



REPRINT

# VEE LINE

NUMBER 18

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## DIRECTOR'S CORNER

"The more I race, the more I feel that a guy driving on his own is never going to stand much chance unless he is (1) an engineer, (2) a mechanic, or (3) really rich. Drivers like me, who love the driving and the competing but are just not knowledgeable mechanics, really can't compete with you brainy fellows." (Excerpt from a letter received recently.)

I am afraid that to a certain extent, "them's the conditions that prevail". Formula Vee was meant to be--and it is the purpose of this Association to keep it--a relatively simple, relatively cheap racing class. But the key word here is *relatively*.

Formula Vee is, after all, a racing class, which implies attempting to obtain the ultimate in performance from both car and driver in order to go faster than anyone else. That's inherent in any type of racing. The Formula Vee rules were compiled to keep this ultimate in performance within the reach of the *average* owner-driver-mechanic by narrowly restricting the field of "preparation", but it was not intended that preparation would be entirely eliminated. Within those restrictions, then, it is true that everything permitted must be done if the goal is championship. To repeat a statement made by Ray Caldwell over a year ago: "Better prepared--not necessarily more expensively prepared--and better driven cars go faster. Formula Vee was never meant to compensate for ineptness." If you can't do your own work, then, and can't afford to have it done, you might as well relinquish that empty space on the mantle to your wife--you'll never fill it with trophies.

There is another side to racing, however, which is sometimes hard to accept, but it is still inescapable. This year, of the nearly 1,000 Vees, only one will be a National Champion, seven will be Divisional Champions, and there will be only one Champion per region. For each of these champions there will also be a Tail-End Charlie, and in between there will be a lot of competitors with no distinction at all. As Whit Tharin once said, "Who remembers who came in second?"

So nine out of ten of us will have to settle for just the fun of racing. Even if you get nothing to show for it, finally beating a car that has been ahead of you all season can give a lot of satisfaction, and the spectators are often more excited about the racing going on back in the pack than about the leader, who may be half a lap ahead of everyone else. If nothing else, you get to drive for half an hour about as fast as you want to go, legally, and in relative safety. Thousands of people bowl and play golf just for fun, never even entering a tournament. So even if you never win a race, have fun trying. That's what this is all about, anyhow.

I'd like to mention one more point before I quit--it is true that it takes a certain amount of mechanical aptitude to dream up some of the ideas presented here, but after they're presented it doesn't take a mechanical genius to put them into effect. A professional mechanic could no doubt do so faster, but most of them can be done, in time, by anyone who can change a spark plug and read English.

So don't use lack of mechanical ability as an alibi for coming in last--grab a wrench in one hand and a VW manual (or a VeeLine) in the other, and dive in. What can you lose?

## BLUEPRINTING

I rather expected more reaction to the suggestion that we should expect the "non-stock bearings" to be standard size. There has been only one comment, so far, but it was a long-distance call from California.

The caller was a mite perturbed at my taking such a position on this question. I assured him that my opinions certainly are not presented as any more than that, and I don't expect everyone to agree with them; but I do hope that they will cause some deep thinking sometimes.

On this particular question, I still feel that, while there is no objection to a fellow getting a crank throw or two or three reground in order to save buying a new shaft, regrounding the entire shaft in order to gain a mechanical advantage is to be discouraged, if possible. Whether or

not it actually helps, if it becomes an accepted "fact" that you have to have your engine "blueprinted" if you wish to get anywhere in Formula Vee, the Class is dead. This caller claims the right to spend as much as he wishes on his engine, as long as he remains within the rules, and I agree, entirely. However, it has always been the intent of the rules to insure that spending money won't give a corresponding mechanical advantage, and I claim the right to advocate any interpretation or change of the rules which will carry out that intent.

In the course of the conversation he mentioned that the rods from the 25 and 30bhp engines were lighter than those in the 34bhp (41.5) engine--and he's right. They are also 5mm smaller on the crankshaft end. He said he had just had his crank reground. You don't suppose.....? He wouldn't dare--would he?

## "GET WELL" CARD

Our Vice President, Vi Hendrickson, is going to be missing a few races this Spring. In the 20-lap Sunday Vee race at Sebastian, Florida, on March 6, Vi's Vee slipped off the airport pavement and tripped in the soft soil. As it flipped it came back on the track, sliding upside down on the pavement for 20 or 30 yards. Apparently the steering wheel contacted the pavement with Vi still hanging on to it, as her right hand is pretty well beat up. Other damage is minor, to both her and the car, consisting of a few skinned spots, on Vi, and a somewhat sprung roll bar on the car.

