

5th Part

How to Get 160 Horsepower from a Ford V-8-60

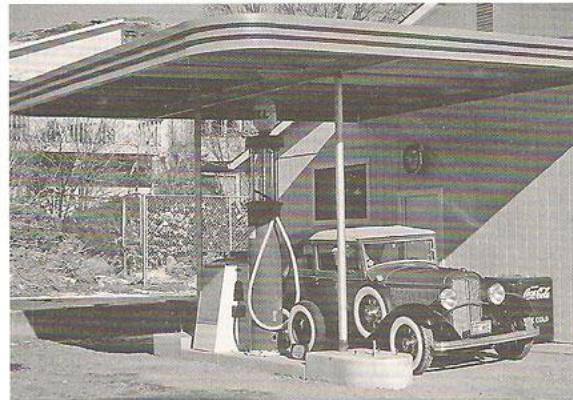
by Dave Cole • Photos from Doug Clem

DOUG CLEM, of Sparks, Nevada, is a forty-year member of the Early Ford V-8 Club who owns a choice lot of 1932 Ford V-8's, as well as a 1950 Mercury station wagon. All of these are fairly rare, but now he has built up something that is totally unique: it's a little Ford V-8 engine that cranks out about 160 horsepower with a displacement of just under 160 cubic inches, or very close to one horsepower per cubic inch! This is phenomenal performance for what started out as a modest, thrifty little Ford V-8 flathead engine. Most such engines are considerably larger, but don't put out nearly that much power. Early Ford V-8's are mostly 221-cubic-inch engines, and later ones more like 239, but they don't deliver 221 or 239 horsepower; we're happy to get 85 to 100 horsepower out of them. Doug's little V-8 wasn't even that powerful to start with. It began as a 60-horsepower engine—one of the last of them, built in 1940, just before the production of such engines in the U.S. was discontinued. The lowest-priced Fords from 1937 to 1940 had these 60-horsepower engines, but the cars that used them were too big and heavy for them, and American drivers who enjoyed snappy Ford V-8 performance with the 221- or 239-inch engines were not happy with the smaller engine, which had only 136 cubic inches.

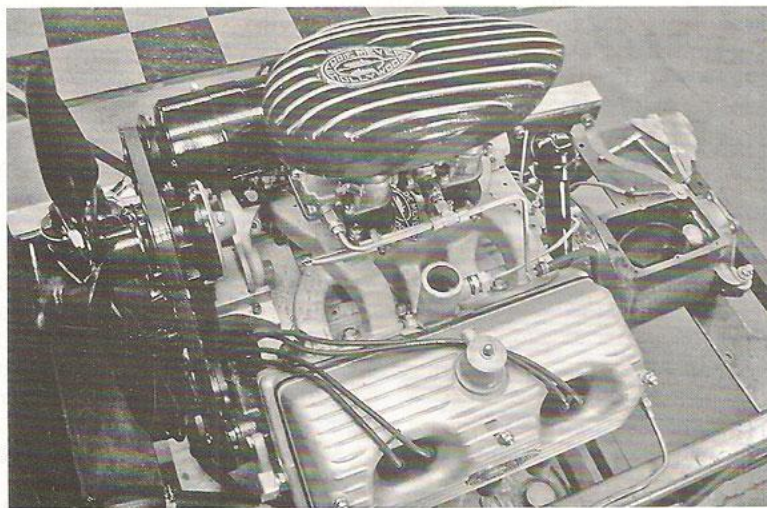
So how does Doug Clem get another hundred horsepower out of a little V-8 that was intended to deliver only sixty? Well, overboring it helped a little—it's .0875" over the stock 2.6"—and it has a longer stroke than it had originally—3.50" instead of 3.20"—but it's mostly the adaptation of cylinder heads with hemispherical combustion chambers and overhead valves that did the trick. That, and the addition of a second carburetor to the intake manifold. That's about all it took, and it's about all that little V-8 block can take, too!

