ARTICLE BEGINNING

2000 ACCESSORIES & EQUIPMENT
General Motors Body Control Modules

Camaro & Firebird

* PLEASE READ THIS FIRST *

WARNING: Deactivate air bag system before performing any service operation. See appropriate AIR BAG RESTRAINT SYSTEMS article. Do not apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

DESCRIPTION & OPERATION

The Body Control Module (BCM) controls the following functions: Remote Keyless Entry (RKE) system, Content Theft Deterrent (CTD) system, chimes, fasten seat belt indicator, Retained Accessory Power (RAP), power door locks, rear compartment lid release and interior lights.

Signals that activate BCM are known as "wake-up" signals. BCM is asleep when it is not controlling or monitoring the following wake-up functions: courtesy light system, remote keyless entry system, ignition switch, parking lights, headlights, door jamb switches, rear compartment lid ajar indicator switch, key-in-ignition switch and shock sensor inputs. When BCM is awake and wake-up signal is removed for 10 minutes, BCM will return to sleep. If BCM receives a door ajar wake-up signal and wake-up remains active after 10 minutes, BCM will turn off courtesy light (if illuminated) to prevent battery drain.

BCM battery terminals operating current should not exceed 75 milliamps while BCM is awake with ignition switch in OFF position. An approximate normal value with ignition switch in RUN position is 250 milliamps. If RAP is active, amperage may be higher. RAP allows operation of power door locks, convertible top and radio until 10 minutes have elapsed or a door is opened. When BCM is asleep, current should not exceed 2 milliamps (3 milliamps with theft deterrent system). BCM will go to sleep after ignition is turned off and 10 minutes has elapsed. BCM IGN 1 and IGN 3 terminals operating current should not exceed 15 milliamps. Most BCM functions will properly operate with a system voltage of 9-16 volts.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
Body Control Module (BCM)	Under Right Side Of Instrument Panel,


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                                                 Near Blower Motor
Door Jamb Switch  ................  Near Base Of Respective "A" Pillar
Engine Coolant Level
 Indicator Module  ..........  Mounted On Upper Right Side Of Radiator
Fusible Links  ...................  In Front Of Left Front Wheelwell,
                              Behind Underhood Electrical Center No. 2
Rear Compartment Lid
 Ajar Indicator Switch  ..........  Part Of Rear Compartment Lid Latch
Rear Compartment Lid
 Release Relay  .................  Under Left Side Of Instrument Panel
Theft Deterrent Relay  ...........  Under Instrument Panel, Mounted To
                                             Passenger's Air Bag Module
Theft Deterrent Shock
 Sensor  .......................  Behind Right Rear Inner Trim Panel,
                                                   Mounted To Wheelwell
Underhood Electrical
 Center No. 2  ..............  Left Front Corner Of Engine Compartment
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PROGRAMMING

BODY CONTROL MODULE (BCM) PROGRAMMING

CAUTION: When BCM is replaced, new BCM will automatically program to resistance of the ignition key or interrogator setting that is used the first time ignition switch is turned to RUN position. This process can only be performed once per replacement BCM.

NOTE: If replacing BCM with NEW BCM, BCM will be programmed by manufacturer in a factory test mode. This mode allows only limited functionality. To exit factory test mode, cycle ignition switch between RUN and OFF positions 10 times.

After a replacement BCM has been installed, use one of customer's keys to turn ignition switch to RUN position. Start engine to verify system operation. If SECURITY warning indicator comes on for about 5 seconds and then goes out, BCM is programmed properly. If SECURITY warning indicator flashes (about one flash per second) until ignition switch is turned to OFF position, BCM did not program. Check for faulty system components and wiring. See SELF-DIAGNOSTIC SYSTEM.

RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) DISABLING

CAUTION: Allowing more than 15 seconds to elapse between each action in this procedure, will cause radio to automatically revert to time function.

Turn ignition switch to ACC or RUN position. Turn radio off. Press and hold 1 and 4 buttons simultaneously until radio displays "SEC". Press MN. Radio will display "000". Press MN again until last 2 digits agree with secret code. Press HR until first 2 digits agree with secret code. Press AM-FM. Radio will display "- - -" indicating radio is no longer secured.

RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) ENABLING

CAUTION: Allowing more than 15 seconds to elapse between each action in this procedure, will cause radio to automatically revert to time function.

Turn ignition switch to ON position. Press MN. Radio will display "000". Press MN again until last 2 digits agree with secret code. Press HR until first 2 digits agree with secret code. Press AM-FM. If "SEC" is displayed, radio is operable and secure. If "INOP" is displayed, incorrect secret code has been entered. Repeat procedure with correct secret code. If incorrect secret code is entered 8 times, turn ignition switch to ON position for one hour before attempting to reenter secret code.

REMOTE KEYLESS ENTRY (RKE) TRANSMITTER PROGRAMMING

CAUTION: If vehicle is equipped with radio anti-theft feature (THEFTLOCK(R)), obtain secret code from customer. Disable THEFTLOCK(R) prior to disconnecting power to vehicle or removing RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) DISABLING.

NOTE: Programming of RKE transmitters can not be done simultaneously. First RKE transmitter must be programmed completely before programming next RKE transmitter(s). A maximum of 4 RKE transmitters may be programmed into BCM memory.

1) Turn ignition switch to RUN position to deactivate Content Theft Deterrent (CTD) alarm system (if equipped). Turn ignition switch to OFF position. Remove RADIO fuse No. 17 (15-amp) from instrument panel fuse block. RADIO fuse is located in lower right-hand corner of fuse block.

NOTE: While programming transmitters, wait for doors to unlock. Failure to do this, will cancel programming.

