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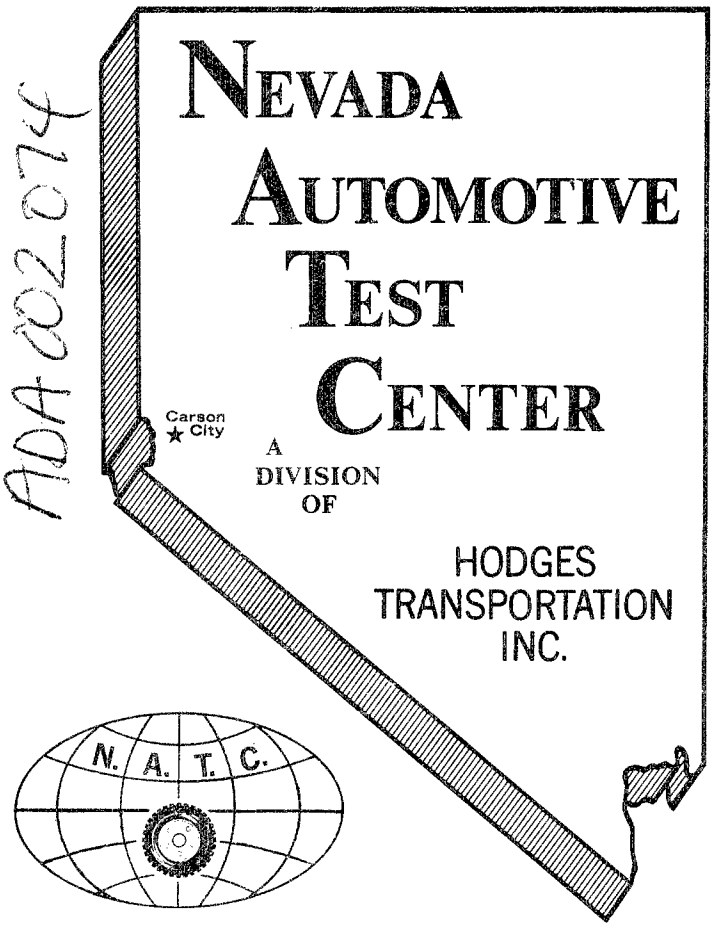


TECHNICAL REPORT NO. 11908

FINAL REPORT

# TREAD DESIGN STUDY OF 9.00R20 RADIAL PLY TIRES

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Contract DAAE07-73-C-0242

NATC Project 20-17-30

July 1974

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# TREAD DESIGN STUDY OF 9.00R20 RADIAL PLY TIRES


by James E. Dobbins

HODGES TRANSPORTATION INC.

Date: July 1974

Contract DAAE07-73-C-0242

TACOM

MOBILITY SYSTEMS LABORATORY

U.S. ARMY TANK AUTOMOTIVE COMMAND Warren, Michigan

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Final Report

NATC Project 20-17-30

Contract DAAE07-73-C-0242

TABLE OF CONTENTS

Final Report

NATC Project 20-17-30

Contract DAAE07-73-C-0242

TABLE OF CONTENTS (Contd.)

Final Report

NATC Project 20-17-30

Contract DAAE07-73-C-0242

TABLE OF CHARTS

TABLE OF CHARTS (Contd.)

TABLE OF CHARTS (Contd.)

Final Report

NATC Project 20-17-30

Contract DAAE07-73-C-0242

TABLE OF FIGURES

TABLE OF FIGURES (Contd.)

# INTRODUCTION

Radial ply tire construction has gained considerable recognition over the past five years and has been proven acceptable in a wide field of wheeled vehicle use. The United States Army has used essentially the same tire tread design since before World War II and found the lug type NDCC tire satisfactory for some applications and marginal or unsatisfactory for others. This test program is one of a series of engineering studies being made to determine the characteristics, attributes and shortcomings of currently available commercial radial ply tires in various environments and applications.

From this and other studies, a composite tread design may be developed to more adequately fulfill military tire requirements, improve vehicular mobility and handling in certain problem areas without compromising existing satisfactory operations, and increase useful tire life. There is another radial ply tire advantage which has been demonstrated in previous military wheeled vehicle comparative tire tests: A modest but consistent reduction in fuel consumption.

The test operation was performed at the Nevada Automotive Test Center proving ground in Lyon County, Nevada, the Sand Mountain Test Site in Churchill County, Nevada, and the Winter Test Facility at West Yellowstone, Montana. This test operation was photographed by John Nellenbach of the U. S. Army Tank Automotive Command under the technical direction of Roger Kirk, also of the U. S. Army Automotive Tank Command. Mr. Kirk also provided technical direction to the Nevada Automotive Test Center division of Hodges Transportation, Inc.

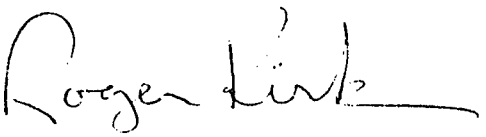
# FOREWORD

The current non-directional cross-country (NDCC) tread pattern of bias multi-plied tires have been used, with minor improvements, on U.S. Military tactical wheeled vehicles since World War II. It has been a good aggressive tread design, adapted particularly for military truck purposes where off-the-road mobility is an absolute must. The chief drawback to the NDCC and NDMS designs is that they are not good performers over the road. The low percentage (about 55%) of tread rubber in contact with the road surface means poor ground contact (low net to gross footprint), resulting in very poor wet surface traction and braking, and poor lateral stability on turns.

With the advent of steel belted radial ply truck tires, a great advance in tread life, puncture resistance, ground contact area and vehicle handling and stability are possible. Safety is thus enhanced. In addition, radials have fewer plies than bias tires (in the case of large tires, i.e., 10.00-20 and above, far fewer) and thus run much cooler. This means that delaminations and ply separations are much less likely to occur, reducing the incidence of blow-outs. Because

of the steel belt, the full tread, or at least that part equal to the width of the belt, is in contact with the road and tire squirming at the contact patch is practically eliminated. This means lowering the rolling resistance of the vehicle which results in greater drawbar pull for the same expenditure of energy. In other words, a conservation of fuel.

With all these established advantages in radial ply tires, the Army Tank-Automotive Command sought to establish an all-purpose tread design optimized for highway performance which would at least equal, and hopefully surpass, the off-the-road aggressiveness of the NDCC bias tires. A number of commercial radials with variable degrees of aggressive tread designs were procured, and two brands, one domestic and one foreign, were buffed and retreaded with a TACOM approved tread design. These tires, in the 9.00R20 size, were then tested over a comprehensive variety of surface conditions on a M34, 2-1/2 ton truck at the Nevada Automotive Test Center. The results of the tests are disclosed in this report.



ROGER KIRK
Radial Ply Tire Project Engineer
U.S. Army Tank-Automotive Command

## 1.0 TEST OBJECTIVE

The objective of this test program was to conduct an engineering evaluation of eight groups of 9.00R20 radial ply tires, with a variety of tread designs, in order to develop data useful in the design of a military radial ply tire. A contract modification added two different bias ply tires for comparison in several static situations. Tread designs included the standard military NDCC, an experimental USATACOM tread, and several commercial designs for on/off-the-road applications.

## 2.0 SCOPE OF WORK

The following dynamic response characteristics of the M34 2-1/2 ton 6x6 truck (using single 9.00R20 tires instead of duals on the rear axles) were determined as a function of radial ply tire tread design and inflation pressures on eight groups of radial ply tires:

a. Lateral stability.

b. Sand, mud, packed clay, virgin and packed snow, dry ice and wet asphalt tractive force.

c. Wet asphalt and dry ice braking efficiency.

d. Sand, mud, packed clay, virgin and packed snow, dry ice and dry asphalt rolling resistance.

e. Ton mile per hour breaker temperature.

f. Stone retention and rock cut resistance.

Static analysis of the eight radial ply tire groups plus two bias ply 9.00-20 groups was made in each of the following areas:

a. Spring rates.

b. Footprint analysis.

c. X-rays.

In the prepared sand and prepared mud phases of testing early in the program, the Group A tires were incorrectly mounted. This group has a directionally designed tread pattern and was installed with the tread rotating in the reverse direction. To correct this situation, reruns were made in sand and mud and the results integrated into the Test Result Summary and into each of the related test result sections.

## 3.0 SUMMARY OF TEST RESULTS

Several methods of tire and tread analyses have been employed to provide discrimination between tire groups.

The most fundamental method is to arbitrarily assign values of 1 through 8 based on tire ranking during the tests as shown in Test Results, page 6. This results in the following ranking:

| Rank | Group | Total |
|---|---|---|
| 1 | B | 78 |
| 2 | D | 81 |
| | J | 81 |
| 3 | G | 83 |
| 4 | C | 94 |
| 5 | E | 98 |
| 6 | A | 106 |
| 7 | F | 114 |

See Groups Rating Summary on the following page.

Another method of analysis is based on the following tests:

1. "S" turns
2. Sand traction
3. Mud traction
4. Dry Ice traction
5. Virgin Snow traction
6. Packed Snow traction
7. Wet Asphalt braking
8. Dry Ice braking
9. Rolling resistance sand
10. Rolling resistance asphalt

These were selected as being characteristics of mobility, control and handling of major importance to military 2-1/2 ton trucks.

## 3.0 SUMMARY OF TEST RESULTS (Contd.)

Using the same rating system shown on page 6 but limited to the ten tests listed on page 3 the rating of the eight tire groups is as shown below.

| Group & Rank | Rating 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
|---|---|---|---|---|---|---|---|---|---|
| D | 2 | 1 | 2 | 1 | 1 | 2 | | 1 | 39 |
| E | 2 | 1 | 2 | | 1 | 2 | 2 | | 40 |
| A | 1 | 1 | 1 | 3 | 2 | 1 | | 1 | 41 |
| G | 1 | 1 | 3 | | 2 | 1 | 1 | 1 | 43 |
| C | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 44 |
| B | 2 | 1 | 1 | | 2 | 1 | 3 | | 44 |
| F | | 3 | | 2 | 1 | 1 | | 3 | 49 |
| J | 2 | | 2 | | 1 | 1 | 1 | 3 | 50 |

An examination of this rating table shows the D group tire to be superior to the other seven groups. Using the ranking from the table on page 3 the D tire is seen to be just below tire Group B. But tire B ranks significantly lower in the ten listed mobility, control and handling characteristics. An examination of the Group Rating Summary on page 6 shows that Group B is low in sand traction which is an important mobility parameter but high in rolling resistance on packed clay which is not considered as significant and leads to the weighting effect of the table above.

A review of the actual test data shows that all of the tires tested tend to be closely grouped.

The higher ply rating of these eight groups of radial tires, 12 and 14 ply rated, as compared to the 8 ply rated 9.00-20 Non Directional Cross-country bias ply Military Standard tires, (tested in Contract DAAE07-70-C-3338, HTI Project 20-14-32-02), makes direct mobility comparisons of the influence of tread design inappropriate because of the different spring rates and tire deflection characteristics.

## 3.0 SUMMARY OF TEST RESULTS (Contd.)

It is also noticeable in the tests, on virgin snow and hard pack snow which are directly comparable, that the radial tires are notably superior to the bias tires of Project 20-14-32-02 (DAAE07-70-C-3338) and comparable to the only radial tire (Group A) in the test. The sand data also reflects a superiority for radial tires which was slightly reduced because of wind blown sand that mixed into the test course during the late period of the year when these tests were performed.

Of the three tire groups noted above, A, D and G showed better mobility characteristics than the other groups, none were seriously damaged by rock cutting, and D and G did not show stone retention.

3.0 SUMMARY OF TEST RESULTS (Contd.)

Group Rating Summary

| Test Phase | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| "J" Turn | G | C | D | J | B | F | A | E |
| "S" Turn | D | G | E & J | | B | C | A | F |
| Sand Traction | G | D | J | A | E & F | | B & C | |
| Mud Traction | J | F | G | A | B | D | E | C |
| Dry Ice Traction | B | C | A | F | D | E | J | G |
| Virgin Snow Traction | B | F | E | A | C | D | G | J |
| Packed Snow Traction | A | B | C & D | | J | G | E | F |
| Wet Asphalt Traction | J | C | D | B & G | | F | E | A |
| Packed Clay Traction | B | J | G | F | E | A | C | D |
| Wet Asphalt Braking | C & J | | B | F | G | A & E | | D |
| Dry Ice Braking | E | F | G | D | A, B & C | | | J |
| Ton Mile Per Hour | C | D | B | A | E | G & J | | F |
| Stone Retention | B, C, D, G, J | | | | | F | A | E |
| Cut Resistance | G | A | J | B | D | E | C | F |
| Rolling Resistance Sand | D | E | G | C | A | J | B | F |
| Rolling Resistance Mud | J | F | C | E | D | B | G | A |
| Rolling Resistance Virgin Snow | J | D | B | G | E | F | A | C |
| Rolling Resistance Packed Snow | J | G | B | E | F | D | A | C |
| Rolling Resistance Packed Clay | E | B | J | A | G | D | F | C |
| Rolling Resistance Dry Ice | D | C | B | E | A | G | F | J |
| Rolling Resistance Dry Asphalt | E | A | D | C | G | F | B | J |

This summary places each group in relation to other groups based on the ratings for each test phase. "1" is the highest rating, "8" the lowest and where groups are equal they are joined by a comma or an "&" sign.

## 4.0 CONCLUSION

The TACOM developed re-capped tread design, Group G exhibits above average performance, whereas the same tread design applied to a different tire carcass, Group J, does not perform as well. This confirms that properly applied radial tire technology requires the tread and carcass to be an integral system with interdependent dynamic characteristics. The x-ray study of these two apparently similar tires shows a significant difference in the geometric lay-up of the belt system, (see Appendix II, this report). Tire Group B, a tread design similar to the TACOM design performs better than "J" and not as well as "G".

Group D, which features the same carcass construction as Group G, but a significantly different tread design, exhibits above average performance and is the best of the U. S. original equipment tires tested in this program.

None of the tire groups tested maximize the traction potential of the standard 2 1/2 ton, 6x6 Military truck.

## 5.0 RECOMMENDATIONS

Design and/or procure a radial ply tire in the 9.00-20 size, having a ply rating equivalent to standard military 9.00-20 NDCC bias ply tires incorporating either the TACOM tread design or one that has tread and shoulder characteristics found most advantageous in this test program.

Conduct a broad series of studies on dynamic capabilities and static properties of this new design relative to the standard military NDCC bias ply tire. These studies to include:

Treadwear and durability characteristics.
Tractive ability in various environments.
Handling response.
Lateral stability.
Footprint and spring rate analyses.

## 6.0 TEST RESULTS

### "J" and "S" Turn Measurements

Chart No 1 "J" Turn

| Tire Group | Maximum Speed, mph | Differential between front and rear tracks | Control relative to prescribed 90' radius. Rear Wheels |
|---|---|---|---|
| A | 29 | 20.5" | 44.0"** |
| B | 29 | 15.0 | 25.0 |
| C* | 30 | 15.0 | 40.0** |
| D | 29 | 11.5 | 35.5 |
| E | 28 | 12.5 | 36.0** |
| F | 29 | 18.5 | 16.0 |
| G | 30 | 9.0 | 20.0 |
| J | 29 | 13.5 | 55.5** |
| C* | 30 | 11.0 | 62.0** |

Chart No 2 "S" Turn

| Tire Group | Maximum Speed, mph | 1st Curve Differential between front and rear tracks | 2nd Curve Differential between front and rear tracks |
|---|---|---|---|
| A | 27 | 13.0" | 29.0" |
| B | 27 | 9.5 | 34.5 |
| C* | 27 | 12.0 | 14.0*** |
| D | 28 | 13.0 | 31.0 |
| E | 28 | 15.0 | 29.0 |
| F | 27 | 15.0 | 27.0 |
| G | 28 | 14.0 | 24.0 |
| J | 28 | 15.0 | 27.5 |
| C* | 27 | 12.0 | 17.0*** |

* Control Group
** Loss of control
*** Severe understeer

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 3 Dynamic Traction - Dry Sand

| | Drawbar Pounds | |
|---|---|---|
| | Inflation Pressure, psig | |
| Group | 10 | 15 |
| D* | 1850 | 1350 |
| A | 1850 | 1150 |
| B | 1775 | 1100 |
| C | 1800 | 1050 |
| E | 1750 | 1200 |
| F | 1800 | 1100 |
| G | 2100 | 1350 |
| J | 1950 | 1150 |
| D | 1950 | 1175 |

Chart No. 4 shows the ratings in percent of drawbar pounds compared to the Control Group D. This was the only test phase that Group D was used as control. All other test phases use Group C as control. The control was run first and last in this test to determine if course conditions were changing during the test. In the case of dry sand testing, a gradient was established at both inflation pressures and this gradient is reflected in the ratings. (Figures No. 1 through 14).

* Control group

6.0 TEST RESULTS (Contd.)

Chart No. 4 Dynamic Traction - Dry Sand

Ratings

| Group | Inflation Pressures, psig 10 | 15 |
|---|---|---|
| D* | 100 | 100 |
| A | 97 | 91 |
| B | 93 | 87 |
| C | 95 | 83 |
| E | 92 | 95 |
| F | 95 | 87 |
| G | 111 | 107 |
| J | 103 | 91 |

Track depth and width, cone and plate penetrometer measurements and other data taken on each traction run are included with each traction curve figure. Figures No. 15 through 22 graphically plot the daily course cone and plate penetrometer readings across and down the length of the test course.

Vehicle: M34
GVW: 11,536 pounds
Mode: 6 Wheel drive

* Control Group

6.0 TEST RESULTS (Contd.)

Chart No. 5 Rolling Resistance - Dry Sand

Pounds Per Ton

| Group | Inflation Pressure, psig 10 | 15 |
|---|---|---|
| D* | 141 | 171 |
| A | 174 | 190 |
| B | 177 | 220 |
| C | 171 | 183 |
| E | 168 | 180 |
| F | 201 | 234 |
| G | 164 | 190 |
| J | 185 | 203 |
| D | 147 | 178 |

* Control group

6.0 TEST RESULTS (Contd.)

Chart No. 6 Rolling Resistance - Dry Sand

Ratings

| Group | Inflation Pressures, psig 10 | 15 |
|---|---|---|
| D* | 100 | 100 |
| A | 83 | 92 |
| B | 81 | 80 |
| C | 84 | 96 |
| E | 86 | 97 |
| F | 72 | 75 |
| G | 88 | 92 |
| J | 78 | 86 |

Chart No. 6 shows the ratings in percent of pounds per ton rolling resistance in dry sand as compared to the control Group D established gradient. (Figures No. 23 and 24).

Vehicle: M34
GVW: 11,536

* Control group

6.0 TEST RESULTS (Contd.)

Chart No. 7 Dynamic Traction - Prepared Mud

Drawbar Pounds

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 1575 | 1875 | 2025 |
| A (1) | 2475 | 2200 | 2150 |
| A (2) | 1500 | 2200 | 2700 |
| B | 2050 | 2000 | 2050 |
| D | 1900 | 1825 | 1900 |
| E | 1800 | 1700 | 2000 |
| F | 2300 | 2325 | 2625 |
| G | 2000 | 2075 | 2675 |
| J | 2025 | 2350 | 2350 |

(1) "A" Group with directional tread mounted incorrectly.

(2) "A" Group with directional tread mounted correctly and drawbar pounds interpolated.

Chart No. 8 shows the ratings in percent of drawbar pound compared to the control Group C. The control group was run first and last in this test but no course change was recorded (Figures 25 through 34).

6.0 TEST RESULTS (Contd.)

Chart No. 8 Dynamic Traction - Prepared Mud

Ratings

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A (1) | 157 | 117 | 106 |
| A (2) | 95 | 117 | 133 |
| B | 130 | 107 | 101 |
| D | 121 | 99 | 96 |
| E | 114 | 91 | 99 |
| F | 146 | 124 | 130 |
| G | 127 | 106 | 132 |
| J | 129 | 125 | 116 |

(1) "A" Group with directional tread mounted incorrectly.

(2) "A" Group with directional tread mounted correctly and drawbar pounds interpolated.

6.0 TEST RESULTS (Contd.)

Chart No. 9 Rolling Resistance - Prepared Mud

Pounds Per Ton

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 277 | 319 | 357 |
| A | 308 | 353 | 360 |
| B | 313 | 328 | 331 |
| D | 322 | 326 | 342 |
| E | 266 | 316 | 247 |
| F | 299 | 315 | 335 |
| G | 325 | 334 | 342 |
| J | 285 | 295 | 303 |

Chart No. 10 shows the ratings in percent of pounds per ton rolling resistance in prepared mud as compared to the control group (Figure No. 35).

6.0 TEST RESULTS (Contd.)

Chart No. 10 Rolling Resistance - Prepared Mud

Ratings

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 89 | 89 | 100 |
| B | 87 | 97 | 107 |
| D | 84 | 98 | 104 |
| E | 104 | 100 | 103 |
| F | 92 | 101 | 106 |
| G | 83 | 95 | 104 |
| J | 97 | 108 | 115 |

Vehicle: M34 6x6
GVW: 11,536 pounds.

6.0 TEST RESULTS (Contd.)

Chart No. 11 Dynamic Traction - Dry Ice

Drawbar Pounds

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 950 | 1250 | 1000 |
| A | 1000 | 900 | 1050 |
| B | 1000 | 1050 | 1200 |
| D | 750 | 850 | 1150 |
| E | 850 | 925 | 900 |
| F | 800 | 1050 | 1000 |
| G | 650 | 750 | 850 |
| J | 600 | 750 | 1050 |
| C | 900 | 1250 | 1000 |

Chart No. 12 shows the ratings in percent of drawbar pounds compared to the control Group C. The control was run first and last in this test to determine if course conditions were changing during the test. In the case of the dry ice testing, a gradient was established for the 50 psig inflation pressure runs. (Figures No. 36 through 45).

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 2 Wheel drive (prop shaft to #3 axle removed)

6.0 TEST RESULTS (Contd.)

Chart No. 12 Dynamic Traction - Dry Ice

Ratings

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 107 | 72 | 105 |
| B | 109 | 84 | 120 |
| D | 81 | 68 | 115 |
| E | 90 | 74 | 90 |
| F | 87 | 84 | 100 |
| G | 72 | 60 | 85 |
| J | 66 | 60 | 105 |

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 2 Wheel drive (prop shaft to #3 axle removed)

6.0 TEST RESULTS (Contd.)

Chart No. 13 Rolling Resistance - Dry Ice

Drawbar Pounds Per Ton

| | Inflation Pressure, psig | | |
|---|---|---|---|
| Group | 50 | 35 | 15 |
| C | 35 | 41 | 62 |
| A | 38 | 44 | 64 |
| B | 36 | 42 | 64 |
| D | 34 | 38 | 58 |
| E | 38 | 43 | 64 |
| F | 44 | 49 | 72 |
| G | 41 | 46 | 65 |
| J | 50 | 53 | 85 |

Chart No. 14 shows the ratings in percent of pounds per ton rolling resistance on dry ice as compared to the control group C. (Figure No. 46 )

Chart No. 14 Rolling Resistance - Dry Ice
Rating

| | Inflation Pressure, psig | | |
|---|---|---|---|
| Group | 50 | 35 | 15 |
| C | 100 | 100 | 100 |
| A | 92 | 93 | 97 |
| B | 97 | 98 | 97 |
| D | 103 | 108 | 107 |
| E | 92 | 95 | 97 |
| F | 80 | 84 | 86 |
| G | 85 | 89 | 94 |
| J | 70 | 77 | 73 |

Vehicle: M34 6x6
GVW: 11,536 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 15 Dynamic Traction - Virgin Snow

Drawbar Pounds

| Group | Inflation Pressures, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 2100 | 2450 | 2500 |
| A | 2375 | 2375 | 2500 |
| B | 2800 | 2500 | 2750 |
| D | 1925 | 1950 | 2300 |
| E | 2500 | 2525 | 2550 |
| F | 2250 | 2600 | 2850 |
| G | 2150 | 2050 | 2100 |
| J | 1850 | 1850 | 2175 |
| C | 2325 | 2575 | 2500 |

Chart No. 16 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and a course gradient established. The ratings take into account this course gradient (Figure No. 47) and are adjusted to it.

Chart No. 16 Dynamic Traction - Virgin Snow

Ratings

| Group | Inflation Pressures, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 109 | 97 | 100 |
| B | 132 | 103 | 110 |
| D | 88 | 81 | 108 |
| E | 113 | 105 | 102 |
| F | 100 | 108 | 114 |
| G | 95 | 86 | 84 |
| J | 81 | 78 | 87 |

Vehicle: TT-6 White Freightliner
GVW: 13,740 pounds
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 17 Rolling Resistance - Virgin Snow

Pounds Per Ton

| | Inflation Pressure, psig | | |
|---|---|---|---|
| Group | 50 | 35 | 15 |
| C | 81 | 106 | 127 |
| A | 91 | 85 | 106 |
| B | 81 | 86 | 91 |
| D | 88 | 85 | 85 |
| E | 88 | 89 | 92 |
| F | 85 | 92 | 96 |
| G | 85 | 86 | 87 |
| J | 69 | 84 | 88 |

Chart No. 18 shows the ratings in percent of pounds per ton rolling resistance in virgin snow as compared to control group C. (Figure No. 57)

Chart No. 18 Rolling Resistance - Virgin Snow

Ratings

| | Inflation Pressure, psig | | |
|---|---|---|---|
| Group | 50 | 35 | 15 |
| C | 100 | 100 | 100 |
| A | 88 | 119 | 116 |
| B | 100 | 119 | 128 |
| D | 99 | 120 | 133 |
| E | 92 | 116 | 127 |
| F | 91 | 113 | 124 |
| G | 96 | 118 | 131 |
| J | 115 | 121 | 131 |

Vehicle: TT-6 White Freightliner
GVW: 13,740 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 19 Dynamic Traction - Hard Packed Snow

Drawbar Pounds

| Group | Inflation Pressures, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 2000 | 2000 | 2000 |
| A | 2500 | 2425 | 2275 |
| B | 2175 | 2150 | 2100 |
| D | 2100 | 1950 | 1925 |
| E | 2000 | 1700 | 1450 |
| F | 1875 | 1725 | 1575 |
| G | 1925 | 1950 | 1625 |
| J | 1675 | 1850 | 1850 |
| C | 2200 | 2150 | 2125 |

Chart No. 20 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and a course gradient established. The ratings take into account this course gradient (Figure No. 58) and are adjusted to it.

Chart No. 20 Dynamic Traction - Hard Packed Snow

Ratings

| Group | Inflation Pressures, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 124 | 120 | 120 |
| B | 106 | 105 | 103 |
| D | 101 | 105 | 94 |
| E | 95 | 82 | 70 |
| F | 88 | 82 | 76 |
| G | 90 | 92 | 78 |
| J | 77 | 87 | 87 |

Vehicle: TT-6 White Freightliner
GVW: 13,740 pounds
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 21 Rolling Resistance - Packed Snow

Pounds Per Ton

| Group | Inflation Pressure, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 64 | 81 | 89 |
| A | 49 | 54 | 80 |
| B | 41 | 44 | 45 |
| D | 45 | 45 | 62 |
| E | 45 | 44 | 44 |
| F | 37 | 45 | 54 |
| G | 36 | 40 | 47 |
| J | 37 | 40 | 43 |

Chart No. 22 shows the ratings in percent of drawbar pounds per ton as compared to the control group C. (Figure No. 68)

Chart No. 22 Rolling Resistance - Packed Snow

Ratings

| Group | Inflation Pressure, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 122 | 134 | 110 |
| B | 136 | 146 | 150 |
| D | 130 | 145 | 130 |
| E | 130 | 146 | 150 |
| F | 142 | 144 | 139 |
| G | 143 | 150 | 147 |
| J | 141 | 150 | 152 |

Vehicle: TT-6 White Freightliner
GVW: 13,740 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 23 Dynamic Traction - Wet Asphalt

Drawbar Pounds

| Group | Inflation Pressures, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 6500 | 6500 | 6500 |
| A (1) | 6000 | 5850 | 5900 |
| A (2) | 5900 | 6050 | 5900 |
| B | 6175 | 6400 | 6500 |
| D | 6450 | 6600 | 6300 |
| E | 5875 | 5950 | 5950 |
| F | 6175 | 6400 | 6050 |
| G | 6300 | 6400 | 6400 |
| J | 6500 | 6500 | 6550 |
| C | 6500 | 6500 | 6500 |

(1) Directional tread mounted in designed direction.
(2) Directional tread mounted in reverse direction.

Chart No. 24 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and no course change was recorded. (Figure No.69 )

Chart No. 24 Dynamic Traction - Wet Asphalt
Ratings

| Group | Inflation Pressures, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A (1) | 92 | 90 | 91 |
| A (2) | 91 | 93 | 91 |
| B | 95 | 98 | 100 |
| D | 99 | 102 | 97 |
| E | 90 | 92 | 92 |
| F | 95 | 98 | 93 |
| G | 97 | 98 | 98 |
| J | 100 | 100 | 101 |

(1) Directional tread mounted in design direction.
(2) Directional tread mounted in reverse direction.

Vehicle: M34 6x6
GVW: 11,536
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 25 Rolling Resistance - Dry Asphalt

Pounds Per Ton

| | 5 mph Inflation Pressure psig | | | 40 mph Inflation Pressure psig | | |
|---|---|---|---|---|---|---|
| Group | 50 | 35 | 15 | 50 | 35 | 15 |
| C | 37 | 46 | 61 | 42 | 53 | 65 |
| A | 32 | 40 | 47 | 35 | 45 | 53 |
| B | 42 | 53 | 64 | 54 | 65 | 73 |
| D | 37 | 41 | 48 | 43 | 46 | 55 |
| E | 31 | 39 | 53 | 35 | 44 | 60 |
| F | 45 | 51 | 60 | 53 | 56 | 68 |
| G | 41 | 48 | 55 | 46 | 54 | 60 |
| J | 53 | 61 | 65 | 60 | 66 | 68 |

Chart No. 26 shows the ratings in percent of pound per ton rolling resistance on dry asphalt at 5 and 40 miles per hour as compared to control group C. (Figures No. 80 and 81 ).

Chart No. 26 Rolling Resistance - Dry Asphalt Ratings

| | 5 mph Inflation Pressure, psig | | | 40 mph Inflation Pressure, psig | | |
|---|---|---|---|---|---|---|
| Group | 50 | 35 | 15 | 50 | 35 | 15 |
| C | 100 | 100 | 100 | 100 | 100 | 100 |
| A | 114 | 113 | 123 | 83 | 115 | 118 |
| B | 86 | 85 | 95 | 71 | 77 | 88 |
| D | 100 | 111 | 121 | 98 | 113 | 115 |
| E | 116 | 115 | 113 | 117 | 117 | 108 |
| F | 78 | 89 | 102 | 74 | 94 | 95 |
| G | 89 | 98 | 110 | 90 | 98 | 108 |
| J | 57 | 67 | 93 | 57 | 75 | 95 |

Vehicle: M-104 2 Wheel trailer
GVW: 2978 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 27 Dynamic Traction - Packed Clay

Drawbar Pounds

| Group | Inflation Pressure, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 3600 | 4400 | 4400 |
| A | 3600 | 4400 | 4550 |
| B | 4000 | 4750 | 4750 |
| D | 3250 | 4050 | 4350 |
| E | 3350 | 4550 | 4650 |
| F | 4000 | 4350 | 4250 |
| G | 3650 | 4350 | 4800 |
| J | 4150 | 4400 | 4700 |
| C | 3600 | 4400 | 4400 |

Chart No. 28 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and no course change was recorded. (Figure No. 82 )

Chart No. 28 Dynamic Traction - Packed Clay
Ratings

| Group | Inflation Pressure, psig 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 100 | 100 | 103 |
| B | 111 | 108 | 108 |
| D | 90 | 92 | 99 |
| E | 93 | 103 | 106 |
| F | 111 | 99 | 97 |
| G | 101 | 99 | 109 |
| J | 115 | 100 | 107 |

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 29 Rolling Resistance - Hard Packed Clay

Pounds Per Ton

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 48 | 54 | 61 |
| A | 43 | 48 | 52 |
| B | 43 | 48 | 49 |
| D | 47 | 50 | 51 |
| E | 40 | 47 | 51 |
| F | 48 | 49 | 53 |
| G | 45 | 49 | 52 |
| J | 40 | 49 | 53 |
| C | 48 | 54 | 61 |

Chart No. 30 shows the ratings in percent of drawbar pounds per ton as compared to the control group C. The control group was run first and last in this test and no course change was recorded.

Chart No. 30 Rolling Resistance - Hard Packed Clay

Ratings

Inflation Pressures, psig

| Group | 50 | 35 | 15 |
|---|---|---|---|
| C | 100 | 100 | 100 |
| A | 110 | 111 | 115 |
| B | 110 | 111 | 121 |
| D | 102 | 107 | 116 |
| E | 117 | 113 | 116 |
| F | 100 | 109 | 113 |
| G | 106 | 109 | 115 |
| J | 117 | 109 | 113 |

Vehicle: M34 6x6
GVW: 11,536 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 31 Ton Mile Per Hour Breaker Temperatures

| Group | 15 psi Inflation Breaker Temperature °F | TMPH | 35 psi Inflation Breaker Temperature °F | TMPH |
|---|---|---|---|---|
| A | 217.0 | 57.07 | 170.0 | 57.24 |
| B | 204.0 | 56.68 | 182.0 | 56.52 |
| C | 189.0 | 57.02 | 166.0 | 57.31 |
| D | 203.0 | 57.14 | 165.0 | 57.44 |
| E | 208.0 | 57.19 | 184.0 | 56.98 |
| F | 229.5 | 56.46 | 199.0 | 56.03 |
| G | 214.0 | 56.01 | 180.0 | 56.80 |
| J | 217.0 | 56.15 | 177.0 | 56.76 |

Figure No. 93 presents the temperatures in graph form.

6.0 TEST RESULTS (Contd.)

Braking. Measured distance to stop on dry ice and wet asphalt. Entrance speed for dry ice was 9 miles per hour and for wet asphalt 30 miles per hour. Figures No. 94 and No. 95 display the results in graphic form.

Chart No. 32 Braking

| Group | Dry Ice | | Wet Ashpalt | |
|---|---|---|---|---|
| | Avg. Feet | Rating | Avg. Feet | Rating |
| C | 71 | 100 | 79 | 100 |
| A | 74 | 100 | 87 | 93 |
| B | 73 | 100 | 89 | 98 |
| D | 71 | 104 | 89 | 92 |
| E | 60 | 120 | 90 | 93 |
| F | 65 | 112 | 85 | 96 |
| G | 69 | 108 | 84 | 95 |
| J | 75 | 95 | 84 | 100 |
| C | 75 | 100 | 85 | 100 |

The two figures for group C, the control group, form the course gradient to which all other test groups are compared. Figures No. 94 and No. 95 show the sequence in which the groups were run.

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 4 Wheel braking

6.0 TEST RESULTS (Contd.)

Stone Retention

Groups A, E and F retained stones during this phase of testing.

Groups B, C, D, G and J show no signs of stone retention.

Group E picked up and retained in the tread pattern nine stones in the 3/8" diameter size. Group F retained one of the 3/8" diameter size and Group A retained one each of the 3/8" diameter and 3/4" diameter sizes.

Rock Cutting

Chart No. 33 gives a description of the number and size of cuts incurred during the 1000 mile rock cutting exercise, gives sipe condition where applicable, enlarges on stone retention and points out other significant results to the tread elements and sidewalls.

6.0 TEST RESULTS (Contd.)

Chart No. 33

Results of Rock Cutting Test

| Tire Group | Sidewall | Significant Cuts | Sipe Condition | Stone Retention | Other |
|---|---|---|---|---|---|
| A | No Action | 8 - 1/4" x 1/8" deep | No Sipes | None | Chipping on heel of lugs. |
| B | No Action | 1 - 1/2" x 1/8" deep<br>1 - 1" x 1/8" deep<br>1 - 1 1/2" x 1/8" deep | End tears on 3 sipes | 1 - 1/8" and 1 - 3/16" in sipes | Slight chipping on corners of lugs |
| C | No Action | 1 - 1" x 1/8" deep<br>1 - 1 1/4" x 1/8" deep<br>16 - 1/4" x 1/8" deep | No Sipes | None | Slight chipping on rib edges. |
| D | No Action | 1 - 1/2" x 1/4" deep<br>1 - 5/8" x 1/4" deep<br>1 - 3/4" x 1/8" deep<br>1 - 1" x 1/4" deep<br>7 - 3/8" to 1/2" x 1/8" deep | Chipping on edges and end tears on 80% | 12 - 1/8" or smaller in sipes | Erosion and chipping on leading edges of shoulder lugs. |
| E | No Action | 1 - 3/8" x 3/8" deep<br>1 - 3/4" x 3/16" deep<br>1 - 3/4" x 1/8" deep<br>1 - 3/8" x 1/8" deep<br>1 - 1/4" x 3/16" deep<br>1 - 1/2" x 3/16" deep<br>1 - 1" x 1/4" deep | All Open<br>17 end tears. Chipping severe on edges | 26 - 3/8" to 5/8" diameter stones in tread. Sand particles in all sipes. | Slight chipping on lug edges. |
| F | No Action | 1 - 1 1/2" x 1/4" deep<br>38 - 3/8" x 1/8" deep<br>3 - 3/4" x 1/4" deep<br>94 - chips and cuts approximately 1/4" x 1/16" to 1/8" deep | No Sipes | None | Tearing at the corners of the heel relief grooves and outside lug relief grooves. |

6.0 TEST RESULTS (Contd.)

Chart No. 33 Results of Rock Cutting Test (Contd.)

| Tire Group | Sidewall | Significant Cuts | Sipe Condition | Stone Retention | Other |
|---|---|---|---|---|---|
| G | 1-1/4" long to steel 7" from shoulder. | 2 - 1/2"x1/8" deep. | 11 - end tears circumferential sipes opened up - radial sipes O.K. | 13 - 1/16" to 1/8" in sipes. | Chipping on sipe edges. |
| J | No action. | 24 - 1/4" to 1/2" long by 1/16" to 1/8" deep. | All sipes open. Small end tears and some edge chipping. | 14 - 1/16" to 1/8" in sipes. | 1/4" retread left at feathered shoulder area on one side of one tire only. |



Each two tire group was run for 1000 miles on the NATC imbedded and loose rock Serpentine Course. After each 333 mile increment, the tire groups were rotated to different axle position giving 333 miles in each of the three positions on the test bed. At the conclusion of this test phase, the shore "A" hardness was measured on each test tire and an x-ray of the tread area on one tire from each group. X-ray prints appear in the Appendix.

Shore "A" Hardness Results

| Group | A | B | C | D | E | F | G | J |
|---|---|---|---|---|---|---|---|---|
| Durometer | 68 | 68 | 68 | 66 | 68 | 69 | 66 | 66 |
| Ambient Temp. °F | 80 | 80 | 82 | 82 | 81 | 82 | 81 | 81 |

6.0 TEST RESULTS (Contd.)

Chart No. 34 Footprint - Length and Width

| Group | Infl. psig | Weight Pounds | Length x Width Inches | Group | Infl. psig | Weight Pounds | Length x Width Inches |
|---|---|---|---|---|---|---|---|
| NDCC | 50 | 1484 | 8.76 x 4.79 | D | 50 | 1484 | 7.40 x 5.90 |
| STD | 35 | 1484 | 9.20 x 5.20 | | 35 | 1484 | 8.05 x 6.30 |
| MIL- | 15 | 1484 | 11.45 x 6.35 | | 15 | 1484 | 11.55 x 7.05 |
| ITARY | 50 | 2090 | 9.65 x 5.32 | | 50 | 2090 | 8.60 x 6.80 |
| BIAS | 35 | 2090 | 10.50 x 5.85 | | 35 | 2090 | 10.00 x 7.20 |
| | 15 | 2090 | 13.25 x 7.15 | | 15 | 2090 | 14.30 x 6.70 |
| R2A | 50 | 1484 | 7.76 x 4.98 | E | 50 | 1484 | 7.75 x 6.30 |
| BIAS | 35 | 1484 | 8.20 x 5.34 | | 35 | 1484 | 8.90 x 6.60 |
| | 15 | 1484 | 9.54 x 6.07 | | 15 | 1484 | 11.65 x 6.61 |
| | 50 | 2090 | 8.90 x 5.67 | | 50 | 2090 | 9.00 x 6.61 |
| | 35 | 2090 | 9.52 x 5.93 | | 35 | 2090 | 10.20 x 6.61 |
| | 15 | 2090 | 11.50 x 6.69 | | 15 | 2090 | 14.15 x 6.61 |
| A | 50 | 1484 | 6.78 x 5.06 | F | 50 | 1484 | 7.70 x 6.45 |
| | 35 | 1484 | 8.50 x 5.80 | | 35 | 1484 | 8.85 x 6.45 |
| | 15 | 1484 | 11.75 x 7.00 | | 15 | 1484 | 11.70 x 6.45 |
| | 50 | 2090 | 8.85 x 6.27 | | 50 | 2090 | 9.10 x 6.30 |
| | 35 | 2090 | 9.30 x 6.84 | | 35 | 2090 | 10.50 x 6.50 |
| | 15 | 2090 | 13.90 x 7.05 | | 15 | 2090 | 14.30 x 6.50 |
| B | 50 | 1484 | 7.15 x 5.55 | G | 50 | 1484 | 7.85 x 5.60 |
| | 35 | 1484 | 8.20 x 5.86 | | 35 | 1484 | 9.00 x 6.55 |
| | 15 | 1484 | 10.60 x 6.65 | | 15 | 1484 | 12.30 x 7.31 |
| | 50 | 2090 | 8.70 x 6.14 | | 50 | 2090 | 9.10 x 6.75 |
| | 35 | 2090 | 9.90 x 6.68 | | 35 | 2090 | 10.55 x 7.33 |
| | 15 | 2090 | 12.03 x 6.83 | | 15 | 2090 | 14.95 x 7.33 |
| C | 50 | 1484 | 7.20 x 4.95 | J | 50 | 1484 | 8.40 x 5.00 |
| | 35 | 1484 | 8.42 x 5.30 | | 35 | 1484 | 9.45 x 5.64 |
| | 15 | 1484 | 11.60 x 5.90 | | 15 | 1484 | 12.85 x 7.23 |
| | 50 | 2090 | 8.50 x 5.45 | | 50 | 2090 | 9.80 x 6.42 |
| | 35 | 2090 | 10.18 x 5.80 | | 35 | 2090 | 11.10 x 6.23 |
| | 15 | 2090 | 14.30 x 6.70 | | 15 | 2090 | 15.84 x 7.23 |

6.0 TEST RESULTS (Contd.)

Chart No. 35 Length to Width Ratios

| Group | Infl. psig | L/W Ratio 1484 Lbs. | Rating | L/W Ratio 2090 Lbs. | Rating |
|---|---|---|---|---|---|
| NDCC STD | 15 | 1.80 | 100 | 1.85 | 100 |
| MILITARY | 35 | 1.77 | 100 | 1.79 | 100 |
| BIAS | 50 | 1.83 | 100 | 1.81 | 100 |
| R2A | 15 | 1.57 | 87 | 1.72 | 93 |
| BIAS | 35 | 1.54 | 87 | 1.61 | 90 |
| | 50 | 1.56 | 85 | 1.57 | 87 |
| A | 15 | 1.68 | 93 | 1.97 | 106 |
| | 35 | 1.47 | 83 | 1.36 | 76 |
| | 50 | 1.34 | 73 | 1.41 | 78 |
| B | 15 | 1.59 | 88 | 1.76 | 95 |
| | 35 | 1.40 | 79 | 1.48 | 83 |
| | 50 | 1.29 | 70 | 1.42 | 79 |
| C | 15 | 1.97 | 109 | 2.13 | 115 |
| | 35 | 1.59 | 90 | 1.76 | 98 |
| | 50 | 1.45 | 79 | 1.60 | 88 |
| D | 15 | 1.64 | 86 | 2.13 | 115 |
| | 35 | 1.28 | 72 | 1.39 | 78 |
| | 50 | 1.25 | 68 | 1.26 | 70 |
| E | 15 | 1.76 | 98 | 2.14 | 116 |
| | 35 | 1.35 | 76 | 1.54 | 86 |
| | 50 | 1.23 | 67 | 1.36 | 75 |
| F | 15 | 1.81 | 100 | 2.20 | 119 |
| | 35 | 1.37 | 76 | 1.62 | 91 |
| | 50 | 1.19 | 65 | 1.44 | 80 |
| G | 15 | 1.68 | 93 | 2.04 | 110 |
| | 35 | 1.37 | 77 | 1.44 | 80 |
| | 50 | 1.40 | 76 | 1.35 | 75 |
| J | 15 | 1.78 | 99 | 2.19 | 118 |
| | 35 | 1.68 | 95 | 1.78 | 100 |
| | 50 | 1.68 | 92 | 1.53 | 85 |

6.0 TEST RESULTS (Contd.)

Footprints - Spring Rates & Length to Width

Ratios - Rated Against Standard Military NDCC Bias

Chart No. 36

Spring Rate Ratings Pounds/1 inch Deflection

| | | | Group | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Infl. Press. psig | NDCC STD. MIL. | R2A BIAS | A | B | C | D | E | F | G | J |
| 50 | 2125 | 2500 | 1750 | 1750 | 1500 | 1750 | 1750 | 1875 | 2000 | 1750 |
| Improvement % | | -18 | +18 | +18 | +29 | +18 | +18 | +12 | +6 | +18 |
| 35 | 1375 | 2150 | 1250 | 1375 | 1167 | 1417 | 1250 | 1250 | 1250 | 1325 |
| Improvement % | | -56 | +9 | -- | +15 | -3 | +9 | +9 | +9 | +4 |
| 15 | 813 | 1050 | 833 | 950 | 813 | 687 | 700 | 813 | 792 | 800 |
| Improvement % | | -29 | -2 | -17 | -- | +15 | +14 | -- | +3 | +2 |

Figures 70 through 79 show the graphic representation of spring rates.

## 6.0 TEST RESULTS (Contd.)

Chart No. 37 — Footprints - Gross and Net Square Inches

| Group | Infl. psig | Weight Pounds | Gross Area Sq. In. | Pounds Per Sq. In. Gross | Net Area Sq. In. | Pounds Per Sq. In. Net | Group | Infl. psig | Weight Pounds | Gross Area Sq. In. | Pounds Per Sq. In. Gross | Net Area Sq. In. | Pounds Per Sq. In. Net |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NDCC | 15 | 1484 | 60.9 | 24.4 | 34.9 | 42.5 | D | 15 | 1484 | 68.9 | 21.5 | 43.7 | 34.0 |
| STD. | 35 | 1484 | 36.3 | 40.9 | 21.9 | 67.8 | | 35 | 1484 | 40.9 | 36.3 | 26.4 | 56.2 |
| MIL. | 50 | 1484 | 31.4 | 47.3 | 20.1 | 73.8 | | 50 | 1484 | 34.1 | 43.5 | 22.4 | 66.3 |
| BIAS | 15 | 2090 | 82.9 | 33.2 | 46.2 | 45.2 | | 15 | 2090 | 93.1 | 22.5 | 57.7 | 36.2 |
| | 35 | 2090 | 49.5 | 42.2 | 29.4 | 71.1 | | 35 | 2090 | 57.9 | 36.1 | 37.2 | 56.2 |
| | 50 | 2090 | 39.7 | 52.6 | 24.5 | 85.3 | | 50 | 2090 | 46.7 | 44.8 | 31.1 | 67.2 |
| R2A | 15 | 1484 | 49.3 | 30.1 | 29.7 | 50.0 | E | 15 | 1484 | 70.6 | 21.0 | 38.6 | 38.5 |
| BIAS | 35 | 1484 | 34.0 | 43.7 | 20.9 | 71.0 | | 35 | 1484 | 48.7 | 30.5 | 27.4 | 54.2 |
| NDCC | 50 | 1484 | 35.5 | 48.7 | 19.2 | 77.3 | | 50 | 1484 | 40.0 | 37.1 | 20.9 | 71.0 |
| | 15 | 2090 | 69.5 | 30.1 | 40.5 | 51.6 | | 15 | 2090 | 92.0 | 22.7 | 53.4 | 39.1 |
| | 35 | 2090 | 47.2 | 44.3 | 28.2 | 74.1 | | 35 | 2090 | 60.6 | 34.5 | 34.3 | 60.9 |
| | 50 | 2090 | 40.3 | 51.9 | 24.6 | 85.0 | | 50 | 2090 | 50.1 | 41.7 | 27.1 | 77.1 |
| A | 15 | 1484 | 68.5 | 21.7 | 35.2 | 42.2 | F | 15 | 1484 | 70.2 | 21.1 | 45.2 | 32.8 |
| | 35 | 1484 | 42.7 | 34.8 | 24.5 | 60.6 | | 35 | 1484 | 48.0 | 30.9 | 32.9 | 45.1 |
| | 50 | 1484 | 32.4 | 45.8 | 19.8 | 75.0 | | 50 | 1484 | 38.3 | 38.8 | 27.1 | 54.8 |
| | 15 | 2090 | 90.8 | 23.0 | 48.4 | 43.2 | | 15 | 2090 | 89.8 | 23.3 | 58.2 | 35.9 |
| | 35 | 2090 | 57.6 | 36.3 | 32.0 | 65.3 | | 35 | 2090 | 61.8 | 33.8 | 41.6 | 50.2 |
| | 50 | 2090 | 46.6 | 44.9 | 26.6 | 78.6 | | 50 | 2090 | 51.4 | 40.7 | 35.0 | 59.7 |
| B | 15 | 1484 | 63.2 | 23.5 | 37.1 | 40.0 | G | 15 | 1484 | 77.6 | 19.1 | 42.2 | 35.2 |
| | 35 | 1484 | 41.0 | 36.2 | 23.6 | 62.9 | | 35 | 1484 | 47.1 | 31.5 | 27.8 | 53.4 |
| | 50 | 1484 | 33.6 | 44.2 | 19.0 | 78.1 | | 50 | 1484 | 36.3 | 40.9 | 21.5 | 69.0 |
| | 15 | 2090 | 81.6 | 25.6 | 48.0 | 43.5 | | 15 | 2090 | 97.5 | 21.4 | 56.4 | 37.1 |
| | 35 | 2090 | 60.5 | 34.6 | 35.8 | 58.4 | | 35 | 2090 | 62.6 | 33.4 | 37.2 | 56.2 |
| | 50 | 2090 | 45.6 | 45.8 | 26.7 | 78.3 | | 50 | 2090 | 48.5 | 43.1 | 29.2 | 71.6 |
| C | 15 | 1484 | 59.0 | 25.2 | 39.9 | 37.2 | J | 15 | 1484 | 72.9 | 20.4 | 42.2 | 35.2 |
| | 35 | 1484 | 32.3 | 45.9 | 25.2 | 58.9 | | 35 | 1484 | 40.4 | 36.7 | 24.4 | 60.8 |
| | 50 | 1484 | 30.6 | 48.5 | 21.3 | 69.7 | | 50 | 1484 | 32.4 | 45.8 | 20.7 | 71.7 |
| | 15 | 2090 | 81.4 | 25.7 | 53.8 | 38.9 | | 15 | 2090 | 98.1 | 21.3 | 58.9 | 35.5 |
| | 35 | 2090 | 50.8 | 41.1 | 35.3 | 59.2 | | 35 | 2090 | 58.5 | 35.7 | 35.2 | 59.4 |
| | 50 | 2090 | 39.7 | 52.6 | 27.2 | 76.8 | | 50 | 2090 | 47.0 | 44.5 | 29.4 | 71.1 |

## 7.0 METHODOLOGY

### 7.1 Lateral stability

"J" and "S" turn maneuvers were used to compare the various construction and tread design capabilities. Diagrams 1 and 2 graphically demonstrate the technique used. The test vehicle enters the test pattern arranged to give a constant radius in the case of "J" turns and two tangent and opposite constant radii in the "S" turn. Vehicle speed is increased in one mile per hour increments until loss of control or full lock steering is achieved. Deviation of front and rear wheels from the test pattern is measured and these measurements plus maximum controlled speed are the criteria for lateral stability.

### 7.2 Tractive force

A dynamometer vehicle is secured by drawbar or cable to the rear axle of the test vehicle. A constant speed is achieved for each environment and the test vehicle, maintaining constant wheel speed, is brought to zero ground speed and the relationship between wheel speed and ground speed, differential interface velocity, is recorded on a Honeywell XXY plotter. Several test runs are recorded for each inflation pressure in each environment and an average determined. These averages are tabulated in each of the environmental segments in the Test Results section of this report.

#### 7.2.1 Prepared Sand

A level course, 20 feet wide by 500 feet long, was built and harrowed to a depth of approximately 15 inches. On each individual run one inch plate penetrometer and cone penetrometer readings were taken in both rear test tire tracks and in the undisturbed areas outside of the tracks. Track depth and width, vehicle attitude at the end of each run and wheel hop frequency were also recorded. Moisture content to a depth of 18 inches was maintained below .5% and the test course was harrowed after each series of runs.

#### 7.2.2 Prepared Mud

An 18 inch deep course was prepared with a 20-24% moisture content. Track depth and width was measured

7.0 METHODOLOGY (Contd.)

7.2 Tractive force (Contd.)

7.2.2 Prepared Mud (Contd.)

each pass and cone and plate penetrometer readings taken. The course was worked and leveled after each series of runs.

7.2.3 Packed clay was run on a course with compaction between 180 and 220+ psi.

7.2.4 Virgin snow was run in fresh snow four to six inches deep over a compacted snow area.

7.2.5 Packed snow was run on two to four inches of compacted new snow with a compaction of 140 to 200 psi.

7.2.6 Dry ice was run on the specially prepared ice surface of the Squaw Valley, California Olympic ice arena. Surface temperature was between 23 and 25°F.

7.2.7 Wet asphalt was run on an SAE #5 surface.

7.3 Braking Efficiency

Wet asphalt was run on an SAE #5 surface with an entrance speed of 30 miles per hour. Dry ice braking was run on the same surface as dry ice traction with an entrance speed of 9 miles per hour. Both of these braking tests were run in a 4-wheel braking mode.

7.4 All rolling resistance measurements were taken in conjunction with tractive effort testing on the same surfaces and all were run at 5 miles per hour.

7.5 Ton Mile Per Hour Breaker Temperature

Each group of tires was run separately using two rear axle tires as the test samples. The test vehicle was run at a constant 35 miles per hour after an initial warm up period. An electric digital temperature recorder was attached to a hand probe and this probe was inserted in the tread shoulder to

## 7.0 METHODOLOGY (Contd.)

### 7.5 Ton Mile Per Hour Breaker Temperature (Contd.)

the depth of the belt. Runs were repeated until a stabilized temperature was reached.

### 7.6 Stone Retention and Rock Cutting

#### 7.6.1 Stone Retention

Three size grades of fractured granite were used for this test; 3/8", 3/4" and 1-1/2". A course was prepared allowing three complete revolutions of the test tire in each size of stone. Three passes at 15 miles per hour were made, recording any retained stones after each pass.

#### 7.6.2 Rock Cutting

Two tires of each of the test groups were run 333 miles in each of the three axle positions over a course of loose and imbedded granite at an average speed of 26 miles per hour. Cuts, tears, abrasions and general tread element conditions were recorded.

### 7.7 The static tests were conducted as follows:

#### 7.7.1 Spring Rates

The test tire was installed on the rear axle of the test vehicle, a Loadometer platform scale placed under it and the opposite tire raised to create a level contact with the platform scale. Zero was obtained by inserting a sheet of paper under the test tire and raising the tire until the paper could be removed with a slight drag. The tire was lowered onto the scale and the height of a preselected point on the rim measured at each 250 pound increment.

#### 7.7.2 Footprint Analysis

Using the same system as for the spring rate measurements, a section of the test tire tread was covered with printers ink, the tire lowered onto a piece of clean white paper

7.0 METHODOLOGY (Contd.)

7.7 The static tests were conducted as follows: (Contd.)

7.7.2 Footprint Analysis (Contd.)

to the proper loading, raised and the recorded print removed. The length and width, gross area and net area were measured and recorded.

7.7.3 An x-ray was taken of a section of the tread on one tire from each test group.

Nevada Automotive Test Center

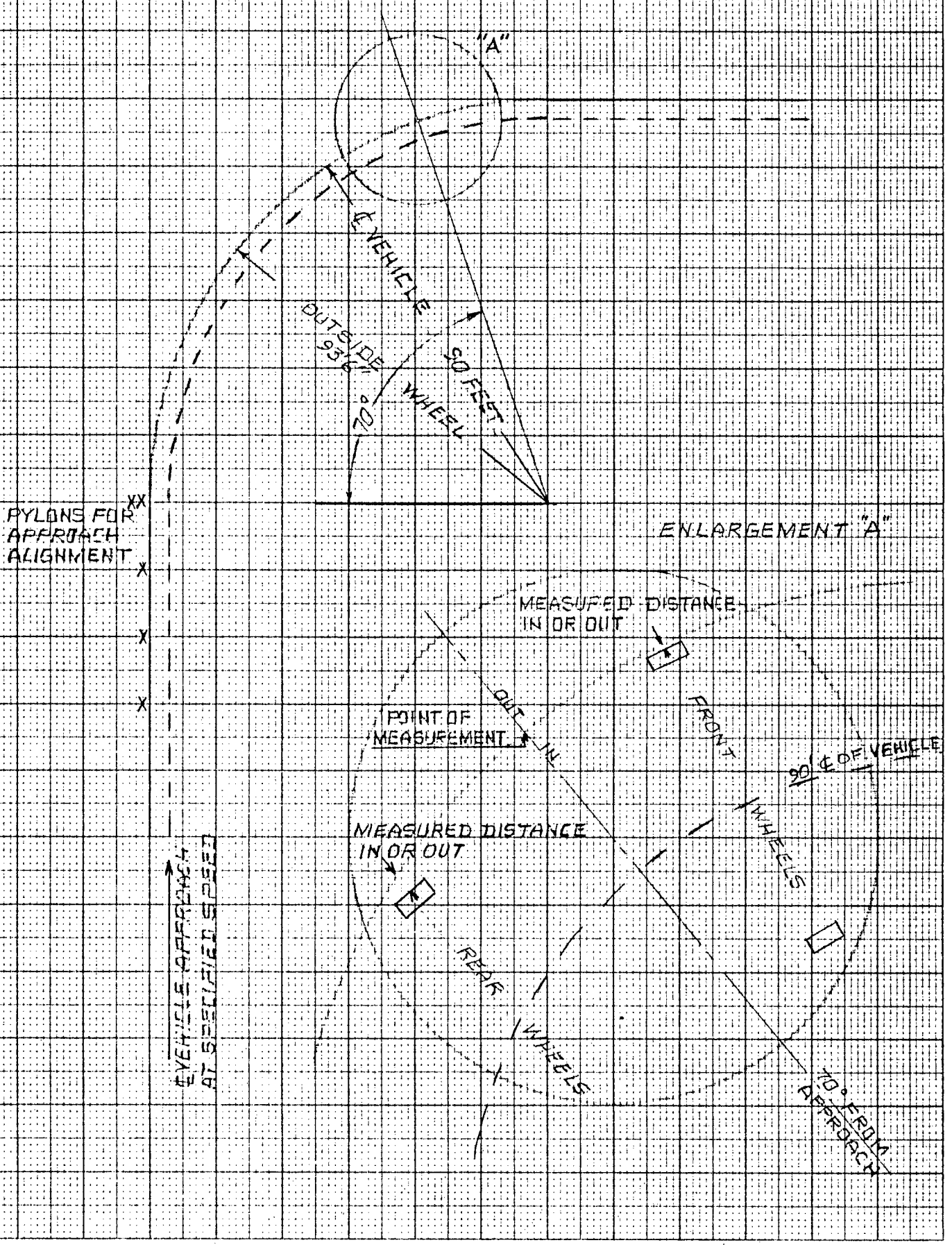
Project: 20-17-30

# DIAGRAM NO. 1
## "J" TURN
## WET ASPHALT

Location: PROVING GROUND

Date: Test By: JED

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

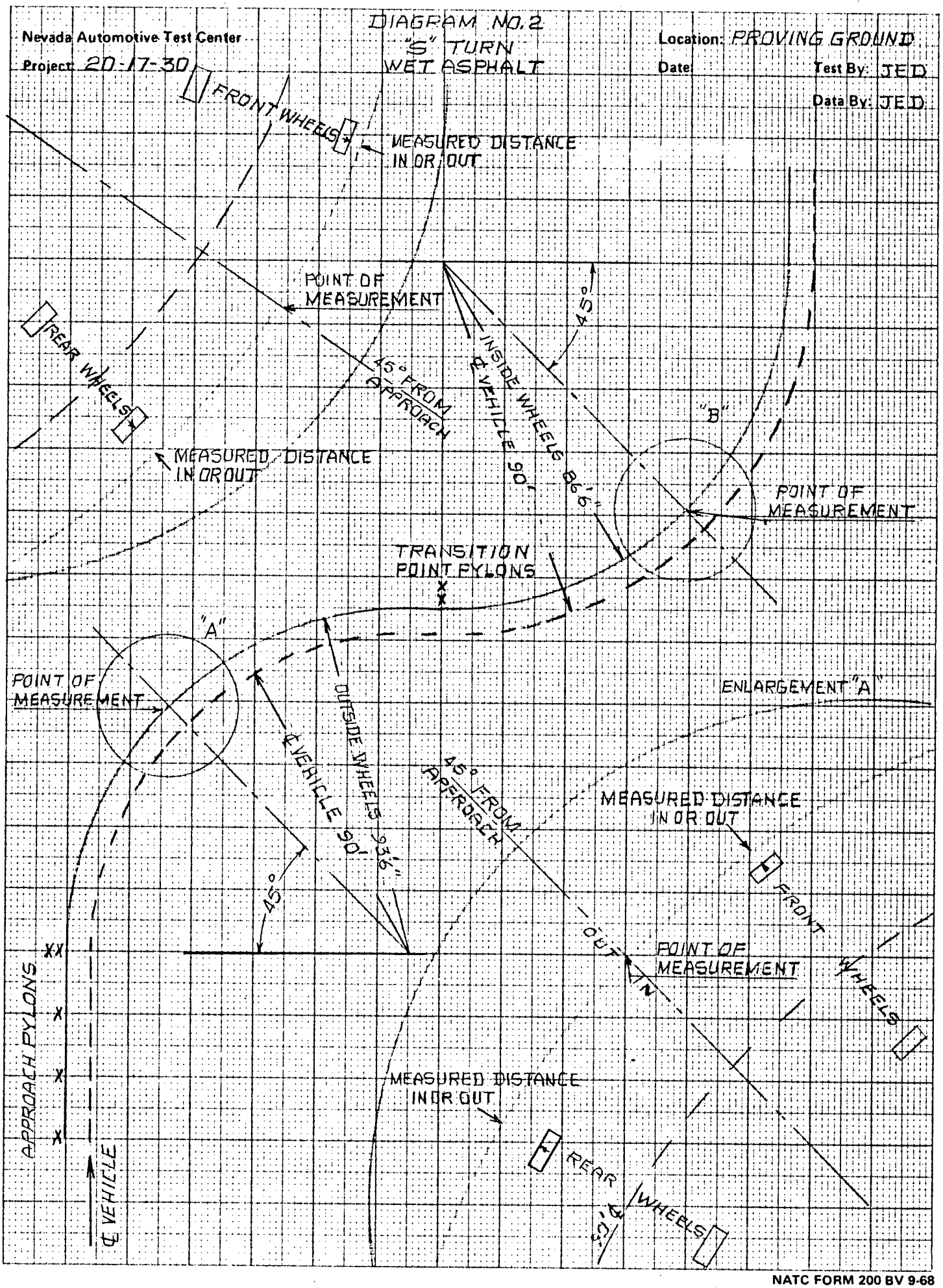
# DIAGRAM NO. 2
## "S" TURN
## WET ASPHALT

Location: PROVING GROUND

Date:

Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

## 8.0 TEST MATERIAL

The dynamic studies of this test project were done on eight groups of 9.00R20 radial ply tires. The static studies were done on the same eight groups plus two groups of 9.00-20 bias ply tires. Each of the radial ply tire groups was given a letter designation which applies throughout this report. Following is a description of these various groups.

| Group | Manufacturer | Tread or Construction Designation |
|---|---|---|
| A | Michelin | XL Ply Rating 14 |
| B | Michelin | XB Ply Rating 14 |
| C | Michelin | XY Ply Rating 14 |
| D | Goodyear | Unisteel L-1 Ply Rating 12 |
| E | Goodrich | Milesaver Radial Steel HDB Ply Rating 12 |
| F | Uniroyal | Max TB-3 Ply Rating 14 |
| G | Goodyear | Unisteel L-1 Carcass with a Lodi retread Ply Rating 12 |
| J | Michelin | XZZ Carcass with a Lodi retread Ply Rating 12 |

The description of the two additional groups of bias ply tires specified in contract Modification P00003 for static tests is as follows:

| Group | Manufacturer | Tread or Construction Designation |
|---|---|---|
| Standard Military Bias Ply | Firestone | Non-Directional Cross-Country (NDCC) Ply Rating 8 |
| R2A Bias Ply | Firestone | Military NDCC with circumferential grooves Ply Rating 8 |

8.0 TEST MATERIAL (Contd.)

Tire Measurements and Weights

| Group | Outside Diameter At Crown, Inches | Cross Section, Inches | Tread Profile, Inches | Tread Arc Width Inches | Shore "A" Hardness | Unmounted Weight, Pounds |
|---|---|---|---|---|---|---|
| A | 40.46 | 10.10 | 13.25 | 7.49 | 68 | 106.4 |
| B | 40.49 | 10.17 | 13.00 | 7.33 | 67 | 104.2 |
| C | 40.20 | 10.12 | 12.75 | 7.30 | 68 | 98.1 |
| D | 40.32 | 10.30 | 13.50 | 7.58 | 68 | 108.7 |
| E | 40.15 | 10.04 | 14.75 | 7.01 | 65 | 103.5 |
| F | 40.21 | 9.60 | 15.25 | 6.90 | 70 | 92.8 |
| G | 40.38 | 10.25 | 12.75 | 7.76 | 68 | 108.6 |
| J | 40.55 | 10.20 | 11.25 | 7.79 | 65 | 100.6 |
| STD. MIL. BIAS PLY NDCC | 39.79 | 10.33 | 7.75 | 6.00 | 65 | 73.3 |
| R2A BIAS PLY MODIFIED NDCC | 40.30 | 10.13 | 8.75 | 6.13 | 68 | 85.3 |

## 9.0 TEST VEHICLE WEIGHT

M34 3 axles 6 wheels

Specified cross-country GVW: For dual rear wheel operation.

| | |
|---|---|
| Front Axle | 5601# |
| #2 Axle | 5587# |
| #3 Axle | 5587# |

Specified cross-country GVW: For single rear wheel operation

| | |
|---|---|
| Front Axle | 5601# |
| #2 Axle | 2968# |
| #3 Axle | 2968# |

| Specified per wheel loads for single wheel operation | | Actual test loads with driver and full fuel tank | |
|---|---|---|---|
| Right Front | 2800.5# | Right Front | 2760# |
| Left Front | 2800.5# | Left Front | 2765# |
| #2 Axle Right | 1484.0# | #2 Axle Right | 1510# |
| #2 Axle Left | 1484.0# | #2 Axle Left | 1540# |
| #3 Axle Right | 1484.0# | #3 Axle Right | 1490# |
| #3 Axle Left | 1484.0# | #3 Axle Left | 1455# |
| | 11,537.0# | | 11,520# |

9.0 TEST VEHICLE WEIGHT (Contd.)

TT-6 White Freightliner

Actual test load with driver and full fuel tank.

| | |
|---|---|
| Rt. Front | 4030 pounds |
| Lt. Front | 4100 pounds |
| #2 Axle Rt. | 1330 pounds |
| #2 Axle Lt. | 1590 pounds |
| #3 Axle Rt. | 1280 pounds |
| #3 Axle Lt. | 1410 pounds |

M-104 2 Wheel Trailer

Test loaded to 1484 pounds per tire with 10 pounds tongue weight.

Total GVW 2978 pounds.

TEST DATA

Project 20-17-30

TEST DATA

Figure No. 1

Dynamic Traction Summary - Dry Sand

Nevada Automotive Test Center

Project: 20-17-30

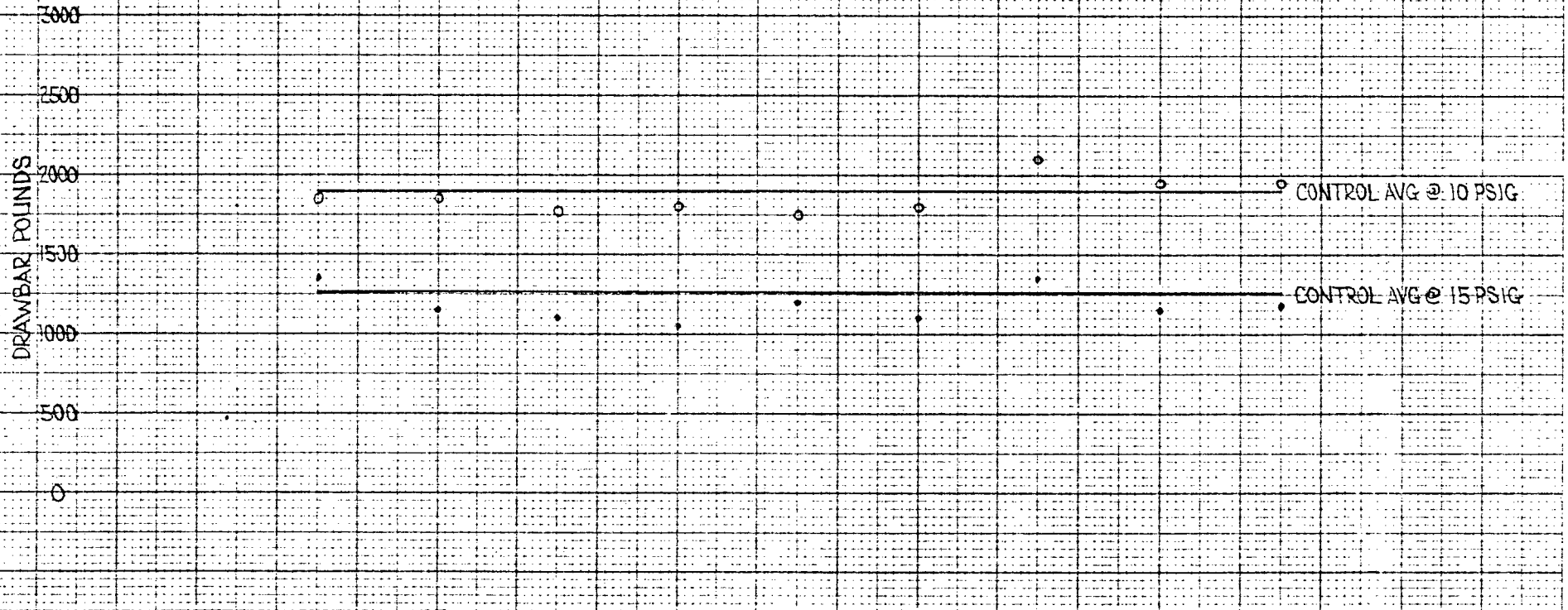
# DYNAMIC TRACTION SUMMARY
## DRY SAND

Location: SAND MOUNTAIN, NEVADA

Date: 9-19/26-73 Test By: WHS

Data By: WHS

## DRAWBAR POUNDS PULL AT PEAK TRACTION
## 3.2 MPH
*FIGURE NO. 1*




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 10 PSIG | 100 | 97 | 93 | 95 | 92 | 95 | 111 | 103 | 100 |
| RATING @ 15 PSIG | 100 | 91 | 87 | 83 | 95 | 87 | 107 | 91 | 100 |
| AVG. DB LBS @ 10 PSIG | 1850 | 1350 | 1775 | 1800 | 1750 | 1800 | 2100 | 1950 | 1950 |
| AVG. DB LBS @ 15 PSIG | 1350 | 1150 | 1100 | 1050 | 1200 | 1100 | 1350 | 1150 | 1175 |
| CODE | D | A | B | C | E | F | G | J | D |
| AMB. °F | 84-92 | 70-88 | 74 | 77-80 | 55-80 | 68-71 | 55-78 | 61 | 70 |
| SURF °F | 100-118 | 72-106 | 78 | 88-94 | 54-94 | 63-72 | 54-84 | 60 | 86 |

WESTERN LITHO CARSON CITY

TEST DATA

Figures 2 through 10

Dynamic Traction - Dry Sand

Nevada Automotive Test Center

Project: 20-17-30

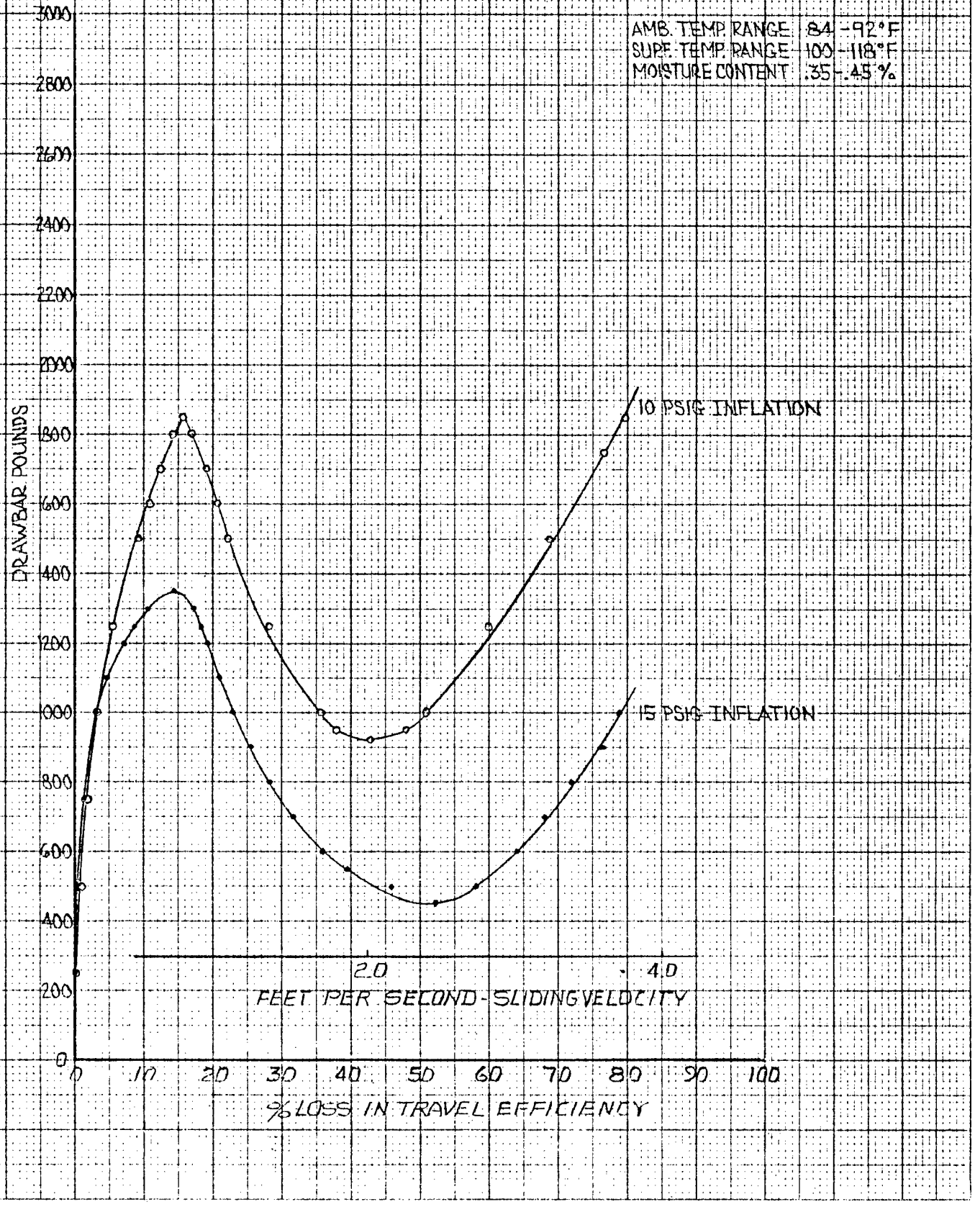
# DYNAMIC TRACTION
## DRY SAND
GROUP: D RUN NO. 1
4 WHEEL DRIVE
3.2 MPH
FIGURE NO. 2

Location: SAND MOUNTAIN, NEVADA

Date: 9-19-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 84 - 92° F
SURF. TEMP. RANGE 100 - 118° F
MOISTURE CONTENT .35 - .45 %




WESTERN LITHO CARSON CITY

# TEST DATA

## DRY SAND

Date: 9-19-73 Time: 10:45 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: D

Inflation, psig: 15 Ambient Temp. °F.: 84 Surface Temp. °F.: 100

Relative Humidity %: 42 Wind Speed, mph: 7 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .40 | .35 | .45 |
| 400 Feet: | .35 | .40 | .45 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 3.25 | - | 3.75 | 2.50 | 3.00 | 3.25 | 2.75 | 3.25 |
| Tire Track Width, Ins.: | | 22.00 | - | 22.00 | 22.50 | 21.00 | - | 20.00 | 22.50 |
| Cone Penetrometer Readings in Track | 3" | 20 | 20 | 20 | 20 | 28 | 20 | 21 | 20 |
| | 6" | 55 | 65 | 55 | 60 | 61 | 60 | 55 | 65 |
| | 9" | 90 | 85 | 80 | 85 | 70 | 85 | 85 | 90 |
| | 12" | 125 | 120 | 90 | 100 | 110 | 105 | 115 | 125 |
| | 15" | OS | 185 | 145 | OS | 145 | OS | OS | 220 |
| | 18" | - | OS | OS | - | OS | - | - | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 20 | 25 | 25 | 25 | 30 | 20 | 25 | 23 |
| | 6" | 38 | 55 | 45 | 40 | 47 | 25 | 45 | 65 |
| | 9" | 51 | 65 | 55 | 55 | 60 | 70 | 45 | 45 |
| | 12" | 70 | 75 | 65 | 60 | 75 | 75 | 50 | 65 |
| | 15" | 87 | 90 | 75 | 75 | 77 | 100 | 185 | 65 |
| | 18" | 155 | 215 | 105 | 140 | 88 | OS | OS | OS |
| | 21" | OS | OS | OS | OS | OS | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 17 | 21 | 30 | 20 | 15 | 29 | 30 | 25 |
| | 6" | 45 | 57 | 60 | 55 | 67 | 54 | 52 | 49 |
| | 9" | 78 | 76 | 100 | 95 | 88 | 109 | 86 | 88 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 25 | 31 | 25 | 26 | 28 | 28 | 38 | 29 |
| | 6" | 60 | 62 | 41 | 45 | 49 | 62 | 50 | 42 |
| | 9" | 69 | 94 | 60 | 73 | 65 | 84 | 56 | 55 |

| Test Vehicle Attitude at Stall, % - | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | - | 1.0 | - | - |

Tire Hop Frequency, Hz 3.0

Comments: _____

OS - Off Scale (Full Scale = 300)

# TEST DATA

## DRY SAND

Date: 9-19-73 Time: 12:50 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,030 LBS Trailer: NA Tire Group: D

Inflation, psig: 10 Ambient Temp. °F.: 92 Surface Temp. °F.: 118

Relative Humidity %: 25 Wind Speed, mph: 7 Wind Direction: SW

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .40 | .35 | .45 |
| 400 Feet: | .35 | .40 | .45 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 3.75 | 4.50 | 4.75 | 5.50 | 3.50 | 5.00 | 4.25 | 5.00 |
| Tire Track Width, Ins.: | | 23.25 | 23.00 | 21.50 | 23.50 | 23.50 | 22.50 | 20.00 | 20.00 |
| Cone Penetrometer Readings in Track | 3" | 30 | 30 | 15 | 35 | 35 | 30 | 5 | 30 |
| | 6" | 60 | 65 | 55 | 15 | 75 | 70 | 55 | 70 |
| | 9" | 90 | 80 | 55 | 80 | 85 | 70 | 75 | 95 |
| | 12" | 175 | 175 | 105 | 145 | 155 | 145 | 85 | 235 |
| | 15" | OS | OS | 275 | OS | OS | OS | 175 | OS |
| | 18" | - | - | OS | - | - | - | OS | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 15 | 5 | 5 | 15 | 17 | 20 | 5 | 15 |
| | 6" | 30 | 15 | 17 | 35 | 33 | 35 | 30 | 20 |
| | 9" | 35 | 37 | 25 | 35 | 37 | 45 | 55 | 55 |
| | 12" | 35 | 45 | 15 | 45 | 37 | 45 | 50 | 70 |
| | 15" | 55 | 75 | 15 | 55 | 35 | 50 | 45 | 80 |
| | 18" | 245 | 285 | 105 | OS | 145 | 195 | 55 | 145 |
| | 21" | OS | OS | OS | - | OS | OS | 285 | 275 |
| | 24" | - | - | - | - | - | - | OS | OS |
| Plate Penetrometer Readings in Track, psi | 3" | 37 | 31 | 36 | 21 | 40 | 34 | 30 | 34 |
| | 6" | 52 | 55 | 51 | 48 | 57 | 65 | 71 | 57 |
| | 9" | 88 | 101 | 93 | 74 | 81 | 82 | 99 | 87 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 23 | 19 | 27 | 25 | 25 | 23 | 22 | 23 |
| | 6" | 31 | 37 | 48 | 48 | 44 | 39 | 47 | 40 |
| | 9" | 44 | 51 | 57 | 62 | 70 | 51 | 66 | 60 |

| Test Vehicle Attitude at Stall, % - | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.0 | 1.5 | 1.0 |

Tire Hop Frequency, Hz 2.2

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

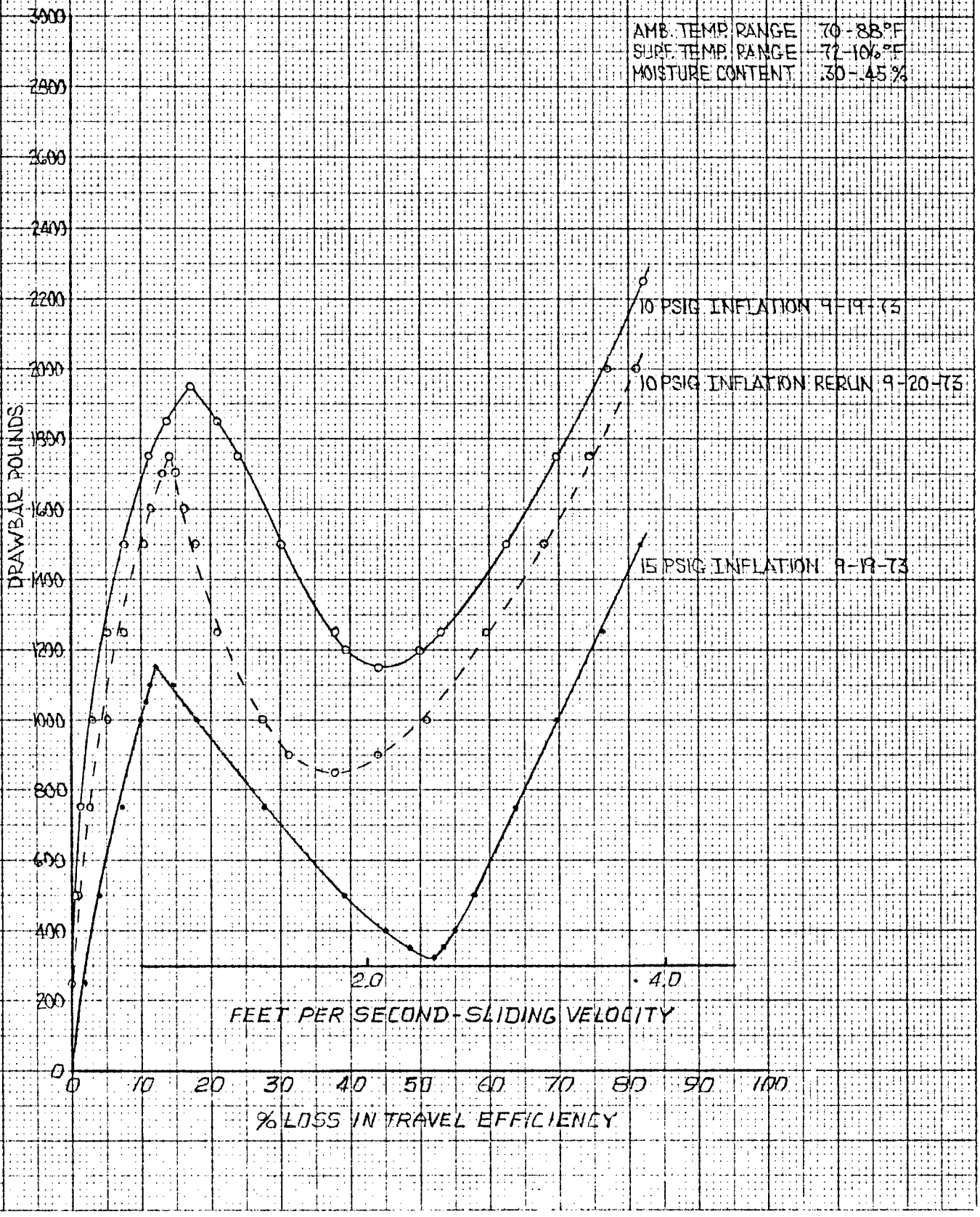
# DYNAMIC TRACTION
## DRY SAND
## GROUP: A RUN NO. 2
## 6 WHEEL DRIVE
## 3.2 MPH
## FIGURE NO.3

Location: SAND MOUNTAIN, NEVADA

Date: 9-19/20-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 70-88°F
SURF. TEMP. RANGE 72-104°F
MOISTURE CONTENT .30-.45%




