DESCRIPTION & OPERATION

Sun roof can be moved by 2 separate switches, located in overhead console, to any position: fully OPEN, partially open, full VENT, partial VENT and fully CLOSED. When sun roof is in VENT position, rear of glass panel is raised to limit of travel, above roof panel. When opening, glass panel retracts into storage space between roof and headliner. Major components of the power sun roof assembly are: sliding glass panel, sun roof switches, limit switch, sunshade panel, wind deflector, drain channel, lifter arms, track, motor and module and wiring harness.

Sun roof control module determines sun roof motor direction based on inputs received from sun roof switches. When ignition switch in RUN position or when Retained Accessory Power (RAP) is active, voltage is applied to sun roof control module enabling operation. Sun roof motor direction is determined by polarity of voltage applied to motor. Sun roof motor limit switch is used to tell sun roof control module that sun roof glass is parallel to roof.

Sun roof uses 2 separate VENT OPEN/CLOSE and OPEN/CLOSE switches to provide control module input selections. With sun roof closed, press switch to OPEN position, sun roof slides open, into roof cavity, until switch is released. To initiate EXPRESS OPEN, move sun roof switch to OPEN position for one second. Sun roof will slide back into roof cavity, to fully open position. If switch is not released within one second, sun roof control module will revert back to manual operation.

VENT mode is initiated by pushing sun roof vent switch to OPEN. Sun roof will open to any vent position until switch is released. To close vent, push sun roof vent switch to CLOSE position. Sun roof will move to close position until switch is released.

When sun roof switch is pressed to CLOSE position, sun roof will move to closed position as long as switch is held. Sun roof motor runs until limit switch indicates glass is parallel to roof surface. Sun roof sunshade will open automatically with window panel to open position but must be closed manually. Sunshade can be opened and closed (if sun roof window panel is closed) manually at any time.

Sun roof can be manually operated by turning center slot in sun roof motor drive gear with large flat bladed screwdriver. Sun roof motor drive gear is made of nylon. Use caution when turning drive gear as not to damage center slot.

COMPONENT LOCATIONS

COMPONENT LOCATIONS

Component	Location
Rear Integration Module (RIM)	Right Rear Of Passenger Compartment, Behind Rear Seatback
Rear Junction Block	Left Side Of Passenger Compartment, Under Rear Seat
Sun Roof Control Module	Rear Of Passenger Compartment Behind Headliner Near Rear Of Sun

	Roof

SERVICING

DRAIN HOSES

Pour about 16 ozs. (.5L) of water slowly into drain channel. Check for water drainage from all 4 hoses. If water flow is restricted, blow out drain hose system with compressed air. If water leaks from headliner, lower headliner and ensure drain hoses are attached to drain tubes.

ADJUSTMENTS

MOTOR & TRACK SYNCHRONIZATION

1. Remove sun roof glass panel. See **GLASS PANEL & SUNSHADE** under REMOVAL & INSTALLATION. Remove sun roof motor. See **MOTOR** under REMOVAL & INSTALLATION.
2. Using medium flat-bladed screwdriver, push rear cable to left until it is at end of its travel. Push forward cable to right until it is at end of its travel.
3. Ensure both sun roof glass panel mounting arms are all the way forward and in full up (vent) position.
4. Install sun roof motor. Install sun roof glass panel. Ensure proper operation of sun roof.

GLASS HEIGHT & OPENING FIT

1. Close sun roof. Slide sun shade completely open. Loosen 2 screws to enable sun roof glass panel to move for adjustment.
2. Move glass panel up or down by hand and tighten 2 screws. Front edge of Glass panel should be flush to 1/32" (0.1 mm) below roof surface. Check glass panel height at each corner. Adjust rear edge of glass panel flush to 1/32" (1.0 mm) above roof surface. Open and close sun roof, check glass panel height. Adjust as necessary. Tighten screws.

TROUBLE SHOOTING

PRE-CHECKS

Water Leak Or Wind Noise

1. Check alignment of glass panel to roof. Adjust as necessary. See **GLASS HEIGHT & OPENING FIT** under ADJUSTMENTS.
2. Ensure glass panel closes completely (excessive gap). Check motor and track synchronization. See **MOTOR & TRACK SYNCHRONIZATION** under ADJUSTMENTS.
3. Ensure drain hoses are not disconnected, frozen, kinked or clogged.
4. Check for improperly positioned or damaged weatherstrip.

