

RS-Caliper



Reference Booklet and Sample Report

Features

- ◆ 35% collapsibility
- ◆ Back-to-back 1.5D Bends
- ◆ Lightweight and Extremely Low Drag

Applications

- ◆ New Construction Geometry
- ◆ DOT Compliant Geometry Inspection
- ◆ Unpiggable Lines
- ◆ Go – No Go



Distinctive Features

- ◆ Instant Automatic Go-No Go Wirelessly
- ◆ Over-speed Immunity
- ◆ Single - Section
- ◆ Optional Technician
- ◆ Substantial Cost Savings

Features

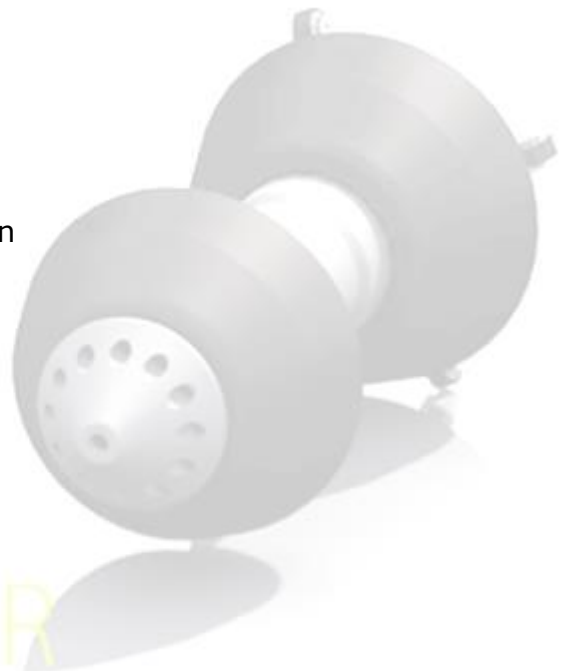
- ◆ 35% collapsibility
- ◆ B2B 1.5D Bends
- ◆ Lightweight / Exceptionally Low Drag

Applications

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- ◆ Unpiggable Lines
- ◆ Go – No Go

Distinctive Features

- ◆ Instant Automatic Go-No Go Wirelessly
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- ◆ Single - Section
- ◆ Optional Technician
- ◆ Substantial Cost Savings



RS-Caliper™ Deformation Capability and Parameters

General Parameters

Speed Range	: 0 mph to 8+ mph
Tool Diameters	: 3" thru 30"
Operating Pressure	: 40 PSI to 2500 PSI
Sample Rate	: 1056 Samples per second (2152)
Minimum Bend Radius	: 1.5D – Back to Back
Battery Life	: 3" - 30 hours 6" - 50 hours 8" thru 14" - 120 hours 16"+ - 240 hours

PoD & PoI

Overall Guaranteed Probability of Detection (PoD)	: 95%
Overall Guaranteed Probability of Identification	: 95%

Dents & Ovalities

Sensitivity	: 0.3% of Outer Diameter (OD)
Depth Accuracy	: ±0.5% of OD
Reportable Anomaly	: 1% of Internal Diameter (ID)
Detectable Anomaly	: 1% of ID
Circumferential Accuracy	: ± 00:30
Location Accuracy	: 0.25' from reference girth weld

Bends

Identifiable Radiuses ¹	: 1.5D, 3D, 5D, 7D, 10D, 10D+
Bend Angle	: ±5°

RS-Caliper™ Deformation Capability and Parameters

General Parameters

Speed Range	: 0 mph to 10+ mph
Tool Diameters	: 3" thru 30"
Operating Pressure	: 40 PSI to 2000 PSI
Sample Rate	: 1056 Samples per second (2152)
Minimum Bend Radius	: 1.5D – Back to Back
Battery Life	: 3" - 30 hours 6" – 50 hours 8" thru 14" – 120 hours 16"+ - 240 hours

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Location Accuracy	: 0.25' from reference girth weld

Bends

Identifiable Radiuses ¹	: 1.5D, 3D, 5D, 7D, 10D, 10D+
Bend Angle	: $\pm 5^\circ$

Recent Projects - "Go-No Go"

Client	Date	Project	Length (miles)	Duration (hours)
Dow Chemicals	01/22/2015	6" DPL – 68	4.7	3
Koch Pipeline	01/24/2015	24" MPL - 4	304	125
Conoco Phillips	01/30/2015	Westeros Sour Gas 6"	12.5	4
Koch Pipeline	02/03/2015	6" WPL - 6	170	110
Centurion Pipeline / Oxy Chemicals	02/04/2015	8" Bradden to Midkiff	9.02	16

Recent Projects - Geometry Inspection, 2% Anomaly Listing

Client	Date	Project	Location
Markwest / General Pipeline	01/15/2015	12" Riggs Hollow to Chevron Pad	Ohio
PG & E	01/26/2015	24" – Section 205	Petaluma, CA
Alta – Mesa / Earth Energy	01/16/2015	4" MLI - 10 to HW30	Idaho
Howard Energy / Boots Smith	02/02/2015	24" Encinallia Pipeline	Laredo, TX
Markwest / B. Miller	12/21/2014	12" Sherwood to Majorsville Spread	Pennsylvania

Sample Report



EnviroCal

Job Number Run Name RS-Caliper Go No Go Report

Run Date

Attn:

Name

Sir/Ma'am,

Sub: **Job Number** – RS-Caliper Geometry Inspection performed in **Run Name on** Trap Date.

The RS-Caliper inspection performed in the above section was a success. The operation and calibrations of the Geometry and odometer sensors were verified after the inspection. Listed below are the three smallest bores found in this section.

Inspection Summary

1. The tool's odometers recorded a total distance of Line Length '.
2. MinID in straight pipe are as follows –
 - a. X.XX" @ XX.XX' –Reduction - Tee
 - b. X.XX" @ XX.XX' – Reduction - Weld
 - c. X.XX" @ XX.XX' – Reduction - Weldd.
3. MinID in bends:

X.XX"

4. Min Bend Radius: 1.5D+
5. Min Straight Pipe between bends
 - a. All bends – 3' +

Please let me know if you would like any other information.

Thank you,

Jimmy Mancinelli
918-939-9138



Company Name

Section Name:
Segment To

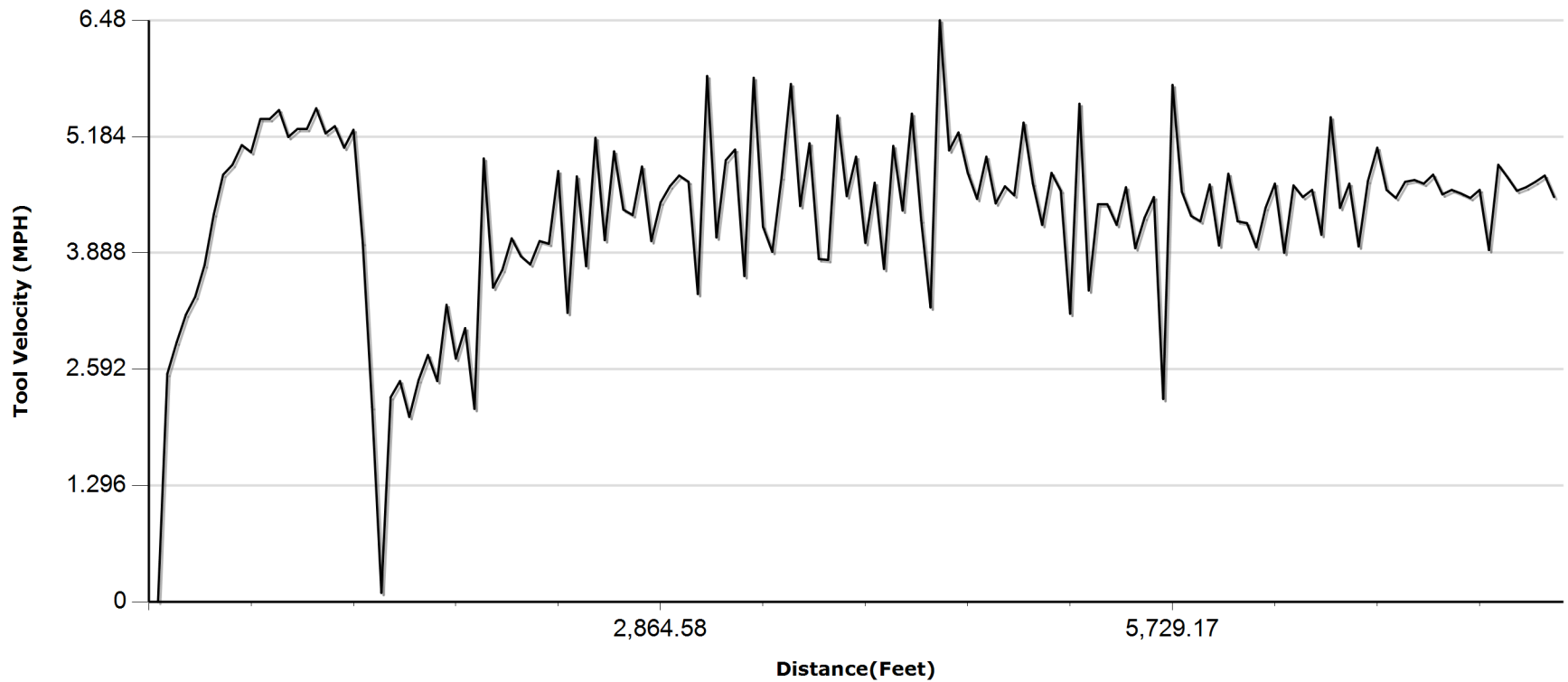
Run Date:

Size:

Job#: Nominal

Wall: .280

Velocity Plot



EnviroCal**SampleJob - 12" Sample Section Geometry Inspection Report**

Attn:

January 03, 1900

Client Project Manager

Address

Phone

Email

Ma'am / Sir,

Ref: **SampleJob** - RS-Caliper Geometry Inspection in section **12" Sample Section** performed on January 01, 1900.

The RS-Caliper inspection performed on the above mentioned section was a 100% success. The operation and calibration of all the twenty two geometry sensors and four odometers were verified before and after the inspection.

Inspection Summary

1. The Inspection tool identified **one dent over 2%** at the time of inspection.
2. No Ovalities identified over 4%.
3. No Combination Dent / Ovality identified over 4% with / without a 2% dent.
4. The tool's odometers measured a total distance of 45,000'.

Attached in this report are the following –

1. Inspection Summary
2. Speed plot
3. Dent List
4. Dig-Sheet
5. Fixture List
6. Weld List
7. Full Registry Listing
8. Calibration Report

A final report will be delivered with bend listing. Please let me know if you need more information.

Thanks,

Data Analyst III
EnviroCal Inc.

RS- aliper Survey Report

Report umber: SampleJob

his Report is Prepared For: nviro al

Pipeline Identification: Sample Job

Pipeline Location: ouston

Survey Date: Jan 01 1900

Line Si e: 12.75"



his Survey Report is prepared by

EnviroCal Inc.

1718 Fry Road, Suite 235

Houston, Texas 77084

(281) 347-3007

Sales Representative
SalesRep

Project Manager
Project Manager

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Executive Summary

This report documents a geometry survey of a pipeline section operated by Enviro Al

Pipeline Section Name: Sample Job

Pipeline Location: Houston

Pipeline Product: Air

Survey Date: Jan 01 1900

Line length: 37036.31"

Pipe nominal D: 12.75"

Pipe nominal Wall: 0.312"

Sample Rate: 1056 Samples Per Second

Geometry findings

Reporting units: Imperial

Total quantity of dents: 1

Total quantity BR : 0

Dents that affect curvature at a weld: 0

Quantity of dents with depth > .25 inch.: 1



Verification Dig Results

As of the date of this report, no verification digs were performed for this section.

Purpose

This report documents pertinent information associated with the geometry survey of a section of pipeline on Jan 01 1900. The pipeline surveyed is located in Houston. With a section name of Sample Job for a total distance of 37036.31 feet

Geometry Criteria

Dent - All dents having depth equal to or greater than 0.250" or 2% of nominal D.

Dent-Weld - All dents having depth equal to or greater than 0.25" and that affect curvature at a weld.

Survey Register Notations and Indications

Non Anomalies

Marker - portable or permanently installed device or feature located on the surface above a pipeline that facilitates the detection and recording of in-line inspection tool passage.

Weld - circumferential girth weld.

Fixture - normal component of a pipeline by design that is not used/noted as a marker.

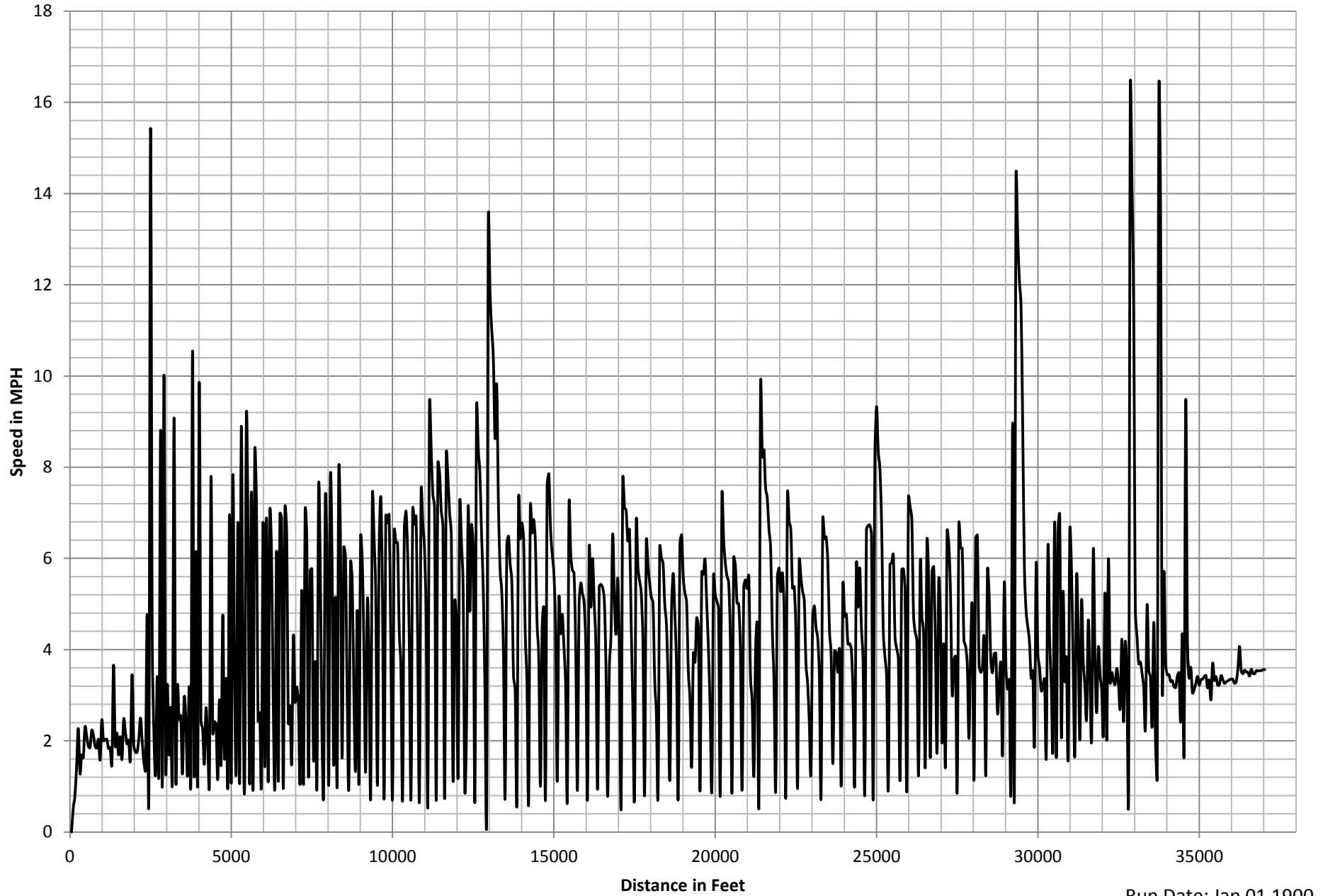
anomalies

Dent - local change in pipe surface contour as compared to adjacent nearby contour.