WESTERN LITHO CARSON CITY

# TEST DATA

## DRY SAND

Date: 9-19-73 Time: 3:00 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A

Inflation, psig: 15 Ambient Temp. °F.: 88 Surface Temp. °F.: 106

Relative Humidity %: 38 Wind Speed, mph: 9 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .45 | .45 | .45 |
| 400 Feet: | .40 | .40 | .45 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 3.50 | 3.38 | 3.75 | 4.75 | 4.50 | 3.75 | 3.50 | 4.75 |
| Tire Track Width, Ins.: | | 23.00 | 22.00 | 23.75 | 23.50 | 23.50 | 23.00 | 22.00 | 22.00 |
| Cone Penetrometer Readings in Track | 3" | 10 | 5 | 10 | 15 | 14 | 10 | 10 | 15 |
| | 6" | 50 | 35 | 50 | 45 | 55 | 40 | 50 | 60 |
| | 9" | 80 | 75 | 75 | 80 | 90 | 85 | 80 | 80 |
| | 12" | 165 | 140 | 115 | 110 | 145 | 140 | 95 | 87 |
| | 15" | OS | OS | 280 | 290 | 290 | 255 | 275 | 255 |
| | 18" | - | - | OS | OS | OS | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 15 | 15 | 10 | 20 | 20 | 5 | 15 | 17 |
| | 6" | 40 | 30 | 37 | 40 | 32 | 30 | 30 | 40 |
| | 9" | 55 | 35 | 60 | 60 | 40 | 55 | 40 | 45 |
| | 12" | 60 | 37 | 77 | 70 | 40 | 40 | 35 | 45 |
| | 15" | 60 | 70 | 105 | 70 | 40 | 45 | 35 | 45 |
| | 18" | 185 | 290 | 255 | 95 | 75 | 105 | 75 | 85 |
| | 21" | OS | OS | OS | 290 | 205 | 290 | 290 | OS |
| | 24" | - | - | - | OS | OS | OS | OS | - |
| Plate Penetrometer Readings in Track, psi | 3" | 21 | 21 | 22 | 21 | 25 | 22 | 22 | 19 |
| | 6" | 68 | 53 | 56 | 51 | 55 | 61 | 57 | 57 |
| | 9" | 87 | 93 | 101 | 96 | 87 | 103 | 100 | 95 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 22 | 26 | 24 | 23 | 23 | 20 | 24 | 25 |
| | 6" | 39 | 47 | 43 | 41 | 41 | 44 | 47 | 46 |
| | 9" | 58 | 59 | 69 | 66 | 60 | 61 | 68 | 64 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | -0.0 | - | - | - |
| | Front Down: | 0.0 | 1.0 | 1.5 | 1.5 |

Tire Hop Frequency, Hz 2.6

Comments: _____

OS - Off Scale (Full Scale = 300)

# TEST DATA

## DRY SAND

Date: 9-19-73 Time: 4:10 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A

Inflation, psig: 10 Ambient Temp. °F.: 88 Surface Temp. °F.: 98

Relative Humidity %: 31 Wind Speed, mph: 15 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .45 | .45 | .45 |
| 400 Feet: | .40 | .40 | .45 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 3.75 | 3.13 | 3.00 | 4.00 | 4.25 | 3.63 | 3.00 | 4.50 |
| Tire Track Width, Ins.: | | 22.00 | 20.50 | 18.00 | 19.00 | 19.50 | 21.50 | 20.00 | 19.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 10 | 20 | 25 | 25 | 20 | 20 | 10 |
| | 6" | 70 | 55 | 60 | 65 | 60 | 55 | 55 | 70 |
| | 9" | 90 | 80 | 85 | 90 | 74 | 75 | 75 | 65 |
| | 12" | 130 | 80 | 115 | 145 | 110 | 110 | 125 | 80 |
| | 15" | OS | 205 | 205 | OS | 270 | 290 | OS | 290 |
| | 18" | - | OS | OS | - | OS | OS | - | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 20 | 25 | 30 | 20 | 25 | 10 | 20 | 15 |
| | 6" | 40 | 50 | 45 | 37 | 45 | 30 | 45 | 45 |
| | 9" | 45 | 85 | 55 | 50 | 55 | 37 | 60 | 80 |
| | 12" | 55 | 110 | 60 | 55 | 80 | 40 | 75 | 120 |
| | 15" | 85 | 135 | 60 | 80 | 160 | 45 | 105 | 150 |
| | 18" | 230 | OS | 130 | 245 | OS | 145 | OS | 255 |
| | 21" | OS | - | OS | OS | - | 285 | - | OS |
| | 24" | - | - | - | - | - | OS | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 25 | 28 | 21 | 21 | 28 | 27 | 21 | 23 |
| | 6" | 67 | 51 | 59 | 66 | 78 | 65 | 57 | 67 |
| | 9" | 90 | 92 | 93 | 89 | 111 | 92 | 88 | 91 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 32 | 25 | 27 | 28 | 32 | 24 | 25 | 23 |
| | 6" | 63 | 52 | 47 | 49 | 55 | 53 | 51 | 49 |
| | 9" | 69 | 54 | 64 | 67 | 79 | 85 | 78 | 72 |

| Test Vehicle Attitude at Stall, % - | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 0.5 | - | - | 1.0 |

Tire Hop Frequency, Hz 2.6

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SAND

Date: 10-20-73 Time: 10:15 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A

Inflation, psig: 10 Ambient Temp. °F.: 70 Surface Temp. °F.: 76

Relative Humidity %: 44 Wind Speed, mph: 9 Wind Direction: WNW

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .35 | .30 | .35 |
| 400 Feet: | .30 | .30 | .45 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 6.00 | 4.75 | 4.00 | 6.00 | 5.63 | 4.25 | 4.25 | 6.50 |
| Tire Track Width, Ins.: | | 22.50 | 23.00 | 21.50 | 21.00 | 22.50 | 23.00 | 21.00 | 22.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 15 | 20 | 35 | 15 | 20 | 10 | 30 |
| | 6" | 55 | 45 | 70 | 80 | 65 | 65 | 45 | 60 |
| | 9" | 105 | 115 | 115 | 90 | 90 | 85 | 155 | 80 |
| | 12" | 100 | 105 | 120 | 150 | 90 | 105 | 105 | 85 |
| | 15" | 275 | OS | 190 | OS | 265 | 245 | 265 | 175 |
| | 18" | OS | - | OS | - | OS | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 20 | 5 | 15 | 10 | 15 | 20 | 20 |
| | 6" | 25 | 35 | 25 | 40 | 25 | 35 | 60 | 45 |
| | 9" | 85 | 50 | 85 | 65 | 75 | 60 | 50 | 55 |
| | 12" | 70 | 50 | 45 | 75 | 40 | 50 | 45 | 65 |
| | 15" | 75 | 50 | 45 | 95 | 35 | 45 | 50 | 80 |
| | 18" | 130 | 195 | 230 | OS | 225 | 185 | 95 | 185 |
| | 21" | OS | OS | OS | - | OS | OS | OS | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 27 | 24 | 21 | 31 | 27 | 28 | 24 | 27 |
| | 6" | 59 | 52 | 52 | 56 | 63 | 72 | 51 | 68 |
| | 9" | 98 | 94 | 76 | 97 | 95 | 104 | 93 | 101 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 22 | 25 | 29 | 27 | 22 | 31 | 21 | 19 |
| | 6" | 41 | 39 | 48 | 45 | 35 | 51 | 40 | 48 |
| | 9" | 66 | 54 | 64 | 57 | 51 | 55 | 62 | 71 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.5 | 1.0 | - | 1.5 |

Tire Hop Frequency, Hz 2.6

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION

DRY SAND

GROUP: B RUN NO. 3

6 WHEEL DRIVE

3.2 MPH

*FIGURE NO. 4*

Location: SAND MOUNTAIN, NEVADA

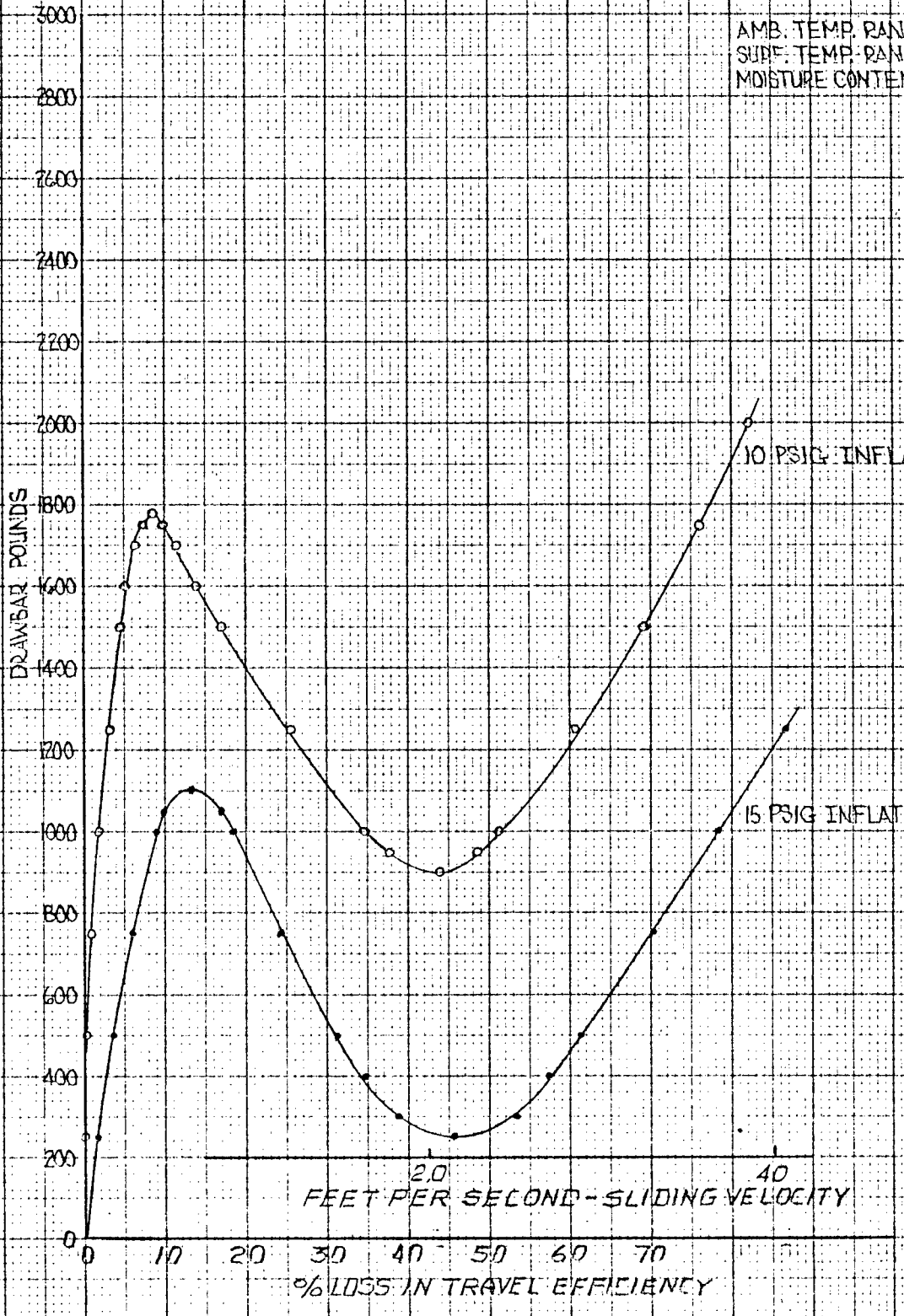
Date: 9-20-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 74°F

SURF. TEMP. RANGE 78°F

MOISTURE CONTENT .30-.45%




WESTERN LITHO CARSON CITY

# TEST DATA

## DRY SAND

Date: 9-20-73 Time: 10:50 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: B

Inflation, psig: 15 Ambient Temp. °F.: 74 Surface Temp. °F.: 78

Relative Humidity %: 44 Wind Speed, mph: 7 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .35 | .30 | .35 |
| 400 Feet: | .30 | .30 | .45 |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 4.75 | 3.75 | 3.50 | 3.75 | 4.50 | 3.75 | 3.00 | 3.00 |
| Tire Track Width, Ins.: | | 22.50 | 24.00 | 24.50 | 24.00 | 22.00 | 24.50 | 23.00 | 22.00 |
| Cone Penetrometer Readings in Track | 3" | 10 | 15 | 13 | 10 | 10 | 20 | 15 | 5 |
| | 6" | 45 | 70 | 40 | 40 | 11 | 55 | 65 | 35 |
| | 9" | 135 | 120 | 75 | 100 | 135 | 105 | 95 | 130 |
| | 12" | 105 | 165 | 130 | 105 | 130 | 145 | 125 | 130 |
| | 15" | OS | OS | 285 | 135 | OS | OS | 275 | 245 |
| | 18" | - | - | OS | OS | - | - | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 10 | 13 | 10 | 5 | 10 | 25 | 20 |
| | 6" | 25 | 20 | 25 | 50 | 20 | 35 | 35 | 40 |
| | 9" | 65 | 35 | 30 | 65 | 70 | 80 | 35 | 45 |
| | 12" | 45 | 60 | 40 | 70 | 65 | 55 | 45 | 55 |
| | 15" | 55 | 65 | 40 | 75 | 80 | 55 | 55 | 55 |
| | 18" | 290 | 105 | 105 | 165 | 240 | 190 | 290 | 290 |
| | 21" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 21 | 24 | 18 | 18 | 23 | 24 | 15 | 19 |
| | 6" | 50 | 50 | 48 | 48 | 59 | 54 | 59 | 42 |
| | 9" | 100 | 100 | 110 | 106 | 100 | 95 | 100 | 97 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 26 | 16 | 24 | 22 | 22 | 20 | 18 | 25 |
| | 6" | 46 | 38 | 50 | 50 | 41 | 46 | 58 | 55 |
| | 9" | 54 | 56 | 76 | 70 | 54 | 62 | 76 | 70 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 0.5 | 0.5 | 1.0 | 1.0 |

Tire Hop Frequency, Hz 3.0

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

## DRY SAND

Date: 9-20-73 Time: 11:15 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: B

Inflation, psig: 10 Ambient Temp. °F.: 74 Surface Temp. °F.: 78

Relative Humidity %: 44 Wind Speed, mph: 7 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .35 | .30 | .35 |
| 400 Feet: | .30 | .30 | .45 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 3.75 | 3.75 | 4.00 | 3.50 | 4.25 | 3.75 | 3.75 | 3.50 |
| Tire Track Width, Ins.: | | 20.00 | 18.00 | 20.00 | 19.50 | 20.00 | 19.00 | 20.00 | 18.50 |
| Cone Penetrometer Readings in Track | 3" | 15 | 10 | 20 | 15 | 20 | 15 | 25 | 20 |
| | 6" | 85 | 55 | 75 | 65 | 65 | 70 | 70 | 65 |
| | 9" | 80 | 80 | 105 | 85 | 70 | 85 | 110 | 95 |
| | 12" | 80 | 95 | 115 | 90 | 90 | 105 | 105 | 125 |
| | 15" | 215 | 195 | 175 | 155 | 215 | 195 | 175 | 240 |
| | 18" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 15 | 10 | 10 | 10 | 10 | 12 | 25 | 20 |
| | 6" | 50 | 55 | 35 | 45 | 30 | 45 | 70 | 35 |
| | 9" | 75 | 55 | 70 | 65 | 55 | 55 | 80 | 50 |
| | 12" | 90 | 65 | 95 | 75 | 50 | 55 | 85 | 80 |
| | 15" | 115 | 90 | 115 | 85 | 35 | 60 | 140 | 85 |
| | 18" | 135 | OS | OS | 275 | 75 | 265 | 255 | 95 |
| | 21" | OS | - | - | OS | 135 | OS | OS | 140 |
| | 24" | - | - | - | - | OS | - | - | 245 |
| Plate Penetrometer Readings in Track, psi | 3" | 21 | 21 | 20 | 21 | 23 | 28 | 23 | 28 |
| | 6" | 50 | 53 | 55 | 52 | 61 | 64 | 49 | 74 |
| | 9" | 84 | 83 | 98 | 70 | 102 | 85 | 90 | 96 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 23 | 25 | 10 | 24 | 23 | 26 | 32 | 27 |
| | 6" | 39 | 45 | 44 | 55 | 52 | 54 | 61 | 55 |
| | 9" | 71 | 58 | 79 | 81 | 55 | 65 | 74 | 78 |

| Test Vehicle Attitude at Stall, % - | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.0 | 1.0 | 1.5 |

Tire Hop Frequency, Hz 2.5

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

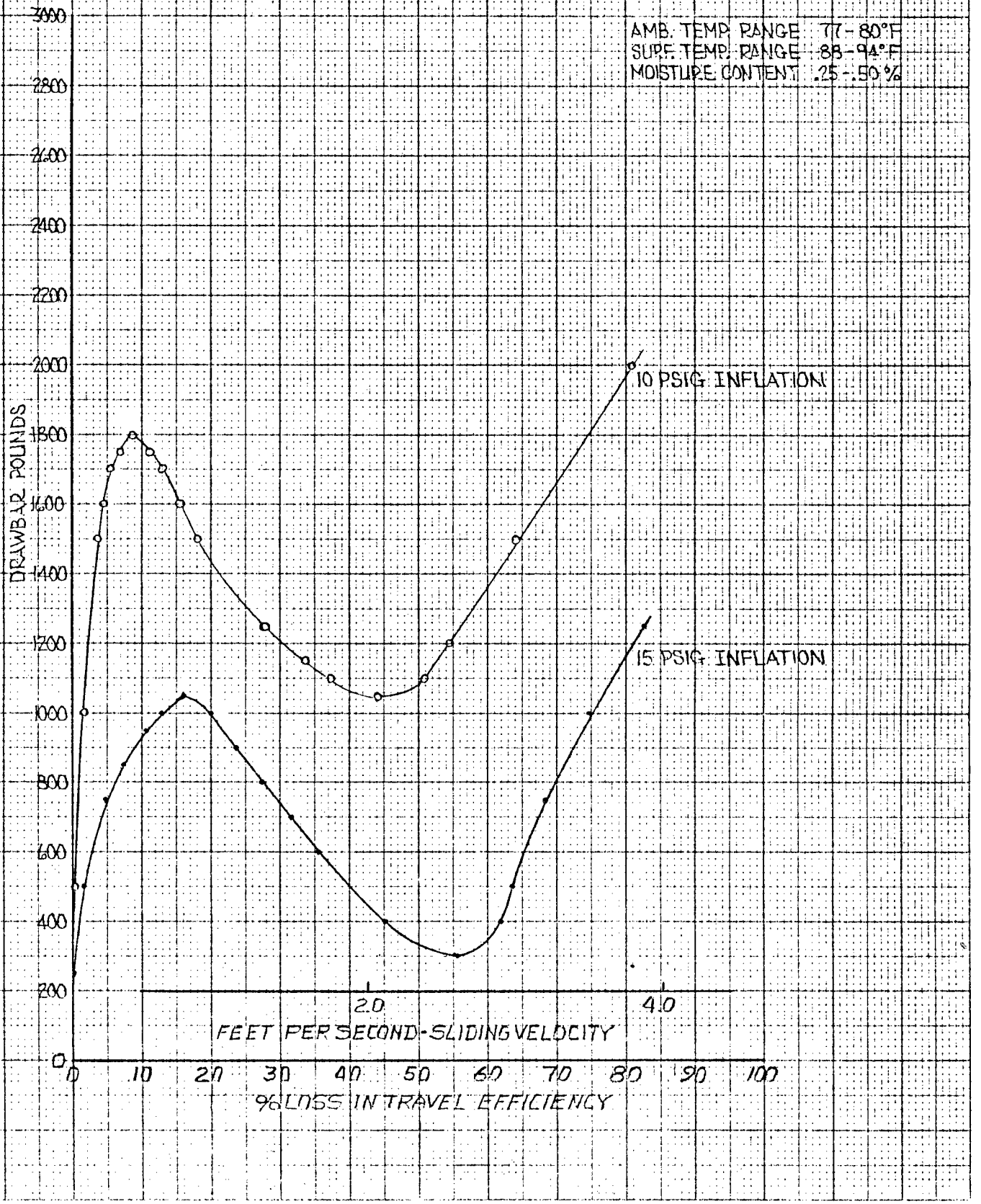
# DYNAMIC TRACTION
## DRY SAND
GROUP: C RUN NO. 4
6 WHEEL DRIVE
3.2 MPH
*FIGURE NO. 5*

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 77-80°F
SURF. TEMP. RANGE 88-94°F
MOISTURE CONTENT .25-.50%




WESTERN LITHO CARSON CITY

# TEST DATA

## DRY SAND

Date: 9-20-73 Time: 1:15 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: C

Inflation, psig: 15 Ambient Temp. °F.: 77 Surface Temp. °F.: 88

Relative Humidity %: 52 Wind Speed, mph: 7 Wind Direction: WNW

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .25 | .40 | .45 |
| 400 Feet: | .35 | .40 | .50 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 4.25 | 4.00 | 3.50 | 4.25 | 4.50 | 4.00 | 4.00 | 4.25 |
| Tire Track Width, Ins.: | | 23.00 | 23.00 | 22.00 | 23.00 | 23.50 | 24.00 | 22.50 | 23.50 |
| Cone Penetrometer Readings in Track | 3" | 15 | 25 | 25 | 10 | 25 | 25 | 20 | 15 |
| | 6" | 55 | 85 | 75 | 40 | 75 | 55 | 65 | 45 |
| | 9" | 130 | 105 | 105 | 150 | 105 | 110 | 110 | 125 |
| | 12" | 135 | 190 | 175 | 140 | 155 | 175 | 145 | 105 |
| | 15" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 10 | 20 | 10 | 10 | 10 | 10 | 20 |
| | 6" | 40 | 50 | 40 | 55 | 45 | 25 | 45 | 55 |
| | 9" | 60 | 45 | 50 | 50 | 50 | 50 | 60 | 50 |
| | 12" | 65 | 45 | 45 | 45 | 50 | 50 | 60 | 50 |
| | 15" | 135 | 65 | 65 | 45 | 55 | 145 | 70 | 120 |
| | 18" | OS | 265 | OS | 235 | 240 | OS | 225 | OS |
| | 21" | - | OS | - | OS | OS | - | OS | - |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 22 | 20 | 22 | 21 | 22 | 21 | 25 | 20 |
| | 6" | 56 | 46 | 52 | 51 | 54 | 51 | 55 | 53 |
| | 9" | 106 | 82 | 102 | 92 | 103 | 96 | 94 | 110 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 22 | 22 | 27 | 23 | 21 | 32 | 26 | 27 |
| | 6" | 46 | 41 | 39 | 37 | 42 | 36 | 46 | 49 |
| | 9" | 61 | 54 | 54 | 55 | 62 | 38 | 61 | 64 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 0.5 | 1.0 | 1.0 | 1.5 |

Tire Hop Frequency, Hz 2.9

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

## DRY SAND

Date: 9-20-73 Time: 1:45 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: C

Inflation, psig: 10 Ambient Temp. °F.: 80 Surface Temp. °F.: 94

Relative Humidity %: 48 Wind Speed, mph: 15 Wind Direction: W

Sand Moisture Content, % (at course location):

| | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .25 | .40 | .45 |
| 400 Feet: | .35 | .40 | .50 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 4.25 | 3.75 | 4.50 | 3.00 | 4.25 | 3.75 | 4.25 | 4.50 |
| Tire Track Width, Ins.: | | 20.50 | 22.00 | 18.50 | 16.50 | 20.50 | 20.00 | 18.50 | 19.50 |
| Cone Penetrometer Readings in Track | 3" | 20 | 10 | 20 | 20 | 5 | 20 | 20 | 10 |
| | 6" | 50 | 65 | 95 | 80 | 25 | 55 | 50 | 75 |
| | 9" | 85 | 80 | 75 | 110 | 125 | 90 | 100 | 80 |
| | 12" | 110 | 135 | 100 | 110 | 125 | 100 | 140 | 95 |
| | 15" | 205 | OS | 280 | 145 | 220 | 215 | 180 | 160 |
| | 18" | OS | - | OS | OS | OS | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 5 | 20 | 15 | 15 | 10 | 10 | 10 |
| | 6" | 40 | 55 | 50 | 45 | 30 | 40 | 50 | 60 |
| | 9" | 70 | 60 | 70 | 60 | 40 | 45 | 60 | 65 |
| | 12" | 75 | 75 | 90 | 60 | 35 | 45 | 80 | 80 |
| | 15" | 110 | 105 | 120 | 55 | 35 | 40 | 95 | 100 |
| | 18" | 290 | OS | 290 | 155 | 190 | 30 | 170 | 210 |
| | 21" | OS | - | OS | OS | OS | 205 | 290 | OS |
| | 24" | - | - | - | - | - | OS | OS | - |
| Plate Penetrometer Readings in Track, psi | 3" | 24 | 18 | 26 | 24 | 23 | 25 | 16 | 22 |
| | 6" | 49 | 42 | 52 | 55 | 40 | 44 | 49 | 66 |
| | 9" | 83 | 72 | 86 | 96 | 98 | 104 | 92 | 102 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 15 | 26 | 23 | 24 | 21 | 20 | 26 | 25 |
| | 6" | 41 | 52 | 44 | 50 | 40 | 46 | 52 | 57 |
| | 9" | 68 | 68 | 86 | 55 | 45 | 59 | 68 | 77 |

Test Vehicle Attitude at Stall, %

| Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Front Up: | -- | - | - | - |
| Front Down: | 0.5 | 1.0 | 1.5 | 1.0 |

Tire Hop Frequency, Hz 2.5

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

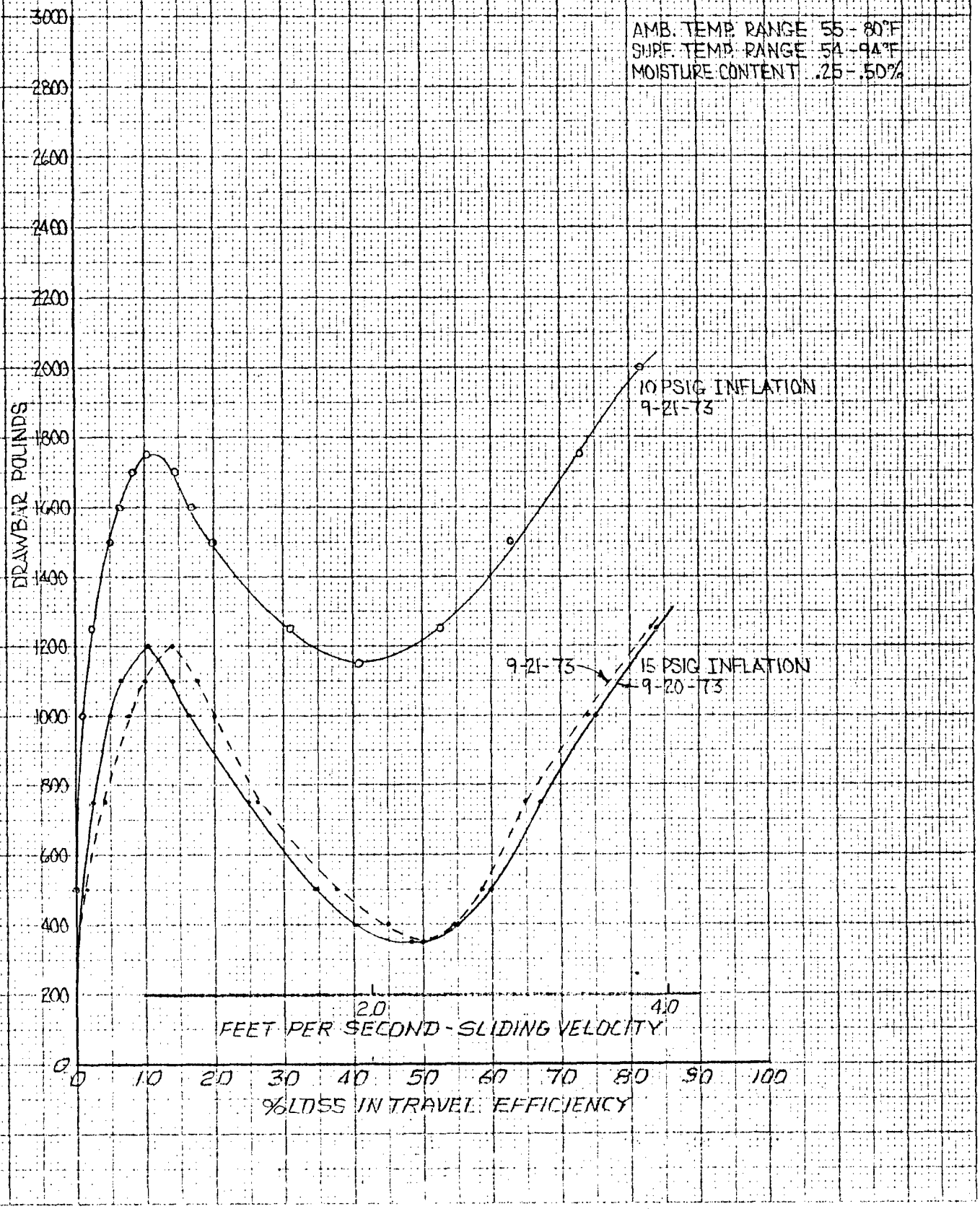
# DYNAMIC TRACTION
## DRY SAND
## GROUP: E RUN NO. 5
## 6 WHEEL DRIVE
## 3.2 M.P.H.
## FIGURE NO.6

Location: SAND MOUNTAIN, NEVADA

Date: 9-20/21-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 55 - 80°F
SURF. TEMP. RANGE 54 - 94°F
MOISTURE CONTENT .25 - .50%




WESTERN LITHO CARSON CITY

TEST DATA

DRY SAND

Date: 9-20-73 Time: 2:40PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: E

Inflation, psig: 15 Ambient Temp. °F.: 80 Surface Temp. °F.: 94

Relative Humidity %: 48 Wind Speed, mph: 15 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .25 | .40 | .45 |
| 400 Feet: | .35 | .40 | .50 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 3.75 | 3.50 | 4.25 | 3.50 | 4.25 | 4.25 | 4.25 | 4.25 |
| Tire Track Width, Ins.: | | 21.50 | 21.50 | 22.50 | 21.50 | 23.00 | 22.50 | 21.50 | 22.50 |
| Cone Penetrometer Readings in Track | 3" | 10 | 10 | 25 | 10 | 10 | 15 | 20 | 20 |
| | 6" | 80 | 70 | 75 | 50 | 40 | 50 | 70 | 75 |
| | 9" | 100 | 90 | 110 | 95 | 150 | 90 | 100 | 110 |
| | 12" | 135 | 135 | 140 | 145 | 125 | 160 | 135 | 125 |
| | 15" | OS | OS | OS | OS | 290 | OS | 285 | OS |
| | 18" | - | - | - | - | OS | - | OS | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 5 | 15 | 20 | 15 | 15 | 20 | 20 | 15 |
| | 6" | 50 | 40 | 50 | 50 | 40 | 50 | 50 | 40 |
| | 9" | 55 | 55 | 60 | 70 | 60 | 60 | 70 | 55 |
| | 12" | 50 | 50 | 55 | 70 | 65 | 65 | 80 | 55 |
| | 15" | 50 | 45 | 55 | 90 | 105 | 110 | 135 | 80 |
| | 18" | 280 | 285 | 295 | OS | 265 | OS | 280 | 285 |
| | 21" | OS | OS | OS | - | OS | - | OS | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 21 | 22 | 25 | 24 | 21 | 20 | 25 | 25 |
| | 6" | 48 | 52 | 53 | 55 | 51 | 51 | 61 | 52 |
| | 9" | 98 | 102 | 101 | 99 | 105 | 101 | 101 | 110 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 25 | 24 | 28 | 25 | 19 | 26 | 18 | 26 |
| | 6" | 48 | 48 | 49 | 50 | 32 | 48 | 55 | 43 |
| | 9" | 66 | 60 | 65 | 66 | 57 | 70 | 80 | 66 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.5 | 1.0 | 1.5 | 1.0 |

Tire Hop Frequency, Hz 2.8

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

## DRY SAND

Date: 9-21-73 Time: 9:15 AM Test Vehicle: M-34 6WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: E

Inflation, psig: 15 Ambient Temp. °F.: 55 Surface Temp. °F.: 54

Relative Humidity %: 51 Wind Speed, mph: 1 Wind Direction: SW

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .25 | .35 | .35 |
| 400 Feet: | .50 | .35 | .35 |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 4.50 | 5.50 | 4.75 | 4.75 | 4.75 | 5.00 | 4.50 | 4.38 |
| Tire Track Width, Ins.: | | 22.50 | 23.00 | 22.50 | 24.00 | 23.00 | 24.00 | 22.50 | 22.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 15 | 10 | 10 | 25 | 20 | 15 | 20 |
| | 6" | 65 | 60 | 90 | 55 | 75 | 85 | 95 | 55 |
| | 9" | 100 | 110 | 95 | 100 | 95 | 105 | 105 | 90 |
| | 12" | 105 | 145 | 105 | 115 | 105 | 135 | 125 | 110 |
| | 15" | 245 | OS | OS | 290 | 265 | 290 | OS | 265 |
| | 18" | OS | - | - | OS | OS | OS | - | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 20 | 15 | 20 | 15 | 10 | 20 | 10 | 15 |
| | 6" | 45 | 35 | 45 | 35 | 50 | 40 | 55 | 25 |
| | 9" | 60 | 50 | 65 | 55 | 50 | 55 | 55 | 40 |
| | 12" | 65 | 55 | 70 | 70 | 65 | 60 | 70 | 50 |
| | 15" | 65 | 65 | 75 | 75 | 70 | 60 | 85 | 50 |
| | 18" | 165 | 165 | 290 | 180 | 115 | 115 | 225 | 190 |
| | 21" | OS | OS | OS | 295 | 270 | 240 | OS | OS |
| | 24" | - | - | - | OS | OS | OS | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 25 | 24 | 21 | 24 | 27 | 25 | 26 | 25 |
| | 6" | 51 | 51 | 60 | 66 | 52 | 61 | 61 | 70 |
| | 9" | 88 | 91 | 104 | 95 | 104 | 101 | 90 | 110 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 22 | 20 | 24 | 24 | 22 | 21 | 24 | 28 |
| | 6" | 51 | 41 | 38 | 45 | 43 | 41 | 44 | 43 |
| | 9" | | | | | | | | |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.5 | 1.0 | 1.0 | 1.0 |

Tire Hop Frequency, Hz 3.0

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SAND

Date: 9-21-73 Time: 9:50 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: E

Inflation, psig: 10 Ambient Temp. °F.: 68 Surface Temp. °F.: 68

Relative Humidity %: 59 Wind Speed, mph: 6 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .25 | .35 | .35 |
| 400 Feet: | .50 | .35 | .35 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 4.75 | 4.50 | 4.50 | 5.50 | 4.25 | 5.00 | 4.50 | 5.50 |
| Tire Track Width, Ins.: | | 21.50 | 19.50 | 19.00 | 22.00 | 20.00 | 19.50 | 18.50 | 22.50 |
| Cone Penetrometer Readings in Track | 3" | 10 | 15 | 10 | 25 | 30 | 10 | 20 | 25 |
| | 6" | 40 | 55 | 80 | 70 | 80 | 95 | 80 | 65 |
| | 9" | 130 | 65 | 80 | 80 | 85 | 70 | 85 | 80 |
| | 12" | 100 | 105 | 95 | 90 | 90 | 80 | 95 | 150 |
| | 15" | 160 | 290 | 240 | OS | 265 | 290 | 275 | OS |
| | 18" | OS | OS | OS | - | OS | OS | OS | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 30 | 20 | 15 | 20 | 20 | 15 | 25 | 10 |
| | 6" | 55 | 40 | 45 | 35 | 50 | 50 | 50 | 30 |
| | 9" | 55 | 45 | 65 | 35 | 70 | 100 | 75 | 50 |
| | 12" | 60 | 40 | 70 | 45 | 90 | 105 | 95 | 50 |
| | 15" | 95 | 85 | 85 | 195 | 110 | 150 | 165 | 60 |
| | 18" | 235 | 270 | 165 | OS | 280 | OS | OS | 200 |
| | 21" | OS | OS | OS | - | OS | - | - | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 26 | 21 | 24 | 32 | 28 | 28 | 25 | 27 |
| | 6" | 59 | 60 | 64 | 54 | 56 | 63 | 68 | 71 |
| | 9" | 98 | 90 | 94 | 101 | 98 | 88 | 88 | 91 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 28 | 28 | 24 | 22 | 27 | 29 | 30 | 21 |
| | 6" | 56 | 42 | 46 | 46 | 56 | 53 | 62 | 38 |
| | 9" | 65 | 55 | 68 | 64 | 71 | 84 | 78 | 49 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 0.5 | 1.0 | 1.0 | 1.0 |

Tire Hop Frequency, Hz 2.8

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

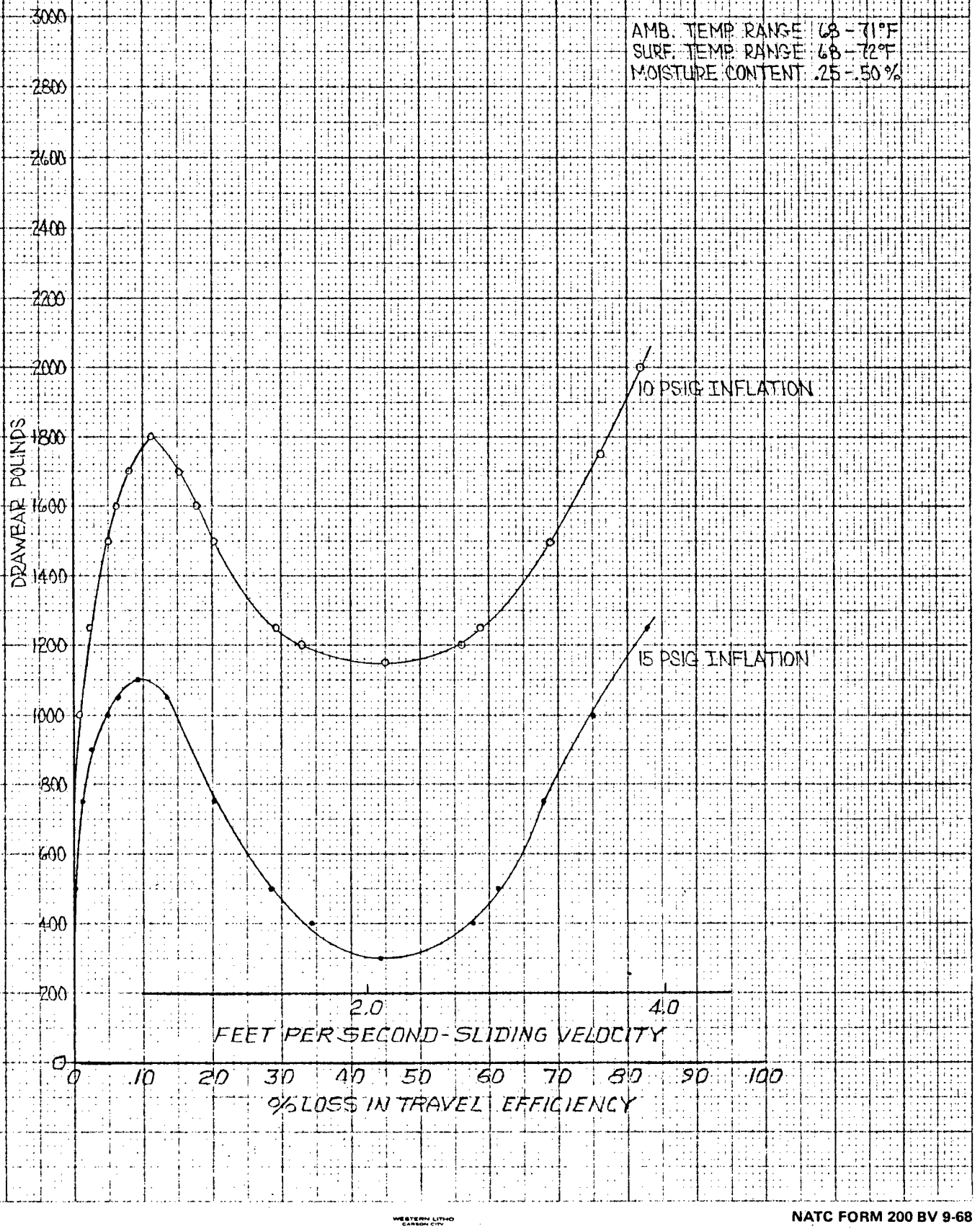
# DYNAMIC TRACTION
## DRY SAND
GROUP: F RUN NO. 6
6 WHEEL DRIVE
3.2 MPH
FIGURE NO. 7

Location: SAND MOUNTAIN, NEVADA

Date: 9-21-73 Test By: WHS

Data By: WHS

AMB. TEMP RANGE 68 - 71°F
SURF. TEMP RANGE 68 - 72°F
MOISTURE CONTENT .25 - .50 %




WESTERN LITHO CARSON CITY

TEST DATA

DRY SAND

Date: 9-21-73 Time: 10:50 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: F

Inflation, psig: 15 Ambient Temp. °F.: 68 Surface Temp. °F.: 68

Relative Humidity %: 59 Wind Speed, mph: 6 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .25 | .35 | .35 |
| 400 Feet: | .50 | .35 | .35 |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 4.75 | 4.75 | 5.00 | 5.00 | 5.13 | 5.00 | 6.00 | 5.50 |
| Tire Track Width, Ins.: | | 22.00 | 22.00 | 21.50 | 22.00 | 23.00 | 22.00 | 24.50 | 22.50 |
| Cone Penetrometer Readings in Track | 3" | 10 | 10 | 20 | 20 | 10 | 20 | 15 | 15 |
| | 6" | 70 | 75 | 70 | 60 | 50 | 65 | 45 | 75 |
| | 9" | 95 | 105 | 130 | 110 | 90 | 115 | 130 | 110 |
| | 12" | 150 | 145 | 200 | 140 | 125 | 165 | 135 | 140 |
| | 15" | 290 | OS | OS | OS | 265 | OS | OS | OS |
| | 18" | OS | - | - | - | OS | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 10 | 20 | 20 | 15 | 10 | 15 | 10 |
| | 6" | 30 | 40 | 30 | 30 | 40 | 40 | 40 | 40 |
| | 9" | 35 | 50 | 35 | 35 | 45 | 55 | 70 | 45 |
| | 12" | 35 | 50 | 35 | 30 | 45 | 60 | 55 | 40 |
| | 15" | 30 | 70 | 30 | 35 | 125 | 90 | 195 | 50 |
| | 18" | 160 | 245 | 290 | 230 | OS | 275 | OS | OS |
| | 21" | OS | OS | OS | OS | - | OS | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 25 | 22 | 25 | 27 | 26 | 21 | 25 | 22 |
| | 6" | 58 | 62 | 56 | 57 | 62 | 54 | 57 | 61 |
| | 9" | 103 | 101 | 104 | 101 | 101 | 108 | 92 | 101 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 21 | 22 | 24 | 22 | 35 | 22 | 30 | 22 |
| | 6" | 38 | 32 | 36 | 34 | 46 | 38 | 41 | 36 |
| | 9" | 47 | 48 | 42 | 39 | 58 | 43 | 57 | 42 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.5 | 1.5 | 1.0 | 1.5 |

Tire Hop Frequency, Hz 3.2

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SAND

Date: 9-21-73 Time: 11:20 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: F

Inflation, psig: 10 Ambient Temp. °F.: 71 Surface Temp. °F.: 72

Relative Humidity %: 40 Wind Speed, mph: 1 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .25 | .35 | .35 |
| 400 Feet: | .50 | .35 | .35 |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 4.50 | 4.50 | 4.75 | 4.50 | 4.50 | 4.50 | 4.75 | 3.75 |
| Tire Track Width, Ins.: | | 17.00 | 18.75 | 18.00 | 18.50 | 17.50 | 17.00 | 18.00 | 16.00 |
| Cone Penetrometer Readings in Track | 3" | 10 | 20 | 15 | 15 | 20 | 25 | 15 | 10 |
| | 6" | 70 | 55 | 60 | 75 | 90 | 90 | 55 | 75 |
| | 9" | 85 | 70 | 70 | 85 | 95 | 95 | 125 | 85 |
| | 12" | 90 | 90 | 110 | 95 | 135 | 95 | 90 | 90 |
| | 15" | 195 | 280 | 265 | 230 | 225 | 95 | 165 | 215 |
| | 18" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 15 | 10 | 20 | 10 | 20 | 15 | 15 | 15 |
| | 6" | 50 | 35 | 45 | 45 | 70 | 45 | 60 | 50 |
| | 9" | 75 | 75 | 65 | 65 | 95 | 45 | 55 | 80 |
| | 12" | 95 | 90 | 75 | 75 | 100 | 40 | 55 | 90 |
| | 15" | 145 | 115 | 90 | 100 | 100 | 70 | 70 | 110 |
| | 18" | OS | OS | 275 | OS | 90 | 235 | 195 | 200 |
| | 21" | - | - | OS | - | 135 | OS | OS | 290 |
| | 24" | - | - | - | - | OS | - | - | OS |
| Plate Penetrometer Readings in Track, psi | 3" | 26 | 27 | 26 | 25 | 26 | 31 | 31 | 27 |
| | 6" | 62 | 63 | 62 | 59 | 71 | 66 | 78 | 65 |
| | 9" | 101 | 87 | 100 | 92 | 85 | 84 | 88 | 97 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 26 | 24 | 28 | 32 | 36 | 39 | 27 | 32 |
| | 6" | 49 | 44 | 54 | 55 | 88 | 55 | 54 | 57 |
| | 9" | 74 | 72 | 79 | 82 | 88 | 72 | 72 | 79 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 2.0 | 1.5 | 2.0 | 1.5 |

Tire Hop Frequency, Hz 2.2

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

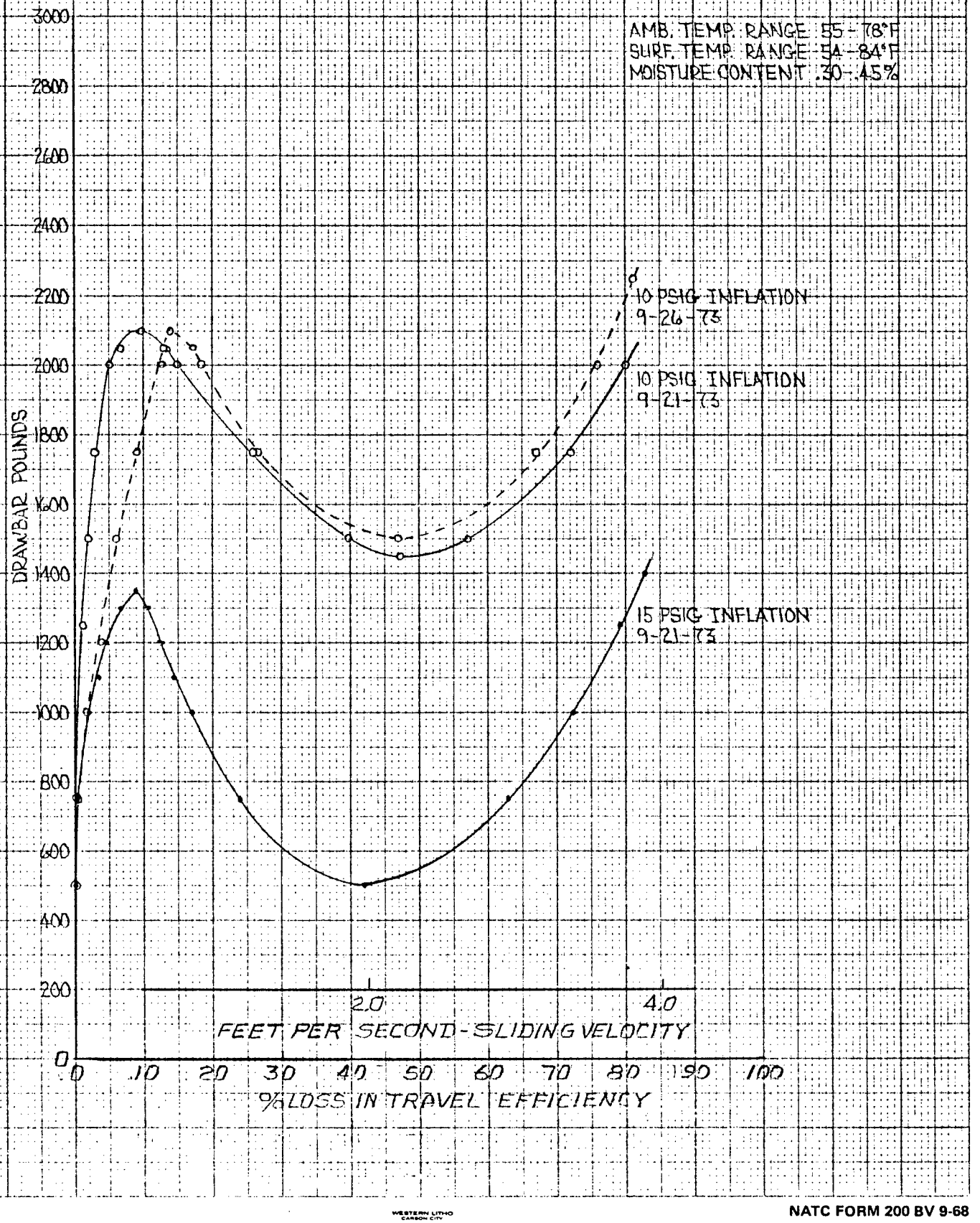
# DYNAMIC TRACTION
## DRY SAND
GROUP: G RUN NO. 1
6 WHEEL DRIVE
3.2 MPH
*FIGURE NO. 8*

Location: SAND MOUNTAIN, NEVADA

Date: 9-21 & 26-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 55 - 78°F
SURF. TEMP. RANGE 54 - 84°F
MOISTURE CONTENT .30 - .45%




WESTERN LITHO CARSON CITY

TEST DATA

DRY SAND

Date: 9-21-73 Time: 12:45 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: G

Inflation, psig: 15 Ambient Temp. °F.: 78 Surface Temp. °F.: 84

Relative Humidity %: 55 Wind Speed, mph: 1 Wind Direction: NE

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .30 | .45 | .35 |
| 400 Feet: | .40 | .35 | .35 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 5.50 | 5.50 | 5.13 | 5.50 | 5.00 | 4.75 | 5.63 | 4.25 |
| Tire Track Width, Ins.: | | 23.00 | 22.00 | 22.00 | 23.50 | 23.50 | 22.00 | 23.00 | 23.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 20 | 15 | 20 | 15 | 10 | 15 | 25 |
| | 6" | 65 | 60 | 55 | 55 | 45 | 35 | 60 | 65 |
| | 9" | 90 | 95 | 90 | 85 | 110 | 135 | 95 | 90 |
| | 12" | 110 | 175 | 130 | 145 | 195 | 100 | 135 | 125 |
| | 15" | 290 | OS | OS | OS | OS | 290 | 235 | 275 |
| | 18" | OS | - | - | - | - | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 15 | 20 | 20 | 20 | 15 | 10 | 20 |
| | 6" | 35 | 45 | 35 | 35 | 35 | 25 | 15 | 35 |
| | 9" | 45 | 45 | 35 | 40 | 35 | 30 | 30 | 30 |
| | 12" | 50 | 40 | 35 | 40 | 35 | 30 | 40 | 25 |
| | 15" | 55 | 45 | 40 | 65 | 90 | 70 | 105 | 105 |
| | 18" | 215 | OS | 290 | OS | OS | 225 | OS | 290 |
| | 21" | OS | - | OS | - | - | OS | - | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 21 | 21 | 21 | 24 | 22 | 25 | 28 | 23 |
| | 6" | 69 | 54 | 59 | 51 | 60 | 52 | 52 | 57 |
| | 9" | 95 | 94 | 97 | 96 | 101 | 104 | 97 | 105 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 21 | 24 | 25 | 21 | 24 | 26 | 21 | 21 |
| | 6" | 33 | 38 | 34 | 38 | 34 | 40 | 31 | 33 |
| | 9" | 55 | 44 | 44 | 53 | 39 | 37 | 53 | 35 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.5 | 1.5 | 1.5 |

Tire Hop Frequency, Hz 3.0

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

## DRY SAND

Date: 9-21-73 Time: 1:10 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,556 LBS Trailer: NA Tire Group: G

Inflation, psig: 10 Ambient Temp. °F.: 78 Surface Temp. °F.: 84

Relative Humidity %: 55 Wind Speed, mph: 1 Wind Direction: NE

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .30 | .45 | .35 |
| 400 Feet: | .40 | .35 | .35 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 3.88 | 4.00 | 4.00 | 3.25 | 3.88 | 4.00 | 4.00 | 4.50 |
| Tire Track Width, Ins.: | | 19.00 | 19.00 | 20.00 | 18.00 | 18.50 | 18.50 | 19.00 | 18.25 |
| Cone Penetrometer Readings in Track | 3" | 25 | 10 | 25 | 15 | 35 | 30 | 25 | 25 |
| | 6" | 75 | 80 | 65 | 55 | 70 | 85 | 70 | 70 |
| | 9" | 80 | 80 | 85 | 70 | 65 | 110 | 95 | 80 |
| | 12" | 235 | 75 | 95 | 80 | 105 | 125 | 130 | 130 |
| | 15" | OS | 195 | 205 | 180 | 195 | 245 | 215 | 255 |
| | 18" | - | OS | OS | OS | OS | OS | OS | OS |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 20 | 30 | 25 | 25 | 30 | 20 | 20 | 15 |
| | 6" | 45 | 50 | 55 | 45 | 50 | 50 | 55 | 45 |
| | 9" | 60 | 55 | 60 | 60 | 45 | 50 | 75 | 70 |
| | 12" | 65 | 65 | 70 | 70 | 60 | 40 | 90 | 80 |
| | 15" | 80 | 90 | 90 | 95 | OS | 30 | 125 | 100 |
| | 18" | OS | 290 | 295 | 235 | - | 160 | 195 | 135 |
| | 21" | - | OS | OS | OS | - | OS | OS | 250 |
| | 24" | - | - | - | - | - | - | - | OS |
| Plate Penetrometer Readings in Track, psi | 3" | 29 | 21 | 21 | 28 | 32 | 22 | 23 | 30 |
| | 6" | 56 | 48 | 61 | 49 | 56 | 72 | 79 | 58 |
| | 9" | 103 | 79 | 81 | 92 | 98 | 112 | 87 | 94 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 26 | 30 | 29 | 24 | 27 | 26 | 29 | 25 |
| | 6" | 44 | 51 | 49 | 50 | 39 | 39 | 56 | 59 |
| | 9" | 68 | 72 | 70 | 69 | 39 | 44 | 92 | 89 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.0 | 2.0 | 2.0 |

Tire Hop Frequency, Hz 2.6

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SAND

Date: 9-26-73 Time: 9:25 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: G

Inflation, psig: 10 Ambient Temp. °F.: 55 Surface Temp. °F.: 54

Relative Humidity %: 60 Wind Speed, mph: 8 Wind Direction: ENE

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .35 | .30 | .45 |
| 400 Feet: | .35 | .35 | .40 |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 5.00 | 6.25 | 6.00 | 5.50 | 5.25 | 5.00 | 6.00 | 6.00 |
| Tire Track Width, Ins.: | | 22.50 | 22.50 | 23.00 | 23.00 | 22.50 | 23.00 | 22.50 | 23.00 |
| Cone Penetrometer Readings in Track | 3" | 15 | 20 | 25 | 20 | 15 | 25 | 20 | 25 |
| | 6" | 70 | 55 | 55 | 35 | 80 | 95 | 90 | 70 |
| | 9" | 95 | 120 | 80 | 85 | 100 | 85 | 100 | 90 |
| | 12" | 120 | 190 | 85 | OS | 145 | 205 | 160 | 110 |
| | 15" | OS | OS | OS | - | OS | OS | OS | OS |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 15 | 10 | 10 | 15 | 10 | 10 | 10 | 10 |
| | 6" | 25 | 20 | 30 | 25 | 25 | 15 | 25 | 25 |
| | 9" | 25 | 20 | 35 | 30 | 30 | 35 | 35 | 40 |
| | 12" | 25 | 20 | 35 | 30 | 30 | 35 | 40 | 50 |
| | 15" | 20 | 20 | 45 | 25 | 30 | 25 | 55 | 60 |
| | 18" | 290 | 245 | 235 | 290 | 165 | 295 | 285 | 200 |
| | 21" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 22 | 32 | 28 | 29 | 23 | 35 | 27 | 34 |
| | 6" | 59 | 59 | 71 | 67 | 61 | 71 | 77 | 73 |
| | 9" | 98 | 96 | 91 | 81 | 103 | 109 | 97 | 95 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 21 | 17 | 23 | 22 | 19 | 19 | 23 | 21 |
| | 6" | 30 | 28 | 28 | 33 | 33 | 34 | 33 | 34 |
| | 9" | 31 | 38 | 35 | 40 | 43 | 44 | 45 | 43 |

| Test Vehicle Attitude at Stall, % - | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 0.5 | 1.0 | 1.0 | 1.0 |

Tire Hop Frequency, Hz 2.6

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

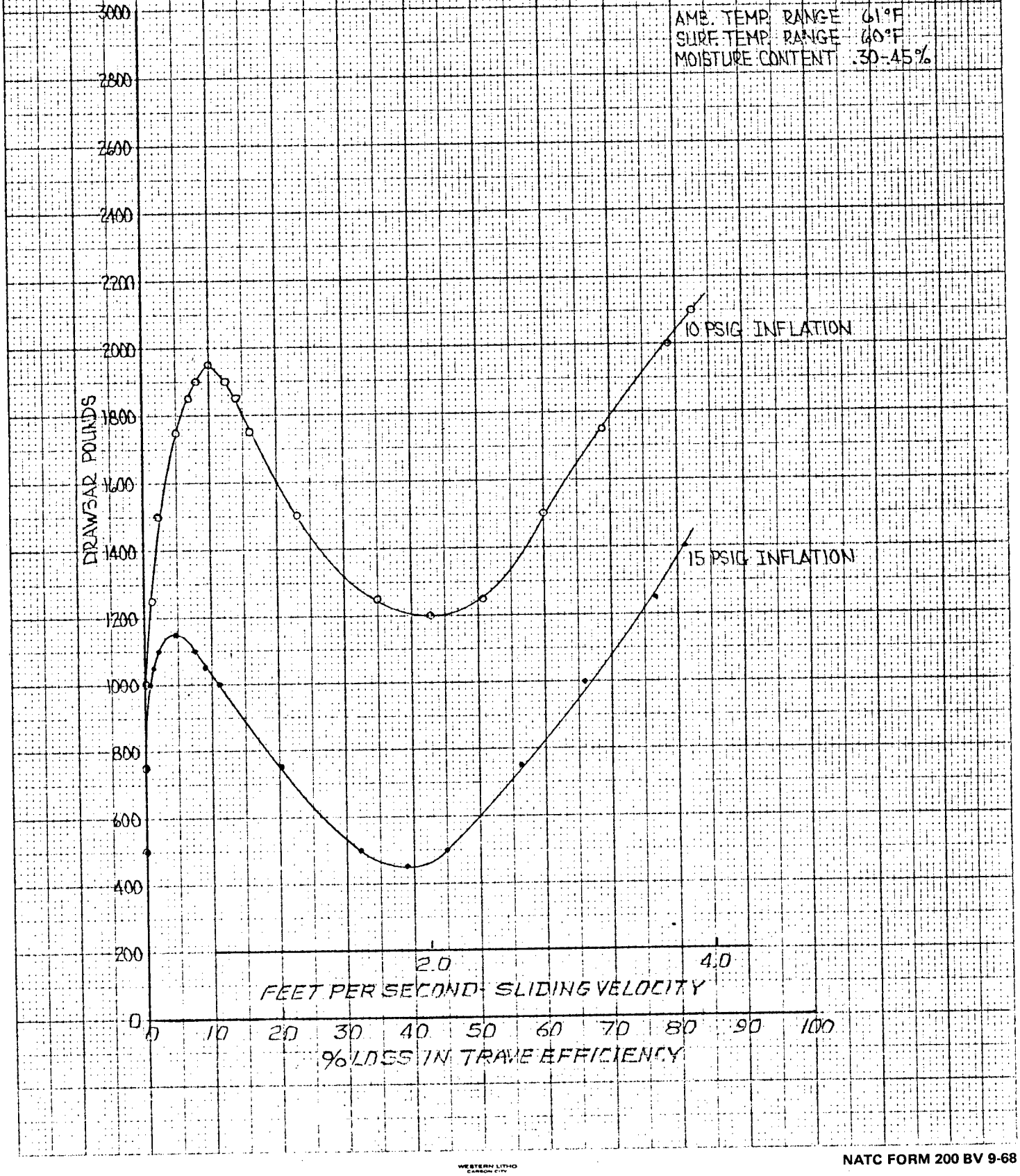
# DYNAMIC TRACTION
## DRY SAND
## GROUP J RUN NO. 8
## 6 WHEEL DRIVE
## 3.2 MPH
## FIGURE NO. 9

Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 61°F
SURF. TEMP. RANGE 60°F
MOISTURE CONTENT .30-.45%




WESTERN LITHO CARSON CITY

TEST DATA

DRY SAND

Date: 9-26-73 Time: 10:15 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: J

Inflation, psig: 15 Ambient Temp. °F.: 61 Surface Temp. °F.: 60

Relative Humidity %: 48 Wind Speed, mph: 10 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .35 | .30 | .45 |
| 400 Feet: | .35 | .35 | .40 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 4.25 | 4.00 | 4.25 | 5.00 | 4.75 | 3.50 | 4.25 | 5.00 |
| Tire Track Width, Ins.: | | 24.00 | 24.00 | 24.25 | 23.00 | 24.00 | 24.00 | 22.50 | 24.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 15 | 10 | 20 | 15 | 20 | 10 | 15 |
| | 6" | 45 | 45 | 40 | 70 | 55 | 60 | 75 | 50 |
| | 9" | 90 | 85 | 140 | 90 | 95 | 105 | 90 | 90 |
| | 12" | 105 | 130 | 160 | 90 | 225 | 225 | 160 | 190 |
| | 15" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 10 | 10 | 10 | 15 | 10 | 10 | 10 |
| | 6" | 30 | 25 | 30 | 20 | 30 | 30 | 30 | 20 |
| | 9" | 40 | 30 | 40 | 30 | 35 | 35 | 30 | 25 |
| | 12" | 45 | 30 | 50 | 35 | 35 | 40 | 30 | 30 |
| | 15" | 75 | 40 | 85 | 50 | 60 | 40 | 55 | 25 |
| | 18" | 285 | 285 | OS | 290 | 290 | OS | OS | 230 |
| | 21" | OS | OS | - | OS | OS | - | - | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 76 | 21 | 21 | 21 | 29 | 21 | 20 | 29 |
| | 6" | 59 | 39 | 48 | 48 | 64 | 51 | 59 | 57 |
| | 9" | 105 | 101 | 83 | 95 | 110 | 105 | 103 | 107 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 19 | 13 | 19 | 21 | 17 | 15 | 15 | 19 |
| | 6" | 34 | 28 | 32 | 31 | 28 | 36 | 21 | 35 |
| | 9" | 41 | 37 | 41 | 39 | 38 | 45 | 39 | 49 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.0 | 1.0 | 0.5 |

Tire Hop Frequency, Hz 2.7

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SAND

Date: 9-26-73 Time: 10:35 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: J

Inflation, psig: 10 Ambient Temp. °F.: 61 Surface Temp. °F.: 60

Relative Humidity %: 48 Wind Speed, mph: 10 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .35 | .30 | .45 |
| 400 Feet: | .35 | .35 | .40 |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 5.00 | 4.75 | 4.50 | 5.50 | 5.50 | 5.75 | 4.50 | 6.00 |
| Tire Track Width, Ins.: | | 21.50 | 22.50 | 22.00 | 22.00 | 22.00 | 24.00 | 24.00 | 23.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 20 | 10 | 10 | 15 | 25 | 20 | 20 |
| | 6" | 80 | 75 | 70 | 90 | 35 | 75 | 55 | 70 |
| | 9" | 95 | 170 | 90 | 80 | 120 | 90 | 105 | 95 |
| | 12" | 175 | 195 | 175 | 105 | 190 | 180 | 155 | 145 |
| | 15" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 10 | 10 | 10 | 10 | 15 | 15 | 10 |
| | 6" | 25 | 25 | 25 | 30 | 20 | 25 | 35 | 20 |
| | 9" | 35 | 30 | 30 | 40 | 30 | 30 | 45 | 40 |
| | 12" | 40 | 40 | 35 | 45 | 40 | 25 | 50 | 50 |
| | 15" | 80 | 80 | 90 | 70 | 70 | 120 | 70 | 85 |
| | 18" | 290 | 265 | 170 | 275 | 285 | 290 | 80 | 290 |
| | 21" | OS | OS | OS | OS | OS | OS | 265 | OS |
| | 24" | - | - | - | - | - | - | OS | - |
| Plate Penetrometer Readings in Track, psi | 3" | 23 | 22 | 23 | 23 | 27 | 25 | 25 | 29 |
| | 6" | 67 | 57 | 45 | 46 | 58 | 65 | 49 | 55 |
| | 9" | 99 | 103 | 97 | 95 | 99 | 106 | 97 | 100 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 19 | 17 | 21 | 19 | 22 | 21 | 19 | 15 |
| | 6" | 27 | 23 | 26 | 32 | 26 | 35 | 28 | 29 |
| | 9" | 38 | 31 | 38 | 34 | 35 | 47 | 32 | 39 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | 0.0 | 0.0 | - | - |
| | Front Down: | 0.0 | 0.0 | 0.5 | 1.0 |

Tire Hop Frequency, Hz 2.3

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

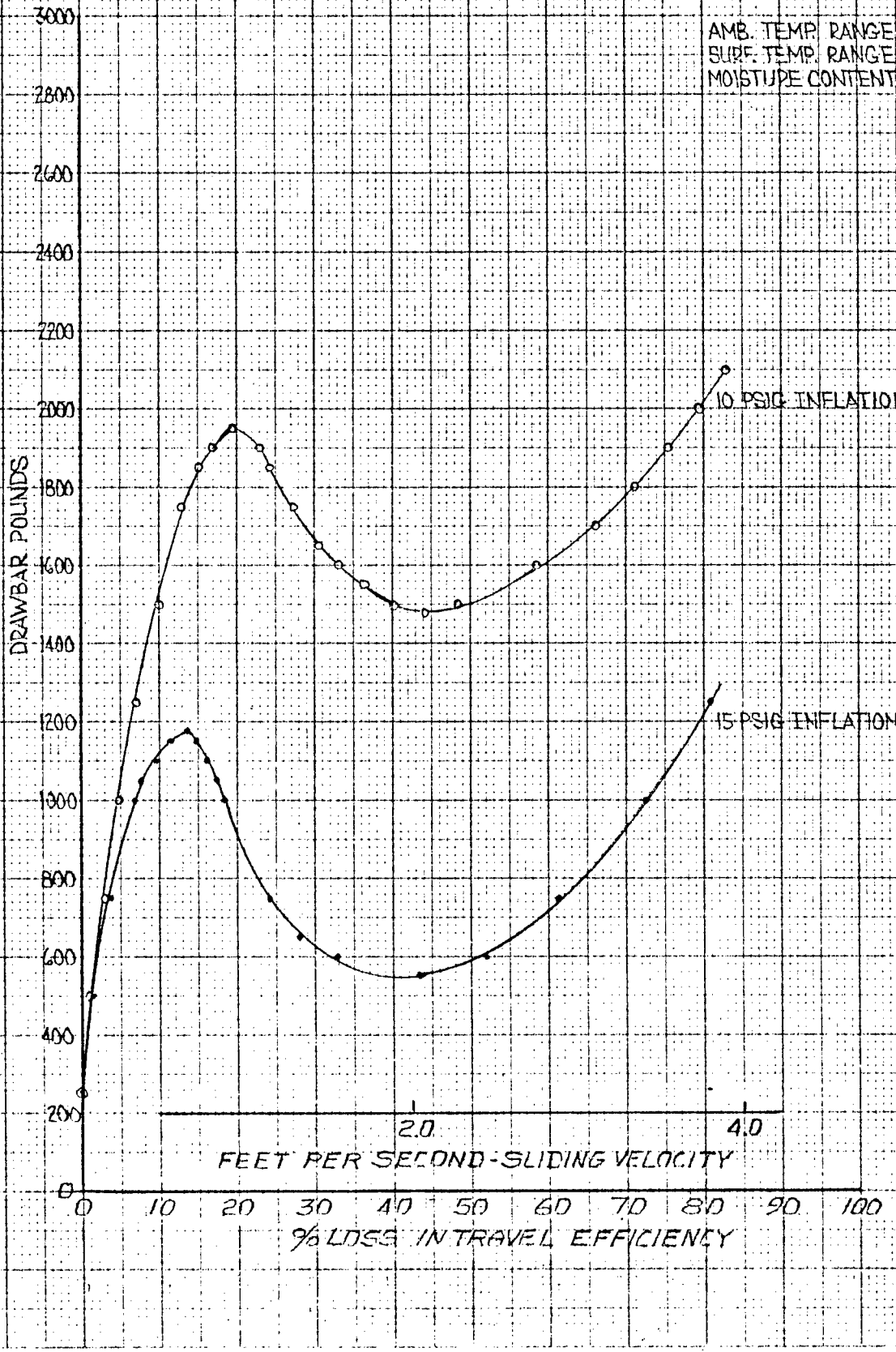
# DYNAMIC TRACTION
DRY SAND
GROUP: D RUN NO. 9
6 WHEEL DRIVE
3.2 MPH
FIGURE NO. 10

Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 70°F
SURF. TEMP. RANGE 86°F
MOISTURE CONTENT .30 - .40%




WESTERN LITHO CARSON CITY

TEST DATA

DRY SAND

Date: 9-26-73 Time: 11:40 AM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: D

Inflation, psig: 15 Ambient Temp. °F.: 70 Surface Temp. °F.: 86

Relative Humidity %: 30 Wind Speed, mph: 1 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | .30 | .35 | .35 |
| 400 Feet: | .35 | .40 | .40 |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 5.00 | 5.15 | 5.50 | 6.00 | 5.00 | 5.25 | 5.00 | 5.50 |
| Tire Track Width, Ins.: | | 22.50 | 22.00 | 21.50 | 22.50 | 23.50 | 23.50 | 23.00 | 24.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 20 | 15 | 10 | 20 | 15 | 10 | 20 |
| | 6" | 65 | 60 | 70 | 80 | 55 | 55 | 35 | 70 |
| | 9" | 85 | 90 | 85 | 90 | 130 | 110 | 140 | 95 |
| | 12" | 175 | 105 | 130 | 110 | 225 | 205 | 185 | 155 |
| | 15" | OS | OS | OS | OS | OS | OS | OS | OS |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 10 | 10 | 10 | 15 | 15 | 15 | 10 | 10 |
| | 6" | 30 | 30 | 20 | 30 | 20 | 30 | 30 | 20 |
| | 9" | 40 | 40 | 25 | 40 | 20 | 30 | 30 | 30 |
| | 12" | 45 | 40 | 25 | 40 | 25 | 25 | 30 | 30 |
| | 15" | 45 | 45 | 55 | 100 | 25 | 70 | 110 | 55 |
| | 18" | 245 | 275 | 270 | 295 | 235 | OS | 285 | 270 |
| | 21" | OS | OS | OS | OS | OS | - | OS | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 28 | 25 | 26 | 28 | 22 | 29 | 21 | 25 |
| | 6" | 64 | 64 | 59 | 57 | 70 | 71 | 66 | 66 |
| | 9" | 95 | 93 | 101 | 98 | 98 | 102 | 102 | 101 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 17 | 21 | 18 | 24 | 21 | 22 | 24 | 22 |
| | 6" | 29 | 39 | 26 | 39 | 29 | 32 | 35 | 32 |
| | 9" | 36 | 39 | 29 | 40 | 32 | 42 | 39 | 44 |

| Test Vehicle Attitude at Stall, % - | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.5 | 1.0 | 1.0 |

Tire Hop Frequency, Hz 2.6

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SAND

Date: 9-26-73 Time: 12:00 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: D

Inflation, psig: 10 Ambient Temp. °F.: 70 Surface Temp. °F.: 86

Relative Humidity %: 30 Wind Speed, mph: 1 Wind Direction: E

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | .30 | .35 | .35 |
| 400 Feet: | .35 | .40 | .40 |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 5.00 | 5.50 | 5.50 | 5.25 | 5.50 | 5.50 | 6.00 | 5.75 |
| Tire Track Width, Ins.: | | 20.50 | 22.00 | 21.50 | 19.50 | 20.50 | 21.50 | 20.50 | 21.00 |
| Cone Penetrometer Readings in Track | 3" | 20 | 35 | 15 | 10 | 20 | 30 | 5 | 10 |
| | 6" | 80 | 75 | 80 | 35 | 60 | 70 | 25 | 30 |
| | 9" | 95 | 80 | 90 | 110 | 75 | 80 | 90 | 130 |
| | 12" | 155 | 230 | 90 | 170 | 215 | 280 | 165 | 230 |
| | 15" | OS | OS | OS | 275 | OS | OS | OS | OS |
| | 18" | - | - | - | OS | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Virgin Sand | 3" | 5 | 10 | 5 | 10 | 10 | 5 | 10 | 5 |
| | 6" | 20 | 25 | 20 | 35 | 20 | 20 | 25 | 15 |
| | 9" | 25 | 25 | 30 | 40 | 30 | 30 | 25 | 30 |
| | 12" | 25 | 25 | 30 | 45 | 40 | 30 | 30 | 40 |
| | 15" | 40 | 60 | 60 | 45 | 75 | 45 | 45 | 50 |
| | 18" | 280 | OS | 290 | 225 | 290 | 280 | 285 | 210 |
| | 21" | OS | - | OS | OS | OS | OS | OS | OS |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | 30 | 34 | 33 | 26 | 33 | 38 | 35 | 39 |
| | 6" | 65 | 64 | 78 | 65 | 83 | 73 | 65 | 67 |
| | 9" | 100 | 86 | 100 | 90 | 94 | 96 | 89 | 93 |
| Cone Penetrometer Readings in Virgin Sand, psi | 3" | 26 | 19 | 19 | 24 | 26 | 16 | 17 | 16 |
| | 6" | 28 | 25 | 27 | 41 | 26 | 26 | 25 | 25 |
| | 9" | 42 | 25 | 37 | 58 | 32 | 29 | 33 | 30 |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | - | - | - | - |
| | Front Down: | 1.0 | 1.5 | 1.0 | 1.0 |

Tire Hop Frequency, Hz 2.3

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

Figures 11 through 14

Dynamic Traction - Dry Sand, Rerun Group A

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION RATING
## DRY SAND
## DRAWBAR PULL A PEAK TRACTION
## 2.5 MPH
## FIGURE NO. 11

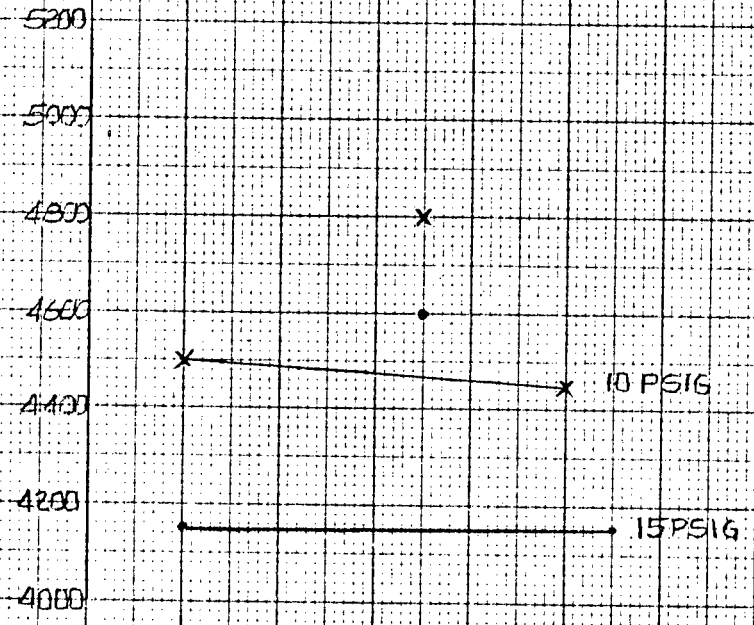
Location: SAND MOUNTAIN

Date: 4-26-74 Test By: WHS

Data By: JED

NOTE: RERUN OF 'A' GROUP WITH DIRECTIONAL TREAD PROPERLY MOUNTED.

IN THE ORIGINAL RUN THE RATINGS FOR THE 'A' GROUP MOUNTED INCORRECTLY COMPARED TO THE 'C' GROUP WAS: 10 PSIG 103%
15 PSIG 109%




| | | | | |
|---|---|---|---|---|
| RATING @ 10 PSIG | | 100 | 107 | 100 |
| RATING @ 15 PSIG | | 100 | 111 | 100 |
| AVE. DE LBS @ 10 PSIG | × | 4500 | 4800 | 4450 |
| AVE. DE LBS @ 15 PSIG | • | 4150 | 4600 | 4150 |
| CODE | | C | A | C |
| AMB. TEMP. °F | | 58 | 60 | 60 |
| SURF. TEMP. °F | | 72 | 72 | 72 |

NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION

DRY SAND

GROUP: C RUN NO. 1

4 WHEEL DRIVE

2.5 MPH

FIGURE NO. 12

Location: SAND MOUNTAIN, NEVADA

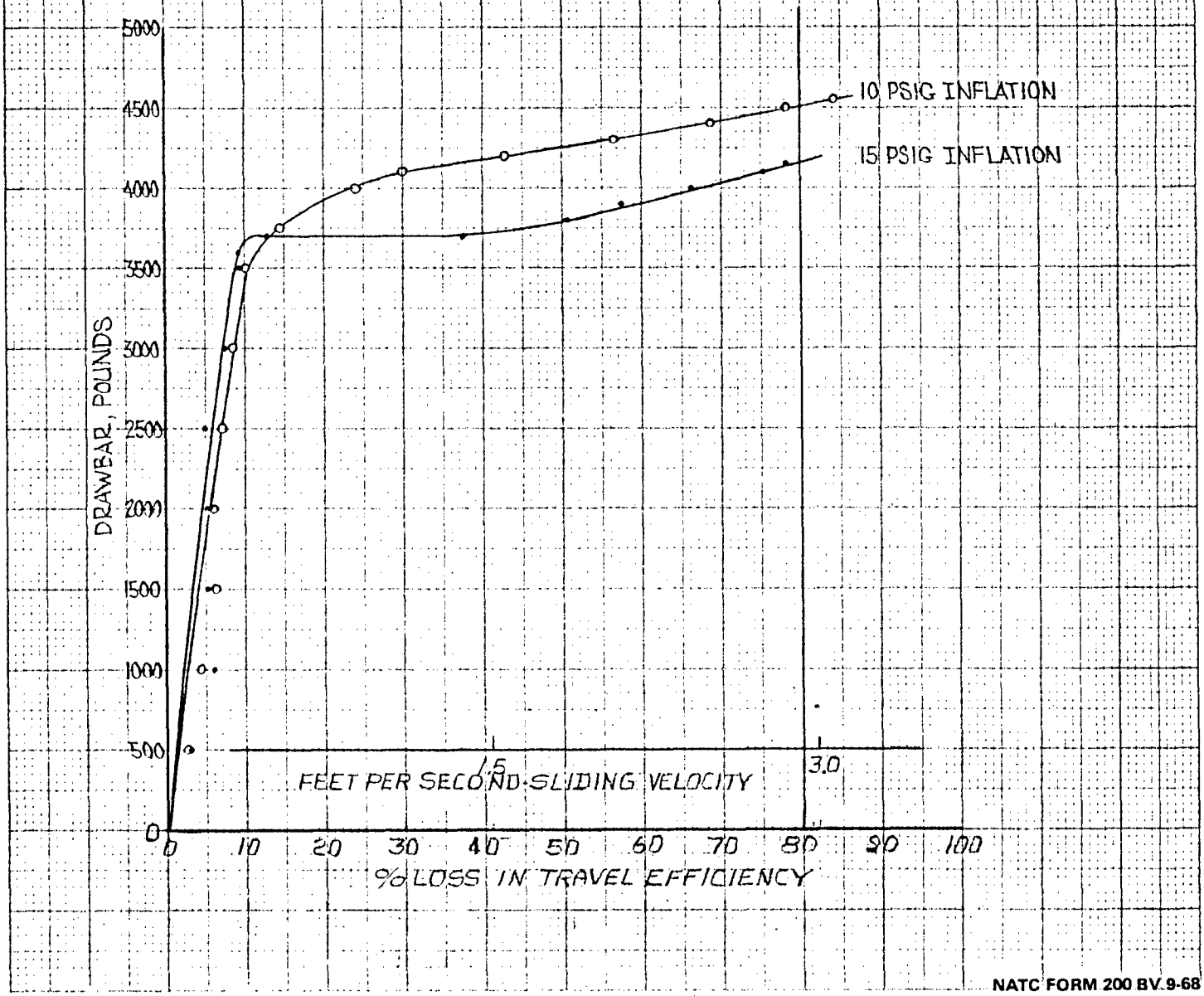
Date: 4-26-74 Test By: DLG

Data By: WHS

AMB. TEMP. 58°F

SURF. TEMP. 72°F

NOTE: CONTROL RUN # 1 FOR RERUN OF "A" GROUP WITH DIRECTIONAL TREAD CORRECTLY MOUNTED.




NATC FORM 200 BV.9-68

# TEST DATA

DRY SAND

Date: 4-26-74 Time: 10:30 AM Test Vehicle: M34 6WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: C

Inflation, psig: 15 Ambient Temp. °F.: 44 Surface Temp. °F.: 52

Relative Humidity %: 42 Wind Speed, mph: 8 Wind Direction: WNW

Sand Moisture Content, % (at course location):

| | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | — | — | — |
| 400 Feet: | — | — | — |

| Run Number: | | Left Rear 1 | Left Rear 2 | Left Rear 3 | Left Rear 4 | Right Rear 1 | Right Rear 2 | Right Rear 3 | Right Rear 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 3.75 | 2.25 | 2.5 | — | 3.5 | 3.0 | 2.75 | — |
| Tire Track Width, Ins.: | | 13.75 | 12.125 | 12.5 | — | 13.5 | 13.25 | 12.5 | — |
| Cone Penetrometer Readings in Track | 3" | 39 | 51 | 54 | — | 40 | 50 | 50 | — |
| | 6" | 290 | 300 | 300 | — | 280 | 280 | 290 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Virgin Sand | 3" | 30 | 30 | 35 | — | 37 | 38 | 40 | — |
| | 6" | 250 | 240 | 270 | — | 240 | 270 | 270 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | 48 | 50 | 55 | — | 45 | 50 | 50 | — |
| | 6" | 105 | 100 | 105 | — | 100 | 95 | 100 | — |
| | 9" | OS | OS | OS | — | — | — | — | — |
| PLATE ~~Cone~~ Penetrometer Readings in Virgin Sand, psi | 3" | 40 | 42 | 44 | — | 35 | 40 | 42 | — |
| | 6" | 100 | 100 | 110 | — | 100 | 100 | 105 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |

| Test Vehicle Attitude at Stall, % | Run Number: 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Front Up: | — | — | — | — |
| Front Down: | 1% | 1% | 1% | — |

Tire Hop Frequency, Hz 0

Comments:

OS - Off Scale (Full Scale = 300)

# DRY SAND

Date: 4.26 Time: 10:45AM Test Vehicle: M34 6WHEEL DRIVE

Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: C

Inflation, psig: 10 Ambient Temp. °F.: 44 Surface Temp. °F.: 52

Relative Humidity %: 42 Wind Speed, mph: 8 Wind Direction: WNW

Sand Moisture Content, % (at course location):

| | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | — | — | — |
| 400 Feet: | — | — | — |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 3.25 | 3.0 | 3.25 | — | 3.5 | 3.5 | 3.25 | — |
| Tire Track Width, Ins.: | | 13.5 | 13.5 | 13.0 | — | 13.25 | 13.0 | 13.0 | — |
| Cone Penetrometer Readings in Track | 3" | 38 | 40 | 45 | — | 40 | 40 | 42 | — |
| | 6" | 280 | 300 | 300 | — | 300 | 270 | 280 | — |
| | 9" | OS | OS | OS | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Virgin Sand | 3" | 32 | 32 | 34 | — | 35 | 36 | 38 | — |
| | 6" | 270 | 240 | 240 | — | 250 | 260 | 260 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | 50 | 47 | 50 | — | 42 | 47 | 48 | — |
| | 6" | 120 | 110 | 120 | — | 100 | 110 | 110 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| PLATE ~~Cone~~ Penetrometer Readings in Virgin Sand, psi | 3" | 40 | 40 | 41 | — | 40 | 41 | 42 | — |
| | 6" | 100 | OS | 100 | — | 85 | OS | OS | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | — | — | — | — |
| | Front Down: | 1% | 1% | 1% | — |

Tire Hop Frequency, Hz 0

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION

DRY SAND

GROUP: A RUN NO. 2

6 WHEEL DRIVE

2.5 MPH

FIGURE NO. 13

Location: SAND MOUNTAIN, NEVADA

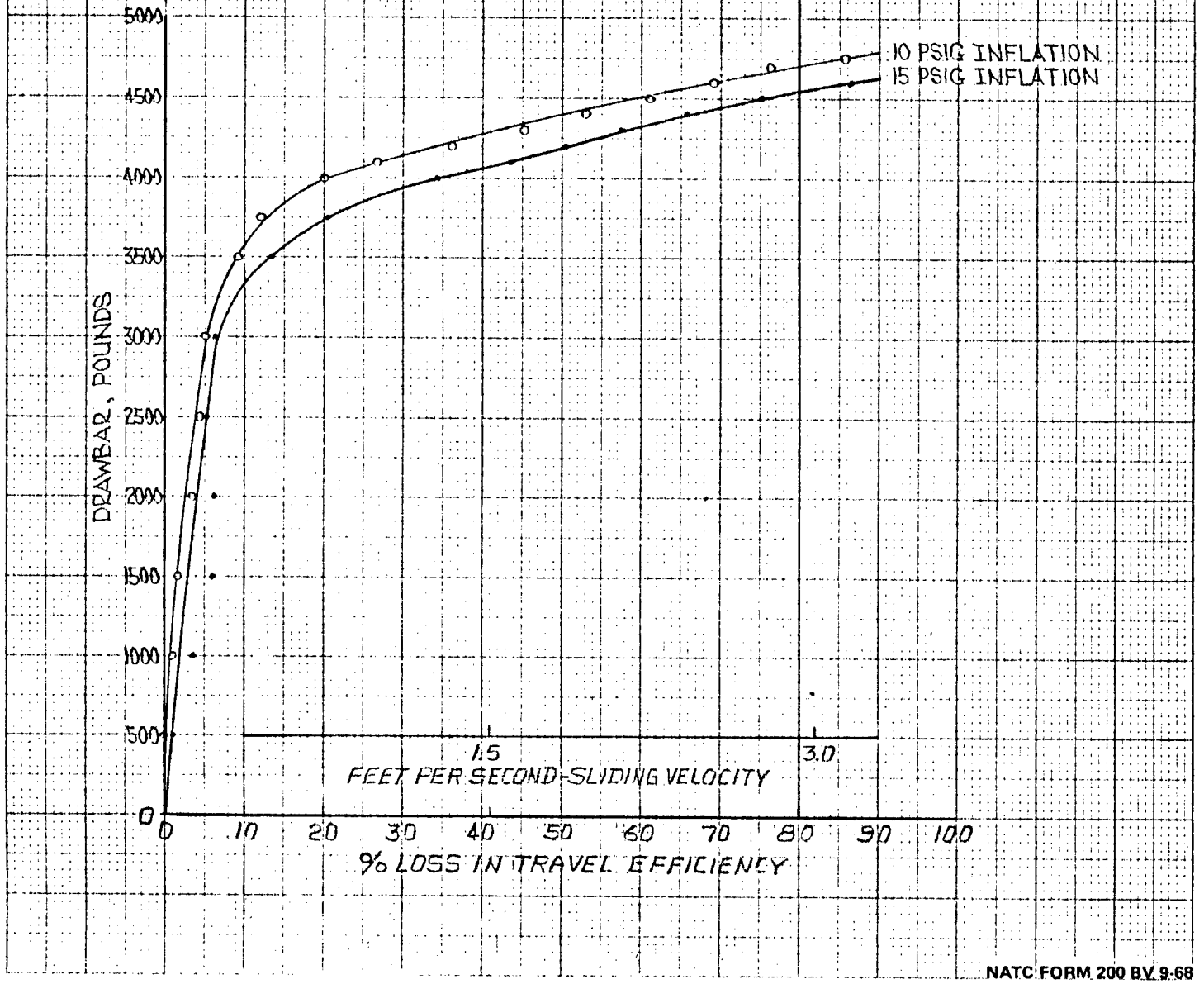
Date: 4-26-74 Test By: DLG

Data By: WHS

AMB. TEMP. 60°F

SURF. TEMP. 72°F

NOTE: GROUP A RUN WITH DIRECTIONAL TREAD CORRECTLY MOUNTED.




