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COMPARISON

HSRI

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I. TABULATED DATA

DYNAMOMETER

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loads, the tire behaves (laterally) like a softening spring. The lateral spring rate is the slope through the origin of the lateral load-deflection curve.

TRACTION STIFFNESS (C_α, C_γ, C_s) - The following three properties are defined to characterize the mechanical behavior of a rolling tire operated at very small slip and camber angles and for very light application of braking or driving power.

Cornering Stiffness

$$C_\alpha = \left.\frac{dF_y}{d\alpha}\right|_{\alpha = 0} \qquad (1)$$

Camber Stiffness

$$C_\gamma = \left.\frac{dF_y}{d\gamma}\right|_{\gamma = 0} \qquad (2)$$

Circumferential Stiffness

$$C_s = \left.\frac{dF_x}{ds}\right|_{s = 0} \qquad (3)$$

where:

α = slip angle
γ = camber angle
s = circumferential slip parameter

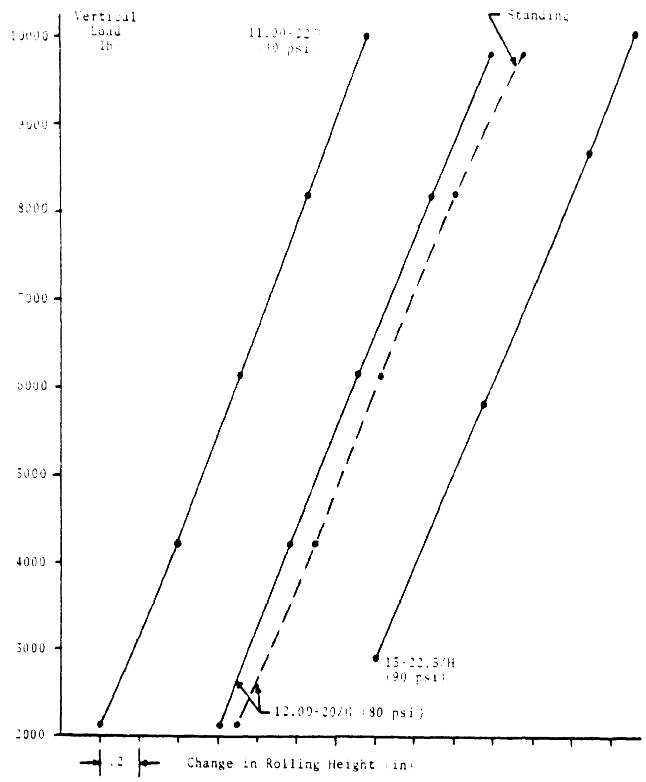


Fig. 1 - Vertical load versus change in low-speed rolling height of tires shown in Figs. 2A-2C

$$s \begin{cases} = 1 \text{ locked wheel} \\ = 0 \text{ free rolling (light braking: } s < 0.05) \\ < 0 \text{ driving} \end{cases}$$

F_x = longitudinal traction force (depends primarily on s)

F_y = lateral traction force (depends on both α and γ)

Graphically, the traction stiffness is the slope taken through the origin of the traction force (F_x or F_y) versus a particular operating variable (α, γ, or s) curve. These stiffnesses measure the initial rise of traction force and have no direct relation to peak values. However, a tire with higher traction stiffness will usually develop higher peak traction force. The usefulness of these definitions depends on linear behavior for small values of the operating variables. Examination of the following truck tire data will show this linearity to be a reasonable assumption.

GENERAL BEHAVIOR

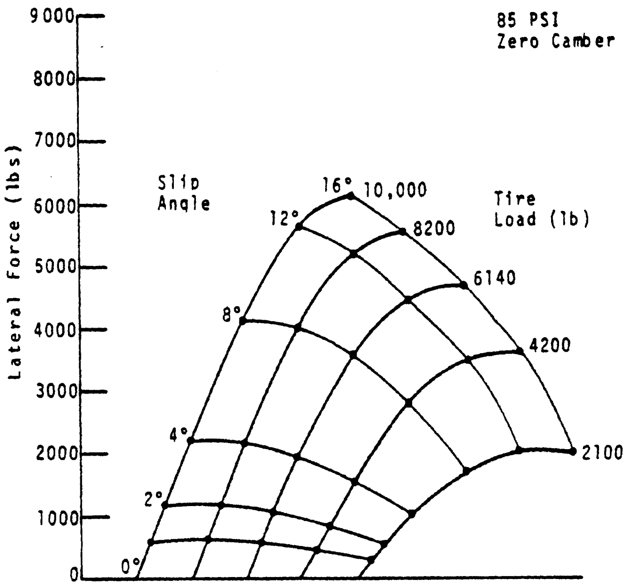
Figs. 2A-2C describe three truck tires chosen to exhibit a broad range of traction stiffness properties*. The mechanical properties listed below each tire were measured at rated load and pressure. The carpet plots of lateral force versus slip angle and vertical load show the variation in lateral force obtained and indicate how the cornering stiffness, C_α, is related to slip angle and load. Although C_α measures only the initial rise of lateral force with slip angle for a particular tire load, the rise is similar at other tire loads. It appears that a tire showing higher cornering stiffness will develop more lateral force than a lower stiffness tire operated at the same slip angle and vertical load.

TIRE LOAD

The operating variable having the greatest influence on traction stiffness is tire load. The influence of tire load derives from the extreme deformation which a tire undergoes in the contact region. Specifically, the meridian and circumference profiles, intersecting at the center of contact, are substantially altered in dimension and curvature as tire load is increased. The camber, cornering, and circumferential stiffnesses, being indirectly influenced by lateral and longitudinal tire stiffness, are consequently dependent on structural geometry, and are seen to increase with test load for the tires diagrammed in Figs. 3A-3D.

Particularly affected by sidewall deformation is the lateral spring rate, K_y. Fig. 3D illustrates the variation of K_y with tire load for the three tires shown in Figs. 2A-2C. Increasing load on the tire from far below the design value results mainly in an increased contact length with some change in the meridian profile. The increased contact length causes an increase in lateral stiffness. At higher loads, the changes in tire

*The tires are representative of the 14 different truck tire sizes tested for this program.



Load 6140 lb.

C_s 51,000 lb/unit slip

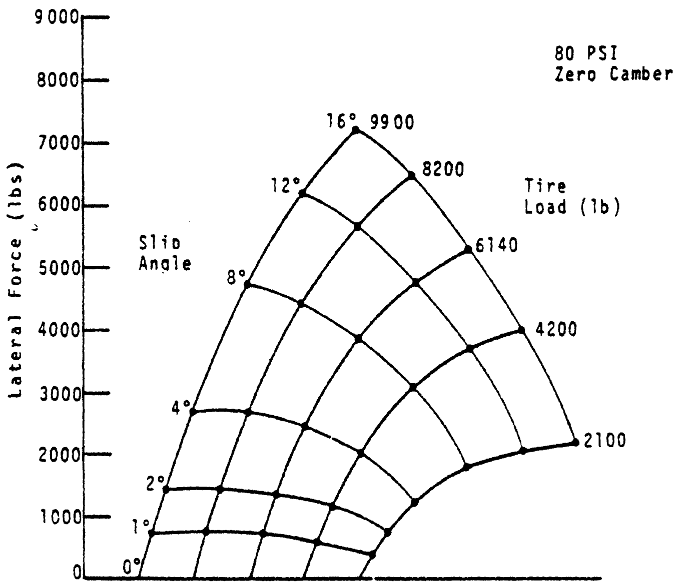
C_α 536.9 lb/deg

C_γ 62.8 lb/deg

K_y 1910 lb/in

K_z 5850 lb/in

A



Load 6140 lb.

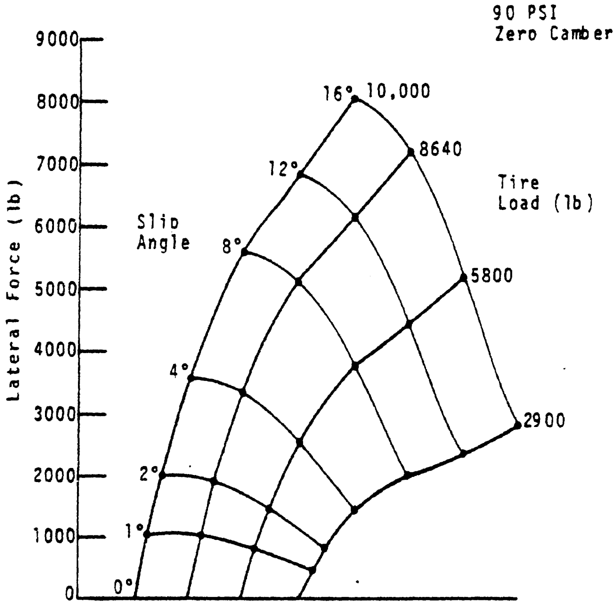
C_s 60,000 lb/unit Slip

C_α 700.8 lb/deg

C_γ 101.6 lb/deg

K_y 1900 lb/in

B



Load 8640 lb.

C_s 85,000 lb/unit slip

C_α 1014.7 lb/deg

C_γ 162.0 lb/deg

K_y 2860 lb/in

K_z 5420 lb/in

C

Fig. 2 - Measured mechanical properties of three different tires. A-11.00-22/G; B-12.00-20/G; C-15-22.5/H

profile become very pronounced, especially in the sidewall area, and cause a reduction in spring rate. It should be noted that the maximum value of lateral spring rate occurs near the design load for each tire tested.

The vertical load-deflection data are remarkably linear for a broad range of tire loads (Fig. 1). Fig. 1 suggests that it is reasonable to consider the tire as a linear vertical spring with spring rate, K_z, defined as the average slope of the load-deflection plot.

INFLATION PRESSURE

Increasing inflation pressure reverses the deformation caused by vertical load. Although a decrease in contact length accompanies an increase in inflation pressure, the dominant effects of increased pressure are reduced curvature in the sidewall and a generally stiffened carcass structure. The net result is a lateral spring rate that increases with inflation pressure, as is demonstrated by Fig. 4; these data being obtained on the three tires shown in Figs. 2A-2C. As may be expected, the effect of increasing the pressure is more pronounced at the higher loads which cause large distortions in the meridian profile.

The cornering stiffness, C_α, exhibits similar pressure sensitivity at higher vertical loads. Fig. 5 compares the lateral force versus slip angle and vertical load exhibited by a 10.00-20/G tire (Fig. 6B) at rated inflation pressure (100 psi) and at 50 psi. As can be anticipated from lateral spring rate behavior measured for these three different tires (Fig. 4), cornering stiffness increases with inflation pressure at higher loads.

The apparent similarity between K_y and C_α is due to the definition of K_y as the lateral stiffness of a standing tire measured at, effectively, a 0 deg slip angle while C_α is defined to measure the stiffness of the rolling tire in generating lateral force at very small slip angles. However, the contact region deformation associated with tire traction is considerably more complicated than the deformation associated with the measurement of K_y. As no rational basis exists for the correlation of these values, they are treated as independent mechanical properties.

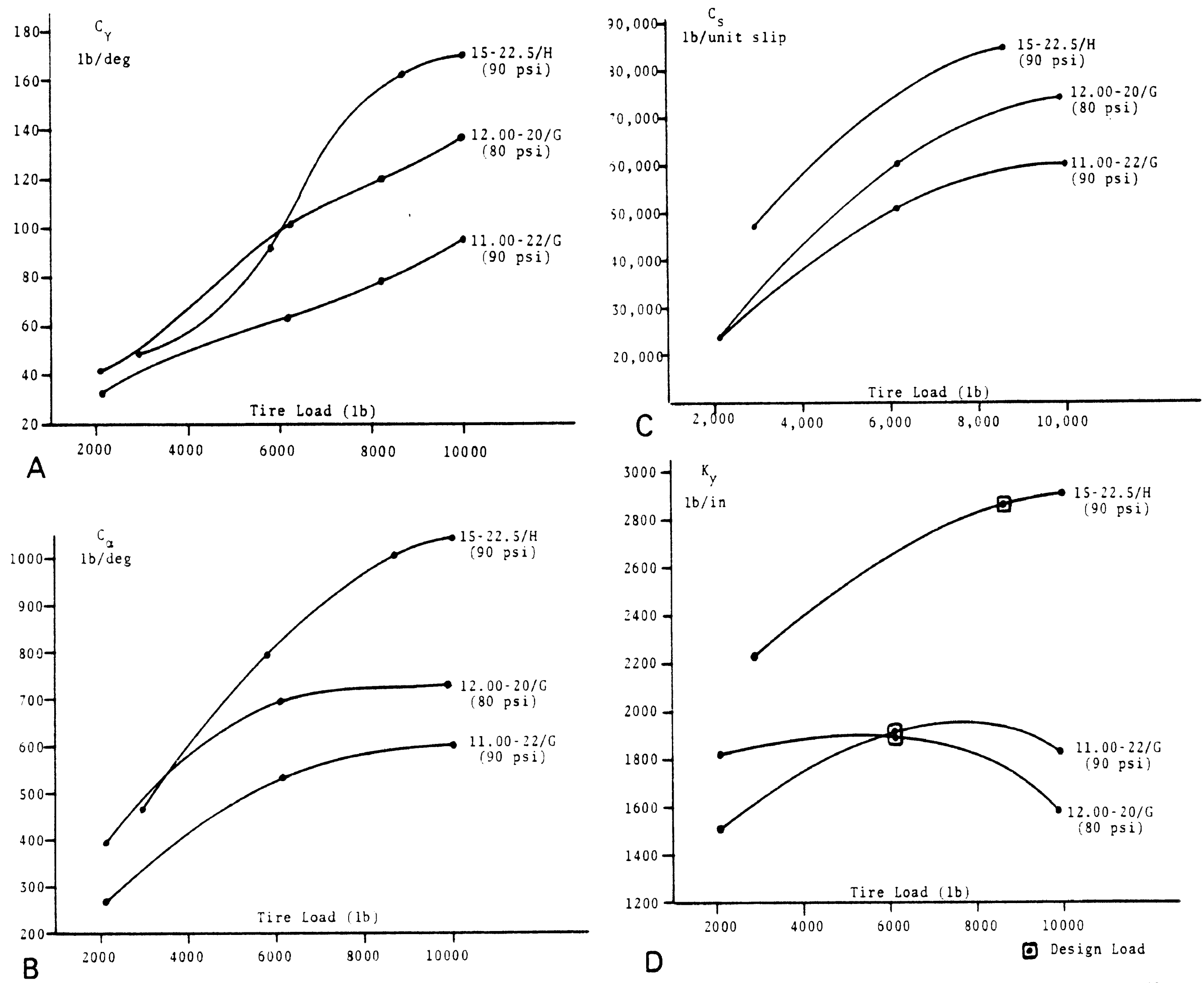


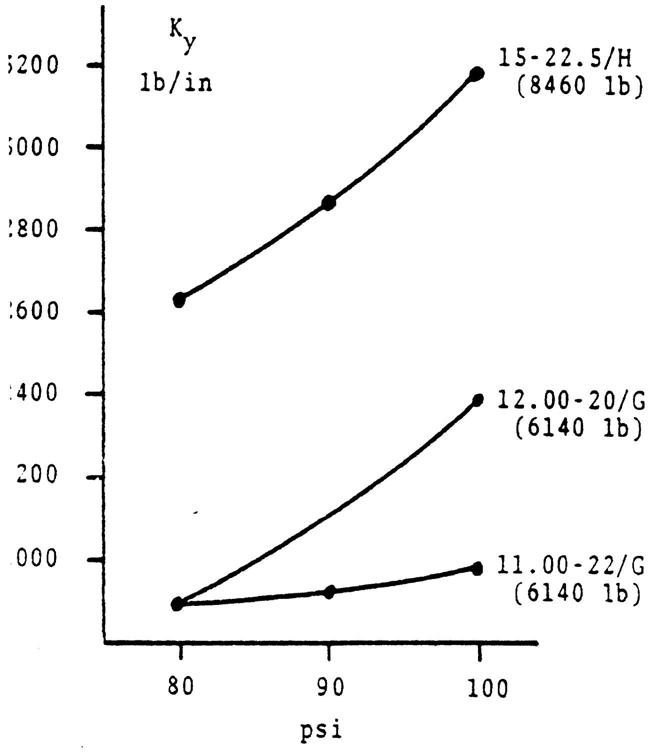
Fig. 3 - Variation of mechanical properties with tire load for tires shown in Figs. 2A-2C. A-camber stiffness versus tire load; B-cornering stiffness versus tire load; C-circumferential stiffness versus tire load; D-lateral spring rate versus tire load

ᴾLY RATING AND TIRE SIZE

The ply rating designates the load range for which a particu-ar size tire is designed. Load limits for various sizes at specific nflation pressures up to the design pressure are tabulated ıccording to empirical formulae. The ply rating is a measure ›f the strength of the tire carcass and does not necessarily ndicate the actual number of plies.

The tire pairs listed in Table 1 were tested on design width ›recision rims at the indicated pressures and loads which are near the design values specified for these tires used as singles and duals. The higher rated tire of each pair is generally used as a dual. The 20 in tires that were tested all have the tread pattern shown in Fig. 6B. The tread pattern of the 11.00-22 tires (Fig. 2A) is similar. Table 2 lists the measured mechanical properties and illustrates the differences which may be found in tires which are similar in all respects, except for ply rating.

The differences seen in Table 2 are slight and possibly influenced by tire nonuniformity and/or measurement precision. There is remarkably little change in the properties of the 11.00-22 tires, the largest set tested for differences due to ply rating. The slight increase in test pressure (see Table 1) may be responsible for the increases in vertical spring rate. It is of interest to note that the vertical spring rate measured for the 10.00-20 tire with the G rating was less than that obtained for the F load rating. However, the lateral force generating ability did increase with increased load rating as evidenced by the



ᶦig. 4 - Lateral spring rate K_y versus inflation pressure for tires shown ı Figs. 2A-2C

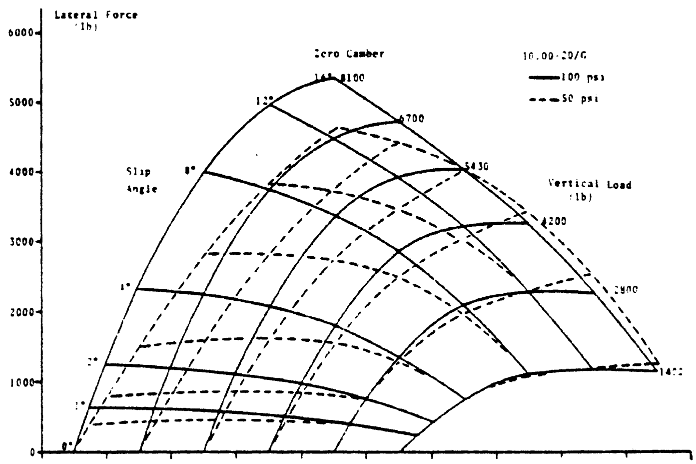
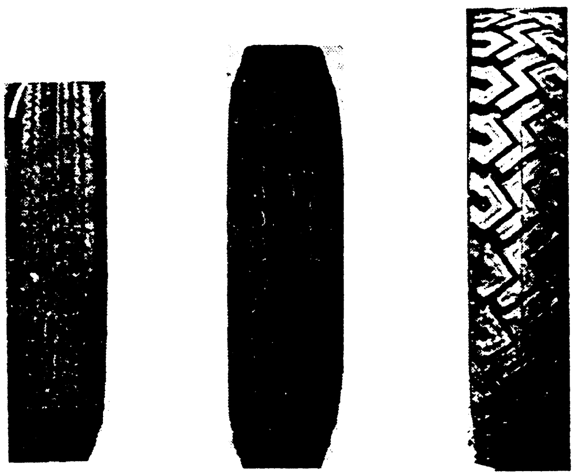


Fig. 5 - Lateral force versus slip angle and vertical load on 10.00-20/G tire at rated pressure (100 psi) and at 50 psi



(a) Rib-type I (b) Rib-type II (c) Open Tread

	(a) Rib-type I	(b) Rib-type II	(c) Open Tread	
s	46000	42000	28000	lb/unit slip
α	508.2	523.4	516.0	lb/deg
Y	56.7	69.0	39.9	lb/deg
y	1477	1618	1291	lb/in
z	5032	4700	4500	lb/in

Fig. 6 - Measured mechanical properties of 10.00-20/F nylon tire in three tread patterns. A-rib-type I; B-rib-type II; C-open tread

measured increase in C_α and by the carpet plot comparison given in Fig. 7.

Fig. 7 represents the extreme in force variation found in this study of ply rating and tire size. More tests are needed to establish firmly the trends evident in Table 2.

TREAD PATTERN INFLUENCE

It is widely recognized that the tread pattern is a very important factor in wet traction performance. However, it also appears that pattern influence is noticeable in the data from low-speed dry-traction flat bed tests. Fig. 6 shows the three 10.00-20/F nylon tires, similar except for tread design, that were tested in this study. Listed beneath the tires are the five basic mechanical properties defined earlier. The values shown were measured at rated inflation pressure, 85 psi, and rated load, 5430 lb.

From an examination of the data, it appears that tread design has little influence on the tire spring rates K_y and K_z. The cornering stiffness, C_α, was affected very little although the open tread did generate slightly higher lateral force at higher slip angles than the rib-type pattern (see comparison presented in Fig. 8). The camber stiffness, C_γ, was substantially changed by the tread pattern. In Fig. 9, it is seen that the open tread generated considerably less lateral force (or camber thrust) than the rib-type pattern.

The marked decrease in longitudinal stiffness, C_s (Fig. 6), is a result of increased tread compliance*. It would be of considerable interest to compare the peak braking traction of the rib-type and open tread tires. Although the force measuring equipment employed in these tests was incapable of responding to a longitudinal slip much above s = 0.04**, the higher initial slope (indicated by the measured C_s) of the F_x

*This is to be expected in the open pattern which has approximately twice the void area of the closed rib-type pattern.

**Far below that required for peak braking force generation.

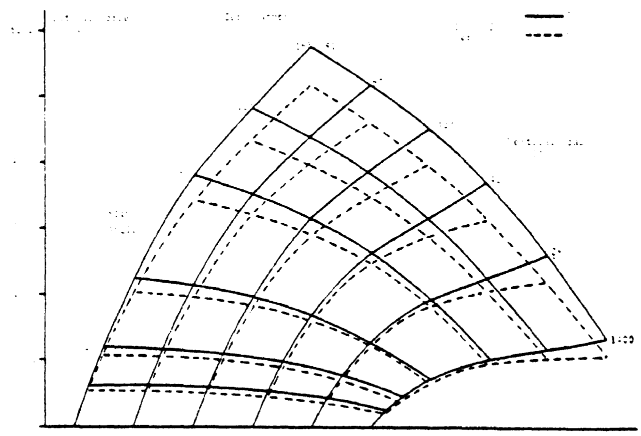


Fig. 7 - Comparison of lateral force versus slip angle and vertical load on 10.00-20 tires with ply ratings F and G

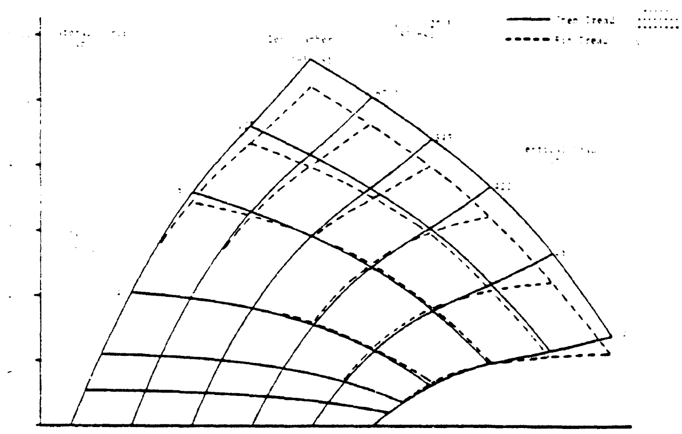


Fig. 8 - Lateral force versus slip angle and vertical load on open and rib-type II tread patterns

Table 1 - Tires Tested to Determine Influence of Ply Rating and Tire Size on Mechanical Properties

Tire Size and Rating	Test Pressure, psi	Test Load, lb
9.00-20/E	80	4160
9.00-20/F	85	4250
10.00-20/F	85	5430
10.00-20/G	85	5430
11.00-22/F	85	6290
11.00-22/G	90	6140

Table 2 - Measured Mechanical Properties for Three Sets of Two Tires Which Differ Only in Ply Rating

Tire	9.00-20		10.00-20		11.00-22	
Rating	E	F	F	G	F	G
C_s, lb/unit slip	41,000	41,000	42,000	50,000	47,000	51,000
C_α, lb/deg	466.1	479.4	523.4	588.8	542.7	536.9
C_γ, lb/deg	59.6	64.4	69.0	74.6	63.3	62.8
K_y, lb/in	1,673	1,889	1,618	1,482	2,116	1,909
K_z, lb/in	3,824	4,122	4,700	4,363	5,578	5,850

2.2 DATA MEASUREMENT AND PROCESSING PROCEDURES

2.2.1 TIRE PREPARATION. Truck tires were prepared for testing through the maintenance of certain practices intended to assure consistency of test conditions as well as representativeness of measured traction performance. All tires were mounted on their respective Tire & Rim Association-recommended rims (disc wheels).

The inflation pressure of each tire was maintained at a representative "hot" inflation level which had been identified in prior testing as the equilibrium value which accompanies operation at 60 mph and rated load, following "cold" inflation to the T&RA-recommended value. The maintained "hot" inflation pressure values are shown for each sample in Table 4.

Table 4.

Tire Sample	Size	Code	T&RA-Recommended "Cold" Inflation	Maintained "Hot" Inflation
Firestone Transport 1	10.00x20/F	FT10	85 psi	100 psi
Goodyear Super Hi Miler	10.00x20/F	GyS10	85	100
General Power Jet	10.00x20/F	GℓJ10	85	100
Goodyear Super Hi Miler	11x22.5/F	GyS11	90	100
Firestone Transport 1	12.00x20/H	FT12	105	120
Uniroyal Unimaster Rib	15x22.5/H	UU15	100	115

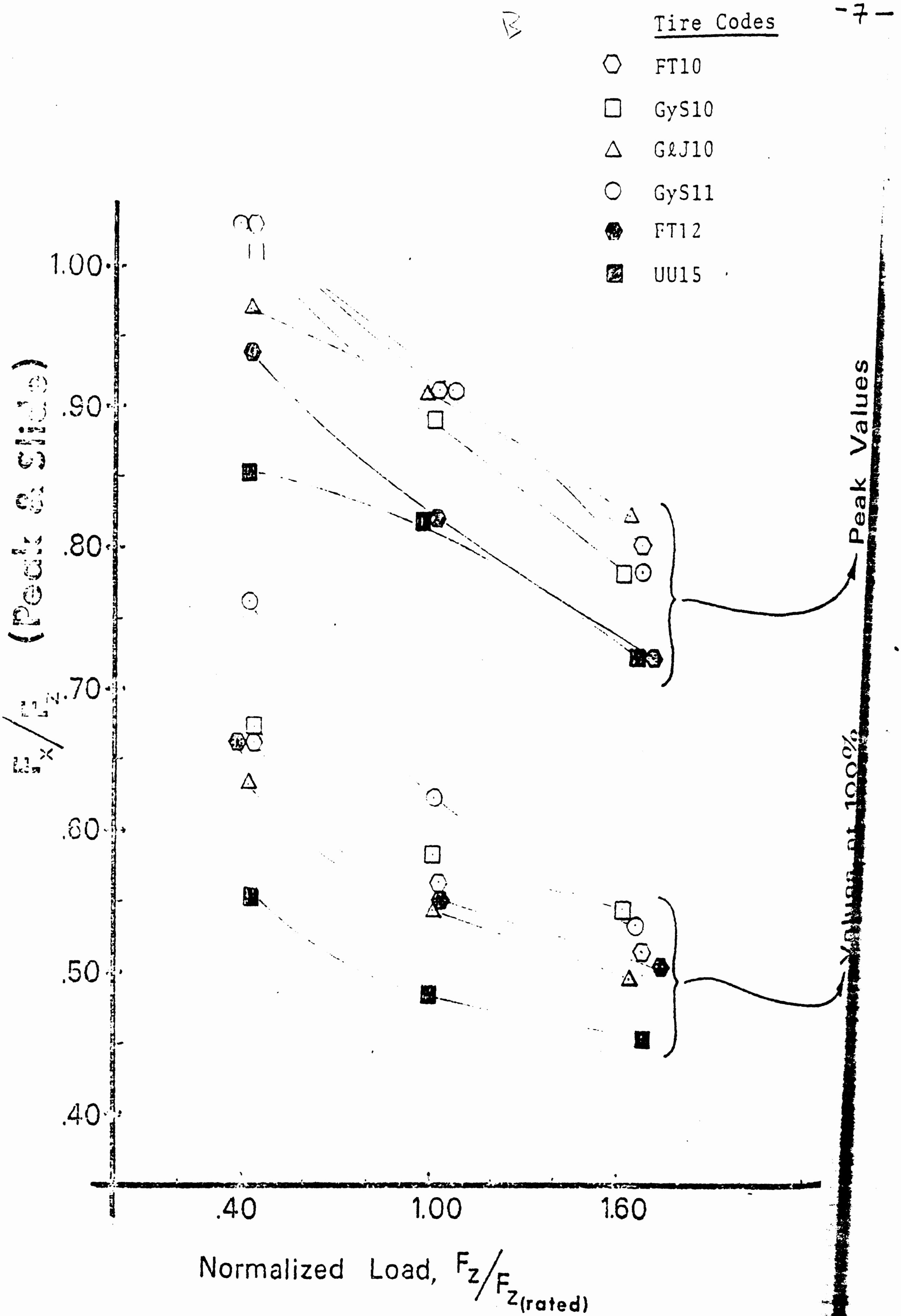


Figure 16. Normalized load sensitivity in the peak and slide traction of the six-tire sample (on BADC's asphalt).

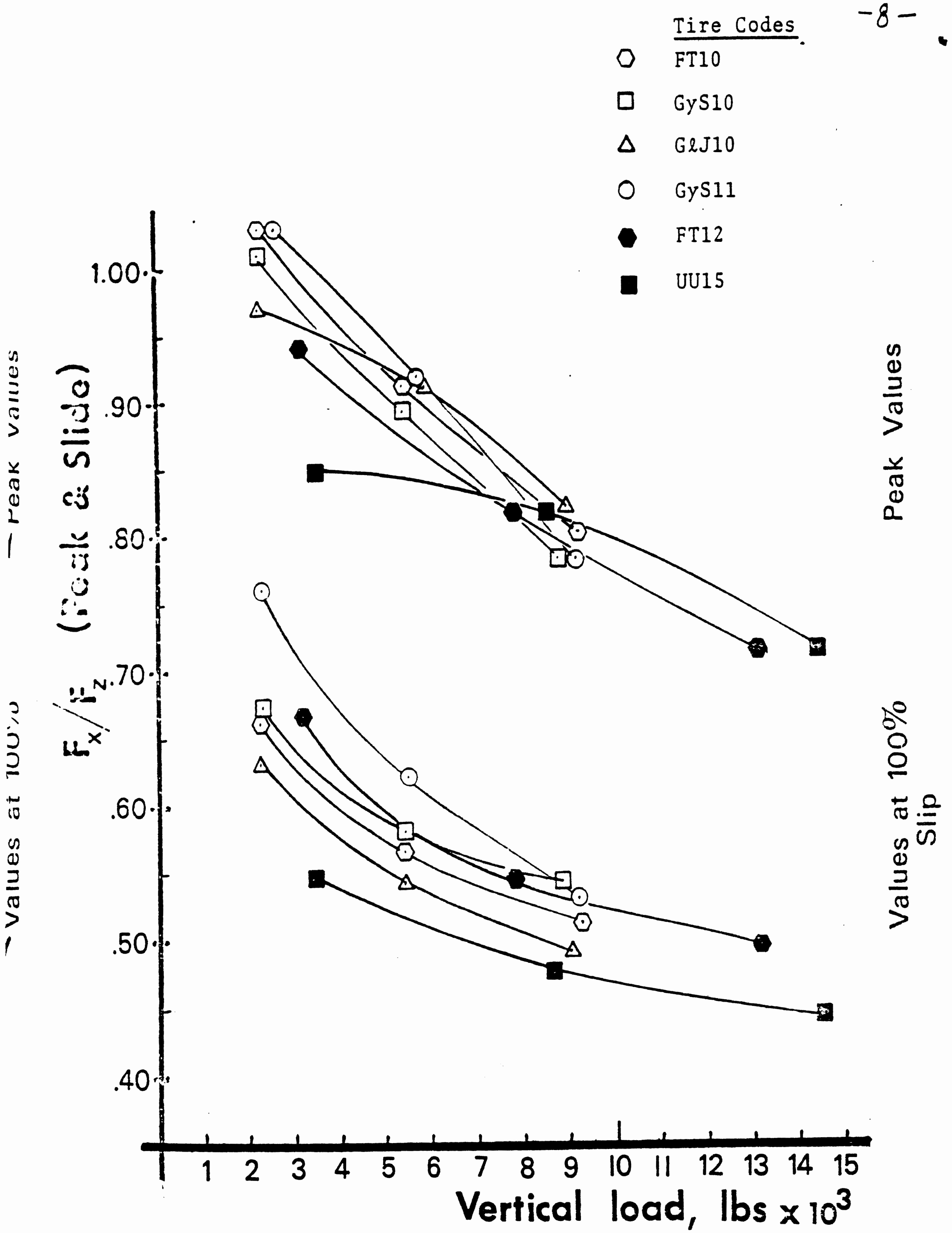


Figure 17. Load sensitivity (non-normalized abscissa) in the peak and slide traction of the six-tire sample (on BADC asphalt).

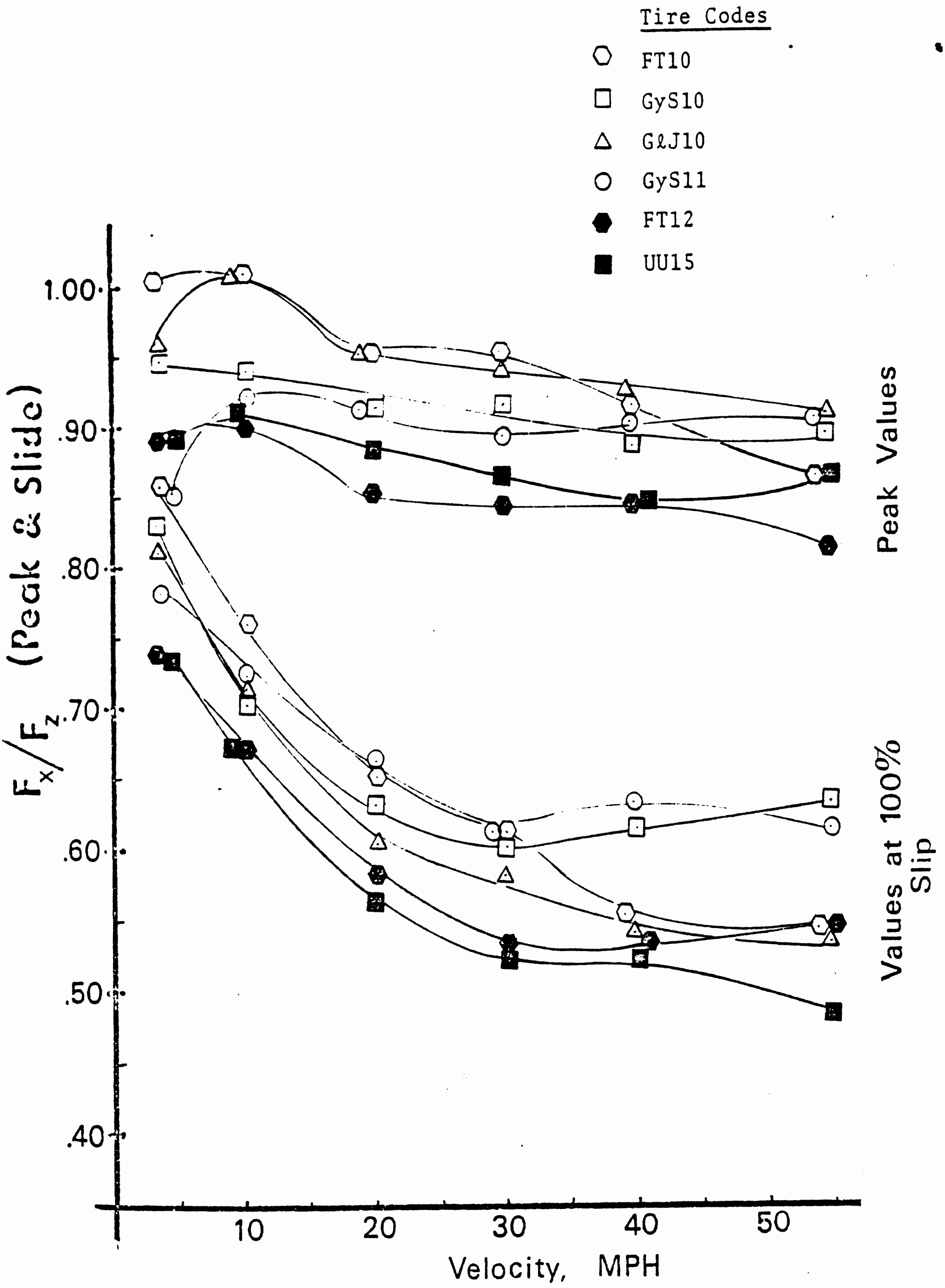


Figure 18. Velocity sensitivity of the peak and slide traction values for the six-tire sample (on BADC asphalt).

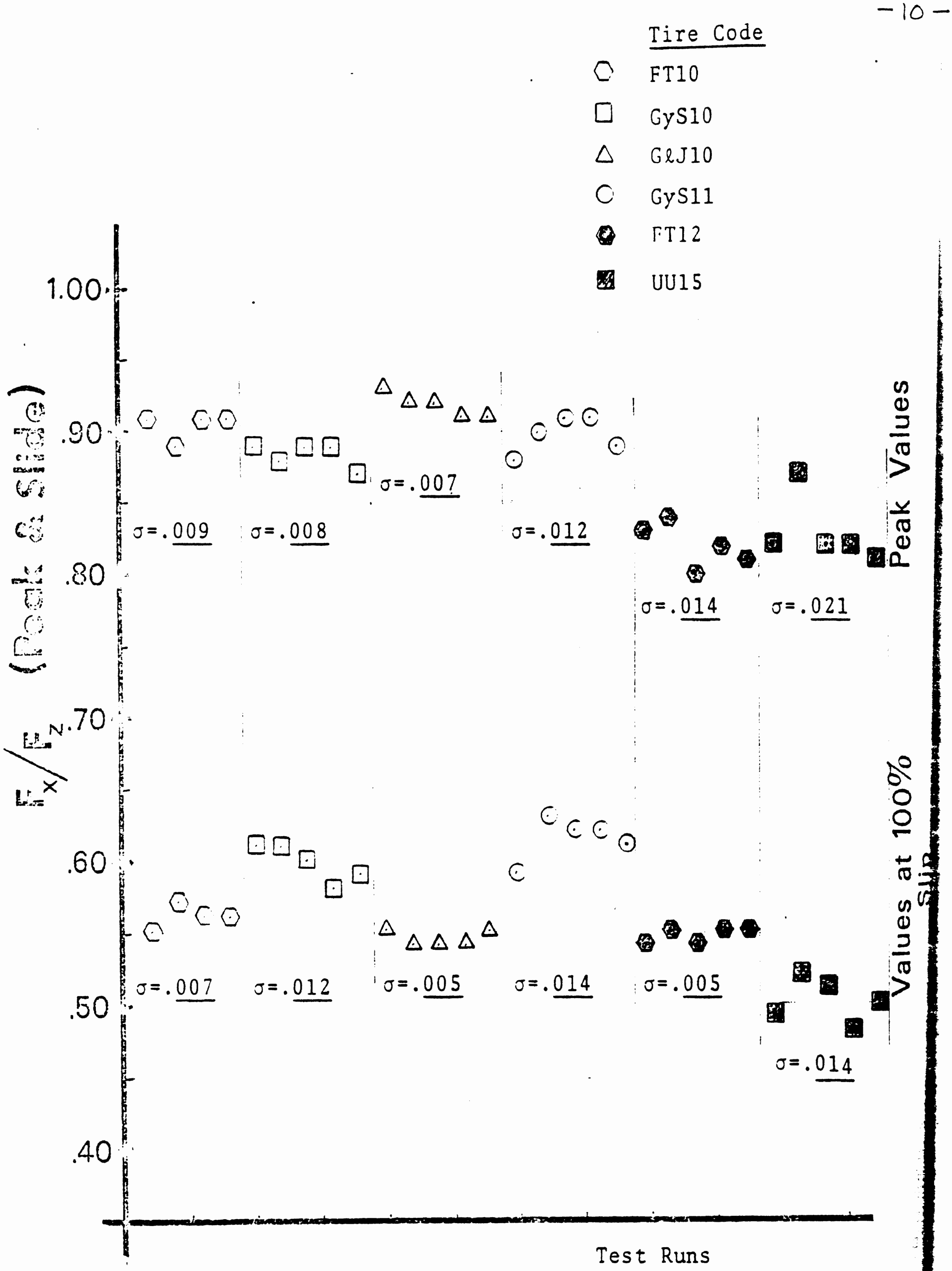


Figure 19. Peak and slide traction measures deriving from repeat runs of each of the six tires tested on the asphalt track at BADC.

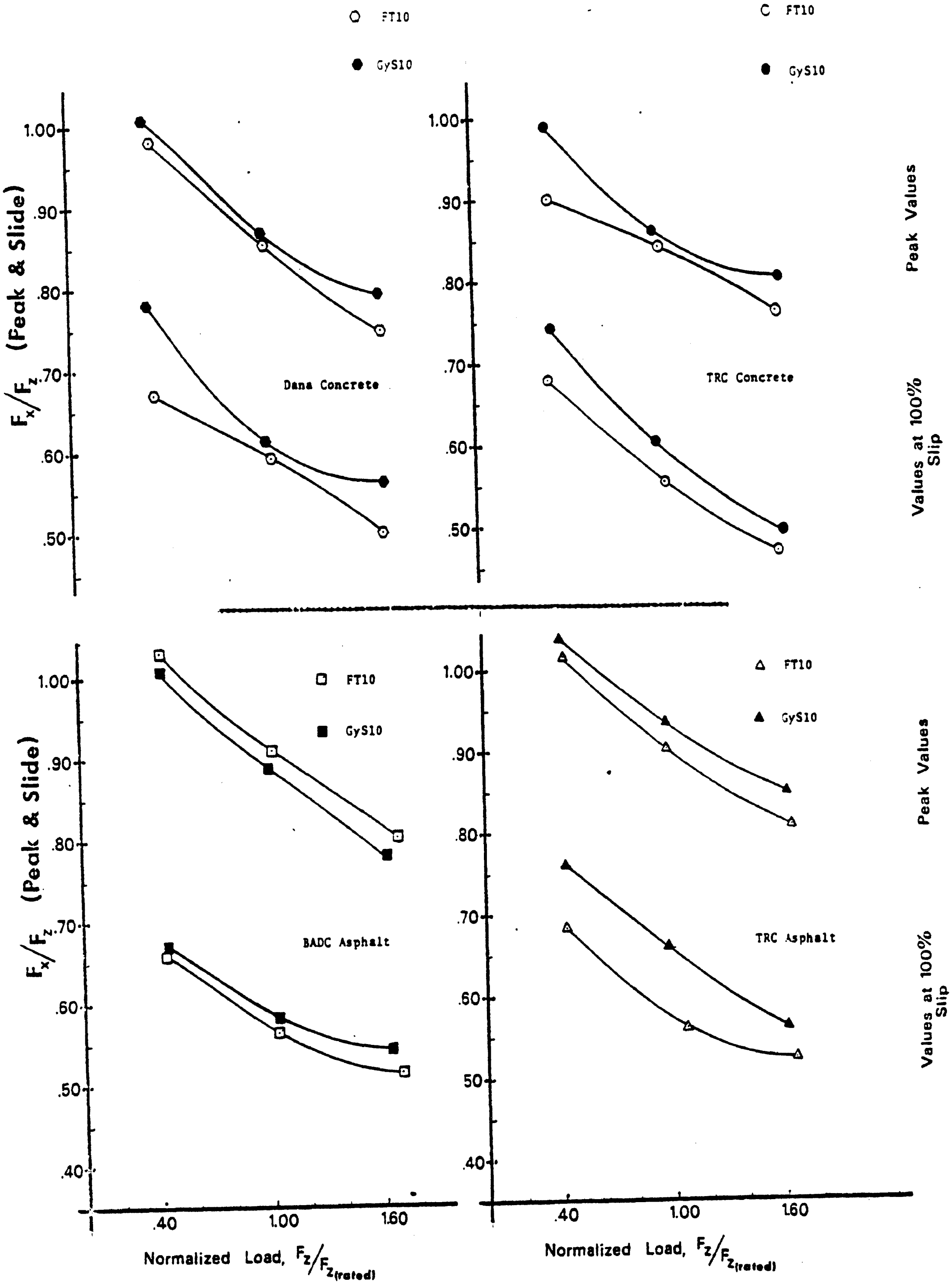


Figure 22. The differing influence of pavement surface on the load sensitivities of two tires.

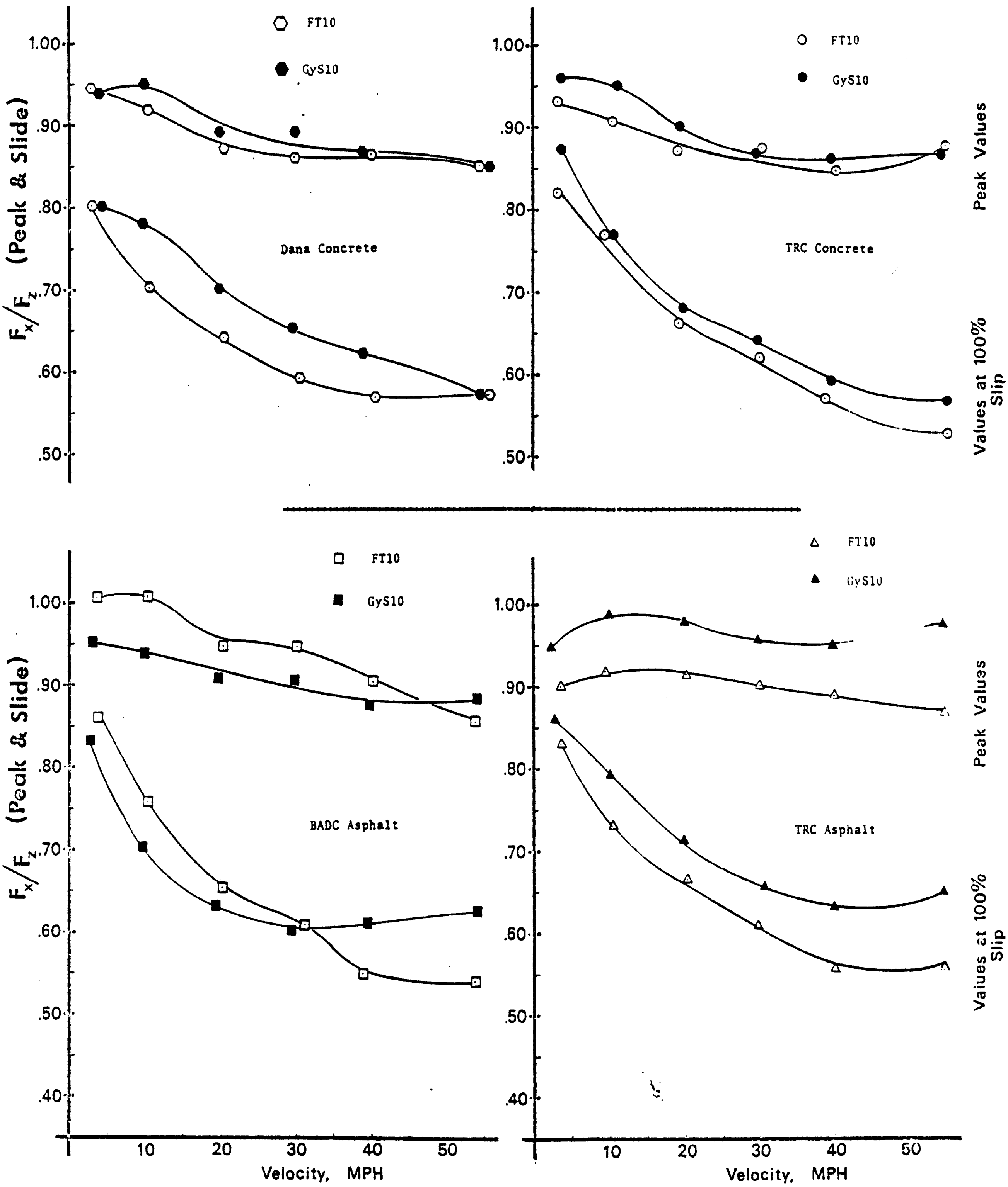


Figure 25. The differing influence of pavement surface on the velocity sensitivities of two tires.

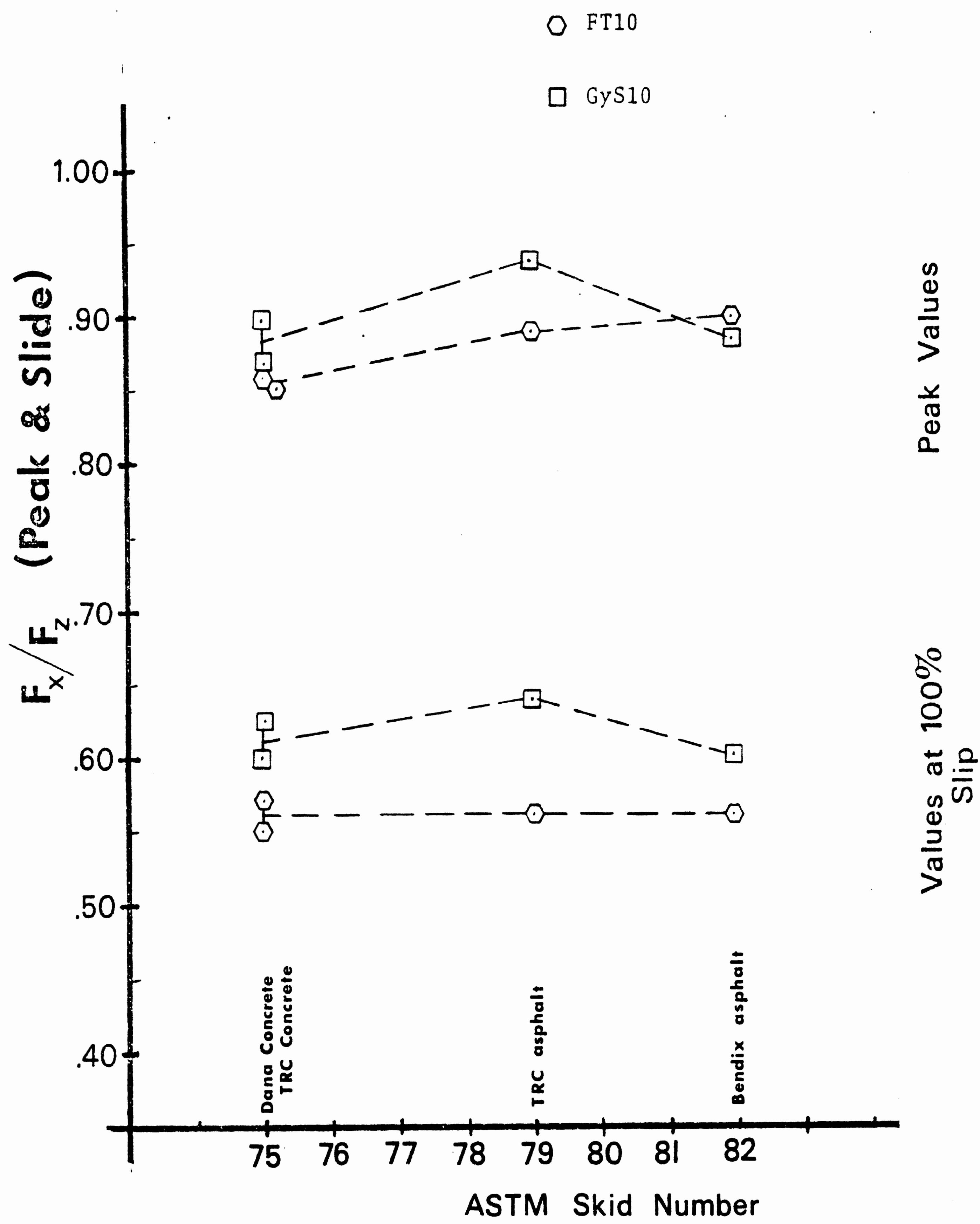


Figure 26. Correlation between the mean peak and slide values measured among the repeat runs of each of two tires and the respective SN_{40} measurements on each of four test pavements.

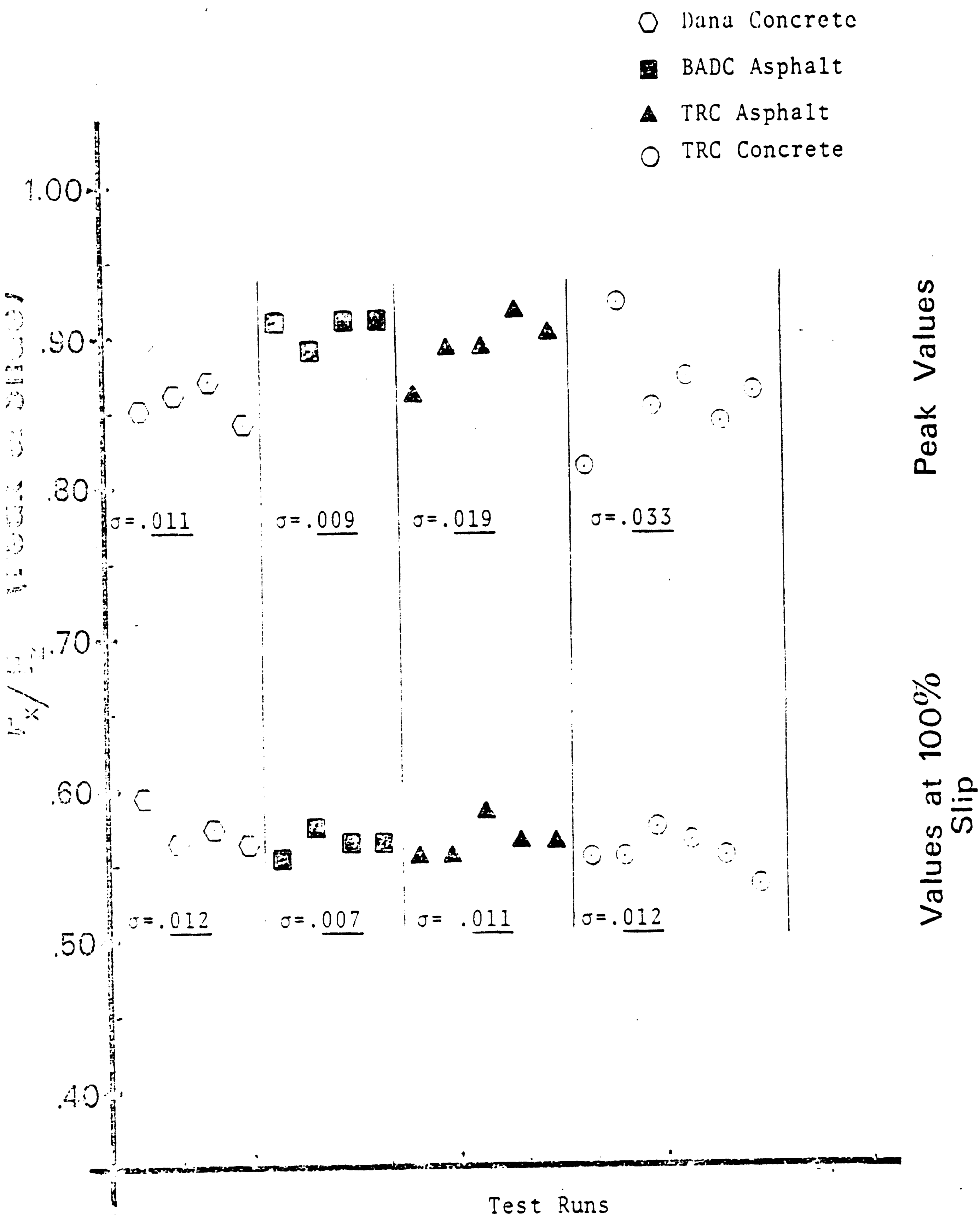


Figure 27. Peak and slide values deriving from repeat runs of the Firestone Transport 1 (10.00x20/F) on four surfaces.

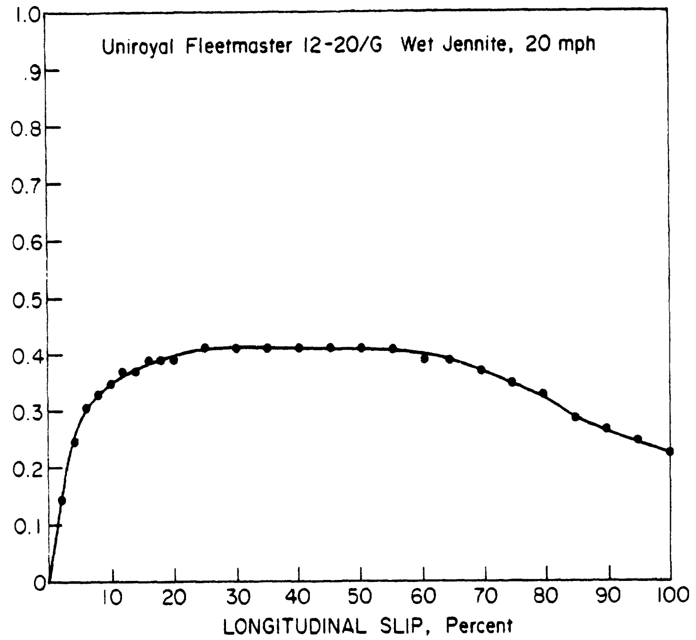


Fig. 6 - Typical "μ-slip" history measured on wet, jennite-coated surface

\SELINE DATA SUMMARY

Shown in Fig. 7 is a summary of peak and slide values F_x/F_z for the tire sample on the dry asphalt surface. ıe general load sensitivity of the subject sample is indi- ted by the variation in performance over the three ex- ıned load levels, expressed as a fraction of the T&RA ɔommended load for each tire. A two-point velocity nsitivity indicator is provided at each load level by the ı and 60 mph data.

In general, the data are rather closely grouped, al- ough the sample of tires was by no means representa- 're of the range of constructions and rubber compounds ıich are available. As can be deduced from the spread :tween the peak and slide values, peak-to-slide ratios are gher at the lower velocity—since the peak F_x/F_z data ıow a significant decrement with velocity in the 40-60 ph range while slide values are essentially unchanged.

Shown in Fig. 8 is a summary of peak and slide F_x/F_z measured for an eight-tire sample on a wet jennite- ıated asphalt. These data, all taken at 20 mph, are pre- nted as a function of vertical load, normalized to the &RA rating of each tire. All of the sample tires in- ırporated a common highway rib tread design and thus e might have anticipated the fairly consistent wet sur- ce performance indicated across the sample. Neverthe- ss, the remarkable tight grouping does suggest that the &RA load rating is a powerful normalizer.

ENSITIVITY TO VERTICAL LOAD

Data taken over a wide range of vertical loads on dry ıcrete (SN ≈ 75) are shown in Fig. 9. For comparison f two tires of widely differing load rating, a 10 × 20/F ımple is represented together with data from a 15 × 2.5/H wide base single tire. Although the brake torque ıpability of the mobile dynamometer limited the load range over which the 15 × 22.5 tire could be tested, sufficient data was obtained to indicate significant differences in normalized longitudinal force capability. Also shown in Fig. 9 are peak and slide values taken over a somewhat narrower load range on asphalt, with the 10 × 20 tire. While the peak values differ markedly in both

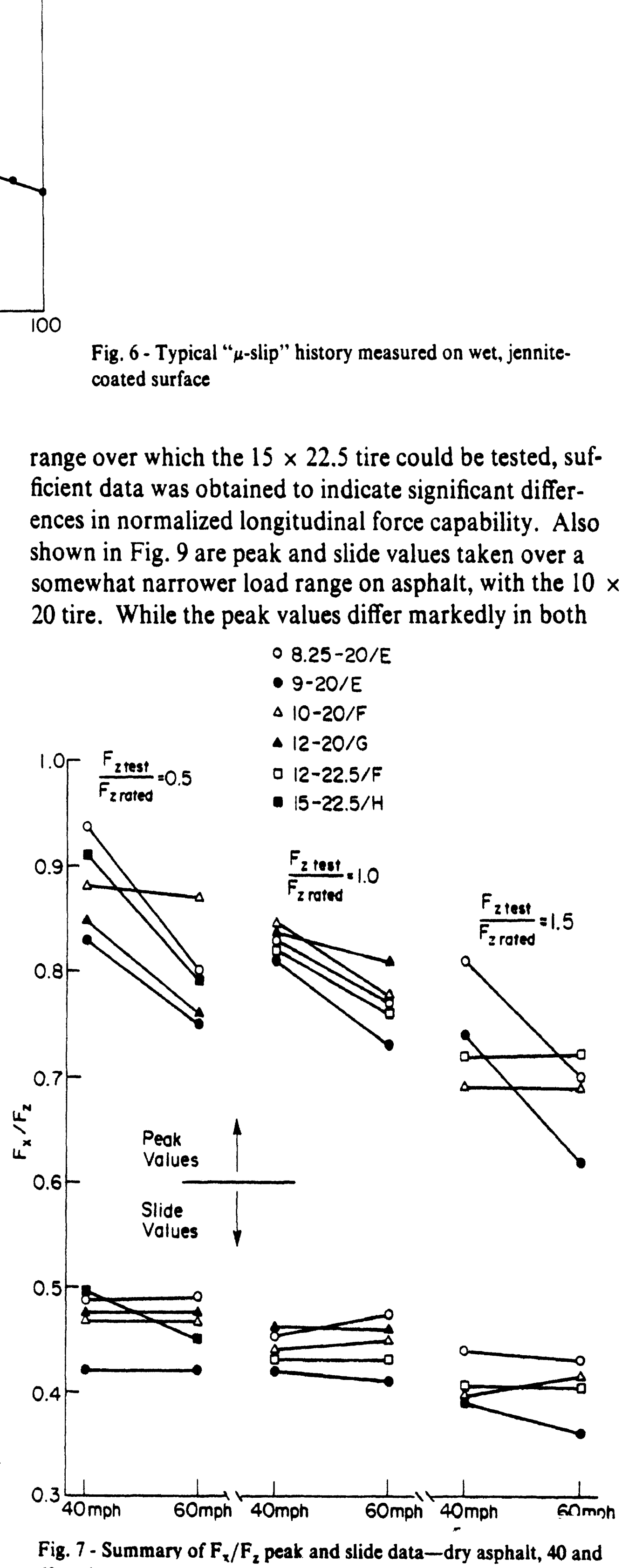


Fig. 7 - Summary of F_x/F_z peak and slide data—dry asphalt, 40 and 60 mph

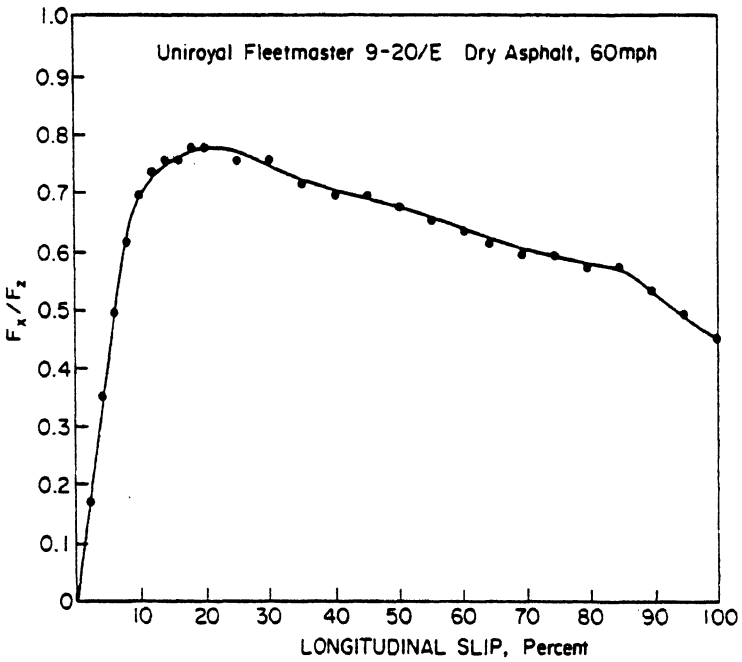


Fig. 5 - Example of "μ-slip" history measured on dry surface

break-in, the tire was operated at its rated load and at the reference value of inflation pressure described above.

DISCUSSION OF PRELIMINARY TRACTION MEASUREMENTS

The mobile dynamometer described earlier has been operated under various conditions of test surface, velocity, tire load, and tire samples to produce analog measurements of the longitudinal traction of truck tires.

As indicated previously, the preliminary measurements which are reported here involve longitudinal force data which has been scaled using steady-state F_X and M_y recordings. Thus the interpretation of absolute values in the normalized longitudinal force measures is not encouraged, since the torque scaling of F_X neglects that torque component which derives from the rearward deflection of the vertical load vector during generation of "braking" shear forces. Although the data have been corrected to account for this influence, per estimates based upon static laboratory measurements of truck tires, we suggest that the presented data have greatest merit as indicators of relative sensitivities.

While longitudinal force production has been found to be sensitive to various operating conditions, the single property which most significantly distinguishes truck tires from automobile tires concerns the remarkable peak-to-slide ratios which are exhibited on dry surfaces. As shown in Figure 5, the typical dry asphalt performance is summarized in the form of a "μ-slip" history (a plot of normalized longitudinal force, F_X/F_Z versus the ratio of instantaneous tangential tire-to-road relative velocities, $s = \frac{V - R_e\omega}{V} \times 100\%$)

where V = vehicle velocity

R_e = effective rolling radius of the test tire

ω = angular velocity of the test tire.

Notable characteristics of the Fig. 5 example include a force peak occurring in the vicinity of $s = 20\%$, followed by a rather steep negative slope out to $s \approx 85\%$, at which point an abrupt inflection occurs, depressing the locked wheel value further. Over a sample of eight tires tested on a dry bituminous asphalt surface (SN $\approx$ 78) the ratio of peak-to-slide F_x/F_z ranged from 1.50 to 2.02 with the force inflection in the high slip regime being observed over a majority of conditions. Comparing this general curve shape with those commonly measured on dry surfaces with passenger car tires, we observe that the truck tire's narrow, accentuated peaking, followed by a 30-50% reduction in force capability at lockup contrasts markedly with the car tire's rather flat shape in the 20-100% slip range.

The typical μ-slip curve shape which was measured with truck tires on a wet jennite-coated asphalt (SN $\approx$ 20) is shown in Fig. 6. In this case, the on-board water delivery system was employed to deposit a water film of 0.025 in nominal thickness ahead of the test tire at 20 mph test velocity. (The film thickness dimension is defined as the height of the rectangular cross section stream which is deposited on the test surface at the indicated velocity.)

The broad peak on the Fig. 6 curve is a characteristic which was observed over all specimens in the eight-tire sample. In most cases, the peak value of F_x/F_z is sustained to within $\pm$ 0.02 over a band of longitudinal slip which is the excess of 40%. The peak-to-slide ratios on the wet-coated asphalt were seen to range from 1.53-2.02. Although the pronounced peak-to-slide decrement is comparable to passenger car tire performance on such a surface, the broad peak characteristic of the truck tire sample is notable.

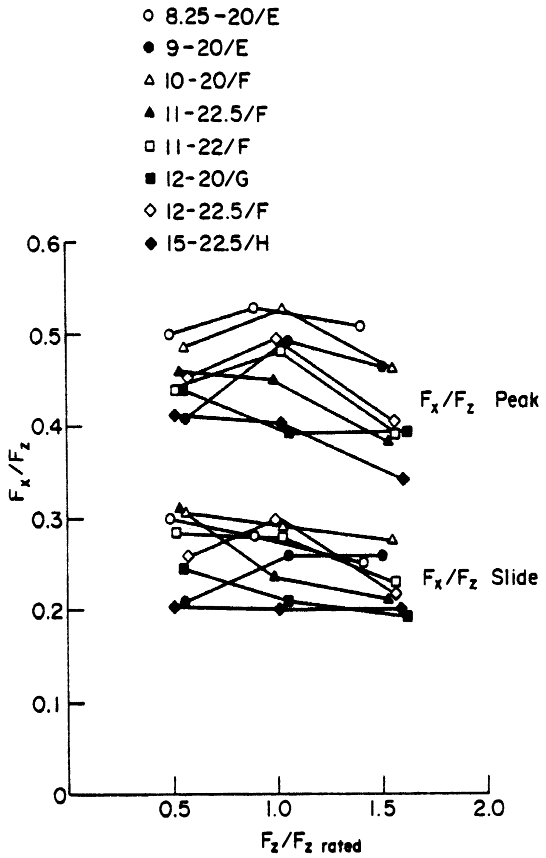


Fig. 8 - Summary of F_x/F_z peak and slide data—wet jennite, 20 mph

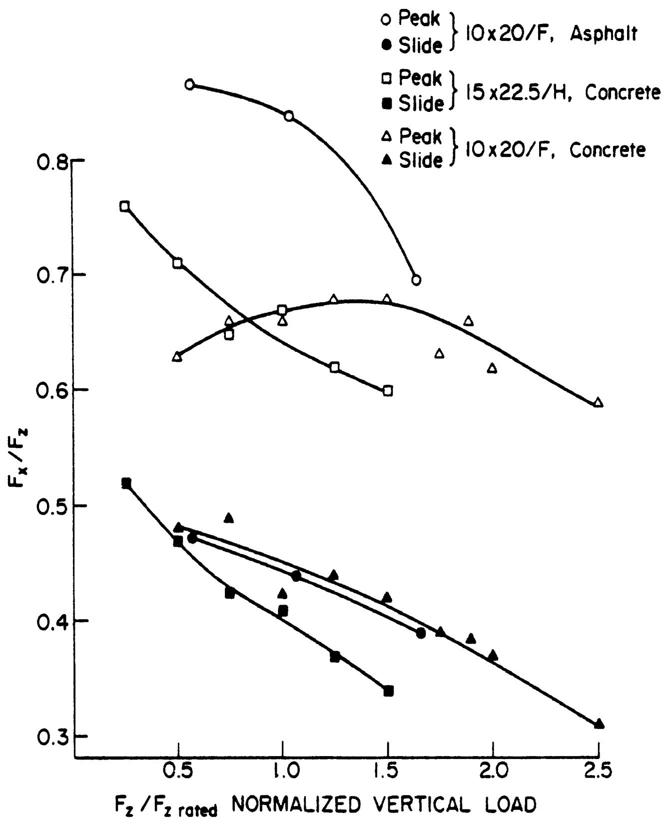


Fig. 9 - F_x/F_z sensitivity to vertical load at velocity = 40 mph

trend and absolute values, the slide data on both surfaces agree well over the common range of loads.

These data suggest that the load sensitivity of truck tires, in terms of longitudinal traction capability, is sufficiently influenced by both surface pavement and tire design characteristics that generalizations are difficult.

SENSITIVITY TO VELOCITY

Data taken over a wide velocity range on both asphalt and concrete surfaces have indicated a significant sensitivity of peak and slide performance to velocities as shown in Fig. 10. Comparing surfaces, the 10 × 20 tire sample which was tested at its rated load of 5430 lbs, indicated a markedly different behavior on an asphalt versus concrete pavement (although the respective ASTM skid numbers were 78 asphalt and 75 concrete).

As shown, this tire indicates a large increase in both peak and slide values of F_x/F_z in the low velocity regime on asphalt, while only the slide values appear to indicate a significant velocity sensitivity on the concrete surface. This phenomenon causes the peak-to-slide ratio on dry concrete to range from 1.75 at 60 mph down to 1.08 at 3 mph.

Comparing two tires of widely differing load rating, the 10 × 20/F and 15 × 22.5/H are seen to exhibit comparable peak and slide behavior, over the 3–60 mph velocity range. Both tires showed, on concrete, a dominant velocity sensitivity of shear force production at the 100% slip condition, with peak values of F_x/F_z being influenced to a much lesser extent.

These dry surface data, in general, seem to indicate that: truck tires can exhibit significant longitudinal traction sensitivity to velocity and that these sensitivities can be markedly influenced by pavement characteristics.

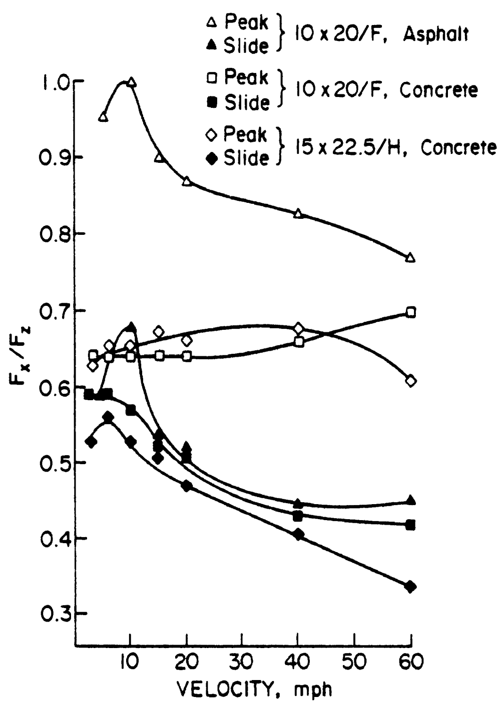


Fig. 10 - F_x/F_z sensitivity to velocity at F_z = rated load

INFLATION PRESSURE SENSITIVITY

Shown in Fig. 11 is a sample of data taken on a 10 × 20/F highway rib tire at two values of cold inflation pressure. The dry asphalt data show a significant decrease in peak force capability with decreased inflation pressure, while the slide values are much less influenced by the 85 to 50 psi pressure reduction. Interestingly, the dry surface sensitivity of peak forces to inflation pressure is greatest at the lighter vertical loads, while on the wetted surface, the least sensitivity of peak force to inflation pressure was found at the lightest load.

TREAD WEAR SENSITIVITY

A set of three 10.00 × 22/F tires was tested representing each of three tread wear conditions: new, half-worn, and fully worn. The fully worn condition of this highway rib tread was represented by a nominal depth of 1/8 in. in the circumferential grooves, of which there were only two (kerfs and sipes were no longer evident at this wear condition). The data shown in Fig. 12 illustrate the anticipated result of increasing dry traction and decreasing wet traction with increasing wear. To the extent that groove depth most significantly effects hydrodynamic phenomena related to wet surface traction, however, the largest influences are to be found at elevated velocities not represented in these data.

IMPLICATIONS OF THESE TEST RESULTS ON PREDICTIVE APPROACHES

The truck tire data presented in this paper show several characteristics which challenge currently available semi-empirical tire models (9). The phenomena which present the greatest challenge to modeling are:

1. The very broad maximum force region which was obtained on the wet jennite-coated surface. (The normalized force is nearly maximum over the range of 20%-60% slip. See Fig. 6)

2. On dry surfaces the peak normalized force obtained for most of the tires tested decreased significantly between the 40 and 60 mph cases but the lock wheel slide values are nearly equal at 40 and 60 mph. (See Fig. 7.)

3. On dry surfaces the load and velocity sensitivities of the peak longitudinal force are highly dependent upon pavement characteristics. Also, the measured level of peak longitudinal force can differ greatly between measurements made on asphalt and concrete surfaces which have equal skid numbers. (See Figs. 9 and 10.)

Clearly, the measured peak and slide longitudinal force properties of truck tires depend upon normal load, velocity, and surface condition in a significant and complicated manner.

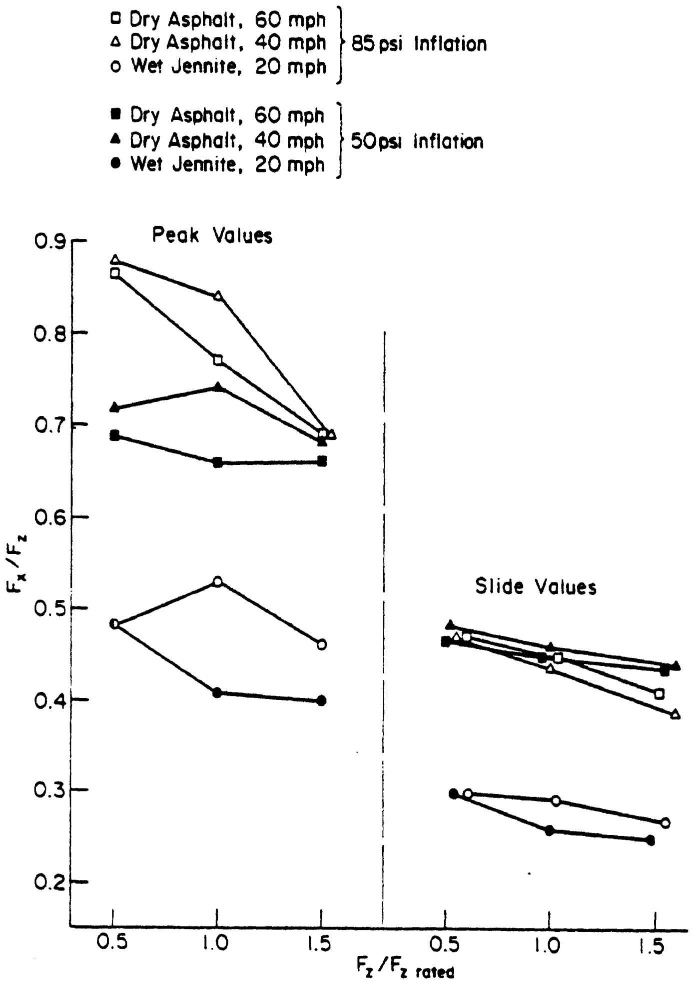


Fig. 11 - F_x/F_z sensitivity to inflation pressure

TABLE 4

SUMMARY OF UNCORRECTED BASELINE DATA

Tire	20 mph Wet Jennite			40 mph Dry Asphalt			60 mph Dry Asphalt		
	F_z	μ_p	μ_s	F_z	μ_p	μ_s	F_z	μ_p	μ_s
	2010	.60	.36	1942	1.11	.59	2012	.95	.59
8.25-20/E	3984	.59	.31	4066	.92	.50	4043	.86	.53
	5675	.54	.27	5883	.86	.47	5936	.75	.46
	2571	.48	.25	2745	.97	.49	2609	.88	.49
9.00-20/E	4826	.53	.28	4929	.87	.45	4927	.78	.44
	6918	.49	.27	7006	.79	.41	7116	.66	.38
	3079	.56	.35	3079	1.01	.54	3138	1.00	.54
10.00-20/F	5601	.63	.31	5550	.89	.47	5662	.82	.48
	8407	.49	.29	8800	.73	.41	8362	.73	.43
	2740	.54	.36	3081	.87	.51	—	—	—
11.00-22.5/F	5380	.48	.25	5364	.88	.49	5507	.79	.48
	8376	.40	.23	8218	.68	.45	8214	.66	.44
	3240	.50	.33	3431	.85	.55	—	—	—
11.00-22/F	6542	.51	.30	6529	.87	.48	—	—	—
	9812	.41	.24	—	—	—	8344	.76	.46
	3820	.49	.27	3875	.95	.53	3859	.84	.53
12.00-20/G	7359	.42	.23	5544	.88	.48	5529	.87	.49
	11248	.37	.20	—	—	—	—	—	—
	3274	.52	.30	—	—	—	3369	.94	.52
12.00-22.5/F	5959	.52	.31	6078	.87	.46	6036	.81	.46
	9293	.42	.23	7830	.76	.42	7821	.76	.43
	4501	.45	.22	4353	.99	.53	4414	.86	.49
15.00-22.5/H	8749	.42	.22	6597	.87	.43	—	—	—
	13519	.36	.20	—	—	—	—	—	—

TABLE 5

SUMMARY OF BASELINE DATA CORRECTED PER THE TABLE 3 ERROR RANGE ESTIMATES

Tire	20 mph - Wet Jennite					40 mph - Dry Asphalt					60 mph - Dry Asphalt				
	F_z	μ_p Hi	μ_p Lo	μ_s Hi	μ_s Lo	F_z	μ_p Hi	μ_p Lo	μ_s Hi	μ_s Lo	F_z	μ_p Hi	μ_p Lo	μ_s Hi	μ_s Lo
8.25-20/E	2010	.52	.49	.31	.30	1942	.97	.91	.51	.48	2012	.83	.78	.51	.48
	3984	.55	.52	.29	.27	4066	.85	.75	.46	.44	4043	.80	.75	.49	.46
	5675	.52	.50	.26	.25	5883	.83	.79	.45	.43	5936	.72	.69	.44	.42
9.00-20/E	2571	.42	.40	.22	.21	2745	.86	.81	.43	.41	2609	.78	.73	.43	.41
	4826	.50	.48	.27	.25	4929	.83	.79	.43	.41	4927	.74	.71	.42	.40
	6918	.48	.45	.26	.25	7006	.77	.72	.40	.38	7116	.64	.61	.37	.35
10.00-20/F	3079	.50	.47	.31	.30	3079	.90	.86	.48	.46	3138	.89	.85	.48	.46
	5601	.61	.58	.30	.28	5550	.86	.82	.45	.43	5662	.79	.75	.46	.44
	8407	.48	.45	.28	.27	8800	.71	.68	.40	.38	8362	.71	.68	.42	.40
11.00-22.5/F	2740	.48	.45	.32	.30	3081	.77	.73	.45	.43	----------------				
	5380	.46	.44	.24	.23	5364	.84	.80	.47	.45	5507	.75	.72	.46	.44
	8376	.39	.37	.22	.21	8218	.66	.63	.44	.42	8214	.64	.61	.43	.41

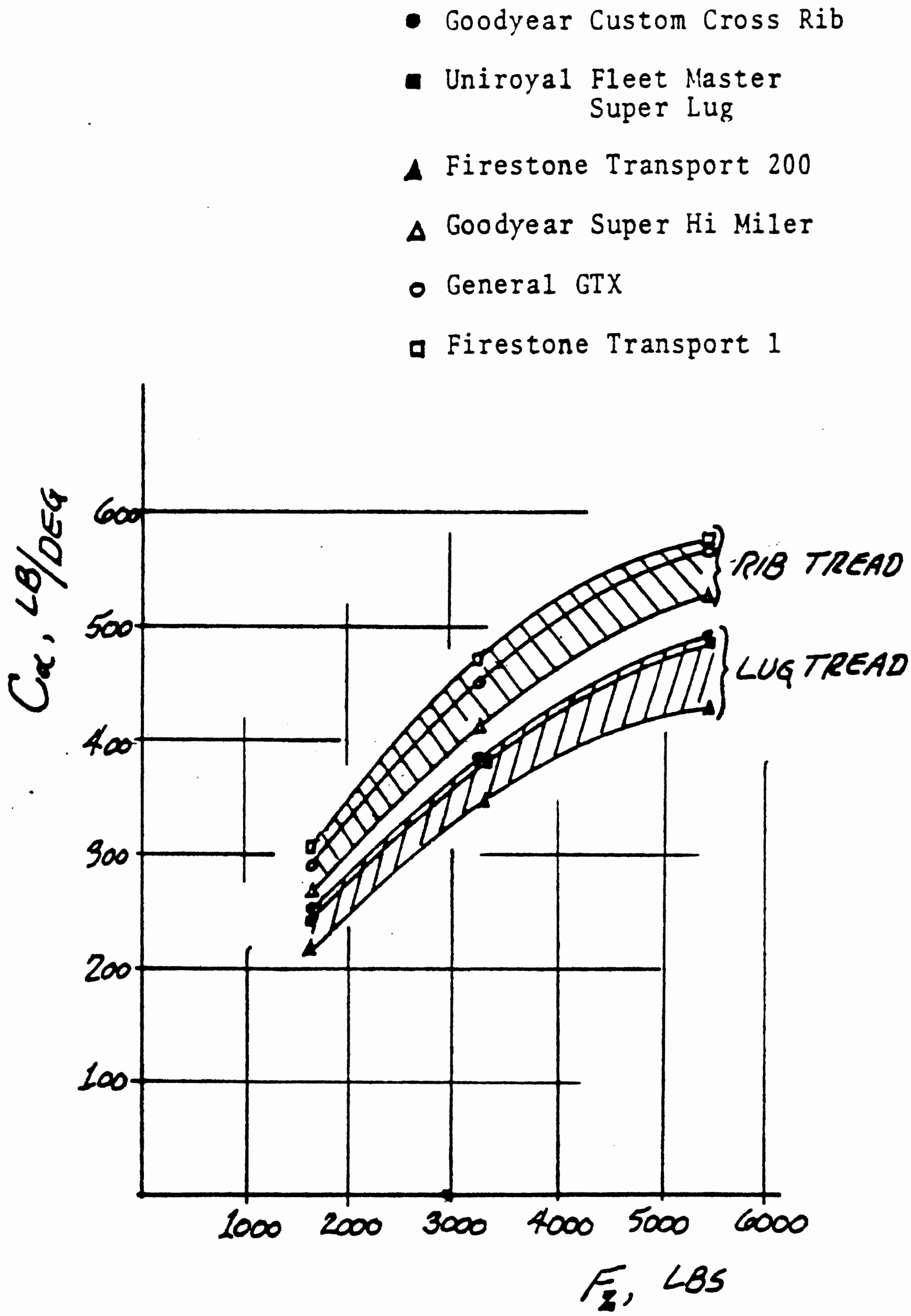


Figure 7. Cornering Stiffness, C_α, as Influenced by Vertical Load, F_z, for the Six-Tire Sample.

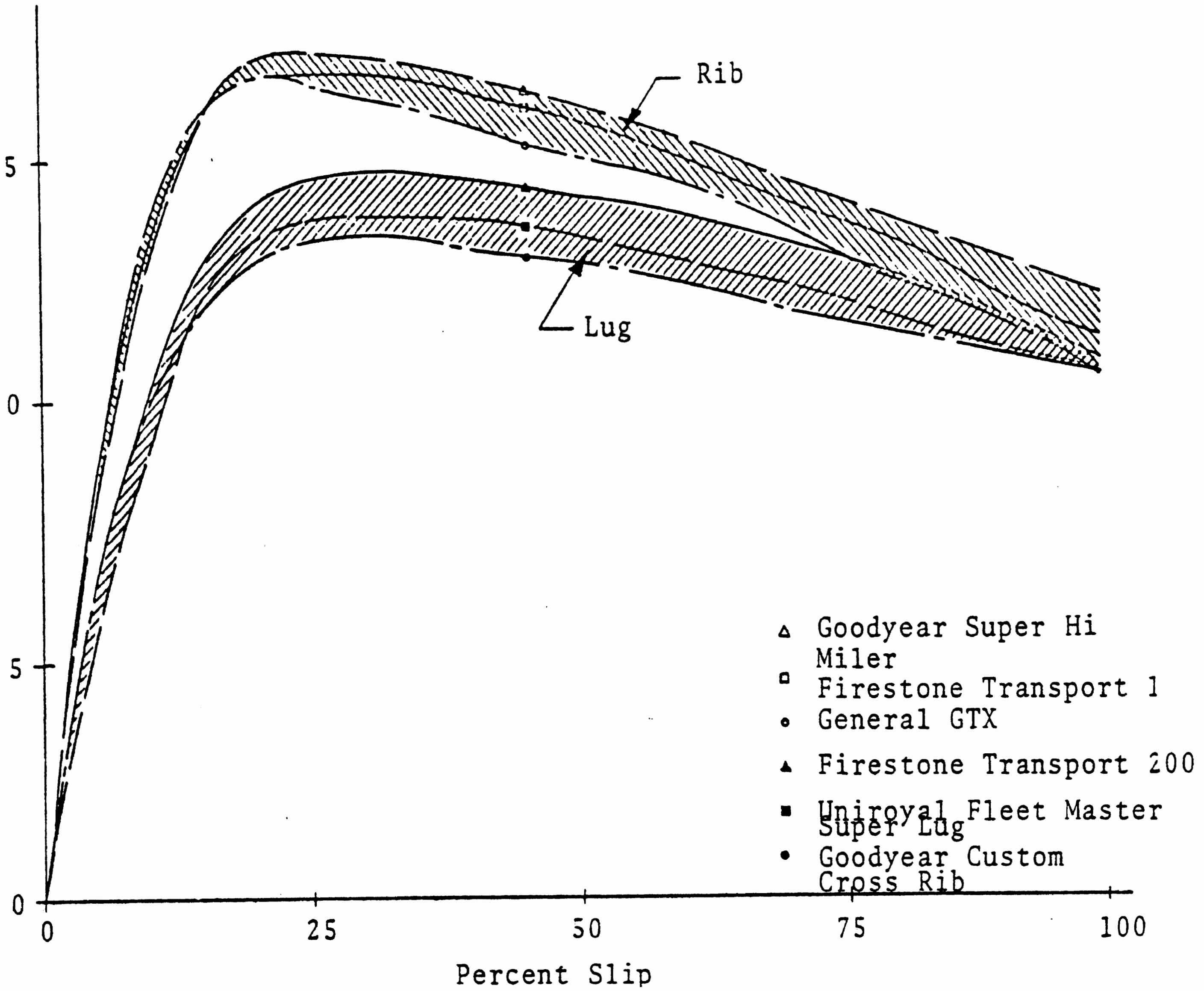


Figure 9. Characteristic μ-slip curve shapes at the reference condition of 40 mph and 1.0 × Rated Load.

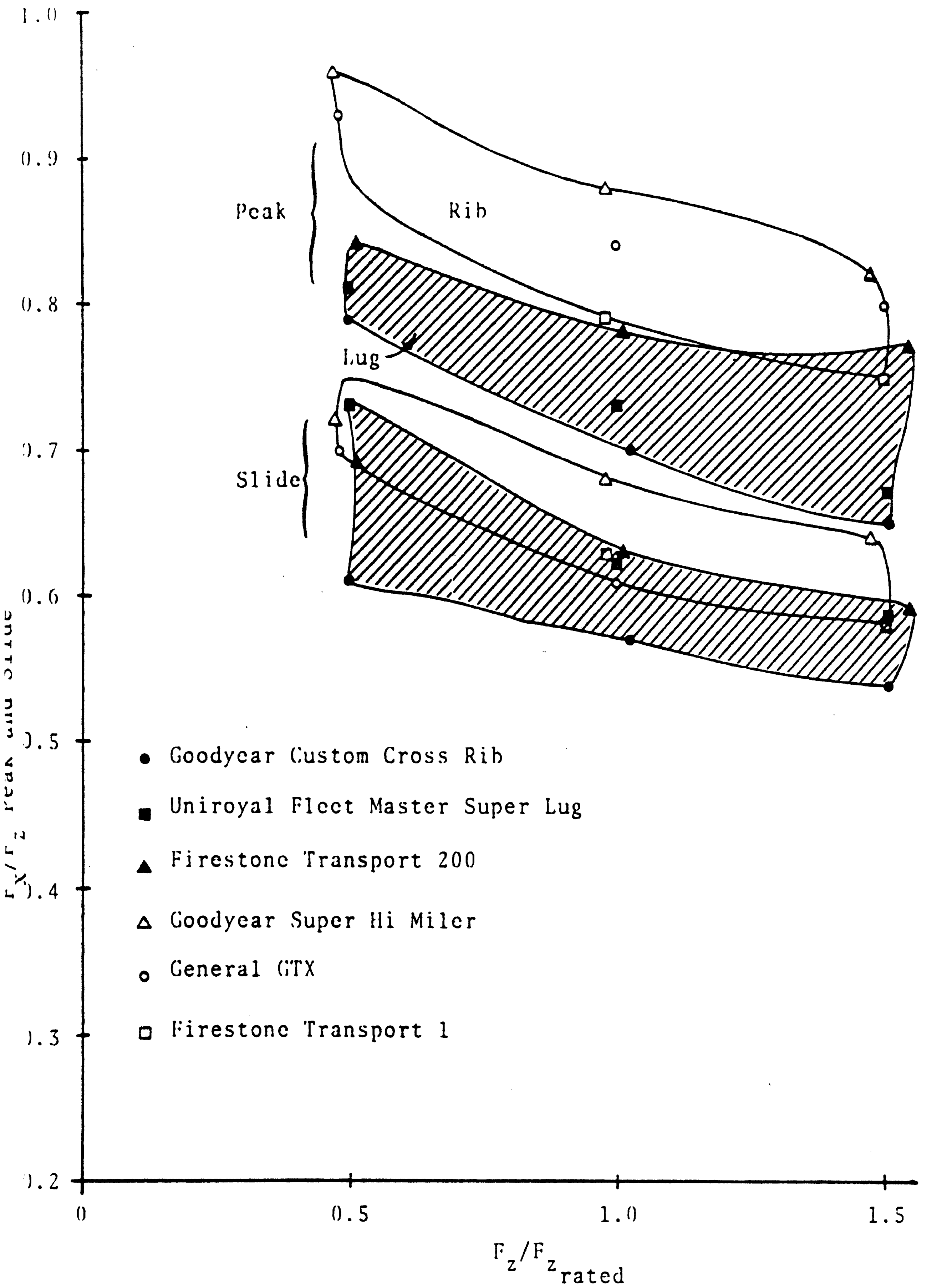


Figure 10. Peak and slide values of F_x/F_z at 20 mph for the six-tire sample.

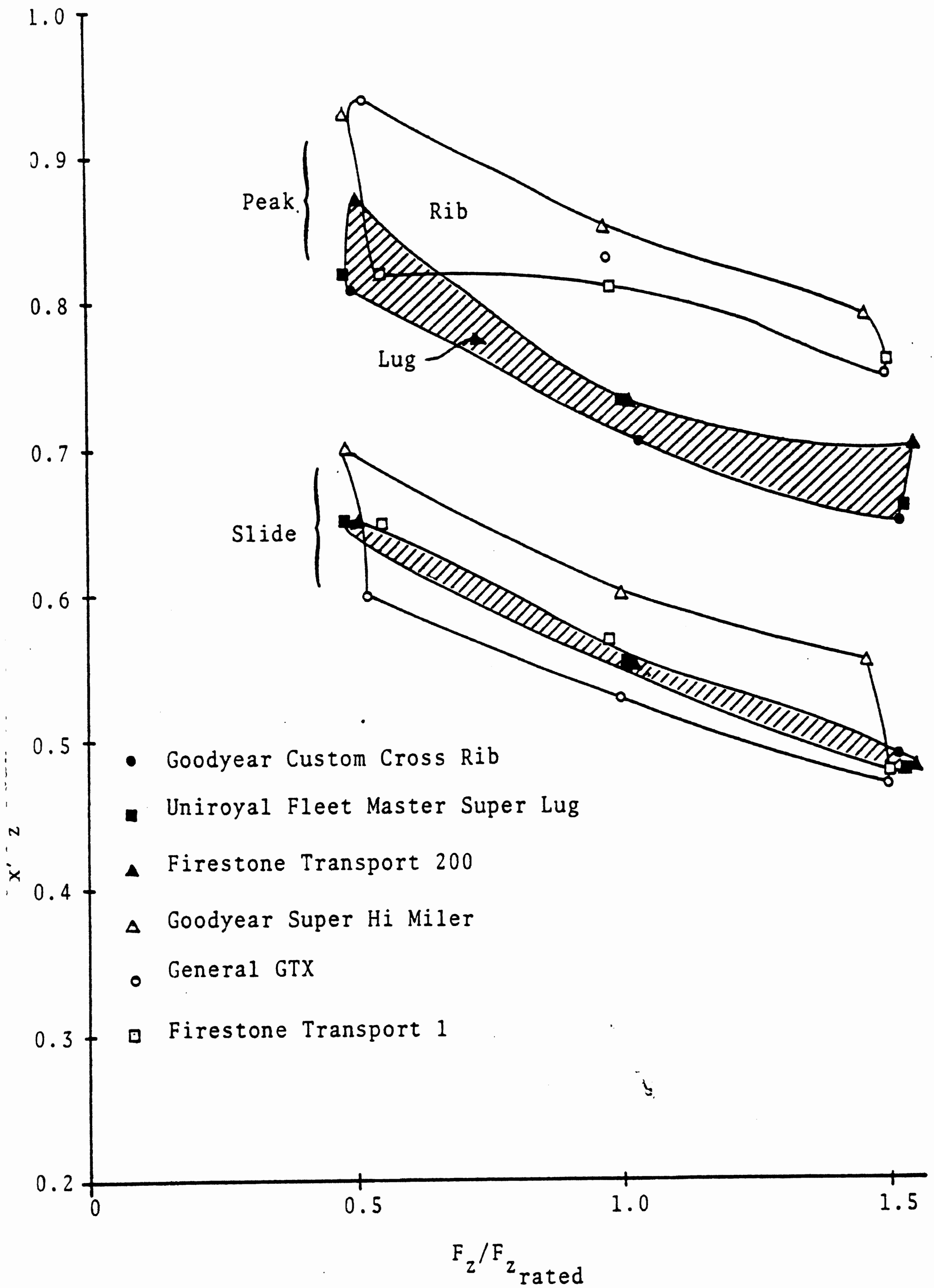


Figure 11. Peak and slide values of F_x/F_z at 40 mph for the six-tire sample.

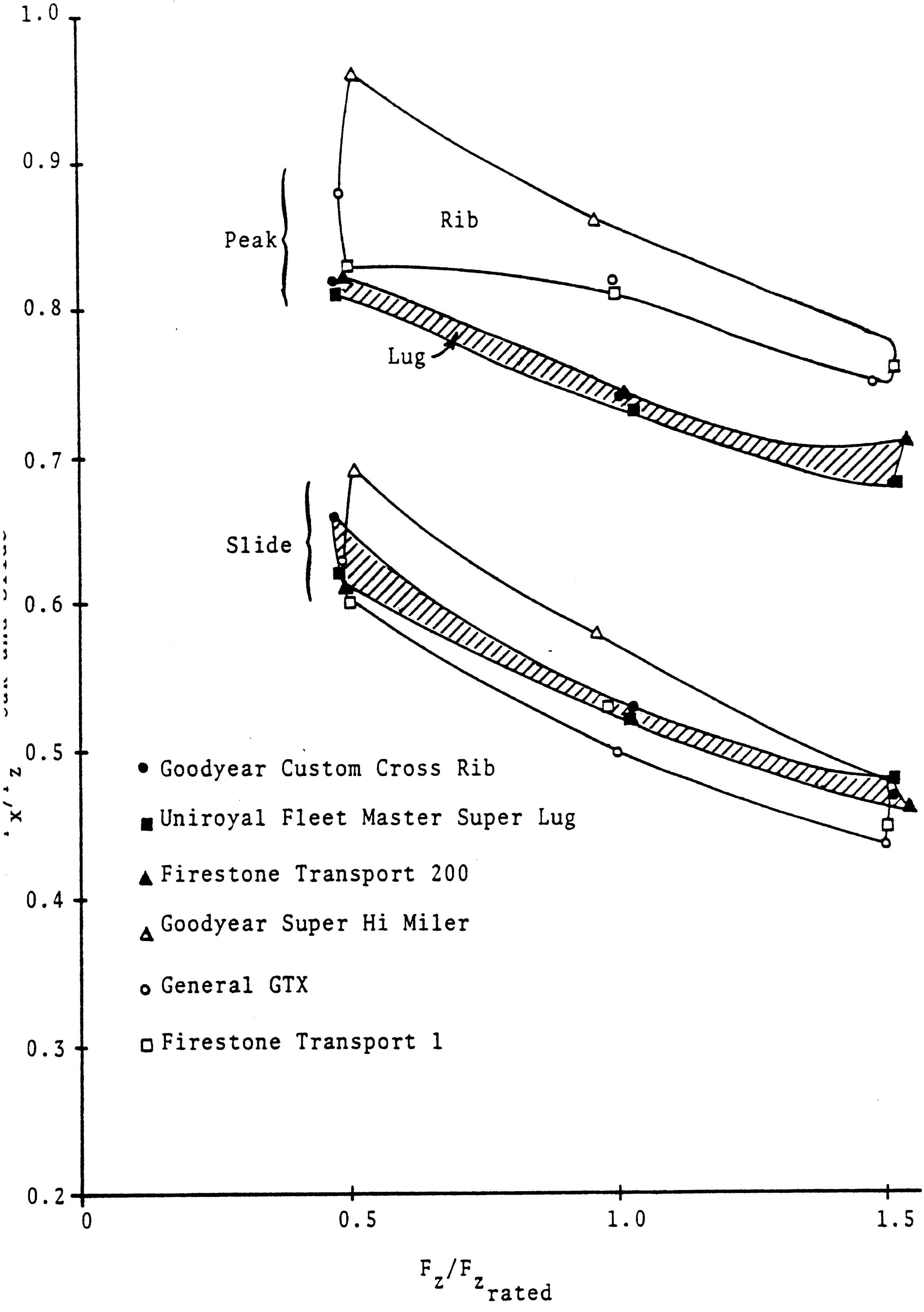


Figure 12. Peak and slide values of F_x/F_z at 55 mph for the six-tire sample.

TABLE 4

PEAK AND SLIDE VALUES OF F_x/F_z AS OBTAINED OVER THE FIVE REPEAT RUNS FOR EACH OF THE SIX SAMPLE TIRES

Goodyear Super Hi Miler

Run	μ_p	μ_s
1	.86	.60
4	.85	.61
7	.87	.63
10	.85	.60
13	.85	.60
Avg.	.856	.608
σ	.00800	.0117

Firestone Transport 200

Run	μ_p	μ_s
1	.74	.56
4	.75	.55
7	.79	.59
10	.73	.56
13	.72	.54
Avg.	.746	.56
σ	.0242	.0167

Firestone Transport 1

Run	μ_p	μ_s
1	.85	.57
4	.83	.56
7	.82	.58
10	.81	.56
13	.80	.57
Avg.	.822	.568
σ	.0172	.00748

Goodyear Custom Cross Rib

Run	μ_p	μ_s
1	.67	.53
4	.70	.56
7	.74	.55
10	.73	.55
13	.73	.55
Avg.	.714	.548
σ	.0258	.00980

General GTX

Run	μ_p	μ_s
1	.83	.54
4	.83	.52
7	.83	.53
10	.80	.53
13	.82	.53
Avg.	.822	.53
σ	.0117	.00632

Uniroyal Fleetmaster Super-Lug

Run	μ_p	μ_s
1	.70	.54
4	.71	.55
7	.73	.55
10	.74	.56
13	.74	.55
Avg.	.724	.55
σ	.01625	.00632

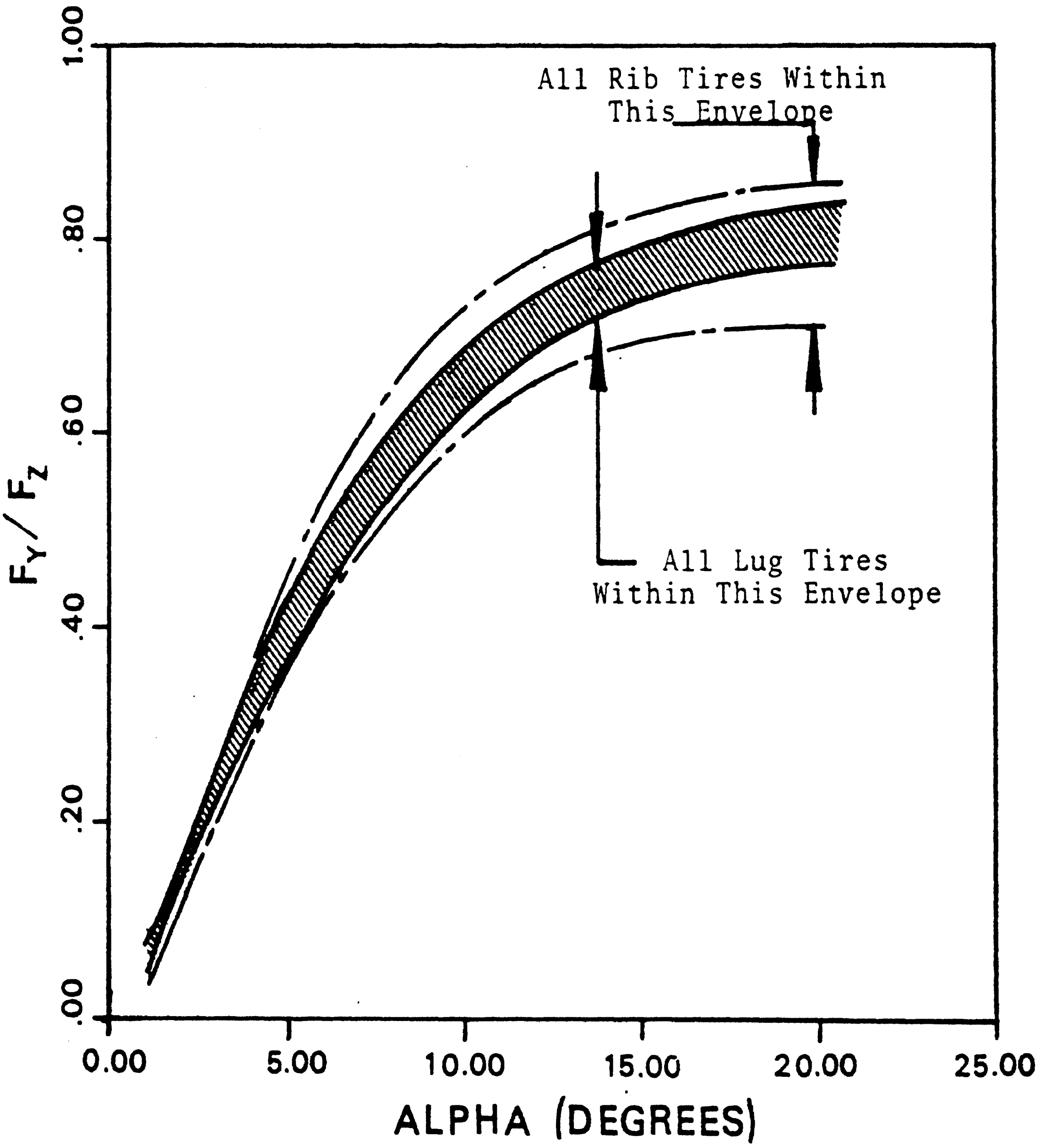


Figure 15. Envelopes of F_y/F_z vs. α data obtained at test velocities of 20, 40, and 55 mph and at rated load for all six tires in the sample.

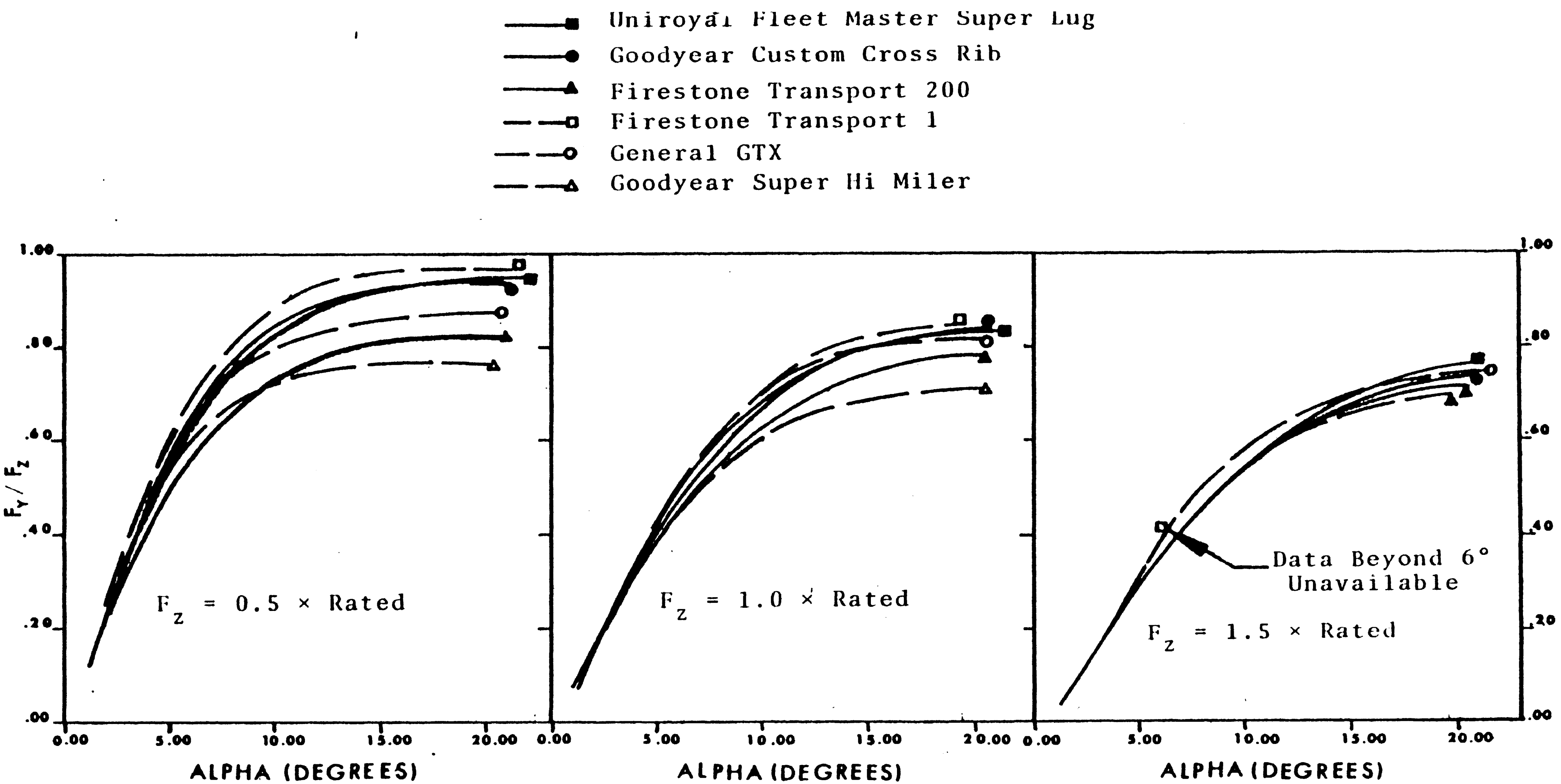


Figure 16. Summary of the F_y/F_z vs. α behavior of the six-tire sample at each of three loads, and at 20 mph.

APPENDIX B-I

TABULAR FLAT-BED TEST RESULTS

The following table indicates lateral force measurements which were obtained with each tire at slip angles of ±1° and at 0° for each of three values of vertical load. The cornering stiffness parameter, C_α, is then listed as the average of the lateral forces obtained at +1° and -1°.

Tire	Vertical Load, lbs.	Lateral Force, lbs at Slip Angles, α +1°	-1°	0°	Cornering Stiffness C_α lbs/deg
Goodyear	1630	-291	234	-31	263
Super Hi Miler	3260	-459	363	-60	411
	5430	-606	444	-73	525
General	1630	-326	260	-37	293
GTX	3260	-503	392	-65	448
	5430	-643	492	-80	568
Firestone	1630	-346	267	-49	306
Transport 1	3260	-540	403	-76	471
	5430	-670	486	-106	578
Uniroyal	1630	-268	215	-26	242
Fleetmaster	3260	-430	340	-47	385
Super Lug	5430	-559	417	-64	483
Goodyear	1630	-270	224	-36	247
Custom Cross	3260	-433	337	-56	385
Rib	5430	-572	418	-77	495
Firestone	1630	-259	178	-30	219
Transport 200	3260	-403	289	-51	346
	5430	-538	315	-84	426

Table 1. Peak and Slide Values of F_X/F_Z as Obtained Over the Five Repeat Runs for Each of the Six Sample Tires on Wet Concrete.

Goodyear Super Hi Miler

Run	μ_p	μ_s
1	.68	.47
4	.69	.47
7	.66	.45
10	.66	.42
13	.68	.43
Avg.	.674	.448
σ	.012	.0204

Firestone Transport 200

Run	μ_p	μ_s
1	.67	.49
4	.64	.49
7	.65	.50
10	.63	.48
13	.64	.48
Avg.	.646	.488
σ	.013	.0075

Firestone Transport 1

Run	μ_p	μ_s
1	.79	.61
4	.77	.57
7	.75	.57
10	.80	.58
13	.79	.54
Avg.	.780	.574
σ	.0179	.0195

Goodyear Custom Cross Rib

Run	μ_p	μ_s
1	.58	.46
4	.62	.47
7	.61	.47
10	.62	.47
13	.61	.44
Avg.	.608	.462
σ	.0147	.0117

General GTX

Run	μ_p	μ_s
1	.76	.54
4	.72	.51
7	.73	.51
10	.73	.52
13	.72	.51
Avg.	.732	.518
σ	.0147	.0156

Uniroyal Fleetmaster Super-Lug

Run	μ_p	μ_s
1	.55	.43
4	.53	.41
7	.48	.37
10	.53	.38
13	.49	.36
Avg.	.516	.390
σ	.0262	.0261

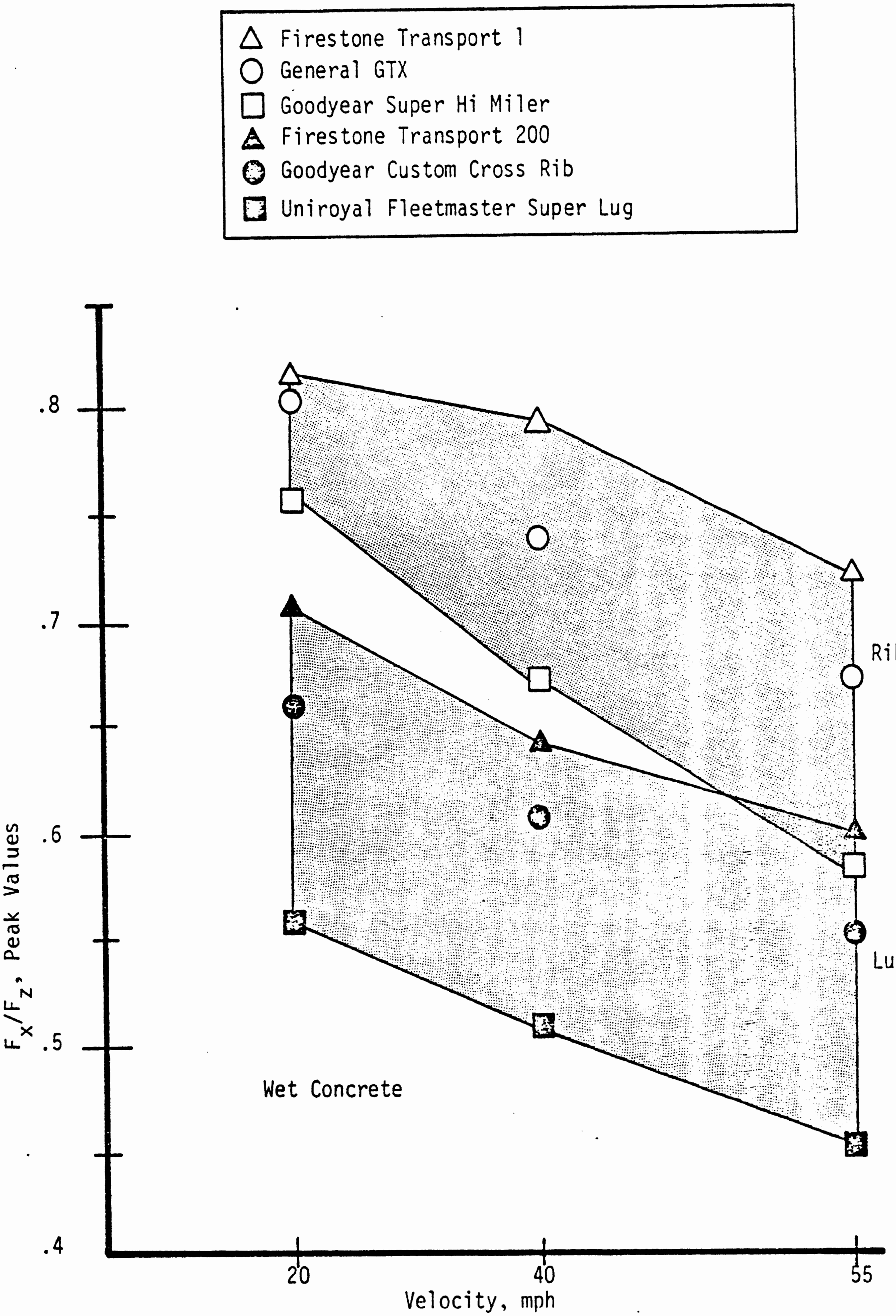


Figure 1. Velocity sensitivity of peak F_x/F_z values at rated load.

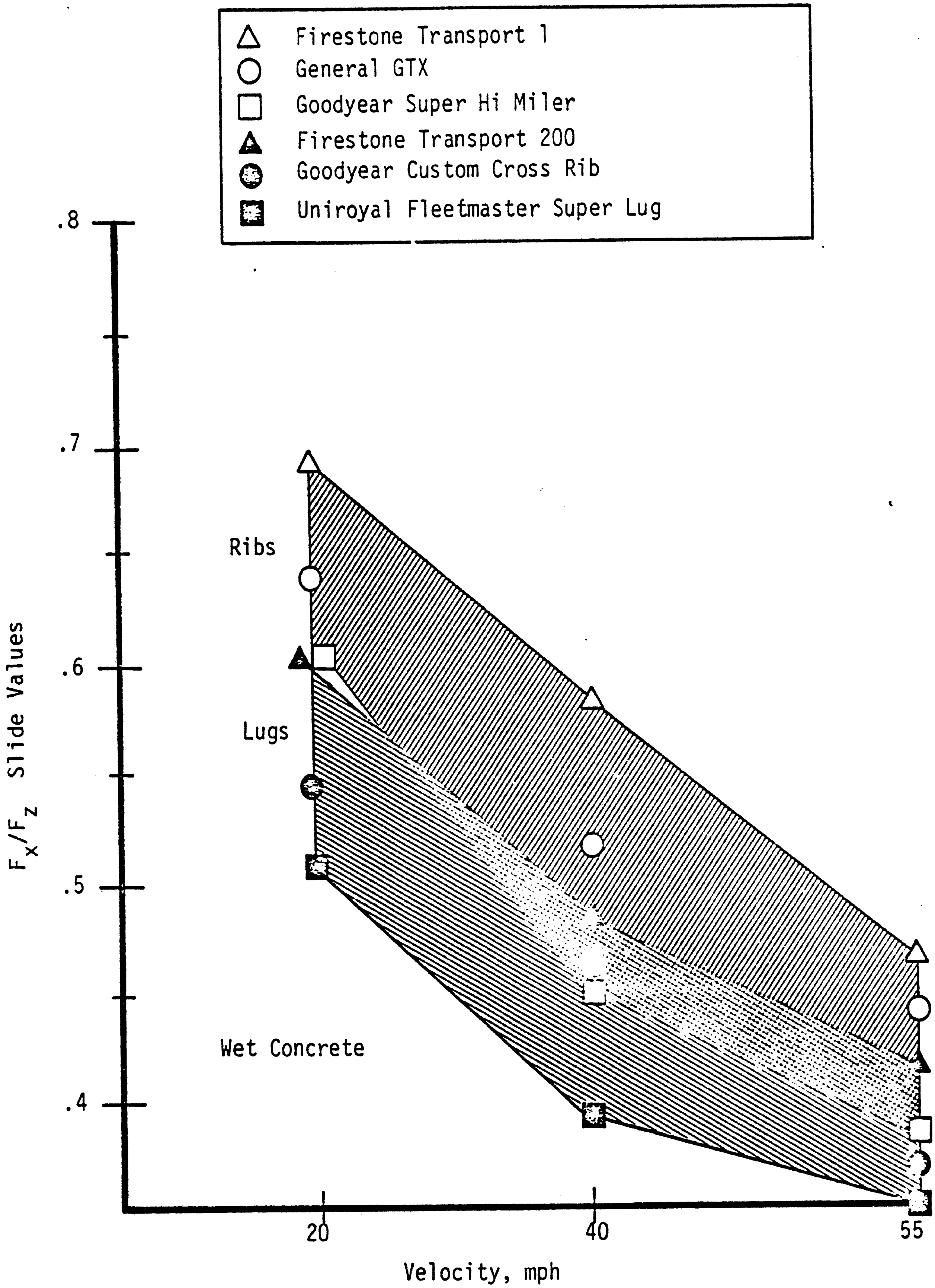


Figure 2. Velocity sensitivity of slide value of F_x/F_z at rated load.

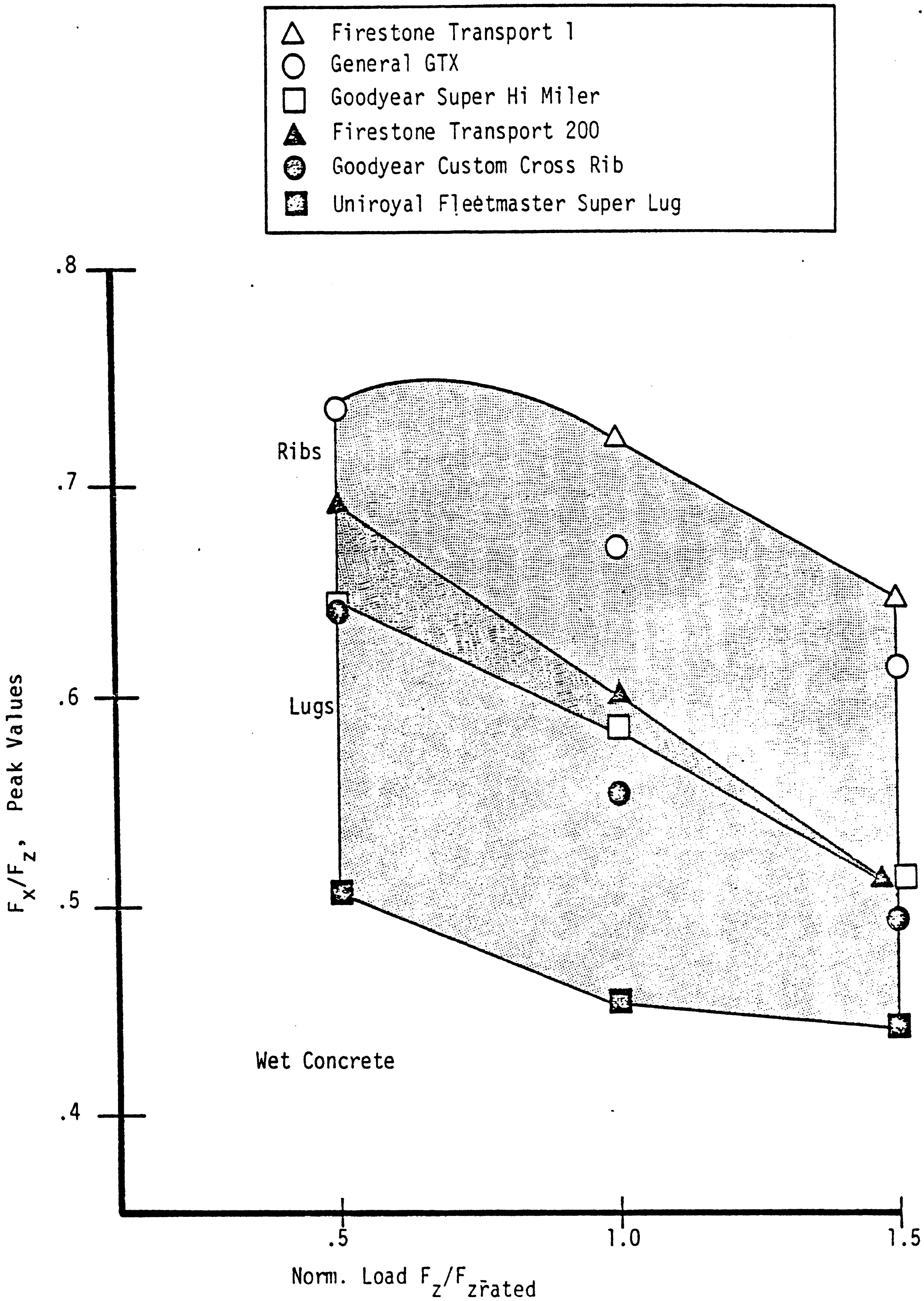


Figure 3. Load sensitivity of peak values of F_x/F_z at 55 mph.

