

Response to informal document No. GRPE-59-14

(Test procedure for energy efficiency of MAC)

1. Context / General Information and Objective

Mobile Air Conditioning Systems (MAC) are complex systems. Their overall performance depends not only on individual MAC components but also on interactions between MAC, and the entire vehicle, as well as on the settings chosen by the driver.

Applying good engineering practice is also very important in this context.

Vehicle manufacturers apply different design strategies for MAC, taking into account cost, comfort, safety and reliability or feasibility aspects (e.g. mechanical / physical / chemical, under hood according to carlines etc.). Consequently, there is a wide variation in MAC systems available on the market.

The energy efficiency of MAC systems is the subject of various discussions and activities in different regions worldwide:

- The European Commission will develop a legal framework for “setting minimum efficiency requirements for air-conditioning systems”¹.
- The US administration proposed rulemaking containing a MAC efficiency idle test¹.
- Preliminary internal study on MAC energy efficiency is under discussion in Japan.

MAC energy efficiency is extremely difficult to measure with sufficient accuracy when applying dynamic physical testing conditions as demonstrated by the TNO report, sponsored by EC¹¹.

A suitable technology-neutral and cost-effective alternative to dynamic physical testing is steady state virtual testing, combined with an appropriate customer-oriented labelling scheme, similar to existing energy rating schemes.

There is a clear need to assess MAC energy efficiency on a globally harmonised scale. There is also a need for a MAC energy efficiency test procedure that will deliver accurate data with acceptable test and cost effort.

¹ Proposed Rulemaking To Establish Light- Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards 49 CFR Parts 531, 533, 537, et al.

2. Steps at UNECE

The Automotive Industry welcomes the European Commission's proposal to start such a project under WP.29.

The Automotive Industry proposes to address MAC energy efficiency as a UN-ECE Regulation, with the objective of establishing worldwide harmonised testing procedures for MAC energy efficiency.

For this purpose, the Automotive Industry supports the EC's idea to establish an Informal MAC working group reporting to GRPE.

Based on terms of reference for this group agreed beforehand, this group shall develop a test dedicated exclusively to MAC energy efficiency, to be based on steady state virtual testing. The idle test proposed by the US administration could be one of the steady state driving conditions used in the virtual test. Therefore, it would be a good starting point for the development of a worldwide harmonised test procedure. The resulting output on MAC energy efficiency of such a test could be utilised in a customer labelling scheme.

Consistently with the objective of global harmonisation Industry would prefer the administrative format to be under the 1998 Agreement.

ⁱ Communication from the Commission to the Council and the European Parliament 6 Results of the review of the Community Strategy to reduce CO₂ emissions from passenger cars and light-commercial vehicles; /* COM/2007/0019 final */; 2 February 2007.

ⁱⁱ. Development of a procedure for the determination of the additional Final Report TNO, 2005. 05.OR.VM. 014.1/RJV