Dave Hendrickson reported that even with double braces on the roll bar, running back to the shock mounts, there was some distortion, but the bar did its job. The helmet and face shield, also, were responsible for confining facial injury to a small "burn" on one cheek.

The Vee will probably be back racing before Vi will, but she's coming along fine, Dave says. Our sympathy, Vi, but everyone is happy it was no worse.

## BARGAIN!

Any of you wish you had a subscription to *Sports Car Graphic*? Would you subscribe for \$4.00 a year? (Regular price is \$5.00.) If we get ten or more subscriptions in a batch, the \$4.00 price applies. If I get that many by Memorial Day I'll send them in and if less than that, I'll send them back. Okay?

## MANUFACTURER'S NOTE

Chuck Tatum, Crusader manufacturer, has offered \$50.00 to any Crusader driver who finishes first in a National race, and will pick up the entry fee for a first in a Regional race. What are the rest of you builders going to do?

## NO BALL JOINTS

Fred Sellers, who is the Service Manager for Auto Associates, Inc., the distributor for VW in Pennsylvania and Delaware, corrects my statement that the serial number for the front end is superfluous for designating the non-ball-joint type. Apparently there were some 1200's built with the ball-joints before the switch to 1300cc. So don't use ball joint front suspension! OK? Thanks, Fred.

## EMPI NEVER GIVES UP

Harriet Gittings forwards the latest attempt by EMPI to subvert Formula Vee---

"Dear Harriet--

"Sorry that we were not able to be more cooperative on the Vee show that you good people threw in your area... etc.

"Apparently Vees still have not caught on down here the way they have in your part of the state, much to our regret... We do not dare to race our EMPI Vee car this year because our customers will be furious if we beat them--we learned that last year. (*What really made them furious was finding out that they were being beaten by engines with 8:1 compression ratio, etc., wasn't it? don*)

"From our troubles of last year concerning regulations we scored one slight victory. The 1966 regs have loosened up slightly to permit valve spring spacers and camber compensating devices. If any of your group's members are interested, the various EMPI Camber Compensator Rear Stabilizer models fit all the VW engines, but on some of the Vees the exhaust pipes may require re-routing to clear the compensating spring. (*Also frame members on most cars. don*) Our people regret that the new regs on the exhausts do not permit joining of the pipes to achieve an extractor effect (*I'll bet they do! don*) for here much power can be gained with a low-cost device (\$49.95, at EMPI. *don*) that does not require extensive engine tear-down. (*Do you by any chance sell valve spring shims? don*)

"OH! Almost forgot! One of the magazines has asked for dope on what people out here are thinking about liberalizing Formula Vee engine and car specs. They are trying to find evidence (*that's exactly what the man said! don*) to support the idea that there's growing demand for a loosening up of the regs. Can you give me a short report that would fairly accurately sum up the opinion of your club members on this?... We'd be pleased to hear your own opinions and the opinions of your members on this matter...

Sincerely,  
Bruce Deutsch  
Public Relations EMPI"

Don't hold your breath while you're waiting to see Harriet's answer in that magazine--

"Dear Bruce--

"I'm sending your letter to Don Cheesman, who can speak more exactly on the subject, but results of our survey showed that almost all wanted a continuation of the strict regulations without a VM class. (Why outdate 1,000 cars when we've got a good thing growing now? says one.) We got our request for more liberal pipes (for noise). Anyone going into Vee, and wishing to stay, must be prepared to abide by the rules, and occasionally this makes the few who must cheat to win unhappy... If Vee starts permitting modifications it will turn into the "car of the month" that Juniors became before they became extinct. I say be strict, be stock, and keep

on increasing the Class! Formulas A, B and C are open to the folks wanting to play around a bit... Quote, if you wish.

Harriet Gittings"

About all I can add to that, Harriet, is that your sentiments are shared by a great majority of our members. In our poll last fall, 15% of them were in favor of allowing "any" wheels, 13% for "any" exhaust system, 9% for "any" camshaft, 10% for "any" engine modification. Of course, our wishes aren't necessarily an indication of things to come--only 37% of us wanted the valve spring shims we got, and 80% of us wanted camber compensating devices restricted to just that, with no weight carrying function. (*See another note from Harriet at right.*) If EMPI wishes to quote those figures, they are more than welcome to them.

