



# VEE LINE

## DIRECTOR'S CORNER

I hope there aren't too many letters this month. There doesn't seem to be any really burning issues to cover, for a change, and some of these I've been holding for a couple of months, as I believe they will be of some general interest (besides the compliments--I just couldn't bring myself to cut them out).

We do have the making of one burning issue here (weight) and it probably isn't too early to start discussing others, judging from past experience. In my opinion we still do not have a completely satisfactory set of rules, so we will follow last year's procedure fairly closely and again present our recommendations to SCCA in the fall, after balloting to determine what they will be. In the meantime, discussion is in order, so let's get some arguments started.

Though not as frequent as they were a year ago, there are still complaints about a few suspiciously fast cars. I'll say it again,--if you are SURE your car can't legally be made to go faster, perhaps the other guy IS cheating. Even in a group of people as fair-minded, upstanding and honest as Vee drivers are known to be, there is still the possibility of an occasional stinker sneaking in.

This year's GCR authorized the Chief Steward to initiate teardowns "on behalf of the race organizers" to ascertain the legality of a suspected car, without the formality of a written protest, so that if it seems to be in order, a heart-to-heart talk with him by a group of Vee drivers might be effective. In cases such as this, I believe a teardown would be beneficial, whether or not the car is found to be legal, as suspicion of cheating is nearly as bad as certainty of it. (To show your concern, you might, as was suggested here once before, even offer to share the expense.)

I'm just a little suspicious, myself, that a few well "worn" cams might be found if all the Vees could be inspected. This is an area where there is no information, as yet, on detection. I'm working on it--bought a long-stroke dial-indicator several months ago, and have a method worked out, but between my job, my home, this "hobby", and a few other little diversions, I haven't had time to work it out. Anyone know where you can get degree-wheels that will fit a VW for around 98¢?

## TECH INSPECTION

"Dear Sir:

I am the technical inspector for the New York Region of the SCCA, and would appreciate any help your organization can offer regarding specific points of importance in inspection of the Vees.

Also, I would like to know about your organization, and any specs you have regarding the Vee suppliers, as I am very interested in constructing a Vee.

Thank you for your help.

*Robert A. Torgersen"*

Thanks so much for your interest! As was mentioned here at least once before, it may very well be that an apparent lack of interest in FV by race officials may instead be due to lack of understanding. This, then, may also be of interest to others in your position.

I would say that the salient point to keep in mind when inspecting a Vee is that most of these cars were built by their owners, which means that nearly every part can be assumed to have been dismantled and reassembled--in many cases by amateurs. Loose or unsecured bolts, then, are not unusual--uncotted tie rod bolts, steering arm extension bolts, loose steering gear mounts, battery hold-down, radius arm pivots, etc.

Brake systems have in all cases been rerouted and should be checked for several items--loose, vibrating lines, leaks, chafing hoses (especially in front

--check at full lock, both ways) etc. Routing of the rear lines should be carefully checked. Many cars will have steel lines from the brake cylinders running along the axle toward the center of the car, with flexible hose near the ball-joint on the swing axle. These lines should be secured to the axle at their inner ends and the flexible sections should be checked for freedom, kinks, and chafing. I have seen several installations where the steel line was loosely waving in the breeze, inviting cracking, and one where the inner end was actually secured to the frame, causing it to bend with every movement of the axle (till it broke). If flexible lines are used at the drums they should be long enough to allow the axle full rebound without tightening the line.

At the pedal and master cylinder, the mount should be strong enough to withstand a "panic" stop without coming unmoored. The pedal adjustment should start moving the shoes as soon as it has been depressed a half-inch. (That half-inch is necessary to uncover the return port in the cylinder, but any more than that is excessive.) Spongy brakes, due to improper bleeding, are not too uncommon.

The throttle return spring(s) (two are required in some Regions) should be at the carburetor so that they pull the pedal back, and so arranged that they will close the throttle in case a cable comes loose.

*(Continued on Page 2)*

## KINDERGARTEN

"Dear Don:

The driver's school at Green Valley Raceway this past week-end was excellent (my first school). There were 73 cars, of which 13 were open wheels, of which 10 were Vees. We had seven hours of class instructions, written test, and films. Saturday found us at the track from 7:00 to 7:00. We really put in our three hours on the course. Our Vee Champion from this Division (*must have been LeRoy Melcher. don*) worked with each of us individually on course by having us follow him around the track, and each time he would go a little faster. My Vee acquired a high-speed miss... I found out that even with a pretty bad miss the Vee is dependable--you just have to find out at what rpm it will run and try to keep it there, which I did because I wanted to get my time on course. By the end of the day there were only 5 of the 13 (open wheelers) that started able to grid for the last two races, all 5 being Vees.