Glass Will Not Vent, Sticks in Opening

1. Check alignment of glass panel to roof. Adjust as necessary. See **GLASS HEIGHT & OPENING FIT** under ADJUSTMENTS.
2. Check glass assembly seal for proper attachment and positioning.
3. Seal stuck to metal roof panel. Run feeler gage along edge of seal.

Glass Will Not Open/Close Or Moves Slowly

1. Check for obstructions or foreign objects in tracks or troughs.
2. Ensure voltage to sun roof system is 12.6 volts or 3-5 amps.

Popping Or Gurgling Sounds

Check drain tubes for restriction.

Glass Does Not Close Fully; Glass Goes Past Closed Position To Vent Position

Synchronize track and motor.

Sun Roof Does Not Function Or Perform Properly

Check for broken drive cable or guide.

Noisy Operation/Rattles

1. Ensure glass panel is fitted properly and closes fully.
2. Ensure lifter arm is properly attached to glass panel.
3. Ensure lifter arm plastic slides are properly installed in track slots. 4) Ensure guide tracks are properly secured to housing.
4. Ensure sunshade is installed properly.

Glass Panel Excessive Up/Down Movement

1. Check glass panel mounting tabs bent or positioned incorrectly. Adjust 90 degrees to glass panel.
2. Lifter assemblies not properly connected to glass module.
3. Lifter arm plastic slides not properly installed in track slots.

Tracks Rattle

Tracks not attached to housing securely. Ensure track under clip at rear of housing.

Glass Scratched

1. Check clearance to roof panel. Adjust as necessary. Adjust roof crown as last resort.
2. Inadequate clearance between underside of roof panel and reinforcement.

Sun Roof Is Inoperative Or Operates Intermittently

1. Check for blown fuse, open or loose connections between control switch travel limit switch, express module or motor. See **TROUBLE SHOOTING HINTS** . Check ground connections.

Sun Roof Operates In One Direction Only

Check for faulty control switch. Replace as necessary. Recheck system operation.

Sunshade Rattles

Ensure sunshade is installed properly. Check guides, replace as necessary.

TROUBLE SHOOTING HINTS

1. Before electrical diagnosis, ensure sun roof is not binding due to mechanical failure.
2. Visually inspect RAP Fuse (20-amp). If fuse is open, check Dark Blue wire for short to ground.
3. Ensure electrical connections and ground are clean and tight. Check for broken wire inside insulation which could cause system failure but prove good in continuity/voltage check.
4. Check for proper installation of aftermarket electronic equipment which may effect integrity of other systems.

SYSTEM CHECK

1. Turn ignition to RUN position. Momentarily push sun roof slide switch to EXPRESS OPEN position. Sun roof should slide to fully open position. To abort express open mode, push switch to any position.
2. Push and hold sun roof slide switch to EXPRESS CLOSE position. Sun roof should slide to fully close position. To abort express close mode, press switch to any position.
3. Push and hold sun roof vent switch to OPEN position. Sun roof (rear of glass panel) should lift up to full vent position unless sun roof switch is released.
4. Momentarily push sun roof vent switch to CLOSE position. Sun roof (rear of glass panel) should lower until fully closed position is reached.

SYSTEM TESTS

CAUTION: To prevent damage to terminals, Connector Test Adaptor Kit (J-35616-A) must be used whenever a diagnostic procedure requires checking or probing terminals. To locate and identify terminals, see WIRING DIAGRAMS .

SUN ROOF DOES NOT OPEN

1. If power sun roof system check was performed, go to next step. If power sun roof system check was not performed, go to **SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition to RUN position. Press sun roof vent switch to OPEN position. If sun roof opened to vent

position, go to step 7). If sun roof does not open to vent position, go to next step.

