29
ALARM SYSTEMS

GENERAL THEFT PROOFING PHILOSOPHY

The first thing you need to keep in mind is that it is virtually impossible to prevent a theft if the thief is clever enough, and determined enough, and wants ***YOUR*** car. What you can do, though, is make it difficult enough for him that he will skip your car and steal someone else's car. Cold, perhaps, but those are the facts of life -- better your neighbor's car than yours.

If the thief wants "A" car, it's fairly easy to discourage him. If he wants a car "like" yours, it's a bit harder. If he wants "your" car, it is very difficult to stop him. In either situation, time is your best weapon, as time is the thief's worst enemy. The longer it takes him to steal a car, the better his chances are of being detected. Every thief knows about hidden kill switches, how to defeat most alarm systems, and the fact that many people take their distributor rotor with them when they leave the car. What you have to do is to design and install your theft-proofing system such that it takes time for the thief to figure out what type of system you are using, find the components, and defeat them, all without drawing attention to his activities.

If you have one switch that must be operated to start your car, and you've hidden it in a very easily detected location under the dash, it won't take him long to find it. If you have three switches that must be operated, as an example, and you've placed one under the dash, one in the locked glove box, and another in the locked trunk, he will most likely move on, as he cannot afford the time it would take to find them all.

Fortunately, thieves rarely target TR6s. When they do, the theft usually falls into one of two categories: A theft of opportunity by someone taking a joyride, or a theft by someone who is familiar with TR6s and is specifically looking for one. Most often, it's the former, making our job of theft prevention a bit easier. In either case, your job is to conceal your theft proofing efforts as much as possible, forcing the thief to spend more time looking for them.

THEFT-PROOFING METHODS

REMOVING THE ROTOR

A very common technique, but one that has a lot of drawbacks. First of all, it is a real pain to have to raise the hood, pop off the distributor cap, and remove the rotor. It's a pain again to go through the same routine to replace the rotor when you get back to your car. It's also quite dirty -- not something you want to do when going to dinner in a fancy restaurant in your best clothes.

It is quite effective if your thief is out for a joy ride, but virtually worthless if the thief is in the market for a TR6. If he wants your TR6, he will have a spare rotor with him, and enough wire, alligator clips, etc, to hot wire it, and, most importantly, the knowledge required to do it.

It is not at all effective if you fail to remove the rotor. You are not very likely to remove it if you are just going to step into a convenience store for a moment to pick up a couple of items, yet that may be just the time it takes for a joy-riding teen to get your car.

KILL SWITCHES

Very easy to install, and easy enough to use that you will most likely use it even for short stops, a kill switch is fairly effective against joy-riders, but nearly worthless against a professional thief. Professional thieves are well acquainted with all the varieties of kill switches, and know how to defeat them with little trouble, and very quickly. How successful they are in preventing a theft depends entirely on how determined the thief is to steal "this" car, as opposed to "a" car.

There are two different types of kill switches generally used. One type bypasses the points and shorts the coil to ground, while the other type interrupts power to the coil. See the **figure 1**, below, for details. In both views, the kill switch is shown in the "kill" position. On the bottom, the kill switch is closed, shorting the negative post of the coil to ground. This is exactly what the points do when they close, so in effect, the kill switch acts as if the points never open. On the top, the kill switch interrupts power to the coil, which is the same as if the ignition switch were in the off position.

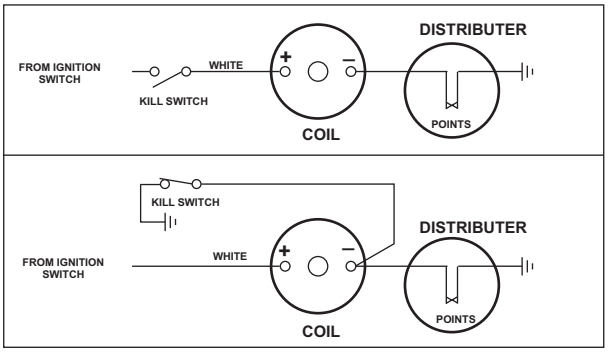

FIGURE 1

Of course, either of these schemes can be easily defeated.

Merely cutting the wire to the switch in the lower figure will do it, while jumping directly from the battery to the coil will defeat the scheme shown on the top.

