



VEE LINE

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DIRECTOR'S CORNER

Some of the things you may find on these pages, in the area of "preparation", may very well be considered "continual hunting for loopholes" and "half suggested legal modifications", as Bob Tomlin called them. (Wonder if he meant "suggested half-legal modifications".)

In the past I certainly have pointed out loopholes, and at the same time the necessity for closing them. I have also presented what I probably described, myself, as "half-legal modifications" which were in common use by the "leading competitors", apparently with the sanction of SCCA officials, or at least with no interference.

My point has always been that these things are questionably legal and in many cases obviously illegal, but they are being done, openly, with no penalty, and that if the rest of us want to stay in the picture we might as well go along until the obvious wrong is righted. Just pointing them out *should* have resulted in corrective action by SCCA.

Finally, however, as Tomlin suggested, I *have* gotten the message. We simply are *not* going to get rules which say exactly what they mean. We're going to continue to have rules which "mean what they say", which boils down to meaning whatever they say—to *you*. If you can convince your scrutineer that your definition *can* be read into a rule, no matter by what obscure reasoning, you're clear.

So pushrods can't be shortened as a *modification* — but they *can* be balanced.

Even though this is the November issue, out in January (sorry about that!) a very Merry Christmas and successful New Year to you all!

BOB TOMLIN WAS RIGHT!

In his letter to FVI regarding '73 rules (VeeLine #97) Bob Tomlin took me to task for assuming that the changes proposed by the "Ad Hoc Committee" would be formally adopted. He mentioned that the Competition Board had made some changes, which was somewhat of an understatement. The only thing they didn't change was the requirement that cams meet the specs for "D" cams, only. The original recommendation for use of a stock VW fan belt was completely reversed—now use of a fan belt (*any* belt) is *optional*. Front caster and toe in are free (no mention of camber—either front or rear), and you may now legally modify your clutch arm for use with a hydraulic cylinder, different angle on the cable, or whatever. And now you can legally rotate the rear axle from its "stock VW" position. That is all. The information I gave you a couple of months ago was, to be sure, misleading!

The requirement for a "D" cam, and the intent to make a cam-check possible, I have to applaud, even though it means we will have to operate on Petunia and remove her "B" version. This, I agree, has become more and more of an unfair advantage, as the old "B" cams become rarer and harder to find.

We had that item in the FVI rules proposal, remember? Along with the modified clutch arm, rotating the rear axle, and free caster and toe-in for the front end. The "Ad Hoc Committee" recommended

requiring VW specs for front camber, but felt that no mention of rear camber was required, since it was "presumed" to be free. The Competition Board dropped that one, though, so now *both* front and rear camber can be "presumed" to be free, presumably.

DAVE WEITZENHOF TAKES ARRC

The "SCCA Stoufer's American Road Race of Champions Formula Vee Hydroplane" event was different this year. The first six cars did *not* cross the finish line all in a single clump. Dave Weitzenhof, following the recognized recipe for winning rain races ("Get out in front and stay there!") finished a minute ahead of second place Bob Lazier, who had no real threat from Ted Schroeder, who was in no danger from Kip Laughlin, and so on, back through the pack. The difference was rain—by the bucketful.

Last year, Garrett Van Camp won the Vee race at an average speed of 83.10 miles per hour. Dave's average, in the rain, was 73.25. (Jerry Hansen, winning his second Formula A championship under the same conditions, was 3.76 mph faster.)

Harvey Templeton started third, lost it on the first lap, got back on the track among the tail enders and stayed there, finishing ahead of the last three cars. Otherwise, the order stayed very much as it was at the start, after the usual sorting out (which didn't take long) with little or no passing.

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MEANS WHAT IT SAYS?

Frank Schultheis' "Formula Vee Scrutineer's Handbook" isn't officially recognized by SCCA, but you can expect to see it used by a good many Scrutineers, regardless. While many of the statements made in it could be called "opinion", it still might be difficult to argue against them.