2) Cycle ignition switch from OFF to RUN position 3 times within 5 seconds, leaving ignition switch in ON position. BCM will indicate programming sequence is active by activating hatch release, locking doors, then unlocking doors.

3) Press and hold both LOCK and UNLOCK buttons on RKE transmitter to be programmed for 15 seconds. Doors will lock and unlock, and hatch release will activate to verify RKE transmitter has been recognized by BCM.

4) Repeat step 3) for remaining RKE transmitters. After programming RKE transmitter(s), reinstall RADIO fuse. Turn ignition switch to OFF position. Enable THEFTLOCK(R) (if equipped). See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) ENABLING.

REMOTE KEYLESS ENTRY (RKE) TRANSMITTER SYNCHRONIZATION

If a previously programmed RKE transmitter stops working, stand within 20 ft. (6.1 m) of vehicle. Press and hold LOCK and UNLOCK buttons for 8 seconds. Body Control Module (BCM) will indicate synchronization by flashing interior lights, locking doors, then unlocking doors. If BCM does not indicate synchronization, check RKE transmitter battery. Replace battery if necessary, then reprogram RKE transmitter. See REMOTE KEYLESS ENTRY (RKE) TRANSMITTER PROGRAMMING. If battery is okay, reprogram RKE transmitter. See REMOTE KEYLESS ENTRY (RKE) TRANSMITTER PROGRAMMING.

SELF-DIAGNOSTIC SYSTEM

CAUTION: If vehicle is equipped with THEFTLOCK(R) (radio anti-theft feature), obtain secret code from customer. Disable THEFTLOCK(R) prior to disconnecting power to vehicle or removing RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) DISABLING under PROGRAMMING. Enable THEFTLOCK(R) after restoring power to vehicle or reinstalling RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) ENABLING under PROGRAMMING.

Body Control Module (BCM) is equipped with a self-diagnostic system which detects system failures or abnormalities. When a malfunction occurs, BCM will store a numerical Diagnostic Trouble Code (DTC). DTCs are recorded as current or history/intermittent failures. See CURRENT DIAGNOSTIC TROUBLE CODES and HISTORY/INTERMITTENT DIAGNOSTIC TROUBLE CODES.

BODY CONTROL SYSTEM DIAGNOSTIC SYSTEM CHECK

NOTE: Diagnostic Trouble Codes (DTC) 41-45 will only set while in Body Control Module (BCM) diagnostic mode and a button on Remote Keyless Entry (RKE) transmitter is pressed. DTCs 42-45 are used to determine performance of RKE transmitter and receiver in BCM.

1) Turn ignition switch to RUN position to deactivate Content Theft Deterrent (CTD) alarm system (if equipped). Turn ignition switch to OFF position. Remove RADIO fuse No. 17 (15-amp) from instrument panel fuse block. RADIO fuse is located in lower right-hand corner of fuse block.

2) Turn ignition switch to ACC position. Chime will sound 1-2 times to verify system has entered programming mode for customizing special features. Within 5 seconds, turn ignition switch to OFF position, then immediately back to ACC position. Chime will sound 3 times to verify diagnostic mode has now been entered.

3) BCM will start to flash DTCs on SECURITY indicator 4 seconds after entering diagnostic mode. Each flash of indicator represents a number. For example, one flash followed by 2 quick flashes represents DTC 12. DTC 12 will always be the first DTC displayed, indicating diagnostic mode is at beginning of DTC display. Last DTC to be displayed will be DTC 55 followed by hardware configuration, then software configuration. Each DTC is displayed 3

times before next DTC is displayed.

4) If more than one DTC is present, DTCs will display beginning with lowest current DTC to highest current DTC, followed by lowest history DTC to highest history DTC. RKE transmitter DTCs 41-45 will then be displayed if invoked while in diagnostic mode. DTCs will cycle sequentially until diagnostic mode is exited. To exit diagnostic mode, turn ignition switch to OFF position, and install RADIO fuse.

BCM DTC DEFINITIONS

DTC	Description
12	Diagnostic System Check
21/31	Courtesy Lights Feed Circuit Shorted To Ground
22/32	Courtesy Lights Return Circuit Shorted To Battery
23/33	Retained Accessory Power (RAP) Circuit Shorted To Ground Or Battery
24/34	Seat Belt Indicator Circuit Shorted To Ground Or Battery
25/35 (1)	Security Indicator Status
41 (2)	Last Message Received Valid
42 (2)	Last Message Received Invalid
43 (2)	Last Message Received With Sumcheck Error
44 (2)	Last Message Received With Encryption Error
45 (2)	Receiver Processing In 20-Second Lock-Out
55	Begin Configuration Display

(1) - On vehicles equipped with Content Theft Deterrent (CTD) system.
(2) - On vehicles equipped with Remote Keyless Entry (RKE) system. DTCs are automatically cleared after they are displayed. To display DTCs again, an RKE transmitter button must be pushed again.

CURRENT DIAGNOSTIC TROUBLE CODES

Current Diagnostic Trouble Codes (DTC) indicate Body Control Module (BCM) has detected a fault which is currently present. Current DTCs can be identified by the number "2" preceding the DTC. For example, 21, 22, 24, and so on. Associated history DTC will also be set when a current DTC is set.

HISTORY/INTERMITTENT DIAGNOSTIC TROUBLE CODES

History/intermittent Diagnostic Trouble Codes (DTC) indicate Body Control Module (BCM) previously detected a fault which later disappeared. History/intermittent DTCs can be identified by the number "3" preceding the DTC. For example, 31, 32, 34, and so on. If a history/intermittent DTC is set, fault may be intermittent or the system for which the DTC is set may not be currently operating.

