



Vehicle Certification
Agency Europe

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Report Number: ESB605378/XLB004893
Issue 01 replacing all previous issues

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written approval of the technical service.

Inspection/Test Report: WAV Seats, Belts, Belt Anchorages and WTORS

Legislation

Regulation (EU) 2018/858 Consolidated to Commission Delegated Regulation (EU) 2021/1445,
Annex II, Part III, Appendix 3
Item 19A (Footnote W5)

Inspection/Test Details

Location of Inspection/Test: Braunability Unwin House, The Horseshoe, Coat Rd, Martock
TA12 6EY
Date(s) of Inspection/Test: 06th July 2023
VCA Representative(s): Calum McGowan-Franklin
Inspectors Home Office Location: VCA HQ
Manufacturer's Representative(s): Paul Nieuwenhuis
Reason for Report: Report Only

Manufacturer Details

Name and Address: Tripod Mobility B.V.
Collseweg 10
5674 TR Nuenen / The Netherlands
Type: ETP / ETO / ETT / ETN
Commercial Description: Rifter / Partner / Berlingo / Doblo / Combo
(Life) / Proace (City) Tripod
Category: M1 SH (Special Purpose Vehicle, Wheelchair Accessible)

Conclusion

The above-mentioned vehicle / engine / component was tested in accordance with the above
mentioned legislation and was found to comply in all respects listed in this report. This report
relates only to the items tested.

Witness Engineer
Signature:

Name: Calum McGowan - Franklin
Position: Type Approval Engineer
Date: 12 July 2023

Stefano Savarese
Technical Manager
21 September 2023

List of Annexes

Annex	No of Pages	Subject
I	1	Comparison of vehicle and WTORS test geometry
II	62	Information Document No. ETX-14R-16R-17R-0010



Issue Record

Issue 0 is original report
Issue 1 update to include new table view and edited Test Report.

Note: Include reason for reissue, date of reissue, who has reissued.

Worst Case Rationale

Tripod mobility convert at Stage 2 a Wheelchair Accessible Vehicle (WAV) with a rear wheelchair position.

A WTORS test was conducted out of vehicle on a rig with representative geometry but NOT representative of anchorage strength.

Test comprised 85kg J hook belts at 85kg wheelchair mass.

- Front WTORS, 85kg J hooks – Braunability- EF3CJ- Electric front tie down 3m cov J hook, Quantity *2
- Rear WTORS, 85Kg J hooks – Braunability – BQEPJ-Quattro bolt EX PL J hook tie downs, quantity *2

WTORS material test not conducted within the scope of this assessment.

Note: Include information on variants and versions this report covers, as applicable. Supporting documents may be annexed to this report.

Significant Interpretations, Alternative Test Methods, New Technologies

Not Applicable

Inspection/Tests Required

Yes, NA, See Report ... / Approval ... / Annex ...

Seats, their anchorages and any head restraints (Item 15A):
Safety-belt anchorages, Isofix anchorages systems and Isofix top tether anchorages (Item 19A):
Safety-belts, restraint systems, child restraint systems and Isofix child restraint systems (Item 31A):
WTORS Anchorages:
WTORS Components – Dynamic Test
WTORS Components– Material Tests

NA
NA
NA
Yes
Yes
NA

Vehicle/Component Specification



Vehicle Type/Variant/Version:
Wheelchair Front Tie-down
Details:
Wheelchair Rear Tie-down
Details:
Occupant Restraint Details:

Not Applicable
85kg J hooks – Braunability- EF3CJ- Electric front tie down 3m cov J hook
85Kg J hooks – Braunability – BQEPJ-Quattro bolt EX PL J hook tie downs
SBT-11040-A

Manufacturer's Documentation

Manufacturer's documentation is complete and reflects the agreed specification for the vehicle component tested and covers all variants and versions agreed in the worst case rationale.

Yes

Information document uploaded to job folder and identified by job number.

Yes

Facility and Equipment Checks

Facility Appraisal reference and date:
Reference and date if formal; state if ad-hoc appraisal).