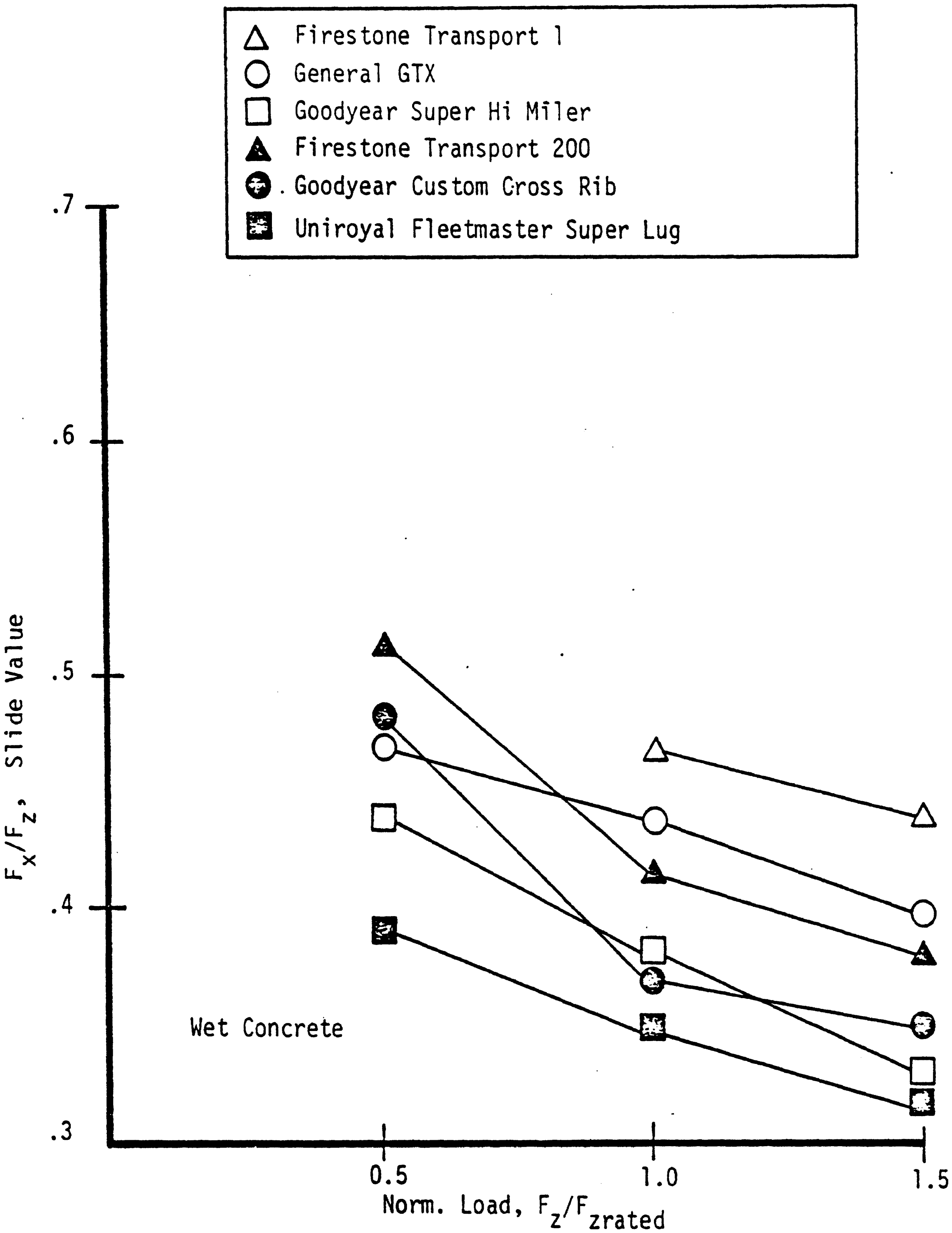


Figure 4. Load sensitivity of slide values of F_x/F_z at 55 mph.

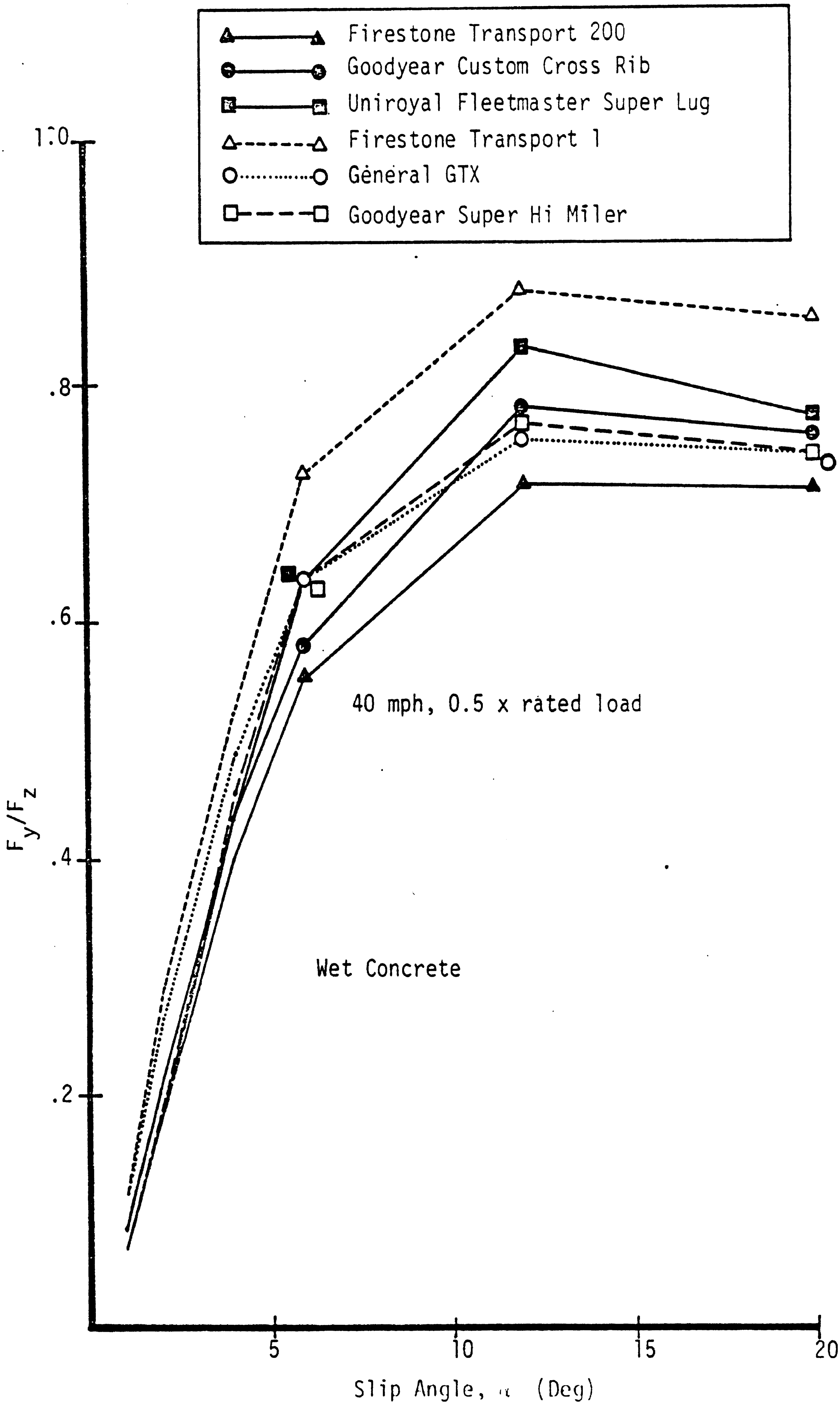


Figure 5. Lateral traction results, 40 mph, 0.5 x rated load.

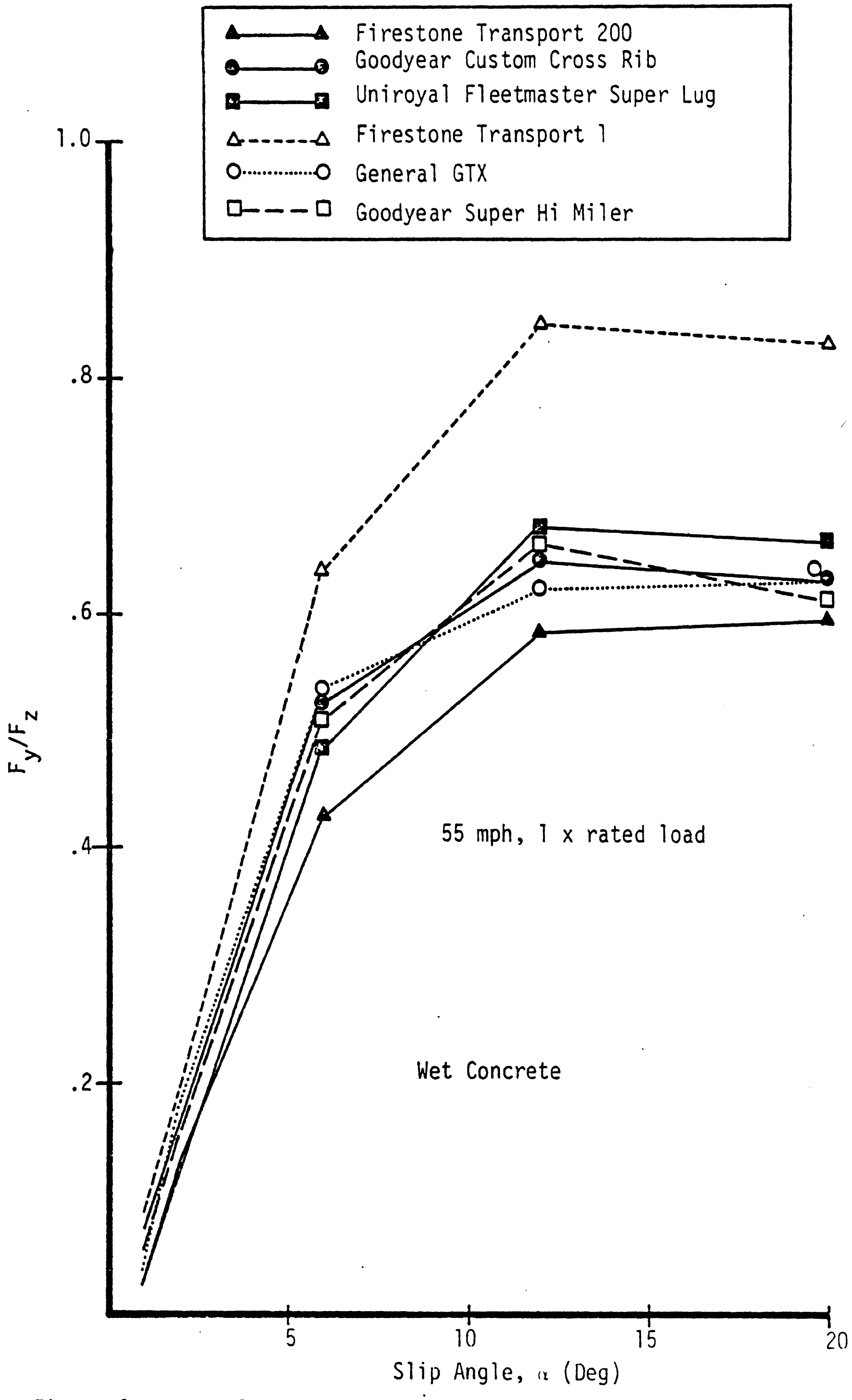


Figure 6. Lateral traction results, 55 mph, 1.0 x rated load.

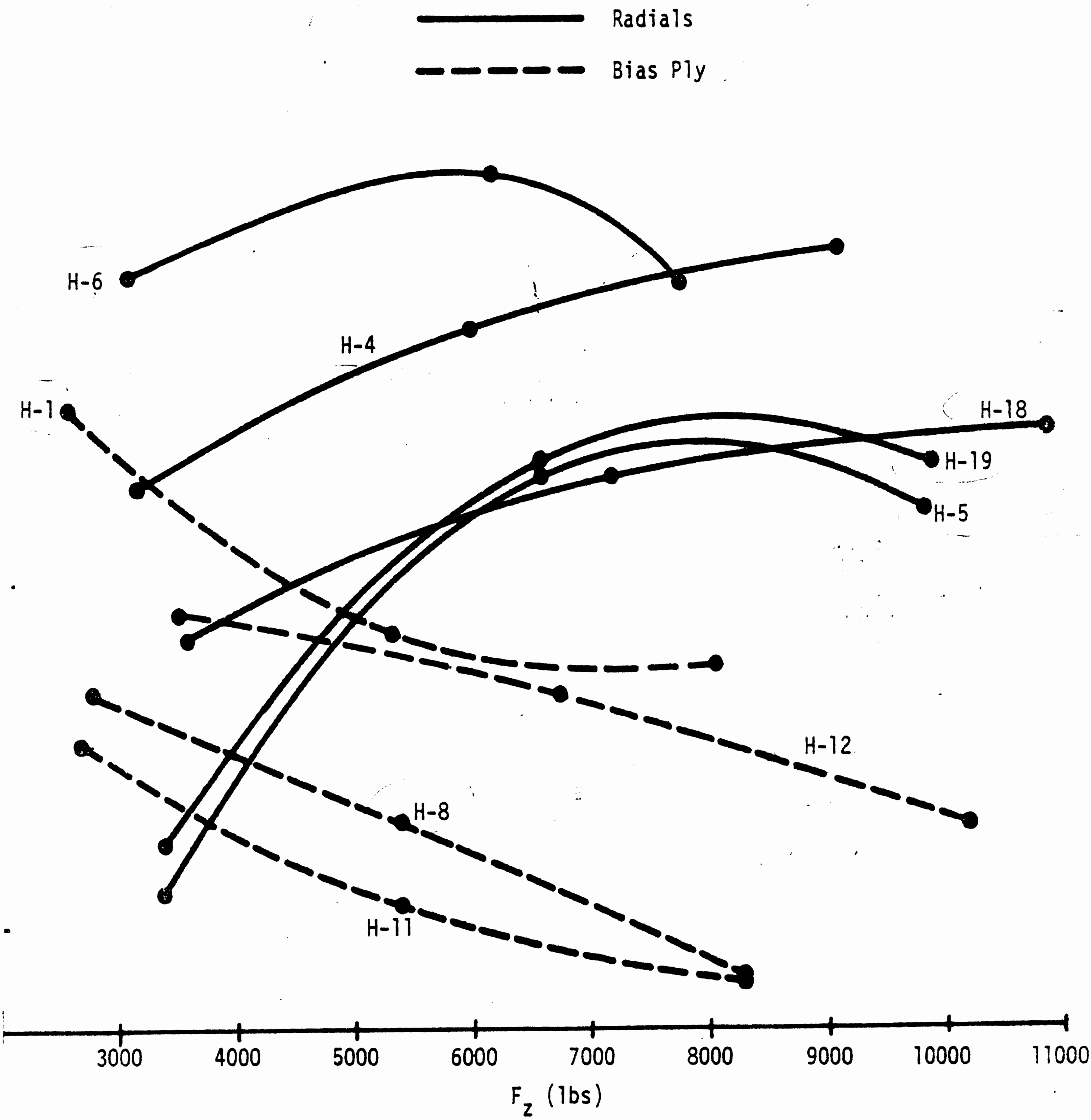


Figure 3.17. The load sensitivity of F_x/F_z values measured at 4% slip for heavy tires of radial and bias-ply construction (tires are identified by code numbers previously listed in Table 3-1).

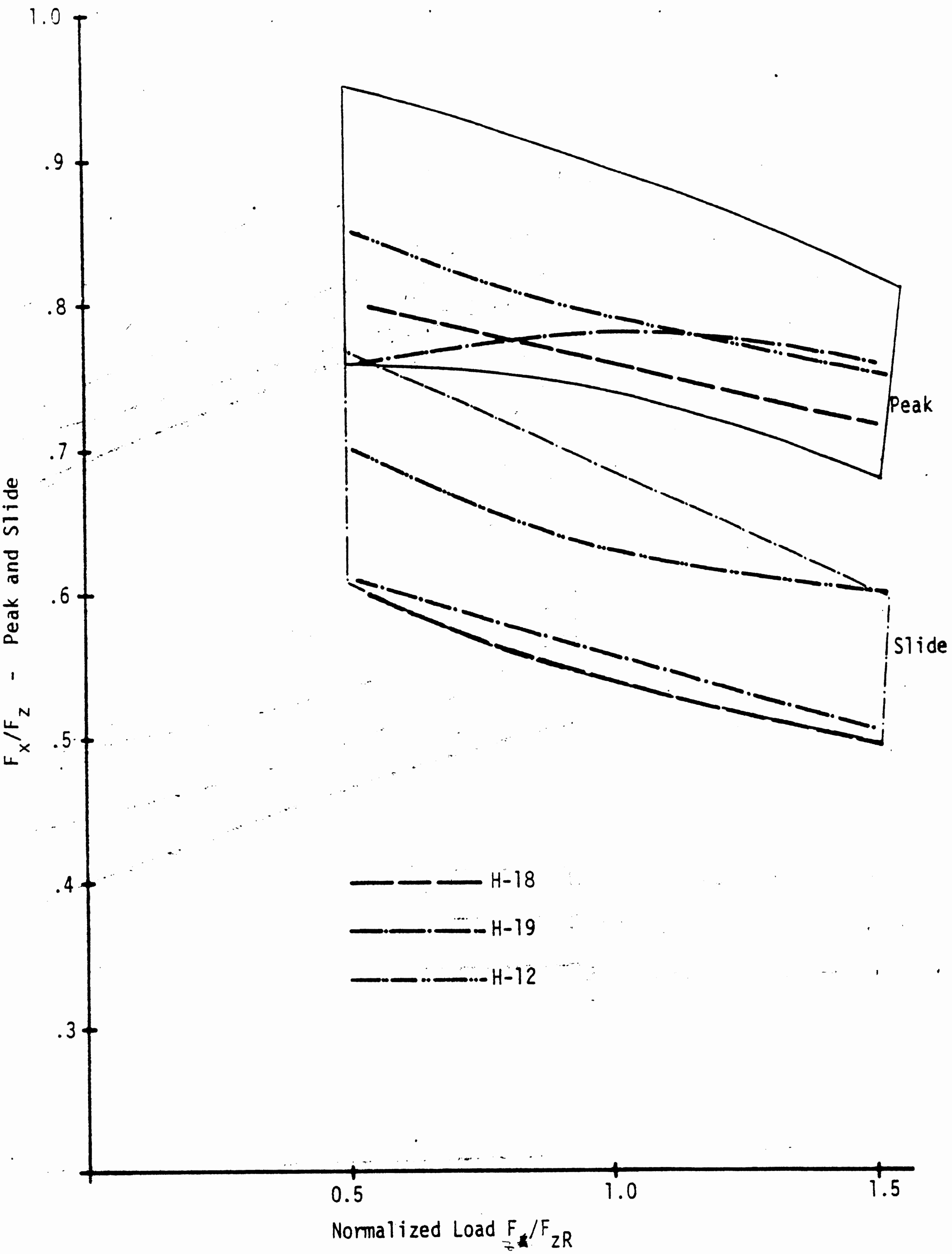


Figure 3.18. "Peak and slide" values of F_x/F_z vs. load for individual bus tires—superimposed within the envelope of data taken on eight truck and bus tires at 20 mph (for code identifications, see Table 3-1).

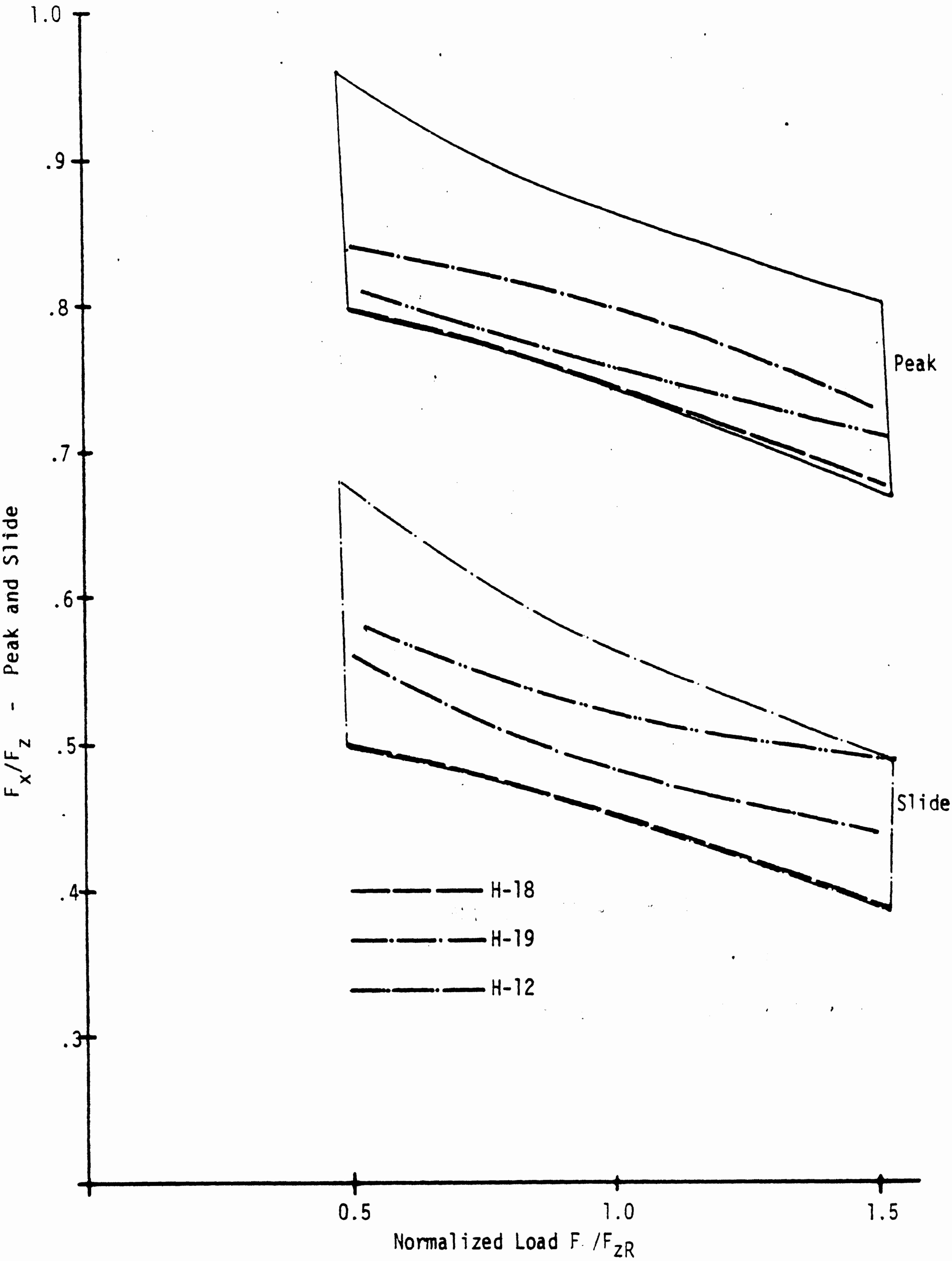


Figure 3.19. "Peak and slide" values of F_x/F_z vs. load for individual bus tires—superimposed within the envelope of data taken on eight truck and bus tires at 40 mph (for code identifications, see Table 3-1).

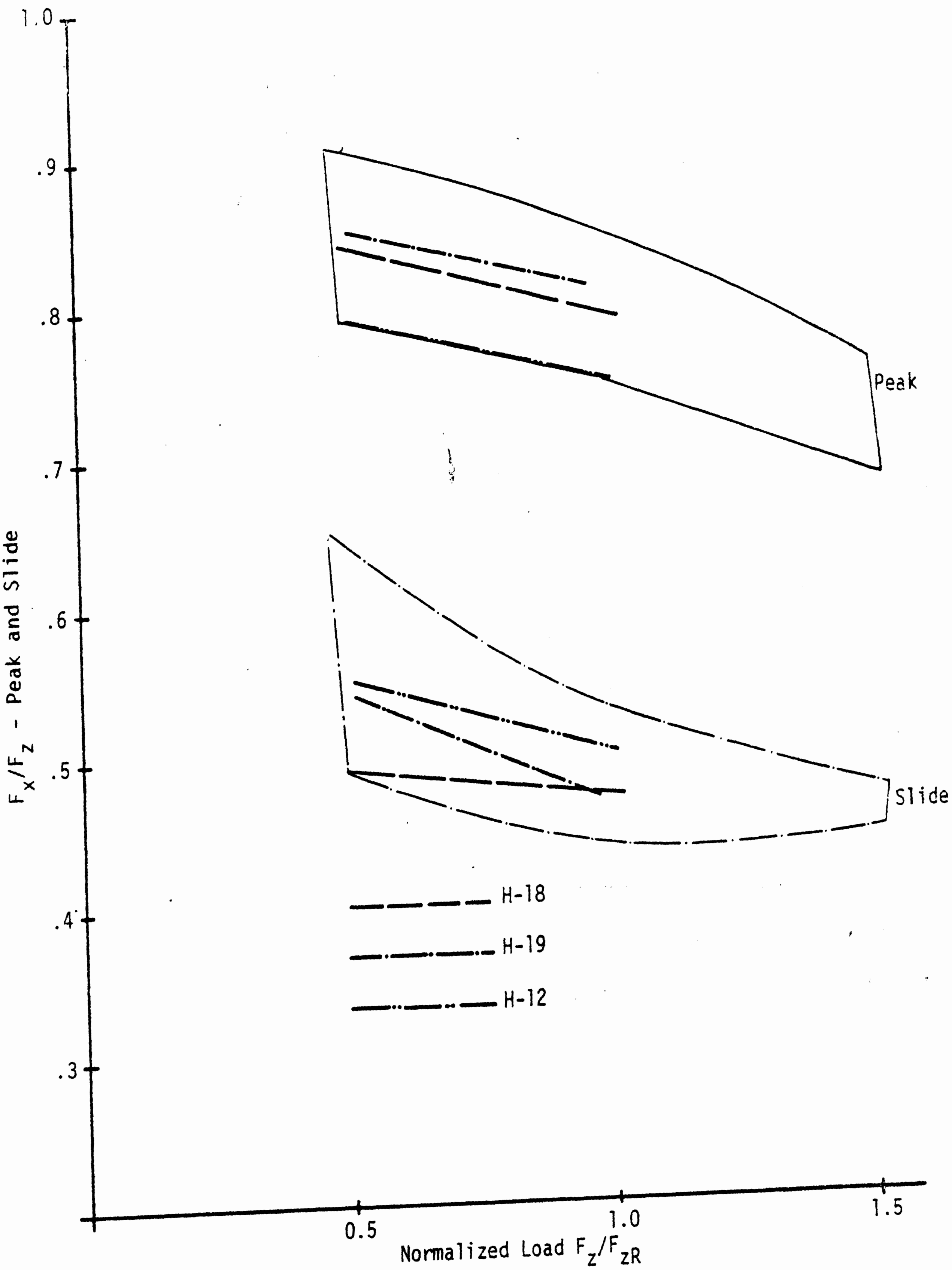


Figure 3.20. "Peak and slide" values of F_X/F_Z vs. load for individual bus tires—superimposed within the envelope of data taken on eight truck and bus tires at 55 mph (for code identifications, see Table 3-1).

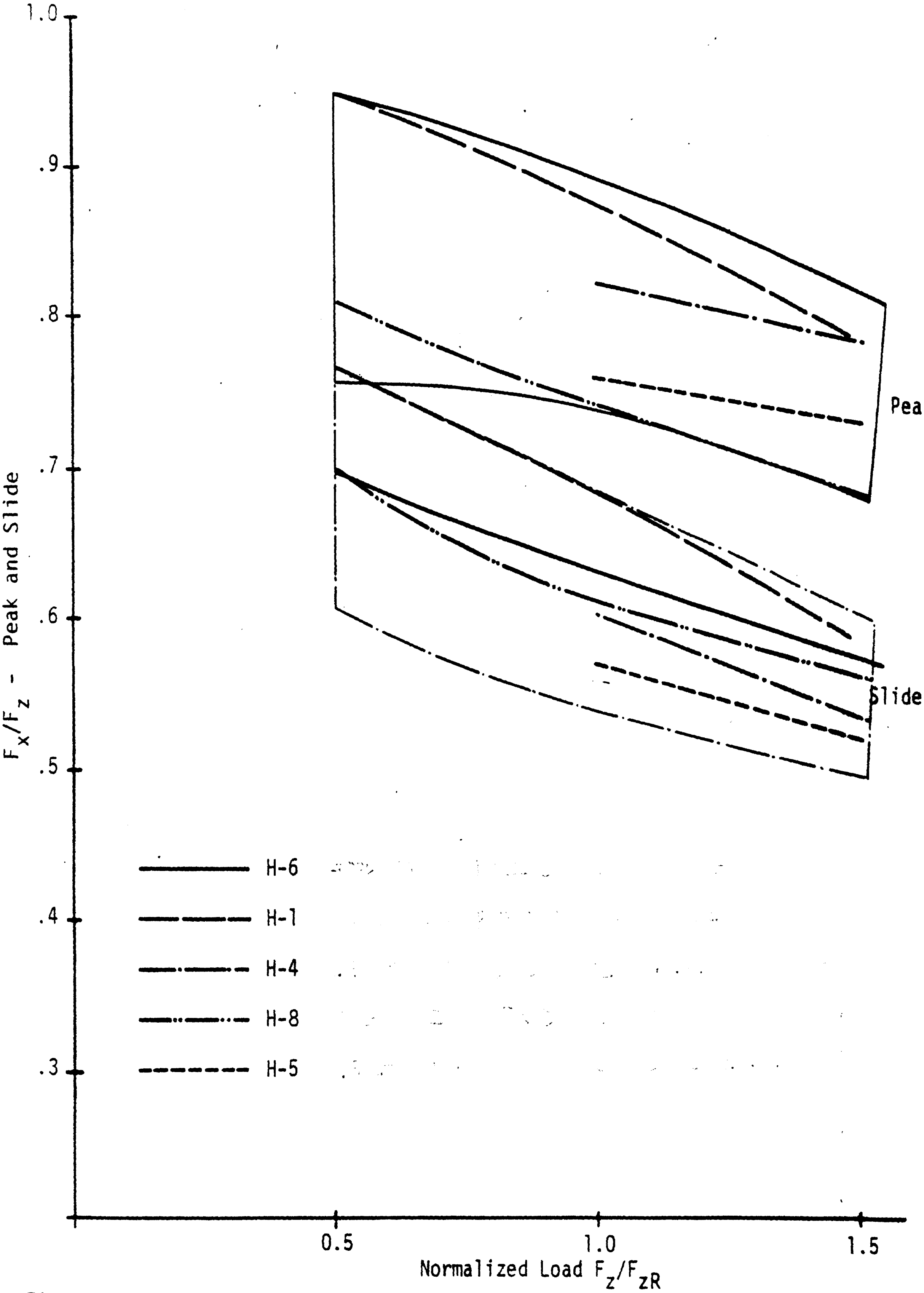


Figure 3.21. "Peak and slide" values of F_x/F_z vs. load for individual truck tires—superimposed within the envelope of data taken on eight truck and bus tires at 20 mph (for code number identifications, see Table 3-1)

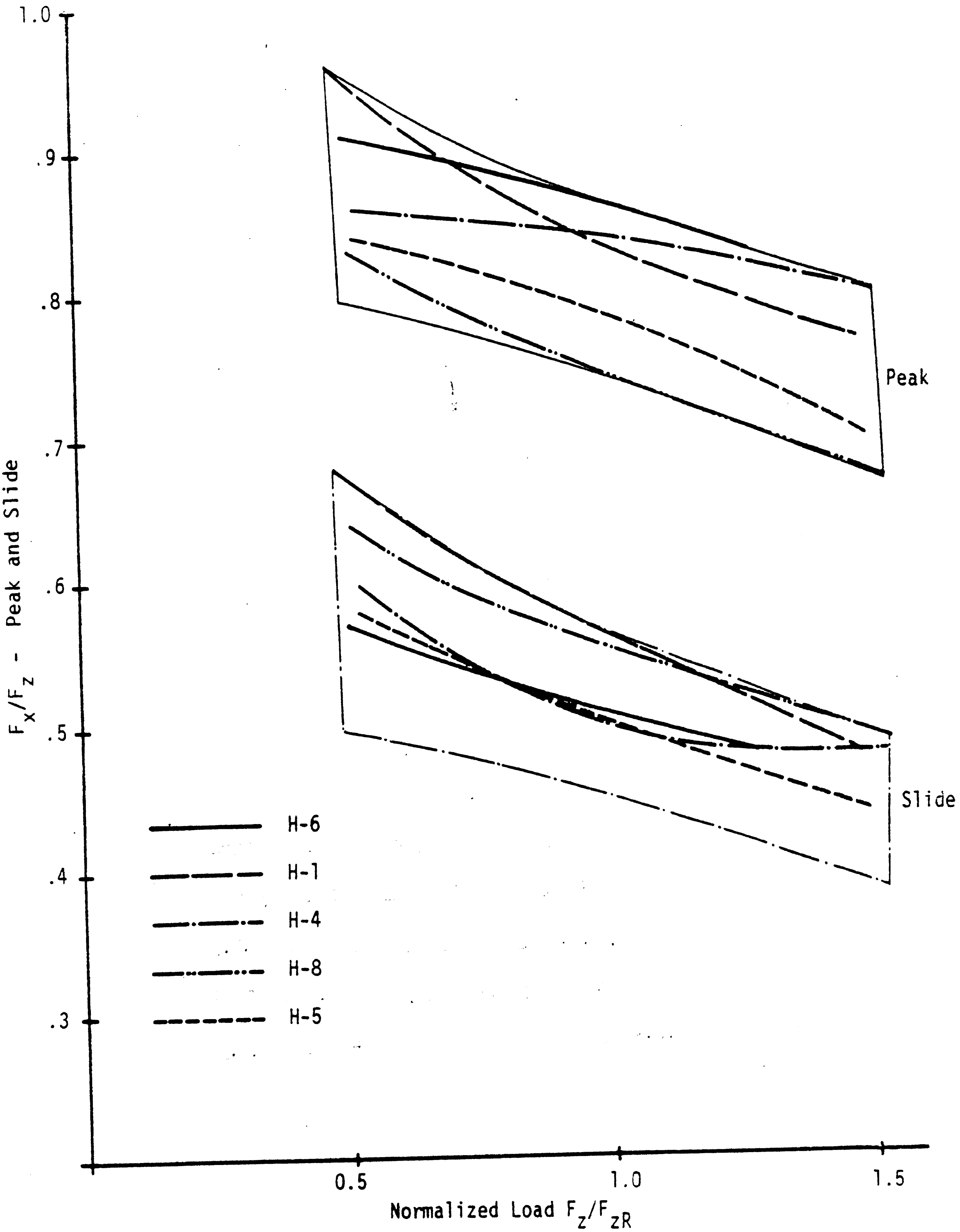


Figure 3.22. "Peak and slide" values of F_x/F_z vs. load for individual truck tires—superimposed within the envelope of data taken on eight truck and bus tires at 40 mph (for code number identifications, see Table 3-1).

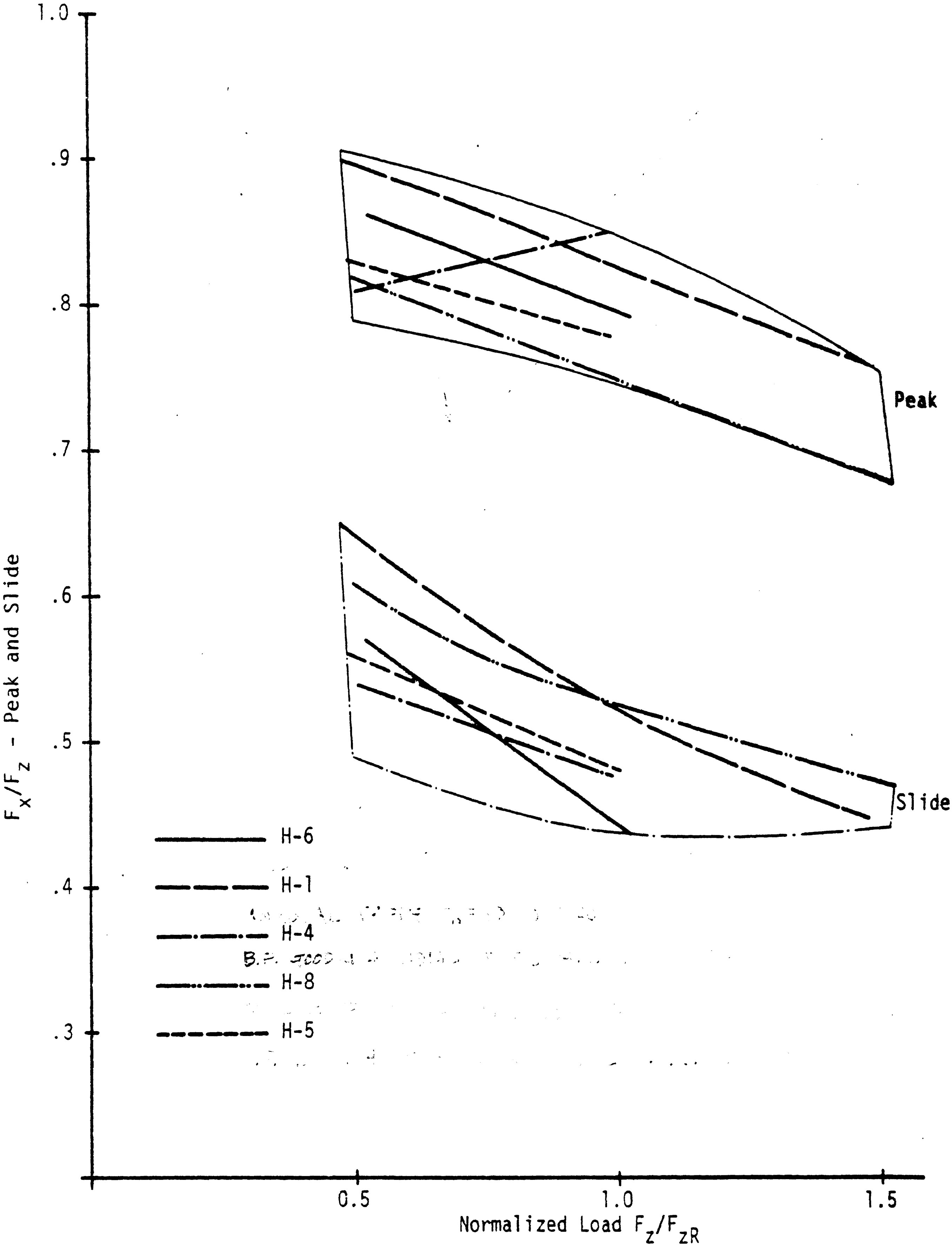


Figure 3.23. "Peak and slide" values of F_x/F_z vs. load for individual truck tires—superimposed within the envelope of data taken on eight truck and bus tires at 55 mph (for code number identifications, see Table 3-1).

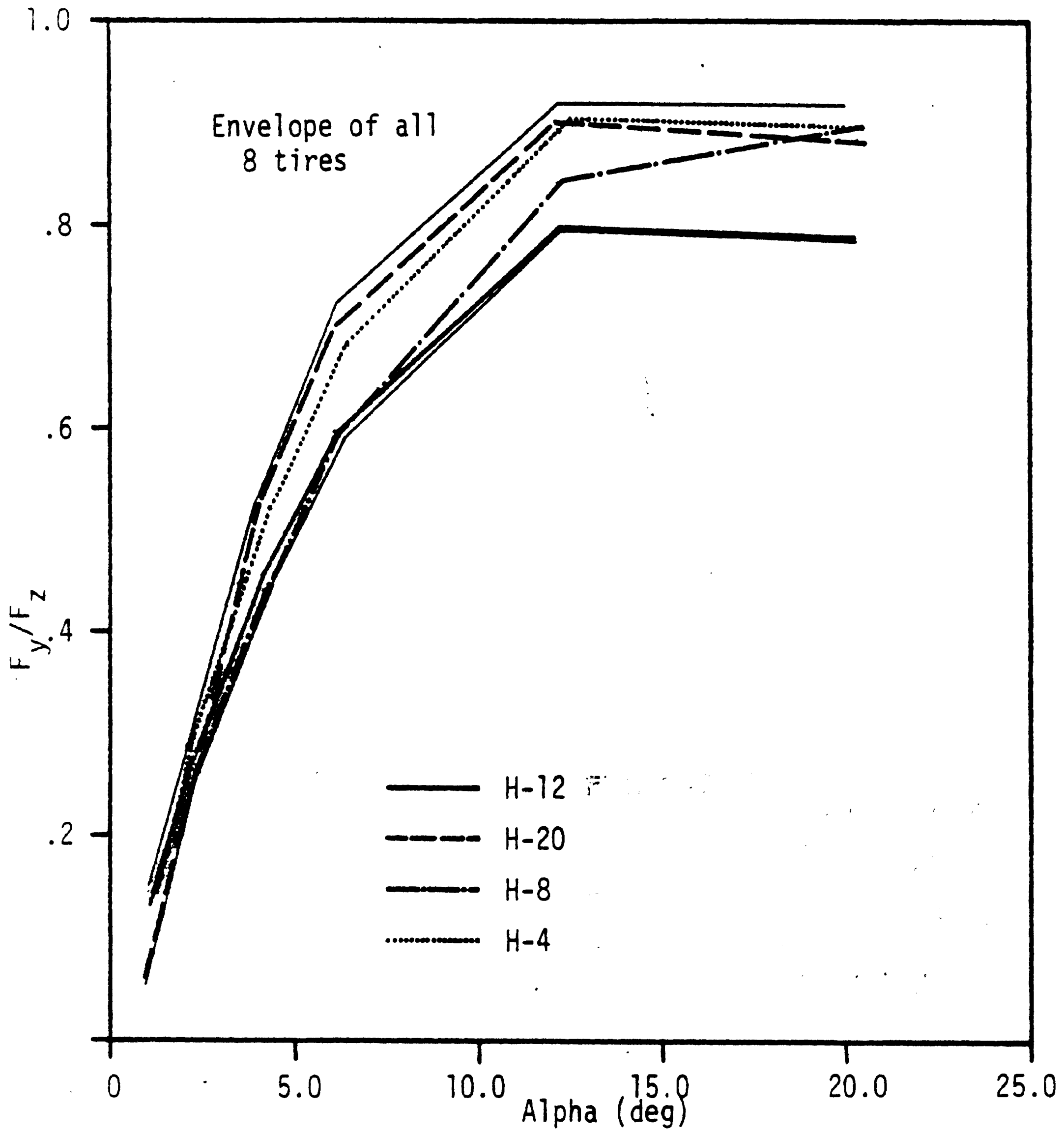


Figure 3.24. Lateral force measurements of heavy truck and bus tires at 20 mph and 0.5 x rated load.

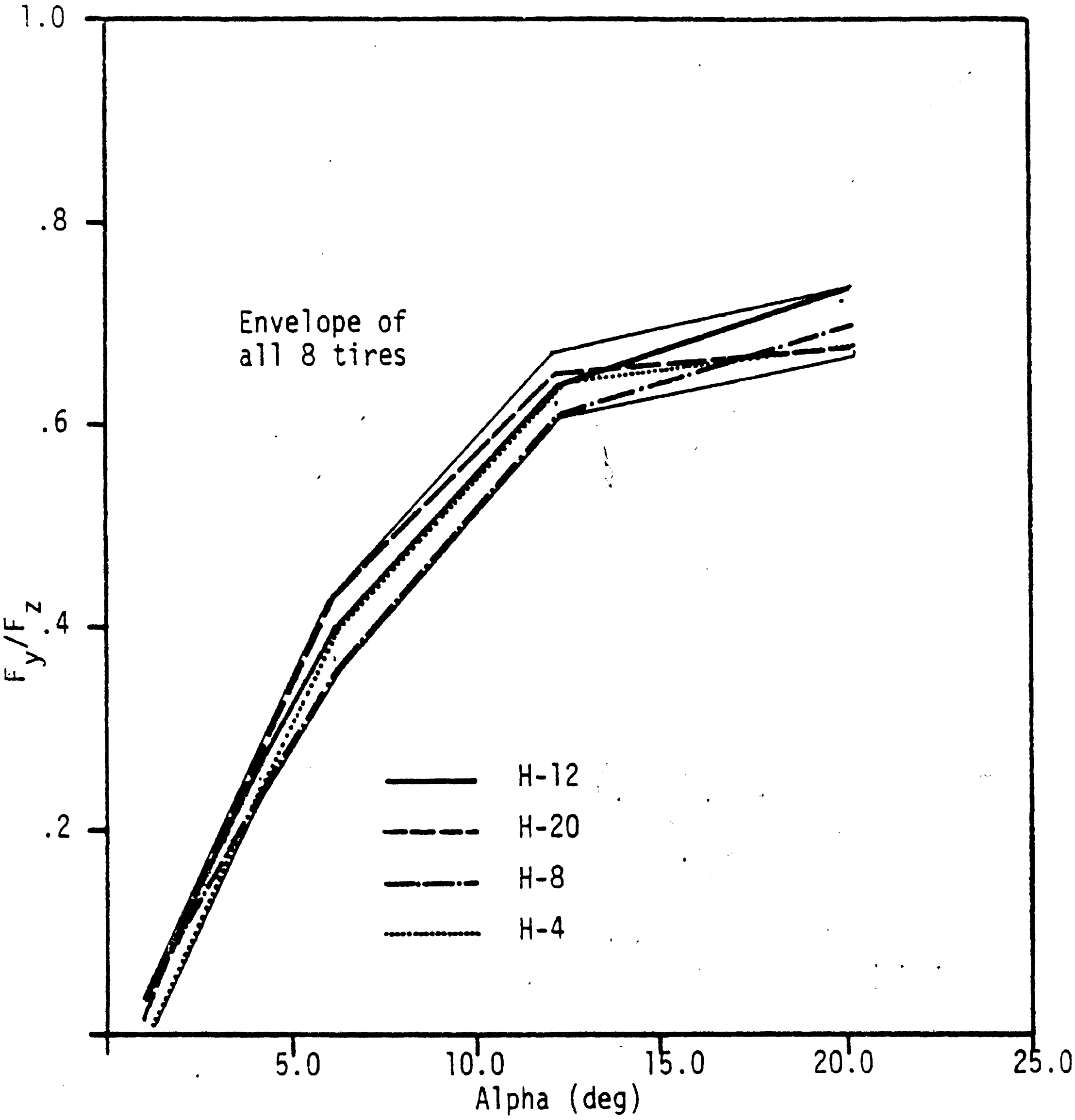


Figure 3.25. Lateral force measurements of heavy truck and bus tires at 20 mph, 1.5 x rated load.

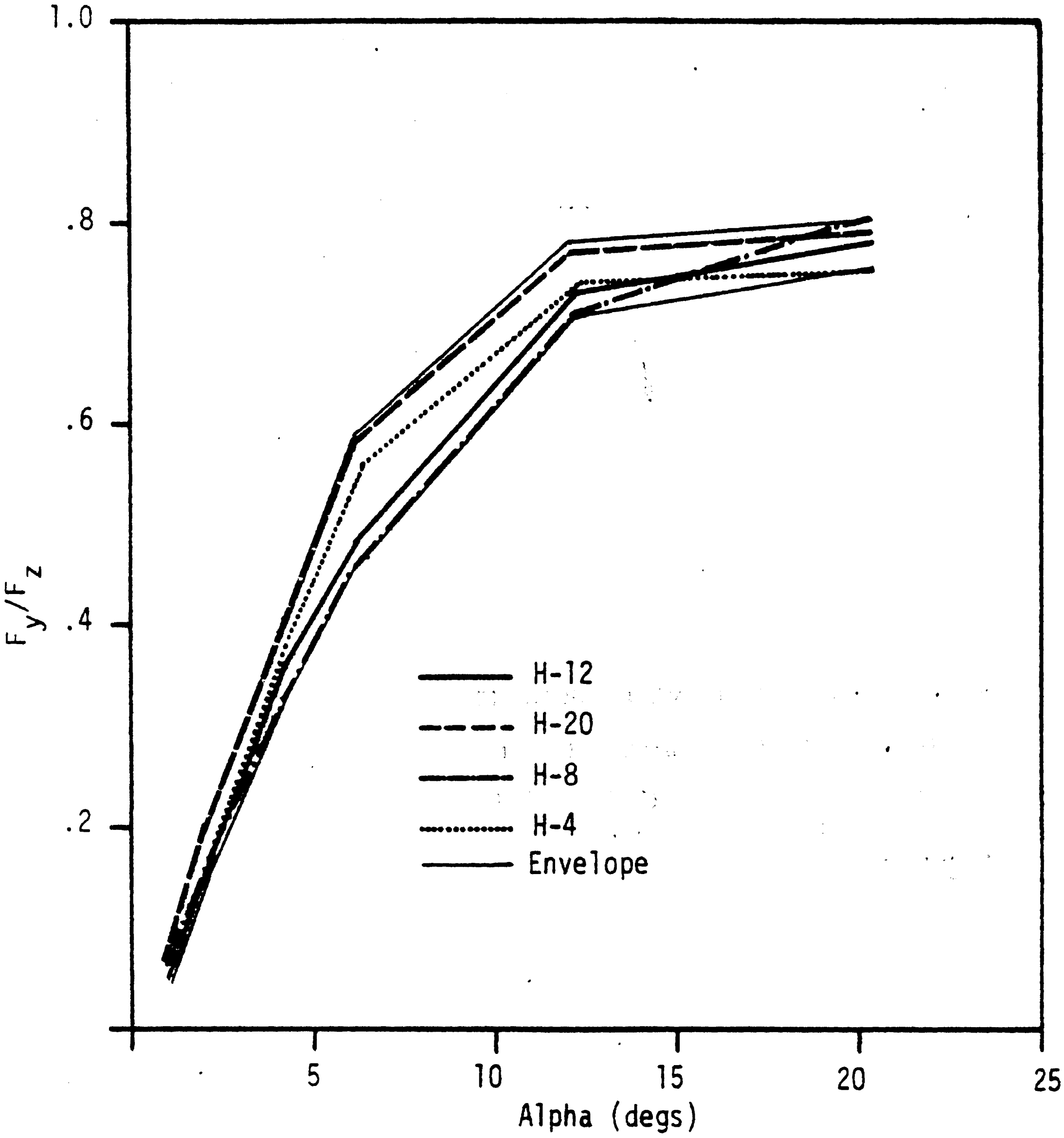


Figure 3.27. Envelope and specific examples of (F_y/F_z vs. α) measurements taken for 8 heavy truck and bus tires at 1.0 F_{zR} and 20 mph.

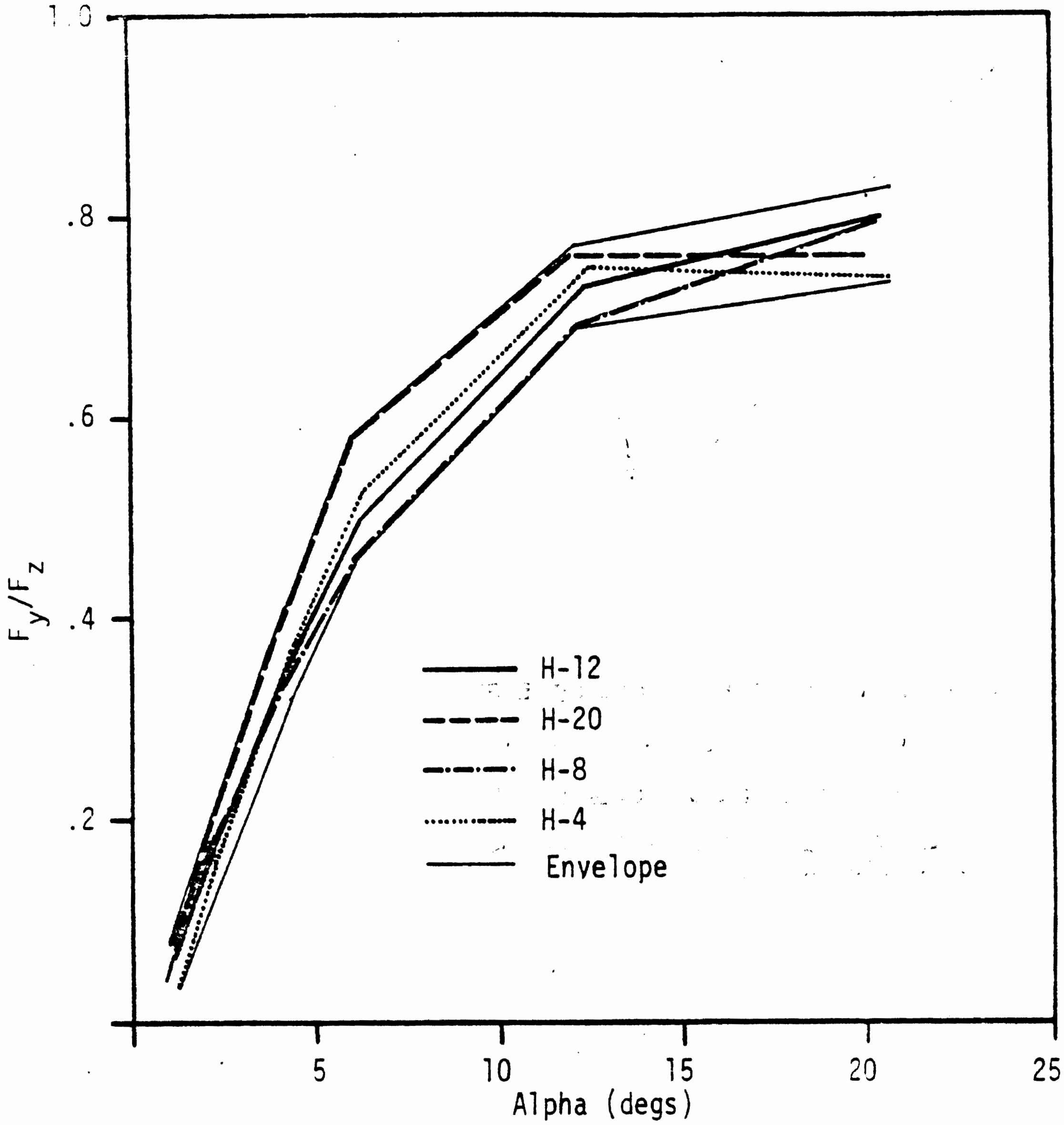


Figure 3.28. Envelope and specific examples of (F_y/F_z vs. α) measurements taken for 8 heavy truck and bus tires at 1.0 F_{zR} and 40 mph.

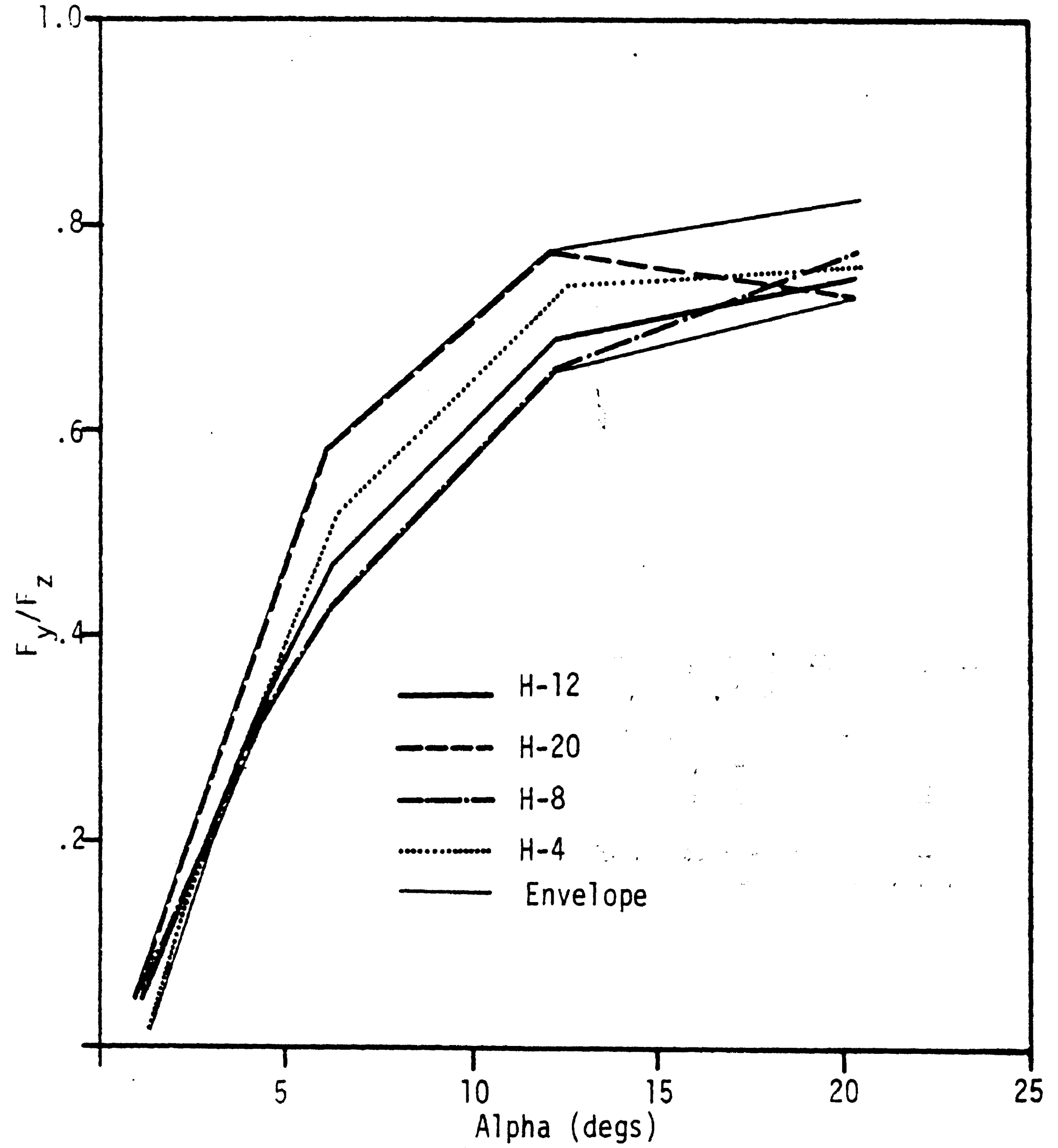


Figure 3.29. Envelope and specific examples of (F_y/F_z vs. α measurements taken for 8 heavy truck and bus tires at 1.0 F_{zR} and 55 mph.

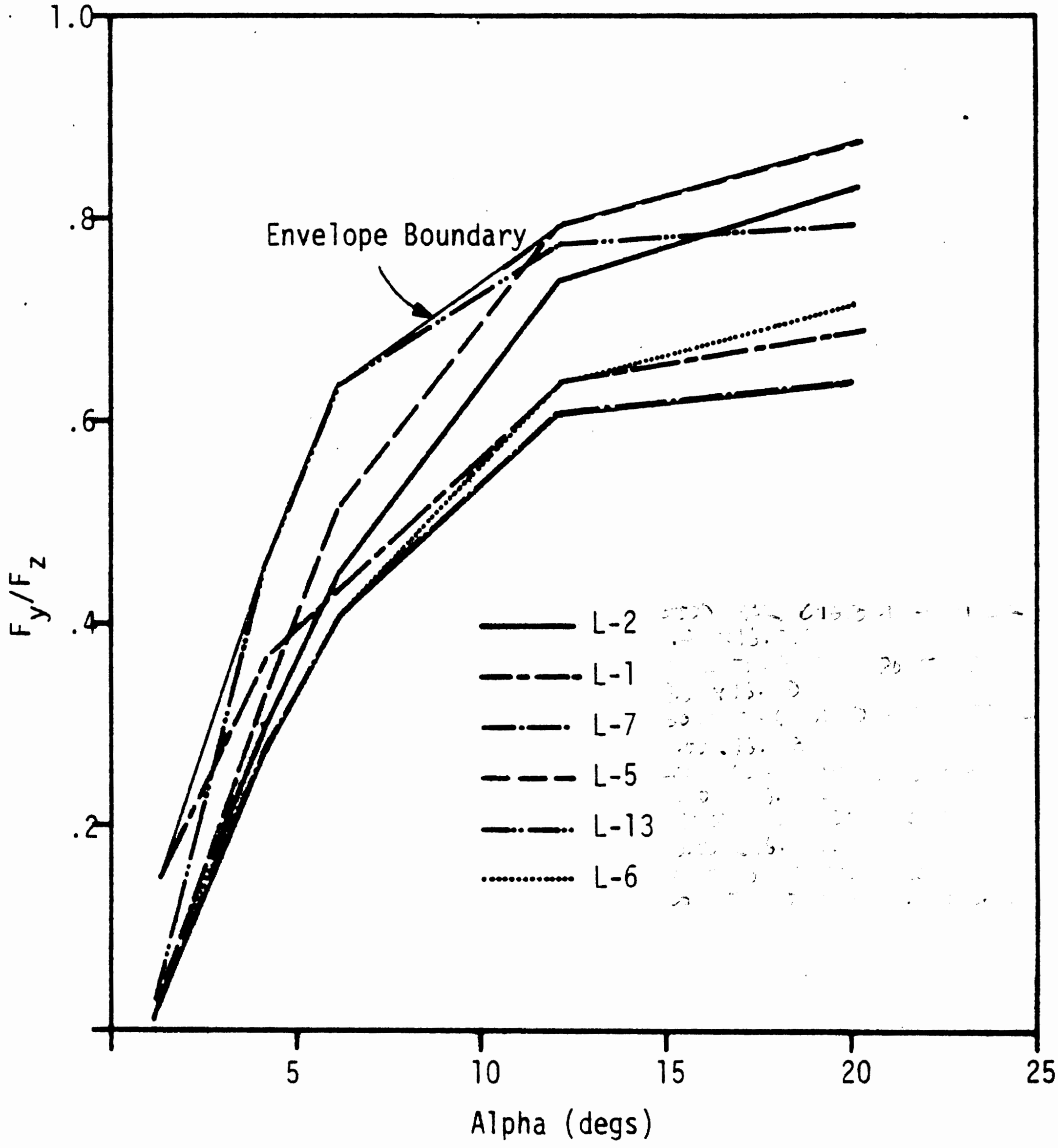


Figure 3.34. Lateral force measurements of light truck tires at rated load, 20 mph.

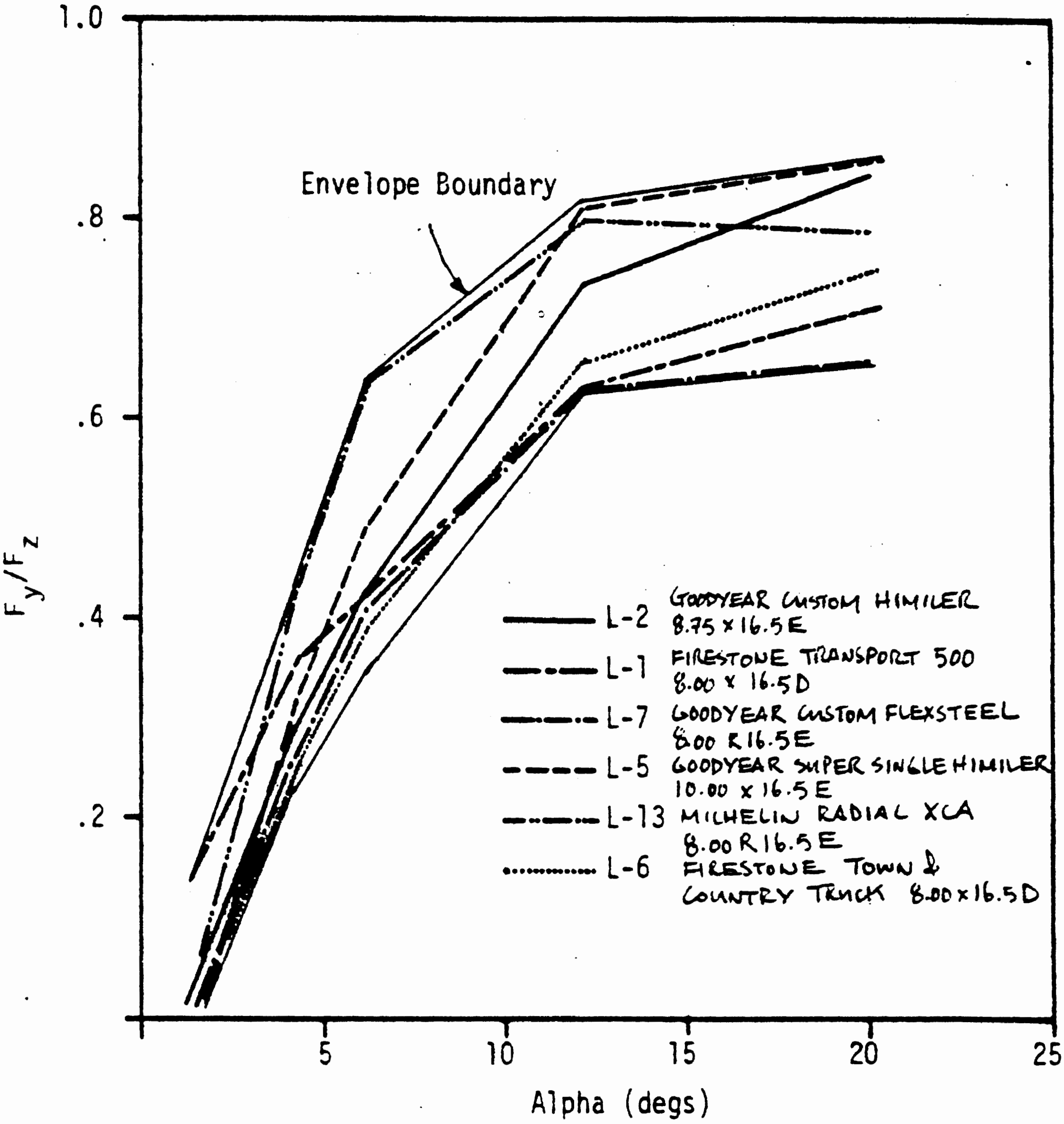


Figure 3.35. Lateral force measurements of light truck tires at rated load, 40 mph.

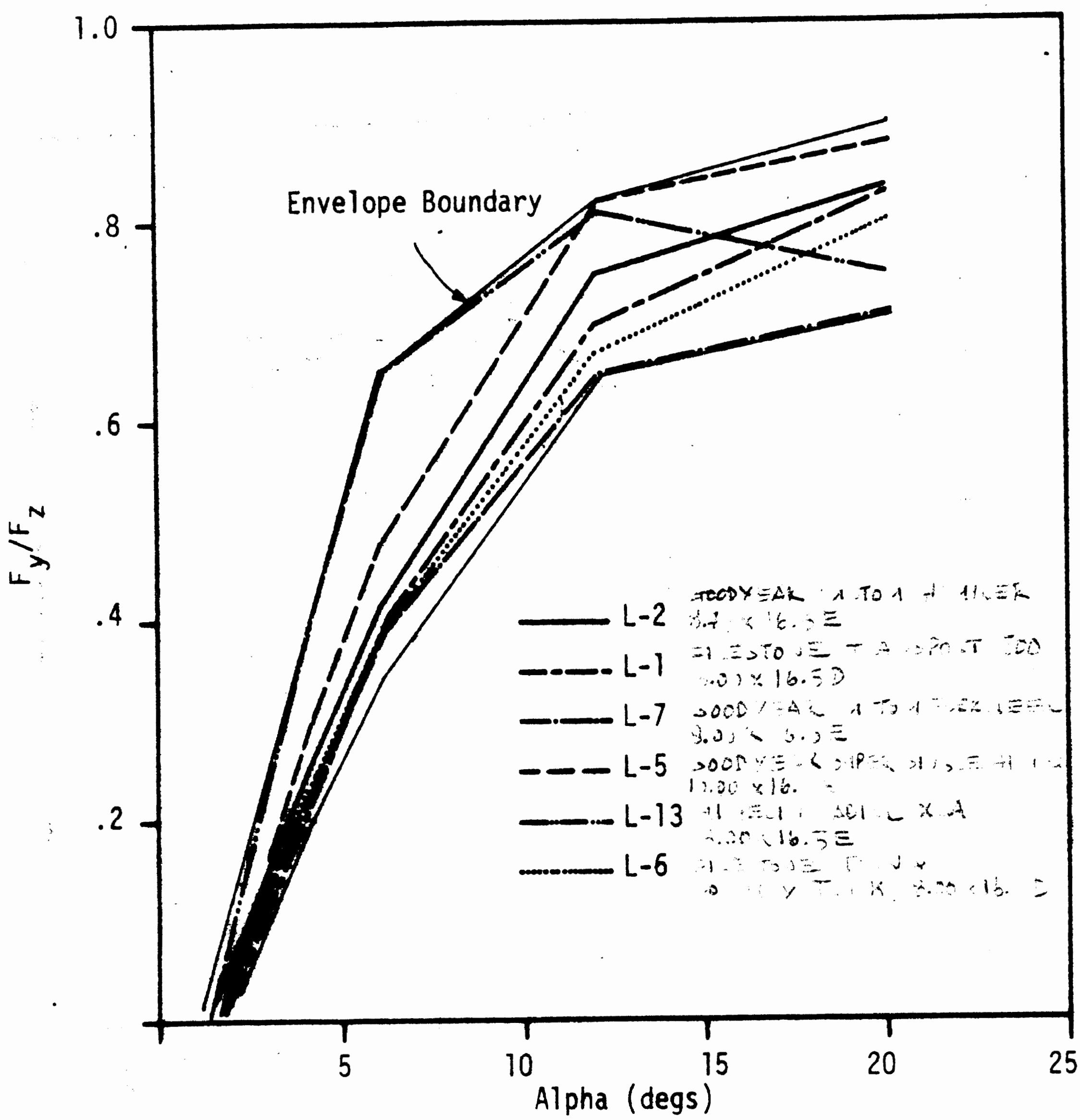


Figure 3.36. Lateral force measurements of light truck tires at rated load, 55 mph.

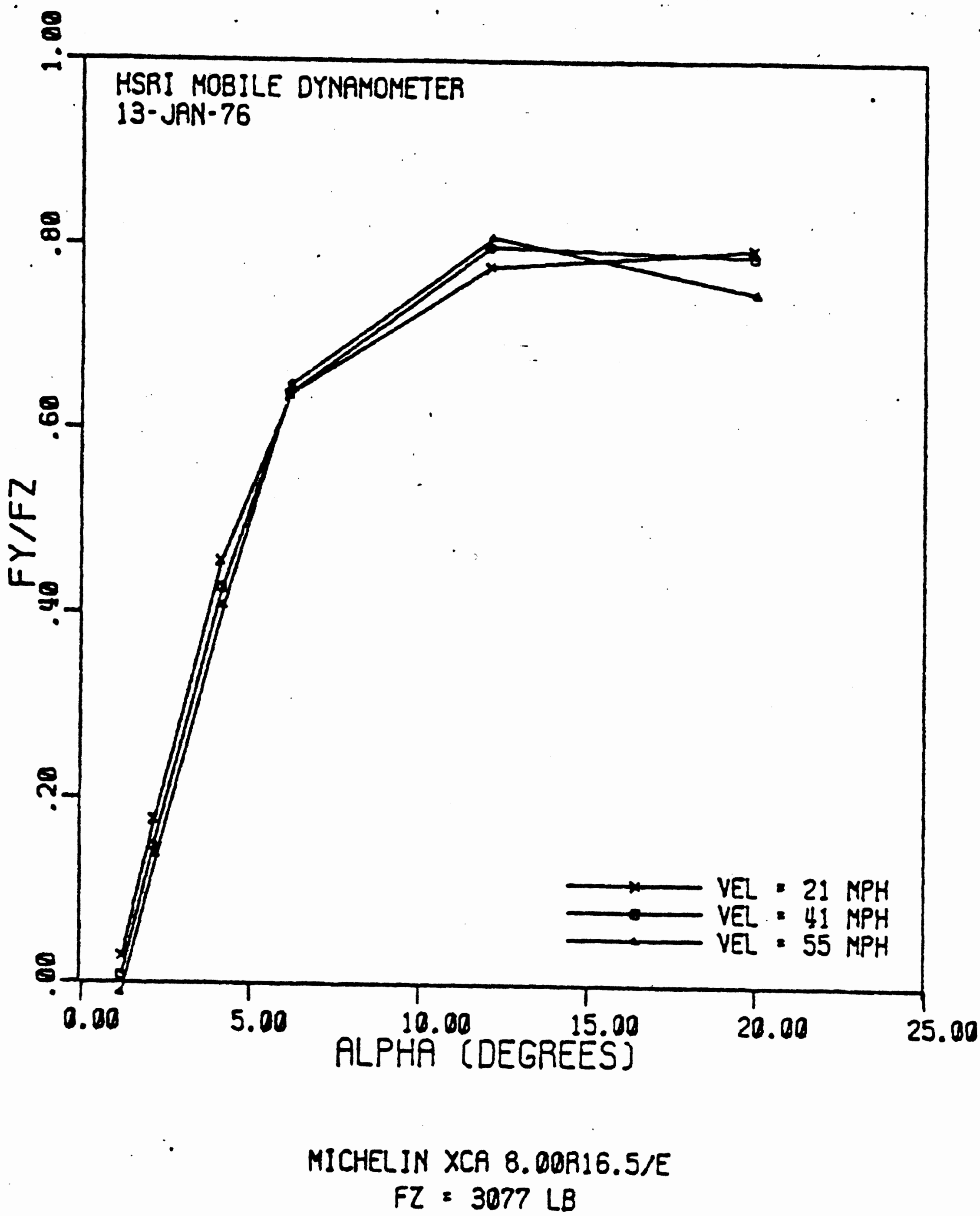


Figure 3.37. Example velocity sensitivity in the lateral traction performance of a Michelin light truck tire.

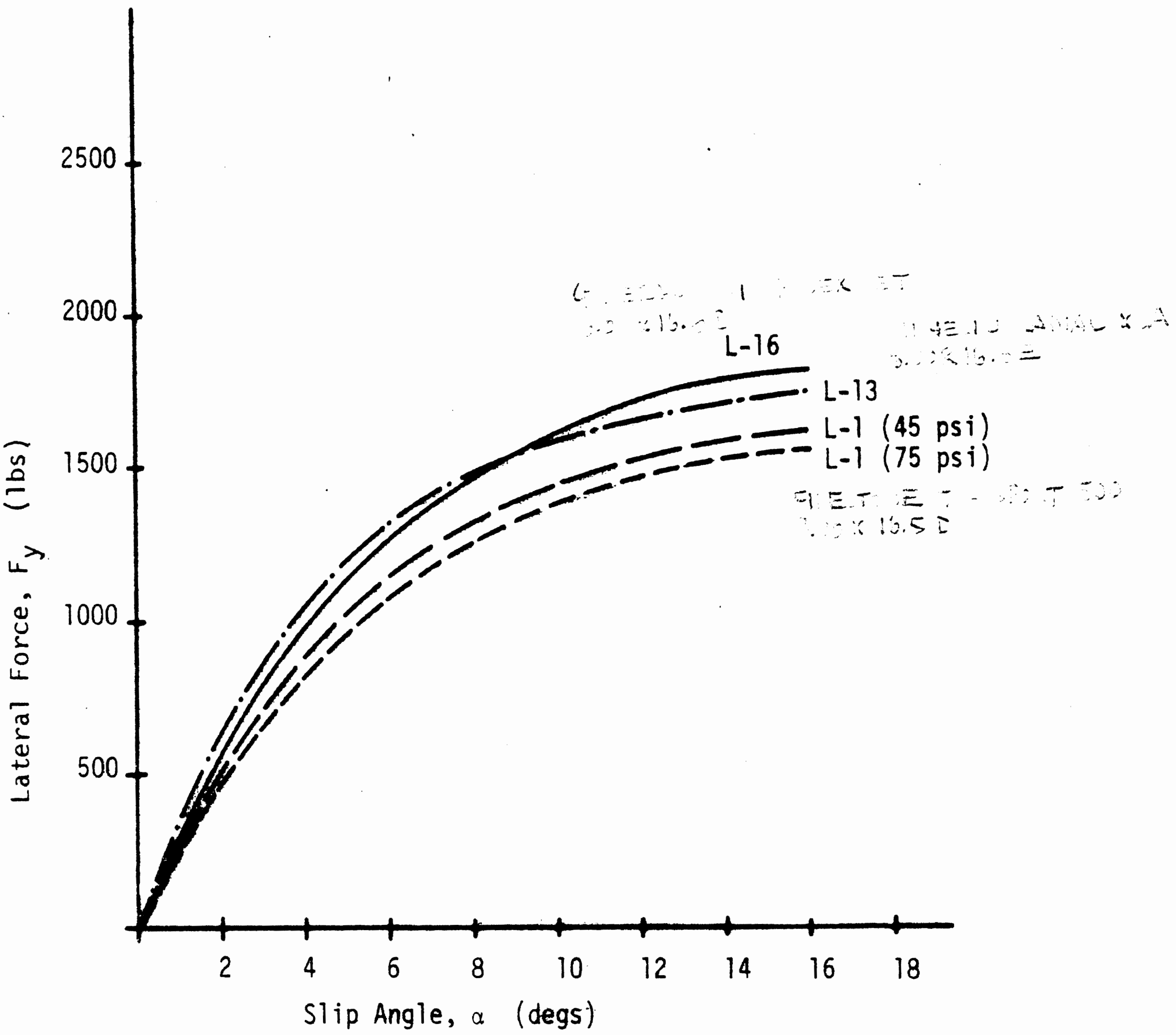


Figure 4.9. F_y versus α behavior of pickup truck tires at 2050 lbs. load.

Overall, the van results indicate that the installation of four tires of the same type and at the same inflation pressure yields a reasonable directional behavior over the entire performance range regardless of the specific shear force behavior of the various types examined. In contrast, any fore/aft bias in tire distribution which places the lower lateral traction capability in the rear will result in the classical reduction in directional stability.

Particularly significant is the calculation of reduced yaw stability for the case of the OE tire installed with its recommended inflation pressure bias. Insofar as light truck tires may or may not indicate the classical polarity of slope in their lateral traction sensitivity to inflation pressure, it would appear that recommendations of a biased distribution of inflation pressure are open to question.

4.2.2 Simulation Results Illustrating Vehicle Response Sensitivity to Tire Selections - Pickup Truck. Design parameters measured on the pickup truck test vehicle were applied in a sequence of simulations examining the influence of "pickup truck tires" on the yaw behavior of the subject vehicle. In these calculations the selected tires covered F_y/F_z versus α characteristics as shown in Figure 4.9. As was shown in the case of the tires selected for the van simulations, the range of properties spans linear range variations as well as variations in the high slip behavior. Note, also, that the traction properties employed in these simulations represent actual tires rather than artificially-generated descriptions.

Three tire configurations were examined with the vehicle in its unloaded condition. As shown in Figure 4.10, calculations of response to trapezoidal steer at 30 mph illustrate virtually zero sensitivity to the differing tires installed uniformly at all four wheel positions. Note that although the sideslip response of the E_0 data indicates a large departure from the other configurations, the expanded β scale tends to exaggerate an otherwise insignificant distinction.

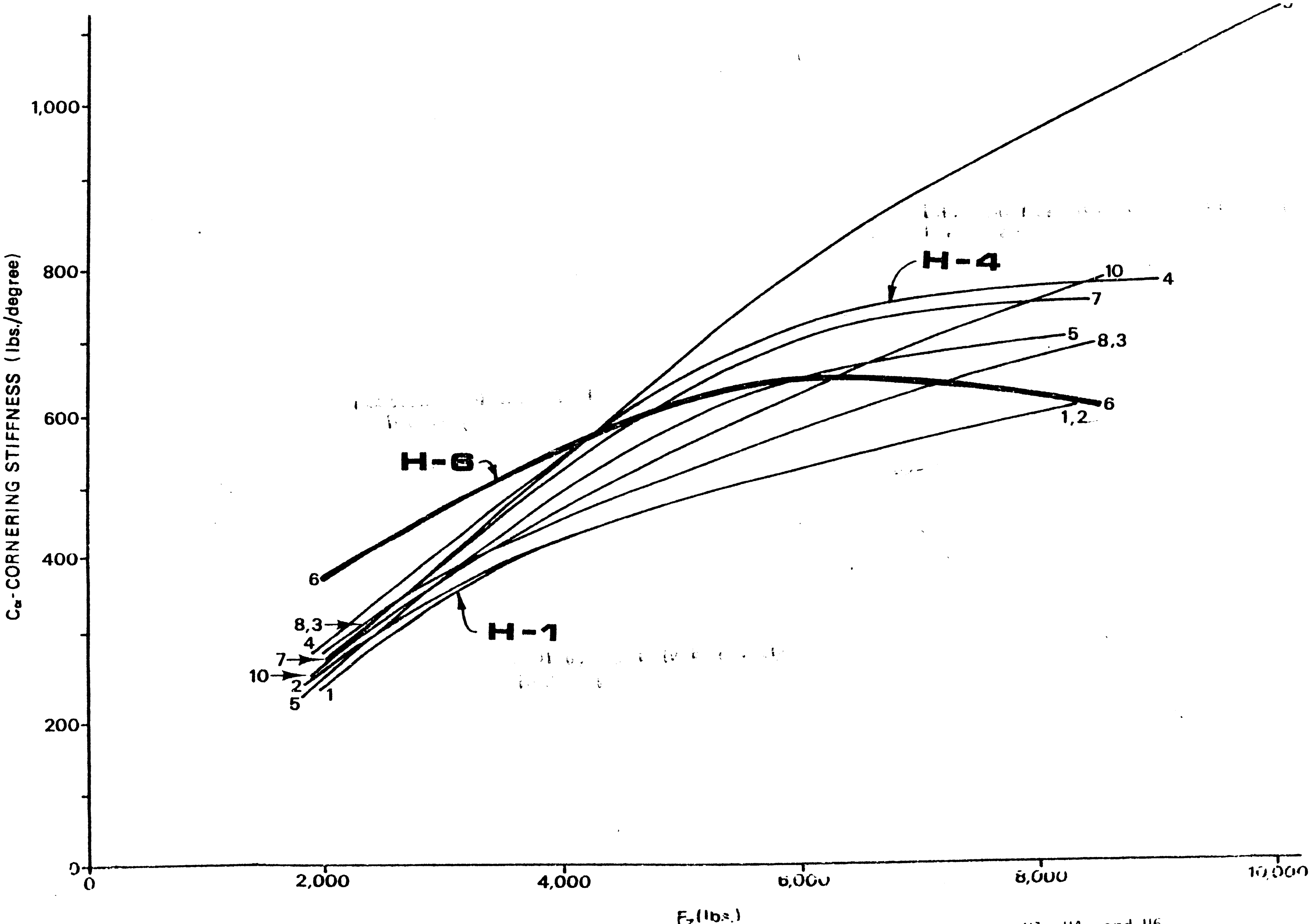


Figure 4.14. Load sensitivity of the cornering stiffness parameter for the three tires, H1, H4, and H6, employed in heavy truck simulations (compared to the remainder of the heavy truck tire sample).

TABLE 3.1. FLAT-BED TEST TIRES

Tire No.	Manufacturer	Model	Size
Heavy Truck Tires			
H-1	Uniroyal	Triple Tread	10 x 20F
H-2	Uniroyal	Triple Tread	10 x 20G
H-3	Uniroyal	Triple Tread	11 x 22.5F
H-4	B.F. Goodrich	Milesaver Radial Steel H.D.R.	10 R 20 G
H-5	B.F. Goodrich	Milesaver Radial Steel H.D.B.	10 R 20 G
H-6	Goodyear	Unisteel R-1	10 R 20 G
H-7	Goodyear	Unisteel L-1	10 R 20 G
H-8	Firestone	Power Drive	10 x 20F
H-9	Uniroyal	Unimaster Rib	15 x 22.5H
H-10	Michelin	Radial	10 R 20 G
H-11	Uniroyal	Fleetmaster Superlug	10 x 20F
Heavy Bus Tires			
H-12	Firestone	Hiway Mileage	12.5 x 22.5G
H-13	B.F. Goodrich	Intercity Mileage	12.5 x 22.5G
H-14	B.F. Goodrich	Intercity Mileage	11.5 x 20G
H-15	Uniroyal	Intercity	12.5 x 22.5G
H-16	Uniroyal	MaxRoute I	11.00 R 20H
H-17	Goodyear	Custom Cruiser	12.5 x 22.5G
H-18	Michelin	Radial XZA	11 R 20 H
H-19	Michelin	Radial XZA	11 R 22.5 H
H-20	Michelin	Radial XZA	12 R 22.5H
Light Truck Tires			
L-1	Firestone	Transport 500	8.00 x 16.5D
L-2	Goodyear	Custom HiMiler	8.75 x 16.5E
L-3	Goodyear	Rib HiMiler	8.00 x 16.5D
L-4	Firestone	Transport 110	7.50 x 16.5C
L-5	Goodyear	Super Single HiMiler	10.00 x 16.5E
L-6	Firestone	Town & Country Truck	8.00 x 16.5D
L-7	Goodyear	Custom Flexsteel	8.00 R 16.5E
L-8	Goodrich	Milesaver Radial	8.00 R 16.5D
L-9	Goodyear	Glas Guard XG	8.00 x 16.5D
L-10	Goodyear	Glas Guard XG	8.75 x 16.5E
L-11	Firestone	Town & Country Truck	8.75 x 16.5E
L-12	Goodyear	Custom Flexsteel	8.75 R 16.5E
L-13	Michelin	Radial XCA	8.00 R 16.5E
L-14	Wards	Steel Belted Super Wide	9.50 x 16.5D
L-15	Michelin	Radial XCA	8.75 R 16.5D
L-16	General	Jumbo Power Jet	8.00 x 16.5D
L-17	General	Jumbo Power Jet	8.75 x 16.5E
L-18	Goodyear	Glas Guard	8.00 x 16.5D
L-19	Goodyear	Glas Guard	8.75 x 16.5E
L-20	Goodyear	Rib HiMiler	8.75 x 16.5E

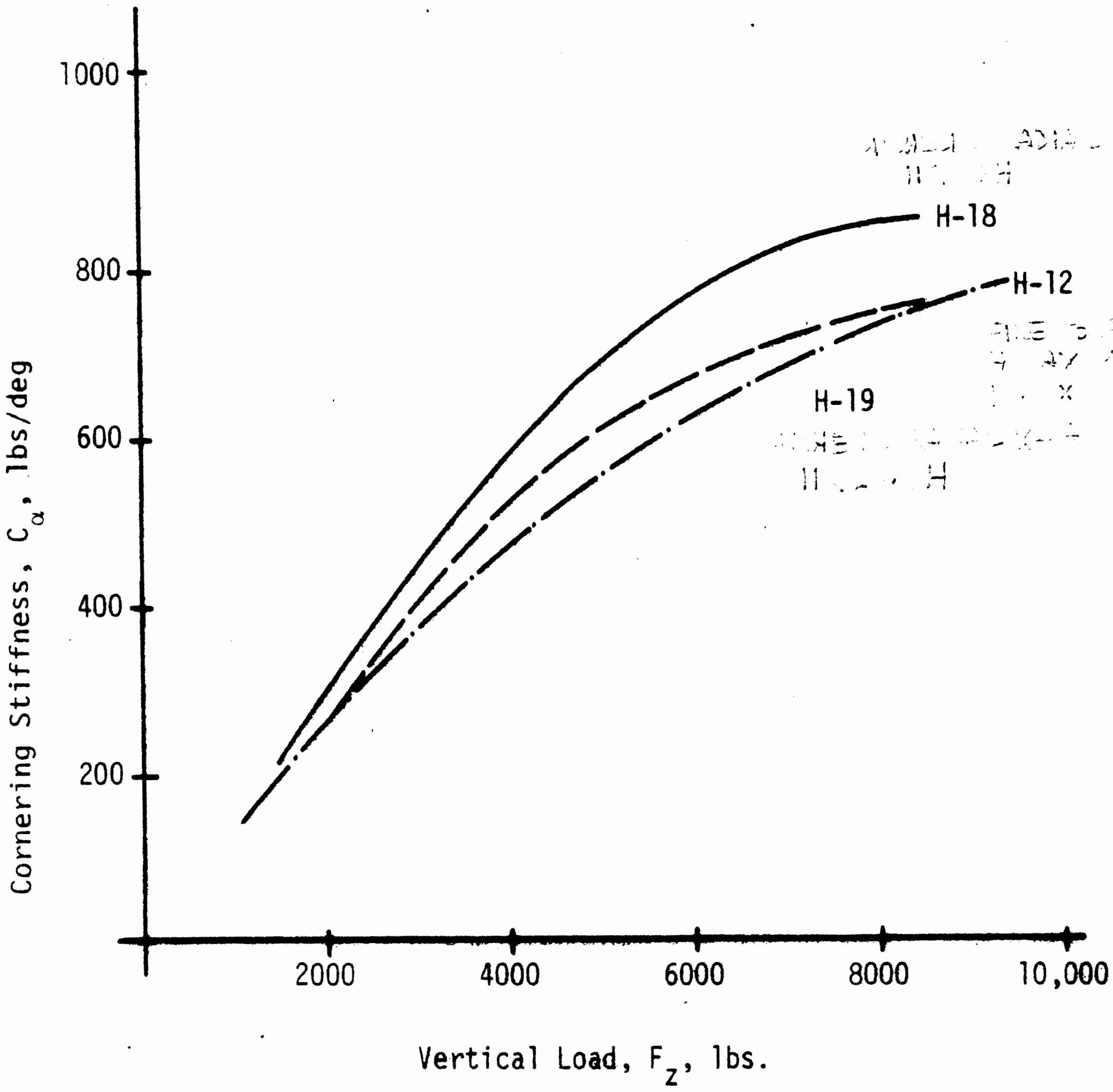


Figure 4.19. Load sensitivity of the cornering stiffness parameter for the three tires employed in intercity bus simulations.

vehicle behavior resulting from the various tire installations were found to be so small as to be contained within the narrow envelopes indicated. The low velocity data, of course, illustrates the reduced yaw velocity gain and is expressed in this unnormalized fashion to give good data separation. As indicated, the loaded vehicle data falls below the empty vehicle responses in each case.

Three tire selections, whose C_α/F_z curves are shown in Figure 4.19, are represented in these calculations; the bias-ply, tube-type baseline tire (Firestone Commercial Mileage 12.5 x 22.5), a tube-type radial (Michelin XZA 11R20/H), and a tubeless radial (Michelin XZA 11R22.5/H). Since tire construction mixes are scrupulously avoided in the operation of intercity bus fleets, the question of a fore/aft mix in carcass construction types was not addressed. Further, since the intercity coach is not characteristically operated with lug-type tires on driving axles (in contrast to the line-haul tractor), the fore/aft mix of tread types is, likewise, a moot issue.

Although the trapezoidal steer response data were selected here to illustrate the positive loading effect and negligible tire effects, detailed results illustrating other less discriminating maneuvers are presented in Appendix F.

4.2.6 Simulation Results Specifically Addressing Heavy Truck Yaw Divergencies. A limited series of computations were performed using HSRI's digital simulation [4] to examine the generality of the divergent yaw response which was observed during full-scale testing of a heavy truck. The findings presented in this section serve to address the sensitivity of heavy truck spinout to various vehicle configuration parameters, thereby expanding upon the test results and computations presented in Appendix G (which directly explained the spinout/rollover incident occurring in this study).

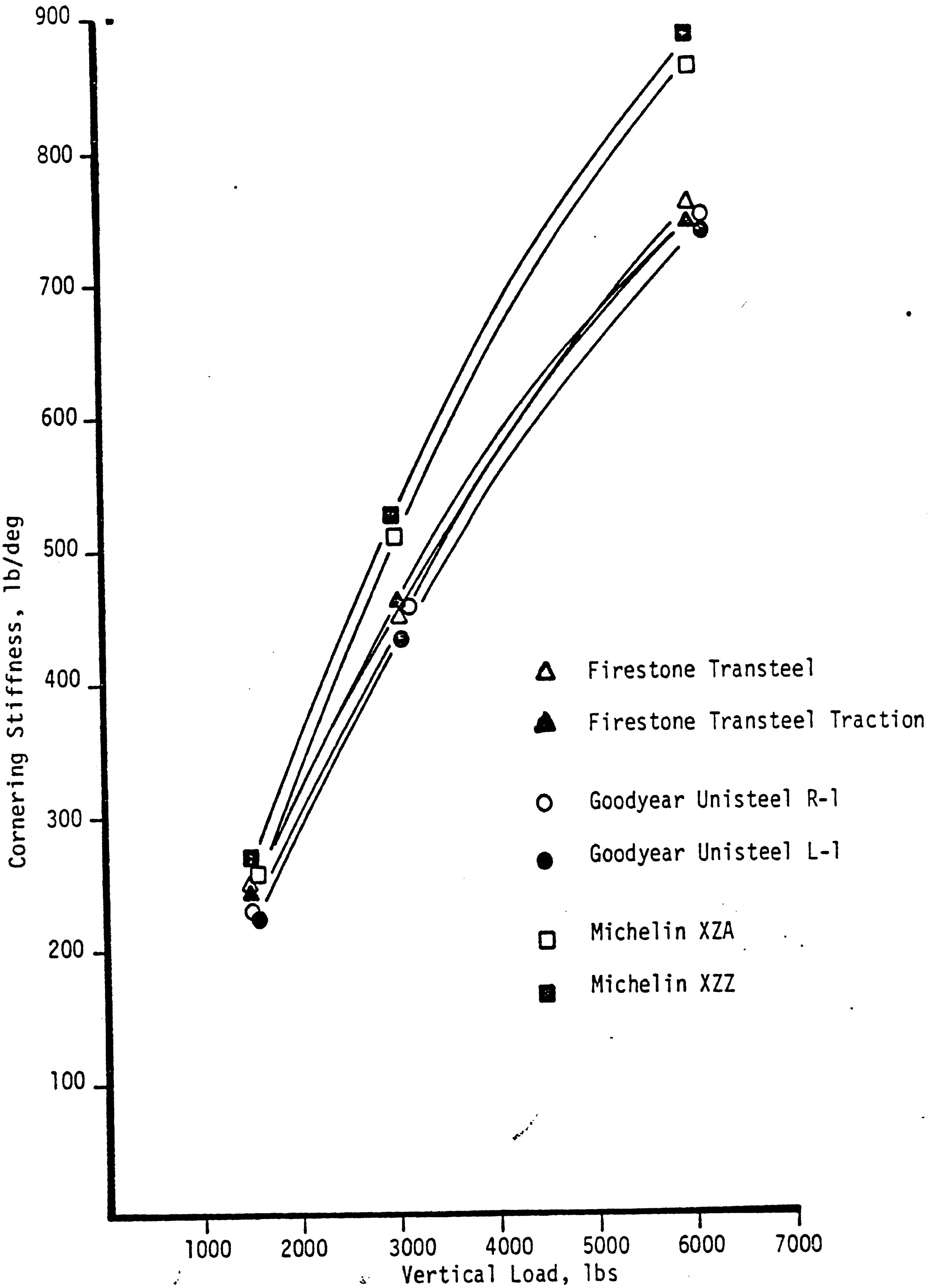
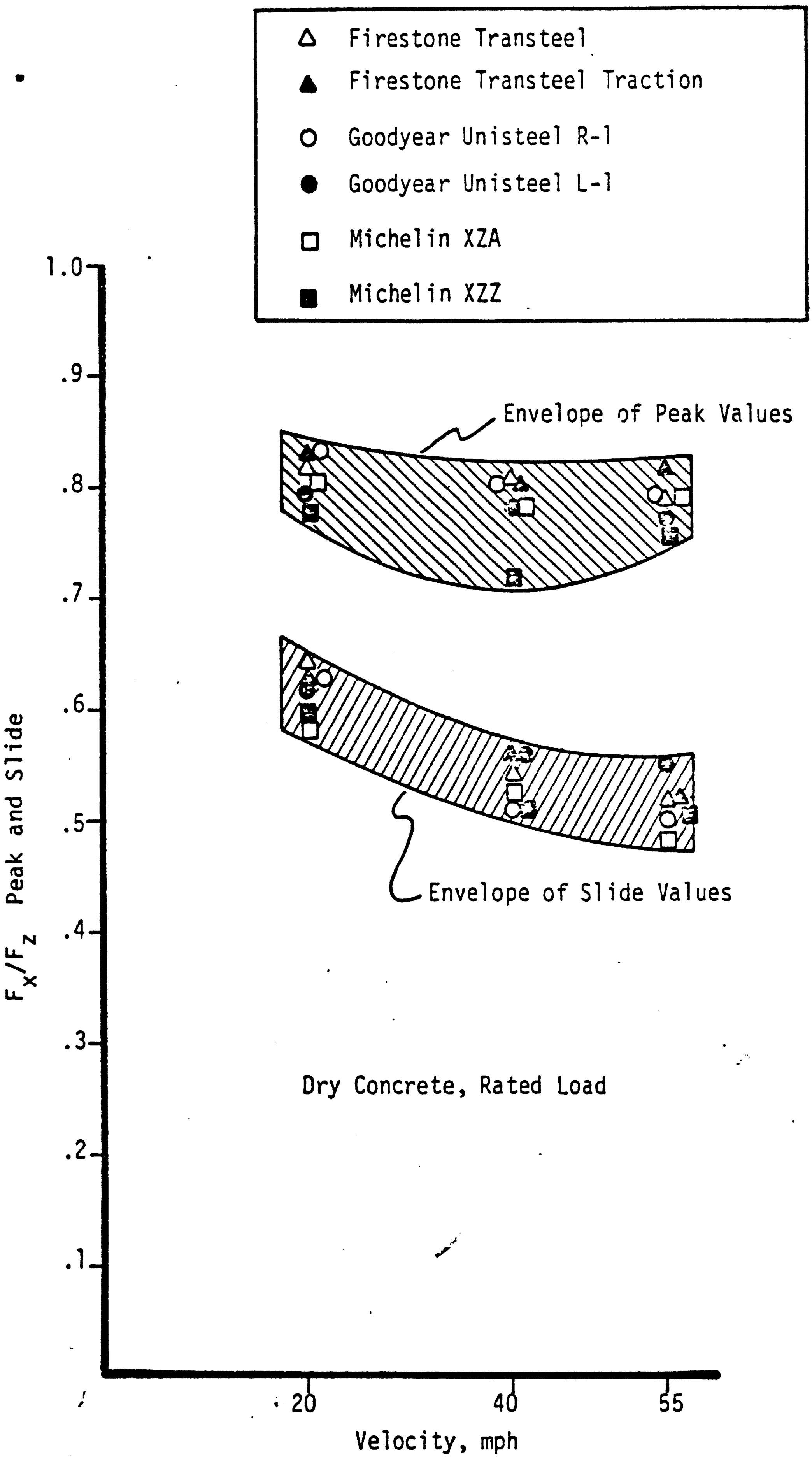

900
800
700
600
500
400
300
200
100
Cornering Stiffness, lb/deg
1000
2000
3000
4000
5000
6000
7000
Vertical Load, lbs
Firestone Transteel
Firestone Transteel Traction
Goodyear Unisteel R-1
Goodyear Unisteel L-1
Michelin XZA
Michelin XZZ

Figure 3



Firestone Transteel
Firestone Transteel Traction
Goodyear Unisteel R-1
Goodyear Unisteel L-1
Michelin XZA
Michelin XZZ
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
F_x/F_z Peak and Slide
Envelope of Peak Values
Envelope of Slide Values
Dry Concrete, Rated Load
20
40
55
Velocity, mph

Figure 4

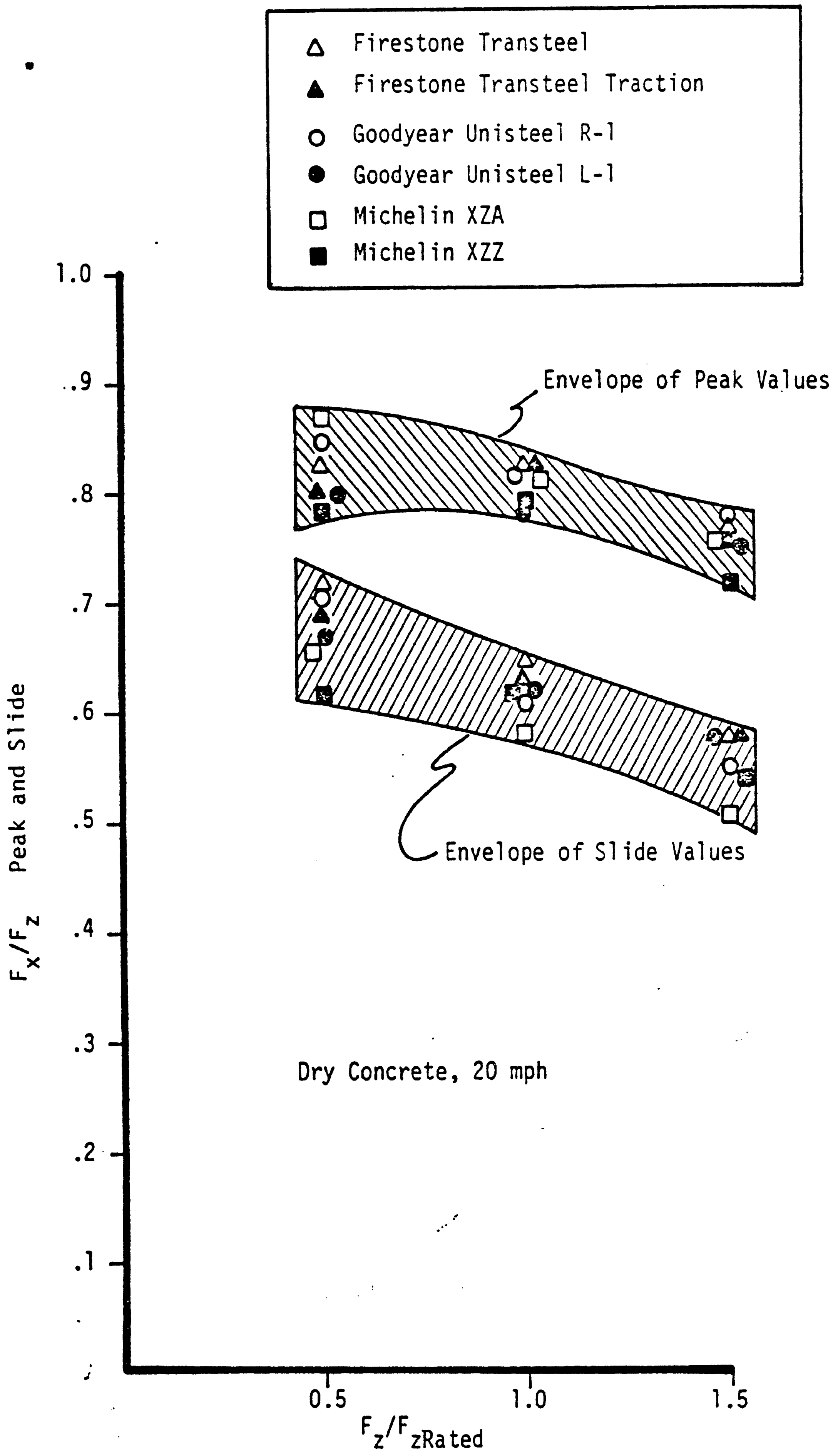
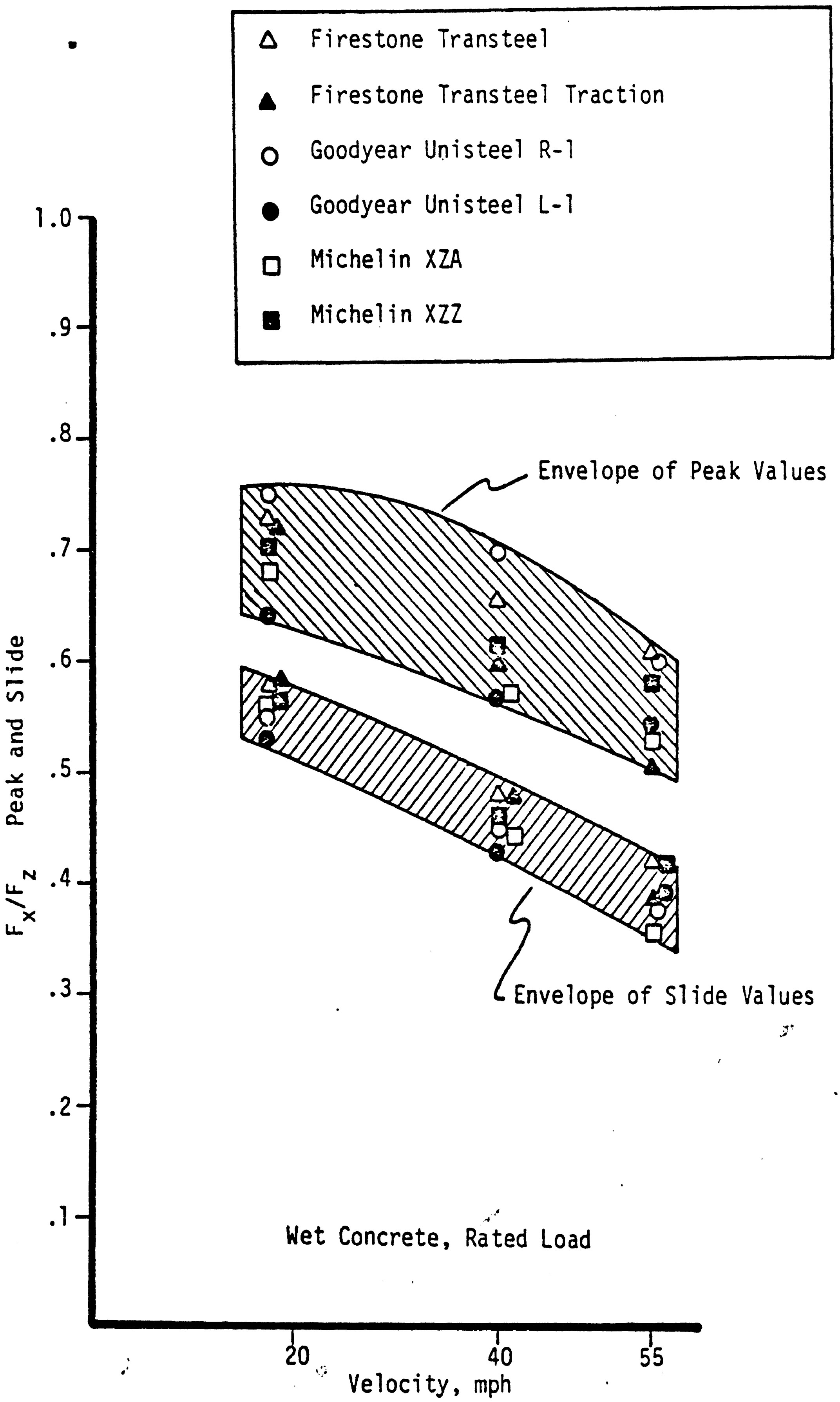
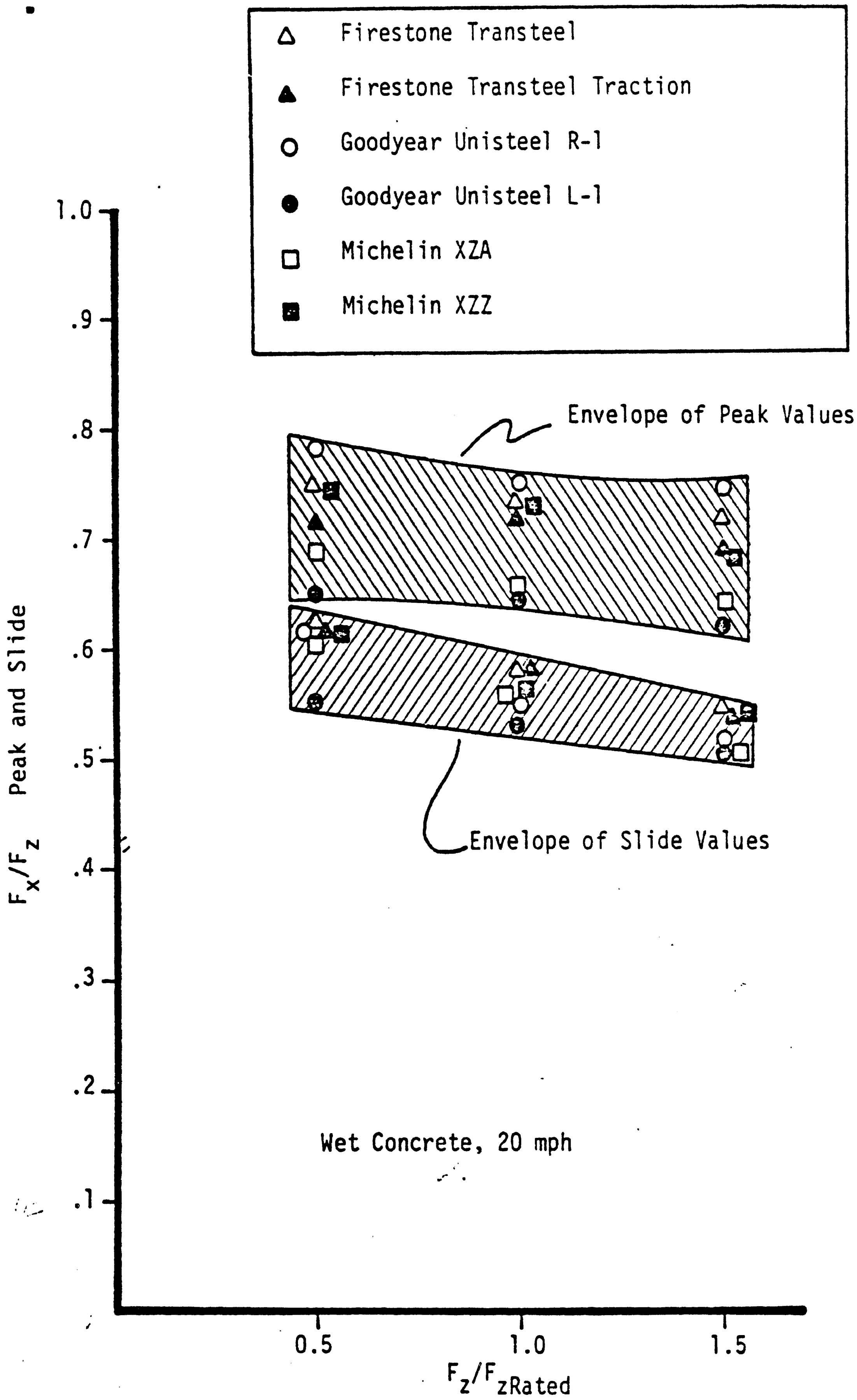

Firestone Transteel
Firestone Transteel Traction
Goodyear Unisteel R-1
Goodyear Unisteel L-1
Michelin XZA
Michelin XZZ
Envelope of Peak Values
Envelope of Slide Values
Dry Concrete, 20 mph
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
F_x/F_z Peak and Slide
0.5
1.0
1.5
F_z/F_{zRated}

Figure 5



Firestone Transteel
Firestone Transteel Traction
Goodyear Unisteel R-1
Goodyear Unisteel L-1
Michelin XZA
Michelin XZZ
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
F_x/F_z Peak and Slide
Envelope of Peak Values
Envelope of Slide Values
Wet Concrete, Rated Load
20
40
55
Velocity, mph

Figure 6



Firestone Transteel
Firestone Transteel Traction
Goodyear Unisteel R-1
Goodyear Unisteel L-1
Michelin XZA
Michelin XZZ
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
F_x/F_z Peak and Slide
Envelope of Peak Values
Envelope of Slide Values
Wet Concrete, 20 mph
0.5
1.0
1.5
F_z/F_{zRated}

Figure 7

it should be noted, by the substantial degree of "mixing" which occurs among rib and lug data—quite in contrast with data taken on the similarly-limited sample of bias tires [2] which showed virtually no mixing and a 23% spread in average (F_x/F_z) peak values on wet concrete.

Regarding "slide" traction values, the data taken on wet and dry concrete display virtually no significant rib/lug distinctions in the case of the radial truck tire. This observation again contrasts radials with bias-ply tires, the latter of which showed an average 16% lower slide traction performance of lug tires on wet concrete.

In summary of longitudinal traction measurements, radial-ply truck tires, as represented in this sample, are not seen to be significantly discriminated, according to tread type, by the gathered peak and slide traction values. As a note regarding the statistical quality of the longitudinal traction measurements, the data obtained in the three repeat runs for each tire and surface are shown in Table 2. The tabulated data show that relatively good repeatability was obtained, with a typical standard deviation of approximately .012 for either peak or slide traction coefficients on both surfaces.

3.4 Mobile Traction Results - Lateral

Tests were conducted on the lateral traction dynamometer to permit examination of the friction-limited lateral force behavior of the six-tire sample. Data resulting from these tests were reduced to the plotted format of Figures 8 through 11. These data indicate the basic sensitivity of the F_y/F_z versus α relationship to velocity and vertical load under the two subject surface conditions. As with longitudinal traction measurements, the tire exhibits a steeply rising (elastic) behavior followed by a friction-determined saturation. In the case of lateral traction, the angular slip range of interest is limited to about $\alpha = 20°$, thereby eliminating any need

Table 2. Peak and Slide Values of F_x/F_z Obtained from three (3) Repeated Runs on Each Tire.

