

# The Alternative Non Genuine Parts

There are many choices when it comes to non genuine parts, some are very good, some are not so good.

Why is this?

Put simply it is Quality Control. The Pacific brand is a good example and here's why.



# The Alternative Non Genuine Parts

Under ADR certification it is incumbent on vehicle manufacturers to insure any changes to the brake system do not render it non compliant.

It is also the responsibility of the vehicle owner and parts supplier to insure the same thing under Chain of Responsibility.



# The Alternative Non Genuine Parts

To insure compliance is not an issue the following needs to occur

Manufacturing partner is ISO 9001 certified & carries out 100% end of line testing.

Every part is identified by brand, part number, and date of manufacturer .



# The Alternative Non Genuine Parts

Continuing ongoing testing by importer to insure performance requirements are maintained.

At Air Brake Corp for example we do the following.

- Site visit and QA assessment of manufacturing facility on regular basis.
- Engineering evaluation of product samples prior to stock ordering.
- QA inspection of all incoming stock.



# What Brake Part Can I Fit Legality ?

**Peter Hart**

Chairman, ARTSA







# The Rules - Europe

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L 185/24

EN

Official Journal of the European Union

13.7.2012

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at:  
<http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29fdocstts.html>

**Regulation No 90 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of replacement brake lining assemblies, drum brake linings and discs and drums for power-driven vehicles and their trailers**

Incorporating all valid text up to:

02 series of amendments — Date of entry into force: 28 October 2011

# The Rules - Europe

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Specifies test or dynamometer comparisons – replacement v OEM.



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ECE R 90 provides a framework for approval of replacement foundation brake rubbing parts.

Specifies test or dynamometer comparisons – replacement v OEM.


Allows a 15 % performance variation between OEM and replacement parts.



# The Rules - USA

FMVSS 121 specifies dynamometer-based testing  
of foundation brakes.



 <b>PROGRAM DOCUMENT</b>  161 Thorn Hill Road Warrendale, PA 15086-7527	<b>PD5000</b>	<b>A</b>
<b>BRAKE LINING REVIEW INSTITUTE PROGRAM</b>		

## 1.0 Introduction

The Brake Lining Review Institute was established in 1994 by the SAE International (SAE) as a service to the heavy-duty commercial trucking industry. In early 2000 the operation of the Brake Lining Review Institute was transferred to the Performance Review Institute, Inc. (PRI) a wholly owned affiliate company of SAE. The purpose of this transfer was to facilitate the development of an industry recognized Qualified Products List (QPL) and to better fit the business strategies of both organizations.

The mission of the Brake Lining Review Institute (BLRI) is to provide a mechanism for reviewing and assessing data generated on brake lining materials used on commercial heavy duty trucks with established standard requirements for those materials.



# The Rules - USA

**Brake Aftermarket Lining Material Report - Provided to Technology & Maintenance Council (TMC)**

Vehicle Specifications (should approximately match your vehicle's specifications)						Brake Torque Output, in-lbs. (should approximately match that of the O.E.M. lining being replaced)			Brake Fade Index	Lining is Asbestos Free	Quality Certification of Manufacturing Plant	Lining has been Tested to FMVSS 121 Vehicle Test	Review Expiration Date
						Primary Torque to Match	Normal Stopping Pressure	Panic Stop Pressure	Lower % = Less Fade, Higher % = More Fade				
Brake Type	Brake Size	GAWR, lbs.	Chamber Type/ Size	Slack Adjuster Length	Tire Rolling Radius	40 PSI Value	20 PSI Value	80 PSI Value					
Drum	16.5 x 7	17-20000	30	5.5"	19.6"	42,956	20,876	92,901	20.00%	Yes	ISO 9001:2008	No	28-Feb-2016
Drum	16.5 x 7	22-23000	30	5.5"	19.6"	53,740	24,220	108,992	16.50%	Yes	ISO 9001:2008	No	28-Feb-2016
Drum	14.5 x 10	26000	30	7"	20.3"	71,792	36,040	122,304	37.40%	Yes	ISO 9001:2008	No	28-Feb-2016
Drum	16.5 x 7	22-23000	30	5.5"	19.6"	51,284	24,804	102,856	44.40%	Yes	ISO 9001:2008	No	28-Feb-2016
Drum	16.5 x 7	22-23000	30	5.5"	19.6"	58,995	29,891	112,712	85.00%	Info Not Provided	Info Not Provided	Info Not Provided	31-May-2014
Drum	16.5 x 7	17-20000	30	5.5"	19.6"	52,446	23,087	107,973	41.60%	Info Not Provided	Info Not Provided	Info Not Provided	31-May-2014
Drum	16.5 x 7	22-23000	30	5.5"	19.6"	66,620	32,348	131,261	77.60%	Info Not Provided	Info Not Provided	Info Not Provided	31-May-2014
Drum	16.5 x 7	17-20000	30	5.5"	19.6"	57,948	26,841	116,755	18.30%	Info Not Provided	Info Not Provided	Info Not Provided	31-Aug-2014
Drum	16.5 x 7	22-23000	30	5.5"	19.6"	53,659	24,643	117,451	11.60%	Info Not Provided	Info Not Provided	Info Not Provided	31-Aug-2014
Drum	16.5 x 7	17-20000	30	5.5"	19.6"	63,469	26,834	133,493	7.40%	Yes	ISO 14001:2004 ISO-TS16949:2009	No	31-Oct-2015

# The Rules - Australia

The ADR Brake Rules 35 & 38 are performance-based rules for the vehicle.



