

## **DRAFT NOTES**

### **7<sup>th</sup> meeting of GRVA MVC IWG on Modular Vehicle Combinations**

Venue: OICA offices  
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Chairman: Pierre Teyssier  
Secretariat: Olivier Fontaine (OICA)  
Dates: January 8-9, 2020

#### **1. Welcome and Introduction**

The host informed about the anti-trust rules applicable during the meeting. Participants were reminded of the legal obligation to take note of the OICA anti-trust charter available on the web site and to acknowledge these rules

Mr. Teyssier (Volvo Trucks) was elected as Chair in absence of Mr. Gunneriusson (S)

#### **2. Approval of the agenda**

Document: MVC-07-01

The agenda was adopted with no change, yet the group agreed to primary focus on the revision of the existing working document such all the subjects in item 5 will be progressively covered.

#### **3. Approval of the minutes of last meeting**

#### **4. Review work program**

Document: MVC Work Program w51.xlsx

#### **5. Review open issues**

Documents: MVC reference document - w51.pptx  
MVC reference document - w02 - prep of MVC-07.pptx

##### 5.1. Electric control line

## 5.1.1. Mandatory installation

Document: Industry proposal expected

## 5.1.2. Failure detection

Document: CLEPA presentation expected

## 5.1.3. Router and repeater (incl. pin 5)

Documents: CLEPA proposal expected  
MVC - Electric control line - v2.1  
MVC - Router and repeater functions v1.docx

## 5.1.4. Data transmission between vehicles

Document: CLEPA presentation expected

## 5.2. Electric supply

Review input from truck and system manufacturers, for decision.

## 5.3. Parking brake

## 5.4. Warning to driver

## 5.5. Type 0 and compatibility bands

Documents: calculations - draft 1.1.xlsx  
Dolly\_Mechanics\_notes.pdf  
Dolly\_Mechanics.pdf

#### Review of the working document structure

Question as to whether there is a definition of “power-driven” vehicle since the “motorized trailers” will progressively appear on the market in the future. Perhaps taking the ratio between the power and the weight of vehicle could be a base for a discriminating criterion.

Conclusion: take this in the “parking list for step 2.

2 items with regard to the compatibility bands and load transfer to the towing vehicle:

- rigid drawbar dolly and
- B-link.

#### **Dolly**

##### Dolly mechanics

Mr. Svensson presented his preparatory presentation per document MVC-07-13.

The presence of a “ballrace” makes a significant difference, compared to a conventional 5<sup>th</sup> wheel, in the dynamics of the combination since it does not allow any rotating movement around the horizontal axis in case of braking.

Demonstration of the mechanics/dynamics of the different configurations.

Hinged dollies

While the proposed new provisions do not cover hinged dollies from the regulations, the group needs to ensure that those countries using UN R13 and needing these hinged dollies do not jeopardise the MVC proposal. The group endorsed the following strategy: addressing the rigid dollies in a 1<sup>st</sup> step, be open to start the work on hinged dollies in a 2<sup>nd</sup> step.

Conclusion:

- rigid dollies in Step 1, hinged dollies in Step 2
- Approach Australian expert before GRVA

Dolly as a centre-axle trailer

Question: for the compatibility bands, should the dolly be considered as a full trailer or as a centre-axle trailer?

The braking system manufacturers favoured to assume the dollies as centre-axle trailers since the experience for the last 20 years shows this is safe. Additionally, the simulations done by the university of Eindhoven shows that most of the load transfer from the semitrailer to the dolly is transferred forward to the truck; this is a very similar situation as for a center-axle-trailer.

The group agreed on the following strategy for GRVA:

- Go forward with the centre-axle approach (yet keeping the door open to the full trailer approach);
- Prepare technical justification for the proposal;
- Any controversial comment to be raised if possible prior GRVA-05.

Conclusion: as above, to be presented to GRVA-05 with relevant justifications.

