



VEE LINE

NUMBER 31

APRIL 1967

DIRECTOR'S CORNER

I've said it before, and I'll probably say it again - Formula Vee is going to inherit the earth! If you think it has made progress, you ain't seen nothin' yet! I predict that it is going to have more overall impact on racing in general than anything since four-wheel brakes. It may be a while yet before over-crowding will become a universal problem, but there is going to have to be some change in the traditional racing schedules (one race for each class - or for several classes) in more and more areas. The "suggestion" by SCCA that Vees race alone rather than with other formulas was taken by a few to be a slap at FV; but I believe it was intended to protect the Vees in those areas where a combined field was too large, and there was some discrimination in weeding out the excess cars. Even with all-Vee races, this is going to become a growing problem. The Steel Cities Region (which sponsors the "Grand Prix for Formula Vee") is already planning for extra races for Vees this year, and there is no doubt that other Regions will find some similar solution is necessary.

Perhaps you think Formula Vee is peaking out, which will automatically take care of the problem? Last year 1,300 inquiries were answered. As this is written (Apr. 9) over 600 inquiries have been processed already in 1967. An increasing number are from drivers in other classes who have found that they can't afford the "production" or "modified" expenditures but feel that Formula Vee is within their budgets. Many are SCCA members who have been participating as "workers" only because they couldn't afford to race before Formula Vee came along.

At this time, the problem of "too many Vees" is strictly local; but in the not-too-distant future, elimination heats for the main Vee race are going to have to be the rule rather than the exception. Race officials, please note!

The recent announcement by the Reynold C. Johnson Co. (Bay-area VW distributor) of prize money for Vees has stirred up a bit of controversy. Obviously their intentions were of the very best, but there is some feeling - and I agree - that the overall interests of Formula Vee would have been better served by awarding "finishing money" to all competitors who finish a Vee race (in smaller amounts, of course).

The \$300 for the first three places will end up in the pockets of perhaps half a dozen of the top contenders throughout the season. These people normally don't bother with Regional races; but with prize money at stake, they'll be taking the top honors - at the lower level, too. The *average* driver won't get much out of that program, I'm afraid.

Q & A

Here's an oldie I've been saving for some time when I'd have room for it. In fact, I've been saving it for so long I seem to have lost the page with the signature. If it's yours, I hope I answered you personally, too; if not, please forgive me. Anyhow, these may be of interest to several of you, I hope -

"Dear Don: . . . I was at 1:54.0 per lap - I am told the best Vee time for this track is 1:52.8 or so. Therefore you can see that my 40hp engine has made all the difference you said it would. (Thanks! Anyone else still trying to race with the 36hp mixmaster?) I haven't started to blueprint the engine yet as is the accepted necessary process to be competitive in So. Calif. (You Southern Californians!) All of the VW manuals I have been able to get hold of do not contain the critical measurements. You said you got them from VW - would you please publish them? I realize that this type of work may be considered illegal by some people; but since it cannot be detected, many people are doing it, and it forces the rest to conform to be competitive."

That's pretty well put, and it's rather a sad situation when plain stock isn't enough - it has to be "blueprint" stock! The other side of the picture, though, is that carefully tuned and well-driven stock-stock cars are so near in performance that only a top-notch driver can take advantage of that last couple of flea-power you can get by blueprinting a VW engine - and he won't really need it. I don't believe that "blueprinting," in itself, can be considered illegal, really, as long as it *can't* be detected. In other words, if the critical measurements are all within limits, it is probably immaterial how they got that way - whether at the factory or at some speed shop. As to the critical measurements, you'll find most of them right in the Vee rules. The 0.039" measurement from the top of the cylinder to the top of the piston automatically determines the length of the cylinder, for instance - and don't start cutting till you have checked your engine as is. You may find that you even have to use a gasket between the cylinder and the crankcase to make it with the standard parts. It'll be very close, anyhow. Volkswagen just doesn't build their machinery all that sloppy!

