LOGISTICS UK

Brake test report

Logistics UK Compliance Guide

Edition 1 • September 2019

Contents

Logistics UK compliance guide to Brake test report

Edition 1 • September 2019

Editor: **Phil Lloyd/James Firth/Georgia Butler**
Production/Design: **Cecilia Giorda**

Logistics UK compliance guides are produced once legislative changes have been published and new requirements and responsibilities are known. Compliance guides are intended to provide clear guidance to members on what to do and how to comply.

1 Introduction

Braking performance is an item in the heavy commercial vehicle annual test. As such, the *Guide to Maintaining Roadworthiness* highlights the need for braking performance to be checked during regular safety inspections.

Brake performance testing equipment can be difficult to access though, particularly for trailers where a roller-brake tester is required. In recognition of this, it is recommended a suitable brake test be conducted four times during a year (one of which may be at the annual test).

It should be noted that, in the annual test, minimum roadworthiness standards need only be met on the day of the test. However, at safety inspections the assessed standards should ensure the vehicle remains roadworthy until at least its next inspection, which may be six or eight weeks later.

During 2019, it was found this potential oversight resulted in several operators needing to appear at public inquiries in front of Traffic Commissioners (the industry's regulators, who issue operator licences and have powers to take regulatory action against operators – including revocation). It was discovered operators had accepted brake test reports that declared a vehicle to have 'passed' (when assessed against minimum legal standards), yet these operators had failed to note details within the report that had indicated concerns. The Traffic Commissioners were worried operators were overlooking the problems revealed in brake tests – especially tests that awarded an overall pass – due to a general lack of technical understanding across the industry.

The brake test report contains detailed engineering data that may not be easily interpreted by transport managers or fleet supervisors who do not have technical backgrounds. Logistics UK has produced this guide to help everyone within the industry understand what the results on a roller-brake test report indicate. This will aid operators in communicating with their maintenance provider on the true condition of their vehicle's brakes. In some circumstances, it may mean remedial maintenance work is advised even when the test report states "pass", to ensure the brake performance remains satisfactory until the vehicle's next test.

In addition to this guide, Logistics UK is investigating, alongside the Driver and Vehicle Standards Agency (DVSA) and brake test equipment manufacturers, whether the format of the reports could be changed. This would include the addition of advisory notices where minimum legal standards are met but further investigation should be undertaken.

2 About this guide

Logistics UK has produced this guidance document to help individuals understand the details of a brake test report.

By the end of this guide, you will be able to:

- Calculate brake performance.
- Explain the details contained within a brake test report and know what each of these means.
- Identify concerns within the results of a brake test, even if the overall result is a "Pass".

The examples used in this document are from one brake machine – the format from other machines will vary, but the details remain broadly the same.

3 Glossary

DTp Number	Department for Transport (DfT) number related to the braking information for the vehicle/trailer.
DVSA	Driver and Vehicle Standards Agency.
Type Approved	Denotes that the braking system has met National Type Approval. This may not apply to some older vehicle/trailers.
Locks (L)	Denotes that, during the brake test, the braking effort was high enough to stop the wheel from being turned by the brake machine.
GVW	Gross Vehicle Weight – the maximum loaded weight of the vehicle/trailer.
GTW	Gross Train Weight – the maximum loaded weight of both the vehicle and its trailer.
TAW	Total Axle Weight – the maximum loaded weight of just the axles of a trailer. (This excludes the load on the trailer kingpin/drawbar coupling.)
Kg	Kilogram – measurement of weight.
KgF	Kilogram Force – the measurement of braking effort.
Bind	The amount of resistance (brake force) recorded when the brake was not applied.
Time Lag	The measurement of delay between the operation of brakes on the same axle.
Ovality	The measurement of brake-force fluctuation as each wheel is rotated.
Imbalance	The variation between the maximum brake force recorded from the brakes on the same axle.
Max Force	Maximum Force – the maximum brake effort recorded for the brake, measured in KgF.
FWA	Front Wheel Allowance – an allowance added to the Max Force of brakes on the front axle of a vehicle, if those front brakes lock.

4 What is in a brake test report?

4.1 How to calculate brake performance

All brake test reports calculate brake performance using the following formula:

$$\text{Brake performance (\%)} = \frac{\text{Brake effort}}{\text{Weight}} \times 100$$

Add together the braking forces from each wheel, to get the total braking effort. Divide this number by the weight (either GVW, GTW, TAW). Then multipy by 100.

EXAMPLE – Service brake

Axle 1: N/S 1,250KgF O/S 1,130KgF
Axle 2: N/S 2,170KgF O/S 2,300KgF
Brake force = 1,250 + 1,130 + 2,170 + 2,300 = 6,850
Weight = 12,000GVW
Brake performance (%) = (6,850 / 12,000) X 100 = 57 (%)

4.2 Overview of the brake test report

The brake report has three main sections:

1 Vehicle/trailer details

These should be checked to ensure the details relate to the correct vehicle or trailer and to its designed weights. If they do not, the test results may not be relevant.

2 Brake performance, by axle

For a meaningful brake test, axles should ideally be loaded 50-65% of their design weight – these weights can be found on the plating certificate of a vehicle/trailer (see *Annex A* for an example). The results are judged against a minimum requirement, so if operators fail to take note of these results then they may continue to run a defective vehicle/trailer.

3 Test summary and overall result

This is the part some operators only focus on – but should not!

1 Vehicle/trailer details

2 Brake performance, by axle

3 Test summary and result

DETAILED BRAKE TEST RESULTS FULL TEST 11244

License pl. no.	: [redacted]	Chassis no.	:		
DTp Number	: 5192 Type Approved	GVTS	: [redacted]		
Vehicle Make	: VOLVO	Date	: 05/04/2019	Time	: 10:42
Vehicle Type	: 3 AXLE TRACTOR UNIT	GVW	: 25700 kg	GTW	: 44000 kg

AXLE 1 6608 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	2417 kgF	2417 kgF (L)
	O/S	Pass	Pass	Pass	2308 kgF (5 %)	2308 kgF (L)
Secondary	N/S	Pass	Pass		1964 kgF	1964 kgF
	O/S	Pass	Pass		1630 kgF (17 %)	1630 kgF
Parking	N/S				2334 kgF	2334 kgF
	O/S				2094 kgF (10 %)	2094 kgF

AXLE 2 2319 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		650 kgF	650 kgF (L)
	O/S	Pass	Pass		687 kgF (5 %)	687 kgF (L)

AXLE 3 5585 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1384 kgF	1384 kgF
	O/S	Pass	Pass		973 kgF (30 %)	973 kgF
Secondary	N/S	Pass	Pass		1353 kgF	1353 kgF
	O/S	Pass	Pass		961 kgF (29 %)	961 kgF
Parking	N/S				1350 kgF	1350 kgF
	O/S				971 kgF (28 %)	971 kgF

TEST SUMMARY INSUFFICIENT LOAD ON AXLE 23

Measured Vehicle Weight 14512 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	50% GVW	33% (FWA)	Pass (Locks)
Secondary	25% GVW	23%	Fail
Parking	12% GTW	15%	Pass

****** OVERALL RESULT : FAILED ******

4.3 In the report: *vehicle/trailer details*

Vehicle/trailer details

Ensure these are correct for the vehicle/trailer. The details should correspond to those on the plating certificate of a vehicle/trailer (see *Annex A* for an example).

