

# ANTI-LOCK/TCS - BOSCH 5.3

## 2001 Chevrolet Camaro

2001 BRAKES  
Anti-Lock/TCS - BOSCH 5.3

Camaro, Firebird, Grand Prix & Intrigue

CAUTION: See ANTI-LOCK BRAKE SAFETY PRECAUTIONS article in GENERAL INFORMATION before servicing anti-lock brake system.

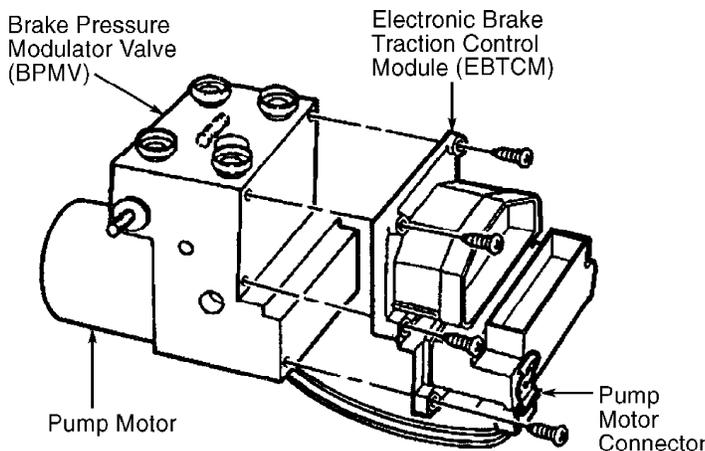
### DESCRIPTION

The Bosch 5.3 Anti-Lock Brake System (ABS) with Traction Control System (TCS) is designed to prevent wheel lock-up during heavy braking. This provides improved driver control and reduces the distance required to stop vehicle. The system also monitors rear wheel speed and compares it to front wheel speed. TCS is operational at all vehicle speeds. If excessive front wheel speed is detected at either front wheel, TCS will be activated. TCS uses front brake intervention, fuel cut-off and spark retard to provide improved traction.

Major system components include the Electronic Brake Control Module (EBCM), speed sensors mounted at each wheel, 3 instrument cluster warning indicators, stoplight switch mounted at brake pedal, pump motor relay and solenoid valve relay mounted internal of EBCM, and Brake Pressure Modulator Valve (BPMV). See Fig. 1. BPMV assembly houses electric pump motor and solenoid valves.

Options and terminology vary between models. Camaro is equipped with Anti-Lock Brakes (ABS) and Traction Control System (TCS) referred to as Acceleration Slip Regulation (ASR). Firebird is equipped ABS and TCS. Grand Prix is equipped with ABS and TCS referred to as Enhanced Traction System (ETS). Intrigue is equipped with ABS, TCS and optional Vehicle Stability Enhancement System (VSES) referred to as Precision Control System (PCS).

NOTE: For more information on brake system, see appropriate DISC & DRUM article.



G98B10372  
Fig. 1: Identifying ABS/TCS Components  
Courtesy of General Motors Corp.

### OPERATION

During normal driving and braking operations, ABS acts like a conventional braking system. Each wheel speed sensor constantly sends an AC voltage signal to EBCM. This information is translated to wheel rotation speed. When EBCM detects wheel lock-up is about to occur, it activates appropriate solenoid to pulse on and off rapidly, regulating hydraulic pressure to each wheel. At this time a slight pulsation should be felt through brake pedal, indicating ABS is working.

BRAKE warning indicator (Red) will illuminate when ignition switch is turned to START position and should go out when ignition switch is turned to ON position, provided that the parking brake is released and brake fluid level is correct. ABS indicator (Amber) and TC indicator (Amber) illuminate when ignition is turned on and goes out after about 2 seconds. If any indicator remains illuminated more than 30 seconds after vehicle is started, system malfunction is indicated. See DIAGNOSIS & TESTING.

Red BRAKE warning indicator will activate if parking brake is applied or brake fluid is low. Amber ABS indicator is controlled by EBCM and comes on if problem is detected with ABS. When indicator is illuminated, ABS is disabled and braking is accomplished by conventional brake system. If both warning indicators are illuminated, check conventional brake system for hydraulic system failure. Amber TC indicator is controlled by EBCM and comes on if problem is detected with TCS. When indicator is illuminated, TCS is disabled and braking (conventional and ABS) is unaffected.

## BLEEDING BRAKE SYSTEM

NOTE: Use DOT 3 brake fluid only. Protect vehicle exterior paint from possible brake fluid spillage.

### MANUAL BLEEDING

1) Clean master cylinder reservoir cover and surrounding area. Remove reservoir cap. Ensure reservoir is full. Install reservoir cap. Raise and support vehicle. Attach a clear hose to specified bleeder valve and submerge other end of hose in a container of clean brake fluid. See BRAKE BLEEDING SEQUENCE table.

#### BRAKE BLEEDING SEQUENCE

Application	Bleeding Sequence
Camaro & Firebird	Right Rear, Left Rear, Right Front, Left Front
Grand Prix & Intrigue	Right Rear, Left Front, Left Rear, Right Front

2) Open bleeder valve. Slowly depress brake pedal. Close bleeder valve and slowly release brake pedal. Wait 5 seconds and repeat process until brake pedal is firm and no air bubbles are seen in hose. Tap lightly on caliper or backing plate to free trapped air. Repeat procedure at remaining bleeder valves. See BRAKE BLEEDING SEQUENCE table.

3) Lower vehicle. Ensure reservoir is full. Turn ignition on, with engine off. Apply moderate force to brake pedal, noting travel and feel. If pedal is firm and travel is not excessive, start engine and recheck. If okay, go to next step. If pedal feels soft or has excessive travel, DO NOT drive vehicle. Repeat manual bleeding procedure.

4) Road test vehicle, making several normal (non-ABS) stops from a moderate speed.

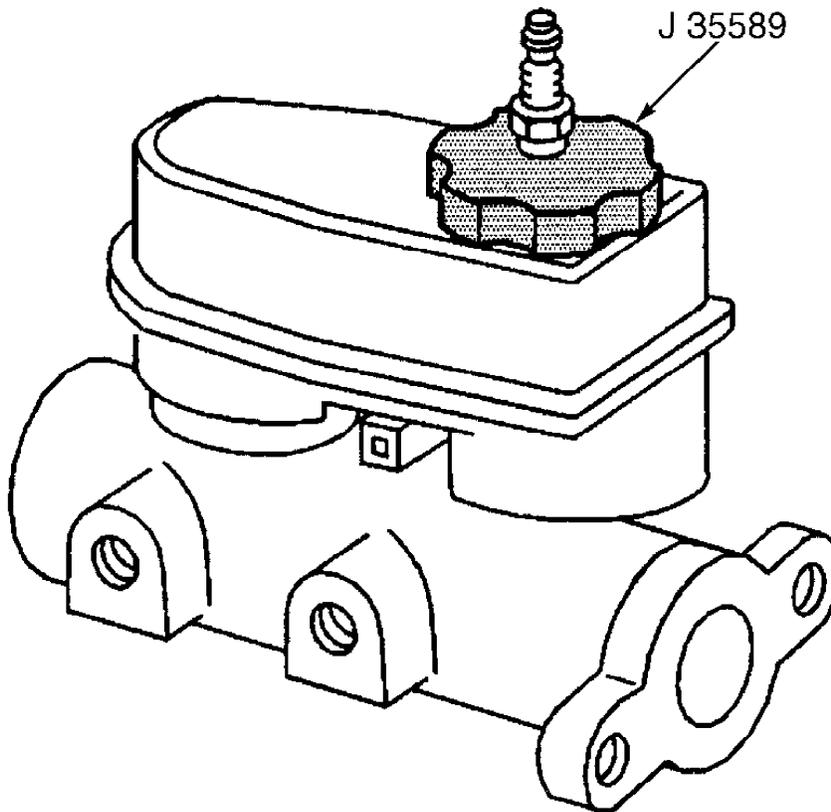
## PRESSURE BLEEDING

1) Clean master cylinder reservoir cover and surrounding area. Remove reservoir cap. Ensure reservoir is full. Attach Bleeder Adapter (J-35589) to reservoir. See Fig. 2. Attach bleeding equipment and pressurize system to 5-10 psi (.35-.70 kg/cm<sup>2</sup>) for 30 seconds to ensure there are no leaks. Slowly increase pressure to 30-35 psi (2.1-2.4 kg/cm<sup>2</sup>).

2) Raise and support vehicle. Attach a clear hose to specified bleeder valve and submerge other end of hose in a container of clean brake fluid. See BRAKE BLEEDING SEQUENCE table. Open bleeder valve. Allow fluid to flow until no air bubbles are seen in hose. Tap lightly on caliper or backing plate to free trapped air. Close valve and repeat procedure on remaining bleeder valves.

3) Lower vehicle. Remove pressure bleeding equipment. Ensure reservoir is full. Turn ignition on, with engine off. Apply moderate force to brake pedal, noting travel and feel. If pedal is firm and travel is not excessive, start engine and recheck. If okay, go to next step. If pedal feels soft or has excessive travel, DO NOT drive vehicle. Repeat manual bleeding procedure.

4) Road test vehicle, making several normal (non-ABS) stops from a moderate speed.



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Fig. 2: Special Bleeder Adapter Tool  
Courtesy of General Motors Corp.

## SERVICING

## TIRES

Tire size is important for proper performance of ABS/TCS. Replace tires in axle sets only. Tires must be same size, load range, and construction as original tires. Using any other tire size or type may affect ABS/TCS operation. Using compact spare supplied with vehicle will not affect ABS/TCS performance.

## SERVICE PRECAUTIONS

**WARNING:** To avoid injury from accidental air bag deployment, read and carefully follow all WARNINGS and SERVICE PRECAUTIONS in appropriate AIR BAG RESTRAINT SYSTEM article in ACCESSORIES & EQUIPMENT.

## PROGRAMMING

### STEERING ANGLE SENSOR CENTERING

Steering angle sensor does not require centering often. Centering of steering angle sensor might be required after certain service procedures are performed. Some of these procedures are as follows:

- \* Steering gear replacement
- \* Steering column replacement
- \* Steering angle sensor replacement
- \* Intermediate shaft replacement
- \* ABS controller replacement
- \* Collision or other physical damage
- \* Engine cradle replacement

The steering angle sensor centering procedure can be manually accomplished by the following steps:

- 1) Using steering wheel, set wheels straight ahead. Set transmission in PARK position. Verify brake pedal switch and TRACTION CONTROL switch are operating properly. Set park brake on to inhibit Daytime Running Lights (DRL).
- 2) Turn ignition on, engine off. After 10 seconds, instrument cluster lights that are on are as follows: SERVICE ENGINE SOON, SECURITY, seat belts and BRAKE.

**NOTE:** Steering angle sensor will be uncentered before it is centered. Steps 3 through 6 will uncenter steering angle sensor. Technician must become familiar with these steps because they have to be performed within a set amount of time. If they are not performed within time period called out by individual step, uncentering of steering angle sensor will not be performed.

- 3) Press TRACTION CONTROL switch 3 times within 5 seconds. TRAC OFF light is on.
- 4) Using scan tool with ABS data list selected, press brake pedal firmly and hold to achieve 725 psi. LOW TRAC light turns on and TRAC OFF light remains on.
- 5) Press TRACTION CONTROL switch 3 times within 5 seconds. LOW TRAC light flashes and TRAC OFF light goes off.
- 6) Release brake pedal within 5 seconds. TRAC OFF light is on, LOW TRAC light is off and PCS light is flashing.

7) Uncentering of steering angle sensor is complete.

NOTE: Steering angle sensor will now be centered. Steps 8 and 9 will center steering angle sensor. Technician must become familiar with these steps because they have to be performed within a set amount of time. If they are not performed within time period called out by individual step, centering of steering angle sensor will not be performed.

8) Press TRACTION CONTROL switch 3 times within 5 seconds. LOW TRAC light is on. TRAC OFF light is on.

9) Press TRACTION CONTROL switch 3 times within 5 seconds. LOW TRAC light is off, TRAC OFF light is off, PCS light is off and SERVICE VEHICLE SOON light will come ON and then go OFF.

10) Centering of steering angle sensor is complete.

## DIAGNOSIS & TESTING

NOTE: To diagnose ABS/TCS, manufacturer recommends using Tech 2 scan tool, DVOM, Universal Pinout Box (J-39700) and Adapter (J-39700-530).

The EBCM has self-diagnostic capability, which can detect system failures. Diagnostic trouble codes stored by EBCM can be displayed using scan tool. See RETRIEVING DIAGNOSTIC TROUBLE CODES. Begin ABS/TCS diagnosis with PRE-DIAGNOSTIC INSPECTION procedure.

### PRE-DIAGNOSTIC INSPECTION

When checking potential ABS/TCS faults, check following before performing diagnostic trouble code testing.

1) Check ABS and HAZARD fuses in instrument panel fuse block located behind left side of instrument panel.

2) Check ABS fuse in power distribution fuse block located in left front of engine compartment.

3) Check all ABS/TCS wiring harness connectors for proper engagement, loose wires or terminals and/or corrosion. Check harness routing paying particular attention to wheel speed sensor wiring harness routing.

4) Ensure brake switches are properly adjusted (if necessary).

5) Check brake system for leaks and proper fluid level.

6) Check ABS/TCS ground circuit for clean tight connections. Ground is located in left front of engine compartment, in body and instrument panel wiring harness.

7) Always perform diagnostic system check before diagnosing DTCs. See DIAGNOSTIC SYSTEM CHECK.

Solenoid valve relay is turned off by EBCM when a diagnostic trouble code is set. Using scan tool to monitor data list when trouble codes are set, solenoid will be displayed as being off. This is normal and not an indication of a system malfunction.

EBCM performs an automatic test during each ignition cycle when vehicle speed reaches 4 MPH in either forward or reverse gears. Automatic test cycles each solenoid valve, pump motor and relays to check component operation. EBCM will set a trouble code if an error is detected. Test may be felt and heard while it is taking place and is a normal mode of operation.

### RETRIEVING DIAGNOSTIC TROUBLE CODES

Diagnostic Trouble Code (DTC) is retrieved using Tech 2 scan tool. Follow scan tool manufacturer's instructions to perform tests.

Before diagnosing DTC(s), perform DIAGNOSTIC SYSTEM CHECK first. Scan tool is also used to perform test modes for diagnosis and service of the ABS/TCS system.

If multiple codes are displayed, begin diagnosis with code that is displayed first. See DIAGNOSTIC TROUBLE CODE DEFINITIONS table. Diagnose all codes in the order displayed by scan tool.

### DIAGNOSTIC SYSTEM CHECK

1) Install scan tool. If scan tool powers up, go to next step. If scan tool does not power up, see SCAN TOOL DOES NOT POWER UP under appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

2) Turn ignition on, engine off. Try to establish scan tool communication with Electronic Brake Control Module (EBCM) and Powertrain Control Module (PCM). If communication with modules is established, go to next step. If communication with modules is not established, see SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE under appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

3) Select display DTC function for each module. Record all displayed DTCs, status of displayed DTCs and module that set DTC. If DTCs are displayed, go to next step. If no DTCs are displayed, see SYMPTOM DIAGNOSIS.

4) Retrieve codes and perform appropriate test. See DIAGNOSTIC TROUBLE CODE DEFINITIONS table.

### DIAGNOSTIC TROUBLE CODE DEFINITIONS

Code	Definition
BXXXX	..... (1)
C0035	..... Left Front Wheel Speed Circuit Malfunction
C0036	..... Left Front Wheel Speed Circuit Range/Performance
C0040	..... Right Front Wheel Speed Circuit Malfunction
C0041	..... Right Front Wheel Speed Circuit Range/Performance
C0045	..... Left Rear Wheel Speed Circuit Malfunction
C0046	..... Left Rear Wheel Speed Circuit Range/Performance
C0050	..... Right Rear Wheel Speed Circuit Malfunction
C0051	..... Right Rear Wheel Speed Circuit Range/Performance
C0060	..... Left Front ABS Solenoid No. 1 Circuit Malfunction
C0065	..... Left Front ABS Solenoid No. 2 Circuit Malfunction
C0070	..... Right Front ABS Solenoid No. 1 Circuit Malfunction
C0075	..... Right Front ABS Solenoid No. 2 Circuit Malfunction
C0080	..... Left Rear ABS Solenoid No. 1 Circuit Malfunction
C0085	..... Left Rear ABS Solenoid No. 2 Circuit Malfunction
C0090	..... Right Rear ABS Solenoid No. 1 Circuit Malfunction
C0095	..... Right Rear ABS Solenoid No. 2 Circuit Malfunction
C0100 (2)	..... Rear ABS Solenoid No. 1 Circuit Malfunction
C0105 (2)	..... Rear ABS Solenoid No. 2 Circuit Malfunction
C0110	..... Pump Motor Circuit Malfunction
C0121	..... Valve Relay Circuit Malfunction
C0131 (3)	..... ABS/TCS System Pressure Circuit Malfunction
C0132 (3)	..... ABS/TCS System Pressure Circuit Range/Performance
C0141 (4)	..... Left TCS Solenoid No. 1 Circuit Malfunction
C0146 (4)	..... Left TCS Solenoid No. 2 Circuit Malfunction
C0151 (4)	..... Right TCS Solenoid No. 1 Circuit Malfunction
C0156 (4)	..... Right TCS Solenoid No. 2 Circuit Malfunction

C0161	.....	ABS/TCS Brake Switch Circuit Malfunction
C0166	(2) .....	TCS Priming Line Valve Circuit Malfunction
C0171	(2) .....	TCS Pilot Valve Circuit Malfunction
C0181	(2) .....	Throttle Reduction Motor Circuit Malfunction
C0182	(2) .....	Throttle Reduction Motor Circuit Range/Performance
C0186	(3) .....	Lateral Accelerometer Circuit Malfunction
C0187	(3) .....	Lateral Accelerometer Circuit Range/Performance
C0196	(3) .....	Yaw Rate Circuit Malfunction
C0197	(3) .....	Yaw Rate Circuit Range/Performance
C0235	.....	TCS RPM Signal Circuit Malfunction
C0236	.....	TCS RPM Signal Circuit Malfunction
C0237	.....	TCS RPM Signal Circuit Malfunction
C0238	(2) .....	TCS Throttle Position Sensor Comparison Malfunction
C0239	(2) .....	TCS Spark Retard Monitoring Malfunction
C0240	.....	PCM Traction Control Not Allowed
C0241	.....	PCM Indicated Requested Torque Malfunction
C0244	.....	PWM Delivered Torque Malfunction
C0245	.....	Wheel Speed Sensor Frequency Error
C0252	(3) .....	Active Brake Control Sensors Uncorrelated
C0253	(3) .....	Centering Fault
C0266	(2) .....	ADS Controller Malfunction
C0550	.....	ECU Malfunction
C0710	(3) .....	Steering Position Signal Malfunction
C0870	(3) .....	BPMV Pressure Sensor Reference Circuit Malfunction
C0875	(3) .....	Yaw/Lateral Accelerometer Sensor Circuit Malfunction
C0896	.....	Device Voltage Range/Performance
C0901	(2) .....	Device No. 2 Voltage Low
P1504	.....	TCS RPM Signal Circuit Malfunction
P1571	.....	PCM Indicated Requested Torque Malfunction
P1689	.....	PWM Delivered Torque Malfunction
PXXXX	.....	(5)
U1650	(3) .....	Chassis System Dedicated Bus Controller Malfunction
U1651	(3) .....	Chassis System Dedicated Bus Sensor Malfunction
UXXXX	.....	(6)

- (1) - See DIAGNOSTIC TESTS under appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.
- (2) - Camaro and Firebird only.
- (3) - Intrigue only.
- (4) - Grand Prix and Intrigue only.
- (5) - For any DTC beginning with the letter "P", except P1504, P1571 or P1689, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.
- (6) - For any DTC beginning with the letter "U" except U1650 and U1651, see SCAN TOOL DOES NOT COMMUNICATE WITH CLASS 2 DEVICE under appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT.