Ovality - general change in pipe lateral cross section characterized as egg or elliptical shape.

Speed Plot

SampleJob – 12" Sample Section



Job umber: SampleJob
Section ame: Sample Job

Date: Jan 01 1900
Line Si e: 12.75"
om. Wall: 0.312"

Small Diameter Dent Report

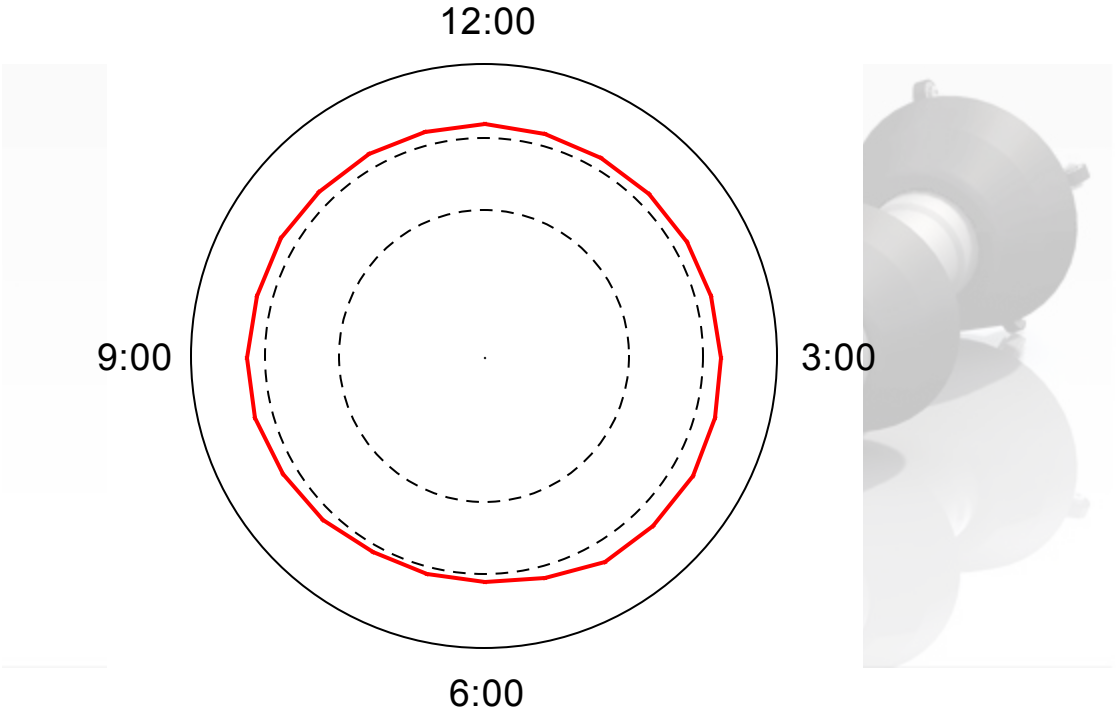
Feature #	Distance (ft)	Min ID (in)	O’Clock	Depth (in)	Length (in)	Comments
1	14020.81	11.41	07:16	0.38	33.75	



Job umber: SampleJob
Section ame: Sample Job

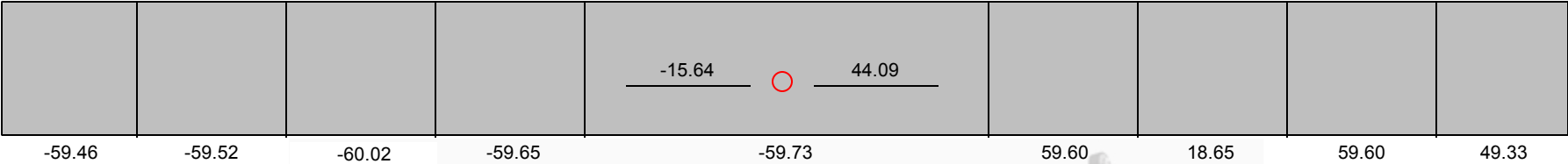
Date: Jan 01 1900
Line Si e: 12.75"
om. Wall: 0.312"

Feature #	Distance (ft)	Min ID (in)	O'Clock	Percent	Length (in)	Comments
1	14 020.81	11.41	07:16	12" 2. perator	33.75	



Flow →

Distance to US Marker (ft) -14 018.08 Distance to DS Marker (ft) 23 018.07



Anomaly	Reported
Depth :	3.18
dometer ft :	14 020.81
ross Sec. in :	11.41
Length in :	33.75
loc :	07:16

nits:	Imperial
-------	----------

Found

Location	Odometer (ft)	Dist. to Anomaly (ft)
Valve	2.73	DS -14 018.08
Weld	13825.98	DS -194.83
Weld	13885.50	DS -135.31
Weld	13945.52	DS -75.29
Weld	14005.17	DS -15.64
Dent	14020.81	- .00
Weld	14064.90	S 44.09
Weld	14124.50	S 103.69
Weld	14143.15	S 122.34
Weld	14202.75	S 181.94
Valve	37038.88	S 23 018.07

Dig Comments

Job umber: SampleJob
 Section ame: Sample Job

 Date: Jan 01 1900
 Line Si e: 12.75"
 om. Wall: 0.312"

Fixture List

Fixture #	Fixture	Distance (ft)	Comments
1	Valve	2.73	
2	Bend	241.73	Bend right-down n - 55 deg - 5D
3	Bend	939.46	Bend left - 65 deg - 5D
4	Bend	1 861.27	Bend right - 40 deg - 5D
5	Bend	2 045.27	Bend left - 90 deg - 5D
6	Bend	2 447.17	Bend right - 90 deg - 5D
7	Bend	4 994.33	Bend left - 90 deg - 5D
8	Bend	5 546.54	Bend right - 90 deg - 5D
9	Bend	7 986.31	Bend right - 90 deg - 5D
10	Bend	8 247.77	Bend left - 90 deg - 5D
11	Bend	9 989.90	Bend left - 90 deg - 5D
12	Bend	11 076.71	Bend right - 90 deg - 5D
13	Bend	11 609.85	Bend right - 45 deg - 5D
14	Bend	12 008.98	Bend left - 90 deg - 5D
15	Bend	12 283.00	Bend right - 27 deg - 5D
16	Bend	12 873.29	Bend right - 90 deg - 5D
17	Bend	14 733.31	Bend left - 90 deg - 5D
18	Bend	16 720.31	Bend right - 90 deg - 5D
19	Bend	17 780.58	Bend right - 30 deg - 5D
20	Bend	18 196.10	Bend right - 28 deg - 5D
21	Bend	25 890.88	Bend left - 50 deg - Possible 7D
22	Bend	29 139.29	Bend right - 90 deg - 5D
23	Bend	32 790.83	Bend right - 90 deg - 5D
24	Bend	32 922.69	Bend left - 90 deg - 5D
25	Bend	33 807.46	Bend right - 87 degree - 5D
26	Bend	34 526.50	Bend left - 90 degree - 5D
27	Bend	36 962.92	Bend right - 90 deg - 5D
28	Valve	37 038.88	

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	.40	.00	.00	.00	.00		
Valve	2.73	.00	.00	.00	.00		
Weld	5.54	5.14	.00	.00	.00		
Weld	10.54	5.00	.00	.00	.00		
Weld	66.08	55.54	.00	.00	.00		
Weld	125.56	59.48	.00	.00	.00		
Weld	173.08	47.52	.00	.00	.00		
Weld	185.79	12.71	.00	.00	.00		
Weld	207.83	22.04	.00	.00	.00		
Weld	232.23	24.40	.00	.00	.00		
Bend	241.73	.00	.00	.00	.00		Bend right-down n - 55 deg - 5D
Weld	253.96	21.73	.00	.00	.00		
Weld	271.71	17.75	.00	.00	.00		
Weld	292.00	20.29	.00	.00	.00		
Weld	313.38	21.38	.00	.00	.00		
Weld	355.42	42.04	.00	.00	.00		
Weld	380.94	25.52	.00	.00	.00		
Weld	404.25	23.31	.00	.00	.00		
Weld	461.94	57.69	.00	.00	.00		
Weld	509.54	47.60	.00	.00	.00		
Weld	568.75	59.21	.00	.00	.00		
Weld	620.25	51.50	.00	.00	.00		
Weld	679.46	59.21	.00	.00	.00		
Weld	739.21	59.75	.00	.00	.00		
Weld	798.58	59.37	.00	.00	.00		
Weld	858.48	59.90	.00	.00	.00		
Weld	918.35	59.87	.00	.00	.00		
Weld	934.94	16.59	.00	.00	.00		
Bend	939.46	.00	.00	.00	.00		Bend left - 65 deg - 5D

