



16V 4000 R43L
AIRBORNE NOISE ANALYSIS
2400 kW / 1800 rpm

ESE Hopt
Drawing No.: 734 343e
Date: 16.07.2007

Engine Surface Noise Analysis - 1/3-Octave

ENGINE TYPE:
POWER / SPEED:
ORDER / PROJECT NO.:

16V 4000 R43L
2400 kW / 1800 rpm

ENGINE NO.: V61
TEST CELL: 129
DATE MEASURED: 05.07.07

TURBOCHARGER: 2 x ZR 195
INTAKE AIR OPENING: Outside test cell

MEASURING DISTANCE: 1 m
MEASURING SURFACE DIMENSION: 18.7 dB
NO. OF MEASURING POINTS: 12
SOUND PROPAGATION: Free-Field
MEASUREMENT STANDARD: ISO 6798
TOLERANCE: +5 dB for single 1/3-octave band, +2 dB(A) for total A-weighted level.

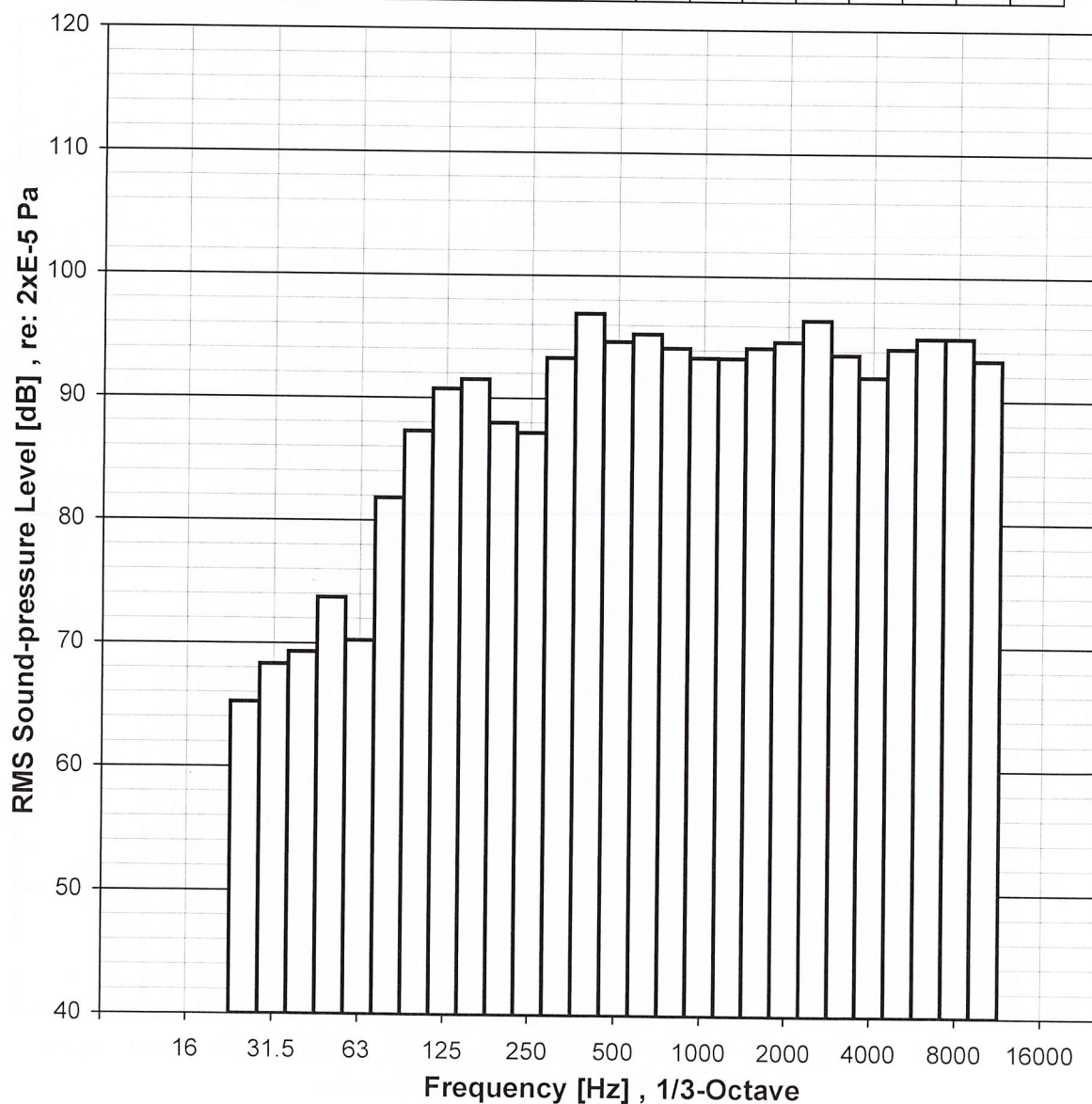
Energy mean free-field levels of the airborne noise that is emitted by the engine surface without intake-air noise. Levels to be expected. For project purposes only.

