



Digital Throttle Control (DTC) Diagnostic Supplement

**This Page Was
Intentionally Left
Blank**

Marine Electronic Fuel Injection (MEFI 4B)

2006 Digital Throttle Control (DTC) System Diagnostic Supplement

This manual will be used to describe the functionality, and perform diagnostic procedures on the 2006 Digital Throttle Control (DTC) equipped engines. It describes the system circuits and diagnostic procedures used to diagnose the circuits. It will be used to correct trouble codes by following step-by-step procedures.

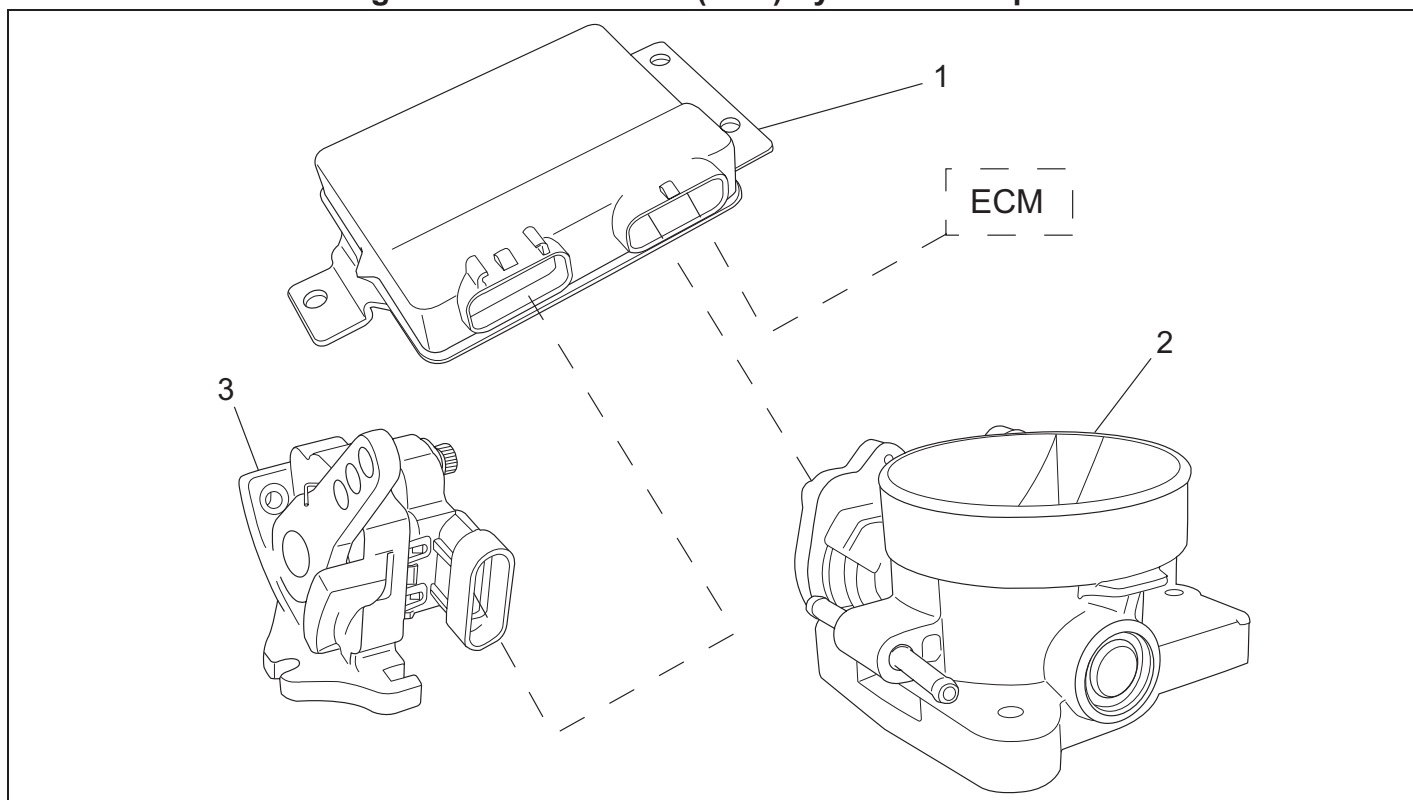
The assumption is made that on all diagnostic procedures, the engine is equipped with MEFI 4B ECM, sensors, wiring harness, and throttle control components. The wiring schematics and circuit identifications are for the MEFI 4B originally equipped DTC System wiring harnesses.

The Diagnostic Procedures (DP) and voltages shown are prepared with the requirement that the system functioned correctly at the time of assembly and that there are no multiple failures.

Contents

DTC System Description	Page 4	DP B-8: DTC81-TAC Fault - Lmt'd Authority; DTC 81-TAC Fault - Actuation Fault; DTC 81-TAC Fault - Not Tracking	Page 38
DTC System Operation	Page 6	DP B-9: DTC 81-TAC Fault - TPS1 Range; DTC 81-TAC Fault - TPS12 Corr; DTC 81-TAC Fault - Actuation Fault	Page 40
DTC Related Trouble Codes	Page 8	DP B-10: DTC 81-TAC Fault - TPS2 Range; DTC 81-TAC Fault - TPS12 Corr; DTC 81-TAC Fault - Lmt'd Authority; DTC 81-TAC Fault - Actuation Fault	Page 42
Typical DTC Related Diacom Data Values	Page 9	DP B-11: DTC 81-TAC Fault - TPS12 Corr; DTC 81-TAC Fault - Lmt'd Authority; DTC 81-TAC Fault - No TAC Reply	Page 44
DTC Related Scan Tool Data Definitions	Page 10	DP B-12: DTC 81-TAC Fault - Lmt'd Authority; DTC 81-TAC Fault - Actuation Fault	Page 46
Clearing Trouble Codes	Page 10	DP B-13: DTC 61, Fuel Pressure Sensor Voltage High ..	Page 48
Circuit Descriptions	Page 11	On-Board Service	Page 50-52
DTC System Wiring Schematics	Page 12-18	Throttle Actuator Control (TAC) Module Replacement	Page 50
DTC System Connector Pinout Identification	Page 20-21	Throttle Control Position Sensor Replacement	Page 50
DTC Diagnostic Procedures	Page 23	Throttle Body Replacement	Page 51
DP B-1: DTC 81-TAC Fault; DTC 81-TPS1 Range; DTC 81-TAC Fault; DTC 81-TPS12 Corr; DTC 81-TAC Fault - Lmt'd Authority	Page 24	DTC Related Fastener Tightening Specifications	Page 53
DP B-2: DTC 81-TAC Fault - No TAC Reply (may also have DTC 81-TAC Fault - Serial Communication Fault and DTC 81-TAC Fault - Lmt'd Authority)	Page 26		
DP B-3: DTC 81-TAC Fault - TPS1 Range; DTC 81-TAC Fault - TPS2 Range; DTC 81-TAC Fault - Lmt'd Authority; DTC 81-TAC Fault - Actuation Fault ..	Page 28		
DP B-4: DTC 81-TAC Fault - TPS2 Range; DTC 81-TAC Fault - TPS12 Corr; DTC 81-TAC Fault - Lmt'd Authority	Page 30		
DP B-5: DTC 81-TAC Fault - No TAC Reply; DTC 81-TAC Fault - Not Tracking	Page 32		
DP B-6: DTC 81-TAC Fault - PPS2 Range; DTC 81-TAC Fault - PPS12 Corr; DTC 81-TAC Fault - Lmt'd Authority	Page 34		
DP B-7: DTC 81-TAC Fault - PPS1 Range; DTC 81-TAC Fault - PPS12 Corr; DTC 81-TAC Fault - Lmt'd Authority	Page 36		

Digital Throttle Control (DTC) System Description



Legend

- (1) Throttle Actuator Control (TAC) Module
- (2) Throttle Body Assembly
- (3) Throttle Control Positioning (TCP) Sensor

The Digital Throttle Control (DTC) system uses engine electronics and components to calculate and control the position of the throttle blade. This system also performs the cruise control and twin engine synchronization control functions as well.

The TAC system components include the following:

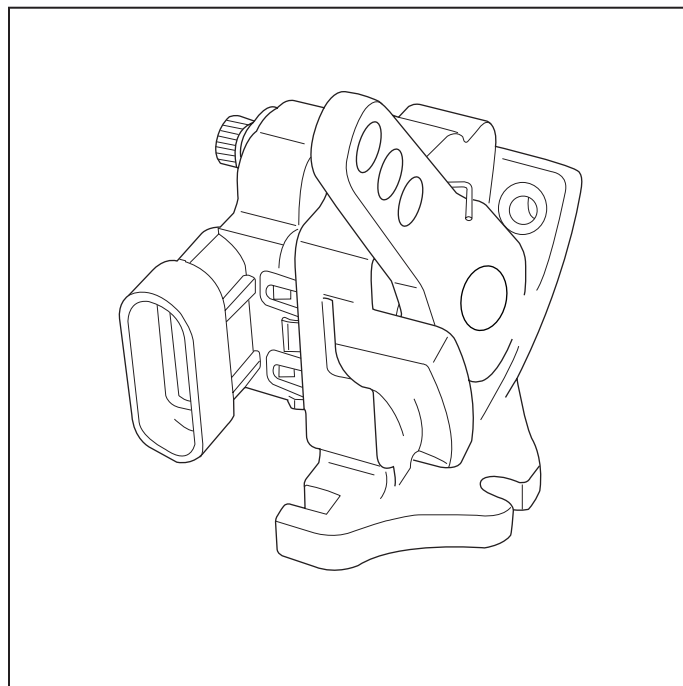
- The throttle control positioning (TCP) sensor
- The throttle body
- The throttle actuator control (TAC) module
- The engine control module (ECM)

Each of these components interface together to ensure accurate calculations and control of the throttle position.

Throttle Control Positioning (TCP) Sensor

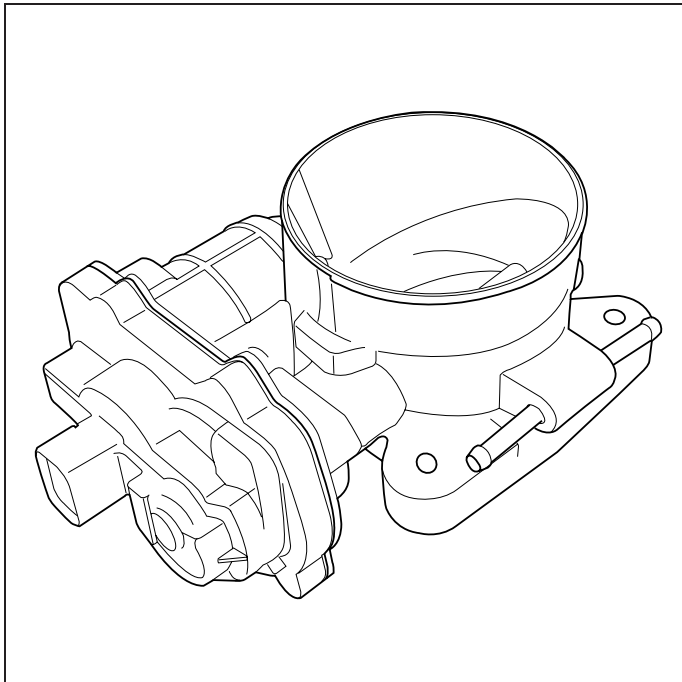
The TCP sensor is mounted on the engine, near the throttle body. The TCP is actually 2 individual throttle control position sensors within one housing. Two separate signal, low reference and 5.0 volt reference circuits are used to connect the TCP and the TAC module. The TCP sensor 1 voltage should increase as the accelerator pedal is depressed, from below 1.0 volt at 0 percent pedal travel to above 2.0 volts at 100 percent pedal travel.

TCP sensor 2 voltage should decrease from above 4.0 volts at 0 percent pedal travel to below 2.9 volts at 100 percent pedal travel.



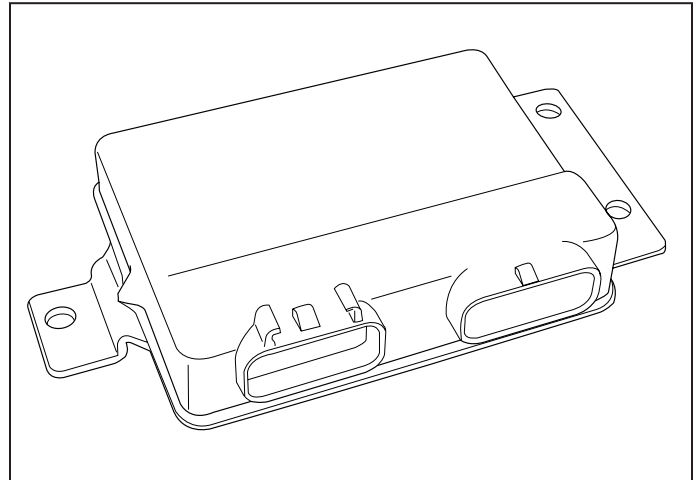
Throttle Body Assembly

The throttle body for the DTC system is similar to a conventional throttle body with a couple of exceptions. One exception being the use of a motor to control the throttle blade instead of a mechanical cable. The other exception is the new design throttle position (TP) sensor. The TP sensor mounts inside of the throttle body cover, along with the throttle actuator motor. The TP sensor is actually 2 individual TP sensors within one housing. Separate signal, low reference and 5.0 volt reference circuits are used to connect the TP sensors and the TAC module. The TP sensor 1 signal voltage increases as the throttle opens, from around 1.0 volt at 0 percent throttle to above 3.5 volts at 100 percent throttle. TP sensor 2 signal voltage decreases as the throttle is opened, from around 3.8 volts at 0 percent throttle to below 1.0 volt at 100 percent throttle.



Throttle Actuator Control (TAC) Module

The TAC module is the control center for the electronic throttle system. The TAC module and the ECM communicate via a dedicated redundant serial data circuit. The TAC module and the ECM monitor the commanded throttle position and compare the commanded position to the actual throttle position. This is accomplished by monitoring the TCP and the TP sensor. These 2 values must be within a calibrated value of each other. The TAC module also monitors each individual circuit of the TP sensor and the TPC sensor to verify proper operation.



Digital Throttle Control (DTC) System Operation

The DTC system operates much like a conventional system. The operator commands a certain handle position, and the engine responds with the appropriate throttle angle.

The DTC system also supports several types of speed control.

