

Door Locking Systems

Wiring Guide



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important information

This guide provides a comprehensive listing of all known power door locking systems. Each door locking system is described in detail, along with wiring diagrams for the specific system types. This guide also outlines proper installation and incorporation of the keyless entry portion of all DEI systems into any type of vehicle.

Also included in this guide are wiring diagrams for incorporating priority door locking systems into any vehicle. These diagrams will show you how to interface the popular priority door locks option on factory keyless entry systems, a feature common to many of these systems.

Because multiplexed door locks are becoming the standard in today's vehicles, we have also included a chart of all vehicles known to have multiplexed door locks and their respective resistor values. This chart has been added to the guide to expedite the process of determining the necessary resistor values for vehicles that use the multiplexed door lock system.

door lock harness wire connection guide

1	GREEN	(-) LOCK, (+) UNLOCK OUTPUT
2	EMPTY	UNLESS USING 451M
3	BLUE	(-) UNLOCK, (+) LOCK OUTPUT

This system can control two common power door lock types without any additional parts! With certain vehicles, or if an actuator is to be installed, either a 451M Door Lock Relay Satellite or two relays will be required.

IMPORTANT! *If you mistake a Type C direct-wired system for a Type A positive-pulse system, the module will be damaged!*

type A: (+) 12V pulses from the switch to the factory relays

The system can control Type A door locks directly, with no additional parts. The switch will have three wires on it, and one will test (+)12V constantly. The others will alternately pulse (+)12V when the switch is pressed to the lock or unlock position.

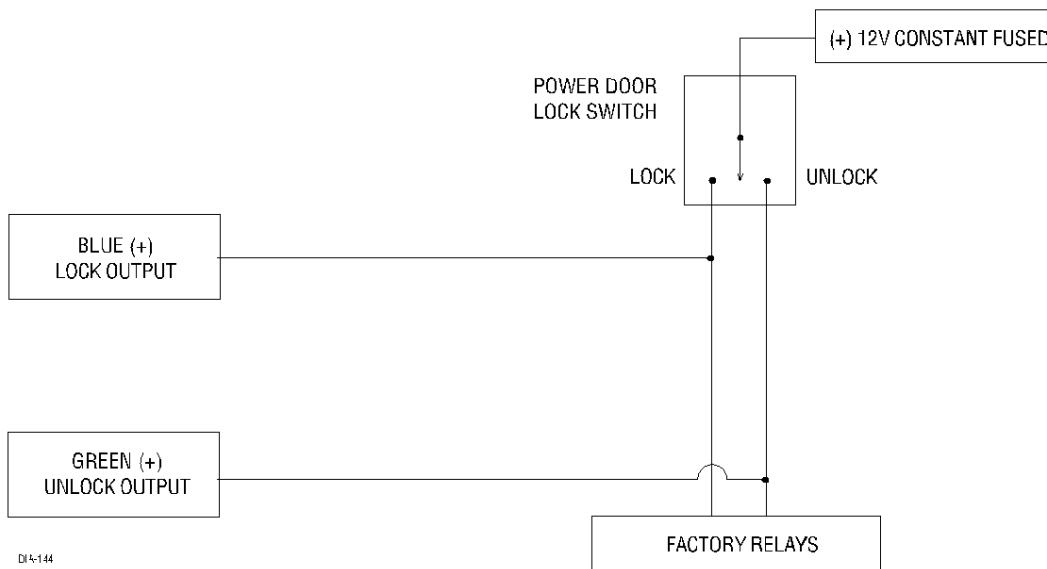
If you cannot get to the switch, and you find a set of wires that pulse (+)12V alternately on lock and unlock, make sure that it is not a Type C direct-wire system.

Here is a test: Cut the wire that pulses (+)12V on lock, and then operate the switch to unlock.

- If all doors unlock, the vehicle uses type A system.
- If you lose all door lock operation in both directions, you are operating the master switch in a Type C system.
- If you lose all door lock operation of one or more, but not all motors, and other doors still work, you have cut a wire leading directly to one or more motors. You must instead find the actual wires leading to the switch.

Many domestically-made GM vehicles use Type A locks. However, many more GM vehicles are Type C than in previous years. The full-size pickups (1989-up), many of the S10 Blazers, the Corvette, '95 Cavalier/Sunfire 1993 and newer, Camaro/Firebird all use Type C door locks, and cannot be controlled without a 451M! Almost all domestically-built Fords are Type C. Ford builds almost no Type A systems. Chrysler builds both Type A and Type C, so proceed with caution.

IMPORTANT! Remember that these wires' functions reverse between Type A and Type B!

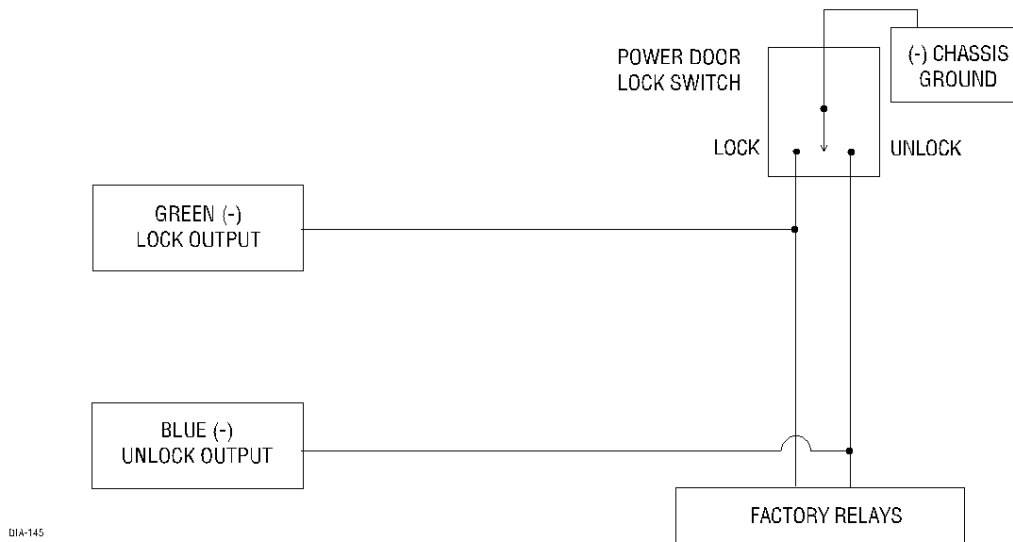


type B: (-) pulses from the switch to the factory relays

This system is common in many Toyotas, Nissans, Hondas, and Saturns, as well as Fords with keyless entry systems (some other Fords also use Type B).

The switch will have three wires on it, and one wire will test ground all the time. One wire will pulse negative (-) when the switch locks the doors, and the other wire will pulse negative (-) when the switch unlocks the doors. This type of system is difficult to mistake for any other type.

