# TRUCK DESIGN OPTIMIZATION PROJECT PHASE II

PHASE I DATA EVALUATION AND ANALYSIS PLAN

# WYLE LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

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#### SECTION 1 - INTRODUCTION

#### 1.1 PURPOSE

As part of the Truck Design Optimization Project (TDOP) Phase II study, Wyle Laboratories was directed by the FRA to evaluate and analyze the test data acquired during Phase I of TDOP for model validation and specification of performance indices. Prior to commencing work on this data analysis task, Wyle prepared this plan which describes the proposed effort.

#### 1.2 SCOPE

The Data Evaluation and Analysis Plan comprises the following sub-tasks:

- a. Description of hardware and software to be used in Phase I data analysis
- b. Specific analytical procedures and evaluation techniques
- c. Selection and format of data to be reduced.

Selecting data to be processed depends to some extent on the requirements of other tasks on this project, among them those covering validation of performance indices and verification of mathematical models. Thus, specific sets of data, grouped according to test conditions, type of transducer, elapsed time, and analysis format will not be identified until the need for them has been established. This document is limited to a discussion of analysis techniques and the overall plan of implementation.

#### 1.3 DEFINITION OF TERMS

<u>Performance Regime.</u> The characteristic behavior in which a mechanism (e.g., railcar or truck) performs. Five major performance regimes have been identified for the railcar and they consist of hunting, curve negotiation, harmonic roll, ride quality, and derailment.

<u>Performance Index.</u> A measurable physical parameter, characteristic of performance in the selected regime (e.g., hunting, harmonic roll). Examples of a performance index for hunting would include critical speed (mph) and lateral accelerations (g's).

#### 1.4 IMPLEMENTATION

The data evaluation and analysis effort will be implemented as follows:

- a. Phase I data will be inventoried and cataloged.
- b. Software enhancements will be implemented as necessary.
- c. TDOP data sorting routine will be upgraded and refined.
- d. Software Post Processing programs developed under Phase I will be converted and validated to run on the Interdata 8/32 computer.
- e. The Interdata 8/32 computer and Tektronix 4014 graphic display system will be used for data reduction and display.
- f. Data analysis will be based upon the measurements and test profiles which are applicable to the major performance regimes.
- g. Phase I data will be utilized in the Phase II model validation task in a manner yet to be determined.
- h. Problem areas of data correlation, measurement adequacy, calibrations, or anomalies will be cataloged for each Phase I test run accessed.
- i. Results of questionnaires submitted to the industry consultants will be used to define any proposed effort in reformatting Phase I data.
- j. Sixty days after completion of the TDOP Phase I data evaluation and analysis task, a report will be prepared that discusses the implementation of the post processing program, the TDOP data sorting program, resolution of the problems identified with the Phase I data and other topics.

#### **SECTION 2 - RESOURCES**

#### 2.1 PHASE I DATA

The Phase I TDOP data, in the form of data tape and computer printouts of analyzed data, were provided by the Federal Railroad Administration. The data was cataloged by a computer-based inventory and stored in boxes. The catalog boxes contain 204 magnetic data tapes from the five test series in Phase I and analyzed data from both the response measurements and the track geometry. Figure 1 depicts a typical computer inventory printout. The first column contains a description of the material, and the last column gives the box number in which the material is located. In addition to the 204 magnetic tapes, a computer tape with the Phase I track geometry data is also available for use in conjunction with the measured data.

#### 2.2 DATA ANALYSIS SOFTWARE

#### 2.2.1 TDOP Data Sorting Routine

Because of the vast amount of Phase I data generated (over 500 test runs made) and the many variables tested (see Figure 3), a need was identified for some type of sorting routine which would provide ready access to the available data. A TDOP data sorting routine was developed which would provide this capability. This routine will be upgraded as part of the Phase I data evaluation.

The sorting routine allows the specification of a given set of test conditions; the program then lists all tests which meet that set of requirements. For example, one may be interested in studying an empty 70-ton refrigerator car traveling at 50 mph over jointed track with a 5K pound preload in the side bearings. If these conditions were entered into the sorting program, the resultant printout would be as shown in Figure 4. The output indicates that only one run was made with these exact conditions: Test 040402TWA001. An example of the test variables available in the data sorting routine is shown in Figure 5. With any selection of variables, the computer will produce a listing of the test runs meeting those conditions.

1/26/78	PROPER	RTY RECORD-P PAGE 20	RIME CONTRACT			118177		
DESCRIPTION	<u>P0</u>	ACCOUNT	MANUFAC/VENDOR	ID NO.	DATE	UNIT	TOTAL	LOCATION
050302CNE001 050302CN0001 TAPE 0506 INPUT 18			SPTCo					BOX 18
TAPE 0508 INPUT 7 050303TWA001 050303TEA001			SPTCo	•				BOX 18
TAPE 0505 INPUT 9 050302M0D001 050302TSM001 050302TWA001			SPTCo					BOX 18
TAPE 0509 INPUT 1 050303CNE001 050303CN0001	,	•	SPTÇo				•	BOX 18
TAPE 0510 INPUT 8 050303CNE002 050303CN0002			SPTCo					BOX 18
TAPE 511 INPUT 7 050303M0D001 050303TSM001			SPTCo					BOX 18
BOX 19 ENSCO TRACK DATA INTEGRATED EXCEPTIONS, CURVATURE AND PSD DATA REDUCTION REPORT TEST OBJECTIVE TEST RG-97.2	, '		SPTCo	•				BOX. 19
PSD DATA REDUCTION TEST OBJECTIVE RG-97.2			ENSCO		01/14/75		v	BOX 20
COMPARE DATA REDUCTION REPORT TEST OBJECTIVE RG 97.3			SPTCo			-		BOX 21 ·
INTEGRATED EXCEPTION REPORT TEST OBJECTIVE RG 97.3 TEST OBJECTIVE RG 97.4 TEST OBJECTIVE RG 97.5	•	•	SPTCo					BOX 21
OUTPUT PAPER JULY 75 TRACK DATA EBM SUISUN (EASTBOUND) . WBM SUISUN (WESTBOUND)			SPTCo					BOX 21
OUTPUT PAPER May 75 TRACK DATA EBM SUISUN (WESTBOUND)			SPTCo					BOX 21

Figure 1. Sample Computer Inventory

No. of Test Series: 5

No. of Test Runs: 502 (Approx.)

Mag. Tapes Generated: 204

Truck Types Tested: 5

Car Bodies Tested: 5

No. of Data Channels: 48

Figure 2. Phase I Data Summary

#### VEHICLE

- Gib Clearance
- Side Bearing Clearance
- Loading
- Spring Group
- Wheel Profile
- Centerplate Friction
- Constant Contact Side Bearings
- Longitudinal Control Devices
- Side Frame Interties
- Hydraulic Dampers

#### TRACK

- Continuous Welded
- Jointed
- Speeds

Figure 3. Variables Tested

```
DATE:
     01/26/78
TIME: 10.884 Hrs.
       PAGE NO.
                    1
TEST CONDITIONS, CAR TYPE
TEST CONDITIONS, PER CENT LOAD
TEST CONDITIONS, TRACK
TEST CONDITIONS, SPEED
TEST CONDITIONS. SIDE BEARING
    10. 040402TWA001
    BOX 13 TAPE 452
    FILE NO. 3
    TAPE NO.
               152
     70 TON
              M RFR
   ASF RIDE CONTROL
    45' 9"
    EMPTY
    1-20 (NEW)
    7-050/6-DSI
    8-9031
    8-3091 SNUBBERS
    NO AUGMENTATION
    STEEL-MOLY
   HI SPD JTD
   .. 50 MPH
    5/8 OGC
```

NUMBER OF ENTRIES =

5. K PRELOAD

Figure 4.

WYLE LABS

COLO. SPGS. TDOP II

70 TON M RFR EMPTY HI SPD JTD 50 5, K PRELOAD USER CODE = 2, 1, USER CODE = 5, 1, USER CODE = 20, 3, USER CODE = 21,50, USER CODE = 23, 6,

Sample Sorting Routine Printout

```
WYLE LABS
DATE: 01/30/78
                                                                COLO. SPGS.
TIME: 14.752 HRS
                                                                 TOOP II
                                                      USER CODE = 1, 1,
TEST CONDITIONS, TAPE NO.
TEST CONDITIONS, TAPE NO.
                                                      USER CODE = 1, 2,
TEST CONDITIONS, TAPE NO.
                                                      USER CODE = 1, 3,
                                                      USER CODE = 1. 4.
TEST CONDITIONS, TAPE NO.
TEST CONDITIONS, TAPE NO.
                                                      USER CODE # 1, 5,
TEST CONDITIONS, TAPE NO.
                                                      USER CODE = 1. 6.
TEST CONDITIONS, TAPE NO.
                                                      USER CODE =
                                                                   1. 7.
TEST CONDITIONS, TAPE NO.
                                                      USER CODE =
                                                                   1, 8,
TEST CONDITIONS, CAR TYPE
                                    70 TON M
                                                      USER CODE =
                                                                   2, 1,
TEST CONDITIONS, CAR TYPE
                                    100 TON 60' BOX
                                                      USER CODE =
                                                                   2, 2,
TEST CONDITIONS, CAR TYPE
                                    70 TON 50' BOX
                                                      USER CODE =
                                                                   2, 3,
                                            891 FLT
                                                      USER CODE = 2, 4,
TEST CONDITIONS, CAR TYPE
                                            871 FLT
TEST CONDITIONS, CAR TYPE
                                                      USER CODE =
TEST CONDITIONS, CAR TYPE
                                    100 TON C
                                                HPR
                                                      USER CODE #
                                                                   2, 6,
                                                      USER CODE =
TEST CONDITIONS, CAR TYPE
                                    40 TON 601 BOX
                                                                   2, 7,
                                    ASF RIDE CONTROL
TEST CONDITIONS, TRUCK TYPE
                                                      USER CODE =
                                                                   3,
TEST CONDITIONS, TRUCK TYPE
                                    BARBER SZC
                                                      USER CODE =
                                                                   3,
                                    ASF LOW LEVEL
                                                      USER CODE =
TEST CONDITIONS, TRUCK TYPE
                                                      USER CODE = 3,
TEST CONDITIONS, TRUCK TYPE
                                           SZC
                                    451
                                                      USER CODE = 4, 1,
TEST CONDITIONS, TRUCK CENTER
                                         911
                                    461 311
                                                      USER CODE # 4, 2,
TEST CONDITIONS, TRUCK CENTER
                                    451 311
                                                      USER CODE = 4. 3.
TEST CONDITIONS, TRUCK CENTER
TEST CONDITIONS, TRUCK CENTER
                                    401 1011
                                                      USER CODE = 4, 4,
                                                      USER CODE = 4, 5,
TEST CONDITIONS, TRUCK CENTER
                                    641 011
                                    411 311
                                                      USER CODE = 4, 6,
TEST CONDITIONS, TRUCK CENTER
TEST CONDITIONS, PER CENT LOAD
                                    EMPTY
                                                      USFR CODE =
                                                                   5, 1,
TEST CONDITIONS, PER CENT LOAD
                                    HALF FULL
                                                      USER CODE =
                                                                   5, 2,
TEST CONDITIONS, PER CENT LOAD
                                    FULLY LOADED
                                                      HSER CODE = 5, 3,
TEST CONDITIONS, WHEEL PROFILE
                                    1-20 (NEW)
                                                      USER CODE =
                                                                   6, 1,
                                    1-40 (NEW)
                                                      USER CODE =
TEST CONDITIONS, WHEEL PROFILE
                                                                   6, 2,
TEST CONDITIONS, WHEEL PROFILE
                                    CYLINDRICAL
                                                      USER CODE =
TEST CONDITIONS, WHEEL PROFILE
                                    HAIF WORN
                                                      USER CODE = 6, 4,
TEST CONDITIONS, WHEEL PROFILE
                                    WORN
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                                    FULLY WORN
TEST CONDITIONS, WHEEL PROFILE
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TEST CONDITIONS, NO. OF OUTER SPG
TEST CONDITIONS, NO. OF OUTER SPG
                                                      USFR CUDE = 7, 2,
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                                                      HISER CODE = 7, 5,
TEST CONDITIONS, NO. OF OUTER SPG
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TEST CONDITIONS, NO. OF OUTER SPG
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TEST CONDITIONS, NO. OF OUTER SPG
                                                      USER CODE =
                                                                   7. 8.
                                                      USER CODE = 8, 1,
TEST CONDITIONS, SPG TYPE (QUITER)
                                                      HISER CODE =
                                                                   8, 2,
TEST CONDITIONS, SPG TYPE (OUTER)
                                                      USER CODE =
TEST CONDITIONS, SPG TYPE (OUTER)
                                                                   8, 3,
                                                      USER CODE = 9, 1,
TEST CONDITIONS, SPG TYPE (OUTER)
                                                      USFR CODE = 9, 2,
TEST CONDITIONS, SPG TYPE (OUTER)
TEST CONDITIONS, SPG TYPE (OUTER)
                                       3
                                                      USER CODE = 9, 3,
                                                      USER CODE = 9. 4.
TEST CONDITIONS, SPG TYPE (CUTER)
                                       4
TEST CONDITIONS, SPG TYPE (OUTER)
                                                      USER CODE =
                                                                   9, 5,
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Figure 5. Example Listing of Sorting Parameters (sheet 1 of 3)

TEST CONDITIONS, SPG TYPE (OUTER) TEST CONDITIONS, SPG TYPE (OUTER) TEST CONDITIONS, SPG TYPE (OUTER) TEST CONDITIONS. SPRING GROUP TEST CONDITIONS. SPRING GROUP TEST CONDITIONS, SPRING GROUP TEST CONDITIONS, NO. OF INNER SPG INNER SPG TEST CONDITIONS, NO. OF NO. OF TEST CONDITIONS, INNER SPG NO, OF INNER SPG TEST CONDITIONS, OF INNER SPG TEST CONDITIONS. ND. TEST CONDITIONS, SPG TYPE (INNER) TEST CONDITIONS, SPG TYPE (INNER) TEST CONDITIONS. SPG TYPE (INNER) TEST CONDITIONS, SPRING GROUP TEST CONDITIONS, SNUBBING TEST CONDITIONS, TEST CONDITIONS, SNUBBING SNUBBING TEST CONDITIONS, SNUBBING TEST CONDITIONS. SNUBBING TEST CONDITIONS, SNUABING TEST CONDITIONS, SNUBBING TEST CONDITIONS, SHUB, AUG. TEST CONDITIONS, SNUB, AUG. TEST CONDITIONS, SNUB. AUG. TEST CONDITIONS, SNUB, AUG. TEST CONDITIONS, C PLT, FRICTION TEST CONDITIONS, C PLT. FRICTION TEST CONDITIONS, C PLT. FRICTION TEST CONDITIONS, FILE NO.

Figure

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USER CODE
   7
                     USER CODE
                                        7,
                     USER CODE
                     USER CODE
                                 =
                                   10.
D
                     USER CODE
                                 Z
                                   10,
                     USER CODE
                                 3
                                   10,
                     USER CODE
                                 =
                                   11.
   234
                     USER
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                     USER
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                     USER CODE
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                                   11,
                     USER CODE
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8-8432
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8-3221
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8-9031
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8-8421
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8-421
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8-6422
                     USER CODE
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8=3092
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                          CODE
8-8442
         SNUPBERS
                     USER
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                                   16,
8-422
         SNUBBERS
                     USER CODE
                                3
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4-H7
         SNUBBERS
                     USER CODE
                                =
                                   16,
1-8433
         SNUBBERS
                     USER CODE
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                                  16.
8-3091
         SNUBBERS
                     USER CODE
                                =
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NO AUGMENTATION
                     USER CODE
                                 =
                                   17,
                     USER CODE
VOLUTE
                                 =
                                   17,
HYDRAULIC
                     USER CODE
                                =
                                   17
TRUCK CEER AUG.
                     USER CODE: =
                                   17,
STEEL-MOLY
                     USER CODE
                                3
COMP, STEEL
                     USER CODE
                                 ş
                                   18,
STEEL-STEEL
                     USER CODE
                                35
                                   18,
   1
                     USER CODE
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                                   19,
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5. (sheet 2 of 3)

5.

TEST CONDITIONS, FILE NO. TEST CONDITIONS, FILE NO. TEST CONDITIONS, FILE NO. TEST CONDITIONS, TRACK TEST CONDITIONS, TRACK TEST CONDITIONS, TRACK TEST CONDITIONS, TEST CONDITIONS, TEST CONDITIONS, TRACK TRACK TEST CONDITIONS, SPEED TEST CONDITIONS, SPEED TEST CONDITIONS, SPEED TEST CONDITIONS, SPEED TEST CONDITIONS. OGC TEST CONDITIONS, OGC TEST CONDITIONS, SIDE BEARING TEST CONDITIONS, SIDE BEARING

9

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USER CODE # 19, 2,
   2
   3
                   USER CODE = 19, 3,
                   USER CODE =
                               19, 4,
   4
                   USER CODE = 20.
CURVED
                                    1.
SHIMMED
                   USER CODE
                             = 20, 2,
                             = 20,
HI SPD JTD
                                    3,
                   USER CODE
HI SPD CWR
                   USER CODE # 20,
MED SPO JTD
                   USER CODE
                             = 20.
MOD SPD JTD
                   USER CODE
                             = 20,
                                    6,
                   USER CODE =
                                21,
                   USER CODE =
                                21.
   2
   3
                   USER CODE = 21,
                                    3,
                   USER CODE = 21,
                                    4.
1/4 OGC
                   USER CODE = 22,
                   USER CODE = 22,
5/8 OGC
                                    2,
                   USER CODE #
3/8 SB CLR
                                23,
                                    1,
                   USER CODE =
                                23,
                                    2,
1/4 SB CLR
                   USER CODE = 23,
                                    3,
5/8 SB CLR
                   USER CODE = 23,
1/8 SB CLR
2.5 K PRELOAD
                   USER CODE = 23,
5,
    K PRELOAD
                   USER CODE = 23, 6,
7.5 K PRELOAD
                   USER CODE = 23, 7.
```

#### 2.2.2 Post Processing Program

The Post Processing program developed by Southern Pacific Transportation Company (SPTCo) will be used for the analysis of the Phase I data. Currently the Post Processing program is stored in Fortran card image format on magnetic tape and will be used to enter the program in the computer. The program is configured as a base module, used to demultiplex the data from tape together with several analysis subroutines. The available data analysis techniques are listed in Figure 6.

After the Post Processing program has been entered into the computer, a series of validation runs will be made to gain assurance that the data analysis techniques are properly programmed. In some instances (such as time history plots and histograms), the validation technique will involve data comparison with previous runs. In other cases a known standard input will be analyzed to verify the accuracy of the routines. Special emphasis will be placed on verifying the PSD routine. This will involve both the calculation validity and the adequacy of the sample rate and averaging window utilized.

#### 2.2.3 Software Enhancements

Enhancements to the TDOP sorting routine are the addition of a run number identifier, box location, and a sorting identification by vehicle type. All of these changes are reflected in the printout shown in this report. The information in the sorting routine data base was derived from a summary listing obtained from National Technical Information Service (NTIS). In several of the tapes used to date this information has not agreed with the data on the tape header. Where cases like this are found, the sorting routine will be revised to reflect the information in the tape header.

The Post Processing program is in modular form, making it easy to add additional subroutines. Two contemplated additions to the analysis capability have been identified to date: transfer function calculation and rain flow fatigue analysis. Presently a tentative need has been established for these capabilities; therefore, actual implementation will depend on analysis requirements.

Time History Plots

RMS vs. Speed

Histograms

Power Spectral Density

Statistical Calculations

Min - Max Display

Figure 6. Data Analysis Techniques

Central Processing Unit, 256 K Bytes (64 K Words)

Disc Unit 67 Million Bytes

Disc Unit 256 Million Bytes

Magnetic Tape System - 2 Unit, 9 Track, 800/1600 BPI

Operational Terminal - 2 Units

Card Reader - 400 Cards/Min.

Line Printer - 600 Lines/Min.

Graphic Display Tektronix 4014

**Electrostatic Printer-Plotter** 

Analog Conversion System - Digitize FM Tapes

UT 200 Protocol - For Interaction with CDC Computers

Hasp Protocol - For Interaction With Boeing Computer Service's IBM Computer

Figure 7. Interdata 8/32 Computer System Features

Slight modification of the Post Processing program output format is planned so as to provide consistency between the different plot types. This will involve a standard printout on every plot which defines the run ID, transducer number, and the time slice depicted for clear identification of what is being presented.

#### 2.3 COMPUTER HARDWARE

The Interdata 8/32 computer will be utilized in the analysis of Phase I data. Figure 7 shows a summary description of this system. The two magnetic tape drives make it possible to simultaneously read the data tapes and write information to another tape. The disk units can be used to store data for immediate access by the various analysis subroutines. Plotting capability and rapid display of graphical data is provided by the Tektronix 4014. (Optional hardcopy is available.) This capability reduces the amount of data plots and, thus, paperwork. For multiple overlay plots the Tektronix 4014 has the capability of producing graphs with different line types for each curve and eliminating color reproduction problems. The electrostatic plotter is available for plots requiring a strip-type chart.

#### SECTION 3 - EVALUATION AND ANALYSIS

Once the software and associated enhancements are functional on the Interdata 8/32, the evaluation and analysis of Phase I data will be possible. Only data in the prescribed reduction formats identified as requisite to the model validation and performance indices identification tasks will be processed.

#### 3.1 DATA EVALUATION

#### 3.1.1 Measurement Quality

The Phase I instrumentation plan was developed so specific car body and truck parameters could be derived from the test measurements. These parameters are listed in Figure 8 with the channels used and a description of the parameter. Figure 9 shows the channel locations on the test specimen. Some cases require a single channel to measure a vehicle parameter, as in the case of A-end bounce where only channel 7 is required to obtain the desired parameter. Other cases use a combination of channels to measure a vehicle parameter, as in the case of car bounce where channels 4 and 7 are averaged to obtain the desired parameter.

For the Phase I data to be of use in the Phase II analytical effort, it is necessary that the channels used in Figure 8 give a valid quantification of the desired parameters. Thus, Phase I data required by the analysis tasks will be analyzed, and an evaluation will be made of the effectiveness of the measured channels to determine the desired parameters. The channels will be considered effective if they give a valid quantification of the desired parameter. For example, vertical accelerometers were placed at each end of the vehicle, and the measured values were subtracted to obtain pitching motion of the car body. This calculated parameter will then be assessed to see if it gives a true indication of car body pitch. This assessment will also be useful in structuring an effective measurement plan for Phase II. Phase I measurements providing usable data may be repeated in Phase II, and those which do not provide usable data will be replaced with new measurement techniques.

One example of the measurement technique failing to produce usable results was in the determination of the lateral wheel/rail force. Other such areas will be identified and

# DESCRIPTION OF CALCULATED PARAMETERS

Calculated Parameter	Channels Used	Description
A-END BOUNCE	7	A-end carbody vertical accelera- tion; measured at center plate
B-END BOUNCE	4	B-end carbody vertical accelera- tion; measured at center plate
BOUNCE CAR	4, 7	Average of A- and B- end vertical center plate accelerations; equal to vertical acceleration of center of gravity
CB-A LAT. ACC	8	Lateral acceleration of A-end carbody; measured at center plate
CB-B LAT. ACC	5	Lateral acceleration of B-end carbody; measured at center plate
L. ACC AROOF	9	Lateral acceleration of A-end car- body; measured at roof directly above center plate
L. ACC AXLE 1	14	Lateral acceleration of indicated axle; measured at axle end
L. ACC AXLE 2	25	
L. ACC AXLE 3	10	
L. ACC AXLE 4	11	
LATERAL CAR	5, 8	Average of A- and B- end lateral acceleration; equal to lateral acceleration of center of gravity
L. DIS B-SF	36, 37, 39, 40	Lateral displacement of bolster with respect to both side frames
L. DIS B-SFL	39, 40	Lateral displacement of bolster with respect to left side frame
L. DIS B-SFR	36, 37	Lateral displacement of bolster with respect to right side frame
L. FOR. AXLE-1	12, 13	Lateral force on axle; measured at
L. FOR. AXLE-2	23, 24	both left and right adapters for each axle
PITCH CAR	4, 7	Angular acceleration of carbody around its lateral axis; computed from difference between A- and B-end vertical accelerations
ROLL CAR	5, 6, 8, 9	Angular acceleration of carbody around its longitudinal axis

Figure 8. Measured Car Body and Truck Parameters (sheet 1 of 2)

Calculated Parameter	Channels Used	Description
ROLL CB-AXLE	32, 34, 41, 43, 44, 46	Degree of rotation from equili- brium position (nominally parallel) between carbody bolster and axle around a longitudinal axis
SB FORCE	42, 45	Side bearing forces; differences between left and right side bear- ings (not used in constant-contact side bearing test)
SWIVEL + TRAM	36, 37, 39, 40, 47, 48	Sum of rotation of truck tram and truck swivel
TRUCK SWIVEL	47, 48	Degree of rotation of truck bolster with respect to carbody
TRUCK TRAM	36, 37, 39, 40	Degree of rotation from equili- brium position of bolster with respect to side frames
TWIST CAR	5, 6, 8, 9	Difference in angular acceleration around longitudinal axis of A-and B-ends of car
V. ACC R-1 V. ACC L-1 V. ACC R-2 V. ACC L-2	21 22 28 29	Vertical acceleration of adapter at indicated wheel location
V. DIS B-SF	32, 33, 34, 35	Vertical displacement of bolster with respect to side frames (shows in-phase spring deflection, not deflection due to roll)
V. DIS B-SFR V. DIS B-SFL	32, 35 34, 35	Vertical deflection of indicated spring nest
V. DIS CB-B	41, 43, 44, 46	Vertical displacement of carbody bolster with respect to truck bolster (shows center plate separa- tion at pin)
V. DIS CB-BR	41, 43	Vertical displacement of carbody with respect to truck bolster for indicated side
V. FOR. AXLE-1 V. FOR. AXLE-2	15, 16 26, 27	Total vertical force on indicated axle
V. FORCE R-1 V. FORCE L-1 V. FORCE R-2	15 16 26	Vertical force on indicated wheel
YAW CAR	5, 8	Angular acceleration of carbody around its vertical axis; computed from difference between A- and B-end lateral accelerations

Figure 8. Measured Car Body and Truck Parameters (sheet 2 of 2)

# **TYPES** 22 ACCELEROMETERS 14 DISPLACEMENT TRANSDUCERS 10 FORCE MEASUREMENTS 1 SPEED 1 AUTOMATIC LOCATION DETECTOR **LOCATIONS** LEGEND Accelerometer ---> Displacement Transducer A-END Force Transducer A-END TRUCK Bolster B-END TRUCK € Bolster B-END

Figure 9. Phase I Instrumentation

documented during the Phase I data reduction effort, and other sources of information will be explored. If it is not possible to obtain satisfactory data for a key parameter, it may be necessary to run a limited series of new tests for those key parameters.