NATC FORM 200 BV 9-68

# TEST DATA

DRY SAND

Date: 4-26-74 Time: 12:00 Noon Test Vehicle: M34 6 WHEEL TRUCK

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A

Inflation, psig: 15 Ambient Temp. °F.: 51 Surface Temp. °F.: 70

Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | — | — | — |
| 400 Feet: | — | — | — |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 2.5 | 2.25 | 3.0 | — | 3.0 | 2.5 | 2.5 | — |
| Tire Track Width, Ins.: | | 13 | 13.5 | 13.25 | — | 13.5 | 13.25 | 13.5 | — |
| Cone Penetrometer Readings in Track | 3" | 47 | 50 | 60 | — | 50 | 50 | 60 | — |
| | 6" | 300 | 300 | 290 | — | 300 | 300 | 300 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Virgin Sand | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | 45 | 42 | 44 | — | 45 | 46 | 45 | — |
| | 6" | 120 | 100 | 110 | — | 100 | 95 | 100 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| PLATE ~~Cone~~ Penetrometer Readings in Virgin Sand, psi | 3" | 36 | 37 | 37 | — | 37 | 39 | 36 | — |
| | 6" | 90 | 95 | 90 | — | 95 | 95 | 95 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | — | — | — | — |
| | Front Down: | 0 | 1% | 0 | — |

Tire Hop Frequency, Hz 0

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

## DRY SAND

Date: 4-26-74 Time: 12:20 PM Test Vehicle: M34 6WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A

Inflation, psig: 10 Ambient Temp. °F.: 51 Surface Temp. °F.: 70

Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | — | — | — |
| 400 Feet: | — | — | — |

| Run Number: | | Left Rear 1 | 2 | 3 | 4 | Right Rear 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Tire Track Depth, Ins.: | | 2.25 | 2.5 | 2.75 | — | 2.5 | 2.5 | 2.5 | — |
| Tire Track Width, Ins.: | | 11.5 | 11.75 | 12.0 | — | 12.0 | 12.0 | 12.25 | — |
| Cone Penetrometer Readings in Track | 3" | 41 | 39 | 36 | — | 40 | 40 | 35 | — |
| | 6" | 280 | 240 | 260 | — | 275 | 260 | 250 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Virgin Sand | 3" | 37 | 35 | 34 | — | 34 | 34 | 30 | — |
| | 6" | 240 | 200 | 200 | — | 210 | 195 | 190 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | 48 | 45 | 40 | — | 50 | 50 | 45 | — |
| | 6" | 120 | 110 | 90 | — | 110 | 110 | 90 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| PLATE ~~Cone~~ Penetrometer Readings in Virgin Sand, psi | 3" | 40 | 40 | 36 | — | 42 | 42 | 40 | — |
| | 6" | 100 | 100 | 80 | — | 90 | 80 | 80 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |

| Test Vehicle Attitude at Stall, % | Run Number: 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Front Up: | — | — | — | — |
| Front Down: | 0 | 0 | 0 | — |

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

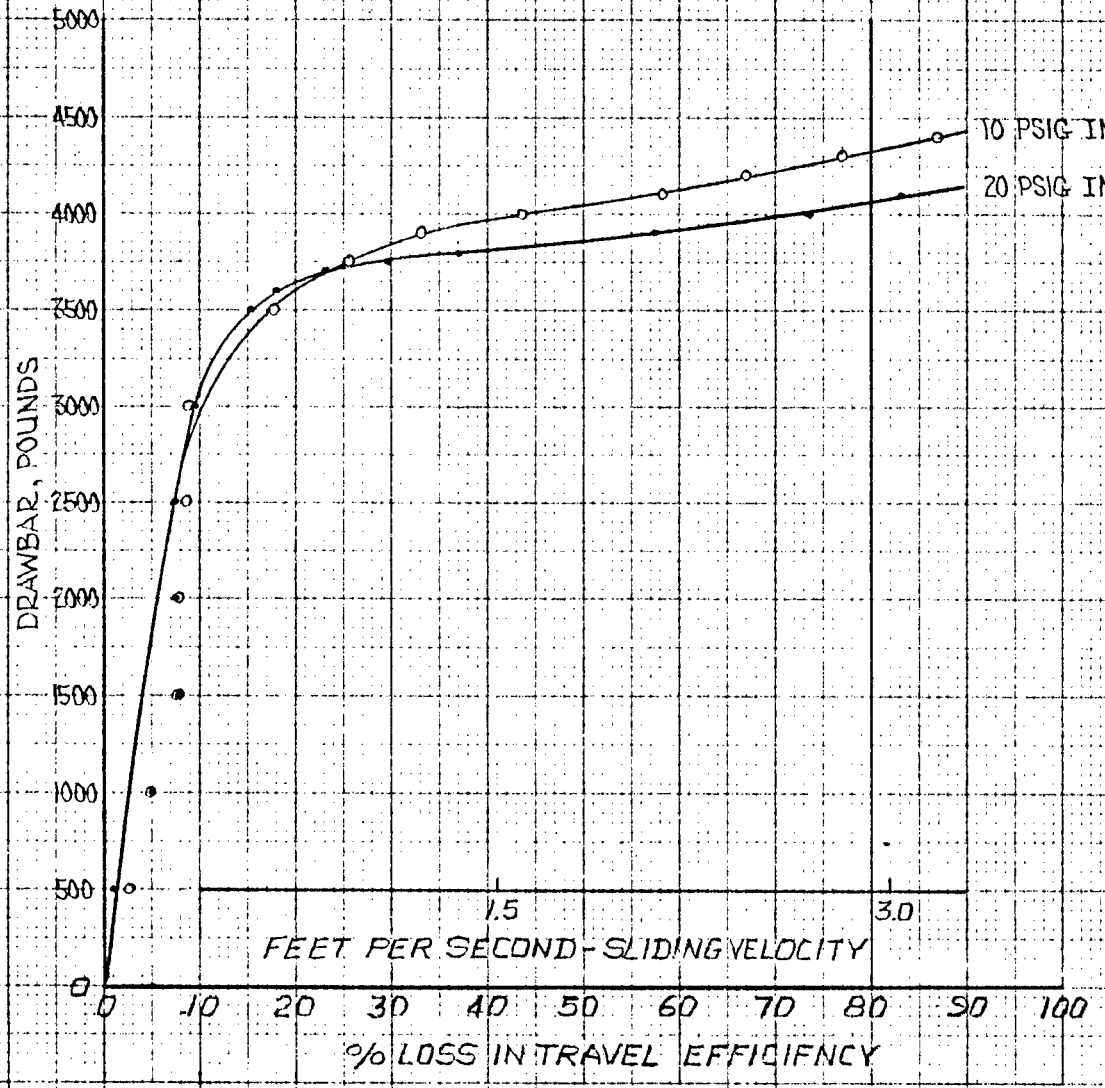
Project: 20-17-30

# DYNAMIC TRACTION
DRY SAND
GROUP C RUN NO. 3
6 WHEEL DRIVE
2.5 MPH
FIGURE NO. 14

Location: SAND MOUNTAIN, NEVADA
Date: 4-26-74 Test By: DLG
Data By: WHS

AMB. TEMP. 60°F
SURF. TEMP. 72°F

NOTE: CONTROL RUN # 2 FOR RERUN OF "A" GROUP WITH DIRECTIONAL TREAD CORRECTLY MOUNTED.




NATC FORM 200 BV 9-68

# TEST DATA

## DRY SAND

Date: 4-26-74 Time: 1:30 PM Test Vehicle: M34 6W HEFL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: C

Inflation, psig: 10 Ambient Temp. °F.: 58 Surface Temp. °F.: 72

Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

Sand Moisture Content, % (at course location):

| | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| 200 Feet: | — | — | — |
| 400 Feet: | — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 2.5 | 2.25 | 2.5 | — | 2.5 | 2.25 | 2.5 | — |
| Tire Track Width, Ins.: | | 12.5 | 12.0 | 12.0 | — | 12.35 | 12.0 | 12.0 | — |
| Cone Penetrometer Readings in Track | 3" | 47 | 58 | 47 | — | 50 | 60 | 50 | — |
| | 6" | 270 | 300 | 270 | — | 260 | 300 | 270 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Virgin Sand | 3" | 40 | 40 | 41 | — | 42 | 45 | 42 | — |
| | 6" | 240 | 255 | 245 | — | 245 | 240 | 250 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | 46 | 45 | 45 | — | 50 | 40 | 45 | — |
| | 6" | 95 | 95 | 90 | — | 90 | 100 | 100 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| PLATE ~~Cone~~ Penetrometer Readings in Virgin Sand, psi | 3" | 40 | 40 | 40 | — | 42 | 36 | 40 | — |
| | 6" | 85 | 85 | 80 | — | 80 | 80 | 78 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | — | — | — | — |
| | Front Down: | — | 1 | — | — |

Tire Hop Frequency, Hz 0

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

## DRY SAND

Date: 4-26-74 Time: 1:45 PM Test Vehicle: M-34 6 WHEEL DRIVE

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: C

Inflation, psig: 15 Ambient Temp. °F.: 60 Surface Temp. °F.: 72

Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

| Sand Moisture Content, % (at course location): | Sample Depth, Inches 3 | 9 | 18 |
|---|---|---|---|
| 200 Feet: | — | — | — |
| 400 Feet: | — | — | — |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 2.25 | 2 | 2.5 | — | 2.5 | 2.0 | 2.25 | — |
| Tire Track Width, Ins.: | | 12.0 | 12.0 | 12.0 | — | 12.25 | 12.0 | 12.0 | — |
| Cone Penetrometer Readings in Track | 3" | 62 | 40 | 45 | — | 65 | 40 | 45 | — |
| | 6" | 300 | 300 | 290 | — | 300 | 300 | 290 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Virgin Sand | 3" | 60 | 35 | 38 | — | 60 | 34 | 38 | — |
| | 6" | 270 | 270 | 270 | — | 260 | 265 | 270 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | 48 | 45 | 45 | — | 45 | 50 | 50 | — |
| | 6" | 95 | 100 | 100 | — | 90 | 110 | 100 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |
| PLATE ~~Cone~~ Penetrometer Readings in Virgin Sand, psi | 3" | 39 | 39 | 40 | — | 40 | 41 | 44 | — |
| | 6" | 80 | 85 | 85 | — | 80 | 87 | 90 | — |
| | 9" | OS | OS | OS | — | OS | OS | OS | — |

| Test Vehicle Attitude at Stall, % | Run Number: | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| | Front Up: | — | — | — | — |
| | Front Down: | 0 | 0 | 0 | — |

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

Figures 15 through 22

Dry Sand Course Grid Profiles

Nevada Automotive Test Center

Project: 20-17-30

# COURSE GRID CONE INDEX

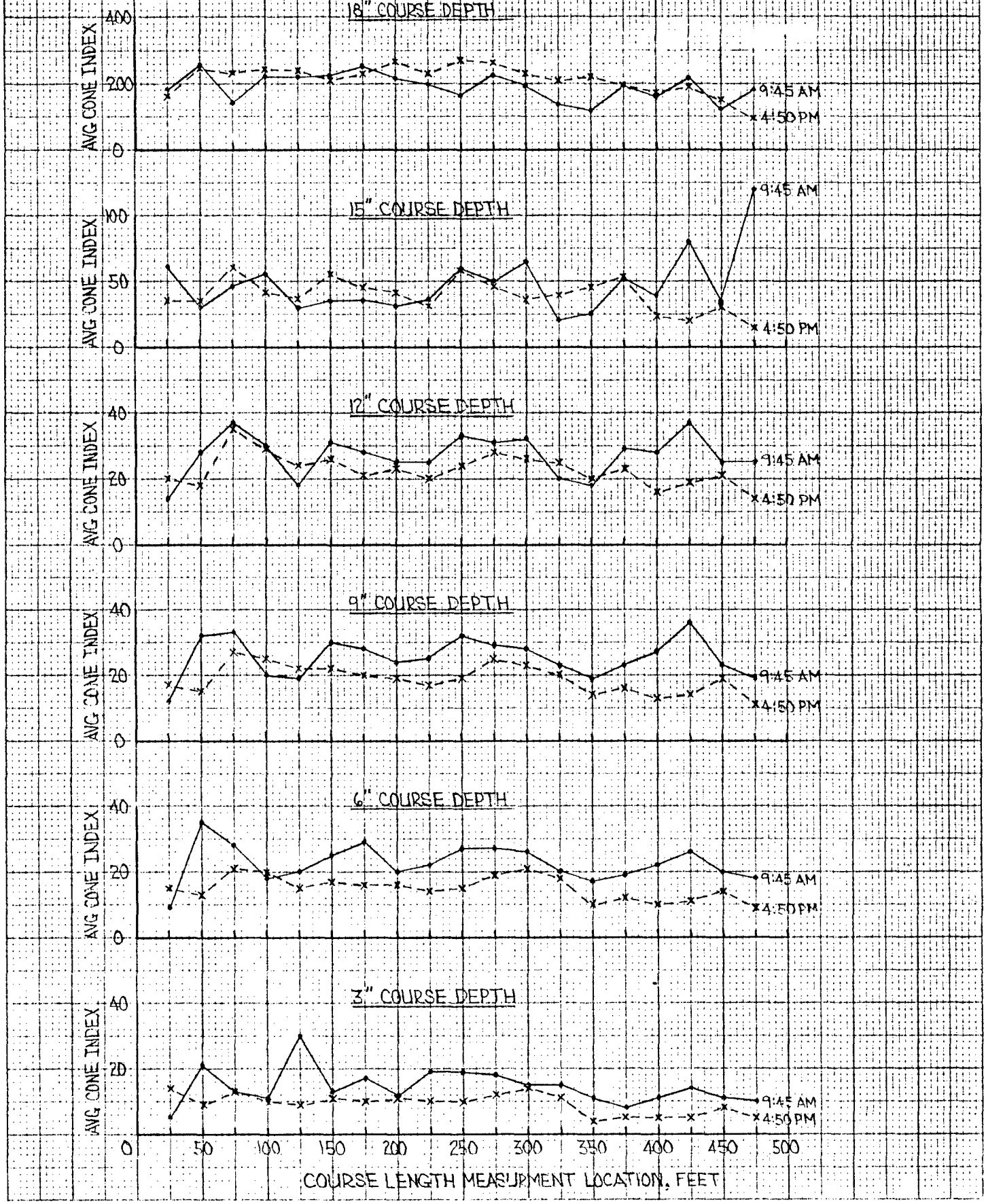
## DRY SAND

## FIGURE NO. 15

Location: SAND MOUNTAIN, NEVADA

Date: 9-19-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

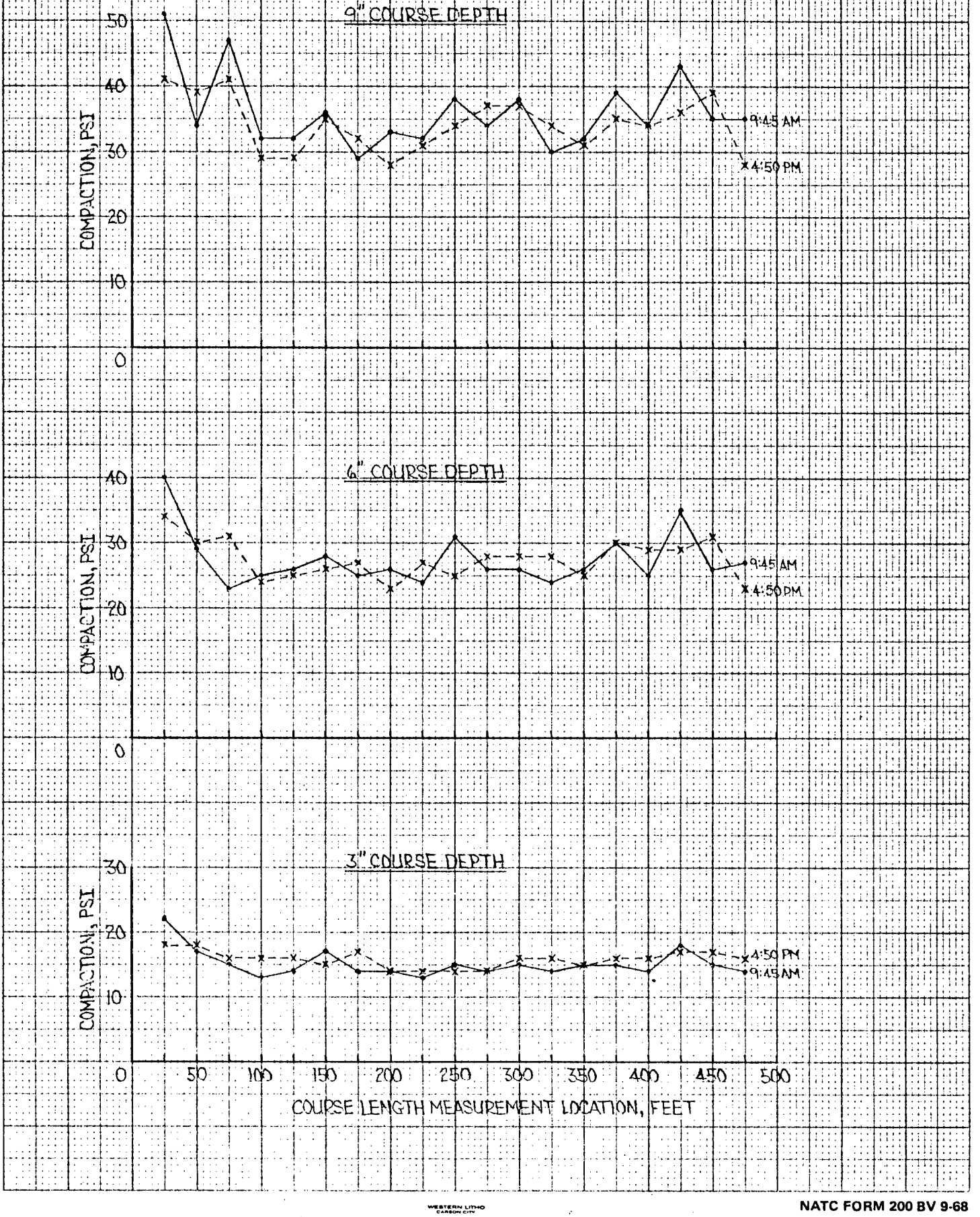
Project: 20-17-30

# COURSE GRID PSI COMPACTION
## DRY SAND
*FIGURE NO. 16*

Location: SAND MOUNTAIN, NEVADA

Date: 9-19-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

NATC FORM 200 BV 9-68

Nevada Automotive Test Center

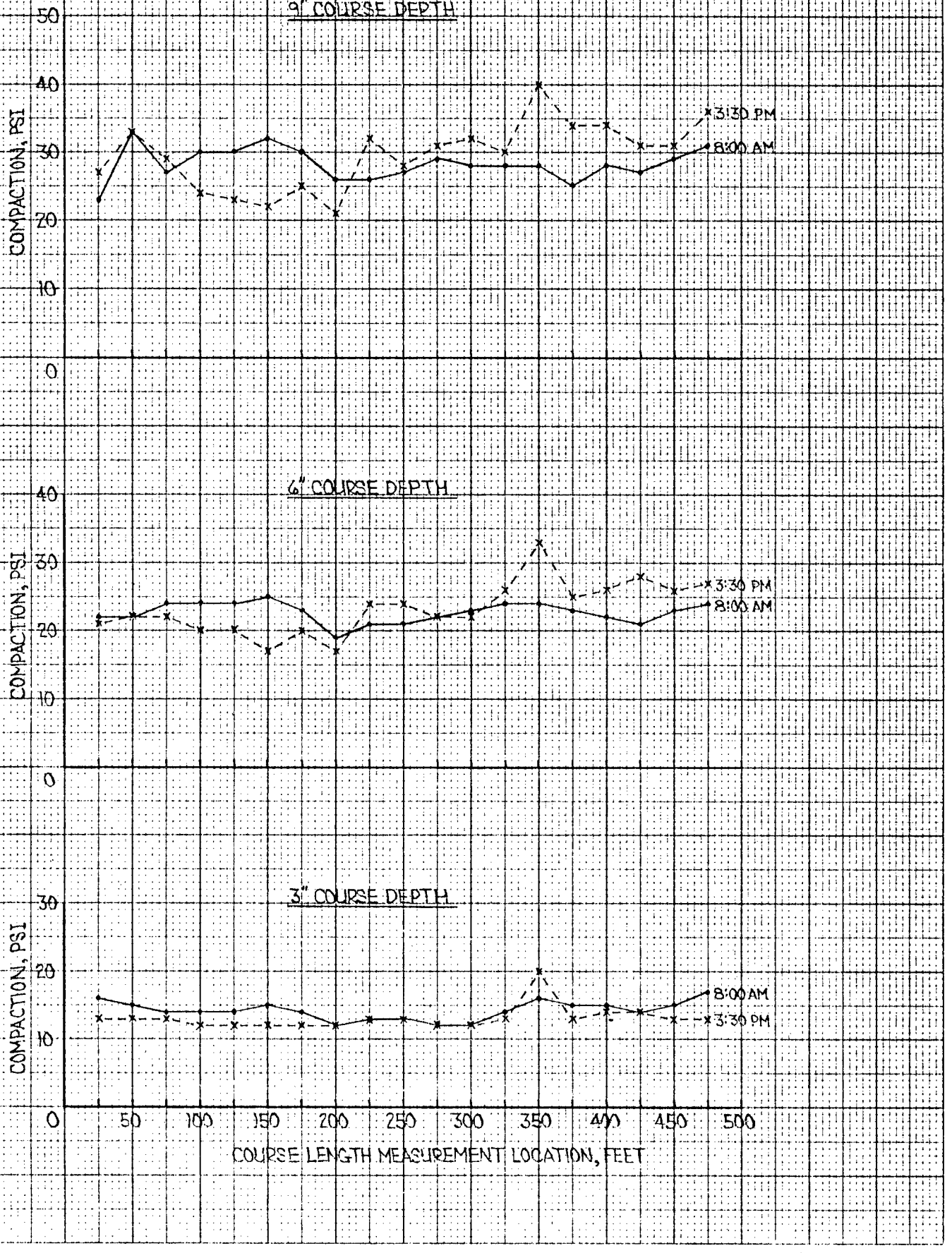
Project: 20-17-30

# COURSE GRIT PSI COMPACTION
## DRY SAND
## FIGURE NO. 17

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# COURSE GRID CONE INDEX

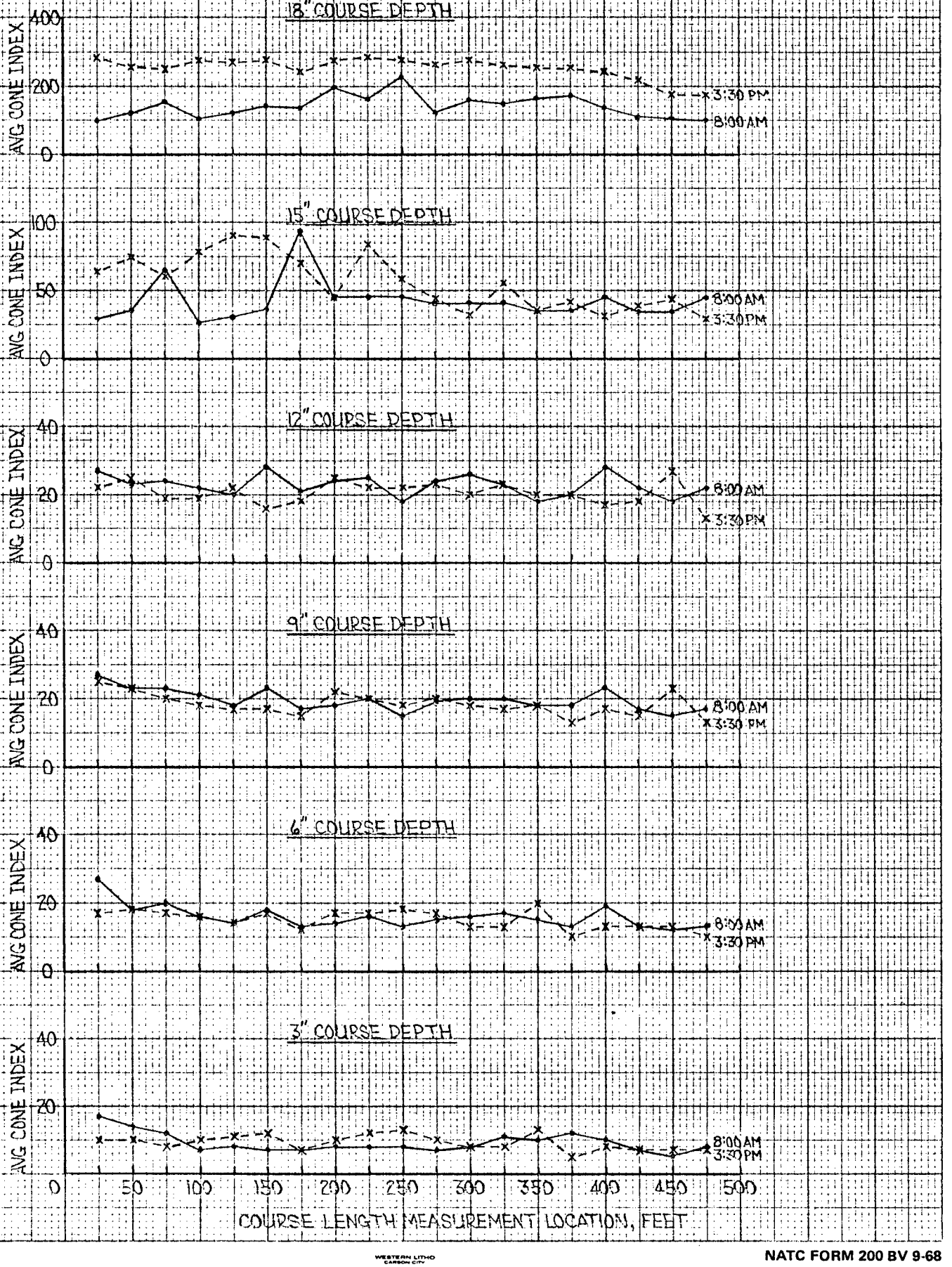
DRY SAND

FIGURE NO. 18

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

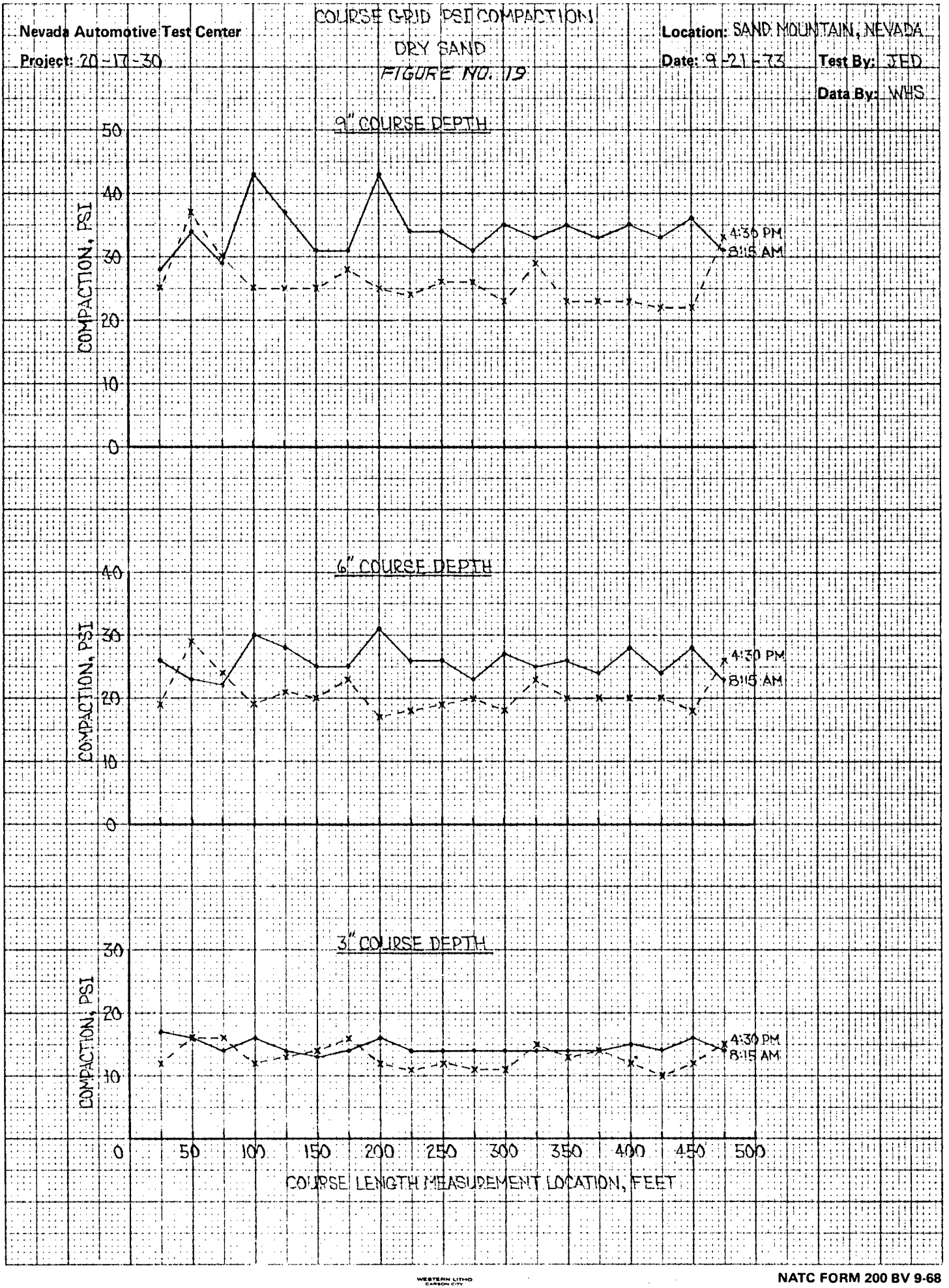
Project: 20-17-30

# COURSE GRID PSI COMPACTION
## DRY SAND
*FIGURE NO. 19*

Location: SAND MOUNTAIN, NEVADA

Date: 9-21-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# COURSE GRID CONE INDEX

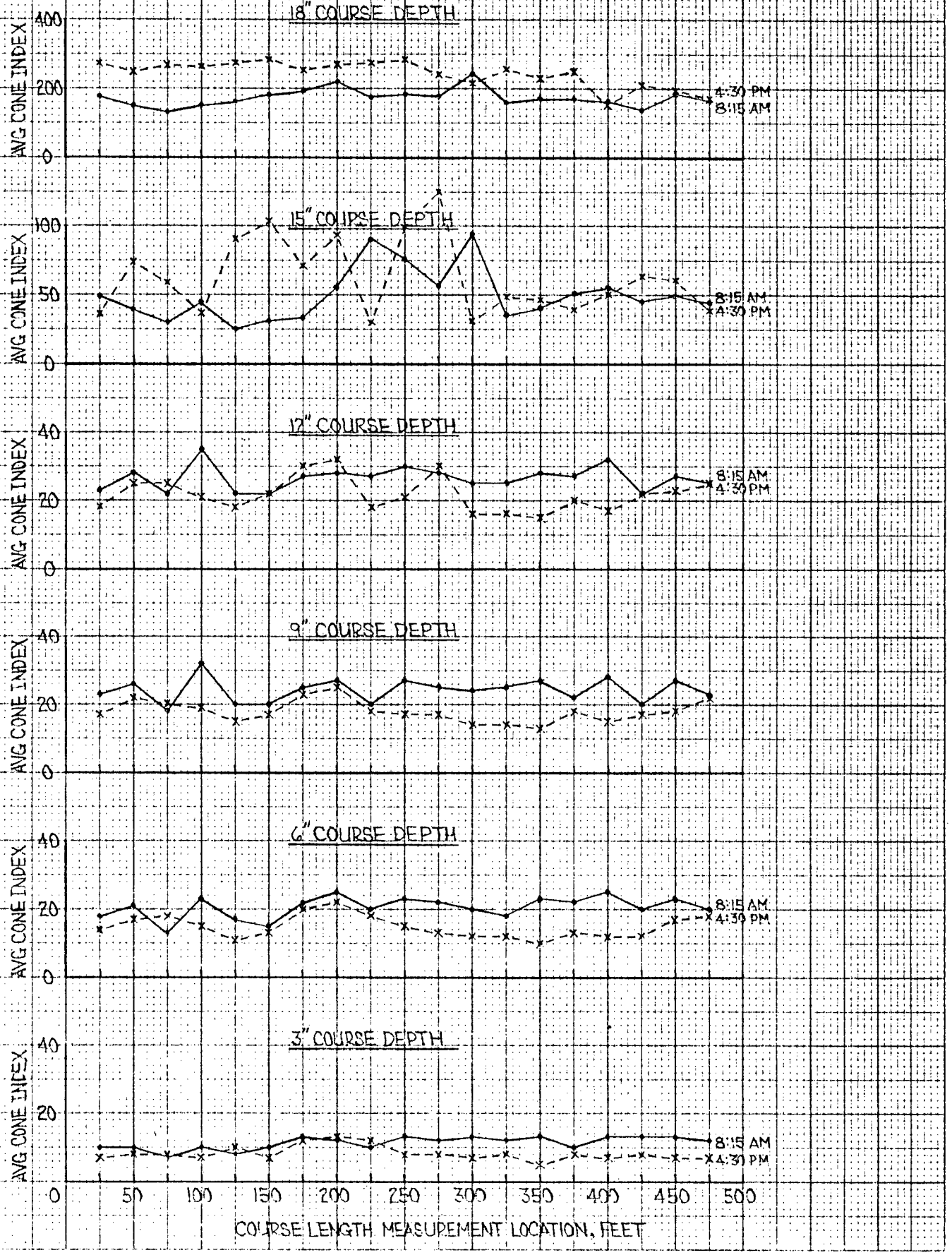
DRY SAND

FIGURE NO. 20

Location: SAND MOUNTAIN, NEVADA

Date: 9-21-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# COURSE GRID CONE INDEX

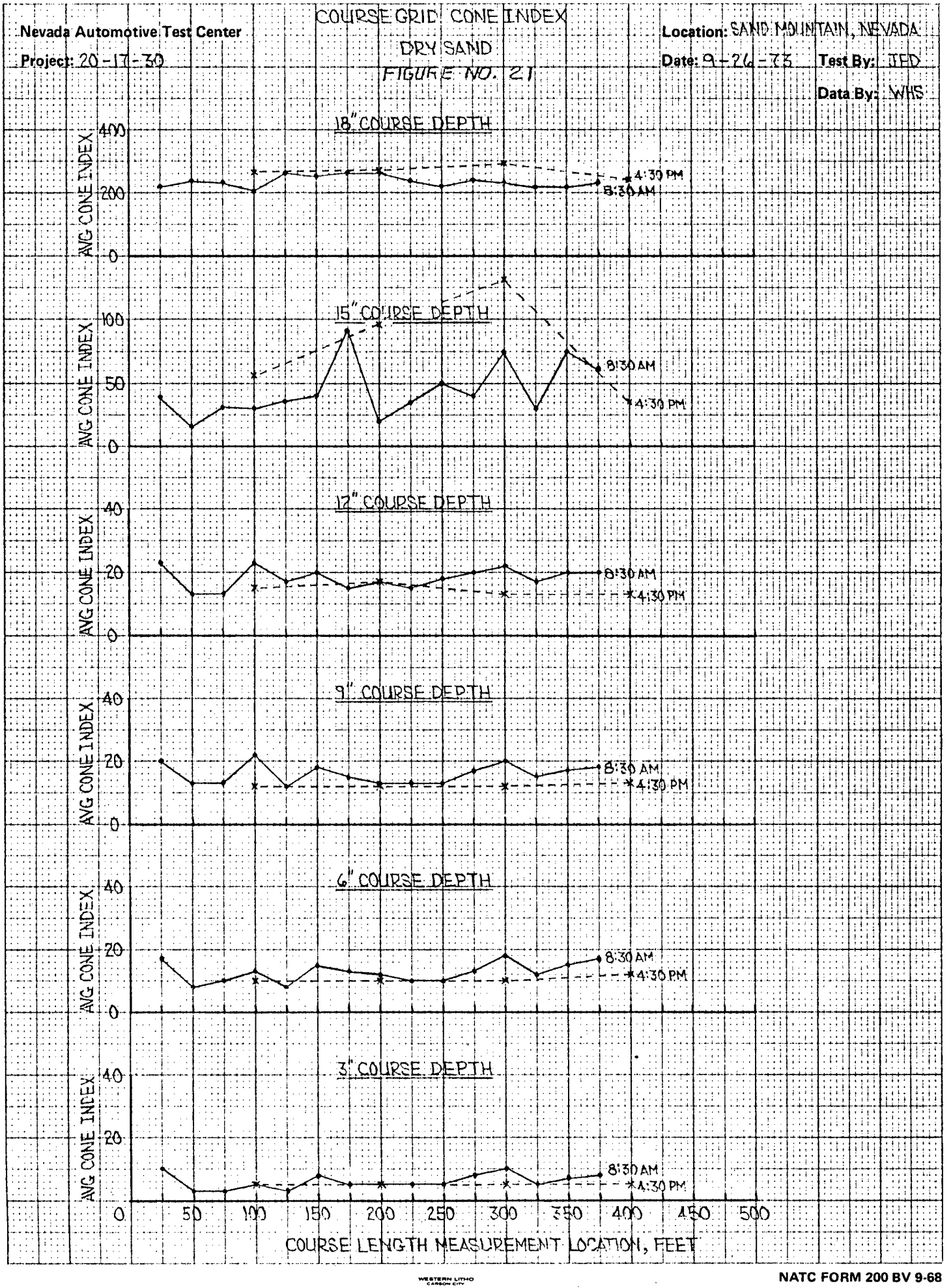
DRY SAND

FIGURE NO. 21

Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# COURSE GRID PSI COMPACTION

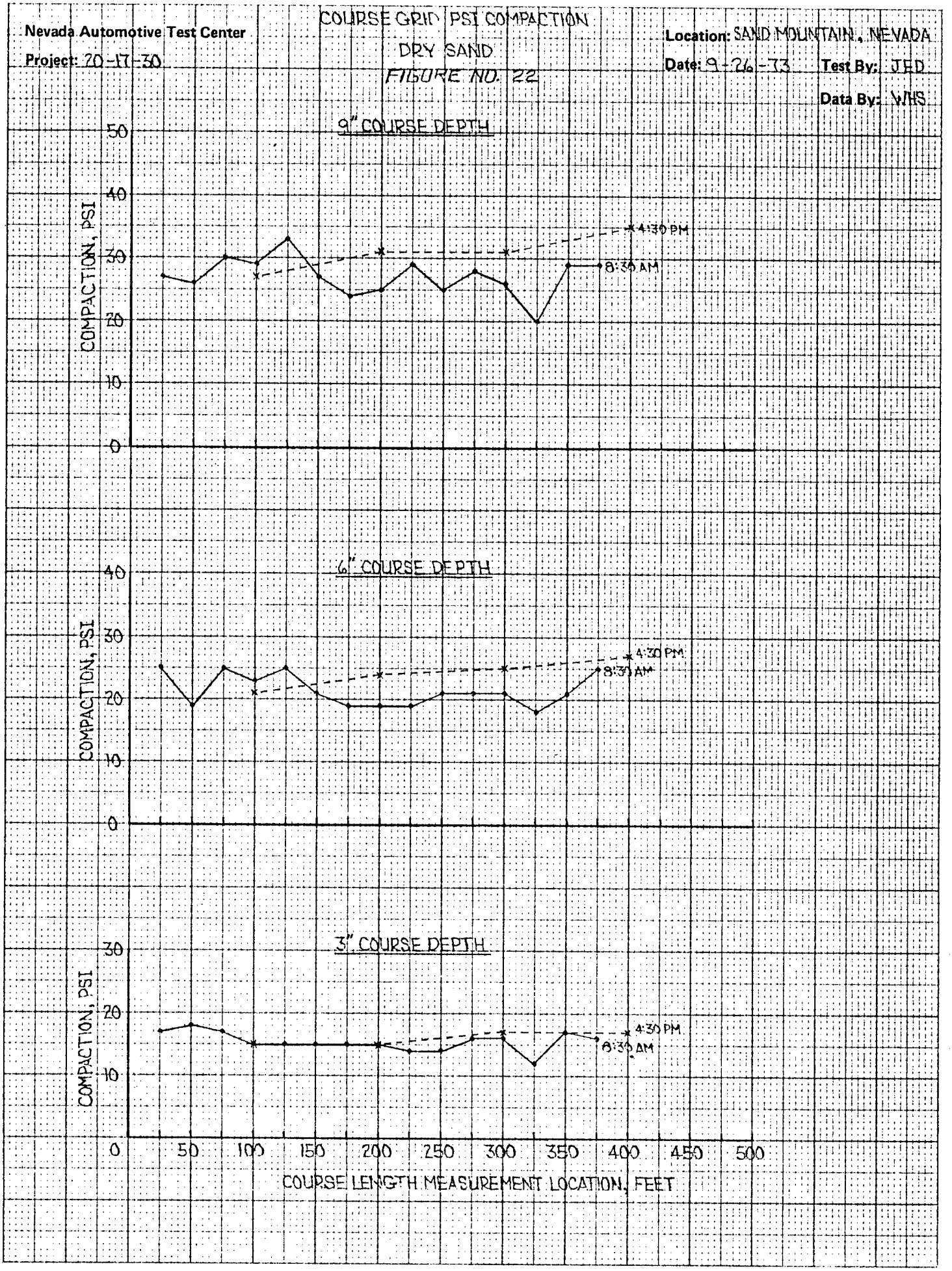
DRY SAND

FIGURE NO. 22

Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73 Test By: JED

Data By: WHS




WESTERN LITHO CARSON CITY

NATC FORM 200 BV 9-68

TEST DATA

Figures No. 23 & 24

Rolling Resistance - Dry Sand

Nevada Automotive Test Center

Project: 20-17-30

# ROLLING RESISTANCE

DRY SAND

5 MPH

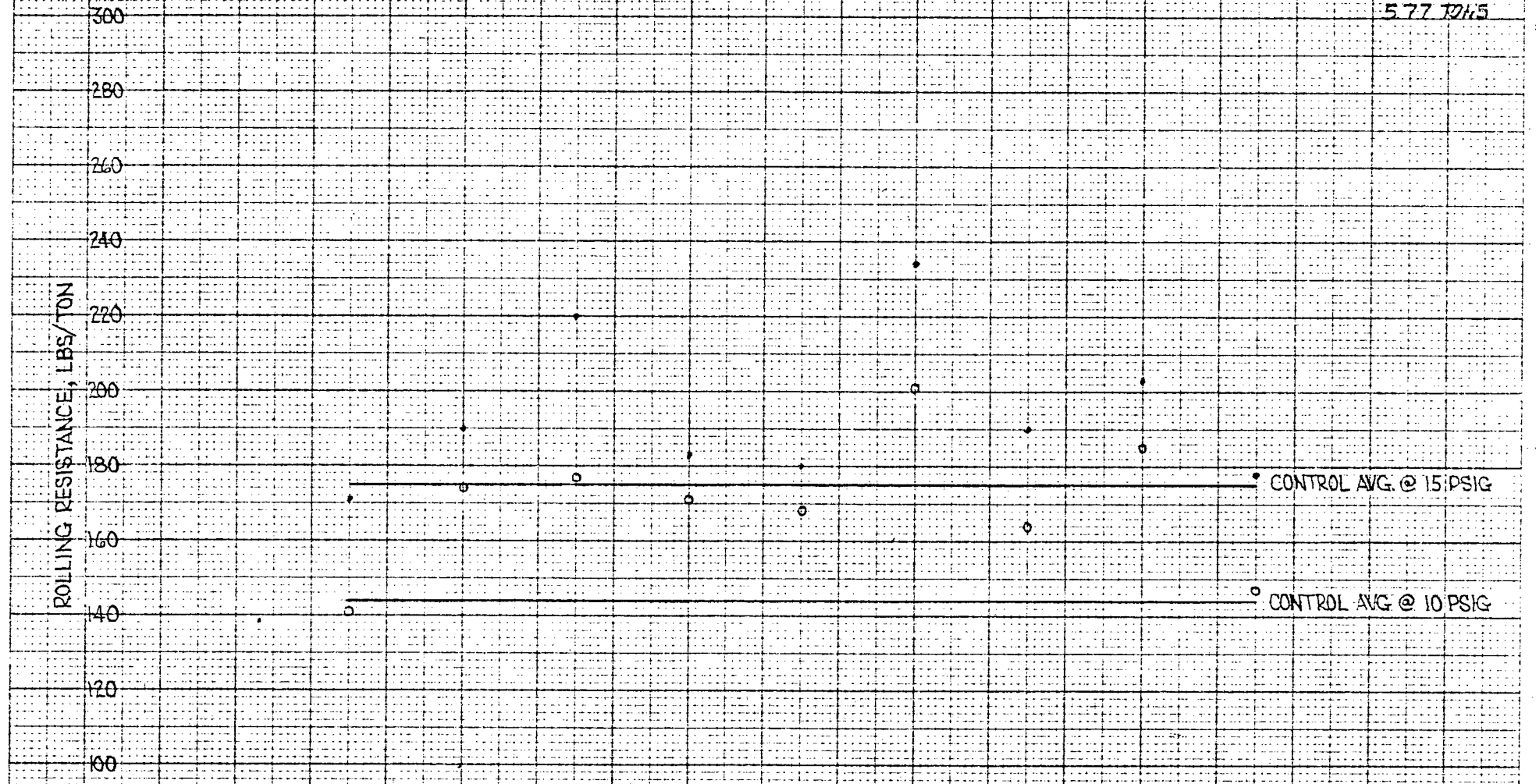
FIGURE NO. 23

Location: SAND MOUNTAIN, NEVADA

Date: 9-19/26-73 Test By: WHS

Data By: WHS

VEHICLE GVW- 11536 LBS
5.77 TONS




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 10 PSIG | 100 | 83 | 81 | 84 | 86 | 72 | 88 | 78 | 100 |
| RATING @ 15 PSIG | 100 | 92 | 80 | 96 | 97 | 75 | 92 | 86 | 100 |
| AVG. LBS/TON @ 10 PSIG | 141 | 174 | 177 | 171 | 168 | 201 | 164 | 185 | 147 |
| AVG. LBS/TON @ 15 PSIG | 171 | 190 | 220 | 183 | 180 | 234 | 190 | 203 | 178 |
| CODE | D | A | B | C | E | F | G | J | D |
| AMB °F | 88-92 | 70-88 | 74 | 77-80 | 55-80 | 68-71 | 55-79 | 61 | 70 |
| SURF °F | 100-118 | 72-106 | 78 | 88-94 | 54-94 | 68-72 | 54-84 | 60 | 86 |

WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# ROLLING RESISTANCE Vs INFLATION PRESSURE

DRY SAND

5 MPH

FIGURE NO. 24

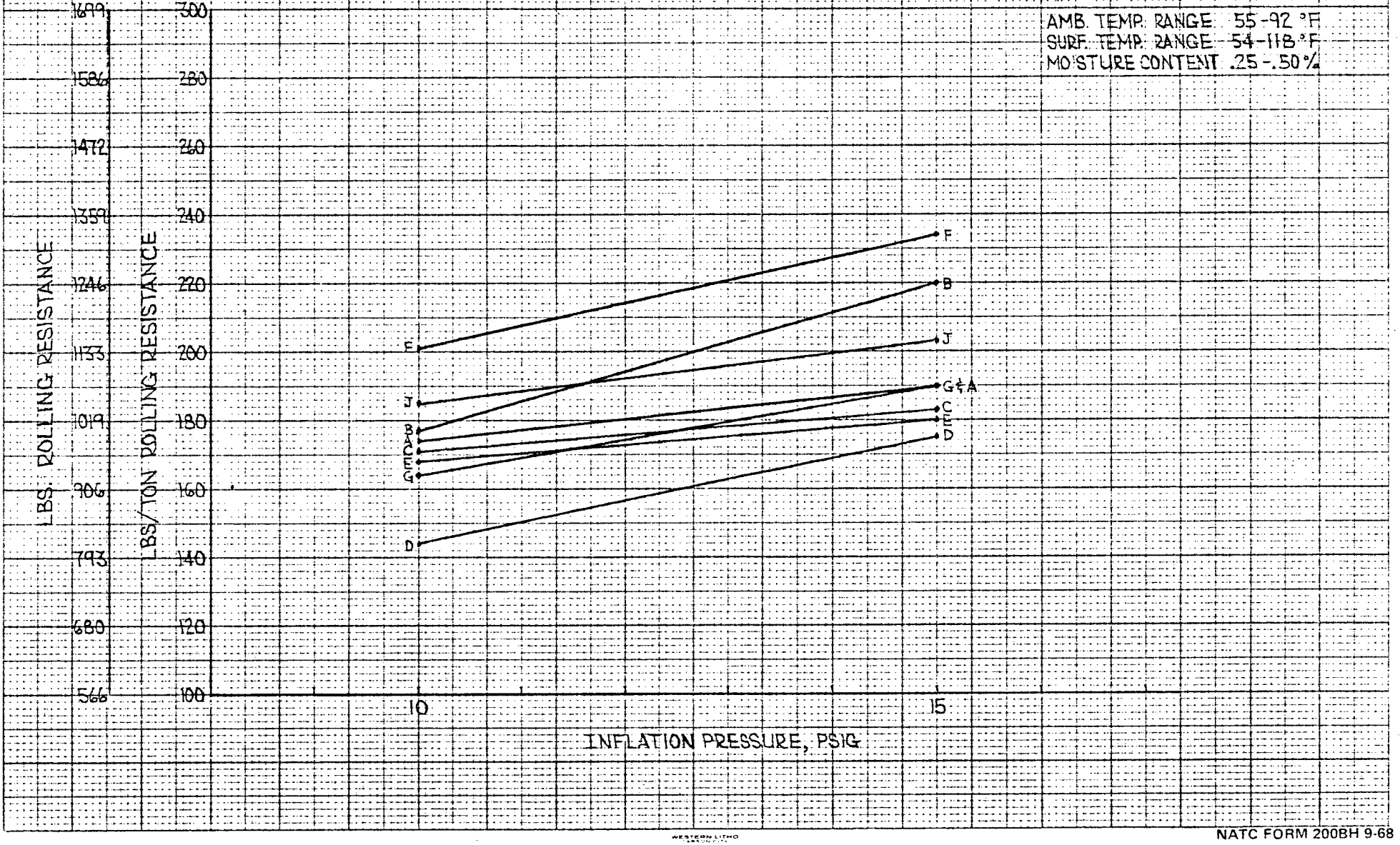
Location: SAND MOUNTAIN, NEVADA

Date: 9-19/26-73 Test By: WHS

Data By: WHS

VEHICLE GVW - 11536 LBS. 5.77 TONS

AMB. TEMP. RANGE 55-92 °F
SURF. TEMP. RANGE 54-118 °F
MOISTURE CONTENT .25-.50 %



TEST DATA

Figure No. 25

Dynamic Traction Summary - Prepared Mud

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION RATINGS
## PREPARED MUD
## 6 WHEEL DRIVE
## FIGURE NO. 25

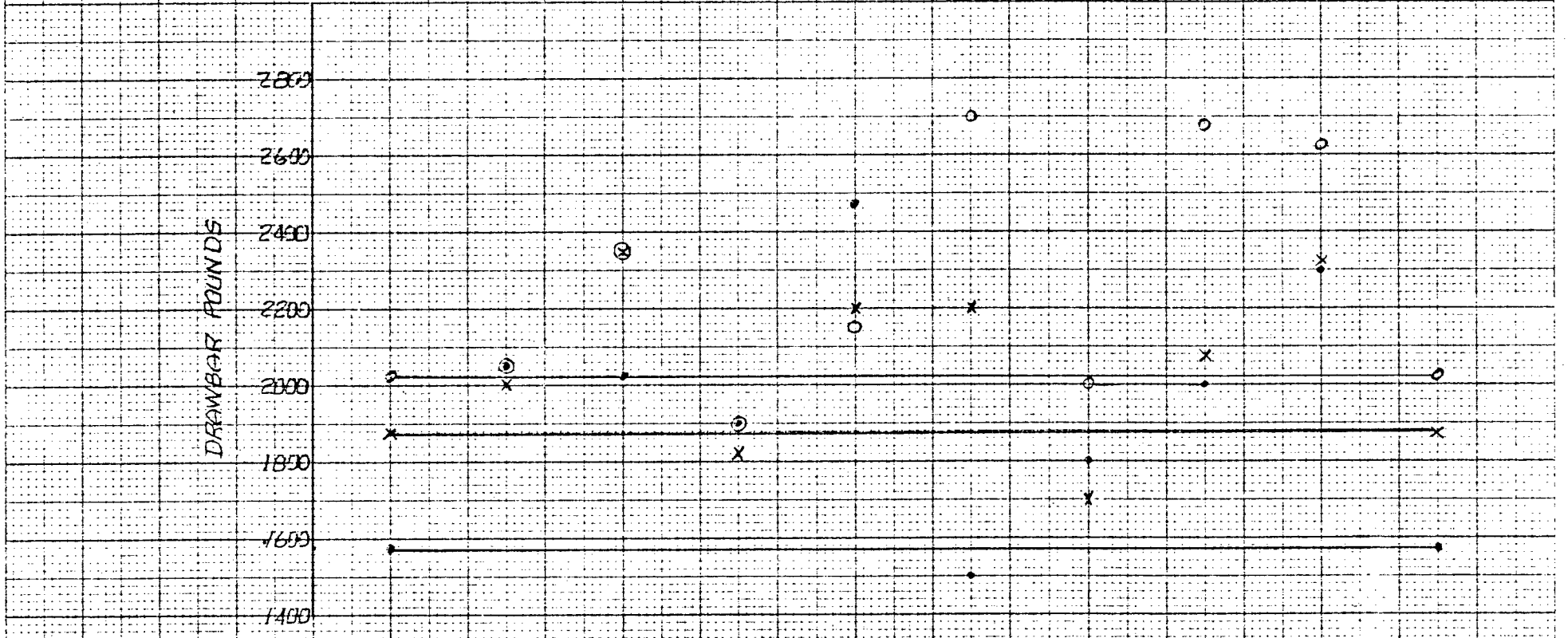
Location: PROVING GROUND

Date: 10-19/20-73 Test By: WHS

Data By: JED

NOTE (1) 'A' GROUP WITH DIRECTIONAL TREAD MOUNTED INCORRECTLY.

NOTE (2) 'A' GROUP WITH DIRECTIONAL TREAD MOUNTED CORRECTLY. DB LBS. INTERPOLATED.




| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RATING @ 50 PSIG | | 100 | 130 | 129 | 121 | 157 | 95 | 114 | 127 | 146 | 109 |
| RATING @ 35 PSIG | | 100 | 107 | 125 | 99 | 117 | 117 | 91 | 106 | 124 | 100 |
| RATING @ 15 PSIG | | 100 | 101 | 116 | 96 | 106 | 133 | 99 | 132 | 130 | 100 |
| AVE. DB LBS @ 50 PSIG | • | 1575 | 2050 | 2025 | 1900 | 2475 | 1500 | 1800 | 2000 | 2300 | 1575 |
| AVE. DB LBS @ 35 PSIG | X | 1875 | 2000 | 2350 | 1825 | 2200 | 2200 | 1700 | 2075 | 2325 | 1875 |
| AVE. DB LBS @ 15 PSIG | O | 2025 | 2050 | 2350 | 1900 | 2150 (1) | 2700 (2) | 2000 | 2675 | 2625 | 2025 |
| CODE | | C | B | J | D | A | A | E | G | F | C |
| AMB. TEMP. | | 70°F | 78°F | 50°F | 69°F | 66°F | 44°F | 50°F | 55°F | 44°F | 51°F |
| SURF. TEMP. | | 57°F | 68°F | 46°F | 62°F | 57°F | 40°F | 48°F | 54°F | 50°F | 55°F |
| MOISTURE CONTENT | | 25% | 25% | 25% | 25% | 25% | 26% | 24% | 25% | 25% | 24% |

WESTERN LITHO CARSON CITY

TEST DATA

Figures 26 through 34

Dynamic Traction - Prepared Mud

Nevada Automotive Test Center

Project: 20-17-30

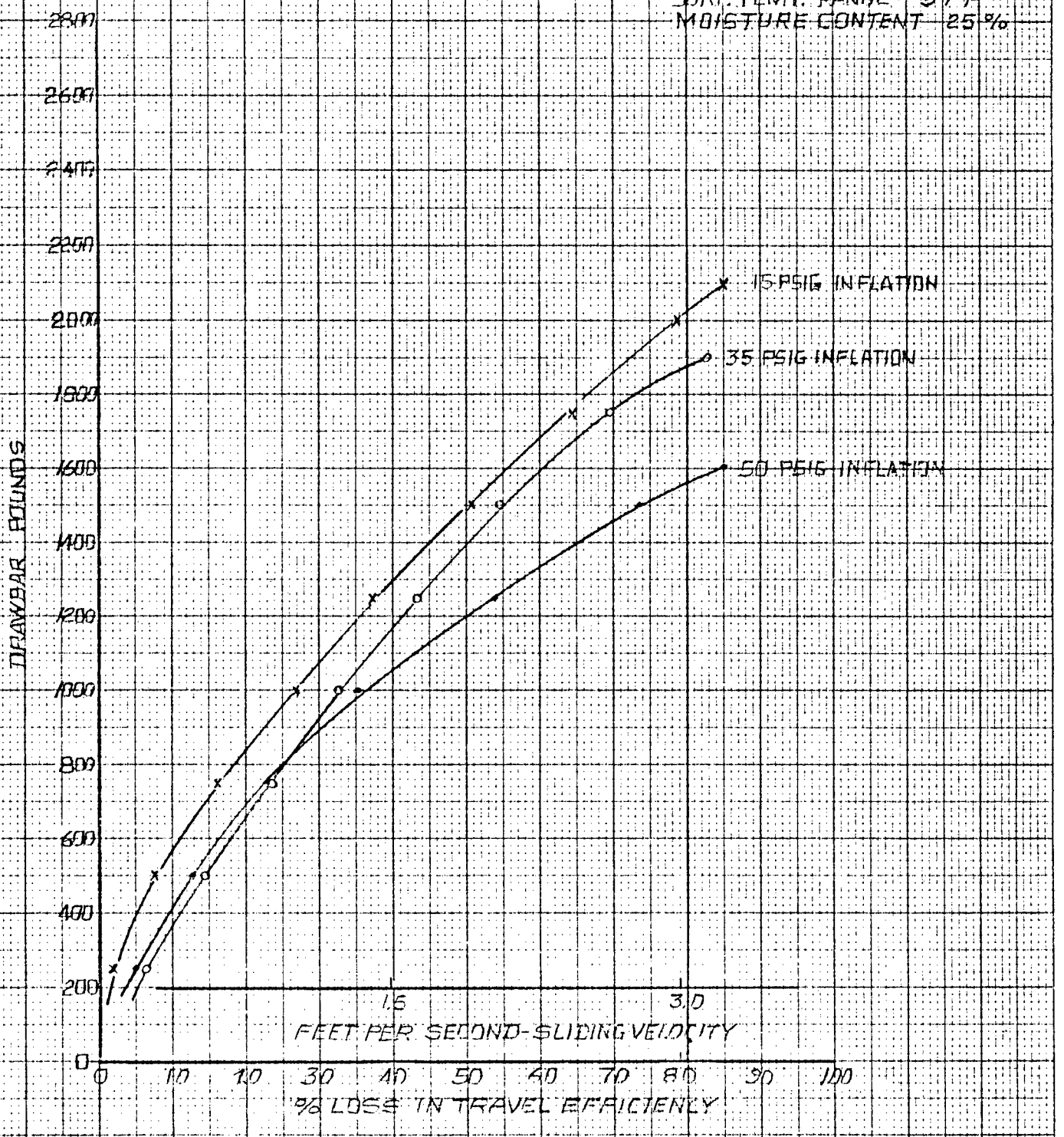
# DYNAMIC TRACTION
## MUD
## GROUP C FOUND 1
## 6 WHEEL DRIVE
## FIGURE NO. 26

Location: PROVING GROUND

Date: 10-19-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 70°F
SURF. TEMP. RANGE 57°F
MOISTURE CONTENT 25%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10-19-73 Time: 11:15 AM Test Vehicle: 1934 6X6

Vehicle Weight, Truck: 11526 LBS Trailer: NA Tire Group: C

Inflation, psig: 50 Ambient Temp. °F.: 66 Surface Temp. °F.: 56

Relative Humidity %: 22 Wind Speed, mph: 0-6 Wind Direction: E

Mud Moisture Content, %: 25.3

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8½ | 8 | 8 3/8 | — | 7½ | 8 3/8 | 8 3/8 | — |
| Tire Track Width, Ins.: | | 7 | 8¼ | 7¾ | — | 8 | 8 | 7½ | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 2 | 5 | 5 | — | 2 | 5 | 5 | — |
| | 6" | 10 | 10 | 10 | — | 15 | 10 | 10 | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 6" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10 - 73 Time: 11:25 AM Test Vehicle: M 34 6x6

Vehicle Weight, Truck: 11536 Trailer: N/A Tire Group: C

Inflation, psig: 35 Ambient Temp. °F.: 75 Surface Temp. °F.: 58

Relative Humidity %: 22 Wind Speed, mph: 0-6 Wind Direction: E

Mud Moisture Content, %: 25.3

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7 5/8 | 9 | — | — | 7 3/4 | 8 1/8 | — | — |
| Tire Track Width, Ins.: | | 7 | 7 1/4 | — | — | 8 1/2 | 6 3/4 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 4 | 5 | — | — | 5 | 5 | — | — |
| | 6" | 12 | 12 | — | — | 15 | 15 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 6" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments: _____

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-19-73 Time: 12:55PM Test Vehicle: 1' 3A 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: 1116 Tire Group: C

Inflation, psig: 15 Ambient Temp. °F.: 78 Surface Temp. °F.: 67

Relative Humidity %: 25 Wind Speed, mph: 0-5 Wind Direction: W

Mud Moisture Content, %: 25.3

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7 3/4 | 9 | – | – | 7 | 7 1/4 | – | – |
| Tire Track Width, Ins.: | | 8 1/2 | 7 | – | – | 8 1/2 | 9 | – | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 4 | – | – | 2 | 2 | – | – |
| | 6" | 10 | 10 | – | – | 5 | 5 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 2 | 0 | – | – | 0 | 0 | – | – |
| | 6" | 1 | 1 | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION

MUD

GROUP: B RUN NO. 2

6 WHEEL DRIVE

FIGURE NO. 27

Location: PROVING GROUND

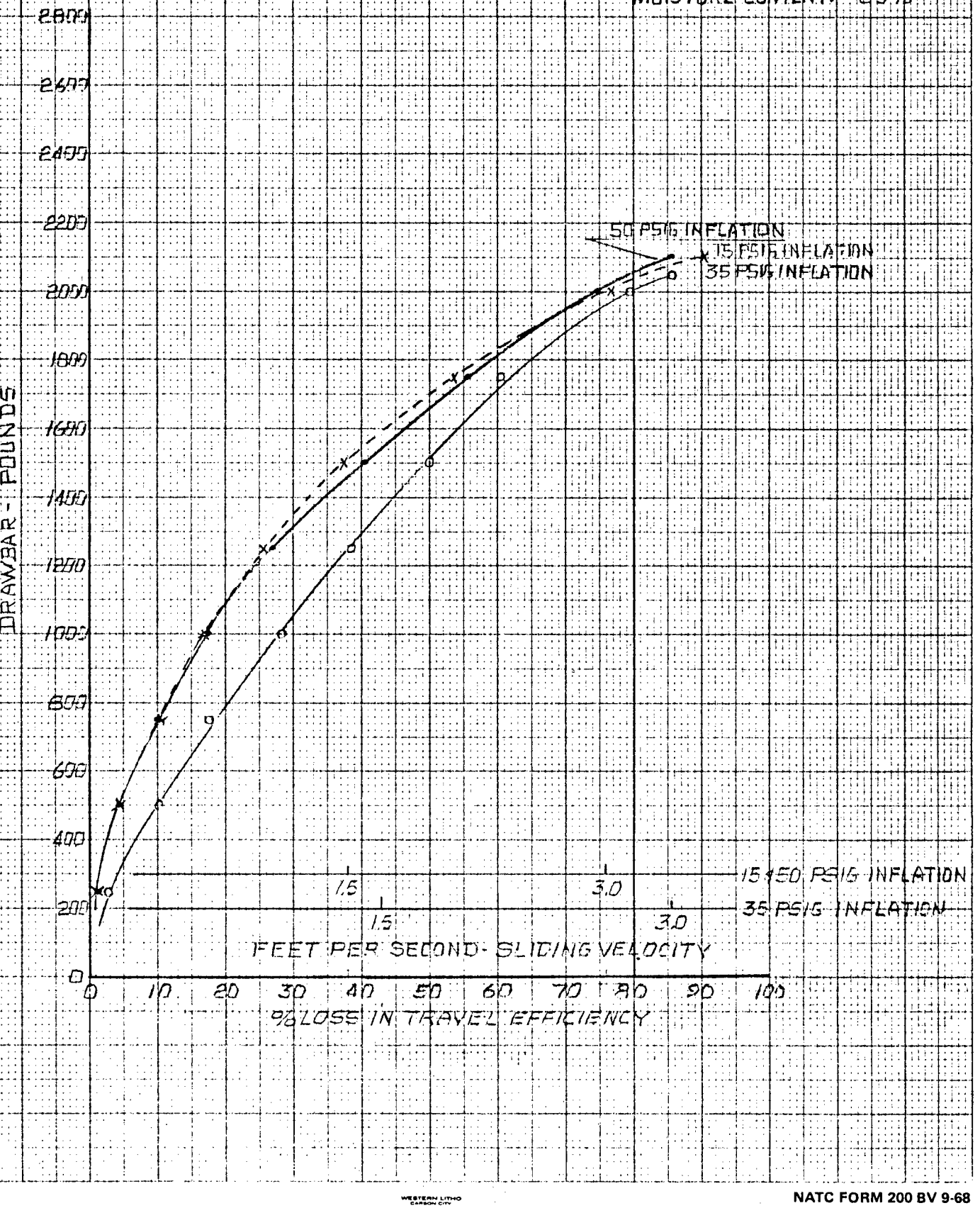
Date: 10-19-73 Test By: WHS

Data By: WHS

AMB. TEMP. 78°F

SURF. TEMP. 68°F

MOISTURE CONTENT: 25%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10-19-73 Time: 2:10 PM Test Vehicle: M74 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: N/A Tire Group: B

Inflation, psig: 50 Ambient Temp. °F.: 78 Surface Temp. °F.: 68

Relative Humidity %: 26 Wind Speed, mph: 0-8 Wind Direction: W

Mud Moisture Content, %: 24.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| - | - | - |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8¼ | 6½ | - | - | 7½ | 7½ | - | - |
| Tire Track Width, Ins.: | | 6½ | 7½ | - | - | 8 | 10 | - | - |
| Cone Penetrometer Readings in Track | 3" | - | - | | - | - | - | - | - |
| | 6" | - | - | | - | - | - | - | - |
| | 9" | - | - | | - | - | - | - | - |
| | 12" | - | - | | - | - | - | - | - |
| | 15" | - | - | | - | - | - | - | - |
| | 18" | - | - | | - | - | - | - | - |
| | 21" | - | - | | | | | | - |
| | 24" | | | | | | | | |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | - | - | 5 | 2 | - | - |
| | 6" | 10 | 10 | - | - | 5 | 5 | - | |
| | 9" | - | - | - | - | - | - | - | |
| | 12" | - | - | - | - | - | - | - | |
| | 15" | - | - | - | - | - | - | - | |
| | 18" | - | - | | | - | - | - | |
| | 21" | - | - | | | - | - | | |
| | 24" | - | | | | - | - | | |
| Plate Penetrometer Readings in Track, psi | 3" | - | | | | | | - | - |
| | 6" | - | - | | | | | | |
| | 9" | | | | | | | | |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | - | - | 0 | 0 | - | |
| | 6" | 0 | | - | | 0 | 0 | | |
| | 9" | | | - | | | | | |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-19-73 Time: 3:00 PM Test Vehicle: 1973 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: N/A Tire Group: B

Inflation, psig: 35 Ambient Temp. °F.: 73 Surface Temp. °F.: 68

Relative Humidity %: 28 Wind Speed, mph: 0-9 Wind Direction: W

Mud Moisture Content, %: 24.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7½ | 9 | – | – | 6¾ | 8⅝ | – | – |
| Tire Track Width, Ins.: | | 8½ | 8¼ | – | – | 8 | 8⅝ | – | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | – | – | 5 | 5 | – | – |
| | 6" | 10 | 10 | – | – | 10 | 10 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 6" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

Date: 10/[illegible]/73 Time: 3:25 PM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: N/A Tire Group: B

Inflation, psig: 15 Ambient Temp. °F.: 77 Surface Temp. °F.: 68

Relative Humidity %: [illegible] Wind Speed, mph: [illegible] Wind Direction: W

Mud Moisture Content, %: 24.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8 1/8 | 8 | – | – | 8 3/8 | 7 | – | – |
| Tire Track Width, Ins.: | | 7 | 7 3/4 | – | – | 6 3/4 | 8 | – | – |
| Cone Penetrometer Readings in Track | 3" | | | | | – | – | – | – |
| | 6" | | | | | – | – | – | – |
| | 9" | | | | | – | – | – | – |
| | 12" | | | | | – | – | – | – |
| | 15" | | | | | – | – | – | – |
| | 18" | | | | | – | – | – | – |
| | 21" | | | | | – | – | – | – |
| | 24" | | | | | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 4 | – | – | 2 | 2 | – | – |
| | 6" | 10 | 10 | – | – | 10 | 10 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 6" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

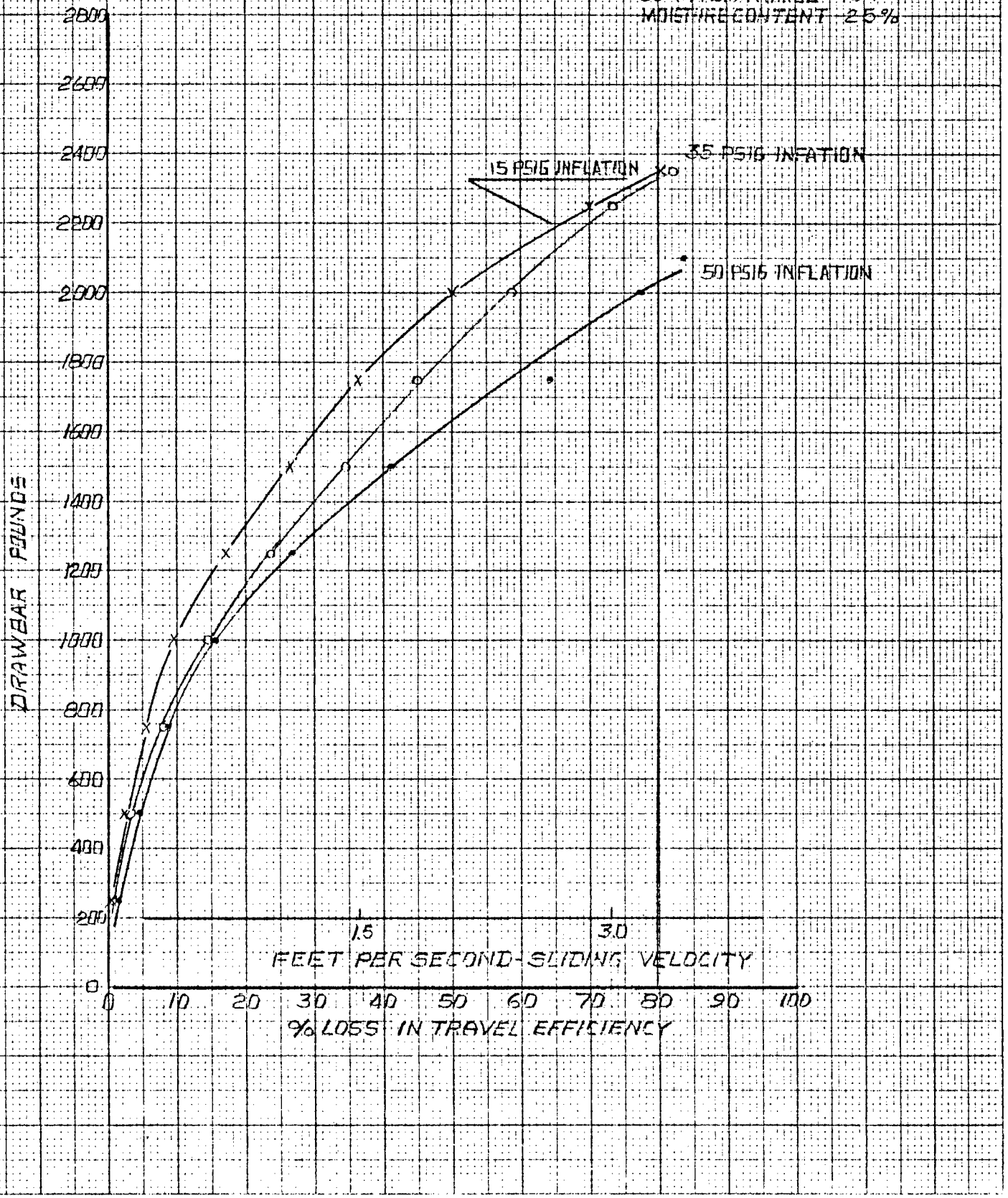
# DYNAMIC TRACTION
## MUD
## GROUP J RUN NO. 3
## 6 WHEEL DRIVE
## FIGURE NO. 28

Location: PROVING GROUND

Date: 10-22-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 50°F
SURF. TEMP. RANGE 46°F
MOISTURE CONTENT 25%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10-22-73 Time: 9:55 AM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: J

Inflation, psig: 50 Ambient Temp. °F.: 44 Surface Temp. °F.: 40

Relative Humidity %: 41 Wind Speed, mph: 0 Wind Direction: —

Mud Moisture Content, %: 25.1

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7 3/4 | 8 1/4 | — | — | 6 1/2 | 8 3/4 | — | — |
| Tire Track Width, Ins.: | | 11 | 9 | — | — | 10 3/4 | 8 1/2 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 2 | 5 | — | — | 2 | 5 | — | — |
| | 6" | 10 | 10 | — | — | 10 | 10 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 3 | 3 | — | — | 0 | 0 | — | — |
| | 6" | 3 | 3 | — | — | 3 | 3 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10 22 73 Time: 10:15 Test Vehicle: M 34 6x6

Vehicle Weight, Truck: 11,536 L 38 Trailer: N/A Tire Group: J

Inflation, psig: 35 Ambient Temp. °F.: 50 Surface Temp. °F.: 46

Relative Humidity %: 40 Wind Speed, mph: 0 Wind Direction: —

Mud Moisture Content, %: 25.1

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8 1/4 | 7 3/4 | 7 | — | 8 | 8 5/8 | 7 3/4 | — |
| Tire Track Width, Ins.: | | 8 | 9 | 8 1/4 | — | 7 3/4 | 9 | 8 1/2 | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 4 | 5 | 5 | — | 5 | 5 | 5 | — |
| | 6" | 15 | 15 | 15 | — | 15 | 10 | 15 | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 6" | 0 | — | 0 | — | 0 | 0 | 0 | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments: _____

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-22-73 Time: 10:45AM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: J

Inflation, psig: 15 Ambient Temp. °F.: 51 Surface Temp. °F.: 47

Relative Humidity %: 40 Wind Speed, mph: 3-7 Wind Direction: N

Mud Moisture Content, %: 25.1

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 6½ | 7¾ | — | — | 7 | 8½ | — | — |
| Tire Track Width, Ins.: | | 8¼ | 8 | — | — | 7¾ | 8 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | — | — | 5 | 5 | — | — |
| | 6" | 5 | 5 | — | — | 5 | 5 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION
## MUD
GROUP: D RUN NO. 4

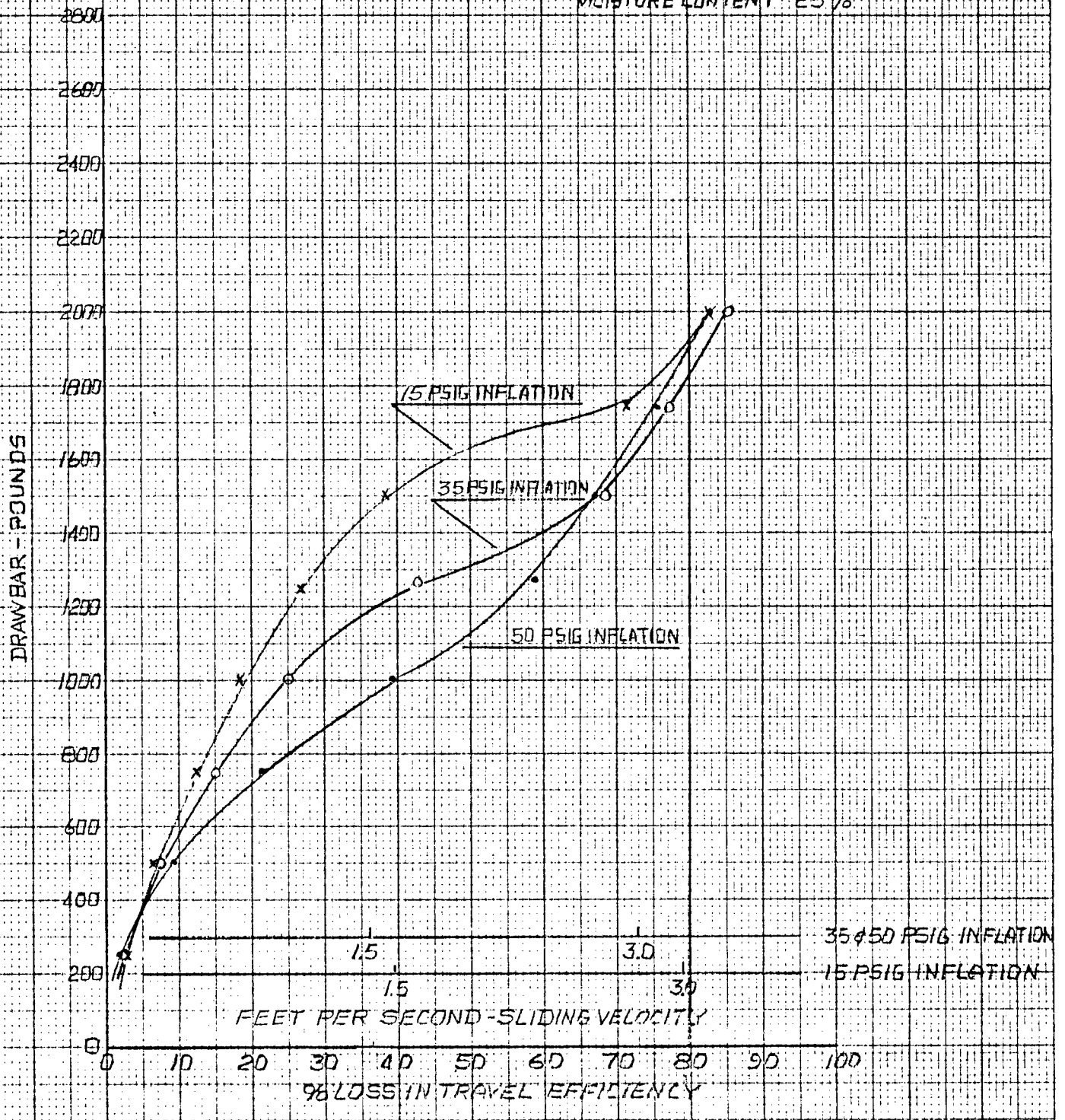
6 WHEEL DRIVE.
FIGURE NO. 29

Location: SAND MOUNTAIN, NEV.