STEERING COLUMN LOCK

Supplied by Triumph from about the start of the '71 model year, a steering column lock is, in my opinion, more of a nuisance than a help. A professional thief can defeat one in 30 seconds or less, if he has the right tools (and he will have). Unless your car is finished to the point that it requires no work at all, having to use the key to allow you to turn the front wheels can be a pain. Both of my TR6s have had this feature removed by previous owners, but if they hadn't, I would have. Chances are your steering column lock has already been deleted by a previous owner as well.

FUEL CUTOFF DEVICES

a) Electric fuel pump:

Replacing the mechanical fuel pump with an electric unit provides an opportunity to install additional theft-proofing to your car. By adding a means to interrupt power to the pump, the thief will not be able to drive the car more than a block or two before the fuel in the carburetors runs out, and the car stalls. As much as a thief hates to spend time in your driveway, he hates it even worse stuck in the middle of the street somewhere. Few things attract attention quite like a disabled car in the middle of the road.

Interrupting power to the pump can be as simple as adding a hidden switch, or can be more complicated by tying the power interrupt scheme into a sophisticated alarm system. Tying it into an alarm system will be discussed later, but a simple scheme for using a hidden switch is shown in **figure 2**, right.

Just like the thief, you are not going to be very happy either if you find yourself stranded in the middle of the street because you forgot to reset the fuel pump cutoff switch before driving off. For this reason, I like to add a chime, or buzzer, that will sound if I turn on the ignition key without resetting the cutoff switch. This feature is also shown in the figure above.

For safety purposes, it's a good idea to have an automatic shutoff feature on the fuel pump in case of an accident. Unlike a mechanical pump, an electric pump will still function with the engine off, and can spill a lot of gas on the ground if a fuel line has been broken. Some folks like to use an oil pressure switch to shut off the pump when the engine dies, but I don't prefer that method for a couple of reasons. First of all, it's unnecessary if the engine has died but the car has not been overturned, as the needle valves in the carburetors will shut off the flow of fuel. Secondly, if you let your car sit for lengthy periods of time between driving it, such as in the off season, the fuel will evaporate from the float bowls, making it hard, if not impossible, to start the car. A mechanical pump will pump fuel while the starter motor is turning to prime the bowls, but if the electrical pump is shut off due to low oil pressure, the starter motor may not produce enough oil pressure to reset the pump. In this circumstance, you want to be able to turn the key to the on position long enough for the pump to fill the bowls before turning to the start position.

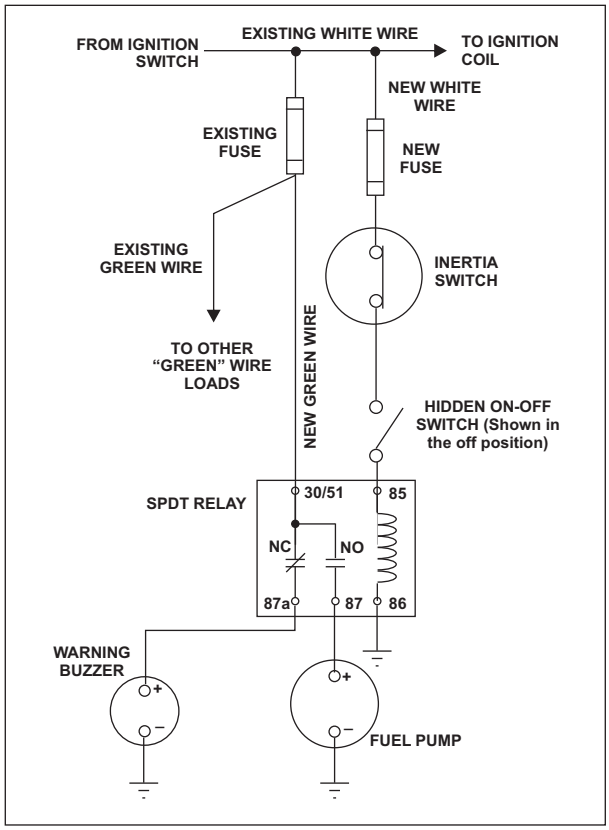

FIGURE 2

My preferred safety shutoff method is to use an inertia switch, wired to shut off the pump in the event of a crash, whether the car has overturned or not. Any accident that jolts the car hard enough to rupture or break a fuel line will certainly operate the inertia switch. Unfortunately, a hard jolt from hitting a pothole can sometimes operate the inertia switch as well. For this reason, I prefer to mount the switch in the cockpit where it can easily be reached and reset by the driver without stopping the car, and I also wire it to sound the chime or buzzer should this happen. This way, there is no need to wonder if that last pothole you hit shut off the fuel pump -- if you don't hear the chime, you're OK. This is also shown in the wiring diagram above.