Energy mean free-field level

Total: L = 106.9 dB LA = 106.1 dB(A)

f [Hz]	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
LpF [dB]				65.2	68.3	69.3	73.7	70.3	81.8	87.3	90.7	91.5	88.0	87.2	93.3	96.9	94.6

f [Hz]	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LpF [dB]	95.3	94.1	93.4	93.3	94.2	94.7	96.5	93.6	91.8	94.2	95.0	95.0	93.2			





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AIRBORNE NOISE ANALYSIS
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Drawing No.: 734 344e
Date: 24.07.2007

Undamped Exhaust Gas Noise Analysis - 1/3-Octave

ENGINE TYPE: **16V 4000 R43L** ENGINE NO.: V61
POWER / SPEED: **2400 kW / 1800 rpm** TEST CELL: 129
ORDER / PROJECT NO.: DATE MEASURED: 05.07.07
TURBOCHARGER: 2 x ZR 195
DIAMETER OF EXHAUST GAS PIPE: 400 mm
MEASURING DISTANCE: 1 m
MEASURING SURFACE DIMENSION: 12.6 dB
NO. OF MEASURING POINTS: 2
PIPE DESIGN AT TEST CELL: 1 x 90° bend, 1 x 45° bend, approx. 10m straight pipe
MEASUREMENT STANDARD: ISO 6798
TOLERANCE: +5 dB for single 1/3-octave band, +3 dB(A) for total A-weighted level

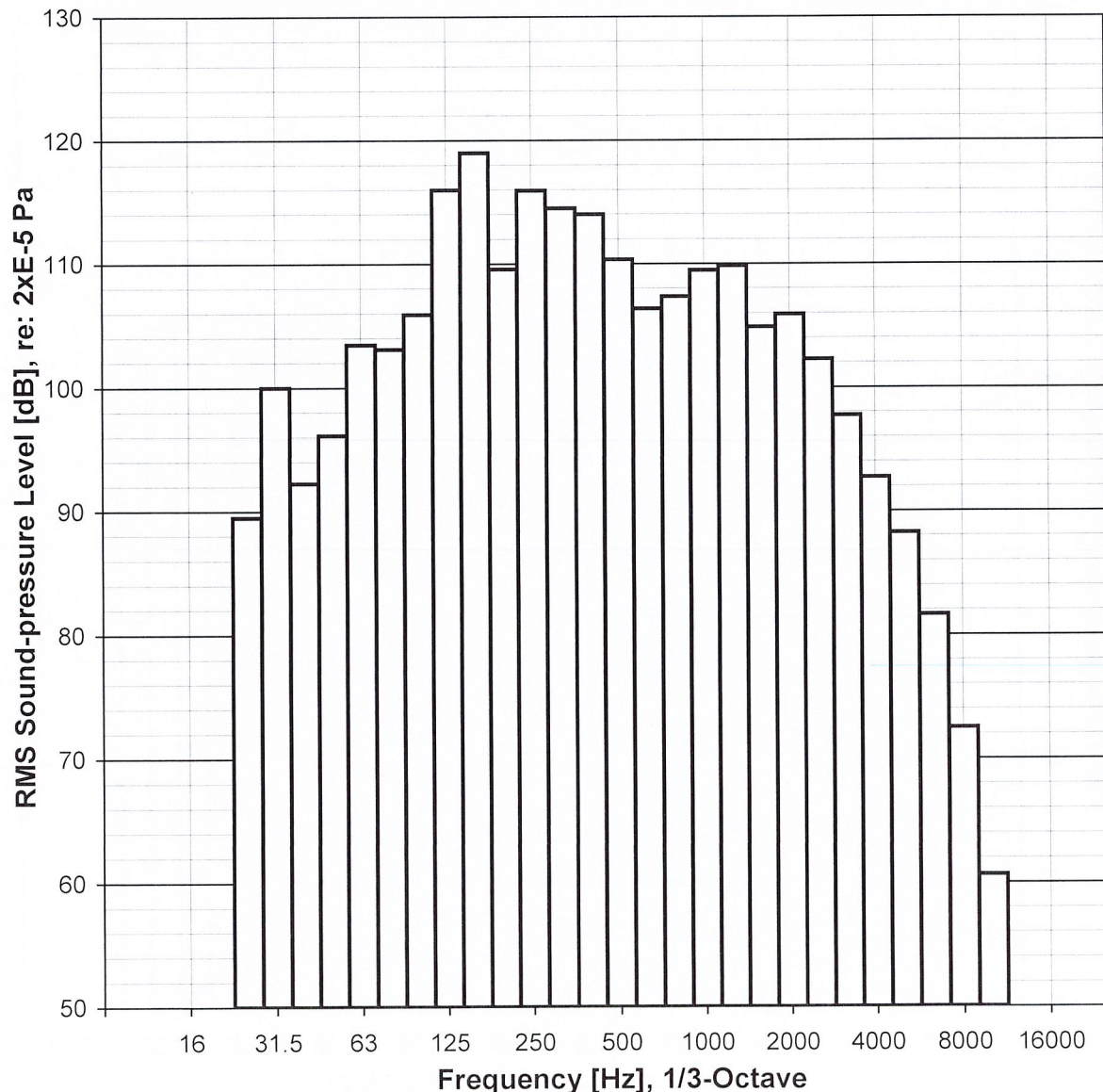
Energy mean free-field levels of the undamped exhaust gas noise.
For project purposes only.

