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16. Abstract

This document presents the results of a program of lateral traction measurements conducted by UMTRI on a sample of three wide-base truck tires. Measurements were made with the tires in three wear states. The UMTRI Flat-Bed Tire Tester was used to perform the measurements. Lateral force and aligning moment response to slip angle were determined at four vertical loads and at two inflation pressures.

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Lateral Performance Measurements of Wide-Base Truck Tires

A Report to:

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May, 1991

The University of Michigan
Transportation Research Institute

Introduction

This document presents the results of a program of lateral traction measurements conducted by UMTRI on a sample of three wide-base truck tires. Measurements were made with the tires in three wear states. The UMTRI Flat-Bed Tire Tester was used to perform the measurements. Lateral force and aligning moment response to slip angle were determined at four vertical loads and at two inflation pressures.

Tire Sample

Tests were conducted on three individual tires as identified in table 1.

Table 1. Test Tires

Manufacturer	*Model*	*Size*
Michelin	XZY	445/65 R 22.5 L
Bridgestone	M747	445/65 R 22.5 L
Goodyear	G165	445/65 R 22.5 L

Each of these three tires was tested in three wear states. The wear states were nominally, (i) new, (ii) 1/2 tread, and (iii) 1/3 tread. The worn states were established by grinding the tread surface as is common in the preparation of a tire for recapping. Table 2 presents numerical data describing the actual wear states that were established.

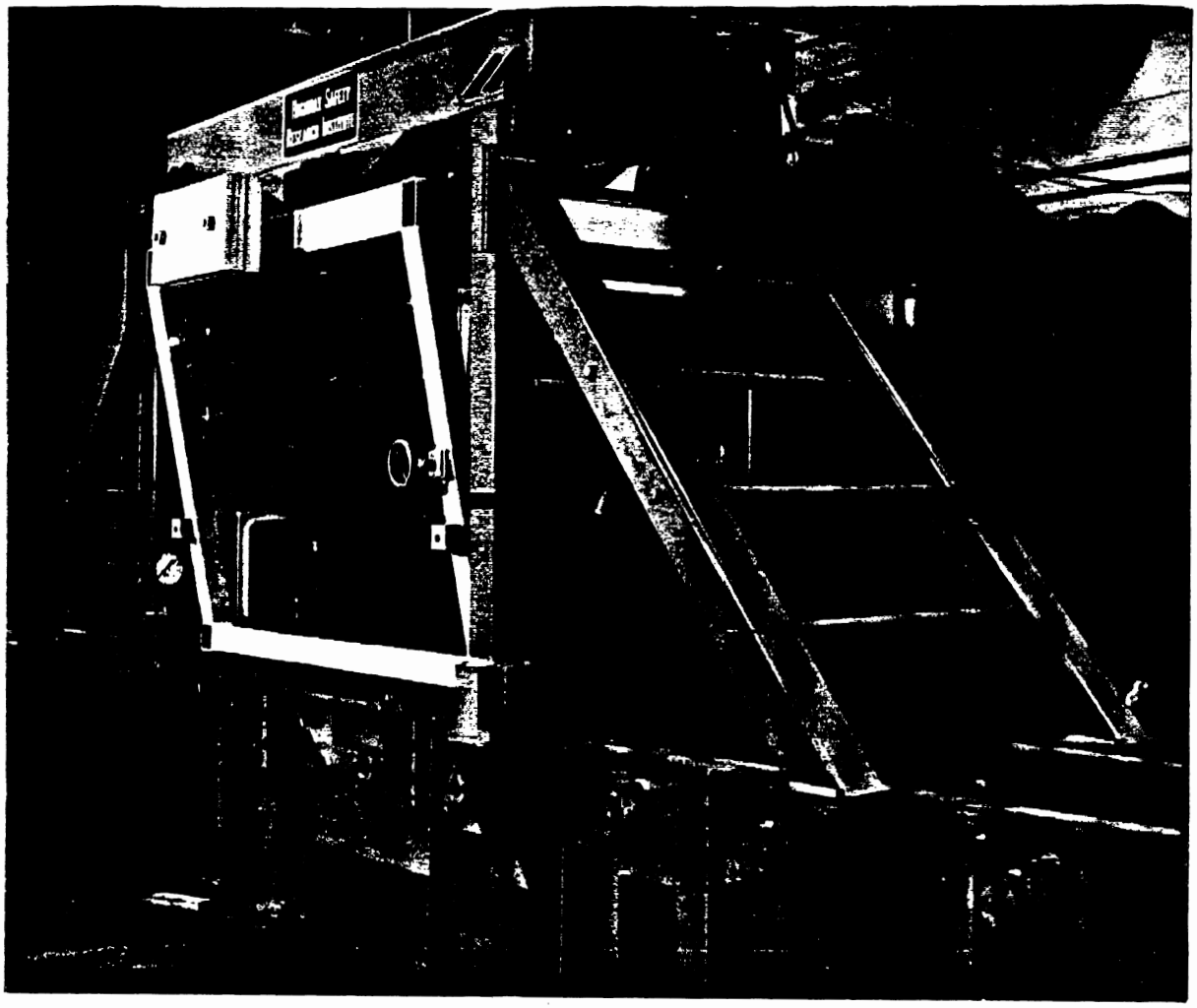
Table 2. Test Wear States[1]

Tire	*New Tread State inches ; % of new*	*1/2 Tread State inches ; % of new*	*1/3 Tread State inches ; % of new*
Michelin	$^{20}/_{32}$; 100%	$^{9.6}/_{32}$; 47.9%	$^{6.3}/_{32}$; 31.7%
Bridgestone	$^{18}/_{32}$; 100%	$^{8.3}/_{32}$; 46%	$^{5.8}/_{32}$; 32%
Goodyear	$^{18}/_{32}$; 100%	$^{7.8}/_{32}$; 43%	$^{6.6}/_{32}$; 36%

[1] Values shown are the average of the tread depth measured at all wear bars of the tire.

Measurement Apparatus

The measurements were made on the UMTRI Flat-Bed Tire Tester. The flat-bed tester is used to obtain precise measurements of the traction response characteristics of tires. It accommodates passenger-car and truck tires ranging from 24-47.5 inches in diameter. The design vertical load capacity of the machine is 10,000 lbs, although that value was exceeded in this program. The device is designed for low-speed tests at slip angles between ±90 degrees and camber angles between ±20 degrees. It is instrumented to measure the three forces and three moments developed at the tire-road interface. Data from analog transducers are converted to digital format on-line and are stored as time histories on digital tape. Automated data processing is used later to produce traditional "carpet plots" as well as data sets compatible with the various UMTRI vehicle models.



The Test Matrix

The matrix of test variables for each of the nine tire/wear state conditions consisted of two inflation pressures, four vertical loads, and seven slip angles.

The two tire inflation pressures used were 120 and 132 psi. The lower of these two was chosen because it is the cold inflation pressure recommended for 445/65 R 22.5 L tires in the *Tire and Rim Association Year Book, 1991*. The higher pressure is simply 110% of this value and is believed to be reasonably representative of the "warm" operating pressure of the tire in use. (The Flat-Bed tire test machine operates intermittently and at low speed and does not cause significant warming of the tire. Thus, inflation pressures above the recommended pressure are usually used to represent the warm condition.)

According to the *Tire and Rim Association Year Book, 1991*, the rated load of the 445/65 R 22.5 L tire is 12,300 pounds. The four nominal vertical loads used in this measurement program were 4000, 8000, 12,000 and 15,000 pounds, or approximately 1/3, 2/3, 1, and 1-1/4 of the rated load. It would have been desirable to test the tires at a higher vertical load (approaching 200%), but 15,000 lbs was seen as the limit of acceptable loading for the flat-bed tester.

Testing was conducted at slip angles of -1, 0, 1, 2, 4, 8, and 12 degrees. All testing was conducted at zero camber angle and zero longitudinal slip. Test were conducted with the tire rolling in both clockwise and counterclockwise directions.

The test matrix used (3 tires x 3 wear states x 2 pressures x 4 loads x 7 slip angles x 2 directions) was "full" except that, in seven of the nine tire/wear state conditions, the combination of the maximum vertical load (15,000 lbs) and maximum slip angle (12 degrees) was not tested. The "design" vertical load of the flat-bed tester is 10,000 pounds. Accompanying this is a design limit of 10,000 pounds on tire side force. While it was determined that the vertical load limit could be exceeded in this program, after the first two cases[2], it was decided that the lateral force limit should not be exceeded. Thus, this most severe operating condition (15,000 lb and 12 degrees slip) was not included in the test matrix for the remaining tires.

Results

Results of the measurement program are appended to this text and appear in the form of graphs and tables. In all of the presentations, the data have been "averaged and justified." That is, the measurements for clockwise and counter-clockwise passes are averaged, and

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[2] Full tread Bridgestone and full tread Michelin.

the results are "shifted" to remove asymmetries about zero slip such that zero force and moment are represented at conditions of zero slip.

For each tire-wear state there are included:

(i) Two lateral force carpet plots, one each for the 120 and 132 psi inflation condition,

(ii) Two aligning moment carpet plots, one each for the 120 and 132 psi inflation condition.

(iii) Two graphs presenting cornering stiffness as a function of vertical load, one each for the 120 and 132 psi inflation condition.

(iv) A tabular presentation of lateral force and aligning moment results in a "readable" format.

(v) A tabular presentation of the data in a format based on the Yaw/Roll Model input stream requirements.[3]

(vi) A tabular presentation of the data in a format based on the "RTAC pre-processor" data file structure and/or the Phase IV Model input stream requirements.[3]

An overview of the relative lateral stiffness of the three tires over the range of wear states examined is provided in the figure on page five. This figure is a plot of cornering stiffness (lateral force at one degree slip) versus vertical load. The range of cornering stiffness measured over the new tread to the 1/3 tread wear state is shown for each of the three tires, respectively. As is generally true, cornering stiffness increases significantly as tread depth decreases. It is also apparent that cornering stiffness varies significantly among the three tire types.

The figure shows data for an inflation pressure of 120 psi. At 132 psi inflation the same general relationships hold, and the influence of inflation pressure over this range is generally small compared to the influences illustrated in the figure.

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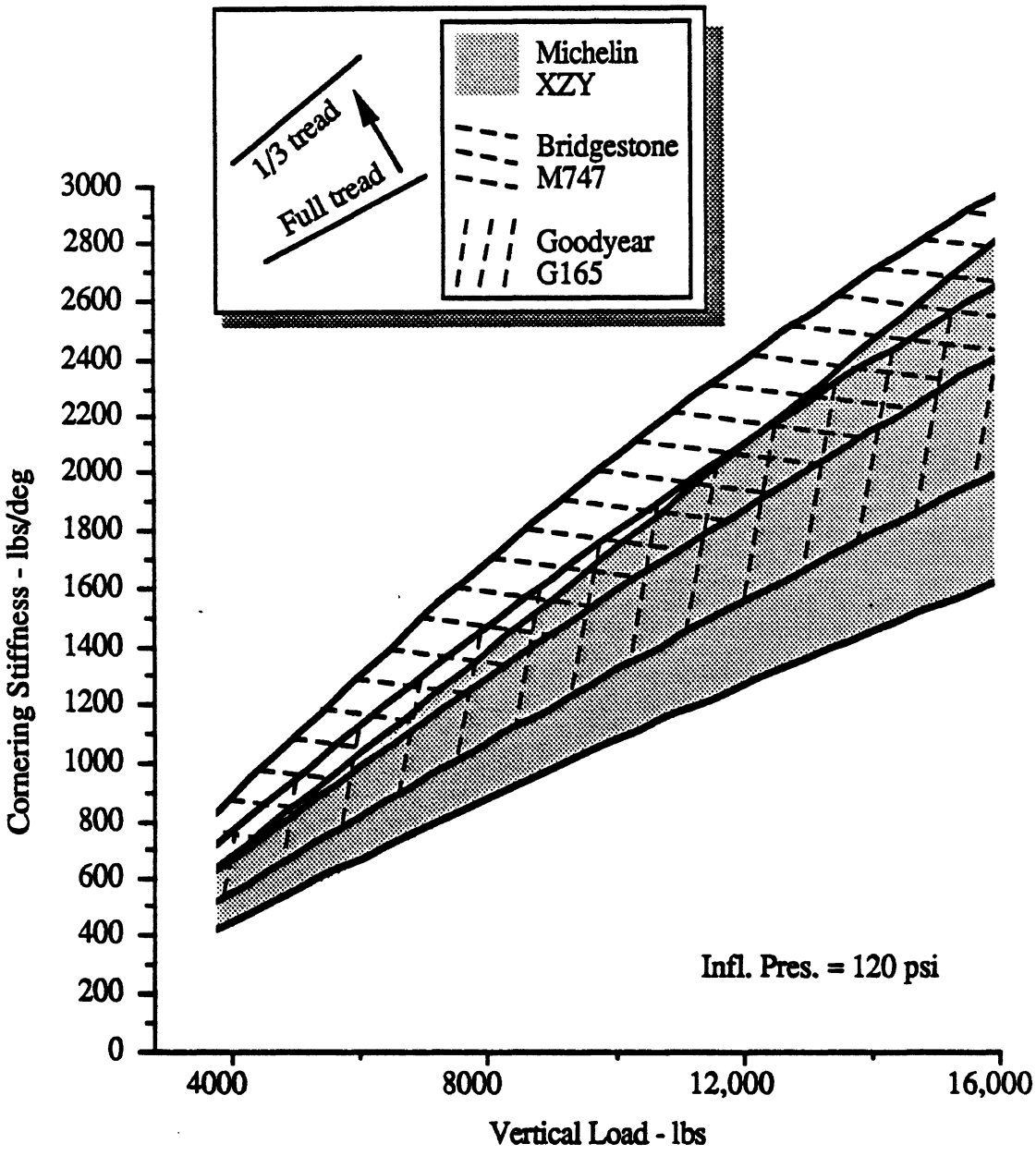
[3] Lateral force and aligning moment are estimated for conditions of 15,000 lb vertical load and 12 degree slip in order to complete the required input for the models.

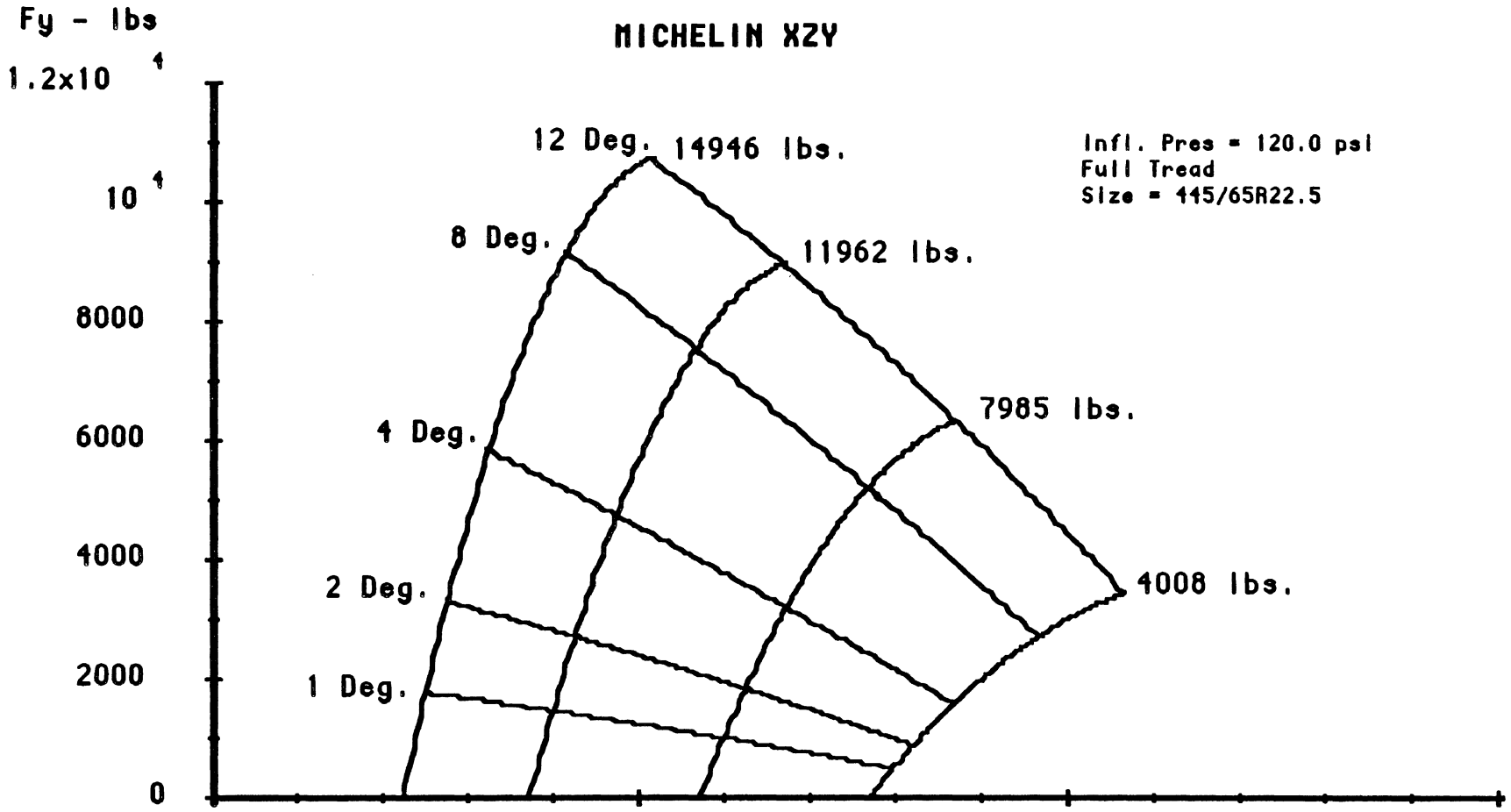
The Influence of Tire Type, Wear State, and Vertical Load on the Cornering Stiffness of Three 445/65 R 22.5 L Tires



Michelin XZY

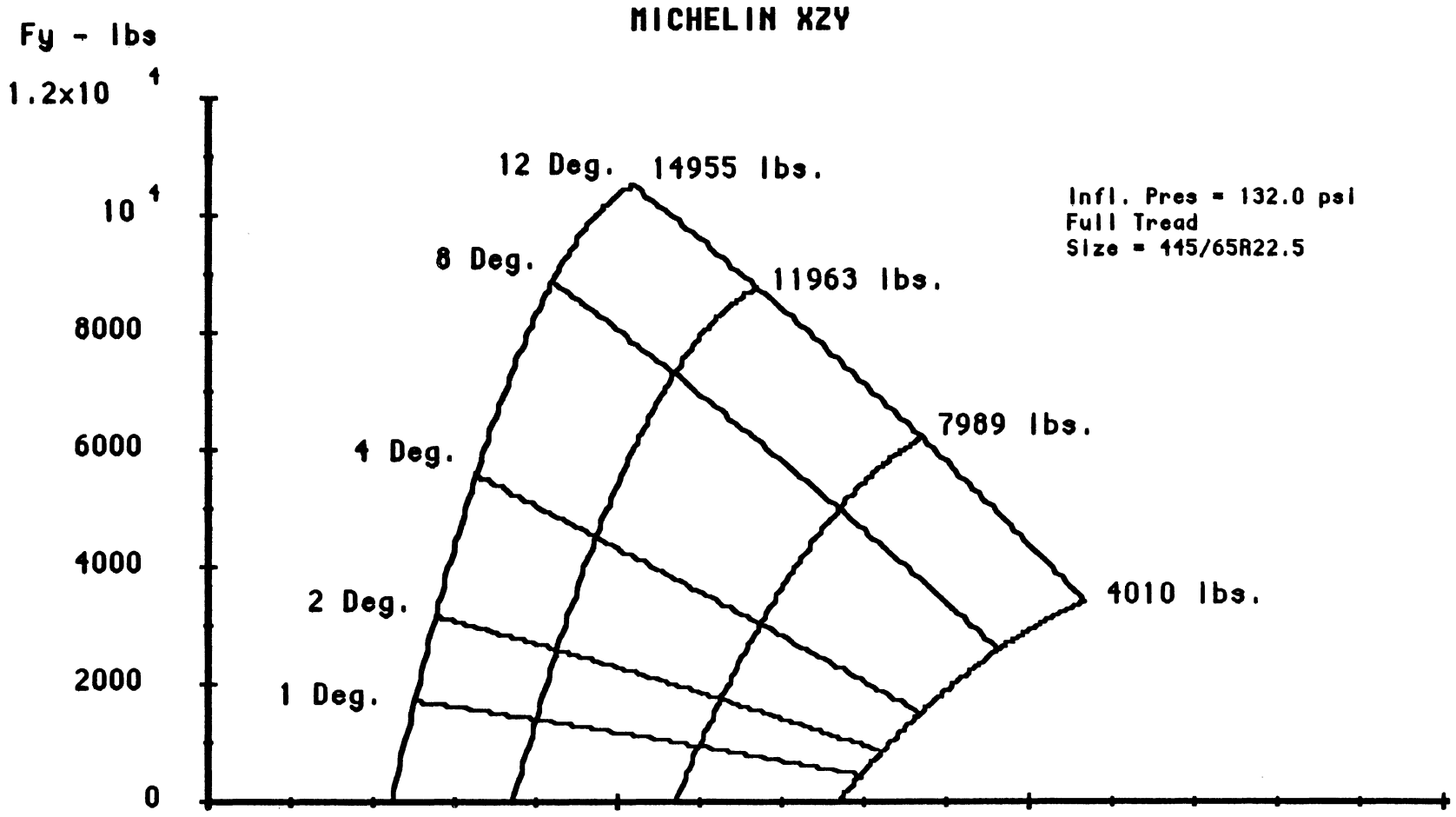
445/65 R 22.5 L

Full Tread



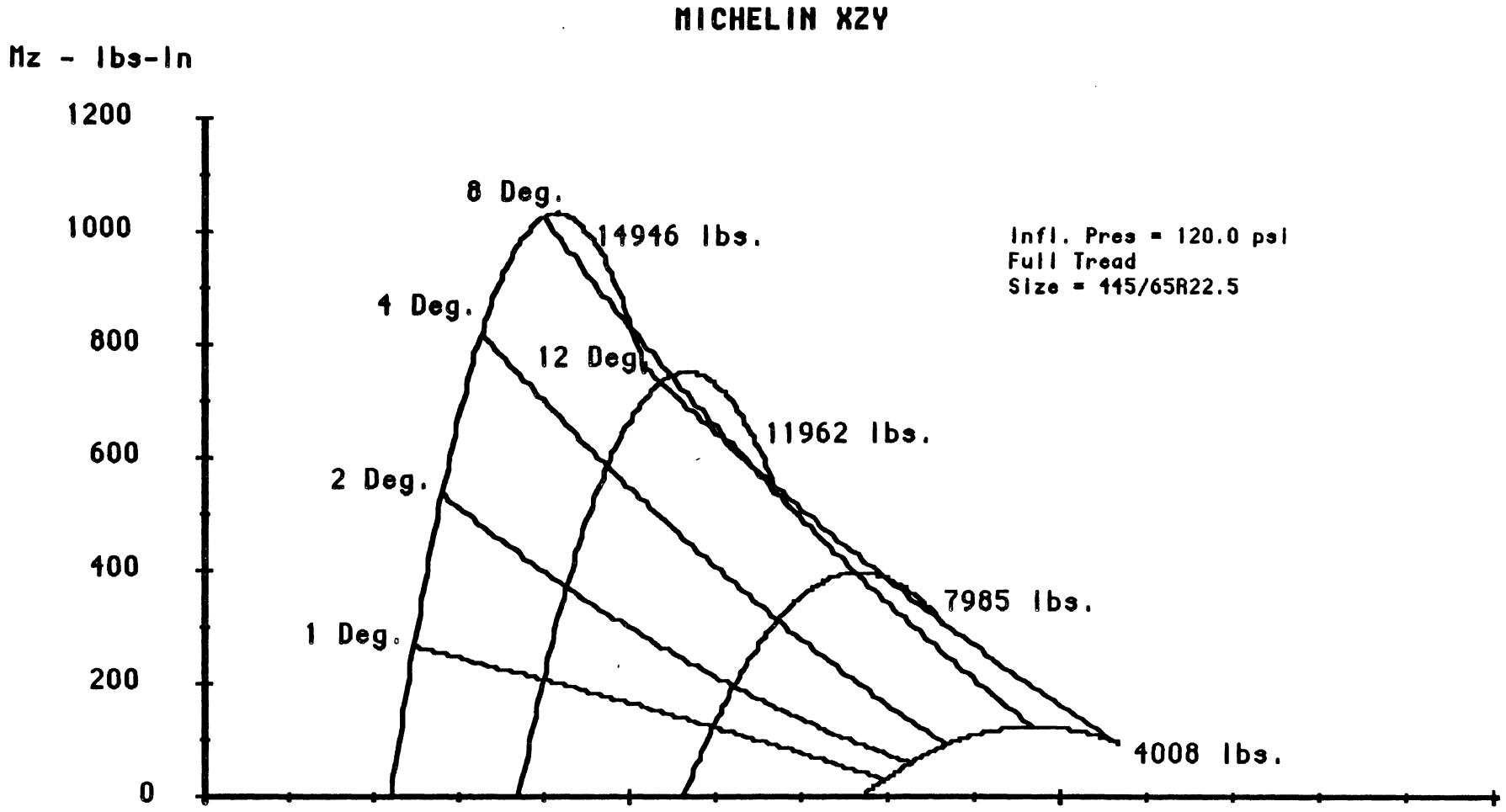
03/20/91 16:22:00 MI XZY 445/65R22.5 FUL 120PSI

Lateral Force as a Function of Slip Angle and Verticle Load



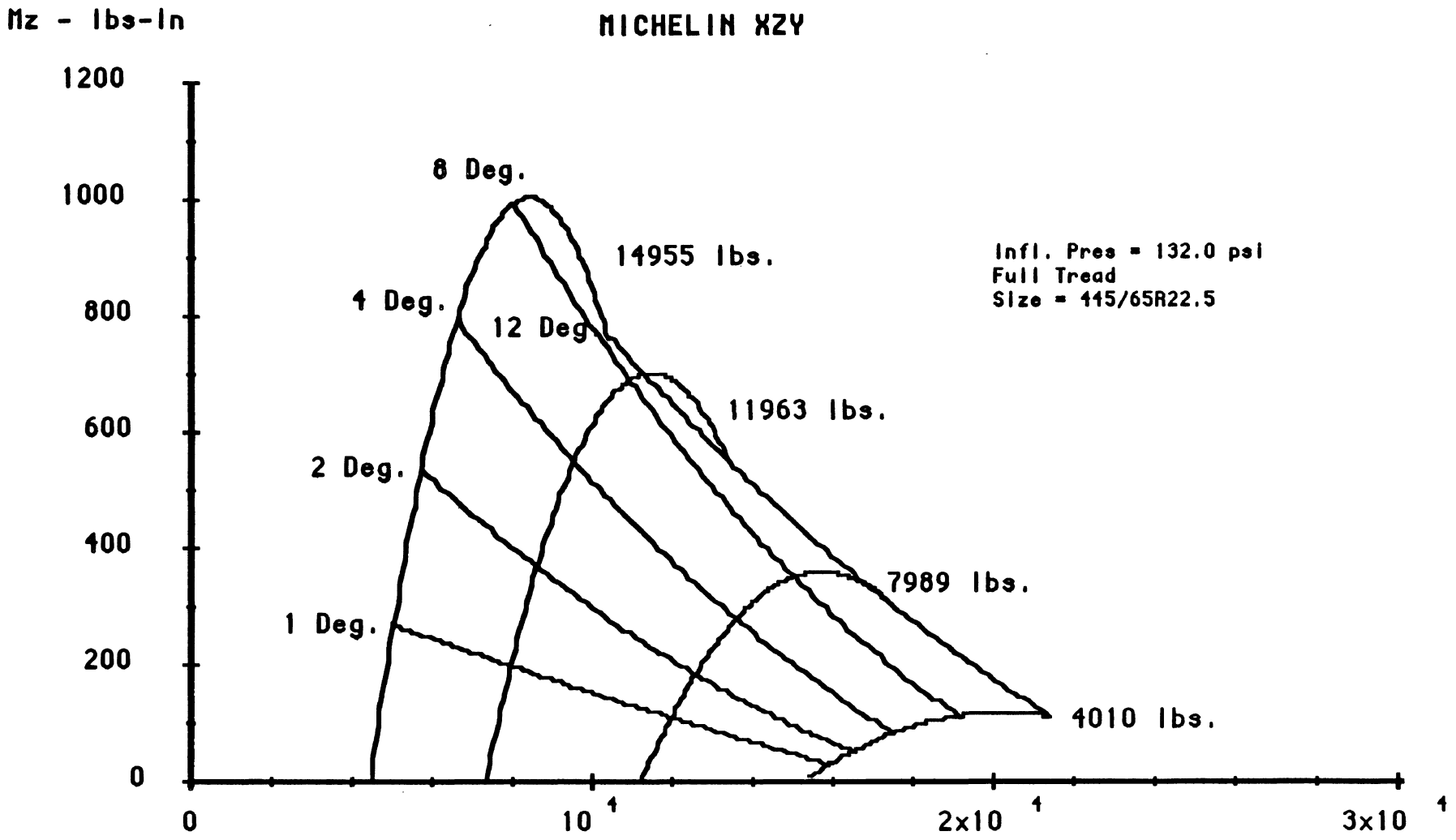
03/20/91 16:22:00 MI XZY 445/65R22.5 FUL 132PSI

