

TEST REPORT

SABS 1506:1994

BRAKING

Date: 30 May 2005


Client: SA Truck Bodies  
Attention : Mr L.D. Engler  
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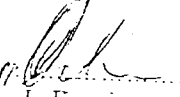
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8111/C2656  
Rev:01

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Sample Tested: Tandem Trailer fitted with MSQR-5000 Brake Valve

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Approved by:   
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Our Reference:  
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Rev:01

Submitted for test on:  
31 March 2005

**Conclusion:**

The sample trailer complied with the requirements of SABS 1506:1994, specific to the tests conducted in this report.

Number of pages 11

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*Contents*

1.	Introduction	
1.1	Object	3
1.2	Submitted information	3
1.3	Sampling procedure	3
1.4	General information	3
1.5	Test equipment	3
2.	Vehicle technical information	4
3.	Static brake test results	5
4.	Dynamic brake test results	6
5.	Remarks	7
6.	Annex 1 Adhesion Utilization Curves	8
7.	Conditions	11

## 1. INTRODUCTION

### 1.1 Object

To evaluate a Tandem axle unit, category O<sub>4</sub> Trailer fitted with MSQR-5000 brake valve for compliance with the static and dynamic requirements of SABS 1506:1994 "Braking device of motor vehicles and their trailers", specific to those tests conducted in this report.

### 1.2 Submitted information

Sample has been handed in together with:  
Vehicle technical Specification

### 1.3 Sampling procedure

Client submitted the vehicle sample personally.  
The test house has no influence on the selection of the sample.

Sample handed in was test worthy.

### 1.4 General information

All tests were conducted in accordance with the specifications as laid out in SABS 1506:1994, specific to those tests conducted in this report.

#### Sample description

Axle Manufacturer	= Hendred Fruehauf (Pty) Ltd
Trailer Manufacturer	= Hendred Fruehauf (Pty) Ltd
Brake Valve	= MSQR - 5000 (Fitted by SA Truck Bodies)
Model	= PHR - F2 - 12,2
Type	= 2 Axle platform semi trailer
Axle type	= Not specified
Suspension	= F2 Tandem axle overslung
Registration	= Not registered
VIN	= AAH131048PURF2122
Date tested	= 12-02-2004 - 13-02-2004
Re-test date	= 31 March 2005

### 1.5 Test equipment

Mecer laptop computer  
Wika Pressure gauges  
Chino model IR HP2 hand held temperature gun  
Datron M1 Microwave Motion Sensor  
Strain gauged 5<sup>th</sup> wheel

## 2. **VEHICLE TECHNICAL INFORMATION**

### 2.1 Dimensions of vehicle

Wheelbase	: 9.0 m
Height of C.O.G. laden	: 1.8 m
Height of C.O.G. unladen	: 1.2 m

### 2.2 Data plate masses supplied by client

Tare mass	: Not specified
Gross vehicle mass	: 36 000 kg
Gross kingpin mass	: 18 000 kg
Rear axle or Bogie Laden mass	: 18 000 kg
Rear axle or Bogie Tare mass	: 22 000 kg

### 2.3 Tyre size and pressure

Tyre size front axle	: Dual 12 R 22.5 Firestone 16 P.R 152/1481 HP 300
Tyre size rear axle	: Dual 12 R 22.5 Firestone 16 P.R 152/1481 HP 300
Tyre pressure front axle	: 700 Kpa
Tyre pressure rear axle	: 700 Kpa

### 2.4 Vehicle brakes circuit description

#### *Service brakes:*

Full air brake system fitted with MSQR-5000 brake valve on each axle of the trailer.

#### *Park brake system:*

Spring brake boosters acting on both axles' foundation brakes.

#### Axle 1 (front axle)

Axle manufacturer	: Hendred Fruehauf (Pty) Ltd
Axle part no.	: AA001903
Service booster size	: Type 24/30
Spring booster size	: Type 24/30
Lever length	: 127 mm
Lever type	: Automatic, Haldex S-ABA
Friction material	: Duroline DNA38
Friction area (per drum)	: 149520 mm <sup>2</sup>
Brake shoe reference no.	: 4515C
Brake drum diameter	: 419 mm
Foundation brake	: S-Cam configuration, single leading shoe .