Energy mean sound pressure levels

Total: L = 124.4 dB LA = 118.4 dB(A)

f [Hz]	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
LpF [dB]				89.5	100.0	92.2	96.1	103.5	103.1	105.9	116.0	119.0	109.5	115.9	114.5	114.0	110.3

f [Hz]	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LpF [dB]	106.3	107.3	109.5	109.8	104.9	105.9	102.3	97.7	92.7	88.2	81.6	72.5	60.6			





16V 4000 R43R
AIRBORNE NOISE ANALYSIS
2000 kW / 1800 rpm

ESE Hopt

Drawing No.: 734 347e
Date: 24.07.2007

Undamped Exhaust Gas Noise Analysis - 1/3-Octave

ENGINE TYPE: **16V 4000 R43R** ENGINE NO.: V61
POWER / SPEED: **2000 kW / 1800 rpm** TEST CELL: 129
ORDER / PROJECT NO.: DATE MEASURED: 05.07.07
TURBOCHARGER: 2 x ZR 195
DIAMETER OF EXHAUST GAS PIPE: 400 mm
MEASURING DISTANCE: 1 m
MEASURING SURFACE DIMENSION: 12.6 dB
NO. OF MEASURING POINTS: 2
PIPE DESIGN AT TEST CELL: 1 x 90° bend, 1 x 45° bend, approx. 10m straight pipe
MEASUREMENT STANDARD: ISO 6798
TOLERANCE: +5 dB for single 1/3-octave band, +3 dB(A) for total A-weighted level