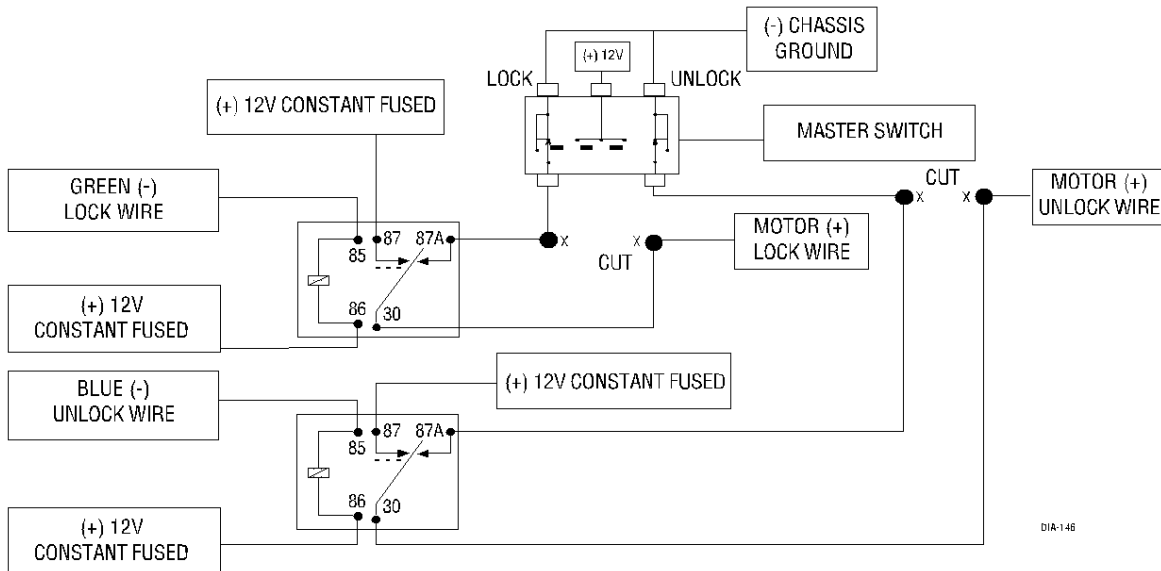
IMPORTANT! Remember that these wires' functions reverse between Type A and Type B!



type C: reversing polarity

Interfacing with a reversing polarity system requires either two relays or one DEI 451M (not included). It is critical to identify the proper wires and locate the master switch to interface the door locks properly. Locate wires that show voltage on lock and unlock. Cut one of the suspected wires and check operation of the locks from both switches. If one switch loses operation in both directions and the other switch operates in one direction only, you have located one of the target wires. The switch that lost all operation is the master switch. If one switch works in both directions and the other switch works in only one direction, you have a Type A system. If both switches still operate, but one or more doors has stopped responding entirely, you have cut a motor lead. Reconnect it and continue to test for another wire. Once both wires have been located and the master switch has been identified, cut both wires and interface as shown in the following diagram.

IMPORTANT! If these wires are not connected properly, you will send (+) 12 Volts directly to (-) ground, possibly damaging the alarm or the factory switch.

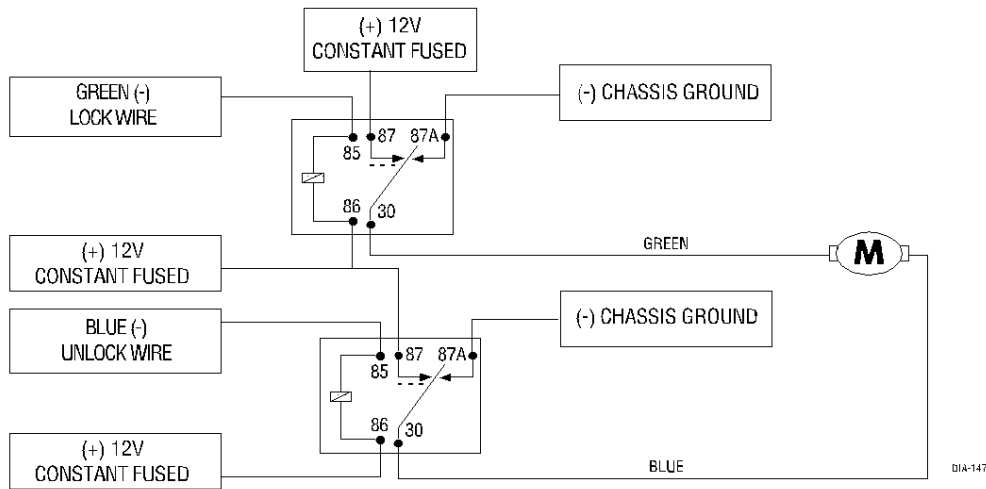


type D: after-market actuators

In order for this system to control one or more after-market actuators, a DEI 451M or two relays (optional) are required. Vehicles without factory power door locks require the installation of one actuator per door. This requires mounting the door lock actuator inside the door. Other vehicles may only require one actuator installed in the driver's door if all door locks are operated when the driver's lock is used. This type of installation is required to operate factory lock systems in Volvo (except 850), SAAB, and most Mazda, Isuzu and Subaru models.

The fuse used on 12V inputs should be 7.5A per motor installed in the vehicle.

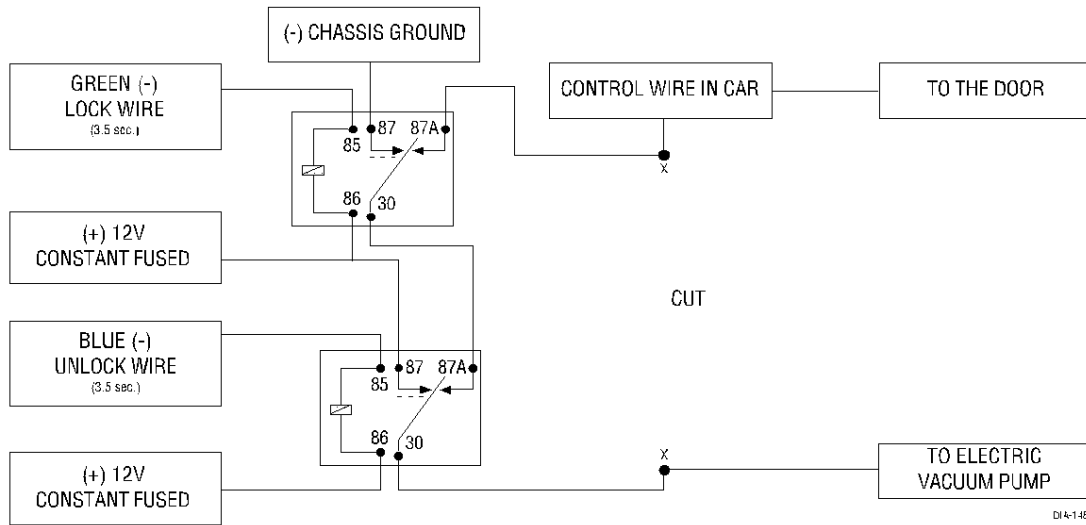
IMPORTANT! Do not connect the outputs of the alarm directly to the actuator!



type E: mercedes-benz and audi (1985 & newer)

Type E door locks are controlled by an electrically activated vacuum pump. Some Mercedes and Audis use a Type D system. Test by locking doors from the passenger key cylinder. If all the doors lock, the vehicle's door lock system can be controlled with just two relays (optional). The control wire can be found in either kick panel and will show (+)12V when doors are unlocked and (-) ground when doors are locked.