Hemispherical combustion chambers are far and away the most efficient design for an internal combustion engine, and their advantages are listed in Part IV of this series, in the November-December, 2010, *V-8 Times*. But perfectly dome-shaped chambers with

the spark plug right in the middle are seldom used in engines, owing to the complexity of the valve train and the resultant high cost of such designs. Poppet valve heads have to intrude in those cylinder heads



■ Doug Clem's best-known car is this '32 Ford V-8 Convertible Sedan (B-400) loaded with accessories, both authorized and un-. The engine is outfitted with all the Eddie Meyer speed equipment that will fit on it, and the personalized Nevada plate says EDE MYR—as close to *Eddie Meyer* as you can get in six characters. The setting here is Doug's '40's-style service station, a work in progress, part of his "Whygoby Garage."



■ It's hard to believe that all these beautifully-finished cast aluminum parts are bolted on top of what was originally just a humble little Ford V-8-60 cylinder block. It's Doug Clem's 160-H.P. Ford engine with Simca hemi heads and OHV's from Brazil.

to let the gas and air in and the exhaust out. To make those valves open and close, overhead camshafts are required, or else a lot of push rods and rocker arms are needed between the cylinder heads and the camshaft located down next to the crankshaft. The overhead cam set-up is very expensive to build, and the push rod design is costly, too, so most engines for low-priced cars—up to World War II, at least—used a cheaper side-valve design, like the Ford V-8 had. It may be less efficient, but it's still pretty good.

Even though the Ford V-8 60-horsepower engine wasn't what American drivers wanted in passenger cars, it turned out to be a great little engine to soup up for use in midget racing cars and in certain classes of racing boats, where engine size was limited. All kinds of speed equipment was made to hop up the V-8-60 to make it even more competitive, but nobody built an overhead valve set-up, with hemispherical combustion chambers, until Ardun Engineering Company did it around 1950. The effort was intended to make a top-notch racing engine out of the Ford V-8-60, but it came too late. Interest in midget auto racing came to an end, and so did Ardun's project, after only a few sets of its hemi heads with OHV's had been made.

But the V-8-60 had not been intended for use in America, anyway; it was designed for the smaller Fords sold in England and France. In a lighter, smaller car, the little V-8 performed just fine, and the French continued to build them after World War II, although the English did not. The same basic engine, with a succession of performance upgrades, was built for another quarter century—first by Ford of France, then by Simca, which took over Ford's design, and then by Chrysler, which bought out Simca. That French auto maker also had a factory in Brazil, and so it was that Chrysler ended up building hopped-up V-8-60's clear up to 1969 in South America!

By 1965, the Brazilians had developed the V-8 as far as they could as a flathead, side-valve engine, so they built overhead-valve engines with hemispherical combustion chambers for it, more or less like parent Chrysler had designed for their American market in 1951. They called the resultant engine the "Emi-Sul V-8," *emi* being *hemi* in Portuguese, the language of Brazil, and *Sul* meaning *south*. They built the Emi-Sul V-8's for four years, ending in 1969. The last of them produced 140 horsepower.

We discussed this briefly in Part IV of this series, in our last issue, and in more detail in Part III, which appeared 22½ years ago. In 1988, when Doug Clem read that business about the Emi-Sul OHV V-8 the Brazilians made for four years in the late 'sixties, it instantly occurred to him that it would be a lot of fun—and a big challenge, perhaps—to scrounge up a set of those heads and see if they would work on an original Ford V-8 60 h.p. block. He was aware of the rarity of Ardun heads, but the Emi-Sul V-8's had been in production for four years; certainly there must be some old ones left that he could get!

So he investigated the possibilities of getting some,

but soon learned that Brazilian car guys were jealous about that engine, a product of local engineering and manufacturing genius. He could buy a whole *car*, perhaps, but no OHV heads. So he let the matter go until he retired, but never gave up the idea entirely.

Years went by, and Doug finally retired. On the internet one day in 2002, he communicated with a fellow '32 Ford owner who lived in São Paulo, Brazil. This Guilherme (that's *William* in Portuguese) Malacarne needed some rare '32 goodies, like sun visors, splash pans, and ash trays. Doug had what Bill needed and said he would give him those parts if he could scrounge up some of those Emi-Sul heads from an old Simca, along with the rotating and reciprocating parts that went with it. The idea was to see if those heads, designed and built in the late 1960's, would work on a Ford block designed in the mid-'30's.

