

OBSERVATIONS ON REGULATION No. 115
(Specific LPG and CNG retrofit systems)

Transmitted by the Expert from India

1. Paragraph 1.4. is only applicable to the vehicles of category M and N. We feel that it should also cater for 3-wheelers as in Asian countries the 3-wheeler population is quite large. Most of the Asian countries are making it mandatory to retrofit CNG/LPG on in-use 3-wheelers to reduce pollution. Indian regulation is available for such retrofitment of CNG/LPG system on in-use 3-wheelers (The Automotive Research Association of India-ARAI has played a major role in formulating the code of practice and regulation).
 2. As per paragraph 2.1.3., the petrol tank capacity is 15 litres for limp-home operation and such vehicles are considered as mono-fuel. Our comment is that it should be country specific because in Indian legislation, there are different capacities prescribed, i.e. 5 litres for 4-wheelers, 3 litres for 3-wheelers and 2 litres for 2-wheelers.
 3. As per paragraph 2.4.1., the vehicle is defined to belong to "a member of the family" if the vehicle is manufactured by the same manufacturer. In Indian legislation, for flexibility, differentiation is made between gasoline and diesel base vehicles (before conversion) and not on OE manufacturer of the vehicle. For in-use gasoline vehicle, extension of type-approval is granted for vehicles if their engine cubic capacity (displacement) is within ± 25 per cent of the already type-approved vehicle. In case of diesel vehicles, extension of type-approval is granted based on engine model as more design complexities are involved for conversions.
 4. As per paragraph 6.1.2.2. (d), in case of diesel vehicle, dual-fuel mode is only allowed when these are CNG/LPG retrofitted. In India, the general practice is first to modify the diesel engines to SI engine and retrofit them with CNG/LPG kit, thereby running them on dedicated mode.
 5. As per paragraph 6.1.2.5. (i) and (ii), the engine is to be tested for emission on (a) reference diesel fuel and (b) commercial LPG for other than M1 and N1 category of vehicles. It is not understood whether the test to be conducted on 100 per cent reference diesel of 100 per cent commercial LPG or on a dual-fuel mode (diesel + LPG). In Indian scenario, as a general practice, dual-fuel retrofitment systems are not in use because of its limitations.
 6. As per paragraphs 6.1.3.2. and 6.2.3.2., the measured power with CNG/LPG shall be lower than that measured with petrol + 5 per cent. Our understanding is that the power obtained in CNG/LPG shall not be more than 105 per cent power in petrol mode. In India, generally the CNG/LPG retrofitted gasoline engine develops less power than in petrol mode. As per Indian legislation this drop is restricted to maximum 25 per cent when the parent engine is tested on engine dynamometer.
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