DESCRIPTION

Remote Keyless Entry (RKE) system is controlled by Remote Function Actuation (RFA) system. RFA system allows transmitter remote control of various vehicle systems without physical contact of switches on vehicle and Tire Pressure Monitoring (TPM) system functions.

RFA system consists of a transmitter located on drivers key fob, a remote control door lock receiver, and an integral antenna. The RFA system does not directly control system functions. RFA system uses one of the following systems to perform driver commands:

- Body Control Module (BCM) for Universal Theft Deterrent (UTD), hatch release, horn and vehicle light control.
- Door Control Module (DCM) for all door lock functions.
- Instrument Panel Cluster (IPC) for RFA system programming and vehicle personalization functions.

When RFA system receives a transmitter command, a message is sent through the serial data line to applicable system module.

RFA system should be used as a supplement to vehicles conventional operated lock/unlock system. It is not meant to replace, but should be used in conjunction with door lock system. RFA system could disable due to radio frequency interference or a low transmitter battery. Always maintain vehicle access with a door key. The remote control door lock receiver is located over left rear wheelwell. The receiver receives and transmits information to other vehicle systems to perform specific functions.

OPERATION

MANUAL FEATURES

Door UNLOCK Button

When transmitter manual UNLOCK button is pressed once, transmitter sends an identification code to remote control door lock receiver to unlock driver door. The receiver sends a signal to Door Control Module (DCM) on the serial data line to unlock the driver door. The DCM then unlocks driver door. The Body Control Module (BCM) disarms Universal Theft Deterrent (UTD) system. BCM will also turn on courtesy lights if ambient light is low. If UNLOCK button is pressed within 10 seconds of driver door unlocking, passenger door will unlock.

Door LOCK Button

When transmitter manual LOCK button is pressed once, transmitter sends an identification code to remote control door lock receiver to lock both doors. The receiver sends a signal to both Door Control Modules (DCMs) on the serial data line to lock both doors. The DCM then locks both doors. The Body Control Module (BCM) arms Universal Theft Deterrent (UTD) system.

HATCH Button

When transmitter manual HATCH button is pressed once, transmitter sends an identification code to remote control door lock receiver to release hatch. The receiver sends a signal to Body Control Module (BCM). The BCM disarms Universal Theft Deterrent (UTD) system and activates hatch release relay.

PANIC Button

When transmitter manual PANIC button is pressed once, transmitter sends an identification code to remote control door lock receiver to activate panic mode. The receiver sends a signal to Body Control Module (BCM) on the serial data line. The Body Control Module (BCM) activates horn relay or flashes lights (depending on selected options) for 90 seconds, or until PANIC button is pressed again.

PASSIVE FEATURES

Passive Locking & Unlocking

With passive locking and unlocking feature, a motion sensor in transmitter causes transmitter to send an identification code to remote control door lock receiver. The receiver sends a signal to Door Control Module (DCM) on the serial data line to lock or unlock the driver door or both doors (depending on selected options). The DCM then locks or unlocks driver door or both doors. The Body Control Module (BCM) arms or disarms Universal Theft Deterrent (UTD) system. When unlocking, BCM will also turn on courtesy lights if ambient light is low.

Passive ON/OFF Slider Switch

The passive on/off slider switch provides the capability to activate or deactivate passive locking and unlocking features. Sliding switch to off, turns off transmitter motion sensor, deactivating passive features. Sliding switch to on, turns on transmitter motion sensor, activating passive features. Manual functions are not affected by passive on/off slider switch position.

ARMING/DISARMING UTD

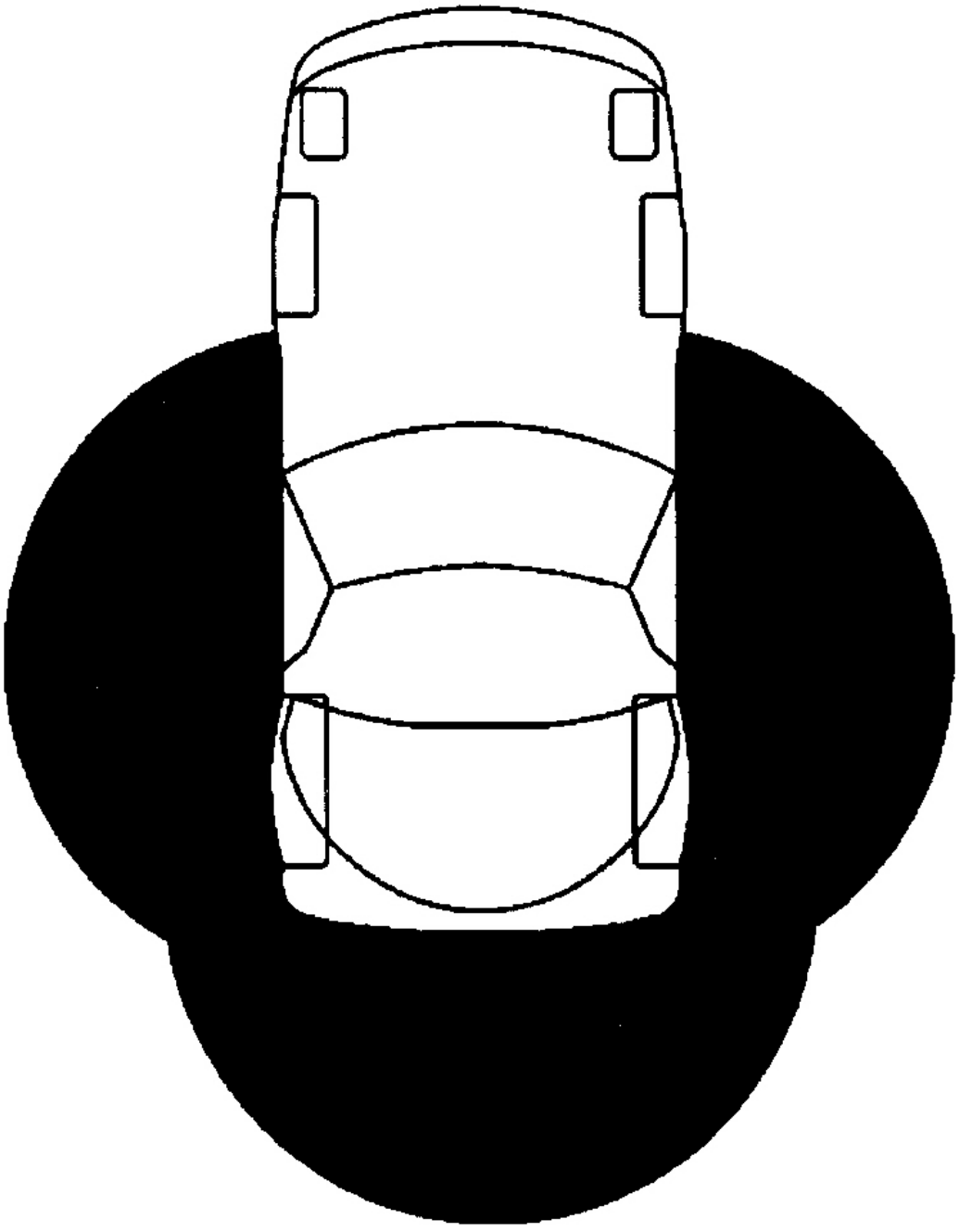
When a lock command is received by Door Control Modules (DCMs), Body Control Module (BCM) will arm Universal Theft Deterrent (UTD) system. The BCM turns off courtesy lights and sounds vehicle horn indicating UTD is armed. When doors or hatch is unlocked, BCM disarms UTD.