Speed Control Applications

Perfect Pass

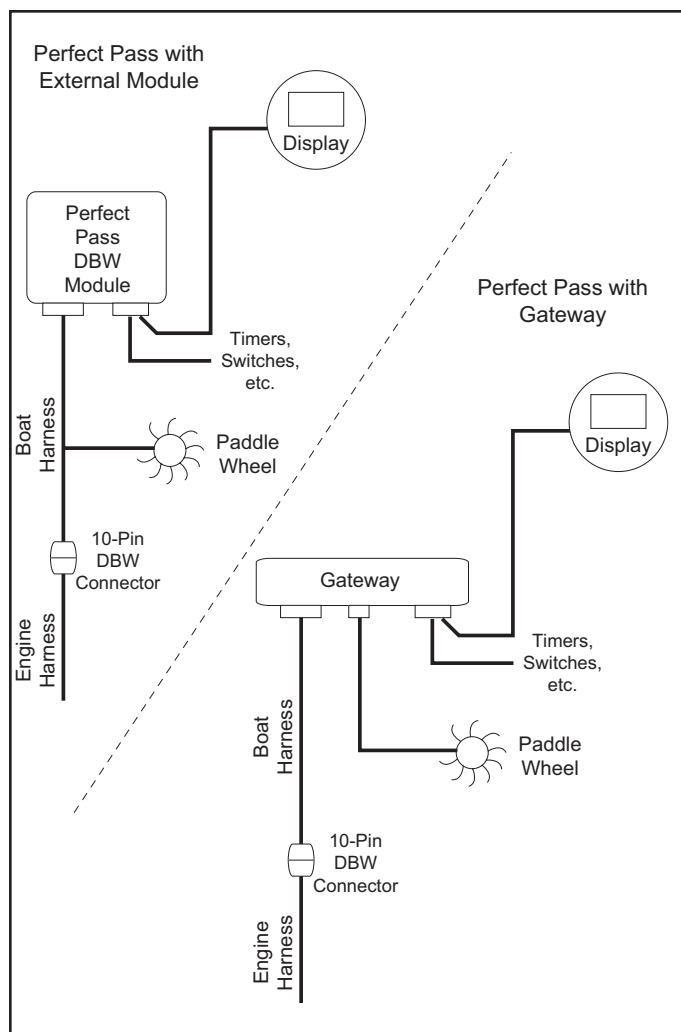
The DTC system works in conjunction with Electronic Perfect Pass Digital Pro and Wakeboard Pro. Perfect Pass may have been ordered as an option from the factory, or may have been installed at the dealer level. The electronics of the DTC system eliminated the need for a servo motor in order to control the throttle blade to maintain a particular boat speed. The Perfect Pass logic now interfaces with the engine's ECM in order to accomplish speed control. With this system having an electronically-controlled throttle, Perfect Pass can input the desired speed (based on operator input through Perfect Pass) directly to the ECM. The ECM then adjusts the throttle angle to maintain the speed being requested from Perfect Pass.

If Perfect Pass becomes inoperable, this section provides diagnostics to ensure that the ECM and engine wiring are working properly. These diagnostic procedures will assist you in determining the fault of the system.

The overall system can be configured in two basic types; one is with an external Perfect Pass DBW Module, and the second has the Perfect Pass circuitry contained within the boat's gateway box. Refer to the boat's Owners Manual to help determine what configuration you have.

For complete installation guidelines and Perfect Pass operation, refer to the Operation and Installation Instructions provided with each Perfect Pass system.

Typical Perfect Pass Configurations

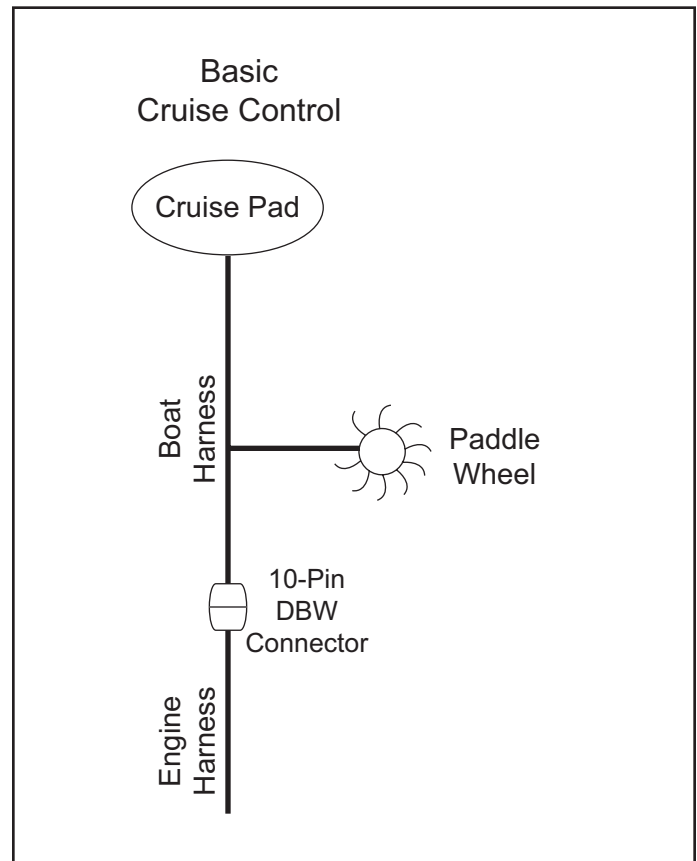


Cruise Control

The boat may be equipped with a “simple” or “basic” cruise control system based on boat speed and/or engine RPM. This allows the operator to run the boat up to the desired speed, either based on engine RPM or boat speed and set the cruise control. The operator can then increment or decrement the set speed.

The operator is always in control of pulling the throttle lever back and reducing the engine and/or boat speed.

This type of system will be specific to each boat manufacturer. Refer to the Boat Manufacturer's Operators Manual for complete operational instructions.

Typical Basic Cruise Configuration

DTC Related Diagnostic Trouble Codes

The Malfunction Indicator Lamp (MIL) will be "ON" if the malfunction exists under the conditions listed below. If the malfunction clears, the lamp will go out and the Diagnostic Trouble Code will be stored in the ECM. Any trouble codes stored will be erased if no problem reoccurs within 50 engine starts. The amount of time after the malfunction occurs before the MIL illuminates may vary.

Many of the Diagnostic Procedures (DP) include a functional check of the system that may pinpoint a problem. However, it is important to remember that the diagnostic procedures are specifically designed for use only when a trouble code is set. Therefore, a thorough understanding of the normal operation of the system being diagnosed is necessary, and use of the diagnostic procedures for this purpose is at the discretion of the technician.

NOTICE: DTC related trouble codes are referred as "Latching Codes." A latching code will cause the MIL lamp to stay "ON" during an ignition cycle whether the malfunction is corrected or not. This also means you can not clear the trouble code during the same ignition cycle.

The following table shows a list of the DTC related trouble codes. This list is based on the definitions displayed with Diacom diagnostic software. Other scan tools may display something different.

DTC Related Trouble Codes Table

DTC Code	Description
DTC 81	TAC Fault - TPS2 Range
DTC 81	TAC Fault - TPS1 Range
DTC 81	TAC Fault - PPS3 Range
DTC 81	TAC Fault - PPS2 Range
DTC 81	TAC Fault - PPS1 Range
DTC 81	TAC Fault - Bad Checksum
DTC 81	TAC Fault - No TAC Reply
DTC 81	TAC Fault - BUS Contention
DTC 81	TAC Fault - Serial Communication Fault
DTC 81	TAC Fault - TPS12 Corr
DTC 81	TAC Fault - PPS12 Corr
DTC 81	TAC Fault - Lmt'd Authority
DTC 81	TAC Fault - Actuation Fault
DTC 81	TAC Fault - Process Fault
DTC 81	TAC Fault - Not Tracking
DTC 81	TAC Fault - Throttle Return Fault
DTC 61	Fuel Pressure Sensor Voltage High

DTC Related Diacom Data List

The DTC Related Diacom Data List contains all DTC related parameters that are available on the scan tool. Use the Diacom Data List only after the following is determined:

- On-Board Diagnostic System Check is completed.
- No Diagnostic Trouble Codes.
- On-board diagnostics are functioning properly.

Scan tool values from a properly operating system may be used for comparison with the sy you are diagnosing. The Diacom Data List represents values that would be seen on a normal running engine.

Important: A scan tool that displays faulty data should not be used. The scan tool problem should be reported to the manufacturer. Use of a faulty scan tool can result in misdiagnosis and unnecessary parts replacement.

Only the parameters listed below are referenced in this service manual for use in diagnosis. If all values are within the typical range described below, refer to *Symptoms* for diagnosis.

Typical Diacom (DTC Related) Data List (Idle / Operating Temperature / Neutral / Sea Level)

[illegible]

Digital Throttle Control Diacom Data

Definitions

The DTC Diacom Data Definitions contain a brief description of all DTC related parameters available on the PEG DTC Preferred Screen.

ETC Desired Pedal Position - Scan Tool Range 0-99.6 percent - Desired Throttle Control Position is computed by the TAC module and ECM from the TCP Sensor voltage. This value should display 0% when the throttle handle is at idle or neutral position and 99.6% when the throttle handle is at wide open, or full forward position.

ETC Pedal Position - Scan Tool Range 0-99.6 percent - Actual Throttle Control Position is computed by the TAC module and ECM from the TCP Sensor voltage. This value should display 0% when the throttle handle is at idle or neutral position and 99.6% when the throttle handle is at wide open, or full forward position. This value should remain at or near ETC Desired Pedal Position.

ETC Pedal Sensor Voltage - Scan Tool Range 0-700 counts - Actual Throttle Control Position is computed by the TAC module and ECM from the TCP Sensor voltage. Voltage is represented by a count value. This value should display 10 - 20 counts when the throttle handle is at idle or neutral position and 630 - 700 counts when the throttle handle is at wide open, or full forward position. This value represents the ETC Pedal Position.

ETC Desired Throttle - Scan Tool Range 0 - 700 counts - Desired Throttle Position is computed by the TAC module and ECM from the TCP Sensor voltage. These are the desired counts for the Throttle voltage coming from the Throttle Body sensors. This value should display 25 - 125 counts when the throttle handle is at idle or neutral position, dependent upon engine temperature, barometric pressure and other inputs. This value will be at or near 700 counts when the throttle handle is at wide open, or full forward position.

ETC Throttle Sensor Voltage - Scan Tool Range 0 - 700 counts - Actual Throttle Position is computed by the TAC module and ECM based on the Throttle Body, Throttle Position Sensor voltage. This value should remain at or near the ETC Desired Throttle Position.

Fuel Pressure Volts - Scan Tool Range 0 - 5.00 volts - The Fuel Pressure Volts signal is the variable governor or speed control voltage. When the speed control system is engaged, Troll Mode - ON, this voltage is the control voltage required to maintain the selected speed. This voltage will vary based on the varying load conditions the speed control system sees and is used to maintain the selected speed.

Troll Mode - Scan Tool Range ON/OFF - This is the speed control request. ON - speed control enabled; OFF - speed control is disabled.

Clearing Trouble Codes - Diacom

1. Install Diacom scan tool.
2. Turn ignition ON, or start the engine.
3. Clear the Trouble Codes.
Follow instructions that are provided with your Diacom.
4. Turn ignition "OFF" for at least 5 seconds.
5. Turn ignition "ON" and read trouble codes. If trouble codes are still present, check "Notice" below and repeat procedure following from step 2.

NOTICE: When clearing trouble codes, the ignition must be cycled to the "OFF" position or the trouble codes may not clear.

Circuit Descriptions

Throttle Position (TP) Sensor 1

The Throttle Position (TP) sensor 1 is a potentiometer type sensor with three circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The TP sensor is used to determine the throttle plate angle for various engine management systems. The TAC module provides the TP sensor a 5-volt reference circuit and a low reference circuit. The TP sensor then provides the TAC module a signal voltage proportional to throttle plate movement. TP sensor 1 is low at closed throttle and increases as the throttle opens. When the TAC module detects that the TP sensor 1 signal or TP sensor 5-volt reference voltage is outside the predetermined range, trouble codes are set.

Throttle Position (TP) Sensor 2

The Throttle Position (TP) sensor 2 is a potentiometer type sensor with three circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The TP sensor is used to determine the throttle plate angle for various engine management systems. The TAC module provides the TP sensor a 5-volt reference circuit and a low reference circuit. The TP sensor then provides the TAC module a signal voltage proportional to throttle plate movement. TP sensor 2 is high at closed throttle and decreases as the throttle opens. When the TAC module detects that the TP sensor 2 signal or TP sensor 5-volt reference voltage is outside the predetermined range, trouble codes are set.

Pedal Position Sensor (PPS) 1

The Pedal Position Sensor (PPS) 1, one of two circuits within the Throttle Control Position (TCP) sensor, is a potentiometer type sensor with three circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The TCP sensor is used to determine the position of the throttle lever(s). The TAC module provides PPS1 circuit a 5-volt reference circuit and a low reference circuit. PPS1 circuit then provides the TAC module a signal voltage proportional to throttle lever movement. PPS1 circuit is low at the idle or neutral position, and increases as the throttle lever is moved toward the wide open throttle position. When the TAC module detects that PPS1 signal or TCP sensor 5-volt reference voltage is outside the predetermined range, trouble codes are set.

Pedal Position Sensor (PPS) 2

The Pedal Position Sensor (PPS) 2, one of two circuits within the Throttle Control Position (TCP) sensor, is a potentiometer type sensor with three circuits:

- A 5-volt reference circuit
- A low reference circuit
- A signal circuit

The TCP sensor is used to determine the position of the throttle lever(s). The TAC module provides PPS2 circuit a 5-volt reference circuit and a low reference circuit. PPS2 circuit then provides the TAC module a signal voltage proportional to throttle lever movement. PPS2 circuit is high at the idle or neutral position, and decreases as the throttle lever is moved toward the wide open throttle position. When the TAC module detects that PPS2 signal or TCP sensor 5-volt reference voltage is outside the predetermined range, trouble codes are set.

TAC Module Ignition Supply

The Throttle Actuator Control (TAC) module requires a constant 12-volt supply for power. If this circuit is interrupted, even momentarily, trouble codes will set and the engine will default to idle speed.