Steered dollies

Steered dollies: not relevant for UN R13. Proposal that the steering capabilities are annihilated above a certain speed. The group agreed in some previous meeting that the steering be addressed as a step 2. .

Definition for Dolly into the RE3

CLEPA proposed that the group raise the concern of adding a definition for Dolly into the RE3 at the 5<sup>th</sup> GRVA session

Conclusion: informal group to question GRVA-05 on definition of dolly into RE3

**B-link**

The state of the art is to consider B-link as a semi-trailer in the braking calculations, with no real safety concern in the field. Additionally, the simulations done by the university of Eindhoven shows that most of the load transfer from the semitrailer to the B-link is transferred forward to the tractor; this is a very similar situation as for a single semitrailer combination.

The group agreed to go forward with the B-link as a semi-trailer (yet keeping the door open to other approach).

Conclusion: as above

## 5.6. EVSC

**6. Review draft proposal for amendment of R13**

Document: MVC-01-06-r3e Working document draft 1.docx

**Paragraph 2 – definitions**

Informal group to propose GRVA to introduce a definition of Dolly into RE3

**Paragraph 5.1.3.2.**

Reference to paragraph 5.2.1.18.2.: this paragraph was already amended by the informal group (see further down in the document) such to make this paragraph apply to the motor vehicles only. Yet a corresponding paragraph for towing trailers seems missing in the text. The paragraph 5.2.2.24.2. address this case of a failure or of a breakage in the supply line of the following trailer. The redundancy is provided by the electric control line.

**Paragraph 5.1.3.4.**

Paragraph makes the provisions applicable to all trailers (more general)

**Paragraph 5.1.3.5**

Exemption to the general prohibition of trailers equipped with only one control line (electric or pneumatic). Provision is relevant, no comment.

**Paragraph 5.1.3.6.3.**

The group reviewed this paragraph in the context of the full paragraph 5.1.3.6.

The group agreed to introduce the text of document MVC-07-10 as adapted:

“Towing trailers shall be equipped with a message routing function as defined in paragraph 6.3 of ISO 11992-2:2003 for the purpose of connecting all multiple electronic control units to the electric control line.

This function is deemed to fulfil the point to point requirement referenced above for the electric control line between electronic control units.

In case the length of an electric control line installed in a trailer exceeds the maximum permissible length(s) according to ISO 11992-1:2003, a device to amplify and repeat the transmitted messages shall be installed within the electric control line to ensure the electric signals fulfil the relevant requirements of ISO-11992-1-2003.

The capabilities of the device to extend the length of the electric control line shall be declared by the manufacturer. [~~In all cases repeating of messages shall not delay the transmission of messages.~~] The requirements of ISO 11992 and the relevant requirements of this Regulation shall continue to be fulfilled.

[ADD a requirement for the routing of the pin 5]”

CLEPA to check whether ISO standard 11992 currently contains MVC messages.

CLEPA informed that the ISO 11992 limits the length (w/o router) to 40 m for empiric reason, there is no study backing the value, nor justifying a possible longer distance. CLEPA was then keen that the wording does not refer to the characteristics of the system.

The expert acknowledged that the latency caused by the router is already covered in ISO 11992.

CLEPA committed to double-check this statement. The group agreed to temporarily delete the provision regarding the delay, subject to further check by CLEPA.

About the routing of PIN5: CLEPA to check whether this provision already exist in the regulation.

When checking the provisions of paragraph 5.2.1.23 vs. paragraph 5.2.2.17 and 5.1.6.3. the group wondered whether the provisions are redundant.

Paragraph 5.1.3. (connections between vehicles) and 5.2.2.17 (electric control line) may be seen complementary. CLEPA proposed to re-organize the provisions. The group developed a re-structuration for re-distributing the provisions. Following this logic, it was agreed to add provisions for routing function for towing vehicles into the proposed new paragraph 5.2.2.24.

Concerning the repeater device (could become a “repeater function”), the provisions were also moved to paragraph 5.2.2.17.

