Federal Ministry
of Transport and
Digital Infrastructure

Informal document GRRF-80-39
80th GRRF, 15–18 September 2015
agenda item 3

ECE-R13
New proposal for Annex 23

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The title of the new Annex 23 is:

Special additional requirements for trailers of category O_2 without pneumatic connections and equipped with service braking systems with pneumatic energy storage devices

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This means, the trailer has

- **no pneumatic control line**
- **no pneumatic supply line**
- **in general, no ISO 7638 connector**

- **The trailer has <u>two</u> kind of <u>energy sources</u>:**
  - **an electrical power supply from the motor vehicle to drive the compressor**
  - **a compressor installed on the trailer to provide the pneumatic energy for the braking system of the trailer**

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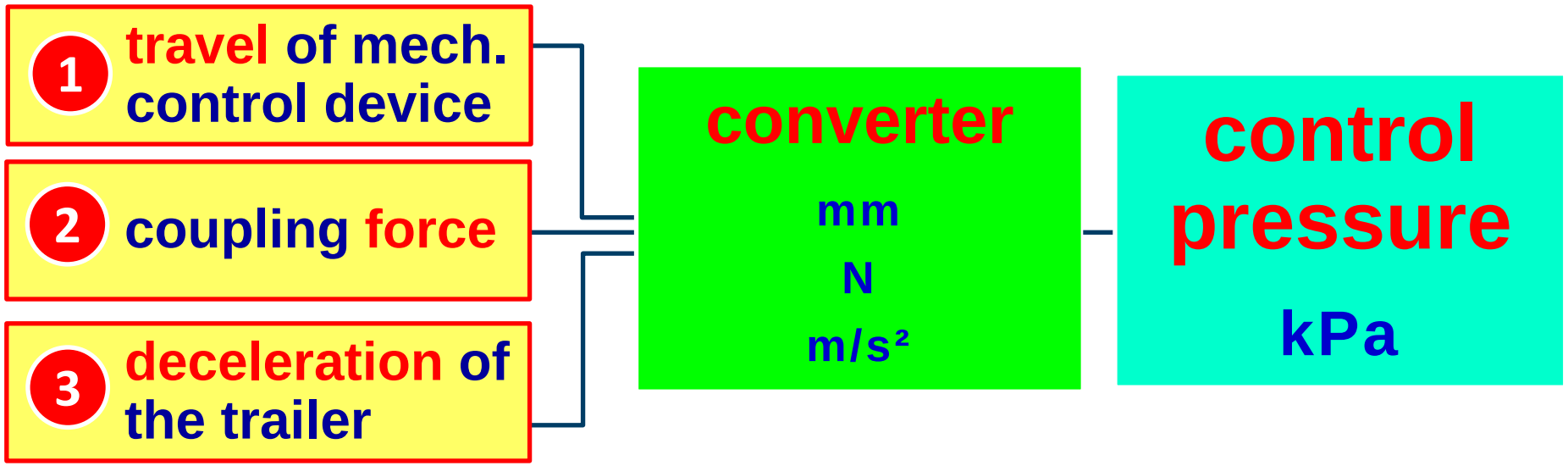
"**no pneumatic control line**" means

