



VEE LINE

NUMBER 71

AUGUST 1970

DIRECTOR'S CORNER

I guess you know, if you've been around here very long, that I'm all for rule enforcement—all the rules. It's too bad that the various hassles we've had on body measurement and construction features during the past couple of years weren't settled on the spot, instead of belatedly requiring purchasers of apparently legal two- or three-year-old cars make the corrections which should have been made at the factory. Nevertheless, I'm very happy to see that the rules *are* being enforced now.

HOWEVER—I hope that this is just the beginning of a definite program of rule enforcement which won't end when all Vees are brought to legal length. Actually, I'm sure most Vee owners consider the length of a competitor's car to be the least of their worries. Of more concern are such items as "What rocker arms, cam, compression ratio, gearing, fan, etc., is he using? Is his carburetor legal? Is his generator free-wheeling? Does he have the synchro units in his transmission?" Let's hope that these items get the same universal attention that is now being given to body conformation.

Even if you had to remodel your body shell, or build a new roll-bar, give your tech inspector a pat on the back, and tell him to keep it up. It will work out in your favor in the long run.

ON TIRES

Whatever happened to the "3-race Good-year gumball?" Are they still available, as has been claimed, to a favored few, or are they definitely extinct? Our last set of Goodyears lasted for 14 races before the cords started showing through the tread. (Friendly tech inspectors!) They weren't much good on a wet track, to start with, and didn't improve any with age, but lack of tread didn't seem to affect their performance on a dry track.

An increasing number of Firestones has been noted lately on the West Coast, and if they're hampering those drivers any, it isn't obvious!

Has anyone found anything better than a Pirelli Cinturato for a rain tire? We haven't.

ABOUT TIME!

(From the Supplementary Regulations for a recent Regional at Blackhawk Farms Raceway—in big black print at the bottom of the page)

"THE AGGRESSIVE DRIVING DISPLAYED BY SOME FORMULA V DRIVERS, WITH RESULTING ACCIDENTS AND INJURIES, IS OF GREAT CONCERN TO THE CHICAGO REGION. THE CONDUCT OF FORMULA V DRIVERS THIS WEEK-END WILL BE CRITICALLY AND CLOSELY OBSERVED BY RACE OFFICIALS."

(The entry fee for this event was \$40. Contributed by Ralph Tremaine, Kirkwood, Mo.) (No! Not the entry fee—the entry form, dum-dum!)

TWO NEW VEES

There's a new FVee on the market—the "Wildcat." It's a good looking, sleek, wedge design, built for quality, rather than price, evidently. It is sold only in completed form, tailored to the individual customer, with all the goodies you'd add (or like to) to a cheaper car—adjustable Konis all around, Z-bar, heavy duty clutch, aircraft U-joints on the shift linkage, 6 gallon Firestone fuel cell, fire extinguisher—the works. No price is announced.

For more details, write: Wildcat Racing Team, 37 Wendell St., Plainview, N.Y. 11803.

And here is a new Super Vee, the Grac, a French model, and the first to come from Europe. The car was first shown at the Nurburgring on August 2.

MEMBERS' SOAPBOX

Dear Don—Re the fan-belt query, my Zink came with a Gates No. 8226 belt, adjusted so that it can be pulled together between the pulleys to an outside measurement of 3¾". It's an automotive belt—Falcon 6 or Chevy II 6.

Ralph Tremaine, Kirkwood, Mo.

Could that possibly be No. 8236, Ralph? Usually a belt has two digits in its code number which indicate the circumference. Ours is a Trueflex No. 1360—the 36 indicating a 36" belt. I'm more familiar with industrial belts than automotive, however, so you may very well be correct.

Dear Don—It's been a pleasure receiving the VeeLine each month because all parts of it are so interesting and informative. I had my doubts about some of the tools you wrote about until I ran into a tight rear wheel bearing. Wow! Did I fume and sweat! Then, calmly, I remembered that article on your removal tool. Using it, the bearing just slipped off nicely.

