

POPULAR SCIENCE

The background of the cover is a photograph of St. Basil's Cathedral in Moscow, with its colorful, onion-shaped domes. In the foreground, a light green station wagon is parked on a cobblestone street. A man is visible in the driver's seat. The license plate of the car reads '17368'.

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Inside Russia by Car

*Firsthand report by a
Popular Science editor
in a U. S. station wagon*

15 NEW COLOR PHOTOS

Next: TV Satellite

to Spy on World

*Just overhauled by the town's new mechanic,
Stafford's car was stone-cold dead at the market*

SU



Gus Gives a Competitor the Business

By Martin Bunn

WALT SOMMERS, the local plumber, was jubilant when he telephoned Gus Wilson at the Model Garage, to inform him that Oliver Stafford required his services. Stafford was out at the new shopping center, which had sprung up in the suburbs like a mushroom in lush soil.

"I warned Stafford not to have his car overhauled by a Johnny-come-lately like Paul Ryberg," Walt crowed. "I tried to get him to take his work to you, but he wouldn't listen. Now his newly overhauled motor is out here on the shopping-center parking lot, stuck tighter'n a glacier in Alaska. Get out here fast, Gus, and take over."

"It seems to me," Gus said, "that the man to call is the fellow who did the

overhaul. Why don't you give him a ring?"

"Are you nuts, Gus?" Sommers inquired. "You've been in the garage business around here for years and now these newcomers like Ryberg are out to cut your throat. This is your chance to show Ryberg up."

"What have you got against this man?" Gus asked the plumber.

"Nothing," Sommers said. "Absolutely nothing. I hardly know him. But with all this new building in the suburbs, it's up to us old-timers to hang together. I'm a plumber and you're a mechanic. If we don't work together to beat down new competition, we're sunk."

"If Paul Ryberg did Stafford's overhaul," Gus insisted, "he's the man to call in on this."

"That's just it," Sommers said exultantly. "Ryberg's away on vacation. Any-



Gus began to remove the spark plugs. Nothing happened until he took out the third one.

way, Stafford's so mad about this now that he wouldn't call him if he could. In fact, he asked me to call you."

"In that case," Gus agreed, "I'll be right out."

WHEN Gus arrived at the shopping center he found that Stafford's stalled car was attracting considerable attention. People going in and out of the various stores were stopping to ask questions and offer advice. It occurred to Gus that if Paul Ryberg's overhaul job had indeed gone sour, he was in for a lot of bad publicity. On the other hand, the

Model Garage, coming to the rescue in Ryberg's absence, stood to gain favorable attention.

Walt Sommers smiled as Gus approached with his tool kit. "Here comes the fellow I wanted you to give your work to, Stafford. Gus, this is Oliver Stafford, one of our newcomers."

"Glad to meet you, Stafford," Gus said as he put down his kit. "Walt phoned me that you were having trouble."

"That's right." Stafford's eyes held a glint of exasperation. "I had Ryberg do a complete overhaul—valves, rings, bearings, everything. And now, in less than

a hundred miles, my motor gets hot and sticks. The starter won't budge it."

"You say that the motor got hot?" Gus asked.

"Yes. I noticed that the heat gauge was in the red when I parked, but I sort of expected this with a tight motor. But I didn't expect the engine to be stuck tight when I came out from shopping."

"Maybe it isn't," Gus said. "Perhaps the starter gear is locked in the flywheel ring gear. I'll take a look."

Gus pulled the starter and found it free. With the ring-gear teeth exposed, he tried to turn the motor by prying against the teeth with a bar. But the motor was, indeed, so tight that it was impossible to budge it. As he straightened from replacing the starter, he found himself ringed by curious shoppers.

He smiled to himself when he heard one of them say, "So that's Gus Wilson, eh? I've heard he's a whiz."

Gus turned to Stafford. "You say the heat gauge was in the red when you parked? Modern engines don't usually heat up that much on an overhaul."

Walt Sommers spoke up loudly: "It depends who has worked on them. If you don't know your business, anything can happen."

GUS raised the hood, removed the radiator cap, peered inside.

"Hmm," he grunted. "Water's awfully low."

He got down on his knees, peering under the car, looking for leaks. Seeing none, he began to remove the spark plugs. Nothing happened—until he removed the third plug on the six-cylinder head. As he took out this plug, water spouted high as though under pressure.

"She'll turn over now," Gus said, wiping moisture from his leathery features. "You must have a leaky head gasket."

"Leaky head gasket!" Stafford exclaimed. "But how would that make the motor stick so it wouldn't turn over?"

"When you parked your car," Gus explained, "number three cylinder was about to come up on the compression stroke. It filled with water, probably from a leaky head gasket, while you were in shopping. When you tried to start the car, the piston moved up against the water. With a well-fitted set of rings and a perfect valve grind, so that the water

couldn't escape, it would act about the same as a cylinder full of cement. Ryberg must have done a good job on those rings and valves."

Stafford grunted. "And how about the water in my cylinder?"

"It sounds like a faulty head gasket," Gus repeated.

"Yeah," Walt Sommers commented. "Maybe Ryberg just forgot to tighten the head bolts."

As Gus turned, planning to fetch his tow car and take the car into the shop, his eyes met the interested and curious gaze of the ring of spectators, mostly new faces to the area. He hesitated, then stooped to pick up his long-handled torque wrench.

