

**DATA REPORT ON DRILLED SHAFT
LOAD TESTING (OSTERBERG METHOD)**

Wahoo South Connector – Wahoo, Nebraska

Prepared for: **Hawkins Construction**
2512 Deer Park Boulevard
Omaha, NE 68105

Attention: **Mr. Jim Gregory**
Fax: **402-342-3221**

PROJECT NUMBER: LT-8810, September 11, 2001

Head Office:
2631-D NW 41st Street, Gainesville, Florida 32606

Telephone:
(352) 378-3717
1-800-368-1138

Fax:
(352) 378-3934

Regional Offices:
785 The Kingsway, Peterborough, Ontario, Canada K9J 6W7
5420 S. Klee Mill Road, Ste. 4, Sykesville, Maryland 21784

(705) 749-0076
(410) 552-1979
1-800-436-2355

(705) 743-6854
(410) 552-1843

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September 10, 2001

Hawkins Construction
2512 Deer Park Boulevard
Omaha, NE 68105

Attention: Mr. Jim Gregory

Data Report: Wahoo South Connector – Wahoo, Nebraska

Location: Production Test Shaft 1

LOADTEST, Inc. performed an Osterberg Cell load test for Hawkins Construction on Production Test Shaft 1 (LTI project LT-8810). The test was carried out on September 5, 2001 by LOADTEST, Inc. under the direction of Mr. Robert Simpson and Mr. David Jakstis. The data and a summary of the results are contained within this Data Report.

Please note that some of the information contained in this report is based on data (i.e. shaft diameter, elevations and concrete strength) provided by others. The engineer, therefore, should come to his or her own conclusions with regard to the analyses as they depend on this information. In particular, LOADTEST, Inc. typically does not observe and record drilled shaft construction details to the level of precision that the project engineer may require. In many cases, we may not be present for the duration of shaft construction. Since construction technique can play a large role in determining the load bearing capacity of a drilled shaft, the engineer should pay close attention to the drilled shaft construction details that were recorded elsewhere.

We trust that this information will meet your current project needs. If you have any questions, please do not hesitate to contact us at (800) 368-1138.



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SITE CONDITIONS AND TEST SHAFT INSTALLATION

Site Sub-surface Conditions: The sub-surface stratigraphy at the test shaft location is reported to consist of soft alluvial clays down to elevation +1154 feet (+351.7 meters). Material underlying the upper clays to approximate elevation +1115 feet (+339.9 meters) is reported to consist of sandy alluvial soils with clayey and gravelly layers. Highly weathered sandstone and shale layers extended down to elevation +1093 feet (+333.1 meters) and are underlain by moderately weathered shale that transitioned to slightly weathered shale at an undetermined depth. Logs of borings indicating conditions near the shaft are presented in Appendix F. Detailed geologic information can be obtained from the Nebraska Department of Roads.

Test Shaft Construction: Hawkins Construction excavated the production test shaft on August 29, 2001. Assembly and installation of the O-cell™ and instrumentation was carried out under the direction of Mr. David Jakstis of LOADTEST, Inc. The test shaft was constructed wet using polymer with a total length of 69.1 feet (21.06 meters) extending to a tip elevation of +1121.3 feet (+341.76 meters). The shaft was started with a 78-inch (1981-mm) O.D. temporary casing and a 74-inch (1880-mm) O.D. permanent CMP was inserted after the drilling progressed 10 feet (3.05 meters). An auger was used for drilling the shaft and the shaft bottom was cleaned with a bucket after drilling reached completion. The reinforcing cage with attached cell was inserted in the shaft and a seating of layer of concrete was placed in the base of the shaft below the cell with the tremie pipe. The remainder of the concrete was continually pumped through the tremie pipe until the top of the concrete reached an elevation of +1190.4 feet (+362.82 meters). The outer temporary casing was removed when the concrete level approached the casing's tip. The Nebraska Department of Roads and Terracon, Inc. observed construction of the shaft.

Shaft Instrumentation: The test assembly included a single 21-inch (533-mm) O-cell™. The base of the O-cell™ assembly was located 2.8 feet (0.85 meters) above the tip of shaft. A pressure vs. load calibration of the O-cell™ was carried out to 2500 kips (11.12 MN) by American Equipment and Fabricating Corporation prior to delivery to the test site (see Appendix B). Standard O-cell™ instrumentation included three LVWDTs (Linear Vibrating Wire Displacement Transducers - Geokon Model 4450 series) positioned between the lower and upper plates to measure O-cell™ expansion (Tables 3 and 7). Two lengths of ½-inch (13 mm) steel pipe (180 degrees opposed) were attached to the test shaft assembly to measure compression of the shaft between the cell and the top of the shaft with traditional telltales.

Three levels of two sister bar vibrating wire strain gages were installed in the shaft above the base of the O-cell™ assembly. Details concerning the strain gage placement appear in Table B and Figure A. The strain gages were used to



assess the side shear load transfer of the shaft above the Osterberg cell. The strain gages were positioned as recommended by LOADTEST, Inc. and approved by Terracon, Inc.

The test shaft assembly also included two lines of steel pipe, starting at the top-of-shaft and terminating at the top of the bottom plate to vent the break in the shaft between upward and downward movement and the resulting annular void. If desired they permit the application of excess fluid pressure to reduce the possibility of soil entering the void. They also provide access for any final grouting to fill the void after completion of testing.

TESTING

Test Arrangement: Telltales located between the top of the O-cell™ and the top of the shaft were provided and installed in pre-installed steel pipe (see above). LVDTs (RDP) at the top of shaft were attached to the traditional telltales. Two LVDTs attached to a reference beam were provided to measure the top of shaft movement. The reference beam consisted of two 14 inch by 40 foot H-beams. The beams were supported at each end by concrete barricades placed perpendicular to the reference beams. The beams were connected together by welding cross beams on either side of the shaft perpendicular to the main beams. The beam was fully protected (shaded) by a tarp over a frame. An automated Leica surveying level (NA3003) was provided in order to monitor the top of shaft independently to a precision of 0.0004 inches (0.01 mm).

Both a Bourdon-type pressure gage (0-10,000 psi) and a vibrating wire pressure transducer were used to measure the pressure applied to the O-cell™ at each load interval. We used the Bourdon pressure gage for setting and maintaining loads and for data analysis. The transducer readings were used for real time plotting and as a check on the Bourdon gage. There was close agreement between the Bourdon gage and the pressure transducer.

Data Acquisition: All of the movement indicators, LVWDTs and strain gages were connected to a data logger (Data Electronics - Model 615 Datataker®). The logger, in turn was connected to a laptop computer. This arrangement allowed LVDT, LVWDT and strain gage readings to be recorded and stored automatically at 30 second intervals during the test. It also allowed the automatic importation of all test data into a laptop computer for real-time display and additional data back-up. The Leica (NA3003) data was imported real-time to a lap top computer set to the same time as the data logging system.

Note: Calibrations for all instrumentation used during this test are available. Calibrations of O-cells, strain gages and LVWDTs are included in Appendix B.

Testing Procedures: We applied the load increments using the Quick Load Test Method (ASTM D1143), holding each successive load increment constant for four minutes by manually adjusting the O-cell™ pressure. We used



approximately one minute to move between increments. The data logger automatically recorded the instrument readings every 30 seconds, but herein we report only the one, two, three and four minute readings during each increment of maintained load. The various plotted results generally use the one, two, three and four minute readings. The creep limit plots use movement difference between the two and four minute readings.

As with all our tests, we begin the load test by pressurizing the O-cell™ in order to break the tack welds that hold the cell closed (for handling and construction of the shaft) and to form the fracture plane in the concrete surrounding the base of the O-cell™. After the break occurs, we immediately release the pressure and then begin the test. Zero readings for all instrumentation are taken prior to the preliminary weld-breaking load-unload cycle, which in this case involved a maximum applied pressure of 1400 psi (9.66 MPa).

The Osterberg cell load test was conducted as follows: The 21-inch (533-mm) diameter O-cell™, with its base located 2.8 feet (0.85 meters) above the tip of shaft was pressurized to assess the base resistance below the O-cell™ assembly and the side shear above the O-cell™ assembly. The O-cell™ was pressurized in 15 loading increments to 7500 psi (51.7 Mpa) resulting in a bi-directional load of 1933 kips (8.60 MN). The loading was halted after load interval 1L-15 because the side shear was approaching ultimate capacity. The O-cell™ was then reloaded in 4 loading increments to a bi-directional O-cell™ load of 1546 kips (6.88 MN) at 2L-4 in order to demonstrate that no weakening of the shaft occurred as a result of the load test.



SUMMARY AND RESULTS

General: The loads applied by the O-cell™ act in two opposing directions, resisted by side shear above the O-cell™ and by base resistance below the O-cell™. Gross, or applied O-cell™ load is defined as load applied above and below the O-cell™ as calculated from the cell's calibration. Net load is defined as the O-cell™ load minus the buoyant weight of the shaft above the cell for upward movements. Net load is used in this report when analyzing average net unit shear values above the cell and also when reconstructing an equivalent top load curve for top loaded compression shafts. For this test we calculated a buoyant weight of 183 kips (0.81 MN).

The top of shaft movement depends on the reference beam movement. The beam was not monitored during the test. Instead, the top of shaft was monitored independently with a digital level (NA3003). There was very close agreement between the two independent measurements indicating little or no beam movement (Appendix G).

Side Shear: The maximum upward net load applied to the side shear was 1,750 kips (7.78 MN) which occurred at load interval 1L-15 (Tables 3 and 7, Figure 1). At this loading, the total upward movement of the top of O-cell™ assembly was 1.43 inches (36.2 mm). The following net unit side shear estimates are based on the strain gage data which appear in Tables 4 and 8 and the shaft stiffnesses computed below.

At the time of testing, the concrete unconfined compressive strength was reported to be 4,670 psi (32.2 Mpa). We used the ACI formula ($E_c = 57000\sqrt{f'_c}$) to calculate an elastic modulus for the concrete. This, combined with the area of reinforcing steel, was used to determine a weighted average shaft stiffness of 15,300,000 kips (67,900 MN) for the nominal shaft. The unit stiffnesses vary somewhat throughout the shaft due to diameter and percent steel variations. Therefore different stiffnesses are used when computing load from strain gages. The various stiffnesses are given in Table B. Estimated net unit side shear values for the shaft based on the strain gage data, estimated shaft stiffnesses and shaft area are as follows:

Table A: Net Unit Side Shear Values (Based on Net Loads)

Load Transfer Zone	Direction* of Loading	Load Increment	Net Unit Side* Shear
Top of Shaft to Strain Gage Level 3	↑	1L-15	0.52 ksf (25 kPa)
Strain Gage Level 3 to Strain Gage Level 2	↑	1L-15	1.42 ksf (68 kPa)
Strain Gage Level 2 to Strain Gage Level 1	↑	1L-15	1.40 ksf (67 kPa)
Strain Gage Level 1 to O-cell™	↑	1L-15	7.41 ksf (355 kPa)

* For upward loaded shear, the buoyant weight of shaft in each zone has been subtracted from the load shed in the respective zone.



Note: Net unit shear values derived from the strain gages above the O-cell™ assembly may not be ultimate values. See Figure E-1 for net unit shear vs. upward O-cell™ displacement plots.

Side shear load distribution curves generated from strain gage data are shown in Figure 3. A unit side shear value for the shaft between the Level 1 Strain Gages and the O-cell™ was calculated for 1L-15 to obtain an estimate of the base shear component of resistance to the downward movement below the O-cell™.

End Bearing: The maximum O-cell™ load applied to the base of the shaft was 1933 kips (8.60 MN) which occurred at load interval 1L-15 (Tables 3 and 7, Figure 1). At this loading, the total downward movement of the O-cell™ base was 0.96 inches (24.5 mm). The base resistance includes a small component of base shear which must be subtracted to obtain unit end bearing values. The shear component of resistance for the 2.8 feet (0.85 meter) shaft base below the O-cell™ is calculated to be 357 kips (1.59 MN) assuming a unit side shear value of 7.41 ksf (355 kPa) and a shaft diameter of 66 inches (1676 mm). The maximum applied load to end bearing is then 1576 kips (7.01 MN) and the end-bearing pressure applied at the tip of the shaft is calculated to be 66.3 ksf (3,180 kPa).

Creep Limit: See Appendix D for our O-cell™ method for determining creep limit. The side shear creep data (Tables 3 and 7) indicate that a creep limit of 1370 kips (6.1 MN) was reached at a movement of 0.28 inches (7.1 mm) (Figure 4). The combined end bearing and lower side shear creep data (Tables 3 and 7) indicate that no creep limit was reached at a movement of 0.96 inches (24.5 mm) (Figure 5). A top loaded shaft will begin significant creep when both components begin creep movement. This will occur at the maximum of the movements required to reach the creep limit for each component. We believe that significant creep for this shaft will not begin until a top loading exceeds 3420 kips (15.2 MN) by some unknown amount.

Equivalent Top Load: Figure 2 presents the equivalent top load-settlement curve. The unadjusted lighter curve, described in Procedure Part I of Appendix C, was generated by using the measured upward top of O-cell™ and downward base of O-cell™ data. Because it can be an important component of the settlements involved, the equivalent top load curve includes an adjustment for the additional elastic compression which would occur in a top-load test. The darker curve as described in Procedure Part II of Appendix C includes this adjustment.

The test shaft was loaded to a combined side shear and end bearing of 3683 kips (17.20 MN). For a top loading of 2150 kips (9.56 MN), the adjusted test data indicate this shaft would settle approximately 0.50 inches (12.7 mm) of which 0.06 inches (1.4 mm) is estimated elastic compression. The equivalent top load curve is shown in Figure 2. Note: as explained previously, the equivalent top load

curve applies to a loading duration of four minutes. Creep effects will reduce the ultimate resistance of both components and increase pile top movement for a given loading over longer times. The Engineer can estimate such additional creep effects by suitable extrapolation of time effects using the creep data presented herein. However, our experience suggests that such corrections are small and perhaps negligible for top loadings below the creep limit indicated above.

Shaft Compression Telltales: The measured maximum shaft compression, averaged from 2 telltales, is 0.022 inches (0.55 mm). Using the shaft nominal diameters (Table B and Figure A) and a weighted average shaft stiffness of 15,300,000 ksi (67,900 MPa) for the shaft and the load distribution in Figure 2, we calculated an elastic compression of 0.024 inches (0.62 mm) over the length of the compression telltales. We believe this excellent agreement provides good evidence that the assumed shaft stiffnesses are reasonable and that the O-cell™ loaded the shaft in accord with the calibration used herein.

Bottom Plate Tilt: The three LVWDTs measuring O-cell™ expansion allow us to evaluate the tilt of the bottom plate. Tables 3 and 7 show these measurements. We calculate a maximum tilt angle of 0.19 degrees and a total tilt of 0.22 inches (5.6 mm) across the nominal 66-inch (1680-mm) diameter of the bottom of the shaft at the 1L-15 maximum loading, assuming only the bottom plate tilts.

Need to Grout O-cell™: Since the test shaft is intended to carry structural loading (a “production shaft”), the contractor needs to fill the annular void in the shaft created outside the cell as a result of the expansion of the cell. The O-cell™ itself should also be filled. The shaft includes the piping to permit filling the O-cell™ and void with grout. If not already grouted, we recommend that this be done as soon as possible.

The analysis provided in this report is based on data (i.e. shaft diameter, elevations and concrete strength) provided by others. The engineer, therefore, should come to his/her own conclusions with regard to the analytical information.

