



HYUNDAI Technical Service Bulletin

Group	ENGINE ELECTRICAL
Number	06-36-003
Date	JUNE, 2006
Model	2001-2005 XG300/350, SANTA FE 3.5L

Subject

**2001-2005 XG300/350, SANTA FE 3.5L
ELECTRONIC THROTTLE SYSTEM (ETS)
DIAGNOSTIC TROUBLE CODES (DTC) UPDATE**

This bulletin supersedes TSB# 05-36-004 to correct the reference number of the TSB for throttle initialization procedure.

DESCRIPTION:

The 2001-2005 MY XG300/350 and Santa Fe 3.5L incorporate an Electronic Throttle control System (ETS).

NOTE: Please see TSB 05-36-002 for a general description of the system, its components and the INITIALIZATION procedure.

The list of DTC codes has been modified. This TSB lists and explains the updated Diagnostic Trouble Codes (DTC) related to the ETS system.

NOTE: Some diagnostic trouble codes (DTCs) for 2004-2005 MY Santa Fe 3.5L and 2004-2005 XG350 vehicles have been added and revised. TSB 04-36-013 provides the newly added and revised DTCs in addition to the diagnostic procedures for these DTCs.

NOTES:

- In most cases, an ETS related DTC will set in pairs of codes. The first code denotes the related system or component. The second code is for the specific fault detected.
- Generally, an ETS related fault will cause the CHECK ENGINE LIGHT to illuminate immediately after detection (does not require two trips).
- When repairing a vehicle for ETS related codes, refer to the appropriate sections of the ETM and Shop Manual.

EXAMPLE: P1118 & P1178. The first code is to signify that the fault is related to the ETS Motor. The second code, P1178, signifies that there is an electrical open circuit. Thus, the power to the ETS Motor may be interrupted.

P1110 + DTC: ETS SYSTEM MALFUNCTION

P2110 + DTC: ETS SYSTEM MALFUNCTION

- The following codes relate to the ETS System.
- This subset of codes relate to diagnosis of the RESPONSE of the ETS to a given input.

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P1110& P1171	ETS VALVE (THROTTLE) STUCK OPEN	TPS value is higher than expected.	Throttle Body
P1110& P1172	ETS -- IMPROPER MOTOR CURRENT	No or small current flow to the motor.	Check the wiring to the ETS motor.
P1110& P1173	ETS -- TARGET FOLLOWING MALFUNCTION	TPS value is lower than expected.	Check for a sticky throttle (too much resistance).
P1110& P1174	ETS VALVE (THROTTLE) STUCK CLOSED #1	Checked during key-off initialization learning. TPS value is lower than expected with throttle closed.	<ul style="list-style-type: none"> • Check TPS ground wiring. • Check for a stuck closed throttle.
P1110& P1175	ETS VALVE (THROTTLE) STUCK CLOSED #2	Checked during key-on. TPS value is lower than expected with throttle closed.	<ul style="list-style-type: none"> • Check TPS ground wiring. • Check for a stuck closed throttle.
P1110& P1179	ETS POSITION F/B -- MISMATCH	Throttle plate position	Throttle body
P2110 & P2111	ETS VALVE (THROTTLE) STUCK OPEN	Valve stuck open	Connections, Throttle Valve, ETS Motor, PCM
P2110 & P2112	ETS VALVE (THROTTLE) STUCK CLOSED	Valve stuck closed	Connections, Throttle Valve, ETS Motor, PCM
P2110 & P2118	ETS -- IMPROPER MOTOR CURRENT	Incorrect motor voltage	Connections, Open ETS Motor Circuit, PCM
P2110 & P2119	ETS -- IMPROPER MOTOR VOLTAGE	Incorrect target voltage of throttle valve	Connections, Short in ETS Motor Circuit, PCM



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P2110 & P2176	ETS VALVE (THROTTLE) STUCK CLOSED	Valve stuck closed	Connections, Throttle Valve, ETS Motor, PCM
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P1118 + DTC:ETS MOTOR SYSTEM MALFUNCTION

P2118 + DTC:ETS MOTOR SYSTEM MALFUNCTION

- The following codes relate to the ETS Motor System.
- This subset of codes relate to diagnosis of the ETS Motor.

