



ALLISON 1000/2000 SERIES TRANSMISSIONS INTERMITTENT HARSH SHIFTS

COMPLAINT (1): The transmission has intermittent harsh shifts due to commanded high clutch pressure.

(2): The transmission is going into limp mode with the “Check Trans” Lamp coming on with solenoid performance codes stored.

CAUSE:

(1): The rotating clutch module is a heavy assembly, if it is mis-handled it is very easy for the turbine speed sensor tone ring which is pressed onto the clutch drum to get damaged (See Figure 1). If one or more of the teeth are bent, this will compromise the Turbine Speed Sensor signal and cause one or more of the above mentioned complaints.

(2): Although the Turbine Speed Sensor sets no trouble code, it can cause the above mentioned complaints when it is malfunctioning.

NOTE: Vehicles equipped with a PTO will have a PTO drive gear pressed onto the rotating clutch module instead of a tone wheel (See Figure 2).

Although it would take some abuse to damage the drive gear, a more likely scenario is that the drive wheel can loosen its grip on the drum and can turn independently of the drum.

This will compromise the TSS signal because in a PTO application the TSS is looking at the PTO drive gear (See Figure 3).

Transmission speed sensor identification can be seen in Figure 4. There is confusion at times as the names of the speed sensors can be misleading.

NOTE: The Input Speed Sensor is actually the engine rpm sensor while the Turbine Speed Sensor is indicating input speed.

The use of an automotive oscilloscope can show a “glitch” in the TSS signal as seen in Figure 5.

CORRECTION:

(1): It is possible to remove a PTO cover and straighten the bent teeth on the tone ring. If it is badly damaged the transmission will have to be dis-assembled at which time either the drum can be replaced or a new tone ring can be purchased and installed onto the drum.

If the PTO gear is loose, either the drive gear will require replacement or the drum will have to be replaced.

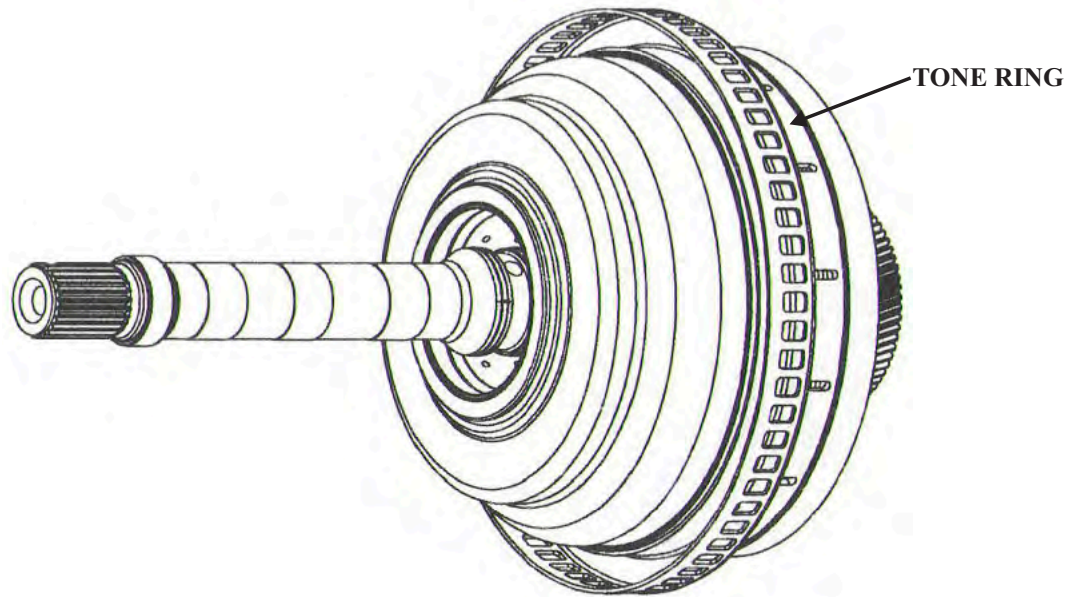
NOTE: In some instances the PTO drive gear will loosen when it gets hot. Be sure to heat the drum when checking the PTO drive gear for tightness.

