



VEE LINE

NUMBER 72

SEPTEMBER 1970

DIRECTOR'S CORNER

As an Active member of FVI you're not asked to serve on any committees, attend any meetings, make any donations, or bring one hot dish to the annual picnic. Your only obligation to your fellow members is to do your bit at ballot time—give ten or fifteen minutes a year. So — please vote!

This annual ballot is the primary reason for the formation and continuation of this organization. While we have never had a 100% response to any of these ballots from SCCA, our continuing demonstration that we like Formula Vee essentially the way it is has been the major factor in keeping it that way. With only a couple of exceptions, the changes which have been made in the rules on the past seven years have been in accord with our requests on the ballots. The very fact that "Super Vee" is a separate class, rather than Formula Vee warmed up, is due to the influence of these ballots. So don't underestimate the value of your vote. It **does** count!

To vote, simply (1) punch out a "yes" or "no" square with a pencil or ballpoint pen, and (2) make sure that all the "confetti" is removed from the back side of the card. If one of those little dealies gets pushed back into the hole, it won't count. One more thing—DON'T change your mind after you have made a punch, or punch out any of the holes in any other part of the card. When a computer finds more than one hole in a line of figures it doesn't know which one to count, and it goes crazy trying to make up its mind. Bells ring and lights flash and fuses blow, and the wiring starts to smoke.

So that we can get the ballots back to Georgia for counting, get the results, and forward them to SCCA in time for the Oct. 24 meeting of the Car Classification Committee, we can include only the ballots which are received here by Thursday, October 15. Actually this voting shouldn't take more than a few minutes so why not get at it right now, while you're thinking about it? Let's try to beat our customary two-thirds return this year!

If you don't want to vote, please return the stamp.

IT'S WHAT'S UP FRONT THAT COUNTS

Way back there in 1965, among the many letters received requesting information on Formula Vee, one from someone named "Harvey Templeton" attracted particular attention. Included with the usual questions was an unusual one—"Do you think that, at 55, I'm too old to start racing?" Well, thinking that I might possibly reach that ripe old age myself, someday, I answered, "Heck no! That's just the right age", or something like that. So a month or so later he joined FVI as an Associate, then he got a car and became an Active member. The next time I ran across his name, it was in the results of the 1966 ARRC, where the top 21 drivers of the US met to decide the National championship. Harvey took fourth place, in one of those Formula Vee photo finishes. To top off his first season of racing he was also selected for the Castrol "Rookie of the Year Award"—and was elected President of FVI.

He repeated his fourth place finish in 1967, but after that he was all washed up—he only got 12th place in 1968 and 13th in 1969. You can bet he'll be in there somewhere this November, too.

There can be no doubt that he holds the record for the most miles driven in a Formula Vee! He's probably driven on every track east of the Mississippi, and has worn grooves in many of them. He's been out to the West Coast a couple of times, traveling track by track, planning to be at some race or other each weekend. His wife, Jewel—his entire pit crew—had a Vee of her own for a while but hasn't driven for some time now.

Harvey's goal for this season (besides winning the ARRC) is to earn National points in each of the seven SCCA Divisions, and judging from his performance at the Delta Park National last weekend,

he should have no difficulty! He started in seventh place and worked his way up to second on a course he had never seen until the day before!

His car, which he designed and built himself, is as unique as he is. The first thing that strikes you is the low profile. The body shell is only about 10" deep at the windshield and tapers toward the nose. You'd swear a 5' 10" driver couldn't even get in it, but Harvey finds room to lie back under the roll bar, which is actually a frame member following the contour of the fan housing. The pedals swing in a horizontal plane, rather than vertically, and so do Harvey's feet as he straddles the center-mounted gas tank.

The view from the rear is even more striking as the rear suspension catches your eye. The shocks are mounted horizontally across the transmission, tied to each other at the center and to an arm, pivoted low on the frame, at each end. The arms are connected by links to each axle. The "camber limiting device" is a couple of rubber cones on a tie-rod between the two arms, arranged so that they come under compression as positive camber is approached. It's like nothing you ever saw before, but it certainly works.

A competitor, explaining Harvey's go-power, might well have credited the suspension, or the low frontal area, or even the engine, which was rather healthy. However, an unbiased observer on the critical last turn before the ¼-mile straight would have to give most of the points to his driving. It was almost flawless, in that one turn, at least. He braked late—and hard—went in deep, turned rather sharply at first, and was at full throttle in third before he reached the apex. He started the turn inches from the outside edge of the track, raised a

(Continued on Page 4)

PETUNIA SURVIVES ANOTHER ILLNESS

Petunia got the shakes last Fall. They weren't chronic, exactly, but on some turns, during braking, she'd shudder and shake as though she just couldn't face the thought of one more corner. There were no visible signs of physical impairment anywhere, so we were just about to diagnose it as psychosomatic, due to old age, when John noticed a tremor in one of her torsion arms during one of her seizures. An exploratory operation was indicated.

