Status report / Activity Plan of Evap Task Force

26th Sep., 2017

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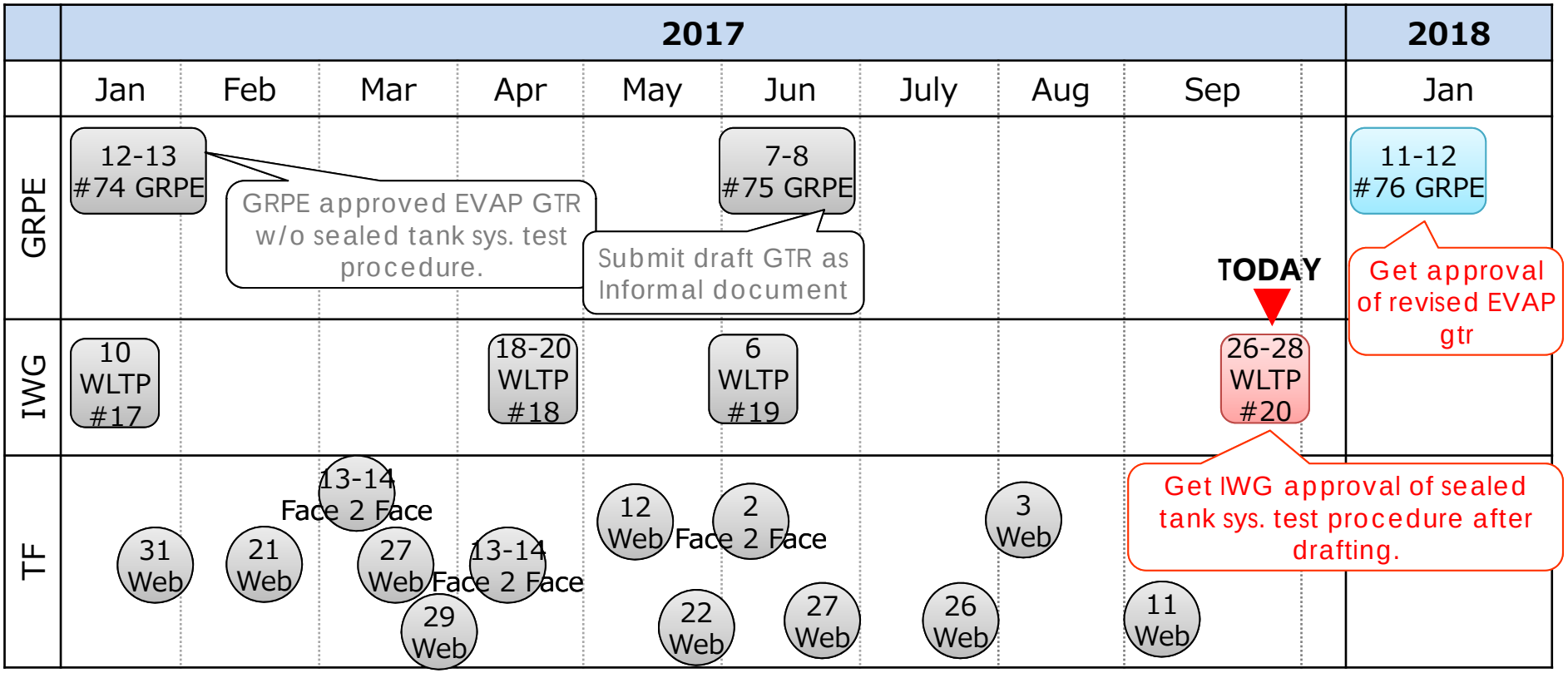
Status & Schedule

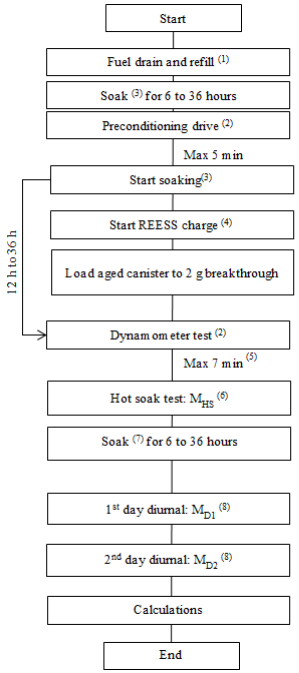
- The discussion on drafting sealed fuel tank system test procedure (GTR 19 amendment 1) is completed.
  - Improved the flowchart and made it consistent with text.
  - Reviewed numbering of paragraphs to make it easier to read.
  - Slightly modified the description of audit/witness tests to make it clear.
- The test procedure of semi-sealed fuel tank system, bi-fuel gas vehicles, and other issues will be discussed at next stage, after January GRPE meeting.