## CLEARING DIAGNOSTIC TROUBLE CODES

NOTE: DTCs cannot be cleared by disconnecting EBCM or negative battery cable, or by turning ignition off. DTCs will be erased when ignition is cycled 100 times without fault reappearing. Ignition cycle counter in EBCM will then be reset to zero. DTCs may also be cleared using Tech 2 scan tool.

1) Connect Tech 2 scan tool. Before clearing DTCs, check and note current DTC data. Select ABS/TCS function. Select DTC(S) function, and then CLEAR CODES function.

2) Verify DTCs are cleared. If other DTCs are displayed, either DTCs were not cleared or ABS/TCS fault still exists. Diagnose

fault and repeat procedure.

## SCAN TOOL TEST MODES

NOTE: Available test modes depend on vehicle equipment. Not all modes are available on all vehicles.

- \* Data List Mode - Mode continuously monitors wheel speed data, brake switch status, ABS/TCS status, and other inputs and outputs.
- \* DTC History Mode - Mode displays diagnostic trouble code history data. Fault occurrence information is stored for first 5 trouble codes stored and very last trouble code stored. Fault occurrence information stored consists of trouble code number, number of failure occurrences and number of ignition cycles since fault first and last occurred.
- \* DTC Mode - Mode displays diagnostic trouble codes. Both ignition cycle and history may be displayed or cleared.
- \* Snapshot Mode - Mode will help isolate intermittent problems by capturing data before and after fault condition. Snapshots cannot be read until all stored DTCs are cleared.

If MANUAL TRIGGER is selected, Tech 2 will wait for ENTER to be pressed before storing data. Tech 2 stores data from 8 seconds before trigger and 8 seconds after trigger is activated. All stored information can be displayed and examined for conditions which might indicate a problem, but may not set a code.

If AUTOMATIC TRIGGER is selected, Tech 2 will capture data, which deviates from normal conditions but may not set a DTC, such as driving over bumpy roads or railroad tracks. Condition may be caused by loose connections or intermittent wiring problems causing signal to drop out momentarily. While Tech 2 is waiting for a trigger, ENTER key may be used to force a trigger.

- \* Special Functions - In this mode, the scan tool performs various ABS functional tests to help isolate problems during trouble shooting.
- \* Automated Test - This mode cycles each solenoid valve, pump motor and necessary relays to check component operation.

## SYMPTOM DIAGNOSIS

If no DTCs are stored, perform appropriate symptom diagnostic test as necessary. See SYMPTOM DIAGNOSTIC INDEX table.

### SYMPTOM DIAGNOSTIC INDEX

Symptom	Perform Test
Camaro & Firebird	
ABS Indicator Always On .....	A
ABS Indicator Inoperative .....	B
ASR Or TCS Indicator Always On .....	C
ASR Or TCS Indicator Inoperative .....	D
LOW TRACTION Indicator Always On .....	E
LOW TRACTION Indicator Inoperative .....	F
Grand Prix	
ABS Indicator Always On .....	A
ABS Indicator Inoperative .....	B
TRACTION OFF Indicator Always On .....	C
TRACTION OFF Indicator Inoperative .....	D
LOW TRACTION Indicator Always On .....	E

LOW TRACTION Indicator Inoperative .....	F
Intrigue	
ABS Indicator Always On .....	A
ABS Indicator Inoperative .....	B
TRACTION OFF Indicator Always On .....	C
TRACTION OFF Indicator Inoperative .....	D
LOW TRACTION Indicator Always On .....	E
LOW TRACTION Indicator Inoperative .....	F
PCS Indicator Always On .....	G
PCS Indicator Inoperative .....	H

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## INTERMITTENTS & POOR CONNECTIONS

Failures in ABS/TCS may be difficult to diagnose accurately. If an ABS/TCS failure or fault occurs, ABS and/or TC indicator will illuminate. If fault is an intermittent problem, which has corrected itself (ABS and/or TC indicator off), DTC will be stored.

ABS/TCS self-diagnostic system can be used to help identify suspect circuit. Perform following procedure:

- \* Display and record DTC history data. Record any descriptive driving circumstances during failure occurrence. Clear any ABS/TCS DTCs set in EBCM.
- \* Test drive vehicle. Attempt to repeat failure under condition in which failure occurred. Use Tech 2 scan tool, SNAPSHOT mode, while test driving vehicle. See RETRIEVING DIAGNOSTIC TROUBLE CODES.
- \* After duplicating condition, stop vehicle and display any ABS/TCS DTCs which may have been stored.
- \* If no trouble codes were stored, see SYMPTOM DIAGNOSIS.

Most intermittent problems are caused by faulty electrical connectors or wiring. When an intermittent failure is encountered, check suspect circuits for:

- \* Poor mating of connector halves, or terminals not fully seated in connector body (backed out).
- \* Improperly formed or damaged terminals. All connector terminals in a problem circuit should be carefully reformed to increase contact tension.
- \* Check for dirt or corrosion on terminals, which could impede proper terminal contact.
- \* Poor terminal-to-wire connection. This requires removing terminal from connector body to inspect.
- \* Wheel speed sensor cables not attached in retainers or routed too close to spark plug wires.
- \* Low system voltage. If low system voltage is detected at EBCM, ABS will turn on ABS indicator until normal system voltage is achieved.

## SYMPTOM TESTS

NOTE: To identify circuits and wire colors referenced in testing, see WIRING DIAGRAMS. After repairs, recheck system operation to verify problem has been repaired.  
See DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. System testing requires the use of Universal Pinout Box (J-39700) and Adapter Cable (J-39700-530).

### TEST A: ABS INDICATOR ALWAYS ON (CAMARO & FIREBIRD)

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, select INSTRUMENT PANEL CLUSTER SPECIAL FUNCTIONS. Select WOW INSTRUMENT PANEL in OUTPUT CONTROL. In WOW mode, you can turn on or off instrument panel indicators. All indicators will turn on when commanded on. If ABS indicator turns on then off, go to next step. If ABS indicator does not turn off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Disconnect instrument cluster connector. Connect test light across appropriate power and ground terminals. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If test light is off, repair open in power or ground circuit to instrument cluster. If test light is on, check instrument panel connector for poor connections. If problem was found, repair as necessary. If problem was not found, replace instrument cluster. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

#### **TEST A: ABS INDICATOR ALWAYS ON (GRAND PRIX)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition switch to OFF position. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to harness connector only. Connect fused jumper wire between terminals No. 16 (Light Green wire) and No. 15 (Black/White wire) of universal pinout box. Turn ignition switch to ON position. If ABS indicator turns off, go to next step. If ABS indicator does not turn off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 7).

4) Turn ignition switch to OFF position. Disconnect instrument cluster connector C1. Using DVOM, measure resistance between terminals No. 16 (Light Green wire) of universal pinout box and instrument cluster connector C1 terminal "E". If resistance is 0-5 ohms, go to step 6). If resistance is not 0-5 ohms, go to next step.

5) Repair open or high resistance in Light Green wire between EBCM and instrument cluster. After repairs, go to step 7).

6) Replace instrument panel. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to next step.

7) Operate system to verify repair.

#### **TEST A: ABS INDICATOR ALWAYS ON (INTRIGUE)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, select INSTRUMENT PANEL CLUSTER SPECIAL FUNCTION, attempt to turn off ABS indicator. If ABS Indicator turns off, go to next step. If indicator remains on, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Replace instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

#### **TEST B: ABS INDICATOR INOPERATIVE (CAMARO & FIREBIRD)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, select INSTRUMENT PANEL CLUSTER SPECIAL FUNCTIONS. Select WOW INSTRUMENT PANEL in OUTPUT CONTROL. In WOW mode, you can turn on or off instrument panel indicators. All indicators will turn on when commanded on. If ABS Indicator turns on, then off, go to next step. If ABS indicator does not turn on, then off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Disconnect instrument cluster connector. Connect test light across appropriate power and ground terminals. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If test light is off, repair open in power or ground circuit to instrument cluster. If test light is on, check instrument panel connector for poor connections. If problem was found, repair as necessary. If problem was not found, replace instrument cluster. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

### **TEST B: ABS INDICATOR INOPERATIVE (GRAND PRIX)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition switch to OFF position. Disconnect EBCM connector. Turn ignition switch to ON position. If ABS indicator comes on, go to next step. If ABS indicator does not come on, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 9).

4) Turn ignition switch to OFF position. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to harness connector only. Disconnect instrument cluster connector C1. Using DVOM, measure resistance between terminals No. 16 (Light Green wire) and No. 15 (Black/White wire) of universal pinout box. If resistance is infinite, go to step 6). If resistance is not infinite, go to next step.

5) Repair short to ground in Light Green wire between EBCM and instrument cluster. After repairs, go to step 9).

6) Turn ignition switch to OFF position. Check ABS indicator bulb. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If ABS indicator bulb is okay, go to step 8). If ABS bulb is not okay, go to next step.

7) Replace ABS Indicator Bulb. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to step 9).

8) Replace instrument panel cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to next step.

9) Operate system to verify repair.

### **TEST B: ABS INDICATOR INOPERATIVE (INTRIGUE)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, select INSTRUMENT PANEL SPECIAL FUNCTIONS. Attempt to turn ABS indicator on. If ABS indicator turns on, go to next step. If ABS indicator does not turn on, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Turn ignition switch to OFF position. Check ABS indicator bulb. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If ABS indicator bulb is okay, go to step 6). If ABS bulb is not okay, go to next step.

5) Replace ABS Indicator Bulb. See appropriate ANALOG

INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

6) Replace instrument panel cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

### TEST C: ASR/TCS INDICATOR ALWAYS ON (CAMARO & FIREBIRD)

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition on, with engine off. Using scan tool, enter ABS/TCS data list. While monitoring ASR/TCS on/off switch status, press and release ASR/TCS on/off switch. If switch status changes as switch is pressed and released, go to next step. If switch status does not change as switch is pressed and released, go to step 5).

3) Using a scan tool, select INSTRUMENT PANEL CLUSTER SPECIAL FUNCTION. Select WOW INSTRUMENT PANEL in OUTPUT CONTROL. Turn instrument panel indicators on then off. If TCS OFF indicator turns on then off, go to step 9). If TCS OFF indicator remains illuminated, go to next step.

4) Disconnect instrument cluster connector. Connect test light across appropriate power and ground terminals. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If test light is off, repair open in power or ground circuit to instrument cluster. If test light is on, check instrument panel connector for poor connections. If problem was found, repair as necessary. If problem was not found, replace instrument cluster. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

5) Remove and disconnect ASR/TCS switch. See TRACTION CONTROL SWITCH under REMOVAL & INSTALLATION. Using scan tool, enter ABS/TCS data list. If TCS SWITCH status reads RELEASED, go to next step. If TCS SWITCH status does not read RELEASED, go to step 7).

6) Replace ASR/TCS Switch. See TRACTION CONTROL SWITCH under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

7) Turn ignition off. Measure resistance between TCS Switch connector terminal "E" and ground. If resistance is infinite, go to step 9). If resistance is not infinite, go to next step.

8) Repair short to ground in Brown/White wire between ASR/TCS on/off switch and EBCM. Also, check for a short in ASR/TCS on/off switch. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

9) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

### TEST C: TRACTION OFF INDICATOR ALWAYS ON (GRAND PRIX)

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition on, engine off. Using scan tool, enter ABS/TCS data list. While monitoring TRAC on/off switch status, press and release TRAC on/off switch. If switch status changes as switch is pressed and released, go to next step. If switch status does not change as switch is pressed and released, go to step 8).

3) Turn ignition off. Disconnect EBCM connector. Turn ignition on, engine off. If TRAC indicator turns off, go to next step. If TRAC indicator remains illuminated, go to step 5).

4) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 10).

5) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) and Cable Adapter (J 39700-530) to EBCM harness connector only. Disconnect driver information display or trip

calculator connector. Using DVOM, measure resistance between universal pinout box terminals No. 15 (Black/White wire) and No. 18 (Purple/White wire). If resistance is infinite, go to step 7). If resistance is not infinite, go to next step.

6) Repair short to ground in Purple/White wire between instrument cluster and EBCM. After repairs, go to step 10).

7) Diagnose driver information display or trip calculator. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to step 10).

8) Turn ignition off. Disconnect EBCM connector. Install universal pinout box and cable adapter to EBCM harness connector only. Using DVOM, measure resistance between universal pinout box terminals No. 17 (Brown/White wire) and No. 15 (Black/White wire). If resistance is infinite, go to step 4). If resistance is not infinite, go to next step.

9) Repair short to ground in Brown/White wire between TRAC on/off switch and EBCM. Also, check for a short in TRAC on/off switch. After repairs, go to next step.

10) Operate system to verify repair.

### **TEST C: TRACTION OFF INDICATOR ALWAYS ON (INTRIGUE)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Install scan tool. Turn ignition on, engine off. With a scan tool, observe TRACTION SWITCH parameter in BODY CONTROL MODULE data list. If scan tool displays OFF, go to next step. If scan tool does not display OFF, go to step 4).

3) Activate traction control switch. Using scan tool, observe TRACTION SWITCH parameter. If TRACTION SWITCH parameter changes state, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING. If TRACTION SWITCH parameter does not change, go to next step.

4) Turn ignition off. Disconnect traction control switch connector. Turn ignition on, engine off. Using scan tool, observe TRACTION SWITCH parameter. If scan tool displays OFF, go to step 7). If scan tool does not display OFF, go to next step.

5) Check Brown/White wire (signal circuit) of traction control switch for short to ground. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to next step.

6) Check Body Control Module (BCM) connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 8).

7) Check traction control switch connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 9).

8) Replace BCM. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT. After repairs, go to step 10).

9) Replace traction control switch. See TRACTION CONTROL SWITCH under REMOVAL & INSTALLATION. After repairs, go to next step.

10) Operate system to verify repair.

### **TEST D: ASR/TCS INDICATOR INOPERATIVE (CAMARO & FIREBIRD)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition switch to ON position, engine off. Using scan tool, enter TCS Data List. While monitoring TCS On/Off switch status, press and release ASR/TCS ON/OFF switch. If switch status changes from PRESSED to RELEASED as ASR/TCS switch is pressed and released, go to next step. If switch status does not change from PRESSED to RELEASED as ASR/TCS switch is pressed and released, go to

step 5).

3) Using scan tool, select INSTRUMENT PANEL CLUSTER SPECIAL FUNCTION. Go to WOW INSTRUMENT PANEL in OUTPUT CONTROL. In WOW mode, you can turn on or off instrument panel indicators. All indicators will turn on when commanded on. If ASR/TCS OFF indicator turns on, then off, go to step 11). If ASR/TCS OFF indicator does not turn on, then off, go to next step.

4) Disconnect instrument cluster connector. Connect test light across appropriate power and ground terminals. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If test light is off, repair open in power or ground circuit to instrument cluster. If test light is on, check instrument panel connector for poor connections. If problem was found, repair as necessary. If problem was not found, replace instrument cluster. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

5) Remove ASR/TCS switch and disconnect connector. See TRACTION CONTROL SWITCH under REMOVAL & INSTALLATION. Using scan tool in ABS/TCS data list, read TCS SWITCH status. Connect jumper wire between AST/TCS switch connector terminals "E" and "F". If TCS SWITCH status reads PRESSED with jumper wire connected, go to next step. If TCS SWITCH status does not read PRESSED with jumper wire connected, go to step 7).

6) Replace ASR/TCS Switch. See TRACTION CONTROL SWITCH under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

7) Turn ignition switch to OFF position. Using DVOM, measure resistance between ASR/TCS switch connector terminal "F" (Black/White wire) and ground. If resistance is 0-5 ohms, go to step 9). If resistance is not 0-5 ohms, go to next step.

8) Repair open or high resistance in Black/White wire between AST/TCS switch and ground. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

9) Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM connector only Using DVOM, measure resistance between ASR/TCS switch connector terminal "E" and universal pinout box terminal No. 17 (Brown/White wire). If resistance is 0-5 ohms, go to step 11). If resistance is not 0-5 ohms go to next step.

10) Repair open or high resistance in Brown/White wire between AST/TCS switch and EBCM. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

11) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

## TEST D: TRACTION OFF INDICATOR INOPERATIVE (GRAND PRIX)

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition on, engine off. Using scan tool, enter ABS/TCS data list. While monitoring TRAC ON/OFF SWITCH status, press and release TRAC on/off switch. If switch status changes as switch is pressed and released, go to next step. If switch status does not change as switch is pressed and released, go to step 8).

3) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Connect fused jumper wire between universal pinout box terminals No. 18 (Purple/White wire) and No. 15 (Black/White wire). Turn ignition on, engine off. If TRAC OFF indicator illuminates, go to next step. If TRAC OFF indicator does not illuminate, go to step 5).

4) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 10).

5) Turn ignition off. Disconnect instrument cluster connector. Using DVOM, measure resistance between universal pinout box terminal No. 18 (Purple/White wire) and instrument cluster connector terminal "L" or A6 (Purple/White wire). If resistance is 0-5 ohms, go to step 7). If resistance is not 0-5 ohms, go to next step.

6) Repair open or high resistance in Purple/White wire between driver information display or trip calculator and EBCM. After repairs, go to step 10).

7) Diagnose driver information display or trip calculator. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to step 10).

8) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Using DVOM, measure resistance between universal pinout box terminals No. 17 (Brown/White wire) and No. 15 (Black/White wire) while an assistance presses and releases TRAC on/off switch. If resistance is 0-5 ohms, go to step 4). If resistance is not 0-5 ohms, go to next step.

9) Repair open or high resistance in Brown/White wire between TRAC on/off switch and EBCM. Also, check for open in TRAC on/off switch. After repairs, go to next step.

