

In discussion

WLTP-SG-EV-08-06

Mode Selectable Switch

Subgroup EV

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Mode Description in the GTR15

In discussion

Definitions:

- 3.5.8. "*Mode*" means a distinct driver-selectable condition which could affect emissions, and fuel and energy consumption.
- 3.5.9. "*Multi-mode*" means that more than one operating mode can be selected by the driver or automatically set.
- 3.5.10. "*Predominant mode*" for the purposes of this gtr means a single mode that is always selected when the vehicle is switched on regardless of the operating mode selected when the vehicle was previously shut down. The predominant mode must not be able to be redefined. The switch of the predominant mode to another available mode after the vehicle being switched on shall only be possible by an intentional action of the driver.

Predominant Mode Description for Conventional Vehicles:

- 1.2.6.5.2.2. Vehicles equipped with automatic shift transmissions with driver-selectable modes shall fulfill the limits of criteria emissions in all automatic shift modes used for forward driving. The manufacturer shall give appropriate evidence to the responsible authority. Provided the manufacturer can give technical evidence with the agreement of the responsible authority, the dedicated driver-selectable modes for very special limited purposes shall not be considered (e.g. maintenance mode, crawler mode).
- 1.2.6.5.2.3. The manufacturer shall give evidence to the responsible authority of the existence of a predominant mode that fulfils the requirements of 3.5.10. in section B of this gtr. With the agreement of the responsible authority, the predominant mode may be used as the only mode for the determination of criteria emissions, CO₂ emissions, and fuel consumption. Notwithstanding the existence of a predominant mode, the criteria emission limits shall be fulfilled in all considered automatic shift modes used for forward driving as described in paragraph 1.2.6.5.2.2.
- 1.2.6.5.2.4. If the vehicle has no predominant mode or the requested predominant mode is not agreed by the responsible authority as a predominant mode, the vehicle shall be tested in the best case mode and worst case mode for criteria emissions, CO₂ emissions, and fuel consumption. Best and worst case modes shall be identified by the given evidence provided on the CO₂ emissions and fuel consumption in all modes. CO₂ emissions and fuel consumption shall be the average of the test results in both modes. Test results for both modes shall be recorded. Notwithstanding the usage of the best and worst case modes for testing, the criteria emission limits shall be fulfilled in all considered automatic shift modes used for forward driving as described in paragraph 1.2.6.5.2.2.

Predominant Mode for EVs

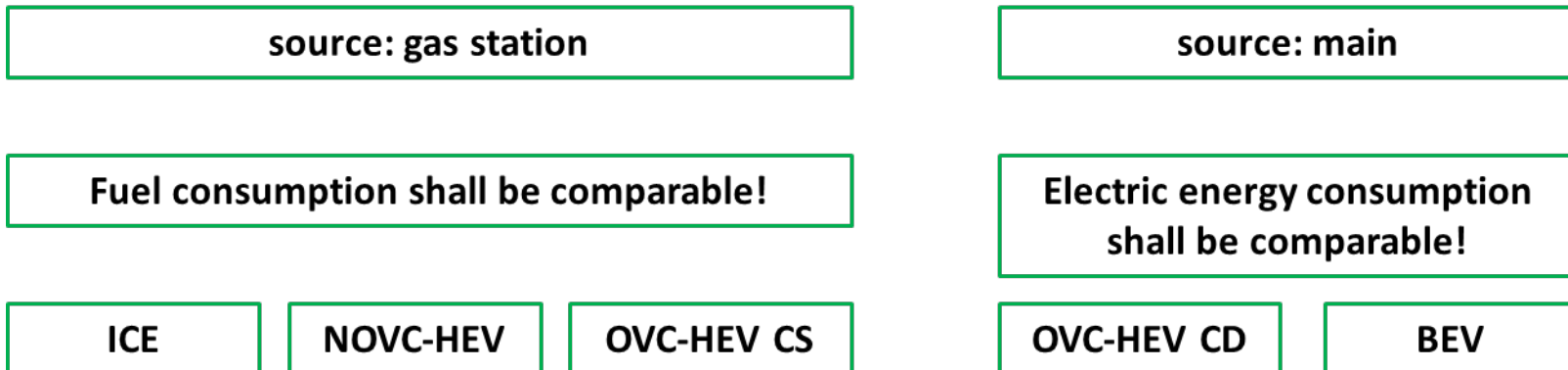
In discussion

Special remark

For OVC-HEV:

1. The manufacturer shall give appropriate evidence to the responsible authority that there is a *predominant mode under charge sustaining conditions, charge sustaining conditions can be assured after having finished the preconditioning of the vehicle according to §3.2.5.1 of Annex 8.*
2. The manufacturer shall give appropriate evidence to the responsible authority that there is a *predominant mode under charge depleting conditions, charge depleting conditions can be assured after having finished the preconditioning of the vehicle according to §3.2.4.1 of Annex 8.*

Justification:



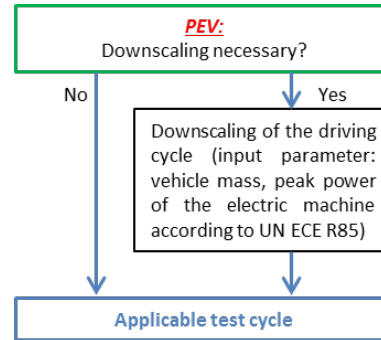
→ Per definition there can be only ONE predominant mode but with respect to the two different kind of independent tests, this has to be reconsidered and reworked.

PEV: Mode Selectable Switch

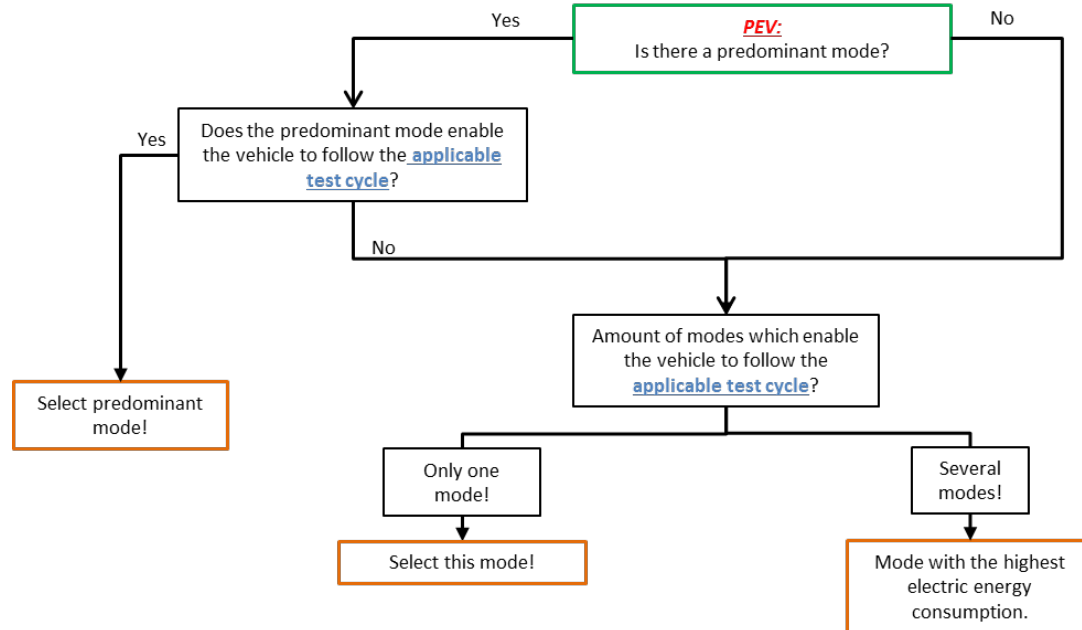
In discussion

Proposal for the mode selection – alternative solution (flow chart):

1. Step:



2. Step:



PEV: Mode Selectable Switch

In discussion

Proposal for the mode selection – alternative solution(text):

For vehicles equipped with a driver-selectable operating mode:

1. If there is a predominant mode that does enable the vehicle to follow the applicable test cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), this mode shall be selected.
2. If there is no predominant mode or if there is a predominant mode but the predominant mode does not enable the vehicle to follow the applicable test cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), the test shall be performed by using a mode that enables the vehicle to follow the applicable test cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.). If this is a single mode, this mode shall be selected. If several modes are capable of following the applicable test cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), the most electric energy consuming mode of those shall be selected.