Guilherme soon found a Simca repair shop that had three engines for sale. He got all three sets of heads and the intake manifolds, along with the engine internal parts to outfit one old Ford V-8 60 block—the crankshaft, camshaft, connecting rods, valves and lifters—and some NOS gaskets. All the parts fit in three big suitcases, which Bill shipped by Federal Express. Doug soon had just what he asked for and was pleased to get it all so quickly—but he was appalled at the cost of shipping it! The parts were reasonably priced, but it cost *three times* what he paid for the stuff just to mail it! Well, international freight rates are pretty high, it's about seven thousand miles from São Paulo, Brazil, to Sparks, Nevada, and a lot of what he got was made of steel, so it's *heavy*! And to make it worse, Doug didn't even know whether those heads would fit on an old Ford block. No one else had ever thought of doing it; there was nobody to ask, but it was quite likely that so many improvements and upgrades had been made in the design of the engine between 1940, when Doug's V-8 60 block was made, and 1965, when the Emi-Sul was designed, that it would be impossible to put an engine together using these parts. Had he bought a colossal "white elephant"?

Anticipating the worst, Doug tried the NOS Emi-Sul head gaskets on a Ford V-8-60 block. Bad news! The gasket was wider than the cylinder block! Worse yet, big holes for the coolant to flow through were thus exposed, with nothing for the top edge of the gasket to seal against. But on the other hand, the holes for the cylinders lined up, and although the gasket had holes for only 15 studs, those holes lined up with 15 out of the 17 stud holes in the Ford block. Maybe this thing could be made to go together after all.

It's hard to think of any V-8'er better situated to do a job like this than Doug Clem. Consider what he had to rely upon:

- He had the *time*, having retired from a career in the printing business;
- he had the *place*, a well-equipped machine shop he calls the "Whygoby Garage," where all the cus-

tom bits and pieces for the job could he made;

- he had the *knowledge and experience*, having been working on Ford V-8's for over forty years; but best of all,

- he had the services of Edwin "Bud" Meyer as a consultant, advisor, and "hands-on" mechanic. Bud and Doug have been close friends for over twenty years.

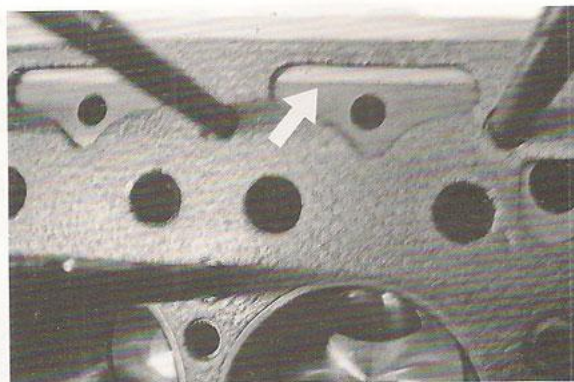
Bud is the son of Eddie Meyer, who made some of the best known and most successful speed equipment for flathead Ford V-8's in the 1930's and '40's, and ran a shop that turned out great racing engines. Bud's Uncle Lou was the first driver to win the Indianapolis 500-mile race three times, in 1928, '33 and '36. The whole family was involved in big-time auto racing, and Bud himself has continued the tradition, as a racing engine consultant and builder, mostly of engines for hydroplane racing.

Especially helpful in the project to adapt Emi-Sul OHV heads to a Ford V-8-60 was Bud's experience in building the only Ardun-equipped V-8-60 that ever ran properly. As noted in Part IV, sportsman Sterling Edwards had great success with a car he designed himself that ran an Ardun set-up on a V-8-60 enlarged to over 152 cubic inches, and it was Eddie Meyer's shop that made it all work. They designed the special racing pistons and the ignition system, assembled and tuned the engine. Bud, working with his father, was a part of it all. This was all nearly sixty years ago, so one would suppose Bud Meyer is somewhat advanced in years, and it's true that he is now 92. His father and his uncles all lived long lives, too.

Bud's usual residence is in Camarillo, California, but he and his wife have a vacation home near where Doug lives in Nevada, and they spend a lot of time there. So it was that Bud Meyer, the only man left on earth who has experience in making the Ardun-equipped V-8-60 run properly, was willing and able to lend his expertise to Doug's project to adapt Emi-Sul heads to a Ford V-8-60.