Calibration problems and data anomalies will be noted and evaluated. In those areas where calibration problems are found to exist, an attempt will be made to define an accuracy bound for the reduced data. Where anomalies are noted in the reduced data, an attempt will be made to define the cause of the anomaly and to take appropriate action.

#### 3.1.2 Track Geometry Correlation

A problem area identified in the Phase II proposal was the difficulty of correlating the response measurements with the track geometry location. The Automatic Location Detector (ALD) used Our Detect

The problem of knowing the exact input which corresponds to a given response is particularly critical in time domain analysis. In this type of an analysis the model must be given exactly the same input at the same time as the test car so the response data can be compared.

The track geometry correlation problem will be studied to determine if anything can be done to improve this correlation. An alternate analysis technique is to calculate frequency domain and averaged quantities (such as PSDs and RMS values) for comparison with model results. This technique has the advantage of being independent of the exact correlation between track geometry and test car. For those models which do require an exact comparison in the time history domain, additional tests may be necessary to acquire the measurements.

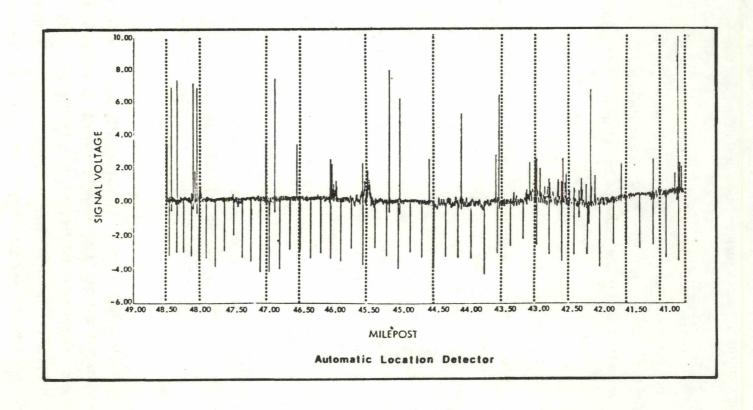


Figure 10. ALD Location Plot

#### 3.2 DATA ANALYSIS

#### 3.2.1 Pilot Program

A small pilot program will be conducted to establish the validity of the techniques used in establishing the value of performance indices and to gain familiarity with and confidence in the data. As an example, a manageable subset such as ride quality could be reviewed. The data could be bounded by reviewing responses for one or two truck types of the same load rating on one type of track (e.g., mainline jointed rail), for a range of speeds; and under all car bodies tested. This would provide a band of performance and a more realistic measure of ride quality. The pilot program would:

- a. Focus on a limited amount of data to produce a definite and easily described result.
- Establish a methodology that can be extended to other truck performance aspects.

#### 3.2.2 Performance Regimes

Pilot program results will be extended to the major performance regimes which have been identified in describing the performance characteristics of a rail truck. These performance regimes are:

- a. Lateral Dynamics (Hunting)
- b. Curve Negotiation
- c. Rock and Roll Dynamics
- d. Ride Quality
- e. Derailment Potential

These performance regimes are then related to physically measurable parameters called performance indices as indicated in Figure 11. Where possible, the Phase I data will be used to quantify values for the performance indices. As an example, the lateral stability of a truck will be characterized by the lowest speed at which hunting occurs. To bound the number of cases, only those variables which are shown to significantly

	PERFORMANCE INDICES				
PERFORMANCE REGIMES	PRIMARY	EXTENDED OR ALTERNATE			
LATERAL STABILITY	Criti <mark>cal Speed</mark> (Primary or Body Hunting)	Lateral Acceleration at Lowest Critical Speed.  Critical Speeds of Wheelset and Truck Hunting (for Some Type II Trucks)			
CURVE NEGOTIATION	Lateral Force on Leading Outer Wheel, per 1000 Lb. Axle Load, per Degree of Curve  (Other Variables, Such as Wheel and Rail Profiles, and Variations in Creep Coefficients, May Have to be Specified)	Angle of Attack of Leading Outer Wheel, per Degree of Curve			

Figure 11. Performance Regimes (sheet 1 of 3)

PERFORMANCE REGIMES	PERFORMANC) PRIMARY	E INDICES EXTENDED OR ALTERNATE
HARMONIC ROLL ("ROCK-AND-ROLL")	Rate of Energy Dissipation of Roll Motion, Lb Ft/Sec, Or: Energy Dissipation Per Cycle, Lb Ft/Cycle, per Degree of Initial Amplitude.  Could be Made Independent of Carbody and Suspension Characteristics, by Specifying Initial Energy of Motion, Including that Stored in Suspension Springs.	Amplitude of Roll Oscillation Under Constant Harmonic Excitation, for a Specific Vehicle. Or: Rate of Decay of Roll Oscillation From a Given Amplitude, for a Specific Vehicle

Figure 11.(sheet 2 of 3)

PERFORMANCE REGIMES	PERFORMA PRIMARY	NCE INDICES EXTENDED OR ALTERNATE		
RIDE QUALITY	Acceleration (Vertical and Lateral) at a Specified Point of Carbody, at a Specified Speed, on Track of Specified Characteristics.	Statistical Measures: Mean & Std. Deviation PSD Exceedances Rainflow Analysis		
DERAILMENT	<ol> <li>L/V Ratio Times Duration of Lateral Force, for a Specified Wheel &amp; Rail Geometry (Wheel Climbing)</li> <li>Absolute Value of Lateral Force (Implies Yielding of Rail as a Factor)</li> <li>Sensitivity to Track Modulus as a Factor in Wheel Unloading (Bridges, Frozen Roadbed)</li> </ol>	For Frogs and Switches:  Derailment Potential May Depend on State of Wheel Wear, as Well as on Truck Kinematics.		

Figure 11. (sheet 3 of 3)

affect hunting would be used in the characterization (such as wheel profile and car body type). The sorting program would be used to obtain listings of all runs made with each combination of wheel profile and car body type for a given truck. These runs would then be accessed to obtain a plot of RMS lateral acceleration versus speed, and, from this, the critical speed would be determined. Curve negotiation indices will not be obtained from the Phase I data because of the lack of adequate measurements.

#### 3.2.3 Model Validation

As the computer model identification and verification phase progresses, certain programs will be identified which are to be used during the analytical task effort. Data required for model validation will be identified from the Phase I tapes and reduced for validation of performance indices predicted by the selected model or models. The sorting routine will be used to retrieve the required data.

#### 3.2.4 Tape Header Information

The test conditions will be printed out for each test accessed during the data analysis phase. Figure 12 shows the complete listing for the conditions under which test ID 010203TWA001 was run. These listings will be used as the basis for establishing the conditions under which each test was run. Where discrepancies exist between the listing and other sources (such as the sorting routine), the listing will be used as the governing document.

```
TIMES
         0.00 TEST: 010203TWA001TTYPE: 11LGN: 1980
SUISUN WESTBOUND, 30 TO 79 MPH, JOINTED PAIL, 3/19/75
SOUTHERN PACIFIC TRANSPORTATION COMPANY, TRUCK OPTIMIZATION FIELD TESTS
FOR FEDERAL RAILROAD ADMINISTRATION, U.S. DEPARTMENT OF TRANSPORTATION
TOOP TAPE NO. 1
                   0035
                                          SEQUCE. ON TAPE: 1
TEST DATES
                   3/19/75
                                          TEST START TIME!
                                                            0825 HOURS
                   52 DEG-F
                                                             NONE
                                          PRECIPITATION:
TEMPERATURE :
                                                            FROM 180 DEG REL
                                          WIND DIRECTIONS
HUMIDITY:
                   95%
                   10 M
                                          RAIL SURF COND!
                                                            MOIST AND SANDED
WIND VELOCITYS
                                          DIRECTIONS
                                                            RAILROAD WEST
LINE:
                   DAKLAND-DGDEN
                                                             40.70
MILEPOST STARTS
                   48.50
                                          MILEPOST END!
                                                            79 MPH
MIN SPEEDS
                   30 MPH
                                          MAX SPEED:
RAIL TYPE:
                   JOINTED
                                          RAIL WEIGHTS
                                                            132 LB./YD.
-RAIL LAID IN:
                   1941 TO 1955
                                          CAR INITIALS:
                                                             SPFE
CAR NUMBER:
                   459997
                                          CAR TYPES
                                                             MECH. REEFER
CAR ORIENTATION:
                   B-END FORWARD
                                          CAR CAPACITY:
                                                            130000 POUNDS
                  89100 POUNDS
                                          EMPTY WT A-END:
                                                             47880 POUNDS
CAR TARE WEIGHTS
                                                             89100 POUNDS
EMPTY WT B-END:
                   41220 POUNDS
                                          TARE WTE
                   60 INCHES
                                          TYPE OF LADING:
                                                             NONE
CENTER GRAVITY:
ALD - LD. TRUCK:
                   +15 FT. 0 IN.
                                          TRUCK CENTERS:
                                                             45 FT. 8.625 IN.
                                          TOTAL H.P. 1
                                                             3000
NO. OF LOCO'S:
                                          TOTAL TONS FORE:
                                                            61
NO. CARS FORE!
NO. OF CARS AFT:
                                          TOTAL TONS AFT:
                                                            25
                                          WHEEL BASES
TRUCK TYPE:
                   ASF A3 RIDE CONT
                                                            5 FT. 8 IN.
SPRNG GROUP OUT:
                   7 05
                                          SPRNG GROUP IN:
                                                             6 D5
SPR GROUP ININE
                                          STAT SPNG COMP!
                                                             B=9.6751A=9.5 IN
                                          CNTR PLATE MATLE
                                                            STEEL
CHTR PLATE DIA:
                   14 INCHES
                                          CNTR PLATE FRICE
                                                            UNKNOWN
LNTR PLATE LUB!
                   MOLYLUD
SIDE BEAR A-END:
                  STUCKI SINGLE
                                          SIDE BEAR B-END:
                                                            STUCKI DOUBLE
                                                            NONE
                                          SIDE BEAR SUPPLE
SIDE BEAR CLEAR!
                   0.375 INCH
                                          SNUBBER TYPE:
                                                            CONSTANT (ASF)
SIDE BEAR PRELD:
                   0 POUNDS
                                                            UNKNOWN
                                          SNUB DAMP RATES
SNUBBER SPRINGS:
                   8
                                          OUTER GIB CLR:
                                                             0.250 INCH
S. /FR. INTERTIE:
                   NONE
INNER GIB CLRI
                   0.250 INCH
                                          ROLLER BEARING:
                                                             AAR 6X11 TAPERED
                                          PAD SHEAR COEFF !
                                                            N/A
ADAPTR PAD TYPE:
                   NONE
                                          LAT DAMPER TYPE:
                                                            NONE
LONG ADPTR CLRI
                   3/32" TO 9/32"
                                          AXL PARAL A-END:
                                                            3 DOT LI 3 DOT R
LAT DAMPER RATE:
                   NIA
                                          WHEEL CONTOUR:
                                                            FG 5.11 AAR WEAM
AXL PARAL B-END: 3 DOT LI 3 DOT R
WHEEL DIAMETER:
                   33.4375 INCHES
```

Figure 12. Test Condition Data For Each Run

#### SECTION 4 - REFORMATTING DATA PLAN

The sheer volume of data acquired during Phase I makes it difficult to access the data without an extensive computer operation. One option discussed was to take some of the Phase I data tapes and produce some new tapes which would concentrate on one particular phenomenon, characteristic, or parameter variation. Thus it would be necessary to obtain only one tape to study a particular test response. These new tapes could be filed with NTIS.

The justification for performing such a reformatting would be the use which the rail-road industry at large could obtain from these tapes. In order to assess the tapes' usefulness, a questionnaire has been distributed to the TDOP Phase II consultants. This questionnaire is reproduced as Figure 13. The decision to do any reformatting will be based on the response to this questionnaire. The reformatting will also be dependent on the funds available for this effort after completion of the tasks defined under this plan.



# PHASE I DATA USAGE QUESTIONNAIRE

Are the Phase I data tapes in their current form, available through NTIS, adequate for anticipated industry usage? Yes or No
If the answer to question #1 is no, would some form of reformatting by Wyle make the data tapes more useful? Yes or No
The most popular form of reformatting seems to be one where data tapes are prepared which concentrate on one particular phenomenon, characteristic or parameter variation. List in order of importance those phenomenon, characteristics or parameters you think would be the most useful to the industry.
Any other comments or suggestions as to Wyle's usage of the Phase I data?

1 February 1978

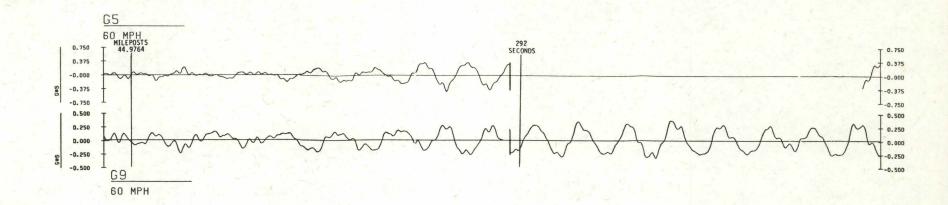
#### **SECTION 5 - DATA REPORTS**

A data report will be prepared at the completion of the Phase I data analysis task which will include:

- a. Implementation of the Post Processing program
- b. Use of the TDOP sorting program
- c. Verification of the Post Processing program data analysis subroutines
- d. Enhancements made to the Post Processing program
- e. Resolution of the problems identified with the Phase I data
- f. Cataloging of the reduced data

An appendix to the data report will catalog all reduced data. The format will consist of a header sheet listing all test conditions and will be followed by all the analysis obtained for that run.

Detailed discussion of the analyzed data will appear in the appropriate Phase II task report for which it was reduced. For example, the data reduced for model verification will be presented and discussed in the model validation report, and the data reduced for performance indices will be discussed in the report which defines values for the performance indices.



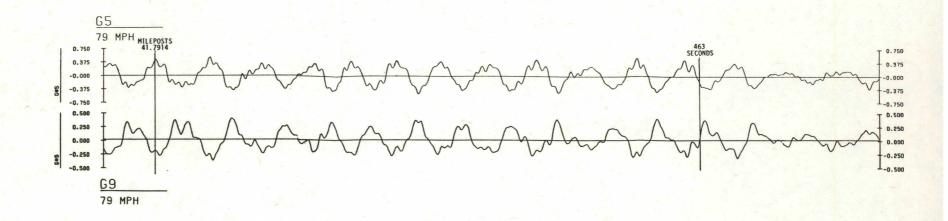
TEST NAME: 010203TWA001 SPEED RANGE: 58 -- 62 MPH M.P. LIMITS: 44.98 TO 44.89

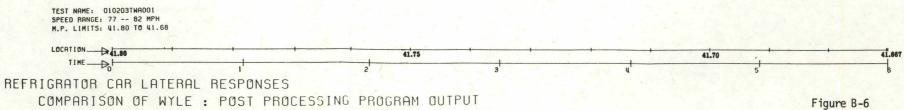


REFRIGRATOR CAR LATERAL RESPONSES

COMPARISON OF WYLE : POST PROCESSING PROGRAM OUTPUT

Figure B-5





COMPARISON OF WYLE : POST PROCESSING PROGRAM OUTPUT

## **PSD Plots**

In the final step in the validation process, Wyle used the PSD routine to calculate values for a known sinusoidal input. The sinusoidal inputs were a one g signal at 1.8 Hz, 20 Hz, and 38 Hz. The results of this analysis are shown in Figures B-7, B-8, and B-9 and were as expected. Figure B-10 shows a combination of all three of these frequencies. The area under the curves in Figure B-7 give a g rms of .5 gs instead of the expected A detailed recheck of the analysis routine showed the calculation to be correct. However, when the computer code in the plotting section was examined, we found that the calculated values were being divided by 2.0 just before plotting. This caused the PSD plot to be low by a factor of two and the rms value to be low by a factor of two. This accounted for the discrepancy noted in the calculated g rms value. No apparent reason could be found for the division by two and discussion with the SPTCo. revealed no rationale for this procedure and they agreed that the g rms should be .707 g.

Wyle also noted during this exercise that the Post Processing Program fails to remove the mean before calculating the PSD. By not removing the mean from the PSD calculation, the algorithm used to calculate the PSD gives a large PSD value at 0 Hz for signals with a large mean value in it and the resulting overflow into adjacent frequencies will also affect the 0.1 Hz data point. Because the Post Processing Program does not plot the 0 Hz PSD value, but rather, starts at the origin of the plot for 0 Hz, the error caused by not removing the mean shows up as a high PSD value at 0.1 Hz. This is illustrated in Figure B-11 for a signal with a large mean. The 0 Hz PSD value starts at the origin and a large peak occurs at 0.1 Hz. These data do not show a PSD peaking at 0.1 Hz, but rather, a PSD of a signal with a large mean. Another example is given in Figure B-12, where a peak occurs at 0.1 Hz but is not a valid peak in the PSD.

Based upon this comparison, Wyle made certain revisions in the program as noted in the following section. Note that the test case specified in Reference 2 gave identical results with the SPTCo's test case and thus it may be concluded that all PSDs run during Phase I are in error. However this error may be corrected easily by multiplying the scale on each PSD curve by a factor of two and ignoring any peaks at 0.1 Hz.

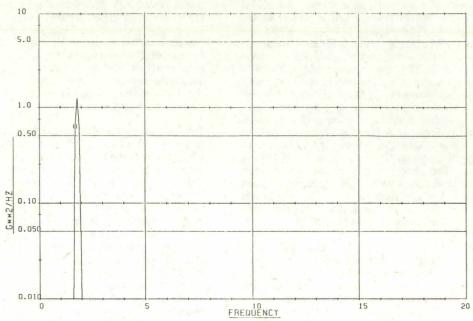
# **Enhancements**

The only modifications made to the Post Processing Program were those associated with the PSD package to enable it to give the correct results. These consisted of removing the mean from the signal before any PSD calculation, calculating the area under the PSD curve, removing the erroneous factor of two, and printing the grms level on the plot.

Once Wyle commenced processing of data using the Post Processing Program, we found that the analysis routines available in the current version of the program were adequate for the analysis of the data. Hence no new data analysis subroutines were added to the Post Processing Program. However, a need was identified in connection with the ALD location problems to provide time-history plots of greater than 20 seconds for one

channel at a time. This capability was implemented by writing a new program which takes the Phase I tapes and produces a reformatted tape which is compatible with the Wyle library of analysis routines. The new program takes the test tapes which are in a multiplexed format and produce a data analysis tape which is demultiplexed, i.e., the data are on the tape one channel at a time. The format of the analysis tape is compatible with the Wyle data analysis library and may be analyzed by any of the available routines. For purposes of this data analysis, the time-history plot capability was used to obtain the desired data analysis.

The data analysis plan called for a slight modification of the Post Processing Program output format to provide consistency between the different plot types. This would involve a standard printout on every plot which defines the run ID, transducer number, and the time slice depicted for clear identification of what is being presented. However, after working with the Post Processing Program during installation on the Interdata computer, we concluded that the effort required to perform these modifications would be significant. Also, after using the plotted data, we believed that the format, while not ideal, was completely adequate in its current form for TDOP Phase II use. The one exception was the printout of the rms value on the PSD curves. Based upon this conclusion, Wyle decided to make no modifications to the output format except as noted above.



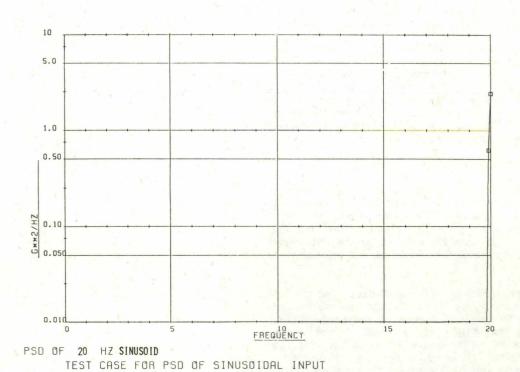
PSD OF 1.8 HZ SINUSOID

TEST CASE FOR PSD OF SINUSOIDAL INPUT

PLOT TYPE: PSD BAZ PLOT NAME: 11JUL78 0001

TEST NAME: 030201TEH001

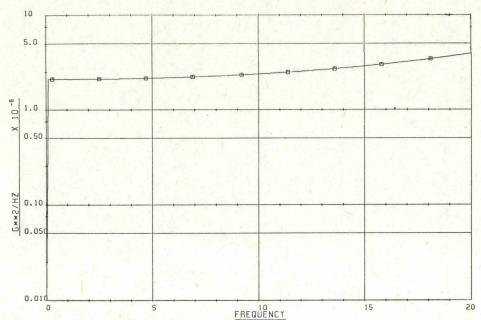
Figure B-7



PLOT TYPE: PSD B 87 PLOT NAME: 11JUL78 0001

TEST NAME: 030201TEH001

Figure B-8

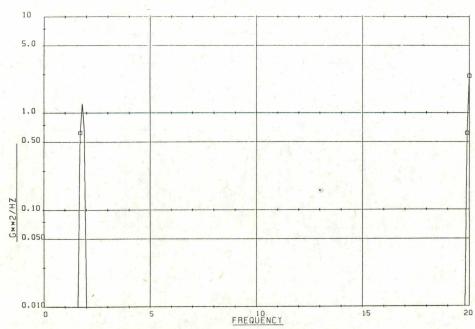


PSD OF 38 HZ SINUSOID

TEST CASE FOR PSD OF SINUSOIDAL INPUT

TEST NAME: 030201TEH001

Figure B-9

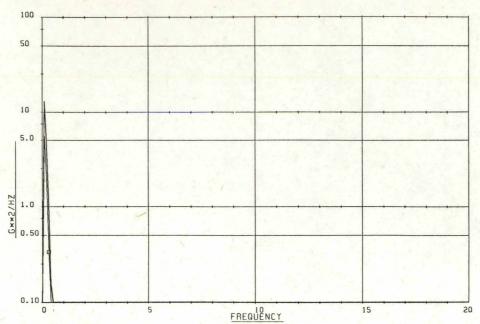


PSD OF 1.8 HZ SINUSOID + 20 HZ SINUSOID + 38 HZ SINUSOID
TEST CASE FOR PSD OF SINUSOIDAL INPUT

PLOT TYPE: PSD B 87
PLOT NAME: 11JUL78 0001

TEST NAME: 030201TEH001

Figure B-10



PSD OF TRAIN SPEED INDICATOR

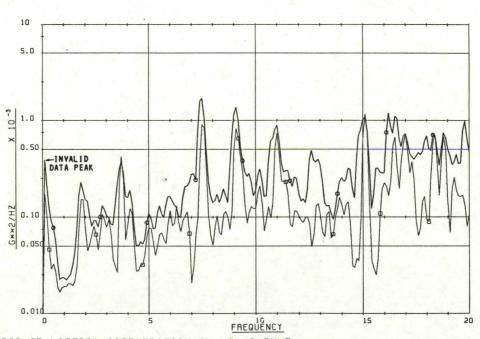
EMPTY 100 TON BOX CAR, BARBER TRUCKS, CWR

PLOT TYPE: PSD
PLOT NAME: 10JUL78 0001 SO MPH-ZONE 1

0 82 50 HPH-ZONE 2

TEST NAME: 030202TEM001

Figure B-11



PSD OF LATERAL ACCELERATION ON NO. 3 AXLE EMPTY 100 TON BOX CAR, BARBER TRUCKS, CWR

PLOT TYPE: PSD BIO PLOT NAME: 10JUL78 0004 50 MPH-ZONE I

TEST NAME: 030202TEM001

Figure B-12

# TEST:--010104TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING ASF RIDE CONTROL 70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK; THREE CAR TEST TRAIN 4 HOURS PRIOR TO TEST RUN NOMINAL NEW CONDITIONS EXCEPT:

CLOSED - SIBS

OPEN SIDE BEARINGS

TDOP TAPE NO.: TEST DATE: TEMPERATURE: HUMIDITY:

MAX. WIND VELOCITY: 8 MPH LINE: DAKLAND-DGDEN MILEPOST STARTS 48.50.\_ MIN SPEED: JOINTED RAIL TYPE: RAIL LAID IN: 1941 10 1955 CAR NUMBER: 459997

B-END FORWARD CAR ORIENTATION: CAR TARE WEIGHT: LOADED WY B-END: 115200 POUNDS CENTER GRAVITY: ALD - LD. TRUCK: NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: ASF AS RIDE CONT

7 D5

14 INCHES MOLYLUB STUCKI SINGLE

0.375 INCH

POUNDS

2/14/75 55 DEG-F

SPRNG GROUP OUT: SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: SIDE BEAR A-END: SIDE BEAR CLEAR:

SIDE BEAR PRELD: SNUBBER. SPRINGS: S./FR. INTERTIE: INNER GIB CLR:

NONE 0.250 INCH ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: NONE. 3/32" TO 9/32" N/A 3 DOT L: 3 DOT-F 33.4375 INCHES AXL PARAL B-END:

SIDE BEAR SUPPLE

SNURBER TYPE: SNUB DAMP RATE: OUTER- GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE:

SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION:

WIND DIRECTION:

RAIL SURF COND:

DIRECTION:

MAX SPEED!