#### Axle 2 (rear axle)

Axle manufacturer	: Hendred Fruehauf (Pty) Ltd
Axle part no.	: AA001903
Service booster size	: Type 24/30
Spring booster size	: Type 24/30
Lever length	: 152 mm
Lever type	: Automatic, Haldex S-ABA
Friction material	: Duroline DNA38
Friction area (per drum)	: 149520 mm <sup>2</sup> (178mm x 210mm x4 segments)
Brake shoe reference no.	: 4515C
Brake drum diameter	: 419 mm
Foundation brake	: S-Cam configuration, single leading shoe .

### 3. **STATIC BRAKE TEST RESULTS**

3.1 The symbols referred to in the results column are as follows:

N/A = not applicable

N/T = not tested

N/F = not fitted

T = tested

P = compliance

F = non compliance

I = inspected

\* = results detailed below table

Annex/Clause	Description	Result
I/2.1.1	Brake system correctly mounted, made of suitable material.	
I/2.1.2.3	The parking brake is held on by a mechanical device only.	I/P
I/2.2.2.3	Air supply to trailer by two pipes and were identified.	I/P
I/2.2.2.4	The service brakes acted on all the wheels.	I/P
I/2.2.2.5	The action of the service braking device must be suitably distributed among the axles	T/P
I/2.2.2.6	The action of every braking device must be distributed between the wheels of each axle symmetrically in relation to the longitudinal median plane of the vehicle	T/P
I/2.2.2.8	Provision for checking wear on the brakes	I/P
I/2.2.2.9	The braking device must be such that the trailer is stopped automatically if the coupling separates while the trailer is in motion	T/P
I/2.2.2.10	Device fitted to the vehicle to ensure trailer braking (trailer control valve)	I/P
II/8	Test connections fitted before and after the load-sensing valve.	I/P
III/1.2	All the brakes were closely adjusted prior to the start of the test.	I/P
III/3.4	The time elapsing between the moment when the pressure produced in the control line by the simulator reaches 65kPa and the moment when the pressure in the brake actuator of the trailer reaches 75% of its asymptotic value must not exceed 0.4 s	T/P*
III/4	Test connections fitted to each brake circuit to enable the testing of reaction time.	I/P
IV/1.3.1	The pressure on the service brake device after 8 applications does not fall below a level equivalent to one-half the figure obtained at the first brake application.	N/T

\* Measured response time: 0.39.s

3.2 Load sensing valve

Annex/Clause	Description	Result
App.7.1.1	Information required visible and indelible.	
	Location of information plate: Not Fitted. (Supplied)	I/P
	Valve setting as specified- Unladen: 650 Kpa in, 270 Kpa out Laden: 650 Kpa in, 600 Kpa out	I*
	Reduction ratios: Unladen - 0.42:1 Laden - 0.9:1	T/P
	Valve setting as per test- Unladen: 650 Kpa in, 290 Kpa out Laden: 650 Kpa in, 600 Kpa out	T/P
	Reduction ratios: Unladen - 0.45:1 Laden - 0.9:1	T/P

#### 4. DYNAMIC BRAKE TEST RESULTS

##### 4.1 Test masses

Trailer Mass Unladen: Kingpin : 1428 kg  
 Axle 1 : 1932 kg  
 Axle 2 : 2023 kg  
 Total : 5383 kg

Trailer Mass Laden: Kingpin : 1048 kg  
 Axle 1 : 9458 kg  
 Axle 2 : 8732 kg  
 Total : 19238 kg

##### 4.2 Park brake gradient test (Annex II 2.2.2)

Gradient %	Vehicle Direction	Result
18	Incline	T/P
18	Decline	T/P

##### 4.3 Unladen dynamic test

SABS 1506:1994	Test type	Spec. start speed (km/h)	Recorded brake efficiency (%)	Required brake efficiency (%)	Stopping distance (m)	Input pressure (kPa)	Result
VII/3.5	Type O	40	70.2	45	33.3	650	T/P
VII/3.5	Type O	60	58.6	45	17.6	650	T/P

##### 4.4 Laden dynamic test

SABS 1506:1994	Test type	Spec. start speed (km/h)	Recorded brake efficiency (%)	Required brake efficiency (%)	Test distance (m)	Stopping distance (m)	Input pressure (kPa)	Result
II/2.2.1.2	Type O	40	46.9	45	-	21.7	650	T/P
II/2.2.1.2	Type O	60	45.6	45	-	32.4	650	T/P
II/1.3.2.2	Type I Drag	40	-	-	1700	-	-	-
II/1.3.3.1	Type I Residual	40	37.9	36	-	25.3	650	T/P
II/1.4	Type II Drag	30	-	-	6000	-	-	-
II/1.4.3	Type II Residual	40	43.4	33	-	22.7	650	T/P
II/6	Load sensing Failure	60	36.3	13.5	-	38.3	550	T/P
I/2.2.2.9	Red line Failure	60	27.7	13.5	-	49.3	650	T/P

4.5 Vehicle Dynamic Performance (Annex II 1.1.3.7)

- The vehicle did **not** deviate during the **brake** test : Pass
- The vehicle did **not** become unstable during the brake test : Pass
- The vehicle did **not** develop abnormal **vibration** : Pass

4.6 Behaviour of vehicle during braking (Annex II 1.1.4.2)

Compatibility Graphs – Please refer to the graphs attached for details of these results.

