Current Aftermarket Rating Systems Recommended Practice RP 628

James R. Clark, Chief Engineer
Foundation Brakes and Wheel Equipment

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Brake/Brake Lining Dynamic Performance Test Procedures

Procedure		Equipment	Parameters				Criteria/ Output
			Brake Size/Type	Axle Load	Tire Size (RR)	Actuation Forces	
Original Equipment	FMVSS 121	Inertia Dynamometer	Production Brake - Various	Various	Various	Various	Pass/Fail
		Vehicle	Production Brake - Various	Various	Various	Various	Pass/Fail

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Brake/Brake Lining Dynamic Performance Test Procedures

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		Vehicle	Production Brake - Various	Various	Various	Various	Pass/Fail
S.A.E.	J-661a	Small Bench Dynamometer	1 Sq. In. Lining Sample	Fixed	Fixed	Fixed	Coeff. Of Friction Range (Letter Code)

Typical Brake's Lining Surface = 240 Times Sample Size

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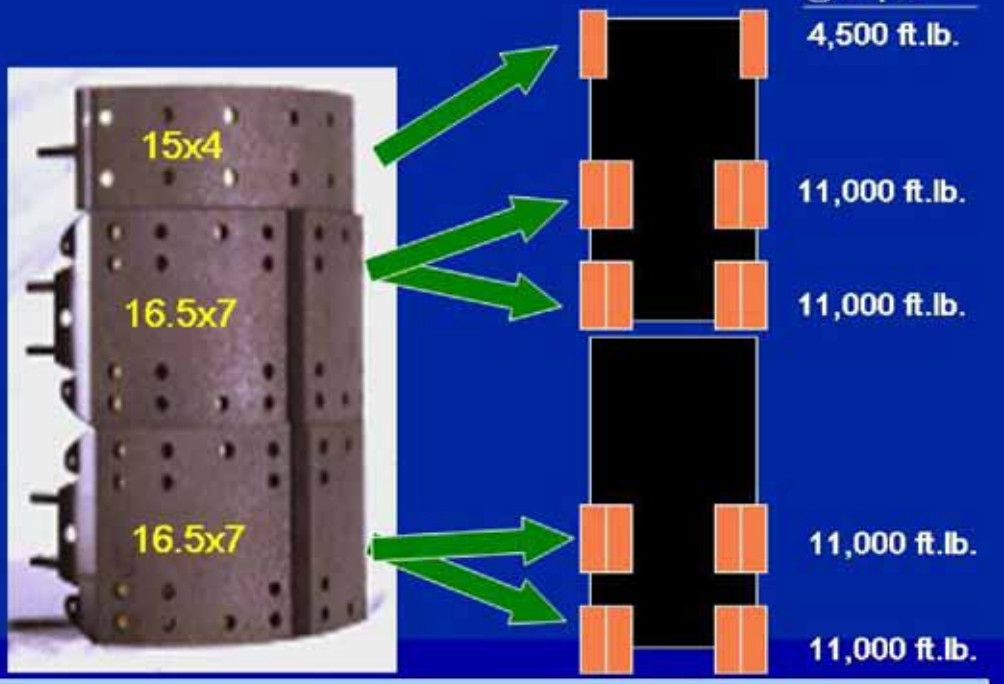
Typical Tractor Trailer Brakes



91% of Braking from 16.5x7 Drive & Trailer Axle Brakes

Brake/Brake Lining Dynamic Performance Test Procedures

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Brake/Brake Lining Dynamic Performance Test Procedures

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S.A.E.	J-1802	Full Size Inertia Dynamometer	"Precision Production Brake" - 16.5x7	Fixed	Fixed	Fixed	Coeff. Of Friction
T.M.C.	R.P. 628 - Current	Full Size Inertia Dynamometer	Production Brake - 16.5x7	Fixed - 20K & 23K	Fixed - 19.6"	T30, T24	Pass/Fail & Torque Output @ 40 PSI
	R.P. 628 - Future	Full Size Inertia Dynamometer	All Sizes	Various	Various	Various	Pass/Fail & Torque Output @ 40 PSI