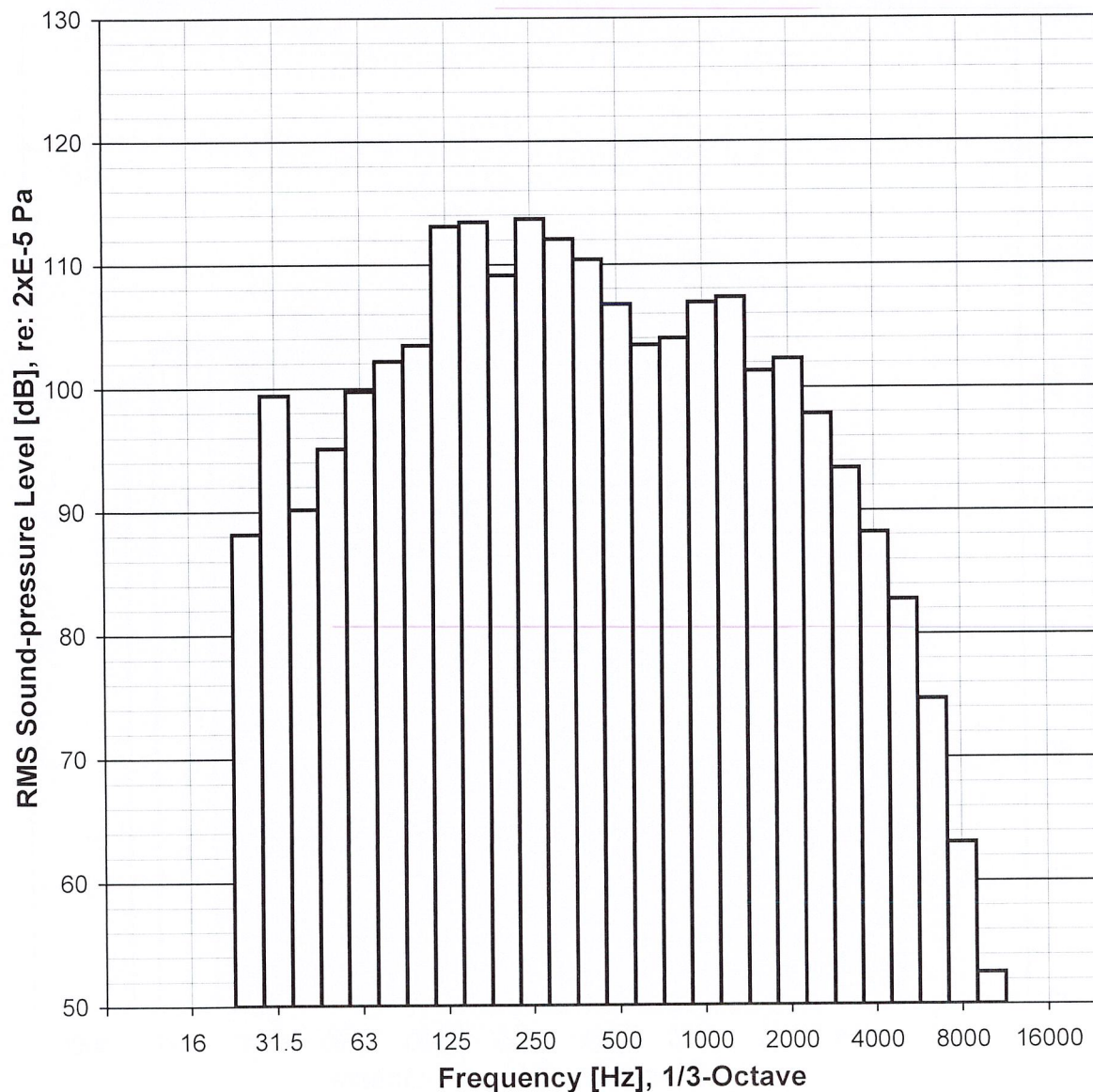
Energy mean free-field levels of the undamped exhaust gas noise.
For project purposes only.

Energy mean sound pressure levels

Total: L = 121.2 dB LA = 115.4 dB(A)

f [Hz]	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
LpF [dB]				88.2	99.4	90.2	95.1	99.7	102.1	103.4	113.1	113.4	109.1	113.7	112.0	110.4	106.8

f [Hz]	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LpF [dB]	103.5	104.0	106.9	107.3	101.3	102.3	97.8	93.4	88.2	82.8	74.7	63.1	52.6			





16V 4000 R43R
AIRBORNE NOISE ANALYSIS
2000 kW / 1800 rpm

ESE Hopt
Drawing No.: 734 349e
Date: 24.07.2007

Engine Surface Noise Analysis - 1/3-Octave

ENGINE TYPE:
POWER / SPEED:
ORDER / PROJECT NO.:

16V 4000 R43R
2000 kW / 1800 rpm

ENGINE NO.: V61
TEST CELL: 129
DATE MEASURED: 05.07.07

TURBOCHARGER: 2 x ZR 195
INTAKE AIR OPENING: Outside test cell

MEASURING DISTANCE: 1 m
MEASURING SURFACE DIMENSION: 18.7 dB
NO. OF MEASURING POINTS: 12

SOUND PROPAGATION: Free-Field
MEASUREMENT STANDARD: ISO 6798

TOLERANCE: +5 dB for single 1/3-octave band, +2 dB(A) for total A-weighted level.