Mandatory FA not applicable

Calibration certificates are traceable to national or international standards of measurement, where available:

Yes

Calibration certificates checked and valid, recorded in the following table:

Yes

Equipment

Description	Make	Model	Serial number	Calibration due date
Tape measure	Festool	5m	TM035	20/03/24
Scales	Gram precision	C3-1t	0000441848	16/06/24
Inclinometer	-	-	K686391	22/07/23

*Specify calibrated date + (interval) or calibration due date.

Software used in Testing

Description	Make	Version
-	-	-



Inspection/Test Requirements

Complies
Yes / NA

Seats (Item 15A) – Not Applicable

Seatbelt Anchorages (Item 19A) – Not Applicable

Seatbelt Installation (Item 31A) – Not Applicable

WTORS Anchorages

(Anchorage strength may be tested using either the dynamic or static options below.)

General Requirements

Footnote W3 Longitudinal plane of the intended wheelchair-travelling position is parallel to the longitudinal plane of the vehicle. Yes

Footnote W3 Appropriate information is made available to the vehicle owner that, in order to be capable of withstanding the forces transmitted by the tie-down mechanism during the various driving conditions, a wheelchair with a structure meeting the relevant part of ISO 7176-19:2008 is recommended. Yes

Dynamic Testing

2018/858, Ann II, Part III, App 3, 4.1. The full assembly of the WTORS system is tested by an in-vehicle dynamic test in accordance with the specified paragraphs and Annex of ISO 10542-1:2012, testing all components/anchorages simultaneously, using a vehicle body-in-white or representative structure. NA

2018/858, Ann II, Part III, App 3, 4.2. The component parts of the WTORS meet the relevant requirements of ISO 10542- 1:2012 and paragraphs 5.1, 5.3 and 5.4. These requirements are deemed to have been met in respect of the occupant restraint if it is approved in accordance with UN Regulation No 16.06. Yes

Geometric Requirements

2018/858, Ann II, Part III, App 3, 1.2. The wheelchair occupant's lower belt anchorages are located in accordance with UNECE Regulation 14-07, paragraph 5.4.2.2, relative to Point P on the SWC when placed in the travelling position designated by the manufacturer (between 30 and 80degrees from the horizontal). Yes

2018/858, Ann II, Part III, App 3, 1.2. The upper actual anchorage(s) are located at least 1,100 mm above the horizontal plane, passing through the points of contact between Yes



the rear tyres of the SWC and the vehicle floor. This condition is still satisfied after the static/dynamic strength test.

WTORS Components – Dynamic Test

Dynamic Test Set-up

ISO10542, Ann A, 4.2.(a)	Wheelchair design meets characteristics specified in Annex E.		Yes
ISO10542, Ann A, 4.2.(b)	Hybrid III dummy used with mass of 77.7 kg. Close-fitting cotton clothes worn and static resistance of all joints set to 1g.		Yes
2018/858, Ann II, Part III, App 3, 3.3.1.	Test carried out in representative vehicle body structure* OR All anchorages on sled set-up are within an absolute linear distance of 50 mm from those on the vehicle* <i>*Strikethrough, as appropriate.</i> <i>Note: There is no tolerance on the SWC P-point with respect to the declared travelling position of the wheelchair and so measurements of anchorage positions should be normalised to give the P-point as the origin in both sets of measurements.</i>		Yes
VCA	In the case of out-of-vehicle tests, comparison of anchorage positions is attached to the report as an Annex.		Yes
ISO10542, Ann A, 5.7. VCA	Wheelchair reference plane parallel to vehicle longitudinal plane (+/- 3°). Where the wheelchair does not rest on a horizontal surface, this attitude is replicated on the sled, wherever possible.		Yes
ISO10542, Ann A, 5.8.	Tie-downs installed and tensioned, as per manufacturer's instructions.		Yes
ISO10542, Ann A, 5.12.	ATD is positioned upright in the SWC and symmetrical about its centreline with the pelvis as far back on the seat as possible and hands resting on thighs.		Yes
ISO10542, Ann A, 5.14.-5.18.	Occupant restraint installed, as per manufacturer's instructions.		Yes
ISO10542, Ann E, E.2.1	Tyre pressures set to 320 ⁺³⁰ / ₋₀ kPa.		Yes