Prepared for LOADTEST, INC. by

D. Wilson
for Robert Simpson, M.S.E.,
For LOADTEST Inc.

D. Wilson
for David Jakstis, B.C.E.
For LOADTEST Inc.

Reviewed by

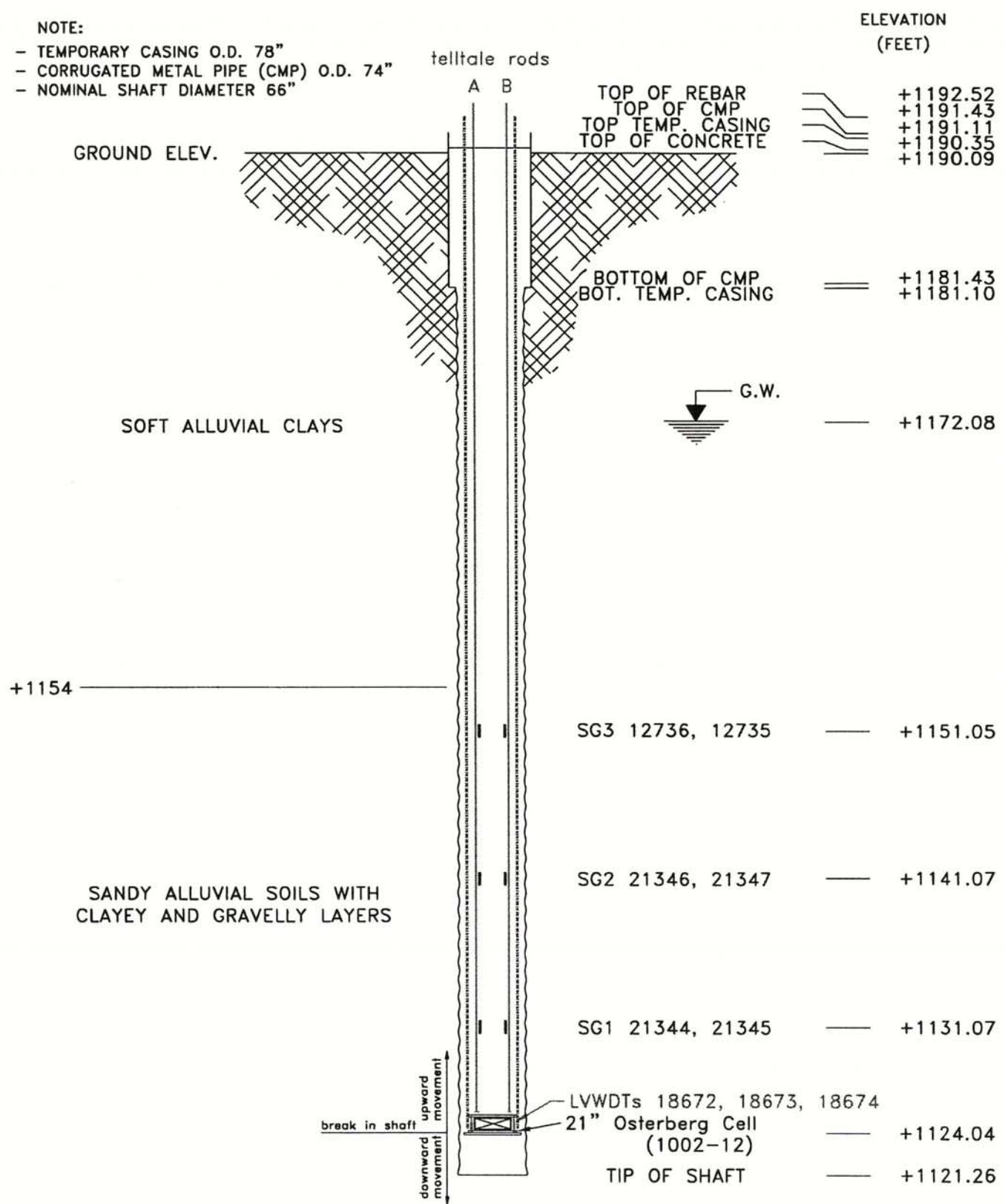
J. A. Hayes
J. A. Hayes, P. Eng., D.I.C.
President

Denton Kort
Denton Kort
For LOADTEST Inc.



NOTE:

- TEMPORARY CASING O.D. 78"
- CORRUGATED METAL PIPE (CMP) O.D. 74"
- NOMINAL SHAFT DIAMETER 66"



2631-D NW 41st St.
Gainesville, FL 32606
Phone 800-368-1138
FAX (352) 378-3934

SCHEMATIC SECTION OF
TEST SHAFT

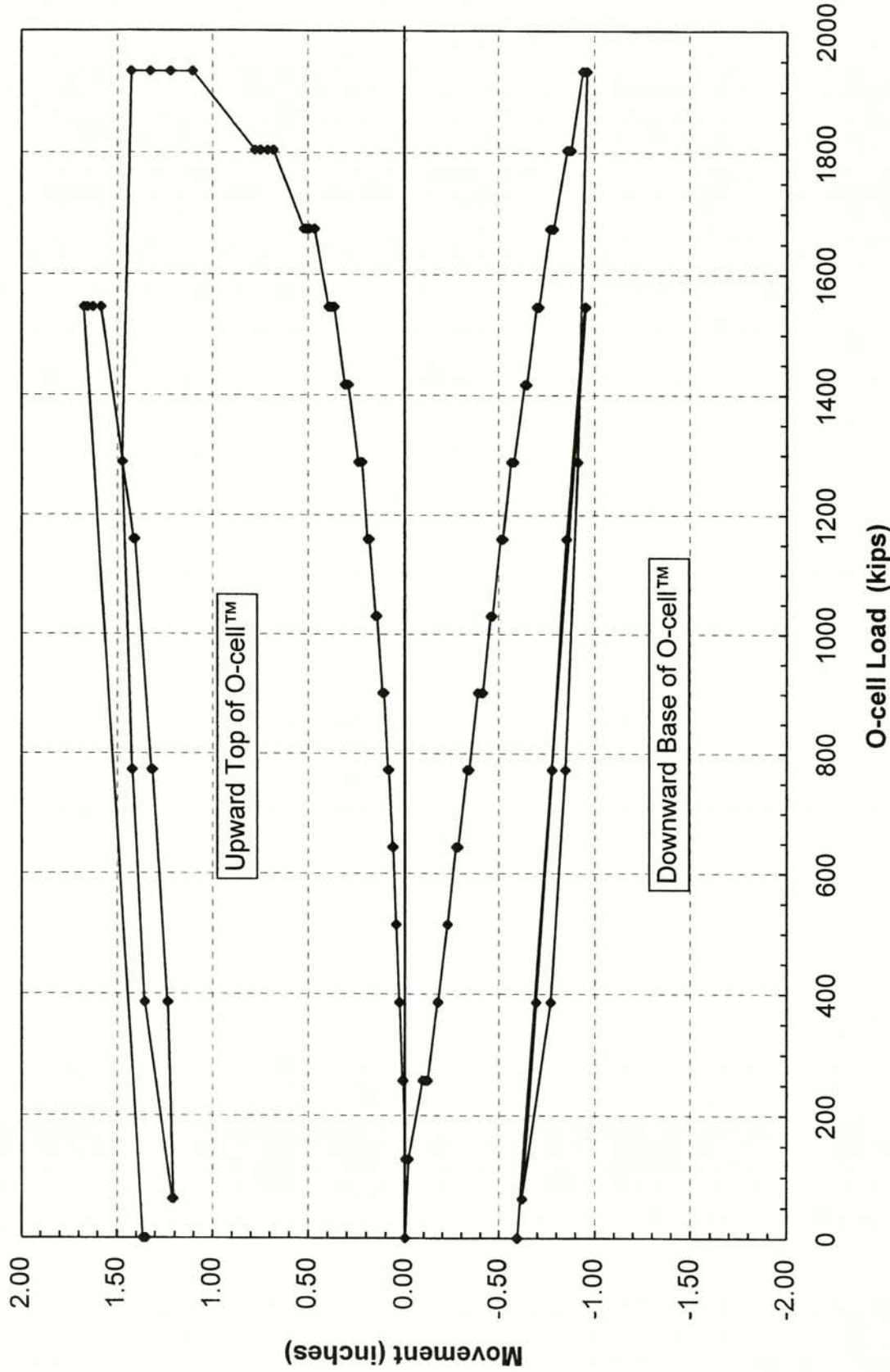
LT-8810
Wahoo South Connector
Wahoo, Nebraska
FIGURE A

**TABLE B: SUMMARY OF DIMENSIONS, ELEVATIONS, AREAS & PROPERTIES
FOR ANALYSIS PURPOSES**

Shaft:			
Nominal shaft diameter: EL+363.15 to EL+360.0	=	74 inches	1880 mm
Nominal shaft diameter: EL+360.0 to EL+341.76	=	66 inches	1676 mm
O-cell size: (Serial no.: 1002-12)	=	21 inches	540 mm
Length of concrete from break at base of cell to tip	=	2.8 feet	0.85 meters
Shaft shear area from break at base of cell to tip	=	48.2 feet ²	4.48 meters ²
Shaft base area	=	23.8 feet ²	2.21 meters ²
Weight of shaft from break at base of cell to top of shaft	=	182.9 kips	0.81 MN
Estimated shaft unit stiffness: EL+363.15 to EL+360.0	=	1.92E+07 kips	85.4 GN
Estimated shaft unit stiffness: EL+360.0 to EL+347.28	=	1.45E+07 kips	64.6 GN
Estimated shaft unit stiffness: EL+347.28 to EL+345.23	=	1.51E+07 kips	67.2 GN
Estimated shaft unit stiffness: EL+345.23 to EL+341.76	=	1.45E+07 kips	67.2 GN
Elevation of top of shaft concrete	=	+1190.4 feet	+362.8 meters
Elevation of ground surface	=	+1190.1 feet	+362.7 meters
Elevation of break at base of O-cell™	=	+1124.0 feet	+342.6 meters
Elevation of shaft tip	=	+1121.3 feet	+341.8 meters
Casings:			
Elevation of top of inner permanent casing: 74 O.D.	=	+1191.4 feet	+363.2 meters
Elevation of top of outer temporary casing: 78 O.D.	=	+1191.1 feet	+363.1 meters
Elevation of bottom of outer temporary casing: 78 O.D.	=	+1181.1 feet	+360.0 meters
Elevation of bottom of inner permanent casing: 74 O.D.	=	+1181.4 feet	+360.1 meters
Compression Sections:			
Elevation of top of telltale used for shaft compression	=	+1192.4 feet	+363.4 meters
Elevation of bottom of telltale used for shaft compression	=	+1125.2 feet	+343.0 meters
Strain Gages:			
Elevation of strain gage Level 3	=	+1151.0 feet	+350.8 meters
Elevation of strain gage Level 2	=	+1141.1 feet	+347.8 meters
Elevation of strain gage Level 1	=	+1131.1 feet	+344.8 meters
Miscellaneous:			
Top plate diameter	=	56.2 inches	1427 mm
Top plate thickness	=	2.0 inches	50.8 mm
Bottom plate diameter	=	59.2 inches	1504 mm
Bottom plate thickness	=	2.0 inches	50.8 mm
Water elevation	=	+1172.1 feet	+357.3 meters
LVWDT radii	=	28.5 inches	723.9 mm
LVWDT orientation	=	0, 180, 270	degrees
Vertical re-bar size	=	# 11	
Hoop re-bar size	=	# 4	
Number of vertical bars	=	32	

