

EU Technical Service No. e8 and e27

**TECHNICAL REPORT
No. 120722 – 18 – TAC**

Test according to Regulation (EU) 134/2014, Annex IX

**Approval and market surveillance of two- or three-wheel vehicles and
quadricycles (sound level)**

Regulation (EU) No. 134/2014 of 2013-12-16
including all amendments up to and including:
Regulation (EU) No. 2018/295 of 2017-12-15
as implemented by:
Regulation (EU) No. 901/2014 of 2014-07-18
including all amendments up to and including:
Regulation (EU) No. 2016/1825 of 2016-09-06

Objectives: Document for issue of approval certificate

I. Technical data

- | | | |
|--------|------------------------------------|--|
| 0.1. | Make (trade name of manufacturer): | Termignoni |
| 0.2. | Type: | BW15 |
| 0.2.1. | Variants: | SSSF, TSSF CSSF, ASSF, STSF, SSTF,
STTF, TTTF, TTSF, TSTF, CTSF, CTF, CTTF,
CTSF, ASTF, ATSF, ATTF |
| 0.3. | Means of identification of type: | manufacturer's plate |
| 0.3.1. | Location of that marking: | on silencer |
| 0.4. | Category of vehicle: | L3e-A3 |
| 0.5. | Name and address of manufacturer: | Termignoni S.p.A.
Via della Rampina, 1
I-15077 Predosa (AL)
Italy |
| 0.8. | Address of assembly plant: | Termignoni S.p.A.
Via della Rampina, 1
I-15077 Predosa (AL)
Italy |
| 0.9. | Location of the approval mark: | on the manufacturer's plate |

II. Test report

1. Test conditions

- 1.1. Test sample: STU: noise-abatement device: BW15, variant SSSF.
 Sample marked: BW15 as pre-production sample. Used materials: Stainless steel and Fibre-glass.
 Assembly of the exhaust system: 1) 2) 3)
- Tested sample was mounted on vehicle: Manufacturer: BMW AG
 Type: 1G12, variant 0A51, version 0
 Approval No.: e1*168/2013*00006*02
 Category: L3e-A3
 VIN: WB10A5109HZ635411
 Year of manufacture: 2017
 Odometer reading: 1124
 Total weight: 244 kg
 Engine code: 122EN
 Engine capacity: 1170 cm³
 Rated maximum engine power: 92,0 kW at 7750 min⁻¹
 Number of gears: 6
 Gearbox: MANUAL
 Tyres: front: 120/70 R19 M/C 60V
 rear: 170/60 R17 M/C 72V
 Unloaded weight plus 75kg driver
 The vehicle is representative of type according to definition 1.1 of Regulation (EU) 134/2014, Annex IX, Appendix 2, see information document paragraph 0.10.
- 1.2. Test procedures used: acc. to Regulation (EU) 134/2014
 Annex IX, Appendix 2, para: 3.5.1 to 3.5.5 (Noise reduction only)
 and ECE Regulation 41.04, para 6.2.1
- 1.3. Measuring and test equipment: Sound level meter: NtI, type XL2; deviation at calibration: < 0.2 dB(A)
 Revolution counter: RACELOGIC MICIN01
 Sound level calibrator: Larson&Davis Cal200
 Temperature hygrometer: Kestrel 4500NV
 Anemometer: KESTREL 4500NV
 Barometer: KESTREL 4500NV
- 1.4. Worst case evaluation: Variant SSSF chosen as worst case as the heaviest and noisier between all variants.
- 1.5. Testing conditions: Ambient air temperature: 10°C
 relative humidity: 70%
 wind speed: 0,1 m/s
 direction of wind: none

atmospheric pressure: 1000 kPa
 temperature of track surface: 11°C
 background noise: <54,5 dB(A)

- 1.6. Test track or site: Asphalt-concrete surface without dust.
 Predosa (AL)

2. Test results

Following numbering is according to Annex IX, Appendix 2 of Regulation (EU) 134/2014 or according to ECE Regulation No. 41 /marked in italics/

- 2.1. 2.3.1.4.2. *Conditioning by pulsation* Proceed before tests.
- 2.2. 3.5.1. *General specifications* The general specifications regarding are fulfilled by the non-original exhaust system as technical unit.
- 3.5.2. *Specifications for sound levels* Test methods are described in followed paragraphs.
- 2.3. *Annex 3 - 1. Noise of the motor cycle in motion (measuring conditions and method for testing of the vehicle during component type approval).*
 Final noise-level of vehicle in motion
 L_{wot} : **76,5 dB(A)**
 Final noise-level of vehicle in motion L_{urban} : **72,7 dB(A)**
 (partial measured values are in Test results)
 Requested limits L_{urban} : 77 dB(A)
- 2.4. *Annex 3 - 2. Noise from stationary motor cycle (measuring conditions and method for testing of the vehicle in use).*
 Final noise-level level of vehicle stationary: **91 dB(A) at 3875 min⁻¹**
 (partial measured values are in Test results)
- 2.5. Tested sample and original system - comparison.
 The same motorcycle fitted with the original equipment silencer:
 Noise-level of vehicle in motion L_{wot} : **78,0 dB(A)**
 Noise-level level of vehicle stationary: **93 dB(A)** (partial measured values are in Test results)
 **) Limit value of directive which was valid by vehicle type homologation
 Measured noise-level values with the replacement silencer do not exceed the values measured, using the same motorcycle fitted with the original equipment silencer.