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COL. GEORGE M. SMITH RETIRES AGAIN



George Smith (right) and Bill Duckworth

Twelve years ago Col. George M. Smith retired from the Air Force. This spring he retired again - from the business of manufacturing race cars.

As a young man he was deeply involved in "Star Class" sailboat racing, and later participated in a number of the well-known international yacht races as a crew member. Flaunting tradition, after his first retirement he did *not* "fade away" - he became even more deeply involved in racing, but this time ashore. He had time for auto racing, not only on the track, but in the administrative end as well. After serving as Regional Executive of the Central Florida Region of SCCA, he was elected Governor for the Southeast Division, and is now one of the "National Chief Stewards."

Around 1960 he was approached by the late Hubert Brundage with an intriguing proposition. Mr. Brundage, a VW distributor, had commissioned a famous Italian automobile designer (Nardi) to build a race car around stock Volkswagen components, but he was not satisfied with the car. Having no desire to get any deeper into the project, he asked George to take it over and see what he could do with it. After some discussion, George and a friend, Bill Duckworth, decided to go into the business of developing the Nardi prototype, even though they didn't know at the time just where it might lead. They were confident of success, but neither of them visualized just how big an impact they were to make on the racing world.

Honors for the development and construction of the original race car must be divided between George and Bill, but credit for the eventual success of the class which it started can belong only to George:

1. He gave the new class its name - "Formula Vee."

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COL. GEORGE M. SMITH RETIRES AGAIN

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2. He visualized and developed it as a "one-design," strictly limited class, drawing on his earlier experience in the one-design "Star Class" sail boats.
3. He compiled the original rules for the class, still largely intact as he wrote them six years ago.
4. He successfully sponsored SCCA recognition for the class.
5. "Formcar Constructors," of which he was President, provided the first cars practically at cost to get the class off to a good start.
6. He organized (and sponsored for a time) the "Formula Vee Automobile Racing Assn." — the forerunner of "Formula Vee International."

Last year, at the age of 66, he gave up actual racing; but until then, he drove his personal Formcar frequently, never winning a race, but never bringing up the rear either. The few changes which were made in the Formcars were adopted only after his own evaluation of their effect on performance. He respected the opinions of others, but insisted on confirming them himself.

In Formula Vee racing, all cars being "brothers under the skin," it follows that from a sales standpoint the skin becomes the most important feature; and Formcar (first on the market) was due for a New Look. After much deliberation, George and Bill decided that developing two cars (the Mark I and the Mark II) was enough. As George put it, "We've made our point — we've proved that a racing class can remain stable without becoming stagnant. We've sold nearly as many cars as all the rest of the builders combined. We've had our fun — why make a rat-race out of it?"

There can be no argument as to whether or not they made their point. That original Nardi has multiplied to the point where Formula Vee is not only the largest single racing class in the United States, but also it is rapidly approaching that status in every country in the world in which there is organized amateur racing. The rules vary slightly from country to country, but from South Africa to New Zealand, they are still essentially the same ones he wrote six years ago.

George isn't really retiring — he has just quit working. He's going to be busy officiating at races, fishing in the South, and exploring the country around his New Hampshire home. His "baby" isn't going to be an orphan, though — it's still living at the same old home address. "Formcar" has arranged for a continuing source of replacement parts to be provided by the "Formcar Products Division" of "Orlando Rent-Alls," which now occupies that well-known address in Florida — 2002 Edgewater Drive, Orlando.

George has always insisted that it was Hubert Brundage who started the Formula Vee rolling, which may be true — Brundage might well be called the god-father. But only to Col. George M. Smith belongs the title of "Father of Formula Vee."

Q & A

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Volkswagen doesn't furnish the type of measurements you are referring to, I'm afraid. Dimensions of bearings, valves, etc., are shown, as are permissible wear limits for such wearing areas; but dimensions such as length of cylinder, measurement across the crankcase and the like aren't available. Cam data isn't yet available either, but I'm working on it. It will be in the form of a graph, such as that shown in #30 VeeLine, with standard directions for measuring.

