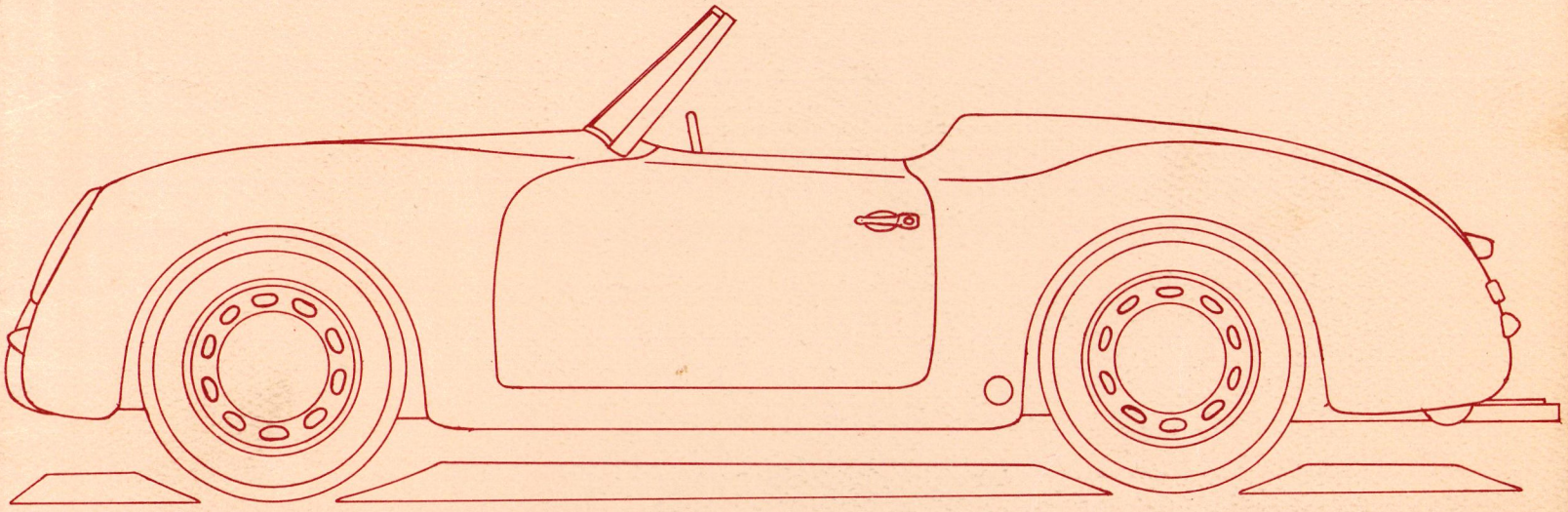
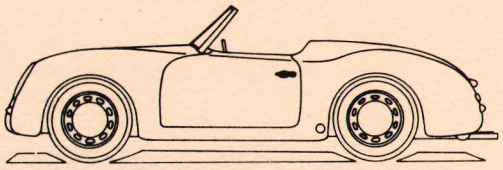
Three Five Six FORUM

no. 10 Jul/Aug 82



356 registry **HOLIDAY VIII EAST** ann arbor, michigan 1982

Special Issue



356 registry **HOLIDAY VIII EAST** ann arbor, michigan 1982

WILLKOMMEN

Hi; glad you could make it to the Eighth Annual 356 HOLIDAY. The Motor Cities 356 Group is both pleased and honored to be your host for this prestigious international event.

Our goal is to put on an event in the best 356 tradition; that is to say: pleasent and refreshing. This event is structured so that 356 friends, who may see each other only once a year, will have some time to reminisce. We also hope you will make some new friends to look for at next years Holiday.

To that end, the only "competitive events" are designed so that everyone can enter and anyone can win. And if that gets you up-tight, stop by our 24 hour Hospitality Suite where everybody wins.

We sincerely hope you have a good time, learn something new, find a needed part perhaps, make some good friends, and come back next year. Please stop by and say Hi!

Ron Roland

Ronald B. Roland
Chairman

ron roland 28140 26 mile rd. new haven michigan 48048
(313) 749 9804

SCHEDULE

FRIDAY 3 Sep 82

12:00 to 12:00 Registration

Hospitality Suite - Open all Weekend

SATURDAY 4 Sep 82

Late Registration

10:00 AM Tour to Greenfield Village

11:30 AM Arrive at Greenfield Village

1:00 PM Concours Judging (Peoples Choice); Till 3:00 PM

5:00 PM Greenfield Village Closes

7:00 PM Cocktail Hour

8:00 PM Banquet - Door Prizes, Trophies, Movies (Including, Made By Hand)

SUNDAY 5 Sep 82

Early Church - Your Choice

9:00 AM Swap Meet (All Day)

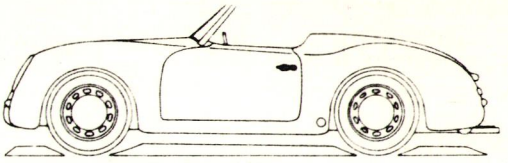
12:00 Noon Foot Race (About 3Miles)

3:00 PM Tech Session - Question & Ans.