TAC Module Ground

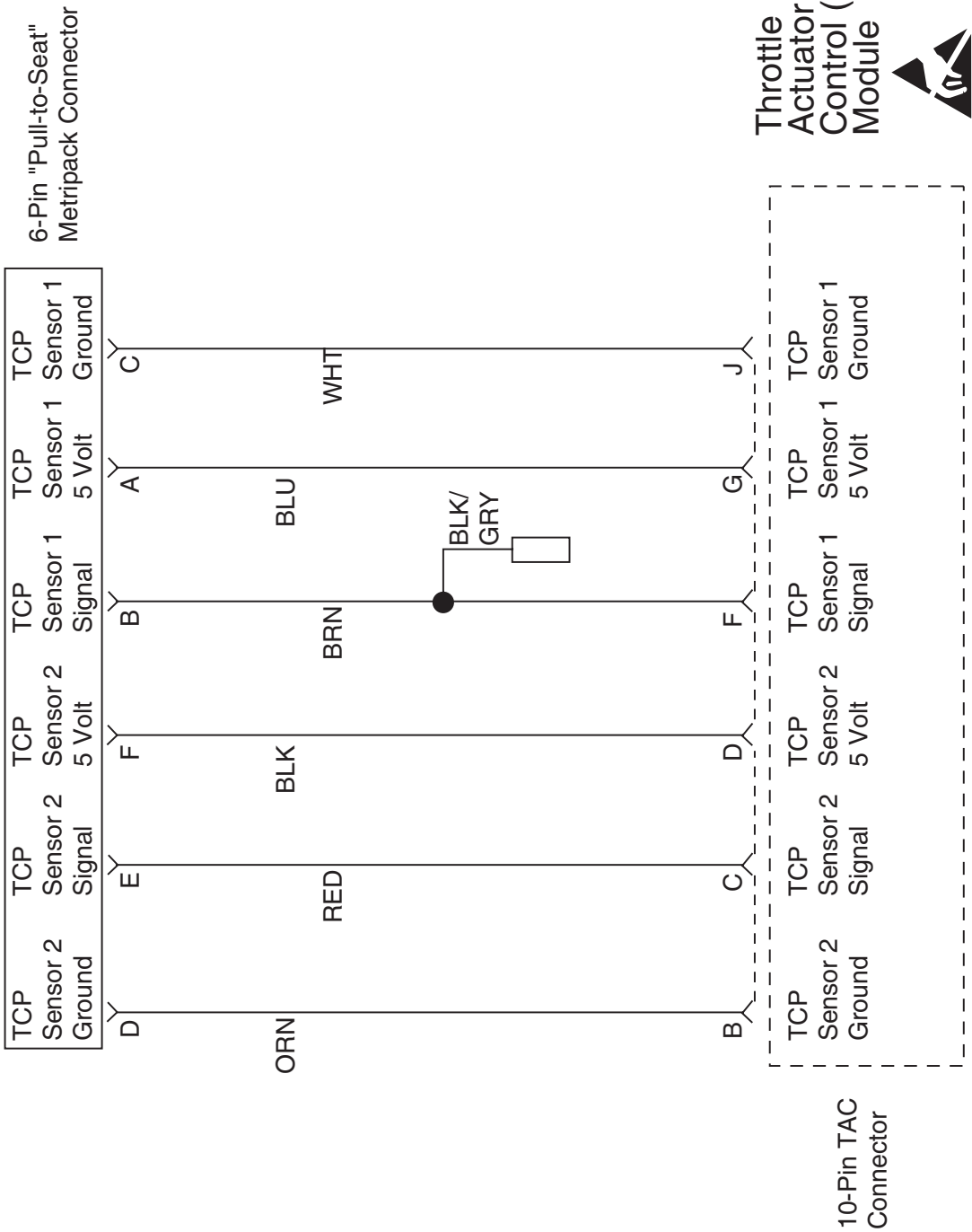
The Throttle Actuator Control (TAC) module requires a constant clean ground. If this circuit is interrupted, even momentarily, trouble codes will set and the engine will default to idle speed.

TAC Module Serial Data

The Throttle Actuator Control (TAC) module utilizes two serial data circuits in order to communicate with the Engine Control Module (ECM). These circuits are electrically connected together within the TAC module.

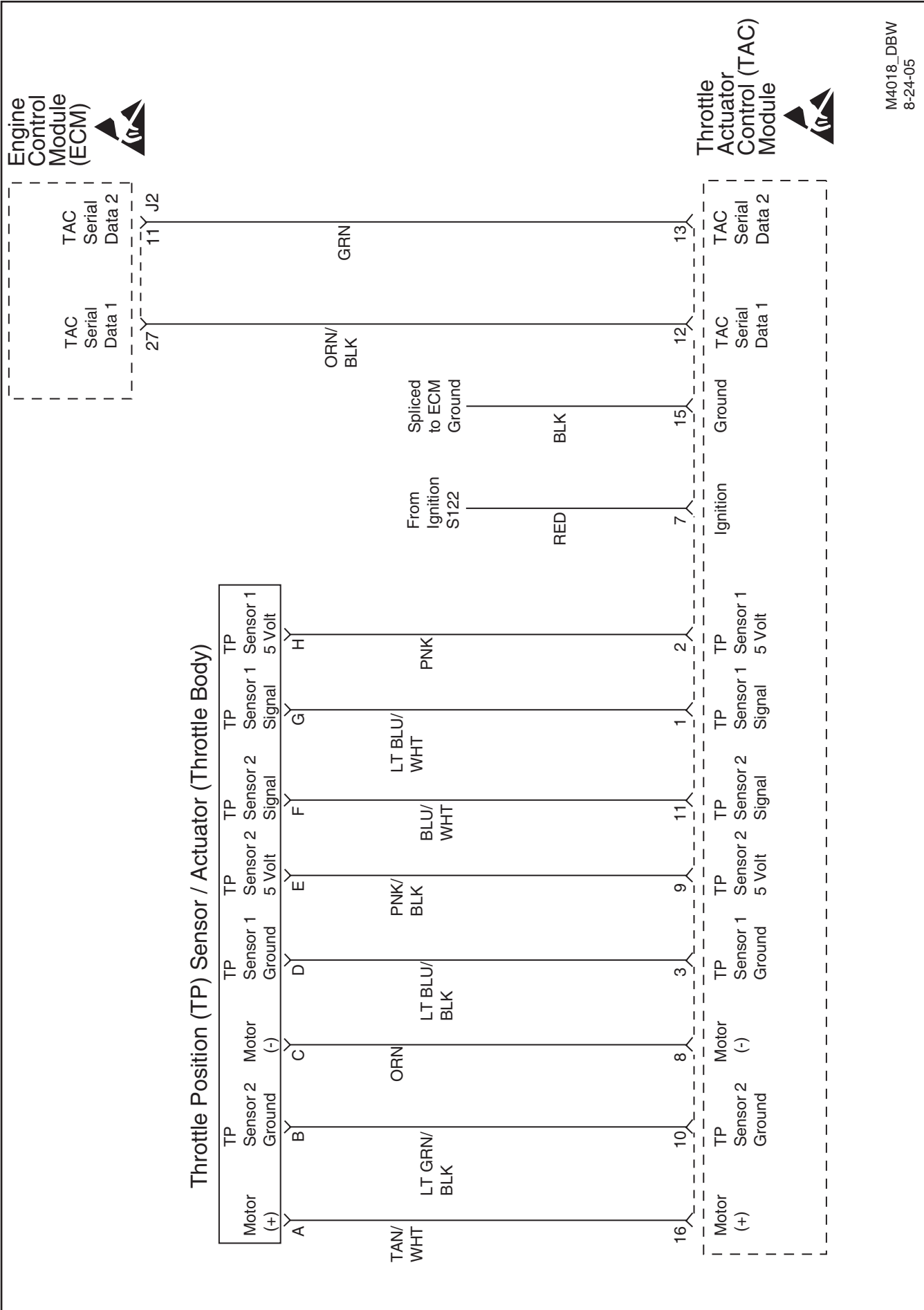
DTC Related Wiring Schematics - Throttle Control Position (TCP) Sensor (1 of 4)

Throttle Control Position (TCP) Sensor

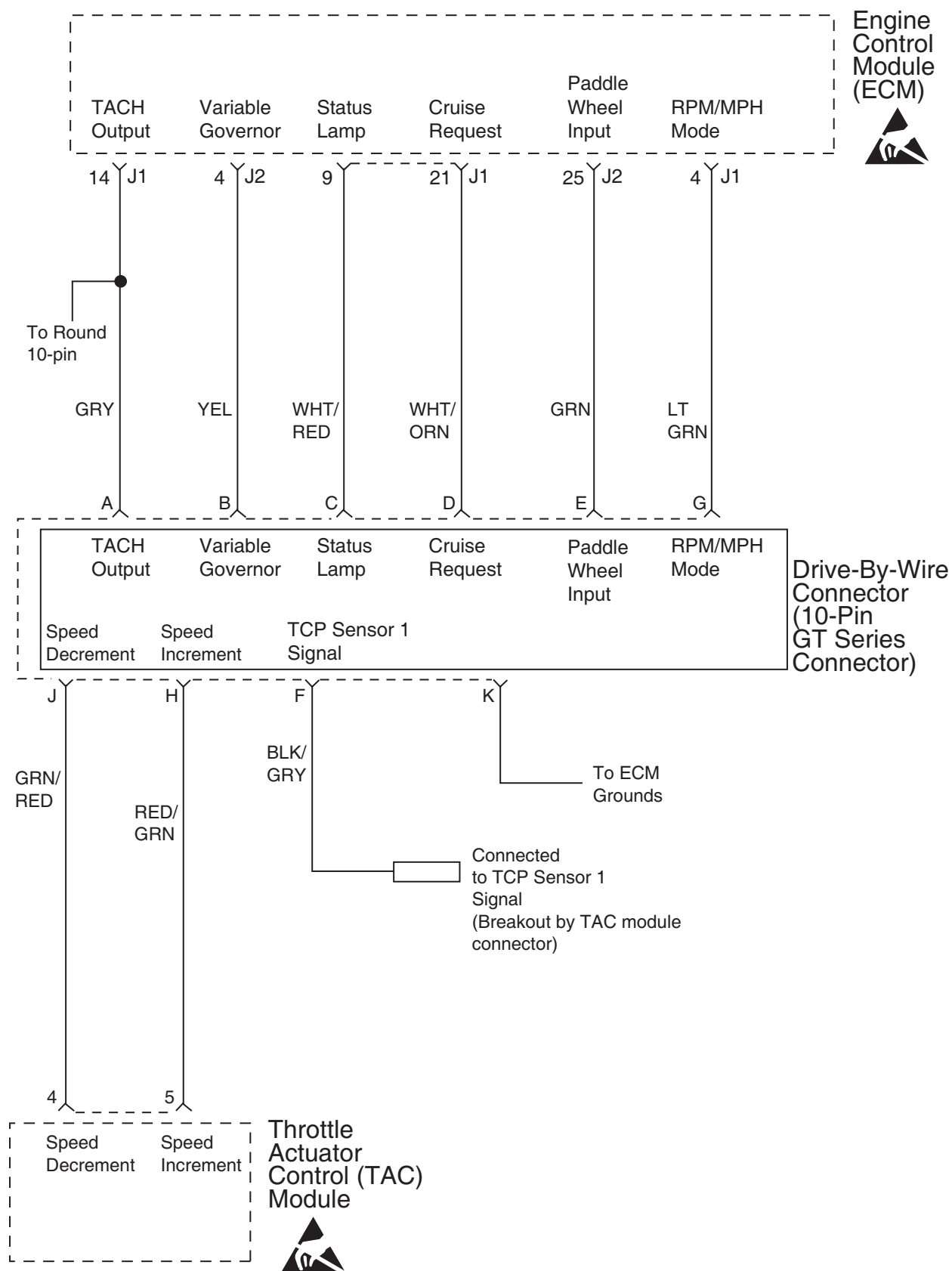


M4016_DBW
2-10-05

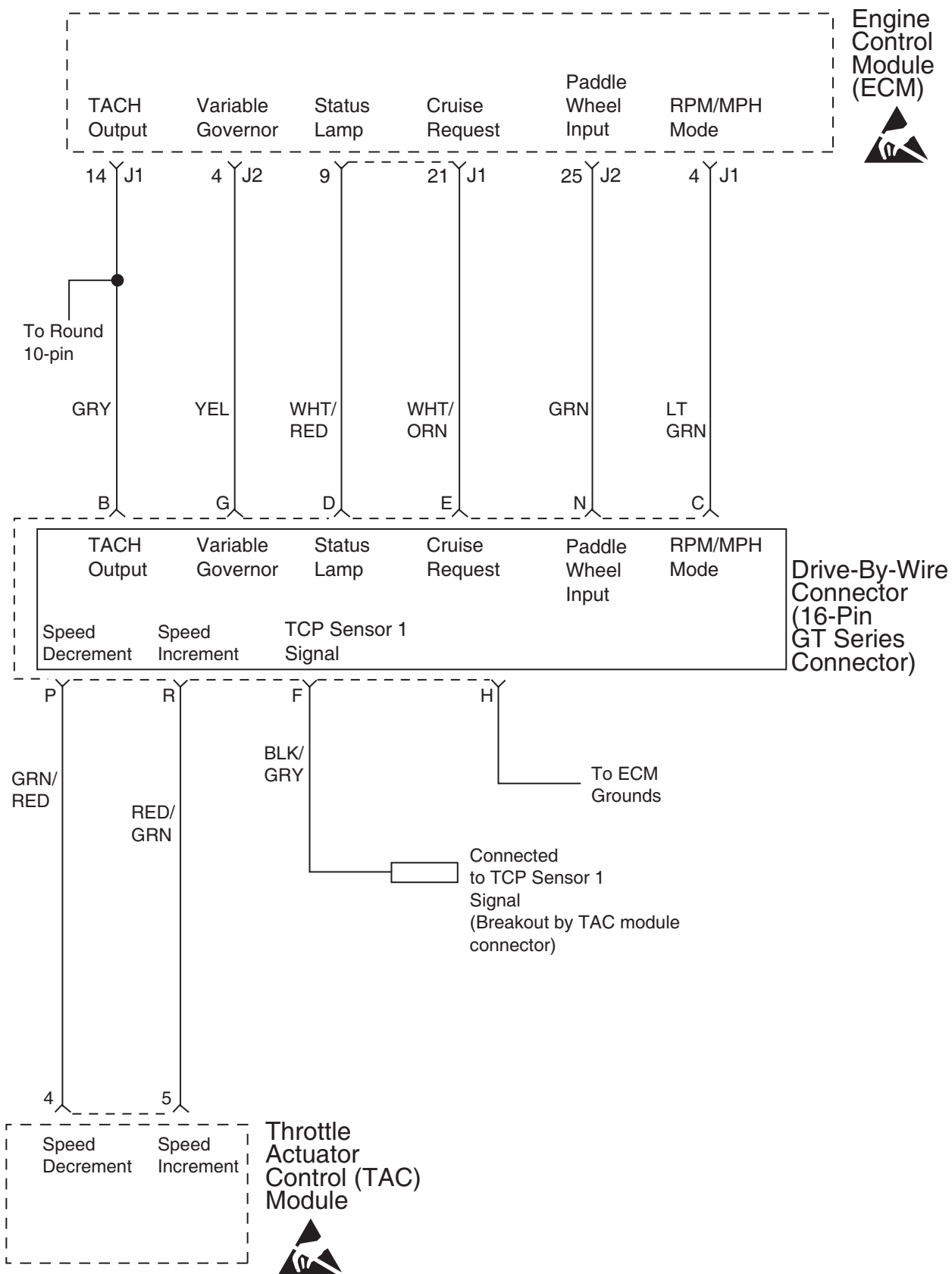
DTC Related Wiring Schematics - Throttle Actuator Control (TAC) Module Wiring (2 of 4)