Vehicle details

Check the Gross Vehicle Weight (GVW) and, if applicable (eg, for a tractor unit), Gross Train Weight (GTW) are correct.

Trailer details

Check the Gross Vehicle Weight (GVW) and Total Axle Weight (TAW) are correct.

DTp Number

The DTp Number is entered into the brake machine and sets all the details against which the test is conducted. This includes the values against which brake performance is calculated (these values are not shown on the brake test report).

Vehicle details

DETAILED BRAKE TEST RESULTS FULL TEST **11244**

License pl. no. : [redacted]
DTp Number : 5192 Type Approved
Vehicle Make : VOLVO
Vehicle Type : 3 AXLE TRACTOR UNIT

Chassis no. :
GVTS : [redacted]
Date : 05/04/2019 Time : 10:42
GVW : 25700 kg GTW : 44000 kg

AXLE 1 6608 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	2417 kgF	2417 kgF (L)
	O/S	Pass	Pass	Pass	2308 kgF (5 %)	2308 kgF (L)
Secondary	N/S	Pass	Pass		1964 kgF	1964 kgF
	O/S	Pass	Pass		1630 kgF (17 %)	1630 kgF
Parking	N/S				2334 kgF	2334 kgF
	O/S				2094 kgF (10 %)	2094 kgF

AXLE 2 2319 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		650 kgF	650 kgF (L)
	O/S	Pass	Pass		687 kgF (5 %)	687 kgF (L)

AXLE 3 5585 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1384 kgF	1384 kgF
	O/S	Pass	Pass		973 kgF (30 %)	973 kgF
Secondary	N/S	Pass	Pass		1353 kgF	1353 kgF
	O/S	Pass	Pass		961 kgF (29 %)	961 kgF
Parking	N/S				1350 kgF	1350 kgF
	O/S				971 kgF (28 %)	971 kgF

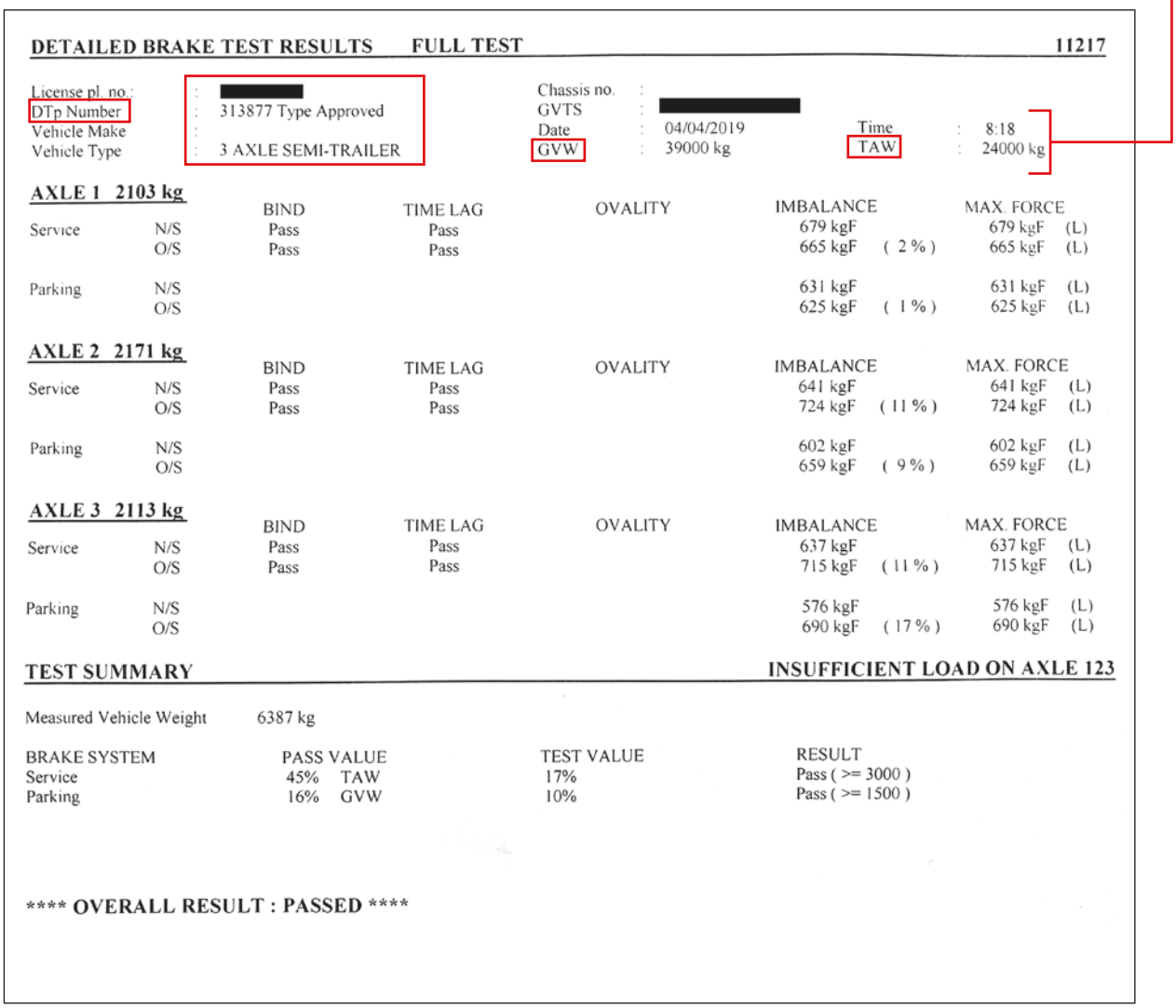
TEST SUMMARY **INSUFFICIENT LOAD ON AXLE 23**

Measured Vehicle Weight 14512 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	50% GVW	33% (FWA)	Pass (Locks)
Secondary	25% GVW	23%	Fail
Parking	12% GTW	15%	Pass

****** OVERALL RESULT : FAILED ******

Trailer details



DETAILED BRAKE TEST RESULTS FULL TEST 11217

License pl. no. : [redacted]
DTp Number : 313877 Type Approved
Vehicle Make :
Vehicle Type : 3 AXLE SEMI-TRAILER

