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GUS TELLS How to Stop Brake Chatter

"GOOD grief! Now I'm in for it," groaned Joe Clark, as he glanced out of the window of the tiny office of the Model Garage. A small sedan was just pulling up in front of the establishment, to the accompaniment of a most unpleasant chattering noise.

Gus Wilson, his partner and the mechanic of the firm, was out on a job with the service car, so Joe tossed aside his pencil and went out to see what he could do for the tall, angular woman who was climbing out of the sedan.

"Howdy, Miss Simpkins. Some little trouble we can fix for you today?" Joe saluted her with a hopeful smile.

"Where's Mr. Wilson?" the customer snapped, glaring at Joe. "I want to give him a piece of my mind! You swindlers relined the brakes on this car only three months ago, and now see how it acts! What kind of brake lining did you use—pasteboard? Every time I put my foot on the brake, the car starts to shake and chatter. It's making me a nervous wreck. I want it fixed *right now*, and I don't expect to pay for your time, either!"

"We'll do that gladly, Miss Simpkins," Joe agreed, hastily. "We guarantee all work. Probably a bit of grease has worked into the linings; something like that. I'll see to it right away."

Joe cast a despairing look down the road to see if by any chance Gus was return-

ing. As there was no sign of the service car, he went inside for a kit of tools.

"Just my luck to have that eagle-eyed old hen on my neck the minute Gus gets out of sight," he grumbled disgustedly, as he grabbed the tool kit and a small can into which he could draw some gasoline to wash out the grease he suspected was causing the trouble.

He had Miss Simpkins start and stop in front of the garage a couple of times. Each time she put on the brake, a most alarming noise broke out and continued almost until the car had reached a complete stop.

"Now I'll have a look at those brakes," he said, wheeling the garage jack under the front axle and lifting both wheels off the ground. There seemed to be no doubt that the chattering noise was coming from the front end of the car.

Miss Simpkins promptly climbed out and came around to watch the job. This didn't improve matters for Joe. A bit clumsy with tools at best, the little book-keeper found all his fingers turning to thumbs under this distinctly hostile scrutiny. However, he kept at it until both front wheels and the hubs were off. No trace of grease appeared on the brake facing of either wheel.

"There! I just knew it would turn out you were wrong," Miss Simpkins observed triumphantly. "Anybody should know that slippery grease couldn't make anything stick and chatter."

As science teacher in the local high school, Miss Simpkins prided herself on her mechanical knowledge.

Joe admitted his error and proceeded to stall along with a minute examination of the brake surface while he racked his brain trying to figure out what could really be the matter.

He was just at the point of admitting he was stumped, when, to his intense relief, he heard the familiar rattle of the old service car, and Gus drove up.

There was a twinkle in the veteran auto mechanic's eye as he took in the situation. He promptly came to his partner's rescue.

"Having trouble with that brake job we did for you, Miss Simpkins?" he asked with a smile. "I see Joe is well along with it." He turned to his partner with a wink. "Mr. Thomas wants you to call him at once. I'll finish this."

JOE took the hint and headed for the office, after explaining to Gus what the symptoms were.

"Chattering brakes are not very common these days, Miss Simpkins," Gus remarked, as he tested for play in one of the brake connections. "Grease can do it, sometimes. A greasy brake shoe may act like a rubber heel on wet pavement. The heel holds all right till it starts to slip, but once it starts, the water forms a cushion under it and you slide like you would on ice. If the brake-drum surface happens to be a (Continued on page 108)

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HOW TO STOP BRAKE CHATTER

(Continued from page 56)

little uneven, a greasy brake facing may slip and catch again and start a vibration. Of course the usual effect of grease in a brake is just to make it not hold at all."

"That may be so", Miss Simpkins admitted. "In fact, I can see how it would work like that under certain conditions if grease got in the brakes, but there isn't a speck of grease on these brakes. *Anybody* can see that."

"So that can't be the trouble in this case," Gus smiled. "But if you look closely, you can see something is wrong. Can you spot it?"

THE science teacher adjusted her spectacles and peered closely at first one brake facing and then the other. "The only thing I notice, is that one is a lot shinier than the other. Is that what you mean?"

"Yes, that's it," replied Gus. "When a brake facing gets that particular kind of a shine on it, we call it glazed, and it doesn't hold nearly as well."

"I can understand that," said Miss Simpkins, interestedly. "Science teaches that friction depends on the kind of surface as well as on the pressure, and a shiny surface should slip more easily than a rough one. But how did that make the brakes chatter, and what causes the glazing?"