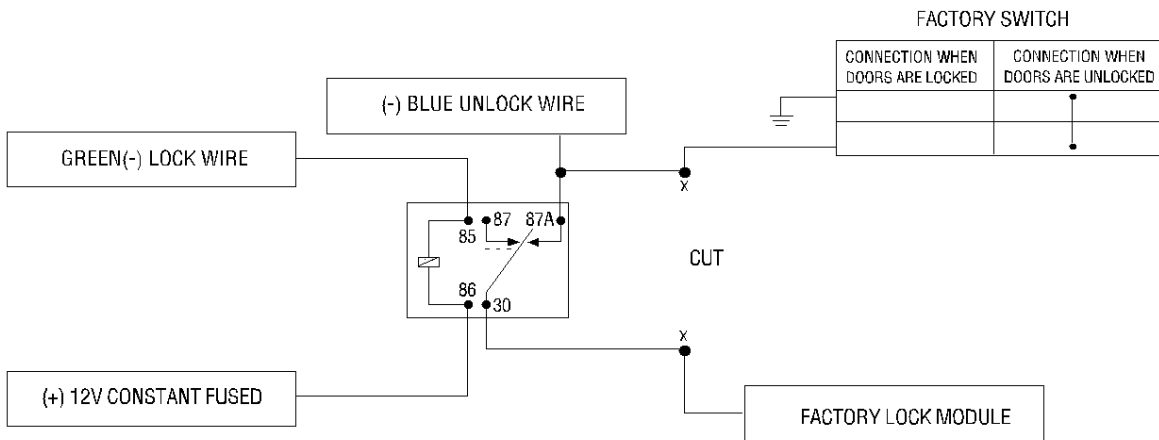
To interface see diagram below. The system must be programmed for 3.5 second door lock pulses.



type F: one-wire system

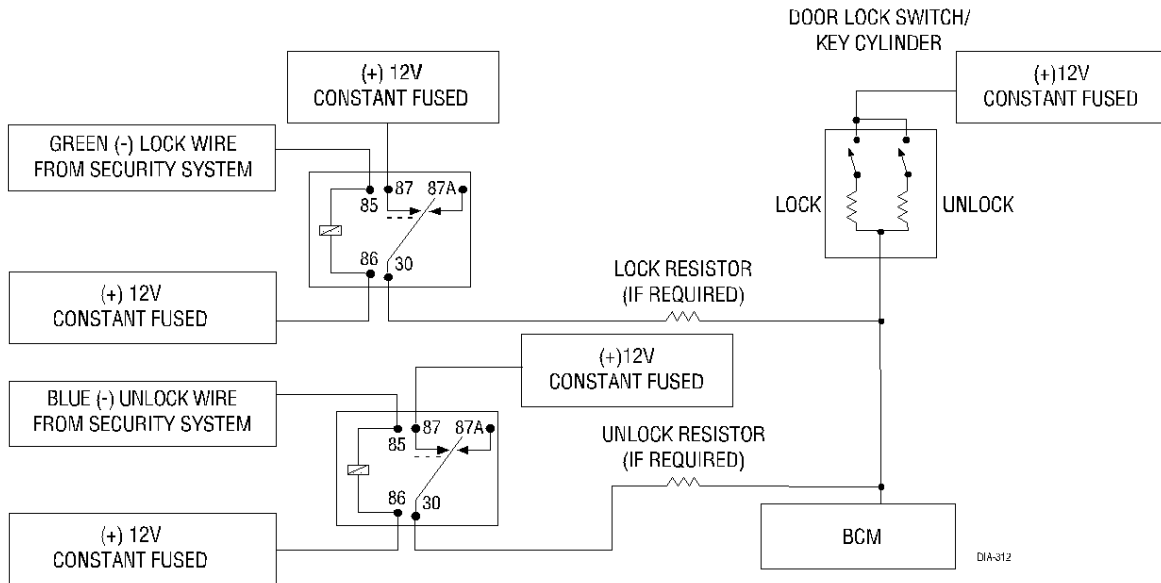
Type F door locks usually require a negative pulse to unlock, and cutting the wire to lock the door. In some vehicles, these functions are reversed. Type F door locks are found in late-model Nissan Sentras, some Nissan 240SX, and Nissan 300ZX 1992-up. They are also found in some Mazda MPV's and some Mitsubishi's.

One relay (optional) is used to interface to this type of system as follows:



type G: positive (+) multiplex

This system is most commonly found in Ford, Mazda, Chrysler and GM vehicles. The door lock switch or door key cylinder may contain either one or two resistors. When interfacing with this type of door lock system, two relays or a DEI 451M must be used.



SINGLE-RESISTOR TYPE

If one resistor is used in the door lock switch/key cylinder, the wire will pulse (+)12V in one direction and less than (+)12V when operated in the opposite direction.

TWO-RESISTOR TYPE

If two resistors are used in the factory door lock switch/key cylinder, the switch/key cylinder will read less than (+)12V in both directions.

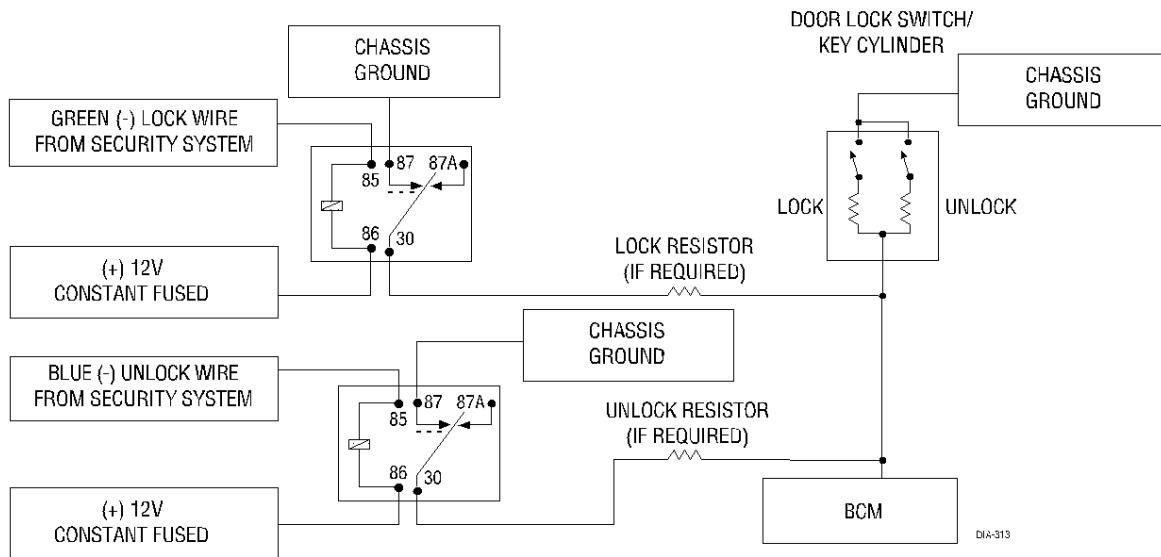
DETERMINING THE PROPER RESISTOR VALUES

(Also see *Multiplexed Systems, Test Procedure for Positive Multiplexed Door Lock Systems* section of this guide.) To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For all testing, use a calibrated digital multimeter that is set to ohms.