"It's possible," he said thoughtfully. "Let's see."

He began to run the torque wrench over the head bolts, testing them for tightness. The center bolt of the middle row turned easily under his hand and lifted. Gus took it out. It was broken off.

"Hah," Walt Sommers said. "Some of these young, inexperienced bucks don't know their strength. Ryberg twisted that head bolt right off."

"Maybe, but not probable," Gus said, taking his flashlight and peering down in the hole the broken bolt had come from. "The stub end of this bolt shows a rust streak through the metal that indicates a flaw. I'd better tow you in to the shop, Stafford."

IN THE Model Garage, Gus faced the tricky job of removing the broken stub of the bolt from the cylinder block.

"How on earth will you get that out?" Stafford wanted to know.

"The usual way," Gus told him, "is to drill a hole through it and then screw in a reverse-threaded tool made of steel hard enough to cut into the broken stub and remove it. The only trouble with that method is that if you drill too large a hole in the broken end of the bolt, the tool will bulge the skeleton of the bolt and lock it in the cylinder-head threads. If you drill too small a hole you have to use too small a reverse-threaded tool to stand the strain of taking out a rusted-in head bolt. If you break the tool off you're really in a jam, since it is made of steel too hard to be drilled."

"Then how do you get it out?" Stafford

asked. "It seems like an impossible job."

Gus grinned.

"If a man's hand is steady enough," he said, "he drills a perfectly aligned hole down through the broken bolt end, just a hair smaller than the bolt. The remaining portion of the bolt is then so thin-walled that you can break it away from the cylinder-head threads with a fine chisel. Then you can take it out with the end of a rat-tailed file."

"You sure know your business, Wilson," Stafford said as he watched Gus delicately remove the broken stud bolt

Stafford spoke thoughtfully: "It seems to me that you are either a very square guy, Wilson, or you don't want any more business."

"I want all the business I can get," Gus told him, "but not by digging at a competitor's reputation. I wouldn't know Paul Ryberg if I met him face to face, but I do know the bad publicity a thing like this could bring him in a new community. It could put him out of business."

Stafford countered, "And give you more business."

"Probably," Gus said. "For a while.

But this area is growing so fast that we need all the skilled help we can get. Folks expect services when they move to a new place, and if they don't get them that place stops growing. In the long run, putting the skids under a fellow like Ryberg would cause me and everyone else in the community to lose. The way I see it, his coming here is progress."

"I guess it is, at that," Stafford conceded. "If folks who move here don't get the services, they'll stop coming. Maybe Sommers didn't think of that. By the way, I hear Paul Ryberg's brother is coming, too, to open a shop in town."

"You don't say," Gus said. "Do you know what line he's in?"

"Yes, let's see—Ryberg told me." Stafford's eyes suddenly widened as they met Gus's. "Come to think of it—his brother is a plumber."

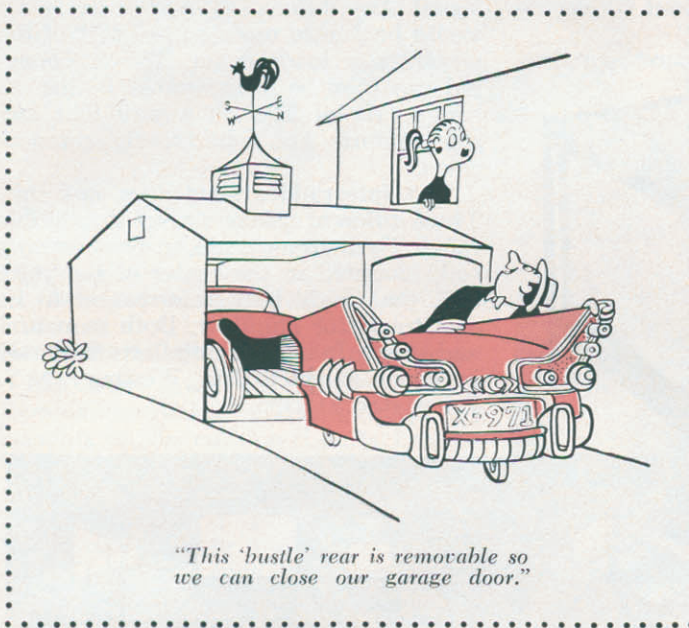
"I see," Gus said, and he did see very clearly.

He drained Stafford's car of oil, to make sure there was no water in the oil pan, and set about installing a new head-bolt stud and gasket.

As he worked, his mind drifted to Walt Sommers. Some folks, he thought, are scared of progress when it starts getting close.

END

Next Month: Gus does it by the numbers.



from the cylinder head. "Walt Sommers warned me that Johnny-come-latelies are dangerous, in plumbing or in auto repair. I should have given you my work."

"I'd have been happy to have it," Gus said. "But it seems to me that Ryberg did a good job. My torque wrench showed that the rest of the head studs were tightened to 60 foot-pounds, as the factory specifications for this car recommend. Ryberg would hardly bear down on this one bolt and break it off. Since we know from the rust streak through the metal at the break that there was a flaw in that stud, which Ryberg couldn't have known about or prevented, I hardly see where he can be blamed."