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- 4.1.6. All components and devices in the '*Brake System*' must meet or exceed at least one appropriate and recognized international, national or association standard, where such standards exist, or the relevant parts thereof. 'Recognized' can be taken to include SA, SAE, BS, JIS, DIN, ISO and ECE standards.





# The Rules - Australia

State Regs require that vehicles must not be modified away from ADR status.

This probably means that only OEM parts can be fitted unless an ADR test has been done.





Tested 5 OEM and replacement brake drums:

- SAE J431 3500c
  - Surface Hardness
  - Tensile Strength
  - Microstructure
  - Chemical Composition
- Weight



# Brake Drum Comparison

Carbon level in chemistry	Minimum 3.4%
Equivalent carbon accounting for other elements in chemistry	Minimum 4%
Surface hardness	187-255 Brinell (Note likely to be location dependent)
Tensile Strength	Minimum 209 MPa
Graphite form	VII
Graphite distribution	A
Graphite size	2-5



# Brake Drum Comparison

Table 2: Mass results

Sample #	Mass (kg)	Ranking
1	51.80	3
2	55.55	5
3	54.10	4
4	50.80	2
5	48.95	1

# Brake Drum Comparison

## 4.0 HARDNESS EVALUATION.

A section was removed each of the subject brake blocks and prepared for Brinell hardness testing. All hardness testing was carried out in accordance with the requirements of AS 1816.1-2003 "Metallic materials - Brinell hardness test" using a load of 3000kg with a 10mm ball indenter. The following results were recorded;

Table 4: Brinell hardness test results

Sample	Brinell Hardness Results (HB 10/3000)			Average (HB 10/3000)	Ranking
1	182	181	185	183	4
2	181	182	181	181	5
3	187	183	183	184	3
4	212	217	217	216	1
5	187	187	183	186	2

X

X

X

X

# Brake Drum Comparison

## 5.0 MECHANICAL TESTING (Tensile Test).

A tensile test piece was removed from each of the subject brake drums and tested in accordance with AS1391-2007, "Metallic materials – Tensile testing at ambient temperature". The following results were obtained:

Table 5: Tensile Test Results

Sample	Specimen dimensions Diameter (mm)	Tensile Strength (MPa)
1	10.04	204
2	10.00	187
3	10.04	268
4	10.05	336
5	10.04	278

X  
X

Ranking
4
5
3
1
2

# Brake Drum Comparison

## 6.0 MICROSTRUCTURAL EVALUATION.

A section from each of the subject brake blocks was removed and metallographically prepared for microstructural evaluation. The following features were observed (refer to table 5.0 and figures );

Sample	Graphite Form	Graphite Size	Graphite Distribution
1	VII	3	A
2	VII	2-3	A*
3	VII	2-3	A
4	VII	3	A
5	VII	2-3	A*

Table 5: Graphite evaluation for samples 1-5.

# Brake Drum Comparison

Table 3: Chemical analysis results

C	Mn	Si	S	P	Ni	Cr	Mo	Cu	V	Nb	Ti	Al	Mg	CEQ
<b>Sample: 1</b>														
3.5	0.73	1.8	0.12	0.12	0.04	0.29	0.03	0.32	0.01	<0.01	0.02	<0.01	<0.01	4.1
<b>Sample: 2</b>														
3.7	1.08	1.4	0.1	0.05	0.05	0.29	0.01	0.11	0.01	<0.01	0.02	<0.01	<0.01	4.2
<b>Sample: 3</b>														
3.6	0.71	1.6	0.03	0.01	0.03	0.21	0.01	0.08	0.01	<0.01	0.01	<0.01	<0.01	4.1
<b>Sample: 4</b>														
3.3	0.84	1.2	0.15	0.08	0.04	0.16	0.01	0.07	0.01	<0.01	0.01	0.01	<0.01	3.7
<b>Sample: 5</b>														
3.6	0.8	1.4	0.07	0.03	0.02	0.45	0.01	0.48	0.01	<0.01	0.02	0.01	<0.01	4.1
<b>Compositional Limits: SAE J431 – Grade 3500c</b>														
3.50 min	0.60 – 0.90	1.30 – 1.80	0.15 max	0.15 max	-	-	-	-	-	-	-	-	-	s