MILEPOST END:

RAIL WEIGHT:

CAR\_INITIALS

CAR TYPE: CAR CAPACITY:

LOADED WT A-END: LOADED WT TOTAL: TYPE OF LADING:

TYPE OF LADING:
TRUCK CENTERS:
TOTAL H.P.:
TOTAL TONS FORE:
TOTAL TONS AFT: ...

WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP:

CNTR PLATE MATL:

CNTR PLATE FRIC:

SIDE BEAR B-END:

0.250 INCH AAR 6X11 TAPERED N/A AXL PARAL A-END:

NONE

1155 HRS

FROM 90 DEG REL

CLEAN AND DRY

RAILROAD WEST

132 LB./YD.

104580 POUNDS

219760 POUNDS

45 FT. 8.625 IN.

STUCKI DOUBLE \_\_\_

BRAKE SHOES

5 FT. 8 IN.

NONE

40.70 . 79 MPH

SPFE MECH. REEFER 130000 POUNDS

3000

6 D5 8.125 INCHES

STEEL

NONE CONSTANT (ASF)

UNKNOWN

LINKNOWN

3 DOT L: 3 DOT R

## TEST: 010202TWA001

BENT AND GIVING INACCURATE READINGS

SEGNCE. ON TAPE: 1-TEST START TIME: 11 PRECIPITATION: NO TOOP TAPE NO.:\_ TEST DATE: .0033 1140 HRS TEMPERATURE: SO DEG-F NONE WIND DIRECTION: RAIL SURF COND: FROM 350 DEG REL HUNIDITY: A7% 5 MPH OAKLAND-OGDEN CLEAN AND DRY WIND VELOCITY: DIRECTION: RAILROAD WEST LINE: 48.50 MILEPOST END 40.70 79 MPH MILEPOST START: MAX SPEED: RAIL WEIGHT: MIN SPEED: 30 MPH JOINTED 132 LB./YD. RAIL TYPE: RAIL LAID IN: 1941 TO 1955 SPFE REEFER MECH.

CAR INITIALS: CAR NUMBER: 459997 B-END FORWARD 89100 POUNDS 41220 POUNDS CAR CAPACITY: CAR ORIENTATION: CAR TARE WEIGHT: EMPTY WT B-END: 130000 POUNDS 47860 POUNDS EMPTY WT A-END: -TARE WT: TYPE OF 89100 POUNDS LADING: CENTER GRAVITY: 60 INCHES NONE TRUCK CENTERS: .....
TOTAL H.P.:
TOTAL TONS FORE:
TOTAL TONS AFT: 45 FT. 8.625 IN. +15.FT ... 0. .3000 61

CENTER GRAVITY:
ALD' - LD. TRUCK:
NO. OF LDCO'S:
NO. CARS FORE:
ND. OF CARS AFT:
TRUCK TYPE:
SPRNG GROUP OUT: 25 5 FT. & IN. ASF AS RIDE CONT WHEEL BASE: SPRNG GROUP IN: 6 D5 B-9.6751A-9.5 7 D5 SPRNG GROUP DUT:
SPR GROUP ININ:
CHTR PLATE DIA:
CNTR PLATE LUB:
SIDE BEAR A-END:
SIDE BEAR CLEAR:
SIDE BEAR PRELD: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: 14 INCHES STEEL UNKNOWN SIDE BEAR B-END: SIDE BEAR SUPPL: STUCKI DOUBLE STUCKI SINGLE 0.125 INCH NONE

CONSTANT (ASF) SNUBBER TYPE: D POUNDS SNUB DAMP RATE: SNUBBER SPRINGS UNKNOWN 0.675 INCH S./FR. INTERTIE: INNER GIB CLR: NONE 0.250 INCH ROLLER BEARING: AAR 6X11 TAPERED PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: N/A ADAPTR PAD\_TYPE:

LONG ADPTR CLR: LAT DAMPER RATE: AXL PARAL B-END: WHEEL DIAMETER: 3/32" 70 9/32" NONE 3 DOT LE 3 DOT R N/A 3. DOT\_LI WHEEL CONTOUR:\_\_\_\_ FG 5-11 AAR MSAM 3 .DOT 33.4375 INCHES

#### 020203TWAD01 TEST:

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING ASF RIDE CONTROL 70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR MITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

ANTRAK PASSENGER TRAIN
20 MINUTES PRIOR TO TEST RUN

NOMINAL NEW CONDITIONS EXCEPT: .. OPEN SIDE BEARINGS WORN WHEELS DF 101

CHANNEL 48 INOPERATIVE DURING TEST

0049

TDOP TAPE NO.: TEST DATE: TEMPERATURE: HUMIDITY: WIND VELOCITY: LINE: MILEPOST START: MIN SPEED: RAIL TYPE: RAIL LAID IN: CAR NUMBER: CAR ORIENTATION: CAR TARE WEIGHT: EMPTY WT B-END: CENTER GRAVITY: ALD - LD. TRUCK: NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: SIDE BEAR A-END: SIDE BEAR CLEAR: SIDE BEAR PRELD: SHUBBER SPRINGS: S./FR. INTERTIE: INNER GIB CLR: ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: AXL PARAL B-END:

4/10/75 62 DEG-F 50% 10 MPH OAKLAND-OGDEN 48.50 30 MPH JOINTED 1941 TO 1955 459997 B-END FORWARD 88720 POUNDS 39780 POUNDS 60 INCHES +15 FT. 0 IN. ASF AS RIDE CONT 7 D5

0 14 INCHES MOLYLUB STUCKI SINGLE 0.375 INCHES 0 POUNDS NONE 0.250 INCH

NONE N/A 3 DOT L: 3 DOT R--- SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPEED: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: EMPTY WT A-END: TARE WT: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE HATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END:

1408 HOURS NONE FROM O DEG REL CLEAN AND DRY RAILROAD WEST 40.70 79 MPH 132 LB./YD. SPFE MECH. REEFER 130000 POUNDS 48940 POUNDS 88720 POUNDS NONE 45 FT. 8.625 IN. 3000 61 23 5 FT. 8 IN. 6 D5 B-9.6751A-9.5 IM STEEL UNKNOWN STUCKI DOUBLE NONE CONSTANT (ASF) UNKNOWN 0.625 INCH AAR 6X11 TAPERED N/A NONE 3 DOT L: 3 DOT R

C-2

#### TEST: 020303TWA001

TEST.CONDUCTED AT MEDIUM AND HIGH TPEED USING ASF RIDE CONTROL 70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

THROUGH FREIGHT TRAIN
3 HOURS 25 MIN. PRIOR TO TEST RUN NOMINAL NEW CONDITIONS EXCEPT: OPEN SIDE BEARINGS WORN WHEELS DF 101

TEST DATE: TEMPERATURE: HUMIDITY: WIND VELOCITY: LINE: MILEPOST START: HIN SPEED: RAIL TYPE: RAIL LAID IN: CAR NUMBER: CAR ORIENTATION: CAR TARE WEIGHT: LOADED WT B-END: CENTER GRAVITY: ALD - LD. TRUCK: NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: SPR GROUP ININ: CATR PLATE DIA: CATR PLATE LUB: SIDE BEAR A-END: SIDE BEAR CLEAR: SIDE BEAR PRELD: SNUBBER SPRINGS: S./FR. INTERTIE: INNER GIB CLR: ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: AXL PARAL B-END: WHEEL DIAMETER:

0054 4/16/75 63 DEG-F 40% CALM OAKLAND-OGDEN JOINTED 1941 TO 1955 459997 8-END FORWARD 89100 POUNDS 115200 POUNDS 86.25 INCHES +15 FT. 0 IN. 1 ASF AS RIDE CONT 7 D5 14 INCHES MOLYLUB STUCKI SINGLE 0.375 INCHES 0 POUNDS NONE 0.250 INCH NONE 3/32" TO 9/32" N/A 3 DOT LI 3 DOT R 33.1406 INCHES

SEQUE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPEED: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: LOADED WT A-END: TARE WT: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: - WHEEL CONTOUR! ....

1305 HOURS NONE CALM CLEAN AND DRY RAILROAD WEST 40.70 79 MPH 132 LB./YD. SPFE MECH. REEFER 130000 POUNDS 104580 POUNDS 219780 POUNDS BRAKE SHOES 45 FT. 8.625 IN. 3000 23 5 FT. 8 IN. 6 05 B-8.250:A-8.375 STEEL DINKHORN STUCKI DOUBLE NONE CONSTANT (ASF) UNKNOWN 0.625 INCH AAR 6X11 TAPERED N/A NONE 3 DOT LI 3 DOT R WORN DF101

#### TEST: 030101TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING BARBER 82C 70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR TO TON CAPACITY INDEX ONDER HECHANICAL RI CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK: THROUGH FREIGHT TRAIN 1 HOUR AND 10 MIN PRIOR TO TEST RUN NOMINAL-NEW-CONDITIONS-EXCEPT:

NONE CHANNEL 14 WAS -. 9 V OFF ZERO CHANNEL 47 WAS -1.5 V OFF ZWRO

TDOP TAPE NO.: --- 0091 TEST DATE: 5/30 SEGNCE. ON TAPE: \_ 2 TEST START TIME: 16 5/30/75 1645 HRS TEMPERATURE: 88 DEG-F PRECIPITATION: NONE WIND DIRECTION: RAIL SURF COND: FROM 90 DEG REI HUMIDITY:-HINKNOWN WIND VELOCITY: 22 MPH CLEAN AND DRY OAKLAND-OGDEN DIRECTION: RAILROAD WEST LINE: 40.70 79 MPH 132 LB./YD. MILEPOST START: 48.479 MILEPOST END: MIN SPEED: 30 MPH MAX SPEED: JOINTED RAIL WEIGHT: RAIL TYPE: CAR INITIALS: SPFE 1941 TO 1955 459997 CAR NUMBER: CAR TYPE: MECH. REEFER 6-END FORWARD 130000 POUNDS CAR ORIENTATION: CAR CAPACITY: CAR TAKE WEIGHT: LOADED WT B-END: CENTER GRAVITY: LOADED WT A-END: 39600 POUNDS TOTAL WT.: TYPE OF LADING: 80760 POUNDS NONE ALD - LD. TRUCK! NO. OF LOCO'S: NO. CARS FORE: TRUCK CENTERS:\_ 45 FT. 8.625 IN. +15 FT. 0 IN TOTAL H.P.: TOTAL TONS FORE: 3000 61 NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: TOTAL TONS AFT: BARBER S2C WHEEL BASE: SPRNG GROUP IN: 5 FT. 8 IN. 4 D5 7 D5 SPR GROUP ININ: CNTR PLATE DIA: STAT SPNG COMP: B-9.751A-9.44 IN. 14 INCHES CNTR PLATE MATL: STEEL CHTR PLATE LUB: MOLYLUB CNTR PLATE FRIC: UNKNOWN STUCKI DOUBLE .. SIDE BEAR B-END: SIDE BEAR SUPPL: SIDE BEAR A-END: STUCKI SINGLE SIDE BEAR CLEAR: SIDE BEAR PRELD: 0.250 INCH 0 POUNDS 8 B-432 NONE LOAD VARIABLE SNUBBER TYPE: SNUBBER SPRINGS: SNUB DAHP RATE: UNKNOWN S./FR. INTERTIE: NONE OUTER GIB CLR: 0.625 INCH AAR 6X11 TAPERED INNER SIB CLR: 0.250 INCH ROLLER BEARING: ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: NONE PAD SHEAR COEFFS N/A 3/32" TO 9/32" LAT DAMPER TYPE: NONE N/A 2.DOT\_L1.3.DOT\_R AXL PARAL A-END: 3 DOT L: 4 DOT R AXL PARAL B-ENDS WHEEL CONTOUR: FG 5.11 AAR WEAM . WHEEL DIAMETER: 33.4375 INCHES

## TEST: 030102TWA001-

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING BARBER \$2C
70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR
CAR WITH FULL GROSS RAIL LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THROUGH FREIGHT TRAIN
3 HOURS AND 15 MIN PRIOR TO TEST RUN
NOMINAL\_NEW\_CONDITIONS\_EXCEPT:
NONE
USE MP 41.6 TO MP 41.1 FOR 79 MPH TEST
CHANNEL 6 MAS. #2.7% VOLIS OFF\_ZERO

	TDOP TAPE NO. :	0077	SEONCE. ON TAPE:	-1
	TEST DATE:	5/21/75	TEST START TIME:	1045 HRS
	TEMPERATURE:	78 DEG-F	PRECIPITATION:	NONE
	HUMIDITY:	- UNKNOWN	PRECIPITATION:	FROM 90 DEG REL
	WIND VELOCITY:		RAIL SURF COND:	CLEAN AND DRY
			DIRECTION:	RAILROAD WEST
	MILEPOST START:	48.479	- MILEPOST END:	40.70
	ATN SPEED:	30 MPH	MAX SPEED:	79 KPH
	RAIL TYPE:	JOINTED	RAIL WEIGHT:	132 LB./YD.
	RAIL LAID IN:	.1941 TO1955	CAR INITIALS:	SPFE
	CAR NUMBER:	459997	CAR TYPE:	MECH. REEFER
	CAR ORIENTATION:	B-END FORWARD	CAR CAPACITY:	130000 POUNDS
	CAR TARE WEIGHT:	88760 POUNDS	LOADED WT A-END:	104520 POUNDS
	LOADED HT B-FAD	114300 POUNDS	TOTAL MT.	218820 POUNOS
	CENTER GRAVITY:	86.25 INCHES	TYPE OF LADING:	BRAKE SHOES
	ALD - LD. TRUCK:	+15 FI . 0 IN.	TYPE OF LADING:	45 FT. 8.625 IN.
9	NO. OF LOCO'S:	1	TOTAL H.P.:	3000
	MO CARE EORE .	•	TOTAL TONS EDDE!	61
	NO. OF CARS AFT:	1	TOTAL TONS AFT:	23
	TRUCK TYPE:		WHEEL BASE:	5 FT. 8 IN.
	SPRNG GROUP OUT!			
	SPR GROUP ININ:	0	SPRNG GROUP IN:  STAT SPNG COMP:	B-8-188:4-8-375
	CNTR PLATE DIA:	14 THOUSE	CNTR PLATE MATL:	STEEL
	CNTR PLATE LUB:	MOI VI LIB	CNTR PLATE FRIC:	HINKNOWN
	STOP READ A-FAID	STUCKT STAGE	SIDE BEAR B-END:	STUCKI DOUBLE
	SIDE BEAR CLEAR:	0.250 THCH	SIDE BEAR SUPPL:	NONE
	SIDE BEAR PRELD:	o POUNDS	SNUBBER TYPE:	
		8 8-432	SNUB DAMP RATE:	UNKNOWN
	S./FR. INTERTIE:			
			ROLLER BEARING:	
			PAD SHEAR COEFF:	
-				
	LAT DAMPER RATE:	3/32" 10 9/32"	LAT DAMPER TYPE:	3 DOT LI 4 DOT R
-			WHEEL CONTOUR:	- PO D.11 AAK. WAAN _
	WHEEL DIAMETER:	33.4375 INCHES		

## TEST: 030201TWA001

TEST CO.::UCTEO AT HEDIUM AND HIGH SPEED USING BARBER S2C 100 TG: CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH FULL BROSS HAIL LOAD PREVIOUS THAFFEC OVER TEST TRACK: THALL CAR TEST TRAIN 35 F.IN-UTES PRIOR TO TEST RUN NORIJAL FEE COMMITTIONS EXCEPT:

	TOOP TAPE NO.:	0089	SEGNCE. ON TAPE: TEST START TIME:	1 0910 HRS
-	TE SPERATURE!	76 DEG-F	PRECIPITATION:	NONE
	HUNIDITY:	UNKNOWN	WIND DIRECTION:	FHOM 90 DEG REL
	WIND VELOCITY:	17 MPH.	RAIL SURF COND:	CLEAN AND DRY
	CINE	DAKEA D-OGDEN	DIRECTION:	RAILROAD WEST
	MILEPOST START:	46.479	HILEPOST END:	40.70
	AIN SPEED:	30 HPH	MAX SPEED:	79 APH
-	RAIL TYPE:	JULITED	RAIL WEIGHT:	132 LB./YD.
	RAIL LAID IN:	1941 TO 1955	CAR INITIALS:	SP
	CAH NUMBER:	666043	CAR TYPE:	60 FT. BGX CAR
-	CAR ORIENTATION:		CAR CAPACITY:	174000 POUNDS
	CAR TAKE WEIGHT:		LOADED WT A-END:	131260 POULDS
	LOADED WT B-END:		TOTAL WT:	263600 POUNUS
-	CELTER GRAVITY:		TYPE OF LADING:	BRAKE SHOES
	ALD - LD. TRUCK:		TRUCK CENTERS:	
	NO. OF LOCO'S:	1	TOTAL H.P.I	3,00
	NO. CARS FURE:	ī	TOTAL TONS FORE!	
	NO. OF CARS AFT:	1	TOTAL TONS AFT:	23
	TRUCK TYPE:	BARBER S2C	WHEEL BASE:	5 FT. 10 IN.
	SPRING GROUP OUT:		SPRING GROUP IN!	7 45
	SPR GROUF INIH:		STAT SPIJG COMP:	B-2.441A-8.44 IN
	CNTR PLATE DIA:		CHTR PLATE MATL:	
	CHIR PLATE LUC!		CHIR PLATE FRICE	
	SIDE BEAR A-ELD:		SIDE BEAR B-EID:	
	SINE BEAR CLEAR!		SIDE BEAR SUPPL:	
-	SIDE BEAR PRELU:		SHUBBER TYPE:	LOAD VARIABLE
	SHUBBER SPRINGS:		SI'UR DAMP RATE:	UNKNOWN
	S./FR. INTERTIE:	NONE	GUTER GIB CLR:	0.625 IACH
-	THNER GIB CLR:		ROLLER BEARING!	TAAR 6.5X12 TAPER
	ADAPTR PAD TYPE:		PAD SHEAR COEFF:	N/A
	LONG ADPIR CLR:		LAT DAMPER TYPE:	NONE
-	LAT DAMPER HATE:			2 DOT LI 1 COT R
	AXL PARAL B-END:	3 DOT LE 3 DOT R	WHEEL CONTOUR:	FG 5.11 AAR WEAR
	WHEEL DIAMETER:	56.1675 INCHES		

## TEST: 030201TEM001

TEST COMDUCTED AT MEDIUM SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

ANTHAM PASSENGER TRAIN
20 MINUTES PRIOR TO YEST RUN
NORIHAL NEW CONDITIONS EXCEPT:
NUME

	TDOP TAPE NO.:	0038 5/29/75	SEGNCE. ON TAPE: TEST START TIME:	1 1130 HRS
-	TELPERATURE!	94 DEG-F	PRECIPITATION:	NONE
	HUNTOITY:	UNKNOWN	WIND DIRECTION:	FROM 310 DEG REL
	WIND VELOCITY:	16 MPH	RAIL SURF COND:	CLEAN AND DRY
	LI:E:	DAKLAND-CGCEN	DIRECTION:	RAILROAD EAST
	MILEPOST START:	42.50	HILEPOST END:	47.33
	ALI SPEED:	34 NPH	MAX SPEED:	60 MPH
7	RAIL TYPE:	Cwit	HAIL WEIGHT!	136 LB.7YD.
	RAIL LAID IN:	1964	CAR INITIALS:	SP
	CAR NUMBER:	666043	CAR TYPE:	60 FT. BGX CAR
	CAR ORIENTATION:		CAR CAPACITY:	174000 POUNDS
	CAR TARE WEIGHT:		LOADED HT A-END:	
	LOADED WT B-END:		TOTAL WT:	263600 POUNDS
7	CENTER GRAVITY!		TYPE OF LADING:	
	ALD - LD. TRUCK:	+17 FT. 0 IN.	TRUCK CENTERS:	46 FT. 3.000 IN.
	NO. OF LOCO'S:	1	TOTAL H.P.:	3600
-	NO. CARS FORE:	1	TOTAL TONS FORE:	
	NO. OF CARS AFT:	1	TOTAL TONS AFT:	23
	TRUCK TYPE:	BARBER SZC	WHEEL BASE:	5 FT. 10 IN.
	SPRNS GROUP CUT!	7 65	SPRIJG GROUP THE	7 D5
	SPH GROUP ININ:	0	STAT SPING COMP:	B-8.44:A-8.44 IN
	CHTR PLATE DIA:	16 INCHES	CNTR PLATE MATL:	
	CNTR PLATE LUB!	MOLYLUB	ENTR PLATE FRICE	
	SIDE BEAR A-EUD:	STUCKI DOUBLE	SIDE BEAR B-END:	
	SIDE BEAR CLEAR:	0.250 INCH	SIDE BEAR SUPPL:	NONE
_	SIDE BEAK PRELD!	O POUNDS	SHUBBER TYPE!	LOAD VARIABLE
	SHUBBER SPRINGS:	8 5-4321 8 8-433	SNUB DAHP RATE:	UNKNOWN
	S./FR. INTERTIE:	NO:1E	OUTER GIB CLR:	0.625 INCH
	TIMER GIE CLR!	0.250 INCH	ROLLER BEARING:	AAR 6.5X12 TAPER
	ADAPTR PAD TYPE:	HONE	PAD SHEAR COEFF:	N/A - / 2
	LONG AUPTR CLR:	3/32" TO 9/32"	LAT DAMPER TYPE:	NONE
	LAT DAMPER RATE!	N/A	AXL PARAL A-END:	2 DOT L: 1 DOT R
	AXL PARAL B-END: WHEEL DIAMETER:	3 DOT L: 3 DOT R 36.1875 INCHES	WHEEL CONTOUR:	FG 5.11 AAR W&AM

#### TEST: 030201TEH001

TEST CONDUCTED AT HIGH SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

THROUGH FREIGHT TRAIN
FIFTY MINUTES PRIOR TO TEST RUN
NOMINAL NEW CONDITIONS EXCEPT:
NOOF

TDOP TAPE NO.: 2089 SEGNCE. ON TAPE: TEST DATE: 5/30/75 TEST START TIME: 1100 HRS 90 DEG-F TEMPERATURE: PRECIPITATION: NONE HUMIDITY: UNKNOWN WIND DIRECTION: FROM 270 DEG REL WIND VELOCITY: 19 MPH RAIL SURF COND: CLEAN AND DRY OAKLAND-OGDEN DIRECTION: LINE: RAILROAD EAST MILEPOST START: 42.50 MILEPOST END: 47.33 MIN SPEED: 70 MPH MAX SPEED: 79 MPH RAIL WEIGHT: RAIL TYPE: CWR 136 LB./YD. CAR INITIALS: CAR TYPE: RAIL LAID IN: 1964 SP CAR NUMBER: 668043 60 FT. BOX CAR CAR CAPACITY: B-END FORWARD CAR ORIENTATION: 174000 POUNDS CAR TARE WEIGHT: 85760 POUNDS LOADED WT A-END: 131260 POUNDS 132340 POUNDS TOTAL WT: LOADED WT B-END: 263600 POUNDS TYPE OF LADING: CENTER GRAVITY: 85.00 INCHES BRAKE SHOES TRUCK CENTERS: ALD - LD. TRUCK: +17 FT. 0 IN. 46 FT. 3.000 IN. NO. OF LOCO'S: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: 3000 NO. CARS FORE: 61 NO. OF CARS AFT: 23 BARBER S2C TRUCK TYPE: 5 FT. 10 IN. SPRNG GROUP OUT: SPRNG GROUP IN: 7 D5 7 D5 SPR GROUP ININ: STAT SPNG COMP: B-8.441A-8.44 CNTR PLATE DIA: 16 INCHES CNTR PLATE MATL: STEEL CNTR PLATE FRICE CNTR PLATE LUB: UNKNOWN MOLYLUB SIDE BEAR A-END: SIDE BEAR CLEAR: SIDE BEAR PRELD: STUCKI DOUBLE SIDE BEAR B-END: SIDE BEAR SUPPL: STUCKI DOUBLE 0.250 INCH NONE LOAD VARIABLE SNUBBER TYPE: O POUNDS SNUBBER SPRINGS: 8 B-432; 8 B-433 SNUB DAMP RATE: UNKNOWN S. /FR. INTERTIE: NONE OUTER GIB CLR: 0.625 INCH AAR 6.5X12 TAPER 0.250 INCH INNER GIB CLR: ROLLER BEARING: ADAPTR PAD TYPE: NONE PAD SHEAR COEFF: N/A NONE LONG ADPTR CLR: LAT DAMPER TYPE: 3/32" TO 9/32" 2 DOT L: 1 DOT R LAT DAMPER RATE: AXL PARAL A-END: N/A FG 5.11 AAR W&AM AXL PARAL B-END: 3 DOT L: 3 DOT R WHEEL CONTOUR: WHEEL DIAMETER: 36.1875 INCHES