Intermittent DTCs may be caused by problems with electrical circuit. If a visual inspection does not locate problem, vehicle may be driven with a DVOM attached to suspect circuit. Abnormal voltage or

resistance readings when problem occurs indicates problem is within that circuit.

INPUT/OUTPUT DIAGNOSTICS

While in diagnostic mode, if certain Body Control Module (BCM) inputs are activated or deactivated, BCM will respond with various indicators. For example, if a door lock switch is pressed, or if door or rear compartment lid is opened or closed, BCM will flash fasten seat belt indicator light and will sound an audible warning tone. BCM will also attempt to perform operation normally performed by that switch transition.

BCM also responds to changes in shock sensor or tamper input. Tamper input is activated by minor blows to vehicle, and shock input is activated by heavy blows to vehicle. Shock input can be activated by tapping on shock sensor located behind right rear wheelwell. If either input is activated, BCM will cause horns to chirp. BCM will also flash the fasten seat belt indicator light and will sound an audible warning tone.

If interior light switch is activated or deactivated while BCM is in diagnostic mode, BCM will flash fasten seat belt indicator light, sound an audible warning tone and flash courtesy lights. On vehicles equipped with Content Theft Deterrent (CTD) system, BCM will cause courtesy lights to flash, horns to chirp and exterior lights to flash at each interior light switch transition.

CLEARING DIAGNOSTIC TROUBLE CODES

NOTE: Current Diagnostic Trouble Codes (DTC), DTC 21-25 will remain stored and displayed as long as Body Control Module (BCM) detects fault conditions.

With Power Door Locks

1) Turn ignition switch to RUN position to deactivate Content Theft Deterrent (CTD) alarm system (if equipped). Turn ignition switch to OFF position. Remove RADIO fuse No. 17 (15-amp) from instrument panel fuse block. RADIO fuse is located in lower right-hand corner of fuse block.

2) Turn ignition switch to ACC position. Chime will sound 1-2 times to verify system has entered programming mode for customizing special features. Within 5 seconds, turn ignition switch to OFF position, then immediately back to ACC position. Chime will sound 3 times to verify BCM has entered diagnostic mode.

3) Press door unlock switch for 4 seconds while BCM is in diagnostic mode. After 4-second time period, chime will sound 3 times to confirm DTCs have cleared. To exit diagnostic mode, turn ignition switch to OFF position. Install RADIO fuse.

Without Power Door Locks

1) Turn ignition switch to RUN position to deactivate Content Theft Deterrent (CTD) alarm system (if equipped). Turn ignition switch to OFF position. Remove RADIO fuse No. 17 (15-amp) from instrument

panel fuse block. RADIO fuse is located in lower right-hand corner of fuse block.

2) Turn ignition switch to ACC position. Chime will sound 1-2 times to verify system has entered programming mode for customizing special features. Within 5 seconds, turn ignition switch to OFF position, then immediately back to ACC position. Chime will sound 3 times to verify BCM has entered diagnostic mode.

3) Using a fused jumper wire connected to ground, backprobe BCM connector C1 terminal "D" (Orange/Black wire) for 4 seconds. See Fig. 1. After 4-second time period, chime will sound 3 times to confirm DTCs have cleared. To exit diagnostic mode, turn ignition switch to OFF position. Install RADIO fuse.

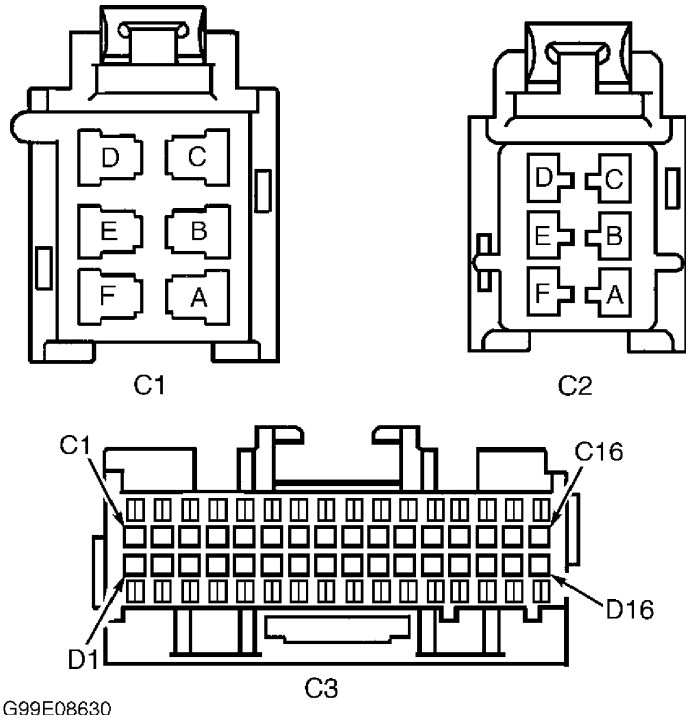

Fig. 1: Identifying BCM Connectors & Terminals
Courtesy of General Motors Corp.

DIAGNOSTIC TESTS

CAUTION: If vehicle is equipped with THEFTLOCK(R) (radio anti-theft feature), obtain secret code from customer. Disable THEFTLOCK(R) prior to disconnecting power to vehicle or removing RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) DISABLING under PROGRAMMING. Enable THEFTLOCK(R) after restoring power to vehicle or reinstalling RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) ENABLING under PROGRAMMING.

NOTE: For circuit identification, see WIRING DIAGRAMS.

DTC 12: DIAGNOSTIC SYSTEM CHECK

Description

DTC 12 is always displayed as the first DTC, indicating Body Control Module (BCM) is in diagnostic mode and DTC display is in progress. If DTCs do not display, go to TESTING. If DTCs display, go to appropriate diagnostic procedure. See BCM DTC DEFINITIONS table under SELF-DIAGNOSTIC SYSTEM.