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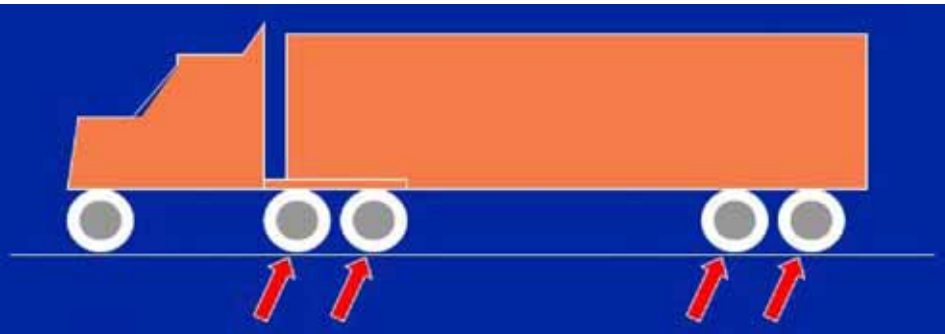

T.M.C. RP 628 Parameters (Current)

Brake Type	Drum
Actuation (Mechanical Advantage)	Cam
Brake Size (Diameter & Width)	16.5x7
Air Chamber Size, Sq.In.	T24, T30
Slack Adjuster Length, In.	5.5, 6.0
G.A.W.R., Lbs.	20,000 23,000
Tire Size (Rolling Radius)	19.6" (Ave.)
Typical Application	Truck, Tractor Drive Axles, Trailer Axles

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T.M.C. Recommended Practice 628 "Qualification of Aftermarket Brake Linings"

Program High Lights

- Originated 1994
- Provides a mechanism to present fleets with aftermarket brake lining performance data (FMVSS 121 certification & 40 psi brake torque), tested on qualified dynamometers
- Uses original equipment, full size inertia dynamometer, O.E. certification procedures, and high volume parameters
- Supported by a "standing" S.A.E./P.R.I. committee of industry brake engineers who review/accept/rejected lining tests
- Results on website www.pri.sae.org-NADCAP-brakerep.pdf

