

DOOR LOCKS - POWER & KEYLESS ENTRY

1998 Mitsubishi Galant

1998 ACCESSORIES & EQUIPMENT
Mitsubishi - Keyless Entry & Power Door Locks
Galant

DESCRIPTION & OPERATION

Power door locks are controlled by driver or front passenger switches which send signals to the Electronic Time Alarm Control System (ETACS) ECU. The ETACS-ECU sends appropriate signals to individual door lock actuators.

The following features are incorporated in power door lock systems that are equipped with an ETACS-ECU:

- * Once locked door is closed, system will unlock door if key remains in ignition switch.
- * Continuous switching between lock and unlock of door will disable system for about one minute.

All door locks can be actuated with operation of driver-side door lock. An optional Remote Keyless Entry (RKE) system is available. Remote control operates door locks within a range of 13 ft. (4 m). Reading light flashes twice when doors are locked and illuminates for 3 seconds when doors are unlocked.

COMPONENT LOCATIONS

COMPONENT LOCATIONS TABLE

Component	Location
Data Link Connector (DLC)	Under Left Side Of Dash, Below Steering Column
Door Lock Actuator	Inside Each Door
Door Lock Relay	Under Rear Deck Shelf
ETACS-ECU	Behind Left Side Of Dash
Remote Keyless Entry (RKE) Receiver	Under Rear Deck Shelf

TRANSMITTER PROGRAMMING

NOTE: Transmitter programming should be performed only after verifying that door lock operates normally using key. Whenever a transmitter is replaced, register 2 secret codes in transmitter.

Each transmitter is programmed with an individual secret code. If transmitter or receiver is replaced or secret code is improperly registered, re-register code into receiver. Before registering, ensure doors lock and unlock using key. Two secret codes may be registered within receiver. One is stored in SET I position and another is stored in SET II position. When 2 codes have already been registered, a new code is replaced with old one.

1) Set code registration switch on receiver to SET I position (registration mode). Press any button on transmitter. Set code

registration switch on receiver to FIX position (operation mode). Ensure keyless entry system operates normally.

2) If system does not operate normally, repeat step 1). Set code registration switch on receiver to SET II position (registration mode). Press any button on transmitter. Set code registration switch on receiver to FIX position (operation mode). Ensure keyless entry system operates normally. After registration is complete, ensure registration switch on receiver is set to FIX position.

SYMPTOM TESTS

NOTE: To diagnose symptom, see Figs. 1 and 2, then go to appropriate test under CIRCUIT TESTS (KEYLESS ENTRY) or CIRCUIT TESTS (POWER DOOR LOCKS).

Trouble Symptom		Probable Cause	Circuit Test No.
No doors can be locked or unlocked.	The indicator light of the transmitter does not illuminate when the transmit switch is pressed.	<ul style="list-style-type: none"> ● Dead transmitter battery. ● Malfunction of transmitter. 	1
	A transmission signal is being sent from the transmitter (indicator light illuminates) but the door lock does not operate.	<ul style="list-style-type: none"> ● Malfunction of central door locking system. ● Malfunction of receiver. ● Malfunction of ETACS-ECU. 	2
Not all of the doors can be locked or unlocked.		<ul style="list-style-type: none"> ● Malfunction of door lock actuator. 	3
All doors can be locked and unlocked with the transmitter, but the dome light and foot light do not flash or illuminate. (However, the dome light operation is normal when a door is opened and closed.)		<ul style="list-style-type: none"> ● Malfunction of door. 	4
When all doors are locked with the transmitter, the theft-alarm system is not set. (The SECURITY indicator doesn't illuminate, and the alarm doesn't function.) <Vehicles with theft-alarm system>		<ul style="list-style-type: none"> ● Malfunction of receiver ● Malfunction of ETACS-ECU 	5
When the PANIC switch of the transmitter is pressed, the headlights do not flash and the horns do not sound. (However, the theft-alarm functions normally.) <Vehicles with theft-alarm system>		<ul style="list-style-type: none"> ● Malfunction of receiver ● Malfunction of ETACS-ECU 	6

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Fig. 1: Symptom Chart (Keyless Entry)
 Courtesy of Mitsubishi Motor Sales of America