Changes on Flow Chart

■ Before (WLTP-19-07e_Appendix)

✓ Separate flow chart among with different systems.



(1) Fuel temp. 18 °C ±2 °C
40 per cent ±2 per cent of nominal tank capacity

(2) Low–Medium–High–Medium phase for Class 2 and 3 vehicles.
Two times of Low–Medium–Low phase for Class 1 vehicles.
Start temp. = 23 °C ±3 °C

(3) Soak at 23 °C ±3 °C

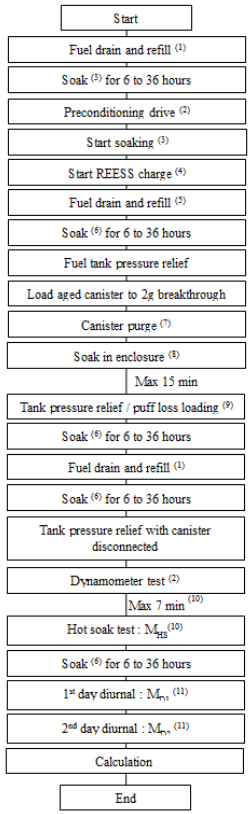
(4) for OVC-H

(5) Within 7 m
of the test driv
minutes of the
switched off.

(6) Min. temp.
Max. temp. =
Duration = 60

(7) Soak at 20

(8) Start temp.
Max. temp. =
Delta temp. =1
Duration = 24
Number of diu



(1) Fuel temp.: 18 °C ±2 °C
40 per cent ± 2 per cent of nominal tank capacity

(2) Low–Medium–High–Medium phase for Class 2 and 3 vehicles.
Two times of Low–Medium–Low phase for Class 1 vehicles.
Start temp. = 23 °C ±3 °C

(3) Soak at 23 °C ±3 °C

(4) for OVC-HEV only

(5) Fuel temp.: 18 °C ±2 °C
15 per cent ± 2 per cent of nominal tank capacity

(6) Soak at 20 °C ±2 °C

(7) Up to 85 per cent fuel consumption equivalent defined in 6.4.1.4.1. in this Annex.

(8) Temperature profile is the first 11 hours portion specified in appendix 2 to Annex 7 to Regulation No. 83-07.

(9) Depressurasation puff loss overflow mass shall be measured by either connecting an auxiliary canister or using a SHED.

(10) Within 7 minutes of the end of the test drive and within 2 minutes of the engine being switched off.

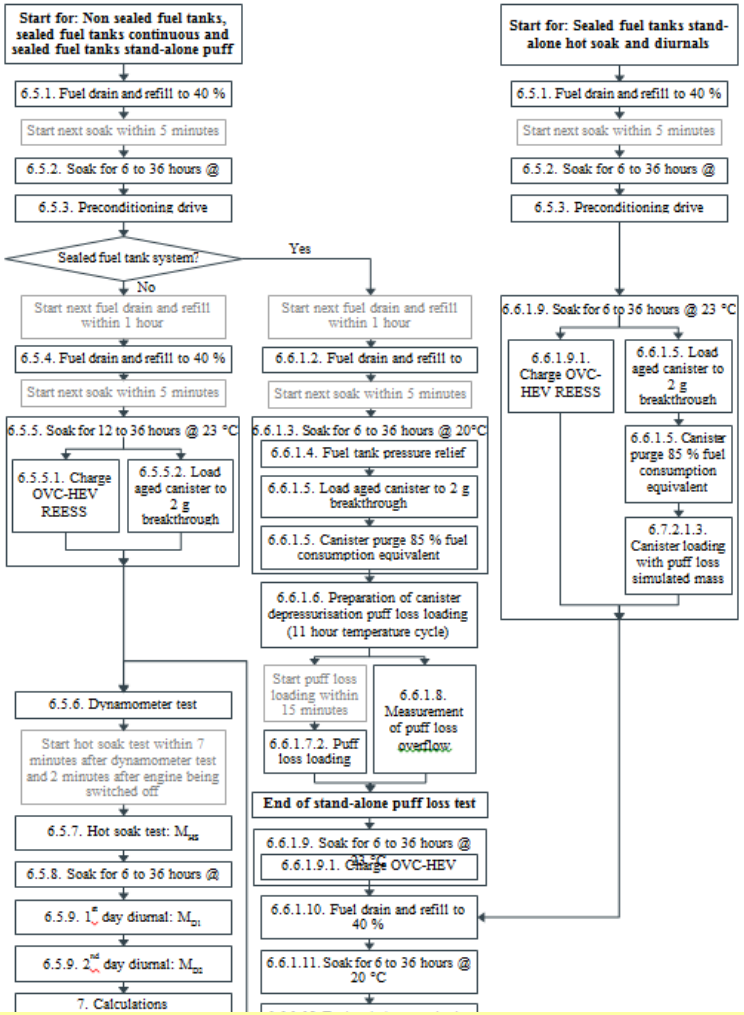
(10) Min. temp. = 23 °C
Max. temp. = 31 °C
Duration = 60 min ±0.5 min