Testing

1) Turn ignition switch to RUN position. If SECURITY indicator comes on, go to next step. If SECURITY indicator does not come on, go to step 3).

2) Attempt to enter Body Control Module (BCM) diagnostic mode. See BODY CONTROL SYSTEM DIAGNOSTIC SYSTEM CHECK under SELF-DIAGNOSTIC SYSTEM. If SECURITY indicator flashes DTCs, system is operating properly. Go to appropriate diagnostic procedure. See BCM DTC DEFINITIONS table under SELF-DIAGNOSTIC SYSTEM. If SECURITY indicator does not flash DTCs, go to next step.

3) Turn ignition switch to RUN position. Operate power windows. If power windows operate, go to step 7). If power windows do not operate, go to next step.

4) Turn ignition switch to OFF position. Disconnect BCM connector C2. Connect test light between BCM connector C2 terminal "C" (Dark Blue wire) and ground. See Fig. 1. If test light comes on, go to next step. If test light does not come on, go to step 6).

5) Repair short to ground in Dark Blue wire between BCM and instrument panel fuse block. After repairs, attempt to enter BCM diagnostic mode. If SECURITY indicator flashes DTCs, system is operating properly. Go to appropriate diagnostic procedure. See BCM DTC DEFINITIONS table under SELF-DIAGNOSTIC SYSTEM. If SECURITY indicator does not flash DTCs, go to next step.

6) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

7) Turn ignition switch to OFF position. Disconnect BCM connector C3. Connect a fused jumper wire between BCM connector C3 terminal C12 (Gray wire) and ground. If SECURITY indicator comes on, go to next step. If SECURITY indicator does not come on, go to step 9).

8) Check for a faulty connection at BCM connector C3 terminal C12 (Gray wire). Repair connection as necessary. If connection is okay, replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

9) Remove instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article. Disconnect instrument cluster connector. Connect a test light between instrument cluster connector terminal A10 (Orange wire) and ground. See Fig. 2. If test light comes on, go to next step. If test light does not come on, go to step 11).

10) Check for an open circuit or faulty connection in Gray wire between instrument cluster and BCM. Repair circuit or connection as necessary. If circuit and connection are okay, replace instrument cluster IPC. See appropriate ANALOG INSTRUMENT PANELS article.

11) Repair open in Orange wire between instrument cluster and instrument panel fuse block.

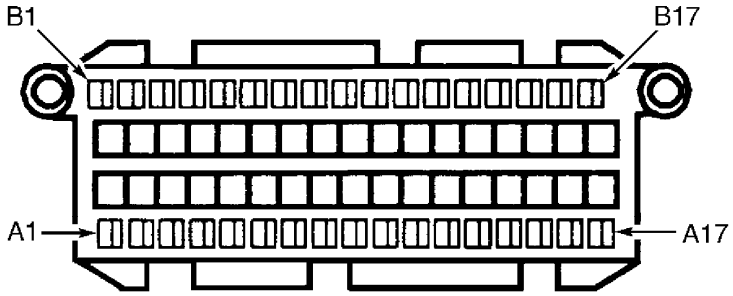

Fig. 2: Identifying Instrument Cluster Connector Terminals
Courtesy of General Motors Corp.

DTC 21/31: COURTESY LIGHTS FEED CIRCUIT SHORTED TO GROUND

Description

Body Control Module (BCM) provides a 12-volt input to courtesy lights on courtesy lights feed circuit when commanded by instrument panel dimmer switch, door jamb switch or rear compartment lid ajar indicator switch inputs.

DTC 21 will set when battery circuit is open due to a problem with COURTESY fuse No. 8, faulty harness or connector, courtesy lights feed circuit is shorted to ground for more than 50 milliseconds while BCM is providing input on circuit, or BCM is defective.

When DTC 21 is set, courtesy lights will not come on and instrument panel dimmer switch will not operate. Glove box and center console lights will also be inoperative. DTC 21 will clear when fault is corrected and memory is cleared.

Diagnostic Aids

If only history DTC 31 is set, problem may be intermittent. Try to recreate fault by wiggling wiring and connectors while performing test. Check for faulty connections at all connectors that may be causing intermittent condition. DTC 31 will clear when fault is corrected and memory is cleared.

Testing

NOTE: Incorrect installation of aftermarket electronic equipment may effect system operation.

1) Turn ignition switch to OFF position. Remove and check COURTESY fuse No. 8 (20-amp) from instrument panel fuse block. If fuse is open, go to next step. If fuse is okay, go to step 3).
2) Check for short to ground in Orange wire between BCM and instrument panel fuse block. Repair wire as necessary. If wire is okay, replace COURTESY fuse.
3) Disconnect BCM connector C2. Connect a test light between BCM connector C2 terminal "B" (Orange wire) and ground. See Fig. 1. If test light comes on, go to step 5). If test light does not come on, go to next step.
4) Repair open in Orange wire between BCM and instrument

panel fuse block and/or open in Red wire between instrument panel and fusible link "E".

5) Ensure glove box is closed. Using DVOM, check continuity between BCM connector C2 terminal "E" (Dark Blue/White wire) and ground. If resistance is zero ohms, go to next step. If resistance is more than zero ohms, go to step 7).

6) Repair short to ground in Dark Blue/White wire between BCM and appropriate interior light.

7) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 22/32: COURTESY LIGHTS RETURN CIRCUIT SHORTED TO BATTERY

Description

Body Control Module (BCM) provides a ground path to courtesy lights on courtesy lights return circuit when commanded by instrument panel dimmer switch, door jamb switch or rear compartment lid ajar indicator switch inputs.

