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MEASUREMENTS OF THE LONGITUDINAL AND LATERAL
TRACTION PROPERTIES OF TRUCK TIRES

Paul S. Fancher
Editor

DESCRIPTIVE PARAMETERS USED IN ANALYZING THE BRAKING
AND HANDLING OF HEAVY TRUCKS

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16. Abstract This volume is one of a set of five volumes being prepared under support from the Motor Vehicle Manufacturers Association. The set of volumes is entitled "Descriptive Parameters Used in Analyzing the Braking and Handling of Heavy Trucks." The volumes address the acquisition of data on (1) steering and suspension systems, (2) inertial properties, (3) tires, (4) brakes, and (5) antilock systems.					
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FOREWORD

This document contains the Introduction to an extensive set of truck tire data and the tables of contents for each of the three volumes comprising the total data set. Since the three volumes of data are lengthy (268, 482, and 445 pages long), this document has been prepared for those persons wishing to know the extent of the information available so that they can request specific data of interest in their work.

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The data presented here were organized by Mr. A. Tsukamoto. The extensive tables and listings were typed by Ms. J. Nafe. The major portion of the work that produced the tire data assembled here was performed under the direction of Mr. R. Ervin.

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INTRODUCTION

The purpose of this data set is to provide research scientists and engineers with detailed information on the shear force properties of specific truck tires.

The data presented herein have been extracted from the results of research studies [A through S]* conducted by the Physical Factors Division of the Highway Safety Research Institute (HSRI) of The University of Michigan. Almost all of this data** was measured using test devices and techniques developed by HSRI under support from the Motor Vehicle Manufacturers Association. These data are intended to be used in predicting and evaluating the braking and directional performance of commercial vehicles.

Due to the large number of tires and the variety of test conditions considered for various tires, the total array of test results fills three notebooks. The first notebook (Volume I) starts with data comparing different tires. These data provide an overview of the general nature of truck tire properties. The remaining data in Volumes I, II, and III are organized by tire size and identified as to tire manufacturer, model, and test conditions. It is assumed that the user of this data will be looking primarily for information on a particular size of tire.

The data are presented in the formats employed in the prior studies [A through S]. Unfortunately, this means that the data are not all in a standard form. Nevertheless, the graphs and tables used are believed to be self-explanatory.

Reference to the Table of Contents indicates that (1) Volume I covers tire sizes from 7.5-16.0C to 10.0-16.5E, (2) Volume II is devoted entirely to 10.0-20F tires, and (3) Volume III contains data on tires ranging in size from 10.0-20G up to 15.0-22.5H. In addition to the main Table of

*Letters in brackets refer to the references listed on pages 9 and 10.

**Data from a few truck tires that were measured on the Calspan TIRF facility are included.

Contents, each of the three volumes contains a detailed Table of Contents listing the type of data presented for each tire size. References to the original sources of the data (References [A through S]) are indicated in the Tables of Contents for each volume.

To aid in finding specific kinds of information, short tables listing the locations of longitudinal force, lateral force, and cornering stiffness data have been prepared. (See Tables 1, 2, and 3 of this document.) The Tables of Contents and short tables should be helpful in finding tire information needed for vehicle dynamics studies.

Table 1. Longitudinal Force Data, X-Direction.

<u>Tire Size</u>	<u>Manufacturer</u>	<u>Volume Number</u>	<u>Pages</u>
8.25-20E	Uniroyal	I	219-227
9.0-20E and 9.0-20F	Uniroyal	I	249
		I	251-258
10.0-20F	Firestone	II	3-6, 9, 11
			17-29
			56-68
			82-94
			107-120
			147-153
			161, 164, 184
			185-188
			193-198
			221
223-226			
369-395			
404-407			
	Goodyear	II	7, 11, 13
			30-42, 69-81
			95-106
			121-134
			147-153
			159, 163, 184
			185-188
			193-198
			402-407
			402-407
	Uniroyal	II	15, 16
			147-153
			162, 184
			185-188
			193-198
			221
			223-226
			342-368
			402-407
			402-407
	General	II	43-55
			136-144
			147-153
			160, 184
			185-188
			402-407
10.0-20G	Goodyear	III	4, 6-8, 11
			81-105
			109-113, 115
			157-161

Table 1. (Cont.)

