

Model 265B

➤ *Owner's/Installation Guide*



limited lifetime consumer warranty

Directed Electronics, Inc. (hereinafter "Directed") promises to the original purchaser to repair or replace with a comparable reconditioned Directed DIY remote start keyless entry unit if this Directed DIY remote start keyless entry unit (hereinafter "Unit"), excluding without limitation, any remote transmitters or associated accessories, proves defective in materials or workmanship under normal use for the life of the vehicle which the Unit is originally installed. During this period, so long as the Unit remained installed in the original vehicle, Directed will at its option, repair or replace this Unit if it is proved defective in workmanship or material PROVIDED the Unit is returned to Directed's warranty department at One Viper Way, Vista, CA 92081, along with \$20 postage and handling fee, a bill of sale or other dated proof of purchase bearing the following information: Date of purchase, name and location of the merchant who sold the Unit, and product description. This warranty does not cover labor costs for the removal or reinstallation of the Unit. This warranty is non-transferable and does not apply to any Unit that has been modified or used in a manner contrary to its intended purpose, and this warranty does not cover damage to any Unit caused by installation or removal of the Unit. This warranty is void if the Unit has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in materials or workmanship. Directed makes no warranty against theft of a vehicle or its contents.

THE FOREGOING WARRANTY IS THE EXCLUSIVE PRODUCT WARRANTY, OTHERWISE, ALL WARRANTIES INCLUDING BUT NOT LIMITED TO EXPRESS WARRANTY, IMPLIED WARRANTY, WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED AND DISCLAIMED TO THE MAXIMUM EXTENT ALLOWED BY LAW, AND DIRECTED NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY LIABILITY IN CONNECTION WITH THE SALE OF THE PRODUCT. DIRECTED HAS ABSOLUTELY NO LIABILITY FOR ANY AND ALL ACTS OF THIRD PARTIES INCLUDING ITS AUTHORIZED DEALERS OR INSTALLERS. SOME STATES DO NOT ALLOW THE LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

LIMITATION OF DAMAGES AND LIABILITY. CONSUMER'S REMEDY IS LIMITED TO REPAIR OR REPLACEMENT OF THE UNIT, AND IN NO EVENT SHALL DIRECTED'S LIABILITY EXCEED THE PURCHASE PRICE OF THE UNIT. IN ANY EVENT, DIRECTED SHALL NOT BE LIABLE FOR ANY DAMAGES INCLUDING, BUT NOT LIMITED TO, ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, LOST PROFITS, LOST SAVINGS, OR, TO THE EXTENT ALLOWED BY APPLICABLE LAW, DAMAGES RESULTING FROM DEATH OR INJURY ARISING OUT OF

OR IN CONNECTION WITH THE INSTALLATION, USE, IMPROPER USE, OR INABILITY TO USE, THE PRODUCT, EVEN IF THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OF LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSION MAY NOT APPLY TO YOU. THE CONSUMER AGREES AND CONSENTS THAT ALL DISPUTES BETWEEN THE CONSUMER AND DIRECTED SHALL BE RESOLVED IN ACCORDANCE WITH CALIFORNIA LAWS IN SAN DIEGO COUNTY, CALIFORNIA.

IMPORTANT NOTE:

This product warranty is automatically void if its date code or serial number is defaced, missing, or altered.

Make sure you have all of the following information from your dealer:

A clear copy of the sales receipt, showing the following:

- Date of purchase
- Authorized dealer's company name and address
- Item number

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what is included

- Control Module
- One 4-Button Remote
- 8-Pin Main H1 Harness
- 7-Pin H2 Secondary Harness
- 6-Pin Relay Heavy Gauge Wires
- Shutdown Toggle Safety Switch
- Hood Pin Switch
- Installation Kit

installation tools

- Digital Multi-Meter
- Drill
- 1/4 Drill Bit (for hood pin switch)
- Screwdrivers (Phillips and Flathead)
- Wire Stripper
- Solder Iron
- Electrical Tape
- Pliers
- Crimping Tool



note: The installation tools required will vary depending on your vehicle.

important information

Congratulations on the purchase of your remote start keyless entry system. This system will allow convenient access to your vehicle with the push of a button, as well as remote start and other optional features. Properly installed, this system will provide years of trouble-free operation.

Please take the time to carefully read this User's Guide in its entirety and watch the BOA Do-It-Yourself Installation Video (CDROM) prior to installing your system.

You can print additional or replacement copies of this manual by accessing the Directed web site at www.boasecurity.com.

important! If you are not comfortable working with electronics or unfamiliar with the tools required, please contact your local dealer for advice or ask to have the remote start professionally installed to avoid costly damages. Failure to properly install the remote starter may result in property damage, personal injury, or both.

system maintenance

The system requires no specific maintenance. Your remote is powered by a miniature 3-volt lithium battery that will last approximately one year under normal use. When the battery begins to weaken, the operating range will be reduced.

→ **fcc/id notice**

This device complies with Part 15 of FCC rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesirable operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

warning! safety first

The following safety warnings must be observed at all times:

- When properly installed, this system can start the vehicle via a command signal from the remote. Therefore, never operate the system in an area that does not have adequate ventilation. The following precautions are the sole responsibility of the user; however, the following recommendations should be made to all users of this system:
 1. Never operate the system in an enclosed or partially enclosed area without ventilation (such as a garage).
 2. When parking in an enclosed or partially enclosed area or when having the vehicle serviced, the remote start system must be disabled using the toggle switch.
 3. It is the user's sole responsibility to properly handle and keep out of reach from children all remote control units

to assure that the system does not unintentionally remote start the vehicle.

4. THE USER MUST INSTALL A CARBON MONOXIDE DETECTOR IN OR ABOUT THE LIVING AREA ADJACENT TO THE VEHICLE. ALL DOORS LEADING FROM ADJACENT LIVING AREAS TO THE ENCLOSED OR PARTIALLY ENCLOSED VEHICLE STORAGE AREA MUST AT ALL TIMES REMAIN CLOSED.

- Use of this product in a manner contrary to its intended mode of operation may result in property damage, personal injury, or death. Except when performing the Safety Check outlined in this user's guide, (1) Never remotely start the vehicle with the vehicle in gear, and (2) Never remotely start the vehicle with the keys in the ignition. The user will be responsible for having the neutral safety feature of the vehicle periodically checked, wherein the vehicle must not remotely start while the car is in gear. This testing should be performed by an authorized Directed dealer in accordance with the Safety Check outlined in this product installation guide. If the vehicle starts in gear, cease remote start operation immediately and consult with the Dealer to fix the problem immediately.
- After the remote start module has been installed, test the remote start module in accordance with the Safety Check outlined in this installation guide. If the vehicle starts when performing the Neutral Safety Shutdown Circuit test, the

remote start unit has not been properly installed. The remote start module must be removed or properly reinstalled so that the vehicle does not start in gear. OPERATION OF THE REMOTE START MODULE IF THE VEHICLE STARTS IN GEAR IS CONTRARY TO ITS INTENDED MODE OF OPERATION. OPERATING THE REMOTE START SYSTEM UNDER THESE CONDITIONS MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY. IMMEDIATELY CEASE THE USE OF THE UNIT AND REPAIR OR DISCONNECT THE INSTALLED REMOTE START MODULE. DIRECTED WILL NOT BE HELD RESPONSIBLE OR PAY FOR INSTALLATION OR REINSTALLATION COSTS.

main harness (H1), 8-pin connector

H1/1	WHITE	(-) Parking light flash
H1/2	LT. GREEN/BLACK	(-) Factory alarm disarm
H1/3	WHITE/BLUE	(-) Remote start activation input
H1/4	BLACK	Ground
H1/5	GRAY	(-) Hood pin shutdown input
H1/6	BROWN	(+) Brake switch shutdown input
H1/7	VIOLET/WHITE	Tachometer input
H1/8	BLUE	(-) 200mA status output

Use the following wiring guidelines for the H1 harness.

Pin #	Wire Color	Note
H1/6	Brown	This wire must be connected.
H1/7	Lt. Green/ Black	Use if the vehicle is equipped with a factory alarm.
H1/8	Blue	Only required when using a bypass module.

secondary harness (H2), 7-pin connector

H2/1	RED/WHITE	(-) Channel 2 (auxiliary channel ie: trunk)
H2/2	WHITE/BLACK	Lock #87A Normally Closed
H2/3	GREEN/BLACK	Lock #30 Common Output
H2/4	VIOLET/BLACK	Lock #87A Normally Open (Input) 15 A
H2/5	BROWN/BLACK	UnLock #87 Normally Closed
H2/6	BLUE/BLACK	Unlock #30 Common Output
H2/7	VIOLET	Unlock #87A Normally Open (Input) looped back to H2/4

relay heavy gauge wires

1	PURPLE	(+) (30A) Output to Starter Circuit
2	RED	(+) (30A) High Current 12V Input
3	ORANGE	(+) (30A) Output to Accessory Circuit
4	PINK	(+) (30A) Output to Ignition Circuit
5	RED	(+) (30A) High Current 12V Input
6	PINK/WHITE	(+) Output for 2 nd Ignition (not programmable)

using LED test probe

note: Do not use this test probe on computerized equipment or on the tachometer wiring as damage can result.