(2): Once the tone ring has been verified good, replace the Turbine Speed Sensor.

Many thanks to Dan Wills of TR Transmissions for sharing his experience and for supplying the waveforms used in this bulletin.

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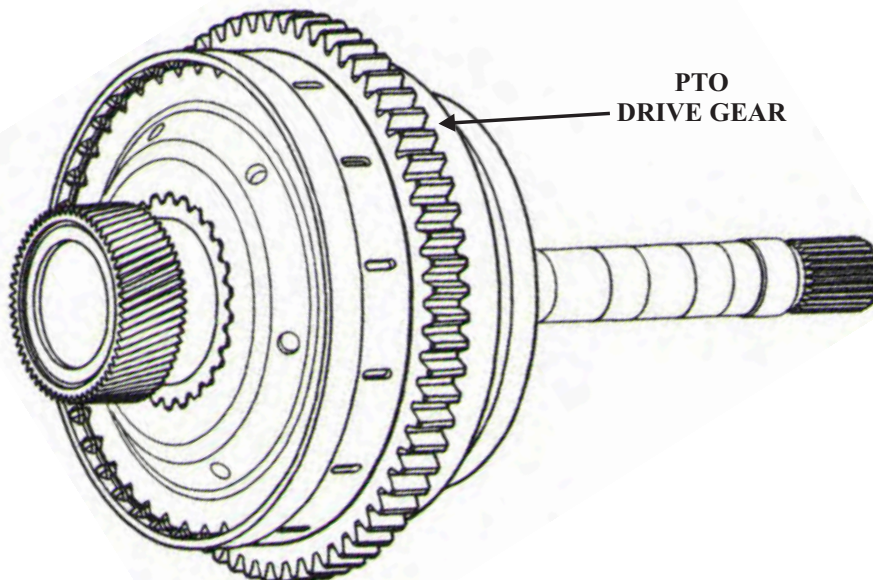
ROTATING CLUTCH MODULE WITHOUT PTO



