

VEE LINE

NUMBER 64

JANUARY 1970

DIRECTOR'S CORNER

In my opinion, SCCA's announcement of "Super Vee" ranks with King Solomon's proposal to divide the baby! Now we have two distinct "Vee" classes, with no conflict between them in any area. "Super Vees" won't even run with the Formula Vees—they'll be competitive with the Fords and "C's" and at least some of the "B's." With the conventional suspension and mag wheels, they'll look different, and at 7000rpm they'll even sound different! I think it's great!

OK, I'll agree that perhaps they went a bit overboard. If I'd been writing the rules (as I've mentioned before) I'd have included specific Vee-type limits for the modifications, and I'd have retained at least the front VW suspension, for identification as well as for economy. (I'm surprised that VWOA passed that up!) However, it is expected that the S/V rules will be subject to change, so if there are enough owners in FVI next fall to warrant including it on the ballot, perhaps we can arrange for some of it. (Incidentally, voting procedures, now that we have two classes, is something else to be considered between now and fall.)

In the meantime, those who don't like it can be thankful to SCCA—and to FVI. There is still Formula Vee! (And vice versa!)

HOW'S YOUR ACKERMANN SYSTEM?

The development of your Vee's steering system goes back to way before your time—even before mine—starting with the cave man who first discovered that he could "steer" the log he was moving on rollers by kicking one end or the other of the front roller. It became a lost art, for a time, when a descendant stuck a length of tree limb through the rotten centers of a couple of slices of log and invented the wheel and axle. The two-wheel cart which evolved was hailed as a great invention because it dispensed with the complicated steering system.

The revival of interest in steering gear had to wait until the time of the Crusades, when it occurred to an enterprising young freight-line owner that he could beat the manpower shortage by hooking one cart behind another, hitching both oxen to the front one, and using only one driver for the two carts.

He was in the midst of a wage dispute with his drivers (who contended that they should get double pay for driving two rigs) when he was invited to bid on moving a large shipment of telephone poles, which, of course, none of his competitors was equipped to handle. He extended the tongue of the rear cart so it would reach farther (he called it a "reach," incidentally), removed the boxes from both carts, fastened the "reach" of the rear cart to the center of the axle on the front one, and loaded the poles on the two axles. He also invented the wagon, at the same time. When the pole job was finished he installed a single long box in place of the two shorter ones, which also solved the wage dispute since the result was obviously a single vehicle. His freight line eventually became the largest in Europe—but that's another story.

Development of the wagon increased the popularity of travel no end. Riding in a cart, bobbing back and forth with every step of the horse, wasn't much better than riding the horse, but wagon travel was a definite improvement, and it wasn't long before strictly passenger vehicles came on the market.

As it became obvious that a large wheel provided a smoother ride over bumps and cobblestones than a small one, wheels even

taller than a man evolved, but with them came problems. For one thing, it became necessary to regress to the "two-cart" stage, with the reach of the rear one (which carried the passengers) formed into a goose-neck shape so that the front axle and large wheels could be turned under it when negotiating street corners. For another thing, with the high center of gravity, and no lateral stability afforded by the center-point front suspension, high-speed cornering became somewhat of an adventure. Nevertheless, people put up with the situation, simply because they didn't know of anything better.

Then, in the latter part of the 1800's, a radical new development in steering hit the scene. One Rudolph Ackermann (does the name ring a bell?), an artistic type who had already made a name for himself in the printing industry primarily in connection with color printing, became also a noted carriage designer.

He didn't plan it that way, really—it just happened. This was in the days before mass production, of course, when carriages were strictly custom-made. Well, he had amassed enough cash to buy any kind of carriage he wanted; he didn't play golf or poker; his only hobby was doodling carriages. So he decided to have one of his designs actually built. His new carriage was such a success among his friends (and strangers, too) that he soon found himself with a second career—professional carriage designer.