One example which you might run into is the definition of a "legal" Vee distributor. The rule *says*, "Fitting of any standard VW distributor" is legal. The handbook says that this rule *means* "any *standard* VW distributor" and not *any* standard VW distributor. "Standard" is defined as referring to the "standard VW 1200 series, type 1, U.S. model sedan", *only*.

It wasn't in the original rules, (1964) and I can't find my '65 book, but the "any distributor" clause was added for 1966, at the latest, simply because it was common knowledge that the hot dogs were using a '58 transporter distributor (#VJ4 BR8) with the centrifugal advance mechanism, in place of the later sedan type with vacuum advance. This distributor number, and a number of others of similar characteristics, are not on the list of "legal" distributors. In fact, there are only two listed—# 0-231-129-010 JF4, and #0-231-129-010-030-JF4.

If you get hung-up on this because of some other distributor, and can holler loud enough, you may be able to get by on *your* definition—"any standard" means "*any* unaltered" VW distributor. If that fails, call attention to the oil pump definition, which is exactly the same ("The use of any standard VW oil pump" is permitted.) and you should either get another black mark on your check sheet, or get every Vee at the race disqualified for use of the 1500cc VW pump. (Widespread use of that pump—before it was legal—was the reason for that section being added to the rules at the same time the distributor was added.)

Do you get the idea? Insist that the rule means exactly what it says, insist that it says exactly what you want it to mean, and holler loudly. If that doesn't work, confuse the issue by bringing something else into it. You, too, can become a "top contender".

The VEELINE of FORMULA VEE INTERNATIONAL

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DAVE WEITZENHOF TAKES ARRC

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Dave Weitzenhof ran on a set of obsolete Firestone "rain tires", Bob Lazier on a set of conventional tires with additional grooves cut in by hand, and at least one car had handgrooved slicks.

Despite the treacherous track, there were no accidents, and only 3 DNF, unexplained.

*1. Dave Weitzenhof	Autodynamics	CEN
2. Bob Lazier	Zink	MW
*3. Ted Schroeder	Lynx	CEN
*4. Kip Laughlin	Zink	NE
5. Rollin Butler	Zink	SE
*6. Kirk McDowell	Crusader	SP
7. Harold MacDonald	Lynx	CEN
*8. Dick Renard	Fox	NP
9. Raymond Fulton	Zink	SW
10. Dave Washburn	Zink	MW
*11. Dave Webb	Ventura	SE
12. Slim Helson	Zink	CEN
*13. Harvey Staab	Zink	MW
14. Murray Forsvall	Lynx	SW
*15. Harvey Templeton	Shadowfax	SE
*16. Bill Bailes	Autodynamics	SW
*17. Bill Noble	Zink	MW
*18. Jerry Gress	Crusader	NP
DNF Dave Voss	Zink	SW
Ray Dona	Zink	NE
Bill Greer	Zink	SE
*FVI Members		

A new system for selecting entrants was in effect this year. In the past, only the top three drivers and the next three as alternates from each division were eligible. Any alternates who wished to attend, with their cars, could fill any vacancies which might occur in the contingent for their Division only. This year they could fill any vacancy, up to track time for the final race, regardless of whether or not it was in their home division. Note that some Divisions had four entrants while a couple of them had only two, and there was only one from the SP DIV. A 21-car field was more likely to be filled, with fewer sidelined hopefuls, under this system. It does make the type of comparison analysis between Divisions which we have had in the past meaningless, so we'll skip that this year. However, there were 11 Zinks (3DNF), 3 Lynx, 2 Autodynamics, 2 Crusaders, 3 specials, 4 drivers named "Dave", 3 "Bills", and 2 "Harveys".

MEMBERS' SOAPBOX

"Dear Don—I've heard some talk of a rule change for '73 that will allow wider wheels for Formula Vees. Anything to it?"

When do the official rules for the year actually come out?

Is there any way we can find out about rule changes early so that we can at least attempt to plan ahead?

I would appreciate any info you can give me. Thanks for everything that FVI has already taught me—it's saved me time and \$ on more than one occasion.

Harry Greenwood, Plainfield, N.J."

I doubt that there was any serious consideration of wider wheels in the SCCA deliberations. That's been proposed ever since Formula Vee was invented but has never been taken seriously, either by the majority of owners, or by SCCA.