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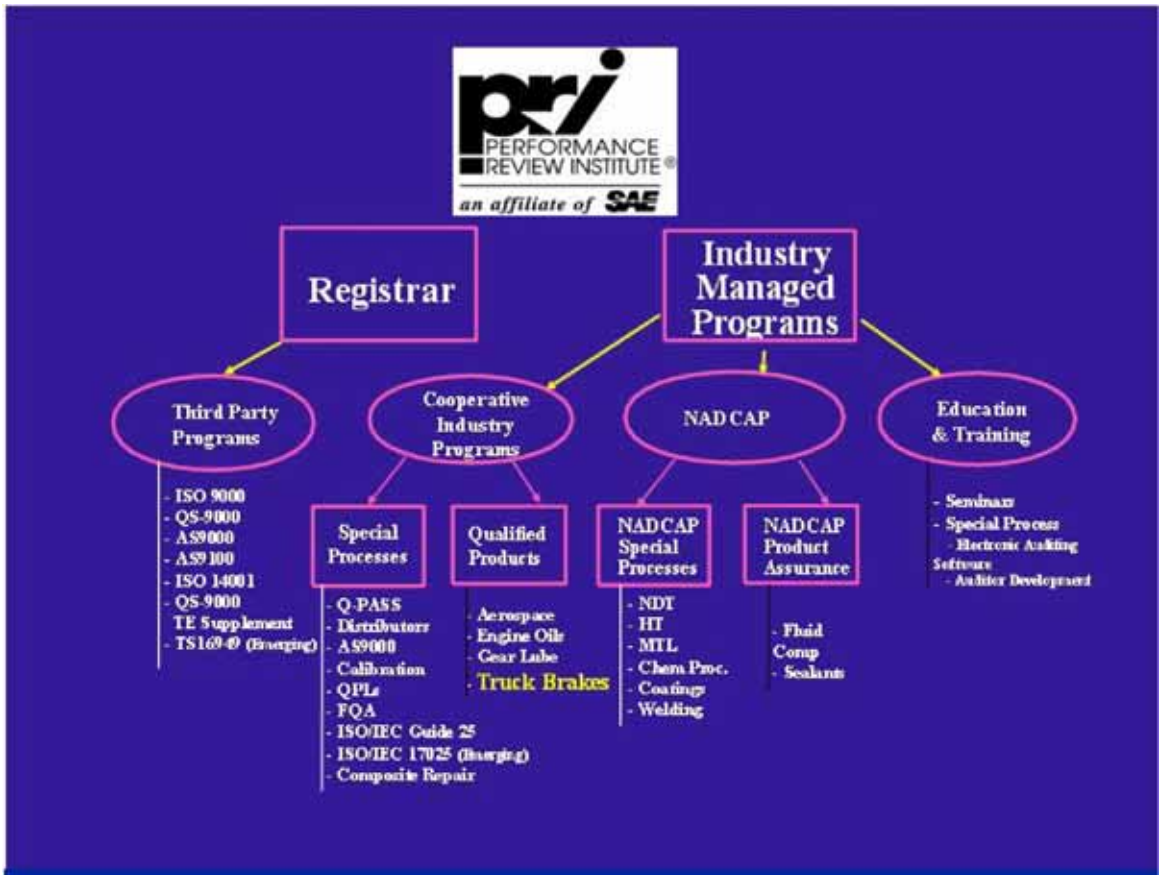

T.M.C. Recommended Practice 628
"Qualification of Aftermarket Brake Linings"

T.M.C.

Task Force RP 628

- Publishes List:
  - Linings That Meet FMVSS 121
  - 40 PSI Ave.Torque
- Updates RP

P.R.I./S.A.E.

P.R.I./S.A.E. Brake Lining Review Committee

- Approves Test Sites
- Reviews Lining Submissions:
  - FMVSS 121 Compliance
  - 40 PSI Ave.Brake Torque
- Upgrades Methodology
- Performs "Off the Shelf" Confirmation Testing

Lining Supplier

- Submits Test Data - Independent Lab or Qualified Internal Lab
- Supplies Technical Representatives to Committee