To send a disarm UTD message to BCM, the following conditions must exist: a valid transmitter is in range, key is not in ignition, and remote control door lock receiver has identified a passive or manual unlock command or hatch release command from a valid transmitter.

To send an arm UTD message to BCM, the following conditions must exist: all valid transmitters are out of range for 5 seconds (passive mode activated) or transmitter LOCK button has been pressed and key is not in ignition.

OPERATIONAL RANGE

Transmitter is in range when located to either side of vehicle or behind vehicle within 50-100 ft. (manual mode) or 5-25 ft. (passive mode) of vehicle. Operational range is considerably less in passive mode as compared with manual mode. See **Fig. 1** . Operational range varies with orientation of transmitter. As useful battery life decreases, so will operational range of transmitter. Replace transmitter battery when operational range has severely decreased.



SHADED AREA IDENTIFIES
TRANSMITTER OPERATIONAL RANGE

G96A29686

Fig. 1: Transmitter Operational Range
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
Body Control Module (BCM)	Behind Carpet In Right Footwell, Mounted To Toe Board
Data Link Connector (DLC)	Behind Left Side Of Instru ment Panel, Below Steering Column Gearshift Lever
Door Ajar Indicator Switch	Rear Of Door, Integral With Latch
Foglight/Rear Compartment Lid Release Switch	In Instrument Panel, To Left Of Steering Column
Ignition Switch	Left Side Of Instrument Panel, Between Radio & Steering Column
Instrument Panel Electrical Center	Behind Carpet In Right Footwell, Mounted To Toe Board
Right Rear Compartment Lid Lock Release Solenoid	Right Side Of Rear Compartment, On Right Compartment Latch
Star Connectors No. 1 & 2	In DLC Instrument Panel Harness
Underhood Electrical Center	Right Rear Corner Of Engine Compartment, Between Battery & Coolant Reservoir

SYSTEM PROGRAMMING

TRANSMITTER PROGRAMMING & SYNCHRONIZATION

Programming Transmitters

Entering a specific button sequence on Driver Information Center (DIC) initiates Remote Function Actuation (RFA) programming. Pressing transmitter LOCK and UNLOCK button programs up to 3 transmitters. Instrument Panel Cluster (IPC) indicates when programming sequence is complete. Remote control door lock receiver memory retains current access codes if a programming sequence is interrupted or battery is disconnected. Perform the following steps:

1. Turn ignition switch to RUN position. Turn radio off. Press Driver Information Center (DIC) RESET button to clear any Instrument Panel Cluster (IPC) warning messages. Press OPTIONS button on DIC until IPC display is blank.
2. Press and hold RESET button for 3 seconds. Press OPTIONS button until FOB TRAINING message is displayed. Press RESET button to begin programming sequence.
3. Simultaneously press and hold LOCK and UNLOCK buttons on first transmitter for 12 seconds. IPC will indicate when transmitter is programmed and when to proceed. Repeat this step for each transmitter.

Programming Cancellation

Remote control door lock receiver will cancel programming sequence if one of the following conditions occur:

- Program Mode Is Exited Through DIC
- Ignition Is Turned Off
- Three Transmitters Have Been Programmed
- RFA System Has Been In Program Mode For More Than 2 Minutes & No Transmitters Have Been Programmed

Synchronizing Transmitters

Each transmitter has a unique code that changes every 5 seconds. After programming transmitter to vehicle, the remote control door lock receiver will update this code every 5 seconds to match code programmed in transmitter. Transmitter may not communicate or become out of synchronization if one of the following conditions occur:

- Transmitter Battery Is Disconnected
- Vehicle Battery Is Disconnected
- Transmitter & Vehicle Are Separated For 5 Weeks Or More
- Receiver Is Disconnected

Move a programmed transmitter within range. Press transmitter LOCK and UNLOCK buttons simultaneously for 6 seconds. Vehicle horn will chirp once when transmitters are synchronized.

TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING

Programming Sensors

1. Turn ignition on. Press Driver Information Center (DIC) RESET button to clear any Instrument Panel Cluster (IPC) warning messages. Press DIC OPTIONS button until IPC display is blank.
2. Press and hold DIC RESET button for 3 seconds. Press DIC OPTIONS button again until TIRE TRAINING message appears. Press DIC RESET button until IPC LEARN L FRONT TIRE message appears to begin programming sequence.

NOTE: TPM Sensor Programming Tool (J 41760) is a large magnet.

3. Install TPM Sensor Programming Tool (J 41760) over left front wheel valve stem. See **Fig. 2** . Vehicle horn will sound, indicating TPM sensor is programmed. Proceed to next TPM sensor as directed by IPC messages.

Programming Cancellation

Programming sequence will cancel if one of the following conditions occur:

- Program Mode Is Exited Through DIC
- Ignition Is Turned Off

- All 4 TPM Sensors Have Been Programmed
- TPM system Has Been In Program Mode For More Than 2 Minutes & No Sensors Have Been Programmed

If program mode is cancelled with less than 4 TPM sensors stored, remote control door lock receiver will only accept codes programmed up to that point.