Trouble Symptom	Probable Cause	Circuit Test No.
When the central door lock switch is operated, other doors do not lock or unlock.	<ul style="list-style-type: none"> ● Malfunction of power window switch (front door) ● Malfunction of door lock actuator ● Incorrect connector connection or malfunction of harness 	1
When the driver's side door lock is turned with the key or if the driver's side door inside door lock knob is operated, other doors do not lock or unlock.	<ul style="list-style-type: none"> ● Malfunction of driver's side door actuator switch ● Malfunction of power window switch (driver's side door) ● Incorrect connector connection or malfunction of harness 	2
When the driver's side door lock is turned with key, other doors do not unlock.	<ul style="list-style-type: none"> ● Malfunction of driver's side door key cylinder switch ● Malfunction of power window switch (driver's side door) ● Incorrect connector connection or malfunction of harness 	3
When the passenger's side door lock is turned with key, other doors do not lock or unlock.	<ul style="list-style-type: none"> ● Malfunction of passenger's side door key cylinder switch ● Malfunction of power window switch (driver's side door) ● Incorrect connector connection or malfunction of harness 	4

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Fig. 2: Symptom Chart (Power Door Locks)
 Courtesy of Mitsubishi Motor Sales of America

CIRCUIT TESTS (KEYLESS ENTRY)

Test No. 1

Verify if transmitter LED illuminates when transmitter switch buttons are pressed. If LED illuminates, go to TEST NO. 2. If LED does not illuminate, replace transmitter battery and test again. If LED still does not illuminate, replace transmitter.

Test No. 2

1) Verify if doors can be locked or unlocked using key at left side door lock. If doors cannot be locked or unlocked, see SYMPTOM CHART (POWER DOOR LOCKS). See Fig. 2. If doors can be locked and unlocked, go to next step.

2) Verify if transmitter secret code has been programmed correctly. If secret code needs to be programmed, see TRANSMITTER PROGRAMMING. If secret code has been programmed correctly, go to next step.

3) Check receiver voltage. See PIN VOLTAGE TESTS. See Fig. 4. If voltages are as specified, go to next step. If voltages are not as specified, check circuit between receiver, ignition switch and fusible link. See WIRING DIAGRAMS. Repair as necessary. If circuit is okay, replace receiver.

4) Check connectors and circuit between receiver and ETACS-ECU. See WIRING DIAGRAMS. Repair as necessary. If connectors and circuit are okay, replace ETACS-ECU.

Test No. 3

1) Check door lock actuator on affected door. See DOOR LOCK ACTUATOR under COMPONENT TESTS. Replace door lock actuator as necessary. If door lock actuator is okay, go to next step.

2) Check connectors and circuit to affected door lock actuator. See WIRING DIAGRAMS. Repair as necessary. If connectors and circuit are okay, check circuit between ETACS-ECU and affected door lock actuator.

Test No. 4

1) Disconnect receiver harness connector. Set dome light in DOOR position. Check voltage between ground and receiver harness-side connector terminal No. 11 (Green/Orange wire). See WIRING DIAGRAMS. If battery voltage is present, go to next step. If battery voltage is not present, replace receiver.

2) Check connectors and circuit between dome light, foot light and receiver. See WIRING DIAGRAMS. Repair as necessary.

Test No. 5

1) Verify if anti-theft system is set when all doors are locked with key. If anti-theft system sets, go to next step. If anti-theft system does not set, diagnose anti-theft system. See ANTI-THEFT SYSTEMS article.

2) Check harness connectors to ETACS-ECU, central locking system and receiver. Repair as necessary. If harness connectors are okay, go to next step.

3) Disconnect receiver harness connector. Using an oscilloscope, check voltage between ground and receiver harness-side connector terminal No. 15 (Green wire). See WIRING DIAGRAMS. If 5-volt pulse output is present, replace receiver. If 5-volt pulse output is not present, check circuit between receiver and ETACS-ECU. Repair as necessary. If circuit is okay, replace ETACS-ECU.

Test No. 6

1) Check operation of anti-theft system. If anti-theft system operates normally, go to next step. If anti-theft system does not operate normally, diagnose anti-theft system. See ANTI-THEFT SYSTEMS article.

2) Check harness connector to ETACS-ECU, central door locking system and receiver. Repair as necessary. If harness connectors are okay, go to next step.

3) Disconnect receiver harness connector. Using an oscilloscope, check voltage between ground and receiver harness-side connector terminal No. 15 (Green wire). See WIRING DIAGRAMS. If 5-volt pulse output is present, replace receiver. If 5-volt pulse output is not present, check circuit between receiver and ETACS-ECU. Repair as necessary. If circuit is okay, replace ETACS-ECU.

CIRCUIT TESTS (POWER DOOR LOCKS)

Test No. 1

1) Check left front door lock switch. See DOOR LOCK SWITCH under COMPONENT TESTS. Repair or replace as necessary. If door lock switch is okay, check opening and closing of power windows. If power windows operate, go to next step. If power windows do not operate, go to POWER WINDOWS article.

