



RP 628B

VMRS 013-001-015; -002-014

AFTERMARKET BRAKE LINING CLASSIFICATION

PREFACE

The following Recommended Practice is subject to the Disclaimer at the front of TMC's *Recommended Maintenance Practices Manual*. Users are urged to read the Disclaimer before considering adoption of any portion of this Recommended Practice.

PURPOSE AND SCOPE

The purpose of this Recommended Practice (RP) is to provide information for judging the performance of aftermarket brake linings on air-actuated foundation brakes, including testing in accordance with the dynamometer test procedure in Federal Motor Vehicle Safety Standard (FMVSS) 121 and lining supplier qualification information. Such information will assist fleet operators in choosing aftermarket brake linings that will perform adequately on typical combination (tractor/trailer) vehicles and single trucks.

BACKGROUND

While performance of original equipment (OE) brake linings is regulated by FMVSS 121, linings sold as replacements for these friction materials are not. Testing of small lining samples to SAE J661 a, producing a two letter "friction identification code" (EE, FF, GH, etc.), is **not** considered accurate in determining performance on a full size brake. **As a result, brakes relined with certain aftermarket materials can have reduced braking output, cause a shift of work to brakes on other axles, and reduce the overall stopping capability of the vehicle.**

NOTE: This RP has been updated in 2009 to include certain additional information on lining performance and suppliers. As a result, some information will not be shown for materials listed prior to this update. As older listings of linings reach their five-year expiration, this additional information will be presented in the listing updates.

The Performance Review Institute (PRI), an affiliate of SAE International, has formed the Brake Lining Performance Review Committee to review results of FMVSS 121 dynamometer performance tests

conducted by qualified laboratories, in accordance with the test conditions described in this RP. The **Appendix** represents the most recent results available at the time of this manual's publication. Results are also made available through TMC's website <http://tmc.truckline.com> and PRI's website www.pri-network.org/ Brake Lining Program. Readers should visit these websites for the most current list.

LINING TORQUE VALUES

Brake torque output can be compared for linings which have been tested for FMVSS 121 dynamometer performance, using the test conditions of this RP.

Three torque values are listed for each lining at application pressures of 20, 40, and 80 psi. Most vehicle brake applications are typically non-panic stops at low pressures—usually 20 psi or less. Medium braking occurs around 40 psi, while heavy or panic stops can be at 80 psi or higher. Historically, the 40 psi value has been used to match brake torques of aftermarket linings. The 20 and 80 psi values are also now reported for additional fleet operator information. See **Table 1**.

CAUTION: The torque values of an aftermarket lining should approximately match that of the original equipment lining it is replacing. The vehicle manufacturer should be able to compare such things as lining wear. Brake lining output torque, by itself, should not be used to measure total brake system performance. Due to variability in testing and lining composition, torques shown in the aftermarket lining classification list are approximations only.

BRAKE FADE INDEX

Fade is a characteristic of brakes in which braking torque is reduced as brake temperature increases. Fade can be a concern for vehicle operations in which high brake temperatures are experienced, such as mountainous operation or heavy brake usage in cities.

The RP628B Brake Fade Index uses the brake power portion of the FMVSS 121 dynamometer test. In this

test, a brake is required to complete 10 snubs from 50 MPH in a timed sequence.

The RP 628B Brake Fade Index is the change in maximum braking force effectiveness from Snub 1 to Snub 10 during the Brake Power portion of the FMVSS 121 dynamometer tests submitted for the given lining and brake listed. A higher brake fade index number indicates a lining with more fade.

LINING MANUFACTURER INFORMATION

To further assist fleet operators in selecting aftermar-

ket linings, the following information is also provided for each manufacturer and lining formula:

- Whether or not the manufacturer of the lining has certified the specific lining formula as “asbestos free.”
- What quality certification is held by the manufacturing plant(s) that produce the specific lining formula.
- Whether or not the lining has been tested via either FMVSS 121 stopping distance vehicle test or FMVSS 121 parking vehicle test.