I am plugging the Association at every race. Cut out the application form from one of the Bulletins and gave it to a guy at the school. I showed him the VeeLines, and how much valuable info they carry. He did not know we even existed! Oh, yes, the VeeLines are bound and they go with us where the car goes. That's what we think of it.

Sincerely,  
*Sue Payne,*  
*Corpus Christi, Texas"*

*(How about that, Vee people? If every member would do the same, we'd have twice as many! don)*

## JOINED LATE, BUT NOT TOO

"Dear Don:

"I was pleased to find your answer to my query about oil, etc. in the January issue. It seems that the saying, 'Moderation is good policy, provided it isn't overdone' might apply here.

"Thanks in general for the VeeLine. I have gained more useful information from this than from my one year of racing. I should have joined a year before starting, instead of a year after, and I am recommending this to anyone I meet who is interested in FV. (*Aw, shucks! don*)

"The Bobsy has been dismantled for a complete fine-tooth-comb job and some minor changes. I also have a set of R6 Green Spots ordered so maybe there is hope for this year.

*John Boyles*  
*Waterloo, Iowa"*

**(TECH INSPECTION)**

I have seen them located at the pedal, so that they pushed the throttle closed by means of the cable. A stuck cable could result in a stuck (open) throttle.

Camber limiting devices, while now authorized for Vees, are not mandatory under the Vee rules, but I would suggest that they be strongly "recommended" for Vees not already equipped. When the rear wheels tuck under, handling changes drastically, usually resulting in a spin-out.

Ventilation of the engine room would not appear to be a safety factor; but in one case, at least, an overheated engine, combined with a poorly fitted firewall, resulted in a driver actually roasting his *derrière*. It was done so gradually he wasn't aware that he was more than just very uncomfortable.

At least two Vees, to my knowledge, have lost wheels due to worn bolt holes, allowing the lug bolts to tighten against the drum rather than against the wheel itself. The wheel working on the bolts (in the case I witnessed) actually unscrewed all five of them, so neatly that the threads weren't even damaged in the hub. This would be hard to detect, as the bolts feel normally tight. Only a visual check to see that they appear to be normal would be possible.

A Vee with negative front camber definitely has something wrong. Either the front components have been bent, or in some cases the front end has been assembled incorrectly. It is possible, by shifting spacer washers, to achieve a certain amount of negative camber, but it is done at the expense of putting the torsion arms and pins in a bind.

The line leading from the engine to the oil pressure gauge should have a section of flexible hose next to the engine. Some of the original kits did not include this--a copper tube ran all the way, with the result that the tube sometimes broke next to the engine due to vibration. Plastic fuel lines seem to be universal, but a check would be in order for a flexible section at least.

An adequate breather extension hose (if used) is at least 1/2" inside diameter--large enough to slip over the nipple on the filler neck. A smaller one will cause back-pressure in the engine and blow oil out the front main bearing when operating under load.

Some sort of reverse gear lock-out should be provided. Missing a shift in the forward gears is bad enough, but getting into reverse instead of second off the line is very disconcerting to the car behind. Yes, it has happened.

Check the flexible joint between the steering "column" and the gear-box. Some of these may be in poor condition. In the VW they only serve to turn the steering gear, but in Vees they also locate the steering wheel fore and aft, and are subject to pulling and pushing as well as torque.

In addition to the regular points covered with any type of car, the above points should result in a pretty thorough inspection--and a long line of Vees waiting to go through "tech".

**ANOTHER CONTRIBUTOR**

"Dear Don:

"...Starting hard? The electric tach has a tendency to drain current from the primary circuit. Try installing a switch in the ground lead to allow full primary current for starting. For high tension wires I suggest Packard 440, rather than plastic "hot-rod" wire. Coil output low? Try switching the primary wires--mistakes are made, even in the factories. For Bobsy owners--get rid of the plastic clutch cable pulley, if your car has one, and install an aircraft pulley.

"So much for now--I'm heading back to the dyno.

Steve O'Bryan, Jr.  
Hamilton, N. Y."

