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NVS-215

2005 APR 27 A 9:00

OFFICE OF  
DEFECTS INVESTIGATION

Mr. Ronald Medford  
Acting Associate Administrator for Enforcement  
National Highway Traffic Safety Administration  
400 Seventh Street, S.W.  
Washington, D.C. 20590

Tuesday, April 19, 2005

05V-177  
(15 pages)

**RE: Defect Information Report**

Dear Mr. Medford:

Pursuant to Part 573 of Title 49 of the Code of Federal Regulations, Hyundai de Puerto Rico is submitting information concerning a recall that is being voluntarily initiated. Specific information as required by Section 573.6 is as follows:

573.6(c)(1)

Manufacturer - Hyundai Motor Company  
Distributor - Hyundai de Puerto Rico

573.6(c)(2)

Certain model year 2005 Hyundai Tucson vehicles produced beginning July 30, 2004 through February 27, 2005.

573.6(c)(3)

Approximately 349 model year 2005 Hyundai Tucson vehicles produced beginning July 30, 2004 through February 27, 2005.

573.6(c)(4)

All model year 2005 Hyundai Tucson vehicles produced beginning July 30, 2004 through February 27, 2005.

573.6(c)(5)

The 2005 model year Tucson is equipped with an Electronic Stability Program (ESP). The ESP Hydraulic Electronic Control Unit (HECU) controls the operation of the ESP based upon the processing of information received from various sensors, as follows:

Wheel Speed Sensors - measure the rotational speed of each wheel

Steering Angle Sensor - measures the position of the steering wheel

Brake Pressure Sensor - measures the brake line pressure at the master cylinder

Yaw Rate and Acceleration Sensor - measures the vehicle's yaw rate and lateral acceleration

The ESP considers the vehicle to be in an unstable state if the yaw rate sensor detects that the vehicle is oversteering or understeering by measuring the vehicle's rotation about the vertical axis through its center of gravity. In response to oversteering, the HECU applies the front brake that is opposite to the direction that the vehicle is oversteering, thereby causing the vehicle to follow the direction the driver is steering. If the vehicle is understeering, the HECU applies the rear brake that is opposite to the direction that the vehicle is understeering, thereby causing the vehicle to follow the direction the driver is steering. The HECU may also reduce engine power.

Each time the vehicle is traveling at speeds less than 2 kph (1.2 mph), the yaw rate sensor offset is recalibrated to provide a "zero" reference value for travel in a straight direction. If the wheels are turned during this calibration process at speeds below 2 kph, the yaw rate sensor offset may be inaccurately set at too high a value, up to a maximum error of 4 degrees/second. Therefore, when the vehicle is traveling, the yaw rate sensor may inaccurately interpret the yaw rate to be up to 4 degrees/second higher than actual, based upon the yaw rate sensor's offset calibration error.

As stated above, the ESP considers the vehicle to be in an unstable state based upon the output and offset calibration of the yaw rate sensor. If the yaw rate sensor offset was calibrated to be 4 degrees/second higher than actual because the wheels were turned while the yaw rate sensor offset was being calibrated, the ESP would consider the yaw rate to be 4 degrees/second higher than actual, and the ESP may activate when it is not needed.

If the ESP operated briefly, vehicle speed would not be reduced, however, the ESP may operate until the vehicle speed is reduced to 15 kph (9.3 mph). The ESP switch on the instrument panel can be pushed to turn off the ESP.

573.6(c)(6)

Hyundai Motor Company became aware of this condition after receiving information in January 2005 about possible inadvertent ESP activation while driving through turns. During February 2005, Hyundai Motor Company and its supplier conducted an evaluation of this condition. This evaluation led to the determination that the HECU programming logic results in this condition. The ESP HECU program was changed in production to correct this condition on February 28, 2005.

The Revised HECU program allows the yaw rate sensor offset calibration to occur at a speed of 0.125 kph (0.08 mph), which virtually eliminates the potential for the misinterpretation of steering wheel inputs and provides for a maximum offset error of 0.2 degrees/second.

Hyundai Motor Company has decided to conduct a recall in the Puerto Rico to reprogram the ESP HECUs of model year 2005 Hyundai Tucson vehicles produced beginning July 30, 2004 through February 27, 2005. In March 2005, Hyundai Motor Company provided notice to its distributor Hyundai de Puerto Rico that it intended to conduct a recall to correct this condition. Hyundai is not aware of any accidents or injuries related to this condition.

