



VEE LINE

NUMBER 24

SEPTEMBER 1966

DIRECTOR'S CORNER

A year ago, I'd have said Formula Vee was nearing its peak. I'd possibly have said it even this Spring. But not now! I believe indications now are that it is still in its infancy!

For the past three years, it's been somewhat of an underdog, growing in spite of the fact; but have you noticed recently how it's suddenly becoming respectable? When did you last hear a nasty crack about Vees—or see a disparaging remark in a racing publication? Have you noticed a somewhat embarrassed interest in Vees by drivers in other classes? Have you been asked about Formula Vee lately, on behalf of an absent friend, perhaps? Or heard them bemoaning the probable cost of their latest blow-up, and the difficulty of obtaining parts for their vehicles, in comparison with your simple problems? Do you know of drivers planning to transfer to Vees?

I know of two Lotus 7's, one Maserati, one TR-4, and one Lotus Jr. which will be replaced by Vees as soon as their owners can find new homes for them. Several other drivers have mentioned recommending Vees to their friends, even though they don't expect to change themselves. Our ad in the SCCA magazine "Sports Car" has drawn more inquiries in the past three months than in the previous twenty! And check the support for the "Vee Gran Prix"!

This could very well be the beginning of a second chapter in "The Story of Formula Vee". Up till now, probably 95% of the Vee owners have been first-timers—newcomers who have found the Formula to be their doorway to racing. Now I'm looking for another jump in the number of Vees, as drivers in other classes decide they'd rather switch than fight!

CAMS

Except that apparently no one has ever faced a firing squad for trying to obtain it, information on VW cams could be classed along with information on the guidance systems in our missiles. It evidently isn't top-secret—it's just that no one seems to know.

Thorough study of the VW workshop manuals reveals that—

1. There is no mention, in the later editions, of the "B" type cam. However, it was installed up to some time late in the 1962 run of cars. Due to trouble with these cams—many ran less than 20,000 miles—it has been VW practice to replace them without charge, on any engine teardown, whether they need it or not. Our '62 engine had one, still in good shape, but our dealer had a couple of old ones around with one or more lobes badly chewed up, which he described as being typical of this particular cam. He also had one which had been replaced, even though it showed no sign of damage, that he gave us free of charge. They are not available new, and used ones—especially in good condition—are becoming very scarce.

2. The "B" type cam was replaced by a "C" (the letters follow the same part number for both cams). This cam has the same characteristics as far as opening and closing times of the valves are concerned, but the lift is not quite as high. Intake lift for the "C" is .022 less than for the "B"; exhaust is .018" less. Not much, but it amounts to approximately 7% more lift for the "B". With no change in overlap, this won't by any means give 7%

better performance—it's effect would be strictly comparable to that obtained by a larger venturi, or port polishing—but if you can find one in the scrap bin at your local VW dealership, it won't hurt anything.

3. There have been four different cam followers used in the 40hp engines. The first one had a very thin cam-contacting face, and each of the following versions has been beefed up in that area. Examination of the ruined "B" cams indicates that it may very well have been the followers which ruined the cams, rather than the other way around—they all appear to have been running against something sharp and rough. It may have been that the attempt to save the followers by decreasing the lift was not enough, that stronger ones were still needed and that with the present followers no trouble would have been encountered. At any rate, with the high engine speeds common to Formula Vee, probably the latest version of the follower (113 109 309C) would be advisable with any cam.

4. Now we come to the mystery—the "D" cam! It is listed in the parts books, it is described in the workshop manual and the "D" number is shown on the sealed boxes that contain new cams; but apparently no one has ever seen a "D" cam! I'm still probing, but what I have, so far, only deepens the mystery—

"From engine #6-864-207, a camshaft of a different shape was installed (Part #113 109 019D-035 D). Until a final identification mark is introduced, these camshafts will be marked with green and yellow paint between the cams" (from the VW "Workshop Manual"). Even the dif-

A REAL GRAND PRIX FOR VEES!

