## Popular Science

MONTHLY

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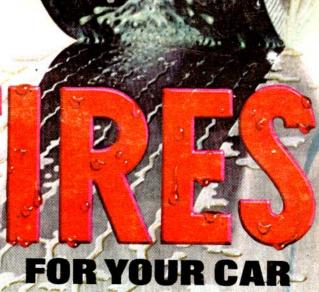
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In-Depth Report to

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Gus Cools Off a Double Boiler

It was the twins vs. their husbands in the rally—and both teams were in hot water. Could Gus turn off the heat?

By MARTIN BUNN

t was the first warm Saturday of spring. Gus Wilson was enjoying the weather and idly eyeing his assistant Stan Hicks—energetically swabbing the windows of the Model Garage—when the Triumph came in.

With a distinctive brrrrrp as it was smartly downshifted, the TR-3 roadster zipped past the gas pumps toward the wide doorway.

What caught Stan's eye were two very blonde young ladies in identical snugfitting sweaters and slacks who popped out of the little car and headed for Gus.

"This might be double trouble," Gus said with a grin, as he indicated with a pointed finger that Stan should stick with the windows, "but I'll handle it."

He'd recognized the girls—the vivacious Griffin twins, both married now.

"Oh, Mr. Wilson, you've just got to help us," the twin who'd been driving pleaded as she brushed aside windblown hair to reveal a concerned but strikingly pretty face.

"What we mean is, how can we possibly enter the rally tomorrow with this stupid thing heating up this way?" the other twin asked.

"Okay, girls," Gus said, "one of you tell the story."

"All right . . . I'm Chris—she's Carol. My husband, Bob Fletcher, bought this TR-3 so the four of us could take part in all the rallies this season. Carol and I were going to enter this car, while Bob and Mike Lanfair—Carol's husband—will

be entering Mike Lanfair's Oldsmobile."

"The TR-3 is a classic, and it looks like you got yourselves a sharp one," Gus observed.

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"Mr. Wilson," Carol said,

wagging an accusing fin-

ger under Gus's nose,

'you just don't know what

"Maybe. But we're just furious with this car—and Bob! We think he bugged it. Or won't fix it, on purpose." Chris's long lashes flew upward as her eyes widened. "I mean, how can we concentrate on speed, time, instructions, unknown checkpoints, and all that in the rally tomorrow if we have to worry about a nutty heat gauge that keeps bouncing back and forth like a yo-yo?"

Gus knew Chris's young husband, Bob Fletcher, a mild-mannered test technician with a local electronics firm. Gus re-





called he'd stopped in just a few days before to buy some wheel bearings and seals for a do-it-yourself repair. Sidling around the girls, Gus opened the hood and looked in on the little four-cylinder engine for any obvious signs of trouble.

"I can't imagine Bob deliberately doing what you say he has," said Gus.

"Mr. Wilson," Carol said, wagging an accusing finger under Gus's nose, "you just don't know what Bob and that awful husband of mine would do to beat us in that rally!"

Gus avoided escalating the argument that was obviously brewing. The engine did not appear to be overheated. It showed signs of recent care. A look in the

radiator showed clear, fresh antifreeze, and no traces of scum or rust that could be the tip-off to a clogged cooling system. The nonelectric capillary-tube-type temperature indicator appeared sound at first glance.

"The heat gauge goes up and down, up and down." Carol Lanfair's brown eyes narrowed. "Bob says he checked it and it worked perfectly. Maybe he did, but I don't think it acted this way when he bought it a week ago."

"Why don't you let me drive you girls home? I can see how it acts, and talk to Bob. No use checking anything he al-

ready has."

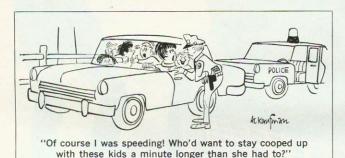
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"Oh no-they think we went to the grocery!" Carol pleaded, then reversed herself. "No, by golly, we'll show 'em. Come on, Mr. Wilson!"

Gus shoehorned himself into the small car, relegating one twin to the cramped, rear bench. Through the gears, and they were gone.

"Talk about the privileges of rank. Two blondes, a sporty roadster, and a spring morning," Stan muttered, as he tossed his sponge into the bucket.

The trip confirmed the twins' story. Gus agreed the heat indicator would be distracting for hours of gauge watching.



Identical twins couldn't have picked more unlike mates, Gus observed as they wheeled into the drive at the Lanfair home. Carol's Mike was lanky, blond, and sharp-featured. Chris's Bob was pudgy, dark, and round-faced. The only similarity was their grimy shirts and hands, and their dumbfounded expressions as they backed away from a sporty '64 Olds in the drive and stared at the arriving entourage.

"Gus Wilson, what the heck are you

doing here?" Bob asked uneasily.

"Never you mind, Mister Fletcher," Chris snapped. "He's going to fix the car so we'll have a fair chance of beating you two connivers in the rally!"

