

DAIMLER

Daimler Truck

TP/EAI – CAE NFZ Exterior Noise Testing

Reverse Warning Sound – Serienrückfahrwarner gemessen am L963V1306 im NAGP unter Freifeldbedingungen

13.07.2020

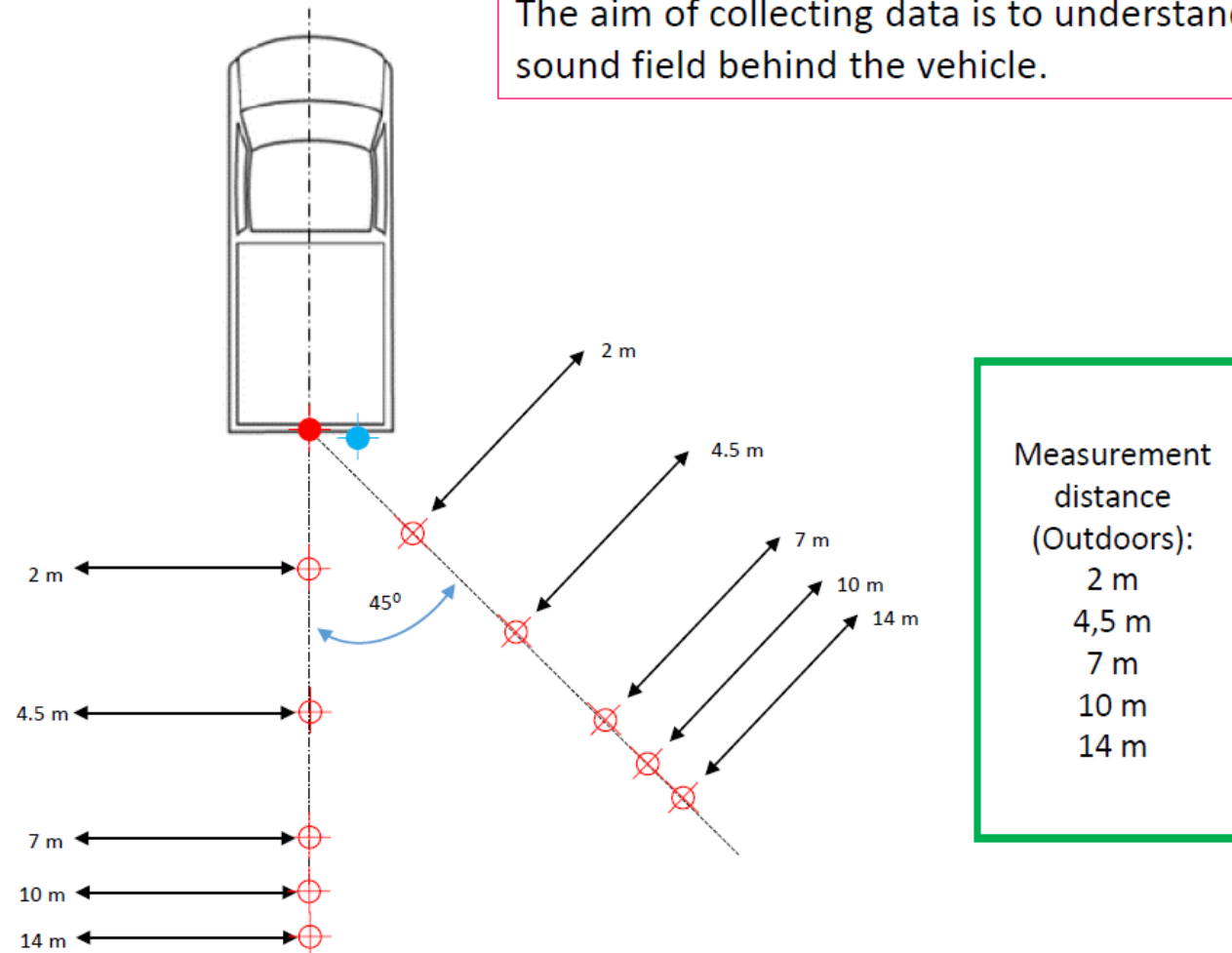