Here's another one for you—how about a tool to remove the cam gear from the crankshaft without having to split the front bearing, chewing it all up before putting a wheel bearing removal tool on it? How's that for a challenge?

Vince Chimera, Rochester, N.Y.

Gee, thanks, Vince. I often wonder if anyone actually tries any of these things.

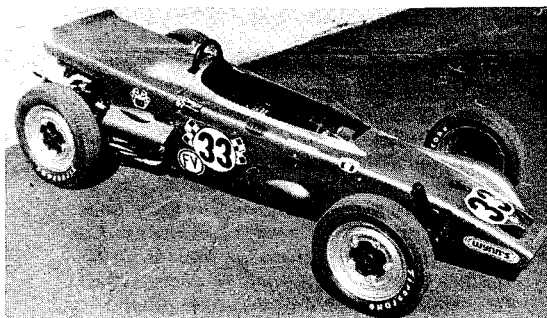
I know what you mean about the main bearing. You want to examine it, and clean out the oil passage in the crank, but after you split it and ruin it, you find that it is (was) in perfect condition. Actually there seems to be very little wear on main bearings, though in the case of a rod bearing failure it's fairly common to find pieces of rod bearing imbedded in the mains. These can be easily scraped off with a knife blade, if you make sure to get every one.

Probably the simplest way to get the gear off and still save the bearing is to buy a gear puller. This doesn't sound exactly kosher for Formula Vee, but you'll have to remodel it somewhat for this particular application, which does qualify it, after all, as a Special Formula Vee Tool.

Get a puller with jaws at least 5" long, and hinged to the cross-bar which has the puller screw in it. You can find these at your auto parts store, in various styles, at prices up to \$10, or at variety stores (with no brand names, possibly made in Japan) for around \$3. We got ours at a "Payless Drug Store." It was rather crude—the jaw tips had just been sheared from a length of bar steel, with practically no taper, but that was OK, as we had to reshape them, anyhow.

This was done on a bench grinder. The tips (Continued on Page 2)

The "Wildcat" Formula Vee



The Grac Super Vee

MEMBERS' SOAPBOX

(Continued)

have to be ground thin enough to fit between the gear and the bearing shell and to go deep enough so that the pressure is exerted below the bottoms of the teeth. This also requires some grinding on the business face of the jaw, where it contacts the gear. If pressure is exerted on the ends of the teeth, themselves, they will be distorted somewhat, which isn't fatal if you carefully file off the burr that is formed; but it's easier to take the time to make the puller fit in the first place.

Another "improvement" was to move the pivots for the jaws inboard on the cross bar. This reduces their tendency to slip off the gear, which does the teeth no good at all. If you do this, do it first, as it will change the angle of the tips. You may have to heat the jaws and bend them slightly about an inch above the original bend in order to get the correct angle.

We've found that the job is facilitated if you remove the snap ring before you start pulling. (The snap ring is easier to remove then, too.) It will also be easier next time if you use STP liberally when installing the gears this time. A length of pipe and a hammer make a good substitute for the heating procedure, but be sure the gears are going on straight.

Hello, Don—Thanks to my ad in the Feb. VeeLine, I found a used frame and body. This week the finish paint job is going on, so will you please change my status from Associate to Active, and send me the FV emblems for my car?

Keep up the good work with the VeeLine.
Charles S. Schnepf, Tiffin, Ohio

OK, Charles—you're an Active Member. Thanks for mentioning the ad—have often wondered if they get results.

Dear Don—The "overall length hassle" has apparently been resolved through a protest at the Elkhart Lake National, June 21. Two cars were protested on overall length, the protest was upheld by the Stewards, and the cars had to be shortened before they could race! Since Jim Patterson was one of the Stewards, I guess it is "Gentlemen, get out your boxes."