Lateral Force as a Function of Slip Angle and Verticle Load



03/20/91 16:22:00 MI XZY 445/65R22.5 FUL 120PSI

Aligning Moment as a Function of Slip Angle and Verticle Load



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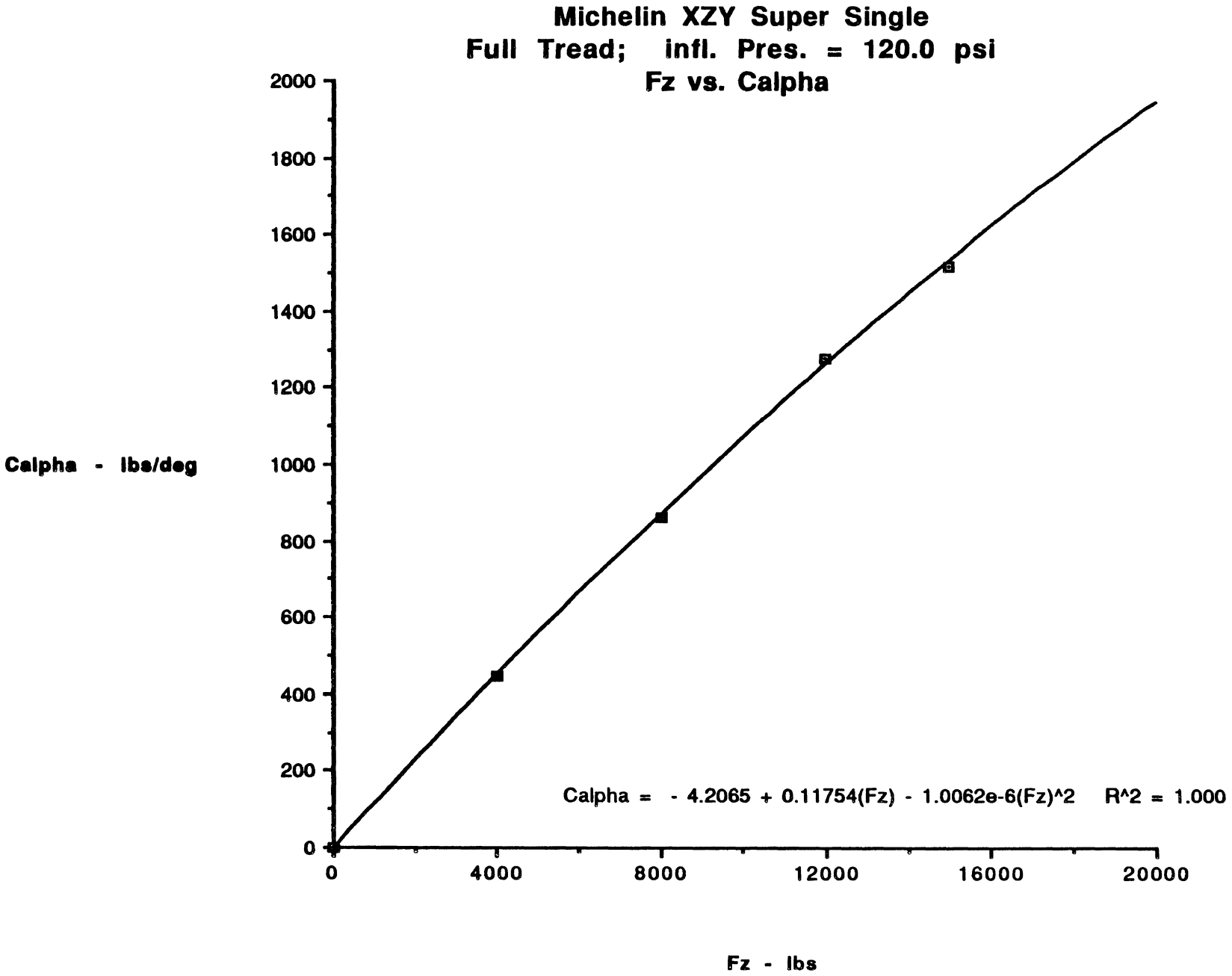
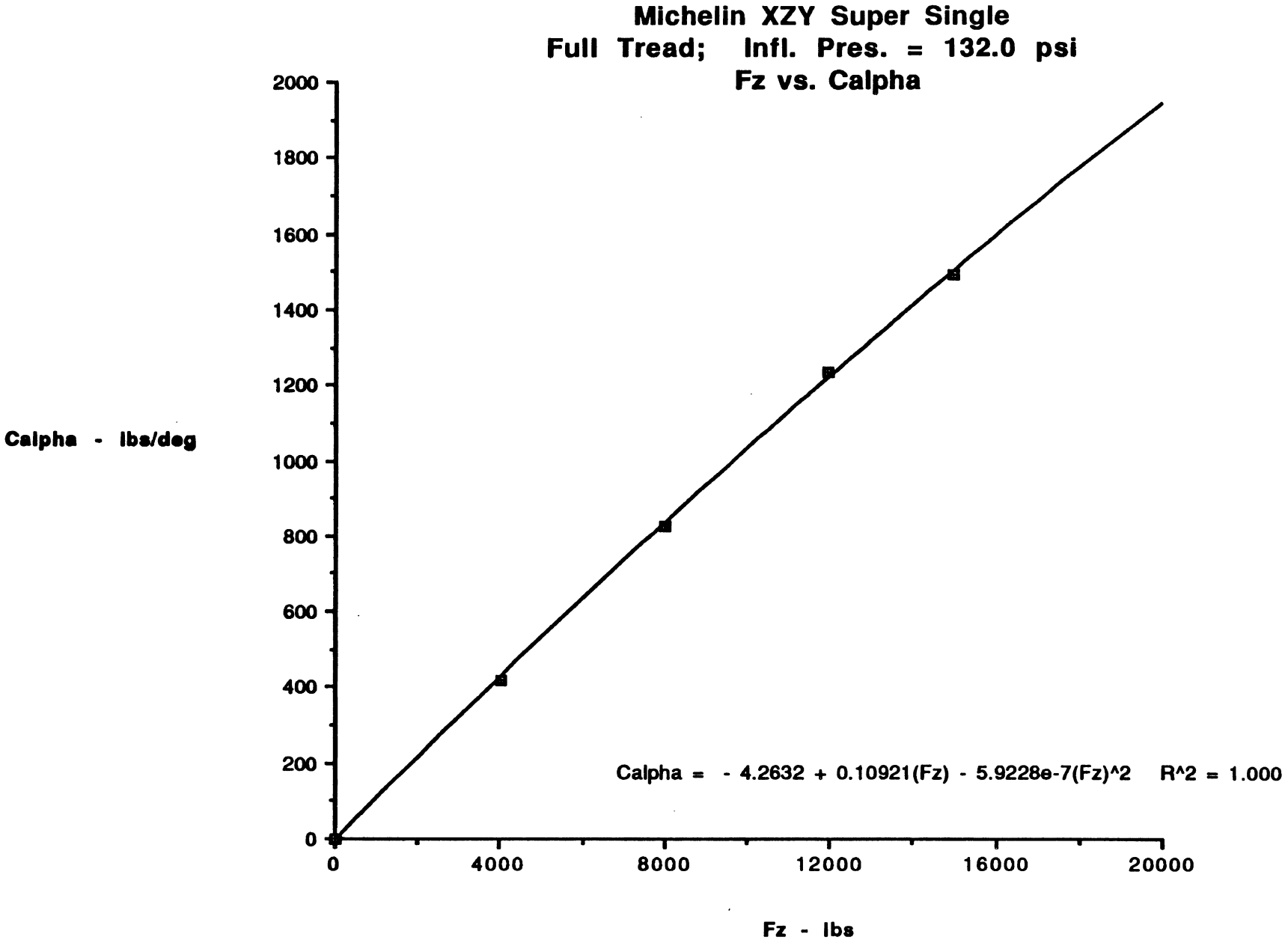
Aligning Moment as a Function of Slip Angle and Verticle Load


Michelin XZY Super Single
Full Tread; infl. Pres. = 120.0 psi
Fz vs. Calpha
Calpha - lbs/deg
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 4.2065 + 0.11754(Fz) - 1.0062e-6(Fz)^2 R^2 = 1.000


Michelin XZY Super Single
Full Tread; Infl. Pres. = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 4.2632 + 0.10921(Fz) - 5.9228e-7(Fz)^2 R^2 = 1.000

MICHELIN XZY

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 120.0 psi

Cornering Force Table

Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4008.00	0.00	444.29	834.51	1497.66	2580.16	3291.49
7985.00	0.00	863.22	1697.56	3057.90	5052.13	6237.21
11962.00	0.00	1276.53	2523.95	4560.79	7334.95	8776.06
14946.00	0.00	1518.19	3051.42	5608.10	8863.03	10508.70

Aligning Torque Table

Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4008.00	0.00	49.90	70.42	95.42	123.84	99.89
7985.00	0.00	133.05	212.94	298.87	388.34	317.92
11962.00	0.00	208.71	359.30	603.56	690.24	540.47
14946.00	0.00	260.85	544.98	813.85	970.79	761.63

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 132.0 psi

Cornering Force Table

Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4010.00	0.00	416.11	810.89	1450.51	2443.25	3265.92
7989.00	0.00	828.06	1628.49	2906.82	4820.76	6118.62
11963.00	0.00	1230.87	2429.06	4340.88	7101.02	8633.18
14955.00	0.00	1489.09	2927.39	5357.87	8605.61	10365.40

Aligning Torque Table

Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4010.00	0.00	48.54	67.34	102.19	101.70	125.58
7989.00	0.00	118.58	192.83	284.90	327.94	322.05
11963.00	0.00	196.13	368.20	566.02	611.10	551.53
14955.00	0.00	245.95	521.56	777.68	911.57	760.76

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4008.00	444.29	834.51	1497.66	2580.16	3291.49
7985.00	863.22	1697.56	3057.90	5052.13	6237.21
11962.00	1276.53	2523.95	4560.79	7334.95	8776.06
14946.00	1518.19	3051.42	5608.10	8863.03	10508.70

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4008.00	4.16	5.87	7.95	10.32	8.32
7985.00	11.09	17.74	24.91	32.36	26.49
11962.00	17.39	29.94	50.30	57.52	45.04
14946.00	21.74	45.42	67.82	80.90	63.47

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4010.00	416.11	810.89	1450.51	2443.25	3265.92
7989.00	828.06	1628.49	2906.82	4820.76	6118.62
11963.00	1230.87	2429.06	4340.88	7101.02	8633.18
14955.00	1489.09	2927.39	5357.87	8605.61	10365.40

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4010.00	4.04	5.61	8.52	8.48	10.47
7989.00	9.88	16.07	23.74	27.33	26.84
11963.00	16.34	30.68	47.17	50.93	45.96
14955.00	20.50	43.46	64.81	75.96	63.40

MICHELIN XZY

RTAC and Phase IV Data

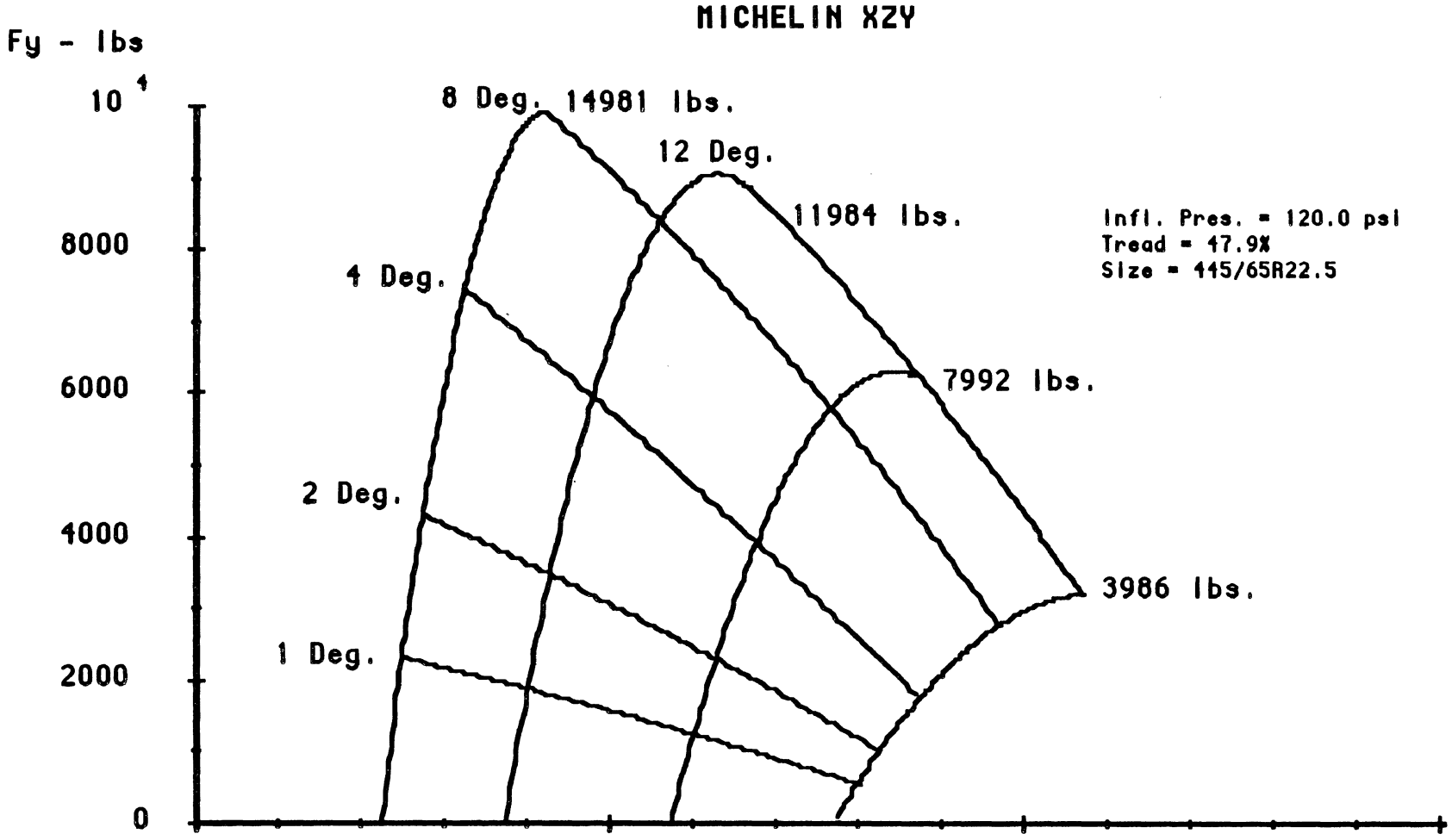
FULL TREAD, PSI = 120
TIRE,21.0,XXX
STIFFYZ,XXX,6624.5
ALIGN, 214.17
CALFA, 1289.31
TABLE
CALFA,4,1
4008.0 7985.0 11962.0 14946.0
2.1
1,1,5
1, 0.111
2, 0.208
4, 0.374
8, 0.644
12, 0.821
2,1,5
1, 0.108
2, 0.213
4, 0.383
8, 0.633
12, 0.781
3,1,5
1, 0.107
2, 0.211
4, 0.381
8, 0.613
12, 0.734
4,1,5
1, 0.102
2, 0.204
4, 0.375
8, 0.593
12, 0.703

FULL TREAD, PSI = 132
TIRE,21.2,XXX
STIFFYZ,XXX,7114.33
ALIGN, 196.58
CALFA, 1249.41
TABLE
CALFA,4,1
4010.0 7989.0 11963.0 14955.0
2.1
1,1,5
1, 0.104
2, 0.202
4, 0.362
8, 0.609
12, 0.814
2,1,5
1, 0.104
2, 0.204
4, 0.364
8, 0.603
12, 0.766
3,1,5
1, 0.103
2, 0.203
4, 0.363
8, 0.594
12, 0.722
4,1,5
1, 0.100
2, 0.196
4, 0.358
8, 0.575
12, 0.693

Michelin XZY

445/65 R 22.5 L

1/2 Tread



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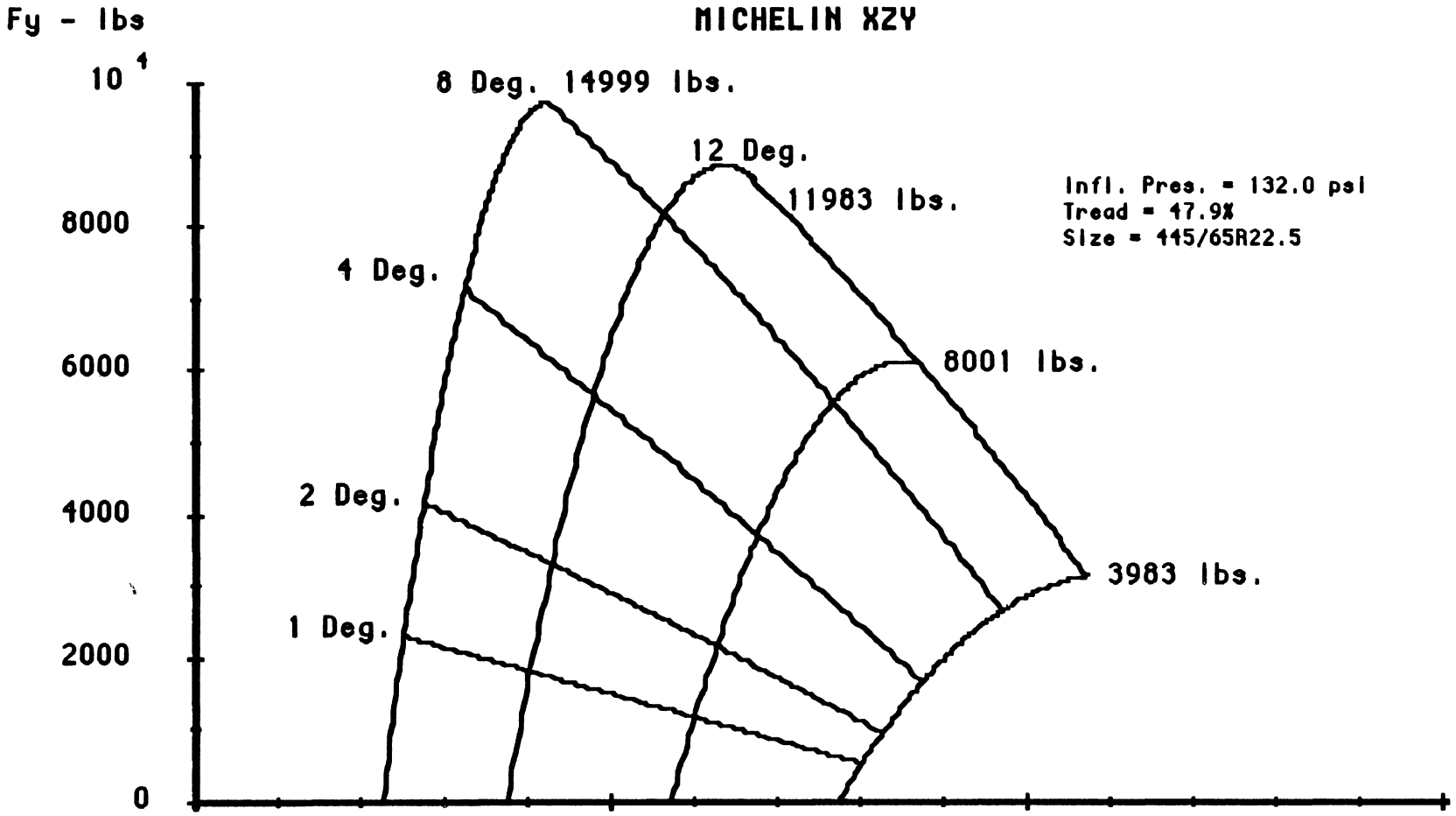
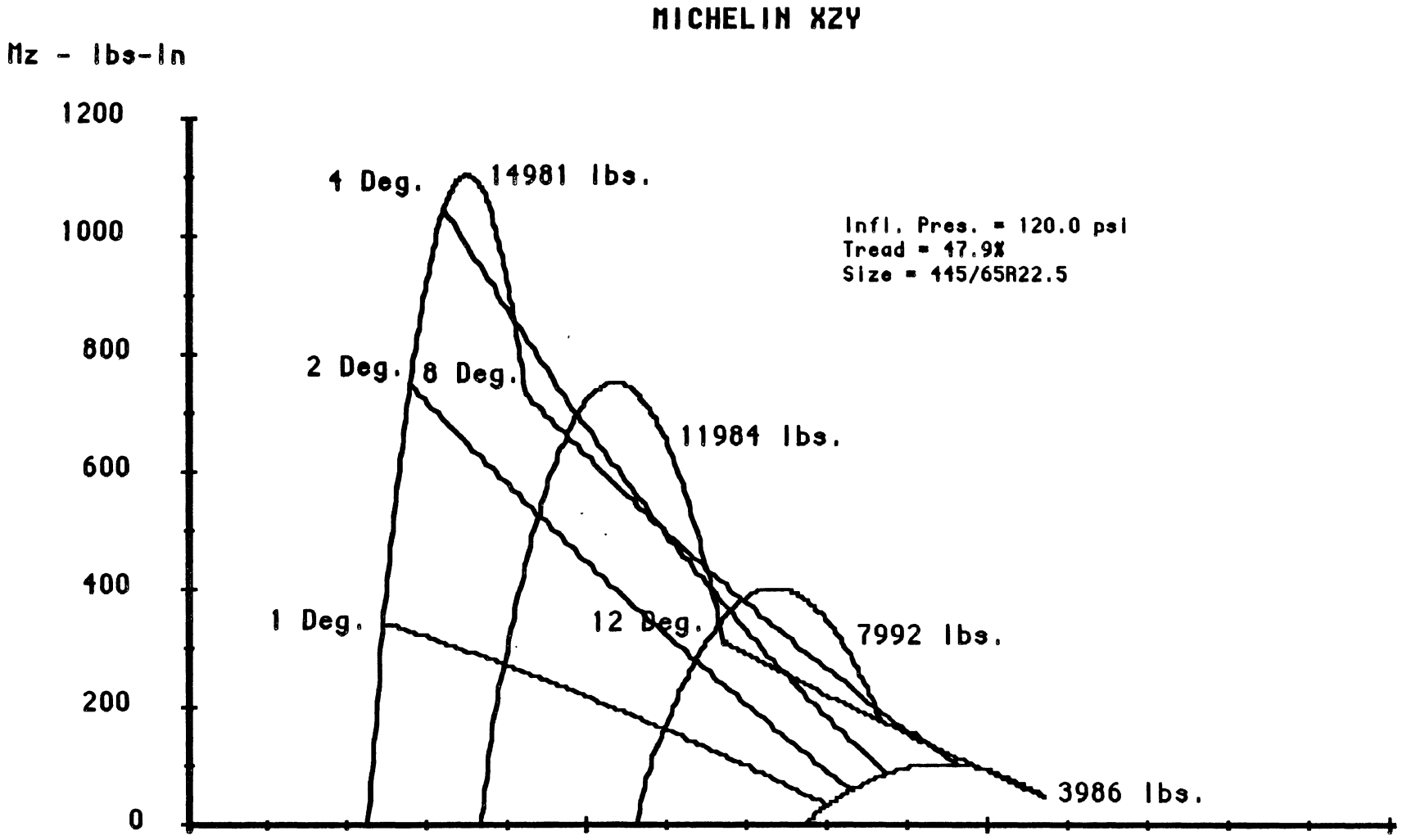
Lateral Force as a Function of Slip Angle and Verticle Load



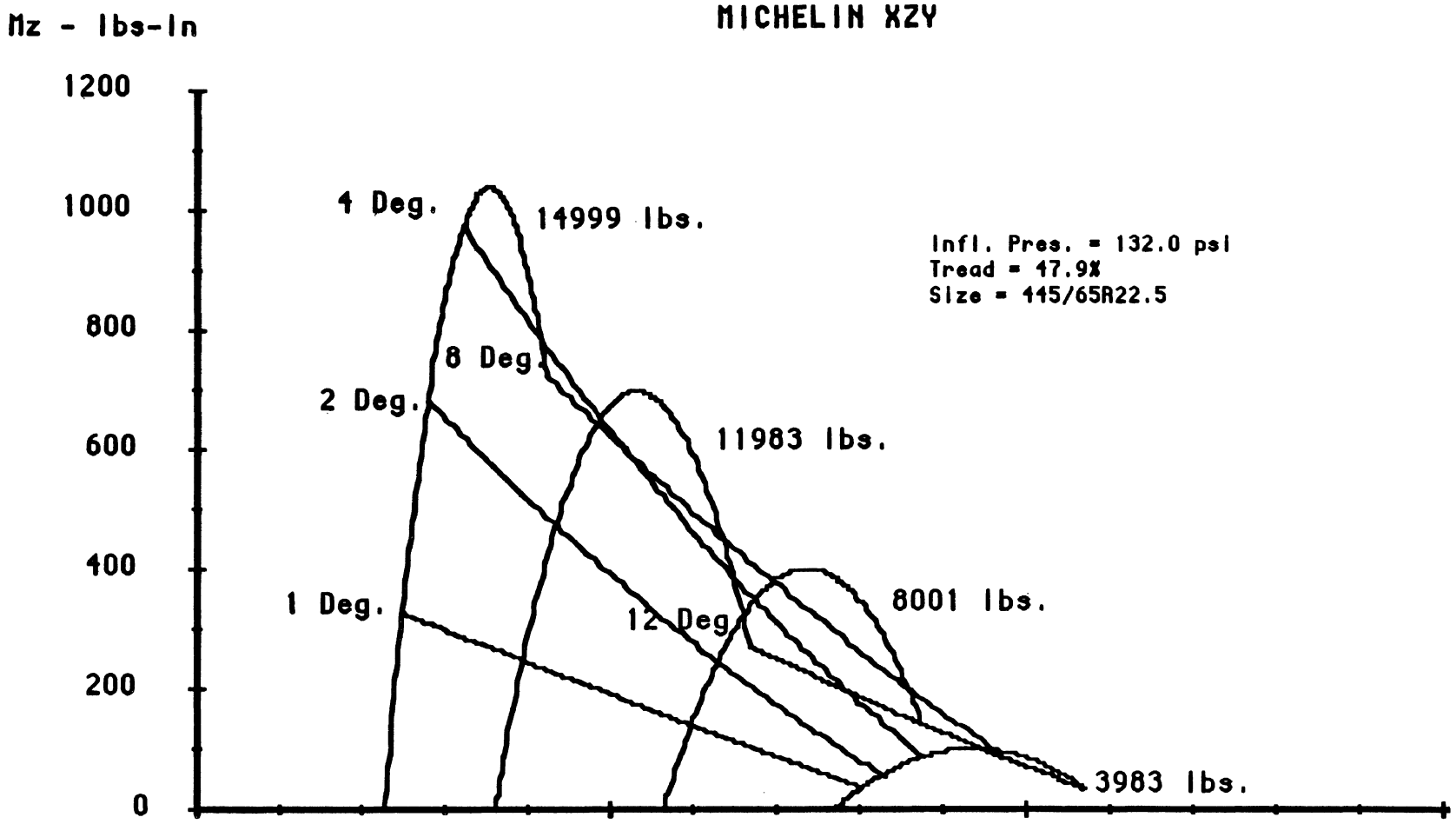
04/17/91 10:46:53 MI XZY 445/65R22.5 1/2 132PSI

Lateral Force as a Function of Slip Angle and Verticle Load



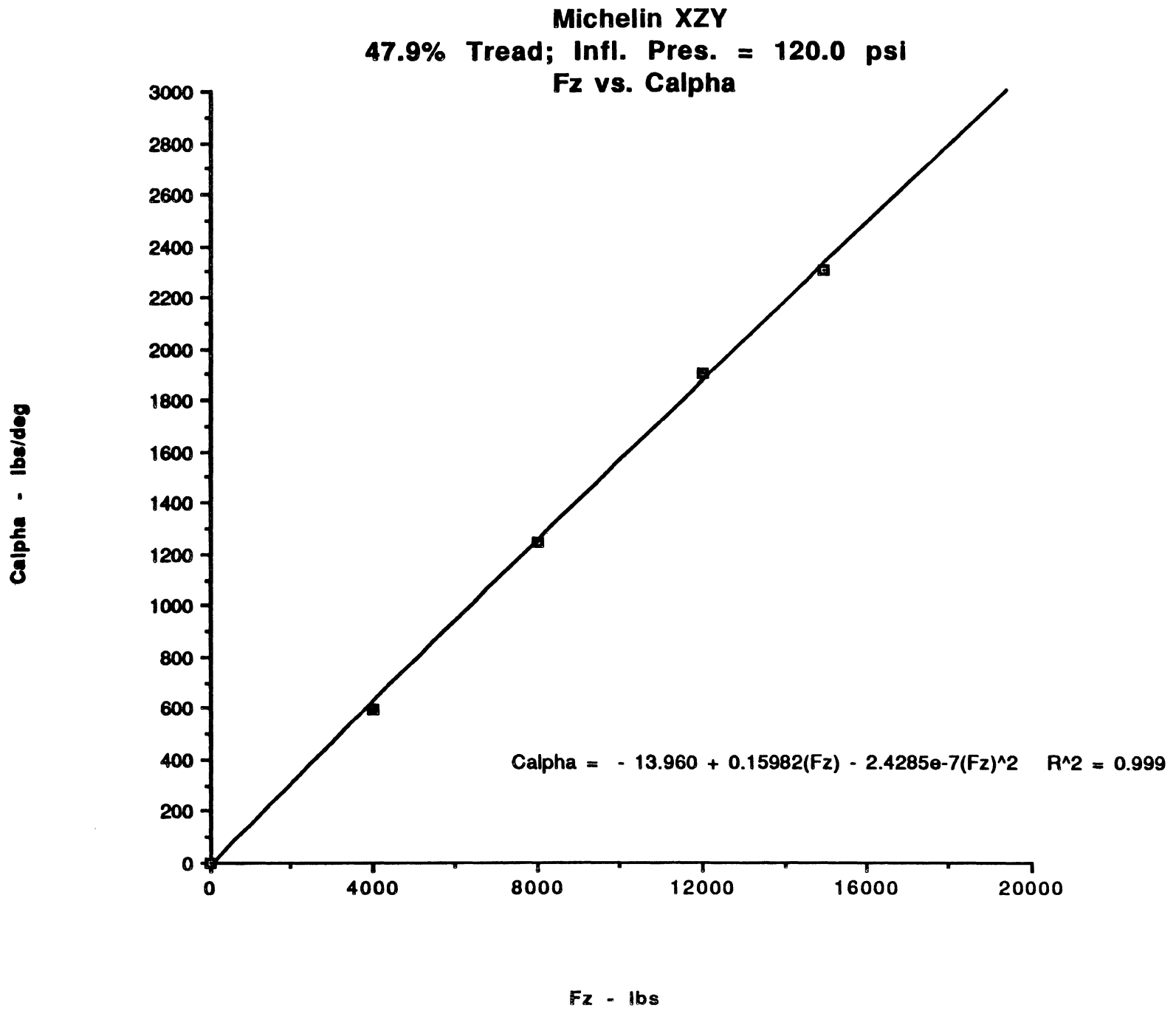
04/17/91 10:46:53 MI XZY 445/65R22.5 1/2 120PSI

Aligning Moment as a Function of Slip Angle and Verticle Load

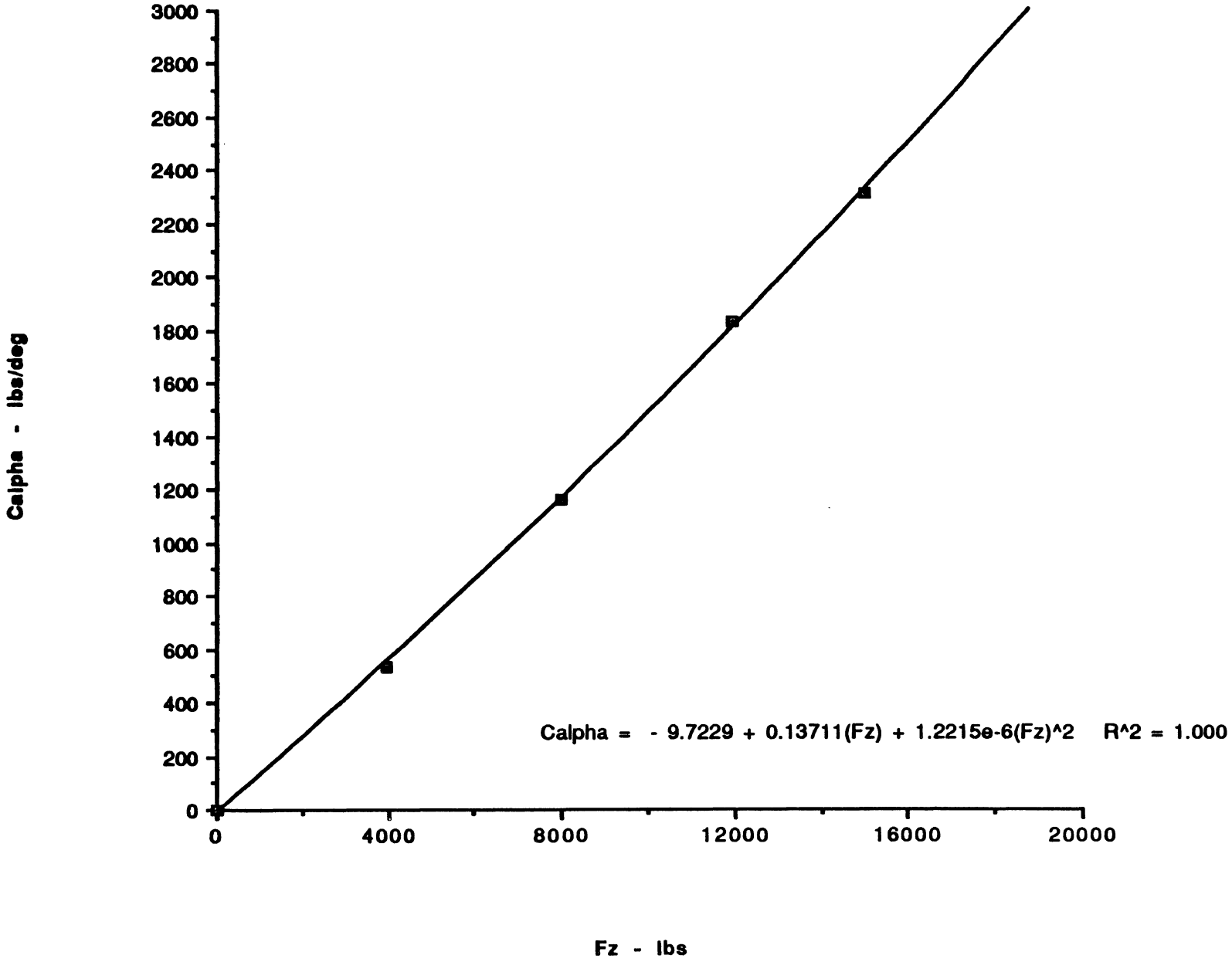


04/17/91 10:46:53 MI XZY 445/65R22.5 1/2 132PSI

Aligning Moment as a Function of Slip Angle and Verticle Load


Michelin XZY
47.9% Tread; Infl. Pres. = 120.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 13.960 + 0.15982(Fz) - 2.4285e-7(Fz)^2 R^2 = 0.999

Michelin XZY
47.9% Tread; Infl. Pres. = 132.0 psi
Fz vs. Calpha



MICHELIN XZY

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; 47.9% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3986.00	0.00	591.72	1031.05	1753.01	2654.87	3140.17
7992.00	0.00	1244.68	2283.66	3941.51	5704.90	6290.12
11984.00	0.00	1904.89	3528.47	6035.66	8232.14	8934.03
14981.00	0.00	2304.05	4298.73	7456.78	9918.00	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3986.00	0.00	42.90	66.51	89.84	89.10	53.18
7992.00	0.00	164.10	273.08	374.47	296.20	172.88
11984.00	0.00	273.10	559.41	725.16	529.37	310.23
14981.00	0.00	341.22	743.15	1041.27	731.68	

Size = 445/65R22.5 L; 47.9% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3983.00	0.00	535.85	980.52	1661.91	2557.10	3073.40
8001.00	0.00	1165.70	2161.75	3682.46	5473.58	6156.98
11983.00	0.00	1832.43	3365.55	5743.31	8030.54	8767.84
14999.00	0.00	2307.69	4146.23	7134.47	9736.61	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3983.00	0.00	41.76	65.50	89.86	85.37	39.21
8001.00	0.00	135.38	249.17	339.70	282.42	160.53
11983.00	0.00	253.39	492.33	682.53	513.99	295.70
14999.00	0.00	323.16	685.23	966.46	699.98	

MICHELIN XZY

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; 47.9% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3986.00	591.72	1031.05	1753.01	2654.87	3140.17
7992.00	1244.68	2283.66	3941.51	5704.90	6290.12
11984.00	1904.89	3528.47	6035.66	8232.14	8934.03
14981.00	2304.05	4298.73	7456.78	9918.00	10763.63 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3986.00	3.57	5.54	7.49	7.42	4.43
7992.00	13.67	22.76	31.21	24.68	14.41
11984.00	22.76	46.62	60.43	44.11	25.85
14981.00	28.43	61.93	86.77	60.97	35.73 *