TP | EA
Predicting reality

Collecting measurements data protocol

Test Condition 1

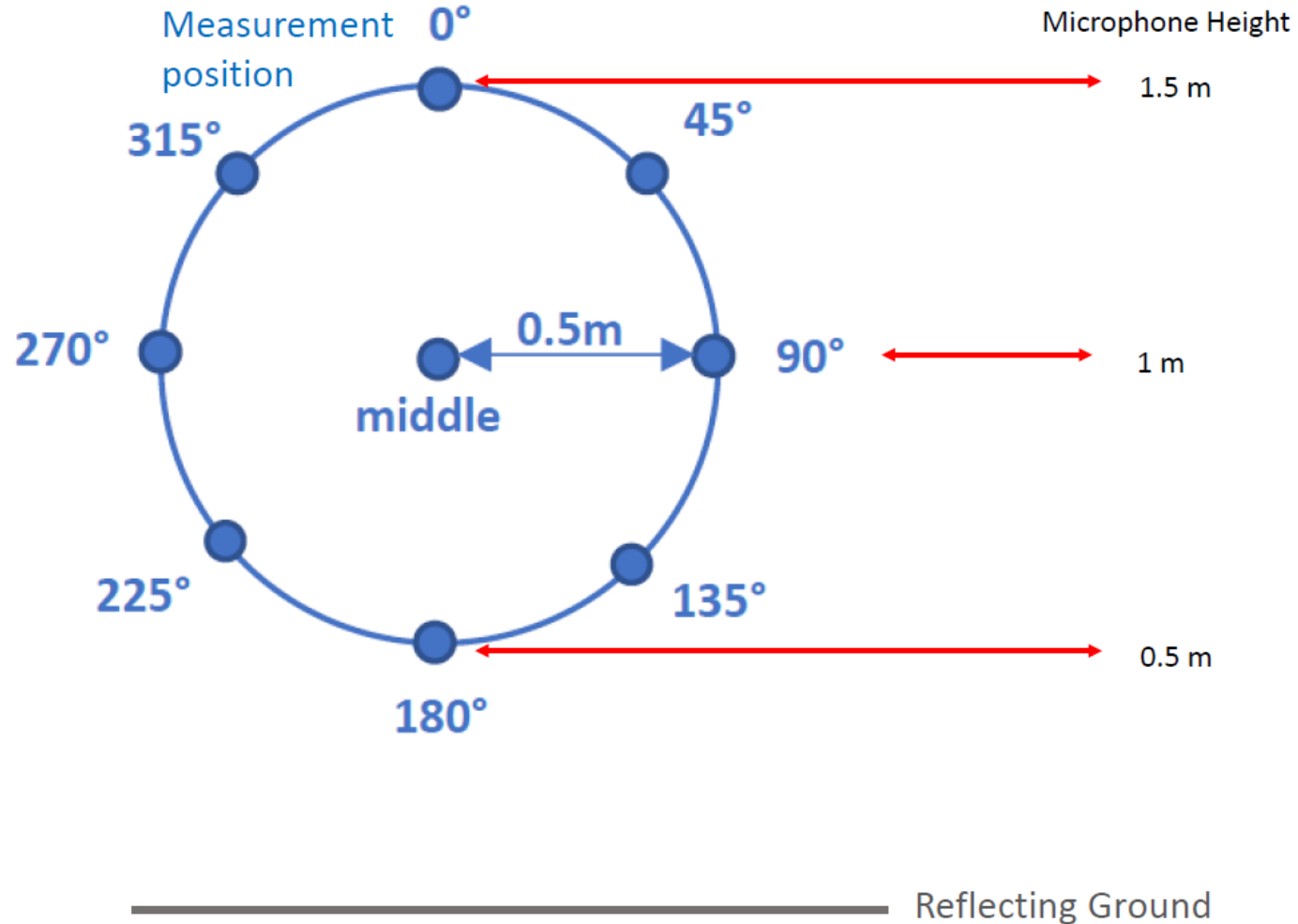
The aim of collecting data is to understand sound field behind the vehicle.