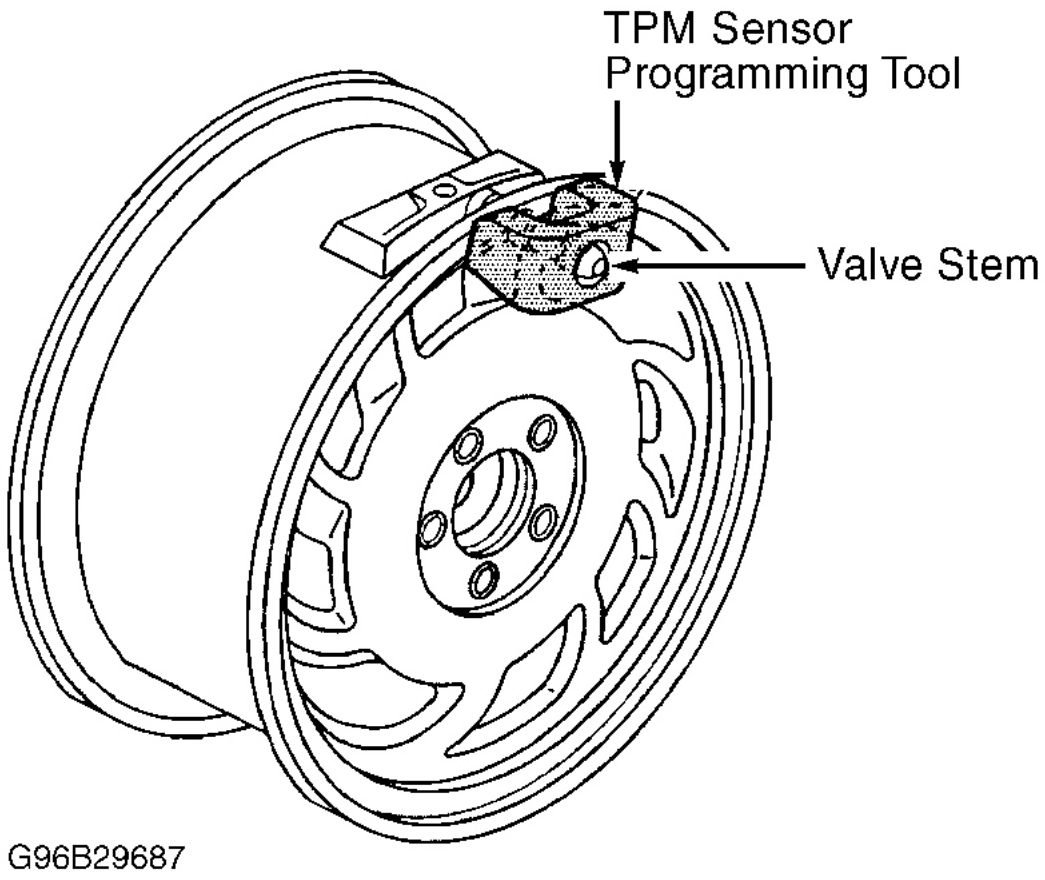


Fig. 2: Programming TPM Sensors
Courtesy of GENERAL MOTORS CORP.

BCM PROGRAMMING & RPO CONFIGURATION

NOTE: Use scan tool to program BCM. Follow scan tool screen prompts to complete programming procedure.

Replacement BCMs EEPROM chip must be programmed with proper Regular Production Option (RPO)

configurations. EEPROM stores vehicle options. When BCM is replaced, replacement BCM must be programmed to identify the following information:

- Country Of Sale (Canada, Europe, US, etc.)
- Front Fog Lights
- HVAC (C60 Manual Or CJ2 Automatic)
- Memory Options
- Real Time Damping (RTD)
- Tire Pressure Monitor (TPM)

If BCM is not properly programmed, vehicle will exhibit a no start condition. If BCM is not properly programmed, BCM will set default values for some systems. These default values may cause malfunctions in other systems.

BCM must be programmed to accept resistance value of existing vehicle keys to allow PASS-Key operation. When BCM is replaced, BCM is programmed to accept first PASS-Key resistance value detected. If BCM is unable to detect a valid PASS-Key resistance value, BCM will end programming sequence and a BCM DTC B2735 will set.

TROUBLE SHOOTING

NOTE: Use this check as a starting point for any RFA complaint to determine next logical step in diagnosing complaint. RFA and TPM system use same receiver, TPM system malfunctions must be accessed through RFA system.

RKE DIAGNOSTIC SYSTEM CHECK

1. Turn ignition off. Install scan tool. Turn ignition on. Attempt to establish communications with Remote Function Actuation (RFA) system. If scan tool communicates with RFA system, go to next step. If scan tool does not communicate with RFA system, go to step 3).
2. Using scan tool, select RFA DTC function. Check for RFA system DTCs. If DTCs are stored, see **DTC IDENTIFICATION** table under DIAGNOSTIC TROUBLE CODES under SELF-DIAGNOSTIC TESTING. Perform appropriate test. If DTCs are not stored, go to step 4).
3. Attempt to establish communications with other systems connected to same serial data line (PCM, BCM, ABS, IPC, etc.). If scan tool communicates with other systems, go to step 5). If scan tool does not communicate with other systems, repair serial data line as necessary. Further information on serial data line testing and repair is not available.
4. Operate transmitter through all button and switch positions. If transmitter is operating properly, system is okay. Test is complete. If transmitter is not operating properly, see procedures in **RKE TRANSMITTER CHECK** .
5. Turn ignition off. Disconnect remote control door lock receiver connector. Receiver is located above left rear wheelwell. Turn ignition on. Using a test light connected to ground, check for power on remote control door lock receiver connector terminal "A" (Orange wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 9).

6. Using test light connected to battery voltage, probe remote control door lock receiver harness connector terminal "G" (Black/White wire). If test light illuminates, go to next step. If test light does not illuminate, go to step 11).
7. Using a DVOM, check for continuity between remote control door lock receiver connector terminal "D" (Pink wire) and Data Link Connector (DLC) terminal No. 2 (Purple wire). If continuity exists, go to next step. If continuity does not exist, go to step 10).
8. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program all RFA transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to step 12).
9. Repair open remote control door lock receiver connector harness Orange wire (circuit No. 540). Inspect mini fuse No. 27 (located in power distribution center). If fuse is open, locate and repair short to ground in circuit No. 540 (Orange wire). After repair, go to step 12).
10. Repair open remote control door lock receiver connector circuit No. 1045 (Pink wire). After repair, go to step 12).
11. Repair open remote control door lock receiver connector circuit No. 851 (Black/White wire). After repair, go to next step.
12. Turn ignition off. Install or connect components which were removed or disconnected. Clear DTCs. See **CLEARING CODES** under SELF-DIAGNOSTIC TESTING. If DTCs are cleared, system is okay.

