Theft Protection

****

How To Automatically

Disable and Enable

Your Jeep

(1997 Jeep Wrangler)

January 26, 2002

Updated June 5, 2002

Added:

- A by-pass switch
- A diode to the relay to eliminate potential relay chatter.
- A few other thoughts on how to disable your vehicle.

Any who would like a soft copy of the write up in MS Word format contact the author via email at:

email.id@worldnet.att.net

or you may download a copy from my rudimentary web site at

http://home.att.net/~email.id/wsb/html/view.cgi-home.html-.html

Introduction

Let's face it; it's not difficult to steal a Jeep.

In truth, Jeeps are probably easier to steal than any other vehicle on or off the road. Easy access, especially with a soft top and plastic windows, doesn't make the task of protecting a Jeep any easier.

I have developed a simple hidden circuit which I call the Automatic Disable / Enable (ADE) System. This system will automatically disable multiple electrical systems that your Jeep requires to run. (Ignition system, Fuel Pump, Fuel Injectors, Automatic Shut Down relay.)

The ADE System will also allow you to easily enable these same electrical systems with one swipe of a magnet.

The ADE System can be used with any fuel-injected vehicle and many non fuel-injected vehicles.

I will provide detailed instructions on how to build this system and specific instruction on where to install this system on a 1997 Jeep TJ. While I do not know this for sure, I would imagine all Jeep TJ wiring would be the same or similar to my 1997 in this regard.

If your Jeep is a different model or year you will need to determine where to install the ADE System based on information provided in this write-up and your Jeep's Factory Service Manual.

ADE System Design

Key Features

- All electrical systems attached to the ADE System will be automatically disabled whenever the ignition key is shut off.
- There will be "stealth look" with no visible indicators that the ADE System is installed. (There is no value in giving a thief any clue that a disabling system is installed and must be overcome.)
- The ADE System will be installed at a key electrical point in the Jeep to "disable", or open, two or more critical circuits which are required to run. (This will make it more complex and difficult to overcome, even if a thief could determine which circuits were disabled.)
- The ADE System will "enable" all circuits when a magnet is momentarily swiped over a reed switch hidden somewhere under the vast amounts of plastic found in a TJ interior.
- The ADE System and all Jeep circuits will be self-sustaining when activated.

Design Description

The ADE System is designed to be self-disabling. When you turn the Ignition Key "OFF", the Jeep cannot be restarted unless and until you momentarily "swipe" a magnet over a hidden reed switch.

The hidden reed switch is the "Key", both figuratively and literally, to this systems success. Only you will know where the reed switch is located as there will be is no outward visual sign.

Take a look around the inside of your Jeep from the drivers seat. See all that plastic?

Pick a spot, any spot, preferably a spot within easy reach of the driver's seat.

That's where you are going to mount the reed switch! Underneath, where it can't be seen and no one knows it is there but you. (And please don't tell people who don't have a need to know!)

The ADE System uses one Double Pole / Double Throw (DPDT) relay that is wired to your Jeep's wiring harness, a diode, and a hidden reed switch. This relay will be inserted in the wiring harness at a point that controls multiple critical circuits required for your Jeep to run.

The DPDT relay will be wired in both parallel and series to the reed switch and the Jeep's critical circuits. This creates a self-latching circuit that allows the DPDT Relay "Coil" to be maintained in the active state once the relay has been tripped by swiping the magnet over the reed switch. (Once activated, the reed switch is no longer in the circuit.)

In order to start the Jeep after the ADE System is installed you will need to follow this sequence.

1. Turn ignition key to the "On" or "Run" position
2. Swipe a magnet over Hidden Reed Switch (To activate the ADE System and Jeep's critical circuits)
3. Turn Ignition Key to "Start"

Without swiping the magnet, or knowing where to swipe the magnet, your Jeep will crank over but it isn't going to go anywhere under its own power.

Automatic Shut Down Relay

The ADE System will either "interrupt or supply" 12 volts DC to the **Coil Side** of a critical control relay in your Jeep. On my 1997 TJ this critical control relay is the **Automatic Shut Down Relay.**

Most fuel-injected vehicles have an Automatic Shut Down Relay. Manufacturers may call it by another name, but if it's fuel-injected most likely your vehicle has this relay.