On a more serious note, an incident occurred during the race which I feel should be of great concern to all drivers and officials (also our insurance people) in SCCA.

On the last lap of the race, the second place car was drafting the first, ready to "sling-shot" past for the checkered flag, when the first place driver, in an apparent attempt to break the draft, stood on his brakes! The incident and resulting crash happened right in front of the Stewards. Fortunately no one was injured and both cars continued, finishing second and third.

A protest was lodged and upheld. The driver was fined \$50 and reprimanded! Was that enough? He lost no National points and still has his competition license. Must someone be hurt before drivers who employ tactics that endanger others, not to mention themselves, are barred from racing? Is winning that important? Aren't SCCA's insurance rates, and consequently our entry fees, high enough already? SCCA drivers and Officials—must we have drivers who employ such dangerous tactics racing on our tracks?

Terry H. Gough, Pinole, Cal.

It does seem odd that points "won" by such driving would be awarded, and that such an offense would be punished that lightly. Of course, the driver you mentioned (I omitted the names for legal reasons) is a well known "top driver," but that wouldn't make any difference, would it? I guess you can tell, by comparison, how serious is the crime of criticism of SCCA officials. That can get you suspended from SCCA!

Dear Don—Speed Secret No. 501, (I guess it's a secret—this is the first time I have heard of it.) Turn the pistons around so that the little arrow points in the opposite direction—strokes it a little bit, and these days every little bit helps. All of one top engine builder's engines are set up this way, so I suppose it's legal.

I also understand that the "hot" set-up is 0.006" piston clearance, plus standard VW top ring, Grant middle ring, and a VW oil ring, without the expander.

I really don't think there is much cheating going on any more—very hard driving, yes, but no real cheating. Some suspects perhaps using moth balls or something in their fuel—protest coming up soon.

At a recent National the Vee field was promised that if any nerfing, pushing, etc., was observed, the race would be red-flagged and no points would be given out. Another entry blank has promised the same thing. It's a shame it took the death at Elkhart to bring on this crack-down.

Thanks, whoever you are! (You evidently forgot to enclose page 2.) This is the first time I've heard about piston rotating in Vee engines, too. However, it's not exactly a speed secret—this has been done on some hot-rod engines for years, so it's probably been done in Formula Vee, too. Try it at your own risk however—remember what Jim Patterson said about rotating carburetors on the manifold. "The rules don't say you can rotate carburetors 180 degrees, so you can't." (This was made legal for 1970, of course.)

Actually, this is of doubtful value, anyhow, if you use a stock cam. (You would, wouldn't you?) It moves the effective point of Top Dead Center ahead several degrees but the valve timing stays the same. Or to put it another way, the valve timing occurs earlier in the piston cycle. This gives more torque in the lower rpm ranges, but drops the power at higher engine speeds. Possibly you could advance the camshaft by one full tooth on the cam gear (which the rules "don't say you can"), but you might very well be off from the optimum setting just as far as you were originally. (Ignition timing would have to be changed, too, of course, but that would be no problem.) If the top engine builder(s) are actually doing this, it's pretty likely that they're messing around with cams, too. It will be interesting to see what Frank Schultheis' cam checking program turns up.

Dear Don—. . . I had a DNS at Lake Garnett, Kansas, due to a wasp's mud nest in the combustion chamber because I didn't plug the exhaust pipes! Indianapolis saw a DNF due to loss of oil pressure after two laps. Guess the engine was still too tight, as nothing came unglued except my mind. Started the car a few days later and showed 60 pounds, and no signs of bearing failure. Your guess is as good as mine as to what happened.

Myron C. Lee II, Galesburg, Ill.

That's the first plausible reason I ever heard for plugging exhaust pipes! I never could swallow that one about cold drafts sneaking up five feet of hot exhaust pipe and warping the valves.

You didn't mention any temperature rise accompanying your loss of oil pressure. If there was, I'd guess that at your next race you lost a rod bearing. If not, could be that a chip from a previous bearing failure jammed your pressure relief valve open. When you started it up with cold oil, later, the increased pressure pushed the piston back and released the chip.