Frankly, I'm just a little teed-off at EMPI. I can see where a ready-made market for their doo-dads, such as FV could be, would make a salesman drool, but is there no limit to salesmanship? I'm afraid this publication may have had some part in their "troubles concerning regulations" last year (I hope) and it will continue to oppose their efforts to transform Formula Vee into a market for EMPI products. If they want to sell to Formula Vee, I would suggest they conform to its needs, rather than trying to fit it to their line of goodies. For instance, there should be a market for a good stabilizer bar to replace one of the torsion bars in the front axle in perhaps three, or more, degrees of stiffness. An exhaust system conforming to the present rules would probably be welcomed by many owners who don't wish to build their own. Seat upholstery, custom steering wheels, a line of plastic tubing that won't harden, Solex jets and venturis, custom toneau covers--How about it, Bruce?

## EMBLEMS

Jacket patches and adhesive car badges have been ordered, and should be arriving soon. They will be sent automatically to those who have joined or renewed since the first of the year, and will be included with all new and renewal memberships. If you don't want to wait till your next renewal, write in and they'll be sent to you, too, as soon as they arrive.

By the way, I never have given credit to those who contributed emblem suggestions. Besides Whit Tharin, who suggested the winner, the others were-- B, C, Dale Gustafson; D, Thomas Uhler; E, Michael Lupo; F, Harriet Gittings; G, H, Charles Maine; I, George McClements; J, D. Cheesman; K, John Baker; L, Mike Chambers.

Anyone still for all-out modification? An ad in the FRA's "Open Wheels" lists four Cosworth pistons, rods, and rings, at a special price of \$320. I'll bet you could spend that much on goodies for the VW mill, too, if they were made legal.

## MORE FROM HARRIET

"...Say, when is a camber compensator not a camber compensator? A car going through the Driver's school has a 3-leaf spring "compensator". At the time he was in school he had no springs on the shocks at all, but will install "springless" ones before the first race. I consider this cheating. GCR may not be explicit enuf..."

Note to the Competition Board, Car Classification Committee, Board of Governors, et al--May I say "We told you so"? That is precisely why we asked you (80%) to include "provided they carry no weight" in the definition of "camber controlling devices".

Ray Caldwell (Autodynamics builder) has an answer of a sort, for those who wish to stay morally as well as technically legal--

"Dear Don: Of interest to you and Vee-Line readers is the fact that we have developed a camber compensator for Formula Vees. The unit is basically an EMPI Camber Compensator suitably modified so that at 2 degrees of negative camber it is under no load. The unit sells for \$27.95 complete with necessary hardware." Their address is 26 Lindsey St., Marblehead, Mass.

This is NOT an endorsement of the EMPI compensator, modified or not. Even this version of it, while a step in the right direction, is still like a stopped clock--right only twice a day. What does it do at 2½ degrees?

## IS 36hp ENOUGH?

Every once in a while some tantalizing remark is received about the 30(36)hp engine. Is this engine actually being used in racing? What can be done with it? If anyone has any facts about it, I'd certainly appreciate being let in on the secret.

## BETTER, NOT BEST

"Dear Don-- Thank you for the January VeeLine, in which you say that I wrote to you that we were having 1500cc engines fitted into all cars. It isn't 1500cc; it is 1300cc... Yours, Andre Pilette, Brussels, Belgium."

Okay, Andre-- glad to print your correction. I certainly wish you could have said 1200, but I'm happy that Vee hasn't slipped to 1500, after all.

The VEE LINE of  
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## FLYWHEELS

Lightening the flywheel is a subject upon which there is probably as much controversy as there is about the effect of balancing. There are some stories of fantastic results which have been observed due to lightening; and at the other end, those who believe that a heavy flywheel is necessary for smoothness but has no effect on performance. There would seem to be scientific backing to prove it is beneficial, but how much?

Well, for a general idea, "tromp" the throttles of two Vee engines, one with and one without the lightened wheel. You can tell the difference in acceleration, all right, though between 3,000 and 5,000 (the range in which we are interested) it would probably be measured in micro-seconds. On the other hand, this same difference would occur with every shift (rather, every acceleration between shifts) and during the course of a race it could add up to several seconds, which could translate into a good many feet. So, from the standpoint of acceleration alone, lightening is probably worthwhile.

There are also some fringe benefits to be noted each time you shift, especially if you are in a hurry (which is likely if you're racing). For a smooth shift in your sedan, you pause during a shift to let the engine slow down a bit so there won't be a jerk when the clutch is re-engaged. In racing though (if you're not doing it this way, try it) you keep your right foot in the carburetor, pull or push on the shift knob in the direction of the next gear, and kick the clutch pedal, shifting before you can pull your foot back. The strain on the whole drive train is, no doubt, terrific, but it's a lot less with a light flywheel than with a heavy one, obviously. This can be important when shifting down, too. If you've ever noticed the rear end breaking loose just when you're shifting and braking for a corner at the same time, the engine probably isn't revved up enough for the shift. The extra drag on the rear wheels, as they bring the engine up to speed, creates a braking effect. A lighter flywheel, then, makes shifting, either up or down, smoother and quicker.

