

BULLETIN:

Shell Research scientists reveal how they got 168.47 miles per gallon

One hundred and sixty-eight miles per gallon must be a world's record. Like most records, it could never have been achieved without the most painstaking effort.

The two Shell scientists who hold this record have given us a report on how they managed it. They have also added some tips on how you can increase your car's mileage. Not by using their own extreme modifications and outlandish techniques. But by a quiet marriage of careful driving and today's Super Shell gasoline.

Unless you are a millionaire, the details are worth reading.

SHELL scientists are a competitive lot. Their constant pursuit of top performance has all the elements of a race.

Some years ago, an argument as to who could get the most miles out of a gallon of gasoline boiled up into a challenge. And Shell's Mileage Marathon was born.

Shell scientists have competed in this Mileage Marathon for several years. Not as a publicity stunt. But purely as a private contest of ingenuity. They use their own cars. Their own time. Their own money.

Not for everyday use

The best mileage recorded so far is a resounding 168 miles per gallon.

Many of the things contestants did to push mileage up to this world record are positively not recommended for informal marathons on the public highway. But they do throw some light on what makes a little gasoline go a long way. Here are some details.

Record-breaking car cost \$35

Shell's record-breaking car was a highly modified 1924 2-passenger coupé (see cut). It was rescued from a junkyard for \$35.

The only rigid requirements that had to be met to qualify for the Mileage Marathon could be written on a book of matches.

The car had to have four rubber-tired wheels. It had to weigh no less than 2000 pounds. It had to have at least 100 cu. in. piston displacement. And it had to use the same gasoline that anybody could buy at a Shell service station, with no doctoring allowed.

After that, no holds were barred. The car that won used a standard carburetor from an old one-cylinder engine.

Tire pressures up to 110 pounds

Some Marathon contestants inflated their tires as high as 110 pounds per square inch to reduce road-wheel friction.

Such crazy pressures would, of course, be quite unsafe under normal road conditions—and hideously uncomfortable, too.

But, under Shell's carefully controlled Marathon safety rules, the only ill effects were a few rattled vertebrae, some broken

springs and an embarrassing bruise or two.

Pressure problems for the champs

Dave Berry and Fred Schuette, who eventually set the existing record, had to be satisfied with something less spectacular in the tire pressure department.

Their 1924 car's beat-up tires couldn't possibly take more than 50 pounds. And, even then, they felt more solid than pneumatic. But there was a helpful mileage dividend in the old, wood-spoked wheels.

They took tires that were nearly a yard in diameter. This moved the car forward an extraordinary 9½ feet at every revolution.

What's more, these ancient tires were worn so smooth that road friction was cut to a minimum. Other competitors achieved a similar result by buffing off their treads, till only the slimmest strip touched the road.

SAFETY NOTE FROM THE CHAMPS: Don't try buffing the tread off your own tires. You risk more than a puncture. It might mean a blow-out and a crash.

Muffled radiator and no fan

Many competitors went as far as to remove their engine's water pump and generator to save engine load. But Berry and Schuette grandly ignored this refinement.

However, they did remove their cooling fan to save energy. And they did muffle their radiator completely to save heat.

As anybody knows, all cars go better when properly warmed up. And, because our mileage champs used an "engine-off, engine-on" driving technique in the contest, they even designed a special exhaust-heated air duct that warmed the mixture as it was sucked into the carburetor.

Incidentally, did you know that fast warm-up is specially provided for in today's Super Shell? Its formula contains a gasoline ingredient called "Pentane Mix." This acts in your engine much as kindling acts in a log fire.

NET RESULT: Your car delivers top performance in a hurry.

One push and wheels spin for 30 minutes

Since the contest had nothing to do with



Shell Research scientists, Dave Berry and Fred Schuette, in the rebuilt 1924 coupé which set the world mileage record. Its original frontal area was reduced by about 75 per cent to cut down wind resistance. Shellzone® anti-freeze was

used as a coolant. And free-fitting aluminum alloy pistons were installed, each of which had only two piston rings to reduce friction. Special shock absorbers were the sole concession to comfort.

wear, many daring liberties were taken with lubrication systems.