"But . . . but," Bob searched carefully for the proper words, "honey, that gauge acting up wouldn't hurt anything. Honestly, I didn't bug the car on you."

"Well! How would you like it if one of your instruments at work flopped around while you were making an important test?" Chris inquired acidly.

"Okay, okay," Bob agreed. "Let Gus

have a go at fixing the Triumph. Right now we've got our hands full with the Olds. You think you've got troubles with a heat gauge? We won't have a chance in the rally. This speedometer is all screwy —acts like it's slipping or something."

Peering into the Olds, Gus saw that the men had shot lube into the top end of the cable.

"That speedometer was rebuilt and calibrated only a few months ago," muttered Mike. "It can't be havwire."

"Hah," Carol gloated, "now maybe we have an even handicap for the rally." "Look, everybody," Gus suggested.

> "Let's concentrate on fixing both these handicaps before tomorrow's rally."

> The tension eased as Gus got Bob involved in telling just what he'd done in checking out the secondhand TR-3.

"Last week, after I'd bought the car, I went over everything I could without a service manual. You know -points, plugs, lube job, and all. I checked the hoses, flushed the radiator, put in

new antifreeze, everything. Gus, that cooling system is as clean as a whistle. Oh yes, I put in a new thermostat, too."

"Was the old one shot?" asked Gus. "Nope, there wasn't one in it."

"Well, that will give me a start," Gus said. "I'll take it to the shop and see what I can find. Now, about the Olds. Didn't you buy parts from me for a wheel-bearing job on it a few days ago?"

"Sure did." Bob agreed.

"Funny, too," said Mike, "it was only when we took it for a road test, after installing them this morning, that we noticed the speedometer problem."

Gus chuckled. "I suspected that, and I think I know what's wrong. Your car has a speedometer driven off the left front wheel instead of the transmission, like most. The cable goes through a hollow wheel spindle. The square end of the cable engages a square hole on a stand inside of the bearing dust cap."

"Yeah." Mike Lanfair's blue eyes lit up. "I remember seeing that."

"You just may have cocked the dust

cap slightly, allowing the drive lug to not fully engage. That could cause the slippage," Gus went on. "Check it out."

Driving back to the Model Garage, Gus watched the pulsating heat gauge. He thumped the glass in case the mechanism was bound up—to no avail. One thing puzzled him: Why was there no thermostat in the car when Bob bought it?

The first thing Gus did was drain the radiator and remove the temperature bulb from the side of the little cast-aluminum water-outlet elbow fastened between the front of the cylinder head and the short top radiator hose. He wanted to double-check Bob's report on the gauge. Alternately dipping the bulb in hot and cold water confirmed that the gauge worked.

"If the gauge is okay, and the cooling system is clean, what can it be but a bum thermostat," Gus asked himself. Even a new thermostat could be defective.

Quickly Gus removed the bolts holding the flanged front end of the elbow to a similarly flanged hose adapter. He knew he also had to unbolt the rear end of the elbow from the head to get at the stat, because the very short hose and the body edge directly over the flanged joint allowed no room for maneuvering. Lifting the elbow from the head exposed the shiny top of a brand-new thermostat—and an older thermostat in its proper place at the front of the elbow.

"Hey Gus, you were right about the Olds," Bob shouted as he and Mike strode into the Model Garage. "Old bearpaw Mike here didn't put the dust cap on quite straight. How are you coming?"

"You fellows have double trouble," Gus said bluntly.

"Gee, Gus, we're sorry about how the twins acted today-real crazy."

"I'll agree they're pretty wild, but I didn't mean that. You've got double thermostat trouble." He held out the twin thermostats to the speechless pair.

"It looks as though in your efforts to bring the car up to snuff you fellows didn't see the front flange of the outlet elbow. You loosened the back end from the head and assumed there was no thermostat. It'd be an easy mistake. Here's where it belongs," Gus pointed out, "between the flanges, at the front end, ahead of the temperature bulb."

"So that caused the trouble!"

"The way I figure it," Gus explained, "the rear thermostat opened, filling the elbow. The heat went up, the front stat opened. About then, cooler water came in from the block, temperature went down, then rose... over and over again."

Monday morning, Gus was checking the newspaper to see how the quartet had fared in the rally when the phone rang.

"Gus?" It was Bob Fletcher. "Would you like to come over to our place this evening? The Fletchers and the Lanfairs are having a little victory dinner."

"You won?"

"Well, not exactly. The twins won third place in their class; Mike and I took fourth in ours. But we all think it was kind of a family victory. You got us out of hot water, and we'd like to show our appreciation."

"Sounds like nobody will be eating crow," Gus said. "I'll be there."



## "Pickup truck" cleans the road

Ever wish you had a magnet on the bumper of your car? In Kentucky, you don't need one. This magnet-equipped



truck operated by the Highway Department picks up nails, beer cans, and other metallic hazards to tires as it travels along. Photo at the right shows what it collected on one 50-mile trip from Louisville to Frankfort.