b) Fuel flow cutoff valves:

Another method of providing theft security by cutting off fuel flow is to add a valve in the fuel line. This can be either a mechanical or an electrical valve, and can be used with either an electrical or a mechanical fuel pump. With

the fuel flow shut off, the car will only operate for a block or two, and the results will be the same as shutting off the fuel pump as described above.

Mechanical valves can be mounted under the floorboard with just the handle or key protruding into the cockpit, in the trunk, or under the hood. The two most important concerns here are safety and accessability. You do ***NOT*** want the fuel line/valve located such that there is even a remote possibility of a line break allowing fuel to get into the car. If you are in an accident and injured enough that you can't get out of the car, the last thing you want is to have gasoline pouring over you. One "good Samaritan" coming to your aid with a lit cigarette, and.....! Not a pleasant thought. I have seen this happen first hand.

You want to have the valve control handy for yourself, but not easy for the thief to find. This isn't easy to do, especially if the thief should be watching you get out of the car and set the valve. If he has in mind stealing your car, he will be watching your hands for clues to any theft-proofing devices you may have. If you can get a valve with a removable handle, and I believe they are available with a removable key/handle, you won't have to worry too much. Even if he does find the valve, it will be difficult for him to operate it if it is installed correctly.

Electrically operated valves can be mounted anywhere you choose, leaving only the switch to worry about hiding. It can also be tied into a sophisticated alarm system, making its operation automatic when the alarm is set. More details on that later.

Electrically operated valves come in three typical configurations - apply power to open, apply power to close, and set/reset. The set/reset valves require a momentary application of power to one terminal to open the valve, and another momentary application of power to the same terminal to close the valve. This would be the preferred type, as they consume no power after they have been operated -- just a momentary surge of power while the valve changes state.

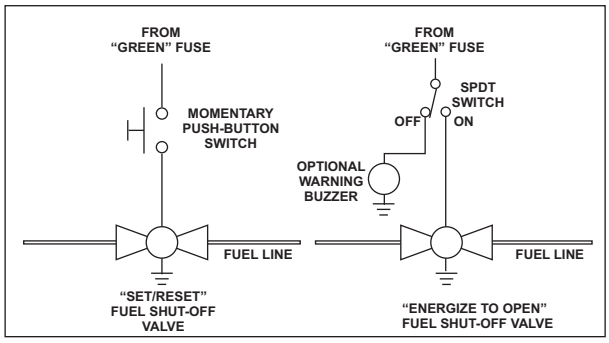

FIGURE 3

If you prefer to use a valve that requires the constant application of power, it is much better to use one that requires power to open, as the car will be running when the valve is open, and the alternator will be supplying power. If you use a power to close valve, the valve will be drawing power all the time the valve is closed. This could easily drain your battery over a period of time.Refer to **figure 3**, left, for wiring details for both types

You'll notice I've added a buzzer to the "energize to open" circuit, for the same reason mentioned above for the fuel pump cutoff switch. If you should forget to open the valve, the buzzer will sound as soon as you turn the key on, and will continue to buzz till you open the valve. Unfortunately, there is no way to monitor the position of the set/reset valve, unless you can find one with a built-in limit switch. If you can get a valve with a limit switch that closes when the valve is closed, just wire it between the green wire and the positive side of the buzzer. Ground the negative side of the buzzer.

You may wish to tie the operation of the set-reset valve into a commercial alarm system such that it is automatically operated each time you actuate the alarm unit. If so, refer to the battery cut-off remote control section on the next page for installation details.

You may have trouble finding a suitable valve, as they are not normally carried by auto parts stores. One place to look is a recreational vehicle dealer, as these valves are often used to switch between two fuel tanks. You could just cap off one of the input ports, and use it as a simple open/close valve. Boating supply houses would be another possible source. If either of these fail, try contacting the maintenance department of any industry or utility in your area, and ask them for a source of supply. These types of valve are used extensively in industrial applications, and they can direct you to a source. They may be a bit pricey, though.