Chassis no. :
GVTS : [redacted]
Date : 04/04/2019
GVW : 39000 kg

Time : 8:18
TAW : 24000 kg

AXLE 1 2103 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		679 kgF	679 kgF (L)
	O/S	Pass	Pass		665 kgF (2 %)	665 kgF (L)
Parking	N/S				631 kgF	631 kgF (L)
	O/S				625 kgF (1 %)	625 kgF (L)

AXLE 2 2171 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		641 kgF	641 kgF (L)
	O/S	Pass	Pass		724 kgF (11 %)	724 kgF (L)
Parking	N/S				602 kgF	602 kgF (L)
	O/S				659 kgF (9 %)	659 kgF (L)

AXLE 3 2113 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		637 kgF	637 kgF (L)
	O/S	Pass	Pass		715 kgF (11 %)	715 kgF (L)
Parking	N/S				576 kgF	576 kgF (L)
	O/S				690 kgF (17 %)	690 kgF (L)

TEST SUMMARY **INSUFFICIENT LOAD ON AXLE 123**

Measured Vehicle Weight 6387 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	45% TAW	17%	Pass (>= 3000)
Parking	16% GVW	10%	Pass (>= 1500)

****** OVERALL RESULT : PASSED ******

4.4 In the report: *brake performance, by axle*

Bind

A check to see if brake effort was recorded when the brakes were not applied.

Time Lag

A check to ensure the brakes on the same axle work at the same time as each other.

Ovality

A check for excessive fluctuation in braking effort as each wheel is rotated. (NOTE: this is only checked on steered axles.)

Imbalance

A check for a percentage variation between brakes on the same axle.

Max Force

This records the maximum brake effort of the brake. (L) indicates the brake locked, so the potential brake effort could be higher.

For "Max Force", some operators just aim for locks (L), but these can be achieved prematurely by not having enough weight on the axle – the lower the weight on the axle, the greater the probability the brake will lock. Should this be the case, operators should question the validity of the brake test as it may not have been carried out correctly and the results may not be wholly accurate.

DETAILED BRAKE TEST RESULTS FULL TEST **11244**

License pl. no.: [redacted]
DTp Number : 5192 Type Approved
Vehicle Make : VOLVO
Vehicle Type : 3 AXLE TRACTOR UNIT

Chassis no. :
GVTS : [redacted]
Date : 05/04/2019 Time : 10:42
GVW : 25700 kg GTW : 44000 kg

AXLE 1 6608 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	2417 kgF	2417 kgF (L)
	O/S	Pass	Pass	Pass	2308 kgF (5 %)	2308 kgF (L)
Secondary	N/S	Pass	Pass		1964 kgF	1964 kgF
	O/S	Pass	Pass		1630 kgF (17 %)	1630 kgF
Parking	N/S				2334 kgF	2334 kgF
	O/S				2094 kgF (10 %)	2094 kgF

AXLE 2 2319 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		650 kgF	650 kgF (L)
	O/S	Pass	Pass		687 kgF (5 %)	687 kgF (L)

AXLE 3 5585 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1384 kgF	1384 kgF
	O/S	Pass	Pass		973 kgF (30 %)	973 kgF
Secondary	N/S	Pass	Pass		1353 kgF	1353 kgF
	O/S	Pass	Pass		961 kgF (29 %)	961 kgF
Parking	N/S				1350 kgF	1350 kgF
	O/S				971 kgF (28 %)	971 kgF

TEST SUMMARY **INSUFFICIENT LOAD ON AXLE 23**

Measured Vehicle Weight 14512 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	50% GVW	33% (FWA)	Pass (Locks)
Secondary	25% GVW	23%	Fail
Parking	12% GTW	15%	Pass

****** OVERALL RESULT : FAILED ******

Axle weights

This is the weight of the axle, as tested (including any load or simulated load force imposed at that time).

Assess the axle weight to see if it was sufficiently loaded for a meaningful brake test. For MOT, DVSA expects this to be between 50–65% of the axle design weight – this can be found on the plating certificate. If the weight is less than this, the results will record which axles had an insufficient load. (NOTE: tri-axle semi-trailers can be tested unladen.)

DETAILED BRAKE TEST RESULTS FULL TEST **11217**

License pl. no.: [redacted]
DTp Number : 313877 Type Approved
Vehicle Make :
Vehicle Type : 3 AXLE SEMI-TRAILER

Chassis no. :
GVTS : [redacted]
Date : 04/04/2019 Time : 8:18
GVW : 39000 kg TAW : 24000 kg

AXLE 1 2103 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		679 kgF	679 kgF (L)
	O/S	Pass	Pass		665 kgF (2 %)	665 kgF (L)
Parking	N/S				631 kgF	631 kgF (L)
	O/S				625 kgF (1 %)	625 kgF (L)

AXLE 2 2171 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		641 kgF	641 kgF (L)
	O/S	Pass	Pass		724 kgF (11 %)	724 kgF (L)
Parking	N/S				602 kgF	602 kgF (L)
	O/S				659 kgF (9 %)	659 kgF (L)

AXLE 3 2113 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		637 kgF	637 kgF (L)
	O/S	Pass	Pass		715 kgF (11 %)	715 kgF (L)
Parking	N/S				576 kgF	576 kgF (L)
	O/S				690 kgF (17 %)	690 kgF (L)

TEST SUMMARY **INSUFFICIENT LOAD ON AXLE 123**

Measured Vehicle Weight 6387 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	45% TAW	17%	Pass (>= 3000)
Parking	16% GVW	10%	Pass (>= 1500)

****** OVERALL RESULT : PASSED ******

5 Example results of a vehicle brake test

5.1 Vehicle example: *brake performance, by axle*

The report below reveals the test was for a tri-axle Volvo tractor unit, with a Type Approved braking system.