One day, when his coachman confessed that he had flipped the empty carriage trying to outcorner a friend of his, Rudolph turned his attention to the steering-and-suspension problem. It soon occurred to him that he could mount each wheel on its own pivot at the end of the axle, connect the short pivoted stub axles with a tie-rod, and swing both wheels at the same time by connecting the tie-rod to the tongue. Then the axle could remain stationary, instead of swinging underneath the frame, and springs could be anchored at all four corners for better stability.

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WHAT MAKES THOSE VEES SO FAST?

"What makes the Northeast Vees so fast?" has been a subject discussed on these pages numerous times in the past few years. It seems to be a generally accepted fact that they *are* faster—on their home grounds, at least. Anyone from that area will verify that any car getting less than 5500 on a straight (and they don't have long ones) is sick! 5700 is pretty competitive, but 5800 is better!

There have been two general explanations for this phenomenon: (1) There are so many Vees in the Northeast—and thus such stiff competition—that the cars have to go faster just to keep up with the rest, and (2) everyone spends his long northern winters when racing is off the menu, fine-tuning his car, to a degree unknown elsewhere, in preparation for the coming season. Will you buy that?

I've asked this question before, and I'll ask it one more time—"If they're all that fast, how come it never shows up at the ARRC runoffs, where they meet cars from all over the rest of the U.S.?" Again, last December, the three Northeast cars failed to show any spectacular superiority. In fact, as a group they came in second, any way you figure it.

Let's just add up the figures representing the finishing places, for instance. First, second, and third place would total 6, for a perfect score. (A low total is "high.")

CEN	NE	SW	SP	SE	NP	MW
1	2	4	6	5	10	15
3	9	8	12	13	17	19
7	11	16	14	21	18	20
11	22	28	32	39	45	54

Or take points as they would have been awarded for an ordinary National race:

CEN	NE	SW	SE	SP	NP	MW
13	6	3	2	1	0	0

Or—the law of averages would put one car from each Division in one of the first seven places. However, we find that the Central Division had three of them, the Northeast one.

So the question really boils down to, "What makes the NE Vees so fast—in the NE?"

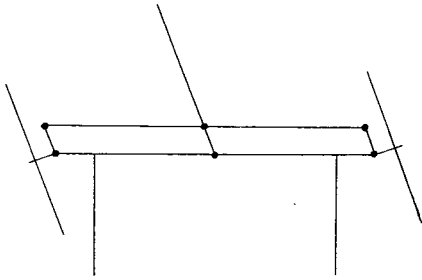
I received a rather amazing answer to that question a couple of months ago, but didn't mention it at the time because I wanted to see if it would be verified at the ARRC. I think it was. During a half-hour phone call from one of our NE members, who I am sure would rather not be identified, we covered a number of interesting subjects, but ended up with this one. I asked him the sixty-four dollar question, and got this answer: "We cheat!"

There is, he says, a sort of informal "gentleman's agreement" in the Northeast, that *nobody* protests *nobody*! At least for just going too fast. You don't ask about my semi-stroker crank, and I won't notice that your heads set uncommonly low on the cylinders.

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HOW'S YOUR ACKERMANN SYSTEM?

(continued from page 1)

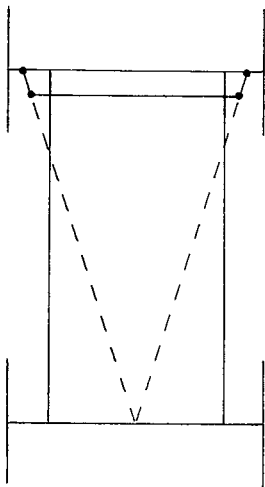


It worked like a charm! In a turn the front wheels "scrubbed" a bit, but the steel tires slid fairly easily on the cobblestones, and being more of an artist than an engineer he didn't consider that a problem.

Somewhat the idea didn't really catch on, however. It was used extensively on the "Rolls Royces" of that time, but the majority of carriage builders in the "popular" price range stuck with the ways of their fathers.

