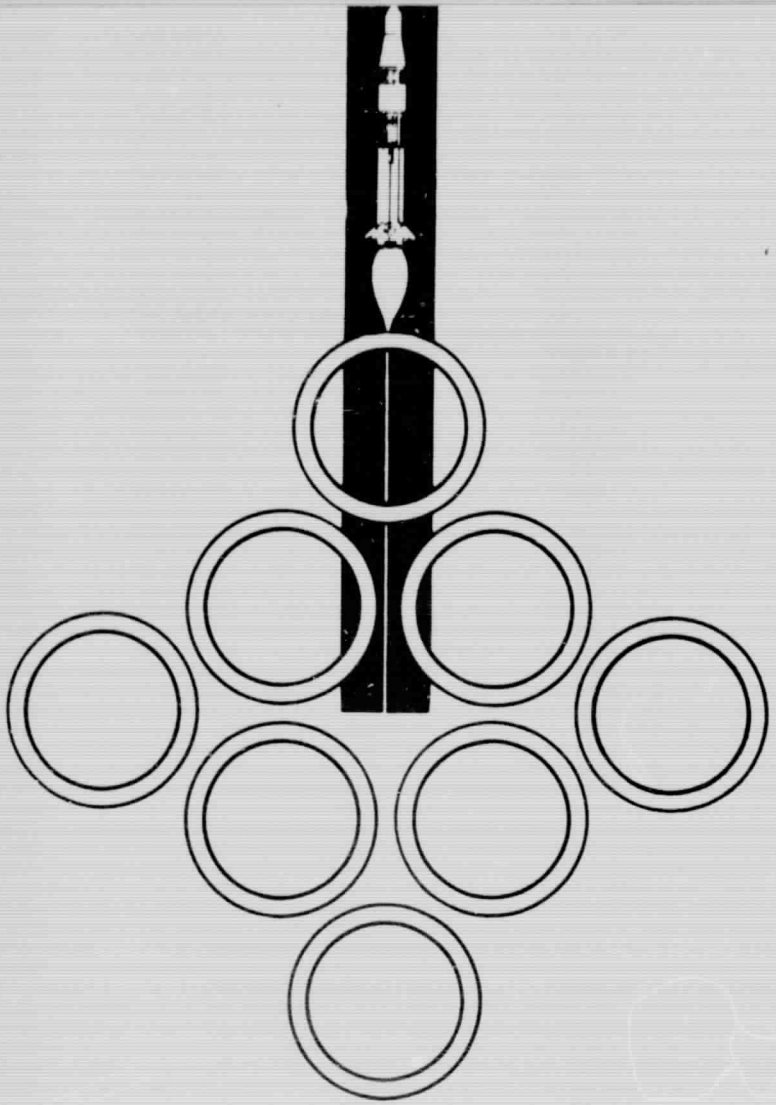

ENGINEERING DEPARTMENT

TECHNICAL REPORT

TR-RE-CCSD-FO-1095-3

February 1, 1967

SATURN IB PROGRAM

TEST REPORT
FOR

GATE VALVE, MANUALLY OPERATED

4-INCH, 300-POUND

Pacific Valve Company Model Number S8530F(8)-12T-ASA

NASA Drawing Number 75M12930 LGV-IC

SPACE DIVISION CHRYSLER CORPORATION

TEST REPORT

FOR

GATE VALVE, MANUALLY OPERATED

4-INCH, 300-POUND

Pacific Valve Company Model Number S8530F(8)-12T-ASA

NASA Drawing Number 75M12930 LGV-IC

ABSTRACT

This report presents the results of tests performed on one sample of manually operated Gate Valve 75M12930 LGV-IC. The following tests were performed:

1. Receiving Inspection
2. Proof Pressure
3. Functional
4. High Temperature
5. Surge
6. Cycle
7. Burst

The results of the tests were satisfactory. The performance of the specimen was in accordance with specification requirements of NASA drawing 75M12930 LGV-IC.

