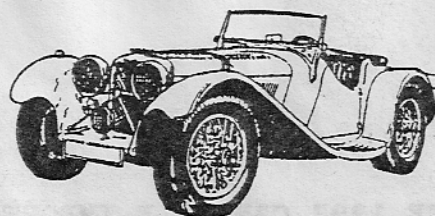


CLBCOM 74

MARCH 1997



Squire SS-100 Registry

THE LAS VEGAS SPRING FLING

was a howling success by anyone's measurement. Members from the East, West and South were well represented and five restored Squire SS-100s drove in for the event. The Hotel San Remo furnished us with a secure parking area and you could find a crowd admiring the cars almost any hour of the day or night. (I slipped out there at 5:00 AM one morning to find three hotel security guards and a Nevada Highway Patrolman drooling over the cars). A particular hit was Jim Dimond's completely restored rolling chassis with its' many modifications and improvements, too many to mention here. One lady was overheard to say "I'll bet that's windy at 75 MPH".

Bob Murray and I set up a suite-hospitality room that was busy from morning till night and the attending male members seemed to alternate between there and the parking garage. One prediction I made was right on target. The attending wives made an initial appearance and then split for the slots like a covey of quail and a few didn't show up at all. Who wants' to talk cars when you can be losing fifty dollars an hour?

A few interesting sidelights: At least two members went home convinced that a properly restored Squire can hold the highway at 75 to 85 MPH for six hours at a time without faltering. Another event that ended well was Bill Lieskes' return to Phoenix on AZ Hwy. 93, a two laner with almost no shoulder. Bill had spent an hour trying to get around a slow moving motorhome and when he finally made it, blew his left rear tire at 75 MPH. He reports that it handled well into a stop but changing the tire with his butt hanging out in high speed traffic made him more than a little nervous. And the trip had one sour note. Rita Dimond had over a hundred \$ in change sitting on a shelf beside her slot machine when two men sat down on either side of her. The one on the left asked her a question and when she turned to reply, the other picked up her money and they both slipped away like a flash. What a shame but I guess that goes on in Las Vegas all the time.

Can't tell you yet if we'll make this an annual event. Let's see how everyone feels next Spring.

MARK OFFENBERG'S SQUIRE SUNDAY IV

at Lloyd Neck, NY has been assigned a tentative date of Sunday September 14th so mark your calendar for this fun event. As of now a number of Western members plan to attend and I've made the last three. It's gotten so I can't complete the year without an annual dose of PAULA'S CHILI! More on this later so plan to be there.

THE 1997 CARLISLE IMPORT/REPLICA NATIONALS

will be held at Carlisle, Pennsylvania Fairgrounds on Friday, Saturday & Sunday, May 9th thru 11th and a number of our members are planning to attend. I have included a map and schedule of events for the three days and if you have that particular Saturday free you may wish to join them. Bob Murray states that they will meet at noon and 1:00 PM Saturday at the Fairgrounds Security Office located under the raised grandstand platform. Fun stuff!

FRIDAY

8:00-5:00 Show field registration office hours.
7:00-7:00 Main office hours (Building "T"). Space reservations, inquiries and general information.

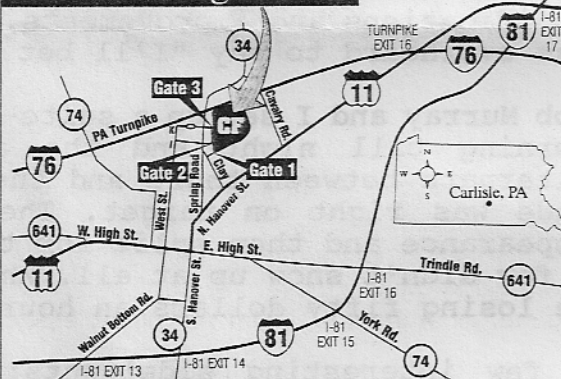
SATURDAY

7:00-5:00 Show vehicle registration office hours.
7:00-7:00 Main office hours (Building "T").
6:00 p.m. Cruise through the scenic Carlisle countryside. A guided cruise open to all Imports, Kits, Replicas & Custom Compacts.
9:00 p.m. Grab your seat and get ready for a free on-grounds movie.