Mack Gaut: Turbocharging
Charlie Brown: Autocross
Vic Skirmants: Mechanical
Ron Roland: Body

(Monday 6 Sep 82 OPTIONAL Informal tour of Vic Skirmants and Ron Roland collections. Sign up at Registration)

AUF WIEDERSEIN



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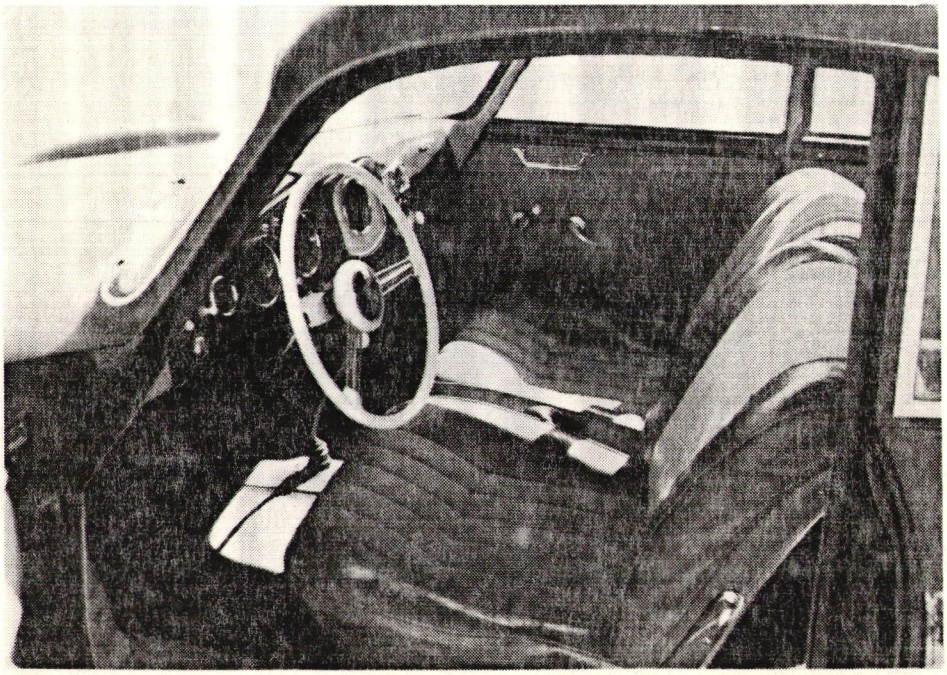

Late 1952 Coupe

BACK ISSUES!

Vol. 5: No. 3, 6
Vol. 6: No. 1, 2, 4, 5, 6
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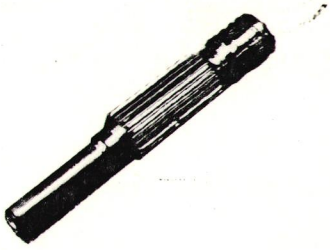

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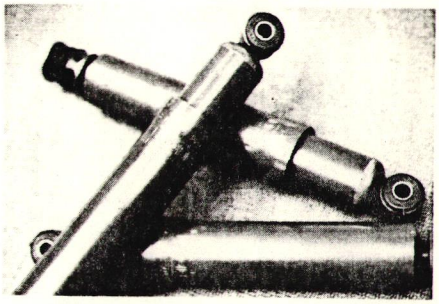

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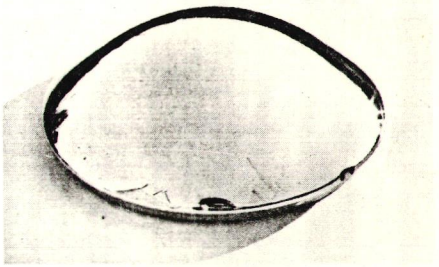

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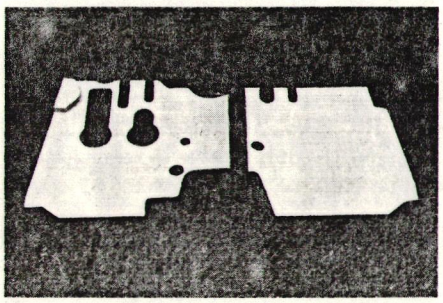

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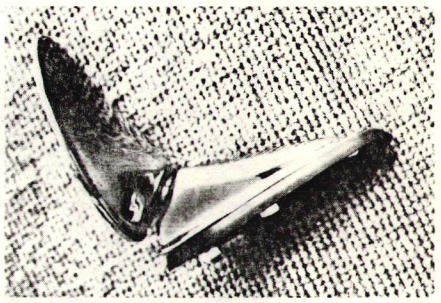