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	945.58	10.64	.00	.00	.00		
Weld	1001.00	55.42	.00	.00	.00		
Weld	1060.38	59.38	.00	.00	.00		
Weld	1120.25	59.87	.00	.00	.00		
Weld	1180.08	59.83	.00	.00	.00		
Weld	1239.33	59.25	.00	.00	.00		
Weld	1298.92	59.59	.00	.00	.00		
Weld	1358.17	59.25	.00	.00	.00		
Weld	1417.69	59.52	.00	.00	.00		
Weld	1477.19	59.50	.00	.00	.00		
Weld	1536.65	59.46	.00	.00	.00		
Weld	1596.02	59.37	.00	.00	.00		
Weld	1655.15	59.13	.00	.00	.00		
Weld	1714.98	59.83	.00	.00	.00		
Weld	1774.44	59.46	.00	.00	.00		
Weld	1825.73	51.29	.00	.00	.00		
Weld	1857.73	32.00	.00	.00	.00		
Bend	1861.27	.00	.00	.00	.00		Bend right - 40 deg - 5D
Weld	1865.46	7.73	.00	.00	.00		
Weld	1917.25	51.79	.00	.00	.00		
Weld	1964.67	47.42	.00	.00	.00		
Weld	1991.96	27.29	.00	.00	.00		
Weld	2039.73	47.77	.00	.00	.00		
Bend	2045.27	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	2051.60	11.87	.00	.00	.00		
Weld	2069.94	18.34	.00	.00	.00		
Weld	2103.83	33.89	.00	.00	.00		
Weld	2163.63	59.80	.00	.00	.00		
Weld	2206.92	43.29	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	2266.60	59.68	.00	.00	.00		
Weld	2325.46	58.86	.00	.00	.00		
Weld	2383.44	57.98	.00	.00	.00		
Weld	2442.75	59.31	.00	.00	.00		
Bend	2447.17	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	2452.17	9.42	.00	.00	.00		
Weld	2504.56	52.39	.00	.00	.00		
Weld	2563.92	59.36	.00	.00	.00		
Weld	2623.50	59.58	.00	.00	.00		
Weld	2682.29	58.79	.00	.00	.00		
Weld	2741.96	59.67	.00	.00	.00		
Weld	2800.17	58.21	.00	.00	.00		
Weld	2859.71	59.54	.00	.00	.00		
Weld	2904.83	45.12	.00	.00	.00		
Weld	2964.25	59.42	.00	.00	.00		
Weld	3023.67	59.42	.00	.00	.00		
Weld	3082.67	59.00	.00	.00	.00		
Weld	3142.48	59.81	.00	.00	.00		
Weld	3201.33	58.85	.00	.00	.00		
Weld	3261.08	59.75	.00	.00	.00		
Weld	3320.54	59.46	.00	.00	.00		
Weld	3380.31	59.77	.00	.00	.00		
Weld	3440.02	59.71	.00	.00	.00		
Weld	3499.31	59.29	.00	.00	.00		
Weld	3558.96	59.65	.00	.00	.00		
Weld	3618.67	59.71	.00	.00	.00		
Weld	3678.27	59.60	.00	.00	.00		
Weld	3738.17	59.90	.00	.00	.00		
Weld	3797.46	59.29	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	3846.40	48.94	.00	.00	.00		
Weld	3895.04	48.64	.00	.00	.00		
Weld	3942.23	47.19	.00	.00	.00		
Weld	3999.63	57.40	.00	.00	.00		
Weld	4059.40	59.77	.00	.00	.00		
Weld	4119.13	59.73	.00	.00	.00		
Weld	4178.48	59.35	.00	.00	.00		
Weld	4238.42	59.94	.00	.00	.00		
Weld	4298.15	59.73	.00	.00	.00		
Weld	4356.60	58.45	.00	.00	.00		
Weld	4416.02	59.42	.00	.00	.00		
Weld	4475.81	59.79	.00	.00	.00		
Weld	4535.67	59.86	.00	.00	.00		
Weld	4579.90	44.23	.00	.00	.00		
Weld	4639.63	59.73	.00	.00	.00		
Weld	4699.19	59.56	.00	.00	.00		
Weld	4758.79	59.60	.00	.00	.00		
Weld	4818.29	59.50	.00	.00	.00		
Weld	4877.94	59.65	.00	.00	.00		
Weld	4937.52	59.58	.00	.00	.00		
Weld	4988.31	50.79	.00	.00	.00		
Bend	4994.33	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	5000.90	12.59	.00	.00	.00		
Weld	5060.42	59.52	.00	.00	.00		
Weld	5120.21	59.79	.00	.00	.00		
Weld	5169.98	49.77	.00	.00	.00		
Weld	5229.54	59.56	.00	.00	.00		
Weld	5288.96	59.42	.00	.00	.00		
Weld	5348.58	59.62	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	5408.38	59.80	.00	.00	.00		
Weld	5467.50	59.12	.00	.00	.00		
Weld	5480.56	13.06	.00	.00	.00		
Weld	5540.40	59.84	.00	.00	.00		
Bend	5546.54	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	5552.73	12.33	.00	.00	.00		
Weld	5607.81	55.08	.00	.00	.00		
Weld	5667.83	60.02	.00	.00	.00		
Weld	5726.00	58.17	.00	.00	.00		
Weld	5785.56	59.56	.00	.00	.00		
Weld	5845.25	59.69	.00	.00	.00		
Weld	5904.88	59.63	.00	.00	.00		
Weld	5964.31	59.43	.00	.00	.00		
Weld	6023.94	59.63	.00	.00	.00		
Weld	6083.56	59.62	.00	.00	.00		
Weld	6143.25	59.69	.00	.00	.00		
Weld	6202.46	59.21	.00	.00	.00		
Weld	6262.00	59.54	.00	.00	.00		
Weld	6321.58	59.58	.00	.00	.00		
Weld	6380.73	59.15	.00	.00	.00		
Weld	6440.04	59.31	.00	.00	.00		
Weld	6449.31	9.27	.00	.00	.00		
Weld	6498.98	49.67	.00	.00	.00		
Weld	6558.40	59.42	.00	.00	.00		
Weld	6611.98	53.58	.00	.00	.00		
Weld	6671.56	59.58	.00	.00	.00		
Weld	6730.98	59.42	.00	.00	.00		
Weld	6790.73	59.75	.00	.00	.00		
Weld	6850.35	59.62	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	6910.02	59.67	.00	.00	.00		
Weld	6969.50	59.48	.00	.00	.00		
Weld	7029.19	59.69	.00	.00	.00		
Weld	7088.73	59.54	.00	.00	.00		
Weld	7148.08	59.35	.00	.00	.00		
Weld	7207.65	59.57	.00	.00	.00		
Weld	7262.54	54.89	.00	.00	.00		
Weld	7321.98	59.44	.00	.00	.00		
Weld	7381.73	59.75	.00	.00	.00		
Weld	7440.77	59.04	.00	.00	.00		
Weld	7500.19	59.42	.00	.00	.00		
Weld	7559.60	59.41	.00	.00	.00		
Weld	7619.40	59.80	.00	.00	.00		
Weld	7678.33	58.93	.00	.00	.00		
Weld	7737.81	59.48	.00	.00	.00		
Weld	7797.44	59.63	.00	.00	.00		
Weld	7857.00	59.56	.00	.00	.00		
Weld	7916.06	59.06	.00	.00	.00		
Weld	7975.56	59.50	.00	.00	.00		
Weld	7980.96	5.40	.00	.00	.00		
Bend	7986.31	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	7993.31	12.35	.00	.00	.00		
Weld	8052.77	59.46	.00	.00	.00		
Weld	8112.19	59.42	.00	.00	.00		
Weld	8171.92	59.73	.00	.00	.00		
Weld	8218.23	46.31	.00	.00	.00		
Weld	8242.98	24.75	.00	.00	.00		
Bend	8247.77	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	8255.42	12.44	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	8300.19	44.77	.00	.00	.00		
Weld	8359.71	59.52	.00	.00	.00		
Weld	8419.46	59.75	.00	.00	.00		
Weld	8478.92	59.46	.00	.00	.00		
Weld	8538.56	59.64	.00	.00	.00		
Weld	8598.33	59.77	.00	.00	.00		
Weld	8657.69	59.36	.00	.00	.00		
Weld	8717.40	59.71	.00	.00	.00		
Weld	8777.02	59.62	.00	.00	.00		
Weld	8836.83	59.81	.00	.00	.00		
Weld	8896.35	59.52	.00	.00	.00		
Weld	8956.33	59.98	.00	.00	.00		
Weld	9015.88	59.55	.00	.00	.00		
Weld	9075.50	59.62	.00	.00	.00		
Weld	9135.19	59.69	.00	.00	.00		
Weld	9194.58	59.39	.00	.00	.00		
Weld	9254.56	59.98	.00	.00	.00		
Weld	9314.48	59.92	.00	.00	.00		
Weld	9373.77	59.29	.00	.00	.00		
Weld	9433.67	59.90	.00	.00	.00		
Weld	9493.69	60.02	.00	.00	.00		
Weld	9535.13	41.44	.00	.00	.00		
Weld	9594.92	59.79	.00	.00	.00		
Weld	9654.75	59.83	.00	.00	.00		
Weld	9714.44	59.69	.00	.00	.00		
Weld	9773.75	59.31	.00	.00	.00		
Weld	9833.44	59.69	.00	.00	.00		
Weld	9893.21	59.77	.00	.00	.00		
Weld	9952.85	59.64	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	9984.04	31.19	.00	.00	.00		
