



## Sample Lab Test Report

Link Test Report: 110691-1  
Test Description: SAE J661 Rev Feb 1997 Brake Lining Quality  
Purpose of Test: To Evaluate the Characteristics of Brake  
Materials  
Program: J661noinsp.chp  
Lining Material: DB 1441  
Test Date(s): 2/24/2011 to 2/24/2011

## Requested By

**HARDEX BRAKES LTD**  
Harry D  
200-1311 Howe Street  
Vancouver, Bc V6Z 2P3,

## CANADA

**Testing Coordination and Facility**  
North America Laboratory Test Operations  
13840 Elmira Ave.  
Detroit, MI 48227  
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Test Number  
110691-1

Customer Reference  
DB 1441

## SAE J661 Rev Feb 1997 Brake Lining Quality Test

### Test Information

Customer Name	Hardex Brakes Ltd
Requestor	Harry D
Test Procedure	SAE J661
Program Number	J661noinsp.chp
Test Coordinator	FOREN, TODD
Test Equipment	Chase Machine 0013
Test Dates	2/24/2011 to 2/24/2011
Datalogger	v1.0.10
Template Version	2.00

### Setup Details

Sample Material	DB 1441
Sample Size	1" X 1"
Sample Manufacturer	Hardex Brakes Ltd
Test Pressure	150 psi

### Sample Test Summary

Normal Friction Coefficient	0.467	Pass
Normal Friction Class	G	
Hot Friction Coefficient	0.443	Pass
Hot Friction Class	F	
Minimum Bold Coefficient	0.427	Pass
Max Variation Below Average	0.000	Pass
Max % Variation for Bold Readings	0%	Pass

**Pass / Fail**

**Pass**

### Comments:

**Created by:** Todd Foren      **Title** Test Engineer      **Date** 2/24/2011  
(313) 933-4900

**Reviewed by:** Todd Foren      **Title** Test Engineer      **Date** 2/24/2011  
(313) 933-4900

Data applicable to the materials tested. **Valid if signed by the test engineer.** Report can be copied in full.  
Bilateral uncertainty of measurements 0.63% of FS. Coverage factor of 2. Confidence of 95%. Details available upon request.



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**Test Number**  
Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
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Manufacturer  
**HARDEX BRAKE**

**Initial Baseline**  
Application Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
1 0.359  
20 0.410

Material  
**DB 1441**

Normal **0.467** **G**

**First Fade**  
Temp (F) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
200 0.471  
500 0.435  
(or Temp @ 10min)

Hot **0.443** **F**

**First Recovery**  
Temp (F) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5 Average Norm/Hot  
500 0.411 0.411  
400 0.415 0.415 Hot  
300 0.419 0.419 Hot  
200 0.402 0.402

**Wear**  
Application Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
1 0.474  
100 0.471

**Second Fade**  
Temp (F) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5 Average Max Var. < Average Norm/Hot % Var  
**200 0.427 0.427 0.000 Normal**  
**250 0.466 0.466 0.000 Normal**  
**300 0.480 0.480 0.000 Normal**  
**350 0.478 0.478 0.000 Normal**  
**400 0.483 0.483 0.000 Normal**  
**450 0.472 0.472 0.000 Hot**  
**500 0.462 0.462 0.000 Hot**  
**550 0.454 0.454 0.000 Hot**  
600 0.424 0.424 0.000 Hot  
650 Hot  
(or Temp @ 10min)

**Second Recovery**  
Temp (F) Sample 1 Sample 2 Sample 3 Sample 4 Sample 5 Average Max Var. < Average Norm/Hot % Var  
600 0.383 0.383 0.000  
500 0.427 0.427 0.000 Hot  
400 0.456 0.456 0.000 Hot  
**300 0.459 0.459 0.000 Hot**  
**200 0.436 0.436 0.000**

**Final Baseline**  
Application Sample 1 Sample 2 Sample 3 Sample 4 Sample 5  
1 0.477  
20 0.509



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Customer Reference  
DB 1441

Manufacturer: HARDEX BRAKE  
Material: DB 1441  
Test Pressure: 150 psi

Normal **0.467** **G**  
Hot **0.443** **F**

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**Wear**

	Initial	Final	Loss		Specific Wear	
Weight (gr)	8.511	8.059	0.452	5%	2.91E-03	gr/hp-hr
Thickness (in)	0.24	0.226	0.014	6%	9.02E-05	in <sup>3</sup> /hp-hr

**Baseline**

Event	Initial		Final	
	Force (lb)	$\mu$	Force (lb)	$\mu$
1	55	0.359	73	0.477
5	59	0.395	75	0.502
10	62	0.407	75	0.494
15	61	0.410	77	0.506
20	62	0.410	77	0.509

**Wear**

Event	Force (lb)	$\mu$
1	71	0.474
10	69	0.457
20	70	0.469
30	69	0.463
40	71	0.470
50	71	0.474
60	71	0.474
70	69	0.465
80	71	0.472
90	71	0.473
100	71	0.471

**First Fade**

Time (sec)	Force (lb)	$\mu$	Temp (°F)
0	70	0.471	230
30	73	0.482	279
60	74	0.491	323
90	72	0.482	367
120	70	0.467	410
150	67	0.444	452
180	65	0.431	491
210	63	0.420	526
240			
270			
300			
330			
360			
390			
420			
450			
480			
510			
540			
570			
600			

**Second Fade**

Time (sec)	Force (lb)	$\mu$	Temp (°F)
0	64	0.427	211
30	71	0.470	253
60	71	0.480	300
90	73	0.486	344
120	72	0.476	388
150	70	0.470	431
180	71	0.473	472
210	69	0.464	512
240	68	0.456	548
270	66	0.435	581
300	62	0.414	610
330	59	0.394	636
360			
390			
420			
450			
480			
510			
540			
570			
600			

**First Recovery**

Event	Force (lb)	$\mu$	Temp (°F)
1	62	0.411	498
2	61	0.415	400
3	62	0.419	300
4	58	0.402	201

**Second Recovery**

Event	Force (lb)	$\mu$	Temp (°F)
1	60	0.383	599
2	63	0.427	500
3	68	0.456	400
4	67	0.459	301
5	64	0.436	202



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Material: DB 1441  
Test Pressure: 150 psi

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### Coefficient of Friction

