



# VEE LINE

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## DIRECTOR'S CORNER

You'll note the ballot questions headed by, "The following should be permitted:" Don't let that influence your vote—it doesn't mean that everything *really* should be permitted. It's just that I've found, after doing seven of these, that it get's confusing if you have to vote "Yes" for something you want *not* permitted.

So vote either way you want to, but please, VOTE! Our ballot returns have always been phenomenally great, according to others who use balloting by mail. Last year we only got back about 60 percent of the ballots, but it has run as high as 65. Let's make it a bit higher this time. Aside from sheer numbers, just the fact that such a high percentage of our members are that actively interested has some effect, too.

To vote, just take a pencil or ball-point pen and poke the little dealie out of the appropriate hole. When you're finished, turn the card over and be sure that all the little dealies are entirely removed. (Otherwise they may get pushed back into the hole again, and your vote won't count.) That's all there is to it. If you want to change your mind, you can stick one of the little dealies back into the hole with a piece of scotch tape, or a dab of glue. Don't cover up any of the other holes, though. And don't punch out *both* yes and no, because then neither one will count.

John and Jinny Morris, both of whom work in the Chemistry Dept. at the University of Georgia, have volunteered again to run these cards through the computer and tabulate the votes. And until you've counted about 20,000 "X"s, on the ballots we used to use, you can't imagine how much their contribution is appreciated!

As usual, time is tight for this thing, but really, how long do you need? If you do it right now, it will take only a few minutes. If you put it off, it may take weeks. (A few ballots always come back over a month late!) The Car Classification Committee is to hold its regular meeting on Oct. 23 and 24, but is going to hold a special session on the evening of the 22nd, exclusively devoted to Formula Vee! In order to get the results to them before that time, then, we'll have to set the cut-off point for Oct. 15. No ballots received here after that date can be included. So do it now? Please?

## SHOULD YOU PUT YOUR VEE ON A DIET?

Is your car overweight? Do you actually know, for sure? Do you really care, or are you satisfied just knowing that it is over the legal minimum and will pass inspection anytime, anywhere? Do "illegal" cars pass you on the straights, even though you can keep up with them in the corners? If they do, there are several possible explanations, of course, including the possibility that the other cars *are* illegal. However, for now let's consider another one. Weight!

Let's assume that your car weighs 850 lbs., which is not at all unusual, (regardless of what it was supposed to weigh when new) unless you have actually checked it out and have made an effort to get it down to the minimum. If you have, you might as well skip the next few paragraphs. If not, consider this:

Your car is 25 lbs. heavier than some of them which are right on at 825 lbs. "Only" 25 lbs.? OK, *only* 25 lbs. That's *only* 3% heavier, so what can that matter?

Well, let's say that it takes 20 seconds

for the lighter car to accelerate up to top speed, coming out of the last corner onto the straight. It will take you 3% longer to get up to the same speed, everything else being equal. That's six tenths of a second—per lap—just on that one corner. Fifteen laps in a 30 minute race? That's 9 seconds! Add in the same effect, to some extent, at every other point on the track where you have to accelerate, and it do add up, don't it? How many seconds behind the leader did you say you usually finish? If you're up there in the front ranks, in spite of your handicap, you're one heck of a good driver!

Now let's consider another set of circumstances. Let's say that you're car has been brought down to the minimum weight, but you weigh 150 lbs. and that same other driver only weighs 125. OK, that was a very sneaky way of getting you interested in this "weight with driver" thing... You don't *have* to be a heavy-weight to benefit by it—it will help you if you merely weigh more than somebody else. Sure, it will help the guy who weighs even more than you do, even more than it

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## A NEW DAY COMING

There appears to be a pretty fair chance that Frank Schultheis's checking procedures for Formula Vee will be adopted as standard for SCCA Scrutineers. A good deal of it won't be of any particular interest to most Vee owners—those who *know* their cars are legal—since it consists mostly of procedures to be used in checking such items as heads, transmission gear ratios, track dimensions, etc. Dimensions for legal parts are included, where there may be some question, identification marks are shown, and stuff like that.