Bend	9989.90	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	9996.54	12.50	.00	.00	.00		
Weld	10033.58	37.04	.00	.00	.00		
Weld	10093.29	59.71	.00	.00	.00		
Weld	10145.63	52.34	.00	.00	.00		
Weld	10183.23	37.60	.00	.00	.00		
Weld	10242.94	59.71	.00	.00	.00		
Weld	10302.71	59.77	.00	.00	.00		
Weld	10362.27	59.56	.00	.00	.00		
Weld	10422.10	59.83	.00	.00	.00		
Weld	10482.04	59.94	.00	.00	.00		
Weld	10541.88	59.84	.00	.00	.00		
Weld	10601.44	59.56	.00	.00	.00		
Weld	10656.65	55.21	.00	.00	.00		
Weld	10710.81	54.16	.00	.00	.00		
Weld	10759.81	49.00	.00	.00	.00		
Weld	10819.42	59.61	.00	.00	.00		
Weld	10878.81	59.39	.00	.00	.00		
Weld	10938.31	59.50	.00	.00	.00		
Weld	10998.13	59.82	.00	.00	.00		
Weld	11057.96	59.83	.00	.00	.00		
Weld	11071.19	13.23	.00	.00	.00		
Bend	11076.71	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	11083.90	12.71	.00	.00	.00		
Weld	11115.00	31.10	.00	.00	.00		
Weld	11174.54	59.54	.00	.00	.00		
Weld	11234.40	59.86	.00	.00	.00		
Weld	11294.21	59.81	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	11353.69	59.48	.00	.00	.00		
Weld	11412.75	59.06	.00	.00	.00		
Weld	11472.31	59.56	.00	.00	.00		
Weld	11532.04	59.73	.00	.00	.00		
Weld	11591.77	59.73	.00	.00	.00		
Weld	11605.60	13.83	.00	.00	.00		
Bend	11609.85	.00	.00	.00	.00		Bend right - 45 deg - 5D
Weld	11614.06	8.46	.00	.00	.00		
Weld	11637.81	23.75	.00	.00	.00		
Weld	11697.58	59.77	.00	.00	.00		
Weld	11742.50	44.92	.00	.00	.00		
Weld	11802.48	59.98	.00	.00	.00		
Weld	11862.31	59.83	.00	.00	.00		
Weld	11921.56	59.25	.00	.00	.00		
Weld	11981.29	59.73	.00	.00	.00		
Weld	12003.33	22.04	.00	.00	.00		
Bend	12008.98	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	12015.92	12.59	.00	.00	.00		
Weld	12053.60	37.68	.00	.00	.00		
Weld	12113.21	59.61	.00	.00	.00		
Weld	12172.96	59.75	.00	.00	.00		
Weld	12232.81	59.85	.00	.00	.00		
Weld	12257.13	24.32	.00	.00	.00		
Weld	12280.15	23.02	.00	.00	.00		
Bend	12283.00	.00	.00	.00	.00		Bend right - 27 deg - 5D
Weld	12286.46	6.31	.00	.00	.00		
Weld	12324.58	38.12	.00	.00	.00		
Weld	12374.52	49.94	.00	.00	.00		
Weld	12406.79	32.27	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	12466.46	59.67	.00	.00	.00		
Weld	12526.31	59.85	.00	.00	.00		
Weld	12585.52	59.21	.00	.00	.00		
Weld	12645.44	59.92	.00	.00	.00		
Weld	12705.19	59.75	.00	.00	.00		
Weld	12764.83	59.64	.00	.00	.00		
Weld	12824.65	59.82	.00	.00	.00		
Weld	12868.58	43.93	.00	.00	.00		
Bend	12873.29	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	12880.04	11.46	.00	.00	.00		
Weld	12901.67	21.63	.00	.00	.00		
Weld	12961.06	59.39	.00	.00	.00		
Weld	12999.65	38.59	.00	.00	.00		
Weld	13039.83	40.18	.00	.00	.00		
Weld	13099.65	59.82	.00	.00	.00		
Weld	13149.79	50.14	.00	.00	.00		
Weld	13179.21	29.42	.00	.00	.00		
Weld	13238.98	59.77	.00	.00	.00		
Weld	13290.13	51.15	.00	.00	.00		
Weld	13349.90	59.77	.00	.00	.00		
Weld	13409.65	59.75	.00	.00	.00		
Weld	13469.50	59.85	.00	.00	.00		
Weld	13528.98	59.48	.00	.00	.00		
Weld	13588.54	59.56	.00	.00	.00		
Weld	13648.17	59.63	.00	.00	.00		
Weld	13708.21	60.04	.00	.00	.00		
Weld	13766.52	58.31	.00	.00	.00		
Weld	13825.98	59.46	.00	.00	.00		
Weld	13885.50	59.52	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	13945.52	60.02	.00	.00	.00		
Weld	14005.17	59.65	.00	.00	.00		
Dent	14020.81	.00	.38	11.41	33.75	07:16	
Weld	14064.90	59.73	.00	.00	.00		
Weld	14124.50	59.60	.00	.00	.00		
Weld	14143.15	18.65	.00	.00	.00		
Weld	14202.75	59.60	.00	.00	.00		
Weld	14252.08	49.33	.00	.00	.00		
Weld	14306.83	54.75	.00	.00	.00		
Weld	14366.73	59.90	.00	.00	.00		
Weld	14426.50	59.77	.00	.00	.00		
Weld	14484.85	58.35	.00	.00	.00		
Weld	14542.60	57.75	.00	.00	.00		
Weld	14600.42	57.82	.00	.00	.00		
Weld	14660.29	59.87	.00	.00	.00		
Weld	14719.10	58.81	.00	.00	.00		
Weld	14727.46	8.36	.00	.00	.00		
Bend	14733.31	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	14740.44	12.98	.00	.00	.00		
Weld	14791.17	50.73	.00	.00	.00		
Weld	14850.96	59.79	.00	.00	.00		
Weld	14910.83	59.87	.00	.00	.00		
Weld	14970.75	59.92	.00	.00	.00		
Weld	15030.69	59.94	.00	.00	.00		
Weld	15090.42	59.73	.00	.00	.00		
Weld	15150.40	59.98	.00	.00	.00		
Weld	15210.42	60.02	.00	.00	.00		
Weld	15270.35	59.93	.00	.00	.00		
Weld	15330.10	59.75	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	15390.00	59.90	.00	.00	.00		
Weld	15449.65	59.65	.00	.00	.00		
Weld	15509.63	59.98	.00	.00	.00		
Weld	15558.25	48.62	.00	.00	.00		
Weld	15604.10	45.85	.00	.00	.00		
Weld	15663.73	59.63	.00	.00	.00		
Weld	15723.58	59.85	.00	.00	.00		
Weld	15783.40	59.82	.00	.00	.00		
Weld	15843.35	59.95	.00	.00	.00		
Weld	15902.88	59.53	.00	.00	.00		
Weld	15962.69	59.81	.00	.00	.00		
Weld	16022.52	59.83	.00	.00	.00		
Weld	16081.94	59.42	.00	.00	.00		
Weld	16141.67	59.73	.00	.00	.00		
Weld	16201.44	59.77	.00	.00	.00		
Weld	16261.29	59.85	.00	.00	.00		
Weld	16321.04	59.75	.00	.00	.00		
Weld	16380.48	59.44	.00	.00	.00		
Weld	16440.25	59.77	.00	.00	.00		
Weld	16500.33	60.08	.00	.00	.00		
Weld	16560.35	60.02	.00	.00	.00		
Weld	16618.21	57.86	.00	.00	.00		
Weld	16677.44	59.23	.00	.00	.00		
Weld	16714.27	36.83	.00	.00	.00		
Bend	16720.31	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	16726.77	12.50	.00	.00	.00		
Weld	16786.56	59.79	.00	.00	.00		
Weld	16804.69	18.13	.00	.00	.00		
Weld	16864.40	59.71	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	16924.27	59.87	.00	.00	.00		
Weld	16984.02	59.75	.00	.00	.00		
Weld	17043.92	59.90	.00	.00	.00		
Weld	17103.42	59.50	.00	.00	.00		
Weld	17162.31	58.89	.00	.00	.00		
Weld	17222.21	59.90	.00	.00	.00		
Weld	17282.06	59.85	.00	.00	.00		
Weld	17329.63	47.57	.00	.00	.00		
Weld	17389.44	59.81	.00	.00	.00		
Weld	17449.23	59.79	.00	.00	.00		
Weld	17508.48	59.25	.00	.00	.00		
Weld	17568.13	59.65	.00	.00	.00		
Weld	17627.92	59.79	.00	.00	.00		
Weld	17687.71	59.79	.00	.00	.00		
Weld	17747.25	59.54	.00	.00	.00		
Weld	17777.77	30.52	.00	.00	.00		
Bend	17780.58	.00	.00	.00	.00		Bend right - 30 deg - 5D
Weld	17784.40	6.63	.00	.00	.00		
Weld	17844.13	59.73	.00	.00	.00		
Weld	17904.08	59.95	.00	.00	.00		
Weld	17963.60	59.52	.00	.00	.00		
Weld	18023.13	59.53	.00	.00	.00		
Weld	18082.88	59.75	.00	.00	.00		
Weld	18133.46	50.58	.00	.00	.00		
Weld	18192.92	59.46	.00	.00	.00		
Bend	18196.10	.00	.00	.00	.00		Bend right - 28 deg - 5D
Weld	18200.08	7.16	.00	.00	.00		
Weld	18259.73	59.65	.00	.00	.00		