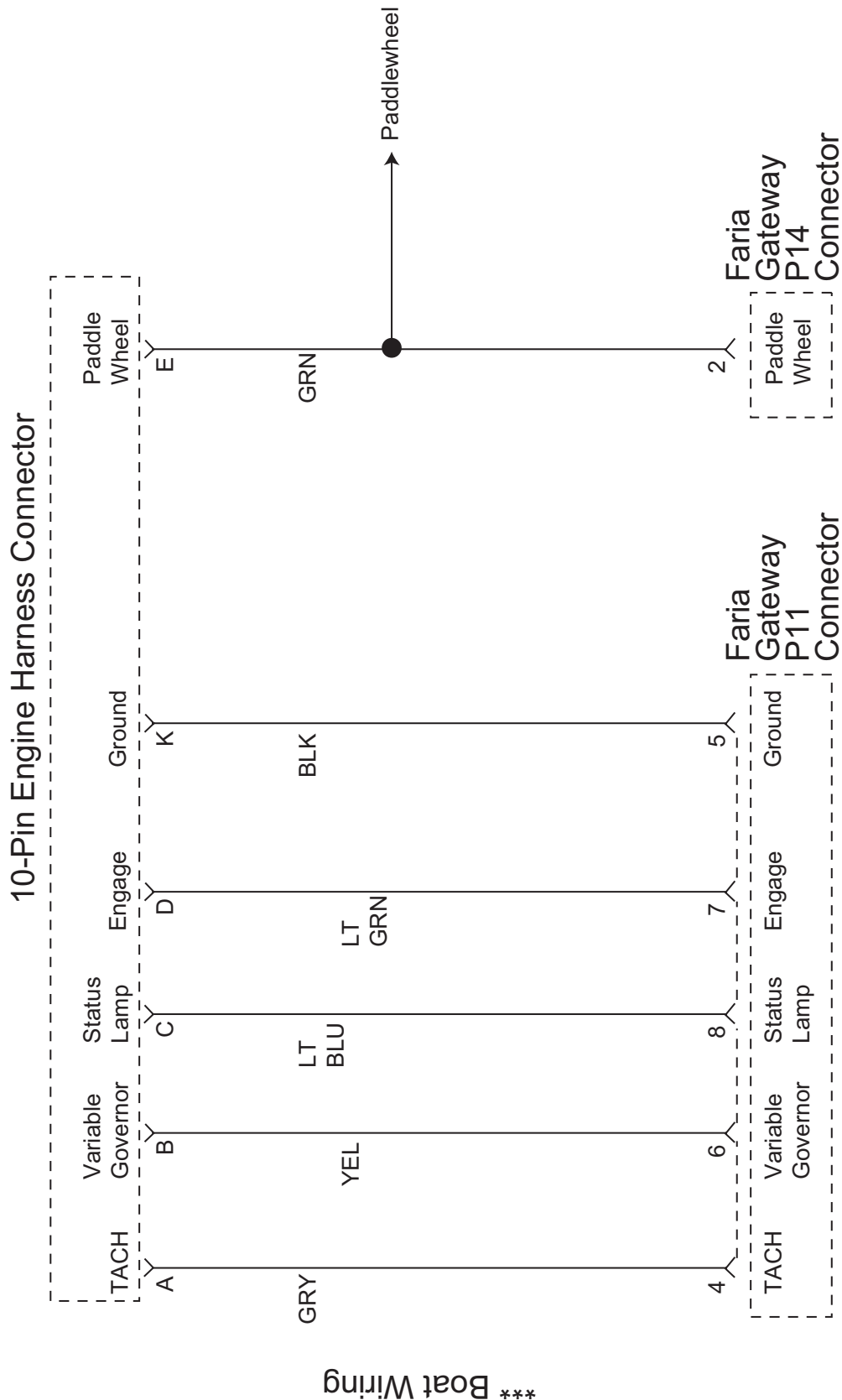
DTC Related Wiring Schematics - Speed Control (10-Pin DBW Connector) (3 of 4)

M4019_DBW
8-24-05

DTC Related Wiring Schematics - Speed Control (16-Pin DBW Connector) (4 of 4)

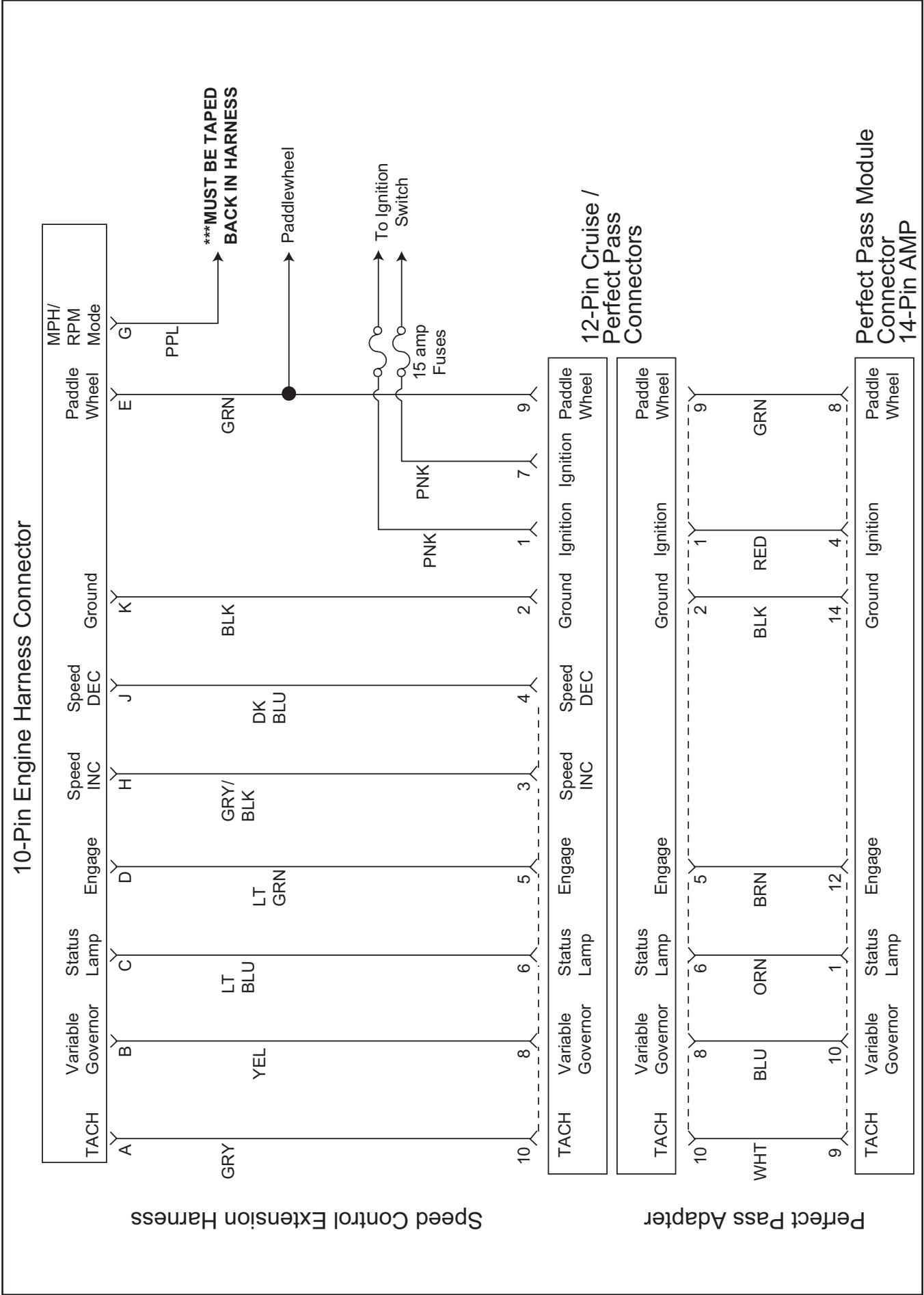
M4019_DBW_MC
8-24-05

Electronic Perfect Pass (Faria Gateway System) (1 of 1)

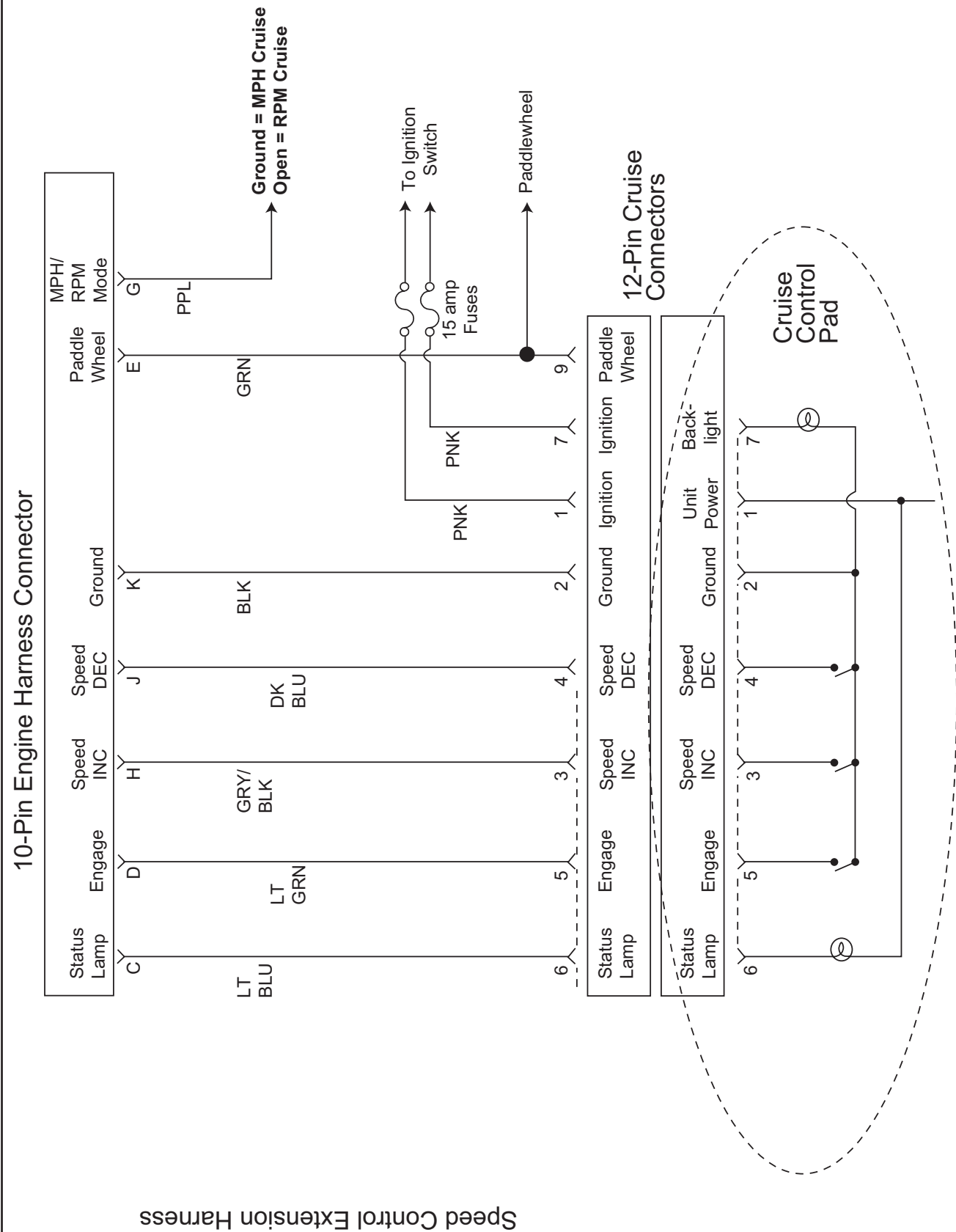


*** See boat manufacturers wiring schematics for exact and complete Gateway and Perfect Pass wiring.

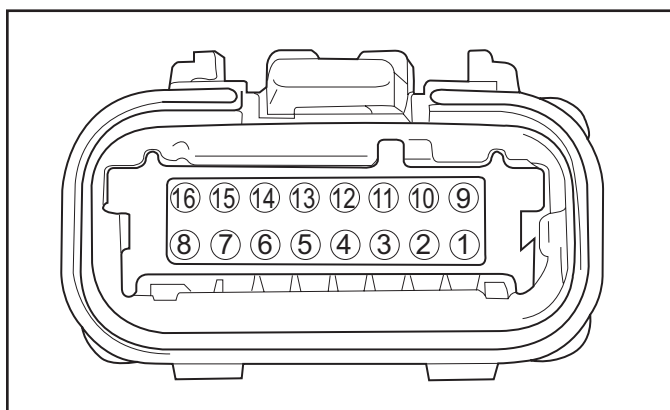
Speed Control Extension Harness (Electronic Perfect Pass - External Module) (1 of 1)



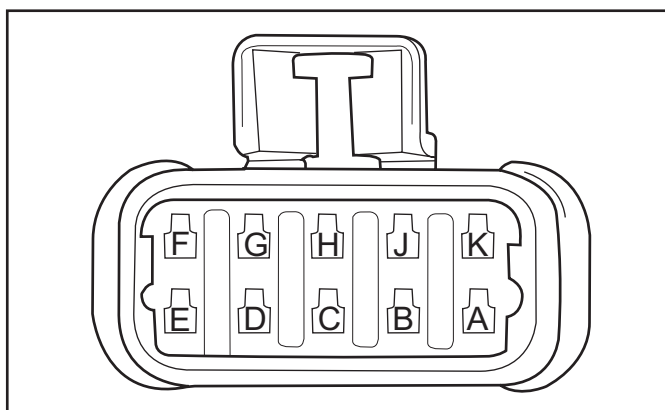
Speed Control Extension Harness (Electronic Cruise Control) (1 of 1)



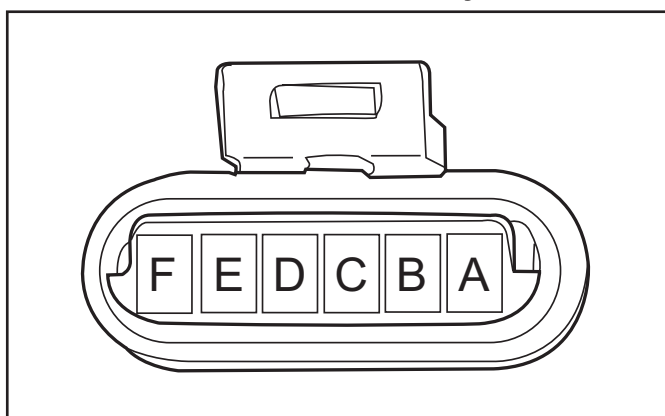
**This Page Was
Intentionally Left
Blank**