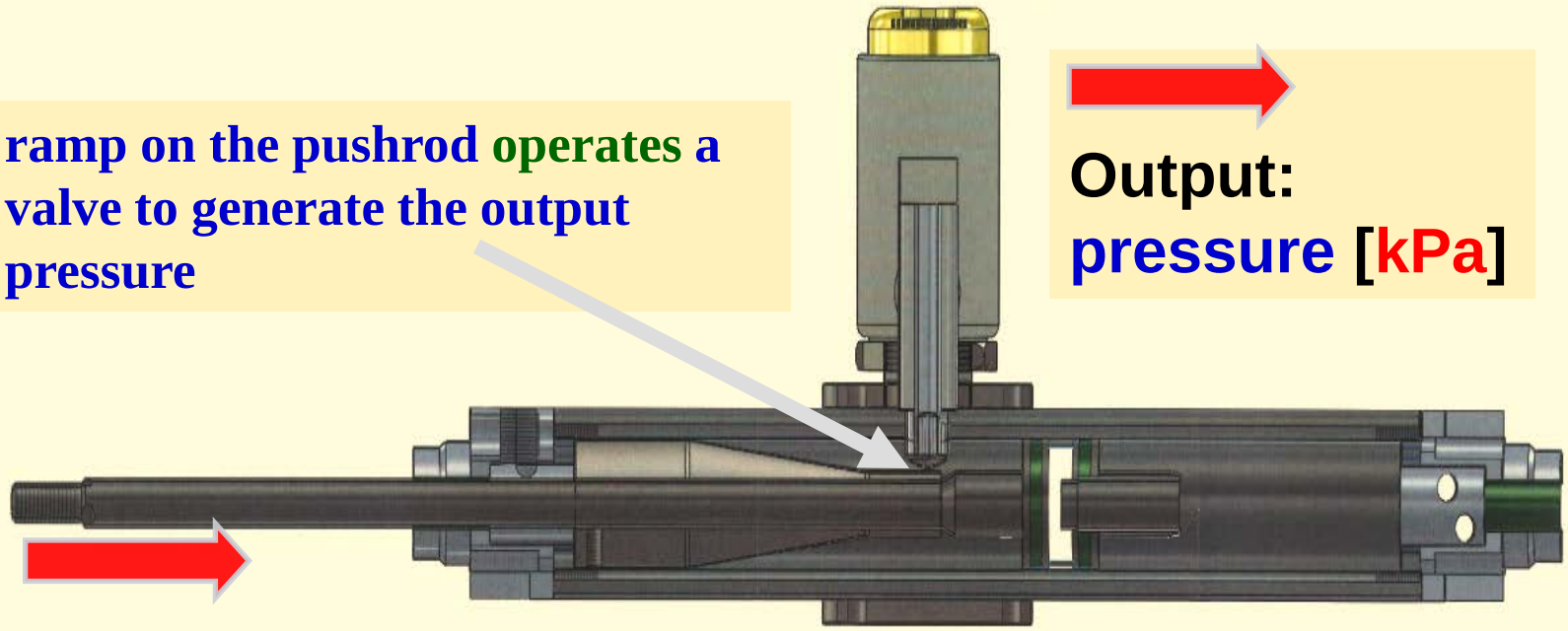
- **The control line pressure "p_m" is generated by the Annex 23 braking system, where**
  - **the control line pressure "p_m" of conventional pneumatic braking systems corresponds with the "control pressure" as defined by paragraph 1.2.**
  - **"Control pressure" means the pneumatic input pressure within the trailer braking system which regulates the braking force (para.1.2).**

There are **three** different input parameters to generate the "**control pressure**" according to paragraph 1.2.



Example: Generation of the "**control pressure**" when the trailer is equipped with a **mechanical control device**

ramp on the pushrod operates a valve to generate the output pressure



Output: pressure [kPa]

Input: travel [mm]

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“**no pneumatic supply line**” means

- **The supply pressure has to be generated by the compressor fitted on the trailer:**
  - **the compressor gets electrical energy by the towing vehicle**
  - **the air reservoir is fed by the trailer compressor**

Conclusions:

- **In principal, the braking systems of an Annex 23 braking system works more or less in a similar way as a trailer with a conventional compressed-air braking system.**
- **Whereas the control pressure "p_m" is 'generated' by the driver, the corresponding "control pressure" of the Annex 23 trailer is generated by its braking system.**

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Overview: Annex 23

1. Symbols and definitions
2. Scope
3. General
4. Control pressure
5. Braking tests and braking performance
6. Validation of the development of braking force
7. Response time
8. Provisions relating to energy sources and energy storage devices (energy reservoirs)

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Special Requirements

Electrical system

- Power supply (in general via the 13 pin connector acc. to ISO 11446)
- Trailer battery
  - Warning when 30 full service brake applications are no longer ensured
- Stop lamp signal
  - Activation enables service braking of the trailer
  - Non-activation precludes braking (except in case of backup braking)

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Missing or failed stop lamp signal

- **Backup braking**
  - Above a trailer braking ratio of [z = 0,2] the service braking system is required to function normally.
  - This means a failed stop lamp signal has no critical effect on the functioning of the service braking system.
- **Reversing**
  - Non-available stop lamp signals enables the trailer to be reversed without application of the brakes.

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No electrical power supply from towing vehicle

- Some car manufactures switch off the electrical power supply for the braking system ‘temporarily’ under certain driving conditions.
  - For this situation safety provisions are laid down in section 8.3 to guarantee that at least [30] full service brake applications are insured even when the battery has reached such a critical state that the warning lamp has to be illuminated.

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Warning signal

- **The main outstanding discussions points are the warning requirements as to:**
  - **Battery charge (para. 3.5.6)**
  - **Backup braking (indicating missing stop lamp signal - para. 3.8)**
  - **ABS failure / initialisation (para. 5.2.2.24.5 and 5.2.2.24.6.)**

Thank you for your attention!

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