Not until the torsion arm was entirely removed was the trouble evident—the inner plastic bushing in the tube had slipped toward the center so that the arm was supported only by the outer needle bearing. Under normal conditions the stiff sway bar kept the arm lined up properly, resisting manual attempts to locate the trouble, but under extreme braking conditions the springy bar allowed the arm to vibrate.

Examination of the other bearings revealed that another bushing had slipped similarly, and was about to lose its effectiveness, and a third had slipped outward, so that it bore on the smaller center diameter of the torsion arm journal. The fourth one was firmly seated in its proper place.

There was no obvious explanation for this condition. True, mounting brackets for the axle beam had been welded on near the location of the bushings, but it had been done in very short beads, with a "cold" arc, with just that possibility in mind. The fact that one bushing was still tight tends to eliminate welding as a factor. Some plastics shrink with age, which might be the answer, or perhaps they simply were loose when they were installed.

The remedy was simple. The proper location was found by measuring the torsion arms, and the bushings were pushed or pulled into their proper place with the steel tape (they were that loose). Then a 9/64" hole was drilled through the tube and bushing and a ¼" x #8 sheet metal screw was screwed in. This size penetrates the bushing enough to restrain it from any movement, but not enough to contact the bearing surface on the torsion arm.

While we had everything disassembled we decided to try "lowering the front end" by twisting the torsion bar, more out of curiosity than from any intention of improving the handling. It turned out to be even simpler than the method described by one of our members in a previous VeeLine.

When we removed the torsion arms, we left the torsion bar anchored in the

(Continued on Page 4)

The VEE LINE of FORMULA VEE INTERNATIONAL

Don Cheesman, Director
1347 Fairmont Ave.
East Wenatchee, Wash. 98801

COMMENTS ON THE PROPOSALS

Several of the proposed rule changes have received special treatment elsewhere, but some of the others perhaps need some explanation, too:

1-2 Not all "current replacement parts" are interchangeable with previous ones. For instance, there is a crankcase available for the 1200 which is bored to fit 1500 cylinders. Special 1200 cylinders are to be used with it. For simplicity in manufacturing, all current cylinder bases, from 1200 through 1600, are now the same size. Replacements for the "Vee" type 1200 engine are still furnished, too, of course. Using this case, cylinders, etc., an entirely different engine could be built. It is possible but unlikely that some new part might show up which would be interchangeable but still different enough to make a difference in Vee performance. On the other hand, although it was promised some time back, it seems unlikely that a complete list of approved parts will ever be made available. It would probably be more feasible to accept all new parts, generally, and get any controversial one ruled out, than to get approval for each change.

5. "Weight with driver" again. And once more—if there is any car-driver combination in your league which is lighter than yours, you should vote for this one. Drivers under 175 lb. would then be equalized. Drivers over that weight would still be handicapped to some extent, but only by the difference between their actual weight and 175 lb.

6. Regardless of your opinion on No. 5, a good many cars are presently "ballasted" in some way or other, and more of them should be. If yours was built for radial tires (and tubes) yours may be among them.

9. (One of the "Australian" proposals) Should have been in the original rules that way, but probably impractical now.

10. Probably more realistic. Modern bodies conform to this definition, rather than to the spirit of the present rule, already.

12-13 The present prohibition against "Wings (airfoils)" leaves this type of thing in question.

14-15 These specs were promised last year, but apparently a reminder is in order.

21-22 Some of the "head cc-ing" has resulted in reduced total combustion chamber volume, and in non-stock combustion chamber shapes.

HOW TO CHEAT LEGALLY

Previous comments on "legal" deviations from the spirit of the rules have brought more of them to light. (If you have any new ones, send them along.)

A real cutesy for the generator system requires only a mercury-bulb switch in the line between the generator and battery (hidden behind a frame member). It's mounted horizontally, so that it's normally closed, allowing normal operation of the generator while the car is standing still (like at tech). However, under acceleration the mercury flows to the back of the bulb, opening the circuit and taking the load off the generator.

Or here's an even better one—no expense at all, anyone can do it, and it's almost foolproof. You take a little wire hook in your left hand, and a small screwdriver in your right. You reach into the generator with the wire, on the carburetor side, and hook the lead to the generator brush. Pull the brush up an eighth of an inch and slip the spring off to the side, so it rests on the edge of the holder, using the screwdriver. That's all!

