


Prüfbericht-Nr.: <i>Test report no.:</i>	NN22JHI9 001	Auftrags-Nr.: <i>Order no.:</i>	244417823	Seite 1 von 57 Page 1 of 57
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2104533	Auftragsdatum: <i>Order date:</i>	2022-04-07	
Auftraggeber: <i>Client:</i>	HEPHA GmbH Lise-Meitner-Str. 7a, 82216 Maisach			
Prüfgegenstand: <i>Test item:</i>	EPAC Bicycle			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	TREKKING 7.0 (HIGH STEP L); TREKKING 7.0 (HIGH STEP M); TREKKING 7.0 (LOW STEP L); TREKKING 7.0 (LOW STEP M)			
Auftrags-Inhalt: <i>Order content:</i>	Test report service			
Prüfgrundlage: <i>Test specification:</i>	EN 15194:2017 Cycles - Electrically power assisted cycles - EPAC Bicycles <i>Except clause 4.3.19.3--lighting systems, 4.3.19.4-reflectors</i> <i>Except clause 4.3.20-warning devices</i> <i>Except clause 4.3.22 Performance levels (PLrs) for control system of EPACs</i>			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-07-01			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003217203-001			
Prüfzeitraum: <i>Testing period:</i>	2022-07-01 - 2022-07-29			
Ort der Prüfung: <i>Place of testing:</i>	Kunshan			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd. Kunshan Branch			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	<i>John He</i>	genehmigt von: <i>authorized by:</i>	<i>Nan Jiang</i>	
Datum: <i>Date:</i>	2022-08-23	Ausstellungsdatum: <i>Issue date:</i>	2022-08-23	
Stellung / Position:	John He / PE	Stellung / Position:	Nan Jiang / Reviewer	
Sonstiges / Other:				
<ol style="list-style-type: none"> Partial tests were subcontracted to external laboratories which were assessed to be competent. As per client's request, the tests in clauses 4.3.19.3, 4.3.19.4, 4.3.20 and 4.3.22 were not performed. The difference for the 4 models are in frame and fork. 				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
<p>* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p> <p>* Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</p>				
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

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Anmerkungen
Remarks

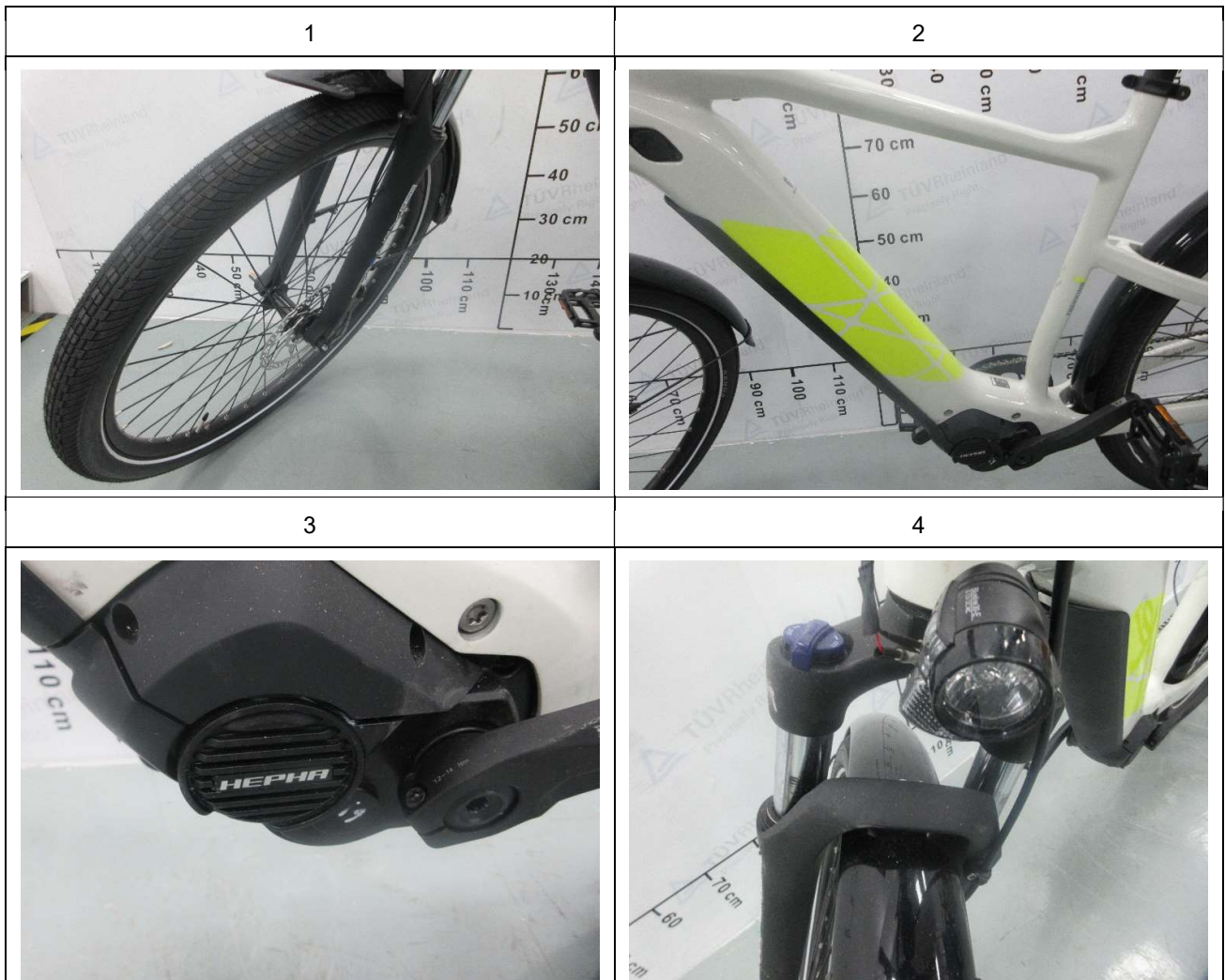
1	<p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>
2	<p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</p> <p><i>As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</i></p>
3	<p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>
4	./.

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Produktbeschreibung
Product description

1	Produktdetails <i>Product details</i>	EPAC Bicycle with a mid-mounted assisted motor.
2	Maße / Gewicht <i>Dimensions / Weight</i>	Weight: 27.20kg Maximum saddle height: 1070mm.
3	Bedienelemente <i>Operating elements</i>	Operated through pedals, motor assisted.
4	Ausstattung / Zubehör <i>Equipment / Accessories</i>	Battery charger.
5	Verwendete Materialien <i>Used materials</i>	Frame: Aluminum alloy; Front fork: Steel, Aluminum alloy.
6	Sonstiges <i>Other</i>	Wheel size: 27. 5×2. 20 inch,30-50PSI; Brakes: front hydraulic disc-brake, rear hydraulic disc-brake; Speed: 1*10.
7	Prüfmusterbereitstellung: <i>Test sample obtaining:</i>	<input checked="" type="checkbox"/> Sending by customer <input type="checkbox"/> Sampling by TÜV Rheinland Group <input type="checkbox"/> others:



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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
1	<p>Scope</p> <p>This European Standard applies to EPAC bicycles for private and commercial use with exception of EPAC intended for hire from unattended station.</p> <p>This European Standard is intended to cover all common significant hazards, hazardous situations and events (see Clause 4) of electrically power assisted bicycles, when used as intended and under condition of misuse that are reasonably foreseeable by the manufacturer.</p> <p>This European Standard is intended to cover electrically power assisted bicycles of a type which have a maximum continuous rated power of 0,25 kW, of which the output is progressively reduced and finally cut off as the EPAC reaches a speed of 25 km/h, or sooner, if the cyclist stops pedalling.</p> <p>This European Standard specifies requirements and test methods for engine power management systems, electrical circuits including the charging system for the design and assembly of electrically power assisted bicycles and sub-assemblies for systems having a rated voltage up to and including 48 V d.c. or integrated battery charger with a nominal 230 V a.c. input.</p> <p>This European Standard specifies safety and safety related performance requirements for the design, assembly, and testing of EPAC bicycles and subassemblies intended for use on public roads, and lays down guidelines for instructions on the use and care of such bicycles.</p> <p>This European Standard applies to EPAC bicycles that have a maximum saddle height of 635 mm or more and that are intended for use on public roads.</p> <p>This European Standard is not applicable to EPACs which are manufactured before the date of its publication as EN.</p>		
2	<p>Normative references</p> <p>Details see EN 15194:2017.</p>		
3	<p>Terms and definitions</p> <p>Details see EN 15194:2017.</p>		

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4	Safety requirements and/or protective measures		
4.1	General		
	<p>EPAC shall be designed according to the principles of EN ISO 12100 for relevant but not significant hazards, which are not dealt with by this document. It includes evaluation of such risks for all relevant components.</p> <p>Means shall be provided to the user to prevent an unauthorized use of the EPAC e.g. key, locks, electronic control device.</p>	<p>Risk assessment according to EN ISO 12100 was not requested.</p>	<p>P <input type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input checked="" type="checkbox"/></p>
4.2	Electrical requirements		
4.2.1	Electric circuit		
	<p>The electrical control system shall be designed so that, should it malfunction in a hazardous manner, it shall switch off power to the electric motor without causing a hazardous situation and it requires user interaction to switch on again.</p> <p>NOTE The mechanical brakes serve as an emergency stop device and provide fast and safe stopping in emergency situations.</p>	<p>The electrical control system meet the requirement.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.2	Controls and symbols		
	<p>If symbols are used, their meaning shall be described in the instructions for use. "On" "Off" symbols, lightings symbols, start-up assistance symbols, audible warning device symbols design shall be in accordance with those described in Annex I and Annex J.</p> <p>A master control device shall be fitted to switch on and shut off the assistance, which shall be apparent, easy to reach and unmistakable.</p> <p>This master control device shall be activated by voluntary action to enable all assistance modes (start up and pedalling) before use of the EPAC.</p>	<p>"On" "off";lightings symbols used, complied with Annex I.</p> <p>Checked Ok.</p> <p>Checked Ok.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.3	Batteries		

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
4.2.3.1	Requirements		
	<p>a) The EPAC and batteries pack shall be designed in order to avoid risk of fire and mechanical deterioration resulting from abnormal use. Compliance is checked by the test described in 4.2.3.2.</p> <p>b) During the test the EPAC and the batteries shall not emit flames, molten metal or poisonous ignitable gas in hazardous amounts and any enclosure shall show no damage that could impair compliance with this European Standard. Safety and compatibility of the battery/charger combination shall be ensured, according to the manufacturer's specifications.</p> <p>c) The battery terminals shall be protected against creating an accidental short circuit.</p> <p>d) An appropriate care shall be taken to ensure that the batteries are protected against overcharging. An appropriate overheating and short circuit protection device shall be fitted.</p> <p>NOTE Example solutions are given in Annex A.</p> <p>Batteries and the charger unit shall be labelled in order to be able to check their compatibility.</p>	<p>Tested with positive result.</p> <p>Tested with positive result.</p> <p>Battery: 36.0V 19.2Ah;</p> <p>Protection device is fitted.</p> <p>Battery pack: Model No: DZ-ZZ0881004.</p> <p>Battery charger: Output: 36.0V 6.0A. Model No.: EC-P100.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.3.2	Test method		
	<p>Compliance with 4.2.3.1 a) is verified by the following test:</p> <p>a) Battery terminals are short-circuited with the batteries in a fully charged condition.</p> <p>b) Motor terminals are short-circuited; all commands are in "ON" position, while the batteries are fully charged.</p> <p>c) The EPAC is operated with the electric motor or drive system blocked until the motor torque stops or the battery is fully discharged.</p> <p>d) The battery is charged for double the recommended charging period or for 24 h whichever is greater.</p> <p>NOTE Testing the battery for example according to EN 62133 or EN 50604–1 is considered as sufficient test to fulfil this requirement.</p>		
4.2.4	Battery charger		