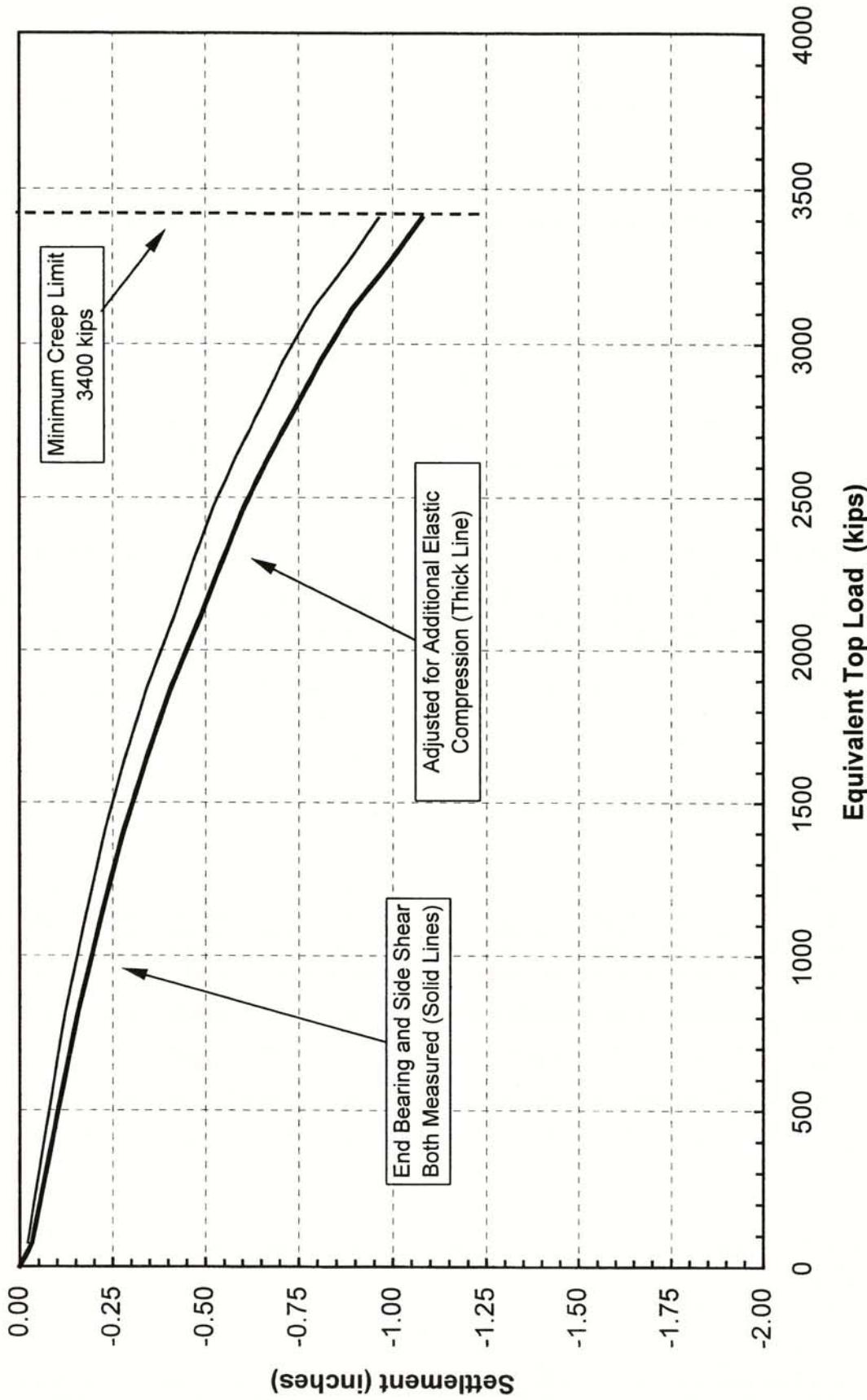
Osterberg Cell Load-Movement Curves

Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1



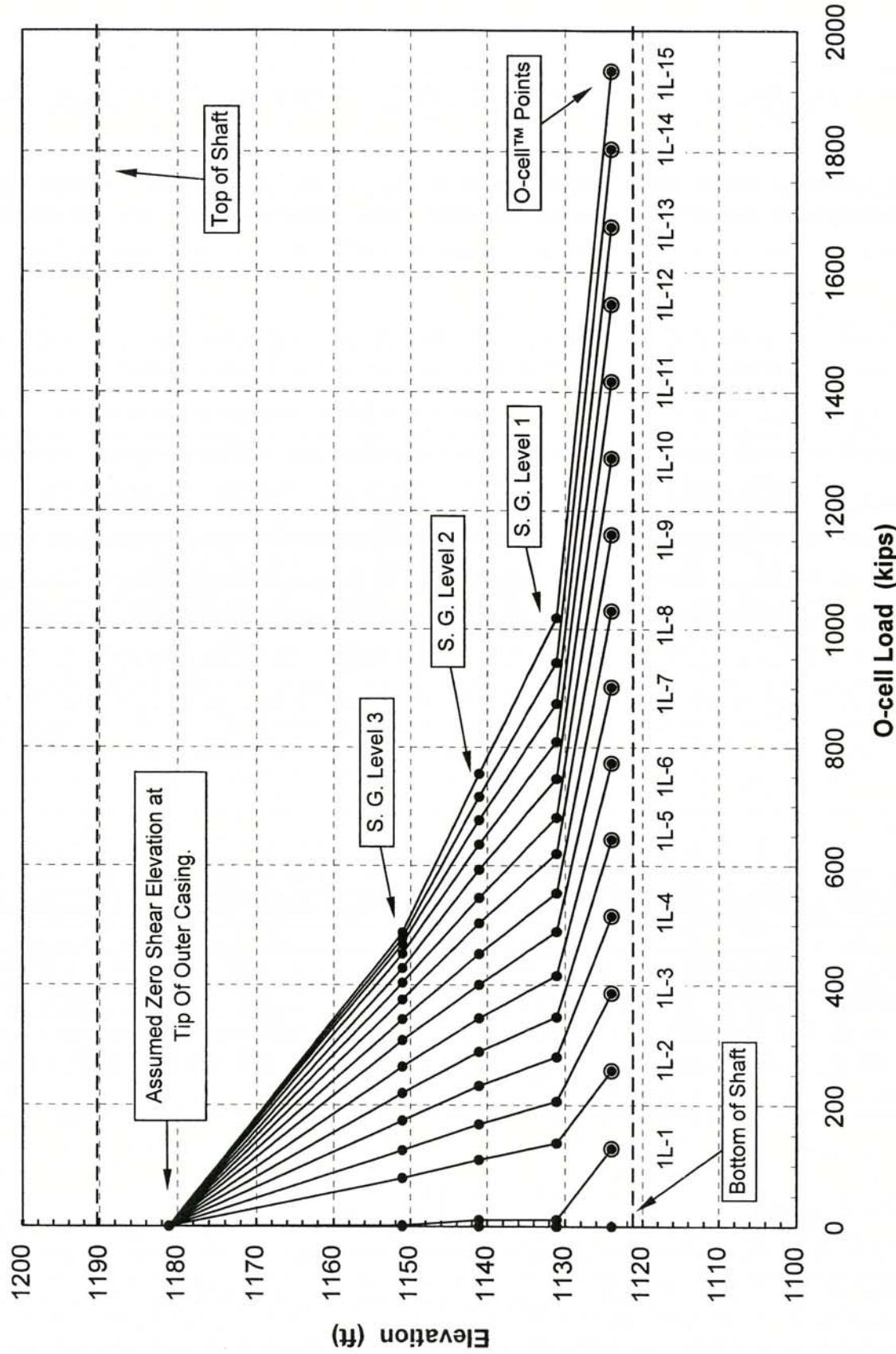
Equivalent Top Load-Movement Curves

Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

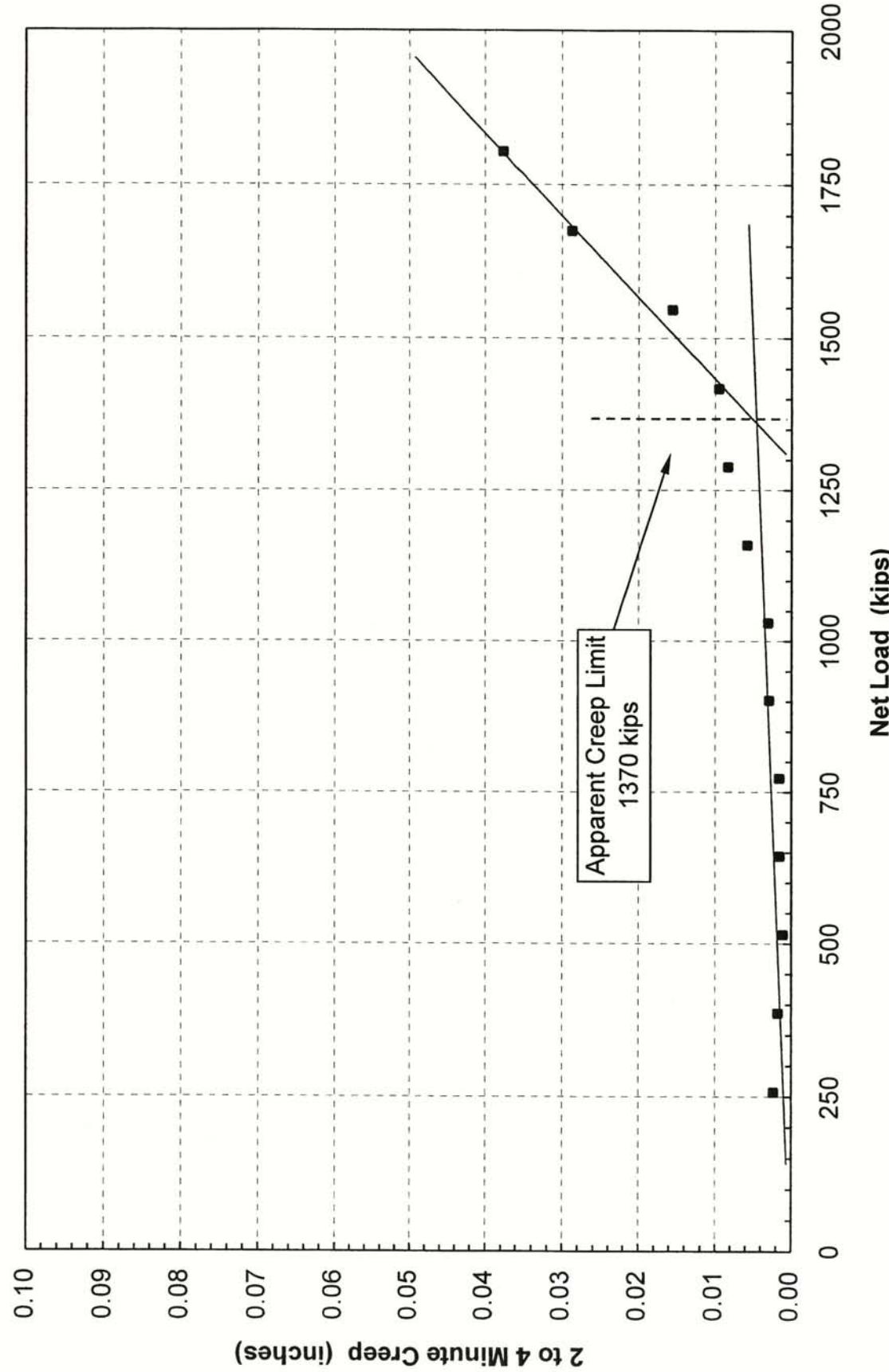


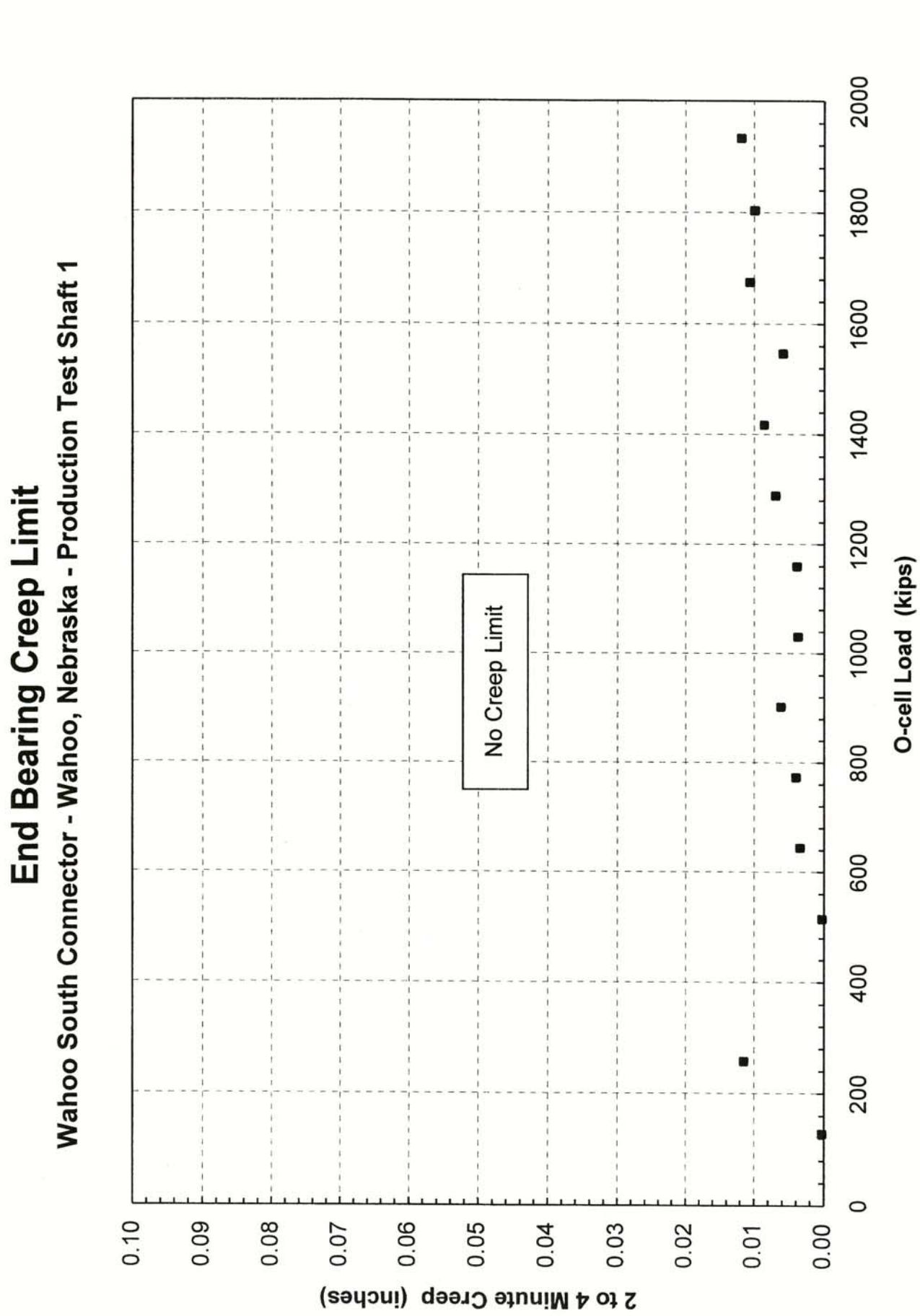
Strain Gage Load Distribution Curves

Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1



Side Shear Creep Limit
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1





APPENDIX A

FIELD DATA & DATA REDUCTION



Gross and Net O-cell™ Loads
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time (h:m:s)	Time After Start Minutes	O-cell™ Pressure (psi)	Gross O-cell™ Load Pos. A1 (kips)	Gross Load Pressure (kips)	Net Load (kips)
1L-0	14:30:00	0	0	0	0	0
1L-1	14:51:00	1	500	128	128	0
1L-1	14:52:00	2	500	128	128	0
1L-1	14:53:00	3	500	128	128	0
1L-1	14:54:00	4	500	128	128	0
1L-2	14:56:00	1	1000	257	257	74
1L-2	14:57:00	2	1000	257	257	74
1L-2	14:58:00	3	1000	257	257	74
1L-2	14:59:00	4	1000	257	257	74
1L-3	15:01:00	1	1500	386	386	203
1L-3	15:02:00	2	1500	386	386	203
1L-3	15:03:00	3	1500	386	386	203
1L-3	15:04:00	4	1500	386	386	203
1L-4	15:06:00	1	2000	515	515	332
1L-4	15:07:00	2	2000	515	515	332
1L-4	15:08:00	3	2000	515	515	332
1L-4	15:09:00	4	2000	515	515	332
1L-5	15:10:00	1	2500	644	644	461
1L-5	15:11:00	2	2500	644	644	461
1L-5	15:12:00	3	2500	644	644	461
1L-5	15:13:00	4	2500	644	644	461
1L-6	15:14:00	1	3000	773	773	590
1L-6	15:15:00	2	3000	773	773	590
1L-6	15:16:00	3	3000	773	773	590
1L-6	15:17:00	4	3000	773	773	590
1L-7	15:18:00	1	3500	902	902	719
1L-7	15:19:00	2	3500	902	902	719
1L-7	15:20:00	3	3500	902	902	719
1L-7	15:21:00	4	3500	902	902	719
1L-8	15:22:30	1	4000	1031	1,031	848
1L-8	15:23:30	2	4000	1031	1,031	848
1L-8	15:24:30	3	4000	1031	1,031	848
1L-8	15:25:30	4	4000	1031	1,031	848
1L-9	15:27:00	1	4500	1160	1,160	977
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1L-12	15:43:30	4	6000	1546	1,546	1363
1L-13	15:45:00	1	6500	1675	1,675	1492
1L-13	15:46:00	2	6500	1675	1,675	1492
1L-13	15:47:00	3	6500	1675	1,675	1492
1L-13	15:48:00	4	6500	1675	1,675	1492
1L-14	15:53:00	1	7000	1804	1,804	1621
1L-14	15:54:00	2	7000	1804	1,804	1621
1L-14	15:56:00	4	7000	1804	1,804	1621
1L-14	15:58:00	6	7000	1804	1,804	1621
1L-15	16:02:00	1	7500	1933	1,933	1750
1L-15	16:03:00	2	7500	1933	1,933	1750
1L-15	16:04:00	3	7500	1933	1,933	1750
1L-15	16:05:00	4	7500	1933	1,933	1750
1U-1	16:08:00	1	5000	1289	1,289	1105
1U-1	16:09:00	2	5000	1289	1,289	1105
1U-1	16:10:00	3	5000	1289	1,289	1105
1U-1	16:11:00	4	5000	1289	1,289	1105
1U-2	16:13:00	1	3000	773	773	590
1U-2	16:14:00	2	3000	773	773	590
1U-2	16:15:00	3	3000	773	773	590
1U-2	16:16:00	4	3000	773	773	590
1U-3	16:18:00	1	1500	386	386	203
1U-3	16:19:00	2	1500	386	386	203
1U-3	16:20:00	3	1500	386	386	203
1U-3	16:21:00	4	1500	386	386	203
1U-4	16:23:00	1	250	64	64	0
1U-4	16:24:00	2	250	64	64	0
1U-4	16:25:00	3	250	64	64	0
1U-4	16:26:00	4	250	64	64	0
2L-1	16:28:00	1	1500	386	386	203
2L-1	16:29:00	2	1500	386	386	203
2L-1	16:30:00	3	1500	386	386	203
2L-1	16:31:00	4	1500	386	386	203
2L-2	16:34:00	1	3000	773	773	590
2L-2	16:35:00	2	3000	773	773	590
2L-2	16:36:00	3	3000	773	773	590
2L-2	16:37:00	4	3000	773	773	590
2L-3	16:40:00	1	4500	1160	1,160	977
2L-3	16:41:00	2	4500	1160	1,160	977
2L-3	16:42:00	3	4500	1160	1,160	977
2L-3	16:43:00	4	4500	1160	1,160	977
2L-4	16:47:00	1	6000	1546	1,546	1363
2L-4	16:48:00	2	6000	1546	1,546	1363
2L-4	16:49:00	3	6000	1546	1,546	1363
2L-4	16:50:00	4	6000	1546	1,546	1363
2U-1	16:54:00	1	0	0	0	0
2U-1	16:55:00	2	0	0	0	0
2U-1	16:57:00	4	0	0	0	0
2U-1	17:01:00	8	0	0	0	0