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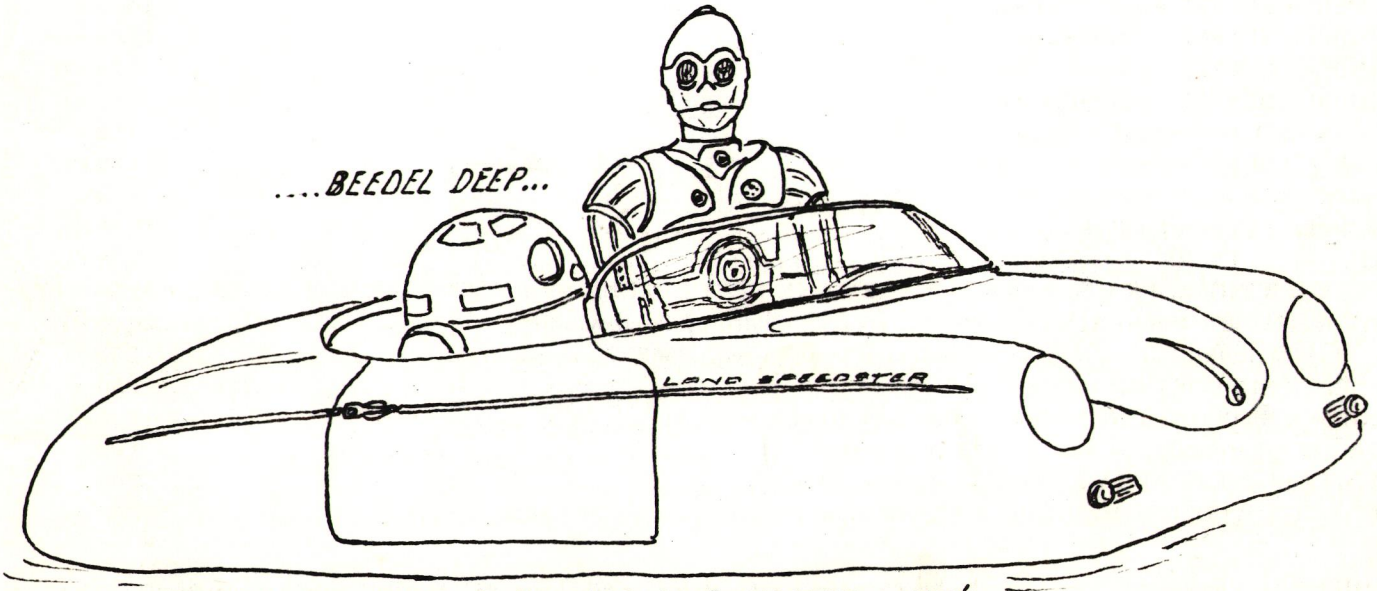

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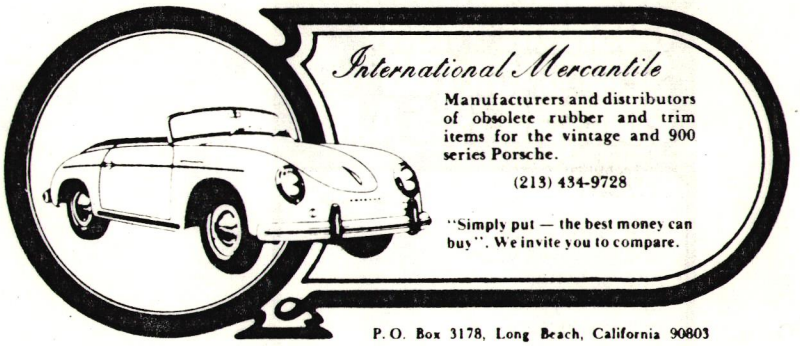

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As of 30 Aug 82

We contacted over 70 businesses directly or closely associated in some way with the Porsche 356. Those listed above replied as of 1 Sep 82. These are the businesses who want to enjoy your hobby with you rather than just take your money.

Please give these businesses preferential treatment.

We are from the Porsche Galaxie.....
Take us to your leader!

THANKS - Workers

Charlie Brown (Registration, reservations and banquet)
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Lou Livengood
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Dave Flanagan
Dave Meier
Tom Youk
... and many others including wives who have helped or understood...

THANK YOU - This event would not have happened without you.

Ron & Karen Roland
Chairman

TECH TIPS

by Ron Roland

CHEMICAL STRIPING: There has been some question lately about the merits of chemical striping; mostly to do with "bleeding" after painting, but also to do with proper paint preparation. There is nothing magic about chemical striping. While it can save you many hours and do a much more thorough job than any hand labor, there is a lot of work required both before and after the actual dipping.

The real question is: how else are you going to get a rusty hulk, with 20 Earl Sheib paint jobs, clean enough to paint? Sand blasting pits the metal and the heat and pressure can warp the panels. Worst of all it leaves a sandy mess you can NEVER get rid of. Paint stripper is also messy and can get into seams and lift new paint. A blow torch and putty knife is a risky method and dynamite, well.... Plus, none of the above, except perhaps the last, get into all the corners and do a thorough job like proper chemical dipping.

There are several companies doing chemical striping. The one I have had the best results with is Chem-Strip. The parts come back completely clean and free of rust and paint. Many of the jobs I have seen from some of the other major companies have had both rust and paint left on them; and one race car body bled for months. Chem-Strip admits this possibility but I have never had it happen.

A chemically striped body is thourghly clean, a joy to behold, like a new body from the Porsche Body Department. However, and this is a big HOWEVER, the body must be "metal preped". The original owners of Chem-Strip implied that the parts were ready to paint when they finished with them. The current owner stresses that they must be "metal preped" first to remove a rust resistant wash applied to protect the parts. This was proven recently when I noticed a black, oily residue while "metal preping" some striped wheels.

Chemical striping should really be thought of as part of the paint process, rather than part of the body work. All welding and leading should be done first (bondo will have to be applied after dipping). A body with no floor, longitudinals, etc., may fall apart during or after dipping. You also don't want your body sitting around with no paint on it as the project progresses from weeks to months and years.