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	<p>Chargers for EPAC are considered to be operated in a residential (household) environment.</p> <p>NOTE 1 For integrated battery charger with a 230V a.c. input the charger and the EPAC and for external battery charger supplied with an EPAC the requirements of the Low Voltage Directive are applicable.</p> <p>NOTE 2 For external chargers with d.c. output less than 42,4 Volt, e.g. EN 60335–2–29 is applicable.</p>		
4.2.5	Electric cables and connections		
4.2.5.1	General		
	All connectors for cable and wire shall be selected to prevent corrosion of electrical contact conductance.		
4.2.5.2	Requirements		
	<p>Cable and plug temperature shall be lower than that specified by the manufacturer of the cables and plugs. Damage to cable and plug insulation shall be prevented.</p> <p>The cable cross sections shall be selected in accordance to EN 60335-1:2012, Table 11. If these requirements are not met, a temperature rise test shall be performed, in accordance to 4.2.5.3.</p> <p>NOTE Cables used exclusively for communication lines are excluded.</p>	<p>Tested with positive result.</p> <p>Temperature rise test was performed.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.5.3	Test method		
	<p>At an ambient room temperature (20 ± 5) °C, discharge the fully charged EPAC battery to the discharging limit specified by the EPAC or ESA manufacturer at the maximum current allowable by the system and record it. Measure the cable and plug temperatures and ensure, by examination, that there is no deterioration of the insulation on either assembly.</p> <p>The increase of outer surface temperature of parts that can be touched shall be ≤ 60 K while in use on performance test rig.</p>		

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4.2.6	Wiring		
	<p>Requirements on wiring shall be checked according to the following sequence at an ambient room temperature (20 ± 5) °C.</p> <p>a) Wire ways shall be smooth and free from sharp edges.</p> <p>b) Wires shall be protected so that they do not come into contact with burrs, cooling fins or similar sharp edges that may cause damage to their insulation. Holes in metal through which insulated wires pass shall have smooth well-rounded surfaces or be provided with bushings.</p> <p>c) Wiring shall be effectively prevented from coming into contact with moving parts.</p> <p>Compliance with a), b), c) shall be checked by inspection.</p> <p>d) Separate parts of the EPAC that can move in normal use or during user maintenance relative to each other, shall not cause undue stress to electrical connections and internal conductors, including those providing ground continuity.</p> <p>If an open coil spring is used to protect wire, it shall be correctly installed and insulated. Flexible metallic tubes shall not cause damage to the insulation of the conductors contained within them.</p> <p>Compliance with d) shall be checked by inspection and by the following test method.</p> <p>If flexing occurs in normal use, the appliance is placed in its normal operational position and is supplied at rated voltage under normal operation.</p> <p>The movable part is moved backwards and forwards through the largest angle permitted by its construction, so that the conductor is flexed.</p> <p>For conductors that are flexed in normal use, flex movable part for 10 000 cycles at a test frequency of 0,5 Hz.</p> <p>For conductors that are flexed during user maintenance, flex the movable part for 100 cycles at the same frequency.</p>	<p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>No open coil and flexible metallic tube fitted.</p> <p>Such conductors were tested for 10 000 cycles without failure.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>

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4.2.7	Power cables and conduits		
	<p>Conduit entries, cable entries and knockouts shall be constructed or located so that the introduction of the conduit or cable does not reduce the protection measures adopted by the manufacturer.</p> <p>Compliance is checked by inspection.</p> <p>Guidance for power cables size selection is given in HD 60364-5-52:2011, 5.22.1.2, 523.1523.3 and Table A.</p> <p>The insulation of internal wiring shall withstand the electrical stress likely to occur in normal use.</p> <p>The wiring and its connections shall withstand the electrical strength test. The test voltage expressed in V shall be equal to $(500+2 \times U_r)$ for 2 min and applied between live parts and other metal parts only.</p> <p>NOTE U_r is the rated voltage.</p>	<p>Checked Ok.</p> <p>The conduit and cable entries have protection of bushing and protective tubes.</p> <p>Electrical strength tested to the voltage of 572V with positive result.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.8	External and internal electrical connections		
	<p>Electrical connection shall comply with HD 60364-5-52:2011, 526.1 and 526.2.</p>	<p>The connections between conductors and between conductors and other equipment were provided with durable electrical continuity and adequate mechanical strength and protection.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.9	Moisture resistance		
	<p>The electrical components of a fully assembled EPAC shall be tested and shall comply with IPX4 requirements according to EN 60529:1991.</p>	<p>The complete vehicle was tested to IEC 60529 for IPX4 with positive results.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>

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4.2.10	Mechanical strength test		
	<p>The electrical components including the battery shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use. Compliance is checked by:</p> <p>— Applying impacts to the battery pack mounted on the EPAC by means of the spring hammer as specified in EN 60068-2-75. The battery pack is rigidly supported and three impacts are applied to every point of the enclosure that is likely to be weak with an impact energy of $(0,7 \pm 0,05)$ J. After the test the battery pack shall show no damage that could impair compliance with this European Standard;</p> <p>— Detachable batteries are submitted to free fall on a rigid surface as specified in EN 22248 at a height of 0,90 m in three different positions. The positions shall be one surface, one edge and one corner of the enclosure that is likely to be weak.</p> <p>After the test the battery pack shall show no damage that could lead to emission of dangerous substances (gas or liquid) ignition, fire or overheating.</p> <p>NOTE 1 Other standards and transportation regulation given in national and international regulations, give additional requirements for general design of the battery and battery pack.</p> <p>NOTE 2 It is advised that the bicycle manufacturer make a risk analysis for the battery and battery holder interface with regard to bicycle tip over. It may be possible for damage to occur to the battery or battery interface when the bicycle falls over (see also the Introduction).</p>	<p>No damage shown after three impacts by the spring hammer to the points which are likely to be weak.</p> <p>The battery is detachable. No damage occurred after the free fall test to the three points.</p> <p>Informative.</p> <p>No risk analysis provided from client.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>

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4.2.11 Maximum speed for which the electric motor gives assistance			
4.2.11. Requirements 1			
	<p>The electrical motor assistance shall stop when the EPAC reaches a speed of 25 km/h or lower speed if limited by design.</p> <p>The maximum speed of the EPAC for which the electric motor gives assistance shall not differ by more than +10 % from the maximum assistance speed indicated in the marking required by Clause 5 when determined according to the test method described in 4.2.11.2.</p>	<p>Allowed maximum speed ≤ 25 (1+10%)km/h=27.5km/h</p> <p>The measured maximum speed : 25.0km/h.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.11. Test method 2			
Details see EN 15194:2017.			
4.2.12 Start-up assistance mode			
	<p>An EPAC can be equipped with a start-up assistance mode that operates up to a maximum speed of 6 km/h.</p> <p>This mode shall be activated by the voluntary and maintained action of the user either when riding without pedalling or when the user is pushing the cycle.</p>	<p>Measurement of the speed: 4.5km/h.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.12. Test method 2			
Details see EN 15194:2017.			

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4.2.13	Power management		
4.2.13. 1	Requirements		
	<p>a) When tested by the method described in 4.2.13.2 the recordings shall show that assistance shall be provided only when the cyclist pedals forward. This requirement shall be checked according to the test methods described in 4.2.13.2.3;</p> <p>b) assistance shall be cut off when the cyclist stops pedalling forward and the cut-off distance shall not exceed 2 m;</p> <p>c) If all braking devices (e.g. levers, back pedal) are equipped with cut-off switches, the cut off distance shall not exceed 5 m;</p> <p>d) the power output or assistance shall be progressively reduced (see Annex B) and finally cut off as the EPAC reaches the maximum assistance speed as designed. This requirement shall be checked according to the test methods described in 4.2.13.2;</p> <p>e) the assistance shall be progressively and smoothly managed (e.g. no hunting);</p> <p>f) two independent applying actions shall be required to start the electrical assistance mode (e.g. power switch and forward pedalling activation); a traffic caused stop (e.g. traffic lights) is not subject to this requirement;</p> <p>g) after a deactivation of the electrical assistance mode due to any hazardous electric drive malfunction, the electric drive shall not start automatically without rider intervention (pedalling is not considered as rider intervention).</p>	<p>a) Pedalling forward: assistance provided; Pedalling backward: no assistance provided.</p> <p>b) Cut off distance checked <2.0m.</p> <p>c) No cut-off switch was fitted.</p> <p>d) Checked Ok.</p> <p>e) Checked Ok.</p> <p>f) Checked Ok.</p> <p>g) Checked Ok.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.2.13. 2	Test method – Electric motor management		
	Details see EN 15194:2017.		

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4.2.14	Maximum power measurement — Measurement at the engine shaft		
	<p>The maximum continuous rated power shall be measured according to EN 60034-1 when the motor reaches its thermal equilibrium as specified by the manufacturer.</p> <p>NOTE Thermal equilibrium: temperatures of motor parts do not vary more than 2K per hour.</p> <p>In circumstance where the power is measured directly at the shaft of the electronic motor, the result of the measurement shall be divided by 1,10 to consider the measurement uncertainty and then divided by 1,05 to include for example the transmission losses, unless the real values of these losses are determined.</p>	Measurement: 250W when reaching the thermal equilibrium.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.2.15	Electro Magnetic Compatibility		
4.2.15.1	Emission		
	The EPAC and ESA shall fulfil the requirements of Annex C.	Refer to Test report: CN22BAT0 001.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.2.15.2	Immunity		
	The EPAC and ESA shall fulfil the requirements of Annex C.	Refer to Test report: CN22BAT0 001.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.2.15.3	Battery charger		
	<p>As an EPAC is not intended to be used while charging on the electric network, for integrated charger the whole EPAC plus integrated charger shall be tested for EMC according to the applicable standards based on the European EMC directive.</p> <p>NOTE The following European Standards are applicable for battery chargers to be used in residential environment: EN 55014–1, EN 55014–2, EN 61000–3-2, EN 61000–3-3.</p>	<p>Test by document review of EMC test report of charger submitted from the client;</p> <p>Reference No.: GZEM220400167601</p> <p>Issued by: SGS-CSTC Standards Technical Services Co., Ltd.</p> <p>Model of battery charger: EC-P100</p> <p>Output: 36.0V 6.0A</p> <p>Manufacturer: Guangdong Gaobiao Electronic Technology Co., Ltd.</p>	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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4.2.16	Failure mode		
4.2.16.1	Requirements		
	<p>It shall be possible to ride the EPAC by pedalling even if the assistance failed.</p> <p>This requirement shall be checked as described in 4.2.16.2.</p>	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.2.16.2	Test method		
	Details see EN 15194:2017.		
4.2.17	Anti-tampering measure		
4.2.17.1	General		
	<p>Anti-tampering measures apply to tampering or modifications that general consumers carry out concerning the control unit, drive unit or other parts of power assisting system by using commercially available tools, equipment or parts.</p>		