"I'm pretty sure it had nothing to do with the chatter in this case," Gus replied. "As to what causes brake linings to glaze, it's one of those troubles nobody is any too sure about. They do it now and then for no reason that you can see."

"One thing is sure," Gus continued, as he remounted the wheel, "and that is, when you have adjusted all the brakes so that they're as tight as you can get 'em but still are free when there is no pressure on the brake pedal, and yet one brake doesn't hold when you put on the brakes, take a look at the brake lining. It's almost sure to be either grease or glazing—unless, of course, the lining is worn out."

"Why couldn't there be something the matter with the levers that work the brakes?" the teacher asked, her frown forgotten in the search for more knowledge.

"Suppose they're hydraulic brakes?" Gus countered. "You know that fluid pressure must be the same in all connected parts of the system unless something has actually jammed in one of the brakes—and that's mighty unlikely."

"But this car hasn't hydraulic brakes," Miss Simpkins objected. "Surely, with all those levers, one might get out of adjustment and pull harder on one brake than on another, mightn't it?"

"The equalizers prevent that," said Gus, looking up from the front of the car, where he was tightening some bolts. "When you push down the brake pedal, the force is applied to the middle of a bar, and the brakes are hooked to the ends so the pull on all the brakes is bound to be the same. So, no matter whether it's hydraulic or mechanical brakes, if one wheel doesn't do any work when you stop, always look first for the trouble in the brake itself. As a matter of fact, you hardly ever get brakes so they're exactly the same on both sides of the car no matter how even the pressure may be. There's sure to be little differences in the surfaces of the brake linings or the drums."

"**WOULDN'T** it be possible to fix things so you could adjust the relative pull applied to each brake to suit its own peculiarities?" Miss Simpkins suggested.

"Gosh!" Gus laughed as he shifted his wrench to the other hand. "That would be a sure-enough headache for the brake-service man. Besides, there'd be no use in doing anything like that. As brakes wear, they keep

changing. One day, they'll be perfect. A few days later, say, after a long trip, you'll find that one rear brake is a bit stronger than the other. In a week or so, you may find that the strong brake has shifted to the other side for no reason at all."

"What are you going to do about that glazing—put in new material?" Miss Simpkins asked, as Gus finished with the other wheel and fished a hack saw out of the tool kit.

"No, I'll just roughen it like this," explained Gus, scraping the fine teeth of the hack-saw blade back and forth across the face of the brake, and gradually working around until he had removed all the shiny glaze.

"Won't it become glazed again very shortly?" Miss Simpkins asked, dubiously.

"It won't happen to this brake any quicker than to the others, now that I've got it in shape," Gus replied, as he tossed the hack saw back in the kit and started to remount the wheel.

BUT what about that awful chattering? Can't you do anything to get rid of it?"

"Oh, that! Sure, it's fixed already. Didn't you see me tighten up the bolts that hold the front axle to the springs?"

"But what does the axle have to do with it?" the teacher asked in astonishment, peering curiously at the bolts he had mentioned.

"A whole lot, in this case," Gus grinned. "Whenever you get chattering or vibration in any piece of machinery, there's three things to look for. The first is motion—and there's plenty of that in an automobile. The second is friction or strain, and that's where brakes shine. The third is looseness that'll give the friction and motion a chance to turn into vibration. Those loose axle bolts were right where the strain of the brake and the motion of the wheel could get together and make the whole works jitter back and forth to beat the band."

Gus finished assembling the wheel and Miss Simpkins climbed into the car to test the brakes again.

"As a science teacher, I should have known it was something like that," she muttered to herself, as she vigorously jammed down the pedal. The chattering was gone.

AIRSHIP TAKES OFF ON WHEELS LIKE A PLANE

TAKING across a grass-covered field at more than sixty miles an hour, on wheels fitted beneath its gondola, the U. S. Army airship TC-13 recently soared aloft in a successful test of a spectacular new take-off method for dirigibles. Lighter-than-air craft usually rise by virtue of their buoyancy alone, but the running start employed in the new method gives an additional boost, as when an airplane leaves the ground, and permits a much heavier load to be lifted. Experts who watched the recent test at Langley Field, Va., calculated that the 365,000-cubic-foot airship would thus be able to carry 580 extra gallons of fuel, thereby increasing its cruising range by 1,300 miles.

PLOWING THOUGH AIR HINDERS ROCKET TRAVEL

BALLS of air, piling up in front of rockets like snow in front of a man's foot, form an obstacle to high-speed travel in such projectiles, experiments conducted by the American Rocket Society have shown. When a test rocket had reached an estimated speed of 700 miles an hour, it wavered like a speedboat out of control and crashed into the ocean near its New York testing ground.