SEPTEMBER 1966 35 CENTS

Popular Science

MONTHLY

Which Oil Is Best for Your Car?

Neglected Treasures of the Sea
By JOHN STEINBECK

600- Jet
Hove r

- 7 Way e
- Mario Andretti Tests New Tires

Gus Cools Off a

Dan Doble wasn't having any of Gus's advice in the morning, but come the afternoon . . .

By MARTIN BUNN

Driving up to the toll booth after answering a turnpike emergency call, Gus Wilson slowed to show the attendant his pass. Instead of waving him on, the man signaled for a full stop.

"Wanted to tell you to look for a stalled Ford convertible, about three miles south," he said. "It's got a help sign out."

"Thanks. I'll be watching for it," replied Gus, putting the Model Garage tow truck in motion.

It was an Indian summer day. Smells of warm earth and hay drifted in through the open cab windows. Three miles slid by before Gus saw the car, in the depressed mall between the roadways. Its hood was up. A handkerchief drooped from a door handle.

Switching on all blinkers, Gus watched the following traffic as he eased into the fast lane and onto the grass. He stopped behind the car, a '65 Ford with a dealer's plate. Gus recognized the driver. A tall man with a paunch and a large nose, he was Dan Doble, a local Rambler agent.

"Didn't expect *you*, Wilson," said Doble.

The can slipped, splashing Doble with water. "You ought to have a spout for this can," he said. "I have," said Gus.

ILLUSTRATION BY RAY QUIGLEY

Hothead

"And I don't need a tow. Just some water for the radiator."

"Sure," said Gus. He hauled out the five-gallon can he carried on the truck.

"Here, I'll do it," said Doble, seizing the can. He twisted off the screw top and tilted the can over the radiator.

"Come far?" asked Gus.

"Far enough. Delivered a new car near Batesville. This is the trade-in."

The can slipped, splashing Doble before he could control it.

"Blast it! These are new slacks. You ought to have a spout for this can."

"I have," said Gus, showing it in his hand. "You didn't let me put it on."

Muttering, Doble set the can down and stepped back. Gus screwed on the flexible spout and resumed filling the radiator.

"Water's real low," he remarked. "Did it blow out when you took off the cap?"

"Like a geyser," growled Doble. "But I had to let off steam to cool it down."

Gus shook his head. "Unless you have water handy, it's best to leave the cap on when a car boils. If you take it off, a lot of what water's left may gush out."

"I'm a businessman," said Doble sourly, "not a smart-aleck mechanic."

Gus held annoyance in check. He guessed Doble was still smarting because, as a school-board member, Doble had opposed a budget boost for the high-school auto shop—a boost that went through largely on Gus's recommendation.

Water welled up in the filler neck. Lowering the can, Gus inspected the radiator cap and tested its spring action. As he bent to look at the neck flanges, Doble snatched the cap from him and put it on.

"Haven't got time to fool around. Send your bill for the service."

"Okay. Want a tip that may save you trouble when you resell this car?"

"Ain't going to have any trouble," said Doble stubbornly. "It runs fine."

Doble didn't pass the truck on the way back. Near the Doble Motors agency, though, Gus was stopped briefly by a traffic light. At the curb before the showroom stood a 1962 six-cylinder Rambler sedan—clean but bearing signs on yellow cardboard cut in the shape of lemons.

"THE MIRACLE CAR—IT'S A MIRACLE IF IT STARTS," read one.

"AFTER DOBLE'S $32 TUNE-UP, I DO EVERYTHING BUT RUN," stated a second.

"THE SERVICE IS GREAT—WHILE THE WARRANTY LASTS," was the parting shot.

Maybe, reflected Gus, Doble's grouch wasn't all due to the school dispute.

About to leave for lunch two hours later, Gus found the Model Garage door blocked by the Ford he'd serviced on the turnpike. Doble got out.

"Thought I'd come pay that bill and save you the trouble of mailing it."

"Fine," said Gus, "I'll make it out."