Size = 445/65R22.5 L; 47.9% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3983.00	535.85	980.52	1661.91	2557.10	3073.40
8001.00	1165.70	2161.75	3682.46	5473.58	6156.98
11983.00	1832.43	3365.55	5743.31	8030.54	8767.84
14999.00	2307.69	4146.23	7134.47	9736.61	10630.55 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3983.00	3.48	5.46	7.49	7.11	3.27
8001.00	11.28	20.76	28.31	23.54	13.38
11983.00	21.12	41.03	56.88	42.83	24.64
14999.00	26.93	57.10	80.54	58.33	33.56 *

*Estimate

MICHELIN XZY

RTAC and Phase IV Data

47.9% TREAD, PSI = 120
TIRE,20.7,XXX
STIFFYZ,XXX,6697.3
ALIGN, 269.65
CALFA, 1915.09
TABLE
CALFA,4,1
3986.0 7992.0 11984.0 14981.0
2.1
1,1,5
1, 0.148
2, 0.259
4, 0.440
8, 0.666
12, 0.788
2,1,5
1, 0.156
2, 0.286
4, 0.493
8, 0.714
12, 0.787
3,1,5
1, 0.159
2, 0.294
4, 0.504
8, 0.687
12, 0.745
4,1,5
1, 0.154
2, 0.287
4, 0.498
8, 0.662
12, 0.718 *

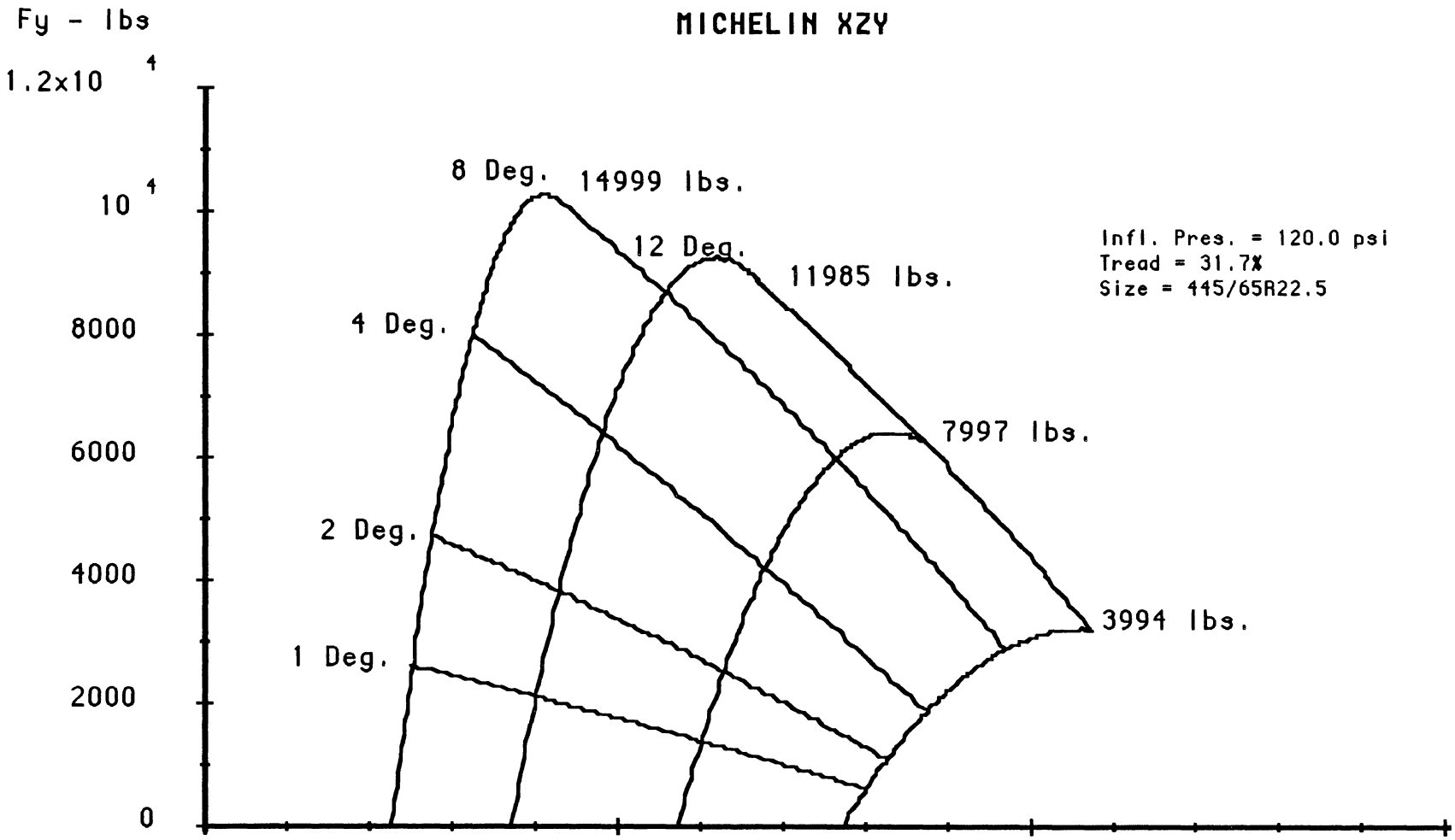
47.9% TREAD, PSI = 132
TIRE,20.9,XXX
STIFFYZ,XXX,7166.8
ALIGN, 247.97
CALFA, 1861.53
TABLE
CALFA,4,1
3983.0 8001.0 11983.0 14999.0
2.1
1,1,5
1, 0.135
2, 0.246
4, 0.417
8, 0.642
12, 0.772
2,1,5
1, 0.146
2, 0.270
4, 0.460
8, 0.684
12, 0.770
3,1,5
1, 0.153
2, 0.281
4, 0.479
8, 0.670
12, 0.732
4,1,5
1, 0.154
2, 0.276
4, 0.476
8, 0.649
12, 0.709 *

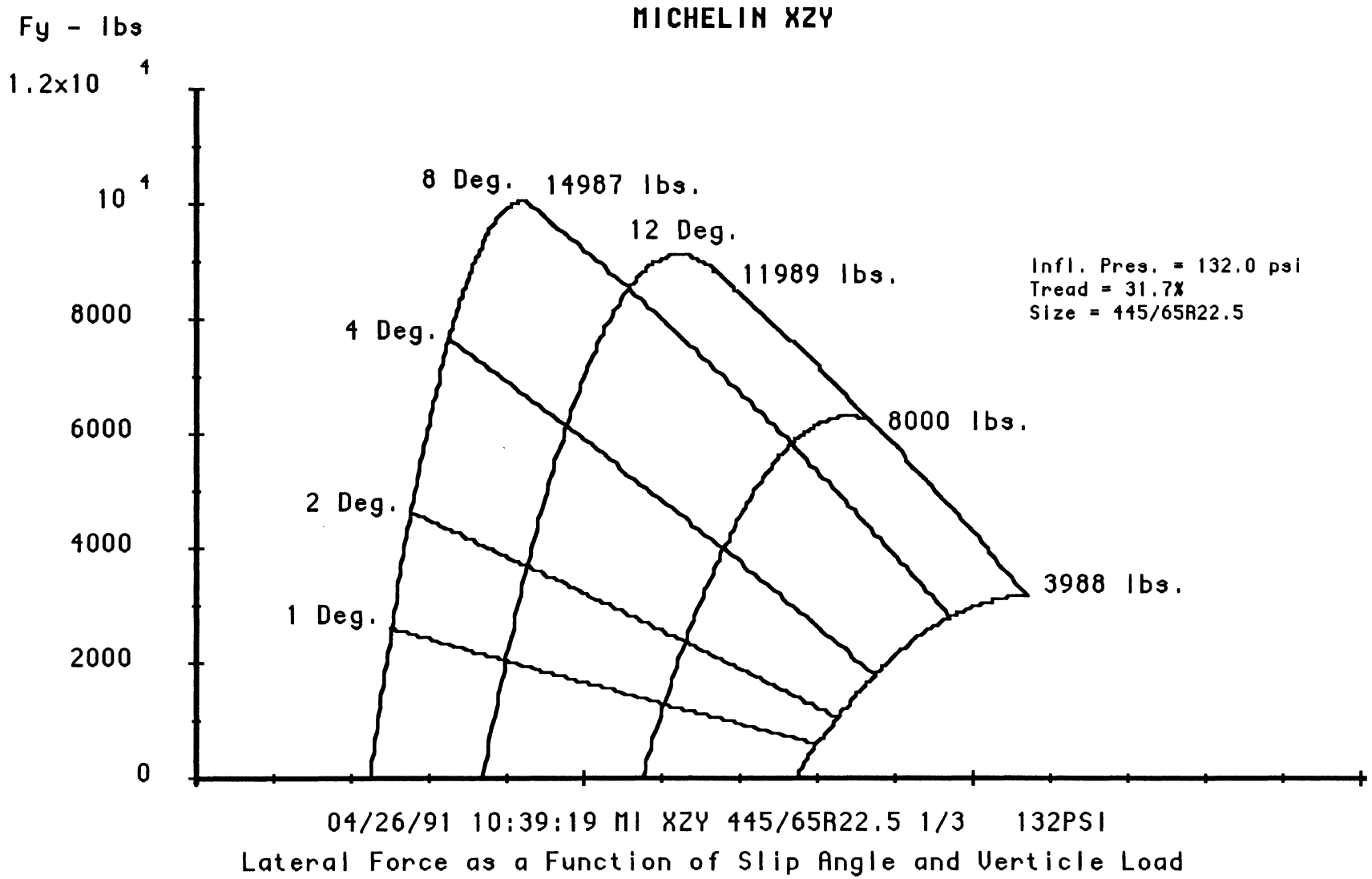
*Estimate

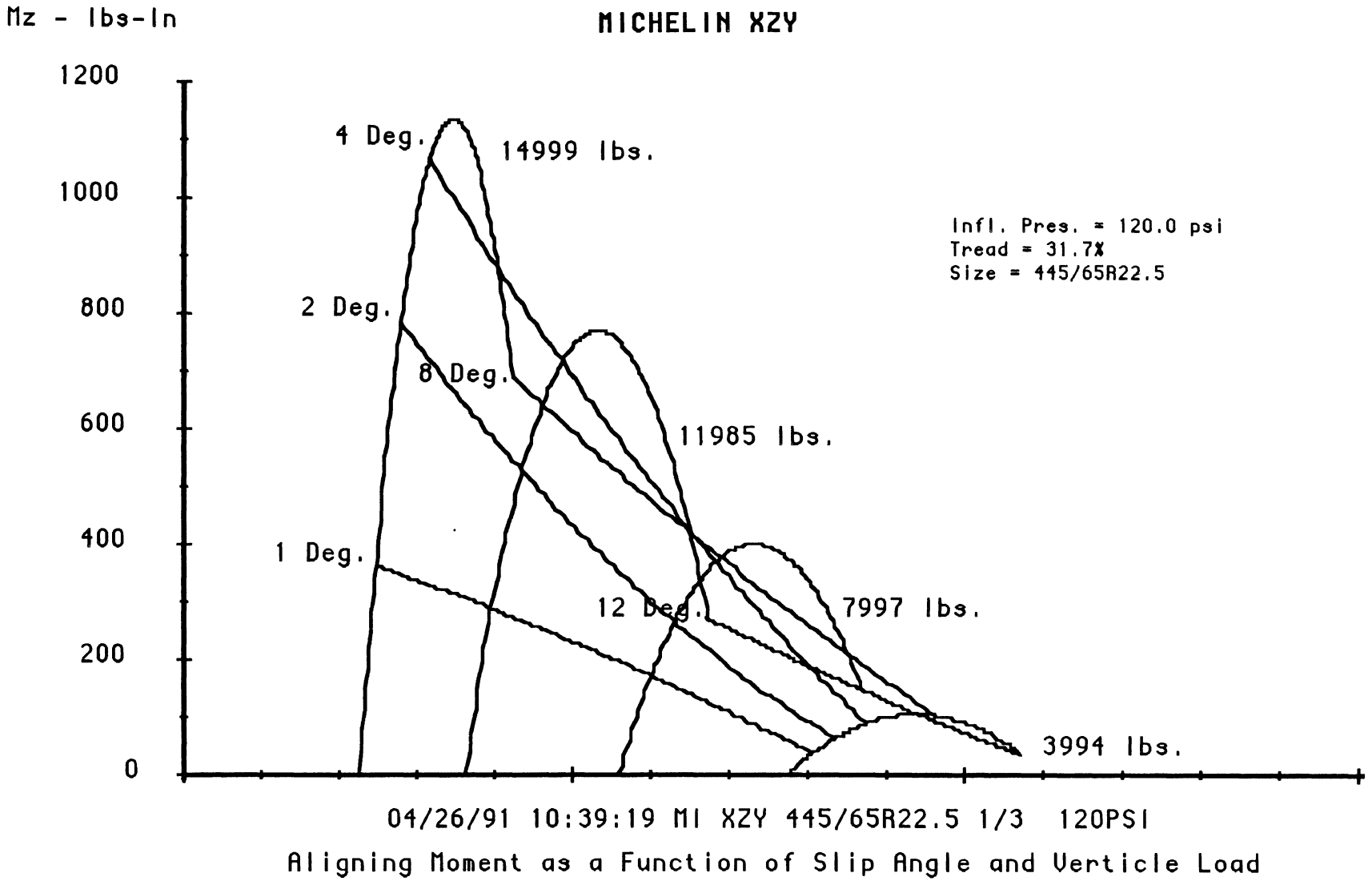
Michelin XZY

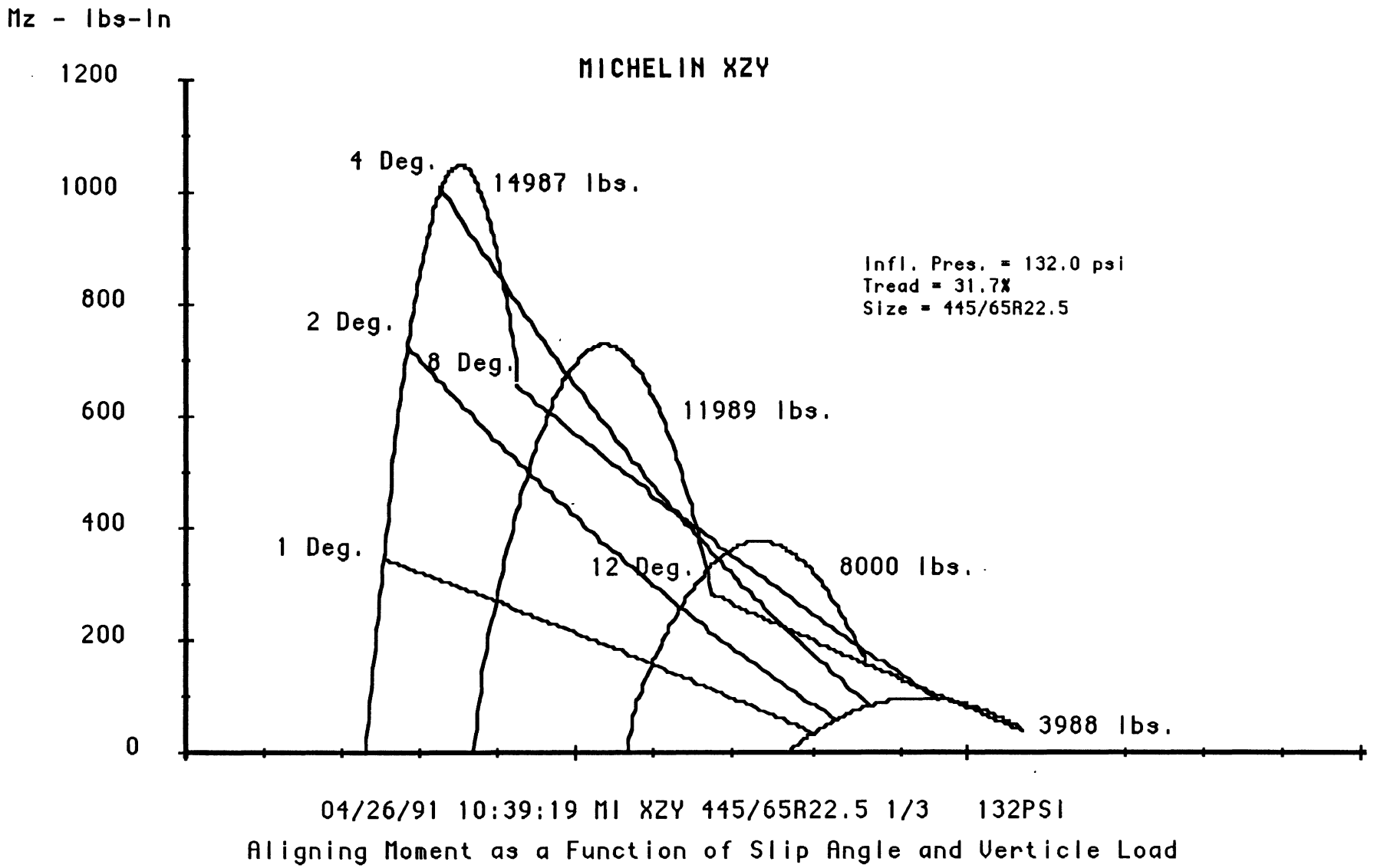
445/65 R 22.5 L

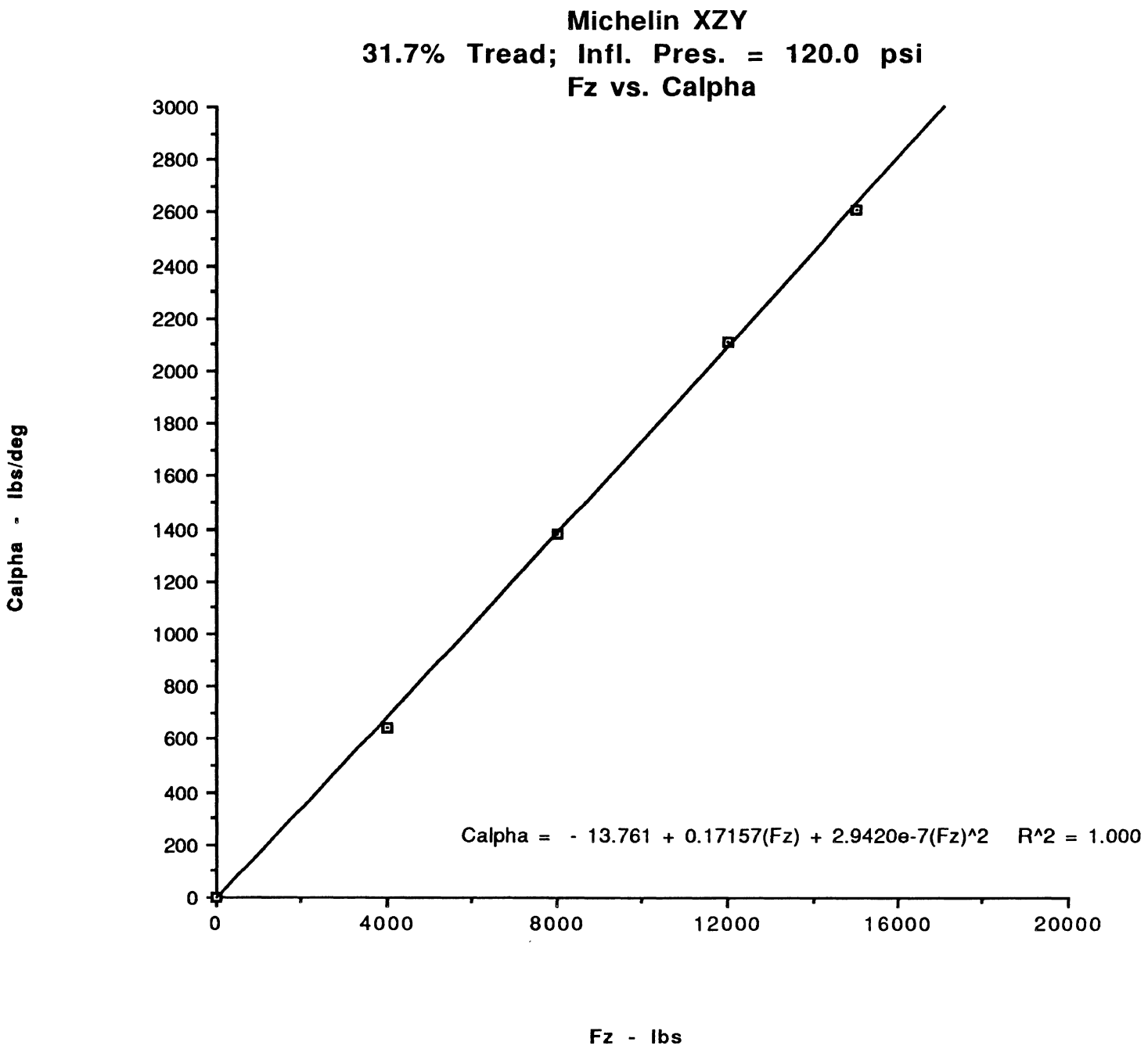
1/3 Tread

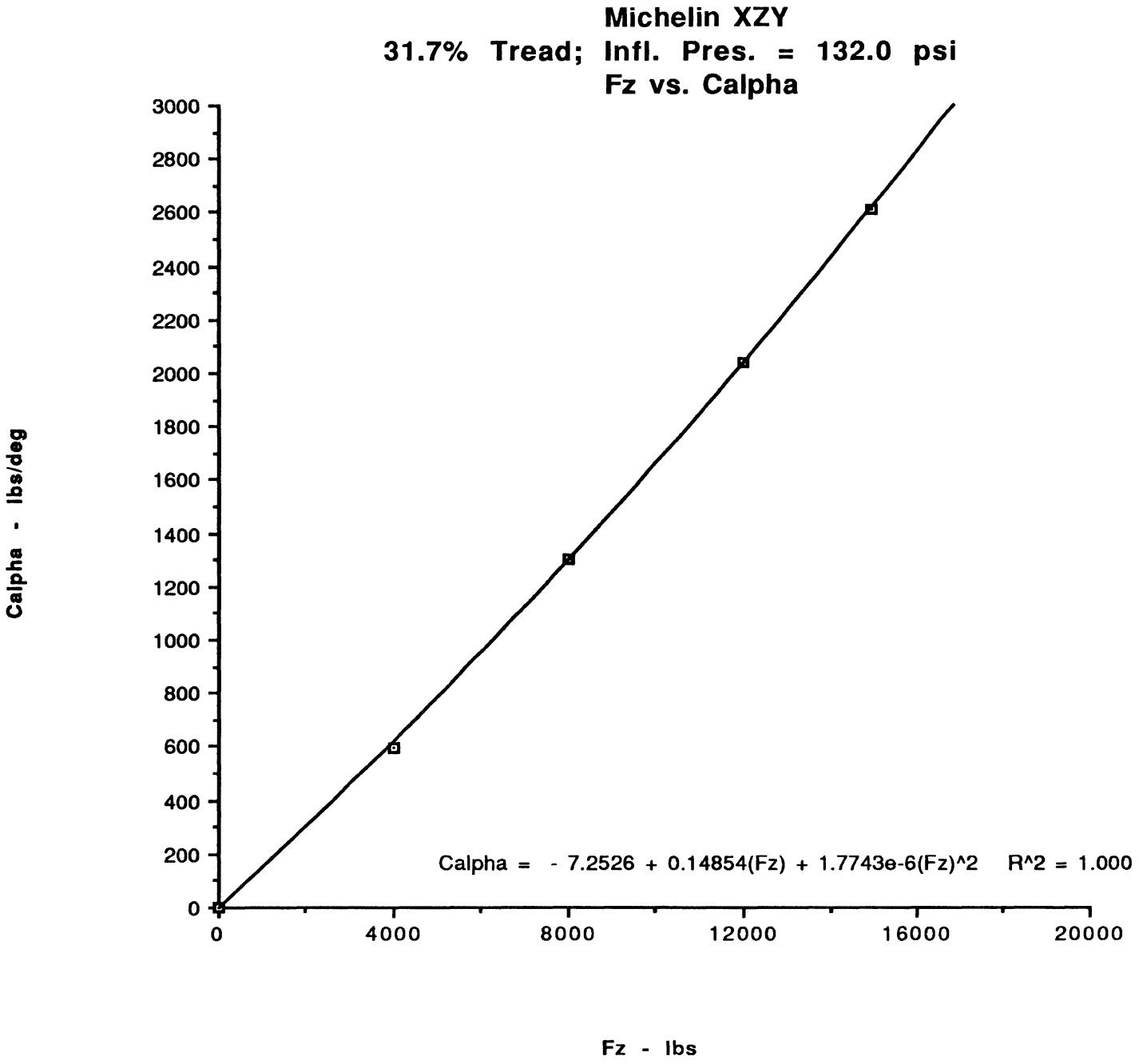

MICHELIN XZY
Fy - lbs
1.2x10 4
10 4
8000
6000
4000
2000
0
8 Deg.
14999 lbs.
12 Deg.
11985 lbs.
4 Deg.
7997 lbs.
2 Deg.
3994 lbs.
1 Deg.
Infl. Pres. = 120.0 psi
Tread = 31.7%
Size = 445/65R22.5
04/26/91 10:39:19 MI XZY 445/65R22.5 1/3 120PSI
Lateral Force as a Function of Slip Angle and Verticle Load


MICHELIN XZY
Fy - lbs
1.2x10 4
10 4
8000
6000
4000
2000
0
8 Deg. 14987 lbs.
12 Deg.
11989 lbs.
4 Deg.
8000 lbs.
2 Deg.
3988 lbs.
1 Deg.
Infl. Pres. = 132.0 psi
Tread = 31.7%
Size = 445/65R22.5
04/26/91 10:39:19 MI XZY 445/65R22.5 1/3 132PSI
Lateral Force as a Function of Slip Angle and Verticle Load


Mz - lbs-In
MICHELIN XZY
1200
1000
800
600
400
200
0
4 Deg.
14999 lbs.
2 Deg.
8 Deg.
11985 lbs.
1 Deg.
12 Deg.
7997 lbs.
3994 lbs.
Infl. Pres. = 120.0 psi
Tread = 31.7%
Size = 445/65R22.5
04/26/91 10:39:19 MI XZY 445/65R22.5 1/3 120PSI
Aligning Moment as a Function of Slip Angle and Verticle Load


Mz - lbs-In
MICHELIN XZY
1200
1000
800
600
400
200
0
4 Deg.
14987 lbs.
2 Deg.
8 Deg.
11989 lbs.
1 Deg.
12 Deg.
8000 lbs.
3988 lbs.
Infl. Pres. = 132.0 psi
Tread = 31.7%
Size = 445/65R22.5
04/26/91 10:39:19 MI XZY 445/65R22.5 1/3 132PSI
Aligning Moment as a Function of Slip Angle and Verticle Load


Michelin XZY
31.7% Tread; Infl. Pres. = 120.0 psi
Fz vs. Calpha
Calpha - lbs/deg
Fz - lbs
Calpha = - 13.761 + 0.17157(Fz) + 2.9420e-7(Fz)^2 R^2 = 1.000
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
0
4000
8000
12000
16000
20000


Michelin XZY
31.7% Tread; Infl. Pres. = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 7.2526 + 0.14854(Fz) + 1.7743e-6(Fz)^2 R^2 = 1.000

MICHELIN XZY

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; 31.7% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3994.00	0.00	646.44	1120.66	1879.94	2783.20	3162.17
7997.00	0.00	1382.12	2512.19	4255.08	5839.92	6344.24
11985.00	0.00	2113.09	3856.20	6431.55	8425.67	8985.45
14999.00	0.00	2608.33	4708.78	8007.25	10218.30	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3994.00	0.00	48.68	74.17	93.92	85.88	48.44
7997.00	0.00	172.26	300.18	381.98	280.54	154.13
11985.00	0.00	296.29	522.20	750.87	502.96	273.84
14999.00	0.00	359.90	805.29	1051.69	683.22	

Size = 445/65R22.5 L; 31.7% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3988.00	0.00	596.58	1065.26	1764.49	2660.71	3086.38
8000.00	0.00	1300.83	2379.97	4000.94	5701.31	6246.76
11989.00	0.00	2039.47	3723.25	6182.05	8298.93	8923.12
14987.00	0.00	2609.95	4611.00	7637.06	10056.90	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3988.00	0.00	45.38	70.25	86.17	79.96	49.32
8000.00	0.00	153.53	260.70	349.99	274.05	159.43
11989.00	0.00	268.14	521.53	702.53	480.98	276.07
14987.00	0.00	343.68	732.98	1008.88	654.90	

MICHELIN XZY

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; 31.7% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3994.00	646.44	1120.66	1879.94	2783.20	3162.17
7997.00	1382.12	2512.19	4255.08	5839.92	6344.24
11985.00	2113.09	3856.20	6431.55	8425.67	8985.45
14999.00	2608.33	4708.78	8007.25	10218.30	10897.18 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3994.00	4.06	6.18	7.83	7.16	4.04
7997.00	14.35	25.01	31.83	23.38	12.84
11985.00	24.69	43.52	62.57	41.91	22.82
14999.00	29.99	67.11	87.64	56.94	31.00 *

Size = 445/65R22.5 L; 31.7% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3988.00	596.58	1065.26	1764.49	2660.71	3086.38
8000.00	1300.83	2379.97	4000.94	5701.31	6246.76
11989.00	2039.47	3723.25	6182.05	8298.93	8923.12
14987.00	2609.95	4611.00	7637.06	10056.90	10813.31 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3988.00	3.78	5.85	7.18	6.66	4.11
8000.00	12.79	21.73	29.17	22.84	13.29
11989.00	22.35	43.46	58.54	40.08	23.01
14987.00	28.64	61.08	84.07	54.58	31.33 *

*Estimate

MICHELIN XZY

RTAC and Phase IV Data

31.7% TREAD, PSI = 120
TIRE,20.6,XXX
STIFFYZ,XXX,6669.0
ALIGN, 287.21
CALFA, 2141.06
TABLE
CALFA,4,1
3994.0 7997.0 11985.0 14999.0
2.1
1,1,5
1, 0.162
2, 0.281
4, 0.471
8, 0.697
12, 0.792
2,1,5
1, 0.173
2, 0.314
4, 0.532
8, 0.730
12, 0.793
3,1,5
1, 0.176
2, 0.322
4, 0.537
8, 0.703
12, 0.750
4,1,5
1, 0.174
2, 0.314
4, 0.534
8, 0.681
12, 0.727 *

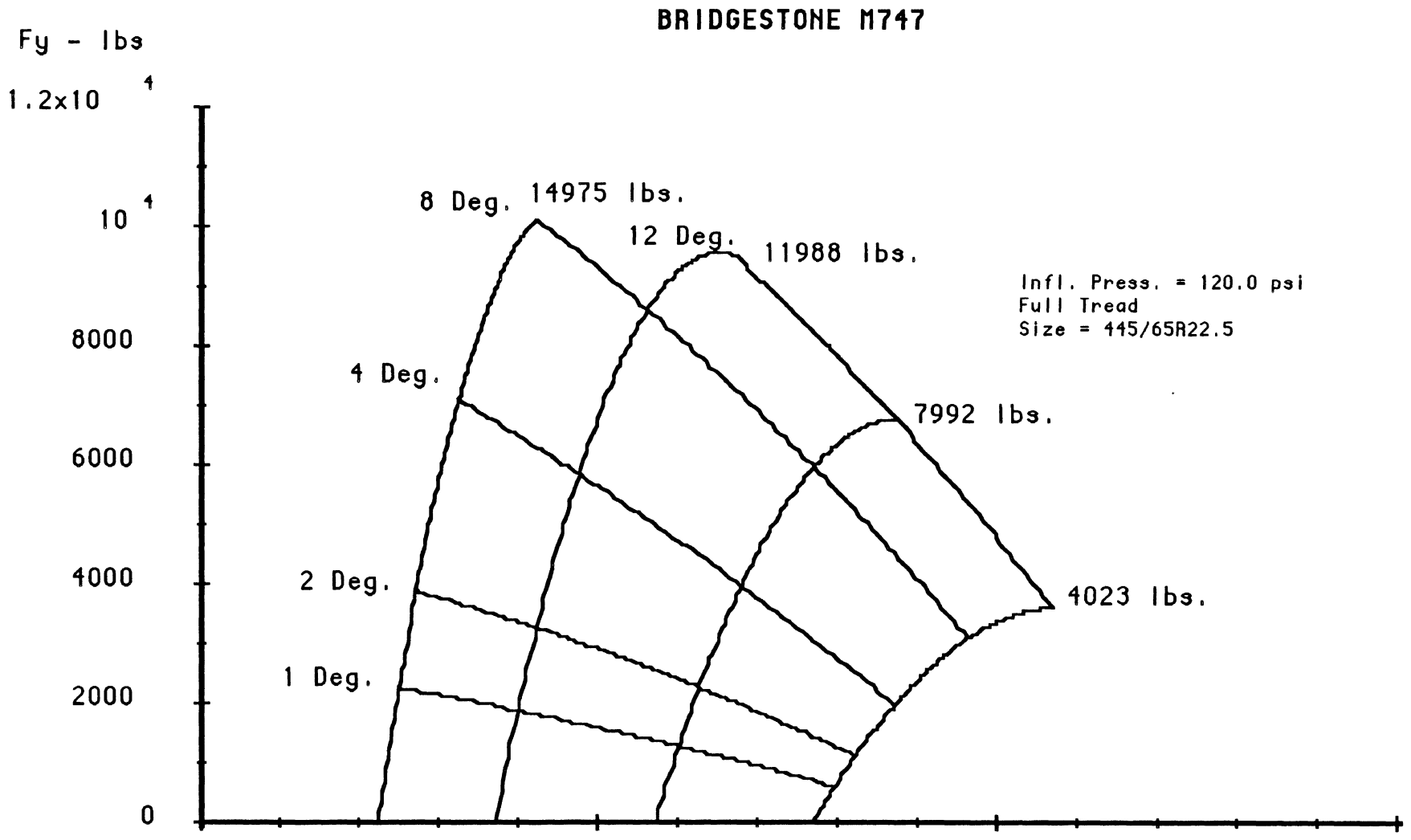
31.7% TREAD, PSI = 132
TIRE,20.8,XXX
STIFFYZ,XXX,7132.17
ALIGN, 266.05
CALFA, 2093.32
TABLE
CALFA,4,1
3988.0 8000.0 11989.0 14987.0
2.1
1,1,5
1, 0.150
2, 0.267
4, 0.442
8, 0.667
12, 0.774
2,1,5
1, 0.163
2, 0.297
4, 0.500
8, 0.713
12, 0.781
3,1,5
1, 0.170
2, 0.311
4, 0.516
8, 0.692
12, 0.744
4,1,5
1, 0.174
2, 0.308
4, 0.510
8, 0.671
12, 0.722 *