(11) Start temp. = 20 °C
Max. temp. = 35 or 38 °C
Delta temp. =15 °C
Duration = 24hours
Number of diurnals = 2 days

■ After (WLTP-20-06e_appendix)

✓ One comparable flow chart.

✓ Added paragraph numbers.



Consolidated the flow chart (Thanks to Bill-san)

Deleted the Description of Audit/Witness Tests

■ Before (WLTP-19-07e_Appendix)

5.6 The responsible authority shall not grant type approval if the information provided is insufficient to demonstrate that the evaporative emissions are effectively limited during the normal use of the vehicle. The responsible authority may audit or witness any part of the tests described in Annex 1, or if there is reasonable doubt regarding the efficiency of the evaporative controls, request to repeat any part of the tests described in annex 1.

*Paragraph 5.6 was added in GTR19 Amendment 1.

■ After (WLTP-20-06e_rev_appendix)

5.6. The responsible authority shall not grant type approval if the information provided is insufficient to demonstrate that the evaporative emissions are effectively limited during the normal use of the vehicle. ~~The responsible authority may audit or witness also the part of the tests which are not performed at the manufacturer site, such as the carbon canister ageing or the determination of the permeability factor, or if there is reasonable doubt regarding the efficiency of the evaporative controls, request to repeat any part of the tests described in Annex 1.~~

The description of audit/witness test were left out and leave this to CP.

Main Discussion Points on Technical Issues and Conclusion

Discussion Points	Conclusion
A: Test sequence Whether to make the test sequence on 1 flow or have separate flows.	Keep both as options; Option 1: 1 flow Option 2: separate flow on measurement of puff loss and DBL
B: Condition before puff loss loading	20°C to 35°C, using first 11 hours of DBL
C: How to measure depressurisation puff loss overflow By auxiliary canister or by SHED	Keep 2 options Measure by auxiliary canister or SHED
D: Relief Pressure Requirement of sealed fuel tank	Relief pressure shall be 30 kPa or more. If less, do DBL tests on °C to 38°C
E: Limit for overflow puff loss emissions after the tank depressurization	Passing measurement should not be changed within the tolerance of ± 0.5 gram.
F: Requirement of tank pressure before refueling	Fully depressurised to reach a pressure less than 2.5 kPa above ambient pressure in normal vehicle operation and use.
G: Definition of sealed fuel tank system (Re-opened issue) Whether to include BMW proposed semi-sealed fuel tank system or not.	Kept as current A fuel tank system where the fuel vapours do not vent during parking over the 24-hour diurnal cycle.
H: Selection of test vehicle within EVAP family (Re-opened issue)	Worst case vehicle. However use the road load setting of the interpolation family vehicle H with the highest cycle energy demand in the EVAP family.