RKE TRANSMITTER CHECK

1. If referenced to this procedure from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this procedure from RKE DIAGNOSTIC SYSTEM CHECK, perform **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Operate door lock switches manually or using scan tool. If door locks operate properly, go to next step. If door locks do not operate properly, see POWER DOOR LOCKS article.
3. Turn ignition off. Put automatic transmission in Park or apply parking brake on manual transmission. Press vehicle hatch release switch. If hatch released, go to next step. If hatch did not release, see POWER HATCH & FUEL DOOR RELEASE article.
4. Turn ignition off. Close both vehicle doors. Place transmitter in range. Transmitter is in range when located to either side of vehicle or behind vehicle within 50-100 ft. (manual mode) or 5-25 ft. (passive mode) of vehicle. Turn transmitter passive switch off. Press LOCK button on transmitter. If doors lock, go to next step. If doors do not lock, go to step 9).
5. Place transmitter in range. Press UNLOCK button on transmitter. First activation of unlock button unlocks driver door. Second activation of unlock button unlocks passenger door. If both doors are unlocked, go to next step. If both or either door did not unlock, go to step 15).
6. Remove ignition key. Turn transmitter passive switch on. Move transmitter out of range. Transmitter is in range when located to either side of vehicle or behind vehicle within 50-100 ft. (manual mode) or 5-25 ft. (passive mode) of vehicle. Both doors should lock. If both doors locked, go to next step. If both doors did not lock, go to step 15.
7. Move transmitter within range. Shake transmitter. Driver door or both doors should unlock (depending on system setup). If appropriate door(s) unlock, go to next step. If appropriate door(s) do not unlock, go to

step 15).

8. Ensure ignition is off. Put automatic transmission in Park or apply parking brake on manual transmission. Press transmitter hatch release button. If hatch released, system is okay. Test is complete. If hatch did not release, go to step 15).
9. Synchronize transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Close both doors. Press transmitter LOCK button. If doors lock, go to step 5). If doors do not lock, go to next step.
10. Program transmitter. See TRANSMITTER PROGRAMMING & SYNCHRONIZATION under SYSTEM PROGRAMMING. Close both doors. Press transmitter LOCK button. If doors lock, go to step 5). If doors do not lock, go to next step.
11. Using a known good transmitter, program transmitter. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Close both doors. Press transmitter LOCK button. If doors locked, go to next step. If doors did not lock, go to step 14).
12. Inspect transmitter battery for improper installation, wrong battery or rundown or weak battery. If a problem was identified, go to next step. If a problem was not identified, go to step 15).
13. Replace transmitter battery. Program transmitter. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Go to step 16).
14. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to step 16).
15. Replace transmitter. Program transmitter. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Go to next step.
16. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** under SELF-DIAGNOSTIC TESTING. Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

BCM DIAGNOSTIC SYSTEM CHECK

NOTE: Use this check as the starting point for any BCM complaint. BCM is a very reliable component, and is not likely the cause of malfunction. Most malfunctions are caused by faulty wiring, connectors or components.

1. Turn ignition off. Install a scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Turn ignition switch to RUN position. Using scan tool, attempt to communicate with Body Control Module (BCM). If communication with BCM is successful, go to next step. If communication with BCM cannot be successfully established, go to step 3).
2. Using scan tool, read Body Control Module (BCM) DTCs. If any DTCs are set, see BODY CONTROL MODULE article. If BCM DTCs are not set, system is okay.
3. Attempt to establish communications with other systems connected to same serial data line (PCM, RFA, IPC, etc.). If scan tool communicates with other systems, go to next step. If scan tool does not communicate with other systems, repair serial data line as necessary. See BODY CONTROL MODULE article.

4. Turn ignition switch to RUN position. Using a test light connected to ground, check each BCM fuse. If test light illuminates for all fuses, go to next step. If test light does not illuminate for all fuses, go to step 9).
5. Turn ignition off. Disconnect 3 BCM connectors C1, C2 and C3. BCM is located behind right kick panel. Turn ignition switch to RUN position. Using a test light connected to ground, check all BCM connector power circuits. If test light illuminates for all power circuits, go to next step. If test light does not illuminate for all power circuits, go to step 11).
6. With a test light connected to battery positive terminal, check all BCM connector ground circuits. If test light illuminates for all ground circuits, go to next step. If test light does not illuminate for all ground circuits, go to step 12).
7. Using a DVOM, check for continuity between BCM connector terminal B6 (Light Green wire) and Data Link Connector (DLC) terminal No. 2 (Purple wire). If continuity exists, go to next step. If continuity does not exist, go to step 10).
8. Replace BCM. Program BCM. See **BCM PROGRAMMING & RPO CONFIGURATION** under SYSTEM PROGRAMMING. After programming BCM, go to step 13).
9. Repair open in ignition or battery feed to BCM fuse. If fuse is open, locate and repair short in circuit connected to open fuse. After repair is complete, go to step 13).
10. Locate and repair open in BCM connector B6 (Light Green wire). After repair is complete, go to step 13).
11. Locate and repair open in BCM power circuit. After repair is complete, go to step 13).
12. Locate and repair open in BCM ground circuit. After repair is complete, go to next step.
13. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** under SELF-DIAGNOSTIC TESTING.

SELF-DIAGNOSTIC TESTING

VISUAL INSPECTION

Before entering diagnostics, perform a comprehensive visual inspection of component integrity, connector damage, improper connector mating, poor wire to terminal connections, wire chafing, damaged terminals, and dirty or corroded terminals. The most common problem is faulty wiring and connections.

WARNING LIGHT

If a malfunction occurs in Remote Keyless Entry (RKE) system, Remote Function Actuation (RFA) system will use SERVICE TIRE WARN SYS warning light located on Instrument Panel Cluster (IPC) to notify driver of a problem with RKE system or tire pressure monitoring system.

RETRIEVING CODES

On-Board Diagnostics

To enter diagnostic display function perform following step in order:

1. Turn ignition switch to RUN position.

2. Press RESET button to acknowledge any warning messages present.
3. Press and hold OPTIONS button on Driver Information Center (DIC).
4. While holding OPTIONS button, press FUEL button 4 times within 10 seconds.
5. System will enter automatic display mode. In automatic display mode, each module will display in sequence, listing DTCs (if any). DTCs for tire pressure monitoring system (if any) will also be displayed with DTCs for RFA system. See **DIAGNOSTIC TROUBLE CODES** . Clear DTCs after repair is complete. See **CLEARING CODES** .

Scan Tool Diagnostics

Connect scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Access DTCs for Remote Function Actuation (RFA) system. DTCs for tire pressure monitoring system (if any) will also be displayed with DTCs for RFA system. See DIAGNOSTIC TROUBLE CODES. Clear DTCs after repair is complete. See **CLEARING CODES** .

CLEARING CODES

Using IPC DTC clearing feature. Using a scan tool, clear DTCs. If DTCs are not cleared using a scan tool, DTCs will automatically clear after 50 ignition cycles if fault has not reoccurred.

DIAGNOSTIC TROUBLE CODES

Current or history DTCs can be stored. History DTCs will normally indicate an intermittent problem. Not all DTCs will cause SERVICE TIRE WARN SYS warning light to come on. See **DTC IDENTIFICATION** table. Perform appropriate test.

