

Astra Telematics EBPMS Verification of Function

Reference:

1. <https://www.gov.uk/government/publications/electronic-braking-performance-monitoring-systems/electronic-braking-performance-monitoring-system-ebpms-industry-standard-specification>

Overview

Astra Telematics offers a solution for monitoring of HGV semi-trailer safety-related parameters, including EBPMS (electronic brake performance monitoring system) features. This solution is sold under the product name “Smart Trailer” and is available as a device only, or a complete solution, encompassing platform services to view the data and create alerts and reports etc. The complete solution complies with the requirements of the DVSA, as stated in reference 1 above. The device only can be used by 3rd party service providers to create a compliant EBPMS service, conditional on the platform side features fulfilling the DVSA requirements.

This document fulfils the purpose of a Verification of function, as stated by the DVSA in reference 1.

EBPMS Solution Information

Manufacturer:	Astra Telematics Limited (06985021)
Solution Name:	Smart Trailer
Hardware Support:	AT600
Software Version:	7.0.82
Compatibility:	Category O HGV semi-trailers, with J1939 “TCAN” data available, such as that Provided by Haldex Gen 3&4, Wabco-ZF TEBS-E and Knorr-Bremse iTEBS
Availability:	Smart Trailer is scheduled to be offered for sale from October 2026

Functional Overview

Astra’s Smart Trailer EBPMS solution is performed on a telematics device, installed on a semi-trailer, and connected to the pneumatic brake EBS device for the purposes of reading J1939 “TCAN” data over CANBus. The data available contains, amongst other things:

- Brake pedal demand from the driver
- Total axle load
- Wheel-based speed
- ABS activity status
- DTC fault codes

In addition to the data read from the EBS, the Smart Trailer device has access to data from on-board peripherals, including:

- An IMU (6-axis MEMS device incorporating an accelerometer and gyroscope)
- A GNSS receiver (providing accurate time/date, speed, heading, altitude and location)

The above data is employed in a proprietary algorithm to assess the performance of the vehicle braking. Details of the technique are confidential. The aim of the process is to give early detection of any deterioration in the vehicle's braking performance. This process is ongoing, using almost all braking events, and hence offers benefits over quarterly roller brake tests (RBT) that are recognised by the DVSA.

It's important to point out that Smart Trailer EBPMS monitors the performance of the entire vehicle, including the tractor unit, which is itself critical to the brake performance of the tractor / trailer combo. Braking performance for any given trailer can be affected by the tractor unit connected and hence some variance is expected. Any alerts raised by the Smart Trailer system shall also apply to the tractor unit that was in use with the trailer at the time.

Test Method

Testing was undertaken at Tockwith Airfield circuit on Tuesday 29th September 2026.