To use the LED test probe:

1. Remove the protective cover off the probe tip. Save the protective cover for reinstallation on the probe tip when the LED tester is not being used.
2. Connect the Black clip to a good chassis ground.
3. Connect the Red clip to a good +12V source. Both the Red and Green LEDs should be illuminated dimly.
4. If a positive voltage source is probed, the Red LED will illuminate brightly, and the Green LED will extinguish.
5. If a negative source is probed the Green LED will illuminate brightly and the Red LED will extinguish.

Alternate procedure to use the LED test probe (only for use on probing positive voltage wires):

1. Remove the protective cover off the probe tip. Save the protective cover for reinstallation on the probe tip when the LED tester is not being used.
2. Connect the Black clip to a good chassis ground.
3. If a positive voltage source is probed, the Red LED will illuminate brightly.

installation

Be sure to read this section thoroughly and view the Do-It-Yourself Installation CDROM video in its entirety before starting the installation. Pay special attention to all warnings to prevent personal injury or damage to your vehicle.

Visit our 24-hour technical Web site (www.boasecurity.com) to get a vehicle-specific wiring guide prior to starting this installation. Have on hand your crash code number when contacting tech support or visiting the web site. If at any time during the installation you are unable to answer your questions on the Web site, call **1-800-873-1314** for live technical assistance.



warning! This system is intended for automatic, fuel-injected vehicles only. Installation in any other vehicle is contrary to its intended use.

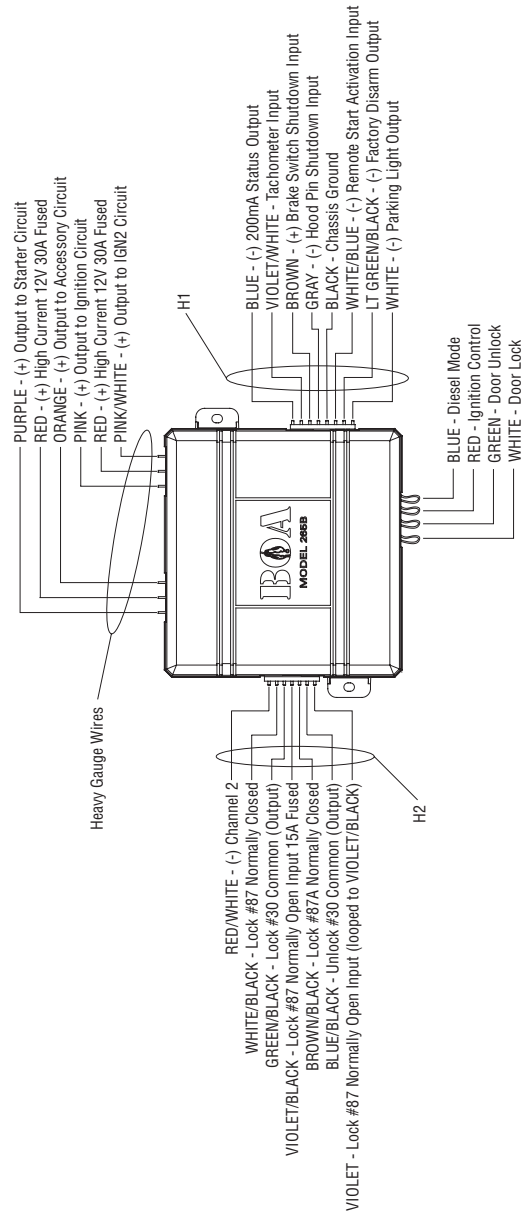


warning! On vehicles with air bags or supplemental restraint systems (SRS) you may notice a bright yellow tube with small wires in it marked SRS underneath the steering column near the key cylinder. DO NOT tamper or unplug these for any reason to prevent costly damages to your vehicle or personal injury. Tampering may cause unintended deployment of airbags.



warning! Verify that the vehicle is set to park and that the parking brake is set before beginning installation.

wiring quick reference guide

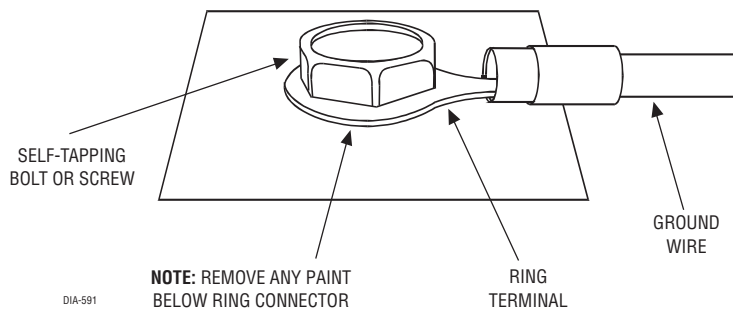


→ step 1

Ground Wire

The BLACK (H1/4) wire on the main 8-pin harness is ground. The ring terminal of this wire should be connected to a clean, paint-free area of metal only in the drivers kick panel area. Using a self-tapping screw, drill the screw with the ring terminal to the metal area. Once screwed down, pull on the wire to ensure a good connection.

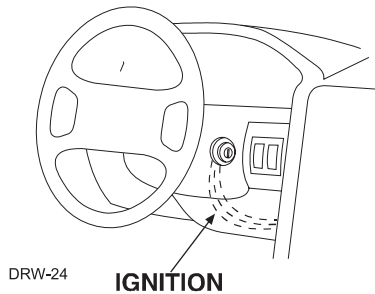
note: More problems are attributed to poor ground connections than any other cause. Take extra care to ensure the ground is a clean metal-to-metal contact and secure.



→ step 2

Constant Power and Ignition wires

Almost all power and ignition wires can be found behind the key cylinder under the lower drivers side dash panel. Using the appropriate hand tools, remove the lower dash panel using care not to break any parts. If the panel does not come off easily check for any additional screws you may have missed.



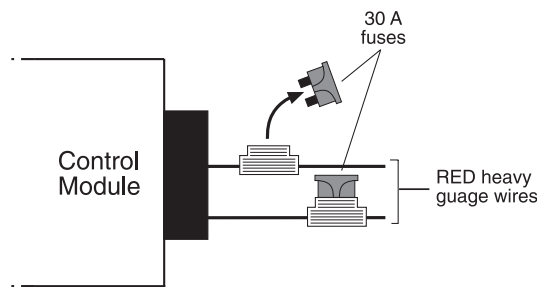
warning! On vehicles with air bags or supplemental restraint systems (SRS) you may notice a bright yellow tube with small wires in it marked SRS underneath the steering column near the key cylinder. DO NOT tamper or unplug these for any reason to prevent costly damages to your vehicle or personal injury. Tampering may cause unintended deployment of airbags.

Once the lower dash panel has been removed, locate the ignition harness at the back of the key cylinder. This is usually a group of thicker wires. With the ignition harness exposed, use your test probe to find your power and ignition wires.

Place the black lead of the test probe to a clean metal surface in the kick panel area and secure it. Put the meter in the DC voltage position, then take the red lead of the test probe and probe one of the thicker gauge wires. The color and identity of your specific vehicle wiring can be obtained at www.boasecurity.com. With the key in the OFF position, test the suspect wire. The constant power wire will illuminate the red LED regardless if the key is on or off.



warning! Before making any connection to constant battery power make sure that the two green 30 amp fuses are removed from the fuse holders on the two thick red wires (heavy gauge wires). Failure to do so may cause fire or shorting of sensitive electrical components.



Once the constant power wire has been identified, solder the two heavy gauge RED wires from the control module (relay heavy gauge) to it and wrap the connection with electrical tape.