The official rules come out whenever you get them in the new GCR (if you are a licensed SCCA driver) or whenever FVI can get an official copy and get them printed, whichever comes first. "Sports Car" usually prints a summary of the changes (only) along about the same time. I can't recall the complete rules ever being available through ANY channel until some time after the first of the year. Odd, isn't it?

For Formula Vee, at least, the only place you can get any advance information is through premature publication in the Vee-Line, which may, or may not, be accurate.

"Dear Don—I have to have some work done on a used trans-axle before I put it into my Vee. How should I tell the mechanic to rebuild it? Are there any tricks? What is the best way to vent it?"

Tom Collins, Columbia, Conn."

I'm glad you didn't ask what gears to put into it—that's something we've covered in a general way several times, and I refuse to get specific about it. Otherwise, tell your mechanic to build it as "loose" as his conscience will allow. Normally the ball bearings are assembled with a specified amount of "preload"—that is, by means of selecting shims of the proper thickness a certain amount of pressure is exerted axially (endwise) on the pair of bearings supporting each shaft. Under full load the thrust of the gears (due to their slanted teeth) exerts pressure on one bearing and takes some of it off the other one while still not permitting it to run actually "loose". The TOTAL thrust against both bearings is approximately the same, whether or not they are under load. A lighter than normal preload, then, will reduce the drag in the transmission somewhat (but not much, really) while possibly shortening the life expectancy of the bearings. However, since you probably won't run your Vee over a thousand miles a year, it will last quite a while, regardless.

Some of the "hot-dogs" run the transmission on a stand for a week or so with powdered pumice mixed with light oil as a lubricant(?) in order to polish the gears and bearings for even less friction. The benefit gained by this is probably impossible to detect on a dyno—much less on the track—but it would at least satisfy that nagging thought—"What ELSE could I do?"

Just above the shifter shaft, in the rear section of the transmission, you will find a little hole, about 1/8" in diameter. That is the vent. Since there is no provision in the Formula Vee rules for modifying the transmission case, the only LEGAL way to connect a hose to that little hole would be to find a short length of metal tubing

which would be a drive fit in that hole, over which a hose could be slipped for connection to the catch tank. Actually, you'd probably have to make something, like turning down a length of rod to the proper outside diameter (metric) and drilling a hole through it. Not legal, but more practical, would be to drill the hole out to 11/32, tap it with a 1/8" pipe thread tap, and insert a 1/8" pipe nipple a couple of inches long, over which a length of hose could be slipped.

You'll find that the wall of the case is quite thin, and that the drill hits an obstruction soon after passing through it. Do NOT drill any further! That's a baffle, which went through several stages of development before Volkswagen found out just how to shape it to prevent oil from being thrown out through the vent hole. Likewise, the tap will go only a little way before bottoming against that baffle. Pipe taps (and threads) are tapered, so it may be that the threads won't be large enough to take the thread on the nipple. In that case, though it means spoiling a tap which will cost around three dollars, grind off the tip of the tap after the first go, and screw it in again. You might even have to repeat this before getting a thread large enough for the nipple. Again, don't screw the nipple in more than two or three threads, as it could bottom on the baffle and seal itself.

Eighth-inch pipe is actually 1/4" ID and the OD will make a tight fit in 3/8" ID tubing. Why is it called "Eighth-inch", then? Just because!

Speaking of venting—if your engine is one of the older ones, with a single vent from the oil filler-breather assembly, venting is simply a case of running a hose to the catch tank. (Large enough to go OVER the vent outlet, naturally—NOT inside it.) If it's one of the later ones, which had one outlet for gasses going to the air cleaner, and another (with a little rubber gizmo on the end) for draining condensed water vapor, better either plug off the smaller one, or run another hose from it to the catch tank, too. (Probably the best choice.) Some Vees, so far, have been getting by with the latter vent open to the air, but the GCR is pretty specific, in this case, at least—"ALL engine breathers ..."

"Dear Don—The engine I ran this year did not have fly-cut heads. What other things must I do when I do have the heads fly-cut?"