Weld	18319.40	59.67	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	18379.08	59.68	.00	.00	.00		
Weld	18430.75	51.67	.00	.00	.00		
Weld	18481.00	50.25	.00	.00	.00		
Weld	18540.90	59.90	.00	.00	.00		
Weld	18600.69	59.79	.00	.00	.00		
Weld	18660.44	59.75	.00	.00	.00		
Weld	18720.33	59.89	.00	.00	.00		
Weld	18780.29	59.96	.00	.00	.00		
Weld	18840.13	59.84	.00	.00	.00		
Weld	18899.71	59.58	.00	.00	.00		
Weld	18959.50	59.79	.00	.00	.00		
Weld	19019.13	59.63	.00	.00	.00		
Weld	19078.79	59.66	.00	.00	.00		
Weld	19138.67	59.88	.00	.00	.00		
Weld	19198.38	59.71	.00	.00	.00		
Weld	19258.17	59.79	.00	.00	.00		
Weld	19317.92	59.75	.00	.00	.00		
Weld	19377.69	59.77	.00	.00	.00		
Weld	19433.33	55.64	.00	.00	.00		
Weld	19493.25	59.92	.00	.00	.00		
Weld	19553.13	59.88	.00	.00	.00		
Weld	19612.92	59.79	.00	.00	.00		
Weld	19672.58	59.66	.00	.00	.00		
Weld	19732.33	59.75	.00	.00	.00		
Weld	19792.00	59.67	.00	.00	.00		
Weld	19852.06	60.06	.00	.00	.00		
Weld	19911.71	59.65	.00	.00	.00		
Weld	19971.44	59.73	.00	.00	.00		
Weld	20031.44	60.00	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	20091.33	59.89	.00	.00	.00		
Weld	20150.98	59.65	.00	.00	.00		
Weld	20210.63	59.65	.00	.00	.00		
Weld	20270.08	59.45	.00	.00	.00		
Weld	20330.06	59.98	.00	.00	.00		
Weld	20389.48	59.42	.00	.00	.00		
Weld	20449.38	59.90	.00	.00	.00		
Weld	20509.10	59.72	.00	.00	.00		
Weld	20568.67	59.57	.00	.00	.00		
Weld	20628.56	59.89	.00	.00	.00		
Weld	20688.19	59.63	.00	.00	.00		
Weld	20735.96	47.77	.00	.00	.00		
Weld	20796.04	60.08	.00	.00	.00		
Weld	20855.50	59.46	.00	.00	.00		
Weld	20915.27	59.77	.00	.00	.00		
Weld	20969.54	54.27	.00	.00	.00		
Weld	21029.50	59.96	.00	.00	.00		
Weld	21082.88	53.38	.00	.00	.00		
Weld	21129.67	46.79	.00	.00	.00		
Weld	21189.27	59.60	.00	.00	.00		
Weld	21231.56	42.29	.00	.00	.00		
Weld	21291.44	59.88	.00	.00	.00		
Weld	21350.00	58.56	.00	.00	.00		
Weld	21409.27	59.27	.00	.00	.00		
Weld	21452.25	42.98	.00	.00	.00		
Weld	21511.67	59.42	.00	.00	.00		
Weld	21553.63	41.96	.00	.00	.00		
Weld	21613.44	59.81	.00	.00	.00		
Weld	21673.08	59.64	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	21733.06	59.98	.00	.00	.00		
Weld	21792.83	59.77	.00	.00	.00		
Weld	21852.75	59.92	.00	.00	.00		
Weld	21912.54	59.79	.00	.00	.00		
Weld	21972.38	59.84	.00	.00	.00		
Weld	21989.88	17.50	.00	.00	.00		
Weld	22050.00	60.12	.00	.00	.00		
Weld	22106.06	56.06	.00	.00	.00		
Weld	22165.92	59.86	.00	.00	.00		
Weld	22225.71	59.79	.00	.00	.00		
Weld	22285.40	59.69	.00	.00	.00		
Weld	22345.29	59.89	.00	.00	.00		
Weld	22405.19	59.90	.00	.00	.00		
Weld	22465.04	59.85	.00	.00	.00		
Weld	22524.98	59.94	.00	.00	.00		
Weld	22584.92	59.94	.00	.00	.00		
Weld	22644.85	59.93	.00	.00	.00		
Weld	22704.63	59.78	.00	.00	.00		
Weld	22764.40	59.77	.00	.00	.00		
Weld	22824.33	59.93	.00	.00	.00		
Weld	22883.90	59.57	.00	.00	.00		
Weld	22943.69	59.79	.00	.00	.00		
Weld	23003.60	59.91	.00	.00	.00		
Weld	23063.38	59.78	.00	.00	.00		
Weld	23123.54	60.16	.00	.00	.00		
Weld	23183.27	59.73	.00	.00	.00		
Weld	23243.10	59.83	.00	.00	.00		
Weld	23302.44	59.34	.00	.00	.00		
Weld	23362.25	59.81	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	23422.13	59.88	.00	.00	.00		
Weld	23482.04	59.91	.00	.00	.00		
Weld	23542.13	60.09	.00	.00	.00		
Weld	23602.00	59.87	.00	.00	.00		
Weld	23661.98	59.98	.00	.00	.00		
Weld	23722.21	60.23	.00	.00	.00		
Weld	23782.06	59.85	.00	.00	.00		
Weld	23841.92	59.86	.00	.00	.00		
Weld	23901.85	59.93	.00	.00	.00		
Weld	23961.77	59.92	.00	.00	.00		
Weld	24015.42	53.65	.00	.00	.00		
Weld	24026.21	10.79	.00	.00	.00		
Weld	24086.02	59.81	.00	.00	.00		
Weld	24117.44	31.42	.00	.00	.00		
Weld	24177.50	60.06	.00	.00	.00		
Weld	24237.40	59.90	.00	.00	.00		
Weld	24297.19	59.79	.00	.00	.00		
Weld	24356.90	59.71	.00	.00	.00		
Weld	24399.40	42.50	.00	.00	.00		
Weld	24459.21	59.81	.00	.00	.00		
Weld	24518.85	59.64	.00	.00	.00		
Weld	24566.85	48.00	.00	.00	.00		
Weld	24626.71	59.86	.00	.00	.00		
Weld	24686.50	59.79	.00	.00	.00		
Weld	24746.21	59.71	.00	.00	.00		
Weld	24806.04	59.83	.00	.00	.00		
Weld	24865.98	59.94	.00	.00	.00		
Weld	24925.79	59.81	.00	.00	.00		
Weld	24985.71	59.92	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	25045.50	59.79	.00	.00	.00		
Weld	25105.27	59.77	.00	.00	.00		
Weld	25164.98	59.71	.00	.00	.00		
Weld	25224.85	59.87	.00	.00	.00		
Weld	25284.85	60.00	.00	.00	.00		
Weld	25344.56	59.71	.00	.00	.00		
Weld	25404.19	59.63	.00	.00	.00		
Weld	25464.25	60.06	.00	.00	.00		
Weld	25522.65	58.40	.00	.00	.00		
Weld	25582.67	60.02	.00	.00	.00		
Weld	25642.60	59.93	.00	.00	.00		
Weld	25702.56	59.96	.00	.00	.00		
Weld	25762.65	60.09	.00	.00	.00		
Weld	25822.42	59.77	.00	.00	.00		
Weld	25882.33	59.91	.00	.00	.00		
Weld	25886.33	4.00	.00	.00	.00		
Bend	25890.88	.00	.00	.00	.00		Bend left - 50 deg - Possible 7D
Weld	25895.60	9.27	.00	.00	.00		
Weld	25955.19	59.59	.00	.00	.00		
Weld	26014.77	59.58	.00	.00	.00		
Weld	26056.21	41.44	.00	.00	.00		
Weld	26115.94	59.73	.00	.00	.00		
Weld	26175.92	59.98	.00	.00	.00		
Weld	26235.73	59.81	.00	.00	.00		
Weld	26295.63	59.90	.00	.00	.00		
Weld	26354.35	58.72	.00	.00	.00		
Weld	26414.42	60.07	.00	.00	.00		
Weld	26474.13	59.71	.00	.00	.00		
Weld	26533.90	59.77	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	26593.73	59.83	.00	.00	.00		
Weld	26653.54	59.81	.00	.00	.00		
Weld	26713.52	59.98	.00	.00	.00		
Weld	26773.42	59.90	.00	.00	.00		
Weld	26833.35	59.93	.00	.00	.00		
Weld	26893.31	59.96	.00	.00	.00		
Weld	26953.27	59.96	.00	.00	.00		
Weld	27013.25	59.98	.00	.00	.00		
Weld	27073.23	59.98	.00	.00	.00		
Weld	27133.27	60.04	.00	.00	.00		
Weld	27193.25	59.98	.00	.00	.00		
Weld	27253.08	59.83	.00	.00	.00		
Weld	27312.79	59.71	.00	.00	.00		
Weld	27372.25	59.46	.00	.00	.00		
Weld	27432.06	59.81	.00	.00	.00		
Weld	27491.90	59.84	.00	.00	.00		
Weld	27551.48	59.58	.00	.00	.00		
Weld	27611.38	59.90	.00	.00	.00		
Weld	27671.08	59.70	.00	.00	.00		
Weld	27730.83	59.75	.00	.00	.00		
Weld	27790.56	59.73	.00	.00	.00		
Weld	27849.75	59.19	.00	.00	.00		
Weld	27909.52	59.77	.00	.00	.00		
Weld	27969.46	59.94	.00	.00	.00		
Weld	28029.31	59.85	.00	.00	.00		
Weld	28089.06	59.75	.00	.00	.00		
Weld	28137.58	48.52	.00	.00	.00		
Weld	28197.31	59.73	.00	.00	.00		
Weld	28257.00	59.69	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	28316.94	59.94	.00	.00	.00		
