

# GM Journal

## Hellfire and Gearboxes

GM recovers from its worst industrial accident ever.

**BY JON G. ROBINSON ■ SOMEWHERE, A CADILLAC LEAVES A STOPLIGHT. THE ENGINE REVS UP AND SEEMS ONLY PARTLY CONNECTED TO THE REST OF THE DRIVETRAIN. EVENTUALLY, THE SPEED OF THE CAR CATCHES UP TO THE SPEED OF THE ENGINE.**

Across town, a Pontiac pulls away from a stop sign and accelerates to highway speed with only a single pronounced thump from the drivetrain at about 25 mph. Someplace else, an Oldsmobile dealer wonders how he'll explain a sudden dent in the brand's performance image.

This was life in the fall of 1953. Something was missing – namely the Hydra-Matic's four gears. On August 12, a contractor was working in General Motors' Hydra-Matic manufacturing plant at the corner of Plymouth Road and Hartel Street in Livonia, Michigan. A spark from a welder landed in a vat of cleaning solution, and a few hours later, the plant was in smoldering ruins. The fire ripped through the plant and killed GM employees William Degner and Danny Staley, and a Livonia Fire Dept. handyman died from a heart attack while unloading fire hoses.

Aerial photos appeared the next day in *GM Folks* magazine. Chemically fueled flames roared through the windows, and smoke was visible 20 miles away. The intense heat melted the plant's frame, and the walls buckled in as the roof melted down. It was a quick death.

The Hydra-Matic was a modern transmission for the modern age. One-third of new American cars carried the Hydra-Matic by 1953. Cadillac, Oldsmobile, and Pontiac employed the Hydra-Matic, and GM supplied the transmissions to Lincoln, Hudson, Nash, and Kaiser.

GM built the plant in 1949 with the best of everything. The accident still holds records as one of the worst industrial fires in world history, and it absolutely stands as GM's single most destructive accident.

"It looked like an atom bomb had gone off," says Livonia native Sue Daniel. "I was in high school and working at a playground for the summer. I was driving home with my sister on Plymouth Road, and it was such a strange appearance. As we got closer, we found out what was going on. We lived about a mile from where the fire took place. It's very vivid in our memory. It was late afternoon when the fire was going good. It was one of these new plants that was open inside. There weren't any firewalls. Once the fire got started, they couldn't stop it. The problem was that the workers tried to put it out, and they didn't call the fire department right away."

GM accessory group president Sherwood Skinner was in New York City, and he boarded the first available flight when news of the fire reached him. He formulated the skeleton of a recovery plan on the plane. GM assembled a team of industrial engineers to draft plans to reopen the Hydra-Matic operation in a rented plant in Willow Run. The team worked 12 hours a day and completed the plans in 17 days.

The fire brought all of GM to a stop, and for a short time, GM told 93,000 employees to stay home. GM put limited numbers of workers back in the plants to complete cars for which

they had supplies. By the middle of September, GM adapted Chevrolet Powerglides into Pontiacs and adapted Buick Dynaflows into Cadillacs and Oldsmobiles. Still, GM could not put everyone back to work right away, and nearly 4,000 workers had to stay home from Cadillac and 5,300 from Oldsmobile. GM's Fleetwood Fisher Body plant temporarily laid off 3,000 employees. Factor in related companies, and 25,000 Michigan citizens were out of work for months.

The barn-like Willow Run plant had been a Kaiser aircraft line. Manufacturing the Hydra-Matic was a delicate, climate-controlled operation, and GM had to build a surgically clean plant within a plant. The 3.5-acre inner plant was dust-free and air-conditioned to a perfect 74 degrees. The doors sealed when closed, and the air-conditioning system kept the inner atmospheric pressure four ounces per square-inch above the outdoor pressure, so when a door opened, the inner pressure prevented dust particles from entering.

GM sent thousands of damaged machines and tools to roughly 160 outside companies for repairs. Hydra-Matic was in partial production in 68 days at a temporary plant, and GM had duplicated the Livonia plant at Willow Run in 85 days. By the 125-day mark, the Hydra-Matic was in full production at 4,000 units per day.

The fire had an \$80 million impact, and there were 100,000 fewer Hydra-Matic-powered cars on the streets.



The new operation flourished at Willow Run, and a Fisher Body plant appeared at the former Hydra-Matic site in Livonia.

GM president Harlow Curtice called it “the most extensive rebuilding job of its kind in our history.”