DTC 22 will set when courtesy lights return circuit is shorted to battery for more than 50 milliseconds while BCM is providing ground for circuit.

When DTC 22 is set, courtesy lights will not come on and instrument panel dimmer switch will not operate. Glove box and center console lights will operate normally. DTC 22 will clear when fault is corrected and memory is cleared.

Diagnostic Aids

If only history DTC 32 is set, problem may be intermittent. Try to recreate fault by wiggling wiring and connectors while performing test. Check for faulty connections at all connectors that may be causing intermittent condition. DTC 32 will clear when fault is corrected and memory is cleared.

Testing

1) Turn ignition switch to OFF position. Disconnect BCM connectors C2 and C3. Ensure glove box is closed. Turn ignition switch to RUN position. Connect a test light between BCM connector C3 terminal D1 (White wire) and ground. See Fig. 1. If test light comes on, leave test light connected and go to next step. If test light does not come on, leave test light connected and go to step 7).

2) Disconnect harness connector C200C from harness connector C200D located between left kick panel and steering column (integral with instrument panel harness). If test light comes on, go to next step. If test light does not come on, go to step 4).

3) Repair short to battery in White wire between BCM and harness connector C200D.

4) Reconnect harness connector C200C to C200D. Disconnect harness connector from rearview mirror/courtesy reading lights. If test light comes on, go to next step. If test light does not come on, go to step 6).

5) Repair short to battery in White wire between harness connector C200C and rearview mirror/courtesy reading lights.

6) Replace rearview mirror.

7) Turn rearview mirror/courtesy reading lights switches on. On coupe, remove bulb from dome light. On convertible, remove bulbs from left, right and rear courtesy lights. On all models, use an ohmmeter to check resistance between BCM connector C2 terminal "E" (Dark Blue/White wire) and BCM connector C3 terminal D1 (White wire). If resistance is infinite, go to next step. If resistance is not infinite, go to step 9).

8) Check light sockets for conditions which could cause socket to short when bulb is installed. Check exposed filament wires at base of bulbs for a shorted condition. Repair bulbs and/or sockets as necessary. If bulbs and sockets are okay, go to step 10).

9) Repair Dark Blue/White wire for short to White wire.

10) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 23/33: RETAINED ACCESSORY POWER (RAP) CIRCUIT SHORTED TO GROUND OR BATTERY

Description

Retained Accessory Power (RAP) is enabled when ignition switch is turned to RUN position. RAP will continue to supply power to power windows, radio and convertible top for up to 10 minutes after ignition switch is turned to OFF position. RAP will shut off if any door is opened during this 10 minute period. Body Control Module (BCM) provides RAP function through RAP feed circuit to WINDOWS circuit breaker No. 15 (30-amp) and RADIO fuse No. 17 (15-amp) located in instrument panel fuse block.

DTC 23 will set when BCM detects RAP output on RAP feed circuit is either shorted to ground with RAP enabled or shorted to battery with RAP disabled for more than 50 milliseconds. DTC will also set if there is an open in Red wire between BCM and fusible link "E".

When DTC 23 is set, RAP will not operate (shorted to ground) or RAP will not deactivate when door is opened (shorted to battery). DTC 23 will clear when fault is corrected and memory is cleared.

Diagnostic Aids

If only history DTC 33 is set, problem may be intermittent. Try to recreate fault by wiggling wiring and connectors while performing test. Check for faulty connections at all connectors that may be causing intermittent condition. DTC 33 will clear when fault is corrected and memory is cleared.

Testing

1) Using a digital voltmeter connected to ground, backprobe BCM connector C2 terminal "F" (Red wire). See Fig. 1. If battery voltage exists, go to step 3). If battery voltage does not exist, go to next step.

2) Repair open Red wire between BCM and fusible link "E".

3) Close all doors. Close trunk lid. Turn ignition switch to RUN position, then to OFF position. Turn radio on. If radio operates, go to next step. If radio does not operate, go to step 9).

4) Open driver's door. Remove RADIO fuse No. 17 (15-amp) from instrument panel fuse block. If radio operates, go to next step. If radio does not operate, go to step 6).
5) Repair short to battery in Yellow wire between BCM and instrument panel fuse block.
6) Remove WINDOWS circuit breaker (30-amp) from instrument panel fuse block. If power windows operate, go to next step. If power windows do not operate, go to step 8).
7) Repair short to battery in Brown wire between power window components and instrument panel fuse block.
8) Check for short to battery in Dark Blue wire between BCM and instrument panel fuse block. If circuit is okay, go to next step.
9) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 24/34: SEAT BELT INDICATOR CIRCUIT SHORTED TO GROUND OR BATTERY

Description

Body Control Module (BCM) provides a 12-volt output to fasten seat belt indicator, located on instrument cluster, while driver's seat belt is unfastened.

DTC 24 will set when BCM detects fasten seat belt output is either shorted to ground or shorted to battery for more than 50 milliseconds.

When DTC 24 is set, fasten seat belt indicator will not come on when ignition is on and driver's seat belt is not fastened, or fasten seat belt indicator is always illuminated. DTC 24 will clear when fault is corrected and memory is cleared.

Diagnostic Aids

If only history DTC 34 is set, problem may be intermittent. Try to recreate fault by wiggling wiring and connectors while performing test. Check for faulty connections at all connectors that may be causing intermittent condition. DTC 34 will clear when fault is corrected and memory is cleared.