An additional test, not specified in TP-RE-CCSD-FO-1095-2F, was performed to determine opening and closing torque. The results of this test are presented in appendix A.

TR-RE-CCSD-FO-1095-3

TEST REPORT

FOR

GATE VALVE, MANUALLY OPERATED

4-INCH, 300-POUND

Pacific Valve Company Model Number S8530F(8)-12T-ASA

NASA Drawing Number 75M12930 LGV-IC

February 1, 1967

CHRYSLER CORPORATION SPACE DIVISION - NEW ORLEANS, LOUISIANA

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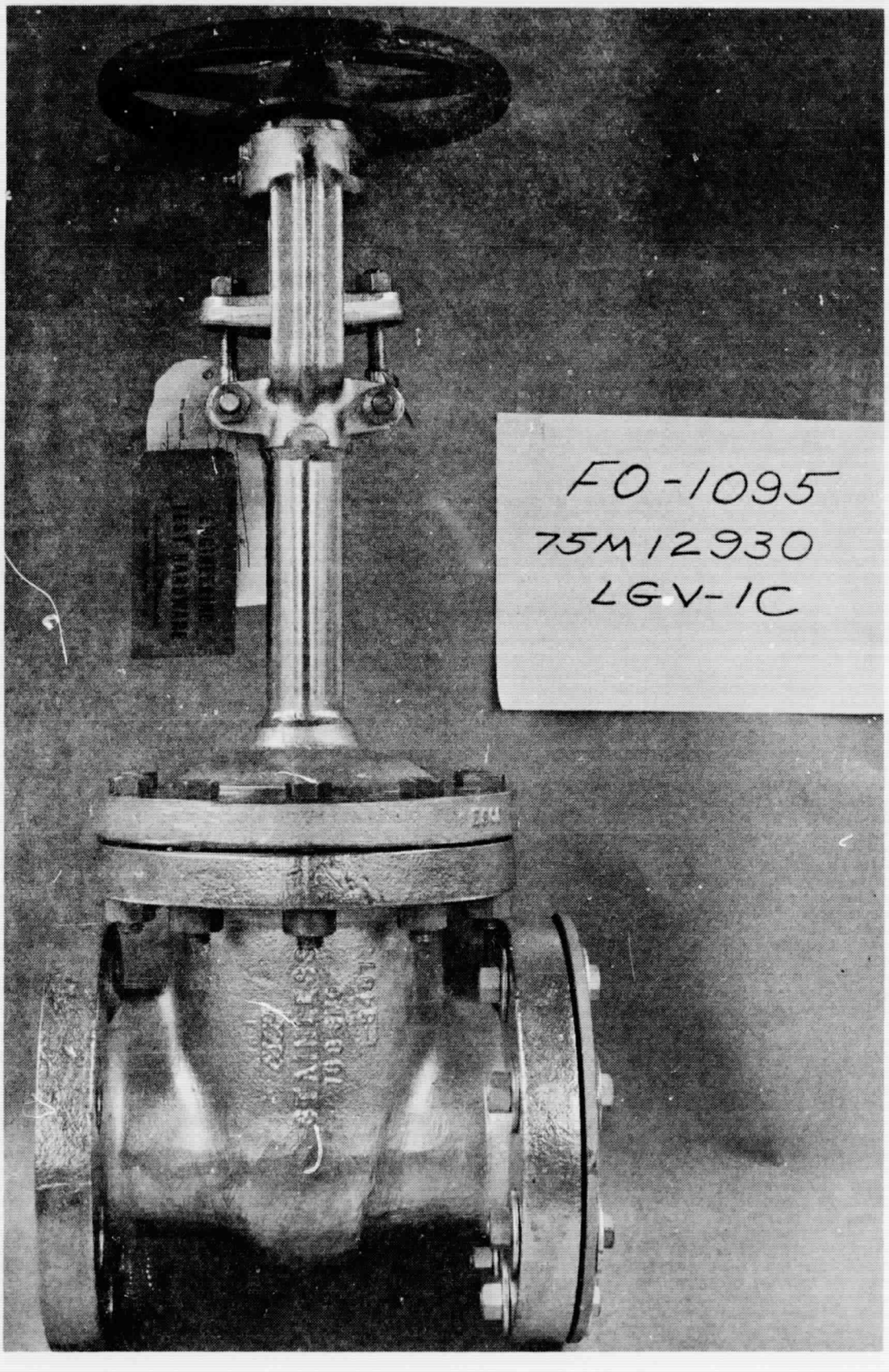