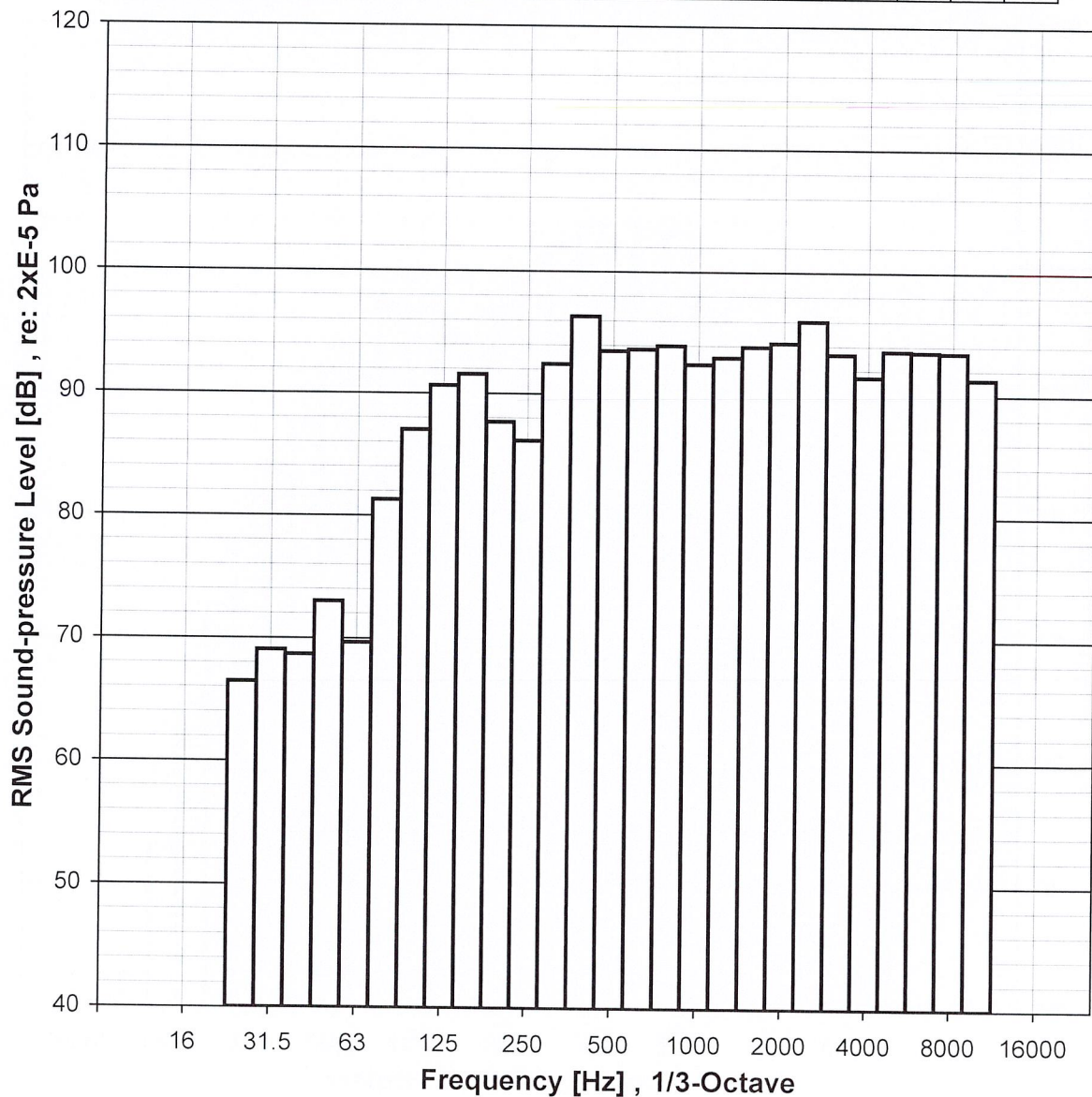
Energy mean free-field levels of the airborne noise that is emitted by the engine surface without intake-air noise. Levels to be expected. For project purposes only.

Energy mean free-field level

Total: L = 106.2 dB LA = 105.4 dB(A)

f [Hz]	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
LpF [dB]				66.4	69.0	68.7	73.0	69.7	81.3	87.0	90.6	91.5	87.7	86.1	92.4	96.3	93.5

f [Hz]	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LpF [dB]	93.7	94.0	92.4	93.0	93.9	94.2	96.0	93.3	91.4	93.6	93.5	93.4	91.3			





16V 4000 R43
AIRBORNE NOISE ANALYSIS
2200 kW / 1800 rpm

ESE Hopt
Drawing No.: 734 346e
Date: 24.07.2007

Undampened Exhaust Gas Noise Analysis - 1/3-Octave

ENGINE TYPE: **16V 4000 R43** ENGINE NO.: V61
POWER / SPEED: **2200 kW / 1800 rpm** TEST CELL: 129
ORDER / PROJECT NO.: DATE MEASURED: 05.07.07
TURBOCHARGER: 2 x ZR 195
DIAMETER OF EXHAUST GAS PIPE: 400 mm
MEASURING DISTANCE: 1 m
MEASURING SURFACE DIMENSION: 12.6 dB
NO. OF MEASURING POINTS: 2
PIPE DESIGN AT TEST CELL: 1 x 90° bend, 1 x 45° bend, approx. 10m straight pipe
MEASUREMENT STANDARD: ISO 6798
TOLERANCE: +5 dB for single 1/3-octave band, +3 dB(A) for total A-weighted level