Weld	28376.81	59.87	.00	.00	.00		
Weld	28436.63	59.82	.00	.00	.00		
Weld	28496.54	59.91	.00	.00	.00		
Weld	28556.40	59.86	.00	.00	.00		
Weld	28616.46	60.06	.00	.00	.00		
Weld	28676.15	59.69	.00	.00	.00		
Weld	28735.69	59.54	.00	.00	.00		
Weld	28795.44	59.75	.00	.00	.00		
Weld	28855.46	60.02	.00	.00	.00		
Weld	28915.42	59.96	.00	.00	.00		
Weld	28975.06	59.64	.00	.00	.00		
Weld	29034.92	59.86	.00	.00	.00		
Weld	29094.63	59.71	.00	.00	.00		
Weld	29132.98	38.35	.00	.00	.00		
Bend	29139.29	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	29145.48	12.50	.00	.00	.00		
Weld	29191.10	45.62	.00	.00	.00		
Weld	29250.38	59.28	.00	.00	.00		
Weld	29269.83	19.45	.00	.00	.00		
Weld	29330.98	61.15	.00	.00	.00		
Weld	29385.94	54.96	.00	.00	.00		
Weld	29445.60	59.66	.00	.00	.00		
Weld	29505.25	59.65	.00	.00	.00		
Weld	29564.98	59.73	.00	.00	.00		
Weld	29624.96	59.98	.00	.00	.00		
Weld	29684.83	59.87	.00	.00	.00		
Weld	29744.79	59.96	.00	.00	.00		
Weld	29804.75	59.96	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	29864.77	60.02	.00	.00	.00		
Weld	29888.46	23.69	.00	.00	.00		
Weld	29948.46	60.00	.00	.00	.00		
Weld	29970.33	21.87	.00	.00	.00		
Weld	30030.38	60.05	.00	.00	.00		
Weld	30090.10	59.72	.00	.00	.00		
Weld	30150.04	59.94	.00	.00	.00		
Weld	30209.94	59.90	.00	.00	.00		
Weld	30269.85	59.91	.00	.00	.00		
Weld	30329.88	60.03	.00	.00	.00		
Weld	30389.79	59.91	.00	.00	.00		
Weld	30439.31	49.52	.00	.00	.00		
Weld	30496.83	57.52	.00	.00	.00		
Weld	30556.65	59.82	.00	.00	.00		
Weld	30616.46	59.81	.00	.00	.00		
Weld	30676.46	60.00	.00	.00	.00		
Weld	30736.25	59.79	.00	.00	.00		
Weld	30795.85	59.60	.00	.00	.00		
Weld	30855.58	59.73	.00	.00	.00		
Weld	30915.65	60.07	.00	.00	.00		
Weld	30975.40	59.75	.00	.00	.00		
Weld	31018.77	43.37	.00	.00	.00		
Weld	31062.19	43.42	.00	.00	.00		
Weld	31105.60	43.41	.00	.00	.00		
Weld	31120.71	15.11	.00	.00	.00		
Weld	31153.58	32.87	.00	.00	.00		
Weld	31200.38	46.80	.00	.00	.00		
Weld	31254.13	53.75	.00	.00	.00		
Weld	31297.40	43.27	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	31346.50	49.10	.00	.00	.00		
Weld	31406.31	59.81	.00	.00	.00		
Weld	31465.88	59.57	.00	.00	.00		
Weld	31525.58	59.70	.00	.00	.00		
Weld	31578.06	52.48	.00	.00	.00		
Weld	31637.92	59.86	.00	.00	.00		
Weld	31697.81	59.89	.00	.00	.00		
Weld	31753.46	55.65	.00	.00	.00		
Weld	31813.35	59.89	.00	.00	.00		
Weld	31873.23	59.88	.00	.00	.00		
Weld	31933.00	59.77	.00	.00	.00		
Weld	31992.79	59.79	.00	.00	.00		
Weld	32052.42	59.63	.00	.00	.00		
Weld	32112.10	59.68	.00	.00	.00		
Weld	32127.15	15.05	.00	.00	.00		
Weld	32186.81	59.66	.00	.00	.00		
Weld	32246.44	59.63	.00	.00	.00		
Weld	32306.27	59.83	.00	.00	.00		
Weld	32366.13	59.86	.00	.00	.00		
Weld	32425.98	59.85	.00	.00	.00		
Weld	32485.81	59.83	.00	.00	.00		
Weld	32545.71	59.90	.00	.00	.00		
Weld	32605.58	59.87	.00	.00	.00		
Weld	32665.35	59.77	.00	.00	.00		
Weld	32725.19	59.84	.00	.00	.00		
Weld	32784.96	59.77	.00	.00	.00		
Bend	32790.83	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	32797.39	12.43	.00	.00	.00		
Weld	32806.13	8.74	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	32808.89	2.76	.00	.00	.00		
Weld	32864.63	55.74	.00	.00	.00		
Weld	32916.83	52.20	.00	.00	.00		
Bend	32922.69	.00	.00	.00	.00		Bend left - 90 deg - 5D
Weld	32929.36	12.53	.00	.00	.00		
Weld	32959.17	29.81	.00	.00	.00		
Weld	33018.63	59.46	.00	.00	.00		
Weld	33078.42	59.79	.00	.00	.00		
Weld	33138.42	60.00	.00	.00	.00		
Weld	33198.21	59.79	.00	.00	.00		
Weld	33242.54	44.33	.00	.00	.00		
Weld	33302.19	59.65	.00	.00	.00		
Weld	33321.08	18.89	.00	.00	.00		
Weld	33350.88	29.80	.00	.00	.00		
Weld	33397.73	46.85	.00	.00	.00		
Weld	33457.50	59.77	.00	.00	.00		
Weld	33517.33	59.83	.00	.00	.00		
Weld	33576.89	59.56	.00	.00	.00		
Weld	33636.73	59.84	.00	.00	.00		
Weld	33674.69	37.96	.00	.00	.00		
Weld	33735.83	61.14	.00	.00	.00		
Weld	33795.21	59.38	.00	.00	.00		
Weld	33801.33	6.12	.00	.00	.00		
Bend	33807.46	.00	.00	.00	.00		Bend right - 87 degree - 5D
Weld	33813.46	12.13	.00	.00	.00		
Weld	33828.88	15.42	.00	.00	.00		
Weld	33888.52	59.64	.00	.00	.00		
Weld	33948.42	59.90	.00	.00	.00		
Weld	34008.11	59.69	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	34067.88	59.77	.00	.00	.00		
Weld	34127.23	59.35	.00	.00	.00		
Weld	34187.00	59.77	.00	.00	.00		
Weld	34238.23	51.23	.00	.00	.00		
Weld	34287.89	49.66	.00	.00	.00		
Weld	34347.46	59.57	.00	.00	.00		
Weld	34407.29	59.83	.00	.00	.00		
Weld	34466.61	59.32	.00	.00	.00		
Weld	34520.44	53.83	.00	.00	.00		
Bend	34526.50	.00	.00	.00	.00		Bend left - 90 degree - 5D
Weld	34533.00	12.56	.00	.00	.00		
Weld	34582.29	49.29	.00	.00	.00		
Weld	34630.98	48.69	.00	.00	.00		
Weld	34690.64	59.66	.00	.00	.00		
Weld	34750.14	59.50	.00	.00	.00		
Weld	34809.71	59.57	.00	.00	.00		
Weld	34869.42	59.71	.00	.00	.00		
Weld	34928.89	59.47	.00	.00	.00		
Weld	34988.48	59.59	.00	.00	.00		
Weld	35048.11	59.63	.00	.00	.00		
Weld	35107.71	59.60	.00	.00	.00		
Weld	35167.67	59.96	.00	.00	.00		
Weld	35227.38	59.71	.00	.00	.00		
Weld	35287.11	59.73	.00	.00	.00		
Weld	35346.96	59.85	.00	.00	.00		
Weld	35404.64	57.68	.00	.00	.00		
Weld	35464.46	59.82	.00	.00	.00		
Weld	35524.31	59.85	.00	.00	.00		
Weld	35584.11	59.80	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O'Clock	Comments
Weld	35643.96	59.85	.00	.00	.00		
Weld	35703.75	59.79	.00	.00	.00		
Weld	35763.39	59.64	.00	.00	.00		
Weld	35823.46	60.07	.00	.00	.00		
Weld	35883.31	59.85	.00	.00	.00		
Weld	35943.17	59.86	.00	.00	.00		
Weld	36003.00	59.83	.00	.00	.00		
Weld	36062.69	59.69	.00	.00	.00		
Weld	36084.33	21.64	.00	.00	.00		
Weld	36143.98	59.65	.00	.00	.00		
Weld	36204.04	60.06	.00	.00	.00		
Weld	36263.75	59.71	.00	.00	.00		
Weld	36323.39	59.64	.00	.00	.00		
Weld	36383.06	59.67	.00	.00	.00		
Weld	36443.08	60.02	.00	.00	.00		
Weld	36502.96	59.88	.00	.00	.00		
Weld	36556.17	53.21	.00	.00	.00		
Weld	36605.61	49.44	.00	.00	.00		
Weld	36658.54	52.93	.00	.00	.00		
Weld	36718.38	59.84	.00	.00	.00		
Weld	36777.98	59.60	.00	.00	.00		
Weld	36837.64	59.66	.00	.00	.00		
Weld	36897.50	59.86	.00	.00	.00		
Weld	36957.46	59.96	.00	.00	.00		
Bend	36962.92	.00	.00	.00	.00		Bend right - 90 deg - 5D
Weld	36970.00	12.54	.00	.00	.00		
Weld	37008.08	38.08	.00	.00	.00		
Weld	37029.33	21.25	.00	.00	.00		
Weld	37036.04	6.71	.00	.00	.00		