TABLE 1: LINING TEST CONDITIONS AND THE VEHICLE CONFIGURATIONS THEY REPRESENT									
Rim Size		Drive/Trailer				Steer			
22.5 In.	Brake Size (Drum - Dia./Width, in., Disc - Rim Size, in.)	16.5x7 Drum	16.5x7 Drum	16.5x7 Drum	22.5 Disc	22.5 Disc	15x4 Drum	16.5x5 Drum	22.5 Disc
	GAWR (lbs.)	20,000	20,000	23,000	20,000	23,000	12,000	14,600	14,600
	Air Chamber Size (type)	30	24	30	Various	Various	20	24	Various
	Cam Brake Slack Adjuster Size (in.) -	5.5	5.5	5.5	Not Req'd.	Not Req'd.	5.5	5.5	Not Req'd.
	Tire Size for Test, Rolling Radius (in.)	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
	Range of Tire Sizes on Vehicle	18.5 - 21.0	18.5 - 21.0	18.5 - 21.0	18.5 - 21.0	18.5 - 21.0	18.5 - 21.0	18.5 - 21.0	18.5 - 21.0
19.5 In.	Brake Size (Drum - Dia./Width, in., Disc - Rim Size, in.)	15x8.625 Drum	15x8.625 Drum	19.5 Disc	Additional brake sizes, linings, axle ratings, etc. can be supplied as special configurations for any wheel size.				
	GAWR (lbs.)	14,500	14,500	14,500					
	Air Chamber Size (type)	30	24	Various					
	Cam Brake Slack Adjuster Size (in.) -	5.5	5.5	Not Req'd.					
	Tire Size, Rolling Radius (in.)	15.3	15.3	15.3					
	Range of Tire Sizes on Vehicle	15.1 - 16.3	15.1 - 16.3	15.1 - 16.3					
17.5 In.	Brake Size (Drum - Dia./Width, in., Disc - Rim Size, in.)	12.25x7.5 Drum	12.25x7.5 Drum	17.5 Disc	Additional brake sizes, linings, axle ratings, etc. can be supplied as special configurations for any wheel size.				
	GAWR (lbs.)	19,200	19,200	19,200					
	Air Chamber Size (type)	30	24	Various					
	Cam Brake Slack Adjuster Size (in.) -	5.5	5.5	Not Req'd.					
	Tire Size, Rolling Radius (in.)	14.6	14.6	14.6					
	Range of Tire Sizes on Vehicle	14.1 - 17.0	14.1 - 17.0	14.1 - 17.0					

The sets of FMVSS 121 test conditions listed above—which depend on gross axle weight rating (GAWR) and air chamber size—can be used to test and evaluate brake lining friction materials. The test conditions simulate vehicle configurations which are commonly used in on-highway tractor-trailer operations.

APPENDIX

AFTERMARKET BRAKE LININGS WHICH MEET FMVSS 121 CRITERIA FOR ORIGINAL EQUIPMENT LININGS AND APPROXIMATE OUTPUT TORQUE VALUES DURING A BRAKE APPLICATION

The Performance Review Institute (PRI)—an affiliate of SAE International—Brake Lining Performance Review Committee has compiled this list of aftermarket brake linings that meet the brake dynamometer requirements specified in FMVSS 121. All original equipment foundation brakes must meet these requirements.

Three torque values are listed for each lining at application pressures of 20, 40, and 80 psi. Most vehicle brake applications are typically non-panic stops at low pressures—usually 20 psi or less. Medium braking occurs around 40 psi, while heavy or panic stops can be at 80 psi or higher. Historically, the 40 psi value has been used to match brake torques of aftermarket linings. The 20 and 80 psi values are also now reported for additional fleet operator information.

The linings are listed in descending torque value. Order is not based on brake lining quality. The aftermarket brake lining list is intended to help fleets replace worn OEM linings with replacement linings of similar torque value to help ensure torque balance. The higher the torque value the more aggressive the brake lining.