SUNDAY

8:00-2:00 Show vehicle registration office hours.
9:00 a.m. Autocross
7:00-5:00 Main office hours (Building "T").
10:00 a.m. Stereo Competition judging begins. Registration closes after receiving 50 participants.
2:00 p.m. Custom Compact Power Jam Awards Presentation
4:00 p.m. The Carlisle "Give-Away" 1986 Alfa Romeo will be given away to a lucky ticket holder. No purchase necessary, but you must be present to win.

Directions to the Carlisle Fairgrounds



From Pittsburgh:
PA Turnpike East (Rt. 76) to exit 16 (Rt. 11 South)
Right onto Clay St. at 4th traffic light.

From Washington DC:
270 North to Frederick, MD.
15 North to junction 94 North
94 North to junction 34 North
34 North into Carlisle (approx. 9 miles)
Turn 1st left after Hardies (Spring Rd.)
Turn right at 2nd traffic light.

From Baltimore:
83 North to PA Turnpike West (Rt. 76)
PA Turnpike to exit 16 (Rt. 11 South)
Right onto Clay St. at 4th traffic light.

From Philadelphia:
Schuylkill Expressway to PA Turnpike West (Rt. 76)
PA Turnpike to exit 16 (Rt. 11 South)
Right onto Clay St. at 4th traffic light.

From New York:
78 West to 81 South
81 South to exit 17 (Rt. 11 South)
Right onto Clay St. at 5th traffic light.

From Route 81 (coming from North):
Exit 17 to Route 11 South
Right onto Clay St. at 5th traffic light.

From Route 81 (coming from South):
Exit 13 to Walnut Bottom Road
Bear left onto West Street
Right onto 'K' St.

ALL EVENTS HELD AT THE CARLISLE PA FAIRGROUNDS

1000 Bryn Mawr Rd, Carlisle, PA 17013-1588

Event Information (717) 243-7855 • Hotel/Motel, only 1-800-874-4832

SQUIRE SS-100 ELECTRICAL SYSTEMS

is a subject that has perplexed a number of us and member Bill Lieske has devoted a couple of hours to a thoughtful study of our problems and possible solutions. The subject is complex enough that Bill broke it into two sections to hold our postage tab to a manageable level. Section One is included with this letter.

AND ALWAYS REMEMBER

If you are not running as the lead dog, guess what you're looking at! (And Bill Lieske's been looking up my tailpipe for ten years).

ABOUT ELECTRICAL SYSTEM AND WIRING PROBLEMS IN THE SQUIRE SS-100

By Bill Lieske

BACKGROUND

In discussions with various Squire SS-100 owners I have found that the most common complaint about their car is with the electrical system. I have been of assistance to some owners in diagnosing problems via telephone to help correct various problems. Of the upwards of forty Squires that are currently in running condition I would guess that most cars have at least one electrical malfunction. It is the purpose of this write-up to provide more insight to the Squire electrical system and some means of dealing with problems of an electrical nature.

There are several Squire owners who roll up their sleeves, get out their tools and dig into their cars. I suspect that this accounts for perhaps fifteen percent of the current owners. Many are scared spitless of electrical things due to a lack of understanding of electrical theory. Some don't seem to fear things electrical but really should, since without some understanding electrical circuits a real mess can be made when trying to fix some simple electrical fault or failure. If the reader understands electricity, you don't need this write-up! Auto repair shop mechanics rarely understand electrical matters thoroughly even though some may be called "automotive electricians." Many of these guys know only how to replace things until the problem goes away and then are known to charge for all of the things that were needlessly installed before the problem was found.

Being an electrical and electronics design engineer by education, training and fifty years of experience, I freely admit that I don't know all there is to know about all things electrical, although I have designed some very complex electrical and electronics based devices in my time. Having tinkered with both electricity and automobiles since I was 13 years old I found automotive electrical circuitry and functions rather simplistic until about the early 60's when such things as alternators and electronic ignition systems began to be introduced. These days, modern automobiles have one or more rather high level computer devices called *chips* that do everything from calculate mileage, fuel consumption and drive all instruments in the dash plus monitor air conditioning, numerous engine functions and continuously correct them along with managing anti-lock braking systems.

THE WAY IT IS.....

For these reasons I won't even try to mess with my own modern vehicles because one needs at least \$45,000 worth of specialized diagnostic equipment, plus specialized training on how to use it, just to do a reasonable job of checking out the electronics, let alone effecting repairs. I take my modern cars back to the dealers and pay their (sometimes ridiculously high) shop rates for their technicians to do step by step analysis, "by the book" until the repair is accomplished.