C

#### TEST: 030202TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

AMTRAK PASSENGER TRAIN
2 HRS AND 25 MIN PRIOR TO TEST RUN
NOMINAL NEW CONDITIONS EXCEPT:
NOOF

TDOP TAPE NO.: 0082 TEST DATE: 5/22/75 78 DEG-E TEMPERATURE: HUMIDITY: UNKNOWN WIND VELOCITY: 14 MPH OAKLAND-OGDEN LINE: MILEPOST START: 48.479 MIN SPEED: 30 MPH RAIL TYPE: RAIL LAID IN: JOINTED 1941 TO 1955 CAR NUMBER: 668043 CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: 85760 POUNDS EMPTY WT B-END: 43420 POUNDS CENTER GRAVITY: 62.00 INCHES ALD - LD. TRUCK: +17 FT. 0 IN. NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: BARBER S2C SPRNG GROUP OUT: 7 D5 SPR GROUP ININ: 0 CNTR PLATE DIA: 16 INCHES CNTR PLATE LUB: MOLYLUB SIDE BEAR A-END: STUCKI DOUBLE SIDE BEAR CLEAR: 0.250 INCH SIDE BEAR PRELD: 0 POUNDS SNUBBER SPRINGS: 8 B-432; 8 B-433 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT L: 3 DOT R WHEEL DIAMETER: 36.1875 INCHES

SEONCE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPEED: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: EMPTY WT A-END: TOTAL WT: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRICE SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: WHEEL CONTOUR:

1610 HRS NONE FROM 70 DEG REL CLEAN AND DRY RAILROAD WEST 40.70 79 MPH 132 LB./YD. SP 60 FT. BOX CAR 174000 POUNDS 42340 POUNDS 85760 POUNDS NONE 46 FT. 3.000 IN. 3000 61 23 5 FT. 10 IN. 7 D5 B-9.8441A-9.844 STEEL UNKNOWN STUCKI DOUBLE NONE LOAD VARIABLE UNKNOWN 0.625 INCH AAR 6.5X12 TAPER N/A NONE 2 DOT L: 1 DOT R FG 5.11 AAR W&AM

## TEST: SBORDETERSS1

TEST CONDUCTED AT MEDIUM SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO LOAD

PREVIOUS TRAFFIC OVER TEST TRACK:

THROUGH FREIGHT TRAIN
25 MINUTES PATOR TO TEST RUN

NOMINAL NEL CONDUITIONS EXCEPT:

NOME

TOOP TAPE HO.:	0030	SEGNCE. ON TAPE: TEST START TIME:	
TENPERATURE:	76 DE6-F	PRECIPITATION:	
HU:IDITY:	UNKNOWII	WIND DIRECTION:	FROM 250 DEG REL
WIND VELOCITY:		RAIL SURF COND:	
LINE	OAKLAHD-OGDEN	DIRECTION:	RAILROAD EAST
MILEPOST START:		HILEPOST END:	
AIN SPEED:		MAX SPEED:	
RAIL TYPE:		RAIL WEIGHT!	
RAIL LAID INS		CAR INITIALS:	
	668045	CAR TYPE:	
	B-END FORWARD		174000 POUNDS
		EPPTY WT A-END:	
	43420 POUNUS	TOTAL WT:	
CE.TER GRAVITY:	-62.00 THCHES	TYPE OF LADING:	NCNE
ALD - LD. TRUCK:		TRUCK CENTERS:	46 FT. 3.000 IN.
ilo. OF LOCO'S:	1	TOTAL H.P.:	3000
NO. CARS FORE!	7	TOTAL TONS FORE:	
NO. OF CARS AFT:		TOTAL TOMS AFT:	
TRUCK TYPE:	BARBER S2C	WHEEL BASE:	
SPRNG GROUP OUT!		SPRING GROUP IN:	
SPA GROUP ININ:		STAT SPIJE COMP:	
CHTR PLATE DIA:		CNTR PLATE MATL:	
CHTR PLATE LUB:	HOLYLUR	CNTR PLATE FRICE	D.IKNORH
	STUCKI DOUBLE	SIDE BEAR B-END:	
SIDE BEAR CLEAR:		SIDE BEAR SUPPL:	NONE
SIDE BEAR PRELD:		SNUBBER TYPE:	LOAD VARIABLE
SHUBBER SPRINGS:			
S./FR. INTERTIE:		OUTER GIB CLR:	
INNER GIB CLR:			AAR 6.5X12 TAPER
ACAPTR PAD TYPE:		PAD SHEAR COEFF:	N/A
LONG AUPTR CLR:		LAT DAMPER TYPE:	NONE
LAT DAMPER RATE!		AXL PARAL A-END:	2 DOT LI TOOT R
	3 DOT L: 3 DOT R	WHEEL CONTOUR:	
WHEEL DIAMETER:			

## TEST: 030202TEH001

TEST CONDUCTED AT HIGH SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

THREE CAR TEST TRAIN
THIRTY RINUTES PRIOR TO TEST RUN
NORMAL NEW CONDITIONS EXCEPT:
NOME
CHANNEL 23 HAD A NEGATIVE ZERO SHIFT

	TOOP TAPE NO.:	0081	SEQUE. ON TAPE:	1
	TEST DATE:	5/22/75	TEST START TIME:	1415 HRS
	TEMPERATURE:	78 DEG-F	TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPEED: RAIL WEIGHT: CAR INITIALS:	BHON
	HUMIDITY:	UNKNOWN	WIND DIRECTION:	FROM 250 DEG REL
	WIND VELOCITY:	12 MPH	RAIL SURF COND:	CLEAN AND DRY
	LINE:	OAKLAND-OGDEN	DIRECTION:	RAILROAD EAST
	MILEPOST START:	42.50	MILEPOST END:	47.33
	MILEPOST START:	70 MPH	MAX SPEED:	79 MPH
	RAIL TYPE:	CWR	RAIL WEIGHT:	136 LB./YD.
	RAIL LAID IN:	1964	CAR INITIALS:	SP
	RAIL LAID IN: CAR NUMBER:	668043	CAR TYPE:	60 FT. BOX CAR
	CAR ORIENTATION:	B-END FORWARD	CAR INITIALS: CAR TYPE: CAR CAPACITY:	174000 POUNDS
		85760 POUNDS	EMPTY WT A-END:	42340 POUNDS
	EMPTY WT B-END:	43420 POUNDS	TOTAL WT:	
	CENTER GRAVITY:	43420 POUNDS 62.00 INCHES	TYPE OF LADING:	NONE
	ALD - LD. TRUCK:		TRUCK CENTERS:	
	NO. OF LOCO'S:		TOTAL H.P.:	3000
	NO. CARS FORE:		TOTAL TONS FORE:	-61
	NO. OF CARS AFT:		TOTAL TONS AFT:	
	TRUCK TYPE:		WHEEL BASE:	
	SPRNG GROUP OUT:		SPRNG GROUP IN:	
	SPR GROUP ININ:		STAT SPNG COMP:	
	CNTR PLATE DIA:	16 THEUES	CNTR PLATE MATL:	
	CNTR PLATE LUB:	TO THELES	CNTR PLATE FRIC:	THE WHOLEN
	SIDE-BEAR A-END:	HOLTEOB	SIDE BEAR B-END:	
	SIDE BEAR A-END:	STUCKT DOUBLE	SIDE BEAR SUPPL:	
	SIDE BEAR CLEAR:	0.250 INCH		
	SIDE BEAR PRELD: SNUBBER SPRINGS:	0 POUNDS	SNUBBER TYPE:	
			SNUB DAMP RATE:	
	S./FR. INTERTIE:		OUTER GIB CLR:	0.625 INCH
	INNER GIB. CLR:			AAR 6.5X12 TAPER
	ADAPTR PAD TYPE:		PAD SHEAR COEFF:	
	LONG ADPTR CLR:	3/32" TO 9/32"	LAT DAMPER TYPE:	
	LAT DAMPER RATE:			2 DOT LI 1 DOT R
	AXL PARAL B-END:		WHEEL CONTOUR:	FG 5.11 AAR WEAM
1	WHEEL DIAMETER:	36.1875 INCHES		

## TEST: 030301TWA001

TEST CUMOUCTED AT MEDIUM: AND HIGH SPEED USING BARBER S2C
70 TON CAPACITY TRUCK UNDER A SEVENTY TON BOX CAR WITH
FULL GROSS RAIL LOAD
PREVICUS TRAFFIC OVER TEST TRACK;
ANTRAK PASSENGER TRAIN
S HIN PRIOR TO TEST RUN
NOMINAL ME. CONDITIONS EXCEPT:
EXCEPT S2C TRUCKS

	TOOP TAPE NO.:	0103	SEGICE. ON TAPE:	
	TEST DATE:		TEST START TIME:	
-	TE PERATURE:	54 DEG-F	PRECIPITATION:	
	HUMIDITY:	UtikNOWH	WIND DIRECTION:	FROM 70 DEG REL
	"IND VELOCITY:	15 MPH	RAIL SURF COND:	
-	LI:E:	OAKLAND-OGDEN	DIRECTION:	RAILROAD WEST
	MILEPOST START:	48.48	MILEPOST END:	40.70
	HI'I SPEED:	30 HPH	FAX SPEED:	79 HPH
-	RAIL TYPE:		RAIL WEIGHT:	132 LB.7YU.
	RAIL LAID IN:	1941 TO 1955	CAR INITIALS:	SCL
	CAR NUMBER:	23045		70 TON BOX CAR
	CAR CRIENTATIONS	B-EIJG FORWARD	CAR CAPACITY:	154000 POUNDS
	CAR TAKE WEIGHT:	61840 POUNDS	LOADED WT A-END:	110614 POUNDS
	LOADED WT B-END:	109420 POUNTS		220034 POUNDS
-	CENTER GRAVITY:		TYPE OF LADING:	
	ALC - LO. TRUCK:	+13 FT. 0 IN.	TRUCK CENTERS:	40 FT. 10.00 IN.
	NO. OF LOCO'S:	1	TOTAL H.P.:	
-	NO. CARS FORE:	1	TOTAL TONS FORE:	61
	NO. OF CARS AFT:	1	TOTAL TOUS AFT:	25
	TRUCK TYPE:	BARBER S2C	WHEEL BASE:	5 FT. B IN.
-	SPANG GROUP OUT:	7 D5	SPENG GROUP IN:	4 D5
	SPR GROUP ININ:	0	STAT SPNG COMP:	B-8.25:A-8.29 In
	CATE PLATE DIA:		CNTR PLATE MATL:	STEEL
	CHTR PLATE LOB!		CNTR PLATE FRIC:	
	SIDE BEAR A-END:	STUCKI SINGLE	SIDE BEAR B-END:	
	SIDE BEAR CLEAR:		SIDE BEAR SUPPL:	
	SILE BEAR PRELD:	0 POUNDS	SNUBBER TYPE:	LOAD VARIABLE
	SHUBBER SPRINGS:	8 B-432	SHUB DAMP RATE:	UNKNOWN
	S. /FK. INTERTIE:	NONE	DUTER GIB CLR:	0.625 INCH
	INNER GIB CLR:		ROLLER BEAKING:	AAR 6X11 TAPERED
	ADAPTR PAD TYPE:	HOUE	PAD SHEAR COEFF:	N/A
	LONG ADPTR CLR:	3/32" TO 9/32"	LAT DAMPER TYPE:	NONE
-	LAT DAMPER RATE:		AXL PARAL A-END:	3 DOT L: 4 DOT R
	AXL PARAL B-END:	2 DOT LI 3 DOT R	WHEEL CONTOUR:	FG 5.11 AAR WEAM
	WHEEL DIAMETER:			

## TEST: 030301TEM001

TEST CONDUCTED AT MEDIUM SPEED USING BARBER S2C TO TON CAPACITY TRUCK UNDER A SEVENTY TON BOX CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK: THROUGH FREIGHT TRAIN 25 MIN PRIOR TO TEST RUN NOMINAL NEW CONDITIONS EXCEPT: "NOME

	TOOP TAPE NO.:	0103	SEQUEE. ON TAPE:	1
		6/19/75	TEST START TIME:	0955 HRS
	EMPERATURE:	59 DZG F	PRECIPITATION:	NONE
	HUMIDITY:	UNKNOWN	WIND DIRECTION:	FROM 210 DEG REL
	IND VELOCITY:	15 MPH	RAIL SURF COND:	CLEAM AND DRY
	INE:	OAKLAND-OGDEN	DIRECTION:	RAILROAD EAST
	TILEPOST START:	42.50	MILEPOST END:	47.33
	IN SPEED:	30 MPH	MAX SPEED:	60 MPH
	RAIL TYPE:	CWR	RAIL WEIGHT:	136 LB./YD.
F	RAIL LAID IN:	1964	CAR INITIALS:	SCL
	AR NUMBER:	23045	CAR TYPE:	70 TON BOX CAR
	AR ORIENTATION:	B-END FORWARD	CAR CAPACITY:	154000 POUNDS
	AR TARE WEIGHT:	61848 POUNDS	LOADED WT A-END:	110614 POUNDS
L	OADED WT B-END:	109420 POUNDS	TOTAL WT.:	220034 POUNDS
	ENTER GRAVITY:		TYPE OF LADING:	
	LD - LD. TRUCK:		TRUCK CENTERS:	40 FT. 10.00 IN.
1	O. OF LOCO'S:	1	TOTAL H.P.:	3000
	O. CARS FORE:	1	TOTAL TONS FORE:	
	O. OF CARS AFT:	1	TOTAL TONS AFT:	23
	RUCK TYPE:	BARBER S2C	WHEEL BASE:	5 FT. 8 IN.
	PRNG GROUP OUT:	7 D5	SPRNG GROUP IN:	
	PR GROUP ININ:	0	STAT SPNG COMP:	
	NTR PLATE DIA:		CNTR PLATE MATL:	STEEL
	NTR PLATE LUB:		CNTR PLATE FRICE	
	IDE BEAR A-END:		SIDE BEAR B-END:	STUCKI DOUBLE
	IDE BEAR CLEAR:		SIDE BEAR SUPPL:	NONE
	IDE BEAR PRELD:		SNUBBER TYPE:	LOAD VARIABLE
	HUBBER SPRINGS:	8 B-432	SNUB DAMP RATE:	UNKNOWN AKTABLE
	./FR. INTERTIE:	NONE		
			OUTER GIB CLR:	0.625 INCH
	NNER GIB CLR:	0.250 INCH	ROLLER BEARING:	AAR 6X11 TAPERED
	DAPTR PAD TYPE:		PAD SHEAR COEFF:	N/A
	ONG ADPTR CLR:		LAT DAMPER TYPE:	NONE
	AT DAMPER RATES		AXL PARAL A-END:	
	XL PARAL B-END:		WHEEL CONTOUR:	FG 5.11 AAR W&AM
	HEEL DIAMETER:	33.4375 INCHES		

FULL GROSS RAIL LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THREE CAR TEST TRAIN
20 MINUTES PRIOR TO TEST RUN

NOMINAL NEW CONDITIONS EXCEPT:

NONE CHANNEL 7 INOPERATIVE

TOOP TAPE NO.: 0103 SEQUCE. ON TAPE: TEST DATE: 6/19/75 TEST START TIME: 1030 HRS TEMPERATURE: 56 DEG F PRECIPITATION: NONE HUMIDITY: UNKNOWN WIND DIRECTION: FROM 210 DEG REL WIND VELOCITY: 15 MPH RAIL SURF COND: CLEAN AND DRY OAKLAND-OGDEN DIRECTION: LINE: RAILROAD EAST MILEPOST START: 42.50 MILEPOST END: 47.33 MIN SPEED: 70 MPH MAX SPEED: 79 KPH RAIL WEIGHT: RAIL TYPE: CWR 136 LB./YD. RAIL LAID IN: 1964 CAR INITIALS: SCL CAR NUMBER: CAR TYPE: 23045 70 TON BOX CAR CAR CAPACITY: CAR ORIENTATION: B-END FORWARD 154000 POUNDS CAR TARE WEIGHT: 61840 POUNDS LOADED WT A-END: 110614 POUNDS LOADED WT B-END: 109420 POUNDS TOTAL WT.: 220034 POUNDS CENTER GRAVITY: 82.80 INCHES TYPE OF LADING: BRAKE SHOES TRUCK CENTERS: ALD - LD. TRUCK: +13 FT. 0 IN. 40 FT. 10.00 IN. NO. OF LOCO'S: TOTAL H.P.: 3000 NO. CARS FORE: TOTAL TONS FORE: 61 TOTAL TONS AFT: NO. OF CARS AFT: 23 WHEEL BASE: 5 FT. 8 IN. TRUCK TYPE: BARBER S2C SPRNG GROUP OUT: SPRNG GROUP IN: 7 D5 4 05 SPR GROUP ININ: STAT SPNG COMP: B-8.251A-8.29 IN CNTR PLATE MATL: CNTR PLATE FRIC: CNTR PLATE DIA: CNTR PLATE LUB: STEEL 14 INCHES UNKNOWN MOLYLUB SIDE BEAR A-END: STUCKI SINGLE SIDE BEAR B-END: STUCKI DOUBLE SIDE BEAR CLEAR: 0.250 INCH SIDE BEAR SUPPL: NONE 0 POUNDS SNUBBER TYPE: LOAD VARIABLE SIDE BEAR PRELD: SHUBBER SPRINGS: 8 B-432 SNUB DAMP RATE: UNKNOWN S./FR. INTERTIE: INNER GIB CLR: OUTER GIB CLR: NONE 0.625 INCH 0.250 INCH ROLLER BEARING: AAR 6X11 TAPERED PAD SHEAR COEFF: ADAPTR PAD TYPE: NONE N/A LAT DAMPER TYPE: 3/32" TO 9/32" LONG ADPTR CLR: NONE AXL PARAL A-END: 3 DOT L: 4 DOT R LAT DAMPER RATE: N/A AXL PARAL B-END: WHEEL CONTOUR: FG 5.11 AAR W&AM 2 DOT L: 3 DOT R WHEEL DIAMETER: 33.4375 INCHES

C-8

#### TEST: 030302TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING BARBER S2C 70 TON CAPACITY TRUCK UNDER A SEVENTY TON BOX CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK: AMTRAK PASSENGER TRAIN
35 MINUTES PRIOR TO TEST RUN NOMINAL NEW CONDITIONS EXCEPT: NONE

TDOP TAPE NO .: 0092 TEST DATE: 6/11/75 72 DEG-F TEMPERATURE: HUMIDITY: UNKNOWN WIND VELOCITY: 26 MPH OAKLAND-OGDEN LINE: MILEPOST START: 48.48 MIN SPEED: .30 MPH JOINTED RAIL TYPE: RAIL LAID IN: 1941 TO 1955 CAR NUMBER: 23045 CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: 61840 POUNDS EMPTY WT B-END: 31000 POUNDS 54.87 INCHES CENTER GRAVITY: ALD - LD. TRUCK: +13 FT. 0 IN. NO. OF LOCO'S: NO. CARS FORE: 1 NO. OF CARS AFT: TRUCK TYPE: BARBER S2C SPRNG GROUP OUT: 7 05 SPR GROUP ININ: 0 14 INCHES CNTR PLATE DIA: CNTR PLATE LUB: MOLYLUB SIDE BEAR A-END: STUCKI SINGLE SIDE BEAR CLEAR: 0.250 INCH SIDE BEAR PRELD: 0 POUNDS SNUBBER SPRINGS: 8 8-432 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 2 DOT L: 3 DOT R 33.4375 INCHES WHEEL DIAMETER:

SEQUCE. ON TAPE: TEST START TIME: 1350 HRS PRECIPITATION: WIND DIRECTION: RAIL SURF COND: CLEAN AND DRY DIRECTION: MILEPOST END: MAX SPEED: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: EMPTY WT A-END: TOTAL WT .: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: NONE WHEEL CONTOUR:

NONE FROM 45 DEG REL RAILROAD WEST 40.70 79 MPH 132 LB./YD. SCL 70 TON BOX CAR 154000 POUNDS 30840 61840 POUNDS NONE 40 FT. 10.00 IN. 3000 61 23 5 FT. 8 IN. 4 D5 B-9.91 1A-9.95 IN STEEL UNKNOWN STUCKI DOUBLE NONE LOAD VARIABLE UNKNOWN 0.625 INCH AAR 6X11 TAPERED N/A AXL PARAL A-END: 3 DOT L: 4 DOT R FG 5.11 AAR W&AM

## TEST: 030302TEH001

TEST CONDUCTED AT HIGH SPEED USING BARBER S2C 70 TON CAPACITY TRUCK UNDER A SEVENTY TON BOX CAR WITH

PREVIOUS TRAFFIC OVER TEST TRACK:

0.250 INCH

0.250 INCH

3/32" TO 9/32"

33.4375 INCHES

2 DOT LI 3 DOT R

0 POUNDS

8 8-432

NONE

NONE

N/A

NO LOAD

SIDE-BEAR CLEAR:

SIDE BEAR PRELD:

S./FR. INTERTIE: INNER GIB CLR:

ADAPTR PAD TYPE:

LAT DAMPER RATE:

AXL PARAL B-END: WHEEL DIAMETER:

LONG ADPTR CLR:

SNUBBER SPRINGS:

		FFIC OVER TEST TRACK: AR TEST TRAIN	· /	
		TES PRIOR TO TEST RUN CONDITIONS EXCEPT:		<u></u>
	<u> </u>			•-
	*	•	1	
	•			
		<del> </del>	<del></del>	······································
	_	_		
٠	TOOP TARE NO .	4000	SEQUES ON TAREA	
	TDOP TAPE NO.: Test date:	0092 6/11/75	SEGNCE. ON TAPE: TEST START TIME:	
.,	TEMPERATURE:	76 DEG-F	PRECIPITATION:	NONE
	HUMIDITY:	UNKNOWN	WIND DIRECTION:	
	WIND VELOCITY:	28 MPH	RAIL SURF COND:	CLEAN AND DRY
•	LINE	OAKLAND-OGDEN	DIRECTION:	RAILROAD EAST
	MILEPOST START:	42.50	MILEPOST END:	47.33
	MIN SPEED:	70 MPH	MAX SPEED:	79 MPH
2	RAIL TYPE:	CWR	RAIL WEIGHT:	136 LB./YD.
6.	RAIL LAID IN:	1964	CAR INITIALS:	SCL
	CAR NUMBER:	23045	CAR TYPE:	70 TON BOX CAR
	CAR ORIENTATIONS		CAR CAPACITY:	154000 POUNDS
	CAR TARE WEIGHT:	61840 POUNDS	EMPTY WT A-END:	30840 POUNDS
	EMPTY WT B-END:	31000 POUNDS	TOTAL WT.:	61840 POUNDS
	CENTER GRAVITY:	54.87 INCHES	TYPE OF LADING:	NONE -
	ALD - LD. TRUCK:	+13 FT. 0 IN.	TRUCK CENTERS:	40 FT. 10.00 IN.
	NO. OF LOCO'S:	1	TOTAL H.P.:	3000
	NO. CARS FORE:	1	TOTAL TONS FORE:	61
	NO. OF CARS AFT:	- <b>1</b>	TOTAL TONS AFT:	23
	TRUCK TYPE:	BARBER S2C	WHEEL BASE:	5 FT. 8 IN. "
	SPRNG GROUP OUT:	7 D5	SPRNG GROUP IN:	4 05
	SPR GROUP ININ:	0 .	STAT SPNG COMP:	B-9.911A-9.95 II
	CNTR PLATE DIA:	14 INCHES	CNTR PLATE MATL:	STEEL
	CNTR PLATE LUB:	MOLYLUB	CNTR PLATE FRICE	UNKNOWN
	SIDE BEAR A-END:	STUCKI SINGLE	· SIDE BEAR B-END:	STUCKI DOUBLE

SIDE BEAR SUPPLE

SNUBBER TYPE:

SNUB DAMP RATE:

ROLLER BEARING:

PAD SHEAR COEFF:

LAT DAMPER TYPE:

AXL PARAL A-END:

WHEEL CONTOUR:

OUTER GIB CLR:

NONE

N/A

NONE

UNKNOWN

LOAD VARIABLE

AAR 6X11 TAPERED

3 DOT LI 4 DOT R

FG 5.11 AAR WAAM

0.625 INCH

#### TEST: 030302TEM001

TEST CONDUCTED AT MEDIUM SPEED USING BARBER S2C 70 TON CAPACITY TRUCK UNDER A SEVENTY TON BOX CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK: THROUGH FREIGHT TRAIN 45 MINUTES PRIOR TO TEST RUN' NOMINAL NEW CONDITIONS EXCEPT: NONE CHANNELS 3 AND 7 INOPERATIVE DURING TEST RUN TDOP TAPE NO.: TEST DATE: "SEQUCE. ON TAPE: TEST START TIME: 0092 6/11/75 1600 HRS TEMPERATURE: 74 DEG-F PRECIPITATION: NONE UNKNOWN WIND DIRECTION: FROM 220 DEG REL HUMIDITY: RAIL SURF COND: WIND VELOCITY: CLEAN AND DRY 24 -MPH LINE: OAKLAND-OGDEN DIRECTION: RAILROAD EAST MILEPOST START: MILEPOST END: 42.50 47.33 MIN SPEED: 30 MPH MAX SPEED: 60 MPH RAIL TYPE: RAIL WEIGHT: CWR 136 LB./YD. RAIL LAID IN: 1964 CAR INITIALS: SCL 70 TON BOX CAR CAR NUMBER: 23045 - CAR TYPE: CAR ORIENTATION: CAR CAPACITY: 154000 POUNDS B-END FORWARD 61840 EMPTY WT A-END: TOTAL WT.: CAR TARE WEIGHT: POUNDS 30840 POUNDS EMPTY WT. B-END: POUNDS 31000 61840 \ POUNDS TYPE OF LADING: CENTER GRAVITY: 54.87 INCHES NONE ALD - LD. TRUCK: TRUCK CENTERS: 40 FT. 10.00 IN. +13 FT. 0 IN. NO. OF LOCO'S: TOTAL H.P.: 1 3000 TOTAL TONS FORE: 61 TOTAL TONS AFT: 23 NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: BARBER S2C WHEEL BASE: SPRNG GROUP IN: 5 FT. 8 IN. 7 D5 4 D5 STAT SPNG COMP: SPR GROUP ININ: n B-9.91 A-9.95 IN CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: CNTR PLATE DIA: 14 INCHES ~STEEL CNTR PLATE LUB: MOLYLUB' UNKNOWN STUCKI SINGLE SIDE BEAR A-END: SIDE BEAR CLEAR: STUCKI DOUBLE 0.250 INCH NONE SIDE BEAR PRELD: O POUNDS SNUBBER TYPE: LOAD VARIABLE SNUBBER SPRINGS: 8 B-432 · SNUB DAMP RATE: UNKNOWN OUTER GIB CLR: S./FR. INTERTIE: NONE 0.625 INCH INNER GIB CLR: 0.250 INCH ROLLER BEARING: AAR 6X11 TAPERED ADAPTR PAD TYPE: NONE PAD SHEAR COEFF: N/A LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER TYPE: NONE

