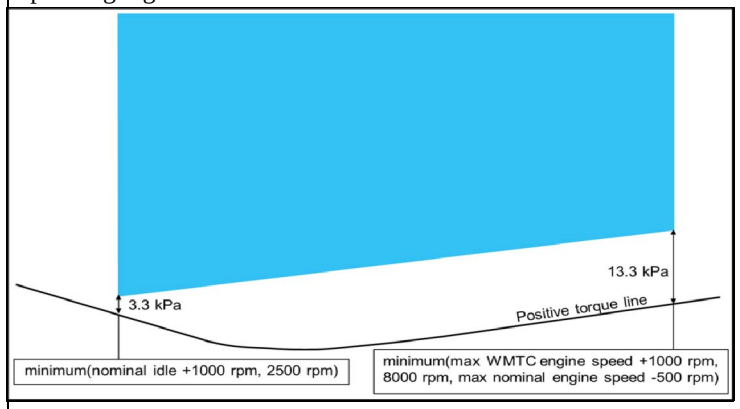
	OBD new GTR draft Red text means change from sources	Sources	comments CLEPA green indicates ok from CLEPA point of view blue indicates proposal / discussion needed red means error identified
5.	**General requirements**	GTR No. 18	ok
5.2.	OBD system		ok
5.2.1.	The technical requirements of this section shall be mandatory for vehicles in the scope of this gtr equipped with an OBD ~~stage I~~ system.	5.2.1. of GTR No. 18	ok
5.3.	**Functional OBD requirements**		ok
5.3.2.1.	Access to the OBD system required for the inspection, diagnosis, servicing or repair of the vehicle shall be unrestricted and standardised. All OBD relevant diagnostic trouble codes shall be consistent with paragraph 3.11. of Annex 1.	5.2.4.1.1. of GTR No. 18	ok
5.3.2.2.	At the manufacturer's discretion, to aid technicians in the efficient repair of vehicles, the OBD system may be extended to monitor and report on any other on-board system. Extended diagnostic systems shall not be considered as falling under the scope of approval requirements.	5.2.4.1.2. of GTR No. 18	ok

5.3.4.	Monitoring requirements for vehicles equipped with positive-ignition engines The OBD system shall indicate the failure of an emission-related component or system when that failure results in emissions exceeding the OBD emission threshold limits referred to in paragraph 5.5. ~~Annex VI(B) to Regulation (EU) No 168/2013~~. In satisfying the requirements of paragraph 5.3.1. ~~Article 21 of Regulation (EU) No 168/2013.~~, the OBD system shall, at a minimum, monitor for:	3.3.1. and 3.3.2. of 44/2014	ok: OTL in paragraph 5.5. at end of table
5.3.4.1.	Catalytic converter deterioration The reduction in the efficiency of the catalytic converter with respect to emissions of non-methane hydrocarbons and nitrogen oxides. Manufacturers may monitor the front catalyst alone or in combination with the next catalyst(s) downstream. Each monitored catalyst or catalyst combination shall be considered to be malfunctioning if the emissions exceed the NMHC or NOx thresholds provided for in paragraph 5.5. ~~[Section B of Annex VI to Regulation (EU) No 168/2013]~~.	3.3.2.1. of 44/2014	typo clarification ok: OTL in paragraph 5.5. at end of table
	Engine misfire The presence of engine misfire in the engine operating region bounded by the following lines: (a) low speed limit: A minimum speed of 2500 min -1 or normal idle speed +1000 min -1, whichever is the lower (b) high speed limit: A maximum speed of 8000 min -1 or 1000 min-1 greater than the highest speed occurring during a type I test cycle or maximum design engine speed minus 500 min-1, whichever is lower (c) a line joining the following engine operating points: (i) a point on the low speed limit defined in (a) with the engine intake vacuum at 3.3 kPa lower than that at the positive torque line; (ii) a point on the high speed limit defined in (b) with the engine intake vacuum at 13.3 kPa lower than that at the positive torque.	3.3.2.2. of 44/2014	ok

5.3.4.2.	The engine operation region for misfire detection is reflected in [figure 10-1]. [Figure 10-1] Operating region for misfire detection  	amending Delegated Regulation on 15.12.2017 = 2018/295	ok
5.3.4.3.	Oxygen sensor deterioration This ~~section~~ paragraph shall mean that the deterioration of all oxygen sensors fitted and used for monitoring malfunctions of the catalytic converter in accordance with the requirements of this section ~~Annex~~ shall be monitored.	3.3.2.3. of 44/2014	ok
5.3.5.	Monitoring requirements for vehicles equipped with compression ignition engines The OBD system shall indicate the failure of an emission-related component or system when that failure results in emissions exceeding the OBD emission threshold limits referred to in paragraph 5.5. ~~Annex VI(B) to Regulation (EU) No 168/2013~~. In satisfying the requirements of paragraph 5.3.1. ~~Article 21 of Regulation (EU) No 168/2013.~~, the OBD system shall, at a minimum, monitor for:	3.3.1. and 3.3.3 of 44/2014	ok - OTL in paragraph 5.5. at end of table