I just went out and tried it on Petunia and I'm sure that with practice I could do it in five seconds. If the brush were worn a bit more, down below the top of the holder, just pushing it down with one finger would allow the spring to snap back into its normal location. No, I didn't invent this—I observed it, but wasn't sure until five minutes ago, just what I had observed.

One Northeastern engine builder furnishes manifolds so "stock" that a serious competitor made an overnight flight from Daytona to obtain a replacement when the original broke (at an invisible non-VW weld) even though there was a large VW agency nearby. It had obviously been sawed apart and welded back together again after the inside of the "T" joint had been faired smooth. (No other modification mentioned.)

Another builder (or perhaps the same one—I didn't get names on this one) forces steel balls through the manifold to stretch the tubing, especially at the bends, where it is somewhat flattened in stock condition.

These comments on "how to cheat" are definitely NOT suggestions! They are purely and simply for the purpose of illustrating the need for better definitions in the rules. Almost without exception these practices are considered "legal" by those who take advantage of them. Remember the kicking and screaming regarding the fan-blade removal? There were some who insisted that it was **not** modification—it was "removal of a cooling duct component". Incidentally, that one has never been settled officially, either, except in isolated local cases.

I hate to say this, after all these years of plugging for stricter rules, but perhaps, in three areas, at least, we should adopt the philosophy, "If you can't lick 'em, join 'em!" This is the seventh FVI ballot on which a clarification of the generator rule has been requested—always with the recommendation that normal operation should be specifically required—yet for seven years that ambiguous rule has remained just the way Col. Smith wrote it. It seems highly unlikely that this year will be any different. Considering the flagrant violations of the spirit, at least, of the present rule, perhaps we would get better results if we requested "free" generator systems, instead. That would put everyone on an equal footing, which certainly isn't the case now. Likewise, it is improbable that at this late date a change in the rules will specifically prohibit enlarging valve seats. It's being done, "legally", by many, so let's try to get it made legal for everyone.

There have been rumors and speculation about manifolds ever since the first Vee race, but until recently it wasn't known for certain that manifold modification was among those mysterious things which go into a thousand-dollar professionally prepared engine. I can't imagine how even the most devious mind could come up with an explanation for this being legal, but outside of X-raying every manifold, how can it be eliminated? It seems more logical to request that it be made legal for everyone, and narrow the gap somewhat between a hundred-dollar engine and a thousand-dollar one.

As I said, I hate like sin to advocate any liberalization of the rules, but let's face it—these things are being done by some, and it's just not realistic to think we're going to be able to stop it, so let's all do it — legally.

LET'S TURN BACK THE CLOCK

The big thing about Formula Vee has been the fact that, generally speaking, anything which can be done—legally—in the way of preparation can be done by any Vee owner. Under a strict interpretation of the rules, with a reasonable amount of mechanical aptitude, a few tools, and a few dollars, you can do practically anything a professional engine builder is allowed to do. OK, you probably don't have a 12" lathe in your basement for turning down flywheels, but you can find one nearby and get it done at a reasonable cost. But have you considered trying to "flow-test" your heads?

For a couple of years Formula Vee's peak power leveled off at around 49 hp, and the top builders agreed that they had reached the limit. Then someone broke loose with "flow-tested" heads, and of course the rest of them followed suit, and claimed horsepower ratings jumped into the 50-plus bracket.

For maximum engine efficiency there's more to getting the fuel mixture from the end of the manifold to the combustion chamber quicker than simply making the ports bigger. It may even prove necessary to make them smaller in some areas. Shape is more important than size, actually, so that sometimes a "bump" in a passage may be helpful, rather than harmful. The proper shape is determined strictly by trial and error—a little grinding, and then a test for its effect, over and over until no further benefit can be obtained. It has been claimed that the first acceptable head may cost as much as a thousand dollars in labor and scrapped heads. Following ones would be cheaper, of course, but even after a basic shape has been established, for a perfect job each head must be tested and finished individually. In this one area, then, the pros have it all over the amateurs, and it's easy to see where an appreciable amount of that "thousand dollars" for a top engine goes.

No one did this (or admitted to it, anyhow) up until a year or so ago, but now it's even being advertised, and as far as I know, no question of its legality has ever been raised. Why? The way I read the rules, there's no way it can be justified as legal!