AXL PARAL A-END:

WHEEL CONTOUR:

3 DOT L: 4 DOT R

FG 5.11 AAR W&AM

LAT DAMPER RATE:

AXL PARAL B-END:

WHEEL DIAMETER:

N/A

2 DOT LI 3 DOT R

33.4375 INCHES

#### TEST: 030401TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING ASF RIDE CONTROL

100 TON CAPACITY TRUCK UNDER A COVERED HOPPER CAR WITH

FULL GROSS RAIL LOAD

PREVIOUS THAFFIC OVER TEST TRACK:

THREE CAR TEST TRAIN

55 HIVITES PRIOR TO TEST RUN

NOMINAL NEW CONDITIONS EXCEPT:

HONE

TDOP TAPE NO.: TEST DATE:	0113	SEGNCE. ON TAPE: TEST START TIME:	1 1315 HRS
TEMPERATURE:	70 DEG-F	PRECIPITATION:	NONE
HUMIDITY:	UNKNOWII	WIND DIRECTION:	FROM 45 DEG REL
WIND VELOCITY:	17 MPH	RAIL SURF COND:	CLEAN AND DRY
LINE:	OAKLAND-OGDEN	DIRECTION:	RAILROAD WEST
MILEPOST START:	43.48	MILEPOST END:	40.70
MIN SPEED:	30 APH	MAX SPEED:	79 MPH
RAIL TYPE:	JOINTED	RAIL WEIGHT:	132 LB./YD.
RAIL LAID IN:	1941 TO 1955	CAR INITIALS:	L&N
CAR NUMBER:	200267	CAR TYPE:	COVERED HOPPER
CAR ORIENTATION:	B-END FORKARD	CAR CAPACITY:	
CAR TARE WEIGHT:	70000 POUNDS	LOADED WT A-ENC:	
LOADED WT B-END:	135440 POUNDS	TOTAL WT.:	260440 PGUNDS
CENTER GRAVITY:	95.00 INCHES	TYPE OF LADING:	SAND
ALD - LD. TRUCK:	+12 FT. 6 IN.	TRUCK CENTERS:	41 FT. 3.25 IN.
NO. OF LOCO'S:	1	TOTAL H.P.:	3000
NO. CARS FORE:	1	TOTAL TONS FORE:	61
NO. OF CARS AFT:	1	TOTAL TONS AFT:	23
THUCK TYPE:	ASF RIDE CONT.	WHEEL BASE:	5 FT. 10 IN.
SPRNG GROUP OUT:	8 05	SPRNG GROUP IN:	
SPR GROUP ININ:	0	STAT SPING COMP:	B-8.06:A-8.16 IN
CNTR PLATE DIA:	15 INCHES	CNTR PLATE MATL:	STEEL
CNIR PLATE LUB:	MOLYLUS	CNTR PLATE FRIC:	
SIDE BEAR A-END:	STUCKI DOUBLE	SIDE BEAR B-END:	STUCKI DOUBLE
SIDE BEAR CLEAR:	0.250 INCH	SIDE BEAR SUPPL:	NONE
SIDE BEAR PRELD:	9 POUITOS	SNUBBER TYPE:	COUSTAINT (ASF)
SNUBBER SPRINGS:	8-309148-3092	SNUB DAMP RATE:	N:1KNOMV
S./FR. INTERTIE:	NONE	OUTER GIB CLR:	0.625 INCH
INJER GIB CLR:	0.250 INCH	ROLLER BEARING:	AAR 6.5X12 TAPER
ADAPTR PAD TYPE:	HONE	PAD SHEAR COEFF:	N/A
LONG ADPTR CLR:	3/32" TO 9/32"	LAT DAMPER TYPE:	NONE
LAT DAMPER RATE:	N/A	AXL PARAL A-END:	5 DOT LI 5 DOT R
AXL PARAL 8-END:	4 DOT L: 4 DOT R 36.1875 INCHES	WHEEL CONTOUR:	FG 5.11 AAR W&AM

## TEST: 030401TEM001

TEST CONDUCTED AT MEDIUM SPEED USING ASF RIDE CONTROL
100 TON CAPACITY TRUCK UNDER A COVERED HOPPER CAR WITH
FULL GROSS RAIL LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THROUGH FREIGHT TRAIN
45 MINUTES PRIOR TO TEST RUN
NOMINAL NEW CONDITIONS EXCEPT:
NONE

TOOP TAPE NO.:		SEQUE. ON TAPE:	
TEST DATE:	7/2/75	TEST START TIME:	
TEMPERATURE!		PRECIPITATION:	
HUMIDITY:	UNKNOWN	WIND DIRECTION:	
WIND VELOCITY:		RAIL SURF COND:	CLEAN AND DRY
LINE:	OAKLAND-OGDEN	DIRECTION:	RAILROAD EAST
MILEPOST START:	42.50	MILEPOST END:	
MIN SPEED:	30 MPH	MAX SPEED:	
RAIL TYPE:	CWR	RAIL WEIGHT:	136 LB./YD.
RAIL LAID IN:	1964	CAR INITIALS:	Lan
CAR NUMBER:	200267		COVERED HOPPER
- CAR ORIENTATION:	B-END FORWARD	CAR CAPACITY:	
CAR TARE WEIGHT:	70000 POUNDS	LOADED WT A-END:	127000 POUNDS
LOADED WT B-END:	133440 POUNDS	TOTAL WT.:	
CENTER GRAVITY:		TYPE OF LADING:	SAND
ALD - LD. TRUCK:		TRUCK CENTERS:	41 FT. 3.25 IN.
NO. OF LOCO'S:	1	TOTAL H.P.:	3000
NO. CARS FORE:	- <u>ī</u>	TOTAL TONS FORE:	61
NO. OF CARS AFT:		TOTAL TONS AFT:	23
TRUCK TYPE:	ASF RIDE CONT.	WHEEL BASE:	
SPRNG GROUP OUT:		SPRNG GROUP IN:	8 D5
SPR GROUP ININ:		STAT SPNG COMP:	B-8.06: A-8.16 IN
CNTR PLATE DIA:	15 INCHES	CNTR PLATE MATL:	
CNTR PLATE LUB:		CNTR PLATE FRIC:	
SIDE BEAR A-END:		SIDE BEAR B-END:	
SIDE BEAR CLEAR:		SIDE BEAR SUPPL:	
SIDE BEAR PRELD		SHUBBER TYPE:	
SNUBBER SPRINGS:		SNUB DAMP RATE:	
S./FR. INTERTIE:		OUTER GIB CLR:	
INNER GIB CLR:		ROLLER BEARING:	
ADAPTR PAD TYPE:		PAD SHEAR COEFF:	
		LAT DAMPER TYPE:	
LONG ADPTR CLR:			5 DOT LT 5 DOT R
LAT DAMPER RATE			
	4 DOT LI 4 DOT R	WHEEL CONTOUR:	FG 5.11 AAR WEAM
WHEEL DIAMETER:	36.1875 INCHES	The state of the s	

# C-11

## TEST: 030401TEH001

TEST CONDUCTED AT HIGH SPEED USING ASF RIDE CONTROL

100 TON CAPACITY TRUCK UNDER A COVERED HOPPER CAR WITH

FULL GROSS RAIL LOAD

PREVIOUS TRAFFIC OVER TEST TRACK;

THROUGH FREIGHT TRAIN

25 MIN PRIOR TO TEST RUN

NOMINAL NEW CONDITIONS EXCEPT;

NOME

	TOOP TAPE NO.:		SEONCE. ON TAPE:	
	TEST DATE:	7/2/15	TEST START TIME: PRECIPITATION:	THOUGHT 1
	TEMPERATURES	DUC-F UNKNOWN 18 MPH OAKLAND-OGDEN- 42,50 70 MPH CUR	PRECIPITATION:	NUNE
	HUMIDITY:	UNKNOWN	BIND DIRECTION:	FROM 200 DEG REL
	WIND VELOCITY:	18 MPH	RAIL SURF COND:	CLEAN AND DRY
	LINE:	OAKLAND-OGUEN	DIRECTIONS	RAILRUAU EAST
	MILEPUST STARTE	42.50	MILEPUSI END:	47.33
	MIN SPEED:	70 MPH	MAX SPEED:	/9 mpm
	RAIL TIPES	CWR	RAIL WEIGHT:	136 LB./TD.
	RAIL LAID IN:	1964	CAR INITIALS:	Lan
	CAR NUMBER:	200267	CAR TYPE:	COVERED HOPPER
	CAK OKIENIALION!	D-CNU FURNANU	CHK CHINCIII	130000 100100
	CAR TARE WEIGHT:	70000 POUNDS	LOADED WT A-END:	127800 POUNDS
	LOADED WT B-END:	133440 POUNDS	TOTAL WT.:	260440 POUNDS
	CENTER GRAVITY:		TYPE OF LADING:	
	ALD - LD. TRUCK:		TRUCK CENTERS:	
	NO. OF LOCO'S:		TOTAL H.P.:	
	NO. CARS FORE:		TOTAL TONS FORE:	
	NO. OF CARS AFT:		TOTAL TONS AFT:	
	TRUCK TYPE:		WHEEL BASE: SPRNG GROUP IN:	5 FT. 10 IN.
	SPRNG GROUP OUT:	8 05	"SPRNG GROUP'IN: '	8 D5
	SPR GROUP ININ:	0 .	STAT SPNG COMP:	
	CNTR PLATE DIA:	15 INCHES	CNTR PLATE MATL:	STEEL
-	CNTR PLATE LUB:	MOLYLUB	"CNTR PLATE FRIC:	
	SIDE BEAR A-END:	STUCKI DOUBLE	SIDE BEAR B-END:	STUCKI DOUBLE
	SIDE BEAR CLEAR:	0.250 INCH	SIDE BEAR SUPPL:	
	SIDE BEAR PRELD:		"SNUBBER TYPE: ""	"CONSTANT (ASF)
	SMUBBER SPRINGS:	8-309118-3092	SNUB DAMP RATE:	UNKNOWN
٠	S./FR. INTERTIE:		OUTER GIB CLR:	
-	INNER GIB CLR:		ROLLER BEARING:	
	ADAPTR PAD TYPE:		PAD SHEAR COEFF:	
	LONG ADPTR CLR:			
	LAT DAMPER RATE			"5 DOT L: 5 DOT"R
	AXL PARAL B-END:	4 DOT LI 4 DOT R		
	WHEEL DIAMETERS			

## TEST: 030402TEH001

TEST CONDUCTED AT HIGH SPEED USING ASF RIDE CONTROL

100 TON CAPACITY TRUCK UNDER A COVERED HOPPER CAR WITH

NO LOAD

PREVIOUS TRAFFIC OVER TEST TRACK:

THREE CAR TEST TRAIN

FIFTEEN MINUTES PRIOR TO TEST RÜN

NOMINAL NEW CONDITIONS EXCEPT:

NONE

	TOOP TAPE NO.:	0115	SEQUEE. ON TAPE:	2
	TEST DATE:	7/8/75	TEST START TIME:	0645
	TEMPERATURE: HUMIDITY: WIND VELOCITY:	64 DEG-F	PRECIPITATION: WIND DIRECTION: RAIL SURF COND:	NONE
	HUMIDITY:	UNKNONN	WIND DIRECTION:	FROM 270 DEG REL
	WIND VELOCITY:	17 MPH	RAIL SURF COND:	CLEAN AND DRY
	LINE:	OAKLAND-OGDEN	DIRECTION:	RAILROAD EAST
	MILEPOST START:	OAKLAND-OGDEN 42.50 70 MPH CWR	MILEPOST END: MAX SPEED:	47.33
	MIN SPEED:	70 MPH	MAX SPEED:	79 MPH
	RAIL TYPE:	CWR	RAIL WEIGHT:	136 LB./YD.
	CAR NUMBER:	200267 B-END FORWARD	CAR TYPE:	COVERED HOPPER
	CAR ORIENTATION:	B-END FORWARD	CAR CAPACITY:	"196000 POUNDS
	CAR TARE WEIGHT:	70000 POUNDS	EMPTY WT A-END:	34000 POUNDS
	EMPTY WT B-END:	36000 POUNDS	TOTAL WY.:	70000 POUNDS
	CENTER GRAVITY:	61.00 INCHES	TYPE OF LADING:	NONE
	ALD - LD. TRUCK:	+12 FT. 6 IN.	TRUCK CENTERS:	41 FT. 3.25 IN.
	NO. OF LOCO'S:	1		3000
	"NO. CARS FORE:	1	TOTAL TONS FORE:	61
	NO. OF CARS AFT:	1	TOTAL TONS AFT:	23
	TRUCK TYPE:	ASF RIDE CONT.	WHEEL BASE:	5 FT. 10 IN.
	SPRNG GROUP OUT:	8 D5	SPRNG GROUP IN:	8 D5
	SPR GROUP ININ:	0	STAT SPNG COMP:	9.69 INCHES
	CNTR PLATE DIA:	15 INCHES	CNTR PLATE MATL:	STEEL
	CNTR PLATE LUB:	MOLYLUB	ENTR PLATE FRICE	UNKNOWN
	SIDE BEAR A-END:	STUCKI DOUBLE	SIDE BEAR B-END:	STUCKI DOUBLE
	SIDE BEAR CLEAR:	0.25D INCH	SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE:	NONE
	SIDE BEAR PRELD:	O POUNDS	SNURBER TYPE:	CONSTANT (ASF)
	SNUBBER SPRINGS:	8-3091:8-3092	SNUB DAMP RATE:	UNKNOWN
	S./FR. INTERTIE:	NONE	OUTER GIB CLR:	0.625 INCH
	INNER GIB CLR:	0.250 INCH	ROLLER BEARING:	AAR 6.5X12 TAPER
	ADAPTR PAD TYPE:		PAD SHEAR COEFF:	
	LONG ADPTR CLR:		LAT DAMPER TYPE:	
_	LAT DAMPER RATE:	N/A	AXI PARAL A-END	5 DOT L'S DOT R
	AXL PARAL B-END:		WHEEL CONTOUR:	
,	WHEEL DIAMETER:			
			<del></del>	_ <del></del>

PREVIOUS TRAFFIC OVER TEST TRACK: THROUGH FREIGHT TRAIN THREE HOURS PRIOR TO TEST RUN

NOMINAL NEW CONDITIONS EXCEPT:

NONE

SEQUCE. ON TAPE: TDOP TAPE NO. : 0115 TEST DATE: 7/8/75 TEST START TIME: 0740 HRS PRECIPITATION: TEMPERATURE: 60 DEG-F NONE WIND DIRECTION: FROM 270 DEG REL :YTIGIMUH UNKNOWN RAIL SURF COND: DIRECTION: WIND VELOCITY: 15 MPH CLEAN AND DRY LINE: RAILROAD EAST OAKLAND-OGDEN MILEPOST START: MILEPOST END: 47.33 42.50 MIN SPEED: 30 MPH MAX SPEED: 60 MPH RAIL WEIGHT: RAIL TYPE: 136 LB./YD. CWR CAR INITIALS: LEN RAIL LAID IN: 1964 CAR NUMBER: 200267 CAR TYPE: COVERED HOPPER CAR CAPACITY: 196000 POUNDS CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: EMPTY WT A-END: 34000 POUNDS 70000 POUNDS EMPTY WT B-END: 70000 36000 POUNDS TOTAL WT.: POUNDS 61.00 INCHES TYPE OF LADING: CENTER GRAVITY: NONE TRUCK CENTERS: 41 FT. 3.25 IN. ALD - LD. TRUCK: +12 FT. 6 IN. NO. OF LOCO'S: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: 3000 NO. CARS FORE: 61 NO. OF CARS AFT: 23 5 FT. 10 IN. TRUCK TYPE: ASF RIDE CONT. WHEEL BASE: SPRNG GROUP OUT! SPRNG GROUP IN: 8 D5 8 D5 STAT SPNG COMP: 9.69 INCHES SPR GROUP ININ: CNTR PLATE MATL: STEEL CNTR PLATE DIA: 15 INCHES CNTR PLATE FRIC: UNKNOWN CNTR PLATE LUB: HOLYLUB SIDE BEAR B-END: SIDE BEAR A-END: STUCKI DOUBLE STUCKI DOUBLE SIDE BEAR CLEAR: SIDE BEAR SUPPL: 0.250 INCH NONE SIDE BEAR PRELDS SNUBBER TYPE: CONSTANT (ASF) 0 POUNDS SNUB DAMP RATE: SNUBBER SPRINGS: 8-3091:8-3092 UNKNOWN OUTER GIB CLR: 0.625 INCH S./FR. INTERTIE: NONE INNER GIB CLR: ROLLER BEARING: 0.250 INCH AAR 6.5X12 TAPER ADAPTR PAD TYPE: NONE PAD SHEAR COEFF: N/A LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER TYPE: NONE AXL PARAL A-END: 5 DOT LI 5 DOT R LAT DAMPER RATE: NIA WHEEL CONTOUR: FG 5.11 AAR WEAM AXL PARAL B-END: 4 DOT L: 4 DOT R WHEEL DIAMETER: 36.1875 INCHES

#### TEST: 030501TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING ASF LOW LEVEL
70 TON CAPACITY TRUCK UNDER A STAC PAC CAR WITH NO
LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THROUGH FREIGHT TRAIN
25 MINUTES PRIOR TO TEST RUN
NOMINAL NEW CONDITIONS EXCEPT:
NOOF

TDOP TAPE NO.: TEST DATE: 0094 6/12/75 TEMPERATURE: 72 DEG-F HUMIDITY: UNKNOWN WIND VELOCITY: 18 MPH LINE: OAKLAND-OGDEN MILEPOST START: 48.48 MIN SPEED: 30 MPH RAIL TYPE: JOINTED RAIL LAID IN: 1941 TO 1955 CAR NUMBER: 517332 CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: 56560 POUNDS EMPTY WT B-END: 28860 POUNDS CENTER GRAVITY: 23.63 INCHES ALD - LD. TRUCK: +20 FT. 7 IN. NO. OF LOCO'S: 1 NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: ASF LOW LEVEL SPRNG GROUP OUT: 5 D4 SPR GROUP ININ: 0 CNTR PLATE DIA: 14 INCHES CNTR PLATE LUB: MOLYLUB SIDE BEAR A-END: STUCKI SINGLE 0.250 INCH SIDE BEAR CLEAR: SIDE BEAR PRELD: 0 POUNDS SNUBBER SPRINGS: 8 OUTER : 8 INNER S./FR. INTERTIE: NONE 0.250 INCH INNER GIB CLR: ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 1 DOT L: 1 DOT R WHEEL DIAMETER: 28.1870 INCHES

SEQUE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPEED: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: EMPTY WT A-END: TOTAL WT .: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: WHEEL CONTOUR:

1225 HRS NONE FROM 75 DEG REL CLEAN AND DRY RAILROAD WEST 40.70 79 MPH 132 LB./YD. SP STAC PAC 122000 POUNDS 27700 POUNDS 56560 POUNDS NONE 64 FT. 0 IN. 3000 61 23 5 FT. 1 IN. 5 03 B-9.063:A-9.188 STEEL UNKNOWN STUCKI SINGLE NONE CONSTANT (ASF) UNKNOWN 0.625 INCH AAR 6X11 TAPERED N/A NONE 1 DOT L: 1 DOT R FG 5.11 AAR W&AM

#### TESŤ: 030501TEM001

TEST CONDUCTED AT MEDIUM SPEED USING ASF LOW LEVEL 70 TON CAPACITY TRUCK UNDER A STAC PAC CAR WITH NO LOAD

PREVIOUS TRAFFIC OVER TEST TRACK:

THROUGH FREIGHT TRAIN
45 MINUTES PRIOR TO TEST
NOMINAL NEW CONDITIONS EXCEPT:

NONE

TOOP TAPE NO.: SEGNCE. ON TAPE: TEST START TIME: 0095 6/12/75 1330 HRS TEMPERATURE 78 DEG-F PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: HUMIDITY UNKNOWN FROM 250 DEC REI WIND VELOCITY: 18 MPH CLEAN AND DRY RAILROAD EAST OAKLAND-DGDEN MILEPOST START: 42.50 30 MPH 47.33 MIN SPEED: RAIL TYPE: RAIL LAID IN: MAX SPEED: 60 MPH CUR RAIL WEIGHT 136 LB./YD. CAR INITIALS: CAR TYPE: 1964 SP CAR NUMBER: 517332 B-END FORWARD STAC PAC CAR ORIENTATION: CAR CAPACITY: 122000 POUNDS B-END FURNAND 56560 POUNDS 28860 POUNDS CAR TARE WEIGHT: EMPTY WT B-END: EMPTY WT A-END: TOTAL HT.: 27700 POUNDS 56560 POUNDS 23.63 INCHES TYPE OF LADING: TRUCK CENTERS: CENTER GRAVITY NONE ALD - LD. TRUCK: +20 FT. 7 IN. 64 FT. 0 IN. NO. OF LOCO'S! TOTAL H.P. : TOTAL TONS FORE: 3000 TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: NO. OF CARS AFT: 23 TRUCK TYPE: 5 FT. 1 IN. 5 D3 ASF LOW LEVEL SPRNG GROUP OUT:
SPR GROUP ININ:
CNTR PLATE DIA:
CNTR PLATE LUB:
SIDE BEAR A-END:
SIDE BEAR CLEAR:
SIDE BEAR PRELD: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: B-9.0631A-9.188 STEEL 14 INCHES MOLYLUB **UNKNOWN** STUCKI SINGLE STUCKI SINGLE SIDE BEAR B-END: SIDE BEAR SUPPL: 0.250 INCH NONE CONSTANT (ASF) D POUNDS SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: SNUBBER SPRINGS: & OUTERIA INNER UNKHOWN S./FR. INTERTIE: INNER GIB CLR: NONE 0.625 INCH 0.250 INCH ROLLER BEARING! AAR 6X11 TAPERED ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: NONE N/A NONE 1 DOT LE 1 DOT R 3/32" TO 9/32" N/A AXL PARAL B-END: 1 DOT LE 1. DOT R WHEEL CONTOUR: FG 5-11 AAR WEAK WHEEL DIAMETER: 28.1870 INCHES

## TEST: 030501TEH001

TEST CONDUCTE	ED AT HIGH SPEED USIN	G ASF LOW LEVEL			
LOAD	·				
PREVIOUS TRAF	FIC OVER TEST TRACKS				
THREE CA	TES PRIOR TO TEST RUI	<del>,</del>			
NOMINAL NEW C	CONDITIONS EXCEPT:				
NONE					
<del></del>		· · · · · · · · · · · · · · · · · · ·			
		<del></del>			
TOOP TAPE NO.:	0095	SEGNCE, ON TAPE:	2		
TEST DATE:	6/12/75	TEST START TIME:	1410 HRS		
TEMPERATURE:	80 DEG-F	PRECIPITATION:	NONE -		
HUMIDITY:	UNKNOWN	WIND DIRECTION:	FROM 250 DEG REL		
WIND VELOCITY:	20 MPH	RAIL SURF COND:	-CLEAN AND DRY -Railroad East		
MILEPOST STARTS	OAKLAND-OGDEN	MILEPOST END:	47.33		
MIN SPEED:	42.50 70 MPH	MAX SPEED:	79 MPH		
RAIL TYPE:	- CWR	RAIL WEIGHT:	136 L8./YD		
RAIL LAID IN:	1964	CAR INITIALS:	SP		
CAR NUMBER:	517332	CAR TYPE:	STAC PAC		
CAR DRIENTATION:	B-END FORWARD	CAR CAPACITY:	122000 POUNDS		
. CAR TARE WEIGHT:	56560 POUNDS	EMPTY WT A-END:	27700 POUNDS		
EMPTY WT B-END: .	28860 POUNDS	TOTAL WT.1	56560 POUNDS		
CENTER GRAVITY:	23.63 INCHES	TYPE OF LADING:"	NONE		
ALD - LD. TRUCK:	+20 FT. 7 IN.	TRUCK CENTERS:	64 FT. 0 IN.		
NO. OF LOCO'S:	_1	TOTAL H.P.:	3000		
NO. CARS FORE:	1	TOTAL TONS FORE!	61		
NO. OF CARS AFTE	1	TOTAL TONS AFT: WHEEL BASE:	23 5 FT. 1 IN.		
TRUCK TYPE:	ASF LOW LEVEL	SPRNG GROUP IN:	-5 D3		
"SPRNG GROUP OUT!" SPR GROUP ININ:	5 04	STAT SPNG COMP:	B-9.063(A-9.188		
CHTR PLATE DIAS	14 INCHES	CNTR PLATE MATLE	STEEL		
CNTR PLATE LUB:	HOLYLUB	CNTR PLATE FRICE	- UNKNOWN		
SIDE BEAR A-END:	STUCKI SINGLE	SIDE BEAR B-END:	STUCKI SINGLE		
SIDE BEAR CLEAR:	0.250 INCH	SIDE BEAR SUPPL:	NONE		
SIDE BEAR PRELD:	O POUNDS	SNUBBER TYPE:	CONSTANT (ASF)		
SNUBBER SPRINGS:	6 OUTERIA INNER	SNUB DAMP RATE:	UNKNOWN		
S./FR. INTERTIE:	NONE	OUTER GIB CLR:	0.625 INCH		
INNER GIB CLR:	0.250 INCH	ROLLER BEARING:	TAAR 6X11 TAPERE		
ADAPTR PAD TYPE:	NONE .	PAD SHEAR COEFF:	N/A		
LONG ADPTR CLR:	3/32" TO 9/32"	LAT DAMPER TYPE:	NONE		
LAT DAMPER RATE:	N/A	AXL PARAL A-END:	1 DOT LE 1 DOT F		
AXL PARAL B-END:	1 DOT L: 1 DOT R	WHEEL CONTOUR:	FG 5.11 AAR WEAR		
WHEEL DIAMETER:	28.1870 INCHES				