You will need to find which wire on your vehicle supplies +12 Volts DC to the Automatic Shut Down Relay coil when the ignition key is turned on.

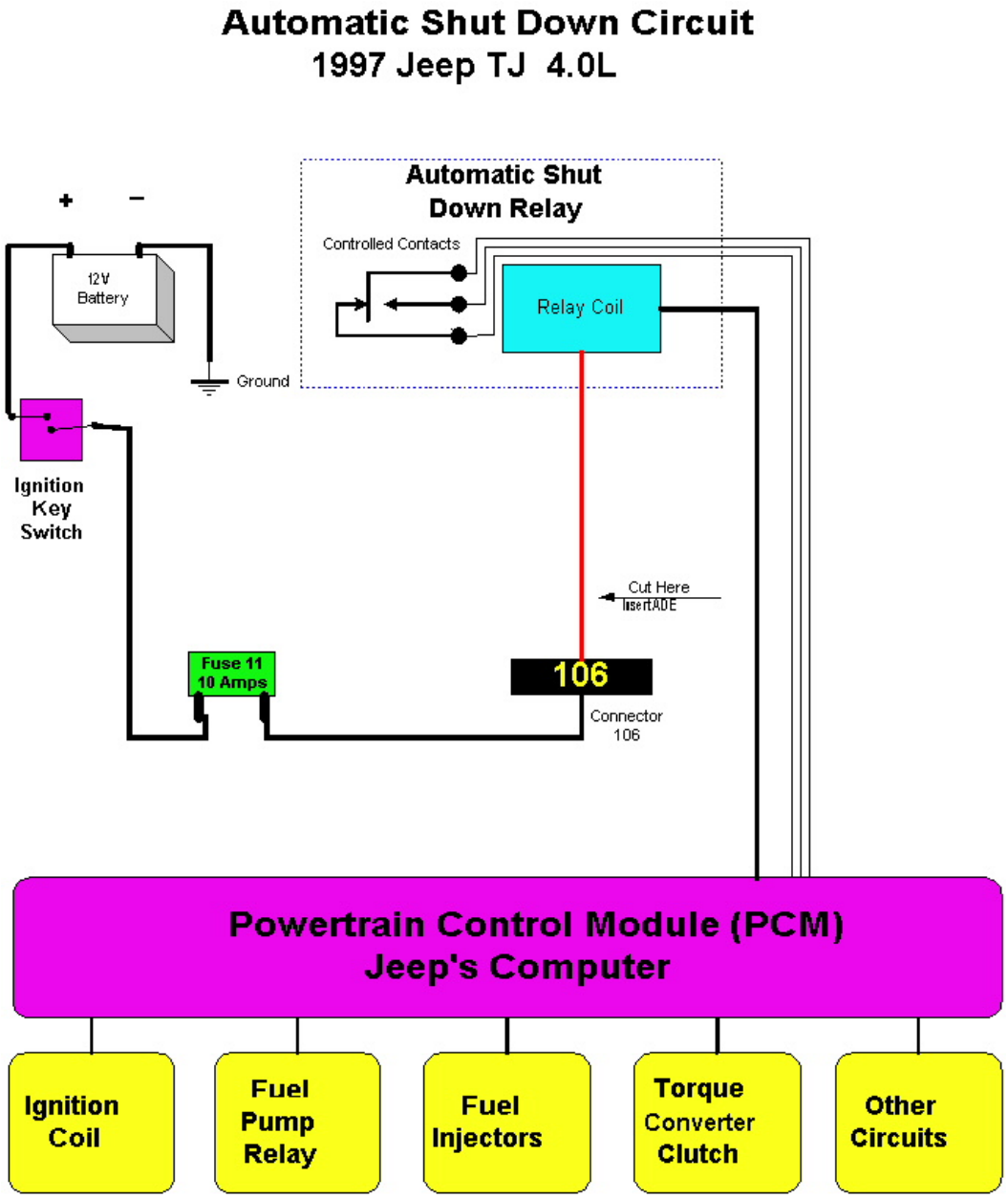
On the 97 TJ, the Automatic Shut Down Relay controls lots of stuff. Critical circuits controlled by this relay are:

- Ignition Coil
- Fuel Injectors
- Fuel Pump
- Torque Converter Clutch (If you have an auto trans.)
- Other signals to the Power Control Module (PCM Computer)

By installing the ADE System “to control” the Automatic Shut Down Relay Coil, you are controlling (disabling or enabling) all of the above circuits.