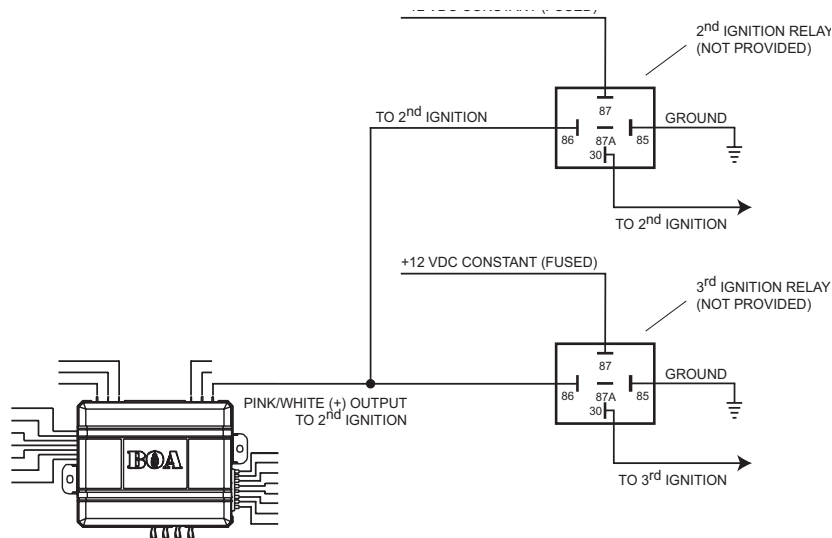
note: If the vehicle has two constant power wires, utilize both constant power wires. Connect one of the heavy gauge RED wires to one of the constant power wires and the other heavy gauge RED wire to the other constant power wire.

With the test probe black lead still in the kick panel, locate the ignition wire in the same location. It will test differently than constant (+)12 volts. Locate the suspected wire using the www.boasecurity.com Web site and place the red lead of the test probe on the suspected wire. With the key in the off position the probes LED will be off. Turn the key to the on position and the test probe LED should illuminate. Now watching your probe,

turn the key to the crank position. If the LED extinguishes this is not an ignition wire but an accessory wire. If the wire tests correctly, solder the thick PINK wire of the heavy gauge wires to it and wrap the connection with electrical tape.

If the vehicle requires more than one ignition as per the Web site information follow the same test procedure and solder the thick PINK/WHITE wire of the heavy gauge wires to it and wrap the connection with electrical tape. If your vehicle has only 1 ignition source, secure the PINK/WHITE out of the way.

If your vehicle requires more than two ignitions, an additional relay (not provided) is required. Refer to the diagram below.



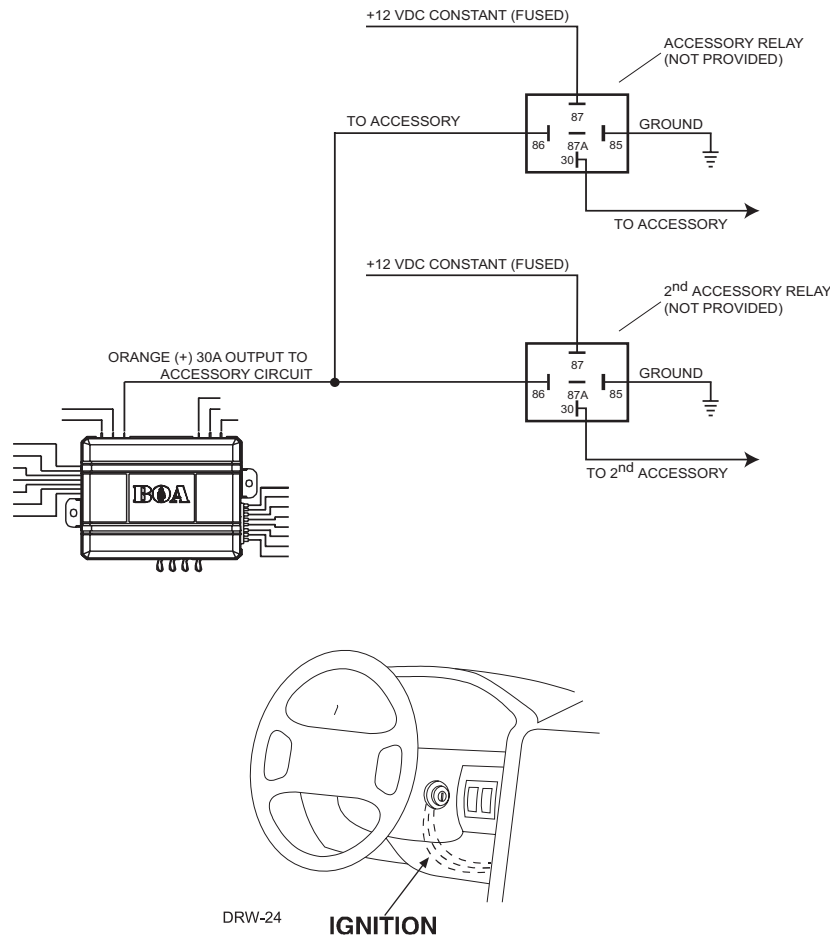
→ **step 3**

Accessory and Starter wires

The starter and accessory wires will be located in the same harness as the ignition and constant power.

Leaving the test probe's black lead connected to the metal ground, take the red lead and probe the wire suspected to be the accessory. With the key off, your test probe's LED should be off. Turn the key to the on position and the test probe's red LED should illuminate. Now turn the key to the crank position. If you have the correct accessory wire the LED will extinguish while the starter is cranking and return once the key returns to the on position. If the wire tests correctly, strip the insulation off a small portion and solder the thick ORANGE wire of the heavy gauge wire and wrap it with electrical tape.

If your vehicle requires more than one accessory, an additional relay (not provided) is required. Refer to the diagram below.

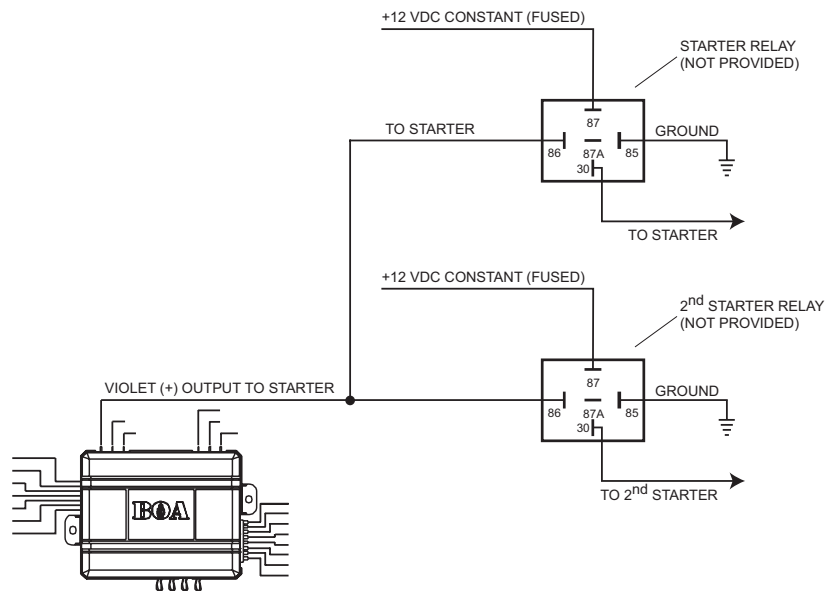


Now that the accessories have been located, find the wire suspected to be the starter wire according to the web information on your vehicle. Place the red lead of your test probe on the wire. With the key in the off position the test probe's LED should be off in all key positions except the crank position. In the crank position your test probe's red LED should illuminate, and will extinguish when the starter disengages.

note: Always check the Web site information on your vehicle for warnings regarding the starter wire and check engine lights. Some vehicles will trip a check engine light if the starter wire is cut.

Once you locate the starter wire, cut the wire in half (**check the web information before cutting**) and try to start the vehicle. If the vehicle does not start, the correct wire has been identified. Reconnect both ends the starter wire while soldering the thick PURPLE wire of the heavy gauge wires to it and wrap the connection with electrical tape.

Many Nissan vehicles have two starter wires. A relay (not provided) is required to hook up the additional starter wire. Refer to the diagram below.



→ step 4

Safety Shutdown Wires



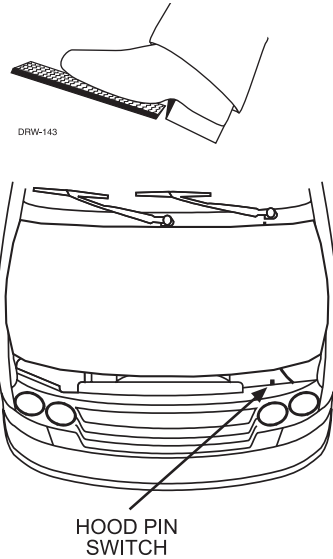
warning! These wires are meant to protect the vehicle and anyone near the vehicle. They **must** be connected appropriately to prevent damage to the vehicle and possible bodily injury. Failure to properly install these wires may cause the vehicle to lunge if remote started while in gear.