573.6(c)(8)

All owners of record of the affected vehicles will be contacted by first class mail and instructed to bring their vehicles to Hyundai dealers. Hyundai dealers will reprogram the ESP HECU in each vehicle.

Hyundai anticipates the recall owner notification will be completed in one mailing during May 2005.

Reprogramming or other service to the ESP HECU of all vehicles affected by this recall would have been covered for 3 years or 36,000 miles under Hyundai's new vehicle limited warranty. As no owners of these 2005 model year vehicles would have incurred expenses for this warranted repair as a result of this condition, Hyundai believes that it is not necessary, and should not be required, to provide notification regarding reimbursement under section 577.11.

573.6(c)(9)

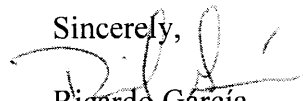
The Technical Service Bulletin containing the service procedure for reprogramming the ESP HECU will be provided to NHTSA when available. Other relevant communications will also be forwarded when they are available.

573.6(c)(10)

A draft of the owner notification letter is attached.

573.6(c)(11)

Hyundai has assigned "Campaign 068" as the designation for the campaign.

Sincerely,  
  
Ricardo García  
Director, Hyundai de PR

Attachments: (1)

Cc: K. Demeter  
K. Shuler

**AFFECTED HYUNDAI VEHICLES:**

- 2005 TUCSON



**HYUNDAI OF PUERTO RICO**  
Box 192216  
San Juan, PR, 00919-22116

Date :

CODE  
CUSTOMER  
ADDRESS1  
ADDRESS2  
ADDRESS3

**DRAFT**

**RE : IMPORTANT SAFETY RECALL NOTIFICATION  
(ESP ECM REPROGRAMMING – Recall no. xxx-xxx.xx)**

**VIN : VIN**

Dear Hyundai Vehicle Owner:

This notice is sent to you in accordance with the requirements of the **National Traffic and Motor Vehicle Safety Act**. Hyundai de Puerto Rico has decided that a defect, which relates to motor vehicle safety, exists in certain 2005 Hyundai Tucson vehicles that were produced during the period beginning on July 30, 2004 through February 27, 2005.

***What is the problem?***

Your vehicle is equipped with an Electronic Stability Program (ESP). The ESP system contains a yaw rate sensor, which detects if the vehicle is oversteering or understeering. The yaw rate sensor output is used by the ESP to decide if it should apply a brake or reduce engine power to help the driver control the vehicle. The yaw rate sensor offset is recalibrated each time the vehicle is traveling at speeds less than 1.2 mph. If the steering wheel is turned while the vehicle is traveling at less than 1.2 mph, the yaw rate sensor offset may be recalibrated inaccurately and the ESP program may become too sensitive. While driving through a turn, under conditions where ESP activation may not be needed, a sensitive ESP program may cause the engine to reduce power and may cause a brake at one of the wheels to be applied without brake pedal application by the driver. This may cause the vehicle to slow and may affect the path that the vehicle is traveling. Brake application caused by inadvertent ESP activation may result in a crash.

The ESP switch, located on the instrument panel to the left of the steering wheel, may be pressed to turn off the ESP and prevent inadvertent ESP activation.

***What should you do?***

We urge you to call your Hyundai dealer to schedule an appointment to have this work performed as soon as possible. If you have already encountered the problem described above and you have paid for the repairs, please call **Hyundai of Puerto Rico** at **1-800-981-0188** for counsel on a possible reimbursement.

***What will Hyundai do?***

To ensure that your vehicle's Electronic Stability Program (ESP) works properly, we are asking you to schedule an appointment as soon as possible to take your vehicle to your Hyundai dealer. The Hyundai dealer will reprogram the ESP Hydraulic Electronic Control Unit (HECU). This procedure will be performed at no charge to you. The time needed for the actual repair is approximately half an hour, but you should plan to leave your vehicle at your Hyundai dealer to have this service performed. Repair times will vary and depend on your dealer's appointment schedule.