2) Disconnect all door lock actuator harness connectors. Check for continuity between ground and front (left and right side) door lock actuator harness-side connector terminals No. 3 and 4, and between ground and rear (left and right side) door lock actuator harness-side connector terminals No. 1 and 3. See WIRING DIAGRAMS. If continuity is present, replace left side power window switch. If continuity is not present, go to next step.

3) Check harness connectors and circuit between ground and door lock actuator. See WIRING DIAGRAMS. Repair as necessary.

Test No. 2

1) Check left side actuator. See DOOR LOCK ACTUATOR under COMPONENT TESTS. Replace as necessary. If actuator is okay, go to next step.

2) Disconnect left side actuator harness connector. Check for continuity between ground and actuator switch harness-side connector terminal No. 1 (Black wire). See WIRING DIAGRAMS. If continuity is present, go to next step. If continuity is not present, check connectors and circuit between actuator switch and ground. Repair as necessary.

3) Check voltage between ground and left side actuator switch harness-side connector terminal No. 2 (Green/White wire). If voltage reading is about 5 volts, replace left side power window switch. If voltage reading is not about 5 volts, go to next step.

4) Check harness connectors and circuit between left side actuator switch and power window switch. See WIRING DIAGRAMS. Repair as necessary.

Test No. 3

1) Check left side key cylinder switch. See DOOR LOCK KEY CYLINDER SWITCH under COMPONENT TESTS. Replace as necessary. If key cylinder switch is okay, go to next step.

2) With key cylinder switch harness connector disconnected, check for continuity between ground and switch harness-side connector terminal No. 2 (Black wire). If continuity is present, go to step 4). If continuity is not present, go to next step.

3) Check connectors and circuit between key cylinder switch and ground. See WIRING DIAGRAMS. Repair as necessary.

4) Check voltage between ground and left side key cylinder switch harness-side connector terminal No. 1 (Yellow/White wire). If voltage reading is about 5 volts, replace left side power window switch. If voltage reading is not about 5 volts, go to next step.

5) Check connectors and circuit between left side key cylinder switch and left side power window switch. See WIRING DIAGRAMS . Repair as necessary.

Test No. 4

1) To check right side key cylinder switch, go to next step. To check left side door lock power supply, go to step 7). To check right side door lock power supply, go to step 12).

2) Check right side key cylinder switch. See DOOR LOCK KEY CYLINDER SWITCH under COMPONENT TESTS. Replace as necessary. If key cylinder switch is okay, go to next step.

3) With key cylinder switch harness connector disconnected, check for continuity between ground and switch harness-side connector terminal No. 2 (Black wire). If continuity is present, go to step 5). If continuity is not present, go to next step.

4) Check connectors and circuit between key cylinder switch and ground. See WIRING DIAGRAMS. Repair as necessary.

5) Check voltage between ground and right side key cylinder switch harness-side connector terminal No. 1 (Green/White wire), and between ground and terminal No. 3 (Red/Green wire). If battery voltage is present, replace right side power window switch. If battery voltage is not present, go to next step.

6) Check connectors and circuit between right side key cylinder switch and right side power window switch. See WIRING DIAGRAMS. Repair as necessary.

7) Disconnect left side power window switch harness connector. Check voltage between ground and power window switch harness-side connector terminals No. 9 (Green/Yellow wire) and No. 23 (Blue/Red wire). If battery voltage is present, go to next step. If battery voltage is not present, go to step 9).

8) Turn ignition on. Check voltage between ground and left side power window switch harness-side connector terminal No. 1 (Gray

wire). If battery voltage is present, go to step 10). If battery voltage is not present, go to next step.

9) Check connectors and circuit between left side power window switch and ground. See WIRING DIAGRAMS. Repair as necessary.

10) Check for continuity between ground and left side power window switch harness-side connector terminal No. 24 (Black wire). If continuity is present, replace left side power window switch. If continuity is not present, go to next step.

11) Check connectors and circuit between left side door power window switch and ground. See WIRING DIAGRAMS. Repair as necessary.

12) Disconnect right side power window switch harness connector. Check voltage between ground and power window switch harness-side connector terminal No. 2 (Blue wire). If battery voltage is present, go to step 14). If battery voltage is not present, go to next step.

13) Check connectors and circuit between right side power window switch and ground. See WIRING DIAGRAMS. Repair as necessary.