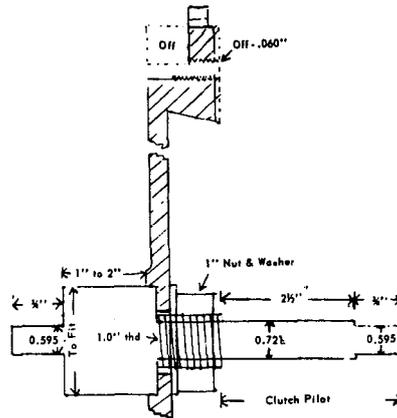
So lightening is probably worthwhile. It is fairly simple, too, requiring only a lathe big enough to swing the wheel, and a machinist who knows what he's doing. Any apprentice could grab the wheel in a three-jaw chuck and carve off some metal, and leave you with a chunk of steel that would wobble and vibrate, and weigh 'most anything. So don't shop for bargains in this department, but get the job done by someone who realizes the pitfalls.

Just for openers, show him the following suggestions, and get his reaction. If he thinks it isn't necessary to go to this trouble, take the job somewhere else.

The mandrel shown should be made to these dimensions, as you will also use it for balancing the wheel after it is lightened, and later as a pilot for assembling the clutch.

The entire job should be done with a live center in the tailstock, if possible, and a self-center turned on a piece of

scrap chucked in the three- or four-jaw chuck, after center holes are drilled in both ends of the piece to be used for the mandrel. Once the flywheel is tightened on the mandrel, it should not be loosened until you have completed the balancing. If the lathe is big enough, both faces of the wheel can be turned at one setting. If it is necessary to turn it around, the clamping nut should be tightened very tight at the start, and light cuts should be taken to avoid loosening the nut when the mandrel is turning "backward". The mandrel will, of course, be turned by means of a "dog".



The clutch side of the flywheel should show perfect alignment when it is set up in the lathe, but the back face will not necessarily be concentric. It will make the balancing easier if the entire back, all the way to the center, is trued up, but only enough for that purpose should be removed from the center part of the disc. The main weight reduction is done at the rim, starting flush with the ring gear, and going toward the center until the holes for the clutch bolts are reached. At final cleanup, cut deep enough so the threads in these holes can be observed. On the clutch side, take .060" from the rim, where the pressure plate bolts to it. This will give a bit of extra tension to the springs, as well as insuring that the face is true with the rest of the clutch. The clutch pressure plate will have to be readjusted for this change.

To balance, leave the flywheel on the mandrel. Set up a couple of lengths of 3/4" or larger cold-rolled shafting, about two feet long, on boxes or blocks so they are level, parallel, and the right distance apart so the small ends of the mandrel will be able to roll on them. Clean them up with a file and emery cloth so that nicks and scratches won't deceive you. From here on it's simple--just drill into the rim of the wheel at the heaviest spot till you can't find it any more. If you get too much, just take a little from the opposite side.

Dynamic balancing is of very little benefit on a flat disc such as this. The area in which the extra weight is concentrated and in which correction can be made is so limited that there is really no choice. If the rods and the ends of the mandrels are smooth, you can do as perfect a job as your time and patience will permit.

As a check, take a very small magnet, such as from your wife's magnetic pot holder, and stick it to the wheel in various locations. It should, of course, go to the low side, regardless.

When you're satisfied, attach the clutch pressure plate (without the lined disc) and repeat the process. Drill only in the metal of the clutch rim this time. Make matching center-punch marks in both clutch and flywheel so you can re-assemble them in the same position every time.

This may not win you any races, but it certainly won't hurt anything. If you balanced your pistons and rods last month, and have followed through this, you will at least find that your mirrors are steadier, and your engine will go "vrooom, vrooom" when you jog the throttle, just like a race car--not like a VW!

Both copies of our film, "Racing on a Budget" are back home, and anxious to travel again (16mm, color and sound, about 10 minutes).

## FAN MAIL FOR FVI

"This sounds like a sincere, well-formed organization... (FV) seems to be an interesting, friendly and unique group in racing circles, and I'm glad I chose it.

Gary McCray, Ft. Lauderdale, Fla."

(Ain't it the danged truth!)