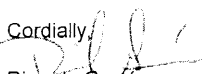
***What if you have other questions?***

If you have any difficulty having this repair performed, we recommend that you call the Hyundai Customer Service Center at 1-800-981-0188. If you are still not satisfied that we have remedied this situation without charge, and within a reasonable amount of time, you may wish to write to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call their toll-free Auto Safety Hotline at 1-888-327-4236.

***Notice to Lessors:*** If you are a lessor receiving this recall notice of vehicles involved in this recall as of the date of this letter, you have an obligation under Federal Law, 49 CFR Part 577, to forward the lessee of the above referenced vehicle with a copy of this letter by first class mail within ten days of receipt. You must also maintain a record identifying the lessee to whom you sent a copy of this letter, the date you sent it, and the VIN of the subject vehicle.

We urge your prompt attention to this safety matter.

Cordially,

  
Ricardo García  
Director, Hyundai of Puerto Rico



# Technical Service Bulletin

Model	TUCSON (JM)
Group	ENGINE ELECTRICAL (27)
Number	5-27-P14-JM
Date	Apr. 15, 2005
Area	Puerto Rico

**Subject**  
**ESP ECM REPROGRAMMING INSTRUCTIONS (SAFETY RECALL)**

## 1. DESCRIPTION

Some 2004-2005 TUCSON (JM) vehicles with ESP (Electronic Stability Program) may experience the following symptom.

- Vehicle may decelerate or lean to one side when steering and/or straight driving due to sensitive operation of ESP.

To improve this problem, reprogram the ESP ECU software with new logic using the Hi-Scan Pro in accordance with the procedure as outlined in this bulletin.

## 2. VEHICLES AFFECTED

- Model: 2004 TUCSON (JM) 2WD/4WD vehicles with ESP (Electronic Stability Control)
- Affected vehicle production date range:
  - Produced from July 30, 2004 through Feb. 27, 2005
- Affected VIN range:
  - Produced through KM8JN72D85U152537
- Area: Puerto Rico.

### 3. ECM SPECIFICATIONS

MODEL	SYSTEM	ECM P/NO.	ECM ID		
			PREVIOUS	NEW	
2004-2005 TUCSON (JM)	ESP(2WD)	58920-2E300	342GAJ2P19	342GAK2Q19	
			342GAI2O18		
	ESP(4WD)	58920-2E350	344GAN2S19	344GAO2T19	
			344GAM2S19		
			344GAL2R18		
			344GAK2Q18		
				344GAJ2P18	

### 4. ECM REPROGRAMMING PROCEDURE

#### 4-1. CAUTIONS BEFORE REPROGRAMMING

- 1) Conduct reprogramming with the ignition key in the "ON" position.
- 2) Be careful not to disconnect any cables connected to the vehicle or Hi-Scan Pro during reprogramming.

**WARNING**

**If reprogramming is interrupted, the manual update procedure must be used.**

- 3) Do not start the engine during reprogramming.
- 4) Do not turn the ignition key OFF during reprogramming.
- 5) When the reprogramming is completed, turn OFF the ignition key for 20 seconds before starting the engine.

#### 4-2. ECM REPROGRAMMING

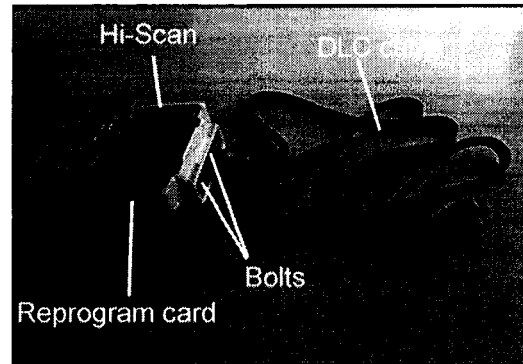
**NOTE**

**Verify that the vehicle is affected by identifying the vehicle production date and VIN.**

## A. AUTOMATIC UPDATE PROCEDURE

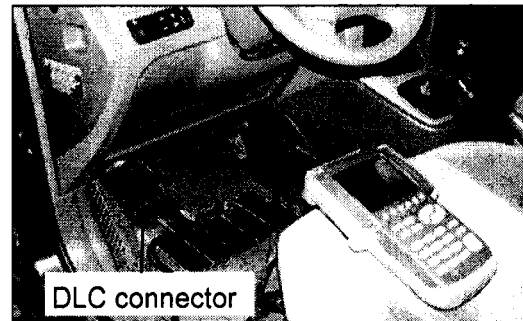
- 1) Attach the Data Link Connector (DLC) cable to the Hi-Scan Pro main body and securely tighten the two bolts.
- 2) Remove the system software card from the Hi-Scan Pro and insert the reprogramming software card, with the new ECM program, into the Hi-Scan top slot.