With all ignition wires properly connected, find the appropriate safety shutdown wires. These are the brake wire and hood pin wires.

First locate the factory brake wire using your test probe. Find the switch at the top of the metal arm coming off the brake pedal. There are usually two wires connected to that switch. Locate the wire color according to the web information. With your black test probe lead still in the kick panel, probe the suspected wire with the red lead of your test probe. With the brake pedal at rest the test probe's LED should be off. While watching the test probe, depress the brake pedal. The test probes red LED should illuminate. Once you have located the correct brake wire, solder the small BROWN (H1/6) wire of the main harness to it and wrap the connection with electrical tape.



warning! Do not use the vehicle until you confirm the operation of the brake shutdown.



Installing the hood pin switch requires drilling a ¼-inch hole in the metal lip under the hood. Choose a location that will allow the pin switch to be depressed when the hood is closed. The pin switch has a spade connector on the bottom for the wire connection.

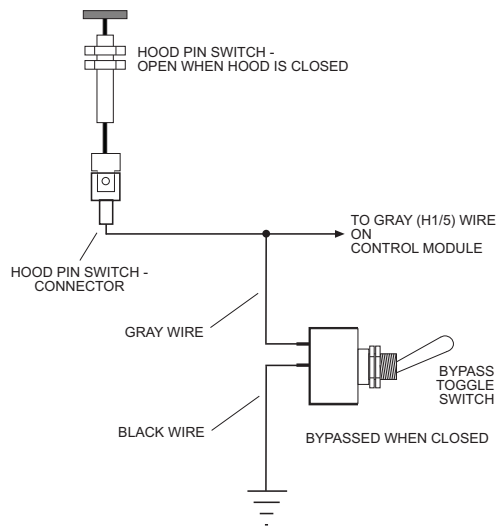
Place the wire with the spade connector onto the pin switch and run the wire into the vehicle's passenger compartment through a factory rubber grommet. Using a sharp, pointed object poke a hole into the grommet and attach the wire to the object with electrical tape. Pull the wire through the grommet taking extra care to keep the wire away from any moving parts or anything that will generate extreme heat. Once the wire is run into the vehicle and secured from any moving parts, solder the wire to the GRAY (H1/5) wire of the main harness and wrap the connection with electrical tape.



warning! Do not use the vehicle until you confirm the operation of the hood pin shutdown.

The bypass toggle switch is designed to bypass the remote start in an emergency or to disable the remote start functions temporarily (i.e., for service on the vehicle or when parking in an enclosed area). This switch is to be mounted in an easily accessible location in the passenger compartment.

Connect the toggle switch as shown below. The Gray (H1/5) wire to the hood pin switch, and the Black wire from the switch to ground. The toggle switch must be in the Off position for normal operation.

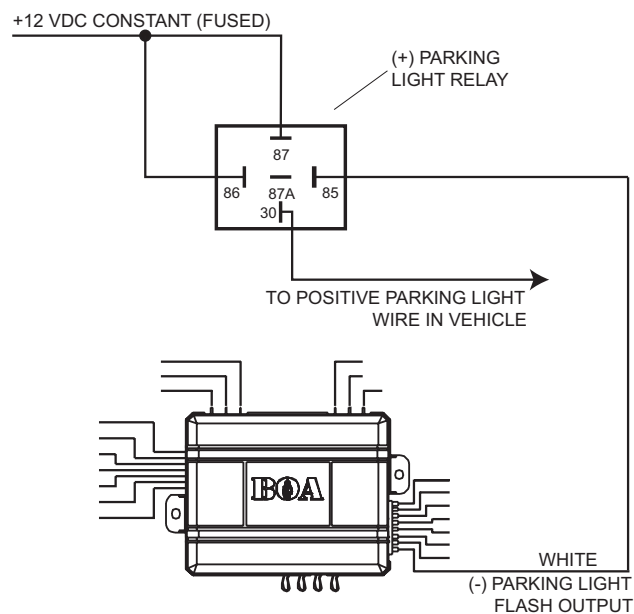


→ step 5

Parking light flash

There are several different types of parking light circuits. The following description is for a standard negative-triggered parking light circuit, only. If the web vehicle information suggests a (+) parking light circuit, a relay (not provided) is required. Refer to the diagram below.

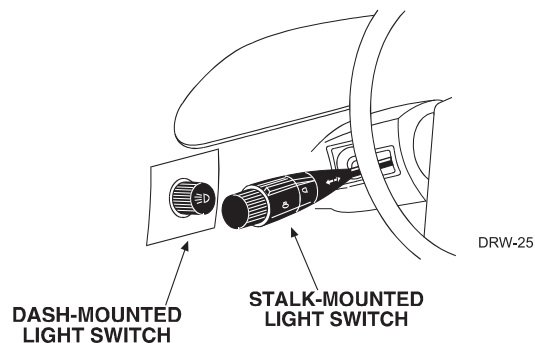
note: When the parking lights are connected, they will flash the whole time the remote start is active.



Using the web information on the vehicle, locate the suspected wire and place the red lead of the test probe to a constant (+)12 volt source and secure it. Leave the black test probe lead in the kick panel,. Probe the suspected wire with the test probe. With

the switch in the off position the test probe should have both LEDs illuminated dimly. While watching the test probe LEDs, turn the switch to the parking light position. The test probe's green LED should illuminate and the red LED should extinguish. While testing the suspected wire, run the dash dimmer light control up and down—the voltage should NOT vary (the green LED should stay illuminated and the red LED should stay off). If the voltage does vary, continue probing to find the correct wire.

Once you have identified the correct wire, solder the WHITE (H1/1) wire of the main harness to it and wrap the connection with electrical tape.



→ step 6

Door Locks

The system comes with a built in relay pack for door lock operation. When attempting to interface the power door locks with your system it is important to understand that there are multiple types of door locking systems in today's vehicles. To determine

your vehicle's power door lock system, check the web information on your vehicle.

If your door lock system is a different type than described in this guide, go to www.boasecurity.com (On-Line Tech Support, Tech Tips) to download the door lock systems guide. This guide identifies the type of system for your vehicle. With the built in door lock relays you can properly interface the power locks with your keyless entry/remote start system. If you are unable to identify your door lock system with the web information please contact BOA Technical Support.

Although there are numerous types of door lock circuits, the most common is the negative triggered door lock system (Type B). If your vehicle has a negative triggered door lock system, follow the steps below. If your vehicle has any other type of door lock system then, the easiest way to determine which type of door lock system you are working with is to remove the master locking switch itself, which is usually on the driver's door or on the center console. Once you have determined which type of factory door lock circuit you are working with, and the color codes of the switch wires to be used, you can usually simplify the installation by locating the same wires in the vehicle's kick panel. If no central locking switch is found, the installation may require a door lock actuator.

note: Always retest the wires in the kick panel to be sure they function the same way as the wires on the switch.

There are eight common types of door lock circuits (some vehicles use more unusual systems):

- **Type A:** Three-wire (+) pulse controlling factory lock relays. Most GM, some Ford and Chrysler, 1995 Saturn, some new VW, newer BMW.
- **Type B:** Three-wire (-) pulse controlling factory lock relays. Most Asian vehicles, early Saturn, some BMW and Porsche.
- **Type C:** Direct-wired reversing-polarity switches. The switches are wired directly to the motors. This type of system has no factory relays. Most Fords, many GM two-door cars and trucks, many Chryslers.
- **Type D:** Adding one or more aftermarket actuators. These include slave systems without an actuator in the driver's door, but with factory actuators in all the other doors. Type D also includes cars without power locks, which will have actuators added. All Saabs before 1994, all Volvo except 850i, all pre-1997 Subarus, most Isuzus, and many Mazdas. Some mid-eighties Nissans, pre-1985 Mercedes-Benz and Audi.
- **Type E:** Electrically-activated vacuum systems. The vehicle must have a vacuum actuator in each door. Make sure that locking the doors from the driver's or passenger side using the key activates all the actuators in the vehicle. This requires a slight modification to the door lock harness. Mercedes-Benz and Audi

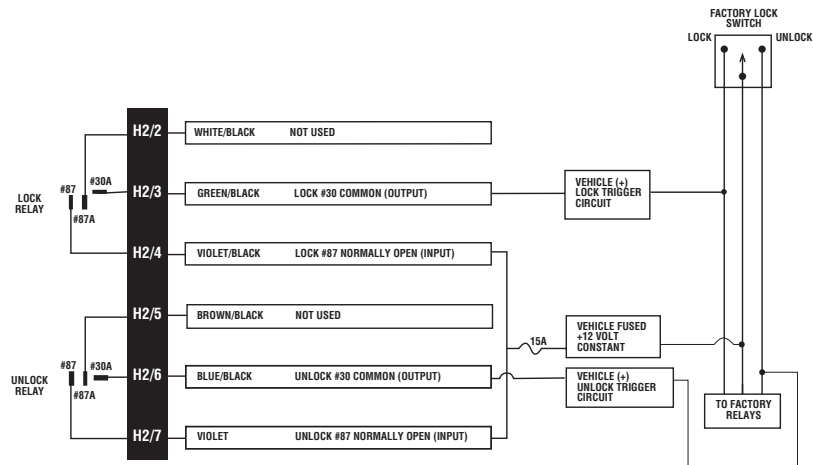
1985 and newer.