3. Turn ignition to OFF position. Disconnect sun roof control module Black 4-pin connector C1. Turn ignition to RUN position. Using DVOM, measure voltage between sun roof control module connector C1, terminal "A" (Dark Blue wire). If 10-15 volts exists, go to next step. If 10-15 volts does not exist, check operation of Retained Accessory Power (RAP). See appropriate wiring diagram in POWER DISTRIBUTION article in WIRING DIAGRAMS.
4. Using DVOM, measure voltage between sun roof control module harness connector C1, terminals "A" (Dark Blue wire) and "D" (Black wire). If 10-15 volts exists, go to next step. If 10-15 volts does not exist, go to step 11).
5. Turn ignition switch to OFF position. Reconnect sun roof module harness connector C1. Turn ignition switch to RUN position. Using DVOM, backprobe between sun roof control module harness connector C1, terminals "C" (Dark Green wire) and "B" (Light Green wire) while pressing sun roof slide switch to OPEN. If 9-15 volts exists, go tostep 12). If 9-15 volts does not exist, go to next step.
6. Turn ignition switch to OFF position. Disconnect overhead console sun roof switch harness Natural 18-pin connector C1. Turn ignition switch to RUN position. Using DVOM, measure resistance between sun roof switch harness connector C1, terminal No. 2 (Dark Blue wire) and ground. If resistance is 0-3 ohms, go to step 8). If resistance is not 0-3 ohms, go to step 13).
7. Turn ignition switch to OFF position. Disconnect overhead console sun roof switch harness Natural 18-pin connector C1. Turn ignition switch to RUN position. Using a fused jumper (20-amp), connect between sun roof switch connector C1, terminals No. 2 (Dark Blue wire) and No. 5 (Brown wire). If sun roof opens, go to step 13). If sun roof does not open, go to next step.
8. Turn ignition switch to OFF position. Disconnect sun roof control module harness connector C2. Measure resistance of Brown wire between sun roof control module harness connector C2, terminal No. 6 and sun roof switch harness connector C1, terminal No. 5. If 0-3 ohms exists, go to next step. If 0-3 ohms does not exist, go to step 10).
9. Replace sun roof control module. Recheck system operation.
10. Repair open in Brown wire between sun roof control module and sun roof slide switch. See **WIRING DIAGRAMS** . Recheck system operation.
11. Repair open in Black wire between sun roof control module and ground. See **WIRING DIAGRAMS** . Recheck system operation.
12. Replace sun roof motor assembly. Recheck system operation.
13. Repair open in Dark Blue wire between sun roof control module and overhead console sun roof switch. See **WIRING DIAGRAMS** . Recheck system operation.
14. Replace overhead console switch. Recheck system operation.

SUN ROOF DOES NOT CLOSE

1. If power sun roof system check was performed, go to next step. If power sun roof system check was not performed, go to **SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition switch to OFF position. Disconnect sun roof control module Black 4-pin connector. Turn ignition switch to RUN position. Using DVOM, measure voltage between sun roof control module harness connector C1, terminal "A" (Dark Blue wire) and ground. If 10-15 volts exists, go to next step. If 10-15 volts does not exist, check operation of Retained Accessory Power (RAP). See appropriate wiring diagram in POWER DISTRIBUTION article in WIRING DIAGRAMS.

3. Measure voltage between sun roof control module harness connector C1, terminals "A" (Dark Blue wire) and "D" (Black wire). If 10-15 volts exists, go to next step. If 10-15 volts does not exist, go tostep 10).
4. Turn ignition switch to OFF position. Reconnect sun roof module harness connector C1. Turn ignition switch to RUN position. Using DVOM, backprobe between sun roof control module harness connector C1, terminals "C" (Dark Green wire) and "B" (Light Green wire) while pressing sun roof slide switch to CLOSE. If 9-15 volts exists, go to step 11). If 9-15 volts does not exist, go to next step.
5. Turn ignition switch to OFF position. Disconnect overhead console sun roof switch harness Natural 18-pin connector C1. Turn ignition switch to RUN position. Using a fused jumper (20-amp), connect between sun roof switch connector C1, terminals No. 2 (Dark Blue wire) and No. 15 (Orange wire). If sun roof closes, go to step 13). If sun roof does not close, go to next step.
6. Measure resistance of Dark Blue wire between sun roof control module harness connector C2, terminal No. 2 and ground. If 0-3 ohms exists, go to next step. If 0-3 ohms does not exist, go to step 12).
7. Disconnect sun roof control module harness Black 4-pin connector C2. Using DVOM, measure resistance of Orange wire between sun roof control module harness connector C2, terminals No. 3 and No. 15. If resistance is 0-3 ohms, go to next step. If resistance is not 0-3 ohms, go to step 9).
8. Replace sun roof control module. Recheck system operation.
9. Repair open in Orange wire between sun roof control module and overhead console sun roof switch. See **WIRING DIAGRAMS** . Recheck system operation.
10. Repair open in Black wire between sun roof control module and ground. See **WIRING DIAGRAMS** . Recheck system operation.
11. Replace sun roof motor assembly. Recheck system operation.
12. Repair open in Dark Blue wire between sun roof control module and overhead console sun roof switch. See **WIRING DIAGRAMS** . Recheck system operation.
13. Replace sun roof slide switch. Recheck system operation.

