

Draft Minutes of the 3rd MAC-TP meeting

GRPE Informal working group on the Mobile Air Conditioning Test Procedure (MACTP)

Meeting held : Tuesday 17 January 2012 at United Nations, Geneva

1 Welcome:

The Chairman, Mr Rijnders (NL) welcomed everyone to the meeting and introduced the acting secretary Ms Hosier (OICA), covering for Mr Bietenbeck (OICA).

Noted

- i) All presentations will be available on the MACTP informal group website.
- ii) All documents relating to the European project are available on the European Commission CIRCA website.

<http://circa.europa.eu/Members/irc/enterprise/wltp/library>

2 Adoption of the Agenda (GRPE-IG-MACTP-03-01).

Agenda adopted with no changes.

3 Adoption of the minutes of second meeting in January 2011 (GRPE-IG-MACTP-02-04).

Minutes of the 2nd meeting adopted with no changes.

4 Report on MAC activities in the Europe

a. Update on latest development (European Commission)

Mr Steiniger (European Commission) presented an overview of the activities in the EU regarding direct and indirect GHGs :

- regarding the MAC Directive 2006/40/EC (mandates working fluid GWP < 150 for passenger car MAC)
- focus on regulatory actions which have low cost but substantial benefits – MAC efficiency identified as one of these in the Commission Communication in Feb 2007.

The MAC efficiency project in the EU is handled by a consortium (.....) who developed a draft type approval procedure, using the normal lab conditions (low cost solution and measuring MAC on / MAC off under steady state conditions. The approach to characterise of components was not followed as too complex for either type approval or customer information .

The pilot study will conclude during Q3 2012, regulation drafting in the EU during early 2013. There are a number of open issues on the test procedure being addressed during the pilot phase and discussions continue.

Following a question from South Korea, the European Commission confirmed there is no intention to look at regulated emissions during MAC efficiency testing as other priorities such as the Real Driving Emissions activities (RDE) already in progress.

Ambition is to include MAC CO₂ in the COC (certificate of conformity) for Euro 6 vehicles. A further step could be taken after the revision of the CO₂ regulation 443/2009/EC to consider mandatory MAC efficiency limits and/or a possible inclusion in the future CO₂ targets.

A future step outside of this project will be to review simulation / virtual testing opportunities.

**b. Report of the draft MAC test procedure and MAC pilot test phase
(Consortium; TNO/TUG/LAT)**

Mr Willar Vonk (TNO) presented the report of the draft MAC test procedure and MAC pilot test phase on behalf of the consortium.

The MAC efficiency project contains two test phases :

- A- Multi lab pilot test (to solve open issues)
- B- Multi lab (4) round robin with golden vehicle.

Documents and the assessment tool are both available on CIRCA website.

Open issues :

- Sensitivities to gearshift – GSI vs fixed shift points
- Soak temperature
- Drive cycle @ min/max speed (dyno power)
- Ambient temperature / humidity

Additional testing in some laboratories will consider solar loading on/off and HVAC blower on/off.

Next steps : European MAC efficiency meeting 16 April 2012 in Brussels regarding report out from pilot phase. Additional participants welcome – registration via Willar Vonk (insert email address) in advance.

Questions :

Mr Pollack (Hungary) requested additional information on the vehicle / lab test matrix. Mr Vonk confirmed that there is an extensive test matrix where all stakeholders have contributed in order to ensure all test options and open issues are adequately addressed.

The MAC efficiency scope is M1 and N1, accordingly are the no N1 vehicles covered in the pilot study test matrix.

Mr Eberhard (Germany) inquired whether a more dynamic cycle would give different results. Mr Steininger (EC) responded that since the protocol measures two large numbers which are subtracted from each other to provide a very small number, that it is important that these are generated using stable conditions with good repeatability in order to secure a precise result, hence the need to use steady state conditions rather than a dynamic cycle. This also gives future opportunities for virtual testing.

Discussions regarding how the MAC efficiency result could be incorporated into EU CO₂ legislation. Mr Steininger confirmed that it's not so easy and there are further steps to go – the political discussions will happen later. In the meantime, focus should remain on completing the pilot phase. It was also explained that it is expected that MAC systems which perform well over the draft procedure would also perform well under EU Summer conditions and that the relative ranking of MAC systems was not expected to change.

5 MAC Test Status in Korea based on proposed procedure by MAC TP (National Institute of Environmental Research of Korea)

Mr Park reminded the group that Korea is actively participating in the MAC TP activities and presented the status and early findings of the study.

Korea follows UN-ECE regulations for diesels and is interested in establishing incentives for eco-innovations, including high efficiency MAC therefore the WP.29 procedures are an important aspect.

NIER has already made some testing on 5 vehicles to contribute to the pilot study on determining additional CO₂ from MAC operation. The vehicles (gasoline ULEV / diesel EU4 / 5) covered the a range of MAC equipment from basic to advanced (classification as in the TNO report).

NIER followed the draft procedure contained in GRPE-61-21 with some exception

- Cell temp / humidity control not perfect
- Issues with setting max cabin air flow
- No glazing corrections

As a result of the testing, the following conclusions and recommendations were given:

- Recommend 30 minutes preconditioning at 90 kmh⁻¹ to give sufficiently stable test conditions.
- CO₂ tolerance of 5% is very severe, recommend is 10%

Questions:

Mr Steininger (EC) asked whether the results for the individual phases are available. Mr Park confirmed that they have them but these are not included in this summary presentation.

There was further discussion on the most representative metric for consumer information kg/hr or l/100km. Mr Park said that Korea currently believes kg/hr is the better metric.

Further discussions followed on the difficulty of obtaining accurate data on the influence of glazing on the various parameter curves. Korea is still hopeful that manufacturers will be able to provide this data.

6 Other presentations (optional)

No other presentations available

7 Information from the regions

Japan reminded the group that there was a presentation from the Ministries of Environment and Transport last year. Testing is on-going on both MAC and real driving and so no data is available at this time.

China confirmed that they are not running any testing for the Pilot Phase, however, they remain interested to follow the EU activities. In case of a final UN-ECE regulation, they will investigate and consider implementation.

The Chairman advised that the USA confirmed by email in advance of the meeting that they had no information to present.

8 Prolongation of the mandate

The Chairman reminded the group that the Mandate has already been extended during the GRPE June 2011 session and this was confirmed by WP29 June 2011 for 3 years from the WP29 date, (i.e. June 2014).

9 Other items

The Chairman reminded the group that it will be necessary to include implementation discussions for future consideration – in particular whether the test procedure should be added to ECE-101 or directly to ECE-83 Annex 4.

10 Next Meeting

The group agreed to meet again during the June 2012 GRPE session for ½ day, avoiding clash with HDH informal group and to continue information exchange. The Chairman requested that in addition to the EU and South Korea, that other Contracting Parties consider whether they can provide additional information.