

How to Take Advantage of an Electric Power Take-Off

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With the increased emphasis to reduce emissions, air pollution, resource waste and traffic noise, government legislation is pushing towards the use of electric power to drive ancillaries in work trucks.

This is particularly relevant in construction, materials handling and refuse collection applications operating in urban areas.

Adopting electric power take-off (ePTO) as an alternative to the traditional PTO from an

internal combustion engine (ICE), brings multiple benefits to the application, the operator, and the environment.



Why switch to electric?

Historically, the PTO output shaft has been part of the internal combustion engine or transmission, which requires the engine to be idling during use. An idling engine can produce up to twice as much exhaust emissions as an engine while driving.

ePTO makes the vehicle environmentally friendly and is the first step towards hybrid and all-electric powertrains. Decoupling the auxiliary functions from the ICE allows independence with the speed of the diesel engine, ensuring work is carried out in the best yield zone with higher efficiency and less fuel consumption.

The reasons for this development are clear. The strengthening of environmental rules for fine-particle and noise emissions and the constraints imposed by prime contractors for urban work sites increase the sense of urgency.

Added benefits of the diesel engine can be a smaller footprint and fuel consumption savings. For example while driving (traction + PTO) and in town, the diesel engine can be switched off and the ePTO can be used. As a result, the reduced noise at the work site improves communication and therefore safety.

What is ePTO?

The ePTO system consists of an inverter and an electric motor powered by a DC power source, for example, a battery. Running auxiliary loads from the battery removes the need to idle the engine during PTO, which reduces fuel consumption, and eliminates air and noise pollution. Similar to a standard PTO, it can be connected to a mechanical transmission system (cardan shaft or gearbox) or to a hydraulic pump. This, however, creates new demands on the hydraulic pump and motors with opportunities for further improvements in efficiency and noise.



There are several solutions to power the ePTO. The first is using a rechargeable battery, which has the capacity to complete a day's work and can be recharged overnight, benefitting from lower energy price, or using 'green' energy.

Alternatively, the battery can be charged using a generator, which is driven by the ICE. This solution is most suited to stop-start applications, such as a refuse truck. Because the battery can be regularly recharged, its size and weight are reduced, but it is still expensive.

Conclusion

While all-electric is not easy to implement on large mobile machines, the electrification of auxiliary loads is profitable, while reducing or eliminating idle time.

As stated previously, power demand from the ePTO can differ depending on the application.

Find out how ePTO is working in three common use cases by [downloading the complete article here](#)

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