## TEST: 030502TWA002

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING ASF LOW LEVEL
70 TON CAPACITY TRUCK UNDER A STAC PAC CAR WITH
FULLY LOADEL CONTAINERS
PREVIOUS TRAFFIC OVER TEST TRACK:
THROUGH FREIGHT TRAIN
2 HRS PRIOR TO TEST RUN
NOMINAL NEW CONDITIONS EXCEPT:
MONE
COCCASIONAL HOISE ON CH 27
CH 21 HAS 9. VOLT NEGATIVE OFFSET

THUP TAPE NO.:	0107	SEGNCE. ON TAPE:	
TEST DATE:	6/25/75	TEST START TIME:	
TE, PERATURE:	72 DEG-F	PRECIPITATION:	
HUMIDITY:	UNKNOWN	WIND DIRECTION:	
WIND VELOCITY:		RAIL SURF COND:	
LINE:	GAKLAND-DGUEN"	DIRECTION:	RAILROAD WEST
MILEPUST START:	48.48	MILEPUST END:	
.1IN SPLEU:	30 MPH	MAX SPEED:	
RAIL TYPE:	JUINTED	RAIL WEIGHT:	
RAIL LAID IN:		CAR INITIALS:	SP '
CYS MAINBEY:	517332	CAR TYPE:	STAC PAC
. CAR ORIENTATION:		CAR CAPACITY:	
CAR TARE WEIGHT:		LOADED AT A-EUD:	
	83260 POUNDS	TOTAL WT.:	
CENTER GRAVITY:		TYPE OF LADING:	
ALD - LO. TRUCK:	+20 FT. 7 IN.	TRUCK CENTERS:	
NO. OF LOCO'S:	1	TOTAL H.P.:	3000
"NO. CARS FORE:"	1	TOTAL TONS FORE:	
:10. OF CARS AFT:	1	TOTAL TONS AFT:	23
TRUCK TYPE:	ASF LOW LEVEL	WHEEL BASE:	5 FT. 1 IN.
SPRING GROUP OUT:	5 D4	SPRUG GROUP IN:	5 D3
SPR GROUP INIA:		STAT SPNG COMP:	
CRIR PLATE DIA:	14 INCHES	CHTR PLATE MATL:	
CHIR PLATE LUG!	HOLYLUB	CHTR PLATE FRIC:	AUKNORM
SIDE BEAR A-END:	STUCKI SINGLE	SIDE BEAR B-END:	STUCKI SINGLE
SIDE BEAR CLEAR:	0.250 INCH	SIDE BEAR SUPPL:	NONE
SIDE BEAR PRECO:		SNUBBER TYPE:	CONSTANT (ASF)
SNUBBER SPRINGS:	6-3221:8-3222	SNUB DAMP RATE:	DUKNON
S./FR. INTERTIE:	NONE	OUTER GIB CLR:	0.625 INCH
INNER GIB CER:	0.250 INCH	- ROLLER BEARING:	TAAH 6X11 TAPERED
ADAPTR PAD TYPE:	NONE	PAU SHEAR COEFF:	N/A
LONG ADPTR CLK:	3/32" TO 9/32"	LAT DAMPER TYPE:	NORE
LAT DATIPER KATE:	TJ/A	AXL PARAL A-END	1 DOT L: 1 DOT R
AXL PARAL B-END:	1 DOT L: 1 DOT R	WHEEL CONTOUR:	FG 5.11 AAR WEAM
THEEL LIAMETER:	28.1870 INCHES		

#### TEST: 030502TEH001

TEST CONDUCTED AT HIGH SPEED USING ASF LOW LEVEL 70 T'N CAPACITY TRUCK UNDER A STAC PAC CAR WITH FULL. LOADED CONTAINERS PREVIOUS TRAFFIC OVER TEST TRACK: THREE CAR TEST TRAIN 10 MIN PRIOR TO TEST RUN NOMINAL NEW CONDITIONS EXCEPT:

NONE TEST NAMED AS 030502TEHD01 SHOULD BE 030502TEH002

TDOP TAPE NO.: TEST DATE: 0106 SEQUE. ON TAPE: TEST START TIME: 2 0820 HRS 6/25/75 TEMPERATURE: 60 DEG-F PRECIPITATION: NONE HUMIDITY: UNKNOWN WIND DIRECTION: CALM WIND VELOCITY: CALM RAIL SURF COND: DIRECTION: CLEAN & DRY LINE: OAKLAND-OGDEN RAILROAD EAST MILEPOST START: 42.50 70 MPH MILEPOST END: 47.33 79 MPH HIN SPEED! MAX SPEED: RAIL TYPE: CWR RAIL WEIGHT: 136 LB./YD. CAR INITIALS: CAR TYPE: CAR CAPACITY: RAIL LAID IN: CAR NUMBER: 1964 SP STAC PAC 517332 CAR ORIENTATION: B-END FORWARD 122000 POUNDS 82100 POUNDS CAR TARE WEIGHT: 56560 POUNDS LOADED WT A-END: POUNDS TOTAL WT.: TYPE OF LADING: LOADED WT B-END: CENTER GRAVITY: 83260 165360 POUNDS 83260 POUNDS FULL CONTAINERS ALD - LD. TRUCK: TRUCK CENTERS: +20 FT. 7 IN. 64 FT. 0 IN. NO. OF LOCO'S: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: 3000 NO. CARS FORE: 61 NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: 23 ASF LOW LEVEL 5 FT. 1 IN. 5 D4 SPRNG GROUP IN: 5 D3 STAT SPNG COMP: CNTR PLATE HATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: B-8.00:A-8.06 IN 14 INCHES STEEL UNKNOWN -- --SIDE BEAR A-END: STUCKI SINGLE STUCKI SINGLE SIDE BEAR CLEAR: SIDE BEAR PRELD: 0.250 INCH D POUNDS NONE SNUBBER TYPE: CONSTANT (ASF) SNUBBER SPRINGS: SNUB DAMP RATE: OUTER GIB CLR: 8-322118-3222 UNKNOWN S./FR. INTERTIE: INNER GIB CLR: NONE 0.625 INCH 0.250 INCH ROLLER BEARING: AAR 6X11 TAPERED ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: NONE PAD SHEAR COEFF: LAT DAMPER TYPE: N/A 3/32\* TO 9/32\* NONE AXL PARAL A-END: N/A 1 DOT LI 1 DOT R 1 DOT LI 1 DOT R 28.1870 INCHES AXL PARAL B-END: WHEEL DIAMETER: FG 5-11 AAR WAAM

#### TEST:030502TEM002

SEQUCE. ON TAPE: TDOP TAPE NO.: 0106 TEST DATE: TEST START TIME: 0735 6/25/75 NONE TEMPERATURE: 58 DEG-F PRECIPITATION: WIND DIRECTION: CALM HUMIDITY: **UNKNOWN** CLEAN & DRY RAIL SURF COND: WIND VELOCITY: CALM DIRECTION: RAILROAD EAST LINE: OAKLAND-OGDEN MILEPOST END: 47.33 MILEPOST START: 42.50 60 MPH MIN SPEED: MAX SPEED: 30 MPH 136 LB./YD. RAIL TYPE: RAIL WEIGHT: CWR CAR INITIALS: SP RAIL LAID IN: 1964 STAC PAC CAR NUMBER: 517332 CAR TYPE: .B-END FORWARD CAR CAPACITY: 122000 POUNDS CAR ORIENTATION: LOADED WT A-END: 82100 POUNDS CAR TARE WEIGHT: 56560 POUNDS 165360 POUNDS 83260 POUNDS TOTAL WT.: LOADED WT B-END: 85.98 INCHES TYPE OF LADING: **FULL CONTAINERS** CENTER GRAVITY: TRUCK CENTERS: 64 FT. 0 IN. ALD - LD, TRUCK: +20 FT. 7 IN. NO. OF LOCO'S: TOTAL H.P.: 3000 TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: NO. CARS FORE: 61 NO. OF CARS AFT: 23 1 5 FT. 1 IN. TRUCK TYPE: ASF LOW LEVEL SPRNG GROUP IN: 5 D3 SPRNG GROUP OUT: 5 D4 SPR GROUP ININ: STAT SPNG COMP: B-8.00:A-8.06 IN n 14 INCHES CNTR PLATE MATL: STEEL CNTR PLATE DIA: UNKNOWN CNTR PLATE LUB: MOLYLUB CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SIDE BEAR A-END: SIDE BEAR CLEAR: STUCKI SINGLE STUCKI SINGLE NONE 0.250 INCH SIDE BEAR PRELD: SNUBBER TYPE: CONSTANT (ASF) 0 POUNDS SNUBBER SPRINGS: 8-3221:8-3222 SNUB DAMP RATE: UNKNOWN S./FR. INTERTIE: OUTER GIB CLR: 0.625 INCH NONE INNER GIB CLR: 0.250 INCH ROLLER BEARING: AAR 6X11 TAPERED ADAPTR PAD TYPE: NONE PAD SHEAR COEFF: N/A LAT DAMPER TYPE: 3/32" TO 9/32" NONE LONG ADPTR CLR: LAT DAMPER RATE: AXL PARAL A-END: 1 DOT L: 1 DOT R N/A AXL PARAL B-END: 1 DOT L: 1 DOT R WHEEL CONTOUR: FG 5.11 AAR W&AM 28.1870 INCHES WHEEL DIAMETER:

#### TEST:030503TWA001

TEST CONDUCTED AT MEDIUM AND HIGH SPEED USING ASF LOW LEVEL
70 TON CAPACITY TRUCK UNDER A STAC PAC CAR WITH NO
LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THROUGH FREIGHT TRAIN
1 HOUR 35 MIN PRIOR TO TEST RUN
NOMINAL NEW CONDITIONS EXCEPT:
ORIGINAL WHEELS FROM SP517332 (NEW 5/73)

TDOP TAPE NO.: TEST DATE: 0109 6/27/75 TEMPERATURE: 86 DEG-F UNKNOWN HUMIDITY: ' WIND VELOCITY: LINE: OAKLAND-OGDEN MILEPOST START: 48.48 MIN SPEED: 30 MPH RAIL TYPE: RAIL LAID IN: JOINTED 1941 TO 1955 CAR NUMBER: 517332 CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: EMPTY WT B-END: 56560 POUNDS 28860 POUNDS CENTER GRAVITY: 23.63 INCHES ALD - LD. TRUCK: +20 FT. 7 IN. NO. OF LOCO'S: 1 No. CARS FORE: 1 NO. OF CARS AFT: 1 TRUCK TYPE: ASF LOW LEVEL SPRNG GROUP OUT: 5 D4 SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: SIDE BEAR A-END: 14 INCHES MOLYLUB STUCKI SINGLE SIDE BEAR CLEAR: SIDE BEAR PRELD: 0.250 INCH. 0 POUNDS SNUBBER SPRINGS: 8-3221:8-3222 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 1 DOT L: 1 DOT R WHEEL DIAMETER: 27.9172 INCHES

SEQUCE. ON TAPE: TEST START TIME: 1225 HRS PRECIPITATION: NONE FROM 85 DEG REL WIND DIRECTION: RAIL SURF COND: DIRECTION: CLEAN AND DRY RAILROAD WEST MILEPOST END: 40.70 MAX SPEED: 79 MPH RAIL WEIGHT: 132 LB./YD. CAR INITIALS: SP STAC PAC CAR TYPE: CAR CAPACITY: .122000 POUNDS EMPTY WT A-END: 27700 POUNDS TOTAL WT.: 56560 POUNDS TYPE OF LADING: NONE TRUCK CENTERS: 64 FT. 0 IN. TOTAL H.P.: 3000 TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: 61 23 5 FT. 1 IN. SPRNG GROUP IN: 5 D3 STAT SPNG COMP: B-9.063 | A-9.188 CNTR PLATE MATL: STEEL CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: UNKNOWN STUCKI SINGLE NONE SNUBBER TYPE: CONSTANT (ASF) SNUB DAMP RATE: UNKNOWN OUTER GIB CLR: 0.625 INCH ROLLER BEARING: AAR 6X11 TAPERED PAD SHEAR COEFF: N/A NONE LAT DAMPER TYPE:

1 DOT L: 1 DOT R

FILE 3.0:T/SER 3

AXL PARAL A-END:

WHEEL CONTOUR:

## TEST: 030503TEM001

TEST CONDUCTED AT MEDIUM SPEED USING ASF LOW LEVEL TO TON CAPACITY TRUCK UNDER A STAC PAC CAR WITH NO PREVIOUS TRAFFIC OVER TEST TRACK:

THROUGH FREIGHT TRAIN
40 MINUTES PRIOR TO TEST RUN
NOHINAL NEW CONDITIONS EXCEPT: ORIGINAL WHEELS FROM SP517332 (NEW 5/73) CHANNEL 14 WAS POSITIVE .4 VOLTS OFF ZERO TOOP TAPE NO.: TEST DATE: SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION: D108 1040 HRS 6/27/75 TEMPERATURE: NONE 80 DEG-F HUMIDITY: UNKNOWN WIND DIRECTION: RAIL SURF COND: FROM 270 DEG REL CLEAN AND DRY WIND VELOCITYS 16 MPH DIRECTION: LINE: OAKLAND-OGDEN RAILROAD EAST 47.33 60 MPH 136 LB./YD. MILEPOST START 42.50 MILEPOST END: MIN SPEED: 30 MPH MAX SPEED: RAIL TYPE: RAIL WEIGHT: CWR 1964 CAR INITIALS: SP CAR NUMBER: CAR TYPE: STAC PAC 517332 CAR ORIENTATION: B-END FORWARD CAR CAPACITY: 122000 POUNDS CAR TARE WEIGHT: EMPTY WT B-END: 56560 POUNDS EMPTY WT A-END: 27700 POUNDS TOTAL WT.: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: 28860 POUND 23,63 INCHES POUNDS POUNDS 56560 CENTER GRAVITY: NONE ALD - LD. TRUCK: 64 FT. 0 IN. +20 FT. 7 IN. NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: 3008 TOTAL TONS AFT: TRUCK TYPE: SPRNG GROUP OUT: WHEEL BASE: SPRNG GROUP IN: 5 FT. 1 IN. 5 D3 ASF LOW LEVEL 5 D4 SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: B-9.0631A-9.188 STEEL 14 INCHES UNKNOWN " MOLYLUB SIDE BEAR A-END: STUCKI SINGLE SIDE BEAR B-END: STUCKI SINGLE SIDE BEAR CLEAR: 0.250 INCH SIDE BEAR SUPPL: NONE SIDE, BEAR PRELD: 0 POUNDS SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: CONSTANT (ASF) SNUBBER SPRINGS 8-3221:8-3222 UNKNOWN S./FR. INTERTIE: 0.625 INCH AAR 6X11 TAPERED NONE 0.250 INCH ROLLER BEARING ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE: AXL PARAL B-END: PAD SHEAR COEFF: N/A LAT DAMPER TYPE: 3/32" TO 9/32" NONE N/A 1 DOT L: 1 DOT R 27.9172 INCHES 1 DOT L' 1 DOT R FILE 3.0:T/SER 3 WHEEL CONTOUR:

WHEEL DIAMETER:

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### TEST: 030503TEH001

TEST CONDUCTED AT HIGH SPEED USING ASF LOW LEVEL

	70 TON CAPACITY TRUCK UNDER A STAC PAC CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK: THREE CAR TEST TRAIN	
	NOMINAL NEW CONDITIONS EXCEPT: ORIGINAL WHEELS FROM SP517332 (NEW 5/73)	
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TOOP TAPE NO.:	0108	SEONCE. ON TAPE:	
TEST DATE:	_6/27/75	TEST START TIME:	
TEMPERATURE	82 DEG-F	PRECIPITATION:	NONE
HUHIDITY:	UNKNOWN	WIND DIRECTION:	FROM 270 DEG REL
WIND VELOCITY:	12 MPH	RAIL SURF COND:	
LINE:	OAKLAND-OGDEN	DIRECTION:	RAILROAD EAST
MILEPOST START:	42.50	MILEPOST END:	47.33
MIN SPEED:	70 MPH	MAX SPEED:	79 MPH
RAIL TYPE:	CWR	RAIL WEIGHT:	136 LB./YD.
RAIL LAID INT	1964	CAR INITIALS:	SP
CAR NUMBER:	517332	CAR TYPE:	STAC PAC
CAR DRIENTATION:	B-END FORWARD	CAR CAPACITY:	122000 POUNDS
CAR TARE WEIGHT:	56560 POUNDS	EMPTY WT A-END:	27780 POUNDS
EMPTY WT B-END:	28860 POUNDS	TOTAL WT.:	56560 POUNDS
CENTER GRAVITY:	23.63 INCHES	TYPE OF LADING:	NONE
ALD - LD. TRUCK:		TRUCK CENTERS:	
NO. OF LOCO'S:	1	TOTAL H.P.:	3000
NO. CARS FORE!	- <u>1</u>	TOTAL TONS FORE:	
NO. OF CARS AFT:		TOTAL TONS AFT:	23
TRUCK TYPE:	ASF LOW LEVEL	WHEEL BASE:	5 FT. 1 IN.
SPRNG GROUP OUT :		SPRNG GROUP IN:	5 D3
SPR GROUP ININ:	0 0.	STAT SPNG COMP:	B-9.0631A-9.168
CNTR PLATE DIAS		CNTR PLATE MATL:	STEEL
CNTR PLATE LUB!	MOI YI UB	CNTR PLATE FRICE	- INKNORN -
SIDE BEAR A-END:		SIDE BEAR B-END:	
SIDE BEAR CLEARS		SIDE BEAR SUPPLE	
SIDE BEAR PRELD:		- SNUBBER TYPE:	CONSTANT (ASF)
SNUBBER SPRINGS:	6-3221:8-3222	SNUB DAMP RATE:	
S./FR. INTERTIE:	NONE	DUTER SIB CLR:	
INNER GIB CLR:			AAR 6X11 TAPERED
ADAPTR PAD TYPE:		PAD SHEAR COEFF:	
LONG ADPTR CLRS	3/32" TO 9/32"	LAT DAMPER TYPE:	
LAT DAMPER RATE:	N/A		1 DOT"L: 1 DOT'R
AXL PARAL B-END:	1 DOT LE 1 DOT R	MHEEL CONTOUR:	FILE 3.0:T/SER 3
WHEEL DIAMETER:	27.9172 INCHES	BILLE TORIODA.	- 155 C1311/3EK 3

TEST CONDUCTED AROUND RESONANT SPEED USING ASF RIDE CONTROL
70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH
NO LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THREE CAR TEST TRAIN
TWENTY FIVE MINUTES PRIOR TO PASS 1

NOMINAL NEW CONDITIONS EXCEPT:

CYLINDRICAL WHEELS

RESONANT SPEED IS 22 MPH

TDOP TAPE NO.: 0178 TEST DATE: . 11/10/75 TEMPERATURE: 56 DEG-F HUMIDITY: UNKNOWN WIND VELOCITY: 8 MPH SCHELLVILLE BR. LINE: MILEPOST START: 63.8956 20 MPH MIN SPD PASS 1: MIN SPD PASS 2: 22 MPH MIN SPD PASS 3: 24 MPH MIN SPD PASS 4: 26 MPH MIN SPD PASS 5: 28 MPH RAIL TYPE: RAIL LAID IN: JOINTED/SH -1952 CAR NUMBER: 459997 CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: EMPTY WT B-END: 89571 POUNDS 40249 CENTER GRAVITY: 60 INCHES ALD - LD. TRUCK: +15 FT. 0 IN. NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: ASF RIDE CONTROL SPRNG GROUP OUT: 7 D5 SPR GROUP ININ: n CNTR PLATE DIA: 14 INCHES CNTR PLATE LUB: MOLYLUB SIDE BEAR A-END: SIDE BEAR CLEAR: SIDE BEAR PRELO: STUCKI SINGLE 0.25 INCH 6 POUNDS SNUBBER SPRINGS: 8-3091 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: LONG ADPTR CLR: NONE 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT LI 3 DOT R 33.109 INCHES WHEEL DIAMETER:

SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPD PASS 1: MAX SPD PASS 2: MAX SPD PASS 3: MAX SPD PASS 4: MAX SPD PASS 5: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: EMPTY WT A-END: TOTAL WEIGHT: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P. F TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: WHEEL CONTOUR:

NONE FROM 170 DEG REL CLEAN AND DRY RAILROAD WEST 63.7991 20 MPH 22 MPH 24 MPH 26 MPH 28 MPH 112 LB./YD. SPFE MECH. REEFER 130000 POUNDS 49322 POUNDS 89571 POUNDS NONE 45 FT. 8.625 IN. 3000 61 23 5 FT. 8 IN. 6 D5 B-9.50:A-9.68 IN STEEL 0.15 COEF FRICT STUCKI DOUBLE NONE CONSTANT (ASF) UNKNOWN 0.625 INCH AAR 6X11 TAPERED N/A NONE 3 DOT LI 3 DOT R FG 2-2 SER 5 T/P

1010 HRS

#### TEST: 050102MOD001

TEST CONDUCTED AROUND RESONANT SPEED USING ASF RIDE CONTROL
70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH
NO LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
 THREE CAR TEST TRAIN
 FIVE MINUTES PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPT:
 1/40 TAPER WHEELS
RESONANT SPEED IS 22 MPH

TDOP TAPE NO.:	0179
TEST DATE:	11/13/75
TEMPERATURE:	58 DEG-F
HUMIDITY:	UNKNOWN
WIND VELOCITY:	11 MDH
LINE:	SCHELLVILLE BR.
MILEPOST START:	
MIN SPD PASS 1:	20 MPH
MIN SPD PASS 2:	22 MPH
	24 MPH
MIN SPD PASS 4:	
MIN SPD PASS 5:	
RAIL TYPE: RAIL LAID IN:	28 MPH JOINTED/SH 1952
RAIL LAID IN:	1952
CAR NUMBER:	459997
CAR ORIENTATION:	B-END FORWARD
CAR TARE WEIGHT:	89571 POUNDS
EMPTY WT B-END:	40249 POUNDS
CENTER GRAVITY:	60 INCHES
CENTER GRAVITY: ALD - LD. TRUCK:	+15 FT. 0 IN.
NO. OF LOCO'S:	1
NO. CARS FORE:	1
NO. OF CARS AFT:	1
TRUCK TYPE:	ASF RIDE CONTROL
SPRNG GROUP OUT:	7 D5
SPR GROUP ININ:	0
CNTR PLATE DIA:	14 INCHES
CNTR PLATE LUB:	MOLYLUB
SIDE BEAR A-END:	STUCKI SINGLE.
SIDE BEAR CLEAR:	0.25 INCH
SIDE BEAR PRELD:	
SNUBBER SPRINGS:	8-3091
S./FR. INTERTIE:	NONE
INNER GIB CLR:	0.250 INCH
ADAPTR PAD TYPE:	NONE
INNER GIB CLR: ADAPTR PAD TYPE: LONG ADPTR CLR:	3/32" TO 9/32"
LAT DAMPER RATE:	
AXL PARAL B-END:	3 DOT L: 3 DOT R
WHEEL DIAMETER:	33.109 INCHES .