5. **REMARKS**

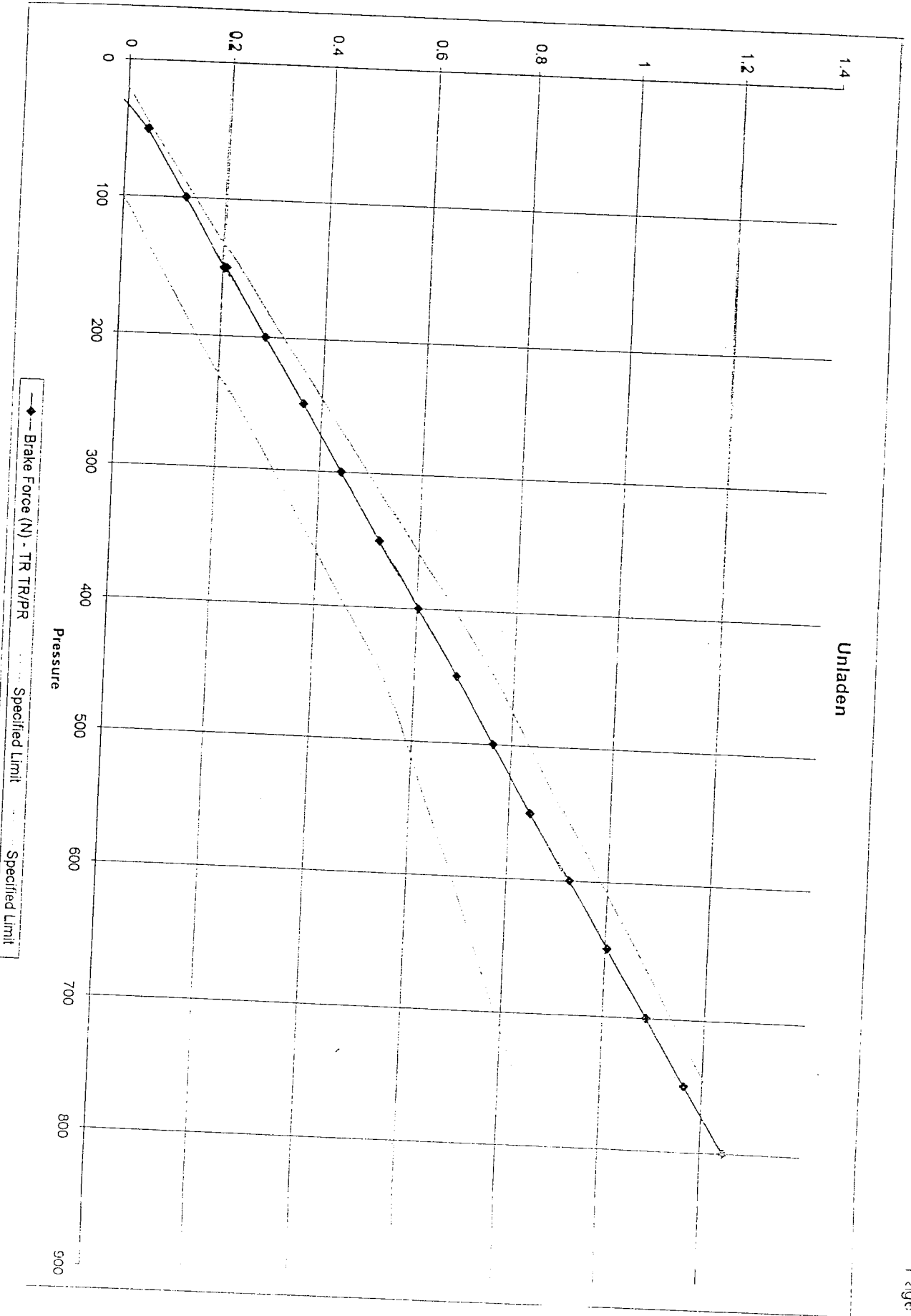
- The trailer was fitted with MSQR-5000 brake valve that is working like an ABS to prevent locking up on the wheels, therefore there was no lock up on the wheels during the dynamic test.
- Revision one of this report is due to re-test of the response time.