Collecting measurements data protocol

Test Condition 2

Microphone position above ground (Outdoors):
8 points on a circle

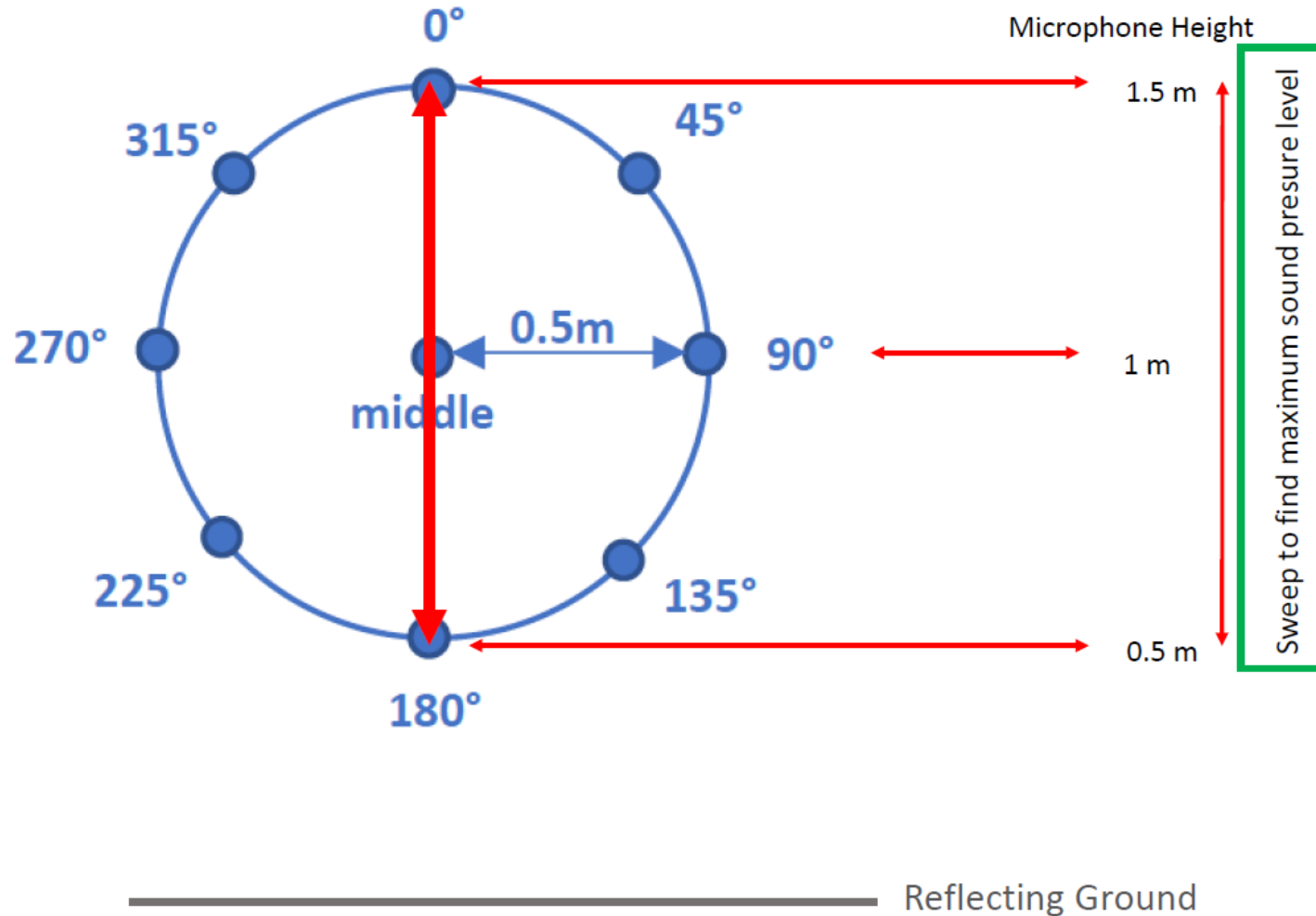


Collecting measurements data protocol

Test Condition 3

Microphone position above ground (Outdoors):