DTC IDENTIFICATION

Code	Description
B0605 (1)	Receiver Internal Memory Malfunction
B2805 (1)	No Transmitters Programmed
C2100 (2)	LF TPM Sensor Malfunction
C2105 (2)	RF TPM Sensor Malfunction
C2110 (2)	RR TPM Sensor Malfunction
C2115 (2)	LR TPM Sensor Malfunction
C2120 (2)	TPM System Malfunction (No Sensors Received)
C2121 (2)	TPM System Programming Malfunction (No Sensors Programmed)
U1000 (1)	(3) Loss Of Communication Undetermined (No SOH Received)
U1016 (1)	(3) Loss Of Communication With PCM (No SOH Message Received)
U1064 (1)	(3) Loss Of Communication With BCM (No SOH Message Received)
U1096 (1)	(3) Loss Of Communication With IPC (No SOH Message Received)
U1255 (1)	Serial Data Line Malfunction

(1) Remote Function Actuation (RFA) system DTC.

(2) Tire Pressure Monitoring (TPM) system DTC.

(3) SOH is an abbreviation for State Of Health.

DIAGNOSTIC TESTS

DTC B0605: RECEIVER INTERNAL MEMORY MALFUNCTION

Description

RFA system calibrations are stored in EEPROM. When ignition is first turned on, receiver performs internal tests on EEPROM and can determine integrity of EEPROM's non-volatile memory. Receiver compares is previously stored checksum with checksum calculated when ignition is first turned on. If 2 checksums do not match, receiver will indicate a calibration malfunction (checksum error) is current.

DTC B0605 will set and store in memory if stored checksum does not match calculated checksum or receiver detects an internal memory malfunction (Checksum error). This condition must occur when ignition is first turned ON. SERVICE TIRE WARN SYS IPC warning will illuminate. All remote control functions will disable.

Under all fault conditions, DTC B0605 requires an ignition cycle from LOCK/OFF to RUN position before DTC will clear. If conditions for malfunction no longer exist, history DTC will clear after 50 consecutive ignition cycles. DTC B0605 will also clear when conditions no longer exist or when scan tool is used to clear codes.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to next step.
3. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

EEPROM is not removable from receiver, DTC B0605 is an internal malfunction to receiver, can only be serviced by receiver replacement. Transmitters and TPM sensors must be programmed to new receiver.

DTC B2805: NO TRANSMITTERS PROGRAMMED

Description

When a receiver is replaced, all transmitters must be programmed to new electronic door lock receiver. DTC will remain current until at least one transmitter is programmed. Up to 3 identification codes can be stored by receiver.

DTC B2805 will set and store in receiver memory when electronic door lock receiver indicates no transmitter Vehicle Access Code (VAC) has been programmed. No driver warning message will be displayed for this DTC.

DTC B2805 will automatically clear when electronic door lock receiver has indicated a valid VAC was programmed properly.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Program transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. If programming procedure was successful, go to next step. If programming procedure was not successful, go to step 4).
3. Clear DTCs. See **CLEARING CODES** . Using scan tool, check for RFA DTCs. If DTC B2805 is set current, go to step 7). If DTC B2805 is not set current, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
4. Program a known-good transmitter. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. If programming procedure was successful, go to next step. If programming procedure was not successful, go to step 7).
5. Inspect malfunctioning transmitter battery for improper installation, wrong battery or weak battery. If any of these battery conditions exist, go to next step. If these battery conditions do not exist, go to step 8).
6. Replace transmitter battery. After replacing transmitter battery, go to step 2).
7. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to step 9).
8. Replace malfunctioning transmitter. Program transmitter. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Go to next step.
9. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE DIAGNOSTIC SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

DTC B2805 will remain stored in receiver memory until at least one transmitter is programmed.

DTC U1000: LOSS OF COMMUNICATION UNDETERMINED (NO SOH RECEIVED)

Description

Serial data circuit is used to communicate information between systems. Each system in serial data line is assigned to its own recognition code (address). This code is used to identify which module or systems are communicating. Systems periodically send State Of Health (SOH) message to each other. When ignition is first turned on, RFA system send SOH message on serial data line. When RFA receives a response back, RFA system is able to recognize that system by "learning" its SOH recognition code.

DTC U1000 will set and store in RFA system if RFA system is unable to learn SOH code, RFA system is unable to determine what system it lost communication with (BCM, PCM or IPC). DTC can set only when ignition is first turned on and must be present for at least 5 seconds. No driver warning message will be displayed for this DTC.

Under all fault conditions, DTC U1000 requires an ignition cycle from LOCK/OFF to RUN position before the DTC will clear. If conditions for malfunction no longer exist, history DTC will clear after 50 consecutive ignition cycles. DTC U1000 will also clear when conditions no longer exist, using IPC clearing DTCs feature, or when scan tool is used to clear codes.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition off. Install a scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Turn ignition on. Using scan tool, attempt to communicate with Body Control Module (BCM). If communication with BCM is successful, go to next step. If communication with BCM is not successful, see procedures in **BCM DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
3. Using scan tool, attempt to communicate with Instrument Panel Cluster (IPC). If communication with IPC is successful, go to next step. If communication with IPC is not successful, further diagnostic information is not available.
4. Using scan tool, attempt to communicate with Powertrain Control Module (PCM). If communication with PCM is successful, go to step 5). If communication with PCM is not successful, see POWERTRAIN OBD SYSTEM CHECK in TESTS W/CODES article in ENGINE PERFORMANCE section.
5. Using scan tool, read RFA DTCs. If DTC U1255 is set, go to DTC U1255. If DTC U1255 is not set, go to next step.
6. If DTC U1016, U1064 or U1096 is set, go to applicable test. If DTC U1016, U1064 or U1096 is not set, go to next step.
7. Inspect serial data line for an intermittent open, short to ground or short to voltage between RFA system and BCM, IPC and PCM. Inspect splice pack 206 (instrument panel harness serial data line). Make sure bus bar is properly inserted. Inspect harness connectors for loose or damaged terminals. If a problem was found and repaired, go to step 10). If a problem was not found, go to next step.
8. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Using scan tool, read RFA DTCs. If DTC U1000 is set, go to next step. If DTC U1000 is not set, system is okay.

9. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to next step.
10. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

If problem is an intermittent loss of communications. Carefully inspect serial data line and related components for following intermittent conditions:

- Intermittent open or short to ground or voltage in serial data line.
- Intermittent loss of communication with BCM, IPC or PCM.
- Damaged or loose star connector terminals.
- Loss of communications when ignition is first turned on.