Date: 10-22-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 69°F
SURF. TEMP. RANGE 62°F
MOISTURE CONTENT 25%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10-22-73 Time: 12:20 PM Test Vehicle: M34 6X6

Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: D

Inflation, psig: 50 Ambient Temp. °F.: 68 Surface Temp. °F.: 61

Relative Humidity %: 31 Wind Speed, mph: 7-9 Wind Direction: N

Mud Moisture Content, %: 25.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8 | 7⅓ | 7⅓ | — | 8 | 8 | 6¾ | — |
| Tire Track Width, Ins.: | | 10 | 7¾ | 7½ | — | 10½ | 7¼ | 7 | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 2 | 4 | 2 | — | 2 | 2 | 2 | — |
| | 6" | 10 | 10 | 5 | — | 10 | 5 | 6 | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 6" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

## TEST DATA

Date: 10-22-73 Time: 12:50 PM Test Vehicle: M34 6X6

Vehicle Weight, Truck: 11,536 LBS Trailer: NIL Tire Group: D

Inflation, psig: 35 Ambient Temp. °F.: 62 Surface Temp. °F.: 62

Relative Humidity %: 31 Wind Speed, mph: 2-3 Wind Direction: N

Mud Moisture Content, %: 25.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 6 3/4 | 3 1/2 | - | - | 7 1/4 | 7 3/8 | — | — |
| Tire Track Width, Ins.: | | 9 | 7 | - | - | 8 1/2 | 7 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 10 | - | — | 5 | 5 | — | — |
| | 6" | 5 | 10 | — | — | 5 | 10 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 6" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-22-73 Time: 1:15 PM Test Vehicle: M 34 6X6

Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: D

Inflation, psig: 15 Ambient Temp. °F.: 68 Surface Temp. °F.: 62

Relative Humidity %: 32 Wind Speed, mph: 3-13 Wind Direction: S

Mud Moisture Content, %: 25.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7 | 7 3/4 | — | — | 6 3/4 | 8 1/2 | — | — |
| Tire Track Width, Ins.: | | 8 | 7 1/4 | — | — | 7 1/4 | 8 1/4 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 4 | 10 | — | — | 7 | 5 | — | — |
| | 6" | 10 | 10 | — | — | 10 | 5 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 6" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

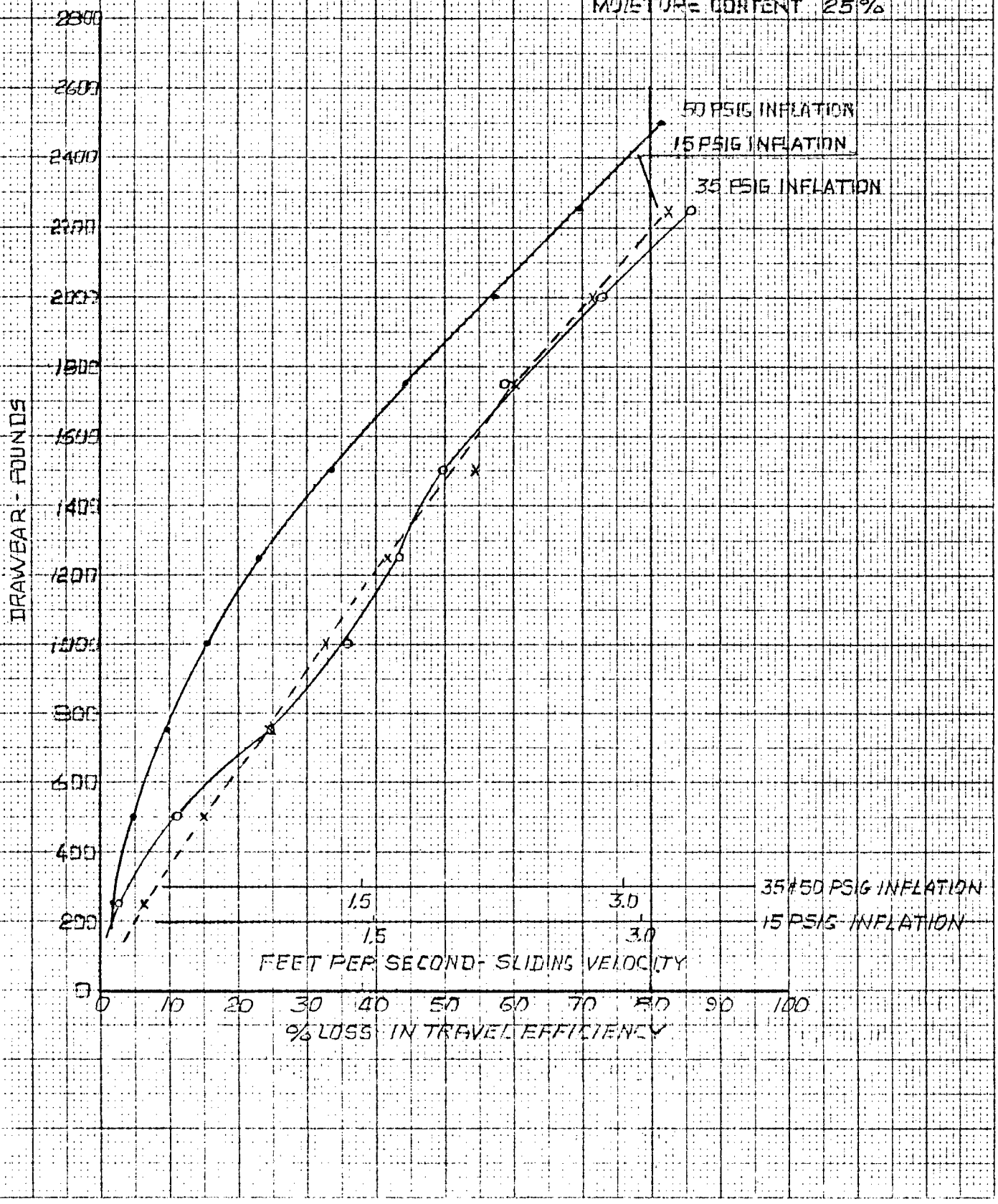
# DYNAMIC TRACTION
## M.O.D.
## GROUP: A RUN NO. 5
## 6 WHEEL DRIVE
## FIGURE NO. 30

Location: PROVING GROUND

Date: 10-22-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 66°F
SURF. TEMP. RANGE 57°F
MOISTURE CONTENT 25%




WESTERN LITHO CARSON CITY

## TEST DATA

Date: 10-22-73 Time: 2:25 PM Test Vehicle: M-34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: N/A Tire Group: A

Inflation, psig: 50 Ambient Temp. °F.: 70 Surface Temp. °F.: 62

Relative Humidity %: 34 Wind Speed, mph: 6-22 Wind Direction: W

| Mud Moisture Content, %: | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| | 24.2 | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8 1/8 | 8 3/4 | 8 1/4 | — | 7 1/4 | 9 3/4 | 8 1/2 | — |
| Tire Track Width, Ins.: | | 7 3/4 | 7 1/2 | 8 1/2 | — | 7 1/2 | 8 | 8 1/2 | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | 5 | — | 5 | 5 | 5 | — |
| | 6" | 5 | 10 | 10 | — | 5 | 5 | 10 | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 6" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-22-73 Time: 2:40 PM Test Vehicle: M-34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A

Inflation, psig: 35 Ambient Temp. °F.: 64 Surface Temp. °F.: 58

Relative Humidity %: 35 Wind Speed, mph: 6-20 Wind Direction: W

| Mud Moisture Content, %: | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| | 24.9 | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 9 | 9½ | – | – | 8½ | 9½ | – | – |
| Tire Track Width, Ins.: | | 8¼ | 7½ | – | – | 8 | 8 | – | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 2 | – | – | 5 | 5 | – | – |
| | 6" | 10 | 10 | – | – | 10 | 10 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 6" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

## TEST DATA

Date: 10-22-73 Time: 3:15 PM Test Vehicle: M-34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: — Tire Group: A

Inflation, psig: 15 Ambient Temp. °F.: 62 Surface Temp. °F.: 57

Relative Humidity %: 35 Wind Speed, mph: 6-20 Wind Direction: W

| | Sample Depth, Inches | | |
|---|---|---|---|
| | 3 | 9 | 18 |
| Mud Moisture Content, %: 24.9 | — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 9 1/4 | 9 1/8 | — | — | 8 1/2 | 10 | — | — |
| Tire Track Width, Ins.: | | 3 1/2 | 7 3/4 | — | — | 9 | 8 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 3 | 2 | — | — | 2 | 2 | — | — |
| | 6" | 5 | 5 | — | — | 5 | 5 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 6" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

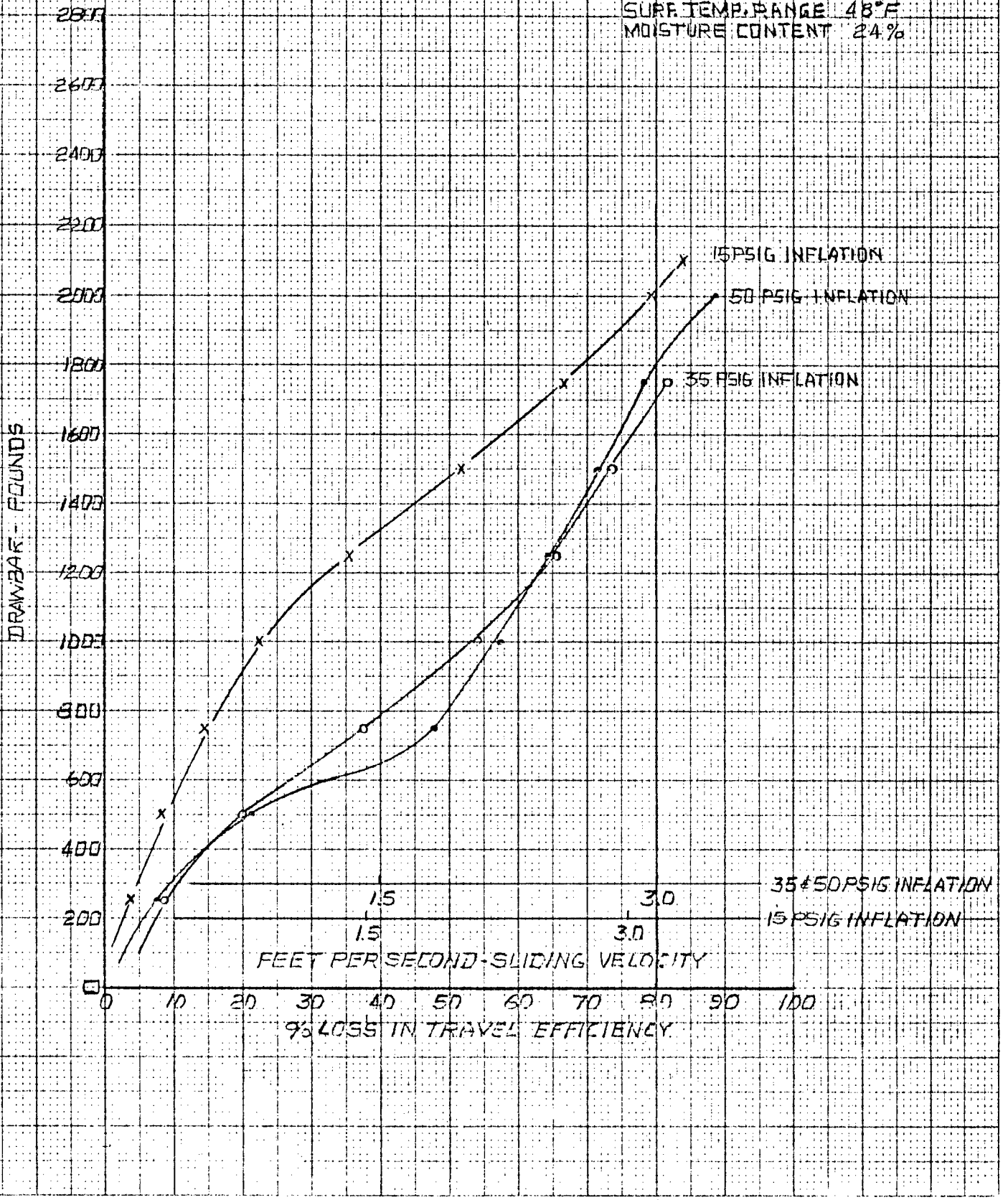
# DYNAMIC TRACTION
## MUD
## GROUP: E RUN NO. 6
## 6 WHEEL DRIVE
## FIGURE NO. 31

Location: PROVING GROUND

Date: 10-23-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 50°F
SURF. TEMP. RANGE 48°F
MOISTURE CONTENT 24%



# TEST DATA

Date: 10-23-73 Time: 9:55 AM Test Vehicle: 11-34 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: NO Tire Group: E

Inflation, psig: 50 Ambient Temp. °F.: 50 Surface Temp. °F.: 47

Relative Humidity %: 56 Wind Speed, mph: 6-13 Wind Direction: W

Mud Moisture Content, %: 23.5

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7 3/4 | 7 | – | – | 8 1/4 | 9 | – | – |
| Tire Track Width, Ins.: | | 8 1/4 | 8 3/4 | – | – | 7 3/4 | 8 | – | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | – | – | 5 | 5 | – | – |
| | 6" | 5 | 5 | – | – | 5 | 5 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 6" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-23-73 Time: 11:20 AM Test Vehicle: M-34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: N/A Tire Group: E

Inflation, psig: 35 Ambient Temp. °F.: 50 Surface Temp. °F.: 48

Relative Humidity %: 54 Wind Speed, mph: 5-15 Wind Direction: W

Mud Moisture Content, %: 33.5

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8½ | 9 | — | — | 8½ | 8½ | — | — |
| Tire Track Width, Ins.: | | 7½ | 8 | — | — | 8½ | 7½ | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 4 | 5 | — | — | 2 | 2 | — | — |
| | 6" | 10 | 5 | — | — | 10 | 12 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 2 | 2 | — | — | 2 | 2 | — | — |
| | 6" | 2 | 2 | — | — | 2 | 2 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments: _____

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-23-73 Time: 11:45AM Test Vehicle: M-3.1 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: N.A. Tire Group: E

Inflation, psig: 15 Ambient Temp. °F.: 51 Surface Temp. °F.: 48

Relative Humidity %: 52 Wind Speed, mph: 5-20 Wind Direction: W

Mud Moisture Content, %: 23.5

| | | Sample Depth, Inches | | |
|---|---|---|---|---|
| | | 3 | 9 | 18 |
| | | — | — | — |

| | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| Run Number: | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7⅛ | 8¼ | — | — | 7¼ | 7⅞ | — | — |
| Tire Track Width, Ins.: | | 8 | 7¼ | — | — | 8¼ | 7 | — | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | — | — | 2 | 2 | — | — |
| | 6" | 10 | 10 | — | — | 10 | 10 | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 6" | 0 | 0 | — | — | 0 | 0 | — | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

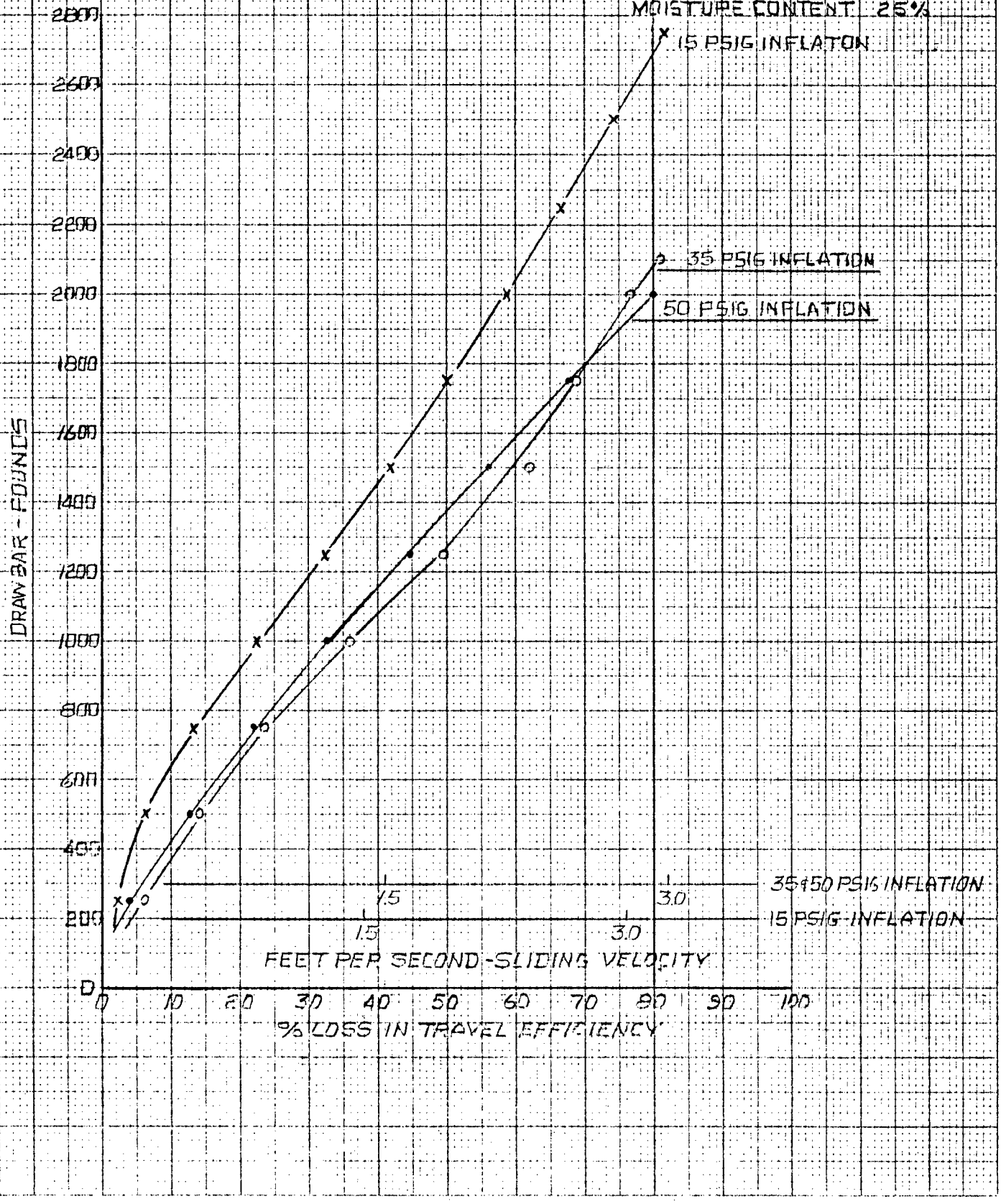
# DYNAMIC TRACTION
## MUD
GROUP: G RUN NO 7
6 WHEEL DRIVE
FIGURE NO. 32

Location: PROVING GROUND

Date: 10-23-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 55°F
SURF. TEMP. RANGE 54°F
MOISTURE CONTENT 25%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10 23 73 Time: 1:25 PM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: G

Inflation, psig: 50 Ambient Temp. °F.: 54 Surface Temp. °F.: 52

Relative Humidity %: 46 Wind Speed, mph: 6-12 Wind Direction: W

Mud Moisture Content, %: 25.3

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 6 3/4 | 7 3/4 | 7 3/4 | — | 7 1/2 | 9 | 9 1/4 | — |
| Tire Track Width, Ins.: | | 10 | 7 1/2 | 6 3/4 | — | 9 3/4 | 7 1/4 | 6 1/2 | — |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 2 | 2 | 4 | — | 2 | 2 | 2 | — |
| | 6" | 10 | 10 | 10 | — | 10 | 10 | 5 | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 6" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments: _____

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-23-73 Time: 1:50 PM Test Vehicle: 1134 6X6

Vehicle Weight, Truck: 11536 L36 Trailer: 111 Tire Group: G

Inflation, psig: 35 Ambient Temp. °F.: 55 Surface Temp. °F.: 54

Relative Humidity %: 44 Wind Speed, mph: 6-20 Wind Direction: W

Mud Moisture Content, %: 25,3

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7¼ | 7⅝ | – | – | 7½ | 8¼ | – | – |
| Tire Track Width, Ins.: | | 9 | 7½ | – | – | 8½ | 7¼ | – | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 4 | – | – | 5 | 2 | – | – |
| | 6" | 12 | 9 | – | – | 12 | 5 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 6" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-27-73 Time: 2:10 PM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: 111 Tire Group: 6

Inflation, psig: 15 Ambient Temp. °F.: 55 Surface Temp. °F.: 54

Relative Humidity %: 42 Wind Speed, mph: 6-20 Wind Direction: W

Mud Moisture Content, %: 25.3

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 6 3/4 | 8 2/3 | 8 2/3 | – | 8 1/4 | 10 | 8 3/4 | – |
| Tire Track Width, Ins.: | | 9 1/4 | 7 3/4 | 10 | – | 8 1/4 | 7 3/4 | 10 1/4 | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | | | | – | – | – | – |
| | 24" | | | | | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | 5 | – | 5 | 5 | 5 | – |
| | 6" | 10 | 10 | 10 | – | 10 | 15 | 10 | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | – | 0 | 0 | 0 | – |
| | 6" | 0 | 0 | 0 | – | 0 | 0 | 0 | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

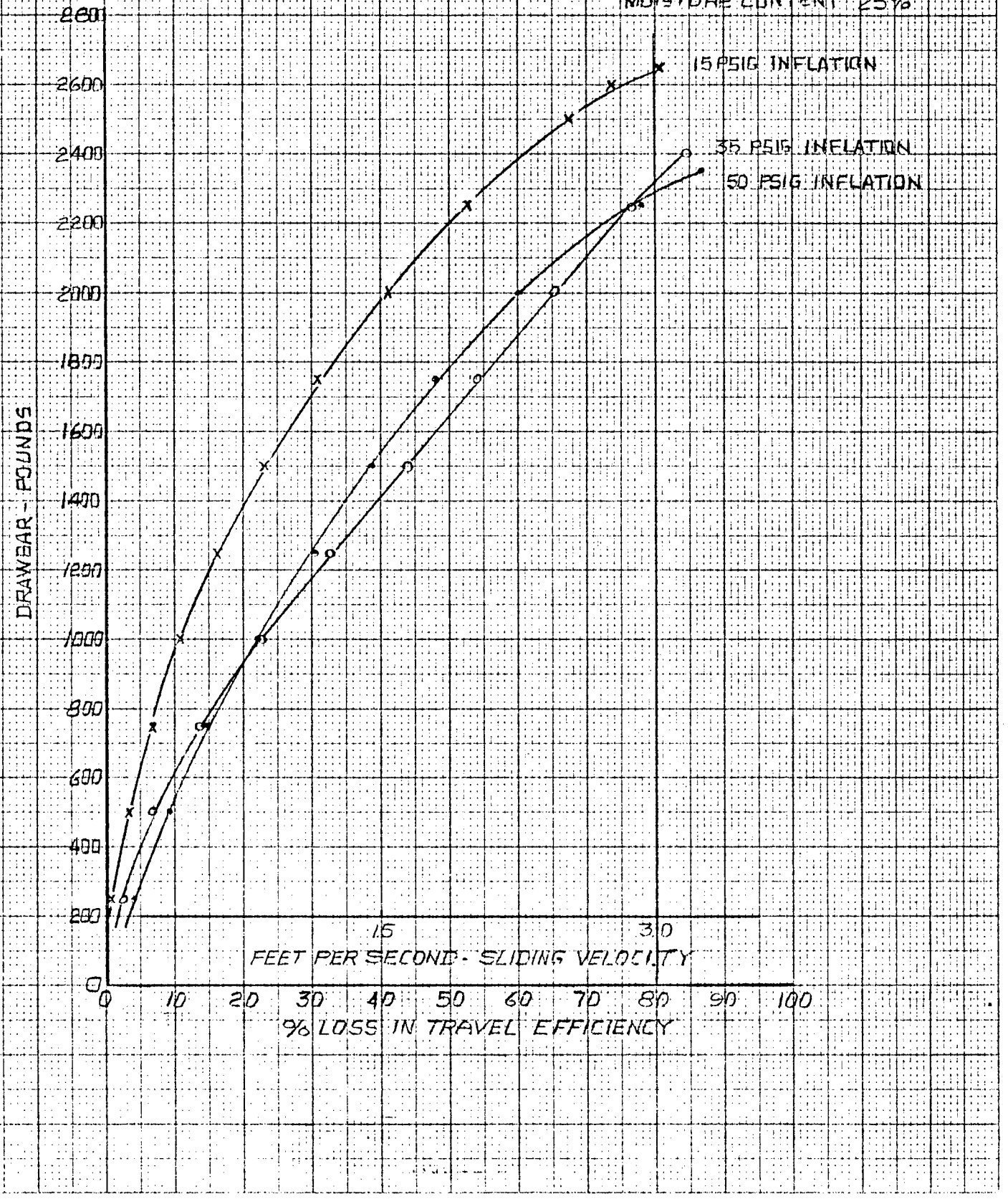
# DYNAMIC TRACTION
## MUD
GROUP: F RUN NO. 8
6 WHEEL DRIVE
FIGURE NO. 33

Location: PROVING GROUND

Date: 10-24-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 44°F
SURF. TEMP RANGE 50°F
MOISTURE CONTENT 25%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10-24-73 Time: 9:30AM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: N/A Tire Group: F

Inflation, psig: 50 Ambient Temp. °F.: 33 Surface Temp. °F.: 36

Relative Humidity %: 64 Wind Speed, mph: 0-3 Wind Direction: W

Mud Moisture Content, %: 25.5

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| – | – | – |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7½ | 7½ | – | – | 7½ | 9 | – | – |
| Tire Track Width, Ins.: | | 7½ | 6½ | – | – | 9 | 7 | – | – |
| Cone Penetrometer Readings in Track | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Cone Penetrometer Readings in Mud, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | 10 | 7 | – | – | 10 | 7 | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| | 12" | – | – | – | – | – | – | – | – |
| | 15" | – | – | – | – | – | – | – | – |
| | 18" | – | – | – | – | – | – | – | – |
| | 21" | – | – | – | – | – | – | – | – |
| | 24" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Track, psi | 3" | – | – | – | – | – | – | – | – |
| | 6" | – | – | – | – | – | – | – | – |
| | 9" | – | – | – | – | – | – | – | – |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | – | – | 0 | 0 | – | – |
| | 6" | – | – | – | – | 0 | 0 | – | – |
| | 9" | – | – | – | – | – | – | – | – |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-24-73 Time: 10:30 AM Test Vehicle: M34 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: n/a Tire Group: F

Inflation, psig: 35 Ambient Temp. °F.: 44 Surface Temp. °F.: 50

Relative Humidity %: 58 Wind Speed, mph: 0-2 Wind Direction: W

Mud Moisture Content, %: 25.5

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| - | - | - |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8 | 7½ | - | - | 7 | 8 | - | - |
| Tire Track Width, Ins.: | | 7¼ | 7¼ | - | - | 7¾ | 7½ | - | - |
| Cone Penetrometer Readings in Track | 3" | - | - | - | - | - | - | - | - |
| | 6" | - | - | - | - | - | - | - | - |
| | 9" | - | - | - | - | - | - | - | - |
| | 12" | - | - | - | - | - | - | - | - |
| | 15" | - | - | - | - | - | - | - | - |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Mud, psi | 3" | 4 | 5 | - | - | 2 | 5 | - | - |
| | 6" | 10 | 5 | - | - | 10 | 5 | - | - |
| | 9" | - | - | - | - | - | - | - | - |
| | 12" | - | - | - | - | - | - | - | - |
| | 15" | - | - | - | - | - | - | - | - |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | - | - | - | - | - | - | - | - |
| | 6" | - | - | - | - | - | - | - | - |
| | 9" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | - | - | 0 | 0 | - | - |
| | 6" | 0 | 0 | - | - | 0 | 0 | - | - |
| | 9" | - | - | - | - | - | - | - | - |

Comments:

OS - Off Scale (Full Scale = 300)

# TEST DATA

Date: 10-24-73 Time: 11:00 AM Test Vehicle: M 34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: N/A Tire Group: F

Inflation, psig: 15 Ambient Temp. °F.: 46 Surface Temp. °F.: 52

Relative Humidity %: 54 Wind Speed, mph: 0-3 Wind Direction: W

Mud Moisture Content, %: 25.5

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| - | - | - |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 8½ | 7 | - | - | 7 | 8 | - | - |
| Tire Track Width, Ins.: | | 8¼ | 7 | - | - | 8 | 7¾ | - | - |
| Cone Penetrometer Readings in Track | 3" | - | - | - | - | - | - | - | - |
| | 6" | - | - | - | - | - | - | - | - |
| | 9" | - | - | - | - | - | - | - | - |
| | 12" | - | - | - | - | - | - | - | - |
| | 15" | - | - | - | - | - | - | - | - |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Cone Penetrometer Readings in Mud, psi | 3" | 5 | 5 | - | - | 2 | 5 | - | - |
| | 6" | 10 | 10 | - | - | 10 | 10 | - | - |
| | 9" | - | - | - | - | - | - | - | - |
| | 12" | - | - | - | - | - | - | - | - |
| | 15" | - | - | - | - | - | - | - | - |
| | 18" | - | - | - | - | - | - | - | - |
| | 21" | - | - | - | - | - | - | - | - |
| | 24" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Track, psi | 3" | - | - | - | - | - | - | - | - |
| | 6" | - | - | - | - | - | - | - | - |
| | 9" | - | - | - | - | - | - | - | - |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | - | - | 0 | 0 | - | - |
| | 6" | 0 | 0 | - | - | 0 | 0 | - | - |
| | 9" | - | - | - | - | - | - | - | - |

Comments:

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

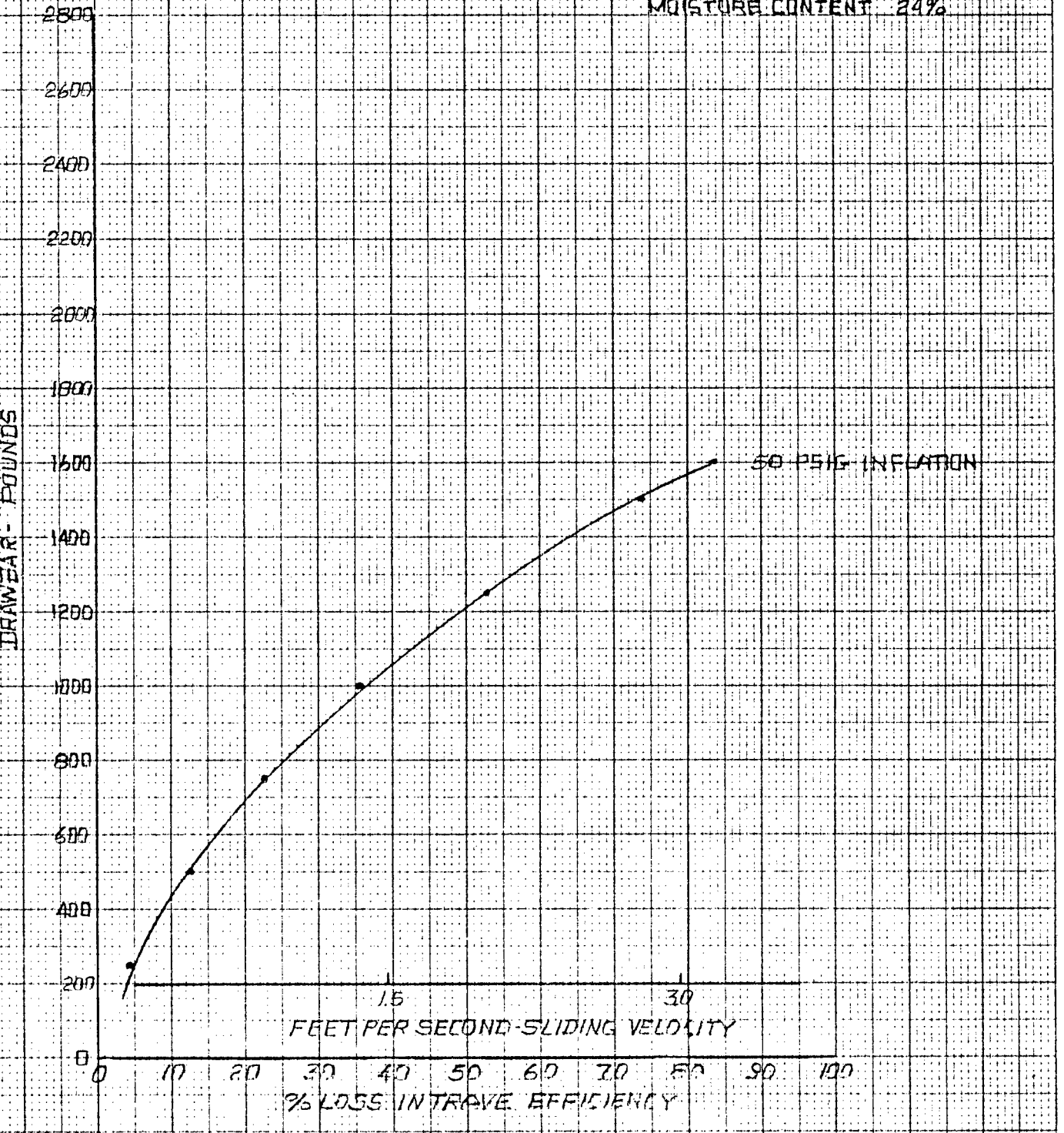
DYNAMIC TRACTION
MUD
GROUP: C RUN NO. 9
6 WHEEL DRIVE
FIGURE NO. 34

Location: PROVING GROUND

Date: 10-24-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 51°F
SURF. TEMP. RANGE 55°F
MOISTURE CONTENT 24%




WESTERN LITHO CARSON CITY

# TEST DATA

Date: 10-24-73 Time: 12:35 PM Test Vehicle: M34 6X6

Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: C

Inflation, psig: 50 Ambient Temp. °F.: 51 Surface Temp. °F.: 55

Relative Humidity %: 50 Wind Speed, mph: 0-4 Wind Direction: W

Mud Moisture Content, %: 23.7

| Sample Depth, Inches | | |
|---|---|---|
| 3 | 9 | 18 |
| — | — | — |

| Run Number: | | Left Rear | | | | Right Rear | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Tire Track Depth, Ins.: | | 7 | 7 5/8 | 7 1/4 | - | 7 1/2 | 7 7/8 | 7 1/4 | - |
| Tire Track Width, Ins.: | | 7 1/2 | 7 1/8 | 7 1/4 | - | 7 | 7 1/2 | 6 3/4 | - |
| Cone Penetrometer Readings in Track | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Cone Penetrometer Readings in Mud, psi | 3" | 1 | 1 | 2 | — | 2 | 2 | 2 | — |
| | 6" | 10 | 10 | 1 | — | 1 | 10 | 10 | — |
| | 9" | — | — | — | — | — | — | — | — |
| | 12" | — | — | — | — | — | — | — | — |
| | 15" | — | — | — | — | — | — | — | — |
| | 18" | — | — | — | — | — | — | — | — |
| | 21" | — | — | — | — | — | — | — | — |
| | 24" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Track, psi | 3" | — | — | — | — | — | — | — | — |
| | 6" | — | — | — | — | — | — | — | — |
| | 9" | — | — | — | — | — | — | — | — |
| Plate Penetrometer Readings in Mud, psi | 3" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 6" | 0 | 0 | 0 | — | 0 | 0 | 0 | — |
| | 9" | — | — | — | — | — | — | — | — |

Comments:

OS - Off Scale (Full Scale = 300)

TEST DATA

Figure No. 35

Rolling Resistance - Prepared Mud

Nevada Automotive Test Center

Project: 20-17-30

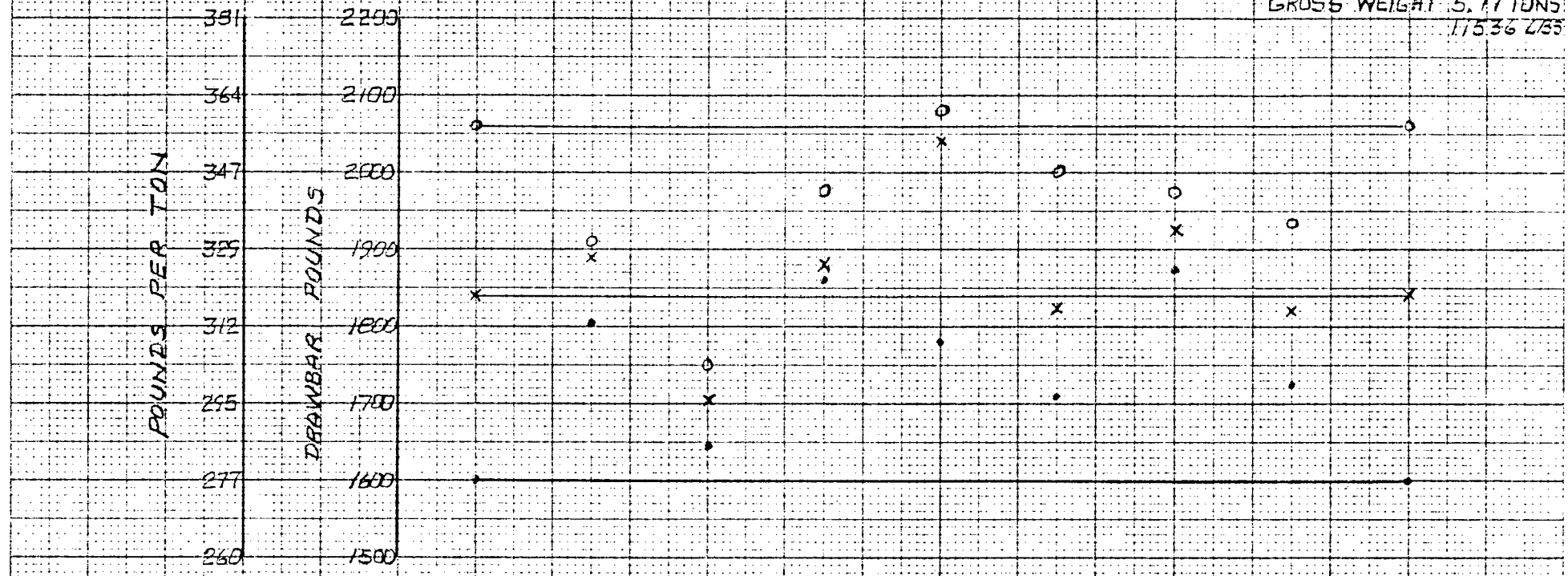
# ROLLING RESISTANCE
## PREPARED MUD
## 6 WHEEL DRIVE
## FIGURE NO. 35

Location: PROVING GROUND

Date: 10-19/20-73 Test By: WHS

Data By: JED

GROSS WEIGHT 5.77 TONS
11536 LBS




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 50 PSIG | 100 | 87 | 97 | 34 | 89 | 104 | 83 | 92 | 100 |
| RATING @ 35 PSIG | 100 | 97 | 105 | 98 | 89 | 100 | 95 | 101 | 100 |
| RATING @ 15 PSIG | 100 | 107 | 115 | 104 | 100 | 103 | 104 | 105 | 100 |
| AVE. LBS/TON @ 50 PSIG | 277 | 313 | 285 | 322 | 308 | 266 | 325 | 299 | 277 |
| AVE. LBS/TON @ 35 PSIG | 319 | 328 | 295 | 325 | 353 | 316 | 334 | 315 | 319 |
| AVE. LBS/TON @ 15 PSIG | 357 | 331 | 303 | 342 | 360 | 347 | 342 | 335 | 357 |
| AVE. LBS @ 50 PSIS • | 1600 | 1805 | 1645 | 1860 | 1780 | 1710 | 1875 | 1725 | 1600 |
| AVE. LBS @ 35 PSIS X | 1840 | 1890 | 1705 | 1880 | 2040 | 1825 | 1925 | 1820 | 1840 |
| AVE. LBS @ 15 PSIS O | 2060 | 1910 | 1750 | 1975 | 2080 | 2000 | 1975 | 1935 | 2060 |
| CODE | C | B | J | D | A | E | G | F | C |
| AMB. TEMP. | 70°F | 78°F | 50°F | 69°F | 66°F | 50°F | 56°F | 44°F | 51°F |
| SURF. TEMP. | 57°F | 68°F | 46°F | 62°F | 57°F | 48°F | 54°F | 50°F | 55°F |
| MOISTURE CONTENT | 25°F | 25% | 25% | 25% | 25% | 24% | 25% | 25% | 24% |

WESTERN LITHO

TEST DATA

Figure No. 36

Dynamic Traction Summary - Dry Ice

Nevada Automotive Test Center

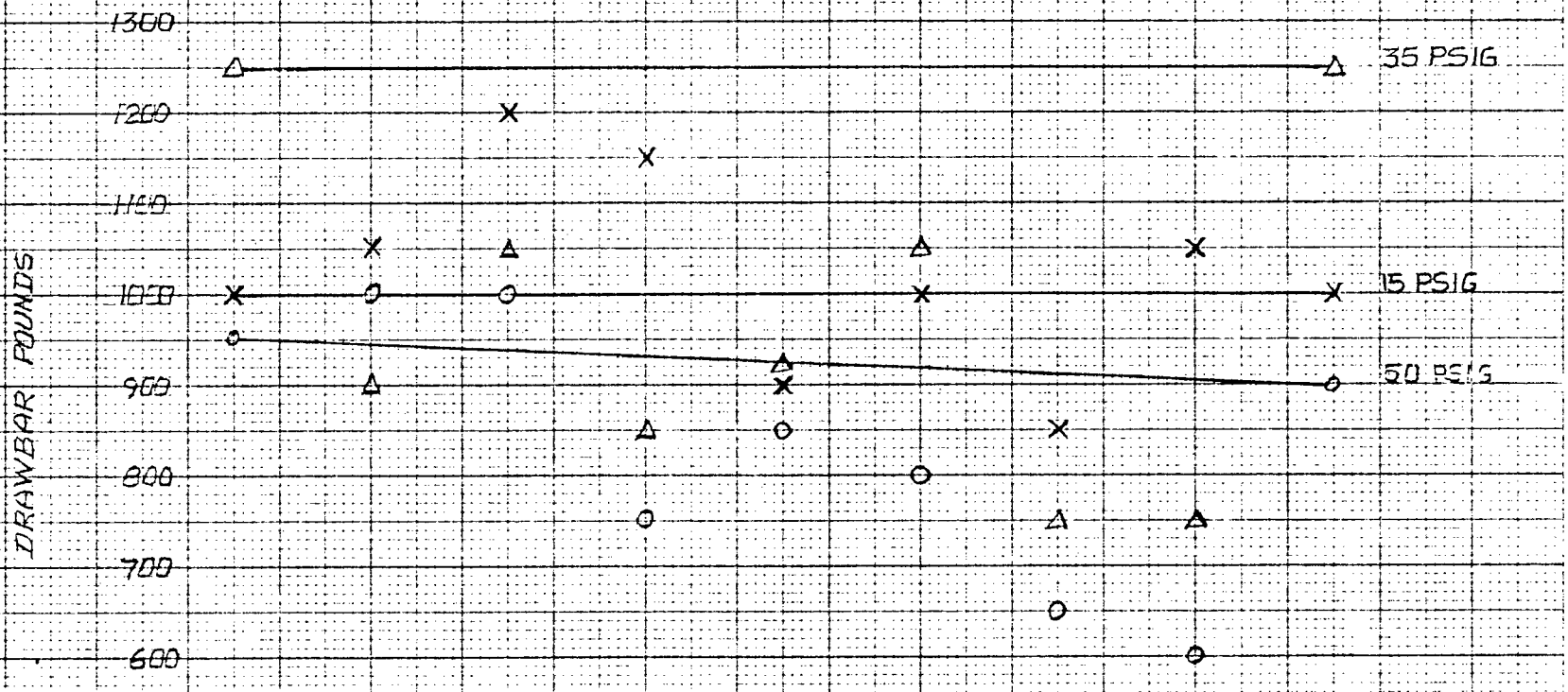
Project: 20-17-30

# DYNAMIC TRACTION
## DRY ICE
## 2 WHEEL DRIVE
## FIGURE NO. 36

Location: SQUAW VALLEY, CALIF.

Date: 11-5/6-73 Test By: WHS

Data By: JED




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| RATING % @ 15 PSIG | | 100 | 105 | 120 | 115 | 90 | 100 | 85 | 105 | 100 |
| RATING % @ 35 PSIG | | 100 | 72 | 84 | 68 | 74 | 84 | 60 | 60 | 100 |
| RATING % @ 50 PSIG | | 100 | 107 | 109 | 81 | 90 | 87 | 72 | 66 | 100 |
| AVE. DB LBS @ 15 PSIG | X | 1000 | 1050 | 1200 | 1150 | 900 | 1000 | 850 | 1050 | 1000 |
| AVE. DB LBS @ 35 PSIG | Δ | 1250 | 900 | 1050 | 950 | 925 | 1050 | 750 | 750 | 1250 |
| AVE. DB LBS @ 50 PSIG | O | 950 | 1000 | 1000 | 750 | 850 | 800 | 650 | 600 | 900 |
| CODE | | C | A | B | D | E | F | G | J | C |
| AMB. TEMP. | | 38 | 38 | 39 | 39 | 38 | 39 | 39 | 39 | 39 |
| ICE TEMP. | | 23 | 24 | 24 | 24 | 23 | 24 | 24 | 25 | 25 |

WESTERN LITHO

TEST DATA

Figures 37 through 45

Dynamic Traction - Dry Ice

Nevada Automotive Test Center

Project: 20-17-30

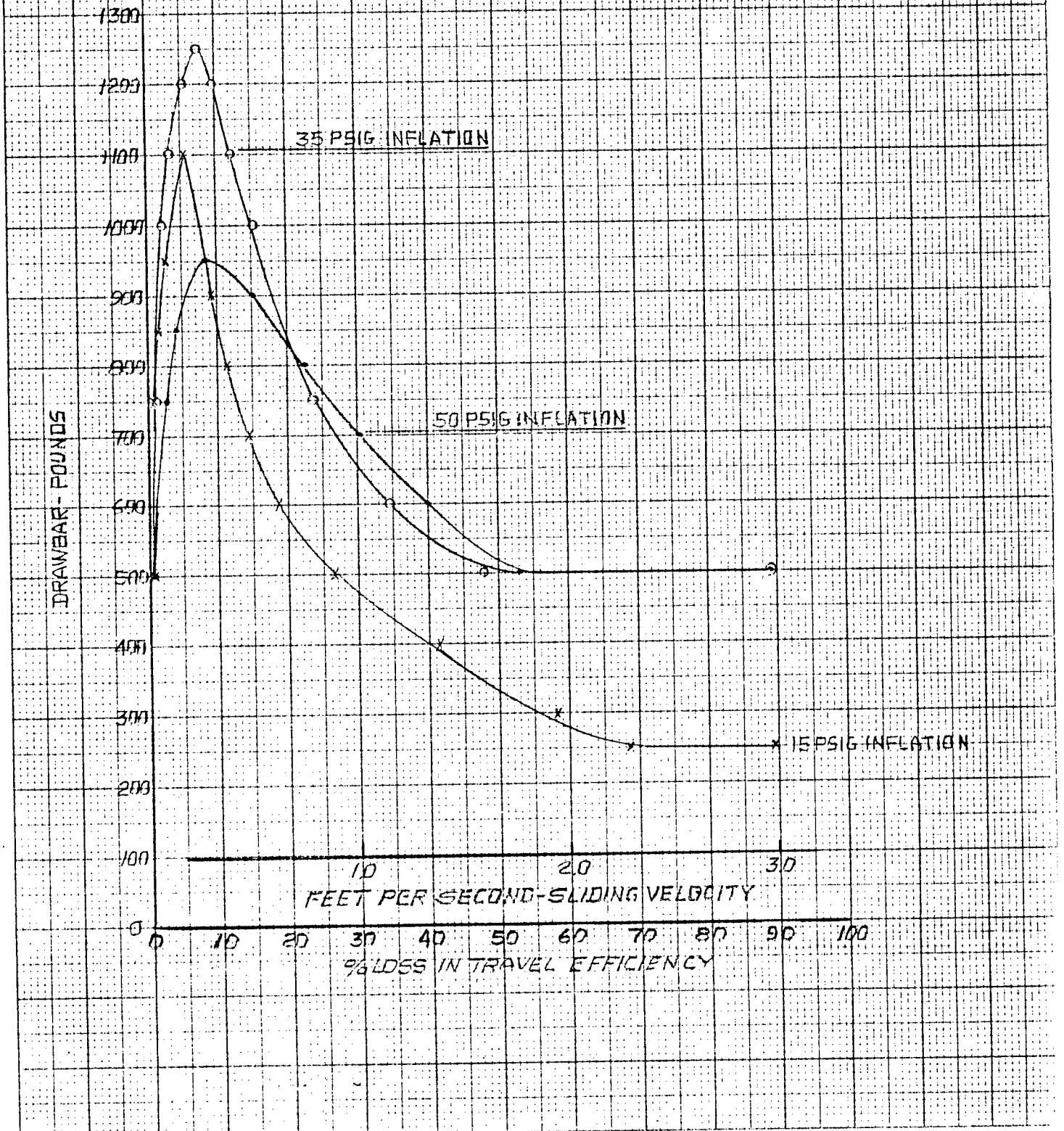
# DYNAMIC TRACTION
DRY ICE
GROUP: C RUN NO. 1
3 WHEEL DRIVE
FIGURE NO. 37

Location: SQUAW VALLEY, CALIF

Date: 11-5-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 38°F
SURF. TEMP. RANGE 23°F






WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

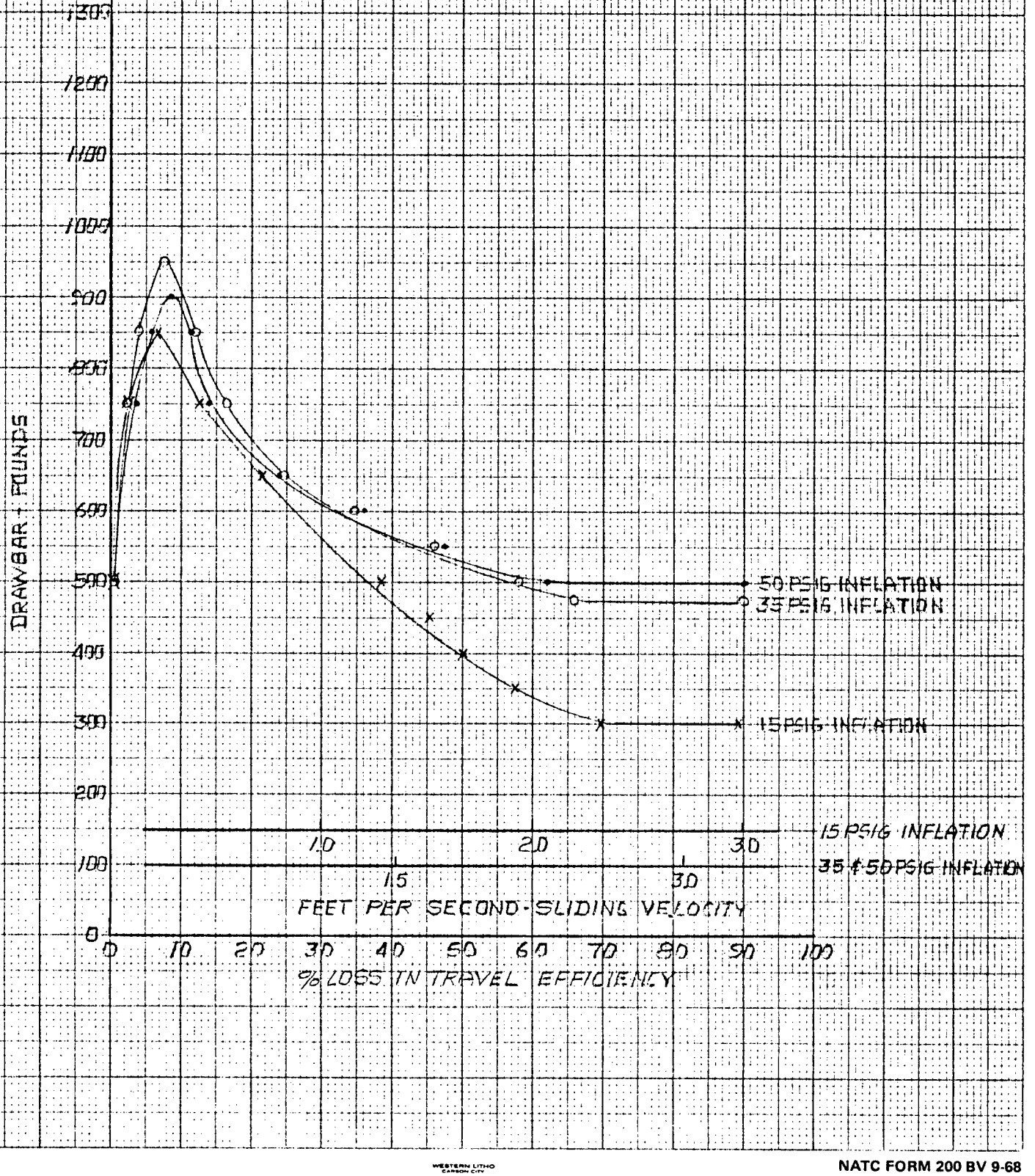
# DYNAMIC TRACTION
## DRY ICE
## GROUP E RUN NO. 2
## 2 WHEEL DRIVE
## FIGURE NO. 38

Location: SQUAW VALLEY, CALIF

Date: 11-5-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 38°F
SURF. TEMP. RANGE 23°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION
## DRY ICE
## GROUP: A RUN NO. 3
## 2 WHEEL DRIVE
## FIGURE NO. 39

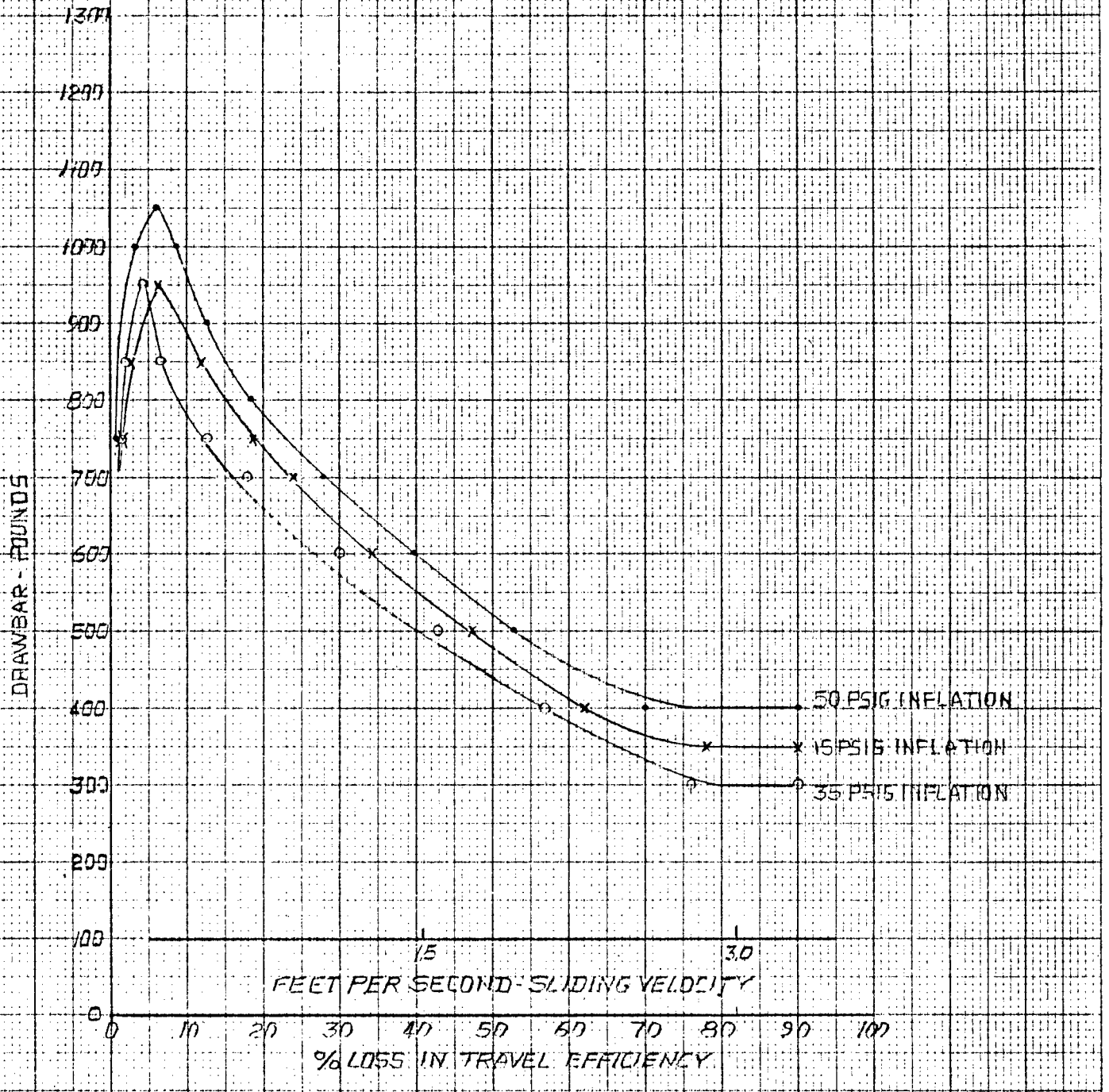
Location: SQUAW VALLEY, CALIF.

Date: 11-5-73 Test By: WHS

Data By: WHS

AMB TEMP: 35°F

SURF. TEMP: 24°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION
## DRY ICE
## GROUP: D RUN NO. 4
## 2 WHEEL DRIVE
## FIGURE NO. 40

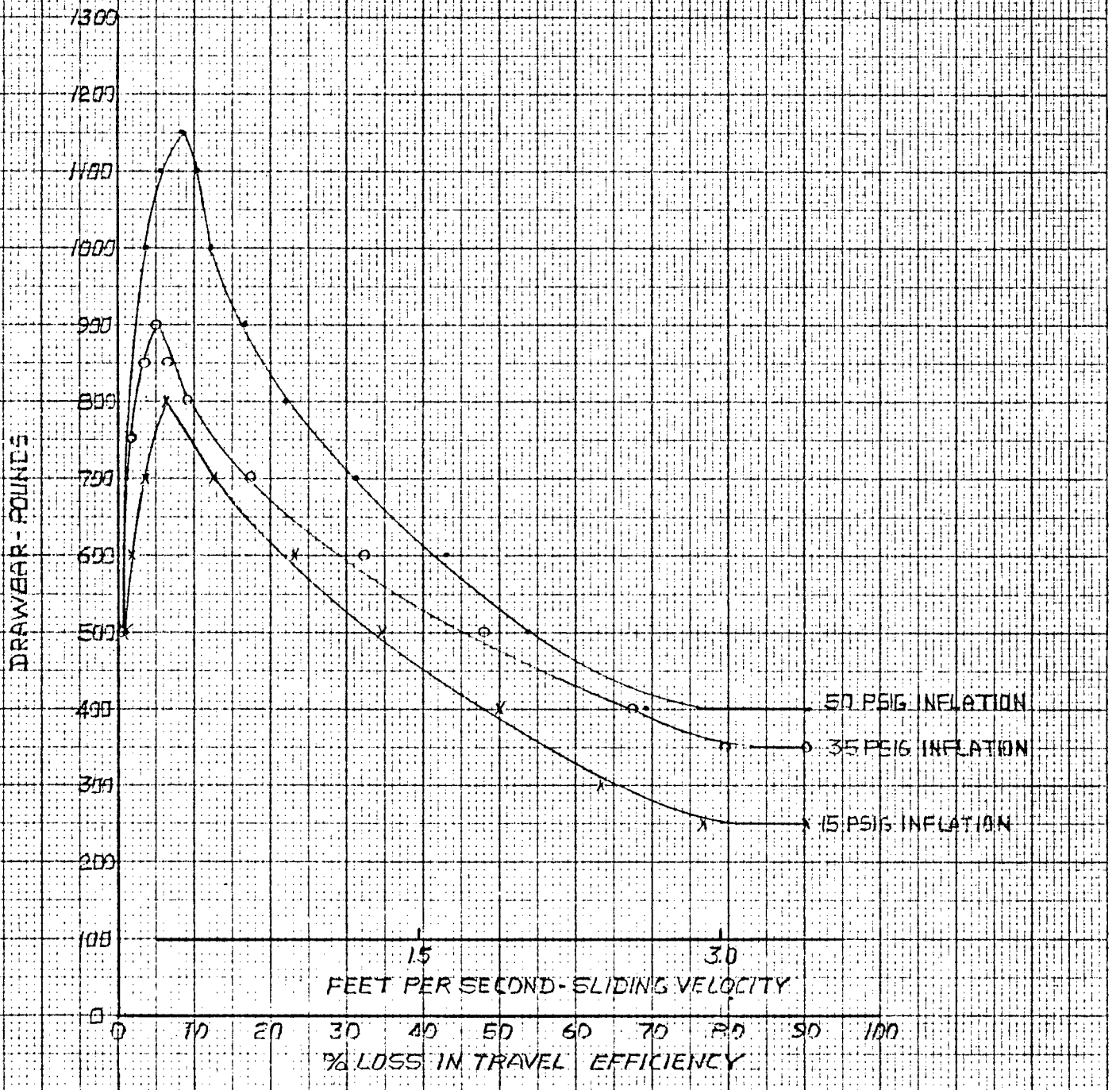
Location: SQUAW VALLEY, CALIF.

Date: 11-5-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°F

SURF. TEMP. RANGE 24°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION
## DRY ICE
## GRAPH RUN NO. 5
## 2 WHEEL DRIVE
## FIGURE NO. 41

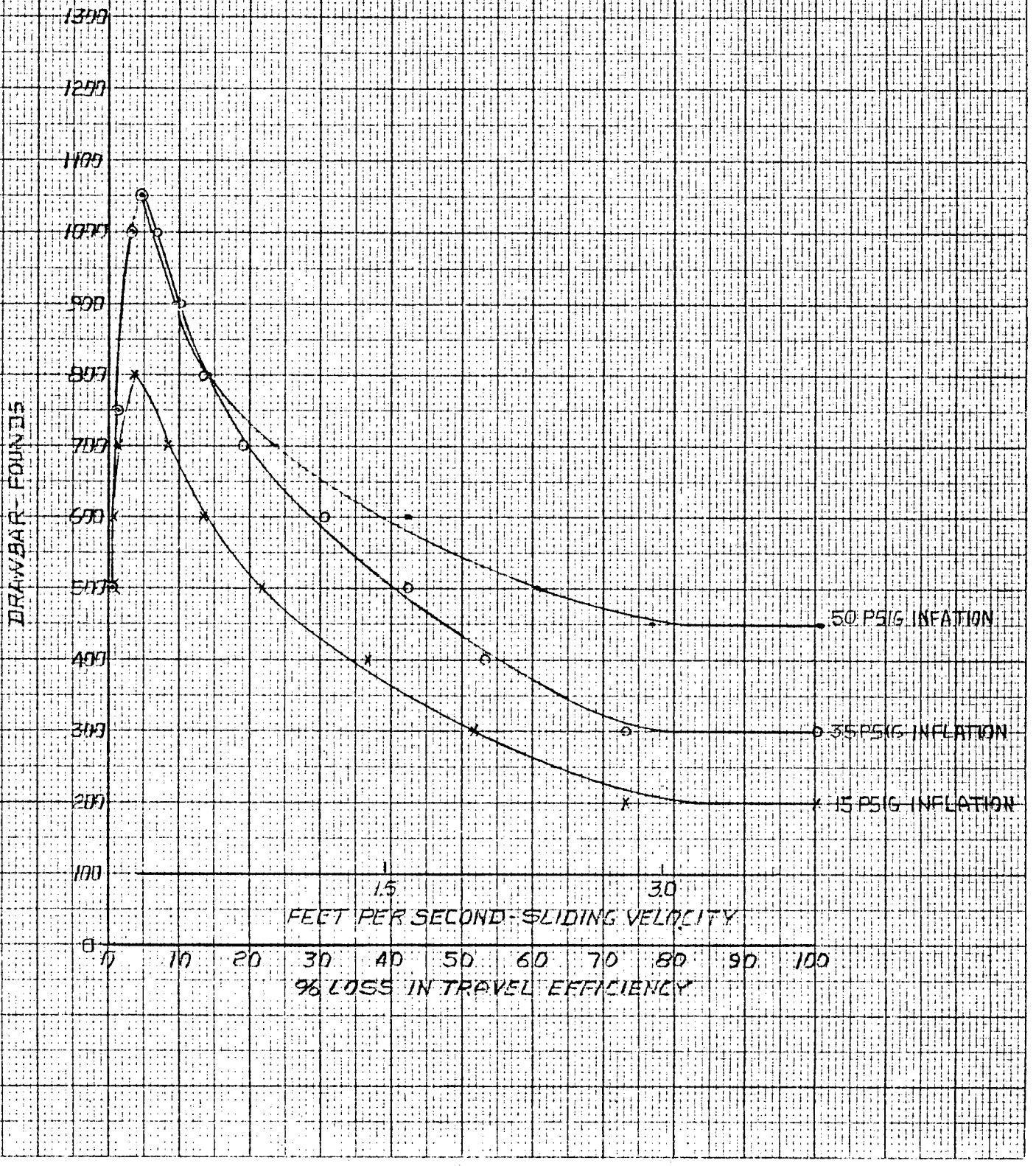
Location: SQUAW VALLEY CALIF

Date: 11-5-73 Test By: WHS

Data By: WHS

AMB. TEMP RANGE 39°F

SURF. TEMP RANGE 24°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

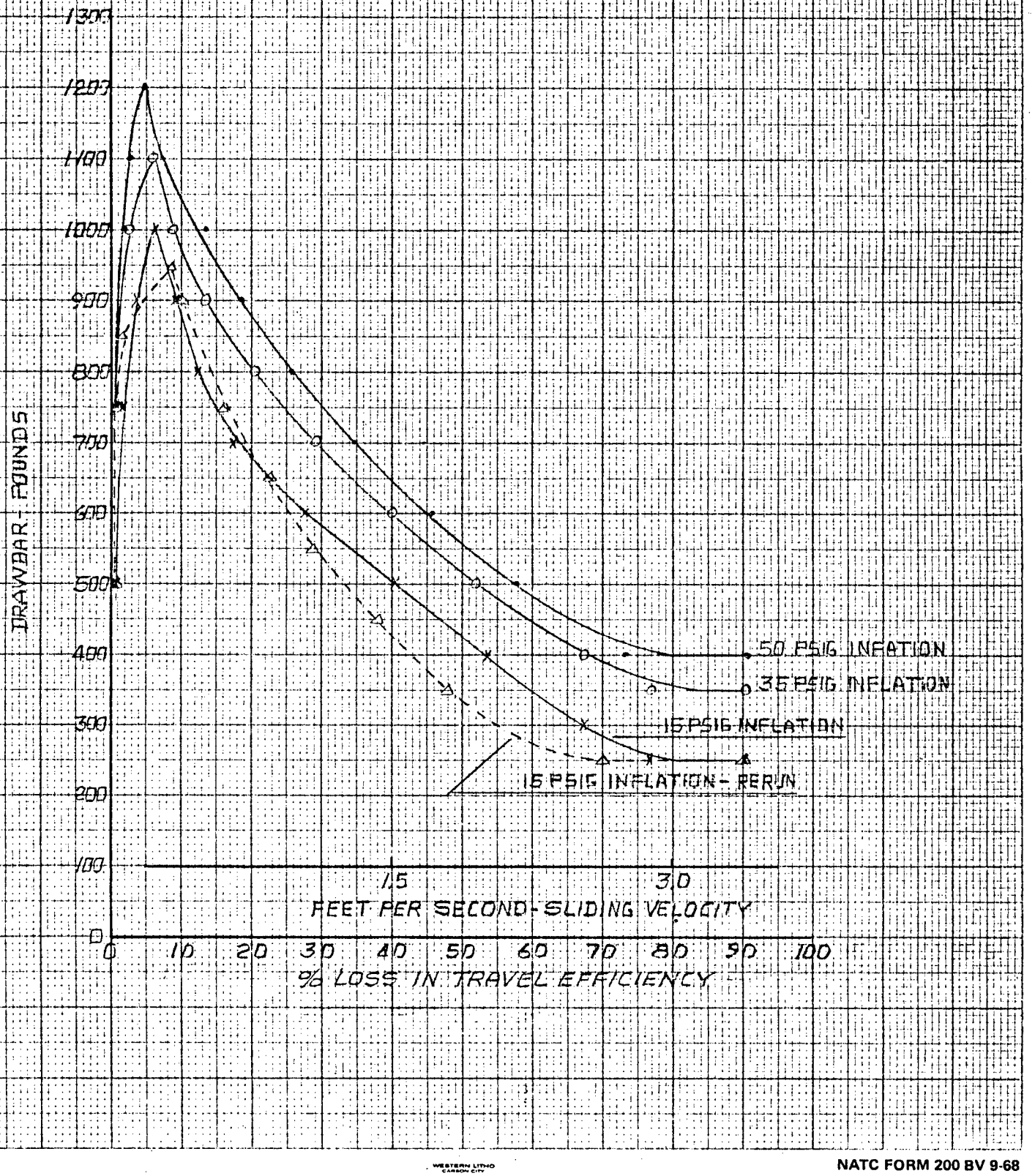
# DYNAMIC TRACTION
## DRY ICE
## GROUP: B RUN NO. 6
## 2 WHEEL DRIVE
## FIGURE NO. 42

Location: SQUAW VALLEY, CALIF.

Date: 11-5-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°F
SURF. TEMP. RANGE 24°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

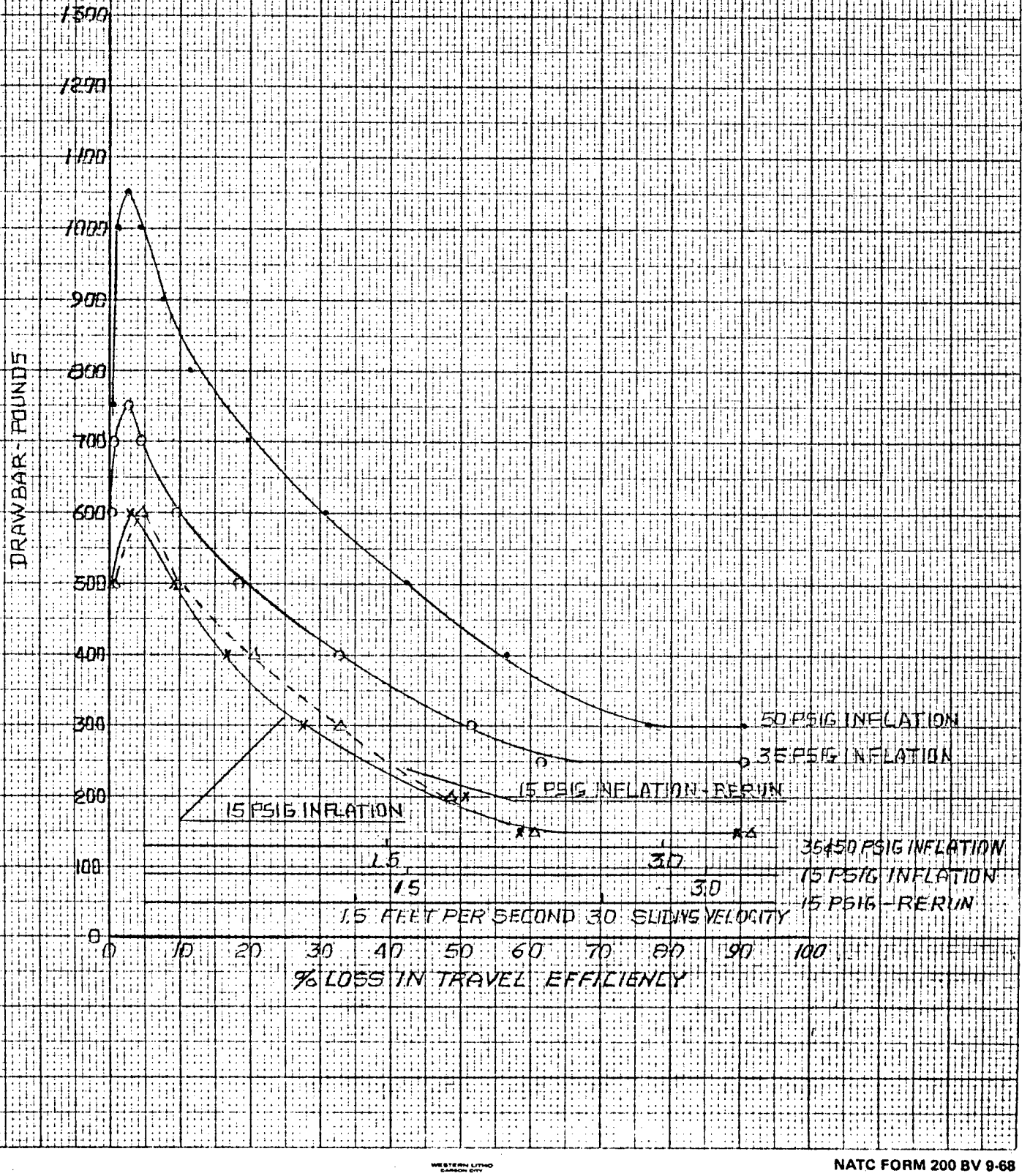
# DYNAMIC TRACTION
## GROUP J RUN NO. 7
## 2 WHEEL DRIVE
## FIGURE NO. 43

Location: SQUAW VALLEY, CALIF.

Date: 11-5/6-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°
SURF. TEMP. RANGE 25°




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

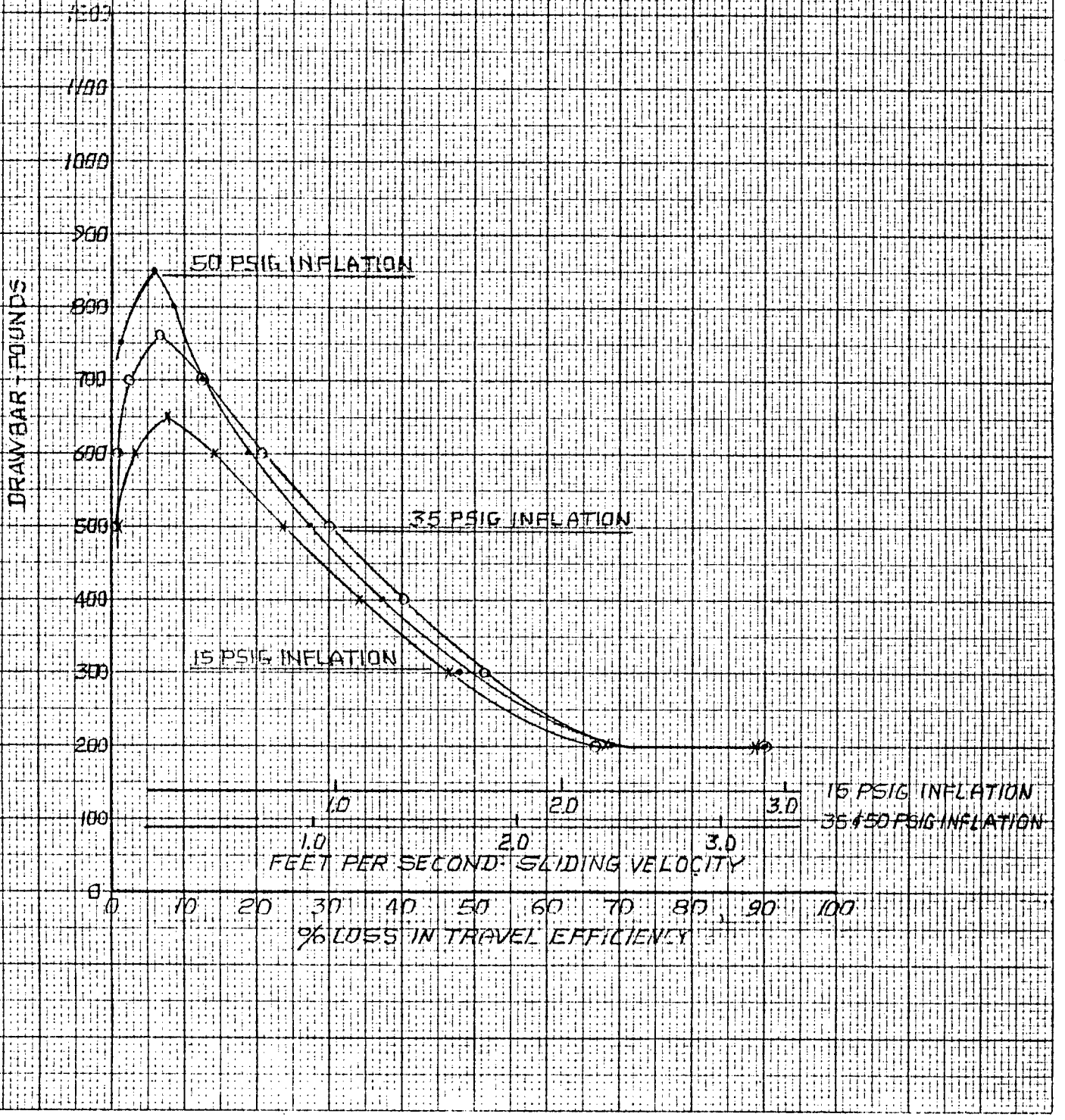
# DYNAMIC TRACTION
## TIRE
## GROUP G RUN NO. 8
## 2WHEEL DRIVE
## FIGURE NO. 44

Location: SQUAW VALLEY, CALIF

Date: 11-6-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°F
SURF. TEMP. RANGE 24°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

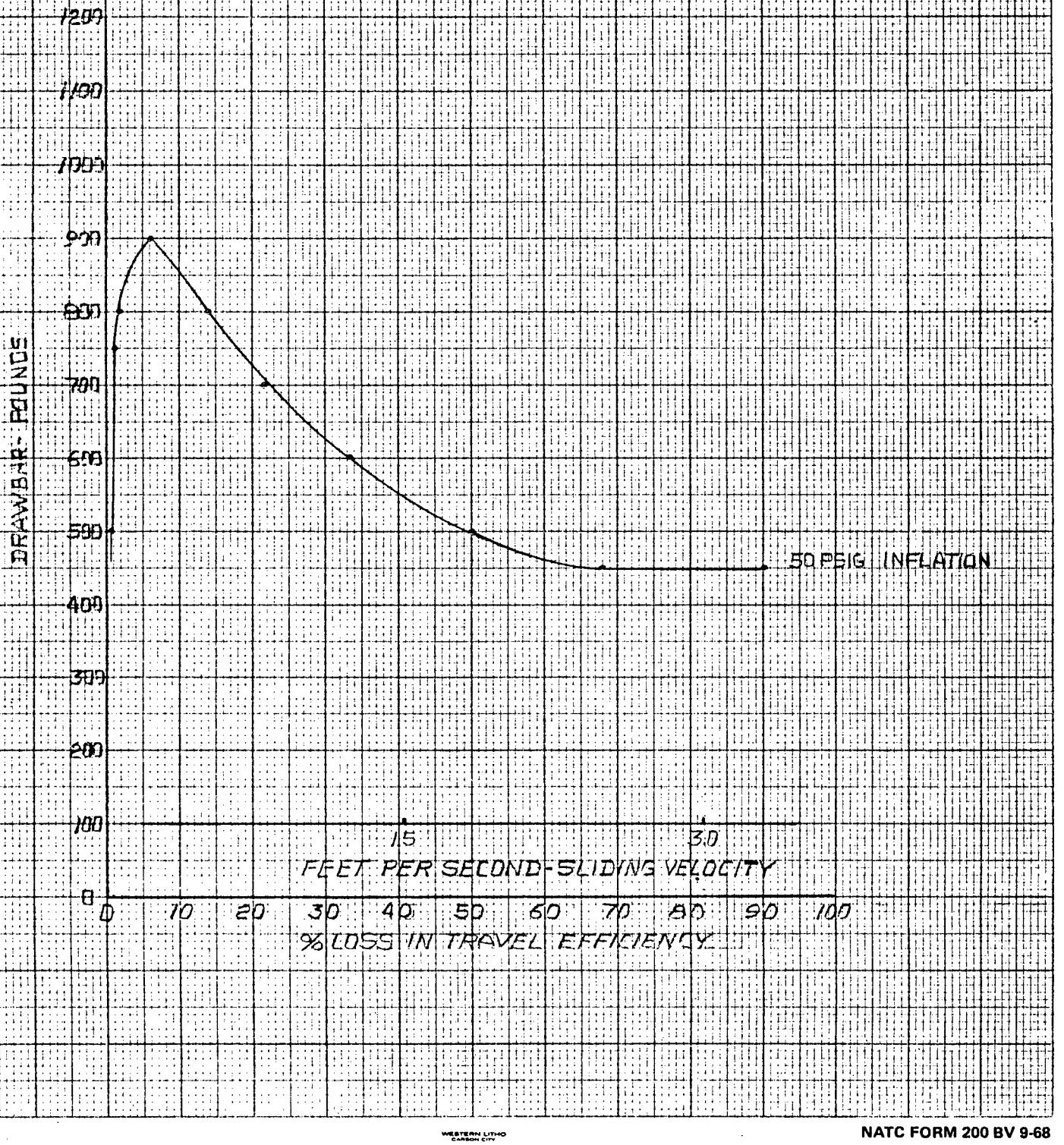
# DYNAMIC TRACTION
## DRY ICE
GROUP: C RUN NO. 9
2 WHEEL DRIVE
FIGURE NO. 45

Location: SQUAW VALLEY, CALIF.

Date: 11-6-73 Test By: WHS

Data By: WHS

AMBIENT TEMP. 39°F
SURFACE TEMP. 25°F




WESTERN LITHO CARSON CITY

TEST DATA

Figure No. 46

Rolling Resistance - Dry Ice

Nevada Automotive Test Center

Project: 20-17-30

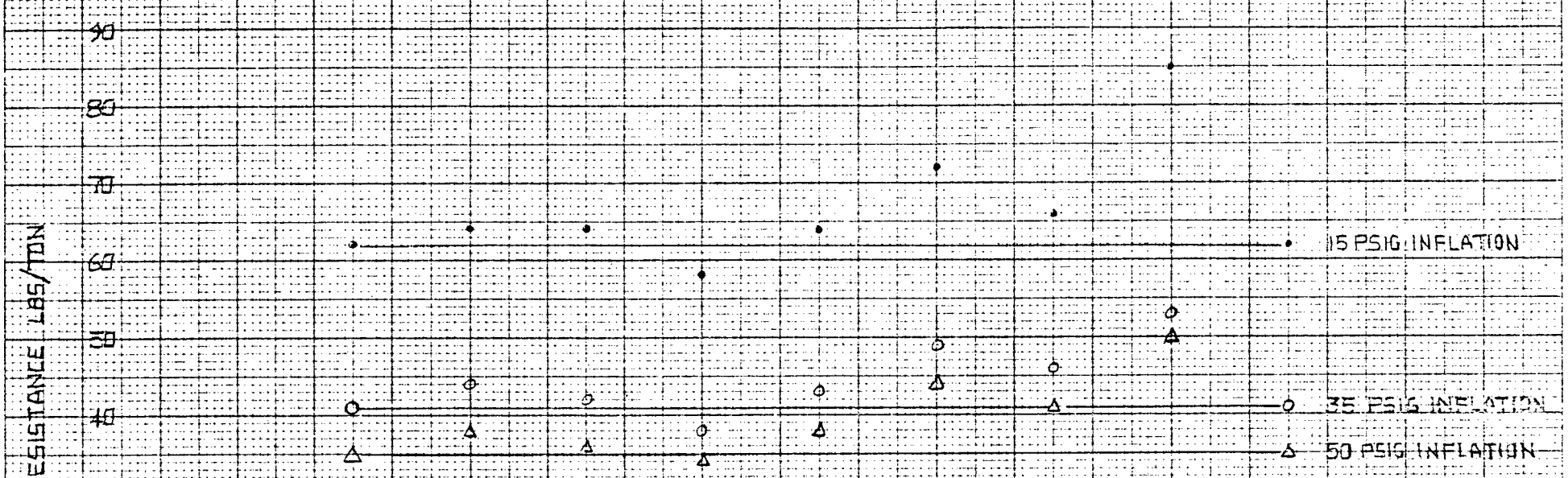
# ROLLING RESISTANCE
## DRY ICE
## 5 MPH

FIGURE NO. 46

Location: SQUAW VALLEY, CAL.