- **Type F:** One-wire system - cut to lock, ground to unlock. This system is found in late-model Nissan Sentras, some Nissan 240SX, and Nissan 300ZX 1992 and later. It is also found in older Mitsubishi's, and some early Mazda MPV's.
- **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.
- **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.

at the door lock switch

- Three-wire switches will have either a constant ground input or a constant (+)12V input, along with the pulsed lock and unlock outputs to the factory relays.
- Many BMW's and VW's have no external switch. The switches are inside the actuator, and instead of pulsing, the proper wires will flip-flop from (+)12V to (-) ground as the door locks are operated.
- Direct-wired switches will have a (+)12V constant input and one or two (-) ground inputs, along with two output leads going directly to the lock motors.

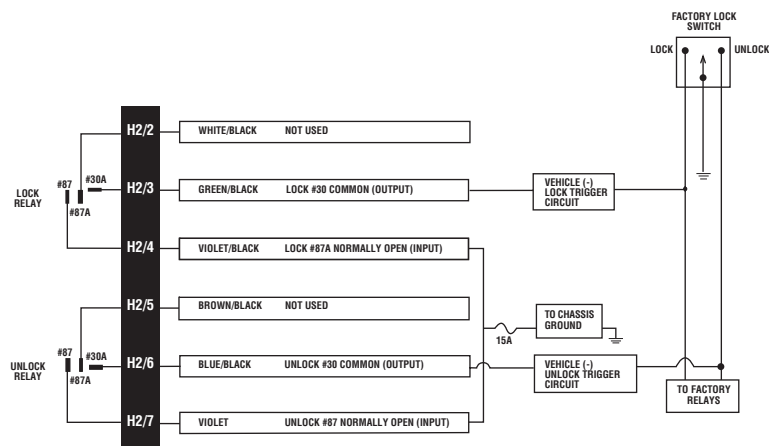
type A: positive-triggered, relay-driven system



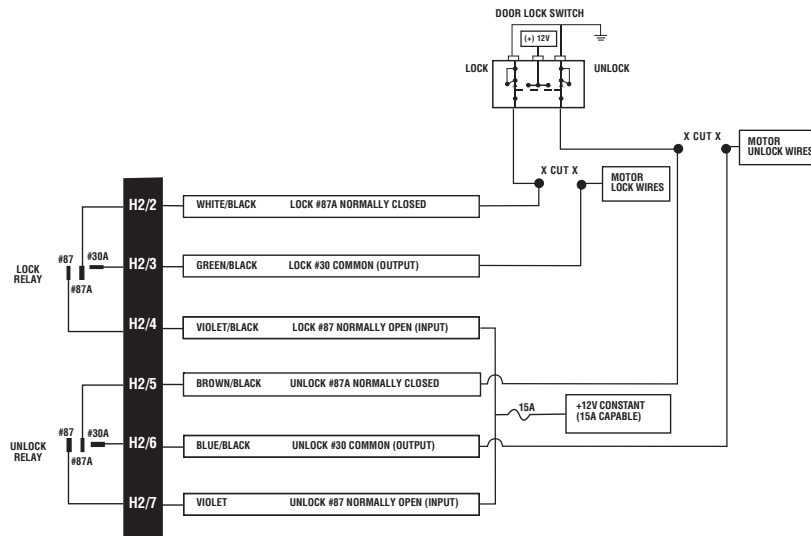
type B: negative-triggered, relay-driven system

This system is common in many Toyota, Nissan, Honda, and Saturn models, as well as Fords with the keyless-entry system (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 (-) when the switch locks the doors, and the other wire will pulse (-) when the switch unlocks the doors. This type of system is difficult to mistake for any other type.



type C: direct-wired, reversing-polarity system



testing reversing polarity systems

Use these instructions if the power door lock switch has four or five heavy-gauge wires. This type of switch has two outputs that rest at (-) ground.

important: To interface with these systems, you must cut two switch leads. The relays must duplicate the factory door lock switches' operation. The master switch will have one or two ground inputs, one (+)12V input, and two switch outputs going directly to the slave switch and through to the motors. These outputs rest at (-) ground. The lock or unlock wire is switched to (+)12V, while the other wire is still grounded, thus completing the circuit and powering the motor. This will disconnect the switch from the motor before supplying the motor with (+)12V, avoiding sending (+)12V directly to (-) ground.

It is critical to identify the proper wires and locate the master switch to interface properly. Locate wires that show voltage when the switch is moved to the lock or unlock position. Cut one of the suspect wires and check operation of the locks from both switches. If one switch loses all operation in both directions then you have cut one of the correct wires and the switch that is entirely dead is the master switch. If both switches still operate in any way and one or more door motors have 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 identified, cut both wires and interface as described in the following paragraphs.

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

- **H2/2 WHITE/BLACK:** Once both door lock wires are located and cut, connect the white/black wire to the master switch side of the lock wire. The master switch side will show (+)12V when the master switch is operated to the lock position and (-) ground when the master switch is in the middle position.
- **H2/3 GREEN/BLACK:** Connect the green/black wire to the other side of the lock wire. This is the motor side of the lock wire and it goes to the lock motor through the slave switch.

- **H2/4 VIOLET/BLACK:** This wire must be connected to a constant (+)12 volts. The best connection point for this wire is the constant (+)12V supply for the door lock switch*, or directly to the positive (+) battery post with a fuse at the battery post.

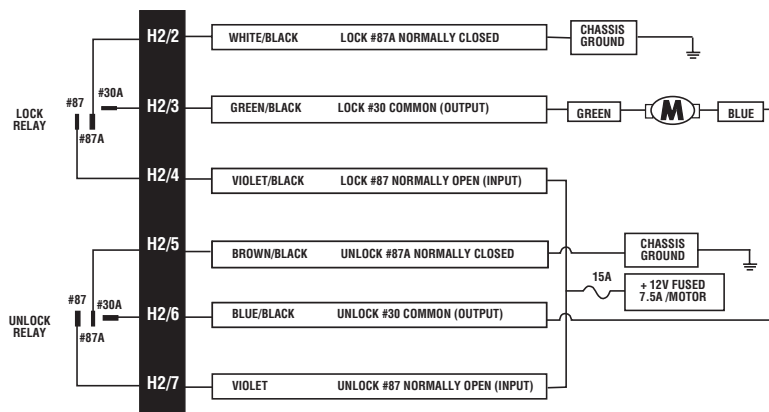
***note:** Except in GM cars with retained accessory power (RAP). In these vehicles, the (+)12V feed to the door lock switches is turned off if the doors are closed for any length of time.

note: Most direct-wired power lock systems require 20-30 amps of current to operate. Connecting the violet/black wire to a poor source of voltage will keep the door locks from operating properly.

- **H2/5 BROWN/BLACK:** Connect the brown/black wire to the master switch side of the unlock wire. The master switch side will show (+)12V when the master switch is in the unlock position and (-) ground when the master switch is in the middle position.
- **H2/6 BLUE/BLACK:** Connect the blue/black wire to the other side of the unlock wire.
- **H2/7 VIOLET:** This wire must be connected to a constant (+)12 volts. The best connection point for this wire is the constant (+)12V supply for the door lock switch*, or directly to the positive (+) battery post with a fuse at the battery post. (See both notes above.)

type D: adding one or more after-market actuators

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.