On the winning car—the transmission and wheel bearings were lubricated with light engine oil instead of with heavy oil and grease, to reduce drag. It worked.

When the front wheels were jacked up and given an experimental push, they continued to spin for half an hour!

Of course, no Shell serviceman would ever approve of such liberties being taken with your own car's lubrication. And he would be right.

A Marathon car is a Marathon car. And nobody minds if it breaks down after it wins. But your family car is a different matter.

Trust your Shell serviceman's advice on all lubrication problems. He's an expert—and he's got the finest tools, charts, lubricants and gasoline to give your car the maximum mileage it was designed to deliver.

The champs' "on-and-off" driving

Shell's record was set in two trips over an 11.94 mile course. The run was almost a walk.

The winning car was accelerated to 20 miles per hour, at which point the driver cut his engine and coasted in neutral.

Only when the "speed" dropped below 5 miles per hour was the engine restarted and the cycle repeated. All acceleration was done in high gear and at nearly full throttle. There was little choice. All other gears were removed prior to the contest.

Serious—or scientific fun?

You already know the result of all this eccentric tinkering and mad-hatter driving.

But, since "on-and-off" driving is illegal on the public road—and since most Marathon modifications are positively dangerous for normal use—you may be wondering if Shell's Mileage Marathon has any point.

Is it a serious test? Or is it a piece of semi-

scientific fun that is just an excuse for a picnic? The answer is—a bit of both.

Knowledge passed on

When Marathon Day rolls around at Shell, there is certainly a picnic atmosphere at the testing grounds.

The somewhat bizarre parade of vehicles—coughing and jerking and puffing around the track has a Mack Sennett quality about it. You expect the Keystone Cops to arrive at any minute.

But remember that the Marathon itself is only a climax to months, and sometimes years, of serious and ingenious work. Not everybody sets a world record. But every contestant learns a little more about the care and feeding of automobiles. Which, after all, is Shell's main job.

Eventually, every bit of this knowledge—whether it comes from the Marathon, the workshop, or the lab—is passed on to you in the form of better and better products.

Today's Super Shell is a shining example. Thanks to continuous engine studies and mileage tests, Super Shell now contains a special mileage booster called Platformate.

Among Platformate's extraordinary super-energy components are benzene, toluene and xylene. These three components alone release 11 per cent more energy per gallon than the finest 100-octane aviation gasoline.

The lesson is obvious. The first thing you do to get extra mileage from your own car is to put extra energy into your fuel tank, by using today's Super Shell. Then, if you want to boost mileage even more, take these tips from Shell's experts.

Seven tips that save gasoline

1. Don't race your engine when stationary. Every revolution is pure waste unless it is taking you somewhere.
2. Avoid jack rabbit starts. In the long run,

they waste gallons of gasoline by holding automatic transmissions in low gear too long.

3. Drive at moderate speeds. Your car uses about 40 per cent more gasoline at 60 mph than at 35 mph.

4. Keep an even speed. Ragged driving uses fuel without using the power it generates.

5. Pace yourself to traffic. Don't be the fastest or the slowest. It traps you into wasteful spurts and slowdowns.

6. Keep tires up to their proper pressures. Soft tires soak up power the way a blotter soaks up ink.

7. Get your Shell man to make these checks. Your carburetor should be adjusted periodically. Spark timing should be correct. Fuel filters and air cleaner should be clean. Brakes should be properly adjusted. And your thermostat must be in working order.

Follow these simple rules—and you'll probably be surprised at the extra mileage you get with today's Super Shell.

Many car-owners report up to 30 extra miles per tankful. We can't guarantee this saving. But, unless you're a millionaire, it's worth thinking about.



A BULLETIN FROM SHELL RESEARCH—where 1,997 scientists are working to make your car go better and better.