BATTERY CUTOFF SWITCHES

The typical battery mounted cutoff switches are more of a convenience/maintenance tool than a theft deterrent. If you have the type that has a removable section, they are a bit better than the other types, but are still fairly easy to defeat by a competent thief.

Much better are the electrically operated cutoff switches, operating much like the starter solenoids used in early Spitfires and TRs, except they are of the set/reset type. These can be hidden from view, which means a thief will have to find it or use jumper cables to bypass it -- well within the capability of a thief, but it does consume time, providing a degree of discouragement.

To operate these, a momentary pulse of current is sent to a terminal to open it, and another pulse is sent to the same terminal to close it. This opens up a world of possibilities for theft deterrent schemes.

On-off momentary toggle or pushbutton switch: This is the simplest way to control the cutoff switch. Just mount the switch in a hidden, yet accessible location and hit it

once to disconnect the battery when you leave the car, and hit it again when you return.

Momentary key lock switch: Operating the same as above, but it requires the use of a key. The key switch can simply be hidden from view or mounted in plain view, either inside or outside the car. If you mount it in view, you must ensure that the back side of the switch isn't accessible without removing a fender or other panel. Otherwise, a knowledgeable thief will just jumper it, and in a very short time.

Magnetic switch: The magnetic switch is mounted behind a non-ferrous panel, and is operated by simply waving a magnet in front of it. Being mounted behind a panel, it would take a thief a long time to find the switch, if he were to be looking for it. It may be difficult to find a location accessible from outside the car to mount one on a TR6, as there are no non-ferrous panels available. A possible location is under the cover for the top, or behind the top. There is no reason to mount it outside, as you don't need the battery until you are inside the car anyway.

Pressure switch: This scheme uses a pressure sensitive switch, one that requires very little pressure to operate. The switch can be hidden behind a slightly flexible surface, an upholstery panel, for example, making if absolutely invisible to prying eyes.

Remote control: The cutoff solenoid can be wired to operate from either an alarm system, or as part of a stand alone remote control setup. If you wire it to one of these units, you must ensure that the output signal is either a single pulse, or an odd number of pulses. If, for example, your alarm system sounds two beeps from the siren when it is activated, and you use this output to set the solenoid, it will be turned off and then right back on again by the second beep. When counting the number of pulses, keep in mind that some alarm systems have a "memory" function, which will adjust the number of pulses to provide an indication of which alarm zone was violated - three pulses for a door switch, and four for a shock sensor, as an example. If your alarm has such a feature (and most do) you may have to arrange for a manual "reset" scheme to turn the switch back on after you've reset the alarm.

FLASHING LED

A flashing LED, even if it is not part of an alarm system, can be a deterrent by making the thief think it ***IS*** part of one. LEDs are available that flash when you turn on a switch (typically as you leave the car), or that can be wired to come on automatically when you turn the ignition key off. These are commercially available, and come with wiring instructions and all wiring components needed for installation.

The effectiveness of these as a theft deterrent depends almost entirely on the thief's motivation. If he is looking for a Chevy Cavalier, and yours is just one of two dozen in the parking lot, he will most likely move on to another one when he sees the LED. On the other hand, if he has his mind set on a TR6, and yours is the only one in the area (as it usually will be), the LED will probably not even slow him down.

COMMERCIAL ALARM SYSTEMS

In spite of the fact that false alarms have become so common that no one pays attention to an alarm siren anymore, a commercial alarm system is still one of the best anti-theft devices you can use. Especially so if combined with some of the other devices discussed above, and a little ingenuity is used in the design and installation of the system. Even though most folks no longer are disturbed by an alarm, the thief never knows but what a security guard or a policeman may be just around the corner when the alarm goes off, and will come to investigate. If he can complete the theft in a hurry, he may not be put off by the alarm, but he certainly won't hang around long, unless he is ***VERY*** bold and really wants your car.

Although each brand/model of alarm system is different, they all have common inputs and outputs, and there are some "gotchas" that impact most all systems.

INPUTS:

Power:

This is a power source that is hot all the time, and should be fused. The alarm system will come with its own fuse for this purpose, but if you connect this input to a purple wire, the additional fuse is not needed. The purple wires are hot all the time, and are fused.