Sweep on the line between 0° and 180°



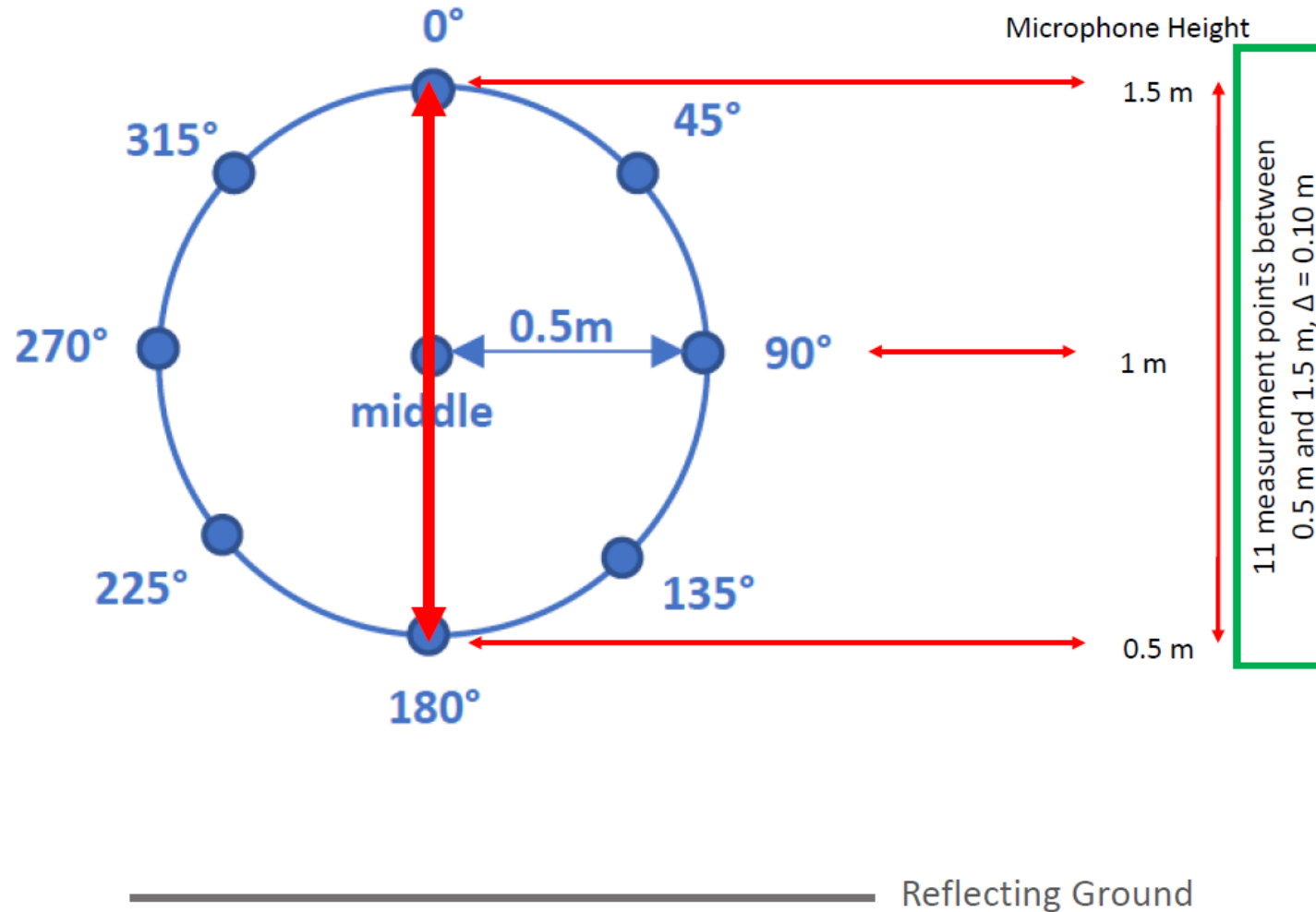
Sweep to find maximum sound pressure level

Collecting measurements data protocol

Test Condition 4

Microphone position above ground (Outdoors):