Together, Doug and Bud measured and compared parts to determine what Simca parts would work in the Ford block. They found they could use just about everything that had come from Brazil except the camshaft. The bearing journals and the cam gear were too big.

As expected, the NOS 1940 Ford V-8-60 cylinder block had to be modified a bit. To enlarge the bore, they knocked out the original sleeves and bored the cylinders .0875" oversize. To provide enough metal around each cylinder bore so the head would seal against it adequately, they had a machine shop in Sparks fill some of the original valve pockets next to the bores by welding. This necessitated grinding the decks to make them smooth again, of course. To fit the Simca valve lifters in the Ford block, they had to recess the area around each hole, and since the Simca lifters are smaller in diameter, they had to make and fit bushings, using 1-inch cast iron bar stock. Other recessing had to be done to allow the crankshaft to



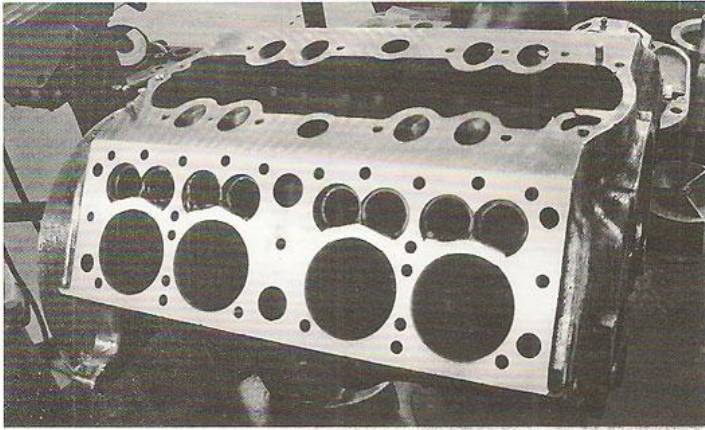
■ See that parting line? Below it is Ford V-8-60 cylinder block; above is the bevel-edged aluminum "valley cover" that gives the Emi-Sul head gasket (and the head, once it's put on) something to seal against.



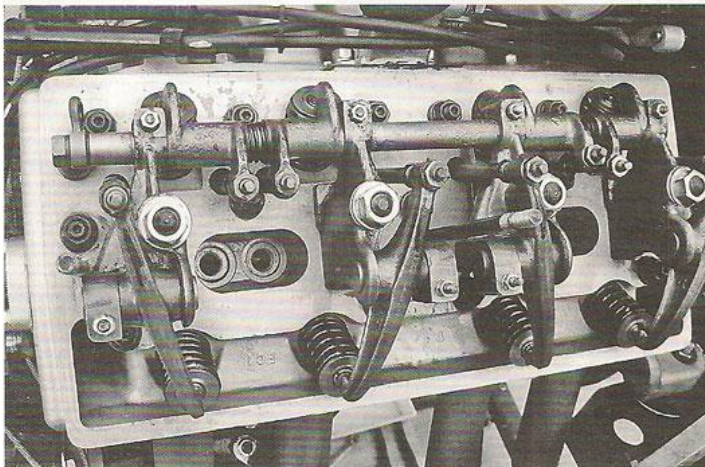
■ Bud Meyer, happily turning valve bushings in Doug's shop in June, 2009, at the age of 90.



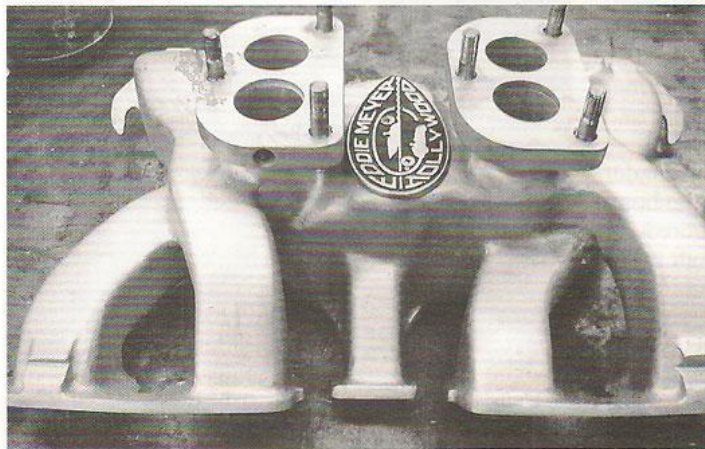
■ Doug Clem (left) put on a birthday party when Bud Meyer (right) turned 91. Between them is Debbie Giossi, a neighbor of Bud's in Nevada. She runs a plant nursery, and served the cake at the party. Behind them are old auto racing photos and memorabilia, part of Doug's Eddie Meyer Museum.