		Dry (Repeat Number) 1	Dry 2	Dry 3	Dry Ave.	Dry Std. Dev. 1 × σ	Wet (Repeat Number) 1	Wet 2	Wet 3	Wet Ave.	Wet Std. Dev. 1 × σ
Firestone Transteel	Peak	.82	.81	.84	.823	.012	.75	.73	.72	.733	.012
	Slide	.65	.65	.63	.643	.009	.58	.58	.57	.577	.005
Firestone Transteel Traction	Peak	.85	.82	.81	.827	.017	.73	.72	.70	.717	.012
	Slide	.65	.63	.62	.633	.012	.58	.58	.57	.577	.005
Goodyear Unisteel R-1	Peak	.83	.80	.84	.833	.017	.74	.75	.76	.750	.008
	Slide	.61	.59	.62	.607	.012	.55	.55	.56	.553	.005
Goodyear Unisteel L-1	Peak	.78	.78	.81	.790	.014	.67	.61	.64	.640	.025
	Slide	.62	.62	.62	.620	.000	.54	.52	.53	.530	.008
Michelin XZA	Peak	.82	.82	.81	.817	.005	.68	.64	.67	.663	.017
	Slide	.57	.59	.58	.580	.008	.56	.55	.56	.557	.005
Michelin XZZ	Peak	.79	.73	.78	.767	.026	.74	.70	.69	.710	.022
	Slide	.62	.59	.59	.600	.014	.60	.56	.56	.573	.019

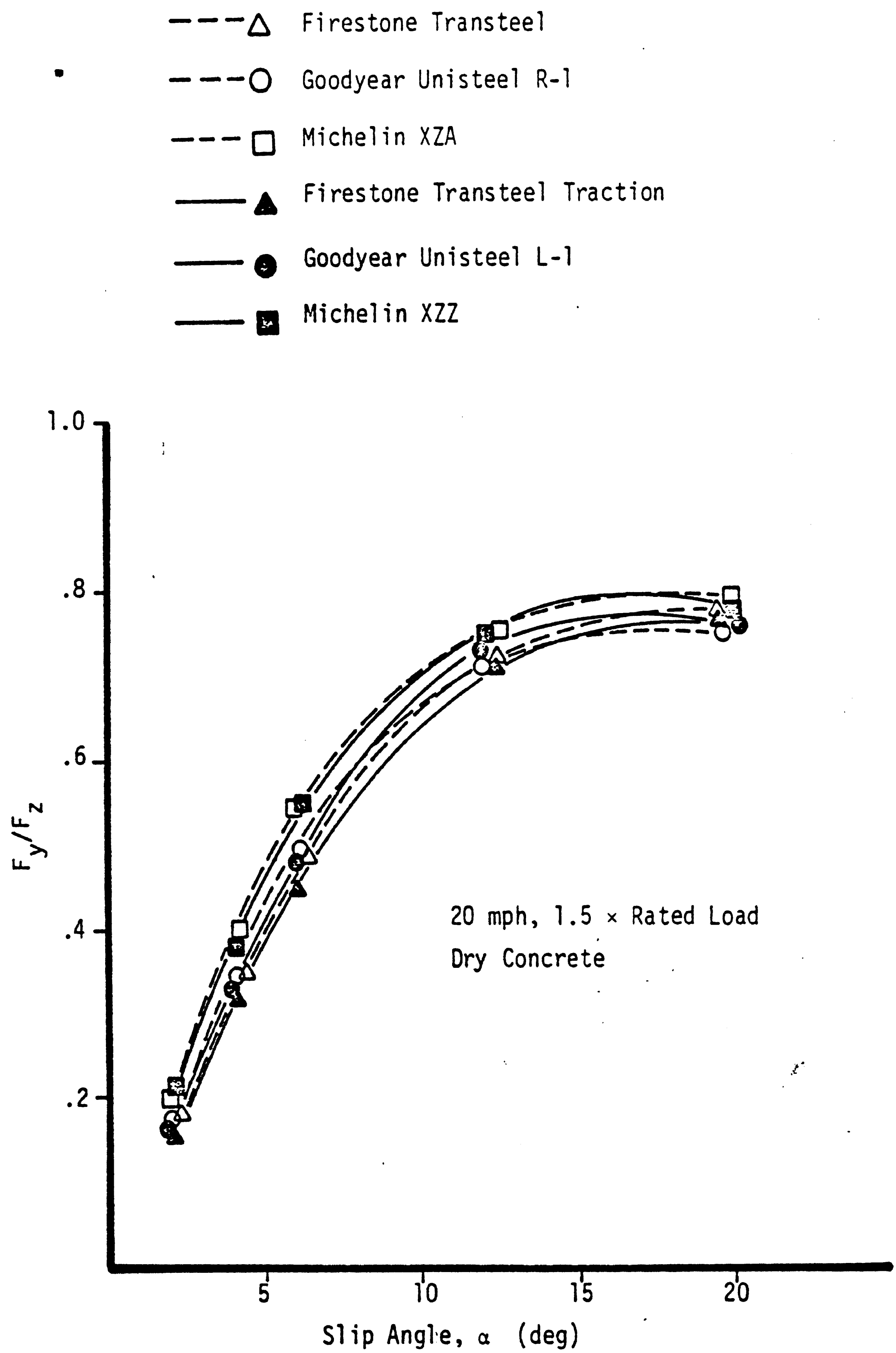

Firestone Transteel
Goodyear Unisteel R-1
Michelin XZA
Firestone Transteel Traction
Goodyear Unisteel L-1
Michelin XZZ
1.0
.8
.6
.4
.2
F_y/F_z
20 mph, 1.5 × Rated Load
Dry Concrete
5
10
15
20
Slip Angle, α (deg)

Figure 8

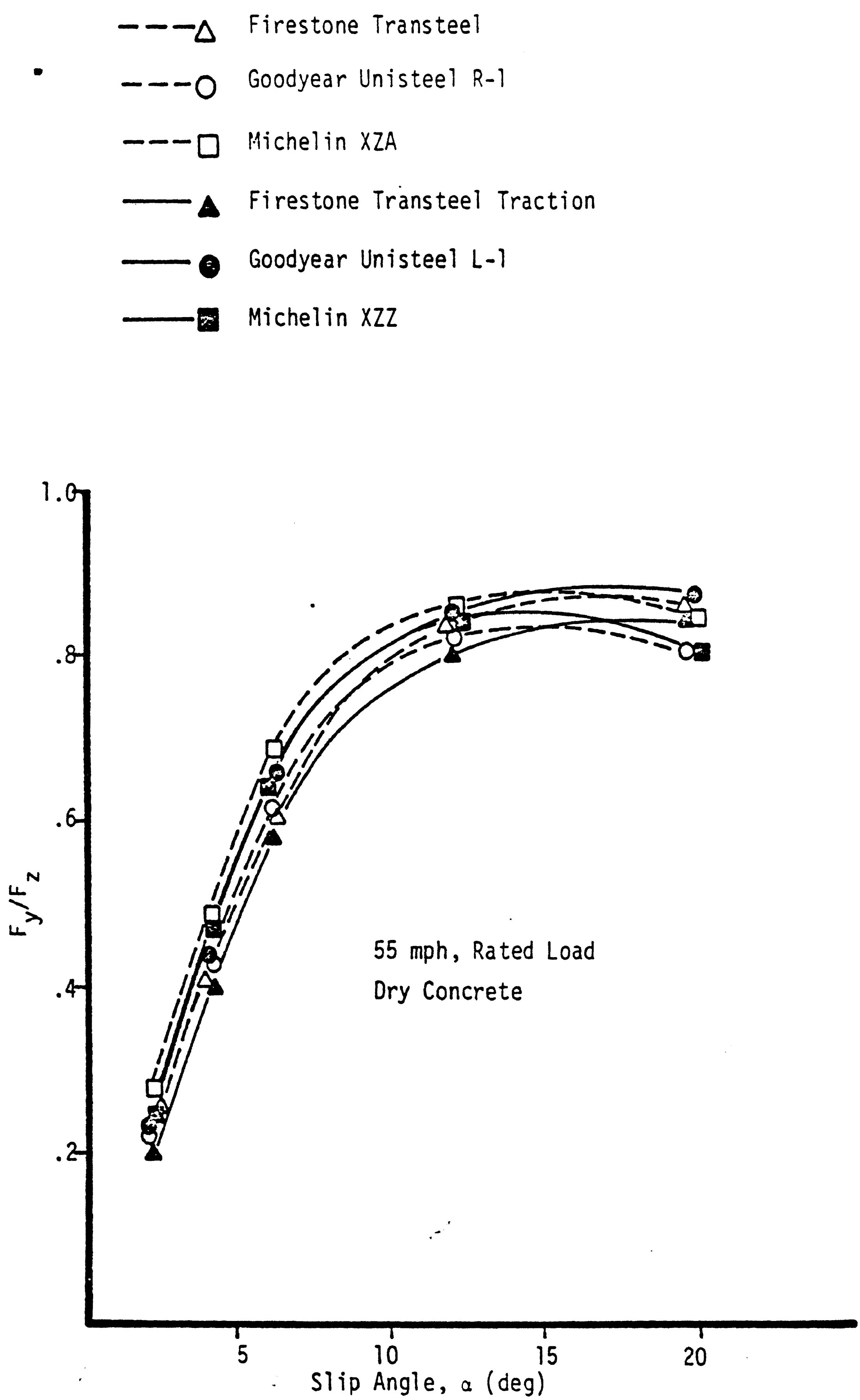

Firestone Transteel
Goodyear Unisteel R-1
Michelin XZA
Firestone Transteel Traction
Goodyear Unisteel L-1
Michelin XZZ
1.0
.8
.6
.4
.2
F_y/F_z
55 mph, Rated Load
Dry Concrete
5
10
15
20
Slip Angle, α (deg)

Figure 9

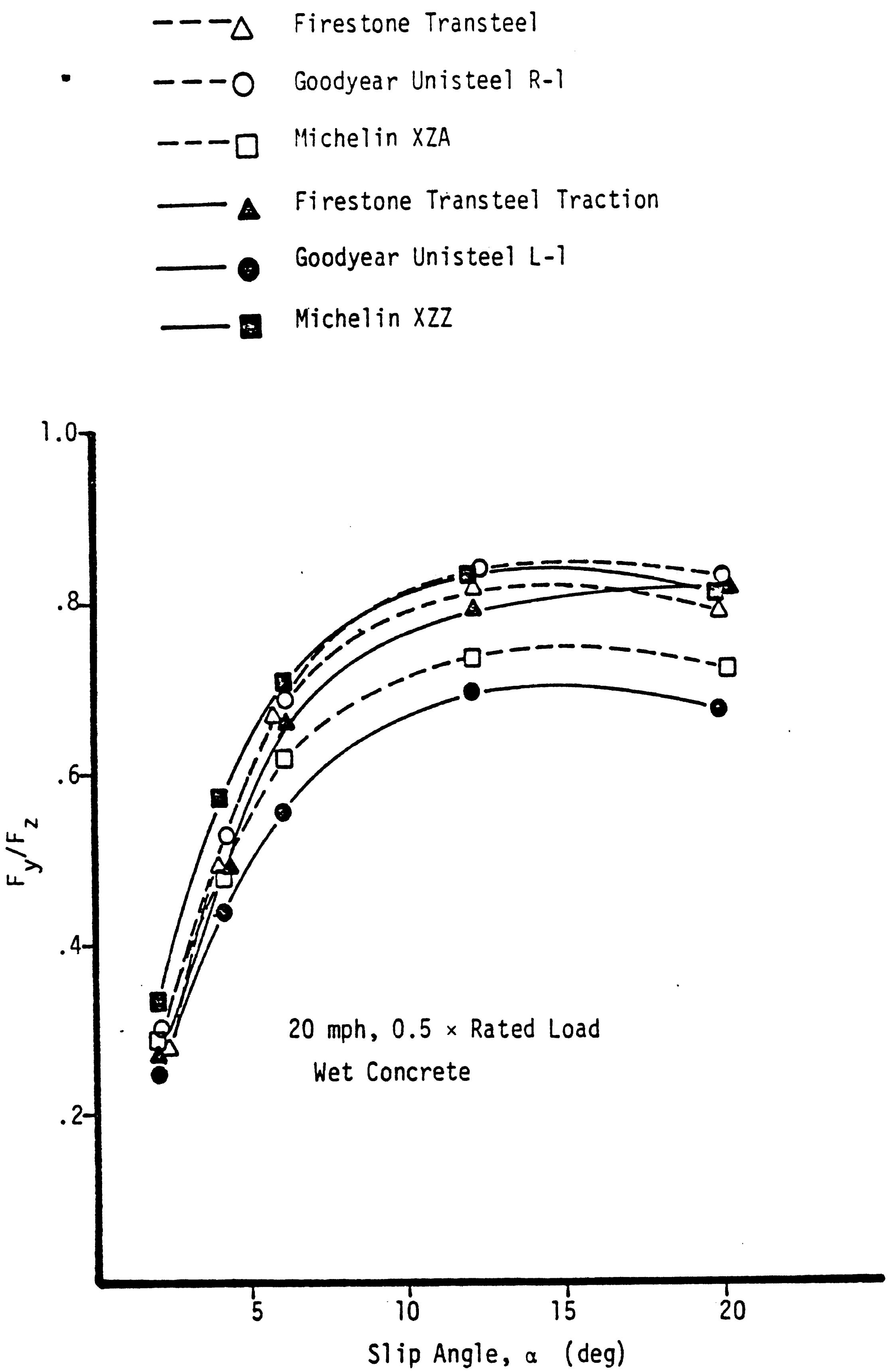
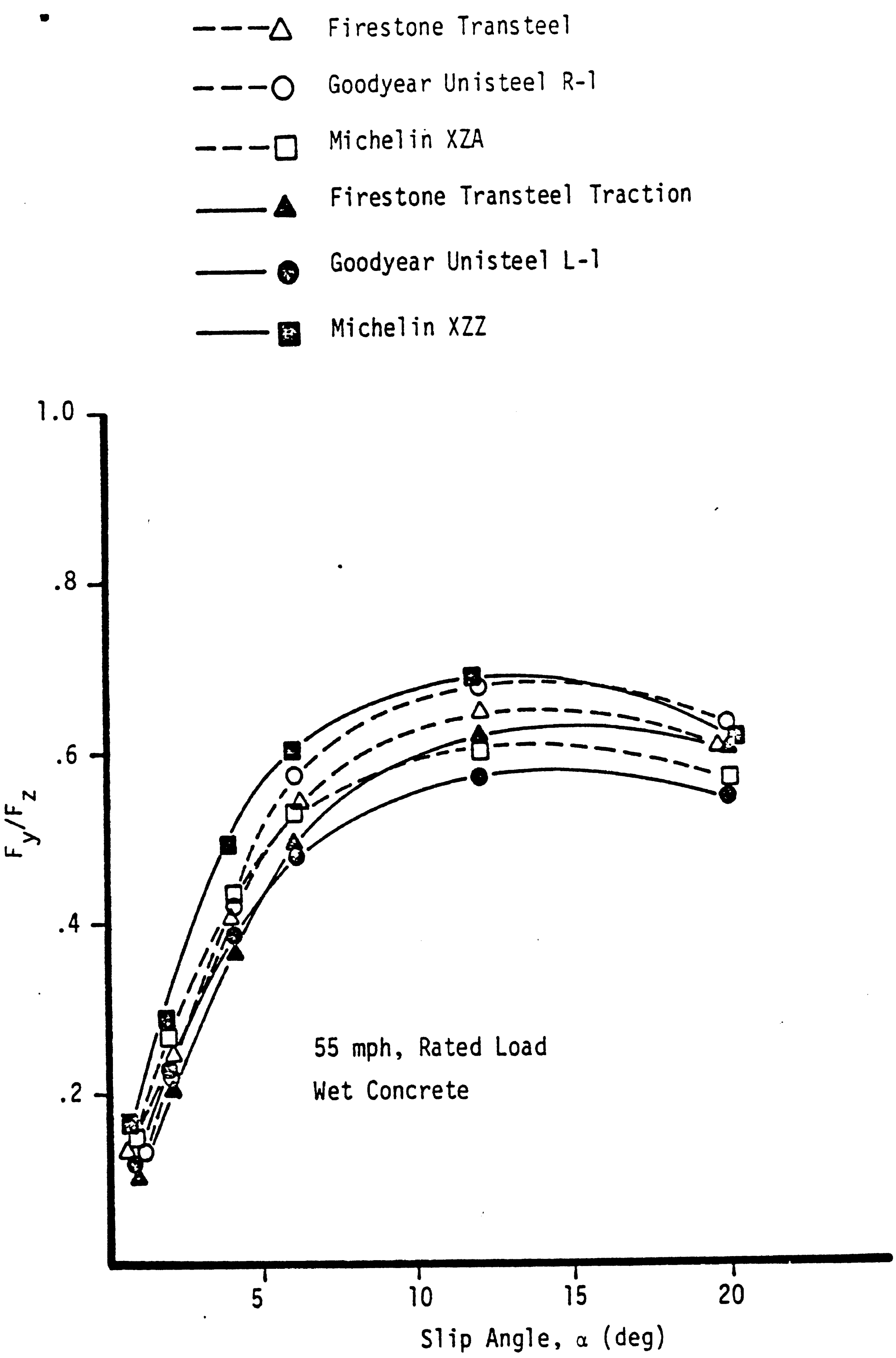
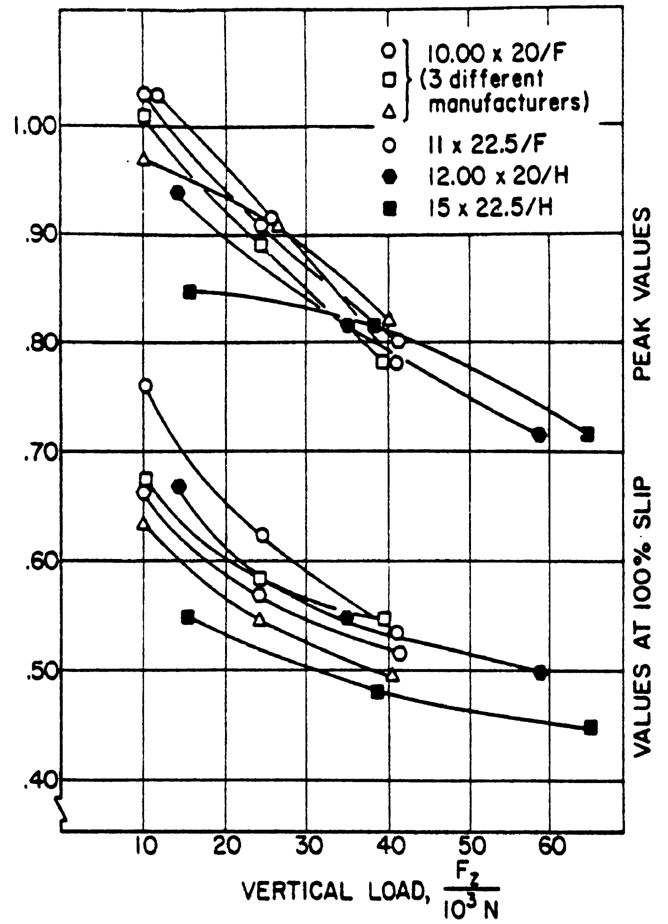

Firestone Transteel
Goodyear Unisteel R-1
Michelin XZA
Firestone Transteel Traction
Goodyear Unisteel L-1
Michelin XZZ
1.0
.8
.6
.4
.2
F_y/F_z
20 mph, 0.5 × Rated Load
Wet Concrete
5
10
15
20
Slip Angle, α (deg)

Figure 10



Firestone Transteel
Goodyear Unisteel R-1
Michelin XZA
Firestone Transteel Traction
Goodyear Unisteel L-1
Michelin XZZ
1.0
.8
.6
.4
.2
F_y/F_z
55 mph, Rated Load
Wet Concrete
5
10
15
20
Slip Angle, α (deg)

Figure 11



. 3: Load sensitivity in the peak and slide traction of a six-tire sample on dry asphalt. All tests run at 64 km/h.

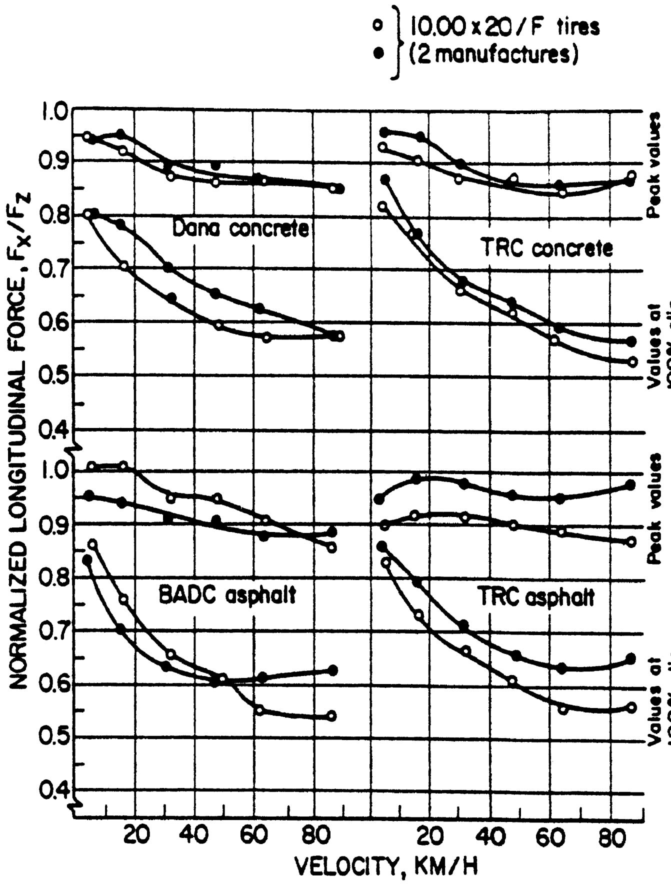
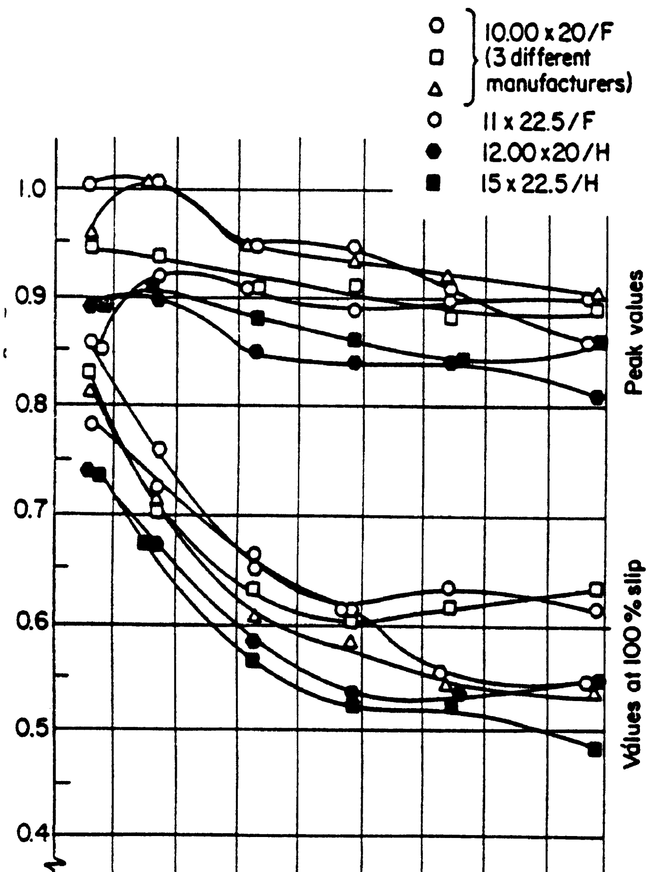


Fig. 5: The differing influence of pavement surface on the velocity sensitivities of two tires.



4: Velocity sensitivity of the peak and slide traction values for a six-tire sample on dry asphalt. All tires operated at their respective T & RA rated load.

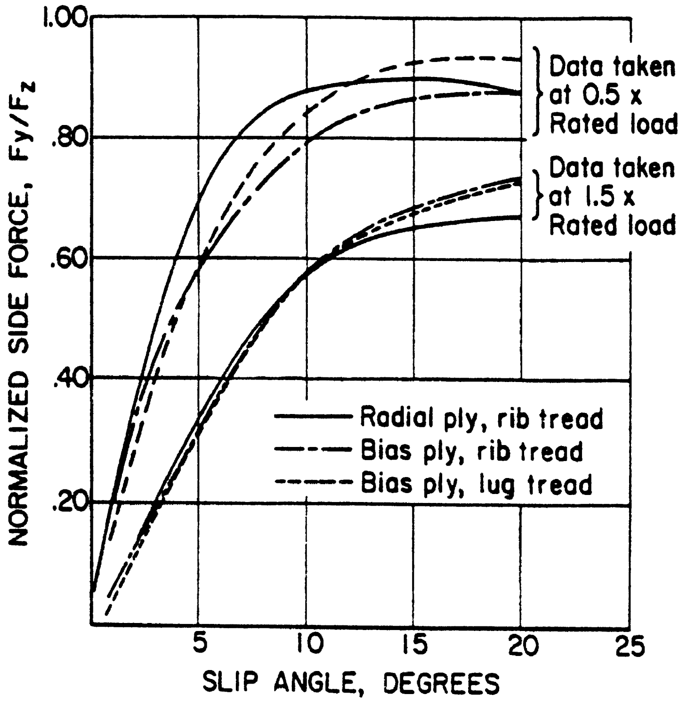


Fig. 6: Typical load sensitivities in the side force response of a sample of 10.00 x 20 tires tested at 32 km/h on a dry concrete surface.

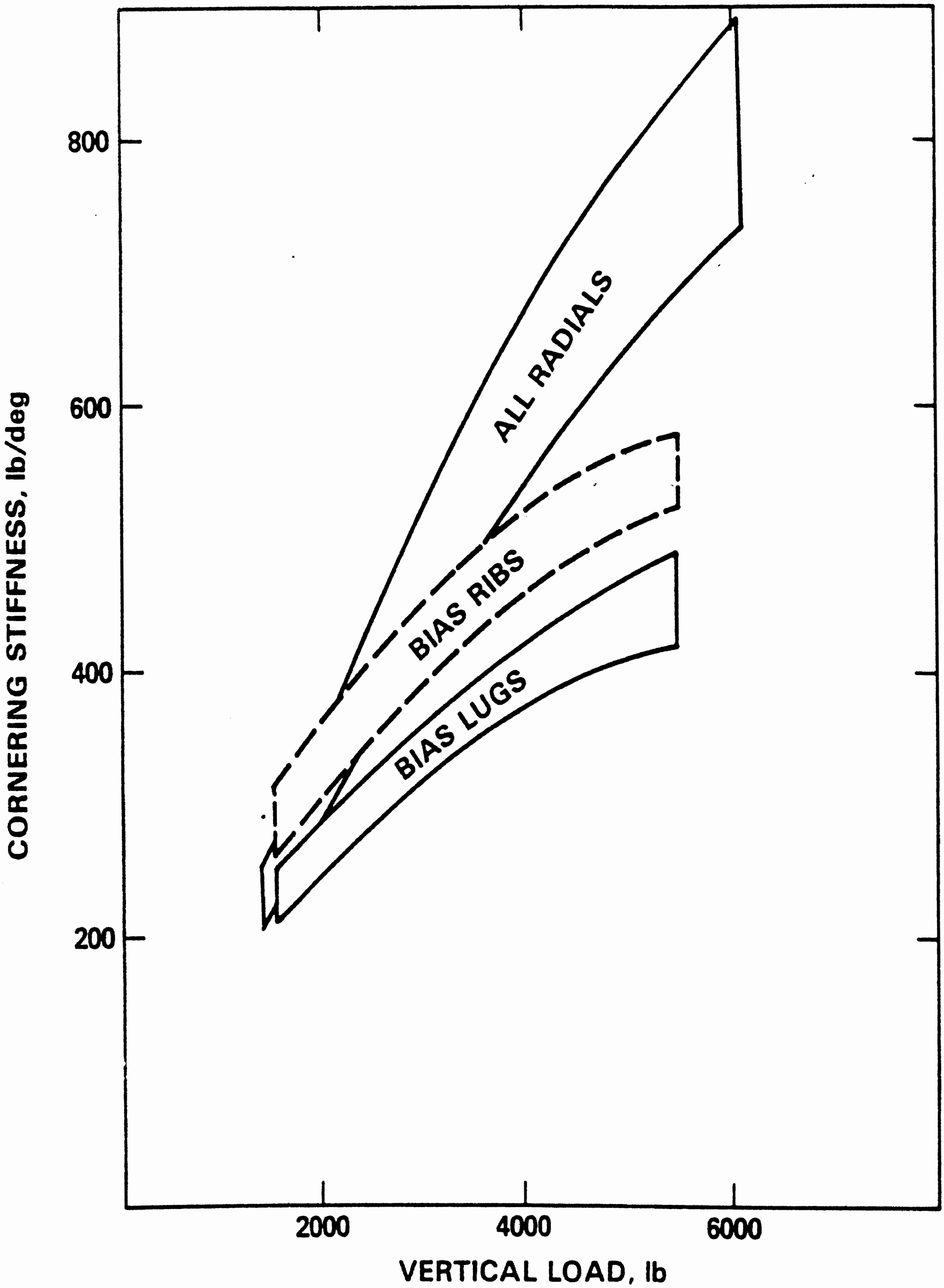


Figure 3. Envelopes of the cornering stiffness parameter measured over a range of vertical loads.

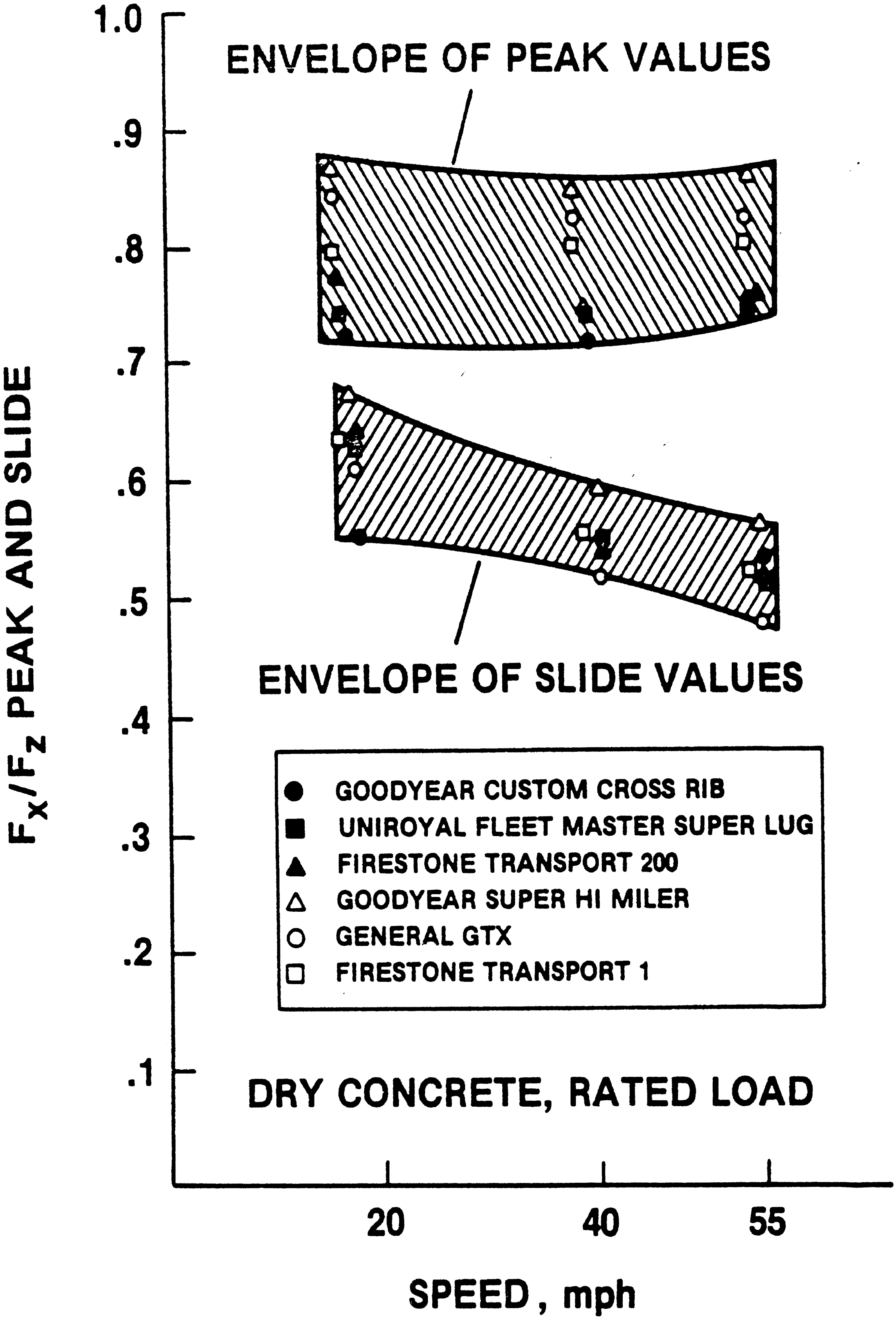


Figure 12. Peak and slide values versus speed for bias-ply tires at rated load on dry concrete.

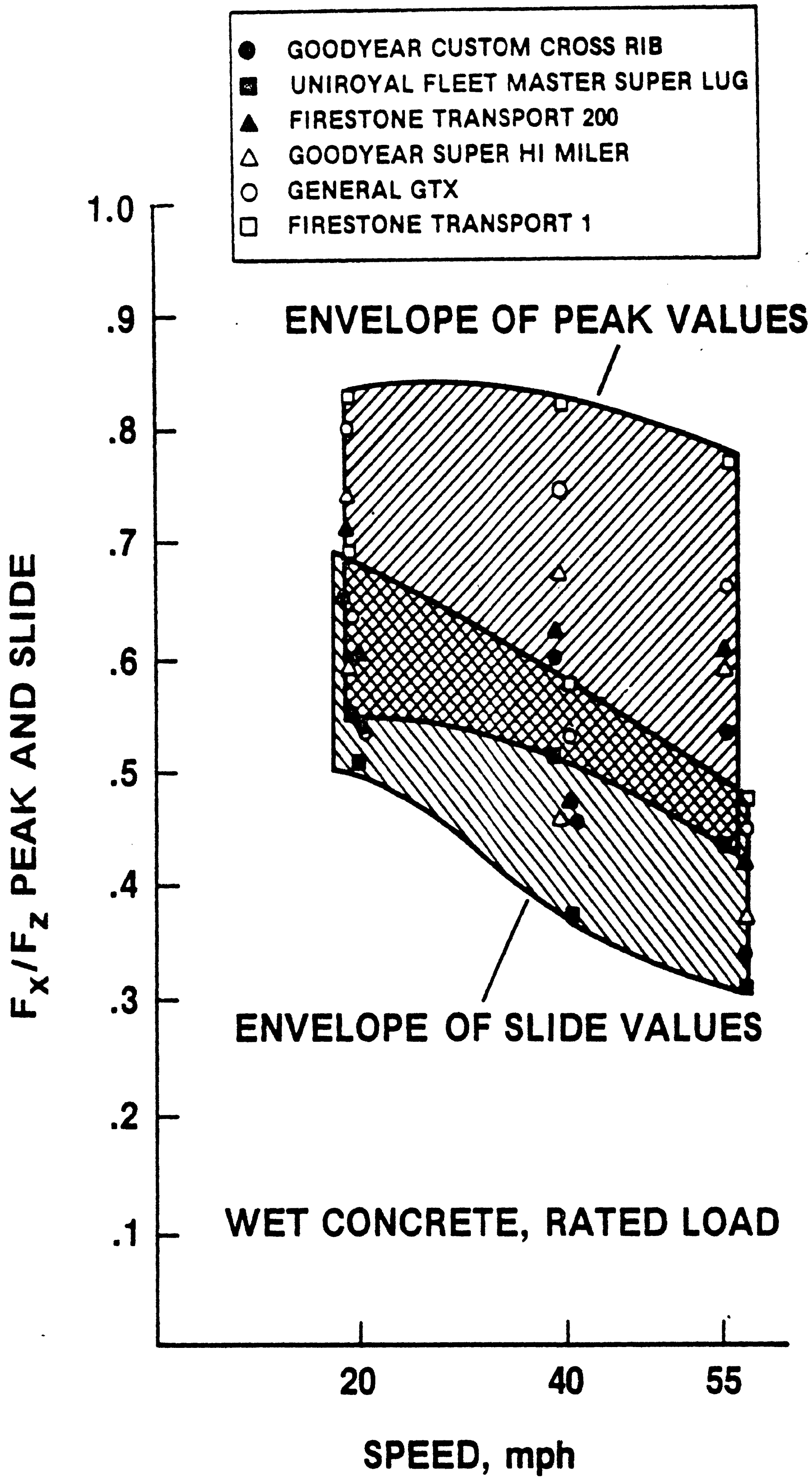


Figure 14. Peak and slide values versus speed for bias-ply tires at rated load on wet concrete.

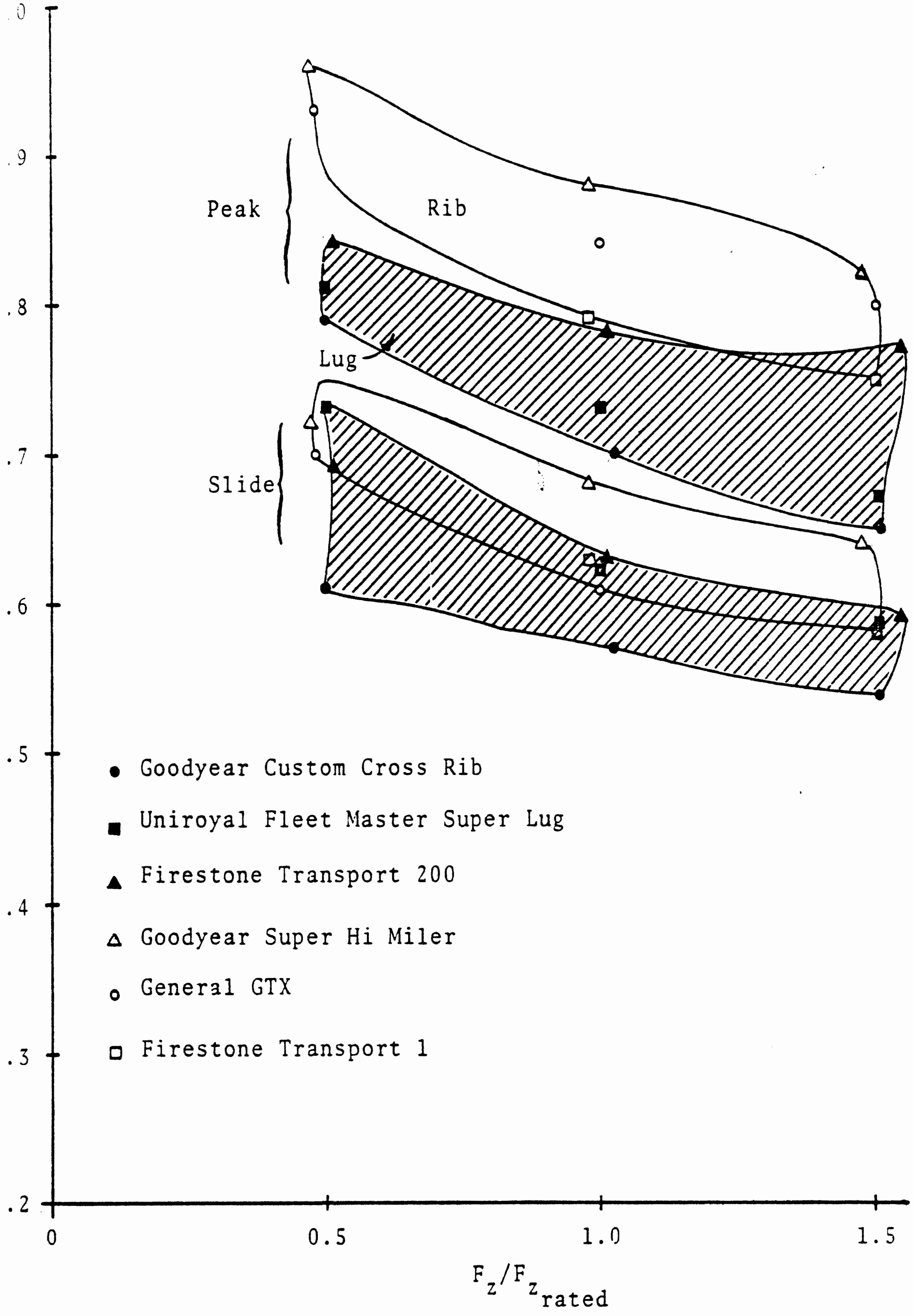


Figure 16. Peak and slide values versus load for bias-ply tires at 20 mph on dry concrete.

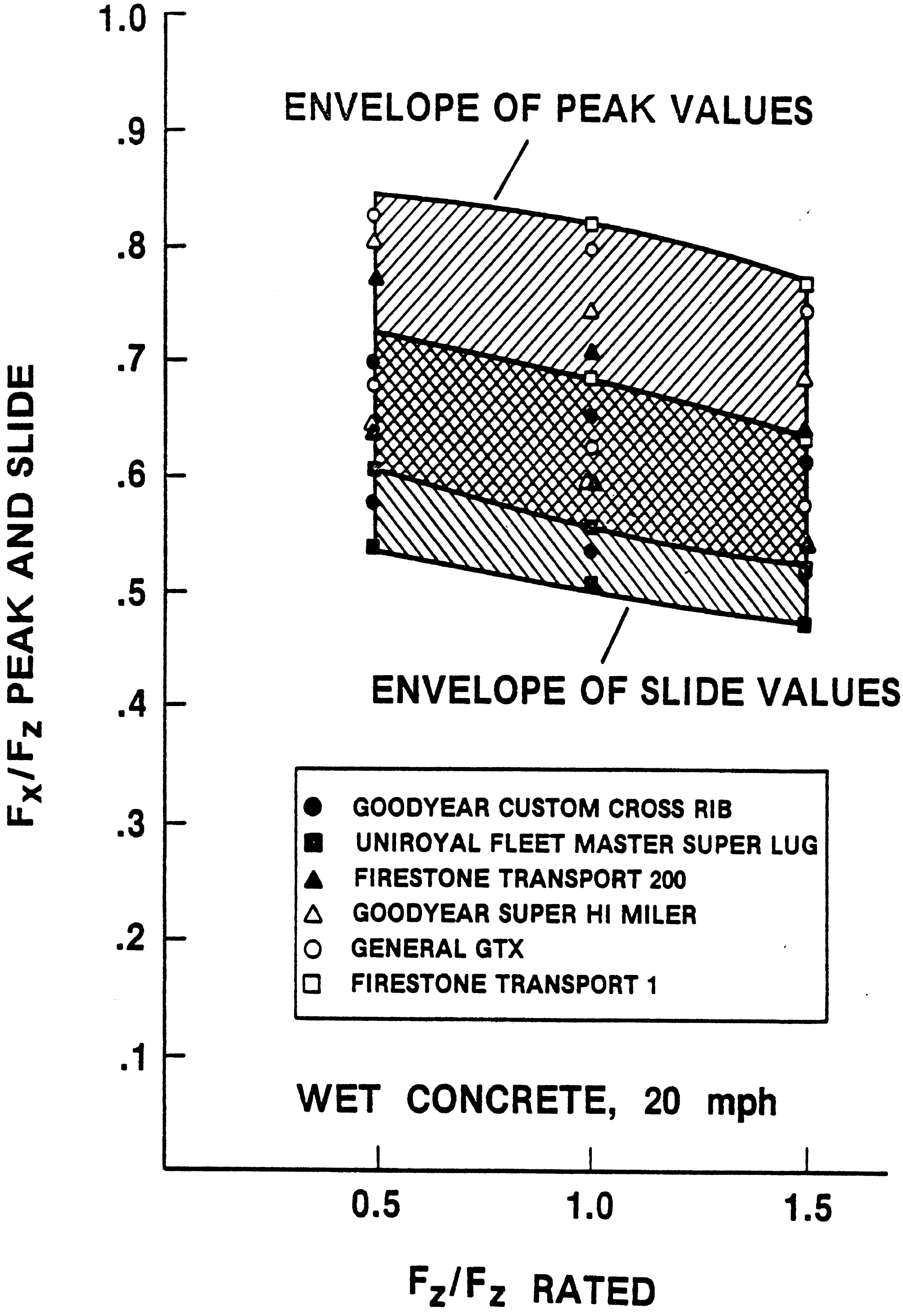


Figure 18. Peak and slide values versus load for bias-ply tires at 20 mph on wet concrete.

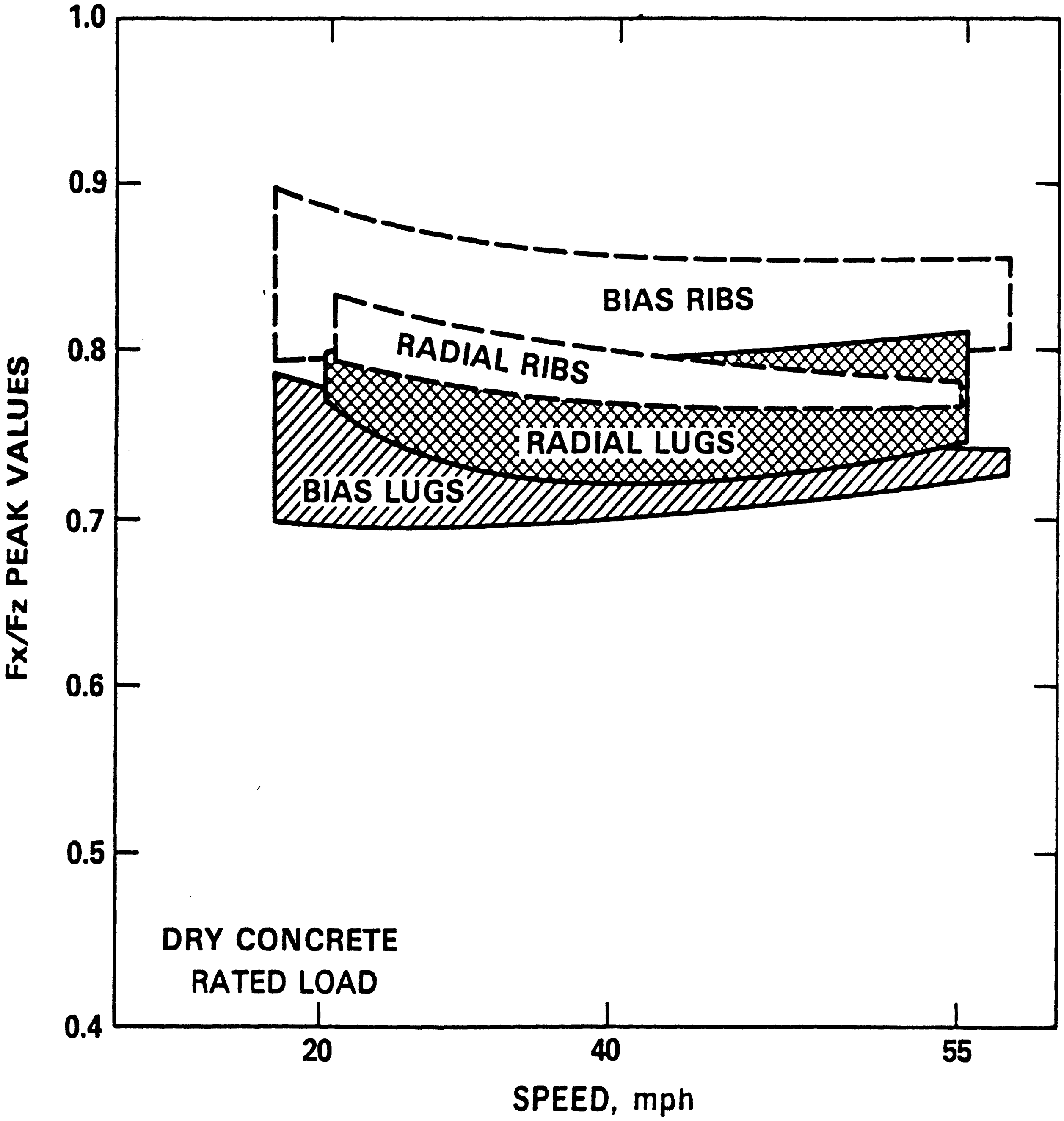


Figure 20. Envelopes of peak longitudinal traction values obtained on dry concrete.

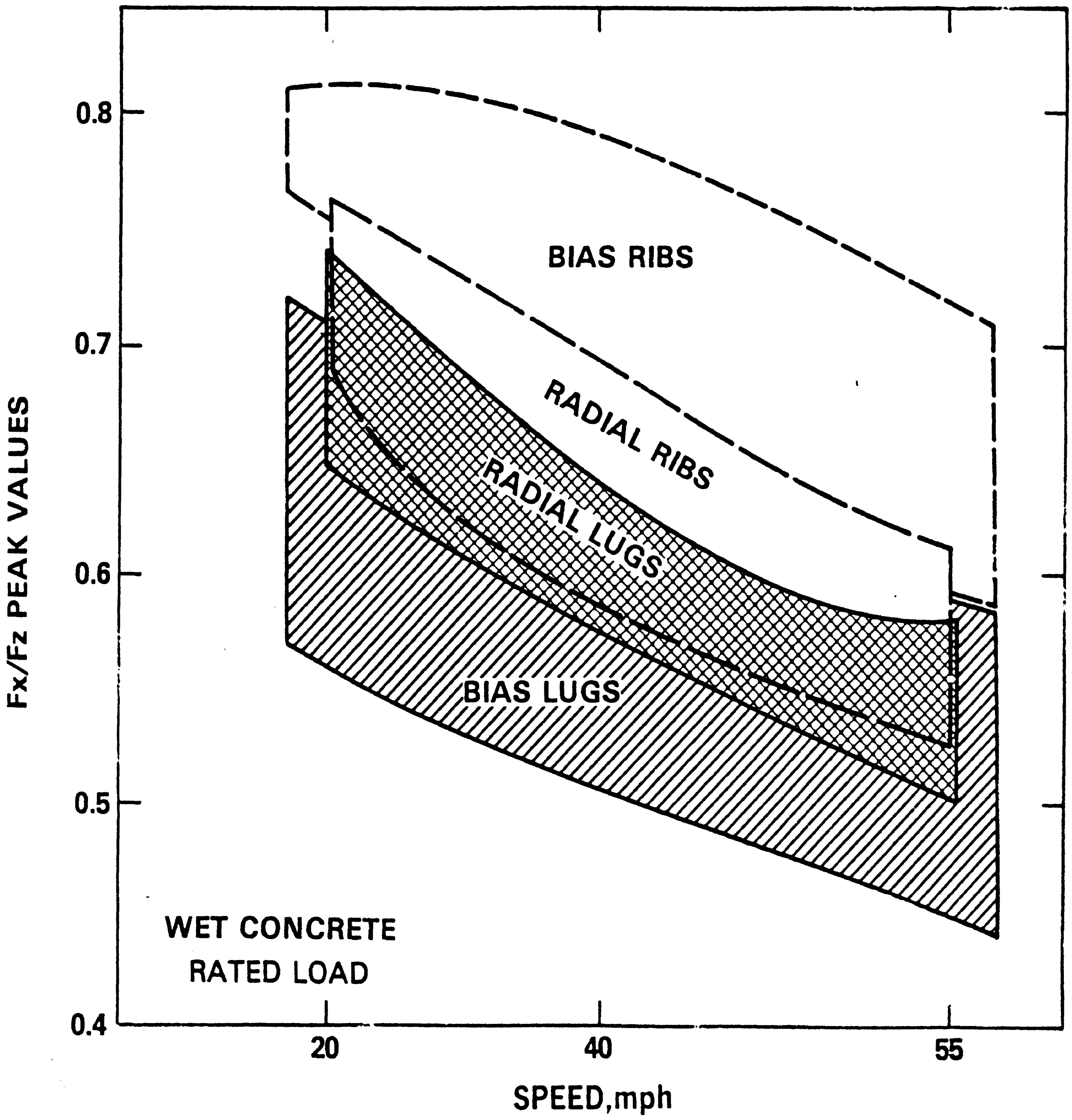


Figure 21. Envelopes of peak longitudinal traction values obtained on wet concrete.

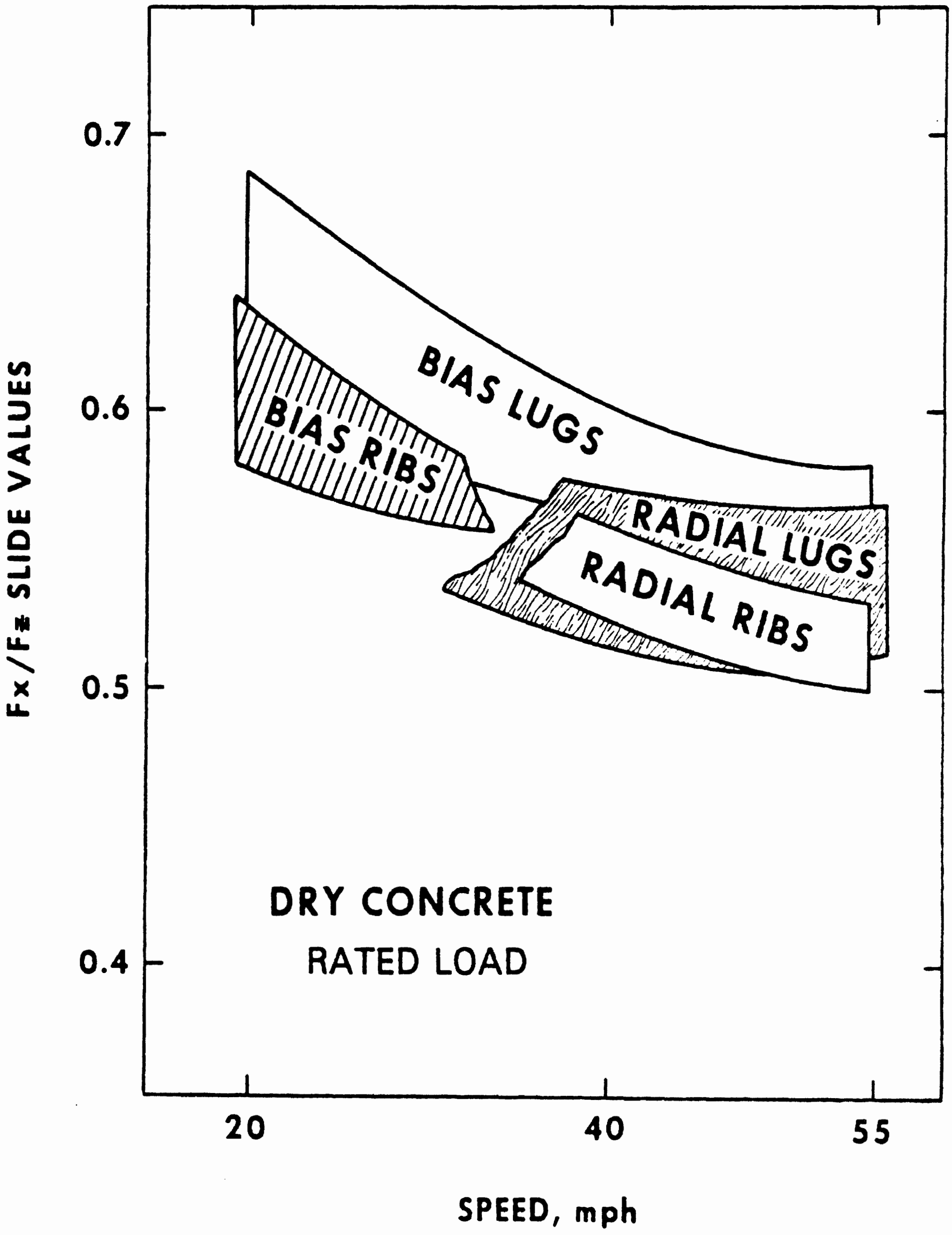


Figure 22. Envelopes of slide values obtained on dry concrete.

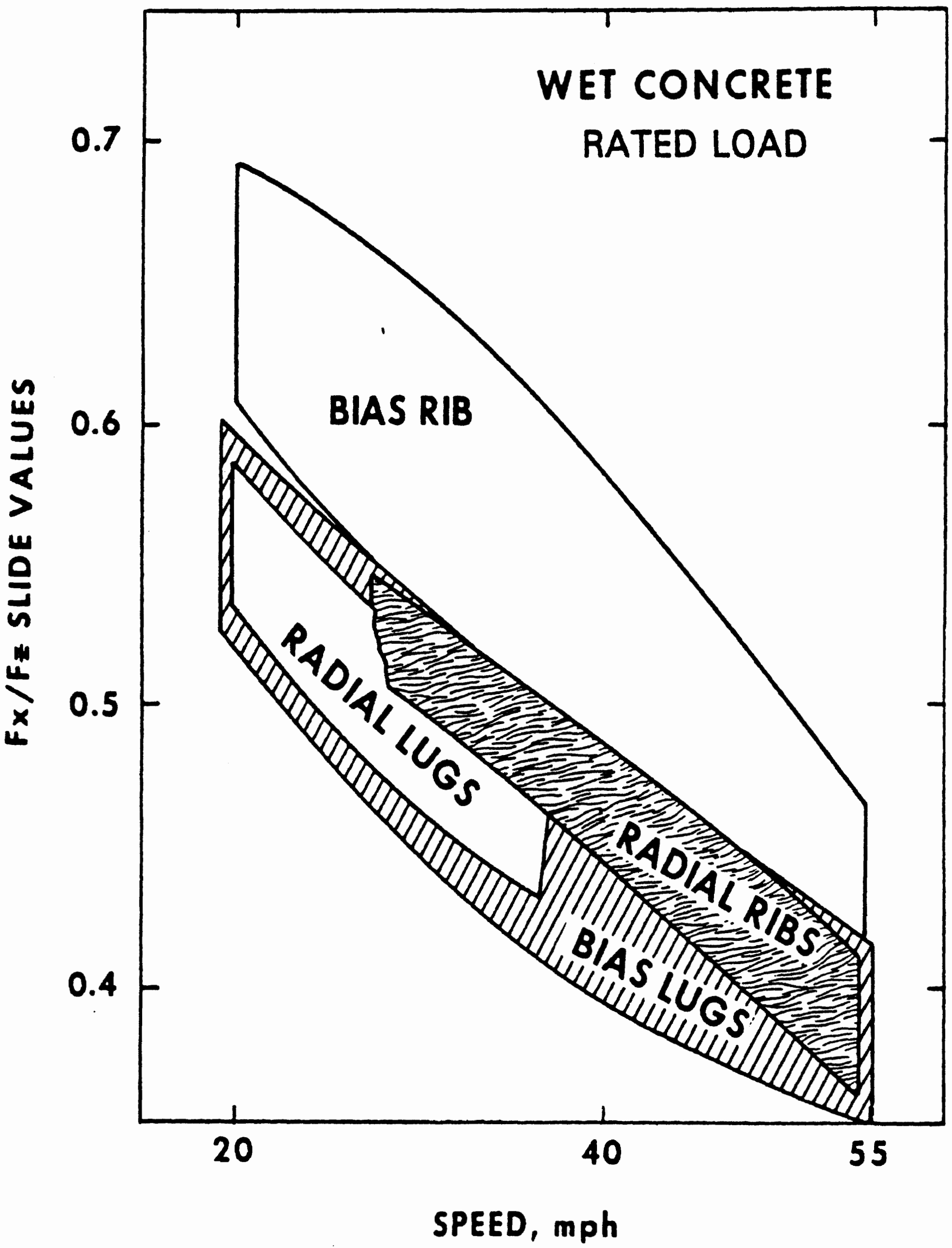


Figure 23. Envelopes of slide values obtained on a wet concrete surface.

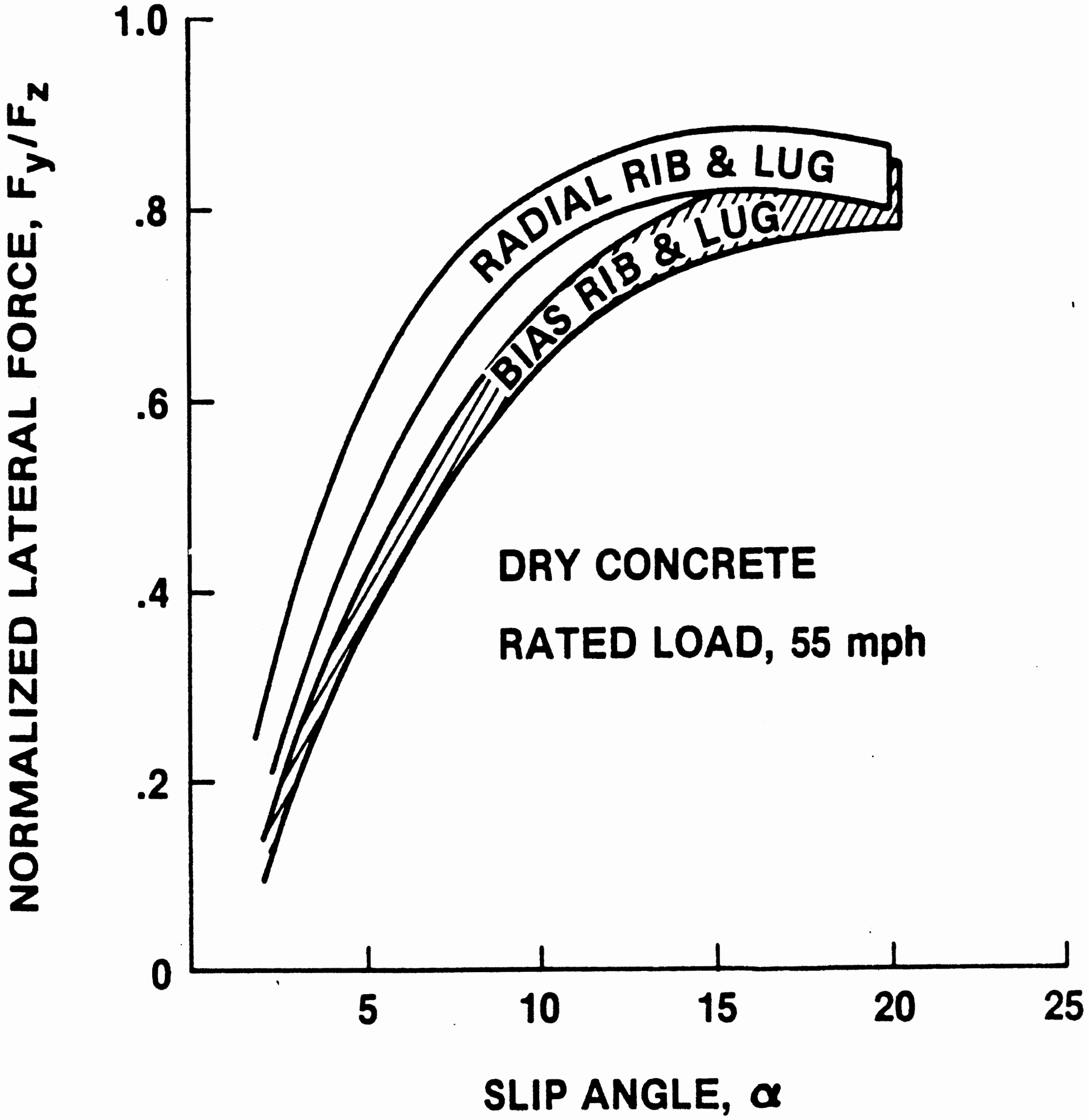


Figure 24. Envelopes of lateral traction performance on dry concrete.

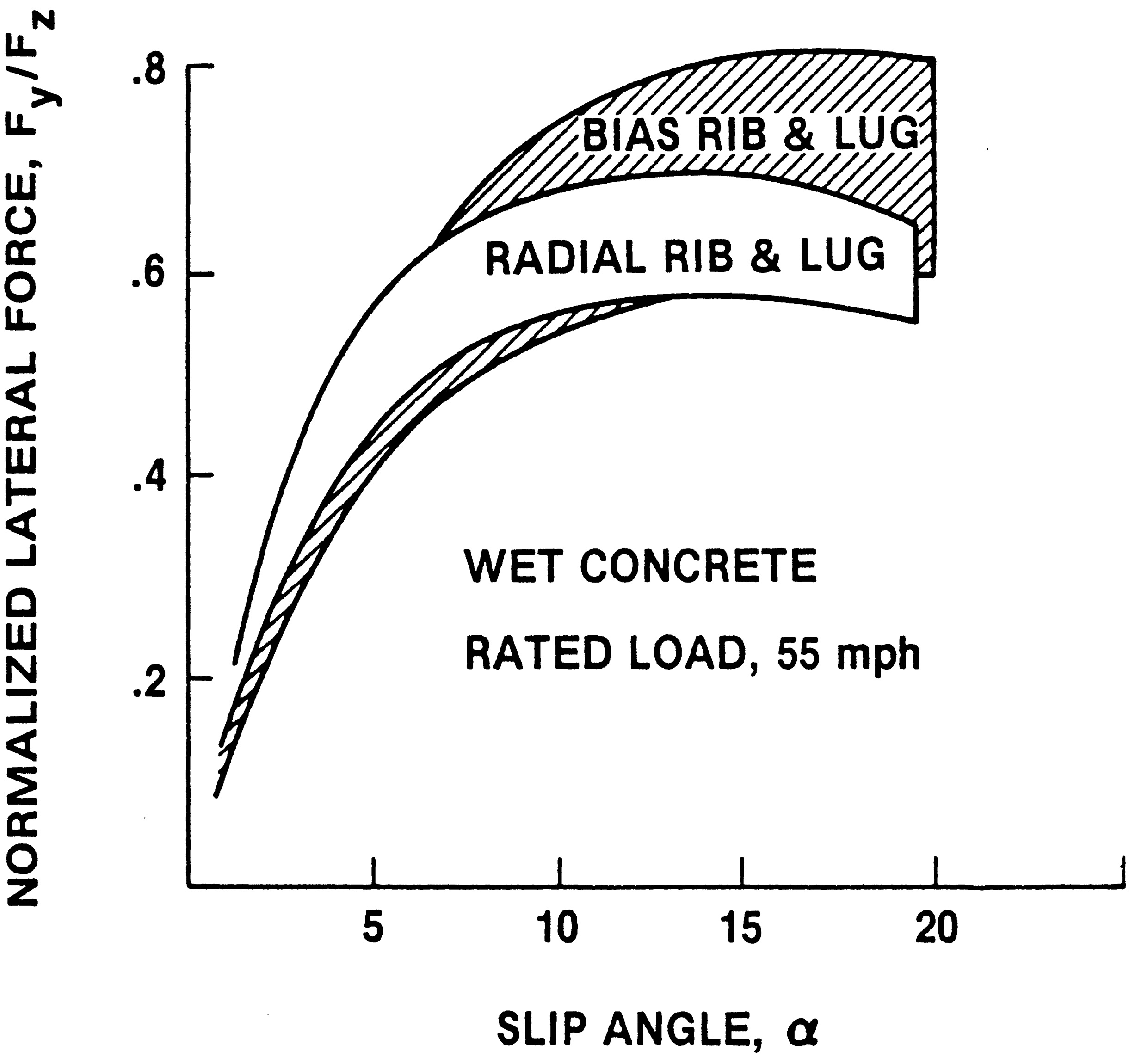


Figure 25. Envelopes of lateral traction performance on wet concrete.

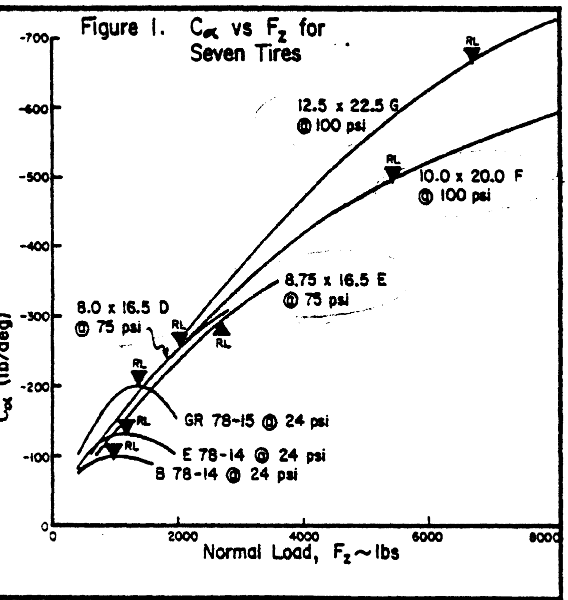


Figure 1. C_α vs F_z for Seven Tires

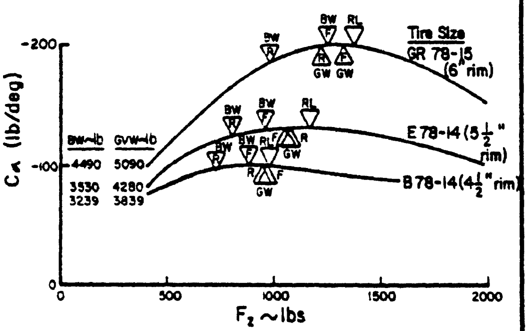


Figure 2. C_α vs F_z for Three Passenger Car-Tire Systems

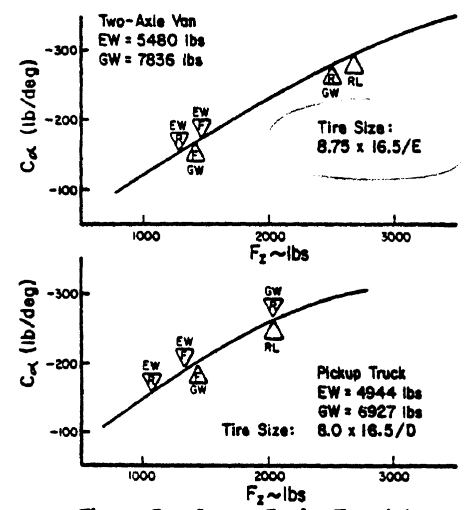


Figure 3. C_α vs F_z for Two-Axle Van and Pickup Truck

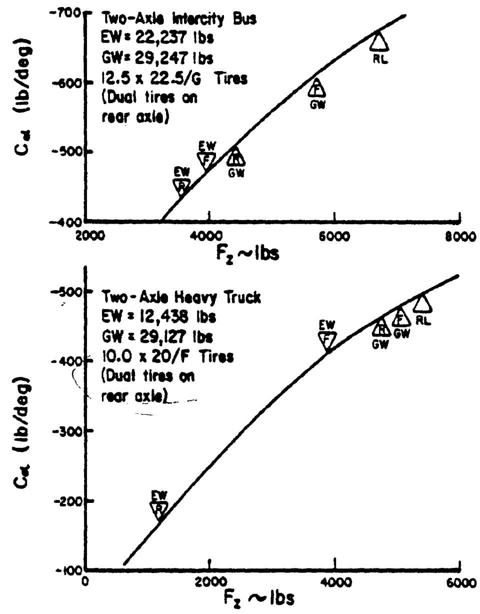


Figure 4. C_α vs F_z for Two-Axle Bus and Heavy Truck

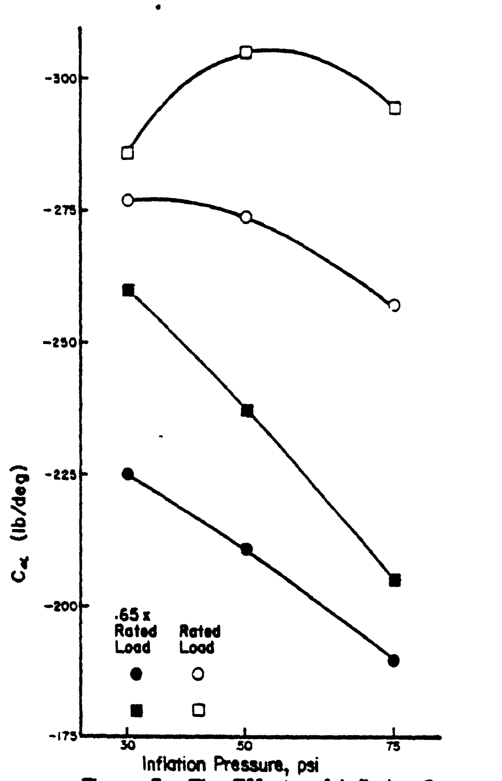


Figure 5. The Effects of Inflation Pressure on Cornering Stiffness: Two Light Truck Tires

2. TEST TIRES

The tire sample was chosen to be representative of the entir truck tire population, that is, representative in constructi brand and popularity. The number of tires of each brand sel for the test sample was based on the market penetration of t sales of that brand, and the relative number of tires of the three major types (bias ply, ribbed tread; bias ply, lug tre and radial ply, ribbed tread) was based on the relative popu rity of the types. Table 1 lists the test tires and identif their type.

All of the tires were of the 10.00 x 20 size and they were mounted on the proper rim recommended by the Tire & Rim Assoc ation. They were inflated to the maximum pressure (85 psi for bias ply tires and 90 psi for radial ply tires) and loade to a nominal 4,620 lbs.

Each tire was warmed-up by traveling about six miles at 50 miles per hour immediately before being tested. Each tire was also broken-in by six brake applications of one second lc up duration during the warm-up. The whole group of tires were tested in braking and then retested later in cornering as a group.

3. SURFACES

Two pavements very much like the Uniform Tire Quality Grading traction pads at San Angelo, Texas were used. The surfaces were located at the Transportation Research Center of Ohio. One surface was a hot mixed bituminous asphalt pavement with a nominal ASTM E274-70 skid number of 60. The other surface was a polished Portland cement concrete pavement with a nomin ASTM E274-70 skid number of 35.

TABLE 1. TEST TIRES

TIRE NO.	MANUFACTURER	% OF MARKET*	MODEL	CARCASS TYPE	TREAD TYPE
1a&b	Goodyear	20%	Unisteel-2	Radial	Rib
2a&b	Goodyear		Himiler Special	Bias	Rib
3a&b	Goodyear		Custom Quiet Drive	Bias	Rib
4a&b	Goodyear		SuperHiMiler	Bias	Rib
5a&b	Goodyear		Custom Hi-Miler	Bias	Rib
6a&b	Firestone	18%	Power Drive	Bias	Lug
7a&b	Firestone		Transteel	Radial	Rib
8a&b	Firestone		Long Hauler	Bias	Rib
9a&b	Firestone		Super All Traction	Bias	Lug
10a&b	Kelly-Springfield	6.5%	Registered Armor Trac	Bias	Rib
11a&b	Kelly-Springfield		Registered Drive Trac	Bias	Lug
12a&b	General	6.1%	GQT	Bias	Rib
13a&b	General		QCL	Bias	Lug
14a&b	Michelin	6.0%	XZA	Radial	Rib
15a&b	Michelin		XZZ	Radial	Rib
16a&b	Uniroyal	5.2%	Fleetmaster Triple Tread	Bias	Rib
17a&b	Uniroyal		Fleetmaster Superlug	Bias	Lug
18a&b	B.F. Goodrich	5.0%	Extra Miler XL	Bias	Rib
19a&b	B.F. Goodrich		Traction Express Custom	Bias	Lug
20a&b	Sears	4.6%	Plus Mileage Rib	Bias	Rib
21a&b	Sears		Silent Trac	Bias	Lug
22a&b	Armstrong	4.5%	SD-200	Bias	Rib
24a&b	Dayton	2%	Thorobred Premium ESD	Bias	Rib
26a&b	Recap		Uniroyal Fleet Carrier	Bias	Rib

*Tire Review Magazine

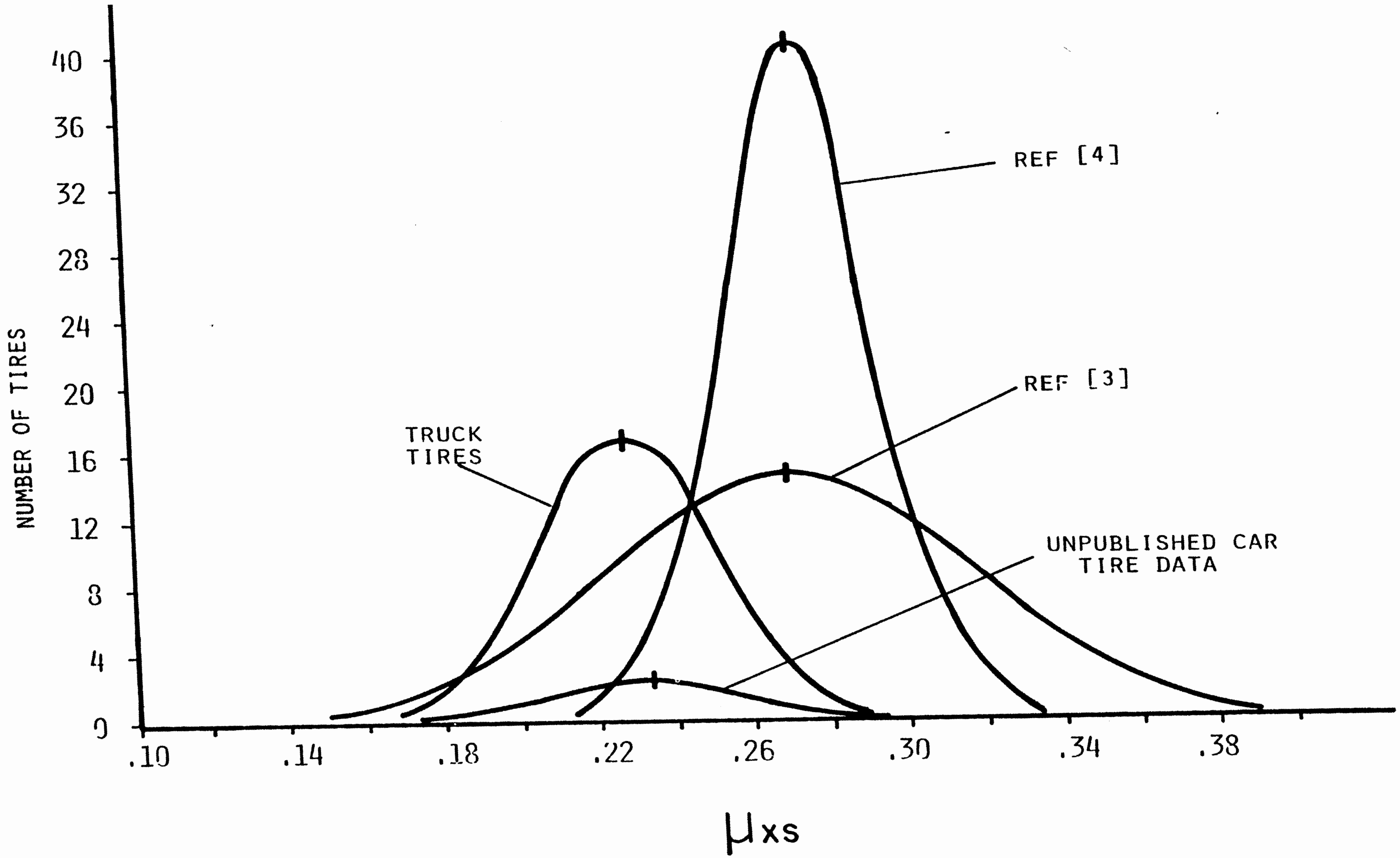


Fig. 26

Comparison of Locked Wheel Braking Force Coefficient (μ_{xs}) for Truck Tire and Car Tire Populations on Concrete

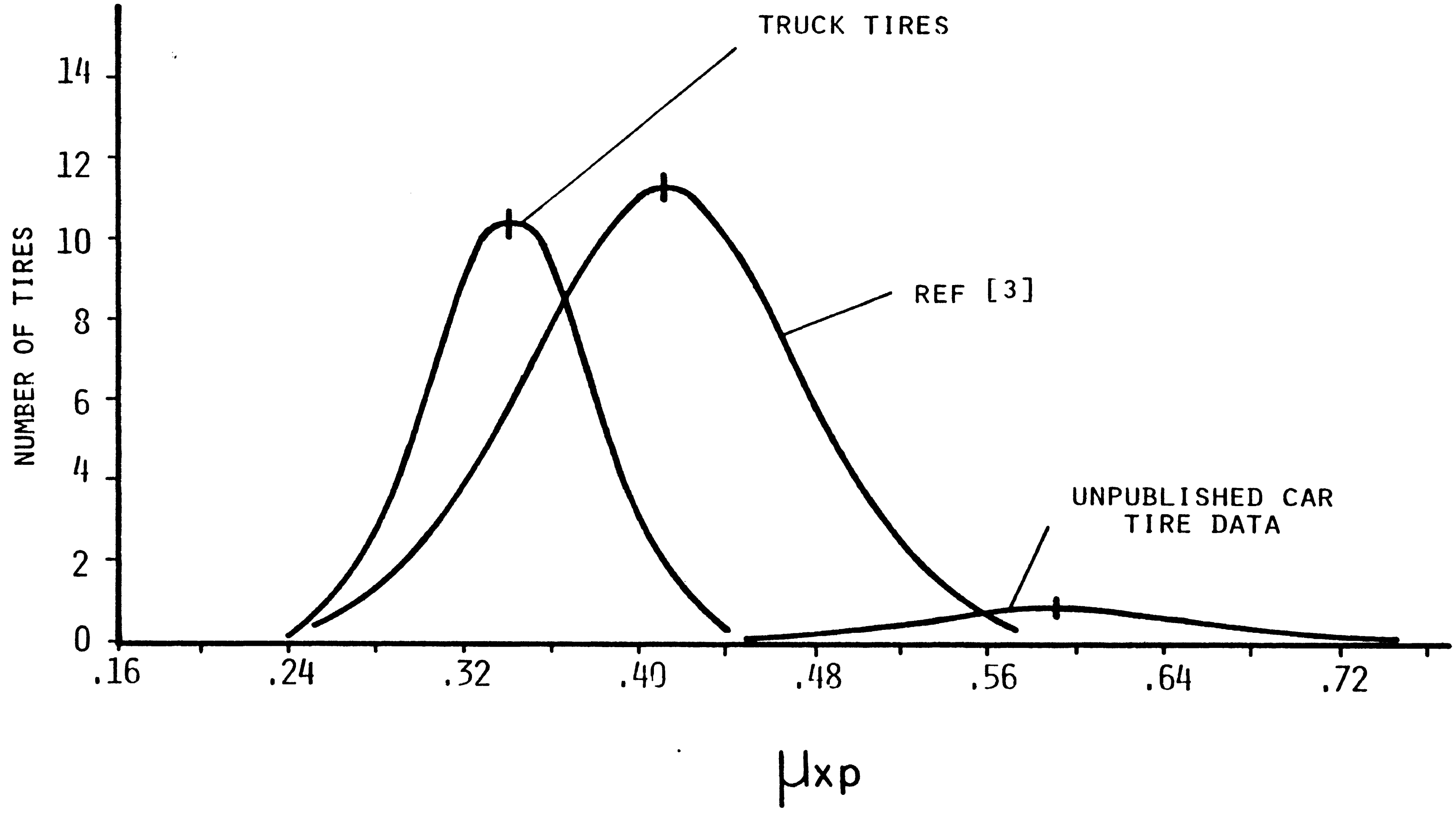


Fig. 27
Comparison of Peak Braking Force Coefficient (μ_{xp}) for Truck Tire and Car Tire Populations on Concrete

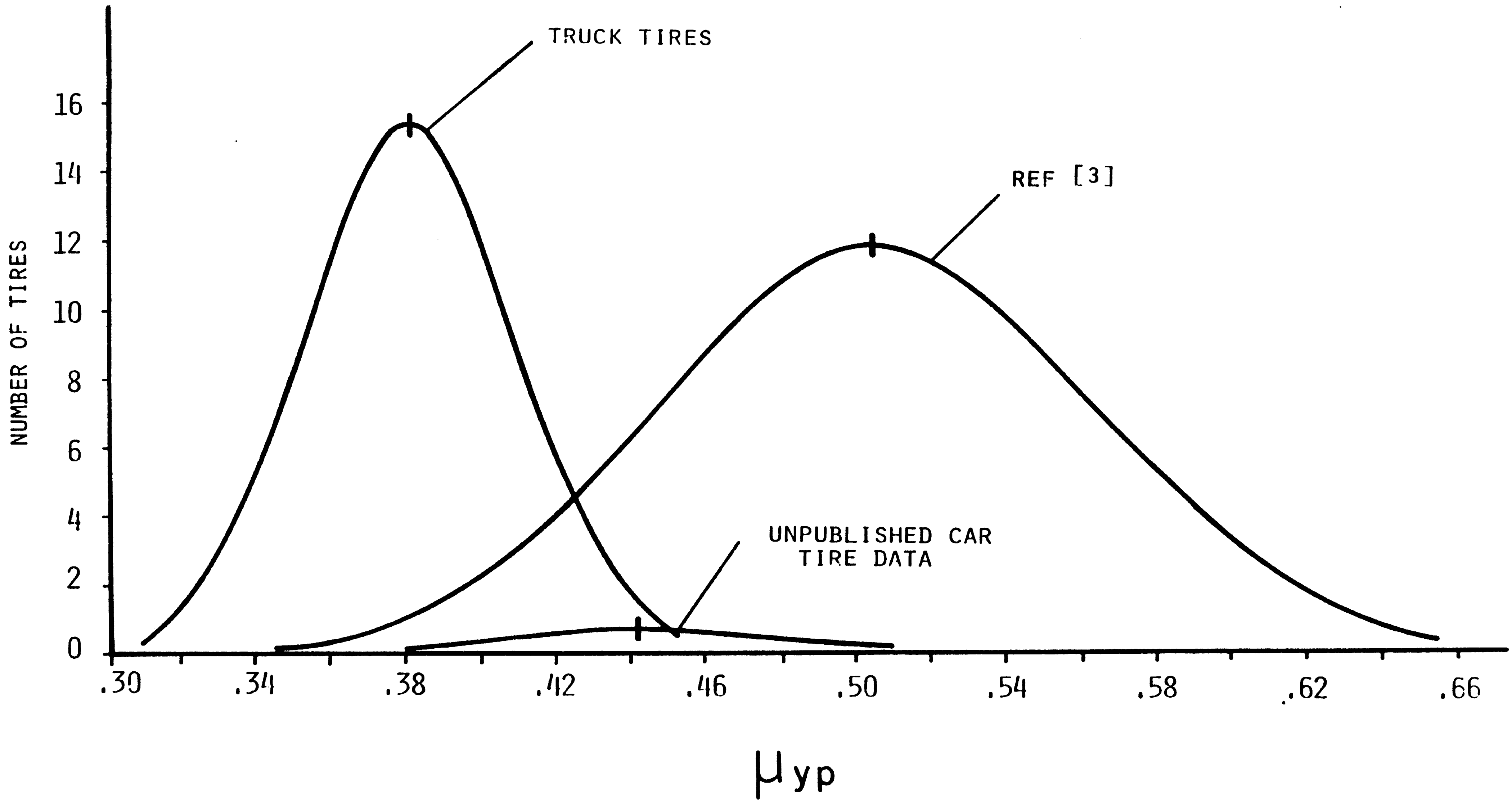


Fig. 28
Comparison of Peak Lateral Force Coefficient (μ_{yp}) for Truck Tire and Car Tire Populations on Concrete

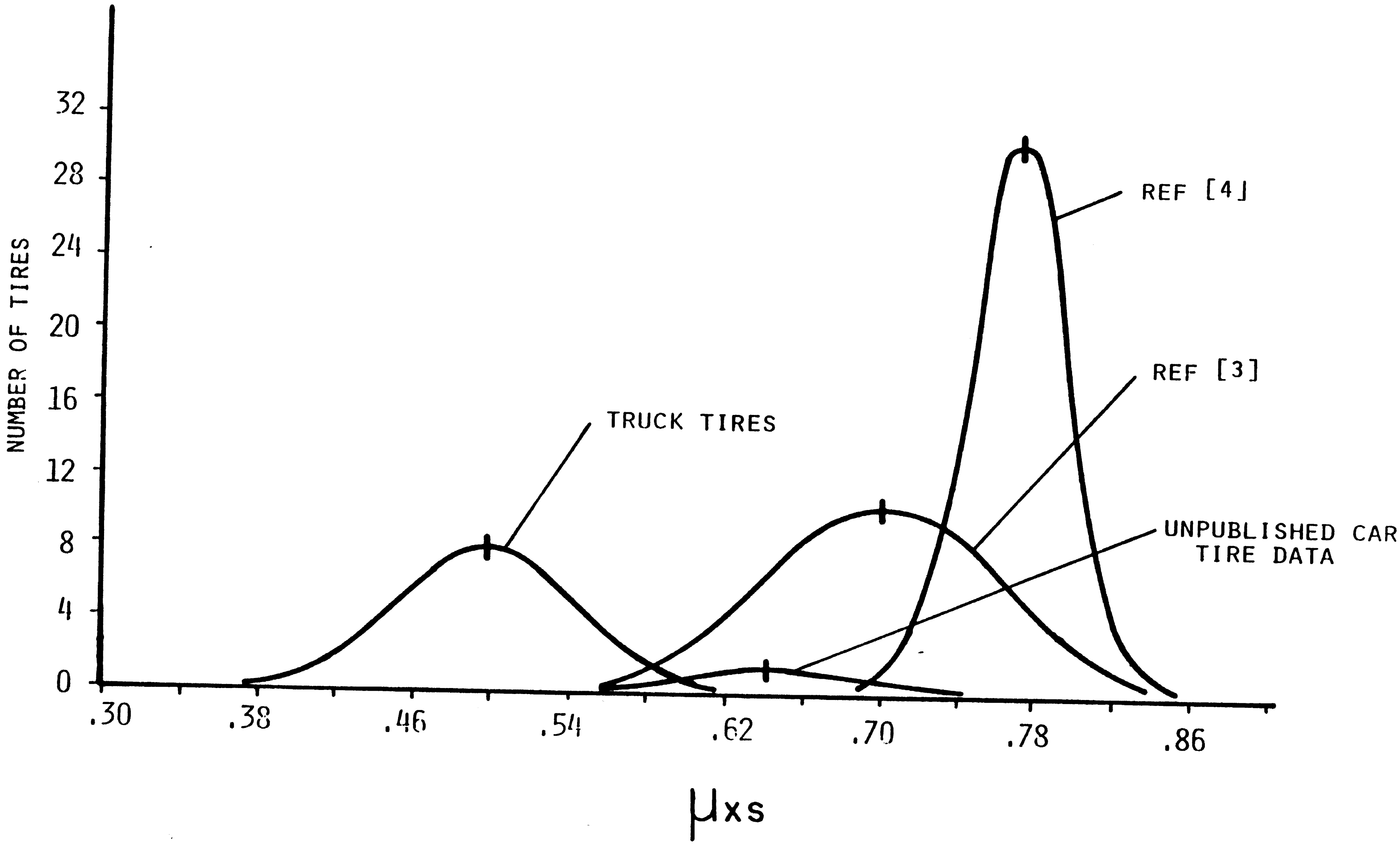


Fig. 29
Comparison of Locked Wheel Braking Force Coefficient (μ_{xs}) for Truck Tire and Car Tire Populations on Asphalt

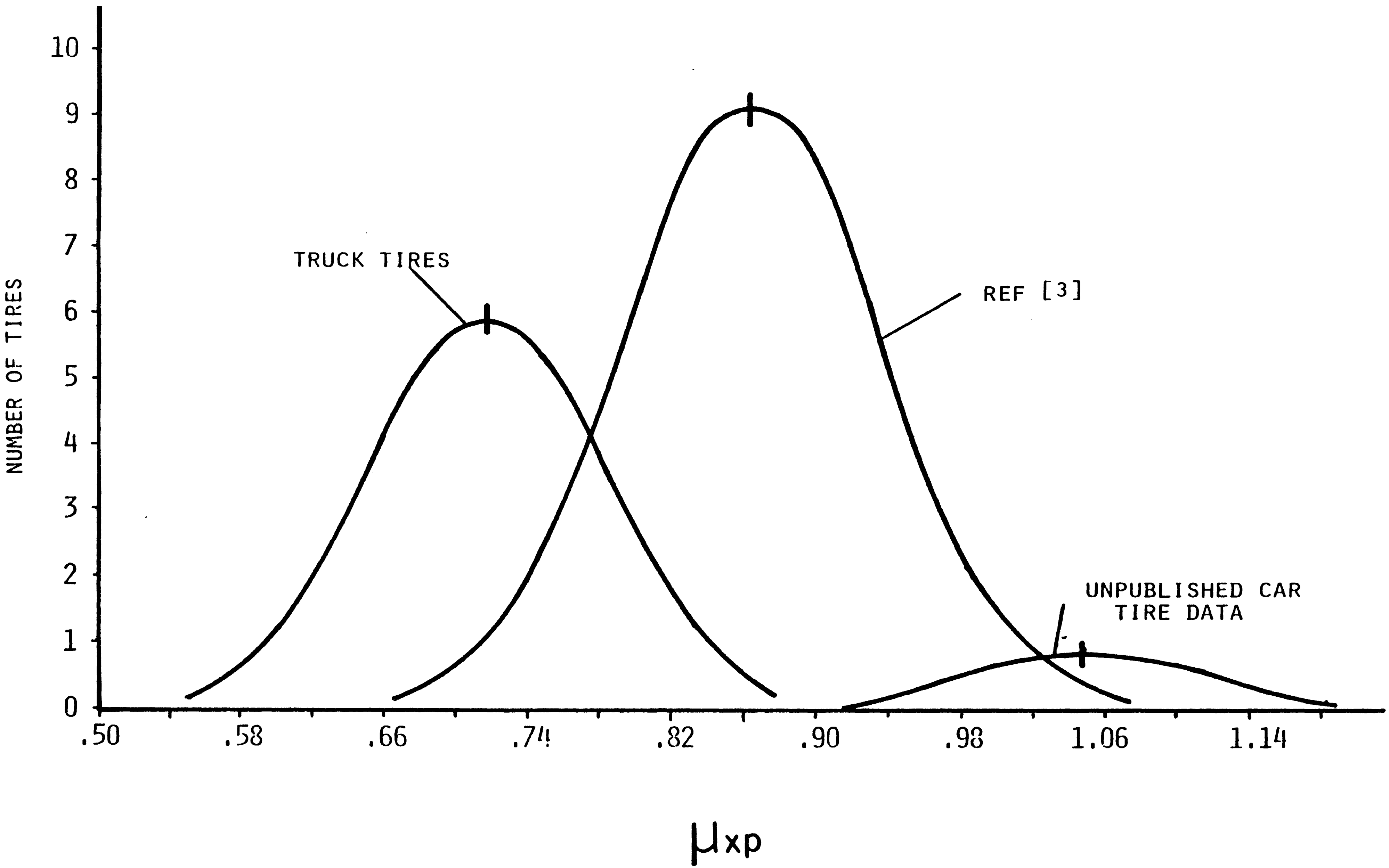


Fig. 30

Comparison of Peak Braking Force Coefficient (μ_{xp}) for Truck Tire and Car Tire Populations on Asphalt

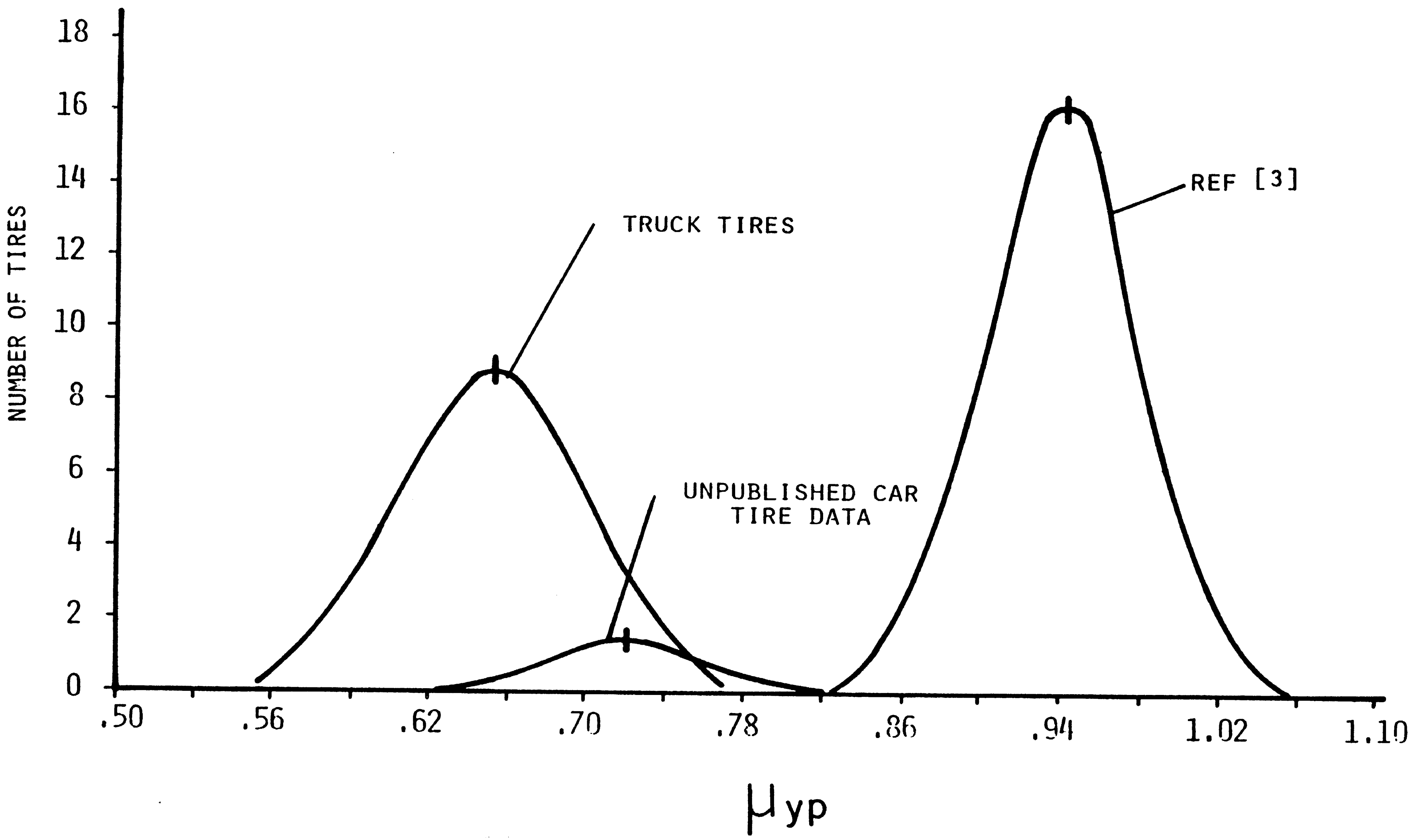


Fig. 31

Comparison of Peak Lateral Force Coefficient (μ_{yp}) for Truck Tire and Car Tire Populations on Asphalt

TABLE 2

TRUCK TIRE TRACTION FORCE COEFFICIENTS ON CONCRETE CORRECTED FOR SURFACE WEAR

TIRE TYPE	TIRE NO.	μ_{xs}				μ_{xp}				μ_{yp}			
		40 mph		55 mph		40 mph		55 mph		40 mph		55 mph	
		avg	s	avg	s	avg	s	avg	s	avg	s	avg	s
	2A	.245	.026	.200	.010	.362	.069	.311	.054	.381	.025	.336	.000
	2B	.222	.031	.186	.019	.337	.021	.308	.016	.376	.022	.333	.019
	4A	.221	.018	.182	.012	.325	.040	.290	.043	.430	.028	.385	.024
	4B	.211	.021	.187	.022	.308	.034	.261	.021	.404	.021	.369	.019
	5A	.264	.024	.211	.021	.347	.028	.303	.025	.371	.023	.325	.017
	5B	.247	.033	.208	.028	.343	.039	.304	.021	.392	.020	.343	.030
	8A	.222	.021	.186	.011	.324	.039	.282	.034	.362	.015	.300	.022
B	8B	.232	.017	.194	.021	.332	.029	.272	.036	.352	.028	.301	.006
I	10A	.266	.011	.209	.012	.350	.029	.305	.025	.396	.018	.368	.015
A	10B	.266	.042	.224	.016	.362	.039	.317	.025	.382	.022	.342	.021
S	12A	.201	.022	.161	.017	.276	.029	.232	.014	.397	.029	.386	.054
	12B	.218	.026	.173	.021	.292	.010	.245	.010	.404	.029	.375	.034
R	16A	.245	.037	.196	.017	.343	.038	.276	.030	.382	.034	.350	.018
I	16B	.238	.024	.217	.018	.353	.043	.310	.040	.400	.025	.371	.012
B	18A	.250	.026	.200	.012	.347	.039	.272	.033	.381	.018	.342	.013
	18B	.239	.025	.198	.016	.352	.045	.302	.030	.395	.024	.360	.020
	20A	.251	.021	.232	.012	.371	.028	.326	.022	.383	.024	.351	.020
	20B	.263	.021	.230	.015	.370	.043	.326	.025	.394	.019	.367	.029
	22A	.228	.013	.222	.027	.358	.029	.290	.041	.393	.028	.342	.017
	22B	.253	.030	.221	.024	.354	.028	.292	.017	.382	.021	.305	.020
	24A	.235	.022	.200	.024	.317	.028	.216	.024	.347	.021	.304	.015
	24B	.251	.032	.208	.021	.344	.023	.287	.011	.363	.019	.320	.016
	3A	.224	.033	.193	.032	.331	.030	.285	.019	.362	.015	.317	.026
	3B	.231	.019	.204	.022	.330	.024	.295	.018	.363	.023	.299	.012
	6A	.229	.027	.203	.024	.301	.021	.285	.023	.365	.032	.316	.015
	6B	.204	.014	.185	.020	.293	.027	.266	.025	.353	.024	.329	.018
B	9A	.226	.012	.179	.024	.320	.036	.260	.044	.361	.022	.298	.023
I	9B	.233	.028	.196	.024	.322	.016	.297	.050	.371	.039	.328	.024
A	11A	.224	.026	.185	.026	.325	.028	.286	.039	.406	.026	.359	.027
S	11B	.214	.018	.202	.028	.335	.032	.291	.040	.415	.034	.374	.051
	13A	.176	.022	.127	.007	.224	.029	.176	.013	.318	.023	.306	.085
L	13B	.167	.013	.138	.027	.224	.025	.216	.032	.316	.024	.274	.025
U	17A	.220	.026	.194	.018	.289	.029	.251	.013	.326	.040	.286	.021
G	17B	.245	.021	.195	.017	.328	.033	.291	.020	.323	.056	.284	.018
	19A	.236	.018	.197	.024	.311	.026	.267	.020	.407	.045	.361	.021
	19B	.239	.012	.189	.022	.310	.029	.250	.018	.386	.035	.323	.020
	21A	.248	.021	.211	.032	.345	.021	.309	.023	.387	.013	.332	.024
	21B	.238	.019	.208	.037	.315	.029	.282	.029	.390	.013	.336	.029
	1A	.235	.015	.180	.012	.352	.037	.338	.055	.416	.026	.392	.016
R	1B	.230	.032	.176	.022	.361	.035	.316	.033	.407	.022	.376	.012
A	7A	.211	.023	.170	.015	.276	.041	.234	.043	.391	.023	.366	.024
D	7B	.212	.022	.167	.033	.290	.037	.240	.039	.361	.050	.314	.026
	14A	.220	.014	.155	.010	.302	.039	.244	.026	.395	.033	.363	.009
R	14B	.217	.017	.175	.010	.296	.037	.244	.019	.407	.021	.369	.031
I	15A	.243	.019	.199	.023	.329	.027	.285	.027	.422	.041	.376	.030
B	15B	.224	.031	.190	.016	.311	.018	.282	.019	.429	.036	.410	.045
RE	26A	.184	.029	.153	.013	.235	.024	.194	.011	.370	.017	.262	.025
CAP	26B	.171	.011	.152	.022	.235	.024	.216	.039	.366	.016	.297	.015

TABLE 3

CK TIRE TRACTION FORCE COEFFICIENTS ON ASPHALT CORRECTED FOR SURFACE WEAR

TIRE NO.	μ_{xs}				μ_{xp}				μ_{yp}			
	40 mph		55 mph		40 mph		55 mph		40 mph		55 mph	
	avg	s	avg	s	avg	s	avg	s	avg	s	avg	s
2A	.538	.026	.462	.024	.784	.023	.718	.036	.620	.023	.572	.033
2B	.481	.015	.417	.019	.745	.040	.684	.051	.651	.018	.589	.021
4A	.521	.024	.444	.033	.778	.032	.729	.030	.612	.018	.597	.023
4B	.506	.020	.462	.021	.738	.068	.770	.027	.620	.014	.586	.019
5A	.612	.017	.461	.046	.779	.021	.682	.034	.666	.034	.620	.020
5B	.507	.020	.487	.029	.769	.014	.692	.031	.631	.017	.611	.022
8A	.474	.017	.421	.026	.674	.033	.604	.052	.613	.018	.554	.012
8B	.747	.040	.403	.026	.676	.025	.619	.034	.615	.021	.578	.030
10A	.500	.036	.465	.026	.745	.039	.684	.018	.655	.023	.624	.022
10B	.514	.015	.451	.047	.735	.022	.680	.048	.648	.018	.604	.031
12A	.552	.034	.445	.034	.784	.022	.726	.025	.657	.024	.611	.014
12B	.519	.026	.461	.034	.754	.026	.721	.042	.675	.008	.610	.031
16A	.538	.026	.437	.021	.710	.054	.666	.036	.670	.020	.608	.018
16B	.524	.022	.451	.042	.731	.027	.663	.012	.662	.019	.591	.015
18A	.519	.030	.482	.036	.817	.055	.770	.020	.648	.027	.557	.018
18B	.544	.044	.463	.037	.797	.047	.606	.040	.662	.032	.582	.014
20A	.585	.008	.479	.017	.791	.012	.640	.021	.623	.016	.574	.008
20B	.576	.044	.453	.052	.742	.027	.633	.043	.604	.021	.548	.015
22A	.475	.032	.419	.014	.760	.031	.660	.037	.573	.023	.518	.015
22B	.471	.018	.411	.023	.728	.038	.642	.036	.653	.027	.609	.023
24A	.518	.013	.459	.031	.679	.038	.640	.036	.665	.016	.611	.018
24B	.552	.018	.485	.028	.721	.031	.574	.017	.700	.023	.644	.004
3A	.560	.006	.479	.024	.744	.031	.654	.024	.635	.015	.581	.911
3B	.556	.025	.471	.024	.745	.026	.669	.016	.681	.016	.585	.012
6A	.461	.031	.416	.026	.614	.031	.587	.029	.642	.023	.633	.019
6B	.398	.082	.405	.025	.567	.046	.603	.029	.643	.021	.599	.025
9A	.562	.022	.437	.025	.697	.032	.657	.018	.688	.008	.663	.008
9B	.501	.059	.431	.008	.679	.031	.677	.021	.709	.014	.704	.008
11A	.471	.018	.403	.023	.610	.034	.590	.016	.710	.031	.649	.021
11B	.478	.016	.404	.018	.611	.027	.586	.019	.678	.014	.635	.014
13A	.458	.027	.402	.045	.642	.031	.611	.037	----	----	.587	.020
13B	.435	.025	.366	.023	.643	.043	.584	.022	.620	.019	.593	.012
17A	.423	.022	.401	.020	.555	.024	.581	.045	.622	.016	.557	.008
17B	.415	.016	.396	.017	.535	.030	.590	.037	.579	.012	.538	.024
19A	.540	.024	.443	.014	.720	.022	.641	.023	.636	.022	.518	.022
19B	.483	.021	.431	.024	.670	.029	.622	.030	.660	.026	.582	.016
21A	.516	.025	.442	.012	.716	.020	.680	.017	.618	.013	.601	.010
21B	.512	.016	.454	.029	.708	.056	.696	.012	.632	.021	.583	.022
1A	.437	.031	.387	.020	.730	.027	.681	.022	.604	.022	.582	.029
1B	.422	.022	.393	.031	.722	.040	.657	.032	.585	.015	.573	.021
7A	.445	.026	.393	.015	.694	.027	.631	.025	.613	.020	.563	.030
7B	.475	.020	.410	.027	.694	.031	.658	.024	.613	.010	.582	.020
14A	.473	.016	.419	.019	.713	.052	.679	.043	.640	.005	.597	.012
14B	.474	.020	.410	.027	.646	.051	.604	.036	.661	.015	.613	.012
15A	.443	.020	.404	.019	.736	.014	.684	.053	.690	.013	.652	.029
15B	.448	.023	.390	.030	.747	.014	.712	.031	.762	.052	.689	.039
26A	.505	.025	.424	.029	.847	.041	.756	.024	.815	.024	.738	.039
26B	.485	.018	.454	.026	.848	.032	.766	.037	.780	.019	.696	.024

TABLE 7. COMPARISON OF TRACTION PROPERTIES ON A SMOOTH CONCRETE PAVEMENT

COMPARISON	40 mph			55 mph		
	μ_{xs}	μ_{xp}	μ_{yp}	μ_{xs}	μ_{xp}	μ_{yp}
Bias/Rib vs. Bias Lug	Bias/Rib**	Bias/Rib	Bias/Rib	Bias/Rib	NS*	Bias/Rib
Radial/Rib vs. Bias/Lug	NS	NS	Radial/Rib	NS	NS	Radial/Rib
Bias/Rib vs. Radial/Rib	Bias/Rib	Bias/Rib	Radial/Rib	Bias/Rib	NS	Radial/Rib

*No significant difference, determined by t test

**The tire type having the highest level of the specified traction property is given

TABLE 8. COMPARISONS OF TRACTION PROPERTIES ON A COARSE ASPHALT PAVEMENT

COMPARISON	40 mph			55 mph		
	μ_{xs}	μ_{xp}	μ_{yp}	μ_{xs}	μ_{xp}	μ_{yp}
Bias/Rib vs. Bias/Lug	NS*	Bias/Rib**	NS	Bias/Rib	Bias/Rib	NS
Radial/Rib vs. Bias/Lug	NS	Radial/Rib	NS	NS	Radial/Rib	NS
Bias Rib vs. Radial/Rib	Bias/Rib	Bias/Rib	NS	Bias/Rib	NS	NS

*No significant difference, determined by the t test

**The tire type having the highest level of the specificed traction property is given

TABLE 5. CORRELATION BETWEEN TRACTION PROPERTIES

COMPARISON	ASPHALT		CONCRETE	
	40 mph	55 mph	40 mph	55 mph
μ_{xs} vs. μ_{xp}	.563	.400	.876	.720
μ_{xs} vs. μ_{yp}	. 20	. 05	.005	.057
μ_{yp} vs. μ_{xp}	-. 23	. 06	.405	.285

TABLE 6. STANDARD DEVIATION BETWEEN PAIRS OF TIRES OF THE SAME BRAND, MODEL AND SIZE, POOLED OVER VARIOUS CATEGORIES

TIRE TYPE	# DEGREES OF FREEDOM	ASPHALT					
		40 mph			55 mph		
		μ_{xs}	μ_{xp}	μ_{yp}	μ_{xs}	μ_{xp}	μ_{yp}
Bias/Rib	11	.028	.022	.022	.016	.040	.024
Bias/Lug	8	.027	.027	.021	.011	.011	.024
Radial/Rib	4	.012	.024	.027	.009	.031	.016
All	23	.026	.024	.023	.013	.031	.023
		CONCRETE					
		40 mph			55 mph		
		μ_{xs}	μ_{xp}	μ_{yp}	μ_{xs}	μ_{xp}	μ_{yp}
Bias/Rib	11	.010	.010	.011	.033	.019	.014
Bias/Lug	8	.010	.014	.007	.009	.019	.016
Radial/Rib	3	.007	.009	.012	.008	.006	.023
All	23	.010	.012	.010	.023	.018	.016
		overall μ_{xs}		overall μ_{xp}		overall μ_{yp}	
All	92	.019		.022		.019	

FIREST TRANSPORT 110 7.50X16.0 C

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
50.0	615.0	-22.8	129.6	-103.7	216.6	-228.0	368.0	-340.0	480.4	-457.7	548.8	-499.7	524.1	-516.9
50.0	1335.0	-27.4	219.3	-180.0	402.8	-359.2	667.2	-630.7	913.9	-891.8	1060.4	-1004.0	1037.9	-1039.2
50.0	2050.0	-33.0	283.8	-232.4	513.3	-452.7	861.6	-820.5	1255.4	-1223.3	1472.1	-1400.7	1516.3	-1481.9
50.0	2800.0	-40.4	311.6	-246.2	579.7	-485.6	1012.3	-946.8	1528.7	-1499.0	1839.2	-1746.8	1918.6	-1888.8

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
50.0	615.0	0.9	8.0	-7.1	6.5	-16.8	9.8	-13.5	0.6	-8.4	-9.6	-2.3	-2.4	2.9
50.0	1335.0	2.4	25.5	-21.2	37.7	-38.9	44.1	-45.5	22.2	-30.4	7.3	-16.1	-5.5	-3.7
50.0	2050.0	4.7	48.6	-35.6	68.5	-66.7	84.5	-89.6	50.3	-60.4	17.3	-44.2	-5.1	-9.1
50.0	2800.0	9.7	61.9	-48.0	102.4	-95.5	136.5	-138.6	99.9	-107.6	48.4	-77.0	6.0	-19.9

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LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
75.0	615.0	-10.6	112.9	-88.0	193.7	-173.3	316.6	-310.2	454.5	-457.0	520.1	-525.0	542.4	-538.8
75.0	1332.0	-22.9	217.3	-163.8	369.7	-328.0	620.3	-592.7	917.7	-899.4	1048.3	-1040.1	1100.1	-1112.6
75.0	2050.0	-33.5	295.2	-218.7	506.8	-443.9	844.2	-820.7	1287.0	-1259.0	1496.8	-1478.2	1565.7	-1593.0
75.0	2767.0	-43.8	355.1	-260.0	617.0	-533.2	1039.7	-1039.0	1611.1	-1581.4	1900.2	-1868.3	2002.4	-2013.0
50.0	1332.0	-27.2	244.3	-178.4	414.7	-356.5	682.6	-647.8	956.7	-951.8	1082.5	-1090.5	1130.0	-1139.9
50.0	2050.0	-39.9	320.2	-227.0	551.0	-469.7	913.8	-881.8	1336.5	-1310.5	1531.5	-1526.6	1607.2	-1616.0
30.0	1332.0	30.8	262.1	-148.0	451.4	-385.3	715.5	-692.8	977.4	-969.3	1112.3	-1089.5	1157.9	-1152.7
30.0	2050.0	38.1	324.9	-228.1	563.4	-477.4	929.9	-873.4	1317.8	-1304.2	1527.9	-1516.4	1607.1	-1594.0

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ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
75.0	615.0	0.0	1.0	-0.4	3.2	-3.3	6.4	-9.3	-4.9	-7.7	-2.6	-0.1	-2.8	-3.4
75.0	1332.0	0.3	11.2	-8.2	18.3	-17.7	22.6	-28.4	13.3	-24.1	2.6	-13.7	-5.7	-4.7
75.0	2050.0	1.5	23.7	-17.3	38.2	-35.0	50.9	-55.8	39.8	-48.9	18.0	-27.1	-2.2	-6.9
75.0	2767.0	4.1	37.4	-26.2	61.0	-53.1	81.4	0.0	70.1	-82.7	35.0	-51.4	8.5	-17.5
50.0	1332.0	0.6	16.3	-11.4	25.2	-22.6	29.4	-37.0	18.0	-25.4	3.9	-12.0	-4.7	-1.5
50.0	2050.0	3.6	33.6	-21.4	51.8	-44.0	68.8	-66.2	49.5	-60.3	15.8	-30.0	-0.6	-7.0
30.0	1332.0	2.0	23.9	-16.1	34.4	-31.1	36.6	-43.2	21.1	-26.3	6.0	-14.0	-10.4	1.0
30.0	2050.0	5.5	43.8	-28.8	67.4	-59.4	85.6	-88.8	56.5	-66.1	19.3	-32.7	-6.0	-4.9

GOODYE' RIB HIMILER 8.00X16.5 D

26

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-9.7	83.5	-74.8	150.4	-140.0	260.7	-248.3	402.4	-410.8	501.2	-457.5	549.4	-519.5
70.0	1335.0	-25.3	172.5	-136.1	320.6	-295.2	552.0	-519.8	857.6	-828.1	1022.0	-937.0	1130.9	-1098.3
70.0	2050.0	-27.6	251.9	-200.5	444.2	-393.3	768.5	-732.8	1222.7	-1177.8	1452.4	-1400.5	1619.9	-1579.8
70.0	2800.0	-33.6	284.8	-243.0	541.4	-469.4	935.3	-885.2	1503.3	-1483.5	1848.3	-1811.5	2063.1	-2022.7

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-3.5	2.8	-8.2	7.4	-13.4	7.1	-12.6	3.9	-12.8	-1.9	-6.3	-1.1	-1.3
70.0	1335.0	-0.5	12.5	-18.1	22.6	-27.4	28.4	-35.7	25.7	-31.8	12.9	-23.0	4.4	-8.6
70.0	2050.0	2.1	27.3	-27.8	44.4	-48.5	61.0	-66.9	56.4	-63.4	33.1	-47.0	17.3	-21.9
70.0	2800.0	3.0	40.0	-36.0	69.9	-68.2	98.6	-107.0	97.9	-109.1	61.7	-75.2	34.3	-37.1

FIRES 'E TOWN & COUNTRY TRUCK 8.00X16.5 D

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-5.8	90.2	-62.7	155.5	-125.4	263.9	-245.1	389.8	-357.1	457.8	-416.4	488.8	-450.9
70.0	1335.0	-24.8	186.9	-142.3	329.3	-288.2	565.2	-537.7	834.6	-819.2	975.1	-940.9	1029.9	-1003.9
70.0	2050.0	-40.5	274.3	-183.5	472.4	-400.9	809.1	-741.6	1227.0	-1176.6	1404.9	-1362.5	1499.9	-1459.8
70.0	2800.0	-49.5	325.4	-222.6	570.7	-481.1	1008.1	-930.6	1522.2	-1520.3	1803.6	-1774.5	1915.5	-1906.8

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-1.6	4.3	-4.9	4.5	-10.9	4.9	-11.4	2.7	-7.2	0.2	-3.7	-7.4	-2.2
70.0	1335.0	-1.0	15.1	-15.0	20.3	-22.1	26.8	-27.9	17.8	-22.5	2.6	-13.7	-4.9	-1.0
70.0	2050.0	3.1	25.9	-21.7	41.6	-40.6	50.5	-55.9	42.6	-52.7	16.0	-29.0	-3.9	-10.7
70.0	2800.0	7.1	41.8	-30.7	66.2	-56.6	84.5	-88.4	74.8	-88.4	39.7	-54.2	8.4	-24.5

GOODR MILESAVER RADIAL STEEL HDR 8.00R16.5 D

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-13.0	86.8	-77.4	164.2	-148.0	267.4	-250.4	416.4	-394.4	502.2	-487.7	558.9	-507.7
70.0	1335.0	-6.4	178.9	-176.7	332.4	-333.7	579.8	-546.0	917.5	-882.8	1110.4	-1049.3	1211.0	-1133.4
70.0	2050.0	-0.9	258.9	-243.3	471.9	-471.0	843.3	-810.7	1334.5	-1264.9	1589.1	-1518.1	1720.0	-1622.0
70.0	2800.0	-12.2	286.3	-289.8	565.6	-557.9	1020.1	-985.2	1681.4	-1619.7	1993.3	-1929.9	2158.3	-2088.1

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-3.3	1.2	-9.5	3.5	-10.1	2.3	-11.6	-1.1	-8.6	0.8	-5.4	-5.6	-5.0
70.0	1335.0	-3.1	12.2	-18.0	22.6	-30.2	28.1	-37.9	26.0	-35.5	12.8	-23.8	2.9	-9.9
70.0	2050.0	-3.9	29.9	-35.4	52.4	-55.7	64.5	-74.4	71.0	-69.9	45.1	-54.9	21.4	-28.6
70.0	2800.0	-2.1	46.9	-48.7	79.0	-85.0	120.1	-122.2	121.4	-124.8	84.2	-95.3	50.0	-55.6

GOODYEAR C S GUARD XG 8.00X16.5 D

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-9.2	79.0	-69.4	144.4	-122.1	238.9	-220.9	360.8	-332.7	431.9	-398.1	469.0	-442.8
70.0	1335.0	-19.3	176.8	-124.2	300.8	-243.5	485.6	-456.9	734.6	-711.7	902.6	-845.8	963.2	-913.9
70.0	2050.0	-37.8	237.2	-168.5	404.4	-337.3	683.0	-634.4	1067.7	-1018.1	1294.8	-1252.9	1015.7	-1347.7
70.0	2800.0	-31.3	285.4	-198.1	509.3	-424.3	860.6	-801.4	1368.4	-1323.9	1660.4	-1630.3	1847.0	-1785.3

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-3.1	3.7	-7.1	2.6	-8.0	1.0	-8.1	-2.4	-7.3	-1.7	-3.9	-3.9	-5.8
70.0	1335.0	1.5	11.3	-11.7	14.3	-1853.0	18.4	-23.7	17.6	-18.4	6.5	-11.6	-0.1	1.4
70.0	2050.0	4.0	21.9	-16.7	33.1	-31.7	42.1	-44.3	37.6	-40.7	21.8	-26.4	5.4	-10.8
70.0	2800.0	6.7	34.2	-24.4	54.1	-49.7	69.7	-70.1	70.0	-71.0	41.9	-46.6	21.4	-23.3

GENERAL 'MBO POWER JET COMMERCIAL 8.00X16.5 D

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-17.0	129.5	-103.9	216.7	-200.1	366.9	-327.7	504.3	-496.3	585.7	-541.2	610.0	-556.0
70.0	1335.0	-25.4	237.5	-199.7	416.7	-394.0	713.6	-690.9	1060.9	-1030.8	1210.6	-1165.2	1272.7	-1215.1
70.0	2050.0	-34.4	313.5	-267.4	578.4	-522.2	1000.7	-932.0	1495.7	-1458.4	1740.7	-1696.3	1851.0	-1771.1
70.0	2800.0	-23.8	369.6	-320.9	683.5	-643.6	1206.5	-1162.7	1851.9	-1839.4	2198.0	-2169.9	2201.3	-2160.8

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-3.3	0.7	-10.0	5.8	-13.4	6.2	-16.0	-2.9	-8.1	-3.8	-5.0	-4.6	1.1
70.0	1335.0	-3.6	18.9	-22.9	31.5	-37.4	38.2	-46.6	19.2	-28.1	5.1	-9.2	-4.1	-1.0
70.0	2050.0	-2.8	36.9	-39.2	60.9	-64.8	78.1	-90.4	56.2	-62.7	28.6	-30.3	5.1	-9.8
70.0	2800.0	-1.9	52.9	-57.8	93.2	-98.9	128.4	-139.1	102.3	-117.9	56.3	-64.8	31.5	-37.6

GOODYE. ;LAS GUARD 8.00X16.5 D

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-9.7	102.2	-80.1	163.0	-152.0	285.0	-268.0	415.0	-406.4	479.0	-448.0	473.0	-505.0
70.0	1335.0	-28.4	227.0	-170.0	384.0	-336.0	624.0	-575.0	880.0	-864.0	1011.0	-964.0	1015.0	-1057.0
70.0	2050.0	-51.3	316.0	-222.0	548.0	-453.0	882.0	-818.0	1273.0	-1247.0	1406.0	-1413.0	1491.0	-1555.0
70.0	2800.0	-50.3	379.0	-289.0	665.0	-561.0	1089.0	-1011.0	1616.0	-1601.0	1893.0	-1838.0	1983.0	-2022.0

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-2.2	4.0	-6.7	6.5	-9.2	5.4	-8.2	5.1	-3.7	-1.0	-1.2	2.3	-2.7
70.0	1335.0	1.5	17.3	-12.8	28.6	-25.5	27.8	-30.2	18.7	-20.9	4.1	-6.9	2.7	-3.6
70.0	2050.0	6.4	33.5	-25.4	52.6	-47.5	57.0	-63.7	41.8	-47.7	16.4	-20.8	-5.9	0.0
70.0	2800.0	11.4	57.1	44.1	88.5	-69.9	102.4	-106.8	80.5	-86.9	36.1	-46.8	-16.7	12.3

TIRF Tire No.	Speed mph	Slip Angle	Vertical Load, lb 1165	2330	3495	Run No.	Remarks
1	20	B	x	x	x	1	Additional TIRF Schedule
	40		x	x	x	2	
	55		x	x	x	3	
2	20		x	x	x	4	
	40		x	x	x	5	
	55		-	-	x	6	Original HSRI Schedule
3	55		x	-	-	7	
	40		-	x	-	8	
	20		-	-	x	9	
	55		x	-	-	10	Repeat of Run 7
13	20		x	-	-	31	Original HSRI Schedule
	40		-	-	x	32	
	55		-	x	-	33	
14	20		-	x	-	34	
	40		x	-	-	35	
	55	B	-	-	x	36	Repeat of Run 6

Table C-1. TIRF TEST SCHEDULE - CORNERING TESTS

Firestone 8.00-16.5D Rim 6 in

Inflation Pressure 80 psi

$B = 0^\circ, 1^\circ, 2^\circ, 4^\circ, 8^\circ, 12^\circ, 16^\circ$

TIRF Tire No.	Speed mph	Slip Angle	Vertical Load, lb 1165	2330	3495	Run No.	Remarks
	55	A	-	x	-	28	Original HSRI Schedule
4	20	0	x	x	x	28	
	40	A	-	x	-	29	
5	40	0	x	x	x	29	
	20	A	-	x	-	30	
6	55	0	x	x	x	30	

Table C-2. TIRF TEST SCHEDULE - BRAKING/CORNERING

Longitudinal Slip From 0 to -1

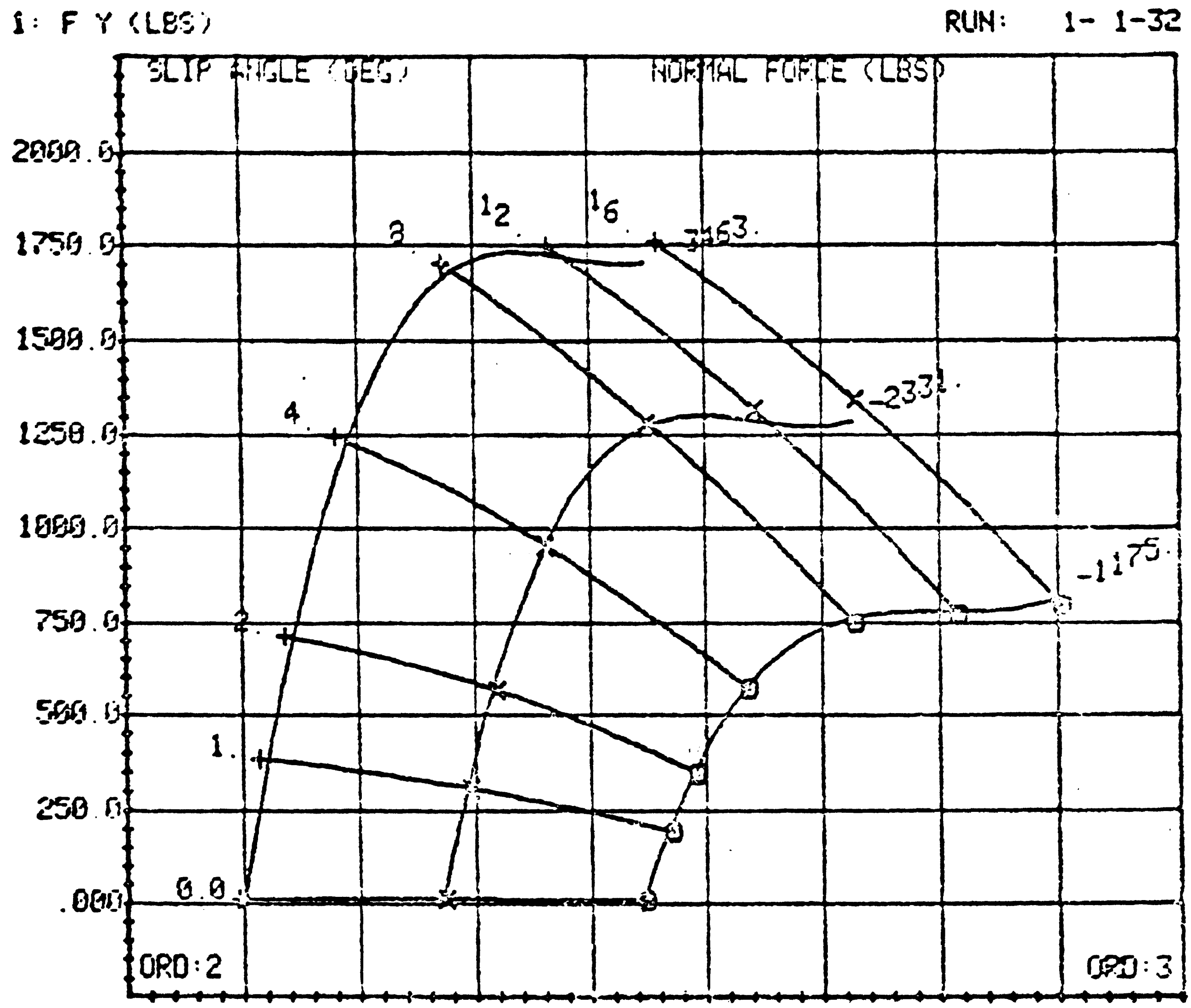
Firestone 8.00-16.5 D, Rim 6 in

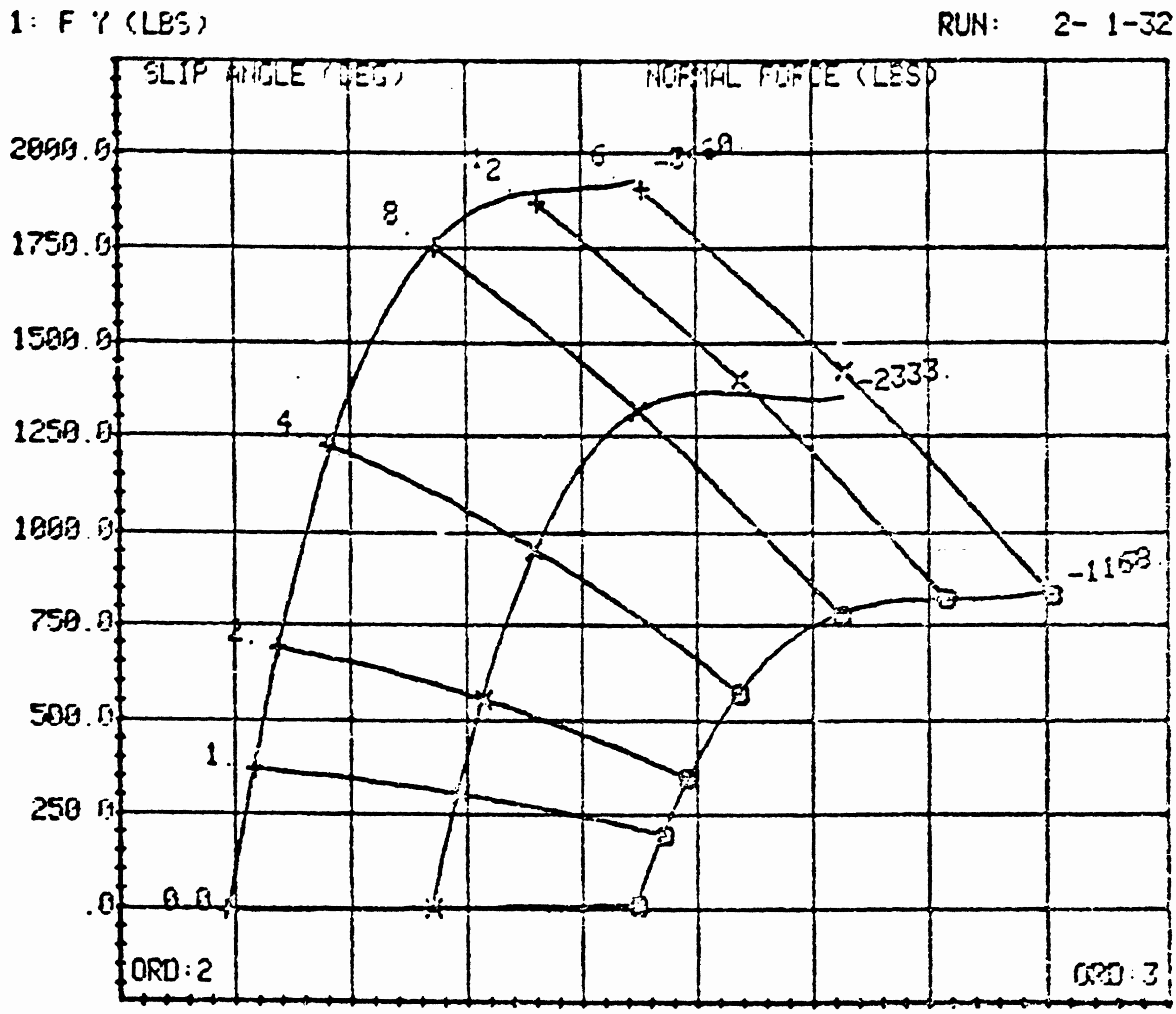
Inflation Pressure 80 psi

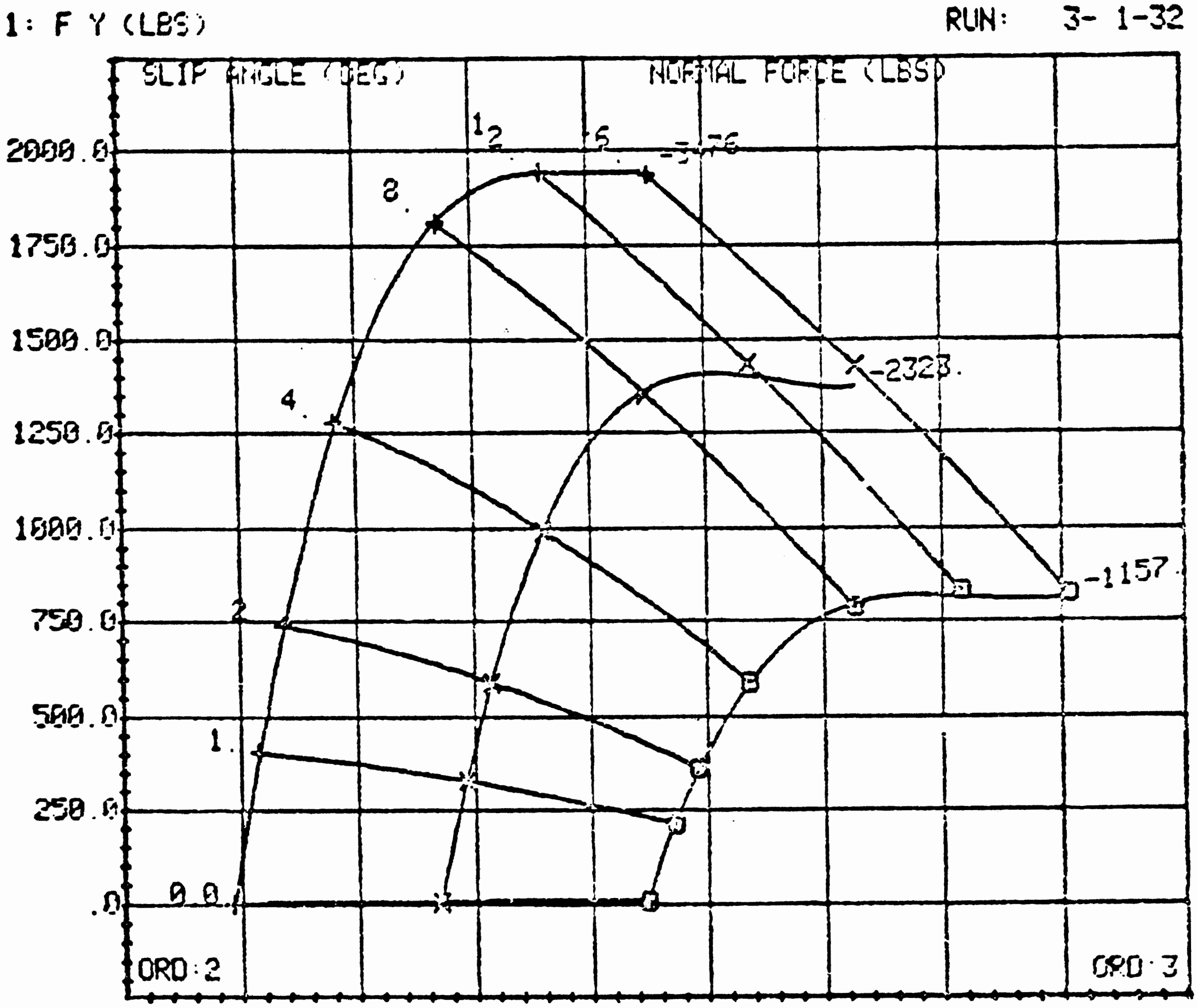
$A = 0^\circ, 4^\circ, 8^\circ, 12^\circ$