Thanks, Steve--hope this will encourage more such comments. don

**UNCLASSIFIED ADS**

FORMCAR: for sale. Good school car and could be a winner in capable hands. We've got a mantle full of trophies with it. Needs tires. On trailer, \$1195. Volkswagen Iowa City, Iowa City, Iowa (Gene Greb).

HELP! I need an engine. Complete, incomplete, new, used, or worn but repairable. Anything and everything. All generous donations gratefully accepted, or if you insist on being mercenary, will negotiate. All letters will be answered as long as I can afford postage. Peter Reidy, 11019 S. Atlantic Avenue, Lynwood, Cal.

(Pete wrote the article on engine balancing about a year ago, and there will be another on balancing con-rods next month. don)

**NEWS CLIP**

Folis Jones gets a nice write-up in the Charleston *Evening Post*, with two pictures, yet! He just got his regional license this spring and is going for his National. He's Chief Machinists Mate on the submarine "Harder", based at Charleston.

**RUN TO YOUR NEWSSTAND**

The June issue of "Sports Car Graphic" is scheduled to carry an article on Formula Vee. Only modesty prevents me from naming the author.

**THE VEE AND ME**

WHIT THARIN

In the February issue (No. 17) we discussed the absolute necessity of a good suspension and how my own is set up. Now let's talk about weight distribution and engine set-up.

Only one significant change has been made in weight distribution, but it seems to have helped. With driver and half a tank of gas the split is very close to 45% front and 55% rear. Originally it was closer to 48-52, but I changed to a smaller battery, for weight reduction, and moved it from the front to over the transmission. I use a motorcycle battery, with jumper leads from the tow car for cold starts, as the small one does not have much capacity. Further weight reduction was gained by replacing the seat with one from a light plastic chair. It somehow got 2 inches lower than the original, which--

1. Lowered my head to the approximate height of the roll bar, thereby
2. Reducing wind drag from the driver,
3. Lowering the center of gravity somewhat,
4. Increasing the wear on the seat of my drivers suit (no "bucket").

Most of this paragraph is only useful to Formcar owners, but pardon one more exclusive for that bunch--you can dump 2 1/2 pounds and gain a couple of mph by cutting off the "hangy-down" part of the rear body section (or a decent alternate is to close in the bottom from the fire-wall back) and nobody's top speed was ever reduced by a shiny new wax job just before a race. Try it!

On weight reduction, be careful. Only the early Formcars (1/4" lower rail--later ones use 1") have enough extra weight to toss away pounds. AD's have always been within 5 pounds of the minimum, as are all but a few very early Beach's. The standard Bobsy is very close, too.

Your local VW dealer can probably give you better engine advice because mine has always been completely standard, with no swapping of parts other than carburetor and distributor. Only after the first nine events of 1965 were the heads removed. At that overhaul, the engine was balanced, the heads polished, the valves lapped, and a simple baffle installed in the crankcase. That's all, but it sure did help. The gain was an indicated 1 1/2 HP but I can't swear to the accuracy--even though the same dyno was used--as the runs were over 6 months apart. On the course, however, it was obvious that some useable gain had been achieved. The engine was then strong enough to help me keep on the straights a lot of what had been gained in the corners, which was a new experience for me. I'd hate to go through all the work again, but this much, at least, appears to be necessary for a winning car these days.

Most professionally prepared cars go a step or two further, paying particular attention to clearances. Last year this was restricted to crankshaft journals, in legal engines, due to the "1192cc" rule, but the 1966 rules give you 8 mils (thousandths) to play with, so I rather expect that many will take full advantage of it.

There is another practice with regard to clearances that worries me because it may be illegal. You can usually assume that any crankshaft which is running with all undersize journals has been "blueprinted". This means it has been trued by grinding each journal until all are in perfect alignment and precisely where the blueprint of the engine says they should be, with all mass-production errors and tolerances eliminated. The rods, and sometimes the camshaft, are similarly aligned and "blueprinted". Frequently second undersize inserts are installed in the rods and then bored back to fit the shaft. The blueprinted shaft will usually wind up with journals about equal to first undersize.

Now this sounds innocent enough, and at first glance, legal; but I believe it should be outlawed. Actually, between one and two hundred dollars has been spent on the shaft; and it has been "altered, modified, and changed", in violation of Art. 4.1, Appendix A, of the GCR. This would be hard to prove, as the only evidence is undersize journals, and who can prove it's not innocent? But then, innocent or not, are undersize journals (reground cranks) legal under the above rule? I don't know, but I'm going to find out! If that stuff is legal, I'm going to need one, but I would rather see it specifically ruled out for '67. It's too expensive a trick for this class.