Date: 11-5/6-73 Test By: WHS

Data By: WHS




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 15 PSIG | 100 | 97 | 97 | 107 | 97 | 86 | 94 | 73 | 100 |
| RATING @ 35 PSIG | 100 | 93 | 98 | 108 | 95 | 84 | 89 | 77 | 100 |
| RATING @ 50 PSIG | 100 | 92 | 97 | 103 | 92 | 80 | 85 | 70 | 100 |
| AVE. LBS/TON @ 15 PSIG | 62 | 64 | 64 | 58 | 64 | 72 | 66 | 85 | 62 |
| AVE. LBS/TON @ 35 PSIG | 41 | 44 | 42 | 38 | 43 | 49 | 46 | 53 | 41 |
| AVE. LBS/TON @ 50 PSIG | 35 | 38 | 36 | 34 | 38 | 44 | 41 | 50 | 35 |
| CODE | L | A | S | D | E | F | G | J | L |
| AMB. °F | 38 | 38 | 39 | 39 | 38 | 39 | 39 | 39 | 39 |
| SURF. °F | 23 | 24 | 24 | 24 | 23 | 24 | 24 | 25 | 25 |

WESTERN LITHO CARSON CITY

TEST DATA

Figure No. 47

Dynamic Traction Summary - Virgin Snow

Nevada Automotive Test Center

Project: 20-17-30

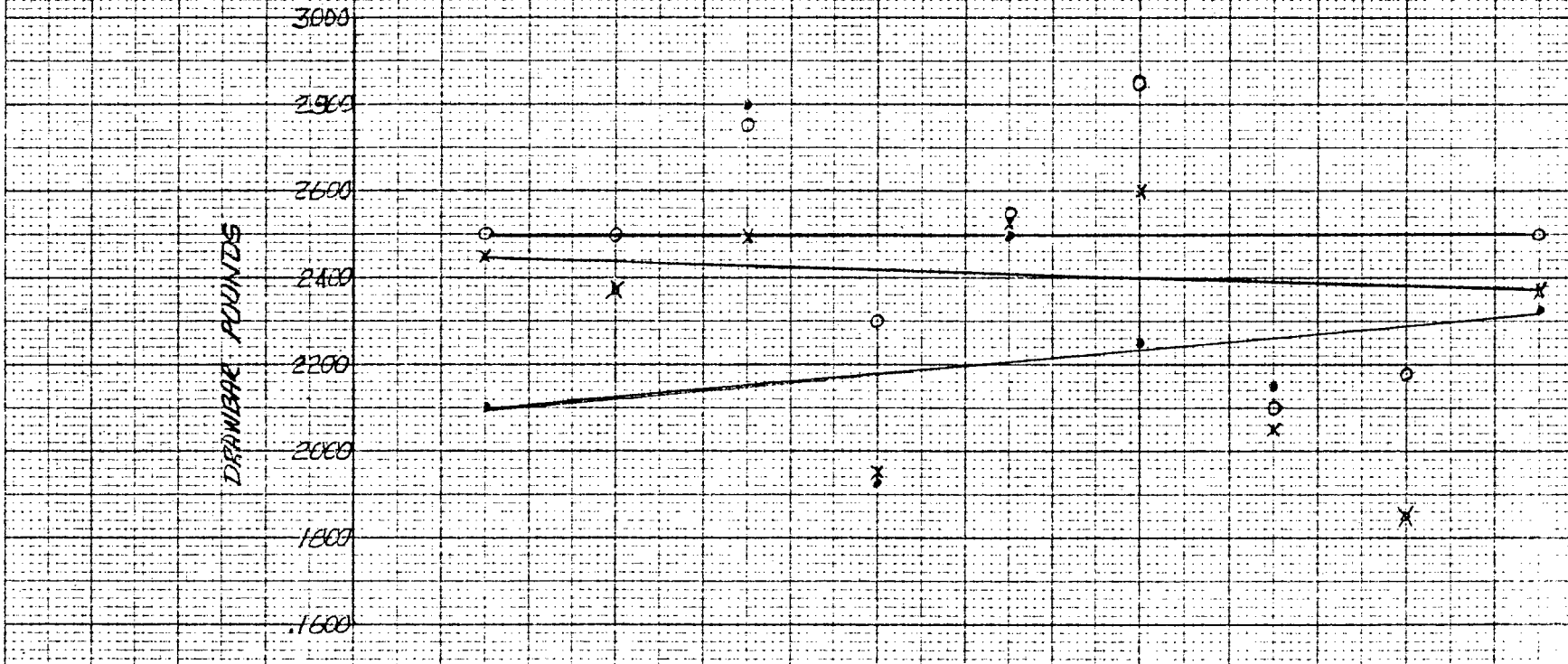
# DYNAMIC TRACTION
## VIRGIN SNOW
## 4 WHEEL DRIVE
## FIGURE NO. 47

Location: WEST YELLOWSTONE

Date: 2-8/9-73 Test By: GS

Data By: JED

MOISTURE CONTENT: 14-17%




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 50 PSIG | | 100 | 109 | 132 | 88 | 113 | 100 | 95 | 81 | 100 |
| RATING @ 35 PSIG | | 100 | 91 | 103 | 81 | 105 | 108 | 86 | 78 | 100 |
| RATING @ 15 PSIG | | 150 | 100 | 110 | 108 | 102 | 114 | 84 | 87 | 100 |
| AVE. DB LBS @ 50 PSIG | • | 2100 | 2375 | 2800 | 1925 | 2500 | 2250 | 2150 | 1850 | 2325 |
| AVE. DB LBS @ 35 PSIG | X | 2450 | 2375 | 2500 | 1950 | 2525 | 2600 | 2050 | 1850 | 2375 |
| AVE. DB LBS @ 15 PSIG | O | 2500 | 2500 | 2750 | 2300 | 2550 | 2850 | 2100 | 2175 | 2500 |
| CODE | | C | A | B | D | E | F | G | J | C |
| AMB. TEMP °F | | 16 | 0 | 9 | 11 | 11 | 19 | 25 | 20 | 20 |
| SNOW TEMP °F | | 21 | 10 | 6 | 10 | 10 | 18 | 21 | 21 | 22 |

WESTERN LITHO CARSON CITY

TEST DATA

Figures 48 through 56

Dynamic Traction - Virgin Snow

Nevada Automotive Test Center

Project: 20-17-30

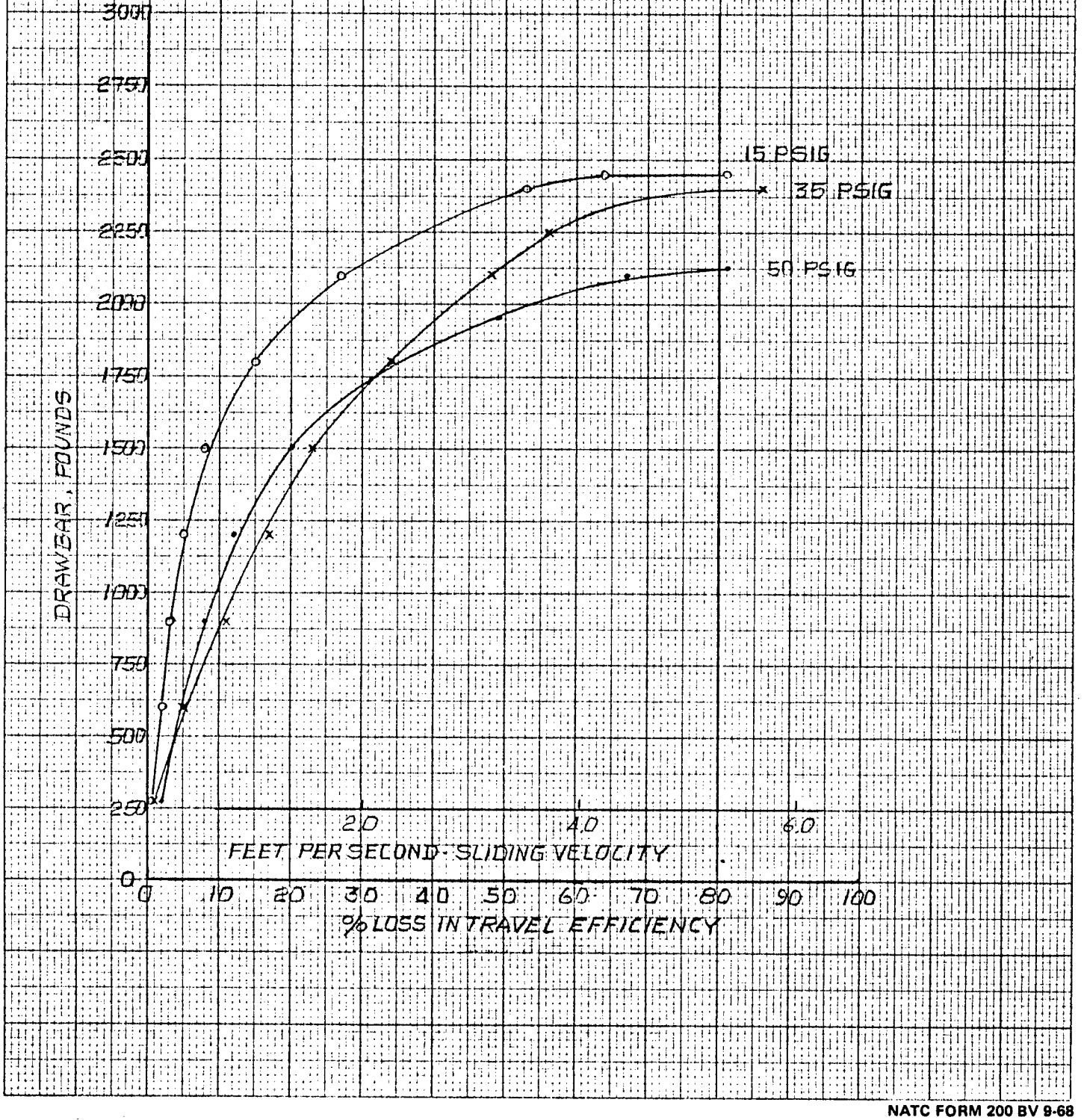
# DYNAMIC TRACTION
## VIRGIN SNOW
### GROUPE C RUN NO.1
### FIGURE NO. 48

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

FIRST RUN
4 WHEEL DRIVE
AMB. TEMP. 16°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

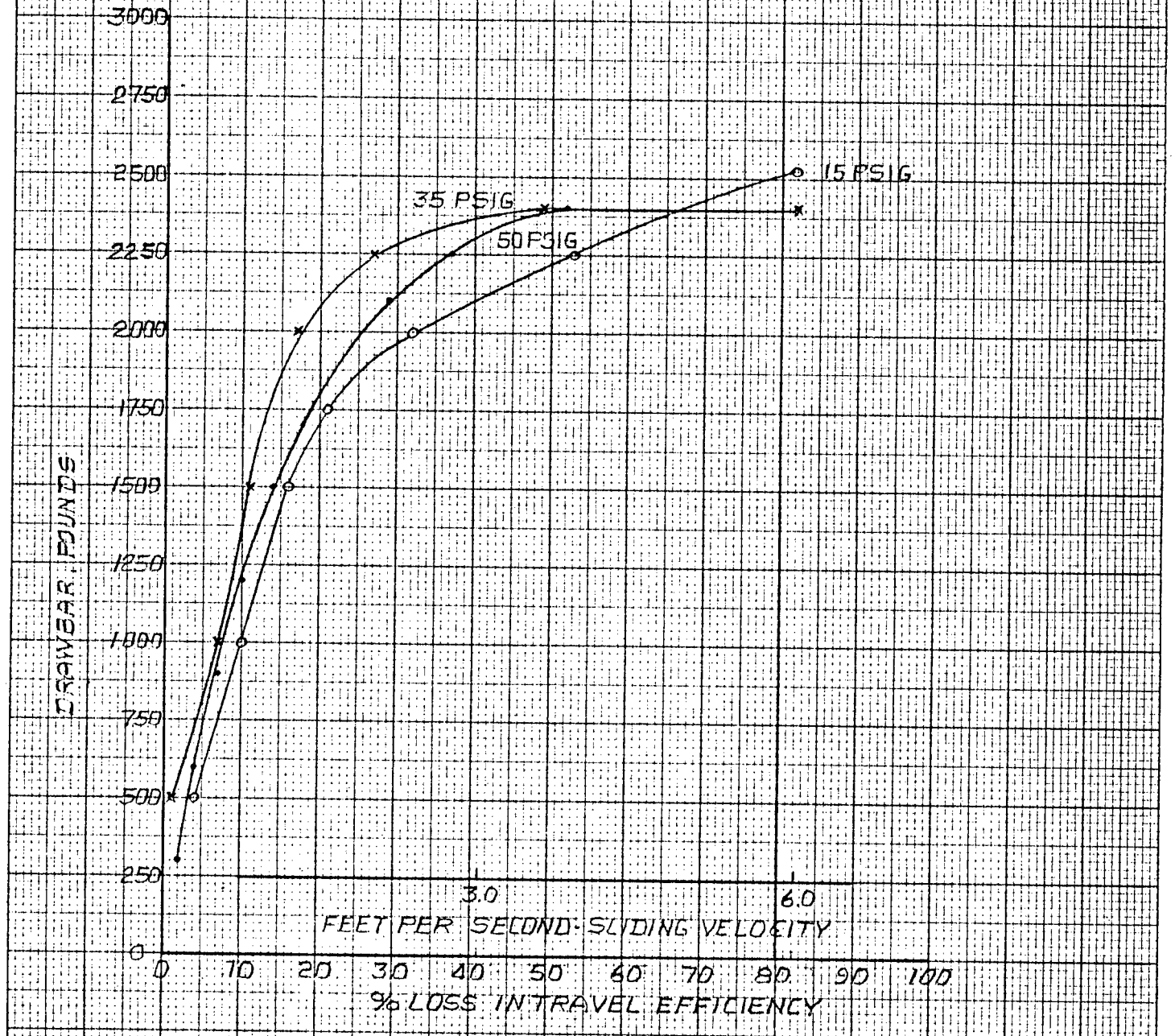
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP A RUN NO. 2
## FIGURE NO. 49

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 0°F
SNOW TEMP. 10°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-11-30

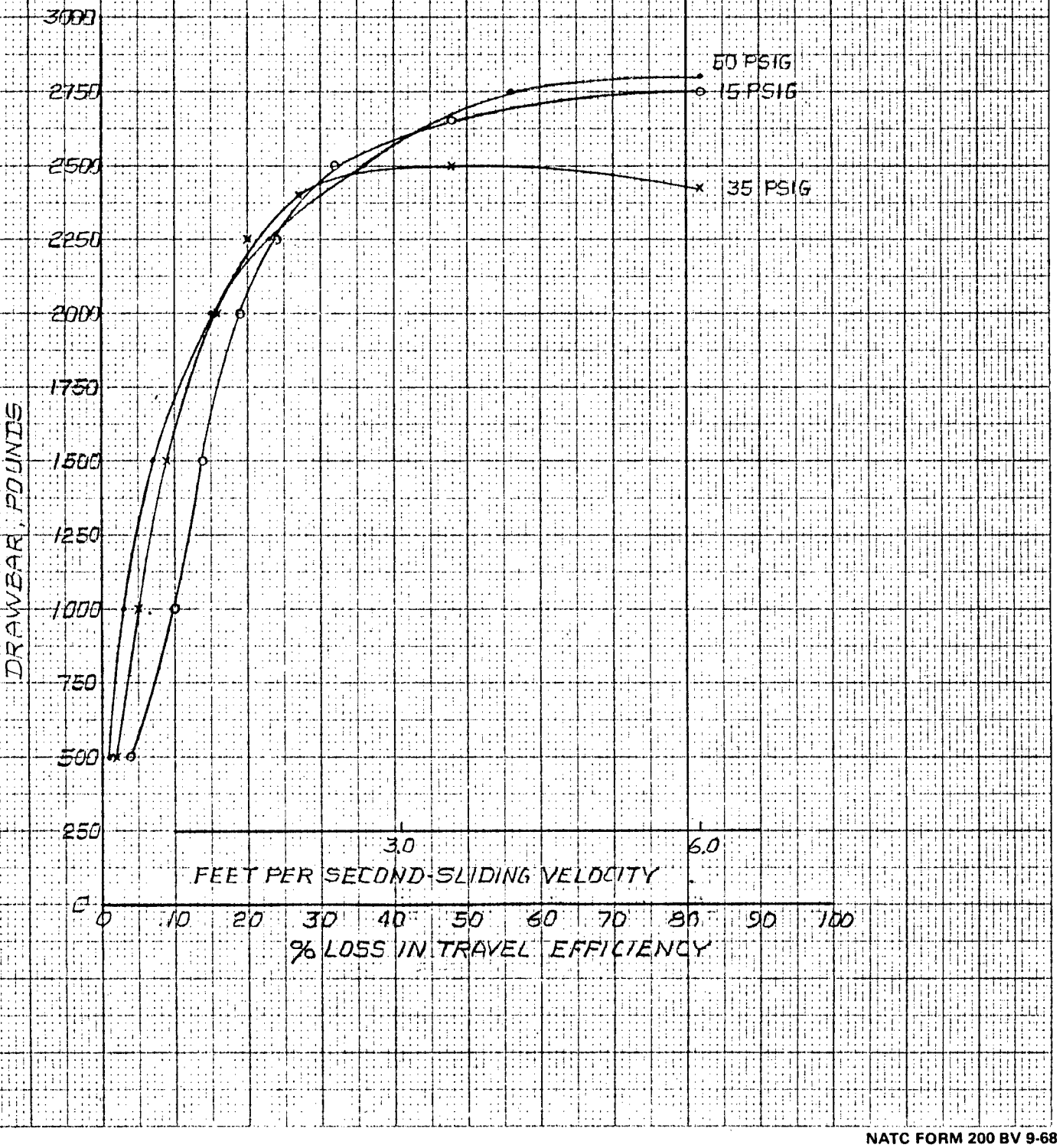
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP B RUN NO. 3
## FIGURE NO. 50

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 9°F
SNOW TEMP. 6°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

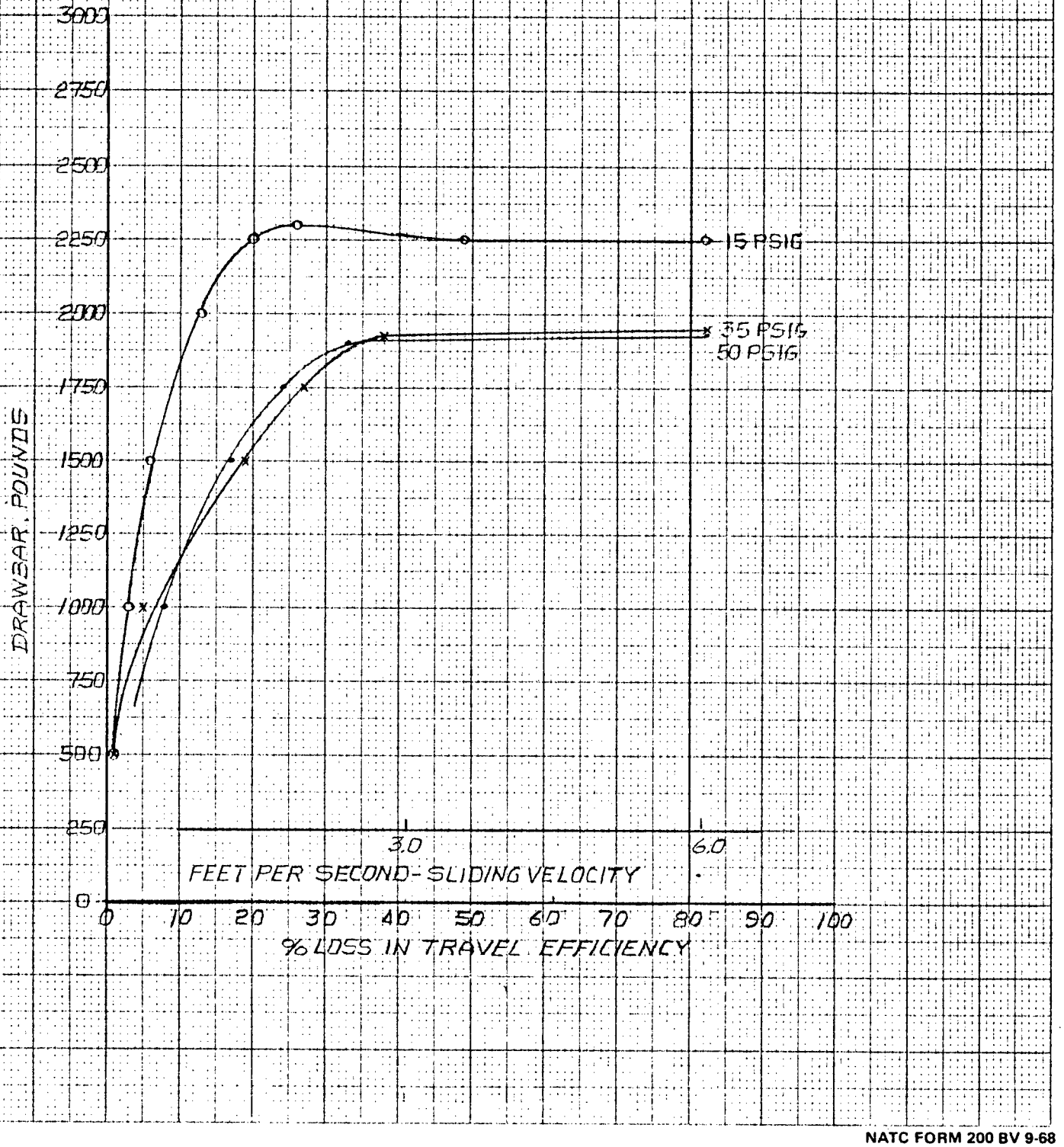
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP D RUN NO. 4
## FIGURE NO. 51

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP. 10°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

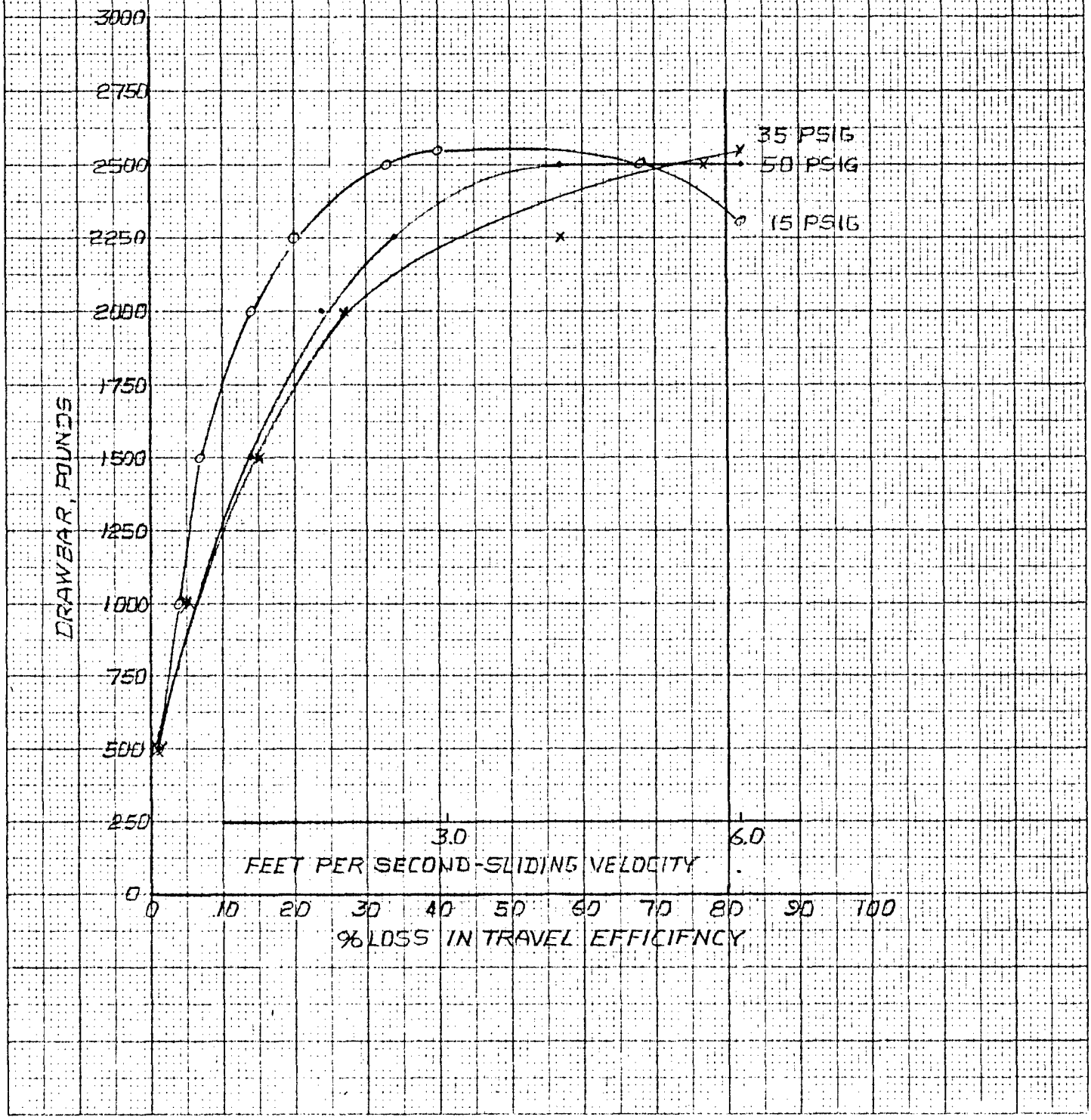
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP E RUN NO. 5
## FIGURE NO. 52

Location: WEST YELLOWSTONE

Date: 2-8/9-73 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP. 10°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

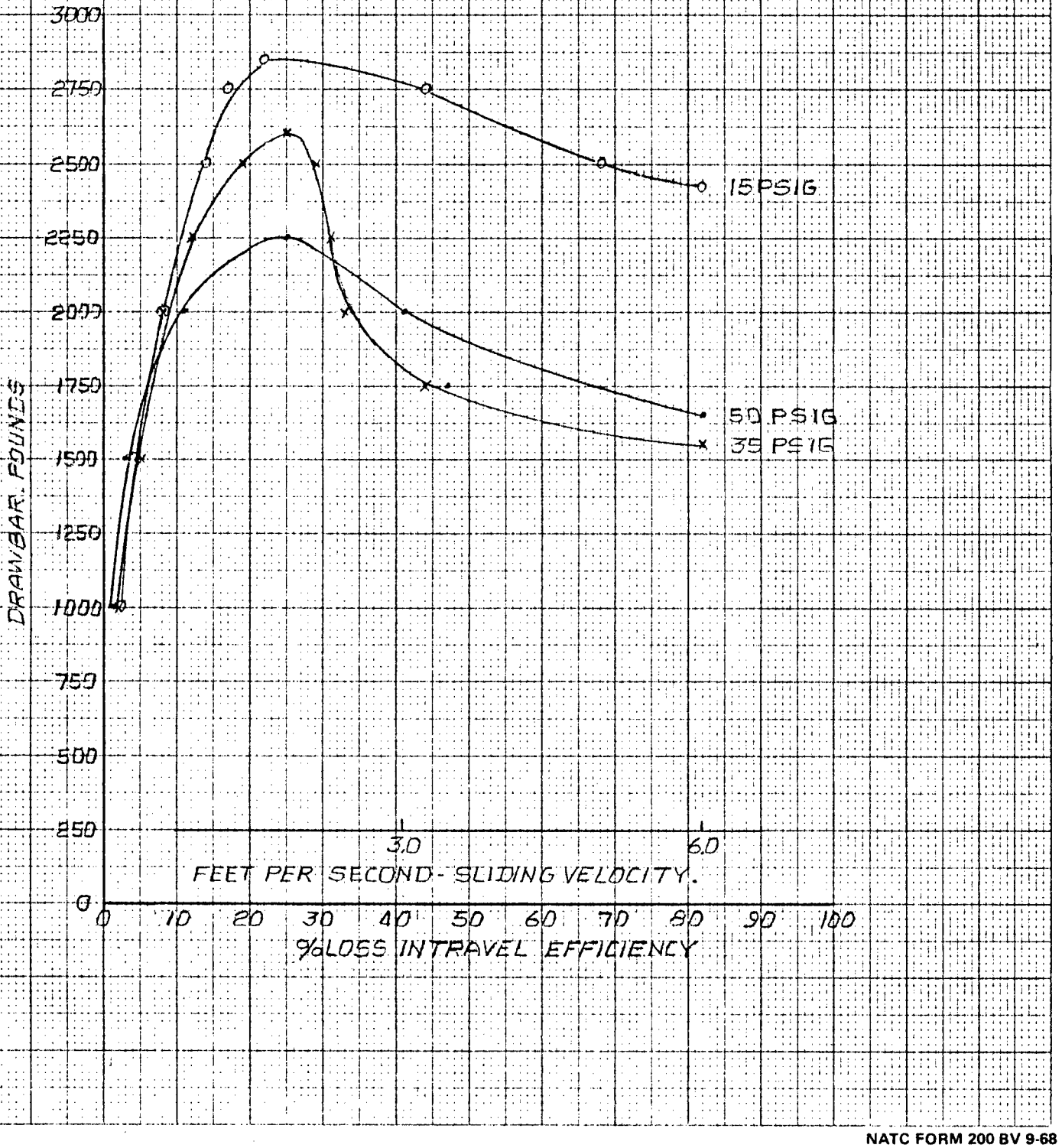
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP F RUN NO. 6
## FIGURE NO. 53

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: TED

4WHEEL DRIVE
AMB. TEMP. 19°F
SNOW TEMP. 18°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

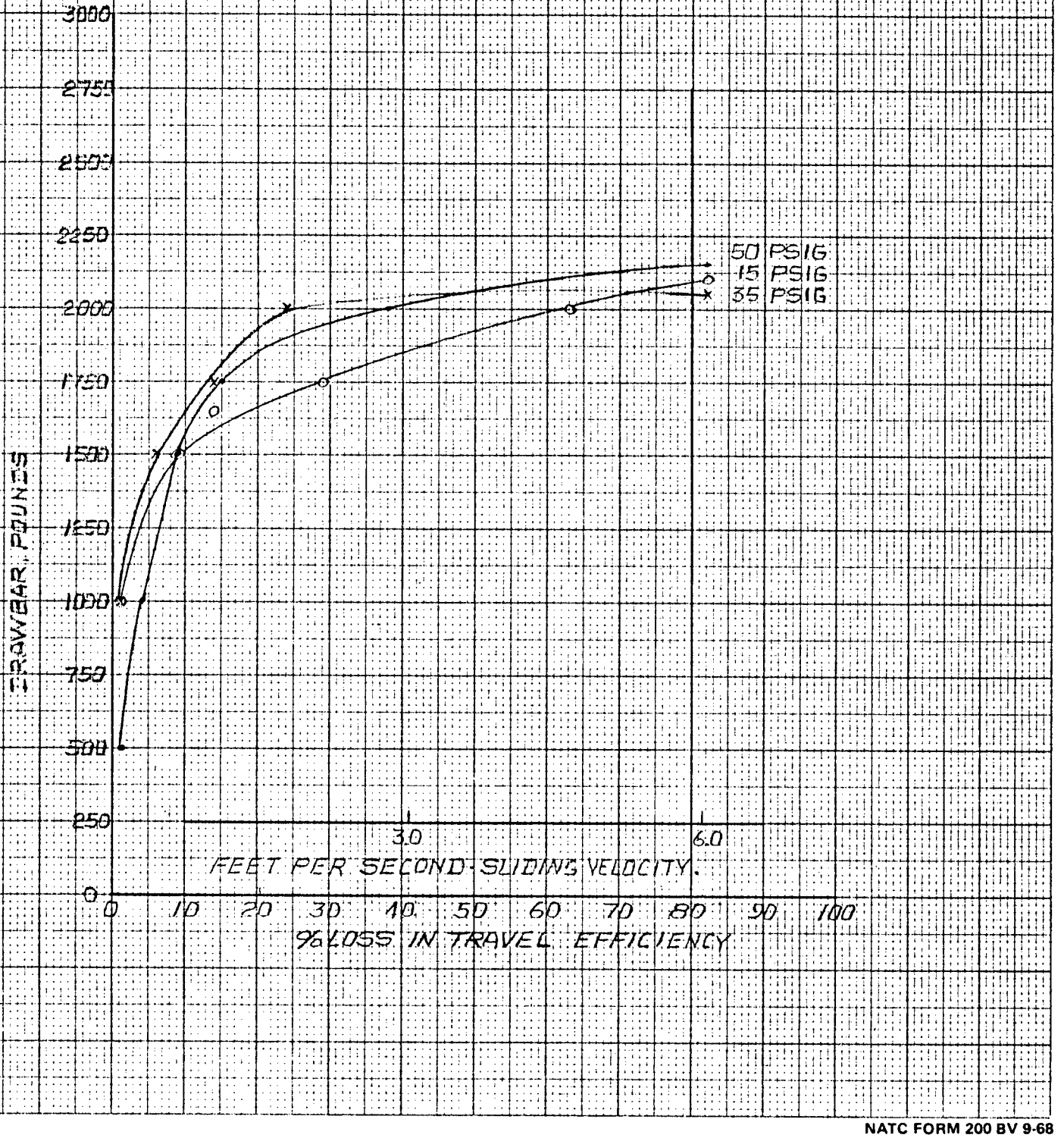
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP 6 RUN NO. 7
## FIGURE NO. 54

Location: WEST YELLOWSTONE

Date: 2-3/5-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 25°F
SNOW TEMP. 21°F
MOISTURE CONTENT: M-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

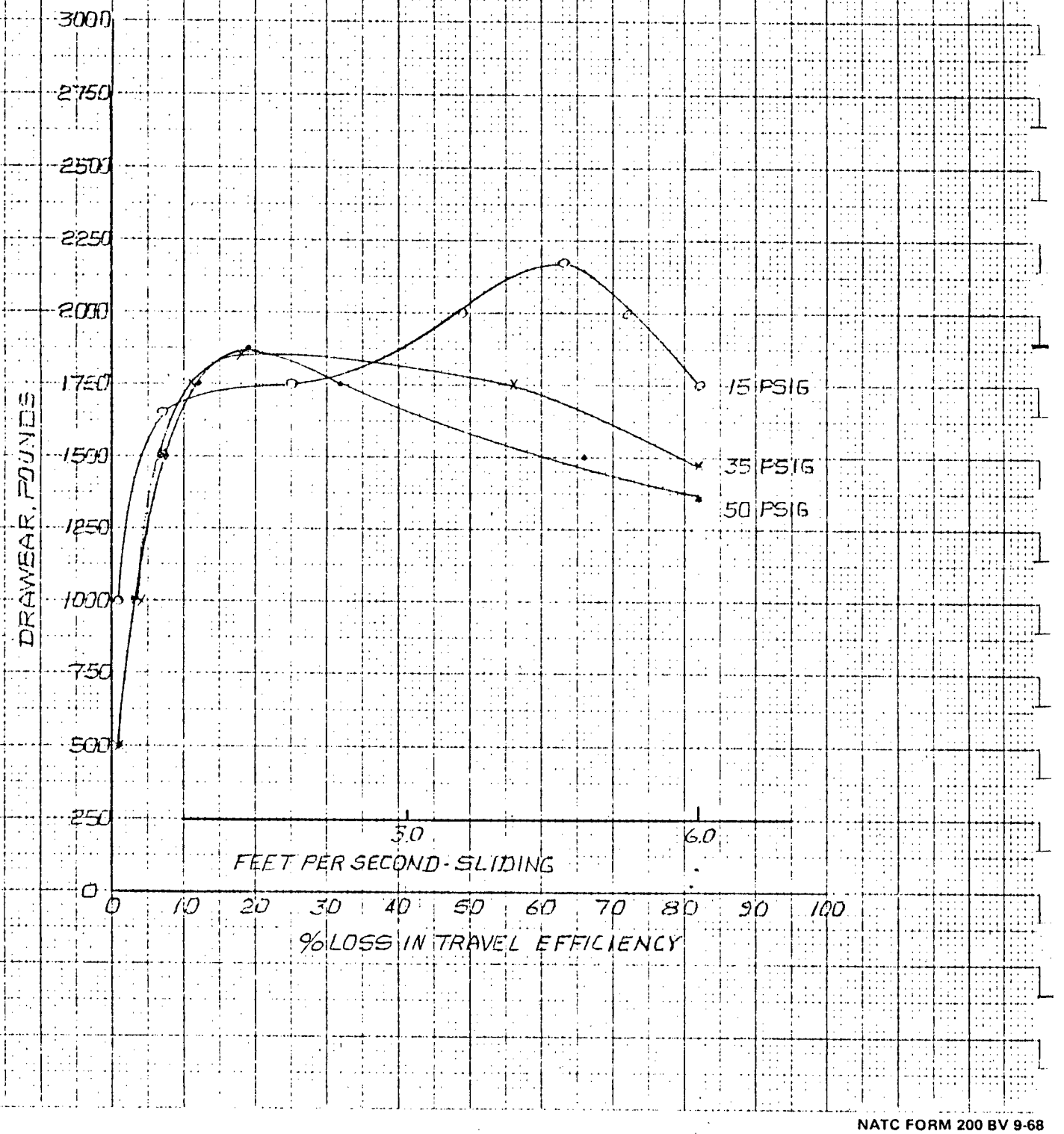
# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP J RUN NO. 8
## FIGURE NO. 55

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 20°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: E0-17-30

# DYNAMIC TRACTION
## VIRGIN SNOW
## GROUP C RUN NO. 9
## FIGURE NO. 56

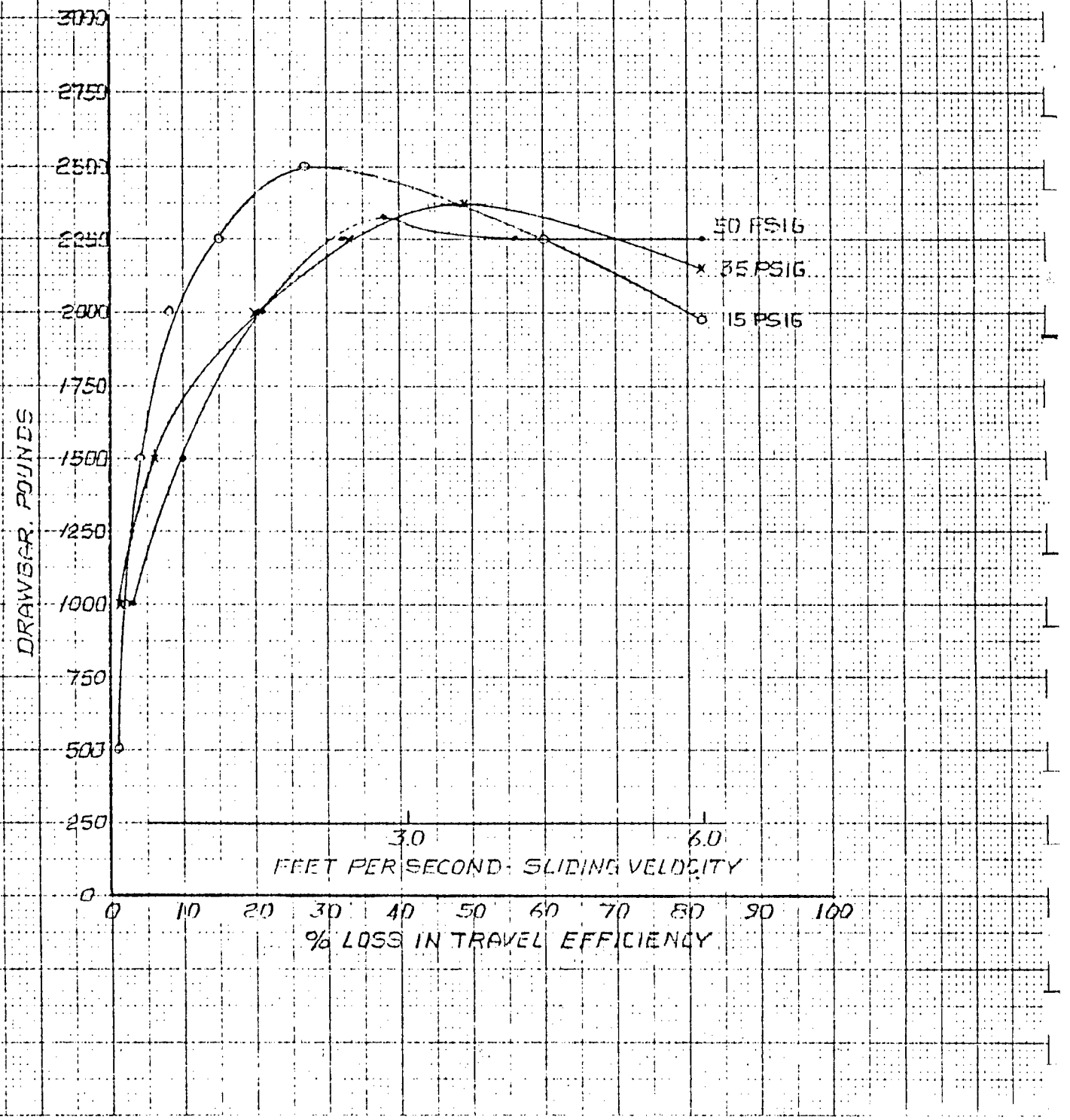
Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

SECOND RUN

4 WHEEL DRIVE
AMB. TEMP. 20°F
SNOW TEMP. 22°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

TEST DATA

Figure No. 57

Rolling Resistance - Virgin Snow

Nevada Automotive Test Center

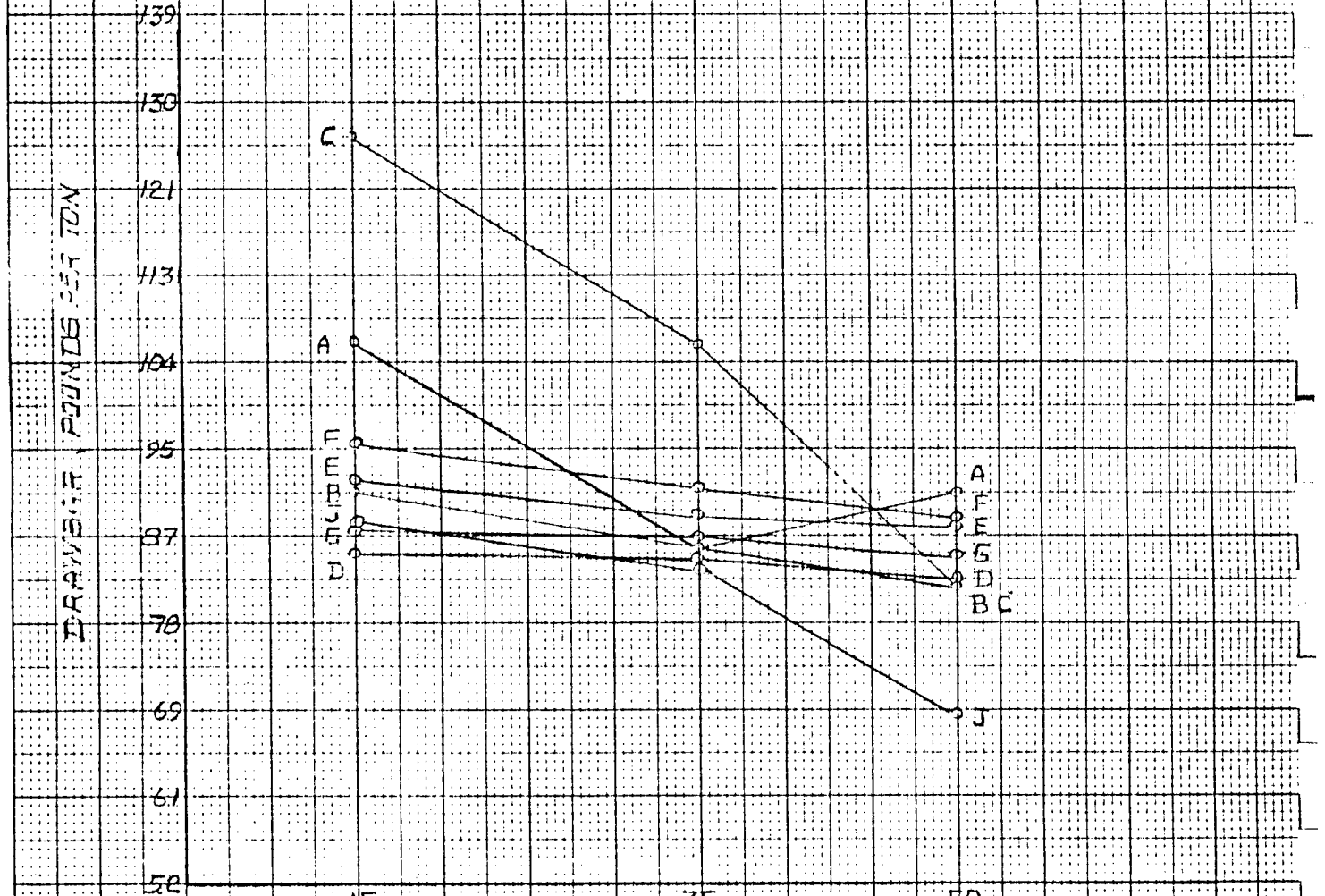
Project: 20-17-30

# ROLLING RESISTANCE
## VIRGIN SNOW
## FIGURE NO. 57

Location: WEST YELLOWSTONE

Date: 2-8/9-71 Test By: GS

Data By: JED




| GROUP | POUNDS PER TON | % | POUNDS PER TON | % | POUNDS PER TON | % |
|---|---|---|---|---|---|---|
| C | 127 | 100 | 104 | 100 | 91 | 100 |
| A | 104 | 116 | 83 | 119 | 91 | 88 |
| F | 91 | 128 | 86 | 119 | 91 | 100 |
| D | 85 | 133 | 85 | 120 | 82 | 85 |
| E | 92 | 127 | 89 | 114 | 89 | 92 |
| F | 96 | 124 | 92 | 113 | 89 | 91 |
| G | 87 | 131 | 84 | 118 | 85 | 96 |
| J | 89 | 131 | 84 | 121 | 69 | 115 |

WESTERN LITHO CARSON CITY

TEST DATA

Figure No. 58

Dynamic Traction Summary - Hard Pack Show

Nevada Automotive Test Center

Project: 20-17-30

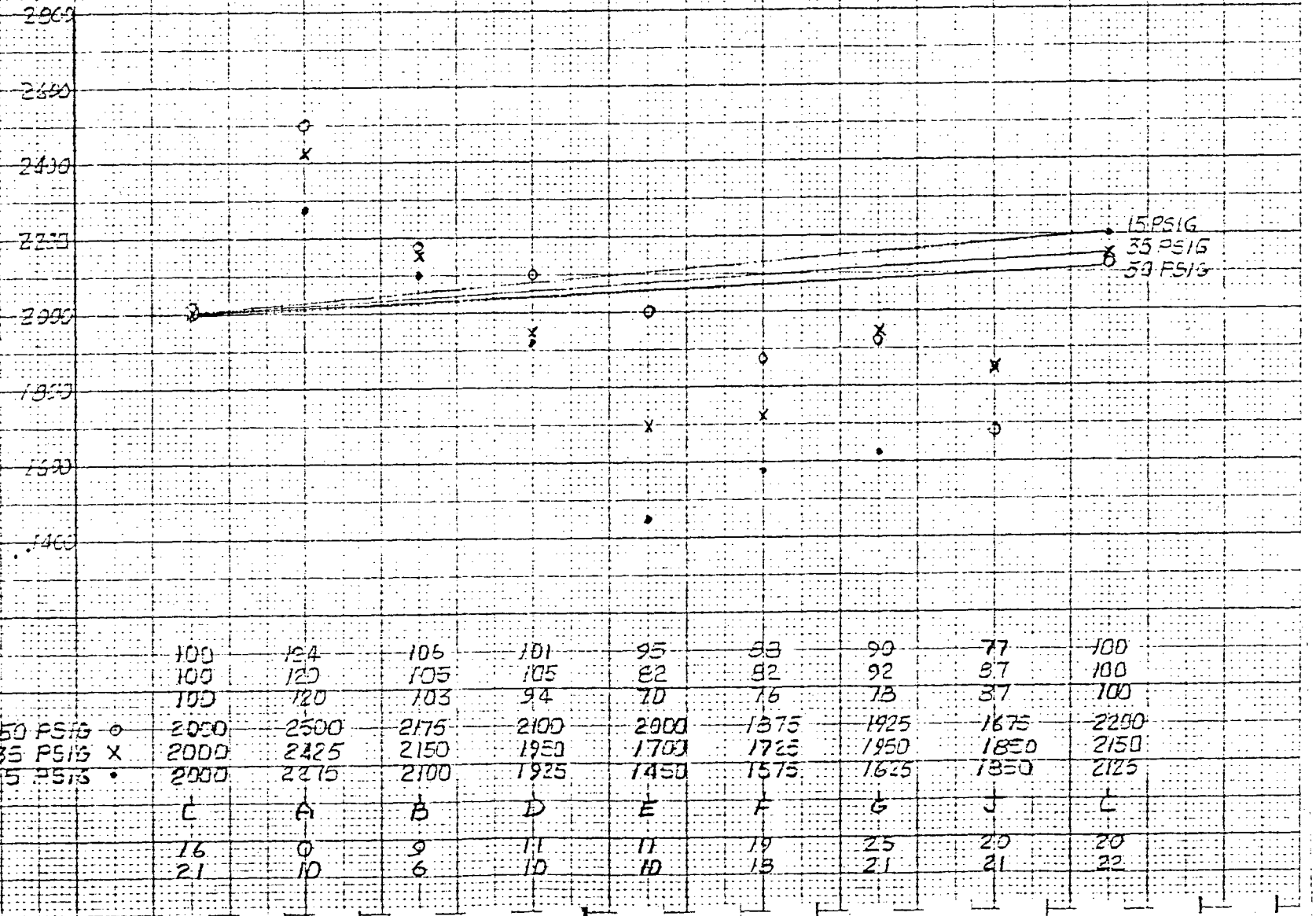
# DYNAMIC TRACTION
## HARD PACK SNOW
## 4 WHEEL DRIVE
## FIGURE NO. 58

Location: WEST YELLOWSTONE

Date: 2-8/9-73 Test By: GE

Data By: JED

MOISTURE CONTENT: 14-17 %




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 50 PSIG | 100 | 124 | 106 | 101 | 95 | 88 | 90 | 77 | 100 |
| RATING @ 35 PSIG | 100 | 120 | 105 | 105 | 82 | 82 | 92 | 87 | 100 |
| RATING @ 15 PSIG | 100 | 120 | 103 | 94 | 70 | 76 | 78 | 87 | 100 |
| AVE. DB LBS @ 50 PSIG ○ | 2050 | 2500 | 2175 | 2100 | 2000 | 1875 | 1925 | 1675 | 2200 |
| AVE. DB LBS @ 35 PSIG X | 2000 | 2425 | 2150 | 1950 | 1700 | 1725 | 1950 | 1850 | 2150 |
| AVE. DB LBS @ 15 PSIG • | 2000 | 2275 | 2100 | 1925 | 1450 | 1575 | 1625 | 1850 | 2125 |
| CODE | C | A | B | D | E | F | G | J | C |
| AMB. TEMP °F | 16 | 0 | 9 | 11 | 11 | 19 | 25 | 20 | 20 |
| SNOW TEMP °F | 21 | 10 | 6 | 10 | 10 | 15 | 21 | 21 | 22 |

TEST DATA

Figure Nos. 59 through 67

Dynamic Traction - Hard Pack Snow

Nevada Automotive Test Center

Project: 20-17-30

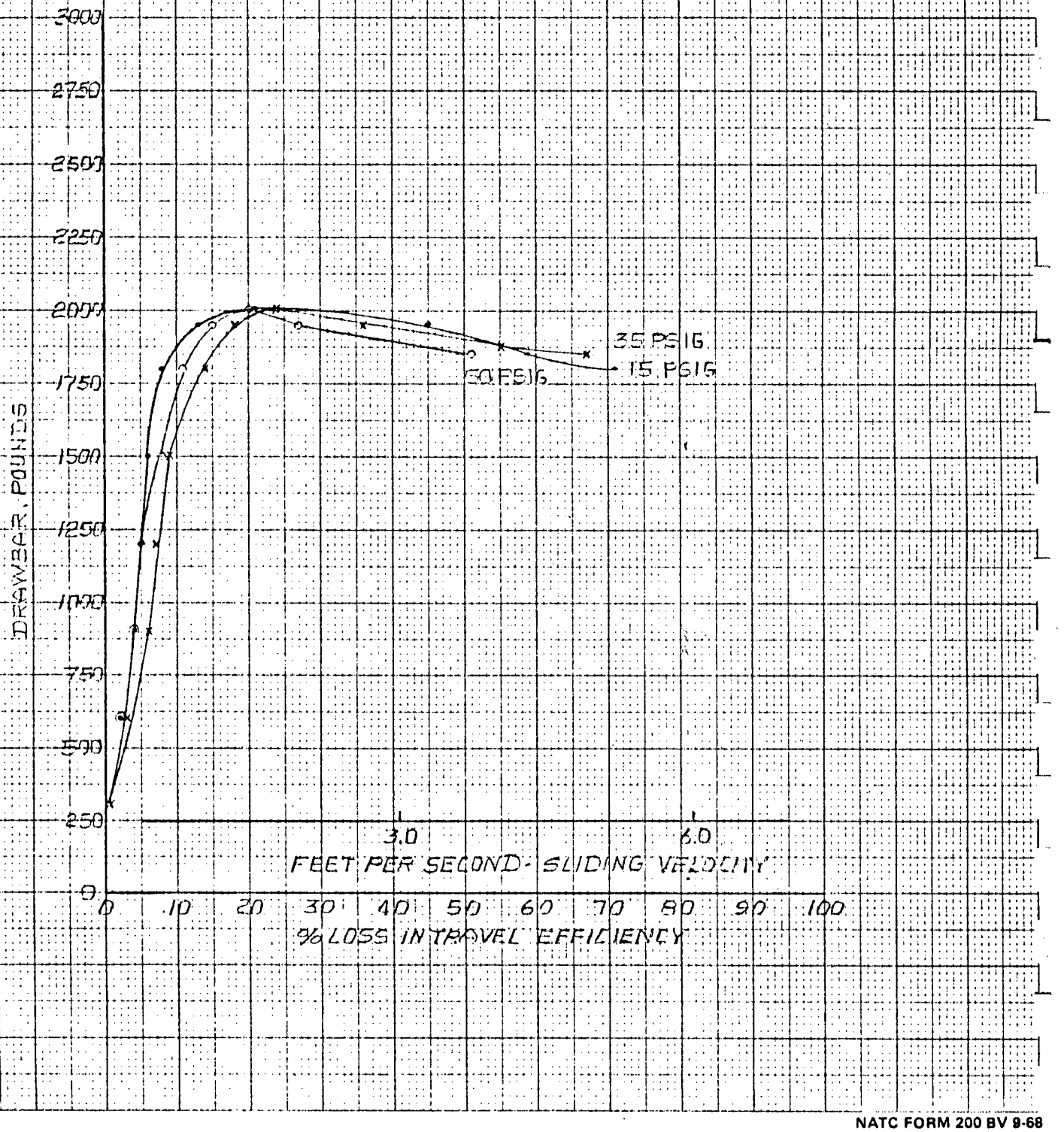
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP C - RUN NO. 1
## FIGURE NO. 59

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

FIRST RUN
4 WHEEL DRIVE
AMB. TEMP. 16°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

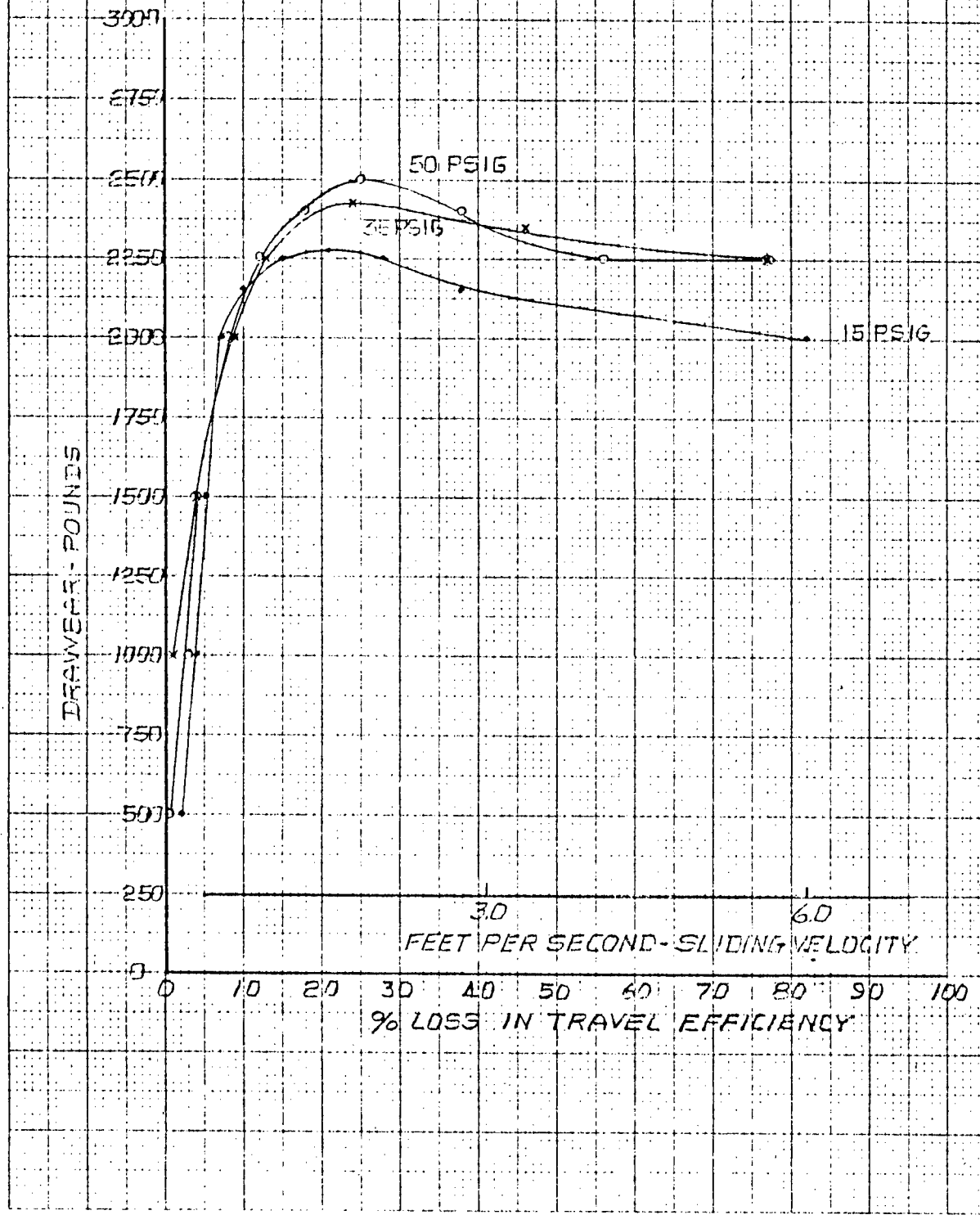
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP 4 RUN NO. 2
## FIGURE NO. 60

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JEO

4 WHEEL DRIVE
AMB. TEMP. 0°F
SNOW TEMP. 10°F
MOISTURE CONTENT 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

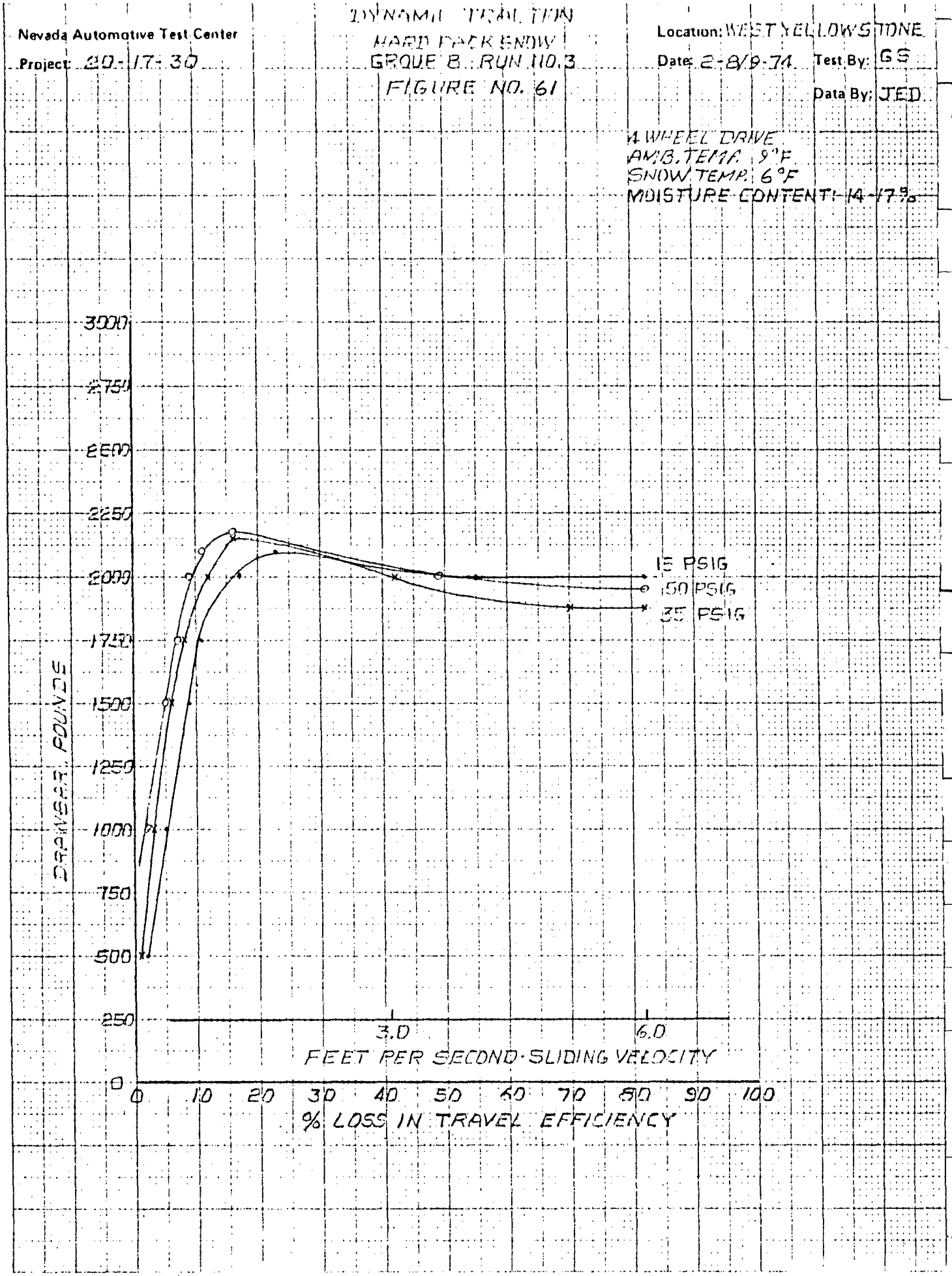
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP B RUN NO. 3
## FIGURE NO. 61

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 9°F
SNOW TEMP. 6°F
MOISTURE CONTENT 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-39

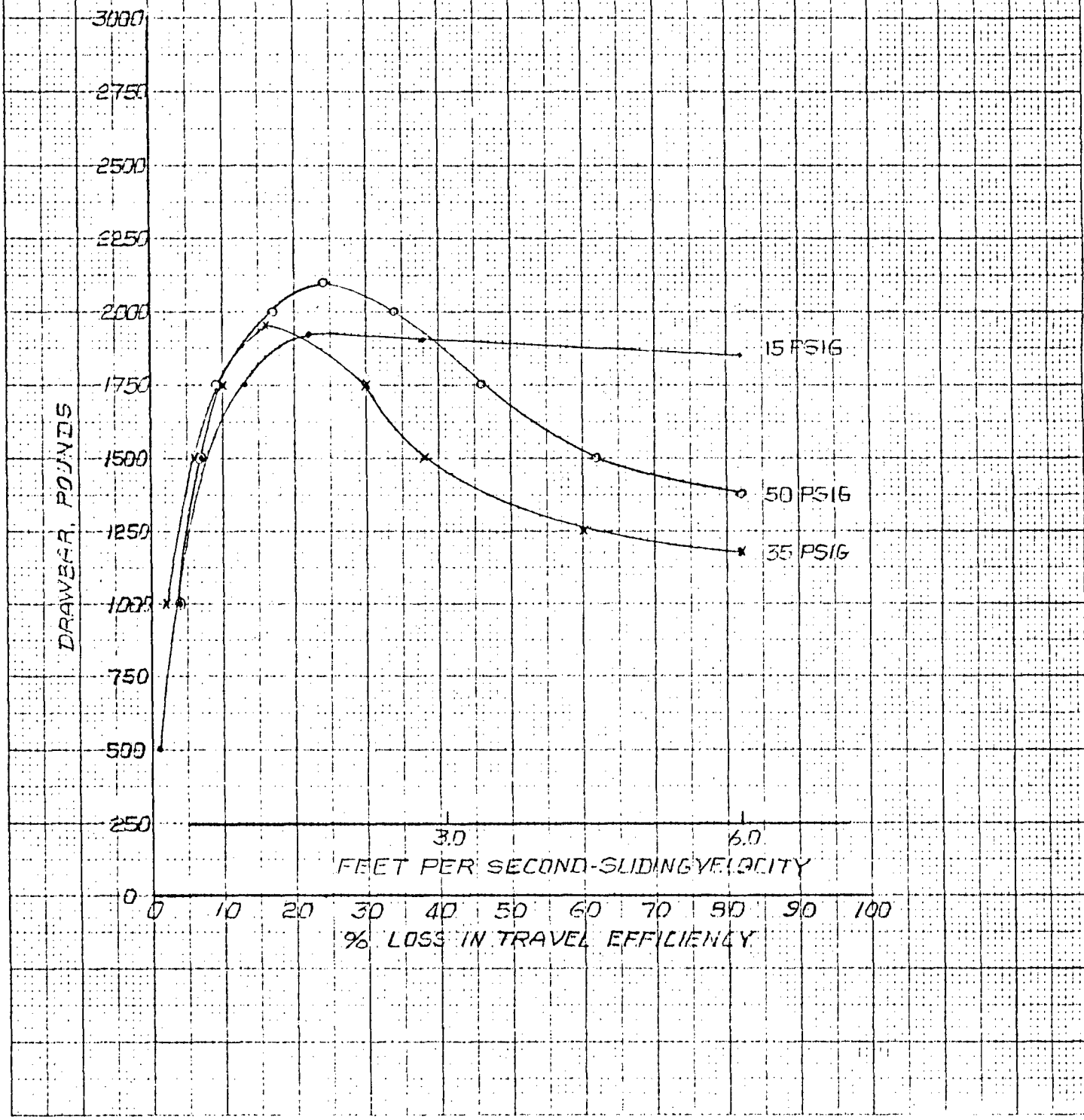
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP D - RUN NO. 4
## FIGURE NO. 62

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

AWHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP. 10°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

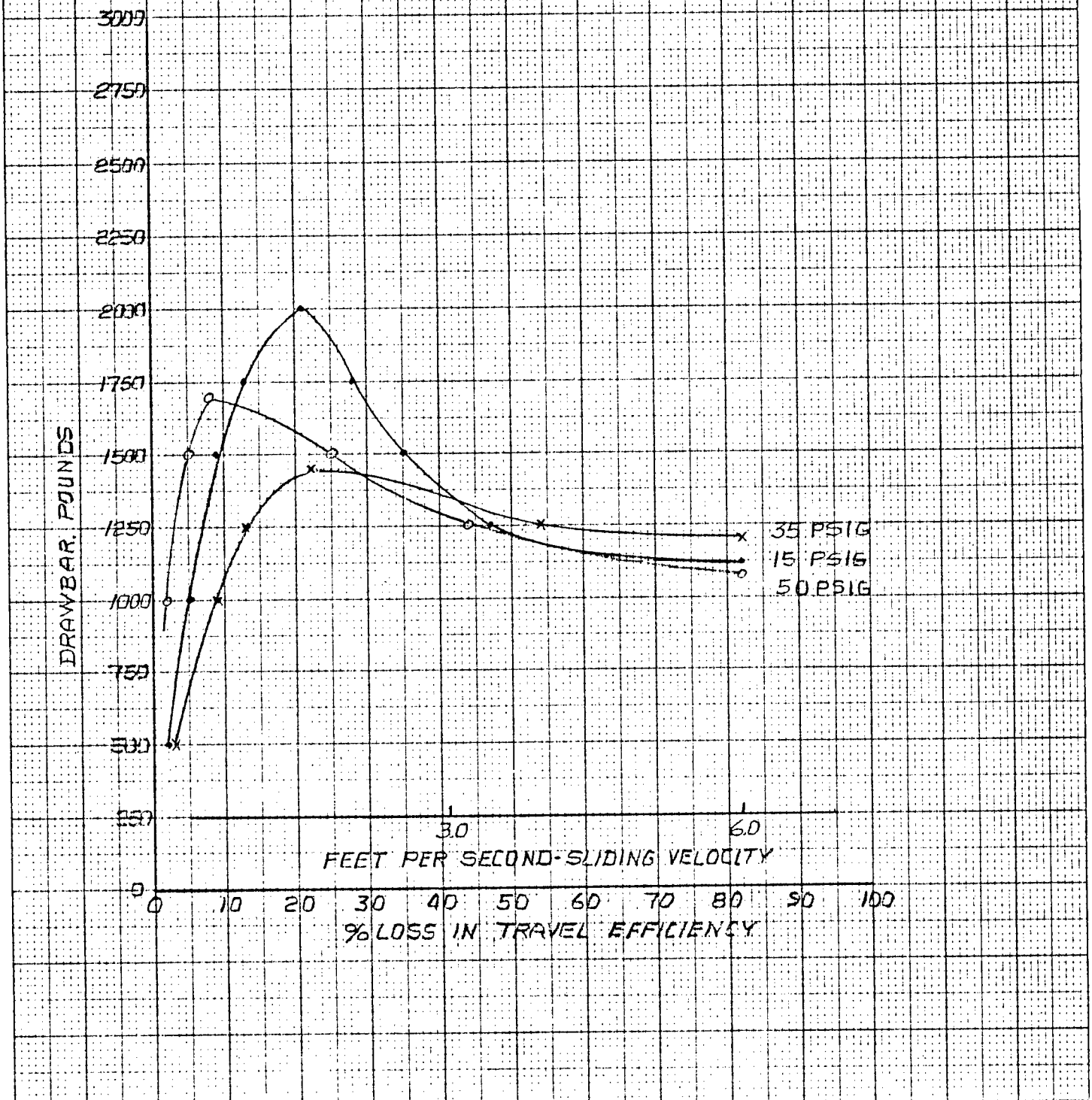
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP E RUN NO. 5
## FIGURE NO. 63

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP 10°F
MOISTURE CONTENT 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

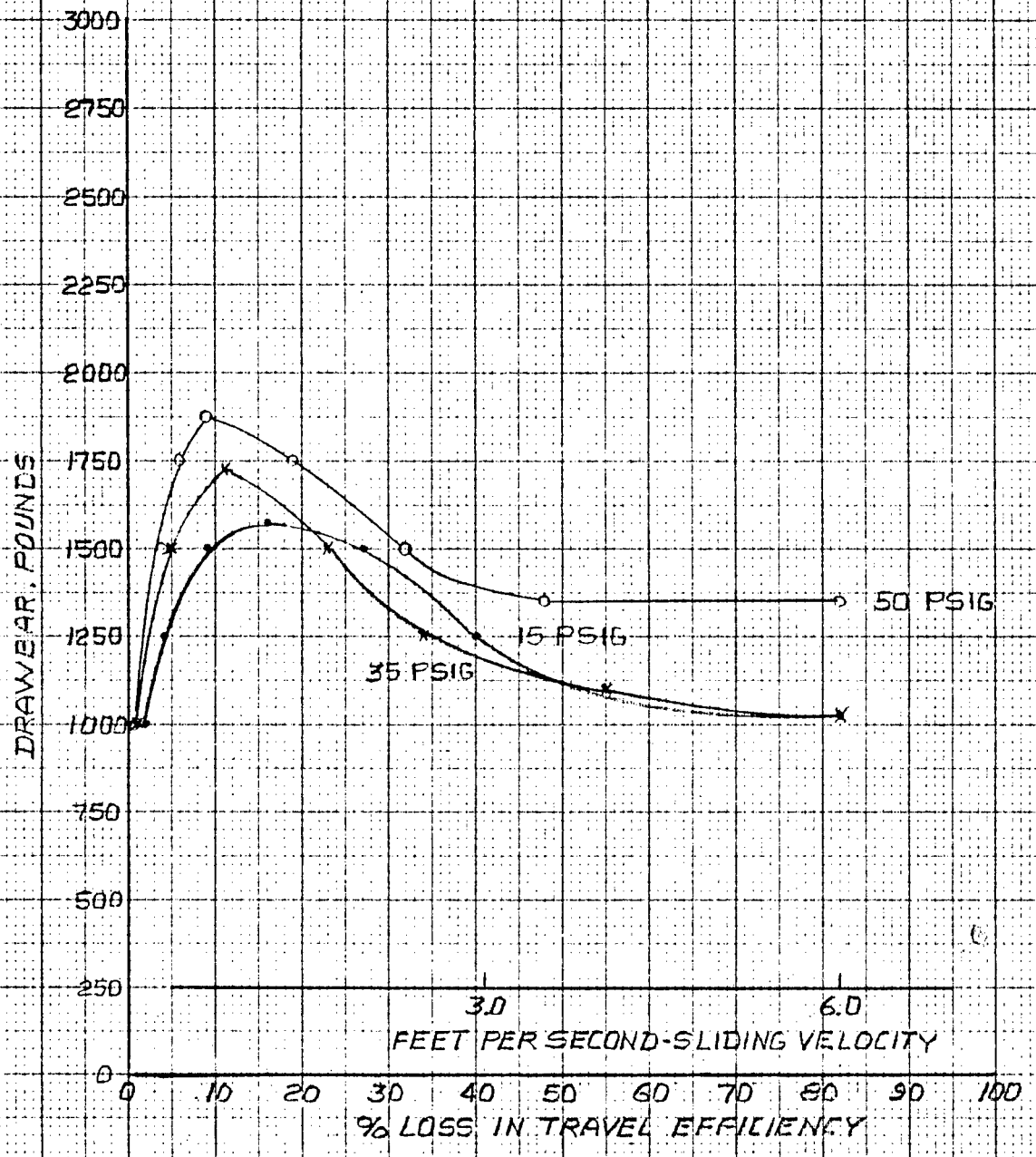
# DYNAMIC TRACTION
## HARE PACK SNOW
## GROUP F RUN NO. 6
## FIGURE NO. 64

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 19°F
SNOW TEMP. 18°F
MOISTURE CONTENT: 14.17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

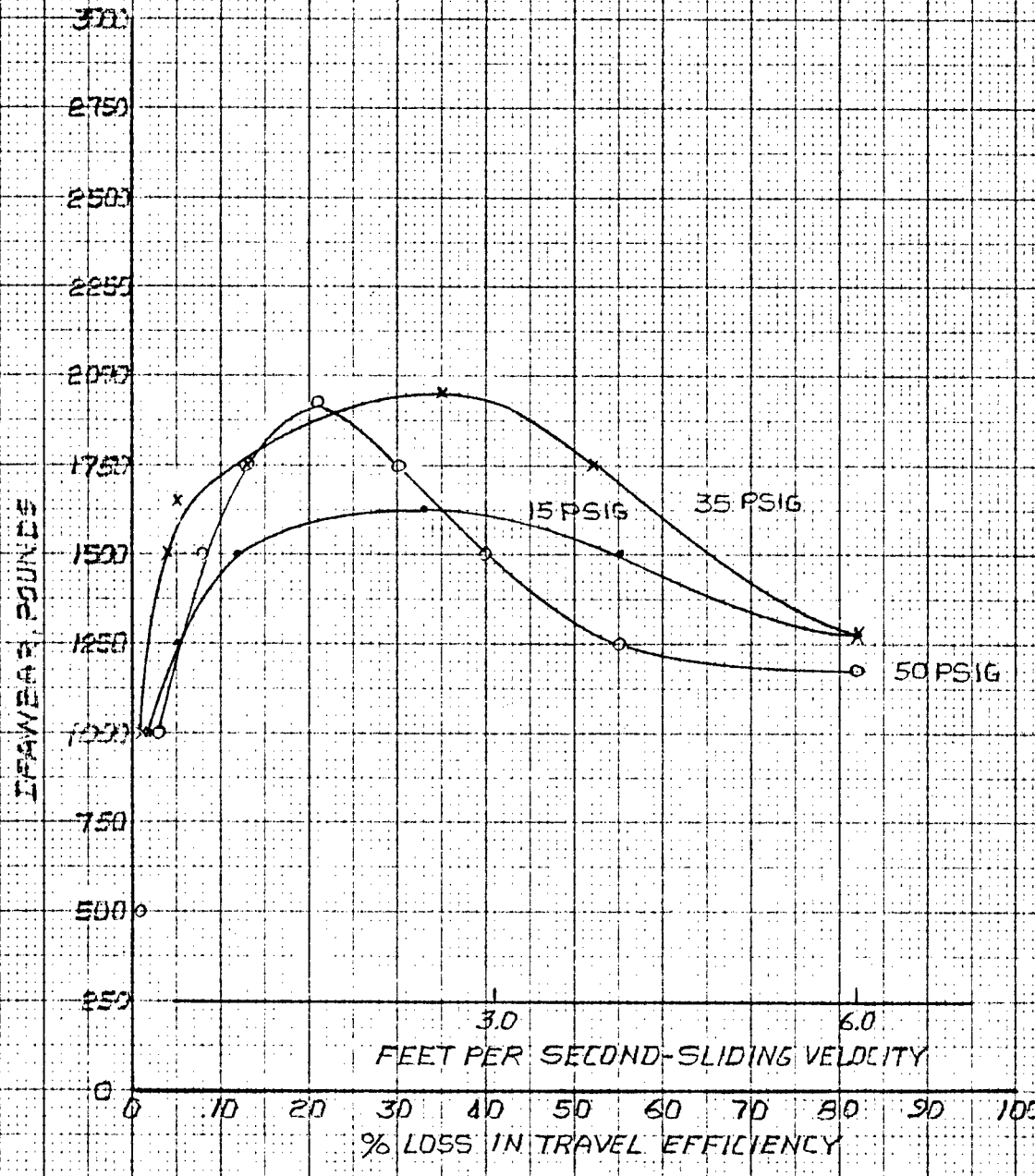
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP G RUN NO. 7
## FIGURE NO. 65

Location: WEST YELLOWSTONE

Date: 2-5, 9-74 Test By: G S

Data By: J E D

4 WHEEL DRIVE
AMB. TEMP. 25°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

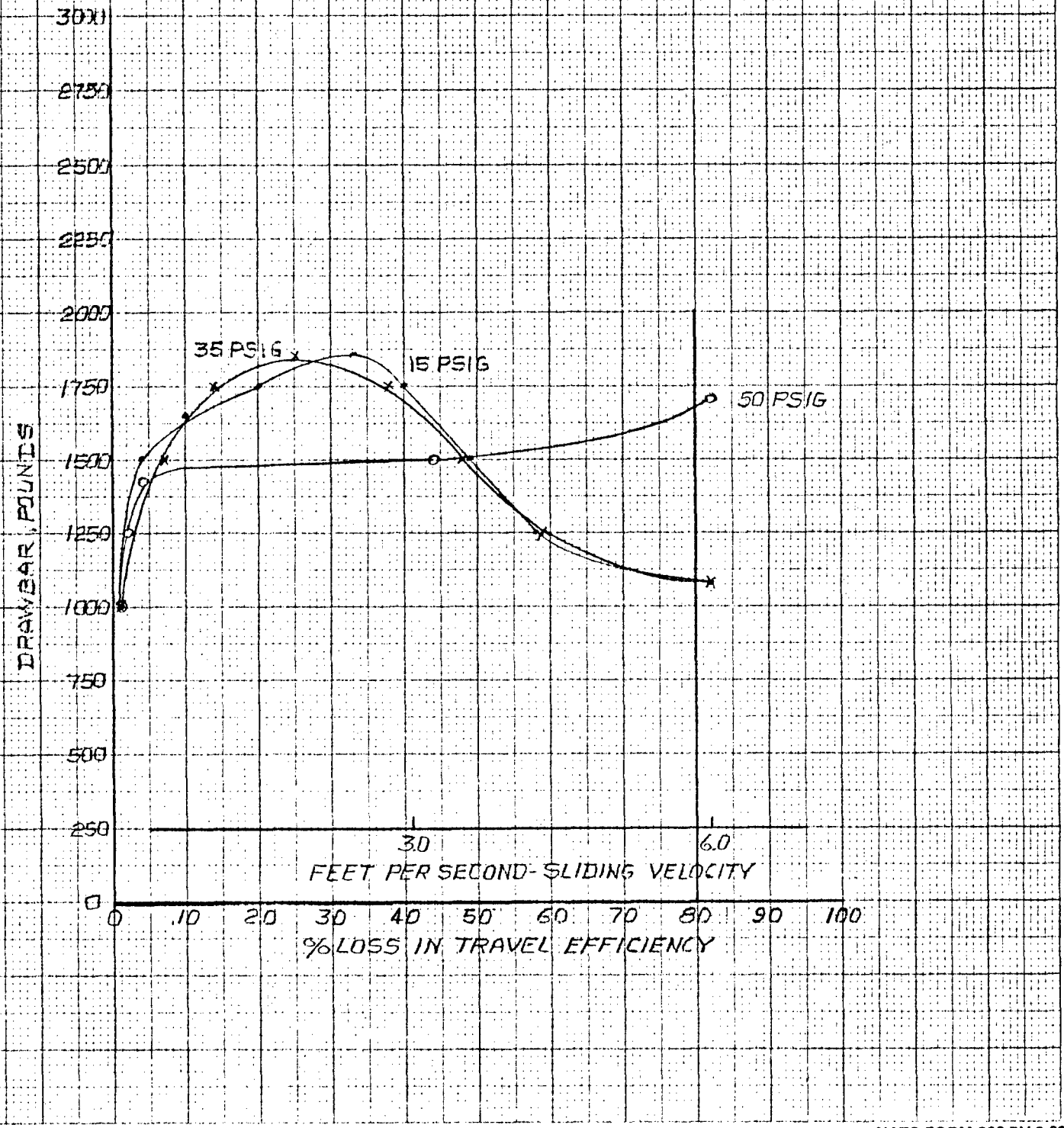
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP J RUN NO. 8
## FIGURE NO. 66

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 20°F
SNOW TEMP 21°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

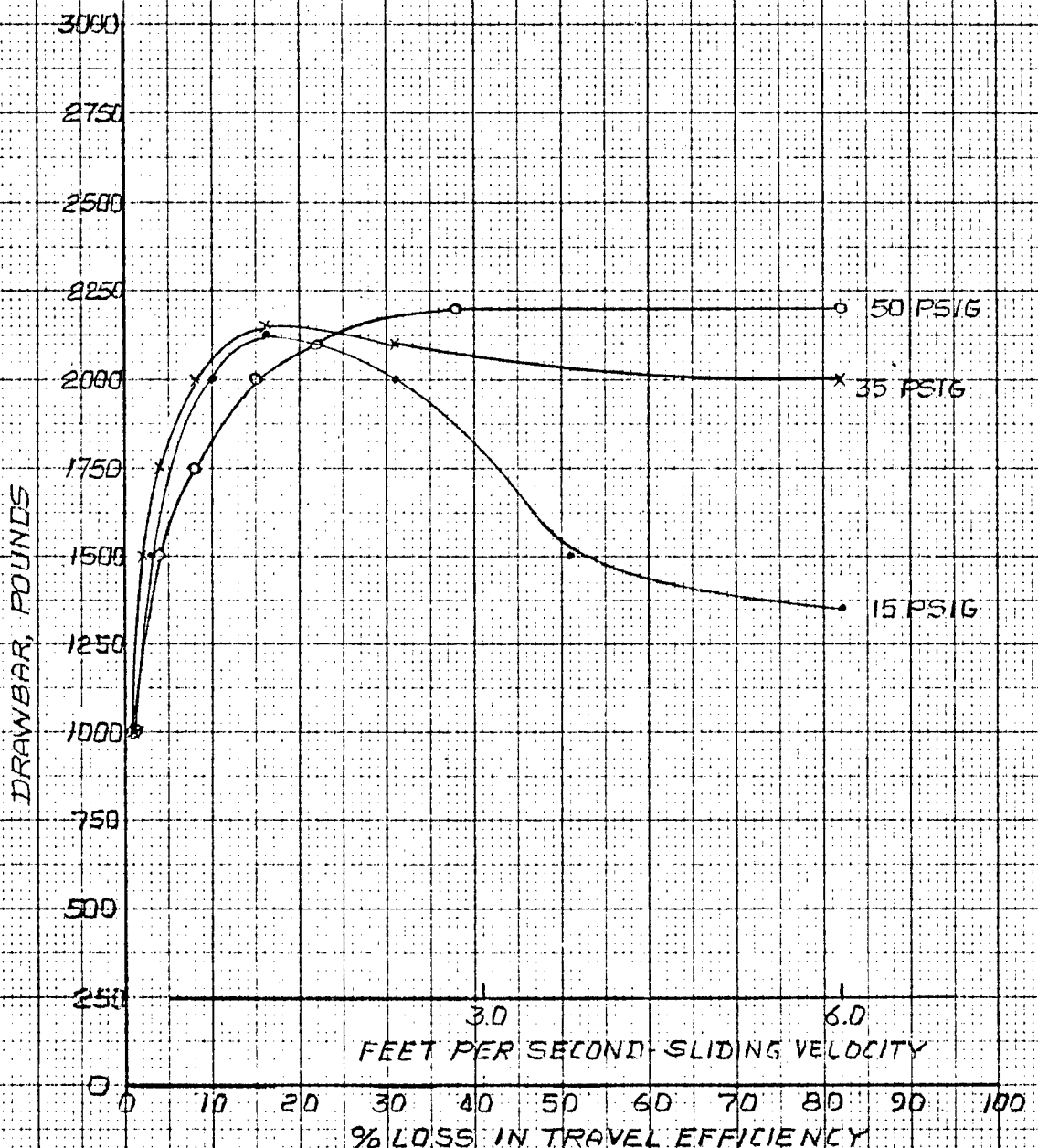
# DYNAMIC TRACTION
## HARD PACK SNOW
## GROUP C - RUN NO. 9
## FIGURE NO. 67

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

SECOND RUN
4 WHEEL DRIVE
AMB. TEMP. 20°F
SNOW TEMP. 22°F
MOISTURE CONTENT: 14-17%




NATC FORM 200 BV 9-68

TEST DATA

Figure No. 68

Rolling Resistance - Hard Pack Snow

Nevada Automotive Test Center

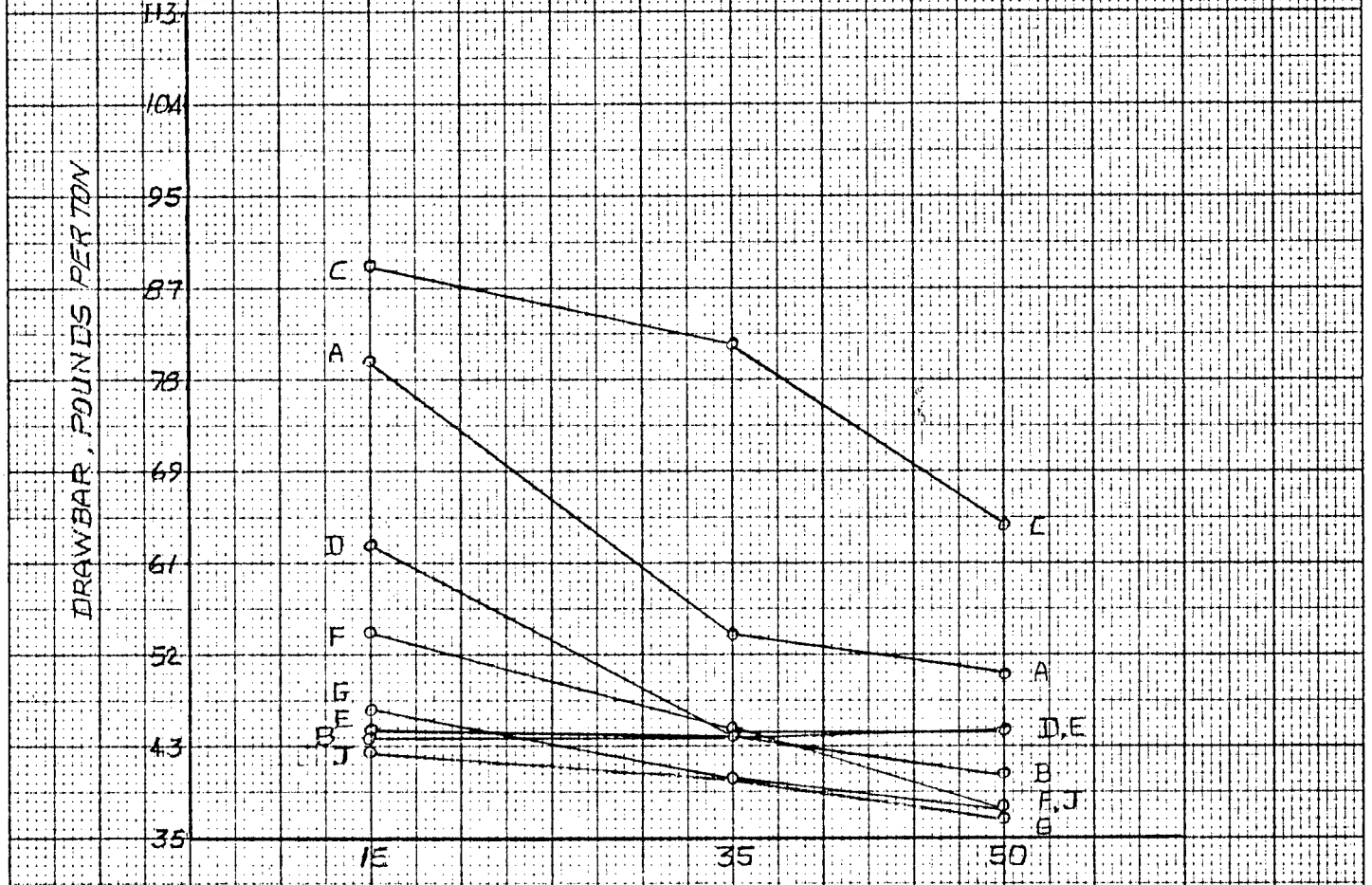
Project 20-17-30

# ROLLING RESISTANCE
## PACKED SNOW
## FIGURE NO. 68

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED




| GROUP | POUNDS PER TON | % | POUNDS PER TON | % | POUNDS PER TON | % |
|---|---|---|---|---|---|---|
| C | 89 | 100 | 81 | 100 | 64 | 100 |
| A | 80 | 110 | 54 | 134 | 49 | 122 |
| B | 45 | 150 | 44 | 146 | 41 | 136 |
| D | 62 | 130 | 45 | 145 | 45 | 130 |
| E | 44 | 150 | 44 | 146 | 45 | 130 |
| F | 54 | 139 | 45 | 144 | 37 | 142 |
| G | 47 | 147 | 40 | 150 | 36 | 143 |
| J | 43 | 152 | 40 | 150 | 37 | 141 |

TEST DATA

Figure No. 69

Dynamic Traction Summary - Wet Asphalt

Nevada Automotive Test Center

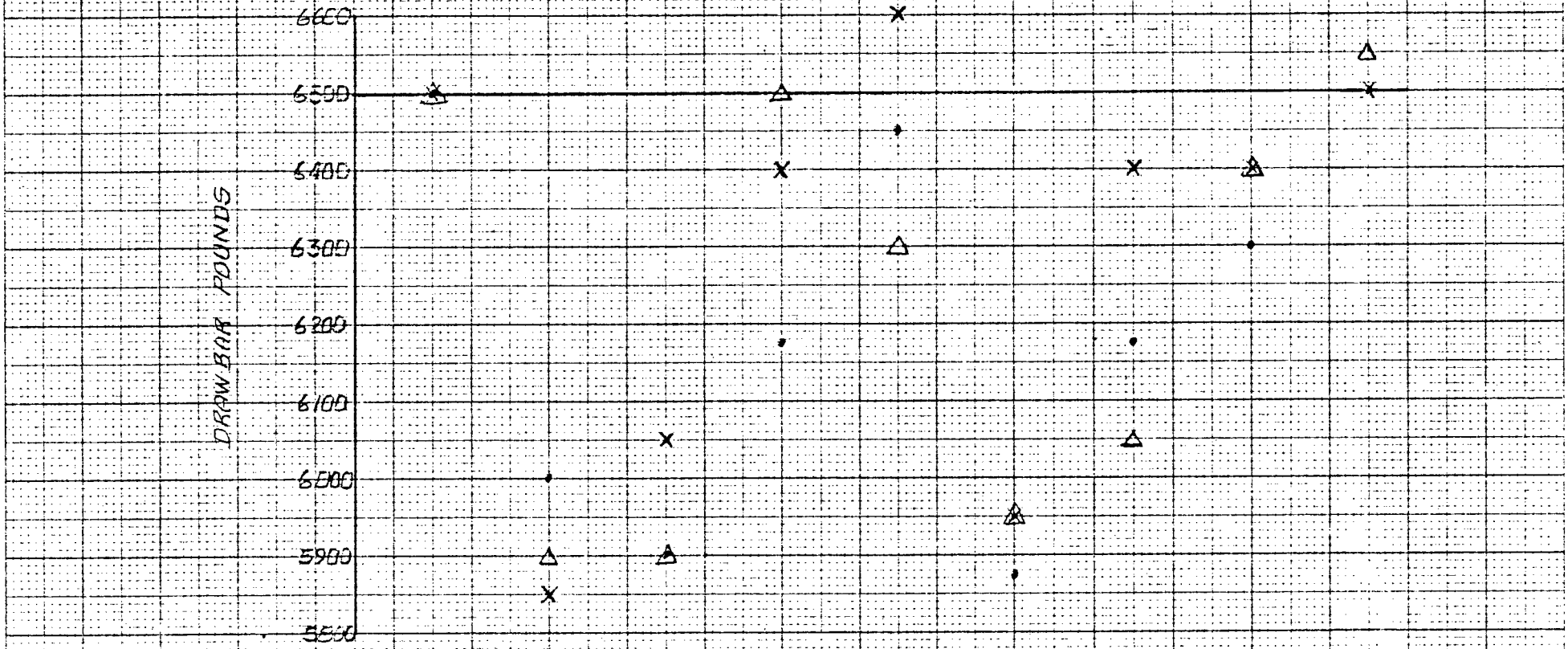
Project: 20-17-30

# DYNAMIC TRACTION
## WET ASPHALT
## 4 WHEEL DRIVE
## FIGURE NO. 69

Location: PROVING GROUND

Date: 11-9-73 Test By: WHS

Data By: JED




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING % @ 50 PSIG | 100 | 92 | 91 | 95 | 99 | 90 | 95 | 97 | 100 |
| RATING % @ 35 PSIG | 100 | 90 | 93 | 98 | 102 | 92 | 98 | 98 | 100 |
| RATING % @ 15 PSIG | 100 | 91 | 91 | 100 | 97 | 92 | 93 | 98 | 101 |
| AVE. DB LBS @ 50 PSIG • | 6500 | 6000 | 5900 | 6175 | 6450 | 5875 | 6175 | 6300 | 6500 |
| AVE. DB LBS @ 35 PSIG X | 6500 | 5850 | 6050 | 6400 | 6600 | 5950 | 6400 | 6400 | 6500 |
| AVE. DB LBS @ 15 PSIG Δ | 5500 | 5900 | 5900 | 6500 | 6300 | 5950 | 6050 | 6400 | 6550 |
| CODE | C | A (1) | A (2) | B | D | E | F | G | J |
| AMB. TEMP. | 62 | 70 | 70 | 74 | 66 | 72 | 68 | 70 | 70 |
| SURF. TEMP. | 52 | 60 | 58 | 58 | 56 | 59 | 56 | 60 | 58 |