## NO-CAL VEE SHOW

The Northern California Vee Group (which seems to have no real name, or even organization) put on a very successful Formula Vee Show at Mezzetti Volkswagen in Fremont on February 19. Due to very fine publicity, a crowd of nearly 400 came to find out what Formula Vee is all about. And they found out! There were several makes of Vees in several stages of construction, and even in action on a short second-gear track. There was "the world's smallest Vee"--a scaled down boy-sized one built by Chuck Tatum, the Crusader builder. (Am still trying to get a picture of it.) A car radio was raffled off, and door prizes were announced several times during the afternoon. It's too early to state the exact impact of the event on Formula Vee in California, but their first Vee show, last year, brought in several recruits, so it is expected that this one should make quite a splash. For some unexplainable reason, California, which is noted for accepting enthusiastically anything new and off-beat, is still holding out against Formula Vee. There are other areas, of course, where it is not possible to field a full grid of Vees, but it's not because of active opposition, as it is in California.

## THINK YOU'VE HAD TROUBLES?

Roy Whitaker (Geneva, N.Y.) mentioned this incident when applying for membership in FVI. Like any other red-blooded American boy, I couldn't believe I was reading him correctly, so asked for details. Here they are considerably condensed--

"I purchased a kit and a fire-damaged VW in February, 1965. I might state that instructions were far from complete--most information was obtained from magazine articles, instructions from another make, and two brief inspections of a completed car. We completed construction in early April.

"The next thing was to find a place to try it out. I finally received permission from a local plant to use their parking lot on Sundays, but was never able to get it higher than third gear because of the cramped quarters. However, the car seemed OK, so my wife and I hooked it behind our Ford and took off for Nelson Ledges on May 7.

"My wife (Peg) was taken ill on our arrival, so I went to the track alone Saturday morning. Two or three things had to be corrected in order to pass inspection, and I was pretty busy trying to do everything by myself. In the rush I forgot the foam seat pad I had been using. Lesson No. 1--Never participate in any event without someone along to assist.

"The first 45-minute session was quite an experience! The first opportunity I'd had to drive the car at speed, and I was quite pleased at the way it handled. The oil temp began to rise, though, till the gauge got nearly to 250 degrees. I knew it was hot in the car, but didn't realize how hot. Five or ten minutes after the session was completed I became aware of a large blister on my left buttock, which I assumed was caused by rubbing on the unpadded seat.

"Before the second session I picked up my wife at the motel, and she reminded me of the seat pad, which no doubt

prevented even worse injury. The engine again ran very hot, and at the finish I discovered that the blister had broken.

"I would like to give credit to Rick Kohler (my instructor), Jerry Mong, and Ted Kessel, who came to my assistance at this time and helped overcome the overheating, which was due mainly to not enough ventilation of the engine compartment, and too much of it being done around the sides of the fire-wall into the cockpit. None of these items were mentioned in the instructions, but needless to say, the trouble is now remedied.

"After the third session I couldn't even drive back to the motel. I stayed in the motel all day Sunday, we drove home Monday and I went to work Tuesday morning. I finally went to my doctor in the afternoon and learned that instead of an ordinary blister I had received a third-degree burn! The doctor said I had been cooked by the heat under and around the seat, just like a roast in a broiler. I ended up in a hospital for four weeks, and off work for nine!

"So ends the saga of the 'Hot Seat'. I hope it has not been too boring, but you said you were curious.

*Sincerely, Whit."*

*(Daddy, why do you call that piece of tin behind the seat the "fire-wall"?)*

## UNCLASSIFIED ADS

FOR SALE: "Gazelle" Vee (not planned for production). Best features of the best of the Brand Vees, but one-of-a-kind. Standard parts. Extensive demonstration rides encouraged. Send \$5.00 for color photos and details, then make an offer, with or without race-prepared engine. Burgess Sports-Racing Cars, 811½ 12th Street, Greeley, Colorado

FOR SALE: '65 Mk II Formcar converted to Mk III specs. 6 races in 1965, very successful. No DNF's, legal and fast. Best offer over \$1650. See at T.D.C. Engineering, 1825 Wilshire Blvd., Santa Monica, or write or phone Bruce Redding, P.O. Box 556, San Bernardino. (714) 796-0586.

## TENNESSEE VEE

Perhaps, as I have, you have noticed "Zink" mentioned as the name of a Vee in the SE for some time now. It has been in the prototype stage for some time, but is now going into production. It has a number of unique features, such as a semi-monocoque-type body and frame, partly covered with sheet steel. The entire power-plant-drive-train combination can be removed by taking out only four bolts. It was run all last season so it should be pretty well debugged. It is built and sold by Machine Specialties, Inc. 2732 Middlebrook Pike, Knoxville, Tenn.



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