Is it legal to have the engine line-bored? What is the advantage?

Jerry Thorpe, Tacoma, Wash."

Since you didn't ask how to go about cutting the heads, we'll assume you know, and only mention that you should have a good valve job done first, (see the recent article by Jim Wild) since your heads will have to hold liquid in order to determine the proper amount of cutting. It wasn't mentioned in the article, but you should

check the volume of the combustion chambers as part of the valve job since you may have to seat the valves in one combustion chamber a bit deeper than those in the other, in order to equalize the original volume. That's the only LEGAL way of doing this, as it's illegal to remove any metal from the combustion chamber proper.

Modifying the ports, as was described in the above article, is probably more important than reducing the combustion chamber volume by a cc or two.

When you assemble the engine the rocker arm shaft, and arms and valves, of course, are going to be lowered—closer to the center line of the engine—by the amount removed from the sealing surface in the head. Depending on the age of the parts, this may or may not create a problem.

There have been FOUR different push rods for the 34hp engine (Part number 113 109 301 A, B, C, and D) each a millimeter or so longer than the previous one. The total maximum difference, including factory tolerances, is approximately 3/8"!

The first one, used with the "A" and "B" heads, until Dec. 1963 ('64 model) and possibly the "B" pushrod (introduced at that time with the "C" head) will probably work all right with flycut heads, but the later rods will very likely give you trouble. There have been several methods of dealing with this problem—all illegal. For a time it was accepted practice to install a washer under the rocker arm shaft supports in order to bring them back to their original location (in relation to distance from the centerline of the engine). That was shot down by a Court of Appeals. Another way was to grind off a part of the tip of the rocker arm, where the adjusting screw protrudes. This is pretty obviously not an "authorized modification", especially when it is done very carefully so that the tip of the rocker arm, rather than the screw, contacts the end of the valve stem, thereby effectively lengthening the rocker arm and increasing the amount of valve travel. A third method was to shorten the push-rod (if a later model was being used).

The only LEGAL way to compensate for flycutting is to find a set of the older push rods, and don't bother your dealer—since they have all been introduced as interchangeable with previous versions (on stock engines, that is) there has been no necessity for stocking any but the current part. You'll find them only in an older engine, if at all.

Look for rods with the tube pressed into the rod ends (the two latest ones have the rod ends pressed into the tubes, with no visible shoulder). The "A" rods have plain tubes and the ends have a bit of a rim at the point where the tube is inserted. The "B" rods have a smoother tip, and the tube has a knurled section about 5/16" wide, near one of the ends. If you have a

choice, try the knurled rods first, and use them if you can. The longer rods give a slightly greater valve movement than the shorter ones. (You probably couldn't tell the difference, even on a dyno, but it will make you feel better.) If you still can't get the valves closed, you'll have to find the original "A" rods somewhere.

There's one more possibility—while the rules don't permit modifying the rods, they do permit "balancing". The logical method of removing metal would be to pull one of the tips and turn a bit of metal off the end of the tube in a lathe (for a square cut) and then replace the tip. You wouldn't want to simply file the tubing and weaken it to the point of buckling, would you? In any case, use rods as long as you can, without shims or modification of the other parts. (Grinding off the tip of a rocker arm won't pass as "balancing".)

There are a couple of other things to consider when heads are fly-cut. First, although many people omit them, is the matter of the copper sealing gaskets between the head and cylinder barrel. It is true that the actual seal is made between the end of the cylinder barrel and the flat surface surrounding the combustion chamber. However, unless this seal is absolutely perfect, there will be some leakage at some point in the circumference. (I have seen only a couple of cylinders which had perfect sealing.) If this allows leakage of combustion gases under pressure the soft head metal will be eroded away until an actual channel around the end of the cylinder is created. This would be somewhat difficult to repair. I prefer using the gaskets, just as insurance, even though it does take a little extra work when the heads are flycut. The groove for the gasket must be deepened by an amount equal to the deepening of the cylinder into the head.