Dear Don—(1) What exactly is meant by engine "blueprinting?" (2) In reading VW manuals I've run across mention of an early non-synchro transmission. Is it legal? (3) What are the best rod and main bearing clearances to use in a Vee? (4) Do you use valve spring shims? (5) How much power do you think is absorbed in the transaxle and running gear? (6) How can I get VW parts at a discount? (There are several VW dealers nearby.) (7) What exactly will a typical sponsor provide for a Vee? Money? Parts? Labor? All of the above? None of the above?

J. T. Ulmer, Redlands, Cal.

(1) Practically everything built on a commercial basis starts life as a blueprint (except that the final blueprint is usually drawn after the mechanics and machinists have solved the problems drawn into the first one). It's impractical to build anything absolutely perfect, so "tolerances" (allowable deviations from the specified dimensions) are specified on the prints. They may range from an inch or so on the overall dimensions of a large building down to one ten-thousandth of an inch for a space craft component.

The term "blueprinting" is applied almost exclusively to racing engines which are to be run in "stock" condition, as compared to "modified" engines which can be overbored, stroked, milled, ported, lightened, etc. "Blueprinting" means that the components can be brought to the most favorable tolerance in the manufacturers specifications, but no farther. For instance, the "stroke" for a Vee engine, as specified in the rules, is 2.520 inches, "plus or minus 0.005". The latter figure is the "tolerance," so you might find one crank which would give you a stroke of 2.515", and another that would measure 2.525". Most of them, of course, will be closer to the base figure. To blueprint the crank you would get it reground to the first undersize, taking slightly more metal off the journal (bearing surface) on the side toward the center (main bearings) and less on the outer side. This would put the center of the journal slightly farther from the center line of the main bearing, resulting in a longer stroke. There's no "tolerance" allowed in this operation—the original crank grinder can exceed the "blueprint" dimension by as much as .005, but the re-grinder can't go over that 2.525 figure any!

"Min. Depth Top of Cylinder Barrel to Top of Piston 0.039 inches" is another example. Note, again, that says "minimum," so there's no tolerance on the minus side, but you may very well find a plus in your engine. If your engine doesn't come out to this figure, you can either add extra paper gaskets under the cylinder barrel, leave them out altogether, or even machine off the seating surface, if you have to, in order to get that minimum measurement. Just remember that if that

measurement is ever checked (like at a tear-down) it will be after the heads have been torqued down and the engine has been run for some time, so that the paper gaskets will be compressed to much less than their original thickness. It's a good idea to "tech" your own engine next time you overhaul it. Check this measurement before you loosen the barrels from the crankcase. You might find, as we did once on Petunia, that you'll need some extra gaskets in order to stay legal.

Again, the VW specs say that the "volume of the combustion chamber in the head" is from 43 to 45cc. Naturally, you want the most favorable measurement (43cc) so you flycut the heads in order to attain it.

Note that "blueprinting" is NOT legal, in the sense of being specifically authorized in the rules. SCCA has repeatedly ignored our recommendation that it be permitted. However, it has been accepted for several years that if your engine components are within the legal dimensions, no one will ask how they got that way. The supposition is that VW built them at the extreme limits of the "tolerances."

(2) Your question on the transmission shows you haven't done your homework! For shame! Sec. 5.6—"...The synchromesh components must be in place and operating on at least three gears..." However, just for general information, up through the 1950 model, the VW did have a non-synchro "crashbox" transmission (and 16 inch wheels!). '51 through '60 models had the "three-speed-synchro" transmission (four speeds, but no synchro on first gear) with the "split" case. Since 1961, all VW's have used the 4-speed synchro "tunnel case" transmission. There have been various mixtures of "sedan" and "transporter" gears, and the substitution of a new third gear midway between the sedan and transporter in the last couple of years, and the final drive covers have been changed to adapt to the double U-joint axle, but the cases, even today, would be interchangeable.

