

Public Summary – Converting Classic Aston Martins to a Cleaner Powertrain

This thesis has been carried out for the University of Twente and Noble House – an Aston Martin Heritage dealer in Almere. Noble House restores and services classic British cars and young timers, mainly Aston Martins. It does this with great care and high quality craftsmanship. Not without reason exclusive car owners from all over Europe come to this place to give their car in best hands.

Over the last years, the awareness of not treating our environment well increased. With this, also the demand for products with less environmental impact. It can clearly be noticed, that the iconic designs of Aston Martins with their polluting internal combustion engine and the trend of living a greener lifestyle causes friction. Upcoming regulations regarding emissions will have influence on the street scene in Europe and Noble House. Stricter rules will mean less classic cars and young timers on the streets an less work for Noble House. For these reasons Noble House wants to start offering conversions of Aston Martins to a cleaner powertrain. This bachelor assignment will kick off the project of converting Aston Martins and other luxury cars and answers the following question:

How does a strategy for starting conversions of Aston Martins at Noble House look like?

Noble Houses customers are wealthy people, living in multi-car households, which makes them perfect possible adopters of the (partly) electric powertrain. Converting an valuable classic car however, is a violation against the authenticity of a car. The solution is to convert a car in such a way, the original structure is not affected. This way the iconic classic cars are future proof and can keep driving despite new regulations, while still being back convertible into its original state and keeping its value. By offering this to Aston Martin and other luxury car owners, Noble House could create an unique position on the European conversion market.

There are different formations of powertrains, partly electrified, plug-ins, completely electric cars either working on battery cells, or a combination of it. Comparing them all, results in the battery electric vehicle (BEV) being the best suitable solution for conversions in the future. This technology is future proof since it has zero emissions from its tailpipe, has a high efficiency, a good infrastructure and further improvements are predicted for the next years. The range is still limited, but is sufficient in a multi-car household. This fits to the client of Noble House, which often has several cars or even a collection.

Because the car undergoes large changes during a conversion to another powertrain, it has to be tested on its roadworthiness again, which is accompanied by a lot of rules and different tests. To avoid surprises and loosing time and money during such a test, TÜV has been contacted for their general procedure. From this could be concluded that it is important to not to exceed the original mass of the car and to use parts that already have been certified to European or German standards. Only suppliers that offer these certified parts are interesting for Noble House. More tips and restrictions have been given which together with the preliminary research resulted in a list of requirements a conversion at Noble House has to meet.

Every car is different and every customer has its own wishes and needs. Therefore every conversion requires an Individual Design of the powertrain. By using the Boxed-Based method for fitting parts, a method simulating the size of different parts by using cardboard boxes, it can be determined fast, easy and cheap which parts fit or not. Quality and performance are of higher importance when

choosing parts, than the price. Besides, the parts have to meet several requirements so the converted car will be certified on its roadworthiness again.

The volume available in an Aston Martin for fitting parts is sufficient. Meeting the requirement of not exceeding the original mass of the car is a more challenging, but a feasible task.

Besides parts, also other resources are needed to complete a conversion. These are people, time, facilities, funding and equipment. The people needed for a conversion are an electrician and a programmer, which can complete a conversion within 5 weeks at Noble House. Before, a place in Almere has to be created where the conversion can take place. Working on BEVs requires some extra equipment that is not available in the conventional workshop yet. To finance the development of conversions and the purchase of this new equipment requires a funding, probably from a bank.

An estimation has been made that the development of converting classic Aston Martins and other luxury cars can be finished in about two years. It means that in spring of 2020, Noble House could be ready to start offering commercial conversions to its customers. During the further development of the BEV powertrain, an eye should be kept on the promising developments in the use of hydrogen in vehicles. Since Noble House can then anticipate fast on this developments, like it does now with the conversions of Aston Martins and other luxury cars into a Battery Electric Vehicle.