If serial data line is shorted to ground or voltage, all systems connected to same serial data line will not be able to communicate properly.

DTC U1016: LOSS OF COMMUNICATION WITH PCM (NO SOH MESSAGE RECEIVED)

Description

Serial data circuit is used to communicate information between systems. Each system in serial data line is assigned to its own recognition code (address). This code is used to identify which module or systems are communicating. Systems periodically send State Of Health (SOH) messages to each other.

DTC U1016 will set if system sending SOH message fails to receive SOH response back, DTC identifying system that did not respond will set and store in each system affected. No driver warning message will be displayed for this DTC.

Under all fault conditions, DTC U1016 requires an ignition cycle from LOCK/OFF to RUN position before the DTC will clear. If conditions for malfunction no longer exist, history DTC will clear after 50 consecutive ignition cycles. DTC B1658 will also clear when conditions no longer exist, using IPC clearing DTCs feature or when scan tool is used to clear codes.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition off. Install a scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Turn ignition on. Using scan tool, attempt to communicate with Powertrain Control Module

(PCM). If communication with PCM is successful, go to next step. If communication with PCM is not successful, see POWERTRAIN OBD SYSTEM CHECK in TESTS W/CODES article in ENGINE PERFORMANCE section.

3. Using scan tool, read RFA DTCs. If DTC U1255 is set, go to DTC U1255. If DTC U1255 is not set, go to next step.
4. Using scan tool, read Instrument Panel Cluster (IPC) DTCs. If DTC U1016 is set, go to **BCM DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING. If DTC U1016 is not set, go to next step.
5. Inspect serial data line for an intermittent open, short to ground or short to voltage between RFA system and PCM. Inspect splice pack 206 (instrument panel harness serial data line). Make sure bus bar is properly inserted. Inspect harness connectors for loose or damaged terminals. If a problem was found and repaired, go to step 8). If a problem was not found, go to next step.
6. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Using scan tool, read RFA DTCs. If DTC U1016 is set, go to next step. If DTC U1016 is not set, system is okay.
7. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to next step.
8. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

If problem is an intermittent loss of communications. Carefully inspect serial data line and related components for following intermittent conditions:

- Intermittent open or short to ground or voltage in serial data line.
- Intermittent loss of communication with PCM.
- Damaged or loose star connector terminals.

If serial data line is shorted to ground or voltage, all systems connected to same serial data line will not be able to communicate properly. If DTC U1016 is stored in RFA system, check for same DTC stored in Instrument Panel Cluster (IPC). IPC also monitors SOH message from PCM. If PCM has DTC U1016 stored, check PCM for intermittent malfunction. If IPC does not have DTC U1016 stored, check for open in serial data line between RFA system and PCM. RFA system must also be checked for intermittent operation due to a loss of power or ground to receiver. After repair, ensure DTC is clear from all systems capable of storing this DTC.

DTC U1064: LOSS OF COMMUNICATION WITH BCM (NO SOH MESSAGE RECEIVED)

Description

Serial data circuit is used to communicate information between systems. Each system in serial data line is

assigned to its own recognition code (address). This code is used to identify which module or systems are communicating. Systems periodically send State Of Health (SOH) message to each other.

DTC U1064 will set and store in RFA system if RFA system sends out SOH message to BCM, and no SOH message response was sent back. This condition must be present for 5 seconds. No driver warning message will be displayed for this DTC.

Under all fault conditions, DTC U1064 requires an ignition cycle from LOCK/OFF to RUN position before the DTC will clear. If conditions for malfunction no longer exist, history DTC will clear after 50 consecutive ignition cycles. DTC U1064 will also clear when conditions no longer exist, using IPC clearing DTCs feature or when scan tool is used to clear codes.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition off. Install a scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Turn ignition on. Using scan tool, attempt to communicate with Body Control Module (BCM). If communication with BCM is successful, go to next step. If communication with BCM is not successful, see procedures in **BCM DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
3. Using scan tool, read RFA DTCs. If DTC U1255 is set, go to DTC U1255. If DTC U1255 is not set, go to next step.
4. Using scan tool, read Instrument Panel Cluster (IPC) DTCs. If DTC U1064 is set, go to **BCM DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING. If DTC U1064 is not set, go to next step.
5. Inspect serial data line for an intermittent open, short to ground or short to voltage between RFA system and BCM. Inspect splice pack No. 206 (instrument panel harness serial data line). Make sure bus bar is properly inserted. Inspect harness connectors for loose or damaged terminals. If a problem was found and repaired, go to step 8). If a problem was not found, go to next step.
6. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Using scan tool, read RFA DTCs. If DTC U1064 is set, go to next step. If DTC U1064 is not set, system is okay.
7. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to next step.
8. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

If problem is an intermittent loss of communications. Carefully inspect serial data line and related components for following intermittent conditions:

- Intermittent open or short to ground or voltage in serial data line.
- Intermittent loss of communication with BCM.
- Damaged or loose star connector terminals.

If serial data line is shorted to ground or voltage, all systems connected to same serial data line will not be able to communicate properly. If DTC U1064 is stored in RFA system, check for same DTC stored in Instrument Panel Cluster (IPC). IPC also monitors SOH message from BCM. If IPC has DTC U1064 stored, check BCM for intermittent malfunction. If BCM does not have DTC U1064 stored, check for open in serial data line between RFA system and BCM. RFA system must also be checked for intermittent operation due to a loss of power or ground to receiver. After repair, ensure DTC is clear from all systems capable of storing this DTC.

DTC U1096: LOSS OF COMMUNICATION WITH IPC (NO SOH MESSAGE RECEIVED)

Description

Serial data circuit is used to communicate information between systems. Each system in serial data line is assigned to its own recognition code (address). This code is used to identify which module or systems are communicating. Systems periodically send State Of Health (SOH) message to each other.

DTC U1096 will set and store in RFA system if RFA system sends out SOH message to Instrument Panel Cluster (IPC), and no SOH message response was sent back. This condition must be present for 5 seconds. No driver warning message will be displayed for this DTC.

Under all fault conditions, DTC U1096 requires an ignition cycle from LOCK/OFF to RUN position before the DTC will clear. If conditions for malfunction no longer exist, history DTC will clear after 50 consecutive ignition cycles. DTC U1064 will also clear when conditions no longer exist, using IPC clearing DTCs feature or when scan tool is used to clear codes.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition off. Install a scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Turn ignition on. Using scan tool, attempt to communicate with Instrument Panel Cluster (IPC). If communication with IPC is successful, go to next step. If communication with IPC is not successful, see procedures in **BCM DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
3. Using scan tool, read RFA DTCs. If DTC U1255 is set, go to DTC U1255. If DTC U1255 is not set, go to next step.
4. Using scan tool, read Body Control Module (BCM) DTCs. If DTC U1096 is set, further diagnostic information is not available. If DTC U1096 is not set, go to next step.
5. Inspect serial data line for an intermittent open, short to ground or short to voltage between RFA system and IPC. Inspect splice pack 206 (instrument panel harness serial data line). Make sure bus bar is properly inserted. Inspect harness connectors for loose or damaged terminals. If a problem was found and repaired, go to step 8). If a problem was not found, go to next step.

6. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Using scan tool, read RFA DTCs. If DTC U1096 is set, go to next step. If DTC U1096 is not set, system is okay.
7. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to next step.
8. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

If problem is an intermittent loss of communications. Carefully inspect serial data line and related components for following intermittent conditions:

- Intermittent open or short to ground or voltage in serial data line.
- Intermittent loss of communication with IPC.
- Damaged or loose star connector terminals.

If serial data line is shorted to ground or voltage, all systems connected to same serial data line will not be able to communicate properly. If DTC U1096 is stored in RFA system, check for same DTC stored in Body Control Module (BCM). BCM also monitors SOH message from IPC. If BCM has DTC U1096 stored, check IPC for intermittent malfunction. If BCM does not have DTC U1096 stored, check for open in serial data line between RFA system and IPC. RFA system must also be checked for intermittent operation due to a loss of power or ground to receiver. After repair, ensure DTC is clear from all systems capable of storing this DTC.

DTC U1255: SERIAL DATA LINE MALFUNCTION

Description

Serial data circuit is used to communicate information between systems. Each system in serial data line is assigned its own recognition code (address). This code is used to identify which module or systems are communicating. Systems periodically send State Of Health (SOH) messages to each other.

DTC U1255 will set and store in RFA system if RFA system detects an open or short to ground or voltage on serial data line circuit. This condition must be present for one seconds. No driver warning message will be displayed for this DTC.

Under all fault conditions, DTC U1255 requires an ignition cycle from LOCK/OFF to RUN position before the DTC will clear. If conditions for malfunction no longer exist, history DTC will clear after 50 consecutive ignition cycles. DTC U1064 will also clear when conditions no longer exist, using IPC clearing DTCs feature or when scan tool is used to clear codes.

Testing

1. If referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to next step. If not referenced to this test from RKE DIAGNOSTIC SYSTEM CHECK, go to **RKE DIAGNOSTIC SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition off. Install a scan tool to Data Link Connector (DLC). DLC is located under driver side of dashboard. Turn ignition on. Using scan tool, attempt to establish communications with other systems connected to same serial data line (PCM, BCM, IPC, etc.). If scan tool communicates with other systems, go to step 3). If scan tool does not communicate with other systems, repair serial data line as necessary. Further information on serial data line testing and repair is not available.
3. Inspect serial data line for an intermittent open, short to ground or short to voltage between RFA system and IPC. Inspect splice pack No. 206 (instrument panel harness serial data line). Make sure bus bar is properly inserted. Inspect harness connectors for loose or damaged terminals. If a problem was found and repaired, go to step 6). If a problem was not found, go to next step.
4. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Using scan tool, read RFA DTCs. If DTC U1255 is set, go to next step. If DTC U1255 is not set, system is okay.
5. Replace remote control door lock receiver. See procedures in **REMOTE CONTROL DOOR LOCK RECEIVER** under REMOVAL & INSTALLATION. Program both transmitters. See **TRANSMITTER PROGRAMMING & SYNCHRONIZATION** under SYSTEM PROGRAMMING. Program all Tire Pressure Monitor (TPM) sensors. See **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** under SYSTEM PROGRAMMING. Go to next step.
6. Turn ignition off. Ensure all components and connectors are connected and installed properly. Turn ignition on. Clear DTCs. See **CLEARING CODES** . Go to RKE SYSTEM CHECK under TROUBLE SHOOTING.

Diagnostic Aids

If problem is an intermittent loss of communications. Carefully inspect serial data line and related components for following intermittent conditions:

- Intermittent open or short to ground or voltage in serial data line.
- Damaged or loose star connector terminals.

If serial data line is shorted to ground or voltage, all systems connected to same serial data line will not be able to communicate properly. If DTC U1255 is stored in RFA system, check for same DTC stored in other systems capable of storing this DTC. If other systems have DTC U1255 stored, check for open or short in serial data line. After repair, ensure DTC is clear from all systems capable of storing this DTC.

REMOVAL & INSTALLATION

REMOTE CONTROL DOOR LOCK RECEIVER

Removal

The remote control door lock receiver is located over left rear wheelwell. Turn ignition off. Remove left rear tub trim plate. Pull on retainer at back side of receiver. Pull out receiver to expose connector. Disconnect receiver

connector. See **Fig. 3** . Remove receiver.

Installation

Connect receiver connector. Align receiver with slots on retainer. Snap receiver into place on retainer. To complete installation, reverse removal procedure. Program transmitters. See procedures in **TRANSMITTER PROGRAMMING** . Program TPM sensors. See procedures in **TIRE PRESSURE MONITOR (TPM) SENSOR PROGRAMMING** .

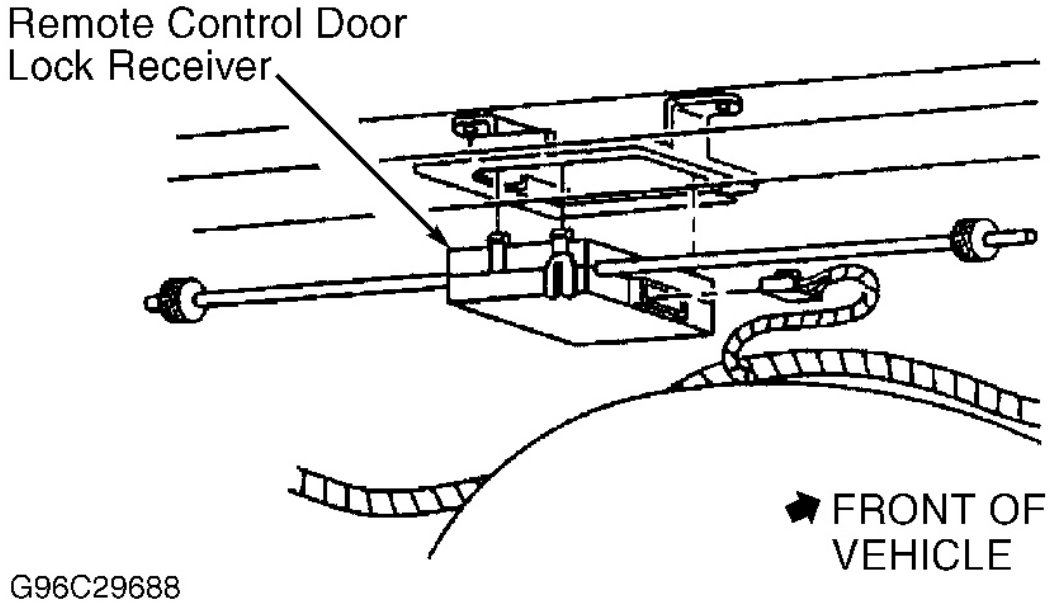


Fig. 3: Removing & Installing Remote Control Door Lock Receiver
Courtesy of GENERAL MOTORS CORP.