The idea was a godsend, though, to several geniuses who had been waiting only for a better steering system so they could invent the automobile. Obviously a mere man couldn't steer one with a conventional axle—he'd lose control the first time a wheel dropped into a chuck hole. (Power steering hadn't been invented yet, either.) One or two of them toyed with tricycle types, but the "Ackermann Steering System" gave them the go-signal. There have been many improvements, of course, but whether activated by a tiller, a wheel, or a hydraulic cylinder, the Ackermann steering system has been used on every automobile built since that time.

With the advent of rubber tires, the "scrubbing" problem did become a problem. "Scrubbing" could even roll the solid rubber tires right off the rim! Finally, in 1878, a Mr. Jeantend brought out the only really major improvement which has been made. He found that if the steering arms were located *behind* the axle and were pointed inward instead of straight fore-and-aft, the inside front wheel would turn sharper than the outer one. If the arms were pointed directly at the center of the rear axle, each wheel could follow its own radius freely, thus extending tire mileage considerably.



Later developments—caster, camber, kingpin inclination, tire slip-angles, etc., have spoiled his original formula somewhat, but the theory is still valid. Somewhere (roughly a third of the wheelbase length ahead of the rear axle, now) there is a spot at which both steering arms should point. Probably this point can be determined mathematically, but its exact location isn't really important. It's results that count, and the correct angle can be found by trial-and-error. Which brings us down to Formula Vee. (If you already know all about what's coming next, you might as well stop here.)

If you're still with us, take a break, and go out to your Vee. Turn the steering wheel hard over, and push the car in a circle, watching the front tires where they contact the pavement, and listening. You'll note that one tire isn't going the way it's pointing. It's sliding sideways while rolling ahead, enough so you can hear it as well as see it. You can also tell that it takes a lot more power to push the car in a circle than straight ahead.

Did Volkswagen goof? Nope—you did it, when you transferred the goodies from the Beetle to your Vee frame. You shortened the car by about a foot, but the front end doesn't know that. It's still lined up for the original VW wheelbase.

Is this serious? Probably not, really—a lot of Vees have been running this way for a long time. In a hard corner, with both wheels sliding anyhow, perhaps it doesn't matter at all that one is sliding at a greater angle than the other. On the other hand, it certainly can't be beneficial. If nothing else, you've already learned that it takes additional power, and it seems reasonable to assume that you'd have better control with both front wheels pointed the same direction than with them fighting each other over which way to go. If you're fussy about things like that, it isn't really hard to correct.

You'll need only a heating torch, a straightedge about a foot long, and a steel rule of some kind, plus your regular tools, of course. It's easier for two, but you can do it alone if you have to.

Remove the wheels, including the inner races and spacers, and the brake backing plates. You probably know already that you don't have to disconnect the brake hoses, but you may not have noticed that the front cap screw holding the backing plate is also the stop for the steering gear at full lock, so put it back in the same place when you're finished.

Remove the tie-rod ends from the steering arms, and get all the loose pieces out of your way as much as possible.

Now lay the straightedge along the face of the backing plate flange on the spindle, angled upward toward the steering arm, and measure across from it to the ball-joint hold. You can probably eyeball the center of the hole close enough, or measure to the nearest edge; but be sure to remember how you did it, because the next time you do it, you'll be in a hurry. To the measurement you get there, add between 5/16 and 3/8 of an inch—whatever comes out to the nearest sixteenth—and make some kind of a mark on the rule at this point that you can find quickly. (This is the distance that suits Petunia. If you want to get more precise, that's up to you.)

