

FORD:

2000-2003 Escort
 2000-2004 Crown Victoria, Mustang
 2000-2005 Focus, Taurus
 2000-2001 Explorer
 2000-2004 E-Series, Expedition, F-150, F-Super Duty
 2000-2005 Excursion, Ranger
 2001-2003 Explorer Sport
 2001-2005 Escape, Explorer Sport Trac
 2004 F-150 Heritage

LINCOLN:

2000-2002 Navigator
 2001-2002 Blackwood

MERCURY:

2000-2002 Cougar
 2000-2004 Grand Marquis
 2000-2005 Sable
 2003-2004 Marauder
 2000-2001 Mountaineer
 2005 Mariner

ISSUE

Stand-alone speed control system diagnostic updates have been made in 2006 model year and newer Workshop Manuals (WSM). These diagnostic updates also apply to 2000-2005 model year vehicles. This TSB provides these WSM updates for 2000-2005 model year vehicles.

ACTION

The vehicles in this article are equipped with a 10-pin speed control servo without a standard corporate protocol (SCP) communication control system. Follow the Service Procedures and Diagnostic Tips in this TSB to assist with accurate diagnosis and repair of speed control issues.

GENERAL SERVICE PROCEDURE

1. Visually inspect the vehicle. Any after market modifications, including but not limited to those listed below, may cause speed control to not operate correctly:
 - Any wiring or lamp modifications affecting brake lamp operation
 - LED brake lamps
 - Non-factory installed trailer wiring
 - Radios (speed sensitive, auto mute)
 - Remote starters and alarms
 - Lighting and electrical accessories modifications

2. Visually inspect the servo and accelerator controls:
 - Visually inspect speed control cable without removing and ensure smooth cable operation. Inspect cable connection to the throttle body
 - Visually inspect accelerator cable without removing and ensure smooth cable operation. Inspect cable connection to throttle body. Also check for interference with carpet, bulkhead grommet, insulation, and instrument panel wiring

SERVICE PROCEDURE

Start by running speed control servo integrated self test diagnostics. The servo has integrated self test diagnostics which is a key tool in quickly and accurately diagnosing speed control system faults. Self test diagnostics are also the basis for starting speed control trouble shooting.

WARNING

THIS TEST IS A KEY ON ENGINE OFF (KOE) TEST THAT IS CONDUCTED ONLY WHILE PARKED WITH THE PARKING BRAKE FULLY ENGAGED. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE: The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers". Do not assume that a condition described affects your car or truck. Contact a Ford, Lincoln, or Mercury dealership to determine whether the Bulletin applies to your vehicle. Warranty Policy and Extended Service Plan documentation determine Warranty and/or Extended Service Plan coverage unless stated otherwise in the TSB article. The information in this Technical Service Bulletin (TSB) was current at the time of printing. Ford Motor Company reserves the right to supersede this information with updates. The most recent information is available through Ford Motor Company's on-line technical resources.

TSB 06-8-5 (Continued)

NOTE

THE SELF-TEST IS COMPRISED OF TWO PARTS. THE FIRST PART IS A STATIC CHECK OF THE SPEED CONTROL ELECTRONICS MODULE AND SYSTEM. THE SECOND PART IS A DYNAMIC PULL-TEST TO CHECK THE ACTUATOR MOTOR AND GEAR MECHANISM.

NOTE

THE MODULE TIMES OUT IF EACH BUTTON IS NOT PRESSED WITHIN 1 SECOND OF THE PREVIOUS BUTTON. IF A MODULE TIME OUT OCCURS (SPEED CONTROL LAMP STOPS FLASHING PART WAY THROUGH THE TEST), THE PROCEDURE MUST BE RE-INITIATED.

NOTE

ON VEHICLES EQUIPPED WITH A MANUAL TRANSMISSION, THE CLUTCH PEDAL SHOULD NOT BE DEPRESSED EXCEPT FOR ESCAPE/MARINER, WHICH SHOULD BE DEPRESSED, IN ORDER TO CORRECTLY PERFORM THE SELF-TEST. ON VEHICLES EQUIPPED WITH AN AUTOMATIC TRANSMISSION, THE TRANSMISSION SELECTOR LEVER NEEDS TO BE IN THE "P" POSITION FOR THE SELF TEST EXCEPT FOR THE ESCAPE/MARINER WHICH SHOULD BE IN "N".

NOTE

REVIEW THE FOLLOWING STEPS BEFORE CARRYING OUT THE SELF-TEST DIAGNOSTIC PROCEDURE.