1. Cut the output wire from the door lock switch/key cylinder in half.
2. Test with the meter from the switch side of the cut door lock switch/key cylinder wire to a reliable constant (+)12V source. Some good constant (+)12V references are the power input source to the door lock switch/key cylinder, the ignition switch power wire, or the (+) terminal of the battery.
3. Operate the door lock switch/key cylinder in both directions to determine the resistor values. If the multimeter displays zero resistance in one direction, no resistor is needed for that direction.
4. Once the resistor value(s) is determined, refer to the wiring diagram for proper wiring.

type H: negative (-) multiplex

The system is most commonly found in Ford, Mazda, Chrysler and GM vehicles. The door lock switch or door key cylinder may contain either one or two resistors.



SINGLE-RESISTOR TYPE

If one resistor is used in the door lock switch/key cylinder, the wire will pulse ground in one direction and resistance to ground when operated in the opposite direction.

TWO-RESISTOR TYPE

If two resistors are used in the factory door lock switch/key cylinder, the door lock switch/key cylinder will read resistance to ground in both directions.

DETERMINING THE PROPER RESISTOR VALUES

(Also see *Multiplexed Systems, Test Procedure for Negative Multiplexed Door Lock Systems* section of this guide.) To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For all testing, use a calibrated digital multimeter that is set to ohms.

1. Cut the output wire from the door lock switch/key cylinder in half.
2. Test with the meter from the switch side of the cut door lock switch/key cylinder wire to a reliable ground source. Some good ground references are the ground input source to the door lock switch/key cylinder or the battery ground.
3. Operate the door lock switch/key cylinder in both directions to determine the resistor values. If the multimeter displays zero resistance in one direction, no resistor is needed for that direction.
4. Once the resistor value(s) is determined, refer to the wiring diagram for proper wiring.

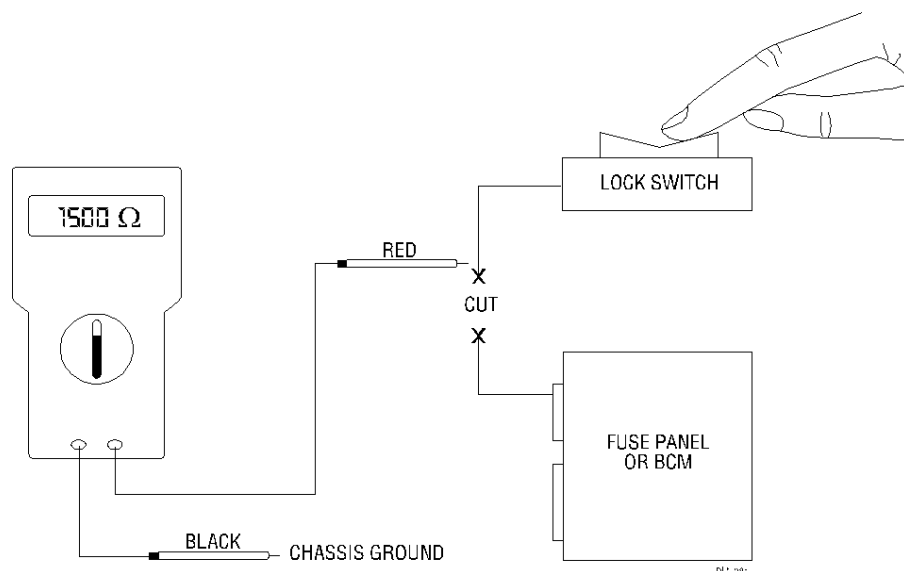
multiplexed systems

As multiplexed door locks become the industry standard in today's vehicles, understanding how these systems operate becomes increasingly important. The term "multiplexed" means having more than one function on the same conductor, using different resistor values to separate the multiple functions. In today's vehicles, the door locking system is the most commonly multiplexed circuit. The second most commonly multiplexed circuit is the lighting circuit, with additional vehicle circuits being multiplexed every year.

DEI alarms and keyless entry modules commonly use a reversing polarity output for the door locking systems, meaning that relays must be used to isolate the outputs of the module. In other words, if you do not relay isolate the outputs, the door lock wire will be pulsed with a dead short, causing the door locks to work intermittently. This can damage the switch and/or the body control module. The information provided in this section is intended to provide a better understanding of the different multiplexed systems and to prevent the system from being damaged.

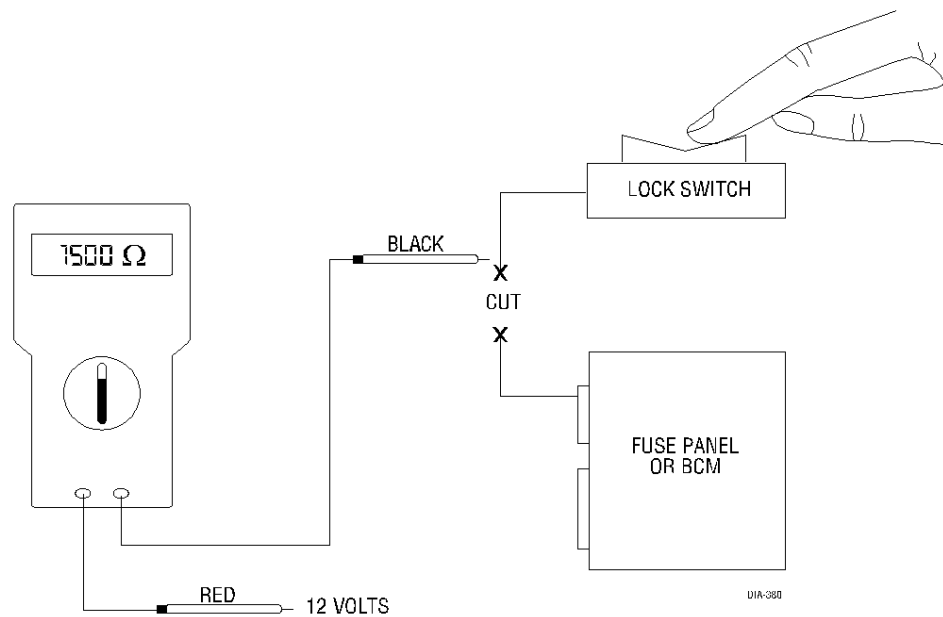
test procedure for positive multiplexed door lock systems