I make a big deal out of "little" things like that because I have to run my tail ragged to get by faster cars and stay in there. It can be done--you don't really need all that stuff to win a championship, and I'm living proof that you don't--but it's a heck of a lot harder when you have to compete with it. End of sermon.

Loose-fitting engines have less internal friction, and most of them seem to run a little faster; but it seems more trouble than it's worth. Two or three races (sometimes only one) is all you get before you have to overhaul it again. I get 8 to 10, depending on the schedule, and I'm never in danger. But if you like to play race mechanic, go ahead and loosen up your engine.

My carb is the old style (PCI) with choke removed and a 24mm venturi. The key item, however, is the adjustable main jet. If you don't have one, get it, if you can get to a dyno. (If not, you might as well leave it in the box.) The degree and precision of your tune will be enhanced, and it will be easier. More on that in a minute. (See *Bulletin #8* for part numbers, prices, and where to get Solex parts if you have trouble locally. don)

My distributor is the straight mechanical type, set just like the VW book says. The vacuum advance type will work pretty well, but not as well as the mechanical.

One item that is almost essential for any engine is a good dyno-tune. Don had a "how-to" a few issues back, but my own procedure is a little different.

Load the dyno so that you are pulling full load at 4,200 rpm. Fiddle with the adjustable main jet until you have a maximum, then rotate the distributor for maximum power at that jet setting. Return to the adjustable main jet and repeat until you have "wiggled in", adjusting the dyno load after each cycle to keep it at 4,200. When you think you have it, run a power curve, taking horsepower readings at 3,500, 4,000, 4,500, and 5,000, and compare it with a similar curve taken before you touched anything. You'll be surprised at how small the difference is, but wait until you get it on a course. If the tail-off at 5,000 is too sharp (more than 15% of your maximum) try a bigger air correction jet and repeat (I run a 190 with the 24mm venturi). Don't worry about what it does below 3,500--that's what gears are for. When all is done, mark the resultant settings, and forever thereafter keep your cotton-picking hands off of them.

Valve clearances are not critical, but I run mine at 0.004 and adjust them after every other race (just for something to do).

Spark plugs are critical. Mine are not right, and never have been, but I didn't find that out until last December at Nassau, and I still don't know what to recommend. Some run racing plugs, but they are very cold and sometimes give you a sluggish engine the first few laps. I run street plugs, and they are strong early but fade when they get too hot. Surely there is a middle ground, but where is it? Suggestions, anyone?

I run the absolute best engine oil available for a racing engine--castor oil, SAE 40. I run an air cleaner--the only time it comes off is for a National points race. And the exhaust pipes are always stuffed when I come in. And the first wise guy who calls me Grandma Tharin gets late-braked in the fourth turn!

Don tells me that a word or two (*Ha! don*) would be in order on how to apply the suspension advice I offered a couple of months ago. "How", he asks, "do you tell if a different suspension setting or tire pressure is better or worse than the previous one?" I wish that question really had a simple answer like the one I gave him--"If you can't tell, you don't belong out there", but it's really not that simple. One time my driver's school instructor changed my tire pressures five pounds and bet me a Coke I couldn't tell whether he had added air or let it out. He won, but it was easy to tell when he changed it ten pounds. From what was learned at ten pounds difference I was able to identify five pounds. Later I tried two-pound changes, and now I can identify a half-pound difference in my tires. So can you with this self-taught method, but don't be impatient if you don't get it down that fine in one day. It'll be a while before you need it that close, anyway. The same approach would apply to suspension adjustments, but be sure you learn them separately, so you can tell which is doing what.

Next time I will discuss some fundamental driving techniques, if anyone is still reading this stuff.

## FROM SOUTH AFRICA

From a newspaper clipping, sent by Dave Clapham--

"If there were any opponents of Formula Vee at Kyalami on Saturday they must have been booing under their breaths. The 14-lap single seater race--the first in the new Transvaal championship--was without a doubt the best held so far." Follows a description of the race, typical of Vee races, except that at one of the corners two of the drivers tried to outdo each other before braking with the result that one Fanie Viljoen missed the turn and flipped, throwing him out. He suffered "only" facial injuries and a broken pelvis. Dave (who sent this) tangled with a Miss Jenifer Tudor-Owen, who had to drop out. Dave was able to continue, but ended up in the pack. In the second heat he came in second, but aggregate times gave the victory to Berrington-Smith, second to Van Wyk, and third to Van der Walt.

