



TEST REPORT
Compulsory Specification
VC8053

REPLACEMENT BRAKE LINING
ASSEMBLIES FOR ROAD VEHICLES

Date: 19 October 2004

Client: **Automotive Regulatory**
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Report No.: **8111/C2969**

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Sample Tested: **DYNOTHERM DNA-S**
RE02762

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Sample Part Number: **4515**

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(Lab Assistant)

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(Senior Technician)

Approved by: **L. Ferreira**.....
(Section Head)

Our Reference: **8111/C2969**

Submitted for test: **21 September 2004**

Conclusion:
The brake lining assembly tested complied with the requirements of the compulsory specification VC8053 specific to the tests mentioned in this report.

This report relates only to the samples tested and is issued subject to the conditions printed on the last page of the report. It does not imply approval by the South African Bureau of Standards of the quality and/or performance of the commodity that has been tested. It does not authorize the use of the Standardization Mark.
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1.6 General information

Table 1: Original Equipment component (Benchmark)

OE part number	4515 Cam and Anchor
OE manufacturer	Duroline
OE component description	Duroline DL15
Vehicle description	Henrad Frouhauf
Vehicle category	G ₄
Gross axle mass	11 000 kg
Torque benchmark for replacement linings	11 830 Nm

Table 2: Replacement component

Replacement part number	4515 Cam and Anchor
Replacement supplier	Dynotherm
Replacement manufacturer	Dynotherm
Replacement component description	4515-C (2 Cam and 2 Anchor)
Replacement component batch number	DNA-S

2. TEST RESULTS

Summary of the results

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

N/A = not applicable	P = compliance
N/T = not tested	F = non compliance
N/P = not filled	I = inspected
N/I = not inspected	* = see remark
T = tested	

Table 3: Summary of the results

Test	Clause	Details on page	Result
Laboratory tests	3.2	5	P
Brake lining attachment - bonded	3.3.1	5	N/A
Brake lining attachment - riveted	3.3.2	6	N/T*
Packing	6.1	6	I/P
Marking	6.2	6	I/P

1. Introduction

1.1 Object

To evaluate replacement brake linings against the requirements of the compulsory specification "Replacement brake lining assemblies for road vehicles", VC8053 as published by Government Notice R95 in Government Gazette no 22014, of 2 February 2001, specific to those tests conducted in this report.

1.2 Submitted information

The sample was delivered together with:

- An inspection report and test request from Automotive Regulatory.

1.3 Sampling procedure

Automotive Regulatory submitted the test sample personally. The test house had no influence on the selection of the sample. The sample handed in was in test worthy condition.

1.4 Conditioning

The sample brake lining assembly was conditioned by conducting repeated stops from various speeds using random pressures. On completion of the conditioning schedule more than 80% contact area between lining assemblies and drum was obtained.

1.5 Test method

The tests were conducted in accordance with clause 3.1 of the compulsory specification for replacement brake lining assemblies for road vehicles.

Clause	Description	Result
Brake lining attachment (continued)		
3.3.2	When riveted replacement brake lining assemblies are inspected, they shall comply with the following requirements:	
3.3.2 a)	There shall be no evidence of cracks in the lining;	N/T*
3.3.2 b)	The lining shall not be askew to the back plate;	N/T*
3.3.2 c)	There shall be no separation of the lining from the brake shoe;	N/T*
3.3.2 d)	The leading edge of the lining shall be on the correct side;	N/T*
3.3.2 e)	The diameter of the rivet head shall not be obviously smaller than the diameter of the lining hole when correctly seated;	N/T*
3.3.2 f)	The rivet head shall not be flush or proud of the lining;	N/T*
3.3.2 g)	There shall be no damage to the rivets;	N/T*
3.3.2 h)	The rivets shall not be loose; and	N/T*
3.3.2 I)	There shall be no sign of the rivet hole on the underside of the brake shoe.	N/T*

Packing and marking

6.1	Packing Replacement brake lining assemblies shall be so packed as to prevent damage or contamination during transportation and storage.	I/P
6.2	Marking Replacement brake lining assemblies shall be so marked as to clearly identify the manufacturer and the vehicle model and any derivative for which they are intended. A parts numbering system that corresponds to the vehicle parts list shall be deemed to satisfy these requirements.	I/P

Clause	Description	Result
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3. DESCRIPTION OF THE CLAUSES

Laboratory test

- 3.2 When a replacement brake lining assembly is tested in accordance with clauses 4.3.2 and clause 4.3.3:
- 3.2 a) *the mean braking torque recorded during the type O test, using the value of test speed 2 relevant to the category of vehicle given in table 1, shall for the same input force, be within 15 % of the mean braking torque recorded when the original brake lining assembly is tested in the same way; The mean braking torque recorded with the original brake lining assembly is the average of the braking torques recorded during at least five tests on the original brake lining assembly.* T/P
- 3.2 b) *The difference in the mean braking torque recorded during the type O test on the replacement brake lining assemblies, at the three different speeds, shall be within:*
 1) *in the case of vehicles of categories M₁, M₂ and N₁, 15 % of one another and*
 2) *in the case of vehicles of categories M₁, N₂ and N₃, 25 % of one another* N/A
- 3.2 c) *The residual performance after the type 1 test shall be not less than 60 % of the figure recorded in the type O test.* T/P
- Upon completion of the test, the replacement brake lining shall be subjected to visual inspection, to check that it is in a satisfactory condition for continued use under normal working conditions.* T/P

Brake lining attachment

- 3.3.1 When a bonded replacement brake lining assembly is tested in accordance with clause 5:
- 3.3.1 a) *Failure shall not occur before the shearing force reaches the appropriate of the following values;*
 1) *pad assembly: 2.5 N per square millimeter of surface area of the brake lining; and*
 2) *shoe assembly: 1.0 N per square millimeter of surface area of the brake lining;* N/A
- 3.3.1 b) *Depending on the actual value of the ultimate shearing force, the failure pattern of the sheared surface shall comply with the following requirements:*
 1) *pad assembly: if the ultimate shearing force is less than 1.8 times the minimum value given in (a)(1) above, the bond over at least 70 % of the interface between the brake lining and the back plate shall not have failed. The bond shall not have failed anywhere at the edge; and*
 2) *shoe assembly: if the ultimate shearing force is less than twice the minimum value given in (a)(2) above, the bond over at least 65 % of the interface between the brake lining and the brake shoe shall not have failed, and no single area of failed adhesion shall exceed 15 % of the total area. The bond shall not have failed anywhere at the edge.* N/A

4. SUMMARY OF TEST DATA

Run No.	Type-O Cold performance test @ 40km/h				Residual performance after Type-I test at 40km/h			
	Mean torque within 15% of prescribed value				Mean torque not less than 60% of the figure recorded during type-O Cold performance			
	Req. Type O	Act. Type O	Variance	Result	Req. Res.	Act. Res.	Variance	Result
	Nm	Nm	%		Nm	Nm	%	
2	11830	10775	9	P	10775	6625	61	P

5. REMARKS

- The four friction lining segments were supplied loosely.
- ETC made use of a sub-contractor to have the linings riveted and radius ground (where applicable).

6. CONDITIONS

This report relates only to the specific sample(s) tested as identified herein. It does not imply SABS approval of the quality and/or performance of the item(s) in question and the test results do not apply to any similar item that has not been tested.

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