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4.2.17. 2	Prevention of tampering of the motor		
	<p>The following anti-tampering requirements shall be taken into account:</p> <p>a) Anti-tampering relevant parameters indicated below shall only be accessible to the manufacturer or authorized persons and changes of software configuration parameters require programming tools that are not commercially available or security protected:</p> <p>1) maximum speed with motor assistance (all systems),</p> <p>2) parameters affecting the maximum vehicle speed limited by design,</p> <p>3) maximum gear ratio (system with middle motors),</p> <p>4) maximum motor power (all systems),</p> <p>5) maximum speed of starting up assistance;</p> <p>b) Assumable manipulations on the approval relevant configuration shall be prevented or compensated by effective counter measures, i.e. plausibility logics to detect manipulations on sensors;</p> <p>c) Closed set of components (i.e. operation only with released battery);</p> <p>d) Protection against opening of relevant components without traces (sealing).</p>	Declaration of anti-tampering submitted.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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4.3	Mechanical requirements		
4.3.1	General		
4.3.1.1	Definition of brake tests		
	Details see EN 15194:2017.		
4.3.1.2	Definition of strength tests		
	Details see EN 15194:2017.		
4.3.1.3	Numbers and condition of specimens for the strength tests		
	Details see EN 15194:2017.	The test sequence is in fatigue→static→impact.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.1.4	Accuracy tolerances of test conditions for brake tests and strength tests		
	Details see EN 15194:2017.	Informative. The test accuracy tolerances of the test conditions meet the requirements.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.1.5	Fatigue test		
	Details see EN 15194:2017.	Informative. Fatigue test frequency < 10Hz.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.1.6	Fatigue test for composite components		
	Details see EN 15194:2017.	There were no composite components fitted.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.1.7	Plastic material test ambient temperature		
	Details see EN 15194:2017.	The ambient temperature range was reached.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.1.8	Crack detection methods		
	Details see EN 15194:2017.	Dye-penetrant methods were adopted to emphasize the presence of cracks.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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4.3.2	Sharp edges		
	Exposed edges that could come into contact with the rider's hands, legs, etc., during normal riding or normal handling and normal maintenance shall not be sharp, e.g. deburred, broken, rolled or processed with comparable techniques. NOTE It is advised to refer to ISO 13715 [29].	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.3	Security and strength of safety-related fasteners		
4.3.3.1	Security of screws		
	Any screws used in the assembly of suspension systems or screws used to attach bracket attached electric generators, brake-mechanisms and mud-guards to the frame or fork, and the saddle to the seat-post shall be provided with suitable locking devices, e.g. lock-washers, lock-nuts, thread locking compound or stiff nuts. NOTE 1 The screws used to attach hub-generator are not included. NOTE 2 Fasteners used to assemble hub and disc brakes will preferably have heat-resistant locking devices.	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.3.2	Minimum failure torque		
	The minimum failure torque of bolted joints for the fastening of handle bars, handlebar-stems, bar-ends, saddle and seat-posts shall be at least 50 % greater than the manufacturer's recommended tightening torque.	Tested with 150% of recommended torque, without failure occurred.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.3.3	Folding bicycles mechanism		
	If provided, folding bicycle mechanism shall be designed so that EPAC can be locked for use in a simple, stable, safe way and when folded no damage shall occur to any cables. No locking mechanism shall contact the wheels or tyres during riding, and it shall be impossible to unintentionally loosen or unlock the folding mechanisms during riding.	No folding mechanism.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>

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4.3.4	Protrusions		
	<p>These requirements are intended to address the hazards associated with the users of EPACs falling on projections or rigid components (e.g. handlebars, levers) on EPAC possibly causing internal injury or skin puncture. Tubes and rigid components in the form of projections which constitute a puncture hazard to the rider should be protected. The size and shape of the end protection has not been stipulated, but an adequate shape shall be given to avoid puncturing of the body. Screw threads which constitute a puncture hazard shall be limited to a protrusion length of one major diameter of the screw beyond the internally threaded mating part.</p> <p>NOTE Handlebar-ends are covered by the paragraph in 4.3.6.2.</p>	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.5	Brakes		
4.3.5.1	Braking-systems		
	<p>EPAC shall be equipped with at least two independently actuated braking-systems. At least one shall operate on the front wheel and one on the rear wheel. The braking-systems shall operate without binding and shall be capable of meeting the braking-performance requirements of 4.3.5.9.</p> <p>No hand shall need to be taken from the handlebar to operate the brake levers.</p> <p>If additional braking-systems are implemented, they shall meet the brake requirements of 4.3.5.</p> <p>Brake-blocks containing asbestos shall not be used.</p>	<p>Front: hydraulic disc-brake; Rear: hydraulic disc-brake.</p> <p>Checked ok.</p> <p>No additional braking-system fitted.</p> <p>Asbesto content was not requested to determine.</p>	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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4.3.5.2	Hand-operated brakes		
4.3.5.2 .1	Brake-lever position		
	The brake levers for front and rear brakes shall be positioned according to the legislation or custom and practice of the country in which EPAC is to be sold, and EPAC manufacturer shall state in the manufacturer's instructions which levers operate the front and rear brakes (see also Clause 6 i)).	Right lever controls rear brake; Left lever controls front brake; The destined country is not known.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.5.2 .2	Brake-lever grip dimensions		
4.3.5.2 .2.1	Requirement		
	The dimension, d, measured between the outer surfaces of the brake-lever in the region intended for contact with the rider's fingers and the handlebar or any other covering present shall over a distance of not less than 40 mm as shown in Figure 1 not exceed 90 mm. Conformance shall be established by the method detailed in 4.3.5.2.2.2. The range of adjustment on the brake-lever ought to permit these dimensions to be obtained.	d<90mm.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.5.2 .2.2	Test method for the brake-lever similar		
	Details see EN 15194:2017.		
4.3.5.3	Attachment of brake assembly and cable requirements		
	Cable pinch-bolts shall not sever any of the cable strands when assembled to the manufacturer's instructions. In the event of a cable failing, no part of the brake mechanism shall inadvertently inhibit the rotation of the wheel. The cable end shall either be protected with a cap that shall withstand a removal force of not less than 20 N or be otherwise treated to prevent unravelling. NOTE See 4.3.3 in relation to fasteners.	Checked Ok. Hydraulic disc-brake.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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4.3.5.4	Brake-levers – Position of applied force		
	For the purposes of braking tests in this standard, for brake-levers similar to Type A, the test force shall be applied at a distance, b, which is equal to either dimension a as determined in 4.3.5.2.2.2 or 25 mm from the free end of the brake-lever, whichever is the greater (see Figure 4).	b=25mm.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.5.5	Brake-block and brake-pad assemblies – Security test		
4.3.5.5	Requirement		
.1			
	The friction material shall be securely attached to the holder, backing-plate, or shoe and there shall be no failure of the braking system or any component thereof when tested by the method specified in 4.3.5.5.2.	Tested with positive results.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.5.6	Brake adjustment		
	Each brake shall be equipped with an adjustment mechanism either manual or automatic.	Manually adjusted.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
	Each brake shall be capable of adjustment with or without the use of a tool to an efficient operating position until the friction material has worn to the point of requiring replacement as recommended in the manufacturer's instructions. Also, when correctly adjusted, the friction material shall not contact anything other than the intended braking surface.	With use of a tool.	
	The brake blocks of a bicycle with rod brakes shall not come into contact with the rim of the wheels when the steering angle of the handlebars is set at 60°, nor shall the rods be bent, or be twisted after the handlebars are reset to the central position.	No rod brakes were fitted.	

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4.3.5.7 Hand-operated braking-system – Strength test			
4.3.5.7 Requirement			
.1			
	When tested by the method described in 4.3.5.7.2, there shall be no failure of the braking-system or of any component thereof.	Tested with positive results.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.5.8 Back-pedal braking system – Strength test			
4.3.5.8 General			
.1			
	If a back-pedal braking system is fitted, the brake shall be actuated by the operator's foot applying force to the pedal in a direction opposite to that of the drive force. The brake mechanism shall function regardless of any drive-gear positions or adjustments. The differential between the drive and brake positions of the crank shall not exceed 60°.	There was no back-pedal braking system fitted.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
	The measurement shall be taken with the crank held against each position with a pedal force of at least 250 N. The force shall be maintained for 1 min in each position.		
4.3.5.8 Requirement			
.2			
	When tested in accordance with 4.3.5.8.3, there shall be no failure of the brake system or any component thereof.		P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>

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4.3.5.9	Braking performance															
4.3.5.9 .1	General															
	<p>The progressive characteristics of the brake are determined by linearity measurements. A final, simple track test checks for smooth, safe, stopping characteristics.</p> <p>NOTE See 4.3.5.9.5.6 h) "Test method —simple track test".</p> <p>Conduct the braking-performance test on a fully-assembled bicycle after the brakes have been subjected to the strength test detailed in 4.3.5.7, 4.3.5.8. Before testing the bicycle, inflate the tyres and adjust the brakes all according to the manufacturer's instructions, but in the case of rim-brakes to the maximum clearance specified by the manufacturer.</p>	<p>Simple track test: bicycle can smooth, safely stop.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>													
4.3.5.9 .2	Requirements															
	<p>Where EPAC is fitted with secondary brake-levers attached to brake-levers, bar-ends or aerodynamic extensions, separate tests shall be conducted for the operation of the secondary brake-levers in addition to tests with the normal levers.</p> <p>When tested in accordance with 4.3.5.9.5, the bicycle shall fulfil the requirements shown in Table 1.</p> <p>Table 1 — Calculated braking performance value</p> <table border="1"> <thead> <tr> <th>Condition</th> <th>Brake in use</th> <th>Minimum braking performance value, B_p N</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Dry</td> <td>Front only</td> <td>340</td> </tr> <tr> <td>Rear only</td> <td>220</td> </tr> <tr> <td rowspan="2">Wet</td> <td>Front only</td> <td>220</td> </tr> <tr> <td>Rear only</td> <td>140</td> </tr> </tbody> </table>	Condition	Brake in use	Minimum braking performance value, B_p N	Dry	Front only	340	Rear only	220	Wet	Front only	220	Rear only	140	<p>$m=100\text{kg}$, $M=130\text{kg}$;</p> <p>"m" is the reference mass of EPAC defined as 100 kg for adult bicycle;</p> <p>"M" is the maximum permissible total mass specified by the manufacturer;</p> <p>No secondary brake-levers were fitted.</p> <p>Braking performance value: Front in dry: $522/1.3= 401\text{N}$; Front in wet: $555/1.3= 427\text{N}$; Rear in dry: $484/1.3= 372\text{N}$; Rear in wet: $503/1.3= 387\text{N}$.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
Condition	Brake in use	Minimum braking performance value, B_p N														
Dry	Front only	340														
	Rear only	220														
Wet	Front only	220														
	Rear only	140														

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4.3.5.9 .3	Linearity requirements																														
	When tested by the methods described in 4.3.5.9.5.6 c) 1) and 2), the braking force $F_{Br\ average}$ shall be linearly proportional (within $\pm 20\%$) to the progressively increasing intended operating forces $F_{Op\ intend}$. The requirement applies to braking forces $F_{Br\ average}$ equal to and greater than 80 N (according to Annex F).	Linearity: see Annex 1	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>																												
4.3.5.9 .4	Ratio between wet and dry braking performance requirements																														
	In order to ensure safety for both wet and dry braking, the ratio of braking performance wet: dry shall be greater than 4:10. The methods for calculating this ratio are given in 4.3.5.9.5.6 g).	<table border="1"> <thead> <tr> <th colspan="2">Front brake:</th> </tr> <tr> <th>Applied force</th> <th>Ratio</th> </tr> </thead> <tbody> <tr> <td>60N</td> <td>91%</td> </tr> <tr> <td>80N</td> <td>94%</td> </tr> <tr> <td>100N</td> <td>98%</td> </tr> <tr> <td>120N</td> <td>106%</td> </tr> <tr> <td>140N</td> <td>106%</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Rear brake:</th> </tr> <tr> <th>Applied force</th> <th>Ratio</th> </tr> </thead> <tbody> <tr> <td>60N</td> <td>99%</td> </tr> <tr> <td>80N</td> <td>105%</td> </tr> <tr> <td>100N</td> <td>98%</td> </tr> <tr> <td>120N</td> <td>105%</td> </tr> <tr> <td>140N</td> <td>104%</td> </tr> </tbody> </table>	Front brake:		Applied force	Ratio	60N	91%	80N	94%	100N	98%	120N	106%	140N	106%	Rear brake:		Applied force	Ratio	60N	99%	80N	105%	100N	98%	120N	105%	140N	104%	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
Front brake:																															
Applied force	Ratio																														
60N	91%																														
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100N	98%																														
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Applied force	Ratio																														
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140N	104%																														