And cams! He has checked enough cams (legal ones) so that he *knows* what they should be like, and has spelled out the procedure for checking them so that *any* Scrutineer with a degree wheel and a dial indicator can make the same check.

Actually, it's not exactly accurate to refer to "cams", since he doesn't even look at the cam itself. The readings are taken directly from the valve, so that any deviation from normal, whether caused by an illegal cam or some more subtle illegality such as modified rocker arms, shortened pushrods, or excessive shimming, can be detected where it really counts—at the valve seat.

We haven't worked out the details yet, but when everything is approved and official, copies will be furnished to every Scrutineer, and they'll be made available to Vee owners, too. (And to professional engine builders!)

## WE KEEP ON LEARNING

If you're a newcomer who recently started your racing career with a complete set of VeeLines you may remember a couple of references to adjusting front camber, with the conclusion that you can't do it—all you can do is add or subtract shims until the torsion arms contact the link equally at the top and bottom without binding. Well, in conjunction with good-as-new parts, that's correct, and is strictly in accordance with standard VW practice, but— it *is* possible to get as much as a degree of negative camber in the front suspension, without altering any of the VW components.

Why would you want to? For the same  
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## The VEE LINE of FORMULA VEE INTERNATIONAL

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## SHOULD YOU PUT YOUR VEE ON A DIET?

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will help you, but you're not afraid of that, are you?

Most of the Vee drivers are against any rule which would give any driver a 3% horsepower advantage (like the opportunity to pick selected parts, if "stock stock" were required) yet we've maintained for seven years a rule which amounts to the same thing—giving some drivers as much as 5% advantage over some of the others in acceleration capability and establishing at least *some* differences for everyone. Think it over!

This proposal was first included on our ballot for 1965, and has been on every one since then, so some of you obviously know what it's all about. However, for the new-comers (and those of the rest of you who haven't yet been convinced) we'll go through it one more time:

The car, just as it is driven into the impound area at the end of a race, with the driver aboard and whatever amount of gas remains in the tank, must weigh not less than 1000 pounds. That's all. Doesn't that seem fair enough, in a class where everything else is as equal (rulewise) as it's possible to make it? For some drivers this would mean that some additional weight would have to be added to the car in order to make up the total requirement—extra bracing, cockpit upholstery, or perhaps a larger and more reliable battery. Or, alternately, actual ballast could be installed. For some of the weight, this would probably be the way to go—an assortment

### UNCLASSIFIED ADS

FOR SALE: Updated Formcar with newly rebuilt engine, new body, new trailer, 4 mounted spares and other goodies. \$1200. R. B. Vawter, Vawter & Co., 1 N. LaSalle, Chicago, Ill. 60602, (312) 368-8311.

FOR SALE: Early Autodynamics, modified Z-bar, new adjustable rear Armstrong shocks, Goodyears. \$900, or \$600 w/o engine. C. Proctor, 203 Patrick, Mineral Wells, Tex. 76067, (817) 325-0248.

FOR SALE: Autodynamics, Nassau model. Latest '71 modifications, 4 mounted rain tires, tilt bed trailer. \$2250 (negotiable). Michael Montaine, 1539 Fred St., Whiting, Ind. 46394, (219) 659-1676 (eves.)

FOR SALE: '69 King, excellent condition, never crashed. '71 rollbar, lowered front end, hyd. clutch, Goodyear gumballs, Z-bar, Konis, Smiths instrumentation. With stock '64 engine, \$1550. Tony Spiridigliozzi, 138 Primrose Ave., Mount Vernon, N. Y., (914) 664-1152 (home).

FOR SALE: Neal Williams' Special. Unique frame, highly aerodynamic body design. Flow tested heads, etched manifold, 10 spare wheels and tires, trailer, and body molds. \$2500 complete. Neal Williams, 3933 Nelson Drive, Palo Alto, Cal., 94306, (415) 322-5134.

of steel plates, of different weights, would permit adjusting the weight to the scales at any particular track. (They *do* vary!)