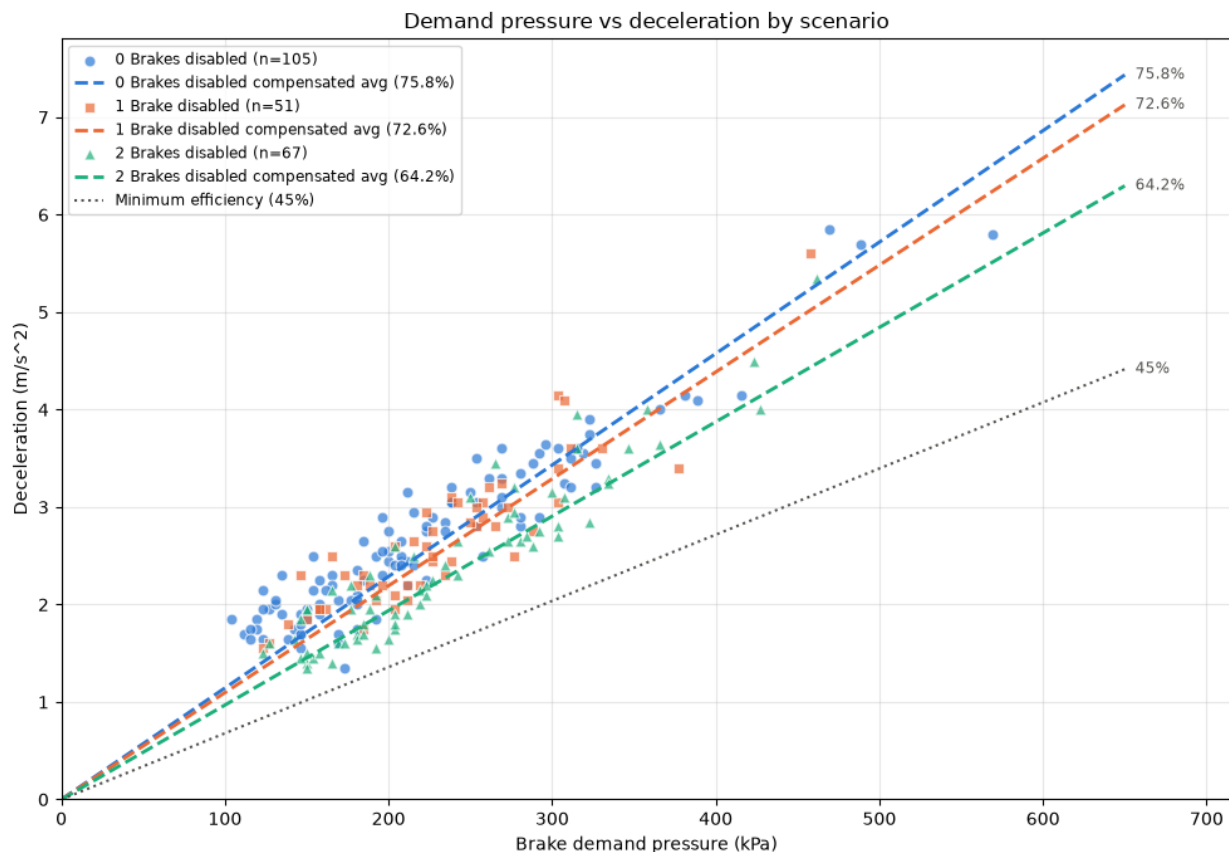
1. A tri-axle semi-trailer was loaded with approx. 15,000kg
2. The laden trailer was first taken for a roller brake test, confirming good working order of the brakes
3. The trailer was fitted with a Smart Trailer AT600 device and driven to the test track
4. Conditions were dry
5. The test track includes road angles of up to 2 degrees
6. The trailer was driven in a 'normal' way, including:
 - a. Emergency stops
 - b. Typical braking for corners, without coming to a stop
 - c. Braking to a complete stop
7. Tests were conducted in 15 minute sessions, with 20-30 minute breaks in between, to avoid excessive heating of the brakes
8. Standard Smart Trailer data was captured live on our SmartFleet platform during each test, including raw and compensated (for road angle) brake performance
9. Test sessions were run with 3 different trailer conditions:
 - a. Normal – all brakes fully functional
 - b. 1 wheel fault – 1 brake chamber disconnected from the EBS
 - c. 2 wheel faults – 2 brake chambers disconnected from the EBS
10. Data from SmartFleet was used to plot graphs of driver pedal demand (kPa) versus deceleration (m/s^2)
11. Data from SmartFleet was used to calculate an average brake performance % for each of the above test scenarios, which would ordinarily be used to create alerts (i.e. when under threshold)
12. Data was used to confirm elimination of braking events based on:
 - a. ABS being active
 - b. Insufficient vehicle speed
 - c. Insufficient brake pedal demand
 - d. Excessive brake pedal demand (i.e. beyond 600kPa the EBS goes into direct mode)