14) Check for continuity between ground and right side power window switch harness-side connector terminals No. 1 (Black wire) and No. 9 (Black wire). If continuity is present, replace right side power window switch. If continuity is not present, go to next step.

15) Check connectors and circuit between right side door power window switch and ground. See WIRING DIAGRAMS. Repair as necessary.

COMPONENT TESTS

* PLEASE READ THIS FIRST *

NOTE: If system is still not functioning properly after all testing procedures are completed, substitute a known-good ETACS-ECU and retest.

DOOR LOCK ACTUATOR

Left Front Door

1) Access left front door lock actuator. See DOOR LOCK ACTUATOR R & I under REMOVAL & INSTALLATION. Disconnect harness connector. Set actuator in LOCK position. Connect positive lead of 12-volt power source to actuator terminal No. 3 (Blue/Black wire). See WIRING DIAGRAMS. Actuator should move to UNLOCK position when terminal No. 4 (Blue/Red wire) is connected to ground.

2) With actuator set in UNLOCK position, connect positive lead of 12-volt power source to actuator terminal No. 4 (Blue/Red wire). Actuator should move to LOCK position when terminal No. 3 (Blue/Black wire) is connected to ground.

3) Check for continuity between actuator terminals No. 1 (Black wire) and No. 2 (Green/White wire). Continuity should be present with actuator set to UNLOCK position. Continuity should not be present with actuator set to LOCK position.

Right Front Door

1) Access right front door lock actuator. See DOOR LOCK ACTUATOR R & I under REMOVAL & INSTALLATION. Disconnect harness connector. Set actuator in LOCK position. Connect positive lead of 12-volt power source to actuator terminal No. 4 (Blue/Yellow wire). See WIRING DIAGRAMS. Actuator should move to UNLOCK position when terminal No. 3 (Blue/Red wire) is connected to ground.

2) With actuator set in UNLOCK position, connect positive lead of 12-volt power source to actuator terminal No. 3 (Blue/Red wire). Actuator should move to LOCK position when terminal No. 4 (Blue/Yellow wire) is connected to ground.

3) Check for continuity between actuator terminals No. 1 (Black wire) and No. 2 (Green/Blue wire). Continuity should be present with actuator set to UNLOCK position. Continuity should not be present with actuator set to LOCK position.

Left Rear Door

1) Access left rear door lock actuator. See DOOR LOCK ACTUATOR R & I under REMOVAL & INSTALLATION. Disconnect harness connector. Set actuator in LOCK position. Connect positive lead of 12-volt power source to actuator terminal No. 1 (Blue/Black wire). See WIRING DIAGRAMS. Actuator should move to UNLOCK position when terminal No. 3 (Blue/Red wire) is connected to ground.

2) With actuator set in UNLOCK position, connect positive lead of 12-volt power source to actuator terminal No. 3 (Blue/Red wire). See WIRING DIAGRAMS. Actuator should move to LOCK position when terminal No. 1 (Blue/Black wire) is connected to ground.

Right Rear Door

1) Access right rear door lock actuator. See DOOR LOCK ACTUATOR R & I under REMOVAL & INSTALLATION. Disconnect harness connector. Set actuator in LOCK position. Connect positive lead of 12-volt power source to actuator terminal No. 3 (Blue/Yellow wire). See WIRING DIAGRAMS. Actuator should move to UNLOCK position when terminal No. 1 (Blue/Red wire) is connected to ground.

2) With actuator set in UNLOCK position, connect positive lead of 12-volt power source to actuator terminal No. 1 (Blue/Red wire). See WIRING DIAGRAMS. Actuator should move to LOCK position when terminal No. 3 (Blue/Yellow wire) is connected to ground.

DOOR LOCK KEY CYLINDER SWITCH

Left Doors

1) Disconnect door lock key cylinder switch harness connector. With door lock key cylinder switch in LOCK position, continuity should be present between switch terminals No. 2 and 3. See WIRING DIAGRAMS.

2) Turn door lock switch to UNLOCK position. Continuity should be present between switch terminals No. 1 and 2. Turn door lock switch to OFF (Neutral) position. Continuity should not be present in any of the terminals. Replace door lock key cylinder if continuity is not as specified.

Right Doors

1) Disconnect door lock key cylinder switch harness connector. With door lock key cylinder switch in LOCK position, continuity should be present between switch terminals No. 1 and 2. See WIRING DIAGRAMS.

2) Turn door lock switch to UNLOCK position. Continuity should be present between switch terminals No. 2 and 3. Turn door lock switch to OFF (Neutral) position. Continuity should not be present in any of the terminals. Replace door lock key cylinder if continuity is not as specified.