The vehicle has a design GVW of 25,700kg, with a design GTW of 44,000kg

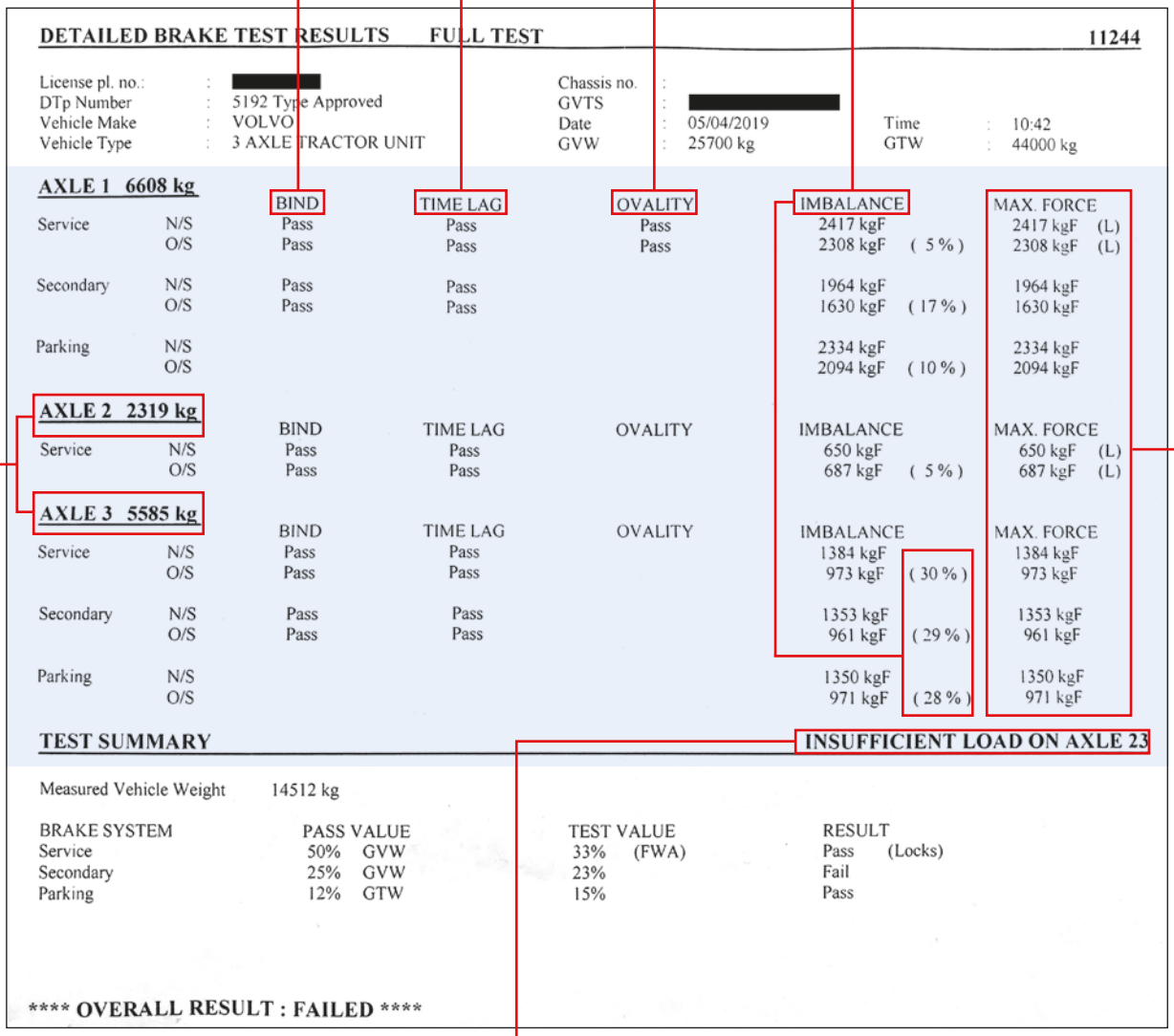
The weight on the axle when tested
Tractor units need a suitably loaded trailer for test – this was not the case here, as axles 2 and 3 are too light.

Time Lag
All brakes pass.

Bind
All brakes pass.

Ovality
Only brakes on steered axles are checked; these all pass.

Imbalance
Although none fail (none exceed 30%), axle 3 O/S brake is a cause for concern, as this brake is underperforming.



DETAILED BRAKE TEST RESULTS FULL TEST 11244

License pl. no.: [redacted] Chassis no. :
DTp Number : 5192 Type Approved GVTS : [redacted]
Vehicle Make : VOLVO Date : 05/04/2019 Time : 10:42
Vehicle Type : 3 AXLE TRACTOR UNIT GVW : 25700 kg GTW : 44000 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
AXLE 1 6608 kg						
Service	N/S	Pass	Pass	Pass	2417 kgF	2417 kgF (L)
	O/S	Pass	Pass	Pass	2308 kgF (5 %)	2308 kgF (L)
Secondary	N/S	Pass	Pass		1964 kgF	1964 kgF
	O/S	Pass	Pass		1630 kgF (17 %)	1630 kgF
Parking	N/S				2334 kgF	2334 kgF
	O/S				2094 kgF (10 %)	2094 kgF
AXLE 2 2319 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		650 kgF	650 kgF (L)
	O/S	Pass	Pass		687 kgF (5 %)	687 kgF (L)
AXLE 3 5585 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1384 kgF	1384 kgF
	O/S	Pass	Pass		973 kgF (30 %)	973 kgF
Secondary	N/S	Pass	Pass		1353 kgF	1353 kgF
	O/S	Pass	Pass		961 kgF (29 %)	961 kgF
Parking	N/S				1350 kgF	1350 kgF
	O/S				971 kgF (28 %)	971 kgF

TEST SUMMARY **INSUFFICIENT LOAD ON AXLE 23**

Measured Vehicle Weight 14512 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	50% GVW	33% (FWA)	Pass (Locks)
Secondary	25% GVW	23%	Fail
Parking	12% GTW	15%	Pass