"In a back issue there is reference to using 8.25x15 tires. How can this be, on 4½" rims? Wouldn't they come off the rim in hard cornering?"

I'm still bleeding from working to put a set of (four!) 9.40 x 15 tires on Petunia this afternoon, on four inch rims. You measured the overall width, I hope, to get that 4½" figure. Measure inside, where the beads go, and if you still get 4½", you'd better get a new set of sedan wheels! After we'd bought them, we were told that they wouldn't go on VW wheels; but it was too late then, so we put them on anyhow. Actually, this is not new — a few were using them last fall and I'm sure you'll see a lot more of them. They probably won't last two seasons, like our Pirelli Cinturatos did; but on the local ¼-mile stock car track, they felt a lot better, with less feeling of rolling under than with the Pirellis.

"Why do some rocker arms have a deep socket for the pushrod while others have a shallow one?"

Probably one of the thousand-odd changes — improvements — made by VW during the lifespan of the 1200cc engine. The latest rocker arms have the oil passage extended on from the center bearing to the adjusting screw so that the end of the valve stem gets some lubrication. An oil seal must be used on the valve stem with these arms to prevent excessive lubrication. Perhaps these are the ones you've seen. They aren't the ones with the two forged "ribs" on the side, near the center bearing, are they — like the 1500 arms, for instance?

"If long rear trailing arms are better (Whit Tharin's article), why don't the factory cars find this out? AD told me that they hadn't changed the rear geometry on the newer cars."

Within the normal limits of rear axle movement, I don't believe there is any noticeable advantage to longer arms, but that is just my opinion. Ideally, the pivot for the arm should be near the center of the car, on a fore-and-aft line passing through the universal joint on the transmission, so that the axle would act as though on a hinge at the U-joint. There would then be absolutely no change in toe-in at any position. With the pivots necessarily mounted outboard of this line, the axle travels up and down in a plane perpendicular to a line drawn through the pivot and the U-joint. At any point above or below horizontal, then, the wheel is no longer pointed straight ahead. However, if the pivot is at the same height as the U-joint the change in alignment caused by the normal couple of inches of spring movement will be negligible. With the driver in the car, move the car back and forth enough to allow the suspension to reach its normal level, and adjust your toe-in under those conditions — from zero to just a little. Then check it after the driver gets out. If you think the change is significant, you will no doubt want to install longer arms. Even this won't entirely cure it — as long as the pivots are outboard, this effect will be present to some degree. Changes will be more noticeable in cars running with excessive camber than in those running nearer to neutral.

"When I was researching for the 40hp engine, I was told that the 'D' head was the best. Now everyone is talking about the 1965 head, never referred to by letter designation. Supposedly this head has gone back to the short rocker arm shaft studs, which allow closer valve settings. Also the heads have different combustion chambers, fin sizes, etc. What have you heard?"

We bought a pair of the latest heads, #113 101 353, a year ago; but after minutely examining and measuring them, we could find no significant difference between them and our "C" heads, so we sent them back. They look different, but the essential measurements are identical: port and combustion chambers are the same size and shape, etc. Later I received a VW Manual Supplement with the following information:

"When driving hard for long periods under certain conditions (strong head winds or high temperatures), the former type cylinder heads are stressed thermally to such an extent that the valves may be damaged. . . . A new cylinder head has been introduced (#113 101 353) from Engine #9 205 700. . . . A deflector plate has been fitted on the underside of the cylinder head to improve the cooling air distribution. . . .