Gate Valve 75M12930 LGV-IC, Manually Operated,
4-Inch, 300-Pound.

CHECK SHEET

FOR

GATE VALVE, MANUALLY OPERATED

4-INCH, 300-POUND

MANUFACTURER: Pacific Valve Company
MANUFACTURER'S MODEL NUMBER: S8530F(8)-12T-ASA
NASA PART NUMBER: 75M12930 LGV-IC
TESTING AGENCY: Chrysler Corporation Space Division, New Orleans, Louisiana
AUTHORIZING AGENCY: NASA KSC

I. FUNCTIONAL REQUIREMENTS

A.	OPERATING MEDIUM:	LN_2
B.	OPERATING PRESSURE:	300 psig
C.	PROOF PRESSURE:	450 psig
D.	BURST PRESSURE:	1200 psig

II. CONSTRUCTION MATERIAL

A.	BODY:	316 stainless steel
B.	BONNET:	316 stainless steel
C.	VALVE TRIM:	316 stainless steel
D.	YOKE:	316 stainless steel
E.	DISCS:	316 stainless steel with Teflon inserts
F.	END CONNECTIONS:	4-inch, 300-pound ASA flanges

III. ENVIRONMENTAL REQUIREMENTS

A.	OPERATING TEMPERATURE:	-320 to +125°F

IV. LOCATION AND USE: Used as a shutoff valve in the LOX replenish fill line at John F. Kennedy Space Center Launch Complexes 34 and 37B.

TEST SUMMARY

GATE VALVE

75M12930 LGV-IC

Environment	Units	Operational Boundary	Test Objective	Test Results	Remarks
Receiving Inspection	1	Visual examination	To determine if specimen conforms with applicable drawings and specifications	Satisfactory	Length: 12 inches flange to flange Height: 30-7/8 inches
Proof Pressure Test	1	450 psig for 5 minutes	Check for leakage and distortion	Satisfactory	Maintained 450 psig. No external leakage
Functional Test	1	Maximum allowable leakage 10 sccm	To determine specimen internal and packing gland leakage	Satisfactory	Internal leakage: 9.84 sccm Packing Gland leakage: none
High Temperature Test	1	Stabilize specimen at 125°F for 72 hours; Perform functional test both at high temperature and after return to ambient conditions	To determine operating ability at high temperature and after return to ambient conditions	Satisfactory	No change of operation ability. No increase in leakage during functional tests
Surge Test	1	50 to 300 psig within 100 milliseconds for 20 cycles	To determine if specimen operation is impaired by surge	Satisfactory	Pressurization time between 80 and 95 milliseconds
Cycle Test	1	Open and close the specimen while the specimen is pressurized to 300 psig. Perform 500 cycles	Perform a functional test after 100, 200, 300, 400, and 500 cycles. Check for leakage	Satisfactory	No increase in leakage from specimen. Maximum torque 90 ft-lb
Burst Test	1	1200 psig for 5 minutes	Maintain 1200 psig with no leakage for 5 minutes	Satisfactory	1200 psig was maintained for 5 minutes with no external leakage or distortion

SECTION I

INTRODUCTION

1.1 SCOPE

This procedure describes the tests to be performed to determine if Gate Valve 75M12930 LGV-IC meets the operational and environmental requirements of the John F. Kennedy Space Center. A summary of the test results is presented on page vii.

