



Diagnose Ignition Switch Problems

by [Larry Carley](#) copyright 2019 AA1Car.com

The ignition switch is the master switch that provides power for the vehicle's electrical accessories, computer, fuel and ignition systems. It also routes current from the battery to the starter to crank the engine.

An ignition switch has four positions:

OFF - Or LOCK position, Turns off power to the engine and electrical accessories

ACC - Accessory position that provides power to electrical accessories only, not the engine.

RUN - The "ON" position that provides power to the engine and electrical accessories. The switch must be in this position for the engine to run and for the vehicle to be driven.

START - Used only to start the engine.

IGNITION SWITCH ANTI-THEFT FUNCTIONS

The ignition switch also serves as a theft prevention device. A key is required to turn the switch. The key portion of the switch (which is often a separate component from the

multi-contact electrical part of the switch) works like any other lock. Inserting a key into the switch moves a row of pins inside a cylinder. If the pins line up correctly, the cylinder will turn allowing the switch to change position. If the pins don't line up, they prevent the switch from turning. Problems here can be caused by a worn key and/or worn pins inside the cylinder.

On applications where the electrical part of the switch is a separate component behind the key cylinder, removing the key cylinder allows the switch to be turned manually (typically with a large screwdriver). On older vehicles, car thieves would use a slide hammer or pry bar to pop the key cylinder out of the ignition switch so they could start the engine without a key. But all that changed when auto makers began using anti-theft systems that included a coded "computer" key.

On newer cars, the engine won't start even if the key cylinder has been removed because the computer must receive the proper code from the key. If the vehicle has a push button start system (no key), the anti-theft code comes from the key fob. If there's no code (or the wrong code), the computer won't energize the fuel pump or start the engine -- and the thief can't steal the car. Starting problems here can occur if the circuit that reads the smart key or key fob is faulty and doesn't recognize or transmit the proper signal back to the computer. The same thing can happen if the smart key or key fob is defective or damaged.

If your car has a smart keyfob and Start button, and you can't start your engine, [Click Here](#), or see [Start Engine Push Button Diagnosis](#).

On some applications, the anti-theft system can be confused if there are more than one smart key on the key ring and the system is reading the wrong key. This may happen if the second or third keys are for a similar make/model of vehicle rather than a different make/model of vehicle.

IGNITION SWITCH INTERLOCKS

The ignition switch is also used to lock the steering wheel when the key is removed. This is also to reduce auto theft. On vehicles with automatic transmissions, there is also a "shift interlock" solenoid that locks the transmission linkage so the transmission cannot be shifted out of Park.

Problems with the column lock (such as binding) may prevent the ignition switch from turning when the key is inserted, or it may prevent the key from being removed when you turn the engine off.

Problems with the shift interlock solenoid may prevent the transmission from being shifted out of Park. The cause may be a bad solenoid, an electrical fault between the ignition switch circuit and the interlock solenoid, or binding in the shift interlock linkage.

COMMON IGNITION SWITCH PROBLEMS

Common problems with ignition switches include any of the following:

IGNITION SWITCH WON'T TURN WHEN KEY HAS BEEN INSERTED

Try jiggling the steering wheel back and forth. The steering column may be binding because one of the front wheels is turned at an angle against a curb. This puts a load on the steering linkage, which may be enough to bind the column lock and ignition switch.

A worn key (or the wrong key) can prevent the ignition switch from turning. If you have a spare key, try the spare key in the ignition switch to see if it works. If the spare key works, the problem is not a bad ignition switch but a bad key. Throw the old key away and get a new copy made of the spare key. If you have no spare key, a lock smith may be able to make you a new key using a key code from the owner's manual or auto maker. If that is not an option, the key cylinder in the ignition switch will have to be replaced along with a new set of keys.

If the ignition switch is binding (hard to turn in either direction), lubricating the switch may help. Use a nonconductive lubricant such as dielectric silicon grease or aerosol electronics cleaner. CAUTION: Do not use penetrating oil or graphite because it might short out the electrical contacts inside the switch.



IGNITION SWITCH TURNS ON BUT ENGINE WILL NOT CRANK

If nothing happens when you turn the ignition switch to the start position, the problem may be a bad ignition switch, or it may be a fault in the starting circuit.

First, do the instrument panel warning lights come on when the key is turned to the ON position? No warning lights or other signs of electrical activity could indicate a dead

battery or that the battery cables are loose or corroded. Try turning on the headlights. No lights? Then you have a battery or battery connection problem.

If the headlights work, the problem is not the battery but an electrical fault in the ignition switch, ignition switch circuit (wiring or fuse), or a problem in the starting circuit (bad relay, solenoid, wiring or starter).