The Squire SS-100 uses 50's to 60's style electrical system design. I can cope with this easily! I find, however, that many otherwise mechanically apt Squire owners get lost rather quickly in even this level of complexity. Moreover, there were a number of rather unusual things done by Intermeccanica mechanics when making up the wire looms. Of the six or seven Squires that I have looked at closely, no two appear to have been factory wired alike. Many wires enter the loom coded, say red, and come out the other end of the bundle some color like brown or green. Apparently when running out of a color coded wire mid-loom, they just grabbed any handy color and spliced in on!

To further complicate the matter, some of the goofy Ralph Nader originated gadgets including the

ugly fender clearance lights, pressure switch in the driver's seat, a buzzer under the dash for something or other and the like made things more difficult. Since most of these things gave problems, many original owners simply cut the wires and left them dangling. The back side of the dash board is a mess of color coded spaghetti, even at best. After having been cut, twisted together and taped up with first aid kit tape by a few experimenters this rats nest can often defy identification.

ENTER MR. ELECTRON

Let's first talk some basic electrical theory. Really, it is not so scary once you get a feel for it. The flow of electricity is the movement of negatively charged particles called *electrons* through an electrical conductor. I have scared you already, haven't I! Even though you cannot see or feel the electrons themselves, you can see what they do all around you. The picture on your television set is produced by a moving, focused stream of these little guys being impacted on mixtures of elements that *produce luminance* (light) when bombarded by electrons. Any light bulb produces *luminance* due to electron flow through a high resistance filament that is placed in a vacuum (thanks to Tom Edison) to prevent it from being burned up by the oxygen in the air. It is easier to think of an electrical conductor as an electrical hose with the electrons being the liquid flowing through it.

The electrical voltage, the "12 volt" battery in this case, is the *pressure* applied to one end of the hose. The amount of electrons that will flow out of the other end is controlled by the *resistance* which is analogous to how the hose nozzle is adjusted. With a given voltage, the lower the resistance, the greater the number of electrons will flow. We think of electrons as flowing from the negative side of the battery, through the appliance (be it a light, fan motor, radio, etc.) and back to the positive pole. The energy consumed to produce lighting, move air, energize the ignition system, etc. is provided by the battery (sort of an electrical storage tank) and supplemented by the generator or alternator as long as the engine is running.

Electrons are *negatively charged particles*. The flow of electrons is commonly called *electrical current flow*. Your battery has a + sign on it's positive pole and a - sign on its negative pole. Since the late 20's, automotive batteries have been negative common grounded with the engine and frame. "12 volts" became the standard in the early 50's and is sufficient for cranking power and operation of automotive electrical systems. 12 volt batteries actually consist of 6, two volt lead-acid type storage cells connected in a series fashion to produce nominally 12 volts. In actuality, each cell will produce 2.2 to 2.3 volts per cell when fully charged resulting in up to 13.6 volts at the terminals of the battery. The generator or alternator has a regulating device to power appliances and manage the charge into the battery according to *electrical power demand*.

CONDUCTORS DON'T JUST LEAD ORCHESTRAS OR TAKE TICKETS ON TRAINS

The wire that brings electrical power to a device is properly referred to as a *conductor*. In a properly designed electrical system the *conductor type and size* is chosen to minimize losses due to *resistance* (similar to friction in our water hose analogy) of the conductor to a safe value. *Multi-strand, flexible copper wire* with an abrasion, oil, gasoline and chemical resistant coating is standard for automotive application. In electrical system design, the size and number of conductor strands is selected according to the circuit demand in *amperes*, the unit of electrical current flow. The larger the current requirement, in amperes, the larger must be the wire size. For example, the cables from the battery (through the starting solenoid switch) must be large enough to handle up to 200 amperes of starter current demand, whereas, cables to the parking lights can be quite small for the 1 ampere or so current demand per light bulb. The following wire size guide is offered:

WIRE GUAGES VS: CURRENT CARRYING CAPACITIES

Assumes length of wire run not to exceed 20 feet.