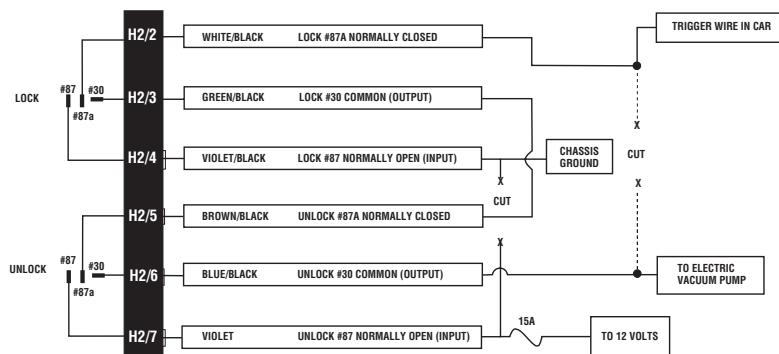


note: Adding door lock actuators can be complicated. Please contact BOA technical support prior to attempting the addition of actuators.

type E: electrically-activated vacuum

This system is found in Mercedes-Benz and Audi 1985 and newer. The door locks are controlled by an electrically activated vacuum pump. The control wire will show (+)12V when doors are unlocked and (-) ground when locked.

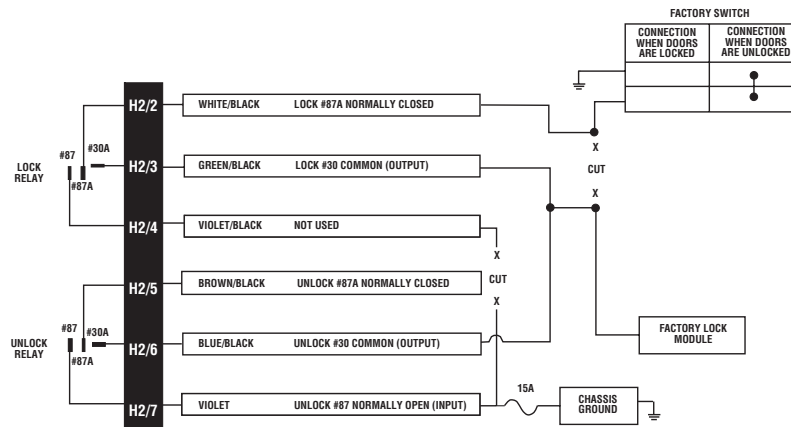
note: The system must be programmed for 3.5-second door lock pulses, and the violet jumper between the #87 lock terminal and the #87 unlock terminal must be cut. Contact BOA technical support. See Programming section.



type F: one-wire system (cut to lock, ground to unlock)

This type of door lock system usually requires a negative pulse to unlock, and cutting the wire to lock the door. (With some vehicles, these are reversed.) It is found in the late-model Nissan Sentras, some Nissan 240SX, Nissan 300ZX 1992 and later. It is also found in some Mazda MPV's.

note: The violet jumper between the #87 lock terminal and the #87 unlock terminal must be cut.



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.

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: To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For testing, use a calibrated digital multimeter that is set to ohms.

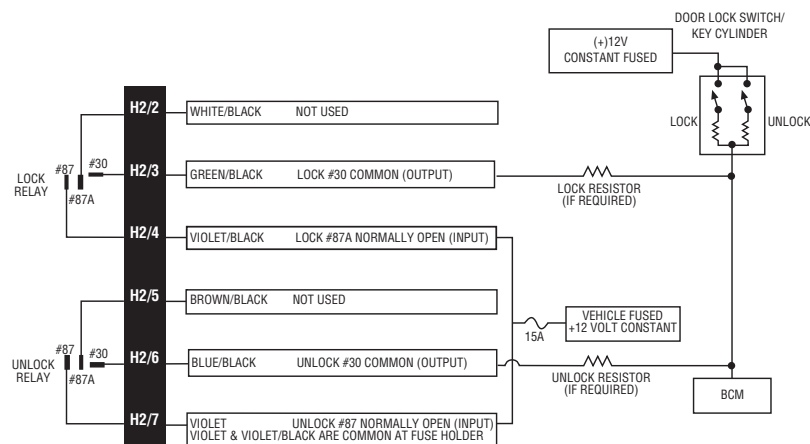
note: To ensure an accurate resistance reading, do not touch the resistor or leads during testing.

note: Please refer to the *Door Locking Systems* document on www.boasecurity.com (On-Line Tech Support, Tech Tips) for complete resistor test procedure and additional information for multiplexed door locks.

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.

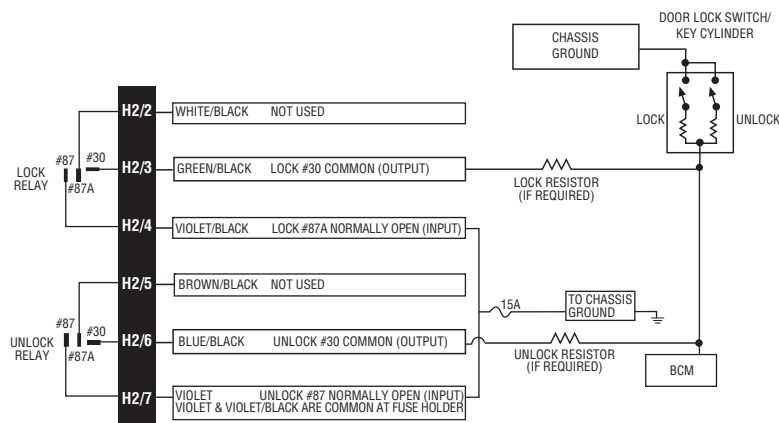
TWO-RESISTOR TYPE: If two resistors are used in the factory door lock switch/key cylinder, the door lock switch/key cylinder will read resistance to ground in both directions.

DETERMINING THE PROPER RESISTOR VALUES: To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For testing, use a calibrated digital multimeter that is set to ohms.

note: To ensure an accurate resistance reading, do not touch the resistor or leads during testing.

note: Please refer to the *Door Locking Systems* document on www.boasecurity.com (On-Line Tech Support, Tech Tips) for complete resistor test procedure and additional information for multiplexed door locks.

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.

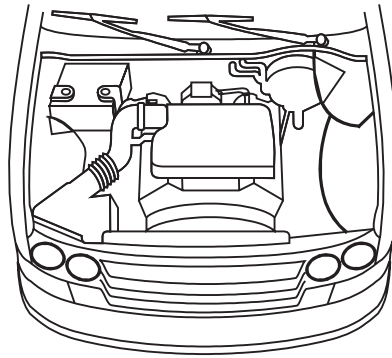


→ step 7

Engine monitoring (voltage)

During remote start the system will need to determine if the engine is running. The module does this by monitoring the voltage of the vehicle's electrical system (or the tachometer-see next topic). When the vehicle is not running the electrical system is approximately 12 volts. The system detects the engine running when the voltage equals or exceeds 13.5 volts. The remote start system monitors the increase to prevent the starter from cranking when the vehicle is already running.

If the voltage is too low, the system assumes the engine is not running and will shut down the Ignition/Accessory circuit. The system will make a total of 3 start attempts. Try connecting the system up without tachometer on first attempt. If vehicle grinds starter or does not finish cranking, hook up tachometer wire.



On some vehicles the electrical system has too low of a voltage variance for the remote start module to see. In this case, it will be necessary to use the tachometer.

Engine monitoring (tachometer)



warning! In the following procedure do not wear loose clothing that could get entangled in rotating engine components. Ensure that your hands and arms are well clear of these rotating components when working in the engine compartment. Lastly, ensure that all wires and tools are clear of falling into or entanglement with these rotating components.

note! In the following procedure do NOT use a test light. Use of this type of tester can cause grounding of sensitive electrical components causing damage, including damage to the power train control module. A digital multi-meter is required to test for this wire.

Identify the suspect wire according to the web information.

Place the black lead of the multi-meter on the negative battery post and secure it. Put the multi-meter in the AC position and connect the probe to the suspect wire with the red lead of the multi-meter. Then start the vehicle with the key. With the engine at idle the multi-meter should read between .05 volts to 1.5 volts.

Have a second person press the gas pedal to increase the RPMs and watch the meter display. When the RPMs increase the voltage should read between 1.5 volts and 2.9 volts. Once the correct tachometer wire has been identified, turn the vehicle off.

Run the VIOLET/WHITE (H1/7) wire from the main connector through the firewall into the engine compartment along side the hood pin wire. Use the same procedure as with the hood pin wire and pull the wire through the grommet taking extra care to keep it away from any moving parts or anything that will generate extreme heat. Once the wire is run into the engine compartment, strip a small portion of insulation off the tachometer wire and solder it to the VIOLET/WHITE wire and wrap the connection with electrical tape. Pull on the wire to ensure a good connection.

note! For the programming of the tachometer, refer to the *Control Module Programming* discussion.