OVC in CD: Mode Selectable Switch

In discussion

Current description for the mode selection for the CD type 1 test (Phase 1a amendment):

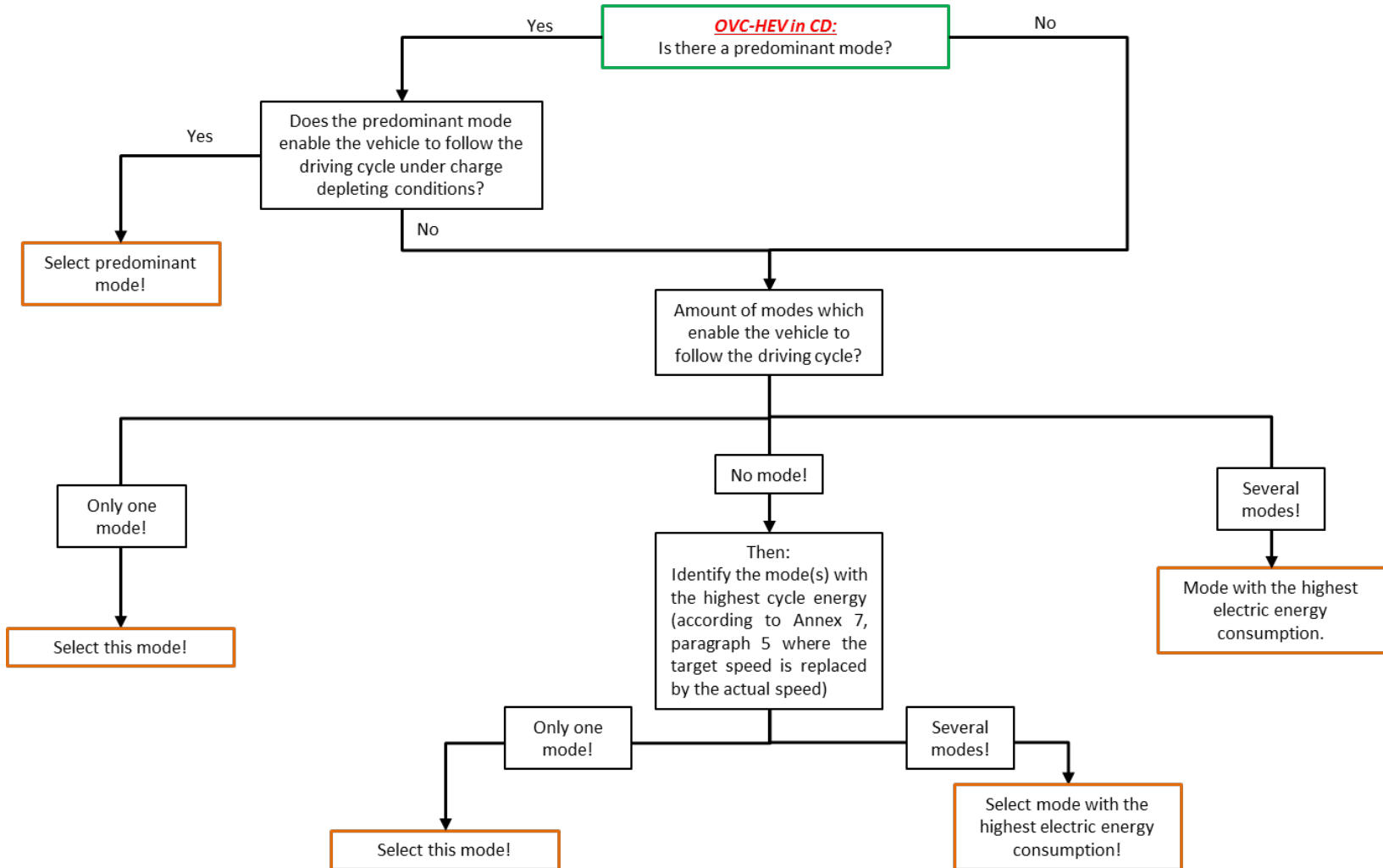
The charge-depleting test shall be performed by using a mode that enables the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.).