Anyway, when you get the parts back from Chem-Strip, be sure to 1) "metal prep" them with Amchem Metal-Prep, Dupont Metal Conditioner, etc. (all are phosphoric acid solutions, however, don't use coca-cola as it is much too sticky). 2) Follow up with Grenodine This is a bromide solution made by Amchem and sold by them and Dupont, etc. (This is the time to apply bondo, but don't worry about finishing it now, just put it on.) 3) Prime with Dupont Corlar Epoxy Primer. (Now you can finish the bondo work, reprime any bare metal with the epoxy primer.) 4)Finally use Dupont 100S Acrylic Lacquer Primer to fill and level any small imperfections; block sand and color coat.

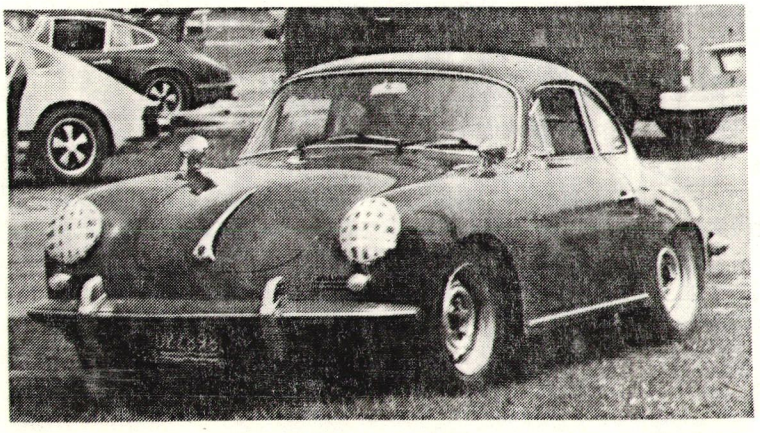
TECH TIPS by Ron Roland

Aluma-Lead *CAUTION* This product could prove hazardous to your restoration. Most amateur and/or home restorers are not proficient with the use of lead, nor want the added expense. Generally, "synthetic" fillers or "bondo" work well if applied properly, and the problems unique to lead are avoided. However, occasionally a product comes along which gives all the associated products a bad name, as Bondo did in the '50's

Several years ago, in the quest for the ultimate body filler, I settled on a product called Aluma-Lead, made by Ditzler (the PPG paint people). It's filling agent was powdered aluminum which was mixed with a (polyester) resin; this gave a nice silver (metal) appearance, and the stuff was easy to work with. Careful instructions by the manufacture on surface preparation, etc. gave the impression of a superior product. The one drawback was the nearly $40/gal price tag; about four times the "cheap stuff". However, you expect to pay more for the best, and it was still a lot cheaper than lead.

You can imagine my "surprise" when this magic product cracked, and broke off, a few months after the job was finished (at the same time the $10/gal stuff was surviving much abuse on my race car). Subsequent investigation discovered other restoration shops having the same problem. Ditzler, unfortunately, does not seem very interested in investigating this problem, which can ruin several thousand dollars in restoration and paint work, and casts a cloud over their other products.

Personally, I have gone back to lead exclusively (except for race cars, of course); you might consider the same!



SUPER FLY

PORSCHE 356 CRANKSHAFTS Vic Skirmants

Why are there so many cracked and broken ones? For those of you who have never had a broken crank, nor found yours cracked during a rebuild, I hoist my glass; there are fewer and fewer of your kind. In other words, as years and miles accumulate, the old 356 cranks eventually crack and then break. Why? The crankshaft is not sufficiently supported for the loads it is being asked to carry. That crank has four main bearings, but only three of them support the connecting rods. The fourth doesn't really do much. Why is the crank so poorly supported? The first Porsches used a VW crankcase. That VW case was designed in the early 1930's for a low-RPM engine of 25 HP. Porsche used the VW case and crank in their 1100cc engines because it was an easy, cheap way to go. As the Porsche engine grew in displacement, naturally the connecting rod loads increased. Part of the displacement increase came from a longer stroke, which didn't help the rigidity of the crankshaft at all. Porsche re-designed many parts through the years, including the engine case, but they were tied-in to those original crank dimensions. As the engines became larger and more powerful, they also became higher revving due to better rods, stronger valve springs, hotter cams. The better rods were much heavier due to the bottom ends having more material to give them the needed strength to keep from going oval at high revs.

Porsche did try several "fixes" to get away from broken cranks; larger main bearing journals, counterbalancing, tuftriding; none of these measures worked. The only solution would have been to re-design the bottom end of the engine, putting a main bearing between each rod journal. This would have meant a completely new engine, a longer engine, and probably one that wouldn't have fit in the 356 without re-designing the back of the car itself. That's why 356 cranks break!

What to do about it? Unfortunately there isn't much you can do. Low power and low revs will keep the crank stresses down; the chances of an old Normal crank being uncracked are greater than an SC crank being uncracked. Of course it all depends on how the engine was treated. Babying it with low revs would probably make the crank last, but at the expense of performance. You might as well plug in a VW engine and rev it til the valves float.