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4.3.5. 10	Brakes – Heat-resistance test		
4.3.5. 10.1	General		
	<p>This test applies to all disc- and hub-brakes but to rim-brakes only where they are known or suspected to be manufactured from or include thermoplastic materials.</p> <p>Each brake on the bicycle shall be tested individually, but where the front and rear brakes are identical only one brake need be tested.</p>		
4.3.5. 10.2	Requirement		
	<p>Throughout the test described in 4.3.5.10.3, the brake-lever shall not touch the handlebar-grip, the operating force shall not exceed 180 N, and the braking force shall not deviate outside the range 60 N to 115 N.</p> <p>Immediately after having been subjected to the test described in 4.3.5.10.3, the brakes shall achieve at least 60 % of the braking performance which was recorded at the highest operating force used during the performance tests 4.3.5.9.5.6 c) 1) and 2).</p>	<p>The front and rear brakes are identical.</p> <p>Rear brake: Dry: 83% Wet: 76%</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.5. 11	Back-pedal brake linearity test		
	<p>This test shall be conducted on a fully assembled EPAC. The output force for a back-pedal brake shall be measured tangentially to the circumference of the rear tyre, when the wheel is rotated in the direction of forward movement, while a force of between 90 N and 300 N is being applied to the pedal at right angles to the crank and in the direction of braking.</p> <p>The braking force reading shall be taken during a steady pull and after one revolution of the wheel. A minimum of five results, each at a different pedal force level, shall be taken. Each result shall be the average of three individual readings at the same load level.</p> <p>The results shall be plotted on a graph, showing the line of best fit and the ± 20 % limit lines obtained by the method of least squares outlined in Annex F.</p>	<p>No back-pedal brake fitted.</p>	<p>P <input type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input checked="" type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>

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4.3.6	Steering		
4.3.6.1	Handlebar – Dimensions		
	Adjust the handlebar height to its highest normal riding position and the saddle to its lowest normal riding position as specified by the manufacturer (see 6 i)). Measure the vertical distance from the centre and top of the handlebar grips to a point where the saddle surface is intersected by the seat post axis (see Figure 9). This dimension shall not exceed 400 mm.	Differential of vertical distance: <400mm.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.2	Handlebar grips and plugs		
4.3.6.2 .1	Requirements		
	The ends of the handlebar shall be fitted with handgrips or end plugs. When tested by the method described in 4.3.6.2.2 and 4.3.6.2.3, the handgrips or plugs shall withstand the specified removal forces.	Handlebar ends fitted with handgrips; The handgrips were not removed with 70N after freezing test and hot water test.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.3	Handlebar stem – Insertion-depth mark or positive stop		
	The handlebar-stem shall be provided with one of the two following alternative means of ensuring a safe insertion depth into the fork steerer: a) it shall contain a permanent, transverse mark, of length not less than the external diameter of the stem, that clearly indicates the minimum insertion depth of the handlebar-stem into the fork steerer. The insertion mark shall be located at a position not less than 2,5 times the external diameter of the handlebar-stem from the bottom of the stem, and there shall be at least one stem diameter's length of contiguous, circumferential stem material below the mark; b) it shall incorporate a permanent stop to prevent it from being drawn out of the fork steerer such as to leave the insertion less than the amount specified in a) above.	See 4.3.6.4.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>

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4.3.6.4 Handlebar stem to fork steerer – Clamping requirements			
	<p>The distance g, see Figure 11, between the top of the handlebar stem and the top of the fork steerer to which the handlebar stem is clamped shall not be greater than 5 mm.</p> <p>The upper part of the fork steerer to which the handlebar stem is clamped shall not be threaded.</p> <p>The dimension g shall also ensure that the proper adjustment of the steering system can be achieved.</p> <p>For aluminium and composite fork steerer any internal device that could damage the internal surface of the fork steerer shall be avoided.</p>	<p>See 4.3.6.3 The distance is < 5mm.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.6.5 Steering stability			
	<p>The steering shall be free to turn through at least 60° either side of the straight-ahead position and shall exhibit no tight spots, stiffness or slackness in the bearings when correctly adjusted.</p> <p>A minimum of 25 % of the total mass of EPAC and rider shall act on the front wheel when the rider is holding the handlebar grips and sitting on the saddle, with the saddle and rider in their most rearward positions.</p> <p>NOTE Recommendations for steering geometry are given in Annex E.</p>	<p>Checked Ok.</p> <p>34%.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>

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4.3.6.6	Steering assembly – Static strength and security tests		
4.3.6.6	Handlebar and stem assembly – Lateral bending test		
.1			
4.3.6.6	General		
.1.1			
	This test is for manufacturers who produce handlebars and stems or for cycle manufacturers.		
4.3.6.6	Requirement		
.1.2			
	When tested by the method described in 4.3.6.6.1.3, there shall be no cracking or fracture of the handlebar, stem or clamp-bolt and the permanent deformation measured at the point of application of the test force shall not exceed 15 mm.	No cracking or fracture of the handlebar, stem or clamp-bolt; Permanent deformation: 2.6mm.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.6	Handlebar-stem – Forward bending test		
.2			
4.3.6.6	Requirement for Stage 1		
.2.2			
	When tested by the method described in 4.3.6.6.2.3, there shall be no visible cracks or fractures and the permanent deformation measured at the point of application of the test force and in the direction of the test force shall not exceed 10 mm.	No visible cracks or fractures occurred; Permanent deformation: 1.8mm; No visible cracks or fractures occurred.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.6	Requirement for Stage 2		
.2.4			
	When tested by the method described in 4.3.6.6.2.5, there shall be no visible cracks or fractures.	No failure occurred.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.6	Handlebar to handlebar-stem – Torsional security test		
.3			
	When tested by the method described in 4.3.6.6.3.2, there shall be no movement of the handlebar relative to the handlebar-stem.	No movement occurred.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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4.3.6.6 .4	Handlebar-stem to fork steerer – Torsional security test		
	When tested by the method described in 4.3.6.6.4.2, there shall be no movement of the handlebar-stem relative to the fork steerer.	No movement occurred.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.6 .5	Bar-end to handlebar – Torsional security test		
	When tested by the method described in 4.3.6.6.5.2, there shall be no movement of the bar-end in relation to the handlebar.	Not bar-end fitted.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.6.7	Handlebar and stem assembly – Fatigue test		
4.3.6.7 .1	General		
	<p>Handlebar-stems can influence test failures of handlebars and for this reason, a handlebar shall always be tested mounted in a stem, but it is permitted to test a stem with a solid bar in place of the handlebar and bar-ends with dimensions corresponding to handlebars/bar-ends suitable for that stem.</p> <p>When the fatigue test is for the stem only, the manufacturer of the stem shall specify the types and sizes of handlebar for which the stem is intended and the test shall be based on the most severe combination.</p> <p>Conduct the test in two stages on the same assembly.</p>		
4.3.6.7 .2	Requirement for Stage 1 and Stage 2		
	<p>When tested by the method described in 4.3.6.7.3 or 4.3.6.7.4, there shall be no visible cracks or fractures in any part of the handlebar and stem assembly or any bolt failure.</p> <p>For composite handlebars or stems, the running displacements (peak-to-peak value) at the points where the test forces are applied shall not increase by more than 20 % of the initial values.</p>	<p>Test frequency: 1.5Hz;</p> <p>No visible cracks or fractures in any part of the handlebar and stem assembly or any bolt failure.</p>	<p>P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/></p>

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4.3.7	Frames								
4.3.7.1	Suspension-frames – Special requirements								
	The design shall be such that if the spring or damper fails, neither the tyre shall contact any part of the frame nor the assembly carrying the rear wheel become detached from the rest of the frame.	Not suspension frame.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>						
4.3.7.2	Frame – Impact test (falling mass)								
4.3.7.2 .1	Requirements								
	<p>When tested by the method described in 4.3.7.2.3, there shall be no visible cracks or fractures of the frame.</p> <p>The permanent deformation measured between the axes of the wheel axles shall not exceed the following values:</p> <p>a) 30 mm where a fork is fitted; b) where a dummy fork is fitted in place of a fork, the values are given in Table 9.</p> <p>NOTE See Annex E (normative) Dummy fork characteristics.</p> <p>Table 9 — The values of permanent deformation</p> <table border="1"> <thead> <tr> <th>Fork type</th> <th>Real fork</th> <th>Dummy fork</th> </tr> </thead> <tbody> <tr> <td>Permanent deformation</td> <td>30 mm</td> <td>10 mm</td> </tr> </tbody> </table>	Fork type	Real fork	Dummy fork	Permanent deformation	30 mm	10 mm	<p>No visible cracks or fractures occurred;</p> <p>A fork was fitted;</p> <p>Permanent deformation: TREKKING 7.0 (HIGH STEP L): 9.5mm; TREKKING 7.0 (HIGH STEP M): 9.9mm; TREKKING 7.0 (LOW STEP L): 8.7mm; TREKKING 7.0 (LOW STEP M): 8.5mm.</p>	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
Fork type	Real fork	Dummy fork							
Permanent deformation	30 mm	10 mm							

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4.3.7.3	Frame and front fork assembly – Impact test (falling frame)				
4.3.7.3 .1	General				
4.3.7.3 .2	Requirement				
	<p>When tested by the method described in 4.3.7.3.3, there shall be no visible cracks or fractures in the assembly and after the second impact there shall be no separation of any parts of any suspension system. The permanent deformation measured between the axes of the wheel axes shall not exceed the values specified in Table 11.</p> <p>Table 11 — The values of permanent deformation</p> <table border="1"> <tr> <td>Permanent deformation</td> <td>60 mm</td> </tr> </table>	Permanent deformation	60 mm	<p>No visible cracks or fractures in the assembly;</p> <p>Permanent deformation:</p> <p>TREKKING 7.0 (HIGH STEP L): 14.0mm;</p> <p>TREKKING 7.0 (HIGH STEP M): 16.0mm;</p> <p>TREKKING 7.0 (LOW STEP L): 13.0mm;</p> <p>TREKKING 7.0 (LOW STEP M): 14.0mm.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
Permanent deformation	60 mm				
4.3.7.4	Frame – Fatigue test with pedalling forces				
4.3.7.4 .1	General				
4.3.7.4 .2	Requirement				
	<p>When tested by the method described in 4.3.7.4.3, there shall be no visible cracks or fractures in any part of the frame, and there shall be no separation of any parts of the suspension system.</p> <p>For composite frames, the running displacements (peak-to-peak values) at the points where the test forces are applied shall not increase by more than 20 % of the initial values (see 4.3.1.6).</p>	<p>Test frequency: 1.5Hz;</p> <p>No visible cracks or fractures in any part of the frame.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>		