10) Operate system to verify repair.

#### **TEST D: TRACTION OFF INDICATOR INOPERATIVE (INTRIGUE)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Install scan tool. Turn ignition on, engine off. Using scan tool, observe TRACTION SWITCH parameter in Body Control Module (BCM) data list. Activate traction control switch. If TRACTION SWITCH parameter changes state, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING. If TRACTION SWITCH parameter does not change, go to next step.

3) Turn ignition off. Disconnect traction control switch connector. Connect fused jumper between traction control switch connector terminal "E" (Brown/White wire) and ground. Turn ignition on, engine off. Using scan tool, observe TRACTION SWITCH parameter. If scan tool displays ON, go to step 5). If scan tool does not display ON, go to next step.

4) Check Brown/White wire (signal circuit) of traction control switch for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 6).

5) Check Black wire (ground circuit) of traction control switch for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 7).

6) Check BCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 8).

7) Check traction control switch connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 9).

8) Replace BCM. See appropriate BODY CONTROL MODULES article in ACCESSORIES & EQUIPMENT. After repairs, go to step 10).

9) Replace traction control switch. See TRACTION CONTROL SWITCH under REMOVAL & INSTALLATION. After repairs, go to next step.

10) Operate system to verify repair.

#### **TEST E: LOW TRACTION INDICATOR ALWAYS ON (CAMARO & FIREBIRD)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

Go to next step.

2) Using scan tool, enter INSTRUMENT PANEL CLUSTER SPECIAL FUNCTIONS. Go to WOW INSTRUMENT PANEL in OUTPUT CONTROL. In WOW mode you can turn on or off the instrument panel indicators. All indicators will turn on when commanded on. If LOW TRAC indicator turns on, then off, go to next step. If LOW TRAC indicator does not turn on, then off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Disconnect instrument cluster connector. Connect test light across appropriate power and ground terminals. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If test light is off, repair open in power or ground circuit to instrument cluster. If test light is on, check instrument panel connector for poor connections. If problem was found, repair as necessary. If problem was not found, replace instrument cluster. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

### **TEST E: LOW TRACTION INDICATOR ALWAYS ON (GRAND PRIX)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition switch to OFF position. Disconnect EBCM connector. Turn ignition switch to ON position. If LOW TRAC indicator is off, go to next step. If LOW TRAC indicator is not off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 7).

4) Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Disconnect driver information display or trip calculator connector. Using DVOM, measure resistance between universal pinout box terminals No. 25 (Light Blue wire) and No. 15 (Black/White wire). If resistance is infinite, go to step 6). If resistance is not infinite, go to next step.

5) Repair short to ground in Light Green wire between EBCM and driver information display or trip calculator. After repairs, go to step 7).

6) Diagnose driver information display or trip calculator. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to next step.

7) Operate system to verify repair.

### **TEST E: LOW TRACTION INDICATOR ALWAYS ON (INTRIGUE)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, enter INSTRUMENT PANEL CLUSTER SPECIAL FUNCTIONS. Attempt to turn off LOW TRAC indicator. If LOW TRAC indicator turned off, go to next step. If LOW TRAC indicator did not turn off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Replace instrument panel cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

### **TEST F: LOW TRACTION INDICATOR INOPERATIVE (CAMARO & FIREBIRD)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, enter INSTRUMENT PANEL CLUSTER SPECIAL FUNCTIONS. Go to WOW INSTRUMENT PANEL in OUTPUT CONTROL. In WOW mode you can turn on or off the instrument panel indicators. All indicators will turn on when commanded on. If LOW TRAC indicator turns on, then off, go to next step. If LOW TRAC indicator does not turn on, then off, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Disconnect instrument cluster connector. Connect test light across appropriate power and ground terminals. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If test light is off, repair open in power or ground circuit to instrument cluster. If test light is on, check instrument panel connector for poor connections. If problem was found, repair as necessary. If problem was not found, replace instrument cluster. After repairs, perform DIAGNOSTIC SYSTEM CHECK.

### **TEST F: LOW TRACTION INDICATOR INOPERATIVE (GRAND PRIX)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition switch to OFF position. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Connect fused jumper wire between universal pinout box terminals No. 25 (Light Green wire) and No. 15 (Black/White wire). Turn ignition switch to ON position. If LOW TRAC indicator comes on, go to next step. If LOW TRAC indicator does not come on, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 7).

4) Turn ignition switch to OFF position. Disconnect driver information display or trip calculator connector. Using DVOM, measure resistance between universal pinout box terminal No. 25 (Light Green wire) and driver information display connector terminal "H" or trip calculator connector terminal A3. If resistance is 0-5 ohms, go to step 6). If resistance is not 0-5 ohms, go to next step.

5) Repair open or high resistance in Light Green wire between EBCM and driver information display or trip calculator. After repairs, go to step 7).

6) Diagnose driver information display or trip calculator. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to next step.

7) Operate system to verify repair.

### **TEST F: LOW TRACTION INDICATOR INOPERATIVE (INTRIGUE)**

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, enter INSTRUMENT PANEL SPECIAL FUNCTIONS. Attempt to turn LOW TRAC indicator on. If LOW TRAC indicator turns on, go to next step. If LOW TRAC indicator does not turn on, go to step 4).

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Turn ignition switch to OFF position. Check LOW TRAC indicator bulb. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. If LOW TRAC bulb is okay, go to step 6). If LOW TRAC bulb is not okay, go to next step.

5) Replace LOW TRAC indicator bulb. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

6) Replace Instrument Panel Cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

### TEST G: PCS INDICATOR ALWAYS ON (INTRIGUE)

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Inspect EBCM ground, making sure ground is clean and tight. If problem was found, repair as necessary. After repairs, go to step 9). If problem was not found, go to next step.

3) Using scan tool, observe PCS WARNING INDICATOR parameter in ABS/TCS/PCS/VSES data list. If scan tool displays OFF, go to next step. If scan tool does not display OFF, go to step 5).

4) Turn ignition off. Turn ignition on, engine off. Observe PCS indicator during instrument cluster bulb check. If PCS indicator illuminates during bulb check, then turns off, go to next step. If PCS indicator does not illuminate during bulb check, then turns off, go to step 6).

5) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 9). If problem was not found, go to step 7).

6) Check instrument cluster connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 9). If problem was not found, go to step 8).

7) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 9).

8) Replace instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to next step.

9) Operate system to verify repair.

### TEST H: PCS INDICATOR INOPERATIVE (INTRIGUE)

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Inspect EBCM ground, making sure ground is clean and tight. If problem was found, repair as necessary. After repairs, go to step 9). If problem was not found, go to next step.

3) Using scan tool, observe PCS WARNING INDICATOR parameter in ABS/TCS/PCS/VSES data list. If scan tool displays OFF, go to next step. If scan tool does not display OFF, go to step 5).

4) Turn ignition off. Turn ignition on, engine off. Observe PCS indicator during instrument cluster bulb check. If PCS indicator illuminates during bulb check, then turns off, go to next step. If PCS indicator does not illuminate during bulb check, then turns off, go to step 6).

5) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 9). If problem was not found, go to step 7).

6) Check instrument cluster connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 9). If problem was not found, go to step 8).

7) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 9).

8) Replace instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article in ACCESSORIES & EQUIPMENT. After repairs, go to next step.

9) Operate system to verify repair.

## DIAGNOSTIC TESTS

NOTE: To identify circuits and wire colors referenced in testing, see WIRING DIAGRAMS. After repairs, recheck system operation to verify problem has been repaired. See DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. System testing requires the use of Universal Pinout Box (J-39700) and Adapter Cable (J-39700-530).

## DTC C0035, C0036, C0040, C0041, C0045, C0046, C0050 & C0051:

### WHEEL SPEED SENSOR CIRCUIT

#### Circuit Description

#### DTC definitions:

- \* DTC C0035 - Left front wheel speed circuit malfunction.
- \* DTC C0036 - Left front wheel speed circuit range/performance.
- \* DTC C0040 - Right front wheel speed circuit malfunction.
- \* DTC C0041 - Right front wheel speed circuit range/performance.
- \* DTC C0045 - Left rear wheel speed circuit malfunction.
- \* DTC C0046 - Left rear wheel speed circuit range/performance.
- \* DTC C0050 - Right rear wheel speed circuit malfunction.
- \* DTC C0051 - Right rear wheel speed circuit range/performance.

Speed sensor used on this vehicle is a multiple pole magnetic pickup. Sensor produces an AC signal that EBCM uses frequency from to calculate wheel speed.

DTC C0035, C0040, C0045 or C0050 sets when ignition is on and EBCM detects a short to voltage (wheel speed sensor signal circuit greater than 4.25 volts) or an open (wheel speed sensor signal circuit voltage is greater than 4.25 volts and wheel speed sensor return circuit voltage is less than 0.75 volt) for more than 0.02 second.

DTC C0036, C0041, C0046 or C0051 sets when all of the following conditions exists for 10 milliseconds:

- \* Suspect wheel speed equals zero.
- \* Other wheel speeds are greater than 25 MPH for 0.01 second.
- \* Suspect wheel equals zero during drive-off, and other wheels are greater than 7.5 MPH.
- \* Short to ground (wheel speed sensor signal circuit is shorted to ground).
- \* Deviation of two wheel speeds at either side of vehicle is greater than 4 MPH, or at front axle, greater than 6 MPH for a time period of 10 to 20 seconds.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Install scan tool. Turn ignition on. Set up scan tool snap shot feature to trigger for this DTC. Drive vehicle at a speed greater than 5 MPH. If DTC resets, go to next set. If DTC does not reset, see DIAGNOSTIC AIDS.

3) Raise and support vehicle. Disconnect wheel speed sensor connector. Measure resistance across wheel speed sensor. If resistance is 800-1600 ohms, go to next step. If resistance is not 800-1600 ohms, go to step 8).

4) Spin wheel. Measure AC voltage across wheel speed sensor. If AC voltage is greater than 100 millivolts, go to next step. If AC voltage is not greater than 100 millivolts, go to step 8).

5) Check wheel speed sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to next step.

6) Disconnect EBCM connector. Install Universal Pinout Box (J-39700) using Adapter Cable (J-39700-530) to EBCM harness connector only. Check wheel speed sensor circuits for open, short to ground, short to voltage or shorted together. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to next step.

7) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 10). If problem was not found, go to step 9).

8) Replace wheel speed sensor. See WHEEL SPEED SENSOR under REMOVAL & INSTALLATION. After repairs, go to step 10).

9) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

10) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

If ABS/TCS indicator illuminates only during moist conditions, inspect wheel speed sensor circuitry for signs of water intrusion. Clear DTCs and simulate effects of water intrusion using a saltwater solution. If DTC resets, replace suspect wiring harness.

Possible cause of DTCs C0036, C0041, C0046 and C0051 is electrical noise on wheel speed sensor harness wiring. Electrical noise could result from wheel speed sensor wires being routed too close to high energy ignition system components, such as spark plug wires.

### **DTC C0060, C0065, C0070, C0075, C0080, C0085, C0090 & C0095:**

#### SOLENOID CIRCUIT MALFUNCTION

##### Circuit Description

##### DTC definitions:

- \* DTC C0060 - Left front ABS solenoid No. 1 circuit malfunction
- \* DTC C0065 - Left front ABS solenoid No. 2 circuit malfunction
- \* DTC C0070 - Right front ABS solenoid No. 1 circuit malfunction
- \* DTC C0075 - Right front ABS solenoid No. 2 circuit malfunction
- \* DTC C0080 - Left rear ABS solenoid No. 1 circuit malfunction
- \* DTC C0085 - Left rear ABS solenoid No. 2 circuit malfunction
- \* DTC C0090 - Right rear ABS solenoid No. 1 circuit malfunction
- \* DTC C0095 - Right rear ABS solenoid No. 2 circuit malfunction

Inlet and outlet valve solenoid circuits are supplied with battery power when ignition is on. EBCM controls valve functions by grounding circuit when necessary.

DTC sets when EBCM detects open, short to ground or short to voltage in solenoid coil or circuit.

##### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, clear DTC. Remove scan tool from DLC. Carefully drive vehicle above 8 MPH for several minutes. Turn ignition

off. Install scan tool. Turn ignition on, engine off. Using scan tool in DIAGNOSTIC TROUBLE CODES, check for DTCs. If DTC resets as a current DTC, go to next step. If DTC does not reset as a current DTC, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING.

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

4) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Solenoid valve circuit and solenoid coil are internal to EBCM. No part of solenoid circuit is diagnosable external to EBCM. DTC sets when there is a malfunction in solenoid circuit internal to EBCM only.

### **DTC C0100 & C0105: REAR ABS SOLENOID NO. 1 OR NO. 2 CIRCUIT**

MALFUNCTION (CAMARO & FIREBIRD)

#### Circuit Description

Inlet and outlet valve solenoid circuits are supplied with battery power when ignition is on. EBCM controls valve functions by grounding circuit when necessary.

DTC sets when EBCM detects open, short to ground or short to voltage in solenoid coil or circuit.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, clear DTC. Remove scan tool from DLC. Carefully drive vehicle above 8 MPH for several minutes. Turn ignition off. Install scan tool. Turn ignition on, engine off. Using scan tool in DIAGNOSTIC TROUBLE CODES, check for DTCs. If DTC resets as a current DTC, go to next step. If DTC does not reset as a current DTC, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING.

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

4) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Solenoid valve circuit and solenoid coil are internal to EBCM. No part of solenoid circuit is diagnosable external to EBCM. DTC sets when there is a malfunction in solenoid circuit internal to EBCM only.

### **DTC C0110: PUMP MOTOR CIRCUIT MALFUNCTION**

#### Circuit Description

Pump motor is an integral part of BPMV, while pump motor relay is integral to EBCM. Pump motor relay is not engaged during normal system operation. When ABS or TCS operation is required, EBCM activates pump motor relay and battery power is provided to the pump motor.

DTC sets when pump motor voltage is not present 60 milliseconds after activation of pump motor relay, pump motor voltage is present for more than 2.5 seconds with no activation of pump motor relay or pump motor voltage is not present for 40 milliseconds after pump motor relay is commanded off.

#### Diagnosis

NOTE: Power supply to Red wire at EBCM connector terminal No. 13 varies with vehicle type. Applications are as follows: ABS BAT 1 fuse (40-amp) - Camaro and Firebird, fusible link - Grand Prix and Intrigue (federal emissions) or ABS MOTOR fuse (40-amp) - Intrigue (California emissions).

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Check both ground circuits of EBCM including EBCM ground for high resistance or open. Check battery voltage circuits for open, high resistance, or short to ground. If problem was found, repair as necessary. After repairs, go to step 8). If problem was not found, go to next step.

3) Disconnect pump motor harness pigtail connector of BPMV. Measure resistance between each pump motor control circuit and housing of BPMV at pump motor pigtail connector of BPMV. If resistance is less than 5 ohms, go to next step. If resistance is not less than 5 ohms, go to step 5).

4) Check BPMV connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 8). If problem was not found, go to step 6).

5) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 8). If problem was not found, go to step 7).

6) Replace BPMV. See BRAKE PRESSURE MODULATOR VALVE under REMOVAL & INSTALLATION. After repairs, go to step 8).

7) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

8) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### DTC C0121: VALVE RELAY CIRCUIT MALFUNCTION

#### Circuit Description

Solenoid valve relay supplies power to solenoid valve coils in EBCM. Solenoid valve relay, located in EBCM, is activated whenever ignition is on and no faults are present. Solenoid valve relay remains engaged until ignition is turned off or a failure is detected.

DTC sets anytime solenoid valve relay is commanded on and EBCM does not see battery voltage at solenoid valves or anytime EBCM commands solenoid valve relay off and battery voltage is still present at solenoid valves.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Install scan tool. Turn ignition on, engine off. Using scan tool, clear DTCs. If DTC resets, go to next step. If DTC does not reset, see DIAGNOSTIC AIDS.

3) Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector

only. Check battery voltage circuit (universal pinout box terminals No. 13 and 14) for open, high resistance, or short to ground. If problem was found, repair as necessary. After repair, go to step 5). If problem was not found, go to next step.

4) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

5) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation. Solenoid valve relay is an integral part of EBCM and is not serviced separately.

### DTC C0131: ABS/TCS SYSTEM PRESSURE CIRCUIT MALFUNCTION (INTRIGUE)

#### Circuit Description

EBCM uses input from brake pressure sensor for more accurate control during a Vehicle Stability Enhancement System (VSES) event.

DTC sets when voltage at pressure sensor signal output to EBCM falls outside 0.25 V - 4.75 volt range for more than 100 milliseconds. DTC C0870 must not be set and vehicle speed must be greater than 24 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is 0.25-4.75 volts, see DIAGNOSTIC AIDS. If voltage is not 0.25-4.75 volts, go to next step.

3) Turn ignition off. Disconnect brake pressure sensor. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is less than 2.5 volts, go to next step. If voltage is not less than 2.5 volts, go to step 9).

4) Turn ignition off. Connect fused jumper wire (3 amp) between Orange wire of the brake pressure sensor (signal circuit) and Gray wire (5-volt reference circuit) of brake pressure sensor. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is greater than 4.75 volts, go to next step. If voltage is not greater than 4.75 volts, go to step 6).

5) Turn ignition off. Disconnect fused jumper wire. Turn ignition on, engine off. Measure voltage between Gray wire (5-volt reference circuit) of brake pressure sensor and ground. If voltage is greater than 5.0 volts, go to step 7). If voltage is not greater than 5.0 volts, go to step 10).

6) Check Gray wire (5-volt reference circuit) of brake pressure sensor for short to ground. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 8).

7) Check Gray wire (5-volt reference circuit) of brake pressure sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go

to step 12).

8) Check Orange wire (signal circuit) of brake pressure sensor for short to ground, high resistance or open. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 12).

9) Check Orange wire (signal circuit) of brake pressure sensor for short to voltage, high resistance or open. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 12).

10) Check Gray/Black wire (ground circuit) of brake pressure sensor for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to next step.

11) Check brake pressure sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 13).

12) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 14).

13) Replace brake pressure sensor. See BRAKE PRESSURE SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After repairs, go to step 15).

14) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

15) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### DTC C0132: ABS/TCS SYSTEM PRESSURE CIRCUIT RANGE/PERFORMANCE (INTRIGUE)

#### Circuit Description

During calibration of offset of pressure sensor signal, pressure sensor signal offset value must be -217.5 to 217.5 psi (-5.29 to 5.29 kg/cm<sup>2</sup>). Pressure sensor is also monitored for sensitivity via a correlation between estimated vehicle deceleration and pressure sensor signal. This is monitored over the course of numerous straight line non ABS braking stops.

DTC sets when sensor signal offset value is out of range for more than one second with brake pedal applied, ABS pump is not on and vehicle speed is greater than 25 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is 0.25-4.75 volts, see DIAGNOSTIC AIDS. If voltage is not 0.25-4.75 volts, go to next step.