Testing

1) Turn ignition switch to OFF position. Disconnect BCM connector C3. Turn ignition switch to RUN position. If fasten seat belt indicator comes on, go to step 6). If fasten seat belt indicator does not come on, go to next step.
2) Turn ignition switch to OFF position. Reconnect BCM connector C3. Remove instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article. Disconnect instrument cluster connector. Connect a test light between instrument cluster connector terminals A13 (Purple/White wire) and B11 (Black wire). See Fig. 2. Ensure driver's seat belt is unfastened. Turn ignition switch to RUN position. If test light comes on, go to step 8). If test light does not come on, go to next step.
3) Turn ignition switch to OFF position. Disconnect BCM connector C3. Connect a test light between BCM connector C3 terminal

C4 (Purple/White wire) and battery voltage. See Fig. 1. If test light comes on, go to next step. If test light does not come on, go to step 5).

4) Repair short to ground in Purple/White wire between BCM and instrument cluster.

5) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

6) Turn ignition switch to OFF position. Remove instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article. Disconnect instrument cluster connector. Connect a test light between BCM connector C3 terminal C4 (Purple/White wire) and ground. If test light comes on, go to next step. If test light does not come on, go to step 8).

7) Repair short to battery in Purple/White wire between BCM and instrument cluster.

8) Replace instrument cluster. See appropriate ANALOG INSTRUMENT PANELS article.

DTC 25/35: SECURITY INDICATOR STATUS

Description

NOTE: DTC 35 is required for Content Theft Deterrent (CTD) operation. SECURITY indicator must be detected for alarm to function.

Body Control Module (BCM) provides an output on security indicator Light Emitting Diode (LED) control circuit to SECURITY indicator LED.

DTC 25/35 will set when ignition is turned on and BCM does not detect a security LED control circuit through BCM connector C3 terminal C16. Presence of security LED control circuit connected through connector C3 at time of battery connection is required for proper CTD operation.

Testing

CAUTION: Do not use test light or battery voltage to test SECURITY indicator LED or LED will be damaged. Test light is okay to test LED circuits with LED disconnected.

NOTE: Perform diagnostic test when DTC 25/35 is not set or if SECURITY indicator is inoperative.

NOTE: SECURITY indicator is a Light Emitting Diode (LED).

1) Disconnect SECURITY indicator 2-pin connector. Connect test light between SECURITY indicator 2-pin connector terminal "A" (Black wire) and battery voltage. If test light comes on, go to next step. If test light does not come on, go to step 3).

2) Using a DVOM in diode scale, connect DVOM positive (Red) test lead to SECURITY indicator terminal "B" (Dark Green wire). Connect negative (Black) test lead to SECURITY indicator terminal "A"

(Black wire). If SECURITY indicator comes on, go to step 4). If SECURITY indicator does not come on, go to step 5).

3) Repair open Black wire between SECURITY indicator 2-pin connector and ground.

4) Check for faulty connection between BCM and SECURITY indicator circuit. Repair circuit as necessary. If circuit is okay, go to step 6).

5) Replace SECURITY indicator. Disconnect and reconnect negative battery cable. Recheck system operation.

6) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 41: LAST MESSAGE RECEIVED VALID

Description

Digital Radio Frequency (RF) message received from Remote Keyless Entry (RKE) transmitter was valid, and all security checks passed. No malfunction is present. RKE transmitter should operate all functions properly (i.e., lock, unlock, etc.).

If RKE transmitter digital RF message is sent, but Diagnostic Trouble Codes (DTC) 41-45 are not set as well, RKE transmitter may be defective. If RKE transmitter digital RF message is sent and DTCs 41-45 are set, but corresponding RKE transmitter function does not operate, Body Control Module (BCM) or harness may be defective.

Testing

1) Attempt to perform all functions controlled by RKE transmitter (door locks, trunk release and alarm). If RKE transmitter controls all functions, go to next step. If RKE transmitter does not control all functions, proceed to TEST C: KEYLESS ENTRY SYSTEM INOPERATIVE under SYMPTOM TESTS in REMOTE KEYLESS ENTRY SYSTEMS - CAMARO & FIREBIRD article.

2) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 42: LAST MESSAGE RECEIVED INVALID

Description

Digital Radio Frequency (RF) message received was from a Remote Keyless Entry (RKE) transmitter not programmed to Body Control Module (BCM). RKE transmitter function capabilities will not exist.

DTC 42 will set when RKE transmitter was used without programming it to BCM. If RKE transmitter was already programmed, RKE transmitter may be defective. DTC 42 will also set if another RKE transmitter was operated in the same area.

BCM should be placed in RKE system programming mode. All RKE transmitters must be programmed to BCM during same programming mode cycle. See REMOTE KEYLESS ENTRY (RKE) TRANSMITTER PROGRAMMING under PROGRAMMING.

Diagnostic Aids

DTC 42 may set if one or more of the following occur during BCM diagnostic mode:

* RKE transmitter is defective.
* RKE transmitter not programmed to BCM was used.
* Another RKE transmitter was used in the immediate area.

Testing

1) Attempt to perform all functions controlled by RKE transmitter (door locks, trunk release and alarm). If RKE transmitter controls all functions, go to next step. If RKE transmitter does not control all functions, proceed to TEST C: KEYLESS ENTRY SYSTEM INOPERATIVE under SYMPTOM TESTS in REMOTE KEYLESS ENTRY SYSTEMS - CAMARO & FIREBIRD article.

2) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 43: LAST MESSAGE RECEIVED WITH SUMCHECK ERROR

Description

The digital RF message received was from a Remote Keyless Entry (RKE) transmitter that is programmed to Body Control Module (BCM), but message did not pass sumcheck security test. No remote function capabilities will exist.

DTC 43 will set when BCM is in diagnostic mode, any RKE transmitter button is pressed and RKE transmitter signal does not pass sumcheck security test. Most likely cause is that RKE transmitter is out of synchronization.