If several modes are capable of following the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), the most electric energy consuming mode of those shall be selected.

OVC in CD: Mode Selectable Switch

In discussion

Proposal for the mode selection for the CD type 1 test – alternative solution (flow chart):



OVC in CD: Mode Selectable Switch

In discussion

Proposal for the mode selection for the CD type 1 test – alternative solution (text):

For vehicles equipped with a driver-selectable operating mode:

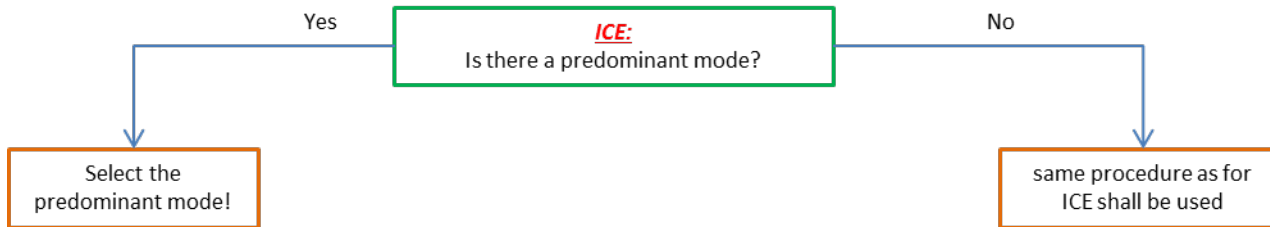
1. If there is a predominant mode that does enable the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.) under charge depleting conditions, this mode shall be selected.
2. If there is no predominant mode or if there is a predominant mode but the predominant mode does not enable the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.) under charge depleting conditions, the test shall be performed by using a mode that enables the vehicle to follow the applicable test cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.).
 - a. If this is a single mode, this mode shall be selected
 - b. If several modes are capable of following the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), the most electric energy consuming mode of those shall be selected
 - c. If no mode enables the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), the mode or modes with the highest cycle energy (according to Annex 7, paragraph 5 where the target speed is replaced by the actual speed) shall be identified. If this is a single mode, this mode shall be selected, otherwise the most electric energy consuming of these modes.

ICE: Mode Selectable Switch

In discussion

ICE

(system power is available for downscaling and p-t-m-ratio)