Dynamic Test Results

ISO10542, Ann A, 4.1.(c)	Sled velocity change: <i>Requirement: 48 ⁻⁰/₊₂ km/h</i>	49.0 km/h	Yes
ISO10542, Ann A, 4.1.(d)	Acceleration pulse conforms to ISO 10542 requirements. <i>Requirement: > 0g for 75 ms; > 15 g for 40 ms; > 20 g for 15 ms</i>		Yes



ISO10542, 5.2.3.(a)	ATD retained in seat of SWC.	Yes
ISO10542, 5.2.3.(b)	SWC is in an upright position on the impact sled.	Yes
ISO10542, 5.2.3.(c)	No WTORS component became detached or separated.	Yes
ISO10542, 5.2.3.(d)	Tools not required for release of SWC from tie-down system.	Yes
ISO10542, 5.2.3.(e)	Tools not required for release of ATD from restraint system.	Yes
ISO10542, 5.2.3.(f)	No part of the WTORS exhibits signs of tearing, fragmentation, fracture, or complete failure (unless designed to do so, e.g. load limiting webbing).	Yes
ISO10542, 5.2.3.(g)	WTORS exhibits no dangerous roughness, sharp edges or protrusions likely to increase the risk of injury.	Yes



ISO10542,
5.2.2.(a)

Movement of the SWC and ATD is within limits:

Yes

- Horizontal excursion of SWC: 149.29 mm Limit: 200
- Horizontal excursion of ATD knee: 181.67 mm Limit: 375
- Horizontal excursion of ATD head: 603.77 mm Limit: 650

ISO10542,
5.2.2.(b)

Horizontal excursion of ATD knee is at least 1.1 times excursion of SWC.

1.22

Remarks (condition of anchorages after test):

All anchorages held solid – some slight deformation at stalk anchorage point.

WTORS Components – Material Tests – Not considered under this report

ECE Regulation 16/Environmental/Material Tests

ISO10542, 5.1.1.

ECE regulation tests as specified in the table below have been carried out and passed for all component parts of the WTORS, as applicable.

Yes

Test report details or other reference:

See UTAC report PV_21-09066 stored in Job folder with associated documentation.

ISO10542, 5.1.2.

Burn rate of webbing and padding does not exceed 100 mm/min.

Yes



Subclause	Component	Subject	ECE R 16 tests referenced	Application ^a
6.2.1.1	rigid parts	sharp edges	—	OR + WTD
6.2.1.2	rigid parts	corrosion	7.2	OR + WTD
6.2.1.4	rigid parts	cold impact test	7.5.4	OR + WTD
6.2.2.1	buckles	correct use and size	—	OR
6.2.2.2	buckles	closing/releasing	7.8.2	OR
6.2.2.3	buckles	cold mating	7.5.3	OR
6.2.2.4	buckles	repeated testing	7.7	OR
6.2.3.2	adjustment devices	micro-slip	7.3	OR
6.2.3.4	belt-adjusting device	force	7.5.6	OR + WTD
6.2.5	various belt retractors	performance	7.2, 7.6.1 to 7.6.4	OR
6.2.6	preloading devices	performance	7.2, 7.9.2	OR
6.3.1	belts	general specs	7.4.3	OR
6.3.2	belts	strength	7.4.1.1, 7.4.2	OR + WTD
6.3.3	belts	strength	7.4.1, 7.4.2	OR + WTD
6.4.2	belts	strength	7.4.1.6, 7.4.2, 7.5	OR + WTD

^a OR = occupant restraint, WTD = wheelchair tiedown.