The accompanying pictures show Vees any of us would be proud to own.

## FV BIG IN CENDIV

"Dear Don--

"...I find owning a Formula Vee is like joining a family--at least so far. A lot more exchange of ideas and so on than I was used to in F Production (Alfa).

The mimeed sheet gives a quick picture of Vees in CENDIV during '65. Thought you might use it as "filler" when you are short of copy.

Wally Reese  
Cincinnati, Ohio"

*Wally is the Treasurer-Scorer for the Central Division, and included a very comprehensive chart of all the races, showing starters, DNF's, etc. for all the classes. How he got all that information on one sheet! The info on the Vees shows that there were 38 at Elkhart! There are names of Vees I've never heard of--Fuller, Londergren, Ausca--(are they in production, Wally?) as well as the well known ones. Formula Vee is by far the largest Class, averaging 25 cars per race. E Production is next with 16.*

## BRAKES

If you removed the hand-brake linkage from your rear wheels (of course you did!) you probably didn't notice it, but you also removed the support that keeps the brake shoes from sliding down on their guides and rubbing on the drums for support. It isn't serious, but it does cause the lower ends of the shoes to wear more rapidly than necessary. You can help the situation a great deal merely by raising the lower return spring and hooking it over the lip of the "grease catcher" so that it exerts an upward force on the shoes as well as pulling them together. This lip probably wasn't designed for that purpose, but it seems made to order.

## FV LOOKS UP DOWN UNDER

A long letter from Aubrey Revell, Mortdale, Australia. Those Australians are catching up in a hurry, believe me. If any of them get to Nassau (and don't be surprised if they do) they'll be right in there. He mentions four makes of Vees, and describes Vee races at four meets. Here's another method of making a stiffer sway bar, if you're interested--"We made it from a length of square, low grade tool steel, grinding the ends to fit the trailing arms, turning the center to just clear the centre bush, and then heat treating.... We have still to fit a camberlimiting device. Last week we severely scrubbed rubber off the outside of the right-hand rear wheel, apparently through the rear end jacking." (*Sound familiar?*) "We are running on sedan final drive and top, with a Kombi third. In top 5000 rpm is about max. Our motor has been balanced, given clearances, flywheel lightened, 24mm venturi, Champion L85 plugs, and has been dyno tuned. Maybe we still have more work in this department.

"There is one problem we have to

attend to here, and that is some form of scrutineering. Cars are continually arriving with transistor ignition systems, carb air horns, etc., and being allowed to run without penalty. I was approached by a flag steward at Warwick Farms and told that they were starting a Formula Vee Association in Sydney, but I have not heard anymore about it. We badly need one.

"The VeeLine is a beaut, especially the items like the new one by Whit Tharin. We have a lot to learn out here, and we will sure soak up information like that.

"Well, that's about all, Don, and I hope all you good people over there are having half as much fun as this old grandfather with his Vee.

*Aub Revell*"

*Here's Aubrey's car. Frankly, I don't think there'd be much market for American cars in either Australia or South Africa. What would we have to offer that they don't have already, and perhaps more so? The rear view of the car is even better, but it's not so good of Aubrey.*



## TWO QUESTIONS; ANY ANSWERS?

"I would very much like to see an article on Camber Compensators--perhaps EMPI's compared to limiting straps, Z-bars, etc.

*Don Williams  
Silver Spring, Md."*

"Do you know of anyone who has track tested a Vee with and without the EMPI Compensator?

*Jim Lindsay  
Seabrook, Texas"*

*No, Jim, I don't. Any comments, anyone?*

## ASKS HIGHER MINIMUM

"Dear Don:

"...In late reply to the letter in the August edition, I am in accord with a change in the rules to allow a 1000-pound minimum with driver. Unlike that writer, I weigh 210 and the difference between me and a 120-pound driver is more than 10% of the present car weight. ...If the engine is to be equated to a general standard, let the mass to be moved by this force be the same for everyone, too. If all other factors are to be equalized, I am obviously going to be beaten by a driver of 140 pounds.

"Keep the trend of Vee going, and thanks for the many pieces of information in the VeeLine.

*Bruce Moffitt  
Albuquerque, N.M."*

*How could the situation be put any clearer? Can there be any logical argument? Thanks, Bruce--for the compliment, too. don*

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