TAC Module 16-Way

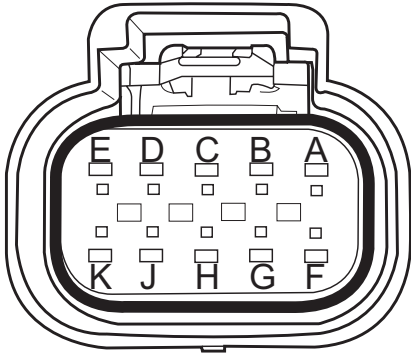
Pin	Wire Color	Function
1	LT BLU/WHT	TP Sensor 1 Signal
2	PNK	TP Sensor 1 5 Volt
3	LT BLU/BLK	TP Sensor 1 Ground
4		
5		
6		
7	RED	Ignition
8	ORN	Motor (-)
9	PNK/BLK	TP Sensor 2 5 Volt
10	LT GRN/BLK	TP Sensor 2 Ground
11	BLU/WHT	TP Sensor 2 Signal
12	ORN/BLK	TAC Serial Data 1
13	GRN	TAC Serial Data 2
14		
15	BLK	Ground
16	TAN/WHT	Motor (+)

TAC Module 10-Way

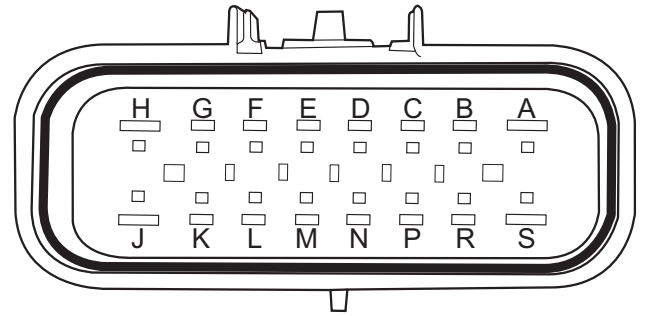
Pin	Wire Color	Function
A		
B	ORN	TCP Sensor 2 Ground
C	RED	TCP Sensor 2 Signal
D	BLK	TCP Sensor 2 5 Volt
E		
F	BRN	TCP Sensor 1 Signal
G	BLU	TCP Sensor 1 5 Volt
H		
J	WHT	TCP Sensor 1 Ground
K		

TCP Sensor 6-Way

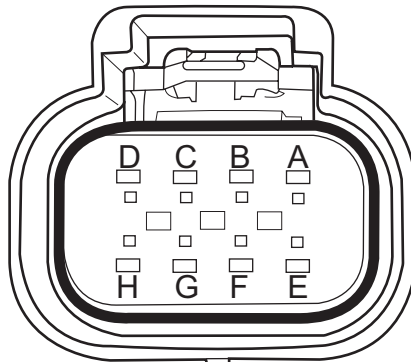
Pin	Wire Color	Function
A	BLU	TCP Sensor 1 5 Volt
B	BRN	TCP Sensor 1 Signal
C	WHT	TCP Sensor 1 Ground
D	ORN	TCP Sensor 2 Ground
E	RED	TCP Sensor 2 Signal
F	BLK	TCP Sensor 2 5 Volt

DBW 10-Way

Pin	Wire Color	Function
A	GRY	TACH Output
B	YEL	Variable Governor
C	WHT/RED	Status Lamp
D	WHT/ORN	Speed Control Request
E	GRN	Paddlewheel
F	BLK/GRY	Speed Control Override
G	LT GRN	RPM/MPH Mode
H	RED/GRN	Speed Increment
J	GRN/RED	Speed Decrement
K	BLK	Speed Control Ground

DBW 16-Way

Pin	Wire Color	Function
A	RED/WHT	Battery
B	GRY	TACH Output
C	WHT/ORN	Speed Control Request
D	WHT/RED	Status Lamp
E	YEL	Variable Governor
F	RED/GRN	Speed Increment
G	GRN/RED	Speed Decrement
H	BLK	Speed Control Ground
J	PPL	Ignition
K	WHT	CAN BUS (+)
L	BLK	CAN BUS (-)
M	PNK	Fuel Level Input
N	GRN	Paddlewheel
P	WHT	RPM/MPH Mode
R	BLK/GRY	Speed Control Override
S	YEL/RED	Starter Circuit

Throttle Body 8-Way

Pin	Wire Color	Function
A	TAN/WHT	Motor (+)
B	LT GRN/BLK	TP Sensor 2 Ground
C	ORN	Motor (-)
D	LT BLU/BLK	TP Sensor 1 Ground
E	PNK/BLK	TP Sensor 2 5 Volt
F	BLU/WHT	TP Sensor 2 Signal
G	LT BLU/WHT	TP Sensor 1 Signal
H	PNK	TP Sensor 1 5 Volt

**This Page Was
Intentionally Left
Blank**

Digital Throttle Control (DTC) Related Diagnostic Procedures

The following Diagnostic Procedures are specifically related to the Digital Throttle Control (DTC) system. Every diagnostic code related to the DTC system has a two-digit code, all of which are code 81. You **MUST** have a scan tool, preferably the Rinda Diacom, in order to distinguish which code 81's the system has. All diagnostic procedures are written, assuming the system was built and operated correctly at the time of production, and there are not multiple failures.

The DTC system will typically set multiple trouble codes based on a single failure. This is due to the many redundant tests run continuously on this system. When diagnosing this system, the appropriate procedure must be chosen. The procedures show a list of trouble codes that will be set for a particular failure. Consult the table below to identify the procedure that has the appropriate list of trouble codes for the particular failure that you are trying to diagnose.

Engine control circuits contain many special design features not found in standard vehicle wiring. Environmental protection is used extensively to protect electrical contacts. Proper splicing methods must be used when necessary.

The proper operation of low amperage input/output circuits depend upon good continuity between circuit connectors. It is important before component replacement and/or during normal troubleshooting procedures that a visual inspection of any questionable mating connector is performed. Mating surfaces should be properly formed, clean and likely to make proper contact. Some typical causes of connector problems are listed below:

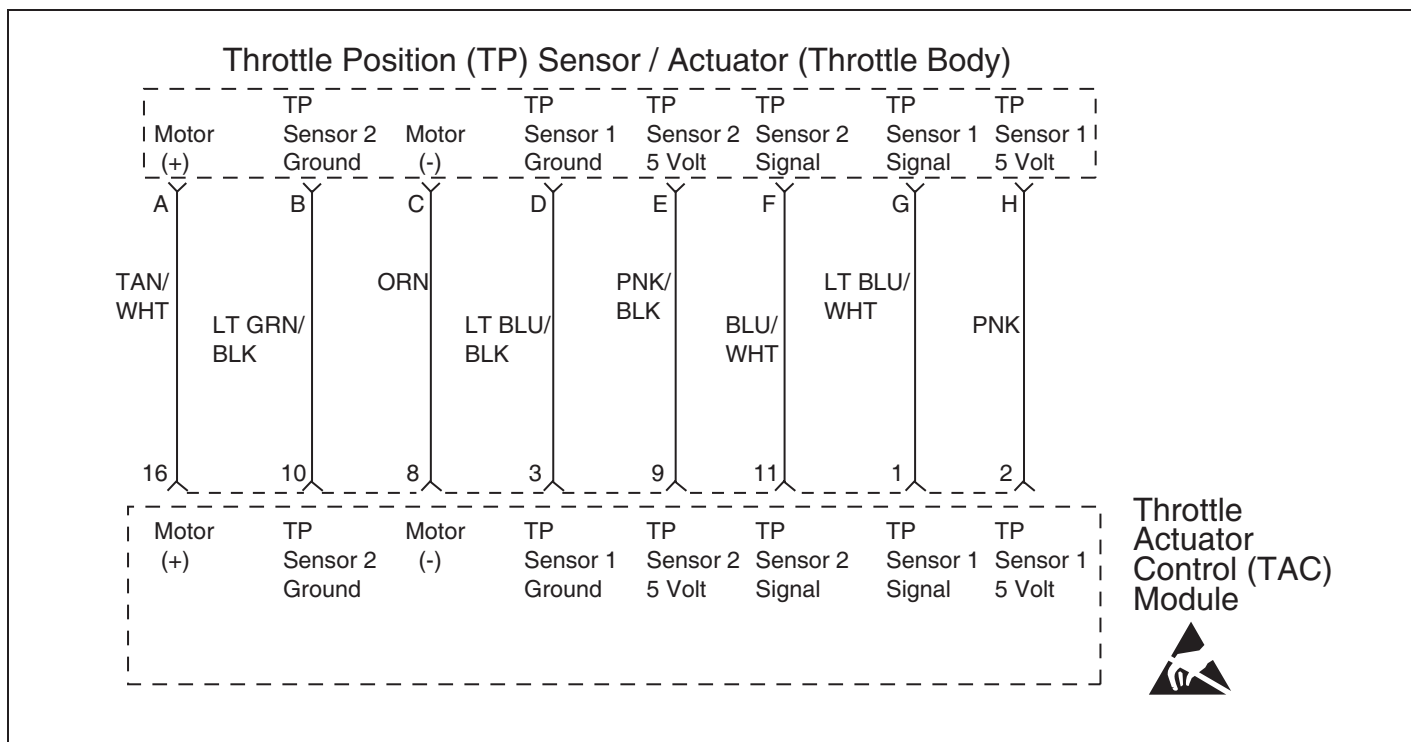
- Improperly formed contacts and/or connector housing.
- Damaged contacts or housing due to improper engagement.
- Corrosion, sealer or other contaminants on the contact mating surfaces.
- Incomplete mating of the connector halves during initial assembly or during subsequent troubleshooting procedures.
- Tendency for connectors to come apart due to vibration and/or temperature cycling.
- Terminals not fully seated in the connector body.
- Inadequate terminal crimps to the wire.

Intermittents

If the trouble codes are determined to be intermittent, refer to the *Intermittent* portion in the Symptoms section of the MEFI Diagnostic Manual.

Diagnostic Procedure/Code Combination Table

Diagnostic Procedure	List of Code Combinations
DP B-1	TAC Fault - TPS1 Range; TAC Fault - TPS12 Corr; TAC Fault - Lmtd Authority
DP B-2	TAC Fault - No TAC Reply (may also have TAC Fault - Serial Communication Fault and TAC Fault - Lmtd Authority)
DP B-3	TAC Fault - TPS1 Range; TAC Fault - TPS2 Range; TAC Fault - Lmtd Authority; TAC Fault - Actuation Fault
DP B-4	TAC Fault - TPS2 Range; TAC Fault - TPS12 Corr; TAC Fault - Lmtd Authority
DP B-5	TAC Fault - No TAC Reply; TAC Fault - Not Tracking
DP B-6	TAC Fault - PPS2 Range; TAC Fault - PPS12 Corr; TAC Fault - Lmtd Authority
DP B-7	TAC Fault - PPS1 Range; TAC Fault - PPS12 Corr; TAC Fault - Lmtd Authority
DP B-8	TAC Fault - Lmtd Authority; TAC Fault - Actuation Fault; TAC Fault - Not Tracking
DP B-9	TAC Fault - TPS1 Range; TAC Fault - TPS12 Corr; TAC Fault - Actuation Fault
DP B-10	TAC Fault - TPS2 Range; TAC Fault - TPS12 Corr; TAC Fault - Lmtd Authority; TAC Fault - Actuation Fault
DP B-11	TAC Fault - TPS12 Corr; TAC Fault - Lmtd Authority; TAC Fault - No TAC Reply
DP B-12	TAC Fault - Lmtd Authority; TAC Fault - Actuation Fault
DP B-13	DTC 61, Fuel Pressure Sensor Voltage High



M40B1_DBW
8-24-05

Diagnostic Procedure (DP) B-1

Combination of Trouble Codes Set:

DTC 81 TAC Fault - TPS1 Range;
DTC 81 TAC Fault - TPS12 Corr;
DTC 81 TAC Fault - Lmt'd Authority

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

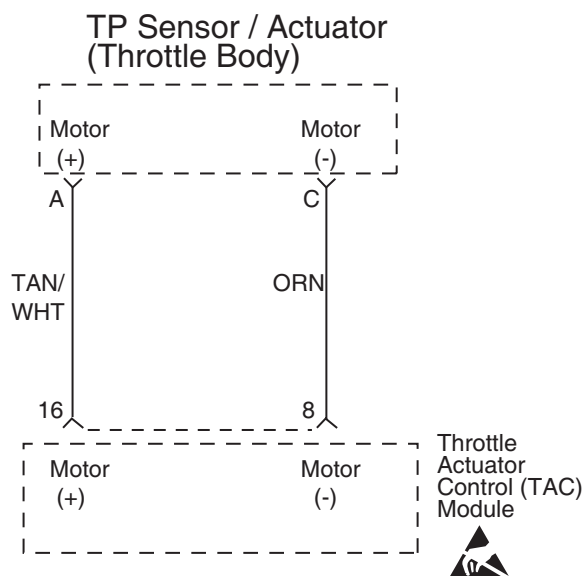
- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-1

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair poor connection, open, short to ground, or short to voltage on the TPS1 signal circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection, open or short to ground on the TPS1 5 volt circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Locate and repair poor connection or open on the TPS1 return circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 6
6	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>

Diagnostic Procedure (DP) B-2

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair poor connection or open on the ignition circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection or open on both serial data circuits. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Locate and repair short to ground or short to voltage on either serial data circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 5
5	Locate and repair short to 12 volts on the PPS1 or PPS2 5 Volt circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 6
6	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 7
7	Repair faulty connections or replace the ECM. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B3_DBW
8-24-05

Diagnostic Procedure (DP) B-3

Combination of Trouble Codes Set:

DTC 81 TAC Fault - TPS1 Range;
DTC 81 TAC Fault - TPS2 Range;
DTC 81 TAC Fault - Lmt'd Authority;
DTC 81 TAC Fault - Actuation Fault