**** OVERALL RESULT : FAILED ****

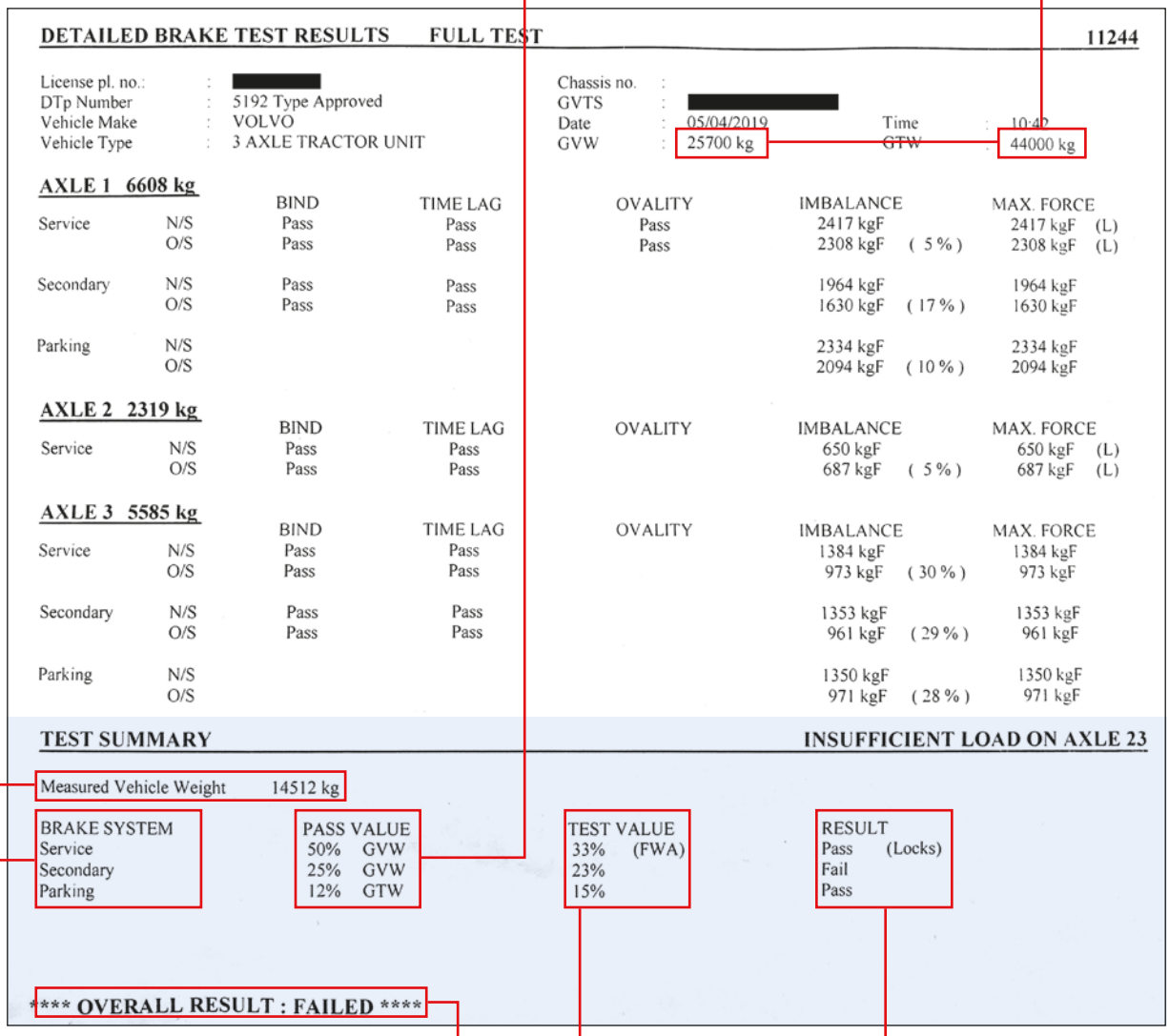
Insufficient load on Axles 23
As the vehicle did not have a suitably loaded trailer, axles 2 and 3 did not meet the MOT requirements of being at least 65% of their design weight. The brake report notes this fact.

Max Force
These are the maximum brake forces achieved by the brakes. (L) indicates when the wheel locked before maximum performance was reached.

5.2 Vehicle example: *test summary and overall result*

Pass Value
What the minimum requirement is, expressed as a percentage:
Service = 50% of GVW (25,700kg).
Secondary = 25% of GVW (25,700kg).
Parking = 16% of GVW or 12% of GTW.

Measured Vehicle Weight
The combined weight of all the axles.



DETAILED BRAKE TEST RESULTS FULL TEST 11244

License pl. no.: [redacted]
DTp Number : 5192 Type Approved
Vehicle Make : VOLVO
Vehicle Type : 3 AXLE TRACTOR UNIT

Chassis no. :
GVTS : [redacted]
Date : 05/04/2019 Time : 10:42
GVW : 25700 kg GTW : 44000 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
AXLE 1 6608 kg						
Service	N/S	Pass	Pass	Pass	2417 kgF	2417 kgF (L)
	O/S	Pass	Pass	Pass	2308 kgF (5 %)	2308 kgF (L)
Secondary	N/S	Pass	Pass		1964 kgF	1964 kgF
	O/S	Pass	Pass		1630 kgF (17 %)	1630 kgF
Parking	N/S				2334 kgF	2334 kgF
	O/S				2094 kgF (10 %)	2094 kgF
AXLE 2 2319 kg						
Service	N/S	Pass	Pass	OVALITY	IMBALANCE	MAX. FORCE
	O/S	Pass	Pass		650 kgF	650 kgF (L)
					687 kgF (5 %)	687 kgF (L)
AXLE 3 5585 kg						
Service	N/S	Pass	Pass	OVALITY	IMBALANCE	MAX. FORCE
	O/S	Pass	Pass		1384 kgF	1384 kgF
					973 kgF (30 %)	973 kgF
Secondary	N/S	Pass	Pass		1353 kgF	1353 kgF
	O/S	Pass	Pass		961 kgF (29 %)	961 kgF
Parking	N/S				1350 kgF	1350 kgF
	O/S				971 kgF (28 %)	971 kgF

TEST SUMMARY **INSUFFICIENT LOAD ON AXLE 23**

Measured Vehicle Weight 14512 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	50% GVW	33% (FWA)	Pass (Locks)
Secondary	25% GVW	23%	Fail
Parking	12% GTW	15%	Pass

**** OVERALL RESULT : FAILED ****

Overall test result
What the overall test result is when assessed against the minimum requirements.

Braking System
Service – footbrake.
Secondary – either:
- part of handbrake.
- half of service brake.

Parking – handbrake.

Test Value
The calculated test results.
(FWA) – indicates an allowance was added due to one or more of the front brakes locking.

Result
Pass – due to FWA and half of those brakes locking.
Fail – due to not meeting the Pass Value of at least 25%.
Pass – due to achieving 15% (the minimum required Pass Value is 12%).

6 Example results of a trailer brake test

6.1 Trailer example: *brake performance, by axle*

This is a tri-axle semi-trailer, with a Type Approved braking system. All vehicles should be tested in a laden condition, however, this trailer is being tested in an unladen condition – tri-axle semi-trailers are allowed to be tested in this condition, providing their brakes' performance meet certain criteria (all brakes lock and the service brake achieves an overall force of 3000kg or more – see *Annex B*).

NOTE: DVSA allows tri-axle semi-trailers to be brake tested unladen. However, one stipulation requires the reading for each locked wheel must be higher than 500kg (which, in this case, they are).