Do you people in the eastern half of the U.S.—and Canada—want to wind up the season in a great big way? Well, what will no doubt be the greatest Formula Vee event in the world to date (yes, I've heard about Nassau) will be held at Nelson Ledges (Warren, Ohio) on October 29 and 30. (OK, so Ohio is in the Midwest, if you insist; but out here we consider anything that side of the Mississippi to be "East".)

This is to be a two-day, professionally-run, adequately supported, SCCA-sanctioned, nothing-but-Formula-Vee event. The schedule calls for registration and mandatory practice on Saturday, with nothing but racing on Sunday, so don't plan on entering just the race. On Sunday there will be at least four heat races in the morning, with the top five finishers in each heat eligible for the three-hour main event in the afternoon.

There will be one mandatory pit-stop (most Vees will need more), so don't try to fit three hours worth of gas tanks into your car. Refueling will be by gravity only. Any stands for fuel tanks will have to be of metal, and approved for safety. Qualifiers for the Grand Prix may select a co-driver (better plan on it—three hours is a long drive, even in the family car).

Tech inspection will be very thorough, and special attention will be given to roll bars. This Region has had one experience in which the roll bar on a Vee flattened out, pinning the driver into his seat, so they are very safety conscious in this respect. If you plan to come, don't waste the trip by trying to pass a questionable roll bar. Factory installation is no guarantee of acceptance (check your GCR!).

Post-race teardown for the winners is scheduled, so don't take any chances if there is *anything* questionable about your car.

This event is being sponsored and/or supported jointly by the Steel Cities Region, the Volkswagen Club of Pittsburgh and a newly formed Vee club, the "Red Foxes". Those familiar with the Nelson Ledges course will have no advantage, as it is being expanded from 1.1 mile to 2.2, with the addition scheduled for inauguration at this race.

Trophies will be awarded to the first five (and perhaps six) places, in both the heat races and the main event—and this Region is famous for the quality of its trophies! No, no money awards. It was felt that besides being out of keeping with the concept of Formula Vee, monetary prizes tend to encourage dangerous

(Continued on Page 3)

(Continued on Page 3)

OVERHEATING

Here's a possible clue to the overheating problem mentioned by Richard Widmann, and—on this page—by Terry Farrell.

“Dear Don—

In answer to Richard Widmann, who is having trouble with the overheating Autodynamics, I had the same trouble with mine—250 degree oil temperature. I wrote Ray Caldwell... and he suggested among other things that an engine set up with proper piston clearance would run cool. I used a hone and gave .006" clearance, and sure enough, the temperature came down to 190. As far as I have been able to find out, this modification is only needed on the Autodynamics, since no other make seems to have this trouble. However, I should point out that engine life is not too great this way, for you approach the “.008” for wear” rather rapidly after having already given .006”. My car has only ten events on this engine, and already two cylinders are down to 80 pounds. I guess either the rings couldn't seat, or the clearance was just too much, giving blow-by. This time I'm going to try the “Blue” pistons and the “Green” cylinders, which should give about .003” clearance. Is that right, Don?

You spoke of cams in the last issue—what is the difference in the three, and which is the fastest? While I have my engine apart I may as well get the correct cam in. What is the solvent test for heads? Is it filling the ports with gas and seeing if the valves leak?

Keep up the good work!

Baxter Rogers,
Indianapolis, Ind.”

Now there is a man who's been doing his homework with the “VeeLine”! As to clearances, I'm a “close-tolerance” man, myself, but there are plenty of advocates of loose fits for racing, and this is the only positive information we've had so far on this heating problem, so use your own judgement. I go along with his combination of “Blue” pistons and “Green” cylinders (and if you don't know what we're talking about, get out your #17 “VeeLine” and go through it again).

Here's something else to consider (but make your own decision)—in honing to .006” oversize, you'll increase the ring-gap by perhaps .015”. The gap is already adequate in new rings—.012” to .018”—and this addition, plus the extra clearance between the piston and cylinder, would provide a relatively large passage for blow-by. Perhaps a set of first-oversize rings filed to give the proper gap would help. I wouldn't think honing this amount would affect the seating of the rings; in fact, it could be that they aren't worn enough yet to be seated. Did you ever consider that, even with practice included, ten races is the equivalent of somewhere around one thousand miles? With unequal readings in the different cylinders I'd suspect valves, rather than rings, for low compression results.