5.3.10.	A sequence of diagnostic checks shall be initiated at each engine start and completed at least once provided that the correct test conditions are met. The test conditions shall be selected in such a way that they all occur in the course of normal driving as represented by the Type I test of GTR No.2 . If the failure cannot be reliably detected under the Type I test conditions, the manufacturer may propose supplemental test conditions that do allow robust detection of the failure to be agreed with the technical service to the satisfaction of the approval authority.	3.4 of 44/2014	ok
5.3.11.	The OBD system shall be so designed, constructed and installed in a vehicle as to enable it to comply with the requirements of this gtr during conditions of normal use.	5.2.4.2 of GTR No. 18	ok,
5.3.11.1.	Temporary disablement of the OBD system	5.2.4.2.1. of GTR No. 18	ok
5.3.11.1.2.	A manufacturer may disable the OBD system at ambient engine starting temperatures below 266.2 K (- 7 deg. C) or at elevations over 2500 metres above sea level, provided it submits data and/or an engineering evaluation which adequately demonstrate that monitoring would be unreliable in such conditions. It may also request disablement of the OBD system at other ambient engine starting temperatures if it demonstrates to the authority with data and/or an engineering evaluation that misdiagnosis would occur under such conditions. It is not necessary to illuminate the malfunction indicator (MI) if the OBD thresholds are exceeded during regeneration, provided no defect is present.	3.2.1.2. of 44/2014	ok, wording as in R83/05 to be discussed: Clarify what is meant with regeneration (of what)? Replace "defect" by "malfunction" ? Change MI to MIL?
5.3.11.1.3.	For vehicles designed to accommodate the installation of power take-off units, disablement of affected monitoring systems is permitted provided disablement occurs only when the power take-off unit is active.	5.2.4.2.1.3. of GTR No. 18	ok
	The manufacturer may temporarily disable the OBD system in the following conditions:		ok
	(a) For flex fuel or mono/bi fuel gas vehicles for one minute after refuelling to allow for the recognition of fuel quality and composition by the powertrain control unit(s) (PCU);		vehicle may have engine control unit and/or power train control unit: to be discussed: replace PCU by CU ?

	(b) For bi fuel vehicles for five seconds after fuel switching to allow for engine parameters to be readjusted;		ok
	(c) The manufacturer may deviate from these time limits if it can be demonstrated that stabilisation of the fuelling system after refuelling or fuel switching takes longer for justified technical reasons. In any case, the OBD system shall be re-enabled as soon as either the fuel quality or composition is recognised or the engine parameters are readjusted.		ok
5.3.11.2.	Engine misfire in vehicles equipped with positive-ignition engines.	3.2.2. of 44/2014	ok
5.3.11.2.1.	Manufacturers may adopt higher misfire percentage malfunction criteria than those declared to the authority, under specific engine speed and load conditions where it can be demonstrated to the authority that the detection of lower levels of misfire would be unreliable. In terms of OBD monitoring, it is that percentage of misfires out of a total number of firing events (as declared by the manufacturer) that would result in emissions exceeding the OBD thresholds set out in paragraph 5.5. ~~Section (B) of Annex VI to Regulation (EU) No 168/2013~~, or that percentage that could lead to an exhaust catalyst, or catalysts, overheating, causing irreversible damage.	3.2.2.1. of 44/2014	ok - OTL in paragraph 5.5. at end of table
5.3.11.2.2.	When a manufacturer can demonstrate to the authority that the detection of higher levels of misfire percentages is still not feasible, or that misfire cannot be distinguished from other effects (e.g. rough roads, transmission shifts, after engine starting, etc.), the misfire monitoring system may be disabled when such conditions exist.	3.2.2.2. of 44/2014	ok
5.3.11.3.	Identification of deterioration or malfunctions may also be done outside a driving cycle (e.g. after engine shutdown).	3.2.3. of 44/2014 amending Delegated Regulation on 15.12.2017	ok, needed as supplement to definition driving cycle
5.3.12.	Activation of the Malfunction Indicator (MI)	5.2.4.5. of GTR No. 18	ok
5.3.12.3.	The MI shall operate in a distinct warning mode, e.g. a flashing light, during any period in which engine misfire occurs at a level likely to cause catalyst damage, as specified by the manufacturer.	3.5.3. of 44/2014	ok