Diagnostic Aids

If DTC 43 is set, RKE transmitter is out of synchronization with BCM. This can be caused by one or more of the following:

* RKE transmitter buttons were pressed more than 256 times while out of BCM RF signal range.
* RKE transmitter buttons were pressed more than 10 times while out of BCM RF signal range after RKE transmitter battery was replaced.
* RKE transmitter RF signal was interrupted due to outside noise from surrounding environment.
* RKE transmitter is defective.

Testing

1) Synchronize RKE transmitter. Go to REMOTE KEYLESS ENTRY (RKE) TRANSMITTER SYNCHRONIZATION under PROGRAMMING. After synchronizing RKE transmitter, go to next step.

2) Attempt to perform all functions controlled by RKE transmitter (door locks, trunk release and alarm). If RKE transmitter controls all functions, go to next step. If RKE transmitter does not control all functions, proceed to TEST C: KEYLESS ENTRY SYSTEM INOPERATIVE under SYMPTOM TESTS in REMOTE KEYLESS ENTRY SYSTEMS - CAMARO & FIREBIRD article.

3) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL &

INSTALLATION.

DTC 44: LAST MESSAGE RECEIVED WITH ENCRYPTION ERROR

Description

The digital RF message received was from a Remote Keyless Entry (RKE) transmitter that is programmed to Body Control Module (BCM), but message did not pass encryption security test. No remote function capabilities will exist.

DTC 44 will set when RKE transmitter has been in program or synchronize mode while out of range of BCM. Fault may also be present if digital RF message has an error. Most likely cause is that RKE transmitter is out of synchronization.

Diagnostic Aids

If DTC 44 is set, RKE transmitter is out of synchronization with BCM. This can be caused by one or more of the following:

* RKE transmitter was in program mode while out of BCM RF signal range.
* RKE transmitter RF signal was interrupted due to outside noise from surrounding environment.
* RKE transmitter is defective.

Testing

1) Synchronize RKE transmitter. Go to REMOTE KEYLESS ENTRY (RKE) TRANSMITTER SYNCHRONIZATION under PROGRAMMING. After synchronizing RKE transmitter, go to next step.

2) Attempt to perform all functions controlled by RKE transmitter (door locks, trunk release and alarm). If RKE transmitter controls all functions, go to next step. If RKE transmitter does not control all functions, proceed to TEST C: KEYLESS ENTRY SYSTEM INOPERATIVE under SYMPTOM TESTS in REMOTE KEYLESS ENTRY SYSTEMS - CAMARO & FIREBIRD article.

3) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 45: RECEIVER PROCESSING IN 20-SECOND LOCK-OUT

Description

At least 50 consecutive digital RF messages were received from a Remote Keyless Entry (RKE) transmitter that is programmed to Body Control Module (BCM), but message did not pass encryption security test. BCM will cease processing any RKE transmitter digital RF messages (good or bad) for 20 seconds. No remote function capabilities will exist.

DTC 45 will set when RKE transmitter has been in program or synchronize mode while out of range of BCM. Fault may also be present if RKE transmitter is defective. Fault could be induced prior to BCM entering diagnostic mode. Most likely cause is that RKE transmitter is out of synchronization with BCM.

Diagnostic Aids

If DTC 45 is set, RKE transmitter is out of synchronization with BCM. This can be caused by one or more of the following:

* RKE transmitter was in program mode while out of BCM RF signal range.
* RKE transmitter is defective.

Testing

1) Synchronize RKE transmitter. Go to REMOTE KEYLESS ENTRY (RKE) TRANSMITTER SYNCHRONIZATION under PROGRAMMING. After synchronizing RKE transmitter, go to next step.

2) Attempt to perform all functions controlled by RKE transmitter (door locks, trunk release and alarm). If RKE transmitter controls all functions, go to next step. If RKE transmitter does not control all functions, proceed to TEST C: KEYLESS ENTRY SYSTEM INOPERATIVE under SYMPTOM TESTS in REMOTE KEYLESS ENTRY SYSTEMS - CAMARO & FIREBIRD article.

3) Replace BCM. See BODY CONTROL MODULE (BCM) under REMOVAL & INSTALLATION.

DTC 55: BEGIN CONFIGURATION DISPLAY

Description

DTC 55 is always displayed when Body Control Module (BCM) is in diagnostic mode. DTC 55 indicates that the next 2 numbers displayed are BCM hardware and software configurations. First number following DTC 55 is the hardware configuration. The second number is the software configuration. After configuration numbers are displayed, entire DTC list will repeat beginning with DTC 12.

REMOVAL & INSTALLATION

WARNING: Deactivate air bag system before performing any service operation. See appropriate AIR BAG RESTRAINT SYSTEMS article. Do not apply electrical power to any component on steering column without first deactivating air bag system. Air bag may deploy.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

CAUTION: If vehicle is equipped with THEFTLOCK(R) (radio anti-theft feature), obtain secret code from customer. Disable THEFTLOCK(R) prior to disconnecting power to vehicle or removing RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) DISABLING under PROGRAMMING. Enable THEFTLOCK(R) after restoring power to vehicle or reinstalling RADIO fuse. See RADIO ANTI-THEFT FEATURE (THEFTLOCK(R)) ENABLING under PROGRAMMING.

BODY CONTROL MODULE (BCM)

Removal & Installation

Turn ignition switch to OFF position. Disconnect negative battery cable. Remove lower instrument panel insulator. Locate BCM under right side of instrument panel, mounted to HVAC duct. See Fig. 3 . Unsnap BCM from HVAC duct bracket BCM. Disconnect BCM harness connectors. Remove BCM from vehicle. To install, reverse removal procedure. Program replacement BCM. See BODY CONTROL MODULE (BCM) PROGRAMMING under PROGRAMMING.