Conclusion:

- CLEPA to check whether ISO standard 11992 currently contains MVC messages
- CLEPA committed to double-check that the latency caused by the router is already covered in ISO 11992. Temporarily deletion of the provisions regarding the delay in the meantime
- Provisions re-distributed among the tractor, the trailers and the towing trailers

### Paragraph 5.1.3.6.3.

Deletion of the last part of the 1<sup>st</sup> paragraph: due to that it is redundant.

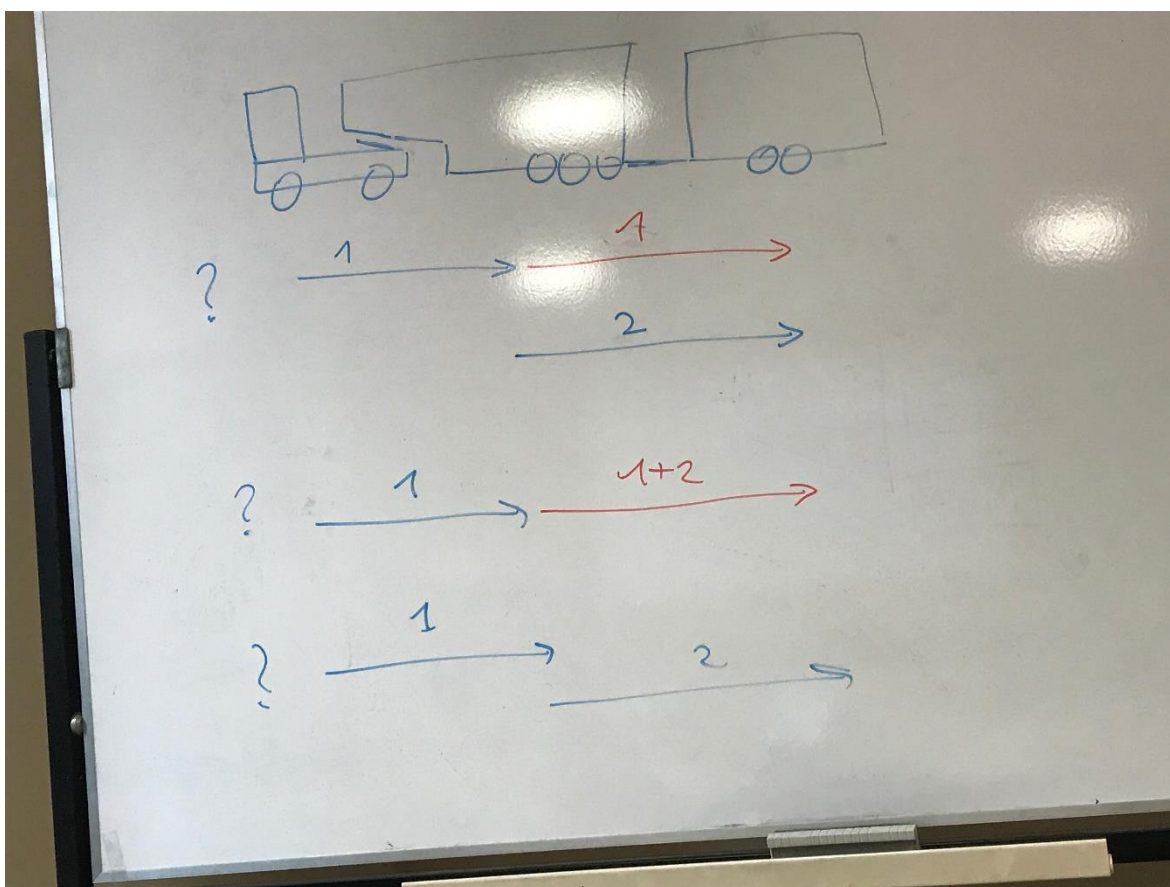
### Paragraph 5.1.3.6.4.

Note: paragraphs 4.3.2. to be re-numbered as 4.3.3.