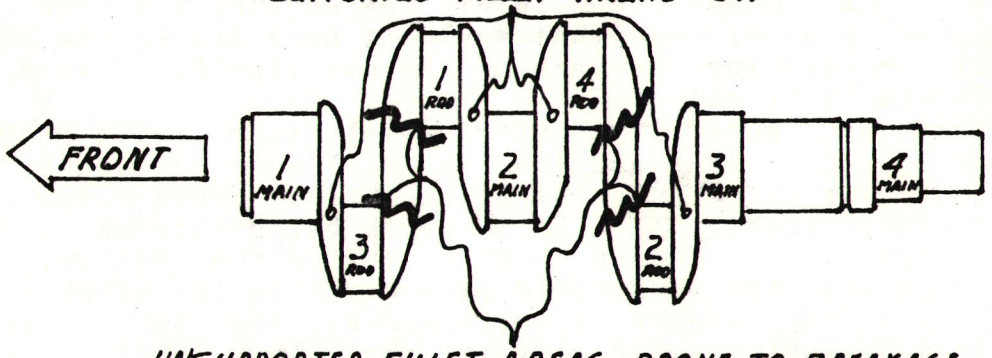
When rebuilding your engine, the first thing to do is check the crank for cracks. After pulling the timing gear, you can "ring" the crank by lightly holding it with your fingertips under the last crank cheek near #3 main bearing and tapping the flywheel end of the crank on a cement floor. If it goes thud, like a watermelon dropped from three feet up, it's cracked; don't waste your money getting it magnafluxed. If it's that bad, look along the journal fillets and you'll see where the oil was squeezed out of the crack. If it rings like a bell, or almost, then get it magnafluxed to be sure it's not cracked. If it passes magnaflux, you've reached first base. The crank should also be checked for straightness. If the journals are worn undersize or oval, the crank should be ground. Be sure that whoever does it

gives you smooth fillets on the journals; roughness here will crack a crank in 5000 miles or less. Now that you have an uncracked, straight, ground crank, some people ruin them by nitriding them. Nitriding is a surface-hardening heat-treating operation. The factory did it on the later cranks, called it tuftriding, and it didn't help at all. My personal opinion is that it makes the surface of the crank brittle and more susceptible to cracking; either that, or all those C, SC, and 912 cranks break only from high revs. One process that will toughen the surface, where the cracks start, is shot-peening. The journals are taped over and the fillet areas are then blasted by little bitty (technical term) steel shot under very high air pressure. This hammers the surface of the metal and makes it tougher. It is not a guarantee to an unbroken crank, but it sure can't hurt!

Now bolt it in and go, right? WRONG! Your engine case could be a leading cause toward breakage. If the main bearing bores are worn or pounded out; #2 is usually the worst; then your crank is not even being supported by the original meager means. If the bores are over-size or oval by more than .003", you should align-bore the case. If the case had a broken crank, align-bore it even if the bores measure perfectly; unless you can definitely dial-indicate the relationship of all four bores to each other. Before boring the case, check on availability of over-size main bearings to fit both your crank and your proposed case bore. The bearings for A's and B's are getting quite scarce, while the C, SC, 912 type are still pretty available. There are no oversize main bearings for a S-90.

Of course you should also be sure your connecting rods and pistons are balanced; uneven weights would result in uneven loads, which aren't good for the crank either.

SUPPORTED FILLET AREAS - OK



UNSUPPORTED FILLET AREAS - PRONE TO BREAKAGE
MAGNAFLUX - CHECK FOR CRACKS
SHOT PEEN - STRESS RELIEVE & TOUGHEN SURFACE

TURBOCHARGING THE 356 ENGINE

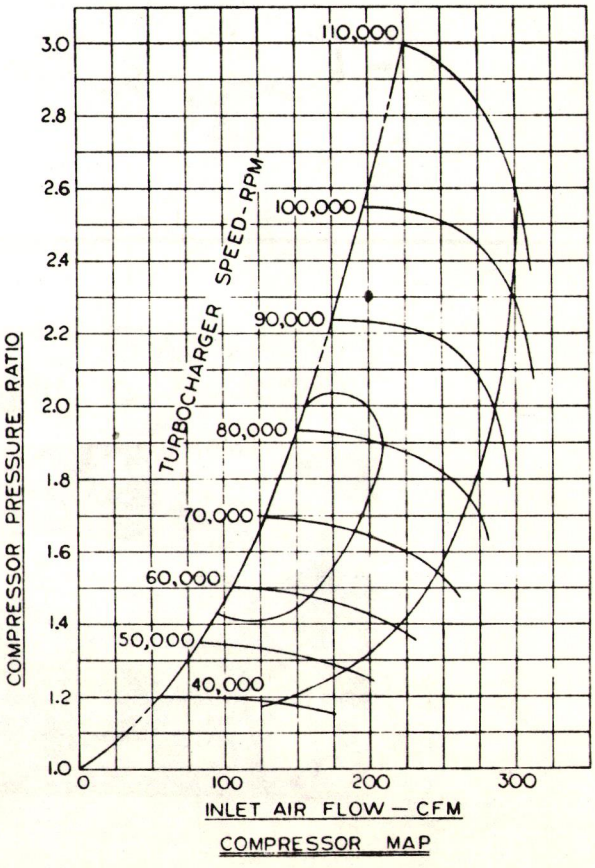
Mack Gaut

The Porsche 356 engine represents a very simple and direct route to internal combustion efficiency and durability. Turbocharging is also a simple and direct route to power and efficiency. Durability is a function of proper size-matching, operation, cooling, and lubrication. To mate these two would seem a simple task. It is!

The main reason more turbo systems are not installed is that it takes time to calculate the exact turbine requirements for a particular engine and turbo application. Flow is the key. It must be measured to calculate ideal performance. Engine displacement is important, and easily determined. You must also determine over what speed range the engine is to deliver maximum torque or efficiency, and for how long. These questions need to be answered before you can begine to choose a turbo for your ego, I mean car.