WESTERN LITHO

TEST DATA

Figure Nos. 70 through 79

Dynamic Traction - Wet Asphalt

Nevada Automotive Test Center

Project: 20-17-30

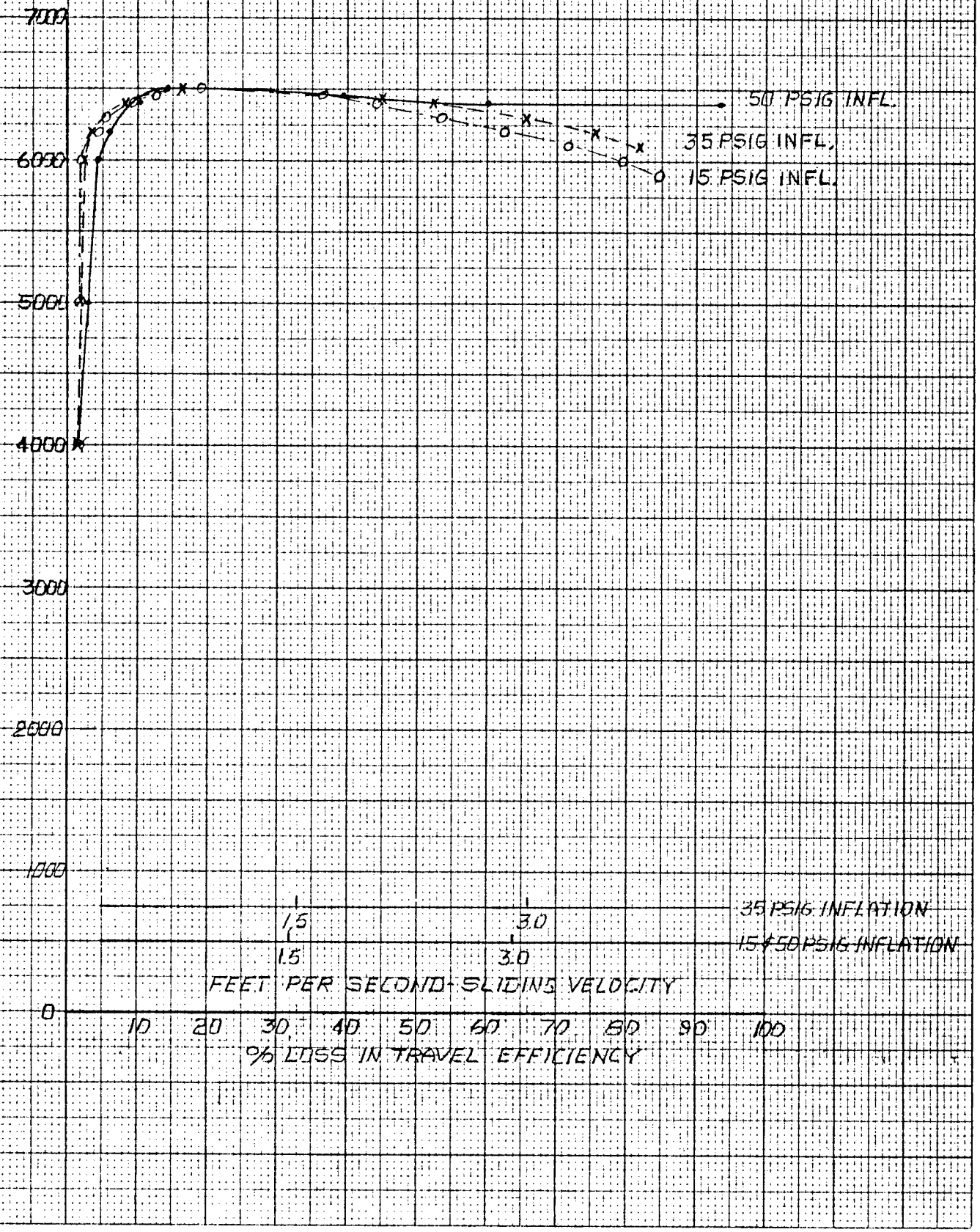
# DYNAMIC TRACTION
## WET ASPHALT
## GROUP C RUN NO. 1
## FIGURE NO. 70

Location: PROVING GROUND

Date: 11-9-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 52°F
SURF. TEMP. RANGE 52°F




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

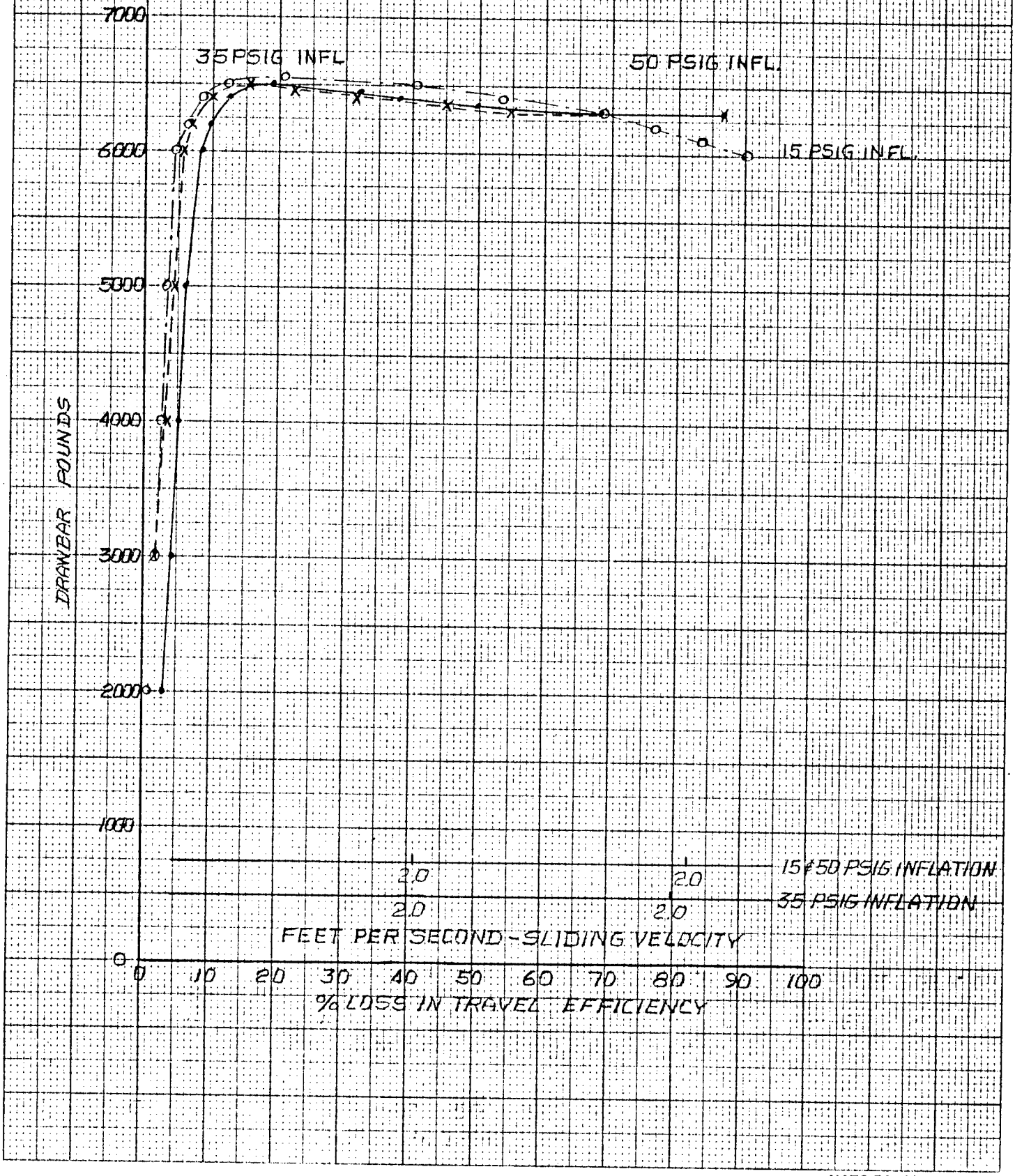
# DYNAMIC TRACTION
## WET ASPHALT
## GROUP J RUN NO. 2
## FIGURE NO. 71

Location: PROVING GROUND

Date: 11-9-73 Test By: WHS

Data By: WHS

AMB. TEMP. 70°F
SURF. TEMP. 58°F




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project 20-17-30

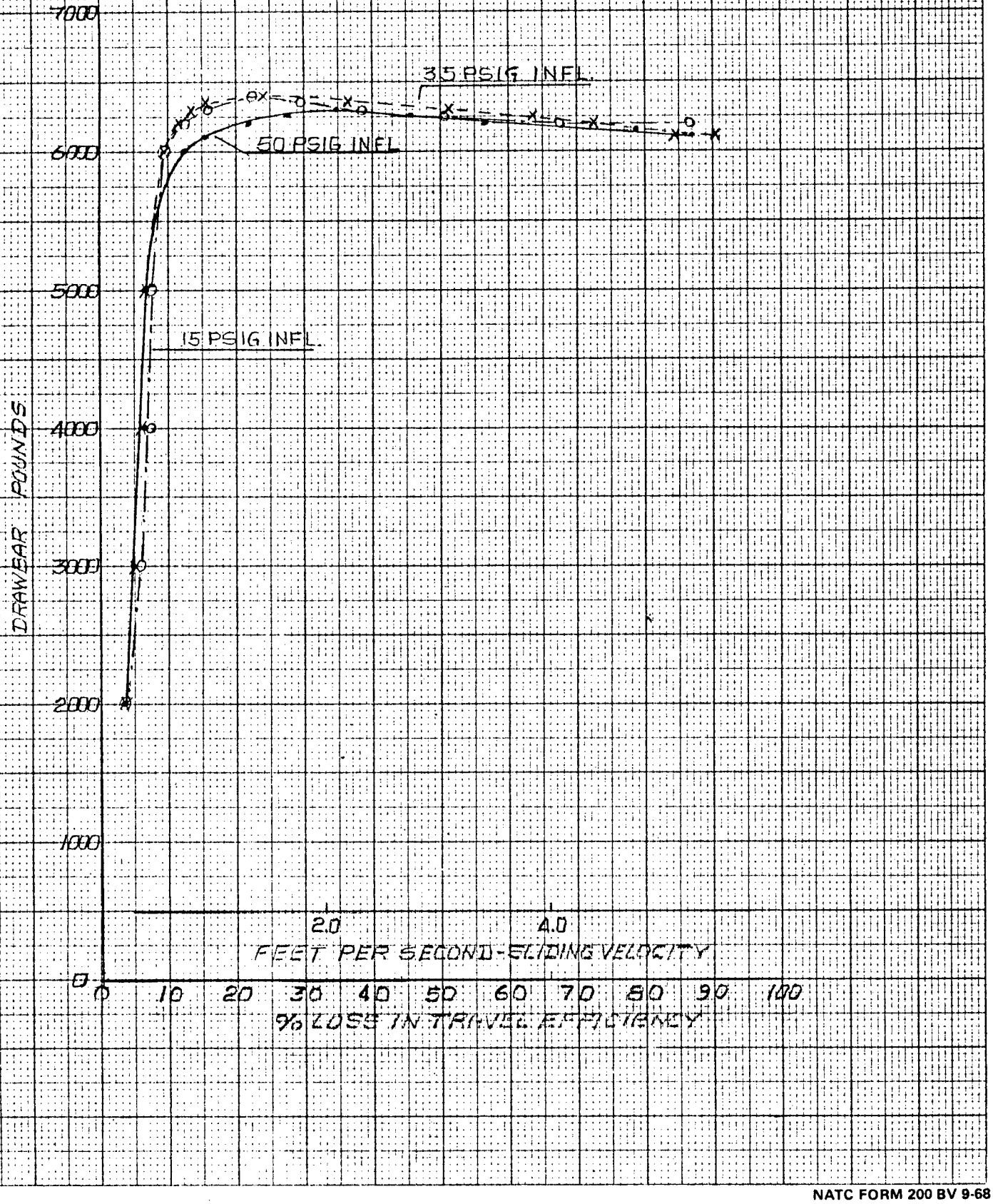
# DYNAMIC TRACTION
## WET ASPHALT
## GROUP G RUN NO. 3
## FIGURE NO. 72

Location: PROVING GROUND

Date: 11-9-73 Test By: WHS

Data By: WHS

AMB. TEMP. 70°F
SURF. TEMP. 60°F



Nevada Automotive Test Center

Project 20-17-30

# DYNAMIC TRACTION
## WET ASPHALT
## GROUP A RUN NO. 4
## FIGURE NO. 73

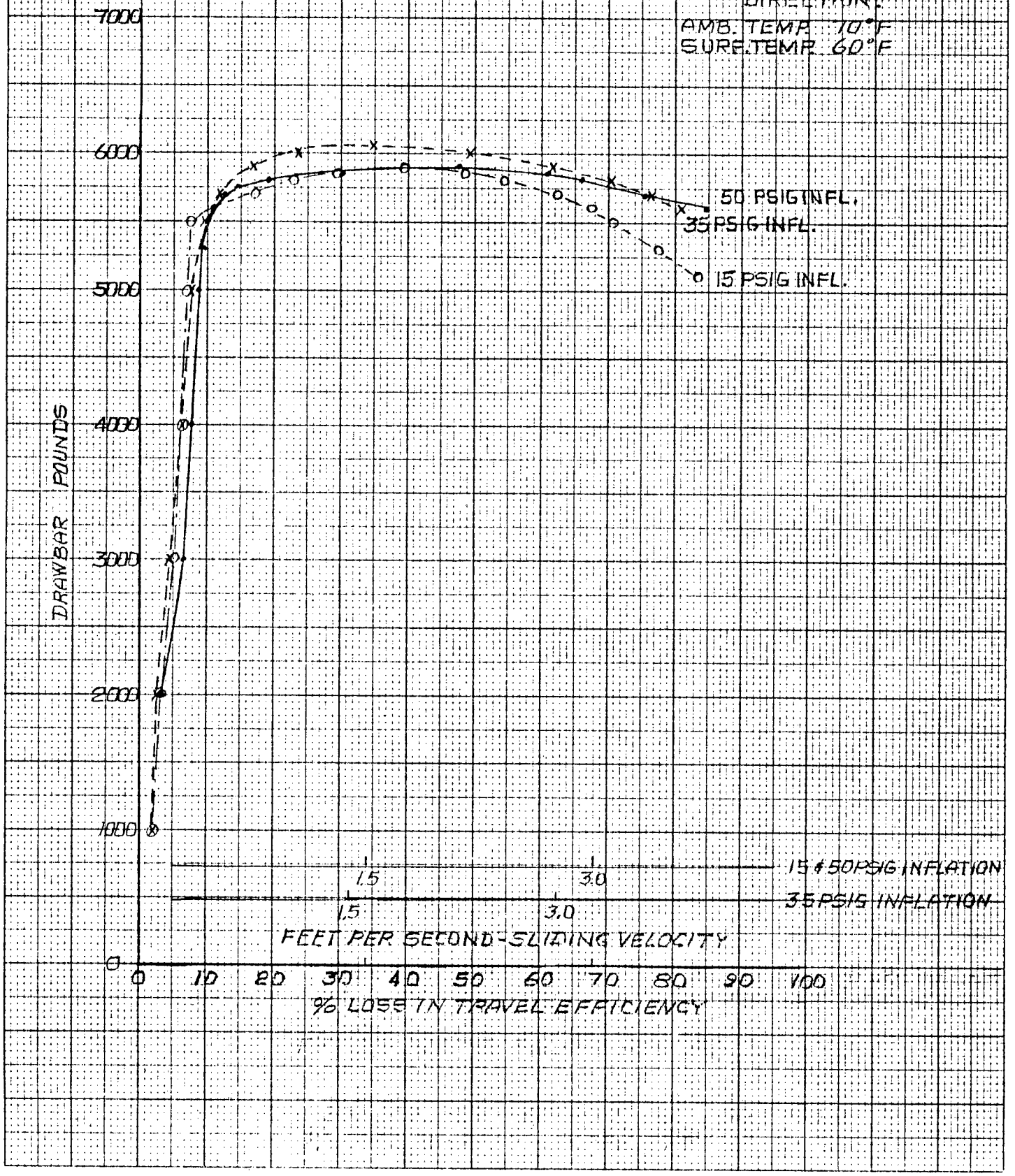
Location: PROVING GROUND

Date 11-9-73 Test By: WHS

Data By: WHS

NOTE: DIRECTIONAL TREAD MOUNTED IN REVERSE DIRECTION.

AMB. TEMP. 70°F
SURF. TEMP. 60°F




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project 20-17-30

# DYNAMIC TRACTION
## WET ASPHALT
## GROUP A RUN NO. 5
## FIGURE NO. 74

Location: PROVING GROUND

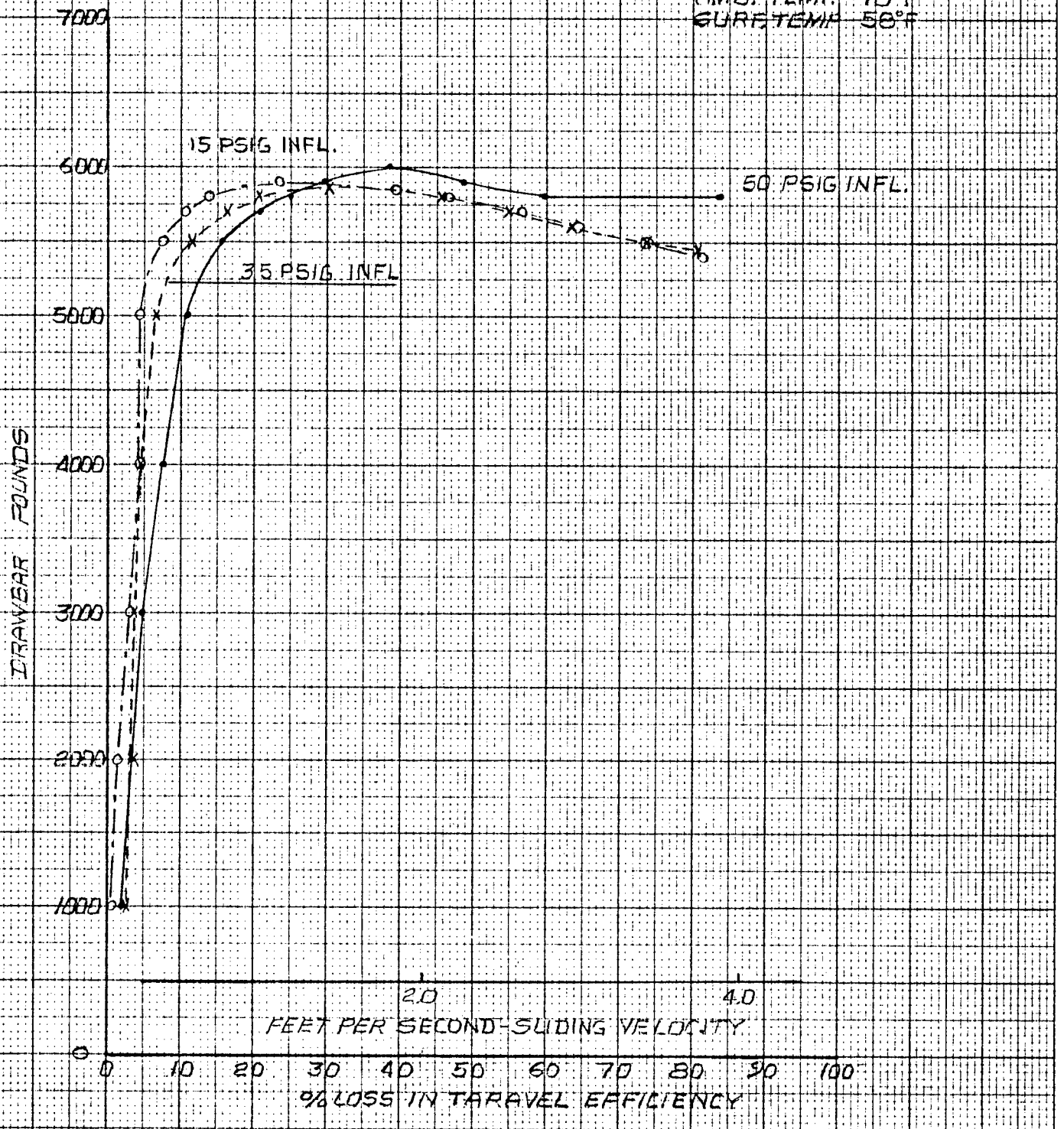
Date: 11-9-73 Test By: WHS

Data By: WHS

NOTE: DIRECTIONAL TREAD IN CORRECT DIRECTION

AMB. TEMP. 70°F

SURF. TEMP. 58°F



Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION
## WET ASPHALT
## GROUP: D RUN NO. 6
## FIGURE NO. 75

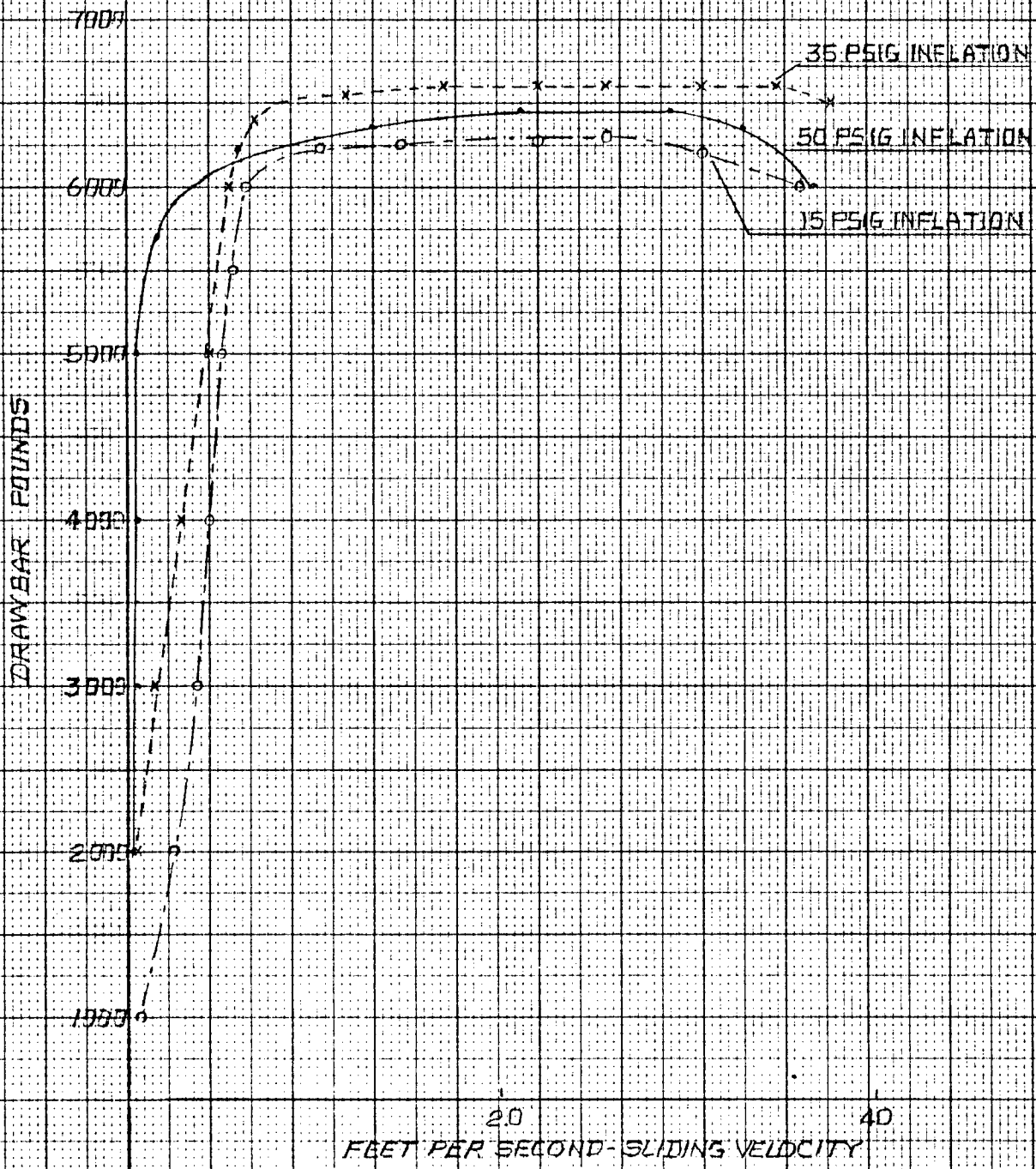
Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP. RANGE 62°F

SURF. TEMP. RANGE 52°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# DYNAMIC TRACTION
## WET ASPHALT
## GROUP: F RUN NO. 7
## FIGURE NO. 76

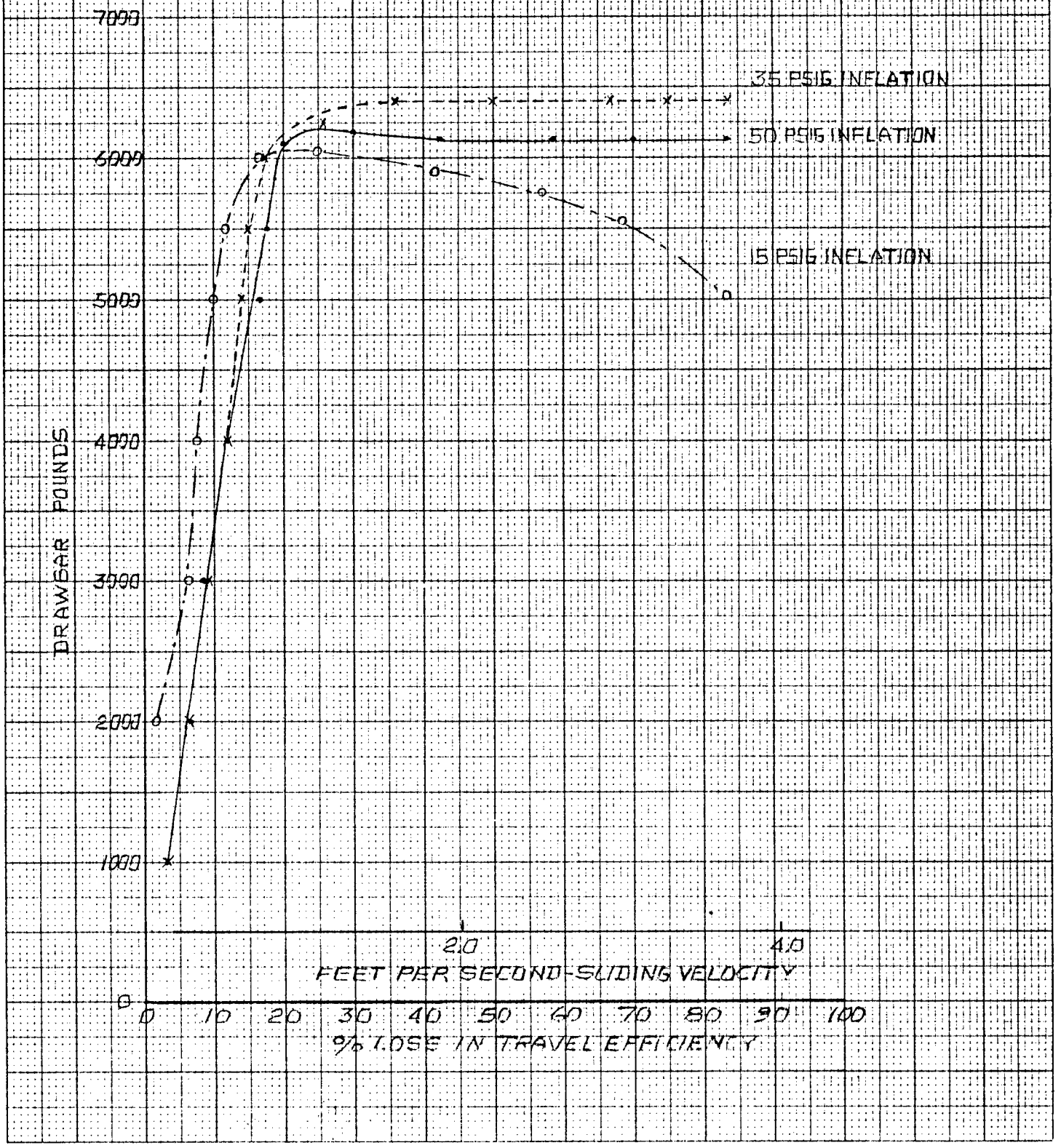
Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP RANGE 68°F

SURF. TEMP. RANGE 56°F




WESTERN LITHO CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

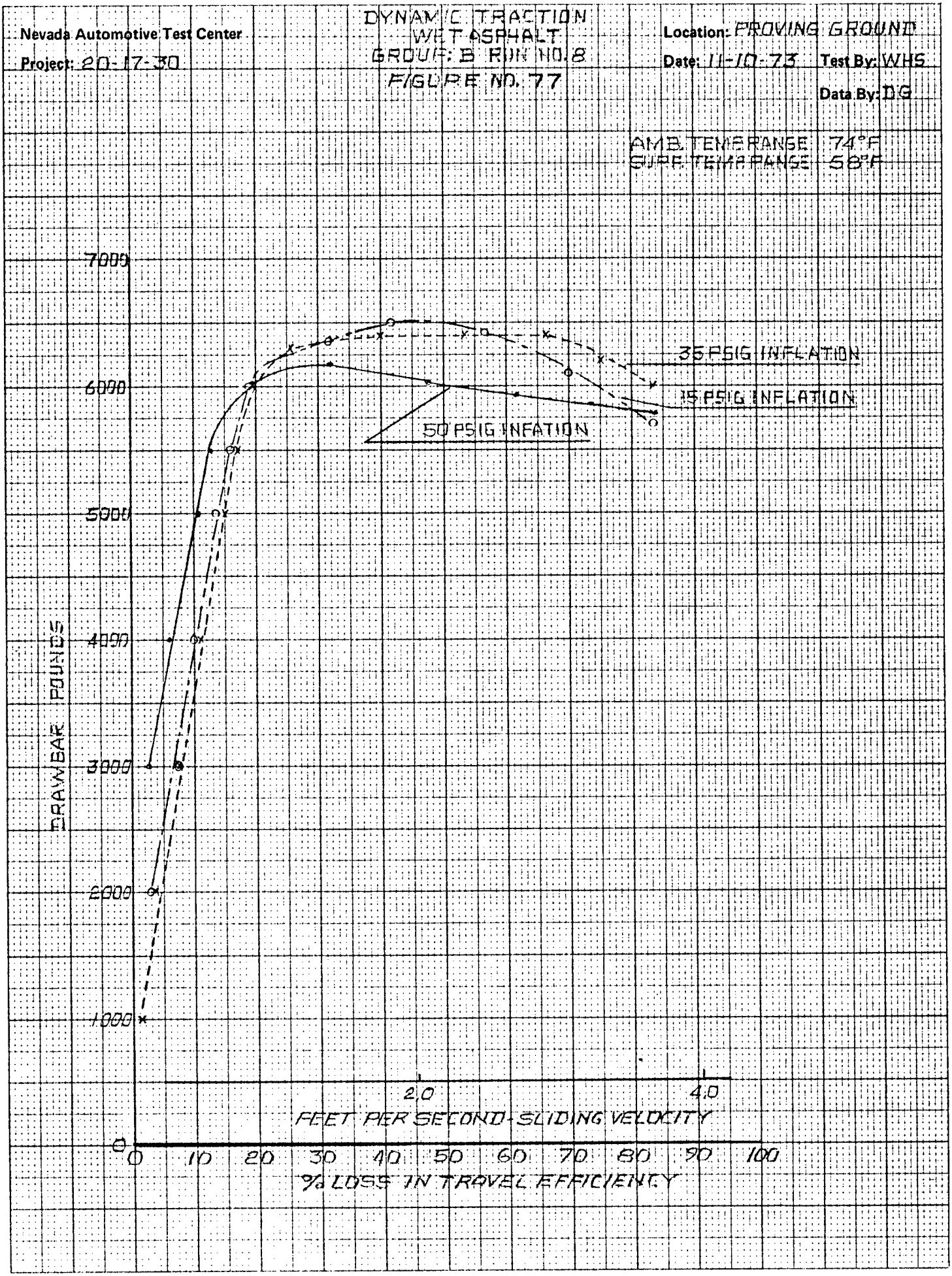
# DYNAMIC TRACTION
## WET ASPHALT
## GROUP: B RUN NO. 8
## FIGURE NO. 77

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP RANGE 74°F
SURF. TEMP RANGE 58°F




WESTERN LITHO CARSON CITY

NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

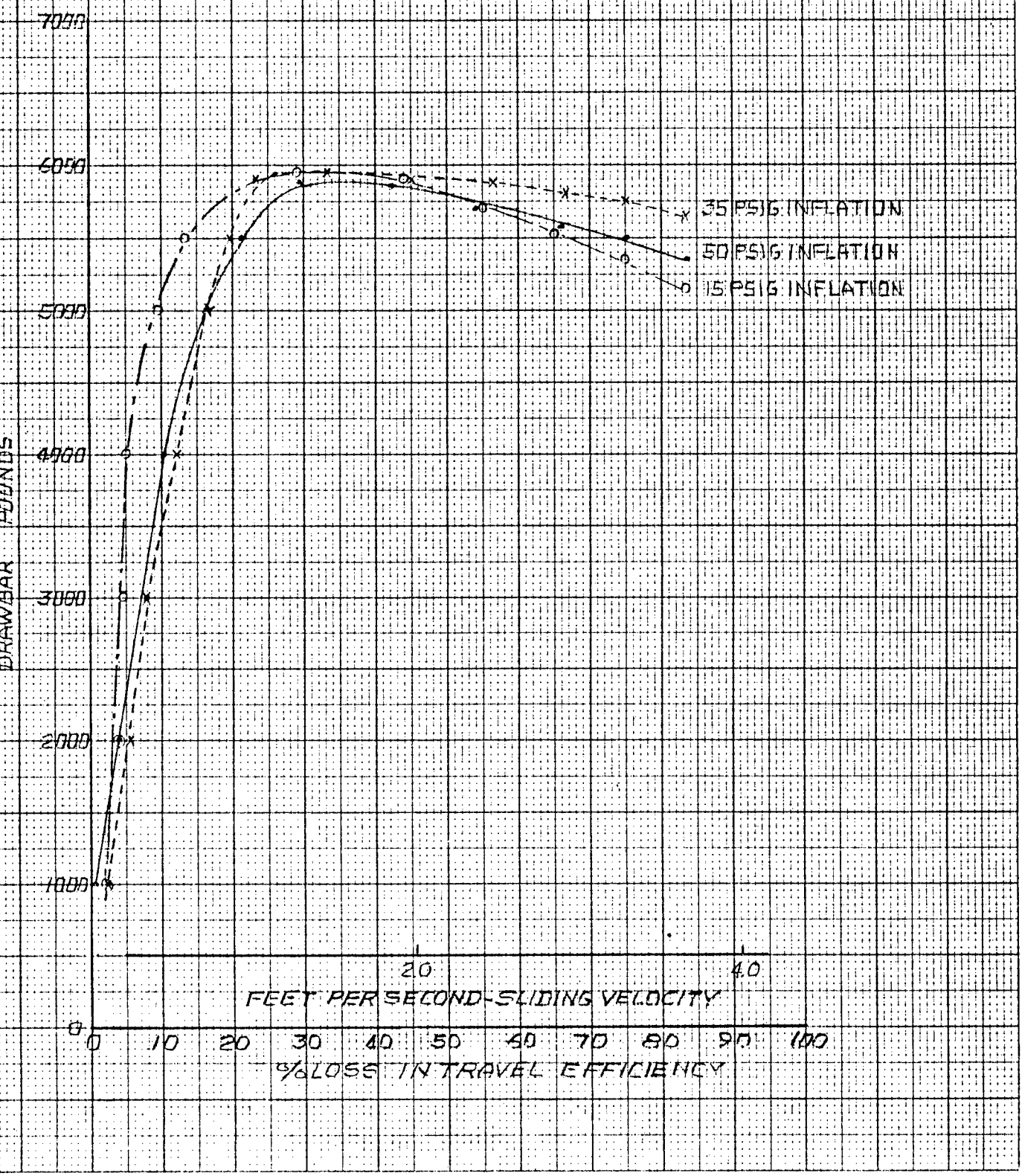
# DYNAMIC TRACTION
## WET ASPHALT
## GROUP: E RUN NO. 9
## FIGURE NO. 78

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP. RANGE 72°F
SURF. TEMP. RANGE 59°F




WESTERN LITHO CARSON CITY

NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

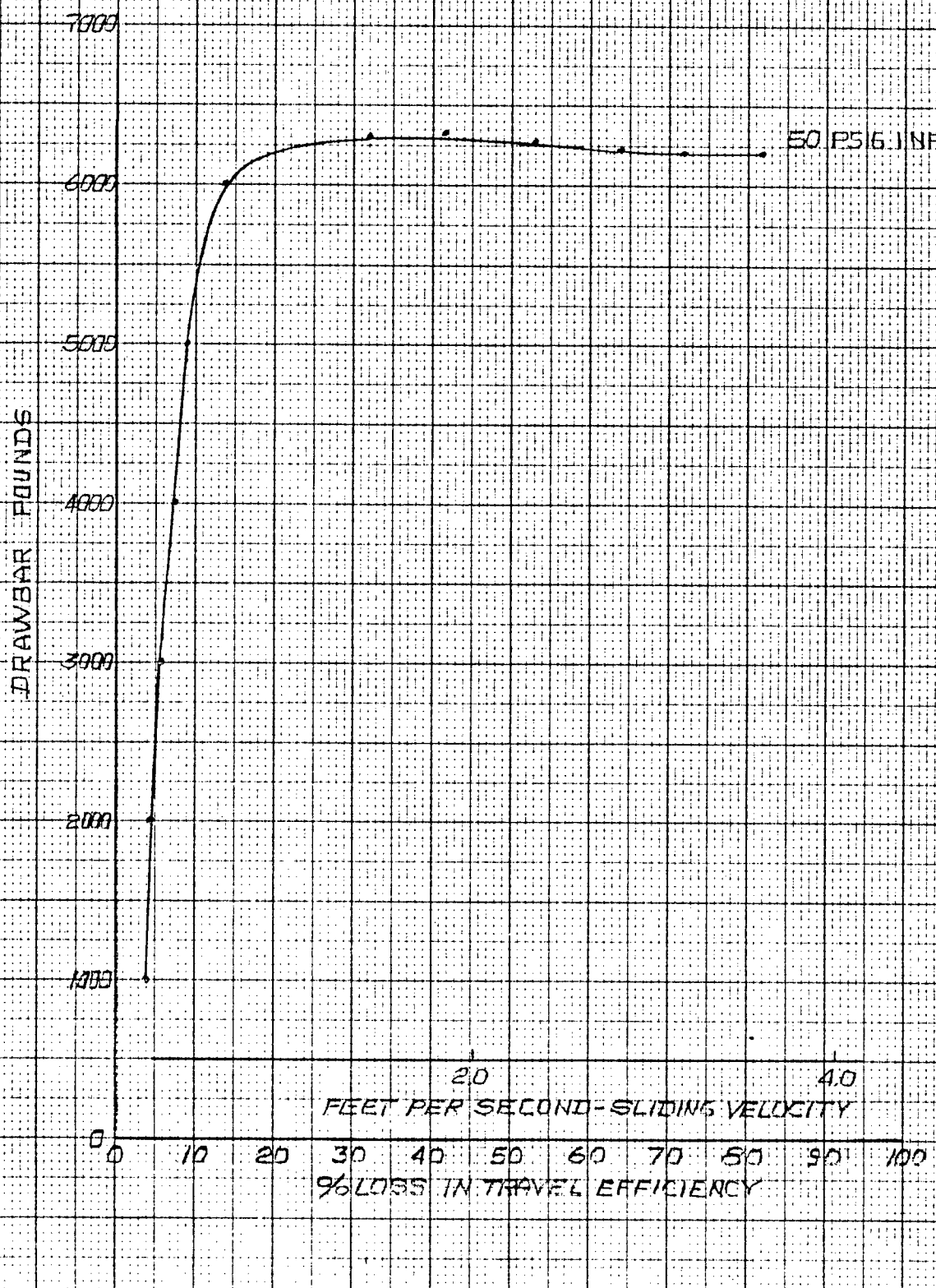
# DYNAMIC TRACTION
## WET ASPHALT
## GROUP 1 C RUN NO. 10
## FIGURE NO. 79

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP RANGE 68°F
SURF. TEMP RANGE 58°F




WESTERN LITHO CARSON CITY

TEST DATA

Figure Nos. 80 and 81

Rolling Resistance - Dry Asphalt

Nevada Automotive Test Center

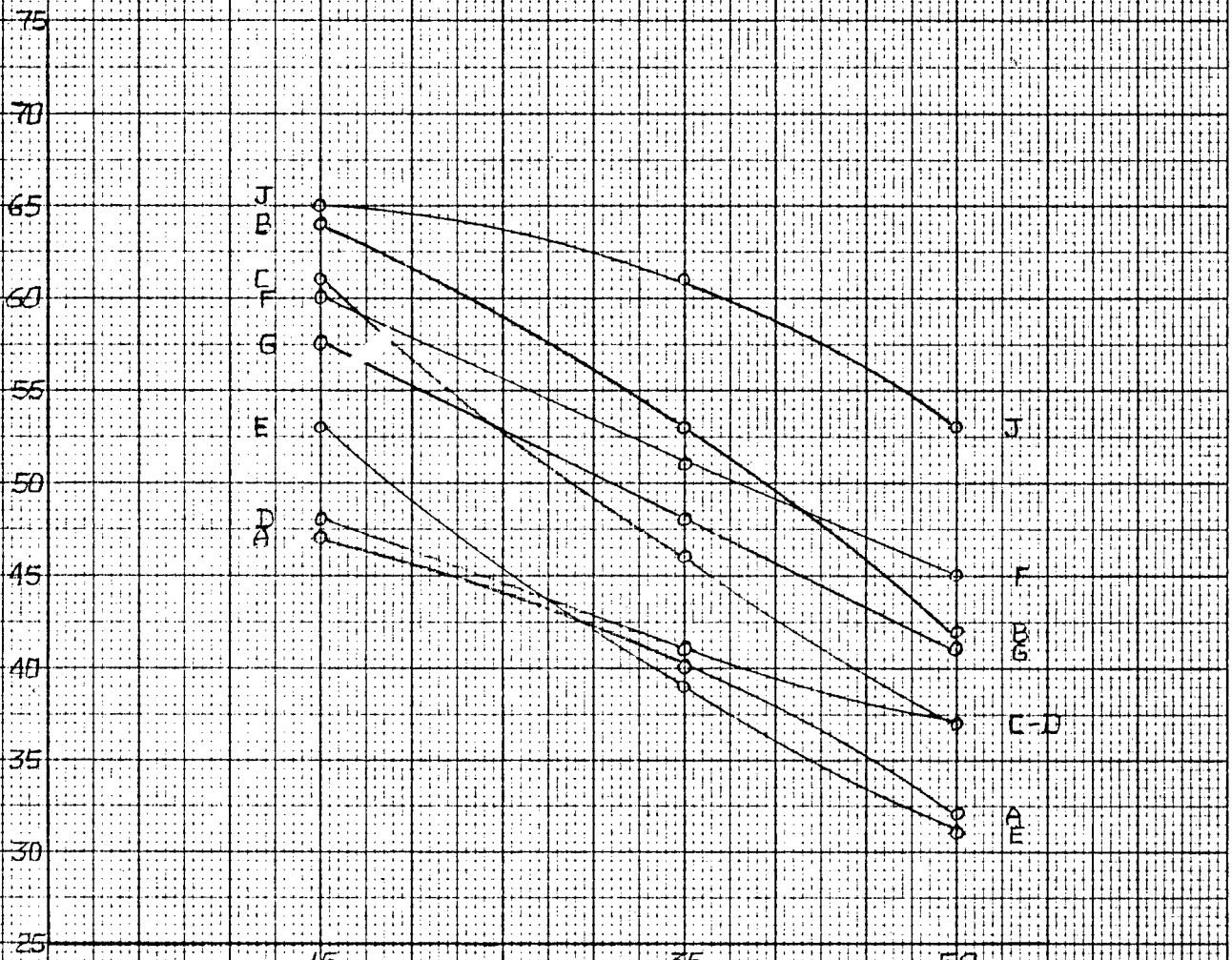
Project: 20-17-30

# ROLLING RESISTANCE
## DRY ASPHALT
## 5 M.P.H.
## FIGURE NO. 80

Location: STOP & GO

Date: 2-27-74 Test By: JED

Data By: JED




| GROUP | LBS/TON | % | LBS/TON | % | LBS/TON | % |
|---|---|---|---|---|---|---|
| A | 47 | 123 | 40 | 113 | 32 | 114 |
| B | 64 | 95 | 53 | 85 | 42 | 86 |
| C | 61 | 100 | 46 | 100 | 37 | 100 |
| D | 48 | 121 | 41 | 111 | 37 | 100 |
| E | 53 | 113 | 39 | 115 | 31 | 116 |
| F | 60 | 102 | 51 | 89 | 45 | 78 |
| G | 55 | 110 | 48 | 98 | 41 | 89 |
| J | 65 | 93 | 61 | 67 | 53 | 57 |

Nevada Automotive Test Center

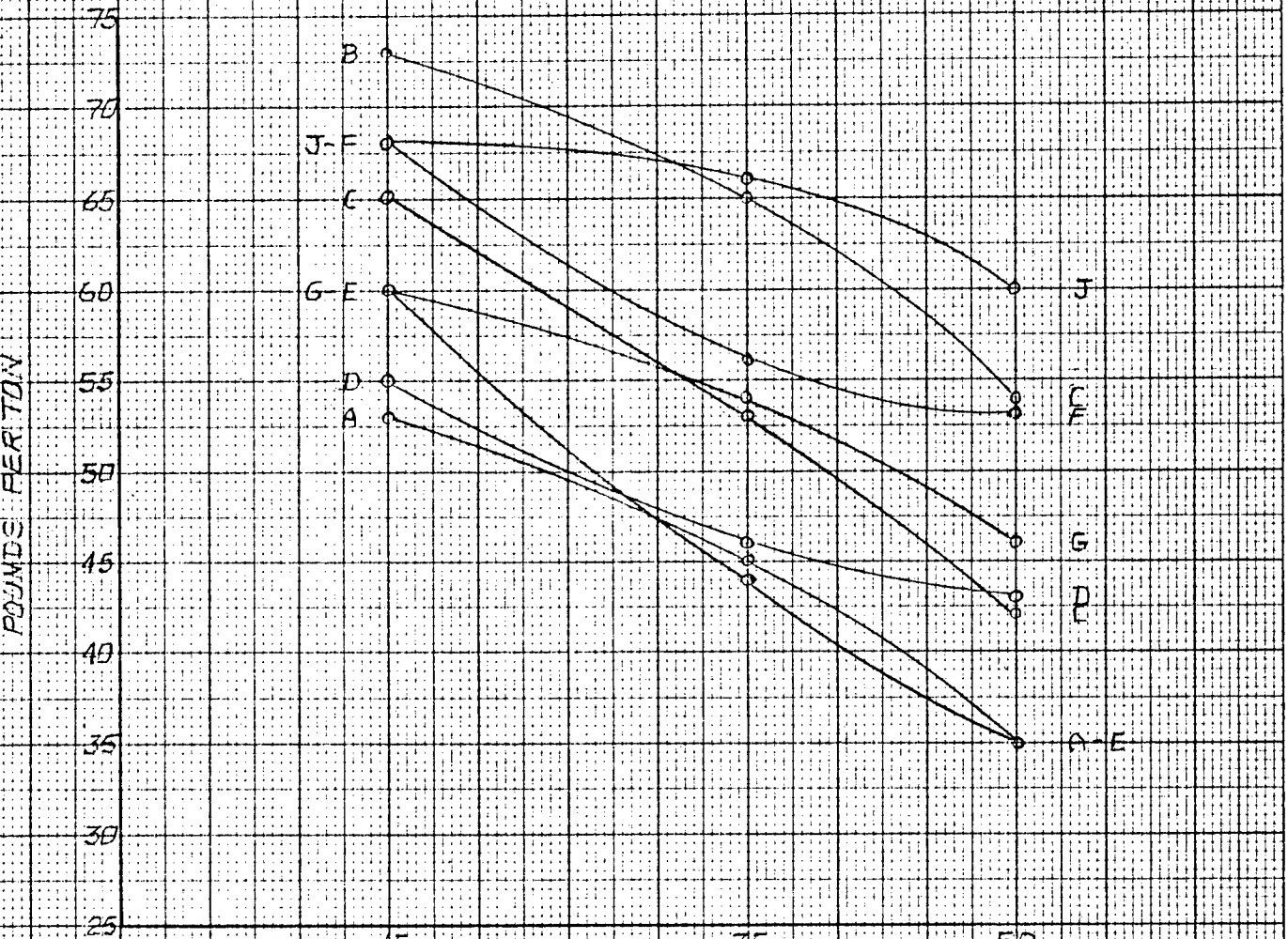
Project: 20-17-30

# ROLLING RESISTANCE
## DRY ASPHALT
## 40 MPH
## FIGURE NO. 81

Location: STOP & GO

Date: 2-27-74 Test By: JED

Data By: JED




| GROUP | LBS/TON | % | LBS/TON | % | LBS/TON | % |
|---|---|---|---|---|---|---|
| A | 53 | 118 | 45 | 115 | 35 | 83 |
| B | 73 | 88 | 65 | 77 | 54 | 71 |
| C | 65 | 100 | 53 | 100 | 42 | 100 |
| D | 55 | 115 | 46 | 113 | 43 | 98 |
| E | 60 | 108 | 44 | 117 | 35 | 117 |
| F | 68 | 95 | 56 | 94 | 53 | 74 |
| G | 60 | 108 | 54 | 98 | 46 | 90 |
| J | 68 | 95 | 66 | 75 | 60 | 57 |

NATC FORM 200 BV 9-68

TEST DATA

Figure No. 82

Dynamic Traction Summary - Packed Clay

Nevada Automotive Test Center

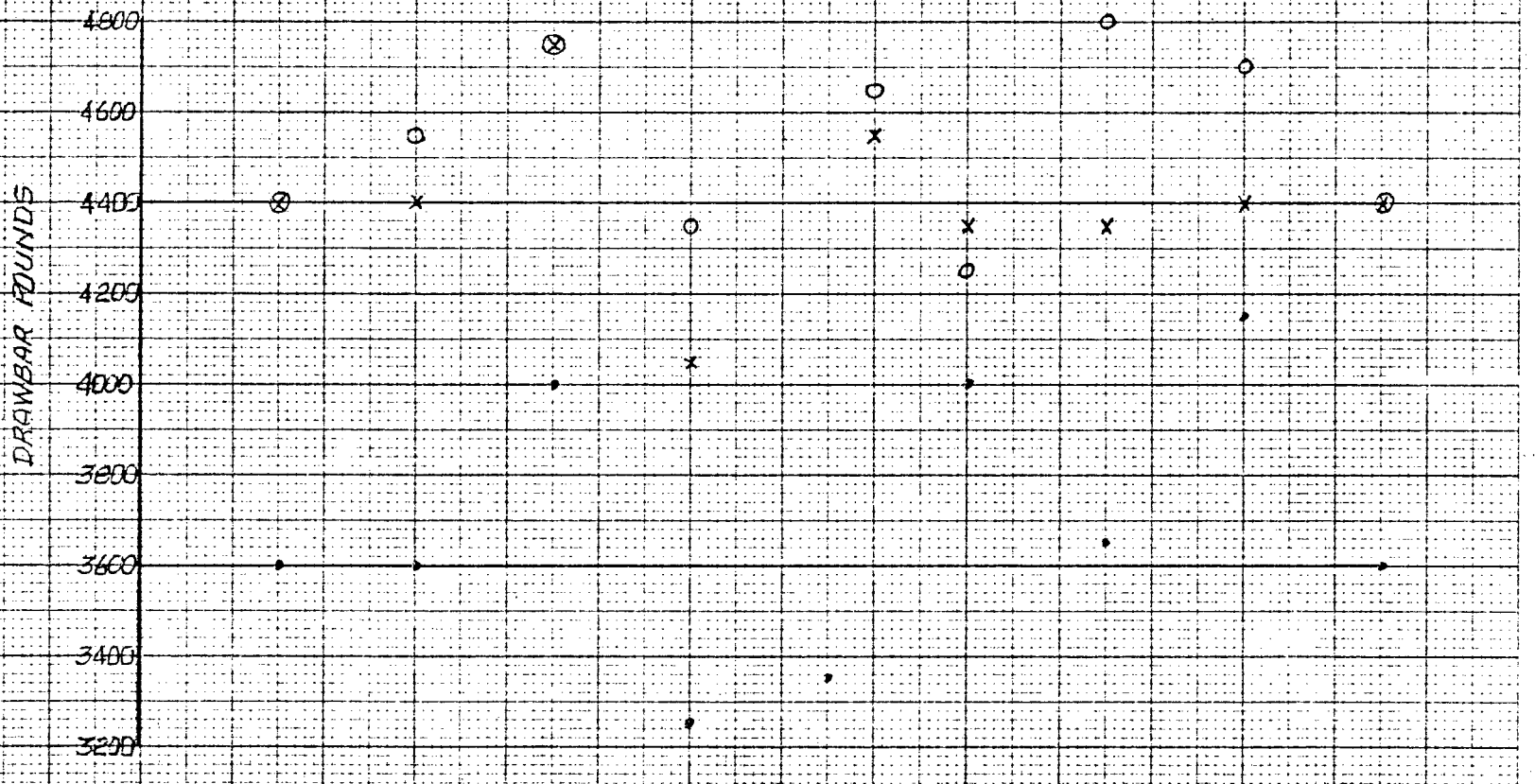
Project: 20-17-30

# DYNAMIC TRACTION RATINGS
## PACKED CLAY
## 4 WHEEL DRIVE
## FIGURE NO. 82

Location: PROVING GROUND

Date: 10-29/30-73 Test By: WHS

Data By: JED




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| RATING % @ 50 PSIG | • | 100 | 100 | 111 | 90 | 93 | 111 | 101 | 115 | 100 |
| RATING % @ 35 PSIG | x | 100 | 100 | 108 | 92 | 103 | 99 | 99 | 100 | 100 |
| RATING % @ 15 PSIG | o | 100 | 103 | 108 | 99 | 105 | 97 | 109 | 107 | 100 |
| AVE. DB LBS @ 50 PSIG | | 3600 | 3300 | 4000 | 3250 | 3350 | 4000 | 3650 | 4150 | 3600 |
| AVE. DB LBS @ 35 PSIG | | 4400 | 4400 | 4750 | 4050 | 4550 | 4350 | 4350 | 4400 | 4400 |
| AVE. DB LBS @ 15 PSIG | | 4400 | 4550 | 4750 | 4350 | 4650 | 4250 | 4300 | 4700 | 4400 |
| CODE | | C | A | B | D | E | F | G | J | C |
| COMPACTION RANGE | | 212-220+ | 208-220+ | 208-220+ | 208-220+ | 208-220+ | 210-220+ | 180-220+ | 216-220+ | 214-220+ |
| AMB. TEMP. | | 40°F | 59°F | 59°F | 58°F | 54°F | 54°F | 29°F | 52°F | 64°F |
| SURF. TEMP. | | 40°F | 62°F | 62°F | 46°F | 60°F | 55°F | 36°F | 60°F | 65°F |

WESTERN LITHO CARSON CITY

TEST DATA

Figure Nos. 83 through 91

Dynamic Traction - Packed Clay

Nevada Automotive Test Center

Project: 20-17-30

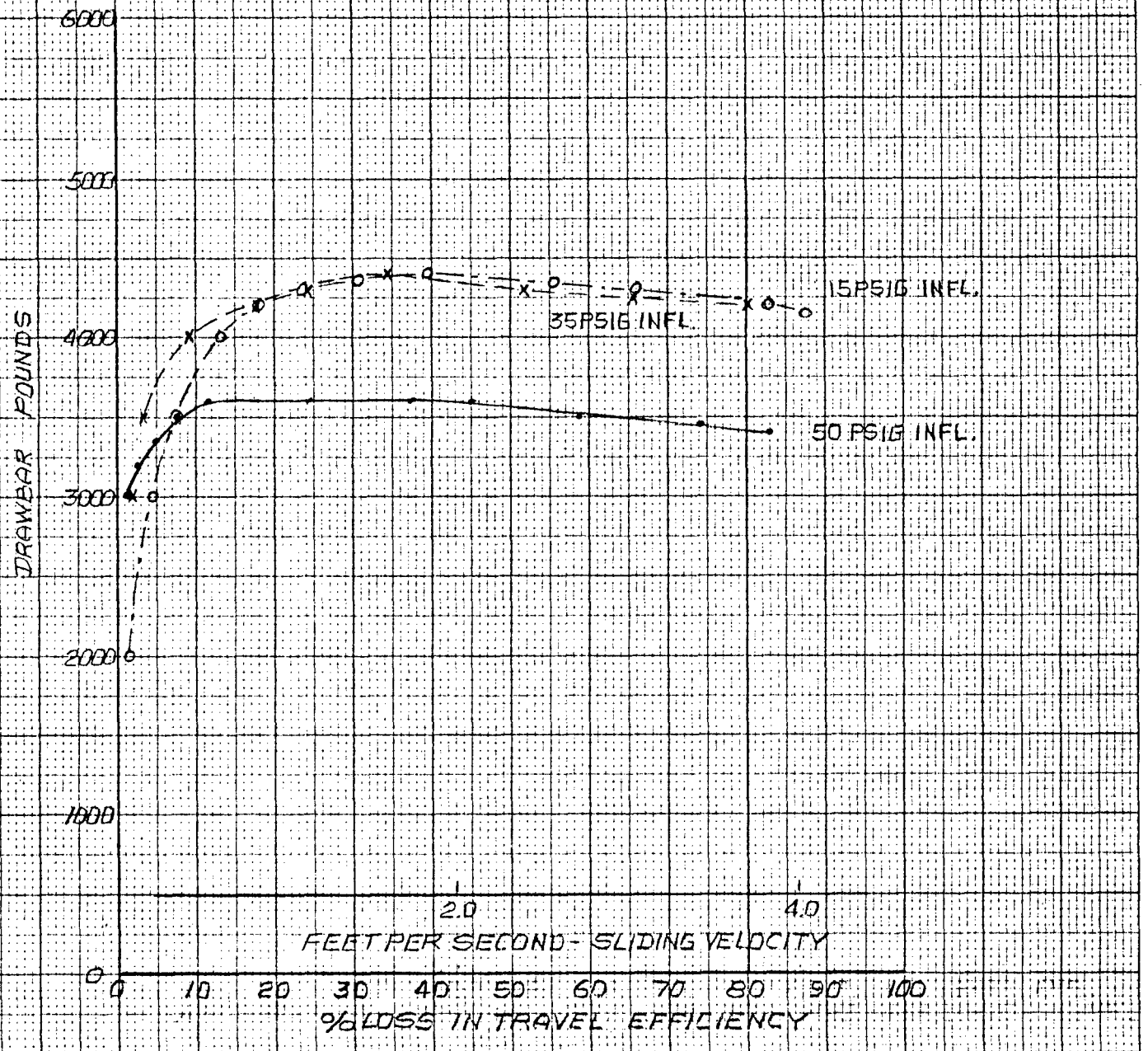
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP C RUN NO. 1
## FIGURE NO. 83

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 40°F
SURF. TEMP. 40°F
COMPACTION RANGE: 212/220+
4 WHEEL DRIVE



Nevada Automotive Test Center

Project: 20-17-30

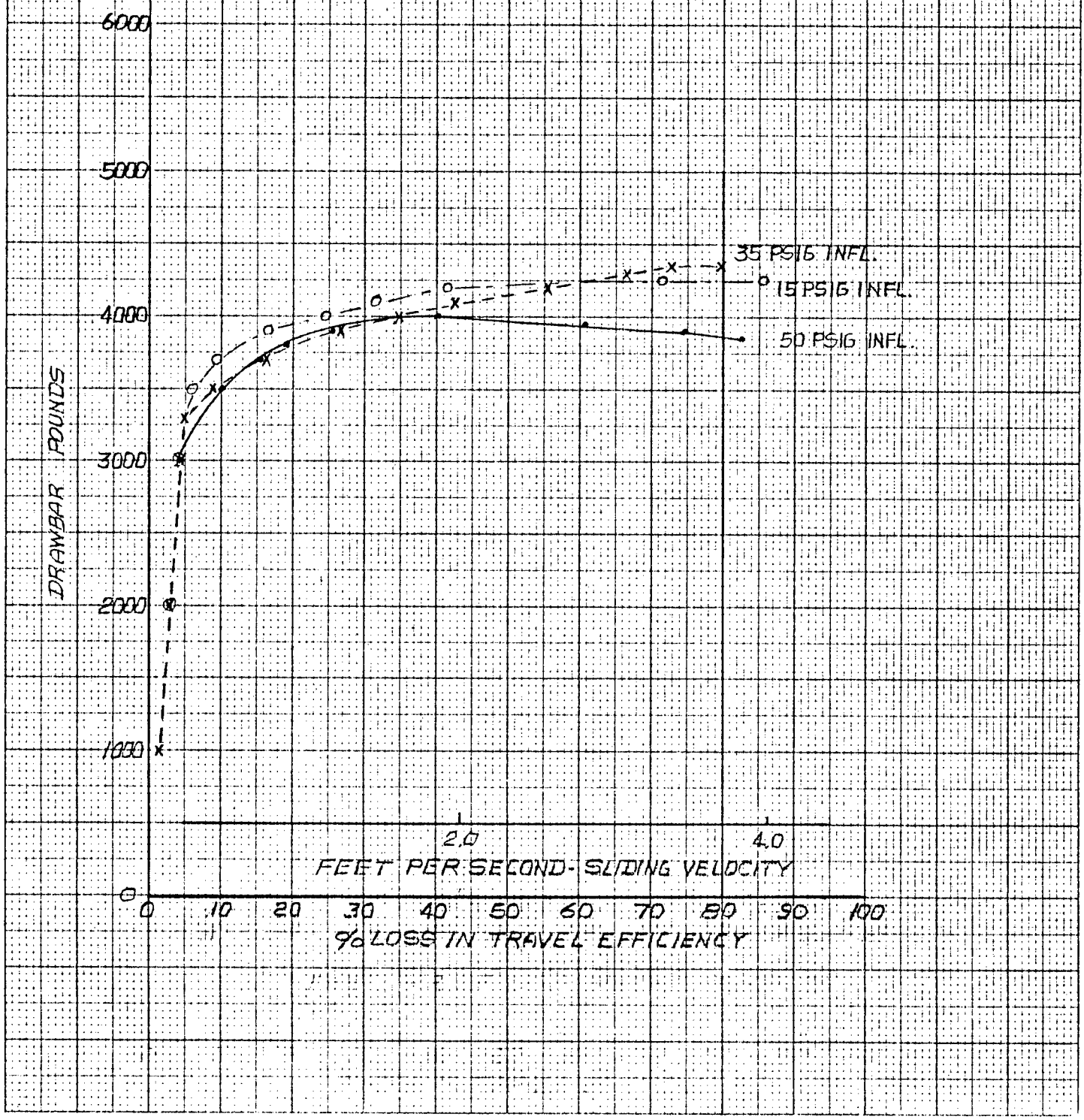
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP F RUN NO. 2
## FIGURE NO. 84

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 54°F
SURF. TEMP. 55°F
COMPACTION RANGE: 210/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

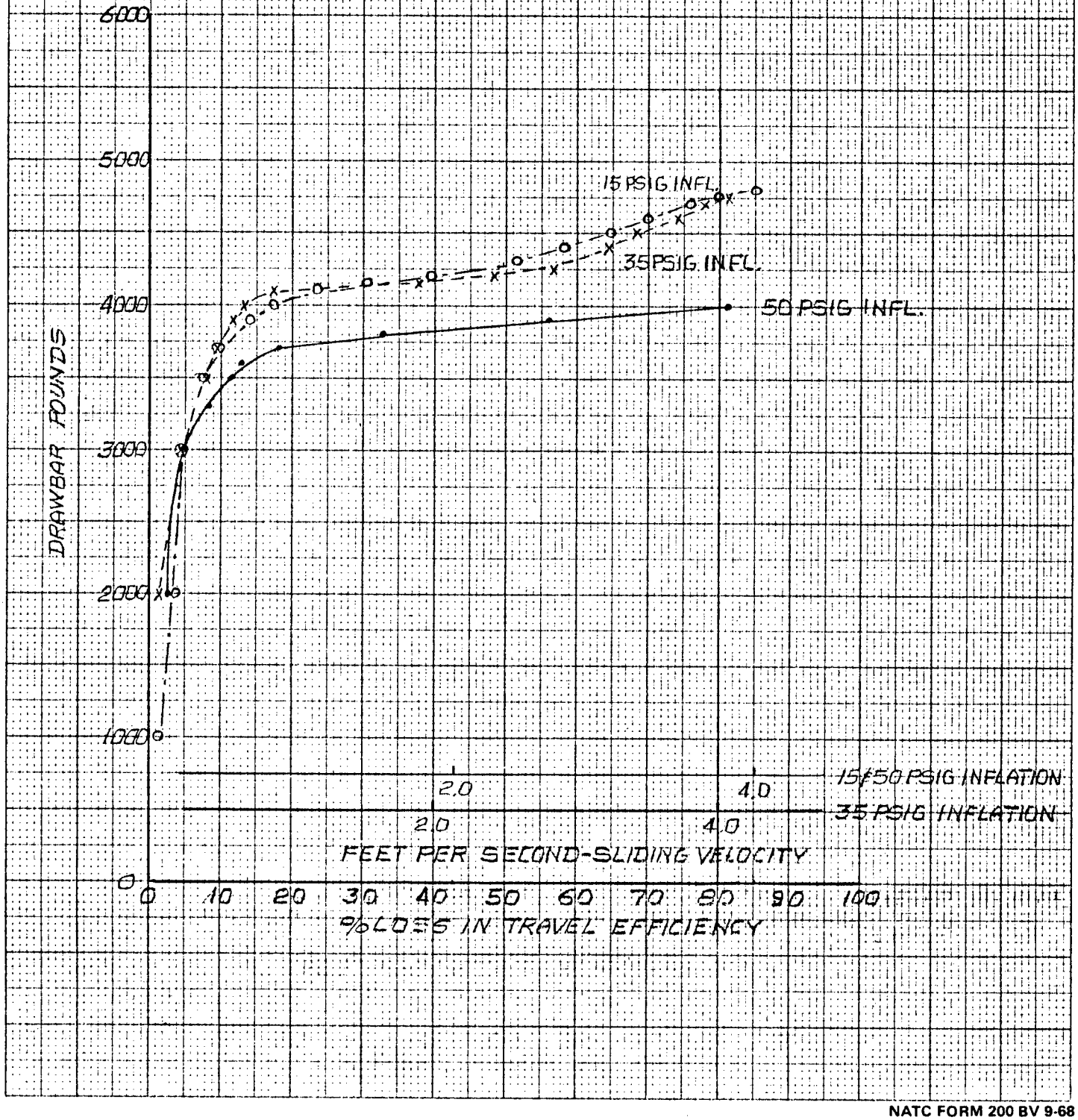
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP B RUN NO. 3
## FIGURE NO. 85

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 59°F
SURF. TEMP. 62°F
COMPACTION RANGE: 208/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project 20-17-30

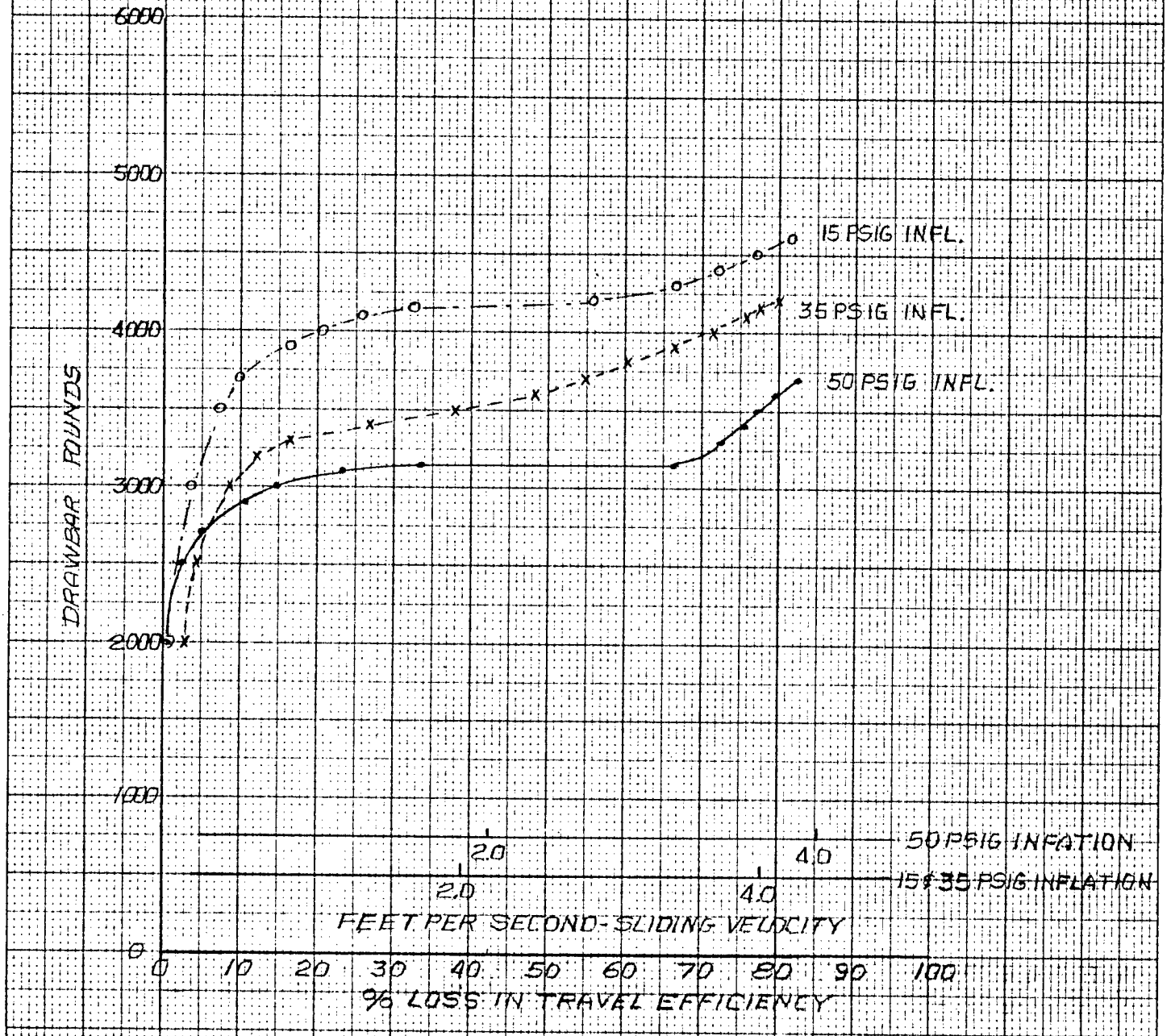
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP A RUN NO.4
## FIGURE NO. 86

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 59°F
SURF. TEMP. 62°F
COMPACTION RANGE: 206/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

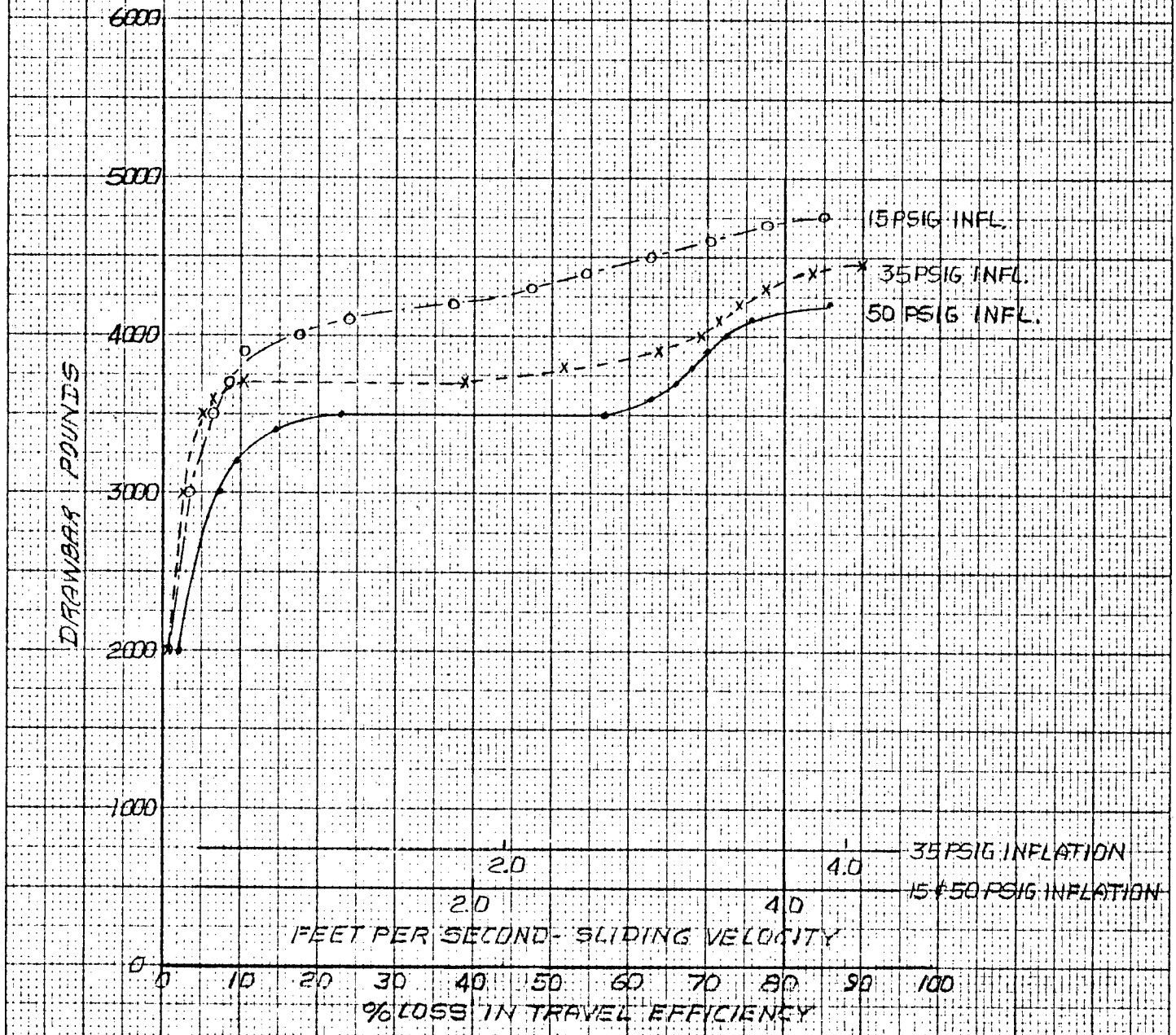
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP J RUN NO. 5
## FIGURE NO. 87

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 52°F
SURF TEMP. 60°F
COMPACTION RANGE: 216/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

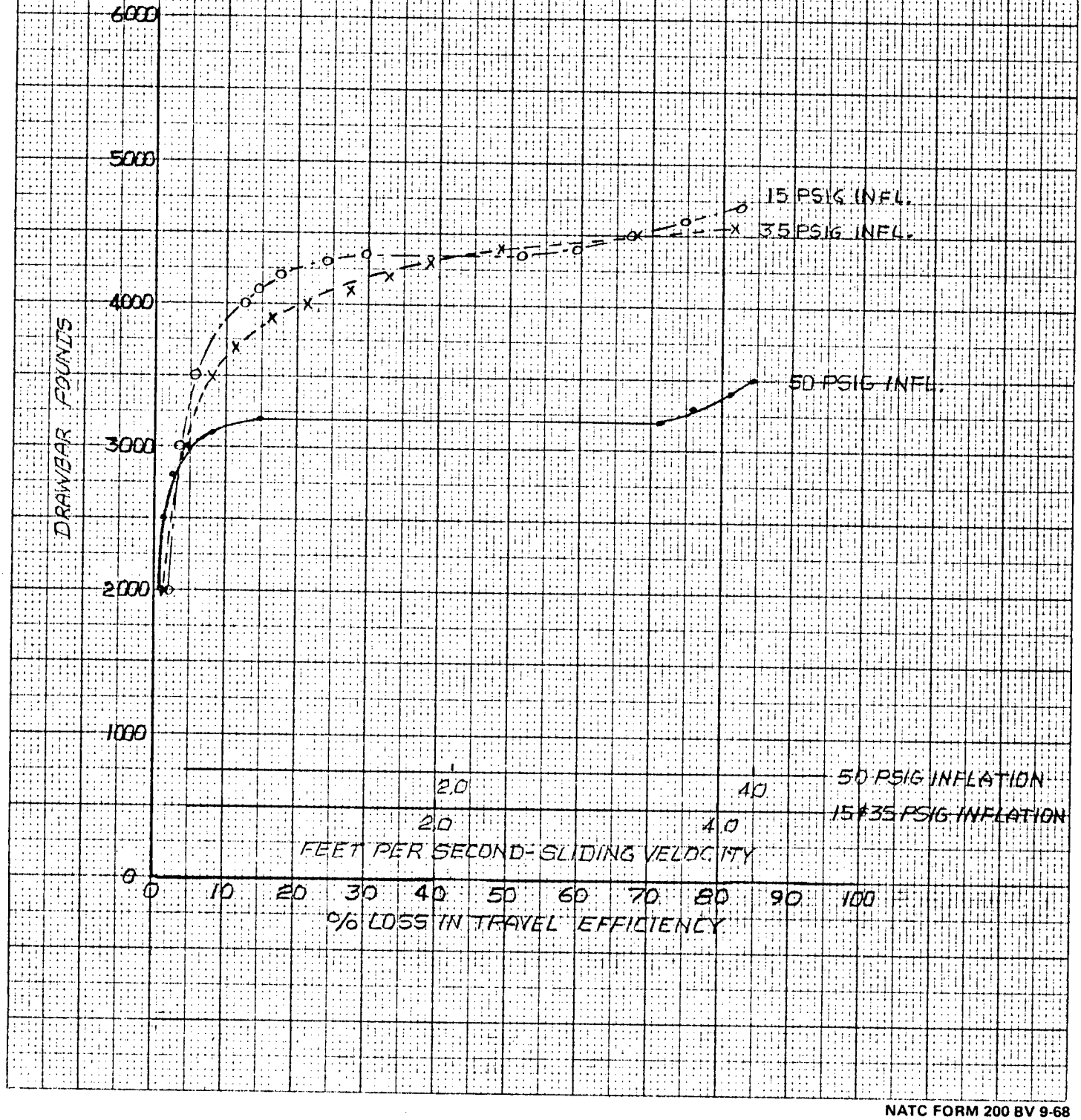
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP E RUN NO. 6
## FIGURE NO. 88

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 54°F
SURF. TEMP. 60°F
COMPACTION RANGE: 208/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

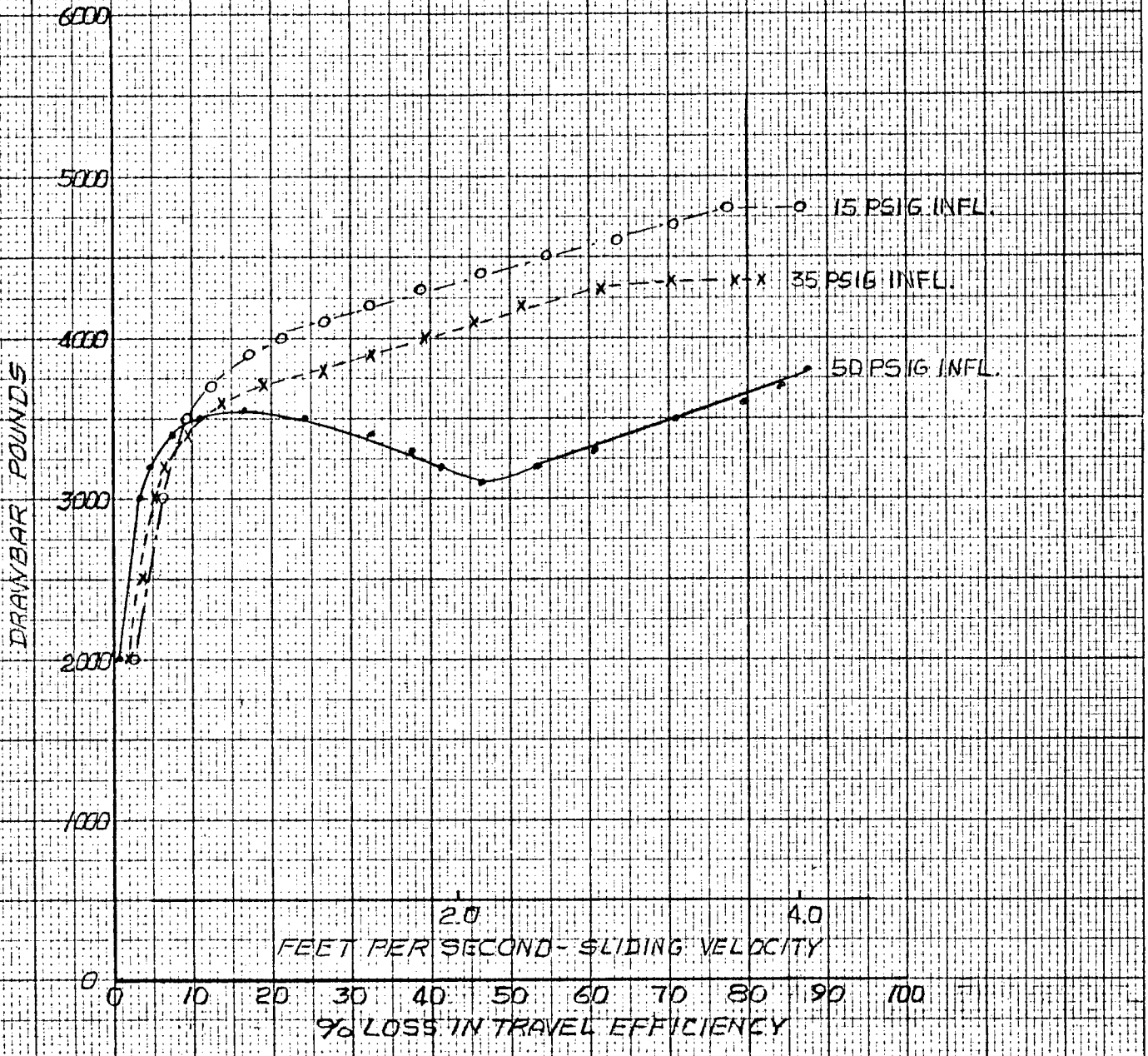
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP G RUN NO. 7
## FIGURE NO. 89

Location: PROVING GROUND

Date: 10-30-73 Test By: WHS

Data By: JED

AMB. TEMP. 29°F
SURF. TEMP. 36°F
COMPACTION RANGE: 180/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

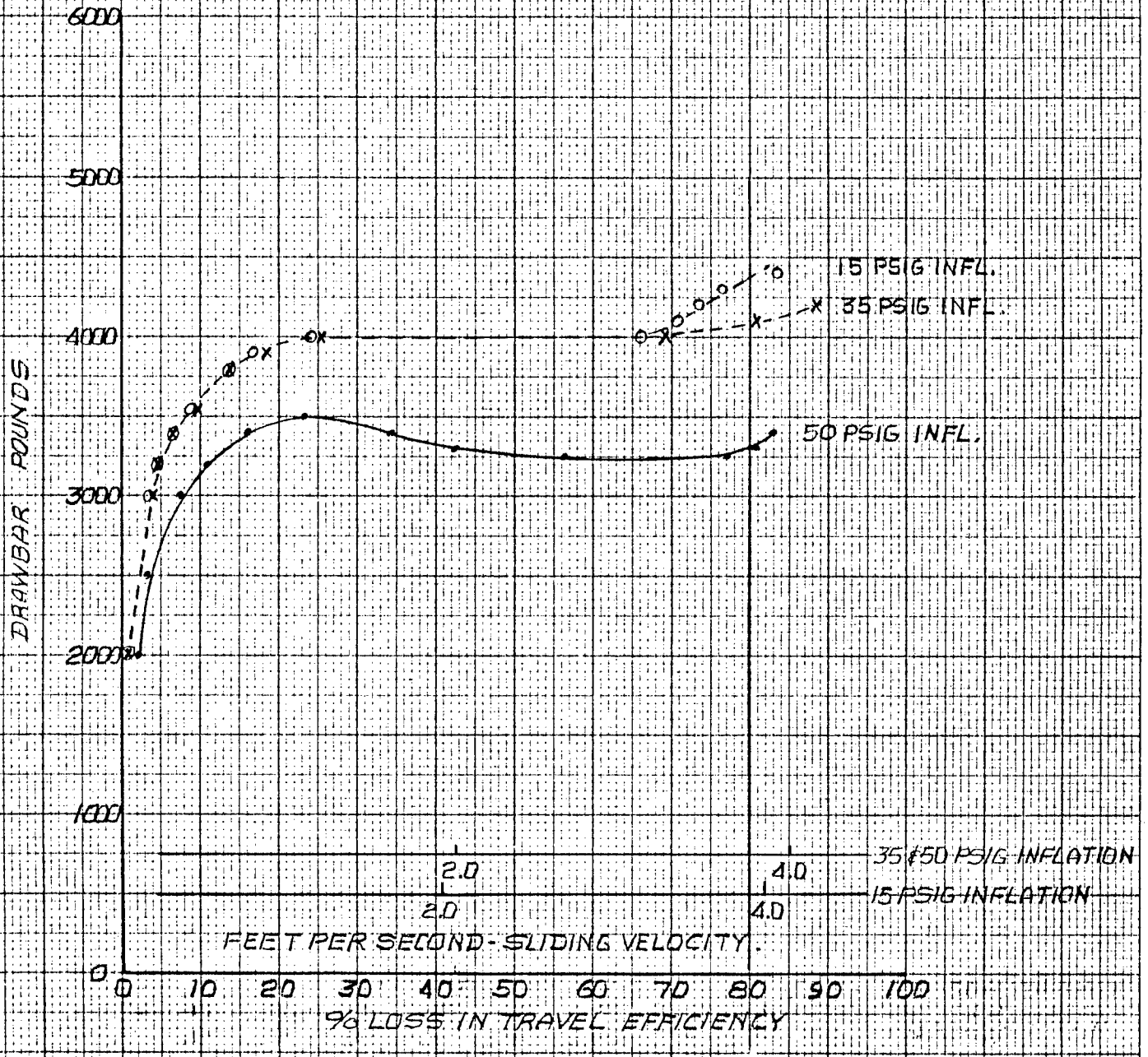
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP D RUN NO. 8
## FIGURE NO. 90