1.2 ITEM DESCRIPTION

1.2.1 Gate Valve 75M12930 LGV-IC is a manually operated, 4-inch, flanged-end gate valve. The valve is manufactured by the Pacific Valve Company, Long Beach, California, and serves as a shutoff valve in the LOX replenish fill line.

1.2.2 The valve is of one piece pattern with an integral seat, extension bonnet, and outside screw and yoke. The valve control handle is of the hand wheel type. The valve measures 12 inches face to face and is constructed of 316 stainless steel with a Teflon insert in the downstream valve disc.

1.3 APPLICABLE DOCUMENTS

The following documents contain the test requirements for Gate Valve 75M12930 LGV-IC.

a. KSC-STD-164(D), dated September 17, 1964, Standard Environmental Test Methods for Ground Support Equipment Installations at Cape Kennedy

b. NASA Drawing 75M12930 LGV-IC

c. Cleaning Standard MSFC-STD-164(D)

d. Test Plan CCSD-FO-1095-1F

e. Test Procedure TP-RE-CCSD-FO-1095-2F

SECTION II

RECEIVING INSPECTION

2.1 TEST REQUIREMENTS

The specimen shall be visually and dimensionally inspected for conformance with the applicable specifications prior to testing.

2.2 TEST PROCEDURE

A visual and dimensional inspection was performed to determine compliance with NASA drawing 75M12930 LGV-IC and the applicable vendor drawing to the extent possible without disassembly of the test specimen. At the same time the test specimen was inspected for poor workmanship and manufacturing defects.

2.3 TEST RESULTS

The specimen successfully complied with the requirements of NASA drawing 75M12930 LGV-IC and vendor drawing 6-2456. No evidence of poor workmanship or manufacturing defects was observed.

2.4 TEST DATA

The data presented in table 2-1 were recorded during receiving inspection.

Table 2-1. Specimen Specifics

Name	Gate Valve, Manually Operated
Serial No.	15319
Size	4-Inch
Figure No.	S8530F(8)-12T-4 A
Material	Stainless steel
Height	30-7/8 inches
Length	12 inches (flange to flange)
End Connections	4-inch, 300-pound, ASA flanges

SECTION III

PROOF PRESSURE TEST

3.1 TEST REQUIREMENTS

3.1.1 With the test specimen in the open position, the inlet and outlet ports shall be simultaneously pressurized to 450 psig. This pressure shall be maintained for 5 minutes.

3.1.2 The test specimen shall be checked for leakage and distortion.

3.1.3 The test medium shall be H_2O.

3.2 TEST PROCEDURE

3.2.1 The test setup shown in figures 3-1 and 3-2 was assembled using the equipment listed in table 3-1.

3.2.2 It was determined that all connections were tight, the gage was installed and operating properly, and that all valves were closed.

3.2.3 The specimen was placed in the opened position and valves 4 and 6 were opened. The specimen and system were purged of air by operating hand pump 3.

3.2.4 Valve 6 was closed and hand pump 3 was operated until the specimen was pressurized to 450 psig. The pressure was monitored on gage 5.

3.2.5 Valve 4 was closed and the pressure was maintained for 5 minutes.

3.2.6 During the 5-minute pressurization period, the specimen was checked for leakage by monitoring gage 5, and by visual inspection. The initial and final pressures were recorded.