X



# Conclusions

- Operators are vulnerable in court if they fit replacement foundation brakes.
- The Federal Government has no jurisdiction.
- It is impractical to rely upon unspecified standards as per ADR.
- Dynamometer testing could provide the basis of a regulation



# Conclusions

- Australia needs a system to certify replacement foundation brakes based upon dynamometer testing





# Doing business with the National Heavy Vehicle Regulator

**Angus Draheim**  
**Assistant Project Director**

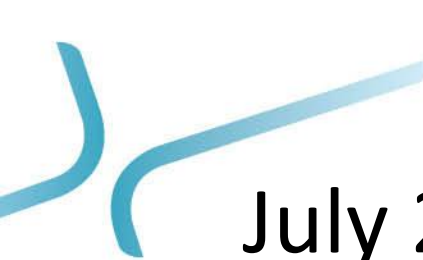


# 1 January 2013



## Improving Efficiency of Doing Business

- One Stop Shop Web site that will receive and process all applications for PBS and NHVAS Accreditation Modules utilising consistent forms and processes.
- NHVR staff providing support to applicants preparing PBS applications, working through the PBS approval process and assisting PBS approved vehicles gaining access to the road network.

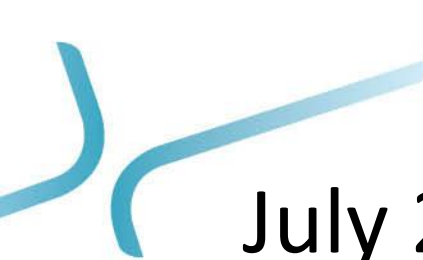


July 2013



## Improving Efficiency of Doing Business

- National on-line permit application and mapping system (phone and fax also available) incorporating:
  - Real time information on application status.
  - NHVR issuing all approved permits and rejections.
  - NHVR issuing statements of reasons for access rejections
  - Route maps displaying all nationally gazetted routes.
  - Details of access arrangements and requirements.

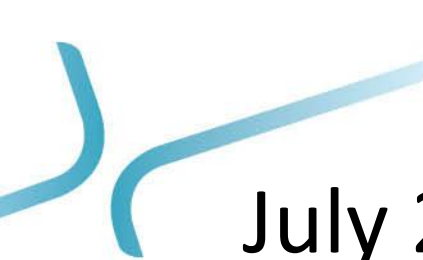


# July 2013



## Improving Efficiency of Doing Business

- NHVR Case Managers assisting applicants throughout the permit process.
- Implementation of new internal review processes for access decisions.
- Standard Fees and Charges for user pays services provided by the NHVR under the HVNL.
- Ministerial Guidelines and other national guidelines available to assist industry with the preparation of access applications and decision making.



# July 2013



## Improving Productivity and Safety

- NHVR providing technical support to local government to facilitate access decision making and access to the road network.
- AFM Risk Classification System (subject to approval), online coaching tool and template applications available to industry.
- National coordination and management of auditing for mass, maintenance and fatigue accredited operators.
- Industry codes of practice assessed and registered by NHVR on a nationally consistent basis.

# Vehicle Standards

## January 2013



- Harmonisation of **KEY** vehicle inspection standards:
  - aimed at ensuring that by commencement, all jurisdictions will inspect the same key things to the same standards
  - achieve mutual recognition of inspections between jurisdictions
- NHVR to engage jurisdictions on a 1 on1 basis



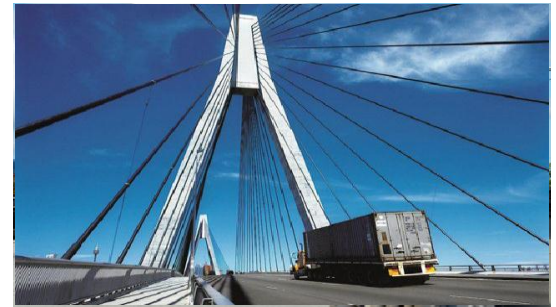
# Vehicle Standards

## Jan to July 2013



- Further harmonisation of vehicle inspection standards
- NHVR issuing guidelines and exemptions from heavy vehicle standards
- National information and training program in vehicle standards
- National collection, storage and analysis of vehicle standards data

# Vehicle Standards – a dynamic future



- In tradition of C&E and COR, regulators looking to industry to self-regulate
- Regulators then:
  - become legislative, policy and guideline setters
  - accredit and administer schemes
  - audit systems and processes
  - monitor compliance
- Model may be delivered in variety of forms including outsourcing inspection to 3<sup>rd</sup> parties / industry

# More Information



‘Road to Regulator’ newsletter – via website subscription

NHVR Project Office contact details

- Subscribe: form on contact page [www.nhvr.gov.au](http://www.nhvr.gov.au)
- Website: feedback/enquiry option [www.nhvr.gov.au](http://www.nhvr.gov.au)
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