MVC Informal group - List of open issues – MVC 4th session – MVC 5th session

Technical area	Item	Issue / background	Comments / proposals	Decision of the group
General	Scope	Describe the combinations covered in the scope of our group e.g. to limit technical complexity of our task	Take ISO 18868 combinations as a base. Some other "similar" combinations may be added (see NL presentation) Limit number of trailers to [3…5] ?	**MVC3:** -Weight and dimensions issue is out of our scope (unless impacting technical requirements) -The group focusses on ISO 18868 MVCs -All to check if a MVC combination type should be added in the focus -Should we limit the number of trailers as in ISO 18868? Keep it open until otherwise. -Exclude "hinged dolly" from scope, : tbc. **MVC4** -The scope shall not be limited to ISO 18868 combinations, at least for braking, tbc for couplings (B.Svensson comes with a proposal) -Other type of combinations should be considered as well, e.g. NL DUO semi-trailer combination where the drawbar is fixed to the towing semi-trailer (i.e. becoming a configuration 5), rigid+dolly+B-link+semi etc. -First priority is on rigid drawbar dollies (i.e. like a CAT). Hinged dollies are kept in the scope, yet with a prio 2. (note: rigid drawbar dollies transfer vertical load to towing vehicle; this is not the case for hinged ones)
	Definition of a dolly	What is a dolly: a centre-axle trailer, A device to convert a semi-trailer into a full-trailer (see CLEPA proposed definition GRRF-66-08), a tractor for semi-trailer?	The definition should be consistent / valid for all regulations in our scope (e.g. from both UN R13 and UN R55 standpoints).	Collect definitions available in the different regulations, standards etc. **done.** **MVC3:** -Dolly: a dolly is a towing trailer designed to taw a semi-trailer. Wording to be fine-tuned.

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		Do we need a definition for B-link trailers? Where should the definition be (RE3…?)	For UN R55: 2 types of dollies should be defined: dollies with hinge or fixed drawbar. For UN R13: the need to differentiate these types of dollies is not obvious for UN R13 (e.g. is the load transfer on truck higher than with a CAT?).	-Link trailer: confirm if definition is needed (e.g. regarding load transfer from semi-trailer behind) -Definition in RE3 or in individual regs: get guidance from GRRF. **MVC4** -Definitions must be in the regulation (s), not in RE3 (GRRF-79 guidance) -Definition of a dolly: "dolly means a towing trailer especially designed to tow a semi-trailer". -Decision to have a small group defining: o Different type of dollies (e.g. rigid drawbar, to start with) o B-Link-trailer (e.g. a semi-trailer able to tow another semi-trailer, with a 5th-weel coupling) o Leader: B.Svensson
	"Special dollies": scope and definition	What about other types of "dollies": are they part of our scope; if so should we define them? -"dolly" coupled via the timber. -"dolly" for heavy transport.	"dolly" for heavy transport: the fifth wheel is ahead of the axles and transfer static and dynamic load to towing vehicles.	**MVC3:** -"dolly" coupled via the timber: confirm it should be out of scope (we should focus our resources on main MVC configurations) -"dolly" for exceptional transport: get technical information; confirm it should be out of scope (e.g. on a prio 2 waiting list) **MVC4** -Decision: out of scope. -Item closed

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	Truck intended for towing multiple trailers	Is it necessary to have special provisions for trucks towing multiple trailers?	No general conclusion; to be discussed case by case	**MVC3** -The ambition is that the truck only depends on the GCW, not on the number of trailers behind. -The ambition is the same for the last trailer. -The specific requirements should be focussed on the towing trailers. **MVC4** -To be discussed under item 6.4
Braking	Electric and pneumatic control lines	Electric control line mandatory or optional? Compatibility with existing vehicles to be considered.	The answers may be different for truck, towing trailer and towed trailer. CLEPA proposal is to mandate the electric control line on towing trailers only.	**MVC3:** -The wording 'Electric control line' shall be used vs 'EBS' (which is only one technical solution). -**MVC5** - Mandatory for vehicles being part of MVC at least for towing trailers, to be confirmed for truck and last trailer. -Presentation document, point to point, routing repeater. Router on towing trailer. -Requirement for a router for a towing trailer in R13.
		Electric control line: failure detection and warning to driver.	CLEPA proposal	
		Response time	CLEPA proposal	
		Maximum length of ISO 11992 CAN bus; point to point connection	Point to point connection between two successive vehicles in the combination.	**MVC4:** -The proposal here fulfils the 40m requirement on ISO 11992 CAN bus. -Item closed
	Communication between vehicles	Transmission of "pin 5" information from all trailers to the truck	CLEPA proposal	