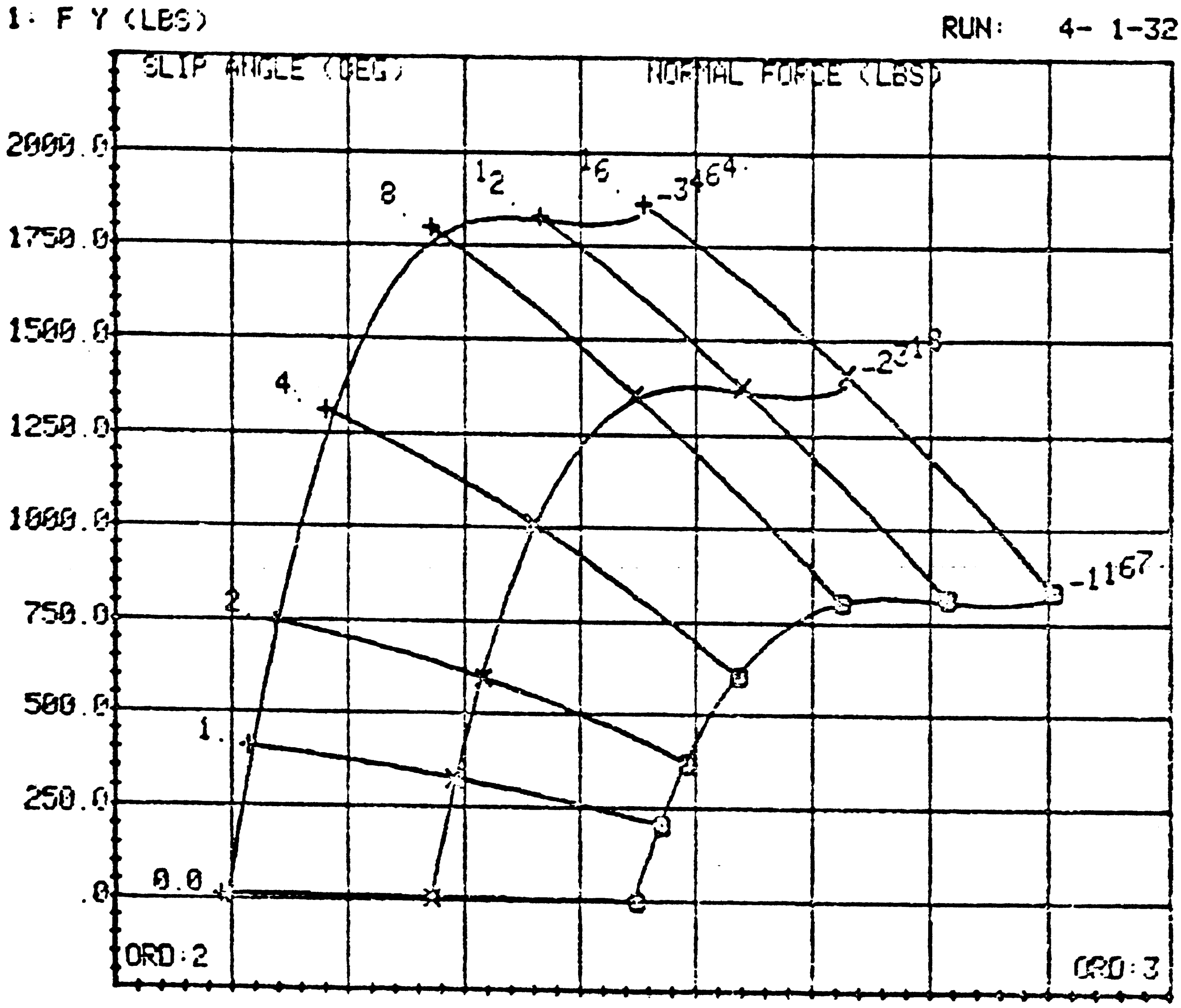
TIRF DATA

GRAPHICAL PRESENTATION

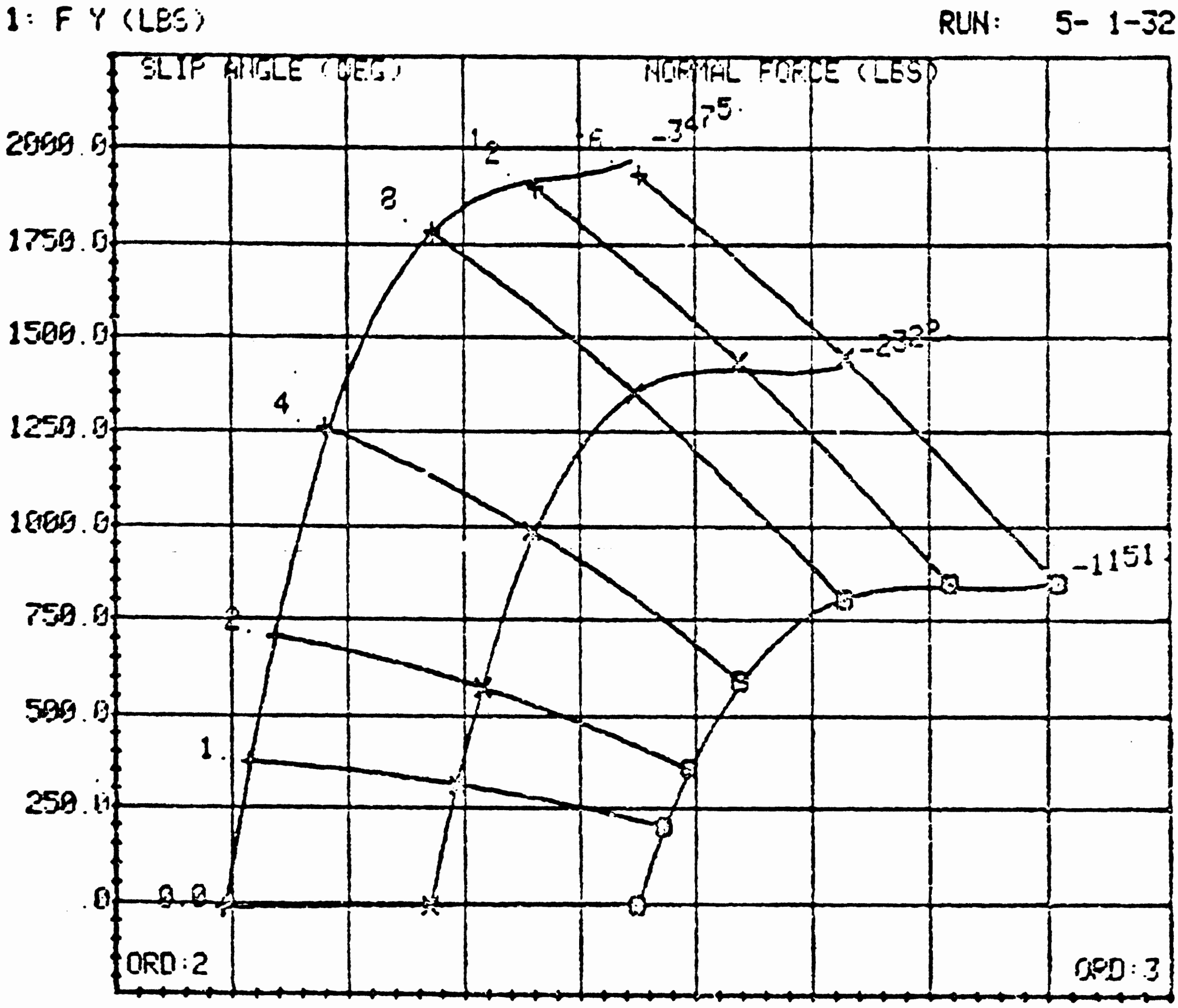

1: F Y (LBS)
RUN: 1- 1-32
SLIP ANGLE (DEG)
NORMAL FORCE (LBS)
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
.000
0.0
1.
2.
4.
8.
12.
16.
ORD:2
ORD:3

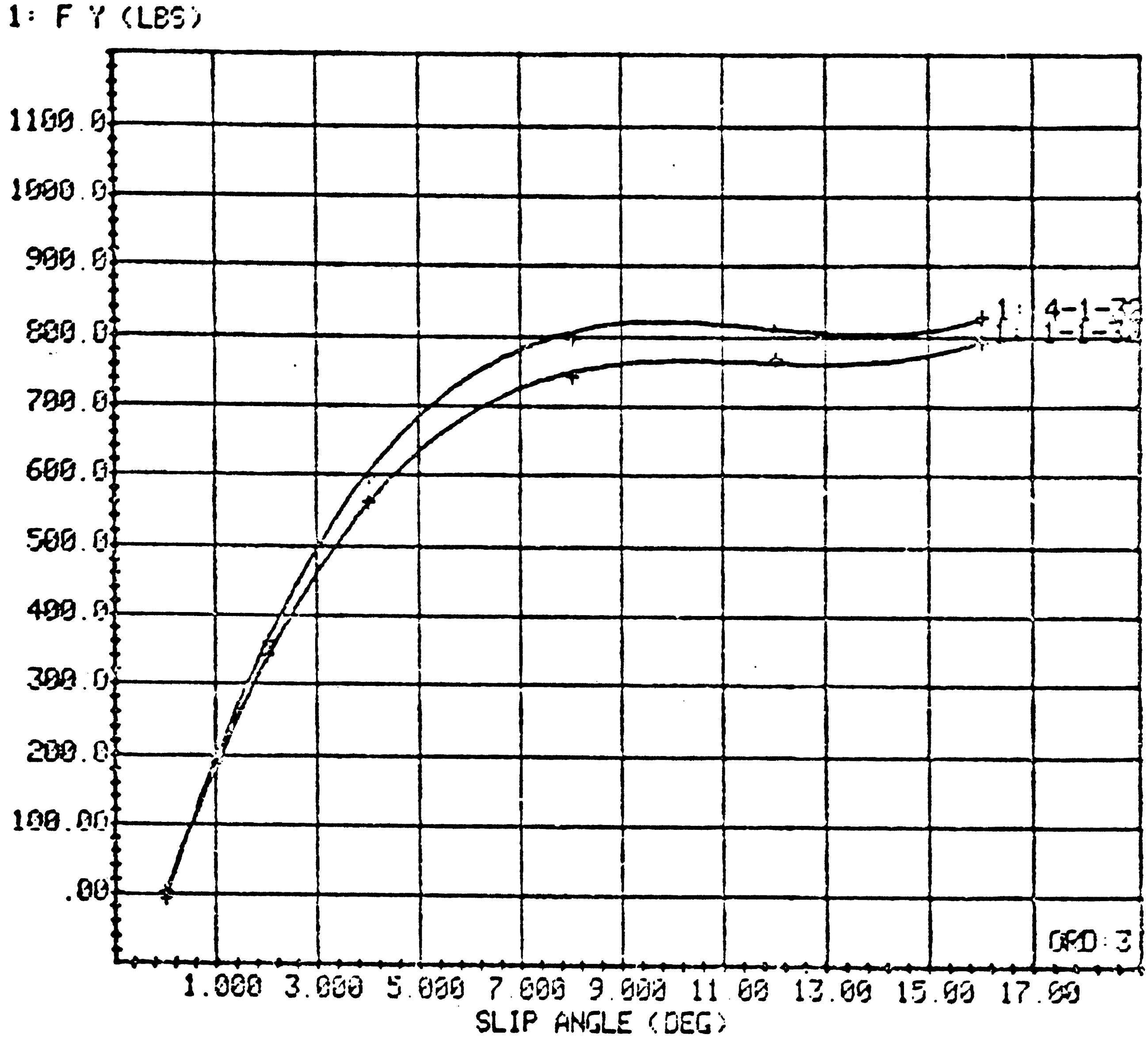

1: F Y (LBS)
RUN: 2- 1-32
SLIP ANGLE (DEG)
NORMAL FORCE (LBS)
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
.0
ORD:2
ORD:3
-2333
-1168
8
4
2
1
0.0


1: F Y (LBS)
RUN: 3- 1-32
SLIP ANGLE (DEG)
NORMAL FORCE (LBS)
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
.0
12
16
8
4
2
1
0.0
-2323
-1157
ORD:2
ORD:3

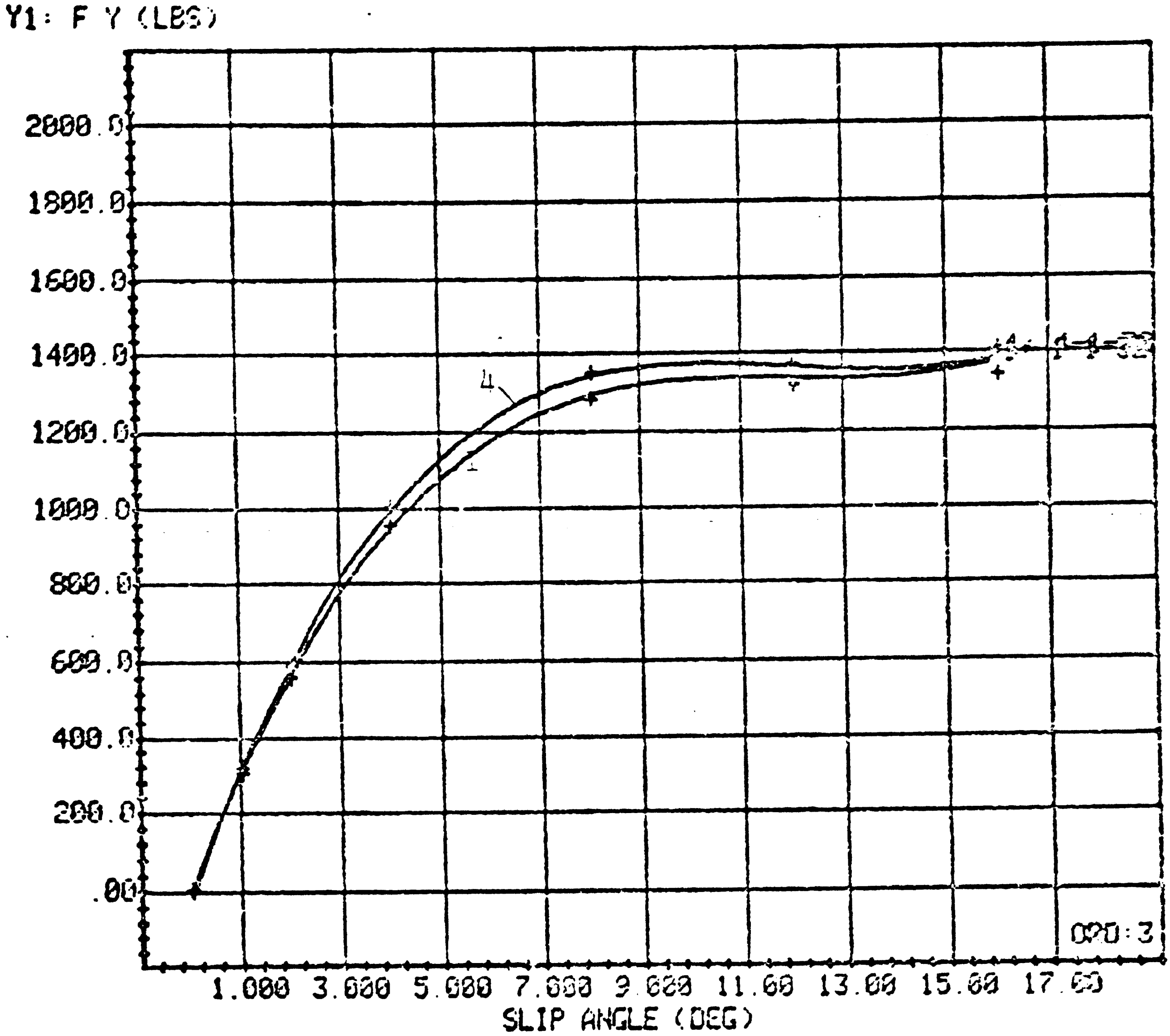


1: F Y (LBS)
RUN: 4- 1-32
SLIP ANGLE (DEG)
NORMAL FORCE (LBS)
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
.0
8
12
16
-3464
4
-2219
-1167
2
1
0.0
ORD:2
ORD:3


1: F Y (LBS)
RUN: 5- 1-32
SLIP ANGLE (DEG)
NORMAL FORCE (LBS)
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
.0
ORD:2
ORD:3
-3475
-2328
-1151

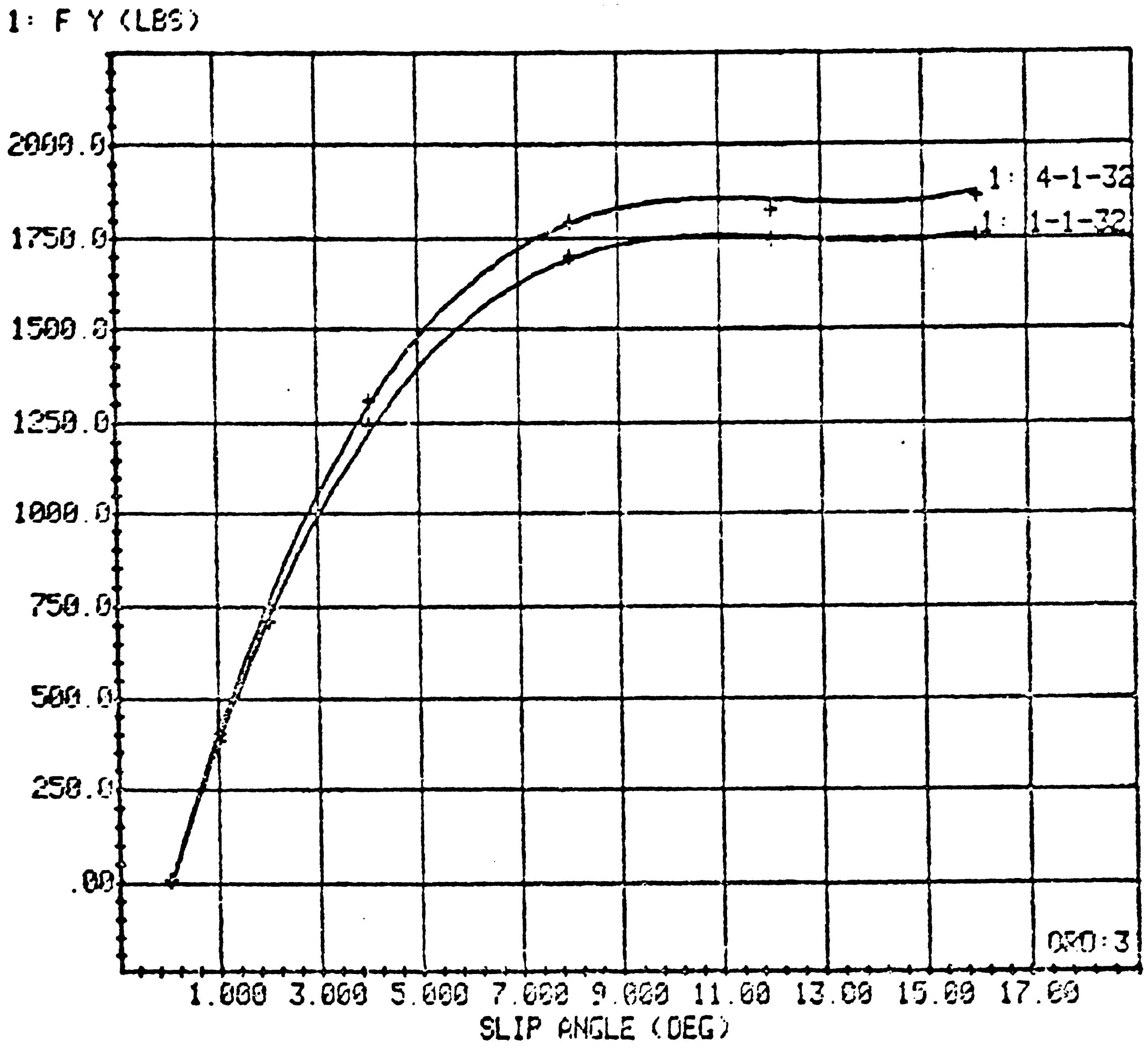


1165 lb
20 mph



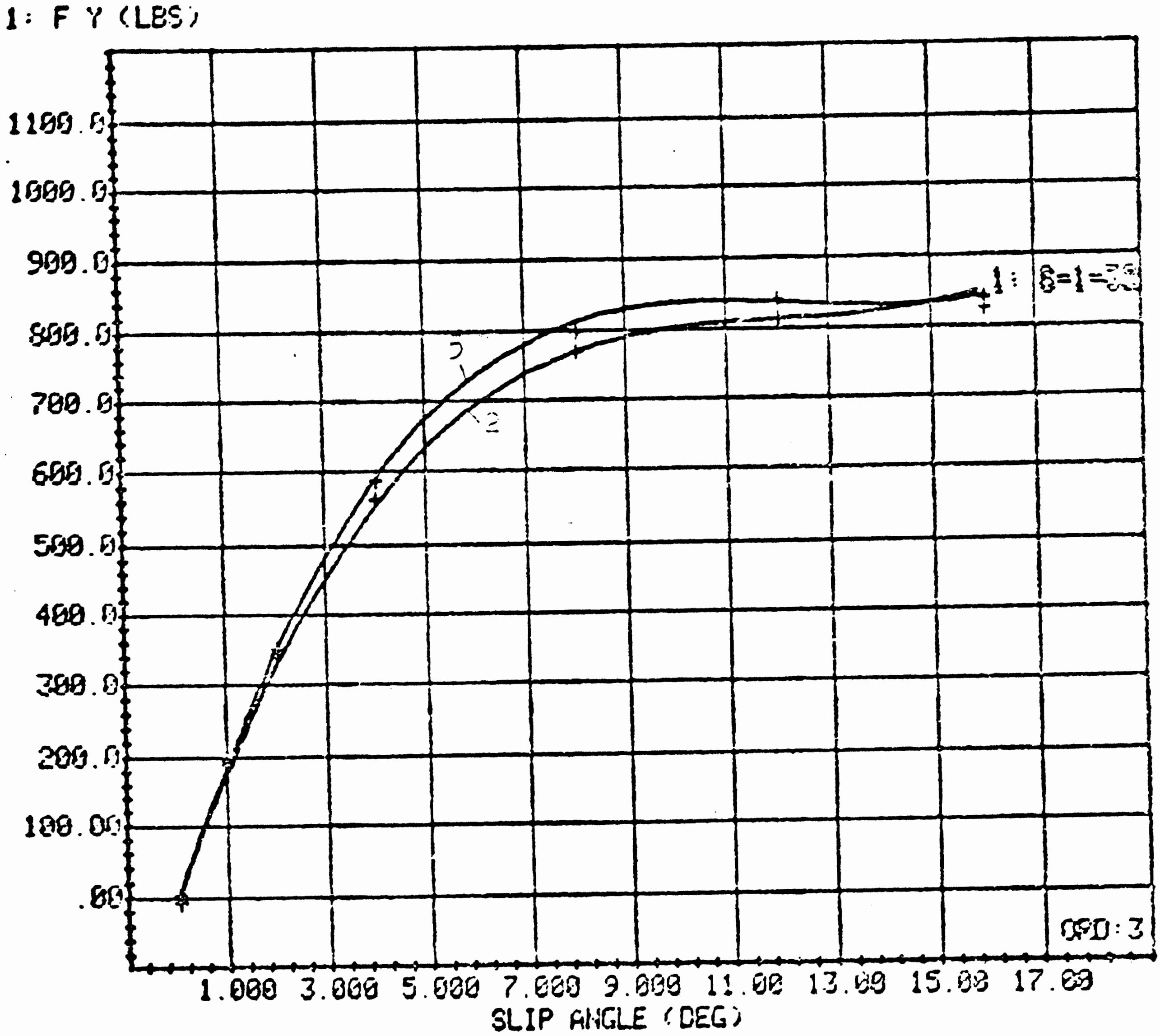
2330 lb

20 mph



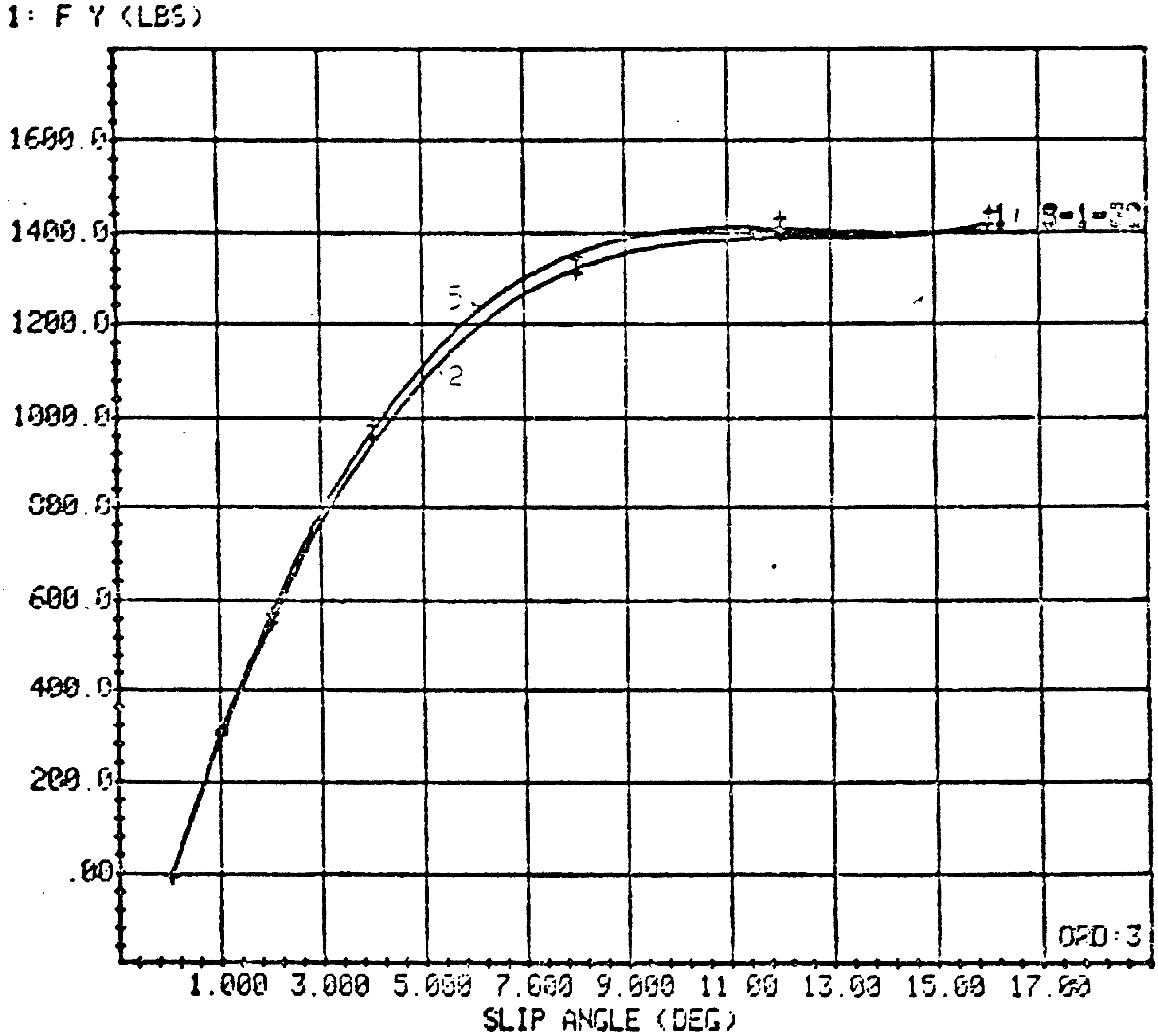
3495 lb

20 mph



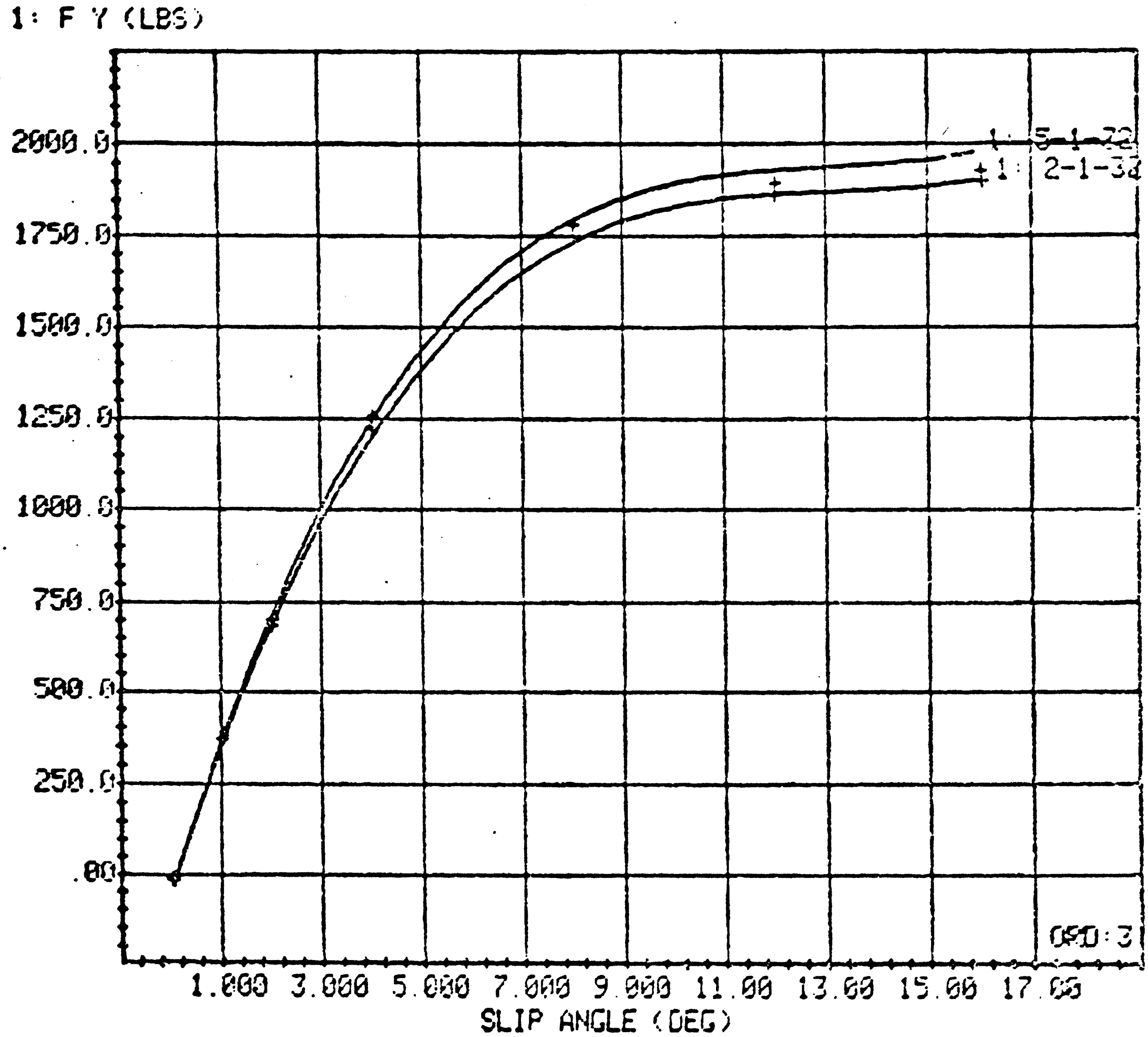
1165 lb

40 mph

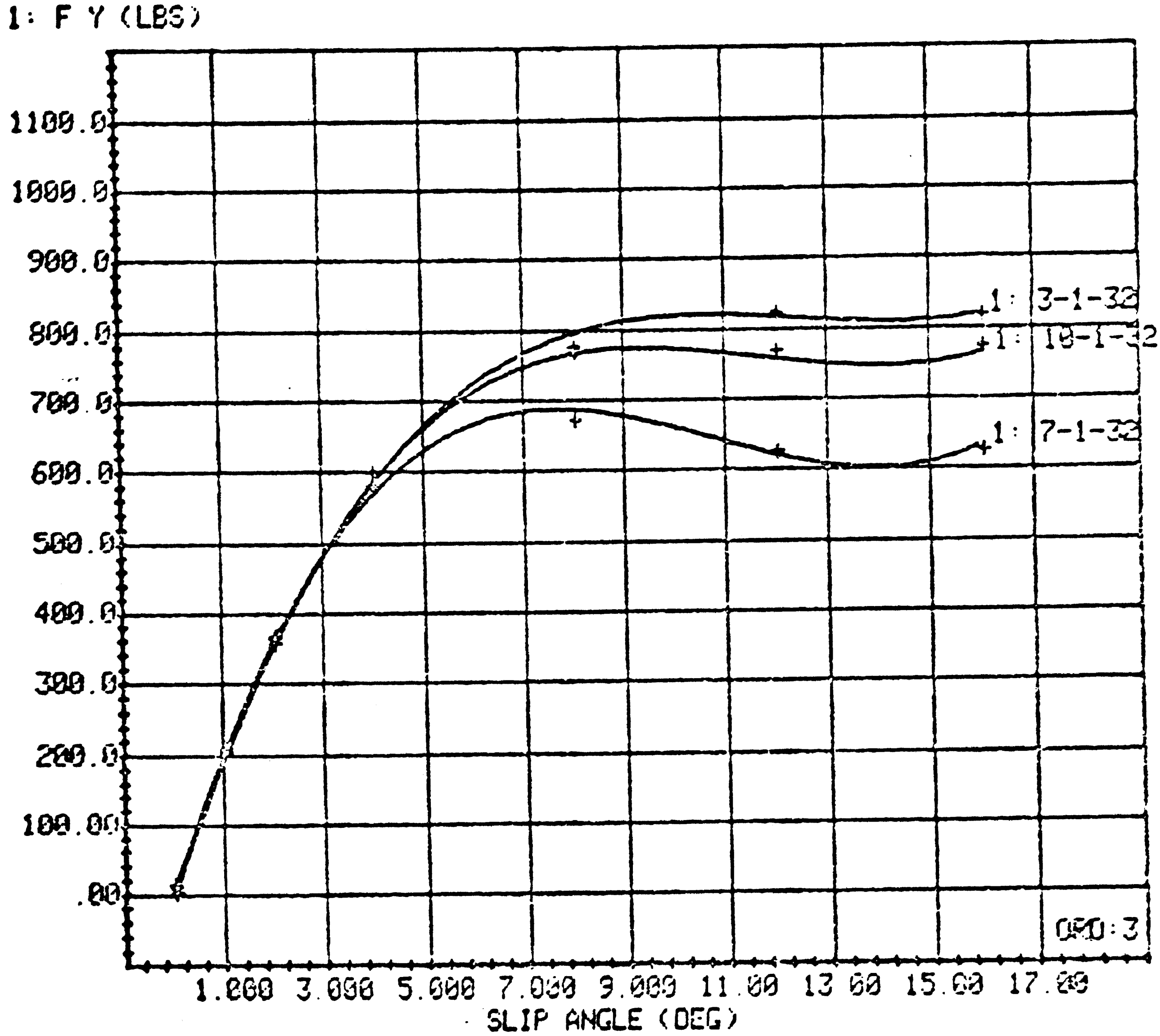


2330 lb

40 mph



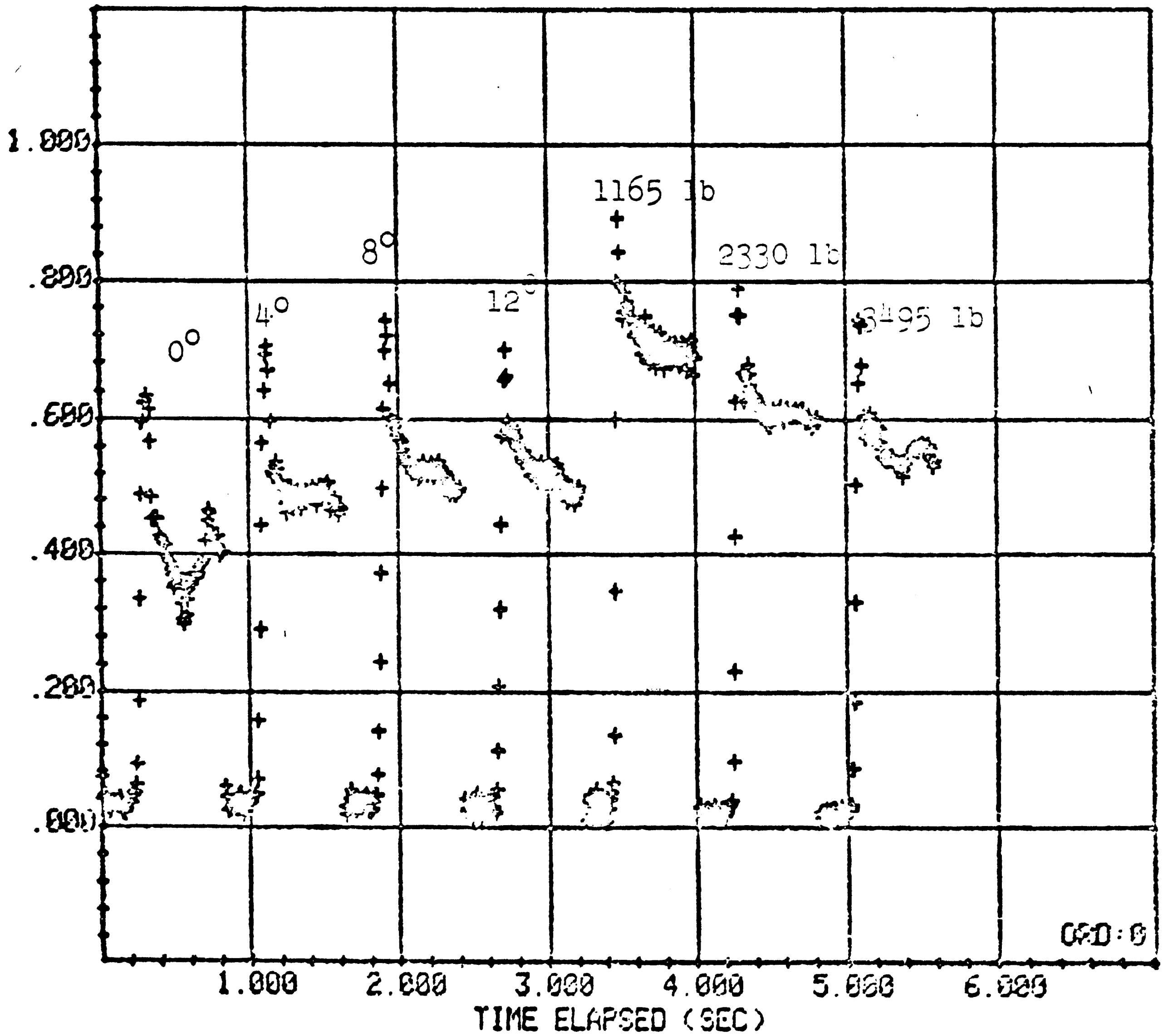
3495 lb
40 mph

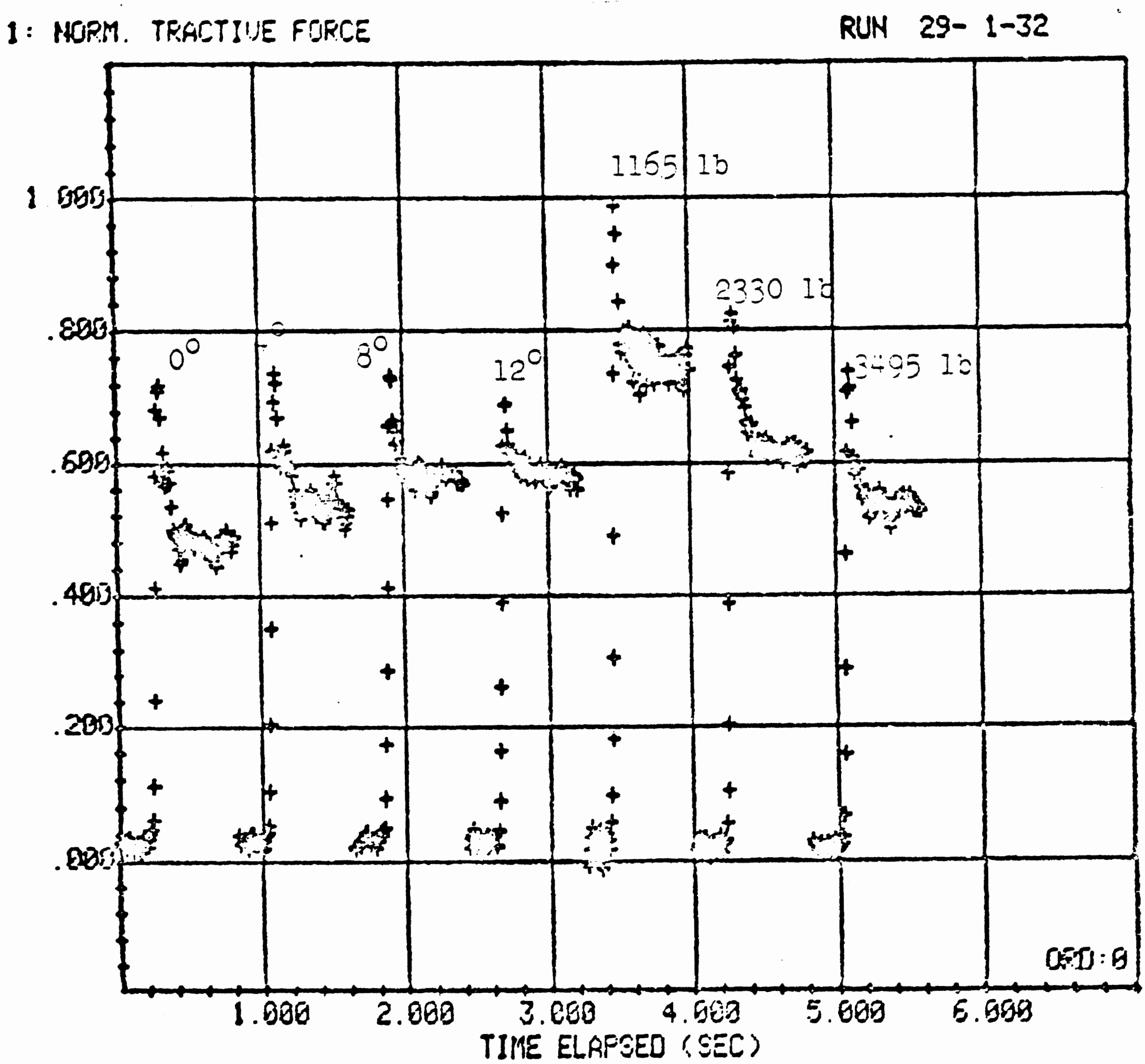


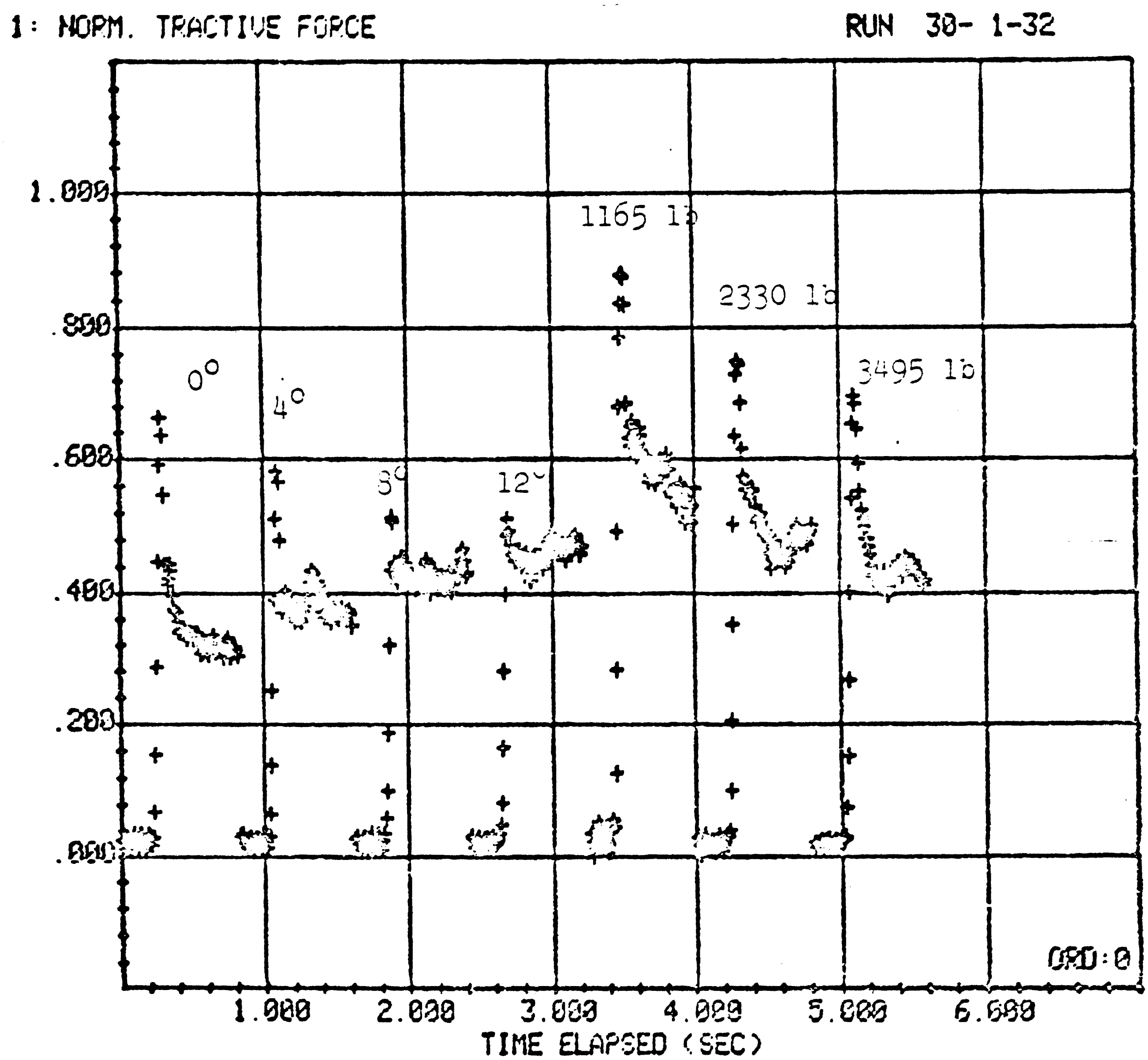
1165 lb

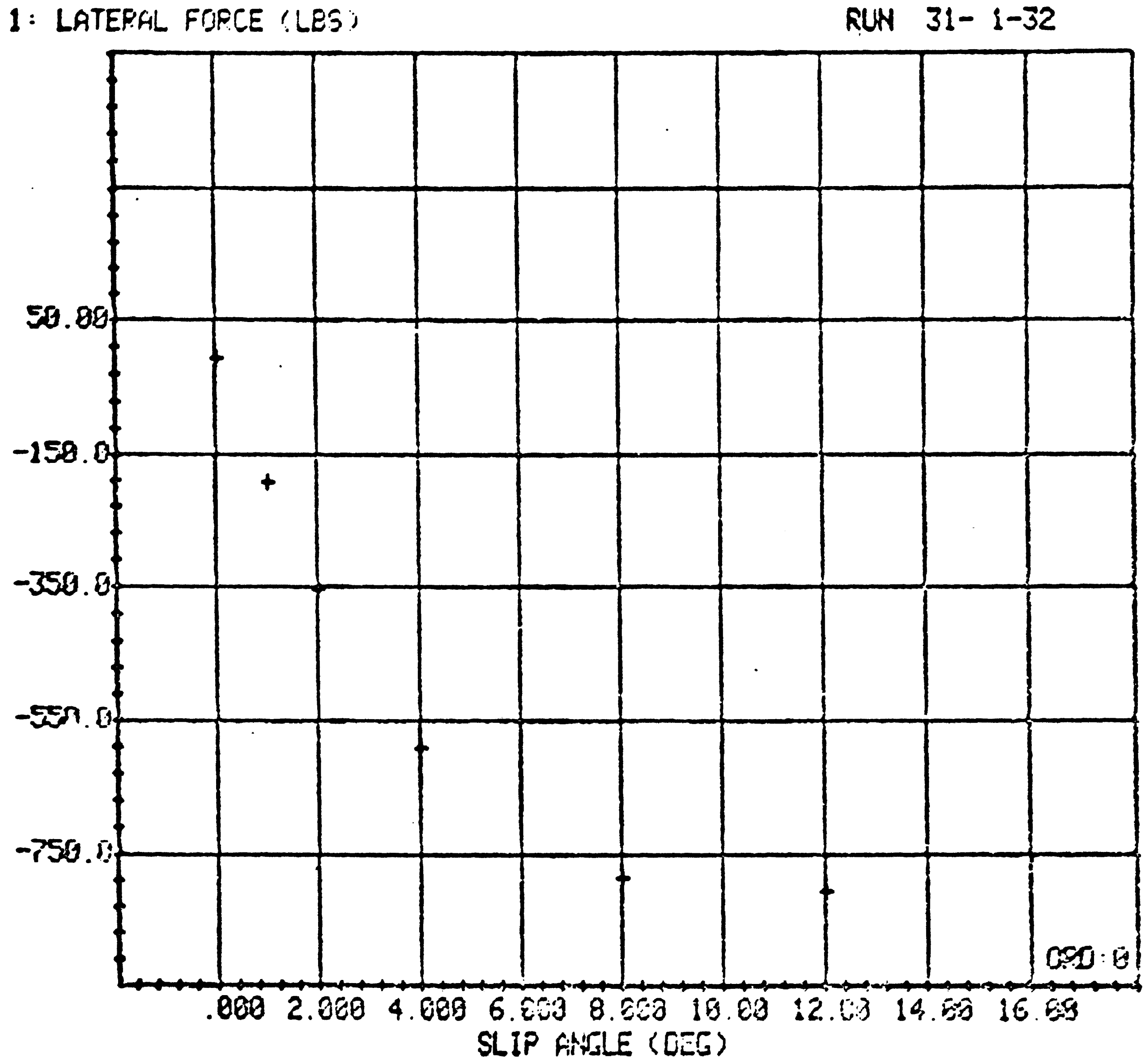
55 mph

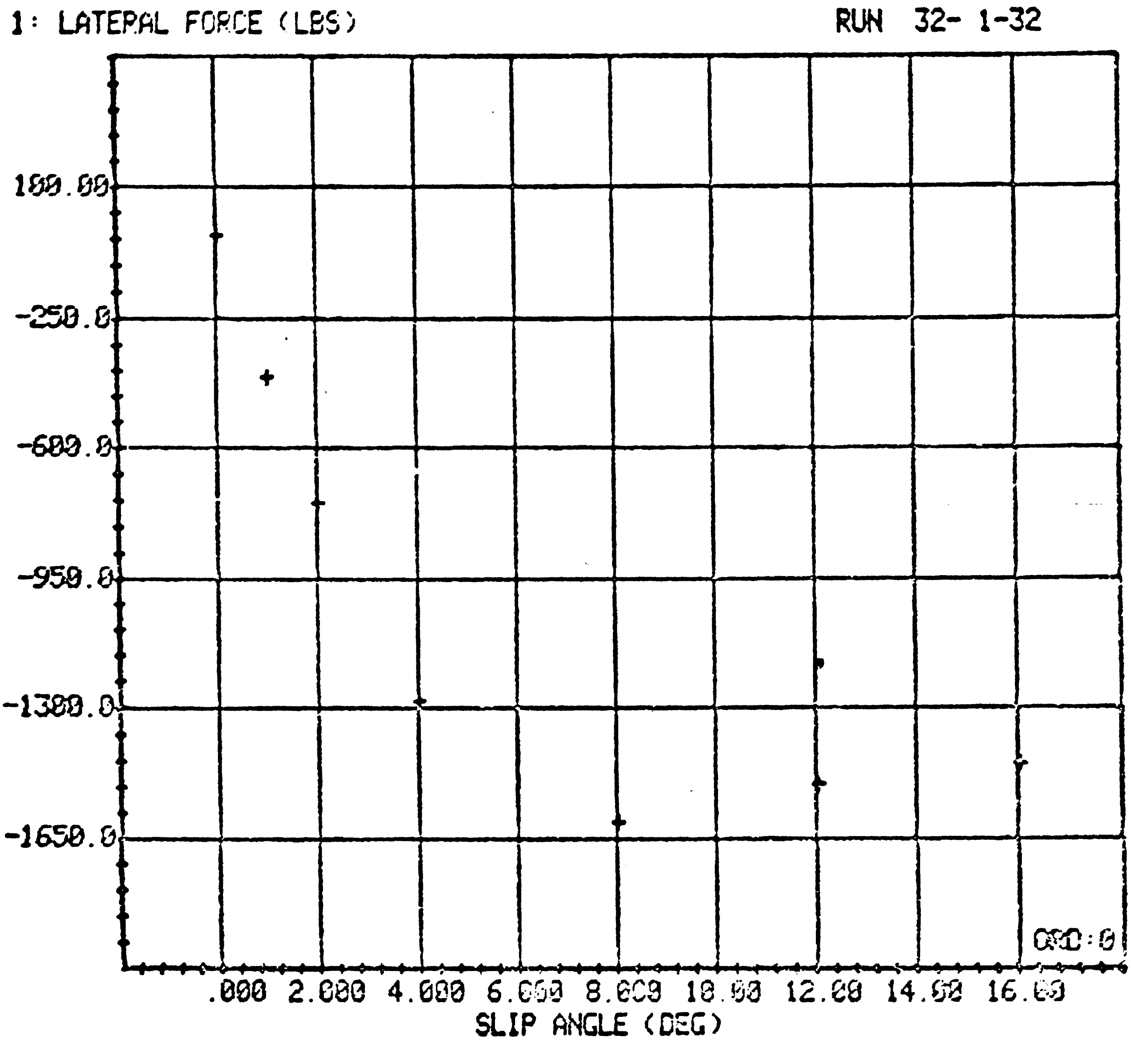
1: NORM. TRACTIVE FORCE RUN 28- 1-32



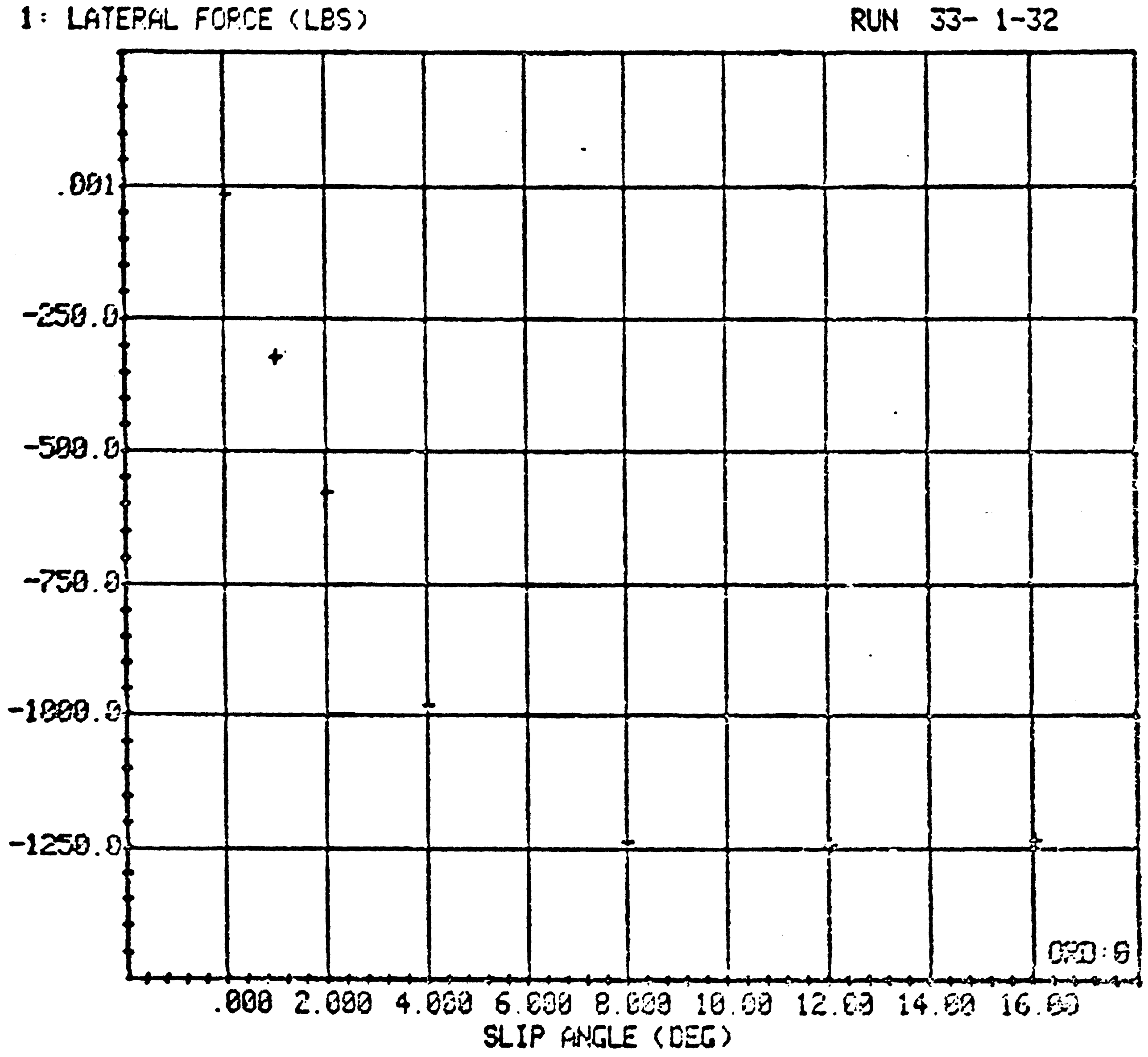

1: NORM. TRACTIVE FORCE
RUN 29- 1-32
1.000
.800
.600
.400
.200
.000
0°
8°
12°
1165 lb
2330 lb
3495 lb
ORD:0
1.000
2.000
3.000
4.000
5.000
6.000
TIME ELAPSED (SEC)


1: NORM. TRACTIVE FORCE
RUN 30- 1-32
1.000
.800
.600
.400
.200
.000
1165 lb
2330 lb
3495 lb
0°
4°
8°
12°
ORD:0
1.000
2.000
3.000
4.000
5.000
6.000
TIME ELAPSED (SEC)

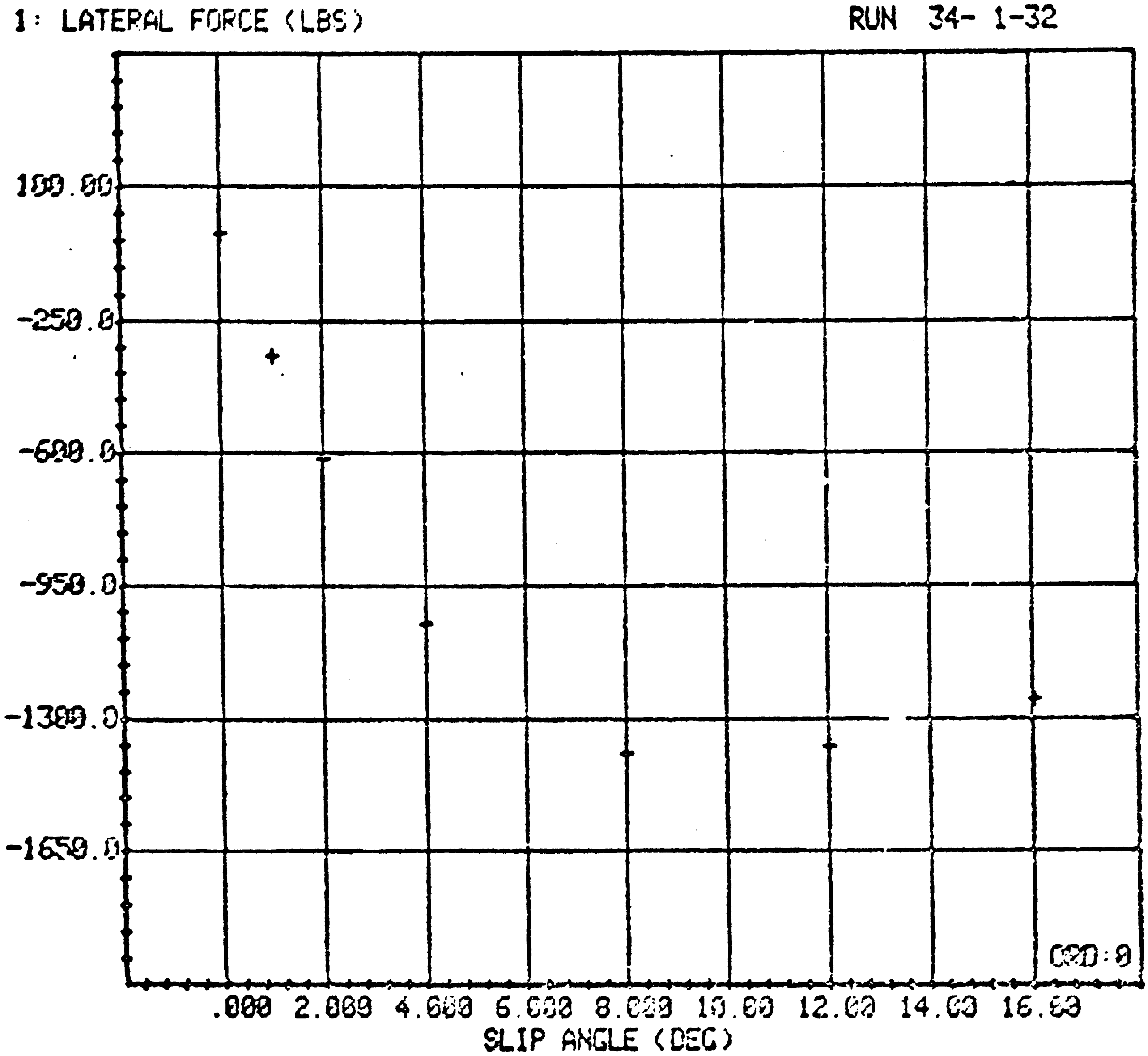

1: LATERAL FORCE (LBS)
RUN 31- 1-32
50.00
-150.0
-350.0
-550.0
-750.0
ORD:0
.000 2.000 4.000 6.000 8.000 10.00 12.00 14.00 16.00
SLIP ANGLE (DEG)

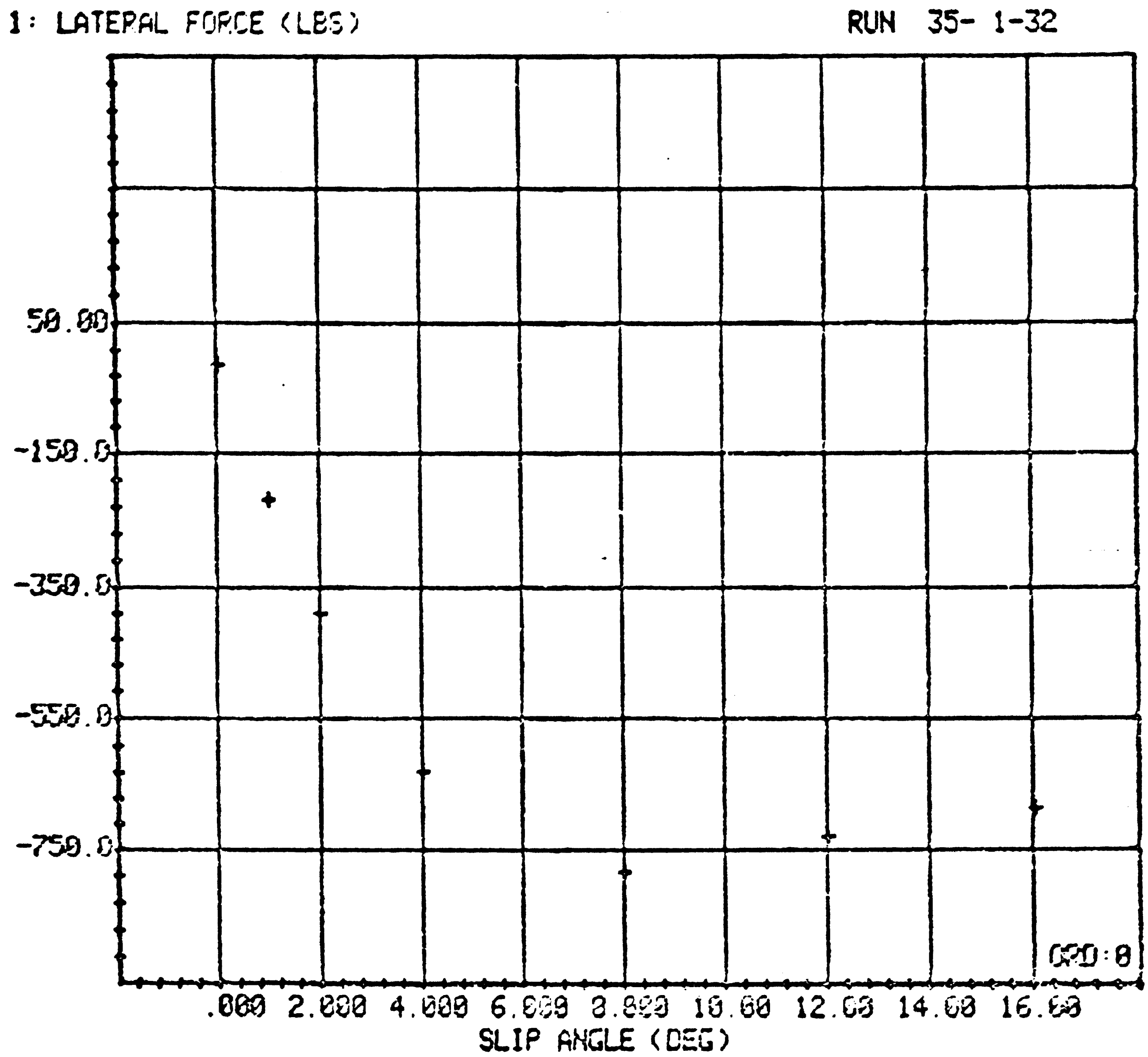


1: LATERAL FORCE (LBS)
RUN 32- 1-32
100.00
-250.0
-600.0
-950.0
-1300.0
-1650.0
.000 2.000 4.000 6.000 8.000 10.00 12.00 14.00 16.00
SLIP ANGLE (DEG)



1: LATERAL FORCE (LBS)
RUN 33- 1-32
.001
-250.0
-500.0
-750.0
-1000.0
-1250.0
ORD: 6
.000 2.000 4.000 6.000 8.000 10.00 12.00 14.00 16.00
SLIP ANGLE (DEG)


1: LATERAL FORCE (LBS)
RUN 34- 1-32
100.00
-250.0
-600.0
-950.0
-1300.0
-1650.0
CRD:0
.000 2.000 4.000 6.000 8.000 10.00 12.00 14.00 16.00
SLIP ANGLE (DEG)


1: LATERAL FORCE (LBS)
RUN 35- 1-32
50.00
-150.0
-350.0
-550.0
-750.0
ORD:0
.000 2.000 4.000 6.000 8.000 10.00 12.00 14.00 16.00
SLIP ANGLE (DEG)

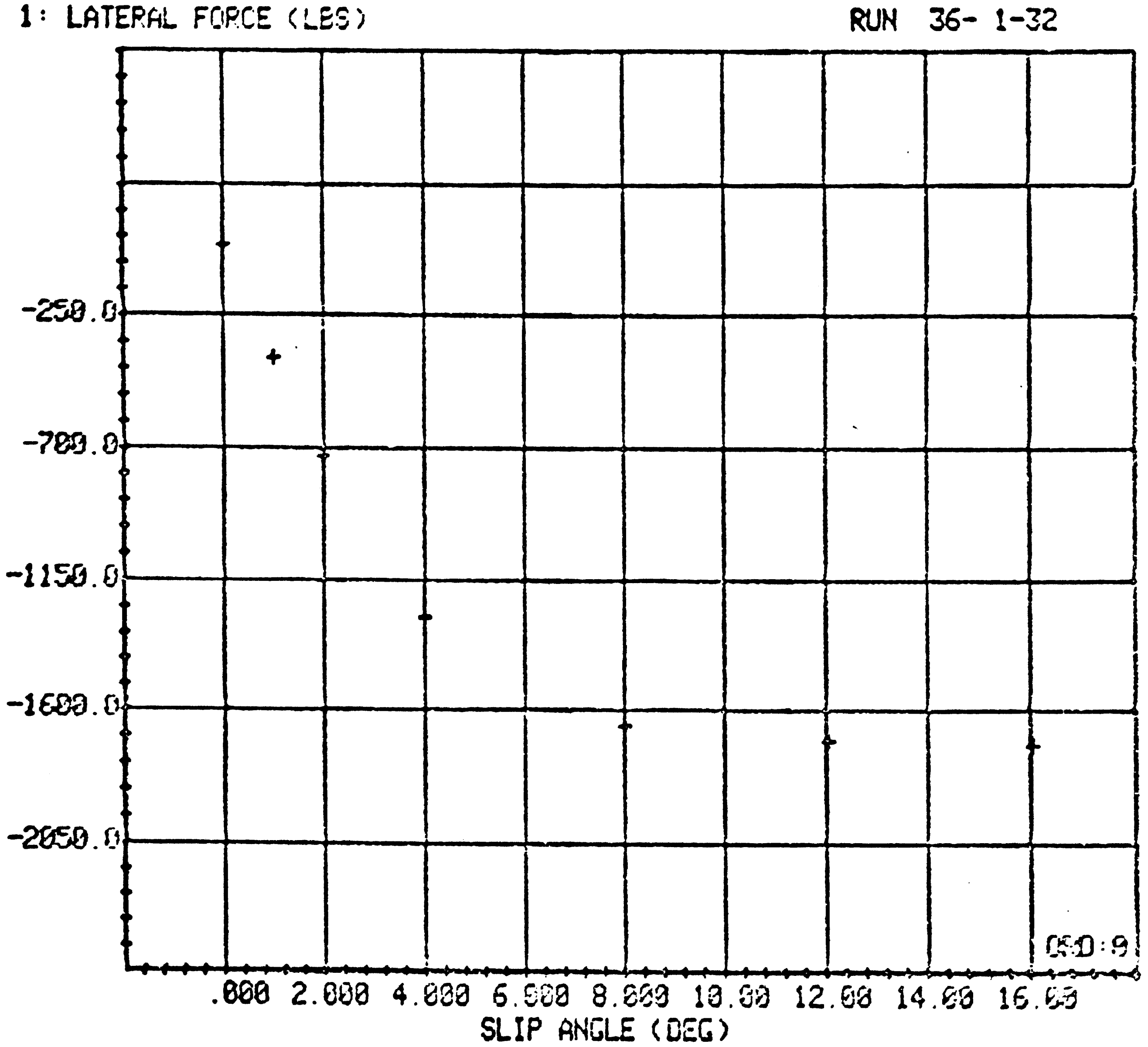

1: LATERAL FORCE (LBS)
RUN 36- 1-32
-250.0
-700.0
-1150.0
-1600.0
-2050.0
.000 2.000 4.000 6.000 8.000 10.00 12.00 14.00 16.00
SLIP ANGLE (DEG)

Table C-6

LISTED DATA SYMBOLS

SYMBOLS	PARAMETERS	DIMENSIONS ENGLISH	DIMENSIONS S.I.
	FORCES AND MOMENTS		
FX	LONGITUDINAL FORCE*	lb	N
FY	LATERAL FORCE*	lb	N
SFY	NEGATIVE LATERAL FORCE (-FY)	lb	N
FZ	NORMAL FORCE*	lb	N
AVL	ANALOG VERTICAL LOAD	lb	N
TF	(DEF. 1)	lb	N
FR	ROLLING RESISTANCE* (DEF. 2)	lb	N
MX	OVERTURNING MOMENT*	ft-lb	N-m
MY	ROLLING RESISTANCE MOMENT*	ft-lb	N-m
MZ	ALIGNING TORQUE*	ft-lb	N-m
HT	TRANSMISSION OUTPUT TORQUE (DEF. 3)	ft-lb	N-m
T	WHEEL TORQUE*	ft-lb	N-m
BFT	BEARING FRICTION TORQUE (DEF. 4)	ft-lb	N-m
	PRESSURE		
P	INFLATION PRESSURE	psi	bar
	SPEEDS		
RS	ROAD SPEED	mph	km/h
N	WHEEL ROTATIONS PER MINUTE	rpm	rpm
R	WHEEL ROTATIONS PER MILE (OR km) (DEF.5)	rev/mi	rev/km
	LONGITUDINAL SLIP		
SR	(DEF. 6)	–	–
LS	(DEF. 7)	–	–
	ANGLES		
SA	SLIP ANGLE*	deg	deg
IA	INCLINATION ANGLE*	deg	deg

Table C-6

LIST DATA SYMBOLS (Cont'd)

SYMBOLS	PARAMETERS	DIMENSIONS ENGLISH	DIMENSIONS S.I.
	TIRE RADII		
RH	RADIUS-LOADED*	in	cm
RE	RADIUS-EFFECTIVE* (DEF. 8)	in	cm
	TIME		
TE	TIME ELAPSED	sec	sec
	TIRE COEFFICIENTS		
NFX	FX/FZ	–	–
NFY	FY/FZ	–	–
NMY	MY/FZ	–	–
NMZ	MZ/FZ	–	–
F	GM f-FUNCTION	–	–
G	GM g-FUNCTION	–	–
H	GM h-FUNCTION	–	–
A	GM ALIGNING TORQUE FUNCTION	ft	cm

*DEFINED ACCORDING TO SAE J670c

Table C-7

SYMBOL DEFINITIONS

NO.	DEFINITION
1	$TF = FX - \frac{BFT}{RH} \times 12$ (FOR PROGRAM CHECKOUT)
2	FR = -FX FOR FREE-ROLLING TIRE (T=0)
3	HI = T - BFT; (FOR PROGRAM CHECKOUT)
4	BFT IS NEGATIVE
5	$R = 60 \frac{N}{RS}$
6	$SR = \frac{N \times RH}{k^{*} \times RS} - 1$; $k^{*} =$ 168.07 FOR ENGLISH SYSTEM, 265.26 FOR S.I. SYSTEM
7	$LS = \frac{N}{RS} \left(\frac{RS}{N}\right)_{\text{FREE ROLLING}} - 1$
8	$RE = k^{*} \frac{RS}{N}$

TABLE V
TABULATED DATA

RUN: 1- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
20.17	0.0	-3478.12	-6.06	-47.41	11.36	32.72	9.69	13.20	0.00	0.0
20.21	0.0	-2362.53	-4.05	-23.64	7.52	9.75	5.66	13.42	0.00	3.00
20.17	0.0	-1148.29	-2.07	-4.33	3.65	-11.34	2.71	13.68	0.00	5.00
20.17	1.00	-3507.32	-379.55	-51.81	52.49	36.70	57.52	13.22	0.11	7.00
20.17	1.01	-2309.98	-301.83	-25.60	39.91	8.42	34.00	13.42	0.13	10.00
20.21	1.00	-1145.79	-168.83	-6.49	7.69	-9.45	15.11	13.67	0.16	12.00
20.13	1.99	-3511.31	-707.62	-50.72	88.21	32.65	90.45	13.21	0.20	14.00
20.17	1.99	-2302.40	-559.24	-23.97	53.83	6.17	52.12	13.42	0.24	17.00
20.17	1.99	-1147.00	-346.25	-8.00	18.96	-6.26	20.70	13.67	0.30	19.00
20.13	4.00	-3516.86	-1243.30	-61.18	161.99	43.83	113.90	13.18	0.35	22.00
20.17	4.00	-2317.21	-953.00	-28.86	93.72	10.43	60.76	13.41	0.41	24.00
20.24	3.98	-1140.34	-562.45	-7.65	35.04	-8.49	21.55	13.67	0.49	26.00
20.13	8.01	-3500.78	-1702.74	-63.82	237.90	45.51	48.87	13.12	0.49	29.00
20.24	8.01	-2320.81	-1281.62	-29.06	115.98	10.18	22.34	13.39	0.55	31.00
20.24	8.01	-1139.85	-744.26	-3.26	33.76	-12.46	5.23	13.66	0.65	34.00
20.17	12.03	-3493.96	-1748.32	-55.25	246.90	36.38	-7.54	13.10	0.50	37.00
20.24	12.03	-2307.64	-1317.00	-26.90	121.19	10.57	-5.26	13.37	0.57	39.00
20.24	12.03	-1153.29	-769.53	-3.60	43.52	-14.18	-2.90	13.66	0.67	41.00
20.17	16.04	-3463.10	-1759.07	-51.32	255.43	32.18	-24.79	13.06	0.51	44.00
20.21	16.04	-2331.87	-1342.29	-26.49	131.49	7.79	-12.24	13.37	0.58	46.00
20.17	16.04	-1175.65	-794.85	-4.49	33.46	-14.89	-4.14	13.67	0.68	49.00

TABLE V
TAPULATED DATA

RUN: 2- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
40.41	0.0	-3487.90	14.18	-56.85	16.19	45.06	10.86	13.27	-0.00	0.0
40.37	0.0	-2318.61	6.04	-22.93	14.81	6.90	6.79	13.49	-0.00	3.00
40.37	0.0	-1146.29	-2.04	-8.66	3.67	-4.76	3.88	13.72	0.00	5.00
40.33	1.00	-3473.94	-364.35	-50.29	52.64	32.49	59.81	13.26	0.10	7.00
40.37	1.00	-2309.24	-297.16	-24.01	32.57	8.32	36.33	13.49	0.13	10.00
40.37	1.00	-1145.84	-188.90	-5.73	7.02	-10.56	16.27	13.72	0.16	12.00
40.41	1.99	-3468.74	-682.28	-58.60	94.49	42.40	93.93	13.25	0.20	14.00
40.41	1.99	-2322.94	-549.18	-26.83	48.39	10.75	55.55	13.49	0.24	16.00
40.41	1.99	-1157.87	-340.35	-6.49	17.22	-8.43	23.00	13.73	0.29	19.00
40.37	4.00	-3499.75	-1223.05	-59.37	164.84	41.32	124.30	13.20	0.35	21.00
40.41	4.00	-2327.40	-953.39	-28.58	79.73	12.36	68.84	13.47	0.41	24.00
40.41	3.98	-1153.69	-562.38	-5.32	32.48	-9.91	25.03	13.71	0.49	26.00
40.37	8.01	-3482.84	-1755.12	-66.01	236.71	48.48	76.43	13.15	0.50	29.00
40.41	8.01	-2318.15	-1311.85	-29.41	118.57	10.56	37.27	13.43	0.57	31.00
40.37	8.01	-1164.06	-769.49	-8.99	39.82	-5.39	12.08	13.71	0.66	33.00
40.37	12.01	-3487.63	-1864.29	-62.00	268.04	41.36	21.02	13.12	0.53	36.00
40.45	12.01	-2331.04	-1397.75	-27.41	133.63	6.90	9.56	13.42	0.60	39.00
40.45	12.03	-1167.74	-814.96	-5.74	43.88	-11.17	1.65	13.71	0.70	41.00
40.29	16.05	-3480.24	-1900.35	-60.65	275.21	40.93	-7.78	13.10	0.55	44.00
40.45	16.04	-2333.26	-1418.35	-26.39	138.26	7.18	-4.29	13.42	0.61	46.00
40.45	16.04	-1167.95	-825.15	-8.05	36.53	-7.73	-1.82	13.71	0.71	48.00

TABLE V
TABULATED DATA

RUN: 3- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	KH	NFY	TE
55.69	0.0	-3476.89	4.09	-61.31	9.06	47.85	11.92	13.34	-0.00	0.0
55.69	0.0	-2316.39	0.64	-33.23	11.41	18.41	6.72	13.57	-0.00	2.00
55.69	0.0	-1148.29	-2.64	-8.66	3.66	-4.70	3.88	13.81	0.00	4.00
55.69	1.00	-3476.68	-400.32	-56.79	53.52	40.23	65.49	13.34	0.12	7.00
55.69	1.00	-2317.10	-321.99	-32.07	40.46	16.29	39.70	13.57	0.14	9.00
55.69	1.00	-1141.31	-205.98	-5.00	3.47	-11.76	17.39	13.81	0.18	11.00
55.69	1.99	-3486.88	-732.75	-60.04	92.07	42.50	99.58	13.32	0.21	14.00
55.73	1.99	-2315.83	-584.48	-25.36	57.02	8.36	57.81	13.57	0.25	16.00
55.69	1.99	-1152.18	-355.48	-11.72	13.39	-4.67	22.91	13.80	0.31	18.00
55.65	4.00	-3487.95	-1278.49	-66.71	164.10	46.01	128.77	13.29	0.37	21.00
55.73	4.00	-2309.50	-988.65	-33.07	85.86	14.75	69.89	13.55	0.43	23.00
55.69	4.00	-1154.62	-582.67	-4.66	22.85	-13.03	26.11	13.80	0.50	25.00
55.65	8.01	-3487.93	-1808.58	-77.04	243.29	56.53	83.14	13.23	0.52	28.00
55.73	8.01	-2315.52	-1552.21	-52.34	117.59	12.78	40.64	13.52	0.58	30.00
55.73	8.01	-1154.08	-779.54	-13.58	36.80	-1.33	13.19	13.79	0.68	33.00
55.61	12.04	-3493.73	-1939.97	-70.73	269.31	47.92	31.19	13.20	0.56	36.00
55.73	12.03	-2322.69	-1433.04	-36.30	127.40	15.91	11.72	13.50	0.62	38.00
55.73	12.04	-1157.77	-825.02	-10.14	41.24	-6.65	2.76	13.78	0.71	40.00
55.61	16.05	-3476.89	-1955.00	-62.12	264.79	39.16	-2.13	13.19	0.56	43.00
55.73	16.05	-2322.92	-1428.05	-25.70	132.15	4.11	-3.19	13.49	0.61	45.00
55.73	16.05	-1156.96	-820.00	-8.03	35.46	-7.76	-1.81	13.78	0.71	48.00

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TABLE V
TABULATED DATA

RUN: 4- I-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
20.17	-0.01	-3496.80	-6.85	-47.50	-17.23	30.99	9.60	13.18	0.00	0.0
20.21	-0.01	-2311.45	0.94	-22.89	-8.01	8.75	6.80	13.39	-0.00	2.00
20.21	-0.01	-1140.11	8.02	-8.65	-17.49	-4.71	3.87	13.63	-0.01	5.00
20.17	1.00	-3495.57	-400.47	-49.63	30.48	31.18	60.87	13.17	0.11	7.00
20.21	1.00	-2335.17	-317.07	-28.41	10.16	14.83	37.43	13.40	0.14	9.00
20.21	1.00	-1150.24	-198.98	-5.77	-8.98	-10.51	16.23	13.64	0.17	11.00
20.17	1.99	-3490.91	-743.62	-52.01	76.12	36.14	96.17	13.16	0.21	14.00
20.17	1.99	-2307.79	-589.97	-26.15	33.95	9.24	56.62	13.58	0.26	16.00
20.17	1.99	-1147.06	-366.56	-6.53	4.98	-8.56	22.96	13.64	0.31	18.00
20.17	3.98	-3496.09	-1306.94	-55.16	150.81	36.32	123.02	13.12	0.37	21.00
20.17	3.98	-2316.42	-1003.93	-25.11	70.94	6.62	66.44	13.36	0.43	23.00
20.17	3.98	-1149.33	-557.83	-5.39	20.14	-10.02	24.96	13.63	0.52	26.00
20.13	8.01	-3495.46	-1798.68	-64.53	236.84	45.60	55.62	13.06	0.51	29.00
20.21	8.01	-2335.23	-1352.35	-31.26	108.50	12.98	26.82	13.34	0.58	31.00
20.24	8.01	-1164.02	-799.86	-6.25	22.86	-10.19	8.55	13.63	0.69	33.00
20.17	12.01	-3466.05	-1829.04	-59.54	250.29	39.56	1.51	13.02	0.53	36.00
20.24	12.01	-2315.54	-1372.57	-29.18	115.30	9.47	-0.83	13.32	0.59	39.00
20.17	12.01	-1159.77	-810.05	-2.93	25.78	-15.34	-1.83	13.62	0.70	41.00
20.17	16.03	-3464.12	-1865.08	-55.62	256.18	37.57	-15.74	13.01	0.54	44.00
20.24	16.03	-2318.76	-1406.32	-24.34	119.93	4.03	-8.91	13.31	0.61	46.00
20.21	16.04	-1166.91	-830.18	-4.44	28.96	-11.15	-4.12	13.63	0.71	48.00

TABLE V
TAPULATED DATA

RUN: 5- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
40.41	0.0	-3479.72	19.16	-51.00	-9.01	36.34	11.97	13.22	-0.01	0.0
40.33	0.0	-2321.22	11.04	-28.02	-10.24	14.62	6.78	13.45	-0.00	2.00
40.41	0.0	-1151.94	8.05	-7.83	-7.91	-3.82	5.07	13.70	-0.01	4.00
40.33	1.00	-3477.57	-369.46	-47.22	31.08	29.97	64.42	13.22	0.11	7.00
40.37	1.00	-2313.61	-300.92	-27.61	16.35	13.66	38.61	13.45	0.13	9.00
40.37	1.00	-1150.24	-193.92	-4.59	-6.17	-11.63	17.39	13.70	0.17	11.00
40.33	1.99	-3477.08	-702.54	-49.70	73.41	31.05	99.65	13.20	0.20	14.00
40.33	1.99	-2312.12	-569.40	-24.59	35.95	7.18	58.96	13.44	0.25	16.00
40.33	1.99	-1151.53	-350.48	-4.99	1.48	-10.73	25.27	13.69	0.30	18.00
40.37	3.98	-3468.60	-1257.73	-59.97	144.74	41.77	131.14	13.15	0.36	21.00
40.37	3.98	-2312.90	-963.72	-25.60	71.16	7.64	73.38	13.42	0.42	23.00
40.37	3.98	-1153.65	-587.68	-3.10	14.93	-13.35	28.42	13.69	0.51	25.00
40.29	6.01	-3471.79	-1783.46	-64.66	222.64	41.99	78.59	13.10	0.51	28.00
40.37	8.01	-2324.43	-1347.24	-32.30	107.88	14.62	40.65	13.38	0.58	31.00
40.41	8.01	-1159.56	-799.61	-7.53	29.24	-8.29	14.32	13.68	0.69	33.00
40.37	12.01	-3476.81	-1899.67	-64.12	251.03	44.04	25.56	13.07	0.55	36.00
40.41	12.01	-2326.54	-1433.11	-31.05	122.20	14.04	11.80	13.38	0.62	38.00
40.41	12.01	-1156.92	-840.24	-5.03	27.67	-12.41	2.74	13.68	0.73	40.00
40.33	16.04	-3474.91	-1930.70	-56.10	260.29	36.03	-0.91	13.06	0.56	43.00
40.37	16.05	-2322.44	-1443.63	-24.17	125.81	3.63	-0.89	13.37	0.62	46.00
40.37	16.04	-1151.86	-840.32	-2.92	27.93	-13.59	-1.82	13.68	0.73	48.00

TABLE V
TABULATED DATA

RUN: 6- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
55.77	0.0	-3458.97	14.18	-56.14	-2.76	42.17	11.95	13.32	-0.00	1.00
55.77	1.00	-3457.61	-394.64	-55.26	29.23	37.87	67.78	13.31	0.11	2.00
55.77	1.98	-3463.44	-732.76	-56.99	74.22	37.87	104.16	13.30	0.21	4.00
55.73	3.98	-3466.00	-1303.09	-61.43	149.07	39.84	136.78	13.26	0.38	6.00
55.69	8.00	-3471.82	-1838.92	-74.23	226.29	54.05	79.66	13.20	0.53	8.00
55.73	12.03	-3471.34	-1950.08	-69.40	257.42	47.71	25.44	13.17	0.56	10.00
55.73	16.05	-3460.80	-1950.15	-62.09	258.91	40.87	-2.13	13.16	0.56	12.00

TABLE V
TABULATED DATA

RUN: 7- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	KII	NFY	TE
55.77	-0.01	-1157.21	-9.43	-7.92	-23.23	-5.71	5.01	13.73	0.01	0.0
55.77	1.00	-1161.14	-206.30	-11.62	-18.32	-1.52	15.09	13.73	0.18	1.00
55.77	1.99	-1156.91	-362.79	-8.11	-11.74	-6.04	20.62	13.73	0.31	3.00
55.77	3.97	-1157.41	-579.87	-9.98	-2.93	-4.81	18.05	13.73	0.50	5.00
55.73	8.01	-1159.31	-670.80	-7.86	5.09	-10.84	-1.68	13.73	0.58	7.00
55.77	12.03	-1150.34	-625.34	-9.24	1.58	-6.41	-3.88	13.72	0.54	9.00
55.77	16.05	-1156.67	-625.33	-9.23	11.13	-6.43	-3.87	13.72	0.54	11.00

TABLE V
TABULATED DATA

RUN: 8- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
40.37	0.0	-2333.03	-12.08	-22.92	-19.38	9.09	6.78	13.49	0.01	0.0
40.41	1.00	-2313.77	-324.97	-24.07	0.61	8.41	36.27	13.48	0.14	2.00
40.33	1.98	-2323.21	-577.35	-22.55	26.45	4.29	54.34	13.48	0.25	3.00
40.41	4.00	-2332.92	-986.26	-28.93	54.19	10.75	60.58	13.46	0.42	5.00
40.33	8.01	-2350.98	-1247.72	-32.84	106.46	14.28	16.60	13.45	0.53	7.00
40.41	12.03	-2359.13	-1212.48	-26.06	104.35	6.42	-4.05	13.44	0.51	9.00
40.41	16.04	-2350.97	-1187.26	-25.48	94.03	5.73	-10.93	13.44	0.51	11.00

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TABLE V
TABULATED DATA

RUN: 9- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
20.24	-0.01	-3497.01	-14.71	-40.78	-24.91	25.36	11.96	13.22	0.00	0.0
20.24	1.00	-3499.55	-383.09	-45.08	19.96	31.06	59.85	13.22	0.11	2.00
20.17	1.99	-3497.39	-701.05	-43.97	52.73	27.08	92.79	13.22	0.20	3.00
20.13	4.00	-3481.31	-1236.00	-51.37	126.94	33.62	120.86	13.18	0.36	5.00
20.21	8.00	-3466.96	-1730.77	-61.34	198.58	41.71	60.30	13.11	0.50	7.00
20.21	12.01	-3488.06	-1766.26	-55.04	224.17	36.04	0.47	13.09	0.51	9.00
20.17	16.04	-3518.27	-1720.14	-48.98	230.85	29.54	-21.31	13.09	0.49	12.00

TABLE V
TABULATED DATA

RUN: 10- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
55.77	0.0	-1145.39	-12.79	-8.73	-36.64	-6.54	3.81	13.75	0.01	0.0
55.81	1.01	-1150.34	-209.66	-4.25	-22.49	-12.75	18.53	13.75	0.18	2.00
55.77	2.01	-1152.44	-366.12	-5.82	-6.58	-11.57	24.08	13.75	0.32	3.00
55.77	4.00	-1153.75	-598.36	-5.49	-0.00	-13.80	24.90	13.75	0.52	5.00
55.77	8.03	-1161.38	-770.07	-8.51	4.98	-8.49	5.13	13.74	0.66	7.00
55.77	12.04	-1150.60	-770.66	-8.74	5.00	-8.24	-2.93	13.74	0.67	9.00
55.77	16.05	-1150.60	-775.14	-5.18	1.16	-13.66	-5.25	13.74	0.67	12.00

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.0	55.98	-0.20	-0.01	-2782.09	-62.38	-192.74	-23.89	175.98	5.67	13.47	0.02	0.07
0.01	57.06	-0.01	-0.01	-2328.15	-40.88	-86.57	21.14	41.86	-11.96	13.53	0.02	0.04
0.02	57.06	-0.01	-0.01	-2344.22	-45.94	-98.87	17.43	56.85	-7.41	13.52	0.02	0.04
0.03	57.06	-0.02	-0.01	-2360.50	-45.99	-97.31	17.36	44.98	-5.05	13.53	0.02	0.04
0.04	57.06	-0.02	-0.01	-2357.93	-43.04	-57.26	9.93	-7.97	-6.14	13.53	0.02	0.02
0.05	57.06	-0.02	-0.01	-2351.81	-38.05	-42.63	4.02	-28.70	-7.22	13.53	0.02	0.02
0.06	57.06	-0.02	-0.01	-2346.54	-37.98	-55.50	4.13	14.53	-8.37	13.53	0.02	0.02
0.07	57.06	-0.02	-0.01	-2332.20	-35.93	-71.78	5.63	24.22	-12.93	13.53	0.02	0.03
0.08	57.06	-0.02	-0.01	-2327.54	-35.85	-85.58	15.28	36.26	-15.29	13.53	0.02	0.04
0.09	57.06	-0.02	-0.01	-2314.81	-37.84	-61.76	13.87	13.19	-13.04	13.53	0.02	0.03
0.10	57.06	-0.02	-0.01	-2333.41	-46.03	-69.10	17.27	10.72	-8.55	13.53	0.02	0.03
0.11	57.06	-0.02	-0.01	-2335.96	-42.83	-90.81	10.24	28.14	-2.81	13.53	0.02	0.04
0.12	57.06	-0.02	-0.01	-2352.24	-42.88	-90.00	10.17	37.88	-1.64	13.53	0.02	0.04
0.13	57.06	-0.02	-0.01	-2352.67	-37.85	-80.34	13.66	27.23	-2.63	13.53	0.02	0.03
0.14	57.06	-0.02	-0.01	-2346.53	-38.05	-58.24	4.03	-25.94	-8.34	13.53	0.02	0.02
0.15	57.06	-0.02	-0.01	-2354.57	-35.13	-41.32	14.86	-17.55	-12.97	13.53	0.02	0.02
0.16	57.06	-0.02	-0.01	-2319.49	-32.79	-66.75	8.04	13.11	-12.95	13.53	0.01	0.03
0.17	57.06	-0.02	-0.01	-2313.99	-37.75	-61.08	4.48	32.55	-3.79	13.53	0.02	0.04
0.18	57.06	-0.02	-0.01	-2314.82	-37.69	-69.79	14.11	14.20	-1.47	13.53	0.02	0.04
0.19	57.06	-0.02	-0.01	-2330.65	-42.90	-71.16	10.14	-12.49	-3.91	13.53	0.02	0.03
0.20	57.06	-0.02	-0.01	-2335.96	-42.92	-77.30	10.13	-64.05	-13.06	13.52	0.02	0.03
0.21	57.06	-0.02	-0.01	-2365.60	-41.00	-99.46	20.95	-312.67	-22.93	13.53	0.02	0.04
0.22	57.06	-0.02	-0.01	-2352.08	-37.79	-109.63	13.96	-698.97	-22.39	13.53	0.02	0.05
0.23	57.06	-0.02	-0.01	-2340.05	-37.64	-139.34	4.59	-1274.64	-12.35	13.53	0.02	0.06
0.24	57.06	-0.02	-0.01	-2327.36	-37.34	-209.08	4.96	-2046.80	-0.17	13.53	0.02	0.09
0.25	57.06	-0.02	-0.01	-2296.38	-31.40	-424.98	9.83	-2541.96	-0.35	13.53	0.01	0.19
0.26	57.06	-0.02	-0.01	-2256.09	-20.01	-753.06	18.89	-2169.41	-24.16	13.53	0.01	0.33
0.27	57.06	-0.03	-0.01	-2203.54	-18.76	-1073.78	20.45	-1810.17	-67.59	13.53	0.01	0.49
0.28	56.96	-0.05	-0.01	-2146.61	-17.95	-1279.07	30.58	-1584.14	-129.68	13.52	0.01	0.60
0.29	56.96	-0.08	-0.01	-2096.32	-20.85	-1306.12	57.36	-1564.94	-193.08	13.52	0.01	0.62
0.30	56.86	-0.13	-0.01	-2026.13	-17.80	-1266.58	69.29	3905.53	-258.05	13.50	0.01	0.63
0.31	56.67	-0.20	-0.01	-1970.14	-17.70	-1246.82	88.54	-1616.09	-297.41	13.50	0.01	0.63
0.32	56.26	-0.29	-0.01	-1943.28	-17.84	-1191.76	78.85	2054.85	-305.10	13.49	0.01	0.61
0.33	55.65	-0.40	-0.01	-1911.47	-28.13	-1084.75	52.31	-517.93	-240.70	13.47	0.01	0.57
0.34	54.91	-0.49	-0.01	-1954.12	-28.62	-935.23	42.22	63.59	-162.94	13.46	0.01	0.48
0.35	54.13	-0.58	-0.01	-1967.67	-8.58	-884.00	56.79	618.90	-125.44	13.44	0.00	0.45
0.36	54.13	-0.67	-0.01	-2010.01	6.53	-905.53	58.19	-852.48	-121.93	13.43	-0.00	0.45
0.37	54.52	-0.74	-0.01	-2062.50	11.47	-929.52	52.10	740.82	-132.57	13.42	-0.01	0.45

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.38	54.81	-0.79	-0.01	-2098.28	11.36	-941.84	32.84	-316.10	-126.39	13.41	-0.01	0.45
0.39	54.81	-0.83	-0.01	-2169.72	-2.16	-921.33	22.64	-89.93	-110.86	13.40	0.00	0.42
0.40	54.91	-0.86	-0.01	-2198.27	-9.31	-920.98	-1.57	340.21	-95.52	13.40	0.00	0.42
0.41	55.11	-0.89	-0.01	-2230.01	-9.32	-934.88	-11.11	-316.34	-77.11	13.39	0.00	0.42
0.42	55.20	-0.91	-0.01	-2285.58	0.72	-943.42	15.19	151.29	-67.50	13.39	-0.00	0.41
0.43	55.11	-0.93	-0.01	-2307.26	0.69	-948.18	15.17	202.21	-59.44	13.39	-0.00	0.41
0.44	55.11	-0.94	-0.01	-2316.24	-4.59	-914.64	-7.91	-181.67	-54.37	13.39	0.00	0.39
0.45	55.30	-0.95	-0.01	-2327.01	-4.67	-903.72	-8.04	266.72	-53.94	13.39	0.00	0.37
0.46	55.40	-0.96	-0.01	-2345.60	5.46	-903.40	18.42	-16.55	-53.27	13.39	-0.00	0.39
0.47	55.40	-0.97	-0.01	-2365.12	5.38	-886.40	27.86	85.12	-51.01	13.39	-0.00	0.38
0.48	55.20	-0.98	-0.01	-2366.48	-7.92	-866.25	27.69	-51.33	-43.72	13.39	0.00	0.37
0.49	55.20	-0.98	-0.01	-2365.62	-23.28	-826.82	6.90	-59.55	-38.06	13.39	0.01	0.35
0.50	55.50	-0.98	-0.01	-2346.38	-4.90	-835.08	10.77	109.26	-43.00	13.39	0.00	0.36
0.51	56.18	-0.99	-0.01	-2341.96	5.37	-864.28	27.87	28.07	-48.52	13.39	-0.00	0.37
0.52	56.57	-0.99	-0.01	-2341.95	5.37	-861.24	27.87	171.59	-44.14	13.39	-0.00	0.37
0.53	56.28	-0.99	-0.01	-2337.28	0.24	-832.37	24.14	277.80	-39.52	13.39	-0.00	0.38
0.54	55.59	-0.99	-0.01	-2322.01	-5.07	-756.29	20.15	58.40	-40.18	13.29	0.00	[illegible]
0.55	54.91	-0.99	-0.01	-2336.35	-8.40	-710.04	27.07	-228.48	-39.49	13.39	0.00	0.30
0.56	54.71	-1.00	-0.01	-2336.98	-8.42	-694.20	27.07	-12.54	-31.63	13.39	0.00	0.30
0.57	54.81	-1.00	-0.01	-2307.38	-5.11	-711.97	20.19	-344.61	-19.53	13.39	0.00	0.31
0.58	54.81	-1.00	-0.01	-2319.66	-2.99	-768.62	31.24	47.73	-20.45	13.39	0.00	0.33
0.59	54.52	-1.00	-0.01	-2305.08	5.27	-794.09	27.78	7.94	-27.60	13.39	-0.00	0.34
0.60	54.42	-1.00	-0.01	-2304.66	0.28	-811.65	24.21	-224.76	-22.76	13.39	-0.00	0.35
0.61	54.42	-1.00	-0.01	-2315.24	0.33	-828.32	24.27	78.68	-17.51	13.39	-0.00	0.36
0.62	54.32	-1.00	-0.01	-2304.69	-9.66	-847.81	17.15	-80.09	-16.01	13.39	0.00	0.37
0.63	54.23	-1.00	-0.01	-2315.06	-9.67	-860.50	17.13	-88.42	-19.57	13.39	0.00	0.37
0.64	54.03	-1.00	-0.01	-2320.11	-4.72	-843.56	20.60	125.47	-24.65	13.38	0.00	0.30
0.65	54.03	-1.00	-0.01	-2315.66	5.48	-853.50	37.59	-205.37	-24.08	13.38	-0.00	0.37
0.66	53.93	-1.00	-0.01	-2319.92	5.55	-876.78	28.13	-67.77	-20.87	13.38	-0.00	0.38
0.67	53.83	-1.00	-0.01	-2308.31	-4.50	-885.17	11.41	-18.08	-10.56	13.38	0.00	0.38
0.68	53.83	-1.00	-0.01	-2302.81	-9.48	-894.42	7.87	-407.95	-0.78	13.38	0.00	0.39
0.69	53.74	-1.00	-0.01	-2319.06	0.60	-902.95	24.62	-49.57	-6.20	13.38	-0.00	0.39
0.70	53.74	-1.00	-0.01	-2318.89	0.82	-965.90	34.42	-150.20	-23.56	13.38	-0.00	0.42
0.71	53.64	-1.00	-0.01	-2311.35	-4.01	-1034.49	21.49	-53.83	-34.37	13.38	0.00	0.42
0.72	53.64	-1.00	-0.01	-2310.12	-8.95	-1068.78	8.46	185.95	-32.49	13.38	0.00	0.40
0.73	53.64	-1.00	-0.01	-2311.36	-8.95	-1058.95	18.04	-12.44	-25.18	13.37	0.00	0.40
0.74	53.54	-1.00	-0.01	-2322.51	-4.16	-998.95	21.31	4.91	-19.44	13.37	0.00	0.43
0.75	53.54	-1.00	-0.01	-2323.96	0.85	-976.78	34.46	128.75	-17.17	13.37	-0.00	0.42

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.76	53.54	-1.00	-0.01	-2318.08	-4.17	-983.17	21.33	-184.78	-18.84	13.37	0.00	0.42
0.77	53.54	-1.00	-0.01	-2311.76	-4.17	-984.69	11.79	126.72	-21.62	13.37	0.00	0.43
0.78	53.44	-1.00	-0.01	-2318.31	0.90	-987.60	25.01	95.56	-26.07	13.37	-0.00	0.43
0.79	53.44	-1.00	-0.01	-2323.77	0.71	-946.08	24.72	-173.62	-24.58	13.37	-0.00	0.41
0.80	53.44	-1.00	-0.01	-2329.23	-4.44	-925.46	20.95	149.57	-17.05	13.37	0.00	0.40
0.81	53.35	-1.00	-0.01	-2324.38	-9.42	-931.56	17.44	-70.02	-10.76	13.37	0.00	0.40
0.82	57.06	-0.02	3.97	-2343.34	-994.84	-126.77	87.30	93.01	21.12	13.50	0.42	0.05
0.83	57.06	-0.02	3.97	-2354.30	-994.99	-96.66	87.09	44.83	28.11	13.50	0.42	0.04
0.84	57.06	-0.02	3.97	-2370.75	-990.16	-51.23	90.48	-30.06	35.16	13.50	0.42	0.02
0.85	57.06	-0.02	3.97	-2370.13	-985.09	-53.10	84.68	-9.30	39.65	13.50	0.42	0.02
0.86	57.06	-0.02	3.97	-2358.54	-979.96	-64.72	78.94	7.20	37.59	13.50	0.42	0.03
0.87	57.06	-0.02	3.97	-2347.77	-974.82	-77.92	82.77	34.21	32.98	13.50	0.42	0.03
0.88	57.06	-0.02	3.97	-2336.77	-979.89	-69.38	79.03	20.17	30.60	13.50	0.42	0.03
0.89	57.06	-0.02	3.97	-2332.07	-984.99	-53.48	84.80	-15.15	31.69	13.50	0.42	0.02
0.90	57.06	-0.02	3.97	-2337.16	-989.94	-80.39	81.24	29.27	37.31	13.50	0.42	0.03
0.91	57.06	-0.02	3.97	-2349.00	-989.87	-99.92	90.91	50.33	38.52	13.50	0.42	0.04
0.92	57.06	-0.02	3.97	-2359.79	-984.82	-105.77	94.60	54.75	37.38	13.50	0.42	0.04
0.93	57.06	-0.02	3.97	-2364.45	-990.05	-77.43	81.10	26.74	33.96	13.50	0.42	0.03
0.94	57.06	-0.02	3.97	-2359.34	-990.20	-57.31	80.89	-31.58	32.93	13.50	0.42	0.02
0.95	57.06	-0.02	3.97	-2353.03	-985.07	-51.04	75.15	0.74	35.21	13.50	0.42	0.02
0.96	57.06	-0.02	3.97	-2342.47	-979.90	-64.65	79.04	10.52	37.63	13.50	0.42	0.03
0.97	57.06	-0.02	3.97	-2337.82	-979.78	-86.63	88.75	28.95	35.28	13.50	0.42	0.04
0.98	57.06	-0.02	3.97	-2337.38	-984.87	-83.30	84.97	17.21	32.82	13.50	0.42	0.04
0.99	57.06	-0.02	3.97	-2343.48	-990.00	-71.21	90.68	-22.63	28.18	13.50	0.42	0.03
1.00	57.06	-0.02	3.97	-2348.80	-989.91	-98.23	90.82	-20.86	25.90	13.50	0.42	0.04
1.01	57.06	-0.02	3.97	-2365.10	-989.94	-104.03	90.78	-248.92	25.21	13.50	0.42	0.04
1.02	57.06	-0.02	3.97	-2358.99	-984.86	-108.23	85.00	-641.52	27.15	13.50	0.42	0.05
1.03	57.06	-0.02	3.97	-2358.76	-979.81	-104.53	88.68	-1266.65	33.95	13.50	0.42	0.04
1.04	57.06	-0.03	3.97	-2340.17	-969.48	-154.67	86.79	-2096.76	37.35	13.50	0.41	0.07
1.05	57.06	-0.03	3.97	-2319.59	-948.46	-361.83	93.09	-2615.66	27.17	13.50	0.41	0.16
1.06	57.06	-0.03	3.97	-2263.70	-901.89	-657.86	89.55	-2277.23	-10.27	13.50	0.39	0.29
1.07	57.06	-0.04	3.97	-2237.77	-799.70	-987.82	88.52	-1906.34	-75.54	13.50	0.36	0.44
1.08	56.96	-0.06	3.97	-2185.61	-647.35	-1235.93	85.76	-1642.19	-153.07	13.50	0.30	0.57
1.09	56.96	-0.09	3.97	-2142.07	-465.07	-1374.90	104.70	-1498.28	-226.44	13.50	0.22	0.64
1.10	56.86	-0.14	3.97	-2093.09	-298.09	-1445.92	122.23	4060.97	-297.30	13.49	0.14	0.69
1.11	56.47	-0.21	3.97	-2038.08	-166.66	-1434.56	142.15	-1412.50	-324.92	13.48	0.08	0.70
1.12	56.47	-0.31	3.97	-2001.12	-91.11	-1339.74	130.50	2004.13	-312.03	13.47	0.05	0.67
1.13	55.98	-0.41	3.97	-1961.90	-76.35	-1170.68	93.51	-462.02	-230.87	13.46	0.04	0.60

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.14	55.20	-0.51	3.97	-1973.17	-76.79	-1026.07	74.01	-242.14	-152.48	13.45	0.04	0.52
1.15	54.32	-0.59	3.97	-2005.93	-71.76	-1031.76	77.83	674.52	-132.09	13.43	0.04	0.51
1.16	53.93	-0.67	3.97	-2037.70	-71.71	-1079.67	77.93	-951.02	-139.65	13.42	0.04	0.53
1.17	54.13	-0.74	3.97	-2088.96	-81.93	-1121.14	51.38	760.12	-151.03	13.41	0.04	0.54
1.18	54.42	-0.79	3.97	-2125.54	-92.22	-1115.99	34.32	-338.26	-141.15	13.40	0.04	0.53
1.19	54.62	-0.83	3.97	-2172.66	-97.55	-1092.42	20.80	-156.33	-121.01	13.39	0.04	0.50
1.20	54.71	-0.86	3.97	-2203.15	-97.56	-1115.91	1.72	497.45	-103.74	13.39	0.04	0.51
1.21	54.91	-0.89	3.97	-2235.92	-82.42	-1121.05	12.76	-400.34	-86.98	13.38	0.04	0.50
1.22	55.01	-0.91	3.98	-2279.87	-62.29	-1125.94	36.80	211.94	-80.00	13.38	0.03	0.49
1.23	55.01	-0.93	3.98	-2308.15	-57.43	-1090.63	49.78	-19.21	-72.60	13.37	0.02	0.47
1.24	55.01	-0.94	3.98	-2318.09	-72.77	-1062.90	28.97	-502.95	-68.37	13.38	0.03	0.46
1.25	55.01	-0.95	3.98	-2332.75	-92.90	-1112.90	5.00	343.76	-75.80	13.37	0.04	0.48
1.26	55.20	-0.96	3.98	-2344.82	-97.79	-1163.08	20.65	-90.92	-68.93	13.37	0.04	0.50
1.27	55.30	-0.97	3.98	-2372.31	-97.79	-1185.19	30.16	-42.71	-91.41	13.37	0.04	0.50
1.28	55.30	-0.98	3.98	-2366.36	-103.00	-1142.52	16.79	237.74	-81.53	13.37	0.04	0.46
1.29	55.30	-0.98	3.98	-2349.84	-103.13	-1094.63	7.08	-301.82	-70.11	13.37	0.04	0.47
1.30	55.69	-0.98	3.98	-2355.97	-82.78	-1122.41	31.39	72.48	-74.18	13.37	0.04	0.48
1.31	56.08	-0.99	3.98	-2346.03	-67.46	-1146.57	52.11	151.68	-80.00	13.37	0.03	0.49
1.32	56.28	-0.99	3.98	-2347.08	-67.39	-1155.92	61.76	-159.23	-78.22	13.37	0.03	0.49
1.33	55.98	-0.99	3.98	-2346.22	-77.66	-1122.33	44.69	159.32	-74.27	13.37	0.03	0.48
1.34	55.30	-0.99	3.98	-2335.62	-87.89	-1087.38	37.22	-89.40	-75.01	13.37	0.04	0.47
1.35	54.91	-0.99	3.98	-2340.94	-92.86	-1113.65	33.70	-153.53	-76.03	13.37	0.04	0.48
1.36	54.71	-1.00	3.98	-2335.66	-97.85	-1123.01	30.15	123.27	-75.32	13.37	0.04	0.48
1.37	54.52	-1.00	3.98	-2319.40	-92.65	-1143.40	33.94	-101.18	-74.89	13.38	0.04	0.45
1.38	54.32	-1.00	3.98	-2318.95	-87.65	-1134.20	37.55	10.65	-76.41	13.37	0.04	0.49
1.39	54.13	-1.00	3.98	-2319.75	-82.64	-1118.98	50.67	8.14	-76.46	13.37	0.04	0.48
1.40	54.13	-1.00	3.98	-2314.49	-82.53	-1136.99	50.84	-84.70	-72.76	13.37	0.04	0.49
1.41	53.93	-1.00	3.98	-2325.28	-82.52	-1145.65	50.86	80.66	-70.73	13.37	0.04	0.49
1.42	53.83	-1.00	3.98	-2308.40	-87.51	-1151.39	37.77	40.46	-71.73	13.37	0.04	0.50
1.43	53.74	-1.00	3.98	-2313.87	-87.64	-1127.42	37.58	-129.39	-73.76	13.37	0.04	0.49
1.44	53.64	-1.00	3.98	-2330.73	-82.74	-1099.81	50.59	22.52	-70.71	13.36	0.04	0.47
1.45	53.54	-1.00	3.98	-2330.96	-77.54	-1120.41	54.47	-130.21	-64.52	13.36	0.03	0.48
1.46	53.44	-1.00	3.98	-2329.73	-87.61	-1145.44	37.70	-43.59	-62.48	13.36	0.04	0.49
1.47	53.35	-1.00	3.97	-2323.43	-97.64	-1165.06	20.99	42.69	-61.46	13.36	0.04	0.50
1.48	53.35	-1.00	3.97	-2323.20	-102.77	-1151.44	17.22	-126.76	-63.58	13.36	0.04	0.50
1.49	53.25	-1.00	3.97	-2339.86	-92.77	-1138.67	33.86	10.28	-67.44	13.36	0.04	0.49
1.50	53.15	-1.00	3.97	-2346.22	-87.57	-1170.70	47.27	22.57	-69.66	13.36	0.04	0.50
1.51	53.15	-1.00	3.97	-2345.20	-82.49	-1182.45	41.40	27.86	-71.98	13.36	0.04	0.50

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TABLE V
TABULATED DATA

RUN: 26- 1-32

TE	KS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.52	53.15	-1.00	3.97	-2340.12	-82.46	-1179.99	41.46	118.28	-68.58	13.36	0.04	0.50
1.53	53.05	-1.00	3.97	-2329.92	-82.61	-1129.29	41.27	3.97	-61.36	13.36	0.04	0.48
1.54	53.05	-1.00	3.97	-2340.68	-82.82	-1085.44	40.96	-115.59	-56.59	13.36	0.04	0.46
1.55	53.05	-1.00	3.97	-2341.12	-82.72	-1107.20	41.12	87.69	-59.12	13.36	0.04	0.47
1.56	52.96	-1.00	3.97	-2335.86	-87.71	-1121.88	37.58	-23.16	-65.76	13.36	0.04	0.46
1.57	52.96	-1.00	3.97	-2340.44	-92.79	-1127.87	33.89	-46.19	-66.94	13.36	0.04	0.48
1.58	52.96	-1.00	3.97	-2341.13	-92.88	-1102.37	33.76	131.93	-67.29	13.36	0.04	0.47
1.59	52.96	-1.00	3.97	-2341.31	-93.01	-1071.73	33.57	-51.63	-66.96	13.36	0.04	0.46
1.60	52.96	-1.00	3.97	-2335.00	-82.83	-1085.45	31.43	-64.90	-64.58	13.36	0.04	0.46
1.61	52.86	-1.00	3.97	-2335.42	-77.73	-1085.73	35.16	182.66	-57.96	13.36	0.03	0.46
1.62	57.06	-0.03	7.98	-2350.94	-1313.16	-62.64	114.19	12.77	25.68	13.48	0.56	0.03
1.63	57.06	-0.03	7.98	-2354.46	-1318.31	-37.44	119.88	-14.79	17.61	13.48	0.56	0.02
1.64	57.06	-0.03	7.98	-2338.00	-1328.33	-56.17	112.60	-6.33	4.64	13.48	0.57	0.02
1.65	57.06	-0.03	7.98	-2338.56	-1328.18	-92.94	122.35	46.60	-4.47	13.48	0.57	0.04
1.66	57.06	-0.03	7.98	-2349.04	-1333.17	-120.15	118.73	77.84	-6.93	13.48	0.57	0.05
1.67	57.06	-0.03	7.98	-2342.91	-1318.02	-110.35	120.26	60.07	0.09	13.48	0.56	0.05
1.68	57.06	-0.03	7.98	-2356.21	-1308.14	-67.01	117.78	6.94	11.67	13.48	0.55	0.03
1.69	57.06	-0.03	7.98	-2364.00	-1308.20	-51.35	117.72	-16.12	19.84	13.48	0.55	0.02
1.70	57.06	-0.03	7.98	-2364.21	-1308.17	-54.80	117.78	12.21	22.18	13.48	0.55	0.02
1.71	57.06	-0.03	7.98	-2348.17	-1308.08	-64.38	117.91	21.13	15.32	13.48	0.56	0.03
1.72	57.06	-0.03	7.98	-2337.18	-1318.14	-72.64	110.57	17.53	10.65	13.48	0.56	0.03
1.73	57.06	-0.03	7.98	-2337.78	-1323.26	-59.08	116.31	4.21	8.22	13.48	0.57	0.03
1.74	57.06	-0.03	7.98	-2333.33	-1323.15	-74.33	126.02	19.61	8.24	13.48	0.57	0.03
1.75	57.06	-0.03	7.98	-2343.91	-1328.16	-91.77	122.38	34.33	12.77	13.48	0.57	0.04
1.76	57.06	-0.03	7.98	-2348.38	-1312.96	-106.25	123.98	67.85	13.92	13.48	0.56	0.05
1.77	57.06	-0.03	7.98	-2353.04	-1308.00	-90.87	117.99	34.38	14.02	13.48	0.56	0.04
1.78	57.06	-0.03	7.98	-2362.97	-1309.26	-47.32	108.06	-27.13	10.59	13.48	0.55	0.02
1.79	57.06	-0.03	7.98	-2369.51	-1313.33	-43.65	113.90	-30.02	8.36	13.48	0.55	0.02
1.80	57.06	-0.03	7.98	-2348.17	-1313.20	-55.97	114.10	-50.13	5.06	13.48	0.56	0.02
1.81	57.06	-0.03	7.98	-2343.53	-1313.13	-79.48	120.12	-237.58	0.77	13.48	0.56	0.03
1.82	57.06	-0.03	7.98	-2327.05	-1323.05	-100.00	116.61	-605.93	1.36	13.48	0.57	0.04
1.83	57.06	-0.03	7.98	-2326.39	-1318.02	-98.06	120.24	-1258.64	5.76	13.48	0.57	0.04
1.84	57.06	-0.04	7.98	-2335.94	-1312.73	-171.49	124.23	-2060.59	4.66	13.48	0.56	0.07
1.85	57.06	-0.04	7.98	-2331.64	-1276.81	-325.62	131.67	-2655.55	-7.45	13.48	0.55	0.14
1.86	57.06	-0.04	7.98	-2317.29	-1215.39	-560.88	129.19	-2386.78	-41.68	13.48	0.52	0.24
1.87	57.06	-0.06	7.98	-2280.89	-1098.26	-848.24	119.67	-2067.56	-103.83	13.48	0.48	0.37
1.88	57.06	-0.06	7.98	-2235.24	-930.78	-1109.29	108.58	-1789.50	-188.39	13.48	0.42	0.50
1.89	56.96	-0.11	7.98	-2183.49	-717.86	-1344.17	112.19	-1528.88	-272.48	13.47	0.33	0.62