To size a turbo to an engine is to give the engine the desired amount of boost. For boost to be accomplished, the compressor must flow more than a normally aspirated engine, creating pressure in excess of atmospheric pressure. This excess, or boost pressure, is expressed in relation to atmospheric pressure. Pressure ratio is atmospheric pressure, plus boost pressure in inches of mercury, divided by atmospheric pressure. This compressor pressure ratio is one of the keys to using compressor flow maps. These compressor flow maps show pressure ratio on the vertical axis and compressor flow (in cubic feet per minute or pounds per minute) on the horizontal axis. The solid line sweeping upward is turbine RPM, to the left of this is the turbine's surge limit. Efficiency rings are also shown.

Matching is accomplished by picking the correct turbine (exhaust) housing to provide the desired boost, at the desired RPM. The turbine housing directs more or less exhaust gas at the exhaust turbine. This determines at which RPM the boost pressure is applied. If your configuration places the boost at low RPM for economy or drag racing, then you must deal with excessive boost at high RPM by using a waste gate, or exhaust and carburetor changes to limit excessive boost.



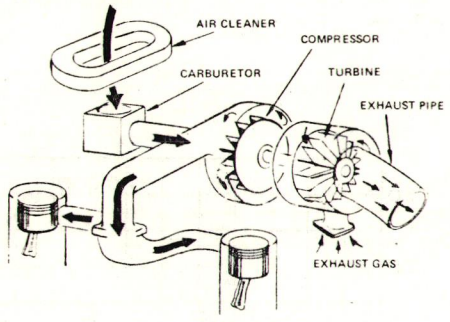
COMPRESSOR MAP

Cooling capacity needs to be increased in proportion to increase to thermal loads. If the engine is to put out twice as much torque or horsepower, and use twice as much fuel, then correspondingly it should have twice the cooling capacity. And in my hands these thermal loads (my favorite kind) cut durability by more than in half. You notice I said thermal loads. If the engine retains its low compression ratio, it's 10 mm valve stems, the same operating

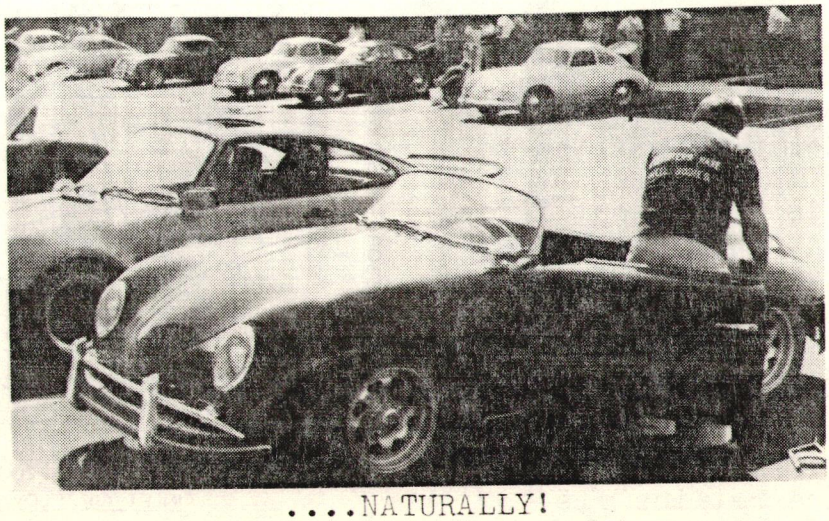
RPM range, and is not operated at maximum boost 98% of the time, it will have a long life.

Lubrication is a very important area to consider when turbocharging. The turbocharger needs a fresh supply of cool and clean oil. The engine oiling system will need to be modified to direct oil pressure into the turbo's bearing assembly, thus lubricating and cooling the 100,000 RPM turbine shaft. Allowances must also be made for the turbo oil return line. It must have an unrestricted downward flow, so oil will not back up in the return line.

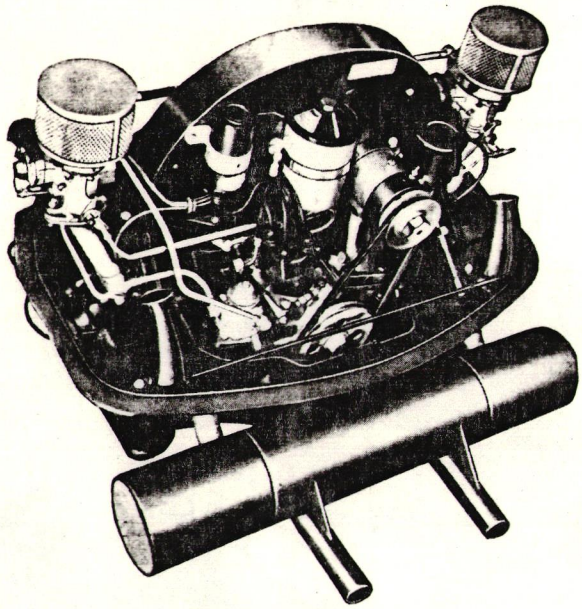
Operation and durability go hand in hand. In my opinion a 120 horsepower turbocharged engine should out last a 120 hp normally aspirated engine. At idle the hot normally aspirated engine must operate under extreme high compression loading on the crank and rods. The turbo engine uses stock low compression. A normally aspirated engine must increase its centrifugal speed (RPM) to gain its increased horsepower. Turbocharged engines can choose the engine speed to produce increased power. Last, but certainly not least, the turbo operates off the volume and the heat of the exhaust gasses. This enables it to operate at varied horsepowers, at varied RPMs. For example, under full throttle acceleration the the tubo would be putting out full boost at let's say 3000 RPM. However, part throttle cruising at 3000 RPM would give little or no boost, and thus excellent economy. Mass production has given turbos a bad name.The general public is not educated enough in simple preventive maintenance to afford or appreciate Porsches, let alone the added responsibility of a turbo.