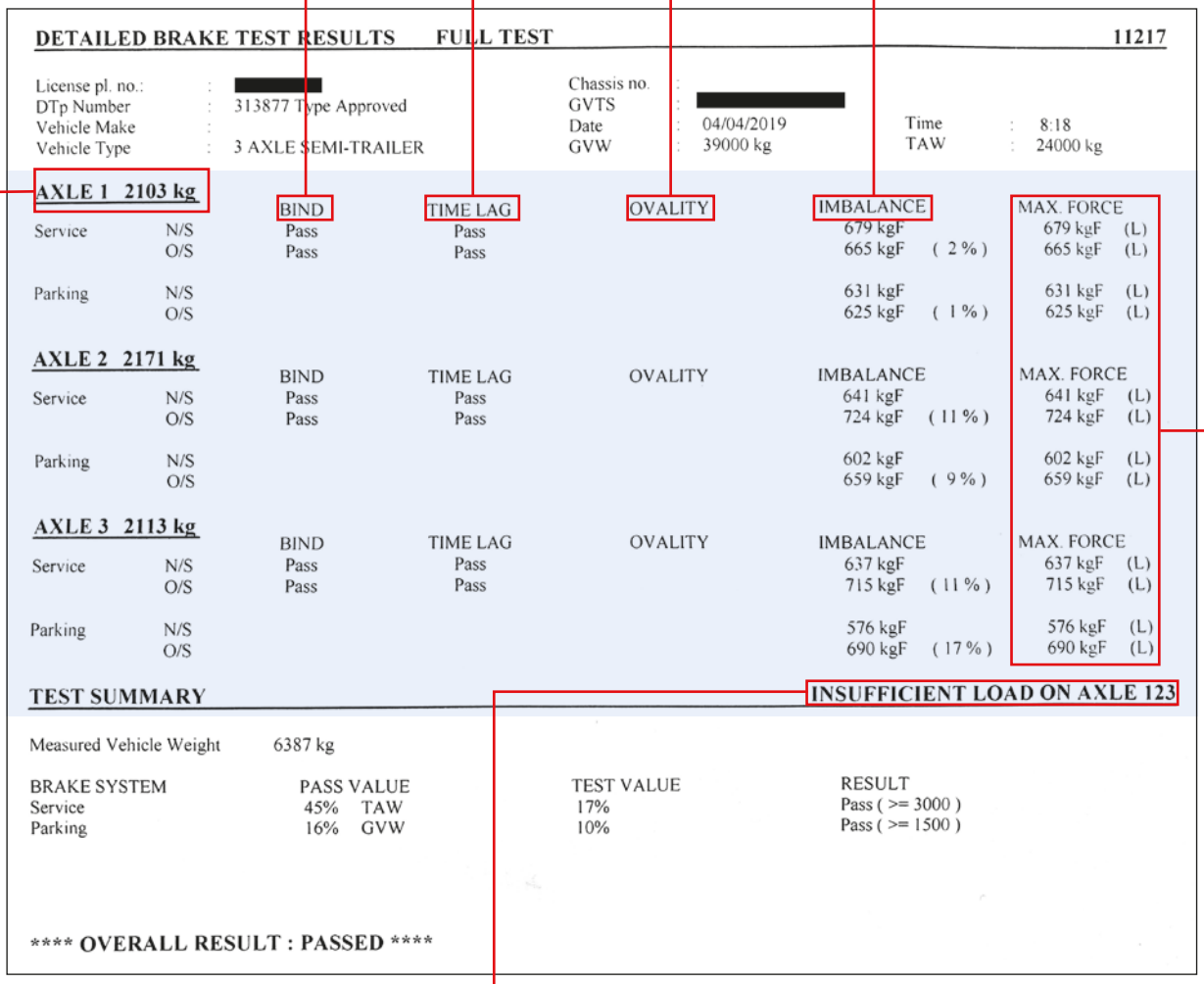
The weight on the axle when tested
If axle design weights were 8,000 kg, then ideally each should be loaded to a minimum of 4,000 kg.

Time Lag
All brakes pass.

Ovality
Not checked on trailers.

Bind
All brakes pass.

Imbalance
All pass, as none exceed 30%.



DETAILED BRAKE TEST RESULTS FULL TEST 11217

License pl. no.: [redacted]
DTp Number : 313877 Type Approved
Vehicle Make :
Vehicle Type : 3 AXLE SEMI-TRAILER

Chassis no. :
GVTS : [redacted]
Date : 04/04/2019
GVW : 39000 kg

Time : 8:18
TAW : 24000 kg

AXLE 1 2103 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		679 kgF	679 kgF (L)
	O/S	Pass	Pass		665 kgF (2 %)	665 kgF (L)
Parking	N/S				631 kgF	631 kgF (L)
	O/S				625 kgF (1 %)	625 kgF (L)

AXLE 2 2171 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		641 kgF	641 kgF (L)
	O/S	Pass	Pass		724 kgF (11 %)	724 kgF (L)
Parking	N/S				602 kgF	602 kgF (L)
	O/S				659 kgF (9 %)	659 kgF (L)

AXLE 3 2113 kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		637 kgF	637 kgF (L)
	O/S	Pass	Pass		715 kgF (11 %)	715 kgF (L)
Parking	N/S				576 kgF	576 kgF (L)
	O/S				690 kgF (17 %)	690 kgF (L)

TEST SUMMARY — INSUFFICIENT LOAD ON AXLE 123

Measured Vehicle Weight 6387 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	45% TAW	17%	Pass (>= 3000)
Parking	16% GVW	10%	Pass (>= 1500)

