The Chinook's Power Plant

By Jim Johnson, retired Michigan DNR fish biologist

The *Chinook's* engine is a GM 671 diesel. GM stands for General Motors. The 6 stands for 6 cylinders and the 71 means each cylinder displaced 71 cubic inches. The name was changed from "GM Diesel" to "Detroit Diesel" in 1965, but the engine remained the same. This engine was introduced in 1938, is rated at just under 200 horsepower, and weighs about 2,500 pounds. Compare that with the *Katherine V's* Kahlenberg diesel, which was designed in 1923, generated about 90 horsepower, and weighed over 9,000 pounds! This illustrates how rapidly diesel engine technology advanced during the early 20th century.

The GM 671 diesel engine, originally developed by the Detroit Diesel Division of General Motors in 1938, gained prominence for its two-stroke design and ruggedness. It was heavily used in military applications during World War II, powering numerous landing craft, tanks, and other vehicles. The '671' was known for its reliability and versatility, and continued to be used in various applications after the war, including commercial fishing boats, trucks, and stationary power.

The Engine that powered the US war effort

Its compact size, high power-to-weight ratio, and two-stroke design made it ideal for military applications.

During WWII, approximately 57,000 GM671 engines were used on landing craft, including LCVPs, LCMs, and LCIs. During the war years, about 100,000 (including a Gray-Marine-marinized variant) GM 671 engines were built, serviced, and operated.

The 671 also powered various types of armor, including tanks like the Valentine, M4A2 and M10 tank destroyers.

After the war, there was a large surplus of these engines, meaning they were available at relatively low cost. That was likely the reason the Conservation Department (precursor to DNR) converted its three patrol vessels (including the *Chinook*) from gasoline to GM671 diesels in 1950.

Post-War Applications and Legacy:

- After the war, the GM671 found applications in a wide range of industries, including trucking, marine, and stationary power.
- It was a popular choice for commercial fishing boats, tugboats, and other workboats due to its reliability and robust construction.
- The '671's' legacy includes its distinctive sound caused by its 2-stroke design. The engine was often referred to as the "screaming Jimmy".
- Detroit Diesel discontinued production of the '671' in 1995. Production ceased due to increasingly strict emissions regulations that two-stroke engines like the '671' could no longer meet, leading to a preference for more environmentally friendly four-stroke engines

- While the Series 71 engines were eventually discontinued, used engines are available and continue to be a popular choice for restoration and hot-rodding.

Key Features:

- **Two-stroke design:**

This design allowed for a power stroke with every compression stroke, resulting in a smooth and powerful engine.

- **Roots blower:**

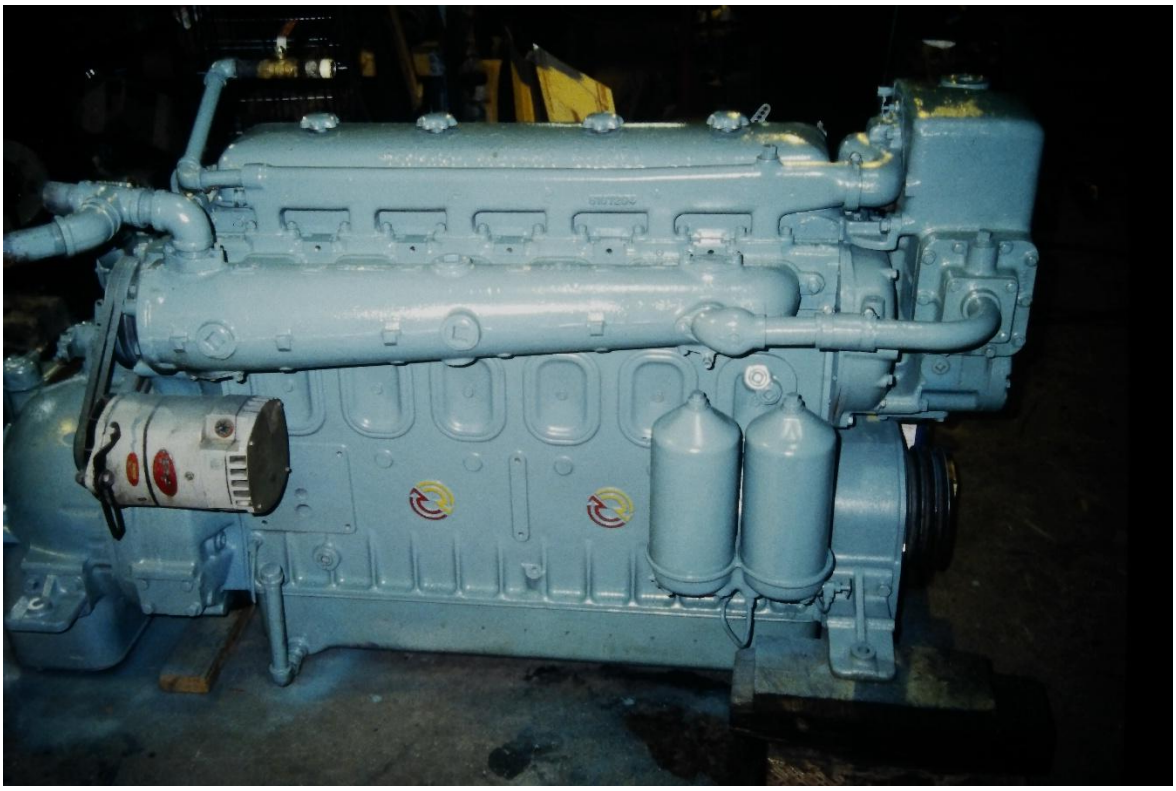
The blower was a positive-displacement pump that increased the engine's torque and horsepower.