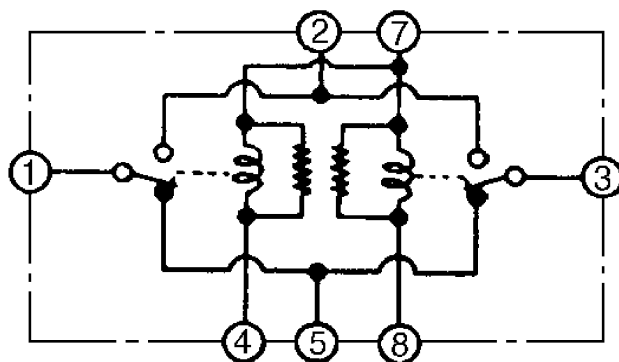
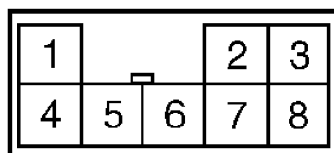
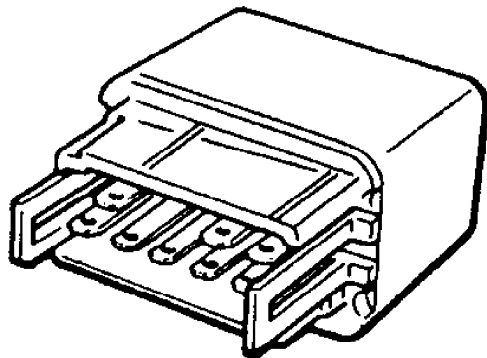
DOOR LOCK RELAY

1) Disconnect relay harness connector. Check for continuity between relay terminals No. 1, 3 and 5, and between relay terminals No. 4, 7 and 8. See Fig. 3. Continuity should be present.

2) Apply positive battery voltage to relay terminal No. 7 and ground to terminal No. 4. Continuity should be present between relay terminals No. 1 and 2. See Fig. 3.

3) Apply positive battery voltage to relay terminal No. 7 and ground to terminal No. 8. Continuity should be present between relay

terminals No. 2 and 3. Replace relay as necessary.



Battery voltage	Terminal No.						
	1	2	3	4	5	7	8
Continuity no voltage	○		○		○		
Continuity with voltage	○	○		⊖		⊕	
		○	○			⊕	⊖

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Fig. 3: Checking Door Lock Relay
 Courtesy of Mitsubishi Motor Sales of America

Left Side

1) Remove left front power window switch from door panel. Apply positive battery voltage to switch terminals No. 9 (Green/Yellow wire) and No. 23 (Blue/Red wire). Apply ground to switch terminal No. 24 (Black wire). See WIRING DIAGRAMS.

2) Place door lock switch in LOCK position. Continuity should be present between power window switch terminals No. 7 (Red/Yellow wire), No. 8 (Red/Green wire), and No. 23 (Blue/Red wire); between power window switch terminals No. 23 (Blue/Red wire) and No. 25 (Blue/Black wire); and between power window switch terminals No. 24 (Black wire) and No. 26 (Blue/Red wire).

3) Place door switch in OFF (Neutral) position. Continuity should be present between power window switch terminals No. 7 (Red/Yellow wire), No. 8 (Red/Green wire), and No. 23 (Blue/Red wire).

4) Place door switch in UNLOCK position. Continuity should be present between power window switch terminals No. 7 (Red/Yellow wire), No. 8 (Red/Green wire), and No. 23 (Blue/Red wire); between switch terminals No. 23 (Blue/Red wire) and No. 26 (Blue/Red wire); and between switch terminals No. 24 (Black wire) and No. 25 (Blue/Black wire).

5) If continuity between switch terminals is not as specified, replace left front power window switch.

Right Side

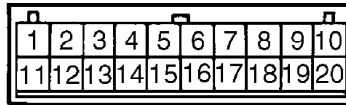
1) Remove right side door lock switch from door panel. Apply positive battery voltage to switch terminal No. 2 (Blue wire). Apply ground to switch terminals No. 1 (Black wire) and No. 9 (Black wire).

2) Place door switch in LOCK position. Continuity should be present between switch terminals No. 1 (Black wire), No. 3 (Green/White wire), and No. 9 (Black wire).

3) Place door switch in UNLOCK position. Continuity should be present between switch terminals No. 1 (Black wire), No. 9 (Black wire), and No. 10 (Red/Green wire).

4) If continuity between switch terminals is not as specified, replace right side door lock switch.