Question on the provisions: as the tractor and the towing trailer are both mandated to provide a signal to the rear, which signal should the last trailer use 1<sup>st</sup> (“that first generate the signal”): chronological order or 1<sup>st</sup> in the combination. The group was missing a presentation on the way the signals and brake applications are managed in the regulation. As paragraph 5.1.3.2. is clear, only the other possibilities make a question.

The Chair was keen that the provisions are transparent in order to further develop the possibilities of multiple trailers.

Conclusion: CLEPA to clarify the issue.



**Paragraph 5.2.1.18.2.****Paragraph 5.2.2.17.**

Agreed to delete the text in [ ] since the provisions are in the relevant footnote.

Agreed to move the paragraph 5.2.2.17.3. (adapted) to the towing trailer section:

**“5.2.2.17.3. Towing trailers shall be equipped with special electrical connectors conforming to ISO 7638:2003 at the front and rear interfaces. Failure warning signals as specified in 5.2.2.17 to 5.2.2.17.2. shall be transmitted from the rear electrical connector to the front electrical connector without modification.”**

**Paragraph 5.1.3.8.**

Seems the provisions are now re-written in paragraph 5.1.3.9. CLEPA explained that the provisions of paragraph 5.1.3.8. aim at prohibiting a “black knob” (control releasing the trailer brakes) which does not automatically reset when the trailer is coupled to a tractor.

END OF MVC-07 REVISION XXXXXX

The group also reviewed the working document starting with paragraph 5.2.2.24.2. (i.e. at the paragraph where the revision was left at MVC-06):

**Paragraph 5.2.2.24.2.**

Inspired from paragraph 5.2.1.15.

**Paragraph 5.2.2.24.3.2.3.**

Concern as to whether the braking system can detect that there is no pneumatic control line. Yet seems this case is covered in the ISO standard. This paragraph seems based on the existing paragraph 5.1.3.3.

CLEPA subsequently announced that in ISO11992 there is a message EBS12 byte 3 “the information of the absence of pneumatic control line is required to be sent by Annex 16 paragraph 2.1.1.”

**Paragraph 5.2.2.24.3.3.**

copy/paste of an existing provision addressing the simple case of a tractor/trailer combination; this addresses the case of a rupture in the supply line. 650 kPa implies a full application of the brakes. Debate as to whether the provision should also contain a mandatory electric signal. This would imply to install a battery in the trailer.

Illumination of the stop lamps: addressed by paragraph 5.2.2.22.1.

Conclusion:

- In the case of this paragraph: stop lamp activation
- In the case of full breakage: no stop lamp illumination

**Paragraph 5.2.2.24.4.**

Wording is inspired from paragraph 5.2.1.21. debate on whether the braking system may be activated by other causes than the driver and the EVSC. Seems the 2<sup>nd</sup> sentence indicates the only exemption where a towed trailer braking system can be applied without the towing vehicle being braking: for stability reason.

Seems also that the 1<sup>st</sup> sentence was introduced to avoid the “stretch brake” which was too much used by some drivers in the past.

Seems from experience, the last trailer is the most vulnerable to the roll-over. It then makes sense that its preceding trailer activates the last trailer EVSC, even if this last trailer is not yet in the curve.

Debate as to whether the text should anticipate a system with intelligence enough to selectively apply the brakes of the trailers (e.g. the last 2 of 4 trailers). However this generates numerous other questions (e.g. the ISO11992 messages, etc.)

CLEPA keen that the initiation of the braking can be triggered by the tractor or a towing trailer.

Conclusion:

- Need for a provision in the proposal to ensure that EVSC of a towing vehicle trailer (or tractor) activates the brakes of the following trailer
- Reminder (EVSC of any vehicle can initiate its own Automatically commanded braking independently from any other vehicle):
  - o Motor vehicle EVSC must be capable of activating the EVSC of the following trailers (not selective)
  - o EVSC can initiate the automatically commanded braking of a vehicle independently from other vehicles
- Selective activation of the EVSC within the combination may be addressed in a Step 2

#### **Paragraph 5.2.2.24.5.**

Debate about the accumulation of delays when there are e.g. 4 trailers: while the electric signal would indeed reach the last trailer, this trailer may not brake due the delay of the pneumatic supply, yet without any failure indication. Seems this paragraph is inspired from paragraph 5.1.3.4.3.