Location: PROVING GROUND

Date: 10-30-73 Test By: WHS

Data By: JED

AMB. TEMP. 58° F
SURF. TEMP. 46° F
COMPACTION RANGE: 200-220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

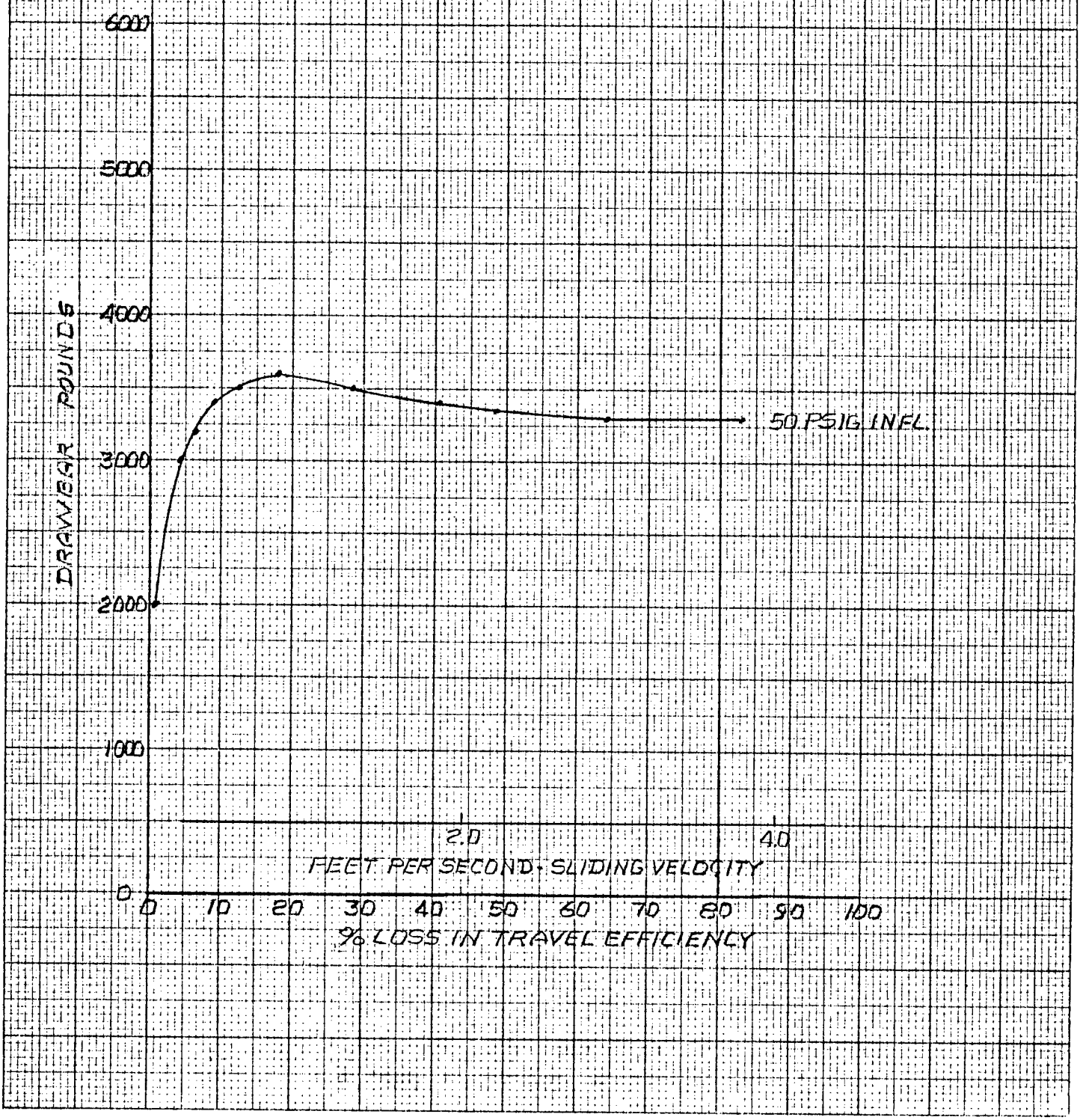
# DYNAMIC TRACTION
## PACKED CLAY
## GROUP C RUN NO. 9
## FIGURE NO. 91

Location: PROVING GROUND

Date: 10-30-73 Test By: WHS

Data By: JED

AMB. TEMP. 64°F
SURF. TEMP. 65°F
COMPACTION RANGE: 214/220+
4 WHEEL DRIVE




NATC FORM 200 BV 9-68

TEST DATA

Figure No. 92

Rolling Resistance - Packed Clay

Nevada Automotive Test Center

Project: 20-17-30

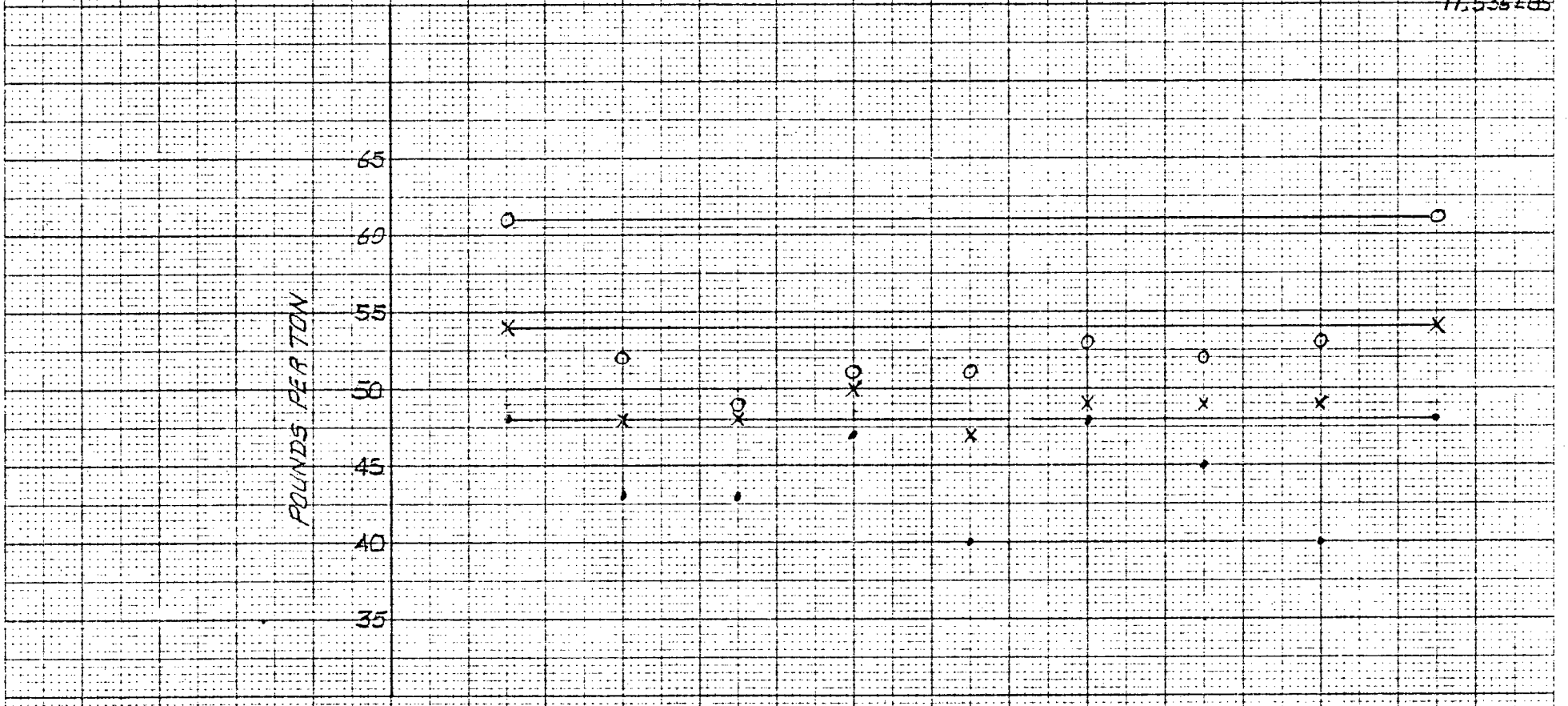
# ROLLING RESISTANCE
## PACKED CLAY
## FIGURE NO. 92

Location: PROVING GROUND

Date: 10-29/30-73 Test By: WHS

Data By: JED

GROSS WT. 5.77 TONS
11,536 LBS




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING @ 50 PSIG | | 100 | 110 | 110 | 102 | 117 | 100 | 106 | 117 | 100 |
| RATING @ 35 PSIG | | 100 | 111 | 111 | 107 | 113 | 109 | 109 | 109 | 100 |
| RATING @ 15 PSIG | | 100 | 115 | 121 | 116 | 116 | 113 | 115 | 113 | 100 |
| AVE. LBS/TON @ 50 PSIG | • | 48 | 43 | 43 | 47 | 40 | 48 | 45 | 40 | 48 |
| AVE. LBS/TON @ 35 PSIG | X | 54 | 48 | 48 | 50 | 47 | 49 | 49 | 49 | 54 |
| AVE. LBS/TON @ 15 PSIG | O | 61 | 52 | 49 | 51 | 51 | 53 | 52 | 53 | 61 |
| CODE | | C | A | B | D | E | F | G | J | C |
| COMPACTION RANGE | | 212-220+ | 206-220+ | 205-220+ | 200-220+ | 208-220+ | 210-220+ | 180-220+ | 216-220+ | 214-220+ |
| AMB. TEMP. | | 40°F | 59°F | 59°F | 58°F | 54°F | 54°F | 29°F | 52°F | 64°F |
| SURF. TEMP. | | 40°F | 62°F | 62°F | 46°F | 60°F | 55°F | 36°F | 60°F | 65°F |

WESTERN LITHO

TEST DATA

Figure No. 93

Ton Mile Per Hour Breaker Temperatures

Nevada Automotive Test Center

Project: 20-17-30

# TON MILE PER HOUR BREAKER TEMPERATURE

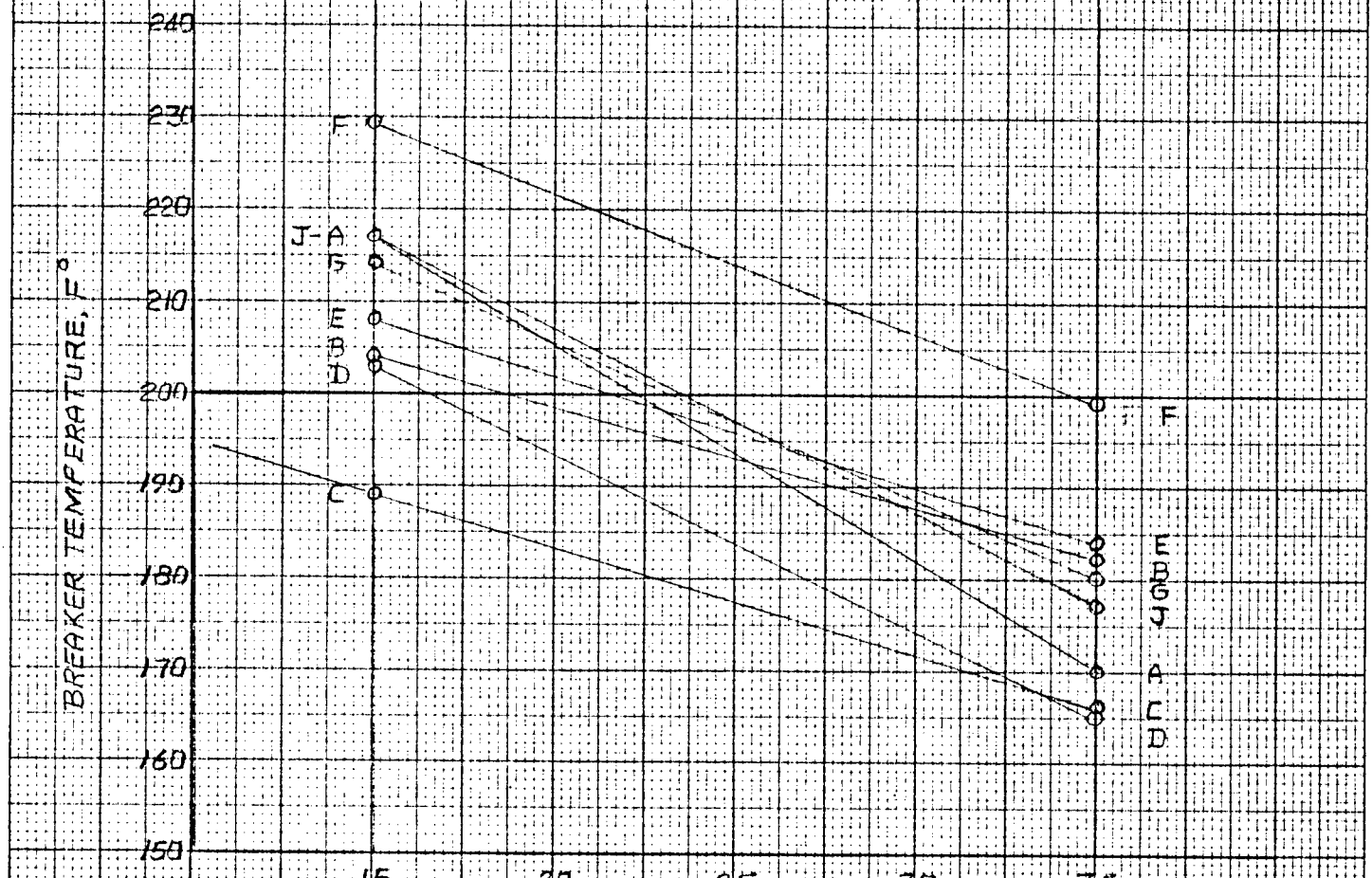
35 MPH

FIGURE NO. 93

Location: ROUTE 50

Date: 2-12/21-74 Test By: JED

Data By: JED




| GROUP | 15 PSI TEMP °F | 15 PSI TMPH | 35 PSI TEMP °F | 35 PSI TMPH |
|---|---|---|---|---|
| A | 217 | 57.07 | 170 | 57.24 |
| B | 204 | 56.68 | 182 | 56.52 |
| C | 189 | 57.02 | 166 | 57.31 |
| D | 203 | 57.14 | 165 | 57.44 |
| E | 208 | 57.19 | 184 | 56.98 |
| F | 229.5 | 56.46 | 199 | 56.03 |
| G | 214 | 56.01 | 180 | 56.87 |
| J | 217 | 56.15 | 177 | 56.76 |

NATC FORM 200 BV 9-68

TEST DATA

Figure Nos. 94 and 95

Braking Summaries

Nevada Automotive Test Center

Project: 20-17-30

# BRAKING

Measured Distance To Stop

WET ASPHALT

4 WHEEL

30 MPH

SURFACE SAE #5

FIGURE NO. 94

Location: PROVING GROUND

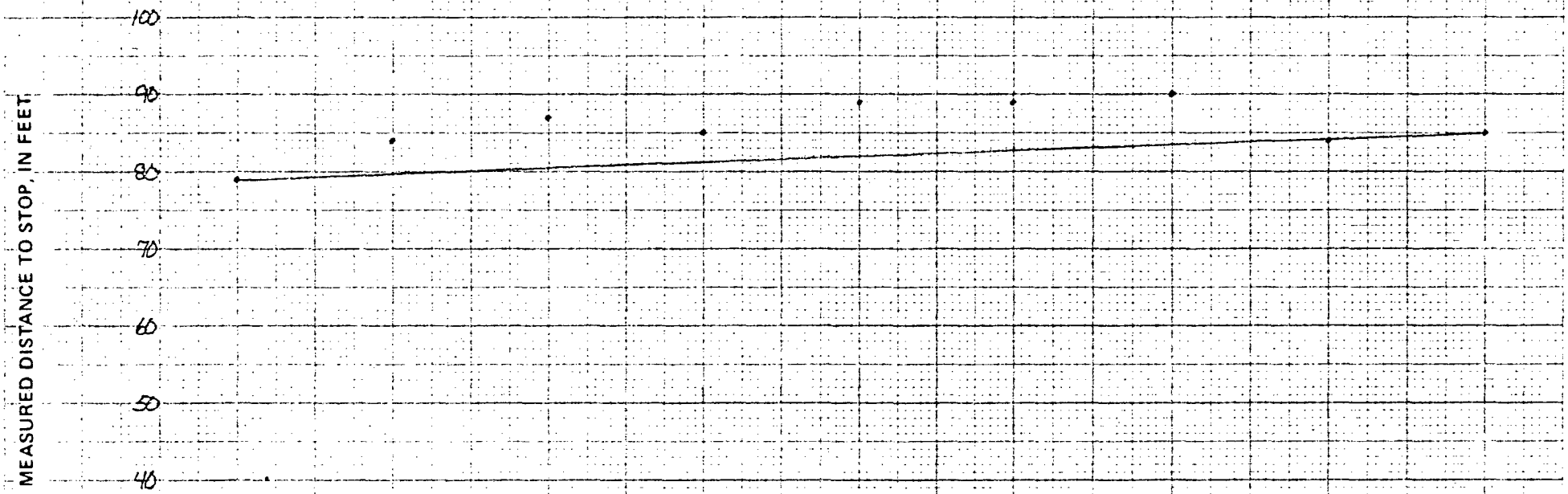
Date: 11-16-73

Test By: D G

Data By: L W

FEET

MEASURED DISTANCE TO STOP, IN FEET




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING | 100 | 95 | 93 | 96 | 92 | 93 | 93 | 100 | 100 |
| AVG. FT. | 79 | 84 | 87 | 85 | 89 | 89 | 90 | 84 | 85 |
| CODE | C | G | A | F | D | B | E | J | C |
| AMB. °F. | 44 | 48 | 52 | 59 | 60 | 56 | 56 | 56 | 57 |
| SURF °F. | 42 | 48 | 54 | 54 | 40 | 54 | 52 | 52 | 52 |

NATC FORM 200BR-STP 9-68

Wet Asphalt

30-0 mph 4-Wheel Braking

| NATC Code | Meas. Dist. To Stop, Feet | Calc. Dist. To Stop, Feet | Meas. Time To Stop, Sec. | Avg. DCLR 30-0 MPH | 30.0-22.5 MPH | | | 22.5-15.0 MPH | | | 15.0-7.5 MPH | | | 7.5-0 MPH | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ |
| C | 79 | 83 | 3.65 | 12.3 | 0.85 | 33 | 12.9 | 1.05 | 29 | 10.5 | 1.00 | 17 | 11.0 | 0.75 | 4 | 14.7 |
| G | 84 | 85 | 3.65 | 12.3 | 0.95 | 37 | 11.6 | 1.00 | 28 | 11.0 | 0.98 | 16 | 11.2 | 0.72 | 4 | 15.3 |
| A | 87 | 90 | 3.95 | 11.2 | 1.00 | 39 | 11.0 | 1.10 | 30 | 10.0 | 0.95 | 16 | 11.6 | 0.90 | 5 | 12.2 |
| F | 85 | 88 | 3.80 | 11.4 | 1.00 | 39 | 11.0 | 1.00 | 28 | 11.0 | 0.95 | 16 | 11.6 | 0.85 | 5 | 12.9 |
| D | 89 | 92 | 4.05 | 10.9 | 1.05 | 40 | 10.5 | 1.10 | 30 | 10.0 | 1.00 | 17 | 11.0 | 0.90 | 5 | 12.2 |
| B | 89 | 90 | 4.55 | 11.3 | 1.65 | 40 | 10.5 | 1.05 | 29 | 10.5 | 1.05 | 17 | 10.5 | 0.80 | 4 | 13.8 |
| E | 90 | 92 | 4.10 | 10.8 | 1.05 | 40 | 10.5 | 1.10 | 30 | 10.0 | 1.05 | 17 | 10.5 | 0.90 | 5 | 12.2 |
| J | 84 | 87 | 3.80 | 11.7 | 1.00 | 39 | 11.0 | 1.05 | 29 | 10.5 | 0.85 | 14 | 12.9 | 0.90 | 5 | 12.2 |
| C | 85 | 88 | 3.80 | 11.8 | 0.90 | 35 | 12.2 | 1.15 | 32 | 9.6 | 1.00 | 17 | 11.0 | 0.75 | 4 | 14.7 |

DCLR - Deceleration

Nevada Automotive Test Center

Project: 20-17-30

# BRAKING

Measured Distance To Stop

DRY ICE

4 WHEEL

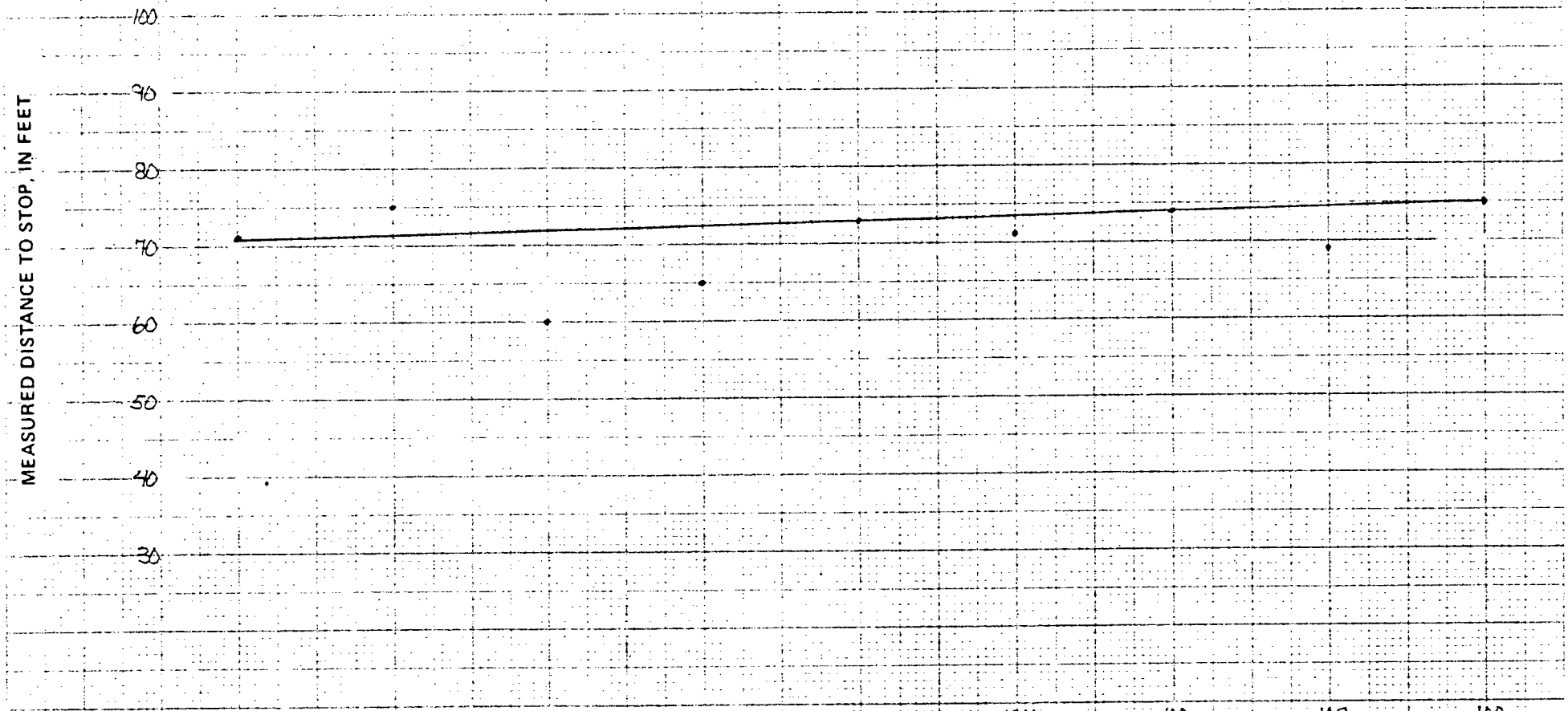
9 MPH

FIGURE NO. 95

Location: SQUAW VALLEY, CALIF.

Date: 11-7-73 Test By: WS

Data By: LW




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RATING | 100 | 95 | 120 | 112 | 100 | 104 | 100 | 108 | 100 |
| AVG. FT. | 71 | 75 | 60 | 65 | 73 | 71 | 74 | 69 | 75 |
| CODE | C | J | E | F | B | D | A | G | C |
| AMB. °F. | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| SURF °F. | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |

Dry Ice

9-0 mph Braking

| NATC Code | Meas. Dist. To Stop, Feet | Calc. Dist. To Stop, Feet | Meas. Time To Stop, Sec. | Avg. DCLR 9-0 MPH | 9.0-6.75 MPH | | | 6.75-4.50 MPH | | | 4.50-2.25 MPH | | | 2.25-0 MPH | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ | Time Sec. | Dist. Feet | DCLR Ft/Sec.$^2$ |
| C | 71 | 73 | 9.70 | 5.52 | 3.35 | 39 | 11.80 | 2.45 | 20 | 6.06 | 2.20 | 11 | 3.33 | 1.70 | 3 | 0.91 |
| J | 75 | 76 | 10.00 | 5.76 | 3.20 | 37 | 11.20 | 3.10 | 26 | 7.88 | 2.20 | 11 | 3.33 | 1.50 | 2 | 0.61 |
| E | 60 | 60 | 8.80 | 4.55 | 2.40 | 28 | 8.48 | 2.30 | 19 | 5.76 | 2.10 | 10 | 3.03 | 2.00 | 3 | 0.91 |
| F | 65 | 66 | 9.60 | 5.00 | 2.60 | 30 | 9.09 | 2.50 | 21 | 6.36 | 2.50 | 12 | 3.64 | 2.00 | 3 | 0.91 |
| B | 73 | 75 | 10.40 | 5.68 | 3.00 | 35 | 10.60 | 3.00 | 25 | 7.58 | 2.50 | 12 | 3.64 | 1.90 | 3 | 0.91 |
| D | 71 | 73 | 10.20 | 5.53 | 3.00 | 35 | 10.60 | 2.80 | 23 | 6.97 | 2.20 | 11 | 3.33 | 2.20 | 4 | 1.21 |
| A | 74 | 74 | 10.20 | 5.61 | 3.00 | 35 | 10.60 | 2.90 | 24 | 7.27 | 2.40 | 12 | 3.64 | 1.90 | 3 | 0.91 |
| G | 69 | 70 | 9.90 | 5.30 | 2.70 | 31 | 9.39 | 2.90 | 24 | 7.27 | 2.40 | 12 | 3.64 | 1.90 | 3 | 0.91 |
| C | 75 | 76 | 10.50 | 5.76 | 3.00 | 35 | 10.60 | 3.20 | 26 | 7.88 | 2.50 | 12 | 3.64 | 1.80 | 3 | 0.91 |

DCLR - Deceleration

TEST DATA

Figure Nos. 96 through 105

Spring Rates

Nevada Automotive Test Center

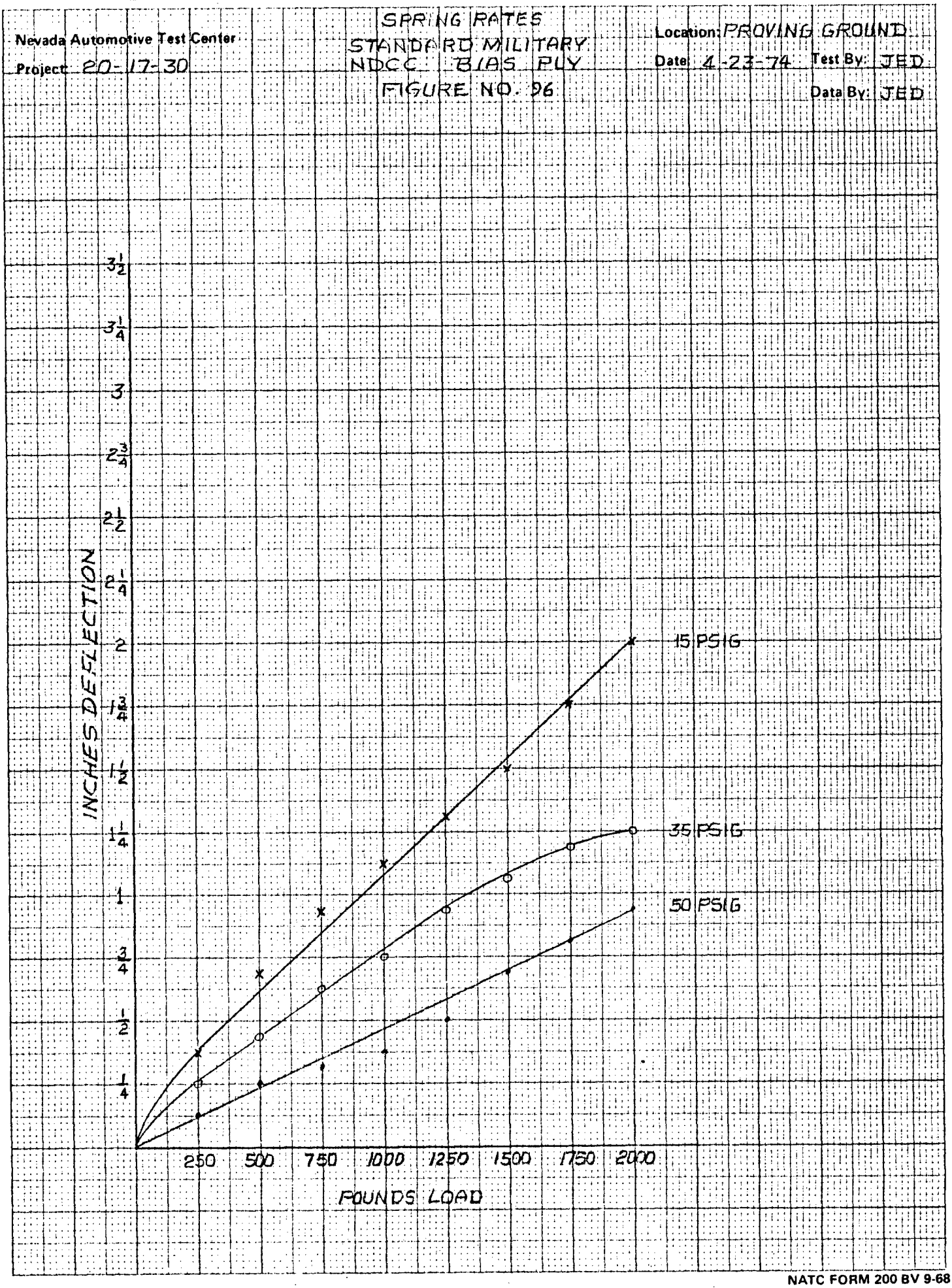
Project: 20-17-30

# SPRING RATES
## STANDARD MILITARY
## NDCC BIAS PLY
## FIGURE NO. 96

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

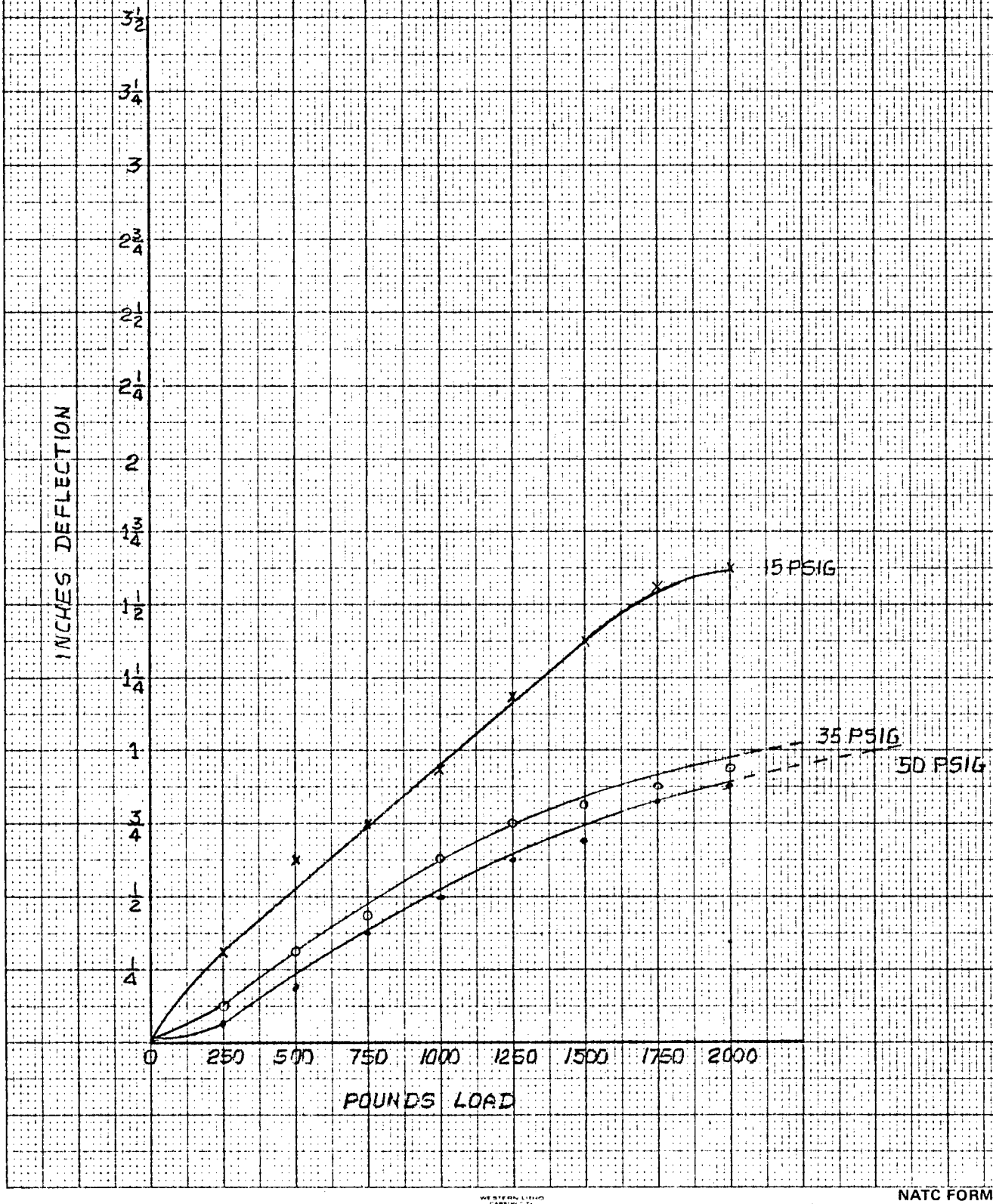
Project: 20-17-30

# SPRING RATES
## R2A MILITARY NDCC
## EXPERIMENTAL BIAS PLY
## FIGURE NO. 97

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# SPRING RATE

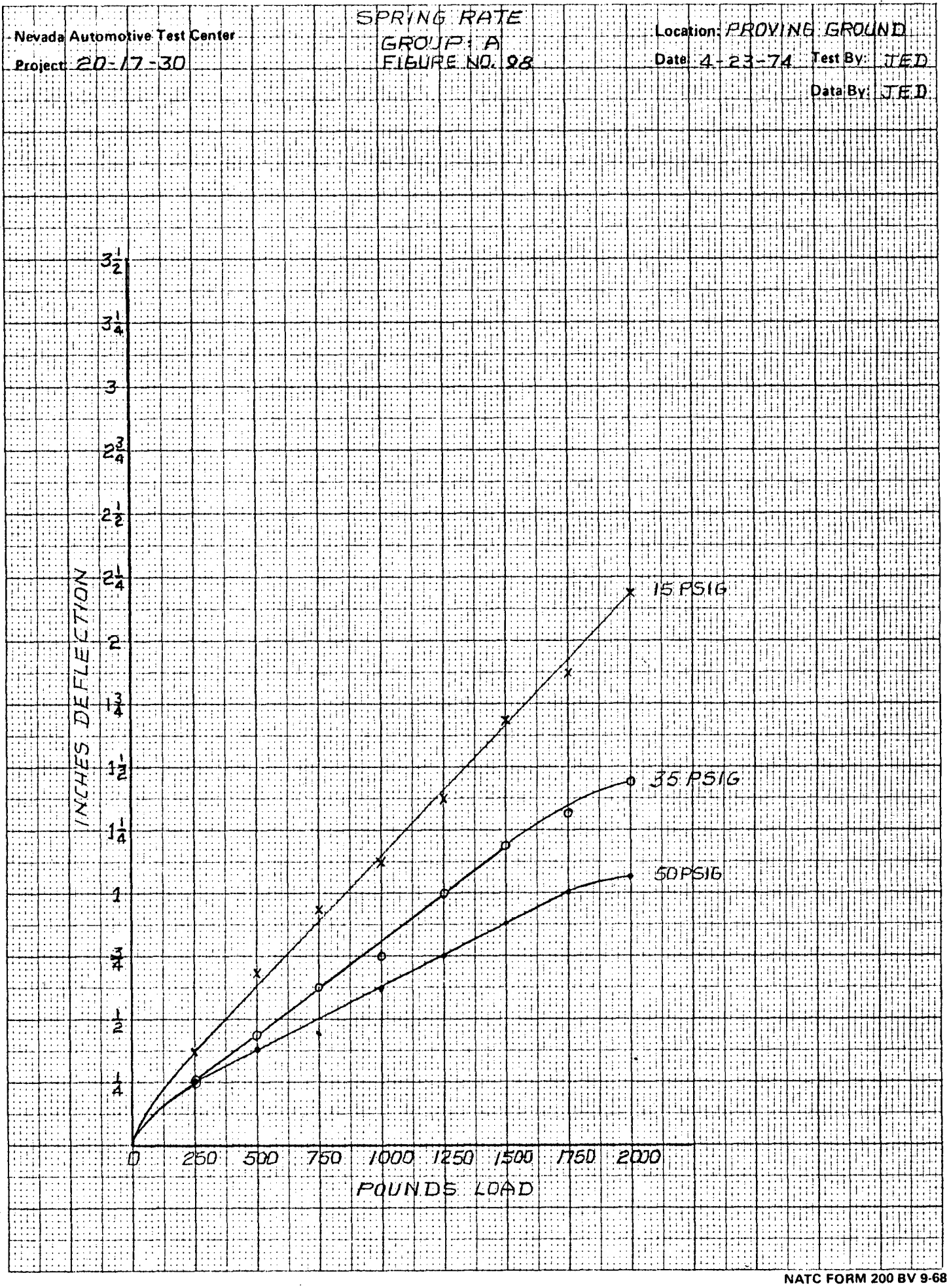
GROUP: A

FIGURE NO. 98

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project 20-17-30

# SPRING RATE

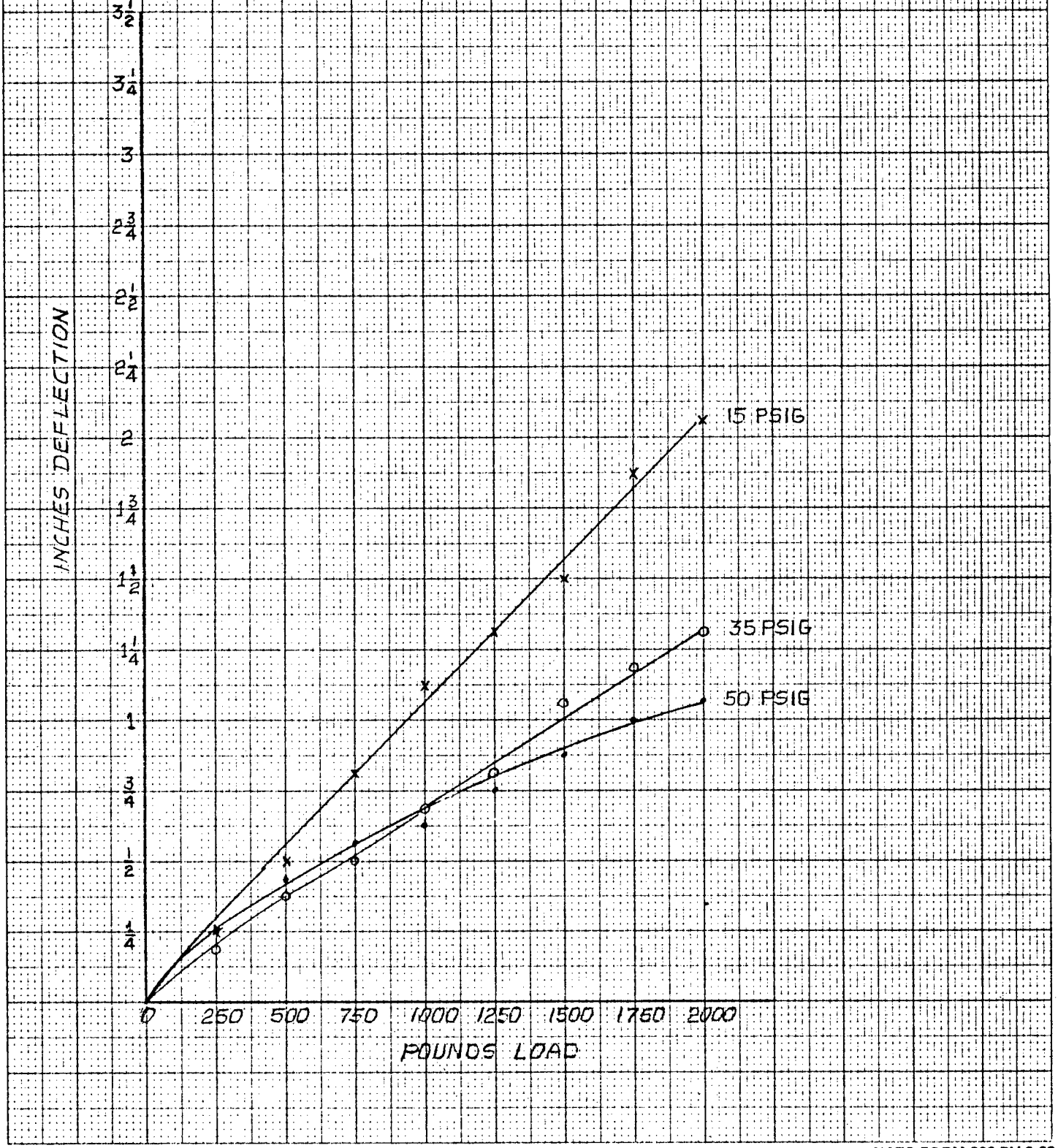
GROUP: B

FIGURE NO. 99

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# SPRING RATE

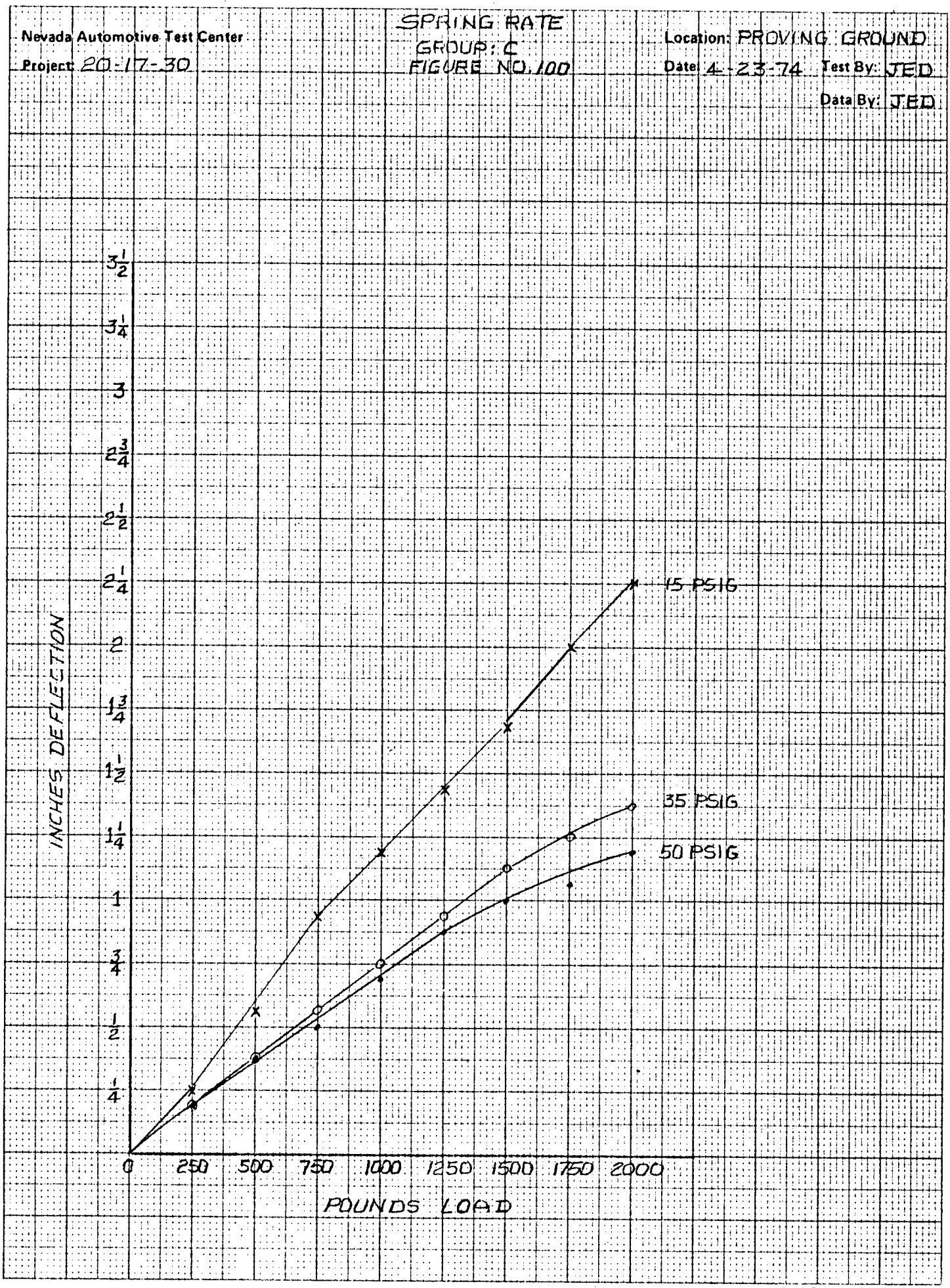
GROUP: C

FIGURE NO. 100

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# SPRING RATES

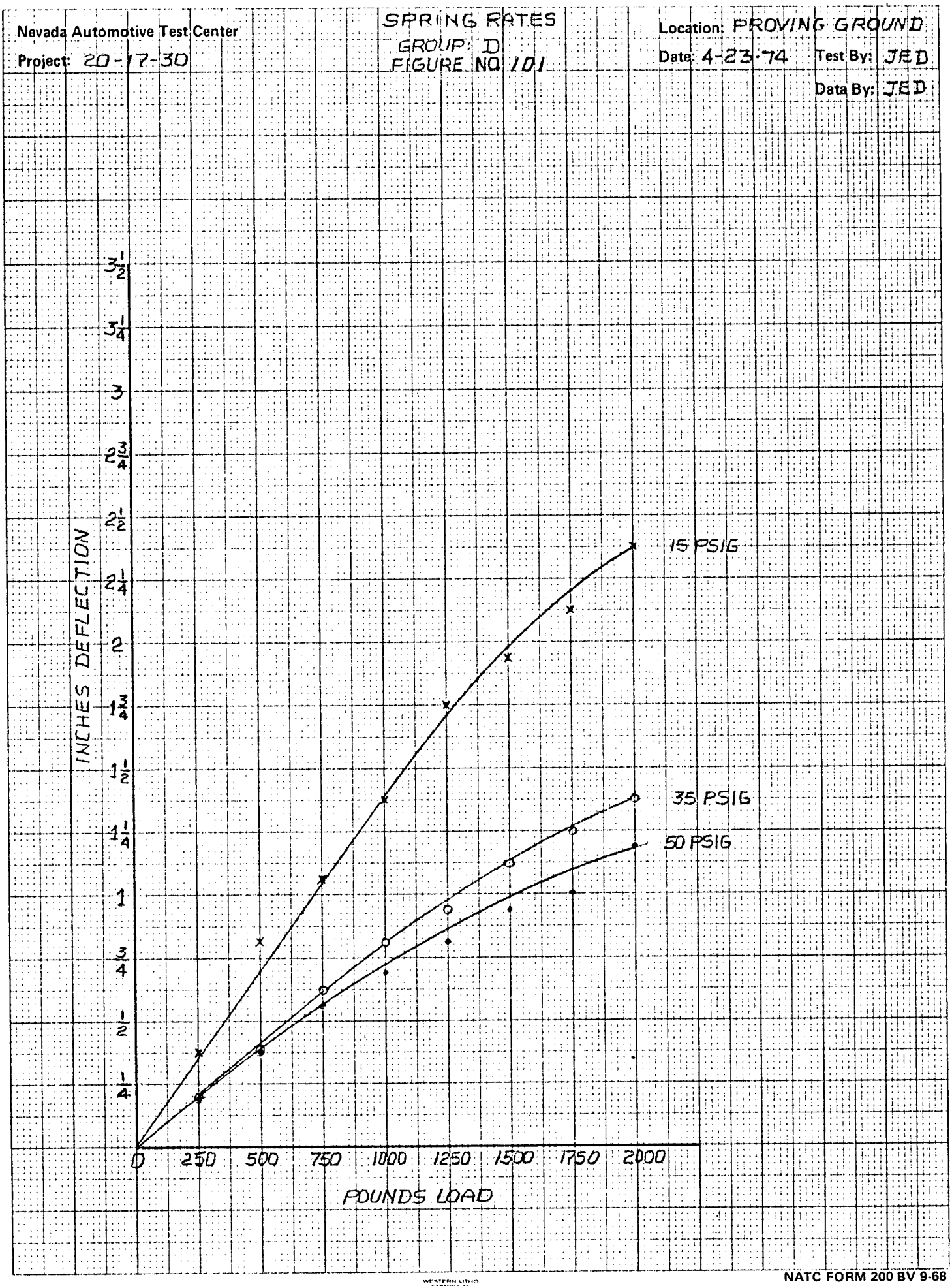
GROUP: D

FIGURE NO 101

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

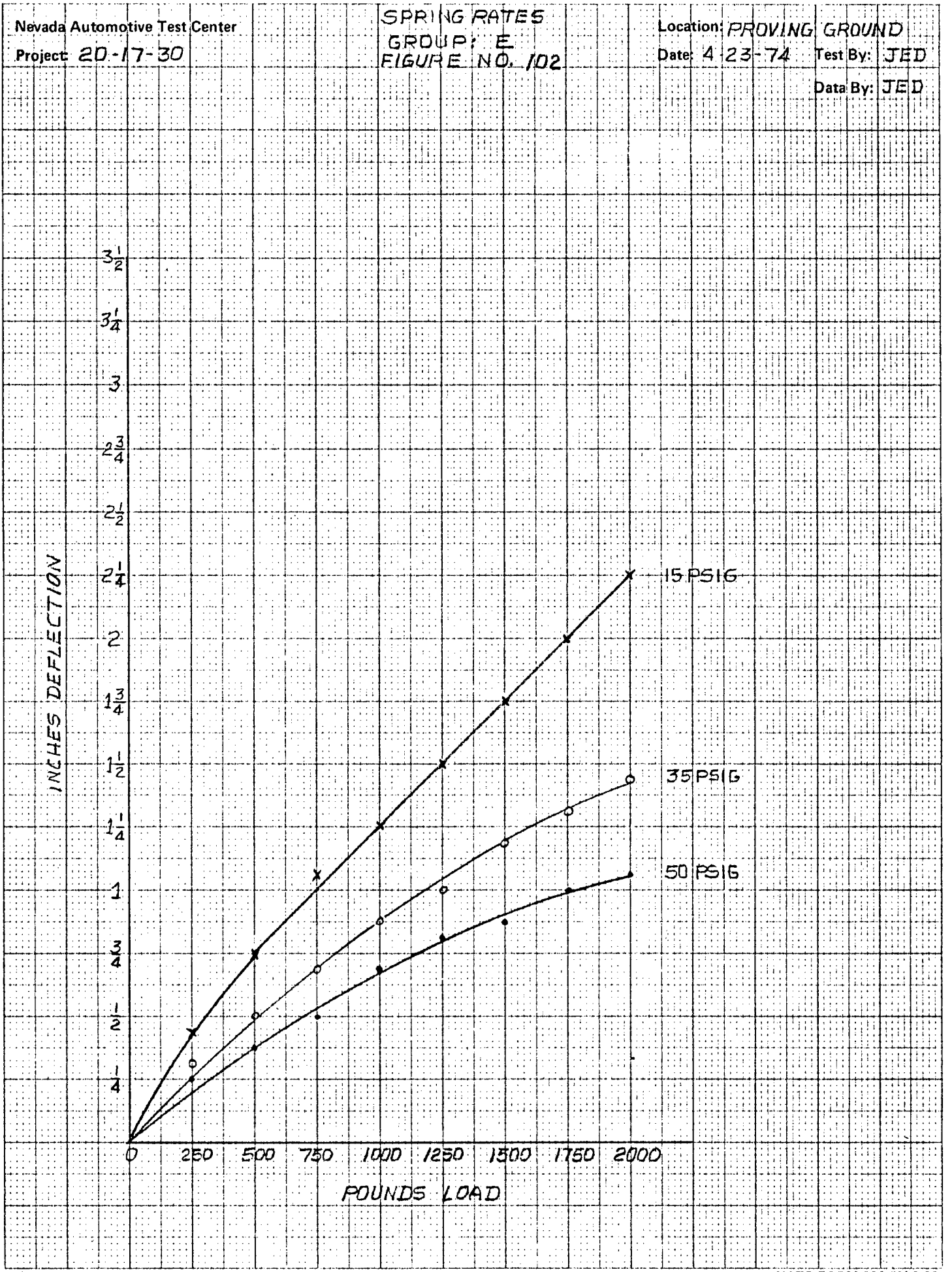
Project: 20-17-30

# SPRING RATES
## GROUP: E
## FIGURE NO. 102

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




WESTERN LITHO
CARSON CITY

Nevada Automotive Test Center

Project: 20-17-30

# SPRING RATES

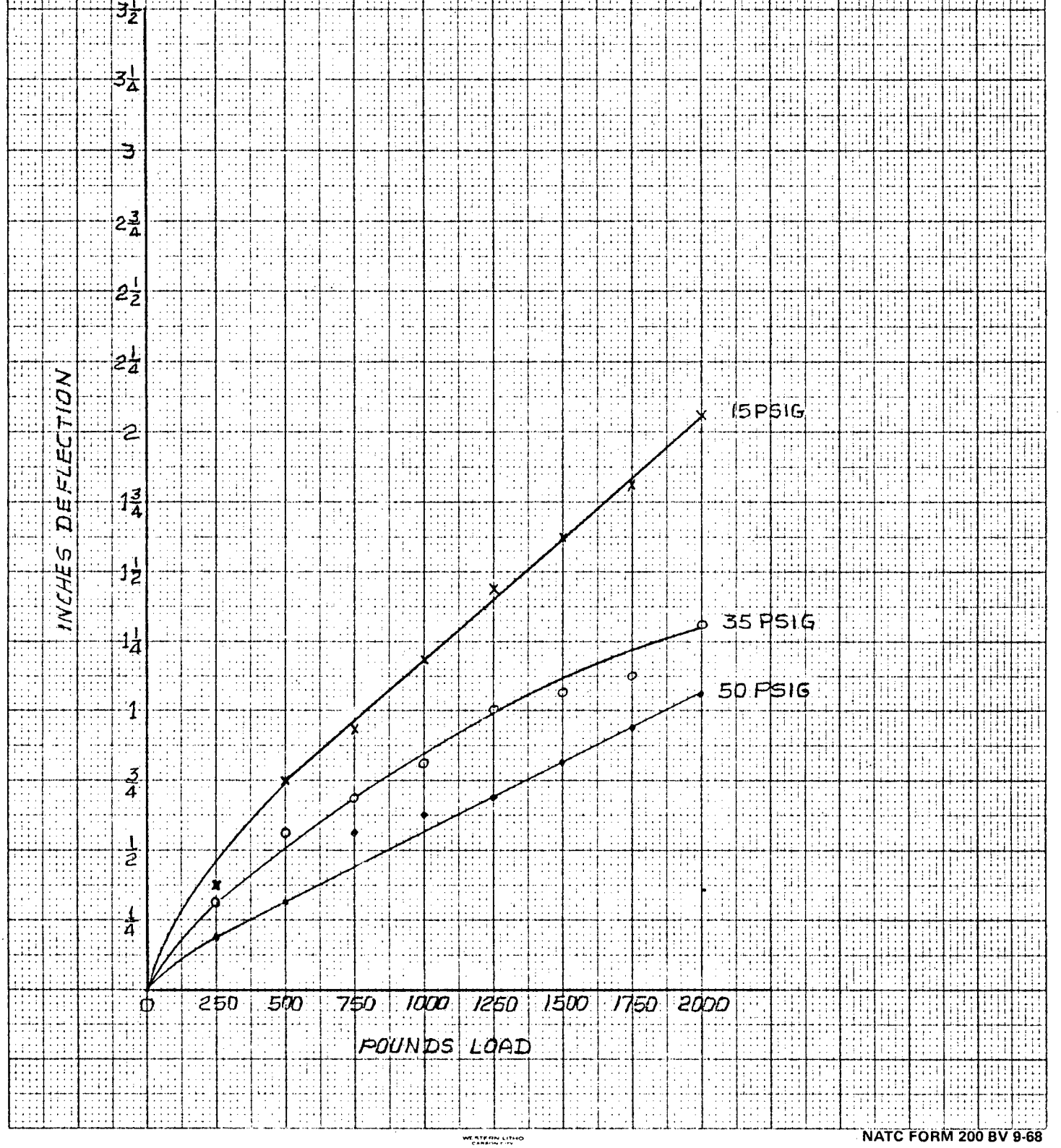
GROUP: F

FIGURE NO. 103

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




WESTERN LITHO COMPANY

Nevada Automotive Test Center

Project: 20-17-30

# SPRING RATES

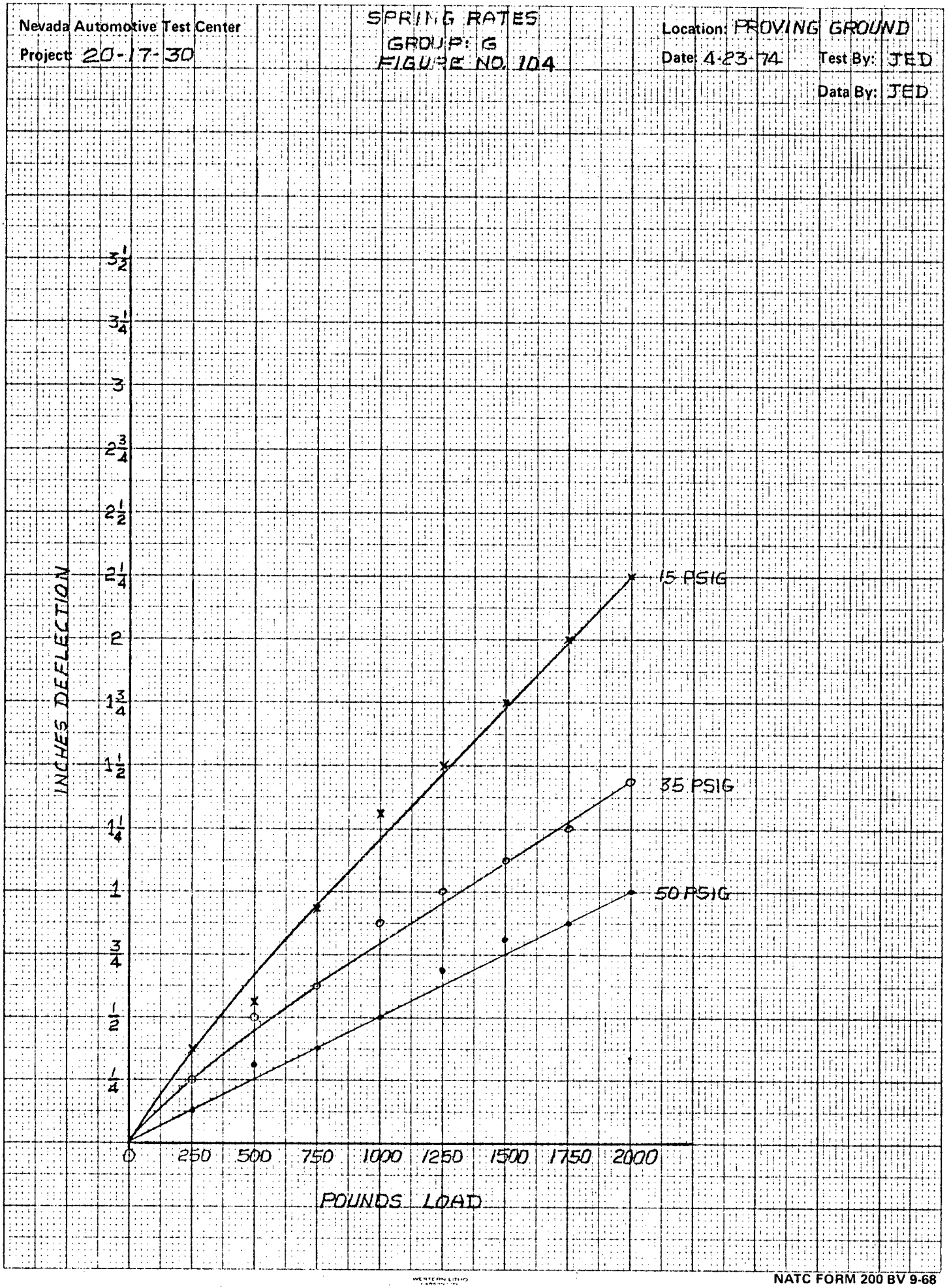
GROUP: G

FIGURE NO. 104

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




WESTERN LITHO

Nevada Automotive Test Center

Project: 20-17-30

# SPRING RATES

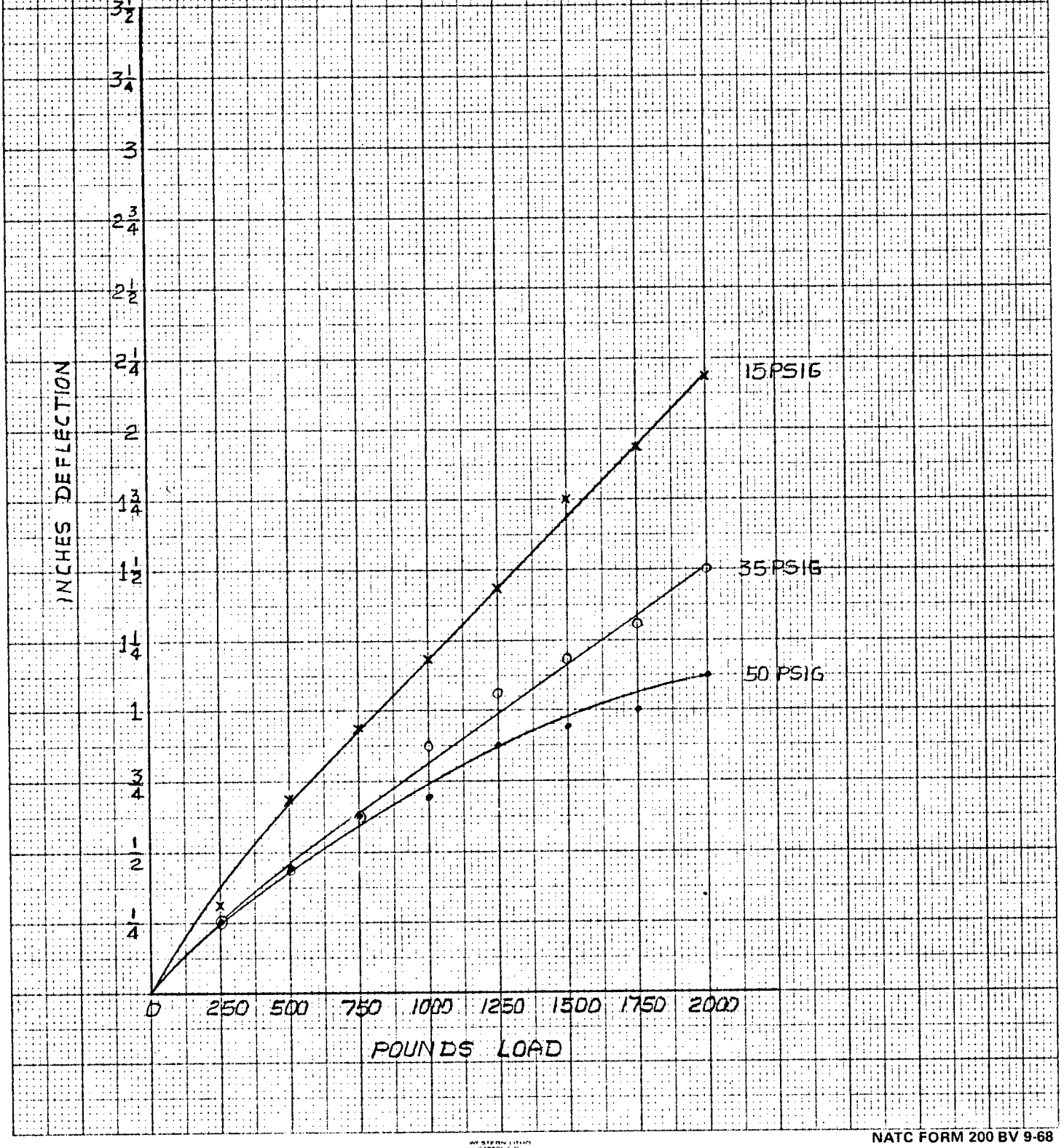
GROUP: J

FIGURE NO. 105

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED




NATC FORM 200 BV 9-68

TEST DATA

Figure Nos. 106 through 109

"J" Turns - Wet Asphalt

Nevada Automotive Test Center

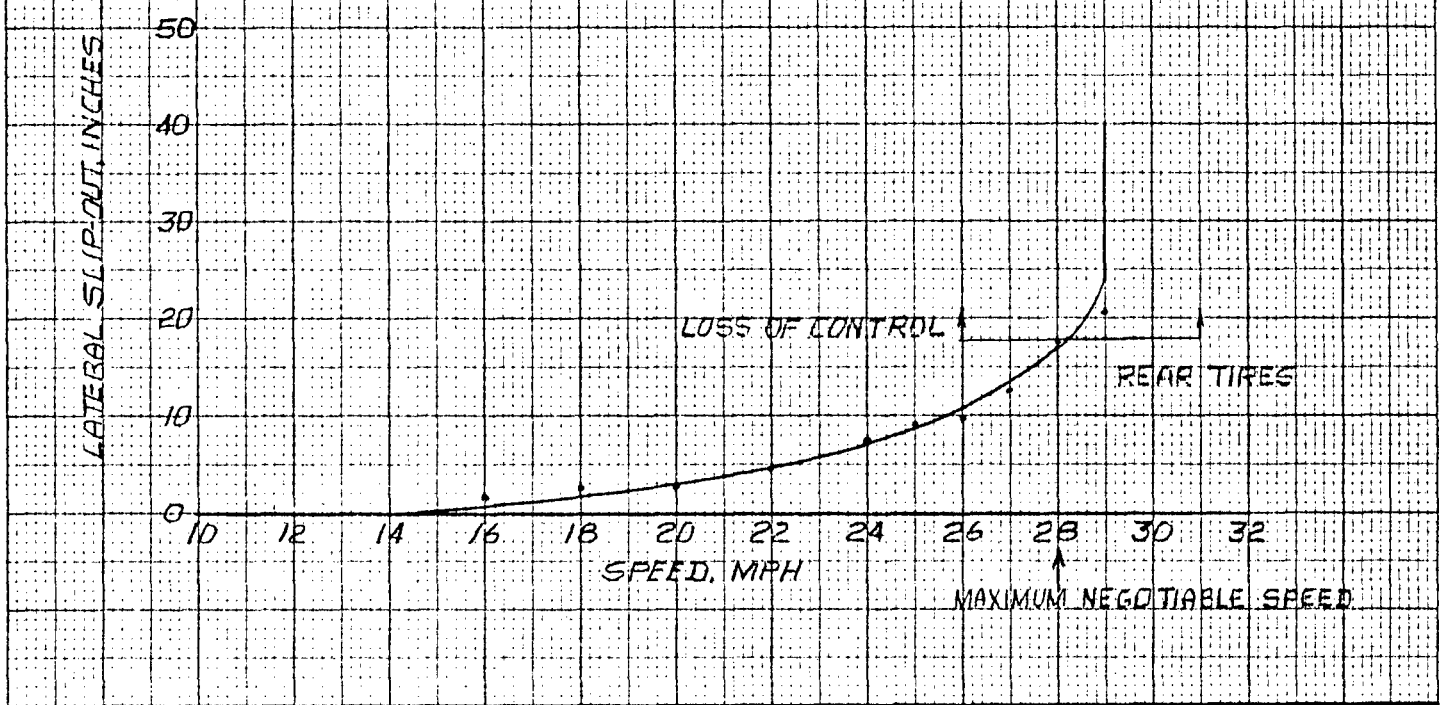
Project: 20-17-30

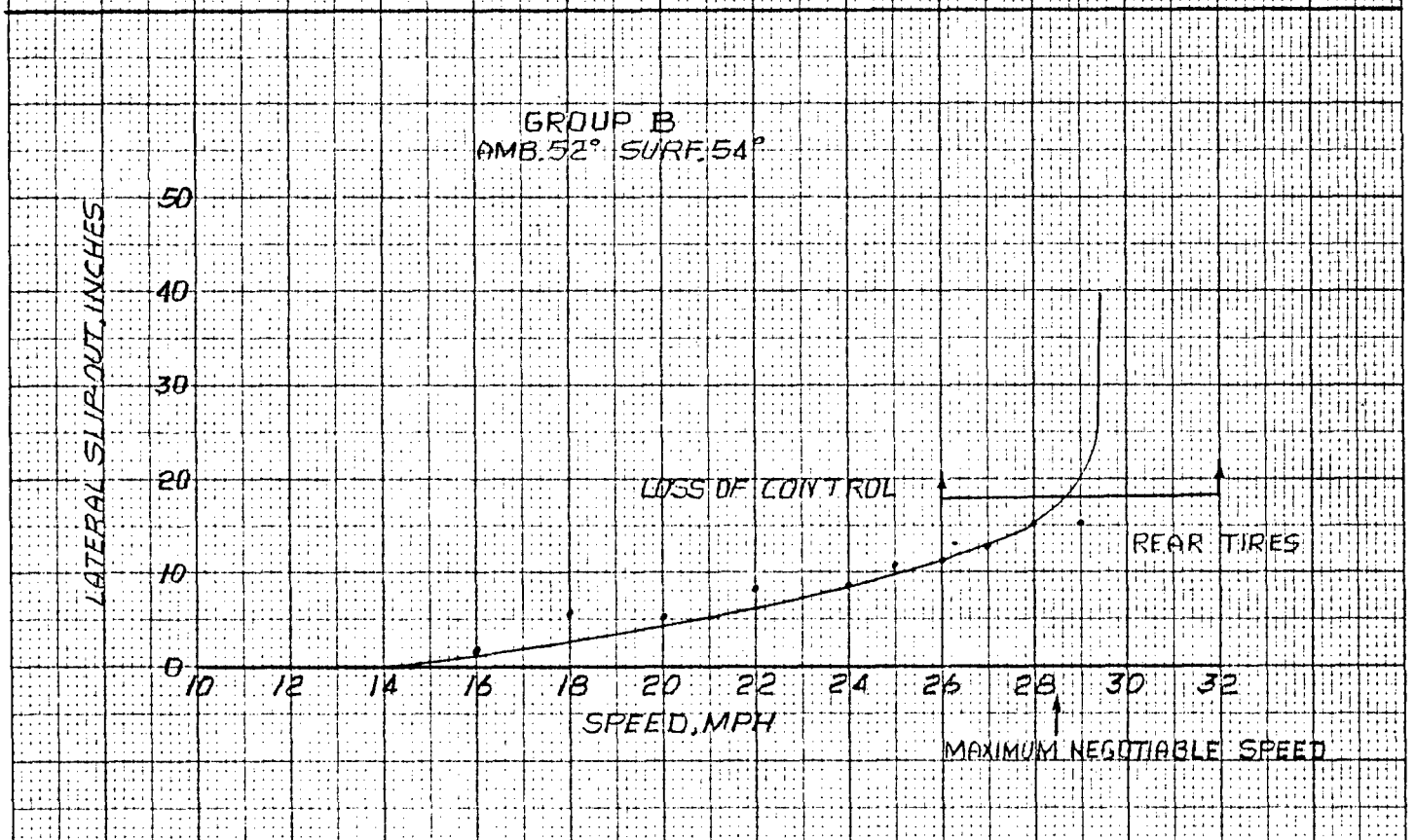
# WET ASPHALT "J" TURN
4WHEEL DRIVE
50 PSIG INFLATION PRESSURE
90' ℄ RADIUS
FIGURE NO. 10G

Location: PROVING GROUND

Date: 11-12-73 Test By: WHS

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

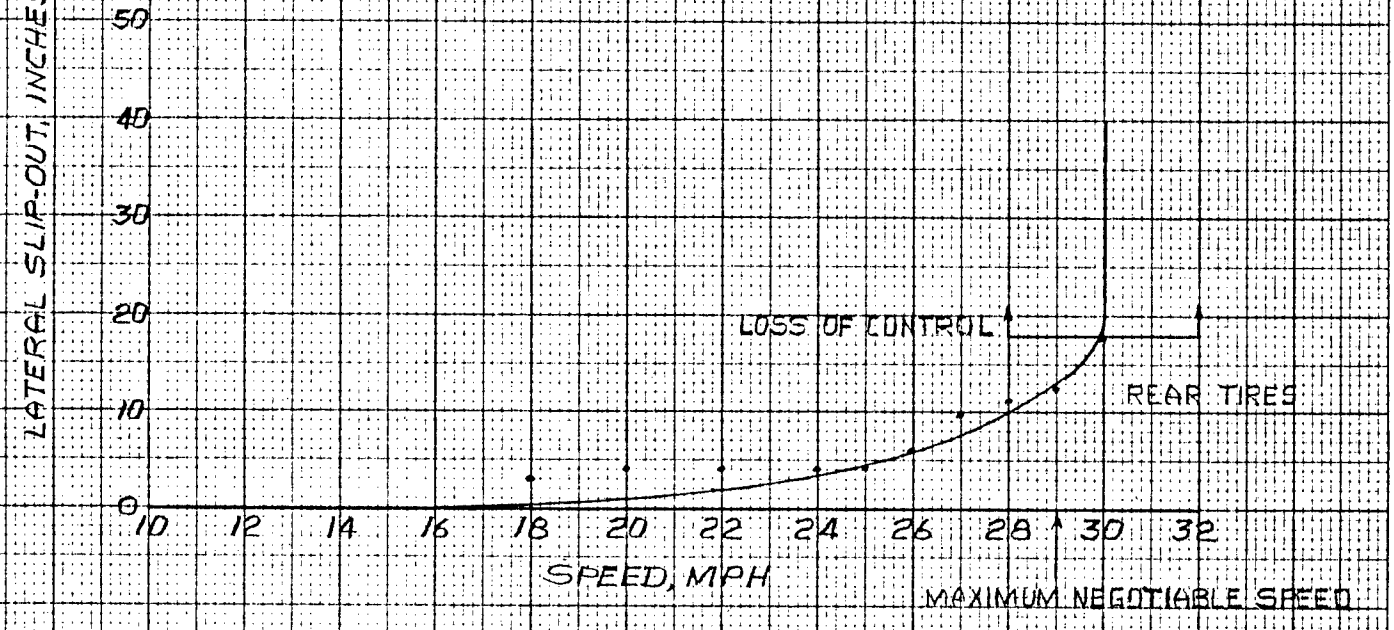
# WET ASPHALT "J" TURN
## 4 WHEEL DRIVE
## 50 PSIG INFLATION PRESSURE
## 90' ℄ RADIUS
## FIGURE NO. 107

Location: PROVING GROUND

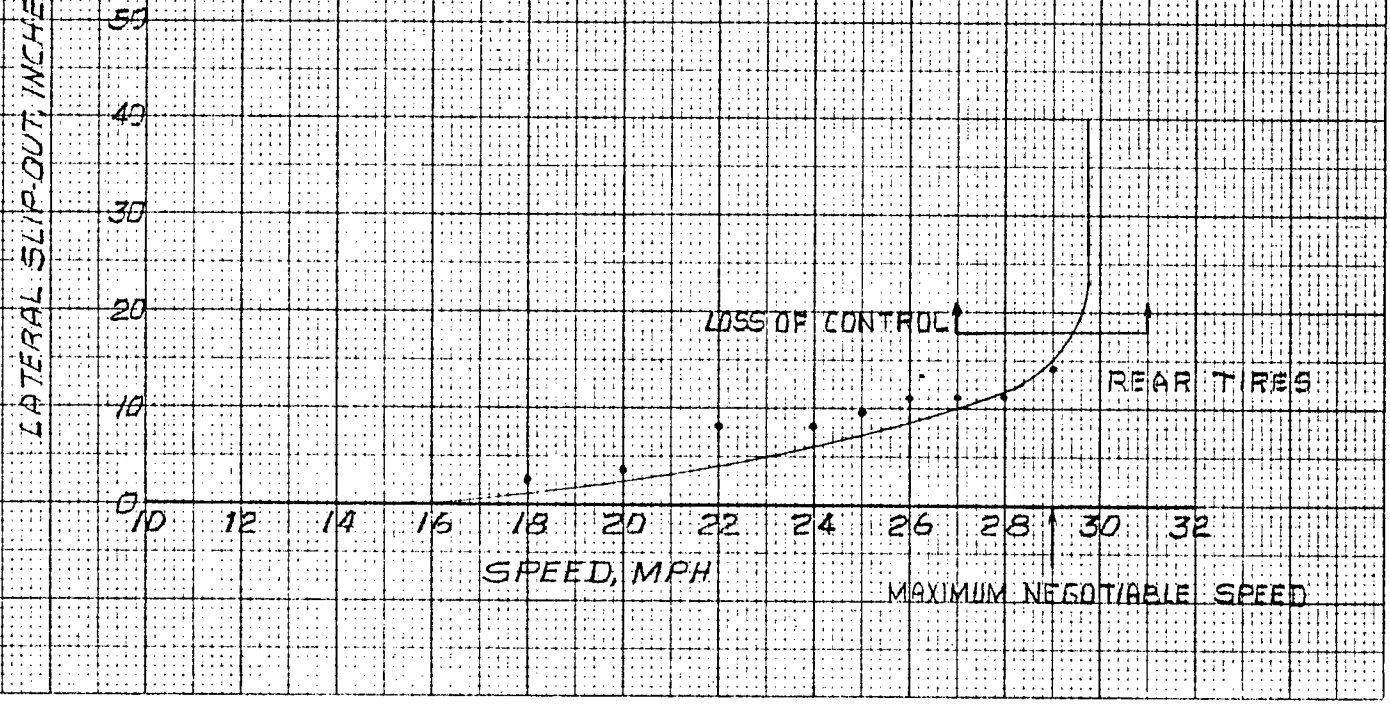
Date: 11-12-73 Test By: WHS

Data By: JED

GROUP C
AMB. 47° SURF. 50°




GROUP D
AMB. 43° SURF. 40°




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

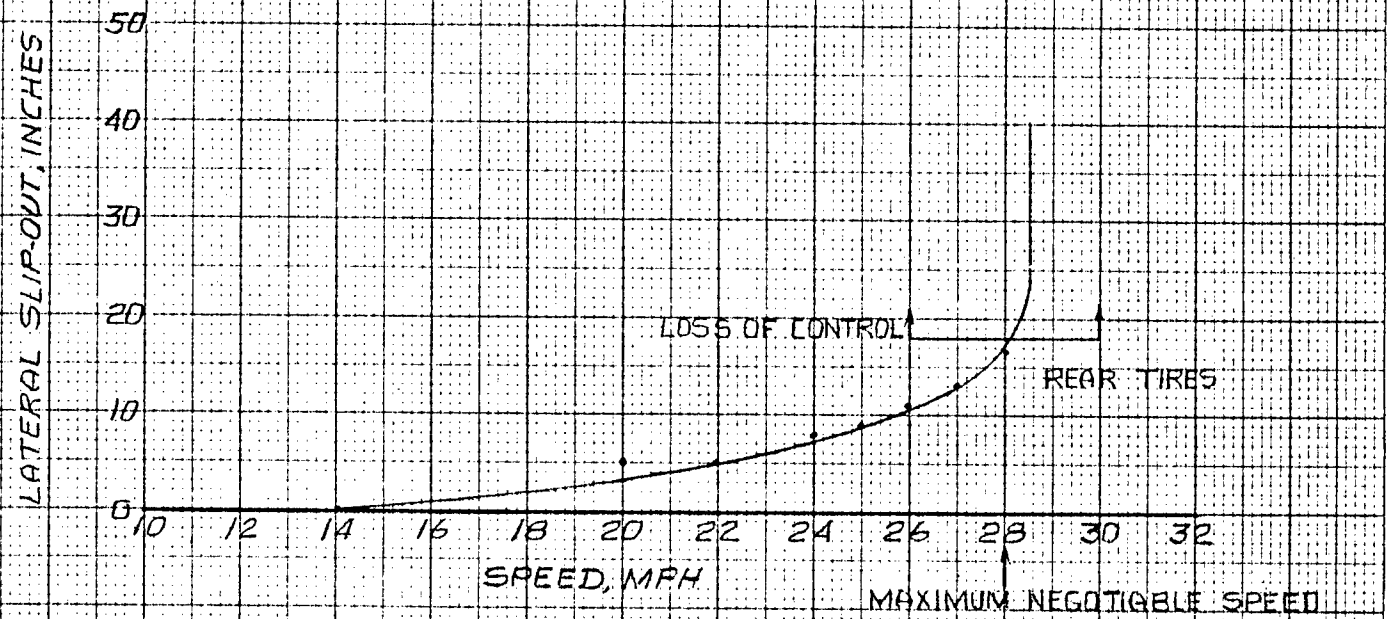
# WET ASPHALT "J" TURN
4 WHEEL DRIVE
50 PSIG INFLATION PRESSURE
90' ℄ RADIUS
FIGURE NO. 108