You're right on the “solvent test”, except that I prefer to set the heads

(Continued on Page 3)

36HP AND OTHER QUESTIONS

“Dear Don—

... About the 36hp engines—I have one and I know of at least two others being raced. During my vacation in Northern California, I stopped at a famous shop known for its fast Porsches and Vees. I asked the simple question—I have a 36 and 40hp engine. Which one do I bring in, and what will it cost? The answer was that the 36hp had given the best results and from \$800 on up. They told me that part of the preparation is putting 40hp valves in the 36hp head. I can't afford that kind of green stuff, so I am still plugging along with my stock 36hp. It peaks out at 4600 in fourth, which is 6 seconds per lap too slow at Willow Springs. I am going to trade it in on a 40hp mill soon, and I'll let you know if it is the engine or me that is 6 seconds slow.

Concerning Mr. Widmann's problem of heat—my AD also does this. I have cut out the belly pan under the engine and transaxle, but it doesn't seem to help.

... Here in Southern California most of the owner/drivers are under the impression that the oversize cylinders are legal. Please explain again what Westport says on this.

About fuel tanks—why don't you print an article telling us where to get the famous fuel cells to save us from cremation?

My roll bar is a joke. I want to build another, but I don't know what kind of steel tube to use, or how to bend it properly, etc. Where is this type of dope located?

I have been running (practice) with my carb and manifold reversed so the carb is on the back of the shroud. Is this illegal? It doesn't add any power, but it makes it a little easier to work on the timing, and the throttle linkage is better. I took the venturi out of the carb altogether. It doesn't seem to help or hinder—please comment.

Terry Farrell,
Lynnwood, Cal.”

Well, Terry, you've raised a number of very interesting questions. It's been some time since I mentioned it, so I'll say it again—opinions expressed here as those of the Director are strictly opinions of the Director. Don't take them as binding definitions of definitions of the SCCA rules—for that kind of ruling, see your Stewards, or write to Westport. OK?

OK. *In my opinion* a stock 36hp engine is useless for racing. A year or so ago, you might have been able to compete with a top-tuned 36 against an average 40, but today most everyone knows all the legal secrets, and 4800, at least, is necessary if you're even going to keep the leaders in sight. About 4999 if you hope to win. You've pretty well answered your own question when you say you can get 4600 in fourth, and I'm surprised that you do that well.

As to the California heads—well, I'd hate to get caught at a teardown with one. As I read the GCR, the two valve diameters shown are for the two respective engines; and if I were inspecting, I wouldn't accept the larger valves in the 36hp heads as being legal, on the grounds that the heads had been illegally “altered, modified, or changed”. It was to save you, and others like you, from the fruitless work and expense of trying to make a racing engine from the 36hp that this association (judging from the ballots received so far) is going to recommend that the 36hp engine be dropped from the “eligible” category.

Haven't had any answers on the hot AD's yet, but am wondering if you have tried a method frequently seen in this area—length of 6” stove-pipe slipped over the neck on the fan housing, extending back through the ventilation opening in the engine “hood” far enough to be fastened to it with a bolt and wing-nut, but not far enough to be unsightly. With assurance that the fan is supplying only fresh air, I'd quit worrying about the gauge reading if it remains at a constant point, the oil pressure stays at a reasonable level, and nothing blows or shows unusual signs during the first couple of races. As was suggested to Mr. Widmann, test your indicator setup in boiling water, which will give you a definite reference point. Most cars will show up to 220 degrees on a hot day with no signs of distress, so perhaps you really don't have as much trouble as you think.

Judging from a few of the ballots, your friends are not the only ones under the impression that the largest cylinders are legal. Our proposal to include “VW standard green size plus .008” in the definition was not an attempt to *change* the legal size, but to better define it. That is the legal size already.