PRI and TMC stress that the review of this information does not constitute PRI or TMC approval, certification, endorsement, or recommendation of the products; it simply verifies

that the brake lining material, as represented by the data presented to the PRI Brake Lining Performance Review Committee, has demonstrated its ability to meet FMVSS 121 dynamometer requirements, when installed on the indicated brake and operated in a configuration specified in TMC RP 628B, *Aftermarket Brake Lining Classification*.

NOTE: Vehicle compliance indicated in a lining's listing does not guarantee vehicle certification under all vehicle configurations. Brake lining products that are not on the list either were not tested, or did not pass. Only successfully tested linings are listed.

TMC permits distribution of this Appendix. However, the preceding preamble must appear in its entirety with any publication of the brake lining list.

Any friction material or foundation brake supplier who wishes to submit lining formulas for review and addition to the RP628B list should visit the website www.pri-network.org — <http://www.pri-network.org/other-programs/automotive-qpl/brake-lining/>— Brake Lining Program or contact PRI for information on how to submit test results. PRI may be reached at 161 Thorn Hill Road, Warrendale, PA 15086; phone: (724) 772-1616.

NOTICE: The material manufacturers provided the information contained in this report. The Performance Review Institute has not tested this material nor verified the manufacturers test results. The review of this information does not constitute an approval by SAE. The listing of these products on the Performance Review Institute Brake Lining Qualified Products List only verifies that the brake lining material, as represented by the data presented by the manufacturer, has demonstrated its ability to meet the established test criteria. It is the sole responsibility of the user to determine whether the material is or is not suitable for a particular application.

The torque of an aftermarket lining should approximately match that of the original equipment lining it is replacing. The vehicle manufacturer should be able to supply the original equipment lining formulation when supplied with the vehicle identification number. Brake lining output torque, by itself, should not be used to measure total brake system performance. Due to variability in testing and lining composition, torques shown in the aftermarket lining classification list are approximations only.

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Brake Lining Material Report - Provided to Technology & Maintenance Council (TMC)																
Company Name	Address	Market Brand Name	Brake Type	Brake Size	GAWR	Chamber Type	Stack Adjuster Length	Rolling Radius	40 PSI Value	20 PSI Value	80 PSI Value	Brake Fade Index	Lining is Ash Free	Quality Certification of Manufacturing Plant	Lining has been tested to FMVSS 121 Vehicle Test	Review Expiration Date
Carlisle Motion Control	4040 Lewis & Clark Drive Charlottesville, Virginia 22911	MB21	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	54,567	24,967	110,096	-2.10%	Info Not Available	Info Not Available	Info Not Available	30-Apr-2013
Carlisle Motion Control	4040 Lewis & Clark Drive Charlottesville, Virginia 22911	MB23	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	72,390	33,079	145,454	41.70%	Info Not Available	Info Not Available	Info Not Available	30-Apr-2013
Carlisle Motion Control	4040 Lewis & Clark Drive Charlottesville, Virginia 22911	CF2000	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	62,976	31,122	118,978	21.40%	Info Not Available	Info Not Available	Info Not Available	30-Apr-2013
Carlisle Motion Control	4040 Lewis & Clark Drive Charlottesville, Virginia 22911	MB20	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	53,145	24,570	111,887	0.30%	Info Not Available	Info Not Available	Info Not Available	30-Apr-2013
DUROLINE SA	Rua Geerson Andreis 366 Distrito Industrial - 95112 - 130 Caxias do Sul, RS, Brasil	CREST XL	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
DUROLINE SA	Rua Geerson Andreis 366 Distrito Industrial - 95112 - 130 Caxias do Sul, RS, Brasil	ULTRAPEAK BRT	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
DUROLINE SA	Rua Geerson Andreis 366 Distrito Industrial - 95112 - 130 Caxias do Sul, RS, Brasil	ULTRAPEAK FT	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
DUROLINE SA	Rua Geerson Andreis 366 Distrito Industrial - 95112 - 130 Caxias do Sul, RS, Brasil	VISTA HP	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	51,284	24,804	102,866	44.40%	Yes	ISO 9001:2008	No	28-Feb-2016
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR SILVER	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
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR BLUE	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
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR ORANGE	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
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR BLACK	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	57,948	26,841	116,785	18.30%	Info Not Provided	Info Not Provided	Info Not Provided	31-Aug-2014
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR GOLD	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
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR RED	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	62,587	26,826	126,420	72.40%	Yes	ISO 14001:2004 ISO/TS 16949:2009	No	31-Aug-2017
Federal Mogul	1 Grizzly Lane Smithville, Tennessee see 37166-2810	OTR GREEN	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	61,840	28,679	122,311	69.10%	Yes	ISO 14001:2004 ISO/TS 16949:2009	No	31-Aug-2017
FRAS-LE North America	37728 Hills Tech Drive Farmington Hills, Michigan 48331	MG1	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	63,469	26,834	133,493	7.40%	Yes	ISO/TS 16949:2009	No	31-Oct-2015
TMD Friction, Inc.	1035 Crooks Road Troy, Michigan 48084	Textar T5000	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	53,537	26,114	108,215	24.80%	Yes	ISO/TS 16949:2009	Yes	28-Feb-2017
TMD Friction, Inc.	1035 Crooks Road Troy, Michigan 48084	Textar T3070	Disc	225	12000	T18	NR	19.6"	37,058	15,544	83,144	-13.20%	Yes	ISO/TS 16949:2009	Yes	28-Feb-2017