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		Which data shall be transmitted to and from the different trailers?	CLEPA proposal Bus load limitations must be considered.	**MVC4:** -Technical principle: Point to point ISO 11992 connection between two successive vehicles in the combination. -Prescribing a router should be avoided, this is a technical solution. The requirement should be a functional one, open to any technical design -Christoph Adam will lead a small group to: o Confirm the technical approach above o Check/define what messages shall be transmitted forward and backward along the combination
	Power supply dimensioning	Air supply: how to make sure the air supply will be sufficient to feed all trailers?	Are there practical problems today? Is UN R13 Annex 7 paragraph 2. sufficient to cover MVC?	**MVC4:** -Current Annex 7 applies to all type of combinations, including MVCs. This is deemed to be sufficient.
		Electric supply: dimensioning of electric wires in tractor-trailer connector; dimensioning of fuses in truck	Are there any practical issue today?	**MVC4:** -Christoph Adam will check with other system manufacturers if any potential / practical issue exists with ISO 7638 dimensioning (UN R13 paragraph 5.2.2.17.2. also to be reviewed) -**MVC5** -Required 4mm2 (modern technology doesn't need so much current) from When? -Need to mention the ISO-13044. -How many amps are used (Clepa) -What about the last trailer current cons. -Look at the current proposal for steering. -Neccessary to specify current capacity (Volvo) PT : 25 amps is available.

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	Parking brake	Ability of the towing vehicle alone to achieve 12% slope for the whole combination. Proposal to actuate service brake of the trailer via parking brake of the truck.	Two logics exist today for park brake. What is the intention of actuating the service brake of the trailer via parking brake: is this proposal about "park brake functionality" or about feature for truck owners (e.g. the ability to keep vehicle standstill in slopes)?	**MVC3:** -To be considered further at next meeting - 12% slope requirement applies to all type of combinations -Trailer braking with truck park brake is rather a "feature to fulfil a specific usage" than a real safety matter. **MVC4:** MVC-04-03 is reviewed and a revision 1 is defined. This rev 1 amends MVC-01-06 as follows: -Agreement that the 12% slope requirement in Annex 4 paragraph 2.3.2 shall apply to all type of combinations (incl. MVC) -Agreement that 5.2.1.34.1 should be deleted from MVC-01-06 proposal, in order to not disqualify the "Nordic park brake" solution which is the standard in northern Europe (tbc with Anders). This way both solutions are permitted, as today. -5.2.1.34 can consequently be deleted, since it is now empty -Agreement to delete Annex 4 - 2.3.2.1, since directly connected to 5.2.1.34.1
	Warning to driver	Any specific requirements needed? E.g. to identify which trailer is failing or performing EVSC intervention		**MVC3:** -Driver only needs to know that one trailer is intervening (EVSC) and that one trailer is failing; no need to know which trailer (this is a diagnostic matter for workshops) **MVC4:**