Set/Reset:

All alarm systems require a signal from the ignition key to enable it to be switched on when the key is off, and to reset any remembered alarms, etc, when the key is turned back on. In a Triumph, this input should be connected to a green wire. No additional fuse is needed, as the green wires are already fused, and they are only hot when the key is on.

Negative input (dome light):

When you open the doors on a TR6, switches in the door jams make a connection to ground (negative) and turn on the courtesy lights (in most sedans, the courtesy lights are mounted to the headliner, and are called "dome" lights, hence the terminology). This alarm input is intended to be connected to these switches, along with the existing courtesy lights. On a TR, the existing wires for the lights are purple/orange. If you also connect this input to other switches, such as the trunk switch, glove box switch, or a hood switch, all of the lights will come on whenever any of the switches are operated. If you open the trunk, for

example, the interior lights and the glovebox light will come on along with the trunk light. For this reason, you may want to use new switches in the door jams, and use the input below. These wires connect to ground, so there is no need for a fuse. The worst case if they short is a false alarm.

Negative input (accessories):

This input triggers the alarm whenever the switches attached to it close and make a connection to ground. This is the input you use for shock sensors, motion detectors, and the switches discussed above. You can add as many devices/switches as you wish to this input. No fuses are needed in this input either.

Positive input:

This input is intended for use in some American vehicles, such as some Fords, that switch power to the dome light rather than ground. This input is not needed in a TR, unless you should have some type of sensor that switches power. There are few if any commercially available sensors that switch power. If you should use this input, ensure that the wires are properly protected by a fuse.

Valet switch

This is a switch supplied with the alarm, and is used to bypass the alarm when you have to leave your car with a valet or mechanic. It switches ground, so no fuse is needed.

Antenna

Usually a short piece of wire hanging from the alarm unit, the antenna needs to be as high as possible and as far away from sheet metal as possible. The lower the antenna or the closer to sheet metal it is, the less the range of the remote unit. A long range is not really needed in most cases, as you normally want to be able to see your car before you operate the remote unit. This is especially true of the family car, as a rapist or kidnaper could open the door and hide in the back seat between the time you shut off the alarm and the time your wife and children get to the car. A longer range is desirable if you use an optional pager, described below, as you may want to operate the remote from your motel room to verify that the pager transmitter is within range of your room, or to reset a false alarm.

OUTPUTS:

Siren

Although not necessary, I recommend fusing this lead anyway. It would be a very simple matter for a thief to find your siren, cut the lead to it, and connect this lead to ground. Then, all the he has to do is open a door, setting off the alarm and blowing the fuse to the alarm - no noise, no alarm, no problem. Goodbye car.

Starter cutout

This lead is grounded when the alarm is set, and operates a relay in the lead from the ignition key to the starter. When the relay is operated, a normally closed contact inside the relay opens, and power to the starter solenoid is interrupted. With care, this output can be used for other things as well, such as interrupting power to the fuel pump. See the "gotchas" section below for some of the problems you may encounter doing this. Interrupting power to the fuel pump will provide protection if the thief should jump start the car. The current capacity of this output will depend on the manufacturer, but it is adequate to drive a few relays, as they are low current devices.

Door locks

Most alarms have a pair of wires that operate the electric door locks - one to open the door locks when the alarm is shut off, and another to lock the doors when the alarm is set. In most cases, it requires a seperate set of relays to perform the lock/unlock function, and additional relays can be used for other purposes, such as operating a battery cutout switch or a fuel flow cutout valve. These outputs are grounded momentarily when they operate, just right for this application.

Trunk release

You probably won't have a trunk release solenoid on a TR6, but this grounding output can be used to drive other devices instead. Usually, this output is triggered by a separate push button on the remote control module, or by operating two buttons at the same time.

Others

Some of the higher scale alarm units will have other output that may be used. Like the trunk release, they are usually grounding outputs, and are triggered from the remote control unit.

Parking lights

Most units have an output that flashes the parking lights when the alarm is set or turned off. I recommend fusing this output for the same reasons stated above for the siren output. The parking light output is a 12 volt signal, and usually consisted of two or more pulses, so it's use for anything other than it was intended for is limited.