**** OVERALL RESULT : PASSED ****

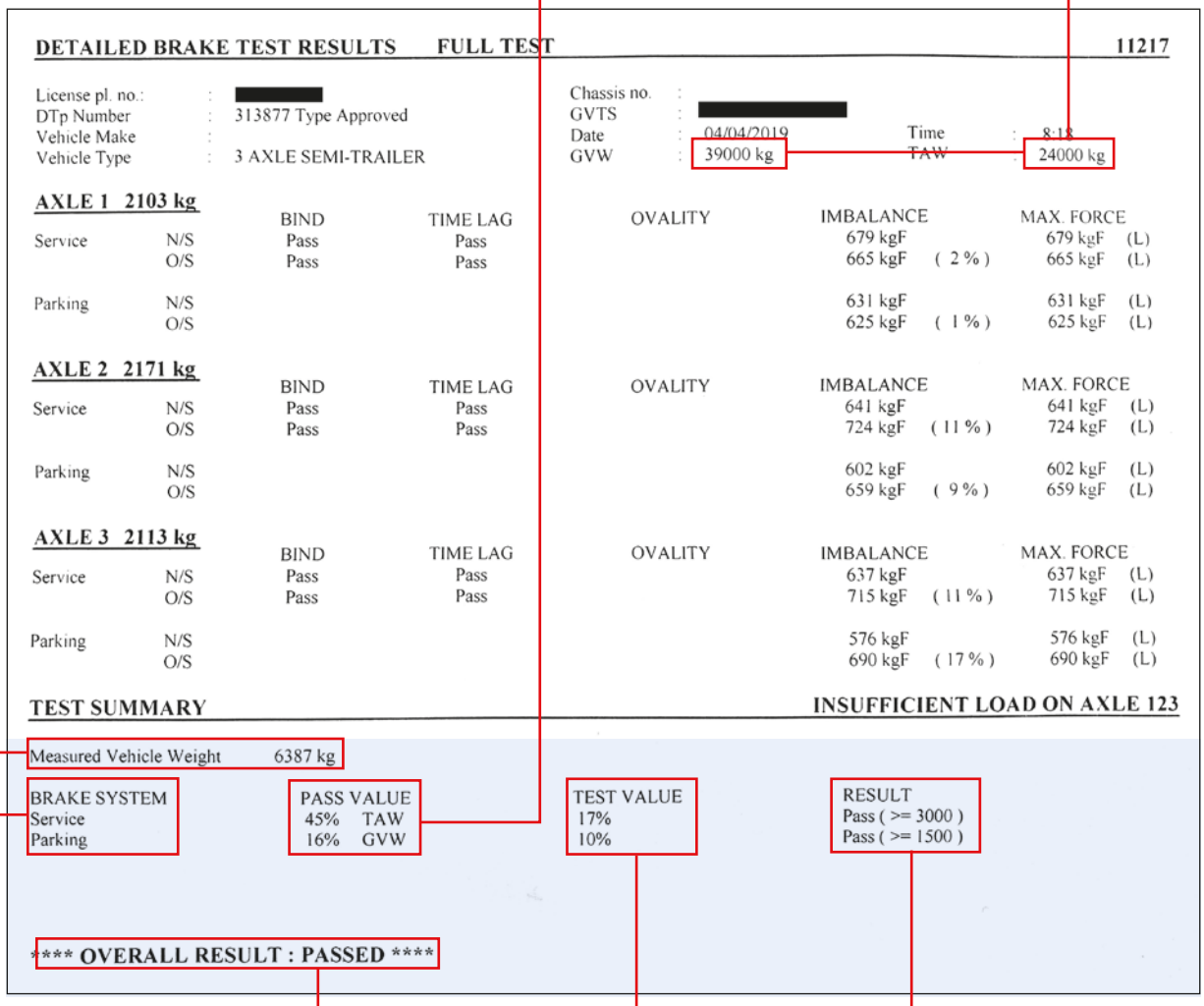
Insufficient load on Axles 123
As the trailer was unladen and all three axles did not meet the MOT requirements of being at least 65% of the axle design weight, the report notes this fact.

Max Force
These are the maximum brake forces achieved by the brakes. (L) indicates when the wheel locked before maximum performance was reached.

6.2 Trailer example: test summary and overall result

Pass Value
What the minimum requirement is, expressed as a percentage:
Service = 45% of TAW (24,000kg).
Parking = 16% of GVW (39,000kg).

Measured Vehicle Weight
The combined weight of all the axles.



DETAILED BRAKE TEST RESULTS FULL TEST 11217

License pl. no.: [redacted]
DTp Number : 313877 Type Approved
Vehicle Make :
Vehicle Type : 3 AXLE SEMI-TRAILER

Chassis no. : [redacted]
GVTS :
Date : 04/04/2019 Time : 8:18
GVW : 39000 kg TAW : 24000 kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
AXLE 1 2103 kg						
Service	N/S	Pass	Pass		679 kgF	679 kgF (L)
	O/S	Pass	Pass		665 kgF (2 %)	665 kgF (L)
Parking	N/S				631 kgF	631 kgF (L)
	O/S				625 kgF (1 %)	625 kgF (L)
AXLE 2 2171 kg						
Service	N/S	Pass	Pass		641 kgF	641 kgF (L)
	O/S	Pass	Pass		724 kgF (11 %)	724 kgF (L)
Parking	N/S				602 kgF	602 kgF (L)
	O/S				659 kgF (9 %)	659 kgF (L)
AXLE 3 2113 kg						
Service	N/S	Pass	Pass		637 kgF	637 kgF (L)
	O/S	Pass	Pass		715 kgF (11 %)	715 kgF (L)
Parking	N/S				576 kgF	576 kgF (L)
	O/S				690 kgF (17 %)	690 kgF (L)

TEST SUMMARY — INSUFFICIENT LOAD ON AXLE 123

Measured Vehicle Weight 6387 kg

BRAKE SYSTEM	PASS VALUE	TEST VALUE	RESULT
Service	45% TAW	17%	Pass (>= 3000)
Parking	16% GVW	10%	Pass (>= 1500)

**** OVERALL RESULT : PASSED ****

Braking System
Service – footbrake.
Parking – handbrake.

Overall test result
What the overall test result is when assessed against the minimum requirements.

Test Value
The calculated test results.

Result
Pass – due to locked brakes and a total reading over 3,000kg.
Pass – due to locked brakes and a total reading over 1,500kg.

7 Warning signs and potential concerns in the results of a brake test report

7.1 Further considerations, even if the overall result shows "PASS"

The MOT brake test criteria are set at the minimum legal requirements; therefore, an operator's own safety inspections should ensure the condition of their vehicle(s)/trailer(s) are being maintaining to a higher standard. As such, even though the "OVERALL BRAKE RESULT" may show "PASS", there may be issues recorded on the brake test report an operator will want to consider:

- Incorrect vehicle/trailer details. If these are wrong, the entire brake test may be null and void.
- Insufficient weight recorded on an axle/s. This may lead to brakes locking at a low reading, which will fail to inform the true performance of that brake. It could also lead to low brake-performance readings, as some braking systems only work fully when the vehicle is substantially loaded.
  - NOTE 1: not all brake reports record weight, but, if the reading is low, it is worth asking whether the vehicle/trailer had been loaded.
  - NOTE 2: some vehicles cannot be tested laden – in this case, the brake results need to be checked to ensure they are meaningful (see *Annex C*).
- Significant imbalance where the brakes **have not** locked. If neither brake locks, test failure will only result when the differentiation is higher than 30% – where no lock occurs and readings are over (circa) 20%, further investigation should still be taken.
- Significant imbalance where the brakes **have** locked. Even when brakes on the same axle have locked, the results should be checked for any indication of concern – if this same imbalance is across all axles, it may be an indication of a fault in the brake machine or defective brake rollers on the side where low brake lock-out readings are being obtained. Where the differentiation is higher than 30%, further investigation may be necessary.
- All brakes locking out on one side, but not on the other. This may indicate the brake test condition on that side of the vehicle/trailer has been compromised (eg, wet or contaminated with oil/fuel, brake rollers worn, etc).
- Brake Test Value/s (where brakes have not locked) are at, or just above, the Pass Value. This may indicate the vehicle/trailer brakes require further investigation to identify possible underperformance.
- Unusual low brake forces recorded from a brake/brakes where the brake/brakes have locked out. This may indicate the brake test was undertaken too quickly so the brake readings do not indicate the brakes' true performance.

