Information Note for Application of Alteration from a Fossil-fuel-engine driven vehicle to Hybrid / Pure Electric Vehicle (applicable to private car, goods vehicle, taxi and light bus)

This information note details the Transport Department's (TD's) approval requirements for an After-market Alteration[1] to hybrid / pure electric vehicle.

1. The base vehicle to be converted should either

- Be a vehicle model with Hong Kong type approval certificate, or
- Have obtained a Whole Vehicle Type Approval certificate from other jurisdictions (e.g. EC Whole Vehicle Type Approval etc.) to demonstrate that the vehicle is properly designed so as to be roadworthy for use on roads in HK.

2. TD's approval is required for the above mentioned alternation on registered vehicles. The applicant should provide the following documents to the TD for consideration and approval.

(i) **Application Letter** - An application letter from the applicant stating the reasons of alteration, and supplemented with the detailed alteration proposal (including a description of all major automotive parts/products involved), the vehicle registration document copy, company history of the automotive parts/products proposed for alteration and details track records of similar alteration which caused any accidents and recalls.

(ii) **Environmental Protection Department's Endorsement** (Applicable to Hybrid Electric Vehicle only) - Approval or no objection from Environmental Protection Department concerning vehicle exhaust and noise emissions shall be required.

(iii) **Vehicle Manufacturer's Endorsement or EC Vehicle Approval**

a) **Vehicle Manufacturer's Endorsement** - Approval or no objection from the original vehicle manufacturer regarding the concerned vehicle after alteration is safe for use on road. Applicant shall declare that there is no modification to structural components of the vehicle. Otherwise, specific endorsement from the vehicle manufacturer regarding this change is required. If the power output of the altered vehicle is greater than the original design, specific endorsement / certificate from the vehicle manufacturer is needed regarding the compatibility of the braking system, suspension and chassis strength.

[1] The alteration referred in these guidelines apply only to the conversion of fossil fuel engines to hybrid or all-electric powertrains. For other alterations, please refer to the relevant guidelines issued by this department: https://www.td.gov.hk/en/public_services/vehicle_typeapp_examination/vehicle_examination/index.html#2

or

b) **EC Vehicle Approval** - Assessment of the altered vehicle model to the level of EC Whole Vehicle Type / Individual Approval or equivalent, as certified by a technical service designated under the EC Directive 2007/46/EC or accredited laboratory with equivalent qualifications[2], that the vehicle is safely designed and integrated as a whole. The details of the assessment, conditions, and related reports with reference to EC regulatory acts should be submitted.

(iv) **RPE/CEng Certification** – a Registered Professional Engineer (RPE) / Chartered Engineer (CEng) or the vehicle manufacturer or an equivalent professional engineer / body to certify the following:

- Substantiation that the powertrain for hybrid / pure electric vehicles is suitable to be installed in the concerned vehicle models
- Substantiation that the distribution of the loading[3], the designed axle loading and gross vehicle weight limits of the altered vehicle are not exceeded
- Substantiation that the passenger seating capacity is not affected
- Declaration of alterations to be made to any vehicle components not directly related to the alternation (e.g. braking system, steering system and etc.)
- Declaration that the modification would be monitored and supervised by a RPE/CEng and strictly follow the modification plan agreed with the original vehicle manufacturer or EC technical service, if applicable.

(v) **Other Reference Technical Information**

- Technical information / specification of electrical system and design of the electrical protection in relation to the electrical system of the hybrid / pure electric vehicle
- Diagram and general description of the essential electrical/control parts and explanation of their functions.
- Schematic diagrams showing the connection between all modified and additional instruments / component, and original instruments (including OBD).
- Schematic diagram of the braking system of the vehicle before and after the alteration
- Technical details of the distribution of the loading of the vehicle before and after the alteration
- Description of electrical safety features and protection measures incorporated into the vehicle and charging system
- Operating characteristics of the electric motor (torque and power curves)

[2] Applicants must provide an accreditation certificate from an accredited laboratory to demonstrate that their qualifications meet the standards.

[3] Apart from Substantiation that the distribution of the loading ” is not exceeded, as stipulated in the Regulation 55 of Cap. 374A Road Traffic (Construction and Maintenance of Vehicles) Regulations, the stability of light bus shall be such that when loaded with weights placed in the correct relative positions to represent the driver and a full complement of passengers, if the surface on which the vehicle stands were tilted to either side to an angle of 35 degrees from the horizontal, the point at which overturning occurs would not be passed. The TD will conduct the concerned test during the inspection of the light bus.

- Information and specification of the batteries and charging system. Indication of charging status and the state of charge of the batteries at the driving enabled mode. (battery status indicator is mandatory)
- Indication of maximum speed, gradeability, fuel consumption, efficiency, range per full charge (including their methods of measurement, which should be traceable to an industrial standard or an international/national automotive regulation).
- Maintenance requirements – Maintenance manual covering the electrical system, including circuit diagrams.
- Testing report on the altered vehicle regarding the functional safety and protection against electric shock with reference to ECE R100 or equivalent standards (Please refer to the guideline "Vehicle Construction Approval Requirements for Pure Electric Vehicles and Plug-in Hybrid Vehicles")

3. For the application of electric vehicles, irrespective of any alteration or not, the vehicle must comply with all provisions in Cap. 374 Road Traffic Ordinance and its subsidiary legislations. Besides, please also refer to the latest version of the following guidelines for compliance:

- "Vehicle Construction Approval Requirements for Pure Electric Vehicles and Plug-in Hybrid Vehicles"
- "Notification on Implementation of Acoustic Vehicle Alerting System (AVAS) for Electric / Electric Hybrid Vehicles in Type Approval Application"

4. After evaluation of the documents, the TD will arrange vehicle examination to ascertain compliance with the Road Traffic (Construction and Maintenance of Vehicles) Regulations and Road Traffic (Safety Equipment) Regulations after the TD is informed of the completion of the vehicle alteration. If the vehicle is found to be roadworthy for use on roads in HK, it may be allowed to be registered and licensed, subject to any other relevant regulatory requirements.

5. Application Document should be submitted to the following address:

Transport Department
Vehicle Safety and Standard Division 1M/F,
Transport Department Vehicle Examination Complex,
18 Sai Tso Wan Road, Tsing Yi, N.T
(Attn: Type approval Section)

6. For enquiries on the above approval requirements, please contact the Vehicle Safety and Standards Division, Type Approval Section **at** 3961 0362.

Vehicle Safety and Standards Division
Transport Department

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