Section 5.5e says, "Polishing of the intake and exhaust ports (is allowed) provided such polishing does not enlarge the exhaust port beyond 33mm inside diameter and the intake port beyond 29mm inside diameter." Section 5.1 says, "No component of the engine . . . may be altered, modified, or changed . . . unless specifically authorized." And Jim Paterson says, "If the rules don't say you can—you can't!" Two years ago (VL #47) Ed Zink stated that he left the original sand casting finish on any port area larger than the specified dimensions in order to avoid any conflict with this rule.

There has been no change in this rule since Formula Vee was born, and it's one of the few which can have no possible secondary interpretation. Metal can't be polished without removing some of the surface. Removing metal from the surface of a port can only enlarge it. And removing metal from any area which ends up larger than the specified dimension after the polishing can only amount to "enlarging the port beyond the specified dimension". And to close any possible sign of a loophole, a Court of Appeals (in a protest appeal by Bill Denison several years ago) decreed that in respect to this rule the term "polishing"

(Continued on Page 4)

**FORMULA VEE INTERNATIONAL
1971 RULES BALLOT**

1. Any part listed by Volkswagen as a current replacement for 1200cc VW, and interchangeable with the original part, should be considered legal for Formula Vee.
2. Updated parts should be individually approved for Formula Vee.
3. A brake light, controlled solely by a pressure switch on the master cylinder, should be required.
4. Three piston rings should be required on each piston.
5. Minimum weight should be ". . . without fuel or driver, 825 lb.; with driver, 1,000 lb."
6. Rule 5.7, which forbids ballasting, should be eliminated.
7. Normal operation of the generator system should be required.
8. Modification of the generator system should be permitted.
9. "Firewall width", rather than "body width", should be specified.
10. Body width and height should be dictated by present requirements for covering the engine, rather than by specific dimensions.
11. Use of "Mahle" pistons and cylinders identical with standard VW should be permitted.
12. Fixed fins, "dive planes" etc., attached below the profile line of the body, should be permitted.
13. The prohibition against "wings (airfoils)" should be expanded to include the above.
14. Actual gear ratios for all legal gearing should be included in the rules.
15. Specifications for legal cams should be included in the rules.
16. Modification of manifolds should be permitted, provide stock outside dimensions are not exceeded.
17. Enlargement of valve seat inserts to dimensions specified for "ports" should be specifically permitted.

(Please vote "yes" for only one of the next 3 items, "no" on the other 2.)

18. Add to Sec. 5.5e (port polishing) "Areas larger than these minimum dimensions must remain stock."
19. Unlimited modification of the ports should be permitted.
20. Entire port should remain strictly stock.

21. Add to Sec. 5.5p ("Standard dimensions") "Minimum capacity of entire combustion chamber, including area in cylinder above head of piston, 47.6cc."
22. Any machining of the head to attain minimum combustion chamber volume should leave the cylinder recess in the head in stock configuration.

(Please vote "yes" on only one of the following 4 items, "no" on the other 3) .

A passing car attains the right-of-way when:

23. The nose overlaps the tail of the leading car.
24. The front wheel overlaps the rear wheel of the leading car.
25. The front wheel gets ahead of the front wheel of the leading car.
26. The driver decides to pass.

(Please vote "yes" on only one of the following 4 items, "no" on the other 3).

A driver actually leading (no overlap) going into a turn should give up his line under:

27. Condition 23, above.
28. Condition 24.
29. Condition 25.
30. Condition 26.

31. In the case of contact between two cars the one at fault should be black-flagged and penalized not less than one lap.
32. A car contacting another to the extent of putting it out of the race should be black-flagged and removed from the race also.
33. Roll-bar specifications tailored to Formula Vee should be included in the Vee rules.
34. I would like to switch to Formula Super Vee within the next year.
35. I *expect* to switch to Formula Super Vee within the next year.

I hold the following license(s):

- | | | | |
|------------------------------|------------------------------|----------|--|
| 36. SCCA Novice (or equal) | 37. SCCA Regional (or equal) | | |
| 38. SCCA National (or equal) | 39. FIA | 40. IMSA | |

FOR FUTURE REFERENCE

Last weeken's National at Delta Park contributed a good deal of the material for this issue. Here's another item:

Dodging a possible tangle, in a rather poorly maintained section of the track, John took to the dirt. Everything went according to plan, except that one of the bumps he encountered bottomed Petunia's rear suspension hard enough to unravel the aluminum trailing-arm-suspension-mount. Welding facilities for aluminum aren't always available at a race-track, in case you didn't know, but we put in a call for a heli-arc welder on the PA system, and one answered our plea for help. His rig, he said, was in his garage, so we removed the broken parts and followed him home.