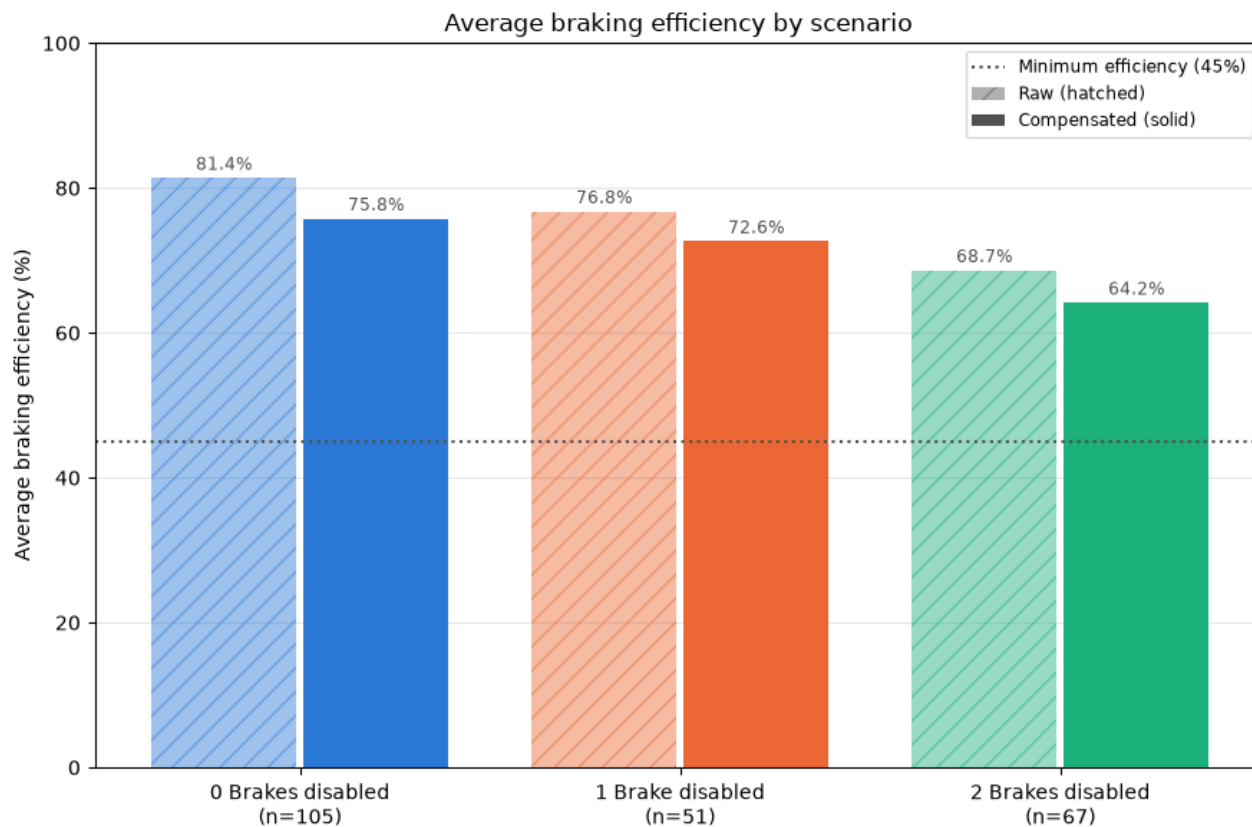
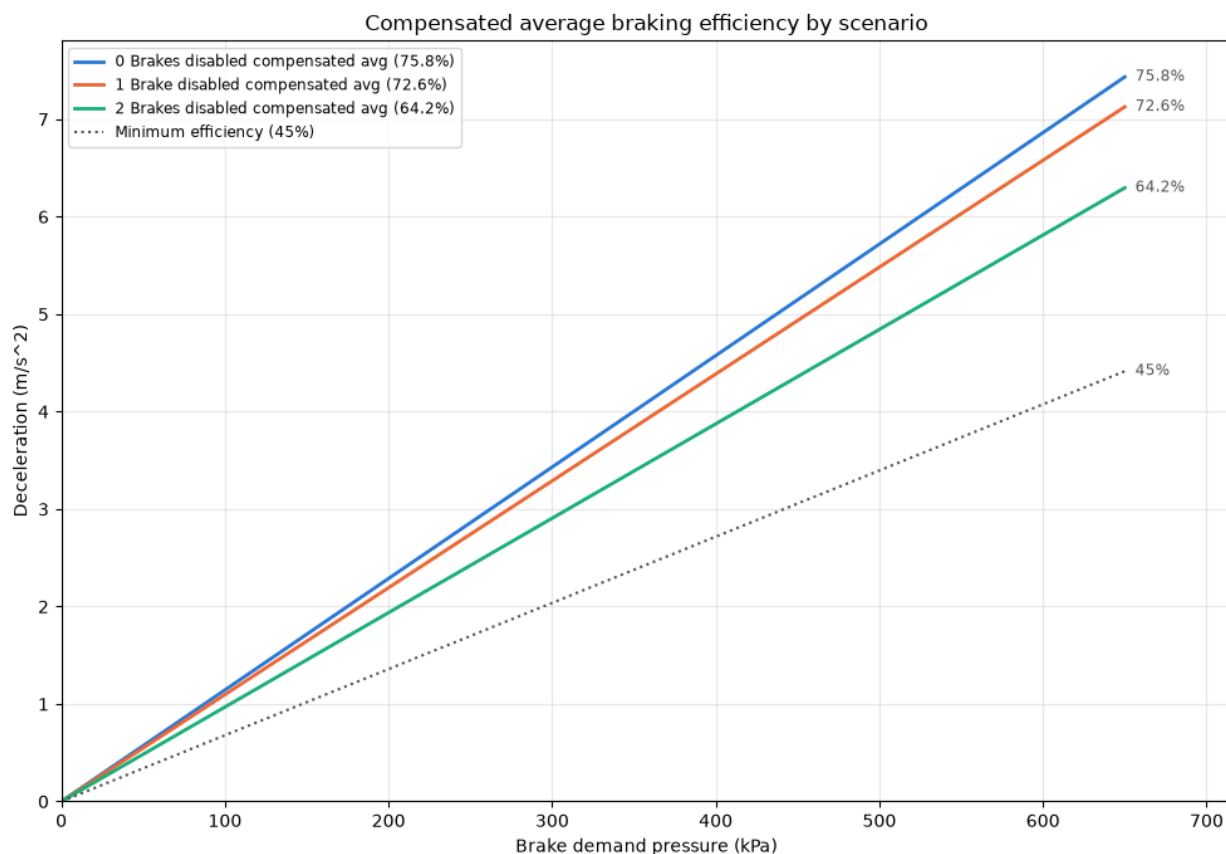
13. Data was used to verify that the Smart Trailer can effectively detect faults affecting brake performance of the trailer