1. Self Test Diagnostic Procedure - Static Test
 - a. Connect the diagnostic scan tool (DST) to a power source that is not interrupted when the ignition switch changes positions. With the ignition switch in the RUN position, set the DST to monitor the powertrain control module (PCM) throttle position PID while the speed control actuator carries out the self-test.
 - b. Enter self-test diagnostics by firmly pressing and holding the speed control OFF switch while quickly cycling the ignition switch from RUN-to-OFF-to-RUN, making sure the engine does not start and is not running.

- c. The speed control indicator lamp on the instrument panel will flash once to indicate that the speed control module has entered the self test diagnostic mode. Release the OFF switch. If 5 flashes are displayed at this point, a speed control subsystem concern exists. Refer to the Symptom Chart in the vehicle WSM.
- d. Then firmly press and release the remaining switches WITHIN 1 SECOND of each other in the sequence below. The speed control indicator lamp flashes once after each of the buttons is successfully pressed.

10 Pin Non-SCP Servos
1. On
2. RSM (resume)
3. CST (coast)
4. Set / Accel

TB-8513-A

Figure 1 - Article 06-8-5

NOTE

MONITOR THE PCM THROTTLE POSITION PID AFTER THE LAST BUTTON IS PRESSED.

NOTE

THERE WILL BE A SLIGHT DELAY FROM WHEN THE LAST BUTTON IS PRESSED AND THE CLUSTER LAMP FLASHES DIAGNOSTIC CODES.

NOTE

IF THE SELF-TEST WILL NOT START OR CANNOT BE COMPLETED AFTER MULTIPLE ATTEMPTS, GO TO THE VEHICLE WSM SYMPTOM CHART.

- e. Follow the list below for diagnostic flash codes, then go to the WSM Symptom Chart.

Sequence of Button Press	Button	Resulting Cluster Lamp Flashes
1	Off	<ul style="list-style-type: none"> • 1 Flash: confirms button was pressed correctly • 5 Flashes: indicates a faulty speed control module
2	On	<ul style="list-style-type: none"> • 1 Flash: confirms button was pressed correctly
3	Resume	<ul style="list-style-type: none"> • 1 Flash: confirms button was pressed correctly
4	Coast	<ul style="list-style-type: none"> • 1 Flash: confirms button was pressed correctly
5	Set / Accel	<p>There is a delay which is followed by diagnostic flash codes consisting of 0 to 5 flashes. The dynamic test occurs within .25 seconds after the flash codes.</p> <ul style="list-style-type: none"> • 0 Flashes: no flash after last button pressed - suspect circuitry or speed control steering wheel switches • 1 Flash: static test passed • 2 Flashes: BPP switch is damaged, circuit is damaged or the brake pedal or clutch is applied • 3 Flashes: brake deactivation switch is open or circuit is damaged • 4 Flashes: Escape/Mariner the Clutch (CPP)/neutral switch (TR sensor) circuit is damaged, clutch switch is damaged or the clutch is not applied. On all other vehicles, 4 flashes indicates the speed signal circuit is open or damaged • 5 Flashes: suspect circuitry or module

TB-8514-A

Figure 2 - Article 06-8-5

2. Self Test Diagnostic Procedure - Dynamic Test

NOTE

THE DYNAMIC TEST OCCURS AUTOMATICALLY AFTER THE STATIC TEST PASSES. IF THE STATIC TEST FAILS RESULTING IN FLASH CODES, THERE WILL BE NO DYNAMIC PULL TEST.

- a. Within .25 seconds after the static test has completed, the speed control actuator carries out a dynamic pull test. The actuator automatically pulls the speed control cable .04 to .39" (1 to 10 mm) to move the throttle from the idle position and then releases the speed control cable returning the throttle to the idle position.

NOTE

THE 2001-2005 ESCAPE/MARINER HOLDS THE PEAK THROTTLE PULL FOR 3 SECONDS PRIOR TO RELEASING.

- b. If the throttle position PID voltage value does not change during the dynamic throttle pull, go to the WSM Symptom Chart Section for Dynamic Pull Test failure.

SPEED CONTROL DIAGNOSTIC TIPS

Servo Pin-Out Test Tips

NOTE

MEASURING THE RESISTANCE OF A SERVO WILL INDICATE THAT A SERVO IS BAD IF READINGS ARE OUTSIDE THE RANGES SPECIFIED BELOW. HOWEVER, A SERVO CAN HAVE RESISTANCE READINGS WITHIN THE SPECIFIED RANGES AND STILL BE FAULTY.

