

Transmission Speed Sensor: Customer Interest

A/T Controls - MIL ON/Harsh Gear Engagement/DTC's Set

Group:
TRANSAXLE

Number:
05-40-011

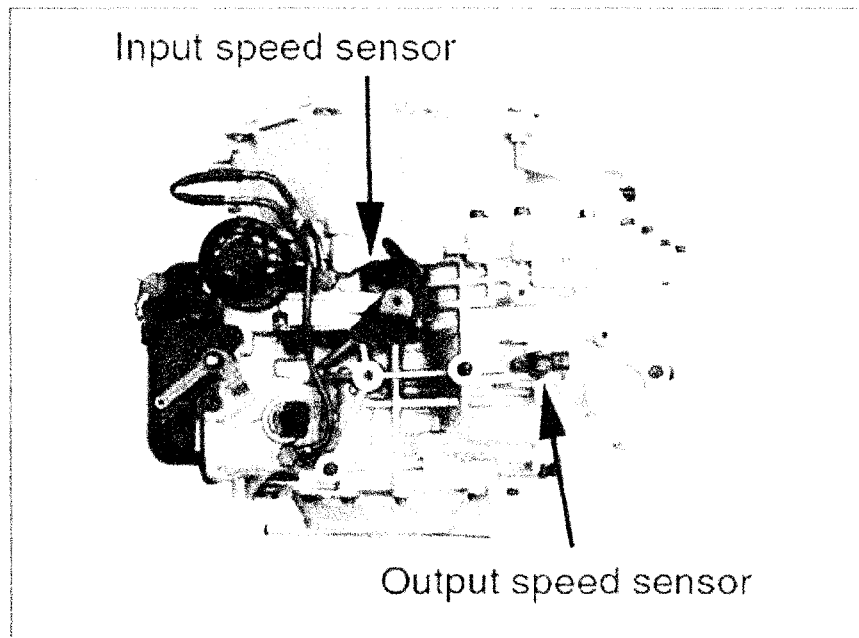
Date:
AUGUST, 2005

Model:
1999 - SONATA,
2001 - ELANTRA, SANTA FE, XG
2003 - TIBURON
2005 - TUCSON

Subject
AUTOMATIC TRANSAXLE DIAGNOSTIC TROUBLE CODES P0715, P0717, P0720, P0721, P0722

This bulletin updates TSB 01-40-005 to add additional DTC code information.

DESCRIPTION:



**CHECK
THE
SPEED
SENSOR
AND
HARNISS
AND
CONNECTORS.**

An improperly functioning input speed sensor or output speed sensor may result in the following four conditions:

1. "Check Engine" light on
2. Harsh P-R or P-D engagement shock
3. Transaxle accelerates in 1st gear to approximately 5000 rpm, then shifts into 3rd gear "fail-safe"

DTC	DESCRIPTION	REPAIR PROCEDURE
P0715	Input speed sensor - no signal	Replace input speed sensor
P0717	Input speed sensor - no signal	
P0720	Output speed sensor range/performance	Replace output speed sensor
P0721	Output speed sensor range/performance	
P0722	Output speed sensor - no signal	
P0700, P1529	TCM MIL request to ECM	Erase code

4. Diagnostic trouble codes shown.

REPAIR PROCEDURE:

1. Using a Hi-Scan Pro, check for DTCs in both the "Engine" and "Automatic Transaxle" menus. Record the DTC and description.
2. From the Hi-Scan Pro, select:
 - ^ "Hyundai Diagnosis" menu
 - ^ Vehicle
 - ^ "Auto Transaxle" menu
 - ^ "Current Data"
 - ^ "Input speed sensor" and "Output speed sensor". While driving the vehicle, if both input and output speed sensors show:
 - ^ Continuous output, go to Step 6 (NOTE: This test indicates the harness does not currently have an open or short circuit)
 - ^ No output or intermittent output, go to Step 3
3. Check the wiring harness visually for any damage.
4. Check the connectors at the input and output speed sensor and PCM/TCM for bent pins or pins not fully inserted into the connector. Repair or replace as necessary.
5. Follow the directions in the "Wire Harness Repair Kit", P/N TRK00A, and check the harness pin tension for the connectors to the input and output speed sensors and PCM/TCM. Repair or replace as necessary.
6. Follow the repair procedure below (NOTE: This step is necessary because the sensor may have an intermittent signal at high temperature or vibration):

NOTE:
Use an air nozzle to remove any debris around the sensor. Carefully clean the area where the sensor mounts before reinstalling the sensor.
7. Drive the vehicle for at least two key-on to key-off driving cycles. If the codes:
 - ^ Do not set again, return the vehicle to the customer
 - ^ Set again, go to step 8
8. Refer to the appropriate ETM and use a DVOM to check the resistance of the wiring between the TCM and the input sensor and output sensor (connect a small 1-pin to the DVOM when probing the connector to avoid damage). If the resistance is:
 - ^ More than 1 ohm, repair or replace the wiring harness
 - ^ Less than 1 ohm, go to Step 9
9. Replace the transaxle control module (TCM) or powertrain control module (PCM).