In any case, whether the heads are done professionally or by hand with the tool described in one of the earlier VeeLines—whether you intend to use gaskets or not—take a few minutes to make sure that the seal between the cylinder and head is perfect. Using the cylinder which will be assembled in that particular hole in the head, seat it in with a little valve grinding compound. Coat the matching surfaces, rotate the cylinder back and forth a few times, rotate it ahead part of a turn and then back and forth a few more times, and repeat until you can see a definite ring around the entire circumference of the combustion chamber where grinding has occurred.

The other thing to watch for is clearance between the top fin of the cylinder and the flat surface of the head. It's very unlikely that there will be any problem, but it's worth checking, preferably at the time the head is being machined. Finding this situation when (or after) you assemble the engine could require additional

machining, which could be done much more cheaply at the time the other work is being done.

Yes, it's legal to have the case linebored for oversize (OD) main bearings, and also for cam bearing inserts if the original case did not have them. There is some contention that lineboring will line up the mainbearings better, for less friction, but it's doubtful that the original job can be improved upon very much. However, it is definitely indicated if you find that the center main bearing shell has pounded itself into the case metal to the point where you can feel the ridge in the center with your finger nail. Once that starts, it will keep getting worse. Installing cam bearing inserts in place of worn original bearings in the case metal is an obvious move.

WHAT ARE YOU GOING TO DO NOW?

Well, like it or not, Direct Cooling of some kind is now the way to go if you want to be competitive. If you decide that you want to be, the next question is how to go about it.

Some of you, I am sure, will try to have your cake and eat it, too—keep your fan belt while running some kind of scoop and duct arrangement to the fan—but you will spill some crumbs in the process. The clue is that little word "optional" in the new rule—"free or optional".

Obviously someone (or several of them) with definite plans for the future got to the Competition Board on that one. The original recommendations made by that "Ad Hoc Committee" included use of a stock VW belt, though no requirement for belt tension was included. However, when the Board passed it on, there was a slight change—belts are now optional!

It's pretty plain, then, that some cars will be running without any belt at all. Even the fan can be eliminated from a Super Vee, so it is evidently possible to ram cool them. If it works on a Super Vee, it should also work on a Vee. Note, however, how many Super Vees fail to finish races, and the well known fact that engines are good for only a couple of races—with luck—between rebuilds.

With even a loose fan belt, you'll lose some horsepower turning the fan unless you can feed air to it so fast that it has no resistance. It's likely that not too much power is gained by a loose belt, since the fan obviously is still turning fast enough to keep the engine cooled. You'll note, if you watch, that the belt tends to tighten itself at high speed, no matter how loose it is at rest, due to the centrifugal force as it comes off the pulleys, and that the fan still turns at a pretty high speed. There is, no doubt, some slippage (friction between the belt and pulleys also constitutes a power loss) in addition to the power actually absorbed by the fan, so it isn't likely that merely using a loose belt will give

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WHAT ARE YOU GOING TO DO NOW?

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you the ultimate in loss-free power.

So, how to go? There are a number of factors to consider before making a decision. One of the hard ones is whether or not to give up your generator. Many drivers still like the security of a fully charged battery, though those with gutted generators don't seem to be cluttering up the track or pre-grid area to any conspicuous degree. The generator has to exert some extra drag on the fan shaft, even if it's electrically disconnected from the rest of the wiring system. Without a belt the drag would still be of some consequence in that it would impede the flow of ram air entering the fan shroud.

How about *reverse* ducting—routing the air directly to the heads from twin scoops along the sides of the car? I believe that's the route we'd go if we had a Lynx, or some other make with a narrow front body section. Even a Zink might very well have the side panels flattened out ahead of the firewall, using the bulge from there aft as a scoop. A deflector could be installed to route some of the air backward through the oil cooler and fan. This would definitely require eliminating the function of the fan belt, since any tendency of the fan to turn forward would oppose the flow through the cooler.