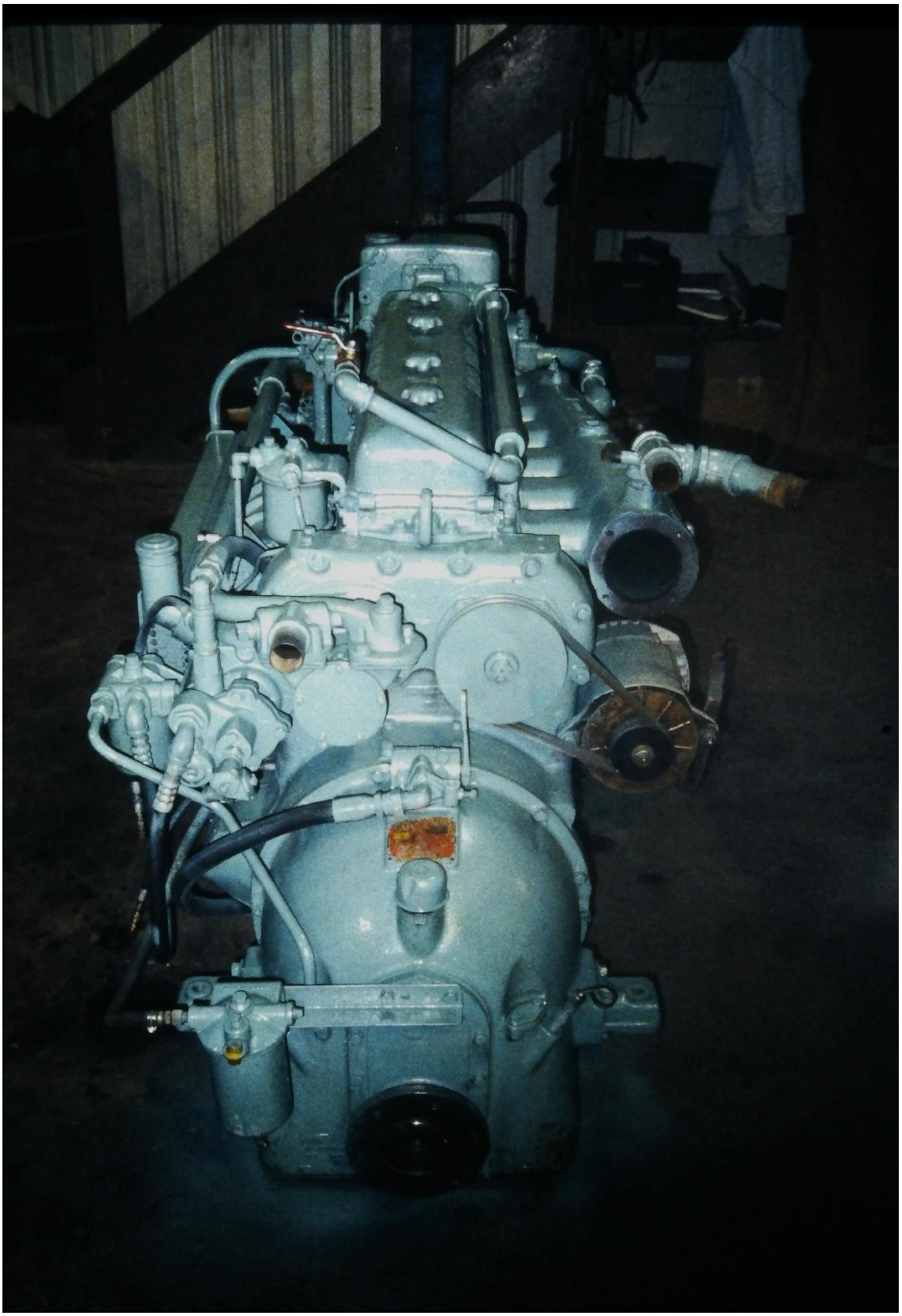
- **Unit injectors:**

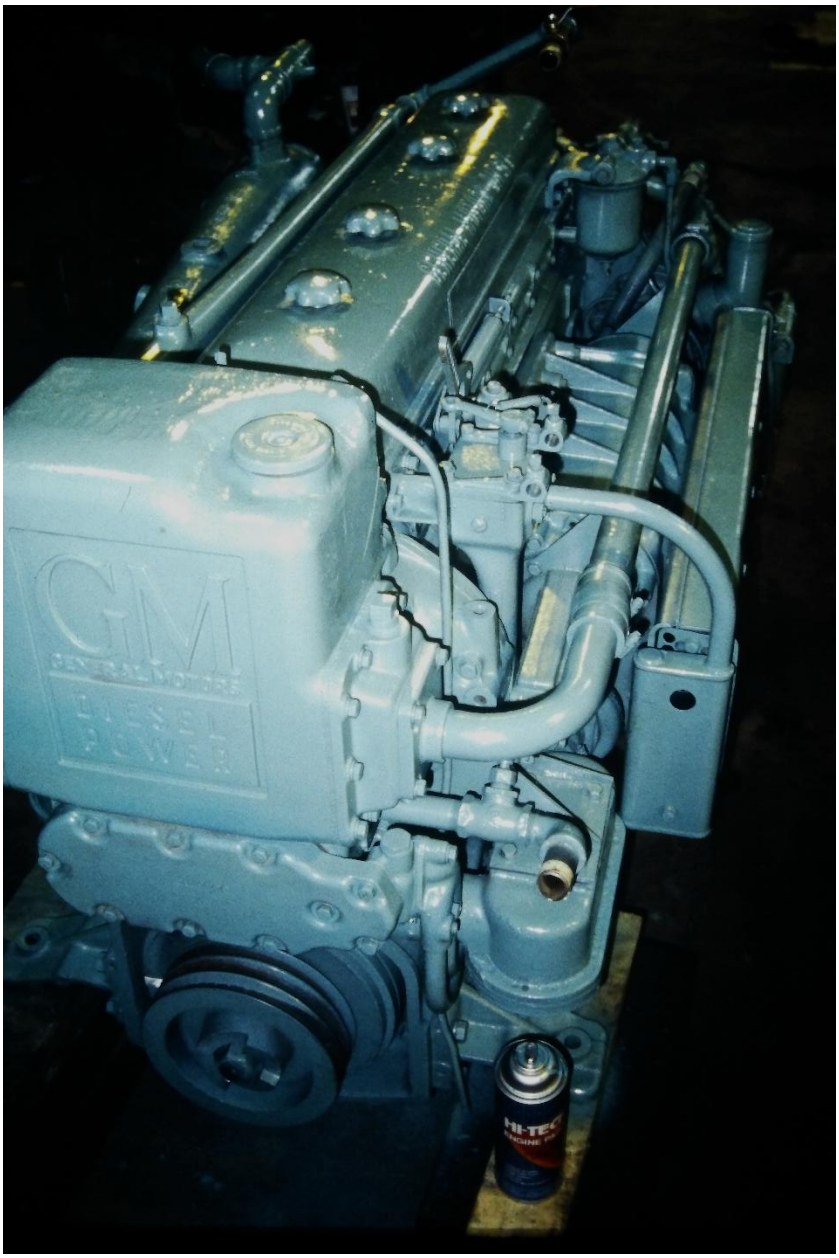
These injectors provided high-pressure fuel injection, contributing to the engine's reliability and efficiency.

The *Chinook's* GM671 diesel engine was incredibly reliable, only failing once, when the boat was fueled with water-contaminated fuel oil. That was quickly remedied when the Captain drained the contaminated fuel from the fuel line. The *Chinook's* engine powered the hydraulic system, which in turn powered the gill-net lifter, the trawling drum, the "A" frame, and the winch that deployed water sampling gear such as the bathythermograph. Eight winches were used for powering trolling gear, such as downriggers and outriggers, when the *Chinook* was rigged as a West Coast type salmon troller; these were also hydraulically powered off the engine. Its alternator was sufficient to power most electrical needs. The Onan auxiliary diesel generator was used only for powering the deck pump and such power-demanding devises as remotely operated vehicles. The *Chinook's* GM 671 engine used about 6 gallons of fuel per hour. With the boat's 400-gallon fuel capacity, the *Chinook* could cruise almost from Duluth Minnesota to Port Huron, Michigan without refueling. The *Chinook* was one of the most fuel-efficient research vessels on the Great Lakes during the boat's 70-year career.

Photos of the Chinook's engine:






GM
GENERAL MOTORS
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