Top of Shaft and Compression

Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time (h:m:s)	Time After Start Minutes	O-cell™ Pressure (psi)	Applied Load (kips)	TOS Indicator Readings			Telltale Compression			TOS Measured With Leica
					Side A (inches)	Side B (inches)	Average (inches)	Side A (inches)	Side B (inches)	Average (inches)	
1L-0	14:30:00	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1L-1	14:51:00	1	500	128	-0.003	-0.002	-0.002	0.000	0.000	0.000	-0.001
1L-1	14:52:00	2	500	128	-0.002	-0.002	-0.002	0.000	0.000	0.000	-0.006
1L-1	14:53:00	3	500	128	-0.002	-0.003	-0.003	0.000	0.000	0.000	-0.005
1L-1	14:54:00	4	500	128	-0.002	-0.002	-0.002	0.000	0.000	0.000	0.000
1L-2	14:56:00	1	1,000	257	0.005	0.005	0.005	0.003	0.001	0.002	0.008
1L-2	14:57:00	2	1,000	257	0.007	0.008	0.008	0.004	0.001	0.002	0.007
1L-2	14:58:00	3	1,000	257	0.009	0.008	0.009	0.004	0.001	0.003	0.011
1L-2	14:59:00	4	1,000	257	0.010	0.010	0.010	0.004	0.001	0.003	0.013
1L-3	15:01:00	1	1,500	386	0.021	0.023	0.022	0.007	0.002	0.004	0.024
1L-3	15:02:00	2	1,500	386	0.022	0.024	0.023	0.007	0.002	0.005	0.024
1L-3	15:03:00	3	1,500	386	0.023	0.024	0.024	0.007	0.002	0.005	0.024
1L-3	15:04:00	4	1,500	386	0.024	0.027	0.025	0.007	0.002	0.005	0.032
1L-4	15:06:00	1	2,000	515	0.037	0.038	0.038	0.009	0.004	0.006	0.038
1L-4	15:07:00	2	2,000	515	0.039	0.039	0.039	0.009	0.004	0.007	0.042
1L-4	15:08:00	3	2,000	515	0.038	0.040	0.039	0.009	0.004	0.007	0.038
1L-4	15:09:00	4	2,000	515	0.039	0.041	0.040	0.009	0.004	0.006	0.039
1L-5	15:10:00	1	2,500	644	0.052	0.053	0.052	0.011	0.005	0.008	0.053
1L-5	15:11:00	2	2,500	644	0.053	0.056	0.055	0.011	0.005	0.008	0.055
1L-5	15:12:00	3	2,500	644	0.055	0.058	0.057	0.012	0.005	0.008	0.057
1L-5	15:13:00	4	2,500	644	0.054	0.058	0.056	0.011	0.005	0.008	0.056
1L-6	15:14:00	1	3,000	773	0.071	0.074	0.072	0.013	0.006	0.010	0.074
1L-6	15:15:00	2	3,000	773	0.075	0.077	0.076	0.014	0.007	0.010	0.077
1L-6	15:16:00	3	3,000	773	0.075	0.079	0.077	0.014	0.007	0.010	0.078
1L-6	15:17:00	4	3,000	773	0.076	0.080	0.078	0.014	0.007	0.010	0.083
1L-7	15:18:00	1	3,500	902	0.094	0.098	0.096	0.015	0.008	0.012	0.096
1L-7	15:19:00	2	3,500	902	0.099	0.103	0.101	0.016	0.008	0.012	0.104
1L-7	15:20:00	3	3,500	902	0.101	0.103	0.102	0.016	0.008	0.012	0.103
1L-7	15:21:00	4	3,500	902	0.102	0.105	0.104	0.016	0.008	0.012	0.106
1L-8	15:22:30	1	4,000	1,031	0.129	0.131	0.130	0.017	0.010	0.013	0.136
1L-8	15:23:30	2	4,000	1,031	0.132	0.135	0.133	0.017	0.010	0.013	0.137
1L-8	15:24:30	3	4,000	1,031	0.135	0.136	0.136	0.017	0.010	0.013	0.141
1L-8	15:25:30	4	4,000	1,031	0.136	0.138	0.137	0.017	0.010	0.013	0.145
1L-9	15:27:00	1	4,500	1,160	0.165	0.168	0.167	0.019	0.011	0.015	0.167
1L-9	15:28:00	2	4,500	1,160	0.170	0.173	0.171	0.019	0.011	0.015	0.179
1L-9	15:29:00	3	4,500	1,160	0.173	0.176	0.174	0.019	0.011	0.015	0.181
1L-9	15:30:00	4	4,500	1,160	0.175	0.179	0.177	0.019	0.011	0.015	0.186
1L-10	15:31:00	1	5,000	1,289	0.203	0.205	0.204	0.020	0.012	0.016	0.211
1L-10	15:32:00	2	5,000	1,289	0.214	0.218	0.216	0.020	0.012	0.016	0.222
1L-10	15:33:00	3	5,000	1,289	0.220	0.223	0.221	0.020	0.012	0.016	0.226
1L-10	15:34:00	4	5,000	1,289	0.223	0.225	0.224	0.020	0.012	0.016	0.233
1L-11	15:36:00	1	5,500	1,417	0.273	0.275	0.274	0.021	0.014	0.017	0.282
1L-11	15:37:00	2	5,500	1,417	0.281	0.283	0.282	0.021	0.014	0.017	0.286
1L-11	15:38:00	3	5,500	1,417	0.287	0.290	0.288	0.021	0.014	0.017	0.293
1L-11	15:39:00	4	5,500	1,417	0.291	0.293	0.292	0.021	0.014	0.017	0.287
1L-12	15:40:30	1	6,000	1,546	0.342	0.346	0.344	0.022	0.015	0.019	0.351
1L-12	15:41:30	2	6,000	1,546	0.357	0.361	0.359	0.022	0.015	0.019	0.362
1L-12	15:42:30	3	6,000	1,546	0.366	0.369	0.367	0.022	0.015	0.019	0.370
1L-12	15:43:30	4	6,000	1,546	0.373	0.375	0.374	0.022	0.015	0.019	0.380
1L-13	15:45:00	1	6,500	1,675	0.444	0.447	0.446	0.024	0.016	0.020	0.454
1L-13	15:46:00	2	6,500	1,675	0.470	0.473	0.472	0.024	0.016	0.020	0.479
1L-13	15:47:00	3	6,500	1,675	0.486	0.490	0.488	0.024	0.016	0.020	0.492
1L-13	15:48:00	4	6,500	1,675	0.499	0.502	0.501	0.024	0.016	0.020	0.506
1L-14	15:53:00	1	7,000	1,804	0.659	0.661	0.660	0.025	0.016	0.021	0.669
1L-14	15:54:00	2	7,000	1,804	0.689	0.692	0.690	0.025	0.016	0.021	0.698
1L-14	15:56:00	4	7,000	1,804	0.727	0.729	0.728	0.025	0.016	0.021	0.739
1L-14	15:58:00	6	7,000	1,804	0.755	0.758	0.757	0.025	0.016	0.021	0.765
1L-15	16:02:00	1	7,500	1,933	1,080	1,083	1,082	0.027	0.016	0.022	1,089
1L-15	16:03:00	2	7,500	1,933	1,196	1,199	1,198	0.027	0.016	0.022	1,204
1L-15	16:04:00	3	7,500	1,933	1,301	1,303	1,302	0.028	0.016	0.022	1,312
1L-15	16:05:00	4	7,500	1,933	1,402	1,405	1,404	0.028	0.016	0.022	1,413
1U-1	16:08:00	1	5,000	1,289	1,453	1,459	1,456	0.023	0.013	0.018	1,457
1U-1	16:09:00	2	5,000	1,289	1,452	1,456	1,454	0.023	0.013	0.018	1,458
1U-1	16:10:00	3	5,000	1,289	1,452	1,455	1,454	0.023	0.013	0.018	1,457
1U-1	16:11:00	4	5,000	1,289	1,452	1,455	1,454	0.023	0.013	0.018	1,457
1U-2	16:13:00	1	3,000	773	1,408	1,412	1,410	0.017	0.009	0.013	1,409
1U-2	16:14:00	2	3,000	773	1,407	1,409	1,408	0.017	0.008	0.013	1,405
1U-2	16:15:00	3	3,000	773	1,406	1,409	1,408	0.017	0.008	0.013	1,404
1U-2	16:16:00	4	3,000	773	1,406	1,408	1,407	0.017	0.008	0.013	1,406
1U-3	16:18:00	1	1,500	386	1,346	1,347	1,347	0.012	0.005	0.008	1,340
1U-3	16:19:00	2	1,500	386	1,345	1,345	1,345	0.012	0.005	0.008	1,339
1U-3	16:20:00	3	1,500	386	1,345	1,345	1,345	0.012	0.005	0.008	1,336
1U-3	16:21:00	4	1,500	386	1,345	1,345	1,345	0.012	0.005	0.008	1,337
1U-4	16:23:00	1	250	64	1,208	1,209	1,209	0.005	0.002	0.004	1,193
1U-4	16:24:00	2	250	64	1,205	1,204	1,204	0.005	0.002	0.004	1,190
1U-4	16:25:00	3	250	64	1,204	1,203	1,203	0.005	0.002	0.004	1,187
1U-4	16:26:00	4	250	64	1,204	1,202	1,203	0.005	0.002	0.004	1,189
2L-1	16:28:00	1	1,500	386	1,229	1,227	1,228	0.010	0.003	0.007	1,209
2L-1	16:29:00	2	1,500	386	1,229	1,228	1,229	0.010	0.003	0.007	1,211
2L-1	16:30:00	3	1,500	386	1,230	1,229	1,229	0.010	0.003	0.007	1,210
2L-1	16:31:00	4	1,500	386	1,230	1,229	1,230	0.010	0.003	0.007	1,211
2L-2	16:34:00	1	3,000	773	1,303	1,305	1,304	0.016	0.005	0.010	1,290
2L-2	16:35:00	2	3,000	773	1,305	1,308	1,306	0.016	0.005	0.011	1,294
2L-2	16:36:00	3	3,000	773	1,306	1,308	1,307	0.016	0.005	0.011	1,293
2L-2	16:37:00	4	3,000	773	1,308	1,310	1,309	0.016	0.005	0.011	1,292
2L-3	16:40:00	1	4,500	1,160	1,389	1,394	1,392	0.021	0.006	0.015	1,384
2L-3	16:41:00	2	4,500	1,160	1,395	1,397	1,396	0.021	0.006	0.015	1,385
2L-3	16:42:00	3	4,500	1,160	1,397	1,401	1,399				