Webbing Slippage Tests

ISO10542, 5.3.	Strap type adjustment mechanisms show slippage of no greater than 25 mm when tested in accordance with Annex C or ECE R16.	Yes
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Partial Engagement Test

ISO10542, 5.4. & Ann D	All parts of the WTORS with potential to be partially engaged separate from this condition, with a force of no greater than 22 ⁺² / ₋₀ N, applied for a maximum of 3 ^{+0.5} / ₋₀ seconds.	Yes
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Description of components and subjected to the above test and manner of partial engagement (with photographs, if applicable):

See UTAC report PV_21-09066 stored in Job folder with associated documentation.

WTORS Occupant Restraint Installation

2018/858, Ann II, Part III, App 3, 2.3. R16.06, 8.2.2.	Belt(s) are installed so that, when properly worn, they will work satisfactorily and reduce the risk of bodily injury in the event of an accident. In particular, they are installed so that the:	Yes
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R16.06, 8.2.2.1.	Straps are not liable to assume a dangerous configuration;	Yes
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R16.06, 8.2.2.2.	Danger of a correctly positioned belt slipping from the shoulder of a wearer as a result of his/her forward movement is reduced to a minimum;	Yes
R16.06, 8.2.2.3.	Risk of the strap deteriorating through contact with sharp rigid parts of the vehicle or seat structure is reduced to a minimum;	Yes
R16.06, 8.2.2.4.	Safety belt provided for each wheelchair position is such as to be readily available for use, including after a seat (or wheelchair) has been displaced/folded and then restored.	Yes
R16.06, 8.3.1.	Rigid parts do not increase the risk of injury in the event of an accident.	Yes
R16.06, 8.3.2.	Device for releasing the buckle is clearly visible to and within easy reach of the wearer, and designed so that it cannot be opened inadvertently or accidentally. It is located so that it is readily accessible to a rescuer in an emergency.	Yes
R16.06, 8.3.2.	Both when not under load and when sustaining the wearer's weight, the buckle is capable of being released by the wearer with a single simple movement of either hand in one direction.	Yes
R16.06, 8.3.2.	If the buckle is in contact with the wearer, the parts of the buckle likely to contact the body of the wearer presents a section of not less than 20 cm ² and at least 46 mm in width, measured in a plane situated at a maximal distance of 2.5 mm from the contact surface.	Yes
R16.06, 8.3.3.	Belt either adjusts automatically to fit or is designed so that the manual adjusting device is readily accessible to the wearer, is convenient and easy to use, and may be tightened with one hand.	Yes
R16.06, 8.3.4.	Belts incorporating retractors are installed so that they operate correctly and stow the strap efficiently.	Yes

Remarks

None.



Annex I – Comparison of Vehicle and WTORS Test Geometry

Measured with arbitrary datum										
	Vehicle			WTORS Test						
	X	Y	Z	X	Y	Z				
Front left	2387	-355	245	-1225	-215	385				
Front right	2387	355	245	-1225	500	385				
Rear left	3579	-150	-17	0	0	125				
Rear right	3579	150	-17	0	300	125				
LB	3434	-480	267	-135	-332	406				
LNB	3369	480	267	-197	620	406				
Upper	3425	429	1398	-168	590	1540				
Reel	3434	480	267	-135	620	406				
P point	3125	0	591	-460	150	700				
Corrected to make P-point the origin (0,0,0) in both cases										
	Vehicle			WTORS Test			Difference			
	X	Y	Z	X	Y	Z	X	Y	Z	Abs
Front left*	-738	-355	-346	-765	-365	-315	27	10	-31	42
Front right*	-738	355	-346	-765	350	-315	27	5	-31	41
Rear left	454	-150	-608	460	-150	-575	-6	0	-33	34
Rear right	454	150	-608	460	150	-575	-6	0	-33	34
LB	309	-480	-324	325	-482	-294	-16	2	-30	34
LNB^	244	480	-324	263	470	-294	-19	10	-30	37
Upper	300	429	807	292	440	840	8	-11	-33	36
Reel^	309	480	-324	325	470	-294	-16	10	-30	35