*Estimate

Bridgestone M747

445/65 R 22.5 L

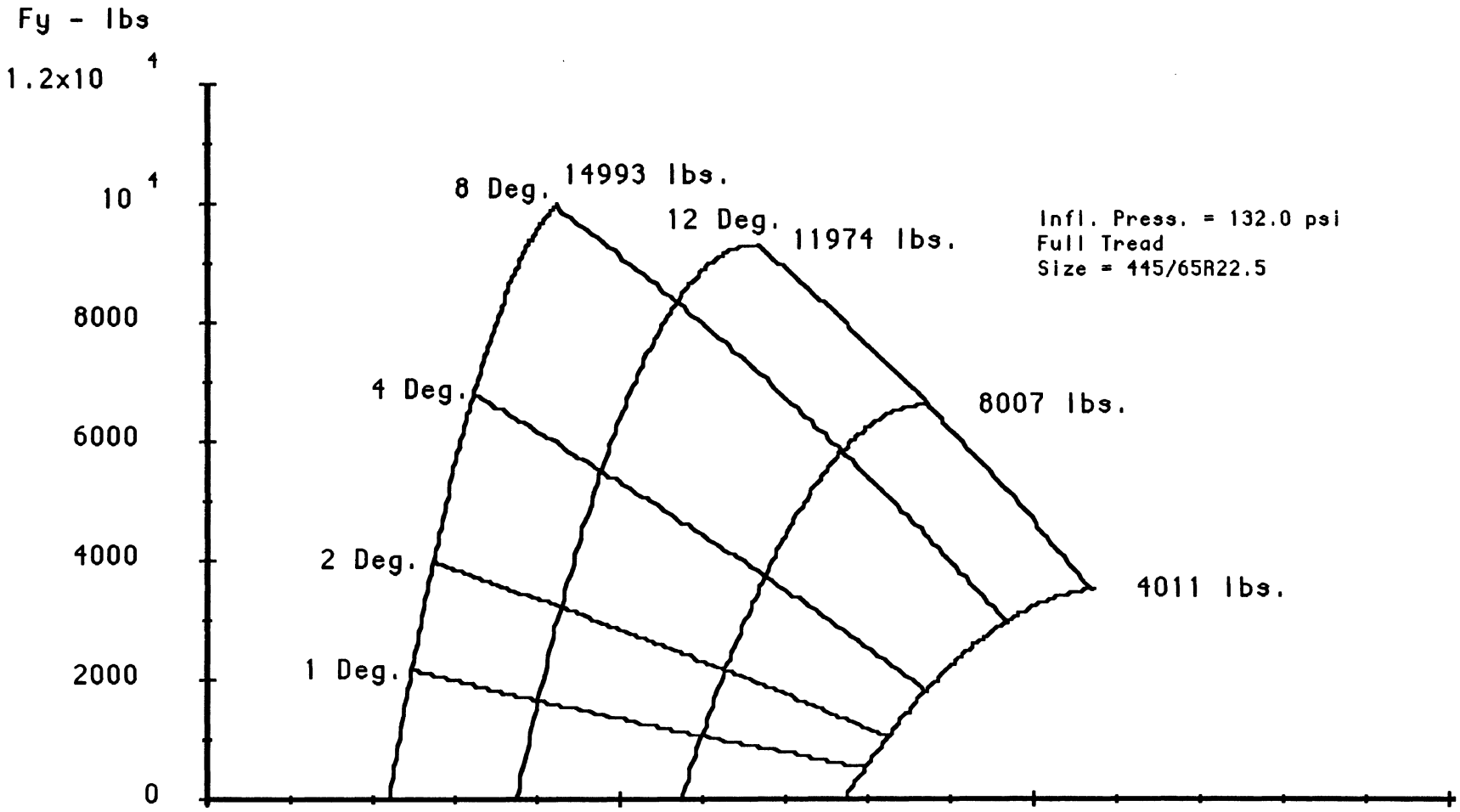
Full Tread



04/12/91 11:32:14 BR M747 445/65R22.5 FUL 120.0 PSI

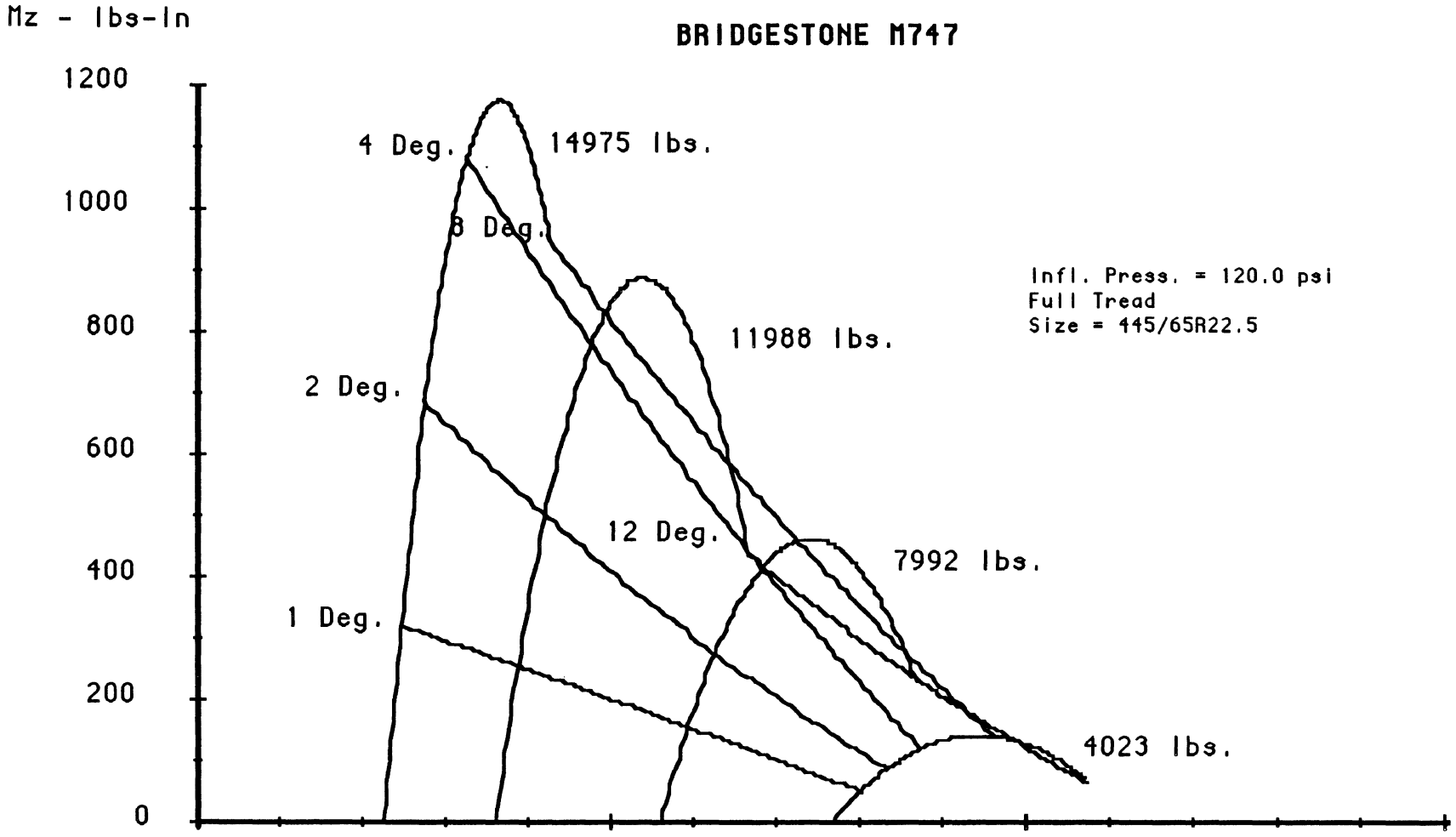
Lateral Force as a Function of Slip Angle and Verticle Load

BRIDGESTONE M747



04/12/91 11:32:14 BR M747 445/65R22.5 FUL 132.0 PSI

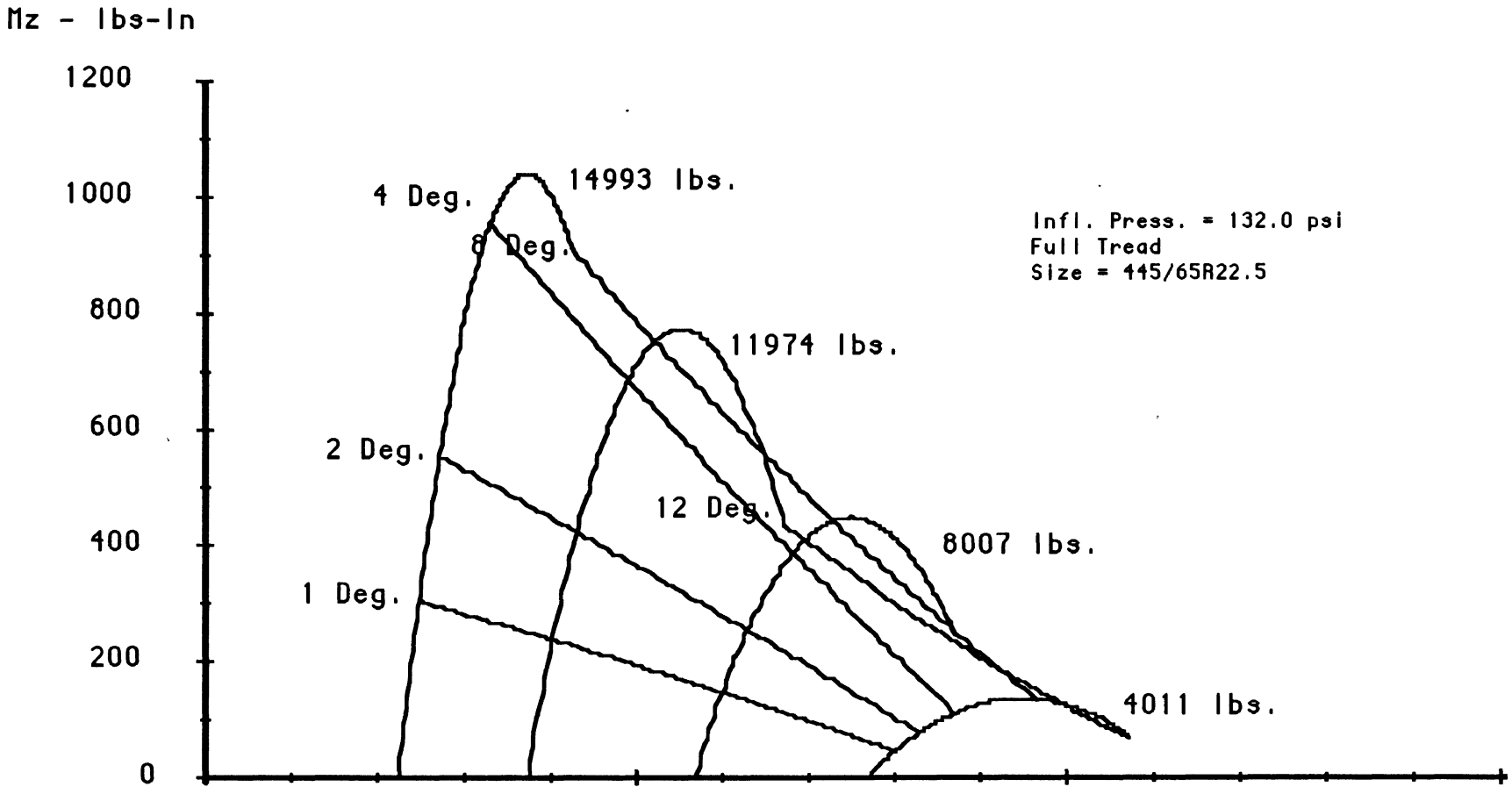
Lateral Force as a Function of Slip Angle and Verticle Load



04/12/91 11:32:14 BR M747 445/65R22.5 FUL 120.0 PSI

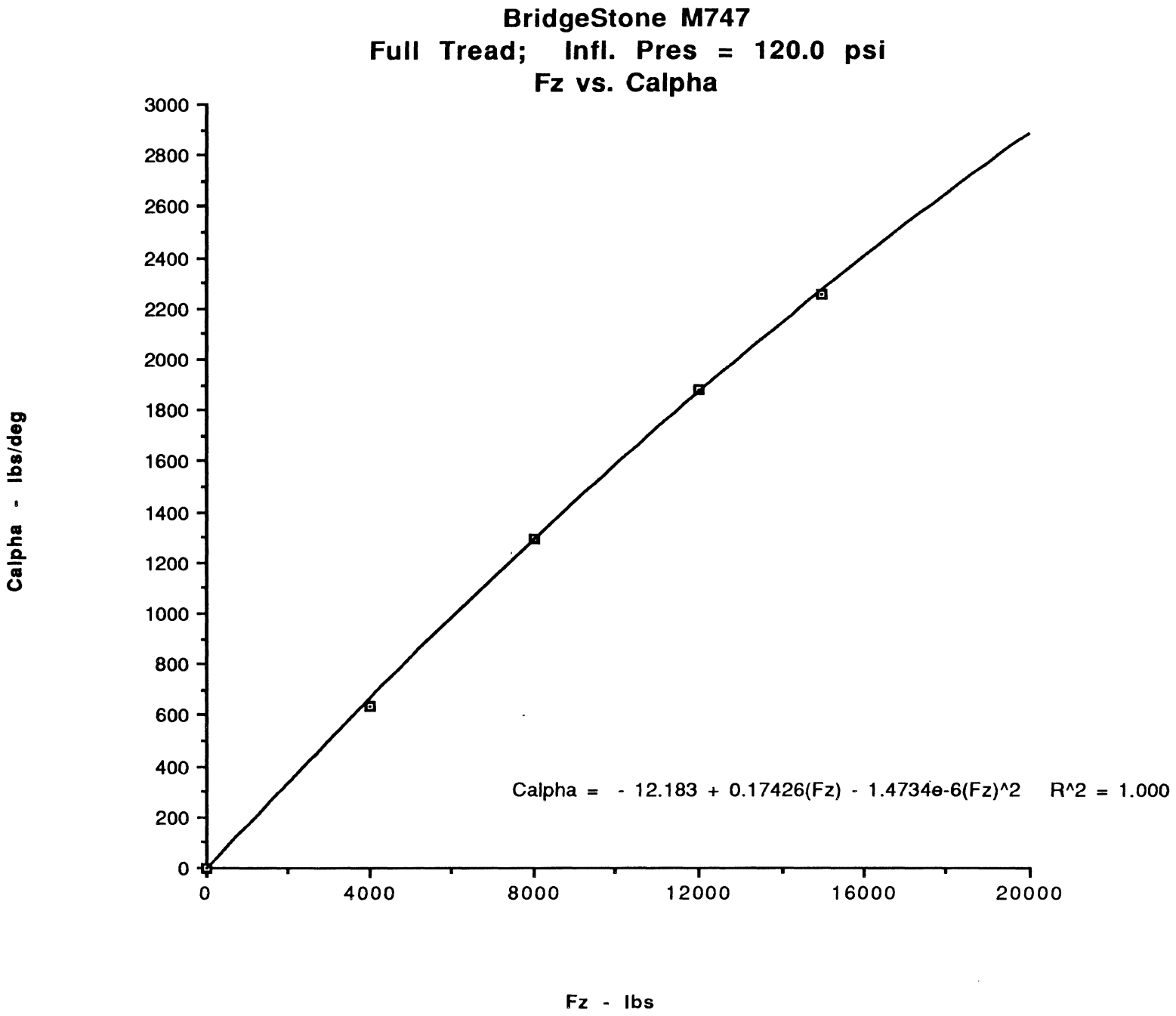
Aligning Moment as a Function of Slip Angle and Verticle Load

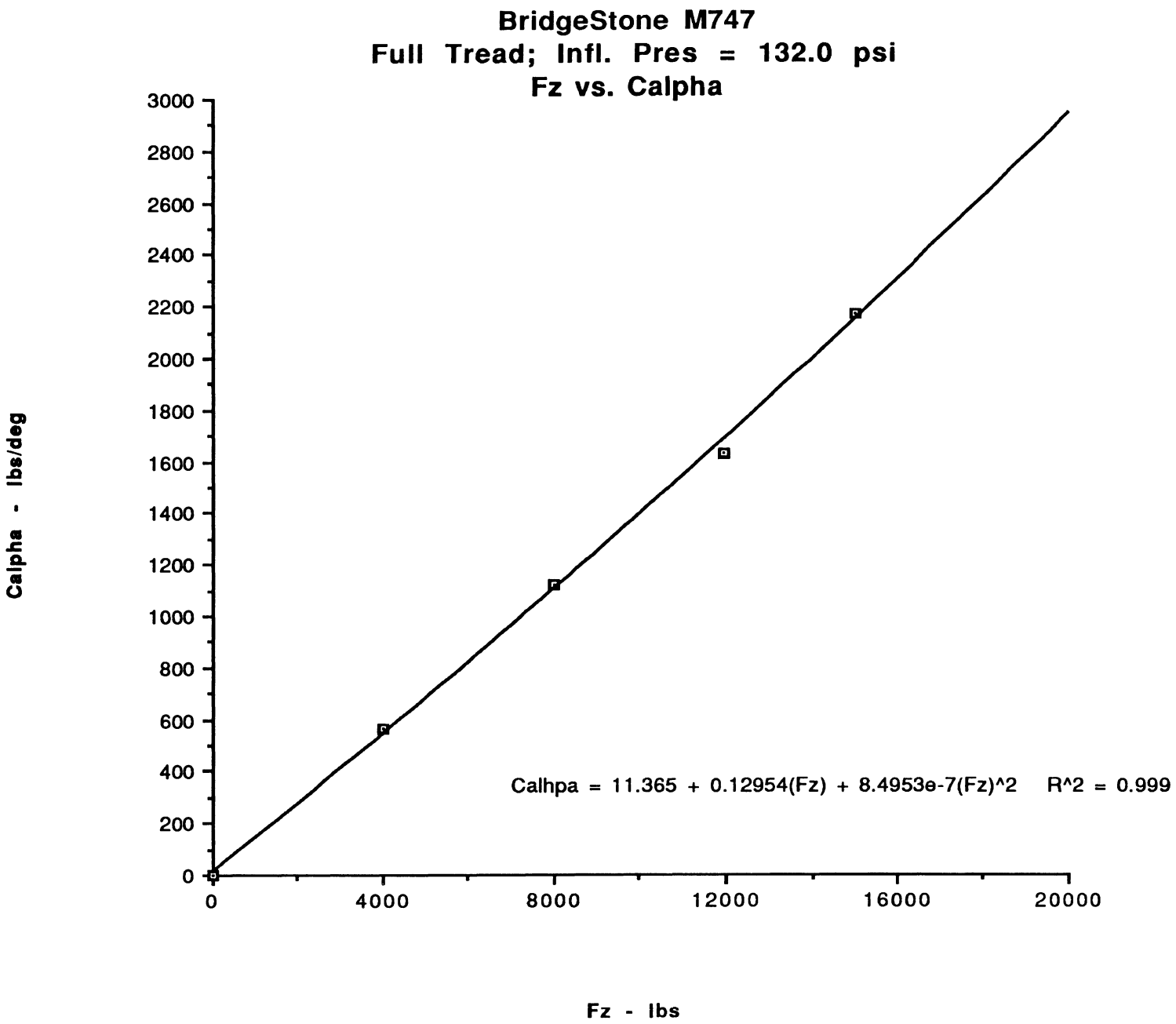
BRIDGESTONE M747



04/12/91 11:32:14 BR M747 445/65R22.5 FUL 132.0 PSI

Aligning Moment as a Function of Slip Angle and Verticle Load


BridgeStone M747
Full Tread; Infl. Pres = 120.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 12.183 + 0.17426(Fz) - 1.4734e-6(Fz)^2 R^2 = 1.000


BridgeStone M747
Full Tread; Infl. Pres = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calhpa = 11.365 + 0.12954(Fz) + 8.4953e-7(Fz)^2 R^2 = 0.999

BRIDGESTONE M747

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4023.00	0.00	636.56	1122.10	1949.37	2978.97	3529.92
7992.00	0.00	1297.08	2304.49	3989.16	5938.02	6776.84
11988.00	0.00	1883.60	3241.55	5870.28	8459.21	9468.18
14975.00	0.00	2254.22	3872.86	7095.89	10115.50	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4023.00	0.00	58.85	94.94	125.77	118.44	80.41
7992.00	0.00	155.11	273.84	423.95	393.83	251.56
11988.00	0.00	250.43	499.01	786.82	699.18	455.17
14975.00	0.00	317.65	685.30	1080.56	958.96	

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4011.00	0.00	561.27	1062.45	1813.65	2877.68	3416.17
8007.00	0.00	1124.08	2178.71	3741.98	5821.10	6630.34
11974.00	0.00	1631.38	3224.19	5545.60	8321.94	9302.61
14993.00	0.00	2171.01	3963.09	6789.00	10014.80	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4011.00	0.00	49.92	89.36	118.09	116.91	80.43
8007.00	0.00	146.50	265.08	397.06	380.19	251.57
11974.00	0.00	240.52	423.44	721.48	667.33	458.57
14993.00	0.00	302.43	551.74	954.47	909.88	

BRIDGESTONE M747

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4023.00	636.56	1122.10	1949.37	2978.97	3529.92
7992.00	1297.08	2304.49	3989.16	5938.02	6776.84
11988.00	1883.60	3241.55	5870.28	8459.21	9468.18
14975.00	2254.22	3872.86	7095.89	10115.50	11322.02 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4023.00	4.90	7.91	10.48	9.87	6.70
7992.00	12.93	22.82	35.33	32.82	20.96
11988.00	20.87	41.58	65.57	58.26	37.93
14975.00	26.47	57.11	90.05	79.91	52.02 *

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4011.00	561.27	1062.45	1813.65	2877.68	3416.17
8007.00	1124.08	2178.71	3741.98	5821.10	6630.34
11974.00	1631.38	3224.19	5545.60	8321.94	9302.61
14993.00	2171.01	3963.09	6789.00	10014.80	11194.96 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4011.00	4.16	7.45	9.84	9.74	6.70
8007.00	12.21	22.09	33.09	31.68	20.96
11974.00	20.04	35.29	60.12	55.61	38.21
14993.00	25.20	45.98	79.54	75.82	52.10 *

*Estimate

BRIDGESTONE M747

RTAC and Phase IV Data

FULL TREAD, PSI = 120
TIRE,21.0,XXX
STIFFYZ,XXX,6919.17
ALIGN, 252.49
CALFA, 1908.3
TABLE
CALFA,4,1
4023.0 7992.0 11988.0 14975.0
2.1
1,1,5
1, 0.158
2, 0.279
4, 0.485
8, 0.740
12, 0.877
2,1,5
1, 0.162
2, 0.288
4, 0.499
8, 0.743
12, 0.848
3,1,5
1, 0.157
2, 0.270
4, 0.490
8, 0.706
12, 0.790
4,1,5
1, 0.151
2, 0.259
4, 0.474
8, 0.675
12, 0.756 *

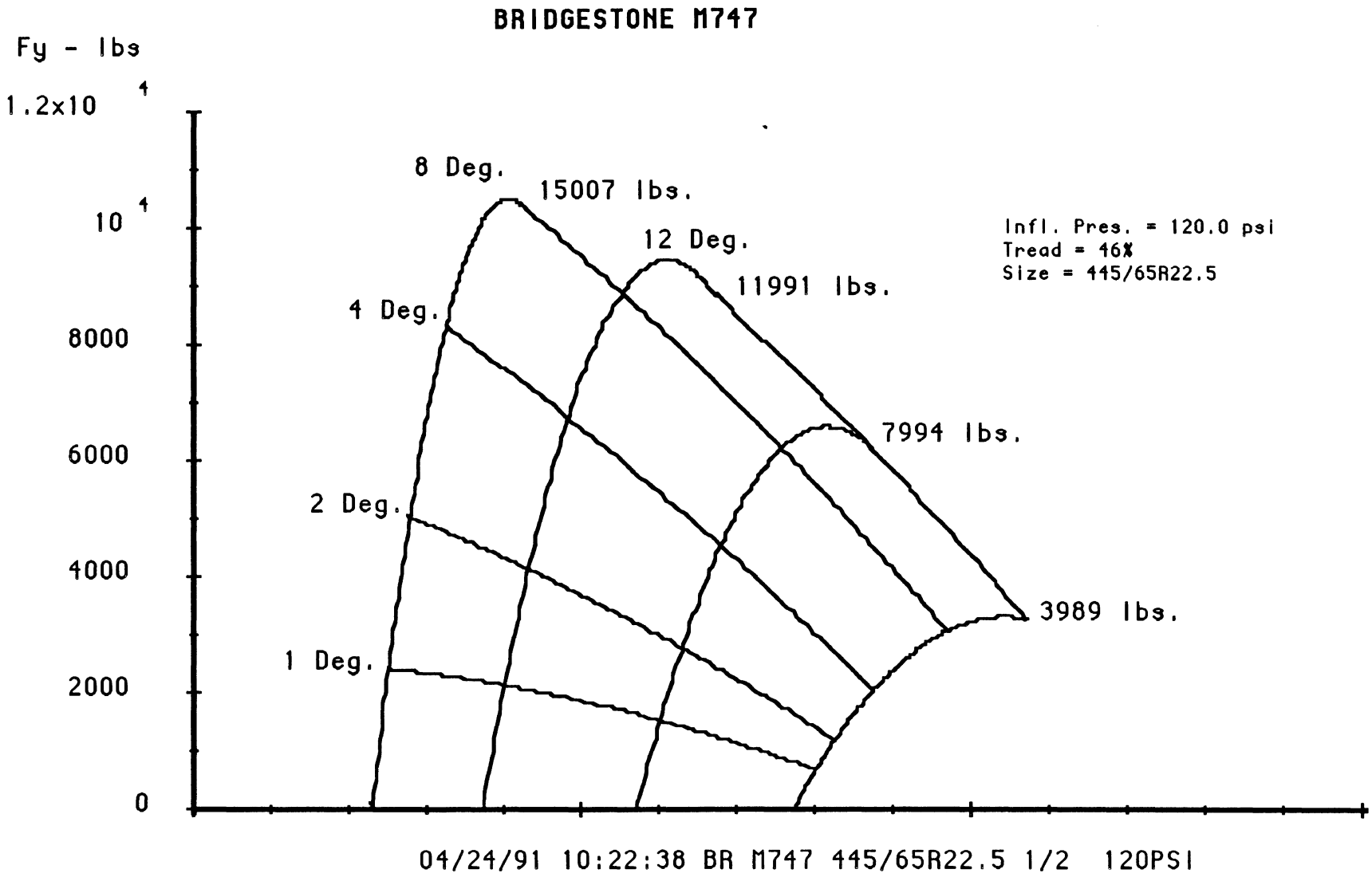
FULL TREAD, PSI = 132
TIRE,21.2,XXX
STIFFYZ,XXX,7305.5
ALIGN, 239.98
CALFA, 1453.45
TABLE
CALFA,4,1
4011.0 8007.0 11974.0 14993.0
2.1
1,1,5
1, 0.140
2, 0.265
4, 0.452
8, 0.717
12, 0.852
2,1,5
1, 0.140
2, 0.272
4, 0.467
8, 0.727
12, 0.828
3,1,5
1, 0.136
2, 0.269
4, 0.463
8, 0.695
12, 0.777
4,1,5
1, 0.145
2, 0.264
4, 0.453
8, 0.668
12, 0.747 *

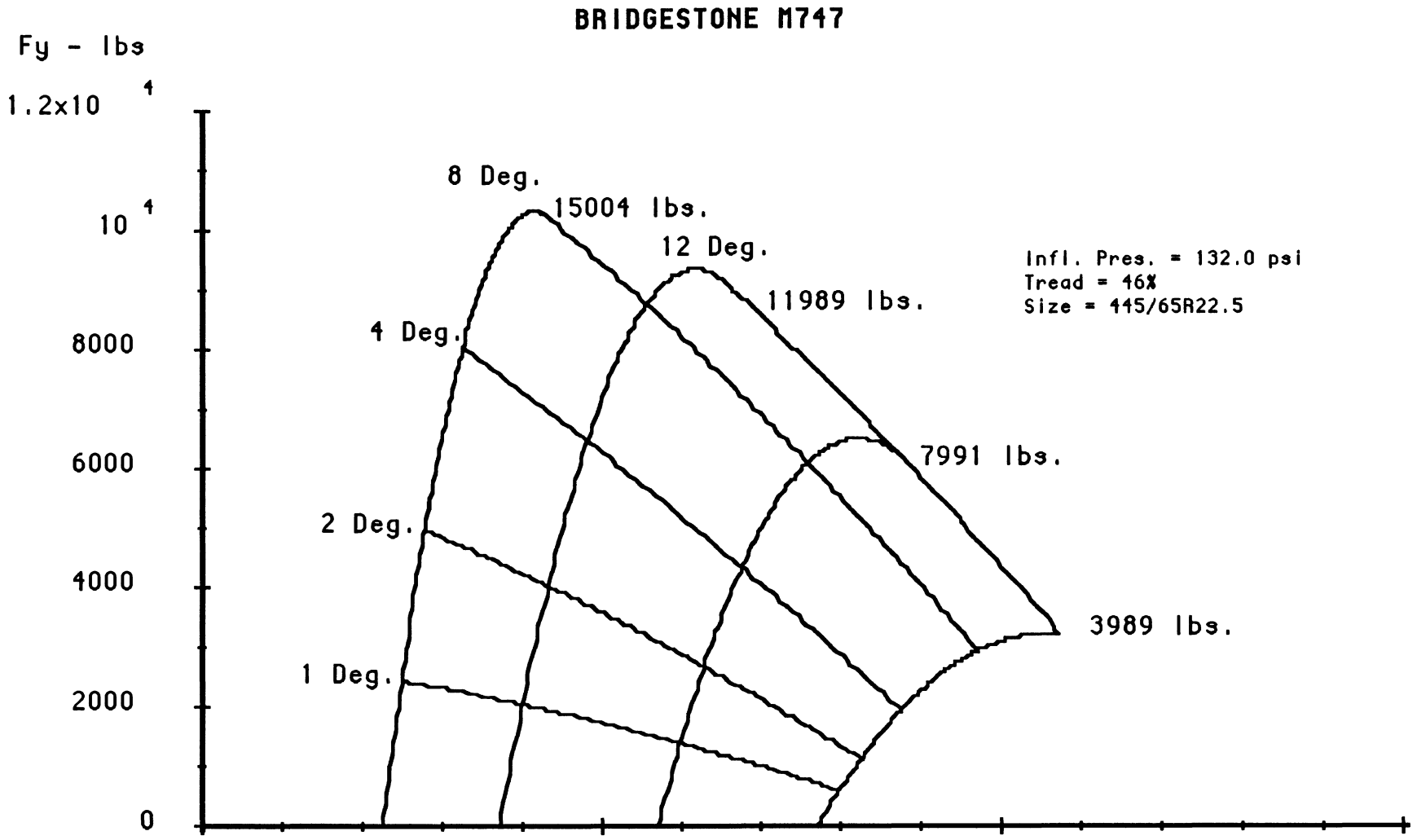
*Estimate

Bridgestone M747

445/65 R 22.5 L

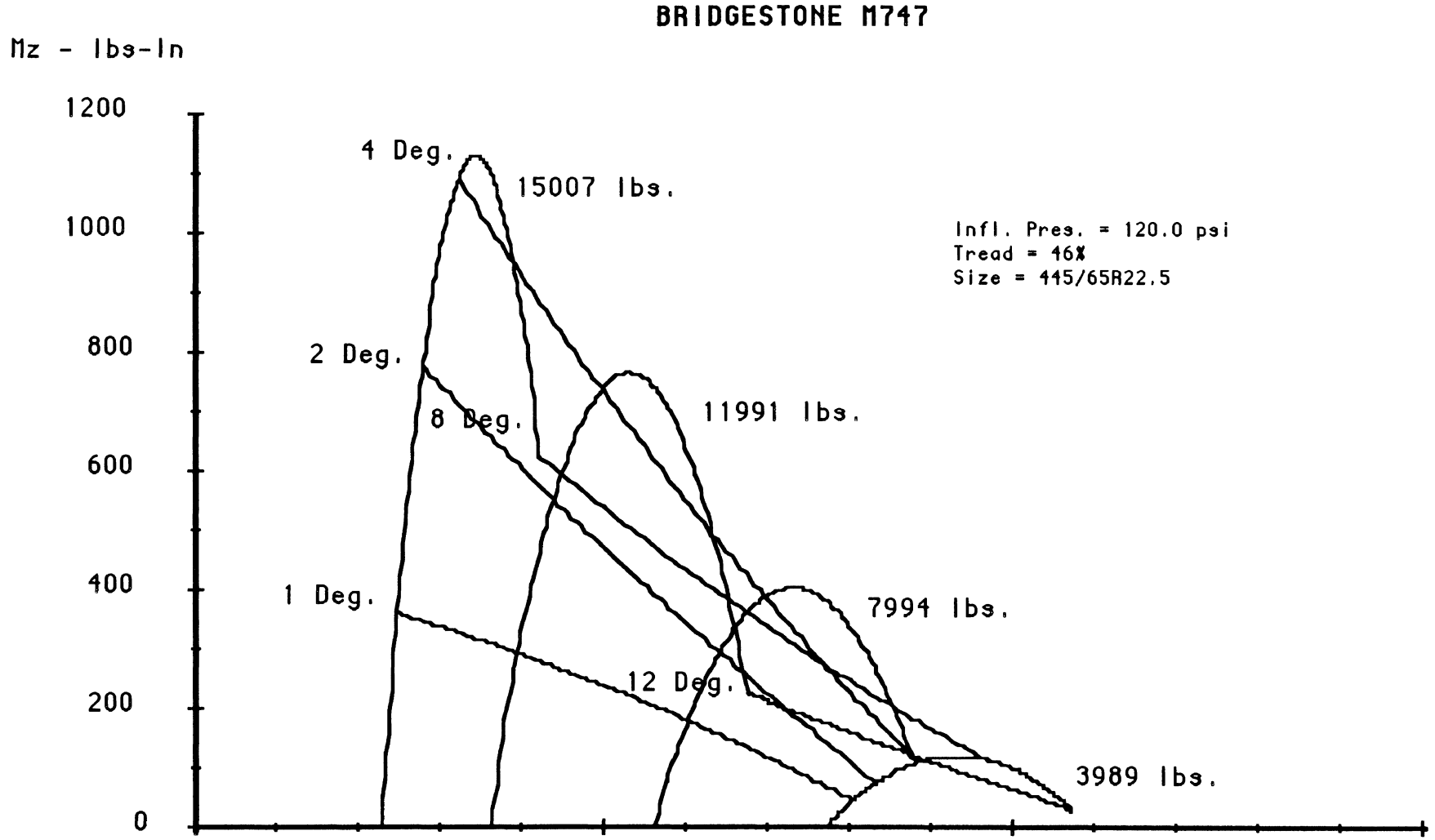
1/2 Tread


BRIDGESTONE M747
Fy - lbs
1.2x10 4
10 4
8000
6000
4000
2000
0
8 Deg.
15007 lbs.
12 Deg.
11991 lbs.
4 Deg.
7994 lbs.
2 Deg.
3989 lbs.
1 Deg.
Infl. Pres. = 120.0 psi
Tread = 46%
Size = 445/65R22.5
04/24/91 10:22:38 BR M747 445/65R22.5 1/2 120PSI
Lateral Force as a Function of Slip Angle and Verticle Load