WIRING DIAGRAMS

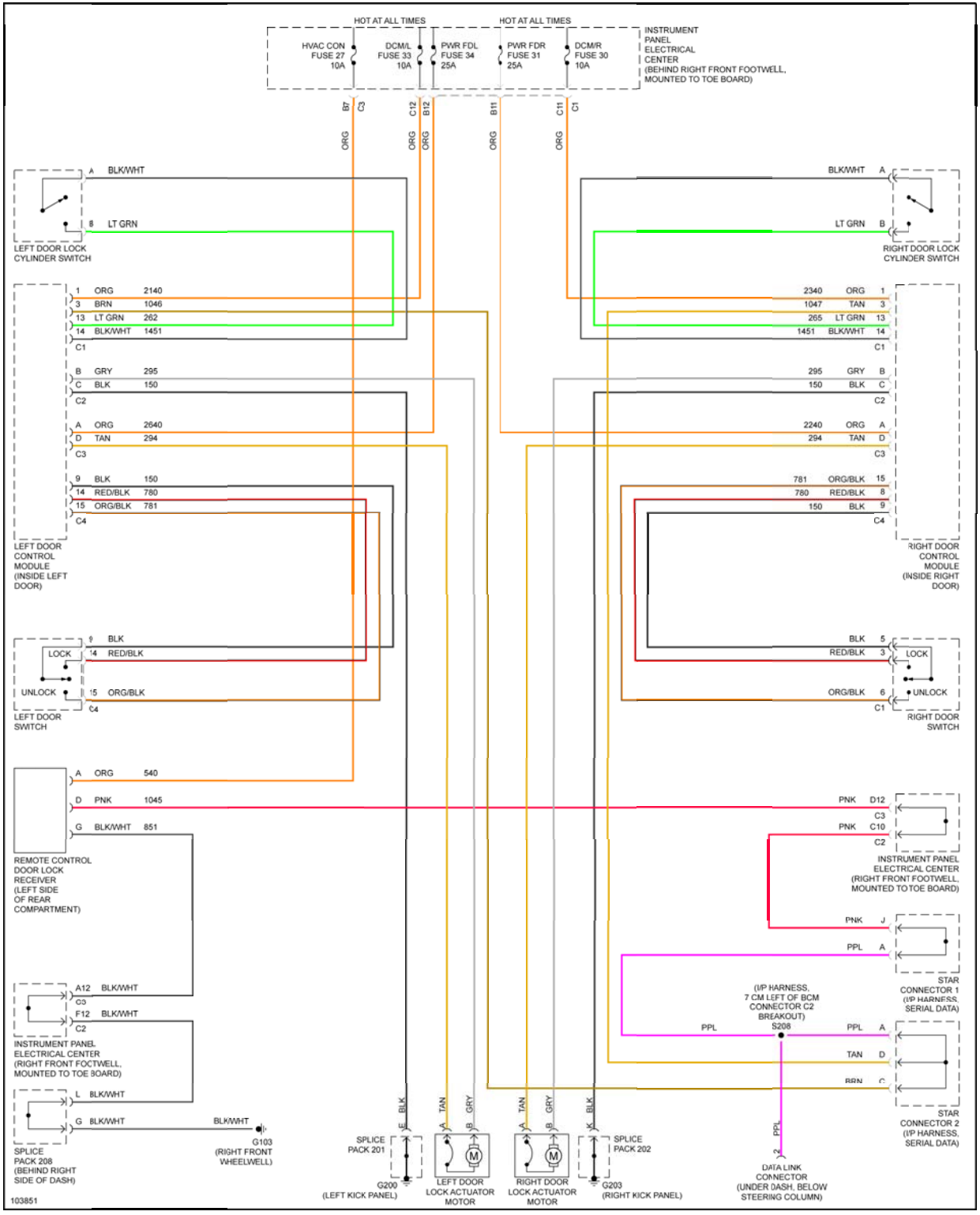

HOT AT ALL TIMES
HOT AT ALL TIMES
HVAC CON FUSE 27 10A
DCM/L FUSE 33 10A
PWR FDL FUSE 34 25A
PWR FDR FUSE 31 25A
DCM/R FUSE 30 10A
INSTRUMENT PANEL ELECTRICAL CENTER (BEHIND RIGHT FRONT FOOTWELL, MOUNTED TO TOE BOARD)
LEFT DOOR LOCK CYLINDER SWITCH
RIGHT DOOR LOCK CYLINDER SWITCH
LEFT DOOR CONTROL MODULE (INSIDE LEFT DOOR)
RIGHT DOOR CONTROL MODULE (INSIDE RIGHT DOOR)
LEFT DOOR SWITCH
RIGHT DOOR SWITCH
REMOTE CONTROL DOOR LOCK RECEIVER (LEFT SIDE OF REAR COMPARTMENT)
INSTRUMENT PANEL ELECTRICAL CENTER (RIGHT FRONT FOOTWELL, MOUNTED TO TOE BOARD)
INSTRUMENT PANEL ELECTRICAL CENTER (RIGHT FRONT FOOTWELL, MOUNTED TO TOE BOARD)
STAR CONNECTOR 1 (I/P HARNESS, SERIAL DATA)
STAR CONNECTOR 2 (I/P HARNESS, SERIAL DATA)
(I/P HARNESS, 7 CM LEFT OF BCM CONNECTOR C2 BREAKOUT)
S208
SPLICE PACK 208 (BEHIND RIGHT SIDE OF DASH)
G103 (RIGHT FRONT WHEELWELL)
SPLICE PACK 201
G200 (LEFT KICK PANEL)
LEFT DOOR LOCK ACTUATOR MOTOR
RIGHT DOOR LOCK ACTUATOR MOTOR
SPLICE PACK 202
G203 (RIGHT KICK PANEL)
DATA LINK CONNECTOR (UNDER DASH, BELOW STEERING COLUMN)
103851

Fig. 4: Remote Keyless Entry System Wiring Diagram