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4.3.7.5	Frame – Fatigue test with horizontal forces		
4.3.7.5 .1	General		
4.3.7.5 .2	Requirement		
	<p>When tested by the method described in 4.3.7.5.3, there shall be no visible cracks or fractures in the frame and there shall be no separation of any parts of any suspension system.</p> <p>For composite frames, the running displacement (peak-to-peak value) at the point where the test forces are applied shall not increase by more than 20 % of the initial values (see 4.3.1.6).</p>	<p>Test frequency: 1.5Hz;</p> <p>No visible cracks or fractures in the frame.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.7.6	Frame – Fatigue test with a vertical force		
4.3.7.6 .1	General		
4.3.7.6 .2	Requirement		
	<p>When tested by the method described in 4.3.7.6.3, there shall be no visible cracks or fractures in the frame and there shall be no separation of any parts of the suspension system.</p> <p>For composite frames, the running displacement (peak-to-peak value) at the point where the test forces are applied shall not increase by more than 20 % of the initial value (see 4.3.1.6).</p>	<p>Test frequency: 1.5Hz;</p> <p>No visible cracks or fractures in the frame.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.8	Front fork		
4.3.8.1	General		
4.3.8.2	Means of location of the axle and wheel retention		
	<p>The slots or other means of location for the wheel-axle within the front fork shall be such that when the axle or cones are firmly abutting the top face of the slots, the front wheel remains central within the fork.</p> <p>The front fork and wheel shall also fulfil the requirements of 4.3.9.4 and 4.3.9.5.</p>	<p>Checked Ok.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>

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4.3.8.3	Suspension-forks – Special requirements		
4.3.8.3 .1	Tyre-clearance test		
4.3.8.3 .1.1	Requirement		
	When tested by the method described in 4.3.8.3.1.2, the tyre shall not contact the crown of the fork nor shall the components separate.	The tyre is not contacted the crown of the fork.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.8.3 .2	Tensile test		
4.3.8.3 .2.1	Requirement		
	When tested by the method described in 4.3.8.3.2.2, there shall be no detachment or loosening of any parts of the assembly and the tubular, telescopic components of any fork-leg shall not separate under the test force.	There is no detachment or loosening of any parts of the fork assembly after test.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.8.4	Front fork – Static bending test		
4.3.8.4 .1	Requirement		
	When tested by the method described in 4.3.8.4.2, there shall be no fractures or visible cracks in any part of the fork, and the permanent deformation, measured as the displacement of the axis of the wheel-axle or simulated axle in relation to the axis of the fork steerer, shall not exceed 10 mm.	No fractures or visible cracks in any part of the fork; Permanent deformation: TREKKING 7.0 (HIGH STEP L): 4.4mm; TREKKING 7.0 (HIGH STEP M): 4.4mm; TREKKING 7.0 (LOW STEP L): 3.7mm; TREKKING 7.0 (LOW STEP M): 4.4mm.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.8.5	Front fork – Rearward impact test		
4.3.8.5 .1	Forks made entirely of metal		
4.3.8.5 .1.1	Crown/steerer joint assembled by welding or brazing		

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	<p>When tested by the method described in 4.3.8.5.3, there shall be no fractures or visible cracks in any part of the fork, and the permanent deformation, measured as the displacement of the axis of the wheel-axle or simulated axle in relation to the axis of the fork steerer, shall not exceed 45 mm.</p> <p>If the fork is used in the frame impact test (falling-mass), 4.3.7.2, there is no need to perform this test.</p>	See 4.3.8.5.1.2.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.8.5 .1.2	Crown/steerer joint assembled by press-fitting, bonding, or clamping		
	<p>When tested by the method described 4.3.8.5.4 a), if there are any fractures or visible cracks in any part of the fork, and the permanent deformation, measured as the displacement of the axis of the wheel-axle or simulated axle in relation to the axis of the fork steerer, exceeds 45 mm, the fork shall be considered to have failed. If the fork meets these criteria then it shall be subjected to a second test as described in 4.3.8.5.4 b), after which, it shall exhibit no fractures, then it shall be subjected to a third test as described in 4.3.8.5.4 c), irrespective of the amount of permanent deformation, there shall be no relative movement between the steerer and the crown.</p>	<p>The fork is used in the frame impact test (falling-mass), see 4.3.7.2.</p> <p>Permanent deformation: TREKKING 7.0 (HIGH STEP L): 13.6mm; TREKKING 7.0 (HIGH STEP M): 13.6mm; TREKKING 7.0 (LOW STEP L): 12.3mm; TREKKING 7.0 (LOW STEP M): 13.6mm.</p>	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.8.5 .2	Forks which have composite parts		
	<p>When tested by the method described in 4.3.8.5.3, there shall be no fractures in any part of a fork and the permanent deformation, measured as the displacement of the axis of the wheel-axle or simulated axle in relation to the axis of the fork steerer, shall not exceed 45 mm. After which, it shall exhibit no fractures, then it shall be subjected to a second test as described in 4.3.8.5.4 c) Torque on fork, irrespective of the amount of permanent deformation, there shall be no relative movement between the steerer and the crown.</p>	No composite parts fitted.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.8.6	Front fork – Bending fatigue test plus rearward impact test		
4.3.8.6 .1	Requirement		

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	<p>When tested by the method described in 4.3.8.6.2, there shall be no fractures in any part of the fork, and the permanent deformation, measured as the displacement of the axis of the wheel-axle or simulated axle in relation to the axis of the fork steerer, shall not exceed 45 mm.</p> <p>For composite forks, the running displacement (peak-to-peak value) at the points where the test forces are applied shall not increase by more than 20 % of the initial values (see 4.3.1.6).</p>	<p>Bending fatigue test: Test frequency: 1.5Hz; No fractures in any part of the fork;</p> <p>Rearward impact test: Permanent deformation: TREKKING 7.0 (HIGH STEP L): 11.5mm; TREKKING 7.0 (HIGH STEP M): 11.5mm; TREKKING 7.0 (LOW STEP L): 13.4mm; TREKKING 7.0 (LOW STEP M): 11.5mm.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.8.7	Forks intended for use with hub- or disc-brakes		
4.3.8.7 .1	General		
4.3.8.7 .2	Static brake-torque test		
	When tested by the method described in 4.3.8.7.3, there shall be no fractures or visible cracks in any part of the fork.	The arm's length: 349mm; No fractures or visible cracks in any part of the fork.	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.8.7 .4	Fork for hub/disc-brake – Brake mount fatigue test		
	When tested by the method described in 4.3.8.7.5, there shall be no fractures or visible cracks in any part of the fork and, in the case of suspension-forks, there shall be no separation of any parts.	Test frequency: 0.5Hz; No fractures or visible cracks in any part of the fork; No separation of any parts.	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.8.8	Tensile test for a non-welded fork		
4.3.8.8 .1	General		
4.3.8.8 .2	Requirement		
	When tested by the method described in 4.3.8.8.3, there shall be no detachment or loosening of any parts of the assembly.	No detachment or loosening occurred.	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.9	Wheels and wheel/tyre assembly		
4.3.9.1	Wheels/tyre assembly – Concentricity tolerance and lateral tolerance		

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4.3.9.1	Requirements								
.1	<p>When measured by the method described in 4.3.9.1.2, the run-out shall not exceed the values which are given in Table 22.</p> <table border="1"> <thead> <tr> <th></th> <th>Intended for rim-brakes</th> <th>Not intended for rim-brakes</th> </tr> </thead> <tbody> <tr> <td>Concentricity and lateral tolerance</td> <td>1</td> <td>2</td> </tr> </tbody> </table>		Intended for rim-brakes	Not intended for rim-brakes	Concentricity and lateral tolerance	1	2	<p>Not intended for rim-brakes.</p> <p>Concentricity tolerance: Front wheel: 0.69mm; Rear wheel: 0.77mm.</p> <p>lateral tolerance: Front wheel: 0.55mm; Rear wheel: 0.94mm.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
	Intended for rim-brakes	Not intended for rim-brakes							
Concentricity and lateral tolerance	1	2							
4.3.9.2	Wheel/tyre assembly – Clearance								
	<p>Alignment of the wheel assembly in EPAC shall allow not less than the clearance values given in Table 23 between the tyre and any frame or fork element or a front mudguard and its attachment bolts.</p> <table border="1"> <tbody> <tr> <td>Clearance</td> <td>6</td> </tr> </tbody> </table>	Clearance	6	<p>Checked >6mm.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>				
Clearance	6								
4.3.9.3	Wheel/tyre assembly – Static strength test								
4.3.9.3	Requirement								
.1	<p>When a fully assembled wheel fitted with a tyre inflated to the maximum inflation pressure is tested by the method described in 4.3.9.3.2, there shall be no failure of any of the components of the wheel, and the permanent deformation, measured at the point of application of the force on the rim, shall not exceed the values which are given in Table 24.</p> <table border="1"> <tbody> <tr> <td>Permanent deformation</td> <td>1,5</td> </tr> </tbody> </table>	Permanent deformation	1,5	<p>No failure of any of the components of the wheel;</p> <p>Permanent deformation: Front wheel: 0.23mm. Rear wheel: 0.21mm.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>				
Permanent deformation	1,5								
4.3.9.4	Wheels – Wheel retention								
4.3.9.4	General								
.1									

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	Wheel nuts shall have a minimum removal torque of 70 % of the manufacturer's recommended tightening torque.	Front wheel: Quick release; Rear wheel: Quick release.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.9.4 .2	Wheel retention – Retention devices secured		
	When tested by the method described in 4.3.9.4.2.2, there shall be no relative motion between the axle and the front fork/frame.	No relative motion occurred.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.9.4 .3	Front wheel retention – Retention devices unsecured		

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	<p>Any quick-release device shall have the following operating features:</p> <p>a) it shall be adjustable to allow setting for tightness;</p> <p>b) its form and marking shall clearly indicate whether the device is in the open or locked position;</p> <p>c) if adjustable by a lever, the force required to close a properly set lever shall not exceed 200 N and, at this closing force there shall be no permanent deformation of the quick-release device;</p> <p>d) the releasing force of the clamping device when closed shall not be less than 50 N;</p> <p>e) if operated by a lever, the quick-release device shall withstand without fracture or permanent deformation a closing force of not less than 250 N applied with the adjustment set to prevent closure at this force;</p> <p>f) the wheel retention with the quick-release device in the clamped position shall be in accordance with 4.3.9.4.2, 4.3.9.4.3;</p> <p>g) the front wheel retention with the quick-release device in the open position shall be in accordance with 4.3.9.4.3.</p> <p>If applied to a lever, the forces specified in c), d), and e) shall be applied 5 mm from the tip end of the lever.</p>	<p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p> <p>Checked Ok.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.10	Rims, tyres and tubes		

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4.3.10. 1	General		
4.3.10. 2	Tyre inflation pressure		
	<p>The maximum inflation pressure recommended by the manufacturer shall be permanently marked on the side wall of the tyre so as to be readily visible when the latter is assembled on the wheel. If the rim manufacturer recommends a maximum tyre inflation pressure, it shall be clearly and permanently marked on the rim and also specified in the manufacturer's instructions.</p> <p>It is recommended that the minimum inflation pressure specified by the tyre manufacturer also be permanently marked on the side wall of the tyre.</p>	<p>The maximum inflation pressure: 55PSI.</p> <p>The minimum inflation pressure: 30PSI.</p>	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.10. 3	Tyre and rim compatibility		
	<p>Tyres that comply with the requirements of ISO 5775-1 and rims that comply with the requirements of ISO 5775-2 are compatible.</p> <p>The tyre, tube and tape shall be compatible with the rim design. When inflated to 110 % of the maximum inflation pressure, determined by the lower value between maximum inflation pressures recommended on the rim or the tyre, for a period of not less than 5 min, the tyre shall remain intact on the rim.</p>	<p>Not checked according to ISO 5775-1/-2.</p> <p>Tested pressure: 60.5 P.S.I.</p>	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.10. 4	Rim-wear		
	<p>In the case where the rim forms part of a braking system and there is a danger of failure due to wear, the manufacturer shall make the rider aware of this danger by durable and legible marking on the rim, in an area not obscured by the tyre</p>	<p>Disc-brake system; Not applicable.</p>	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.10. 5	Greenhouse effect test for composite wheels		