O-cell™ Expansion and Upward and Downward Movement
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time (h:m:s)	Time After Start Minutes.	O-cell™ Pressure (psi)	Applied Load (kips)	LVWDT Readings (Expansion)*				Upward Movement (inches)	Upward Creep (inches)	Downward Movement (inches)	Downward Creep (inches)
					(inches)	(inches)	(inches)	Average				
1L-0	14:30:00	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1L-1	14:51:00	1	500	128	0.018	0.017	0.024	0.018	-0.002	-0.020		
1L-1	14:52:00	2	500	128	0.018	0.018	0.025	0.018	-0.002	-0.020		
1L-1	14:53:00	3	500	128	0.019	0.018	0.025	0.018	-0.002	-0.020		
1L-1	14:54:00	4	500	128	0.019	0.018	0.025	0.018	-0.002	-0.020	0.000	
1L-2	14:56:00	1	1,000	257	0.118	0.083	0.112	0.100	0.007	-0.093		
1L-2	14:57:00	2	1,000	257	0.141	0.100	0.134	0.120	0.010	-0.110		
1L-2	14:58:00	3	1,000	257	0.158	0.104	0.140	0.130	0.011	-0.118		
1L-2	14:59:00	4	1,000	257	0.159	0.109	0.146	0.134	0.013	0.002	-0.121	0.011
1L-3	15:01:00	1	1,500	386	0.236	0.163	0.218	0.200	0.027	-0.173		
1L-3	15:02:00	2	1,500	386	0.242	0.168	0.224	0.205	0.028	-0.177		
1L-3	15:03:00	3	1,500	386	0.243	0.168	0.224	0.205	0.028	-0.177		
1L-3	15:04:00	4	1,500	386	0.244	0.169	0.225	0.206	0.030	0.002	-0.175	0.000
1L-4	15:06:00	1	2,000	515	0.315	0.224	0.295	0.270	0.044	-0.226		
1L-4	15:07:00	2	2,000	515	0.319	0.227	0.296	0.273	0.046	-0.228		
1L-4	15:08:00	3	2,000	515	0.321	0.228	0.299	0.275	0.046	-0.229		
1L-4	15:09:00	4	2,000	515	0.321	0.228	0.299	0.275	0.047	0.001	-0.228	0.000
1L-5	15:10:00	1	2,500	644	0.382	0.263	0.363	0.333	0.060	-0.272		
1L-5	15:11:00	2	2,500	644	0.399	0.288	0.372	0.344	0.063	-0.281		
1L-5	15:12:00	3	2,500	644	0.403	0.293	0.377	0.348	0.065	-0.283		
1L-5	15:13:00	4	2,500	644	0.404	0.294	0.377	0.349	0.065	0.002	-0.284	0.003
1L-6	15:14:00	1	3,000	773	0.473	0.355	0.449	0.414	0.082	-0.332		
1L-6	15:15:00	2	3,000	773	0.484	0.364	0.460	0.424	0.086	-0.338		
1L-6	15:16:00	3	3,000	773	0.489	0.368	0.464	0.428	0.087	-0.341		
1L-6	15:17:00	4	3,000	773	0.491	0.369	0.466	0.430	0.088	0.002	-0.342	0.004
1L-7	15:18:00	1	3,500	902	0.555	0.435	0.537	0.495	0.107	-0.388		
1L-7	15:19:00	2	3,500	902	0.575	0.465	0.573	0.520	0.113	-0.407		
1L-7	15:20:00	3	3,500	902	0.579	0.471	0.576	0.525	0.114	-0.411		
1L-7	15:21:00	4	3,500	902	0.582	0.476	0.580	0.529	0.115	0.003	-0.414	0.006
1L-8	15:22:30	1	4,000	1,031	0.649	0.550	0.657	0.600	0.144	-0.456		
1L-8	15:23:30	2	4,000	1,031	0.656	0.561	0.665	0.609	0.147	-0.462		
1L-8	15:24:30	3	4,000	1,031	0.660	0.566	0.670	0.613	0.149	-0.464		
1L-8	15:25:30	4	4,000	1,031	0.662	0.569	0.673	0.616	0.150	0.003	-0.466	0.004
1L-9	15:27:00	1	4,500	1,160	0.738	0.649	0.755	0.694	0.181	-0.512		
1L-9	15:28:00	2	4,500	1,160	0.748	0.660	0.766	0.704	0.186	-0.518		
1L-9	15:29:00	3	4,500	1,160	0.752	0.666	0.772	0.709	0.189	-0.520		
1L-9	15:30:00	4	4,500	1,160	0.757	0.671	0.775	0.714	0.192	0.006	-0.522	0.004
1L-10	15:31:00	1	5,000	1,289	0.828	0.745	0.850	0.784	0.220	-0.563		
1L-10	15:32:00	2	5,000	1,289	0.846	0.765	0.872	0.806	0.232	-0.574		
1L-10	15:33:00	3	5,000	1,289	0.856	0.778	0.882	0.817	0.237	-0.579		
1L-10	15:34:00	4	5,000	1,289	0.860	0.782	0.887	0.821	0.240	0.008	-0.581	0.007
1L-11	15:36:00	1	5,500	1,417	0.965	0.892	0.999	0.928	0.292	-0.637		
1L-11	15:37:00	2	5,500	1,417	0.971	0.906	1,014	0.939	0.300	-0.639		
1L-11	15:38:00	3	5,500	1,417	0.990	0.915	1,022	0.953	0.306	-0.647		
1L-11	15:39:00	4	5,500	1,417	0.993	0.920	1,026	0.957	0.309	-0.648	0.009	
1L-12	15:40:30	1	6,000	1,546	1,094	1,029	1,137	1,061	0.363	-0.698		
1L-12	15:41:30	2	6,000	1,546	1,118	1,051	1,160	1,084	0.377	-0.707		
1L-12	15:42:30	3	6,000	1,546	1,130	1,064	1,172	1,097	0.386	-0.711		
1L-12	15:43:30	4	6,000	1,546	1,139	1,072	1,183	1,106	0.393	0.016	-0.713	0.006
1L-13	15:45:00	1	6,500	1,675	1,262	1,207	1,314	1,234	0.465	-0.769		
1L-13	15:46:00	2	6,500	1,675	1,296	1,244	1,355	1,270	0.492	-0.779		
1L-13	15:47:00	3	6,500	1,675	1,319	1,269	1,375	1,294	0.508	-0.787		
1L-13	15:48:00	4	6,500	1,675	1,334	1,285	1,391	1,310	0.520	0.029	-0.789	0.011
1L-14	15:53:00	1	7,000	1,800	1,559	1,523	1,628	1,541	0.681	-0.860		
1L-14	15:54:00	2	7,000	1,804	1,594	1,561	1,665	1,577	0.711	-0.866		
1L-14	15:56:00	4	7,000	1,804	1,643	1,607	1,716	1,625	0.749	0.038	-0.876	0.010
1L-14	15:58:00	6	7,000	1,804	1,677	1,641	1,753	1,659	0.777	-0.882		
1L-15	16:02:00	1	7,500	1,933	2,057	2,032	2,132	2,045	1,104	-0.941		
1L-15	16:03:00	2	7,500	1,933	2,183	2,158	2,261	2,171	1,220	-0.951		
1L-15	16:04:00	3	7,500	1,933	2,294	2,269	2,370	2,281	1,324	-0.956		
1L-15	16:05:00	4	7,500	1,933	2,398	2,378	2,482	2,388	1,426	0.206	-0.963	0.012
1U-1	16:08:00	1	5,000	1,289	2,401	2,373	2,494	2,387	1,474	-0.913		
1U-1	16:09:00	2	5,000	1,289	2,400	2,372	2,493	2,386	1,472	-0.915		
1U-1	16:10:00	3	5,000	1,289	2,400	2,372	2,493	2,386	1,471	-0.914		
1U-1	16:11:00	4	5,000	1,289	2,401	2,372	2,493	2,386	1,472	-0.915		
1U-2	16:13:00	1	3,000	773	2,284	2,258	2,379	2,271	1,423	-0.848		
1U-2	16:14:00	2	3,000	773	2,282	2,256	2,379	2,269	1,421	-0.848		
1U-2	16:15:00	3	3,000	773	2,282	2,256	2,379	2,269	1,420	-0.848		
1U-2	16:16:00	4	3,000	773	2,281	2,256	2,379	2,269	1,420	-0.849		
1U-3	16:18:00	1	1,500	386	2,136	2,117	2,231	2,127	1,355	-0.771		
1U-3	16:19:00	2	1,500	386	2,135	2,112	2,216	2,124	1,353	-0.771		
1U-3	16:20:00	3	1,500	386	2,135	2,112	2,216	2,124	1,353	-0.771		
1U-3	16:21:00	4	1,500	386	2,136	2,112	2,216	2,124	1,353	-0.771		
1U-4	16:23:00	1	250	64	1,844	1,821	1,909	1,833	1,212	-0.620		
1U-4	16:24:00	2	250	64	1,841	1,819	1,910	1,830	1,208	-0.621		
1U-4	16:25:00	3	250	64	1,841	1,818	1,910	1,829	1,207	-0.622		
1U-4	16:26:00	4	250	64	1,841	1,817	1,911	1,829	1,207	-0.622		
2L-1	16:28:00	1	1,500	386	1,940	1,917	1,994	1,929	1,235	-0.694		
2L-1	16:29:00	2	1,500	386	1,940	1,918	1,993	1,929	1,236	-0.693		
2L-1	16:30:00	3	1,500	386	1,940	1,918	1,994	1,929	1,236	-0.693		
2L-1	16:31:00	4	1,500	386	1,940	1,918	1,994	1,929	1,237	-0.693		
2L-2	16:34:00	1	3,000	773	2,107	2,080	2,174	2,093	1,315	-0.779		
2L-2	16:35:00	2	3,000	773	2,109	2,083	2,174	2,096	1,317	-0.779		
2L-2	16:36:00	3	3,000	773	2,109	2,083	2,174	2,096	1,317	-0.779		
2L-2	16:37:00	4	3,000	773	2,109	2,083	2,174	2,095	1,319	-0.777		
2L-3	16:40:00	1	4,500	1,160	2,273	2,246	2,346	2,261	1,407	-0.854		
2L-3	16:41:00	2	4,500	1,160	2,280	2,254	2,355	2,267	1,411	-0.856		

Strain Gage Readings and Loads at Levels 1, 2 and 3
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time 0 (h:m:s)	Time After Start Minutes	O-cell™ Pressure (psi)	Applied Load (kips)	Level 1		Level 2		Level 3	
					21344	21345	Av. Load (kips)	21346	21347	Av. Load (kips)
1L-0	14:30:00	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1L-1	14:51:00	1	500	128	-0.9	2.5	12.1	-0.5	1.7	9.5
1L-1	14:52:00	2	500	128	-0.8	2.6	13.4	-0.6	1.9	9.7
1L-1	14:53:00	3	500	128	-0.8	2.6	12.9	-0.6	1.8	9.5
1L-1	14:54:00	4	500	128	-1.0	2.6	11.1	-0.5	1.9	10.8
1L-2	14:56:00	1	1,000	257	6.7	6.8	98.1	4.6	5.8	79.0
1L-2	14:57:00	2	1,000	257	8.8	8.9	128.2	6.1	7.5	103.0
1L-2	14:58:00	3	1,000	257	9.3	9.1	133.4	6.6	7.5	107.0
1L-2	14:59:00	4	1,000	257	9.5	9.3	137.0	6.7	7.8	109.3
1L-3	15:01:00	1	1,500	386	13.6	14.5	203.6	9.7	12.2	165.6
1L-3	15:02:00	2	1,500	386	13.9	14.8	208.1	9.9	12.6	170.3
1L-3	15:03:00	3	1,500	386	13.7	14.7	205.1	10.0	12.6	171.1
1L-3	15:04:00	4	1,500	386	13.6	14.8	205.1	9.8	12.5	168.2
1L-4	15:06:00	1	2,000	515	17.8	19.8	273.0	12.9	16.8	224.7
1L-4	15:07:00	2	2,000	515	18.3	20.3	279.8	13.4	17.2	230.8
1L-4	15:08:00	3	2,000	515	18.1	20.4	279.5	13.3	17.4	232.1
1L-4	15:09:00	4	2,000	515	18.2	20.3	279.8	13.3	17.3	231.6
1L-5	15:10:00	1	2,500	644	22.2	25.6	347.2	16.1	21.6	285.0
1L-5	15:11:00	2	2,500	644	21.9	25.4	343.4	15.9	21.6	283.6
1L-5	15:12:00	3	2,500	644	22.3	25.7	348.4	16.4	22.0	290.5
1L-5	15:13:00	4	2,500	644	21.9	25.8	346.4	16.3	21.9	288.4
1L-6	15:14:00	1	3,000	773	25.2	29.8	397.6	18.3	25.1	328.0
1L-6	15:15:00	2	3,000	773	26.5	31.2	418.8	19.2	26.5	345.2
1L-6	15:16:00	3	3,000	773	26.3	30.9	415.3	19.0	26.3	342.3
1L-6	15:17:00	4	3,000	773	26.2	30.9	415.0	19.1	26.5	344.1
1L-7	15:18:00	1	3,500	902	29.6	35.6	473.3	21.5	30.0	389.0
1L-7	15:19:00	2	3,500	902	30.2	36.5	483.9	21.9	31.0	400.1
1L-7	15:20:00	3	3,500	902	30.2	36.7	486.2	22.0	31.2	401.9
1L-7	15:21:00	4	3,500	902	30.5	36.9	488.7	21.8	31.1	400.1
1L-8	15:22:30	1	4,000	1,031	34.4	41.1	548.5	24.8	34.6	449.5
1L-8	15:23:30	2	4,000	1,031	34.8	41.4	553.3	25.3	34.7	452.9
1L-8	15:24:30	3	4,000	1,031	34.9	41.3	553.0	25.0	34.8	451.8
1L-8	15:25:30	4	4,000	1,031	34.8	41.4	553.6	25.1	34.6	451.3
1L-9	15:27:00	1	4,500	1,160	38.8	46.1	616.1	27.9	38.1	499.1
1L-9	15:28:00	2	4,500	1,160	39.2	46.1	619.1	28.1	38.3	501.5
1L-9	15:29:00	3	4,500	1,160	39.2	46.0	619.1	28.4	38.3	503.6
1L-9	15:30:00	4	4,500	1,160	39.3	46.0	619.9	28.4	38.1	502.8
1L-10	15:31:00	1	5,000	1,289	42.0	49.7	665.6	30.2	40.8	536.9
1L-10	15:32:00	2	5,000	1,289	43.3	50.6	681.7	31.1	41.4	548.0
1L-10	15:33:00	3	5,000	1,289	43.1	50.7	681.0	31.1	41.3	546.9
1L-10	15:34:00	4	5,000	1,289	43.3	50.5	681.0	31.0	41.2	545.6
1L-11	15:36:00	1	5,500	1,417	47.6	55.2	746.0	34.0	44.4	592.1
1L-11	15:37:00	2	5,500	1,417	47.5	55.2	745.5	34.1	44.3	592.6
1L-11	15:38:00	3	5,500	1,417	47.7	55.2	747.3	34.2	44.3	592.9
1L-11	15:39:00	4	5,500	1,417	47.8	55.1	748.6	34.2	44.2	592.6
1L-12	15:40:30	1	6,000	1,546	51.7	59.4	806.8	36.5	47.1	632.3
1L-12	15:41:30	2	6,000	1,546	51.7	59.3	806.3	36.6	47.1	632.8
1L-12	15:42:30	3	6,000	1,546	51.8	59.5	808.4	37.1	47.2	636.7
1L-12	15:43:30	4	6,000	1,546	52.0	59.4	809.1	37.0	47.0	635.4
1L-13	15:45:00	1	6,500	1,675	56.0	64.1	871.4	39.7	50.2	679.0
1L-13	15:46:00	2	6,500	1,675	56.1	63.9	871.2	39.8	50.0	678.7
1L-13	15:47:00	3	6,500	1,675	56.2	64.0	872.7	39.9	49.7	676.9
1L-13	15:48:00	4	6,500	1,675	56.5	63.9	873.4	40.0	49.5	676.5
1L-14	15:53:00	1	7,000	1,804	60.8	68.4	938.3	42.9	51.9	717.1
1L-14	15:54:00	2	7,000	1,804	60.9	68.6	940.0	43.0	51.9	717.1
1L-14	15:56:00	3	7,000	1,804	61.2	68.2	939.5	43.1	51.7	716.0
1L-14	15:58:00	4	7,000	1,804	61.6	68.3	942.8	43.3	51.4	715.7
1L-15	16:02:00	1	7,500	1,933	66.1	73.1	1010.9	45.4	54.2	752.7
1L-15	16:03:00	2	7,500	1,933	66.3	73.3	1013.4	45.4	54.4	754.3
1L-15	16:04:00	3	7,500	1,933	66.8	73.5	1018.2	45.5	54.3	754.3
1L-15	16:05:00	4	7,500	1,933	66.9	73.5	1018.7	45.5	54.4	754.8
1U-1	16:08:00	1	5,000	1,289	49.3	56.6	769.0	35.0	43.1	590.3
1U-1	16:09:00	2	5,000	1,289	49.5	56.8	771.8	35.0	43.0	589.8
1U-1	16:10:00	3	5,000	1,289	49.4	56.8	771.0	35.1	43.2	591.6
1U-1	16:11:00	4	5,000	1,289	49.5	56.9	772.0	35.2	43.0	591.1
1U-2	16:13:00	1	3,000	773	33.1	38.8	521.5	24.2	30.8	415.2
1U-2	16:14:00	2	3,000	773	32.7	38.5	516.2	24.6	30.6	417.3
1U-2	16:15:00	3	3,000	773	32.9	38.6	518.5	24.3	30.8	416.5
1U-2	16:16:00	4	3,000	773	33.0	38.6	520.0	24.4	30.9	417.8
1U-3	16:18:00	1	1,500	386	20.8	23.1	318.4	16.1	19.5	269.1
1U-3	16:19:00	2	1,500	386	20.5	22.8	314.1	16.2	19.5	269.4
1U-3	16:20:00	3	1,500	386	20.4	22.6	312.1	16.1	19.4	268.1
1U-3	16:21:00	4	1,500	386	20.4	23.0	315.4	16.4	19.7	272.6
1U-4	16:23:00	1	250	64	61.0	6.5	126.5	10.3	5.9	122.3
1U-4	16:24:00	2	250	64	61.8	6.4	124.8	10.3	5.7	121.0
1U-4	16:25:00	3	250	64	61.9	6.5	126.6	10.4	5.9	122.9
1U-4	16:26:00	4	250	64	61.6	6.5	124.1	10.2	5.9	121.8
2L-1	16:28:00	1	1,500	386	20.0	19.3	285.1	16.0	15.9	240.9
2L-1	16:29:00	2	1,500	386	19.9	19.0	282.5	16.1	15.8	240.8
2L-1	16:30:00	3	1,500	386	19.8	18.9	280.5	15.9	15.8	239.1
2L-1	16:31:00	4	1,500	386	19.7	18.9	280.3	16.1	15.7	240.6
2L-2	16:34:00	1	3,000	773	32.4	34.6	486.4	24.4	28.2	397.2
2L-2	16:35:00	2	3,000	773	32.7	34.6	488.4	24.6	28.3	399.9
2L-2	16:36:00	3	3,000	773	32.7	34.6	488.4	24.4	28.5	399.6
2L-2	16:37:00	4	3,000	773	32.7	34.9	490.9	24.5	28.3	398.8
2L-3	16:40:00	1	4,500	1,160	44.9	49.0	681.7	32.5	39.1	541.7
2L-3	16:41:00	2	4,500	1,160	44.8	49.0	680.9	32.5	38.8	539.3
2L-3	16:42:00	3	4,500	1,160	45.0	49.1	683.4	32.3	39.2	540.6
2L-3	16:43:00	4	4,500	1,160	44.8	49.1	681.4	32.5	38.8	539.1
2L-4	16:47:00	1	6,000	1,546	56.5	62.0	860.3	38.6	47.6	653.4
2L-4	16:48:00	2	6,000	1,546	56.7	61.9	860.8	38.4	47.3	647.9
2L-4	16:49:00	3	6,000	1,546	56.6	62.1	861.8	38.4	47.2	646.8
2L-4	16:50:00	4	6,000	1,546	56.6	61.8	859.8	38.5	47.0	646.0
2U-1	16:54:00	1	0	0	10.1	2.9	94.3	10.3	1.7	90.4
2U-1	16:55:00	2	0	0	9.7	2.6	89.2	10.0	1.6	87.5
2U-1	16:57:00	4	0	0	9.7	2.1	85.4	10.2	1.4	87.3
2U-1	17:01:00	8	0	0	9.3	2.0	82.2	10.0	1.0	83.8