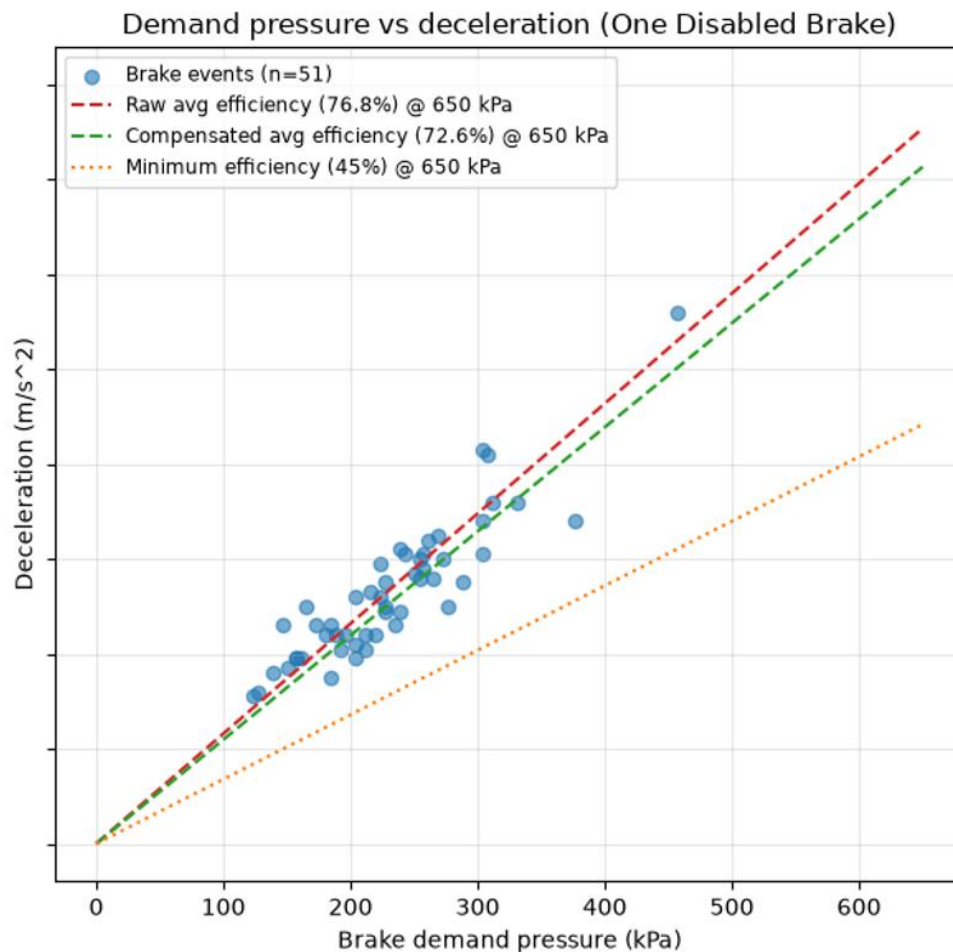
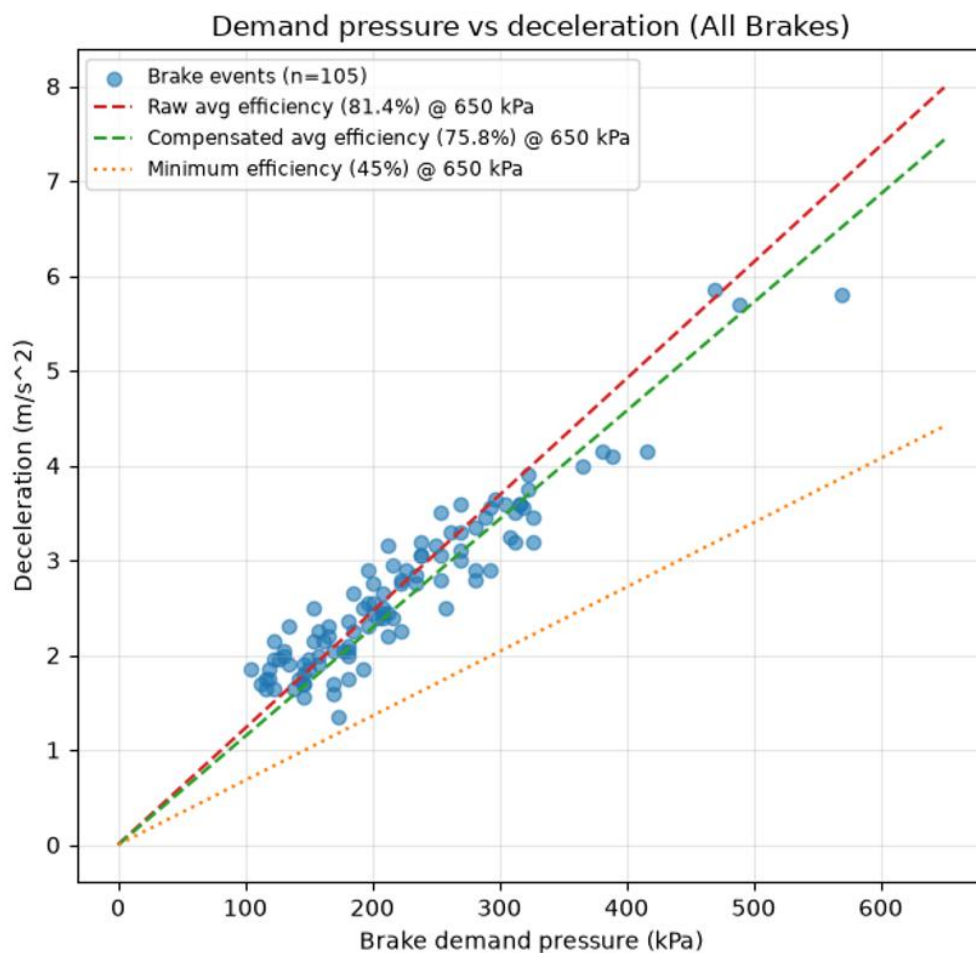
Results