LED warning light

Mounted in the car where it is easily visible from the outside, the LED flashes when the alarm is set, warning a thief that you have an alarm. This can be a good thing or a bad thing, depending on circumstances. As stated above, if you have a common car, the thief may very well move to an easier target if he sees you have an alarm. If he wants ***YOUR*** car, a warning that you have an alarm may not be

good. If he doesn't know, he will not take steps to defeat it, and it will go off as planned. The noise of the siren may be enough to send him on his way. If, on the other hand, he knows you have an alarm, he might be able to defeat it or otherwise work around it, and it may not do you any good to have the alarm.

GOTCHAS:

The installation of commercial alarm units is pretty straight forward, but there are a few things that can be tricky for a first time installer. I've itemized a few of them here to save you some time and possibly a lot of frustration.

Starter cutout

The instructions that come with your alarm unit will most likely tell you to connect the power side of the starter cutout relay to the "start" position of your ignition switch. This is fine if you haven't added other functions to the cutout grounding lead. If you add an additional function/relay on this lead, power to both relays must come from the same point, which will be the "run" position of the ignition switch (on a TR6, this should be a green wire, as the green wires are all hot only when the key is on, and they are already fused). The "run" position of the ignition switch is also hot when the key is in the "start" position, so it will kill the starter just the same as if the relay were wired to the "start" position.

Why do this? If you have the starter cutout relay wired to the "start" position, and the other relays wired to the "run" position, both of the relays will be energized every time you put the key to the "run" position, alarm activated or not. Compared to the resistance of a relay, the starter solenoid resistance is virtually zero. Current will flow through one relay, then through the other, and through the solenoids as if the solenoid were a good ground connection. The relays will be effectively wired in series, and they will operate just fine that way. The current path through the solenoid is what is referred to as a "**sneak circuit"** -- current going somewhere other than where you wanted or expected it to. Sneak circuits are the bane of electrical engineering departments every where (and usually occur when modifications are being made, rather than in the original design). Most large engineering offices have a special section just looking for such problems. See the **figures 4** and **5** for details.

Figure 4, right, illustrates how you would wire the starter cutout along with the fuel pump cutout, if you followed the alarm instructions and used common sense. Alas, this is the ***WRONG*** way to do it.

Figure 5, right, shows the problem with wiring it this way. When the ignition key is released to the "run" position after the engine has been started, current will now flow from the run position of the ignition switch, through the fuel pump cutout relay, through the starter cutout relay, and through the starter solenoid. The relative resistance of the relays and the solenoid are such that both relays will be energized in this situation, as the "grounding" lead from the alarm will ***NOT*** be grounded.

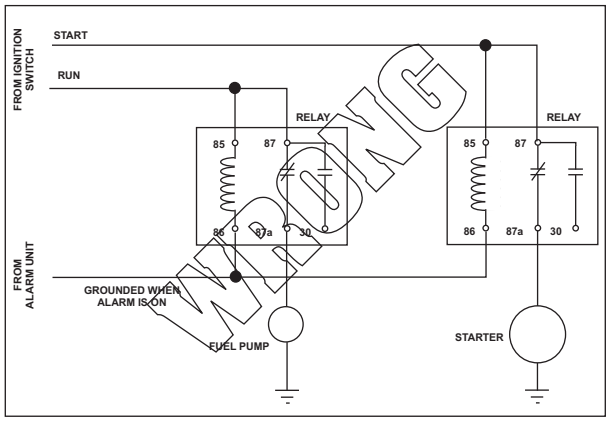

FIGURE 4

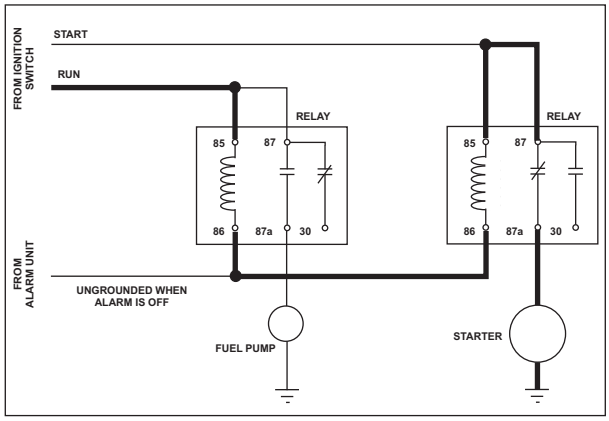

FIGURE 5

Figure 6 below represents the correct way to wire the relays. The lead from the "run" position of the ignition switch is hot in both the "run" and "start" position, so the starter relay will be energized while the engine is cranking and the alarm is on, just as before, but with 12 volts applied to the starter cutout relay, there will be no path for current flow through either relay when the alarm is off.