It has been proposed that the minimum weight be reduced to 800 lbs. for the bare car. This would be of no consequence to drivers whose car-driver combination already weighs less than half a ton, but it would permit the real heavyweights to reduce the weight of their cars by another 25 pounds, below the present 825 pound minimum. Actually, this figure could be omitted, but it has been suggested that *some* minimum should be established in order to prevent 250 pound drivers from building 750 pound cars, which *might* be getting into the dangerous area. In other words, this rule would still leave the driver weighing over 200 at *some* disadvantage, but drivers weighing less than that would all be on an equal footing.

If you're the lightest driver in your area, vote "NO" on this one, of course, but if you're not, just remember that in addition to whatever other handicaps you may have, each 10 pounds of weight differential between you and a lighter outfit means a 1% difference in acceleration times.

The vote in favor of this proposal has been increasing each year—last year it was slightly more than 61%. If we get 67% or more (that's 2 to 1) I'd think it would have a good chance of being adopted by SCCA. And why shouldn't it be, really?

### WE KEEP ON LEARNING

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reason that you want a trace of it in the rear suspension—under cornering loads it tends to cancel out the tendency of the tires to roll under and take the load on the outer shoulder. In addition, if you've ever watched anyone else going through a tight turn with a Vee, you must have noticed how much spring there is in those trailing arms. Starting with the normal amount of positive camber, and adding perhaps another degree due to the side thrust, that outer front wheel often looks ready to fold right under.

This is pretty simple, really, and if you have ever given it a thought you may have already figured it out. It took us several years, though. Now all you gotta do—

First, this won't work if your torsion bar is in the upper tube and your sway bar in the lower one, but it's simple to switch them. Then get those brass spacer washers (which, hopefully, will be legal next year) machined down to an eighth of an inch, or even less, in thickness. Have them contoured to fit the radius of the machined shoulder on the torsion arms, so that they will be centered on it, rather than settle down as they will if the hole is too large.

When you reassemble, turn the sway bar over so that another side will face the setscrews, which will now be about half an inch closer together than they were be-

fore, due to the thinner spacers. You'll have to drill new dimples for the setscrews, of course. Assemble the arms on the bar, and you can drill the dimples right through the set-screw holes. Use a 5/16" drill bit, but don't try to center the hole—hold the drill against the side of the thread toward the center of the car, so that it will be somewhat offset in that direction. Drill the hole deep enough so that the taper on the screw, rather than the end of the point, will be the point of contact. As you tighten the screws they will try to center themselves, drawing the torsion arms against the bushings, and eliminating all end play. Tighten them just enough to achieve this, and tighten the locknut. In the future, as wear occurs and play results, you can tighten the screws a bit more and draw the arms in tighter again.

OK, now try to replace the torsion arm link and you'll find that you can't get the upper end to fit against the arm, even with all the shims removed from the lower pin, assuming that the pins and bushings are in good shape, of course. What to do! Well, you have a choice. You can shop around at junk yards, and you'll have no trouble finding a couple of spindle assemblies with the link pin bushings worn egg-shape, and probably with pins to match. Or, if you wish to risk illegality (unauthorized modification) you *could* take a rat-tail file to your bushings and achieve the same effect, filing the holes on a slant to match the new angle at which they will have to fit on the pins. It's strictly a cut-and-try procedure, but if you don't wait too long between tries, you can get the effect of a brand new rebush-and-pin job by stopping just when the parts can be assembled without a lot of binding. You can increase the negative camber effect by using only one washer on the upper pin between the link and the torsion arm and the other seven (or so) on the outer end, and reversing the order on the lower pin.

About this time it will occur to purists that those mating shoulders, washers or no washers, aren't going to be parallel—they aren't going to provide a conventional all-around contact on the thrust surfaces. So? If the surface area is so small that the loading per square inch is so great that lubrication fails, there will be metal-to-metal contact, to be sure, and wear will occur. As wear occurs the surface will increase, and when it reaches the point where lubrication can be sustained, wear will cease. In other words, forget it! If it wears, tighten the link pin adjustment a few times until things get seated in.