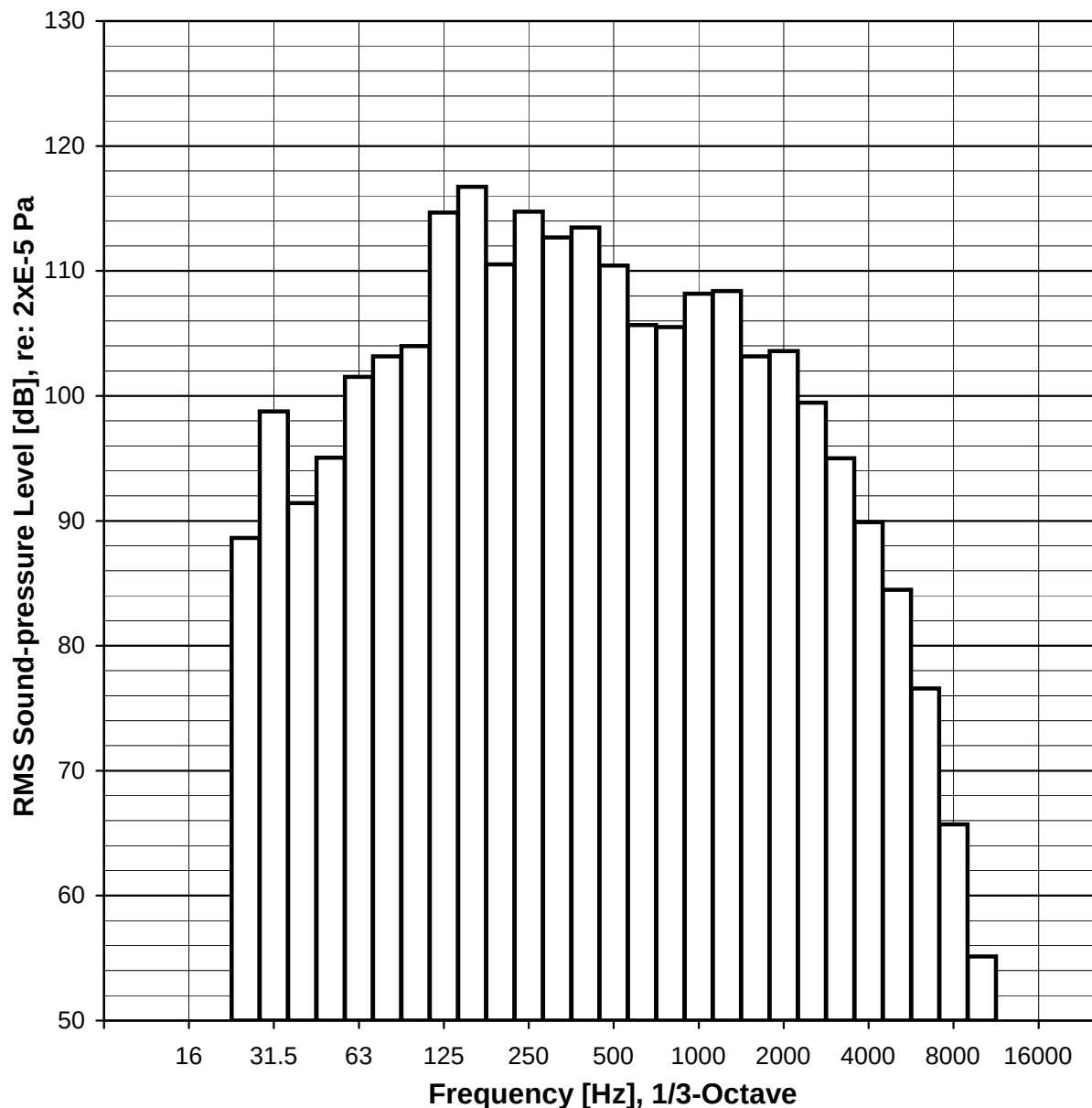
Energy mean free-field levels of the undampened exhaust gas noise.
For project purposes only.

Energy mean sound pressure levels

Total: L = 123.1 dB LA = 117.1 dB(A)

f [Hz]	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
LpF [dB]				88.6	98.8	91.4	95.0	101.5	103.2	104.0	114.7	116.7	110.5	114.7	112.7	113.5	110.4

f [Hz]	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LpF [dB]	105.7	105.5	108.2	108.4	103.2	103.6	99.5	95.0	89.9	84.5	76.6	65.7	55.1			





16V 4000 R43

AIRBORNE NOISE ANALYSIS
2200 kW / 1800 rpm

ESE Hopt

Drawing No.: 734 348e
Date: 24.07.2007

Engine Surface Noise Analysis - 1/3-Octave

ENGINE TYPE: **16V 4000 R43**
POWER / SPEED: **2200 kW / 1800 rpm**
ORDER / PROJECT NO.:

ENGINE NO.: V61
TEST CELL: 129
DATE MEASURED: 05.07.07

TURBOCHARGER: 2 x ZR 195
INTAKE AIR OPENING: Outside test cell

MEASURING DISTANCE: 1 m

MEASURING SURFACE DIMENSION: 18.7 dB

NO. OF MEASURING POINTS: 12

SOUND PROPAGATION: Free-Field

MEASUREMENT STANDARD: ISO 6798

TOLERANCE: +5 dB for single 1/3-octave band, +2 dB(A) for total A-weighted level.