The only card in the Hi-Scan should be the reprogramming card.



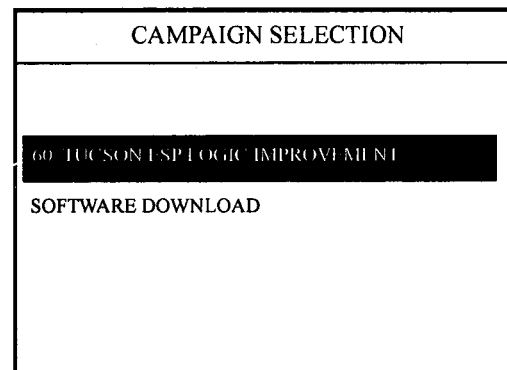
DCP03217

- 3) Plug the DLC cable from the Hi-Scan Pro into the data link connector (16 Pin connector) under the instrument panel on the driver's side.



DSC06262

- 4) Turn the ignition switch to the ON position (Do not start the engine).
- 5) Turn the Hi-Scan Pro ON and press ENTER.
- 6) Select option "60. TUCSON ESP LOGIC IMPROVEMENT" and press ENTER.



7) Select option "01. TUCSON ESP LOGIC IMPROVEMENT [AUTO]" and press ENTER.

RE-PROGRAMMING
01. TUCSON ESP LOGIC IMPROVEMENT [AUTO]
02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]

8) Enter "1229" as the password for automatic reprogramming mode and press ENTER.

RE-PROGRAMMING
01. TUCSON ESP LOGIC IMPROVEMENT [AUTO]
02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]
ENTER YOUR PASS WORD : 1229

9) The Hi-Scan Pro will establish communication, check the ECM ID, and reprogram the ECM automatically. Wait until the reprogramming is finished.

RE-PROGRAMMING
01 TUCSON ESP LOGIC IMPROVEMENT [AUTO]
02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]
ESTABLISHING COMMUNICATION PLEASE WAIT

10) Turn the IG key off and on.

RE-PROGRAMMING
TURN THE IG KEY OFF AND ON



## NOTES

- The Hi-Scan Pro detects the current ECM ID, assigns the new ECM ID and displays them on the Hi-Scan Pro screen.
- Check the ECM IDs displayed on the Hi-Scan Pro screen to verify that the correct ECM software is being downloaded.  
Refer to the "ECM SPECIFICATION TABLE" on page 2 of this TSB.
- If the Hi-Scan Pro does not download the program, use the Manual Update Procedure following this section.

## WARNINGS

- Do not interrupt the reprogramming at any time.
- The ECM will be rendered inoperative if the program does not download completely.

11) When the "COMPLETED" message is displayed, turn the Hi-Scan Pro OFF and the process is over.

12) Turn the ignition key off and then start the engine to check for proper operation.

13) In case of 4WD vehicle, "ERASE DTC (P1765) IN 4WD SYSTEM." will be displayed when the reprogramming is completed.

In this case, erase the DTC (P1765) by referring to the procedure shown on page 9 of this TSB.

RE-PROGRAMMING
OLD: 34*GA*2*1* → 34*GA*2*1*
MAIN PROGRAM DOWNLOAD ██
CONFIRM CHECKSUM ██

RE-PROGRAMMING
REPROGRAMMING COMPLETED! PLEASE FOLLOW THE DIRECTION. AFTER IG. KEY OFF AND ON. *UPGRADE SUCCESSFULLY: ESP, ESP OFF, ABS LAMP ON FOR 3 SECONDS AND OFF *UPGRADE FAIL: ESP, ESP OFF, ABS LAMP ON PERMANENTLY IF FAIL, TRY AGAIN IN ERROR MODE  PRESS [ENTER] KEY

RE-PROGRAMMING
ERASE DTC (P1765) IN 4WD SYSTEM

## B. MANUAL UPDATE PROCEDURE

### NOTES

- In the event that “01. TUCSON ESP LOGIC IMPROVEMENT [AUTO]” fails to download the new ECM program, option “02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]” must be used.
- Confirm all connections are established as shown in the “AUTOMATIC UPDATE PROCEDURE” before continuing.