3) Turn ignition off. Disconnect brake pressure sensor. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is less than 0.25 volt, go to next step. If voltage

is not less than 0.25 volt, go to step 10).

4) Turn ignition off. Connect fused jumper wire (3 amp) between Gray wire (5-volt reference circuit) of the brake pressure sensor and signal circuit (Orange wire) of brake pressure sensor. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is greater than 0.25 volt, go to next step. If voltage is not greater than 0.25 volt, go to step 8).

5) Disconnect fused jumper wire. Measure voltage between Gray wire (5-volt reference circuit) of brake pressure sensor and Gray/Black wire (ground circuit) of brake pressure sensor. If voltage is less than 5 volts, go to next step. If voltage is not less than 5 volts, go to step 7).

6) Turn ignition off. Disconnect negative battery cable. Measure resistance of Gray/Black wire (ground circuit) between brake pressure sensor and ground. If resistance is 0-5 ohms, go to step 12). If resistance is not 0-5 ohms, go to step 11).

7) Check Gray wire (5-volt reference circuit) of brake pressure sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to step 13).

8) Check Gray wire (5-volt reference circuit) of brake pressure sensor for short to ground, high resistance, or open. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to next step.

9) Check Orange wire (signal circuit) of brake pressure sensor for short to ground, high resistance, or open. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to step 13).

10) Check Orange wire (signal circuit) of brake pressure sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to step 13).

11) Disconnect EBCM. Check Gray/Black wire (ground circuit) of brake pressure sensor for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to step 13).

12) Check brake pressure sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to step 14).

13) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 16). If problem was not found, go to step 15).

14) Replace brake pressure sensor. See BRAKE PRESSURE SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After repairs, go to step 16).

15) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

16) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Probable causes are malfunctioning pressure sensor or malfunctioning EBCM.

### DTC C0141, C0146, C0151 & C0156: TCS SOLENOID CIRCUIT MALFUNCTION (GRAND PRIX & INTRIGUE)

#### Circuit Description DTC definitions:

- \* DTC C0141 - Left TCS solenoid No. 1 circuit malfunction.
- \* DTC C0146 - Left TCS solenoid No. 2 circuit malfunction.

- \* DTC C0151 - Right TCS solenoid No. 1 circuit malfunction.
- \* DTC C0156 - Right TCS solenoid No. 2 circuit malfunction.

Isolation and prime valve solenoid circuits are supplied with battery power when ignition is on. EBCM controls valve functions by grounding circuit when necessary.

DTC sets when EBCM detects an open in solenoid coil or circuit, short to ground in solenoid coil or circuit or short to voltage in solenoid coil or circuit.

#### Diagnosis

- 1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.
- 2) Using scan tool, clear DTC. Remove scan tool from DLC. Carefully drive vehicle above 8 MPH for several minutes. Turn ignition off. Install scan tool. Turn ignition switch on, engine off. Using scan tool in DIAGNOSTIC TROUBLE CODES mode, check for DTCs. If DTC resets, go to next step. If DTC does not reset, see DIAGNOSTIC AIDS.
- 3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.
- 4) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Solenoid valve circuit and solenoid coil are internal to EBCM. No part of solenoid circuit is diagnosable external to EBCM. DTC sets when there is a malfunction in solenoid circuit internal to EBCM only.

### **DTC C0161: ABS/TCS BRAKE SWITCH CIRCUIT MALFUNCTION**

#### Circuit Description

Stoplight switch is a normally open switch, when brake pedal is depressed, EBCM will sense battery voltage. This allows EBCM to determine state of brake lights.

DTC sets when EBCM detects battery voltage at all times, EBCM never detects battery voltage from stoplight switch or both brake lights are faulty.

#### Diagnosis

- 1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.
- 2) Press brake pedal. Using scan tool, observe BRAKE SWITCH STATUS parameter in ABS data list. If BRAKE SWITCH STATUS parameter displays APPLIED, go to step 4). If BRAKE SWITCH STATUS parameter does not display APPLIED, go to next step.
- 3) Check signal circuit (Light Blue wire for Camaro and Firebird, or White wire for Grand Prix and Intrigue) of stoplight switch for open. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 11).
- 4) Press brake pedal. If all stoplights are off, go to next step. If all stoplights are not off, go to step 7).
- 5) Check feed circuit (Orange wire) of stoplights for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to next step.
- 6) Check ground circuit (Black wire) of stoplights for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, see DIAGNOSTIC AIDS.
- 7) Press brake pedal. Using scan tool, observe BRAKE SWITCH STATUS parameter. If BRAKE SWITCH STATUS parameter changes state, see

DIAGNOSTIC AIDS. If BRAKE SWITCH STATUS parameter does not change state, go to next step.

8) Turn ignition off. Inspect stoplight switch and adjust and/or calibrate if needed. See STOPLIGHT SWITCH under ADJUSTMENTS. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to next step.

9) Turn ignition off. Disconnect stoplight switch connector. Turn ignition on, engine off. Using scan tool, observe BRAKE SWITCH STATUS parameter. If scan tool displays RELEASED, go to step 11). If scan tool does not display RELEASED, go to next step.

10) Check stoplight signal circuit (Light Blue wire for Camaro and Firebird, or White wire for Grand Prix and Intrigue) for short to voltage. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 12).

11) Check stoplight switch connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 13).

12) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 15). If problem was not found, go to step 14).

13) Replace stoplight switch. See STOPLIGHT SWITCH under REMOVAL & INSTALLATION. After repairs, go to step 15).

14) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

15) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### DTC C0166 & C0171: TCS PRIMING LINE OF PILOT VALVE CIRCUIT

MALFUNCTION (CAMARO & FIREBIRD)

#### Circuit Description

Master cylinder isolation valve, or TCS prime solenoid circuits are supplied with battery power when ignition is on. EBCM controls valve functions by grounding circuit when necessary.

DTC sets when EBCM senses an open, short to ground, or short to voltage in circuit.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Using scan tool, clear DTC. Remove scan tool from DLC. Carefully drive vehicle above 8 MPH for several minutes. Turn ignition off. Install scan tool. Turn ignition switch on, engine off. Using scan tool in DIAGNOSTIC TROUBLE CODES mode, check for DTCs. If DTC resets, go to next step. If DTC does not reset, see DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

4) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

### DTC C0181: THROTTLE REDUCTION MOTOR CIRCUIT MALFUNCTION

(CAMARO & FIREBIRD)

### Circuit Description

Identifies an adjuster assembly motor circuit that is shorted to ground, shorted to voltage, or open circuit. This malfunction will not allow adjuster assembly motor to be controlled at commanded current rate or will cause driver circuit to allow current directly to ground.

DTC sets anytime EBCM detects an open, short to ground, or short to voltage with ignition on.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect accelerator control and adjuster connector. Disconnect all cables from accelerator control and adjuster. Rotate adjuster by hand fully, then release and allow to return to stop. Repeat this procedure three times. Zero leads on DVOM. Using DVOM, measure resistance between accelerator control and adjuster connector terminals "A" and "B". If resistance is 0.5-10 ohms, go to step 4). If resistance is not 0.5-10 ohms, go to next step.

3) Replace accelerator control and adjuster. See ADJUSTER ASSEMBLY (CAMARO & FIREBIRD) under REMOVAL & INSTALLATION. After repairs, go to step 19).

4) Disconnect Accelerator & Servo Module (ASM) connector. Using a DVOM, measure resistance between ASM connector terminals No. 22 (White wire) and No. 28 (Black/White wire). If resistance is infinite, go to step 6). If resistance is not infinite, go to next step.

5) Repair short to ground in White wire between accelerator control and adjuster and ASM. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

6) Using DVOM, measure resistance between ASM connector terminals No. 26 (Gray wire) and No. 28 (Black/White wire). If resistance is infinite, go to step 8). If resistance is not infinite, go to next step.

7) Repair short to ground in Gray wire between accelerator control and adjuster and ASM. After repairs, go to step 19).

8) Using DVOM, measure resistance between ASM harness connector terminal No. 22 (White wire) and accelerator adjuster connector terminal "A". If resistance is 0-5 ohms, go to step 10). If resistance is not 0-5 ohms, go to next step.

9) Repair open circuit in White wire between accelerator control and adjuster and ASM. After repairs, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

10) Using DVOM, measure resistance between ASM connector terminal No. 49 (White wire) and accelerator adjuster connector terminal "A". If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 9).

11) Using DVOM, measure resistance between ASM connector terminal No. 26 (Gray wire) and accelerator adjuster connector terminal "B". If resistance is 0-5 ohms, go to step 13). If resistance is not 0-5 ohms, go to next step.

12) Repair open circuit in Gray wire between accelerator control and adjuster and ASM. After repairs, go to step 19).

13) Using DVOM, measure resistance between ASM connector terminal No. 53 (Gray wire) and accelerator adjuster connector terminal "B". If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 12).

14) Turn ignition on, engine off. Using DVOM, measure voltage at ASM connector terminal No. 22 (White wire). If voltage is more than one volt, go to next step. If voltage is not more than one volt, go to step 16).

15) Repair short to voltage in White wire between accelerator control and adjuster and ASM. After repairs, go to step 19).

16) Using DVOM, measure voltage at ASM connector terminal No. 26 (Gray wire). If voltage is more than one volt, go to next step. If voltage is not more than one volt, go to step 18).

17) Repair short to voltage in Gray wire between accelerator control and adjuster and ASM. After repairs, go to step 19).

18) Replace ASM. See ACCELERATOR & SERVO CONTROL MODULE (CAMARO & FIREBIRD) under REMOVAL & INSTALLATION. After repairs, go to next step.

19) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### DTC C0182: THROTTLE REDUCTION MOTOR CIRCUIT RANGE/PERFORMANCE

(CAMARO & FIREBIRD)

#### Circuit Description

Throttle position signal is used by Accelerator & Servo Module (ASM) to control actual throttle position that is requested by EBCM. EBCM compares delivered throttle position sensor value that is sent from ASM to throttle position sensor value sent from PCM over Class 2 serial data line.

DTC sets if ASM delivers current greater than 18 amps to accelerator control and adjuster for more than three seconds without cable adjuster reaching its desired position.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Inspect accelerator control and adjuster cables/linkages for any problems that could cause binding or sticking. If any problems are found, go to next step. If no problems are found, go to step 4).

3) Repair as necessary. After repairs, go to step 7).

4) Check to see if DTC C0181 is also set as a current DTC. If DTC is also set, see DTC C0181: THROTTLE REDUCTION MOTOR CIRCUIT MALFUNCTION (CAMARO & FIREBIRD). If DTC is not set, go to next step.

5) Install scan tool and clear DTCs. Raise rear of vehicle so that rear wheels are at least 6 inches off of floor. Start engine. Using scan tool in TCS DATA LIST, monitor THROTTLE ANGLE. Depress brake pedal, put vehicle in gear, then release brake pedal. Depress and hold accelerator pedal between 15 degrees and 45 degrees for at least 4 seconds. If DTC resets, go to next step. If DTC does not reset, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

6) Replace accelerator control and adjuster assembly. See ADJUSTER ASSEMBLY (CAMARO & FIREBIRD) under REMOVAL & INSTALLATION. After repairs, go to next step.

7) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

If an intermittent malfunction exists, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING.

### DTC C0186: LATERAL ACCELEROMETER MALFUNCTION (INTRIGUE)

### Circuit Description

Vehicle Stability Enhancement System (VSES) uses lateral accelerometer input when calculating desired yaw rate. Usable output voltage range for lateral accelerometer is 0.25-4.75 volts. Lateral accelerometer sensor bias compensates for sensor mounting alignment errors and electronic signal errors.

DTC sets when voltage at lateral accelerometer signal output to EBCM falls outside 0.25-4.75 volts for more than 100 milliseconds. Vehicle speed must be greater than 25 MPH.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 10 (Light Blue wire) and No. 15 (Black/White wire). If voltage is 0.25-4.75 volts, see DIAGNOSTIC AIDS. If voltage is not 0.25-4.75 volts, go to next step.

3) Turn ignition off. Disconnect yaw/lateral accelerometer sensor. Turn ignition on, engine off. Using DVOM, measure voltage between ignition (Pink wire) and ground (Gray/Black wire) circuits of yaw/lateral accelerometer sensor. If battery voltage is present, go to step 5). If battery voltage is not present, go to next step.

4) Check Pink wire between yaw/lateral accelerometer sensor and underhood accessory wiring junction block for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, see POWER DISTRIBUTION article in WIRING DIAGRAMS.

5) Reconnect yaw/lateral accelerometer sensor. Using DVOM, measure voltage between universal pinout box terminals No. 10 (Light Blue wire) and No. 15 (Black/White wire). If voltage is less than 4.75 volts, go to next step. If voltage is not less than 4.75 volts, go to step 13).

6) Using DVOM, measure voltage between universal pinout box terminals No. 10 (Light Blue wire) and No. 15 (Black/White wire). If voltage is greater than 0.25 volt, go to next step. If voltage is not greater than 0.25 volt, go to step 12).

7) Using DVOM, measure voltage between universal pinout box terminals No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage is less than 2 volts, go to step 11). If voltage is not less than 2 volts, go to next step.

8) Using DVOM, measure voltage between universal pinout box terminals No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage is greater than 3 volts, go to step 10). If voltage is not greater than 3 volts, go to next step.

9) Turn ignition off. Disconnect negative battery cable. Measure resistance between Gray/Black wire of yaw/lateral accelerometer connector and ground. If resistance is 0-5 ohms, go to step 16). If resistance is not 0-5 ohms, go to step 14).

10) Check Orange wire (5-volt reference circuit) of yaw/lateral accelerometer sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 15).

11) Check Orange wire (5-volt reference circuit) of yaw/lateral accelerometer sensor for short to ground, high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to next step.

12) Check Light Blue wire (lateral accelerometer signal circuit) of yaw/lateral accelerometer sensor for short to ground, high

resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 15).

13) Check Light Blue wire (lateral accelerometer signal circuit) of yaw/lateral accelerometer sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 15).

14) Disconnect EBCM. Check Gray/Black wire (ground circuit) of yaw/lateral accelerometer sensor for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to next step.

15) Check yaw/lateral accelerometer sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 17).

16) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 18).

17) Replace yaw/lateral accelerometer sensor. See YAW/LATERAL ACCELEROMETER SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After repairs, go to step 19).

18) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

19) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### **DTC C0187: LATERAL ACCELEROMETER CIRCUIT RANGE/PERFORMANCE (INTRIGUE)**

#### Circuit Description

Vehicle Stability Enhancement System (VSES) uses lateral accelerometer input when calculating desired yaw rate. Usable output voltage range for lateral accelerometer 0.25-4.75 volts. Scan tool will report zero lateral acceleration as 2.5 volts with no sensor bias present. Lateral accelerometer sensor bias compensates for sensor mounting alignment errors and electronic signal errors.

DTC sets when one of the following exists:

- \* A reference lateral acceleration from data of yaw rate sensor, wheel speed sensors, and steering angle sensor is used to test lateral accelerometer signal. If during stable driving conditions, lateral accelerometer signal becomes larger than 0.26 g, EBCM controller will disregard signal so that a false EBCM intervention is prevented. A malfunction is detected if this condition continues for more than two seconds.
- \* Under normal driving conditions, long time filtered driving direction is straight ahead. Long time filtered lateral accelerometer value is called offset. If offset value is higher than 0.23 g, a malfunction is detected. Malfunction time depends on driving distance, vehicle speed and the amount of malfunctioning lateral accelerometer signal.
- \* Lateral accelerometer signal is limited to an electrical stop of 1.8 g. If lateral accelerometer signal is greater than 1.5 g for more than 500 milliseconds, a malfunction

is detected.

- \* At a standstill, range of lateral accelerometer signal is less than 0.7 g. If lateral accelerometer signal is greater than 0.7 g at standstill, a malfunction is detected.
- \* Lateral accelerometer signal cannot change rapidly under normal driving conditions. If lateral accelerometer signal is changing faster than 55 g per second, a malfunction is detected.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

Go to next step.

2) Perform STEERING ANGLE SENSOR CENTERING procedure under PROGRAMMING. If centering procedure was completed successfully, go to next step. If centering procedure was not completed successfully, go to step 7).

3) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 10 (Light Blue wire) and No. 15 (Black/White wire). If voltage is 2.3-2.7 volts, go to next step. If voltage is not 2.3-2.7 volts, go to step 8).

4) Using DVOM, measure voltage between universal pinout box terminals No. 26 (Dark Blue wire) and No. 15 (Black/White wire). If voltage is 2.3-2.7 volts, go to next step. If voltage is not 2.3-2.7 volts, go to step 8).

5) Using scan tool, clear DTCs. Perform DIAGNOSTIC TEST DRIVE. If DTC resets, go to next step. If DTC does not reset, see DIAGNOSTIC AIDS.

6) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 9).

7) Replace steering angle sensor. See appropriate STEERING COLUMNS article in STEERING. After repairs, go to step 9).

8) Replace yaw/lateral accelerometer sensor. See YAW/LATERAL ACCELEROMETER SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After repairs, go to next step.

9) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Find out from customer under what condition DTC was set. This information will help to duplicate failure. Check vehicle for proper alignment. Car should not pull in either direction while driving straight on a level surface. During diagnosis, park vehicle on a level surface. Check for malfunctioning EBCM and lateral accelerometer. Snapshot function on scan tool can help find an intermittent DTC.

#### Diagnostic Test Drive

When servicing vehicles with Vehicle Stability Enhancement System (VSES), test drives will be necessary to allow all tests to be run, and all system functions to be enabled and exercised. A test drive may also be required to duplicate specific DTCs covered in this section. Diagnostic system check (including test drive) should be run when vehicle repairs are complete in order to verify repair. Diagnostic test drive will vary for ABS/TCS or VSES problems. The following is a suggested VSES diagnostic test drive.

- 1) Read diagnostic aids and circuit description.
- 2) Reconnect any previously disconnected components.
- 3) Start engine.
- 4) Drive vehicle under following conditions for at least 10

minutes.

- \* Highway driving.
- \* Rough roads.
- \* Perform turning maneuvers (curved freeway entrance ramp, parking lot maneuvers) and high steering angles and yaw rates at low speeds.
- \* Verify customer's concern and duplicate driving conditions.
- \* With engine still running, use scan tool and check for any DTCs.

## DTC C0196: YAW RATE CIRCUIT MALFUNCTION (INTRIGUE)

### Circuit Description

Vehicle Stability Enhancement System (VSES) is activated by EBCM calculating desired yaw rate and comparing it to actual yaw rate input. Desired yaw rate is calculated from measured steering wheel position, vehicle speed, and lateral acceleration. Difference between desired yaw rate and actual yaw rate is yaw rate error, which is a measurement of oversteer or understeer. If yaw rate error becomes too large, EBCM will attempt to correct vehicle's yaw motion by applying differential braking to wheels. To correct for oversteer, differential braking is used on left front or right front wheel brake. To correct for understeer, differential braking is used on left rear or right rear wheel brake.