3.2.7 Valves 4 and 6 were opened and the system was allowed to depressurize to zero psig.

3.2.8 The specimen was inspected for distortion and all data were recorded.

3.3 TEST RESULTS

3.3.1 The test specimen was successfully subjected to the proof pressure test. No leakage or distortion was noted.

3.4 TEST DATA

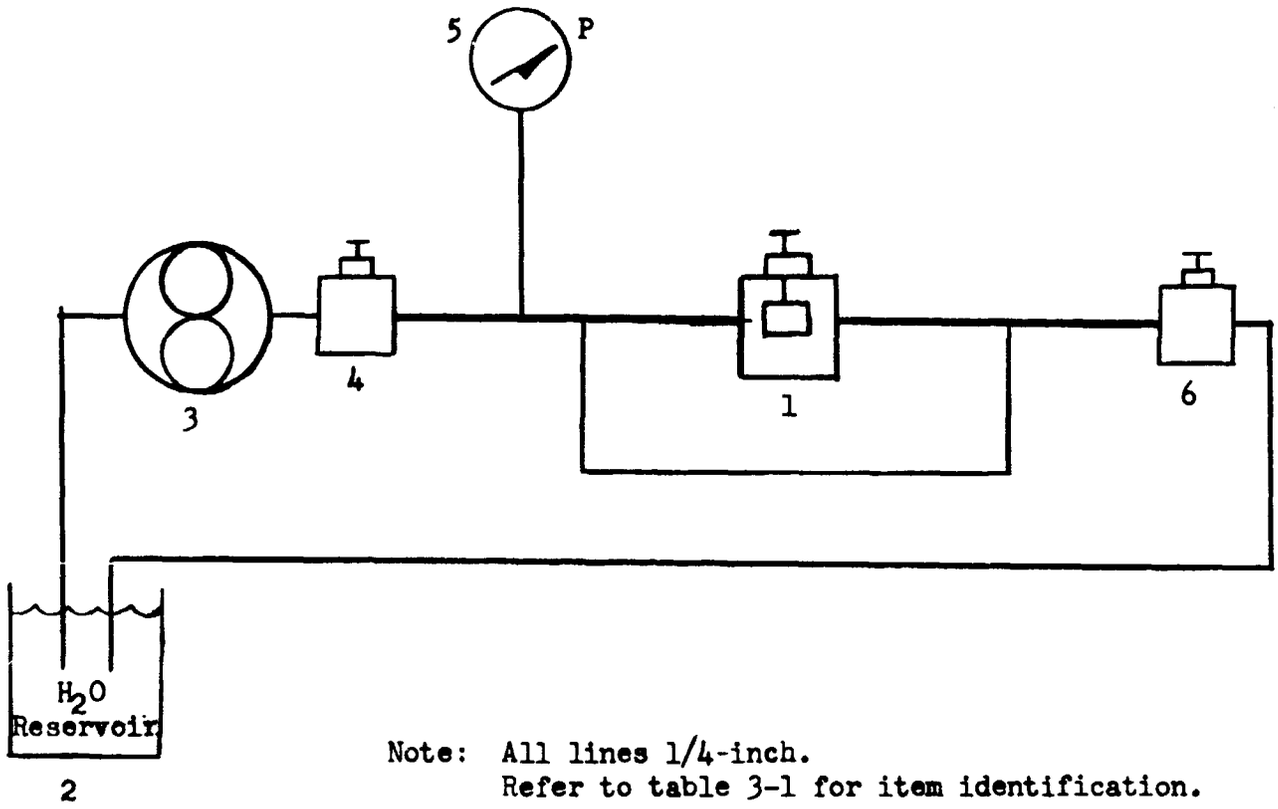
The data recorded during the proof pressure test are presented in table 3-2.

Table 3-1. Proof Pressure and Burst Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Test Specimen	Pacific Valve Co.	S8530F (8)-12T-ASA	15319	Gate valve, 4-inch, 300-pound
2	H_2O Reservoir	CCSD	NA	NA	
3	Pump	Sprague Engineering Corp.	300-16-6A	NA	
4	Hand Valve		NA	NA	1/4-inch
5	Pressure Gage	Duragage	NA	109-1001-B	0-to 500-psig ±0.5% FS accuracy Cal. date 4/10/66
6	Hand Valve	Robbins Aviation Inc.	SSNA-250-4T	NA	1/4-inch

Table 3-2. Proof Pressure Test Data

Test Media	H_2O
Pressure	450 psig
Duration	5 minutes
Leakage	None
Distortion	None



Note: All lines 1/4-inch.
Refer to table 3-1 for item identification.