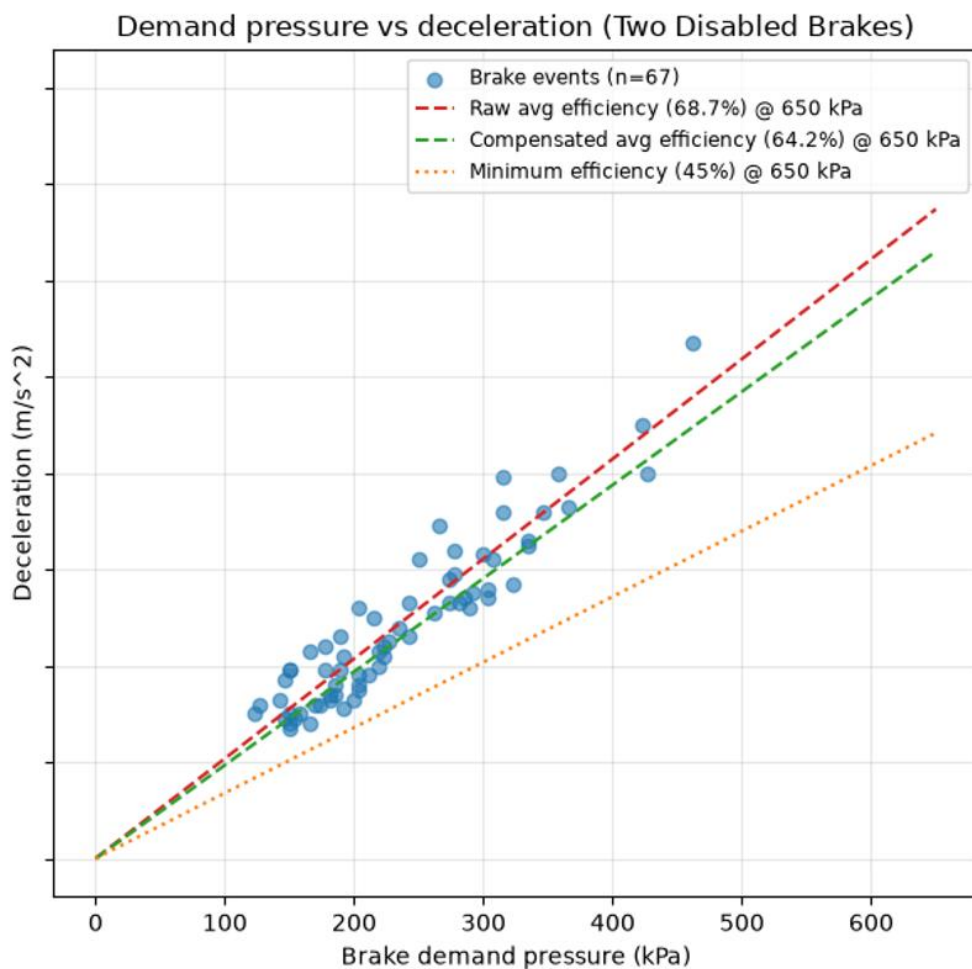
The table and graphs below summarise the test results and demonstrate a clear margin to differentiate the “normal” and fault conditions.