Debate as to whether the proposed values of 1 second per trailer is relevant.

#### **Paragraph 5.2.2.24.6**

Clarification of the point where the pressure is observed since there are two control lines (one at front, one at rear), each having two ends (one at front and one at rear).

Reference also to paragraph 5.1.3.4.1. (*Both signals shall be present at the coupling head and the trailer shall use the electric control signal unless this signal is deemed to have failed. In this case the trailer shall automatically switch to the pneumatic control line*)

#### **Paragraph 5.2.2.24.6.1**

The current wording would apply to any control line, even electronic. Need to specify it is limited to the pneumatic control line.

#### **Paragraph 5.2.2.24.7.1**

The group wondered the origin of these provisions.

Conclusion: add a requirement for spring brakes on non-towing trailers to be coupled with an MVC

#### **Paragraph 5.2.2.24.7.2**

No comment

#### **Paragraph 5.2.2.24.8.**

Debate on the origin of this provision. Seems it is applicable in the context of homologation test.

Conclusion: to be further revisited, once the experts understand the background.

#### **Paragraph 5.2.2.24.9.**

Transmission of “VDC Active” message within ISO 11992:

Wording of the 1<sup>st</sup> sentence is a justifications: deleted.

Conclusion: keep the 2<sup>nd</sup> sentence as a requirement.

#### **Paragraph 5.2.2.24.10.**

No need to change

### **Paragraph 5.2.2.24.11.**

refers to the performance requirements of all trailers, and in particular those of centre-axle trailers.

The group then reviewed the beginning of the document (see also above).

Paragraph 2.42.2. addition of a definition for “link-trailer”

“dolly” should be replaced everywhere by “rigid drawbar dolly”.

The group then agreed to add provisions for non-towing trailers

Add a new paragraph 5.2.2.25

5.2.2.25. Special requirements for non-towing trailers to be part of a combination with multiple trailers

5.2.2.25.1. the trailer shall be equipped with a pneumatic and an electric control line, as per paragraph 5.1.3.1.2.

5.2.2.25.2. the parking brake performance of the trailer shall be fulfilled by the application of the spring brakes fulfilling the relevant requirements of Annex 4 and Annex 8.

5.2.2.25.3. the trailer shall have a marking to indicate that the trailer is authorized to be used in a combination with multiple trailers.

(see re-worked working document)

## **7. Review new input to the IWG and update “MVC parking list”**

Documents: MVC-07-02 (N) 1217362\_fast\_title=Trucker's+guide++engelsk+(EN)  
 MVC-07-03 (N) KRONE PRINSIPP SKISSE SVING  
 MVC-07-04 (N) Produktbeskrivelse Dolly med Aktiv Sving gjennom DRAG  
 MVC-07-05 (N) Tilbakemelding til MVC - Om Nasjonale regler  
 MVC-07-06 (N) TYSK Nasjonal Enkelgodkjenning \_inkl-Lenkanlage  
 MVC-07-12 (N) Norsk utgave til MVC - møte i Paris 8-9 Januar 2020

### **Definition of dolly in R55**

Question as to whether there is a definition of “power-driven” vehicle since the “motorized trailers” will appear on the market. Perhaps take the ratio between the power and the weight of vehicle

### **Inputs from Norway**

The Chair suggested that the input from N are discussed by the group. N proposed to put the priority to the revision of the working document, and that the group reviews the N inputs at a later stage

Conclusion: N inputs to be reviewed at a next

**Definition of “power-driven” vehicle** since the “motorized trailers” will progressively appear on the market in the future

## **8. Other business**

## **9. Date and place of next meetings**

GRVA-MVC-08 on 8-9 April TBC. Venue to be decided (preferably at the OICA offices).