Gross and Net O-cell™ Loads
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time (h:m:s)	Time After Start Minutes	O-cell™ Pressure (MPa)	Gross O-cell™ Load		Net Load (MN)
				Pos. A1 (MN)	Pressure (MN)	
1L-0	14:30:00	0	0	0	0	0
1L-1	14:51:00	1	3.45	0.57	0.57	0.00
1L-1	14:52:00	2	3.45	0.57	0.57	0.00
1L-1	14:53:00	3	3.45	0.57	0.57	0.00
1L-1	14:54:00	4	3.45	0.57	0.57	0.00
1L-2	14:56:00	1	6.90	1.14	1.14	0.33
1L-2	14:57:00	2	6.90	1.14	1.14	0.33
1L-2	14:58:00	3	6.90	1.14	1.14	0.33
1L-2	14:59:00	4	6.90	1.14	1.14	0.33
1L-3	15:01:00	1	10.34	1.72	1.72	0.90
1L-3	15:02:00	2	10.34	1.72	1.72	0.90
1L-3	15:03:00	3	10.34	1.72	1.72	0.90
1L-3	15:04:00	4	10.34	1.72	1.72	0.90
1L-4	15:06:00	1	13.79	2.29	2.29	1.48
1L-4	15:07:00	2	13.79	2.29	2.29	1.48
1L-4	15:08:00	3	13.79	2.29	2.29	1.48
1L-4	15:09:00	4	13.79	2.29	2.29	1.48
1L-5	15:10:00	1	17.24	2.86	2.86	2.05
1L-5	15:11:00	2	17.24	2.86	2.86	2.05
1L-5	15:12:00	3	17.24	2.86	2.86	2.05
1L-5	15:13:00	4	17.24	2.86	2.86	2.05
1L-6	15:14:00	1	20.69	3.44	3.44	2.62
1L-6	15:15:00	2	20.69	3.44	3.44	2.62
1L-6	15:16:00	3	20.69	3.44	3.44	2.62
1L-6	15:17:00	4	20.69	3.44	3.44	2.62
1L-7	15:18:00	1	24.13	4.01	4.01	3.20
1L-7	15:19:00	2	24.13	4.01	4.01	3.20
1L-7	15:20:00	3	24.13	4.01	4.01	3.20
1L-7	15:21:00	4	24.13	4.01	4.01	3.20
1L-8	15:22:30	1	27.58	4.58	4.58	3.77
1L-8	15:23:30	2	27.58	4.58	4.58	3.77
1L-8	15:24:30	3	27.58	4.58	4.58	3.77
1L-8	15:25:30	4	27.58	4.58	4.58	3.77
1L-9	15:27:00	1	31.03	5.16	5.16	4.34
1L-9	15:28:00	2	31.03	5.16	5.16	4.34
1L-9	15:29:00	3	31.03	5.16	5.16	4.34
1L-9	15:30:00	4	31.03	5.16	5.16	4.34
1L-10	15:31:00	1	34.48	5.73	5.73	4.92
1L-10	15:32:00	2	34.48	5.73	5.73	4.92
1L-10	15:33:00	3	34.48	5.73	5.73	4.92
1L-10	15:34:00	4	34.48	5.73	5.73	4.92
1L-11	15:36:00	1	37.92	6.30	6.30	5.49
1L-11	15:37:00	2	37.92	6.30	6.30	5.49
1L-11	15:38:00	3	37.92	6.30	6.30	5.49
1L-11	15:39:00	4	37.92	6.30	6.30	5.49
1L-12	15:40:30	1	41.37	6.88	6.88	6.06
1L-12	15:41:30	2	41.37	6.88	6.88	6.06
1L-12	15:42:30	3	41.37	6.88	6.88	6.06
1L-12	15:43:30	4	41.37	6.88	6.88	6.06
1L-13	15:45:00	1	44.82	7.45	7.45	6.64
1L-13	15:46:00	2	44.82	7.45	7.45	6.64
1L-13	15:47:00	3	44.82	7.45	7.45	6.64
1L-13	15:48:00	4	44.82	7.45	7.45	6.64
1L-14	15:53:00	1	48.27	8.02	8.02	7.21
1L-14	15:54:00	2	48.27	8.02	8.02	7.21
1L-14	15:56:00	4	48.27	8.02	8.02	7.21
1L-14	15:58:00	6	48.27	8.02	8.02	7.21
1L-15	16:02:00	1	51.71	8.60	8.60	7.78
1L-15	16:03:00	2	51.71	8.60	8.60	7.78
1L-15	16:04:00	3	51.71	8.60	8.60	7.78
1L-15	16:05:00	4	51.71	8.60	8.60	7.78
1U-1	16:08:00	1	34.48	5.73	5.73	4.92
1U-1	16:09:00	2	34.48	5.73	5.73	4.92
1U-1	16:10:00	3	34.48	5.73	5.73	4.92
1U-1	16:11:00	4	34.48	5.73	5.73	4.92
1U-2	16:13:00	1	20.69	3.44	3.44	2.62
1U-2	16:14:00	2	20.69	3.44	3.44	2.62
1U-2	16:15:00	3	20.69	3.44	3.44	2.62
1U-2	16:16:00	4	20.69	3.44	3.44	2.62
1U-3	16:18:00	1	10.34	1.72	1.72	0.90
1U-3	16:19:00	2	10.34	1.72	1.72	0.90
1U-3	16:20:00	3	10.34	1.72	1.72	0.90
1U-3	16:21:00	4	10.34	1.72	1.72	0.90
1U-4	16:23:00	1	1.72	0.28	0.28	0.00
1U-4	16:24:00	2	1.72	0.28	0.28	0.00
1U-4	16:25:00	3	1.72	0.28	0.28	0.00
1U-4	16:26:00	4	1.72	0.28	0.28	0.00
2L-1	16:28:00	1	10.34	1.72	1.72	0.90
2L-1	16:29:00	2	10.34	1.72	1.72	0.90
2L-1	16:30:00	3	10.34	1.72	1.72	0.90
2L-1	16:31:00	4	10.34	1.72	1.72	0.90
2L-2	16:34:00	1	20.69	3.44	3.44	2.62
2L-2	16:35:00	2	20.69	3.44	3.44	2.62
2L-2	16:36:00	3	20.69	3.44	3.44	2.62
2L-2	16:37:00	4	20.69	3.44	3.44	2.62
2L-3	16:40:00	1	31.03	5.16	5.16	4.34
2L-3	16:41:00	2	31.03	5.16	5.16	4.34
2L-3	16:42:00	3	31.03	5.16	5.16	4.34
2L-3	16:43:00	4	31.03	5.16	5.16	4.34
2L-4	16:47:00	1	41.37	6.88	6.88	6.06
2L-4	16:48:00	2	41.37	6.88	6.88	6.06
2L-4	16:49:00	3	41.37	6.88	6.88	6.06
2L-4	16:50:00	4	41.37	6.88	6.88	6.06
2U-1	16:54:00	1	0.00	0.00	0.00	0.00
2U-1	16:55:00	2	0.00	0.00	0.00	0.00
2U-1	16:57:00	4	0.00	0.00	0.00	0.00
2U-1	17:01:00	8	0.00	0.00	0.00	0.00

Top of Shaft and Compression
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time	Time After Start Minutes	O-cell™ Pressure (MPa)	Applied Load (MN)	TOS Indicator Readings			Telltale Compression			TOS Measured (mm)
					Side A (mm)	Side B (mm)	Average (mm)	Side A (mm)	Side B (mm)	Average (mm)	
1L-0	14:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1L-1	14:51:00	1	3.45	0.57	-0.07	-0.06	-0.06	0.01	0.00	0.00	-0.02
1L-1	14:52:00	2	3.45	0.57	-0.04	-0.04	-0.04	0.01	0.00	0.00	-0.14
1L-1	14:53:00	3	3.45	0.57	-0.06	-0.07	-0.07	0.01	0.00	0.00	-0.12
1L-1	14:54:00	4	3.45	0.57	-0.05	-0.04	-0.05	0.01	0.00	0.00	-0.01
1L-2	14:56:00	1	6.90	1.14	0.14	0.13	0.13	0.08	0.02	0.05	0.21
1L-2	14:57:00	2	6.90	1.14	0.19	0.21	0.20	0.10	0.03	0.06	0.18
1L-2	14:58:00	3	6.90	1.14	0.23	0.21	0.22	0.11	0.03	0.07	0.28
1L-2	14:59:00	4	6.90	1.14	0.24	0.25	0.25	0.11	0.03	0.07	0.33
1L-3	15:01:00	1	10.34	1.72	0.54	0.58	0.56	0.17	0.06	0.11	0.62
1L-3	15:02:00	2	10.34	1.72	0.57	0.62	0.60	0.17	0.06	0.12	0.62
1L-3	15:03:00	3	10.34	1.72	0.59	0.61	0.60	0.17	0.06	0.12	0.60
1L-3	15:04:00	4	10.34	1.72	0.60	0.68	0.64	0.17	0.06	0.12	0.81
1L-4	15:06:00	1	13.79	2.29	0.95	0.97	0.96	0.23	0.09	0.16	0.97
1L-4	15:07:00	2	13.79	2.29	0.99	1.00	0.99	0.24	0.10	0.17	1.07
1L-4	15:08:00	3	13.79	2.29	0.97	1.02	0.99	0.24	0.09	0.17	0.97
1L-4	15:09:00	4	13.79	2.29	1.00	1.05	1.02	0.24	0.09	0.16	1.00
1L-5	15:10:00	1	17.24	2.86	1.31	1.33	1.32	0.29	0.12	0.21	1.34
1L-5	15:11:00	2	17.24	2.86	1.35	1.43	1.39	0.29	0.13	0.21	1.40
1L-5	15:12:00	3	17.24	2.86	1.40	1.48	1.44	0.30	0.13	0.21	1.45
1L-5	15:13:00	4	17.24	2.86	1.38	1.48	1.43	0.29	0.13	0.21	1.41
1L-6	15:14:00	1	20.69	3.44	1.79	1.88	1.84	0.34	0.16	0.25	1.88
1L-6	15:15:00	2	20.69	3.44	1.91	1.97	1.94	0.34	0.17	0.26	1.96
1L-6	15:16:00	3	20.69	3.44	1.92	2.00	1.96	0.34	0.17	0.26	1.98
1L-6	15:17:00	4	20.69	3.44	1.93	2.02	1.98	0.35	0.17	0.26	2.10
1L-7	15:18:00	1	24.13	4.01	2.36	2.48	2.43	0.38	0.20	0.29	2.44
1L-7	15:19:00	2	24.13	4.01	2.51	2.61	2.56	0.40	0.21	0.30	2.53
1L-7	15:20:00	3	24.13	4.01	2.56	2.63	2.59	0.40	0.21	0.30	2.61
1L-7	15:21:00	4	24.13	4.01	2.60	2.67	2.63	0.40	0.21	0.30	2.70
1L-8	15:22:30	1	27.58	4.58	3.26	3.33	3.31	0.43	0.25	0.34	3.45
1L-8	15:23:30	2	27.58	4.58	3.36	3.42	3.39	0.43	0.25	0.34	3.49
1L-8	15:24:30	3	27.58	4.58	3.42	3.47	3.44	0.43	0.25	0.34	3.59
1L-8	15:25:30	4	27.58	4.58	3.44	3.50	3.47	0.43	0.25	0.34	3.69
1L-9	15:27:00	1	31.03	5.16	4.19	4.27	4.23	0.47	0.28	0.37	4.24
1L-9	15:28:00	2	31.03	5.16	4.32	4.39	4.36	0.47	0.28	0.37	4.54
1L-9	15:29:00	3	31.03	5.16	4.39	4.46	4.42	0.47	0.28	0.38	4.81
1L-9	15:30:00	4	31.03	5.16	4.45	4.54	4.50	0.47	0.28	0.38	4.72
1L-10	15:31:00	1	34.48	5.73	5.16	5.21	5.19	0.51	0.32	0.41	5.36
1L-10	15:32:00	2	34.48	5.73	5.44	5.53	5.49	0.51	0.32	0.41	5.64
1L-10	15:33:00	3	34.48	5.73	5.58	5.66	5.62	0.51	0.32	0.41	5.74
1L-10	15:34:00	4	34.48	5.73	5.67	5.72	5.70	0.50	0.32	0.41	5.93
1L-11	15:36:00	1	37.92	6.30	6.93	7.00	6.96	0.54	0.35	0.44	7.17
1L-11	15:37:00	2	37.92	6.30	7.15	7.19	7.17	0.54	0.35	0.44	7.27
1L-11	15:38:00	3	37.92	6.30	7.28	7.36	7.32	0.54	0.35	0.44	7.44
1L-11	15:39:00	4	37.92	6.30	7.38	7.44	7.41	0.54	0.35	0.44	7.29
1L-12	15:40:30	1	41.37	6.88	8.70	8.79	8.74	0.57	0.38	0.47	8.91
1L-12	15:41:30	2	41.37	6.88	9.06	9.16	9.11	0.57	0.38	0.47	9.20
1L-12	15:42:30	3	41.37	6.88	9.30	9.36	9.33	0.57	0.38	0.47	9.40
1L-12	15:43:30	4	41.37	6.88	9.46	9.53	9.51	0.57	0.38	0.47	9.65
1L-13	15:45:00	1	44.82	7.45	11.27	11.36	11.32	0.60	0.41	0.51	11.52
1L-13	15:46:00	2	44.82	7.45	11.95	12.02	11.99	0.60	0.41	0.50	12.16
1L-13	15:47:00	3	44.82	7.45	12.35	12.44	12.38	0.60	0.40	0.50	12.50
1L-13	15:48:00	4	44.82	7.45	12.67	12.76	12.72	0.60	0.40	0.50	12.84
1L-14	15:53:00	1	48.27	8.02	16.73	16.80	16.77	0.64	0.42	0.53	17.00
1L-14	15:54:00	2	48.27	8.02	17.50	17.58	17.54	0.64	0.42	0.53	17.72
1L-14	15:55:00	3	48.27	8.02	18.46	18.53	18.49	0.64	0.41	0.53	18.78
1L-14	15:58:00	6	48.27	8.02	19.19	19.25	19.22	0.64	0.41	0.53	19.44
1L-15	16:02:00	1	51.71	8.60	27.43	27.52	27.48	0.69	0.41	0.55	27.67
1L-15	16:03:00	2	51.71	8.60	30.39	30.47	30.43	0.70	0.41	0.55	30.59
1L-15	16:04:00	3	51.71	8.60	33.04	33.09	33.06	0.70	0.40	0.55	33.33
1L-15	16:05:00	4	51.71	8.60	35.62	35.69	35.66	0.71	0.40	0.55	35.90
1U-1	16:08:00	1	34.48	5.73	36.90	37.05	36.97	0.59	0.32	0.45	37.00
1U-1	16:09:00	2	34.48	5.73	36.88	36.98	36.93	0.59	0.32	0.45	37.03
1U-1	16:10:00	3	34.48	5.73	36.89	36.96	36.92	0.59	0.32	0.45	37.01
1U-1	16:11:00	4	34.48	5.73	36.88	36.97	36.92	0.59	0.32	0.45	37.02
1U-2	16:13:00	1	20.69	3.44	35.77	35.87	35.82	0.44	0.22	0.33	35.80
1U-2	16:14:00	2	20.69	3.44	35.74	35.79	35.76	0.44	0.22	0.33	35.69
1U-2	16:15:00	3	20.69	3.44	35.72	35.79	35.75	0.44	0.21	0.32	35.67
1U-2	16:16:00	4	20.69	3.44	35.71	35.77	35.74	0.44	0.21	0.32	35.71
1U-3	16:18:00	1	10.34	1.72	34.19	34.23	34.21	0.31	0.12	0.21	34.03
1U-3	16:19:00	2	10.34	1.72	34.15	34.17	34.16	0.30	0.12	0.21	34.01
1U-3	16:20:00	3	10.34	1.72	34.16	34.15	34.15	0.30	0.12	0.21	33.94
1U-3	16:21:00	4	10.34	1.72	34.16	34.16	34.16	0.30	0.12	0.21	33.96
1U-4	16:23:00	1	1.72	0.28	30.69	30.71	30.70	0.13	0.05	0.09	30.31
1U-4	16:24:00	2	1.72	0.28	30.60	30.59	30.59	0.14	0.05	0.09	30.22
1U-4	16:25:00	3	1.72	0.28	30.58	30.56	30.57	0.14	0.05	0.10	30.14
1U-4	16:26:00	4	1.72	0.28	30.58	30.54	30.58	0.14	0.05	0.10	30.21
2L-1	16:28:00	1	10.34	1.72	31.21	31.15	31.19	0.26	0.08	0.17	30.71
2L-1	16:29:00	2	10.34	1.72	31.22	31.20	31.21	0.26	0.08	0.17	30.77
2L-1	16:30:00	3	10.34	1.72	31.24	31.21	31.22	0.26	0.08	0.17	30.73
2L-1	16:31:00	4	10.34	1.72	31.25	31.22	31.24	0.26	0.08	0.17	30.77
2L-2	16:34:00	1	20.69	3.44	33.11	33.14	33.12	0.40	0.13	0.27	32.77
2L-2	16:35:00	2	20.69	3.44	33.15	33.21	33.18	0.40	0.13	0.27	32.86
2L-2	16:36:00	3	20.69	3.44	33.17	33.21	33.19	0.40	0.13	0.27	32.84
2L-2	16:37:00	4	20.69	3.44	33.21	33.27	33.24	0.40	0.14	0.27	32.81
2L-3	16:40:00	1	31.03	5.16	35.29	35.41	35.35	0.53	0.21	0.37	35.15
2L-3	16:41:00	2	31.03	5.16	35.43	35.49	35.46	0.53	0.21	0.37	35.18
2L-3	16:42:00	3	31.03	5.16	35.49	35.59	35.54	0.54	0.22	0.38	35.27
2L-3	16:43:00	4	31.03	5.16	35.53	35.60	35.56	0.54	0.22	0.38	35.32
2L-4	16:47:00	1	41.37	6.88	39.72	39.81	39.77	0.64	0.29	0.46	39.73
2L-4	16:48:00	2	41.37	6.88	40.79	40.91	40.85	0.64	0.29	0.46	40.95
2L-4	16:49:00										

