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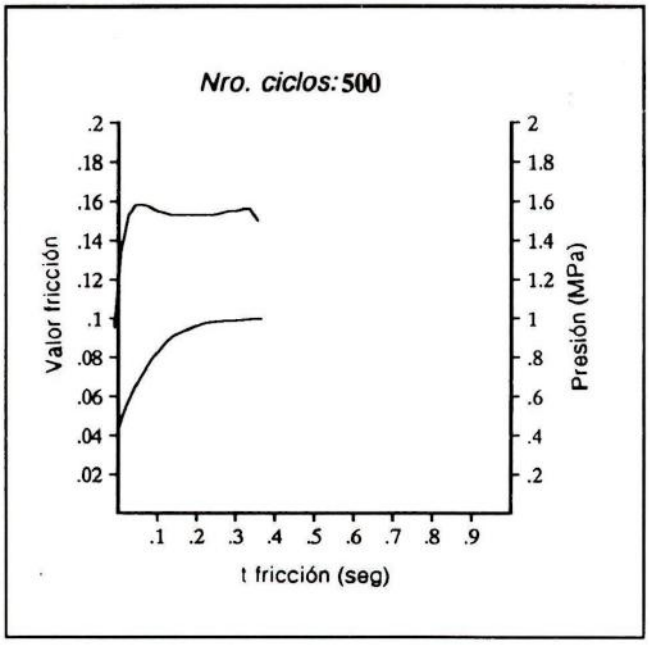