(3) The "best" bearing clearances are strictly a matter of opinion. "Loose" bearings are said to run freer and faster, but tend to pound out in a hurry. "Tight" bearings will last longer—IF they don't heat up and seize. Ed Zink (VL No. 47) stated that he used the maximum (blueprint) clearance for new bearings, which is .003", measured with "Plastiguage." (The minimum is .0008"—that's eight ten-thousandths—and the wear limit is .006".) We've never actually measured ours—we've used VW parts out of the box—both bearings and cranks—and for some time, we had a rash of bearing troubles. We tried one crank grind which was at the maximum "blueprint" dimension, and another at the minimum, and both failed prematurely. We had one rod which wouldn't swing freely of its own weight when it was installed (the VW test for proper clearance), and when the engine blew, due to a rod failure, it was another rod which failed. That one still did not swing freely (we replaced the rod) but showed no sign of undue wear. So I'm the last guy in the world to tell you what is the best clearance.

(4) Yes, our engine does have a shim under each valve spring, installed by a VW shop before we had access to valve tools, and left there ever since. On our "B" heads, the valves are getting pretty deep in the seats. Actually, I doubt that they do any good. We certainly don't need any more, as we've never had any warning of valve-float. Shimming in excess of

the actual need (if any!) only puts extra strain on the valve gear and doesn't do anything beneficial.

(5) I would make a wild guess that the transmission absorbs around 10 horsepower at top speed. At 95% efficiency the fourth gear and ring and pinion alone will take about 5 hp, and the other gears (all of which are in mesh, even though not loaded) synchro components, shifter forks, etc., probably take that much more. Comparison of engine dyno figures against those obtained on a chassis dyno would also include the friction of the tires on the dyno rollers, which is considerable, even if the tires are at maximum pressure.

(6) There's no formula for getting VW parts at a discount—that's strictly between you and your dealer. Leaf Automotive, in Moses Lake, has given us 20% off ever since we started racing, while Alpine Motors, here in Wenatchee, has a policy of discounts to other dealers only. All you can do is ask.

(7) Likewise, there are no "typical sponsors." Again, all you can do is ask. As a general rule, a sponsor is likely to be more generous in direct proportion to your place on the race results sheet. Be prepared, when you ask, to show how sponsorship will be mutually beneficial. What will it do for him? Will you put his ad on your car? Will you get his ad across the finish line ahead of some of the other sponsors? Is your car enough of a show piece that it would look good on his showroom floor in the off season? There's no predicting what you might get—one of our people got a brand-new Vee kit and all the other goodies to build himself a new Vee on the basis of his showing with the old one.

Dear Don—Just a note to thank you for answering each month the questions I have concerning FV. You have a propensity for covering in detail that which is puzzling me that particular month. Your article on the steering geometry (No. 64 VL) was excellent. Please keep up your technical articles.

I have only one question regarding that article: How would one know if the modification had already been made? Do you know the stock dimension from the machined face that the brake plate bolts to, to the center of the tie-rod hole? Also, do you have any fast and dirty (read "cheap") way to align the rear suspension? I have just rebuilt the frame on my Formcar and am not sure how to do this, or where to have it done.

T. R. Wilson, Jr., Covington, Ga.

It must be mental telepathy. Keep those thought-waves coming!

Probably the simplest way to tell you if your steering arms have already been bent is to make the "rolling test" mentioned in the article. However, if you want to be technical about it, the original measurement is 2-5/8" on a couple of spare spindles we have.

There are several methods for aligning the rear end, including taking the car to your friendly VW dealer.