His garage turned out to be jammed full of machine shop equipment — lathe, drill press, crankshaft grinder, boring bars, etc.—and Volkswagen crankcases and crankshafts. While he was doing our welding job we found that he had recently had to move a good sized machine shop from his previous location, and was in the process of setting it up in a new one. The garage location was merely a temporary setup, in which he was working in his spare time, while the new location was being prepared.

His boring bars were set up on specially constructed bases for the sole purpose of lineboring Volkswagen crankcases—one for the main bearings, and one for enlarging the cylinder openings for the installation of oversize cylinders. Most of the work, he said, was done for independent shops, although he did some work for VW dealers, and for individuals. In his new shop he plans to install one more bar for enlarging camshaft bores to take the new replaceable bearing inserts.

According to the VW shop manuals, reboring the cases for oversized bearings, where they have beaten or worn the original seats to a loose fit, is a standard procedure. The oversized bearing shells are standard items. However, in this country, with our philosophy of "new is better", few, if any, VW dealers are equipped to do this job, and according to Joe Hoppen (Volkswagen of America) only two or three of the area distributors

IT'S WHAT'S UP FRONT THAT COUNTS

(Continued from Page 1)

little puff of dust at the apex, and drifted to the outside edge (beyond it a couple of times) not just frequently, but every time around. As a result, his acceleration coming out on the straight was spectacular. No doubt some of the drivers he passed within the next couple of hundred yards concluded that he had to be cheating, but from the side lines it was obvious that his passing actually started at the beginning of the turn. It was beautiful!

I hope you won't find this account discouraging. Instead, take heart—it's proof that by the time you're sixty, you too can become a good driver.

FVI GOES BIG-TIME!

FVI this month joins General Motors, AT&T, and several other large organizations in switching to computer control for one of its most complex operations—vote counting. It is expected that numerous other organizations will follow in our footsteps.

This method was suggested by John and Jinny Morris, who are employed in the Chemistry Dept. at the University of Georgia, and who have volunteered to run the cards through a computer which is at their disposal, thereby saving your Director and his Assistant at least three days of tedious work. Their contribution is certainly appreciated!

can do it. Any good machine shop can do the job, at a price, but you'd have to pay for the time involved in setting up the machinery as well as for the work—probably twice the \$29 charged by this shop. (Estimated around \$12 for reboring the cam bearings.) If you're in the market for this work, the present address is—"Danny Hall, 1608 Skidmore, Portland, Ore. His home phone number is (503) 289-5015. Will try to get the dope on his shop when it's available.

Oh, yes—Petunia was ready and eager before the track closed, Saturday afternoon.

PETUNIA SURVIVES ANOTHER ILLNESS

(Continued from Page 1)

tube. (If you remove it you'll nearly always have to get the leaves welded together at the end in order to get it through the center anchor again.) It was easy, then, to insert the torsion arms half a turn off their normal position, pointed upward and forward. A three-foot length of pipe slipped over the arm provided plenty of leverage for twisting the bar. By comparison with the opposite arm the amount of twist induced was easily determined. When the desired amount was reached, the second arm was twisted until it lined up with the first one.

With everything buttoned up there was a decided improvement in Petunia's handling characteristics, but we attributed it to the elimination of the shakes, rather than to the lowering.

LET'S TURN BACK THE CLOCK

(Continued from Page 2)

refers to the removal of metal by any means, regardless of the surface finish attained.

We could go the protest-and-appeal route on this one, too, if need be (and I can't imagine any other interpretation the Court might conceivably render) but their decisions are only binding for the balance of the year, the assumption being that their conclusions will be incorporated in the permanent rules thereafter. The Competition Board will have to come to grips with the problem sooner or later, then, so let's request it now.

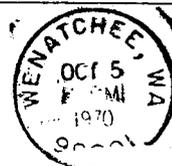
I agree, as I have said, with what I am sure one SCCA official will say—"The rule is perfectly plain the way it is", but let's request a little reinforcement for it anyhow, just for the psychological effect. Perhaps that would kill this off without a lot of legal hasselling. Otherwise, there are going to be two classes of Formula Vee—those with professionally built engines, and those without. Yes, it would mean that some expensive cylinder heads would have to be scrapped, but the board had no compunction when it required correction of illegal bodies, so why should it in this case of obvious rule violation?

Flow tested heads just don't fit in with the Formula Vee concept. That's why Super Vee was born!



**Formula Vee
International**

1347 FAIRMONT AVE.
EAST WENATCHEE
WASH. 98801
U.S.A.



Van D. Durrett, Jr.
1508 S. Jennings
Bartlesville, Okla. 74003

A
B