It's rather a long story, but—SCCA last year accepted our recommendation that the largest *grade* (green) in the *standard* size VW cylinder be the maximum legal size, with an additional .008” (the specified VW wear-limit) permitted for wear, etc. They went even farther and printed in the GCR the specific measurement of the cylinder instead of the VW description. The only problem was that when the book was distributed it was discovered that the measurement specified applied to the “second oversize” cylinders rather than to the “standard” size. This figure was 3.080”, but should have been 3.040. A correction was printed in the “Drivers' Meeting” section of the SCCA official magazine “Sports Car” for February, 1966, in accord with the usual practice of making corrections or definitions which won't wait for the next issuance of the General Competition Rules. If the GCR is still being issued with the erroneous figure, and if your friends obtained them after the correction was made in “Sports Car,” they would have a good excuse for not complying; but I doubt that it would be valid at Riverside, no matter how good their intentions. The same mistake was made in our booklet, “All About Formula Vee,” by the way, but every copy was hand-corrected before it was

issued. Tell your friends that if they had been members of FVI they would have been better informed.

Borrowing again from Sports Car (May), gas tanks can be filled with foam and covered with a plastic coating at the following Goodyear distributors -

RRR Motors, Inc.
Homewood, Ill.

Fort Lauderdale Auto Marine Service, Inc.
Fort Lauderdale, Fla.

Bob Schroeder Race Cars
Dallas, Tex.

Huggins Tire Sales
Thomasville, N. D.

Gofaster, Inc.
New Rochelle, N. Y.

Carroll Shelby Enterprises, Inc.
Gardena, Cal.

Reports indicate that even this method has its weak points, but it's certainly better than nothing; and with three or four gallons of gasoline to snuggle up to as you do in a Vee, this is something we should all consider.

However, unless you're in a big hurry, it might pay to wait just a little longer. I can't tell you who, just yet; but a large company, famous in the field of industrial safety, is about to announce its solution to the fuel tank problem. It has been in use for some time already (on a few guinea-pig Vees, yet!) with completely satisfactory results and is about ready for commercial production. It displaces about a pint of gas in the average Vee tank, and will probably cost in the neighborhood of \$3.00!

Roll bars? See page 98 in your General Competition Rules, and the following two and a half pages. Most everything is covered except where to get them bent. For this, try an industrial electrical contractor. He will no doubt have a power bender he uses for fitting electrical conduit into unusual corners. In case you didn't know, non-SCCA members can get a copy of the GCR from SCCA for a dollar. Write to Box 791, Westport, Conn.

Running a PCI carburetor with the venturi removed isn't new - nor, in my opinion, is it beneficial. You could get carburetion, of a sort, by using a straight length of pipe, with a small one stuck in one side for a jet, but it wouldn't be very efficient over a wide range of rpm's, even if you could get the proper mixture for one given speed. This is the ultimate goal of a carburetor - to give a mixture as close as possible to ideal for all conditions. The largest possible passage for air is not necessarily the best one. In fact I've had a couple of comments to the effect that a 23.5mm venturi is better than a 24mm for a Vee, though we're still using the 24. Even at its best, a venturi and a single fixed jet won't adequately cover the entire speed range of the engine, which is the reason for the addition of the "air correction jet". According to Solex, the main jet (or adjustment, if an adjustable jet is used) should be based on performance in the lower range (about 3500 rpm) with selection of the air correction jet made on the basis of top speed. It is claimed that air correction jet sizes don't affect lower speed performance, but main jets affect the entire range.

As for the carb behind the engine, I can't find it now, but there was, for a time, a prohibition against such mounting. However, it is not included in the 1966 GCR. As it can be done without any modification of parts, and gives no improvement in performance, I can see nothing wrong with it. Again, however, this is only my opinion.

Well, Terry, you've just about taken care of one page of this thing for me!
Thanks! *don*

(CAMS)

HORSEPOWER

ference in timing is given, though it amounts to only an average of two degrees earlier opening and later closing for both intake and exhaust.