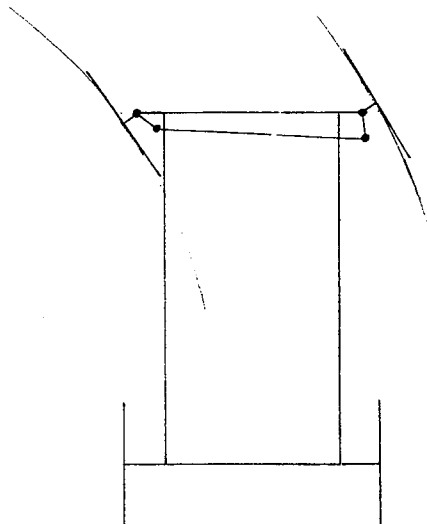
Now you're ready to start the action. You're going to heat the steering arm—close to the kingpin—enough so that you can bend it easily, which means a good light red, toward the yellowish side. You're going to do this in a hurry, so as not to overheat the whole assembly, so use a *big* tip in your torch. You should be able to finish it before the heat spreads enough to start the grease smoking at the kingpin or spindle. If not, let it cool an hour or so, and start over. **DON'T COOL IT ARTIFICIALLY—AT ANY TIME—**or you'll end up with a hard, brittle spindle, with minute hairline cracks just waiting to spread! (Incidentally, if you should see, in the red area, a sharp line separating definite shades of red, that's an existing crack. Throw the whole thing away and start over with a new one.) It's a good idea to have a "dry run" first, so you'll know where you're going to lay the torch (leave it burning until you're through), where your tools are, etc.

OK, ready? Concentrate your heat fairly close to the kingpin. The arm sort of "fairs in" to the kingpin section, so that it's hard to say where one ends and the other starts; but you can pretty well tell where it will be possible to bend it. Heat only an inch or two of the arm, and evenly all around. Just before you start bending, give the inner (thinner) edge an extra blast of heat, as it will cool quicker.

Now—rapidly!—turn the spindle as for an inside turn, as far as it will go, and whap the edge of the ball-joint eye with a hammer. Start with a light lick or two, to get the feel of it, watching the amount of bending. (It will take harder licks as it cools, of course.) When you think you're close, turn the spindle to straight ahead, and level the eye. It will twist somewhat in the bending process, so grasp it with a crescent wrench and twist it back to normal. Quickly check the new distance between the eye and the straightedge. If further bending is required (if you get it right on the first time it's a miracle!), you can probably reheat the spot, once, at least, and whap it again.

If you don't make it this time, though, things are probably getting pretty hot all over, so perhaps you'd better leave it and start on the other side, letting it cool until later. The polished surface of the stub shaft is probably starting to turn blue, and the grease around the kingpin is probably starting to smoke, but resist all temptation to douse it with water. It won't hurt a thing, and may even relieve internal stresses which might result in future cracks.

When you're satisfied with both sides, put everything back together (except don't lock up the bearing adjusting nuts yet) and realign



the front end. You'll have gobs of toe-in to start with. Then make the rolling check on the floor. You may not get a perfect job the first time, but you should at least get sharp tracks from wet tires on a dry floor. If not, try, try again.

This is also a good time to check your steering stops (the longer cap screws holding the backing plate, remember?). If you want to turn sharper, and can do it without rubbing either the body or the ends of the torsion arms, grind off the ends of the longer cap screws, or try substituting one of the shorter ones. A short turning radius is not only handy in the pits, but can be helpful in pulling you out of a potential spin.

Well, that's it. Next time on the track you just know it will handle better. Oh—don't forget—you didn't lock your adjusting nuts yet.

MEMBERS' SOAPBOX

Regarding Super Vee: I feel you have done everyone a service with the info you have published. Otherwise we haven't had word one. I think you should stay with "the" Vee. Period. Though if enough S/Vee cars appear and the interest is there, you might begin to do the same you've done for us "little Vee" people, and that might make it a full time job for you.

Harriet Gittings, Fremont, Cal.

Like everyone else, I view the new Super Vee class with interest and excitement, even though I have no intention of moving into it. I am still driving No. 57 Formcar. . . .

Here are my comments: I would recommend that the VeeLine continue as it has so successfully in the past, with the addition of a Super Vee section. . . . My thinking is based on the following reasons:

1. A great percentage of Formula Vee drivers are interested in the class, whether they intend to participate or not.

2. A great percentage of Super Vee drivers will have come from the ranks of Formula Vee and will certainly remain interested in it.

3. Some drivers and owners will participate in both classes.

4. Technical information published in the VeeLine will in some cases apply to both Classes.

(and six additional items of a similar nature. don)

Fred Sellers, King of Prussia, Pa.