MODEL	PART NAME	PART NUMBER
1999~ Sonata 2001~ Elantra	Input speed sensor	42620-39051
2001~ Santa Fe 2001~ XG300 2003~ Tiburon 2005~ Tucson	Output speed sensor	42621-39052

PARTS INFORMATION

MODEL	OP CODE	OPERATION	OP. TIME	CAUSAL PART NUMBER	NATURE CODE	CAUSE CODE
1999~ Sonata 2001~ Elantra	42620R00	Replace Input Speed Sensor	0.3 M/H	See Parts Information	*N26	**C15
2001~ Santa Fe 2001~ XG300	42620RP0	Scan Tool Operation	0.3 M/H			
2003~ Tiburon 2005~ Tucson	42621R00	Replace Output Speed Sensor	0.3 M/H			
	42621RP0	Scan Tool Operation	0.3 M/H			

*N26: Abnormal Shift

**C15: Poor Contact & Short, Open Circuit

WARRANTY INFORMATION

Automatic Transmission/Transaxle: Testing and Inspection

Torque Converter Stall Test

TORQUE CONVERTER STALL TEST

This test measures the maximum engine speed when the selector lever is in the D or R position. The torque converter stalls to test the operation of the torque converter, starter motor, one-way clutch operation, the holding performance of the clutches, and brakes in the transaxle.

CAUTION: Do not let anybody stand in front of or behind the vehicle while this test is being carried out.

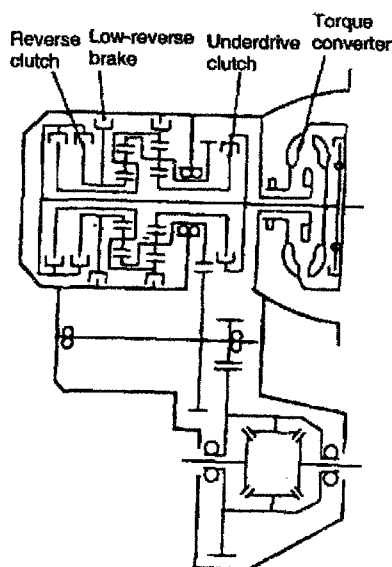
- a. Check the automatic transaxle fluid level and temperature, and the engine coolant temperature.
 - ^ Fluid level: At the **HOT** mark on the oil level gauge
 - ^ Fluid temperature: **80 - 100°C**
 - ^ Engine coolant temperature: **80 - 100°C**
- b. Chock both rear wheels (left and right).
- c. Apply the parking brake lever with the brake pedal fully depressed.
- d. Start the engine.
- e. Move the selector lever to the D position, fully depress the accelerator pedal and take a reading of the maximum engine speed at this time.

CAUTION:

1. The throttle should not be left fully open for more than eight seconds.
2. If carrying out the stall test two or more times, move the selector lever to the N position and run the engine at 1,000 rpm to let the automatic transaxle fluid cool down before carrying out subsequent tests.
Standard value stall speed: **2,100 - 2,900 rpm**
3. Move the selector lever to the R position and carry out the same test again.
Standard value stall speed: **2,100 - 2,900 rpm**

TORQUE CONVERTER STALL TEST JUDGEMENT RESULTS

1. Stall speed is too high in both D and R ranges
 - ^ Low line pressure
 - ^ Low & reverse brake slippage
2. Stall speed is too high in D range only
 - ^ Underdrive clutch slippage
3. Stall speed is too high in R range only
 - ^ Reverse clutch slippage



EKA9006A

4. Stall speed too low in both D and R ranges
 - ^ Malfunction of torque converter
 - ^ Insufficient engine output

Automatic Transmission/Transaxle: All Technical Service Bulletins**A/T - Torque Converter Inspection**