Test Condition	Number of Data Points (braking events)	Compensated Brake Efficiency (average %)	Difference
normal	105	75.8	reference
1 wheel disabled	51	72.6	3.2% deterioration
2 wheels disabled	67	64.2	11.6% deterioration









Conclusion

Astra Telematics' Smart Trailer solution has been demonstrated and verified to be an effective tool to monitor semi-trailer brake performance and detect faults which lead to a deterioration in brake performance.

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Technical Director
Astra Telematics Limited

Appendix A Roller Brake Test Results

MOT test certificate (Trailer) <i>ST2016</i>		 Driver & Vehicle Standards Agency
(1) Vehicle identification number SMWCV39SFFA150293		
(2a) Identification number C392954	(2b) Country of registration GB	
(2c) Registration Number		
Make and model CARTWRIGHT,		
(5) Vehicle category O4	Odometer history No data available	
 (7) Pass		
(3a) Date of the test 28.09.2026	(8) Expiry date 31.10.2027	
To preserve the anniversary of the expiry date, the earliest you can present your vehicle for test is 01.09.2027.		
(7a) Location of the test P50494, John Brindley Ltd		
(9) Testing organisation and inspector DRIVER AND VEHICLE STANDARDS AGENCY Jovan Dragisic		
Test number Y14U37083		
Check that this document is genuine by visiting www.gov.uk/check-mot-history		
If any of the details are not correct, please contact DVSA by email at MYVT@dvsa.gov.uk or by telephone on 0300 1239000.		
Receive a free annual MOT reminder by subscribing at www.gov.uk/mot-reminder or by telephone on 0300 1239000.		
Page 1 of 1 VTG5A/1.1		 _____ Issuer signature



2311-005761-000 LANE 3

DETAILED BRAKE TEST RESULT - FULL TEST

ST2016 VOL

Test Type : Full test
 Test Number & Id : 14470 AUTO
 Vehicle Make : Other
 Vehicle Type : 3 AXLE SEMI-TRAILER
 VRM/ID : C392954
 DTP Number : 313877 TYPE APPROVED

Time : 07:52
 Date : 28-09-2026
 Station : John Brindley Commercials Ltd
 GW : 39000 kg
 TAN : 24000 kg

Axle 1 - 6088 kg

		WEIGHT	BIND	OVALITY	IMBALANCE	MAX FORCE
			Pass		Pass	
Service	N/S	2912 kg	43 kgf / 1 %	--		1457 kgf (L)
	O/S	3176 kg	73 kgf / 2 %	--	21 %	1834 kgf (L)
Park	N/S	2912 kg		--		1462 kgf (L)
	O/S	3176 kg		--	21 %	1836 kgf (L)

Axle 2 - 5979 kg

		WEIGHT	BIND	OVALITY	IMBALANCE	MAX FORCE
			Pass		Pass	
Service	N/S	3066 kg	78 kgf / 2 %	--		1453 kgf (L)
	O/S	2913 kg	91 kgf / 2 %	--	21 %	1834 kgf (L)
Park	N/S	3066 kg		--		1471 kgf
	O/S	2913 kg		--	14 %	1707 kgf

Axle 3 - 6199 kg

		WEIGHT	BIND	OVALITY	IMBALANCE	MAX FORCE
			Pass		Pass	
Service	N/S	3103 kg	64 kgf / 2 %	--		1385 kgf
	O/S	3096 kg	74 kgf / 2 %	--	26 %	1856 kgf (L)
Park	N/S	3103 kg		--		1210 kgf
	O/S	3096 kg		--	24 %	1587 kgf

TEST SUMMARY

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	: 45% TAN	40%	Pass (Locks)
Park	: 16% GW	23%	Pass