GM knew how to fix things in 1953.

## DYNAFLOWS AND POWERGLIDES

The Greeks said Phoenix was the bird of eternal life, but Phoenix had to burst into flames before he could resurrect himself.

The Buick Dynaflow appeared in '48 and did not shift. All ratio changes took place in the torque converter's currents. Dynaflow appeared in Chevrolets in 1950 under the Powerglide name. In 1953, the Powerglide became fully automatic and shifted between its two ranges, but the Buick Twin-Turbine Dynaflow still did not shift and existed to be the emphatically *smooth* alternative to the Hydra-Matic's four gears and three pronounced shifts.

GM's adaptation of the Dynaflow and Powerglide into the Hydra-Matic's place was not a hatchet job. GM created special bellhousings to fit the engines and transmissions together. Cadillac's 1953 parts lists show the Dynaflow-equipped Cadillacs having a different part number for the crankshaft than the Hydra-Matic Cadillacs. The special part numbers include “TT,” meaning Twin-Turbine.

Buick and Chevrolet used enclosed driveshafts while Cadillac, Oldsmobile, and Pontiac all used open driveshafts. GM created new tailhousings for the Dynaflow and Powerglide with slip yokes to connect to the stock Hydra-Matic-style driveshafts.

The engineers took rear axle ratios into consideration. For example, Oldsmobile used a 3.07:1 rearend with Hydra-Matic, but when GM adapted Dynaflow into Olds, they installed a 3.36:1 rearend. This gave the torque converter 10 percent more rpm to work efficiently.

Upon acceleration, the Dynaflow/Powerglide torque converter works differently than the Hydra-Matic fluid coupling. If the driver begins to accelerate and suddenly closes the throttle within a few seconds, the torque converter will stall the engine.

GM installed the Dynaflow-style carburetor along with the Dynaflow or Powerglide, and this carburetor had an anti-stall dashpot that cushioned the throttle so it closed more slowly and did not stall the engine.

GM also replaced pages in the 1953 owners' manuals so they included the right explanations for the transmissions the cars carried. Cadillac, Pontiac, and Oldsmobile dealership service departments also got service bulletins covering Dynaflow and Powerglide.

Many of these cars survive today as direct artifacts of the fire. Cadillac, Oldsmobile, and Pontiac buyers may not have been happy with them when they were new, but today, their owners take special interests in them as collectors' items.

Paul Allen drives his Dynaflow-equipped '53 Cadillac hardtop around North Reading, Massachusetts.

“I like it a lot,” Allen says. “Some of those early Hydra-Matics had a really hard first-to-second shift. The Dynaflow has none of that. It's just *smooth* all the way up to 70 without feeling like it's working. I kind of like that whistling sound the Dynaflow makes. It's a little slower at first, but if you stick your foot in it, it goes really well. If you start off in low, you're flying in no time. It's amazing how fast those big, old cars were.”

Dale Terry restored his '53 Olds 98, and he drives it into the Rockies from the Denver area.

“Colorado has a lot of challenges

on the road,” Terry says. “We've taken it over all the tall mountain passes. It hasn't caused me any discomfort going up the pass. There's always been talk that the Dynaflow affects performance, but we've seen no lack of performance. It's a smooth-driving car going down the highway, and you don't go through all that shifting or bumping. It passes cars fine, and we keep up with everybody at 70. I wouldn't have any trouble considering another Dynaflow '53 Oldsmobile.”

French-speaking Andre Fitzback drives his flathead-six, Powerglide-equipped, export-model '53 Pontiac Pathfinder Deluxe through the Quebec countryside often. He likes to compare the car to his friend's six-cylinder Hudson with Hydra-Matic.

“The smooth shifting, smooth idle, and low noise are very pleasant,” Fitzback reports. “Always using the Hudson to compare, the Hydra-Matic is more versatile in traffic. My Powerglide Pontiac has to be driven with a slow start in mind, and you can't pass on the left too quickly. You need a place in front before passing. The Hydra-Matic would help the engine torque do the job at its best. The Powerglide is a good, smooth, tough transmission – low noise and not so bad on gas – but it is missing an intermediate speed for my engine.”

There is a Russian version of Phoenix rising from the ashes. The Russians called him Zhar-Ptitsa – literally, the “Firebird.” ■



**Apparent GM assemblers and office workers watch the Hydra-Matic fire from the parking lot on the south side of the plant. (Photo George Grady – Livonia Historical Commission)**