<u>Tire Size</u>	<u>Manufacturer</u>	<u>Volume Number</u>	<u>Pages</u>
10.0-20G	Goodrich	III	5, 6-8
			31-53
			54-80
			109-113, 115
	Firestone	III	109-113, 115
	Michelin	III	109-113, 115
11.0R20H	Michelin	III	228-252
11.0-22F and 11.0-22G	Uniroyal	III	258-263
11.0-22.5F and 11.0-22.5H	Goodyear	III	269-286
	Uniroyal	III	287-294
	Michelin	III	297-299 303-327
12.0-20G and 12.0-20H	Firestone	III	335-347
	Uniroyal	III	348-354
12.0-22.5F	Uniroyal	III	364-371
12.5-22.5G	Firestone	III	385-411
15.0-22.5H	Uniroyal	III	417-429
			430-433
			436-441

Table 2. Lateral Force Data, Y-Direction.

<u>Tire Size</u>	<u>Manufacturer</u>	<u>Volume Number</u>	<u>Pages</u>	
7.5-16.0C	Firestone	I	97	
8.0-16.5D	Firestone	I	98, 100	
			105-194	
			195-197	
			198-200	
	Goodyear	I	99, 102, 104	
	Goodrich	I	101	
	General	I	103, 204-206	
8.0R16.5E	Goodyear	I	207, 209-211	
	Michelin	I	208, 212-214	
8.75-16.5E and 8.75R16.5D	Goodyear	I	229-231	
			231.1-233	
			234-236	
			237-239	
			240, 241, 243	
			246, 247	
9.50-16.5E	Montgomery Wards	I	261	
10.0-16.5E	Goodyear	I	262	
			263-265	
			266-268	
10.0-20F	Goodyear	II	166-168	
			178-180	
			202-204	
			211-213	
			426-428	
			429-431	
			432-434	
	435-437			
	General	II		169-171
				205-207
				420-422
				423-425
				172-174
181-183				
Firestone	II		199-201	
			208-210	
			227, 229, 231	
			233, 234	

Table 2. (Cont.)

<u>Tire Size</u>	<u>Manufacturer</u>	<u>Volume Number</u>	<u>Pages</u>
10.0-20F	Firestone	II	335-337
			408-410
			411-413
			414-416
			417-419
	Uniroyal	II	175-177
			191, 192
			214-216
			329-331
			332-334
10.0-20G	Goodrich	III	9-10
			12-14
			21-23
			24-26
	Goodyear	III	11
			27-29
			116-119
			127-129
			130-132
			145-147
148-150			
174-185			
Uniroyal	III	15	
Michelin	III	20	
		116-119	
		133-135	
		136-138	
		151-153	
		154-156	
		186-188	
		189-191	
		192-194	
		195-197	
Firestone	III	116-119	
		121-123	
		124-126	
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		142-144	
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Table 2. (Cont.)

<u>Tire Size</u>	<u>Manufacturer</u>	<u>Volume Number</u>	<u>Pages</u>
11.0R20H	Uniroyal	III	226
	Michelin	III	227
11.0-22.5F and 11.0-22.5H	Uniroyal	III	301
	Michelin	III	302
11.5-20G	Goodrich	III	330
12R22.5H	Michelin	III	373-376
12.5-22.5G	Firestone	III	378 382-384
	Goodrich	III	379
	Uniroyal	III	380
	Goodyear	III	381
15.0-22.5H	Uniroyal	III	443

Table 3. Cornering Stiffness Data

<u>Tire Size</u>	<u>Volume Number</u>	<u>Pages</u>
Comparison	I	3, 5, 21 55, 57, 59 71, 82
8.0-22.5D	I	215
10.0-20F	II	145, 157 217, 219, 235
10.0-20G	III	2-3, 109, 157
11.0-20F and 11.0-22G	III	254, 257
11.0-22.5F and 11.0-22.5H	III	295, 296, 300
12.0-20G and 12.0-20H	III	333
12.0-22.5F	III	357
12.5-22.5G	III	374
15.0-22.5H	III	415, 442

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