The following readings are the expected values for a good servo.

Resistance between Pins 6 and 10 should measure less than 5 ohms. This is the ground circuit through the module. Resistance between Pins 7 and 10 will vary with polarity, the type of meter, and source voltage of the meter. Also measurements between Pins 7 and 10 can be any of the following: an open circuit, increasing reading (as a capacitor charging), or changing value (re-apply leads and different value indicated), or a stable reading of 10,000 ohms or greater are all valid results as this is a solid state circuit.

DST Testing Tips (TPS PID)

- 1. Pinpoint Test: The Speed Control Does Not Disengage When The Brakes Are Applied

TSB 06-8-5 (Continued)

With the vehicle speed above 30 MPH (48 Km/h) engage the speed control. Then check to see if the TPS PID returns to base voltage when the brakes are applied. If it does return to base voltage, then the speed control system is working. Need to advise customer that tapping the brakes deactivates speed control and that the brakes must be applied to make the vehicle slow down. On the Escape/Mariner the brake pedal should be depressed at least 13/32" (10 mm) in order to deactivate speed control.

NOTE

CHECK FOR CALIBRATION SERVICE MESSAGES RELATING TO DASHPOT OR IDLE SPEED CONTROL UPDATES.

2. Pinpoint Test: The Speed Control Does Not Disengage When The Clutch Is Applied

Check to see if the TPS PID returns to base voltage when the clutch is pressed. If it does then the speed control system is working. Need to advise customer that pressing clutch deactivates speed control and that the brakes must be applied to make the vehicle slow down.

NOTE

CHECK FOR CALIBRATION SERVICE MESSAGES RELATING TO DASHPOT OR IDLE SPEED CHANGES. ALSO A SLIGHT ENGINE RPM FLARE MAY OCCUR ON SOME VEHICLES WHEN SPEED CONTROL IS DISENGAGED WHICH IS A NORMAL CONDITION.

Speed Signal Testing Tips

NOTE

A FAULTY VEHICLE SPEED SIGNAL TO THE SERVO CAN RESULT IN INTERMITTENT, IRREGULAR OR INOPERATIVE SPEED CONTROL.

NOTE

FOR VEHICLES THAT HAVE OSS OR HALL EFFECT VEHICLE SPEED SIGNALS TO THE SERVO, REFER TO WSM FOR DIAGNOSTICS.

To verify that the speed control signal sent to the servo is valid, the following inspection may be done for ABS and PCM generated speed signals:

1. Disconnect speed control module (C122).
2. Connect DVOM set to Hz to C122 Pin 3 harness side and C122 Pin 10 (ground) harness side.

3. Start the vehicle; place the transmission in DRIVE, test drive vehicle between 25-30 MPH (40-48 Km/h).
4. Measure the frequency between the speed control actuator C122 Pin 3 harness side and C122 Pin 10 (ground) harness side. Divide frequency by 2.2 to give MPH and compare to speedometer reading. Measure AC Volts and record.
5. If the AC Voltage is greater than 4.5V and the frequency reading does match the speedometer reading then the speed signal is valid. If further diagnostics are required see WSM.

Deactivator Switch Inspection Tips

A faulty deactivator switch can result in intermittent or inoperative speed control. There are two types of deactivator switches; a brake line pressure switch, which is integrated into the brake master cylinder, and a pedal travel switch, which is connected to the brake pedal arm.

Proper switch function should be confirmed. Inoperative switches of both types should be inspected for connector corrosion or pin push-out. Pedal travel switches should also be inspected for proper mechanical adjustment relative to brake pedal travel.

ADDITIONAL REFERENCE INFORMATION

Speed Control Servo Operation and Function

NOTE

ALL FUNCTIONALITY LISTED BELOW IS PERFORMED WITH CONNECTORS CONNECTED AND KEY IN RUN POSITION UNLESS OTHERWISE NOTED.

PIN 1 - Indicator. (if used) Speed control servo grounds this circuit to turn the speed control lamp in cluster on during operation. This will not affect operation of system.

PIN 2 - Clutch/TRS Input. (Escape/Mariner only) Signal comes from clutch switch (MT) or TRS (AT). On the harness side the signal can be measured by connecting a DVOM, set to ohms, between Pins 2 and B-. With clutch depressed (MT) or in N (AT) you should read 0 ohms, which disables speed control. With clutch released (MT) or in D (AT) signal should read greater than 10,000 ohms, which enables speed control operation.

