



Backgrounder

Hybrid Utility Bucket Truck

Key points:

- The first of its kind in Alberta
- Represents fewer carbon emissions, reduced fuel consumption, quieter operation and longer service life/performance when compared to a traditional bucket truck
- The truck will be deployed to Grande Prairie and represents a first step in ongoing plans for ATCO Electric

An Alberta First:

ATCO Electric will have Alberta's first hybrid utility bucket truck.

Advantages of the hybrid:

This hybrid vehicle represents fewer carbon emissions, reduced fuel consumption, quieter operation and longer service life/performance when compared to a traditional diesel powered bucket truck.

Smaller carbon footprint:

Electric hybrid technology substantially improves fuel economy; the corresponding reduction in fuel consumption alone can cut carbon monoxide, nitrous oxide and particulate matter emissions by up to 70 per cent.

As well, typical usage of a conventional bucket truck would result in 16.8 metric tonnes per year of CO₂ being produced. Testing of the hybrid truck indicates that an estimated 5.6 metric tonnes per year will be produced. The net result should be a reduction of 11.2 metric tonnes per year of CO₂.

Hybrid operation:

ATCO Electric's hybrid bucket truck is a diesel/electric hybrid on a Freightliner chassis. Common hybrid technology, such as regenerative braking, helps to charge and power lithium ion batteries that can power the truck and hydraulic systems.

The batteries can last for 12-18 minutes of continuous operation at a worksite before the diesel engine needs to kick in for approximately eight minutes to recharge the battery. While operating on electric power the unit is significantly quieter than a standard diesel powered bucket truck. The hybrid is expected to produce up to 80 per cent less noise than its non-hybrid counterparts.

When the hybrid electricity storage runs low, a diesel engine assumes the role of primary power source. The diesel engine in this truck incorporates a particulate diesel filter system. While not unique to hybrid vehicles, it is a more environmentally friendly option than past generations of diesel engines. The filter in this system traps the soot produced by the engine and has a method to incinerate the soot when the filter is almost full. This contributes to the reduced emissions of the truck.

One other piece of noteworthy technology is the cab heating system in the truck. When operating in hybrid mode there is typically no engine idling; accordingly there is no interior heating system in the truck. To ensure the comfort and safety of the driver in Canadian winters, an aftermarket heating system was added to the truck. While using a small amount of diesel fuel to heat the truck, engine idling is still not necessary and the operator can remain warm in the cab of the hybrid. This supplemental heating system not only reduces emissions, it also allows the diesel engine to be almost silently warmed up without idling.

Operating in Grande Prairie:

While the trucks have been thoroughly tested in Kalamazoo, Michigan, ATCO Electric chose Grande Prairie to run its hybrid bucket truck. This community offers the urban setting needed to optimally run the truck through its regular paces of work but also has a varied climate throughout the year with a range of temperature and weather conditions. By running the truck in Grande Prairie we can evaluate how it will handle operating year-round in Alberta.



Cost Savings and operational efficiencies:

The decrease in fuel costs because of the hybrid components are significant and estimated to result in a 33 per cent reduction in operating expenses for the truck when compared to traditional diesel powered models. The manufacturer's hybrid fuel systems have been shown to reduce fuel consumption by up to 60 per cent.

As well, because of the regenerative braking technology that is used, brake life for the truck is increased by as much as 50 per cent. A reduction in engine-idle time means that wear and tear on the engine itself is reduced and fewer/less frequent repairs of the engine are expected: the end result is that the overall engine life expectancy for a hybrid is greater than a standard bucket truck.

Given typical usage for the utility application, the hybrid is expected to have a payback in less than seven years. Moreover, the hybrid electrical system yields savings in excess of \$69,000 over the vehicle's service life of 12 years.

Manufacturer:

As a Premier Diversified Industrial (PDI), Eaton supplies business and industry around the world with well-established, reliable brand names, and also manufactures many original, high-quality products under the Eaton brand.

Following years of successful development and extensive real-world testing, Eaton has emerged as a market leader in the development and production of hybrid electric and hybrid hydraulic power systems for commercial vehicle fleets.

Eaton has invested in three separate hybrid power solutions for commercial vehicles instead of a one-size-fits-all approach:

- Hybrid Electric
- Eaton Hydraulic Launch Assist™ (HLA®) System
- Series Hydraulic