Figure 3-1. PROOF PRESSURE AND BURST TEST SCHEMATIC

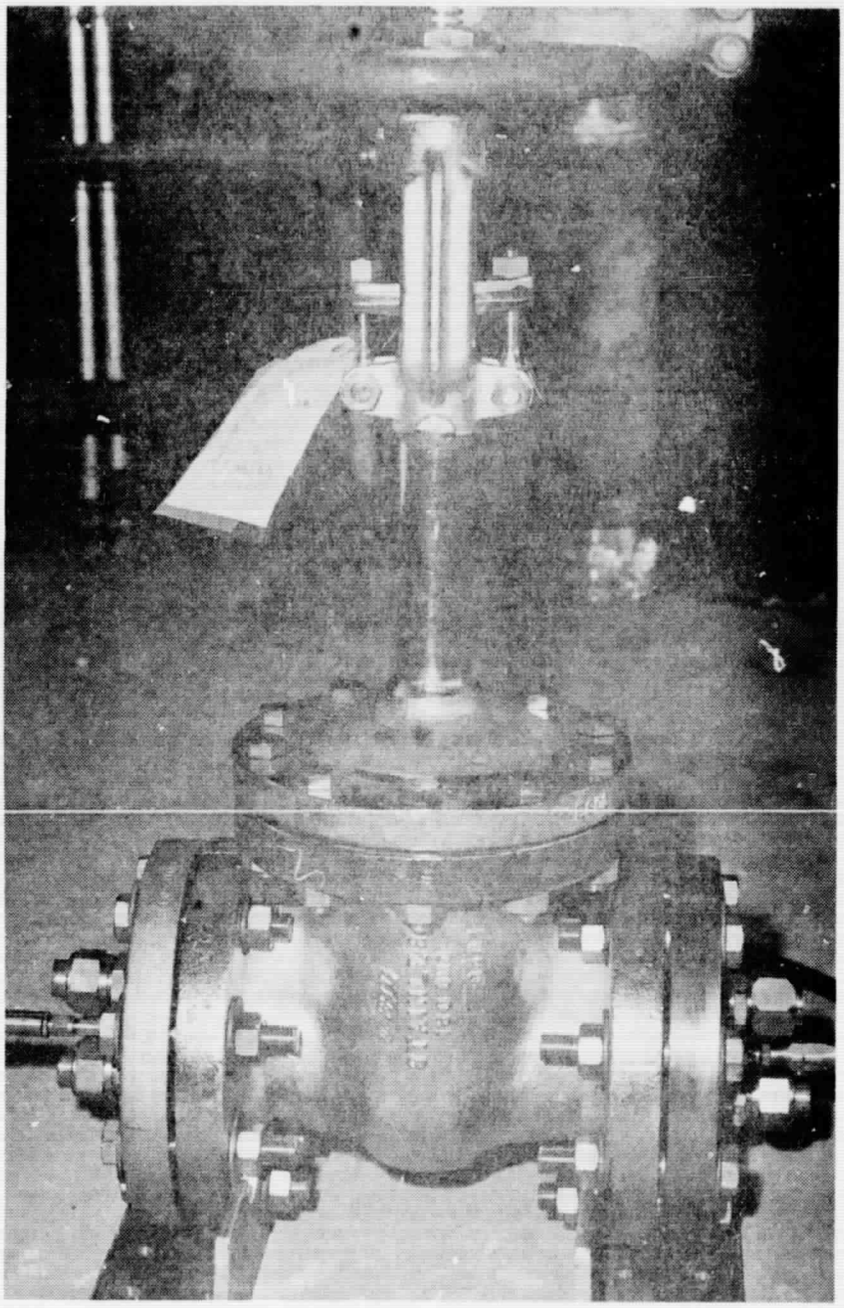


Figure 3-2. PROOF PRESSURE TEST SETUP

SECTION IV

FUNCTIONAL TEST

4.1 TEST REQUIREMENTS

4.1.1 The test specimen shall be opened and closed five times while pressurized to 300 psig with LN_2.

4.1.2 The test specimen shall be checked for internal leakage while pressurized to 300 psig with LN_2. The maximum allowable leakage shall be 10 sccm per inch of seat diameter.