TABLE V
TABULATED DATA

RUN: 28- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.90	56.86	-0.16	7.98	-2146.22	-505.20	-1494.63	133.86	3511.16	-346.21	13.47	0.24	0.70
1.91	56.77	-0.24	7.98	-2102.90	-328.06	-1559.44	158.51	-1274.54	-366.22	13.46	0.16	0.74
1.92	56.57	-0.33	7.98	-2100.64	-212.03	-1510.52	157.27	1381.33	-336.10	13.45	0.10	0.72
1.93	56.28	-0.44	7.98	-2081.51	-166.95	-1355.97	132.85	105.08	-247.97	13.44	0.08	0.65
1.94	55.69	-0.53	7.98	-2078.91	-167.25	-1252.24	85.00	-566.83	-168.02	13.43	0.08	0.60
1.95	54.91	-0.62	7.98	-2093.95	-172.39	-1238.19	62.30	1043.83	-150.00	13.42	0.08	0.59
1.96	54.13	-0.69	7.98	-2120.85	-167.36	-1264.92	66.07	-1050.26	-163.47	13.41	0.08	0.60
1.97	53.83	-0.75	7.98	-2174.17	-172.60	-1281.80	62.09	731.72	-184.14	13.41	0.08	0.59
1.98	54.13	-0.80	7.98	-2188.36	-187.95	-1263.61	31.89	-145.37	-178.11	13.40	0.09	0.56
1.99	54.52	-0.84	7.98	-2219.45	-203.18	-1274.85	11.45	-299.69	-156.11	13.39	0.09	0.57
2.00	54.62	-0.87	7.98	-2250.95	-198.15	-1282.77	5.56	505.93	-131.04	13.39	0.09	0.57
2.01	54.62	-0.89	7.98	-2273.75	-177.89	-1289.23	29.84	-323.68	-108.66	13.39	0.08	0.57
2.02	54.81	-0.91	7.98	-2305.90	-157.76	-1282.42	53.88	98.20	-99.06	13.39	0.07	0.56
2.03	55.01	-0.93	7.98	-2306.03	-162.95	-1250.10	40.49	108.55	-88.94	13.39	0.07	0.54
2.04	55.01	-0.94	7.98	-2310.68	-173.09	-1244.47	23.75	-301.72	-71.92	13.38	0.07	0.54
2.05	54.91	-0.95	7.98	-2339.60	-173.08	-1249.81	42.88	80.66	-57.58	13.38	0.07	0.53
2.06	55.01	-0.96	7.98	-2356.92	-183.17	-1257.38	45.18	144.46	-46.11	13.38	0.08	0.52
2.07	55.30	-0.97	7.98	-2356.09	-203.42	-1252.82	20.99	-257.42	-38.51	13.38	0.09	0.53
2.08	55.79	-0.98	7.98	-2353.98	-218.79	-1219.42	-9.36	103.62	-34.78	13.38	0.09	0.52
2.09	56.28	-0.98	7.98	-2343.41	-208.58	-1227.16	-1.90	12.25	-31.04	13.38	0.09	0.52
2.10	56.57	-0.98	7.98	-2344.23	-183.20	-1241.66	26.05	-152.87	-29.53	13.38	0.06	0.53
2.11	56.28	-0.99	7.98	-2356.04	-162.96	-1243.61	50.25	95.47	-25.27	13.38	0.07	0.53
2.12	55.79	-0.99	7.98	-2334.88	-152.78	-1252.93	57.68	-4.59	-16.88	13.38	0.07	0.53
2.13	55.40	-0.99	7.98	-2334.83	-163.06	-1193.54	50.13	-164.28	-10.97	13.38	0.07	0.51
2.14	55.01	-0.99	7.98	-2340.14	-178.21	-1206.09	39.18	-7.01	-14.74	13.38	0.08	0.52
2.15	54.71	-0.99	7.98	-2334.69	-193.28	-1231.85	28.37	-0.20	-22.81	13.38	0.06	0.53
2.16	54.32	-1.00	7.98	-2334.50	-203.31	-1253.86	21.17	-94.73	-24.99	13.38	0.09	0.54
2.17	54.13	-1.00	7.98	-2333.43	-203.36	-1242.76	11.55	71.46	-16.16	13.38	0.09	0.53
2.18	54.03	-1.00	7.98	-2317.73	-198.39	-1198.47	15.10	-82.34	-3.15	13.38	0.09	0.52
2.19	53.93	-1.00	7.98	-2329.34	-183.22	-1203.58	35.76	-101.15	-3.08	13.37	0.08	0.52
2.20	53.74	-1.00	7.98	-2323.87	-167.95	-1224.95	46.94	14.99	-12.44	13.37	0.07	0.53
2.21	53.74	-1.00	7.98	-2313.10	-162.80	-1238.90	50.62	56.17	-18.22	13.37	0.07	0.54
2.22	53.64	-1.00	7.98	-2313.31	-172.96	-1225.35	43.26	-173.83	-14.33	13.37	0.07	0.53
2.23	53.54	-1.00	7.98	-2324.05	-178.20	-1193.57	39.35	3.21	-11.30	13.37	0.08	0.51
2.24	53.44	-1.00	7.98	-2324.06	-183.21	-1202.99	35.76	-53.14	-10.03	13.37	0.08	0.52
2.25	53.35	-1.00	7.98	-2329.38	-193.26	-1224.95	28.56	-158.67	-12.15	13.37	0.08	0.53
2.26	53.35	-1.00	7.98	-2328.15	-198.26	-1246.25	15.43	95.28	-13.84	13.37	0.09	0.54
2.27	53.25	-1.00	7.93	-2322.86	-193.18	-1246.16	19.13	57.64	-13.72	13.37	0.06	0.54

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TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
2.28	53.15	-1.00	7.98	-2322.82	-183.22	-1209.02	26.19	-125.64	-11.17	13.37	0.08	0.52
2.29	53.15	-1.00	7.98	-2340.12	-173.18	-1196.43	43.08	35.55	-7.93	13.36	0.07	0.51
2.30	53.05	-1.00	7.98	-2329.78	-173.10	-1204.32	43.22	-7.83	-12.27	13.36	0.07	0.52
2.31	53.05	-1.00	7.98	-2328.77	-178.16	-1214.80	29.87	-43.16	-20.30	13.37	0.06	0.52
2.32	52.96	-1.00	7.98	-2334.26	-178.22	-1204.57	29.93	93.69	-20.53	13.36	0.08	0.52
2.33	52.96	-1.00	7.98	-2334.63	-173.33	-1156.79	33.35	-64.27	-9.85	13.36	0.07	0.50
2.34	52.86	-1.00	7.98	-2351.93	-168.35	-1144.22	46.45	-64.10	-6.34	13.36	0.07	0.49
2.35	52.86	-1.00	7.98	-2340.56	-173.33	-1155.75	33.38	-20.35	-8.59	13.36	0.07	0.49
2.36	52.86	-1.00	7.98	-2334.26	-178.34	-1168.21	20.25	-63.40	-11.95	13.36	0.08	0.50
2.37	52.86	-1.00	7.98	-2344.82	-178.41	-1164.01	20.14	-25.33	-13.26	13.36	0.08	0.50
2.38	52.86	-1.00	7.98	-2339.52	-178.50	-1140.03	20.01	-45.74	-15.55	13.36	0.08	0.49
2.39	52.76	-1.00	7.98	-2345.64	-178.44	-1156.17	29.63	-59.61	-16.70	13.36	0.08	0.49
2.40	52.76	-1.00	7.98	-2345.63	-173.36	-1157.44	33.32	14.14	-11.06	13.36	0.07	0.49
2.41	52.76	-1.00	7.98	-2335.28	-168.23	-1159.24	37.10	-36.56	-6.20	13.36	0.07	0.50
2.42	57.06	-0.05	12.00	-2351.44	-1403.99	-87.25	145.58	48.56	-26.49	13.46	0.60	0.04
2.43	57.06	-0.05	12.00	-2356.07	-1399.12	-48.46	159.44	-22.71	-21.78	13.46	0.59	0.02
2.44	57.06	-0.05	12.00	-2366.26	-1409.22	-56.26	122.57	-4.72	-13.65	13.46	0.60	0.02
2.45	57.06	-0.05	12.00	-2360.14	-1409.20	-59.44	113.08	37.62	-7.90	13.46	0.60	0.03
2.46	57.06	-0.05	11.98	-2349.57	-1389.88	-67.92	126.86	34.15	-5.44	13.47	0.59	0.03
2.47	57.06	-0.05	11.98	-2338.77	-1394.01	-44.01	123.05	-14.87	-7.73	13.47	0.60	0.02
2.48	57.06	-0.05	12.00	-2333.86	-1404.19	-26.94	125.08	-28.19	-12.52	13.47	0.60	0.01
2.49	57.06	-0.05	12.00	-2329.24	-1409.01	-75.89	132.42	27.47	-17.17	13.46	0.60	0.03
2.50	57.06	-0.05	12.00	-2346.16	-1408.96	-97.88	142.03	56.25	-19.54	13.46	0.60	0.04
2.51	57.06	-0.05	11.98	-2350.63	-1403.90	-105.77	135.04	77.03	-16.10	13.47	0.60	0.04
2.52	57.06	-0.05	12.00	-2355.26	-1404.09	-67.01	125.22	1.33	-11.40	13.47	0.60	0.03
2.53	57.06	-0.05	12.00	-2371.70	-1394.20	-23.09	133.42	-31.63	-6.72	13.46	0.59	0.01
2.54	57.06	-0.05	12.00	-2360.33	-1389.03	-42.49	126.63	-2.32	-5.45	13.47	0.59	0.02
2.55	57.06	-0.05	12.00	-2348.53	-1383.91	-56.51	120.87	-1.05	-11.20	13.47	0.59	0.02
2.56	57.06	-0.05	12.00	-2332.28	-1398.93	-81.50	111.13	60.38	-18.22	13.46	0.60	0.03
2.57	57.06	-0.05	11.98	-2333.92	-1398.99	-65.05	130.12	11.08	-23.98	13.46	0.60	0.03
2.58	57.06	-0.05	11.98	-2340.83	-1404.10	-49.21	145.41	-34.93	-22.90	13.46	0.60	0.02
2.59	57.06	-0.05	11.98	-2346.16	-1414.06	-89.24	137.12	31.66	-21.83	13.47	0.60	0.04
2.60	57.06	-0.05	12.00	-2350.62	-1408.98	-100.70	132.46	10.72	-16.01	13.46	0.60	0.04
2.61	57.06	-0.05	12.00	-2355.29	-1403.96	-97.54	126.57	-260.90	-10.85	13.46	0.60	0.04
2.62	57.06	-0.05	12.00	-2367.29	-1399.06	-60.22	139.57	-637.25	-7.84	13.46	0.59	0.03
2.63	57.06	-0.05	12.00	-2355.44	-1399.14	-40.69	128.77	-1295.72	-7.91	13.47	0.59	0.02
2.64	57.06	-0.05	12.00	-2336.51	-1383.64	-121.28	121.20	-2096.53	-12.35	13.47	0.59	0.05
2.65	57.06	-0.05	12.00	-2323.49	-1367.96	-254.49	134.03	-2731.39	-26.64	13.46	0.59	0.11

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TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
2.66	57.06	-0.06	11.98	-2306.98	-1316.62	-478.54	152.76	-2474.75	-63.57	13.46	0.57	0.21
2.67	57.06	-0.07	11.98	-2283.40	-1229.99	-729.48	139.79	-2206.40	-125.14	13.46	0.54	0.32
2.68	57.06	-0.10	11.98	-2249.37	-1082.72	-997.02	123.24	-1921.16	-204.03	13.46	0.48	0.44
2.69	56.96	-0.13	12.00	-2218.81	-879.79	-1280.77	116.73	-1594.95	-284.84	13.46	0.40	0.50
2.70	56.86	-0.19	12.00	-2196.36	-646.94	-1442.36	145.88	1751.73	-356.79	13.45	0.29	0.60
2.71	56.77	-0.27	12.00	-2149.30	-439.55	-1504.07	154.15	-65.55	-377.48	13.44	0.20	0.70
2.72	56.67	-0.37	12.00	-2118.67	-303.41	-1402.18	148.01	-241.12	-331.85	13.44	0.14	0.66
2.73	56.38	-0.47	12.00	-2086.88	-243.16	-1246.09	115.37	1134.29	-246.15	13.44	0.12	0.60
2.74	55.98	-0.56	12.00	-2070.13	-222.95	-1165.44	101.78	-1353.19	-174.24	13.43	0.11	0.57
2.75	55.20	-0.64	12.00	-2096.98	-217.93	-1196.21	105.76	1105.69	-171.75	13.41	0.10	0.57
2.76	54.32	-0.71	12.00	-2135.95	-222.89	-1261.42	121.46	-653.93	-197.47	13.40	0.10	0.59
2.77	53.85	-0.76	12.00	-2160.10	-253.43	-1263.80	80.05	140.22	-209.69	13.40	0.12	0.55
2.78	54.03	-0.81	12.00	-2162.67	-299.10	-1240.83	18.47	385.06	-190.76	13.39	0.14	0.57
2.79	54.42	-0.85	12.00	-2168.06	-314.25	-1256.34	-11.24	-644.47	-150.85	13.38	0.14	0.57
2.80	54.62	-0.88	12.00	-2237.68	-294.11	-1249.44	13.08	494.88	-119.42	13.37	0.13	0.56
2.81	54.71	-0.90	12.00	-2266.81	-258.66	-1259.66	57.84	-141.55	-103.08	13.37	0.11	0.56
2.82	54.91	-0.92	12.00	-2293.21	-238.61	-1246.94	72.16	-281.89	-106.47	13.37	0.10	0.54
2.83	55.11	-0.93	12.00	-2296.41	-243.81	-1234.92	49.19	363.93	-112.41	13.37	0.11	0.54
2.84	55.20	-0.95	12.00	-2301.74	-258.83	-1273.44	38.47	-257.97	-107.82	13.37	0.11	0.55
2.85	55.11	-0.96	12.00	-2341.45	-263.96	-1274.70	54.03	1.53	-102.49	13.36	0.11	0.54
2.86	55.01	-0.96	12.00	-2370.39	-269.02	-1281.79	69.48	253.08	-98.28	13.36	0.11	0.54
2.87	55.30	-0.97	12.00	-2364.25	-289.39	-1248.92	45.15	-191.77	-94.09	13.36	0.12	0.53
2.88	55.89	-0.98	12.00	-2356.87	-304.73	-1219.26	14.86	-66.41	-95.64	13.36	0.13	0.52
2.89	56.47	-0.98	12.00	-2356.07	-299.55	-1248.96	9.15	211.39	-94.67	13.36	0.13	0.53
2.90	56.77	-0.99	12.00	-2351.81	-274.17	-1254.39	37.09	-249.78	-86.98	13.36	0.12	0.53
2.91	56.47	-0.99	12.00	-2358.11	-253.91	-1253.35	61.27	47.75	-78.25	13.36	0.11	0.53
2.92	55.89	-0.99	12.00	-2342.21	-243.87	-1216.54	68.47	109.12	-69.11	13.36	0.10	0.52
2.93	55.50	-0.99	12.00	-2343.20	-249.02	-1185.73	74.24	-350.83	-60.27	13.36	0.11	0.51
2.94	55.20	-0.99	12.00	-2348.31	-258.97	-1229.44	67.19	140.29	-57.73	13.36	0.11	0.52
2.95	54.91	-0.99	12.00	-2331.23	-274.02	-1249.02	46.88	26.64	-57.51	13.36	0.12	0.54
2.96	54.52	-1.00	12.00	-2336.74	-284.13	-1253.25	35.60	-150.51	-54.87	13.36	0.12	0.54
2.97	54.32	-1.00	12.00	-2336.90	-264.29	-1210.79	39.39	65.95	-44.93	13.36	0.12	0.52
2.98	54.23	-1.00	12.00	-2320.16	-279.34	-1168.08	33.34	-115.29	-34.20	13.36	0.12	0.50
2.99	54.13	-1.00	12.00	-2326.30	-274.11	-1207.37	46.79	-160.69	-31.78	13.36	0.12	0.52
3.00	53.93	-1.00	12.00	-2320.62	-268.93	-1236.00	50.61	139.45	-36.95	13.36	0.12	0.53
3.01	53.93	-1.00	12.00	-2315.35	-263.80	-1247.62	54.37	-61.10	-38.81	13.36	0.11	0.54
3.02	53.83	-1.00	12.00	-2320.09	-263.99	-1210.50	54.07	-98.58	-36.54	13.36	0.11	0.52
3.03	53.74	-1.00	12.00	-2319.94	-264.15	-1173.25	44.30	-16.41	-34.41	13.36	0.11	0.51

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.04	53.64	-1.00	12.00	-2314.69	-269.03	-1205.78	40.93	-168.32	-29.42	13.36	0.12	0.52
3.05	53.54	-1.00	12.00	-2331.59	-263.93	-1224.72	54.40	-45.55	-27.35	13.35	0.11	0.53
3.06	53.54	-1.00	11.98	-2335.68	-263.87	-1246.00	54.27	101.11	-28.83	13.36	0.11	0.53
3.07	53.44	-1.00	12.00	-2325.06	-274.07	-1221.29	37.51	-113.40	-29.65	13.35	0.12	0.53
3.08	53.35	-1.00	11.98	-2335.80	-279.35	-1179.09	33.53	-17.71	-27.64	13.35	0.12	0.50
3.09	53.35	-1.00	12.00	-2330.96	-279.23	-1196.87	33.75	80.48	-24.13	13.35	0.12	0.51
3.10	53.25	-1.00	11.98	-2336.66	-269.14	-1190.07	41.02	-134.42	-21.32	13.35	0.12	0.51
3.11	53.15	-1.00	11.98	-2347.67	-264.11	-1191.47	44.63	62.36	-23.68	13.35	0.11	0.51
3.12	53.15	-1.00	11.98	-2330.74	-259.19	-1151.39	38.53	-7.72	-24.93	13.35	0.11	0.49
3.13	53.15	-1.00	11.98	-2330.90	-249.22	-1113.36	45.60	-203.65	-21.12	13.35	0.11	0.48
3.14	53.15	-1.00	12.00	-2342.75	-238.99	-1140.77	62.63	23.82	-16.79	13.35	0.10	0.49
3.15	53.15	-1.00	11.98	-2337.48	-238.90	-1155.21	62.77	-55.31	-15.42	13.35	0.10	0.49
3.16	53.05	-1.00	11.98	-2336.24	-249.00	-1167.87	45.94	-36.81	-19.02	13.35	0.11	0.50
3.17	53.05	-1.00	11.98	-2341.72	-264.33	-1138.84	34.78	29.11	-21.51	13.35	0.11	0.49
3.18	53.05	-1.00	11.98	-2331.12	-269.50	-1103.12	30.97	-198.70	-21.13	13.35	0.12	0.47
3.19	53.05	-1.00	11.98	-2347.22	-269.42	-1133.71	31.09	-26.27	-21.40	13.35	0.11	0.48
3.20	53.05	-1.00	11.98	-2331.17	-264.23	-1148.89	34.93	-16.41	-21.32	13.35	0.11	0.49
3.21	53.05	-1.00	11.98	-2331.17	-254.05	-1161.85	42.32	-46.95	-17.76	13.35	0.11	0.50
3.22	21.30	-0.21	0.0	-23.24	-2.78	24.69	6.57	-65.29	-16.27	14.13	0.12	-1.06
3.23	21.30	-0.21	0.0	-18.17	-2.71	21.52	6.70	-57.14	-5.80	14.13	0.15	-1.18
3.24	21.30	-0.21	0.0	-25.46	-2.67	9.99	6.77	-42.73	-0.09	14.13	0.11	-0.43
3.25	21.30	-0.22	0.0	-18.18	-2.60	-0.13	6.88	-19.17	-0.06	14.13	0.14	0.01
3.26	21.40	-0.01	0.0	-1205.24	-22.01	-41.38	1.26	19.48	-14.64	13.69	0.03	0.03
3.27	21.40	-0.01	0.0	-1199.75	-31.95	-50.85	1.35	24.39	-13.51	13.69	0.03	0.04
3.28	21.40	-0.01	0.0	-1199.73	-21.88	-39.13	8.85	6.71	-11.18	13.69	0.02	0.03
3.29	21.40	-0.01	0.0	-1188.90	-11.86	-7.81	16.27	-40.67	-10.00	13.69	0.01	0.01
3.30	21.40	-0.01	0.0	-1188.93	-11.76	-28.92	16.41	-7.29	-11.16	13.69	0.01	0.02
3.31	21.40	-0.01	0.0	-1205.02	-11.78	-42.97	16.38	13.43	-16.96	13.69	0.01	0.04
3.32	21.40	-0.01	0.0	-1216.66	-16.79	-62.10	22.21	46.15	-22.76	13.69	0.01	0.05
3.33	21.40	-0.01	0.0	-1200.58	-21.85	-47.54	18.41	23.14	-23.88	13.69	0.02	0.04
3.34	21.40	-0.01	0.0	-1167.36	-32.01	-13.92	1.23	-34.60	-19.24	13.69	0.03	0.01
3.35	21.40	-0.01	0.0	-1129.71	-26.77	-16.68	5.29	-25.52	-11.13	13.69	0.02	0.02
3.36	21.40	-0.01	0.0	-1119.14	-21.61	-27.73	9.26	-1.87	-1.86	13.69	0.02	0.02
3.37	21.40	-0.01	0.0	-1129.93	-11.46	-40.70	16.88	14.92	1.62	13.69	0.01	0.04
3.38	21.40	-0.02	0.0	-1163.10	-6.54	-32.87	30.00	-4.72	-1.84	13.68	0.01	0.03
3.39	21.40	-0.02	0.0	-1190.26	-6.77	-6.58	39.19	-44.32	-8.78	13.68	0.01	0.01
3.40	21.40	-0.02	0.0	-1223.16	-21.98	-27.67	27.80	-50.20	-16.85	13.68	0.02	0.02
3.41	21.40	-0.02	0.0	-1210.54	-37.09	-44.49	-2.53	-317.92	-18.68	13.68	0.03	0.04

TABLE V
TABULATED DATA

RUN: 28- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.42	21.40	-0.02	0.0	-1192.61	-42.07	-55.91	-25.28	-792.50	-12.04	13.68	0.04	0.05
3.43	21.40	-0.02	0.0	-1187.49	-26.79	-72.00	-4.25	-1469.30	-4.07	13.68	0.02	0.06
3.44	21.40	-0.02	0.0	-1180.94	-6.20	-158.07	20.85	-2310.90	-0.76	13.68	0.01	0.13
3.45	21.40	-0.02	0.0	-1160.56	9.93	-399.74	33.42	-2558.95	-9.30	13.68	-0.01	0.34
3.46	21.40	-0.04	0.0	-1140.00	16.04	-684.22	48.06	-2236.01	-44.51	13.68	-0.01	0.60
3.47	21.40	-0.07	0.0	-1130.47	1.57	-905.48	37.53	2647.21	-106.39	13.68	-0.00	0.80
3.48	21.40	-0.13	0.0	-1102.86	-18.39	-986.41	32.25	-1407.64	-153.35	13.68	0.02	0.89
3.49	21.30	-0.22	0.0	-1113.85	-33.83	-941.02	20.49	853.64	-173.58	13.68	0.03	0.84
3.50	21.20	-0.33	0.0	-1105.97	-58.98	-879.69	26.27	180.74	-149.93	13.67	0.04	0.86
3.51	21.01	-0.43	0.0	-1107.38	-23.92	-823.48	37.51	-638.80	-118.11	13.67	0.02	0.74
3.52	20.62	-0.53	0.0	-1095.59	-18.81	-826.86	31.84	914.24	-118.46	13.67	0.02	0.75
3.53	20.13	-0.62	0.0	-1072.15	-3.58	-842.01	24.13	-763.85	-130.51	13.67	0.00	0.79
3.54	19.54	-0.68	0.0	-1082.28	11.48	-852.39	35.22	450.02	-140.97	13.66	-0.01	0.77
3.55	19.25	-0.74	0.0	-1112.24	31.78	-845.74	79.07	23.03	-129.67	13.66	-0.03	0.76
3.56	19.25	-0.79	0.0	-1140.32	21.67	-848.54	81.12	-356.81	-102.46	13.66	-0.02	0.74
3.57	19.74	-0.83	0.0	-1142.92	-23.89	-853.81	13.54	470.54	-81.05	13.66	0.02	0.75
3.58	20.42	-0.87	0.0	-1124.13	-54.27	-838.05	-32.72	-256.22	-63.70	13.65	0.05	0.75
3.59	20.91	-0.90	0.0	-1138.90	-44.32	-618.45	-35.00	-65.68	-57.29	13.65	0.04	0.72
3.60	21.10	-0.92	0.0	-1163.17	-13.87	-840.07	16.41	261.57	-52.65	13.65	0.01	0.72
3.61	20.91	-0.95	0.0	-1169.70	16.57	-851.35	48.70	-279.57	-45.14	13.65	-0.01	0.73
3.62	20.42	-0.95	0.0	-1174.16	21.63	-857.72	42.94	116.67	-40.09	13.65	-0.02	0.73
3.63	19.93	-0.96	0.0	-1169.08	5.41	-840.80	31.59	108.95	-37.73	13.65	-0.01	0.72
3.64	19.54	-0.96	0.0	-1168.01	-8.94	-810.37	10.47	-286.36	-37.18	13.65	0.01	0.69
3.65	19.54	-0.97	0.0	-1190.24	-24.07	-840.59	8.78	153.17	-44.94	13.65	0.02	0.71
3.66	19.83	-0.98	0.0	-1190.06	-23.96	-871.46	8.93	43.20	-52.80	13.65	0.02	0.73
3.67	20.42	-0.98	0.0	-1184.57	-18.82	-886.01	12.82	-105.46	-51.37	13.65	0.02	0.75
3.68	21.10	-0.99	0.0	-1190.01	-8.83	-851.37	20.17	191.80	-38.12	13.65	0.01	0.72
3.69	21.40	-0.99	0.0	-1179.79	1.18	-802.46	27.58	-121.69	-17.87	13.65	-0.00	0.66
3.70	21.10	-0.99	0.0	-1185.29	1.23	-812.35	27.67	-107.58	-9.78	13.65	-0.00	0.69
3.71	20.62	-0.99	0.0	-1179.82	1.34	-835.80	27.83	160.18	-14.84	13.65	-0.00	0.71
3.72	20.03	-1.00	0.0	-1174.36	-8.72	-852.13	20.37	-82.01	-23.63	13.65	0.01	0.73
3.73	19.74	-0.99	0.0	-1179.65	-18.93	-856.95	12.69	-12.30	-23.65	13.65	0.02	0.71
3.74	19.83	-1.00	0.0	-1179.79	-24.15	-795.91	8.70	60.34	-15.97	13.65	0.02	0.67
3.75	20.13	-1.00	0.0	-1174.73	-18.99	-807.95	12.63	-155.69	-10.82	13.65	0.02	0.69
3.76	20.22	-1.00	0.0	-1174.53	-3.75	-824.05	24.03	37.49	-12.32	13.65	0.00	0.70
3.77	19.93	-1.00	0.0	-1163.98	6.49	-840.69	31.75	84.24	-14.56	13.65	-0.01	0.72
3.78	19.74	-1.00	0.0	-1163.96	6.42	-824.66	31.64	-102.41	-13.11	13.65	-0.01	0.71
3.79	19.64	-1.00	0.0	-1169.20	1.18	-786.85	27.59	15.04	-10.02	13.65	-0.00	0.67

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.80	19.64	-1.00	0.0	-1169.43	-18.99	-798.24	12.64	-33.45	-4.12	13.65	0.02	0.68
3.81	19.54	-1.00	0.0	-1169.65	-24.00	-806.03	8.96	-102.59	-0.46	13.65	0.02	0.69
3.82	19.35	-1.00	0.0	-1174.74	-23.96	-823.75	9.00	68.96	-4.29	13.65	0.02	0.70
3.83	19.35	-1.00	0.0	-1163.96	-18.89	-822.44	12.79	-43.01	-9.83	13.65	0.02	0.71
3.84	19.25	-1.00	0.0	-1174.29	1.20	-800.24	27.60	-91.95	-14.51	13.65	-0.00	0.68
3.85	19.15	-1.00	0.0	-1174.30	11.41	-818.28	35.28	43.79	-11.24	13.65	-0.01	0.70
3.86	19.05	-1.00	0.0	-1163.94	11.50	-822.14	35.44	-65.98	-1.66	13.64	-0.01	0.71
3.87	19.05	-1.00	0.0	-1174.72	1.38	-827.03	27.92	-17.51	0.29	13.64	-0.00	0.70
3.88	19.05	-1.00	0.0	-1180.00	-8.83	-814.13	20.24	26.92	2.66	13.64	0.01	0.69
3.89	18.95	-1.00	0.0	-1174.50	-24.11	-794.86	8.79	-120.09	-6.40	13.64	0.02	0.68
3.90	18.86	-1.00	0.0	-1178.78	-29.10	-825.00	-4.43	-11.31	-13.52	13.64	0.02	0.70
3.91	18.86	-1.00	0.0	-1175.50	-23.97	-832.06	-0.56	27.78	-8.92	13.64	0.02	0.71
3.92	18.76	-1.00	0.0	-1180.02	-8.74	-835.24	20.38	-57.03	1.72	13.64	0.01	0.71
3.93	18.76	-1.00	0.0	-1175.99	6.35	-812.57	31.55	23.83	5.00	13.65	-0.01	0.69
3.94	18.76	-1.00	0.0	-1169.39	16.39	-784.94	33.94	-77.47	0.61	13.64	-0.01	0.67
3.95	18.76	-1.00	0.0	-1174.50	11.39	-810.04	35.26	-80.96	-6.35	13.64	-0.01	0.69
3.96	18.65	-1.00	0.0	-1179.81	-3.75	-826.16	24.02	52.65	-7.78	13.64	0.00	0.70
3.97	18.66	-1.00	0.0	-1174.53	-23.91	-837.61	9.10	-26.29	-1.86	13.64	0.02	0.71
3.98	18.66	-1.00	0.0	-1173.68	-29.08	-813.42	-4.37	-31.36	3.86	13.64	0.02	0.69
3.99	18.66	-1.00	0.0	-1179.97	-24.15	-782.88	6.74	-36.37	3.81	13.64	0.02	0.66
4.00	18.56	-1.00	0.0	-1174.71	-13.91	-806.18	16.45	-62.21	-0.62	13.64	0.01	0.69
4.01	21.40	-0.02	0.0	-2359.24	-5.69	-59.74	27.80	40.59	-2.54	13.45	0.00	0.03
4.02	21.40	-0.02	0.0	-2365.78	-5.68	-61.91	37.37	43.30	-5.90	13.45	0.00	0.03
4.03	21.40	-0.02	0.0	-2376.33	-16.00	-31.00	29.68	-5.47	-12.90	13.45	0.01	0.01
4.04	21.40	-0.02	0.0	-2365.56	-36.22	-29.75	14.98	-6.05	-18.70	13.44	0.02	0.01
4.05	21.40	-0.02	0.0	-2316.34	-46.09	-49.98	-1.59	20.67	-18.64	13.45	0.02	0.02
4.06	21.49	-0.02	0.0	-2278.69	-40.85	-55.98	2.36	25.59	-9.37	13.45	0.02	0.02
4.07	21.40	-0.02	0.0	-2267.87	-25.63	-49.90	13.51	29.82	4.46	13.45	0.01	0.02
4.08	21.40	-0.02	0.0	-2290.44	-5.55	-20.57	37.57	-13.22	10.30	13.44	0.00	0.01
4.09	21.40	-0.02	0.0	-2346.22	9.47	-18.52	67.45	-27.77	5.76	13.43	-0.00	0.01
4.10	21.40	-0.02	0.0	-2400.80	4.30	-42.36	73.15	10.61	-7.04	13.43	-0.00	0.02
4.11	21.40	-0.02	0.0	-2391.63	-31.13	-65.38	9.19	39.59	-18.70	13.44	0.01	0.03
4.12	21.40	-0.02	0.0	-2377.12	-66.61	-59.63	-54.88	27.02	-17.66	13.44	0.03	0.03
4.13	21.40	-0.02	0.0	-2382.78	-56.66	-16.22	-47.75	-27.06	-6.03	13.44	0.02	0.01
4.14	21.40	-0.02	0.0	-2385.88	-26.24	-12.16	3.11	-25.50	-0.07	13.44	0.01	0.01
4.15	21.40	-0.02	0.0	-2381.21	4.28	-38.40	34.97	3.68	-1.20	13.44	-0.00	0.02
4.16	21.40	-0.02	0.0	-2370.23	9.44	-56.03	58.79	33.15	-4.73	13.44	-0.00	0.02
4.17	21.40	-0.02	0.0	-2363.93	-10.81	-59.12	14.51	34.76	-9.38	13.44	0.00	0.03

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.18	21.40	-0.02	0.0	-2379.99	-31.22	-36.08	-0.49	-0.19	-12.92	13.44	0.01	0.02
4.19	21.40	-0.02	0.0	-2390.78	-41.40	-31.78	-7.95	-16.83	-14.07	13.44	0.02	0.01
4.20	21.40	-0.02	0.0	-2397.11	-41.33	-46.29	1.70	-30.38	-12.85	13.44	0.02	0.02
4.21	21.40	-0.02	0.0	-2386.34	-36.14	-65.86	5.58	-298.74	-11.16	13.44	0.02	0.03
4.22	21.40	-0.02	0.0	-2370.05	-25.93	-72.25	13.06	-790.98	-4.52	13.45	0.01	0.03
4.23	21.40	-0.02	0.0	-2357.55	-15.74	-82.34	10.98	-1635.82	12.88	13.45	0.01	0.03
4.24	21.40	-0.02	0.0	-2361.39	-5.06	-221.36	28.63	-2544.59	28.93	13.44	0.00	0.09
4.25	21.40	-0.03	0.0	-2362.16	1.19	-539.13	43.39	-2407.04	28.58	13.44	-0.00	0.23
4.26	21.40	-0.04	0.0	-2332.18	-2.18	-989.99	41.83	-1902.17	4.92	13.45	0.00	0.42
4.27	21.40	-0.06	0.0	-2263.56	-20.79	-1420.91	19.50	346.87	-61.06	13.45	0.01	0.63
4.28	21.30	-0.10	0.0	-2199.06	-25.02	-1652.27	16.74	-474.17	-144.97	13.44	0.01	0.75
4.29	21.20	-0.17	0.0	-2139.09	-29.83	-1690.41	13.32	1899.43	-198.86	13.44	0.01	0.79
4.30	21.10	-0.26	0.0	-2111.52	-24.96	-1582.44	35.95	-1252.57	-185.47	13.43	0.01	0.75
4.31	20.91	-0.37	0.0	-2133.96	-10.26	-1423.84	75.12	1387.77	-152.40	13.42	0.00	0.67
4.32	20.62	-0.48	0.0	-2137.90	-10.44	-1348.94	94.05	-886.67	-136.22	13.41	0.00	0.63
4.33	20.22	-0.57	0.0	-2139.88	-20.76	-1340.61	57.72	51.49	-163.52	13.41	0.01	0.63
4.34	19.74	-0.65	0.0	-2135.80	-25.71	-1409.97	25.51	387.80	-199.01	13.40	0.01	0.66
4.35	19.15	-0.71	0.0	-2167.34	-10.43	-1465.62	35.64	-601.92	-196.23	13.39	0.00	0.66
4.36	18.95	-0.76	0.0	-2211.25	4.71	-1468.31	57.15	461.51	-163.61	13.39	-0.00	0.66
4.37	18.55	-0.81	0.0	-2238.67	9.71	-1450.85	60.79	-82.61	-121.06	13.38	-0.00	0.65
4.38	19.44	-0.85	0.0	-2252.00	-5.70	-1415.37	20.86	-331.46	-97.76	13.38	0.00	0.63
4.39	20.03	-0.88	0.0	-2265.99	-20.91	-1429.67	-9.25	282.07	-89.80	13.38	0.01	0.63
4.40	20.62	-0.91	0.0	-2294.72	-10.69	-1456.69	17.32	-196.97	-78.51	13.37	0.00	0.64
4.41	21.01	-0.93	0.0	-2333.17	-0.59	-1474.36	34.17	-161.38	-63.63	13.37	0.00	0.63
4.42	21.01	-0.94	0.0	-2343.12	-10.76	-1469.55	17.27	260.14	-49.44	13.37	0.00	0.63
4.43	20.71	-0.95	0.0	-2325.34	-31.11	-1429.77	-16.60	-229.54	-34.80	13.37	0.01	0.61
4.44	20.22	-0.96	0.0	-2341.40	-31.16	-1428.85	-16.65	-43.77	-25.97	13.37	0.01	0.61
4.45	19.83	-0.97	0.0	-2359.55	-20.99	-1441.00	9.84	153.72	-21.61	13.37	0.01	0.61
4.46	19.64	-0.98	0.0	-2354.49	-0.66	-1453.23	24.59	-169.27	-24.29	13.37	0.00	0.62
4.47	19.64	-0.98	0.0	-2366.09	9.39	-1443.85	41.34	24.36	-25.82	13.37	-0.00	0.61
4.48	19.64	-0.99	0.0	-2355.69	4.20	-1399.88	37.51	60.97	-21.25	13.37	-0.00	0.59
4.49	19.64	-0.99	0.0	-2344.28	-5.94	-1384.23	20.65	-233.13	-12.63	13.37	0.00	0.59
4.50	19.35	-0.99	0.0	-2355.07	-21.10	-1395.74	9.73	-59.17	-7.19	13.37	0.01	0.59
4.51	19.15	-0.99	0.0	-2344.32	-26.03	-1419.13	6.27	26.79	-11.90	13.37	0.01	0.61
4.52	19.05	-0.99	0.0	-2343.91	-25.97	-1439.19	6.33	-142.18	-18.60	13.37	0.01	0.61
4.53	18.86	-0.99	0.0	-2348.95	-21.06	-1412.40	9.73	-31.28	-16.67	13.37	0.01	0.60
4.54	18.76	-0.99	0.0	-2338.36	-5.83	-1406.92	20.79	-0.11	-8.57	13.37	0.00	0.60
4.55	18.56	-0.99	0.0	-2327.79	-0.66	-1419.00	24.62	-131.66	-3.61	13.27	0.00	0.61

TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.56	18.47	-0.99	0.0	-2339.42	4.43	-1433.03	37.86	12.88	-9.61	13.37	-0.00	0.61
4.57	18.37	-1.00	0.0	-2322.33	-0.59	-1437.59	24.71	-2.42	-16.49	13.37	0.00	0.62
4.58	18.27	-1.00	0.0	-2327.80	-10.89	-1402.71	17.14	-146.01	-17.46	13.37	0.00	0.60
4.59	18.17	-1.00	0.0	-2338.36	-21.06	-1399.82	9.76	-67.90	-13.11	13.37	0.01	0.60
4.60	18.08	-1.00	0.0	-2327.81	-20.92	-1417.00	9.98	-35.05	-8.44	13.36	0.01	0.61
4.61	17.96	-1.00	0.0	-2333.11	-20.88	-1432.53	10.03	-80.56	-8.36	13.37	0.01	0.61
4.62	17.88	-1.00	0.0	-2332.90	-10.74	-1439.79	17.36	1.48	-11.99	13.36	0.00	0.62
4.63	17.78	-1.00	0.0	-2333.90	-0.73	-1410.70	34.04	-44.10	-14.22	13.36	0.00	0.60
4.64	17.68	-1.00	0.0	-2333.90	4.34	-1410.68	37.69	-121.78	-14.07	13.36	-0.00	0.60
4.65	17.68	-1.00	0.0	-2343.87	-0.74	-1417.03	24.49	-61.82	-8.39	13.36	0.00	0.60
4.66	17.59	-1.00	0.0	-2333.31	-10.77	-1424.82	17.34	-50.61	-4.88	13.35	0.00	0.61
4.67	17.49	-1.00	0.0	-2333.11	-20.86	-1456.66	10.08	-79.68	-7.20	13.36	0.01	0.62
4.68	17.49	-1.00	0.0	-2343.44	-21.00	-1418.82	9.85	-49.85	-10.91	13.36	0.01	0.61
4.69	17.39	-1.00	0.0	-2338.16	-15.92	-1418.75	13.53	-62.57	-10.83	13.35	0.01	0.61
4.70	17.29	-1.00	0.0	-2338.17	-10.79	-1431.72	17.29	-62.33	-7.34	13.36	0.00	0.61
4.71	17.29	-1.00	0.0	-2343.67	-5.70	-1440.31	20.99	-9.35	-5.06	13.36	0.00	0.61
4.72	17.20	-1.00	0.0	-2333.10	-0.61	-1436.61	24.69	-3.48	-7.29	13.36	0.00	0.62
4.73	17.10	-1.00	0.0	-2343.86	-5.87	-1402.54	20.74	-65.78	-9.58	13.36	0.00	0.60
4.74	17.10	-1.00	0.0	-2343.85	-10.95	-1397.46	17.06	-46.95	-9.64	13.36	0.00	0.60
4.75	17.00	-1.00	0.0	-2338.79	-15.94	-1405.95	13.53	-41.41	-7.22	13.36	0.01	0.60
4.76	17.00	-1.00	0.0	-2339.01	-20.97	-1408.65	9.94	-64.07	-3.65	13.36	0.01	0.60
4.77	17.00	-1.00	0.0	-2339.00	-10.87	-1402.78	17.21	-44.91	-2.53	13.36	0.00	0.60
4.78	16.90	-1.00	0.0	-2333.69	-5.92	-1375.22	20.69	-69.17	-7.11	13.36	0.00	0.59
4.79	16.90	-1.00	0.0	-2328.19	-0.82	-1381.11	24.39	-102.06	-8.21	13.36	0.00	0.59
4.80	16.80	-1.00	0.0	-2338.78	-0.78	-1400.83	24.45	-60.70	-7.16	13.36	0.00	0.60
4.81	16.81	-1.00	0.0	-2333.50	-5.77	-1409.43	20.91	-29.78	-4.87	13.36	0.00	0.60
4.82	21.40	-0.03	0.0	-3561.91	-45.39	-68.30	6.25	42.36	1.40	13.22	0.01	0.02
4.83	21.40	-0.03	0.0	-3557.43	-50.54	-41.57	12.06	-2.99	-4.35	13.22	0.01	0.01
4.84	21.40	-0.03	0.0	-3546.67	-45.31	-70.56	15.90	33.81	-2.02	13.22	0.01	0.02
4.85	21.40	-0.03	0.0	-3517.94	-35.10	-74.56	4.14	46.17	7.22	13.22	0.01	0.02
4.86	21.40	-0.03	0.0	-3496.57	-19.79	-79.25	15.11	51.28	15.40	13.22	0.01	0.02
4.87	21.40	-0.03	0.0	-3508.15	-4.72	-59.68	35.25	26.33	14.25	13.22	0.00	0.02
4.88	21.40	-0.03	0.0	-3525.86	-4.85	-39.74	54.11	-4.95	6.10	13.22	0.00	0.01
4.89	21.40	-0.03	0.0	-3525.90	-14.86	-70.53	47.10	38.96	-1.99	13.22	0.00	0.02
4.90	21.40	-0.03	0.0	-3509.04	-40.07	-81.40	19.76	61.88	-3.13	13.22	0.01	0.02
4.91	21.40	-0.03	0.0	-3470.57	-50.06	-79.00	3.22	53.47	0.38	13.22	0.01	0.02
4.92	21.40	-0.03	0.0	-3432.07	-50.06	-51.15	-6.31	7.58	3.92	13.22	0.01	0.01
4.93	21.40	-0.03	0.0	-3432.64	-29.91	-28.64	17.44	-15.57	7.30	13.22	0.01	0.01

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TABLE V
TABULATED DATA

RUN: 28- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.94	21.40	-0.03	0.0	-3449.78	-9.54	-65.73	41.53	39.12	5.05	13.21	0.00	0.02
4.95	21.40	-0.03	0.0	-3500.09	5.56	-80.51	71.25	41.45	-1.82	13.21	-0.00	0.02
4.96	21.40	-0.03	0.0	-3560.15	5.39	-92.59	80.54	67.11	-12.28	13.21	-0.00	0.03
4.97	21.40	-0.03	0.0	-3562.76	-30.23	-71.82	26.53	40.94	-19.30	13.21	0.01	0.02
4.98	21.40	-0.03	0.0	-3554.77	-65.81	-41.27	-27.44	-18.99	-19.30	13.21	0.02	0.01
4.99	21.49	-0.04	0.0	-3548.67	-65.72	-56.19	-36.83	14.40	-11.20	13.21	0.02	0.02
5.00	21.40	-0.03	0.0	-3561.31	-35.28	-72.66	3.91	-18.34	-5.26	13.21	0.01	0.02
5.01	21.40	-0.03	0.0	-3545.03	-9.83	-90.72	22.04	-308.90	-1.22	13.21	0.00	0.03
5.02	21.40	-0.03	0.0	-3534.00	-4.79	-76.08	25.58	-837.19	6.53	13.22	0.00	0.02
5.03	21.40	-0.03	0.0	-3533.96	-9.74	-99.53	31.67	-1611.15	19.14	13.21	0.00	0.03
5.04	21.40	-0.03	0.0	-3553.51	-19.15	-296.61	34.96	-2441.25	24.59	13.22	0.01	0.08
5.05	21.40	-0.04	0.0	-3557.94	-38.13	-646.49	22.18	-2296.39	19.33	13.22	0.01	0.16
5.06	21.40	-0.05	0.0	-3521.41	-46.29	-1157.76	17.44	-1737.27	7.95	13.22	0.01	0.33
5.07	21.40	-0.06	0.0	-3428.26	-33.92	-1724.60	17.82	-1128.57	-28.14	13.22	0.01	0.50
5.08	21.30	-0.09	0.0	-3304.83	-6.84	-2157.59	28.31	3170.35	-108.33	13.22	0.00	0.65
5.09	21.20	-0.13	0.0	-3193.61	14.45	-2375.95	43.96	-425.36	-176.22	13.22	-0.00	0.74
5.10	21.10	-0.21	0.0	-3152.78	14.37	-2316.09	53.40	2129.82	-198.83	13.21	-0.00	0.75
5.11	21.01	-0.32	0.0	-3143.93	3.79	-2127.95	74.42	-406.80	-158.53	13.19	-0.00	0.60
5.12	20.71	-0.42	0.0	-3181.80	-72.24	-1925.61	74.78	-171.66	-116.70	13.19	0.01	0.61
5.13	20.42	-0.52	0.0	-3198.50	-47.96	-1834.82	46.85	602.59	-120.15	13.17	0.01	0.57
5.14	20.03	-0.61	0.0	-3212.60	-58.02	-1891.93	20.74	-934.40	-149.63	13.16	0.02	0.59
5.15	19.64	-0.68	0.0	-3241.67	-37.77	-1955.99	15.85	529.17	-179.08	13.15	0.01	0.60
5.16	19.35	-0.74	0.0	-3272.77	-2.31	-1992.02	31.30	-146.37	-162.87	13.14	0.00	0.61
5.17	19.05	-0.78	0.0	-3314.75	22.75	-1953.00	39.19	-438.20	-118.73	13.13	-0.01	0.59
5.18	18.95	-0.83	0.0	-3352.53	27.63	-1924.32	42.53	218.36	-84.27	13.13	-0.01	0.57
5.19	19.05	-0.86	0.0	-3372.05	22.73	-1979.97	20.10	-293.19	-67.21	13.12	-0.01	0.59
5.20	19.35	-0.89	0.0	-3425.15	12.58	-2023.24	12.94	-164.53	-63.04	13.11	-0.00	0.59
5.21	19.74	-0.91	0.0	-3462.39	-12.73	-2053.91	-4.79	291.42	-56.02	13.11	0.00	0.59
5.22	20.13	-0.93	0.0	-3466.00	-48.28	-2031.09	-48.86	-63.77	-44.00	13.11	0.01	0.59
5.23	20.22	-0.94	0.0	-3486.88	-53.64	-1975.28	-62.36	-29.18	-29.16	13.11	0.02	0.57
5.24	19.93	-0.95	0.0	-3511.35	-28.37	-1958.16	-25.53	108.64	-11.73	13.11	0.01	0.56
5.25	19.44	-0.96	0.0	-3531.34	7.00	-1923.47	27.90	-224.94	9.99	13.10	-0.00	0.54
5.26	19.05	-0.97	0.0	-3537.04	12.02	-1914.40	31.43	-88.26	15.61	13.11	-0.00	0.54
5.27	18.95	-0.97	0.0	-3518.67	6.90	-1903.88	8.67	14.71	8.35	13.11	-0.00	0.54
5.28	18.86	-0.98	0.0	-3512.12	-3.30	-1891.80	-9.10	-235.83	4.05	13.10	0.00	0.54
5.29	18.66	-0.98	0.0	-3529.24	-13.35	-1911.18	-5.51	-76.68	13.01	13.11	0.00	0.54
5.30	18.47	-0.96	0.0	-3525.20	-23.40	-1909.21	-2.92	0.20	23.37	13.11	0.01	0.54
5.31	18.37	-0.99	0.0	-3519.94	-23.33	-1922.37	-2.81	-103.12	19.02	13.11	0.01	0.55

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TABLE V
TABULATED DATA

RUN: 28- 1-52

TL	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
5.32	16.17	-0.99	0.0	-3519.51	-23.42	-1910.61	-2.99	10.63	5.97	13.11	0.01	0.54
5.33	17.58	-0.99	0.0	-3508.91	-8.35	-1877.12	7.48	-38.73	2.63	13.11	0.00	0.53
5.34	17.78	-0.99	0.0	-3510.36	1.83	-1874.29	24.23	-124.90	14.52	13.11	-0.00	0.53
5.35	17.68	-0.99	0.0	-3510.77	-3.25	-1861.38	20.70	-12.45	25.94	13.11	0.00	0.53
5.36	17.59	-0.99	0.0	-3494.10	-8.28	-1858.34	7.67	33.74	22.53	13.11	0.00	0.53
5.37	17.39	-1.00	0.0	-3500.63	-13.48	-1850.99	13.46	-217.74	10.33	13.11	0.00	0.52
5.38	17.29	-1.00	0.0	-3500.40	-23.76	-1860.08	6.12	-226.15	3.25	13.11	0.01	0.51
5.39	17.20	-1.00	0.0	-3489.64	-23.55	-1837.73	6.40	-147.63	7.82	13.10	0.01	0.53
5.40	17.00	-1.00	0.0	-3489.22	-8.23	-1866.69	17.27	-217.35	18.26	13.11	0.00	0.53
5.41	16.90	-1.00	0.0	-3488.60	2.05	-1905.44	24.55	-129.01	21.44	13.10	-0.00	0.55
5.42	16.81	-1.00	0.0	-3476.56	2.04	-1905.56	14.96	-104.24	16.66	13.10	-0.00	0.55
5.43	16.71	-1.00	0.0	-3469.59	-3.07	-1902.63	1.77	-176.56	10.78	13.10	0.00	0.55
5.44	16.61	-1.00	0.0	-3491.61	-8.02	-1944.29	7.93	-107.05	9.49	13.10	0.00	0.56
5.45	16.51	-1.00	0.0	-3498.36	-13.00	-1955.65	14.07	-70.21	15.28	13.10	0.00	0.56
5.46	16.41	-1.00	0.0	-3505.87	-23.10	-1962.75	7.04	-114.90	20.00	13.10	0.01	0.56
5.47	16.32	-1.00	0.0	-3501.77	-28.30	-1944.06	-15.81	-116.98	17.55	13.10	0.01	0.56
5.48	16.22	-1.00	0.0	-3490.76	-23.29	-1929.15	-12.38	-128.36	9.41	13.10	0.01	0.55
5.49	16.12	-1.00	0.0	-3496.58	2.17	-1967.08	5.54	-116.44	6.01	13.10	-0.00	0.56
5.50	16.12	-1.00	0.0	-3502.19	17.39	-1979.32	25.77	-87.29	10.60	13.10	-0.00	0.57
5.51	16.02	-1.00	0.0	-3514.00	12.34	-1979.05	31.79	-69.63	18.66	13.09	-0.00	0.56
5.52	15.93	-1.00	0.0	-3490.76	-2.92	-1951.24	1.98	-119.32	22.16	13.10	0.00	0.56
5.53	15.83	-1.00	0.0	-3501.31	-23.32	-1928.26	-12.41	-82.44	18.45	13.09	0.01	0.55
5.54	15.83	-1.00	0.0	-3506.66	-33.30	-1969.28	-19.30	-0.56	10.29	13.10	0.01	0.56
5.55	15.73	-1.00	0.0	-3501.59	-28.21	-1970.61	-15.70	-45.64	6.20	13.10	0.01	0.56
5.56	15.63	-1.00	0.0	-3513.61	-23.18	-1960.02	-2.63	-25.60	16.33	13.10	0.01	0.56
5.57	15.63	-1.00	0.0	-3509.72	-3.11	-1901.89	20.86	-83.64	26.94	13.10	0.00	0.54
5.58	15.53	-1.00	0.0	-3499.32	6.89	-1858.65	27.76	-150.45	30.58	13.10	-0.00	0.53
5.59	15.44	-1.00	0.0	-3504.64	12.04	-1887.94	31.44	-100.83	24.78	13.10	-0.00	0.54
5.60	2.64	-1.00	0.0	-18.38	-7.70	12.44	-3.13	-31.05	3.45	23.50	0.42	-0.68

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.0	41.23	-0.03	-0.01	-2321.13	-43.38	-58.28	20.09	13.54	7.66	13.46	0.02	0.03
0.01	41.62	-0.02	-0.01	-2305.70	-38.30	-44.11	23.90	0.72	5.63	13.44	0.02	0.02
0.02	41.62	-0.02	-0.01	-2333.41	-38.34	-62.02	33.38	29.25	-5.96	13.44	0.02	0.03
0.03	41.52	-0.01	-0.01	-2344.20	-38.41	-56.41	33.26	15.05	-12.86	13.44	0.02	0.02
0.04	41.62	-0.02	-0.01	-2359.00	-48.72	-34.81	16.06	-17.93	-10.74	13.44	0.02	0.01
0.05	41.52	-0.01	-0.01	-2368.97	-48.67	-55.64	6.61	15.35	-3.82	13.44	0.02	0.02
0.06	41.62	-0.02	-0.01	-2374.25	-38.49	-70.71	14.07	26.55	4.24	13.44	0.02	0.02
0.07	41.62	-0.02	-0.01	-2374.25	-28.31	-79.87	21.54	43.75	13.46	13.44	0.01	0.02
0.08	41.62	-0.02	-0.01	-2351.83	-28.32	-60.74	11.98	18.68	19.25	13.44	0.01	0.03
0.09	41.62	-0.02	-0.01	-2318.62	-28.36	-30.89	2.37	-25.41	18.14	13.44	0.01	0.01
0.10	41.62	-0.02	-0.01	-2308.90	-28.22	-49.13	12.12	0.78	13.58	13.44	0.01	0.02
0.11	41.62	-0.02	-0.01	-2299.16	-28.13	-56.43	21.79	10.66	10.18	13.44	0.01	0.02
0.12	41.62	-0.02	-0.01	-2259.19	-38.24	-62.53	14.43	32.89	0.93	13.44	0.02	0.03
0.13	41.62	-0.02	-0.01	-2311.02	-43.40	-50.50	20.14	11.06	-11.69	13.44	0.02	0.02
0.14	41.62	-0.02	-0.01	-2327.07	-43.59	-24.00	19.64	-28.09	-18.63	13.44	0.02	0.01
0.15	41.62	-0.02	-0.01	-2349.49	-43.54	-49.35	29.50	8.28	-17.52	13.43	0.02	0.02
0.16	41.62	-0.02	-0.01	-2353.75	-48.54	-70.36	16.34	25.40	-10.69	13.44	0.02	0.03
0.17	41.62	-0.02	-0.01	-2368.99	-48.53	-83.13	6.82	44.65	0.80	13.44	0.02	0.04
0.18	41.62	-0.02	-0.01	-2368.96	-33.41	-68.36	17.79	6.57	7.77	13.44	0.01	0.03
0.19	41.62	-0.02	-0.01	-2368.71	-23.41	-43.77	24.96	-20.99	6.55	13.44	0.01	0.02
0.20	41.62	-0.02	-0.01	-2340.85	-23.22	-71.48	15.70	-64.79	3.25	13.44	0.01	0.03
0.21	41.62	-0.02	-0.01	-2319.31	-23.07	-88.24	15.91	-388.72	1.57	13.44	0.01	0.04
0.22	41.62	-0.02	-0.01	-2303.03	-28.01	-105.56	12.40	-834.08	2.36	13.44	0.01	0.04
0.23	41.62	-0.02	-0.01	-2297.73	-32.90	-135.84	18.47	-1560.62	9.23	13.44	0.01	0.06
0.24	41.62	-0.02	-0.01	-2295.02	-37.55	-251.33	15.29	-2351.29	14.49	13.44	0.02	0.11
0.25	41.62	-0.02	-0.01	-2301.51	-36.45	-552.40	26.26	-2398.53	8.77	13.43	0.02	0.29
0.26	41.62	-0.03	-0.01	-2283.54	-24.92	-937.15	35.37	-1968.70	-15.57	13.43	0.01	0.41
0.27	41.52	-0.04	-0.01	-2233.67	-18.49	-1296.92	40.72	-1567.14	-63.93	13.44	0.01	0.50
0.28	41.52	-0.06	-0.01	-2174.85	-17.80	-1483.39	31.96	-1370.79	-128.59	13.43	0.01	0.63
0.29	41.43	-0.11	-0.01	-2124.43	-17.73	-1509.18	22.38	2885.82	-205.57	13.43	0.01	0.71
0.30	41.33	-0.18	-0.01	-2094.88	-7.57	-1504.43	48.88	-819.70	-253.82	13.42	0.00	0.72
0.31	41.13	-0.27	-0.01	-2115.71	7.31	-1418.58	88.16	373.15	-257.72	13.41	-0.00	0.67
0.32	40.84	-0.38	-0.01	-2114.11	-8.11	-1304.24	85.51	844.40	-210.61	13.40	0.00	0.62
0.33	40.35	-0.49	-0.01	-2102.44	-33.69	-1265.91	59.27	-1210.47	-159.36	13.40	0.02	0.57
0.34	39.67	-0.58	-0.01	-2109.88	-39.94	-1190.97	6.69	1131.92	-163.83	13.39	0.02	0.56
0.35	38.89	-0.65	-0.01	-2130.68	-18.55	-1264.08	21.53	-425.44	-186.44	13.38	0.01	0.59
0.36	38.40	-0.72	-0.01	-2179.72	11.74	-1284.62	52.90	183.88	-167.56	13.37	-0.01	0.59
0.37	38.50	-0.77	-0.01	-2202.08	26.82	-1252.69	63.77	501.97	-155.66	13.37	-0.01	0.57

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TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	KS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.36	38.98	-0.82	-0.01	-2222.74	16.42	-1185.39	27.06	-324.04	-106.84	13.36	-0.01	0.53
0.39	39.28	-0.85	-0.01	-2249.32	-4.14	-1118.81	12.50	181.76	-76.68	13.36	0.00	0.50
0.40	39.28	-0.88	-0.01	-2276.81	-9.24	-1120.37	8.84	266.35	-63.99	13.36	0.00	0.49
0.41	39.08	-0.90	-0.01	-2298.59	-4.23	-1123.07	12.44	-223.11	-59.57	13.35	0.00	0.49
0.42	39.08	-0.92	-0.01	-2320.17	-9.35	-1126.66	8.71	241.06	-58.11	13.35	0.00	0.49
0.43	39.28	-0.94	-0.01	-2313.38	-19.62	-1084.48	-17.86	-114.55	-40.17	13.35	0.01	0.47
0.44	39.28	-0.95	-0.01	-2324.51	-9.67	-1036.99	-10.79	-390.59	-14.31	13.35	0.00	0.45
0.45	39.06	-0.96	-0.01	-2347.73	5.64	-1064.86	19.45	65.99	4.48	13.35	-0.00	0.45
0.46	38.69	-0.97	-0.01	-2330.34	10.94	-1115.30	23.43	-111.83	5.86	13.35	-0.00	0.46
0.47	38.69	-0.97	-0.01	-2346.12	0.98	-1175.15	16.32	-125.61	-7.04	13.35	-0.00	0.50
0.48	38.98	-0.98	-0.01	-2345.50	-9.14	-1166.68	8.99	223.53	-17.09	13.35	0.00	0.51
0.49	39.18	-0.98	-0.01	-2340.19	-19.36	-1158.93	1.56	-16.45	-15.27	13.35	0.01	0.50
0.50	39.28	-0.99	-0.01	-2340.58	-14.29	-1147.28	5.25	-100.18	4.29	13.35	0.01	0.49
0.51	39.37	-0.99	-0.01	-2336.11	-4.19	-1119.31	12.57	165.57	22.53	13.35	0.00	0.48
0.52	39.57	-0.99	-0.01	-2331.25	0.90	-1115.72	15.30	-122.58	26.70	13.35	-0.00	0.48
0.53	39.66	-0.99	-0.01	-2330.82	5.89	-1110.80	19.80	-101.52	12.69	13.35	-0.00	0.46
0.54	40.00	-1.00	-0.01	-2330.40	5.79	-1099.05	19.62	70.61	-0.47	13.35	-0.00	0.47
0.55	39.77	-1.00	-0.01	-2325.14	-4.19	-1122.95	12.53	-82.47	2.19	13.35	0.00	0.48
0.56	39.28	-1.00	-0.01	-2330.62	-14.32	-1118.86	5.26	-39.49	15.93	12.35	0.01	0.48
0.57	38.79	-1.00	-0.01	-2325.55	-19.33	-1120.74	1.71	14.87	20.55	13.35	0.01	0.48
0.58	38.49	-1.00	-0.01	-2320.05	-9.25	-1112.35	8.91	-71.50	10.31	13.35	0.00	0.48
0.59	38.40	-1.00	-0.01	-2324.90	0.77	-1104.20	16.02	-99.71	-0.20	13.35	-0.00	0.47
0.60	38.20	-1.00	-0.01	-2324.70	5.96	-1131.79	19.85	68.13	4.08	13.35	-0.00	0.49
0.61	38.01	-1.00	-0.01	-2319.83	6.01	-1176.70	19.97	-14.64	19.41	13.35	-0.00	0.49
0.62	37.91	-1.00	-0.01	-2325.52	0.91	-1116.13	16.29	6.66	27.50	13.35	-0.00	0.48
0.63	37.91	-1.00	-0.01	-2325.73	-9.33	-1090.84	6.82	107.97	19.25	13.35	0.00	0.47
0.64	37.91	-1.00	-0.01	-2325.94	-19.62	-1059.17	1.27	-75.73	5.74	13.35	0.01	0.46
0.65	37.81	-1.00	-0.01	-2331.24	-14.53	-1072.43	4.96	-7.64	1.02	13.34	0.01	0.46
0.66	37.81	-1.00	-0.01	-2326.38	-9.44	-1058.53	8.08	-33.37	7.02	13.35	0.00	0.46
0.67	37.81	-1.00	-0.01	-2321.29	-4.33	-1065.62	12.42	-10.67	18.61	13.35	0.00	0.46
0.68	37.81	-1.00	-0.01	-2315.98	0.66	-1042.16	15.96	-135.15	23.43	13.34	-0.00	0.45
0.69	37.81	-1.00	-0.01	-2326.31	10.66	-1028.63	23.05	-136.97	20.96	13.34	-0.00	0.44
0.70	37.81	-1.00	-0.01	-2325.94	5.79	-1078.46	19.67	-100.60	15.10	13.34	-0.00	0.45
0.71	37.91	-1.00	-0.01	-2325.54	0.85	-1109.99	16.19	-62.05	13.80	13.34	-0.00	0.46
0.72	37.91	-1.00	-0.01	-2330.65	-9.17	-1141.48	9.05	-39.08	12.55	13.34	0.00	0.49
0.73	38.01	-1.00	-0.01	-2335.50	-19.35	-1136.71	1.64	-58.93	12.42	13.34	0.01	0.49
0.74	38.01	-1.00	-0.01	-2335.25	-14.39	-1116.46	5.13	-50.98	12.22	13.34	0.01	0.48
0.75	38.01	-1.00	-0.01	-2335.27	-9.21	-1140.37	8.94	88.57	14.34	13.34	0.00	0.49

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.76	38.10	-1.00	-0.01	-2324.71	1.02	-1154.72	16.41	-56.06	15.89	13.34	-0.00	0.50
0.77	38.20	-1.00	-0.01	-2324.92	6.09	-1153.07	20.07	-3.08	18.19	13.34	-0.00	0.50
0.78	38.20	-1.00	-0.01	-2320.03	5.97	-1114.13	19.91	15.34	22.85	13.34	-0.00	0.48
0.79	38.30	-1.00	-0.01	-2314.70	0.77	-1076.94	16.07	-147.73	25.38	13.34	-0.00	0.47
0.80	38.30	-1.00	-0.01	-2325.31	-9.28	-1105.57	8.88	53.32	20.39	13.34	0.00	0.48
0.81	38.40	-1.00	-0.01	-2314.57	-19.29	-1126.17	1.75	69.10	12.33	13.34	0.01	0.49
0.82	41.62	-0.02	3.97	-2324.19	-1062.96	-87.02	83.16	31.14	58.05	13.42	0.46	0.04
0.83	41.62	-0.02	3.97	-2325.20	-1058.03	-54.38	96.18	2.08	53.48	13.42	0.46	0.02
0.84	41.62	-0.02	3.97	-2309.35	-1057.96	-55.71	96.29	-8.93	51.32	13.42	0.46	0.02
0.85	41.62	-0.02	3.97	-2308.32	-1068.06	-65.97	79.43	17.51	51.22	13.42	0.46	0.03
0.86	41.52	-0.02	3.97	-2314.87	-1068.03	-70.18	89.03	33.74	52.44	13.42	0.46	0.03
0.87	41.52	-0.02	3.97	-2338.29	-1063.03	-62.81	112.57	0.79	55.96	13.41	0.45	0.03
0.88	41.52	-0.02	3.97	-2365.93	-1063.22	-35.22	121.82	-28.16	59.32	13.41	0.45	0.01
0.89	41.62	-0.02	3.97	-2370.20	-1073.30	-56.48	104.12	-3.45	58.07	13.42	0.45	0.02
0.90	41.52	-0.02	3.97	-2374.48	-1078.29	-84.34	91.00	41.33	54.51	13.42	0.45	0.04
0.91	41.52	-0.02	3.97	-2369.21	-1078.22	-94.45	91.10	59.89	54.54	13.42	0.46	0.04
0.92	41.52	-0.02	3.97	-2363.92	-1068.10	-91.56	98.46	45.89	51.17	13.42	0.45	0.04
0.93	41.52	-0.02	3.97	-2341.28	-1063.15	-59.02	92.41	-3.27	40.54	13.42	0.45	0.03
0.94	41.62	-0.02	3.97	-2318.89	-1057.99	-66.83	86.70	17.71	50.02	13.42	0.46	0.03
0.95	41.52	-0.02	3.97	-2303.02	-1052.84	-66.40	90.52	15.86	58.21	13.42	0.46	0.03
0.96	41.62	-0.02	3.97	-2314.84	-1047.80	-64.82	103.73	14.12	60.57	13.42	0.45	0.03
0.97	41.62	-0.02	3.97	-2331.95	-1057.99	-56.19	105.81	4.21	58.25	13.42	0.45	0.02
0.98	41.62	-0.02	3.97	-2325.61	-1073.28	-31.55	85.06	-35.48	57.06	13.42	0.46	0.01
0.99	41.62	-0.02	3.97	-2331.12	-1083.37	-41.70	78.65	-46.20	57.12	13.41	0.46	0.02
1.00	41.52	-0.02	3.97	-2354.36	-1078.24	-67.24	100.63	-59.04	57.16	13.42	0.46	0.03
1.01	41.62	-0.02	3.97	-2370.46	-1073.15	-89.17	104.35	-281.86	55.28	13.42	0.45	0.04
1.02	41.62	-0.02	3.97	-2375.32	-1068.11	-97.58	107.98	-701.64	51.26	13.42	0.45	0.04
1.03	41.52	-0.02	3.97	-2362.87	-1073.08	-119.86	94.84	-1361.40	49.91	13.42	0.45	0.05
1.04	41.62	-0.03	3.97	-2343.71	-1062.49	-237.24	93.26	-2210.93	52.12	13.42	0.45	0.10
1.05	41.62	-0.03	3.97	-2305.61	-1036.29	-467.25	93.70	-2494.36	37.98	13.42	0.45	0.20
1.06	41.62	-0.03	3.97	-2261.74	-969.44	-792.38	85.49	-2128.83	-12.34	13.42	0.43	0.35
1.07	41.52	-0.05	3.97	-2202.75	-831.91	-1122.41	90.27	-1768.12	-100.70	13.42	0.38	0.51
1.08	41.52	-0.07	3.97	-2163.23	-629.23	-1344.26	104.30	-1536.43	-203.34	13.41	0.29	0.62
1.09	41.52	-0.12	3.97	-2142.06	-416.70	-1469.63	124.70	2309.65	-298.01	13.41	0.19	0.70
1.10	41.43	-0.19	3.97	-2108.73	-239.66	-1554.10	138.73	-488.67	-336.50	13.40	0.11	0.74
1.11	41.33	-0.29	3.97	-2106.51	-133.69	-1522.98	129.60	122.15	-314.20	13.39	0.06	0.72
1.12	41.13	-0.39	3.97	-2085.96	-93.61	-1393.97	91.67	1196.99	-245.38	13.39	0.04	0.67
1.13	40.74	-0.50	3.97	-2080.15	-73.74	-1271.54	77.41	-1310.35	-180.44	13.37	0.04	0.61

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.14	40.25	-0.59	3.97	-2119.24	-58.69	-1261.65	97.81	961.33	-177.43	13.36	0.03	0.60
1.15	39.47	-0.66	3.97	-2140.25	-58.60	-1319.43	97.92	-367.69	-200.46	13.36	0.03	0.62
1.16	38.69	-0.72	3.97	-2170.77	-78.82	-1366.81	73.82	-108.67	-210.42	13.35	0.04	0.63
1.17	38.30	-0.77	3.97	-2201.63	-109.36	-1364.29	32.68	530.07	-192.18	13.35	0.05	0.62
1.18	38.50	-0.82	3.97	-2221.91	-129.74	-1320.27	8.41	-457.60	-154.81	13.34	0.06	0.59
1.19	38.98	-0.86	3.97	-2259.52	-124.70	-1335.40	12.15	82.30	-129.31	13.33	0.06	0.59
1.20	39.16	-0.88	3.97	-2275.79	-104.42	-1348.10	26.72	302.41	-113.48	13.34	0.05	0.59
1.21	39.08	-0.91	3.97	-2280.24	-94.26	-1358.56	24.61	-234.05	-97.52	13.33	0.04	0.60
1.22	38.98	-0.92	3.97	-2301.76	-79.21	-1338.48	35.34	171.71	-83.31	13.33	0.03	0.58
1.23	38.98	-0.94	3.97	-2313.95	-69.26	-1293.44	51.95	228.15	-69.50	13.33	0.03	0.56
1.24	39.18	-0.95	3.97	-2331.46	-74.37	-1279.02	57.82	-242.18	-54.73	13.33	0.03	0.55
1.25	39.18	-0.96	3.98	-2341.82	-94.68	-1260.79	53.66	169.12	-35.82	13.33	0.04	0.54
1.26	38.96	-0.97	3.98	-2336.33	-114.92	-1243.69	9.62	40.34	-18.12	13.33	0.05	0.53
1.27	38.79	-0.97	3.97	-2330.20	-120.05	-1225.49	-3.65	-251.03	-12.98	13.33	0.05	0.53
1.28	38.79	-0.98	3.97	-2346.85	-110.07	-1207.63	12.94	11.86	-17.08	13.33	0.05	0.51
1.29	38.93	-0.98	3.98	-2335.88	-94.75	-1233.90	24.05	-33.92	-10.12	13.33	0.04	0.53
1.30	39.18	-0.99	3.97	-2330.71	-84.48	-1259.13	41.09	-231.55	-9.65	13.33	0.04	0.54
1.31	39.47	-0.99	3.97	-2336.48	-84.43	-1266.91	41.17	88.10	1.23	13.33	0.04	0.54
1.32	39.77	-0.99	3.97	-2325.69	-84.39	-1263.86	41.23	-5.86	6.00	13.33	0.04	0.54
1.33	40.06	-0.99	3.97	-2325.47	-94.60	-1249.73	33.79	-250.83	-2.91	13.33	0.04	0.54
1.34	40.06	-1.00	3.97	-2330.38	-99.58	-1283.84	30.25	103.06	-16.32	13.33	0.04	0.55
1.35	39.67	-1.00	3.97	-2319.61	-104.53	-1298.34	26.77	140.62	-15.21	13.33	0.05	0.56
1.36	39.08	-1.00	3.98	-2320.22	-104.57	-1277.94	26.77	-110.27	0.38	13.33	0.05	0.55
1.37	38.69	-1.00	3.97	-2315.31	-99.61	-1241.03	30.28	46.06	9.42	13.33	0.04	0.54
1.38	38.40	-1.00	3.97	-2303.88	-94.72	-1197.35	24.12	-46.30	6.14	13.33	0.04	0.52
1.39	38.30	-1.00	3.97	-2305.91	-89.59	-1217.15	27.93	-202.59	-0.42	13.32	0.04	0.53
1.40	38.10	-1.00	3.97	-2315.32	-89.53	-1238.43	37.55	76.36	-2.13	13.32	0.04	0.53
1.41	37.81	-1.00	3.98	-2310.05	-94.50	-1250.60	34.06	146.25	2.41	13.32	0.04	0.54
1.42	37.81	-1.00	3.97	-2315.53	-99.64	-1233.02	30.31	-145.93	6.37	13.32	0.04	0.53
1.43	37.81	-1.00	3.97	-2320.15	-99.88	-1185.60	20.42	-11.22	8.37	13.32	0.04	0.51
1.44	37.81	-1.00	3.97	-2315.29	-89.75	-1180.20	27.74	-92.50	8.72	13.32	0.04	0.51
1.45	37.71	-1.00	3.97	-2326.93	-84.62	-1202.88	41.02	-232.40	5.56	13.32	0.04	0.52
1.46	37.62	-1.00	3.97	-2320.00	-84.50	-1238.31	31.61	-31.00	-1.86	13.32	0.04	0.53
1.47	37.62	-1.00	3.97	-2320.63	-94.54	-1255.29	33.99	-117.61	-4.09	13.32	0.04	0.54
1.48	37.71	-1.00	3.97	-2325.46	-99.67	-1245.94	30.24	-275.04	2.87	13.32	0.04	0.54
1.49	37.62	-1.00	3.97	-2324.84	-104.57	-1283.20	26.81	-46.00	8.06	13.32	0.04	0.55
1.50	37.62	-1.00	3.97	-2329.74	-109.49	-1325.73	23.37	146.93	5.31	13.32	0.05	0.57
1.51	37.62	-1.00	3.97	-2318.99	-109.38	-1346.30	23.53	-18.53	-2.39	13.32	0.05	0.58

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TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.52	37.71	-1.00	3.97	-2324.47	-99.38	-1323.83	30.60	39.66	-7.10	13.32	0.04	0.57
1.53	37.71	-1.00	3.97	-2330.33	-89.52	-1264.52	37.52	80.01	-2.50	13.32	0.04	0.54
1.54	37.71	-1.00	3.97	-2320.39	-89.50	-1249.31	37.60	-52.84	4.92	13.32	0.04	0.54
1.55	37.81	-1.00	3.97	-2325.05	-94.62	-1239.57	24.35	-1.53	11.76	13.32	0.04	0.55
1.56	37.81	-1.00	3.97	-2320.19	-94.60	-1231.91	24.40	174.70	15.08	13.32	0.04	0.55
1.57	37.91	-1.00	3.97	-2326.93	-94.72	-1204.95	33.79	-151.67	10.00	13.32	0.04	0.52
1.58	37.91	-1.00	3.97	-2332.40	-94.93	-1164.45	33.46	-142.26	1.86	13.32	0.04	0.50
1.59	38.01	-1.00	3.97	-2326.09	-99.92	-1178.94	20.38	-18.15	2.81	13.32	0.04	0.51
1.60	38.01	-1.00	3.97	-2320.61	-94.72	-1206.47	24.24	-194.84	7.77	13.32	0.04	0.52
1.61	38.10	-1.00	3.97	-2325.48	-89.59	-1231.43	27.96	-21.50	8.49	13.32	0.04	0.53
1.62	41.62	-0.03	7.98	-2313.17	-1355.89	-45.44	141.27	-10.15	21.00	13.39	0.59	0.02
1.63	41.52	-0.03	7.98	-2312.35	-1361.01	-36.74	127.97	-19.55	18.71	13.39	0.59	0.02
1.64	41.52	-0.03	7.98	-2300.75	-1376.10	-49.70	107.58	-4.13	22.17	13.39	0.60	0.02
1.65	41.52	-0.03	7.98	-2329.69	-1381.14	-60.37	123.05	12.40	29.11	13.39	0.59	0.03
1.66	41.52	-0.03	7.97	-2359.45	-1386.21	-63.95	148.01	17.75	31.43	13.39	0.59	0.03
1.67	41.52	-0.03	7.98	-2369.80	-1396.47	-47.66	140.45	-8.83	25.50	13.39	0.59	0.02
1.68	41.52	-0.03	7.98	-2363.29	-1416.67	-63.32	116.30	10.28	17.31	13.39	0.60	0.03
1.69	41.52	-0.03	7.98	-2380.21	-1411.56	-85.30	129.57	40.39	14.95	13.39	0.59	0.04
1.70	41.52	-0.03	7.98	-2364.15	-1401.34	-96.15	137.06	59.98	13.86	13.39	0.59	0.04
1.71	41.52	-0.03	7.98	-2347.04	-1391.18	-96.88	133.76	59.65	12.73	13.40	0.59	0.04
1.72	41.62	-0.03	7.98	-2318.29	-1386.20	-67.03	118.22	20.16	11.61	13.40	0.60	0.03
1.73	41.52	-0.03	7.97	-2307.70	-1371.02	-54.42	130.33	1.05	15.18	13.39	0.59	0.02
1.74	41.62	-0.03	7.98	-2307.90	-1355.80	-60.64	141.41	7.16	21.05	13.39	0.59	0.03
1.75	41.62	-0.03	7.98	-2318.69	-1350.76	-64.96	145.05	19.54	22.20	13.39	0.58	0.03
1.76	41.52	-0.03	7.98	-2312.38	-1370.99	-65.77	120.86	19.22	21.00	13.39	0.59	0.03
1.77	41.52	-0.03	7.97	-2318.68	-1386.28	-41.15	119.25	-16.05	19.82	13.39	0.60	0.02
1.78	41.52	-0.03	7.98	-2342.12	-1396.43	-41.16	130.97	-32.13	19.64	13.39	0.60	0.02
1.79	41.52	-0.03	7.98	-2370.87	-1401.43	-67.44	146.48	-11.16	18.68	13.39	0.59	0.03
1.80	41.62	-0.03	7.98	-2369.65	-1406.43	-91.02	143.35	-33.52	14.04	13.39	0.59	0.04
1.81	41.62	-0.03	7.97	-2369.45	-1411.45	-102.84	129.73	-251.62	12.67	13.39	0.60	0.04
1.82	41.62	-0.03	7.97	-2369.20	-1406.47	-85.40	133.27	-689.06	16.19	13.39	0.59	0.04
1.83	41.52	-0.03	7.98	-2346.17	-1391.13	-111.61	134.94	-1338.89	24.17	13.39	0.59	0.05
1.84	41.52	-0.03	7.98	-2316.02	-1375.52	-208.98	127.41	-2198.25	25.47	13.39	0.59	0.09
1.85	41.52	-0.04	7.97	-2288.49	-1334.40	-390.73	128.38	-2579.11	7.07	13.39	0.58	0.17
1.86	41.52	-0.05	7.98	-2267.21	-1247.65	-649.09	134.71	-2292.97	-42.84	13.39	0.55	0.29
1.87	41.62	-0.06	7.98	-2251.09	-1080.10	-925.82	151.13	-1597.51	-112.49	13.39	0.48	0.41
1.88	41.52	-0.09	7.98	-2234.90	-862.07	-1216.39	146.77	-1678.97	-187.80	13.39	0.39	0.54
1.89	41.52	-0.15	7.98	-2218.09	-629.05	-1459.69	134.59	1135.58	-266.08	13.39	0.28	0.66

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.90	41.43	-0.22	7.97	-2182.78	-411.42	-1600.63	120.10	324.60	-307.42	13.38	0.19	0.73
1.91	41.23	-0.32	7.98	-2163.54	-259.88	-1593.63	124.75	-669.01	-279.99	13.37	0.12	0.73
1.92	41.13	-0.42	7.98	-2185.35	-169.32	-1458.63	132.08	1451.90	-211.84	13.37	0.08	0.67
1.93	40.94	-0.53	7.98	-2179.16	-144.23	-1375.93	122.28	-1270.10	-152.29	13.36	0.07	0.63
1.94	40.15	-0.61	7.98	-2176.70	-159.44	-1377.09	82.67	788.22	-150.17	13.36	0.07	0.63
1.95	39.60	-0.68	7.98	-2175.73	-174.54	-1411.22	62.42	101.36	-169.65	13.35	0.08	0.65
1.96	39.08	-0.74	7.98	-2219.29	-184.78	-1419.68	64.61	-315.02	-173.70	13.34	0.08	0.64
1.97	38.30	-0.79	7.98	-2258.11	-195.18	-1372.00	66.49	624.83	-158.19	13.34	0.09	0.61
1.98	38.20	-0.83	7.98	-2257.03	-220.55	-1338.48	29.16	-411.64	-120.52	13.34	0.10	0.59
1.99	38.30	-0.86	7.98	-2260.02	-240.85	-1322.89	-14.08	-29.15	-90.10	13.34	0.11	0.59
2.00	38.98	-0.89	7.98	-2271.00	-220.57	-1332.44	0.76	254.99	-74.36	13.33	0.10	0.59
2.01	39.08	-0.91	7.98	-2288.92	-185.11	-1343.88	45.36	-259.02	-67.60	13.33	0.08	0.59
2.02	38.98	-0.93	7.98	-2316.35	-154.91	-1329.55	76.49	60.54	-69.44	13.33	0.07	0.57
2.03	38.96	-0.94	7.98	-2316.36	-154.89	-1336.16	75.53	166.16	-71.95	13.33	0.07	0.58
2.04	39.08	-0.95	7.98	-2321.03	-170.08	-1335.10	56.07	-228.98	-61.97	13.33	0.07	0.56
2.05	39.16	-0.96	7.98	-2331.20	-195.41	-1331.73	28.48	-3.13	-49.68	13.32	0.08	0.57
2.06	39.08	-0.97	7.98	-2337.74	-210.58	-1327.85	26.99	97.40	-44.07	13.33	0.09	0.57
2.07	38.79	-0.98	7.98	-2342.80	-220.82	-1311.50	19.51	-287.70	-49.31	13.33	0.09	0.56
2.08	38.89	-0.98	7.98	-2341.16	-220.75	-1344.18	10.21	-71.50	-60.25	13.32	0.09	0.57
2.09	38.79	-0.98	7.98	-2336.30	-210.42	-1384.32	27.14	112.77	-59.45	13.33	0.09	0.59
2.10	39.19	-0.99	7.98	-2325.50	-200.16	-1401.37	34.64	0.31	-46.52	13.33	0.09	0.60
2.11	39.67	-0.99	7.98	-2331.79	-190.05	-1390.71	51.61	3.98	-30.41	13.32	0.08	0.60
2.12	40.16	-0.99	7.98	-2332.15	-185.19	-1337.84	54.83	122.58	-20.24	13.33	0.08	0.57
2.13	40.35	-0.99	7.98	-2322.00	-185.19	-1321.46	54.99	-166.05	-18.38	13.32	0.08	0.57
2.14	40.06	-1.00	7.98	-2326.48	-185.21	-1329.59	45.28	-25.35	-23.22	13.33	0.08	0.57
2.15	39.47	-1.00	7.98	-2321.00	-195.24	-1347.21	38.13	132.01	-26.97	13.33	0.08	0.58
2.16	38.93	-1.00	7.98	-2315.92	-200.30	-1338.92	34.67	11.91	-22.07	13.32	0.09	0.58
2.17	38.69	-1.00	7.98	-2321.37	-200.50	-1292.85	34.38	-89.42	-13.92	13.32	0.09	0.56
2.18	38.50	-1.00	7.98	-2320.74	-200.58	-1275.14	24.74	-30.31	-10.51	13.32	0.09	0.55
2.19	38.36	-1.00	7.98	-2315.68	-200.50	-1285.14	24.87	-186.70	-10.09	13.32	0.09	0.55
2.20	38.01	-1.00	7.98	-2315.28	-195.34	-1312.31	28.63	-87.21	-12.64	13.32	0.08	0.57
2.21	37.91	-1.00	7.98	-2315.69	-195.23	-1338.03	36.32	25.60	-12.96	13.32	0.08	0.58
2.22	37.91	-1.00	7.98	-2310.17	-190.22	-1322.05	41.85	-148.16	-11.56	13.32	0.08	0.57
2.23	37.81	-1.00	7.98	-2315.23	-190.21	-1329.37	41.67	-121.45	-7.11	13.32	0.08	0.57
2.24	37.71	-1.00	7.98	-2321.36	-190.10	-1354.16	51.57	22.56	-6.22	13.32	0.08	0.58
2.25	37.62	-1.00	7.98	-2304.29	-189.97	-1376.78	42.21	-68.54	-9.46	13.32	0.08	0.60
2.26	37.62	-1.00	7.98	-2326.48	-200.11	-1369.44	44.45	-39.78	-13.06	13.32	0.09	0.60
2.27	37.72	-1.00	7.98	-2313.80	-210.37	-1356.66	17.88	109.50	-10.00	13.32	0.09	0.59

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	FH	NFY	NFA
2.28	37.62	-1.00	7.98	-2315.04	-215.42	-1346.85	23.82	-189.10	-2.47	13.32	0.09	0.56
2.29	37.62	-1.00	7.98	-2331.31	-210.40	-1347.32	27.42	-77.76	4.28	13.32	0.09	0.54
2.30	37.62	-1.00	7.98	-2326.25	-205.27	-1356.54	31.18	44.65	5.37	13.32	0.09	0.58
2.31	37.62	-1.00	7.98	-2320.56	-205.21	-1372.97	31.24	-135.08	-3.59	13.32	0.09	0.59
2.32	37.71	-1.00	7.98	-2330.91	-195.23	-1358.16	38.27	7.74	-12.08	13.32	0.08	0.56
2.33	37.71	-1.00	7.98	-2320.34	-190.10	-1361.59	42.17	5.53	-9.67	13.31	0.08	0.59
2.34	37.71	-1.00	7.98	-2326.86	-185.02	-1359.71	55.25	-109.24	0.99	13.32	0.08	0.55
2.35	37.71	-1.00	7.98	-2326.03	-190.08	-1360.19	42.09	10.84	7.70	13.32	0.08	0.56
2.36	37.81	-1.00	7.98	-2320.76	-200.17	-1362.43	34.86	64.50	4.17	13.32	0.09	0.59
2.37	37.81	-1.00	7.98	-2326.24	-210.46	-1332.11	27.51	-109.95	-3.64	13.31	0.09	0.57
2.38	37.91	-1.00	7.98	-2336.81	-210.52	-1325.43	27.40	-24.18	-7.33	13.31	0.09	0.57
2.39	37.91	-1.00	7.98	-2337.03	-210.47	-1355.69	27.49	58.10	-1.63	13.31	0.09	0.57
2.40	38.01	-1.00	7.95	-2320.55	-200.30	-1330.75	25.16	-47.18	5.70	13.32	0.09	0.57
2.41	38.10	-1.00	7.98	-2326.86	-190.23	-1319.03	42.06	15.01	7.89	13.31	0.08	0.57
2.42	41.52	-0.05	12.00	-2355.77	-1517.75	-40.93	131.54	-21.45	-10.37	13.37	0.04	0.02
2.43	41.62	-0.05	12.00	-2379.23	-1517.65	-71.46	150.79	16.63	-10.35	13.37	0.04	0.03
2.44	41.62	-0.05	12.00	-2390.64	-1517.61	-88.42	159.15	44.55	-12.76	13.38	0.03	0.04
2.45	41.62	-0.05	12.00	-2356.44	-1517.46	-105.19	140.26	62.05	-15.07	13.38	0.04	0.04
2.46	41.62	-0.05	12.00	-2332.96	-1502.39	-71.58	131.99	12.12	-10.44	13.38	0.04	0.03
2.47	41.62	-0.05	12.00	-2333.13	-1477.19	-43.46	150.16	-26.93	1.20	13.38	0.02	0.02
2.48	41.52	-0.05	12.00	-2327.02	-1461.92	-59.10	151.74	7.86	8.19	13.38	0.03	0.03
2.49	41.62	-0.05	12.00	-2303.81	-1451.71	-69.13	140.11	28.34	8.26	13.38	0.03	0.03
2.50	41.62	-0.05	12.00	-2296.45	-1441.62	-70.69	128.29	28.69	5.93	13.38	0.03	0.03
2.51	41.62	-0.05	12.00	-2313.74	-1431.69	-35.70	146.04	-17.71	4.88	13.37	0.02	0.02
2.52	41.62	-0.05	12.00	-2331.66	-1441.89	-22.04	157.69	-41.57	2.54	13.37	0.02	0.01
2.53	41.52	-0.04	12.00	-2343.33	-1472.13	-57.26	144.29	7.18	-4.46	13.38	0.03	0.02
2.54	41.62	-0.05	12.00	-2349.48	-1507.45	-61.61	129.57	31.73	-10.35	13.37	0.04	0.02
2.55	41.52	-0.05	12.00	-2372.71	-1522.65	-68.37	137.67	43.51	-12.75	13.37	0.04	0.04
2.56	41.62	-0.05	12.00	-2385.33	-1517.69	-65.73	160.28	4.00	-9.26	13.37	0.04	0.03
2.57	41.62	-0.05	12.00	-2361.88	-1522.73	-56.85	136.31	-12.11	-3.53	13.38	0.04	0.02
2.58	41.62	-0.05	12.00	-2350.07	-1512.49	-75.28	134.27	20.69	1.06	13.38	0.04	0.03
2.59	41.62	-0.05	12.00	-2321.55	-1487.11	-81.08	135.61	17.85	5.83	13.38	0.04	0.03
2.60	41.62	-0.05	12.00	-2321.76	-1461.81	-80.15	151.92	-70.21	7.27	13.38	0.03	0.03
2.61	41.62	-0.05	12.00	-2309.90	-1446.77	-48.35	153.12	-408.25	2.03	13.38	0.03	0.02
2.62	41.62	-0.05	12.00	-2297.26	-1441.75	-44.25	137.61	-832.03	-6.44	13.38	0.03	0.02
2.63	41.52	-0.05	12.00	-2313.79	-1431.47	-101.53	155.86	-1431.90	-14.62	13.37	0.02	0.04
2.64	41.62	-0.05	12.00	-2329.28	-1421.15	-203.16	165.79	-2215.05	-27.38	13.37	0.01	0.09
2.65	41.62	-0.06	12.00	-2335.98	-1425.56	-376.34	160.54	-2595.77	-48.17	13.37	0.01	0.10

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TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
2.66	41.62	-0.07	12.00	-2336.25	-1379.45	-609.91	136.75	-2346.88	-91.25	13.37	0.59	0.26
2.67	41.62	-0.09	12.00	-2329.90	-1242.21	-907.66	121.51	-2622.65	-154.13	13.37	0.53	0.39
2.68	41.52	-0.12	12.00	-2341.62	-1019.06	-1226.47	130.10	115.27	-229.16	13.37	0.44	0.52
2.69	41.52	-0.16	12.00	-2329.25	-760.80	-1463.64	125.69	-472.28	-291.22	13.37	0.33	0.63
2.70	41.43	-0.25	12.00	-2304.68	-528.03	-1594.68	121.92	1800.02	-324.01	13.37	0.23	0.65
2.71	41.33	-0.35	12.00	-2265.69	-361.33	-1555.65	118.10	-1288.58	-269.45	13.37	0.16	0.69
2.72	41.23	-0.46	12.00	-2244.71	-265.52	-1463.01	120.39	1697.80	-226.32	13.37	0.12	0.65
2.73	41.04	-0.55	12.00	-2228.81	-230.18	-1403.83	126.92	-655.11	-179.09	13.37	0.10	0.63
2.74	40.64	-0.64	12.00	-2240.23	-225.23	-1382.37	130.63	-12.26	-179.78	13.36	0.10	0.62
2.75	40.06	-0.70	12.00	-2250.84	-250.56	-1393.19	112.31	692.82	-197.26	13.36	0.11	0.62
2.76	39.28	-0.76	12.00	-2238.19	-291.12	-1373.70	63.88	-712.41	-196.05	13.36	0.13	0.61
2.77	38.50	-0.80	12.00	-2240.67	-331.69	-1361.01	15.73	606.10	-179.08	13.35	0.15	0.61
2.78	38.10	-0.84	12.00	-2246.46	-341.74	-1364.38	-0.94	-55.58	-152.41	13.35	0.15	0.61
2.79	38.40	-0.87	12.00	-2268.19	-316.51	-1353.35	17.48	-352.94	-127.61	13.34	0.14	0.60
2.80	38.89	-0.90	12.00	-2280.18	-281.09	-1345.27	52.56	327.33	-109.09	13.34	0.12	0.59
2.81	39.18	-0.92	12.00	-2280.13	-260.91	-1325.93	67.05	-230.30	-94.28	13.34	0.11	0.58
2.82	39.08	-0.93	12.00	-2279.49	-255.78	-1344.33	70.76	-162.51	-91.13	13.34	0.11	0.59
2.83	38.89	-0.95	12.00	-2289.88	-260.72	-1385.29	67.29	246.21	-91.92	13.34	0.11	0.60
2.84	38.98	-0.96	12.00	-2301.49	-265.71	-1399.63	73.51	-97.65	-82.11	13.33	0.12	0.61
2.85	39.18	-0.97	12.00	-2329.58	-286.02	-1389.70	68.42	-103.75	-67.13	13.33	0.12	0.60
2.86	39.18	-0.97	12.00	-2339.71	-316.57	-1348.44	36.80	229.69	-51.69	13.33	0.14	0.58
2.87	38.93	-0.98	12.00	-2315.66	-336.83	-1233.56	-6.40	-240.53	-43.94	13.33	0.15	0.58
2.88	36.79	-0.98	12.00	-2331.74	-336.81	-1351.72	-6.35	-52.90	-40.82	13.33	0.14	0.58
2.89	36.69	-0.98	12.00	-2326.24	-311.43	-1366.22	11.95	161.53	-39.99	13.33	0.13	0.59
2.90	38.98	-0.99	12.00	-2327.27	-286.07	-1372.47	39.79	-225.72	-33.42	13.33	0.12	0.59
2.91	39.47	-0.99	12.00	-2333.53	-271.03	-1335.85	60.04	-48.41	-24.59	13.33	0.12	0.57
2.92	40.00	-0.99	12.00	-2323.78	-265.91	-1333.47	73.32	58.51	-21.27	13.33	0.11	0.57
2.93	40.35	-0.99	12.00	-2323.60	-270.86	-1362.84	69.83	-187.88	-26.60	13.33	0.12	0.59
2.94	40.25	-1.00	12.00	-2326.70	-286.00	-1382.11	58.96	-26.27	-32.74	13.33	0.12	0.59
2.95	39.67	-1.00	12.00	-2327.69	-306.21	-1394.68	34.90	123.64	-36.52	13.35	0.13	0.60
2.96	39.05	-1.00	12.00	-2322.38	-321.48	-1366.93	23.85	-107.56	-32.72	13.33	0.14	0.59
2.97	38.69	-1.00	12.00	-2326.81	-326.63	-1350.70	10.54	-33.28	-23.72	13.33	0.14	0.58
2.98	38.49	-1.00	12.00	-2327.23	-316.48	-1350.97	17.90	135.15	-16.94	13.33	0.14	0.56
2.99	38.40	-1.00	12.00	-2311.37	-301.23	-1350.75	28.92	-134.59	-16.30	13.33	0.13	0.58
3.00	38.10	-1.00	12.00	-2322.98	-291.15	-1349.50	45.67	-0.71	-22.30	13.33	0.13	0.58
3.01	37.91	-1.00	12.00	-2323.16	-281.18	-1315.27	52.73	69.90	-24.72	13.33	0.12	0.57
3.02	37.91	-1.00	12.00	-2312.58	-271.05	-1307.75	60.04	-183.37	-20.73	13.33	0.12	0.57
3.03	37.91	-1.00	12.00	-2323.37	-276.08	-1318.48	56.68	-71.73	-14.01	13.32	0.12	0.57

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.04	37.81	-1.00	12.00	-2323.37	-281.09	-1327.14	52.89	28.65	-11.88	13.33	0.12	0.57
3.05	37.71	-1.00	12.00	-2306.29	-291.13	-1341.13	36.19	-161.75	-17.28	13.33	0.12	0.56
3.06	37.62	-1.00	12.00	-2328.26	-296.32	-1331.50	42.10	-111.14	-25.65	13.32	0.13	0.57
3.07	37.71	-1.00	12.00	-2327.84	-306.39	-1347.02	34.89	-18.71	-25.96	13.32	0.13	0.58
3.08	37.71	-1.00	12.00	-2317.07	-316.36	-1367.15	27.85	-112.04	-17.71	13.32	0.14	0.59
3.09	37.71	-1.00	12.00	-2321.53	-321.40	-1377.12	14.72	27.40	-9.90	13.32	0.14	0.59
3.10	37.62	-1.00	12.00	-2317.07	-311.22	-1382.93	31.62	-16.79	-10.92	13.32	0.13	0.60
3.11	37.71	-1.00	12.00	-2323.37	-296.17	-1355.41	51.86	-63.43	-15.47	13.32	0.13	0.58
3.12	37.71	-1.00	12.00	-2322.33	-286.09	-1354.92	49.50	55.48	-22.61	13.32	0.12	0.58
3.13	37.71	-1.00	12.00	-2317.28	-280.96	-1365.67	53.27	27.72	-23.55	13.32	0.12	0.59
3.14	37.71	-1.00	12.00	-2311.36	-281.00	-1349.18	43.69	-113.02	-13.99	13.32	0.12	0.58
3.15	37.81	-1.00	12.00	-2328.87	-286.15	-1326.87	49.50	-7.37	-3.73	13.32	0.12	0.57
3.16	37.81	-1.00	12.00	-2323.56	-296.38	-1297.07	42.06	-77.40	-4.82	13.32	0.13	0.56
3.17	37.91	-1.00	12.00	-2316.84	-306.46	-1315.10	25.27	-139.57	-16.35	13.32	0.13	0.57
3.18	37.91	-1.00	12.00	-2327.23	-311.46	-1345.34	21.72	103.71	-23.79	13.32	0.13	0.56
3.19	38.01	-1.00	12.00	-2322.17	-306.33	-1353.81	25.48	-25.61	-21.10	13.32	0.13	0.56
3.20	38.01	-1.00	12.00	-2327.64	-296.27	-1338.24	32.66	-99.29	-12.89	13.32	0.13	0.57
3.21	38.10	-1.00	12.00	-2322.52	-286.29	-1300.15	39.74	23.36	-9.62	13.32	0.12	0.56
3.22	41.52	-0.69	0.0	5.92	0.01	19.83	-0.03	-54.73	6.94	14.09	0.00	3.35
3.23	41.52	-0.70	0.0	-4.67	0.03	3.67	0.00	-33.81	5.71	14.09	-0.01	-1.79
3.24	41.62	-0.70	0.0	-4.68	0.07	-5.74	0.07	-17.79	6.86	14.09	-0.02	1.23
3.25	41.62	-0.70	0.0	-4.64	-0.04	22.74	-0.11	-57.39	11.46	14.09	0.01	-4.90
3.26	41.52	-0.01	0.0	-1171.35	-19.36	12.23	11.27	-70.17	-2.95	13.68	0.02	-0.01
3.27	41.52	-0.01	0.0	-1192.73	-19.30	-18.96	11.38	-19.44	3.86	13.68	0.02	0.02
3.28	41.62	-0.01	0.0	-1181.96	-19.17	-39.30	11.58	6.64	3.87	13.68	0.02	0.03
3.29	41.62	-0.01	0.0	-1187.05	-19.13	-56.26	11.62	23.21	1.46	13.68	0.02	0.05
3.30	41.62	-0.01	0.0	-1176.25	-19.16	-41.75	11.57	2.67	0.31	13.68	0.02	0.04
3.31	41.62	-0.01	0.0	-1164.40	-19.28	-12.04	1.83	-47.24	-0.87	13.68	0.02	0.01
3.32	41.52	-0.01	0.0	-1158.93	-14.09	-39.04	5.80	-5.58	-3.21	13.68	0.01	0.03
3.33	41.62	-0.01	0.0	-1148.36	-8.94	-46.04	9.73	14.94	1.47	13.68	0.01	0.04
3.34	41.62	-0.01	0.0	-1143.29	-8.89	-46.67	9.83	27.99	5.03	13.68	0.01	0.04
3.35	41.62	-0.01	0.0	-1137.98	-19.12	-16.87	2.09	-12.14	3.89	13.68	0.02	0.02
3.36	41.62	-0.01	0.0	-1143.45	-19.29	16.05	1.83	-73.09	2.79	13.68	0.02	-0.01
3.37	41.62	-0.01	0.0	-1159.55	-24.28	-13.81	-1.83	-31.40	3.89	13.68	0.02	0.01
3.38	41.62	-0.01	0.0	-1171.38	-19.17	-27.46	11.59	-8.64	6.25	13.68	0.02	0.02
3.39	41.62	-0.01	0.0	-1187.47	-19.16	-44.33	11.60	-12.98	3.95	13.68	0.02	0.04
3.40	41.62	-0.01	0.0	-1187.25	-19.23	-33.75	11.47	-94.67	-2.91	13.68	0.02	0.03
3.41	41.62	-0.01	0.0	-1181.52	-9.19	-18.86	18.89	-336.60	-10.66	13.68	0.01	0.02

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TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.42	41.62	-0.01	0.0	-1181.14	-9.00	-65.64	19.16	-714.52	-11.17	13.68	0.01	0.06
3.43	41.62	-0.01	0.0	-1168.92	-8.80	-110.20	9.90	-1297.89	-7.91	13.68	0.01	0.09
3.44	41.62	-0.01	0.0	-1156.50	-8.39	-207.78	10.43	-2099.29	-6.85	13.68	0.01	0.18
3.45	41.62	-0.02	0.0	-1148.55	-12.93	-351.67	16.82	-2613.32	-21.68	13.68	0.01	0.31
3.46	41.62	-0.02	0.0	-1123.06	-12.25	-549.32	17.61	-2401.11	-64.60	13.68	0.01	0.49
3.47	41.52	-0.04	0.0	-1087.34	-16.37	-802.17	24.52	-2107.78	-129.42	13.68	0.02	0.74
3.48	41.52	-0.07	0.0	-1058.62	-15.86	-951.67	34.62	1174.71	-206.17	13.68	0.01	0.90
3.49	41.52	-0.13	0.0	-1016.71	-10.52	-1006.18	57.82	-590.31	-261.74	13.67	0.01	0.99
3.50	41.43	-0.21	0.0	-1007.38	-5.66	-954.17	70.64	1693.09	-287.61	13.67	0.01	0.95
3.51	41.33	-0.31	0.0	-988.86	-5.93	-833.47	80.10	-1538.82	-246.78	13.66	0.01	0.84
3.52	41.13	-0.42	0.0	-983.51	-16.16	-765.17	53.47	1387.71	-188.22	13.65	0.02	0.78
3.53	40.74	-0.53	0.0	-960.59	-21.18	-740.99	30.75	-800.67	-148.29	13.65	0.02	0.77
3.54	40.16	-0.61	0.0	-981.02	-16.05	-784.44	25.07	133.17	-153.62	13.64	0.02	0.80
3.55	39.37	-0.68	0.0	-1002.78	4.14	-799.01	49.55	424.53	-166.13	13.63	-0.00	0.80
3.56	38.79	-0.74	0.0	-1018.60	14.16	-786.49	56.92	-696.56	-154.75	13.63	-0.01	0.77
3.57	38.69	-0.79	0.0	-1044.41	9.16	-813.43	43.73	429.58	-128.04	13.62	-0.01	0.78
3.58	39.18	-0.83	0.0	-1042.54	-5.90	-837.46	13.58	-15.82	-101.92	13.62	0.01	0.80
3.59	39.47	-0.86	0.0	-1068.34	-16.02	-855.23	-3.47	-247.90	-82.01	13.62	0.01	0.80
3.60	39.57	-0.89	0.0	-1096.19	-16.18	-827.83	5.88	268.72	-64.60	13.61	0.01	0.76
3.61	39.47	-0.91	0.0	-1107.13	-1.10	-801.02	17.00	-207.00	-46.44	13.61	0.00	0.72
3.62	39.47	-0.93	0.0	-1128.30	-1.00	-841.74	17.16	-207.97	-38.44	13.61	0.00	0.75
3.63	39.67	-0.94	0.0	-1120.73	-5.96	-868.65	-5.55	250.02	-33.59	13.61	0.01	0.78
3.64	39.77	-0.95	0.0	-1120.73	-0.80	-887.24	-1.63	-146.19	-22.46	13.60	0.00	0.79
3.65	39.57	-0.96	0.0	-1154.90	9.15	-855.48	24.73	-133.68	-5.27	13.60	-0.01	0.74
3.66	39.47	-0.97	0.0	-1165.63	3.93	-621.70	20.75	80.86	6.50	13.60	-0.00	0.70
3.67	39.37	-0.97	0.0	-1160.18	-16.12	-864.02	6.04	-165.38	5.07	13.60	0.01	0.74
3.68	39.47	-0.98	0.0	-1157.72	-21.10	-903.28	-16.72	-43.87	-7.98	13.60	0.02	0.78
3.69	39.47	-0.98	0.0	-1163.86	-15.95	-926.01	-3.30	153.30	-11.78	13.60	0.01	0.80
3.70	39.37	-0.99	0.0	-1165.06	-5.94	-887.68	13.60	-109.22	0.25	13.60	0.01	0.76
3.71	39.18	-0.99	0.0	-1170.71	-1.05	-842.01	17.11	-105.73	15.22	13.60	0.00	0.72
3.72	39.18	-0.99	0.0	-1165.44	4.14	-865.85	21.07	40.65	17.37	13.60	-0.00	0.74
3.73	39.37	-0.99	0.0	-1159.98	4.25	-895.10	21.23	-15.74	7.15	13.60	-0.00	0.77
3.74	39.90	-1.00	0.0	-1165.09	-0.76	-913.67	17.52	-9.72	-1.00	13.60	0.00	0.78
3.75	40.04	-1.00	0.0	-1170.55	-16.12	-877.48	6.01	43.08	-0.03	13.60	0.01	0.75
3.76	40.94	-1.00	0.0	-1160.15	-21.29	-835.56	2.12	-136.40	9.54	13.60	0.02	0.72
3.77	40.55	-1.00	0.0	-1165.66	-16.14	-855.61	6.03	-80.64	17.59	13.60	0.01	0.73
3.78	39.86	-1.00	0.0	-1160.17	-5.93	-876.90	13.65	54.63	17.38	13.60	0.01	0.75
3.79	39.20	-1.00	0.0	-1154.70	-0.76	-896.61	17.55	-46.54	9.54	13.60	0.00	0.78

TABLE V
TABULATED DATA

RUN: 29- 1-32

TE	RS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.80	39.08	-1.00	0.0	-1159.76	4.18	-880.99	21.10	-2.92	2.41	13.60	-0.00	0.76
3.81	39.08	-1.00	0.0	-1148.94	4.08	-849.70	20.95	-19.29	3.51	13.60	-0.00	0.74
3.82	38.89	-1.00	0.0	-1154.87	-5.96	-861.42	13.61	-67.53	16.46	13.60	0.01	0.75
3.83	38.59	-1.00	0.0	-1155.07	-16.08	-854.49	6.14	-15.22	26.76	13.60	0.01	0.74
3.84	38.50	-1.00	0.0	-1149.61	-16.01	-868.40	6.25	15.04	21.03	13.60	0.01	0.76
3.85	38.59	-1.00	0.0	-1149.61	-16.09	-858.05	6.09	-47.22	6.07	13.60	0.01	0.75
3.86	38.69	-1.00	0.0	-1159.94	-6.15	-827.39	13.31	-54.21	-1.01	13.60	0.01	0.72
3.87	38.59	-1.00	0.0	-1149.39	-0.89	-863.22	17.35	-31.77	6.01	13.60	0.00	0.75
3.88	38.40	-1.00	0.0	-1144.30	-0.85	-859.77	17.44	-64.49	16.85	13.60	0.00	0.75
3.89	38.40	-1.00	0.0	-1155.09	-0.82	-870.48	17.49	-13.10	25.69	13.60	0.00	0.75
3.90	38.50	-1.00	0.0	-1155.07	-5.97	-852.42	13.60	-54.96	22.25	13.60	0.01	0.74
3.91	38.59	-1.00	0.0	-1159.93	-6.10	-839.96	13.38	-64.54	10.53	13.60	0.01	0.72
3.92	38.50	-1.00	0.0	-1159.76	-11.00	-880.27	9.85	-15.77	3.55	13.60	0.01	0.76
3.93	38.50	-1.00	0.0	-1165.26	-5.92	-886.57	13.65	33.95	9.28	13.60	0.01	0.76
3.94	38.59	-1.00	0.0	-1160.39	-5.88	-879.44	13.74	-3.15	19.88	13.60	0.01	0.76
3.95	38.69	-1.00	0.0	-1165.85	-1.00	-843.00	17.23	-41.22	21.06	13.60	0.00	0.72
3.96	38.59	-1.00	0.0	-1149.76	-1.06	-816.57	17.11	-126.83	14.28	13.60	0.00	0.71
3.97	38.59	-1.00	0.0	-1160.16	-0.96	-856.62	17.26	-50.42	8.33	13.60	0.00	0.74
3.98	38.69	-1.00	0.0	-1149.40	-5.89	-876.21	13.70	-0.49	9.43	13.60	0.01	0.76
3.99	38.79	-1.00	0.0	-1149.41	-5.83	-858.44	13.81	23.78	14.03	13.60	0.01	0.77
4.00	38.79	-1.00	0.0	-1160.16	-15.10	-860.75	6.08	-69.13	17.55	13.60	0.01	0.74
4.01	41.52	-0.02	0.0	-2338.27	-28.38	-28.21	31.00	-15.80	-1.20	13.43	0.01	0.01
4.02	41.62	-0.02	0.0	-2350.61	-28.40	-51.03	21.40	24.00	-4.79	13.44	0.01	0.02
4.03	41.62	-0.02	0.0	-2357.60	-33.39	-73.73	8.27	55.83	-8.30	13.44	0.01	0.03
4.04	41.62	-0.02	0.0	-2357.36	-23.37	-54.24	15.48	10.54	-9.48	13.44	0.01	0.02
4.05	41.62	-0.02	0.0	-2362.61	-13.36	-32.40	22.67	-20.67	-7.20	13.44	0.01	0.01
4.06	41.62	-0.02	0.0	-2345.52	-13.19	-59.12	13.38	19.17	-1.45	13.44	0.01	0.03
4.07	41.62	-0.02	0.0	-2329.46	-13.07	-71.28	13.53	33.41	3.20	13.44	0.01	0.03
4.08	41.52	-0.02	0.0	-2324.99	-13.01	-73.31	23.21	52.52	7.79	13.44	0.01	0.03
4.09	41.52	-0.02	0.0	-2309.10	-23.20	-39.59	15.75	6.79	12.49	13.44	0.01	0.02
4.10	41.62	-0.02	0.0	-2303.78	-28.39	-2.40	11.87	-42.27	14.81	13.44	0.01	0.00
4.11	41.62	-0.02	0.0	-2298.74	-33.33	-24.11	8.39	-15.52	12.62	13.44	0.01	0.01
4.12	41.62	-0.02	0.0	-2314.83	-33.34	-36.15	8.39	6.35	6.82	13.43	0.01	0.02
4.13	41.62	-0.02	0.0	-2337.25	-28.27	-57.27	21.60	29.99	1.05	13.44	0.01	0.02
4.14	41.52	-0.02	0.0	-2353.10	-28.43	-42.43	21.35	9.07	-7.13	13.44	0.01	0.02
4.15	41.52	-0.02	0.0	-2369.15	-29.60	-19.34	21.11	-36.15	-10.60	13.43	0.01	0.01
4.16	41.52	-0.02	0.0	-2374.25	-23.39	-57.93	24.98	6.54	-7.23	13.44	0.01	0.02
4.17	41.62	-0.02	0.0	-2362.64	-13.17	-72.11	22.98	34.21	2.02	13.44	0.01	0.03

TABLE V
TABULATED DATA

RUN: 29- 1-22

TE	RS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.18	41.62	-0.02	0.0	-2340.25	-13.04	-82.75	13.63	44.75	8.97	13.44	0.01	0.04
4.19	41.62	-0.02	0.0	-2334.71	-13.16	-49.99	13.43	-10.57	12.40	13.44	0.01	0.02
4.20	41.62	-0.02	0.0	-2319.65	-18.27	-26.11	19.22	-108.37	11.42	13.44	0.01	0.01
4.21	41.62	-0.02	0.0	-2314.41	-23.17	-52.86	15.79	-347.70	8.51	13.44	0.01	0.02
4.22	41.62	-0.02	0.0	-2303.65	-33.18	-68.90	8.58	-798.72	8.19	13.44	0.01	0.03
4.23	41.62	-0.02	0.0	-2302.84	-38.05	-123.29	5.15	-1463.88	4.59	13.44	0.02	0.05
4.24	41.62	-0.02	0.0	-2317.47	-32.64	-236.07	16.80	-2326.97	-1.39	13.43	0.01	0.10
4.25	41.62	-0.02	0.0	-2334.89	-21.75	-471.63	30.63	-2498.32	-8.11	13.43	0.01	0.20
4.26	41.62	-0.03	0.0	-2322.02	-10.05	-897.05	45.98	-2013.93	-24.50	13.43	0.00	0.39
4.27	41.52	-0.04	0.0	-2263.54	1.69	-1325.73	56.24	-1527.23	-68.72	13.43	-0.00	0.59
4.28	41.52	-0.06	0.0	-2187.66	2.91	-1636.31	37.72	-1191.89	-143.23	13.43	-0.00	0.75
4.29	41.45	-0.10	0.0	-2126.87	-1.76	-1729.04	43.96	3674.68	-221.66	13.43	0.00	0.81
4.30	41.33	-0.17	0.0	-2064.49	-6.75	-1702.44	59.42	-1137.18	-257.81	13.42	0.00	0.82
4.31	41.23	-0.26	0.0	-2062.33	-6.82	-1661.73	78.48	1456.57	-263.18	13.41	0.00	0.81
4.32	41.04	-0.37	0.0	-2055.05	-22.16	-1569.86	76.94	43.45	-223.12	13.40	0.01	0.76
4.33	40.64	-0.47	0.0	-2061.12	-37.52	-1498.64	56.27	-537.79	-176.81	13.39	0.02	0.73
4.34	40.06	-0.57	0.0	-2058.62	-47.85	-1462.13	20.05	1071.99	-178.57	13.38	0.02	0.71
4.35	39.28	-0.65	0.0	-2073.45	-22.71	-1460.74	23.55	-890.01	-195.89	13.37	0.01	0.70
4.36	[illegible]	-0.71	0.0	-2121.48	7.67	-1509.06	50.49	420.56	-201.70	13.37	-0.00	0.71
4.37	38.20	-0.76	0.0	-2154.21	32.92	-1503.54	68.72	230.71	-170.10	13.36	-0.02	0.70
4.38	38.40	-0.81	0.0	-2174.28	27.80	-1490.49	45.92	-475.94	-126.18	13.35	-0.01	0.69
4.39	38.79	-0.85	0.0	-2210.83	12.39	-1464.54	25.13	317.14	-103.63	13.35	-0.01	0.66
4.40	38.58	-0.88	0.0	-2243.16	-2.96	-1448.35	13.95	-36.18	-93.88	13.34	0.00	0.65
4.41	38.59	-0.90	0.0	-2269.85	-18.05	-1492.84	3.16	-289.83	-91.17	13.34	0.01	0.66
4.42	38.79	-0.92	0.0	-2302.00	-28.18	-1513.89	-4.13	317.64	-85.41	13.34	0.01	0.66
4.43	38.89	-0.94	0.0	-2294.93	-33.20	-1518.47	-26.77	102.81	-68.89	13.33	0.01	0.66
4.44	38.98	-0.95	0.0	-2317.58	-18.24	-1472.02	-6.59	-301.18	-52.02	13.33	0.01	0.64
4.45	38.89	-0.96	0.0	-2335.04	6.85	-1420.40	20.87	168.55	-36.67	13.33	-0.00	0.61
4.46	38.69	-0.96	0.0	-2336.51	17.14	-1440.73	37.98	-79.70	-20.99	13.33	-0.01	0.62
4.47	38.10	-0.97	0.0	-2324.70	7.10	-1452.27	21.27	-262.51	-14.95	13.33	-0.00	0.62
4.48	38.39	-0.98	0.0	-2335.09	-2.96	-1481.01	14.07	174.54	-20.44	13.33	0.00	0.63
4.49	39.69	-0.98	0.0	-2334.66	-8.10	-1471.31	10.28	-14.78	-28.35	13.33	0.00	0.63
4.50	38.98	-0.99	0.0	-2340.95	-18.32	-1447.94	12.41	-273.69	-23.35	13.33	0.01	0.62
4.51	39.28	-0.99	0.0	-2346.46	-18.20	-1469.29	12.60	145.57	-10.20	13.33	0.01	0.63
4.52	39.17	-0.99	0.0	-2329.78	-18.11	-1473.91	3.22	24.31	-1.77	13.33	0.01	0.63
4.53	39.77	-0.99	0.0	-2324.28	-7.95	-1481.31	10.55	-66.44	-5.06	13.33	0.00	0.64
4.54	39.07	-1.00	0.0	-2324.05	-3.03	-1456.97	13.96	116.09	-14.72	13.33	0.00	0.63
4.55	39.06	-1.00	0.0	-2325.48	-3.19	-1410.88	23.28	-28.49	-14.37	13.33	0.00	0.61

TABLE V

TABULATED DATA

RUN: 29- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.56	38.50	-1.00	0.0	-2320.62	-8.17	-1413.18	19.80	-218.53	-2.33	13.33	0.00	0.01
4.57	38.20	-1.00	0.0	-2320.62	-8.15	-1413.59	19.85	33.89	4.20	13.33	0.00	0.01
4.58	36.01	-1.00	0.0	-2310.06	-2.98	-1433.39	23.65	-17.43	-2.55	13.33	0.00	0.02
4.59	37.81	-1.00	0.0	-2309.43	-3.04	-1431.93	23.51	-141.89	-15.22	13.33	0.00	0.02
4.60	37.52	-1.00	0.0	-2319.76	-3.16	-1416.14	23.31	40.53	-14.60	13.33	0.00	0.01
4.61	37.42	-1.00	0.0	-2308.58	-8.10	-1427.09	10.34	37.75	-0.58	13.33	0.00	0.02
4.62	37.32	-1.00	0.0	-2320.82	-8.11	-1418.44	19.92	-181.64	12.66	13.33	0.00	0.01
4.63	37.32	-1.00	0.0	-2326.11	-13.19	-1420.04	16.24	44.37	9.90	13.33	0.01	0.01
4.64	37.23	-1.00	0.0	-2309.00	-18.32	-1402.97	2.94	-14.77	-2.72	13.33	0.01	0.01
4.65	37.13	-1.00	0.0	-2314.28	-19.43	-1386.76	2.77	-257.74	-11.57	13.32	0.01	0.00
4.66	37.13	-1.00	0.0	-2319.38	-3.10	-1428.08	13.89	-45.75	-9.63	13.33	0.00	0.02
4.67	37.13	-1.00	0.0	-2320.42	2.10	-1446.60	27.29	-29.40	0.81	13.33	-0.00	0.02
4.68	37.13	-1.00	0.0	-2320.20	7.24	-1460.97	31.03	-127.63	10.17	13.32	-0.00	0.03
4.69	37.13	-1.00	0.0	-2324.21	2.03	-1440.88	17.62	37.65	9.64	13.33	-0.00	0.02
4.70	37.13	-1.00	0.0	-2325.04	-3.08	-1431.00	23.44	-10.89	1.61	13.32	0.00	0.02
4.71	37.13	-1.00	0.0	-2330.58	-8.04	-1459.44	19.96	-151.64	-2.65	13.33	0.00	0.02
4.72	37.13	-1.00	0.0	-2329.77	-18.16	-1463.73	3.15	72.24	-1.88	13.33	0.01	0.03
4.73	37.13	-1.00	0.0	-2319.20	-18.11	-1465.61	3.24	110.08	-1.87	13.32	0.01	0.03
4.74	37.13	-1.00	0.0	-2319.38	-18.26	-1427.88	3.01	-69.50	-1.56	13.33	0.01	0.02
4.75	37.23	-1.00	0.0	-2325.04	-8.33	-1383.95	10.02	-53.32	3.04	13.32	0.00	0.00
4.76	37.23	-1.00	0.0	-2321.01	1.89	-1393.10	27.01	-15.80	4.34	13.33	-0.00	0.00
4.77	37.32	-1.00	0.0	-2321.25	6.99	-1401.10	30.71	-180.10	0.14	13.33	-0.00	0.00
4.78	37.32	-1.00	0.0	-2320.84	7.06	-1423.96	30.79	-23.69	-3.69	13.32	-0.00	0.01
4.79	37.42	-1.00	0.0	-2315.22	1.93	-1403.68	27.04	-41.19	-3.76	13.32	-0.00	0.01
4.80	37.42	-1.00	0.0	-2320.38	-8.27	-1393.70	19.64	-191.10	-3.66	13.32	0.00	0.00
4.81	37.52	-1.00	0.0	-2320.79	-18.26	-1436.95	12.55	-80.98	-7.38	13.32	0.01	0.02
4.82	41.62	-0.03	0.0	-3528.72	-22.39	-96.49	25.83	70.46	4.92	13.21	0.01	0.03
4.83	41.62	-0.03	0.0	-3516.86	-27.39	-75.95	19.77	36.73	12.95	13.21	0.01	0.02
4.84	41.62	-0.03	0.0	-3499.71	-27.47	-45.94	10.11	4.26	19.83	13.21	0.01	0.01
4.85	41.52	-0.03	0.0	-3484.69	-17.17	-64.62	27.09	22.57	22.27	13.21	0.00	0.02
4.86	41.62	-0.03	0.0	-3465.53	-17.11	-76.37	36.73	45.09	19.93	13.21	0.00	0.02
4.87	41.52	-0.03	0.0	-3474.97	-27.16	-82.11	29.67	67.81	18.81	13.21	0.01	0.02
4.88	41.62	-0.03	0.0	-3464.38	-37.37	-53.77	22.37	21.28	15.42	13.21	0.01	0.02
4.89	41.62	-0.03	0.0	-3464.57	-42.60	-16.01	18.54	-30.25	10.88	13.21	0.01	0.00
4.90	41.62	-0.03	0.0	-3478.22	-42.50	-45.31	28.22	9.36	9.09	13.21	0.01	0.01
4.91	41.62	-0.03	0.0	-3497.60	-37.44	-67.30	31.81	27.50	2.74	13.21	0.01	0.02
4.92	41.52	-0.02	0.0	-3518.97	-42.49	-87.03	28.23	70.15	3.78	13.21	0.01	0.02
4.93	41.62	-0.03	0.0	-3523.41	-42.60	-70.25	18.53	29.42	6.10	13.21	0.01	0.02