DTC sets when yaw rate sensor signal input voltage is less than 0.23 volt or greater than 4.78 volts for more than 100 milliseconds.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 26 (Dark Blue wire) and No. 15 (Black/White wire). If voltage is 0.23-4.78 volts, see DIAGNOSTIC AIDS. If voltage is not 0.23-4.78 volts, go to next step.

3) Turn ignition off. Disconnect yaw/lateral accelerometer sensor. Turn ignition on, engine off. Using DVOM, measure voltage between ignition (Pink wire) and ground (Gray/Black wire) circuits of yaw/lateral accelerometer sensor. If battery voltage is present, go to step 5). If battery voltage is not present, go to next step.

4) Check Pink wire between yaw/lateral accelerometer sensor and underhood accessory wiring junction block for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, see POWER DISTRIBUTION article in WIRING DIAGRAMS.

5) Reconnect yaw/lateral accelerometer sensor. Using DVOM, measure voltage between universal pinout box terminals No. 26 (Dark Blue wire) and No. 15 (Black/White wire). If voltage is less than 4.78 volts, go to next step. If voltage is not less than 4.78 volts, go to step 13).

6) Using DVOM, measure voltage between universal pinout box terminals No. 26 (Dark Blue wire) and No. 15 (Black/White wire). If voltage is greater than 0.23 volt, go to next step. If voltage is not greater than 0.23 volt, go to step 12).

7) Using DVOM, measure voltage between universal pinout box terminals No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage is less than 2 volts, go to step 11). If voltage is not less than 2 volts, go to next step.

8) Using DVOM, measure voltage between universal pinout box

terminals No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage is greater than 3 volts, go to step 10). If voltage is not greater than 3 volts, go to next step.

9) Turn ignition off. Disconnect negative battery cable. Measure resistance between Gray/Black wire of yaw/lateral accelerometer connector and ground. If resistance is 0-5 ohms, go to step 16). If resistance is not 0-5 ohms, go to step 14).

10) Check Orange wire (5-volt reference circuit) of yaw/lateral accelerometer sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 15).

11) Check Orange wire (5-volt reference circuit) of yaw/lateral accelerometer sensor for short to ground, high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to next step.

12) Check Dark Blue wire (yaw rate signal circuit) of yaw/lateral accelerometer sensor for short to ground, high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 15).

13) Check Dark Blue wire (yaw rate signal circuit) of yaw/lateral accelerometer sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 15).

14) Disconnect EBCM. Check Gray/Black wire (ground circuit) of yaw/lateral accelerometer sensor for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to next step.

15) Check yaw/lateral accelerometer sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 17).

16) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 19). If problem was not found, go to step 18).

17) Replace yaw/lateral accelerometer sensor. See YAW/LATERAL ACCELEROMETER SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After repairs, go to step 19).

18) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

19) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Following conditions may cause a malfunction:

- \* Open in yaw rate signal circuit.
- \* Short to ground in yaw rate signal circuit.
- \* Short to voltage in yaw rate signal circuit.
- \* Open in yaw rate ground circuit.
- \* Open in ignition voltage circuit.
- \* Malfunctioning vehicle yaw/lateral accelerometer sensor.
- \* Malfunctioning EBCM.

### DTC C0197: YAW RATE CIRCUIT RANGE/PERFORMANCE (INTRIGUE)

#### Circuit Description

EBCM triggers a yaw rate sensor test every 40 milliseconds and switches sensor into test mode. EBCM sends a test signal to sensor via test circuit. When test is run, measured yaw rate from sensor to EBCM must be 18-32 degrees per second. At standstill, the vehicle yaw rate is zero. Yaw rate signal at standstill is called offset. If calibration at standstill is not possible, a quick calibration during driving is done. Measured yaw rate is calibrated to a calculated reference yaw rate signal. Yaw rate sensor sensitivity is estimated by

comparison of reference yaw rate and measured yaw rate during cornering. Steering angle centering is process by which EBCM calibrates steering sensor output so output reads zero when steering wheel is centered. PCS steering angle sensor centering process is performed manually.

DTC sets if one or more of the following conditions exist:

- \* Yaw rate sensor signal is out of range for 220-420 milliseconds.
- \* Yaw rate sensor signal at standstill, which is called offset, is outside allowed range of -8 to 8 degrees per second.
- \* Sensor sensitivity, which is estimated by comparing reference yaw rate and measured yaw rate during cornering, is outside a predetermined range.
- \* Yaw rate is changing at a rate greater than 6-23 degrees per second in 40 milliseconds.

Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

Go to next step.

2) Perform STEERING ANGLE SENSOR CENTERING procedure under PROGRAMMING. If centering procedure was completed successfully, go to next step. If centering procedure was not completed successfully, go to step 7).

3) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 10 and No. 15 (Black/White wire). If voltage is 2.3-2.7 volts, go to next step. If voltage is not 2.3-2.7 volts, go to step 8).

4) Using DVOM, measure voltage between universal pinout box terminals No. 26 (Dark Blue wire) and No. 15 (Black/White wire). If voltage is 2.3-2.7 volts, go to next step. If voltage is not 2.3-2.7 volts, go to step 8).

5) Using scan tool, clear DTCs. Perform DIAGNOSTIC TEST DRIVE under DTC C0187: LATERAL ACCELEROMETER CIRCUIT RANGE/PERFORMANCE (INTRIGUE). If DTC resets, go to next step. If DTC does not reset, see DIAGNOSTIC AIDS.

6) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 9).

7) Replace steering angle sensor. See appropriate STEERING COLUMNS article in STERLING. After repairs, go to step 9).

8) Replace yaw/lateral accelerometer sensor. See YAW/LATERAL ACCELEROMETER SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After repairs, go to next step.

9) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

Diagnostic Aids

Possible causes are a malfunctioning lateral accelerometer or a malfunctioning EBCM.

## DTC C0235-C0237 & P1504: TCS RPM SIGNAL CIRCUIT MALFUNCTION

Circuit Description

RPM signal circuit provides EBCM with an indication of engine RPM to help determine TCS control methods and rates when a TCS event takes place.

DTC sets when EBCM does not receive an RPM input signal after one second, after engine has been started.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

Go to next step.

2) Start engine. Vary engine RPM with throttle while observing tachometer on instrument cluster. If tachometer operates properly as engine RPM changes, go to next step. If tachometer does not operate properly as engine RPM changes, go to step 9).

3) Turn ignition off. Disconnect Powertrain Control Module (PCM) connector C2. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-530) to EBCM harness connector only. Using DVOM, measure resistance between PCM connector C2 terminal No. 8 (White wire) on Camaro and Firebird 3.8L, Grand Prix and Intrigue, or terminal No. 10 on Camaro and Firebird 5.7L, and universal pinout box terminal No. 11 (White wire) on Camaro, Firebird and Grand Prix, or terminal No. 7 (White wire) on Intrigue. If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 10).

4) Using DVOM, measure resistance between universal pinout box terminals No. 11 (White wire) on Camaro, Firebird and Grand Prix or terminal No. 7 (White wire) on Intrigue and No. 15 (Black wire on Camaro and Firebird, or Black/White wire on Grand Prix and Intrigue). If resistance is infinite, go to next step. If resistance is not infinite, go to step 11).

5) Turn ignition on. Using DVOM, measure voltage between universal pinout box terminals No. 11 (White wire) on Camaro, Firebird and Grand Prix, or terminal No. 7 (White wire) on Intrigue, and No. 15 (Black/White wire). If voltage is 0-2 volts, go to next step. If voltage is not 0-2 volts, go to step 12).

6) Check PCM connector C2 and EBCM connector for damage, poor terminal contact and corrosion. If connectors are faulty, go to step 13). If connectors are okay, go to next step.

7) Reconnect all connectors. Using scan tool, clear DTCs. Remove scan tool. Start engine. If DTC resets, go to next step. If DTC does not reset, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

8) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 14).

9) Diagnose PCM. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. After repairs, go to step 14).

10) Repair open in White wire between PCM and EBCM. After repairs, go to step 14).

11) Repair short to ground in White wire between PCM and EBCM. After repairs, go to step 14).

12) Repair short to voltage in White wire between PCM and EBCM. After repairs, go to step 14).

13) Replace all damaged or corroded terminals and connectors, or any terminals and connectors with poor terminal contact. After repairs, go to next step.

14) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### **DTC C0238: TCS THROTTLE POSITION SENSOR COMPARISON MALFUNCTION (CAMARO & FIREBIRD)**

#### Circuit Description

Throttle position signal is used by Accelerator and Servo control Module (ASM) to control actual throttle position requested by EBCM. EBCM compares delivered throttle position sensor value that is sent from ASM to throttle position sensor value sent from PCM over Class 2 serial data line.

DTC sets when EBCM detects a difference between PCM throttle position and throttle position sent from ASM.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Check to see if any PCM Throttle Position Sensor (TPS) DTCs are set. If DTCs are set, see appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE.

3) Install scan tool and clear DTCs. Turn ignition off. Disconnect scan tool. Turn ignition on, with engine off. If DTC resets, go to next step. If DTC does not reset, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

4) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

5) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent malfunction may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### **DTC C0239: TCS SPARK RETARD MONITORING MALFUNCTION (CAMARO & FIREBIRD)**

#### Circuit Description

Spark Retard is simultaneously controlled by EBCM and PCM. PCM supplies a 12-volt pull-up voltage. This voltage is monitored by PCM, EBCM requests spark retard by pulling voltage low.

DTC sets when EBCM senses short to ground, short to battery voltage or open in Gray/White wire between PCM and EBCM.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminal No. 19 (Gray/Black wire) and ground. If voltage is greater than 10 volts, go to next step. If voltage is not greater than 10 volts, go to step 6).

3) Turn ignition off. Disconnect PCM connector C2. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminal No. 19 (Gray/Black wire) and ground. If voltage is greater than one volt, go to next step. If voltage is less than one volt, go to step 5).

4) Repair short to voltage in Gray/Black wire between PCM and EBCM. After repairs, go to step 11).

5) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to step 11).

6) Turn ignition off. Disconnect PCM connector C2. Using DVOM, measure resistance between universal pinout box terminals No. 15

(Black wire) and No. 19 (Gray/Black wire). If resistance is infinite, go to step 8). If resistance is not infinite, go to next step.

7) Repair short to ground in Gray/White wire between PCM and EBCM. After repairs, go to step 11).

8) Using DVOM, measure resistance between universal pinout box terminal No. 19 (Gray/Black wire) and PCM connector C2 terminal No. 53. If resistance is 0-5 ohms, go to step 10). If resistance is not 0-5 ohms, go to next step.

9) Repair open in Gray/White wire between PCM and EBCM. After repairs, go to step 11).

10) Diagnose PCM. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. After repairs, go to next step.

11) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### DTC C0240: PCM TRACTION CONTROL NOT ALLOWED

#### Circuit Description

PCM monitors various parameters and will not allow traction control operation if any parameter falls below a specified value.

DTC sets when PCM detects a malfunction and then causes TCS shut down until malfunction has been corrected.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition on, engine off. Using scan tool, read any ABS/TCS DTCs. If any DTCs are set, go to appropriate DTC for diagnosis. If no other DTCs are set, go to next step.

3) If DTC C0240 is set as a current code, go to step 5). If DTC C0240 is not set, go to next step.

4) Install scan tool and clear DTC. Remove scan tool. Carefully drive vehicle at speed greater than 8 MPH for several minutes. If DTC C0240 is set as a current code, go to next step. If DTC C0240 is not set, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

5) Perform powertrain OBD system check. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. If vehicle passes OBD system check, go to next step. If vehicle did not pass OBD system check, perform tests recommended in self-diagnostics article.

6) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

This code is primarily for information only. As an aid to technician, if DTC C0240 is a history code, this indicates that there are no problems in ABS/TCS system. If DTC C0240 is a current code, PCM has detected a malfunction that would not allow traction control to function, or there may be a suspect PCM.

### DTC C0241 OR P1571: PCM INDICATED REQUESTED TORQUE MALFUNCTION

#### Circuit Description

EBCM and PCM simultaneously control traction control. EBCM sends a requested torque message via a Pulse Width Modulated (PWM) signal to PCM. Duty cycle of signal is used to determine how much engine torque EBCM is requesting PCM to deliver. Normal values are 10-90 percent duty cycle. Signal should be at 90 percent when traction control is not active and at lower values during traction control activations. PCM supplies pull up voltage that EBCM switches to ground to create signal.

If a defective requested torque signal is detected by PCM, a message is broadcasted back to EBCM via class 2 data line. DTC sets anytime ignition voltage is present and PCM detects requested torque PWM signal is less than 5 percent duty cycle or greater than 95 percent duty cycle or requested torque PWM signal is not present for 10 seconds.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Check Powertrain Control Module (PCM) and EBCM grounds for damaged, loose or corroded connections. See GROUND DISTRIBUTION article in WIRING DIAGRAMS. If problem was found, repair as necessary. After repairs, go to step 13). If problem was not found, go to next step.

3) Install scan tool. Start engine. Using scan tool, observe TORQUE REQUEST SIGNAL parameter in POWERTRAIN CONTROL MODULE data list. If scan tool displays less than 100%, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING. If scan tool does not display less than 100%, go to next step.

4) Turn ignition off. Disconnect EBCM harness connector. Install Universal Breakout Box (J 39700) using (J 39700-530) Cable Adapter to EBCM harness connector and EBCM connector. Start engine. Measure DC duty cycle between universal pinout box terminal No. 27 (Orange wire) and ground. If duty cycle is 5-95 percent, go to next step. If duty cycle is not 5-95 percent, go to step 6).

5) Measure DC Hz between universal pinout box terminal No. 27 (Orange wire) and ground. If frequency is 121-134 hertz, go to step 8). If frequency is not 121-134, go to next step.

NOTE: Disconnecting EBCM connector and turning ignition on could cause other modules to set loss of communication DTCs (Uxxxx). Once EBCM is reconnected, EBCM may set DTC C0241.

6) Turn ignition off. Disconnect cable adapter from EBCM. Turn ignition on, engine off. Measure voltage between universal pinout box terminal No. 27 (Orange wire) and ground. If voltage is 4-6 volts, go to step 10). If voltage is not 4-6 volts, go to next step.

7) Turn ignition off. Disconnect PCM connector. Check Orange wire between EBCM and PCM for short to voltage or short to ground. If problem was found, repair as necessary. After repairs, go to step 13). If problem was not found, go to step 10).

8) Turn ignition off. Disconnect PCM harness connector. Check Orange wire between EBCM and PCM for open or high resistance. If problem was found, repair as necessary. After repairs, go to step 13). If problem was not found, go to next step.

9) Check PCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 13). If problem was not found, go to step 11).

10) Check EBCM connector for poor connections. If problem is found, repair as necessary. If problem is not found, go to step 12).

11) Replace PCM. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. After repairs, go to step 13).

12) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under

REMOVAL & INSTALLATION. After repairs, go to next step.

13) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

## DTC C0244 OR P1689: PWM DELIVERED TORQUE MALFUNCTION

### Circuit Description

Traction control is simultaneously controlled by EBCM and PCM. PCM sends a delivered torque message via a Pulse Width Modulated (PWM) signal to EBCM confirming delivered torque level for proper traction control system operation. EBCM supplies pull up voltage.

DTC sets when ignition voltage is present and PWM signal is out of range or no signal is received for a period of 2 seconds.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Check PCM and EBCM grounds for damaged, loose or corroded connections. See GROUND DISTRIBUTION article in WIRING DIAGRAMS. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

3) Install scan tool. Select display DTC function on scan tool for PCM. If scan tool displays DTC P1571, see DTC C0241 OR P1571: PCM INDICATED REQUESTED TORQUE MALFUNCTION. If scan tool does not display DTC P1571, go to next step.

4) Start engine. Using scan tool, observe PCM-to-EBCM DELIVERED parameter in PCM data list. If scan tool displays 90 percent, go to next step. If scan tool does not display 90 percent, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING.

5) Turn ignition off. Disconnect PCM connector C2. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector and EBCM. Turn ignition on, with engine off. Using DVOM, measure voltage between universal pinout box terminals No. 9 (Tan/Black wire) and No. 15 (Black wire for Camaro and Firebird, or Black/White wire for Grand Prix and Intrigue). If voltage is equal to battery voltage, go to next step. If voltage is not equal to battery voltage, go to step 7).

6) Turn ignition off. Disconnect cable adapter from EBCM. Turn ignition on, engine off. Check delivered torque signal circuit for short to voltage. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 8).

7) Turn ignition off. Disconnect cable adapter from EBCM connector. Check delivered torque signal circuit for open, short to ground or high resistance. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 9).

8) Check PCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 10).

9) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 11).

10) Replace PCM. See appropriate SELF-DIAGNOSTICS article in ENGINE PERFORMANCE. After repairs, go to step 12).

11) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

12) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper

mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

The following are possible causes of DTC:

- \* Open in delivered torque circuit.
- \* Short to ground or voltage in delivered torque circuit.
- \* Communication frequency problem.
- \* Communication duty cycle problem.
- \* Wiring problem, terminal corrosion, or poor connections in delivered torque circuit.
- \* EBCM not receiving information from PCM.

## DTC C0245: WHEEL SPEED SENSOR FREQUENCY ERROR

### Circuit Description

Speed sensor used on this vehicle is a multiple pole magnetic pickup. This sensor produces an AC signal that EBCM uses frequency from to calculate wheel speed.

NOTE: Camaro and Firebird use a single rear wheel speed sensor with 3.8L engine.

DTC sets when one of the following occurs:

- \* EBCM detects a deviation between left and right rear wheel speeds of greater than 3.75 MPH at a vehicle speed of less than 62 MPH.
- \* EBCM detects a deviation between left and right front wheel speeds of greater than 6.25 MPH at a vehicle speed of less than 62 MPH.
- \* EBCM detects a deviation between left and right rear wheel speeds of greater than 6 percent of vehicle speed at greater than 62 MPH.
- \* EBCM detects a deviation between left and right front wheel speeds of greater than 2.5 MPH plus 6 percent of vehicle speed at greater than 62 MPH.

This DTC will set when EBCM cannot specifically identify which wheel speed sensor is causing malfunction. If EBCM can identify a specific wheel speed sensor causing malfunction, DTC associated with sensor (DTC C0036, DTC C0041, DTC C0046, or DTC C0051) will be set.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) If DTC C0036, C0041, C0046, C0051 or C0056 is set concurrently with a history DTC C0245, see DIAGNOSTIC TROUBLE CODE DEFINITIONS table under DIAGNOSIS & TESTING for diagnosis. If DTC C0036, C0041, C0046, C0051 or C0056 is not set concurrently with DTC C0245, go to next step.