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Figure 1

ROTATING CLUTCH MODULE WITH PTO



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Figure 2

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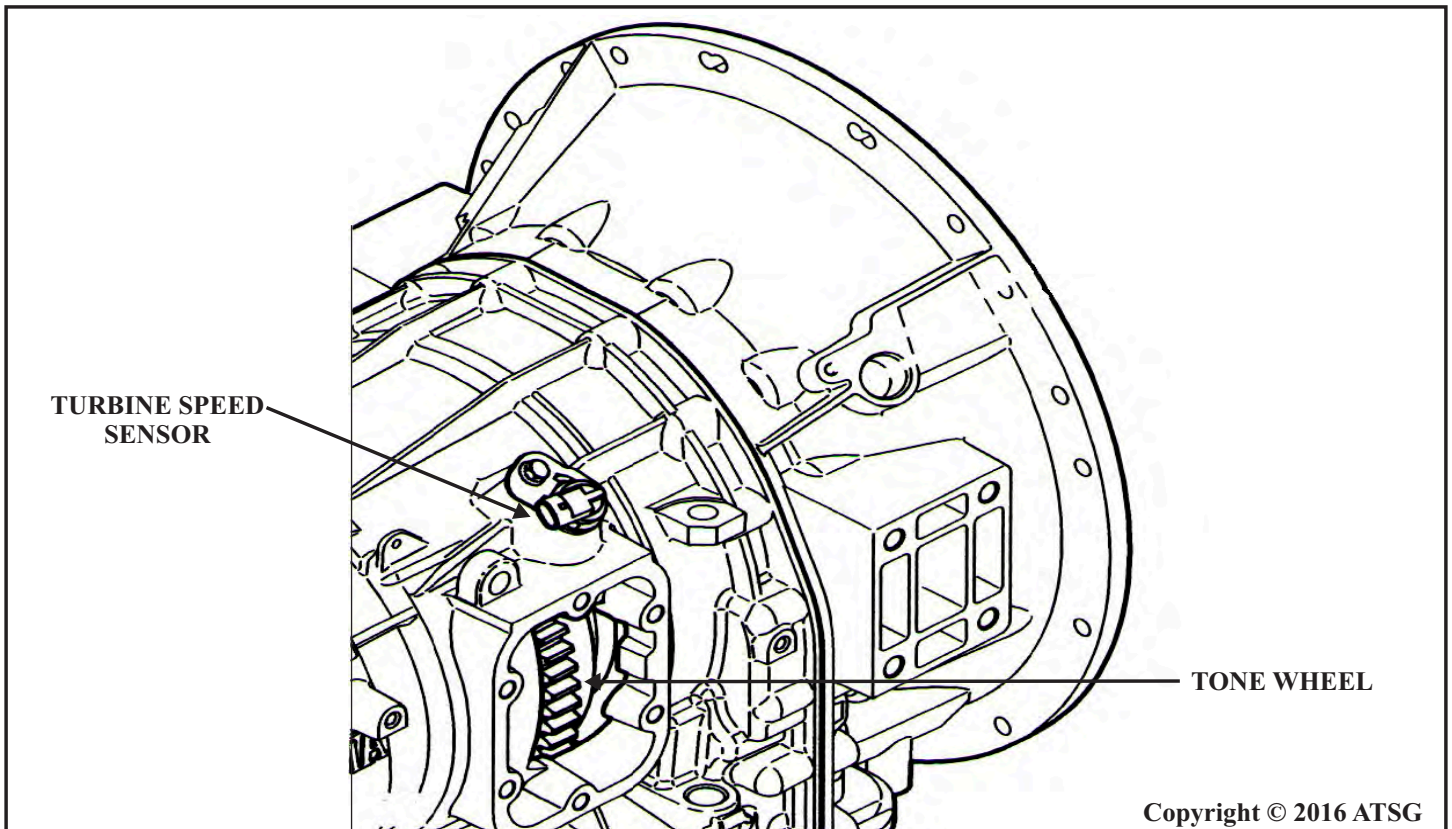