Probably the simplest and easiest way is to support a good straight straightedge at axle height, just behind the rear wheels. Support it so that it can be moved forward or backward easily. Now take a steel tape marked in 16ths (that's those little marks) and measure from the straight edge to the axle tubes, right next to the bearing housings. Move the straight-edge, as required, until you get exactly the same measurement at each end. Next,

measure in the same way, to the axle tube, but right next to the rubber boot on the transmission. If you do not get the same measurement at all four points, shift the axles until you do. Oh—before you start this (or any other method) have the driver (or a reasonable facsimile) in the car, and roll it back and forth a few times so that the suspension will be at the normal level. It may then be necessary to bend your straightedge somewhat to conform to the "bend" in the axles. The accuracy of this method depends only on your patience, but it does have one drawback. If your frame has ever been sprung, or if the engine-transaxle is not mounted exactly along the center-line of the car, the rear end will not track exactly behind the front. Which won't hurt anything (unless it is very extreme) as the wheels will line up straight ahead regardless, but it might annoy the workers and get you black-flagged. You can tell if this is likely to be a problem by going to the front of the car and eyeballing the rear wheels. Due to different tire sizes, and the built-in difference in track width, the front and rear wheels won't line up with each other exactly, anyhow, but you can tell whether one side is more out of line than the other.

If it is, go to method number two, which you really should have done in the first place, except that it involves the construction of "Formula Vee Tool No. 668—Wheel Aligning Gauge." For a base you'll need any old piece of lumber (preferably 1x2 to 2x4) at least 54" long. Then you'll need a couple of up-rights 12" long, nailed or screwed to the edge of the base. (I'd suggest glue, too, to make it perfectly rigid, but you wouldn't wait for it to dry.) Right next to the top of each upright—and 50½" apart—drive a nail clear through, so that the point is exposed for about an inch. Give it four or five coats of spar varnish or Day-Glo orange, and you're in business. (If you didn't use glue.)

Again with the driver (or equal) in the car, roll it back and forth a couple of times (stopping at the end of a "forth" roll) and set the gauge behind the wheels with the nail points just touching the tires. Make a conspicuous vertical mark (chalk, knife cut, ball-point pen) at each nail point and roll the car ahead, half a turn of the wheel. Now set the gauge in front of the wheel and check the marks against the nail points. This will tell you whether to adjust for more toe-in, or more toe-out. To determine which wheel to move, step to the front of the car and check which wheel seems to be most out of line.

There's some difference of opinion as to how much toe-in or toe-out you should give it. Some say you should start with a bit of toe-out, because when you get under way the rear wheels pushing ahead will tend to cancel it out. However, if you have enough slack in the suspension that this could happen, you'd better take care of that first. We set Petunia to as nearly neutral as possible.

This method works equally well for aligning the front wheels, too, of course, but there a sixteenth to an eighth of toe-in is probably in order.

Dear Don—I have a small question—does everyone you know run tubes in their tires, or just some of them, or none of them? Sure would like to know what other people are doing.

Tom Hanes, Erie, Pa.
(Continued on Page 4)

MEMBERS' SOAPBOX

(Continued)

You sound like a man who has discovered that his racing tires go flat during the week, and can't make up his mind whether or not to take them back and demand a refund. We went through that, too.

I wouldn't say that no-one uses tubes in racing tires, but I don't know of anyone who does. I know that the Goodyear and Firestone dealers don't install them. (They don't tell you they are going to leak, either.)

There's a partial cure that's better than tubes—at least lighter and cheaper. Put a cupful of water in a tire pump, connect the hose to the tire valve, and push down on the handle. The tires won't stay up indefinitely but they won't go flat on the trailer while you're towing to a race, either. The water seeps through the pores in the tire much slower than does air. Don't overdo it, or try to improve on it using honey or syrup, or some other substitute—you might run into balancing problems.

Dear Don—... What with the cost of racing going through the roof, how about a plug for Solo I events (time trials, hill climbs) as a means of exercising a Vee for a lot less money? The Solo Event Rules provide for Formula Vee as a class, and around here we've always had enough Vees for competition. Same rule applies, maybe more so: "It's what's up front that counts."