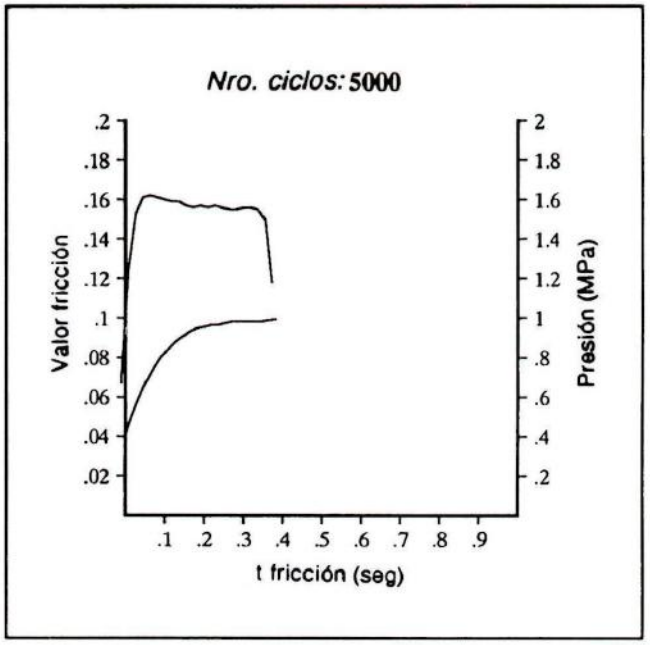

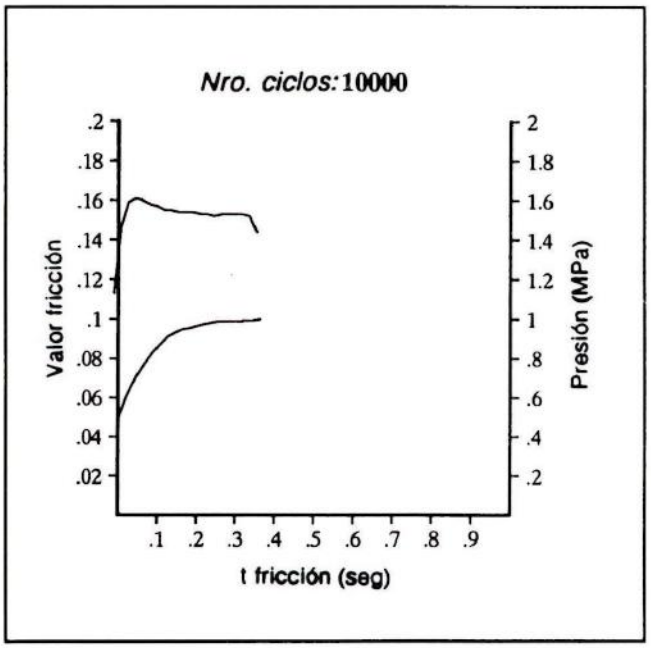

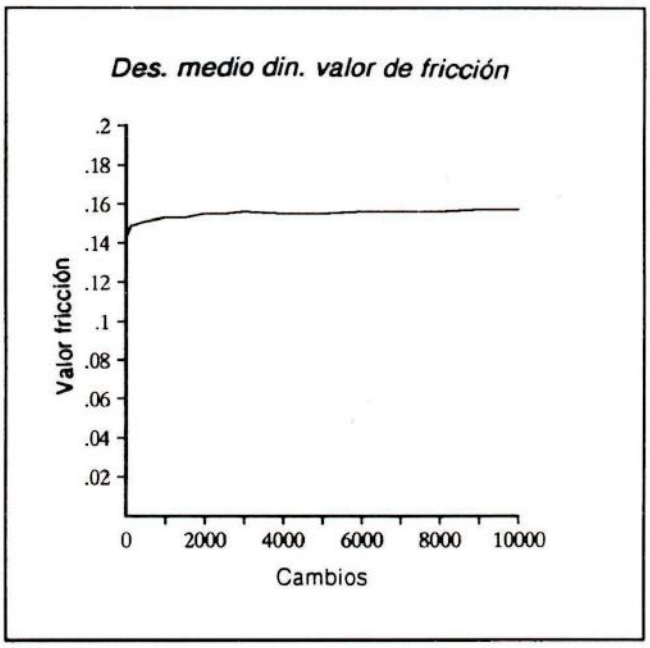

Condiciones de ensayo

Cantidad de cambios: 10000 cambios
Momento de inercia de las masas: 5.1 kg m^2
Revoluciones: 1500 min^{-1}
Cambios por minuto: 3
Velocidad de deslizamiento: 22.61 m s^{-1}
Energía específica de cambio: 0.64 J mm^{-2}
Rendimiento específico de cambio: 3.33 W mm^{-2}

Diámetro externo del recubrimiento: 306mm
Diámetro interno del recubrimiento: 270mm
Superficies de fricción: 6
Material opuesto: CK 60 nitrurado
Tipo de aceite: Shell DONAX TM
Paso de aceite: 8 l min^{-1}

Sample Lab Test Report

Link Test Report #:	170019-4
Test Description:	SAE J661 Rev Feb 1997 Brake Lining Quality Test
Purpose of Test	To Evaluate the Characteristics of Brake Materials
Program #:	BRW16008A0
Lining Material:	P.VO.165
Test Date(s):	16/02/2017

Requested By:

Fricciones Universales S.A
Alfredo Tomas Bertucci
Cuenca 678/80 - V.Lynch
San Martin - Prov. Bs.As
Código Postal B1672AHN
Argentina

Tested By:

Testing Coordination and Facility
Link South America
Avenida Jaraguá, 89
Sorocaba, SP
www.linkeng.com
Phone: (55) 15-3416-0600

SAE J661 Rev Feb 1997 Brake Lining Quality Test

Test Information

Customer Name	Fricciones Universales S.A
Requestor	Alfredo Tomas Bertucci
Test Procedure	SAE J661
Program Number	BRW16008A0
Test Coordinator	Pedro Oliveira
Test Equipment	Chase Machine #3443
Test Dates	16/02/2017
Datalogger	v1.0.10
Template Version	3.00

Setup Details

Sample Material	P.VO.165
Sample Size	25.4 mm x 25.4 mm
Sample Manufacturer	Fricciones Universales
Test Pressure	150 psi

Sample Test Summary

Normal Friction Coefficient	0.383
Normal Friction Class	F
Hot Friction Coefficient	0.369
Hot Friction Class	F
Minimum Bold Coefficient	0.278
Max Variation Below Average for Bold Readings	0.000
Max % Variation for Bold Readings	0.00%

Comments:

Processed by:	Henrique Rodrigues +55 (15) 3416 0607	Title:	T. Q. Engineer Trainee	Date:	16/02/2017
Reviewed by:	Pedro Oliveira +55 (15) 3416 0604	Title:	T.E. Coordinator	Date:	16/02/2017

Signed by:

Test Number

Sample 1
170019-4

Manufacturer
Fricciones Universales

Initial Baseline

Material
P.VO.165

Application	Sample 1
1	0.376
20	0.457

Normal **0.383** **F**

First Fade

Temp (°F)	Sample 1
200.0	0.453
550.0	0.339
(or Temp @ 10min)	