SUN ROOF DOES NOT OPEN TO VENT POSITION

1. If power sun roof system check was performed, go to next step. If power sun roof system check was not performed, go to **SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition switch to OFF position. Disconnect overhead console sun roof switch harness Natural 18-pin connector C1. Turn ignition switch to RUN position. Using fused jumper (20-amp), connect jumper between overhead console sun roof switch harness connector C1, terminals No. 1 (Orange/Black wire) to No. 2 (Dark Blue wire). If sun roof vent opens, go to step 5). If sun roof vent does not open, go to next step.
3. Turn ignition switch to OFF position. Disconnect sun roof control module harness connector C2. Measure resistance of Orange/Black wire between sun roof control module harness connector C2, terminal No. 7 and sun roof switch harness connector C1, terminal No. 1. If 0-3 ohms exists, go to next step. If 0-3 ohms does not exist, go tostep 6).
4. Replace sun roof control module. Recheck system operation.
5. Replace sun roof vent switch. Recheck system operation.
6. Repair open in Orange/Black wire between sun roof control module and sun roof vent switch. See **WIRING DIAGRAMS** . Recheck system operation.

SUN ROOF DOES NOT CLOSE FROM VENT POSITION

1. If power sun roof system check was performed, go to next step. If power sun roof system check was not performed, go to **SYSTEM CHECK** under TROUBLE SHOOTING.
2. Turn ignition switch to OFF position. Disconnect overhead console sun roof switch harness Natural 18-pin connector C1. Turn ignition switch to RUN position. Using fused jumper (20-amp), connect jumper between overhead console sun roof switch harness connector C1, terminals No. 3 (Pink wire) to No. 2 (Dark Blue wire). If sun roof vent closes, go to step 11). If sun roof vent does not open, go to next step.
3. Turn ignition switch to OFF position. Disconnect sun roof control module harness connector C2. Measure resistance of Pink wire between sun roof control module harness connector C2, terminal No. 2 and sun roof switch harness connector C1, terminal No. 3. If 0-3 ohms exists, go to next step. If 0-3 ohms does not exist, go to step 12).
4. Measure resistance of Dark Blue wire between sun roof control module harness connector C2, terminal No. 5 and overhead console sun roof switch harness connector C1, terminal No. 2 . If 0-3 ohms exists, go to next step. If 0-3 ohms does not exist, go to step 10).
5. Disconnect sun roof control module harness Black 4-pin connector C1. Turn ignition switch to RUN position. Using DVOM, measure voltage between sun roof control module harness connector C1, terminals "A" (Dark Blue wire) and ground. If 10-15 volts exists, go to next step. If 10-15 volts does not exist, check operation of Retained Accessory Power (RAP). See appropriate wiring diagram in POWER DISTRIBUTION article in WIRING DIAGRAMS.
6. Measure voltage between sun roof control module harness connector C1, terminals "A" (Dark Blue wire) and "D" (Black wire). If 10-15 volts exists, go to next step. If 10-15 volts does not exist, go tostep 13).
7. Turn ignition switch to OFF position. Reconnect sun roof module harness connector C1. Turn ignition switch to RUN position. Using DVOM, backprobe between sun roof control module harness connector C1, terminals "C" (Dark Green wire) and "B" (Light Green wire) while pressing sun roof vent switch to CLOSE. If 9-15 volts exists, go tostep 9). If 9-15 volts does not exist, go to next step.
8. Replace sun roof control module. Recheck system operation.
9. Replace sun roof motor assembly. Recheck system operation.
10. Repair open in Dark Blue wire between sun roof control module and overhead sun roof switch. See **WIRING DIAGRAMS** . Recheck system operation.
11. Replace sun roof vent switch. Recheck system operation.
12. Repair open in Pink wire between sun roof control module and overhead console sun roof switch. See **WIRING DIAGRAMS** . Recheck system operation.
13. Repair open in Black wire between sun roof control module and ground. See **WIRING DIAGRAMS** . Recheck system operation.