"This will reduce the cylinder head temperature at full load, particularly near the exhaust valve seats and guides. . . . The rocker arm shaft is secured with studs which are screwed into the two bosses in the valve chamber, as in the 30 bhp engine. The bosses are now rectangular in shape, not round as they were formerly. The new heads can be identified by this feature when the cylinder head covers have been removed. . . ; the upper four cylinder head securing studs have been lengthened. . . ; new rocker shaft supports (#113 109 427C) are to be replaced at the same time. The 2mm-longer pushrods with knurled ends (113 109 301B) must be installed together with the new heads. . . ; drilled-out rocker arms (113 109 443B) can also be installed, but only together with oil deflector ring 113 109 619 on the valve stems. . . ; the longer studs (N145131) should be used."

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The following note regarding the older heads may also be of interest: "In all cases of damage where the installation of the new type head is not justified, three 10mm holes should be drilled in each of the two ribs near the intake port after the head has been repaired. This measure should also be carried out when using exchange heads of the previous type. . . ; the previous type of heads will remain available."

Apparently this head differs from previous ones only in improved cooling, and can be equaled by them with the drilling of the extra holes. The myth will probably persist as long as Volkswagens do that improvements in the various components improved performance. However, there is no indication of this in the VW literature. Changes are indicated only for the purpose of improving reliability. How about the change from the B to the C (D?) cam, for instance? Performance probably suffered a bit from that one, but cam failures ceased. The changes in the valve train were made because the original setup didn't line up perfectly — the rocker arms pushed sideways on the valve stems as well as downward. So the valve angle in the head was changed from 9 to 9½ degrees, the rocker arm shaft was moved outboard 1mm, pushrods 2mm longer were adopted, and wear on the valve stems and guides was reduced. Improved performance? Not a bit!

"Does anyone know whether the stock points setting is best for Formula Vee? Would it be better to set the points on a dwell meter?"

Probably the dwell meter readings in this country were arrived at by checking a VW with the standard .016 point setting — at least I've found that they equal each other. As to whether that's best or not, I'd hate to say — any other opinions? Last time I checked ours (last summer), they were at .014; but the engine was running so well I decided not to touch them.

Thanks, whoever you are! You really helped in putting this thing together this month. don.

IT'S HAPPENED AGAIN!

For the benefit of you newcomers, the following newspaper item, sent by our Vice President, Vi Hendrickson, is somewhat fantastic in that it closely describes an accident she was in, with the same results, except that the fingers she lost were on her right hand.

"Veteran driver Bill Buchman flipped his Vee during the race. The upended machine came down squarely on the rollbar, which bent back. As a result, the fingers of Buchman's left hand were caught between the crushed dash cowling and the steering wheel and were severely crushed."

"Dear Don: Well, it happened again! The enclosed clipping. . . is about a race at Osceola on March 5. The irony of the event was that it happened one year to the day after my accident, and under somewhat similar circumstances. . . ."

His roll bar was *not* braced (he was driving a Formcar); he was wearing a full faceshield, which, again, took a terrible beating but saved him from facial injury, and, of course, shoulder harness which is now mandatory. My friend states that she didn't know how many fingers he would lose, if any, but the injury was very painful and severe (amen to that!).

This is only the second injury of this kind that I know of, Don; but can't we devise a way of protecting hands from this type of accident? There isn't any other place to put your hands *but* on the steering wheel, and it's instinctive to hold on to it when you roll or flip. Actually it happens so fast that you can't stop to think, "Now where will I put my hands to keep them from getting crushed?" Is the steering wheel so high that when the car inverts it protrudes above the highest point on the car? If so, maybe we should look more closely to the

place it lower. I'll hear a loud scream from most every Formula driver, but how about making it mandatory that all Formula drivers must wear face shields? We made them wear harnesses to keep them in the car — why not shields to keep the drivers from winding up with half a face from being dragged over a rough concrete road? It's a nasty thought, isn't it? We were lucky — Bill and I — that we were protected, but maybe the next one won't be, and I shudder to think of the agony he'll go through — if he lives through it. Do I sound like a crepe-hanger? I'm sorry if I do, but I've seen the elephant, and I know what it is. Enough said. . . ."