What kind of scoop will you use? "NASA scoops" are very "in" on race cars now, and if they are ducted to an operating fan, they will work just as well as a plain hole in the body shell—but not much better. On a Vee, that is. Their function in life is to skim off some of the "laminar flow" air along the side of an aerodynamic body without disturbing that flow. They depend on a smooth non-turbulent flow of air in order to get any ram effect. It's possible that there may be some such spot on a Vee, but just sticking a NASA scoop in the skin wherever you may feel that you want it may be a pure waste of time and money. Something less beautiful and more functional will probably work better, like maybe a shroud over the top of your roll-

bar, or big mouse-ear scoops on the sides. They may add some drag to the car, but the overall effect has to be a positive pressurized feed to the engine or you might as well forget it. I've never seen or heard exactly how he did it, but Garrett Van Camp says, "I built the duct system I used at the ARRC last year in one evening, using stove-pipe, hardware store aluminum sheet, and pop rivets." From the press reports, it obviously looked like stove-pipe, too—and it worked.

Which way are we going? I don't really know, yet. Having had a little experience with it five years or so ago, it scares me somewhat. We put twin scoops (made from old streamlined headlight shells) on the sides of Petunia, constructed a cross duct between them with an outlet to the fan housing, and went out on an old abandoned highway to try it out. We did think there was some improvement, using a tight belt, but it wasn't impressive. We then made a couple of runs without the belt, and while no damage was done, parts of the engine which had never been that hot before started to smoke. There were a few factors against us—for one thing, the run was made about half a mile down the road, turn around, about a mile run back, turn again, and back to the starting point. The turns, with no ram cooling, no doubt had something to do with the fever. For another thing, the generator was still operative, which may very well have restricted the fan from turning freely. It did spin, but never fast enough to put out the generator idiot light. We did pick up a couple of hundred rpm, but didn't have nerve enough to experiment further without the belt.

We abandoned the scoops after a couple of races, not noticing any great improvement in our lap times, and have never tried them since. However, we may try them again, with a larger less restrictive "manifold" to the fan. Perhaps with the cutout switch we now have on the generator we can get enough cooling to get by with.

Incidentally, on that same strip we did

prove conclusively the value of cold air to the carburetor. That was when we installed the ram tube to the carburetor (not attached to the engine in any way, of course, but to the engine room cover).

One more incidentally—has anyone ever heard any explanation for our knowledgeable officials' steadfast refusal to allow ducting to be connected directly to the engine? It's been recommended on our ballots several times, but they stand by the original version—you can duct all you want to, but can't connect it to anything. It doesn't prevent anything—just makes it more difficult. I'd certainly like to know the reasoning behind this decision!

UNCLASSIFIED ADS

FOR SALE: 8 Formula Vee tires, mounted and balanced—4 are Firestone Indy's, raced once. All for \$125. Trailer, can handle larger cars \$125. Engine ready to assemble, completely balanced, magna-fluxed, additional spare engine for parts, \$350, assembled, \$450. Simpson Nomex suit, underwear, \$75. Heuer stopwatch, split second hand, \$50. Jack Barbera, 26 Renee Drive, Berlin, Ct. 06037 (203) 828-4823.

FOR SALE: '70 King Vee, never bent. Hyd. clutch, Z-bar, Smith's instruments, lowered front end, Goodyears, new wheel bearings, front suspension parts and brake cyls. 2 schools, 4 races since new. Without engine, \$1050, with stock 40HP engine, \$1200 or best offer. Will deliver reasonable distance from N.Y.C. Tony Spiridigliozzi, 138 Primrose Ave., Mt. Vernon, N.Y. 10552 (914) 664-1152.

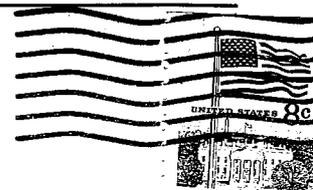
FOR SALE: Venus Vee, excellent condition. 2 sets wheels and tires, good condition. Comfortable for 200 lb. driver. Asking \$1200. Gale Mielke, 1622 Brighton Beach Rd., Menasha, Wisc. 54952 (414) 739-4870 or 734-7177.

FOR SALE: Zink with all latest factory mods. Zink engine, new paint, only 14 races since new. Many spares and trailer included. Robert Morris, RR. 13, Box 202, Muncie, Ind. 47302 (317) 289-8565.



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