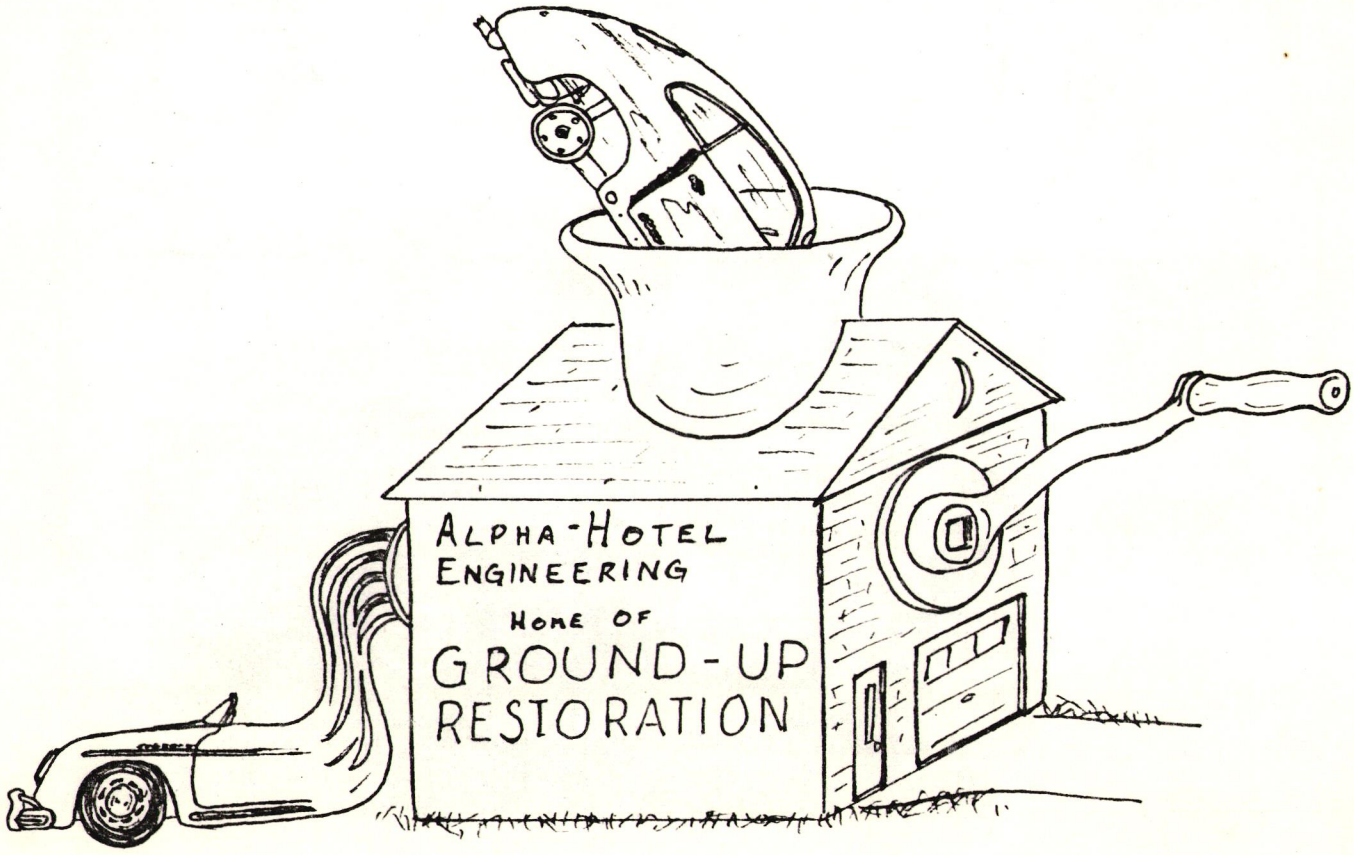


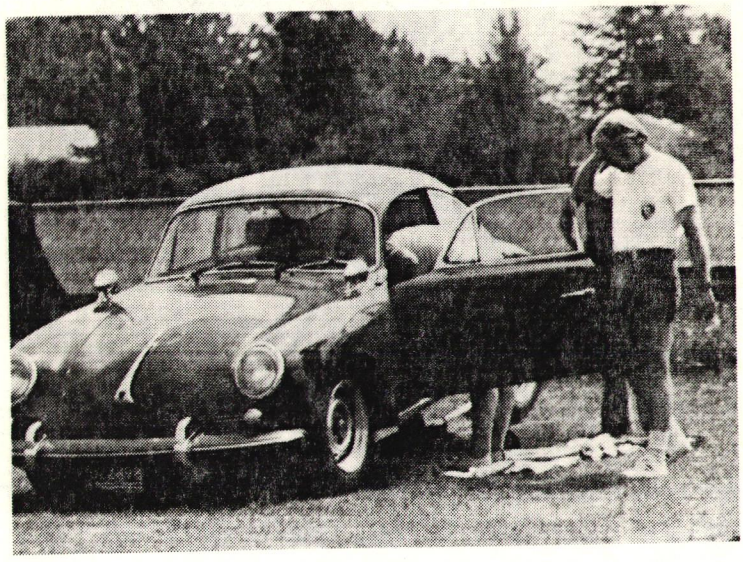
Line drawing sho s ultimate simplicity of a turbocharger installation. From: Hugh MacInnes' book: How to Select and Install Turbochargers