1. Locate the lock/unlock wire using the *Multiplex Door Lock Reference Chart* in this guide.
2. Test the wire using a multimeter. Place the black lead of the meter on ground and the red lead on the wire you are testing. The correct wire will show voltage in both the lock and unlock switch positions, but the voltage values will be different.
3. Once you have located the correct lock/unlock wire, cut it in half and set your meter to ohms. Place the red lead to 12 volts and the black lead to the SWITCH side of the lock/unlock wire.
4. Press and hold the switch to the lock position. Your meter will display the proper resistance for the lock function.
5. Now repeat the process, except this time press the switch to the unlock position and your meter will display the proper resistance for the unlock function. (Refer to the following diagram.)



test procedure for negative multiplexed door lock systems

1. Locate the lock/unlock wire using the *Multiplex Door Lock Reference Chart*.
2. Test the wire using a multimeter. Place the red lead of the meter on 12 volts and the black lead on the wire you are testing. The correct wire will show voltage in both the lock and unlock switch positions, but the voltage values will be different.
3. Once you have located the correct lock/unlock wire, cut it in half and set your meter to ohms. Place the black lead to ground and place the red lead on the switch side of the lock/unlock wire.
4. Press and hold the switch to the lock position. Your meter will display the proper resistance for the lock function.
5. Now repeat the process, except this time press the switch to the unlock position and your meter will display the proper resistance for the unlock function. (Refer to the following diagram.)



multiplex door lock reference chart

Vehicle	Year	Lock Resistance	Unlock Resistance	Disarm Resistance	Polarity	Color	Location
300 M	1999	2700 ohms	620 ohms	none	positive	white/green	Back of fusebox dr kick
300 M	2000	2700 ohms	620 ohms	none	positive	white/green	Back of fusebox dr kick
Alero	1999	none	1500 ohms	none	negative	white	Driver's kick panel
Alero	2000	none	1500 ohms	none	negative	white	Driver's kick panel
Alero	2001	none	1500 ohms	none	negative	white	Driver's kick panel
Aztek	2001	470 ohms	none	none	negative	red/black	Pink plug at BCM
Breeze	1996	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Breeze	1997	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Breeze	1998	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Breeze	1999	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Breeze	2000	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Caravan	1996 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Caravan	1996 w/o*2	4020 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Caravan	1997 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Caravan	1997 w/o*2	4020 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Caravan	1998 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Caravan	1998 w/o*2	4020 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Caravan	1999 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Caravan	1999 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Caravan	2000 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Caravan	2000 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Caravan	2001	5300 ohms	2000 ohms	Meter for value*1	negative	purple/green	Pin 21 @ BCM
Cirrus	1995	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Cirrus	1996	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Cirrus	1997	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Cirrus	1998	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Cirrus	1999	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Cirrus	2000	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Concorde	1998	2700 ohms	620 ohms	681 ohms	positive	white/green	Back of fusebox dr kick
Concorde	1999	2700 ohms	620 ohms	681 ohms	positive	white/green	Back of fusebox dr kick
Concorde	2000	2700 ohms	620 ohms	681 ohms	positive	white/green	Back of fusebox dr kick
Dakota	2001	820 ohms	310 ohms	none	negative	white/dk. green	Driver's kick panel
Durango	2000	647 ohms	1562 ohms	1562 ohms	negative	lt. green/orange	Dr. kick black plug
Durango	2001	650 ohms	390 ohms	1230 ohms	negative	white/green	Factory keyless mod
Escape	2001	1000 ohms	none	none	negative	pink/white	Driver's kick panel
Grand Am	1999	none	1500 ohms	none	negative	white	Driver's kick panel

*1 See *Test Procedure for Positive and Negative Multiplexed Door Lock Systems* sections of this guide to determine resistance values.

*2 With or without factory security.

multiplex door lock reference chart, cont.

Vehicle	Year	Lock Resistance	Unlock Resistance	Disarm Resistance	Polarity	Color	Location
Grand Am	2000	none	1500 ohms	none	negative	white	Driver's kick panel
Grand Am	2001	none	1500 ohms	none	negative	white	Driver's kick panel
Impala	2000	470 ohms	none	none	negative	orange/black	BCM above brake
Impala	2001	470 ohms	none	none	negative	orange/black	BCM above brake
Intrepid	1998	2700 ohms	620 ohms	none	positive	white/green	Back of fusebox dr kick
Intrepid	1999	2700 ohms	620 ohms	none	positive	white/green	Back of fusebox dr kick
Intrepid	2000	2700 ohms	620 ohms	none	positive	white/green	Back of fusebox dr kick
LHS	1999	2700 ohms	620 ohms	none	positive	white/green	Back of fusebox dr kick
LHS	2000	2700 ohms	620 ohms	1865 ohms	positive	white/green	Back of fusebox dr kick
Millenia	1994	1000 ohms	none	none	negative	blue/yellow	Passenger kick panel
Millenia	1995	1000 ohms	none	none	negative	blue/yellow	Passenger kick panel
Millenia	1996	1000 ohms	none	none	negative	blue/yellow	Passenger kick panel
Millenia	1997	1000 ohms	none	none	negative	blue/yellow	Passenger kick panel
Millenia	1998	1000 ohms	none	none	negative	blue/yellow	Passenger kick panel
Millenia	1999	1000 ohms	none	none	negative	blue/red	Passenger kick panel
Millenia	2000	1000 ohms	none	none	negative	blue/red	Passenger kick panel
Monte Carlo	2000	470 ohms	none	none	negative	orange/black	BCM above brake
Monte Carlo	2001	470 ohms	none	none	negative	orange/black	BCM above brake
MPV	2000	1200 ohms	none	1200 ohms	negative	green	Theft module
MPV	2001	1200 ohms	none	1200 ohms	negative	green	Theft module
Neon	2000 w/*2	7500 ohms	none	7500 ohms double p	negative	light green	Dr. door harness
Neon	2000 w/o*2	1500 ohms	none	none	negative	light green	Dr. door harness
Neon	2001 w/*2	7500 ohms	none	7500 ohms double p	negative	light green	Dr. door harness
Neon	2001 w/o*2	1500 ohms	none	none	negative	light green	Dr. door harness
Probe	1993	none	4700 ohms	none	positive	green/black	Driver's kick panel
Probe	1994	none	4700 ohms	none	positive	green/black	Driver's kick panel
Probe	1995	none	4700 ohms	none	positive	green/black	Driver's kick panel
Probe	1996	none	4700 ohms	none	positive	green/black	Driver's kick panel
Probe	1997	none	4700 ohms	none	positive	green/black	Driver's kick panel
PT Cruiser	2001	3000 ohms	7200 ohms	7200 ohms double p	negative	white/green	Back of fusebox dr kick
Sebring conv.	2001	1800 ohms	750 ohms	Meter for value*1	positive	white/green	C4, pin 15 @ BCM
Sebring JX conv.	1996	none	1500 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Sebring JX conv.	1997	none	1500 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Sebring JX conv.	1998	none	1500 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Sebring JX conv.	1999	none	1500 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Sebring JX conv.	2000	none	1500 ohms	470 ohms	positive	white/green	Back of fusebox dr kick

*1 See *Test Procedure for Positive and Negative Multiplexed Door Lock Systems* sections of this guide to determine resistance values.