PIN 3 - VSS Input. (Note: Performed with engine running and vehicle driven.) Signal comes from PCM, ABS, OSS, hall effect sensor depending on application. Except for hall effect sensor, the signal can be measured by removing Connector C122 and measuring the frequency between Pins 3 and 10 with a DVOM set to AC Hz. The signal should measure 2.2 Hz/MPH. The vehicle must be traveling 30 MPH (48 Km/h) before the system will set, therefore a minimum of 66 Hz must be observed. Take note that on vehicles equipped with SVC (speed sensitive volume control), an internal problem within the radio can bring signal down to 0 Hz even though it reads correctly in PCM PIDs. If signal is missing disconnect radio and retest. Note, for vehicles with a hall effect input to the speed control servo, see WSM for speed signal verification.

PIN 4 - Brake Switch Input (BOO/BPP).

NOTE

ENSURE THAT BRAKE LAMPS ARE FUNCTIONING CORRECTLY.

Vehicles with automatic transmission and all Escape and Mariner vehicles (auto and manual): With a DVOM set to ohms, measure resistance between Pins 4 and B- with brake pedal not depressed, you should get less than 5 ohms. Then measure voltage with brake pedal depressed, you should get 12 V. Operation: The servo sends out a reference voltage on Pin 4 (4-7V) which is grounded through the brake lamps or switched directly to ground.

Vehicles with manual transmissions (except Escape and Mariner vehicles, see above): With a DVOM set to ohms, measure resistance between Pin 4 and B- with brake pedal not depressed and clutch pedal not depressed, you should get less than 5 ohms. Next, depress clutch pedal only, measuring resistance, you should get an open circuit / infinite resistance. Then measure voltage with brake pedal depressed, clutch pedal not depressed and you should get 12 V. Repeat with both pedals depressed and you should get 0 volts. Operation: The servo sends out a reference voltage on Pin 4 (4-7V) which is grounded through the brake lamps or switched directly to ground when the clutch pedal is not depressed.

PIN 5 - Control Switch Input. (Note: Performed with key in OFF position.) Remove Connector C122, using a DVOM set to resistance, measure the resistance between Pins 5 and 6. See table of resistance readings below for each switch when it is depressed.

Speed Control Switch	Resistance Value
Coast	Between 114 and 126 ohms
Set / Accel	Between 646 and 714 ohms
Resume	Between 2,090 and 2,310 ohms
Off	Less than 5 ohms
No Buttons Pressed	Infinite

TB-8516-A

Figure 3 - Article 06-8-5

PIN 6 - Control Switch Return. This is the return side of the switches, which are grounded internally to the servo to Pin 10. If test for Pin 5 checks good then Pin 6 is functioning normally.

PIN 7 - Power. Remove Connector C122, Using a DVOM set to DC volts, measure the voltage between Pin 7 and ground. You should read greater than 10 volts with the key in the run position. Record the voltage from Pin 7 to ground, then re-measure with a test lamp (1156) from Pin 7 to ground, to ensure current carrying capability. The difference between the two measurements should be less than 0.3 VDC. If voltage drop test fails then check wiring.

PIN 8 - Not used.

PIN 9 - Brake Deactivator Switch (BPS). This is a redundant shutoff switch. Without depressing the brake pedal, measure voltage on Pin 9, and re-measure with a test lamp (1156) from Pin 9 to ground, to ensure current carrying capability. The difference between the two measurements should be less than 0.3 VDC. The system requires enough current at this pin to engage properly. If voltage drop test fails, check for corroded wiring or deactivation switch. You should measure 0 volts at Pin 6 when the brake pedal is depressed firmly.

An alternate to the voltage drop test would be to disconnect the switch connector and measure the switch resistance. It should be less than 5 ohms. If the switch is suspected, a bypass test may also be done: On the harness side of the BPS connector, connect a jumper between the two deactivation switch pins and drive vehicle above 30 MPH (48 Km/h). If speed control engages then the brake deactivation switch was faulty, otherwise wiring is at fault.

TSB 06-8-5 (Continued)

PIN 10 - Ground. Using a DVOM set to DC volts, measure the voltage between B+ and Pin 10. You should read greater than 10 volts. Record the voltage between B+ and Pin 10 , then re-measure with a test lamp (1156) from B+ to Pin 10. The difference between the two measurements should be less than 0.3 VDC. If voltage drop test fails then check wiring. This verifies circuit can carry proper load as well as continuity to ground.

WARRANTY STATUS: Information Only