DEFICIENCIES

ADVISORIES

Advise Service brake 3 Imbalance 26%

DETAILED BRAKE TEST RESULT - FULL TEST

Test Type	: Full test	Time	: 07:52
Test Number & Id	: 14470 AUTO	Date	: 28-09-2026
Vehicle Make	: Other	Station	: John Brindley Commercials Ltd
Vehicle Type	: 3 AXLE SEMI-TRAILER	GVW	: 39000 kg
VRM/ID	: C392954	TAW	: 24000 kg
DTP Number	: 313877 TYPE APPROVED		

**** Overall Result: Passed ****

NOTES

Measured Vehicle Weight 18266 kg

Tested By inspector

Signed

Lane 3

*** VL Test Systems Ltd. Buckingham Tel. 01280-822488 ***



2311-005761-000 LANE 3

DETAILED BRAKE TEST RESULT - FULL TEST

ST2016 2ND VOL

Test Type : Full test
 Test Number & Id : 14471 AUTO
 Vehicle Make : Other
 Vehicle Type : 3 AXLE SEMI-TRAILER
 VRM/ID : C392954
 DTP Number : 313877 TYPE APPROVED

Time : 08:12
 Date : 28-09-2026
 Station : John Brindley Commercials Ltd
 GVW : 39000 kg
 TAW : 24000 kg

Axle 1 - 6136 kg

		WEIGHT	BIND Pass	OVALITY	IMBALANCE Pass	MAX FORCE	
Service	N/S	2964 kg	50 kgf / 1 %	--		1497 kgf	(L)
	O/S	3172 kg	69 kgf / 2 %	--	24 %	1950 kgf	(L)
Park	N/S	2964 kg		--		1659 kgf	(L)
	O/S	3172 kg		--	10 %	1837 kgf	(L)

Axle 2 - 6038 kg

		WEIGHT	BIND Pass	OVALITY	IMBALANCE Pass	MAX FORCE	
Service	N/S	3081 kg	77 kgf / 2 %	--		1525 kgf	(L)
	O/S	2957 kg	90 kgf / 2 %	--	17 %	1829 kgf	(L)
Park	N/S	3081 kg		--		1663 kgf	(L)
	O/S	2957 kg		--	11 %	1860 kgf	(L)

Axle 3 - 6167 kg

		WEIGHT	BIND Pass	OVALITY	IMBALANCE Pass	MAX FORCE	
Service	N/S	3109 kg	67 kgf / 2 %	--		1473 kgf	(L)
	O/S	3058 kg	68 kgf / 2 %	--	27 %	2006 kgf	(L)
Park	N/S	3109 kg		--		1576 kgf	(L)
	O/S	3058 kg		--	18 %	1913 kgf	(L)

TEST SUMMARY

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	: 45% TAW	42%	Pass (Locks)
Park	: 16% GVW	26%	Pass

DEFICIENCIES

ADVISORIES

DETAILED BRAKE TEST RESULT - FULL TEST

Test Type	: Full test	Time	= 08:12
Test Number & Id	: 14471 AUTO	Date	= 28-09-2026
Vehicle Make	: Other	Station	= John Brindley Commercials Ltd
Vehicle Type	: 3 AXLE SEMI-TRAILER	GVW	= 39000 kg
VRM/ID	: C392954		
DTP Number	: 313877 TYPE APPROVED	TAW	= 24000 kg

**** Overall Result: Passed ****

NOTES

Measured Vehicle Weight 18341 kg

Tested By inspector

Signed

lane 3

*** VL Test Systems Ltd. Buckingham Tel. 01280-822488 ***



2311-005760-000

ST2016

DETAILED BRAKE TEST RESULT - FULL TEST

Test Type	: Full test	Time	: 08:37
Test Number & Id	: 14853 AUTO	Date	: 28-09-2026
Vehicle Make	: Other	Station	: john brindley lane 2
Vehicle Type	: 3 AXLE SEMI-TRAILER	GVW	: 39000 kg
VRM/ID	: C392954	TAW	: 24000 kg
DTP Number	: 313877 TYPE APPROVED		

Axle 1 - 6185 kg

		WEIGHT	BIND	OVALITY	IMBALANCE	MAX FORCE
			Pass		Pass	
Service	N/S	3020 kg	69 kgf / 2 %	--		1551 kgf (L)
	O/S	3165 kg	75 kgf / 2 %	--	24 %	2015 kgf (L)
Park	N/S	3020 kg		--		1718 kgf
	O/S	3165 kg		--	6 %	1809 kgf

