

Can a parallel hybrid electric Orchard tractor be used to test energy management?

The HIL testing activity proposed in this work focused on replicating a scaled version of a parallel hybrid electric orchard tractor to test feasibility of the electro-mechanical solution and performance of the energy management strategy.

What is a hybrid powertrain?

A hybrid powertrain consists of at least two different types of power sources. In vehicle applications, the most common solutions aim to take advantage of the joint operation of a thermal engine and one or more electric machines to provide power for the mechanical transmission [19,20,21].

Can ice tractors be used for electric storage?

Orchard tractors are very small and narrow machines, thus the available on board space for electric storage would be very limited. If the energy management strategy is properly configured, for most of the common tasks a system with a smaller ICE could still perform as well as the traditional vehicles.

Can hybrid electric powertrain architecture be replicated in an orchard tractor?

The HIL simulator developed in this work aimed to replicate a parallel hybrid electric powertrain architecture for an orchard tractor.

Are hybrid powertrains still a viable option?

Today, hybrid solutions still represent the most promising option to improve emissions footprint and productivity as well. A hybrid powertrain consists of at least two different types of power sources.

Is a hybrid power unit better than a diesel engine?

The hybrid solution to be investigated considered a diesel engine with a nominal power output of 54 kW at 2300 rpm and an electric motor with 30 kW at 2300 rpm. The overall peak power capability of this hybrid power unit is higher than the traditional diesel power unit of the studied vehicle.

efficiency of the 130 kW BLDC motor for an electric tractor, which can be pure electric or hybrid as described in [19]. The study comprises of mathematical modelling and performance analysis ...

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The HIL bench was designed to replicate a scaled architecture of a parallel hybrid electric tractor at mechanical and electrical level. The vehicle behavior was simulated with a personal computer connected on the CAN BUS ...

The conventional tractor and parallel hybrid electric tractor model have a diesel engine as a power source and a dual-clutch transmission. The parallel hybrid transmission has a mechanical ...

Evaluation of alternative battery technologies for a solar assist plug-in hybrid electric tractor. *Transp. Res. Part D Transp. Environ. Times* (2010) ... Effects Between The ...

Since tractors are equipped with numerous components, it is possible to convert some of them to use electric energy to power the implements. Zhang et al. [6] suggests a ...

Agricultural tractors are highly fuel-consuming and soil/air polluting machines; thus, the introduction of new sustainable technologies, such as hybridization, can be very impactful for the development of electric hybrid ...

The field of Non-Road Mobile Machineries (NRMM) is now more than ever considering the adoption of electric systems to reduce the amount of pollutant emissions per unit of work. However, the intensity and complexity of ...

2 ???· In this section, an electric tractor capable of performing the above 8-hours cycle is designed. Fuel consumption has been translated to energy requirements by means of Eq. (1) ...

conventional tractor, a series electric-hybrid tractor, and a parallel electric-hybrid tractor have been developed by modifying some models of on-road vehicles already present in ...

This work presented a techno-economic study to identify favorable operating conditions for deploying electric and hybrid tractors. We developed pragmatic simulation models to predict ...

with an energy storage system (ESS). The presence of electric machines can ensure a power boost to the ICE, or they can independently operate in low-load conditions, also ... The ...

categories: engine auxiliaries, electric traction drives, energy storage, and implement electrification [4]. Similar to the on-road hybrid electric vehicles (HEVs), several commonly ...

Analysis of a Parallel Hybrid Electric Tractor for ... so the energy storage system and the energy management strategy should be carefully designed to fulfill the most common working cycles ...

A solar-assisted plug-in hybrid electric tractor (SAPHT) was prototyped for light-duty farm applications by Mousazadeh et al. (2010). ... Energy storage for electric vehicles. ...

The electric tractor is based on utilizing electric power to support driving and working loads for the tractor to realize independent speed regulation. In addition, more and ...

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