REMOVAL & INSTALLATION

WARNING: 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 section before disconnecting battery.

CONTROL SWITCH

Removal & Installation

Using small screwdriver, remove trim panel. Remove retainer screw. Remove sun roof motor cover. Remove switch from cover. To install, reverse removal procedure.

MOTOR R & I

NOTE: Motor must be synchronized if removed from vehicle. See MOTOR & TRACK SYNCHRONIZATION .

Removal & Installation

Lower rear of headliner. Disconnect electrical connectors. Remove 3 sun roof motor bolts. Remove motor. To install, reverse removal procedure. Synchronize track to motor. See **MOTOR & TRACK SYNCHRONIZATION** . Tighten sun roof motor bolts to 62 INCH lbs. (7 N.m).

EXPRESS MODULE

Removal & Installation

Lower rear of headliner to gain access to express module. Remove express module out of sun roof module. Disconnect electrical wiring harness connector. Depress tab on side of sun roof express module and slide express module towards sun roof motor to release from mounting to remove. To install, reverse removal procedure.

GLASS PANEL & SUNSHADE

Removal & Installation

Open sun roof to VENT position. Open sunshade fully. Remove 4 retainer screws. Lift sun roof glass from vehicle. Using small flatbladed screwdriver, slide 4 spring loaded tabs back to release sunshade panel. Lift sunshade panel from vehicle. To install, reverse removal procedure. Adjust glass panel as needed. See **ADJUSTMENTS** . tighten screws to 27 INCH lbs. (3 N.m.).

Removal & Installation

Remove sun roof module. See SUN ROOF MODULE. Move sun roof glass panel to rear of module. Raise wind deflector up and unhook from sun roof module. Lift out deflector assembly. To install, reverse removal procedure.

SUN ROOF MODULE

Removal & Installation

Remove sun roof glass panel. Remove sunshade. See **GLASS PANEL & SUNSHADE** . Remove headliner.

Disconnect electrical connector. Remove wiring harness from retainer clips. Disconnect drain hoses from sun roof module. Loosen 2 center bolts. Remove 6 sun roof module mounting bolts. With aid of helper to hold sun roof up, remove 2 center bolts. Remove sun roof module from vehicle. To install, reverse removal procedure. Tighten bolts to 80 INCH lbs (9 N.m).

DRAIN HOSES

Removal & Installation (Front)

Lower front of headliner to gain access to drain hose connections. Remove tape and tie wrap retaining hose. Disconnect drain hose from sun roof module. Remove instrument panel, gauges and console. Remove tape retaining front drain hose. Pull end of front drain hose out of grommet in wheelhousing. Remove front drain hose. To install, reverse removal procedure. Ensure clearance is maintained between clamps and headliner.

Removal & Installation (Rear)

Lower rear of headliner to gain access to rear drain hose. Remove tape and tie wrap retaining hose to sun roof module. Disconnect rear drain hose from module. Remove rear compartment trim to gain access to lower end of hose. Remove lower end of rear drain hose from grommet in rear compartment inner panel. Remove rear hose. To install, reverse removal procedure.