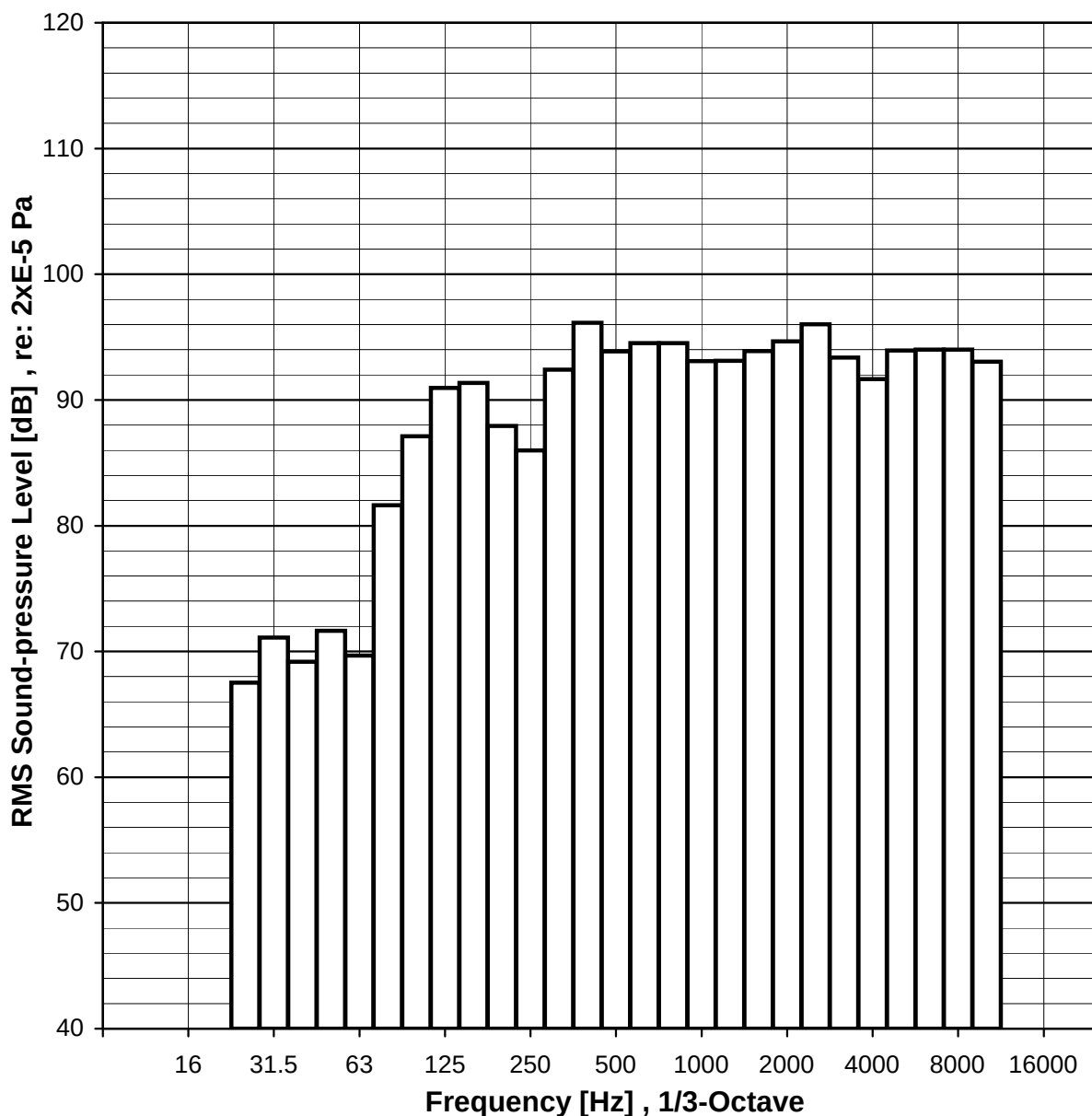
Energy mean free-field levels of the airborne noise that is emitted by the engine surface without intake-air noise. Levels to be expected. For project purposes only.