List current as of March 2013

NR=Not Required

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

Company Name	Address	Market Brand Name	Brake Type	Brake Size	GAWR	Chamber Type	Stack Adjuster Length	Rolling Radius PSI Value	40 PSI Value	20 PSI Value	80 PSI Value	Brake Fade Index	Lining is Ashless Free	Quality Certification of Manufacturing Plant	Lining has been tested to FMVSS 121 Vehicle Test	Review Expiration Date
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	AR1	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	77,919	35,398	152,545	16.20%	Yes	ISO 9001:2000 ISO/ TS16949:2002 ISO 14001:2004	Yes	31-Aug-2014
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	Armada AR1	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	56,880	25,508	117,044	32.50%	Yes	ISO / TS 16949:2009	No	31-Jan-2018
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	AR2	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	73,797	34,159	140,183	109.80%	Yes	ISO 9001:2000 ISO/ TS16949:2002 ISO 14001:2004	Yes	31-Aug-2014
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	AR3	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	71,045	31,256	143,452	6.80%	Yes	ISO 9001:2000 ISO / TS 16949:2002 ISO 14001:2004	Yes	31-Aug-2014
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	AR4	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	67,674	30,478	128,463	21.20%	Yes	ISO 9001:2000 ISO / TS 16949:2002 ISO 14001:2004	Yes	31-Aug-2014
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	AR5	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	66,408	29,415	132,504	78.30%	Yes	ISO 9001:2000 ISO / TS 16949:2002 ISO 14001:2004	Yes	30-Sep-2015
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	ARSM	Drum	16.5 x 7	22-23000	30	5.5"	19.6"	79,805	36,522	147,360	32.60%	Yes	ISO 9001:2000 ISO / TS 16949:2002 ISO 14001:2004	Yes	30-Sep-2015
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	Armada AR20P	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	51,464	29,956	97,564	49.90%	Yes	ISO/TS 16949:2009	No	31-Jan-2018
TruckPro, Inc.	8110 Cordova Road, Suite 116 Cordova, Tennessee 38018	Armada AR23P	Drum	16.5 x 7	17-20000	30	5.5"	19.6"	64,920	29,604	131,896	73.50%	Yes	ISO/TS 16949:2009	No	31-Jan-2018

NR=Not Required

List current as of March 2013