Figure 3

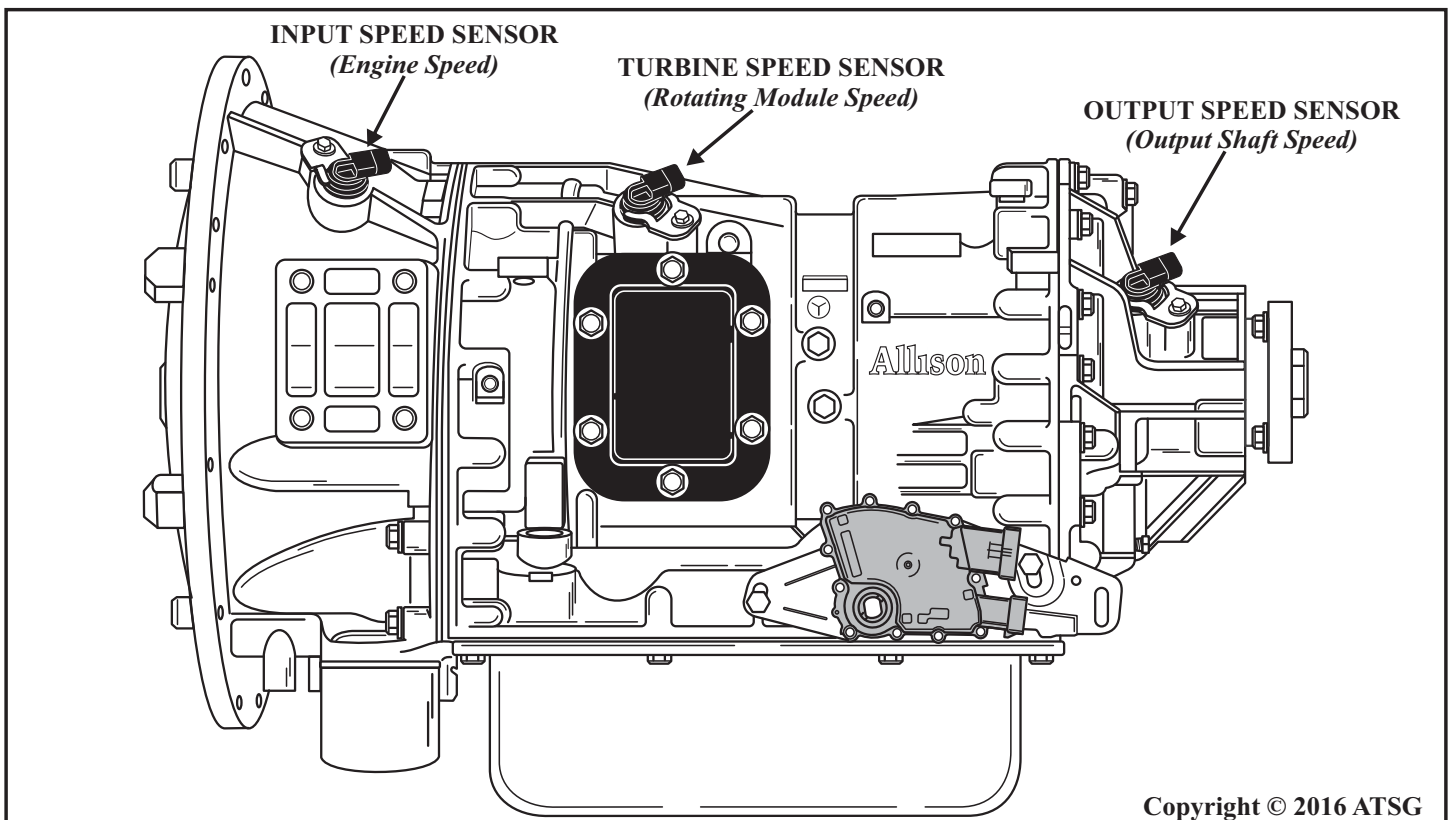
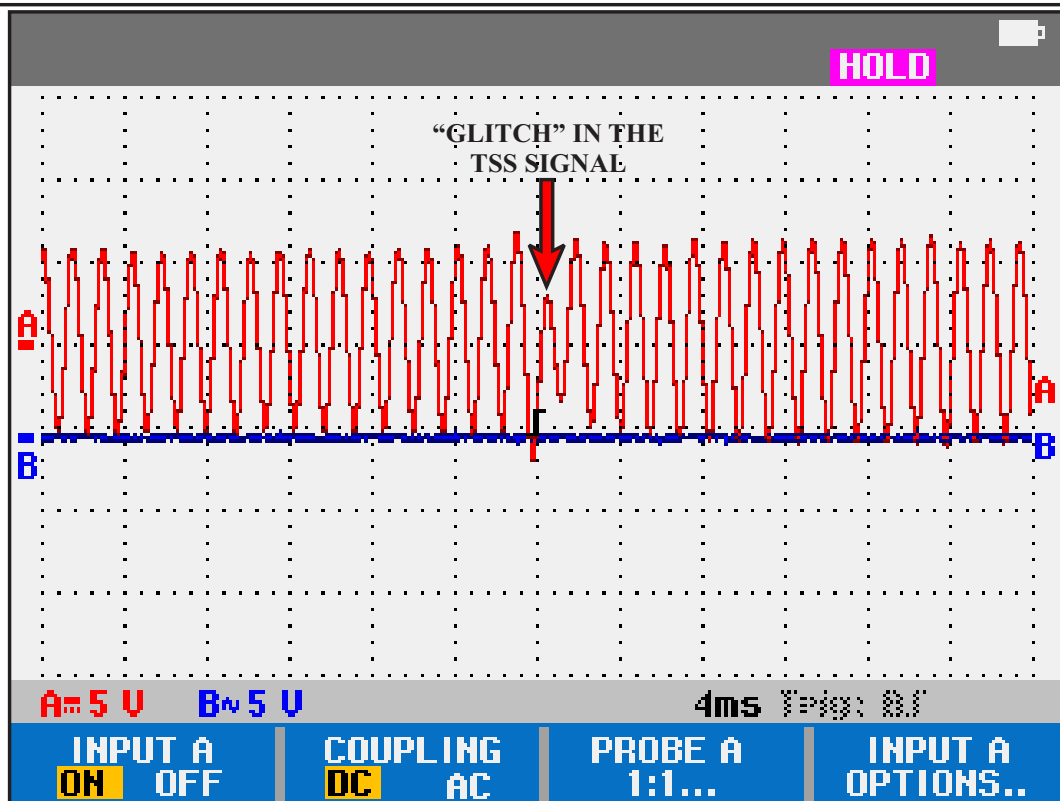