No change on technical issues

Conclusions

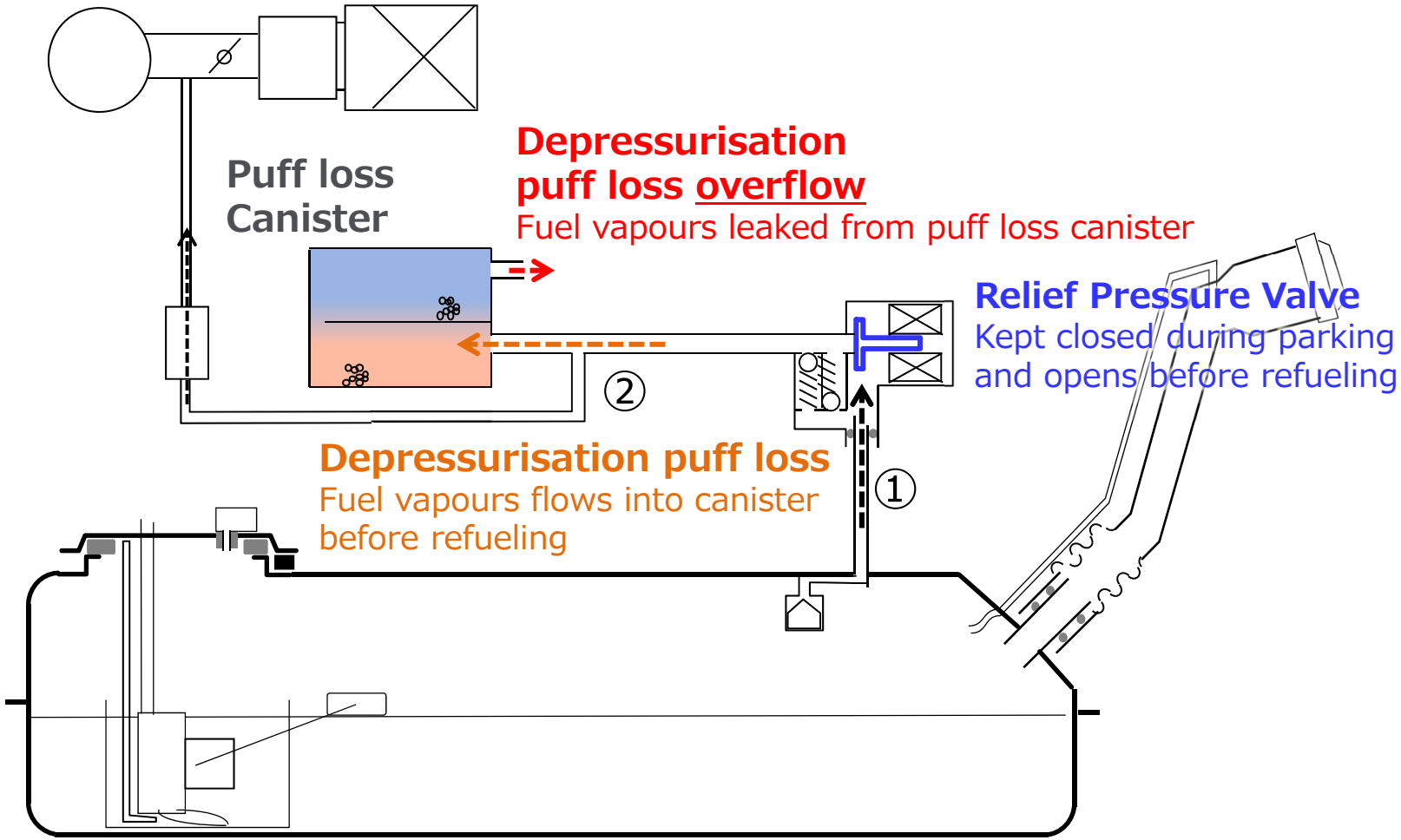
- After intensive and many fruitful discussions among experts since 2016,

ALL missions EVAP TF initially had are COMPLETED successfully.

- GTR 19 amendment 1 (WLTP-20-06e_Appendix) will be submitted as GRPE working document.
  This document is expected to be reviewed and approved during 78th GRPE session.

Thank you very much
for your attention!

Feature of Sealed Tank System and New Words



① No fuel vapour flow into the canister during parking because the control valve kept closed.
② Fuel vapour into the puff loss canister only before refueling.
(The relief pressure valve opens when the refueling event starts, then closes after tank pressure goes down.)

Discussion points of Sealed Tank System Test Procedure

Non Sealed Tank System Test procedure

Fuel drain and refill	
Pre-conditioning	
Soak	•23 +/- 3 °C
Canister loading	• 2g breakthrough
Test drive	•WLTC purge cycle
Hot Soak	•Min 23 °C / Max 31 °C for 60 min
Soak	•23 +/- 3 °C
1st and 2nd day Diurnal	•Start 20 °C to Max 35 °C 24 hrs for 2days

G Sealed Tank System Test Procedure

A "A series of procedure" OR "Separate procedure for puff loss loading volume"

2g breakthrough to be replaced by puff loss loading.

Drain and refill	• 15% refill
Tank pressure relief	• by opening fuel lid and/or cap
Canister loading	• 2g breakthrough
Canister purge	• 85% fuel consumed equivalent
Soak inside SHED	• temperature, duration,,,
Canister loading	• loading by opening the fuel lid • overflow vapor limit
Fuel drain and refill	• 40% refill to be consisted with non-sealed system
Battery fully charge	• OVC-HEV only

B **F** **C** **E**

H Selection of test vehicle

D Relief Pressure Requirement for Sealed Tank System