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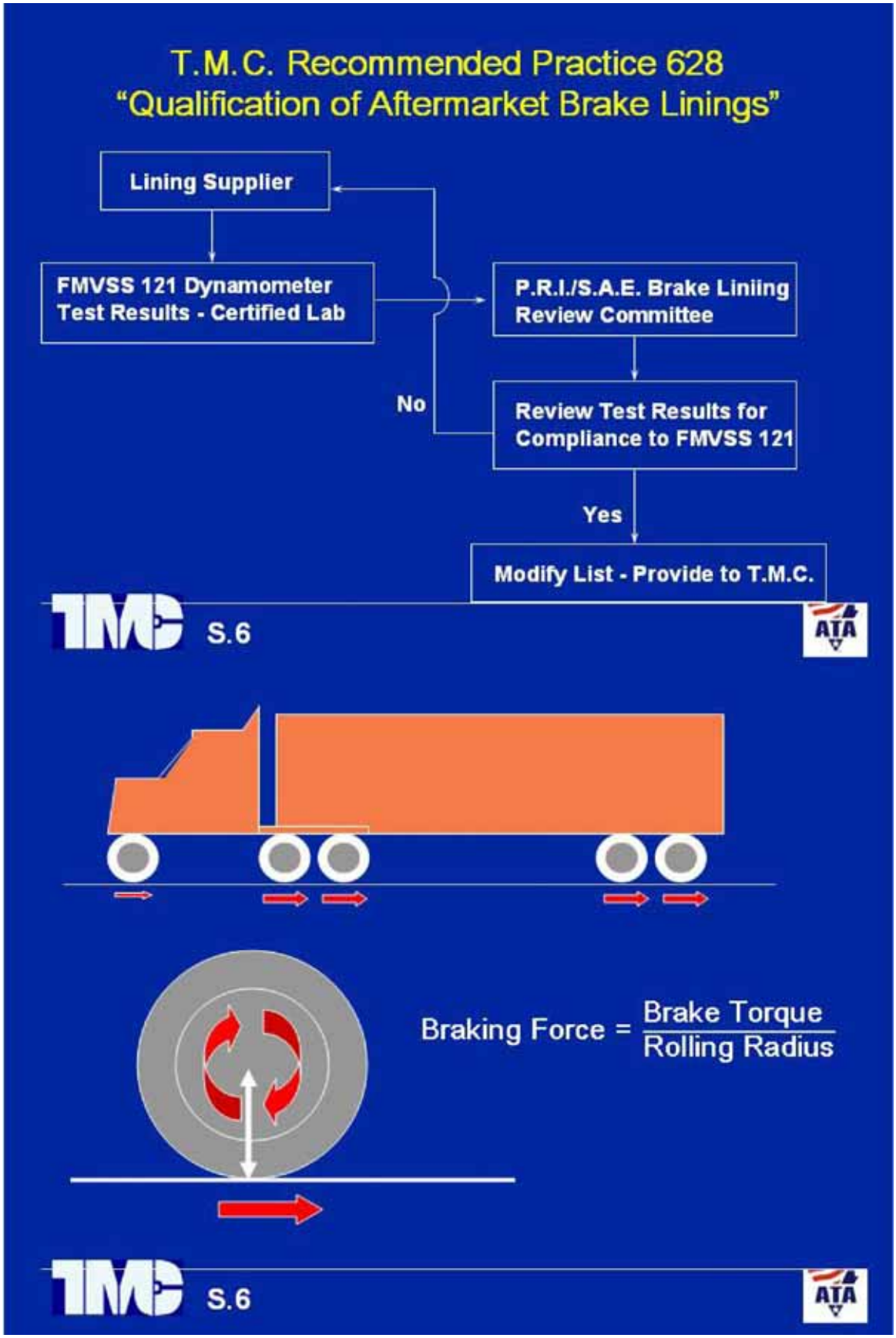
T.M.C. Recommended Practice 628
"Qualification of Aftermarket Brake Linings"
Lining Supplier
FMVSS 121 Dynamometer Test Results - Certified Lab
P.R.I./S.A.E. Brake Lining Review Committee
No
Review Test Results for Compliance to FMVSS 121
Yes
Modify List - Provide to T.M.C.
TMC
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Braking Force = Brake Torque / Rolling Radius
TMC
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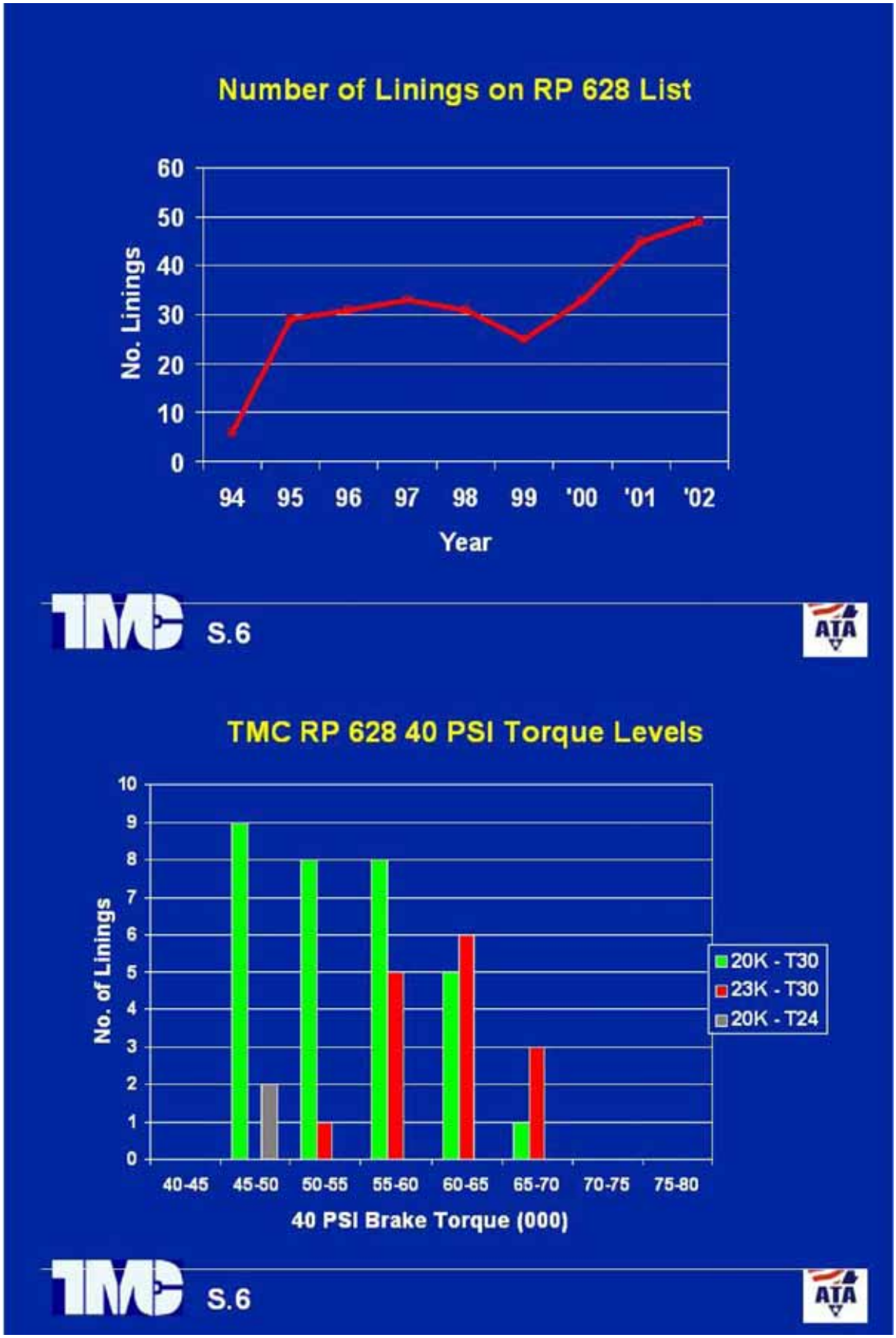
ATA