- | | | |
|------|---|--|
| 2.6. | <i>3.5.3. Testing of motorcycle performance</i> | Engine power curve was measured.
Measured net maximum power and top speed with the replacement silencer are in the 5% tolerance in comparison with the original equipment silencer.
(see Test results) |
| 2.7. | <i>3.5.4. Additional provisions relating to silencers as separate technical units containing fibrous material</i> | Absorbent fibrous material is asbestos-free.
Requirements according to point 2.3.1.4. are met, see paragraph 2.1. |
| 2.8. | <i>3.5.5. Evaluation of the pollutant emissions of vehicles equipped with a replacement silencer system</i> | The pollution test was not necessary because the original catalytic converter remains without any changes in the exhaust system. A degradation of catalyst efficiency is not expected. |
| 3. | <u>Specimen submitted to test on:</u> | 2018-02-16 |
| 4. | <u>Date of test:</u> | 2018-02-16 |
| III. | <u>Manufacturer's information folder</u> | BW15/134/2014 rev.00
12 pages total of 2018-04-20 |
| IV. | <u>Other documentation</u> | |
| | Test results | 2 pages |
| V. | <u>Attachments</u> | |
| | No attachments | |

Technical Report No.: 120722 – 18 – TAC
Regulation: (EU) 134/2014, Annex IX
Manufacturer: Termignoni S.p.A., Italy
Type: BW15



Czech

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Measuring and test equipment and test site meet the requirements of the applicable legislation.
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VI. Final assessment

The described sample

complies

with the requirements of Regulation (EU) No. 134/2014 as last amended by
Regulation (EU) No. 2018/295 as implemented by
Regulation (EU) No. 901/2014 as last amended by
Regulation (EU) No. 2016/1825
for issue of approval certificate.

This technical report consists of pages No. 1 to 7 and has no attachments.

Pietro Vergani

Test executive



Luděk Piskač

Officially recognized expert

Prague, 2018-05-10

Test results

Testing of noise-level - vehicle in motion

Gears used for test of motor cycle in motion: 4rd
 Final drive ratio(s): 1/2,91
 Test mass: 319 kg
 Reference length l_{ref} : 2,175 m
 Power to mass ratio index (PMR): 288,4 Third category
 Reference full throttle acceleration ($a_{wot\ ref}$): 4,03 m/s²
 Target acceleration (a_{urban}): 1,96 m/s²

Full throttle acceleration test

TEST RESULTS												
Measurement No.	v _{AA'} [km/h]	Test speed [km/h]	v _{PP'} [km/h]	v _{BB'} [km/h]	L _{wot(4),side} [dB(A)]		L _{wot(4),side} ⁻¹⁾ [dB(A)]		a _{wot,(4),j} [m/s ²]	a _{wot,(4)} [m/s ²]	k _p	L _{wot} [dB(A)]
					left	right	left	right				
1	38,9	50	50,1	61,4	76,9	76,3	75,3	75,9	3,93	3,99	0,51	76,5
2	38,9		50,3	62,0	77,6	76,3	75,3	76,6	4,06			
3	38,7		50,1	61,6	77,9	78,0	77,0	76,9	4,00			

¹⁾ Recorded values are reduced by 1 dB(A) (account of inaccuracies).

Vehicle speed $v_{AA'}$ (average of 3 runs) for gear (4): 38,8km/h

Vehicle speed $v_{PP'}$ (average of 3 runs) for gear (4): 50,2 km/h

Vehicle speed $v_{BB'}$ (average of 3 runs) for gear (4): 61,7 km/h

Wide-open-throttle test result L_{wot} : **76,5 dB(A)**

Constant speed test

TEST RESULTS						
Measurement No.	Test speed [km/h]	$L_{crs(4),side}$ [dB(A)]		$L_{crs(4),side}^{-1)}$ [dB(A)]		L_{crs} [dB(A)]
		left	right	left	right	
1	50	70,2	70,2	69,2	69,2	69,1
2		69,6	70,2	68,6	69,2	
3		69,9	69,9	68,9	68,9	

¹⁾ Recorded values are reduced by 1 dB(A) (account of inaccuracies).

Constant speed test results L_{crs} : **69,1 dB(A)**

Final test result $L_{urban} = 72,7$ dB(A)

Requested limits $L_{urban} = 77$ dB(A)

Technical Report No.:
Regulation:
Manufacturer:
Type:

TÜV SÜD Czech s.r.o.
120722 – 18 – TAC
(EU) 134/2014, Annex IX
Termignoni S.p.A., Italy
BW15



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Testing of noise-level - vehicle stationary
Engine speed at which the maximum net power is 7750 rpm.

TEST RESULTS				
		Left silencer dB(A)	Right silencer dB(A)	Engine speed [min^{-1}]
Original silencer	1 st measurement	0	93,1	3875
	2 nd measurement	0	92,9	3875
	3 rd measurement	0	92,8	3875
Tested silencer	1 st measurement	0	91,2	3875
	2 nd measurement	0	90,9	3875
	3 rd measurement	0	91,3	3875
Original silencer	Test result (max of arithmetic average of the three valid measurements): 93 dB(A)			
Tested silencer	Test result (max of arithmetic average of the three valid measurements): 91 dB(A)			

Value indicated on the original silencer manufacturer's data plate: **93 dB(A)**

Measured value does not exceed by more than 3,0 dB(A) the value recorded when the motorcycle was granted type-approval and indicated on the manufacturer's data plate.

Testing of motorcycle performance

TEST RESULTS		
	Net maximum power [kW] at [min^{-1}]	Top speed difference
original silencer	92,0 kW at 7750	< 5%
tested silencer	91,7 kW at 7750	

End of the technical report