5.3.12.4.	The MI shall also activate when the vehicle's ignition is in the 'key on' position before engine starting or cranking and deactivate if no malfunction has been detected. For vehicles not equipped with a battery, the MI shall illuminate immediately after engine starting and shall subsequently be deactivated after 5 seconds, if no malfunction has previously been detected.	3.5.4. of 44/2014	ok for 2wh specific bulb check without battery to be discussed: bulb check for P/HEV - for vehicle startig in electric mode - when to switch off MI?
5.3.13.1.	The distance travelled by the vehicle while the MI is activated shall be available at any moment through the serial port on the standardised diagnostic connector. By means of derogation for vehicles equipped with a mechanically operating odometer that does not allow input to the electronic control unit, "distance travelled" may be replaced with "engine operation time" and shall be made available at any moment through the serial port on the standardised diagnostic connector. Engine operation time in this context means the total accumulated time in which the propulsion unit(s) provide(s) mechanical output (e.g. the crankshaft of a combustion engine or electric motor rotates) after triggering the MI activation during one or more key cycles.	5.2.4.6.1. of GTR No. 18	ok
5.3.13.2.	In the case of vehicles equipped with positive-ignition engines, misfiring cylinders need not be uniquely identified if a distinct single or multiple cylinder misfire fault code is stored.	3.6.2. of 44/2014	ok, same as for EOBD
5.3.13.3.	The MI may be activated at levels of emissions below the OBD emission thresholds set out in paragaraph 5.5. ~~[Section B of Annex VI to Regulation (EU) No 168/2013]~~.	3.6.3. of 44/2014	ok, taken over from R83 amendment note: § 5.5. at end of table
5.3.13.4.	The MI may be activated if a default mode is active without significant reduction of propulsion torque.	3.6.3. of 44/2014	ok, allows MIL activation for any default mode
5.3.14.	Extinguishing the MI	3.7. of 44/2014	ok
5.3.14.1.	If misfire at levels likely to cause catalyst damage (as specified by the manufacturer) is no longer taking place, or if the engine is operated after changes to speed and load conditions where the level of misfire will not cause catalyst damage, the MI may be switched back to the previous state of activation during the first driving cycle on which the misfire level was detected and to the normal activated mode on subsequent driving cycles. If the MI is switched back to the previous state of activation, the corresponding fault codes and stored freeze-frame conditions may be erased.	3.7.1. of 44/2014	ok, as EOBD

5.3.14.2.	For all other malfunctions, the MI may be deactivated after three subsequent sequential driving cycles during which the monitoring system responsible for activating the MI ceases to detect the malfunction and if no other malfunction has been identified that would independently activate the MI.	3.7.2. of 44/2014	ok, same as for EOBD
5.3.15.	Erasing a diagnostic trouble code	3.8. of 44/2014	ok
5.3.15.1.	The OBD system may erase a diagnostic trouble code and the distance travelled and freeze-frame information if the same fault is not re-registered in at least 40 engine warm-up cycles.	5.2.4.8.1. of GTR No. 18	same wording as for original EOBD. To be discussed: R83 extension of WUC for P/HEV and start/stop systems to be included (R83/05 1st amendment) ? Compare with definition WUC
5.3.16	Bi-fuelled gas vehicles	3.9. of 44/2014	section on bi fuelled gas vehicle - low priority - not evaluated
5.3.17.	Additional provisions for vehicles employing engine shut - off strategies.	3.10. of 44/2014 amending Delegated Regulation on 15.12.2017	ok, taken over from R83 amendment
5.3.17.1.	Driving cycle	3.10.1. of 44/2014 amending Delegated Regulation on 15.12.2017	ok, taken over from R83 amendment
5.3.17.1.1.	Autonomous engine restarts commanded by the engine control system following an engine stall may be considered a new driving cycle or a continuation of the existing driving cycle.	3.10.1.1. amending Delegated Regulation on 15.12.2017	ok, taken over from R83 amendment
5.4.	Requirements relating to the approval of on-board diagnostic systems	5.2.5. of GTR No. 18	section on deficiencies - low priority - not evaluated
5.5.	**OBD emission threshold**	New	to be discussed; use term "OBD threshold limit"
	The requirements of OBD emission threshold are set out in paragraph 5.5.1.	New	The OTL are given in § 5.5.1.

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<td>5.5.1.</td>
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<tr><td></td><td></td><td>CO</td><td>THC</td><td>NMHC</td><td>Nox</td><td>(mg/km)
PM</td></tr>
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Principal</td><td>PI class 1/2</td><td>2170</td><td>1400</td><td>–</td><td>350</td><td>–</td></tr>
<tr><td></td><td>PI class 3</td><td>2170</td><td>630</td><td>–</td><td>450</td><td>–</td></tr>
<tr><td></td><td>CI</td><td>2170</td><td>630</td><td>–</td><td>900</td><td>–</td></tr>
<tr><td>OTL 2.
Enhanced</td><td>PI</td><td>1900</td><td>–</td><td>250</td><td>300</td><td>50</td></tr>
<tr><td></td><td>CI</td><td>1900</td><td>–</td><td>320</td><td>540</td><td>50</td></tr>
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<td>168/2013</td>
<td>question: OTL in GTR ?</td>
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<tr>
<td>5.5.2.</td>
<td>Contracting Parties may require the alternative OBD emission threshold according to their limit value of tailpipe emission legislation.</td>
<td>New</td>
<td>question: OTL in GTR ?</td>
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