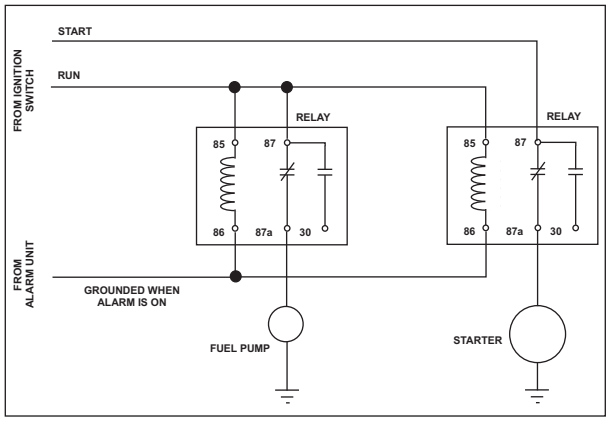

FIGURE 6

You can't wire the fuel pump relay to the "start" lead, because the pump would still be operable after the engine started. Usually, there is enough fuel in the float bowls for a thief to jump start the car without the fuel pump running.

Nuisance alarms

There are occasions where you will be expecting to get false alarms, such as on a very windy day when the shock sensor will be frequently activated. You can't prevent the shock sensor from being activated in a strong gust of wind, but you can add a cutoff switch in the lead from the sensor to the alarm unit to prevent nuisance alarms. You lose the benefit of the shock sensor, but under these circumstance, it is lost anyway, so why annoy yourself (and others) by having frequent false alarms that either require you to investigate, or at least, to reset the alarm each time?

You could just shut the alarm off, but then you lose the benefit of the other alarm functions, such as door opening, and the protection of the starter and/or fuel pump cutout.

If you have a roll bar, you will be guaranteed to have false alarms if you have a shock sensor. For some unknown reason, people seem compelled to grab the roll bar and give it a big shake. Their logic behind this completely escapes me, but it's a fact of life I've learned to live with.

It is also desirable on occasions to be able to shut off the siren, while still retaining all other functions of the alarm, especially if you have added an optional pager module. Often, when parking in a restaurant or other public parking lot, complete strangers will open the door to an unusual car such as a TR6 just to have a look. You may not want to annoy others with the siren, but you will be notified by the pager and you can go investigate to see if any action is required on your part. If it is a family of a dozen or so unruly kids, climbing in and out of your car, you will certainly want to put a stop to it. If it's a beautiful young lady (or a handsome guy for you lady owners), you may choose instead to walk over and start a conversation!

One of the more important reasons for having a siren cutout is to eliminate the "chirps" that accompany setting and resetting the alarm. In some locations/situations, it's just better not to have the noise. While the chirp feature can be programmed out by setting DIP switches in the alarm module, or by programming with the remote control unit, it is much simpler just to have a switch.

Time delay

Most alarm systems have a built in time delay to allow shock and motion sensors time to settle down before the alarm is actually in service, usually on he order of 3 - 5 seconds. If you turn on the alarm immediately after closing the door, the shock sensor may still be vibrating from the door closure, and you would get an alarm without the time delay. However, few, if any, alarm unit instructions mention this time delay. If you don't know about the time delay, you might think your unit is defective when you test it after installation. You turn the alarm on, open a door, and nothing happens! It can be very frustrating trying to find out what's wrong if you don't know about the time delay (ask me how I know!).

PAGERS

A useful addition to an alarm system, a pager will notify you if you of an attempted break in, even if you are in a location where you can't hear the siren, or if the thief has cut the wire to the siren. Most pagers advertise a range of up to 2 miles, but in practice, the maximum range is much, much shorter, typically 1000 feet or so. In an open field, in the flatlands, you might get 2 miles or more, but by the time the signal goes through a parking lot with a lot of metal cars, through walls with steel studs, etc., the signal is attenuated quite a bit.