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
4.3.10. 5.2	Requirement		
	When a fully assembled wheel made of composite material, fitted with the appropriate size tyre and inflated according to the lowest value between maximum inflation pressure recommended on the rim or the tyre, is tested by the method described as 4.3.10.5.3, there shall be: — no failure of any of the components of the wheel; — no tyre separation from the rim during the test; — no increase in rim width greater than 5 % of the initial maximal width value; — compliance of lateral and concentricity tolerance according to 4.3.9.1; — compliance of tyre and rim compatibility according to 4.3.10.3; — compliance of static strength according to 4.3.9.3.	Not composite wheels.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.11	Front mudguard		
4.3.11. 1	Requirements		
	If front mudguard is fitted, when tested by the method described in the two-stage tests in 4.3.11.2 (for mudguard with stays) or 4.3.11.3 (for mudguard without stays), the front mudguard shall not prevent rotation of the wheel or shall obstruct the steering.	Mudguard fitted.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.11. 2	Front mudguard with stays test methods	Tested with positive result.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.11. 3	Front mudguard without stays test methods		P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.12	Pedals and pedal/crank drive system		
4.3.12. 1	Pedal tread		
4.3.12. 1.1	Tread surface		
	The tread surface of a pedal shall be secured against movement within the pedal assembly.	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.12. 1.2	Toe Clips		

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result					
	<p>Pedals intended to be used without toe-clips, or for optional use with toe-clips, shall have:</p> <p>a) tread surfaces on the top and bottom surfaces of the pedal; or</p> <p>b) a definite preferred position that automatically presents the tread surface to the rider's foot.</p> <p>Pedals designed to be used only with toe-clips or shoe-retention devices shall have toe-clips or shoe-retention devices securely attached and need not comply with the requirements of 4.3.12.1.2 a) and b).</p>	<p>Checked Ok.</p> <p>Complied with a).</p> <p>Not applicable.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>					
4.3.12.2	Pedal clearance							
4.3.12.2.1	Ground clearance							
	<p>EPAC shall be capable of being leaned over at an angle of θ from the vertical before any part of the pedal touches the ground. The values are given in Table 26.</p> <table border="1"> <tr> <td>Lean angle θ</td> <td>25</td> </tr> </table>	Lean angle θ	25	<p>Crank length: 175mm;</p> <p>Checked > 25°.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>			
Lean angle θ	25							
4.3.12.2.2	Toe clearance							
	<p>EPACs shall have at least C clearance between the pedal and front tyre or mudguard (when turned to any position).</p> <table border="1"> <tr> <td rowspan="2">Toe clearance C</td> <td>without foot retention</td> <td>100</td> </tr> <tr> <td>with foot retention</td> <td>89</td> </tr> </table> <p>NOTE Foot retention system, e.g. quick-release pedal or toe-clip</p>	Toe clearance C	without foot retention	100	with foot retention	89	<p>Without foot retention;</p> <p>Checked > 100mm.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
Toe clearance C	without foot retention		100					
	with foot retention	89						
4.3.12.3	Pedal – Static strength test							
	<p>When tested by the method described in 4.3.12.3.2, there shall be no fractures, visible cracks, or distortion of the pedal or spindle that could affect the operation of the pedal and pedal-spindle.</p>	<p>No fractures, visible cracks, or distortion of the pedal, spindle not affect the operation of the pedal and pedal-spindle.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>					
4.3.12.4	Pedal – Impact test							

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
	When tested by the method described in 4.3.12.4.2, there shall be no fractures of any part of the pedal body, the pedal-spindle or any failure of the bearing system.	No fractures of any part of the pedal body, the pedal-spindle or any failure of the bearing system.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.12. 5	Pedal – Dynamic durability test		
	When tested by the method described in 4.3.12.5.2, there shall be no fractures or visible cracking of any part of the pedal, the pedal-spindle nor any failure of the bearing system.	No fractures or visible cracking of any part of the pedal, the pedal-spindle or any failure of the bearing system.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.12. 6	Drive-system – Static strength test		
4.3.12. 6.1	Requirement		
	<p>a) Drive-system with chain When tested by the method described in 4.3.12.6.2, there shall be no fracture of any component of the drive system, and drive capability shall not be lost.</p> <p>b) Drive-system with belt When tested by the method described in 4.3.12.6.3, there shall be no fracture of any component of the drive system, and the belt shall not slip/skip, fracture or cause any loss in drive capability. Smooth sliding between pulleys and belt is allowed at a rate not exceeding 1 °/s at the drive axis.</p>	<p>Complied with a); Multi-speed system; No fracture of any component of the drive system, and drive capability not be lost.</p>	<p>P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/></p>
4.3.12. 7	Crank assembly – Fatigue test		

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
	<p>When tested by the method described in 4.3.12.7.2, there shall be no fractures or visible cracks in the cranks, the bottom-bracket spindle or any of the attachment features, or loosening or detachment of the chain-wheel from the crank.</p> <p>For composite cranks, the running displacements (peak-to-peak values) of either crank at the point where the test forces are applied shall not increase by more than 20 % of the initial value (see 4.3.1.6).</p>	<p>Test frequency: 1.5Hz.</p> <p>No fractures or visible cracks in the cranks, the bottom-bracket spindle or any of the attachment features, or loosening or detachment of the chain-wheel from the crank.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.13	Drive-chain and drive belt		
4.3.13.1	Drive-chain		
	<p>Where a chain-drive is used as a means of transmitting the motive force, the chain shall operate over the front and rear sprockets without binding.</p> <p>The chain shall conform to the tensile strength and push-out force requirements of the ISO 9633.</p>	<p>Checked OK;</p> <p>Tensile strength: 9 360N; Push-out force: 940N.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.13.2	Drive belt		
	<p>Where a belt-drive is used as a means of transmitting the motive force, the drive belt shall operate over the front and rear pulleys without binding. And when tested by the methods described in 4.3.13.2.2, there shall be no evidence of cracking, fracture or delamination of the belt drive.</p>	<p>Not fitted with belt-driven system.</p>	<p>P <input type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input checked="" type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.14	Chain-wheel and belt-drive protective device		
	<p>EPAC shall be equipped with one of the following:</p> <p>a) a chain wheel disc or drive pulley disk which conforms to 4.3.14.2; or</p> <p>b) a chain and drive belt protective device which conforms to 4.3.14.3; or</p> <p>c) where fitted with positive foot-retention devices on the pedals, a combined front gear-change guide which conforms to 4.3.14.4 shall be used.</p>	<p>Complied with a). A chain wheel disc was fitted.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.15	Saddles and seat-posts		

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
4.3.15.1	Limiting dimensions		
	No part of the saddle, saddle supports, or accessories to the saddle shall be more than 125 mm above the top saddle surface at the point where the saddle surface is intersected by the seat-post axis.	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.15.2	Seat-post – Insertion-depth mark or positive stop		
	The seat-post shall be provided with one of the two following alternative means of ensuring a safe insertion-depth into the frame: a) it shall contain a permanent, transverse mark of length not less than the external diameter or the major dimension of the cross-section of the seat-post that clearly indicates the minimum insertion-depth of the seat-post into the frame. For a circular cross-section, the mark shall be located not less than two diameters of the seat-post from the bottom of the seat-post (i.e. where the diameter is the external diameter). For a non-circular cross-section, the insertion-depth mark shall be located not less than 65 mm from the bottom of the seat-post (i.e. where seat-post has its full cross-section); b) it shall incorporate a permanent stop to prevent it from being drawn out of the frame such as to leave the insertion less than the amount specified in a) above.	Complied with a); Diameter of the seat post: 31.53mm; The marking locates at 100.58mm from the bottom of the pillar. Length of marking > 30.27mm.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.15.3	Saddle/seat-post – security test		
4.3.15.3.1	General		
4.3.15.3.2	Saddles with adjustment-clamps		
	When tested by the method described in 4.3.15.3.4, there shall be no movement of the saddle adjustment clamp in any direction with respect to the seat-post, or of the seat-post with respect to the frame, nor any failure of saddle, adjustment clamp or seat-post. If the saddle design is such that it cannot accurately test the saddle/seat-post clamp, it shall be possible to use a fixture which is representative of the saddle dimensions.	No movement occurred, no any failure of saddle, adjustment clamp or seat-post.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.15.3.3	Saddles without adjustment-clamps		

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	Saddles that are not clamped, but are designed to pivot in a vertical plane with respect to the seat-post, shall be allowed to move within the parameters of the design and shall withstand the tests described in 4.3.15.3.4 without failure of any components.	See 4.3.15.3.2.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.15.4	Saddle – Static strength test		
	When tested by the method described in 4.3.15.4.2, the saddle cover and/or plastic moulding shall not disengage from the chassis of the saddle, and there shall be no cracking or permanent distortion of the saddle assembly.	There is no cracking or permanent distortion of the saddle assembly.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.15.5	Saddle and seat-post clamp – Fatigue test		
4.3.15.5.1	General		
4.3.15.5.2	Requirement		
	When tested by method described in 4.3.15.5.3, there shall be no fractures or visible cracks in the seat-post or in the saddle, and no loosening of the clamp.	Test frequency: 1.5Hz. No fractures or visible cracks in the seat-post or in the saddle, and no loosening of the clamp.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.15.6	Seat-post – Fatigue test		

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4.3.15. 6.1	General		
4.3.15. 6.2	Requirement for stage 1		
	<p>4.3.15.6.2.1 Seat-post without suspension system When tested by the method described in 4.3.15.6.3, there shall be no visible cracks or fractures in the seat-post, nor any bolt failure.</p> <p>For composite seat-post, the peak deflection of seat-post during the test shall not increase by more than 20 % of the initial value.</p> <p>4.3.15.6.2.2 Seat-post with suspension system When tested by the method described in 4.3.15.6.3, there shall be no visible cracks or fractures in the seat-post, nor any bolt failure. The design shall be such that in the event of failure of the suspension system, the two main parts do not separate nor does the upper part (i.e. the part to which the saddle would be attached) become free to swivel in the lower part.</p>	<p>Seat-post without suspension system; Test frequency: 1.5Hz; No visible cracks or fractures in the seat-post, no any bolt failure, no any failure of the suspension system.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.15. 6.4	Requirement for stage 2		
	<p>4.3.15.6.4.1 Seat-post without suspension system When tested by the method described in 4.3.15.6.5, there shall be no fractures, and the displacement shall not exceed 10 mm during testing.</p> <p>4.3.15.6.4.2 Seat-post with suspension system When tested by the method described in 4.3.15.6.5, there shall be no fractures. The design shall be such that in the event of failure of the suspension system, the two main parts do not separate nor does the upper part (i.e. the part to which the saddle would be attached) become free to swivel in the lower part.</p>	<p>Seat-post without suspension system; Permanent displacement: 0.16mm. No fracture occurred, no any failure of the suspension system.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.16	Spoke protector		
	<p>EPAC bicycles with multiple free-wheel/cassette sprockets shall be fitted with a spoke-protector guard to prevent the chain interfering with or stopping rotation of the wheel through improper adjustment or damage.</p>	<p>Checked Ok.</p>	<p>P <input checked="" type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input type="checkbox"/></p>
4.3.17	Luggage carriers		