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

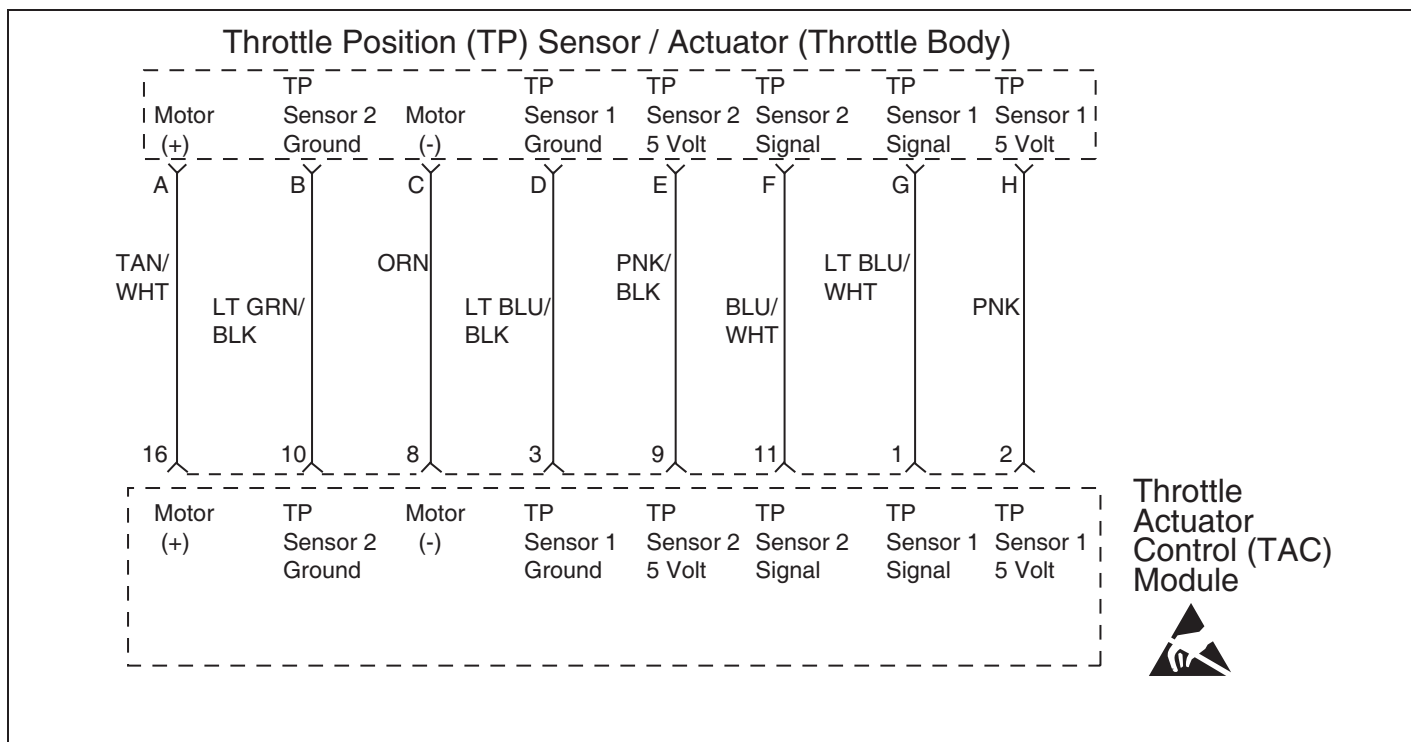
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-3

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair poor connection or open on the motor (+) circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection or open on the motor (-) circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B1_DBW
8-24-05

Diagnostic Procedure (DP) B-4

Combination of Trouble Codes Set:

DTC 81 TAC Fault - TPS2 Range;
DTC 81 TAC Fault - TPS12 Corr;
DTC 81 TAC Fault - Lmtd Authority

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

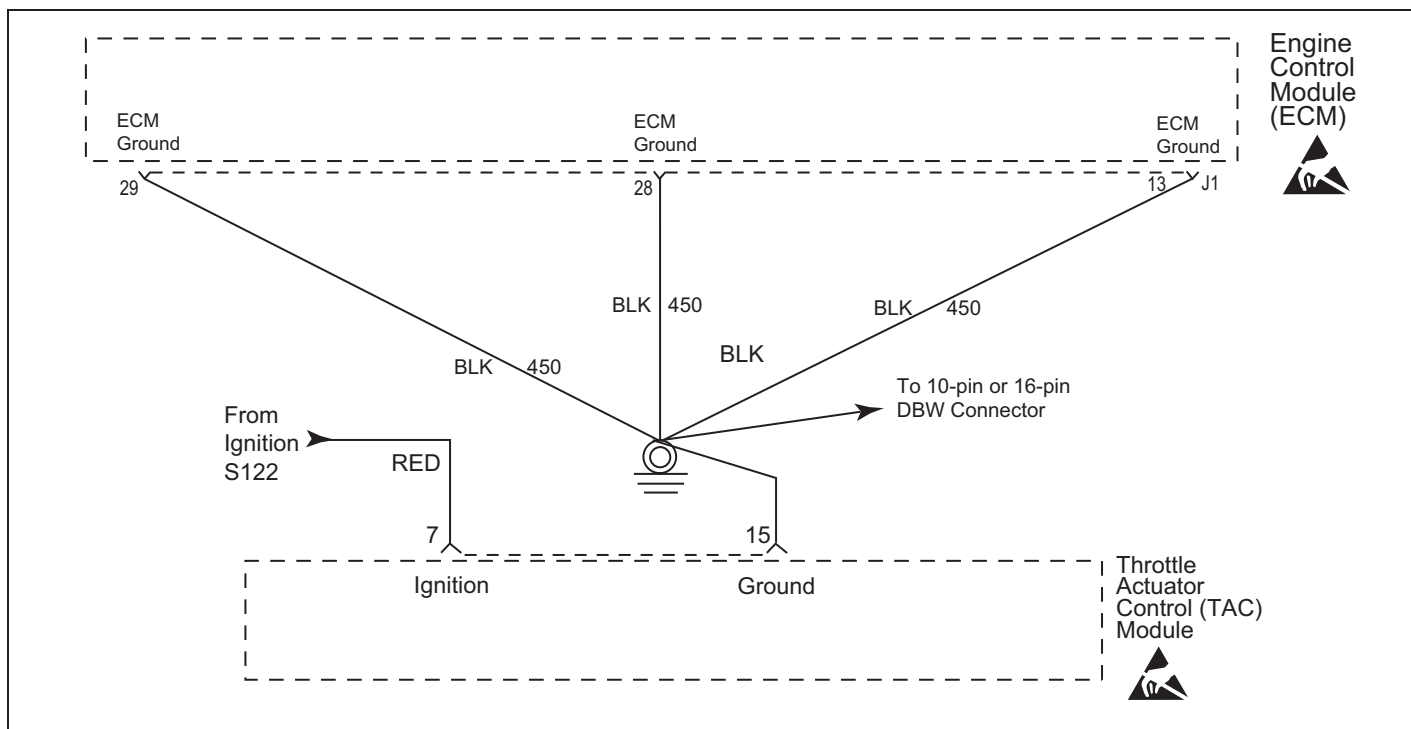
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-4

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair poor connection, open, short to ground, or short to voltage on the TPS2 signal circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection, open or short to ground on the TPS2 5 volt circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Locate and repair poor connection or open on the TPS2 return circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 6
6	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B5_DBW
10-8-05

Diagnostic Procedure (DP) B-5

Combination of Trouble Codes Set:

**DTC 81 TAC Fault - No TAC Reply;
DTC 81 TAC Fault - Not Tracking**

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

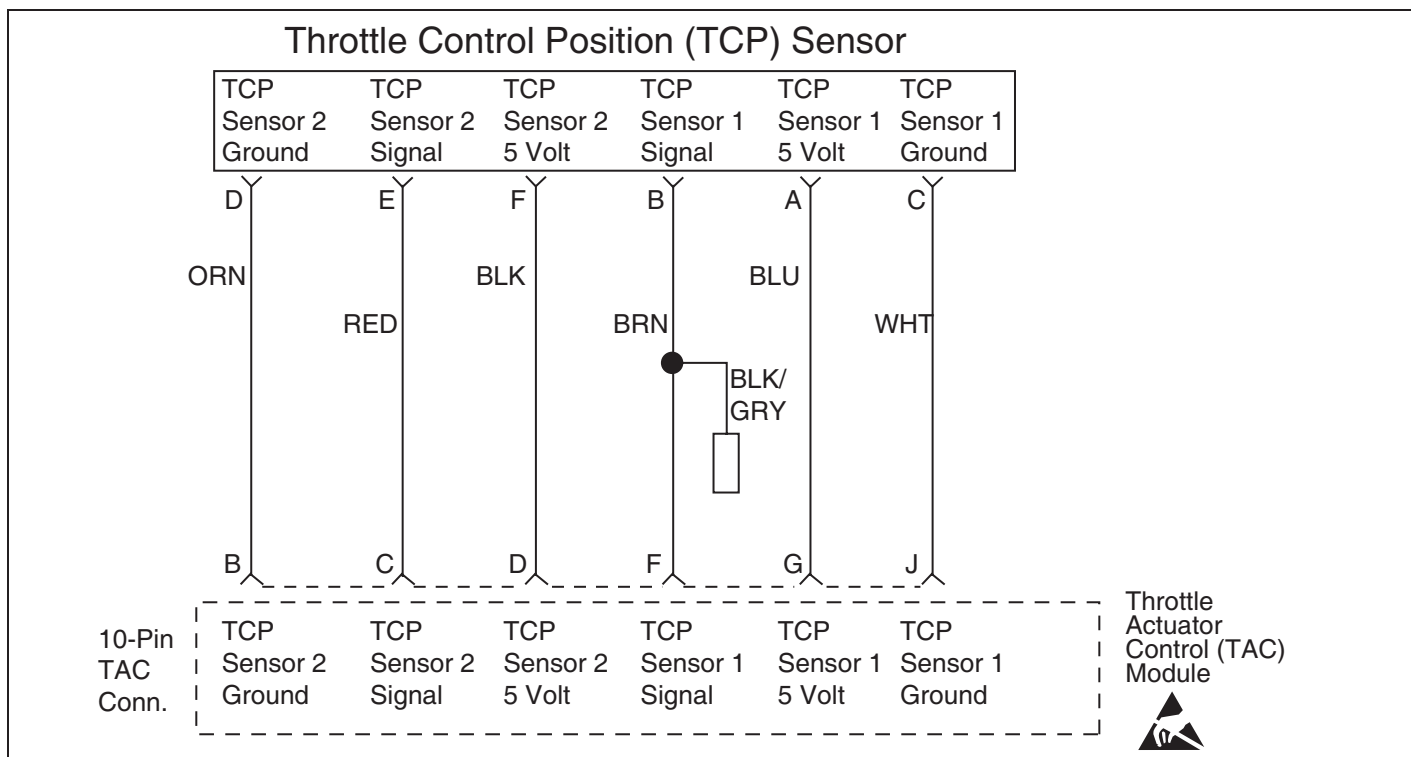
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check the ECM ground connection for poor crimping, corroded terminals and correct location.
- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-5

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair short to ground on the ignition circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection, open or short to voltage on the TAC module ground circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Refer to <i>Intermittents</i>



M40B6_DBW
8-24-05

Diagnostic Procedure (DP) B-6

Combination of Trouble Codes Set:

DTC 81 TAC Fault - PPS2 Range;
DTC 81 TAC Fault - PPS12 Corr;
DTC 81 TAC Fault - Lmt'd Authority

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

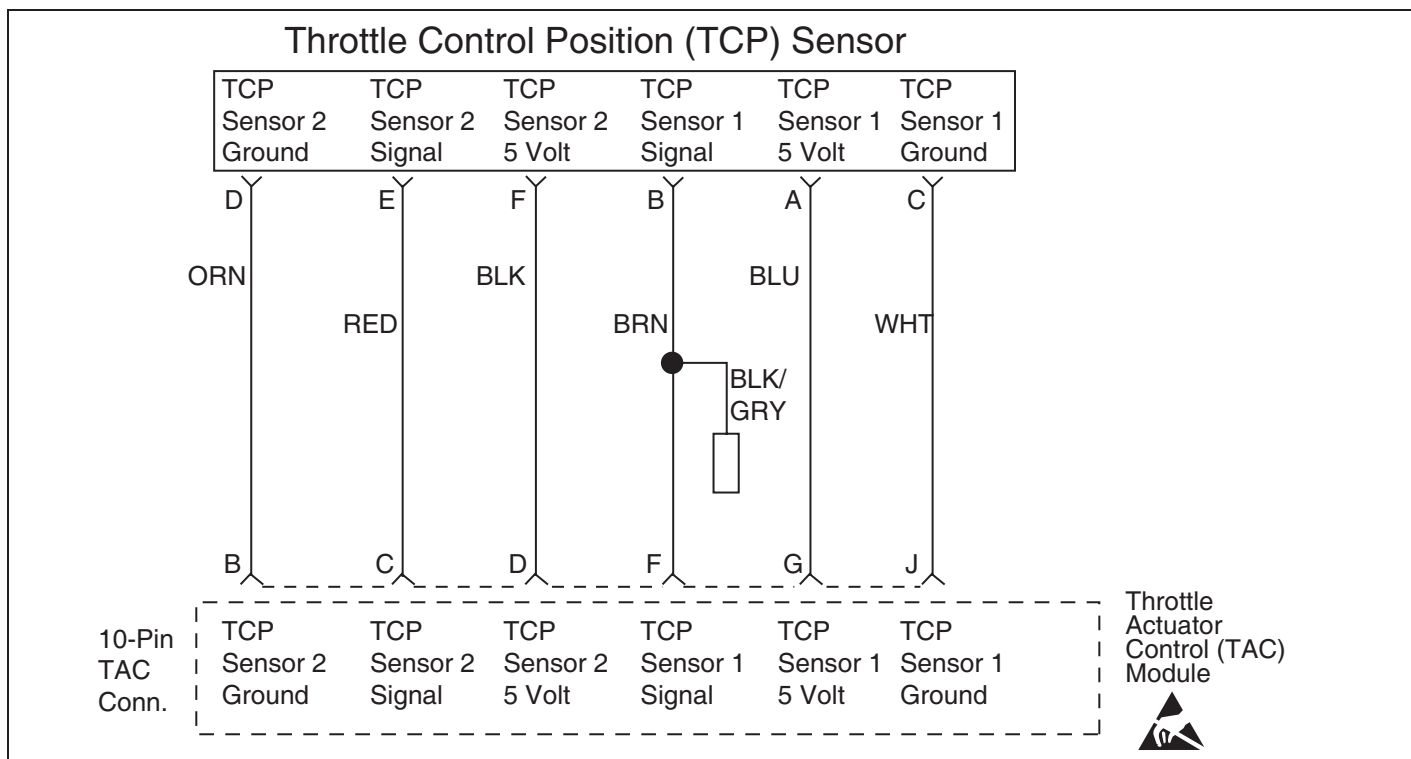
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-6

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair poor connection, open, short to ground, or short to voltage on the PPS2 signal circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection, open short to ground or short to 12 volts on the PPS2 5 volt circuit. If a problem was found repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Locate and repair poor connection, open or short to 12 volts on the PPS2 return circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the TCP sensor. Was a problem found?	—	Verify Repair	Go to Step 6
6	Repair faulty connections or replace the TAC module. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B6_DBW
8-24-05

Diagnostic Procedure (DP) B-7

Combination of Trouble Codes Set:

**DTC 81 TAC Fault - PPS1 Range;
DTC 81 TAC Fault - PPS12 Corr;
DTC 81 TAC Fault - Lmt'd Authority**

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

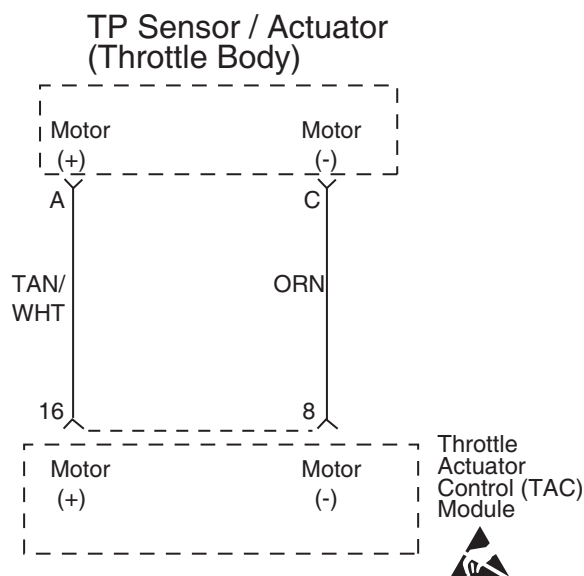
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-7