There is one possible solution - with the clue in the statement above that the cams will be identified for a time with paint spots - which would indicate that the previous numbers would still be shown. It may be, then, that the "C" cam is actually the "D" cam in disguise. Our "C" (which we bought for a "D", as shown on the box) does have a couple of green paint spots on it - but no yellow - and a couple of new cams at our dealer's have a round white spot on them. (The others have none.)

As to the statement above, that the timing is the same between the "B" and "C", it is based on tests with a dial indicator bearing directly on a cam follower in a partially assembled engine; and it would be easy to miss the start or finish of the movement of the follower by two degrees.

So there you have all the info that is available at this time. If anyone can shed any further light on the subject, it would certainly be welcome!

There have been a number of horsepower changes made in VW's since their introduction here in 1949. The first one was rated at 25bhp. There is some confusion, even about the two 1200cc versions used in Vees, as the engines are referred to by both their "brake horsepower" and "SAE horsepower" ratings. In 1954 the displacement was raised from 1131cc to 1192cc ("1200"), the SAE rating was changed from 30 to 36 and brake horsepower from 25 to 30. The 1961 model, while it kept the same displacement, was given an entirely different engine, with higher compression ratio, bigger bearings, different carb, etc., and was rated at 40 horsepower, SAE, or 34 brake horsepower. In 1965 the SAE rating was changed to 41.5 for some undisclosed reason, although the actual brake horsepower remained the same. So we have -

1954 to 1960	30bhp	36 SAE hp.
1961 to 1964	34bhp	40 SAE hp.
1965	"	41.5SAE hp.

Brake horsepower is the power that turns the rear wheels. SAE horsepower is a theoretical figure, arrived at by engineering formula, useful mostly for selling cars.

(A REAL GRAN PRIX FOR VEES)

driving if they are of any considerable amount, and are of no incentive if they are not. (Check the stories from Nassau!)

There is to be a party Saturday night (for which the Region is also famous!) where you can meet a lot of drivers you've heard of but have never seen.

The officials conducting this event are all SCCA-licensed, and have had a little experience at this sort of thing, so it is expected to move smoothly and efficiently.

You can get entry applications from -

Reynolds Sports Car Center
Route 30
Irwin, Pa. (412) UN3-3719

or

Ronald E. McCurdy
The Daily News
Lysle Boulevard
McKeesport, Pa. (412) 664-9161

Better be there - you just might end up on one of the films in our library!

(OVERHEATING)

level, and fill the combustion chambers rather than the ports. It's easier than testing the ports individually, and not so messy. And PLEASE use cleaning solvent - not gasoline! The only place for gasoline in a shop is in gas tanks and cans with tight lids - NOT in open cleaning buckets, wiping rags, or cylinder heads! I've already lost one friend due to careless use of gasoline - I'd hate to lose any more.

As to cams, I do have some dope on them on page 1. *don*

ANOTHER BOOSTER

Bob Dixon, of Everett, Wash., just started racing in a Vee this Spring. Now he's shooting for a National license. Also, he's writing a regular column on Formula cars and their drivers for the Northwest Region's newsletter. Guess what Formula was featured in the first one.

NEW FILM

We now have two copies of a new Vee film, called "To Vee or Not To Vee". It includes the 1965 races at Daytona and at Nassau, plus some background on the Class. It runs about 15 minutes, and is, of course in sound and color. Like "Racing on a Budget", it is 16mm and won't work on a home projector (8mm). First come, first served.

OLDER FILM

In addition to the new film, one copy of "Racing on a Budget" (16mm sound and color) is back and ready to go again. As usual, the first one to ask will receive.

This one includes racing at the American Road Race of Champions and Nassau Speed Week of a few years ago. In both films you will see some familiar faces.

BALLOTS

As this is being written, about fifty ballots have already been returned. Not enough to be decisive, but some deductions can be made. For one thing, anyone who thinks this is a "rubber stamp" organization is way off base—there probably aren't more than two or three identical ballots in the lot.