■ To provide enough metal for the head gasket to seal against, they welded up the lower part of the valve holes in the V-8-60 block. With OHV's, the original intake and exhaust ports aren't used anyway.



■ Here's the OHV set-up in the Simca Emi-Sul cylinder head. Four short rocker arms ride on the upper shaft for the intake valves; four long rocker arms ride on four short shafts for the exhausts. Spark plugs go side by side in pairs in deep recesses.

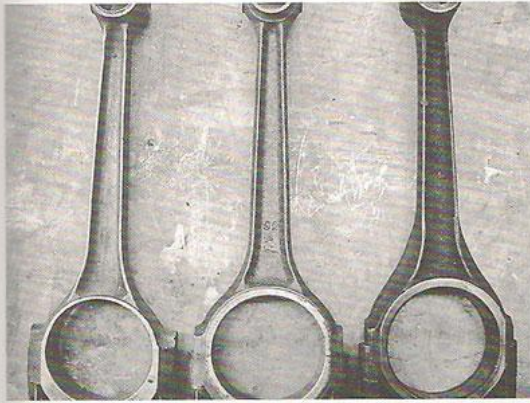


■ Doug and Bud made the Simca intake manifold a 2x2 by cutting off the single carb base and TIG-welding two others on. It looked so good they put an Eddie Meyer emblem on it!

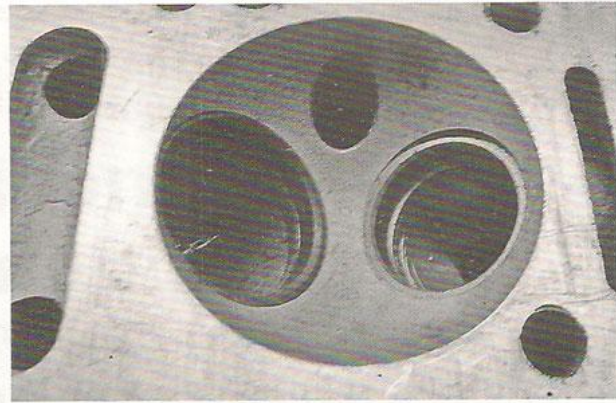
revolve and to give clearance for the connecting rods. Since the notorious exhaust ports cored through the Ford block are of no use with the OHV heads, they were filled with ceramic block filler. To provide extra strength to hold the crankshaft in proper alignment so the extra hundred horsepower they expected wouldn't blow up the engine, they designed and fabricated a great big husky center main bearing cap. And, of course, they had to make a "valley cover" to replace the original-type intake manifold. They used an aluminum plate with beveled edges that is thick enough so that, when the block was decked, the edges of that cover would, in effect, extend the width of the decks far enough to give the heads something to seal against. To provide lubrication for the rocker arms in the heads, they drilled into and thus tapped the oil gallery that runs up the back end of the block. There were sundry other mods needed, too, but these were the main ones.

Surprisingly, the Simca crankshaft, designed for an engine of 140 horsepower, would fit in the Ford V-8-60 block with only minor lathe work to turn down the counterweights. They found the rod journals larger than Ford used, so they increased the stroke by offset grinding, and the rod journals are now of standard size. Incidentally, the Simca crank is made of steel, not cast iron.

The cylinder head assemblies, complicated as they are with rocker arms and shafts and related bits and pieces, were adapted to the Ford block almost as they came out of the suitcase, with the exception of the lubricating system for the rocker arms. The Simca engine had built-in oil galleries leading to the heads, but there is no such thing in a flathead Ford V-8, as nothing in the stock cylinder head needs lubricating. Thus, Doug and Bud had to design and build an external oiling system, to carry oil from the vertical oil gallery in the back of the Ford block into the heads, and a drain system to let the lube go back into the crankcase. Complicating this were the water jackets surrounding the sides of the heads, so drilling holes for oil supply or drain returns would go through a water jacket, but the oil had to be kept out of the coolant, and the coolant could not be allowed to get into the oil. Devising a neat workable oiling system proved to



■ Connecting rods for the V-8-60 were #52-6200's for 1937-'39 (left); then Ford made the 1940 rods, #92A-6200, a bit stronger. To handle 140 H.P., Simca made really husky rods (right), and Doug Clem's hopped-up V-8 uses these.