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P1118 & P1176	ETS MOTOR OPEN/SHORT #1	Current to the ETS motor is too high when the duty signal to the motor is low.	ETS Motor.
P1118 & P1177	ETS MOTOR OPEN/SHORT #2	Current to the ETS motor is too high when the duty signal to the motor is high.	ETS Motor.
P1118 & P1178	ETS MOTOR POWER -- OPEN	Open circuit detected in the circuit which supplies power to the ETS Motor.	<ul style="list-style-type: none"> • Check the ETS Relay for malfunction or poor electrical connection. • Check the wiring related to supplying power to the ETS Module / Motor.
P2118 & P2100	MOTOR CIRCUIT OPEN	Open power circuit to ETS Motor	<ul style="list-style-type: none"> • Connections, Open in ETS Relay Circuit, ETS Relay/ Fuse, PCM
P2118 & P2102	ETS MOTOR CIRCUIT LOW	Calculated value of ETS motor is less than 6 Volts / Current more than 9 Amps	<ul style="list-style-type: none"> • Connections, Short to Ground in ETS Motor Circuit, ETS Motor, PCM

P2118 & P2103	ETS MOTOR CIRCUIT HIGH	Calculated value of ETS motor is less than 9 Volts / Current more than 9.5 Amps	<ul style="list-style-type: none"> • Connections, Short to Battery in ETS Motor Circuit, ETS Motor, PCM
P2118 & P2107	ETS-ECM MALFUNCTION	PCM cannot write to the E- PROM	<ul style="list-style-type: none"> • Connection, PCM
P2118 & P2108	ETS-ECM MALFUNCTION	PCM Detected an Internal Failure	<ul style="list-style-type: none"> • PCM

P1191 + DTC:ETS -- LIMP-HOME VALVE ON

- The following codes relate to conditions which cause the ETS Limp-Home Valve to be turned on.

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P1191 & P1192	LIMP-HOME -- TARGET FOLLOWING MALFUNCTION	Detected malfunction of the throttle plate following the input command.	Check for a sticky throttle (too much resistance).
P1191 & P1193	LIMP-HOME -- LOW RPM	Detected engine speed below 470 RPM.	Check components which may cause engine stalling / low rpm.
P1191 & P1194	LIMP-HOME -- TPS2 POSITION MALFUNCTION	TPS2 signal variation over 0.3V while idling.	<ul style="list-style-type: none"> • Check TPS ground wiring. • Check for a stuck closed throttle.
P1191 & P1195	LIMP-HOME -- TARGET FOLLOWING DELAY	While accelerating, the TPS value deviates more than 0.5V from the target.	Check for a sticky throttle (too much resistance).
P1191 & P1196	LIMP-HOME -- THROTTLE STUCK CLOSED	Throttle stuck closed detected by the ETS system diagnostics.	<ul style="list-style-type: none"> • Check TPS ground wiring. • Check for a stuck closed throttle.



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OTHER ETS RELATED CODES

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P1614	ETS MODULE RELATED ERROR	<ul style="list-style-type: none"> ETS Module to ECM communication error. APS & TPS have large deviation from expected values. 	<ul style="list-style-type: none"> ETS Module. Check communication wiring between the ETS Module & ECM.
P2106	LIMP HOME VALVE MALFUNCTION	Limp Home Valve Opened Abnormally	<ul style="list-style-type: none"> Connections, Limp Home Valve, Open/Short in Limp Home Valve circuit, PCM

Throttle Position Sensor (TPS) 1 & 2:

TPS1 = MAIN SENSOR

TPS2 = SECONDARY SENSOR

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P0120	ETS -- TPS1 (MAIN) MALFUNCTION	<ul style="list-style-type: none"> TPS1 output is too high or too low. TPS1 output does not change properly in response to current to the ETS Motor. TPS1 does not rationalize to good TPS2 signal. 	<ul style="list-style-type: none"> Throttle Position Sensor 1. Check TPS1 related wiring.
P0120 & P0220	TPS1 CHARACTERISTIC ABNORMAL	TPS1 + TPS2 is out of expected 4 to 6V range when TPS2 is good.	<ul style="list-style-type: none"> Throttle Position Sensor. Check TPS related wiring.