Hot **0.369** **F**

First Recovery

Temp (°F)	Sample 1	Average	Norm/Hot
500.0	0.438	0.438	
400.0	0.454	0.454	Hot
300.0	0.468	0.468	Hot
200.0	0.445	0.445	

Wear

Application	Sample 1
1	0.498
100	0.295

Second Fade

Temp (°F)	Sample 1	Average	Max Var. < Average	Norm/Hot	% Var
200.0	**0.346**	**0.346**	**0.000**	**Normal**	**0%**
250.0	**0.413**	**0.413**	**0.000**	**Normal**	**0%**
300.0	**0.423**	**0.423**	**0.000**	**Normal**	**0%**
350.0	**0.389**	**0.389**	**0.000**	**-**	**0%**
400.0	**0.348**	**0.348**	**0.000**	**Normal**	**0%**
450.0	**0.360**	**0.360**	**0.000**	**Hot**	**0%**
500.0	**0.372**	**0.372**	**0.000**	**Hot**	**0%**
550.0	**0.425**	**0.425**	**0.000**	**Hot**	**0%**
600.0	0.372	0.372	0.000	Hot	0%
650.0	0.305	0.305	0.000	Hot	0%
(or Temp @ 10min)					

Second Recovery

Temp (°F)	Sample 1	Average	Max Var. < Average	Norm/Hot	% Var
600.0	0.359	0.359	0.000	-	0%
500.0	0.354	0.354	0.000	Hot	0%
400.0	0.302	0.302	0.000	Hot	0%
300.0	**0.278**	**0.278**	**0.000**	**Hot**	**0%**
200.0	**0.336**	**0.336**	**0.000**	**-**	**0%**

Final Baseline

Application	Sample 1
1	0.355
20	0.430

Manufacturer: Fricciones Universales
Material: P.VO.165
Test Pressure: 150 psi

Normal **0.383** **F**
Hot **0.369** **F**

16/02/2017
170019-4
Sample 1 of 1

Wear

	Initial	Final	Loss
Weight (gram)	6.000	5.700	0.300
Thickness (mm)	4.723	4.513	0.210
Indicator	N/A	N/A	N/A

Specific Wear Rate
-4.59E-01
-2.07E-01

Baseline

	Initial		Final	
Event	Force (ib)	μ	Force (ib)	μ
1	55.3	0.376	54.1	0.355
5	57.2	0.388	62.1	0.407
10	61.2	0.414	65.5	0.429
15	63.9	0.433	64.5	0.423
20	67.6	0.457	65.6	0.430

Wear

Event	Force (ib)	μ
1	74.6	0.498
10	55.0	0.368
20	46.8	0.312
30	51.4	0.343
40	49.4	0.329
50	47.8	0.319
60	49.0	0.326
70	47.7	0.317
80	49.7	0.330
90	47.1	0.313
100	44.5	0.295

First Fade

Time (sec)	Force (ib)	μ	Temp (°F)
0.0	60.8	0.422	180
30.0	68.7	0.459	213
60.0	70.5	0.470	255
90.0	69.1	0.461	296
120.0	71.1	0.474	335
150.0	71.2	0.475	375
180.0	68.1	0.454	414
210.0	62.0	0.414	449
240.0	57.7	0.385	482
270.0	56.9	0.379	519
295.3	55.9	0.339	550

Second Fade

Time (sec)	Force (ib)	μ	Temp (°F)
0.0	45.5	0.298	180
30.0	52.5	0.349	201
60.0	61.5	0.410	239
90.0	64.2	0.428	278
120.0	61.4	0.409	318
150.0	57.8	0.386	356
180.0	53.0	0.353	389
210.0	51.6	0.344	421
240.0	54.0	0.360	450
270.0	54.7	0.365	482
300.0	63.9	0.426	520
330.0	61.9	0.413	561
360.0	56.1	0.374	597
390.0	52.5	0.350	628
414.4	50.4	0.305	650

First Recovery

Event	Force (ib)	μ	Temp (°F)
1	64.9	0.438	492
2	67.4	0.454	397
3	69.5	0.468	302
4	66.2	0.445	204

Second Recovery

Event	Force (ib)	μ	Temp (°F)
1	54.7	0.359	588
2	53.9	0.354	492
3	46.0	0.302	396
4	42.3	0.278	299
5	51.2	0.336	203

Manufacturer: Fricciones Universales
Material: P.VO.165
Test Pressure: 150 psi

16/02/2017
170019-4
Sample 1 of 1

Coefficient of Friction