TEST START TIME:
PRECIPITATION:
WIND DIRECTION:
RAIL SURF COND:
DIRECTION:
MILEPOST END:
MAX SPD PASS 1: MAX SPD PASS 2:
MAX SPD PASS 2:
MAX SPD PASS 3:
MAX SPD PASS 4:
MAX SPD PASS 5:
RAIL WEIGHT: CAR INITIALS: CAR TYPE:
CAR INITIALS:
CAR TYPE:
CAR CAPACITY:
EMPTY WT A-END:
TOTAL WEIGHT:
TYPE OF LADING:
TRUCK CENTERS:
TOTAL H.P.:
TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: HHEEL BASE: SPRNG GROUP IN:
MIEEL BASES
SDDNC CROUD TNA
STAT SPNG COMP:
CNTR PLATE MATL:
CNTR PLATE FRIC:
SIDE BEAR B-END:
SIDE BEAR SUPPL:
SNUBBER TYPE:
SNUB DAMP RATE: OUTER GIB CLR:
ROLLER BEARING:
PAD SHEAR COEFF:
LAT DAMPER TYPE:
AXL PARAL A-END:
WHEEL CONTOUR:

SEGNCE. ON TAPE:

1020 HRS NONE FROM 15 DEG REL CLEAN AND DRY RAILROAD WEST 63,7991 20 MPH 22 MPH 24 MPH 26 MPH 28 MPH 112 LB./YD. SPFE MECH. REEFER 130000 POUNDS POUNDS 49322 89571 POUNDS NONE 45 FT. 8.625 IN. 3000 61 23 5 FT. 8 IN. . 6 05 B-9.50:A-9.68 IN STEEL 0.15 COEF FRICT STUCKI DOUBLE NONE CONSTANT (ASF) UNKNOWN 0.625 INCH AAR 6X11 TAPERED N/A NONE 3 DOT LI 3 DOT R FG 2-3 SER 5 T/P

## TEST: 050103M0D001

TEST COMBUCILD AROUND RESONANT SPEED USING ASF RIDE CONTROL
70 TON CAPACITY TRUCK UNDER HECHAMICAL REFRIGERATOR CAR WITH
NO LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THEEE CAR TEST TRAIN
FIVE SIMULES PRIOR TO PASS 1
NOMINAL NEW COMMITTIONS EXCEPT:
CYLINDRICAL WHEELS
DY SPRINGS
RESONANT SPEED IS 22 MPH.
CHAMMEL 10 IS +.7 VOLT OFF ZERO AT END OF TEST
CHAMMEL 30 IS +.4 VOLT OFF ZERO

INNER GIB CLR: ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE:	0123 12/0/75 12/0/75 40 0E6-F UNKNOWN 60 REP SCHELLVILLE BR. 65/6863 20 MPH 22 MPH 24 MPH 26 MPH 26 MPH 27 MPH 27 MPH 28 MFH 28 MFH 29 MPH 29 MPH 29 MPH 20 MPH 20 MPH 20 MPH 21 MPH 21 MPH 22 MPH 24 MPH 25 MPH 26 MPH 27 MPH 28 MFH 29 MPH 29 MPH 29 MPH 20 MPH 21 MPH 21 MPH 21 MPH 22 MPH 22 MPH 23 MPH 24 MPH 25 MPH 26 MPH 27 MPH 27 MPH 28 MPH 28 MPH 28 MPH 29 MPH 29 MPH 29 MPH 29 MPH 20	ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: .	MAR 6x11 TAPERED N/A NONE 3 DOT L: 3 DOT R
AXL PARAL B-END: WHEEL DIAMETER:	3 DOT L: 3 DOT R	WHEEL CONTOUR:	FG 2-2 SER 5 T/P

#### --- --- TEST: 050104M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING ASE RIDE CONTROL 70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

PREVIOUS TRAFFIC OVER TEST TRACK:
THREE CAR TEST TRAIN
FIVE MINUTES PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPT:
CYLINDRICAL WHEELS
D3 SPRINGS

TDOP TAPE NO.: TEST DATE: 0171 SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: 1035 HRS 12/10/75 TEMPERATURE: 44 DEG-F FROM 70 DEG REL DAMP AND SANDED RAILROAD WEST HUMIDITY: UNKNOWN . WIND VELOCITY: LINE: MILEPOST START: SCHELLVILLE BR. DIRECTION: 63.8956 20 EPH 22 EPH 24 EPH MILEPOST END: 63.7991 MAX SPD PASS 1: MAX SPD PASS 2: MAX SPD PASS 3: MIN SPO PASS 1: MIN SPU PASS 2: 20 MPH 22 MPH HIN SPD PASS 3: MIN SPD PASS 4: 24 (4PH 26 MPH 28 MPH MAX SPD PASS 4: 26 MPH MIN SPU PASS 5: RAIL TYPE: RAIL LAID IN: MAX SPD PASS 5: 28 MPH JOINTED/SH RAIL WEIGHT: CAR INITIALS: CAR TYPE: 112 LB./YD. 1952 SPFE MECH. REFFER 459997 CAR NUMBER: CAR ORIENTATION: CAR TARE WEIGHT: EMPTY WT B-END: B-END FORWARD 89571 POUNDS 40249 POUNDS CAR CAPACITY: 130000 POUNDS 49322 POUNDS 89571 POUNDS EMPTY WT A-END: TOTAL WEIGHT: TYPE OF LADING: CENTER GRAVITY: 60 INCHES NAME ALD - LD. TRUCK: No. OF LOCO'S: TRUCK CENTERS: +15 FT. 0 IN. 45 FT. 8.625 IN. TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: 3600 NO. CARS FORE: NO. OF CARS AFT: 1 .. .. 61 ASF RIDE CONTROL TRUCK TYPE: 7 D3 . . . 0 WHEEL BASE: SPRNG GROUP IN: 5 FT. 8 IN. SPRING GROUP OUT: 2 D3 SPH GROUP ININ: CHTR PGATE JIA: CHTR PLATE LUB: SIDE BEAR A-END: SIDE BEAR CLEAR: STAT SPNG COMP: B-8.46;A-8.29 IN STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: 14 INCHES STEEL HOLYLUB STUCKI SINGLE 0.15 COEF FRICT STUCKI DOUBLE 0.25 INCH NUNE SIDE BEAR PRELD: 0 POUNDS CONSTANT (ASF) SNUBBER SPRINGS: 8-3091 SHUB DAMP RATE: OUTER GIB CLR: UNKNOWN S./FR. INTERTIE: INNER GIB CLR: ... NONE 0.625 INCH 0.250 INCH ---- ROLLER BEARING: AAR 6X11 TAPERED ADAPTR PAD TYPE: NONE PAD SHEAR COEFF: LAT DAMPER TYPE: N/A LONG ADPTR CLR: 3/32" TO 9/32" NONE LAT DAMPER RATE: AXL PARAL B-END: WHEEL DIAMETER: AXL PARAL A-END: 3 DOT L: 3 DOT R WHEEL CONTOUR: FG 2-2 SER 5 T/P

#### TEST: 050201M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING ASF RIDE CONTROL
70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH
FULL GROSS RAIL LOAD
PREVIOUS TRAFFIC OVER TEST TRACK;
THREE CAR TEST TRAIN
5 MINUTES PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPT:
1/40 TAPER WHEELS
CHANNEL 5 INOPERATIVE DURING FIRST TWO PASSES

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SEONCE. ON TAPE:
TEST START TIME:
TDOP TAPE NO.:
TEST DATE:
                   0183
                   11/19/75
                                                              1100 HRS
TEMPERATURE:
                                          PRECIPITATION:
                                                              NONE
                  42 DEG-F·
HUMIDITY:
                  UNKNOWN
                                          WIND DIRECTION:
                                                              FROM 5 DEG REL
WIND VELOCITY:
                   17 MPH
                                          RAIL SURF COND:
                                                              CLEAN AND DRY
LINE:
                   SCHELLVILLE BR.
                                          DIRECTION:
                                                              RAILROAD WEST
MILEPOST START:
                   63.8956
                                          MILEPOST END:
                                                              63.7991
                                          MAX SPD PASS 1:
MIN SPD PASS 1:
                   12 MPH
                                                              12 MPH
MIN SPD PASS 2:
                   14 MPH
                                          MAX SPD PASS 2:
                                                              14 MPH
                                          MAX SPD PASS 3:
MAX SPD PASS 4:
MAX SPD PASS 5:
                                                              16 MPH
MIN SPO PASS 3:
                   16 MPH
MIN SPD PASS 4:
                   18 MPH
                                                              16 MPH
MIN SPD PASS 5:
                   20 MPH
                                                              20 MPH
RAIL TYPE:
                                          RAIL WEIGHT: "
                                                              112 LB./YD.
                   JOINTED/SH
                                         CAR INITIALS:
RAIL LAID IN:
                   1952
                                                              SPFE
                                         CAR TYPE:
CAR CAPACITY:
LOADED WT A-END:
CAR NUMBER:
                                                              MECH. REEFER
                   459997
                   B-END FORWARD
CAR ORIENTATION:
CAR TARE WEIGHT:
                                                              130000 POUNDS
                   89571 POUNDS
                                                              101500 POUNDS
                                          TOTAL WEIGHT:
LOADED WT B-END:
                   118400 POUNDS
                                                              219900 POUNDS
CENTER GRAVITY:
                   86 INCHES
                                          TYPE OF LADING:
                                                              BRAKE SHOES
                                          TRUCK CENTERS:
ALD - LD. TRUCK:
                   +15 FT. 0 IN.
                                                              45 FT. 8.625 IN.
                   1
                                        TOTAL H.P.: 30
TOTAL TONS FORE: 61
TOTAL TONS AFT: 23
NO. OF LOCO'S:
                                                              3000
NO. CARS FORE:
                   1
                   ī
NO. OF CARS AFT:
                   ASF RIDE CONTROL
TRUCK TYPE:
                                         WHEEL BASE:
                                                              5 FT. 8 IN.
SPRNG GROUP OUT:
                                          SPRNG GROUP IN:
                   7 D5
                                                              6 D5
SPR GROUP ININ:
                                          STAT SPNG COMP:
                                                              B-8.00:A-8.38 IN
                   n
CNTR PLATE DIA:
                   14 INCHES
                                          CNTR PLATE MATL:
CNTR PLATE FRIC:
                                                              STEEL
CNTR PLATE LUB:
                   MOLYLUB .
                                                               0.15 COEF FRICT
SIDE BEAR A-END:
                   STUCKI SINGLE
                                          SIDE BEAR B-END:
                                                               STUCKI DOUBLE
SIDE BEAR CLEAR:
                                          SIDE BEAR SUPPL:
                   0.25 INCH
                                                              NONE
SIDE BEAR PRELD:
                   0 POUNDS
                                          SNUBBER TYPE:
                                                              CONSTANT (ASF)
SNUBBER SPRINGS:
                   8-3091
                                          SNUB DAMP RATE:
                                                              UNKNOWN
S./FR. INTERTIE:
                                          OUTER GIB CLR:
                   NONE
                                                               0.625 INCH
INNER GIB CLR:
                   0.250 INCH
                                          ROLLER BEARING:
                                                               AAR 6X11 TAPERED
ADAPTR PAD TYPE:
                   NONE
                                          PAD SHEAR COEFF:
                                                              N/A
LONG ADPTH CLR:
                   3/32" TO 9/32"
                                          LAT DAMPER TYPE:
                                                              NONE
LAT DAMPER RATE:
                   N/A
                                          AXL PARAL A-END:
                                                              3 DOT L: 3 DOT R
                   3 DOT L: 3 DOT R
AXL PARAL B-END:
                                          WHEEL CONTOUR:
                                                              FG 2-3 SER 5 T/P
WHEEL DIAMETER:
                   33.109 INCHES
```

#### TEST:050203M00001

TEST CONDUCTED AROUND RESONANT SPEED USING ASF RIDE CONTROL
70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAR WITH
FULL GROSS RAIL LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THREE CAR TEST TRAIN
TEN MINUTES PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPT:
CYLINDRICAL WHEELS
RESONANT SPEED IS 16 MPH

TDOP TAPE NO.: TEST DATE: FEMPERATURE: 0099 SEQUCE. ON TAPE: TEST START TIME: 11/24/75 48 DEG-F 1010 HRS PRECIPITATION: NONE UNKNOWN . . FROM 160 DEG REL HUMIDITY: WIND DIRECTION: WIND VELOCITY: CLEAN AND DRY RAIL SURF COND: SCHELLVILLE BR. DIRECTION: RAILROAD WEST LINE: MILEPOST START: 63,8956 MILEPOST END: 63.7991 MILEPUS: START: 12 MPH MIN SPD PASS 1: - 12 MPH MTN SPD PASS 2: 14 MPH MAX SPD PASS 1: 12 MPH MAX SPD PASS 2: 14 MPH MAX SPD PASS 3: MAX SPD PASS 4: 16. MPH, MIN SPD PASS 3: 16 MPH MIN SPD PASS 4: 18 MPH 20 MPH 18 MPH MIN SPO PASS 5: . MAX SPD PASS 5: 20 MPH RAIL TYPE: RAIL LAID IN: JOINTED/SH' RAIL WEIGHT: 112 LB./YD. CAR INITIALS: 1952 SPFE CAR NUMBER: 459997 CAR TYPE: MECH. REEFER CAR CAPACITY: CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: 89571 POUNDS 130000 POUNDS LOADED WT A-END: 101500 POUNDS TOTAL WEIGHT: LOADED WT B-END: 118400 POUNDS 219900 POUNDS CENTER GRAVITY: 86 INCHES TYPE OF LADING: BRAKE SHOES ALD - LD. TRUCK: +15 FT. 0 IN. TRUCK CENTERS: 45 FT. 8.625 IN. TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: NO. OF LOCO'S: 1 3000 NO. CARS FORE: NO. OF CARS AFT: 61 23 TRUCK TYPE: ASF RIDE CONTROL 5 FT. 8 IN. SPRNG GROUP OUT: SPRNG GROUP IN: 7 D5 6 D5 SPR GROUP ININ: CNTR PLATE DIA: STAT SPNG COMP: B-8.00:A-8.38 IN O CNTR PLATE MATL: CNTR PLATE FRIC: 14 INCHES STEEL CNTR PLATE LUB: 0.15 COEF FRICT MOLYĽUB SIDE BEAR B-END: STUCKI DOUBLE SIDE BEAR A-END: STUCKI SINGLE 0.25 INCH SIDE BEAR SUPPL: SIDE BEAR CLEAR: NONE SIDE BEAR PRELD: O POUNDS CONSTANT (ASF) SNUBBER TYPE: 8-3091 SNUB DAMP RATE:
OUTER GIB CLR:
ROLLER BEARING: SNUBBER SPRINGS: UNKNOWN S./FR. INTERTIE: INNER GIB CLR: NONE 0.625 INCH 0.250 INCH AAR 6X11 TAPERED ADAPTR PAD TYPE: NONE PAD SHEAR COEFF: N/A LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER TYPE: NONE LAT DAMPER RATE: N/A AXL PARAL A-END: 3 DOT LI 3 DOT R AXL PARAL B-END: 3 DOT L: 3 DOT WHEEL DIAMETER: 33.109 INCHES 3 DOT L: 3 DOT R WHEEL CONTOUR: FG 2-2 SER 5 T/P

TEST CONDUCTED AROUND RESONANT SPEED USING ASE RIDE CONTROL TO TON CAPACITY TRUCK UNDER MECHANICAL REFRICERATOR CAR WITH FULL GRUSS RAIL LOAD FULL GRUSS KAIL LOAD
PREVIOUS TRAFFIC OVER TEST TRACK;
THICE CAN TEST TRAIN
FIVE ATHUTES PRIOR TO PASS 1
NOMINAL NEW COMMITTIONS EXCEPT;
CYLINDRICAL WHEELS
D3 SPRINGS

CHARMEL 23 IS +.3 VOLT OFF ZERO CHARMEL 47 IS -.3 VOLT OFF ZERO RESONANT SPEED IS 16 MPH

SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION: TOCH TAPÉ NO.: ... TEST DATE: 12/1/75 1000 HKS TE-PERATURE: 40 DLG-F NONE WIND DIRECTION: RAIL SURF COND: FROM 355 DEG REL UNKNOWN HUMICITY: WIND VLLOCITY: 3 APH CLEAN AND DRY SCHELLVILLE BR. DIFECTION: RAILROAD WEST LINES MAX SPD PASS 1: MAX SPD PASS 2: MAX SPD PASS 2: MAX SPD PASS 3: MAX SPD PASS 4: MILEPOST STARTS 63.6936 63.7991 MIN SPU PASS 1: MIN SPU PASS 2: MIN SPU PASS 3: MIN SPU PASS 3: MIN SPU PASS 4: KIN SPJ PASS 5: 12 HPH 14 MPH 12 NPH 14 NPH 16 NPH 16 FIPH 18 PPH 16 APH 20 HPH MAX SPD PASS 5: 20 HPH RAIL TYPE: JOINTEG/SH RAIL WEIGHT: 112 L3./YD CAR INITIALS: CAR TYPE: CAR CAPAGITY: SPFE 1952 MECH. CAR NUMBER: 459997 CAR CRIENTATION: CAR TARE WEIGHT: B-END FORWARD 69571 POUNDS 116400 POLIDS 130000 POUNDS LOADED WY A-END: 103,500 FOUNDS LOADED MT A-ENU:
TOTAL MEIGHT:
TYPE OF LADING:
TRUCK CENTERS:
TOTAL H-P.:
TOTAL TONS FGRE:
TOTAL TONS AFT:
WHEEL BASE:
SPRAG GROUP IN:
TOTAL TONS COUPLY TONS
TOTAL TONS COUPLY TONS
TOTAL TONS COUPLY TONS
TOTAL TONS
TOTAL
TONS
TOTAL TONS
TONS
TOTAL
TONS LOADED WT B-END: CENTER GRAVITY: 219900 FOUNDS BRAKE SHOES ALU - LU. TRUCK: NO. OF LOCO'S: 45 FT. 8.625 IN. 3000 NO. CARS FORE: ... 61 25 5 FT. 8 14. TRUCK TYPE: ASF RIDE CONTROL SPRNG GROUP DUT: .7\_D3\_\_\_\_ 2 D3 STAT SPHG COMP: CHTR PLATE HATL: CNTR PLATE FRIC: SPRING GROUP ININ:
SPR GROUP ININ:
CNTR PLATE DIA:
CNTR PLATE LUB:
SIDE BEAR A-E-D:
SIDE BEAR CLEAR:
SIDE BEAR PREED: B-7.371A-7.65 IN STEEL 0.15 COEF FRICT 0 14 INCHES MOLYLUB STUCKI SINGLE SIDE BEAR B-END: SIDE BEAR SUPPL: STUCKI DOUBLE 0.25 INCH NONE SHUBBER TYPE: ...
SNUB DAMP RATE:
OUTER GIB CLR: CONSTANT (ASF) DINKHONN SHUBBER SPRINGS: 6-3091 0.625 InCH S./FR. INTERTIE: INNER GIO CLR:.... NONE

ROLLER BEARING:

PAD SHEAR COEFF:

LAT DAMPER TYPE: AXL PARAL A-END: WHEEL CONTOUR:

AAR 6X11 TAPERED

3 DOT L: 3 DOT R

FG 2-2 SER 5

N/A

NONE

0.250 INCH....

N/A BUOT LI B DOT R

NOLE 3/32\* TO 9/32\*

ADAPTR PAD TYPE: LONG ADPTR CLR: LAT DAMPER RATE:

AXL PARAL B-END:

#### TEST: 050205K000001

TEST CONDUCTED AROUND RESONANT SPEED USING ASF RIDE CONTROL 70 TON CAPACITY TRUCK UNDER MECHANICAL REFRIGERATOR CAM WITH FULL GROSS RAIL LOAD PREVIOUS THATEIC OVER TEST TRACK!

PULL GROSS RATE LOAD
PREVIOUS TRAFFIC OVER TEST TRACKE.
THREE CAR TEST TRAIN
TEN HINUTES PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPTE ...
CYLINGRICAL WHEELS

D7 SPRINGS.
RESONANT SPEED IS 14 MPH.

```
TOOP TAPE NO.: __.
TEST DATE:
                                                        SEONCE. ON TAPE:
TEST START TIME:
PRECIPITATION:
                             12/4/75
                                                                                              1055 HRS
                             12/4/75
56 DEG-F :
UNKNOWN
 TEMPERATURE:
                                                                                              NO.JE
                                                               WIND DIRECTION:
RAIL SURF COND:
                                                                                              CALM
HUSIOITY:
WIND VELOCITY:
                             CALM
                                                                                              CLEAN AND DRY
LIME:
                             SCHELLVILLE BR.
                                                                 DIRECTION:
                                                                                              RAILROAD WEST
                                                                MILEPOST END:
MAX SPD PASS 1:
MAX SPD PASS 2:
MAX SPD PASS 3:
MAX SPD PASS 4:
MILEPOST START:
                             63.8833
                                                                                              63.7991
MIN SPU PASS 1:
MIN SPC PASS 2:
MIN SPC PASS 3:
MIN SPC PASS 4:
                             12 MPH
                                                                                              12 GPH
                              14 HPH
                                                                                              14 SPH
                                                                                              16 HPH
18 MPH
                             16 MPH
18 MPH
                                                                 MAX SPD PASS 5:
                                                                                              20 HPH
 HIN SPU PASS 5:
                             20 MPH
                                                                 RAIL WEIGHT:
CAR INITIALS:
RAIL TYPE:
                              JOINTED/SH
                                                                                              112 Le./YD.
RAIL LAID IN:
                             1952
                                                                                              SPEE
                              459997
                                                                 CAR TYPE:
                                                                                            ACCH. KEEFER
CAR NUMBER:
CAR ORIENTATION:
                                                                                             130000 POUNDS
101500 POUNDS
                             B-END FORWARD
89571 POUNDS
118400 POUNDS
                                                                 CAR CAPACITY:
CAR TARE WEIGHT:
LONDED WT B-END:
CEUTER GRAVITY:
                                                                 LOADED WT A-END:
                                                              LOADED WT A-EAD:
TOTAL WEIGHT:
TYPE OF LAOING:
TRUCK CENTERS:
TOTAL H.P.:
TOTAL TOWS FORE:
TOTAL TOWS AFT:
WHEEL BASE:
SPRUG GROUP IN:
STAT SPING COMP:
                                                                                              219900 POUNDS
                                                                                              BRAKE SHOES
                             66 INCHES
                             ыь INCHES ... ...
+15 FT. 0 IN.
ALD - LD. TRUCK:
NO. OF LOCO'S:
                                                                                              45 FT. 8.625 IN.
                                                                                              3000
NO. CARS FORE:
                                                                                              61
TRUCK TYPE: ASF RIDE CONTROL
SPRING GROUP OUT: 7 07
                                                                                              5 FT. 8 IN.
                                                                                              6 D7
                                                                                             B-8.13:A-8.50 IN
STEEL
                                                                STAT SPNG COMP:
ENTR PLATE MATL:
CNTR PLATE FRIC:
SIDE BEAR 8-END:
SIDE BEAR SUPPL:
SPR GROUP ININ:
CNTR PLATE DIA:
CNTR PLATE LUB:
                             14 INCHES
                             0.15 COEF FRICT
SIDE BEAR A-END:
SIDE BEAR CLEAR:
                                                                                              STUCKI DOUBLE
                             0.25 INCH
                                                                                              NONE
                                                                                              CONSTANT (ASF)
 SIDE BEAR PRELD:
                                                              SNUBBER TYPE: ...
                                                                                              UNKNOWN
SHUBBER SPRINGS:
                             8-3091
S./FR. INTERTIE:
INNER GIB CLR:
ADAPTR PAD TYPE:
LONG ADPTR CLR:
                             NONE
                                                                 OUTER GIB CLR:
                                                                                              0.625 INCH
                                                                ROLLER BEARING:
                             0.250_INCH____
                                                                                              AAR 6X11 TAPERED
                                                                 PAD SHEAR COEFF:
                                                                                              N/A
                              3/32" TO 9/32"
                                                                 LAT DAMPER TYPE:
                                                                                              NONE
                                                                                              3 997 L: 3 DOT R.
LAT DAMPER RATE:
AXL PARAL B-END:
WHEEL DIAMETER:
                             N/A
3 DOT LE 3 DOT R
                                                                 AXL PARAL A-END:
                                                                 WHEEL CONTOUR:
                              33.109 INCHES
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TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C
100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH
NO LOAD
PREVIOUS TRAFFIC OVER TEST TRACK:
THREE CAR TEST TRAIN
TEN MINUTES PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPT:
CYLINDRICAL WHEELS
RESONANT SPEED IS 22 MPH
DISREGARD NEGATIVE SIGNALS ON CHANNELS 42 AND 45

SEQUCE. ON TAPE: TOOP TAPE NO.: 0201 TEST START TIME: TEST DATE: 1/7/76 1245 HRS PRECIPITATION: NONE TEMPERATURE: 50 DEG-F FROM 90 DEG REL HUMIDITY: UNKNOWN WIND DIRECTION: 10 MPH RAIL SURF COND: CLEAN AND DRY WIND VELOCITY: RAILROAD WEST SCHELLVILLE BR. DIRECTION: LINE: MILEPOST START: 63.8956 MILEPOST END: 63.7991 MIN SPD PASS 1: MIN SPD PASS 2: MAX SPD PASS 1: 20 MPH 20 MPH MAX SPD PASS 2: 22 MPH 22 MPH MIN SPD PASS 3: 24 MPH MAX SPD PASS 3: 24 MPH MIN SPD PASS 4: 26 MPH MAX SPD PASS 4: 26 MPH MAX SPD PASS 5: 28 MPH MIN SPD PASS 5: 28 MPH RAIL TYPE: JOINTED RAIL WEIGHT: 112 LB./YD. RAIL LAID IN: CAR INITIALS: SP 1952 CAR TYPE: 60 FT. BOX CAR CAR NUMBER: 668043 CAR CAPACITY: B-END FORWARD 174000 POUNDS CAR ORIENTATION: CAR TARE WEIGHT: EMPTY WT B-END: 85760 POUNDS EMPTY WT A-END: 42340 POUNDS TOTAL WT: 43420 POUNDS 85760 POUNDS 62.00 INCHES TYPE OF LADING: NONE CENTER GRAVITY: ALD - LD. TRUCK: TRUCK CENTERS: 46 FT. 3.000 IN. +17 FT. 0 IN. TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: NO. OF LOCO'S: NO. CARS FORE: 3000 1 61 NO. OF CARS AFT: 23 TRUCK TYPE: BARBER S2C 5 FT. 10 IN. SPRNG GROUP IN: SPRNG GROUP OUT: 7 05 7 U5 SPR GROUP ININ: STAT SPNG COMP: B-9.751A-9.75 IN ο. CNTR PLATE DIA: CNTR PLATE LUB: SIDE BEAR A-END: 16 INCHES CNTR PLATE MATL: STEEL CNTR PLATE FRIC: UNKNOWN
SIDE BEAR B-END: STUCKI DOUBLE
SIDE BEAR SUPPL: NONE MOLYLUB STUCKI DOUBLE SIDE BEAR CLEAR: 0.250 INCH LOAD VARIABLE SIDE BEAR PRELD: 0 POUNDS SNUBBER TYPE: SNUB DAMP RATE: UNKNOWN SNUBBER SPRINGS: 8 B-432; 8 B-433 NONE OUTER GIB CLR: 0.625 INCH S./FR. INTERTIE: INNER GIB CLR: 0.250 INCH ROLLER BEARING: AAR 6.5X12 TAPER N/A ADAPTR PAD TYPE: PAD SHEAR COEFF: NONE 3/32" TO 9/32" LONG ADPTR CLR: LAT DAMPER TYPE: NONE AXL PARAL A-END: 2 DOT L: 1 DOT R LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT L: 3 DOT R WHEEL CONTOUR: FG 2~2 SER 5 T/P WHEEL DIAMETER: 35.8906 INCHES

#### TEST: 050302M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

THREE CAR TEST TRAIN
TEN MINUTES PRIOR TO PASS 1

NOMINAL NEW CONDITIONS EXCEPT:

CYLINDRICAL WHEELS

D7 SPRINGS
DISREGARD NEG SIGNALS ON CHNLS 42 AND 45
RESONANT SPEED IS 24 MPH

0205

TDOP TAPE NO.:

TEST DATE: 1/12/76 TEMPERATURE: 40 DEG-F HUMIDITY: UNKNOWN WIND VELOCITY: CALM SCHELLVILLE BR. LINE: MILEPOST START: 63.8956 20 MPH 22 MPH MIN SPD PASS 1: MIN SPD PASS 2: MIN SPD PASS 3: 24 MPH MIN SPD PASS 4: 26 MPH MIN SPD PASS 5: 28 MPH RAIL TYPE: JOINTED. RAIL LAID IN: 1952 CAR NUMBER: 668043 CAR ORIENTATION: B-END FORWARD CAR TARE WEIGHT: 85760 POUNDS EMPTY WT B-END: 43420 POUNDS 43420 POUNDS 62.00 INCHES CENTER GRAVITY: ALD - LD. TRUCK: +17 FT. 0 IN. NO. OF LOCO'S: 1 NO. CARS FORE: NO. OF CARS AFT: 1 TRUCK TYPE: BARBER S2C SPRNG GROUP OUT: 7 D7 SPR GROUP ININ: 0 . 16 INCHES CNTR PLATE DIA: CNTR PLATE LUB: MOLYLUB · SIDE BEAR A-END: STUCKI DOUBLE 0.250 INCH SIDE BEAR CLEAR: SIDE BEAR PRELD: 0 POUNDS SNUBBER SPRINGS: 8 B-432: 8 B-433 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A

AXL PARAL B-END: 3 DOT L: 3 DOT R

35.8906 INCHES

WHEEL DIAMETER:

SEGNCE. ON TAPE: TEST START TIME: 0815 HRS PRECIPITATION: NONE CALM WIND DIRECTION: RAIL SURF COND: CLEAN AND DRY DIRECTION: RAILROAD WEST MILEPOST END: 63.7991 MAX SPD PASS 1: 20 MPH MAX SPD PASS 2: MAX SPD PASS 3: 22 MPH 24 MPH MAX SPD PASS 4: 26 MPH MAX SPD PASS 5: 28 MPH RAIL WEIGHT: 112 LB./YD. CAR INITIALS: SP CAR TYPE: 60 FT. BOX CAR CAR CAPACITY: 174000 POUNDS EMPTY WT A-END: 42340 POUNDS TOTAL WT: 85760 POUNDS TYPE OF LADING: NONE TRUCK CENTERS: 46 FT. 3.000 IN. TOTAL H.P.: 3000 TOTAL TONS FORE: 61 TOTAL TONS AFT: 23 WHEEL BASE: 5 I 5 FT. 10 IN. SPRNG GROUP IN: 7 D7 STAT SPNG COMP: B-10,18;A-10,18 CNTR PLATE MATL: STEEL CNTR PLATE FRIC: 0.15
SIDE BEAR B-END: STUCE
SIDE BEAR SUPPL: NONE STUCKI DOUBLE SNUBBER TYPE: LOAD VARIABLE SNUB DAMP RATE: UNKNOWN OUTER GIB CLR: 0.625 INCH ROLLER BEARING: AAR 6.5X12 TAPER PAD SHEAR COEFF: N/A LAT DAMPER TYPE: NONE AXL PARAL A-END: 2 DOT L: 1 DOT R . WHEEL CONTOUR: FG 2-2 SER 5 T/P

#### TEST: 050303M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C 200 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO. 10a.)