IGNITION SWITCH TURNS ON AND ENGINE CRANKS BUT WILL NOT START

The problem here is probably an [anti-theft fault](#), or a fault in the [fuel pump](#) circuit, ignition circuit or engine computer.

If the anti-theft light is flashing, the computer is NOT recognizing the key or key fob and is preventing the engine from starting. This could be due to a bad receiver in the ignition switch that reads the key, a damaged smart key or key fob, or a wiring fault between the switch and computer. On some vehicles, reprogramming the computer may be required so the computer will correctly recognize the smart key or key fob. You can't circumvent an anti-theft system because it is hard wired into the computer.

If the anti-theft light is NOT flashing when you attempt to start the engine, and the engine is cranking normally, the computer is recognizing the key but the engine may not be starting because it is not getting fuel or spark. Check the fuel gauge to make sure it is not on empty. Got fuel? Listen for the fuel pump to buzz when the key is first turned on. No buzz means a fault in the fuel pump, pump relay or pump wiring. There could also be a problem in the ignition system (such as a bad crankshaft position sensor, ignition control module or computer) that is preventing the engine from starting. See the related articles on these subjects for further diagnosis.

If the engine cranks, but much slower than normal, the problem is not a bad ignition switch but low voltage to the starter (check the battery and cable connections) or a bad starter.

ENGINE STARTS AND RUNS NORMALLY, BUT SUDDENLY DIES WHILE DRIVING

This is one of the most common symptoms of a worn ignition switch. Worn contacts inside the switch may cause a momentarily loss of voltage as a result of heat or vibration (as when driving on a rough road or hitting a bump). Any loss of power through the ignition switch will cause the engine to stumble, misfire or die.

Ignition switches wear from normal use. The more you drive your vehicle, the more times you use the ignition switch. After many years and miles, the electrical contacts inside the switch may become worn or corroded, resulting in poor or intermittent electrical contact.

The wear problem can be made worse by heavy key rings that place extra stress on the switch. A large heavy key ring that rocks and sways as you drive twists and tugs on the switch. Over time, this will accelerate wear and eventually cause the ignition switch to fail.



ADVICE: Lighten your key ring as much as possible. Don't carry extra keys, fobs, remotes, pendants, jewelry or other things on the key ring that you don't really need.

KEY WON'T COME OUT OF THE SWITCH WHEN YOU TURN THE ENGINE OFF

This may be due to binding in the steering column lock. Try jiggling the steering wheel back and forth until you feel it "click" into a locked position. You should now be able to remove the key from the switch. If the key still won't come out, the problem may be a damaged column locking mechanism, or one or more pins sticking inside the key lock cylinder.

KEY IS BROKEN OFF INSIDE THE IGNITION SWITCH

Your best option here is to find a lock smith and have them try to remove the broken key from the ignition switch.

If the broken key can be successfully removed, you can use a spare key (if you have one) or get a new key made from the old broken key (which may or may not be possible depending on the damage). If a new key cannot be made from the broken key and you do not have a spare key, you will have to get a new lock cylinder and keys.

If your vehicle has a smart key, the new key will have to be programmed to the computer. This usually requires having your vehicle towed to a new car dealer or other authorized repair facility so the computer can be programmed to recognize the new key.

REPLACING AN IGNITION SWITCH

The easiest and safest way to replace an ignition switch is to take your vehicle to a repair shop or new car dealer and have them replace your ignition switch.

Ignition switches are often difficult to replace by design. Auto makers make the switches hard to remove to deter auto theft. Ignition switches that are mounted on the steering column are usually located under some type of shroud or trim cover that must first be removed to access the switch.

NOTE: On some applications, the switch must be in a certain position before it is removed or installed so that it will align properly. Always refer to a service manual for removal/installation instructions BEFORE you attempt to replace the switch.

Also, on newer vehicles with smart key anti-theft systems, a special "learn procedure" or reprogramming the computer is usually required after the ignition switch has been replaced. If this is not done, the engine won't start and run.

WARNING: *On airbag equipped vehicles, the air bag system should always be deactivated before you attempt to replace the ignition switch to prevent the accidental deployment of the driver's airbag. The airbag can be deactivated by removing its power fuse, or by disconnecting the battery. Wait at least 15 minutes after deactivating the airbag system to start work so the capacitors that store reserve power for the airbags have time to discharge.*

On some vehicles with a column-mounted ignition switch, it may be necessary to remove the steering wheel to replace the ignition switch. This requires deactivating the airbag system and using a steering wheel puller to remove the steering wheel.

CAUTION: Care must be taken to make sure the steering wheel is removed and installed properly so the airbag connections are not damaged, and are reconnected correctly so the airbag will work.