Vi

This isn't a problem that's peculiar to Formula Vee — or to Formula cars of any type. It happened also to a Triumph driver at Shelton last year. Anyone know of any other similar accidents? The cause is obvious — in some cars at least, as Vi suggests, the steering wheel is too high, or rather the roll bar is too low, even if it were rigid enough to remain in its original position. It's easy to check this by eyeballing an imaginary plane connecting the roll bar and the front suspension horns (on a Vee) or any other two points which would contact the pavement in a roll. If one of them is the steering wheel you'd better stick your hands in your pockets as you go over!

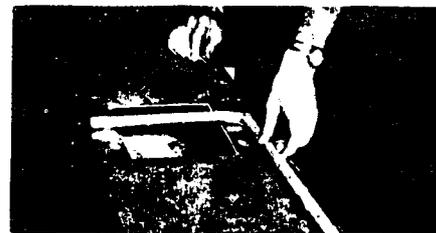
I'm sure there's no need to go into what we *should* do (and I do mean WE — our Formcar is in this category), but probably very few of us will do it until we're compelled to. As Vi said, SCCA has succeeded in making seat belts, and now shoulder harness, mandatory, in spite of those who would rather live dangerously. Adequate roll bars and face shields might very well be next

THAT GAS TANK PROCESS

It's here! Part of it, at least — the way to "fireproof" your gas tank. There are still a number of questions unanswered, but here's what we have, so far —

Essentially, the process consists of the following steps:

1. Obtain a block of polyurethane foam of suitable size. Check your mail-order catalog or local upholstery shop. (NOT latex foam — it would disintegrate in gasoline.)
2. Cut it to the size and shape of your tank.
3. Cut a good sized "window" in the side of your tank.
4. Cut the foam block into smaller loaf-size pieces and insert them in the tank in their relative positions.
5. Make distribution tube of three pieces of 3/4" perforated aluminum tubing. After insertion in the tank, it is joined at the center by a sheet metal clip and pop rivets. No mention is made of the method of getting gas to the outlet, but it would seem a good idea to have the lower end of the outlet tube terminate inside the distribution tube. The vertical leg of the distribution tube terminates in the filler neck of the tank.
6. Replace the cut-out panel. As illustrated, this process is designed for fiberglass tanks, making this step a simple patching job. On a metal tank, a larger, overlapping patch and a cork gasket — fastened with sheet metal screws and lots of Permatex — would probably do the job.



Builder checks fit of fuel distribution tube before inserting it into tank. Assembly of three-part tube is completed inside the tank.

No performance data is given, though it was mentioned once that the foam only cut down the capacity of the tank by about one pint. How much gas can be recovered before symptoms of insufficient fuel are noted, and how much is retained (or detained) in case of rupture are among the details not available at this time. However the process is said to have been tested for nearly a year on three Vees with no sign of problems from disintegration of the foam, which has plagued other fire-proofing attempts.

FILMS

We've caught up on the waiting list for our films, and at this time have one ready to go at a moment's notice. We have "Racing on a Budget" — ten minutes, on the origin of Formula Vee and the first Vee race at Nassau in 1963, and "To Vee or Not to Vee" — similar, but about 15 minutes, and includes Daytona and Nassau in 1965. Both are 16mm (pro-

"NASSAU"

"Nassau," referring to the 13th Annual Bahamas Speed Weeks" and to the Oakes Field Course on which it was held, is no more — but dry your tears! It has merely been transported to another of the Bahama Islands, and given a new name — "Grand Bahama Grand Prix."

This year, it will be held at Lucaya, on Grand Bahama Island, which is already noted for fun and games in contrast to the more sedate atmosphere of Nassau. The dates, which will fit in better with the ARRC at Daytona, are from December 10 through 17.

This year, at least, the event will be for strictly, only, nothing but Formula Vee, and on a truly international scale. Prize money will total at least \$20,000, with approximately \$8000 going to the overall winner! You can bet that this will *not* be just another Regional race this year.