<u>Max. Current @ 12.6 Volts</u>	<u>AWG Number and Typical Application</u>
2 Amperes	#18 (Instruments)
4 Amperes	#16 (Dome & courtesy lites)
6 Amperes	#14 (Park, tail & brake lites)
9 Amperes	#12 (Ignition, accessory and
15 Amperes	#10 heater system wiring)
20 Amperes	#8 (Common lighting leads)
40 Amperes	#6 (Output of alternator to
60 Amperes	#4 Battery + terminal)
200 Amperes+	#0 to #00 (Starter leads)

Auto electrical AWG (American Wire Gauge) wire size numbers get smaller as current carrying capacity gets greater. Terminals and connectors are made to handle the various wire sizes and are found in automotive supply stores. Apply these connectors to wires using *only proper insulation strippers and crimping tools* to suit various wire sizes to ensure that correct low resistance and mechanically suitable connections will result. NOTE: Yes, it is possible to improve on crimp connections by application of solder after crimping, *but*, you must be adept at soldering, use the right solder and flux and the right amount of heat, or you could compromise the integrity of the connection and wire insulation materials. Never use solid house wire, radio speaker wire, lamp cord or anything other than automotive grade wire in your car's electrical system. Don't simply try to twist stranded wire and loop it around a connection lug and tighten a screw, nut or bolt over it. More than likely several strands will be left free and a "hot spot" will result. Don't use house wiring type "wire nuts" in your car's electrical system. Vibration loosens them! When stripping wire ends for lug application, do not use a pocket knife or similar tool. Unless you are most adept at doing this, you will "nick" several of the wires, reducing their effective current carrying capability. *Use a wire stripping tool.* Remember, fiber glass car bodies, cloth or leather upholstery and the like burns readily. A hot wire or connector can cause wire insulation to melt, allowing a short to the frame or between wires to start a blaze!. Don't take chances with cruddy wiring!!! It's simply not worth the risk.

WHEN A FUSE IS NOT A FUSE, IS NOT A FUSE.....

Why do we have fuses? To protect against electrical overload or short circuits, that's why. The original Squire fuse strip is behind a flap at the right side kick panel, just ahead of the right door. This is a *Euro-Style* fuse block. The various fuses range from 3.5 to 30 amperes. Intermeccanica also didn't bother to provide a legend to identify the circuit(s) protected by each fuse.

Do not attempt to use American style automotive fuses, since if you try to bend the Euro holder tabs to accomodate an American style fuse a poor connection will result, at best. It's a good idea to first identify the function and current rating of each fuse (a little number representing current rating, or a color code) then go to an export car parts house such as a VW "Bug House," or B. A. P. and buy a *double set* of fuses. Now, take each of the original fuses out, one at a time, to find out what won't work and make a list that you can understand as to which one to replace when a problem occurs. The reason for two of each fuse size is that you will probably blow one spare in trying to find out if the fuse was faulty or that a short or overload has developed, the latter being most likely.

Never put in a fuse rated higher than the original. You can mess up some rather expensive things doing this. Fuses in general and Euro-fuses in particular are very reliable. Sometimes a fuse may

look good to the naked eye but has developed an internal stress fracture through being operated too close to its rating for a long time. This can be checked with an *ohm meter*. Fuses "blow" when their internal conducting strip melts due to sufficient heat being developed at some specific rate of current flow. By the way, fuses don't *fuse*. To fuse means to combine or mend by melting together. They *de-fuse*, in effect, by melting to open a circuit at some designated level of current flow.

SWITCHES, SWITCHES.....

The dashboard switches on most Squires have taken a beating. The original dash plate was thin (16 guage) steel with a padded vinyl cover over it. The switches are Lucas (British) and are of high quality and rugged in design and construction. The threaded mounting ring, or nut, is round and fluted, with some slots for tightening. Intermeccanica did not furnish a tool to suit these rings. As they loosened up over time, or were taken out for whatever reason, people have used pliers, vise grips and the like often scarring them unmercifully. Some of us have made, or had made, a spanner wrench for this purpose (see attached drawing). I will make one for you and supply it post paid for five bucks.

Sadly, many Squires have sat idle for years and years. Moisture and corrosion will eventually get into the spring loaded roller style Lucas switch mechanism and render them intermittent. Although I have repaired several of these switches using some fifteen year old TV tuner lubricant/contact cleaner, this stuff isn't easily found these days since most radio and TV controls are now solid state. You could try squirting in a very small amount of light detergent oil and flipping the switch on and off until the thing clears up. This has worked in several cases.

To be continued in CLBCOM 75