That's all there is, except that you'll have to readjust your toe-in. You've just moved the entire upper part of the spindle assembly, including the steering arms, closer to the center line of the car, so your tie rods will have to be shortened to match.

## FVI EIGHTH ANNUAL RULES BALLOT, FOR 1972

*The following should be permitted:*

1. Streamlining the throttle shaft and butterfly.
2. Use of 12 volt electrical components.
3. Attachment of air ducting to engine components.
4. Air ducting directly to cylinders and heads.
5. Modification of fan housing to permit passage of roll-bar braces or frame members, if shape and size are not altered.
6. Regulation of cooling air from the cockpit.
7. Trimming of horizontal areas only on cylinder cover plates.
8. Mounting the manifold and carburetor behind the fan housing.
9. Removal of the cast aluminum heat exchanger on the manifold.
10. Use of any Solex float in the carburetor.
11. Use of the 28PCI carburetor with venturi removed.
12. Drilling of accelerator pump jet.
13. Only shelf-stock heads.
14. Flycutting of the head to attain 43cc min. combustion chamber.
15. Enlarging the ports to 29mm and 33mm.
16. Enlarging valve seat bores to match port diameters.
17. Cutting off valve guides flush with port walls.
18. Other modification within the ports.
19. Machining of cylinder barrels to attain .039 headspace.
20. Use of shims under the barrels to attain .039 headspace.
21. Installing pistons with the wrist-pin offset reversed.
22. Increasing wheelbase and overall length by 4".
23. Use of '66 and later ball-joint front suspension.
24. Use of later VW front disc brakes.
25. Installing an oil filter.
26. Modifying pump and cover for filter installation.
27. Front camber adjustment as described in August VeeLine.
28. Only tires approved for 100 mph highway use.

*The following should be required:*

29. Minimum weight empty 800 lbs., with driver and remaining fuel 1,000 lbs.
  30. Body and firewall dimensions not less than corresponding dimensions of the engine.
  31. Fuel tank mounted within the frame and behind front axle.
  32. Safety "fuel cells".
  33. Valve movement in relation to crankshaft rotation to be in compliance with specifications, regardless of parts used.
  34. Removal of the cast aluminum heat-exchanger on the manifold.
  35. Mounting of manifold and carburetor behind the fan housing.
  36. Minimum limits on softness of tire tread compound.
- \* \* \* \* \*
37. We should start planning now to update Formula Vee to 1973 components for 1974.
  38. Do you do most of your own engine work?
  39. Have the heads on your engine been flycut?
  40. Have the ports been modified?

## WHAT'S GOING TO HAPPEN AT THE ARRC

Believe it, or not, "strictly stock" is going to be the rule at the ARRC. Well, that is a little oversimplified—actually the word is that the "no modifications unless specifically permitted" clause in the rules will be strictly interpreted and enforced. I called Bob Tomlin, Director of Club Racing, just a few minutes ago. He has just mailed out a letter to this effect to all National drivers.

Flycutting, and other "flow-testing" procedures in the heads (except the permitted enlarging of the ports) is the most obvious practice which will be affected, of course, but there will also be a pretty strict look at whether or not reversing the pistons, setting the cam gear one tooth off the normal timing marks, etc., is "specifically permitted", too.

Actually, it's doubtful that the effect will be noticeable. In fact, I'll bet anyone (not everyone!) a buck that, barring a wet track, the winner's average speed will be higher this year than it was last time, regardless.

(One thing that's got the Competition Board and the Car Classification Committee bugged is what to do about those spacers on the front suspension. They're not Volkswagen and they're not specifically authorized, so they're illegal! Obviously! Yet the only way a car could run without them would be to use *both* torsion bars. Well, you *might* be able to weld a spool in the center of your anti-sway bar, with a groove around it, and set the point of the setscrew in the groove lightly, so that the bar could still rotate. If you're going to the ARRC, you might give it some thought.)