- 1) Turn the ignition to the ON position.
- 2) Turn the Hi-Scan Pro ON and press ENTER.
- 3) Select option “60.TUCSON ESP LOGIC IMPROVEMENT” and press ENTER.

CAMPAIGN SELECTION
60. TUCSON ESP LOGIC IMPROVEMENT
SOFTWARE DOWNLOAD

- 4) Select option “02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]” and press ENTER.

RE-PROGRAMMING
01. TUCSON ESP LOGIC IMPROVEMENT [AUTO]
02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]

- 5) Choose 1 of the 2 vehicle types which is correct for your vehicle by using the “ECM SPECIFICATION TABLE” shown on page 2 of this TSB.  
And then press ENTER.

RE-PROGRAMMING	
01. TUCSON 4WD ESP	: 58920-2E350
02. TUCSON 2WD ESP	: 58920-2E300

6) Enter the correct password by using the chart below and press ENTER.

**WARNINGS**

- **Be sure to input the correct password.**
- **If an incorrect password is selected, the correct ECM software will not be downloaded.**

MENU	PASSWORD
01. TUCSON 4WD ESP : 58920-2E350	2350
02. TUCSON 2WD ESP : 58920-2E300	2300

7) Turn the IG key off and on.

8) Wait until the reprogramming is completed. Hi-Scan Pro will reprogram the ECM.

**WARININGS**

- **Do not interrupt the reprogramming at any time.**
- **The ECM will be rendered inoperative if the program does not download completely.**

**NOTES**

- **The Hi-Scan Pro displays the new ECM ID on the Hi-Scan Pro screen.**
- **Check the new ECM ID displayed on the Hi-Scan Pro screen to verify that the correct ECM software is being downloaded.**  
Refer to the "ECM SPECIFICATION TABLE" shown on page 2 of this TSB.

RE-PROGRAMMING	
01. TUCSON 4WD ESP	: 58920-2E350
02. TUCSON 2WD ESP	: 58920-2E300
ENTER YOUR PASSWORD: 23**	

RE-PROGRAMMING
TURN THE IG KEY OFF AND ON

RE-PROGRAMMING	
01. TUCSON 4WD ESP	: 58920-2E350
02. TUCSON 2WD ESP	: 58920-2E300
ESTABLISHING COMMUNICATION PLEASE WAIT	

RE-PROGRAMMING
FORCED→ 34*GA*2*1*
MAIN PROGRAM DOWNLOAD
CONFIRM CHECKSUM

9) When the "COMPLETED" message is displayed, turn the Hi-Scan Pro OFF and the process is over.

10) Turn the ignition key off and then start the engine to check for proper operation.

11) In case of 4WD vehicle, "ERASE DTC (P1765) IN 4WD SYSTEM." will be displayed when the reprogramming is completed.

In this case, erase the DTC (P1765) by referring to the procedure shown on page 9 of this TSB.

RE-PROGRAMMING
REPROGRAMMING COMPLETED! PLEASE FOLLOW THE DIRECTION. AFTER IG. KEY OFF AND ON. *UPGRADE SUCCESSFULLY : ESP, ESP OFF, ABS LAMP ON FOR 3 SECONDS AND OFF *UPGRADE FAIL : ESP, ESP OFF, ABS LAMP ON PERMANENTLY IF FAIL, TRY AGAIN IN ERROR MODE  PRESS [ENTER] KEY

RE-PROGRAMMING
ERASE DTC (P1765) IN 4WD SYSTEM

□ ERASING PROCEDURE OF DTC P1765 (4WD system only)

1) To erase DTC (P1765) using the Hi-Scan Pro, select option "01. HYUNDAI VEHICLE DIAGNOSIS".