TABLE V
TABULATED DATA

RUN: 29- 1-22

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.18	41.62	-0.02	0.0	-2340.25	-13.04	-82.75	13.63	44.75	8.97	13.44	0.01	0.04
4.19	41.62	-0.02	0.0	-2334.71	-13.16	-49.99	13.43	-10.57	12.40	13.44	0.01	0.02
4.20	41.62	-0.02	0.0	-2319.65	-18.27	-20.11	19.22	-108.37	11.42	13.44	0.01	0.01
4.21	41.62	-0.02	0.0	-2314.41	-23.17	-52.86	15.79	-347.70	8.51	13.44	0.01	0.02
4.22	41.62	-0.02	0.0	-2303.65	-33.18	-68.90	8.58	-798.72	8.19	13.44	0.01	0.03
4.23	41.62	-0.02	0.0	-2302.84	-38.05	-123.29	5.15	-1463.88	4.59	13.44	0.02	0.05
4.24	41.62	-0.02	0.0	-2317.47	-32.64	-236.07	16.80	-2326.97	-1.59	13.43	0.01	0.10
4.25	41.62	-0.02	0.0	-2334.89	-21.75	-471.63	36.63	-2498.32	-8.11	13.43	0.01	0.20
4.26	41.62	-0.03	0.0	-2322.02	-10.05	-897.03	45.98	-2013.93	-24.50	13.43	0.00	0.39
4.27	41.52	-0.04	0.0	-2263.54	1.69	-1325.75	36.24	-1537.23	-68.72	13.43	-0.00	0.59
4.28	41.52	-0.06	0.0	-2187.66	2.91	-1636.31	37.72	-1191.89	-143.23	13.43	-0.00	0.75
4.29	41.43	-0.10	0.0	-2126.87	-1.76	-1729.04	43.96	3674.68	-221.66	13.43	0.00	0.81
4.30	41.33	-0.17	0.0	-2064.49	-6.75	-1702.44	59.42	-1137.18	-257.81	13.42	0.00	0.82
4.31	41.23	-0.26	0.0	-2062.33	-6.82	-1661.73	73.48	1456.57	-263.18	13.41	0.00	0.81
4.32	41.04	-0.37	0.0	-2055.05	-22.16	-1569.86	76.94	43.45	-223.12	13.40	0.01	0.76
4.33	40.64	-0.47	0.0	-2061.12	-37.52	-1498.64	56.27	-537.79	-176.81	13.39	0.02	0.73
4.34	40.06	-0.57	0.0	-2058.62	-47.85	-1462.13	20.05	1071.99	-178.57	13.38	0.02	0.71
4.35	39.28	-0.65	0.0	-2073.45	-22.71	-1460.74	28.55	-890.01	-195.69	13.37	0.01	0.70
4.36	38.50	-0.71	0.0	-2121.48	7.67	-1509.06	50.49	420.56	-201.70	13.37	-0.00	0.71
4.37	38.20	-0.76	0.0	-2154.21	32.92	-1503.54	68.72	230.71	-170.10	13.36	-0.02	0.70
4.38	38.40	-0.81	0.0	-2174.28	27.80	-1490.49	45.92	-475.94	-126.18	13.35	-0.01	0.69
4.39	38.79	-0.85	0.0	-2210.83	12.39	-1464.54	25.13	317.14	-103.63	13.35	-0.01	0.66
4.40	38.90	-0.88	0.0	-2243.16	-2.96	-1448.35	13.95	-36.18	-93.88	13.34	0.00	0.65
4.41	38.69	-0.90	0.0	-2269.85	-18.05	-1492.84	3.16	-289.83	-91.17	13.34	0.01	0.66
4.42	38.79	-0.92	0.0	-2302.00	-28.18	-1513.89	-4.13	317.64	-85.41	13.34	0.01	0.66
4.43	38.89	-0.94	0.0	-2294.83	-33.20	-1518.47	-26.77	102.81	-68.89	13.33	0.01	0.66
4.44	38.98	-0.95	0.0	-2317.58	-18.24	-1472.02	-6.59	-301.18	-52.02	13.33	0.01	0.64
4.45	38.89	-0.96	0.0	-2335.04	6.85	-1420.40	20.87	168.55	-36.67	13.33	-0.00	0.61
4.46	38.69	-0.96	0.0	-2335.51	17.14	-1440.73	37.98	-79.70	-20.99	13.33	-0.01	0.62
4.47	38.50	-0.97	0.0	-2324.70	7.10	-1452.27	21.27	-262.51	-14.95	13.33	-0.00	0.62
4.48	38.59	-0.98	0.0	-2335.09	-2.96	-1481.01	14.07	174.94	-20.44	13.33	0.00	0.63
4.49	38.69	-0.98	0.0	-2334.66	-8.10	-1471.31	10.28	-14.78	-28.35	13.33	0.00	0.63
4.50	38.98	-0.99	0.0	-2340.95	-18.32	-1447.94	12.41	-273.69	-23.35	13.33	0.01	0.62
4.51	39.28	-0.99	0.0	-2346.46	-18.20	-1469.29	12.60	145.57	-10.20	13.33	0.01	0.63
4.52	39.57	-0.99	0.0	-2329.78	-18.11	-1473.91	3.22	24.31	-1.77	13.33	0.01	0.63
4.53	39.77	-0.99	0.0	-2324.28	-7.95	-1461.31	10.55	-66.44	-5.06	13.33	0.00	0.64
4.54	39.67	-1.00	0.0	-2324.05	-3.03	-1456.97	13.96	115.09	-14.72	13.33	0.00	0.63
4.55	39.08	-1.00	0.0	-2325.48	-3.19	-1410.88	23.28	-28.49	-14.37	13.33	0.00	0.61

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TABLE V
TABULATED DATA

RUN: 29- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.56	38.50	-1.00	0.0	-2320.62	-8.17	-1413.18	19.80	-218.53	-2.33	13.33	0.00	0.61
4.57	38.20	-1.00	0.0	-2320.82	-8.15	-1413.59	19.85	33.89	4.20	13.33	0.00	0.61
4.58	38.01	-1.00	0.0	-2310.06	-2.98	-1433.39	23.65	-17.43	-2.55	13.33	0.00	0.62
4.59	37.81	-1.00	0.0	-2309.43	-3.04	-1431.93	23.51	-141.89	-15.22	13.33	0.00	0.62
4.60	37.52	-1.00	0.0	-2319.76	-3.16	-1416.14	23.31	40.53	-14.60	13.33	0.00	0.61
4.61	37.42	-1.00	0.0	-2308.58	-8.10	-1427.09	10.34	37.75	-0.58	13.33	0.00	0.62
4.62	37.32	-1.00	0.0	-2320.82	-8.11	-1418.44	19.92	-181.64	12.66	13.33	0.00	0.61
4.63	37.32	-1.00	0.0	-2326.11	-13.19	-1420.04	16.24	44.37	9.90	13.33	0.01	0.61
4.64	37.23	-1.00	0.0	-2309.00	-18.32	-1402.97	2.94	-14.77	-2.72	13.33	0.01	0.61
4.65	37.13	-1.00	0.0	-2314.28	-13.43	-1388.76	2.77	-257.74	-11.57	13.33	0.01	0.60
4.66	37.13	-1.00	0.0	-2319.39	-3.10	-1428.08	13.89	-45.75	-9.63	13.33	0.00	0.62
4.67	37.13	-1.00	0.0	-2320.42	2.10	-1446.60	27.29	-29.40	0.81	13.33	-0.00	0.62
4.68	37.13	-1.00	0.0	-2320.20	7.24	-1460.97	31.03	-127.63	10.17	13.32	-0.00	0.63
4.69	37.13	-1.00	0.0	-2324.21	2.03	-1440.88	17.62	37.85	9.64	13.33	-0.00	0.62
4.70	37.13	-1.00	0.0	-2325.04	-3.08	-1431.00	23.44	-10.89	1.61	13.32	0.00	0.62
4.71	37.13	-1.00	0.0	-2330.58	-8.04	-1455.44	19.96	-151.64	-2.65	13.33	0.00	0.63
4.72	37.13	-1.00	0.0	-2329.77	-18.16	-1463.75	3.15	72.24	-1.88	13.33	0.01	0.63
4.73	37.13	-1.00	0.0	-2319.20	-18.11	-1465.61	3.24	110.08	-1.87	13.32	0.01	0.63
4.74	37.13	-1.00	0.0	-2319.38	-18.26	-1427.88	3.01	-69.50	-1.56	13.33	0.01	0.62
4.75	37.23	-1.00	0.0	-2325.04	-8.33	-1383.95	10.02	-53.32	3.04	13.32	0.00	0.60
4.76	37.23	-1.00	0.0	-2321.01	1.89	-1393.10	27.01	-15.80	4.34	13.33	-0.00	0.60
4.77	37.32	-1.00	0.0	-2321.25	6.99	-1401.10	30.71	-180.10	0.14	13.33	-0.00	0.60
4.78	37.32	-1.00	0.0	-2320.84	7.06	-1423.96	30.79	-23.69	-3.69	13.32	-0.00	0.61
4.79	37.42	-1.00	0.0	-2315.32	1.93	-1403.68	27.04	-41.19	-3.76	13.32	-0.00	0.61
4.80	37.42	-1.00	0.0	-2320.38	-8.27	-1393.70	19.64	-191.10	-3.66	13.32	0.00	0.60
4.81	37.52	-1.00	0.0	-2320.79	-18.26	-1436.95	12.55	-80.98	-7.38	13.32	0.01	0.62
4.82	41.62	-0.03	0.0	-3528.72	-32.39	-96.49	25.83	70.46	4.92	13.21	0.01	0.63
4.83	41.62	-0.03	0.0	-3516.86	-27.39	-75.95	19.77	36.73	12.95	13.21	0.01	0.62
4.84	41.62	-0.03	0.0	-3499.71	-27.47	-45.94	10.11	4.26	19.83	13.21	0.01	0.61
4.85	41.52	-0.03	0.0	-3484.69	-17.17	-64.62	27.09	22.57	22.27	13.21	0.00	0.62
4.86	41.62	-0.03	0.0	-3485.53	-17.11	-76.37	36.73	45.09	19.93	13.21	0.00	0.62
4.87	41.52	-0.03	0.0	-3474.97	-27.16	-82.11	29.67	67.81	18.81	13.21	0.01	0.62
4.88	41.62	-0.03	0.0	-3464.38	-37.37	-53.77	22.37	21.26	15.42	13.21	0.01	0.62
4.89	41.62	-0.03	0.0	-3464.57	-42.60	-16.01	18.54	-30.25	10.88	13.21	0.01	0.60
4.90	41.62	-0.03	0.0	-3478.22	-42.50	-45.31	28.22	9.36	5.09	13.21	0.01	0.61
4.91	41.62	-0.03	0.0	-3497.60	-37.44	-67.30	31.81	27.50	2.74	13.21	0.01	0.62
4.92	41.52	-0.02	0.0	-3518.97	-42.49	-87.03	28.23	70.15	3.78	13.21	0.01	0.62
4.93	41.62	-0.03	0.0	-3523.41	-42.60	-70.25	18.53	29.42	6.10	13.21	0.01	0.62

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TABLE V
TABULATED DATA

RUN: 25- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.94	41.62	-0.03	0.0	-3528.44	-27.57	-43.44	29.05	-10.26	8.32	13.21	0.01	0.01
4.95	41.62	-0.03	0.0	-3517.90	-17.26	-73.06	36.50	37.43	9.56	13.21	0.00	0.02
4.96	41.62	-0.03	0.0	-3500.59	-17.17	-88.45	27.03	54.44	9.49	13.21	0.00	0.03
4.97	41.62	-0.03	0.0	-3484.53	-22.12	-100.07	23.66	73.50	7.21	13.21	0.01	0.03
4.98	41.62	-0.03	0.0	-3479.23	-27.29	-71.01	19.91	44.44	4.92	13.21	0.01	0.02
4.99	41.62	-0.03	0.0	-3474.95	-27.40	-36.03	29.29	-13.29	3.87	13.21	0.01	0.01
5.00	41.62	-0.03	0.0	-3469.69	-37.41	-55.59	22.30	-48.46	5.15	13.21	0.01	0.02
5.01	41.62	-0.03	0.0	-3469.91	-47.47	-64.15	15.22	-321.95	8.02	13.21	0.01	0.02
5.02	41.62	-0.03	0.0	-3486.82	-47.43	-81.58	24.83	-739.99	13.34	13.21	0.01	0.02
5.03	41.62	-0.03	0.0	-3502.03	-42.29	-115.96	28.50	-1478.57	24.77	13.21	0.01	0.03
5.04	41.62	-0.03	0.0	-3520.88	-41.93	-231.21	28.92	-2408.46	38.38	13.21	0.01	0.07
5.05	41.62	-0.03	0.0	-3520.61	-25.60	-548.10	31.60	-2411.95	39.51	13.21	0.01	0.16
5.06	41.62	-0.04	0.0	-3484.51	-3.59	-1008.14	48.14	-1905.14	25.11	13.21	0.00	0.29
5.07	41.52	-0.05	0.0	-3403.01	8.74	-1566.63	46.49	-1292.72	-14.17	13.21	-0.00	0.46
5.08	41.52	-0.06	0.0	-3279.63	5.55	-2023.07	37.59	-806.41	-92.14	13.21	-0.00	0.62
5.09	41.43	-0.09	0.0	-3166.52	1.46	-2244.81	35.10	-412.45	-179.27	13.21	-0.00	0.71
5.10	41.33	-0.14	0.0	-3092.98	-8.30	-2288.08	47.45	380.45	-238.25	13.20	0.00	0.74
5.11	41.23	-0.22	0.0	-3049.16	-18.61	-2180.89	59.22	1550.58	-256.82	13.18	0.01	0.72
5.12	41.04	-0.32	0.0	-3038.65	-34.20	-2015.80	67.22	-801.56	-220.54	13.17	0.01	0.66
5.13	40.74	-0.43	0.0	-3045.92	-49.92	-1849.27	46.38	1593.82	-174.74	13.16	0.02	0.61
5.14	40.25	-0.52	0.0	-3046.28	-45.14	-1767.94	40.14	-1056.09	-147.84	13.14	0.01	0.58
5.15	39.67	-0.61	0.0	-3099.41	-19.84	-1827.61	57.91	203.50	-162.86	13.13	0.01	0.59
5.16	38.89	-0.68	0.0	-3130.35	15.60	-1872.58	73.20	558.75	-177.32	13.12	-0.00	0.60
5.17	38.10	-0.74	0.0	-3171.81	25.57	-1865.74	60.97	-795.12	-155.28	13.10	-0.01	0.59
5.18	37.91	-0.79	0.0	-3230.52	25.17	-1809.63	50.83	452.02	-120.71	13.09	-0.01	0.56
5.19	38.20	-0.83	0.0	-3272.98	14.79	-1775.25	33.93	-218.53	-90.76	13.08	-0.00	0.54
5.20	38.50	-0.86	0.0	-3330.77	-5.45	-1829.15	10.27	-465.71	-78.98	13.08	0.00	0.55
5.21	38.69	-0.89	0.0	-3371.44	-25.71	-1872.53	-22.97	517.44	-76.34	13.07	0.01	0.56
5.22	38.50	-0.91	0.0	-3410.13	-20.67	-1891.17	-9.91	-111.47	-72.85	13.06	0.01	0.55
5.23	38.30	-0.93	0.0	-3465.05	-10.88	-1851.71	6.23	-241.45	-66.91	13.06	0.00	0.53
5.24	38.40	-0.94	0.0	-3481.69	-11.15	-1793.72	5.86	213.35	-57.33	13.06	0.00	0.52
5.25	38.50	-0.95	0.0	-3474.98	-21.22	-1804.17	-20.16	-121.26	-49.46	13.06	0.01	0.52
5.26	38.50	-0.96	0.0	-3457.39	-6.02	-1820.22	-0.03	-327.25	-50.38	13.06	0.00	0.52
5.27	39.20	-0.97	0.0	-3509.63	14.33	-1846.88	33.29	99.17	-55.77	13.06	-0.00	0.53
5.28	37.91	-0.97	0.0	-3510.05	19.42	-1861.08	46.37	-230.44	-65.67	13.06	-0.01	0.53
5.29	37.91	-0.98	0.0	-3514.50	9.27	-1873.55	39.23	-223.42	-76.38	13.06	-0.00	0.53
5.30	38.20	-0.98	0.0	-3507.59	-10.75	-1932.19	15.89	219.14	-80.77	13.06	0.00	0.55
5.31	38.79	-0.59	0.0	-3496.82	-20.75	-1948.76	9.03	4.37	-74.61	13.06	0.01	0.56

TABLE V
TABULATED DATA

RUN: 29-1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
5.32	39.37	-0.99	0.0	-3502.72	-25.86	-1929.95	5.47	-103.62	-61.62	13.06	0.01	0.55
5.33	39.47	-0.99	0.0	-3504.13	-20.97	-1878.54	18.32	88.06	-53.83	13.05	0.01	0.54
5.34	39.08	-0.99	0.0	-3481.91	-5.87	-1844.23	19.22	10.37	-55.93	13.06	0.00	0.53
5.35	38.30	-1.00	0.0	-3477.69	-0.69	-1861.63	32.47	-45.20	-59.14	13.06	0.00	0.54
5.36	37.81	-0.99	0.0	-3483.39	4.32	-1850.52	35.93	154.36	-58.25	13.06	-0.00	0.53
5.37	37.52	-1.00	0.0	-3467.95	4.31	-1828.23	35.95	-7.12	-55.44	13.06	-0.00	0.53
5.38	37.42	-1.00	0.0	-3468.54	-0.96	-1774.74	32.16	-231.59	-51.50	13.06	0.00	0.51
5.39	37.13	-1.00	0.0	-3474.00	-1.13	-1736.03	31.90	-192.20	-47.03	13.06	0.00	0.50
5.40	36.83	-1.00	0.0	-3473.62	-5.96	-1790.72	28.71	-64.88	-44.98	13.06	0.00	0.52
5.41	36.74	-1.00	0.0	-3455.90	-10.83	-1831.77	15.90	-160.95	-44.96	13.06	0.00	0.53
5.42	36.64	-1.00	0.0	-3466.08	-10.71	-1872.07	16.05	-63.06	-44.11	13.06	0.00	0.54
5.43	36.54	-1.00	0.0	-3460.54	-10.77	-1853.06	15.96	-100.24	-38.38	13.05	0.00	0.54
5.44	36.44	-1.00	0.0	-3472.11	-0.76	-1827.45	32.37	-171.85	-30.27	13.05	0.00	0.53
5.45	36.35	-1.00	0.0	-3483.54	-0.59	-1871.11	42.16	-86.38	-26.97	13.05	0.00	0.54
5.46	36.35	-1.00	0.0	-3465.43	-10.59	-1898.91	16.22	-55.25	-30.48	13.05	0.00	0.55
5.47	36.35	-1.00	0.0	-3474.98	-20.71	-1915.14	-0.38	4.65	-31.85	13.05	0.01	0.55
5.48	36.25	-1.00	0.0	-3469.67	-10.66	-1893.18	6.56	-133.57	-29.30	13.05	0.00	0.55
5.49	36.15	-1.00	0.0	-3481.42	4.33	-1847.07	26.38	-112.23	-21.32	13.05	-0.00	0.53
5.50	36.15	-1.00	0.0	-3468.20	9.54	-1872.04	39.69	-132.04	-12.99	13.05	-0.00	0.54
5.51	36.15	-1.00	0.0	-3498.78	4.49	-1886.67	36.20	-67.84	-12.01	13.05	-0.00	0.54
5.52	36.15	-1.00	0.0	-3491.25	-15.69	-1913.33	3.10	67.45	-21.57	13.05	0.00	0.55
5.53	36.05	-1.00	0.0	-3491.03	-20.87	-1894.10	-0.61	63.06	-30.90	13.05	0.01	0.54
5.54	36.05	-1.00	0.0	-3486.12	-21.05	-1840.65	-0.86	-192.28	-26.94	13.05	0.01	0.52
5.55	36.15	-1.00	0.0	-3503.86	-10.93	-1838.54	15.77	-83.26	-16.52	13.05	0.00	0.52
5.56	36.15	-1.00	0.0	-3488.20	-0.73	-1833.65	22.94	-50.84	-9.46	13.05	0.00	0.53
5.57	36.15	-1.00	0.0	-3462.72	9.50	-1855.55	30.13	-148.45	-11.55	13.05	-0.00	0.53
5.58	36.15	-1.00	0.0	-3467.57	9.39	-1843.62	29.95	-47.14	-16.56	13.05	-0.00	0.53
5.59	36.15	-1.00	0.0	-3476.76	4.28	-1823.28	26.35	-57.86	-16.60	13.05	-0.00	0.52
5.60	2.64	-1.00	0.0	0.40	-5.05	14.02	-7.93	-38.57	5.80	23.51	-12.46	54.62

TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.0	21.10	-0.03	-0.03	-2380.78	-33.48	-56.79	27.15	28.63	-13.13	13.47	0.01	0.02
0.01	21.40	-0.02	-0.03	-2365.28	-28.42	-22.66	30.96	-25.30	14.79	13.44	0.01	0.01
0.02	21.40	-0.02	-0.03	-2386.67	-28.42	-45.62	30.95	3.24	11.26	13.45	0.01	0.02
0.03	21.40	-0.02	-0.03	-2390.11	-33.47	-60.96	8.18	27.13	11.18	13.45	0.01	0.03
0.04	21.40	-0.02	-0.03	-2378.50	-38.49	-64.48	-4.98	35.68	13.50	13.45	0.02	0.03
0.05	21.40	-0.02	-0.03	-2378.69	-28.46	-43.99	2.27	3.57	13.60	13.45	0.01	0.02
0.06	21.40	-0.02	-0.03	-2378.46	-18.46	-20.93	9.45	-33.48	10.10	13.45	0.01	0.01
0.07	21.40	-0.02	-0.03	-2384.59	-19.35	-48.76	19.14	12.76	6.57	13.46	0.01	0.02
0.08	21.40	-0.02	-0.03	-2385.65	-23.31	-64.73	25.14	37.13	5.45	13.46	0.01	0.03
0.09	21.40	-0.02	-0.03	-2397.50	-28.34	-77.15	31.05	50.38	2.04	13.46	0.01	0.03
0.10	21.40	-0.02	-0.03	-2403.60	-43.61	-59.99	29.26	23.49	-2.66	13.46	0.02	0.02
0.11	21.40	-0.02	-0.03	-2381.18	-58.88	-25.86	8.60	-22.63	-4.97	13.45	0.02	0.01
0.12	21.40	-0.02	-0.03	-2343.56	-58.65	-45.88	8.94	9.12	-6.07	13.46	0.03	0.02
0.13	21.40	-0.02	-0.03	-2327.29	-48.41	-62.17	16.49	31.30	-5.08	13.46	0.02	0.03
0.14	21.40	-0.02	-0.03	-2312.05	-38.15	-76.63	33.63	48.40	-4.89	13.46	0.02	0.03
0.15	21.40	-0.02	-0.03	-2289.62	-33.14	-49.59	27.69	14.42	-2.55	13.46	0.01	0.02
0.16	21.40	-0.02	-0.03	-2273.73	-33.23	-13.80	27.57	-41.78	-2.42	13.46	0.01	0.01
0.17	21.49	-0.03	-0.03	-2268.04	-33.13	-34.32	27.70	-24.65	-2.52	13.46	0.01	0.02
0.18	21.40	-0.02	-0.03	-2279.67	-33.04	-59.81	37.40	17.21	-2.56	13.45	0.01	0.03
0.19	21.40	-0.02	-0.03	-2279.90	-32.97	-74.20	37.53	28.14	-1.31	13.45	0.01	0.03
0.20	21.40	-0.02	-0.03	-2289.63	-43.22	-57.51	20.41	-73.45	1.06	13.45	0.02	0.03
0.21	21.40	-0.02	-0.03	-2287.74	-48.43	-32.10	-2.59	-473.33	1.67	13.45	0.02	0.01
0.22	21.40	-0.02	-0.03	-2297.31	-48.37	-62.61	-12.05	-962.60	2.50	13.45	0.02	0.03
0.23	21.40	-0.02	-0.03	-2335.59	-32.91	-158.68	18.48	-1775.15	6.04	13.45	0.01	0.07
0.24	21.40	-0.02	-0.03	-2359.99	-17.04	-361.09	39.98	-2601.05	11.37	13.44	0.01	0.15
0.25	21.40	-0.03	-0.03	-2364.36	-15.94	-675.02	41.32	-2259.36	9.15	13.45	0.01	0.29
0.26	21.40	-0.04	-0.03	-2322.51	-14.62	-1037.63	23.82	-1871.06	-19.97	13.44	0.01	0.45
0.27	21.40	-0.07	-0.03	-2272.67	-23.63	-1345.22	8.21	3081.21	-99.16	13.45	0.01	0.59
0.28	21.30	-0.12	-0.03	-2211.73	-18.06	-1466.00	12.49	-1257.50	-164.36	13.45	0.01	0.66
0.29	21.20	-0.20	-0.03	-2197.97	-13.24	-1394.63	25.42	1511.97	-193.09	13.44	0.01	0.63
0.30	21.10	-0.31	-0.03	-2182.34	-3.67	-1189.36	51.25	306.57	-159.95	13.43	0.00	0.54
0.31	20.81	-0.42	-0.03	-2210.44	5.74	-975.18	86.40	-501.05	-113.84	13.43	-0.00	0.44
0.32	20.52	-0.52	-0.03	-2212.31	5.53	-907.77	86.18	829.89	-107.64	13.42	-0.00	0.41
0.33	20.03	-0.61	-0.03	-2167.29	-14.70	-922.14	33.31	-715.78	-126.71	13.42	0.01	0.42
0.34	19.44	-0.67	-0.03	-2188.89	-19.71	-971.28	1.01	557.80	-148.85	13.42	0.01	0.44
0.35	19.05	-0.73	-0.03	-2217.57	0.45	-960.89	34.68	220.17	-140.20	13.41	-0.00	0.43
0.36	19.65	-0.79	-0.03	-2263.10	25.44	-891.92	71.70	-326.35	-104.58	13.40	-0.01	0.39
0.37	19.54	-0.83	-0.03	-2284.63	20.25	-857.71	58.38	453.44	-70.07	13.40	-0.01	0.38

TABLE V
TABULATED DATA

RUN: 30- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.38	20.13	-0.86	-0.03	-2266.49	-5.07	-840.06	11.45	-23.87	-50.63	13.40	0.00	0.37
0.39	20.71	-0.90	-0.03	-2280.93	-15.28	-843.85	-15.11	-102.52	-56.24	13.40	0.01	0.37
0.40	21.01	-0.92	-0.03	-2315.14	-0.30	-820.14	14.68	257.32	-67.25	13.39	0.00	0.35
0.41	21.10	-0.93	-0.03	-2333.46	9.66	-785.09	40.87	-174.08	-67.56	13.39	-0.00	0.34
0.42	20.91	-0.94	-0.03	-2343.22	4.60	-798.16	27.67	47.13	-64.54	13.39	-0.00	0.34
0.43	20.52	-0.95	-0.03	-2337.12	-5.48	-805.96	10.88	190.34	-61.28	13.39	0.00	0.34
0.44	20.13	-0.96	-0.03	-2337.55	-5.46	-803.45	10.93	-112.93	-57.13	13.39	0.00	0.34
0.45	19.83	-0.97	-0.01	-2349.14	-0.51	-786.19	23.96	67.45	-62.12	13.39	0.00	0.33
0.46	19.74	-0.98	-0.03	-2338.34	9.54	-765.28	31.17	2.57	-68.94	13.39	-0.00	0.35
0.47	19.93	-0.98	-0.03	-2338.14	14.71	-769.30	34.98	-53.70	-66.54	13.39	-0.01	0.34
0.48	20.22	-0.99	-0.01	-2343.63	9.67	-790.31	31.37	39.34	-52.87	13.39	-0.00	0.34
0.49	20.62	-0.99	-0.03	-2333.26	4.68	-786.82	27.84	43.80	-40.08	13.39	-0.00	0.34
0.50	20.62	-0.99	-0.01	-2333.25	-5.49	-775.90	20.45	-32.55	-38.85	13.39	0.00	0.33
0.51	20.32	-1.00	-0.03	-2332.81	-15.72	-759.61	12.94	-16.70	-44.85	13.39	0.01	0.33
0.52	19.93	-1.00	-0.03	-2327.33	-5.49	-780.75	20.42	61.05	-46.10	13.39	0.00	0.34
0.53	19.74	-1.00	-0.03	-2322.25	-5.42	-784.67	20.55	-0.23	-36.66	13.39	0.00	0.34
0.54	19.83	-1.00	-0.03	-2327.94	4.69	-776.12	27.88	116.44	-24.09	13.39	-0.00	0.35
0.55	19.74	-1.00	-0.03	-2317.55	9.67	-745.06	31.43	40.27	-20.42	13.39	-0.00	0.32
0.56	19.64	-1.00	-0.03	-2312.44	9.52	-703.70	31.22	-104.50	-22.45	13.39	-0.00	0.30
0.57	19.54	-1.00	-0.03	-2323.24	9.52	-713.89	31.24	-27.74	-22.56	13.39	-0.00	0.31
0.58	19.44	-1.00	-0.03	-2317.97	-0.49	-720.40	24.08	-8.48	-16.78	13.39	0.00	0.32
0.59	19.44	-1.00	-0.03	-2317.97	-5.46	-746.20	20.56	-23.06	-9.82	13.39	0.00	0.32
0.60	19.35	-1.00	-0.03	-2328.52	-5.58	-726.78	20.38	21.74	-6.58	13.39	0.00	0.31
0.61	19.25	-1.00	-0.03	-2316.88	-5.67	-702.52	10.70	-101.75	-5.24	13.39	0.00	0.30
0.62	19.25	-1.00	-0.03	-2311.40	-0.50	-722.52	14.51	-111.58	-5.20	13.39	0.00	0.31
0.63	19.15	-1.00	-0.03	-2326.10	9.70	-754.41	31.49	25.34	-6.64	13.39	-0.00	0.32
0.64	19.15	-1.00	-0.03	-2322.62	14.87	-774.05	35.31	58.35	-5.52	13.39	-0.01	0.33
0.65	19.05	-1.00	-0.03	-2333.17	9.69	-757.40	31.47	14.88	-3.28	13.39	-0.00	0.32
0.66	19.05	-1.00	-0.03	-2332.52	-0.62	-714.27	14.32	11.13	0.16	13.39	0.00	0.31
0.67	18.95	-1.00	-0.03	-2327.67	-5.63	-717.56	10.78	-49.96	2.76	13.39	0.00	0.31
0.68	18.95	-1.00	-0.03	-2333.17	-5.62	-721.07	10.80	-70.49	5.15	13.39	0.00	0.31
0.69	18.86	-1.00	-0.03	-2327.69	-0.49	-729.65	14.57	24.93	7.35	13.39	0.00	0.31
0.70	18.86	-1.00	-0.03	-2327.68	4.52	-718.71	18.16	-70.47	8.66	13.39	-0.00	0.31
0.71	18.76	-1.00	-0.03	-2332.92	4.40	-698.53	17.96	-80.23	8.50	13.39	-0.00	0.30
0.72	18.76	-1.00	-0.03	-2322.16	9.62	-724.71	21.85	-23.75	7.33	13.39	-0.00	0.31
0.73	18.76	-1.00	-0.03	-2316.69	4.66	-747.41	16.54	-43.39	3.93	13.39	-0.00	0.32
0.74	18.76	-1.00	-0.03	-2321.78	-0.36	-763.62	14.72	58.12	2.50	13.39	0.00	0.33
0.75	18.76	-1.00	-0.03	-2321.76	-0.43	-745.32	14.62	61.68	7.06	13.39	0.00	0.32

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TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	RS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
0.76	18.66	-1.00	-0.03	-2323.17	-0.60	-696.19	23.94	-64.18	11.96	13.39	0.00	0.30
0.77	18.70	-1.00	-0.03	-2317.07	-0.57	-701.17	14.45	-42.40	12.01	13.39	0.00	0.30
0.78	18.64	-1.00	-0.03	-2312.02	4.55	-710.63	18.21	-44.20	5.26	13.39	-0.00	0.31
0.79	18.66	-1.00	-0.03	-2311.83	4.61	-728.29	18.28	-59.28	1.80	13.38	-0.00	0.32
0.80	18.66	-1.00	-0.03	-2328.71	4.54	-721.80	27.72	-65.65	4.02	13.38	-0.00	0.31
0.81	18.66	-1.00	-0.03	-2327.42	-0.64	-698.60	14.32	-82.23	8.46	13.39	0.00	0.30
0.82	21.40	-0.02	3.97	-2383.19	-1027.85	-67.00	98.10	26.40	42.01	13.43	0.43	0.03
0.83	21.40	-0.02	3.97	-2405.81	-1037.95	-78.44	100.33	51.45	47.77	13.43	0.43	0.03
0.84	21.40	-0.02	3.97	-2395.25	-1053.08	-77.59	88.52	46.92	48.98	13.44	0.44	0.03
0.85	21.40	-0.02	3.97	-2364.21	-1058.25	-47.19	84.66	3.23	46.89	13.44	0.44	0.02
0.86	21.40	-0.02	3.97	-2356.51	-1063.19	-26.70	78.79	-16.00	48.96	13.44	0.45	0.01
0.87	21.40	-0.02	3.97	-2346.78	-1032.76	-54.02	103.36	17.72	52.52	13.44	0.44	0.02
0.88	21.40	-0.02	3.97	-2335.99	-1017.50	-61.91	114.55	31.24	57.16	13.44	0.44	0.03
0.89	21.40	-0.02	3.97	-2308.31	-1012.36	-61.77	106.80	37.97	57.23	13.44	0.44	0.03
0.90	21.40	-0.02	3.97	-2285.88	-1017.50	-29.67	95.45	-6.49	59.55	13.44	0.45	0.01
0.91	21.40	-0.02	3.97	-2280.37	-1017.55	-15.22	95.36	-27.20	58.36	13.44	0.45	0.01
0.92	21.40	-0.02	3.97	-2280.41	-1017.41	-47.27	96.40	8.83	56.08	13.43	0.45	0.02
0.93	21.40	-0.02	3.97	-2290.99	-1012.33	-63.40	100.10	34.72	54.86	13.43	0.44	0.03
0.94	21.40	-0.02	3.97	-2278.56	-1017.39	-61.76	77.35	34.96	57.20	13.43	0.45	0.03
0.95	21.40	-0.02	3.97	-2294.80	-1017.60	-23.84	77.04	-26.77	60.70	13.43	0.44	0.01
0.96	21.40	-0.02	3.97	-2321.43	-1007.64	-14.59	84.16	-37.73	59.45	13.43	0.43	0.01
0.97	21.40	-0.02	3.97	-2360.98	-1002.51	-54.63	107.84	12.55	52.54	13.42	0.42	0.02
0.98	21.40	-0.02	3.97	-2376.87	-1007.55	-61.46	103.37	53.91	43.19	13.43	0.42	0.03
0.99	21.40	-0.02	3.97	-2369.74	-1022.74	-82.96	73.22	46.48	40.89	13.43	0.43	0.04
1.00	21.40	-0.02	3.97	-2368.88	-1033.01	-48.61	56.10	-106.71	46.84	13.43	0.44	0.02
1.01	21.40	-0.02	3.97	-2364.60	-1022.94	-24.31	72.94	-487.65	53.32	13.43	0.43	0.01
1.02	21.40	-0.02	3.97	-2355.95	-1007.53	-66.37	93.86	-940.53	59.97	13.43	0.43	0.03
1.03	21.40	-0.03	3.97	-2347.93	-1002.10	-146.97	98.05	-1629.02	67.67	13.43	0.43	0.06
1.04	21.40	-0.03	3.97	-2344.03	-995.40	-319.86	102.56	-2464.56	74.41	13.43	0.42	0.14
1.05	21.40	-0.03	3.97	-2350.04	-975.29	-582.68	118.30	-2372.23	56.75	13.43	0.42	0.25
1.06	21.40	-0.05	3.97	-2342.35	-898.53	-909.35	107.63	-2016.48	-2.99	13.43	0.38	0.39
1.07	21.40	-0.08	3.97	-2317.90	-726.00	-1186.15	90.02	2820.80	-96.64	13.43	0.31	0.51
1.08	21.40	-0.13	3.97	-2275.49	-488.25	-1323.07	71.81	-1030.98	-172.75	13.43	0.21	0.58
1.09	21.30	-0.32	3.97	-2271.13	-261.23	-1282.45	74.16	1165.63	-208.42	13.43	0.12	0.56
1.10	21.20	-0.32	3.97	-2254.63	-100.20	-1082.21	95.36	449.10	-176.04	13.43	0.04	0.48
1.11	21.01	-0.43	3.97	-2242.90	-14.85	-887.58	109.42	-585.30	-121.32	13.42	0.01	0.40
1.12	20.91	-0.54	3.97	-2243.73	20.39	-829.21	125.42	795.53	-112.86	13.42	-0.01	0.37
1.13	20.62	-0.63	3.97	-2226.69	15.42	-856.11	112.33	-712.20	-135.42	13.42	-0.01	0.38

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TABLE V
TABULATED DATA

RUN: 30-1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.14	20.32	-0.70	3.97	-2241.77	-25.01	-901.81	82.94	370.07	-159.63	13.41	0.01	0.40
1.15	20.03	-0.75	3.97	-2245.80	-70.62	-893.27	40.23	173.23	-153.81	13.41	0.03	0.40
1.16	19.74	-0.80	3.97	-2261.60	-105.13	-875.13	4.89	-337.26	-125.43	13.41	0.05	0.39
1.17	19.54	-0.84	3.98	-2288.25	-116.26	-876.36	-2.33	325.38	-97.76	13.40	0.05	0.36
1.18	19.44	-0.86	3.98	-2270.71	-101.02	-871.77	-10.28	-2.26	-75.11	13.40	0.04	0.30
1.19	19.64	-0.89	3.97	-2281.46	-65.63	-867.66	15.36	-150.28	-60.97	13.40	0.03	0.36
1.20	19.93	-0.91	3.98	-2293.21	-25.32	-830.15	54.01	206.49	-51.21	13.40	0.01	0.30
1.21	20.32	-0.93	3.98	-2306.04	-5.10	-818.06	87.76	-179.57	-40.05	13.40	0.00	0.35
1.22	20.91	-0.94	3.96	-2316.00	-15.19	-830.79	70.94	-110.08	-28.63	13.40	0.01	0.36
1.23	21.30	-0.96	3.96	-2320.48	-55.62	-845.16	32.15	129.68	-19.93	13.40	0.02	0.39
1.24	21.30	-0.96	3.98	-2314.38	-85.93	-849.97	0.77	-123.59	-11.41	13.39	0.04	0.37
1.25	21.01	-0.97	3.98	-2330.00	-96.19	-835.04	-6.80	-66.08	-11.77	13.39	0.04	0.36
1.26	20.52	-0.98	3.98	-2330.11	-86.10	-831.56	10.02	-49.51	-14.15	13.39	0.04	0.36
1.27	20.22	-0.98	3.98	-2329.80	-70.77	-862.58	11.70	-334.47	-6.63	13.39	0.03	0.37
1.28	20.13	-0.99	3.98	-2324.07	-55.46	-882.59	22.88	-137.82	9.10	13.39	0.02	0.38
1.29	20.32	-0.99	3.98	-2319.20	-50.18	-922.51	36.41	-14.85	18.06	13.39	0.02	0.40
1.30	20.32	-0.99	3.98	-2307.35	-50.13	-938.58	36.42	-175.72	9.95	13.39	0.02	0.41
1.31	20.22	-0.99	3.98	-2223.65	-65.27	-967.79	34.97	-15.36	-5.27	13.39	0.03	0.42
1.32	20.03	-1.00	3.98	-2324.52	-75.21	-1005.76	37.46	3.80	-6.71	13.39	0.03	0.43
1.33	19.93	-1.00	3.98	-2323.70	-80.25	-1010.58	24.30	-96.83	1.56	13.39	0.03	0.43
1.34	19.83	-1.00	3.98	-2322.84	-85.36	-997.85	11.04	69.56	12.76	13.39	0.04	0.43
1.35	19.74	-1.00	3.98	-2317.73	-75.35	-964.84	18.22	41.29	16.32	13.39	0.03	0.42
1.36	19.64	-1.00	3.98	-2323.01	-65.32	-952.66	25.40	-21.35	11.77	13.39	0.03	0.41
1.37	19.54	-1.00	3.98	-2323.25	-60.20	-966.50	29.15	81.02	5.96	13.39	0.03	0.42
1.38	19.44	-1.00	3.98	-2323.89	-65.28	-954.47	25.49	85.69	8.44	13.39	0.03	0.41
1.39	19.35	-1.00	3.98	-2329.78	-75.52	-924.21	14.02	9.93	15.58	13.39	0.03	0.40
1.40	19.35	-1.00	3.98	-2335.65	-75.77	-865.68	17.67	-36.06	19.16	13.39	0.03	0.37
1.41	19.25	-1.00	3.98	-2330.78	-70.78	-839.94	21.25	-108.08	19.43	13.39	0.03	0.36
1.42	19.15	-1.00	3.98	-2330.58	-60.56	-866.23	28.72	-46.66	18.18	13.39	0.03	0.37
1.43	19.15	-1.00	3.98	-2330.39	-45.30	-889.70	39.82	54.53	13.41	13.39	0.02	0.38
1.44	19.05	-1.00	3.98	-2314.33	-40.15	-895.47	43.61	46.02	12.34	13.39	0.02	0.35
1.45	19.05	-1.00	3.98	-2314.49	-45.41	-846.54	39.66	-60.77	17.08	13.39	0.02	0.37
1.46	18.95	-1.00	3.97	-2324.64	-65.79	-821.51	15.28	-47.80	23.56	13.39	0.03	0.35
1.47	18.95	-1.00	3.97	-2319.59	-80.89	-851.55	4.42	-79.56	24.12	13.39	0.03	0.36
1.48	18.86	-1.00	3.97	-2324.91	-90.94	-855.78	-2.80	-66.10	18.34	13.39	0.04	0.37
1.49	18.86	-1.00	3.97	-2324.49	-80.79	-868.45	4.55	4.63	14.66	13.39	0.03	0.37
1.50	18.76	-1.00	3.97	-2319.99	-65.68	-842.20	24.56	-75.47	15.94	13.39	0.03	0.36
1.51	18.76	-1.00	3.97	-2319.75	-40.42	-834.13	43.24	-99.48	20.54	13.38	0.02	0.36

TABLE V
TABULATED DATA

RUN: 3C- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.52	18.76	-1.00	3.97	-2319.76	-25.14	-657.25	54.39	-45.98	23.59	13.38	0.01	0.37
1.53	18.76	-1.00	3.97	-2309.21	-30.08	-871.64	50.89	-28.64	25.22	13.39	0.01	0.36
1.54	18.76	-1.00	3.97	-2319.90	-55.40	-877.67	32.54	-35.52	23.96	13.39	0.02	0.36
1.55	18.66	-1.00	3.97	-2324.04	-80.85	-855.46	4.49	-16.24	19.12	13.38	0.03	0.37
1.56	18.66	-1.00	3.97	-2335.87	-96.06	-852.63	3.02	-6.18	15.65	13.36	0.04	0.37
1.57	18.66	-1.00	3.97	-2341.39	-96.03	-863.52	3.07	-0.18	14.55	13.36	0.04	0.37
1.58	18.65	-1.00	3.97	-2329.95	-80.80	-867.63	4.59	-5.45	15.87	13.36	0.03	0.37
1.59	18.56	-1.00	3.97	-2324.89	-55.53	-854.16	22.87	-39.74	20.67	13.38	0.02	0.37
1.60	18.56	-1.00	3.97	-2330.33	-30.43	-809.58	40.87	-84.84	26.49	13.38	0.01	0.35
1.61	18.56	-1.00	3.97	-2325.96	-20.27	-809.53	57.78	-76.14	26.51	13.39	0.01	0.35
1.62	21.40	-0.03	7.97	-2378.52	-1366.09	-51.20	131.68	32.52	27.90	13.41	0.57	0.03
1.63	21.40	-0.03	7.97	-2367.95	-1365.00	-57.45	131.82	40.03	33.74	13.41	0.58	0.03
1.64	21.40	-0.03	7.97	-2350.61	-1366.11	-40.07	122.10	3.88	29.04	13.41	0.58	0.02
1.65	21.40	-0.03	7.97	-2334.52	-1350.98	-18.33	133.05	-23.59	23.36	13.41	0.58	0.01
1.66	21.40	-0.03	7.97	-2333.37	-1340.73	-46.64	150.11	9.45	18.76	13.41	0.57	0.02
1.67	21.40	-0.03	7.97	-2312.77	-1340.63	-57.82	140.70	22.20	17.57	13.41	0.58	0.03
1.68	21.40	-0.03	7.97	-2290.40	-1350.64	-68.71	123.97	40.22	16.42	13.41	0.59	0.03
1.69	21.40	-0.03	7.97	-2273.47	-1345.67	-38.81	117.95	2.82	15.35	13.41	0.59	0.02
1.70	21.40	-0.04	7.97	-2285.05	-1330.65	-10.59	139.36	-39.75	11.90	13.40	0.58	0.00
1.71	21.40	-0.03	7.97	-2301.16	-1325.51	-44.98	142.06	6.57	6.12	13.41	0.58	0.02
1.72	21.40	-0.04	7.97	-2293.83	-1335.59	-64.13	116.78	31.52	0.29	13.40	0.58	0.03
1.73	21.40	-0.04	7.97	-2298.31	-1345.68	-76.66	99.95	48.81	1.41	13.40	0.59	0.03
1.74	21.40	-0.04	7.97	-2331.45	-1340.83	-50.25	112.84	9.04	5.59	13.40	0.58	0.02
1.75	21.40	-0.04	7.97	-2360.35	-1335.94	-20.95	135.36	-35.34	11.81	13.40	0.57	0.01
1.76	21.40	-0.04	7.97	-2363.06	-1340.93	-55.94	141.35	15.68	12.68	13.40	0.56	0.02
1.77	21.40	-0.04	7.97	-2364.65	-1361.06	-71.25	107.75	29.57	12.83	13.40	0.58	0.03
1.78	21.40	-0.04	7.97	-2364.66	-1371.14	-78.41	100.48	46.07	17.40	13.40	0.58	0.03
1.79	21.40	-0.04	7.97	-2355.08	-1366.14	-43.12	113.61	-6.22	24.45	13.40	0.58	0.02
1.80	21.40	-0.05	7.97	-2344.26	-1356.10	-15.69	119.72	-140.53	25.80	13.41	0.58	0.01
1.81	21.40	-0.05	7.97	-2332.80	-1355.93	-54.08	119.93	-408.20	24.04	13.41	0.58	0.02
1.82	21.40	-0.04	7.97	-2344.10	-1350.78	-76.52	124.88	-842.86	29.45	13.40	0.58	0.03
1.83	21.40	-0.04	7.97	-2371.17	-1340.50	-134.23	141.97	-1608.58	36.44	13.40	0.57	0.06
1.84	21.40	-0.04	7.97	-2383.08	-1320.03	-253.72	136.73	-2562.45	35.23	13.41	0.55	0.10
1.85	21.40	-0.05	7.97	-2373.16	-1259.78	-438.19	124.08	-2541.63	5.39	13.41	0.53	0.18
1.86	21.40	-0.07	7.97	-2349.33	-1101.21	-749.35	105.06	-1914.99	-55.46	13.41	0.47	0.32
1.87	21.40	-0.11	7.97	-2336.34	-832.75	-1015.55	108.90	659.32	-136.87	13.41	0.36	0.43
1.88	21.40	-0.17	7.97	-2311.93	-529.22	-1185.62	109.41	715.63	-200.48	13.41	0.23	0.51
1.89	21.40	-0.27	7.97	-2288.74	-286.92	-1159.18	103.46	-692.42	-204.57	13.41	0.13	0.51

TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
1.90	21.30	-0.37	7.97	-2280.51	-135.83	-1019.90	107.71	1222.54	-168.19	13.41	0.05	0.45
1.91	21.10	-0.48	7.97	-2257.68	-65.13	-954.10	120.89	-1081.18	-127.51	13.41	0.03	0.42
1.92	21.10	-0.58	7.97	-2257.27	-50.00	-941.32	122.35	512.72	-126.72	13.40	0.02	0.42
1.93	20.91	-0.66	7.97	-2245.93	-80.16	-991.79	100.58	8.08	-147.85	13.40	0.04	0.44
1.94	20.91	-0.73	7.97	-2249.15	-130.76	-1016.99	54.29	-357.30	-161.53	13.40	0.06	0.45
1.95	20.81	-0.78	7.97	-2258.46	-171.32	-1011.30	15.28	469.63	-154.12	13.40	0.04	0.45
1.96	20.71	-0.82	7.98	-2270.49	-191.42	-1029.32	10.56	-219.22	-126.30	13.39	0.08	0.45
1.97	20.71	-0.85	7.97	-2286.94	-186.40	-1015.99	14.21	48.75	-99.07	13.39	0.08	0.44
1.98	20.62	-0.88	7.97	-2291.80	-161.12	-1010.92	22.99	284.14	-84.35	13.39	0.07	0.44
1.99	20.62	-0.91	7.98	-2274.03	-135.94	-974.64	22.06	-217.59	-75.53	13.39	0.06	0.43
2.00	20.62	-0.92	7.97	-2279.26	-105.72	-947.88	43.82	27.63	-73.51	13.39	0.05	0.42
2.01	20.52	-0.94	7.98	-2292.15	-85.36	-973.15	77.82	92.03	-73.42	13.38	0.04	0.42
2.02	20.52	-0.95	7.98	-2315.59	-85.35	-983.33	96.93	-130.22	-72.98	13.38	0.04	0.42
2.03	20.42	-0.96	7.97	-2336.98	-120.78	-1000.33	71.30	132.77	-75.87	13.38	0.05	0.43
2.04	20.32	-0.97	7.98	-2323.51	-166.46	-972.14	9.52	101.61	-79.43	13.38	0.07	0.42
2.05	20.32	-0.97	7.97	-2310.33	-186.85	-940.35	-24.43	-139.25	-77.96	13.38	0.04	0.41
2.06	20.22	-0.98	7.97	-2344.24	-176.70	-964.76	-7.50	-41.99	-75.74	13.38	0.01	0.41
2.07	20.13	-0.98	7.97	-2333.67	-141.18	-976.01	18.39	-40.91	-69.80	13.37	0.06	0.42
2.08	20.03	-0.99	7.97	-2323.69	-120.78	-992.33	42.70	-140.95	-55.75	13.38	0.05	0.43
2.09	20.03	-0.99	7.97	-2329.54	-110.71	-977.57	59.48	-17.17	-41.18	13.38	0.05	0.42
2.10	19.93	-0.99	7.97	-2318.32	-120.78	-981.38	52.21	-22.73	-39.03	13.38	0.05	0.42
2.11	19.83	-1.00	7.93	-2324.06	-135.77	-1032.87	51.02	9.17	-47.27	13.38	0.06	0.44
2.12	19.83	-1.00	7.98	-2329.38	-145.84	-1051.26	43.89	118.58	-52.08	13.37	0.06	0.45
2.13	19.74	-1.00	7.98	-2323.69	-155.97	-1040.53	26.95	70.39	-43.77	13.38	0.07	0.45
2.14	19.64	-1.00	7.98	-2324.25	-156.20	-975.10	26.76	-51.55	-29.68	13.37	0.07	0.42
2.15	19.64	-1.00	7.97	-2323.56	-151.34	-926.62	20.59	-70.82	-18.15	13.37	0.07	0.40
2.16	19.54	-1.00	7.98	-2313.04	-141.04	-956.24	28.18	-53.51	-16.85	13.37	0.06	0.41
2.17	19.54	-1.00	7.97	-2323.42	-135.92	-984.95	31.91	-30.72	-21.56	13.37	0.06	0.42
2.18	19.44	-1.00	7.97	-2323.23	-135.84	-1008.45	32.03	32.33	-26.29	13.37	0.06	0.43
2.19	19.35	-1.00	7.97	-2324.24	-141.01	-977.11	37.75	-9.32	-25.11	13.37	0.06	0.42
2.20	19.35	-1.00	7.97	-2317.88	-141.14	-945.07	28.00	-65.71	-22.80	13.37	0.06	0.41
2.21	19.25	-1.00	7.97	-2329.73	-135.96	-974.77	41.39	-3.36	-21.63	13.37	0.06	0.42
2.22	19.25	-1.00	7.97	-2319.17	-130.82	-963.29	45.19	-17.40	-19.19	13.37	0.06	0.42
2.23	19.15	-1.00	7.97	-2316.13	-125.74	-992.00	39.32	-2.05	-16.93	13.37	0.05	0.43
2.24	19.15	-1.00	7.97	-2312.82	-130.91	-962.94	35.50	-56.42	-19.18	13.37	0.06	0.42
2.25	19.15	-1.00	7.97	-2318.08	-141.14	-940.40	26.02	-102.22	-15.77	13.37	0.04	0.41
2.26	19.05	-1.00	7.97	-2328.68	-151.15	-971.60	20.88	-21.79	-9.03	13.37	0.06	0.42
2.27	19.05	-1.00	7.97	-2328.69	-161.18	-989.59	13.71	37.32	-5.66	13.37	0.07	0.42

TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
2.28	16.65	-1.00	7.97	-2328.72	-161.13	-1003.67	13.78	30.22	-11.37	13.37	0.07	0.43
2.29	13.95	-1.00	7.97	-2323.40	-146.09	-970.95	24.53	-55.86	-15.82	13.37	0.06	0.42
2.30	16.86	-1.00	7.97	-2328.85	-126.03	-953.76	38.89	-101.70	-13.45	13.37	0.05	0.40
2.31	16.66	-1.00	7.98	-2318.29	-110.67	-958.81	56.15	-104.32	-5.21	13.37	0.05	0.41
2.32	16.66	-1.00	7.97	-2312.80	-115.61	-979.75	46.67	-84.05	1.66	13.37	0.05	0.42
2.33	16.75	-1.00	7.97	-2317.91	-130.53	-1010.49	35.65	-48.94	1.53	13.37	0.06	0.44
2.34	16.76	-1.00	7.97	-2323.59	-145.92	-1006.02	34.30	-110.51	-6.69	13.37	0.05	0.43
2.35	13.76	-1.00	7.97	-2333.74	-166.26	-1000.80	19.50	-142.33	-13.63	13.37	0.07	0.43
2.36	16.66	-1.00	7.97	-2333.58	-181.22	-1050.31	8.86	-14.28	-11.75	13.37	0.08	0.45
2.37	16.66	-1.00	7.97	-2321.77	-176.03	-1072.75	3.15	27.30	-7.20	13.37	0.08	0.46
2.38	16.66	-1.00	7.97	-2327.97	-155.74	-1085.04	27.40	79.63	-2.68	13.37	0.07	0.47
2.39	[illegible]	-1.00	7.97	-2328.25	-135.67	-1044.06	41.78	66.58	-2.56	13.37	0.06	0.45
2.40	[illegible]	-1.00	7.97	-2323.35	-115.62	-993.60	56.13	-34.75	-3.41	13.37	0.05	0.43
2.41	[illegible]	-1.00	7.97	-2329.67	-115.58	-1005.61	56.21	-10.76	-3.32	13.37	0.05	0.43
2.42	21.40	-0.05	12.00	-2346.82	-1340.81	-68.68	122.42	39.10	-6.59	13.40	0.57	0.03
2.43	21.40	-0.05	12.00	-2338.01	-1325.74	-60.53	126.11	32.61	-1.59	13.40	0.57	0.03
2.44	21.40	-0.05	12.00	-2350.83	-1325.75	-26.82	152.35	-17.63	2.74	13.40	0.56	0.01
2.45	21.40	-0.05	12.00	-2373.23	-1335.92	-27.67	154.48	-22.77	1.54	13.40	0.56	0.01
2.46	21.40	-0.05	12.00	-2383.02	-1356.13	-51.94	130.31	20.11	-4.32	13.40	0.57	0.02
2.47	21.40	-0.05	12.00	-2376.72	-1366.20	-63.66	113.50	36.06	-6.66	13.40	0.57	0.03
2.48	21.40	-0.05	12.00	-2382.21	-1351.06	-60.01	124.45	31.28	-8.89	13.40	0.57	0.03
2.49	21.40	-0.05	12.00	-2381.15	-1325.93	-31.00	132.98	-13.83	-11.17	13.40	0.56	0.01
2.50	21.40	-0.05	12.00	-2357.70	-1310.71	-33.24	123.88	-6.07	-14.61	13.41	0.56	0.01
2.51	21.40	-0.05	12.00	-2341.65	-1290.35	-49.91	139.80	13.39	-16.82	13.40	0.55	0.02
2.52	21.40	-0.05	12.00	-2342.48	-1275.11	-60.86	160.43	26.18	-17.56	13.40	0.54	0.03
2.53	21.40	-0.05	12.00	-2331.70	-1275.07	-63.89	159.45	33.59	-22.56	13.41	0.55	0.03
2.54	21.40	-0.05	12.00	-2297.47	-1290.30	-38.71	129.25	-4.11	-30.66	13.41	0.56	0.02
2.55	21.40	-0.05	12.00	-2274.88	-1300.36	-41.06	112.45	-5.72	-34.17	13.41	0.57	0.02
2.56	21.40	-0.05	12.00	-2293.03	-1295.25	-54.73	136.33	10.82	-31.60	13.40	0.56	0.02
2.57	21.40	-0.05	12.00	-2310.15	-1300.28	-66.97	142.26	34.96	-27.21	13.40	0.56	0.03
2.58	21.40	-0.05	12.00	-2305.68	-1315.42	-63.96	140.87	23.64	-22.62	13.40	0.57	0.03
2.59	21.40	-0.05	12.00	-2304.62	-1340.85	-36.37	112.78	-25.97	-19.26	13.40	0.58	0.02
2.60	21.40	-0.05	12.00	-2303.80	-1350.95	-43.47	97.05	-69.63	-14.55	13.39	0.59	0.02
2.61	21.40	-0.05	12.00	-2348.81	-1335.82	-56.44	127.07	-404.17	-10.42	13.39	0.57	0.02
2.62	21.40	-0.05	12.00	-2376.50	-1315.57	-76.11	151.27	-893.24	-8.37	13.39	0.55	0.03
2.63	21.40	-0.05	12.00	-2386.67	-1320.54	-112.09	147.73	-1636.05	-7.20	13.39	0.55	0.05
2.64	21.40	-0.05	12.00	-2364.78	-1315.24	-190.26	113.48	-2587.47	-7.21	13.39	0.56	0.08
2.65	21.40	-0.06	12.00	-2350.20	-1253.96	-384.44	100.84	-2595.73	-21.78	13.39	0.53	0.16

TABLE V
TABULATED DATA

RUN: 30- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
2.66	21.40	-0.09	12.00	-2367.27	-1091.48	-661.34	112.78	-568.04	-64.32	13.40	0.46	0.26
2.67	21.49	-0.13	12.00	-2366.71	-843.17	-943.26	120.98	-765.10	-125.87	13.40	0.26	0.40
2.68	21.49	-0.20	12.00	-2365.51	-574.93	-1150.95	124.35	1351.21	-187.81	13.40	0.24	0.45
2.69	21.40	-0.30	12.00	-2342.97	-362.68	-1195.20	115.67	-1194.28	-195.95	13.40	0.15	0.51
2.70	21.30	-0.41	12.00	-2334.39	-221.47	-1150.04	115.15	1364.60	-171.38	13.40	0.10	0.45
2.71	21.20	-0.51	12.00	-2310.10	-165.85	-1090.62	114.97	-589.58	-140.72	13.40	0.07	0.47
2.72	21.10	-0.60	12.00	-2304.82	-150.78	-1057.21	116.33	128.72	-138.23	13.40	0.07	0.46
2.73	21.01	-0.68	12.00	-2288.99	-165.95	-1050.15	105.34	402.62	-151.51	13.40	0.07	0.46
2.74	20.91	-0.74	12.00	-2288.77	-196.42	-1027.94	83.31	-510.44	-154.48	13.39	0.09	0.45
2.75	20.91	-0.80	12.00	-2304.41	-231.82	-1041.08	57.68	319.59	-144.70	13.29	0.10	0.45
2.76	20.81	-0.83	12.00	-2292.81	-267.07	-1062.27	22.78	45.38	-122.35	13.39	0.1[illegible]	0.46
2.77	20.81	-0.86	12.00	-2280.35	-277.13	-1060.73	-3.52	-216.50	-96.53	13.39	0.1[illegible]	0.47
2.78	20.71	-0.89	12.00	-2286.81	-251.87	-1038.75	24.32	246.06	-71.96	13.39	0.11	0.45
2.79	20.71	-0.91	12.00	-2282.49	-206.39	-1006.77	66.76	-140.20	-53.90	13.39	0.09	0.44
2.80	20.62	-0.93	12.00	-2293.87	-181.04	-1021.92	94.84	-175.81	-45.79	13.28	0.08	0.45
2.81	20.52	-0.94	12.00	-2298.14	-186.01	-1043.02	81.61	273.14	-39.72	13.39	0.08	0.46
2.82	20.52	-0.95	12.00	-2280.42	-206.19	-1050.47	48.17	-41.82	-27.59	13.38	0.09	0.46
2.83	20.42	-0.96	12.00	-2313.99	-216.48	-1023.15	50.16	-76.13	-17.15	13.38	0.09	0.44
2.84	20.42	-0.97	12.00	-2331.49	-226.83	-974.88	52.07	69.92	-13.95	13.38	0.10	0.42
2.85	20.32	-0.98	12.00	-2330.67	-236.96	-975.61	35.38	-258.95	-14.50	13.37	0.10	0.42
2.86	20.22	-0.98	12.00	-2333.92	-252.08	-1007.12	5.22	-161.70	-15.92	13.38	0.11	0.43
2.87	20.22	-0.99	12.00	-2322.72	-251.90	-1039.91	5.47	42.96	-11.75	13.38	0.11	0.45
2.88	20.13	-0.99	12.00	-2323.34	-241.66	-1061.70	22.49	-127.18	-5.72	13.38	0.10	0.46
2.89	20.03	-0.99	12.00	-2334.48	-221.53	-1044.40	45.66	26.61	-2.73	13.37	0.09	0.45
2.90	20.03	-0.99	12.00	-2324.74	-206.24	-1056.75	67.33	58.66	-6.12	13.37	0.09	0.45
2.91	19.93	-1.00	12.00	-2330.26	-201.17	-1065.57	71.00	-116.68	-11.49	13.37	0.09	0.46
2.92	19.93	-1.00	12.00	-2341.27	-216.38	-1065.50	59.84	-10.67	-11.64	13.38	0.09	0.4[illegible]
2.93	19.74	-1.00	12.00	-2329.87	-236.64	-1051.39	35.84	-16.14	-5.85	13.37	0.10	0.45
2.94	19.74	-1.00	12.00	-2335.11	-246.89	-1021.48	28.13	-215.67	1.28	13.38	0.11	0.44
2.95	19.64	-1.00	12.00	-2334.70	-251.88	-1041.31	24.56	-74.22	2.06	13.38	0.11	0.45
2.96	19.54	-1.00	12.00	-2329.03	-251.69	-1084.46	25.03	-56.72	-1.43	13.37	0.11	0.47
2.97	19.54	-1.00	12.00	-2324.16	-245.49	-1110.87	38.41	-107.62	-2.55	13.37	0.11	0.46
2.98	19.44	-1.00	12.00	-2329.24	-241.40	-1125.54	42.11	65.08	-1.79	13.37	0.10	0.46
2.99	19.44	-1.00	12.00	-2324.73	-236.43	-1092.71	55.16	-31.04	1.78	13.37	0.10	0.47
3.00	19.35	-1.00	12.00	-2324.95	-231.37	-1091.06	58.83	-87.98	4.27	13.37	0.10	0.47
3.01	19.25	-1.00	12.00	-2325.74	-226.30	-1102.00	62.50	-4.24	3.01	13.37	0.10	0.47
3.02	19.25	-1.00	12.00	-2318.87	-231.27	-1114.34	49.45	-24.37	-0.32	13.37	0.10	0.46
3.03	19.15	-1.00	12.00	-2324.15	-236.38	-1108.57	45.72	-56.97	0.83	13.37	0.10	0.46

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TABLE V
TABULATED DATA

RUN: SC- 1-32

TE	KS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.04	19.15	-1.00	12.00	-2329.40	-246.65	-1075.85	38.17	-25.57	4.08	13.37	0.11	0.46
3.05	19.15	-1.00	12.00	-2318.83	-246.59	-1076.55	38.28	-29.50	7.64	13.37	0.11	0.47
3.06	19.05	-1.00	12.00	-2329.62	-251.64	-1087.96	34.64	-18.10	8.77	13.37	0.11	0.47
3.07	18.95	-1.00	12.00	-2323.33	-251.59	-1102.70	25.16	6.71	1.84	13.37	0.11	0.47
3.08	18.95	-1.00	12.00	-2318.26	-240.54	-1056.90	28.81	-8.99	-4.92	13.37	0.11	0.47
3.09	18.95	-1.00	12.00	-2324.53	-231.55	-1054.64	49.04	-60.02	-2.55	13.37	0.10	0.45
3.10	18.86	-1.00	12.00	-2330.01	-221.45	-1050.76	56.33	-68.04	3.23	13.37	0.10	0.45
3.11	18.86	-1.00	12.00	-2319.45	-221.34	-1062.86	56.51	-98.75	8.00	13.37	0.10	0.46
3.12	18.76	-1.00	12.00	-2319.47	-221.27	-1078.12	56.61	-126.83	8.09	13.37	0.10	0.46
3.13	18.76	-1.00	12.00	-2324.35	-231.36	-1097.50	49.33	-91.27	2.10	13.37	0.10	0.47
3.14	18.76	-1.00	12.00	-2323.71	-246.60	-1093.05	38.23	-50.23	-6.31	13.37	0.11	0.47
3.15	18.66	-1.00	12.00	-2318.03	-266.71	-1119.45	23.73	-21.63	-7.61	13.37	0.12	0.48
3.16	18.66	-1.00	12.00	-2328.83	-271.72	-1136.02	20.21	42.64	-1.94	13.37	0.12	0.49
3.17	18.66	-1.00	12.00	-2323.96	-261.59	-1126.81	27.57	23.39	4.03	13.37	0.11	0.48
3.18	18.56	-1.00	12.00	-2324.36	-241.43	-1106.18	42.09	-22.70	4.28	13.37	0.10	0.48
3.19	18.56	-1.00	12.00	-2324.53	-225.42	-1066.85	52.80	-90.20	2.11	13.37	0.10	0.46
3.20	18.56	-1.00	12.00	-2318.21	-216.31	-1066.35	50.56	-73.28	-0.21	13.37	0.09	0.46
3.21	18.47	-1.00	12.00	-2319.05	-216.18	-1092.32	60.29	-80.78	2.14	13.37	0.09	0.47
3.22	56.86	-0.91	0.0	-10.20	0.10	-18.85	0.13	10.94	-12.85	14.12	-0.01	1.85
3.23	56.96	-0.91	0.0	-4.88	0.01	3.18	-0.01	-25.93	-10.52	14.12	-0.00	-1.67
3.24	56.96	-0.91	0.0	0.43	-0.08	33.69	-0.15	-64.87	-10.47	14.12	-0.18	78.03
3.25	56.96	-0.91	0.0	0.41	0.01	14.09	-0.01	-38.92	-9.32	14.12	0.03	34.39
3.26	57.06	-0.01	0.0	-1176.06	-19.13	-39.55	1.99	11.66	-4.22	13.76	0.02	0.03
3.27	57.06	-0.01	0.0	-1149.19	-14.04	-24.95	5.85	-11.53	-5.31	13.76	0.01	0.02
3.28	57.06	-0.01	0.0	-1133.92	-9.03	3.32	19.12	-41.43	-8.75	13.76	0.01	-0.00
3.29	57.06	-0.01	0.0	-1129.48	-13.99	-12.71	25.00	-20.12	-9.90	13.76	0.01	0.01
3.30	57.06	-0.01	0.0	-1140.07	-29.10	-36.02	13.65	11.22	-6.56	13.76	0.03	0.03
3.31	57.06	-0.01	0.0	-1161.44	-39.19	-58.58	6.05	42.95	-2.06	13.76	0.03	0.05
3.32	57.06	-0.01	0.0	-1193.79	-39.33	-52.75	5.86	28.44	-0.91	13.76	0.03	0.04
3.33	57.06	-0.01	0.0	-1209.82	-34.49	-17.20	9.33	-33.36	-0.92	13.76	0.03	0.01
3.34	57.06	-0.01	0.0	-1209.01	-24.37	-23.73	7.44	-19.85	-3.18	13.76	0.02	0.02
3.35	57.06	-0.01	0.0	-1170.55	-19.16	-29.43	1.93	0.07	-4.26	13.76	0.02	0.03
3.36	57.06	-0.01	0.0	-1133.13	-13.93	-34.30	6.01	13.42	-4.14	13.76	0.01	0.03
3.37	57.06	-0.01	0.0	-1117.88	-13.90	-25.63	15.60	-8.70	-6.41	13.76	0.01	0.02
3.38	57.06	-0.01	0.0	-1134.74	-14.04	-3.12	24.93	-38.12	-3.03	13.76	0.01	0.00
3.39	57.06	-0.01	0.0	-1145.54	-29.16	-20.47	13.56	-24.92	1.56	13.76	0.03	0.02
3.40	57.06	-0.01	0.0	-1172.20	-39.28	-43.85	5.93	-78.98	5.02	13.76	0.03	0.04
3.41	57.06	-0.01	0.0	-1199.08	-39.29	-65.04	5.92	-311.03	4.29	13.76	0.03	0.05

TABLE V
TABULATED DATA

RUN: SC- 1-32

TE	PS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.42	[illegible]	-0.01	0.0	-1208.83	-39.37	-63.06	-3.76	-751.27	0.42	13.76	0.04	[illegible]
3.43	[illegible]	-0.01	0.0	-1197.61	-29.29	-52.56	3.79	-1462.84	-5.37	13.76	0.02	[illegible]
3.44	[illegible]	-0.01	0.0	-1169.33	-13.68	-145.06	15.85	-2213.67	-12.30	13.76	0.02	[illegible]
3.45	57.00	-0.01	0.0	-1123.52	-7.87	-317.10	20.63	-2646.96	-23.69	13.76	0.01	[illegible]
3.46	57.06	-0.02	0.0	-1093.22	-1.90	-538.01	35.16	-2391.84	-48.08	13.76	0.00	[illegible]
3.47	57.02	-0.04	0.0	-1052.75	-5.28	-715.71	41.68	-2194.87	-101.14	13.76	0.01	0.60
3.48	56.96	-0.06	0.0	-1018.21	-16.17	-802.23	34.21	-2110.72	-175.58	13.76	0.02	0.79
3.49	56.90	-0.11	0.0	-1014.90	-21.15	-849.27	59.05	3231.12	-263.56	13.75	0.02	0.84
3.50	56.85	-0.17	0.0	-991.06	-10.91	-871.30	95.43	-1965.01	-318.49	13.74	0.01	0.73
3.51	56.77	-0.26	0.0	-974.39	-10.96	-852.46	85.81	2275.72	-336.34	13.74	0.01	0.87
3.52	56.57	-0.37	0.0	-913.23	-26.20	-761.75	36.24	-1360.05	-270.71	13.74	0.02	0.82
3.53	56.10	-0.48	0.0	-901.66	-21.53	-617.05	11.03	1035.43	-188.27	13.73	0.02	0.61
3.54	55.40	-0.57	0.0	-904.09	8.82	-570.45	43.50	-289.76	-139.33	13.72	-0.01	0.63
3.55	54.62	-0.65	0.0	-960.50	34.10	-595.27	91.08	-281.97	-138.17	13.71	-0.04	0.62
3.56	54.23	-0.72	0.0	-961.48	29.08	-636.04	87.29	669.78	-154.98	13.71	-0.03	0.65
3.57	54.52	-0.77	0.0	-983.89	-1.33	-646.43	35.81	-555.47	-152.94	13.71	0.00	0.66
3.58	54.81	-0.82	0.0	-1003.13	-26.85	-621.60	-2.55	232.35	-139.69	13.70	0.03	0.62
3.59	55.01	-0.85	0.0	-1024.88	-21.78	-625.12	1.31	36.36	-113.93	13.69	0.02	0.61
3.60	55.11	-0.88	0.0	-1063.53	9.59	-641.92	33.61	-417.63	-92.30	13.68	-0.01	0.60
3.61	55.30	-0.90	0.0	-1083.64	18.77	-675.31	31.71	223.71	-82.04	13.68	-0.02	0.62
3.62	55.50	-0.92	0.0	-1081.36	8.72	-700.02	5.15	18.47	-72.60	13.68	-0.01	0.65
3.63	55.50	-0.94	0.0	-1090.64	-1.49	-691.99	-12.11	-229.49	-59.75	13.68	0.00	0.63
3.64	55.40	-0.95	0.0	-1147.24	3.51	-701.01	20.26	283.02	-43.40	13.67	-0.00	0.61
3.65	55.59	-0.96	0.0	-1159.26	3.54	-700.37	29.68	-142.56	-26.41	13.67	-0.00	0.60
3.66	55.59	-0.97	0.0	-1169.22	-11.66	-703.70	9.00	39.03	-16.37	13.67	0.01	0.60
3.67	55.59	-0.97	0.0	-1151.69	-16.75	-684.36	-13.91	105.08	-10.62	13.67	0.01	0.59
3.68	55.50	-0.98	0.0	-1151.64	-1.71	-651.52	-2.78	-209.72	-6.66	13.67	0.00	0.57
3.69	55.69	-0.98	0.0	-1162.01	13.49	-667.75	8.50	42.64	-8.34	13.67	-0.01	0.57
3.70	56.18	-0.99	0.0	-1164.11	23.75	-587.95	35.44	28.84	-8.14	13.67	-0.02	0.59
3.71	56.56	-0.99	0.0	-1169.62	13.66	-695.05	27.93	-125.43	-3.23	13.67	-0.01	0.59
3.72	57.16	-0.99	0.0	-1174.89	-11.70	-685.52	9.97	89.67	3.17	13.67	0.01	0.58
3.73	56.96	-0.99	0.0	-1169.58	-21.93	-655.72	1.24	1.20	2.11	13.67	0.02	0.56
3.74	56.26	-0.99	0.0	-1163.90	-21.83	-681.16	1.37	-175.57	-5.67	13.67	0.02	0.55
3.75	55.69	-0.99	0.0	-1169.19	-11.69	-691.01	8.96	78.54	-4.97	13.67	0.01	0.55
3.76	55.40	-1.00	0.0	-1156.82	3.59	-693.31	20.46	-59.22	6.98	13.67	-0.00	0.60
3.77	55.40	-1.00	0.0	-1158.79	10.74	-682.87	31.76	-8.96	14.96	13.67	-0.02	0.59
3.78	55.30	-1.00	0.0	-1153.27	23.71	-660.51	35.38	19.67	10.22	13.67	-0.02	0.57
3.79	55.01	-1.00	0.0	-1153.09	13.68	-686.32	27.95	-130.18	2.40	13.67	-0.01	0.60

TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	KS	SK	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
3.80	54.51	-1.00	0.0	-1163.68	-1.51	-697.42	16.60	108.18	0.73	13.67	0.00	0.60
3.81	54.61	-1.00	0.0	-1153.34	-21.67	-699.27	1.63	76.58	5.51	13.67	0.02	0.61
3.82	54.61	-1.00	0.0	-1164.10	-21.80	-679.69	1.43	-18.89	4.48	13.67	0.02	0.58
3.83	54.71	-1.00	0.0	-1158.99	-16.91	-635.99	4.95	104.42	0.82	13.67	0.01	0.55
3.84	54.62	-1.00	0.0	-1148.63	3.36	-630.62	20.13	-62.56	1.31	13.67	-0.00	0.55
3.85	54.52	-1.00	0.0	-1154.33	18.53	-627.37	31.48	-84.65	6.09	13.67	-0.02	0.54
3.86	54.42	-1.00	0.0	-1149.04	23.66	-634.44	35.36	57.04	10.52	13.67	-0.02	0.55
3.87	54.42	-1.00	0.0	-1143.76	18.60	-630.06	31.59	-94.12	9.65	13.67	-0.02	0.55
3.88	54.32	-1.00	0.0	-1159.39	3.25	-612.32	19.97	-52.60	5.84	13.67	-0.00	0.53
3.89	54.32	-1.00	0.0	-1164.70	-16.95	-628.46	4.93	47.95	4.47	13.67	0.01	0.54
3.90	54.23	-1.00	0.0	-1153.11	-26.95	-648.77	-12.00	17.61	4.59	13.67	0.02	0.56
3.91	54.23	-1.00	0.0	-1170.23	-16.85	-654.66	5.09	36.76	3.44	13.67	0.01	0.56
3.92	54.23	-1.00	0.0	-1159.85	-1.70	-633.98	16.38	28.45	3.60	13.67	0.00	0.55
3.93	54.23	-1.00	0.0	-1154.72	13.31	-584.93	27.46	-81.93	8.43	13.67	-0.01	0.51
3.94	54.13	-1.00	0.0	-1160.21	18.37	-585.40	31.26	-52.72	15.33	13.67	-0.02	0.50
3.95	54.13	-1.00	0.0	-1160.21	18.43	-596.86	31.35	-3.62	21.03	13.66	-0.02	0.51
3.96	54.13	-1.00	0.0	-1160.24	8.40	-618.75	23.95	-50.72	16.84	13.67	-0.01	0.53
3.97	54.13	-1.00	0.0	-1165.54	-11.91	-613.25	8.72	-52.36	11.84	13.67	0.01	0.53
3.98	54.13	-1.00	0.0	-1165.30	-17.08	-589.46	4.75	-121.74	9.51	13.67	0.01	0.51
3.99	54.03	-1.00	0.0	-1164.07	-17.00	-615.07	-4.68	-69.14	9.36	13.66	0.01	0.53
4.00	54.03	-1.00	0.0	-1158.59	-11.80	-644.12	-0.69	-81.04	11.73	13.67	0.01	0.56
4.01	57.05	-0.02	0.0	-2342.75	-28.23	-65.55	21.52	55.77	-3.71	13.53	0.01	0.03
4.02	57.06	-0.02	0.0	-2310.57	-23.18	-33.39	25.21	-1.75	-1.29	13.53	0.01	0.01
4.03	57.06	-0.02	0.0	-2306.06	-23.28	0.94	34.61	-41.55	4.46	13.53	0.01	-0.00
4.04	57.06	-0.02	0.0	-2306.09	-33.26	-28.09	27.38	-3.92	6.75	13.53	0.01	0.01
4.05	57.06	-0.02	0.0	-2322.19	-48.41	-47.78	16.26	22.14	7.82	13.53	0.02	0.02
4.06	57.06	-0.02	0.0	-2337.25	-48.40	-71.31	6.72	62.22	3.12	13.53	0.02	0.03
4.07	57.06	-0.02	0.0	-2359.63	-43.49	-55.57	19.76	27.85	-3.79	13.53	0.02	0.02
4.08	57.06	-0.02	0.0	-2369.36	-43.67	-30.97	9.95	-8.06	-4.99	13.53	0.02	0.01
4.09	57.06	-0.02	0.0	-2357.76	-43.56	-49.74	0.58	19.20	-2.66	13.53	0.02	0.02
4.10	57.06	-0.02	0.0	-2326.40	-33.34	-50.11	8.18	22.33	4.35	13.53	0.01	0.02
4.11	57.06	-0.02	0.0	-2310.79	-23.09	-48.31	25.37	29.15	6.63	13.53	0.01	0.02
4.12	57.05	-0.02	0.0	-2311.59	-23.18	-25.96	34.76	-6.47	2.20	13.53	0.01	0.01
4.13	57.06	-0.02	0.0	-2311.37	-33.39	-8.03	27.16	-31.64	-1.35	13.53	0.01	0.00
4.14	57.06	-0.02	0.0	-2327.48	-43.41	-43.74	19.88	27.22	-1.43	13.53	0.02	0.02
4.15	57.06	-0.02	0.0	-2337.24	-48.43	-66.22	6.69	45.80	3.13	13.53	0.02	0.03
4.16	57.06	-0.02	0.0	-2365.13	-43.40	-72.60	19.92	51.12	8.91	13.53	0.02	0.03
4.17	57.06	-0.02	0.0	-2374.86	-43.55	-51.56	10.14	11.78	10.03	13.53	0.02	0.02

TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.18	57.06	-0.02	0.0	-2352.64	-38.61	-12.18	4.15	-48.50	7.85	13.53	0.02	0.01
4.19	57.06	-0.02	0.0	-2336.39	-33.40	-36.37	8.08	-7.07	2.06	13.53	0.01	0.02
4.20	57.06	-0.02	0.0	-2310.59	-28.19	-45.10	21.56	-61.90	-3.47	13.53	0.01	0.02
4.21	57.06	-0.02	0.0	-2300.66	-28.04	-69.30	31.32	-307.74	-8.74	13.53	0.01	0.03
4.22	57.06	-0.02	0.0	-2311.00	-33.18	-63.70	27.47	-777.15	-6.93	13.53	0.01	0.03
4.23	57.06	-0.02	0.0	-2326.21	-38.22	-85.12	23.74	-1422.89	0.82	13.53	0.02	0.04
4.24	57.06	-0.02	0.0	-2351.04	-42.79	-232.15	20.68	-2165.75	12.05	13.53	0.02	0.10
4.25	57.06	-0.02	0.0	-2357.51	-36.84	-480.30	25.54	-2469.03	9.31	13.53	0.02	0.20
4.26	57.06	-0.03	0.0	-2323.48	-30.53	-814.36	21.29	-2091.56	-15.85	13.53	0.01	0.35
4.27	57.06	-0.04	0.0	-2246.70	-14.08	-1131.28	33.98	-1750.46	-68.74	13.53	0.01	0.50
4.28	56.96	-0.06	0.0	-2133.97	-2.94	-1356.32	42.61	-1512.57	-145.19	13.53	0.00	0.64
4.29	56.96	-0.09	0.0	-2025.45	-12.34	-1479.91	45.02	-1363.23	-215.98	13.53	0.01	0.73
4.30	56.86	-0.14	0.0	-1963.91	-12.18	-1474.69	74.44	3300.10	-276.26	13.52	0.01	0.75
4.31	56.67	-0.22	0.0	-1914.40	-12.14	-1427.39	103.18	-1209.12	-259.59	13.50	0.01	0.75
4.32	56.47	-0.31	0.0	-1899.92	-17.56	-1305.89	99.02	876.36	-282.28	13.49	0.01	0.69
4.33	55.98	-0.42	0.0	-1884.36	-33.13	-1157.37	68.42	603.67	-220.27	13.48	0.02	0.61
4.34	55.20	-0.52	0.0	-1895.51	-33.30	-1087.59	49.30	-1066.53	-159.06	13.46	0.02	0.57
4.35	54.42	-0.60	0.0	-1930.01	-13.26	-1075.20	54.28	1172.24	-149.19	13.45	0.01	0.55
4.36	53.53	-0.65	0.0	-1975.48	12.06	-1115.04	72.72	-1021.75	-154.43	13.44	-0.01	0.56
4.37	54.03	-0.74	0.0	-2026.68	21.94	-1122.13	60.57	363.30	-159.51	13.42	-0.01	0.55
4.38	54.42	-0.79	0.0	-2073.83	21.75	-1120.65	50.72	60.71	-148.80	13.41	-0.01	0.54
4.39	54.52	-0.83	0.0	-2126.31	11.65	-1169.90	33.88	-511.32	-129.48	13.40	-0.01	0.55
4.40	54.62	-0.86	0.0	-2184.07	-3.60	-1205.48	13.24	624.53	-115.60	13.40	0.00	0.55
4.41	54.71	-0.89	0.0	-2210.11	-13.74	-1223.37	-3.63	-306.62	-102.42	13.39	0.01	0.55
4.42	54.91	-0.91	0.0	-2257.66	-14.03	-1155.94	-13.59	-67.15	-69.14	13.39	0.01	0.52
4.43	54.91	-0.93	0.0	-2290.98	0.94	-1155.51	6.65	226.95	-70.12	13.39	-0.00	0.50
4.44	54.81	-0.94	0.0	-2307.48	11.14	-1176.73	14.12	-186.14	-55.39	13.38	-0.00	0.51
4.45	54.91	-0.95	0.0	-2322.53	11.14	-1197.22	4.58	30.87	-55.82	13.38	-0.00	0.52
4.46	55.01	-0.96	0.0	-2340.50	11.20	-1215.58	23.75	142.57	-60.60	13.38	-0.00	0.52
4.47	55.01	-0.97	0.0	-2352.30	6.01	-1151.62	29.45	-61.02	-62.56	13.38	-0.00	0.51
4.48	54.91	-0.98	0.0	-2363.04	-14.44	-1151.50	14.51	52.29	-56.01	13.38	0.01	0.49
4.49	54.91	-0.98	0.0	-2357.16	-24.48	-1162.76	-2.20	229.67	-50.43	13.38	0.01	0.49
4.50	55.20	-0.98	0.0	-2341.52	-14.30	-1156.56	5.22	-31.64	-46.60	13.38	0.01	0.49
4.51	55.69	-0.99	0.0	-2352.74	0.79	-1133.63	25.64	136.57	-45.27	13.38	-0.00	0.46
4.52	56.18	-0.99	0.0	-2332.95	15.85	-1073.13	36.48	-29.92	-30.97	13.39	-0.01	0.40
4.53	56.08	-0.99	0.0	-2333.59	15.65	-1022.38	36.20	-130.77	-15.85	13.38	-0.01	0.44
4.54	55.40	-0.99	0.0	-2333.12	10.74	-1051.45	32.76	-61.79	-13.65	13.38	-0.00	0.45
4.55	54.71	-0.99	0.0	-2327.45	0.76	-1085.21	25.64	160.88	-18.59	13.38	-0.00	0.47

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TABLE V
TABULATED DATA

RUN: 30- 1-32

TI	KS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.56	54.42	-1.00	0.0	-2321.97	-14.32	-1105.65	14.82	-184.49	-18.10	13.38	0.01	0.48
4.57	54.42	-1.00	0.0	-2327.22	-19.52	-1077.24	10.95	183.08	-14.28	13.38	0.01	0.46
4.58	54.32	-1.00	0.0	-2316.41	-14.53	-1052.54	14.49	24.66	-15.20	13.38	0.01	0.45
4.59	54.03	-1.00	0.0	-2316.64	0.75	-1071.98	25.63	-173.83	-13.53	13.38	-0.00	0.46
4.60	53.83	-1.00	0.0	-2317.04	15.92	-1059.79	36.61	84.54	-3.48	13.38	-0.01	0.46
4.61	53.83	-1.00	0.0	-2306.67	15.97	-1054.23	36.71	53.68	4.78	13.38	-0.01	0.46
4.62	53.83	-1.00	0.0	-2311.45	10.80	-1037.75	32.88	-179.53	-0.65	13.38	-0.00	0.45
4.63	53.64	-1.00	0.0	-2317.01	0.52	-1015.03	25.29	130.74	-12.92	13.38	-0.00	0.44
4.64	53.54	-1.00	0.0	-2317.27	-14.57	-1038.34	14.47	-169.11	-16.88	13.38	0.01	0.45
4.65	53.44	-1.00	0.0	-2333.55	-14.58	-1043.15	14.47	-260.90	-8.61	13.38	0.01	0.45
4.66	53.25	-1.00	0.0	-2333.35	-14.46	-1069.25	14.66	90.37	-2.35	13.38	0.01	0.46
4.67	53.25	-1.00	0.0	-2310.31	-4.27	-1075.33	12.49	-236.22	-3.07	13.38	0.00	0.47
4.68	53.15	-1.00	0.0	-2320.23	10.86	-1082.37	23.35	-180.51	-5.74	13.38	-0.00	0.47
4.69	53.15	-1.00	0.0	-2319.84	21.20	-1132.70	30.97	144.08	-5.17	13.38	-0.01	0.49
4.70	53.05	-1.00	0.0	-2320.68	21.32	-1154.39	40.69	-168.15	1.17	13.37	-0.01	0.50
4.71	52.96	-1.00	0.0	-2331.27	6.16	-1169.31	29.76	45.08	0.72	13.38	-0.00	0.50
4.72	52.96	-1.00	0.0	-2324.94	-14.19	-1150.50	5.41	271.81	-9.00	13.37	0.01	0.49
4.73	52.96	-1.00	0.0	-2319.85	-24.48	-1108.36	-2.16	-282.14	-13.78	13.38	0.01	0.48
4.74	52.86	-1.00	0.0	-2331.06	-14.37	-1109.40	5.18	-4.97	-8.34	13.37	0.01	0.48
4.75	52.86	-1.00	0.0	-2315.39	-4.15	-1105.80	12.67	60.03	4.42	13.37	0.00	0.48
4.76	52.76	-1.00	0.0	-2321.72	11.10	-1120.27	33.28	-174.90	6.07	13.37	-0.00	0.46
4.77	52.76	-1.00	0.0	-2321.28	21.15	-1109.77	40.44	9.41	-1.33	13.37	-0.01	0.48
4.78	52.76	-1.00	0.0	-2315.78	21.07	-1094.04	40.32	-36.62	-8.23	13.37	-0.01	0.47
4.79	52.66	-1.00	0.0	-2315.60	6.04	-1129.60	29.58	-167.88	-8.01	13.37	-0.00	0.49
4.80	52.66	-1.00	0.0	-2326.20	-14.18	-1145.99	14.98	174.49	-9.86	13.37	0.01	0.49
4.81	52.66	-1.00	0.0	-2314.61	-19.17	-1157.64	1.89	39.52	-11.67	13.37	0.01	0.50
4.82	57.06	-0.03	0.0	-3528.88	-52.70	-66.67	11.04	36.12	11.68	13.30	0.01	0.02
4.83	57.06	-0.03	0.0	-3518.28	-47.73	-36.01	14.53	-14.00	11.78	13.30	0.01	0.01
4.84	57.06	-0.03	0.0	-3508.56	-37.43	-62.11	31.59	25.15	10.70	13.30	0.01	0.02
4.85	57.06	-0.03	0.0	-3476.43	-37.29	-69.34	31.31	42.68	7.32	13.30	0.01	0.02
4.86	57.06	-0.03	0.0	-3471.98	-37.22	-76.70	41.45	63.73	3.85	13.30	0.01	0.02
4.87	57.06	-0.03	0.0	-3471.96	-47.45	-52.80	34.03	29.78	1.53	13.30	0.01	0.02
4.88	57.05	-0.03	0.0	-3493.28	-47.63	-29.54	33.76	-13.00	6.07	13.30	0.01	0.01
4.89	57.06	-0.03	0.0	-3508.57	-42.45	-71.54	28.06	44.89	11.83	13.29	0.01	0.02
4.90	57.06	-0.03	0.0	-3524.64	-47.50	-83.08	24.42	57.16	17.54	13.30	0.01	0.02
4.91	57.06	-0.03	0.0	-3529.11	-47.52	-88.18	14.35	63.32	17.53	13.30	0.01	0.02
4.92	57.06	-0.03	0.0	-3513.02	-42.53	-62.13	18.37	51.62	10.63	13.30	0.01	0.02
4.93	57.06	-0.03	0.0	-3492.46	-37.55	-26.66	31.41	-9.29	2.66	13.30	0.01	0.01

TABLE V
TABULATED DATA

RUN: 30- I-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
4.94	57.06	-0.03	0.0	-3465.65	-42.37	-60.92	28.14	24.22	-3.04	13.30	0.01	0.02
4.95	57.06	-0.03	0.0	-3477.27	-47.40	-71.17	34.09	56.39	-3.11	13.30	0.01	0.02
4.96	57.06	-0.03	0.0	-3477.28	-52.40	-81.88	30.57	69.34	3.79	13.30	0.02	0.02
4.97	57.06	-0.03	0.0	-3492.49	-52.57	-56.99	20.81	20.89	10.70	13.29	0.02	0.02
4.98	57.06	-0.03	0.0	-3519.08	-47.72	-31.50	24.09	-19.81	18.66	13.30	0.01	0.01
4.99	57.06	-0.03	0.0	-3523.80	-47.57	-70.57	14.79	-3.21	21.10	13.30	0.01	0.02
5.00	57.06	-0.03	0.0	-3516.33	-42.45	-86.11	18.50	-20.41	13.08	13.30	0.01	0.02
5.01	57.06	-0.03	0.0	-3503.11	-37.28	-98.77	31.81	-246.60	2.04	13.30	0.01	0.03
5.02	57.06	-0.03	0.0	-3481.31	-37.31	-80.27	31.73	-731.12	-7.57	13.30	0.01	0.02
5.03	57.06	-0.03	0.0	-3465.22	-42.26	-95.99	37.77	-1442.55	-6.57	13.30	0.01	0.03
5.04	57.06	-0.03	0.0	-3468.47	-46.68	-255.99	35.01	-2220.37	8.22	13.30	0.01	0.07
5.05	57.06	-0.03	0.0	-3474.52	-50.76	-522.23	52.67	-2432.45	16.69	13.29	0.01	0.15
5.06	57.06	-0.04	0.0	-3460.78	-39.19	-919.62	32.19	-1992.18	11.84	13.29	0.01	0.27
5.07	57.06	-0.04	0.0	-3413.87	-22.33	-1368.25	45.08	-1511.37	-23.50	13.29	0.01	0.40
5.08	56.96	-0.06	0.0	-3307.16	-15.60	-1786.50	41.13	-1067.83	-97.83	13.29	0.00	0.54
5.09	56.86	-0.08	0.0	-3168.00	-4.18	-2068.67	40.39	-724.42	-198.52	13.29	0.00	0.66
5.10	56.77	-0.12	0.0	-3075.00	1.33	-2144.50	54.07	-661.67	-282.75	13.29	-0.00	0.70
5.11	56.67	-0.17	0.0	-3005.37	1.27	-2056.65	92.18	1363.80	-331.79	13.28	-0.10	0.68
5.12	56.47	-0.26	0.0	-2950.70	-4.13	-1901.14	107.26	925.53	-336.08	13.27	0.00	0.64
5.13	58.08	-0.35	0.0	-2914.00	-29.88	-1727.42	69.64	-941.31	-287.26	13.26	0.01	0.59
5.14	55.59	-0.46	0.0	-2932.08	-50.40	-1618.46	45.54	1573.49	-220.82	13.24	0.02	0.55
5.15	54.71	-0.55	0.0	-2949.35	-40.50	-1541.64	43.05	-1306.11	-162.15	13.23	0.01	0.52
5.16	53.93	-0.63	0.0	-2997.13	-15.40	-1532.35	51.23	776.62	-151.98	13.21	0.01	0.51
5.17	53.54	-0.70	0.0	-3033.70	14.71	-1512.88	62.73	27.97	-151.87	13.19	-0.00	0.50
5.18	53.74	-0.76	0.0	-3102.40	34.60	-1494.05	66.99	-420.41	-145.50	13.18	-0.01	0.48
5.19	54.03	-0.81	0.0	-3172.63	44.62	-1523.56	73.95	621.06	-138.04	13.16	-0.01	0.48
5.20	54.03	-0.84	0.0	-3231.43	24.17	-1517.87	49.87	-442.43	-119.96	13.15	-0.01	0.47
5.21	54.13	-0.87	0.0	-3294.48	-15.60	-1504.99	1.95	98.69	-101.45	13.14	0.01	0.46
5.22	54.32	-0.90	0.0	-3329.81	-42.20	-1468.78	-44.88	219.97	-85.60	13.14	0.01	0.44
5.23	54.42	-0.92	0.0	-3393.68	-27.31	-1440.08	-34.50	-362.20	-71.95	13.13	0.01	0.43
5.24	54.32	-0.93	0.0	-3456.37	3.05	-1471.74	15.34	-112.81	-58.50	13.13	-0.00	0.43
5.25	54.23	-0.95	0.0	-3465.48	13.13	-1475.48	3.36	346.58	-41.58	13.13	-0.00	0.43
5.26	54.32	-0.96	0.0	-3469.96	13.16	-1493.04	-6.16	-293.81	-44.25	13.12	-0.00	0.43
5.27	54.52	-0.97	0.0	-3492.14	18.03	-1471.00	6.62	-51.12	-58.65	13.12	-0.01	0.42
5.28	54.81	-0.97	0.0	-3522.09	17.85	-1438.36	35.00	13.91	-62.20	13.12	-0.01	0.41
5.29	55.01	-0.98	0.0	-3528.45	-2.24	-1474.02	30.60	-193.34	-61.78	13.12	0.00	0.42
5.30	55.40	-0.98	0.0	-3532.54	-27.46	-1508.64	3.42	114.41	-68.22	13.12	0.01	0.43
5.31	55.59	-0.99	0.0	-3520.53	-32.46	-1526.60	-9.61	408.55	-80.34	13.12	0.01	0.43

TABLE V
TABULATED DATA

RUN: 30- 1-32

TE	RS	SR	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	NFX
5.32	55.50	-0.99	0.0	-3516.66	-17.49	-1468.19	10.28	-273.24	-85.59	13.13	0.00	0.42
5.33	55.01	-0.99	0.0	-3512.13	12.61	-1386.49	31.24	-103.26	-68.73	13.13	-0.00	0.39
5.34	54.42	-0.99	0.0	-3503.24	22.89	-1392.84	48.18	28.56	-55.91	13.13	-0.01	0.40
5.35	54.13	-0.99	0.0	-3485.73	17.98	-1424.36	35.29	-423.02	-56.34	13.13	-0.01	0.41
5.36	53.83	-0.99	0.0	-3491.04	13.10	-1477.58	41.48	153.19	-67.98	13.13	-0.00	0.42
5.37	53.44	-1.00	0.0	-3479.42	-7.11	-1490.01	27.27	-15.20	-78.36	13.13	0.00	0.43
5.38	53.25	-1.00	0.0	-3478.99	-22.33	-1485.19	16.54	-335.36	-77.99	13.13	0.01	0.43
5.39	53.15	-1.00	0.0	-3478.81	-27.20	-1527.30	13.27	109.19	-73.01	13.13	0.01	0.44
5.40	53.05	-1.00	0.0	-3462.75	-16.93	-1545.28	20.61	230.08	-69.66	13.12	0.00	0.45
5.41	52.86	-1.00	0.0	-3457.46	3.34	-1546.69	34.84	-258.20	-71.00	13.12	-0.00	0.45
5.42	52.66	-1.00	0.0	-3457.62	18.21	-1496.42	45.16	76.80	-72.77	13.12	-0.01	0.43
5.43	52.66	-1.00	0.0	-3452.52	18.20	-1465.72	45.02	-59.61	-72.41	13.12	-0.01	0.42
5.44	52.47	-1.00	0.0	-3452.35	18.40	-1512.38	45.30	-248.07	-73.25	13.12	-0.01	0.44
5.45	52.37	-1.00	0.0	-3474.36	3.27	-1544.76	44.27	11.89	-76.16	13.12	-0.00	0.44
5.46	52.27	-1.00	0.0	-3467.64	-16.85	-1575.57	20.69	79.53	-76.41	13.12	0.00	0.45
5.47	52.27	-1.00	0.0	-3461.08	-32.11	-1556.94	0.38	-157.07	-73.85	13.12	0.01	0.45
5.48	52.17	-1.00	0.0	-3465.29	-27.21	-1525.81	-5.87	80.60	-68.68	13.12	0.01	0.44
5.49	52.08	-1.00	0.0	-3472.04	3.30	-1555.96	25.21	-71.87	-58.90	13.11	-0.00	0.45
5.50	51.98	-1.00	0.0	-3463.85	23.54	-1553.62	48.95	-99.50	-50.71	13.11	-0.01	0.45
5.51	51.98	-1.00	0.0	-3484.06	33.70	-1558.57	56.05	93.61	-50.94	13.11	-0.01	0.45
5.52	51.66	-1.00	0.0	-3484.04	13.32	-1528.85	41.71	164.34	-52.34	13.11	-0.00	0.44
5.53	51.78	-1.00	0.0	-3477.07	-12.18	-1484.25	4.63	-226.03	-45.96	13.11	0.00	0.43
5.54	51.78	-1.00	0.0	-3493.79	-27.34	-1492.43	-5.52	-2.91	-35.83	13.11	0.01	0.42
5.55	51.78	-1.00	0.0	-3495.26	-22.24	-1469.08	7.25	37.62	-31.09	13.11	0.01	0.43
5.56	51.69	-1.00	0.0	-3495.26	-7.04	-1494.89	17.92	-115.03	-31.92	13.11	0.00	0.43
5.57	51.59	-1.00	0.0	-3495.00	8.00	-1464.45	28.32	12.20	-32.27	13.11	-0.00	0.42
5.58	51.59	-1.00	0.0	-3484.18	18.03	-1432.57	35.26	66.34	-30.12	13.11	-0.01	0.41
5.59	51.49	-1.00	0.0	-3479.25	18.18	-1458.28	35.51	-122.93	-30.67	13.11	-0.01	0.42
5.60	2.44	-1.00	0.0	-5.28	5.04	25.44	7.88	-65.76	0.03	23.51	-0.95	-4.81

TABLE V
TABULATED DATA

RUN: 31- 1-2

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
20.17	0.0	-1147.45	-7.14	-2.77	-9.69	-11.01	5.03	13.66	0.01	0.0
20.21	0.98	-1139.68	-193.90	-5.63	-5.46	-6.65	16.32	13.66	0.17	2.00
20.21	1.99	-11[illegible].92	-355.49	-1.39	-2.03	-14.14	22.98	13.67	0.31	3.00
20.17	4.00	-1164.59	-592.83	-6.16	12.79	-8.70	23.81	13.66	0.51	5.00
20.17	8.00	-1141.43	-784.60	-7.02	23.38	-11.10	7.39	13.65	0.69	7.00
20.21	12.01	-1159.58	-804.92	-5.96	27.32	-10.76	-6.41	13.65	0.69	9.00
20.17	16.01	-1144.32	-749.30	-7.31	21.58	-6.33	-9.60	13.64	0.65	12.00

115 7
2 379

TABLE V
TABULATED DATA

RUN: 32- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
40.41	0.0	[illegible]	-31.34	-48.76	-6.61	34.79	15.39	13.24	0.01	0.0
40.41	1.00	-3474.91	-409.85	-47.29	30.79	29.82	64.36	13.23	0.12	2.00
40.37	1.99	-3474.4[illegible]	-747.99	-52.83	68.73	35.41	94.98	13.22	0.22	3.00
40.37	3.98	-3479.66	-1232.99	-60.48	141.91	42.42	114.99	13.19	0.37	5.00
40.37	6.01	-3479.77	-1606.89	-62.65	197.33	42.56	35.12	13.14	0.46	8.00
40.33	12.03	[illegible]	-1501.68	-55.67	185.77	35.67	-3.46	13.14	0.43	10.00
40.33	16.04	[illegible]	-1446.17	-50.65	186.49	30.15	-16.40	13.14	0.42	12.00

3479

TABLE V
TABULATED DATA

RUN: 33- I-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
55.77	0.0	-2312.26	-14.20	-26.54	-9.53	12.29	9.05	13.50	0.01	0.0
55.77	1.00	-2314.41	-322.08	-26.18	13.54	9.49	40.85	13.50	0.14	2.00
55.77	1.99	-2312.93	-579.50	-24.67	35.32	5.28	58.90	13.50	0.25	3.00
55.73	4.00	-2317.41	-983.71	-30.21	65.58	12.59	66.44	13.49	0.42	5.00
55.73	8.00	-2326.88	-1236.21	-34.14	93.99	16.31	22.36	13.46	0.53	7.00
55.73	12.03	-2322.44	-1241.31	-27.47	100.77	6.17	1.62	13.45	0.53	9.00
55.73	16.03	-2310.85	-1231.21	-26.86	99.61	7.29	-5.23	13.44	0.53	12.00

2317

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TAPLE V
TABULATED DATA

RUNS 34- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
20.17	-0.01	[illegible]	-19.24	-27.32	-3.64	15.34	7.90	13.47	0.01	0.0
20.24	1.00	-2516.47	-342.25	-27.62	19.00	15.49	38.60	13.46	0.15	2.00
20.17	1.99	-2516.66	-615.20	-26.13	40.39	11.22	56.63	13.46	0.27	3.00
20.17	4.00	-2517.63	-1054.33	-31.05	75.51	15.21	65.24	13.44	0.45	5.00
20.17	8.00	-2517.35	-1392.09	-35.12	108.71	18.47	21.03	13.42	0.60	8.00
20.21	12.01	-2516.60	-1372.15	-32.39	115.91	16.40	-13.43	13.40	0.59	10.00
20.17	16.04	[illegible]	-1246.60	-26.49	101.29	10.72	-20.14	13.41	0.54	12.00

TABLE V
TABULATED DATA

RUN: 35- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
40.41	0.0	-1148.28	-12.14	-13.01	-3.90	1.82	5.02	13.73	0.01	0.0
40.41	1.00	-1153.12	-219.12	-10.07	2.95	-2.09	17.41	13.73	0.19	2.00
40.41	1.99	-1149.62	-390.76	-11.73	7.71	-2.92	22.89	13.73	0.34	3.00
40.33	4.00	-1151.99	-628.10	-12.11	20.70	-2.08	22.60	13.73	0.55	5.00
40.33	8.00	-1147.77	-784.65	-10.82	27.82	-5.33	1.65	13.72	0.68	7.00
40.37	12.01	-1149.62	-729.12	-10.13	31.29	-3.94	-5.13	13.72	0.63	10.00
40.33	16.04	-1151.23	-685.70	-10.11	27.16	-5.67	-5.11	13.72	0.59	12.00

TABLE V
TABULATED DATA

RUN: 36- 1-32

RS	SA	FZ	FY	FX	MX	MY	MZ	RH	NFY	TE
55.81	0.0	-3466.29	-11.09	-54.61	-1.80	41.82	14.25	13.32	0.00	0.0
55.77	0.98	-3469.45	-394.63	-55.96	38.76	40.98	66.68	13.31	0.11	2.00
55.77	1.98	-3474.45	-727.73	-54.83	77.70	38.83	99.64	13.30	0.21	4.00
55.77	3.98	-3480.46	-1277.88	-63.09	146.79	44.63	126.49	13.27	0.37	6.00
55.73	8.00	-3479.78	-1657.26	-69.46	208.59	50.54	55.76	13.22	0.48	8.00
55.77	12.03	-3473.75	-1707.82	-64.61	223.23	45.04	16.59	13.20	0.49	10.00
55.73	16.04	-3480.30	-1718.00	-58.05	228.30	38.99	-4.08	13.18	0.49	12.00

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IHN218I FIOCS - I/O ERROR LC2THSK2,GO ,182,TA,FT08F001,READ ,WRNG.LEN.RECORD,0009117,BSAM

?