I will be providing specific and detailed instructions on how and where to install this circuit on a 1997 Jeep TJ.

Here is a drawing to illustrate the Automatic Shut Down Relay circuit on my Jeep. If you care to see this entire circuit in detail it can be found in the 1997 Jeep TJ Factory Service Manual, Section 8W-30.



Please take note of the **Red Wire** that runs between Connector 106 and the Automatic Shut Down Relay. This is the wire that activates the relay "Coil".

If the relay coil is not activated the Automatic Shut Down relay Controlled **Contacts** remain in the OFF positions, which DISABLES the critical circuits through the PCM.

That is why it is called "Automatic Shut Down Relay"!

It kills these circuits!!!!

Shutting down these circuits and your Jeep!!

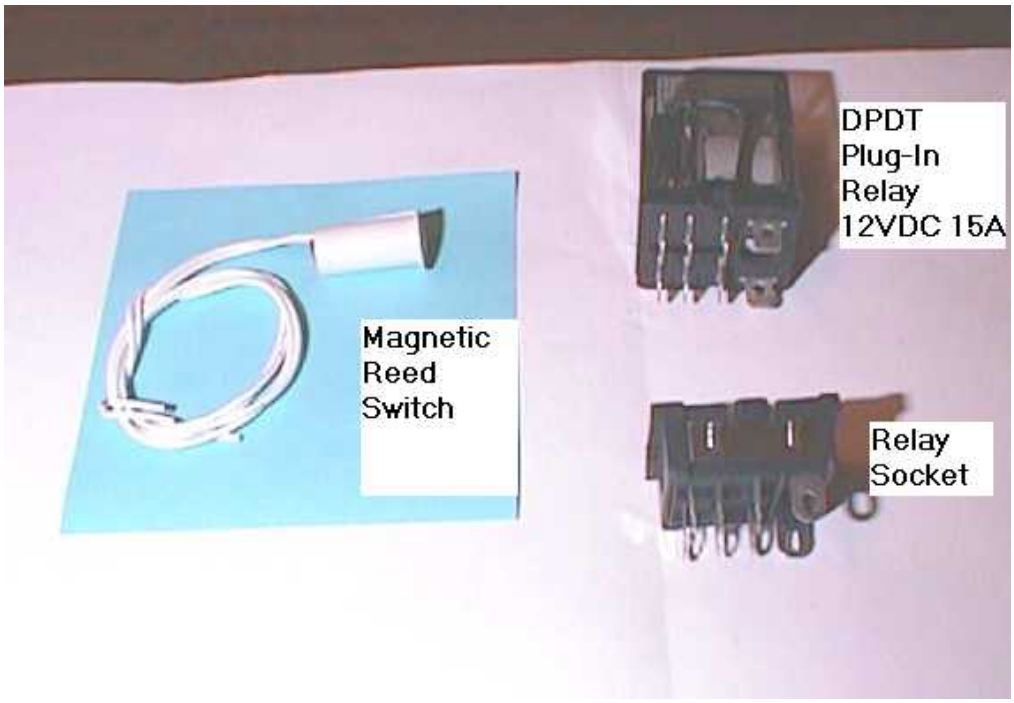
ADE System Circuit

Parts and Material List:

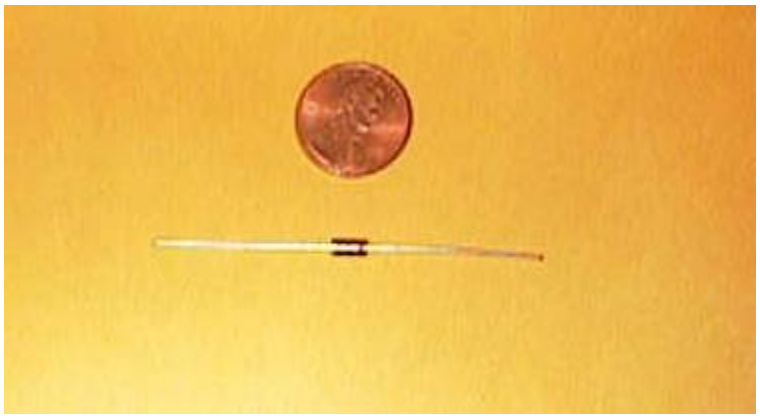
Here is a list of the key components you will need to build and install the ADE System and where you can get them. If you want to go mail order you can find most of these parts at www.MPJA.com or www.allelectronics.com for less then half the Radio Shack price, but obviously you have to pay shipping. It might be worth the effort if you are building more then one unit.