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair poor connection, open, short to ground, or short to voltage on the PPS1 signal circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair poor connection, open short to ground or short to 12 volts on the PPS1 5 volt circuit. If a problem was found repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Locate and repair poor connection, open or short to 12 volts on the PPS1 return circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the TCP sensor. Was a problem found?	—	Verify Repair	Go to Step 6
6	Repair faulty connections or replace the TAC module. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B3_DBW
8-24-05

Diagnostic Procedure (DP) B-8

Combination of Trouble Codes Set:

**DTC 81 TAC Fault - Lmtd Authority;
DTC 81 TAC Fault - Actuation Fault;
DTC 81 TAC Fault - Not Tracking**

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

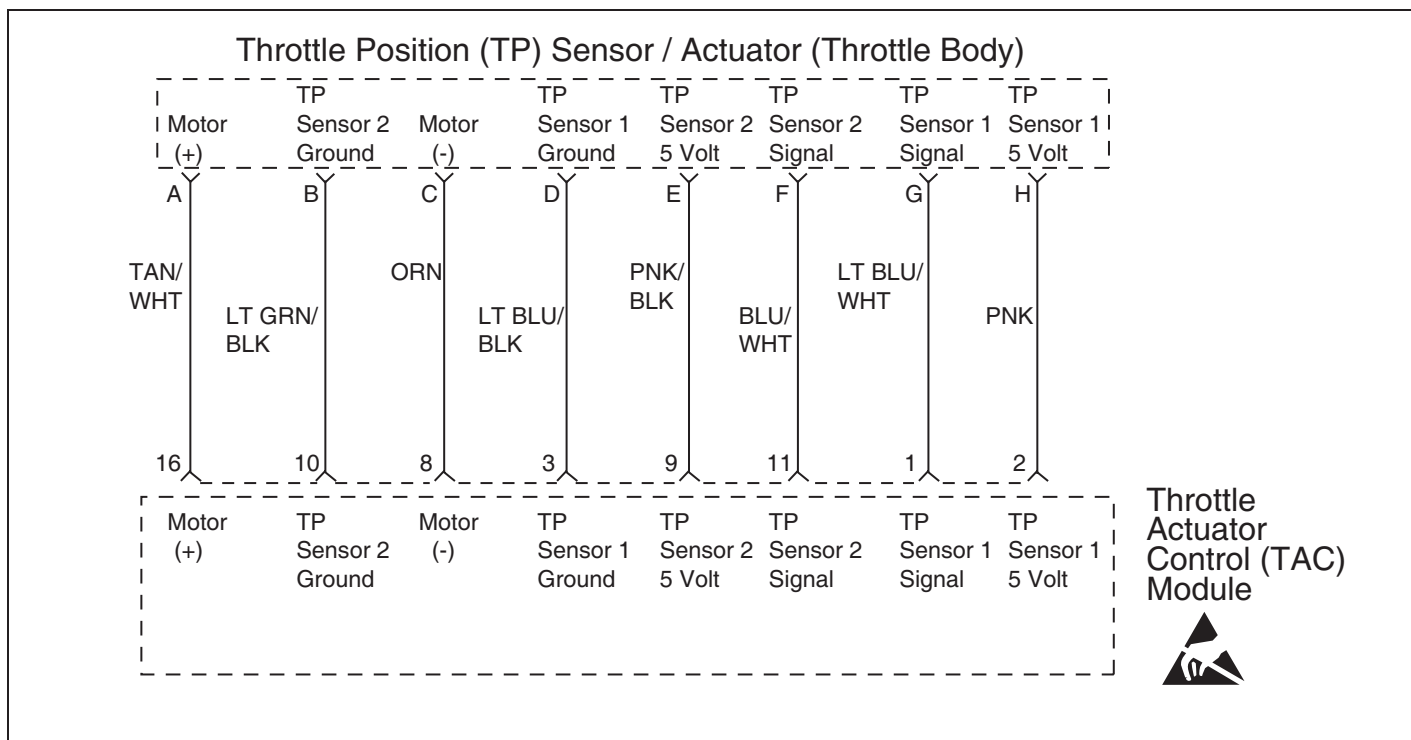
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-8

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair short to ground on the motor (+) circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair short to ground on the motor (-) circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B1_DBW
8-24-05

Diagnostic Procedure (DP) B-9

Combination of Trouble Codes Set:

DTC 81 TAC Fault - TPS1 Range;
DTC 81 TAC Fault - TPS12 Corr;
DTC 81 TAC Fault - Lmtd Authority;
DTC 81 TAC Fault - Actuation Fault

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

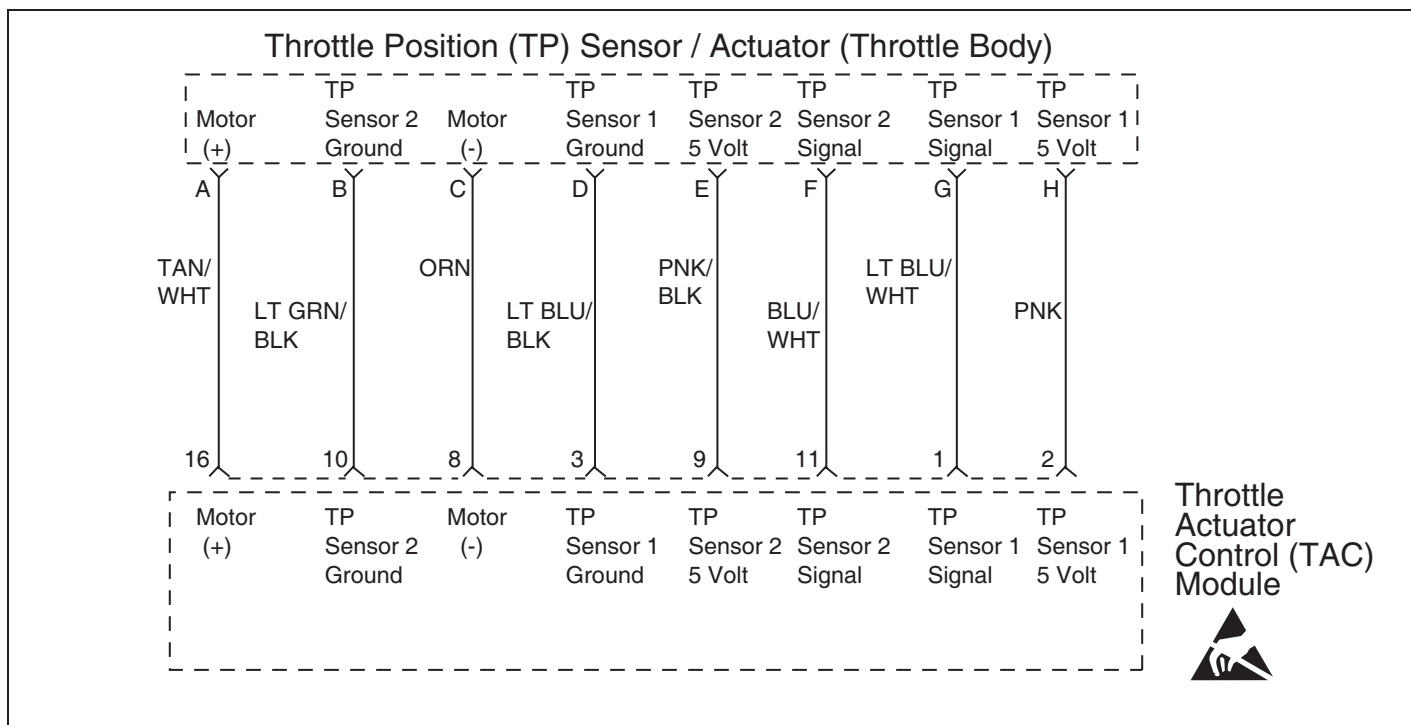
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-9

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair short to 12 volts on the TPS1 5 volt circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>

M40B1_DBW
8-24-05**Diagnostic Procedure (DP) B-10****Combination of Trouble Codes Set:**

DTC 81 TAC Fault - TPS2 Range;
DTC 81 TAC Fault - TPS12 Corr;
DTC 81 TAC Fault - Lmt'd Authority;
DTC 81 TAC Fault - Actuation Fault

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

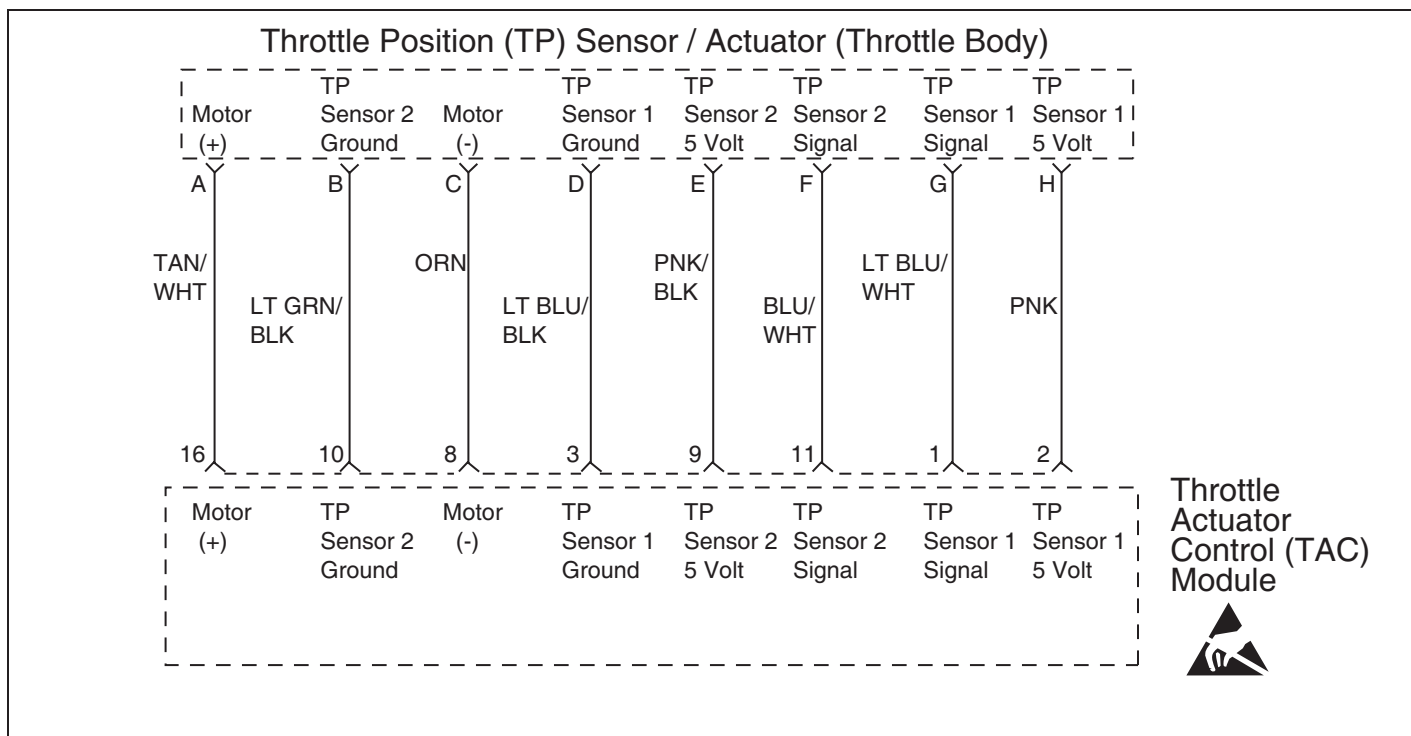
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-10

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair short to 12 volts on the TPS2 5 volt circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>

M40B1_DBW
8-24-05**Diagnostic Procedure (DP) B-11****Combination of Trouble Codes Set:**

DTC 81 TAC Fault - TPS12 Corr;
DTC 81 TAC Fault - Lmtd Authority;
DTC 81 TAC Fault - No TAC Reply

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

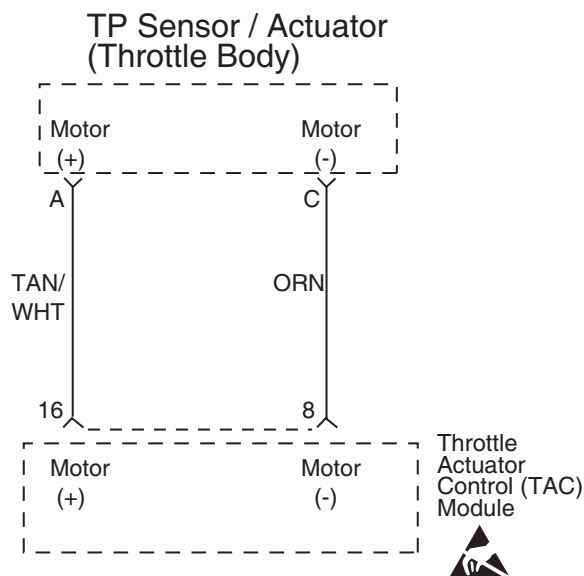
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-11

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair short to 12 volts on the TPS1 return circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair short to 12 volts on the TPS2 return circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



M40B3_DBW
8-24-05

Diagnostic Procedure (DP) B-12

Combination of Trouble Codes Set:

**DTC 81 TAC Fault - Lmt'd Authority;
DTC 81 TAC Fault - Actuation Fault**

Diagnostic Aids

- Inspect DTC related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.
- When the TAC module detects a condition within the TAC system, more than one TAC system related trouble code may set. This is due to the many redundant tests run continuously on this system. Locating and repairing one individual condition may correct more than one trouble code. Disconnecting components during testing may set additional trouble codes.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.
- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