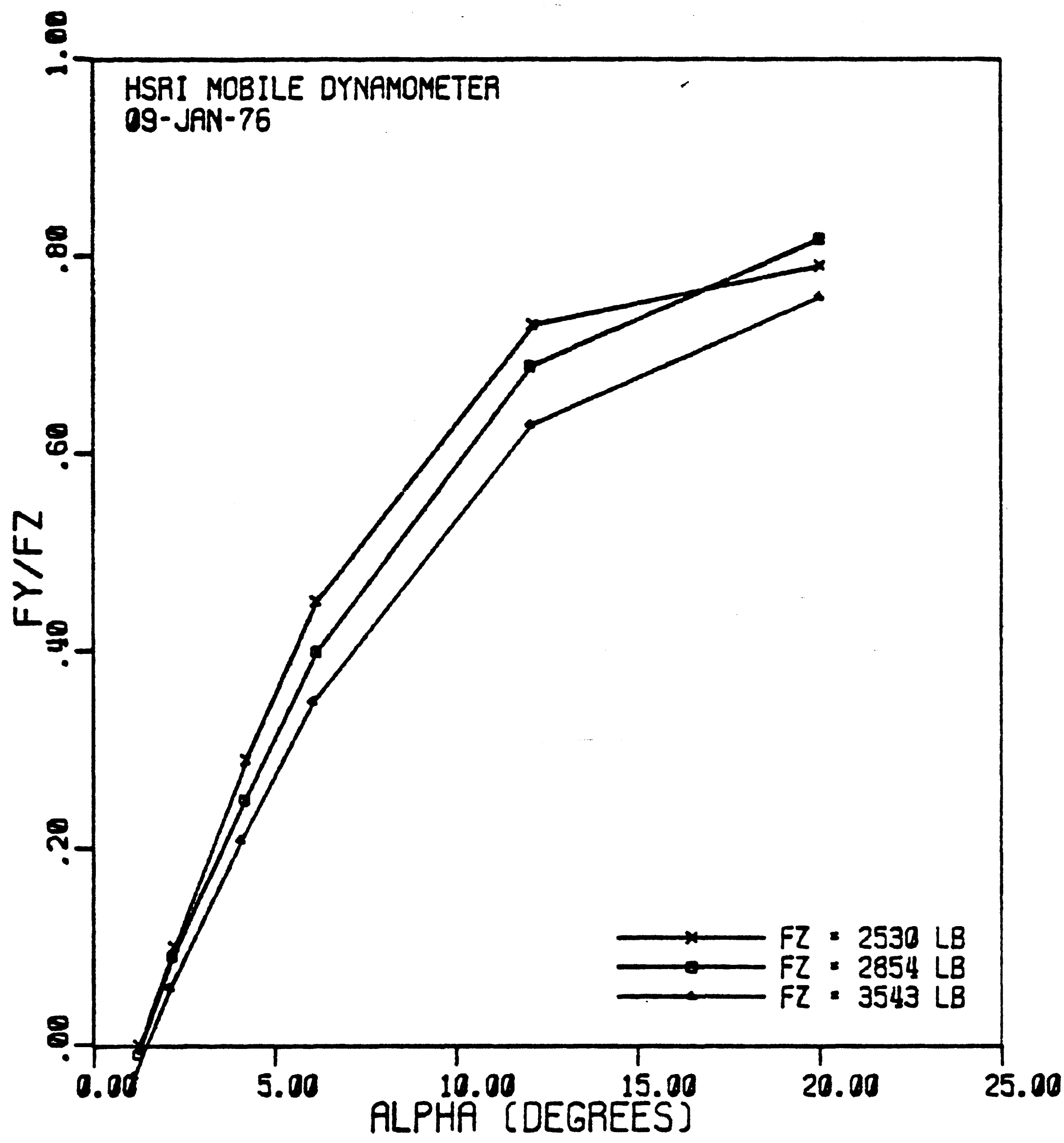
TRACEBACK ROUTINE CALLED FROM ISN REG. 14 REG. 15 REG. 0 REG. 1

		REG. 14	REG. 15	REG. 0	REG. 1
IBCOM		00340594	00340B7C	0000000A	00340144
MAIN		0000B070	01340C10	0035EF0C	0035EF30

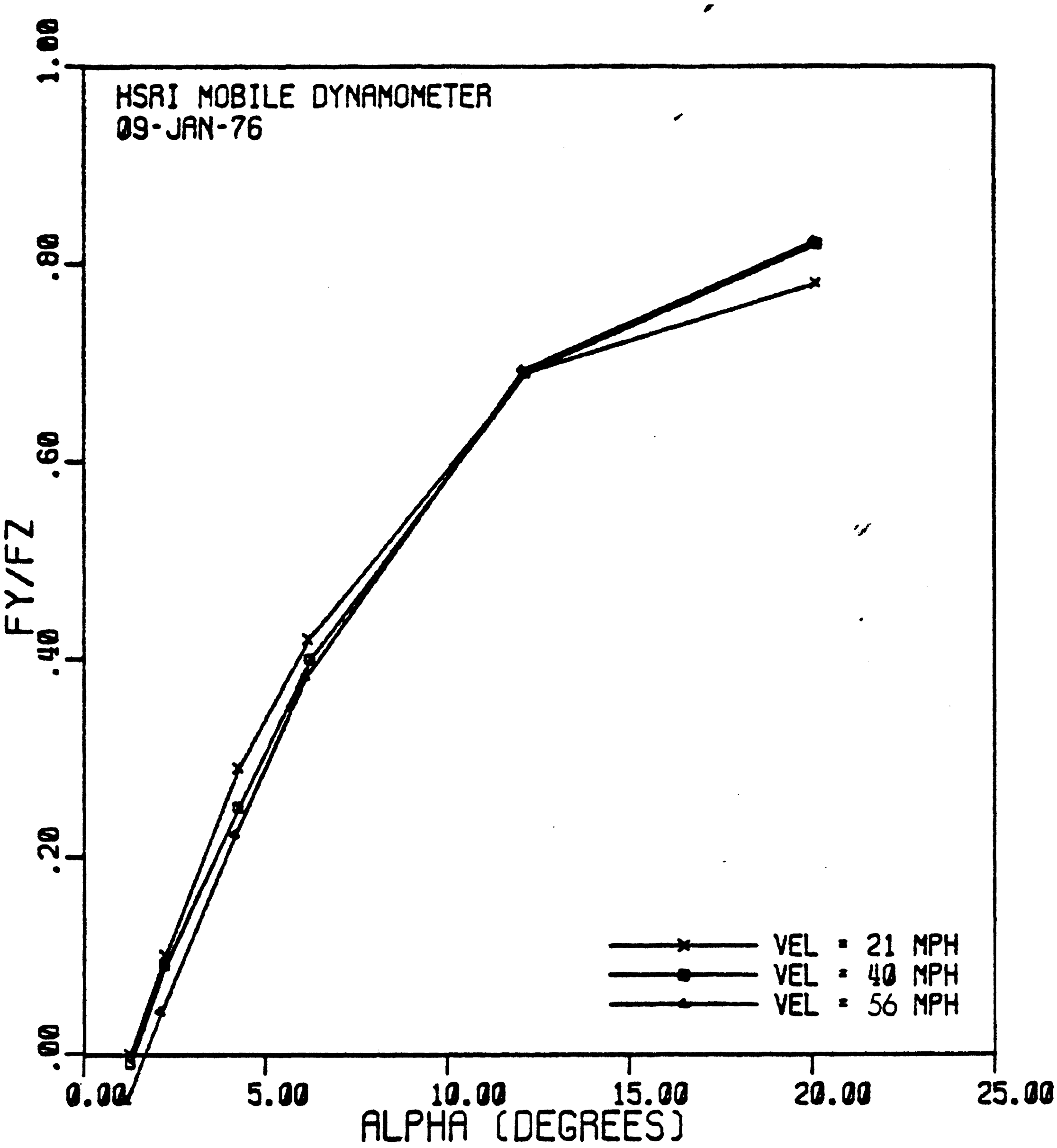
ENTRY POINT= 01340010

STANDARD FIXUP TAKEN , EXECUTION CONTINUING
TERM CODE = 10 MERR = 0 CERR= 0

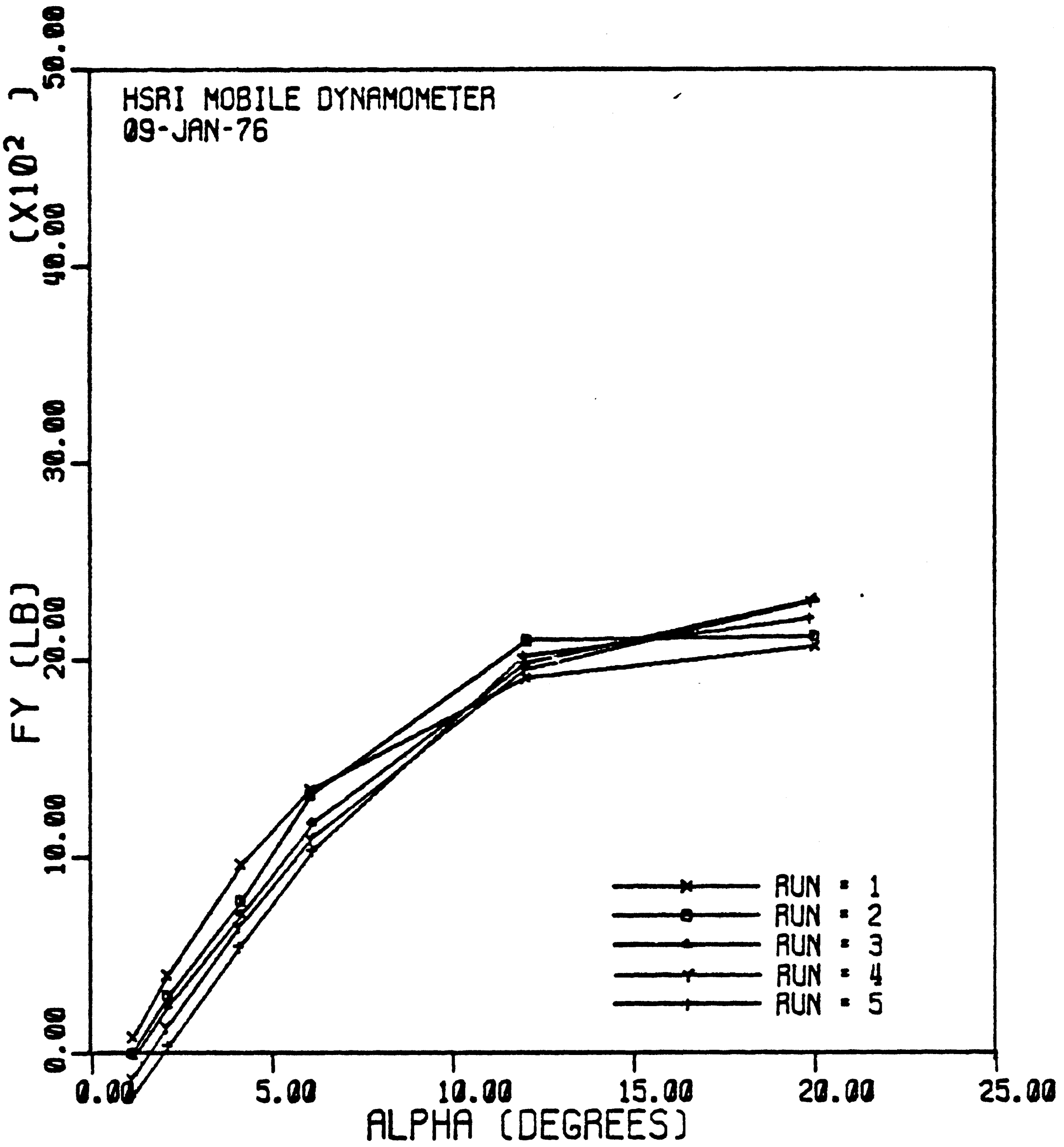
224



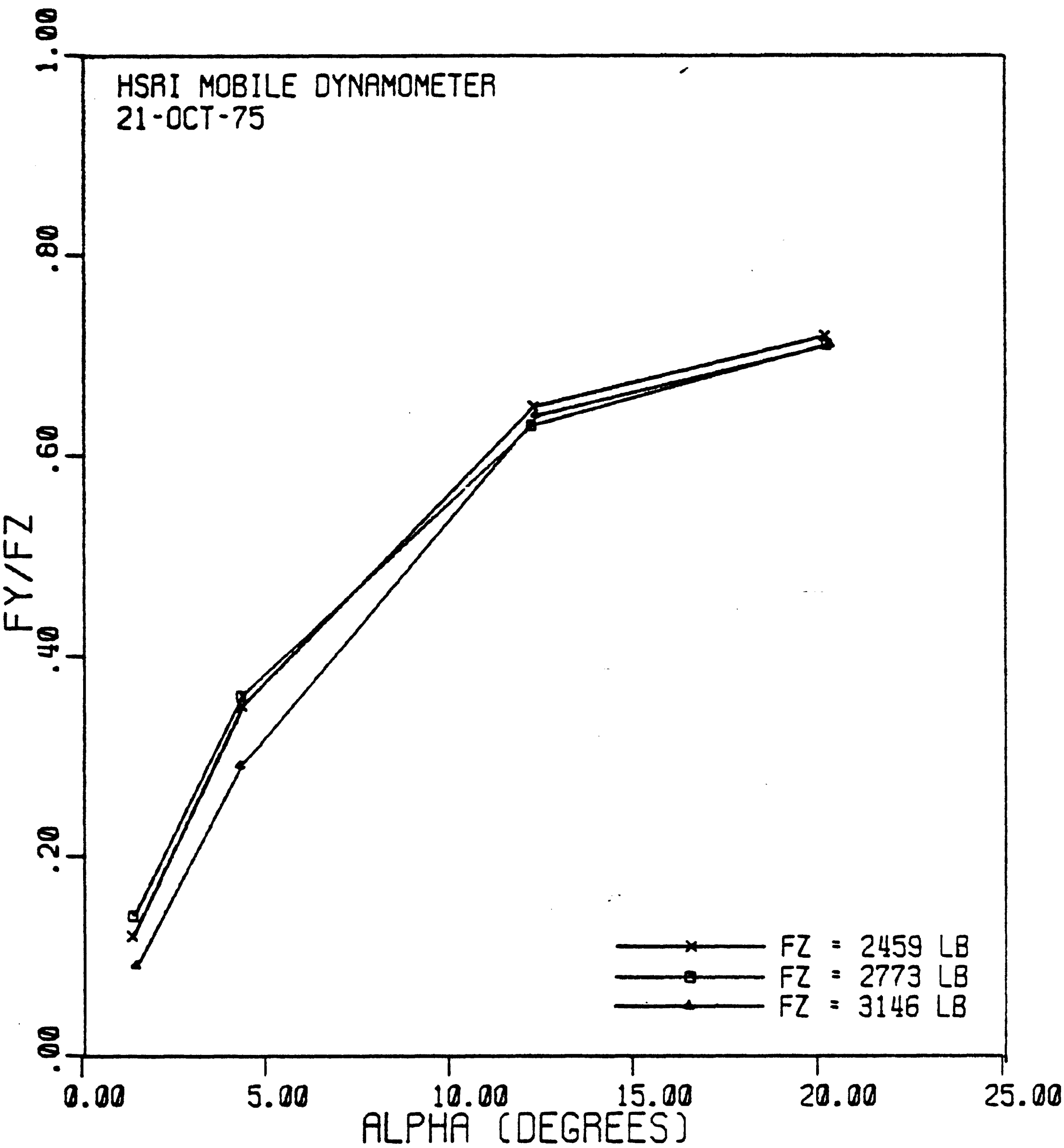
FIRESTONE TRANSPORT 500 WIDE OVAL 8.00X16.5/D
VEL = 40 MPH



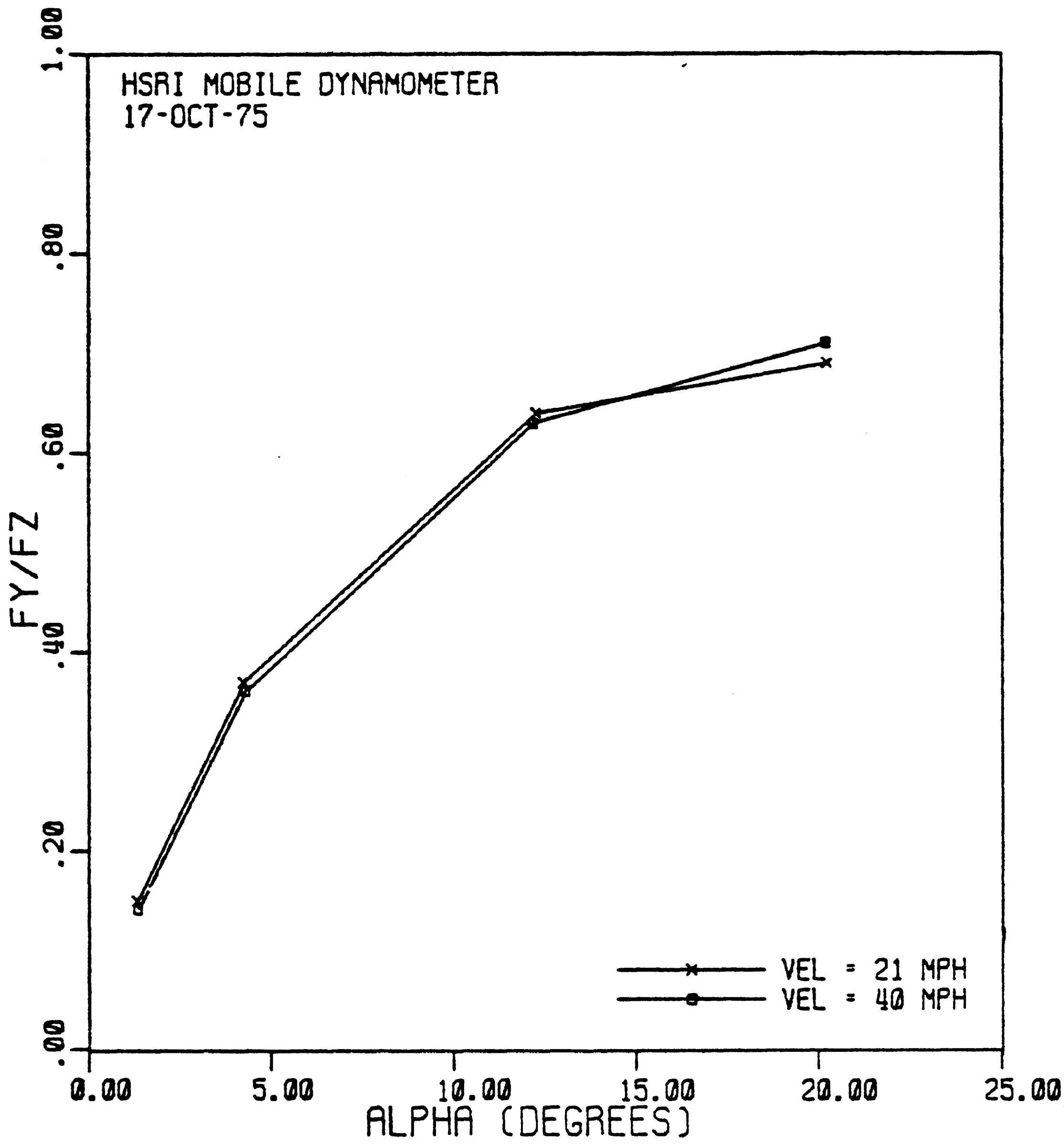
FIRESTONE TRANSPORT 500 WIDE OVAL 8.00X16.5/D
FZ = 2865 LB



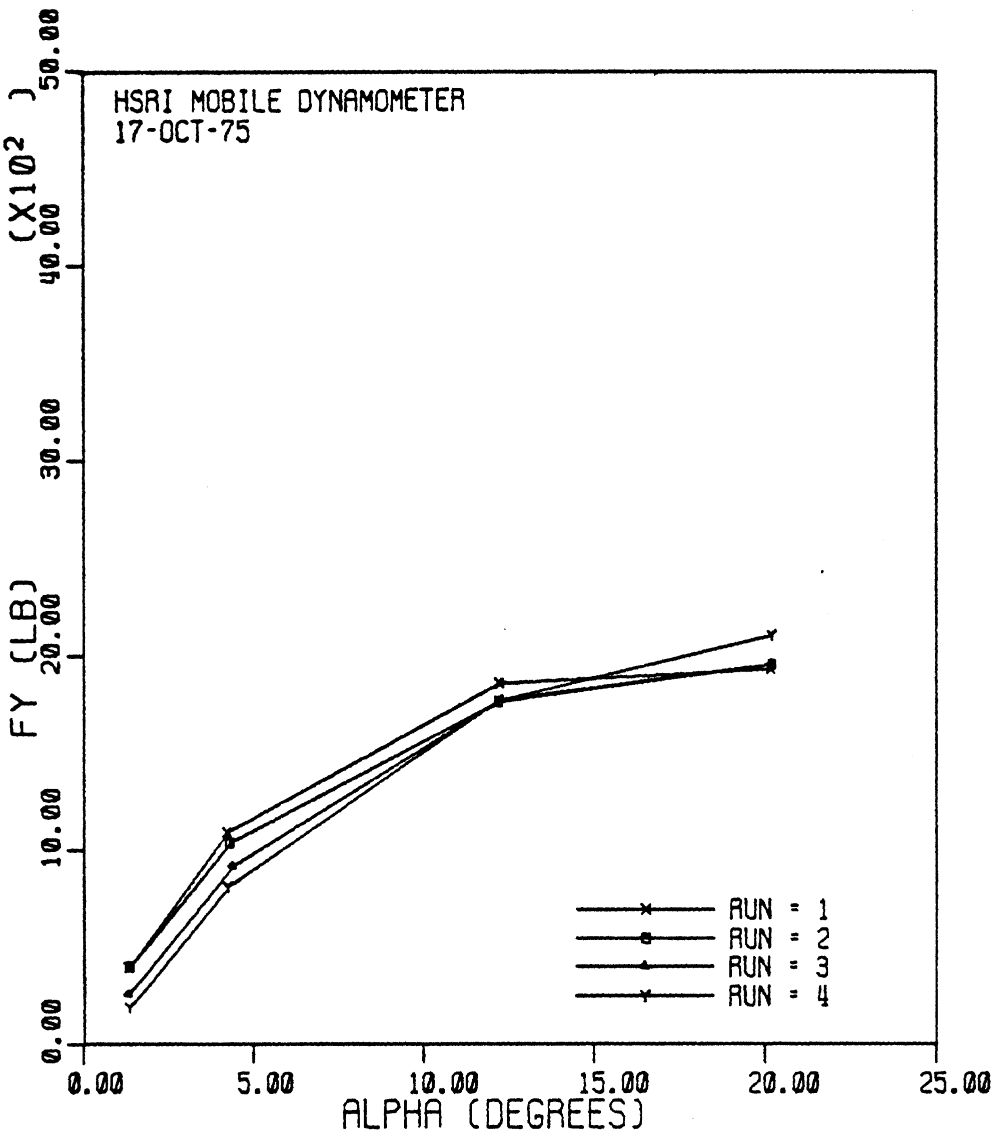
FIRESTONE TRANSPORT 500 WIDE OVAL 8.00X16.5/D
FZ = 2844 LB VEL = 40 MPH



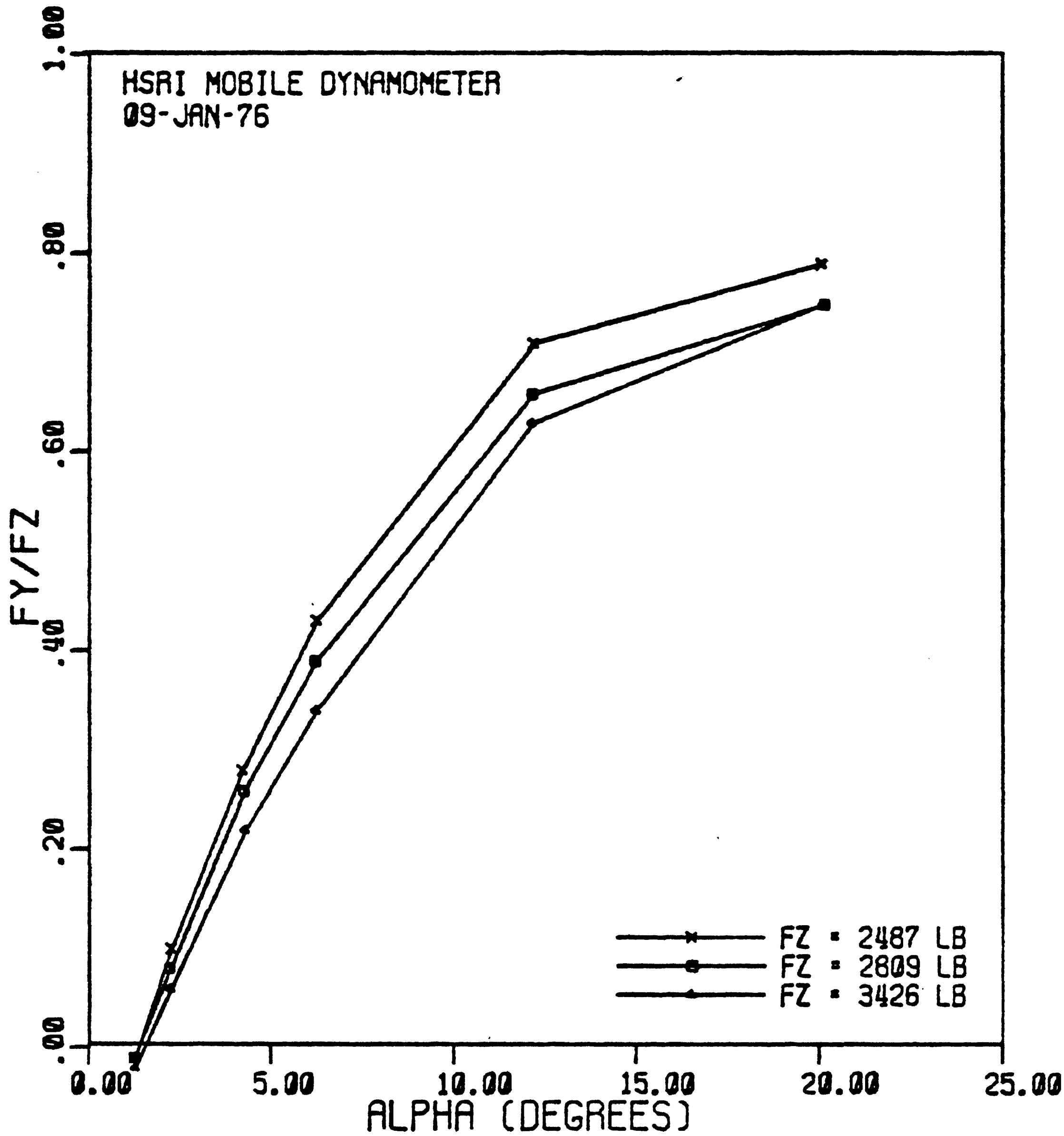
FIRESTONE TRANSPORT 500 8.00X16.5/D
VEL = 40 MPH
ASPHALT



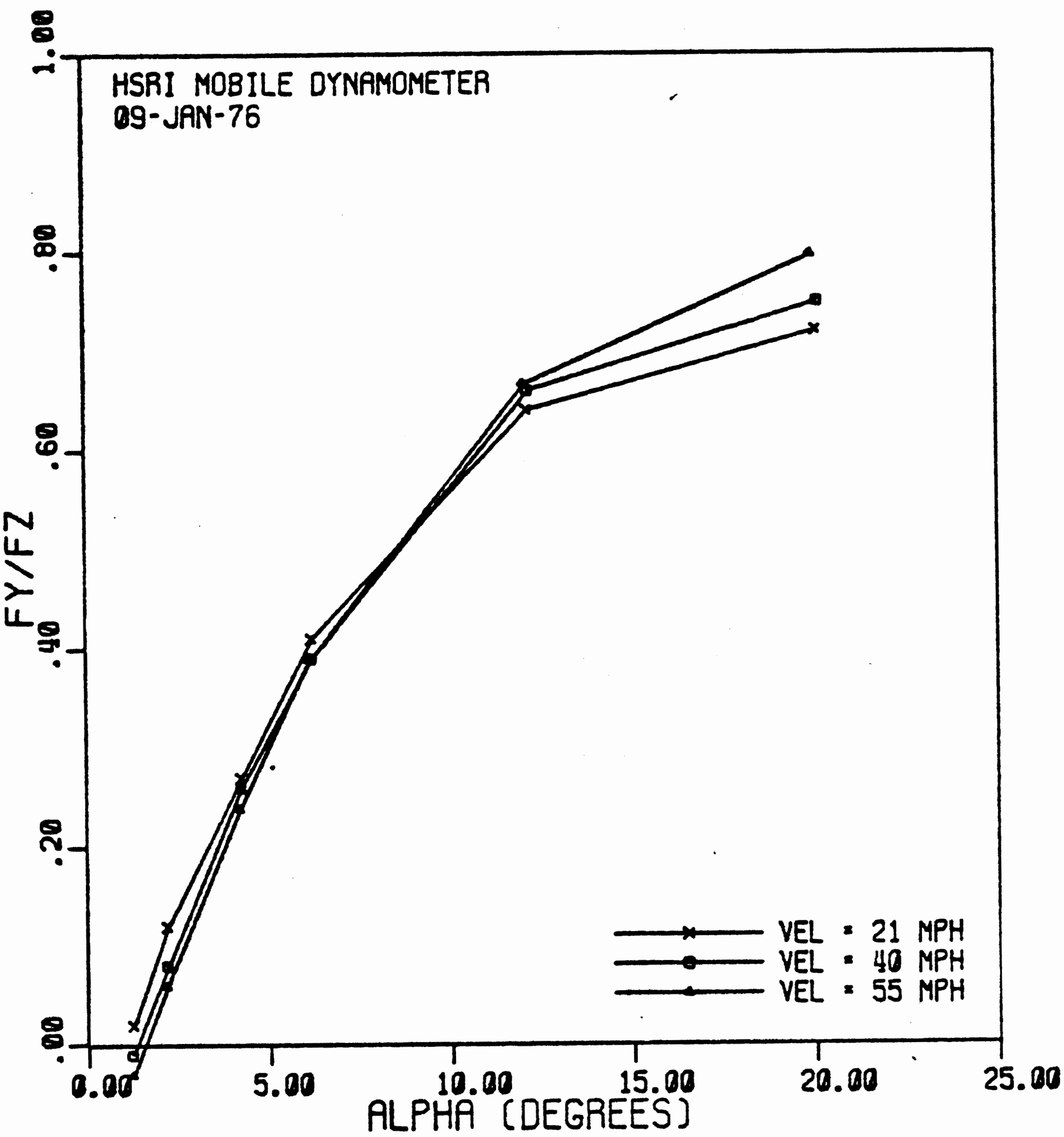
FIRESTONE TRANSPORT 500 8.00X16.5/D
FZ = 2771 LB
ASPHALT



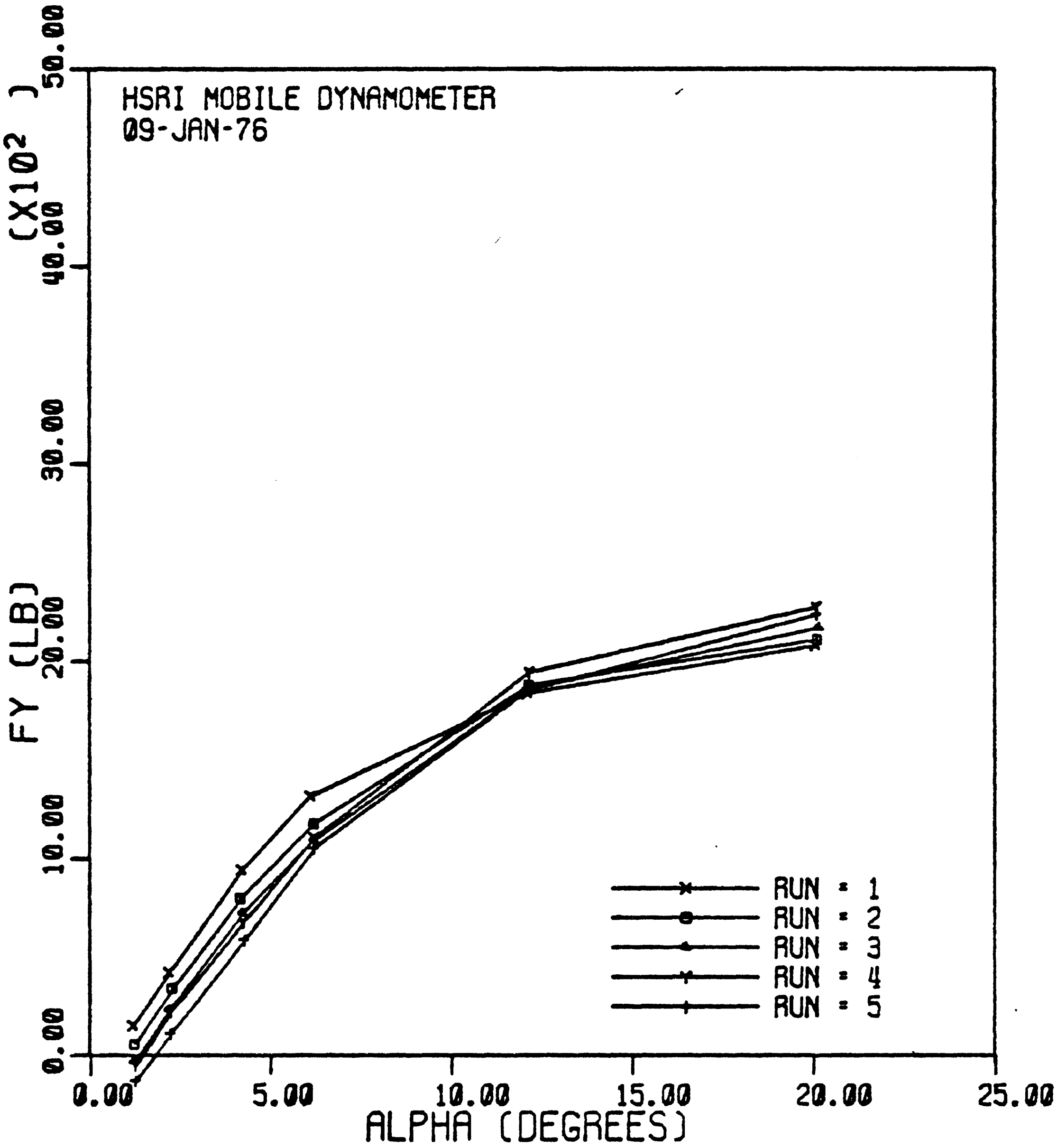
FIRESTONE TRANSPORT 500 8.00X16.5/D
FZ = 2787 LB VEL = 41 MPH
ASPHALT



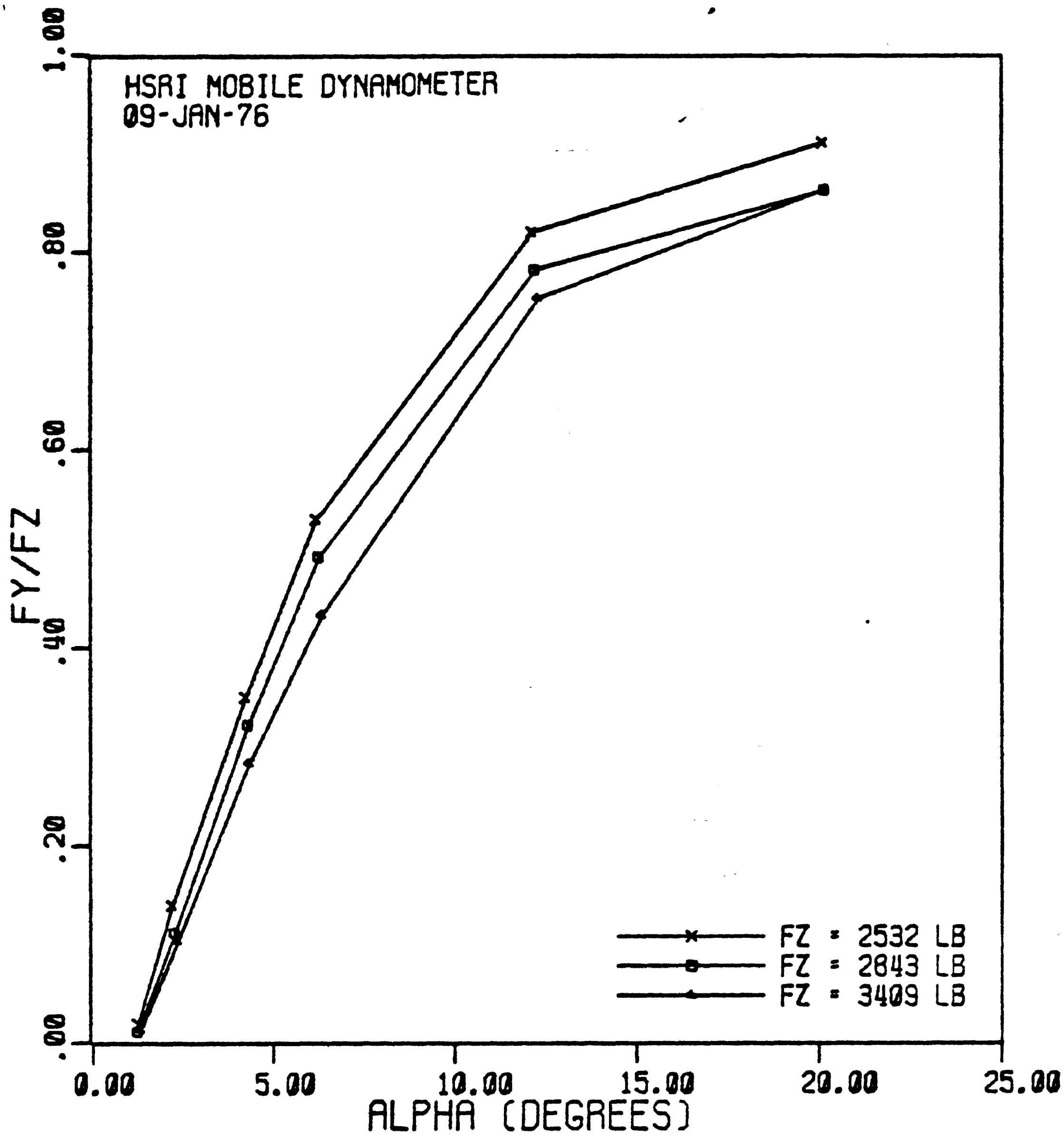
FIRESTONE TOWN & COUNTRY TRUCK 8.00X16.5/D
VEL = 40 MPH



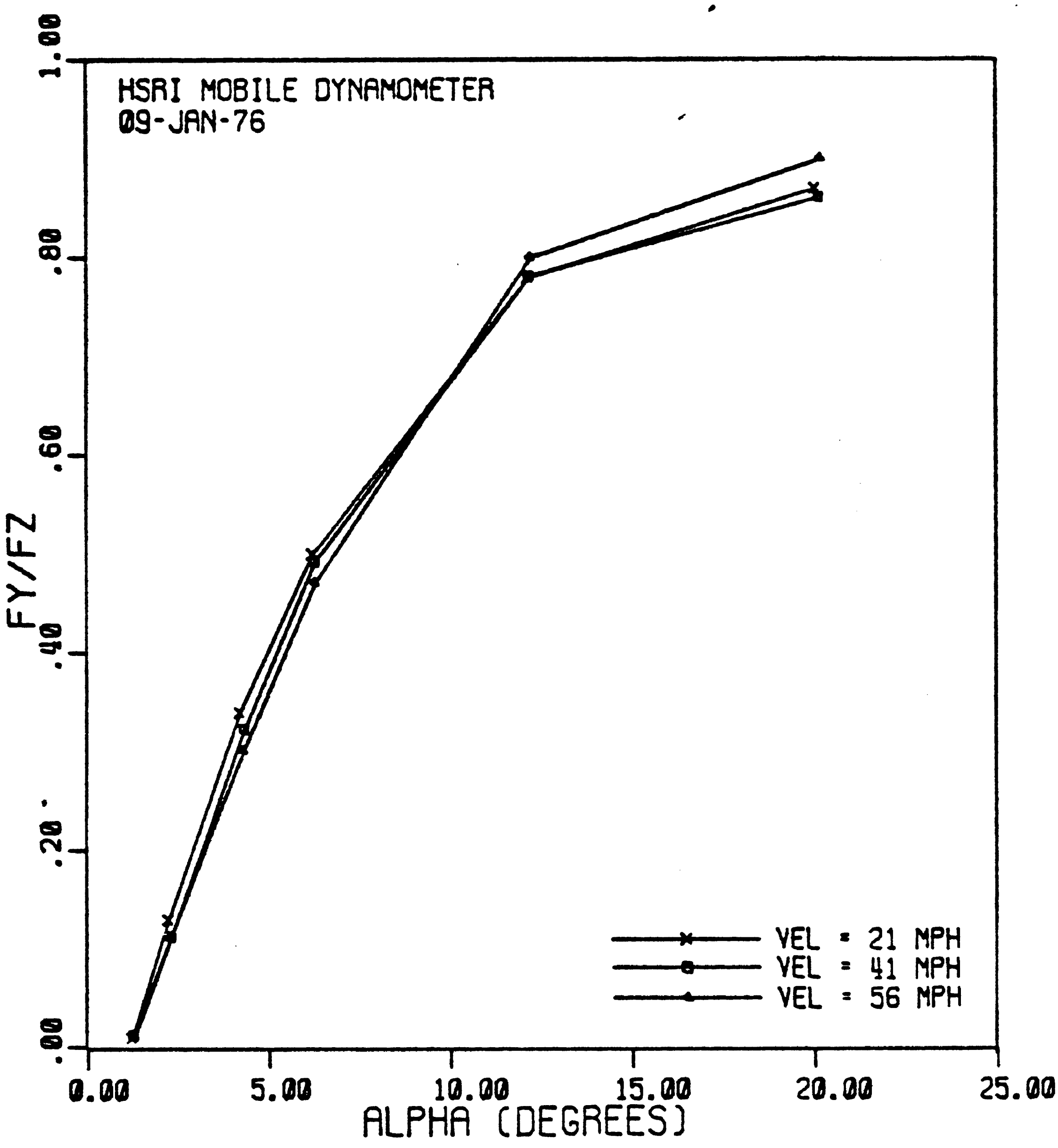
FIRESTONE TOWN & COUNTRY TRUCK 8.00X16.5/D
FZ = 2804 LB



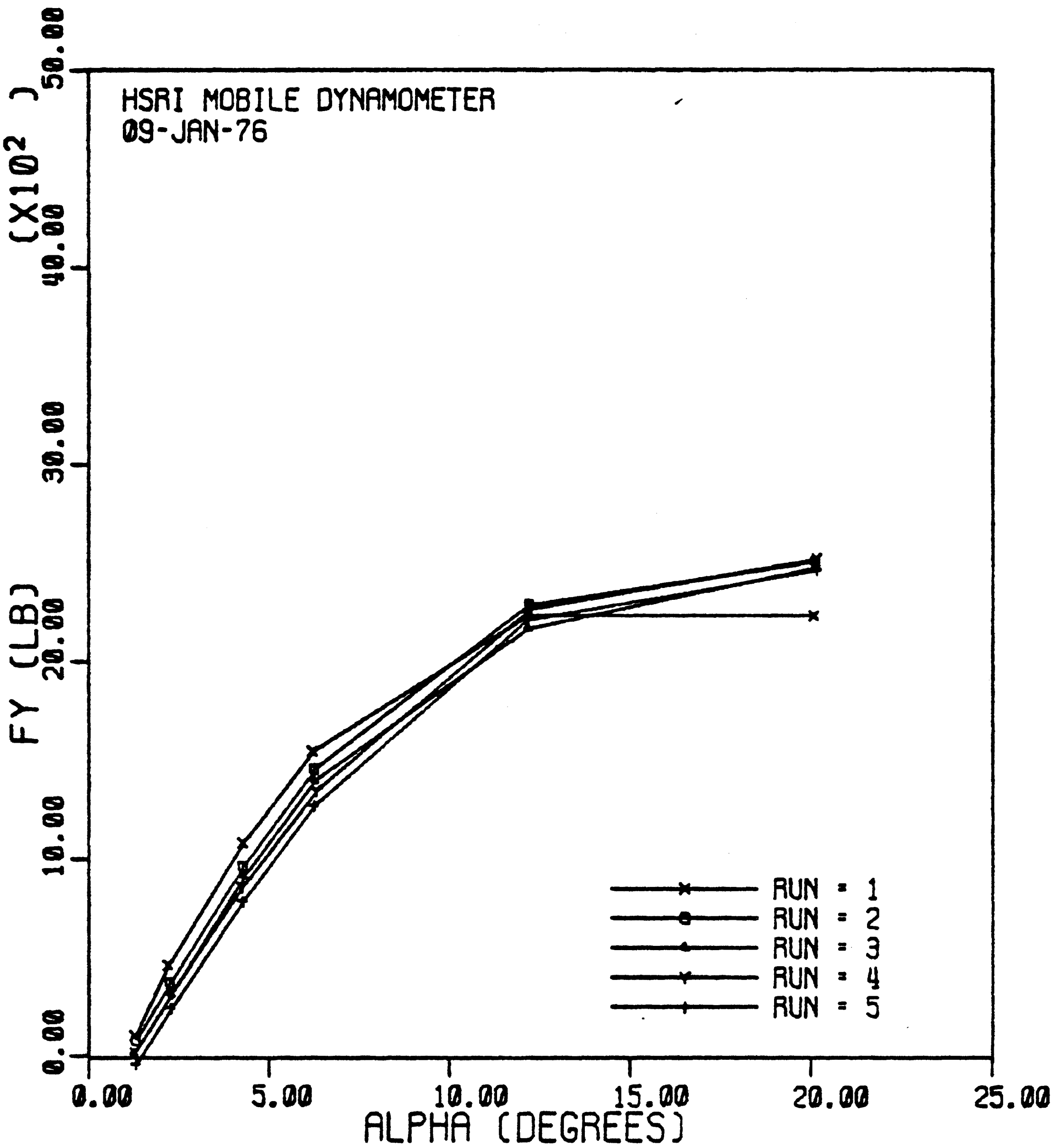
FIRESTONE TOWN & COUNTRY TRUCK 8.00X16.5/D
FZ = 2801 LB VEL = 40 MPH



GENERAL JUMBO POWER JET 8.00X16.5/D
VEL = 41 MPH



GENERAL JUMBO POWER JET 8.00X16.5/D
FZ = 2843 LB



GENERAL JUMBO POWER JET 8.00X16.5/D
FZ = 2832 LB VEL = 41 MPH

GOODYEAR   TUM FLEXSTEEL 8.00R16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-21.5	89.8	-72.3	161.2	-144.9	283.1	-264.1	447.1	-389.7	510.6	-488.3	568.2	-545.0
70.0	1335.0	-30.6	207.7	-148.1	351.3	-305.0	599.2	-544.3	905.2	-856.2	1062.4	-1014.0	1141.4	-1105.2
70.0	2050.0	-40.3	292.2	-208.5	495.0	-441.1	843.5	-778.5	1296.6	-1224.1	1528.4	-1457.0	1600.5	-1537.5
70.0	2800.0	-50.7	334.4	-251.0	606.2	-529.6	1064.1	-983.8	1649.1	-1597.3	1948.7	-1892.5	2048.8	-2008.3

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-3.7	0.8	-4.8	4.6	-6.8	5.8	-9.0	2.3	-7.9	-1.4	-6.9	-5.3	-5.5
70.0	1335.0	-1.8	12.0	-15.5	19.8	-26.6	26.2	-33.4	25.4	-31.4	10.8	-20.9	2.5	-12.5
70.0	2050.0	-1.2	26.5	-30.3	43.9	-44.9	58.9	-67.4	58.9	-63.8	32.3	-43.4	18.7	-22.3
70.0	2800.0	1.4	38.8	-45.3	67.2	-70.2	101.5	-108.8	102.4	-109.3	67.7	-73.4	39.7	-40.4

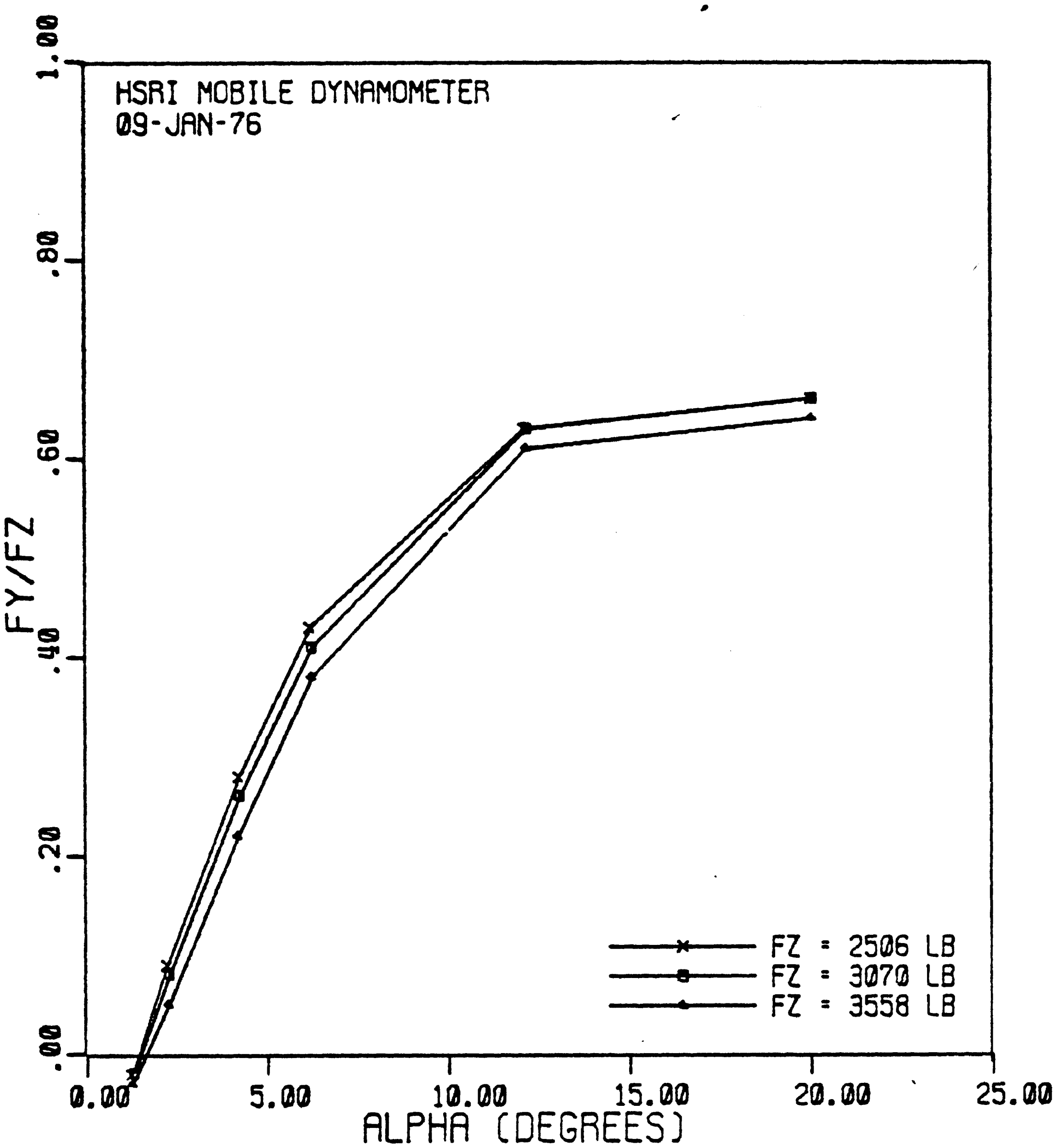
MICHELIN RADIAL XCA 8.00R16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

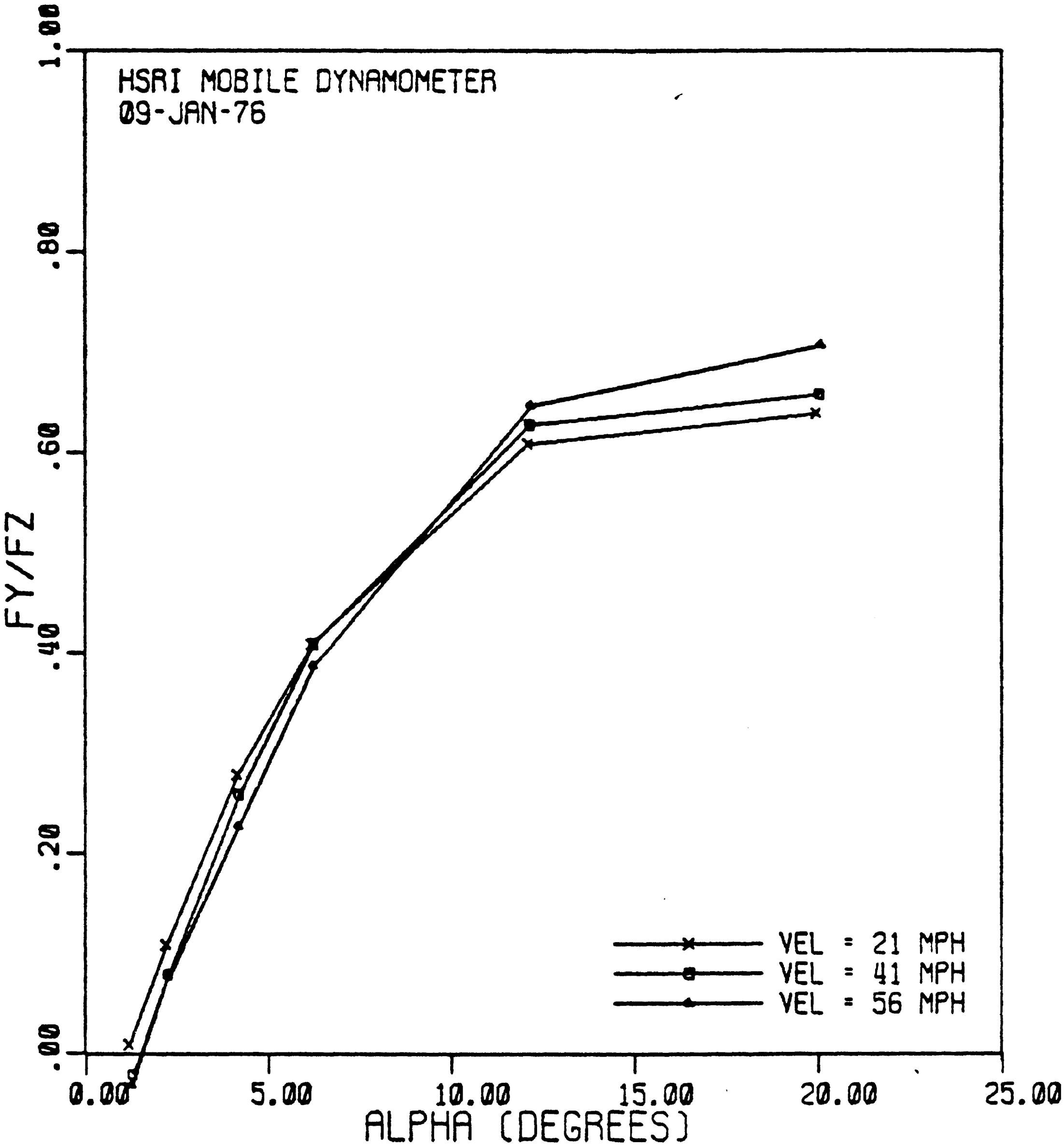
PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-5.9	112.7	-98.1	191.0	-188.1	329.4	-308.6	488.6	-449.4	542.7	-516.0	594.5	-520.0
70.0	1335.0	8.2	229.0	-241.7	429.0	-422.2	736.2	-699.9	1052.7	-999.4	1163.7	-1115.3	1240.6	-1154.3
70.0	2050.0	15.7	303.3	-343.4	615.4	-612.5	1080.3	-1054.0	1534.9	-1450.6	1696.1	-1612.9	1805.3	-1690.2
70.0	2800.0	34.4	362.9	-422.9	745.5	-785.0	1369.0	-1359.6	1960.1	-1900.5	2179.2	-2111.1	2303.0	-2218.1

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

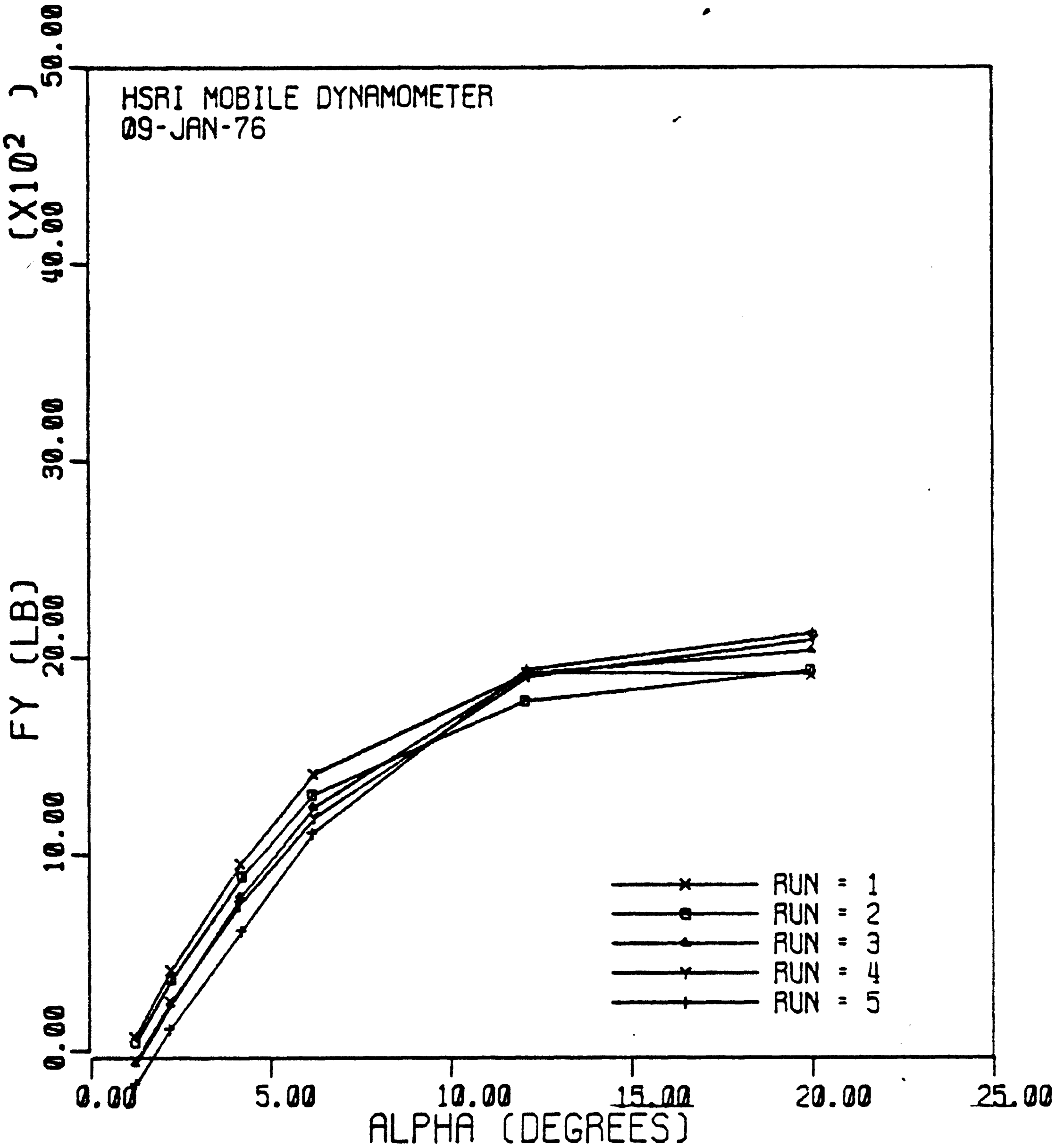
PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	615.0	-2.7	1.7	-6.8	3.4	-11.2	5.6	-6.3	-1.0	-6.2	-5.1	-1.3	-5.2	0.8
70.0	1335.0	-2.4	13.3	-21.8	21.8	-29.5	27.9	-33.9	17.5	-18.5	4.6	-4.6	-2.3	3.6
70.0	2050.0	-6.6	27.3	-36.4	47.3	-55.9	62.3	-67.5	47.0	-41.2	25.2	-20.9	11.0	-4.6
70.0	2800.0	-9.3	40.6	-54.9	77.3	-91.0	108.9	-114.0	87.3	-79.7	52.4	-51.6	30.9	-24.8



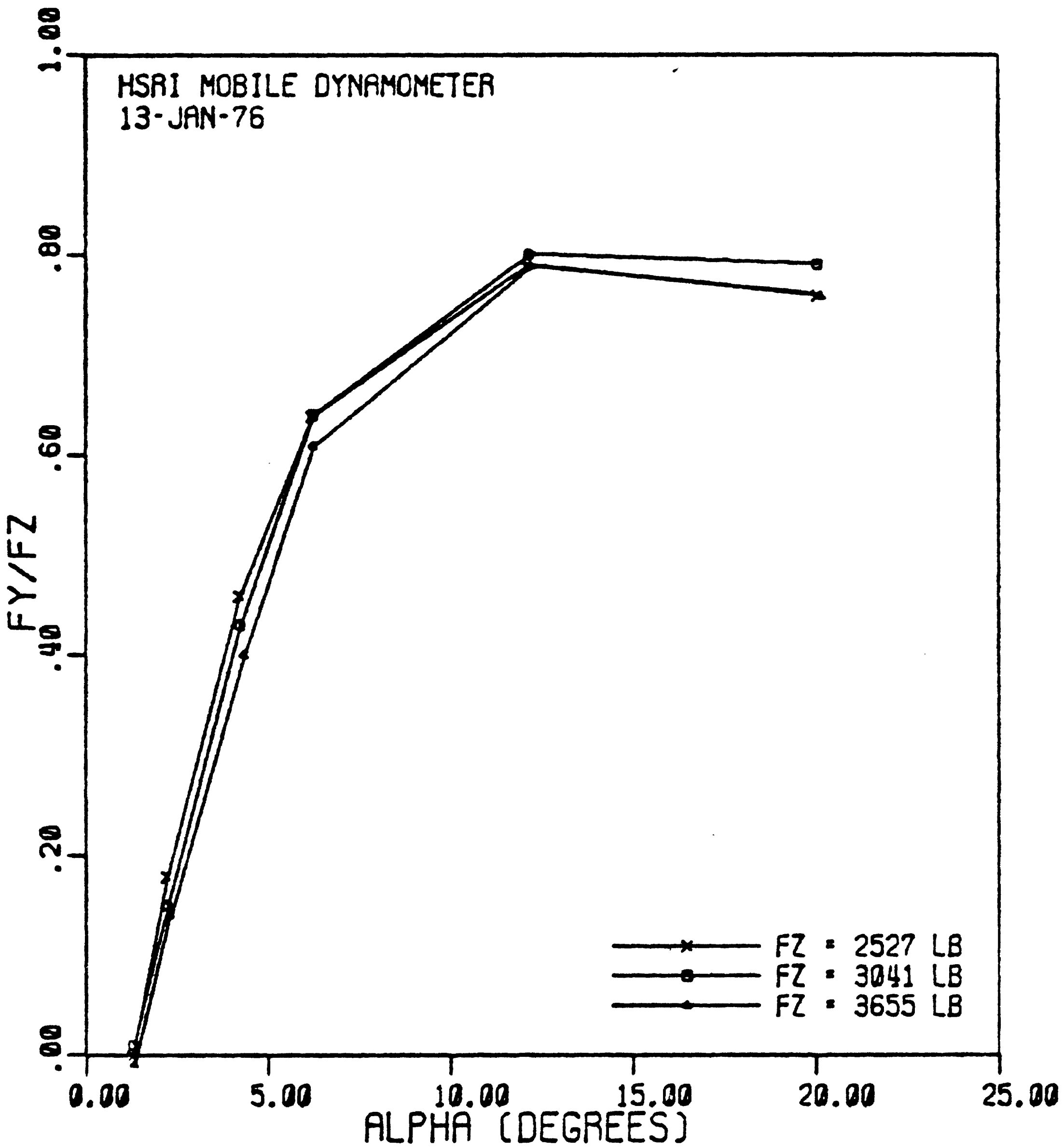
GOODYEAR CUSTOM FLEXSTEEL 8.00R16.5/E
VEL = 40 MPH



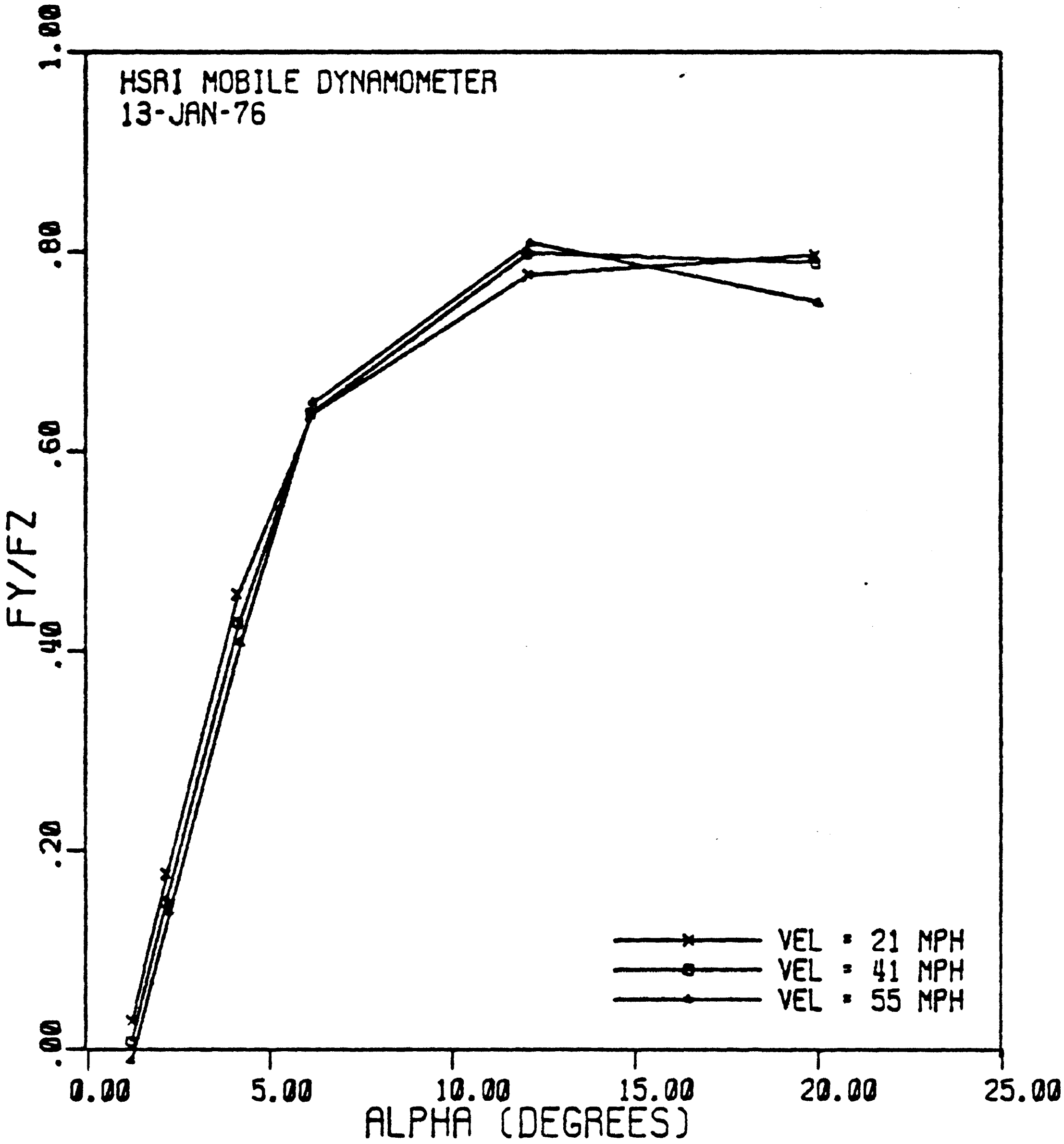
GOODYEAR CUSTOM FLEXSTEEL 8.00R16.5/E
FZ = 3025 LB



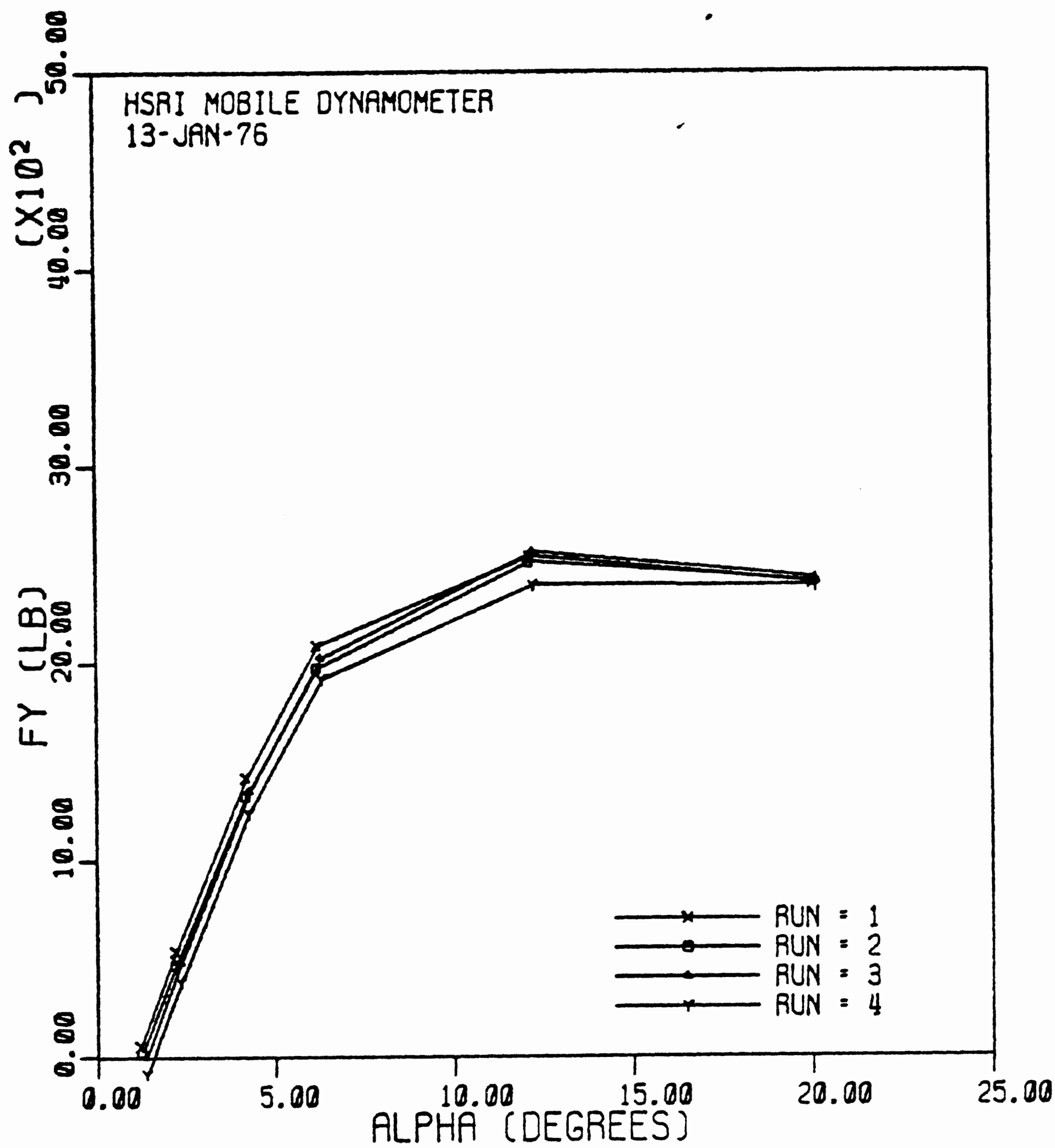
GOODYEAR CUSTOM FLEXSTEEL 8.00R16.5/E
FZ = 3026 LB VEL = 41 MPH



MICHELIN XCA 8.00R16.5/E
VEL = 41 MPH



MICHELIN XCA 8.00R16.5/E
FZ = 3077 LB



MICHELIN XCA 8.00R16.5/E

FZ = 3084 LB VEL = 41 MPH

This expectation is confirmed by Fig. 13 which compares the carpet plots of lateral force versus slip angle and vertical load for dual tires with twice the measured lateral force from the single tire. The vertical loads in Fig. 13 are twice the test loads on the single tire.

Figs. 14A-14B show the dependence of the traction stiffnesses C_α and C_γ on vertical load. The vertical loads on the single tire were half of the dual tire loads indicated on the abscissas of Fig. 14.

The dual tire aligning moment as a function of slip angle and vertical load was found to be very close to twice the single tire aligning moment measured at the same slip angles and half of the loads on the dual assembly. A comparison of the moment data for selected slip angles is given in Table 6.

Table 4 - Mechanical Properties of Single and Dual Tire Assembly at 65 psi

	Single*	Dual**
C_s, lb/unit slip	31,000	54,000
C_α, lb/deg	311.1	594.4
C_γ, lb/deg	52.0	97.1
K_y, lb/in	1,279	2,423
K_z, lb/in	2,690	5,756

*Single tire load is 2750 lb (rated single tire load is 3140 lb).
**Dual tire load is 5500 lb (rated load).

Table 5 - Dependence of Single and Dual Tire Lateral Force on Inflation Pressure

Pressure, psi	Lateral Force, at 6 deg Slip Angle, lb	
	Single*	Dual**
50	1290	2414
65	1361	2616
75	1494	2787
90	1512	2807

*Single tire load is 2750 lb.
**Dual tire load is 5500 lb.

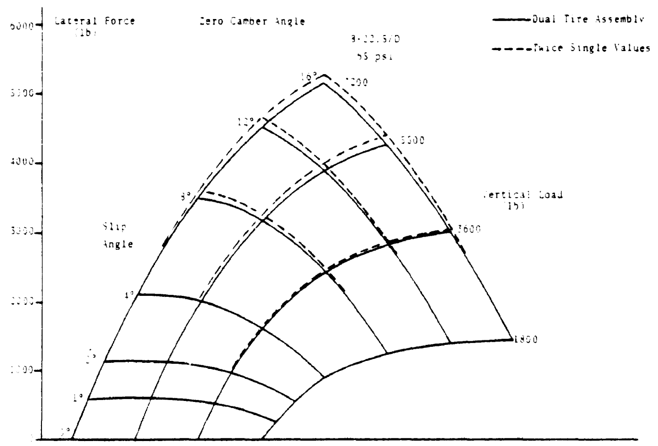


Fig. 13 - Comparison of lateral force versus slip angle and vertical load on dual assembly of 8-22.5/D tires with twice lateral force obtained from single 8-22.5/D tire operated at same pressure, slip angles, and half of vertical loads applied to dual assembly

CLOSURE

It cannot be overemphasized that the tire data presented in this paper have been obtained in a specific set of experiments on a single testing machine. From the highway data available

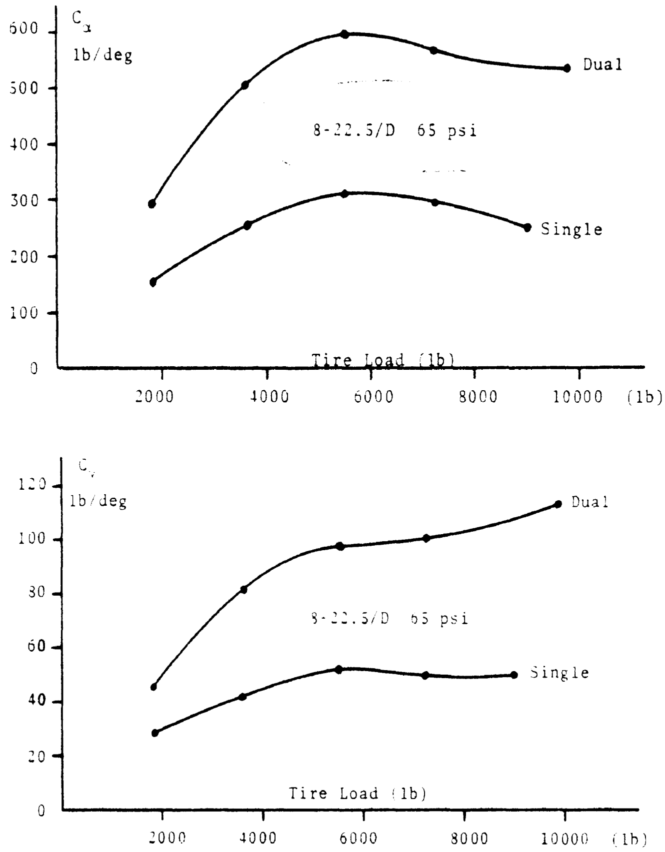


Fig. 14 - Variation of dual and single tire mechanical properties with tire load. A-cornering stiffness versus tire load; B-camber stiffness versus tire load

Table 6 - Comparison of Dual and Single Tire Aligning Moments* at 65 psi

Dual Tire Load, lb	Aligning Moment, ft-lb, at Indicated Slip Angle, deg					
	1 deg		4 deg		12 deg	
	Dual	Single	Dual	Single	Dual	Single
1800	26.6	26.6	49.0	50.6	6.1	5.8
3600	69.2	70.8	151.7	137.2	59.4	60.4
5500	110.2	113.6	282.5	281.2	171.8	174.2
7200	141.1	153.6	406.3	399.4	311.7	326.4

*The single tire moment is twice the measured value.

DUAL VERSUS SINGLE TIRE TRACTION

A special experiment was conducted to determine the relationship between the force and moment producing properties of tires used as singles with the same tires used as duals. A nylon 8-22.5/D rib-type II tire (Fig. 6B) was selected for test, being the maximum size that could be mounted in a dual configuration on the flat bed machine. To represent the dual configuration, the tires were mounted on a precision dual rim with 5.25 in bead spacing. The inflated sidewall spacing was 1 in. For single tire testing, the test tire was mounted on the same rim with 5.25 in bead spacing located midway between the previous duals (dashed outline in Fig. 12A).

The bead spacing used in these tests is less than the 6.00 in design rim width. No data are yet available on the influence of rim width, but it is believed that the mechanical properties and traction forces measured in this test are indicative of the differences to be expected in dual and single wheel application.

To eliminate the effect of inflation pressure, the single tire tests were run at the rated dual tire pressure, 65 psi. This practice was followed because the influence of inflation pressure on the lateral force developed by single and dual tires is measurable, though slight (Table 5).

Table 4 shows that the vertical spring rate, K_z, of the dual tire assembly is slightly more than twice the single tire spring rate. For identical tires, each carrying half of the vertical load, the spring rate should be exactly two times the single tire rate. The variation may be attributed to a slight difference in tire stiffnesses.

A comparison of the C_s, C_α, and C_γ values tabulated in Table 4 suggests that the traction force generated by dual tires should be nearly double that generated by a single tire.

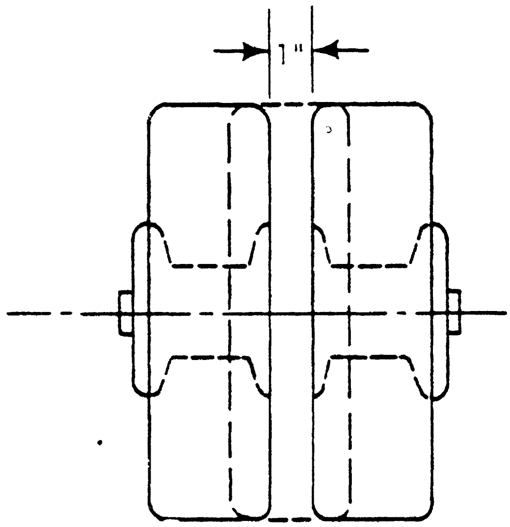


Fig. 12A - Dual and single tire positioning on precision test rim

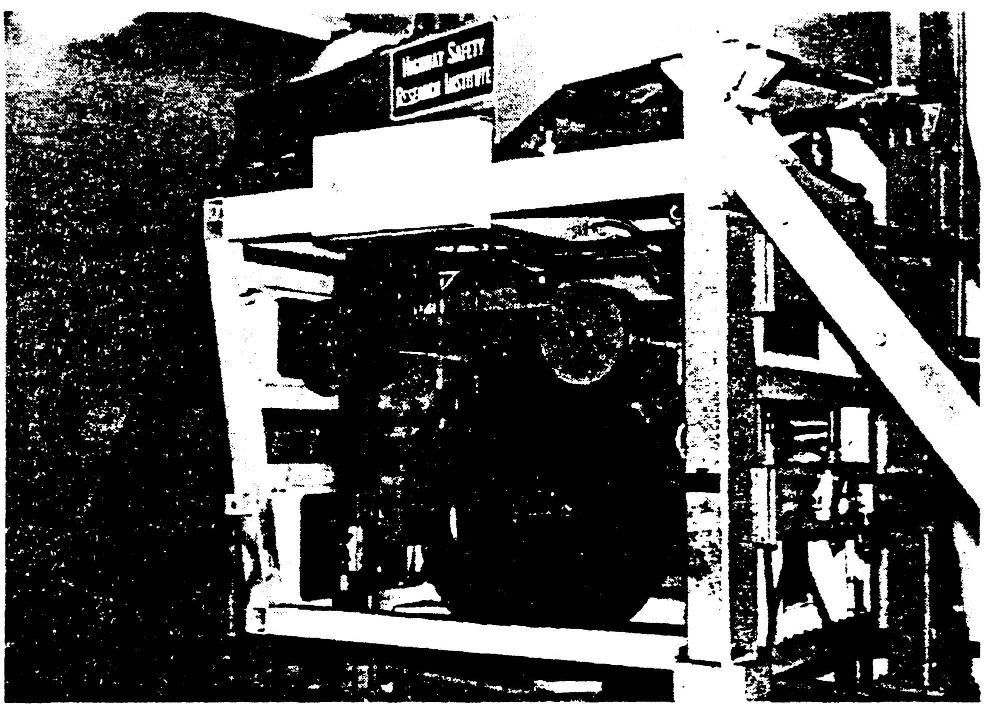


Fig. 12B - Dual tire assembly mounted in flat bed tire testing machine

Tire: Highway Tread 8-22.5/D: Single Rim: 22.5x5.25

LATERAL FORCE vs SLIP ANGLE AND VERTICAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	Lateral Force at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
900	65	153	292	447	643	712	748
1800	65	259	496	809	1235	1439	1527
2750	65	311	588	1018	1654	2002	2210
3600	65	295	577	1053	1804(?)	2334	2635
4500	65	275	548	1039(?)	1926	2530	2936

ALIGNING TORQUE vs SLIP ANGLE AND VERTICAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	Aligning Torque at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
900	65	13	22	25	10	3	1
1800	65	35	61	69	52	30	17
2750	65	57	102	141	126	87	53
3600	65	77	144	200	214	163	104
4500	65	100	186	275	322	272	191

CIRCUMFERENTIAL STIFFNESS vs SLIP ANGLE AND NORMAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	C_s (lbs.)	Vertical Spring Rate (lbs./in.)
2750	65	31,000	2690

Tire: Highway Tread 8-22.5/D: Dual   Rim: 22.5x5.25

LATERAL FORCE vs SLIP ANGLE AND VERTICAL LOAD

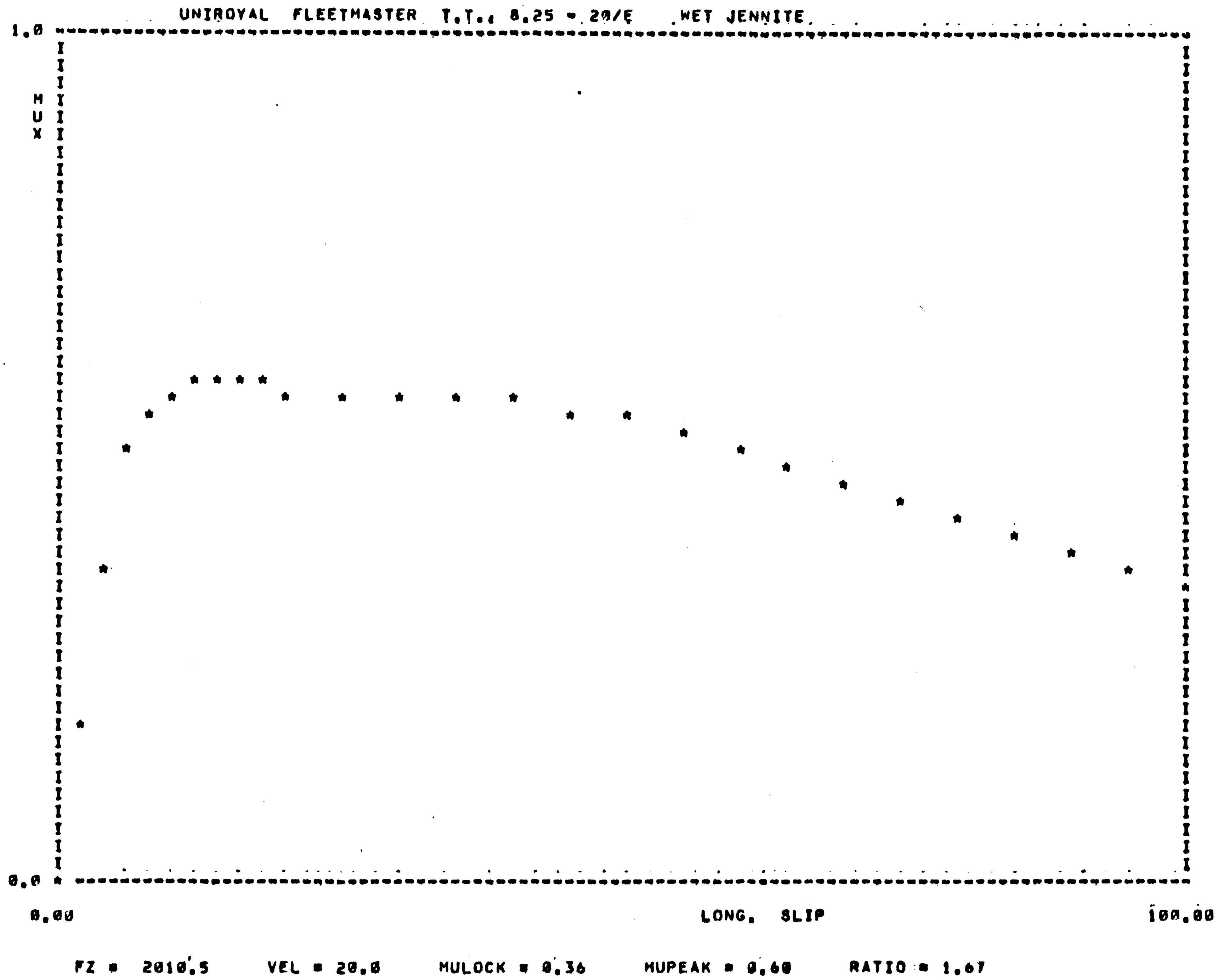
Vertical Load (lbs.)	Inflation Pressure (psi)	Lateral Force at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1800	65	294	543	911	1249	1394	1452
3600	65	508	956	1654	2431	2827	3000
5500	65	594	1137	2020	3182	3905	4290
7200	65	570	1127	2096	3485	4521	5151
9800	65	540	1072	2052	3617	4980	6071

ALIGNING TORQUE vs SLIP ANGLE AND VERTICAL LOAD

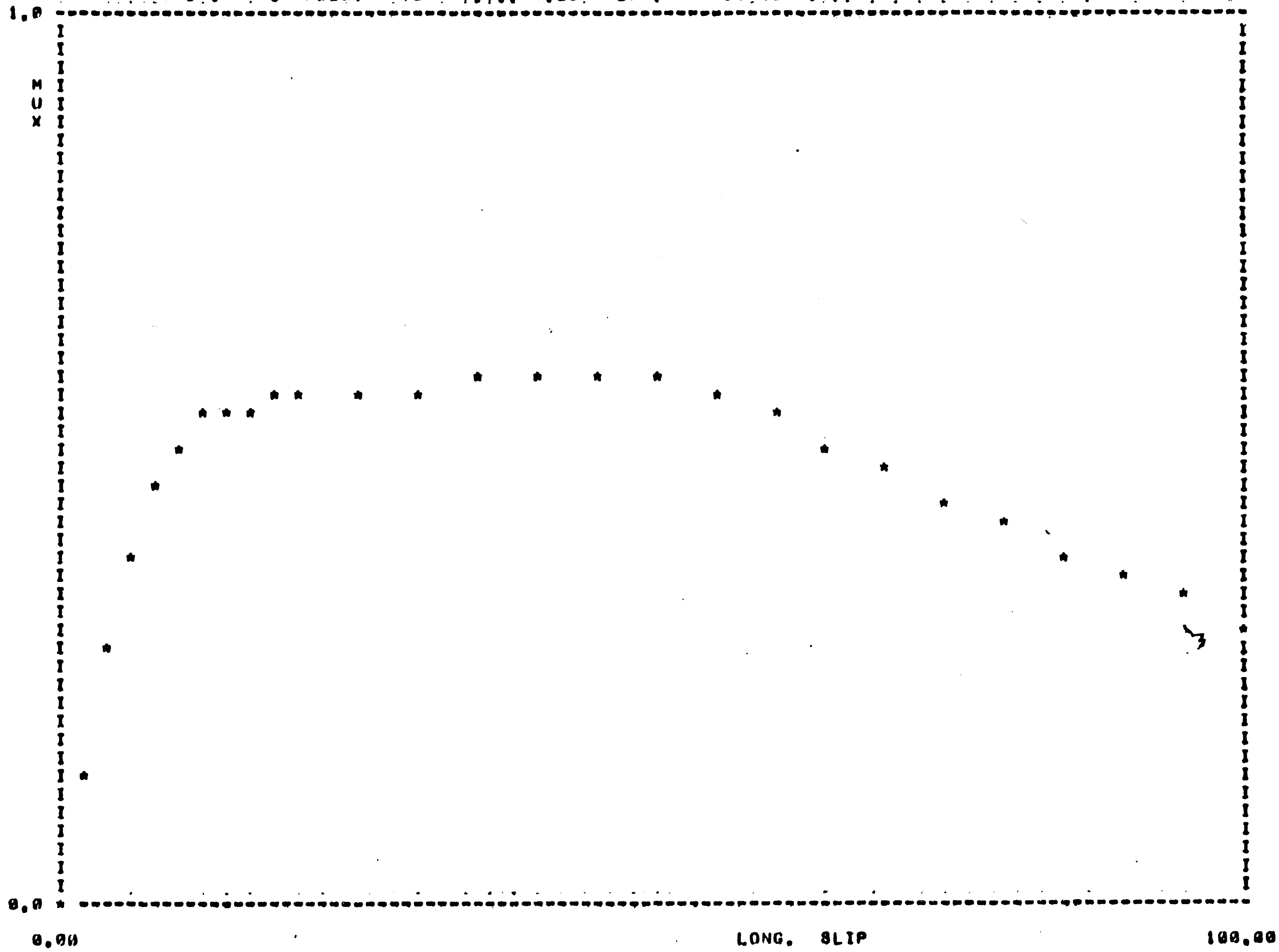
Vertical Load (lbs.)	Inflation Pressure (psi)	Aligning Torque at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1800	65	27	42	49	21	6	-0(?)
3600	65	69	118	152	103	59	31
5500	65	110	197	283	252	172	92
7200	65	141	262	406	423	312	178
9800	65	189	353	580	704	604	429

CIRCUMFERENTIAL STIFFNESS vs SLIP ANGLE AND NORMAL LOAD

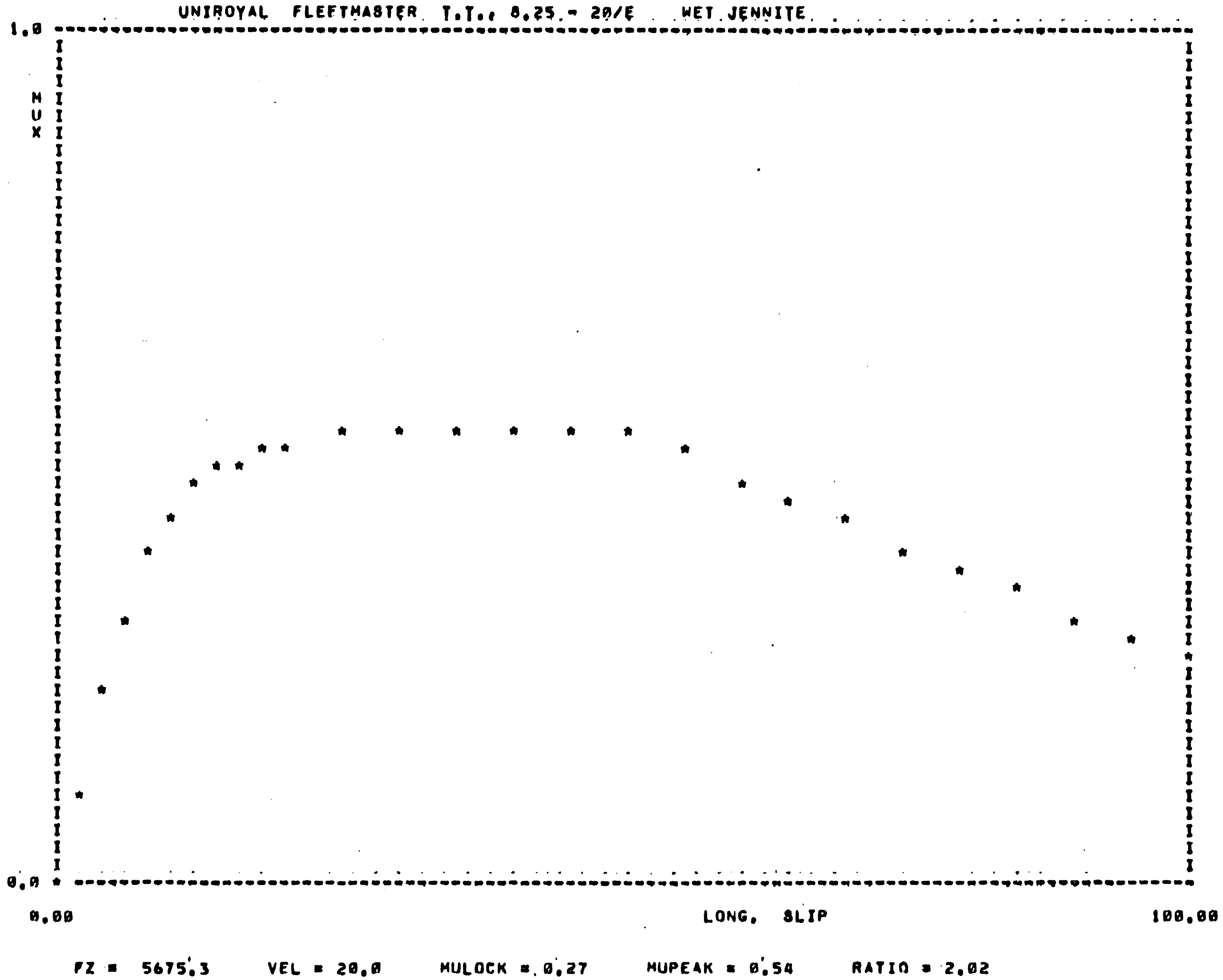
Vertical Load (lbs.)	Inflation Pressure (psi)	C_s (lbs.)	Vertical Spring Rate (lbs./in.)
5500	65	54,000	1556

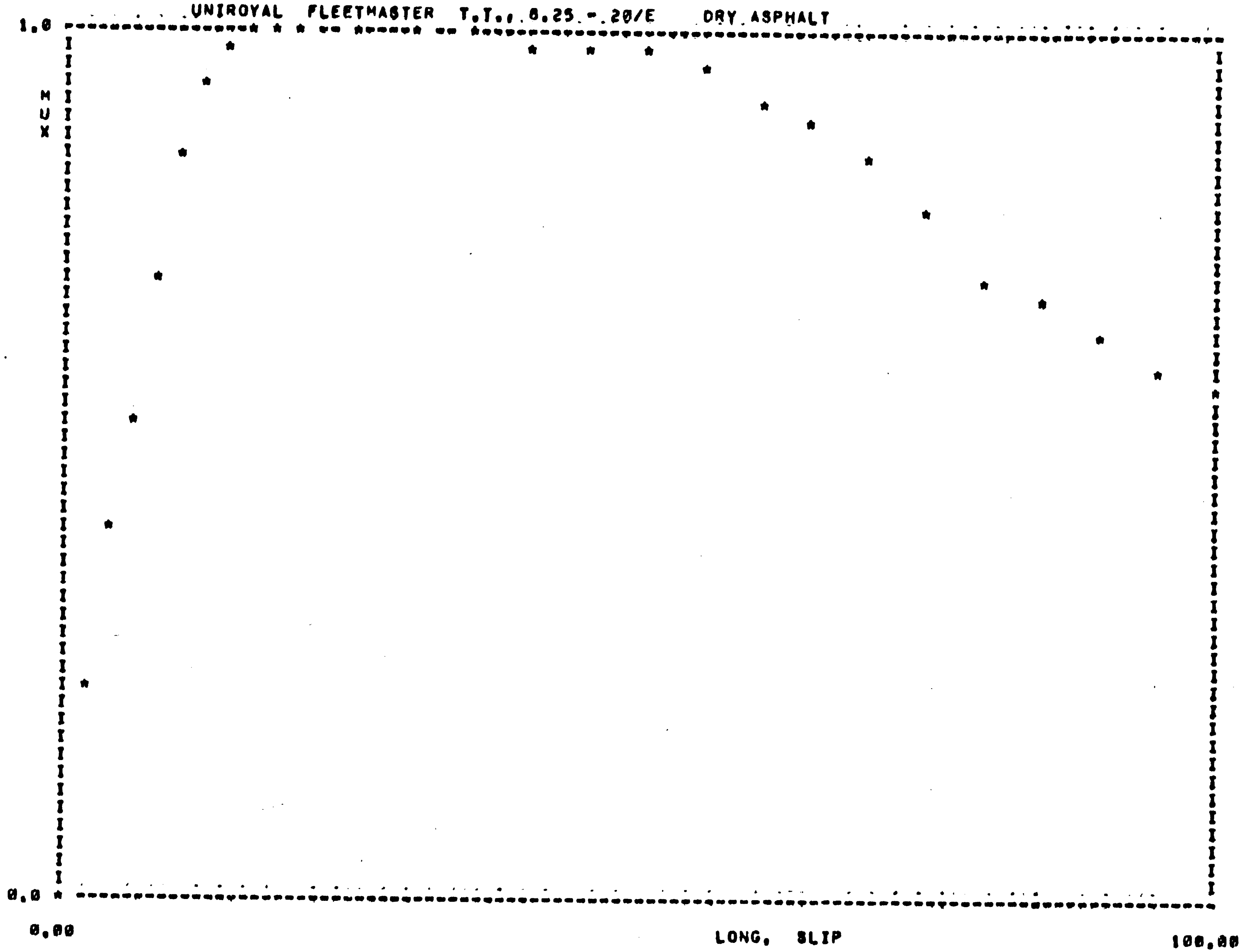

UNIROYAL FLEETMASTER T.T., 8.25 - 20/E WET JENNITE
1.0
MUX
0.0
0.00
LONG. SLIP
100.00
FZ = 2010.5 VEL = 20.0 MULOCK = 0.36 MUPEAK = 0.60 RATIO = 1.67

UNIROYAL FLEETMASTER T.T., 8.25 - 20/E WET JENNITE

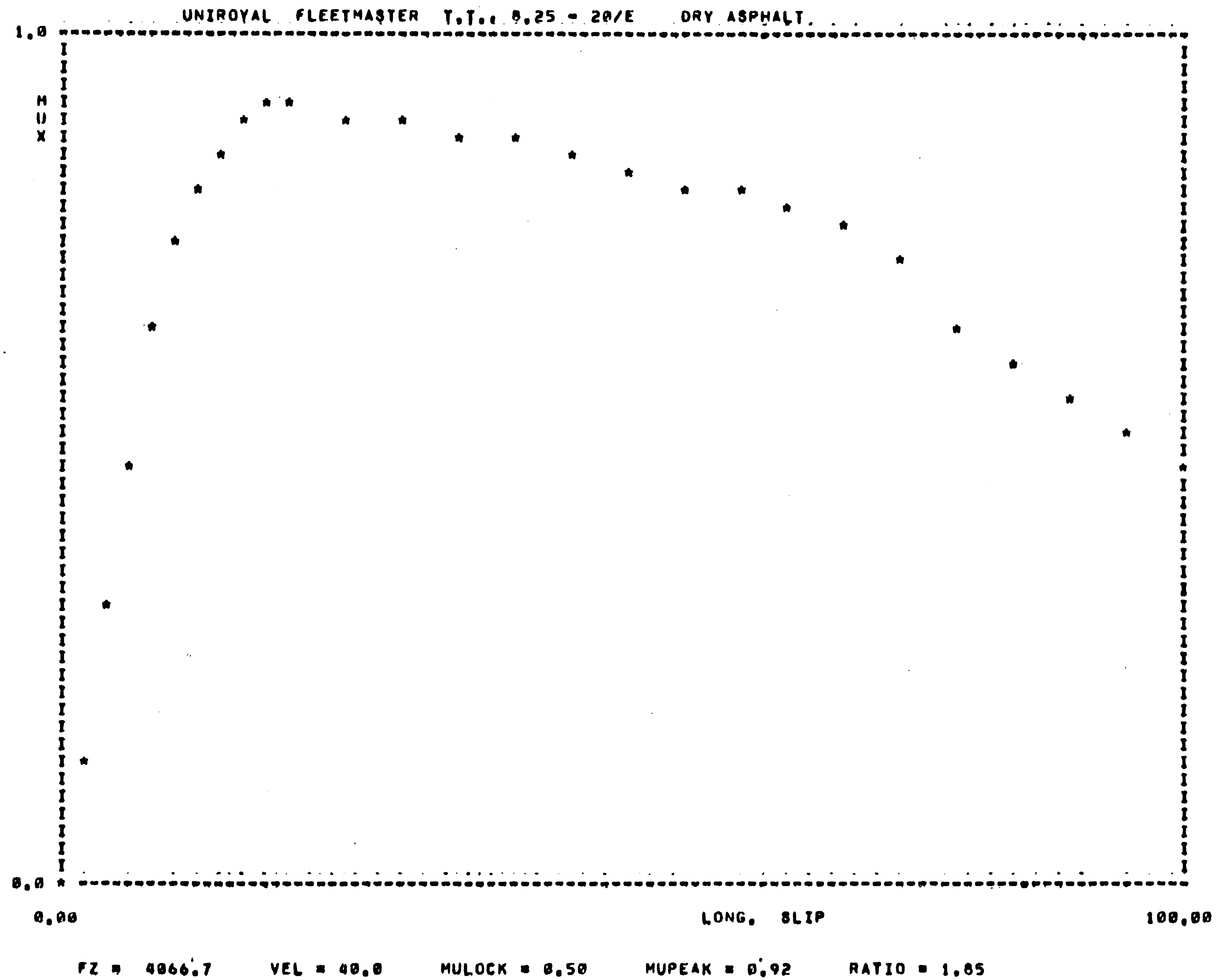


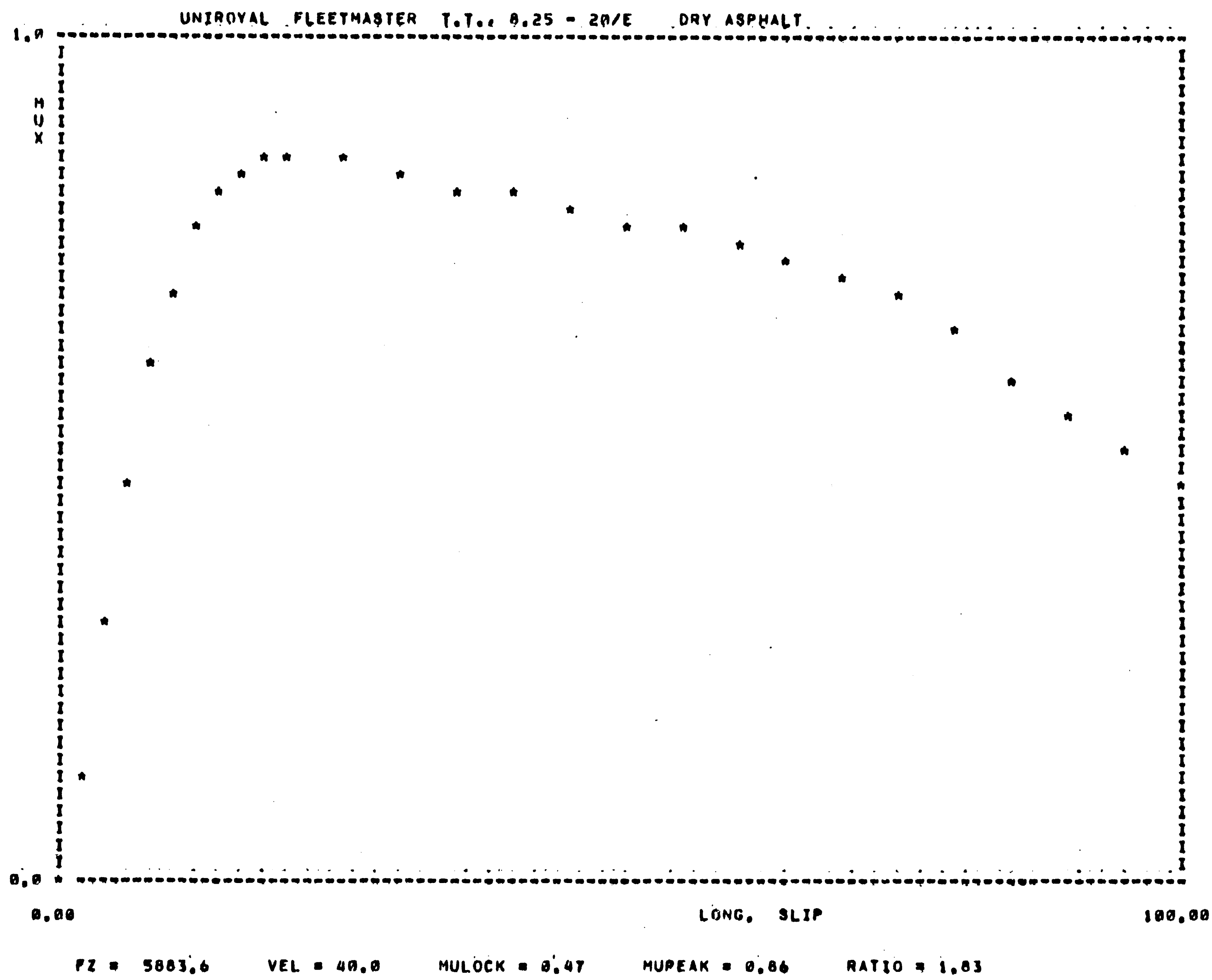
FZ = 3984.9 VEL = 20.0 MULOCK = 0.31 MUPEAK = 0.59 RATIO = 1.92

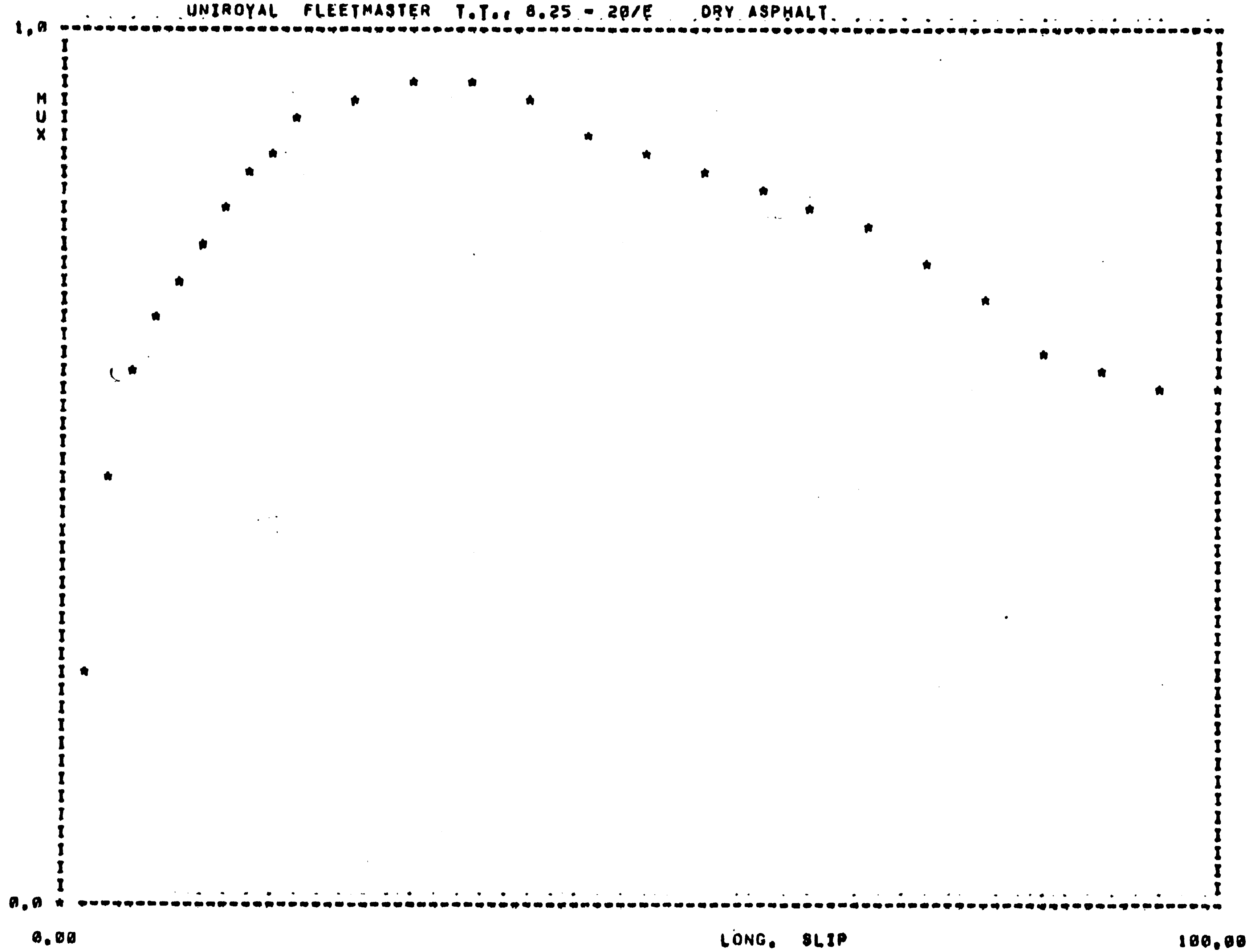

UNIROYAL FLEETMASTER T.T., 8.25 - 20/E WET JENNITE
1.0
MUX
0.0
0.00
LONG. SLIP
100.00
FZ = 5675.3 VEL = 20.0 MULOCK = 0.27 MUPEAK = 0.54 RATIO = 2.02



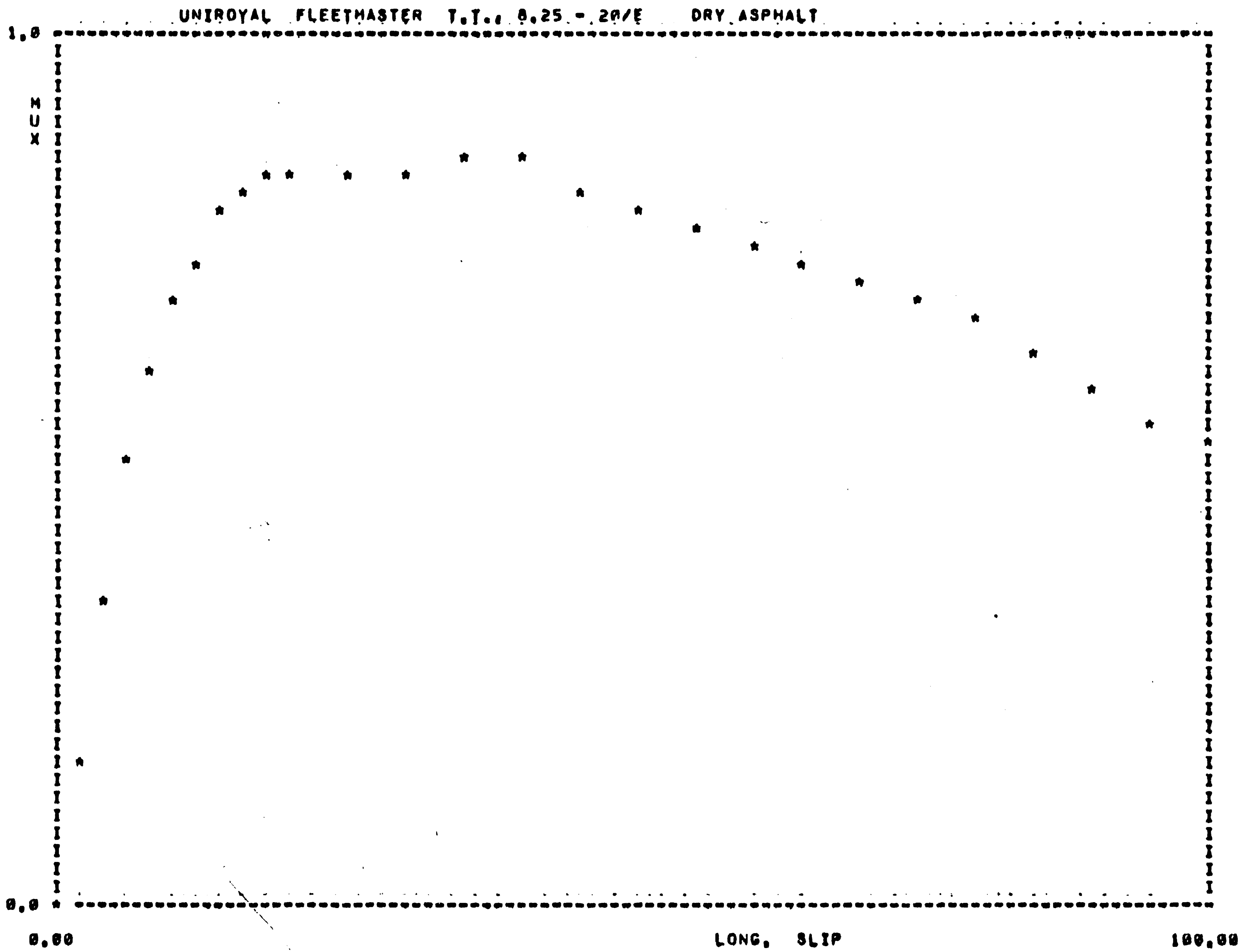
FZ = 1942.3 VEL = 40.0 MULOCK = 0.59 MUPEAK = 1.11 RATIO = 1.89


UNIROYAL FLEETMASTER T.T., 8.25 - 20/E DRY ASPHALT
1.0
MUX
0.0
0.00
LONG. SLIP
100.00
FZ = 4066.7 VEL = 40.0 MULOCK = 0.50 MUPEAK = 0.92 RATIO = 1.05

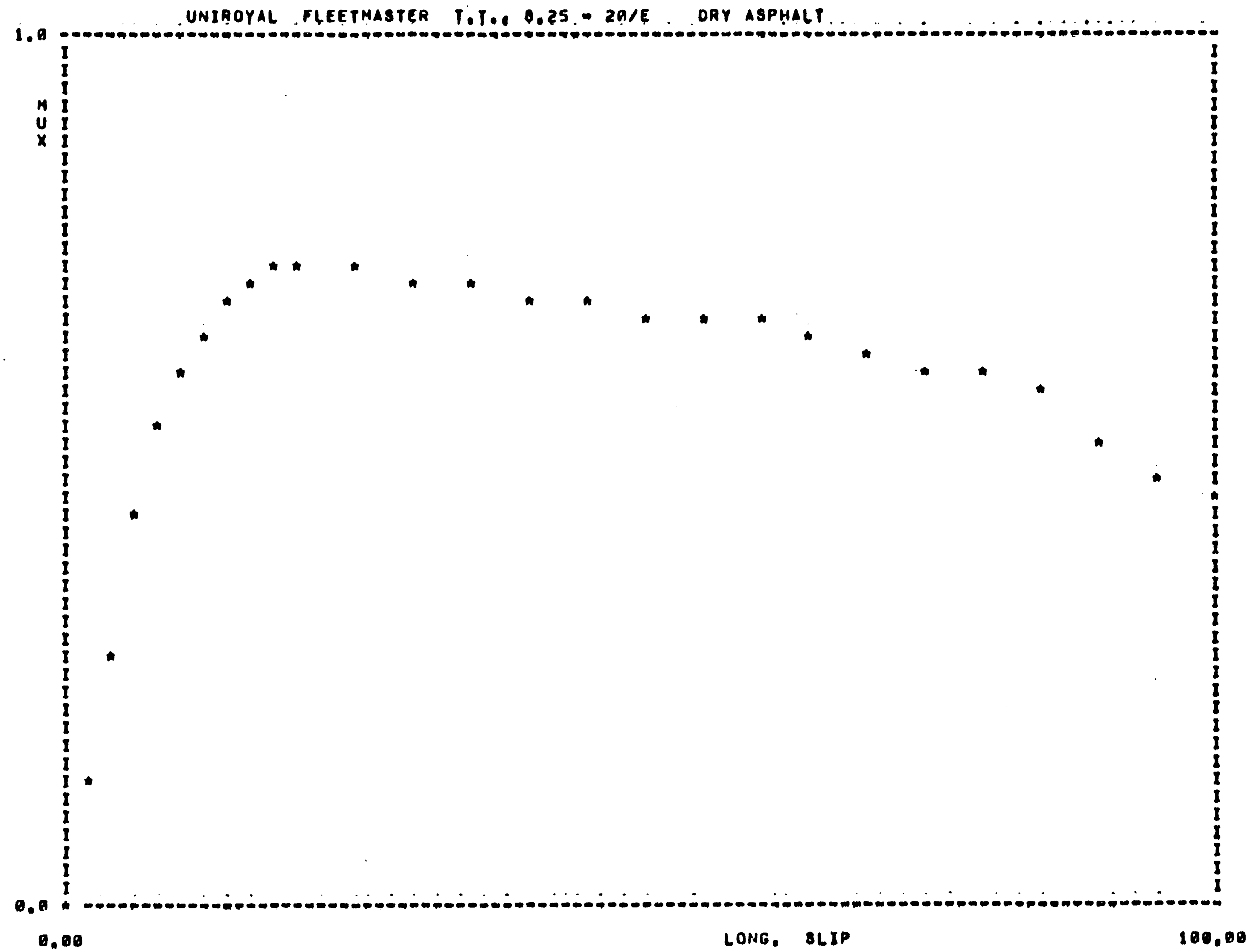

UNIROYAL FLEETMASTER T.T.: 0.25 - 20/E DRY ASPHALT
1.0
MUX
0.0
0.00
LONG. SLIP
100.00
FZ = 5883.6 VEL = 40.0 MULOCK = 0.47 MUPEAK = 0.86 RATIO = 1.83



FZ = 2012.2 VEL = 60.0 MULOCK = 0.59 MUPEAK = 0.95 RATIO = 1.60



FZ = 4043.0 VEL = 60.0 MULOCK = 0.53 MUPEAK = 0.86 RATIO = 1.62



FZ = 5935.9 VEL = 60.0 MULOCK = 0.46 MUPEAK = 0.75 RATIO = 1.61

Tire: Highway Tread 8.25-20/E Rim: 20x7.00

LATERAL FORCE vs SLIP ANGLE AND VERTICAL LOAD

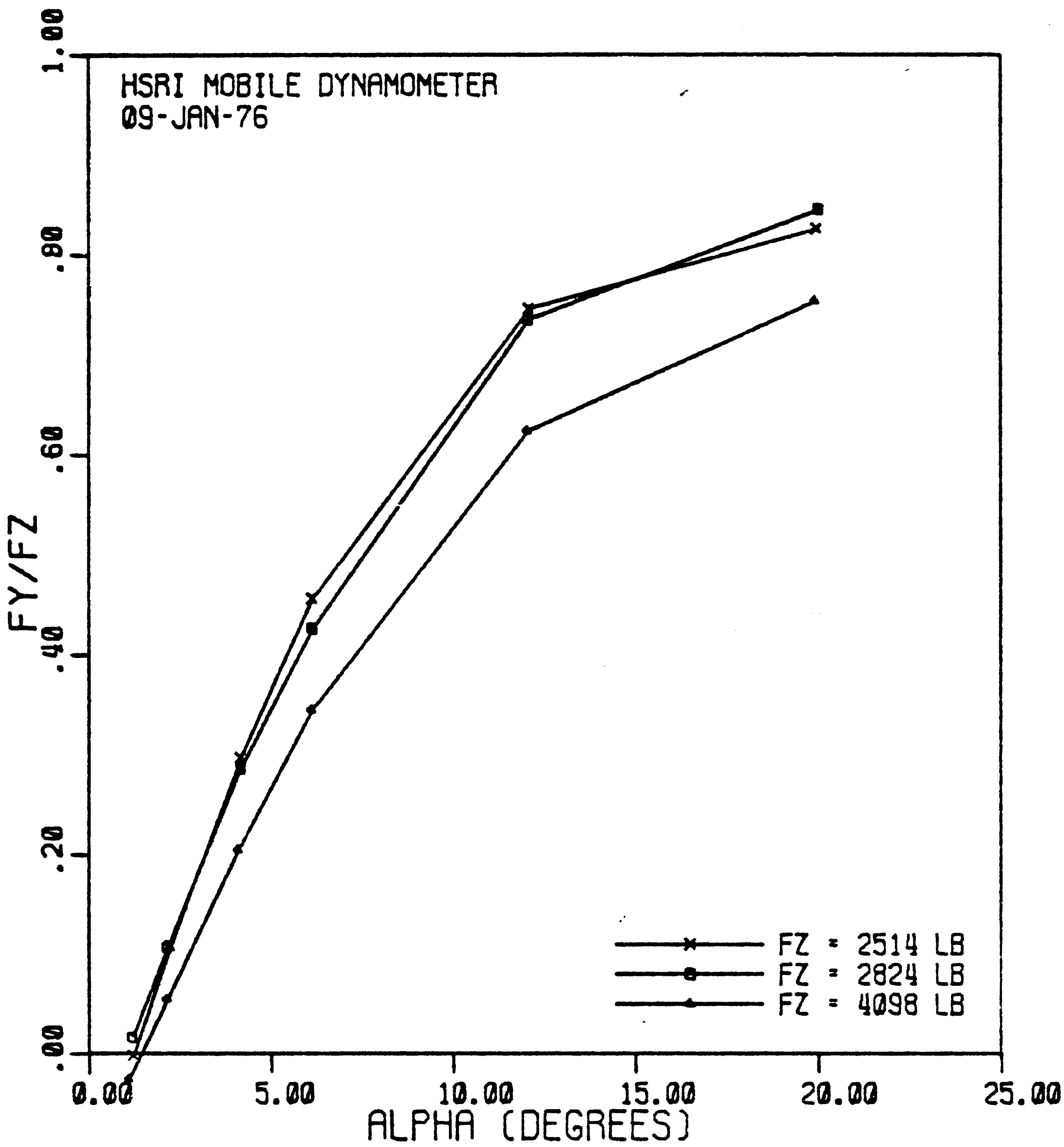
Vertical Load (lbs.)	Inflation Pressure (psi)	Lateral Force at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1300	85	188	368	636	969	1137	1001
2700	85	318	631	1137	1814	2189	2076
4050	85	399	770	1404	2340	2934	2865
5400	85	398	807	1550	2662	3455	3530
6500	85	393	807	1546	2765	3719	3931

ALIGNING TORQUE vs SLIP ANGLE AND VERTICAL LOAD

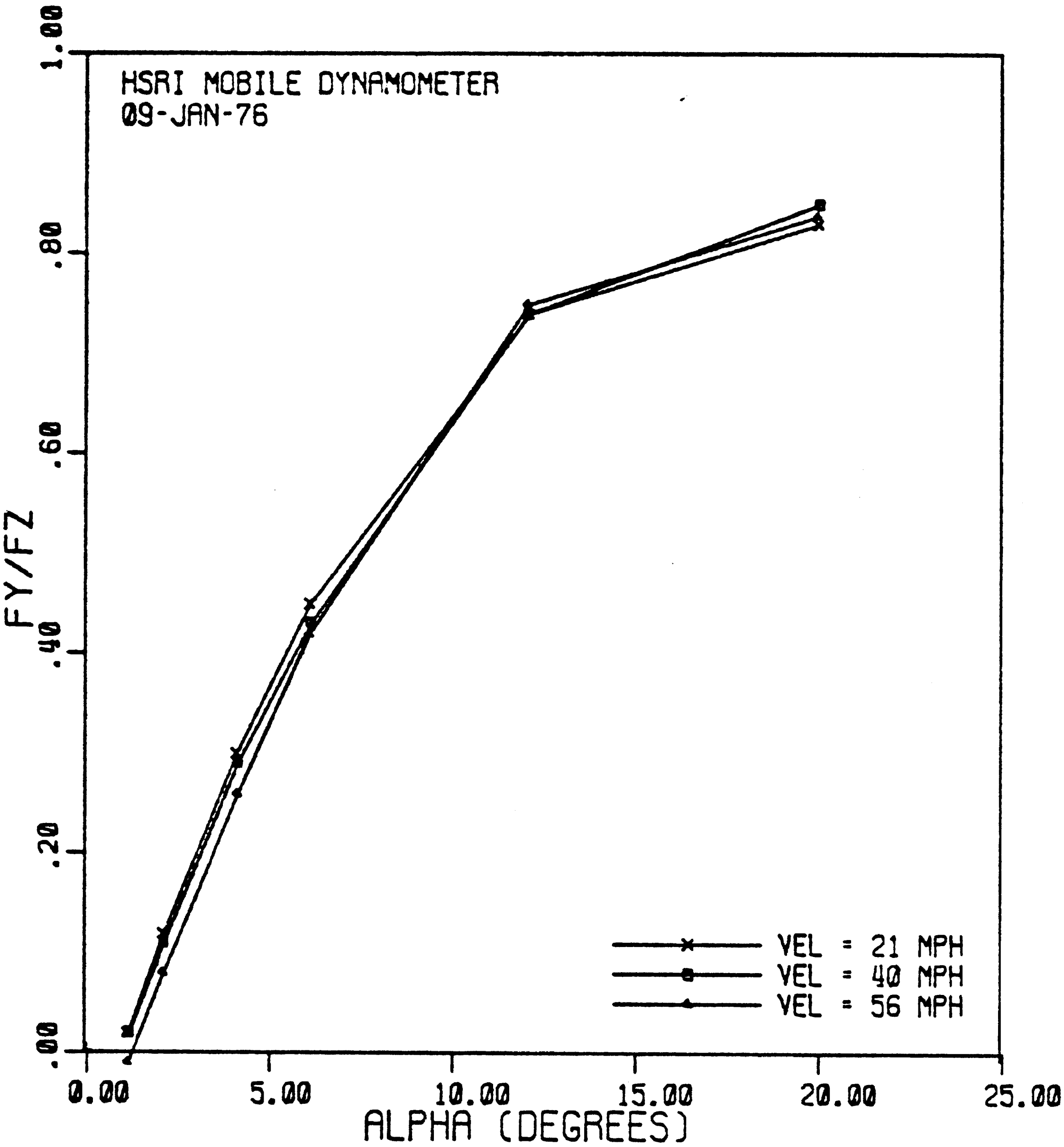
Vertical Load (lbs.)	Inflation Pressure (psi)	Aligning Torque at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1300	85	16	30	40	32	17	4
2700	85	42	77	116	116	81	34
4050	85	69	124	196	220	172	87
5400	85	92	175	288	351	296	164
6500	85	112	219	369	468	422	242

CIRCUMFERENTIAL STIFFNESS vs SLIP ANGLE AND NORMAL LOAD

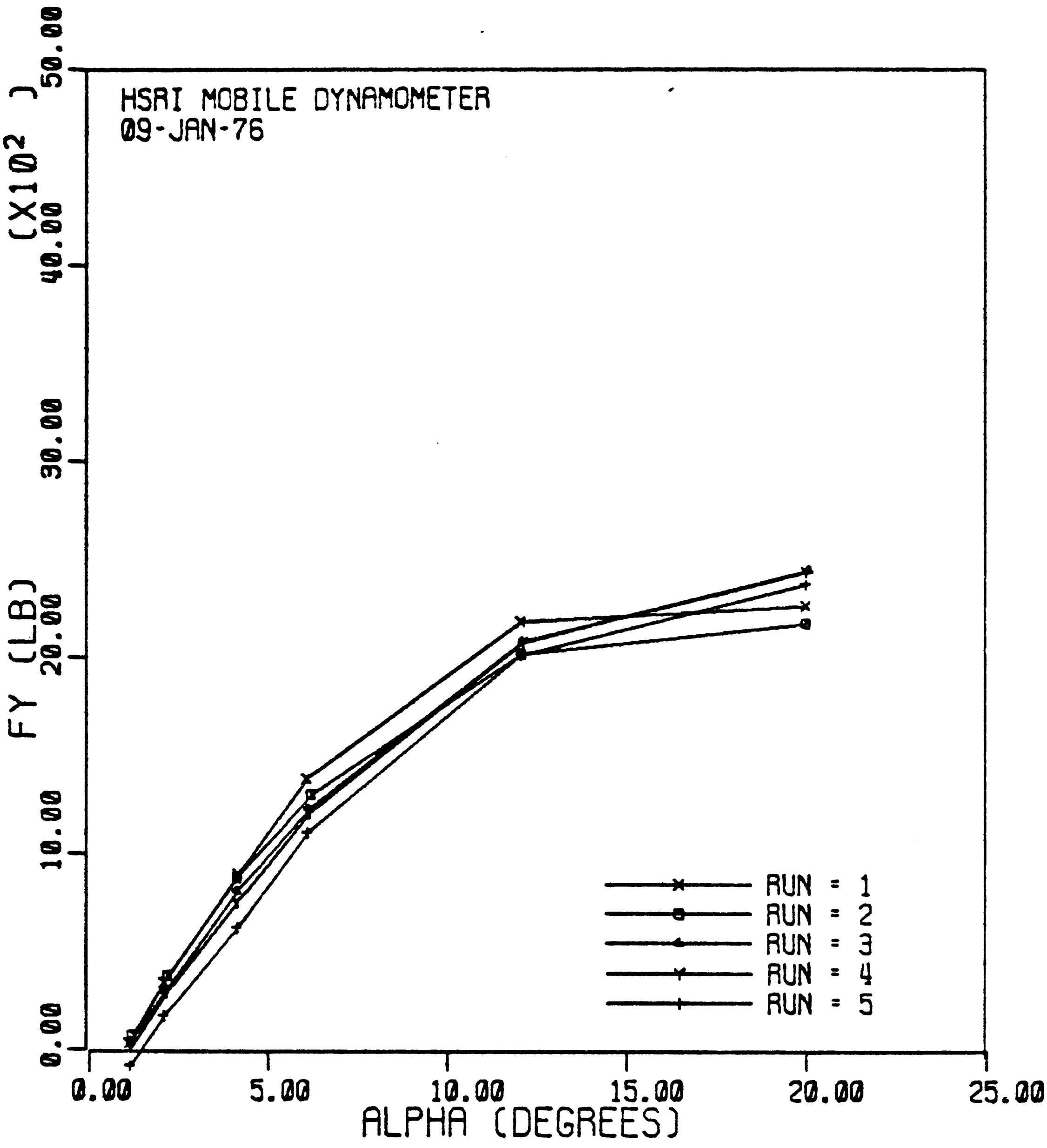
Vertical Load (lbs.)	Inflation Pressure (psi)	C_s (lbs.)	Vertical Spring Rate (lbs./in.)
1300	85	14,000	
4050	85	22,000	3900
6500	85	36,000	



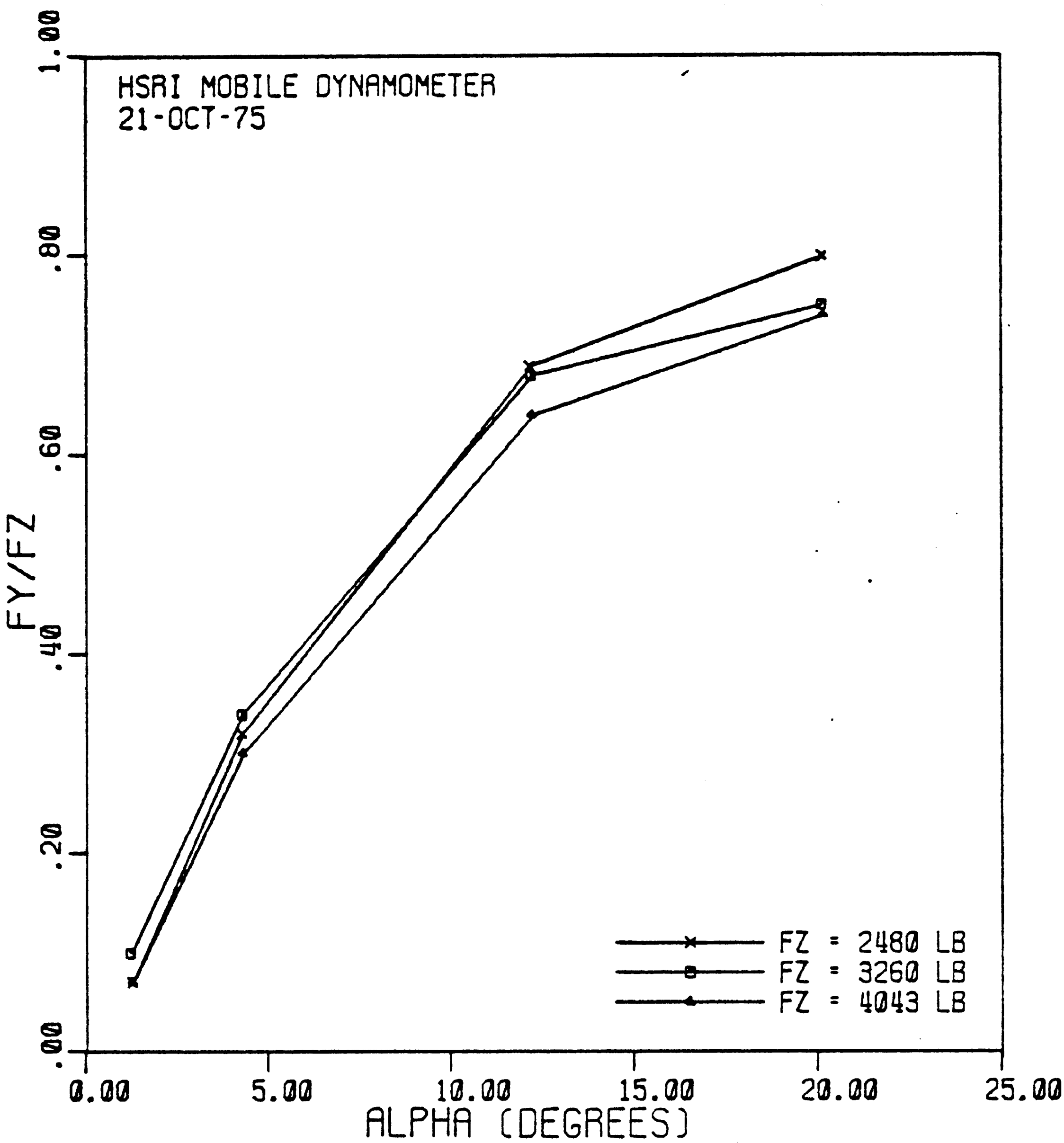
GOODYEAR SUPER HI-MILER WIDE TREAD 8.75X16.5/E
VEL = 40 MPH