The way things look here in the East, Super Vee is going to be \$5000 or more to start! Some of the guys are saying it will be faster than Ford. F/Vee is already tough enough if one wants to compete. Heard any other good gripes lately?

Ed Tripp, New York, N.Y.

An updating of the Vee rules to include newer components was inevitable. However, I expected that the new class would be completely parallel to the 1200 class, with relatively unmodified components. The new class rules seem to be designed to raise the cost of Vee racing, and thereby discourage wholesale abandoning of the 1200cc class and avoid oversubscribing 1600cc grids. I would like to see us recognize the new class, while lobbying for a set of rules with restrictions similar to the 1200cc rules. . . .

Bob Lockhart, Sunnyvale, Cal.

Sorry about the delay in renewing my membership. Was inspired by the article in the November VeeLine entitled "Super Vee." Do by all means embrace it! Keep up the great work, and let's hear more on Super Vee!

Capt. Roy Bates, Wiesbaden, Germany

I believe that FVI should support "Super Vee" for a while, but this class should have enough participants to carry its own weight soon. We should support it for a year or two, to get the information out and to get it going properly, but I do not believe that "Super Vee" is in the spirit (as much as I've disagreed with it, at times) of FVI.

Lt. Lash Hansborough, USS Enterprise

Regarding your request for reaction on the "Super Vee," it is my opinion that we could offer basic information in the VeeLine to them until they get their own information system set up, but I definitely do not believe that we should treat them as our own. Let's keep Formula Vee pure, because it is still the greatest!

Gordon Webster, Memphis, Tenn.

As to the Super Vees, I think it will be up to the F/F types to embrace this new class, which will be in direct competition to it. Rots of Ruck!

Bruce McDonald, Malton, Ontario

I am afraid that because of the relative complexity of this class, articles in the VeeLine might become more and more involved with it, to the exclusion of the original purpose of promoting "genuine Formula Vee."

ANOTHER FORMULA VEE CHANGE

One item missed in previous previews of the '70 rule is permission to install another "oil sump" on the bottom of the crankcase.

This item is copied from the European rules, which from the beginning have permitted an auxilliary sump as a solution to the "Pressure loss in the corners" problem. There, and now here, this is limited to a capacity of 250cc, which is equal to about 8½ fluid ounces, or just slightly more than ½ pint. This sump can be constructed by welding or brazing a band of light steel 2 inches wide and 3-1/8 inches inside diameter just inside the bolt circle on the oil cover plate, and then enclosing it with a disk of the same diameter. A strip of 14-gauge black sheet steel, sheared at your sheet metal shop, would probably be the best to work with—light enough to bend easily, and heavy enough to weld. Or you might get a strip of 2-inch "strapping steel" at a freight warehouse, if you can braze it. You won't need a drain plug in the lid, as you no doubt remove and clean the cover plate when you change oil anyhow.

The screen and dished metal plate will have to be discarded, because you will extend the pickup tube to the bottom of the new sump. (You'll have to enlarge the plug hole in the original plate, of course.) A piece of steam-hose, or other high-temperature plastic would be ideal—otherwise you can braze or solder a piece of copper tubing to the original tube. In any event, cut the bottom end at an angle, to prevent the tube slipping down against the bottom plate and shutting off the oil supply.

This isn't guaranteed to work—Bill Scott won the 1967 Nurburgring without them—but if it does, let's hear about it.

And the Vee Line is FVI.

Douglas Dayton, Cincinnati, Ohio

John and I—and Petunia—got in on the ground floor with Formula Vee. Petunia was built originally to the rules of the "Formula Vee Automobile Racing Association," because SCCA had not yet officially adopted the Class. At her first race, Petunia was the only private entry—the other three cars were demonstrators, entered by Seattle's largest Volkswagen dealer. With that kind of a start we've pretty well been able to keep up with developments in Formula Vee. (We've even made a couple of them ourselves.) A great deal of the stuff you've read in the VeeLine had been learned the hard way, and the rest has been contributed by other Vee owners. The general philosophy in Formula Vee seems to be: "What the heck! The front-runners know this already—let's tell the guys in the back of the pack about it, too."