Group: TRANSAXLE

Number: 04-40-021

Date: DECEMBER, 2004

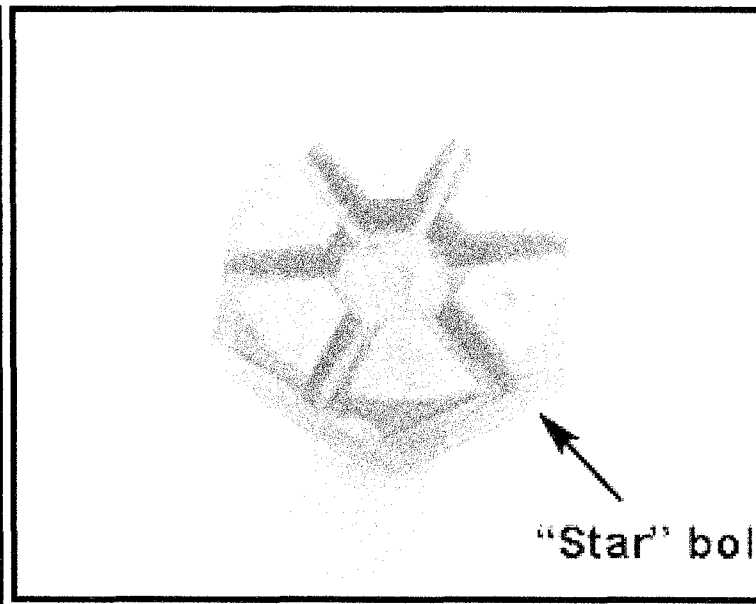
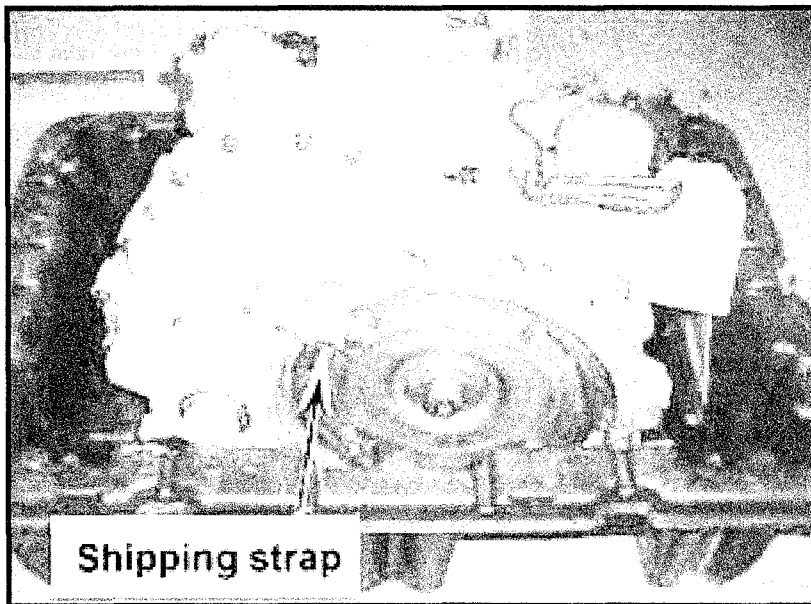
Model: ALL MODELS
ALL YEARSSubject
AUTOMATIC TRANSAXLE TORQUE CONVERTER