Qty.	Description	Source	Cost	Notes
1	12 Volt 15A DPDT Plug-In Relay	Radio Shack #275-218 C	$5.99	12 Volts DC 15 Amps @ 30VDC 160 Ohms 75 mA coil draw
1	Relay Socket	Radio Shack #275-220 A	$1.99	Socket for above relay.
1	Magnetic Reed Switch	Radio Shack #49-505	$2.99	For Normally Closed Loop
1	Diode	Radio Shack #276-1104	$0.49	Type 1N4005
1	Small household magnet	Ace Hardware	$0.49	Donut Shaped. Get a few as spares and keep under hood.
1	Eye-hook Wire terminator	Ace Hardware	$0.15	Used for the Ground Wire
	16 or 20 gauge hookup wire			
	RTV Silicon Glue			
			$12.10	**TOTAL**

Here is a picture of the three major components you will be assembling.

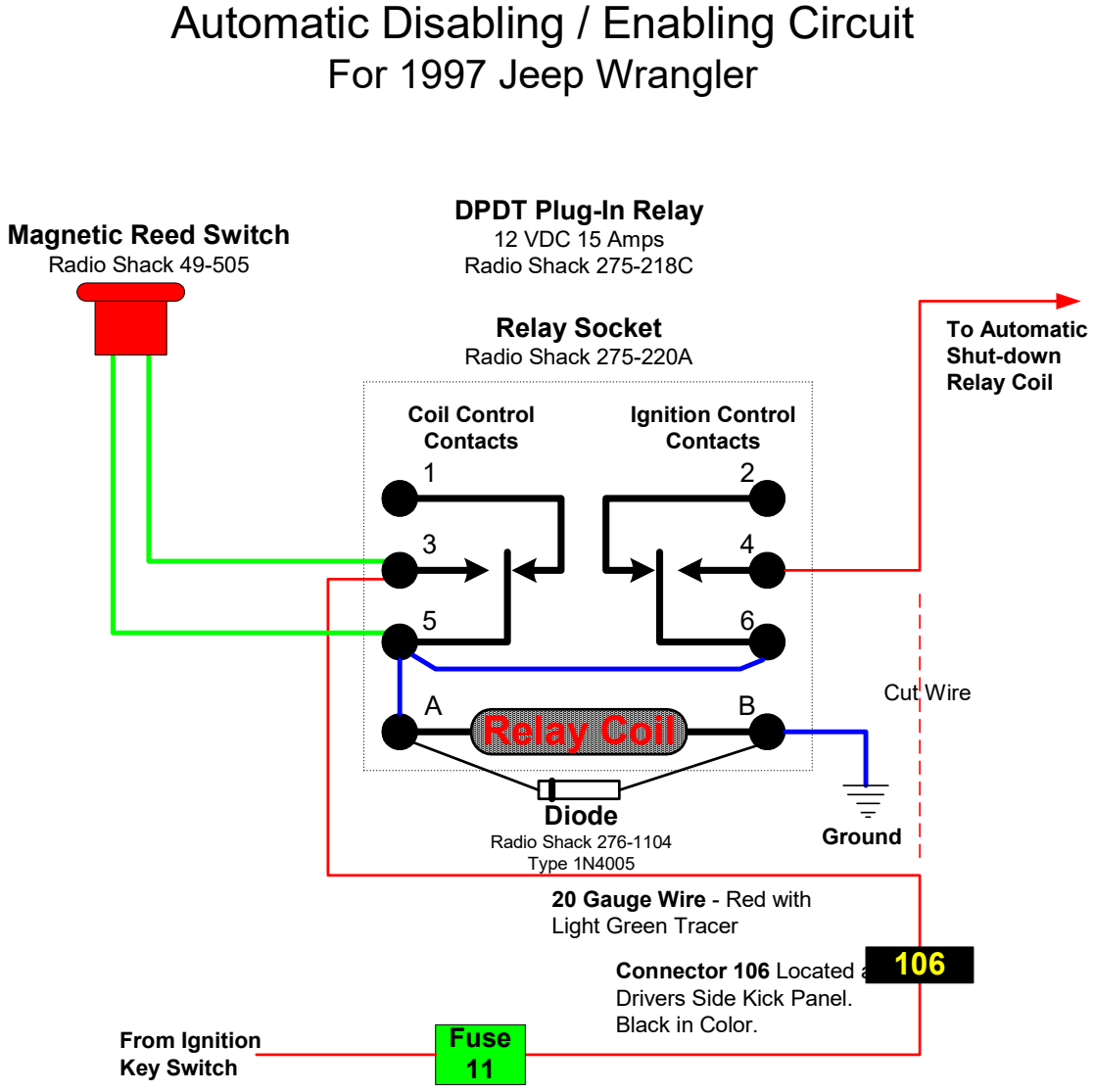


Here is a picture of the diode. This is Radio Shack # 276-1104, Diode type 1N4005.



ADE System Wiring Diagram

This drawing illustrates the ADE System wire connections.



Instructions:

These instructions will walk you through building the relatively simple ADE System circuit for any vehicle. The installation steps in these instructions deal specifically with the 1997 Jeep TJ.

If your Jeep is different you will have to determine which wire controls the Automatic Shut Down Relay Coil for your vehicle. I would suggest looking in the Factory Service Manual for your vehicle under the section dealing with Fuel and Ignition Systems. For the 1997 TJ this is section 8W – 30.

Please refer to the Automatic Disable / Enable Circuit drawing while we build and install this system. Be sure to **disconnect both the Positive (+) and Negative (-) Battery Terminals** prior to inserting this circuit into your Jeep's wiring harness.

Understanding the circuit

Before we begin, take a look at the ADE System circuit. Normally when the Ignition Key is turned "ON", the circuit would be completed from the Battery through the Ignition Switch, Fuse 11 and Connector 106 to energize the Automatic Shut Down Relay and all down-stream circuits.

See the dotted red line? (It has a label saying "Cut Here".)