"By the way," remarked Doble. "What did you want to tell me about this car?"

Gus grinned. "Didn't your boys spot it?"

"My shop manager said you must have thought the system didn't hold pressure,

Continued

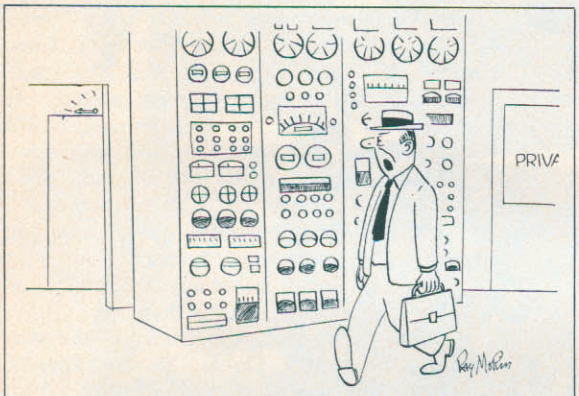
whatever that means. It's Greek to me."

"It means overheating. Open to the air, water boils at 212 degrees. Put a lid on it, with a safety valve set at 14 pounds, and it won't boil until it's over 235 degrees. That way you can use a smaller radiator to cool today's big engines. But if the pressure leaks off, the water boils away at a lower temperature. That's what happened to you."

"My shop manager says no. He put a gauge on the radiator neck and pumped in air. The system held pressure fine."

Gus flung back the hood.

"If your boys would read the competition's service bulletins, they'd have seen a



"Good night, know-it-all!"

note about this. The hose fitting used in the Ford assembly plants to fill radiators last year sometimes bent up these neck flanges, or cam-lock ramps. Then they don't hold the cap down all the way, and pressure leaks off. That gauge your man put on clamps down tight for testing, so it held pressure, though the cap didn't. I'll bend these flanges back down where they belong."

Gus busied himself briefly with pliers, then dropped the hood.

"Guess you really did save me trouble," remarked Doble, paying the bill. "With that car parked in front of my place, I don't need any more. It's got customers running like scared rabbits."

"What's the owner's beef?" asked Gus.

"He didn't buy that car from me, but I checked back. Almost from the day he bought it, it's been hard to start. He burned up two starters by overcranking. He's had almost the whole ignition system replaced piece by piece, besides a new fuel pump and a new battery.

"Last year he put in 52 emergency calls to his auto club. For two years he's been hounding our dealerships with signs on the car, because they can't get it running right. Now it's my turn."

"What work did you do on it?"

Doble brought out a small notebook.

"When he brought us the car, it was barely crawling. We put in new plugs, points, another fuel pump, some new plug wires, and a condenser. Checked the timing, spark advance, compression, fuel line, and filter. Solvent-soaked the carb and installed new kit. Checked float for leaks and set float level. It ran okay when we delivered it, but this morning there he was with those yellow signs."

"Okay," put in Gus. "I'll look at it."

Doble went to the door and waved an arm. A mechanic drove in the lemon-placarded car.

It stood for an hour before Gus could turn his attention to it. When he did turn the key, the starter ground with no response.

Considering the ignition work recently done, Gus thought fuel was probably the missing essential. He removed the air cleaner and got a little gas in a can. While his helper, Stan Hicks, cranked the engine, Gus dribbled a little down the carburetor throat. The engine roared—and died.

Removing three screws on top of the single-barrel carb, Gus withdrew the economizer assembly. Into the opening he lowered a pocket scale. It came out dry.

Taking off four clamps and a clamp ring, Gus drew off the side-mounted carburetor bowl. No gas ran out, but as the bowl nudged the float, fuel squirted from the inlet valve under pressure from the pump.

Lifting the float with a finger, Gus felt a hollow in its underside. Unless the dent leaked—and Doble's mechanic had checked that—it shouldn't matter. He'd checked the float setting, too, and as this should be done with the carburetor upside down, Gus decided to accept it for the moment. Gently he worked the float sidewise. The hinge was loose.