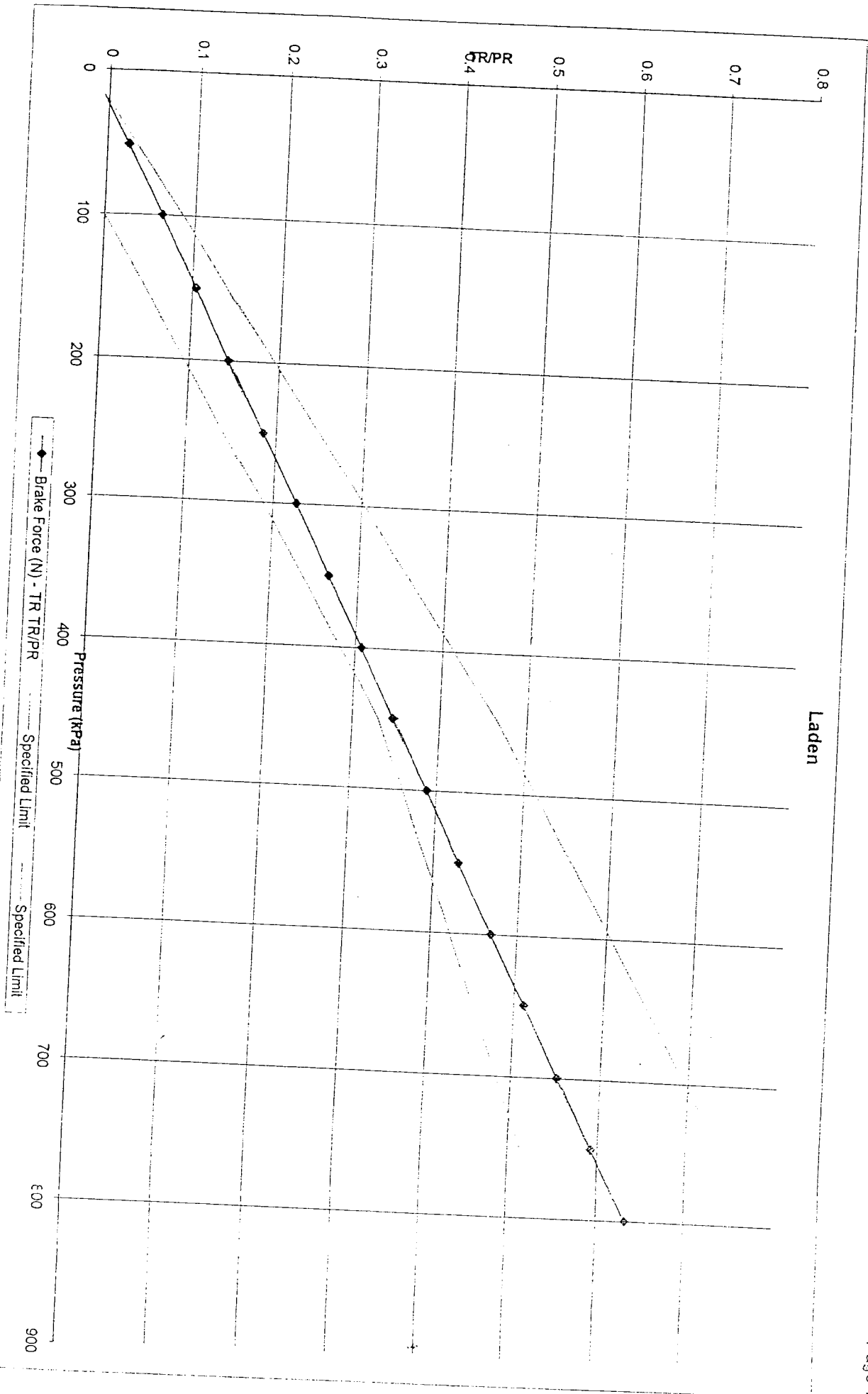
5.1 App.7.1.1

- The trailer was not fitted with a load sensing valve data plate. Information relating to the setting of the load-sensing valve was supplied by the trailer manufacturer.
- The axle unit was fitted to a Hendred Flat Bed Trailer that has been purpose built for the testing of axles.

6. *ANNEX 1*

*ADHESION UTILISATION  
CURVES*





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