0. INITIAL SCREEN	
<b>01. HYUNDAI VEHICLE DIAGNOSIS</b>	
02. TOOL BOX(DVOM/SCOPE)	
03. CARB OBD-II DIAGNOSIS	
04. FLIGHT RECORD REVIEW	
05. SYSTEM SETUP	
06. DATA DOWN LOAD	

2) Select option "09. TUCSON ALL" and press "ENTER".

1. HYUNDAI VEHICLE DIAGNOSIS ▲	
02. ELANTRA	ALL
03. SONATA	ALL
04. SANTAFE	ALL
05. TIBURON	ALL
06. XG 300/350	ALL
07. EXCEL	ALL
08. SCOUPE	ALL
<b>09. TUCSON</b>	<b>ALL</b>

3) Select option "06. 4WD CONTROL" and press "ENTER".

1. HYUNDAI VEHICLE DIAGNOSIS ▼	
MODEL : TUCSON	ALL
01. ENGINE L4	
02. ENGINE V6	
03. AUTOMATIC TRANSAXLE	
04. ABS/TCS/ESP	
05. SRS-AIRBAG	
<b>06. 4WD CONTROL</b>	
07. FULL AUTO AIR/CON.	
08. ETACS	

4) Select option "01. DIAGNOSTIC TROUBLE CODES" and press "ENTER".

1. HYUNDAI VEHICLE DIAGNOSIS	
MODEL : TUCSON	ALL
SYSTEM : 4WD CONTROL	
01. DIAGNOSTIC TROUBLE CODES	
02. IDENTIFICATION CHECK	

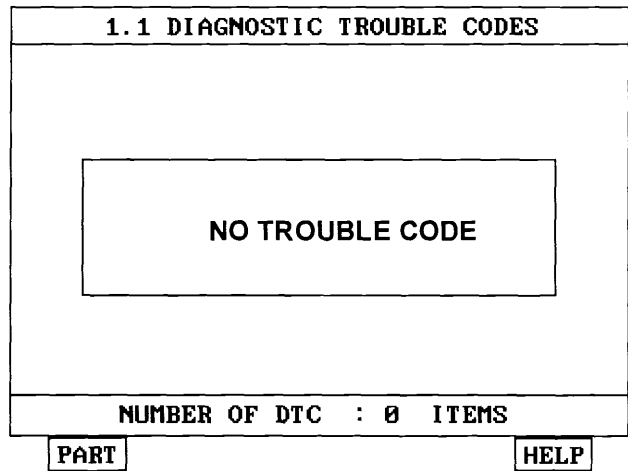
5) "P1765 TCS-ITM CAN COMM. LINE" will be detected and press "F2" to erase it.

1.1 DIAGNOSTIC TROUBLE CODES	
P1765 TCS-ITM CAN COMM.LINE	
NUMBER OF DTC : 0 ITEMS	
PART	HELP

6) Press "YES" to erase "DTC P1765".

1.1 DIAGNOSTIC TROUBLE CODES		
ARE YOU SURE ? [Y/N] (CONDITION : KEY ON, ENGINE OFF)		
NUMBER OF DTC : 0 ITEMS		
PART	ERAS	HELP

7) "NO TROUBLE CODE" will be displayed when the erasing procedure is completed.



8) When the reprogramming and erasing DTC is completed successfully, turn the ignition key to the off position and then start the engine to check for proper operation.

## 5. EXPLANATION OF ERROR MESSAGE

- 1) "INVALID PASSWORD": Please enter the exact password again.
- 2) "REPROGRAMMING ERROR, PLEASE WAIT FOR RETRY": An error occurred during reprogramming, the Hi-Scan Pro will retry reprogramming automatically.
- 3) "ALREADY REPROGRAMMED " or " INCORRECT TARGET ID": This reprogramming has previously been done on this vehicle or the ECM is not the type subject to this reprogramming procedure.
- 4) "REPROGRAM ERROR, PLEASE CHECK THE SYSTEM": In this case, you must reprogram manually after selecting the menu option "02. TUCSON ESP LOGIC IMPROVEMENT [ERROR]".

## 6. WARRANTY INFORMATION

OP CODE	OPERATION	OP TIME	DEFECT CODE	
			NATURE	CAUSE
51B003R0	ESP ECU reprogramming	0.3 M/H	*N13	**C40

\*N13 : Poor acceleration  
 \*\*C40 : Improper adjustment