That is where the wire runs now. Soon it will no longer be there. We are going to cut this wire and insert the ADE System here.

After we do this, the only way the Automatic Shut Down Relay can be activated is through the ADE System circuit.

These two events must occur before the ADE System circuit becomes activated.

1. Ignition Key must be in the "ON" position
2. The hidden reed switch must be closed momentarily via a magnet

The above events will cause the coil of the DPDT to activate, which in turn will close both sets of contacts inside the DPDT relay (Coil Control Contacts and Ignition Control Contacts).

When these contact close, the DPDT relay coil will be latched "on" in a self-sustaining mode. The DPDT relay will also complete the "coil side circuit" of the Automatic Shut Down Relay, which in turn will activate all critical downstream circuits for your Jeep.

Building the Circuit

OK, let's build this thing on your workbench.

Step 1: Relay Jumper Wires and Diode

You are going to wire up the two blue jumper wires and the diode as shown in the ADE System circuit drawing.

Connect a jumper wire between pins 5 and 6 on the relay plug. (Use 18 or 20 gauge wire).

Connect a second jumper wire between pins 5 and pin "A".

Connect the diode to pins "A" and "B". **NOTE:** The diode body has a ring painted around it. Connect the wire closest to this ring to pin "A". If you do this backwards the circuit will not work.

Solder only the pins 6, and "A". You will solder the others later.

Step 2: Reed Switch Wires

Take a look at the length of the reed switch wires. If you think they will not be long enough to reach where you want to hide the reed switch, now would be a good time to lengthen them.

If you do lengthen these wires please solder them and cover with heat shrink insulation.

Connect one wire from the reed switch to pin 3 on the relay socket.

Connect the second reed switch wire to pin 5 of the relay socket.

It does not matter which wire is connected to which pin.