PIN VOLTAGE TESTS



Terminal No.	Signal	Conditions	Terminal Voltage	
1	Key reminder switch (vehicles with theft alarm)	ON (Key removed)	Battery positive voltage	
		OFF (Key inserted)	0V	
2	Door switch	All doors close (Door switch: OFF)	Battery positive voltage	
		One of doors open (Door switch: ON)	0V	
6	Door lock actuator (L.H.)	LOCK	5V (Pulse output*)	
		UNLOCK	0V	
9	Receiver power source	Ignition switch (ACC or ON)	Battery positive voltage	
		Ignition switch (OFF)	0V	
10	Receiver power source	Always	Battery positive voltage	
11	Room light	All doors close (door switch: OFF)	To operate	0V
			Not to operate	Battery positive voltage
12	Door lock output (All doors)	To operate	0V	
		Not to operate	Battery positive voltage	
13	Door unlock output (All doors)	To operate	0V	
		Not to operate	Battery positive voltage	
14	Door unlock output (Driver's side)	To operate	0V	
		Not to operate	Battery positive voltage	
15	ETACS-ECU <Vehicle with theft-alarm system>	Transmitter switch: ON	0V	
		Transmitter switch: OFF	5V (Pulse output*)	
20	Ground	Always	0V	

NOTE

*: Use an oscilloscope. When using the tester, 0 – 0.03V are indicated repeatedly.

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Fig. 4: Pin Voltage Chart (Keyless Entry System)
Courtesy of Mitsubishi Motor Sales of America

REMOVAL & INSTALLATION

DOOR LOCK ACTUATOR R & L

Removal & Installation

Remove inner door panel. Remove switch panel and door trim. Remove mounting screws, and slide panel up to remove. Remove waterproof film. Remove actuator. To install, reverse removal procedure.