O-cell™ Expansion and Upward and Downward Movement
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

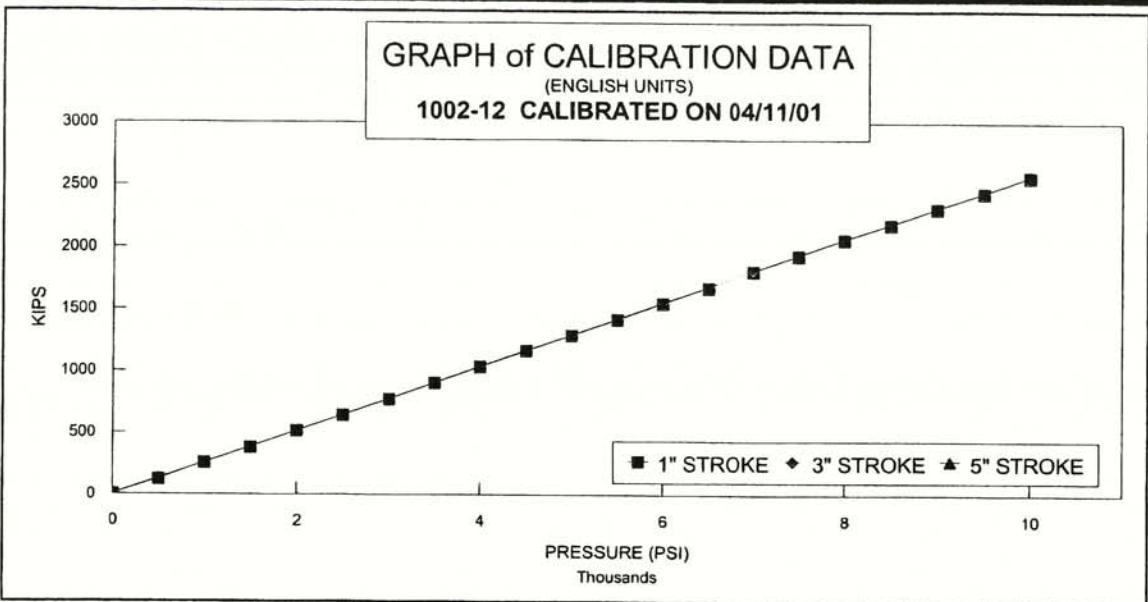
Load Test Increment	Time (h:m:s)	Time After Start Minutes	O-cell™ Pressure (MPa)	Applied Load (MN)	LVWDT Readings (Expansion*)				Upward Movement (mm)	Upward Creep (mm)	Downward Movement (mm)	Downward Creep (mm)
					18672	18673	18674	Average (mm)				
IL-0	14:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IL-1	14:51:00	1	3.45	0.57	0.46	0.44	0.61	0.45	-0.06	-0.04	-0.51	
IL-1	14:52:00	2	3.45	0.57	0.47	0.45	0.63	0.46	-0.04	-0.04	-0.50	
IL-1	14:53:00	3	3.45	0.57	0.47	0.45	0.63	0.46	-0.06	-0.06	-0.52	
IL-1	14:54:00	4	3.45	0.57	0.47	0.45	0.65	0.46	-0.05	-0.05	-0.51	0.01
IL-2	14:56:00	1	6.90	1.14	2.99	2.11	2.84	2.55	0.18	-2.37		
IL-2	14:57:00	2	6.90	1.14	3.57	2.53	3.40	3.05	0.26	-2.79		
IL-2	14:58:00	3	6.90	1.14	3.95	2.65	3.56	3.30	0.29	-3.01		
IL-2	14:59:00	4	6.90	1.14	4.04	2.76	3.72	3.40	0.32	0.06	-3.08	0.29
IL-3	15:01:00	1	10.34	1.72	5.99	4.15	5.54	5.07	0.67	-4.40		
IL-3	15:02:00	2	10.34	1.72	6.14	4.26	5.69	5.20	0.71	-4.48		
IL-3	15:03:00	3	10.34	1.72	6.16	4.26	5.70	5.21	0.72	-4.50		
IL-3	15:04:00	4	10.34	1.72	6.19	4.28	5.72	5.24	0.76	0.04	-4.48	-0.01
IL-4	15:06:00	1	13.79	2.29	8.01	5.70	7.50	6.86	1.12	-5.73		
IL-4	15:07:00	2	13.79	2.29	8.11	5.77	7.58	6.94	1.16	-5.78		
IL-4	15:08:00	3	13.79	2.29	8.15	5.80	7.60	6.97	1.16	-5.82		
IL-4	15:09:00	4	13.79	2.29	8.15	5.80	7.60	6.98	1.19	0.03	-5.79	0.01
IL-5	15:10:00	1	17.24	2.86	9.71	7.18	9.21	8.45	1.53	-6.92		
IL-5	15:11:00	2	17.24	2.86	10.14	7.32	9.44	8.73	1.60	-7.13		
IL-5	15:12:00	3	17.24	2.86	10.24	7.45	9.56	8.85	1.65	-7.20		
IL-5	15:13:00	4	17.24	2.86	10.26	7.46	9.58	8.86	1.64	0.04	-7.22	0.09
IL-6	15:14:00	1	20.69	3.44	12.02	9.01	11.41	10.51	2.09	-8.42		
IL-6	15:15:00	2	20.69	3.44	12.30	9.24	11.68	10.77	2.19	-8.58		
IL-6	15:16:00	3	20.69	3.44	12.42	9.34	11.79	10.88	2.22	-8.66		
IL-6	15:17:00	4	20.69	3.44	12.46	9.37	11.83	10.91	2.23	0.04	-8.68	0.10
IL-7	15:18:00	1	24.13	4.01	14.10	11.04	13.65	12.57	2.73	-9.85		
IL-7	15:19:00	2	24.13	4.01	14.61	11.82	14.55	13.21	2.86	-10.35		
IL-7	15:20:00	3	24.13	4.01	14.71	11.97	14.62	13.34	2.90	-10.44		
IL-7	15:21:00	4	24.13	4.01	14.79	12.10	14.72	13.44	2.93	0.07	-10.51	0.16
IL-8	15:22:30	1	27.58	4.58	16.49	13.97	16.68	15.23	3.65	-11.59		
IL-8	15:23:30	2	27.58	4.58	16.67	14.26	16.89	15.46	3.73	-11.73		
IL-8	15:24:30	3	27.58	4.58	16.76	14.38	17.02	15.57	3.78	-11.79		
IL-8	15:25:30	4	27.58	4.58	16.82	14.44	17.08	15.63	3.81	0.08	-11.82	0.09
IL-9	15:27:00	1	31.03	5.16	18.74	16.50	19.17	17.62	4.61	-13.01		
IL-9	15:28:00	2	31.03	5.16	18.99	16.77	19.45	17.88	4.73	-13.15		
IL-9	15:29:00	3	31.03	5.16	19.11	16.92	19.60	18.01	4.80	-13.21		
IL-9	15:30:00	4	31.03	5.16	19.22	17.03	19.69	18.13	4.88	0.15	-13.25	0.10
IL-10	15:31:00	1	34.48	5.73	20.95	18.87	21.58	19.91	5.60	-14.31		
IL-10	15:32:00	2	34.48	5.73	21.50	19.44	22.16	20.47	5.90	-14.57		
IL-10	15:33:00	3	34.48	5.73	21.73	19.75	22.41	20.74	6.03	-14.71		
IL-10	15:34:00	4	34.48	5.73	21.84	19.87	22.52	20.86	6.11	0.21	-14.75	0.18
IL-11	15:36:00	1	37.92	6.30	24.50	22.66	25.39	23.58	7.41	-16.17		
IL-11	15:37:00	2	37.92	6.30	24.67	23.02	25.74	23.85	7.61	-16.23		
IL-11	15:38:00	3	37.92	6.30	25.15	23.25	25.96	24.20	7.76	-16.44		
IL-11	15:39:00	4	37.92	6.30	25.23	23.38	26.07	24.31	7.85	0.24	-16.45	0.22
IL-12	15:40:30	1	41.37	6.88	27.78	26.13	28.87	26.95	9.22	-17.74		
IL-12	15:41:30	2	41.37	6.88	28.39	26.69	29.47	27.54	9.58	-17.96		
IL-12	15:42:30	3	41.37	6.88	28.70	27.02	29.78	27.86	9.80	-18.06		
IL-12	15:43:30	4	41.37	6.88	28.94	27.23	30.04	28.09	9.98	0.40	-18.11	0.15
IL-13	15:45:00	1	44.82	7.45	32.05	30.65	33.37	31.35	11.82	-19.53		
IL-13	15:46:00	2	44.82	7.45	32.93	31.81	34.41	32.27	12.49	-19.78		
IL-13	15:47:00	3	44.82	7.45	33.51	32.23	34.93	32.87	12.89	-19.98		
IL-13	15:48:00	4	44.82	7.45	33.88	32.65	35.32	33.27	13.22	0.73	-20.05	0.27
IL-14	15:53:00	1	48.27	8.02	39.60	38.68	41.35	39.14	17.29	-21.85		
IL-14	15:54:00	2	48.27	8.02	40.49	39.64	42.28	40.06	18.06	-22.00		
IL-14	15:55:00	3	48.27	8.02	41.73	40.81	43.58	41.27	19.02	0.96	-22.25	0.25
IL-14	15:58:00	6	48.27	8.02	42.60	41.69	44.54	42.15	19.74		-22.40	
IL-15	16:02:00	1	51.71	8.60	52.25	51.61	54.14	51.93	28.03	-23.90		
IL-15	16:03:00	2	51.71	8.60	55.45	54.82	57.43	55.13	30.98	-24.15		
IL-15	16:04:00	3	51.71	8.60	58.26	57.63	60.19	57.95	33.62	-24.33		
IL-15	16:05:00	4	51.71	8.60	60.91	60.41	63.05	60.66	36.21	5.23	-24.45	0.30
UJ-1	16:08:00	1	34.48	5.73	60.98	60.67	63.34	60.63	37.43	-23.20		
UJ-1	16:09:00	2	34.48	5.73	60.96	60.26	63.32	60.61	37.38	-23.23		
UJ-1	16:10:00	3	34.48	5.73	60.96	60.25	63.33	60.60	37.37	-23.23		
UJ-1	16:11:00	4	34.48	5.73	60.98	60.26	63.32	60.62	37.38	-23.24		
UJ-2	16:13:00	1	20.69	3.44	58.01	57.36	60.42	57.69	36.15	-21.54		
UJ-2	16:14:00	2	20.69	3.44	57.96	57.30	60.41	57.63	36.09	-21.54		
UJ-2	16:15:00	3	20.69	3.44	57.96	57.29	60.43	57.62	36.08	-21.55		
UJ-2	16:16:00	4	20.69	3.44	57.95	57.30	60.42	57.62	36.07	-21.55		
UJ-3	16:18:00	1	10.34	1.72	54.24	53.78	56.67	54.01	34.42	-19.59		
UJ-3	16:19:00	2	10.34	1.72	54.23	53.86	56.29	53.94	34.37	-19.57		
UJ-3	16:20:00	3	10.34	1.72	54.24	53.65	56.29	53.94	34.37	-19.58		
UJ-3	16:21:00	4	10.34	1.72	54.24	53.64	56.29	53.94	34.37	-19.57		
UJ-4	16:23:00	1	1.72	0.28	46.84	46.26	48.50	46.55	30.79	-15.76		
UJ-4	16:24:00	2	1.72	0.28	46.75	46.19	48.52	46.47	30.69	-15.78		
UJ-4	16:25:00	3	1.72	0.28	46.75	46.17	48.51	46.46	30.66	-15.80		
UJ-4	16:26:00	4	1.72	0.28	46.75	46.16	48.53	46.46	30.66	-15.80		
ZL-1	16:28:00	1	10.34	1.72	49.28	48.70	50.64	48.99	31.36	-17.63		
ZL-1	16:29:00	2	10.34	1.72	49.28	48.71	50.63	48.99	31.39	-17.61		
ZL-1	16:30:00	3	10.34	1.72	49.28	48.71	50.65	48.99	31.40	-17.60		
ZL-1	16:31:00	4	10.34	1.72	49.28	48.73	50.64	49.00	31.41	-17.60		
ZL-2	16:34:00	1	20.69	3.44	53.52	52.83	55.21	53.17	33.39	-19.78		
ZL-2	16:35:00	2	20.69	3.44	53.58	52.90	55.23	53.24	33.45	-19.79		
ZL-2	16:36:00	3	20.69	3.44	53.57	52.90	55.23	53.24	33.46	-19.78		
ZL-2	16:37:00	4	20.69	3.44	53.57	52.91	55.23	53.24	33.51	-19.73		
ZL-3	16:40:00	1	31.03	5.16	57.75	57.10	59.58	57.42	35.73	-21.70		
ZL-3	16:41:00	2	31.03	5.16	57.91	57.26	59.81	57.58	35.83	-21.75		
ZL-3	16:42:00	3	31.03	5.16	58.00	57.32	59.81	57.66	35.91	-21.75		
ZL-3	16:43:00	4	31.03	5.16	58.02	57.33</						