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	If luggage carriers are fitted or provided they shall comply with ISO 11243.	Rear luggage carriers: 25kg. Complied with EN ISO 11243.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.18	Road-test of a fully-assembled EPAC		
	There shall be no system or component failure and no loosening or misalignment of the saddle, handlebar, controls or reflectors. The EPAC shall with or without assistance exhibit stable handling in braking, turning and steering, and it shall be possible to ride with one hand removed from the handlebar (as when giving hand signals), without difficulty of operation or hazard to the rider.	No system or component failure and no loosening or misalignment of the saddle, handlebar, controls or reflectors.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.19	Lighting systems and reflectors		
4.3.19.1	General		
	EPAC shall be equipped with reflectors at the front, rear and side. EPAC shall be equipped with lighting systems and reflectors in conformity with the national regulations in the country in which EPAC is marketed, because national regulations for lighting systems and reflectors differ from country to country.	A front reflector set, a rear reflector set, pedal reflector and side reflectors were fitted; The lighting systems were not fitted; It is reminded to the customer to follow national regulations for lighting system and reflectors before used on public roads.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.19.2	Wiring harness		
	When a wiring harness is fitted, it shall be positioned to avoid any damage by contact with moving parts or sharp edges. All connections shall withstand a tensile force in any direction of 10 N.	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
4.3.19.3	Lighting systems		

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	The lighting system consists of a front and a rear light. These devices shall comply with the provisions in force in the country in which the product is marketed. If there are no forced provisions of these devices, the lighting system shall comply with the requirements of ISO 6742-1.	See 4.3.19.1.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.19.4	Reflectors		
4.3.19.4.1	General		
	These devices shall comply with the provisions in force in the country in which the product is marketed. If there are no forced provisions of these devices, the retro-reflective devices shall comply with the requirements of ISO 6742-2.	Reflectors are fitted; Not checked according to the national legislations, or ISO 6742-2.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.19.4.2	Rear reflectors		
	Rear reflectors shall be red in colour.	(Record only) Colour: red.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.19.4.3	Side reflectors		
	The retro reflective device(s) shall be either a) a reflectors fitted on the front half and on the rear half of EPAC. At least one of these shall be mounted on the spokes of the wheel. Where EPAC incorporates features at the rear wheel other than the frame and mudguard stays, the moving reflector shall be mounted on the front wheel; or b) a continuous circle of reflective material applied to both sides of each wheel within 10 cm of the outer diameter of the tyre. All side reflectors shall be of the same colour, either white (clear) or yellow.	(Record only) Complied with b).	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.19.4.4	Front reflectors		

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	Front reflectors shall be white (clear) in colour.	(Record only) Colour: white.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.19. 4.5	Pedal reflectors		
	Each pedal shall have reflectors, located on the front and rear surfaces of the pedal. The reflector elements shall be either integral with the construction of the pedal or mechanically attached, but shall be recessed from the edge of the pedal, or of the reflector housing, to prevent contact of the reflector element with a flat edge placed in contact with the edge of the pedal.	(Record only) Colour: yellow.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.20	Warning device		
	Where a bell or other suitable device is fitted, it shall comply with the provisions in force in the country in which the product is marketed.	Record only. Not checked according to the national provisions.	P <input type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input checked="" type="checkbox"/>
4.3.21	Thermal hazards		
	A warning shall be placed on the surface if the temperature of the hot accessible surface could be above 60°C (see EN ISO 7010:2012, symbol W017). Brake systems are excluded from this requirement.		P <input type="checkbox"/> F <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/T <input type="checkbox"/>
4.3.22	Performance levels (PLRs) for control system of EPACs		

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	<p>The safety related parts of the control systems of the EPAC shall comply with the required performance level (PLr) given in Table 34 in accordance with EN ISO 13849-1.</p> <p>Should risk assessment indicate that additional or different PLr are required for a particular application, these should be determined in accordance with EN ISO 13849 (all parts). Such PLr will be outside the scope of this standard.</p> <p>The manufacturer of the EPAC shall record the process adopted for verification of compliance with PLr for each relevant safety function.</p> <p style="text-align: center;">Table 34 — Safety functions related to defined hazards</p> <table border="1"> <thead> <tr> <th>Safety function</th> <th>Performance Level</th> </tr> </thead> <tbody> <tr> <td>Prevention of an unintentional self-start of the EPAC</td> <td>PLr c</td> </tr> <tr> <td>Prevention of electric motor assistance functions without pedalling, and without activation of the start-up assistance mode</td> <td>PLr c</td> </tr> <tr> <td>Prevention of risk of fire in case of management system failure for batteries with capacity above 100 Wh</td> <td>PLr c</td> </tr> </tbody> </table>	Safety function	Performance Level	Prevention of an unintentional self-start of the EPAC	PLr c	Prevention of electric motor assistance functions without pedalling, and without activation of the start-up assistance mode	PLr c	Prevention of risk of fire in case of management system failure for batteries with capacity above 100 Wh	PLr c	<p>Performance level determination according to ISO 13849 not requested.</p>	<p>P <input type="checkbox"/></p> <p>F <input type="checkbox"/></p> <p>N/A <input type="checkbox"/></p> <p>N/T <input checked="" type="checkbox"/></p>
Safety function	Performance Level										
Prevention of an unintentional self-start of the EPAC	PLr c										
Prevention of electric motor assistance functions without pedalling, and without activation of the start-up assistance mode	PLr c										
Prevention of risk of fire in case of management system failure for batteries with capacity above 100 Wh	PLr c										

4.4	List of significant hazards		
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	<p>The following significant hazards have been considered in this standard:</p> <p>NOTE 1 The risk analysis was focused on EPAC as bicycles for city and trekking, including folding bicycles. Mountain bike and racing bike were not considered.</p> <p>a) Mechanical hazards: high deceleration, high acceleration, Protrusion, instability; kinetic energy; rotating elements and moving elements, rough, slippery surface, sharp edges;</p> <p>b) Electrical hazards: electromagnetic phenomena; electrostatic phenomena; overload; short-circuit; thermal radiation;</p> <p>NOTE 2 The strength of the battery holder combination should the EPAC fall to the side will be considered at the next revision.</p> <p>c) Thermal hazards: explosion; flame; radiation from heat sources;</p> <p>d) Ergonomic hazards: effort; lighting; posture;</p> <p>e) Hazards associated with the environment in which the machine is used: water (rain and projection);</p> <p>f) Combination of hazards: braking under wet and dry condition, handgrips, motor management system, engine power management, installed braking power.</p>		
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5	Marking, labelling		
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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
	When tested by the method described in 5.2.2, the marking shall remain easily legible. It shall not be easily possible to remove any label nor shall any label show any sign of curling.	Checked Ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
6	Instruction for use		
	<p>Each EPAC shall be provided with a set of instructions in the language of the country to which EPAC will be supplied. Different countries may have local requirements regarding this type of information (see IEC/ISO 82079-1). Instructions for use shall be delivered obligatory in paper form. For more detailed information and enabling an access for vulnerable people instructions for use should be available additionally in electronic form on demand. Instructions for use shall contain the following information on:</p> <p>a) Concept and description of electric assistance including varying levels of motor assistance;</p> <p>b) Recommendation for cleaning and the use of high pressure cleaners;</p> <p>c) Control and tell tales;</p> <p>d) Specific EPAC recommendation for use (e.g. removal of the battery, temperature range for the use of the bicycle including battery, use of start-up assistance mode);</p> <p>e) Specific EPAC warnings (e.g. always remove the battery during maintenance, inappropriate use including manipulation of the electric management system);</p> <p>f) Recommendations about battery charging and charger use (e.g. temperature range for the battery storage, indoor or outdoor charging) as well as the importance of following the instruction contained on the label of the battery charger;</p> <p>g) The meaning of symbol and tell tales used shall be explained in the instruction for use. Warning about contact with hot surfaces as for example disc brakes after heavy use;</p> <p>h) The type of use for which EPAC has been designed (i.e. the type of terrain for which it is suitable) with a warning about the hazards of incorrect use;</p> <p>i) Preparation for riding - how to measure and adjust the saddle height to suit the rider with an explanation of the insertion-depth warning marks on the seat-post and handlebar-stem. Clear information on which lever operates the front brake, which lever operates the rear brake, the presence of any brake-power modulators with an explanation of their function and adjustment, and the correct method of using a back-pedal brake if fitted;</p> <p>j) Indication of minimum saddle height and the way to measure it;</p>	Electronic user's manual submitted and checked ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse – Bemerkungen / Measuring results - Remarks	Ergebnis Result
	<p>k) The recommended method for adjusting any adjustable suspension system fitted;</p> <p>l) Recommendations for safe riding, the use of a bicycle helmet, regular checks on brakes, tyre pressure, steering, rims and caution concerning possible increased braking distances in wet weather;</p> <p>m) The safe use and adjustment of foot-securing devices if fitted (i.e. quick-release pedals and toe-clips);</p> <p>n) The permissible total payload (rider plus luggage) and the empty weight of the EPAC;</p> <p>o) Recommendation about usage for bicycle trailer or trailer bicycle if allowed by EPAC manufacturer;</p> <p>p) An advisory note to draw attention to the rider concerning possible national legal requirements when EPAC is to be ridden on public roads (e.g. lighting and reflectors);</p> <p>q) Recommended tightening of fasteners related to the handlebar, handlebar-stem, saddle, seat-post, wheels, and aerodynamic extension if fitted with torque values for threaded fasteners;</p> <p>r) The method for determining the correct adjustment of quick-release devices, such as “the mechanism should emboss the fork-ends when closed to the locked position”;</p> <p>s) The correct method of assembling any parts supplied unassembled;</p> <p>t) Lubrication - where and how often to lubricate, and the recommended lubricants;</p> <p>u) The correct chain tension and how to adjust it (if appropriate);</p> <p>v) Adjustments of gears and their operation (if appropriate);</p> <p>w) Adjustment of brakes and recommendations for the replacement of the friction components;</p> <p>x) Recommendations on general maintenance;</p> <p>y) The importance of using only genuine replacement parts for safety-critical components;</p> <p>z) Care of the wheel-rims and a clear explanation of any danger of rim-wear (see also 4.3.10.4 and 5.1);</p>	Electronic user’s manual submitted and checked ok..	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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	<p>For composite rims wear damage may be invisible to the user, the manufacturer shall explain the consequences of rim wear and how the cyclist can assess the degree of wear or should recommend returning the composite rim to the manufacturer for inspection.</p> <p>aa) The correct gluing technique for wheels equipped with tubular tyres if fitted;</p> <p>bb) Appropriate spares, i.e. tyres, tubes, and brake friction-components;</p> <p>cc) Accessories - where these are offered as fitted, details should be included such as operation, maintenance required (if any) and any relevant spares (e.g. light bulbs);</p> <p>dd) An advisory note to draw attention of the rider to possible damage due to intensive use and to recommend periodic inspections of the frame, fork, suspensions joints (if any), and composite components (if any). The wording of the advice may be as follows;</p> <p>WARNING — As with all mechanical components, EPAC is subjected to wear and high stresses. Different materials and components may react to wear or stress fatigue in different ways. If the design life of a component has been exceeded, it may suddenly fail, possibly causing injuries to the rider. Any form of crack, scratches or change of colouring in highly stressed areas indicate that the life of the component has been reached and it should be replaced.</p> <p>WARNING — For composite components impact damage may be invisible to the user, the manufacturer shall explain the consequences of impact damage and that in the event of an impact; composite components should either be returned to the manufacturer for inspection or destroyed and replaced.</p> <p>ee) For composite components, an advisory note to draw attention to the influence of high temperature (heat radiations) in confined environment on composite materials (if appropriate);</p>	Electronic user's manual submitted and checked ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>