IGNITION SWITCH RECALLS

In some cases, auto makers have issued safety recalls for vehicles with known ignition switch problems. Other times, they have issued technical service bulletins that describe ignition switch faults and recommended repairs. Recalls typically involve inspecting and/or replacing the original switch with a redesigned switch at no cost to the vehicle owner. Safety recalls with free repairs are generally good for a fixed period of

time/mileage from the date of manufacture. TSBs, on the other hand, do NOT cover free repairs, and only offer suggested repairs for a specific problem or symptom.

Some notable recent ignition switch recalls include:

June 16, 2014 - GM Recalls Another 3.3 Million Cars for Ignition Switch Risk

General Motors has recalled 3.3 million of its vehicles for a problem that could allow the ignition switch to turn itself off. The problem is the key. The key has a slot across the top so the key can be attached to a key ring or fob. The problem is the slot allows the key ring or fob to slide and tug on the key. If there is a lot of weight on the key ring and the vehicle hits a bump or rough stretch of road, it's possible for the key to jiggle out of the RUN position and turn the ignition off. If this happens, the vehicle loses power steering and brake assist, and the airbags are turned off (which means they can't deploy if the vehicle hits something).

The latest recall affects the following 2000 to 2014 model year GM cars:

- Buick Lacrosse, 2005-2009
- Chevrolet Impala, 2006-2014
- Cadillac Deville, 2000-2005
- Cadillac DTS, 2004-2011
- Buick Lucerne, 2006-2011
- Buick Regal LS & GS, 2004-2005
- Chevy Monte Carlo, 2006-2008

The fix is to replace the original ignition key that has a slotted head with one that has only a single small hole for a key ring. This will keep the weight on the key ring from twisting the key out of the RUN position.

You can also fix the problem yourself by removing the key from your key ring or fob and using the key by itself.

June 13, 2014 - GM Recalls Half a Million Camaros over Ignition Switch Issue

GM issued a safety recall notice for over half a million 2010 to 2014 Camaros because of the design of the ignition switch key fob. The key is part of the fob, and the fob protrudes in such a way that the driver may accidentally bump the key fob with his or her knee while driving, causing the switch to flip from the ON position to ACC or OFF. This causes the engine to quit running as well as a loss of power steering and brakes. Also, the air bags are deactivated when the ignition is not in the ON position (which means no air bags if you crash!). The car will still steer and brake with the key not in the ON position, but both require increased effort from the driver. The fix is to replace the original key fob with one that has a separate key and fob.

February 2014 - GM recalls 1.6 million vehicles for faulty ignition switch.

The ignition switch recall affects 2005 to 2007 Chevy Cobalt and Pontiac G5, 2006 to 2007 Chevy HHR and Pontiac Solstice, and 2003 to 2007 Saturn Ion and 2007 Saturn Sky.

The ignition switches on these vehicles may fail or rotate to the Accessory or OFF position as a result of vibration or wear (a problem GM has blamed on heavy key rings). The ignition switch problem may cause the engine to suddenly stall while driving. The loss of power also causes a loss of power steering assist (which increases steering effort), and cuts power to the airbags (which prevents the airbags from deploying if the vehicle is involved in an accident at the same time). GM says it will replace the ignition switches in the recalled vehicles at no cost to the vehicle owner.



This is the troublesome ignition switch that led to the GM safety recall.

June 2012 - GM Recalls Various Chevy Cobalt & HHR, and Pontiac G5 Models for Sticky Ignition Switch

Recall bulletin 12089A issues June 6, 2012 recalled 2007 to 2008 Chevy Cobalt, 2008 to 2009 Chevy HHR and 2007 to 2008 Pontiac G5 models for a sticky ignition switch that may make it difficult or impossible to turn the switch and/or remove the key. The

recall covers the above vehicles for 10 years or 120,000 miles from date of manufacture. The replacement ignition switch cylinder kit for these vehicle is P/N 20869121.

Ford Recalls 8 Million Vehicles for Ignition Switch Fire Hazard

Starting in 1996, Ford issued a series of recalls for various 1988 through 1993 models for faulty ignition switches that could short out and start a fire. Similar recalls were issued later for various 1992 through 2003 models for the same problem (as well as a faulty cruise control switch that could short and catch fire). The ignition switches recalled were found to have badly worn brass contacts that could short out and start a fire even if the vehicle was parked with the ignition OFF.



Related Articles:

[Keyfob Won't Start Car](#)

[Start Engine Push Button Diagnosis](#)

[Troubleshoot an Engine That Won't Crank](#)

[Troubleshooting a Car That Won't Start](#)

[Troubleshoot Anti-Theft System](#)

[Fuel Pump Diagnosis](#)

[Battery Testing](#)

[Starting & Charging System Troubleshooting](#)

[Starter Diagnosis](#)

[Power Centers: Relays & Fuses](#)