INSPECTION

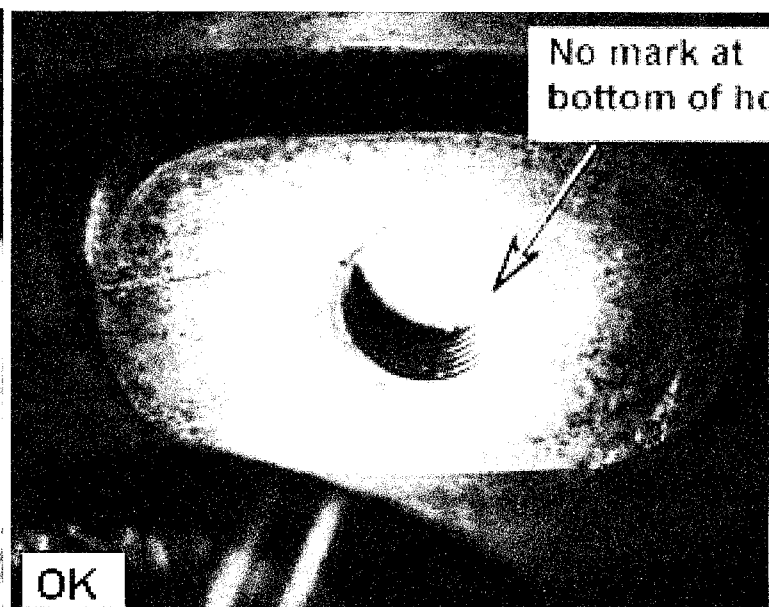
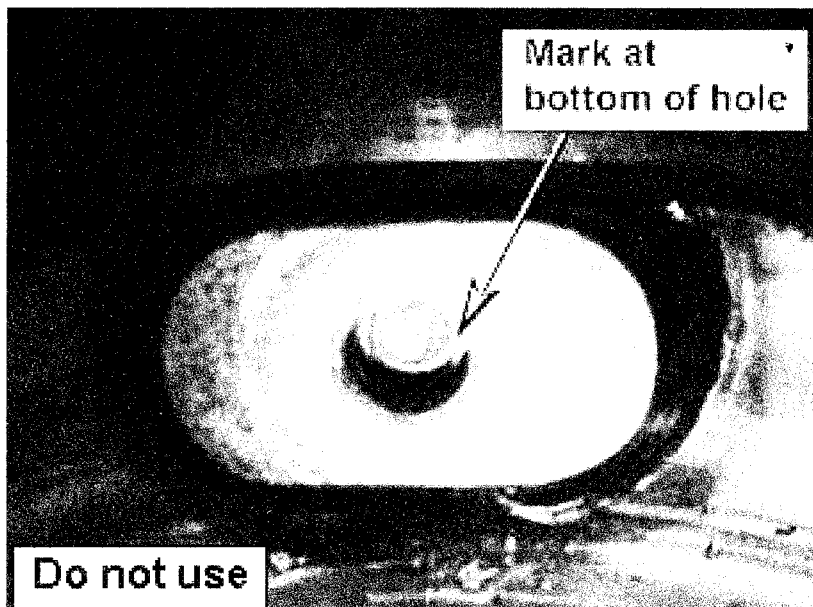
DESCRIPTION

Prior to installation, please inspect all transaxle torque converter mounting holes according to the Repair Procedure shown below.

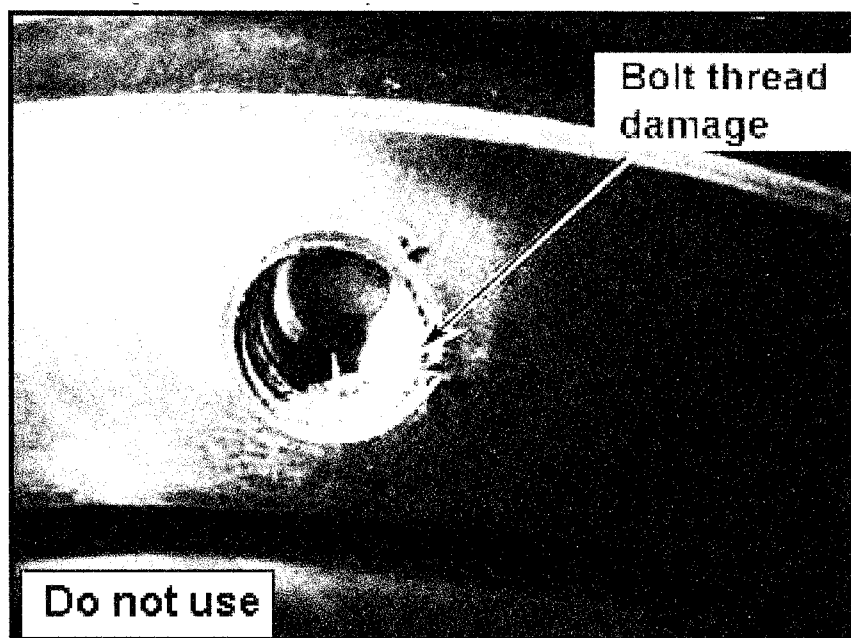
REPAIR PROCEDURE



1. Loosen the 14mm bolt securing the shipping strap to the transaxle. Remove the bolt that secures the shipping strap to the torque converter. Check if the bolt is a "Star" bolt, (M10 x 1.25 x 11 mm, P/N 42121-21720):
 - ^ IF NOT, discard the bolt
 - ^ IF SO, retain the bolt
2. Use a light to inspect all the mounting bolt holes and threads for:
 - ^ An interference mark at the bottom of the hole indicating the existing bolt or a previous bolt has bottomed out and damaged the torque converter.
 - ^ Stripped threads caused by a bolt with incorrect threads.