### MEMBERS' SOAPBOX

"Dear Don—I would like to know the availability of old VeeLines, from issue #1 to the present. I would like to acquire as many as possible as I find them invaluable in the restoration of my ancient Autodynamics. What is the price per issue... or possibly a package deal?"

W. C. Ross, Orange Park, Fla."

*We keep them all in stock, most of the time (except when the budget is tight and we have to wait till next month to get an*

*issue reprinted). They're 25¢ each, and we pay the postage. Note that this is issue #84. Sorry, no quantity discounts—we most break even at this price.*

"Dear Don—What is the hot set-up on gear boxes? I hear some of the drivers talking about "short boxes" and "long boxes". What are the legal gears, and what are their advantages? Also, in assembling the differential, what does one use for spacers? What is meant by "loose"?"

Peter Christie, East Longmeadow, Mass."

*All the legal gears are now included directly in the '71 rules. As for which is best—well, like suspension adjustment, that's to some extent, at least, a matter of opinion.*

*The trend recently has been toward acceleration, rather than top speed, especially on the shorter tracks. Witness the number of cars running "front" tires all around, for their smaller circumference and lower "gear ratio". Up until very recently the common gearing was "Sedan" ring and pinion and fourth gears, with "Transporter" third. Transporter third gear (23:28) gives more speed than the "sedan" ratio (22:29) for the same engine speed, which permits less drop in rpm when shifting from third to fourth, keeping the engine speed in a more favorable area on the "horsepower curve". On the other hand, of course, the acceleration would be somewhat less, while in third gear, even though it would be improved at the shift into fourth. If you use third gear a lot, perhaps the lower ratio would be beneficial. If you have long straights on which you can peak out, it might be better to go for the transporter third. These gears are somewhat difficult to find now, incidentally, except actually in transporter transmissions. Your dealer now carries only a "universal" third gear, used in all the boxes, which is about half-way between "sedan" and "transporter".*

*If you're merely switching the ring gear from one side to the other, you MAY be able to keep the same shims in place on the same bearing housings, and switch EVERYTHING from one side to the other, and luck out. As you tighten the bolts on the ring-gear side (first) keep rocking the gear to make sure you're not forcing it against the pinion. If it turns freely, with*

*no obvious backlash, tighten the other side and try it again. The proof, of course, is when you get it on the track—if it screams at you, you'd better take it to a VW dealer. If it merely whines, a bit, give it a chance to break in, and see if it quiets down.*

*If you actually meant the DIFFERENTIAL—the gears inside the ring-gear carrier—you'll find that they are retained by heavy snap rings, and that between the snap ring and the axle gear there's a spacer washer with an ear on it which fits into a groove in the gear carrier. Those spacers come in different thicknesses. Use the thickest one you can, ideally, but if you don't have any choice, and there's room for the old ones, use 'em. This isn't critical, as those gears don't turn at all except when you're cornering, or spinning one wheel.*

*As to "loose" boxes, the shims are selected originally to provide some "preload" on the bearings. Under load, the thrust is mostly on the ring gear side, and inside the box the angled teeth on the gears create end thrust on the shafts. If they were fitted with no preload they would tend to work back and forth as the load varied. At rest, the preload is distributed evenly to both bearings, of course, but under full load the pressure against one is increased while it decreases equally at the other.*

*A "loose" box would be assembled with very little, or perhaps no, preload, by the use of thinner shims, or by installing washers. The difference in friction would probably be very slight, especially at full throttle, but every little bit helps in Formula Vee, and if the life expectancy is decreased somewhat—well, how many thousand miles do you expect to drive it, anyhow?*

### ANOTHER RULES PROPOSAL

For the benefit of the various SCCA officials who read this thing, I'd like to add a pet peave of my own which doesn't even pertain to Formula Vee! How about requiring exhausts on Production cars and Sedans to angle upward? The dust they raise driving through the paddock is bad enough any time, but if you happen to be adjusting valves or wheel bearings at the time, it's downright annoying!



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