3) Check wheel speed sensors and sensor rings for damage. If sensors or rings are damaged, go to next step. If sensors and rings are okay, go to step 5).

4) Replace wheel speed sensor or sensor ring. After repairs, go to step 14).

5) Check wheel speed sensor wiring for physical damage. If wiring is damaged, go to next step. If wiring is not damaged, go to step 7).

6) Repair wiring as necessary. After repairs, go to step 14).

7) Check for proper routing of wheel speed sensor wiring

harnesses. Ensure harnesses are routed away from spark plug wires. If harnesses are properly routed, go to step 9). If harnesses are not properly routed, go to next step.

8) Reroute wheel speed sensor wiring harnesses away from spark plug wires. After repairs, go to step 14).

9) Install scan tool. Turn ignition on. Set scan tool to SNAPSHOT AUTO TRIGGER MODE and monitor wheel speed sensors. Drive vehicle faster than 8 MPH for several minutes. If scan tool triggers on any wheel speed sensor, go to next step. If scan tool does not trigger on any wheel speed sensor, go to step 11).

10) Note which wheel speed sensor triggered scan tool. Diagnose DTC for sensor that triggered scan tool. After repairs, go to step 14).

11) Reconnect all previously disconnected components. Using scan tool, clear DTCs. Remove scan tool. Drive vehicle faster than 8 MPH for several minutes. If DTC resets, go to step 13). If DTC does not reset, go to next step.

12) Malfunction is intermittent. Inspect all connectors and wiring harnesses for damage resulting in an open or high resistance when connected. See INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING. After repairs, go to step 14).

13) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

14) Reconnect all previously disconnected components. Using scan tool, clear DTCs. Remove scan tool. Drive vehicle faster than 8 MPH for several minutes. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

If ABS/TCS indicator illuminates only during moist conditions, inspect wheel speed sensor circuitry for signs of water intrusion. Clear DTCs and simulate effects of water intrusion using a saltwater solution. If DTC resets, replace suspect wiring harness.

The following are possible causes of DTC:

- \* Damaged or missing teeth on one or more wheel speed sensor rings.
- \* Large grooves or gouges, or foreign material buildup in gaps between wheel speed sensor ring teeth.
- \* Worn front hub bearing assembly, or inner axle bearing which could allow sensor-to-toothed ring gap to change excessively.

### **DTC C0252: ACTIVE BRAKE CONTROL SENSORS UNCORRELATED (INTRIGUE)**

#### Circuit Description

Vehicle Stability Enhancement System (VSES) is activated by EBCM calculating desired yaw rate and comparing it to actual yaw rate input. The desired yaw rate is calculated from measured steering wheel position, vehicle speed, and lateral acceleration. Difference between desired yaw rate and actual yaw rate is yaw rate error, which is a measurement of oversteer or understeer. If yaw rate error becomes too large, EBCM will attempt to correct vehicle's yaw motion by applying differential braking to left or right wheels.

DTC sets when VSES is engaged for 10 seconds with yaw rate error always in either understeer or oversteer (under this condition, this DTC will set by itself) or yaw rate error is greater than 10 degrees/second for 5 seconds. Steer angle must have been centered, VSES is active, direction (understeer or oversteer) of yaw rate error has not changed and lateral acceleration is less than 0.5 g.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Install scan tool. Turn ignition on, engine off. Select ABS DTC display function. If scan tool displays any DTC other than DTC C0252, see DIAGNOSTIC TROUBLE CODE DEFINITIONS table under DIAGNOSIS & TESTING for diagnosis. If scan tool does not display any other DTCs, go to next step.

3) Using scan tool, clear DTCs. Perform DIAGNOSTIC TEST DRIVE. Using scan tool, select ABS DTC display function. If DTC resets, go to next step. If DTC does not reset, see DIAGNOSTIC AIDS.

4) Using scan tool, select VSES data list. Compare data to typical values located in VSES SCAN TOOL DATA LIST table. See VSES SCAN TOOL DATA LIST table. If all parameters are correct, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING. If all parameters are not correct, go to next step.

5) Check wiring harness connectors for the following: EBCM, brake pressure sensor, steering angle sensor, yaw/lateral accelerometer sensor, left front wheel speed sensor, right front wheel speed sensor, left rear wheel speed sensor and right rear wheel speed sensor. If problem was found, repair as necessary. After repairs, go to next step. If problem was not found, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING.

6) Reconnect previously disconnected components and connectors. Using scan tool, clear DTCs. If DTC does not reset, system is okay.

#### VSES SCAN TOOL DATA LIST

Scan Tool Parameter	Units	Typical Data Value
BPMV Pressure Sensor	PSI	Varies
Lateral Acceleration Sensor	g	0
Left Front Wheel Speed	MPH	0
Left Rear Wheel Speed	MPH	0
Right Front Wheel Speed	MPH	0
Right Rear Wheel Speed	MPH	0
VSES Active	Yes/No	No
VSES Auto Learn Complete	Yes/No	No
VSES Failed	Yes/No	No
VSES Malfunction	Set/Not Set	Not Set
VSES Steering Angle Sensor	Deg.	Varies
Yaw Rate Sensor	Deg./Sec.	0

#### Diagnostic Aids

During diagnosis, park vehicle on a level surface. Check vehicle for proper alignment. Car should not pull in either direction while driving straight on a level surface. Find out from customer the conditions under which DTC was set. This information will help to duplicate failure. Snapshot function on scan tool can help find an intermittent DTC.

#### Diagnostic Test Drive

When servicing vehicles with Vehicle Stability Enhancement System (VSES), test drives will be necessary to allow all tests to be

run, and all system functions to be enabled and exercised. A test drive may also be required to duplicate specific DTCs covered in this section. Diagnostic system check (including test drive) should be run when vehicle repairs are complete in order to verify repair. Diagnostic test drive will vary for ABS/TCS or VSES problems. The following is a suggested VSES diagnostic test drive.

- 1) Read diagnostic aids and circuit description.
- 2) Reconnect any previously disconnected components.
- 3) Start engine.
- 4) Drive vehicle under following conditions for at least 10

minutes.

- \* Highway driving.
- \* Rough roads.
- \* Perform turning maneuvers (curved freeway entrance ramp, parking lot maneuvers) and high steering angles and yaw rates at low speeds.
- \* Verify customer's concern and duplicate driving conditions.
- \* With engine still running, use scan tool and check for any DTCs.

### **DTC C0253: CENTERING FAULT (INTRIGUE)**

#### Circuit Description

Steer angle centering is the process by which EBCM calibrates steering sensor output so output reads zero when steering wheel is centered.

DTC sets if steering angle sensor Controller Area Network (CAN) message or EBCM indicates an uncentered sensor and vehicle speed is greater than 25 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Install scan tool. Turn ignition on, engine off. Select ABS DTC display function. If scan tool displays any DTC other than DTC C0253, see DIAGNOSTIC TROUBLE CODE DEFINITIONS table under DIAGNOSIS & TESTING for diagnosis. If scan tool does not display any other DTCs, go to next step.

3) Perform steering angle sensor centering procedure. See STEERING ANGLE SENSOR CENTERING under PROGRAMMING. If centering procedure was successfully completed, go to next step. If centering procedure was not successfully completed, go to step 5).

4) Using scan tool, clear DTCs. Test drive vehicle. See DIAGNOSTIC TEST DRIVE under DTC C0252: ACTIVE BRAKE CONTROL SENSORS UNCORRELATED (INTRIGUE). If DTC resets, go to step 6). If DTC does not reset, see DIAGNOSTIC AIDS.

5) Replace steering angle sensor. See appropriate STEERING COLUMNS article in STEERING. After repairs, go to step 7).

6) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

7) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Perform steering angle sensor centering procedure. See STEERING ANGLE SENSOR CENTERING under PROGRAMMING.

### **DTC C0266: ADS CONTROLLER MALFUNCTION (CAMARO & FIREBIRD)**

#### Circuit Description

This circuit monitors DELIVERED THROTTLE POSITION input for proper operation.

DTC sets anytime ignition is on and EBCM does not receive a DELIVERED THROTTLE POSITION input.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect and check Accelerator and Servo control Module (ASM) and connector for corrosion or damage. If connector is faulty, go to step 7). If connector is okay, go to next step.

3) Measure resistance between ASM connector terminal No. 28 (Black/White wire) and ground. If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 8).

4) Measure resistance between ASM connector terminal No. 55 (Black/White wire) and ground. If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 8).

5) Turn ignition on, engine off. Using DVOM, measure voltage between ASM harness connector terminals No. 1 (Pink wire) and No. 28 (Black/White wire). If voltage is equal to battery voltage, go to step 10). If voltage is not equal to battery voltage, go to next step.

6) Repair open or high resistance in Pink wire between ASM and engine wiring harness junction block 2. After repairs, go to step 16).

7) Repair ASM connector as necessary. After repairs, go to step 16).

8) Repair open or high resistance in Black/White wire between ASM and ground. After repairs, go to step 16).

9) Replace ASM. See ACCELERATOR & SERVO CONTROL MODULE (CAMARO & FIREBIRD) under REMOVAL & INSTALLATION. After repairs, go to step 16).

10) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Measure resistance between terminals No. 9 (Tan/Black wire) and No. 15 (Black wire). If resistance is infinite, go to step 12). If resistance is not infinite, go to next step.

11) Repair short to ground in Tan/Black wire between ASM and EBCM. After repairs, go to step 16).

12) Measure resistance between universal pinout box terminal No. 9 (Tan/Black wire) and ASM connector terminal No. 35 (Tan/Black wire). If resistance is 0-5 ohms, go to step 14). If resistance is not 0-5 ohms, go to next step.

13) Repair open or high resistance in Tan/Black wire between ASM and EBCM. After repairs, go to step 16).

14) Turn ignition on, engine off. Using DVOM, measure voltage at universal pinout box terminal No. 9 (Tan/Black wire). If voltage is greater than one volt, go to next step. If voltage is not greater than one volt, go to step 9).

15) Repair short to voltage in Tan/Black wire between ASM and EBCM. After repairs, go to next step.

16) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

## DTC C0550: ECU MALFUNCTION

### Circuit Description

This DTC identifies a malfunction within EBCM

DTC sets when an internal EBCM malfunction exists.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

Go to next step.

2) If any other DTCs than DTC C0550 are set, see DIAGNOSTIC TROUBLE CODE DEFINITIONS table under DIAGNOSIS & TESTING for diagnosis. If no other DTCs than DTC C0550 are set, go to next step.

3) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

4) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

## DTC C0710: STEERING POSITION SIGNAL MALFUNCTION (INTRIGUE)

### Circuit Description

Under normal driving conditions, EBCM monitors steering angle sensor inputs to see if steering wheel is moving. If steering wheel is not moving for a set period of time, EBCM assumes vehicle is going in a straight line. At this point, EBCM looks at steering angle sensor inputs and considers degree angle to be zero. This is called offset value. Steer angle centering is process by which EBCM calibrates steering sensor output so that output reads zero when steering wheel is centered.

DTC sets if one or more of following conditions exist and vehicle speed is greater than 25 MPH.

- \* Steering angle sensor detects an internal malfunction and sends a Controller Area Network (CAN) message to EBCM.
- \* If offset value is higher than 15 degrees, a malfunction is detected. Malfunction time depends on driving distance, vehicle speed and amount of malfunctioning steering angle signal.
- \* Rapid changes of steering angle sensor signal cannot occur under normal driving conditions. If signal change is higher than 2000 degrees per second or steering angle acceleration is higher than 37500 degrees per second squared, a malfunction is detected.
- \* A reference steering angle signal based on a vehicle model is used to check actual steering angle. If measured steering angle varies from reference steering angle by more than a predetermined value, a malfunction is detected.

### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

Go to next step.

2) Turn ignition off. Install scan tool. Turn ignition on, engine off. Select ABS DTC display function. If scan tool displays any DTC other than DTC C0710, see DIAGNOSTIC TROUBLE CODE DEFINITIONS table under DIAGNOSIS & TESTING for diagnosis. If scan tool does not display any other DTC, go to next step.

3) Perform steering angle sensor centering procedure. See STEERING ANGLE SENSOR CENTERING under PROGRAMMING. If centering procedure was successfully completed, go to next step. If centering procedure was not successfully completed, go to step 5).

4) Using scan tool, clear DTCs. Test drive vehicle. See DIAGNOSTIC TEST DRIVE under DTC C0252: ACTIVE BRAKE CONTROL SENSORS UNCORRELATED (INTRIGUE). If DTC resets, go to step 6). If DTC does not reset, see DIAGNOSTIC AIDS.

5) Replace steering angle sensor. See appropriate STEERING COLUMNS article in STEERING. After repairs, go to step 7).

6) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

7) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Perform steering angle sensor centering procedure. See STEERING ANGLE SENSOR CENTERING under PROGRAMMING.

### DTC C0870: BPMV PRESSURE SENSOR REFERENCE CIRCUIT MALFUNCTION

(INTRIGUE)

#### Circuit Description

Brake pressure sensor reference voltage is monitored for an over or under voltage condition.

DTC sets when 5-volt reference is greater than 5.6 volts or less than 4.4 volts for more than 60 milliseconds.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 17 (Orange wire) and No. 15 (Black/White wire). If voltage is 4.4-5.6 volts, see DIAGNOSTIC AIDS. If voltage is not 4.4-5.6 volts, go to next step.

3) Turn ignition off. Disconnect brake pressure sensor. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 28 (Gray wire) and No. 15 (Black/White wire). If voltage is greater than 4.4 volts, go to next step. If voltage is not greater than 4.4 volts, go to step 5).

4) Using DVOM, measure voltage between universal pinout box terminals No. 28 (Gray wire) and No. 15 (Black/White wire). If voltage is less than 5.6 volts, go to step 8). If voltage is not less than 5.6 volts, go to step 6).

5) Check Gray wire (5-volt reference circuit) between brake pressure sensor and EBCM for short to ground. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 9).

6) Check Gray wire (5-volt reference circuit) between brake pressure sensor and EBCM for short to voltage. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

7) Check Gray/Black wire (ground circuit) between brake pressure sensor and EBCM for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 9).

8) Check brake pressure sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 10).

9) Check connector of EBCM for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 11).

10) Replace brake pressure sensor. See BRAKE PRESSURE SENSOR (INTRIGUE) under REMOVAL & INSTALLATION. After

repairs, go to step 12).

11) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

12) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Possible causes of this DTC are open, short to ground or short to battery voltage in pressure sensor 5-volt reference circuit.

### DTC C0875: YAW/LATERAL ACCELEROMETER SENSOR CIRCUIT

MALFUNCTION (INTRIGUE)

#### Circuit Description

Yaw rate sensor reference voltage is monitored for an over or under voltage condition.

DTC is set if supply voltage is greater than 5.6 volts or less than 4.4 volts for more than 200 milliseconds and vehicle speed is greater than 25 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and EBCM connector. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage is 4.4-5.6 volts, see DIAGNOSTIC AIDS. If voltage is not 4.4-5.6 volts, go to next step.

3) Turn ignition off. Disconnect yaw/lateral accelerometer sensor. Turn ignition on, engine off. Using DVOM, measure voltage between universal pinout box terminals No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage greater than 4.5 volts, go to next step. If voltage is not greater than 4.4 volts, go to step 5).

4) Using DVOM, measure voltage between universal pinout box terminal No. 16 (Orange wire) and No. 15 (Black/White wire). If voltage is less than 5.6 volts, go to step 8). If voltage is not less than 5.6 volts, go to step 6).

5) Check Orange wire (5-volt reference circuit) of yaw/lateral accelerometer sensor for short to ground. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 9).

6) Check Orange wire (5-volt reference circuit) of yaw/lateral accelerometer sensor for short to voltage. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

7) Check Gray/Black wire (ground circuit) of yaw/lateral accelerometer sensor for high resistance or open. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 9).

8) Check yaw/lateral accelerometer sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 10).

9) Check connector of EBCM for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to step 11).

10) Replace yaw/lateral accelerometer sensor. See under REMOVAL & INSTALLATION. After repairs, go to step 12).

11) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

12) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Possible causes of this DTC are open, short to ground or short to battery voltage in yaw rate sensor 5-volt reference circuit.

### DTC C0896: DEVICE VOLTAGE RANGE/PERFORMANCE

#### Circuit Description

EBCM is required to operate within a specified range of voltage to function properly. During ABS and TCS operation, there are current requirements that will cause voltage to drop. Because of this, voltage is monitored out of ABS/TCS control to indicate a good charging system condition, and also during ABS/TCS control when voltage may drop significantly. PCM also monitors for high voltage conditions which could damage EBCM.

DTC sets when EBCM operating voltage at terminal No. 8 (Pink wire) drops to less than 9.4 volts out of ABS/TCS control, or 8.8 volts during ABS/TCS control, or EBCM operating voltage at terminal No. 8 increases to greater than 17.4 volts. Condition must exist for more than 500 milliseconds with vehicle speed above 3.6 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn all accessories off. Start engine. Using scan tool, select ABS/TCS DATA LIST. Monitor battery voltage while running engine at about 2000 RPM. If voltage is 0-17.4 volts, go to step 4). If voltage is not 0-17.4 volts, go to next step.

3) Using DVOM, check actual battery voltage while running engine at about 2000 RPM. If voltage is 0-17.4 volts, go to next step. If voltage is not 0-17.4 volts, diagnose charging system. See appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS.

4) Continue monitoring battery voltage while running engine at about 2000 RPM, Using scan tool. If voltage is 0-9.4 volts, go to step 6). If voltage is not 0-9.4 volts, go to next step.

5) Turn ignition off. Disconnect scan tool. Test drive vehicle faster than 3 MPH. If DTC C0896 resets, go to step 12). If DTC C0896 does not reset, perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

6) Turn ignition off. Disconnect EBCM connector. Install Universal Pinout Box (J 39700) using Cable Adapter (J 39700-25) to EBCM harness connector only. Using DVOM, measure resistance between universal pinout box terminal No. 15 (Black wire for Camaro and Firebird or Black/White wire for Grand Prix and Intrigue) and ground. If resistance is 0-5 ohms, go to step 8). If resistance is not 0-5 ohms, go to next step.

7) Repair open or high resistance in Black wire or Black/White wire between ground and EBCM. After repairs, go to step 13).

8) Turn ignition on, with engine off. Using DVOM, measure voltage between universal pinout box terminals No. 15 (Black wire for Camaro and Firebird, or Black/White wire for Grand Prix and Intrigue) and No. 8 (Pink wire). If voltage is greater than 9.4 volts, go to step 11). If voltage is not greater than 9.4 volts, go to next step.

9) Turn ignition off. Remove ABS fuse (10-amp) or ABS IGN fuse (10-amp) in. Using DVOM, measure resistance of Pink wire between junction block and EBCM connector terminal No. 8. If resistance is 0-5 ohms, diagnose charging system. See appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS. If resistance is not 0-5 ohms, go to step 10).