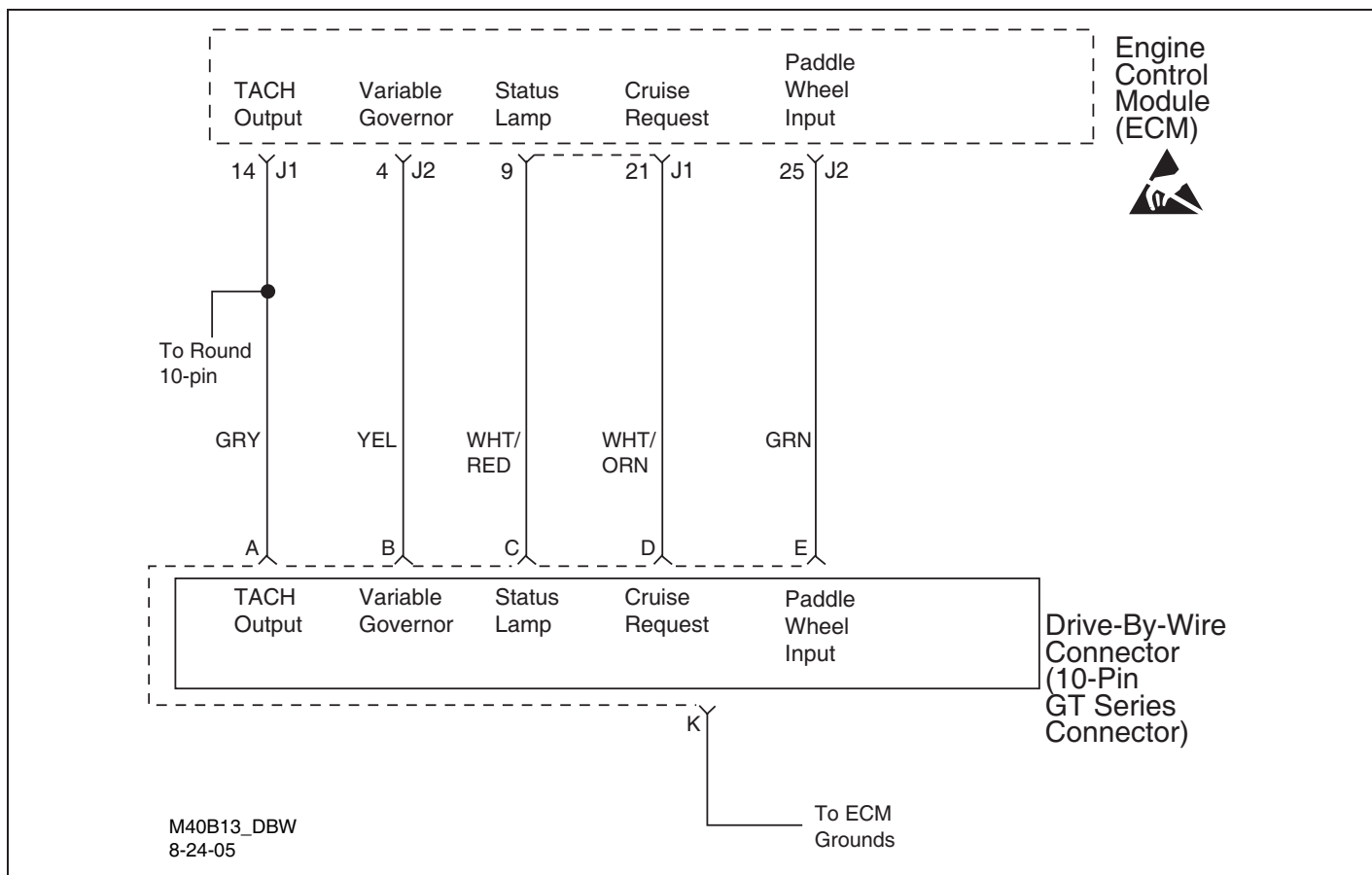
Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at the connector prior to replacing the module.

Diagnostic Procedure (DP) B-12

Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Locate and repair short to 12 volts on the motor (+) circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair short to 12 volts on the motor (-) circuit. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4
4	Repair faulty connections or replace the TAC module. Was a problem found?	—	Verify Repair	Go to Step 5
5	Repair faulty connections or replace the throttle body. Is action complete?	—	Repeat <i>OBD System Check</i>	Refer to <i>Intermittents</i>



Diagnostic Procedure (DP) B-13

DTC 61 Fuel Pressure Sensor Voltage High

Circuit Description

The Fuel Pressure Volts signal is the variable governor or speed control voltage. When the speed control system is engaged, Troll Mode - ON, this voltage is the control voltage (0 - 5.0 vdc) required to maintain the selected speed. This voltage is output by the speed control system, and will vary based on the varying load conditions the system detects, and is input to the ECM, J2-1, to maintain the boat at the selected speed.

Diagnostic Aids

- Inspect DTC and speed control related connectors for signs of water intrusion. When this occurs, multiple trouble codes could be set with no circuit or component conditions found during diagnostic testing.

Intermittents

Check for the following conditions:

- Poor mating of the connector halves, or a terminal not fully seated in the connector body (backed out or loose).
- Improperly formed or damaged terminals and/or connectors.

- All connector terminals in the problem circuit should be carefully checked for proper contact tension.
- Poor terminal to wire connection (crimping).

Test Description

Number(s) below refer to the Step number(s) on the Diagnostic Table:

- Be sure to check for backed out terminals, poor crimping, etc. at each connector prior to replacing any module or speed control unit.

Diagnostic Procedure (DP) B-13

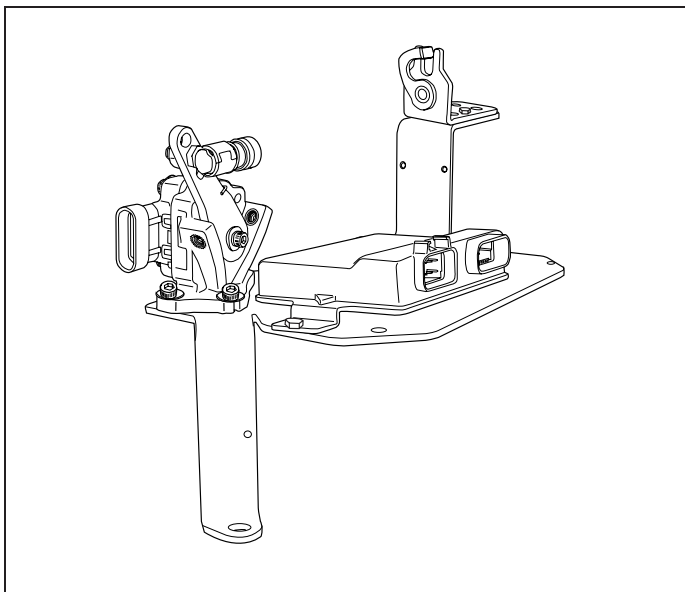
Step	Action	Value	Yes	No
1	Was the "On-Board Diagnostic"(OBD) System Check performed?	—	Go to Step 2	Go to <i>OBD System Check</i>
2	Disconnect the Drive By Wire 10-pin Connector from the boat harness. Locate and repair short to 5 volts on the variable governor circuit, engine side. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 3
3	Locate and repair short to 5 volts on the variable governor circuit, boat side. Refer to boat/speed control manuals for troubleshooting instructions. If a problem was found, repair as necessary. Was a problem found?	—	Verify Repair	Go to Step 4

On-Board Service

Throttle Actuator Control (TAC) Module Replacement - Typical

Notice: When replacing the TAC module, the ignition must be "OFF" before disconnecting or reconnecting the TAC module 10-pin and 16-pin connectors.

Notice: To prevent possible electrostatic discharge damage to the TAC module, do not touch the connector pins. The TAC module is an electrical component. Do Not soak in any liquid cleaner or solvent, as damage may result.



Remove or Disconnect

1. TAC module 10-pin and 16-pin connectors.
2. The TAC module mounting bolts.
4. TAC module from mounting bracket.

Install or Connect

1. New TAC module to mounting bracket.
2. The TAC module mounting bolts. Torque to 10-14 N•m (88-124 lb in).
3. TAC module 10-pin and 16-pin connectors.

Throttle Control Position (TCP) Sensor Replacement

Remove or Disconnect

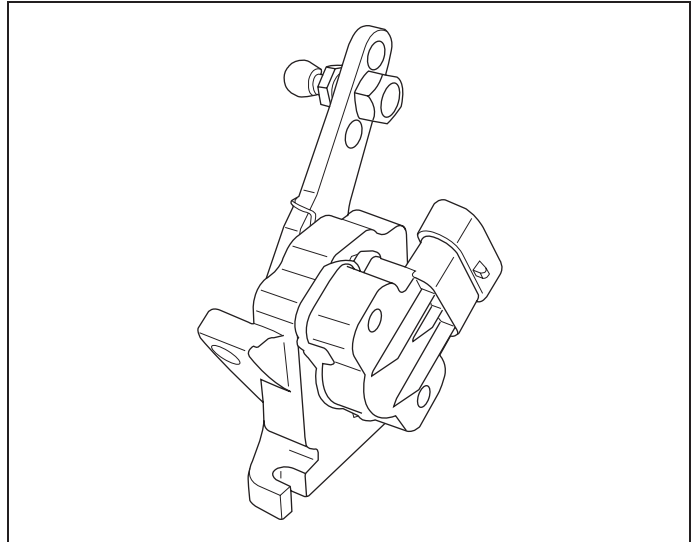
1. TCP sensor 6-pin electrical connector.
2. The two TCP attaching bolts.
3. Rotate the sensor counterclockwise, and remove the sensor from the assembly bracket.

Important

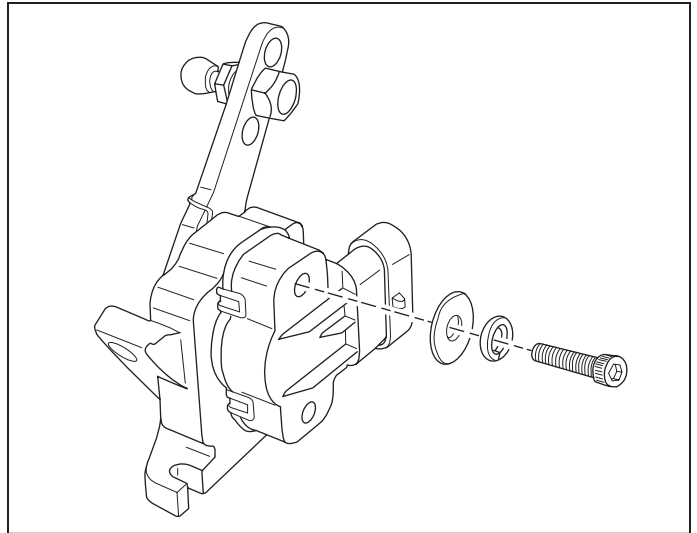
- When installing the sensor onto the mounting bracket, the sensor needs to be installed as shown. Be sure to align the shaft keyway to the sensor key.

Install or Connect

1. New TCP sensor to the mounting bracket.
2. Rotate the sensor clockwise in order to align the attaching holes.



3. The TCP sensor attaching bolts. Torque to 3.5 N•m (30 lb in).
4. TCP sensor 6-pin electrical connector.

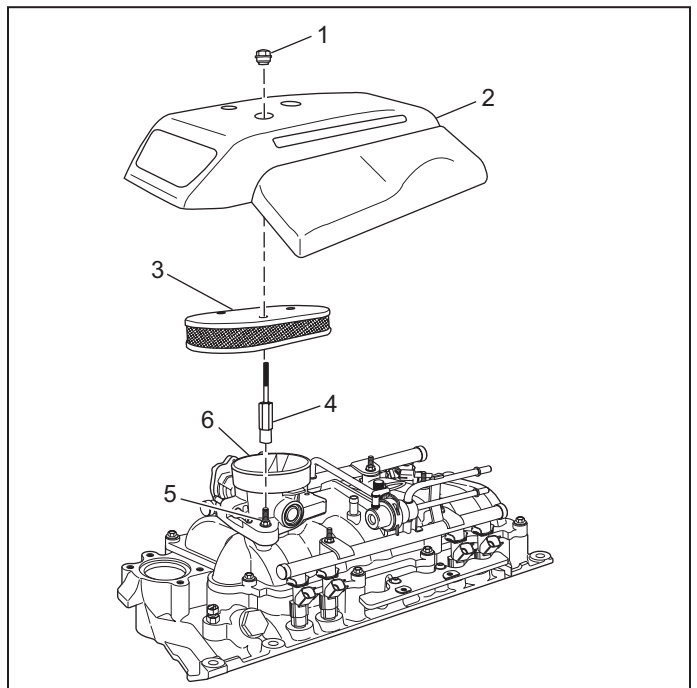
**Throttle Body Replacement - Typical****Remove or Disconnect**

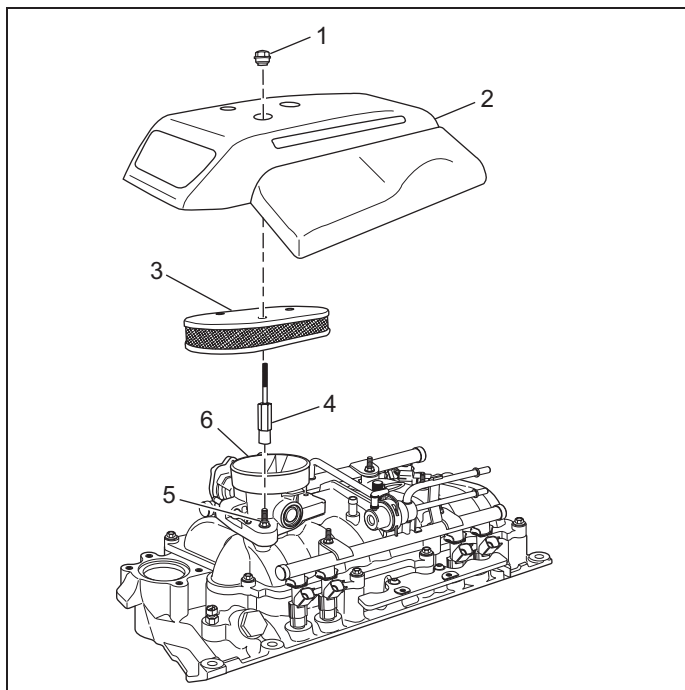
1. Engine cover attaching hardware (1) and engine cover (2).
2. Flame arrestor clamp and flame arrestor (3).
3. Flame arrestor extension studs (4) (5.0/5.7L only).
4. Throttle body electrical connector.
5. Throttle body attaching nuts (5).
6. Throttle body assembly (6).
7. Remove gasket and discard.

Notice: The TP sensor (internal to the throttle body) is an electrical component and should NOT come in contact with solvent or cleaner as they may be damaged.

Clean

Notice: Use care in cleaning old gasket material from machined aluminum surfaces as sharp tools may damage sealing surfaces.



**Install or Connect**

1. New throttle body gasket.
2. Throttle body assembly (6).
3. Throttle body attaching nuts (5). Torque to 10 N•m (88.5 lb in).
4. Throttle body electrical connector.
5. Flame arrestor extension studs (4) (5.0/5.7L only).
6. Flame arrestor clamp and flame arrestor (3).
7. Engine cover attaching hardware (1) and engine cover (2).

DTC Related Fastener Tightening Specifications

Application	Specifications	
	Metric	English
Throttle Body Attaching Bolts	10 N·m	88.5 lb in
Throttle Actuator Control (TAC) Module Attaching Bolts	10 N·m	88.5 lb in
Throttle Control Positioning (TCP) Sensor Bolts	3.5 N·m	30 lb in
TCP Sensor Assembly-to-Bracket Mounting Screws	?? N·m	?? lb in