Location: PROVING GROUND

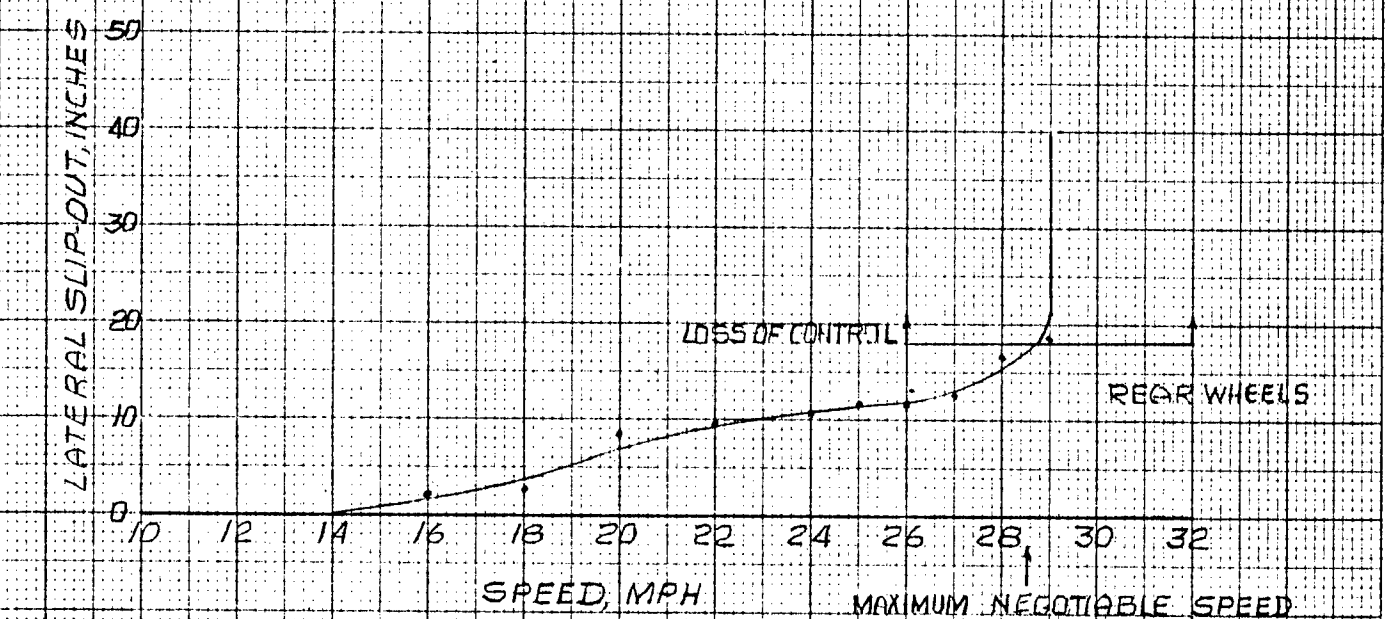
Date: 11-13-73 Test By: WHS

Data By: JED

## GROUP E
AMB. 57° SURF. 60°




## GROUP F
AMB. 61° SURF. 59°




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

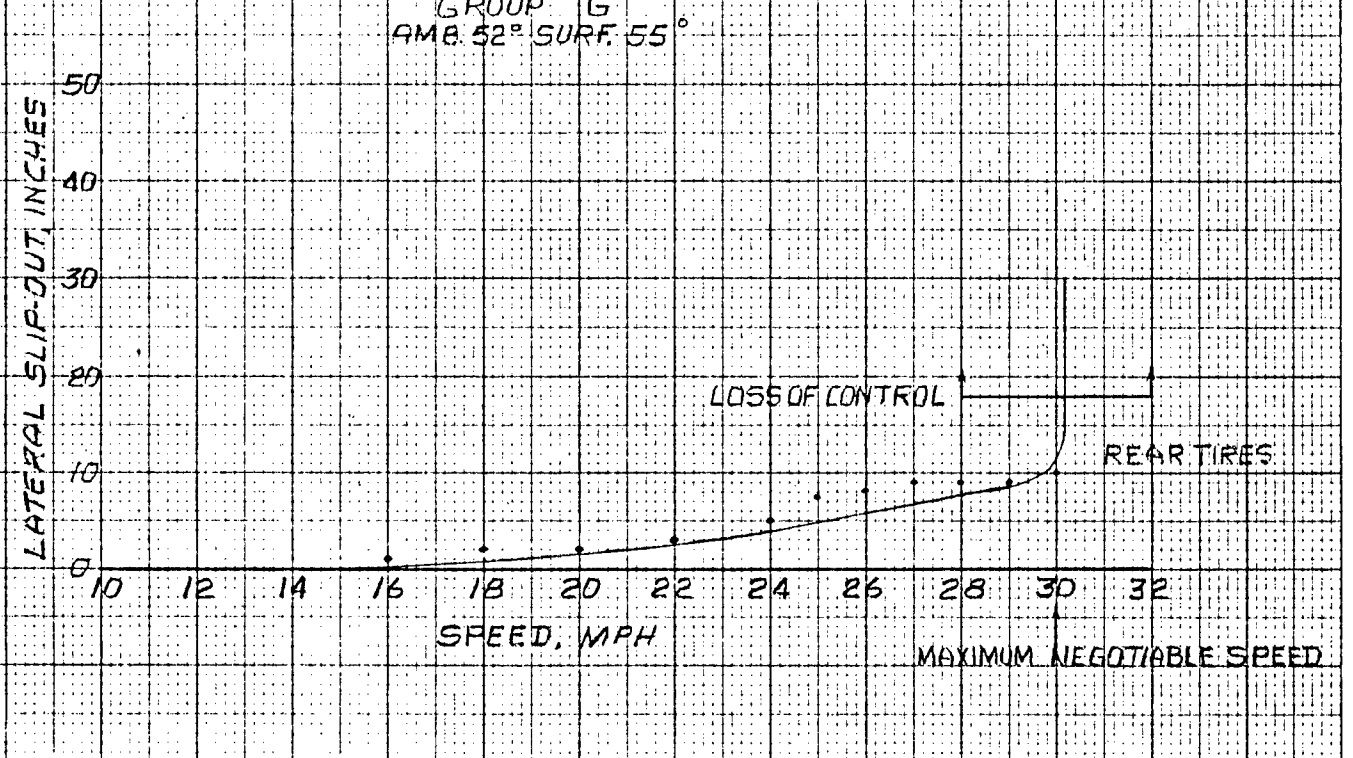
Project: 20-17-30

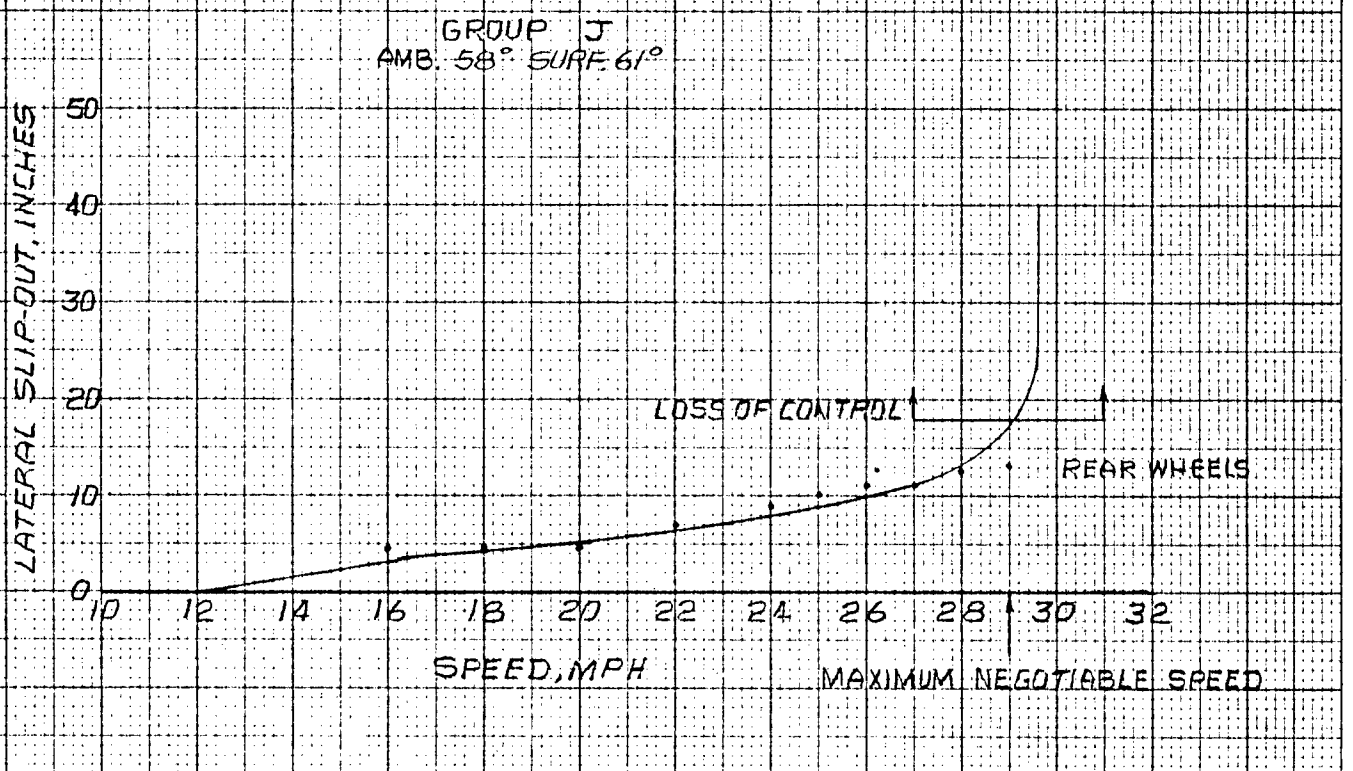
# WET ASPHALT "J" TURN
## 4 WHEEL DRIVE
## 50 PSIG INFLATION PRESSURE
## 90' ℄ RADIUS
## FIGURE NO. 109

Location: PROVING GROUND

Date: 11-13-73 Test By: WHS

Data By: JED




NATC FORM 200 BV 9-68

TEST DATA

Figure Nos. 110 through 113

"S" Turns - Wet Asphalt

Nevada Automotive Test Center

Project: 20-17-30

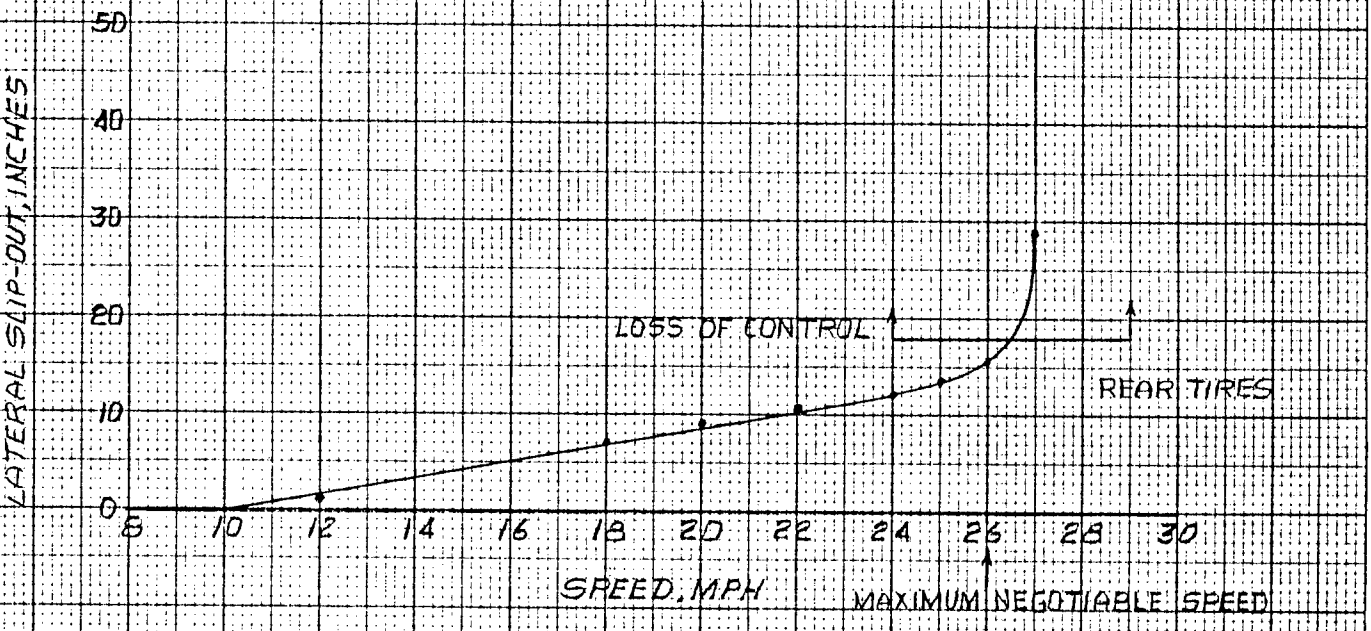
WET ASPHALT "S" TURN
4WHEEL DRIVE
60PSIG INFLATION PRESSURE
90°C REDII
FIGURE NO. 110

Location: PROVING GROUND

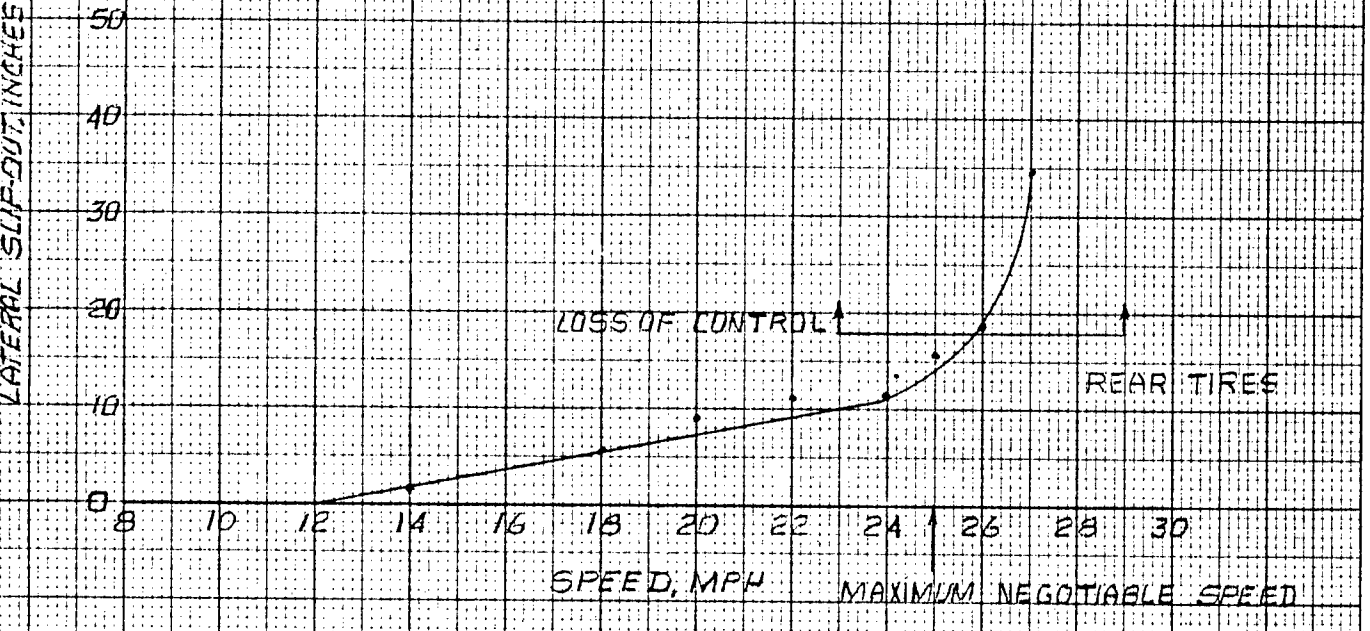
Date: 11-13-73 Test By: WHS

Data By: JED

GROUP A
AMB. 54° SURF. 54°




GROUP B
AMB. 54° SURF. 47°




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

# WET ASPHALT "S" TURN
## 4WHEEL DRIVE
## 50PSIG INFLATION PRESSURE
## 90' ℄ RADII
## FIGURE NO. III

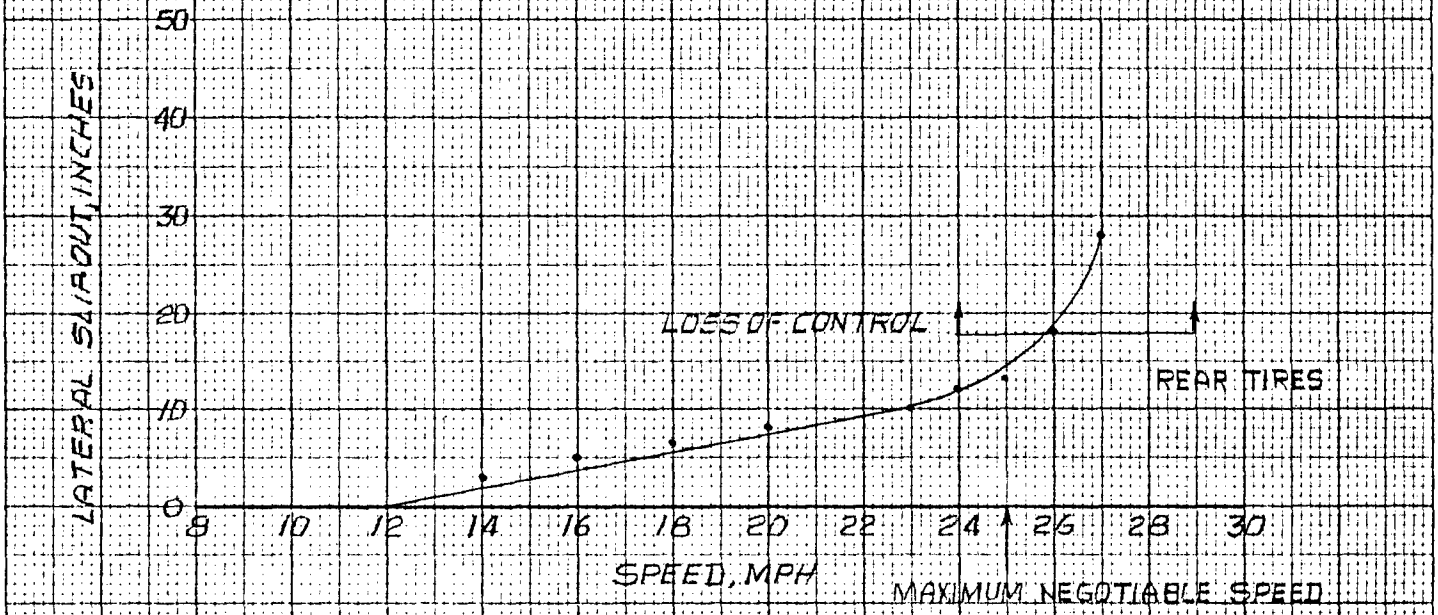
Location: PROVING GROUND

Date: 11-13-73 Test By: WHS

Data By: JED

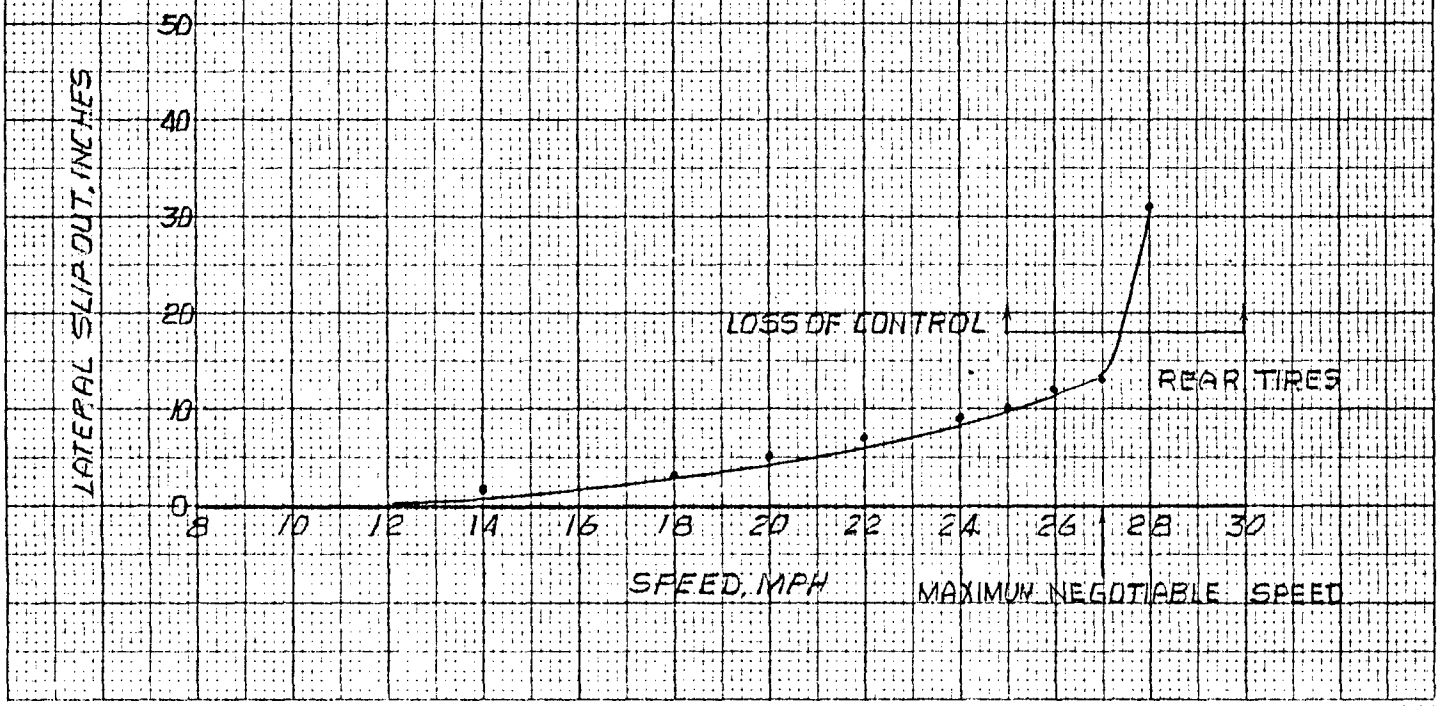
GROUP C

AMB. 54° SURF. 45°




GROUP D

AMB. 42° SURF. 43°




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

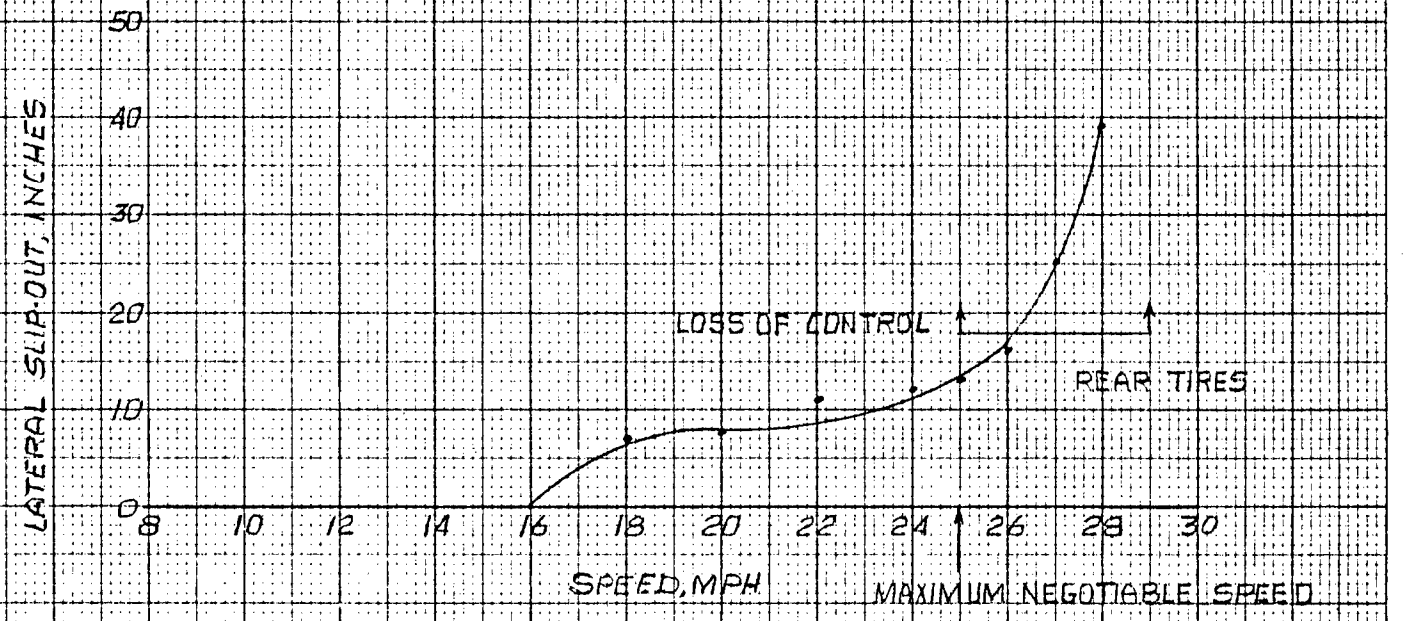
WET ASPHALT "S" TURN
4WHEEL DRIVE
50 PSIG INFLATION PRESSURE
90° ℄ RADII
FIGURE NO. 112

Location: PROVING GROUND

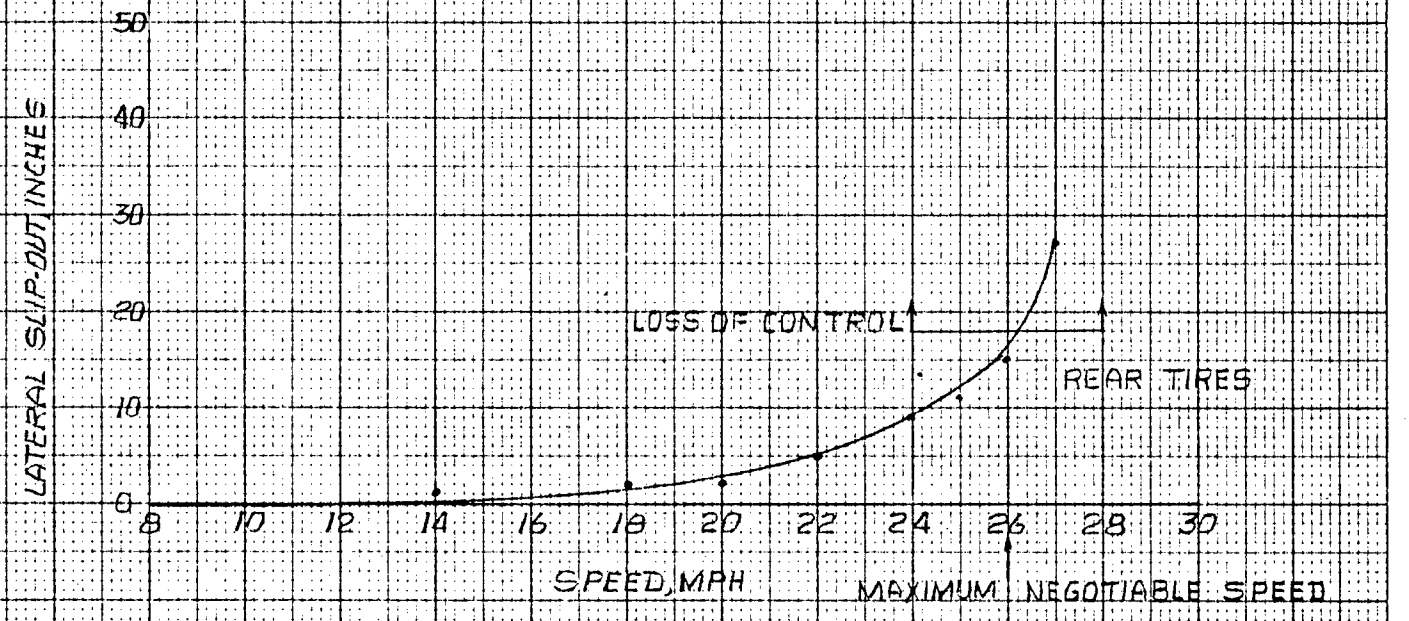
Date: 11-14-73 Test By: WHS

Data By: JED

GROUP E
AMB. 42° SURF. 50°




GROUP F
AMB. 43° SURF. 50°




NATC FORM 200 BV 9-68

Nevada Automotive Test Center

Project: 20-17-30

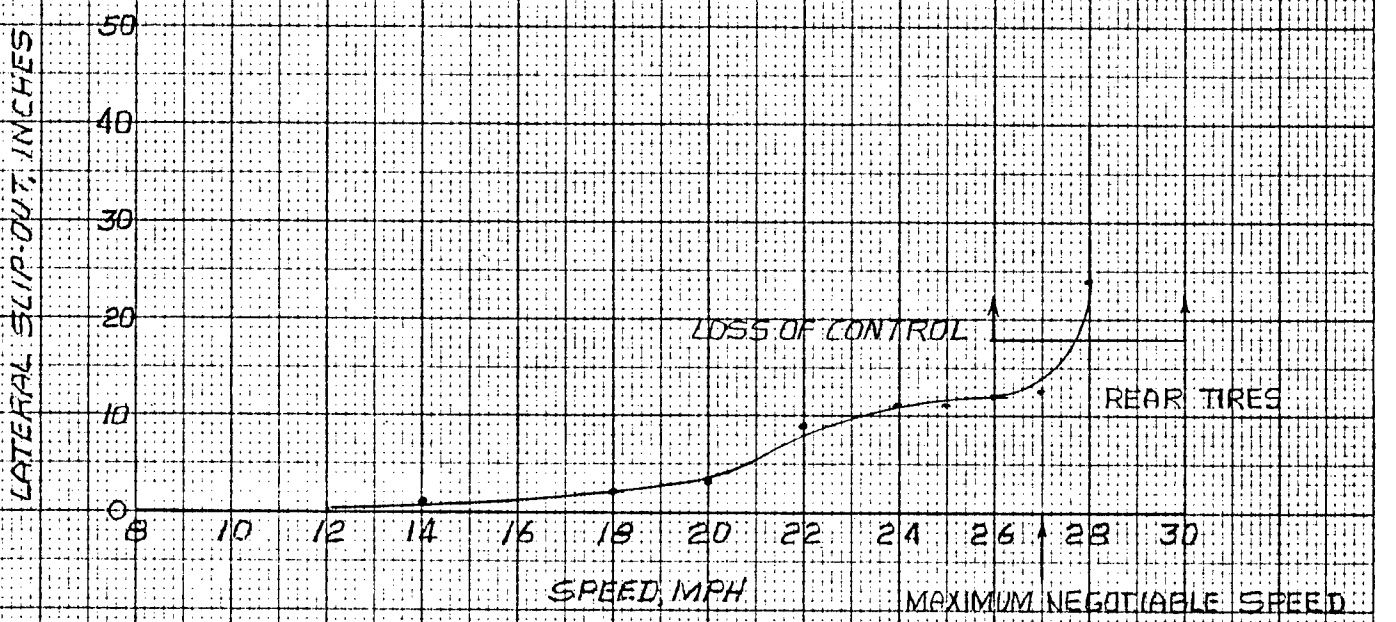
WET ASPHALT 'S' TURN
AWHEEL DRIVE
50PSIG INFLATION PRESSURE
90'€ RADII
FIGURE NO. 113

Location: PROVING GROUND

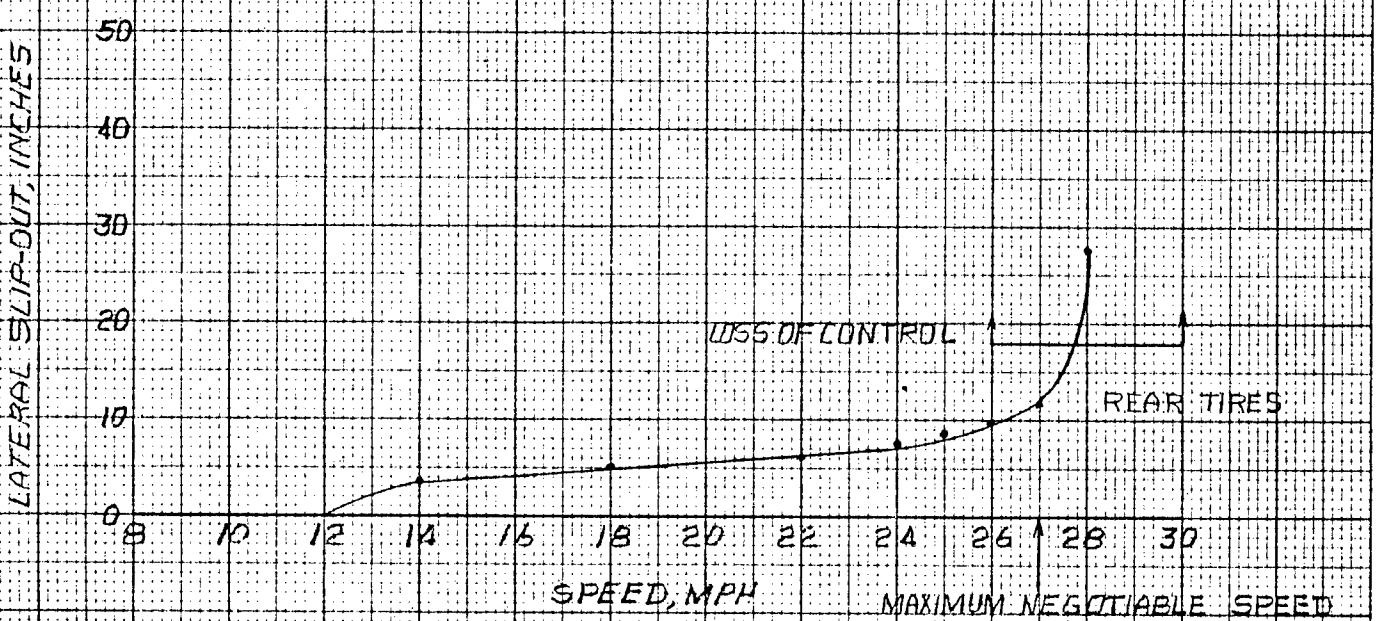
Date: 11-13-73 Test By: WHS

Data By: JED

GROUP G
AMB. 50° SURF. 51°




GROUP J
AMB. 50° SURF. 52°




NATC FORM 200 BV 9-68

# APPENDIX I

## Soil Analysis

HARDING-LAWSON ASSOCIATES
1030 Matley Lane, Reno, Nevada 89502 • (702) 329-6123

ALASKA
HAWAII
GUAM
WASHINGTON, D. C.

*Consulting Engineers and Geologists*

# LETTER OF TRANSMITTAL

TO: Hodges Transportation, Inc.
P. O. Box 234
Carson City, Nevada 89701

ATTENTION: Mr. Robert Torp

SUBJECT: Test Data for Dayton, Nevada and Sand Mt. Test Sites

OUR JOB NO. 7138,001.05; Hodges Transportation Project No. 20-17-30

Transmitted herewith ~~is~~/are the following:

Plate 1 - Particle Size Analysis (and organic content) for samples from Dayton, Nevada and Sand Mt. Test Sites; Plate 2 - Plasticity Chart for sample from Dayton Test Site; Plate 3 - Field Moisture-Density and Remolded Triaxial Compression Test Data, for samples from Dayton Test Site.

~~This~~/These ~~is~~/are for

- [x] Your use and need not be returned.
- [ ] Your use; please return them when you have finished.
- [ ] Your review; please return them with your comments.

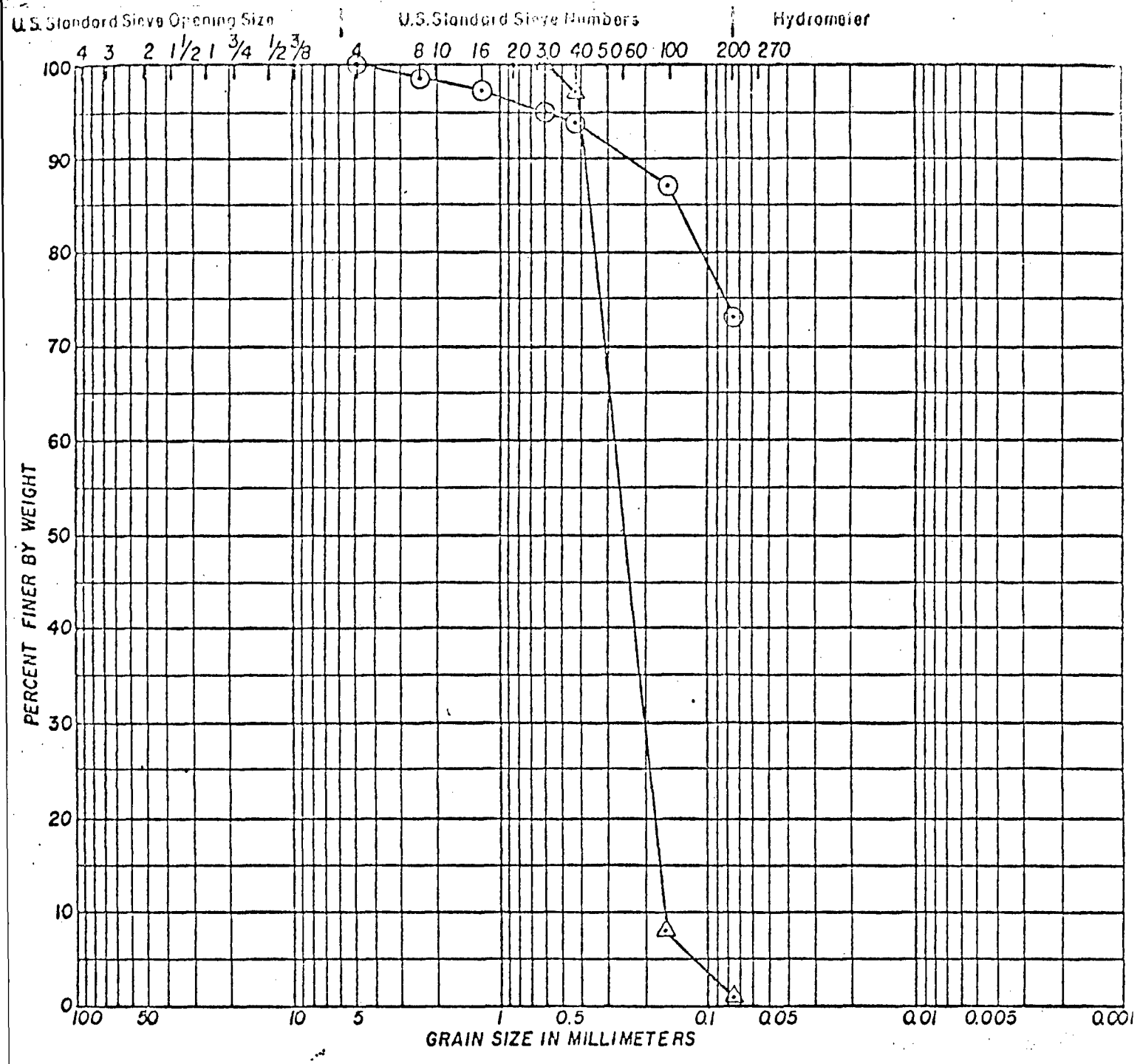
HARDING - LAWSON ASSOCIATES

By Henry T. Taylor

Henry T. Taylor

Date November 7, 1973

cc:




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |

| Symbol | Sample Source | Classification |
|---|---|---|
| ⊙ | Dayton Test Site | BROWN SANDY SILTY CLAY (CL)<br>*Organic Content = 0.5% |
| △ | Sand Mountain Test Site | TAN SAND (SP)<br>**Organic Content = 0.0% |

*Based on the dry weight of the total sample using the loss by ignition test method. **Using the organic impurities in sand, ASTM C 40 Test Method.

**HARDING-LAWSON ASSOCIATES**
*Consulting Engineers and Geologists*

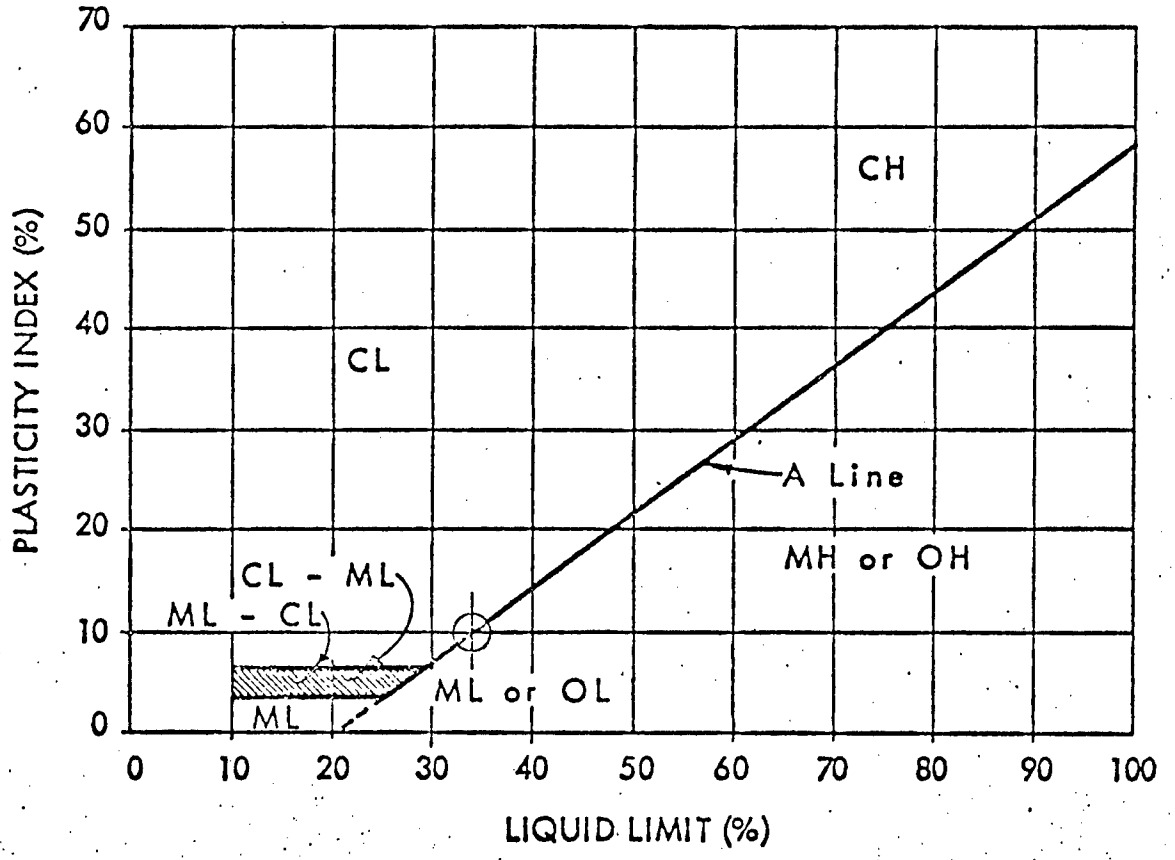
Job No. 7138,001.05 Appr. RJ Date 11/9/73

PARTICLE SIZE ANALYSIS

HODGES TRANSPORTATION
Dayton, Nevada and
Sand Mountain Test Sites

PLATE 1

102470




| Symbol | Classification and Source | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | % Passing #200 Sieve |
|---|---|---|---|---|---|
| ⊕ | BROWN SANDY SILTY CLAY (CL)<br>Dayton Test Site | 33.5 | 23.5 | 10.0 | 73 |

**HARDING-LAWSON ASSOCIATES**
*Consulting Engineers and Geologists*

Job No. 7138,001.05 Appr. JY Date 11/9/73

PLASTICITY CHART

HODGES TRANSPORTATION
Test Site Near
Dayton, Nevada

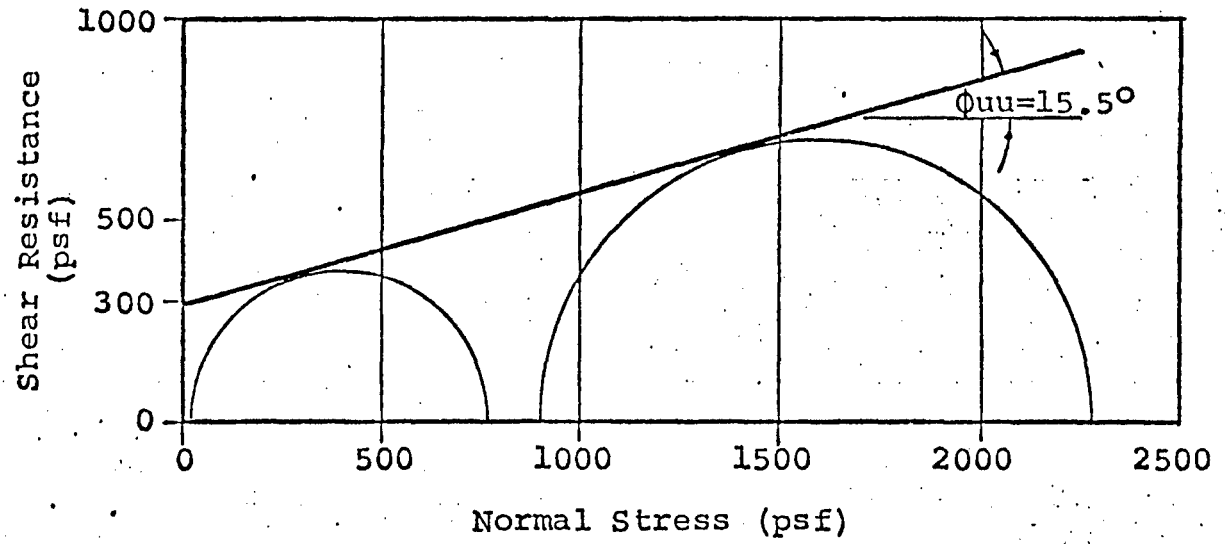
PLATE 2

FIELD SAMPLE MOISTURE – DENSITY TEST RESULTS

| Sample | Classification | Moisture Content Percent (%) | Dry Density (pcf) | Average Dry Density (pcf) |
|---|---|---|---|---|
| A* | BROWN SANDY SILTY CLAY (CL) | 33.1 | 85 | 85.5 |
| B* | BROWN SANDY SILTY CLAY (CL) | 33.3 | 86 | |

*Samples obtained from Dayton, Nevada Test Site when they were watered to near liquid condition on October 25, 1973.

REMOLDED TRIAXIAL COMPRESSION (Unconsolidated-Undrained) TEST RESULTS



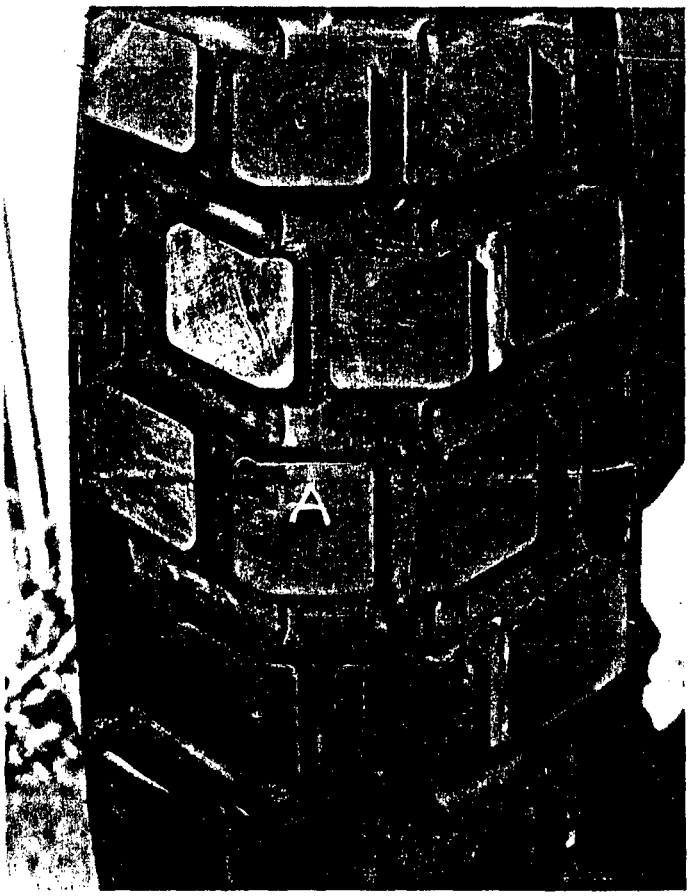

| Sample | Classification | Moisture Content (%) | Dry Density (pcf) | Confining Stress (psf) | 1/2 Deviator Stress (psf) |
|---|---|---|---|---|---|
| C | BROWN SANDY SILTY CLAY (CL) | 23.9 | 85 | 0 | 381 |
| D | BROWN SANDY SILTY CLAY (CL) | 23.8 | 85 | 864 | 711 |

The above triaxial compression test results show that, for the unconsolidated-undrained condition, samples remolded to near the plastic limit moisture content (23.5%, about 68% saturation) and to near the dry density of the field samples A and B have an angle of internal friction (shearing resistance) = $\phi$ = 15.5 degrees and C-value for undrained shear = 300 psf.

| | | |
|---|---|---|
| HARDING-LAWSON ASSOCIATES *Consulting Engineers and Geologists* | FIELD MOISTURE - DENSITY AND REMOLDED TRIAXIAL COMPRESSION TEST RESULTS | PLATE 3 |
| Job No. 7138,001.05 Appr. [illegible] Date 11/12/73 | HODGES TRANSPORTATION TEST SITE NEAR DAYTON, NEVADA | |

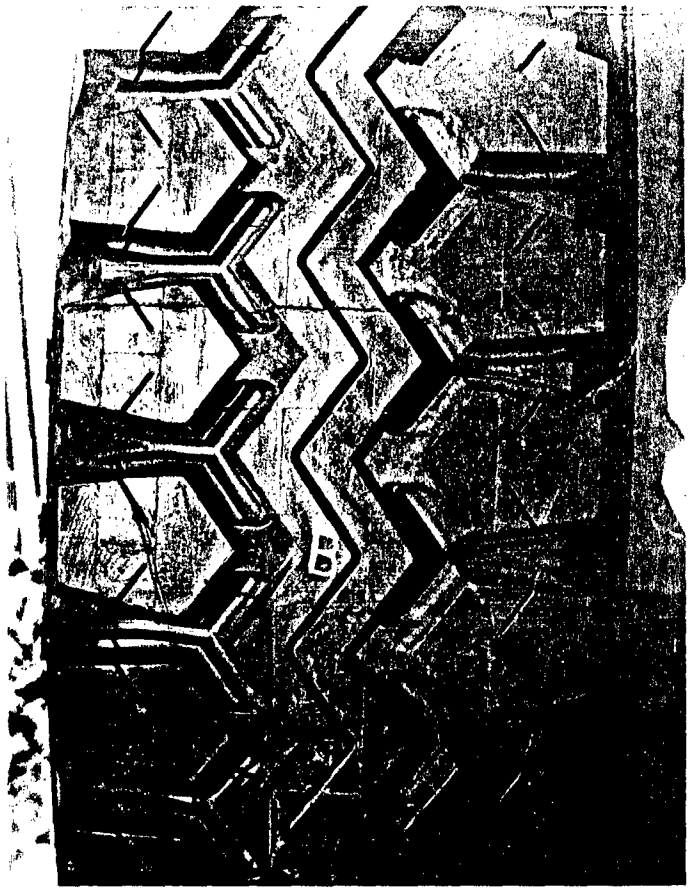
# Appendix II

## Photographic Supplement




GROUP A

Tread Pattern

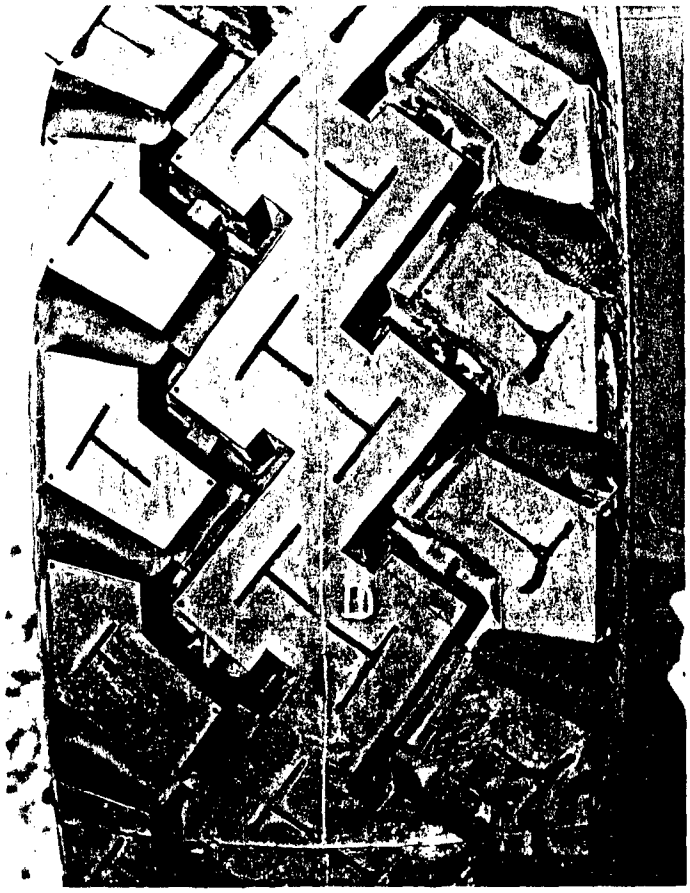


GROUP B

Tread Pattern

GROUP C

Tread Pattern



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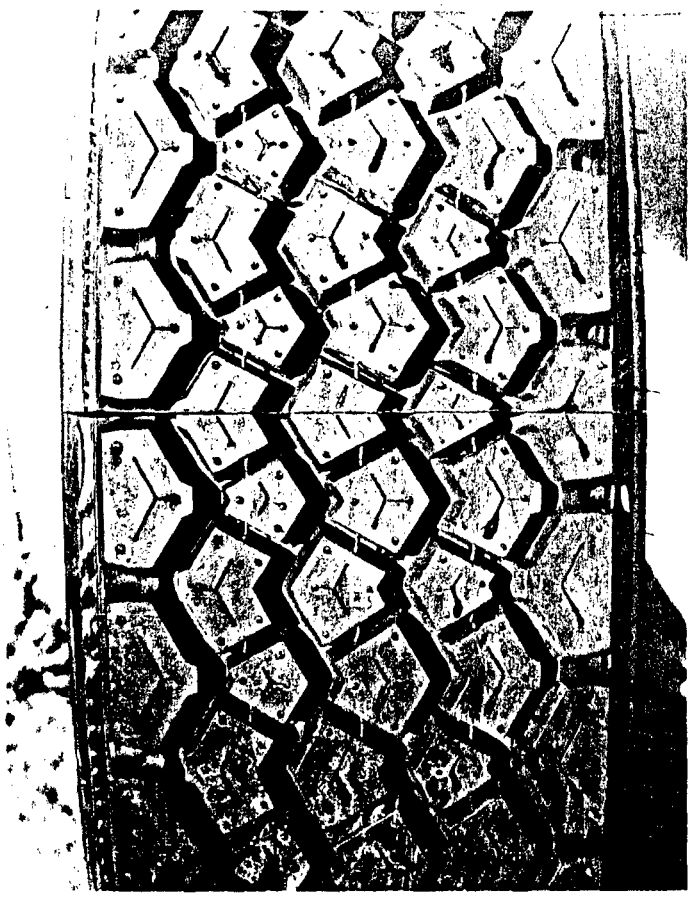
Tread Pattern

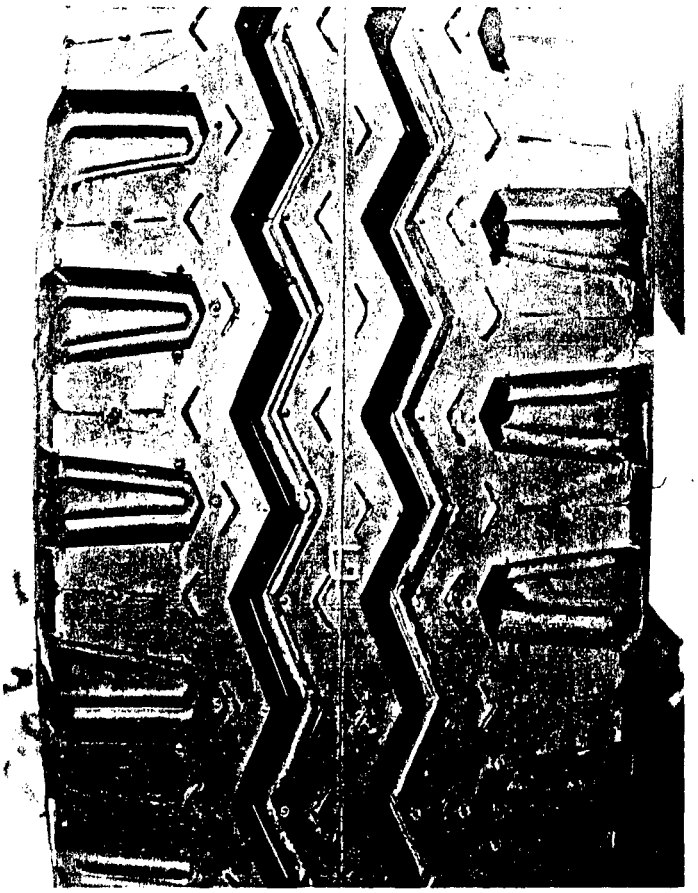


GROUP E

Tread Pattern

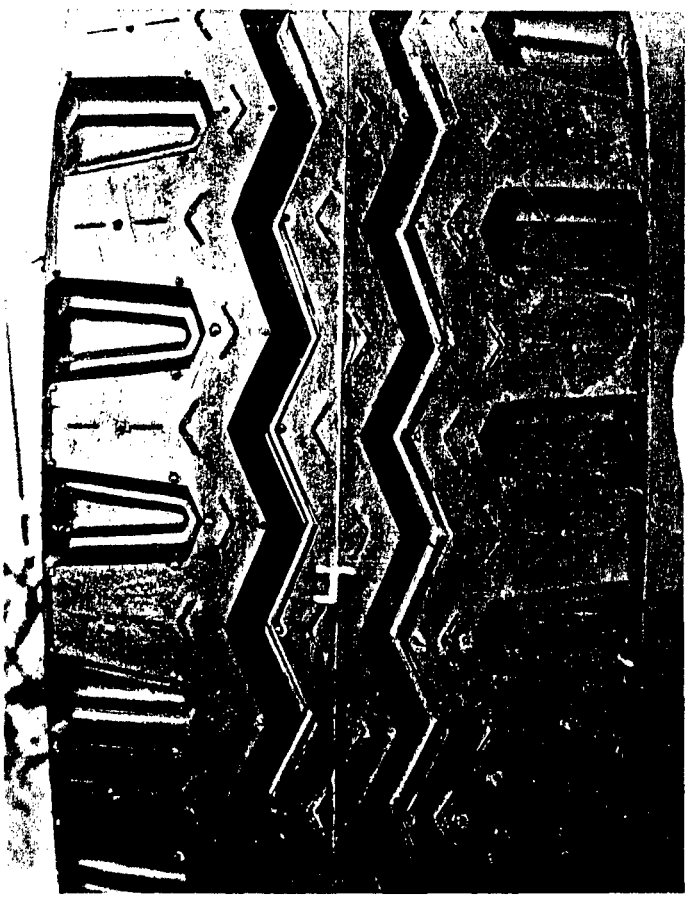
GROUP F

Tread Pattern



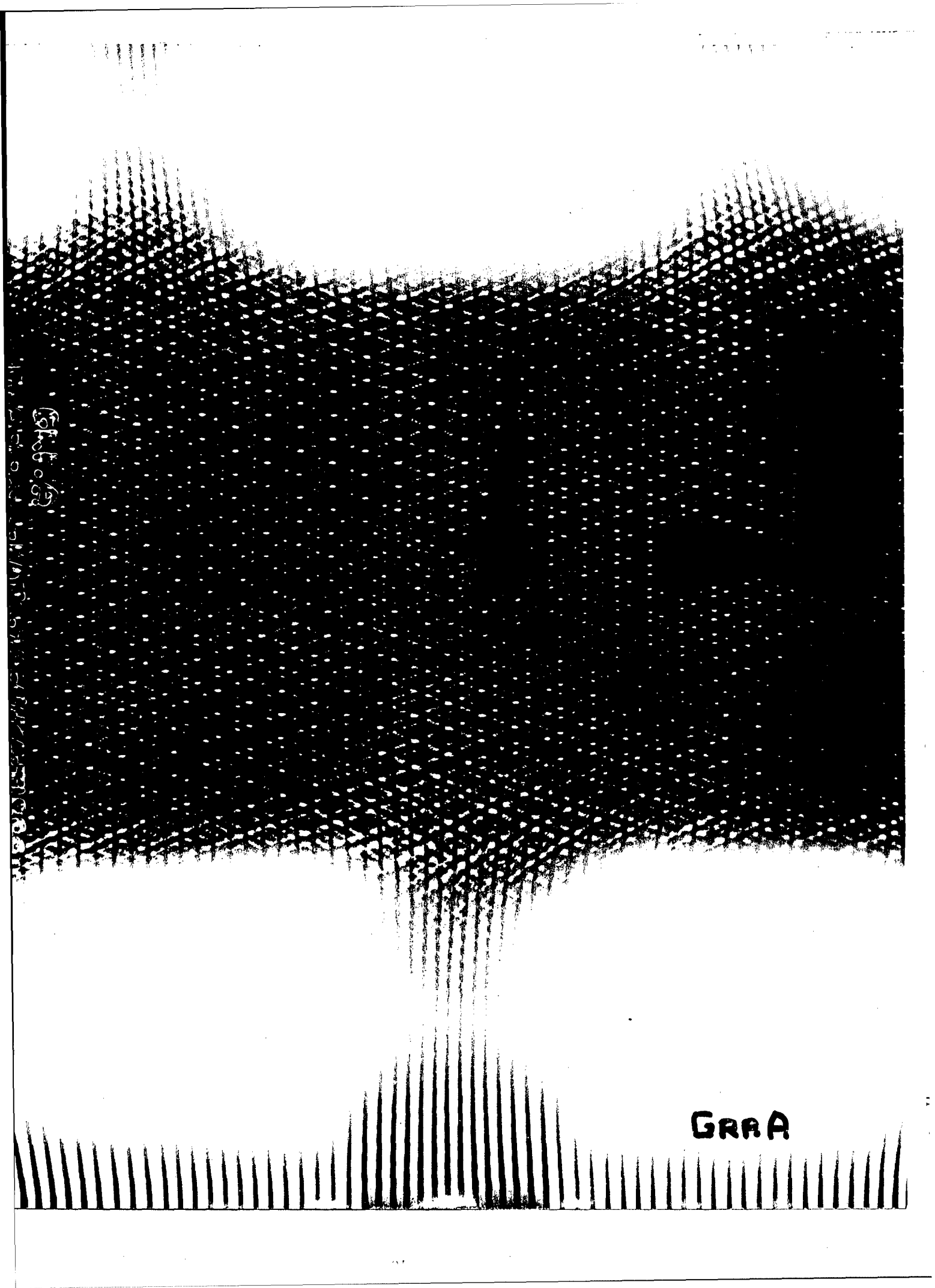
GROUP G

Tread Pattern



GROUP J

Tread Pattern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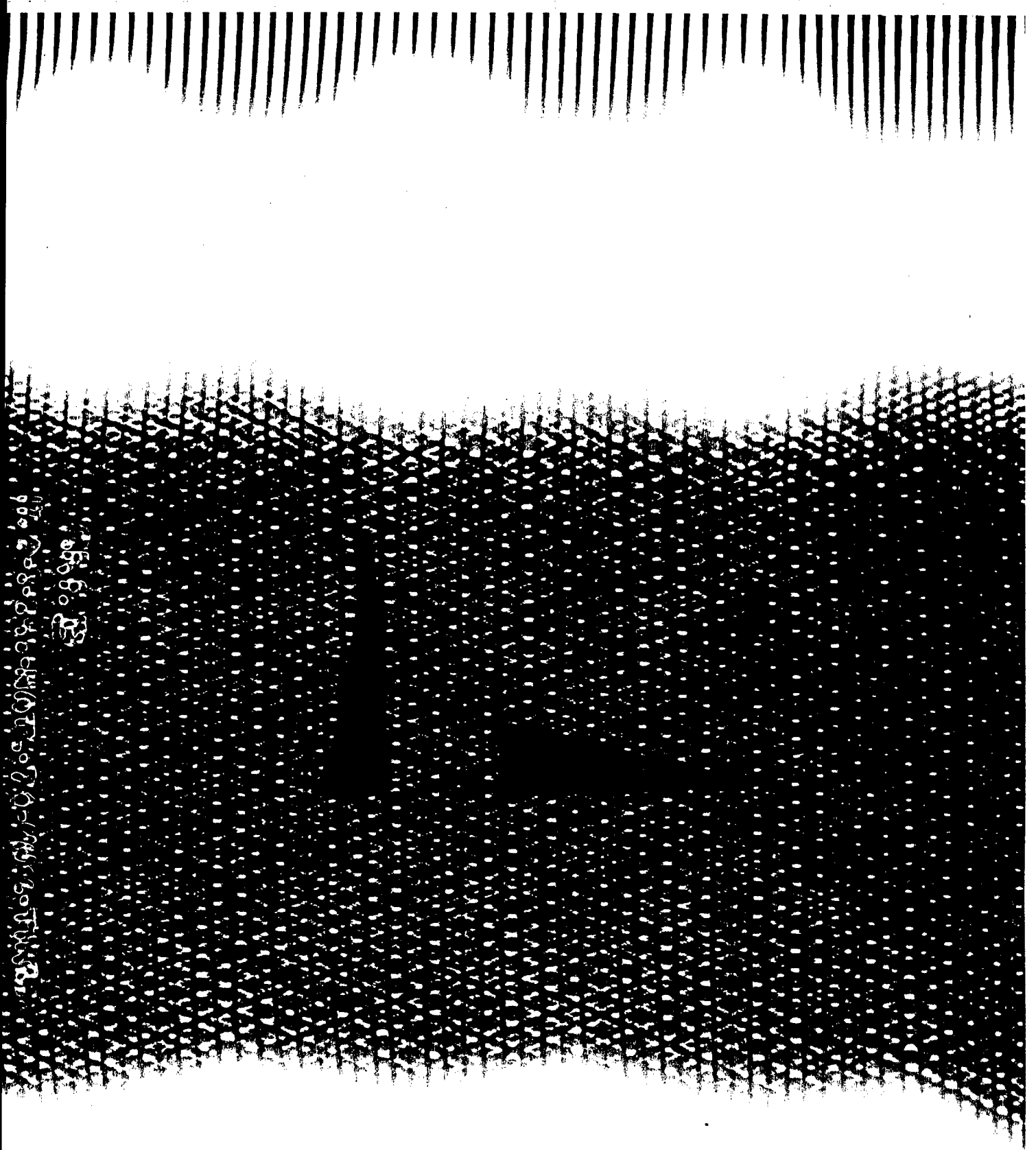
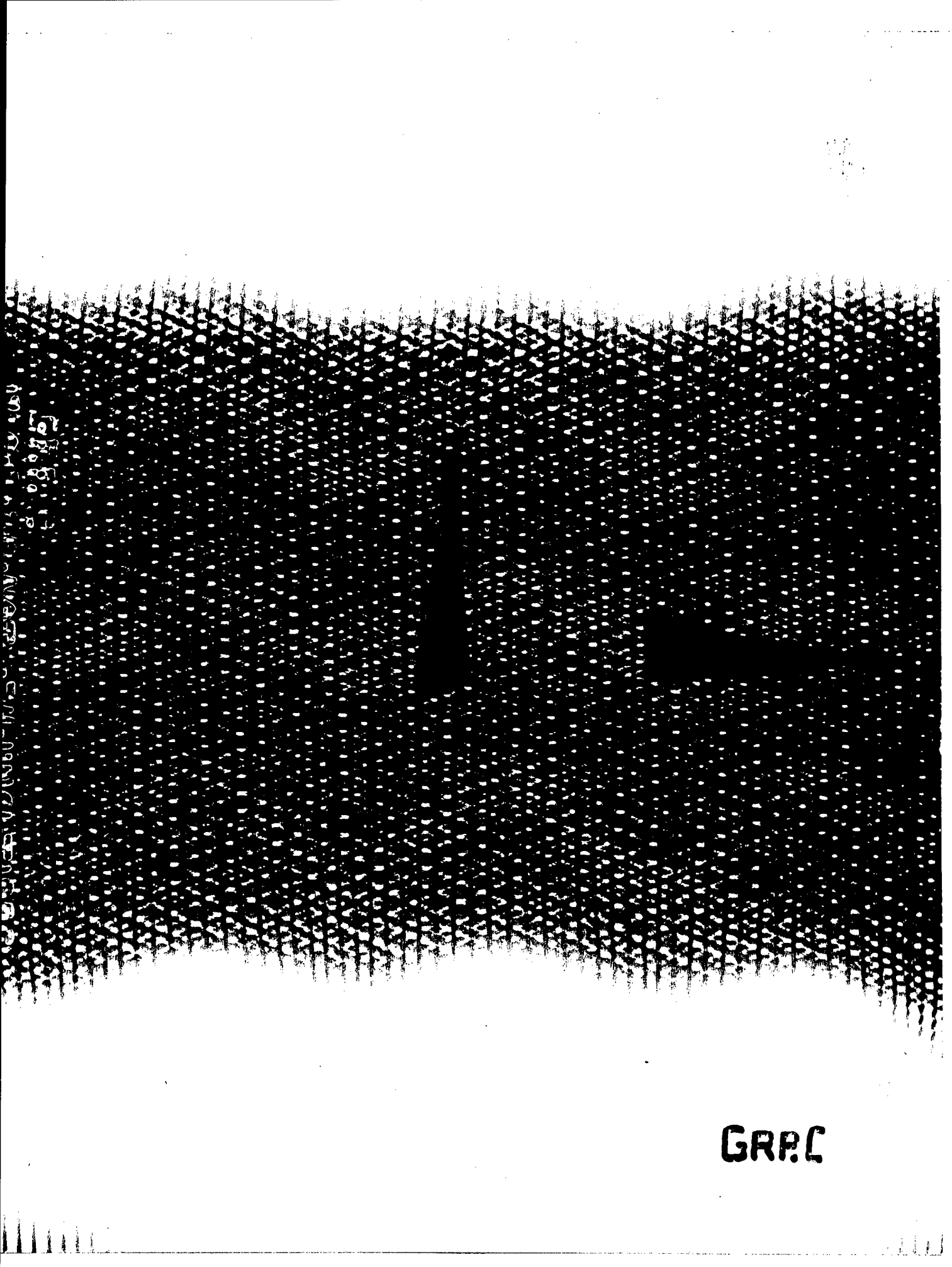


GRP. B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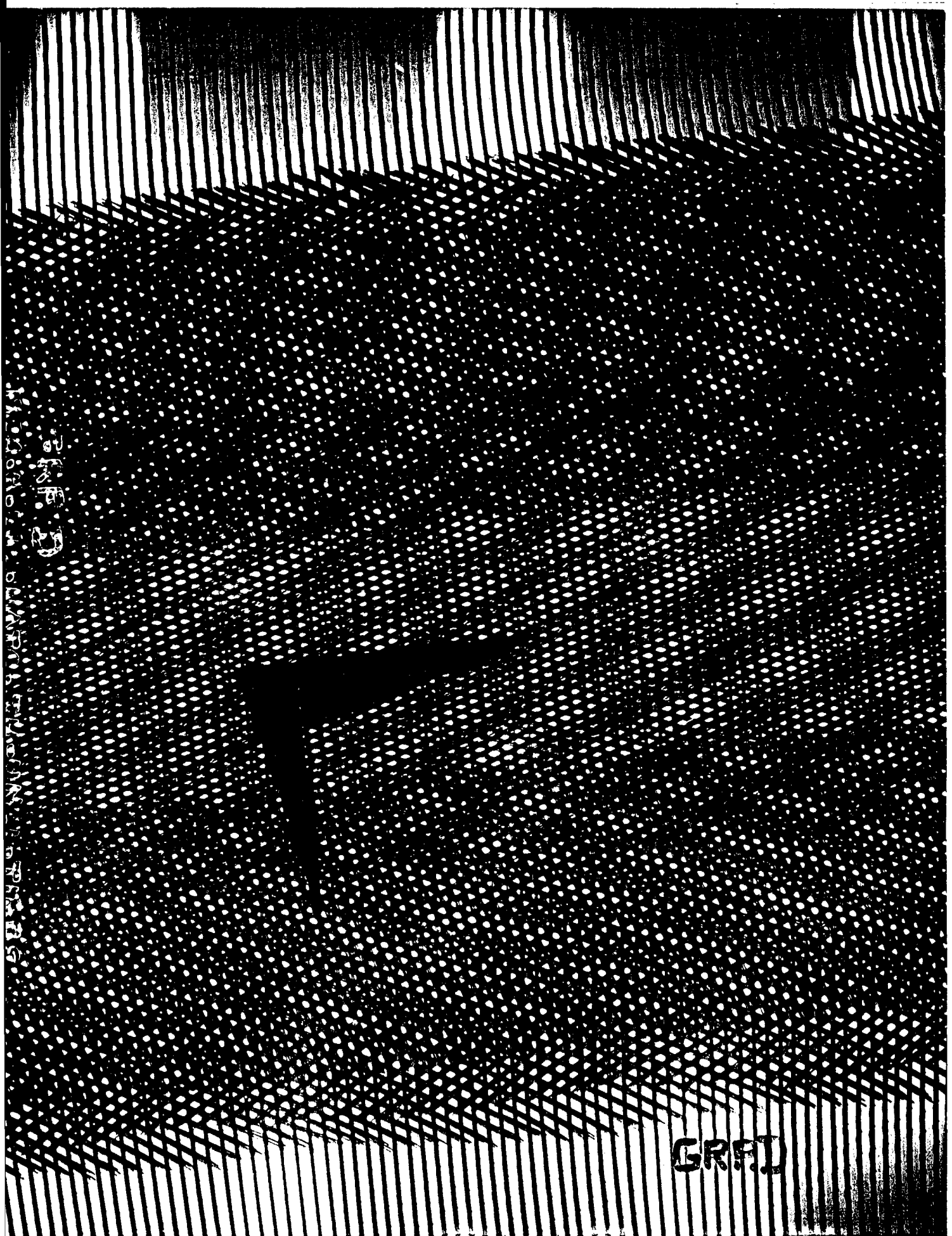
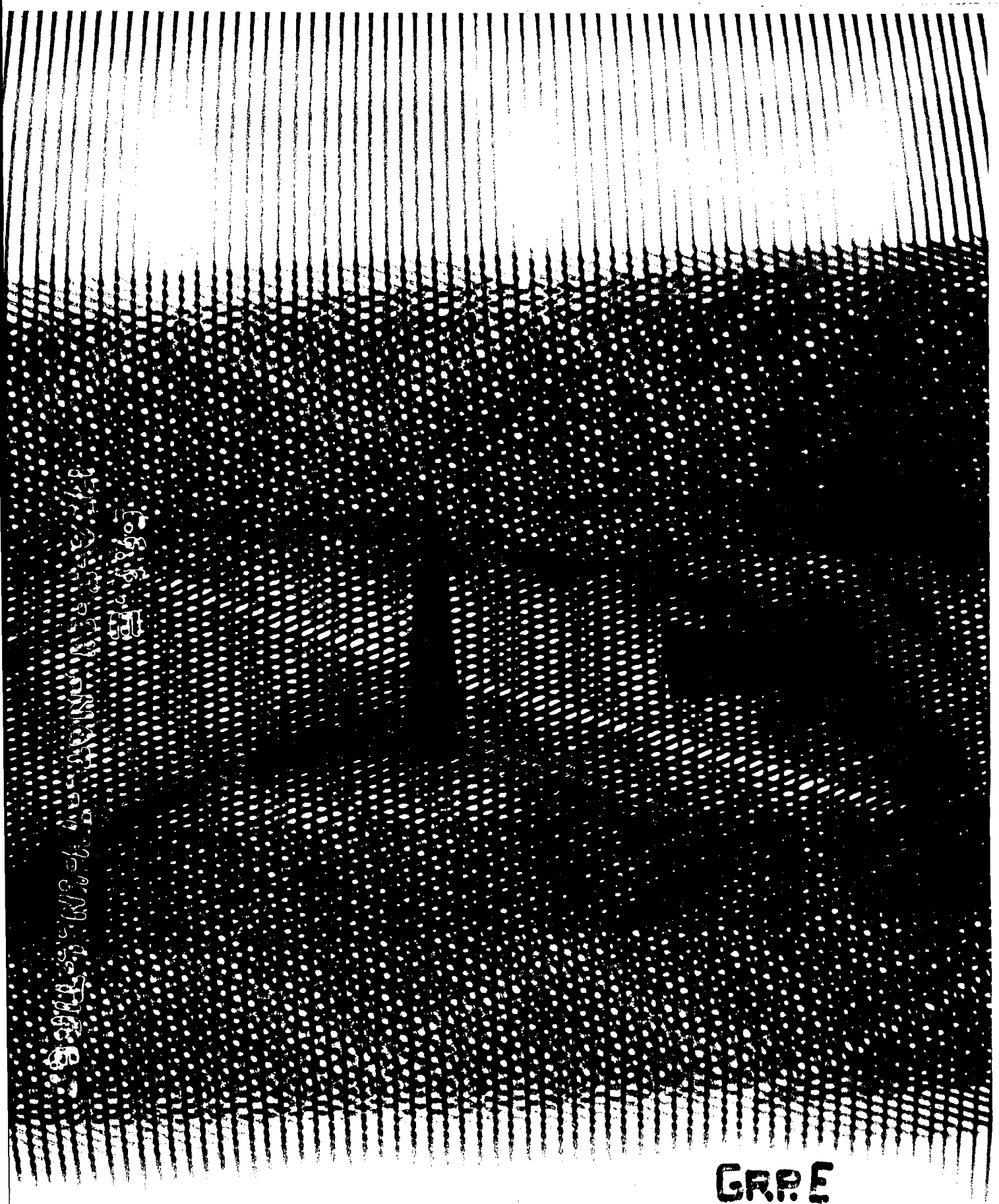
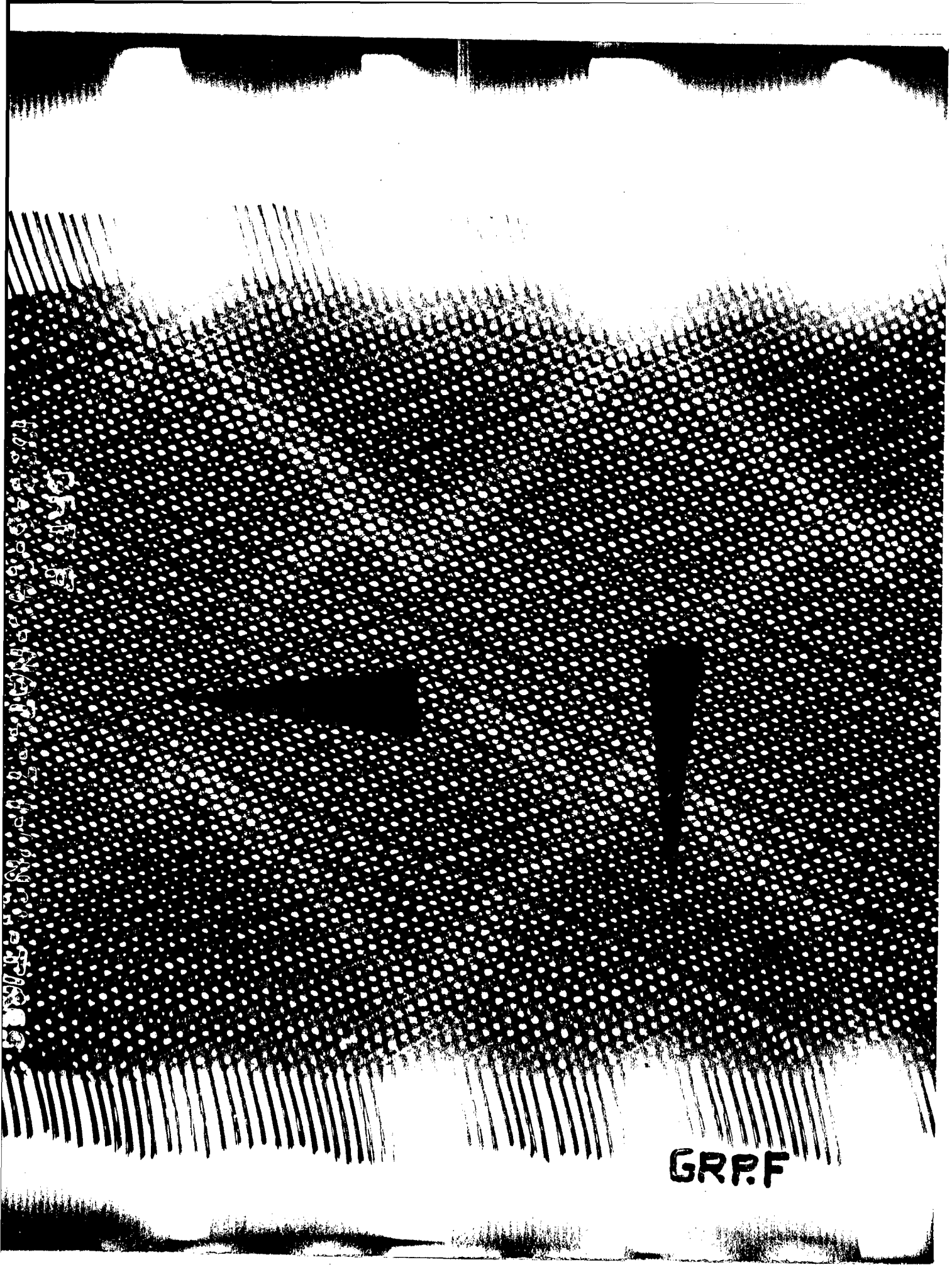
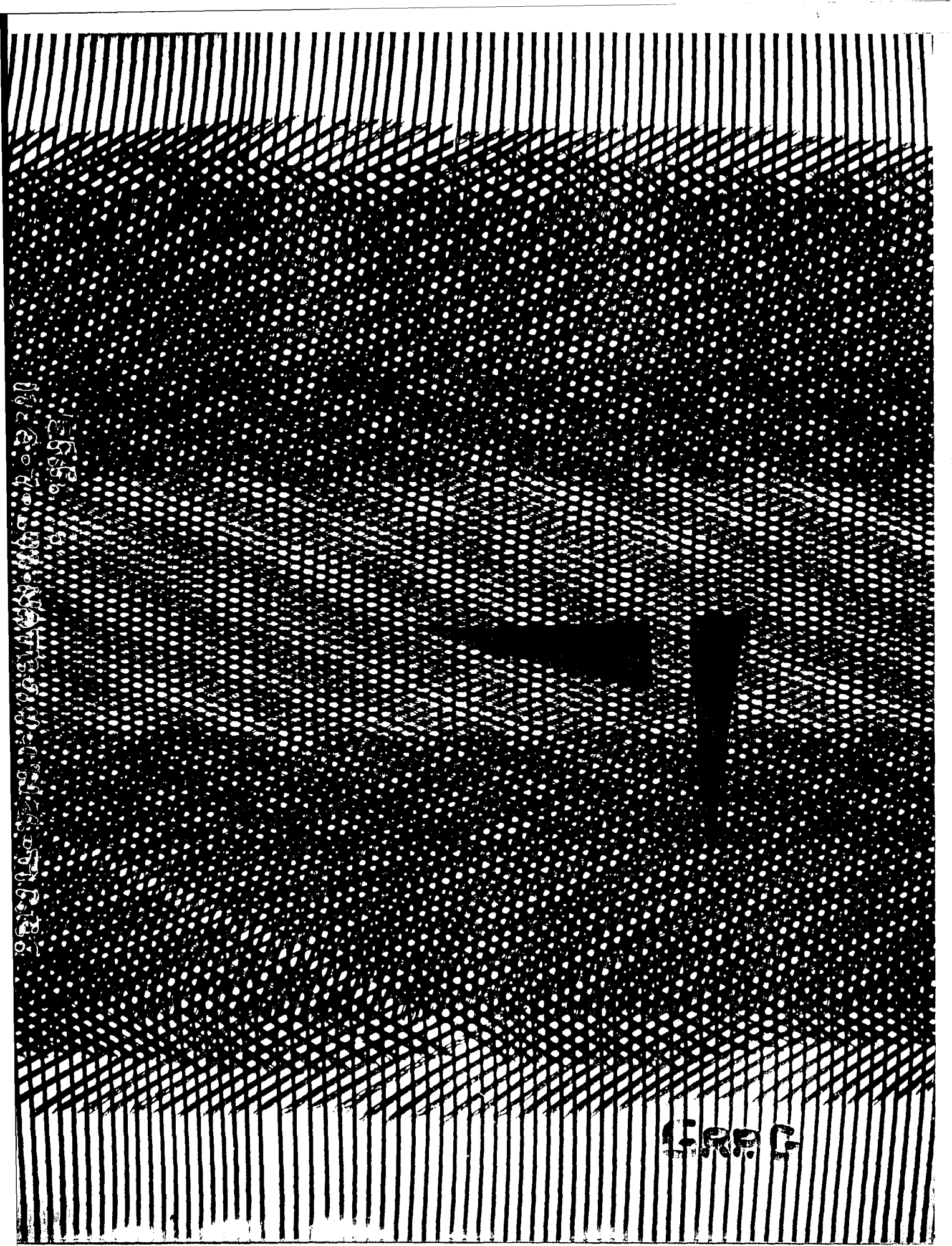
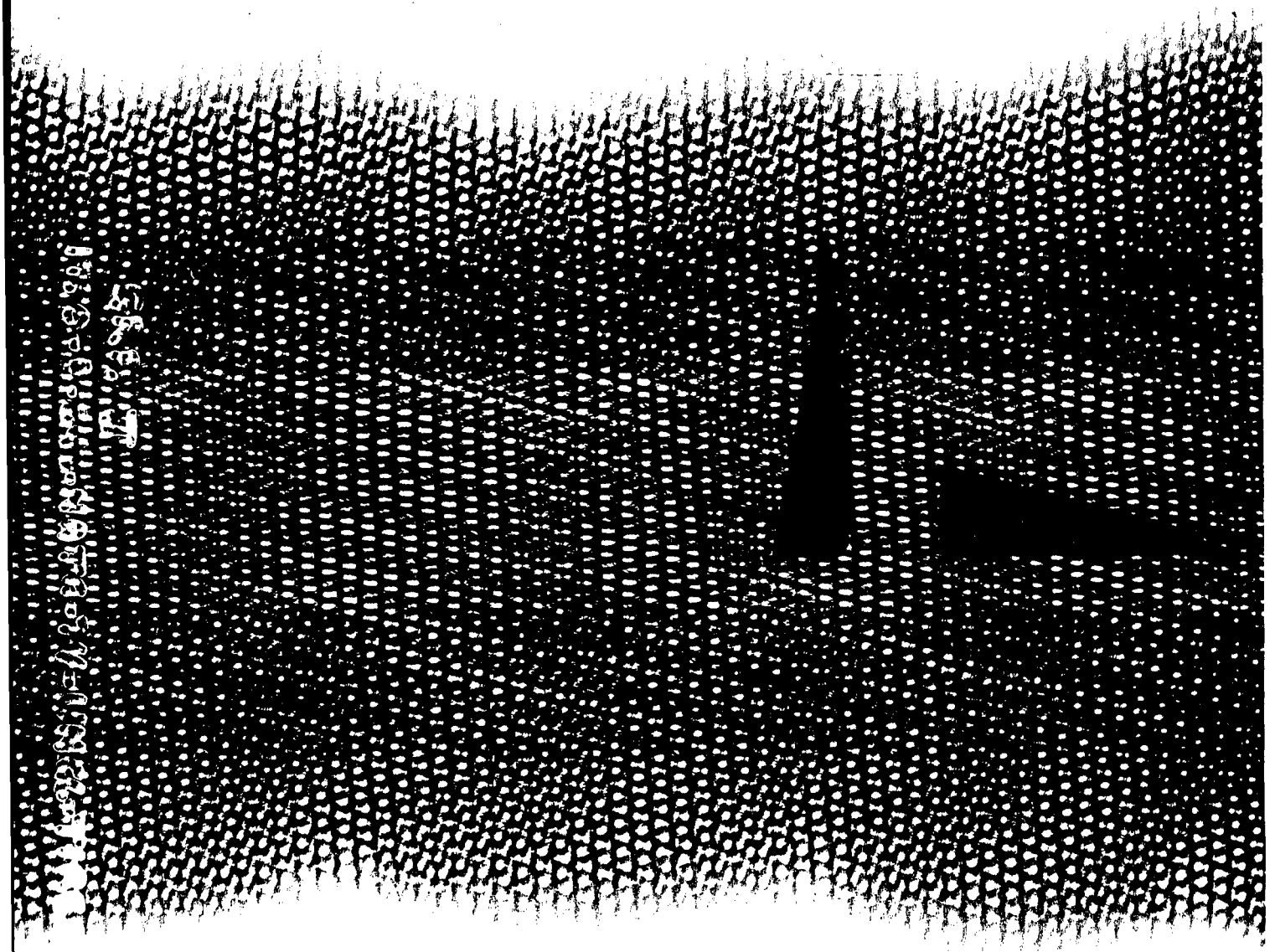

GRAD



GR.E


GRF





GRF. J

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| Commander, U.S. Army Tank-Automotive Command, Warren, Michigan 48090 | | |
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| | AMSTA-WR, Tire Project Office | 1 |
| | AMSTA-RE, Systems Development Division | 1 |
| | AMSTA-REB, Transport Vehicle Branch | 1 |
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13. ABSTRACT

The report of Tread Design Study of 9.00R20 Radial Ply Tires is published to disseminate the detailed data and results of a test of eight groups of 9.00R20 tires that were considered to be candidates for military use. Two of the tire groups were radial ply tire carcasses that were retreaded with a TACOM proposed tread design. The data sources were engineering tests performed by Nevada Automotive Test Center at its test facilities.

The analysis methodology used was direct comparison of test results which were combined in rank order by level of comparative performance.

Key Words

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