→ step 8

Factory Alarm Arm or Disarm

Since most newer vehicles come equipped with a factory alarm

system, it is sometimes necessary for the factory alarm to be armed/disarmed when unlocking the doors and disarmed while remote starting the vehicle.

note: Some vehicles use a + trigger system. Use the www.boasecurity.com website to determine if your vehicle has a + trigger system. If this vehicle has this system call **1-800-873-1314** for live technical assistance as special wiring and an additional relay is required.

note: On some vehicles the Factory Alarm Disarm wire is connected to a Body Control Module or a Door Module. If you find this configuration, please call BOA Technical Support at **1-800-873-1314**.

Locate the factory alarm arm/disarm wires using the web site vehicle information. Once the suspect wires are located, place the multi-meter's red lead to a (+)12 volt constant source and secure it. Put the multi-meter in the DC position then probe the suspect wire with the black lead of your meter. While probing the wire, place the key in the drivers door cylinder. Turn it to the unlock position and hold it when testing for the disarm wire. The multi-meter should read between 10.00 volts and 13.00 volts and will disappear when the key is released.

When the correct wire has been found, solder the LIGHT GREEN/BLACK (H1/2) wire of the main harness to the wire which activates in the unlock position when the key is turned. After this wire has been connected wrap the connection with electrical tape.

→ step 9

Immobilizer Bypass Modules

note: Any vehicle equipped with a factory immobilizer must use an immobilizer bypass module to remote start. If not used, the vehicle ignition or fuel supply circuits could lock up and require a costly trip to the dealer to reset the computer system.

Most newer vehicles have a factory engine immobilizer system designed to prevent any unauthorized use of the vehicle. These immobilizers will cut off power to the starter and the fuel supply preventing a thief from starting the vehicle.

There are several types of immobilizers, with the most common being the resistance based passlock/passlock 2 systems found on most newer GM vehicles. This system can be bypassed using the 555L immobilizer bypass module available at your local retail dealer. The majority of transponder-based immobilizer systems can be bypassed using the 555U or 556U immobilizer bypass module available at your local retail dealer.

To determine what bypass module your vehicle requires, use the www.boasecurity.com web-site in the Interface Module Look-Up section.

→ step 10

Learning the remote

The system comes with one transmitter. The receiver can store up to 2 different transmitter codes in memory. An additional transmitter can be ordered by contacting your local dealer at 1-800-274-0200. Use the following to learn the transmitter or to add a transmitter to the system.

note: If power is lost to the control module (battery disconnected), the remote(s) must be relearned. The remote must **not** be closer than 3-feet from the control module when programming.

The following is the basic sequence of steps to remember whenever programming this unit:



warning! In the following procedure do not activate the remote start feature with the remote. This feature will be tested in the next step.

1. **Fuses.** Be sure to place the two 30-amp fuses into the relay harness RED wire fuse holders



2. **Key.** Turn the ignition to the ON position.

note: The system can only learn, after being connected and with the FIRST IGNITION ON. If not learned with the first ignition on the main power fuses will have to be disconnected from the BOA unit and then reconnected and the procedure repeated.

3. **Program.** After 5-seconds, the parking lights will flash twice, press and hold the **PROG** button on the remote, until the doors lock and unlock (approximately 5-seconds).

note: A second remote can only be added to the system immediately after programming the first remote.

important: When programming a remote ensure to hold the remote about 4-feet away from the BOA unit. If the remote is too close to the unit, the remote may not program.

To add a second remote (within 5-seconds of the first remote door lock and unlock acknowledgment):


1. **Program.** Hold the **PROG** button on the additional remote for an additional 5-seconds, until another door unlock acknowledgment.


→ step 11

Testing the system

Once steps 1-10 have been completed, the operation of the system can be tested.

note: If power has been removed or the fuses removed, the remote(s) will have to again be learned to the system.

Ensure that the two 30-amp fuses are in the relay harness RED wire fuse holders. Make sure that the vehicle is in park with the emergency brake on and the hood closed. Press  once on the remote to initiate the remote start function. The parking lights

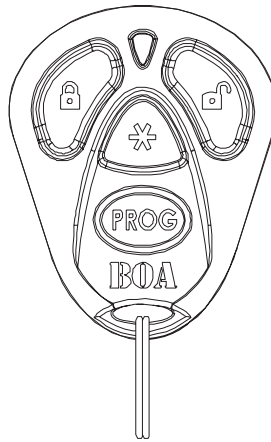
should flash to confirm the remote start command has been received, The accessories and ignition should turn on followed by the starter cranking and the vehicle engine running (this may take a moment to initiate). Pressing  once again on the remote will shut the engine off.

This completes the testing, if all functions do not work correctly check your wiring against the manual and verify all connections. If you still experience problems contact BOA Technical Support at **1-800-873-1314**.


remote functions

The receiver uses a computer-based learn routine to learn the remote buttons.


➔ **standard configuration**




Button 

Press the  button to lock the vehicle.


Button 

Press the  button to unlock the vehicle.



Button 

Press the  button once to remote start the vehicle.

Button 

Press the  button once to remote stop the vehicle.

Buttons  and 

These buttons engage timer mode. Press the  and  buttons simultaneously once to start the engine every 3 hours (12-minute run time).

Buttons  and 

These buttons activates the auxiliary output when simultaneously pressed.

Button 

This button is used to program the system.

control module programming

Dependent on the vehicle, use the following data with the instructions to program your system. These wire loops are found at the side of the control module.

Door Lock Pulse Duration (WHITE) - Some European vehicles, such as Mercedes-Benz and Audi, require longer lock and unlock pulses to operate the vacuum pump. Programming the system to provide 3.5 second pulses will accommodate door lock interface in these vehicles. The default setting is 0.8 second door lock pulses. See *Mercedes-Benz and Audi - 1985 and Newer (Type E Door Locks section)* diagram.

Uncut – 0.8 seconds

Cut – 3.5 seconds

Double Pulse Unlock Single Pulse/Double Pulse (GREEN) - Some vehicles require two pulses on a single wire to unlock the doors. When the double pulse unlock feature is turned on, the H2/6 BLUE/BLACK wire will supply two pulses instead of a single pulse. This makes it possible to directly interface with double pulse vehicles without any extra parts.


Uncut – single pulse

Cut – double pulse

Ignition Controlled Door Locks On/Off (RED) - When on, the doors will lock three seconds after the ignition is turned on and unlock when the ignition is turned off.

Uncut – ignition controlled door locks on

Cut – ignition controlled door locks off

Diesel Mode (BLUE) - Cut this loop if you have a diesel vehicle. When cut the remote start will start the engine about 30 seconds after pressing the  button once.

Uncut – Gas Mode

Cut – Diesel Mode

Voltage Mode/Tachometer Mode - Default is voltage mode. The control module will automatically look at the tachometer input during normal driving. If it finds a valid tachometer signal the module will use tachometer mode, otherwise the module will use voltage mode (battery voltage will rise after the engine starts).

To program tachometer mode, start the engine and let it run for at least 30 seconds. If the tachometer is seen by the control module, it will enter tachometer mode, and will monitor the tachometer input for the next startup.

The system is programmed to attempt two starts using tachometer mode. If after the second start attempt the control module did not see a tachometer input the system will attempt to start a third time using voltage mode.

using your system

warning! safety first

The following safety warnings must be observed at all times:

■ When properly installed, this system can start the vehicle via a command signal from the remote. Therefore, never operate the system in an enclosed area or partially enclosed area without ventilation (such as a garage). When parking in an enclosed or partially enclosed area or when having the vehicle serviced, the remote start system must be disabled using the installed toggle switch. It is the user's sole responsibility to properly handle and keep out of reach from children all remotes to assure that the system does not unintentionally remote start the vehicle. **THE USER MUST INSTALL A CARBON MONOXIDE DETECTOR IN OR ABOUT THE LIVING AREA ADJACENT TO THE VEHICLE. ALL DOORS LEADING FROM ADJACENT LIVING AREAS TO THE ENCLOSED OR PARTIALLY ENCLOSED VEHICLE STORAGE AREA MUST AT ALL TIMES REMAIN CLOSED.** These precautions are the sole responsibility of the user.


■ Use of this product in a manner contrary to its intended mode of operation may result in property damage, personal injury, or death. (1) Never remotely start the vehicle with the vehicle in gear, and (2) Never remotely start the vehicle with the keys in the ignition. The user must also have the neutral safety feature of the vehicle periodically checked, wherein the vehicle

must not remotely start while the car is in gear. This testing should be performed by an authorized Directed Electronics, Inc. dealer in accordance with the Safety Check outlined in the product installation guide. If the vehicle starts in gear, cease remote start operation immediately and consult with the authorized Directed Electronics, Inc. dealer to fix the problem.