Axle 2 - 5952 kg

		WEIGHT	BIND	OVALITY	IMBALANCE	MAX FORCE
			Pass		Pass	
Service	N/S	3238 kg	98 kgf / 2 %	--		1448 kgf (L)
	O/S	2714 kg	84 kgf / 2 %	--	17 %	1733 kgf (L)
Park	N/S	3238 kg		--		1719 kgf (L)
	O/S	2714 kg		--	5 %	1809 kgf (L)

Axle 3 - 6037 kg

		WEIGHT	BIND	OVALITY	IMBALANCE	MAX FORCE
			Pass		Pass	
Service	N/S	3177 kg	74 kgf / 2 %	--		1534 kgf (L)
	O/S	2860 kg	67 kgf / 2 %	--	29 %	2156 kgf (L)
Park	N/S	3177 kg		--		1408 kgf (L)
	O/S	2860 kg		--	30 %	2006 kgf (L)

TEST SUMMARY

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	: 45% TAW	43%	Pass (Locks)
Park	: 16% GVW	26%	Pass

DEFICIENCIES

ADVISORIES

Test Type	: Full test	Time	: 08:37
Test Number & Id	: 14853 AUTO	Date	: 28-09-2026
Vehicle Make	: Other	Station	: john brindley lane 2
Vehicle Type	: 3 AXLE SEMI-TRAILER	GVW	: 39000 kg
VRM/ID	: C392954		
STP Number	: 313877 TYPE APPROVED	TAM	: 24000 kg

**** Overall Result: Passed ****

NOTES

Measured Vehicle Weight 18174 kg

Tested By dvaa

Signed



*** VL Test Systems Ltd. Buckingham Tel. 01280-822488 ***

Appendix B Trailer Identification

 150293		CHASSIS No./MODEL		DATE/ MINISTRY. I.D.	
		150293 C14.39A		Feb-15 C392954	
L 13600		S CARTWRIGHT & SONS TYPE APPROVAL No. e11*2007/46*0782*00*00 VEHICLE I.D. No. SMWCV39SFFA150293 MAX LADEN MASS 39000 kg MAX KINGPIN MASS 0- 15000 kg MAX AXLE MASS 1- 8000 kg 2- 8000 kg 3- 8000 kg MAX BOGIE LOAD T- 24000 kg			
W 2550		 S CARTWRIGHT & SONS ATLANTIC ST. BROADHEATH, ALTRINCHAM CHESHIRE, WA14 5EW. 0161 928 0966			
a 12000					

VOSA 		Department for Transport ROAD TRAFFIC ACT 1988 SECTIONS 41, 49, 57 & 58 EXAMINATION OF GOODS VEHICLES This is issued as proof of compliance with the Weights and Dimensions Directive 85/3/EEC		Serial No. H99900928765	
Vehicle & Operator Services Agency		Plate VTG 6A		DTp Ref. No. 313877	
Reg./Ident. Mark C392954	Vehicle Identification No. SMWCV39SFFA150293	Variant 03(SF)-NX			
Type Approval No. e11*2007/0046*0782					
Manufacturer/ Model CARTWRIGHT /		Year of Original Registration		Speed Limit Exempt 2015	
(1) Description of Weights Applicable to vehicle	(2) Weights not to be exceeded in Gt Britain	(3) EEC Maximum permitted weights (See note 3)	(4) Design Weights (If higher than shown in column 2)	Length Width	
Gross Weight (See notes 1 & 4)	39000			13600	2550
Train Weight (See note 2)				a. Coupling centre to vehicle foremost part (See note 6)	Max Min
Max Train Weight (See note 5)				b. Coupling centre to vehicle rearmost part (See note 7)	Max 12000 Min 12000
Axle Weights (Axles numbered from front to rear) (See note 1)	Axle 1 8000 8000			Date of issue DEPARTMENT FOR 25/02/15 TRANSPORT GREAT BRITAIN	
	Axle 2 8000 8000				
	Axle 3 8000 8000				
	Axle 4				
Maximum Kingpin Load (See note 1)			15000	Tyre use conditions applicable to vehicle 2B	
NOTES			NOTES (Cont'd)		
1. A reduced gross weight and axle weight may apply in certain cases to a vehicle towing or being towed by another.			7. This dimension only applies to trailers and semi-trailers.		
2. The MAXIMUM permissible train weight can vary depending on the type of suspension and trailer drawn.			8. Where there is no weight shown in the EEC maximum permitted weights column this is because there is no EEC standard related to that weight.		
3. If the last letter in the function box is 'R' road friendly suspension is fitted.					
4. All weights shown are subject to the fitting of correct tyres.					
5. This weight applies to combined transport operations.					
6. This dimension only applies to drawing vehicles of					

Appendix C AT600 Device Installation