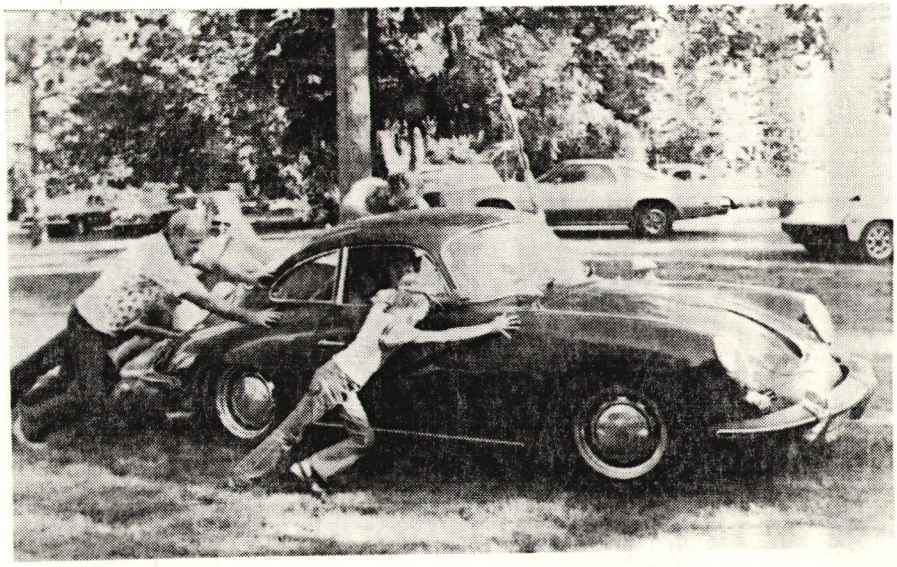
....NATURALLY!




ALPHA-HOTEL
ENGINEERING
HOME OF
GROUND-UP
RESTORATION

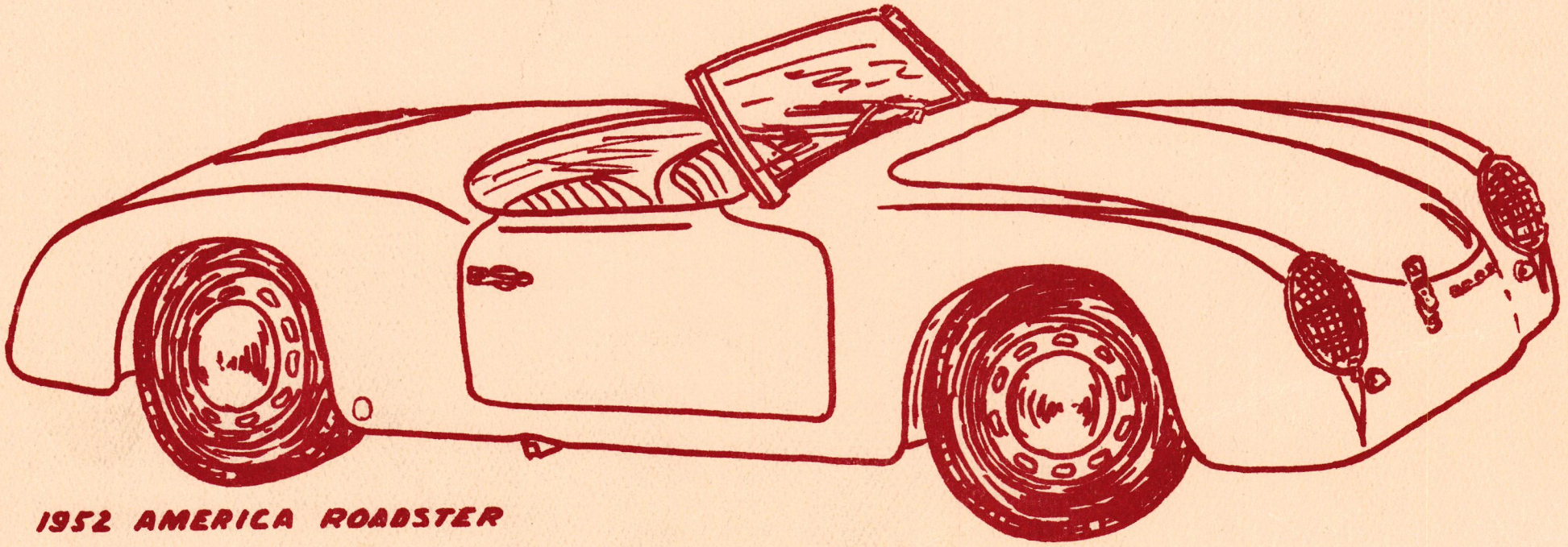


RUNS GREAT!



HAVE A SAFE TRIP

MANY THANKS FOR THE HOSPITALITY SUITE AND THE BEER



1952 AMERICA ROADSTER