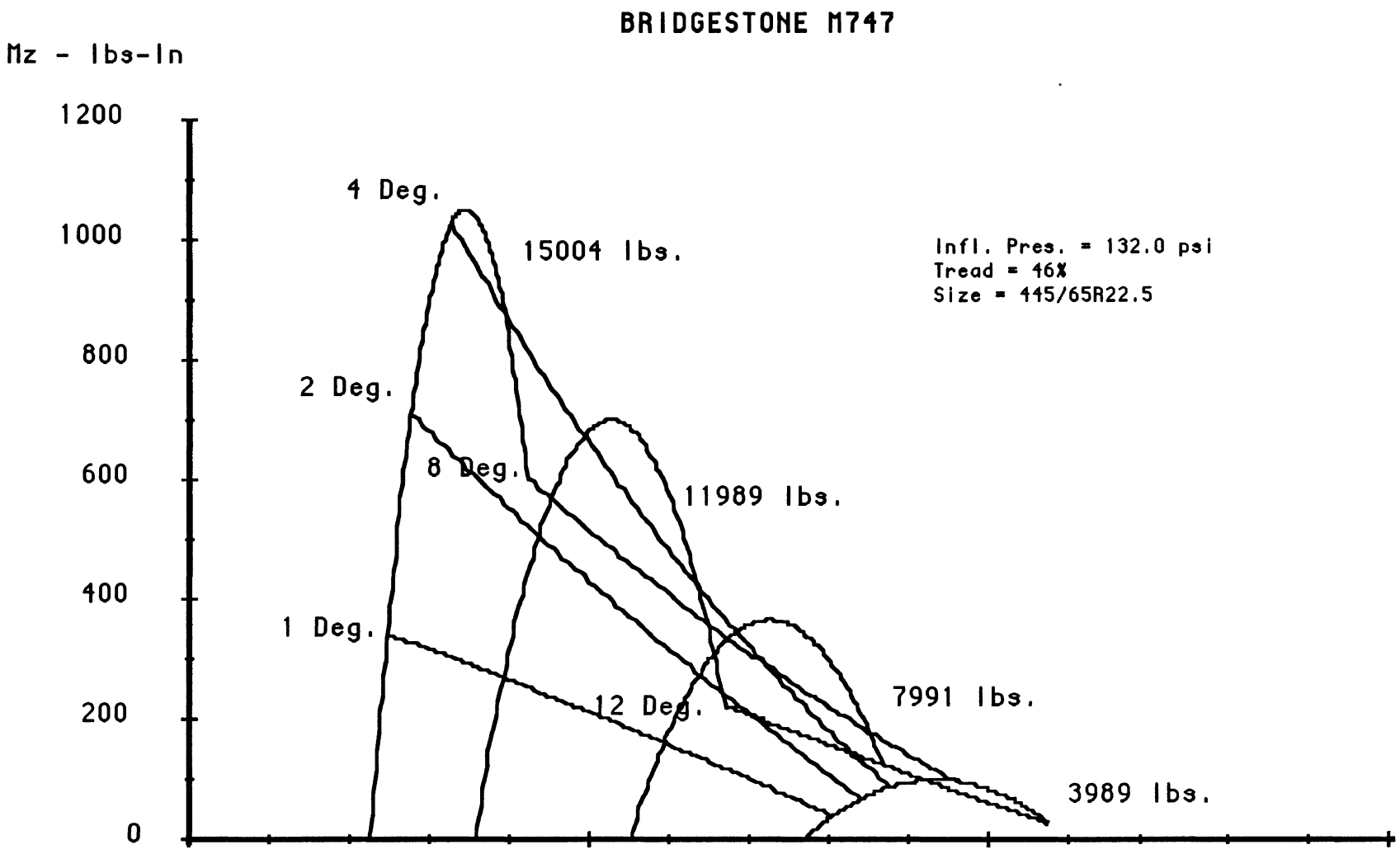
04/24/91 10:22:38 BR M747 445/65R22.5 1/2 132PSI

Lateral Force as a Function of Slip Angle and Verticle Load



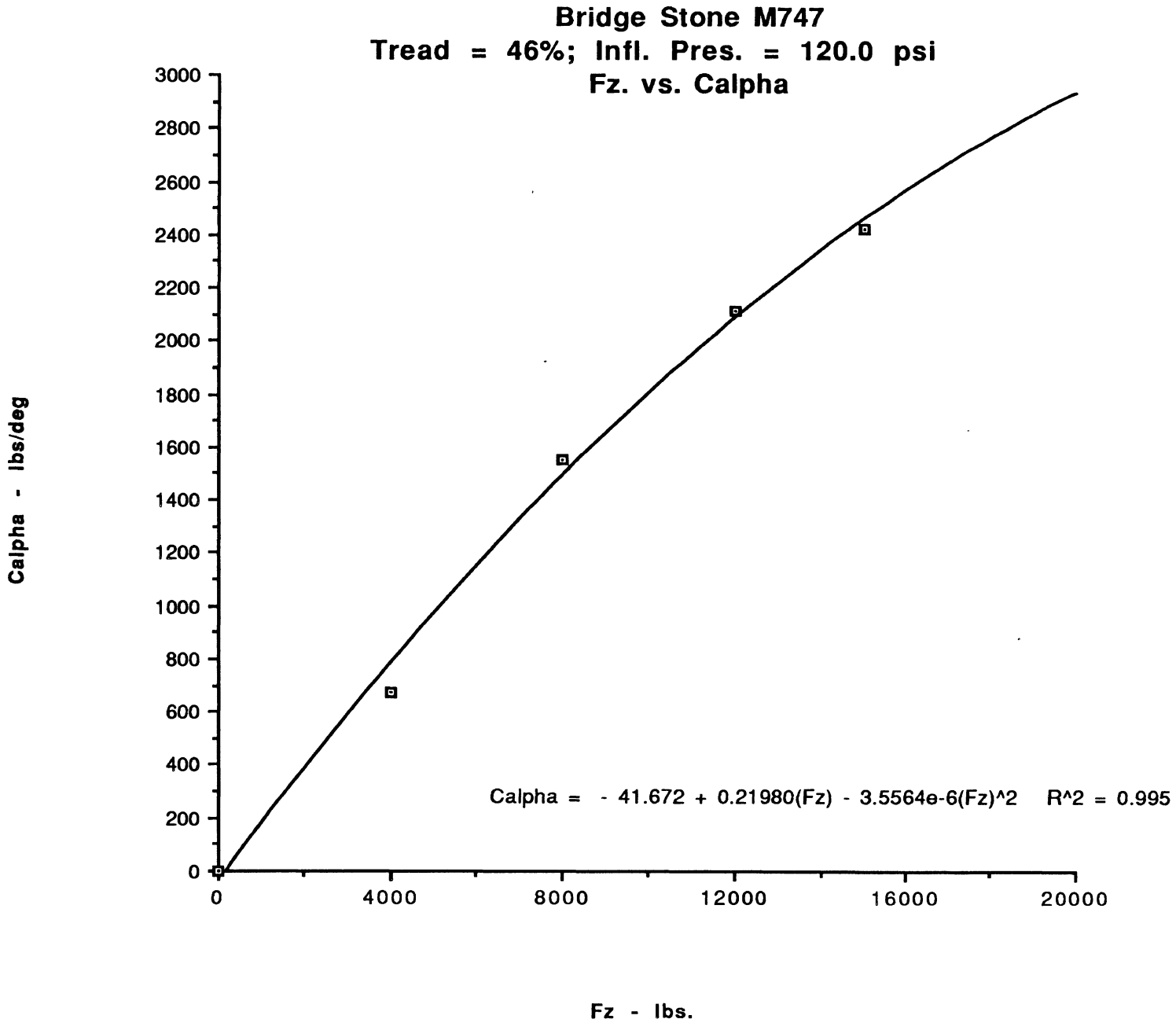
04/24/91 10:22:38 BR M747 445/65R22.5 1/2 120PSI

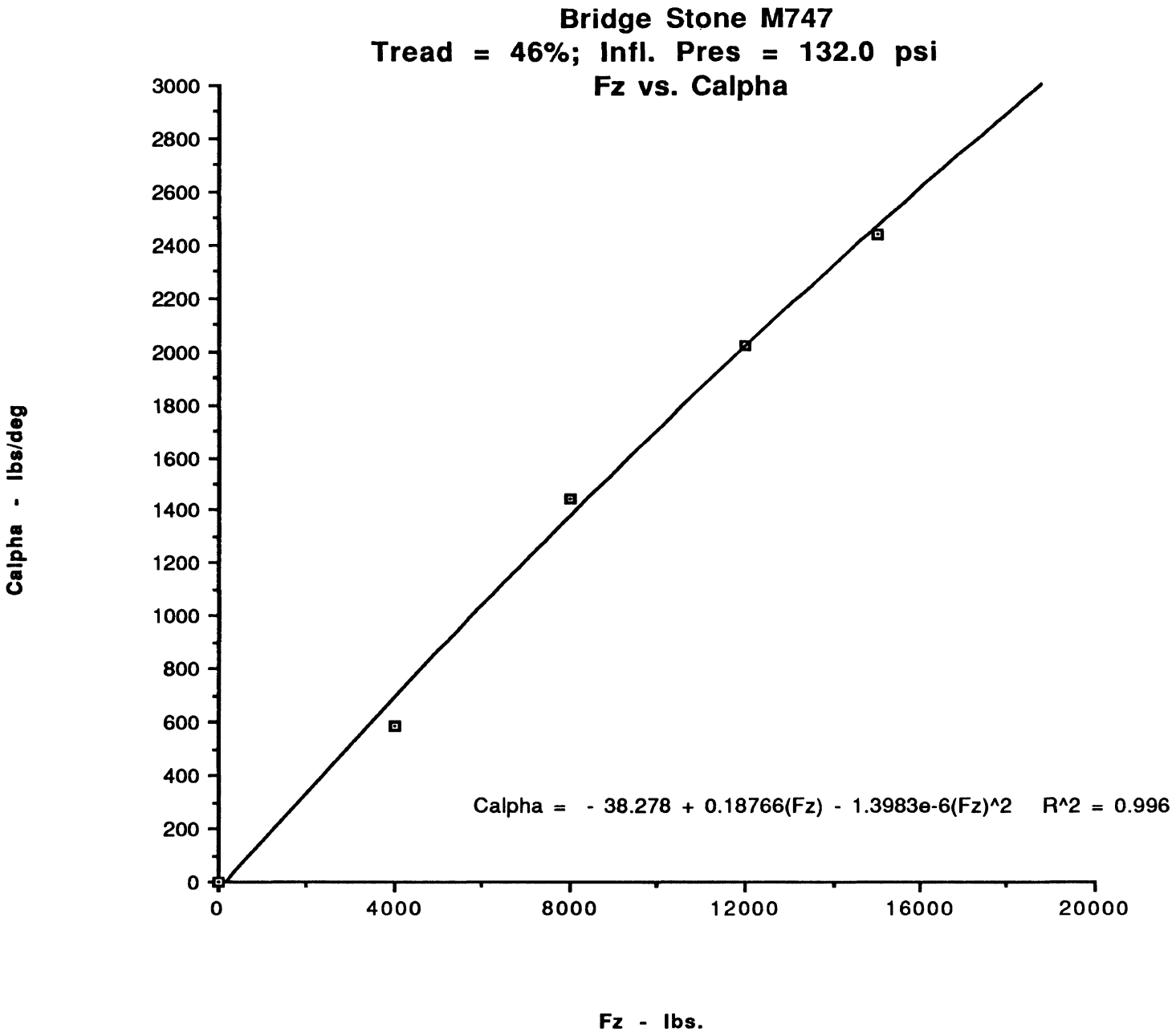
Aligning Moment as a Function of Slip Angle and Verticle Load



04/24/91 10:22:38 BR M747 445/65R22.5 1/2 132PSI

Aligning Moment as a Function of Slip Angle and Verticle Load


Bridge Stone M747
Tread = 46%; Infl. Pres. = 120.0 psi
Fz. vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs.
Calpha = - 41.672 + 0.21980(Fz) - 3.5564e-6(Fz)^2 R^2 = 0.995


Bridge Stone M747
Tread = 46%; Infl. Pres = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs.
Calpha = - 38.278 + 0.18766(Fz) - 1.3983e-6(Fz)^2 R^2 = 0.996

BRIDGESTONE M747

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; 46% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3989.00	0.00	674.22	1205.41	2054.30	2963.69	3258.58
7994.00	0.00	1548.72	2799.92	4614.68	5966.91	6294.70
11991.00	0.00	2115.50	4186.02	6787.27	8633.80	9012.62
15007.00	0.00	2425.15	5034.11	8323.53	10407.90	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3989.00	0.00	57.73	88.20	119.45	85.89	29.24
7994.00	0.00	185.00	302.86	425.52	251.85	142.62
11991.00	0.00	294.53	588.16	775.04	457.63	242.93
15007.00	0.00	357.47	772.15	1084.19	624.62	

Size = 445/65R22.5 L; 46% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3989.00	0.00	587.09	1100.64	1881.72	2823.03	3190.59
7991.00	0.00	1443.79	2655.67	4348.98	5861.67	6198.00
11989.00	0.00	2022.12	4045.81	6480.68	8545.43	8896.01
15004.00	0.00	2442.07	4949.51	8027.07	10307.80	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3989.00	0.00	30.54	68.40	80.20	60.40	20.36
7991.00	0.00	160.06	293.41	362.54	236.45	138.92
11989.00	0.00	265.89	509.01	715.66	436.03	234.30
15004.00	0.00	339.98	709.30	1026.11	604.67	

BRIDGESTONE M747

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; 46% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3989.00	674.22	1205.41	2054.30	2963.69	3258.58
7994.00	1548.72	2799.92	4614.68	5966.91	6294.70
11991.00	2115.50	4186.02	6787.27	8633.80	9012.62
15007.00	2425.15	5034.11	8323.53	10407.90	10864.56 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3989.00	4.81	7.35	9.95	7.16	2.44
7994.00	15.42	25.24	35.46	20.99	11.89
11991.00	24.54	49.01	64.59	38.14	20.24
15007.00	29.79	64.35	90.35	52.05	27.63 *

Size = 445/65R22.5 L; 46% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3989.00	587.09	1100.64	1881.72	2823.03	3190.59
7991.00	1443.79	2655.67	4348.98	5861.67	6198.00
11989.00	2022.12	4045.81	6480.68	8545.43	8896.01
15004.00	2442.07	4949.51	8027.07	10307.80	10730.68 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3989.00	2.55	5.70	6.68	5.03	1.70
7991.00	13.34	24.45	30.21	19.70	11.58
11989.00	22.16	42.42	59.64	36.34	19.52
15004.00	28.33	59.11	85.51	50.39	27.08 *

*Estimate

BRIDGESTONE M747

RTAC and Phase IV Data

46% TREAD, PSI = 120
TIRE,20.7,XXX
STIFFYZ,XXX,6885.5
ALIGN, 290.16
CALFA, 2053.53
TABLE
CALFA,4,1
3989.0 7994.0 11991.0 15007.0
2.1
1,1,5
1, 0.169
2, 0.302
4, 0.515
8, 0.743
12, 0.817
2,1,5
1, 0.194
2, 0.350
4, 0.577
8, 0.746
12, 0.787
3,1,5
1, 0.176
2, 0.349
4, 0.566
8, 0.720
12, 0.752
4,1,5
1, 0.162
2, 0.335
4, 0.555
8, 0.694
12, 0.724 *

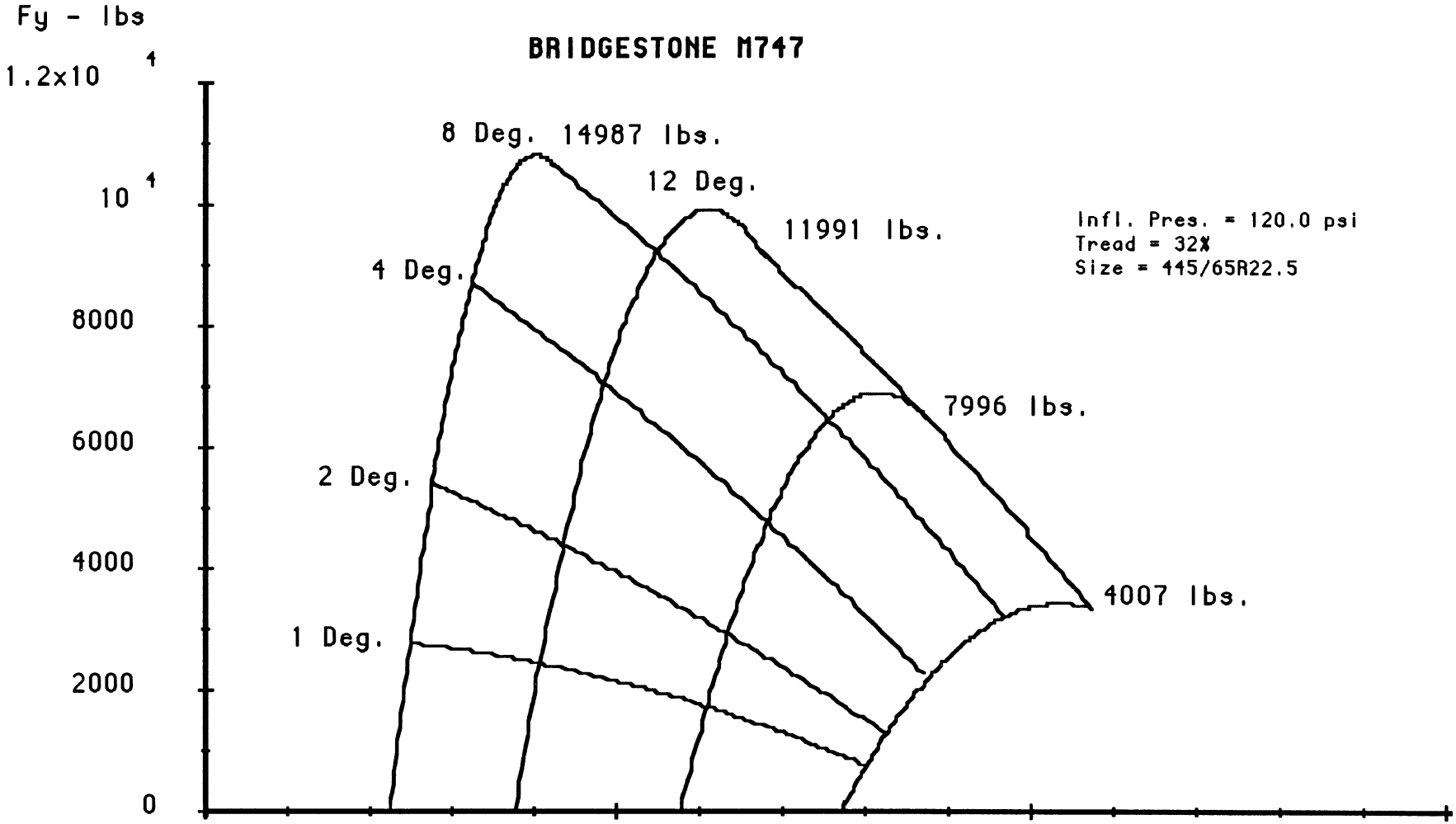
46% TREAD, PSI = 132
TIRE,20.9,XXX
STIFFYZ,XXX,7302.0
ALIGN, 263.77
CALFA, 1976.95
TABLE
CALFA,4,1
3989.0 7991.0 11989.0 15004.0
2.1
1,1,5
1, 0.147
2, 0.276
4, 0.472
8, 0.708
12, 0.800
2,1,5
1, 0.181
2, 0.332
4, 0.544
8, 0.734
12, 0.776
3,1,5
1, 0.169
2, 0.337
4, 0.541
8, 0.713
12, 0.742
4,1,5
1, 0.163
2, 0.330
4, 0.535
8, 0.687
12, 0.715 *