A mark indicating the existing bolt or a previous bolt has bottomed out:



Damage caused by a bolt with incorrect threads:

If the inspection shows:

- ^ No damage to either the mounting bolt hole or bolt threads - install the transaxle using 'Star' bolts to install the torque converter to the engine drive plate.
- ^ Damage to either the mounting bolt hole or bolt threads:
- ^ Install the shipping strap and use a "Star" bolt to secure the torque converter.
- ^ Write "Bolt holes damaged" on the Core Return Checklist.
- ^ Return the transaxle to the remanufacturer following the normal procedure.

Automatic Transmission/Transaxle: Customer Interest A/T - Shift Flare/Harsh/Delayed Shifts

Group
40 - TRANSAXLE

Number
03-40-019

Date
October, 2003

Model
Accent 1995-2004, Elantra 1992-2004, Excel 1986-1994, Santa Fe 2001-2004, Scoupe 1991-1995, Sonata 1989-2004, Tiburon 1997-2004, XG 300 2001 and XG 350 2002-2004

Subject
AUTOMATIC TRANSAXLE FLUID LEVEL

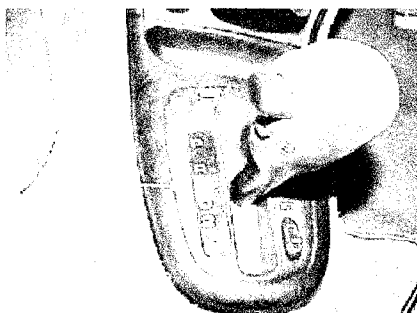
DESCRIPTION:

The automatic transaxle fluid (ATF) level must be checked during Pre-Delivery Inspection (PDI). Low ATF level may cause the following driveability conditions:

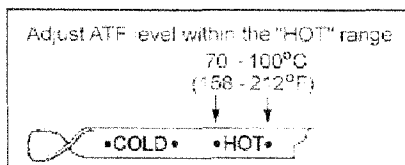
- ^ Engine "flare" during the 2-3 shift (slight engine rpm increase during the shift) at light throttle when the ATF is cold
- ^ Harsh or delayed shift during acceleration from a stop following a rapid deceleration

PROCEDURE:

1. Attach a Hi-Scan Pro and select "Automatic Transaxle" menu, "Current Data" menu and "Fluid Temperature".
2. Drive the vehicle until the ATF is at normal operating temperature 70-100°C (158-212°F).



3. Park the vehicle on a level surface, set the parking brake and firmly apply the foot brake. Start the engine and move the shift lever through each gear, then to "Neutral" (do not check ATF level in the Park position as this may result in an incorrect reading).



4. Check the ATF level on the dipstick. Add Hyundai SP-III until the level is within the "HOT" range.

NOTE

The ATF level can be accurately checked only if the ATF temperature is at normal operating temperature 70-100°C (158-212°F).

NOTE

Do not add ATF above the "HOT" range. Overfilling the ATF may cause foaming of the ATF and possible transaxle damage.

USE OF NON-APPROVED AUTOMATIC TRANSMISSION FLUIDS:

Only Hyundai SPIII is approved for use in Hyundai vehicles beginning with the 1996 model year. Use of aftermarket additives or other types of ATF, such as Chrysler/Mopar ATF+3, Dexron and Mercon, are not approved for use in Hyundai vehicles and may affect driveability or damage the transaxle. Damage caused by a non-specified fluid is not covered by your new vehicle limited warranty.

SERVICE INFORMATION:

WARNING

SPIII has a red color when new; however, the ATF may change color to a dark brown after 10,000 to 25,000 miles in service. This change is normal for this type of ATF and does not indicate an internal transaxle condition.

NOTE

To diagnose for a possible internal transaxle condition, follow the diagnosis in the appropriate shop manual, TSB or ATM Diagnosis Worksheet, P/N NP150-07006.

SERVICE	CHANGE ATF	COMMENT
NORMAL	105,000 miles/84 months	
SEVERE	30,000 miles/30 months	See definition below

SEVERE DRIVING CONDITIONS:

- Repeated short distance driving
- Extensive idling
- More than 50% driving in heavy city traffic during hot weather above 90°F (32°C)
- Driving in very cold weather below 0°F (-18°C)
- Towing a trailer
- Driving in mountainous areas

MAINTENANCE INTERVAL:

Refer to the maintenance schedule in the owners manuals for maintenance requirements.