*2 With or without factory security.

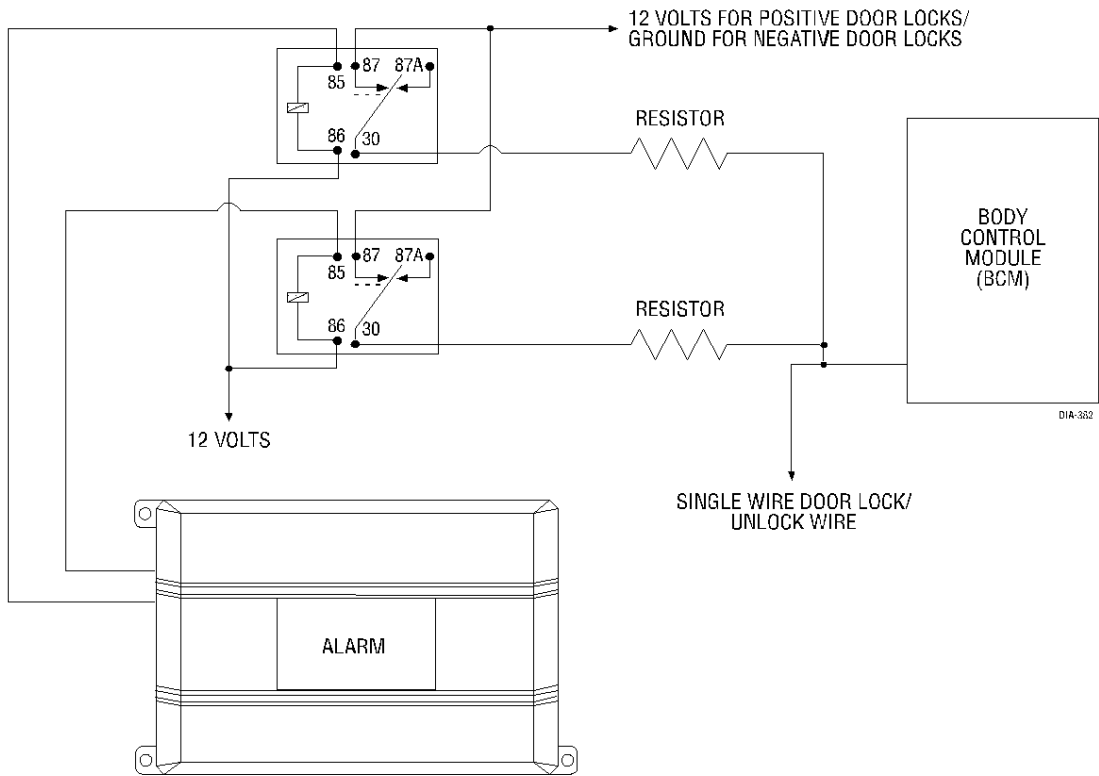
multiplex door lock reference chart, cont.

Vehicle	Year	Lock Resistance	Unlock Resistance	Disarm Resistance	Polarity	Color	Location
Sebring sedan	2001	1800 ohms	750 ohms	Meter for value*1	positive	white/green	C4, pin 15 @ BCM
SLK Mercedes	1998	526 ohms	none	none	negative	white/green	Left of center console
SLK Mercedes	1999	562 ohms	none	none	negative	white/green	Left of center console
Stratus	1995	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Stratus	1996	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Stratus	1997	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Stratus	1998	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Stratus	1999	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Stratus	2000	620 ohms	2700 ohms	470 ohms	positive	white/green	Back of fusebox dr kick
Stratus Sedan	2001	1800 ohms	750 ohms	Meter for value*1	positive	white/green	C4, Pin 15 @ BCM
Town & Country	1996 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Town & Country	1996 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Town & Country	1997 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Town & Country	1997 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Town & Country	1998 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Town & Country	1998 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Town & Country	1999 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Town & Country	1999 w/o*2	4020 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Town & Country	2000 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Town & Country	2000 w/o*2	4020 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Town & Country	2001	4020 ohms	2000 ohms	Meter for value*1	negative	purple/green	Pin 21 @ BCM
Tribute	2001	1000 ohms	none	none	negative	pink/white	Driver's kick panel
Voyager	2001	4020 ohms	2000 ohms	Meter for value*1	negative	purple/green	Pin 21 @ BCM
Voyager	1996 w/*2	4020 ohms	665 ohms	4020 ohms	negative	white/green	Back of fusebox dr kick
Voyager	1996 w/o *2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Voyager	1997 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Voyager	1997 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Voyager	1998 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Voyager	1998 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Voyager	1999 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Voyager	1999 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick
Voyager	2000 w/*2	4020 ohms	665 ohms	665 ohms	negative	white/green	Back of fusebox dr kick
Voyager	2000 w/o*2	1500 ohms	250 ohms	none	negative	white/green	Back of fusebox dr kick

*1 See *Test Procedure for Positive and Negative Multiplexed Door Lock Systems* sections of this guide to determine resistance values.