Solder only pin 5 at this time.

Please read "**Step 9 - Optional By-pass Switch**" at the end of this document if you wish to wire in a switch to disable the ADE system.

Step 3: Find the Automatic Shut Down Relay Coil Wire

Connector 106 - Pin F10

(These instructions are specific to the 1997 Jeep TJ.)

Take the DPDT Relay, relay plug and reed switch over to your Jeep.

You will be installing the ADE System circuit between Fuse 11 and the Automatic Shut Down Relay Coil.

On the 1997 Jeep TJ I have found a place to insert the ADE System circuit that is both relatively hidden yet accessible. This is at Connector 106.

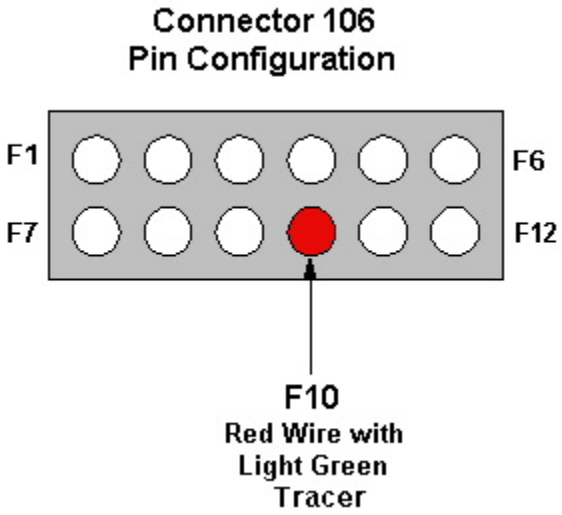
Stick your head down under the dash by the driver-side kick panel. (By your left foot.)

You will see three plug connectors. These are connectors 106, 107 and 108.

Connector 106 is BLACK in color and is the only connector of the three that has twelve (12) pins. Connector 107 is Yellow, and connector 108 is Blue and both have fourteen (14) pins in each connector.

OK, look for connector 106. Did you find it? (Black with 12 pins.) If not, stick your head farther under the dash and look at the top of the kick panel area, it is there.

The pin layout of Connector 106 looks like this.



The wire you have an interest in is located in pin location F10 and is Red in color with a Light Green tracer (line).

This is the wire that energizes the Coil of the Automatic Shut Down Relay.

If you have not already done so, disconnect both the positive and negative terminals of your battery.

Peel back the factory electrical tape wrapped around the wiring harness going to Connector 106.

Cut the Red wire with Light Green Tracer going to pin F10 in Connector 106 about five (5) inches from the connector.

Strip 1/2 –inch of insulation from each end of the wire you just cut.

Connect the wire end closest to Connector 106 to the relay plug pin 3.

Connect the other end of this wire (closest to the firewall) to pin 4.

Solder these wires to pins 3 and 4.

Step 4: Add the Ground Wire

Connect a short ground wire to pin "B" on the relay socket and connect this wire to your Jeep's ground. There is a convenient bolt located about six inches from where you are working on the kick panel.

Solder all remaining socket pins.

All the wiring is now completed.

Step 5: Testing the ADE System Circuit

Test A:

Plug the DPDT Relay in the relay socket.

Reconnect both the positive and negative battery terminals.

Sit in the driver's seat and try to start your Jeep.

The engine should crank over but it shouldn't run.

Test B:

Turn the Ignition Key to the On position.

Take your magnet and momentarily place it on the reed switch. (You should hear the relay latch shut.)

Turn the Ignition Key to Start.

Your Jeep should crank over and the engine should run.

(See!! You wired it up correctly!)

Step 6: Locate Reed Switch

Now that you know the system works, you need to decide where you want to hide the reed switch.

DO THIS RIGHT! Hide it inside the dashboard or some other plastic part of your Jeep. Make sure you will be able to swipe the reed switch with a magnet in this location.

Once you have settled on a location, take the plastic apart so you can glue the reed switch to the underside.

If you are using the Radio Shack Reed Switch, which I recommended, you can mount the switch in any direction and it will still work. I like the flat top of the reed switch to glue it down.

RTV silicone or epoxy glue should work fine.

Let the glue dry and then reassemble everything.