■ After the remote start module has been installed, contact your authorized dealer to have him or her test the remote start module by performing the Safety Check outlined in the product installation guide. If the vehicle starts when performing the Neutral Safety Shutdown Circuit test, the remote start unit has not been properly installed. The remote start module must be removed or the installer must properly reinstall the remote start system so that the vehicle does not start in gear. All installations must be performed by an authorized Directed Electronics dealer.

OPERATION OF THE REMOTE START MODULE IF THE VEHICLE STARTS IN GEAR IS CONTRARY TO ITS INTENDED MODE OF OPERATION. OPERATING THE REMOTE START SYSTEM UNDER THESE CONDITIONS MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY. YOU MUST IMMEDIATELY CEASE THE USE OF THE UNIT AND SEEK THE ASSISTANCE OF AN AUTHORIZED DIRECTED ELECTRONICS, INC. DEALER TO REPAIR OR DISCONNECT THE INSTALLED REMOTE START MODULE. DIRECTED ELECTRONICS, INC. WILL NOT BE HELD RESPONSIBLE OR PAY FOR INSTALLATION OR REINSTALLATION COSTS.

→ **locking with remote**

To lock the doors press  for one second. The doors will lock and the parking lights will flash once to confirm that the doors are locked.


→ **unlocking with remote**

To unlock the doors press  for one second. The parking lights will flash twice to confirm that the doors are unlocked.

→ **ignition-controlled door locks**

If power door locks have been connected to your system and the ignition-controlled door locks are programmed on, the vehicle's door will lock three seconds after the ignition has been turned on and unlock when the ignition is turned off.

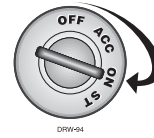
→ **remote start**

Pressing  once allows you to remotely start your vehicle. This makes it possible to warm up the engine, as well as adjust the interior temperature of the vehicle with the climate control system. If interior heating or cooling is desired, the climate controls must be preset, and the fan blower must be set to the desired level prior to remote starting the vehicle.

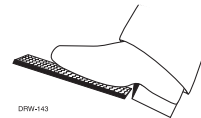
note: (1) Never remotely start the vehicle with the vehicle in gear, and (2) Never remotely start the vehicle with the key in the ignition.

When you are ready to drive the vehicle:


1. Insert the ignition key and turn it to the ON (not the START) position.
2. Press the brake pedal.



note: If the brake pedal is pressed before the key is in the ON position, the engine will shut down.



While the vehicle is running during remote start operation, the system will monitor the vehicle and will automatically shut down the engine if the system receives any of the following shut-down inputs:



- The brake pedal is pressed.
- The hood is opened.
- The shutdown toggle switch is put into the ON position.
- The pre-programmed run time has elapsed (12-minutes).
- The  button is pressed.
- The tachometer is either too high or low.
- The battery voltage is too low.

timer mode

This feature allows you to remotely start and run your vehicle for 12-minutes every 3 hours (for a maximum of 6 starts for cold weather conditions). This makes it possible to warm up the engine, as well as adjust the interior temperature of the vehicle with the climate control system. If interior heating or cooling is desired, the climate controls must be preset, and the fan blower must be set to the desired level prior to remote starting the vehicle.



note: (1) Never remotely start the vehicle with the vehicle in gear, and (2) Never remotely start the vehicle with the key in the ignition.

To remote start the vehicle in timer mode:

1. Press the  and  buttons simultaneously.
2. The parking lights will flash in a sequence of 4 times to confirm remote start timer operation.
3. The vehicle will start every 3 hours, it will run for a period of 12-minutes or until a shutdown input is triggered.


Remote start timer mode is cancelled by:

- Activation of the ignition (turning the ignition key On)
- The car has started 6 times.
- The brake pedal is pressed.
- The hood is opened.

- The shutdown toggle switch is put into the ON position.
- Note: The  button on the remote can be pressed once at any time to stop the engine during the 12-minute timer engine run interval. The  button does not affect the 3-hour time interval between engine starts. If the engine fails to start on 3 attempts it is counted as one start in timer mode. The system will attempt to start again 3-hours later (if this wasn't its 6th start attempt).

pit stop mode



This feature allows you to exit the car and leave the engine running. Use the following procedure to enter Pit Stop Mode:

1. Place the transmission in park and put the parking brake on.
2. Leave the ignition on.
3. Do not step on the brake.
4. Press the  button once. The parking lights will flash once to confirm pit stop mode.
5. Turn the key off and remove the key.
6. Exit and lock the vehicle.



Use the following procedure to exit Pit Stop Mode:

1. Enter the vehicle.
2. Place the key into the run (not the crank or start position).
3. Step on the brake (this causes the system to exit Pit Stop Mode).

trunk/auxiliary

This feature allows the trunk to be opened or other accessory to be operated by the remote. Simultaneously press the  and  buttons.

code hopping® re-synchronize

If the remote is pressed many times out of range, or the battery is removed from the remote, the remote may get temporarily out of sync and fail to operate the system. To synchronize the remote, simply press  or  several times within range of the vehicle. The system will automatically synchronize and the remote will respond normally.

troubleshooting

- The ignition comes on, but the starter will not crank.
Does it start with the key in the ignition? If so, does the vehicle have an engine immobilizer?
Will it start with the brake pedal depressed? (Make sure to disconnect the brake shutdown when performing this test.)
If so, it may have a brake/starter interlock.
Is the correct starter wire being energized? Check by energizing it yourself with a fused test lead.
- The starter cranks for 1 or 2-seconds but does not start.
Either the wrong ignition wire is being energized, the system's ignition and accessory wires have been connected backwards, or the vehicle has two ignition circuits. Try activating the unit with the ignition key in the "run" position. If the vehicle then runs normally, retest your ignition system.
- The starter continues to crank even though the engine has started.
Has the tach wire been learned? See the Tach Learning section of this guide.
Is the tach wire receiving the correct information? Either the wrong tach wire has been used, or a bad connection exists.
- The climate control system does not work while the unit is operating the vehicle.
Either the wrong accessory wire is being energized or more than one ignition or accessory wire must be energized in order to operate the climate control system.

- The remote start will not activate.

Check harnesses and connections. Make sure the harnesses are fully plugged into the remote start module. Make sure there are good connections to the vehicle wiring.

Check voltage and fuses. Use a meter and check for voltage between the RED wire and the BLACK ground wire. If you have less than battery voltage, check the and both 30A fuses on the RED heavy gauge wires. Also make sure that the ground wire is going to a good paint-free chassis ground.
- The remote start will activate but the starter never engages.
 1. Check for voltage on the purple starter wire two seconds after the remote start becomes active. If there is voltage present, skip to Step 4. If there is no voltage present, advance to Step 2.
 2. Check the 30A fuses.
 3. Does the vehicle have an immobilizer? Some immobilizer systems will not allow the vehicle to crank if active.
 4. Check connections. The two red heavy gauge input wires should have solid connections. "T-taps", or "scotch locks" are not recommended for any high current heavy gauge wiring. Also, if the vehicle has more than one 12-volt input wire, then connect one red wire to each.

- The vehicle starts, but immediately dies.
Does the vehicle have an immobilizer? The vehicle's immobilizer will cut the fuel and/or spark during unauthorized starting attempts.
- The vehicle will start and run only for about 10 seconds.
Is the remote start programmed for voltage sense? Try programming the unit using a tach wire.

glossary of terms

Control Module: The “brain” of your system. Usually hidden under the dash area of the vehicle. It houses the microprocessor that monitors your vehicle and controls all system functions.


Remote: A hand-held, transmitter control which operates the various functions of your system.

[illegible]


Cut along dotted line and fold for a quick and easy reference to keep in your purse or wallet.

QUICK REFERENCE GUIDE:


To lock the doors using your remote

- Pressing  for one second will lock the doors. The doors will lock and the parking lights will flash once to confirm the doors are locked.



To unlock the doors using your remote

- To unlock the doors, press  for one second. The the doors will unlock and the parking lights will flash twice to confirm the doors are unlocked.

To remote start the vehicle

- Press the  button once. The engine will start and the parking lights will flash to confirm remote start operation.


To enter timer mode

- Press the  +  buttons simultaneously. The parking lights will flash 4-times for confirmation.

To exit timer mode

- Turn the ignition key On when the engine is not running. The parking lights will flash 4-times for confirmation.

To enter pit stop mode

- Press the  button once while the engine is running. The parking lights will flash once.

The company behind this system is Directed Electronics, Inc.

Since its inception, Directed Electronics has had one purpose, to provide consumers with the finest vehicle security and car stereo products and accessories available. The recipient of nearly 100 patents and Innovations Awards in the field of advanced electronic technology, DIRECTED is ISO 9001 registered.

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