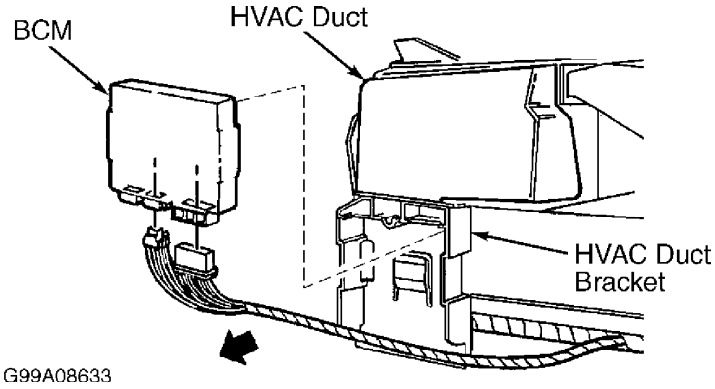

Fig. 3: Locating Body Control Module (BCM)
Courtesy of General Motors Corp.

WIRING DIAGRAMS

NOTE: For additional wiring diagrams, see WIRING DIAGRAMS in appropriate ANTI-THEFT, ANALOG INSTRUMENT PANELS, ILLUMINATION/INTERIOR LIGHTS, POWER CONVERTIBLE TOPS, POWER DOOR LOCKS & REMOTE KEYLESS ENTRY SYSTEMS, POWER SUN ROOFS and POWER WINDOWS articles. Also, see GROUND DISTRIBUTION and POWER DISTRIBUTION articles in WIRING DIAGRAMS.

ABC123

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2000 Chevrolet Camaro

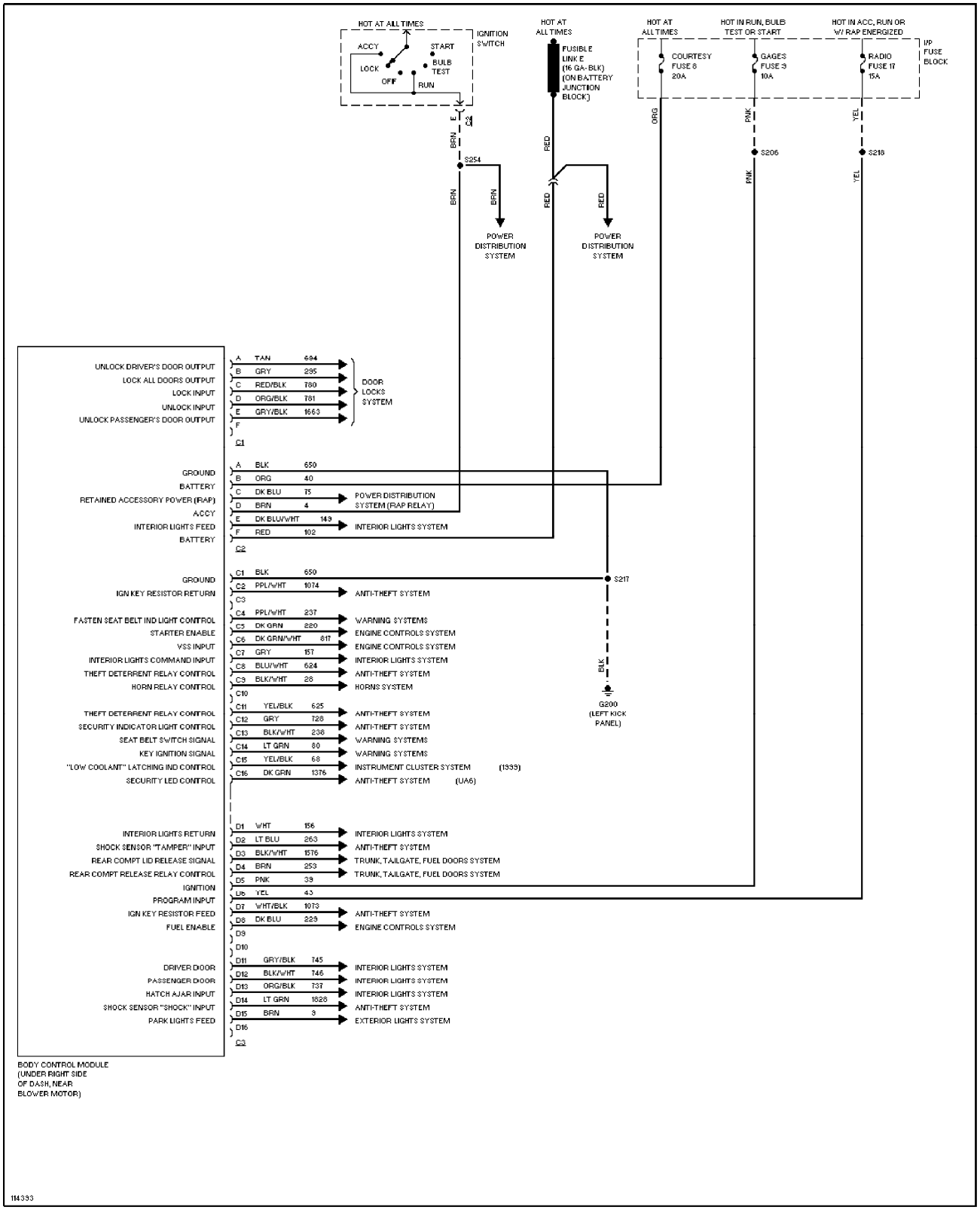

Fig. 4: Body Control Module (BCM) Wiring Diagram (Camaro & Firebird)

END OF ARTICLE

