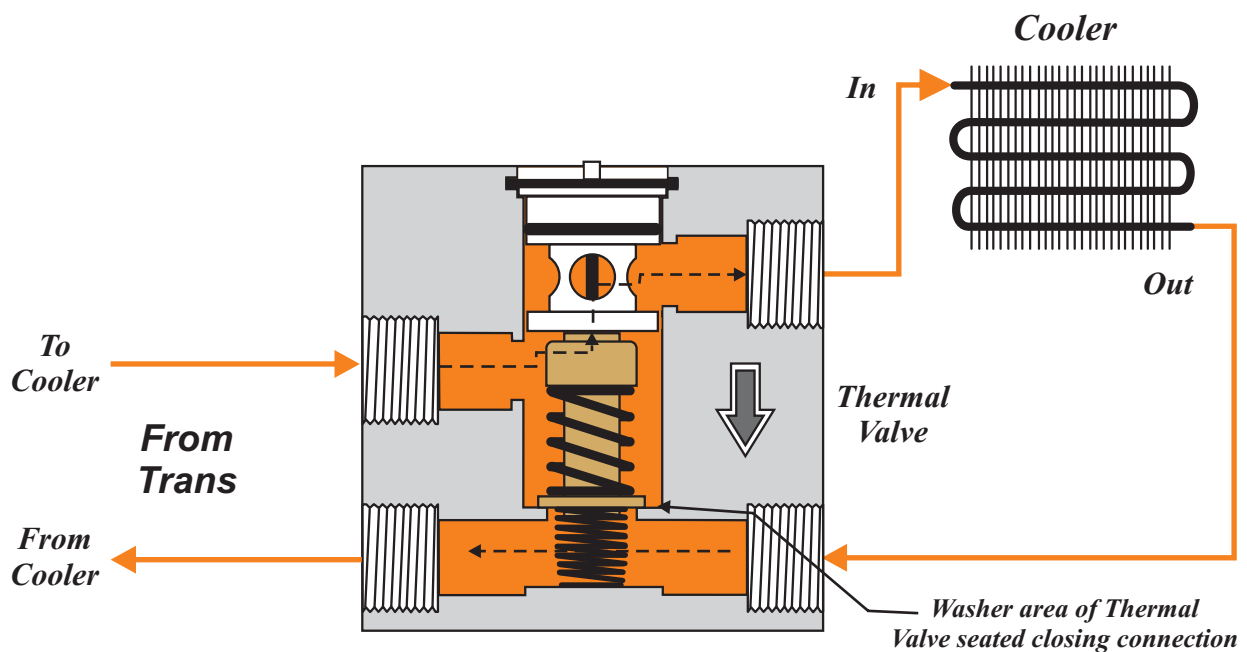
Figure 2

COOLER BYPASS IN USE BELOW 160°



*Summary: When ATF temp is Below 160°F the Thermal Valve is against the aluminum Plug closing the connection to the cooler, although there is residual pressure going to the cooler from the clearance between the plug and the bore(.006")
In this position the bottom of the thermal valve opens the connection from the To cooler passage, from the Trans, to the From Cooler passage, bypassing the Cooler.*

COOLER BYPASS NOT IN USE ABOVE 160°



*Summary: When ATF temp is Above 160°F the Thermal Valve moves away from the aluminum Plug opening the connection from the Trans, to the cooler.
In this position the bottom of the thermal valve closes the connection for the bypass and the To Cooler passage is connected solely to the Cooler.*

Copyright © 2013 ATSG

Figure 3