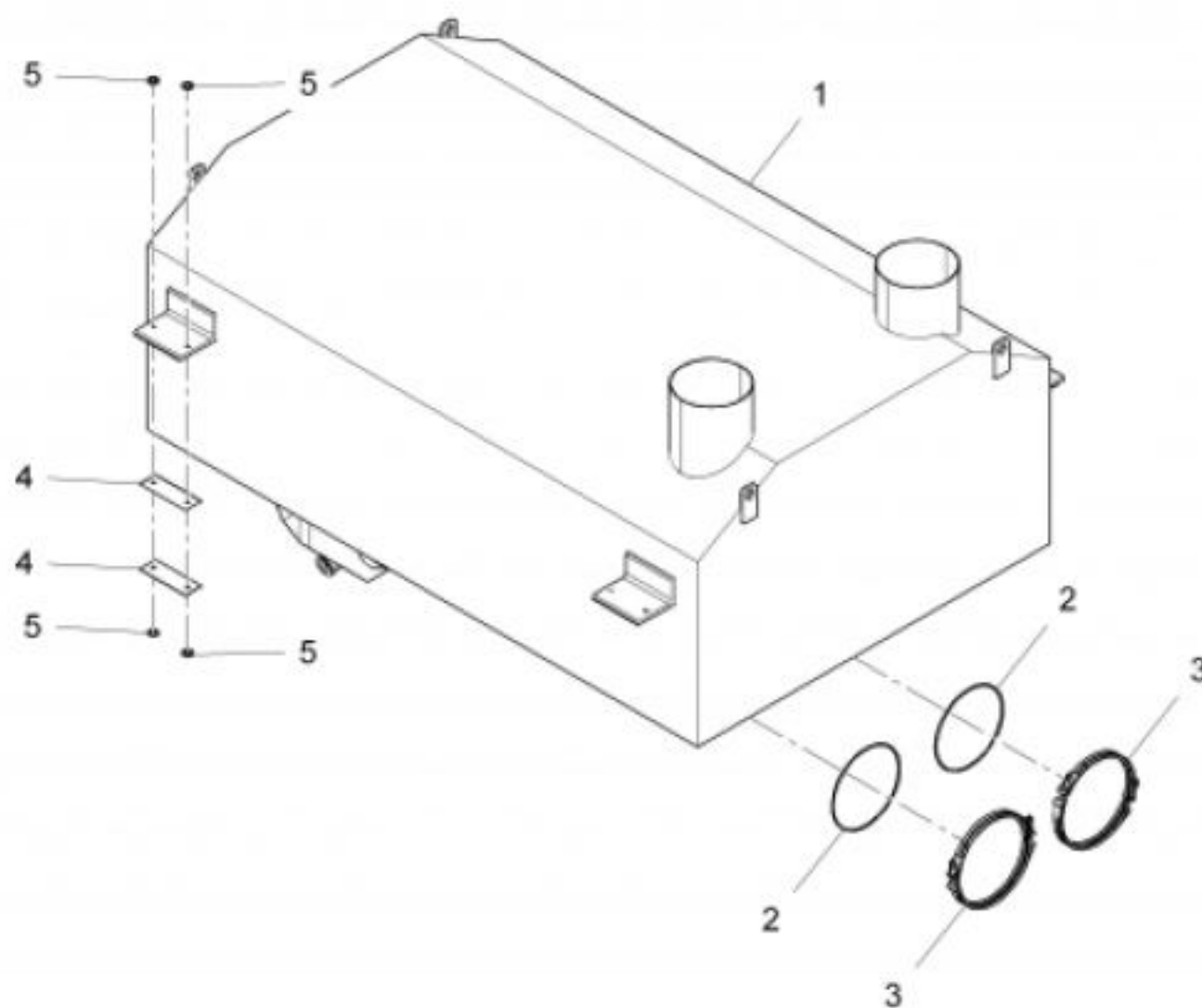
Energy mean free-field level

Total: L = 106.5 dB LA = 105.7 dB(A)

f [Hz]	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
LpF [dB]				67.5	71.1	69.2	71.6	69.7	81.6	87.1	91.0	91.4	87.9	86.0	92.4	96.1	93.9

f [Hz]	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LpF [dB]	94.5	94.5	93.1	93.1	93.9	94.7	96.0	93.4	91.7	93.9	94.0	94.0	93.0			





№	Наименование	Обозначение	Артикул	Шт.	Примечание
1	ГЛУШИТЕЛЬ NOR 25	NOR 25-00	048290277	1	