WIRING DIAGRAMS

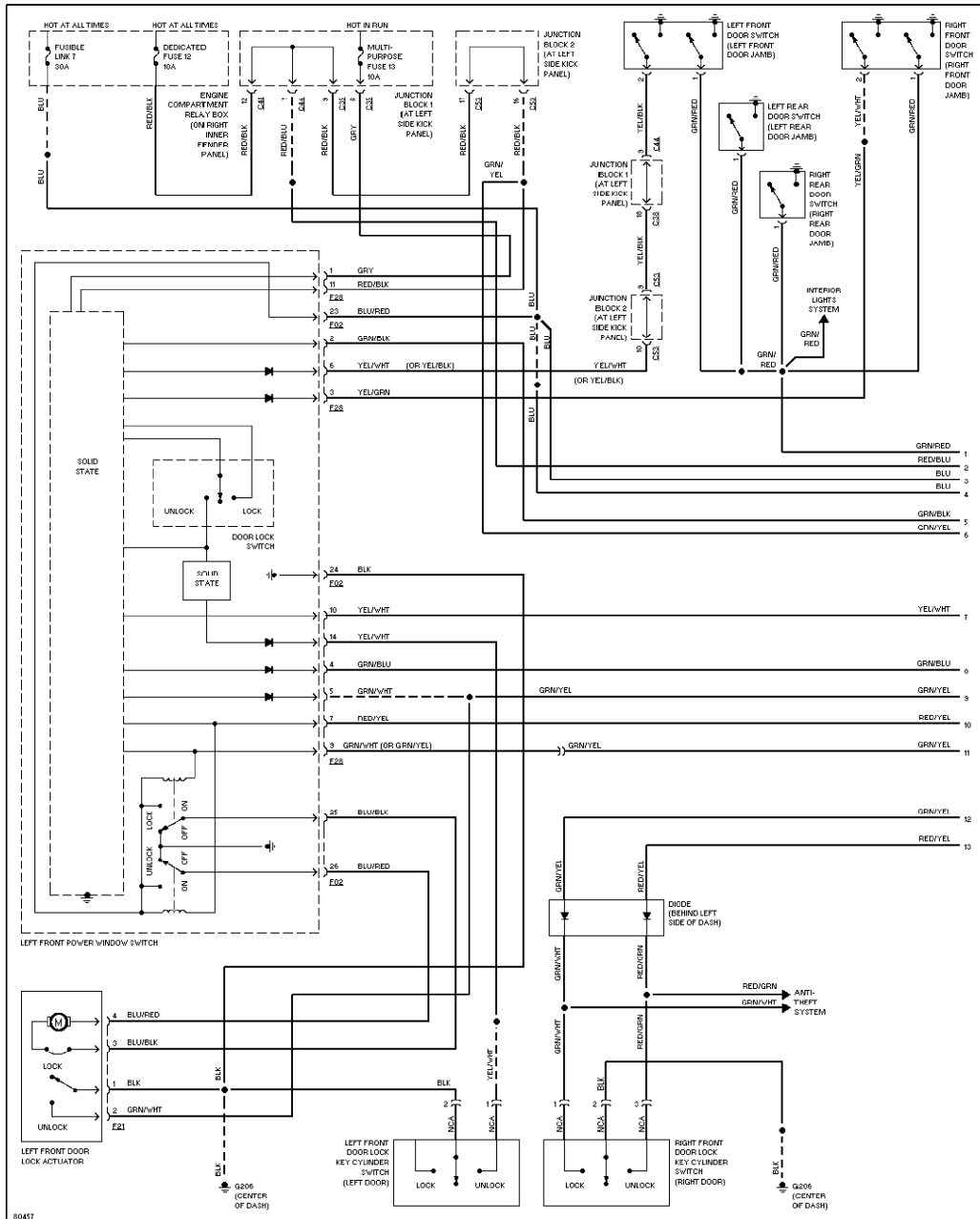


Fig. 5: Keyless Entry Wiring Diagram (1 Of 2)

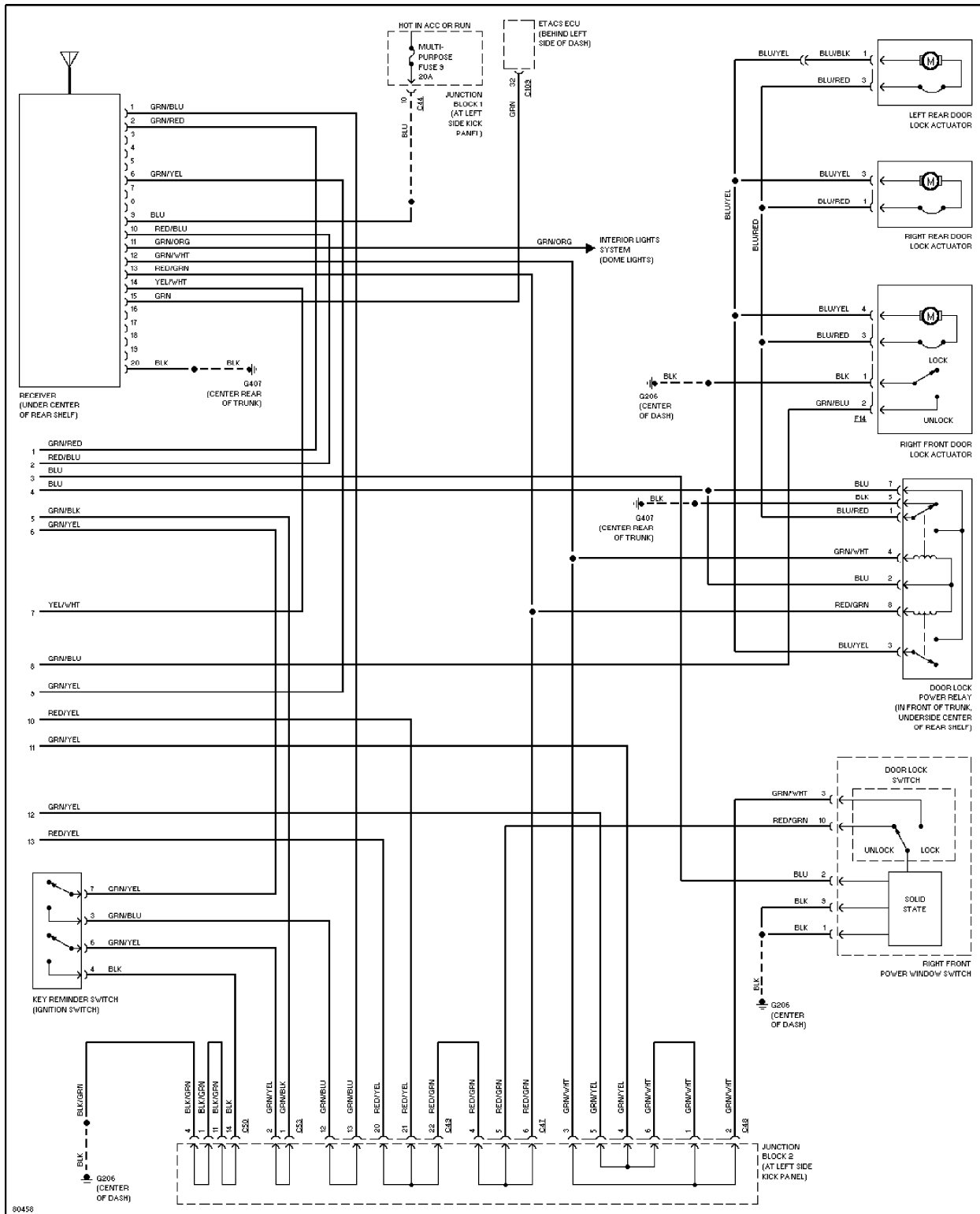


Fig. 6: Keyless Entry Wiring Diagram (2 Of 2)