10) Repair open or high resistance in Pink wire between

junction block and EBCM connector terminal No. 8. After repairs, go to step 13).

11) Turn ignition off. Reconnect all connectors. Disconnect scan tool. Test drive vehicle faster than 3 MPH. If DTC C0896 resets, go to next step. If DTC C0896 does not reset, go to step 13).

12) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

13) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

A thorough inspection of wiring and connectors is important to prevent misdiagnosis. Check for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wiring connections, or damaged wiring harness. An intermittent may be caused by a poor connection, rubbed-through wire insulation, or a broken wire inside insulation.

### DTC C0901: DEVICE NO. 2 VOLTAGE LOW (CAMARO & FIREBIRD)

#### Circuit Description

This circuit monitors voltage level available to Accelerator and Servo control Module (ASM). If voltage decreases to less than 7.5 volts, full performance of traction control system cannot be guaranteed.

DTC sets when ignition is on and ignition voltage is less than 7.5 volts.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Check charging system for proper operation. See appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS. If charging system is okay, go to next step.

3) Turn ignition off. Disconnect and check ASM and connector for corrosion or damage. If connector is faulty, go to step 7). If connector is okay, go to next step.

4) Measure resistance between ASM connector terminal No. 28 (Black/White wire) and ground. If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 8).

5) Measure resistance between ASM harness connector terminal No. 55 (Black/White wire) and ground. If resistance is 0-5 ohms, go to next step. If resistance is not 0-5 ohms, go to step 8).

6) Turn ignition on, engine off. Using DVOM, measure voltage between ASM connector terminals No. 1 (Pink wire) and No. 28 (Black/White wire). If voltage is greater than 7.5 volts, go to step 9). If voltage is less than one volt, see appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS.

7) Repair ASM connector as necessary. After repairs, go to step 10).

8) Repair open or high resistance in Black/White wire or Black wire between ASM and ground. After repairs, go to step 10).

9) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

10) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Thoroughly inspect wiring and connectors. Failure to carefully and fully inspect wiring and connectors can result in misdiagnosis. Misdiagnosis may cause replacement of parts without repairing malfunction. Inspect other low voltage conditions. Test

charging system. See appropriate GENERATORS & REGULATORS article in STARTING & CHARGING SYSTEMS.

Following conditions are other possible causes of low system voltage:

- \* Charging system malfunction.
- \* Excessive parasitic drain.
- \* Weak battery.
- \* Faulty system ground.

If an intermittent malfunction exists, see INTERMITTENTS & POOR CONNECTIONS under DIAGNOSIS & TESTING.

### **DTC U1650: CHASSIS SYSTEM DEDICATED BUS CONTROLLER MALFUNCTION (INTRIGUE)**

#### Circuit Description

Controller Area Network (CAN) serial data circuit is a high speed serial data bus used to communicate information between steering angle sensor and EBCM. When ignition is on, module and steering angle sensor begin to transmit data between each other. CAN bus circuit is monitored continuously after ignition is turned on.

DTC sets when line interruptions are detected by CAN message monitor and vehicle speed is greater than 25 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect EBCM. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) to EBCM connector only. Disconnect steering angle sensor. Using DVOM, Check CAN HI (Tan/White wire) and CAN LO (Tan wire) circuits for short to ground between steering angle sensor and EBCM. If problem was found, repair as necessary. After repairs, go to step 8). If problem was not found, go to next step.

3) Using DVOM, check CAN HI and CAN LO circuits between steering angle sensor and EBCM for being shorted together. If problem was found, repair as necessary. After repairs, go to step 8). If problem was not found, go to next step.

4) Perform steering angle sensor centering procedure. See STEERING ANGLE SENSOR CENTERING under PROGRAMMING. If centering procedure was successfully completed, go to next step. If centering procedure was not successfully completed, go to step 6).

5) Using scan tool, clear DTCs. Test drive vehicle. See DIAGNOSTIC TEST DRIVE under DTC C0252: ACTIVE BRAKE CONTROL SENSORS UNCORRELATED (INTRIGUE). If DTC U1650 reset, go to step 7). If DTC U1650 did not reset, go to step 8).

6) Replace steering angle sensor. See appropriate STEERING COLUMNS article in STEERING. After repairs, go to step 8).

7) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

8) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Possible causes of DTC are CAN HI and CAN LO circuits shorted together, shorted to ground or shorted to voltage.

### **DTC U1651: CHASSIS SYSTEM DEDICATED BUS SENSOR MALFUNCTION (INTRIGUE)**

#### Circuit Description

EBCM monitors received messages from steering angle sensor for corruption or missing messages.

DTC sets when EBCM receives a corrupt or missing message after 100 milliseconds and vehicle speed is greater than 25 MPH.

#### Diagnosis

1) Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING. Go to next step.

2) Turn ignition off. Disconnect steering angle sensor connector. Using DVOM, check ignition circuit (Pink wire) for open. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

3) Disconnect EBCM connector. Install Universal Pinout Box (J 39700) with Cable Adapter (J 39700-530) between EBCM and the EBCM connector. Disconnect steering angle sensor. Using DVOM, check ground circuit (Gray/Black wire) for open. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

4) Using DVOM, check CAN HI circuit (Tan/White wire) for open. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

5) Using DVOM, check CAN LO circuit (Tan wire) for open. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

6) Check steering angle sensor connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

7) Check EBCM connector for poor connections. If problem was found, repair as necessary. After repairs, go to step 12). If problem was not found, go to next step.

8) Perform steering angle sensor centering procedure. See STEERING ANGLE SENSOR CENTERING under PROGRAMMING. If centering procedure was successfully completed, go to next step. If centering procedure was not successfully completed, go to step 10).

9) Using scan tool, clear DTCs. Test drive vehicle. See DIAGNOSTIC TEST DRIVE under DTC C0252: ACTIVE BRAKE CONTROL SENSORS UNCORRELATED (INTRIGUE). If DTC U1651 reset, go to step 11). If DTC U1651 did not reset, go to step 12).

10) Replace steering angle sensor. See appropriate STEERING COLUMNS article in STEERING. After repairs, go to step 12).

11) Replace EBCM. See ELECTRONIC BRAKE CONTROL MODULE under REMOVAL & INSTALLATION. After repairs, go to next step.

12) Using scan tool, clear DTCs. Operate vehicle. If DTC does not reset, system is okay.

#### Diagnostic Aids

Possible causes of this DTC are:

- \* Open in the CAN HI or CAN LO circuit.
- \* Open in the ignition circuit.
- \* Open in the ground circuit.
- \* Malfunctioning steering angle sensor.
- \* Malfunctioning EBCM.

## REMOVAL & INSTALLATION

### ADJUSTER ASSEMBLY (CAMARO & FIREBIRD)

NOTE: Adjuster assembly may also be referred to as throttle relaxer assembly.

**NOTE:** The adjuster assembly cables must always be adjusted each time adjuster assembly is removed and/or replaced to ensure optimum system performance. See ADJUSTMENTS under ADJUSTMENTS.

#### Removal

1) Remove adjuster assembly splash cover and cable cam cover. Disconnect adjuster assembly electrical connector.  
2) Remove nuts that mount adjuster assembly to bracket, then remove cables from adjuster assembly.

#### Installation

1) Install cables to adjuster assembly, and install assembly to mounting bracket. Install assembly mounting nuts and tighten nuts to specification. See TORQUE SPECIFICATIONS.  
2) Connect adjuster assembly electrical connector. Adjust adjuster assembly cables. See ADJUSTMENTS under ADJUSTMENTS. Install cable cam cover and adjuster assembly splash cover.

### **ACCELERATOR & SERVO CONTROL MODULE (CAMARO & FIREBIRD)**

#### Removal & Installation

1) The Accelerator & Servo Control Module (ASM) is located under left side of instrument panel, near kick panel. Disconnect fasteners on lower sound insulator panel under steering column. Remove lower sound insulator panel from vehicle. If equipped with a manual transmission, remove left side kick panel. Remove bolt that mounts ASM bracket to upper instrument panel.  
2) Remove push in retainer that mounts ASM bracket to side wall, then remove ASM and bracket assembly from mounting location. Disconnect ASM wiring connector. Remove ASM-to-mounting bracket screws. Remove ASM and bracket from vehicle. To install, reverse removal procedure.

### **BRAKE PRESSURE MODULATOR VALVE**

**NOTE:** DO NOT loosen screws located on BPMV. Screws may not be able to be retightened enough to eliminate leakage. BPMV is not serviceable and must be replaced as an assembly.

**CAUTION:** Avoid getting water, brake fluid and engine coolant in socket of EBCM connector.

#### Removal

1) Brake Pressure Modulator Valve (BPMV) is located next to EBCM, on top of left front frame rail (Camaro and Firebird) or on left side strut tower in engine compartment (Grand Prix and Intrigue). Turn ignition switch to OFF position. Disconnect negative battery cable. Pull out lock tab from EBCM harness connector and disconnect connector.  
2) Note location of primary and secondary BPMV brakelines, and remove lines. Plug brakelines to prevent loss and contamination of fluid. Remove BPMV bracket nuts.

**NOTE:** When removing BPMV, protect vehicle exterior paint from possible brake fluid spillage.

3) Reposition brakelines to one side as necessary for removal of BPMV. Remove BPMV and EBCM as an assembly from bracket. If necessary, separate EBCM from BPMV.

#### Installation

1) To install, reverse removal procedure. Ensure brakelines are installed in original locations. If installing a NEW BPMV, ensure shipping plugs are removed from valve openings. Install NEW wave spring(s) in original location and position between EBCM and BPMV. Install EBCM to BPMV. Install 4 NEW top mounting screws and tighten in an "X" pattern. Install 2 NEW bottom screws and tighten. Tighten screws, nuts and brakelines to specification. See TORQUE SPECIFICATIONS.

2) Refill brake master cylinder reservoir, bleed brakes and check for leaks. See BLEEDING BRAKE SYSTEM. Turn ignition on, with engine off. Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

## **BRAKE PRESSURE SENSOR (INTRIGUE)**

### **Removal & Installation**

Turn ignition off. Loosen two retaining nuts and carefully reposition EBCM to access brake pressure sensor. Disconnect brake pressure sensor connector. Remove brake pressure sensor. To install, reverse removal procedure.

## **ELECTRONIC BRAKE CONTROL MODULE**

**CAUTION:** To prevent EBCM damage, never disconnect EBCM wiring harness connector with ignition on. DO NOT attempt to remove relays from EBCM. EBCM must be replaced as an assembly.

**CAUTION:** Avoid getting water, brake fluid and engine coolant in socket of EBCM connector.

### **Removal**

1) EBCM is mounted on top of left front frame rail (Camaro and Firebird) or on left side strut tower in engine compartment (Grand Prix and Intrigue). Disconnect negative battery cable. Turn ignition switch to OFF position. Pull out lock tab from EBCM harness connector and disconnect connector. Disconnect pump motor connector from bottom of EBCM.

2) Remove and discard 6 EBCM-to-Brake Pressure Modulator Valve (BPMV) screws. Using care so as not to damage seal and solenoid valves, pull EBCM and separate from BPMV. Note location and position of wave spring(s) between EBCM and BPMV. Remove and discard wave spring(s).

### **Installation**

1) To install, clean BPMV gasket surface with alcohol. Install NEW wave spring(s) in original location and position between EBCM and BPMV. Install EBCM to BPMV. Install 4 NEW top mounting screws and tighten in an "X" pattern. Install 2 NEW bottom screws and tighten. See TORQUE SPECIFICATIONS.

2) Connect pump motor connector at bottom of EBCM. Connect EBCM harness connector and push in lock tab. Turn ignition on, with engine off. Perform DIAGNOSTIC SYSTEM CHECK under DIAGNOSIS & TESTING.

## **STOPLIGHT SWITCH**

### **Removal & Installation**

Remove left lower sound insulator panel from vehicle. Disconnect stoplight switch electrical connector. Remove stoplight switch from brake pedal bracket. To install, reverse removal procedure. Perform stoplight switch adjustment. See STOPLIGHT SWITCH under ADJUSTMENTS.

## **TOOTHED SENSOR RING**

#### Removal & Installation (Front)

Front toothed sensor ring is an integral part of front hub/bearing assembly, and is not serviced separately. If ring replacement is necessary, hub/bearing must be replaced. See appropriate FRONT article in SUSPENSION.

#### Removal & Installation (Rear - Camaro & Firebird Without Traction Control)

Rear toothed sensor ring is located in differential case, and is not serviced separately. If sensor ring is determined to be damaged, differential gear set must be replaced.

#### Removal & Installation (Rear - Camaro & Firebird With Traction Control)

Rear toothed sensor ring is an integral part of rear axle shaft, and is not serviced separately. If sensor ring requires replacement, rear axle shaft must be replaced.

#### Removal & Installation (Rear - Grand Prix & Intrigue)

Rear toothed sensor ring is an integral part of rear hub/bearing assembly, and is not serviced separately. If ring replacement is necessary, hub/bearing must be replaced. See appropriate REAR article in SUSPENSION.

### TRACTION CONTROL SWITCH

#### Removal & Installation (Camaro)

Unsnap instrument panel accessory trim plate. Disconnect electrical connectors from fog light switch and traction control switch. Unsnap traction control switch from accessory trim plate and remove from vehicle.

#### Removal & Installation (Firebird)

Unsnap front floor console accessory trim plate. Disconnect electrical connectors from convertible top switch (if equipped) and traction control switch. Unsnap traction control switch from accessory trim plate and remove from vehicle. To install, reverse removal procedure.

#### Removal & Installation (Intrigue)

Raise center console armrest. Remove 2 retaining screws for console trim plate. Open console cup holder. Gently pull up on console trim plate to gain access to traction control switch. Disconnect traction control switch connector. Using a flat-blade tool, release retaining tabs from back side of console trim plate and remove traction control switch. To install, reverse removal procedure.

### WHEEL SPEED SENSOR

#### Removal & Installation (Front)

Front wheel speed sensor is an integral part of front hub and bearing assembly, and cannot be serviced separately. If wheel speed sensor replacement is necessary, hub and bearing assembly must be replaced. See appropriate FRONT article in SUSPENSION.

#### Removal & Installation (Rear - Camaro & Firebird)

**NOTE:** Camaro and Firebird vehicles equipped with traction control utilize two rear wheel speed sensors. One mounted at each rear wheel hub. However, Camaro and Firebird vehicles not equipped with traction control utilize only one rear wheel speed sensor, which is mounted in center of rear axle

assembly on top of differential case.

Raise and support vehicle. Disconnect wheel speed sensor electrical connector. Clean all contaminants from sensor face and mounting area. Remove appropriate wheel speed sensor mounting bolt, and remove appropriate wheel speed sensor from vehicle. To install, reverse removal procedure. Tighten wheel speed sensor bolt to specification. See TORQUE SPECIFICATIONS.

#### Removal & Installation (Rear - Grand Prix & Intrigue)

Rear wheel speed sensor is an integral part of rear hub/bearing assembly, and is not serviced separately. If wheel speed sensor replacement is necessary, hub/bearing assembly must be replaced. See appropriate REAR article in SUSPENSION.

### YAW/LATERAL ACCELEROMETER SENSOR (INTRIGUE)

#### Removal & Installation

Raise center console armrest. Remove 2 retaining screws for console trim plate. Open console cup holder. Gently pull up on console trim plate to gain access to traction control switch. Disconnect traction control switch connector. Lift front floor console trim plate up and over transaxle shift lever. Remove 2 lateral accelerometer sensor retaining nuts. Disconnect lateral accelerometer sensor electrical connector. Remove lateral accelerometer sensor. To install, reverse removal procedure.

## ADJUSTMENTS

### STOPLIGHT SWITCH

#### Camaro & Firebird

NOTE: Adjust cruise control release switch and stoplight and Torque Converter Clutch (TCC) switch at same time.

1) Depress brake. Insert cruise control release switch and stoplight and TCC switch into pedal with bracket until retainers on switches are fully seated.

NOTE: Apply proper amount of force to brake pedal during adjustment. Too much force may damage vacuum booster. Too little force may cause brakes to drag.

2) Slowly pull brake pedal rearward with a force of 50 lbs (222 N) until clicking sounds are no longer heard. At this point, retainers on switches will be adjusted.

3) Measure cruise control release switch and stoplight and TCC switch. Switch contacts should be open at 1.0" (25.4 mm) or less of pedal travel. Switch contacts should be open at same time or before onset of braking. Brake pedal travel can be up to 1.0" (25.4 mm) before cruise control system disengages.

#### Grand Prix & Intrigue

NOTE: Adjust the stoplight switch and the cruise control switch at the same time. The adjustment procedure for both switches is identical.

Insert stoplight switch and cruise control switch (if equipped) into brake pedal bracket. Push brake pedal forward in order to set brake push rod into booster. Pull brake pedal to rear, against

internal stop. This adjusts both stoplight switch and cruise control switch. Inspect stoplight switch for proper adjustment.

### THROTTLE/CRUISE CABLES & LINKAGE (CAMARO & FIREBIRD)

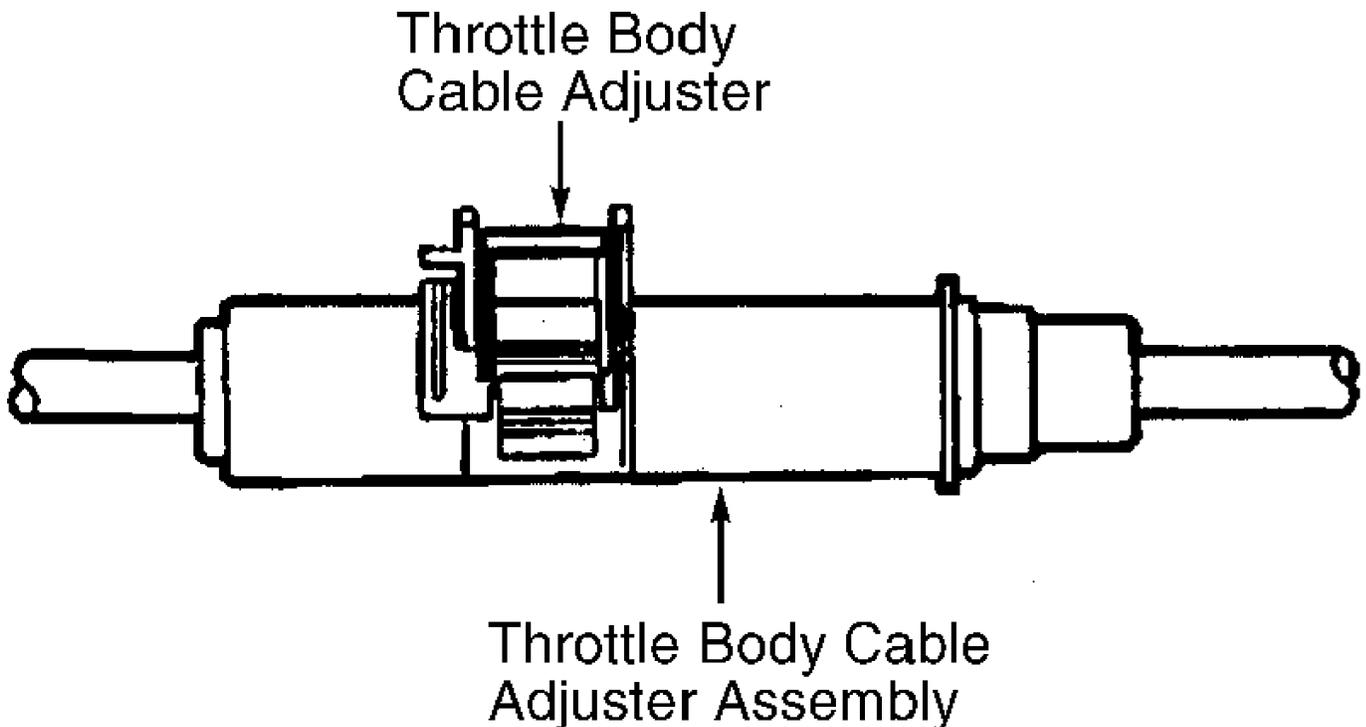
NOTE: Throttle body, accelerator pedal control and cruise control cables must be fully installed before making adjustments.