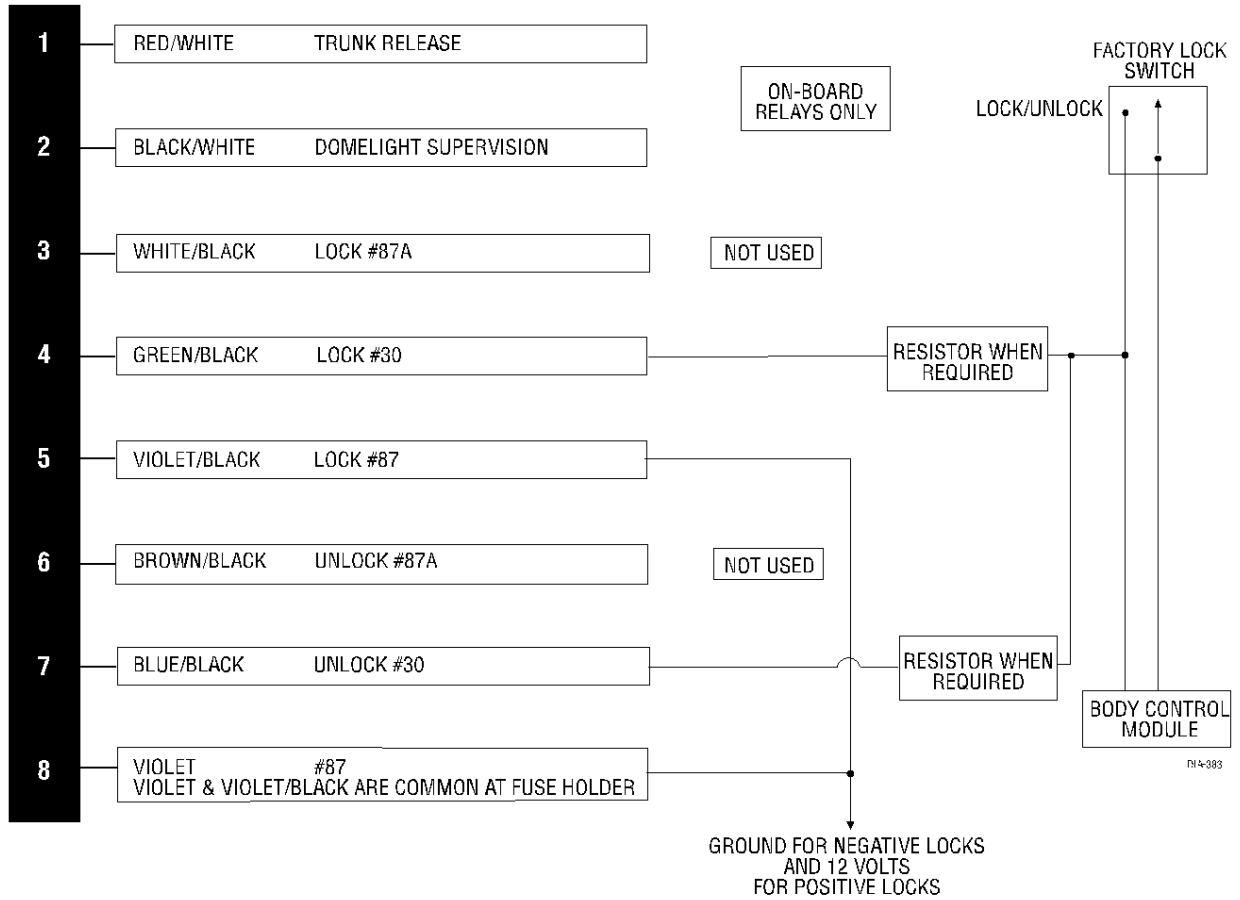
*2 With or without factory security.

multiplexed door lock wiring diagram



NOTE: See Multiplex Door Lock Reference Chart for resistor values.

multiplexed wiring with 451 relay pack or on-board relays

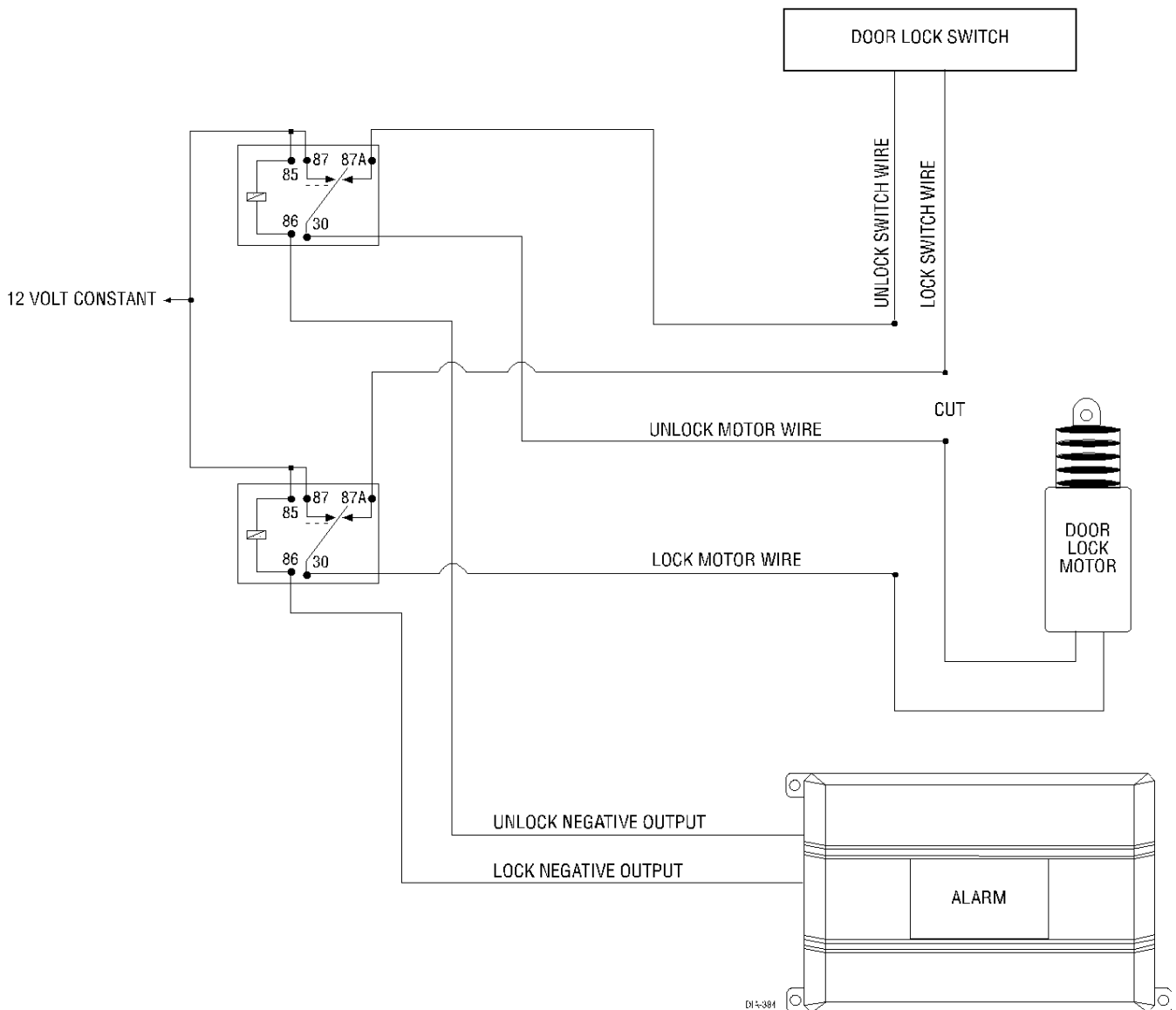


NOTE: See Multiplex Door Lock Reference Chart for resistor values.