As far as the VeeLine is concerned, however, "Super Vee" is going to have to be something else. John and I have neither the time nor the money to build or buy—or campaign—a Super Vee, so there simply won't be any of those little first-hand tidbits to share with you, and I doubt that the guy who discovers a better shape for the combustion chamber will dash off a letter to the VeeLine either, although it certainly would be welcome.

On the other hand, the "Super Vee" rules will be included in the 1970 "All About Formula Vee" booklet, and there will no doubt be news of a general nature from time to time. So the VeeLine will continue to feature Formula Vee out in front, with "Super Vee" back in the pack. (The only place it will ever happen!) This issue leans pretty heavily toward S/V, all right, but it is pretty newsworthy right now.

UNCLASSIFIED ADS

FOR SALE: Bobsy Vanguard, Good shape, five hours on new engine. \$995. Gordon Webster, 1837 Union Plaza Bldg., Memphis, Tenn. Home: 324-2946, work: 278-7533

FOR SALE: Autodynamics MK III. New Koni shocks, fresh engine, rebuilt gear-box, latest R5 Goodyears. Excellent condition. Trailer available. Paul Tillotson, Hellwig Rd., Genoa, Ohio 43430 (419) 855-4972

FOR SALE: Beach. 47.6 hp engine, extractor exhaust, R5 Goodyears, Z-bar, Koni shocks, new paint, some spares. With trailer, \$1795. Bob Lockhart, 1476 Kingfisher Way, Sunnyvale, Cal. 94087 (408) 245-0586

FOR SALE: Crusader. metallic brakes, never bent. With or without recently rebuilt dyno-tuned engine. Trailer available. Jerry Gress, 216 E. Blain Ave., Stockton, Cal. 95204 (209) 464-6069

FOR SALE: 46 hp Cassis engine, 6 races, \$400. Also two transaxles, front axle beam and sway bar, Z-bar, Brabham type and early Autodynamics shift linkages, steering boxes, misc. wheels and drums, Autodynamics MK I and III body parts, compensator. Edward Tripp, 417 Riverside Drive, New York, N.Y. 10025 (212) 222-9335

FOR SALE: '65 Beach kit. Everything but major VW components. \$500. Art Holt, 6 Cedar Lane, Poughkeepsie, N.Y. 12601 (914) 454-7552 (eves.)

FOR SALE: '68 Venus. Professionally built and maintained. New balanced dyno-tuned engine. Armstrong shocks, Z-bar, Goodyears. \$1350. Trailer available. Richard W. Meyer, 7012 Sunset Road, Sheboygan, Wisc. 53081 (414) 467-6624.

WHAT MAKES THOSE VEES SO FAST?

(continued from page 1)

You don't nose around my carburetor and I'll assume that your generator light is merely burned out. Actual cheating isn't condoned, you understand—a car was protested and disqualified for use of a full 1300cc engine, which was not considered gentlemanly—but just fudging a little, if it's not conspicuously overdone, won't get you into any trouble, because "everybody's doing it." His engine, he said, was perfectly legal—except that the cam might not pass a strict inspection. So I asked what he'd do if he got to Daytona, and he said, "Oh, I'd run my *legal* engine there!" Does that answer your question?

IF this incredible explanation is true, and IF you live in the Northeast, and IF you are getting lapped by the leaders—and IF you're not a "gentleman"—I'd suggest that you get together with some other finks and study sections 8 and 9 in the GCR on "Protests" and "Appeals." You might even be doing the "gentlemen" a favor, in the long run—if they run the same equipment at Riverside next Fall that they've been using all season, perhaps they'll do better with it.

Now PLEASE—don't go around saying that I said that the Northeast Vee drivers cheat! I didn't say that—I said that HE said it.

So much for that. Now—what makes the Central Division Vees so fast—at Daytona?