4.1.3 The packing gland shall be checked for leakage for 30 minutes while the specimen is open and pressurized to 300 psig with LN_2.

4.2 TEST PROCEDURE

4.2.1 The test setup was assembled as shown in figures 4-1 and 4-2 using the equipment listed in table 4-1. The test specimen was closed.

4.2.2 It was determined that all connections were tight, that gages were installed and operating properly, and that all valves were closed.

4.2.3 Hand valve 5 was opened and the 3000-psig supply pressure was monitored on pressure gage 6.

4.2.4 LN_2 tank 10 was pressurized to 300 psig by adjusting regulator 7. The LN_2 tank pressure was monitored on pressure gages 8 and 11.

4.2.5 Hand valves 12 and 18 were opened and hand valve 16 was slightly opened. The test specimen was allowed to cool. The test specimen inlet pressure was maintained at 300 psig by adjusting regulator 7. The test specimen inlet pressure was monitored with pressure gage 13.

4.2.6 When thermometer 14 indicated the presence of LN_2 in the test specimen, the test specimen was slowly opened. The test specimen was opened and closed five times.

4.2.7 Hand valves 12 and 18 were closed and hand valve 15 was opened. All the LN_2 was drained from the specimen outlet. Flowmeter 17 was connected as shown in figure 4-1 (view A).

4.2.8 LN_2 boiloff was monitored by observing flowmeter 17. The presence of boiloff was evidenced by a flowmeter indication when the specimen inlet pressure was zero psig.

4.2.9 When the boiloff ceased, hand valve 12 was opened. The test specimen inlet pressure was maintained at 300 psig by adjusting regulator 7.

4.2.10 When thermometer 14 indicated the presence of LN_2 in the test specimen inlet, leakage from the test specimen outlet was checked for 5 minutes. Leakage was indicated by flowmeter 17. The maximum allowable leakage was 10 sccm per inch of seat diameter.

4.2.11 Flowmeter 17 was disconnected from the outlet of hand valve 15. Hand valve 15 was closed and hand valve 18 was opened.

4.2.12 The test specimen was opened slowly. The entire specimen was allowed to fill with LN_2. The specimen pressure was maintained at 300 psig.

4.2.13 While thermometer 14 indicated the presence of LN_2 in the test specimen, leakage from the packing gland of the specimen was checked for 30 minutes. A soap solution was used to check for leakage.

4.2.14 For the initial functional test, the procedures described in 4.2.1 through 4.2.13 were performed as necessary to obtain consistent data. For all subsequent functional tests, the procedures were performed once.

4.3 TEST RESULTS

The specimen successfully completed the functional test requirements. No leakage was recorded.

4.4 TEST DATA

Data recorded during the functional test are recorded in table 4-2.