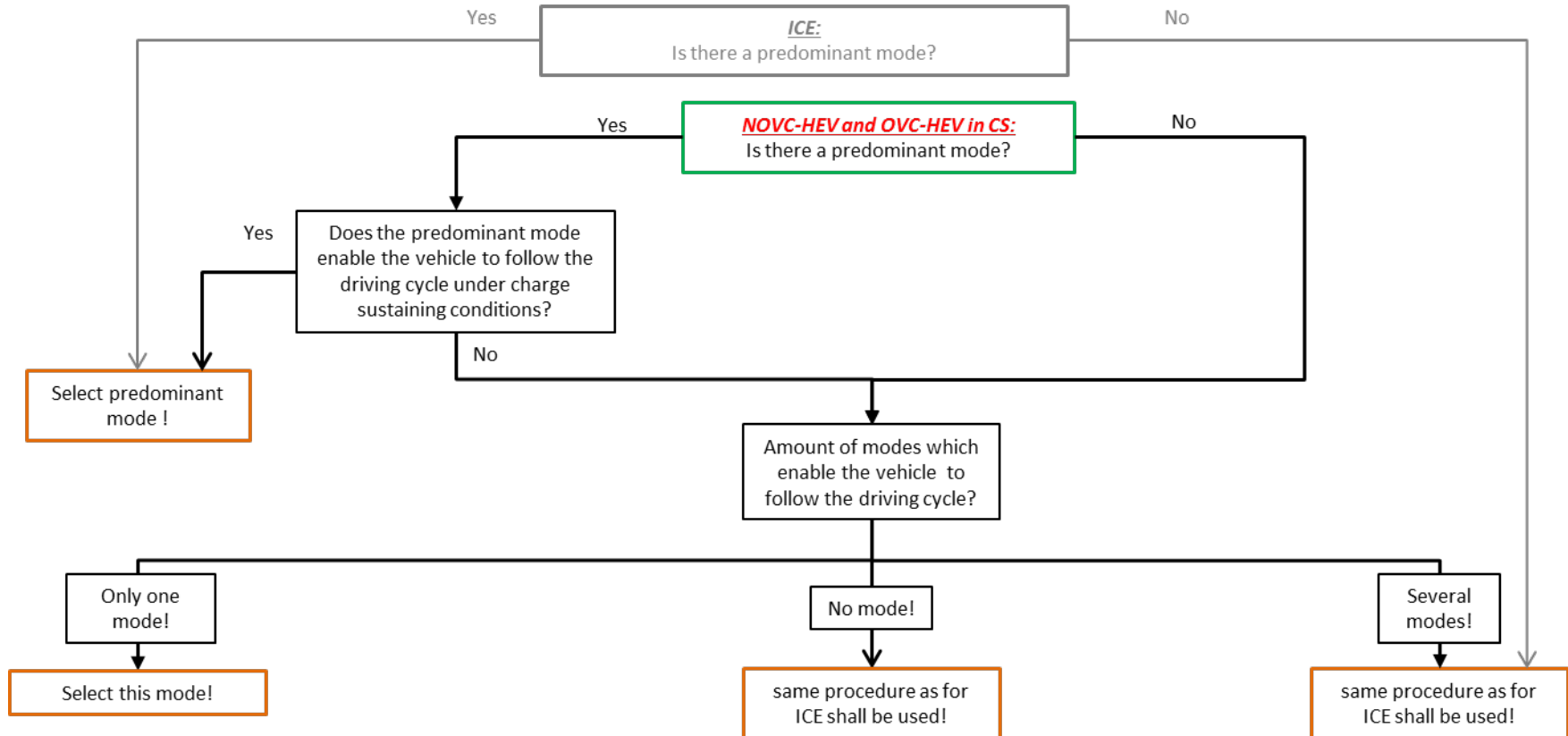


OVC in CS: Mode Selectable Switch

In discussion

Proposal for the mode selection for the CS type 1 test – alternative solution (flow chart):

(No system power is available for downscaling and p-tm-ratio)



Due to the non-availability of a system power, there is no downscaling and power to mass ratio applicable
→ Additional requirement for predominant mode in case of NOVC-HEVs and OVC-HEVs under Charge-Sustaining conditions: Following the drive cycle

OVC in CS: Mode Selectable Switch

In discussion

Proposal for the mode selection for the CS type 1 test – alternative solution (text):

For vehicles equipped with a driver-selectable operating mode:

1. If there is a predominant mode that does enable the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.) under charge sustaining conditions, this mode shall be selected.
2. If there is no predominant mode or if there is a predominant mode but the predominant mode does not enable the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.), the charge-sustaining test shall be performed by using a mode that enables the vehicle to follow the driving cycle (within the speed trace tolerances according to Annex 6, paragraph 1.2.6.6.).
 - a. If this is a single mode, this mode shall be selected
 - b. If there are several modes, same procedure as for ICE shall be used
 - c. If there is no mode, same procedure as for ICE shall be used

Thank you!

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