

Proposal submitted by Irisbus for the testing of power-operated ramps

Proposed new text is marked in **bold** and deleted text strikethrough

Annex 8, paragraph 3.11.4.3.3. amend to read:

- 3.11.4.3.3. **These safety devices shall stop the movement of the ramp when the ramp is subject to a reactive force not exceeding 150 N. The reactive force may be measured by any method to the satisfaction of the competent authority. Guidelines for measuring the reactive forces are given in annex 6 to this Regulation. The peak force may be higher than 150 N for a short time provided that it does not exceed 300 N.** ~~In the event of one of these safety devices coming into operation, the movement of the ramp shall immediately be stopped.~~

Annex 6, amend to read:

Annex 6

GUIDELINES FOR MEASURING :

THE CLOSING FORCES OF POWER-OPERATED DOORS (see annex 3, paragraph 7.6.5.6.1.1.) **AND THE REACTIVE FORCES OF POWER-OPERATED RAMPS (see annex 8, paragraph 3.11.4.3.3.)**

1. General

The closing of a power-operated door **and the extension of a power-operated ramp are** ~~is a~~ dynamic ~~process~~ **processes**. When a moving door **or ramp** hits an obstacle, the result is a dynamic reaction force, the history of which (in time) depends on several factors (e.g. mass of the door **or ramp**, acceleration, dimensions).

2. Definitions

- 2.1. Closing **or reactive** force $F(t)$ is a time function, measured at the outer edge of the door **or ramp** (see paragraph 3.2. below).
- 2.2. Peak force F_S is the maximum value of the closing **or reactive** force.
- 2.3. Effective force F_E is the average value of the closing **or reactive** force related to the pulse duration:

$$F_E = \frac{1}{T} \int_{t_1}^{t_2} F(t) dt$$

2.4. Pulse duration T is the time between the t_1 and t_2 :

$$T = t_2 - t_1$$

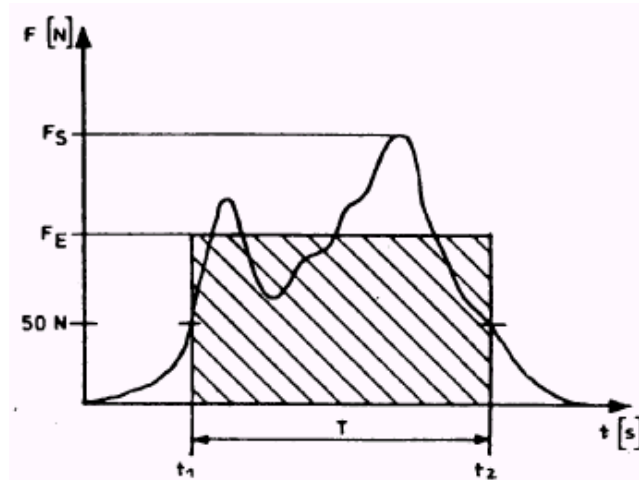
Where,

t_1 = threshold of sensitivity, where the closing **or reactive** force exceeds 50 N.

t_2 = fade-away threshold, where the closing **or reactive** force becomes less than 50 N.

2.5. The relation between the above parameters is shown in figure 1 below (as an example):

Figure 1



2.6. Clamping **or reactive** force F_c is the arithmetical mean value of the effective forces, measured at the same measuring point subsequently more times:

$$F_c = \frac{\sum_{i=1}^{i=n} (F_E)_i}{n}$$

3. Measurements

3.1. Conditions of measurement:

3.1.1. Temperature range: 10° - 30°C

3.1.2. The vehicle shall ~~stay~~ **be standing** on a horizontal surface. **In the case of ramp measurements this surface shall be fitted with a rigidly mounted block or other similar device having a vertical face against which the ramp can react.**

3.2. Measurement points shall be:

3.2.1. **in the case of doors:**

3.2.2.1.1. at the main closing edges of the door:

one in the middle of the door;
one 150 mm above the lower edge of the door.

~~3.2.2.1.2.~~ ~~in the case of doors~~ equipped with clamping prevention devices for the opening process:

at the secondary closing edges of the door at that point which is considered to be the most dangerous place of clamping.

3.2.2. **in the case of ramps:**

3.2.2.1. at the outer edge of the ramp situated transversally to its direction of movement:

**one in the middle of the ramp;
one 100 mm inboard from each of the edges parallel to the direction of travel of the ramp.**

3.2.2.2. when the ramp is extended to at least [90%] of its maximum horizontal travel.

3.3. At least three measurements shall be taken at each of the measuring points to determine the clamping **or reactive** force according to paragraph 2.6.

3.4. The signal of the closing **or reactive** force shall be recorded by means of a low-pass filter with a limiting frequency of 100 Hz. Both the threshold of sensitivity and the fade-away threshold to limit the pulse duration shall be set at 50 N.

3.5. The deviation of the reading from the rated value shall not be more than ± 3 percent.

4. Measuring device

4.1. The measuring device shall consist of two parts: one handle and one measuring part which is a load cell (see figure 2).

4.2. The load cell shall have the following characteristics:

4.2.1. It shall consist of two sliding housings with the outer dimension of 100 mm in diameter and 115 mm in width. Inside the load cell a compression spring shall be fitted between the two housings such that the load cell can be pressed together if an appropriate force is applied.

4.2.2. The stiffness of the load cell shall be 10 ± 0.2 N/mm. The maximum spring deflection shall be limited to 30 mm so that a maximum peak force of 300 N is achieved.

Figure 2

