



INDEX

1 - WHISTLES

2 - DETONATORS

APPENDIX - Conditions for measuring the noise level of an explosion produced by a powerful detonator.

1 - WHISTLES

The noise of a shunting whistle with a frequency of 2600 c/s and a sound level of 95 dB (A), emitted from a point situated along the centre-line of the powered unit, must be audible to the driver of this unit when seated, with the window open, in the driving cab located at the opposite end to the noise source in relation to the motor compartment, up to the following minimum distances (measured between the driving cab and the source of the sound signal):

a) for locomotives and railcars powered by combustion engines with an international power rating not exceeding 1100 kW (1500 ch\*)

150 m - with the engine at idling speed

50 m - with the engine running at rated speed

b) for locomotives powered by combustion engines with an international power rating exceeding 1100 kW (1500 ch\*) and

c) for electric locomotives and railcars :

150 m - when the ventilators of the traction motors are not in use,

40 m - when the ventilators of the traction motors are in use.

2 - DETONATORS

The noise of an explosion produced by a powerful detonator (1) must be audible to the driver when in the driving cab of the powered unit, with the windows closed, regardless (within the permitted limits) of the speed and rating of the powered unit.

\* ch = metric horse power

(1) A powerful detonator must produce a static acoustic pressure of 157 dB at a distance of 10 metres, compared with the reference level of  $2 \times 10^{-5}$  N/m<sup>2</sup>. The conditions for measuring the explosive force of a powerful detonator are given in the Appendix.

CONDITIONS FOR MEASURING THE NOISE LEVEL

OF AN EXPLOSION PRODUCED BY A POWERFUL DETONATOR

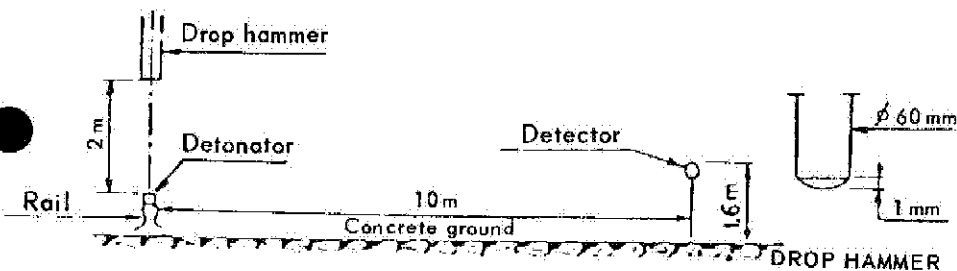
The detonator is placed on a section of rail laid on a concrete area of flat ground, free of any obstacle which may reflect the pressure wave within a radius of 30 metres around the explosion.

The pressure detector is placed 10 metres away from the detonator and 1.6 m above the ground,

The measuring sequence must allow pressure levels of at least 162 dB (1) to be correctly determined without cutting off the over-pressure wave (2).

The detonator is exploded by the impact of a 5 kg drop hammer falling from a height of 2 m.

This drop hammer is a metal cylinder 60 mm in diameter with an impact surface consisting of a spherical cap 1 mm thick.



(1) Reference level  $2 \times 10^{-5} \text{ N/m}^2$

(2) This wave usually presents a very rigid front : the total rise in pressure takes approximately 9.15 millisecond; 85% of the final value are obtained in approximately 0.05 millisecond.

APPLICATION

As from 1 July 1980.

All Railways in the Union.

RECORD REFERENCES

Headings under which the question has been dealt with :

- Determination, in conjunction with the ORE, of the maximum permitted noise level in driving cabs and near powered units at which acoustic safety signals are audible.

(5th Committee M.P. : Stuttgart, May 1960; Paris, May 1961 ; Portsmouth, May 1962 ; Berne, May 1964 ; Leipzig, May 1965).

- Revision of Leaflet 643.

(Working Party 5/B for Diesel Traction : Paris, January 1978).

- Question 5/B/FIC - Approval of the new version of Leaflet 643.

(Traction and Rolling Stock Committee : Paris, June 1979).

- Examination of observations made on draft Leaflet 643.

(Working Party for Diesel Traction : Paris, January 1980).