P0220 & P0122	TPS2 MALFUNCTION LOW VOLTAGE	TPS2 signal voltage is much lower than expected.	<ul style="list-style-type: none"> • Throttle Position Sensor 2. • Check TPS 2 related wiring.
P0220 & P0123	TPS2 MALFUNCTION HIGH VOLTAGE	TPS2 signal voltage is much higher than expected.	<ul style="list-style-type: none"> • Throttle Position Sensor 2. • Check TPS 2 related wiring.
P0121	TPS2 MALFUNCTION RATIONALITY CHECK	TPS2 signal does not match what's expected based on engine load and speed.	<ul style="list-style-type: none"> • Throttle Position Sensor 2. • Check TPS 2 related wiring.



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Accelerator Position Sensor (APS) 1 & 2:

APS2 = MAIN SENSOR

APS1 = SECONDARY SENSOR

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P1151	ETS -- APS2 (MAIN) MALFUNCTION	<ul style="list-style-type: none"> • APS2 open/short circuit. • APS2 output is below low threshold (<0.2V). • APS2 output is above high threshold (>4.5V). 	<ul style="list-style-type: none"> • APS2 Sensor output. • Check APS2 related wiring. • ECM.
P1147	ETS -- APS1 (SECONDARY) MALFUNCTION	<ul style="list-style-type: none"> • APS1 open/short circuit. • APS1 output is below low threshold (<0.2V). • APS1 output is above high threshold (>4.5V). 	<ul style="list-style-type: none"> • APS1 Sensor output. • Check APS1 related wiring. • ECM.
P1147 & P1151	APS1 & APS2 RATIONALITY	<ul style="list-style-type: none"> • APS1 & APS2 should be similar to each other when APS1 is changing slowly (APS1 -APS2 should be less than 1V). • APS2 output is too high with the idle switch in the ON position. 	<ul style="list-style-type: none"> • APS Sensor output. • Check APS related wiring. • ECM.
2122	THROTTLE PEDAL POSITION SENSOR "D" CIRCUIT LOW INPUT	<ul style="list-style-type: none"> • Accelerator position sensor 1 voltage is low. 	<ul style="list-style-type: none"> • Connection, Accelerator position sensor 1, Open/ Short in APS 1 circuit, PCM
2123	THROTTLE PEDAL POSITION SENSOR "D" CIRCUIT HIGH INPUT	<ul style="list-style-type: none"> • Accelerator position sensor 1 voltage is high. 	<ul style="list-style-type: none"> • Connection, Accelerator position sensor 1, Open/ Short in APS 1 circuit, PCM

2125	THROTTLE PEDAL POSITION SENSOR "E" CIRCUIT	<ul style="list-style-type: none"> Accelerator position sensor 2 changes voltage less than 0.1V in 25msec. 	<ul style="list-style-type: none"> Connection, Accelerator position sensor 1, Open/Short in APS 1 circuit, PCM
2127	THROTTLE PEDAL POSITION SENSOR "E" CIRCUIT LOW INPUT	<ul style="list-style-type: none"> Accelerator position sensor 2 voltage is low. 	<ul style="list-style-type: none"> Connection, Accelerator position sensor 2, Open/Short in APS 2 circuit, PCM
2128	THROTTLE PEDAL POSITION SENSOR "E" CIRCUIT HIGH INPUT	<ul style="list-style-type: none"> Accelerator position sensor 2 voltage is high. 	<ul style="list-style-type: none"> Connection, Accelerator position sensor 2, Open/Short in APS 2 circuit, PCM
2135	THROTTLE POSITION SENSOR RANGE / PERFORMANCE	<ul style="list-style-type: none"> TPS1 and TPS2 signal is out of normal range. 	<ul style="list-style-type: none"> Connection, TPS, PCM
2138	THROTTLE PEDAL POSITION SENSOR "D"/"E" CORRELATION	<ul style="list-style-type: none"> APS2 Subtracted from APS1 is greater than 1 Volt. 	<ul style="list-style-type: none"> Connection, APS Sensor, PCM

OTHER ETS RELATED CODES:

DTC	CODE DESCRIPTION	CRITERIA	INSPECT
P1607	ETS SYSTEM COMMUNICATION ERROR	ECM & ETS Module cannot communicate properly.	<ul style="list-style-type: none"> Wiring between ECM & ETS Module. ETS Module. ECM.
P1155	ETS LIMP-HOME VALVE MALFUNCTION	<ul style="list-style-type: none"> Limp-Home Valve is stuck open. Wiring open/short. 	<ul style="list-style-type: none"> Limp-Home Valve. Limp-Home Valve related wiring.