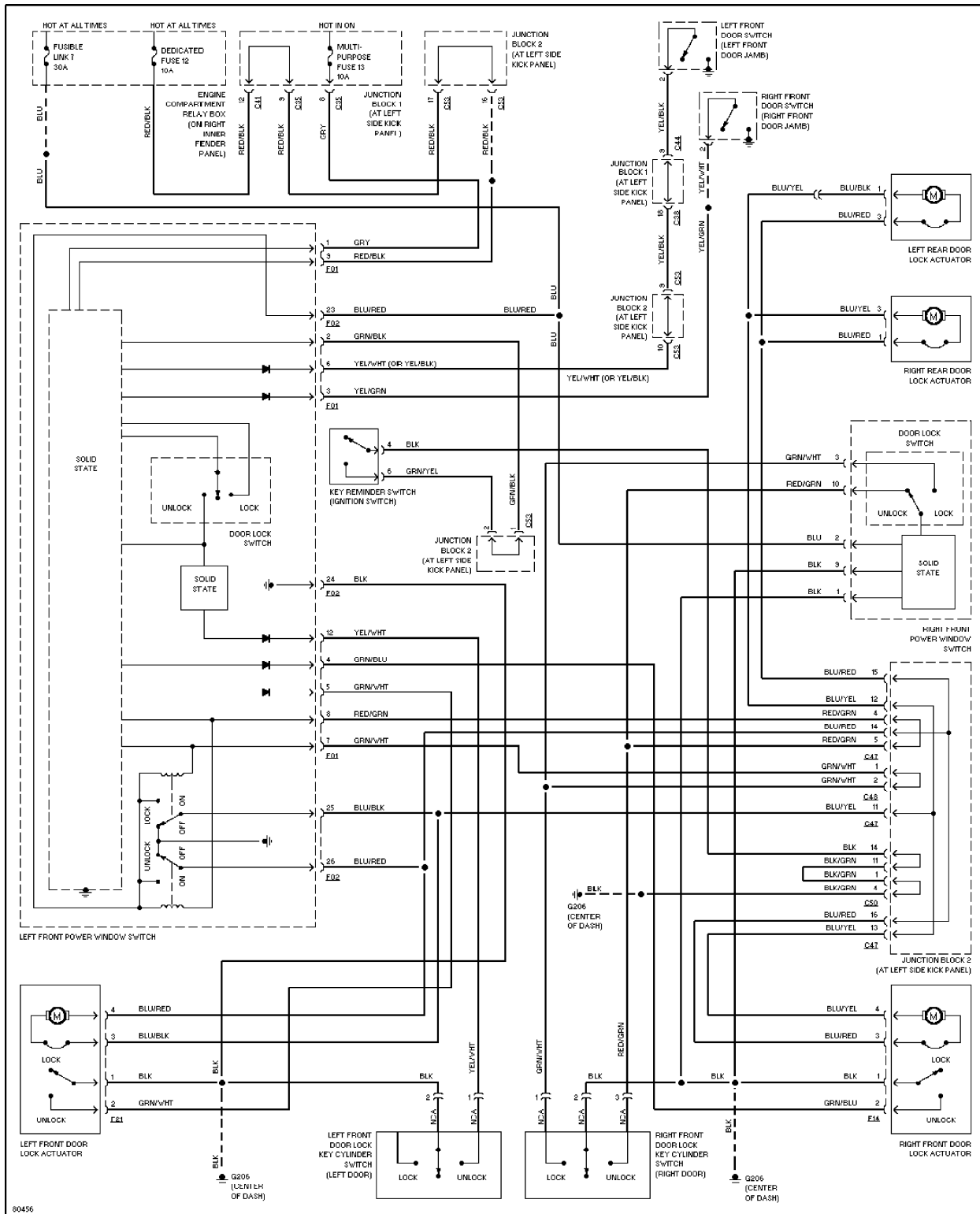


Fig. 7: Power Door Locks Wiring Diagram