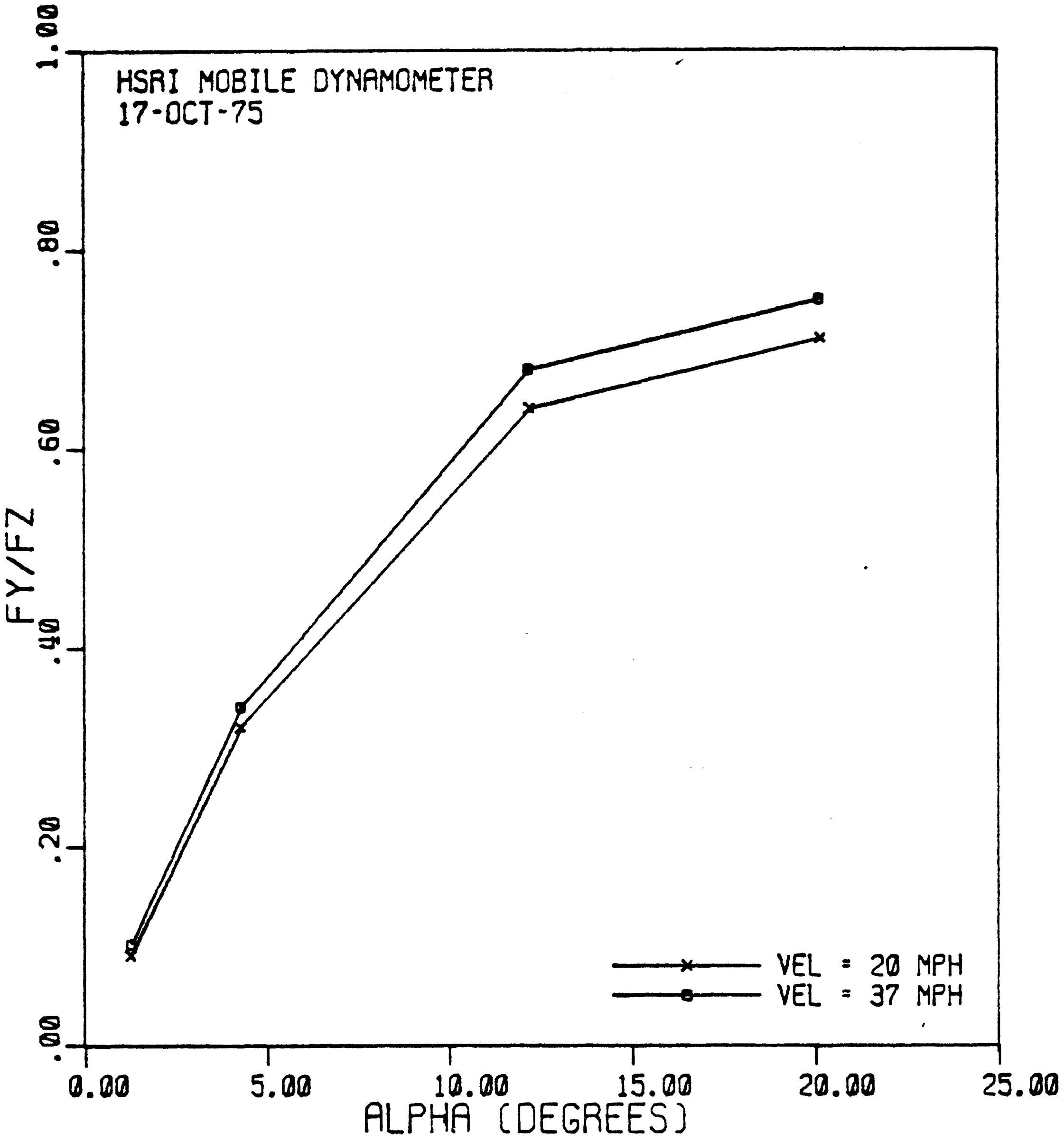
GOODYEAR SUPER HI-MILER WIDE TREAD 8.75X16.5/E
FZ = 2846 LB



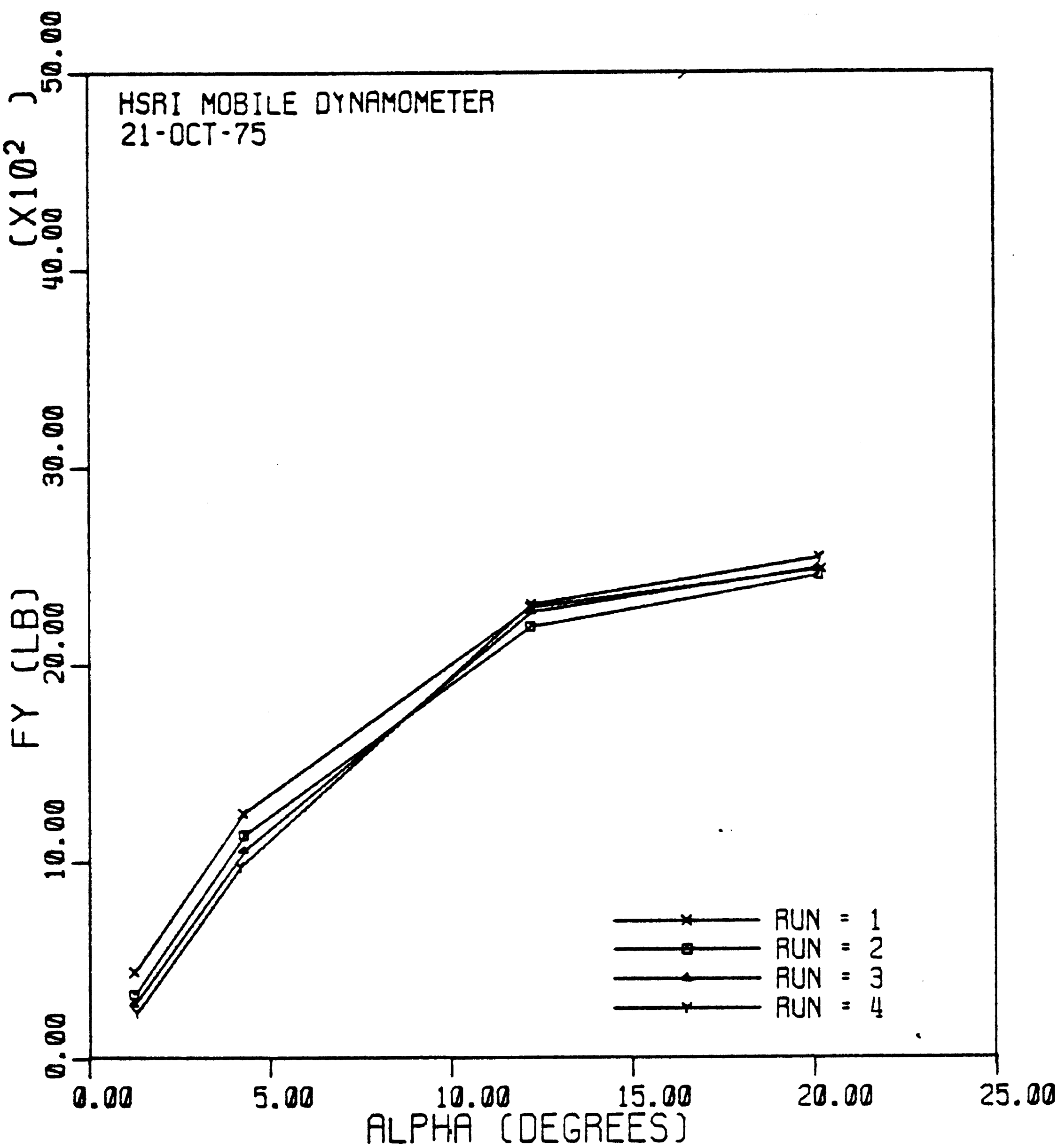
GOODYEAR SUPER HI-MILER WIDE TREAD 8.75X16.5/E
FZ = 2832 LB VEL = 40 MPH



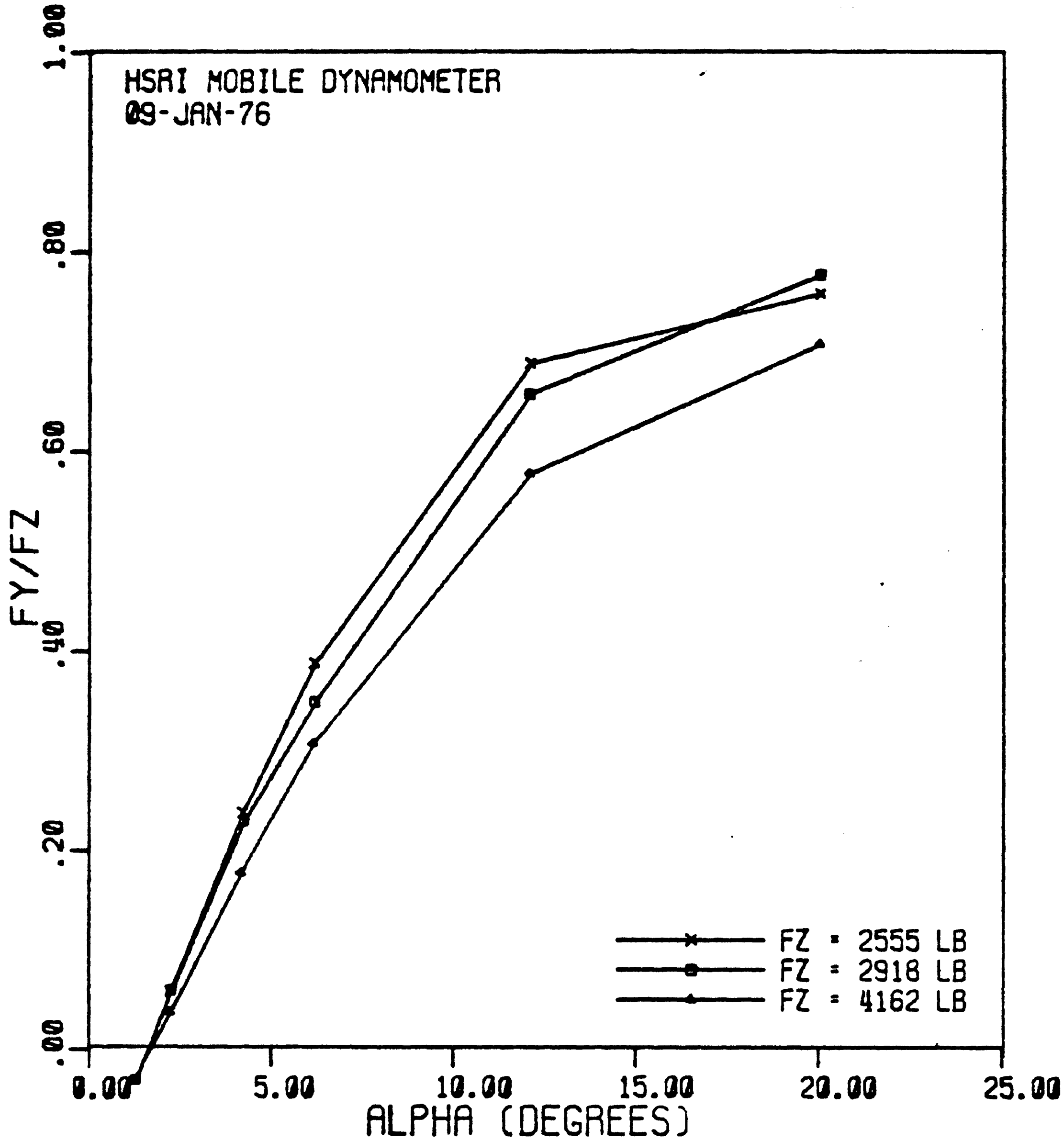
GOODYEAR HI-MILER WIDE TREAD 8.75X16.5/E
VEL = 39 MPH
ASPHALT



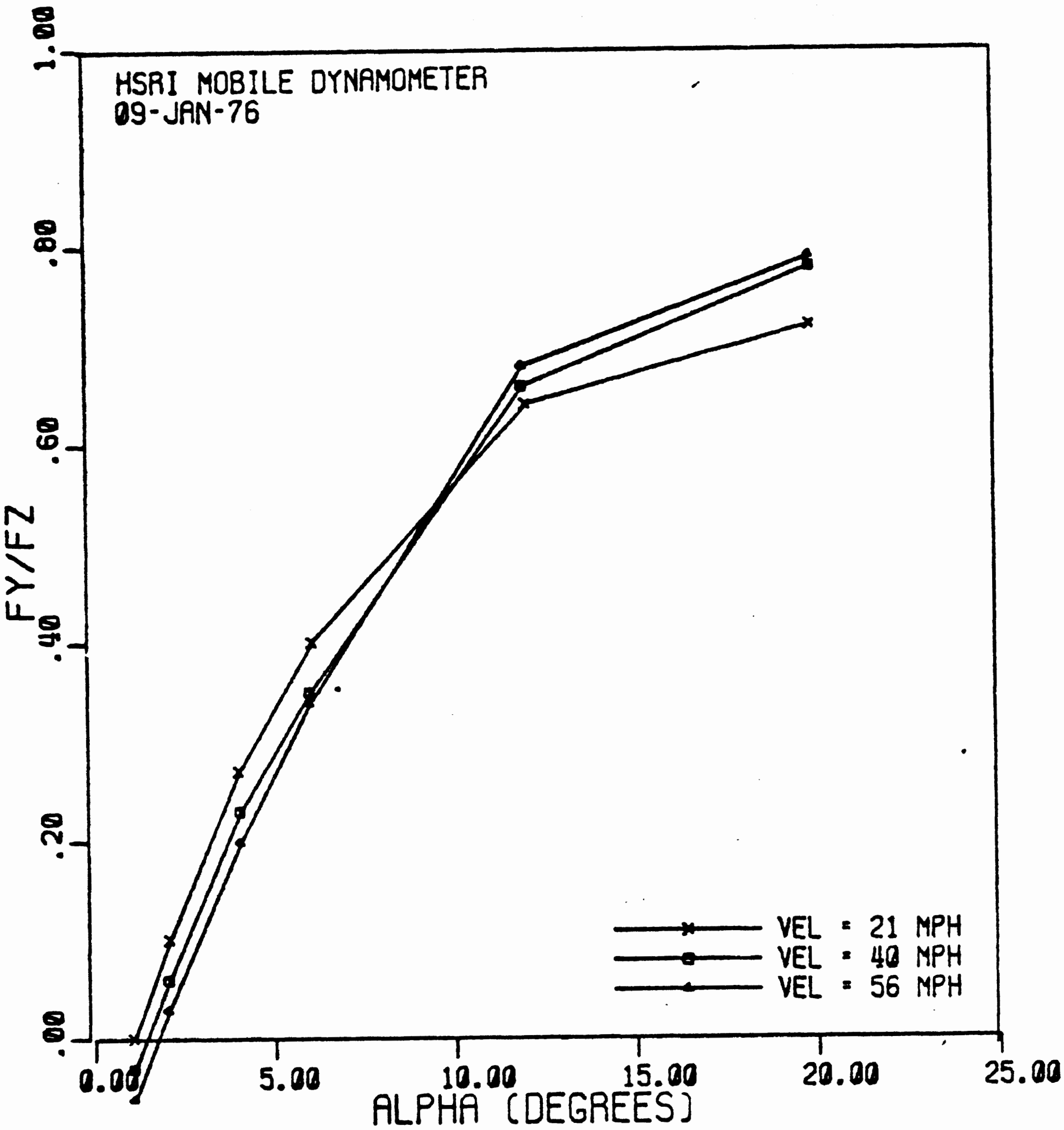
GOODYEAR HI-MILER WIDE TREAD 8.75X16.5/E
FZ = 3268 LB
ASPHALT



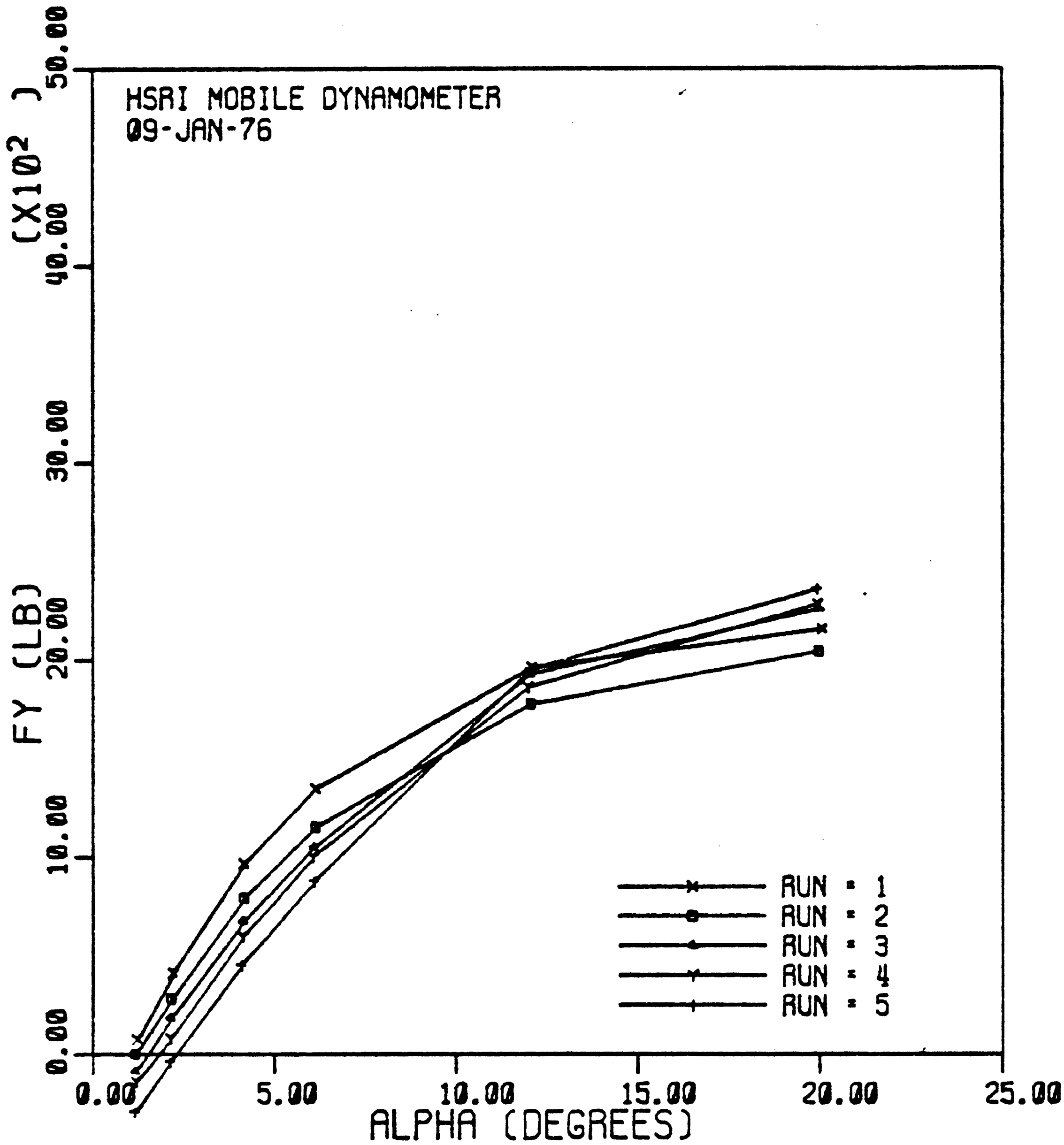
GOODYEAR HI-MILER WIDE TREAD 8.75X16.5/E
FZ = 3314 LB VEL = 40 MPH
ASPHALT



GOODYEAR GLAS-GUARD XG 8.75X16.5/E
VEL = 41 MPH



GOODYEAR GLAS-GUARD XG 8.75X16.5/E
FZ = 2915 LB



GOODYEAR GLAS-GUARD XG 8.75X16.5/E
FZ = 2945 LB VEL = 41 MPH

TABLE 3.1. FLAT-BED TEST TIRES

Tire No.	Manufacturer	Model	Size
Heavy Truck Tires			
H-1	Uniroyal	Triple Tread	10 x 20F
H-2	Uniroyal	Triple Tread	10 x 20G
H-3	Uniroyal	Triple Tread	11 x 22.5F
H-4	B.F..Goodrich	Milesaver Radial Steel H.D.R.	10 R 20 G
H-5	B.F. Goodrich	Milesaver Radial Steel H.D.B.	10 R 20 G
H-6	Goodyear	Unisteel R-1	10 R 20 G
H-7	Goodyear	Unisteel L-1	10 R 20 G
H-8	Firestone	Power Drive	10 x 20F
H-9	Uniroyal	Unimaster Rib	15 x 22.5H
H-10	Michelin	Radial	10 R 20 G
H-11	Uniroyal	Fleetmaster Superlug	10 x 20F
Heavy Bus Tires			
H-12	Firestone	Hiway Mileage	12.5 x 22.5G
H-13	B.F. Goodrich	Intercity Mileage	12.5 x 22.5G
H-14	B.F. Goodrich	Intercity Mileage	11.5 x 20G
H-15	Uniroyal	Intercity	12.5 x 22.5G
H-16	Uniroyal	MaxRoute I	11.00 R 20H
H-17	Goodyear	Custom Cruiser	12.5 x 22.5G
H-18	Michelin	Radial XZA	11 R 20 H
H-19	Michelin	Radial XZA	11 R 22.5 H
H-20	Michelin	Radial XZA	12 R 22.5H
Light Truck Tires			
L-1	Firestone	Transport 500	8.00 x 16.5D
[redacted]	[redacted]	[redacted]	[redacted]
L-3	Goodyear	Rib HiMiler	8.00 x 16.5D
L-4	Firestone	Transport 110	7.50 x 16.5C
L-5	Goodyear	Super Single HiMiler	10.00 x 16.5E
L-6	Firestone	Town & Country Truck	8.00 x 16.5D
L-7	Goodyear	Custom Flexsteel	8.00 R 16.5E
L-8	Goodrich	Milesaver Radial	8.00 R 16.5D
L-9	Goodyear	Glas Guard XG	8.00 x 16.5D
[redacted]	[redacted]	[redacted]	[redacted]
L-13	Michelin	Radial XCA	8.00 R 16.5E
L-14	Wards	Steel Belted Super Wide	9.50 x 16.5D
[redacted]	[redacted]	[redacted]	[redacted]
L-16	General	Jumbo Power Jet	8.00 x 16.5D
[redacted]	[redacted]	[redacted]	[redacted]
L-18	Goodyear	Glas Guard	8.00 x 16.5D
[redacted]	[redacted]	[redacted]	[redacted]

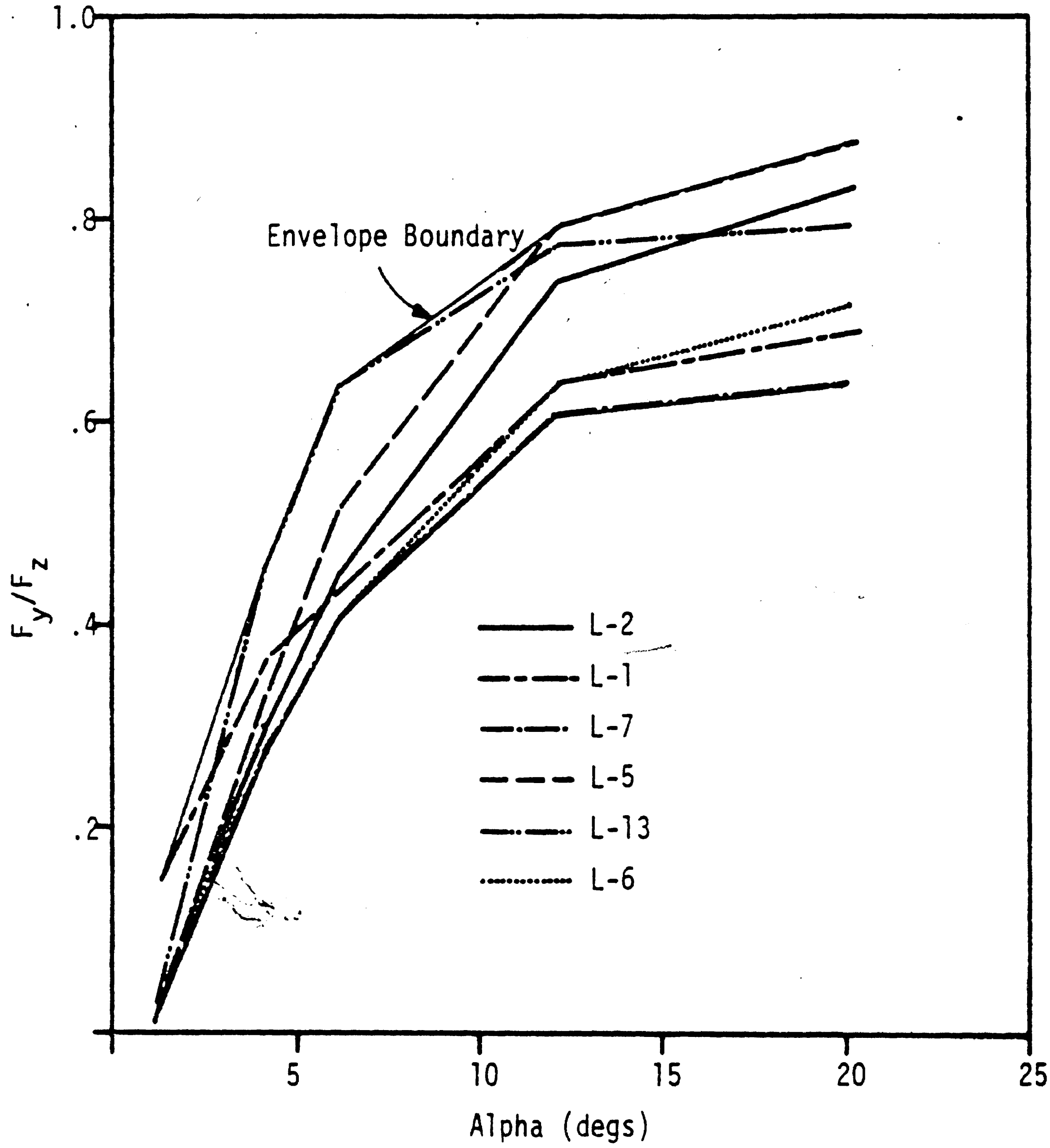


Figure 3.34. Lateral force measurements of light truck tires at rated load, 20 mph.

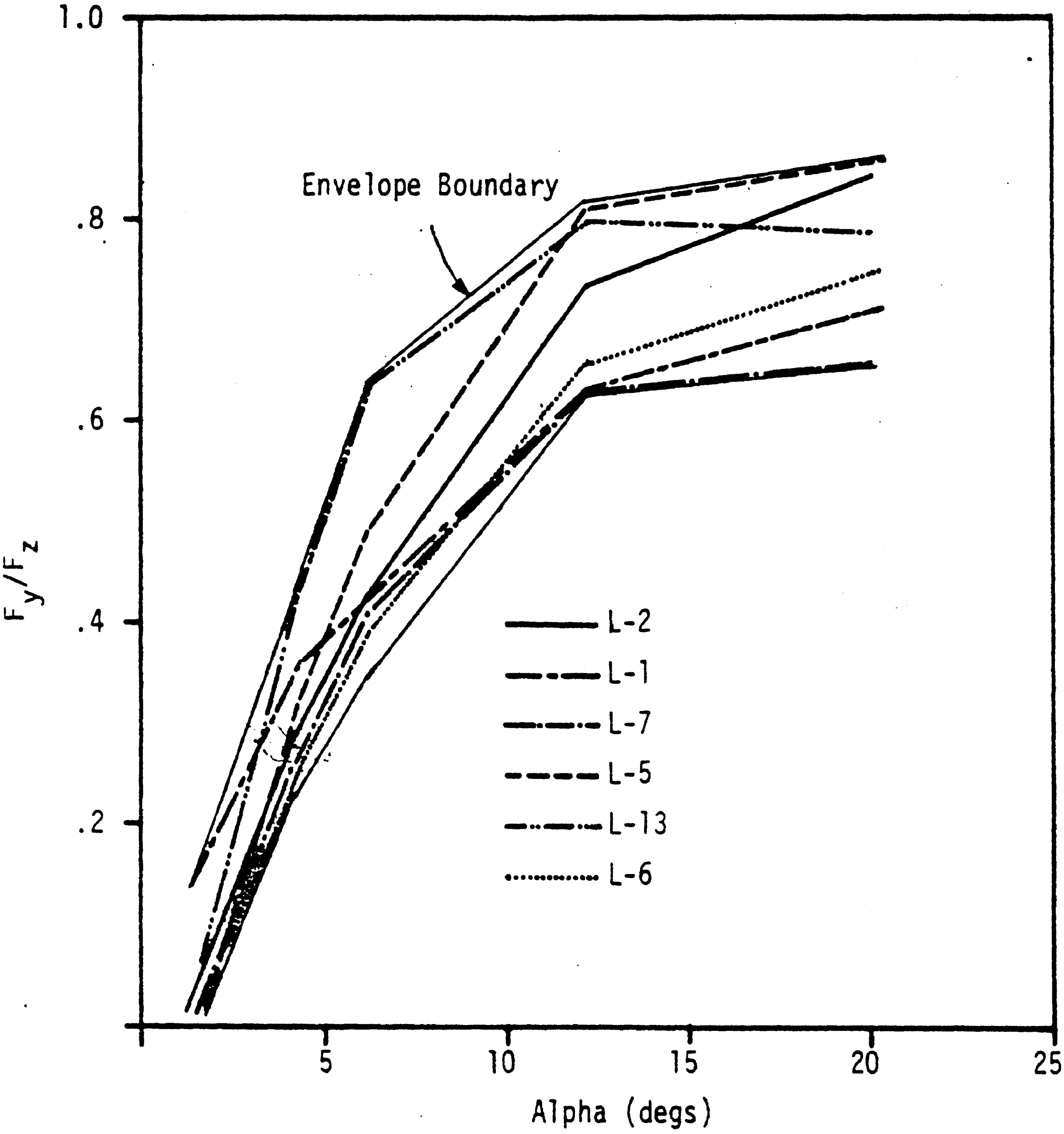


Figure 3.35. Lateral force measurements of light truck tires at rated load, 40 mph.

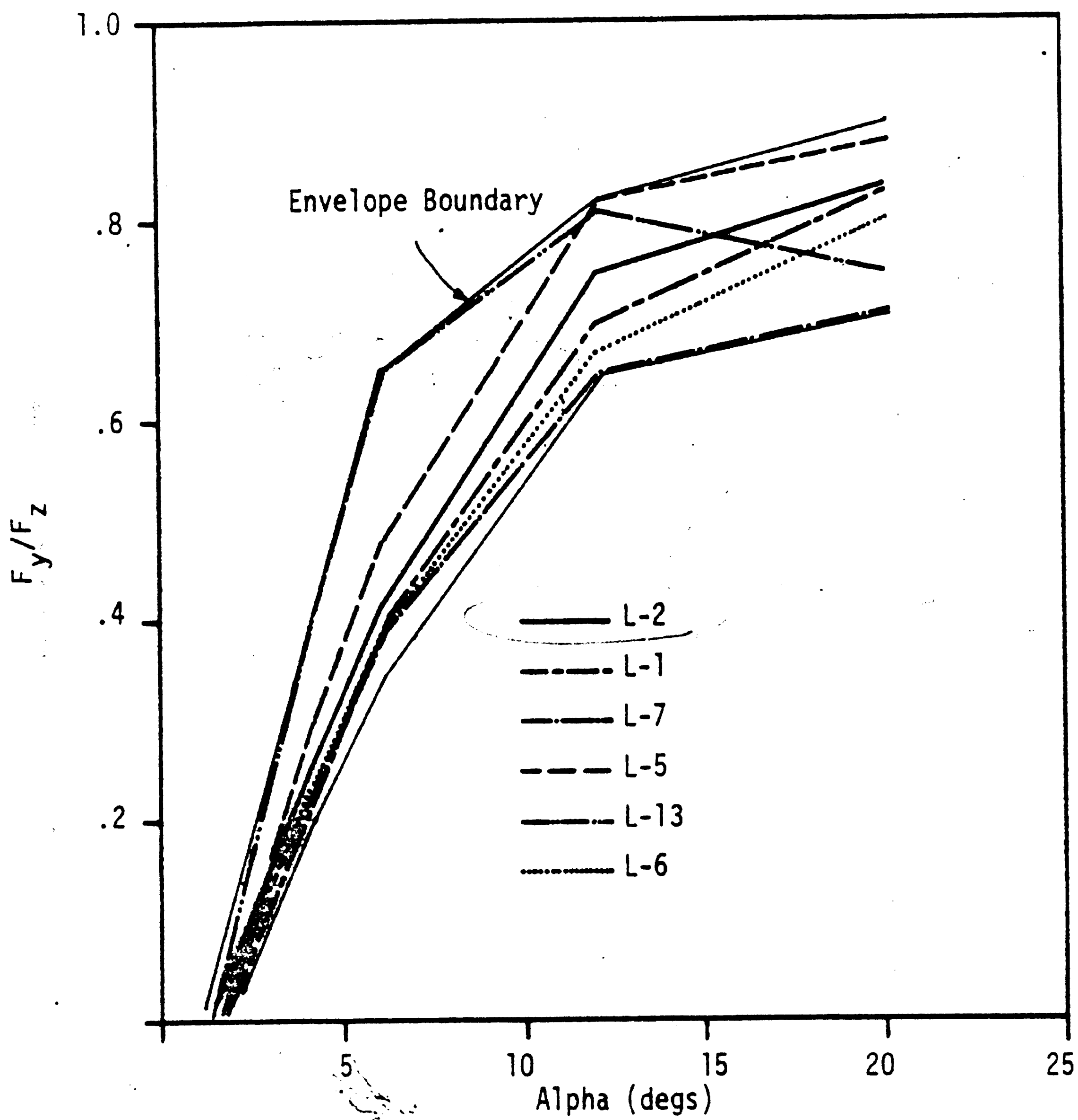


Figure 3.36. Lateral force measurements of light truck tires at rated load, 55 mph.

GOODYEA- SUPER HIMILER 8.75X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
75.0	804.0	-7.9	109.5	-86.6	194.9	-172.3	304.7	-321.1	539.2	-529.3	653.5	-647.3	713.3	-712.5
75.0	1742.0	-24.8	231.9	-178.2	406.6	-358.9	715.9	-671.3	1107.3	-1091.3	1348.7	-1340.4	1483.3	-1492.2
75.0	2680.0	-38.4	336.0	-254.2	596.6	-526.2	1058.4	-996.6	1668.6	-1638.1	2017.7	-2007.5	2238.9	-2238.9
75.0	3618.0	-46.7	407.7	-305.0	730.6	-640.6	1332.4	-1243.0	2113.7	-2070.2	2571.4	-2555.1	2865.4	-2865.4
50.0	1742.0	-25.5	267.2	-206.9	475.6	-417.8	838.1	-801.0	1260.6	-1254.4			1616.3	-1644.2
50.0	2680.0	-33.0	347.3	-262.9	629.7	-551.5	1165.0	-1098.4	1789.6	-1766.5			2354.3	-2363.2
30.0	1742.0	-30.3	300.0	-220.3	534.7	-461.3	926.7	-865.3	1398.2	-1370.2			1759.9	-1733.2
30.0	2680.0	-31.8	328.5	-243.1	602.5	-520.1	1089.4	-1009.8	1776.2	-1755.2			2377.8	-2361.0

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ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
75.0	804.0	0.0	4.5	-2.3	8.3	-6.6	9.5	-8.0	6.9	-10.6	6.0	-4.0	0.8	-1.0
75.0	1742.0	0.6	19.6	-13.1	31.4	-27.3	40.0	-38.6	35.7	-43.0	23.1	-24.2	9.4	-10.8
75.0	2680.0	3.5	39.5	-29.0	64.9	-57.6	87.0	-85.8	84.3	-94.7	59.6	-61.4	0.0	-34.5
75.0	3618.0	5.9	61.1	-44.9	101.3	-90.4	143.9	-141.6	147.9	-161.0	108.7	-113.7	62.3	0.0
50.0	1742.0	2.9	29.2	-20.1	44.4	-37.9	55.6	-54.9	43.4	-46.9			9.2	-18.6
50.0	2680.0	6.4	54.7	-39.2	89.2	-77.2	120.8	-118.4	105.0	-113.4			33.6	-37.4

GOODYEAR GLAS GUARD XG 8.75X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-28.7	106.0	-79.3	184.4	-157.0	310.1	-294.2	475.5	-450.0	567.0	-541.6	615.2	-595.1
85.0	1742.0	-21.7	202.5	-162.6	353.1	-319.0	611.0	-572.0	964.4	-924.0	1123.2	-1071.7	1184.8	-1139.8
85.0	2680.0	-34.6	286.6	-230.8	506.1	-442.2	865.4	-803.9	1369.3	-1332.6	1619.9	-1564.6	1712.4	-1657.6
85.0	3618.0	-41.4	360.4	-275.2	643.0	-569.5	1080.3	-1019.4	1750.3	-1706.5	2076.8	-2011.2	2189.0	-2115.5

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-2.4	1.7	-7.7	4.8	-8.8	8.7	-11.9	4.1	-14.0	0.1	-7.9	-4.2	-1.5
85.0	1742.0	0.3	14.8	-12.1	21.8	-24.9	30.9	-33.0	26.5	-30.3	10.5	-16.0	-0.9	-2.6
85.0	2680.0	2.4	29.4	-23.2	45.1	-40.0	58.5	-61.8	54.3	-58.8	28.3	-31.1	7.4	-10.5
85.0	3618.0	7.4	45.9	-33.9	70.4	-61.4	95.6	-92.6	94.7	-93.7	49.4	-54.7	18.1	-21.2

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FIRESTONE TOWN & COUNTRY TRUCK 8.75X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-15.6	102.7	-74.1	162.9	-157.9	308.2	-286.7	471.3	-456.0	575.3	-547.9	630.9	-578.3
85.0	1742.0	-26.8	221.0	-168.6	372.4	-339.4	630.2	-588.5	969.2	-941.2	1162.9	-1125.6	1286.8	-1218.1
85.0	2680.0	-40.2	316.6	-236.4	515.1	-456.8	885.4	-843.6	1396.0	-1360.9	1689.6	-1647.3	1846.5	-1778.2
85.0	3618.0	-46.8	374.4	-282.8	646.8	-573.3	1110.1	-1049.5	1770.6	-1741.6	2161.4	-2116.9	2379.2	-2342.1

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	0.8	5.4	-8.1	4.1	-11.9	7.9	-13.2	5.6	-10.1	-1.4	-7.8	-6.2	-2.6
85.0	1742.0	2.9	16.2	-14.9	26.7	-26.0	30.9	-37.2	26.6	-33.6	12.4	-20.9	-9.3	-7.9
85.0	2680.0	4.1	29.3	-26.0	46.8	-47.8	58.5	-66.1	55.7	-66.9	29.1	-43.4	-3.7	-19.0
85.0	3618.0	9.1	46.8	-37.0	71.6	-65.3	98.0	-103.1	95.8	-109.3	55.0	-76.8	4.8	-28.0

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GOODYEA[illegible] [illegible]STUM FLEXSTEEL 8.75R16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-21.5	117.0	-82.6	202.6	-182.4	340.2	-318.9	575.5	-539.8	685.7	-646.7	765.1	-716.4
85.0	1742.0	-44.6	257.9	-189.1	431.1	-364.3	717.7	-669.0	1131.4	-1078.7	1339.3	-1265.7	1390.7	-1331.7
85.0	2680.0	-55.7	356.4	-263.2	613.9	-541.8	1062.0	-989.1	1636.5	-1593.4	1876.8	-1841.0	1936.7	-1886.2
85.0	3618.0	-69.2	433.6	-321.0	770.5	-666.1	1366.1	-1241.0	2107.7	-2046.3	2375.4	-2310.8	2415.4	-2373.5

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-2.4	3.6	-4.4	8.3	-13.6	9.3	-14.8	8.5	-17.3	2.9	-10.1	-2.3	-5.4
85.0	1742.0	-0.4	19.8	-14.9	29.6	-31.6	41.1	-45.4	23.6	-46.6	24.4	-27.2	3.6	-8.5
85.0	2680.0	-1.3	33.2	-35.0	57.3	-60.9	82.3	-89.0	78.8	-87.7	43.9	-50.1	11.6	-12.4
85.0	3618.0	2.1	54.6	-52.2	90.4	-91.7	132.2	-141.4	132.5	-142.6	71.3	-81.0	26.6	-29.4

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MICHEL RADIAL XCA 8.75R16.5 D

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	705.0	-12.5	134.2	-134.1	227.6	-217.7	377.0	-370.6	589.5	-555.7	650.2	-615.7	646.8	-494.7
70.0	1530.0	19.8	236.8	-279.0	502.9	-502.9	871.0	-851.8	1233.1	-1146.9	1244.3	-1173.3	1366.8	-1202.5
70.0	2350.0	35.2	351.7	-412.0	722.0	-760.8	1281.0	-1258.8	1691.8	-1634.1	1717.7	-1628.2	1830.5	-1768.7
70.0	3170.0	42.0	437.9	-502.7	889.6	-935.8	1606.0	-1583.7	2125.0	-2058.1	2077.2	-2047.2	2263.7	-2316.7
85.0	804.0	0.1	135.8	-124.6	245.2	-239.3	419.4	-408.2	629.7	-511.6	711.9	-668.5	759.9	-697.6
85.0	1742.0	1.2	270.5	-292.9	519.2	-523.5	911.9	-889.1	1317.6	-1255.8	1512.0	-1419.2	1596.6	-1486.8
85.0	2680.0	30.2	391.4	-459.2	771.3	-793.6	1366.3	-1347.8	1941.5	-1892.1	2189.3	-2118.3	2316.2	-2218.7
85.0	3618.0	44.3	466.5	-548.1	970.6	-1009.5	1757.7	-1723.0	2473.8	-2400.5	2749.8	-2684.6		

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
70.0	705.0	-3.5	1.5	-9.4	3.9	-11.2	3.9	-14.4	0.1	-7.3	-1.9	0.4	-4.3	-0.2
70.0	1530.0	-4.4	12.7	-25.5	27.8	-33.5	34.6	-39.2	21.6	-21.8	9.6	-10.3	-12.5	10.1
70.0	2350.0	-8.0	31.1	-44.1	58.9	-68.3	79.8	-88.5	46.3	-45.7	25.6	-25.2	8.1	11.3
70.0	3170.0	-11.7	50.6	-72.5	96.2	-116.2	131.4	-144.1	83.6	-83.1	54.4	-61.8	29.1	-3.2
85.0	804.0	-3.8	4.1	-10.6	7.3	-10.2	7.7	-12.4	3.3	-3.4	-2.2	-1.9	-4.1	0.1
85.0	1742.0	-7.2	16.0	-27.0	26.0	-36.6	38.9	-45.4	26.9	-25.2	12.4	-11.2	3.5	1.4
85.0	2680.0	-5.3	32.2	-46.9	63.4	-72.8	85.5	-91.3	68.7	-62.6	37.1	-38.2	21.4	-14.6
85.0	3618.0	-11.2	52.0	-74.0	99.6	-117.8	146.6	-153.5	123.0	-117.6	75.8	-79.0		

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GENERAL 30 POWER JET COMMERCIAL 8.75X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-16.2	150.6	-127.5	240.1	-221.1	404.1	-378.3	621.2	-590.1	722.4	-681.7	773.3	-742.6
85.0	1742.0	-3.0	256.0	-216.1	464.2	-421.9	812.1	-768.6	1241.9	-1193.3	1449.9	-1397.1	1468.2	-1384.9
85.0	2680.0	-32.5	348.6	-291.6	621.7	-592.8	1122.4	-1070.1	1731.1	-1711.3	1994.1	-1929.0	2058.2	-2086.7
85.0	3618.0	-23.9	401.6	-355.9	741.3	-690.5	1361.0	-1298.9	2115.8	-2092.4	2459.1	-2409.0	2578.3	-2537.3

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-3.1	4.5	-11.0	9.0	-14.5	5.7	-17.4	3.6	-12.5	-1.2	-5.4	-5.0	0.7
85.0	1742.0	-2.9	19.4	-23.0	31.1	-41.4	39.6	-52.1	36.7	-40.7	13.8	-26.0	9.5	-11.3
85.0	2680.0	-309.0	35.3	-39.2	64.6	-68.4	87.5	-97.7	74.2	-83.5	43.0	-50.9	18.3	-27.4
85.0	3618.0	-2.3	53.5	-59.9	92.2	-102.3	139.1	-152.9	132.6	-141.6	81.0	87.3	43.1	-45.3

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GOODYEA `LAS GUARD 8.75X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-18.0	134.0	-108.0	223.0	-215.0	372.0	-343.0	565.0	-522.0	648.0	-605.0	691.0	-646.0
85.0	1742.0	-30.0	280.0	-215.0	462.0	-435.0	778.0	-725.0	1149.0	-1109.0	1334.0	-1277.0	1408.0	-1358.0
85.0	2680.0	-52.0	392.0	-286.0	658.0	-583.0	1104.0	-1029.0	1642.0	-1604.0	1921.0	-1849.0	2027.0	-1952.0
85.0	3618.0	-56.0	458.0	-335.0	795.0	-699.0	1349.0	-1267.0	2066.0	-1999.0	2430.0	-2361.0	2600.0	-2500.0

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-1.0	5.0	-8.0	8.1	-11.0	-8.7	-11.8	3.5	-8.1	-0.6	-3.6	6.5	-3.1
85.0	1742.0	2.0	22.6	-20.4	33.4	-34.0	36.9	-41.6	28.6	-28.4	9.1	-16.4	-4.5	-1.0
85.0	2680.0	6.7	44.0	-37.9	65.4	-61.0	80.3	-84.8	62.5	-65.4	26.2	-36.2	-1.5	-6.2
85.0	3618.0	9.8	67.0	-50.4	105.0	-95.0	133.1	-135.8	108.7	-117.2	53.0	-68.3	5.9	-21.6

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GOODYEAR 8 HIMILER WIDE TREAD 8.75X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-14.0	122.0	-86.0	180.0	-158.0	311.0	-284.0	512.0	-458.0	604.0	-593.0	683.0	-649.0
85.0	1742.0	-30.0	213.0	-182.0	402.0	-347.0	684.0	-629.0	1048.0	-982.0	1253.0	-1226.0	1368.0	-1345.0
85.0	2680.0	-36.0	322.0	-250.0	562.0	-514.0	972.0	-900.0	1509.0	-1458.0	1817.0	-1763.0	2024.0	-1967.0
85.0	3618.0	-40.0	372.0	-302.0	685.0	-604.0	1189.0	-1132.0	1884.0	-1823.0	2298.0	-2215.0	2548.0	-2477.0

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	804.0	-1.1	6.2	-5.6	8.1	-10.8	11.5	-10.3	12.4	-11.4	7.6	-10.4	0.3	-3.9
85.0	1742.0	0.3	19.2	-18.4	31.1	-33.1	40.8	-42.0	36.6	-36.0	23.5	-31.0	13.3	-16.4
85.0	2680.0	6.5	36.6	-31.7	63.4	-58.2	80.5	-80.8	83.6	-76.6	54.9	-64.1	30.8	-37.7
85.0	3618.0	10.5	59.4	-46.6	94.1	-87.7	131.1	-131.0	1333.3	-128.0	93.9	-108.3	56.7	-65.5

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measured increase in C_α and by the carpet plot comparison given in Fig. 7.

Fig. 7 represents the extreme in force variation found in this study of ply rating and tire size. More tests are needed to establish firmly the trends evident in Table 2.

TREAD PATTERN INFLUENCE

It is widely recognized that the tread pattern is a very important factor in wet traction performance. However, it also appears that pattern influence is noticeable in the data from low-speed dry-traction flat bed tests. Fig. 6 shows the three 10.00-20/F nylon tires, similar except for tread design, that were tested in this study. Listed beneath the tires are the five basic mechanical properties defined earlier. The values shown were measured at rated inflation pressure, 85 psi, and rated load, 5430 lb.

From an examination of the data, it appears that tread design has little influence on the tire spring rates K_y and K_z. The cornering stiffness, C_α, was affected very little although the open tread did generate slightly higher lateral force at higher slip angles than the rib-type pattern (see comparison presented in Fig. 8). The camber stiffness, C_γ, was substantially changed by the tread pattern. In Fig. 9, it is seen that the open tread generated considerably less lateral force (or camber thrust) than the rib-type pattern.

The marked decrease in longitudinal stiffness, C_s (Fig. 6), is a result of increased tread compliance*. It would be of considerable interest to compare the peak braking traction of the rib-type and open tread tires. Although the force measuring equipment employed in these tests was incapable of responding to a longitudinal slip much above s = 0.04**, the higher initial slope (indicated by the measured C_s) of the F_x

*This is to be expected in the open pattern which has approximately twice the void area of the closed rib-type pattern.

**Far below that required for peak braking force generation.

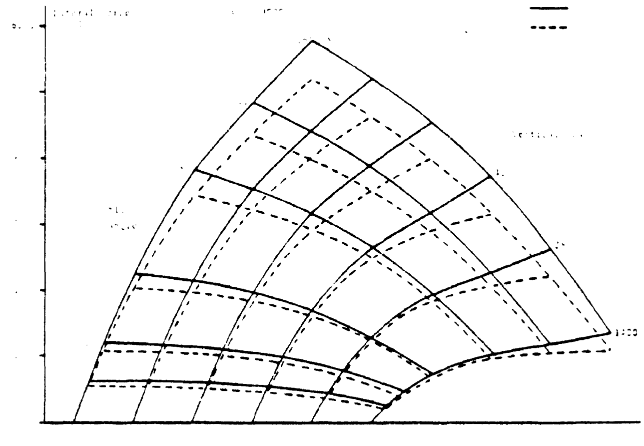


Fig. 7 - Comparison of lateral force versus slip angle and vertical load on 10.00-20 tires with ply ratings F and G

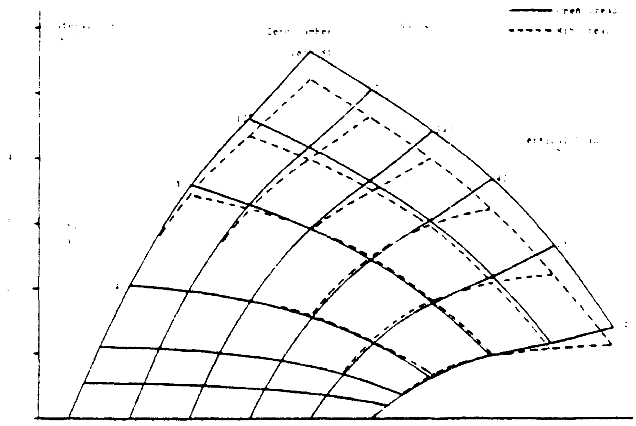


Fig. 8 - Lateral force versus slip angle and vertical load on open and rib-type II tread patterns

Table 1 - Tires Tested to Determine Influence of Ply Rating and Tire Size on Mechanical Properties

Tire Size and Rating	Test Pressure, psi	Test Load, lb
9.00-20/E	80	4160
9.00-20/F	85	4250
10.00-20/F	85	5430
10.00-20/G	85	5430
11.00-22/F	85	6290
11.00-22/G	90	6140

Table 2 - Measured Mechanical Properties for Three Sets of Two Tires Which Differ Only in Ply Rating

Tire	9.00-20		10.00-20		11.00-22	
Rating	E	F	F	G	F	G
C_s, lb/unit slip	41,000	41,000	42,000	50,000	47,000	51,000
C_α, lb/deg	466.1	479.4	523.4	588.8	542.7	536.9
C_γ, lb/deg	59.6	64.4	69.0	74.6	63.3	62.8
K_y, lb/in	1,673	1,889	1,618	1,482	2,116	1,909
K_z, lb/in	3,824	4,122	4,700	4,363	5,578	5,850

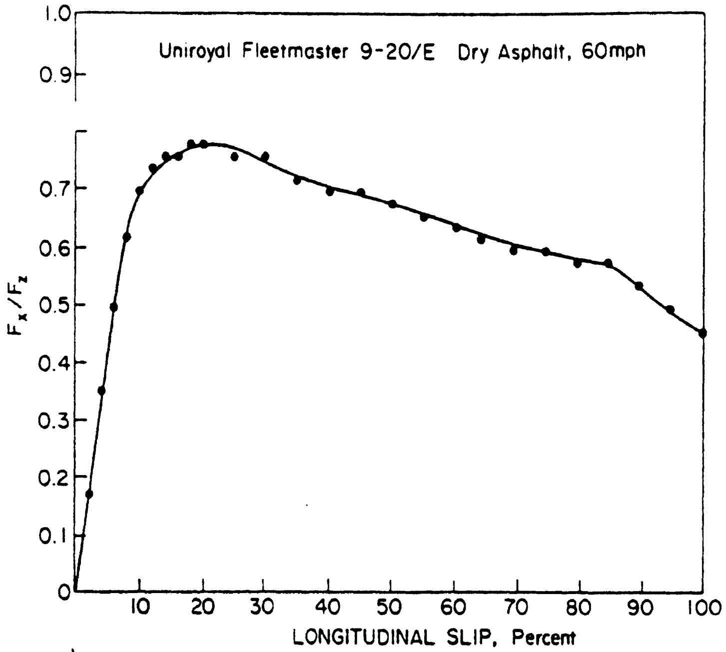


Fig. 5 - Example of "μ-slip" history measured on dry surface

break-in, the tire was operated at its rated load and at the reference value of inflation pressure described above.

DISCUSSION OF PRELIMINARY TRACTION MEASUREMENTS

The mobile dynamometer described earlier has been (.ted under various conditions of test surface, velocity, tire load, and tire samples to produce analog measurements of the longitudinal traction of truck tires.

As indicated previously, the preliminary measurements which are reported here involve longitudinal force data which has been scaled using steady-state F_x and M_y recordings. Thus the interpretation of absolute values in the normalized longitudinal force measures is not encouraged, since the torque scaling of F_x neglects that torque component which derives from the rearward deflection of the vertical load vector during generation of "braking" shear forces. Although the data have been corrected to account for this influence, per estimates based upon static laboratory measurements of truck tires, we suggest that the presented data have greatest merit as indicators of relative sensitivities.

While longitudinal force production has been found to be sensitive to various operating conditions, the single property which most significantly distinguishes truck tires from automobile tires concerns the remarkable peak-to-slide ratios which are exhibited on dry surfaces. As shown in Figure 5, the typical dry asphalt performance is summarized in the form of a "μ-slip" history (a plot of normalized longitudinal force, F_x/F_z versus the ratio of instantaneous tangential tire-to-road relative velocities, $s = \frac{V - R_e\omega}{V} \times 100\%$)

\. .ie V = vehicle velocity

R_e = effective rolling radius of the test tire

ω = angular velocity of the test tire.

Notable characteristics of the Fig. 5 example include a force peak occurring in the vicinity of s = 20%, followed by a rather steep negative slope out to s ≈ 85%, at which point an abrupt inflection occurs, depressing the locked wheel value further. Over a sample of eight tires tested on a dry bituminous asphalt surface (SN ≈ 78) the ratio of peak-to-slide F_x/F_z ranged from 1.50 to 2.02 with the force inflection in the high slip regime being observed over a majority of conditions. Comparing this general curve shape with those commonly measured on dry surfaces with passenger car tires, we observe that the truck tire's narrow, accentuated peaking, followed by a 30-50% reduction in force capability at lockup contrasts markedly with the car tire's rather flat shape in the 20-100% slip range.

The typical μ-slip curve shape which was measured with truck tires on a wet jennite-coated asphalt (SN ≈ 20) is shown in Fig. 6. In this case, the on-board water delivery system was employed to deposit a water film of 0.025 in nominal thickness ahead of the test tire at 20 mph test velocity. (The film thickness dimension is defined as the height of the rectangular cross section stream which is deposited on the test surface at the indicated velocity.)

The broad peak on the Fig. 6 curve is a characteristic which was observed over all specimens in the eight-tire sample. In most cases, the peak value of F_x/F_z is sustained to within ± 0.02 over a band of longitudinal slip which is the excess of 40%. The peak-to-slide ratios on the wet-coated asphalt were seen to range from 1.53-2.02. Although the pronounced peak-to-slide decrement is comparable to passenger car tire performance on such a surface, the broad peak characteristic of the truck tire sample is notable.

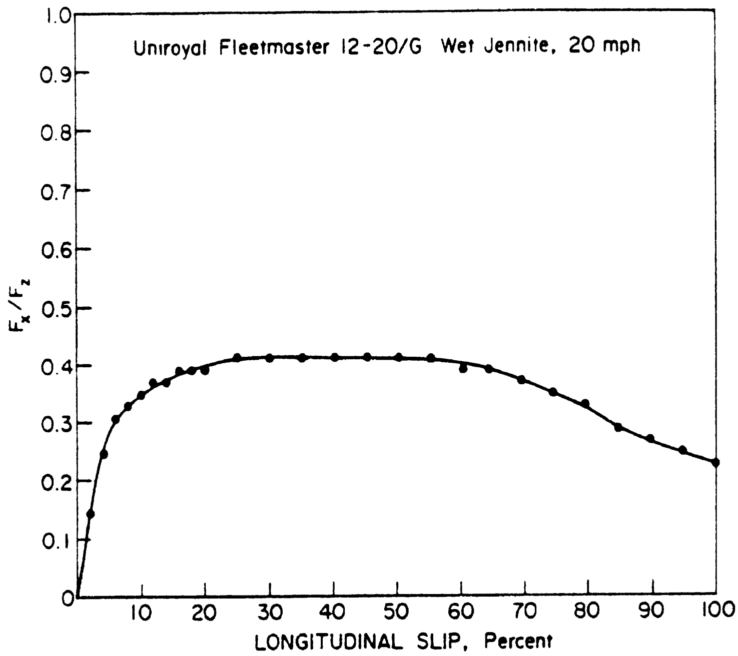


Fig. 6 - Typical "μ-slip" history measured on wet, jennite-coated surface

BASELINE DATA SUMMARY

Shown in Fig. 7 is a summary of peak and slide values of F_x/F_z for the tire sample on the dry asphalt surface. The general load sensitivity of the subject sample is indicated by the variation in performance over the three examined load levels, expressed as a fraction of the T&RA recommended load for each tire. A two-point velocity sensitivity indicator is provided at each load level by the 40 and 60 mph data.

In general, the data are rather closely grouped, although the sample of tires was by no means representative of the range of constructions and rubber compounds which are available. As can be deduced from the spread between the peak and slide values, peak-to-slide ratios are higher at the lower velocity—since the peak F_x/F_z data show a significant decrement with velocity in the 40-60 mph range while slide values are essentially unchanged.

Shown in Fig. 8 is a summary of peak and slide F_x/F_z as measured for an eight-tire sample on a wet jennite-coated asphalt. These data, all taken at 20 mph, are presented as a function of vertical load, normalized to the T&RA rating of each tire. All of the sample tires incorporated a common highway rib tread design and thus we might have anticipated the fairly consistent wet surface performance indicated across the sample. Nevertheless, the remarkable tight grouping does suggest that the T&RA load rating is a powerful normalizer.

SENSITIVITY TO VERTICAL LOAD

Data taken over a wide range of vertical loads on dry concrete (SN ≈ 75) are shown in Fig. 9. For comparison of two tires of widely differing load rating, a 10 × 20/F sample is represented together with data from a 15 × 22.5/H wide base single tire. Although the brake torque capability of the mobile dynamometer limited the load range over which the 15 × 22.5 tire could be tested, sufficient data was obtained to indicate significant differences in normalized longitudinal force capability. Also shown in Fig. 9 are peak and slide values taken over a somewhat narrower load range on asphalt, with the 10 × 20 tire. While the peak values differ markedly in both

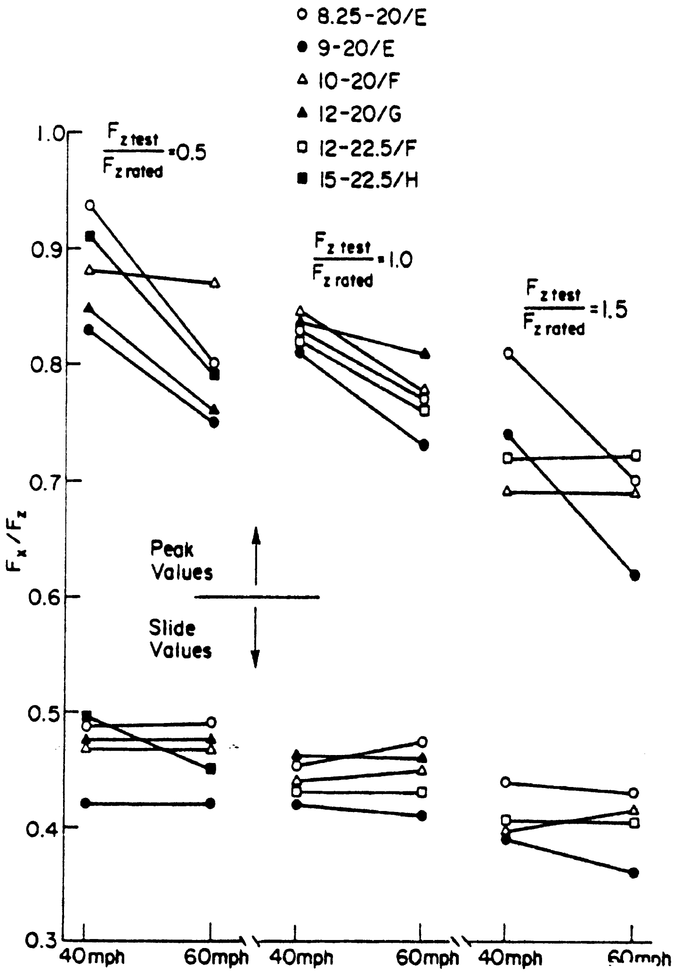
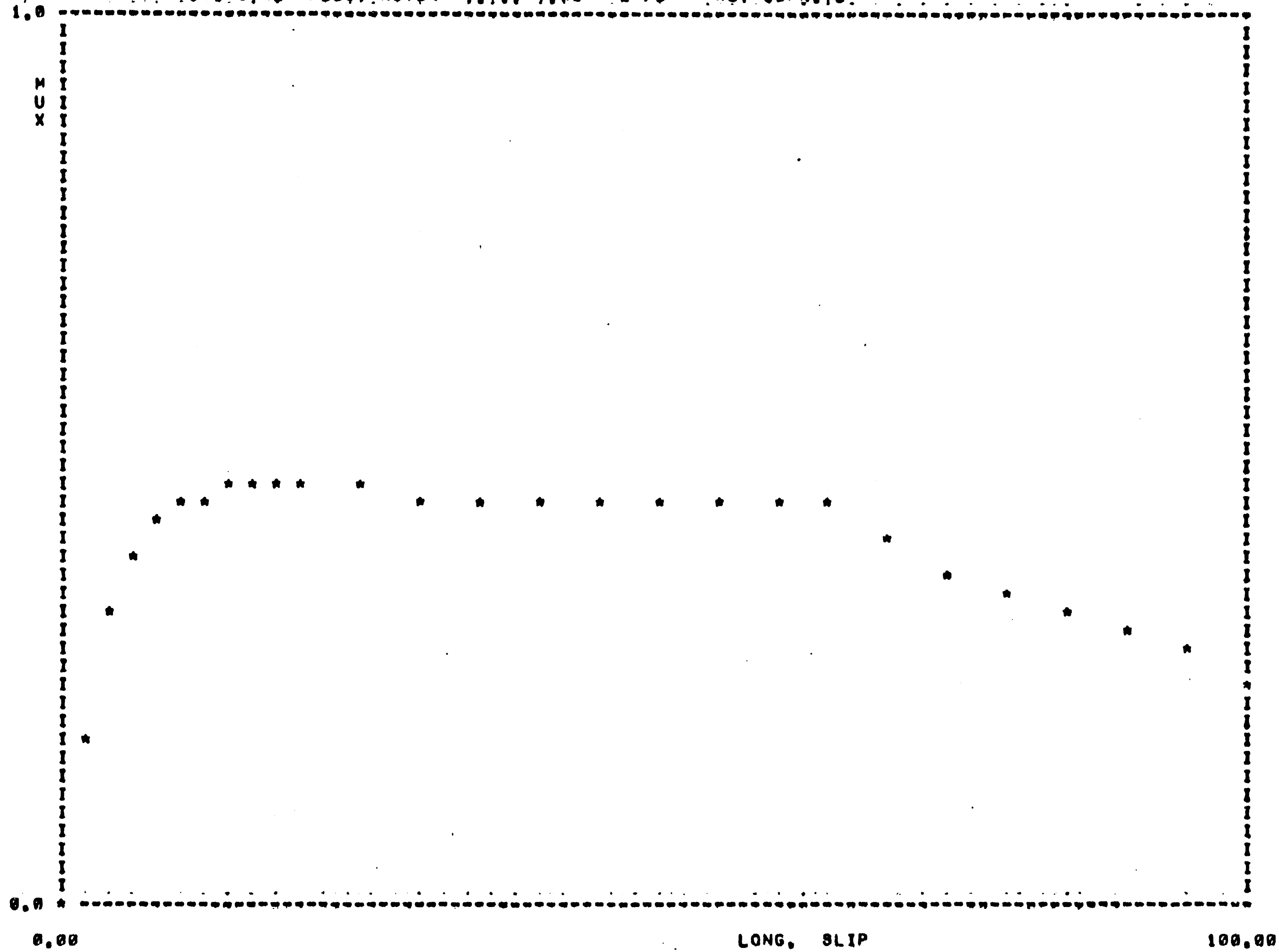
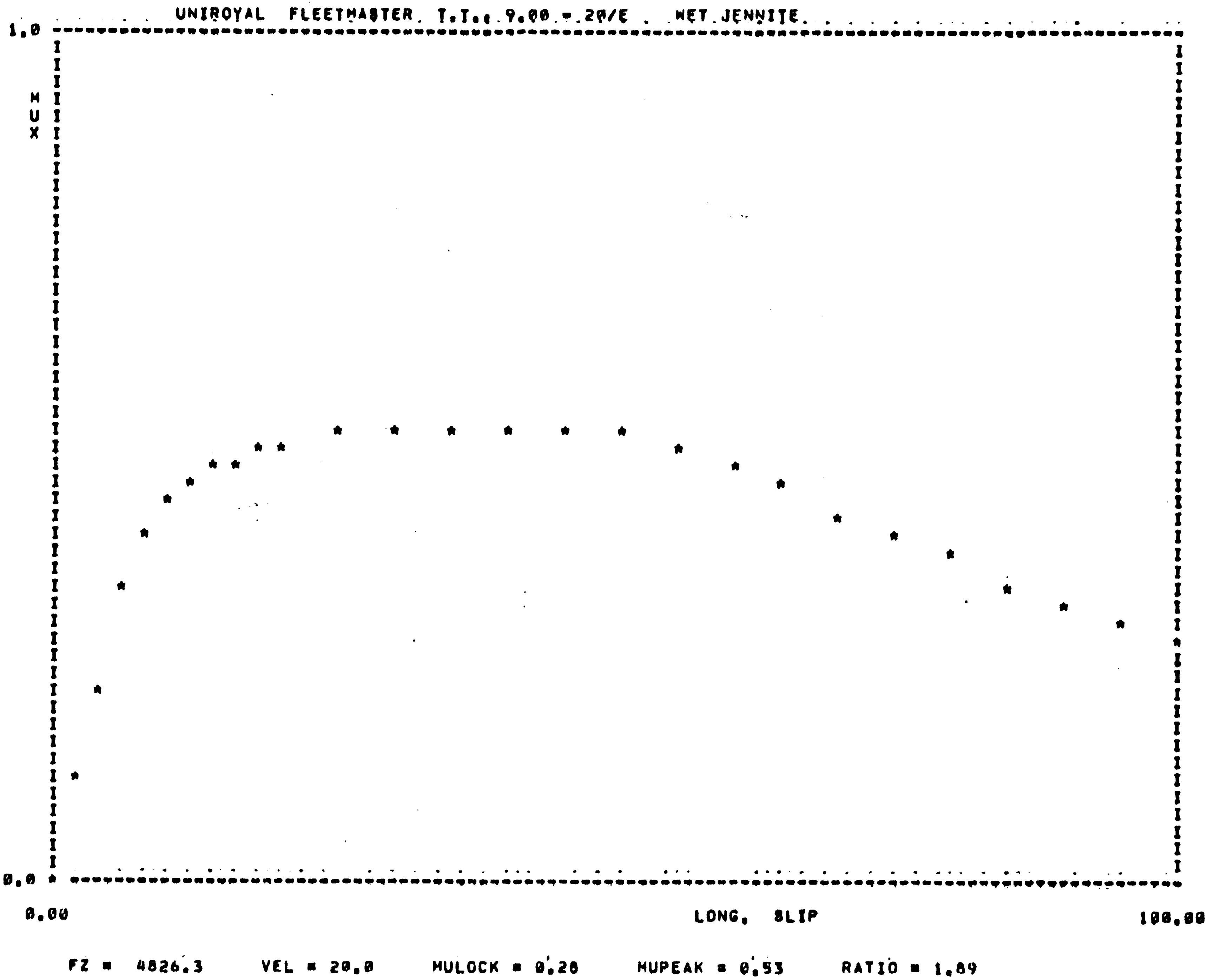


Fig. 7 - Summary of F_x/F_z peak and slide data—dry asphalt, 40 and 60 mph

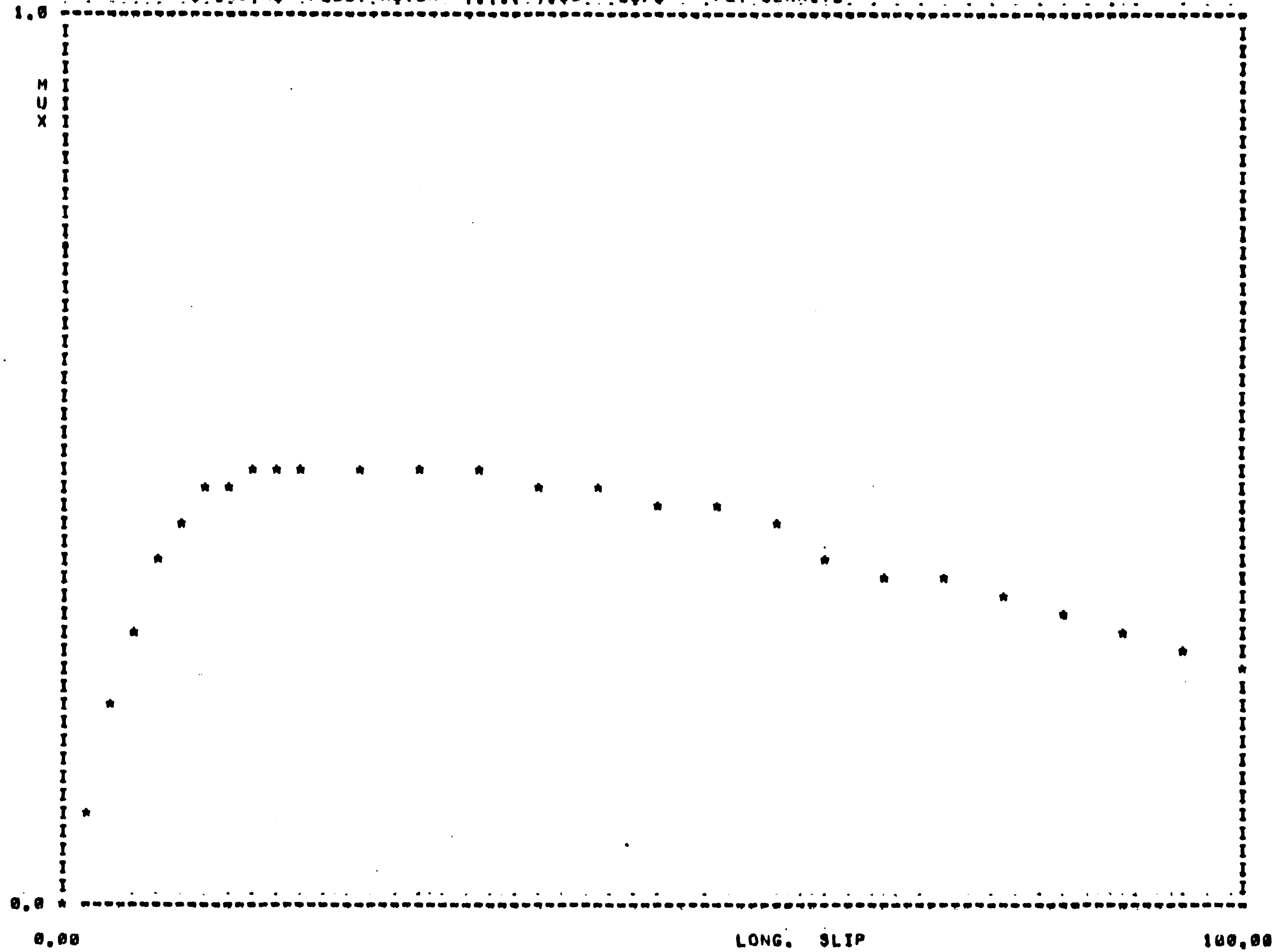
UNIROYAL FLEETMASTER T.T., 9.00 - 20/E WET JENNITE



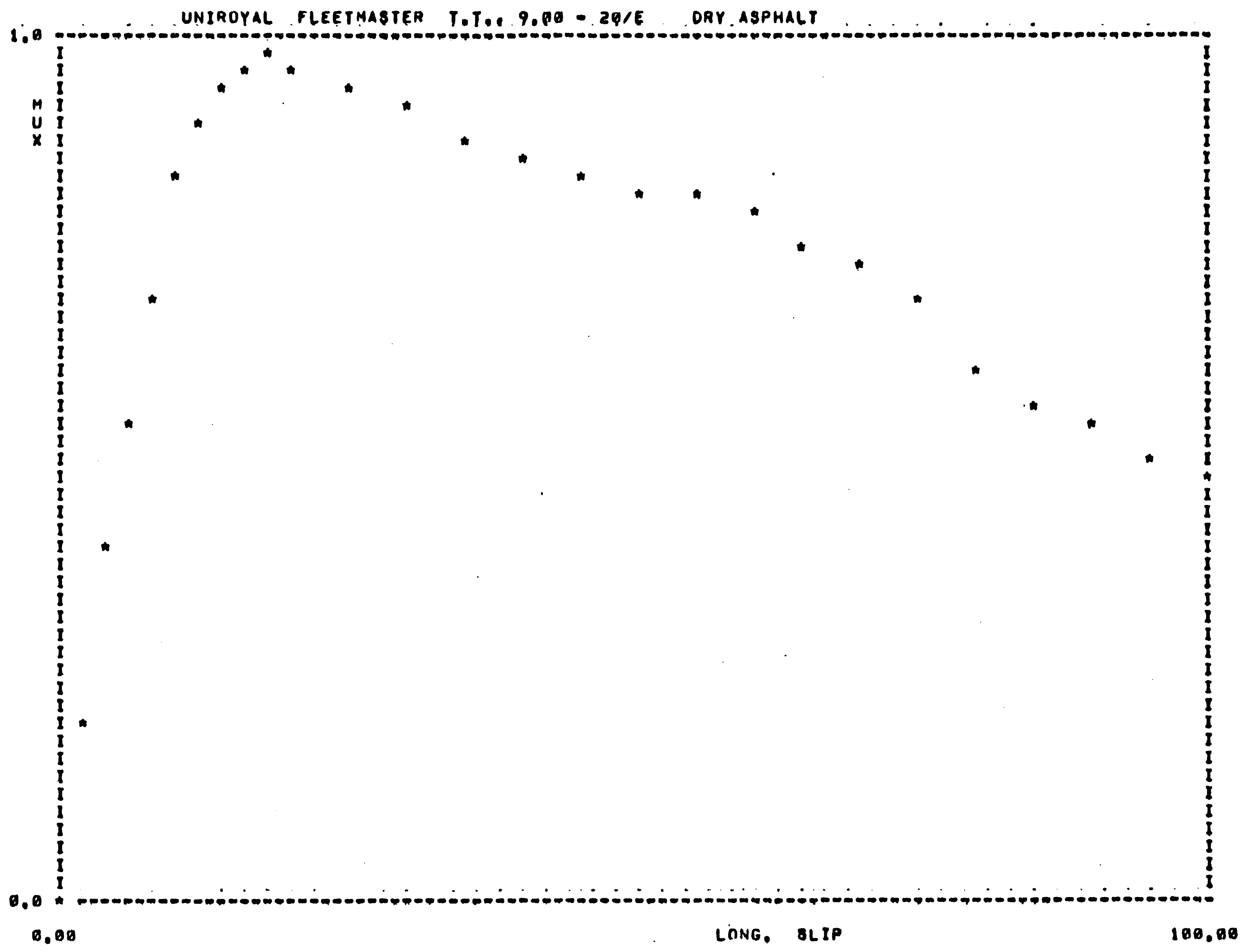
FZ = 2571.2 VEL = 20.0 MULOCK = 0.25 MUPEAK = 0.48 RATIO = 1.90


UNIROYAL FLEETMASTER. T.T.: 9.00 - 20/E . WET JENNITE.
1.0
MUX
0.0
0.00
LONG. SLIP
100.00
FZ = 4826.3 VEL = 20.0 MULOCK = 0.28 MUPEAK = 0.53 RATIO = 1.89

UNIROYAL FLEETMASTER T.T.: 9.00 - 20/E WET JENNITE

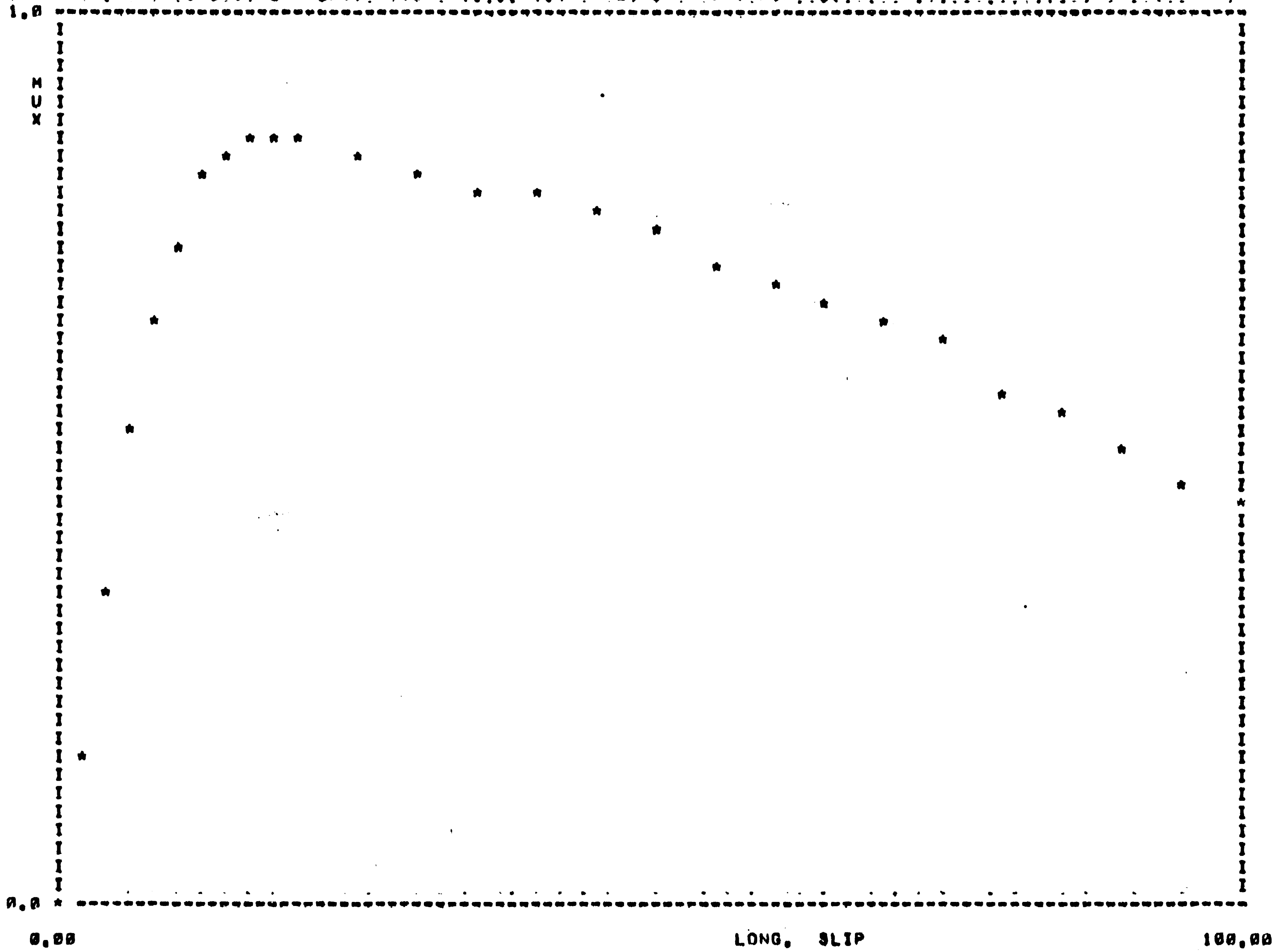


FZ = 6910.2 VEL = 20.0 MULOCK = 0.27 MUPEAK = 0.49 RATIO = 1.86

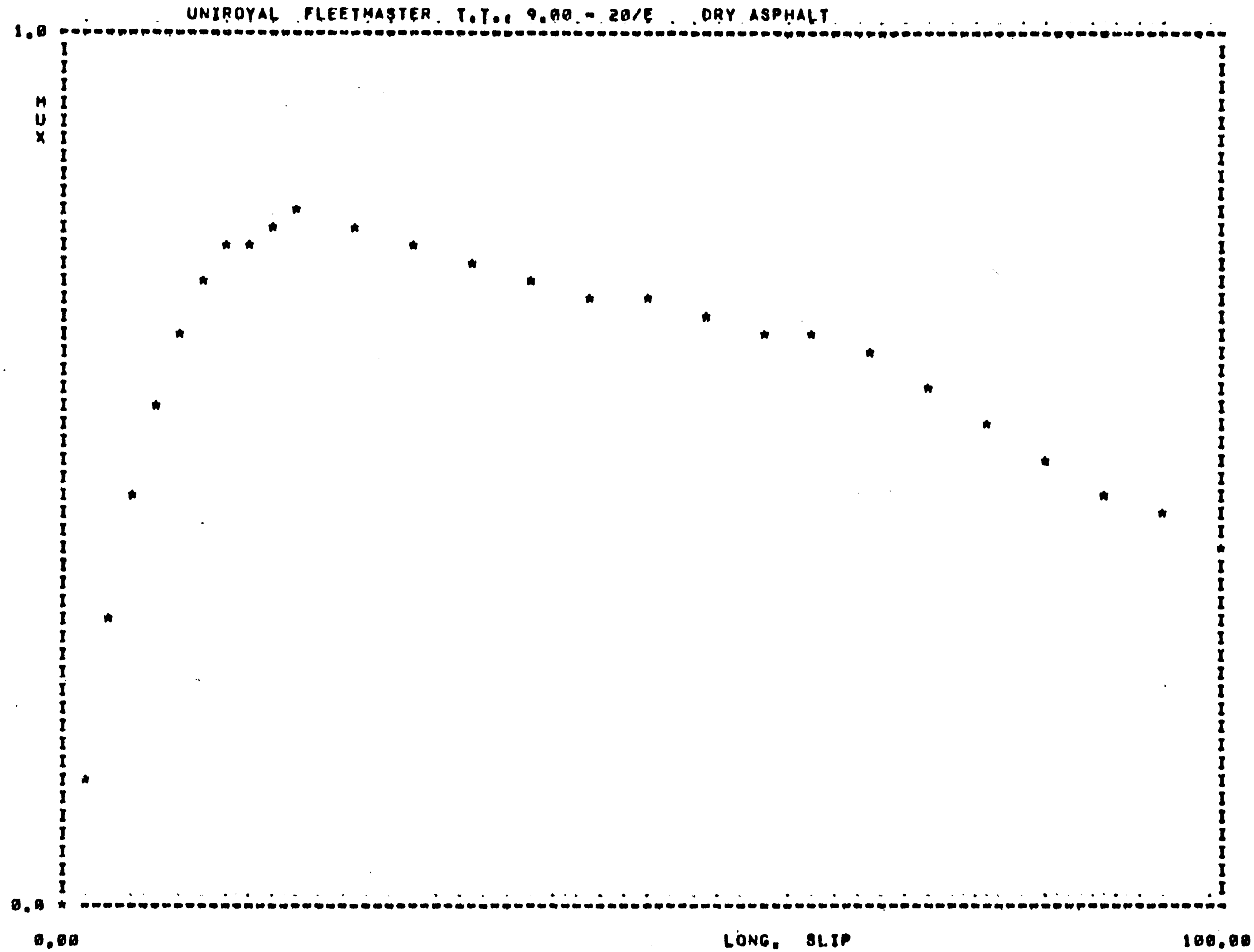


FZ = 2745.1 VEL = 40.0 MULOCK = 0.49 MUPEAK = 0.97 RATIO = 1.99

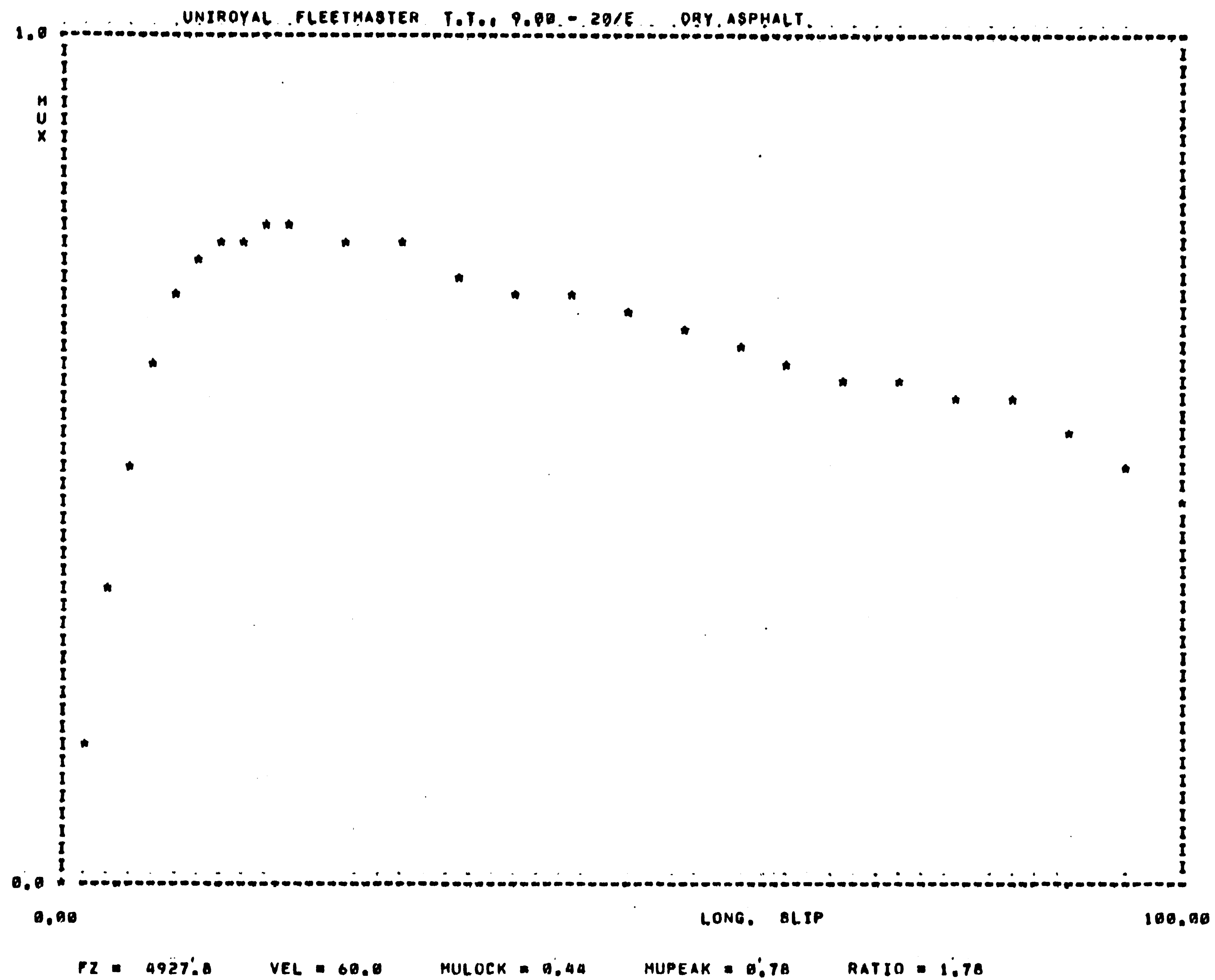
UNIROYAL FLEETMASTER T.T.: 9.00 - 20/E DRY ASPHALT



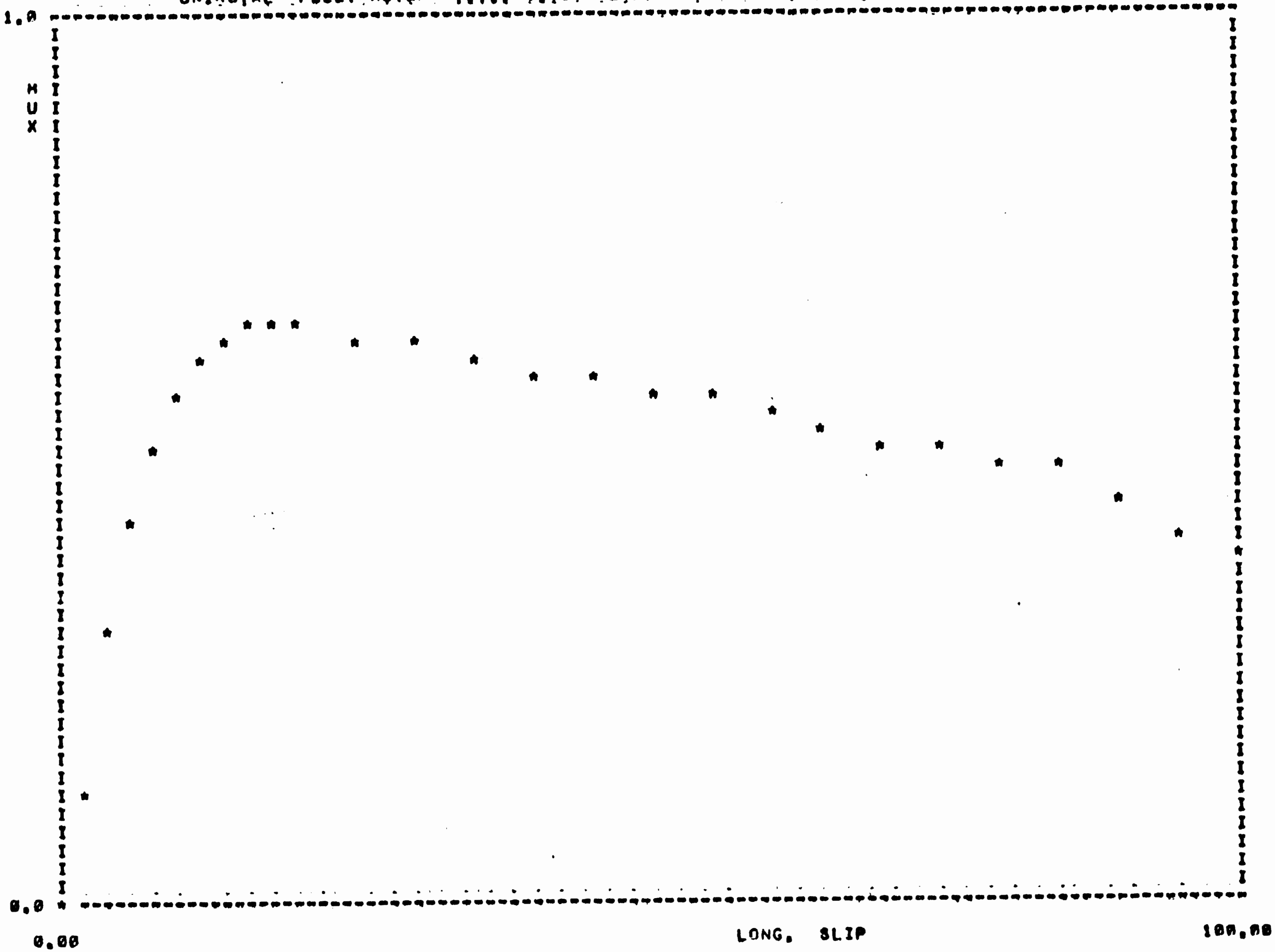
FZ = 4929.7 VEL = 40.0 MULOCK = 0.45 MUPEAK = 0.87 RATIO = 1.94



FZ = 7006.0 VEL = 40.0 MULOCK = 0.41 MUPEAK = 0.79 RATIO = 1.93


UNIROYAL FLEETMASTER T.T., 9.00 - 20/E DRY ASPHALT
1.0
MUX
0.0
0.00
LONG. SLIP
100.00
FZ = 4927.8 VEL = 60.0 MULOCK = 0.44 MUPEAK = 0.78 RATIO = 1.78

UNIROYAL FLEETMASTER T.T., 9.00 - 20/E DRY ASPHALT



FZ = 7116.3 VEL = 60.0 MULOCK = 0.38 MUPEAK = 0.66 RATIO = 1.73

Tire: Highway Tread 9-20/E Rim: 20x7.00

LATERAL FORCE vs SLIP ANGLE AND VERTICAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	Lateral Force at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1300	80	216	388	632	911	1026	1048
2700	80	367	687	1187	1791	2081	2181
4160	80	466	868	1535	2441	2937	3162
5400	80	479	926	1696	2812	3478	3828
6500	80	460	924	1771	3026	3807	4314

ALIGNING TORQUE vs SLIP ANGLE AND VERTICAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	Aligning Torque at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1300	80	19	29	32	19	8	0
2700	80	52	84	108	88	49	21
4160	80	87	146	202	198	136	70
5400	80	112	196	288	304	223	134
6500	80	134	240	365	410	312	206

CIRCUMFERENTIAL STIFFNESS vs SLIP ANGLE AND NORMAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	C_s (lbs.)	Vertical Spring Rate (lbs./in.)
1300	80	14,000	
4160	80	41,000	3824
6500	80	6,500	

Tire: Highway Tread 9-20/F Rim: 20x7.00

LATERAL FORCE vs SLIP ANGLE AND VERTICAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	Lateral Force at Indicated Slip Angle (degs.)					
		1	2	4	8	12	16
1400	85	238	440	718	1001	1263	1232
2800	85	391	743	1286	1898	2500	2431
4250	85	479	920	1631	2538	3082	3459
5600	85	509	987	1805	2943	3690	4227
6500	85	506	1005	1856	3115	3990	4628

ALIGNING TORQUE vs SLIP ANGLE AND VERTICAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	Aligning Torque at Indicated Slip Angle					
		1	2	4	8	12	16
1400	85	20	33	38	20	6	-3
2800	85	52	89	118	87	49	19
4250	85	84	148	213	187	118	74
5600	85	114	202	306	295	208	139
6500	85	135	250	382	385	279	191

CIRCUMFERENTIAL STIFFNESS vs SLIP ANGLE AND NORMAL LOAD

Vertical Load (lbs.)	Inflation Pressure (psi)	C_s (lbs.)	Vertical Spring Rate (lbs./in.)
1400	85	16,000	
4250	85	41,000	4122
6800	85	50,000	

MONTGOME' ·ARDS STEEL BELTED SUPER WIDE 9.50X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	835.0	-28.2	172.4	-129.2	298.2	-254.1	463.6	-425.3	637.5	-620.4	737.0	-684.2	743.7	-692.1
85.0	1810.0	-53.5	339.7	-236.3	562.2	-491.5	914.0	-859.3	1310.0	-1259.9	1431.9	-1406.7	1452.9	-1430.1
85.0	2780.0	-58.3	444.5	-342.6	776.0	-679.8	1283.5	-1224.7	1820.8	-1826.9	2073.1	-2045.8	2014.7	-2007.0
85.0	3750.0	-68.1	527.5	-387.6	926.0	-814.6	1552.7	-1454.3	2291.3	-2245.0	2600.0	-2525.7	2556.6	-2515.5

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	835.0	-1.5	3.2	-8.8	6.1	-15.1	5.9	-14.4	0.4	-8.7	-7.5	-2.4	-10.8	-0.5
85.0	1810.0	1.4	29.0	-25.1	34.2	-44.5	43.8	-53.2	23.2	-35.6	3.5	-15.6	-2.6	-2.6
85.0	2780.0	6.9	50.7	-48.4	79.3	-81.0	92.9	-104.4	61.1	-77.5	24.9	-39.7	13.9	-22.3
85.0	3750.0	10.5	77.8	-69.0	129.3	-124.8	160.6	-175.3	119.4	-132.4	54.5	-73.0	29.0	-45.1

GOODYEAR SUPER SINGLE HIMILER 10.00X16.5 E

LATERAL FORCE (LB.) AT INDICATED INFLATION PRESSURE (PSI.), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	940.0	-12.9	130.4	-107.5	235.6	-195.6	410.0	-375.6	583.7	-553.7	691.0	-644.1	706.8	-665.3
85.0	2038.0	-24.3	264.6	-208.8	469.1	-419.1	815.8	-748.0	1200.2	-1171.8	1409.0	-1342.9	1447.0	-1379.8
85.0	3135.0	-29.8	378.2	-304.5	666.4	-600.1	1172.9	-1109.3	1763.1	-1762.5	2049.5	-2005.9	2091.7	-2033.2
85.0	4230.0	-32.4	464.2	-362.9	822.2	-742.3	1477.5	-1393.5	2286.5	-2239.0	2627.3	-2555.7	2684.7	-2627.0

ALIGNING MOMENT (FT.-LB.) AT INDICATED INFLATION PRESSURE (PSI), LOAD (LB.), AND STEER ANGLE (DEG.)

PSI	LOAD	0	+1	-1	+2	-2	+4	-4	+8	-8	+12	-12	+16	-16
85.0	940.0	-0.4	2.5	-10.0	8.2	-16.0	20.2	-17.4	2.1	-9.1	-4.7	-5.4	-5.6	-0.4
85.0	2038.0	0.2	20.6	-21.2	27.9	-34.8	37.7	-46.6	29.4	-38.4	8.1	-18.3	-3.6	-6.3
85.0	3135.0	3.0	39.9	-38.4	62.0	-69.4	83.7	-94.6	68.6	-81.4	27.8	-38.1	7.8	-14.5
85.0	4230.0	6.2	64.1	-56.2	104.3	-101.8	148.4	-148.7	120.9	-135.5	57.0	-67.6	22.8	-31.4

28

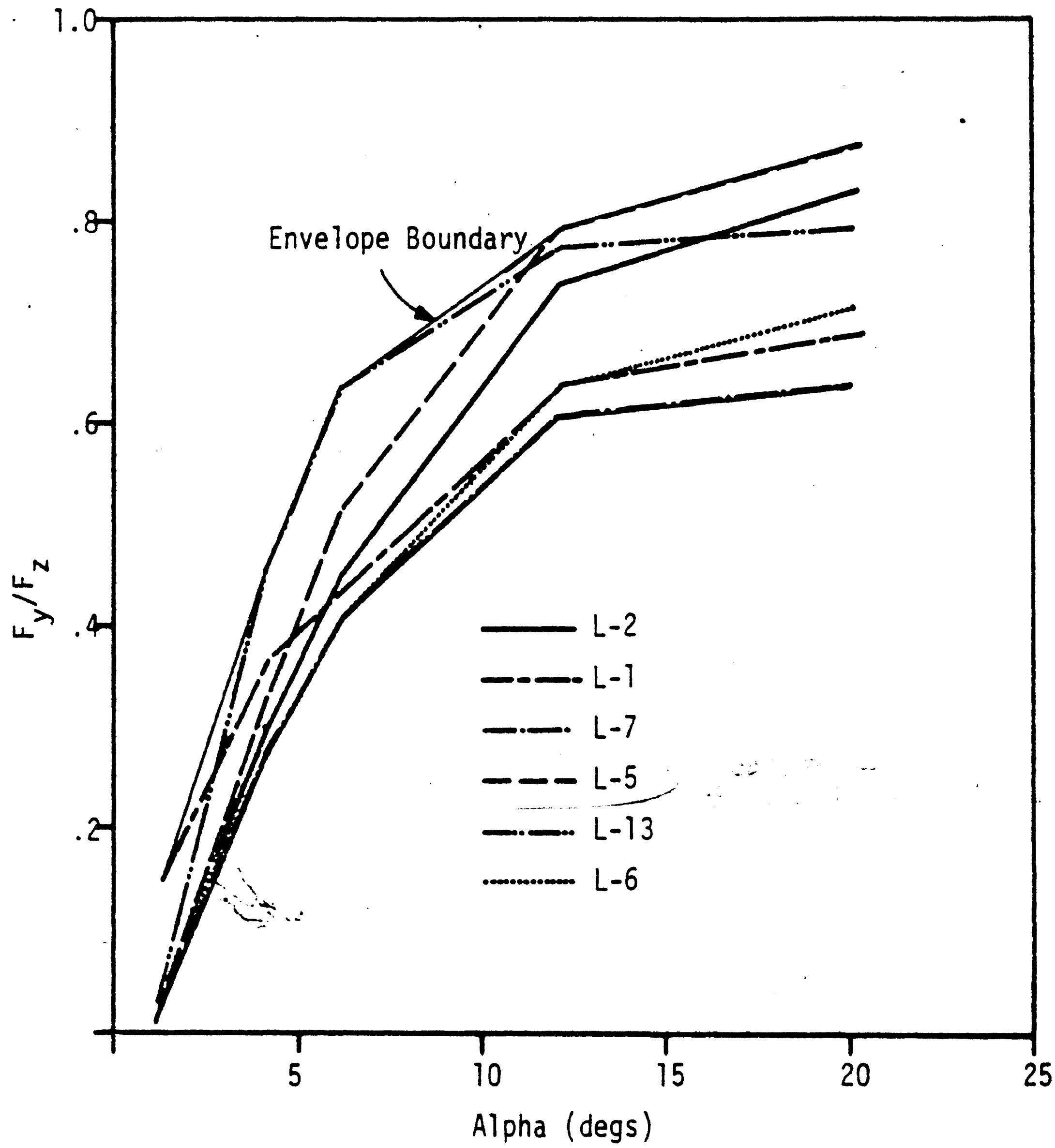


Figure 3.34. Lateral force measurements of light truck tires at rated load, 20 mph.

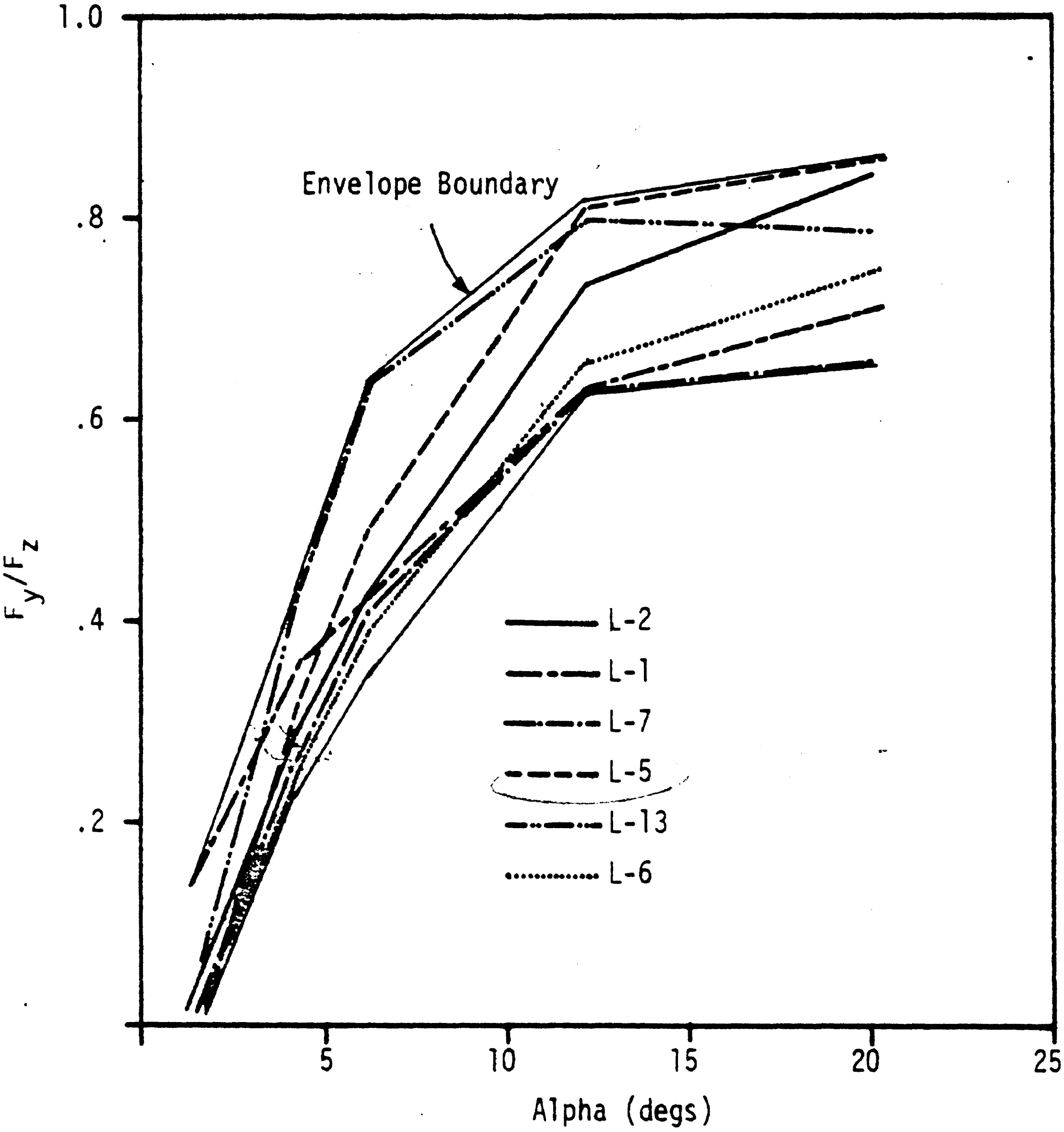


Figure 3.35. Lateral force measurements of light truck tires at rated load, 40 mph.

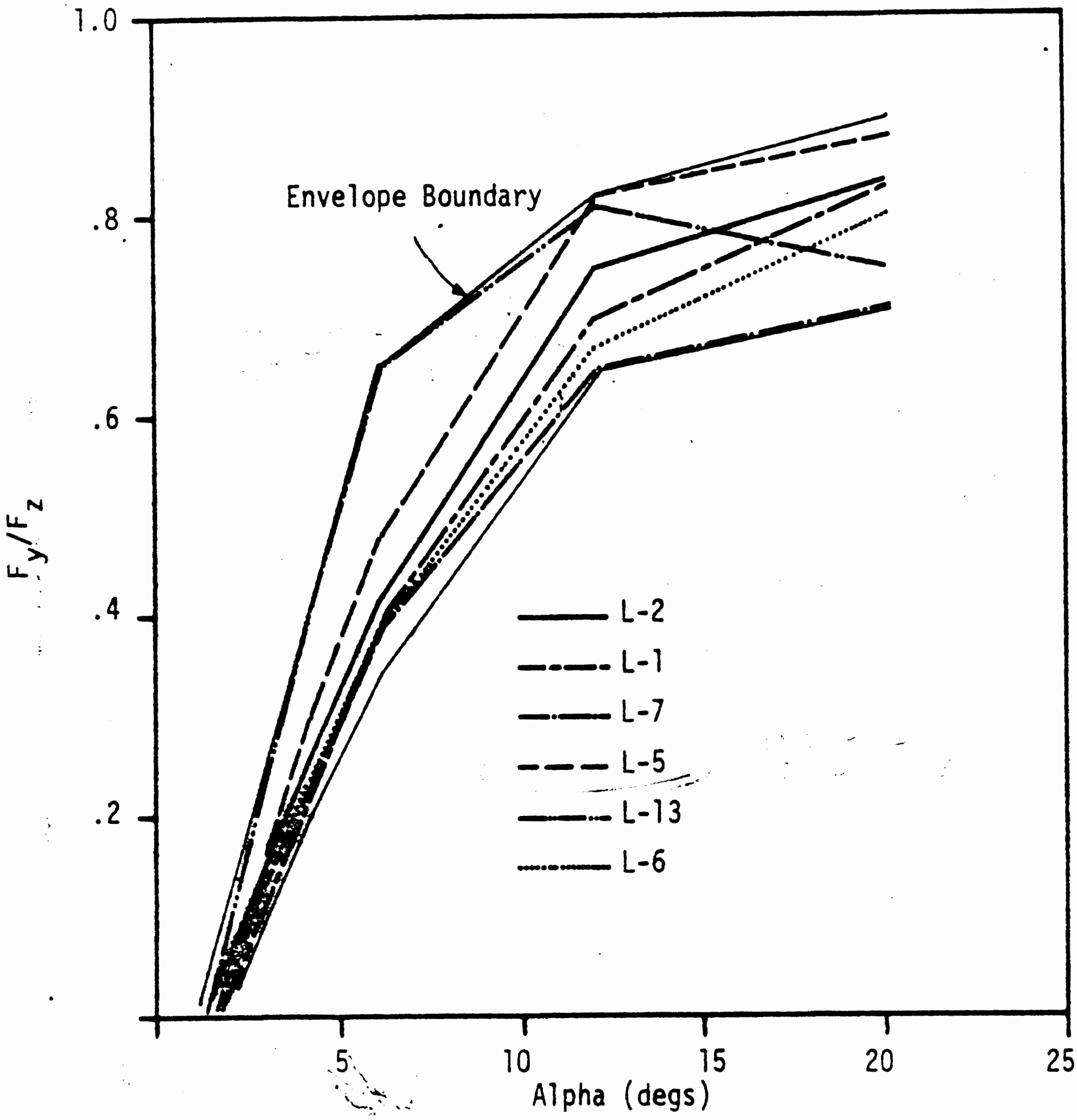
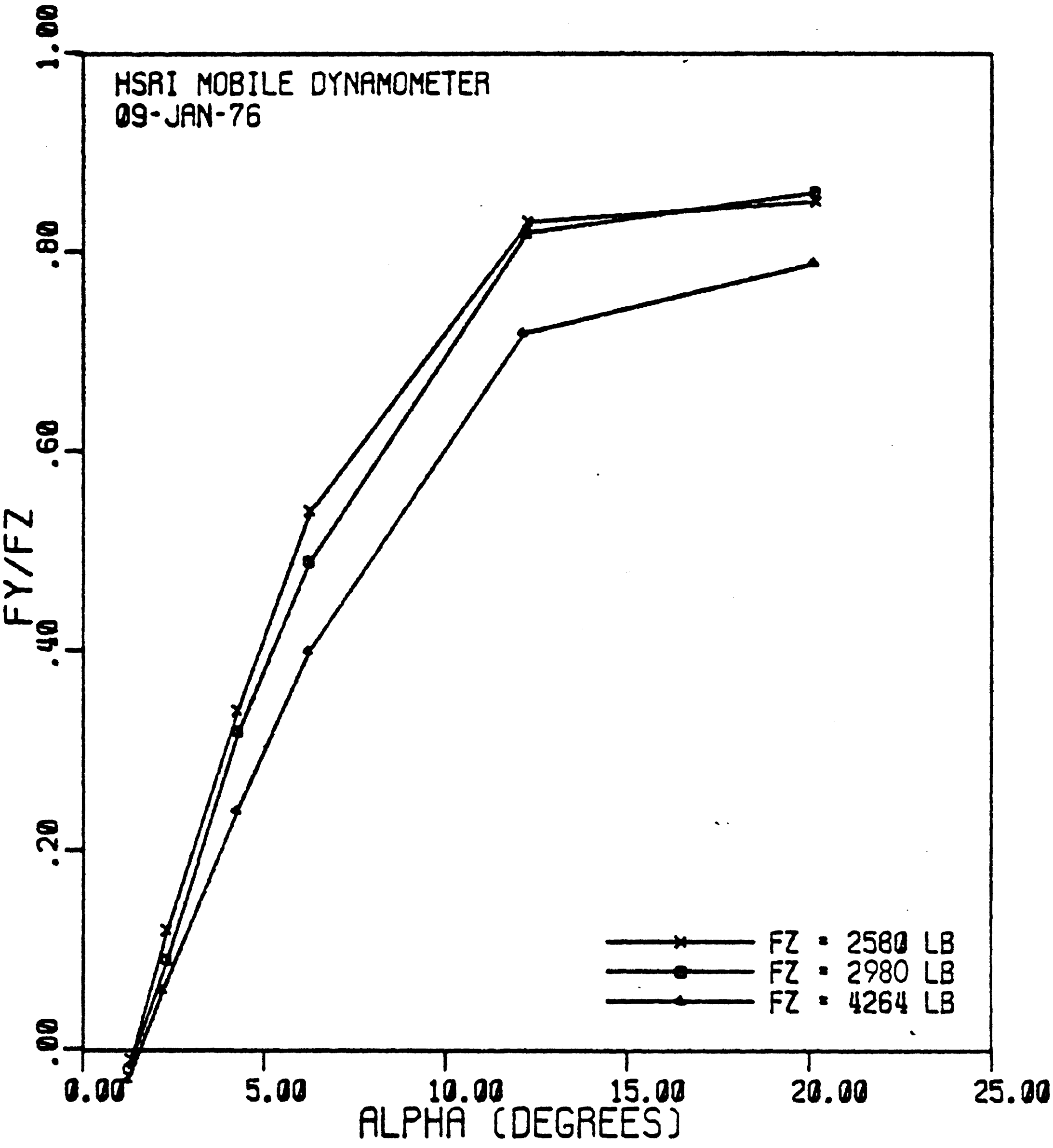
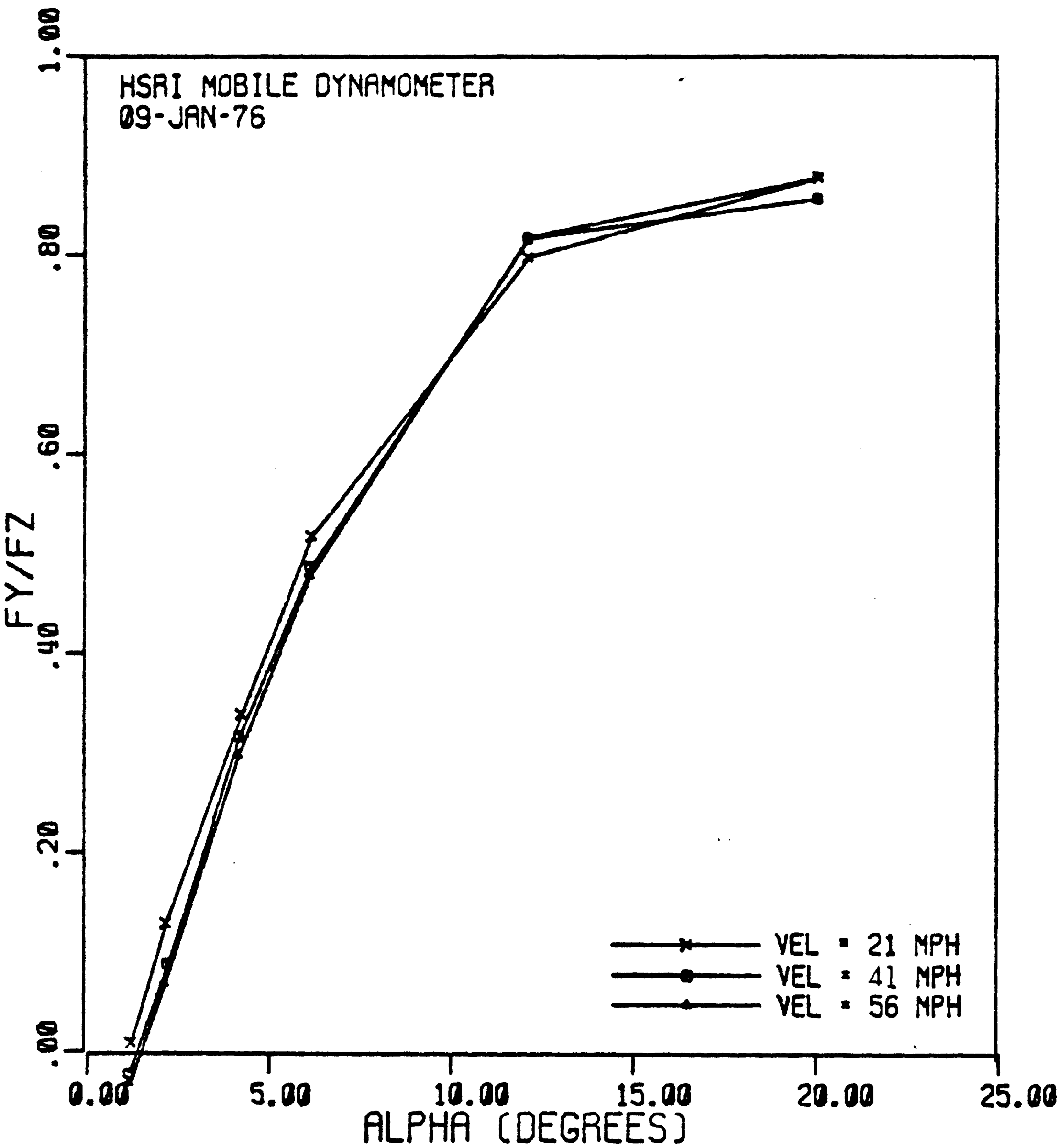


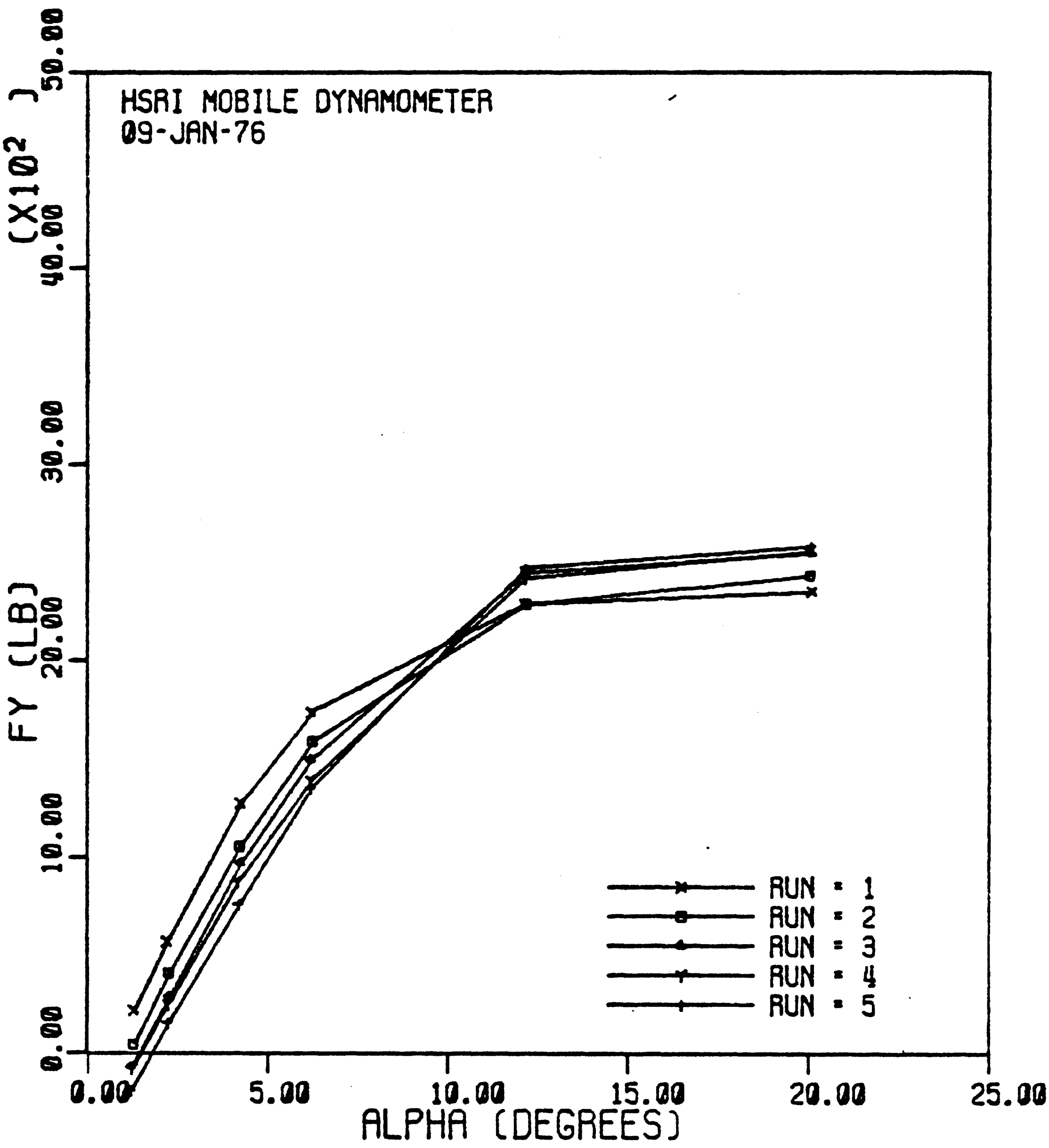
Figure 3.36. Lateral force measurements of light truck tires at rated load, 55 mph.



GOODYEAR SUPER SINGLE 10.00X16.5/D
VEL = 41 MPH



GOODYEAR SUPER SINGLE 10.00X16.5/D
FZ = 2984 LB



GOODYEAR SUPER SINGLE 10.00X16.5/D
FZ = 2980 LB VEL = 41 MPH

TABLE 3.1. FLAT-BED TEST TIRES

Tire No.	Manufacturer	Model	Size
Heavy Truck Tires			
H-1	Uniroyal	Triple Tread	10 x 20F
H-2	Uniroyal	Triple Tread	10 x 20G
H-3	Uniroyal	Triple Tread	11 x 22.5F
H-4	B.F. Goodrich	Milesaver Radial Steel H.D.R.	10 R 20 G
H-5	B.F. Goodrich	Milesaver Radial Steel H.D.B.	10 R 20 G
H-6	Goodyear	Unisteel R-1	10 R 20 G
H-7	Goodyear	Unisteel L-1	10 R 20 G
H-8	Firestone	Power Drive	10 x 20F
H-9	Uniroyal	Unimaster Rib	15 x 22.5H
H-10	Michelin	Radial	10 R 20 G
H-11	Uniroyal	Fleetmaster Superlug	10 x 20F
Heavy Bus Tires			
H-12	Firestone	Hiway Mileage	12.5 x 22.5G
H-13	B.F. Goodrich	Intercity Mileage	12.5 x 22.5G
H-14	B.F. Goodrich	Intercity Mileage	11.5 x 20G
H-15	Uniroyal	Intercity	12.5 x 22.5G
H-16	Uniroyal	MaxRoute I	11.00 R 20H
H-17	Goodyear	Custom Cruiser	12.5 x 22.5G
H-18	Michelin	Radial XZA	11 R 20 H
H-19	Michelin	Radial XZA	11 R 22.5 H
H-20	Michelin	Radial XZA	12 R 22.5H
Light Truck Tires			
L-1	Firestone	Transport 500	8.00 x 16.5D
L-2	Goodyear	Custom HiMiler	8.75 x 16.5E
L-3	Goodyear	Rib HiMiler	8.00 x 16.5D
L-4	Firestone	Transport 110	7.50 x 16.5C
[redacted]			
L-6	Firestone	Town & Country Truck	8.00 x 16.5D
L-7	Goodyear	Custom Flexsteel	8.00 R 16.5E
L-8	Goodrich	Milesaver Radial	8.00 R 16.5D
L-9	Goodyear	Glas Guard XG	8.00 x 16.5D
L-10	Goodyear	Glas Guard XG	8.75 x 16.5E
L-11	Firestone	Town & Country Truck	8.75 x 16.5E
L-12	Goodyear	Custom Flexsteel	8.75 R 16.5E
L-13	Michelin	Radial XCA	8.00 R 16.5E
L-14	Wards	Steel Belted Super Wide	9.50 x 16.5D
L-15	Michelin	Radial XCA	8.75 R 16.5D
L-16	General	Jumbo Power Jet	8.00 x 16.5D
L-17	General	Jumbo Power Jet	8.75 x 16.5E
L-18	Goodyear	Glas Guard	8.00 x 16.5D
L-19	Goodyear	Glas Guard	8.75 x 16.5E
L-20	Goodyear	Rib HiMiler	8.75 x 16.5E