Disconnecting the fuel line and inlet

Continued

fittings, Gus withdrew the bracket with the needle valve and float. He slid the shaft out, removed the float, and set aside the spring, plunger, and needle valve.

The float tab that lifted the plunger was free of scoring or grooves that might cause it to stick. But the dent in the float was bigger than he had thought. It cocked the float body slightly in relation to the tab, and that *might* mean something.

Carefully Gus pinched the hinge lugs until they worked freely without excessive side play. Putting back the valve parts, he reinstalled the float. Then he bent the tab down very slightly.

With the carburetor reassembled and the gas line reconnected, Gus turned the key. The engine spun twice, then caught with enthusiasm. Gus drove the car out. A road test showed no fault. Back in the shop, Gus again removed the economizer. The fuel level was 11/16 inch below the top, just where specs said it should be.

At closing time Doble returned. With him was a tall man.

"This is Mr. Rawlins, who owns the car," said Doble. "Did you find anything?"

"Try it, Mr. Rawlins," said Gus.

The engine caught instantly when Rawlins turned the key. His lips thinned.

"Could be a fluke," he remarked.

"The fluke was a dent in the carburetor float," said Gus, "that changed the angle between the float and the tab that works the valve. Probably not Rambler's fault at all—the same carb is on Ford-built sixes. A float-setting gauge, being read against the float body, couldn't show that misalignment, which kept the fuel level way too low.

"The float hinge was loose, too. That may be why the trouble was intermittent. Shifted sidewise, maybe the float hung up somewhere before it opened the valve. Could also be that somebody, bending the tab to set the float to a gauge, put a side slope on it. Shifting on the sloppy hinge, the tab might let the valve open up okay on its low side but keep it closed down on the high side."

"In that case, how did it ever get started at all?" asked Rawlins.

"Cranking, or getting in and out, might eventually jiggle the float down. Fast cranking, or pushing the car, could build up enough fuel pressure to force some past the valve—it's lightly spring-loaded. But the fuel level was always low, so it evaporated completely after the engine was stopped in warm weather. If the float hung up then, no gas could get in for starting."

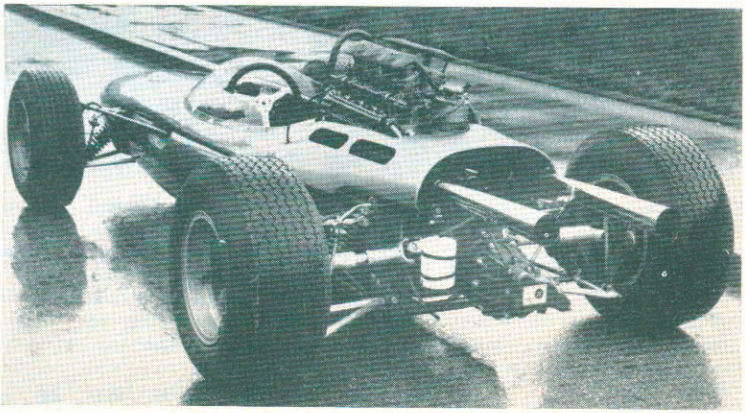
Rawlins suddenly smiled. "It really was a miracle that it ran at all!"

"You're batting good, Wilson," said Doble. "You were right about the Ford, too—we wrung it out on the pike to make sure. I may as well say you were also right about that increased budget for the high-school auto shop."

"What makes you think so at this late date?"

"After today," said Doble, "I'm willing to admit we need more trained mechanics like Gus Wilson." PS

Offbeat racing car built by BMW



The new car that BMW has been testing this summer doesn't fit any racing regulations—it's purely an experimental car with a BMW engine in a Brabham chassis. The four-cylinder overhead-cam engine is based on the 120-hp. unit used in the BMW 2000 sedan and puts out 260 hp. The racing car's cylinder head has four valves per cylinder. Displacement is 121 cu. in., while Grand Prix Formula One allows 181.5 and Formula Two 95.6. If BMW reduces engine size, it can compete in F-2.