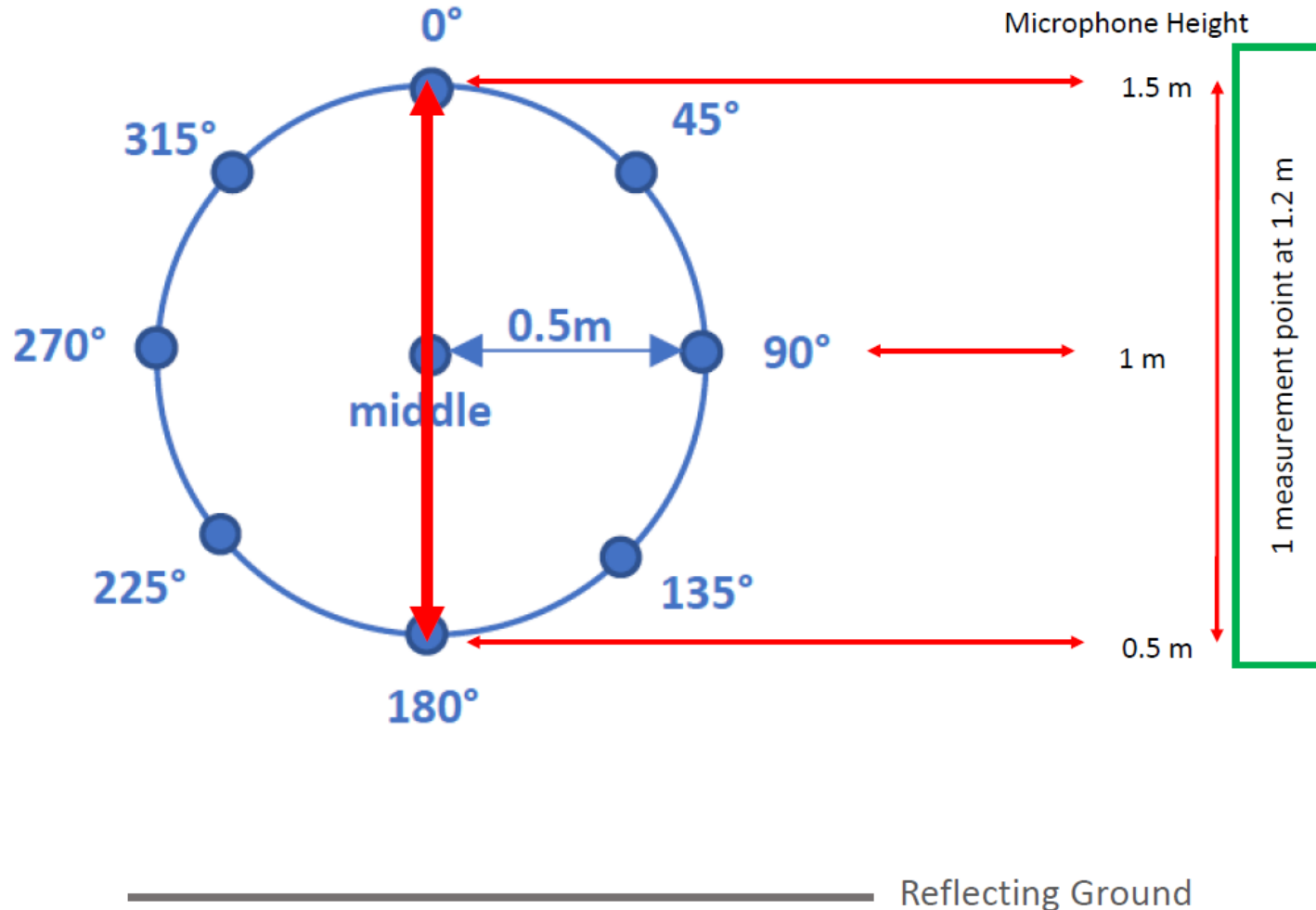
11 points on the line between 0° and 180°



Collecting measurements data protocol

Test Condition 5

Microphone position above ground (Outdoors):
1 point at 1.2 m on the line between 0° and 180°