Number of Linings on RP 628 List
No. Linings
60
50
40
30
20
10
0
94
95
96
97
98
99
'00
'01
'02
Year
S.6
TMC RP 628 40 PSI Torque Levels
No. of Linings
10
9
8
7
6
5
4
3
2
1
0
40-45
45-50
50-55
55-60
60-65
65-70
70-75
75-80
40 PSI Brake Torque (000)
20K - T30
23K - T30
20K - T24
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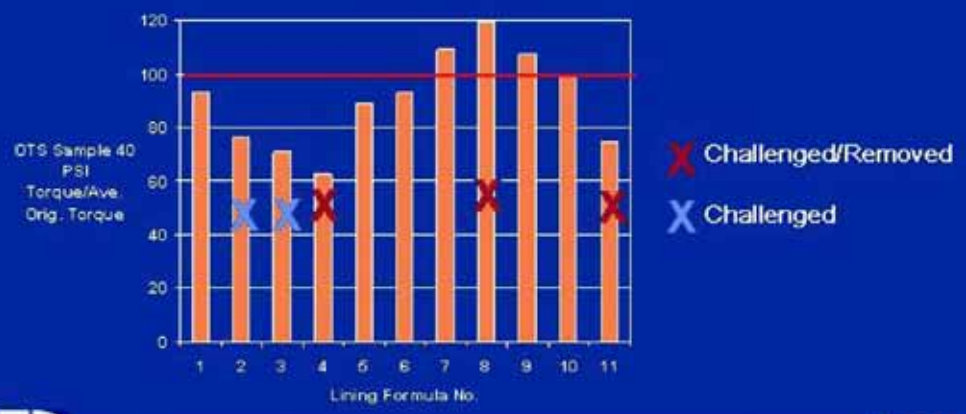
T.M.C. Recommended Practice 628 "Qualification of Aftermarket Brake Linings"