Don't tell anyone who doesn't have a need to know where the reed switch is located!!!!

Step 7: Re-Test

Go back to Step 5 and re-test the ADE System with Test A and Test B.

Please note the Radio Shack Reed Switch comes with a small magnet. I have found this magnet to be very weak and easy to lose.

Run over to Ace Hardware and buy a couple of donut shaped magnets about the size of a quarter. Keep one wherever you want to keep it and stick the extras to the underside of the hood inside the engine compartment just in case.

Step 8: Cleanup and Make Neat

Make your installation of the ADE System look neat! Factory Look!

Re-tape the wiring harness with electrical tape.

Also place a dap of RTV or epoxy glue on the top of the relay housing and glue it to the side lick panel near Connector 106.

When you're done, IF anyone should ever stick their head all the way under the driver side kick panel area all they should see is "factory look stuff".

You're Done!

Step 9: Optional By-Pass Switch

Some Jeepers have expressed an interest in having a means of disabling the ADE system from time to time.

This can be easily done by mounting a "Normally Open" SPST, waterproof toggle switch under your hood. If you do this please hide this switch well. (Heck, stick it inside the air filter box where no one would think to look.)

Connect two wires to the toggle switch and route them to the ADE relay socket.

Connect and solder one wire to pin 3 and the other wire to pin 4 on the relay socket.

To utilize the ADE System this switch must be in the “off” position.

If you turn this switch to the “On” position you will completely disable the ADE System as if it was not installed.

Alternatives

If you do not want to use the ADE System in your Jeep you can still provide an increased level of security against theft.

Simply cut the same wire from Connector 106 and insert a good 10-amp toggle switch that you can hide somewhere. Be aware this will not be as stealthy as the ADE System but it will function equally well so long as you remember to use it. (Turn it off when you park and on when you want to go.)

A second means of completely disabling your Jeep can be achieved by simply picking up the hood, and taking the Automatic Shut Down Relay out of the Power Control Center when you park your Jeep.

I am not sure I would want to do this all the time, but for parking for a long period of time I might consider this.

If your vehicle is not fuel injected you will not have an Auto-Shutdown Relay. You can however install the ADE System to disrupt another circuit on your vehicle.

Perhaps the electric fuel pump, or the ignition system. If I were to do this I would break the wire on the ignition-controlled side of the fuse used for the circuit I wanted to disable.

In the past I have used various means of disabling my vehicles. All had good points and bad points. Here are some of the things I have done in the past.

Stereo Phone Jack – I have drilled the faceplate of my radio and installed a stereo headset plug there. The contacts of this plug were wired to a critical circuit, in effect breaking the circuit or causing an "Open" condition to exist.

I then wired the contacts of a stereo headset phone jack together.

When I wanted to start the vehicle I plugged the jack in, which then completed the circuit and the vehicle would start. This works nicely because not too many thieves would suspect this for anything more then a stereo headset jack for the radio.

This could easily be used in place of the Reed Switch in the ADE System.

The drawback is obvious; you don't want to loose the plug. I kept mine on an easily removable clip on my key chain.

Cigarette Lighter Switch – If you care to give up the function of your cigarette lighter you can place a small push button switch inside at the base of the lighter plug. If you used a "momentary on" switch inside the lighter plug you could replace the Reed Switch

in the ADE System as well. Simply push the lighter in to activate the ADE system instead of swiping the magnet.

Obviously you loose the function of the power outlet with this approach.

I think if you give it some thought, come up with any number of ways to control the ADE System or simply control any critical vehicle circuit.

Good luck.

Document Ownership

The ADE System was developed and documented by Frank D. (Daless2 on the Jeeps Unlimited, Jeepaholics Anonymous, and JeepBBS forums) and is being place in the public domain for unrestricted non-commercial use.

Commercial and non-commercial organizations are encouraged to distribute, post or host this write up and accompanying spreadsheet on their web sites. All I ask is that no "fee" is charged for this information.

Any who would like a soft copy of the write up in MS Word format you can download it my rudimentary web site at

http://home.att.net/~email.id/wsb/html/view.cgi-home.html-.html

Or drop me an email.

email.id@worldnet.att.net

Frank D.

(Daless2)