There are a few puzzles already—some of the items which might be expected to be unanimously approved show a surprising number of "No" votes. "Inverting" the transmission is the best example. Either a number of owners don't understand what is meant, or else they are planning to build new Vees with the transmission upside down for a lower center of gravity. I hope they didn't confuse this with "transposing the ring gear" as now permitted in the GCR, thinking that we were proposing to abolish this.

There are several "Noes" on adding tie rod joints, brake cylinders and brake shoes to the "Non-VW" list. Brake shoes I can understand, but tie-rod ends and master cylinders have been non-VW on several makes of cars since FV started. The only point here is to make them technically, as well as actually, legal.

The vote on "Weight with driver" is split almost exactly down the middle, but on the "suspension" question it is almost unanimous for the better definition of coil springs as the sole suspension medium.

On the other questions, there are varying divisions of opinion, but "Yes" is predominant on all of them. A full report will be made next month on the final tabulation of votes.

**The VEE LINE of
Formula Vee International**

Don Cheesman, Director

Box 291

Ephrata, Washington 98823

BUSY

Our President, Whit Tharin, hasn't made many racing points this season, but he's been making a lot of others. His "Vee and Me" articles have been printed not only in this literary gem, but in a number of Regional newsletters, and in "Foreign Car Guide" (the Vees' best friend). FCG has also printed several special articles he has written about the Vees. In addition, he has been conducting "Vee Clinics" all over the Southeast, and now he's been appointed "Research Consultant" to the South Carolina Traffic Safety Council. He works for a living in his spare time as a Chemical Engineer.

These activities, plus injuries received at Nassau Speed Week last December, have cut into his racing and preparation time somewhat, and he's been invited to become a "Factory Driver" at Nassau this year, so his "old yellow Formcar" is for sale. See the "Unclassified" section.

ANOTHER "36"

"...Indeed I do have a 1954 36hp engine, with few modifications. Not yet racing; will see how it goes in 2 or 3 months. Very carefully prepared!

Total investment to date for my Crusader is well under \$1000. Expect to get my license—including car (new), equipment, *Transporter (!)* tools, school—for under \$1000! True racing on a budget!

*Ed Jones,
Sacramento, Cal."*

Like we keep saying—Vee racing is inexpensive! But this is ridiculous! Will you give us some details, Ed? Am tempted to feel sorry for his wasted effort on that 36hp mill, but he'll probably trade it off for a wrecked '65 VW with a new engine in it—and get something to boot.

HARD LESSON

We've learned it the hard way—if your temperature suddenly goes abnormally high and your oil pressure goes abnormally low, it's best to shut down and tear down and find out why, even though the engine still feels and sounds and runs normally after cooling off. There has to be a reason.

Twice, with us, it's been rod bearings, and once a piston with a hole burned in it. By continuing to run after the symptoms appeared, we've lost two races, two conrods, and one crank, and had to regrind the throw on another.

If you do gamble and lose, a check of the other bearings will no doubt reveal a build-up of small metal particles. Assuming that they are either aluminum from a piston or flakes of bearing metal, you *might* get by without replacement, though that's another gamble. This build-up naturally reduces the clearance of the bearings, and could result in losing another one if they are not all replaced.

In order to replace the #3 main bearing, the distributor and cam gears must be removed with a puller. In order to avoid damage to the gear teeth, split the old bearing with a cold-chisel before using a puller; then make sure the puller is bearing on the body of the gear, rather than the teeth.

The next issue of Small World, VW's owner magazine, will have an article by Alice Bixler about her running in the Ladies' Race last year at Nassau.

UNCLASSIFIED ADS

FOR SALE 1965 SE Division Vee (Formcar) Sacrifice for \$1250. Whit Tharin, Allendale, S. C. Call collect (station-to-station) after 8:00 PM, 803 584-2485.

FOR SALE, or trade for Vee—Lotus 7, with spares, etc. In storage in Seattle. Dicker with Pvt. Peter Barbus, HHB 9th Div. Arty, Fort Riley, Kan. 66442



**Formula Vee
International**

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