Figure 4

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ENGINE RUNNING IN PARK

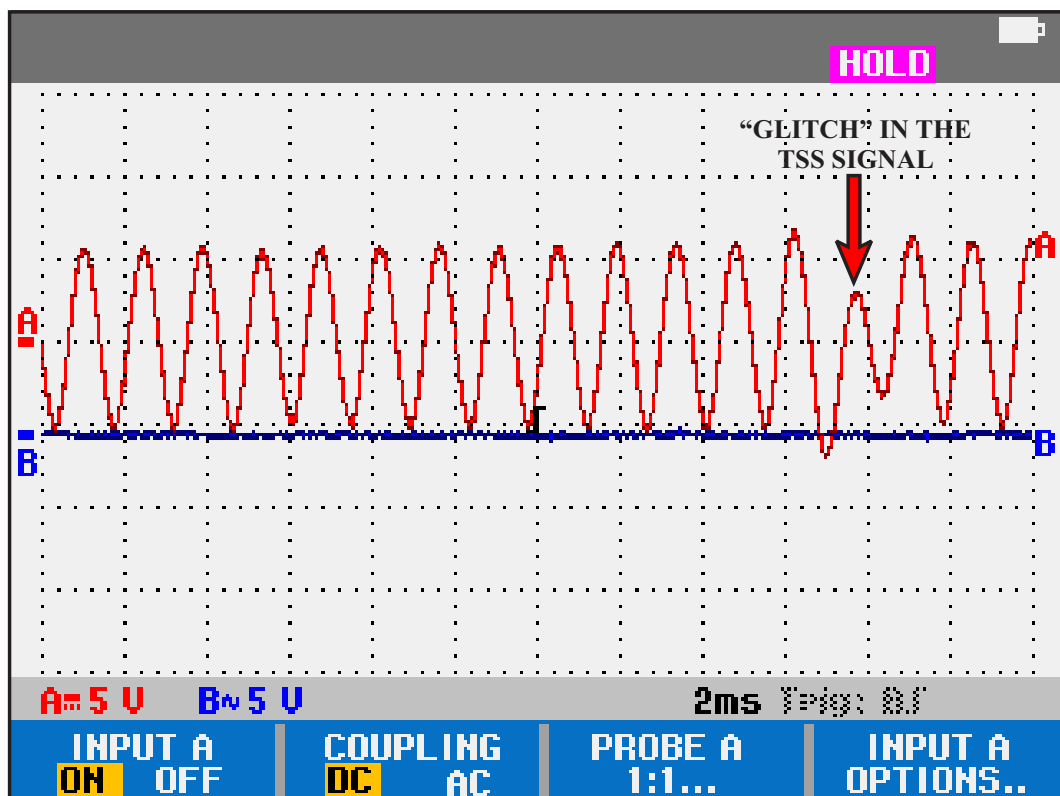


Figure 5