Collecting measurements data protocol

Test Conditions

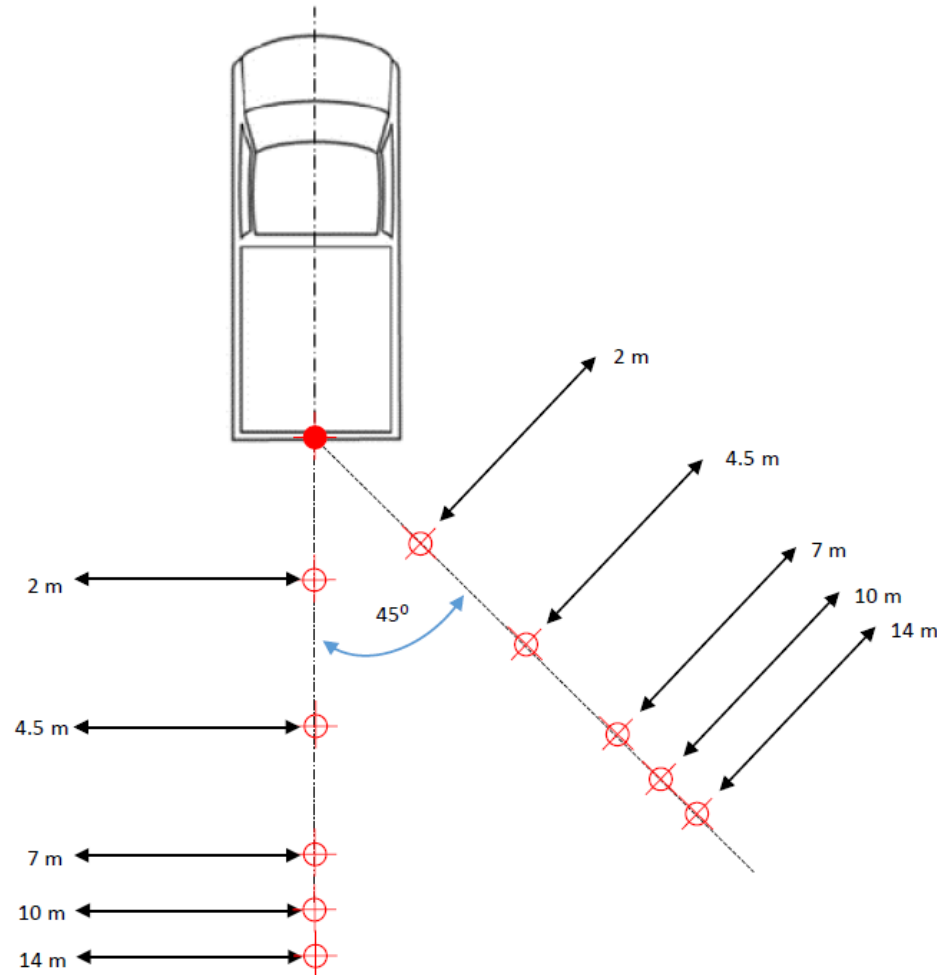
At
Measurement
distance
(Outdoors):

2 m
4,5 m
7 m
10 m
14 m