NO RATIONING IN SIGHT!

When asked if the rumored scarcity of 1200VW parts (which has been widely cited to justify a new Formula Vee class) would be alleviated now that a new class is a reality, Joe Hoppen (Competition Manager for VWoA) explained that it has all been a misunderstanding. The scarcity referred to, he said, has been strictly in regard to *used* components, due chiefly to the competition from dune-buggy builders for 1200 wrecks.

He affirmed what has been stated here before a number of times: *New* parts for the 1200 VW Beetle—and Formula Vee—will continue to be furnished indefinitely. Some of the slower moving items, he explained, may not be stocked on a dealer's shelf, but his distributor will have them for immediate delivery. So there!

SUPER VEE

IMSA says, "We are sure the new Vees will be very attractive to entrants, drivers and the public, and therefore to race organizers. We expect there will be enough cars built by mid-season to stage some one-class races, and we'll be there."

SCCA has, for the first time, copyrighted the GCR. (If you didn't know it, any material quoted from it here is by courtesy of SCCA.) No word yet as to how IMSA plans to get around that. IMSA races under SCCA rules?

No word from Europe as to the adoption of "Super Vee" there, although a couple of inquiries indicate that it is under consideration, at least.

Competition Components (Beach) will have the first "Super Vee" in action. It is expected that it will appear at Daytona for track testing during the week between the two Vee events.

Autodynamics Corp. is full-bore on development of a "Super Vee," and plans to have the first cars available for sale in early March.

Zink Cars reports good progress on its "Super Vee" prototype. Testing is planned for February, with a run of 25 cars to start immediately afterward. Cars will be sold either complete, or as a "rolling chassis," without engine or transmission.

(From a VWoA News Release) According to Joseph Hoppen, Competition manager for Volkswagen of America, "This means an entirely new class of racing cars which will deliver top performance, but still hold costs down so that the independent amateur can keep right up with the sponsored professional. . . .

"Super Vees, while more up to date than their smaller brothers, will be in that same image."

The comment in the November VeeLine, to the effect that you could stuff a 1600 engine in your Vee and race it as a "Super Vee" may have been in error. The only requirement for "suspension" is that the hubs, brakes, spindles and axles be "standard VW parts."

However, in the "Definition," the class is specifically "based on standard Volkswagen 1600, Type 1, 2, or 3 components." It could be interpreted that this overall definition applies to the suspension components. Will try to get clarification on this before the next issue, so don't do anything drastic to your Vee in the meantime. Incidentally, you'd have to install an SCCA approved fuel cell, too.

If it is legal, and if you do it soon enough, it might be not only fun, but profitable, as well. VWoA hasn't yet announced its support program for either Vee class for 1970, but there will be one, you can bet. In some areas, during the first part of the season, a 1600cc Formcar "Super Vee" might just take first place and a handful of cash.

If you're seriously planning to get into "Super Vee," you'd better get an order in with your favorite manufacturer right away. At least if you want to get started this year.

If you're planning to build one, get all the engineering dope you can find on suspension (it will have to be typical Formula Car type) and engine hop-up practice. Not the typical "How to Hop Up Your Volkswagen With Bolt-on Goodies" dope, but the basic information on combustion chamber shapes, flame propagation, compression ratios, fluid flow patterns, ramming effects (intake and exhaust) ignition timing etc., and study it while you wait—to see two or three professionally built cars. If you're really serious about racing in this class, that is. If you just want to play, go the "1600 Formcar" route.

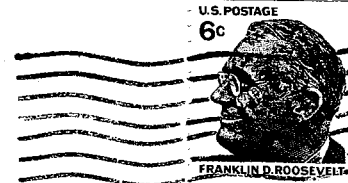
CHARTER MEMBERS

Dr. Ed Shantz, Whit Tharin, and Pete Smith were members and officers in the original "Formula Vee Automobile Racing Association," which was formed at about the same time as the first Formcar. (The "FVARA," of course, was the original name of "FVI.") Do we have any other "Charter Members?"

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