*Estimate

Bridgestone M747

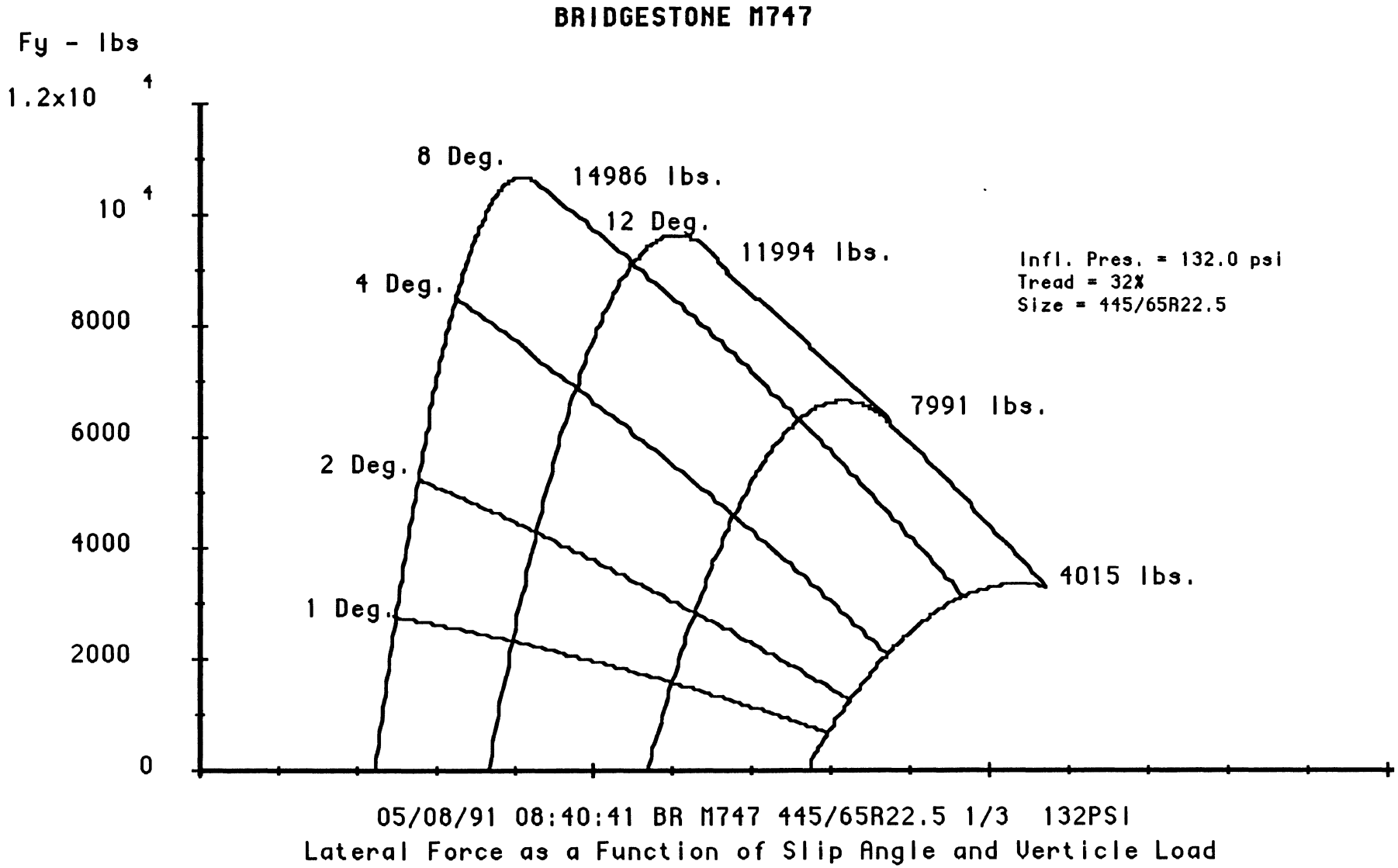
445/65 R 22.5 L

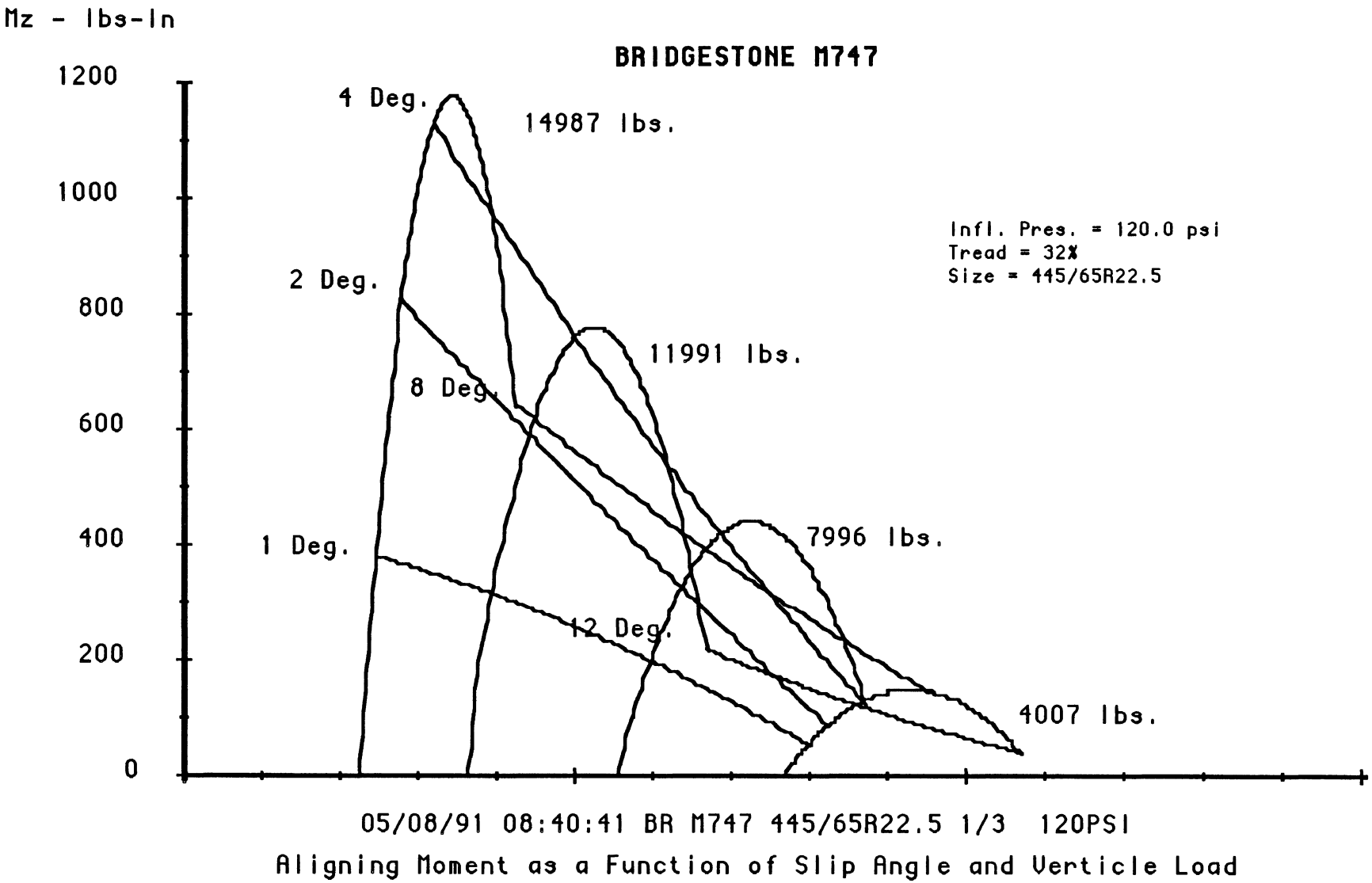
1/3 Tread

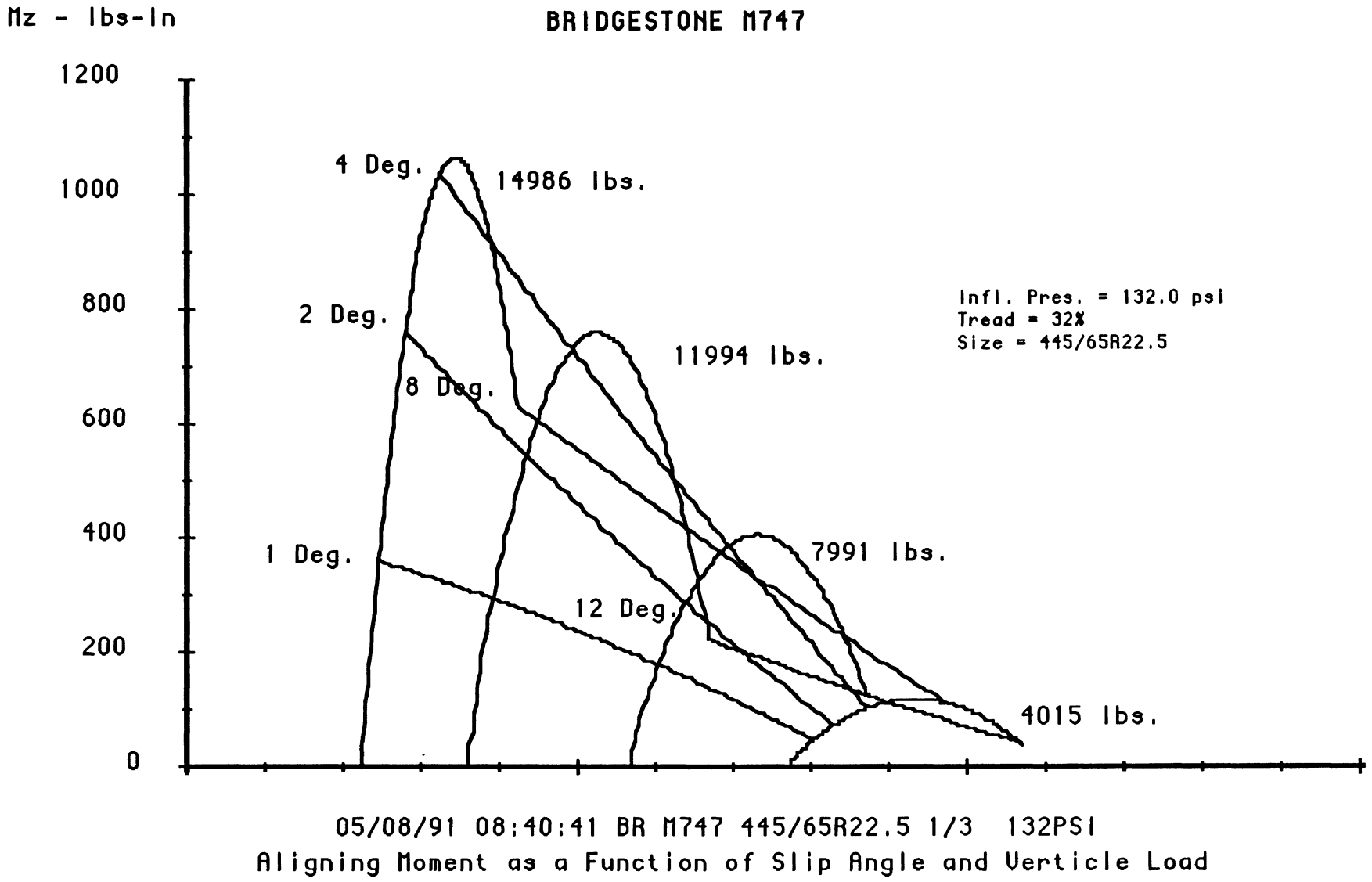


05/08/91 08:40:41 BR M747 445/65R22.5 1/3 120PSI

Lateral Force as a Function of Slip Angle and Verticle Load

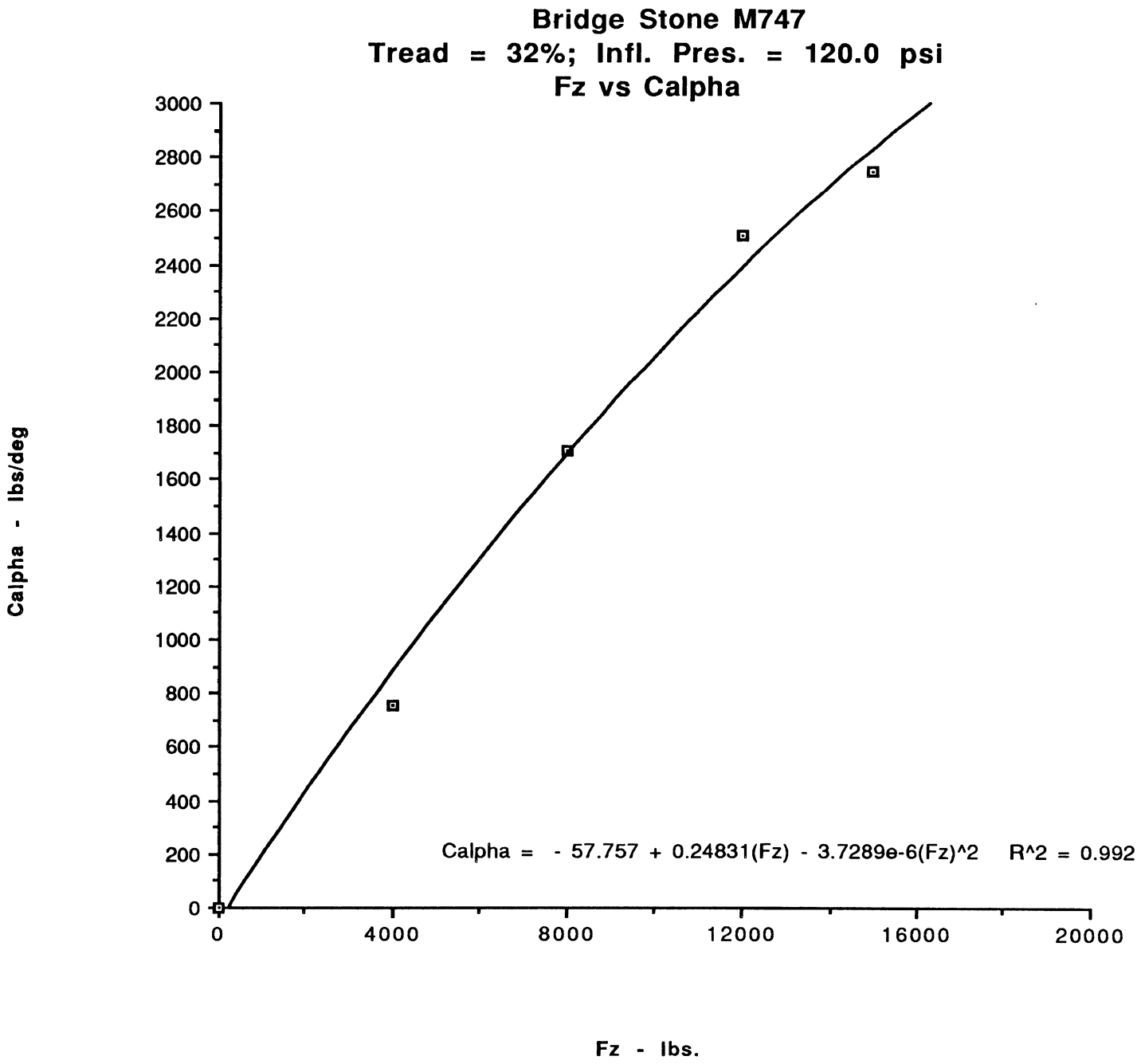

BRIDGESTONE M747
Fy - lbs
1.2x10 4
10 4
8000
6000
4000
2000
0
8 Deg.
14986 lbs.
12 Deg.
11994 lbs.
4 Deg.
7991 lbs.
2 Deg.
4015 lbs.
1 Deg.
Infl. Pres. = 132.0 psi
Tread = 32%
Size = 445/65R22.5
05/08/91 08:40:41 BR M747 445/65R22.5 1/3 132PSI
Lateral Force as a Function of Slip Angle and Verticle Load

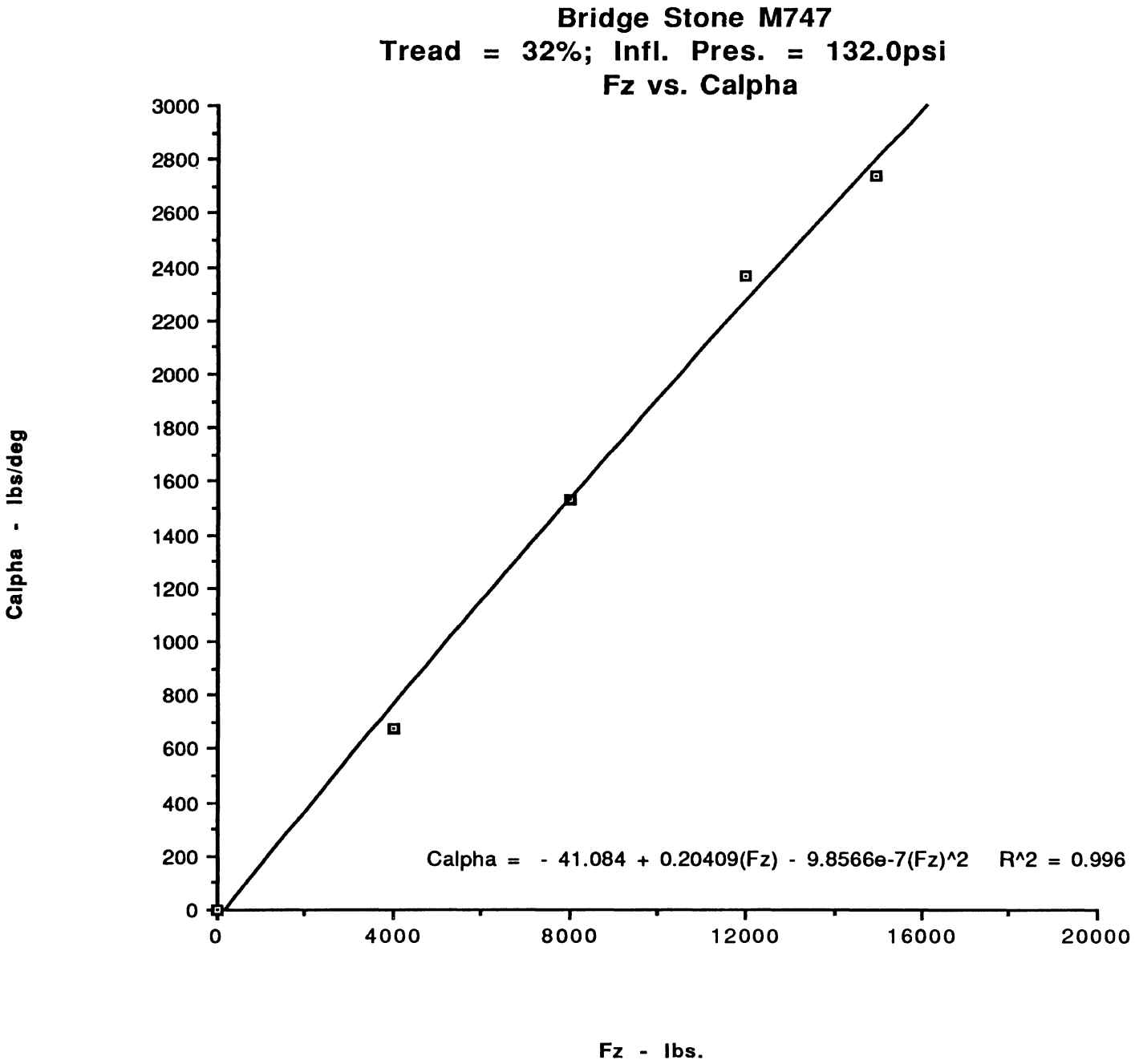

Mz - lbs-In
BRIDGESTONE M747
1200
1000
800
600
400
200
0
4 Deg.
14987 lbs.
2 Deg.
11991 lbs.
8 Deg.
7996 lbs.
1 Deg.
12 Deg.
4007 lbs.
Infl. Pres. = 120.0 psi
Tread = 32%
Size = 445/65R22.5
05/08/91 08:40:41 BR M747 445/65R22.5 1/3 120PSI
Aligning Moment as a Function of Slip Angle and Verticle Load



05/08/91 08:40:41 BR M747 445/65R22.5 1/3 132PSI

Aligning Moment as a Function of Slip Angle and Verticle Load


Bridge Stone M747
Tread = 32%; Infl. Pres. = 120.0 psi
Fz vs Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs.
Calpha = - 57.757 + 0.24831(Fz) - 3.7289e-6(Fz)^2 R^2 = 0.992


Bridge Stone M747
Tread = 32%; Infl. Pres. = 132.0psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs.
Calpha = - 41.084 + 0.20409(Fz) - 9.8566e-7(Fz)^2 R^2 = 0.996

BRIDGESTONE M747

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; 32% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4007.00	0.00	754.14	1308.65	2198.96	3099.05	3320.02
7996.00	0.00	1704.44	2957.19	4862.09	6222.05	6495.17
11991.00	0.00	2510.97	4504.34	7175.27	8888.30	9247.06
14987.00	0.00	2749.09	5399.67	8708.20	10655.60	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4007.00	0.00	58.80	88.77	119.80	93.13	70.46
7996.00	0.00	213.62	342.60	448.74	272.39	141.29
11991.00	0.00	300.68	616.18	806.71	477.02	251.30
14987.00	0.00	384.04	824.45	1123.10	640.50	

Size = 445/65R22.5 L; 32% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4015.00	0.00	676.62	1229.06	2058.40	3012.65	3241.40
7991.00	0.00	1531.39	2808.25	4620.16	6116.56	6385.94
11994.00	0.00	2363.18	4328.25	6943.13	8828.53	9135.52
14986.00	0.00	2737.94	5247.54	8472.83	10612.20	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4015.00	0.00	54.73	82.59	109.34	94.28	29.54
7991.00	0.00	178.92	285.51	421.22	282.21	144.52
11994.00	0.00	294.86	578.20	771.96	471.22	250.17
14986.00	0.00	356.26	755.90	1030.78	628.09	

BRIDGESTONE M747

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; 32% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4007.00	754.14	1308.65	2198.96	3099.05	3320.02
7996.00	1704.44	2957.19	4862.09	6222.05	6495.17
11991.00	2510.97	4504.34	7175.27	8888.30	9247.06
14987.00	2749.09	5399.67	8708.20	10655.60	11085.69 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4007.00	4.90	7.40	9.98	7.76	5.87
7996.00	17.80	28.55	37.40	22.70	11.77
11991.00	25.06	51.35	67.23	39.75	20.94
14987.00	32.00	68.70	93.59	53.38	28.12 *

Size = 445/65R22.5 L; 32% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4015.00	676.62	1229.06	2058.40	3012.65	3241.40
7991.00	1531.39	2808.25	4620.16	6116.56	6385.94
11994.00	2363.18	4328.25	6943.13	8828.53	9135.52
14986.00	2737.94	5247.54	8472.83	10612.20	10981.21 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4015.00	4.56	6.88	9.11	7.86	2.46
7991.00	14.91	23.79	35.10	23.52	12.04
11994.00	24.57	48.18	64.33	39.27	20.85
14986.00	29.69	62.99	85.90	52.34	27.79 *

*Estimate

BRIDGESTONE M747

RTAC and Phase IV Data

32% TREAD, PSI = 120
TIRE,20.6,XXX
STIFFYZ,XXX,6930.3
ALIGN, 309.99
CALFA, 2432.31
TABLE
CALFA,4,1
4007.0 7996.0 11991.0 14987.0
2.1
1,1,5
1, 0.188
2, 0.327
4, 0.549
8, 0.773
12, 0.829
2,1,5
1, 0.213
2, 0.370
4, 0.608
8, 0.778
12, 0.812
3,1,5
1, 0.209
2, 0.376
4, 0.598
8, 0.741
12, 0.771
4,1,5
1, 0.183
2, 0.360
4, 0.581
8, 0.711
12, 0.740 *

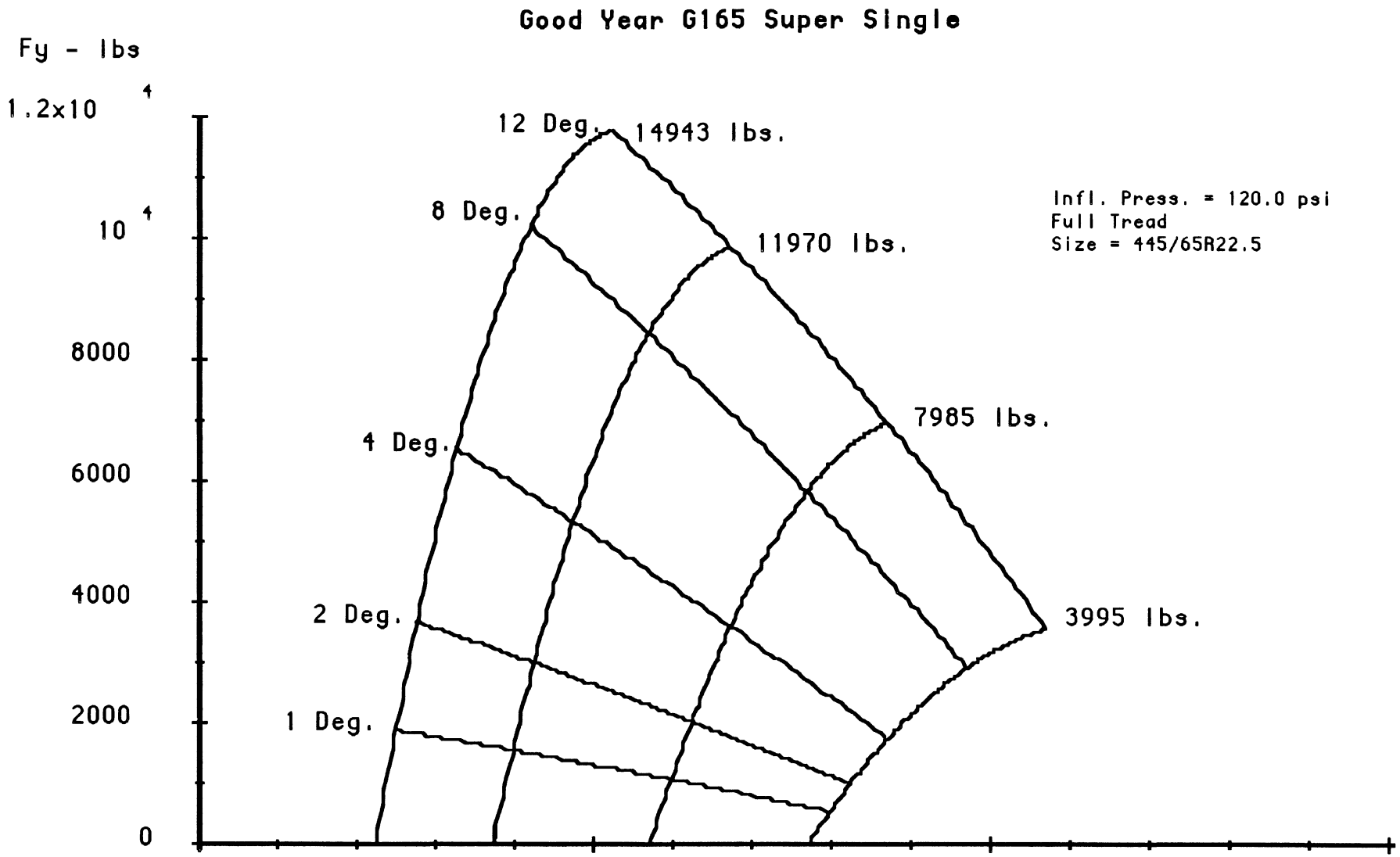
32% TREAD, PSI = 132
TIRE,20.8,XXX
STIFFYZ,XXX,7404.8
ALIGN, 287.94
CALFA, 2320.10
TABLE
CALFA,4,1
4015.0 7991.0 11994.0 14986.0
2.1
1,1,5
1, 0.169
2, 0.306
4, 0.513
8, 0.750
12, 0.807
2,1,5
1, 0.192
2, 0.351
4, 0.578
8, 0.765
12, 0.799
3,1,5
1, 0.197
2, 0.361
4, 0.579
8, 0.736
12, 0.762
4,1,5
1, 0.183
2, 0.350
4, 0.565
8, 0.708
12, 0.733 *