No formal announcement has been made as yet as to what rules will govern "Crise Formula Vee." Last December, anticipating another normal "Nassau" meet, "Red" Crise announced that there would be at least one big event for "FVI-legal" cars; but you can expect that cars for the main event will be Vees in name only. You will even find the first 1500cc "Vees" at this event.

If there were no provision for FVI-type cars, this event would be viewed by the average Vee owner as in the same category with the Can-Am Series, or "Indy;" but it looks as if there *are* events for your car, including the week's opener — a 100-mile event over the streets of Lucaya. You could have an unforgettable week in the Bahamas for \$150, for two.

**The VEE LINE of
Formula Vee International**

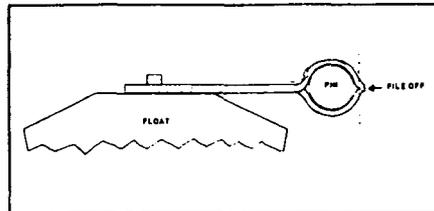
Don Cheesman, Director
Box 291
Ephrata, Washington 98823

ANOTHER CUTTING-OUT CURE?

"Petunia" really got short-changed on preparation this past winter. She went into the first race of the season without even an oil change or a spark-plug check. All she got was a new carburetor float and valve, as last year's valve developed a leak during the winter.

There was no intention of curing the cutting-out which showed up at the last race of the season, but a clue was discovered in the process. If it doesn't help, it won't hurt anything; and it's easy to try.

If you check the brass arm to which the float is attached, you'll find that the three little fingers which are bent to form the pivot on the float pin have a slight projection on the end, apparently left when excess metal was sheared off after bending. On our particular float, at least, it was possible to raise the float, push it in the direction of the pivot, and release it — and see it remain in the raised position, even though there was no gas in the bowl. It appears possible that in a turn, the gas being thrown toward the side of the bowl might conceivably exert this same pressure on the float, pushing it to the back of the hinge-pin recess and hooking those little projections on the wall of that recess. The "cure," of course, would be to file off the excess metal on the back of those three fingers which form the hinge. I can't say yet whether it helped or not — there were no cut-out turns on last weekend's course — but next week-end we'll be on the course where the trouble started and I'll let you know. In the meantime, why don't you try it anyhow?

**UNCLASSIFIED ADS**

FOR SALE: Autodynamics, used one season. Fresh engine to legal specs. With trailer, \$1500 or best offer. Nub Turner, 1030 Fountain, Ann Arbor, Mich. (313) 761-5796.

FOR SALE: All back issues of VeeLine, 25¢ each. Write FVI.

WANTED: Used Vees for this section. If they're not in use, let's get them to someone who wants one.

FOR SALE: Beach MK5, fresh engine, only two driver's school sessions. Want to sell fast. Rick Marshall, Riverview Rd., Irvington-on-Hudson, N.Y. (914) LY 1-7899.

FOR SALE: Discovered one more '63 Formcar in the basement. Complete with rebuilt engine, etc. Used only a few times as a demonstrator. Any ridiculous offer accepted, on your terms if you have an honest face. Metro Motors, 2121 8th Ave., Seattle, Wash.

CAMBER DEVICE

There have been a couple of questions on the camber limiting device described in the #29 VeeLine. Seeing it in print, I can see where the drawing does have some limitations. Anyhow — the cable runs clear across the car and is fastened to both axles. The spring and strut are located in the center of the transmission. The spring acts like an archer's hand when he pulls back on a bowstring, except that the "bowstring" is normally slack. The "pull" occurs only when tucking-under tightens the cable, tending to straighten it out. The restraint provided by the spring prevents the cable from straightening completely and does so progressively so there is no shock. This system is quite widely used without a spring, too — so it evidently isn't essential. It just looked like a good idea, so it was included. OK?



**Formula Vee
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