Microphone
position above
ground
(Outdoors):

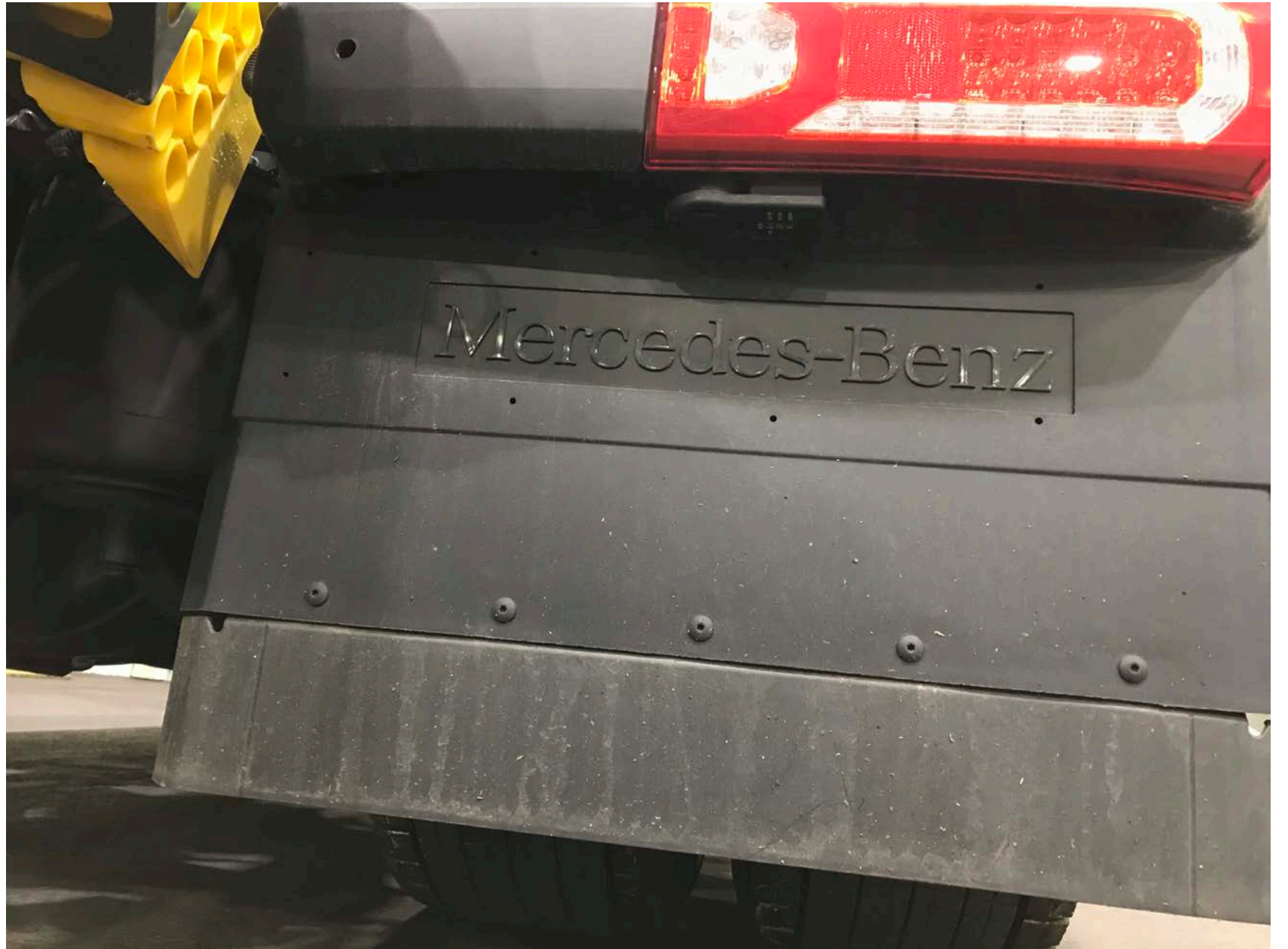
Condition 3, 5
Condition 3,5
Condition 2, 3, 4
Condition 3, 5
Condition 3, 5