Inputs to the pager can be as simple as a relay driven by the siren output of the main alarm system. In this case, you will get a page if any alarm trigger actuates the alarm, but you won't know if it was a door opening or a shock that set it off. In most cases, that's adequate, but in some cases, you may wish to know which trigger was involved. Some of the fancier pagers accept the same inputs as the main alarm unit, listed above, and will tell you, by the number of beeps or the color of the flashing LED, which input triggered the alarm.

Regardless of which module you use, they will all have the same power input needs as the alarm module - constant power from a purple wire, and "ignition on" power from a green wire to set/reset the pager. As the pager module wiring is completely contained within the cockpit, fusing of the inputs and outputs is not required as an alarm defeat prevention measure, as described above for the alarm unit.

The paging output from the module is sent to the same antenna as your radio, if you have one. The antenna lead is removed from your radio and inserted into the module. A short antenna lead in is then placed from the pager to the radio. When the pager is actuated, it switches the antenna from the radio to the module, and the signal is sent out to your pocket pager.

The pager also has an output to operate an automatic antenna, if you should be using one. I have mixed feelings about using an automatic antenna with a pager. If the thief sees the antenna going up, he may very well realize that you have a pager and immediately break the antenna. You may or may not get a page before he breaks it, depending on the location and distance of the pocket pager. On the other hand, when he sees it going up, he may be afraid that you have already gotten the page and will be calling the police. This may be enough to send him on his way. It's a judgement call, and there is no way to predict just how any given thief will react to the antenna coming up.

Figures 7 and **8**, below, are wiring diagrams from my own Triumphs, one using a simple pager, and the other with a complete set of inputs.

Of course, absolutely none of the preceding information will help if the thief is really determined, and he has a wrecker or tow truck. He can back up, get your car, and be gone in a matter of seconds. Even if your alarm is screaming its heart out, it will do little to deter the thief. The only thing you can do to help is to keep the car locked in your garage at home, and park it in a very conspicuous place when away from home. Maybe, just maybe, if there are a lot of folks milling about, the thief will pass on by and get someone else's car.

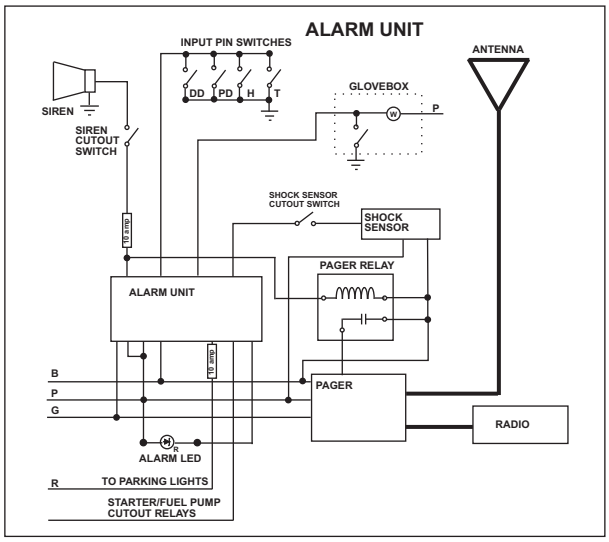

FIGURE 7

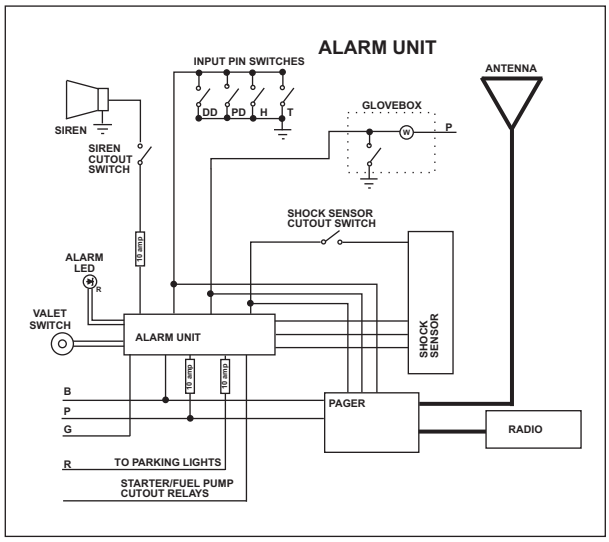

FIGURE 8