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				- ISO 11992 protocol as required in MVC-01-06 permits the motor vehicle to know which trailer fails. However this information is confirmed not necessary for the driver.
	Brake performance for dollies	Type 0 requirements (value of deceleration)	2 approaches: - Dolly is a "tractor-like" towing trailer, thus 50% for type O - Dolly+semi-trailer should brake as good as a full trailer (50%), thus dolly should brake ~55% since semi-trailer is only 45%	**MVC3:** -See document MVC-03-09 **MVC4:** -Base proposal is CLEPA document MVC-01-06: 50% for type O of a dolly -All to review this proposal for next meeting
		Which compatibility bands for dollies?	Center-axle trailer for front yellow coupling? Tractor bands for rear yellow coupling? In practice today, the yellow coupling pressure output is identical to the input.	**MVC3:** -See document -03-09 -Consider the use of tractors formula in Annex 10 - 3.1.6.2: Ps = Pso (1 + 0.45z). **MVC4:** -Base proposal is CLEPA document MVC-01-06: the compatibility bands of a centre-axle trailer should be used -All to review this proposal for next meeting -Industry prepares justification and explanation for next meeting -Other eventual proposals should be prepared and justified
Stability	EVSC	In case of EVSC intervention on a towing trailer, should trailer behind be automatically braked (via pneumatic and electric control)?	It looks better to brake following trailers to avoid jack-knifing risk and stretch the rear part of the combination. Wabco will check this internally CLEPA.	**MVC3:** -EVSC intervention on a towing trailer shall activate brakes of following trailers, e.g. to prevent creating jacknifing situations. **MVC4** -Technical impact and feasibility on trailers to be documented → system manufacturers

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		EVSC directional control on trailers with steered axles involved in MVC		**MVC3:** -Trailer EVSC systems senses lateral acceleration to prevent roll-over. -Directional control technology not available
		EVSC Mandatory or optional? Compatibility with existing vehicles should also be considered.		**MVC4** -EVSC is mandatory in Series 11 -The use of an "old" vehicle without EVSC is an in-use requirement matter
		EVSC for dollies?		**MVC3:** -EVSC needed on dollies -EVSC shall brake semi-trailer and trailer behind -Jacknifing risk if dolly over-braked: should be managed by dolly braking system (similar situation as on a full-trailer) **MVC4** -Confirm interest of EVSC on a dolly (semi-trailer behind may detect roll over before the dolly…) -Market standard on dollies will be with an electronic control line (i.e. low technical impact to have a roll over prevention function) -Confirm jacknifing risk if dolly over braked vs semi-trailer…
		EVSC , brake signal transmitted to the last trailer even if this has no EVSC		**MVC5** Yes, braking signal generated ahead is transmitted to the last trailer.
Coupling	Link with R55 Informal group	Avoid redundant work. Avoid amending R55 at the same time in two different groups.	Coordinate with IG R55. Extract from TOR: The first step in the group will be to amend UN R13 and identify what	Item discussed in the informal R55 IWG group.

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			changes are needed in UN R55, which are not addressed in the on-going Informal Group on UN R55. In a second step, the group will address these missing items in UN R55.	
	Identify what is missing in UN R55 IG to fully address MVC in R55		Coordinate with IG R55	Items likely to treated by R55 IWG.
	In-use calculation for multiple trailers	These formulas exist for single trailer combinations. They should be updated / added for MVC. This is dealt in item 21 of the IG R55 ("D-value calculation for multiple trailers")	ISO 18868 is proposed as a base. Coordinate with IG R55.	Item discussed at R55 informal group.
	Remote indication	There may be an issue for MVC if the proposal from the IF R55 to allow remote indication on other places than in the cab (e.g. on chassis side) is not accepted by GRRF	Coordinate with IG R55	**MVC5** Proposed amendments accepted at GRRF 80. Standard for remote indication connector? Can the ISO 12098 be used or 11992.
Steering	Steered axle on a dolly	Do we need requirements in UN R79?		Need for amendments to harmonise requirements. Information from Krone about stability.
	Steering table	Is this steering equipment?	The purpose is for winter time in Nordic countries, when ice can increase friction on the fifth wheel to a point where it locks. The primary intention is not for steering the vehicle.	**MVC5** Studies about pros and cons of ballbearing. - Sweden - Norway - Australia - Aditional test? R79 covers?
	Krone steered axel Dolly	Approved to regulation 79?		**MVC5** C.A. info from Krone: no only individual approval, mainly for test. Not so many per year. Bast report. Good experience so far.

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				Ballbearing with 20 degre stop. Trailer follows very good and gives good stability. Locks at speed higher than 60.
Misc.	Towing capacity of the truck	Issue raised by Norway on lack of towing capacity of 4x2 trucks involved in MVC during winter time	The total weight should not be more than what the tractor towing capacity, but can we do anything in UNECE regulations to help fixing this issue? This is rather a matter for national regulations?	
	Trailer identification	Is there a need to be able to identify if a vehicle can be used in an MVC?		