The sound pressure level shall be
measured at the fixed height(s) for a
duration of at least 30 seconds



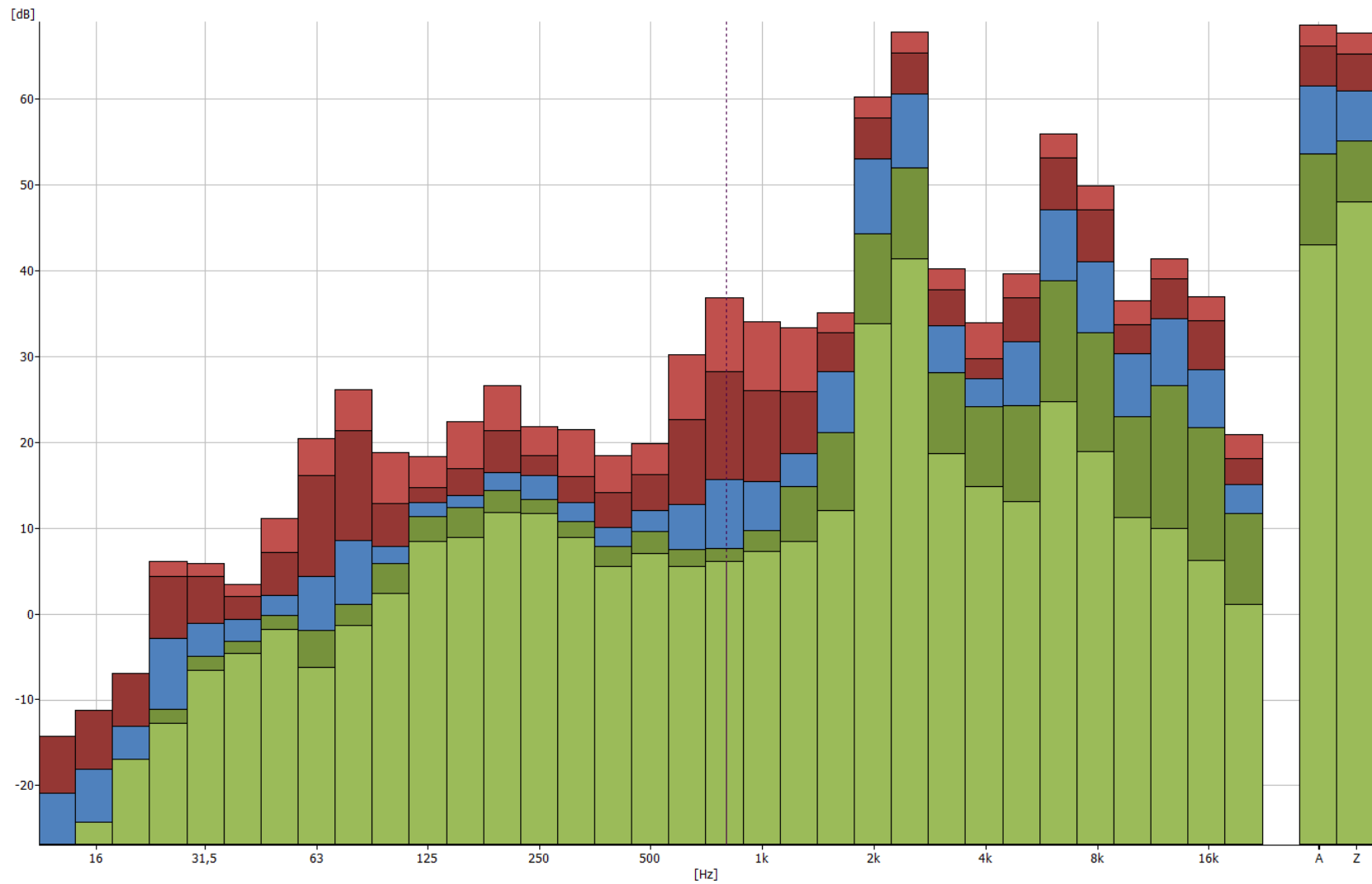
Position of reverse warning device





Example of 3rd Octave band analysis

Here: distance 7 m, angle 0°, condition 3



For this measurements:

LAFmax = 68,7 dB(A)

LAFmax 1/3 Octave band always at 2.5 kHz

Backgroundnoise < 40 dB(A)

Measurement Results

distance	angle (to vehicle)	condition	result [dB(A)]
2,0 m	0°	3	83,4
2,0 m	0°	5	79,2
2,0 m	45°	3	83,9
2,0 m	45°	5	81,4
4,5 m	0°	3	73,0
4,5 m	0°	5	71,6
4,5 m	45°	3	75,1
4,5 m	45°	5	71,2
7,0 m	0°	2	0°: 62,0 45°: 63,2 90°: 64,8 135°: 61,5 180°: 64,3
7,0 m	0°	2	225°: 65,0 270°: 66,6 315°: 65,5
7,0 m	0°	3	68,7
7,0 m	0°	4	1,5 m: 62,0 1,4 m: 62,9 1,3 m: 65,2 1,2 m: 66,4
7,0 m	0°	4	1,1 m: 67,2 1,0 m: 61,8 0,9 m: 64,0 0,8 m: 63,3
7,0 m	0°	4	0,7 m: 60,3 0,6 m: 59,6 0,5 m: 63,5

For all measurements:

Backgroundnoise < 40 dB(A), LAFmax 1/3 Octave band always at 2.5 kHz

Measurement Results

distance	angle (to vehicle)	condition	result [dB(A)]
7,0 m	45°	2	0°: 66,7 45°: 69,5 90°: 70,3 135°: 69,1 180°: 64,7
7,0 m	45°	2	225°: 66,9 270°: 65,0 315°: 65,6
7,0 m	45°	3	72,4
7,0 m	45°	4	1,5 m: 66,7 1,4 m: 67,2 1,3 m: 69,4 1,2 m: 69,3
7,0 m	45°	4	1,1 m: 69,3 1,0 m: 70,9 0,9 m: 70,6 0,8 m: 69,5
7,0 m	45°	4	0,7 m: 68,9 0,6 m: 66,9 0,5 m: 64,7
10,0 m	0°	3	65,7
10,0 m	0°	5	62,3
10,0 m	45°	3	69,8
10,0 m	45°	5	65,3
14,0 m	0°	3	62,0
14,0 m	0°	5	54,9
14,0 m	45°	3	63,5
14,0 m	45°	5	58,5

For all measurements:

Backgroundnoise < 40 dB(A), LAFmax 1/3 Octave band always at 2.5 kHz