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	<p>ff) importance of possible suitably covering any coil springs under the saddle if a child-seat is fitted to prevent trapping of fingers;</p> <p>gg) The handlebar, the rider's response to steering and braking can be adversely affected;</p> <p>hh) The maximum inflation pressure for a conventional or tubular tyre, according to the lowest value between maximum inflation pressure recommended on the rim or the tyre (see also 4.3.10.2);</p> <p>ii) Recommendation on the installation of bicycle carriers as well as child seats (max. load, mounting, etc.); NOTE It is permitted to include any other relevant information at the discretion of the manufacturer.</p> <p>jj) Definition of tampering in user manual (i.e. exclude exchange of sprocket with non-original parts);</p> <p>kk) Recommendations and users responsibility in case of tampering.</p> <p>ll) The following statement: The A-weighted emission sound pressure level at the driver ears is less than 70 dB(A).</p>	Electronic user's manual submitted and checked ok.	P <input checked="" type="checkbox"/> F <input type="checkbox"/> N/A <input type="checkbox"/> N/T <input type="checkbox"/>
Annex A	Example of recommendation for battery charging (informative)		
Annex B	Example of relation between speed/torque/current (informative)		
Annex C	Electromagneticcompatibility of EPAC and ESA (normative)		
Annex D	Steering geometry (informative)		
Annex E	Dummy fork characteristics(normative)		
Annex F	Explanation of the method of least squares for obtaining line of best fit and ± 20 % limit lines for braking performance linearity(informative)		
Annex G	Fork mounting fixture(normative)		
Annex H	Wheel/tyre assembly - Fatigue test(informative)		
Annex I	Light, warning device, on-off symbols (normative)		
Annex J	Start-up assistance mode symbols(informative)		
Annex ZA	Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC Machinery Directive(informative)		

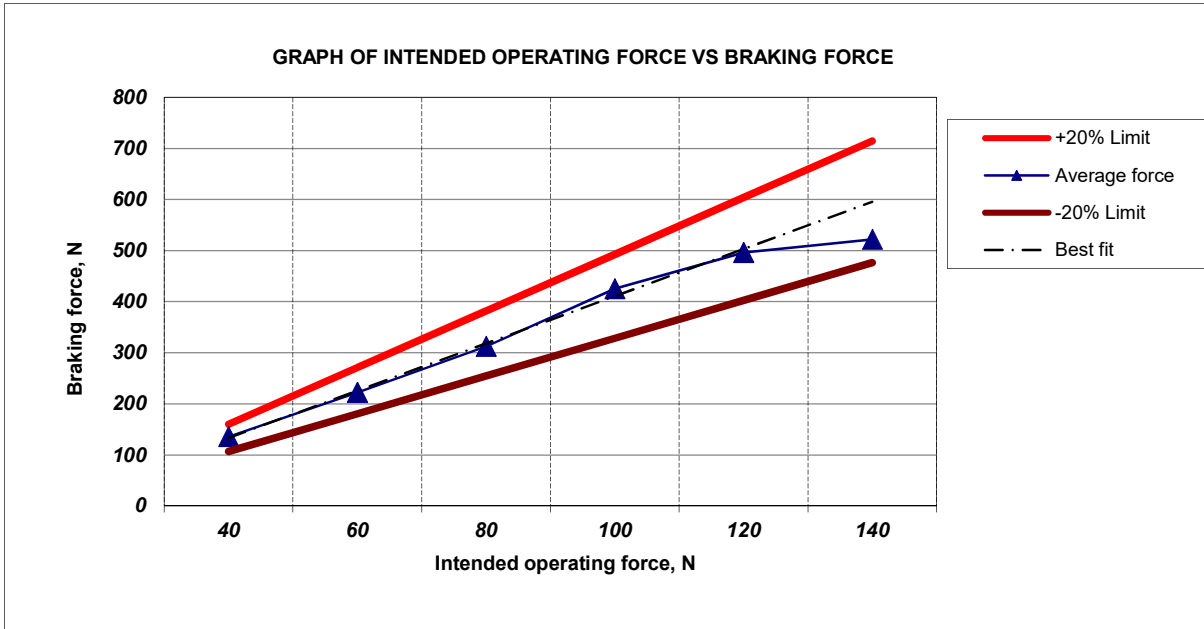
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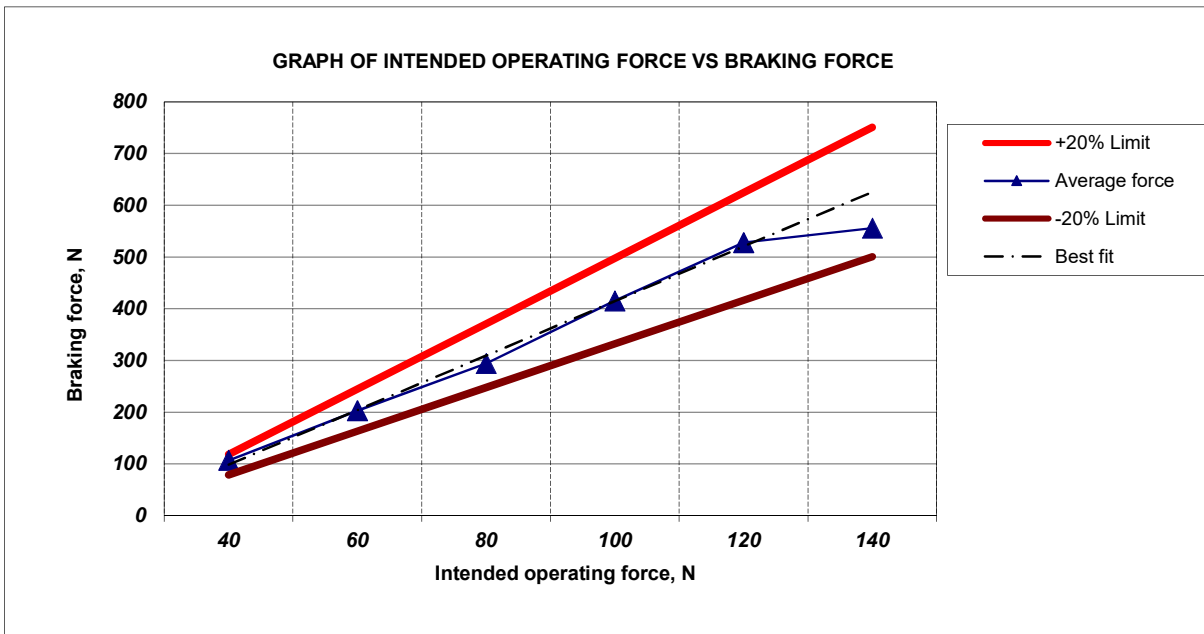
Absatz Clause	Anforderungen - Prüfungen / Requirements - Tests	Messergebnisse - Bemerkungen / Measuring results - Remarks	Ergebnis Result
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Annex 1-Linearity (clause 4.3.5.9.3 Linearity requirements)

Front brake in dry



Front brake in wet

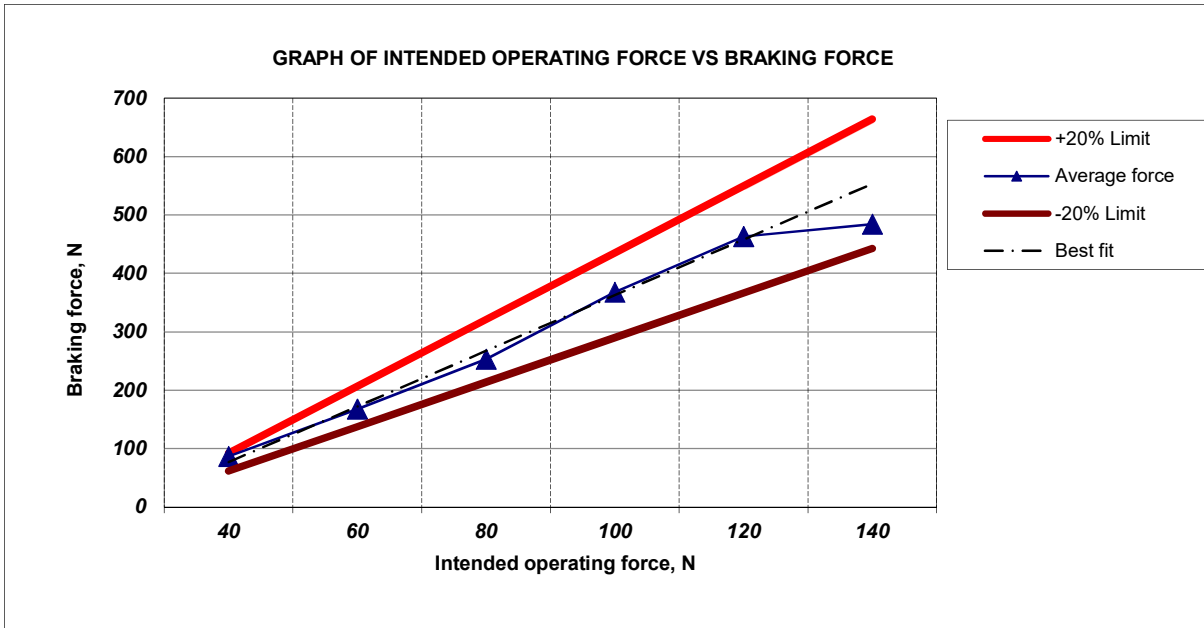


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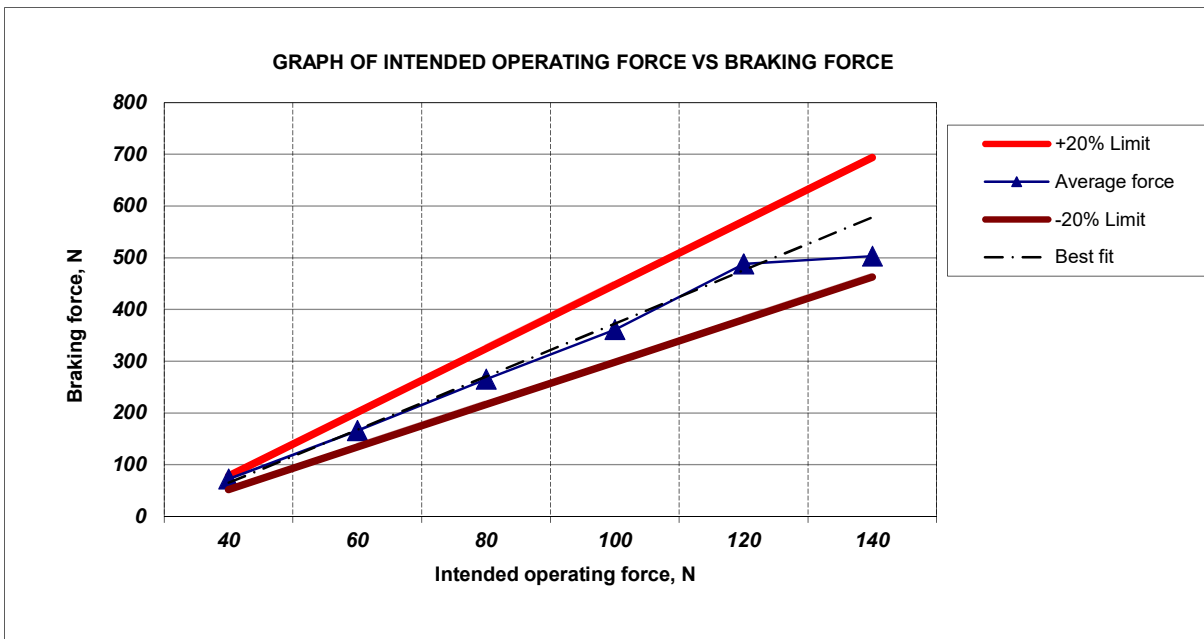
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Rear brake in dry



Rear brake in wet



*** End of test report ***