Strain Gage Readings and Loads at Levels 1, 2 and 3
Wahoo South Connector - Wahoo, Nebraska - Production Test Shaft 1

Load Test Increment	Time After Start (h:m:s)	O-cell™ Pressure (MPa)	Applied Load (MN)	Level 1			Level 2			Level 3		
				21344			21345			21346		
				με	με	(MN)	με	με	(MN)	με	με	(MN)
1L-0	14:30:00	0	0.00	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00
1L-1	14:51:00	1	3.45	0.57	-0.9	2.5	0.05	-0.5	1.7	0.04	-0.1	0.6
1L-1	14:52:00	2	3.45	0.57	-0.8	2.6	0.06	-0.6	1.9	0.04	-0.3	0.5
1L-1	14:53:00	3	3.45	0.57	-0.8	2.6	0.06	-0.6	1.8	0.04	-0.1	0.6
1L-1	14:54:00	4	3.45	0.57	-1.0	2.6	0.05	-0.5	1.9	0.05	-0.3	0.5
1L-2	14:56:00	1	6.90	1.14	6.7	6.8	0.44	4.6	5.8	0.35	3.4	3.9
1L-2	14:57:00	2	6.90	1.14	8.8	8.9	0.57	6.1	7.5	0.46	4.6	5.2
1L-2	14:58:00	3	6.90	1.14	9.3	9.1	0.59	6.6	7.5	0.48	4.6	5.5
1L-2	14:59:00	4	6.90	1.14	9.5	9.3	0.61	6.7	7.8	0.49	5.1	5.8
1L-3	15:01:00	1	10.34	1.72	13.6	14.5	0.91	9.7	12.2	0.74	7.8	9.0
1L-3	15:02:00	2	10.34	1.72	13.9	14.8	0.93	9.9	12.6	0.76	7.9	9.3
1L-3	15:03:00	3	10.34	1.72	13.7	14.7	0.92	10.0	12.6	0.76	7.9	9.4
1L-3	15:04:00	4	10.34	1.72	13.6	14.8	0.92	9.8	12.5	0.75	7.9	9.3
1L-4	15:06:00	1	13.79	2.29	17.8	19.8	1.21	12.9	16.8	1.00	10.7	12.9
1L-4	15:07:00	2	13.79	2.29	18.3	20.3	1.24	13.4	17.2	1.03	11.0	13.2
1L-4	15:08:00	3	13.79	2.29	18.1	20.4	1.24	13.3	17.4	1.03	10.9	13.2
1L-4	15:09:00	4	13.79	2.29	18.2	20.3	1.24	13.3	17.3	1.03	11.1	12.9
1L-5	15:10:00	1	17.24	2.86	22.2	25.6	1.54	16.1	21.6	1.27	13.5	16.6
1L-5	15:11:00	2	17.24	2.86	21.9	25.4	1.53	15.9	21.6	1.26	13.5	16.5
1L-5	15:12:00	3	17.24	2.86	22.3	25.7	1.55	16.4	22.0	1.29	13.7	16.8
1L-5	15:13:00	4	17.24	2.86	21.9	25.8	1.54	16.3	21.9	1.28	13.7	16.5
1L-6	15:14:00	1	20.69	3.44	25.2	29.6	1.77	18.3	25.1	1.46	15.4	18.9
1L-6	15:15:00	2	20.69	3.44	26.5	31.2	1.86	19.2	26.5	1.54	16.3	20.1
1L-6	15:16:00	3	20.69	3.44	26.3	30.9	1.85	19.0	26.3	1.52	16.3	20.0
1L-6	15:17:00	4	20.69	3.44	26.2	30.9	1.85	19.1	26.5	1.53	16.3	20.0
1L-7	15:18:00	1	24.13	4.01	29.6	35.6	2.11	21.5	30.0	1.73	18.0	22.7
1L-7	15:19:00	2	24.13	4.01	30.2	36.5	2.15	21.9	31.0	1.78	18.6	23.4
1L-7	15:20:00	3	24.13	4.01	30.2	36.7	2.16	22.0	31.2	1.79	18.6	23.6
1L-7	15:21:00	4	24.13	4.01	30.5	36.9	2.17	21.8	31.1	1.78	18.8	23.5
1L-8	15:22:30	1	27.58	4.58	34.4	41.1	2.44	24.8	34.6	2.00	21.0	26.2
1L-8	15:23:30	2	27.58	4.58	34.8	41.4	2.46	25.3	34.7	2.01	21.1	26.0
1L-8	15:24:30	3	27.58	4.58	34.9	41.3	2.46	25.0	34.8	2.01	21.2	26.1
1L-8	15:25:30	4	27.58	4.58	34.8	41.4	2.46	25.1	34.6	2.01	21.2	26.0
1L-9	15:27:00	1	31.03	5.16	38.8	46.1	2.74	27.9	38.1	2.22	23.4	28.5
1L-9	15:28:00	2	31.03	5.16	39.2	46.1	2.75	28.1	38.3	2.23	23.5	28.4
1L-9	15:29:00	3	31.03	5.16	39.2	46.0	2.75	28.4	38.3	2.24	23.4	28.3
1L-9	15:30:00	4	31.03	5.16	39.3	46.0	2.76	28.4	38.1	2.24	23.5	28.2
1L-10	15:31:00	1	34.48	5.73	42.0	49.7	2.96	30.2	40.6	2.39	25.1	29.6
1L-10	15:32:00	2	34.48	5.73	43.3	50.6	3.03	31.1	41.4	2.44	25.4	30.3
1L-10	15:33:00	3	34.48	5.73	43.1	50.7	3.03	31.1	41.3	2.43	25.7	30.1
1L-10	15:34:00	4	34.48	5.73	43.3	50.5	3.03	31.0	41.2	2.43	25.6	29.9
1L-11	15:36:00	1	37.92	6.30	47.6	55.2	3.32	34.0	44.4	2.53	27.6	31.7
1L-11	15:37:00	2	37.92	6.30	47.5	55.2	3.32	34.1	44.3	2.64	27.6	31.7
1L-11	15:38:00	3	37.92	6.30	47.7	55.2	3.32	34.2	44.3	2.64	27.4	31.6
1L-11	15:39:00	4	37.92	6.30	47.8	55.1	3.32	34.2	44.2	2.64	27.4	31.4
1L-12	15:40:30	1	41.37	6.88	51.7	59.4	3.59	36.5	47.1	2.81	29.3	33.2
1L-12	15:41:30	2	41.37	6.88	51.7	59.3	3.59	36.6	47.1	2.81	29.2	33.1
1L-12	15:42:30	3	41.37	6.88	51.8	59.5	3.60	37.1	47.2	2.83	29.2	33.0
1L-12	15:43:30	4	41.37	6.88	52.0	59.4	3.60	37.0	47.0	2.83	29.4	32.9
1L-13	15:45:00	1	44.82	7.45	56.0	64.1	3.88	39.7	50.2	3.02	31.0	34.9
1L-13	15:46:00	2	44.82	7.45	56.1	63.9	3.87	39.8	50.0	3.02	30.5	34.6
1L-13	15:47:00	3	44.82	7.45	56.2	64.0	3.88	39.9	49.7	3.01	30.6	34.3
1L-13	15:48:00	4	44.82	7.45	56.5	63.9	3.89	40.0	49.5	3.01	30.5	34.0
1L-14	15:53:00	1	48.27	8.02	60.8	68.4	4.17	42.9	51.9	3.19	31.8	35.2
1L-14	15:54:00	2	48.27	8.02	60.9	68.6	4.18	43.0	51.9	3.19	31.8	35.0
1L-14	15:56:00	4	48.27	8.02	61.2	68.2	4.18	43.1	51.7	3.18	31.7	34.7
1L-14	15:58:00	6	48.27	8.02	61.6	68.3	4.19	43.3	51.4	3.18	31.5	34.4
1L-15	16:02:00	1	51.71	8.60	66.1	73.1	4.50	45.4	54.2	3.35	32.2	35.9
1L-15	16:03:00	2	51.71	8.60	66.3	73.3	4.51	45.4	54.4	3.36	32.0	35.8
1L-15	16:04:00	3	51.71	8.60	66.8	73.5	4.53	45.5	54.3	3.36	31.7	35.6
1L-15	16:05:00	4	51.71	8.60	66.9	73.5	4.53	45.5	54.4	3.36	31.7	35.5
1U-1	16:08:00	1	34.48	5.73	49.3	56.6	3.42	35.0	43.1	2.63	24.8	28.4
1U-1	16:09:00	2	34.48	5.73	49.5	56.8	3.43	35.0	43.0	2.62	25.0	28.5
1U-1	16:10:00	3	34.48	5.73	49.4	56.8	3.43	35.1	43.2	2.63	25.2	28.5
1U-1	16:11:00	4	34.48	5.73	49.5	56.9	3.43	35.2	43.0	2.63	25.0	28.5
1U-2	16:13:00	1	20.69	3.44	33.1	38.8	2.32	24.2	30.8	1.85	18.4	20.8
1U-2	16:14:00	2	20.69	3.44	32.7	38.5	2.30	24.6	30.6	1.86	18.5	21.0
1U-2	16:15:00	3	20.69	3.44	32.9	38.6	2.31	24.3	30.8	1.85	18.6	20.8
1U-2	16:16:00	4	20.69	3.44	33.0	38.6	2.31	24.4	30.9	1.86	18.5	21.0
1U-3	16:18:00	1	10.34	1.72	20.8	23.1	1.42	16.1	19.5	1.20	13.0	13.7
1U-3	16:19:00	2	10.34	1.72	20.5	22.8	1.40	16.2	19.5	1.20	13.0	13.7
1U-3	16:20:00	3	10.34	1.72	20.4	22.6	1.39	16.1	19.4	1.19	13.1	13.9
1U-3	16:21:00	4	10.34	1.72	20.4	23.0	1.40	16.4	19.7	1.21	13.2	14.0
1U-4	16:23:00	1	1.72	0.28	11.0	6.5	0.56	10.3	5.9	0.54	8.8	4.0
1U-4	16:24:00	2	1.72	0.28	10.8	6.4	0.56	10.3	5.7	0.54	8.7	4.0
1U-4	16:25:00	3	1.72	0.28	10.9	6.5	0.56	10.4	5.9	0.55	8.6	4.0
1U-4	16:26:00	4	1.72	0.28	10.6	6.5	0.55	10.2	5.9	0.54	8.7	4.0
2L-1	16:28:00	1	10.34	1.72	20.0	19.3	1.27	16.0	15.9	1.07	13.4	10.8
2L-1	16:29:00	2	10.34	1.72	19.9	19.0	1.26	16.1	15.8	1.07	13.2	10.7
2L-1	16:30:00	3	10.34	1.72	19.8	18.9	1.25	15.9	15.8	1.08	13.3	10.9
2L-1	16:31:00	4	10.34	1.72	19.7	18.9	1.25	16.1	15.7	1.07	13.1	10.8
2L-2	16:34:00	1	20.69	3.44	32.4	34.6	2.16	24.4	28.2	1.77	19.0	19.5
2L-2	16:35:00	2	20.69	3.44	32.7	34.6	2.17	24.6	28.3	1.78	19.2	19.4
2L-2	16:36:00	3	20.69	3.44	32.7	34.6	2.17	24.4	28.5	1.78	19.2	19.3
2L-2	16:37:00	4	20.69	3.44	32.7	34.9	2.18	24.5	28.3	1.77	19.1	19.3

APPENDIX B

CALIBRATION OF O-CELLS STRAIN GAGES AND LVWDTs



STROKE: 1 INCH 3 INCH 5 INCH

21" O-CELL, SERIAL # 1002-12

PRESSURE PSI	LOAD KIPS	LOAD KIPS	LOAD KIPS
0	0	0	0
500	123	127	127
1000	256	254	254
1500	381	381	382
2000	518	514	511
2500	645	643	642
3000	773	776	770
3500	907	905	902
4000	1039	1037	1030
4500	1165	1166	1158
5000	1292	1289	1287
5500	1420	1420	1413
6000	1552	1550	1545
6500	1676	1676	1675
7000	1811	1808	
7500	1934		
8000	2064		
8500	2184		
9000	2313		
9500	2440		
10000	2567		

LOAD CONVERSION FORMULA

$$\text{LOAD} = \text{PRESSURE} * 0.2578 + (-0.5)$$

{KIPS} {PSI}

Regression Output:

Constant	-0.534
X Coefficient	0.258
R Squared	1.0000
No. of Observations	47
Degrees of Freedom	45
Std Err of Y Est	4.2890
Std Err of X Coef.	0.0002

CALIBRATION STANDARDS:

All data presented is derived from 6" dia. certified hydraulic pressure gauges and electronic load transducer, manufactured and calibrated by the University of Illinois at Champaign, Illinois. All calibrations and certifications are traceable through the Laboratory Master Deadweight Gauges directly to the National Institute of Standards and Technology. No Specific guidelines exist for calibration of load test jacks and equipment but procedures comply with similar guidelines for calibration of gauges, ANSI specifications B40.1.

*AE & FC CUSTOMER: LOADTEST INC.
*AE & FC JOB NO.: 2331
*CUSTOMER P.O.NO.: LT-8810

*CONTRACTOR: HAWKINS CONSTRUCTION
*JOB LOCATION: WAHOO, NE
*DATED: 08/14/01

SERVICE ENGINEER:

John Peeler

DATE: 8/15/01



48 Spencer St. Lebanon, N.H. 03766 USA

Vibrating Wire Displacement Transducer Calibration Report

Model Number: 4450-3-6Range: 6"Serial Number: 18672Mfg. Number: 01-657Customer: Loadtest Inc.Temperature: 24.2 °CCust. I.D. #: n/aCal. Std. Control #(s): 124, 213, 370, 506, 524Job Number: 17473Date of Calibration: June 13, 2001Technician: MLC

Displacement (inches)	GK-401 Reading Position B				
	Cycle 1	Cycle 2	Average	Change	% Linearity
0.000	2428	2427	2428		-0.24
1.200	3687	3686	3687	1259	0.10
2.400	4930	4930	4930	1244	0.19
3.600	6163	6163	6163	1233	0.12
4.800	7393	7392	7393	1230	-0.02
6.000	8622	8621	8622	1229	-0.16

Calibration Factor (C): 0.0009695 (Inches/Digit)Regression Zero: 2442

Refer to manual for temperature correction information.

Function Test at Shipment (GK-401 Reading)

Position "B":* 5603Date: August 16, 2001

or

Position "F":* Temperature: 24.3 °C

Wiring Code:

Red and Black: Gage

White and Green: Thermistor

The above instrument was found to be in tolerance in all operating ranges.

The above named instrument has been calibrated by comparison with standards traceable to
the NIST, in compliance with ANSI Z540-1.

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