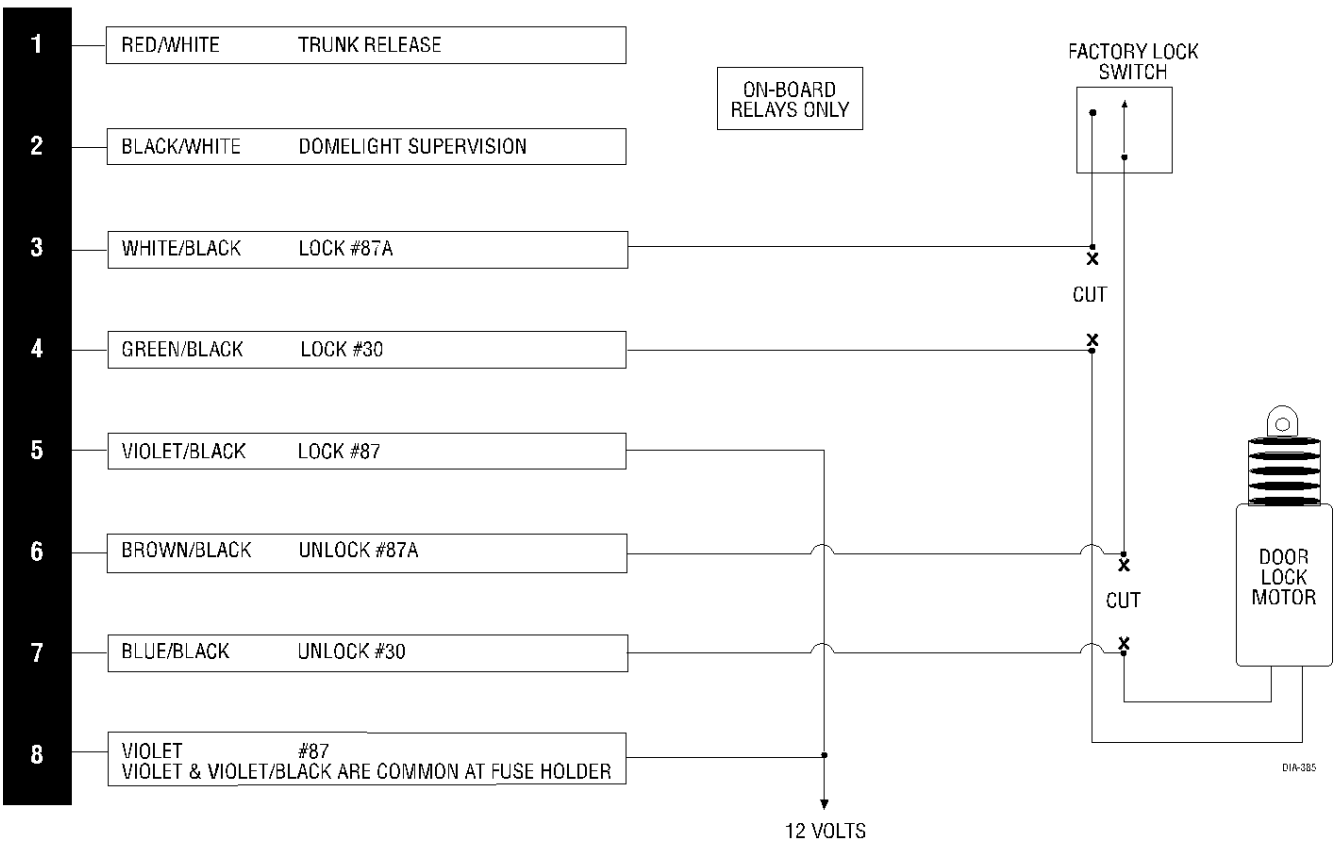
standard "5-wire" relay wiring

The term "5-wire" is used to describe the isolation of a circuit, so that the switch side is isolated from the motor side. This means that the wire you are using that comes from the switch has a grounded resting state. Sending 12 volts to that wire without isolating the switch side from the motor side will produce a dead short and blow the 12 volt source fuse. To prevent this from happening, interrupt the wire (cut it in half) and send 12 volts to only the motor side. To do this, a relay is commonly used to interface with many door locking systems. The following diagrams show basic "5-wire" door lock wiring and can be used as references to guide you through the wiring of any "5-wire" system.

standard "5-wire" relay diagram

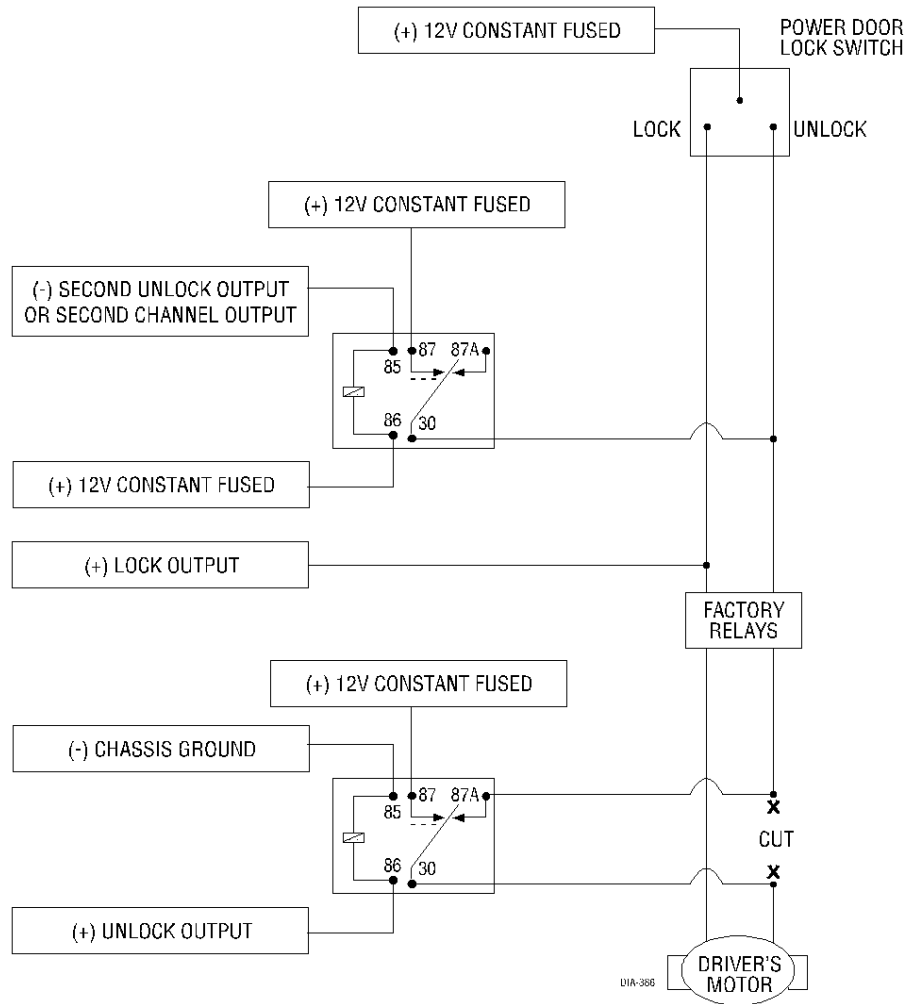


standard "5-wire" with 451 relay pack or on-board relays



progressive door locks

using positive (+) door lock outputs



NOTE: The second unlock output is a (-) output from the security/keyless entry system.

using negative (-) door lock outputs