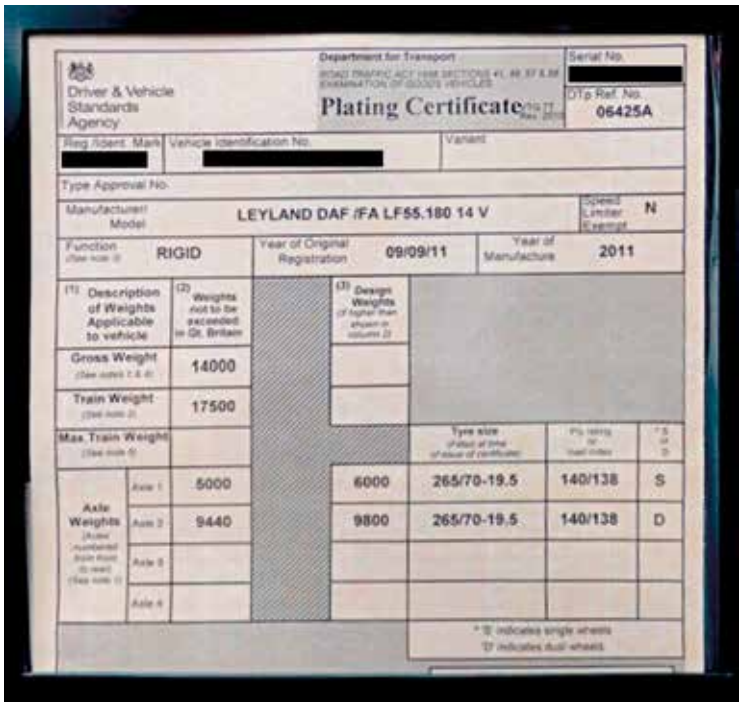
7.2 What to do if you suspect there may be something wrong with the brakes

- Look at a previous brake report to identify if there was a similar issue.
- Note down your concerns and discuss these with your fleet engineer or, if applicable, your third-party service provider. You should expect them to be able to explain the reason for a variation and/or why this does not materially affect the performance of the brakes.
- Seek assurance from the fleet engineer or third-party service provider that the vehicle/trailer is fit for service. If you are not satisfied with their response:
  - Ask them to put it in writing – you will be able to use this as evidence, should anything untoward happen.
  - Discuss your concerns with your audit provider, if you have one.
- Note your concerns, on the vehicle record, and review this after the vehicle's/trailer's next safety inspection.

Annex A – Plating Certificate (VTG7) example

A plating certificate shows the permitted axle and gross vehicle weights.

The details on the certificate should correspond to those shown in the vehicle/trailer detail section of the brake test report. If they do not, the test results may not be relevant (see *sections 4.2* and *4.3*).



Driver & Vehicle Standards Agency

Department for Transport

Serial No. [redacted]

Plating Certificate

DTp Ref. No. 06425A

Reg Ident. Mark [redacted] | Vehicle Identification No. [redacted] | Variant

Type Approval No.

Manufacturer/ Model: LEYLAND DAF /FA LF55.180 14 V | Speed Limiter Exempt: N

Function: RIGID | Year of Original Registration: 09/09/11 | Year of Manufacture: 2011

(1) Description of Weights Applicable to vehicle	(2) Weights not to be exceeded in Gt. Britain	(3) Design Weights (if higher than shown in column 2)	Tyre size	Ply rating or load index	* S or D
Gross Weight	14000				
Train Weight	17500				
Max Train Weight					
Axle Weights Axle 1	5000	6000	265/70-19.5	140/138	S
Axle 2	9440	9800	265/70-19.5	140/138	D
Axle 3					
Axle 4					

* 'S' indicates single wheels
'D' indicates dual wheels

Annex B – DVSA MOT brake test requirements for unladen tri-axle semi-trailers

For unladen tri-axle semi-trailers only, the calculation used to calculate brake performance (as shown on page five) does not currently apply. Therefore, DVSA implements a different criteria (shown in the table below). Please note: **this does not apply to any other vehicle types**.

Service Brake Performance	
Number of wheels locking	Minimum total brake force required
Six	3,000kg
Five	3,600kg
Four	4,200kg
Three wheels or fewer	Normal requirements for a laden trailer ap-ply
Parking Brake Performance	
Number of wheels locking	Minimum total brake force required
All wheels on which the parking brake operates lock	1,500kg
Any wheel on which the parking brake operates does not lock	16% of design GVW

Annex C – Vehicles that cannot be loaded for brake tests

The *Guide to Maintaining Roadworthiness* (GTMR) suggests that, in addition to the MOT test, three further brake tests should be undertaken per annum, spread evenly throughout the year. The GTMR also accepts that some vehicles cannot be brake tested in a laden state – DVSA lists these in section 2.1 of its *Heavy vehicle brake test: best practice* guide[1].

Brake tests conducted on an unladen vehicle/trailer tend to result in premature locking of the brake and, as such, it can be difficult to assess the brake's true performance. It is difficult to say at what point a locked brake on an insufficiently loaded axle is too low, as there are a number of factors that could influence this: the amount of weight imposed on the axle, the condition of the brake test machine, weather conditions (eg, wet tyres), etc.

Logistics UK endorses that all brake tests should be undertaken laden wherever possible. However, where this is not possible: as a guide, when a brake locks out on an insufficiently loaded axle, the following suggested minimum readings should be obtained for the brake test to be considered meaningful.

NOTE: The following figures should not be considered in any way to indicate a vehicle meets the minimum legal requirements for brake performance.

1 https://www.gov.uk/government/publications/the-heavy-vehicle-brake-test-best-practice-guide/the-heavy-vehicle-brake-test-best-practice-guide

For vehicles *(which tend to have a heavier unladen weight than trailers):*

Axle design weight	Minimum read-ing from a locked brake	Principle applied		
		At minimum efficiency of 50% =	Minimum efficiency of 50% divided by the two brakes (n/s and o/s) =	Half of this =
2,500kg	312kg	1,250kg	625kg per brake	312kg
5,000kg	625kg	2,500kg	1,250kg per brake	625kg
6,500kg	812kg	3,250kg	1,625kg per brake	812kg
10,000kg	1,250kg	5,000kg	2,500kg per brake	1,250kg
12,000kg	1,500kg	6,000kg	3,000kg per brake	1,500kg

For trailers *(which tend to have a lighter unladen weight, compared to vehicles):*

Axle design weight	Minimum read-ing from a locked brake	Principle applied		
		At minimum efficiency of 50% =	Minimum efficiency of 50% divided by the two brakes (n/s and o/s) =	Quarter of this =
8,000kg	500kg	4,000kg	2,000kg per brake	500kg
10,000kg	625kg	5,000kg	2,500kg per brake	625kg

T: 01892 526171* F: 01892 534989 www.logistics.org.uk

Logistics UK is a trading name of Freight Transport Association Limited
Registered office: Hermes House, St John's Road, Tunbridge Wells, Kent TN4 9UZ
Registered in England Number 391957