



EFA-S delivers first electric locomotive made in Germany for Rügen road train

- Trips for tourists: ElektroFahrzeuge Stuttgart (EFA-S) aims to make the operation of small trains exhaust gas-free, quiet and more efficient
- 5,000 tourist trains are already in use in Europe: annual requirement for 50 new trains

(Zell unter Aichelberg/Binz on Rügen) EFA-S GmbH, the Swabian electrical vehicle specialist, has equipped the first road train locomotive made in Germany with an electric drive and delivered it to Rügen. The manufacturer, www.sightseeing-trains.de will complete it with carriages on site. This will enable the finished train to carry up to 60 people per trip; the aim from April onwards is for this quiet, environmentally-friendly train to open up the island in the Baltic for tourists.

“It is impossible now to imagine tourist attractions without road trains”, says Bastian Beutel, Managing Director of ElektroFahrzeuge Stuttgart (EFA-S) GmbH. According to information from the local association, the *Verein Touristische Sonderverkehre und Wegebahnen* [TSW - Association of Special Tourist Transport and Road Trains], there are some 500 road trains in Germany, Austria and Switzerland alone. TSW estimates the total number in Europe at 5,000. Beutel adds: “With just a few exceptions, they are driven by heavy petrol or diesel engines, which are rightly viewed more and more critically because of the exhaust gas and noise they emit.” Previous attempts at electrification in The Netherlands and Italy are based on a technique for fork-lift trucks, which according to Beutel “is less than ideal for the conditions of use demanded by road trains”. This is because “the trains are often over 30 meters long, may weigh over 14 tons fully laden and, as on Rügen, still have to cope with inclines of 18 per cent”.

To meet the requirements, EFA-S uses a technology by means of which the company has already equipped over 100 trucks with environmentally-friendly and economical electric drives. “The synchronous motors from AMK fitted by EFA-S are up to 98 per cent efficient. In combination with high-voltage technology and sophisticated energy management, we achieve maximum capacity for minimum power consumption.” **At speed 0, the torque of the motor they use is 1,150 Nm.** That is about twice as high as in a current Formula 1 vehicle. The lithium iron phosphate (LiFePO₄) batteries from manufacturer CALB which the company fits are inherently stable and equipped with ceramic separators. Experts consider them among the most reliable energy storage facilities in the world. The road train can travel some 100 kilometers on the rated battery capacity of 70 kWh. A 30-minute stop between two tours is enough for the integrated charger to provide the train with energy for another 20 kilometers. The battery is fully charged in four hours.

“Electric drives are perfect for road trains, not only because of the clear environmental benefits, but also because of the weight required in the locomotive”, explains Beutel. “The batteries supply the weight we need to stop the wheels spinning.” In test runs in the Swabian Alps, the all-wheel drive locomotive was able to cope with a 20 per cent incline. EFA-S has obtained Europe-wide certification for the vehicle in line with standard ECE-R 100, with specialists from TÜV Süd performing the acceptance procedure. EFA-S has provided a warranty of three years on all the parts it has fitted.

Local authorities demand the electrification of tourist railways

Demand by towns and local authorities for the electrification of tourist trains and rejection of operation with combustion engines is on the rise. The university town of Tübingen, for example, turned down an application for operation of a new train in 2015 because the owner/operator felt that no suitable electric drive was available, but the local council did not want to allow a “dirty diesel” to drive through its historic old town. The local road train association (TWS) estimates that around 50 new road trains a year are purchased. Chairman of the association, Ralf Graumann, expressly welcomes the new offering: “Operators find high-performance trains with an electric drive a very interesting alternative to the products of established manufacturers.”

About EFA-S

ElektroFahrzeuge Stuttgart GmbH (EFA-S) specializes in the development, conversion and production of vehicles run purely on electricity. Over 100 cars, trucks and buses with combustion engines have already been converted into environmentally-friendly vehicles with an electric drive. EFA-S is considered a technology leader in this field. It was 25 years ago that the initiator of the idea, Reinhardt Ritter, first converted a new VW Polo straight from the factory to high-voltage synchronous motor drive technology. From the outset, EFA-S put its faith in high-efficiency synchronous motors which have the lowest energy losses of all electric drives. By combining these with high-voltage technology (300 to 750 V) and a continuously-developed energy management system, EFA-S vehicles achieve maximum capacity for minimum power consumption. This has enabled the company to convert trucks of 7.5 tons permitted gross weight and a high payload to exhaust gas-free electric vehicles already - and even higher weight classes and special vehicles are in preparation. EFA-S works independently of manufacturers, converting vehicles of a wide variety of makes and models. The EFA-S conversion concept minimizes the pollution which would be generated during the production of new vehicles and by operation without an electric drive. It extends the potential uses of vehicles which have already been written off and thus leads to economic operation of quiet trucks with no exhaust gas emissions. It is cheaper to convert vehicles than to buy a comparable newly-developed electric vehicle. For more information, go to www.efa-s.de.

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