Full Registry Listing

Feature	Distance	Joint	Depth	Min. ID	Length	O’Clock	Comments
Valve	37038.88	.00	.00	.00	.00		
Weld	37042.61	6.57	.00	.00	.00		



EnviroCal Inc.

RS-Caliper Calibration Verification Report

Job no

Date

Tool

12" RS-Caliper

No. of Geometry Sensors

12

No. of Orientation Sensors

1

No. of Odometer Sensors

4

Verification Plan

The 12" RS-Caliper tool has 12 geometry arms covering the pipe's circumference. Each arm measures the radius of the pipe from the center of the tool body. Hence, arms are calibrated to radial value ranges. After calibration, the arms are set to known radius positions and results are recorded for calibration accuracy. The allowable error for geometry sensors is $\pm 0.1\%$. The orientation sensor is tested by revolving the tool by known degrees and compared against the measured results. The four odometer sensors are spun while distance is logged individually. Each revolution measures 7 inches. 100% accurate distance measurement is the passable criteria for odometer sensors.

Geometry Sensor Results

Arm No.	Radial Values in inches				Arm No.	Radial Values in inches			
	Actual	Measured	Actual	Measured		Actual	Measured	Actual	Measured
1	6	6.02	5.75	5.69					
2	6	6.03	5.75	5.71					
3	6	6.02	5.75	5.73					
4	6	5.94	5.75	5.72					
5	6	5.98	5.75	5.71					
6	6	6.01	5.75	5.78					
7	6	5.99	5.75	5.77					
8	6	6.02	5.75	5.72					
9	6	5.97	5.75	5.71					
10	6	5.98	5.75	5.74					
11	6	5.97	5.75	5.79					
12	6	6.00	5.75	5.73					

Orientation Sensor Verification

Actual tool revolving angle from steady state – 90 degrees

Measured tool O'Clock – 03:00

Odometer Sensor Verification

Odometer	Revolutions Loaded	Measured Distance
1	2	14"
2	2	14"
3	2	14"
4	2	14"

Calibration Verified by