WIRING DIAGRAMS

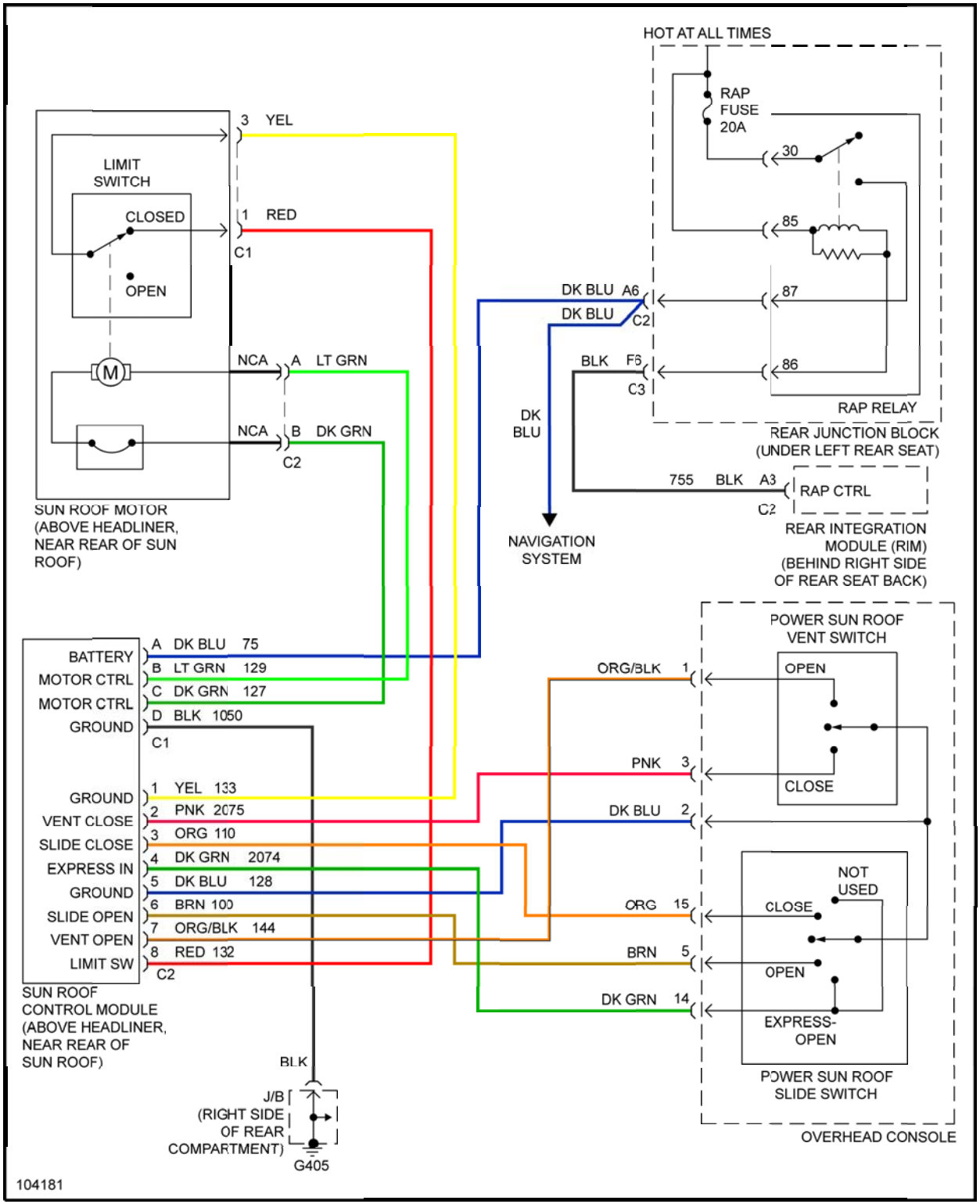
HOT AT ALL TIMES
RAP FUSE 20A
30
85
87
86
RAP RELAY
REAR JUNCTION BLOCK (UNDER LEFT REAR SEAT)
DK BLU A6
DK BLU
C2
BLK F6
C3
755 BLK A3
RAP CTRL
C2
REAR INTEGRATION MODULE (RIM) (BEHIND RIGHT SIDE OF REAR SEAT BACK)
DK BLU
NAVIGATION SYSTEM
3 YEL
LIMIT SWITCH
CLOSED
OPEN
1 RED
C1
M
NCA A LT GRN
NCA B DK GRN
C2
SUN ROOF MOTOR (ABOVE HEADLINER, NEAR REAR OF SUN ROOF)
BATTERY A DK BLU 75
MOTOR CTRL B LT GRN 129
MOTOR CTRL C DK GRN 127
GROUND D BLK 1050
C1
GROUND 1 YEL 133
VENT CLOSE 2 PNK 2075
SLIDE CLOSE 3 ORG 110
EXPRESS IN 4 DK GRN 2074
GROUND 5 DK BLU 128
SLIDE OPEN 6 BRN 100
VENT OPEN 7 ORG/BLK 144
LIMIT SW 8 RED 132
C2
SUN ROOF CONTROL MODULE (ABOVE HEADLINER, NEAR REAR OF SUN ROOF)
BLK
J/B (RIGHT SIDE OF REAR COMPARTMENT)
G405
POWER SUN ROOF VENT SWITCH
ORG/BLK 1
OPEN
PNK 3
CLOSE
DK BLU 2
NOT USED
ORG 15
CLOSE
BRN 5
OPEN
DK GRN 14
EXPRESS-OPEN
POWER SUN ROOF SLIDE SWITCH
OVERHEAD CONSOLE
104181

Fig. 1: Power Sun Roof System Wiring Diagram