*Estimate

Goodyear G165

445/65 R 22.5 L

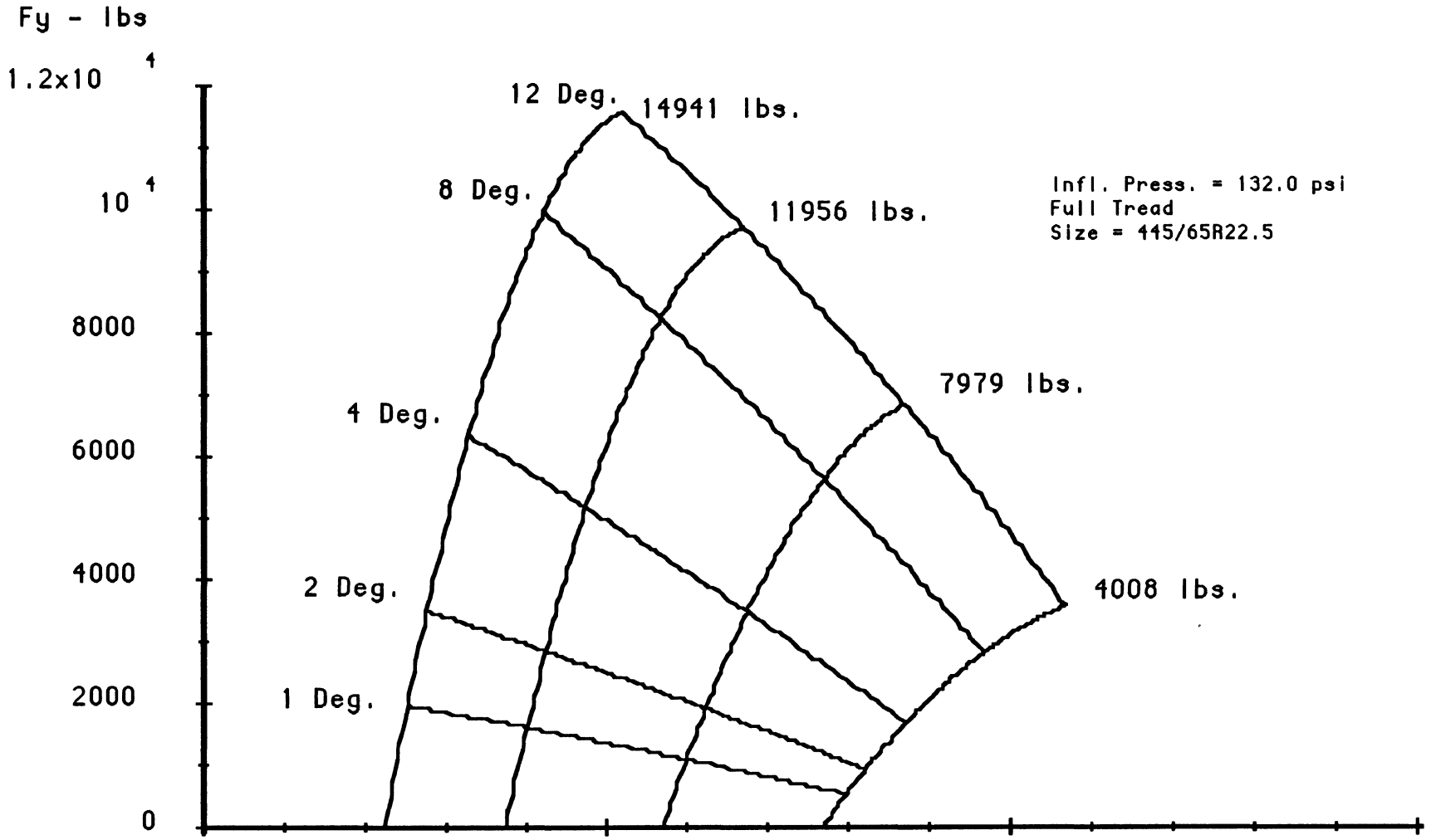
Full Tread



03/04/91 11:09:11 GY G165 445/65R22.5 FUL 120PSI

Lateral Force as a Function of Slip Angle and Veritcle Load

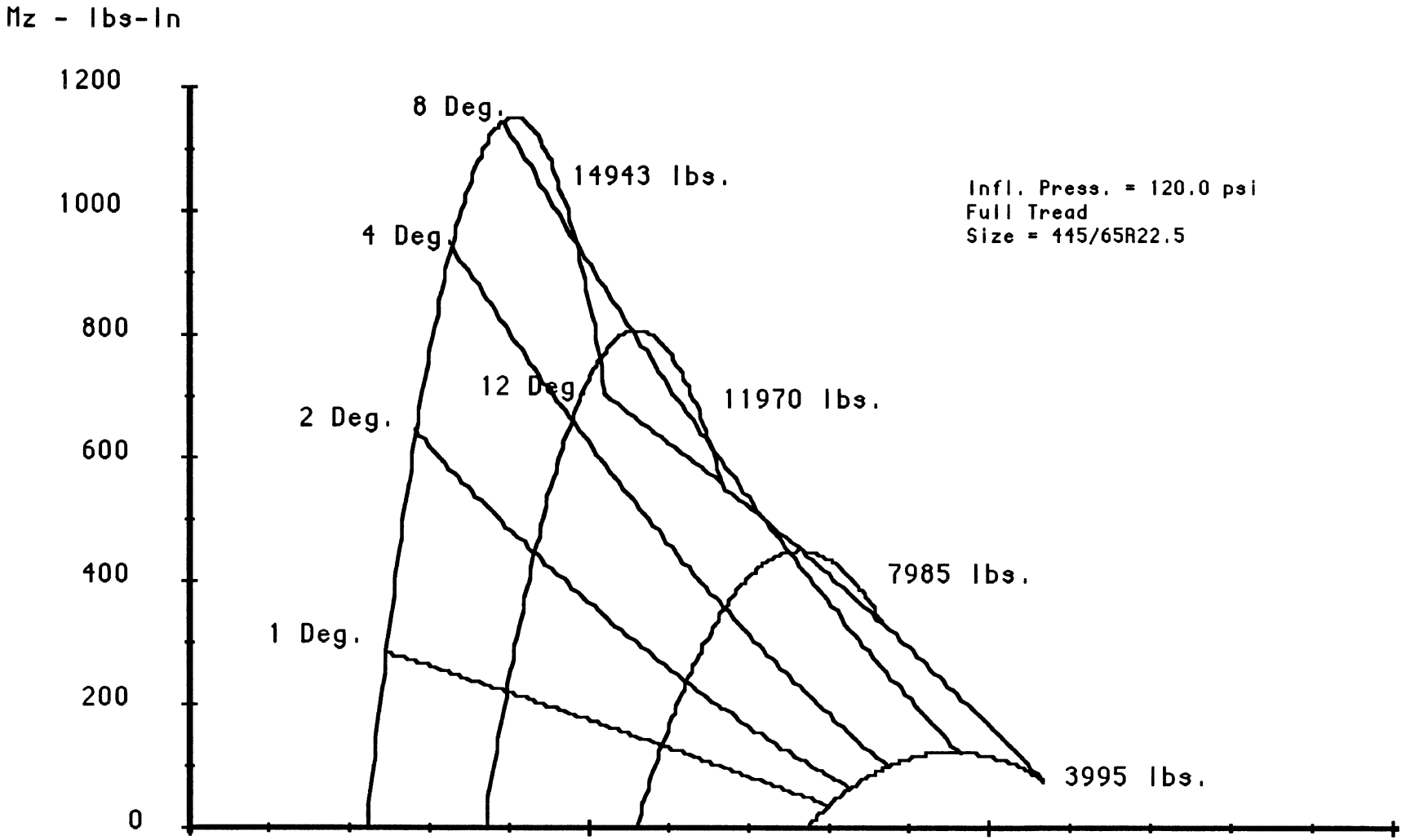
Good Year G165 Super Single



03/04/91 11:41:32 GY G165 445/65R22.5 FUL 132PSI

Lateral Force as a Function of Slip Angle and Veritcle Load

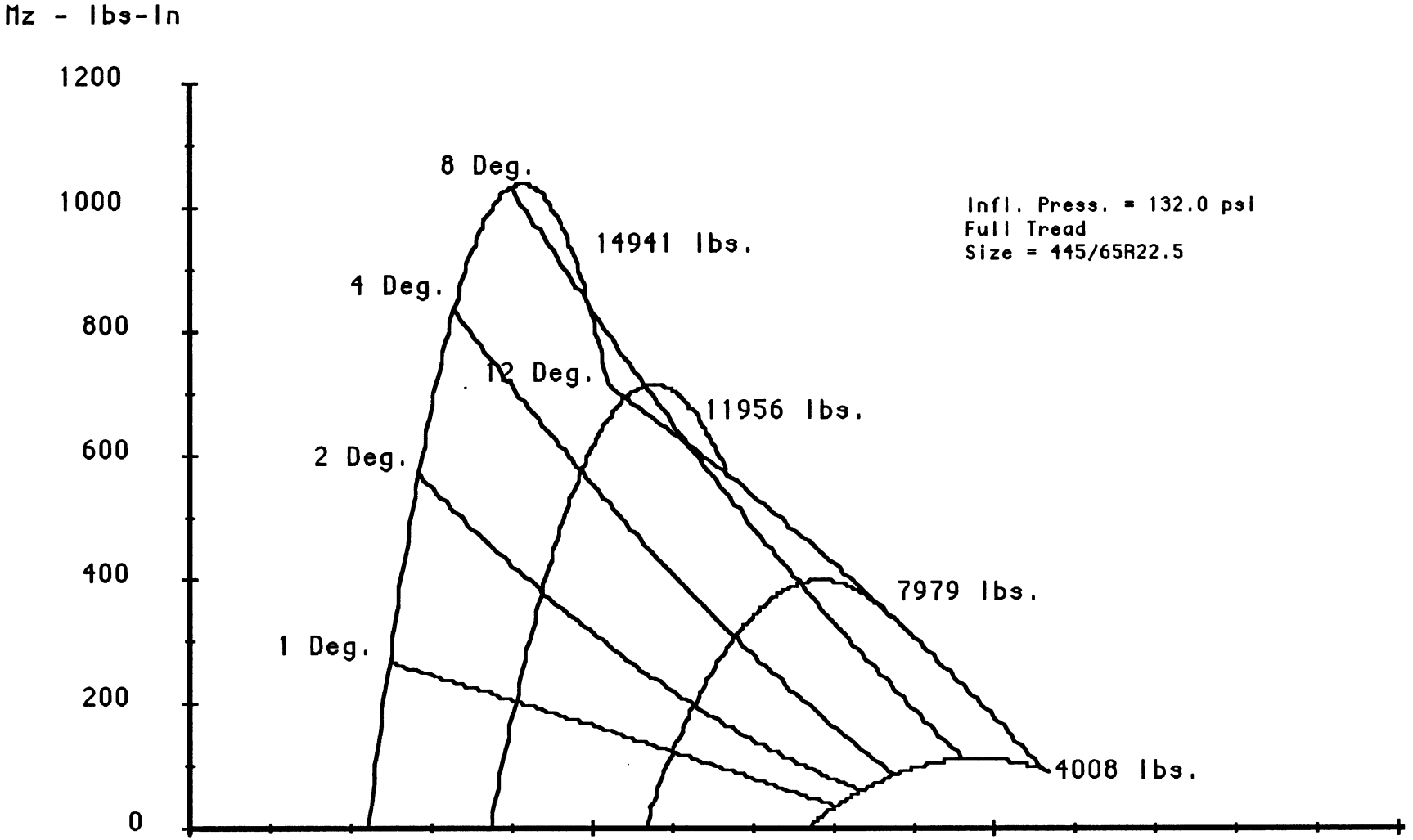
Good Year G165 Super Single



03/04/91 11:09:11 GY G165 445/65R22.5 FUL 120PSI

Aligning Moment as a Function of Slip Angle and Veritcle Load

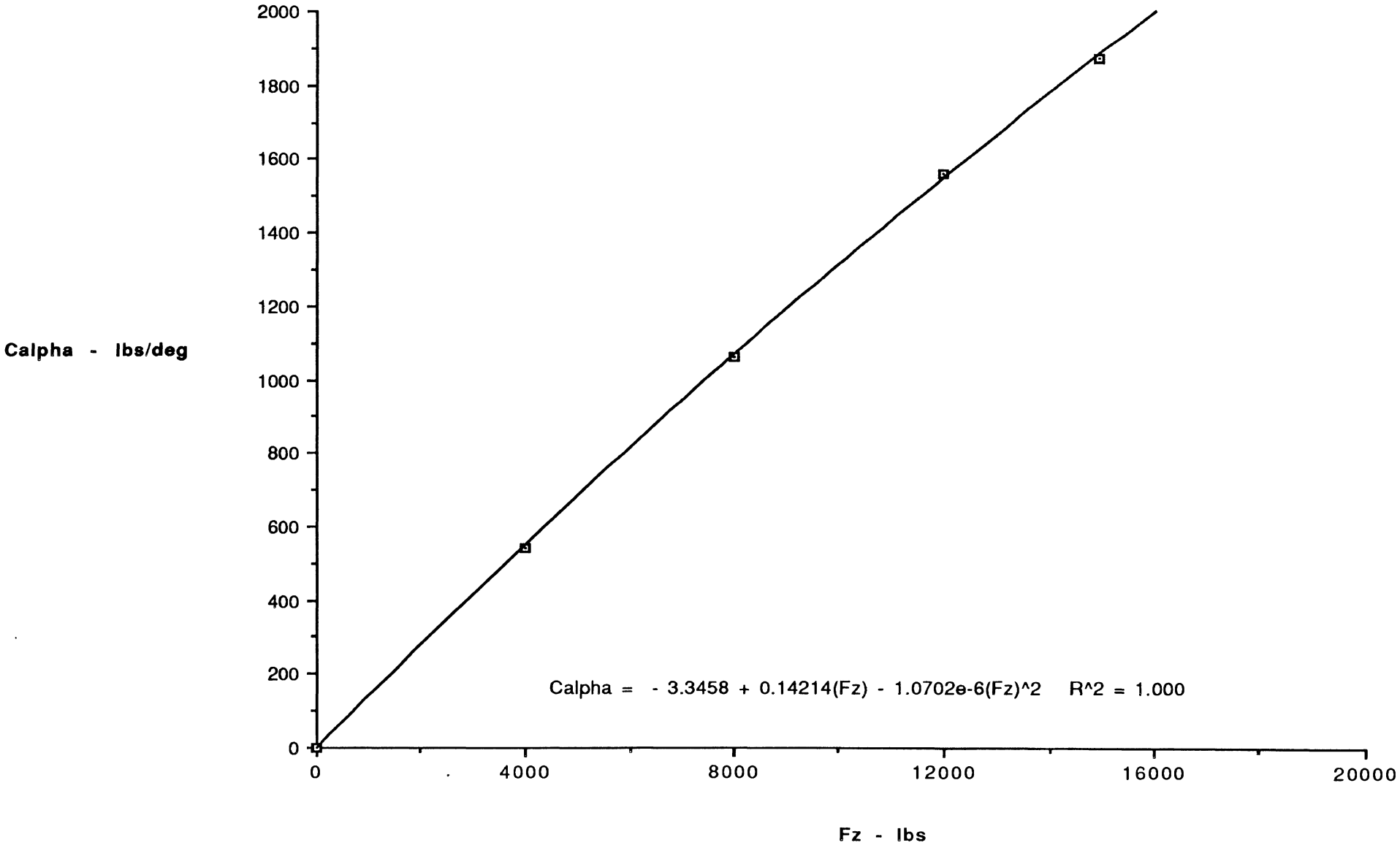
Good Year G165 Super Single

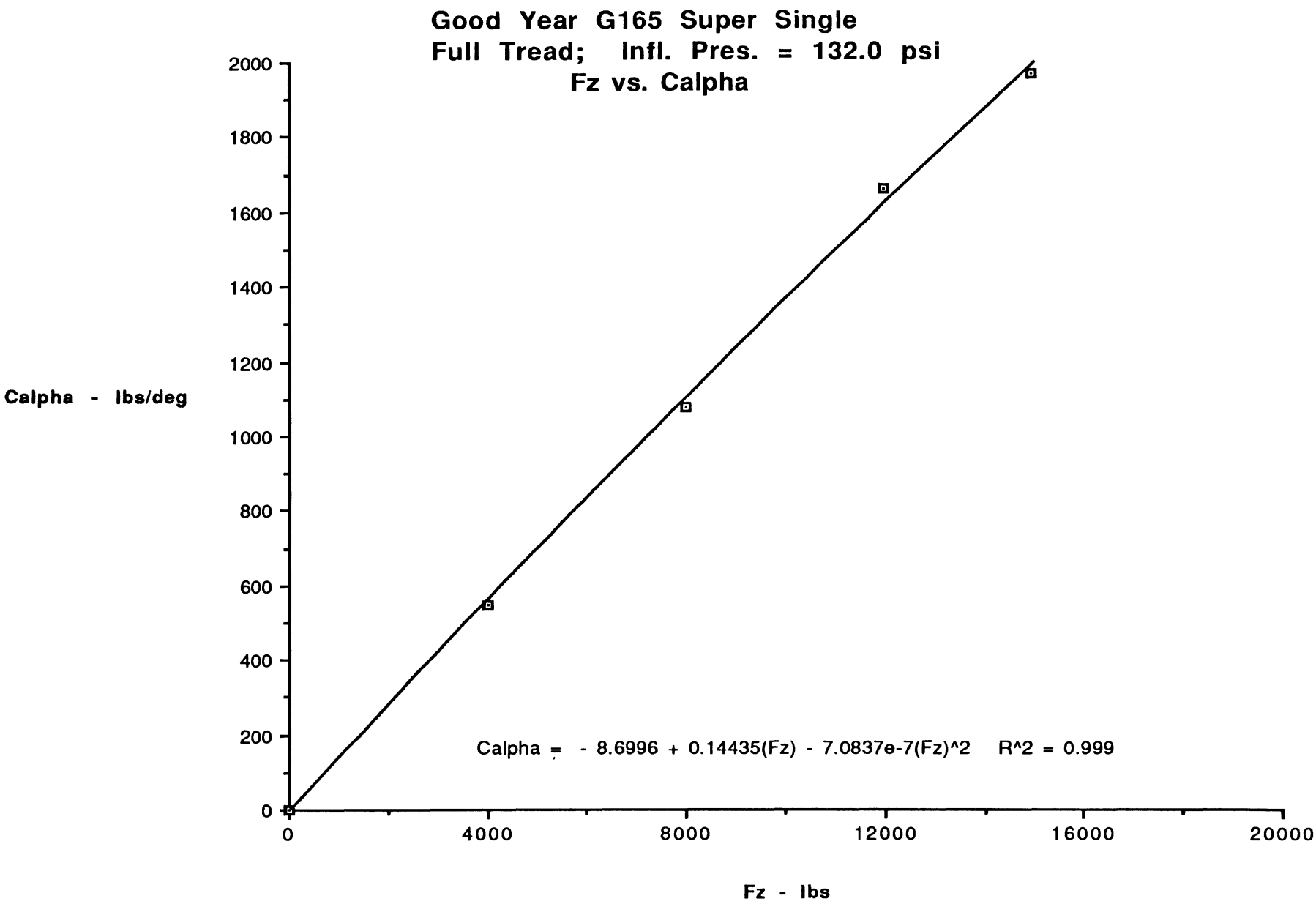


03/04/91 11:41:32 GY G165 445/65R22.5 FUL 132PSI

Aligning Moment as a Function of Slip Angle and Verticle Load

Good Year G165 Super Single
Full Tread; Infl. Pres. = 120.0 psi
Fz vs. Calpha




Good Year G165 Super Single
Full Tread; Infl. Pres. = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 8.6996 + 0.14435(Fz) - 7.0837e-7(Fz)^2 R^2 = 0.999

Good Year G165 Super Single

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3995.00	0.00	541.89	1007.22	1751.34	2871.54	3574.28
7985.00	0.00	1059.29	2017.15	3575.84	5805.58	6985.06
11970.00	0.00	1558.02	3016.03	5364.98	8400.10	9881.67
14943.00	0.00	1874.78	3669.59	6537.78	10196.30	11788.80

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3995.00	0.00	47.30	77.01	105.07	108.02	82.57
7985.00	0.00	134.47	235.68	352.10	403.65	329.75
11970.00	0.00	225.84	466.42	677.72	766.36	588.57
14943.00	0.00	283.02	655.27	954.23	1072.74	720.73

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4008.00	0.00	547.59	973.38	1705.61	2765.11	3611.72
7979.00	0.00	1075.95	1900.29	3435.52	5582.30	6881.41
11956.00	0.00	1663.45	2897.06	5260.33	8224.84	9759.51
14941.00	0.00	1966.44	3485.13	6342.00	9912.57	11629.10

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4008.00	0.00	45.61	73.88	95.25	91.47	100.17
7979.00	0.00	121.76	220.47	314.22	357.21	350.21
11956.00	0.00	215.05	386.78	598.17	691.49	610.43
14941.00	0.00	263.31	591.74	838.67	962.93	743.75

Good Year G165 Super Single

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3995.00	541.89	1007.22	1751.34	2871.54	3574.28
7985.00	1059.29	2017.15	3575.84	5805.58	6985.06
11970.00	1558.02	3016.03	5364.98	8400.10	9881.67
14943.00	1874.78	3669.59	6537.78	10196.30	11788.80

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3995.00	3.94	6.42	8.76	9.00	6.88
7985.00	11.21	19.64	29.34	33.64	27.48
11970.00	18.82	38.87	56.48	63.86	49.05
14943.00	23.58	54.61	79.52	89.40	60.06

Size = 445/65R22.5 L; Full Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4008.00	547.59	973.38	1705.61	2765.11	3611.72
7979.00	1075.95	1900.29	3435.52	5582.30	6881.41
11956.00	1663.45	2897.06	5260.33	8224.84	9759.51
14941.00	1966.44	3485.13	6342.00	9912.57	11629.10

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4008.00	3.80	6.16	7.94	7.62	8.35
7979.00	10.15	18.37	26.18	29.77	29.18
11956.00	17.92	32.23	49.85	57.62	50.87
14941.00	21.94	49.31	69.89	80.24	61.98

Good Year G165 Super Single

RTAC and Phase IV Data

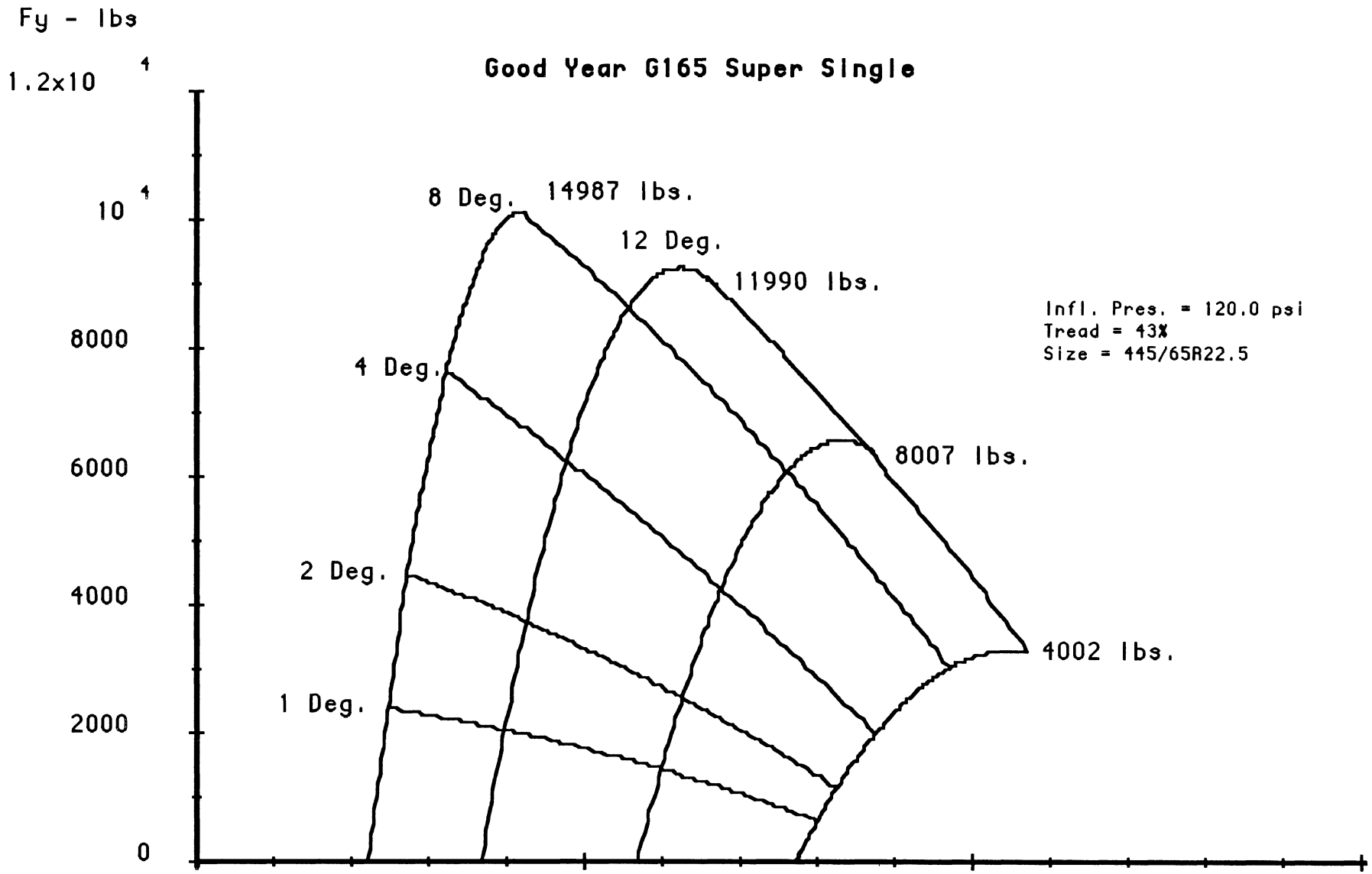
FULL TREAD, PSI = 120
TIRE,21.0,XXX
STIFFYZ,XXX,6817.17
ALIGN, 224.84
CALFA, 1583.07
TABLE
CALFA,4,1
3995.0 7985.0 11970.0 14943.0
2.1
1,1,5
1, 0.136
2, 0.252
4, 0.438
8, 0.719
12, 0.895
2,1,5
1, 0.133
2, 0.253
4, 0.448
8, 0.727
12, 0.875
3,1,5
1, 0.130
2, 0.252
4, 0.448
8, 0.702
12, 0.826
4,1,5
1, 0.125
2, 0.246
4, 0.438
8, 0.682
12, 0.789

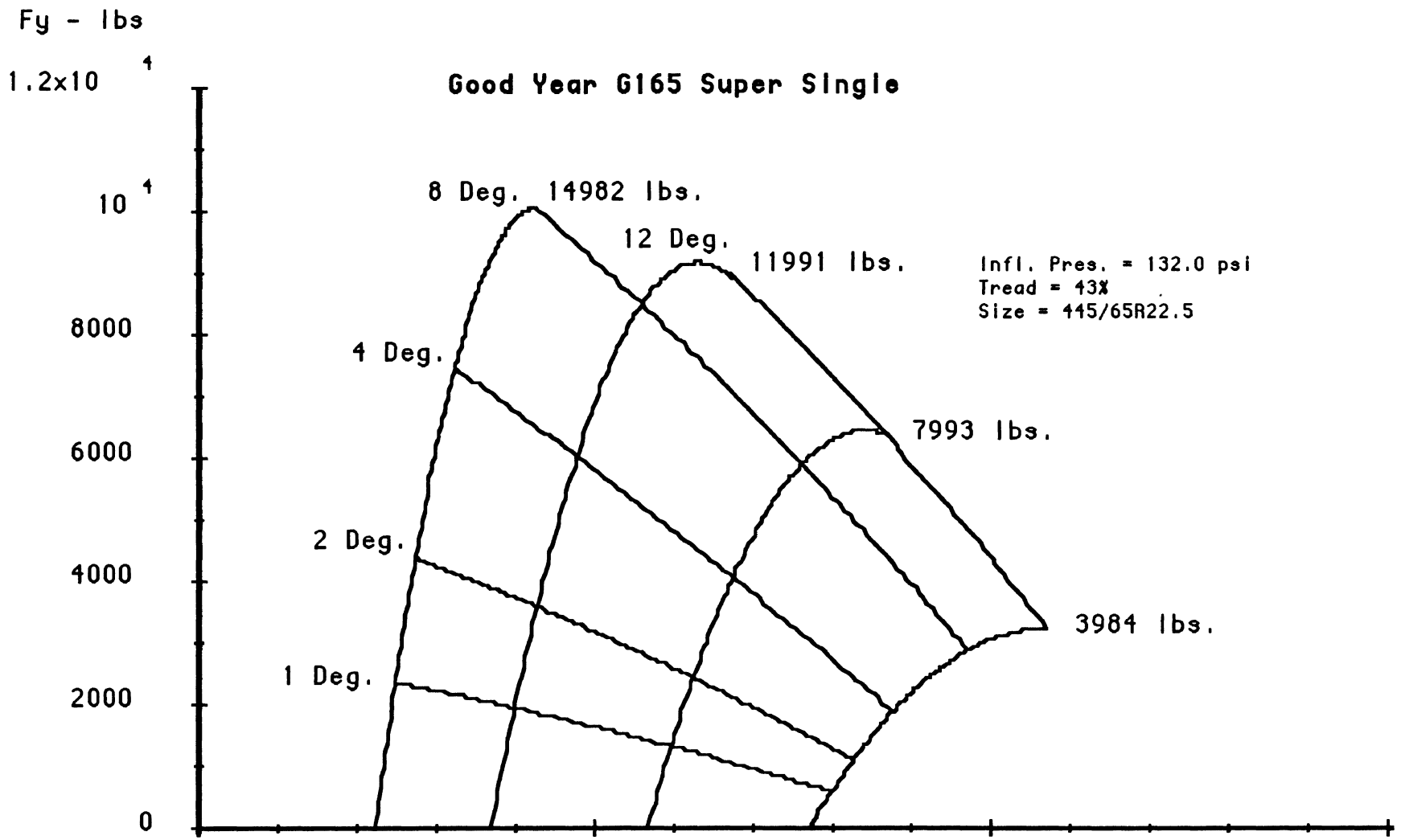
FULL TREAD, PSI = 132
TIRE,21.2,XXX
STIFFYZ,XXX,7156.5
ALIGN, 210.40
CALFA, 1659.64
TABLE
CALFA,4,1
4008.0 7979.0 11956.0 14941.0
2.1
1,1,5
1, 0.137
2, 0.243
4, 0.426
8, 0.690
12, 0.901
2,1,5
1, 0.135
2, 0.238
4, 0.431
8, 0.700
12, 0.862
3,1,5
1, 0.139
2, 0.242
4, 0.440
8, 0.688
12, 0.816
4,1,5
1, 0.132
2, 0.233
4, 0.424
8, 0.663
12, 0.778

Goodyear G165

445/65 R 22.5 L

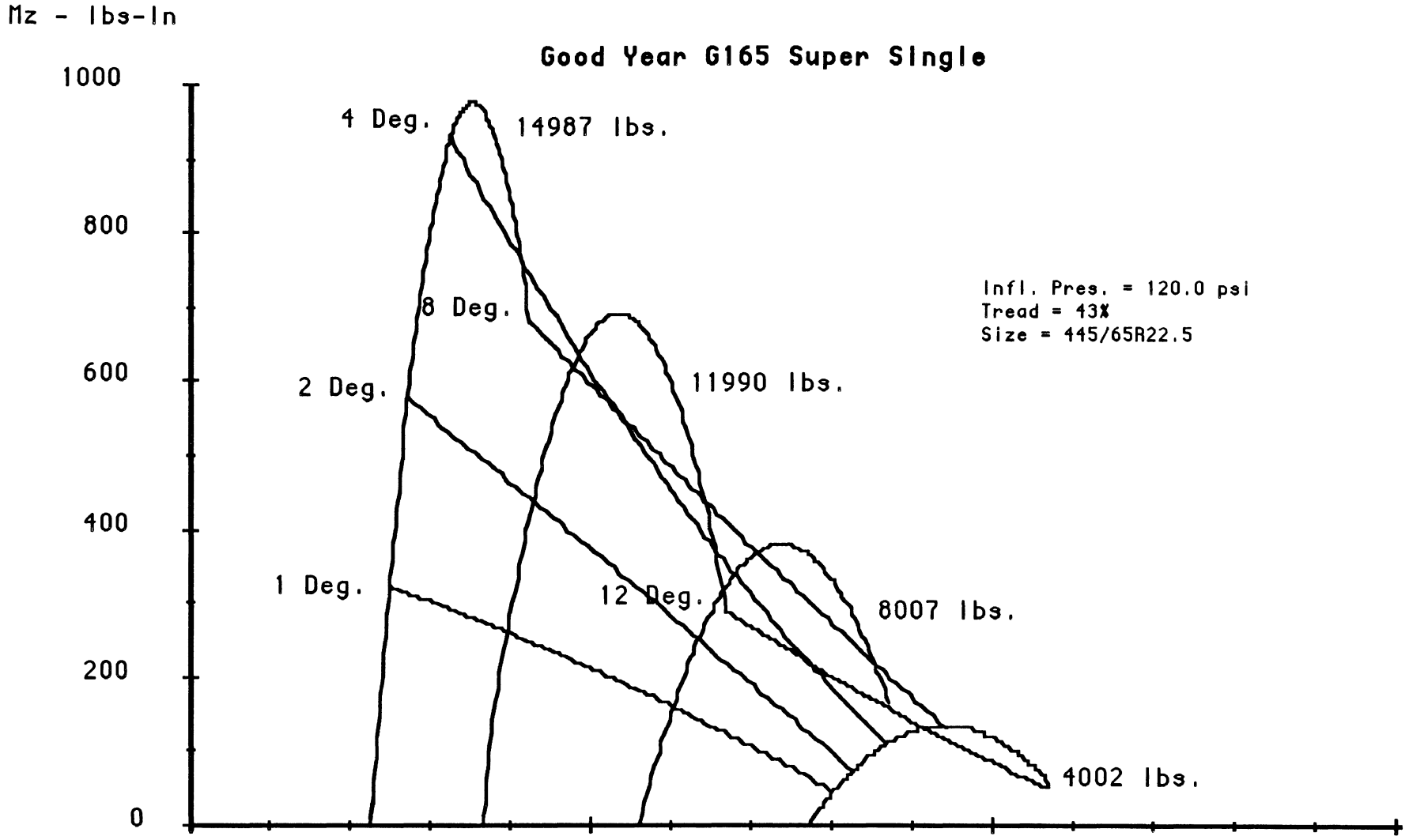
1/2 Tread


Fy - lbs
1.2x10 4
10 4
8000
6000
4000
2000
0
Good Year G165 Super Single
8 Deg. 14987 lbs.
12 Deg.
11990 lbs.
4 Deg.
8007 lbs.
2 Deg.
4002 lbs.
1 Deg.
Infl. Pres. = 120.0 psi
Tread = 43%
Size = 445/65R22.5
04/22/91 09:32:22 GY G165 445/65R22.5 1/2 120PSI
Lateral Force as a Function of Slip Angle and Verticle Load



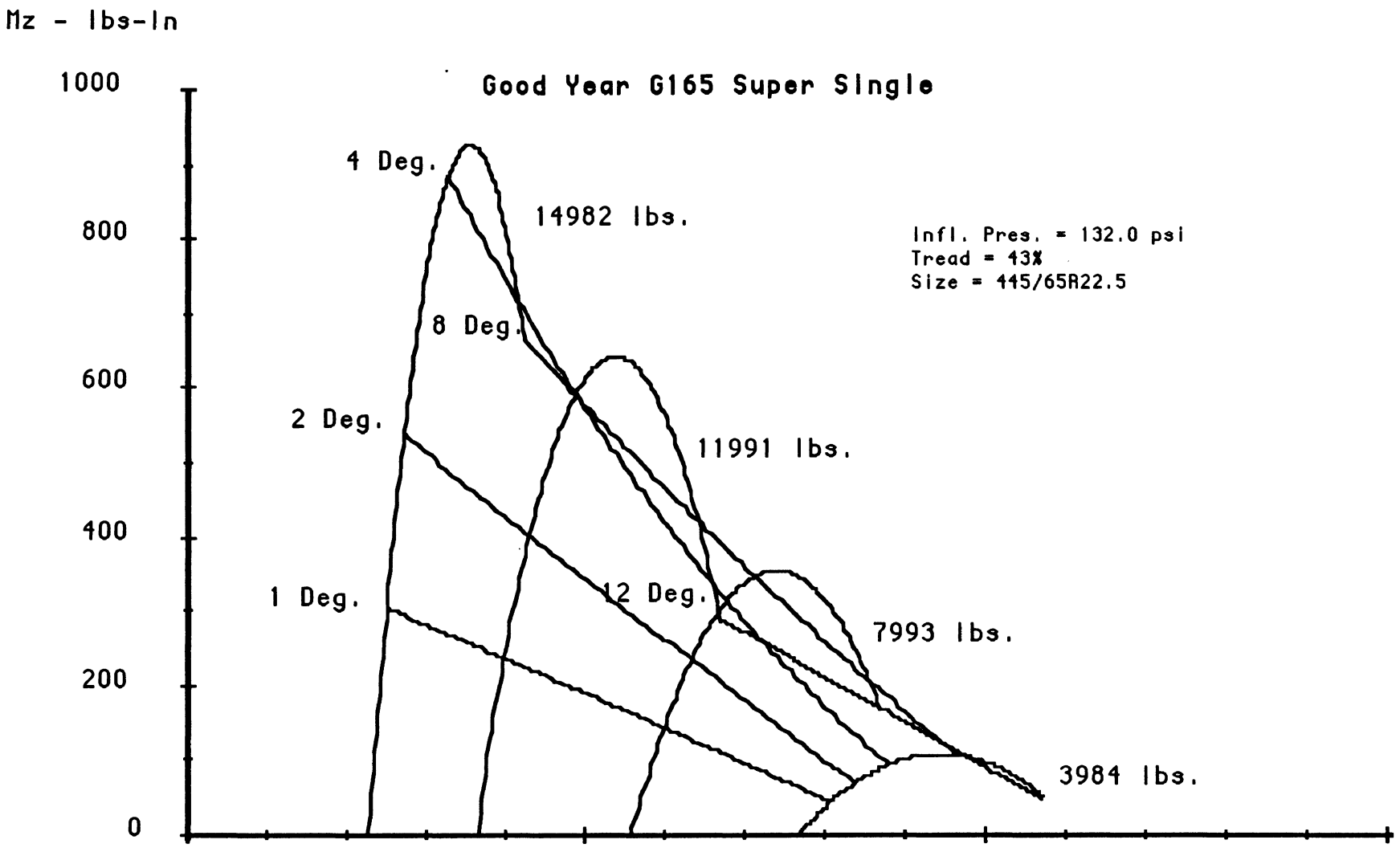
04/22/91 09:32:22 GY G165 445/65R22.5 1/2 132PSI

Lateral Force as a Function of Slip Angle and Verticle Load



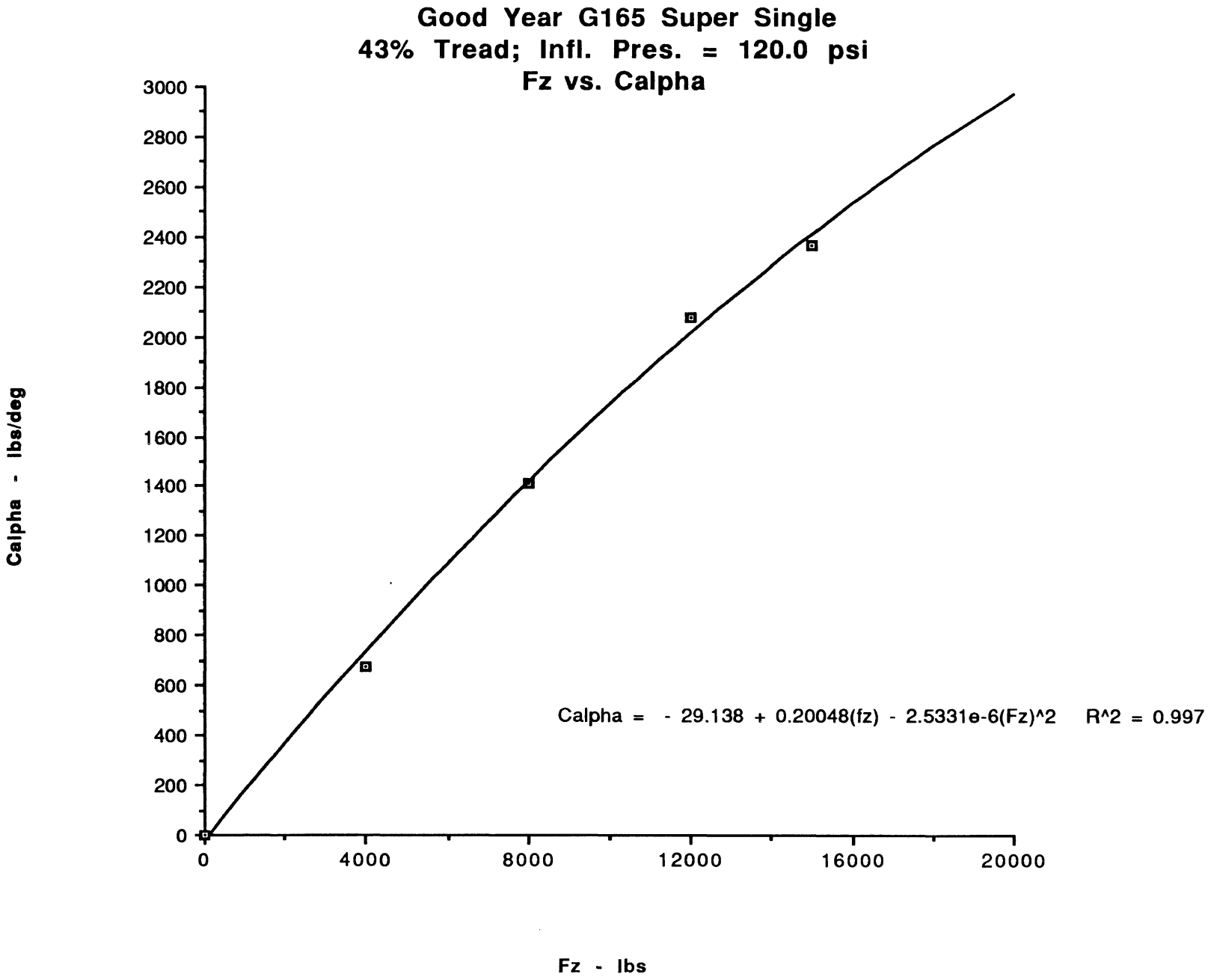
04/22/91 09:32:22 GY G165 445/65R22.5 1/2 120PSI

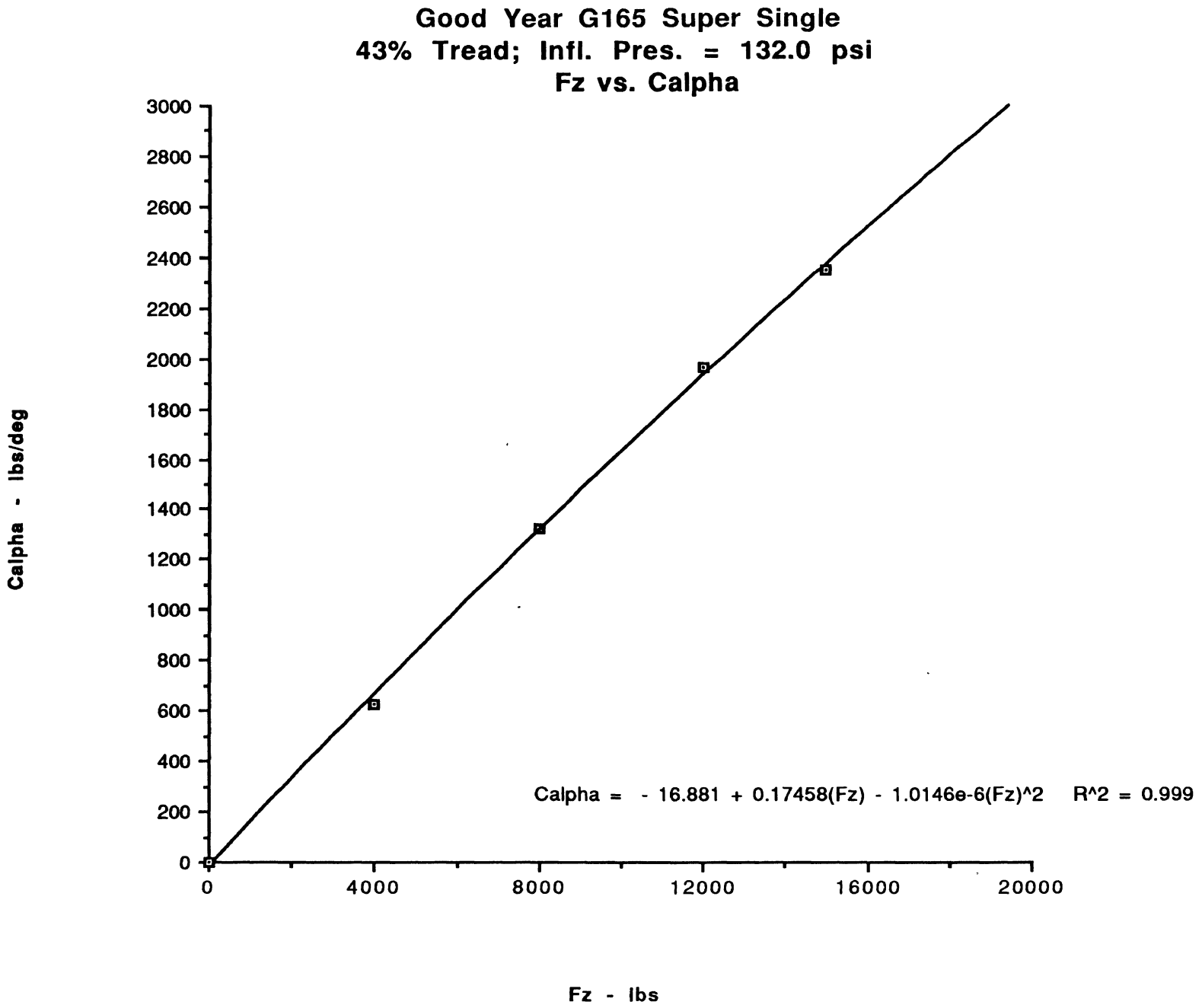
Aligning Moment as a Function of Slip Angle and Verticle Load



04/22/91 09:32:22 GY G165 445/65R22.5 1/2 132PSI

Aligning Moment as a Function of Slip Angle and Verticle Load


Good Year G165 Super Single
43% Tread; Infl. Pres. = 120.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 29.138 + 0.20048(fz) - 2.5331e-6(Fz)^2 R^2 = 0.997


Good Year G165 Super Single
43% Tread; Infl. Pres. = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 16.881 + 0.17458(Fz) - 1.0146e-6(Fz)^2 R^2 = 0.999

Good Year G165 Super Single

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; 43% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4002.00	0.00	672.30	1177.02	1995.78	2963.74	3299.12
8007.00	0.00	1415.65	2543.38	4263.09	5944.13	6411.57
11990.00	0.00	2081.10	3775.37	6283.16	8464.36	9078.06
14987.00	0.00	2364.93	4451.18	7629.48	10127.70	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4002.00	0.00	55.13	75.89	102.67	93.57	60.06
8007.00	0.00	162.27	257.68	351.52	293.35	173.21
11990.00	0.00	263.79	448.32	653.55	515.89	303.93
14987.00	0.00	321.35	575.80	934.41	676.96	