Program High Lights

- 5 year expiration, "Off the Shelf" verification program



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T.M.C. Recommended Practice 628 "Qualification of Aftermarket Brake Linings"

Program High Lights

- 114 Programs Reviewed by the Committee
- 23 for Dynamometer Qualification
- 70 for product listing
- 6 for clarification/review of additional data
- 11 off-the-shelf tests
- 4 for responses to off-the-shelf tests

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T.M.C. Recommended Practice 628
"Qualification of Aftermarket Brake Linings"

Program High Lights

- 28 Products Removed due to expiration
- 8 Products expired and were renewed
- 5 Products Removed due to Off-The-Shelf Testing
- Updated on PRI WEB site 2 weeks following transmittal to TMC

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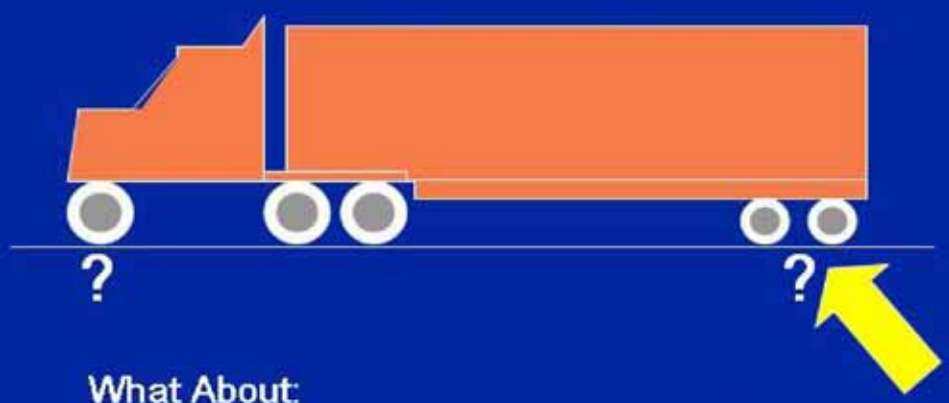

What About:

Steer
Other Wheel Sizes
Other Brake Sizes
Other Brake Types

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S.A.E./P.R.I. Brake Lining Review Committee Recommendations

- Other brake sizes, types, parameters will be added to RP 628
- Other brakes may not contain "equivalent" actuation systems:
  - Cam profile
  - Lever mechanical advantage (air disc)
- Revise R.P. 628 to permit other brake configurations, then publish brand name, full list of parameters, along with 40 psi torque
- Allow market to dictate supplier submissions

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Ideas for New Friction Material Rating System Including Federal Rulemaking

A. Require the exact lining formula that was on the new vehicle, as replacement lining

B. Require suppliers to certify the parameters that each aftermarket lining product must have to meet FMVSS 121 dynamometer test requirements (axle load, tire size, actuation system) & publish torque output

C. Develop a large sample lining test that accurately identifies friction level under FMVSS 121 type conditions, identify acceptable ranges, require all suppliers to test and report findings for each lining

Note: For B & C, establish a monitoring system for compliance

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