--- RESONANT SPEED IS 24 MPH

TOOP TAPE NO.: TEST DATE: 0211 2/3/76 TEMPERATURE : 50 DEG-F HUMIUITY: UNKNOWII WIND VELOCITY: 7 MPH LINES SCHELLVILLE BR. MILEPOST START: 63.8956 MIN SPE PASS 1: HIM SPU PASS 2: 20 MPH 22 HPH 24 MPH MIN SPJ PASS 5: MIN SPU FASS 4: 26 APH MIN SPU FASS 5: 28 MPH RAIL TYPÉ: RAIL LAID IN: JOINTED 1952 CAR NUI BER: 668043 CAR ORIENTATION: B-END FORWARD 85760 POUNDS 43420 POUNDS 62.00 INCHES CAR TARE WEIGHT: EMPTY WT B-ENJ: CENTER GRAVITY: ALD - LD. THUCK: +17 FT. 0 IN. NO. OF LUCO'S: 40. CARS FURE: NO. UF CARS AFT: TRUCK TYPE: SPRIG GROUP CUT: BARBER SPC 7 13 SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: 16 INCHES HOLYLUB SIDE BEAR A-END: SIDE BEAR CLEAK: STUCKI DOUBLE 0.250 INCH SIDE BEAR PRELD: D POUNDS SIMBBER SPRINGS: S./FR. INTERTIE: INNER GIB CLR: AJAPTR PAD TYPE: LONG ADPTR CLR: 8 8-42118 B-422 NOIJE 0.250 INCH NONE 3/32" TO 9/32" LAT DAMPER RATE: AXL PARAL B-END: WHEEL DIAMETER: N/A 3 DOT L: 3 DOT R 35.8906 INCHES

SEONCE. ON TAPE: TEST START TIME: 1100 HRS PRECIPITATION: NONE WIND DIRECTION: RAIL SURF COND: FROM 180 DEG REL CLEAN AND DRY DIRECTION: RAILROAD WEST MILEPOST END: MAX SPD PASS 1: MAX SPD PASS 2: 63.7991 20 MPH 22 MPH MAX SPD PASS 3: 24 MPH 26 MPH MAX SPD PASS 4: MAX SPD PASS 5: 28 MPH 112 LB./YD. RAIL MEIGHT: CAR INITIALS: CAR TYPE: 60 FT. BOX CAR CAR CAPACITY: 174000 POUNDS EMPTY WT A-END: TOTAL WT: TYPE OF LADING: 42340 POUNDS 85760 POUNDS NUNE TRUCK CENTERS: 46 FT. 3.000 IN. TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: 3000 23 5 FT. 10 IN. SPRNG GROUP IN: 3 D3 STAT SPNG COMP: B-8.63:A-8.59 IN CNTR PLATE MATL: CNTR PLATE FRIC: STEEL . 0.15 SIDE BEAR B-END: SIDE BEAR SUPPL: STUCKI DOUBLE NONE SNUBBER TYPE: LOAD VARIABLE SNUB DAMP RATE: OUTER GIB CLH: ROLLER BEARING: UNKNOWN 0.625 INCH AAR 6.5X12 TAPER PAD SHEAR COEFF: LAT DAMPER TYPE: N/A NONE AXL PARAL A-END: 2 DOT LE 1 DOT R FG 2-2 SER 5 T/P

C-22

#### TEST: 050304M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO LOAD

PREVIOUS TRAFFIC OVER TEST TRACK:
THREE CAR TEST TRAIN
TEN MINUTES PRIOR TO PASSI
NOMINAL NEW CONDITIONS EXCEPT: CYLINDRICAL WHEELS FRICTION SNUBBERS

RESONANT SPEED IS 24 MPH DISREGARD NEGATIVE SIGNALS ON CHANNELS 42 AND 45

TOOP TAPE NO.: SEGNCE. ON TAPE: TEST START TIME: PRECIPITATION: 0199 1/6/76 1230 HRS TEMPERATURE: 50 DEG-F HUMIDITY: WIND DIRECTION: RAIL SURF COND: FROM 160 DEG REL RUKNOWN 6 HPH WIND VELOCITY: CLEAN AND DRY LINE: SCHELLVILLE BR. DIRECTION: RAILROAD WEST MILEPOST START: 63.8883 MILEPOST END: 63.7991 MAX SPD PASS 1: MAX SPD PASS 2: MIN SPD PASS 1: MIN SPD PASS 2: 24 MPH 24 MPH 26 MPH 26 MPH MAX SPD PASS 3: MAX SPD PASS 4: hax SPD PASS 5: MIN SPU PASS 3: MIN SPU PASS 4: 28 MFH 28 MPH 30 MPH: 30 MPH MIN SPD PASS 5: 32 MPH 32 MPH RAIL TYPE: RAIL LAID IN: RAIL WEIGHT: JOTHTED 112 LB./YD. 1952 CAR INITIALS: SP CAR NUMBER: CAR TYPE: 60 FT. BOX CAR 174000 POUNDS 668043 B-END FORWARD 85760 POUNDS 43420 POUNDS 62.00 INCHES CAR ORIENTATION: CAR CAPACITY: EMPTY WT A-END: TOTAL WT: TYPE OF LADING: CAR TARE WEIGHT: 42340 POUNDS 65760 POUNDS CENTER GRAVITY: NONE ALD - LD. TRUCK: +17 FT. 0 IN. TRUCK CENTERS: 46 FT. 3.000 IN. NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: 3000 61 1 BARBER S2C TRUCK TYPE: SPRNG GROUP OUT: 5 FT. 10 IN. 5 D5 B-10.06:A-10.06. WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: 5 D5 SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: ō 16 INCHES CNTR PLATE MATL: STEEL MOLYLUB CHTR PLATE FRICE 0.15 SIDE BEAR A-END: SIDE BEAR CLEAR: SIDE BEAR PRELD: STUCKI DOUBLE 0.250 INCH SIDE BEAR B-END: STUCKI DOUBLE SIDE BEAR SUPPLE NONE SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: LD. VAR./VOLUTE SHUBBER SPRINGS: S./FR. INTERTIE: INNER GIB CLR: NONE 0.625 INCH 0.250 INCH. ROLLER BEARING: AAR 6.5X12 TAPER ADAPTR PAD TYPE: LONG ADPTR CLR: NONE PAD SHEAR COEFF: N/A LAT DAMPER TYPE: .AXL PARAL A-END: 3/32" TO 9/32" NONE LAT DAHPER RATE: 2 DOT L: .1 DOT R AXL PARAL B-END: WHEEL CONTOUR: WHEEL DIAMETER: 35.8906 INCHES

TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH NO LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

THREE CAR TEST TRAIN TEN MINUTES PRIOR TO PASS1

NOMINAL NEW CONDITIONS EXCEPT:

CYLINDRICAL WHEELS HYDRAULIC SNUBBERS

RESONANT SPEED IS 26 MPH

TDOP TAPE NO.: -TEST DATE: 0197 1/5/76 TEMPERATURE: 48 DEG-F UNKNOWN HUMIDITY: WIND VELOCITY: CALM LINE: SCHELLVILLE BR. MILEPOST START: 63.8883 MIN SPD PASS 1: 24 MPH MIN SPD PASS 2: 26 MPH MIN SPD PASS 3: 28 MPH MIN SPD PASS 4: 30 MPH MIN SPD PASS 5: 32 MPH RAIL TYPE: JOINTED RAIL LAID IN: 1952 CAR NUMBER: 668043 B-END FORWARD CAR ORIENTATION: CAR TARE WEIGHT: 85760 POUNDS EMPTY WT B-END: 43420 POUNDS 62.00 INCHES 3 CENTER GRAVITY: ALD - LD. TRUCK: +17 FT. 0 IN. NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: BARBER S2C TRUCK TYPE: SPRNG GROUP OUT: 6 D5 SPR GROUP ININ: 6 D5 CNTR PLATE DIA: 16 INCHES CNTR PLATE LUB: MOLYLUB SIDE BEAR A-END: STUCKI DOUBLE SIDE BEAR CLEAR: SIDE BEAR PRELD: 0.250 INCH 0 POUNDS SNUBBER SPRINGS: 8 B-43214 H-7 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT LI 3 DOT R WHEEL DIAMETER: 35.8906 INCHES

SEQUCE. ON TAPE: TEST START TIME: PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPD PASS 1: MAX SPD PASS 2: MAX SPD PASS 3: MAX SPD PASS 4: MAX SPD PASS 5: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: EMPTY WT A-END: TOTAL WT: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: . ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: AXL PARAL A-END: WHEEL CONTOUR:

1400 HRS LIGHT RAIN CALM WET AND SANDED RAILROAD WEST 63.7991 24 MPH 26 MPH 28 MPH 30 MPH 32 MPH 112 LB./YD. SP 60 FT. BOX CAR 174000 POUNDS 42340 POUNDS 85760 POUNDS NONE 46 FT. 3.000 IN. 3000 61 23 5 FT. 10 IN. 6 D5 B-9.621A-9.62 IN STEEL UNKNOWN STUCKI DOUBLE NONE LOAD VAR/HYDRAU. UNKNOWN 0.625 INCH AAR 6.5X12 TAPER N/A NONE 2.DOT L: 1 DOT R FG 2-2 SER 5 T/P

## TEST: 050401M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK: . THREE CAR TEST TRAIN TEN MINUTES PRIOR TO PASS 1 NOMINAL NEW CONDITIONS EXCEPT: CYLINDRICAL WHEELS HYDRAULIC SNUBBERS

TEST DATE: 12/30/75 TEMPERATURE: 56 DEG-F HUMIDITY: NKNOWN WIND VELOCITY: 20 MPH LINE: SCHELLVILLE BR. MILEPOST START: 63.8883 MIN SPO PASS 1: MIN SPO PASS 2: 12 MPH 14 MPH MIN SPD PASS 3: MIN SPD PASS 4: 16 MPH 18 MPH MIN SPD PASS 5: 20 MPH RAIL TYPE: JOINTED RAIL LAID IN: 1952 CAR NUMBER: 668043 B-END FORWARD CAR ORIENTATION: 85760 POUNDS 132780 POUNDS CAR TARE WEIGHT: LUADED WT B-END: CENTER GRAVITY: 85.00 INCHES ALD - LD. TRUCK: +17 FT. 0 IN. NO. OF LOCO'S: 1 NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: BARBER S2C 6 D5 SPR GROUP ININ: 6 D5 CNTR PLATE DIA: CNTR PLATE LUB: SIDE BEAR A-END: 16 INCHES MOLYLUB STUCKI DOUBLE SIDE BEAR CLEAR: 0.250 INCH SIDE BEAR PRELD: 0 POUNDS SNUBBER SPRINGS: 8 B-432;4 H-7 S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT L: 3 DOT R WHEEL DIAMETER: 35.8906 INCHES

RESONANT SPEED IS 18 MPH

0195

TDOP TAPE NO .:

PRECIPITATION: WIND DIRECTION: RAIL SURF COND: DIRECTION: MILEPOST END: MAX SPD PASS 1: MAX SPD PASS 2: MAX SPD PASS 3: MAX SPD PASS 4: MAX SPD PASS 5: RAIL WEIGHT: CAR INITIALS: CAR TYPE: CAR CAPACITY: LOADED WT A-END: TOTAL WT: TYPE OF LADING: TRUCK CENTERS: TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: SPRNG GROUP IN: STAT SPNG COMP: CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: SIDE BEAR SUPPL: SNUBBER TYPE: SNUB DAMP RATE: OUTER GIB CLR: ROLLER BEARING: PAD SHEAR COEFF: LAT DAMPER TYPE: WHEEL CONTOUR:

SEGNCE. ON TAPE:

TEST START TIME: 1325 HRS

NONE

FROM 180 DEG REL

CLEAN AND DRY

RAILROAD WEST

63.7991 12 MPH 14 MPH 16 MPH 18 MPH 20 MPH 112 LB./YD. SP 60 FT. BOX CAR 174000 POUNDS 132180 POUNDS 264960 POUNDS BRAKE SHOES 46 FT. 3.000 IN. 3000 61 23 5 FT. 10 IN. 6 05 B-7.82 [A-7.82 IN STEEL UNKNOWN STUCKI DOUBLE LOAD VAR/HYDRAU. UNKNOWN 0.625 INCH AAR 6.5X12 TAPER N/A NONE AXL PARAL A-END: 2 DOT L: 1 DOT R FG 2-2 SER 5 T/P

CYLINDRICAL WHEELS

D7 SPRINGS

D7 SPRINGS
RESONANT SPEED IS 16 MPH

DISREGARD NEGATIVE SIGNALS ON CHANNELS 42 AND 45

TOOP TAPE NO.: 0173 TEST DATE: 12/17/75 TEMPERATURE: 52 DEG-F UNKNOWN . HUMIDITY: WIND VELOCITY: 15 MPH SCHELLVILLE BR. LINE: MILEPOST START: 63.8883 MIN SPD PASS 1: 12 MPH MIN SPD PASS 2: 14 MPH MIN SPD PASS 3: 16 MPH 18 MPH MIN SPD PASS 4: MIN SPD PASS 5: 20 MPH RAIL TYPE: JOINTED RAIL LAID IN: 1952 CAR NUMBER: 668043 B-END FORWARD CAR ORIENTATION: CAR TARE WEIGHT: 85760 POUNDS -LOADED WT B-END: 132780 POUNDS CENTER GRAVITY: 85.00 INCHES ALD - LD. TRUCK: +17 FT. 0 IN. NO. OF LOCO'S: NO. CARS FORE: NO. OF CARS AFT: TRUCK TYPE: BARBER S2C SPRNG GROUP OUT: 7 D7 SPR GROUP ININ: CNTR PLATE DIA: 16 INCHES CNTR PLATE LUB: MOLYLUB SIDE BEAR A-END: STUCKI DOUBLE 0.250 INCH . SIDE BEAR CLEAR: SIDE BEAR PRELD: 0 POUNDS 8 B-432; 8 B-433 SNUBBER SPRINGS: S./FR. INTERTIE: NONE INNER GIB CLR: 0.250 INCH. ADAPTR PAD TYPE: NONE 3/32" TO 9/32" LONG ADPTR CLR: LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT LI 3 DOT R WHEEL DIAMETER: 35.8906 INCHES

SEQUCE. ON TAPE: TEST START TIME: 1215 HRS PRECIPITATION: NONE WIND DIRECTION: FROM 10 DEG REL RAIL SURF COND: CLEAN AND DRY RAILROAD WEST DIRECTION: MILEPOST END: 63.7991 MAX SPD PASS 1: 12 MPH MAX SPD PASS 2: 14 MPH MAX SPD PASS 3: 16. MPH MAX SPD PASS 41 18 MPH MAX SPD PASS 5: 20 MPH RAIL WEIGHT: 112 LB./YD. CAR INITIALS: SP CAR TYPE: 60 FT. BOX CAR CAR CAPACITY: 174000 POUNDS LOADED WT A-END: 132180 POUNDS TOTAL WT: 264960 POUNDS TYPE OF LADING: BRAKE SHOES TRUCK CENTERS: 46 FT. 3.000 IN. TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: 3600 61 23 5 FT. 10 IN. SPRNG GROUP IN: 7 D7 STAT SPNG COMP: B-8.56 | A-8.56 CNTR PLATE MATL: CNTR PLATE FRIC: SIDE BEAR B-END: STEEL UNKNOWN ... STUCKI DOUBLE SIDE BEAR SUPPL: NONE SNUBBER TYPE: LOAD VARIABLE SNUB DAMP RATE: UNKNOWN OUTER GIB CLR: 0.625 INCH ROLLER BEARING: AAR 6.5X12 TAPER PAD SHEAR COEFF: N/A LAT DAMPER TYPE: NONE AXL PARAL A-END: 2 DOT L: 1 DOT R WHEEL CONTOUR: FG 2-2 SER 5 T/P

C-24

#### TEST: 050404M0D001

TEST CONDUCTED AROUND RESONANT SPEED USING BARBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH FULL GROSS RAIL LOAD PREVIOUS TRAFFIC OVER TEST TRACK:

THREE CAR TEST TRAIN
25 MIN PRIOR TO PASS 1
NOMINAL NEW CONDITIONS EXCEPT:

CYLINDRICAL WHEELS

D3 SPRINGS
RESONANT SPEED IS 18 MPH
CHANNEL 42 IS NEG .8 VOLT OFF ZERO

0188

12/22/75 47 DEG-F

UNKNOWN

WIND VELOCITY: CALM SCHELLVILLE BR. LINE: MILEPOST START: 63.8883 MIN SPD PASS 1: 12 MPH MIN SPD PASS 2: MIN SPD PASS 3: 14 MPH 16 MPH MIN SPD PASS 4: 18 MPH MIN SPD PASS 5: 20 MPH RAIL TYPE: JOINTED RAIL LAID IN: 1952 CAR NUMBER: 668043 CAR ORIENTATION: B-END FORWARD
CAR TARE WEIGHT: 85760 POUNDS
LOADED WT B-END: 132780 POUNDS CENTER GRAVITY: 85.00 INCHES ALD - LD. TRUCK: +17 FT. 0 IN. NO. OF LOCO'S: 1 NO. CARS FORE: 1 NO. OF CARS AFT: TRUCK TYPE: SPRNG GROUP OUT: BARBER S2C 7 D3 SPR GROUP ININ: CNTR PLATE DIA: CNTR PLATE LUB: n 16 INCHES MOLYLUB SIDE BEAR A-END: STUCKI DOUBLE SIDE BEAR CLEAR: SIDE BEAR PRELD: 0.250 INCH 0 POUNDS SNUBBER SPRINGS: 8 B-421; 8 B-422 S./FR. INTERTIE: NONE INNER GIB CLK: 0.250 INCH ADAPTR PAD TYPE: NONE LONG ADPTR CLR: 3/32" TO 9/32" LAT DAMPER RATE: N/A AXL PARAL B-END: 3 DOT L: 3 DOT R WHEEL DIAMETER: 35.8906 INCHES

TDOP TAPE NO.: TEST DATE:

TEMPERATURE:

HUMIDITY:

SEGNCE. ON TAPE: TEST START TIME: 0925 HRS PRECIPITATION: LIGHT FOG WIND DIRECTION: CALM RAIL SURF COND: CLEAN AND DRY DIRECTION: RAILROAD WEST 63.7991 MILEPOST END: MAX SPD PASS 1: 12 MPH MAX SPD PASS 2: 14 MPH MAX SPD PASS 3: 16 MPH MAX SPD PASS 4: 18 MPH MAX SPO PASS 5: 20 MPH RAIL WEIGHT: 112 LB./YD. . CAR INITIALS: SP CAR TYPE: 60 FT. BOX CAR CAR CAPACITY: 174000 POUNDS LOADED WT A-END: 132180 POUNDS TOTAL WT: 264960 POUNDS TYPE OF LADING: BRAKE SHOES TRUCK CENTERS: 46 FT. 3.000 IN. TOTAL H.P.: TOTAL TONS FORE: TOTAL TONS AFT: WHEEL BASE: 3000 61 23 5 FT. 10 IN. SPRNG GROUP IN: 3 D3 STAT SPNG COMP: B-7.69:A-7.69 IN CNTR PLATE MATL: STEEL
CNTR PLATE FRIC: UNKNOW
SIDE BEAR B-END: STUCK UNKNOWN STUCKI DOUBLE SIDE BEAR SUPPL: NONE SNUBBER TYPE: LOAD VARIABLE SNUB DAMP RATE: UNKNOWN OUTER GIB CLR: 0.625 INCH ROLLER BEARING: AAR 6.5X12 TAPER

PAD SHEAR COEFFE N/A

WHEEL CONTOUR:

LAT DAMPER TYPE: NONE
AXL PARAL A-END: 2 DOT L: 1 DOT R

FG 2-2. SER 5 T/P

# ST: 050405M000U1

TEST COMPUCETD AROUND RESOMANT SPEED USING BAPBER S2C 100 TON CAPACITY TRUCK UNDER A SIXTY FT. BOX CAR WITH FULL GROSS RAIL LOND THE FILE OVER TEST TRACK!

THREE CAR TEST TRAIN FIVE HINDTES PRIOR TO PASS 1 NOMINGL ME. CONDITIONS EXCEPTA

SEQUEE. ON TAPE: .1	ART.	PITATION: NOME	: CALM	COND: CLEAN AND	::	T END: 63.	PASS 1: 12	SPD PASS 2: 14	SPD PASS 3: 16	PASS 4: 13	5: 20 M/H	WEIGHT:	INITIALS: SP	TYPE: 60 FT.	PACITY: 174000	D WT A-END: 132160	r: 264960	BRAKE S	CENTERS:	H.P.	Tous	TONS AFT: 23	BASE: 5	G GROUP IN:	SPING COMP:	PLATE MATL: STEEL	PLATE FRIC:	HEAR B-END:	<u>:</u>	PE:	RATE: UNKNO	. 0.625 INCH	ROLLER BEARING: AAR 6.5x12 TA	PAD SHEAR COEFF: N/A	TYPE: NONE	0 7 10	MMEEL CONTOUR: FG 2-2 SER 5	
0191	12/20/75	42 DEG-F	UNKNOWN	CALM	SCHELLVILLE 3R.	65.43.3	12 iiph	14 IIPH .	16 PH	To TIPH	20 HPH	JOINTED	1952	a64043	8-ENG FORWARD	85760 POJMDS	152760 POUNDS	65.00 INCHES	+17 FT. D IN.		**************************************		HARBER S2C	7 05		16 INCHES	40LYLUB	STUCKI DOUBLE	0.250 INCH	1	o B-4321 8 8-435	HO1/E	0.250 INCH	NONE	3/32" TO. 9/32"	N/A	3 DOT LE 3 DOT N	55.8906 INCHES
TOOP TAPE NO.:	TEST DATE:	TE.PERATURE:	HULLDITY	Al:: J VELOCITY:	. III	5	PASS		SPL	SPL	HIR SPO PASS 5:		RAIL LAID IN:		CAR ORIENTATIONS	CAR TANE WEIGHTS	LOADED WT 8-END:	CE.ITER GRAVITY:	ALU - LD. TAUCK:		CARS FOR		TRUCH TYPE:		ROUP 1	PLATE.		BEAR				S./FR. INTERTIE:	INTER GIB CLR:	AJAPTH PAD TYPE:	LONG AUPTR CLR:	LAT DAMPER-KATES		WHEEL JIANETER:

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