NOTE: DO NOT adjust cables too tightly that tension does not allow throttle to fully close. If tension is too tight, cable will prevent engine from returning to idle, causing unstable idle quality.

1) Remove throttle body lever shield. Unlock throttle body cable and cruise control cable adjuster. Hold throttle body lever firmly at stop/idle position. Remove slack from throttle body cable by pulling throttle body cable assembly just rearward of adjuster lock. See Fig. 3. Without disturbing cable, lock throttle body cable adjuster.

2) Hold throttle body lever firmly at stop/idle position. Remove slack from cruise control cable by pulling cruise control cable assembly just rearward of adjuster lock. See Fig. 3. Without disturbing cable, lock throttle body cable adjuster.

3) Check throttle angle using a scan tool. The throttle angle should read 100 percent with accelerator fully depressed. The throttle angle should read zero percent when accelerator is fully released. If proper results are not obtained, inspect cables for kinks or damage, and repeat procedure.



G98D63522

Fig. 3: Locating Throttle Cable Adjuster  
Courtesy of General Motors Corp.

### TORQUE SPECIFICATIONS

## TORQUE SPECIFICATIONS

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Application	Ft. Lbs. (N.m)
Adjuster Assembly Mounting Bracket Nut (Camaro & Firebird) .....	19 (25)
BPMV Bracket Nut .....	8 (12)
BPMV Brakeline Fitting .....	11 (15)
Wheel Lug Nut .....	100 (140)

INCH Lbs. (N.m)

EBTCM-To-BPMV Mounting Screw .....	26 (3)
Rear Wheel Speed Sensor Bolt (Camaro & Firebird) .....	89 (10)
Wheel Caliper Bleeder Valves (Front) .....	115 (13)
Wheel Caliper Bleeder Valves (Rear) .....	62 (7)

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## WIRING DIAGRAMS

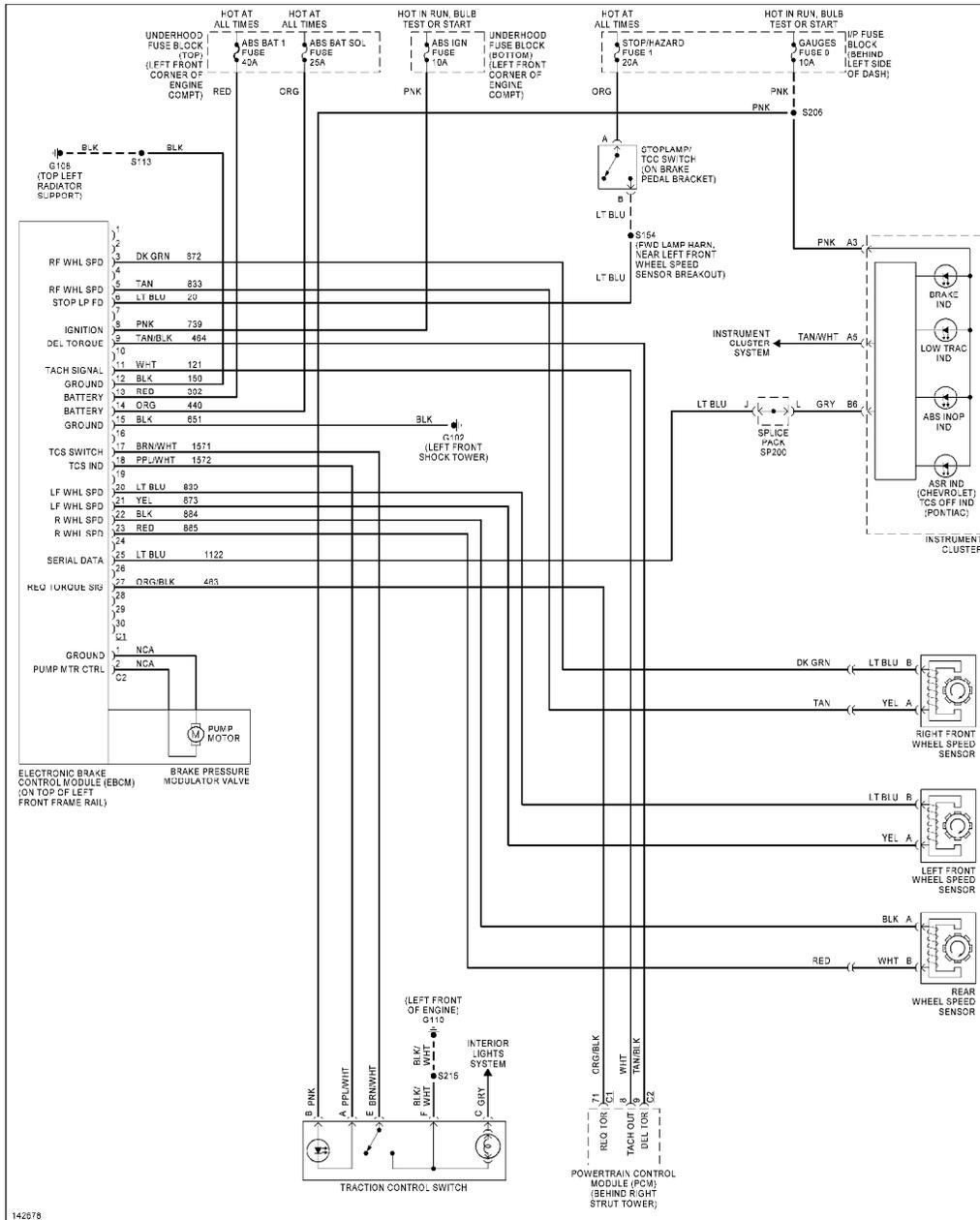


Fig. 4: Anti-Lock Brake System Wiring Diagram (Camaro & Firebird - 3.8L With Traction Control)

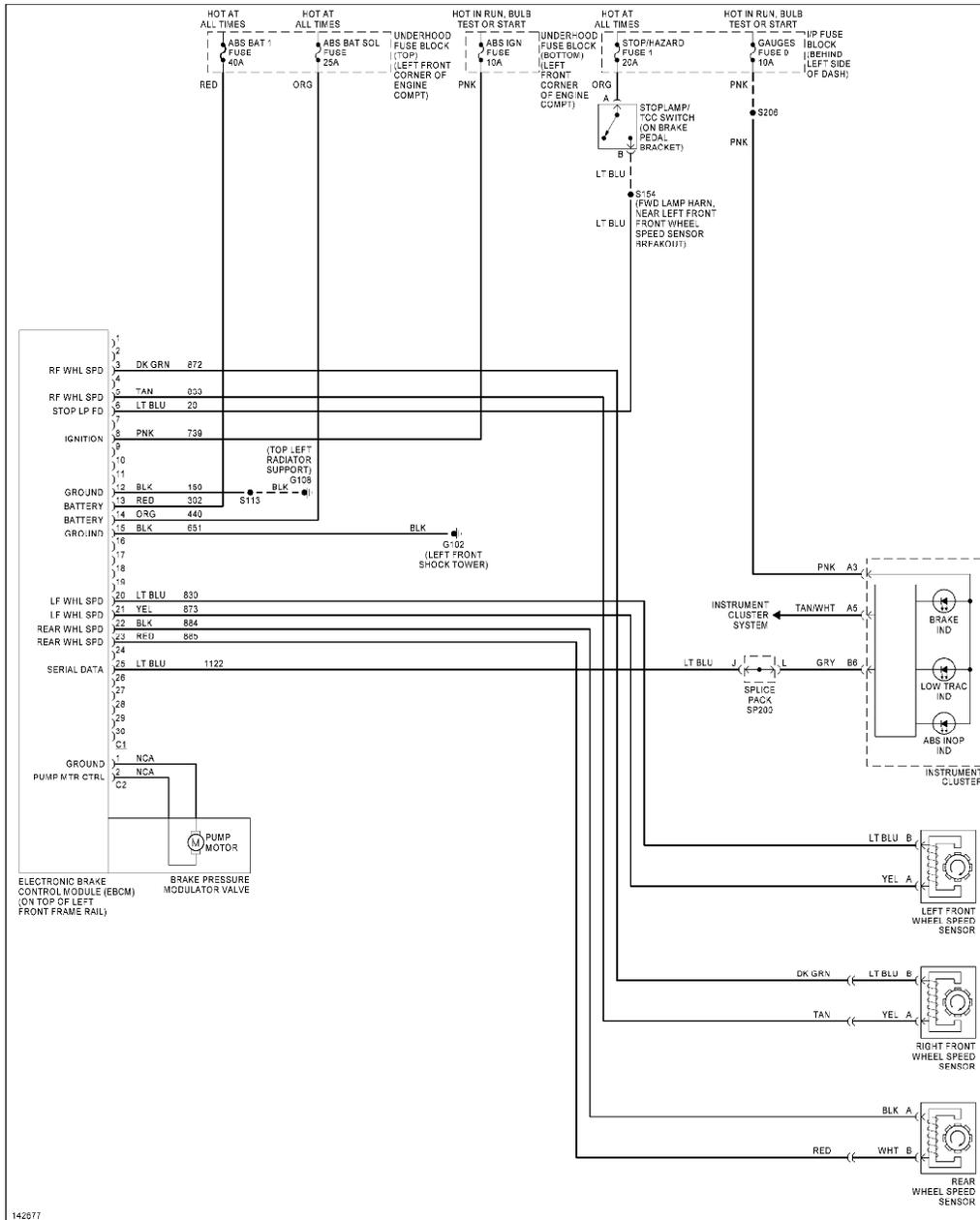


Fig. 5: Anti-Lock Brake System With Traction Control Wiring Diagram (Camaro & Firebird - 3.8L & 5.7L Without Traction Control)

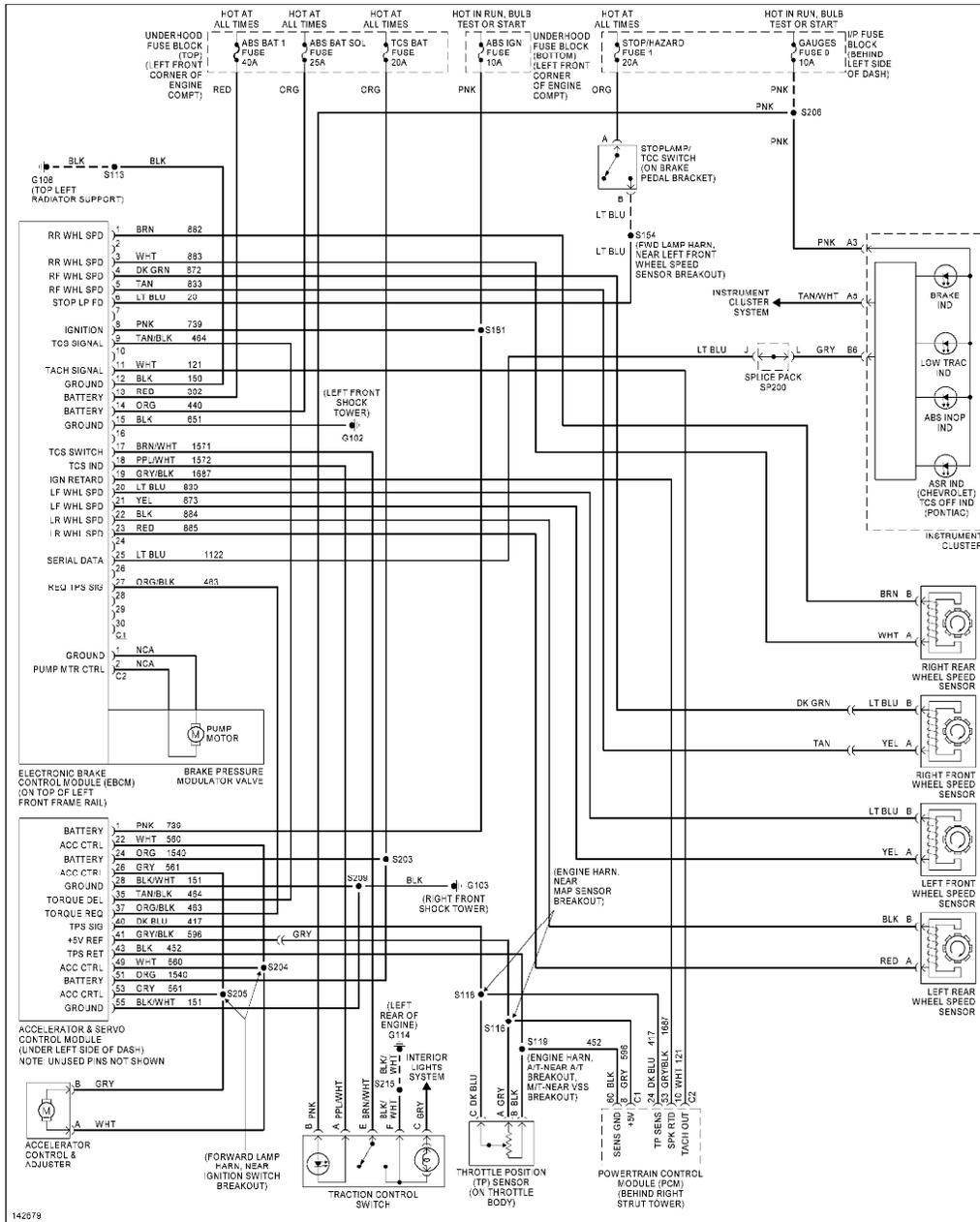


Fig. 6: Anti-Lock Brake System With Traction Control Wiring Diagram (Camaro & Firebird 5.7L With Traction Control)

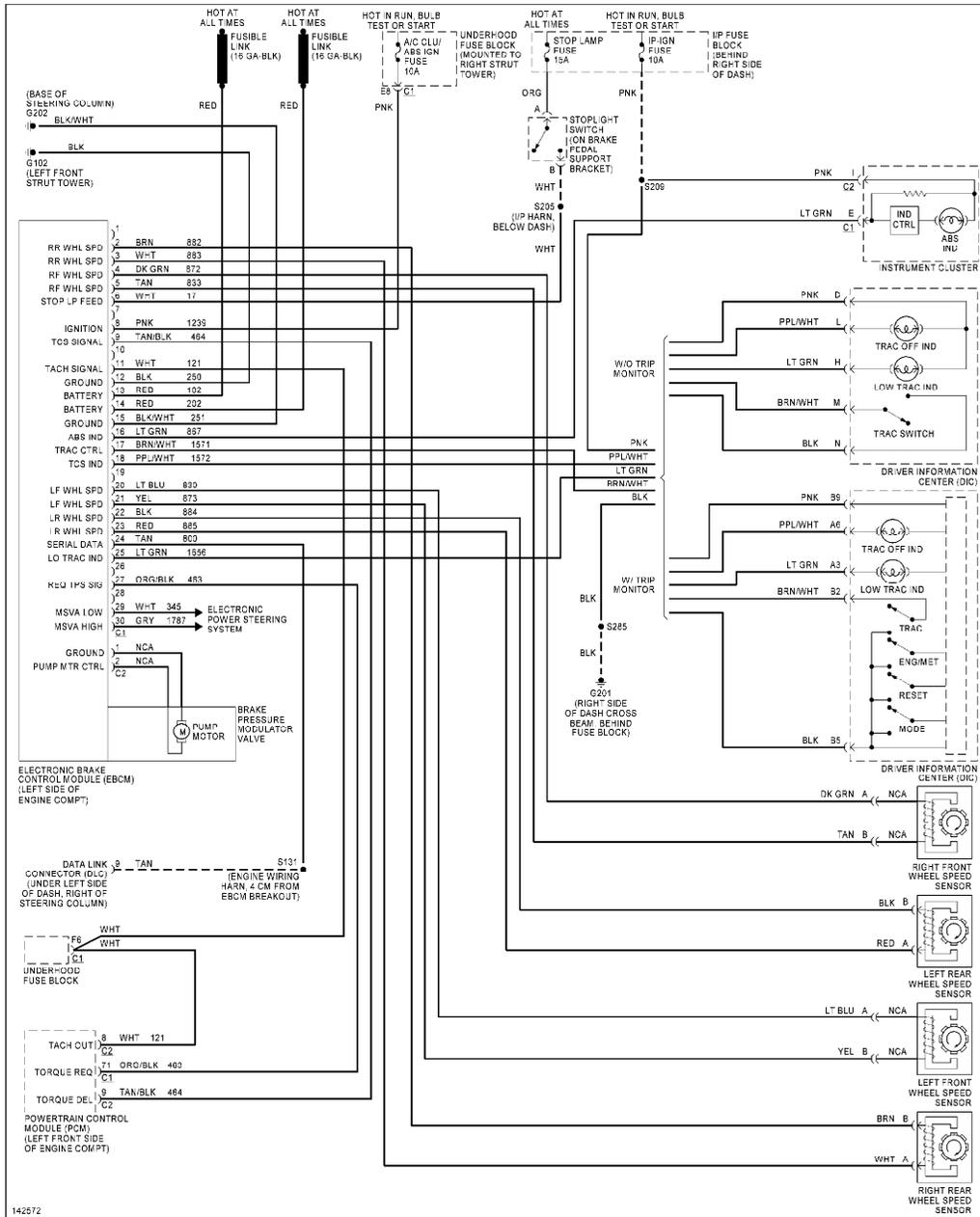


Fig. 7: Anti-Lock Brake System Wiring Diagram (Grand Prix)