Size = 445/65R22.5 L; 43% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3984.00	0.00	626.13	1127.95	1869.93	2847.11	3245.61
7993.00	0.00	1319.88	2411.68	4047.79	5746.74	6294.01
11991.00	0.00	1965.42	3636.36	6040.09	8290.39	8967.51
14982.00	0.00	2349.39	4364.14	7449.09	10056.30	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3984.00	0.00	50.62	77.64	95.10	90.65	63.81
7993.00	0.00	148.12	240.49	332.63	276.62	175.95
11991.00	0.00	234.47	407.95	599.97	479.19	287.72
14982.00	0.00	304.91	534.44	895.99	648.67	

Good Year G165 Super Single

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; 43% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 7

0.00	1.00	2.00	4.00	8.00	12.00
4002.00	672.30	1177.02	1995.78	2963.74	3299.12
8007.00	1415.65	2543.38	4263.09	5944.13	6411.57
11990.00	2081.10	3775.37	6283.16	8464.36	9078.06
14987.00	2364.93	4451.18	7629.48	10127.70	10862.00 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 7

0.00	1.00	2.00	4.00	8.00	12.00
4002.00	4.59	6.32	8.56	7.80	5.01
8007.00	13.52	21.47	29.29	24.45	14.43
11990.00	21.98	37.36	54.46	42.99	25.33
14987.00	26.78	47.98	77.87	56.41	33.24 *

Size = 445/65R22.5 L; 43% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 7

0.00	1.00	2.00	4.00	8.00	12.00
3984.00	626.13	1127.95	1869.93	2847.11	3245.61
7993.00	1319.88	2411.68	4047.79	5746.74	6294.01
11991.00	1965.42	3636.36	6040.09	8290.39	8967.51
14982.00	2349.39	4364.14	7449.09	10056.30	10877.65 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 7

0.00	1.00	2.00	4.00	8.00	12.00
3984.00	4.22	6.47	7.92	7.55	5.32
7993.00	12.34	20.04	27.72	23.05	14.66
11991.00	19.54	34.00	50.00	39.93	23.98
14982.00	25.41	44.54	74.67	54.06	32.46 *

*Estimate

Good Year G165 Super Single

RTAC and Phase IV Data

43% TREAD, PSI = 120
TIRE,20.7,XXX
STIFFYZ,XXX,6940.2
ALIGN, 261.37
CALFA, 2053.53
TABLE
CALFA,4,1
4002.0 8007.0 11990.0 14987.0
2.1
1,1,5
1, 0.168
2, 0.294
4, 0.499
8, 0.741
12, 0.824
2,1,5
1, 0.177
2, 0.318
4, 0.532
8, 0.742
12, 0.801
3,1,5
1, 0.174
2, 0.315
4, 0.524
8, 0.706
12, 0.757
4,1,5
1, 0.158
2, 0.297
4, 0.509
8, 0.676
12, 0.725 *

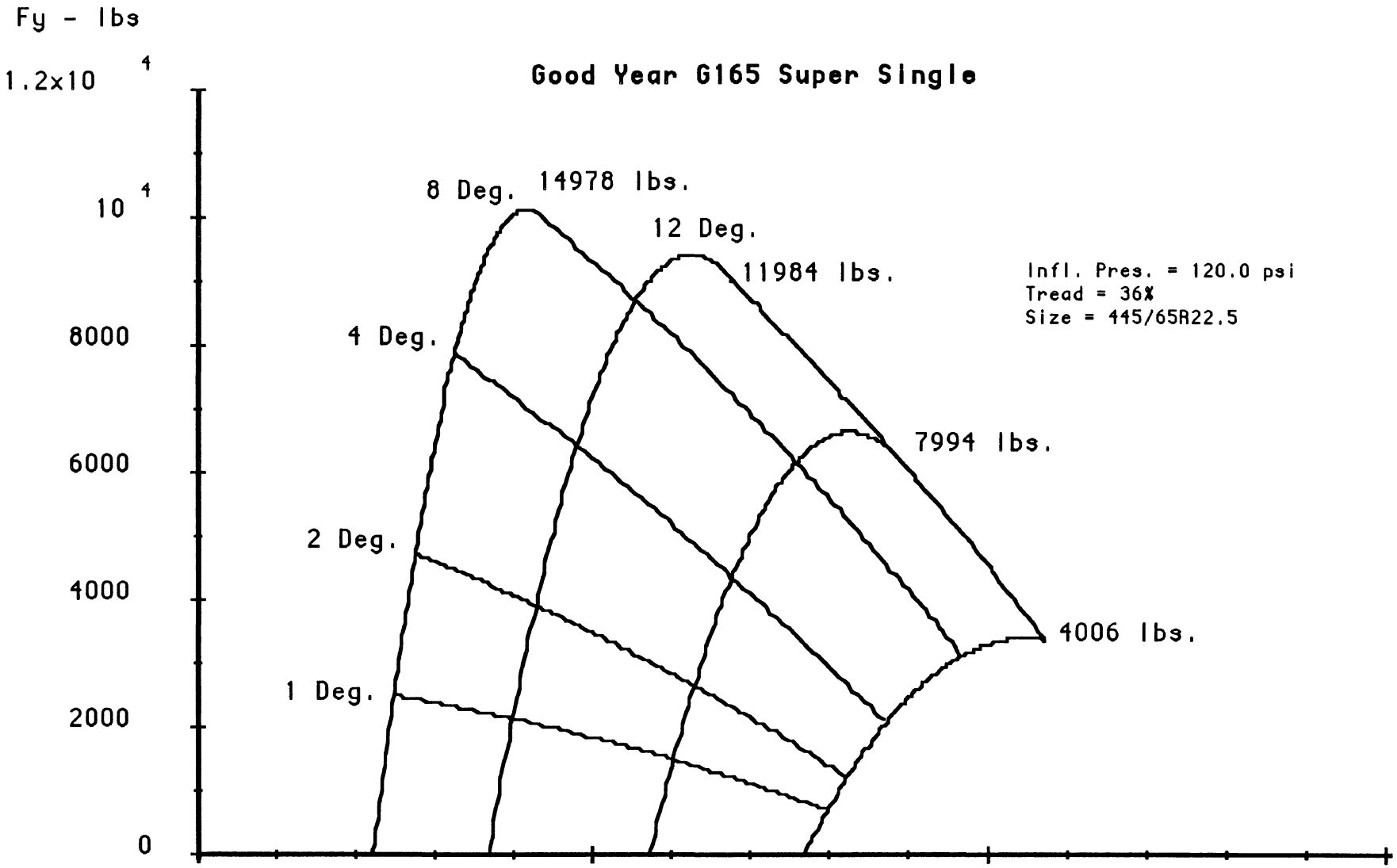
43% TREAD, PSI = 132
TIRE,20.9,XXX
STIFFYZ,XXX,7504
ALIGN, 239.39
CALFA, 1976.95
TABLE
CALFA,4,1
3984.0 7993.0 11991.0 14982.0
2.1
1,1,5
1, 0.157
2, 0.283
4, 0.469
8, 0.715
12, 0.815
2,1,5
1, 0.165
2, 0.302
4, 0.506
8, 0.719
12, 0.787
3,1,5
1, 0.164
2, 0.303
4, 0.504
8, 0.691
12, 0.748
4,1,5
1, 0.157
2, 0.291
4, 0.497
8, 0.671
12, 0.726 *

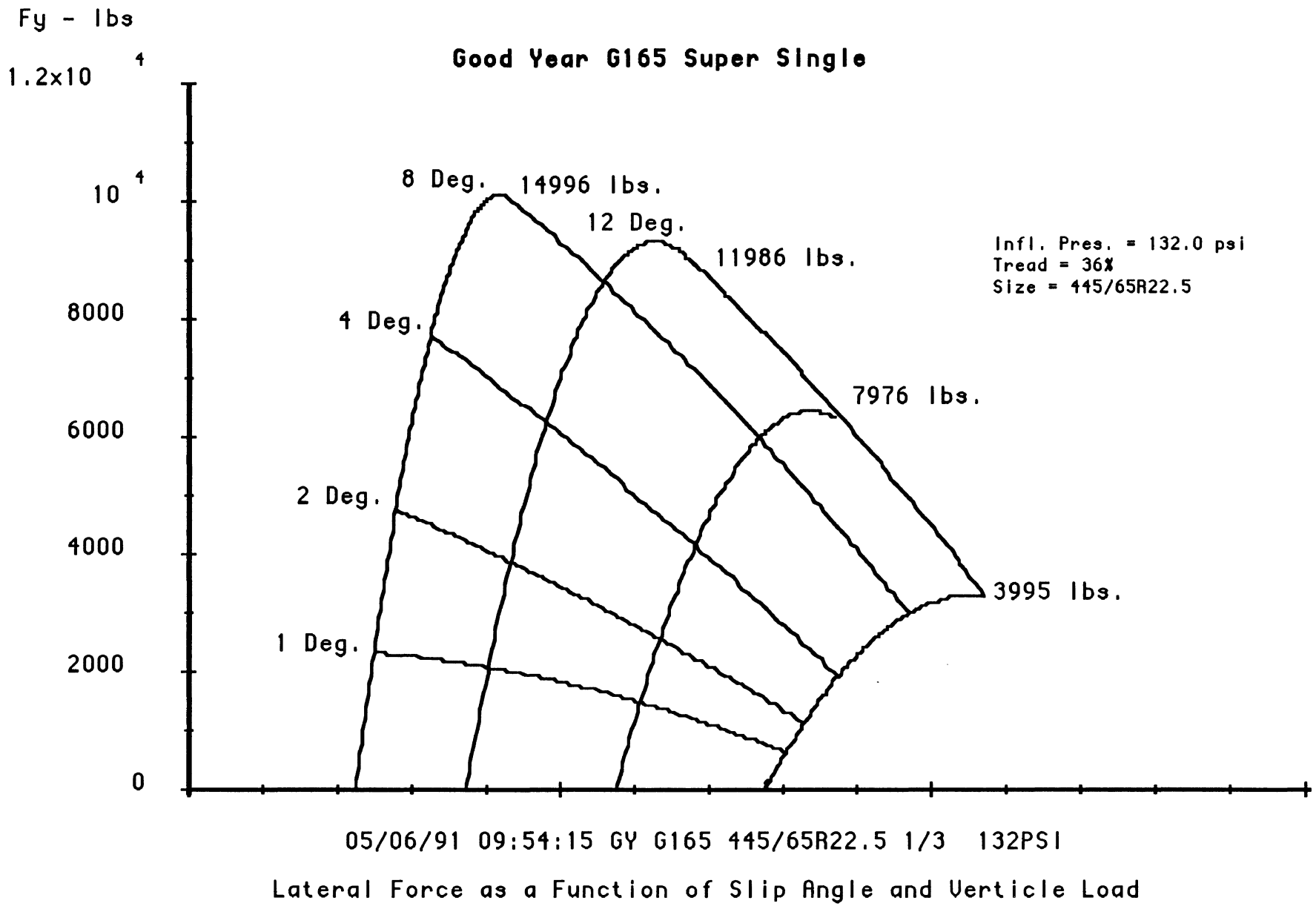
*Estimate

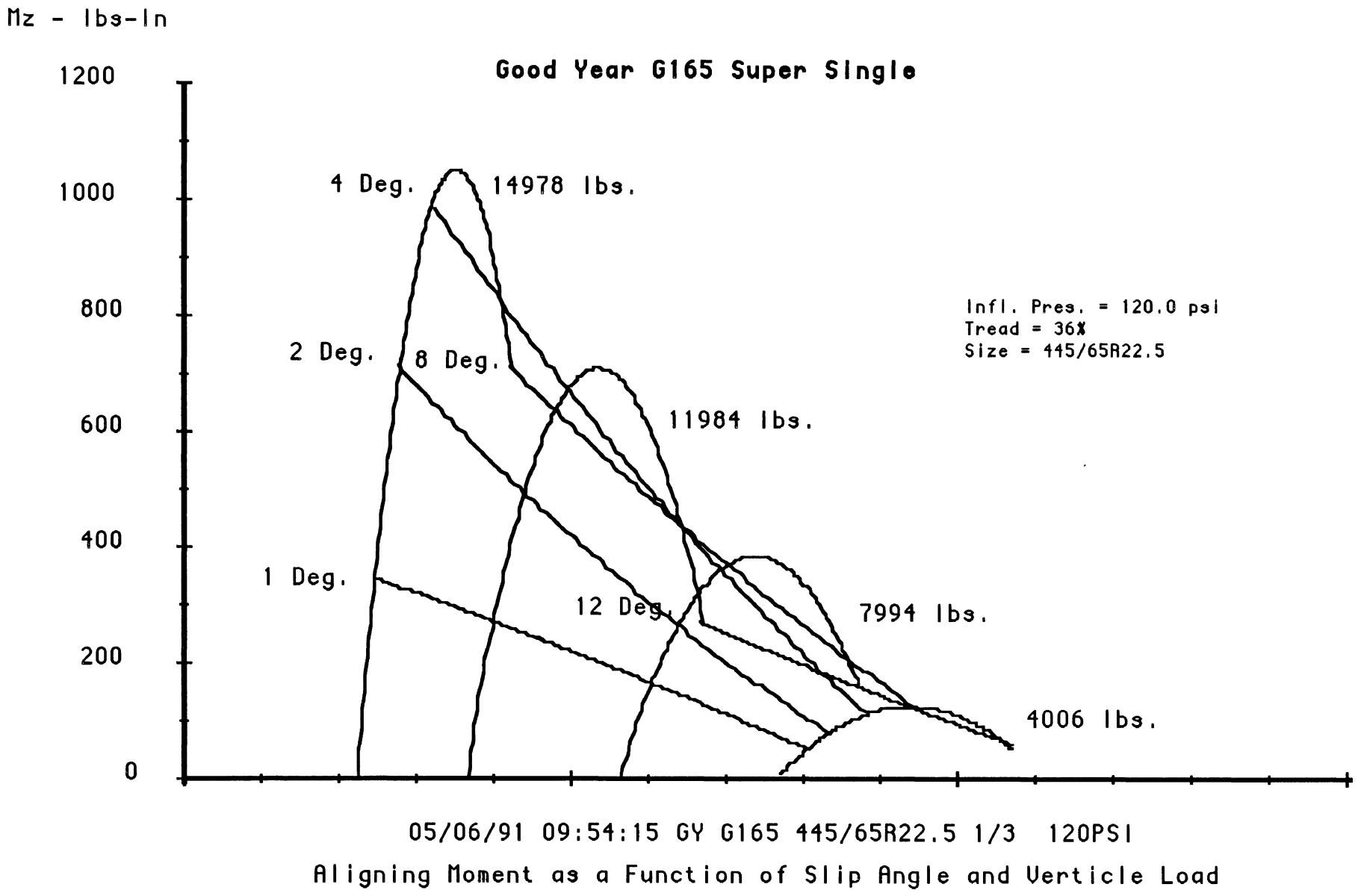
Goodyear G165

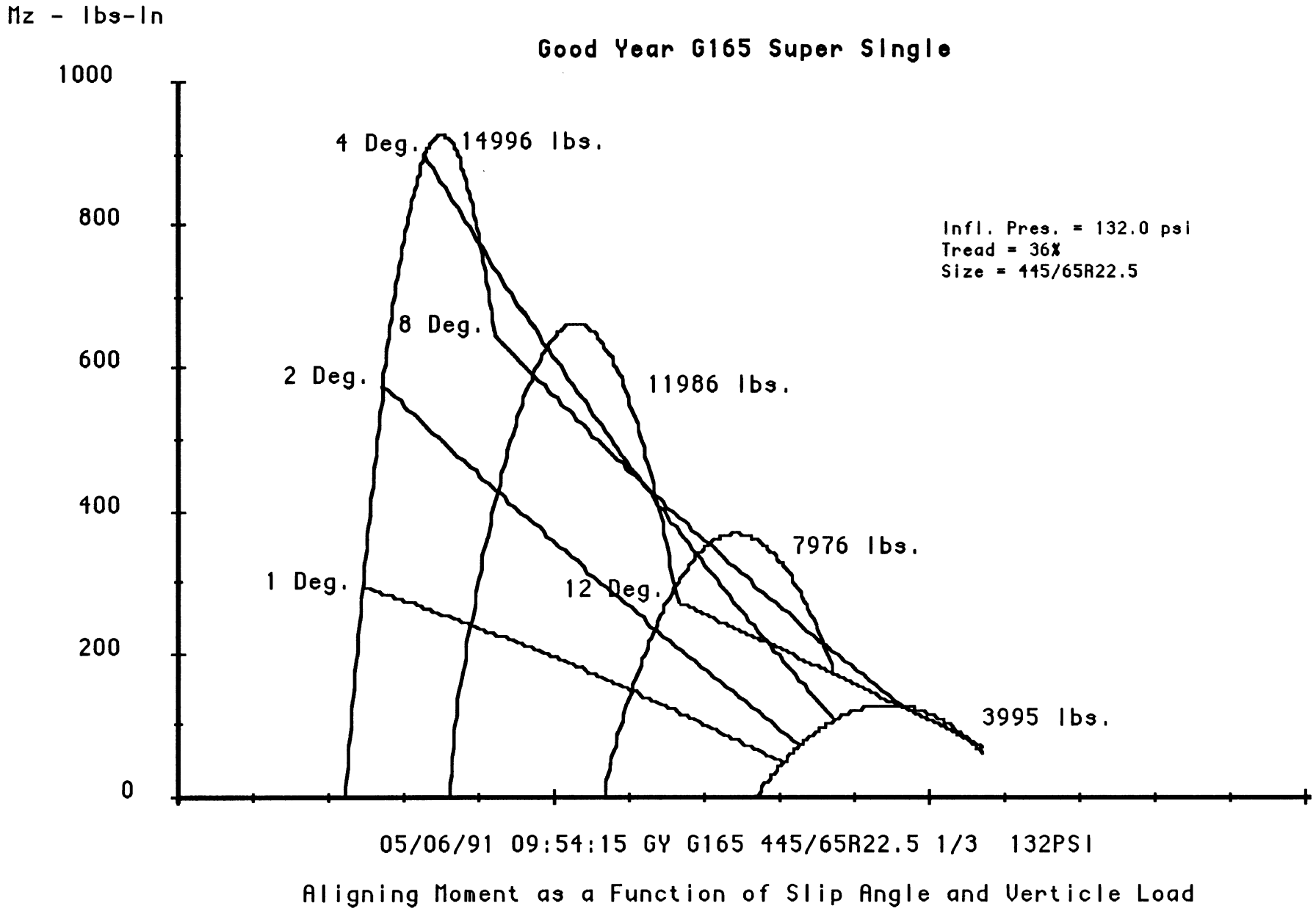
445/65 R 22.5 L

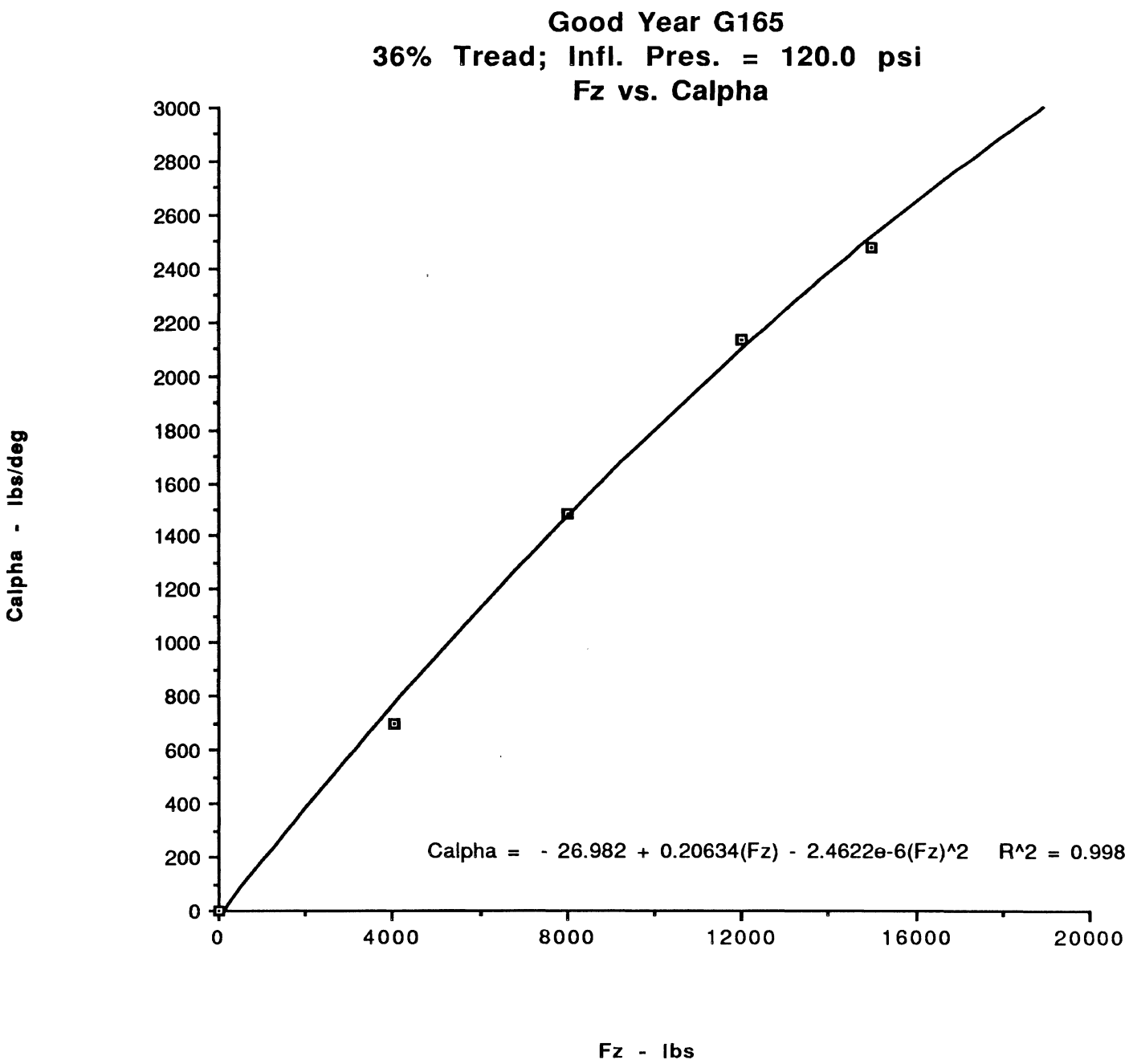
1/3 Tread

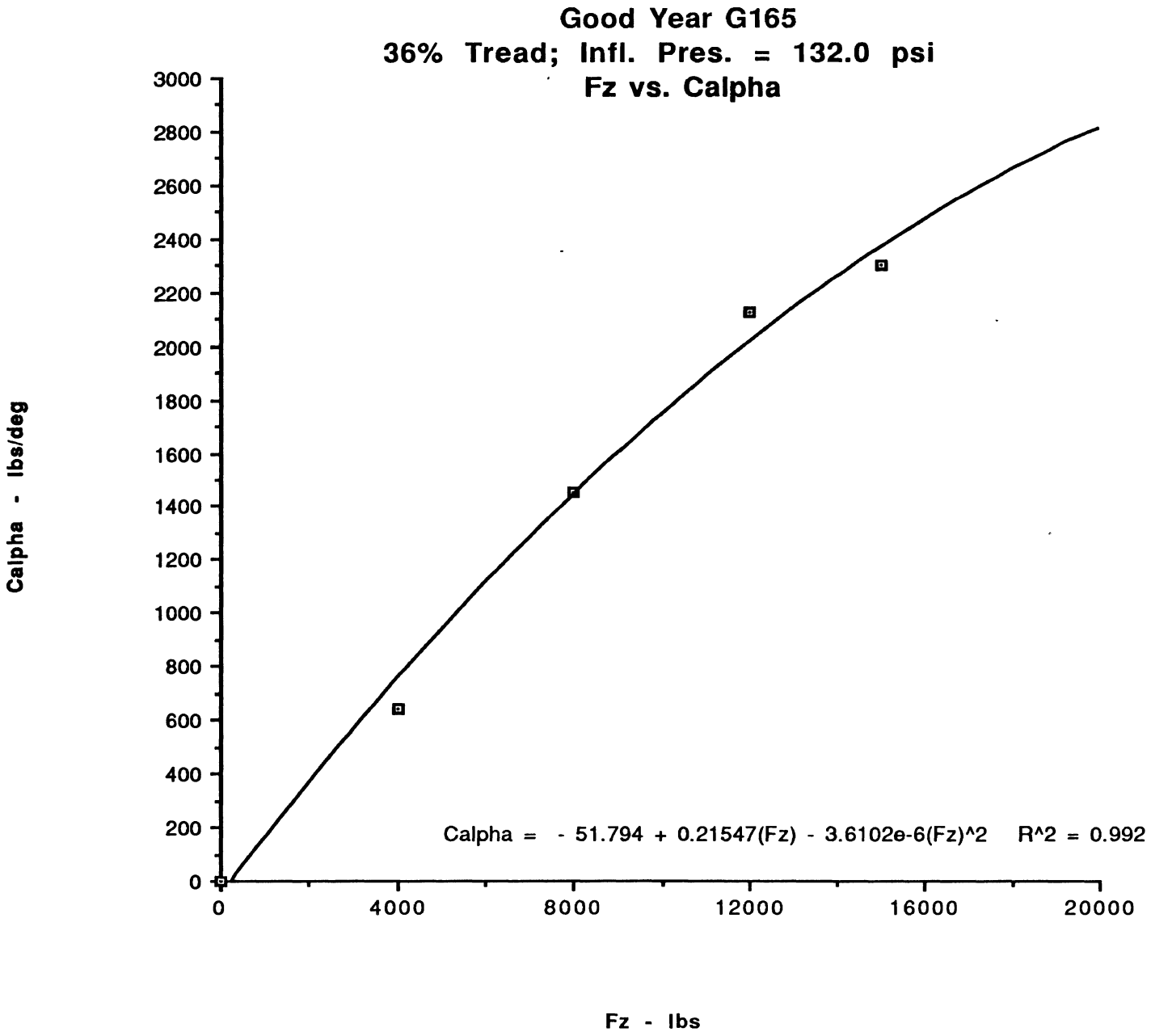

Fy - lbs
1.2x10 4
10 4
8000
6000
4000
2000
0
Good Year G165 Super Single
8 Deg.
14978 lbs.
12 Deg.
11984 lbs.
4 Deg.
7994 lbs.
2 Deg.
4006 lbs.
1 Deg.
Infl. Pres. = 120.0 psi
Tread = 36%
Size = 445/65R22.5
05/06/91 09:54:15 GY G165 445/65R22.5 1/3 120PSI
Lateral Force as a Function of Slip Angle and Verticle Load


Fy - lbs
Good Year G165 Super Single
1.2x10 4
10 4
8000
6000
4000
2000
0
8 Deg.
14996 lbs.
12 Deg.
11986 lbs.
4 Deg.
7976 lbs.
2 Deg.
3995 lbs.
1 Deg.
Infl. Pres. = 132.0 psi
Tread = 36%
Size = 445/65R22.5
05/06/91 09:54:15 GY G165 445/65R22.5 1/3 132PSI
Lateral Force as a Function of Slip Angle and Verticle Load


Mz - lbs-In
Good Year G165 Super Single
1200
1000
800
600
400
200
0
4 Deg.
14978 lbs.
2 Deg.
8 Deg.
11984 lbs.
1 Deg.
12 Deg.
7994 lbs.
4006 lbs.
Infl. Pres. = 120.0 psi
Tread = 36%
Size = 445/65R22.5
05/06/91 09:54:15 GY G165 445/65R22.5 1/3 120PSI
Aligning Moment as a Function of Slip Angle and Verticle Load


Mz - lbs-In
Good Year G165 Super Single
1000
800
600
400
200
0
4 Deg.
14996 lbs.
8 Deg.
2 Deg.
11986 lbs.
7976 lbs.
1 Deg.
12 Deg.
3995 lbs.
Infl. Pres. = 132.0 psi
Tread = 36%
Size = 445/65R22.5
05/06/91 09:54:15 GY G165 445/65R22.5 1/3 132PSI
Aligning Moment as a Function of Slip Angle and Verticle Load


Good Year G165
36% Tread; Infl. Pres. = 120.0 psi
Fz vs. Calpha
Calpha - lbs/deg
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
4000
8000
12000
16000
20000
Fz - lbs
Calpha = - 26.982 + 0.20634(Fz) - 2.4622e-6(Fz)^2 R^2 = 0.998


Good Year G165
36% Tread; Infl. Pres. = 132.0 psi
Fz vs. Calpha
Calpha - lbs/deg
Fz - lbs
Calpha = - 51.794 + 0.21547(Fz) - 3.6102e-6(Fz)^2 R^2 = 0.992
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
0
4000
8000
12000
16000
20000

Good Year G165 Super Single

Lateral Force and Aligning Moment Tables

Size = 445/65R22.5 L; 36% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4006.00	0.00	698.12	1217.23	2053.23	2998.02	3326.90
7994.00	0.00	1486.05	2661.48	4385.47	5953.21	6399.61
11984.00	0.00	2135.60	3953.59	6469.08	8454.14	9025.19
14978.00	0.00	2481.90	4720.26	7859.92	10101.90	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
4006.00	0.00	58.54	88.09	115.41	100.44	64.21
7994.00	0.00	168.72	271.28	381.88	289.66	177.99
11984.00	0.00	273.77	523.13	706.08	520.43	303.40
14978.00	0.00	345.05	714.54	982.97	700.50	

Size = 445/65R22.5 L; 36% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3995.00	0.00	641.05	1162.68	1942.44	2890.81	3252.79
7976.00	0.00	1451.00	2579.63	4188.03	5876.59	6375.52
11986.00	0.00	2125.07	3910.45	6302.97	8414.56	8988.64
14996.00	0.00	2299.33	4757.06	7715.84	10126.00	

Aligning Torque Table
Aligning Torque (in-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)

	Slip Angle					
Verticle Load	0	1	2	4	8	12
3995.00	0.00	53.01	76.60	104.49	100.08	67.88
7976.00	0.00	150.60	234.66	355.99	280.36	182.81
11986.00	0.00	238.20	439.58	652.34	467.56	287.57
14996.00	0.00	291.52	566.07	902.46	635.87	

Good Year G165 Super Single

Input Format for the Constant Velocity Yaw/Roll Program

Size = 445/65R22.5 L; 36% Tread; Inflation Pressure = 120.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4006.00	698.12	1217.23	2053.23	2998.02	3326.90
7994.00	1486.05	2661.48	4385.47	5953.21	6399.61
11984.00	2135.60	3953.59	6469.08	8454.14	9025.19
14978.00	2481.90	4720.26	7859.92	10101.90	10784.25 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
4006.00	4.88	7.34	9.62	8.37	5.35
7994.00	14.06	22.61	31.82	24.14	14.83
11984.00	22.81	43.59	58.84	43.37	25.28
14978.00	28.75	59.55	81.91	58.37	34.03 *

Size = 445/65R22.5 L; 36% Tread; Inflation Pressure = 132.0 psi
Cornering Force Table
Lateral Force (lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3995.00	641.05	1162.68	1942.44	2890.81	3252.79
7976.00	1451.00	2579.63	4188.03	5876.59	6375.52
11986.00	2125.07	3910.45	6302.97	8414.56	8988.64
14996.00	2299.33	4757.06	7715.84	10126.00	10816.84 *

Aligning Torque Table
Aligning Torque (ft-lbs) VS. Slip Angle (deg) and Verticle Load (lbs)
5 6

0.00	1.00	2.00	4.00	8.00	12.00
3995.00	4.42	6.38	8.71	8.34	5.66
7976.00	12.55	19.55	29.67	23.36	15.23
11986.00	19.85	36.63	54.36	38.96	23.96
14996.00	24.29	47.17	75.20	52.99	32.59 *

*Estimate

Good Year G165 Super Single

RTAC and Phase IV Data

36% TREAD, PSI = 120
TIRE,20.6,XXX
STIFFYZ,XXX,6963
ALIGN, 274.35
CALFA, 2138.49
TABLE
CALFA,4,1
4006.0 7994.0 11984.0 14978.0
2.1
1,1,5
1, 0.174
2, 0.304
4, 0.513
8, 0.748
12, 0.830
2,1,5
1, 0.186
2, 0.333
4, 0.549
8, 0.745
12, 0.801
3,1,5
1, 0.178
2, 0.330
4, 0.540
8, 0.705
12, 0.753
4,1,5
1, 0.166
2, 0.315
4, 0.525
8, 0.674
12, 0.720 *

36% TREAD, PSI = 132
TIRE,20.8,XXX
STIFFYZ,XXX,7434
ALIGN, 236.77
CALFA, 2052.30
TABLE
CALFA,4,1
3995.0 7976.0 11986.0 14996.0
2.1
1,1,5
1, 0.160
2, 0.291
4, 0.486
8, 0.724
12, 0.814
2,1,5
1, 0.182
2, 0.323
4, 0.525
8, 0.737
12, 0.799
3,1,5
1, 0.177
2, 0.326
4, 0.526
8, 0.702
12, 0.750
4,1,5
1, 0.153
2, 0.317
4, 0.515
8, 0.675
12, 0.721 *

*Estimate