Grant C. Reynolds, Chairman
SCCA Solo Events Committee
(But, like you, an unpaid professional Vee Crew Chief at heart.)

Consider that a plug, Grant, but why did you restrict it to Solo I? Solo II is pretty competitive, too (autocrosses, etc.,) and has the advantage that you may be able to get your wife, girl friend, crew chief, etc., into the act, also.

Dear Don—Were you asleep at the switch when the copy for "All About Formula Vee—1970" was locked up for printing? I refer to your reference to entry fees, on page 12. Willow Springs, National Race, now \$51; Phoenix International Raceway, Regional and

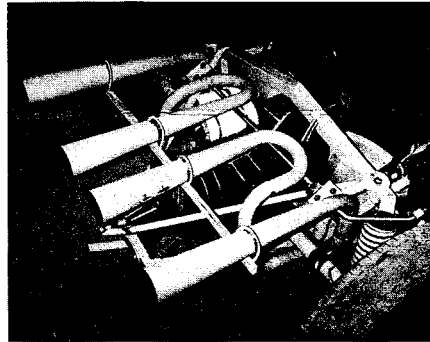
Driver's School, \$40 each—\$80 total for the weekend!

Enclosed is a picture of the loudest Vee in the West—total length 59½ inches, 18" of megaphone. I now use the car for slaloms and hillclimbs only, as I can't justify to myself the high cost of racing. I've entered 3 slaloms, and won 3 first places.

I've really benefitted from the VeeLine, Don.

Bob Adams, Phoenix, Ariz.

Good point, Bob. I've written myself a note to change that "\$15 to \$30" to a more up-to-date figure for the next issue. Thanks! That's an impressive batch of plumbing! It should terrorize the opposition. Does it shatter windows?



Bob Adams' Bundle (Den?) of Snakes

Dear Don—I am 6'1½" tall and weigh 210. My '69 Autodynamics MK5B is much too small—I keep banging my knees on the dash. I don't see how I can move the pedals forward any more, or they'll hit the front axle. Any suggestions?

Tom Tomlinson, Erlanger, Ky.

Bob Dunsmore (Portland, Ore.) had a suggestion in the No. 62 VeeLine for modifying the seat for more room in a MK4 or 5. Is a 5B different?

We were informed at the last National (at tech inspection) that it is almost certain that roll bars will have to be at least 3" above the driver's head next season. We're considering ways to get John's head 3" below the present

SUPER VEE

Super Vee is attracting almost as many builders as is Formula Ford, even though it may not yet be apparent on the tracks. A number of them have made names for themselves in Formula Vee, already, but some are jumping into fresh waters. The latest to come to our attention is the "Libra," built by Libra Automotive, Columbus, Ohio. No price for a competitive race-ready car is announced, but a "rolling chassis" is \$3400—somewhat less than the announced prices for some of the other makes.

John Zeitler proved, at Lime Rock, that a Super Vee can equal the lap times of Formula Ford, with a "mild-tuned" engine of "only" 103 hp, yet! Tim Sharp, at Riverside, proved that a Vee can finish a race, even with a hot engine. However the real proof of Formula Super Vee will come when there are enough of them to provide real competition—when they have to get that last ounce of horsepower, and the maximum rpm, and still last for thirty minutes, in order to win, place, or show. Like at the ARRC, this November.

There are some rumbles, already, that roller-bearing cranks should be allowed for Super Vee for 1971.

Speaking of cranks, it is legal—and probably a good idea—to install extra dowel pins between the crankshaft and flywheel for S/V engines.

**The VEE LINE of
FORMULA VEE INTERNATIONAL**

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

roll bar, instead, which will involve stuffing him deeper into the car, which will involve some shifting of steering gear and pedals—a winter-time job. Perhaps you can get something from that, if you can wait that long. Or perhaps you should turn in your AD on a Formcar.



**Formula Vee
International**

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