■ Here's the heart of it all, the hemispherical combustion chamber of the Simca Emi-Sul cylinder head, a perfect dome except for the valve ports and the smaller spark plug hole. Push rods go through the two holes in the recess above.

be one of the team's biggest challenges.

A lot of time was devoted to the design of the pistons, too. They are racing pistons, of course, custom forged by Aries, yielding a compression ratio of 9.5 to 1.

The stock Simca intake manifold was a beautiful little casting, with individual runners leading to each intake port on the heads, but it had only a single carburetor in the middle. True, Simca got 140 h.p. from the Emi-Sul V-8 with one carb, but can you see this beautiful little V-8, hot-rodged to within an inch of its life and all tricked out with sophisticated smooth aluminum castings, showing its stuff with *one carburetor*? Well, neither could Doug nor Bud. It would have to have at least two, and they would have to be the archetypal hot-rodder's choice for carbs, too: Stromberg 97's. So they cut off the carb base, TIG-welded up the hole it left, and built two others on the original manifold, side by side. It looked so good they stuck one of the old-time *Eddie Meyer - Hollywood* teardrop emblems in the middle, where the original carb once stood. There's another on the cast aluminum air cleaner.

This forced the generator off to one side, on a custom-made bracket, but to keep the fan centered behind the radiator, the guys had to make an idler pulley out of generator front and back plates, with no generator between them. The fan bolts to that.

To handle the output from the end of the crankshaft, there's a 9-inch Ford V-8-60 Commercial flywheel and clutch pressure plate, and a NOS Commercial V-8-60 transmission, which uses sturdy 85-h.p. gears. They *should* be strong enough . . .

So Doug and Bud got the Emi-Sul/Ford V-8-60 all put together; it looks great and runs fine. Doug reported that after running for 1½ hours on the test stand, it has 20 pounds oil pressure at idle and 60 at 2,000 r.p.m., and the bark from the eight stubby little exhaust pipes portends some wonderful performance. In fact, you may have seen and heard

Doug's V-8 yourself, as he posted a 35-second film clip showing the engine running on YouTube on the internet, and several thousand guys have been able to see and hear it run. Search "Ford Flathead Hemi V8 60" and you can listen to that delicious rumble too.

But a hot little V-8 like this should not remain on a test stand forever. What's next for it? Doug envisions a little roadster, a "lakes modified" job on the order of the car built by Danny Sakai before the War, using late '20's Essex frame rails with a gentle "kick-up" at the rear, a '37 Ford tubular front axle and a Halibrand Quick-Change rear, Kinmont disc brakes and the obligatory '39 LaSalle grille in a custom-crafted nacelle. The body would consist of the front half of a late Model T touring car, narrowed so only the driver can sit in it. Everything would be period-correct for the age of the Ford V-8-60. Sounds like a pipe dream, but it isn't! Doug has all those parts on hand, and he's itching to put 'em all together. Let's hope he does!

Also on hand is a second set of Emi-Sul heads and another NOS V-8-60 block. Doug could build another one of these hot little V-8's, but he says that won't be any time soon. Whether he builds another such engine or not, there may be another one built soon by another well-known long-time V-8'er, Doug tells us. We'll have more about that, if, as and when it comes to pass. And elsewhere in the news, another member has turned up some rare survivors of the earliest Ford V-8-60 engines with four main bearings and only two exhaust ports on each side, as described in the last two issues of the *V-8 Times* for 2006. It's another fascinating story we'll have to cover in this magazine before long. It's really amazing that seventy years after the Ford V-8-60 went out of production, we're still piecing together the history of that engine, and hot-rodging V-8-60 specimens in imaginative ways. Well, it's all part of the fun of fooling around with old Ford V-8's! ☺