Table 4-1. Functional Test Equipment List

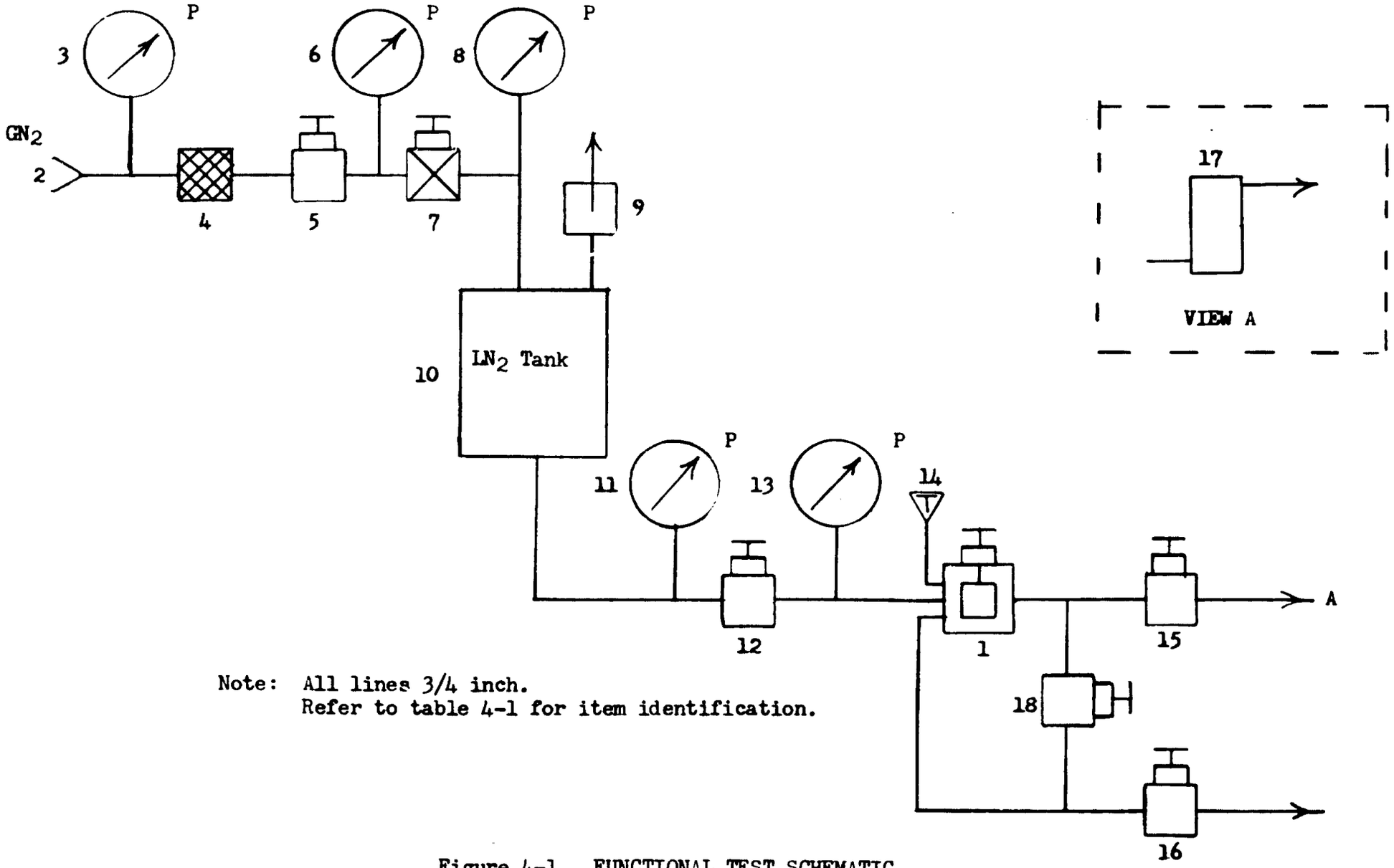
Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Test Specimen	Pacific Valve Co.	S8530F (8)-12T-ASA	15319	Gate valve, 4-inch, 300-pound
2	GN_2 Source	CCSD	NA	NA	3000-psig
3	Pressure Gage	Ashcroft	1057	NA	0-to 5000-psig ±1.0% FS accuracy
4	Filter	Bendix	5-S-13460-16-B-0	NA	10-micron
5	Hand Valve	Vacco	NA	5116-13	1-inch
6	Pressure Gage	Duragage	NA	109-1001	0-to 5000-psig ±1.0% FS accuracy Cal. date 10-13-66
7	Regulator	Tescom	26-1101-162	NA	0-to 500-psig outlet 0-to 5000-psig inlet
8	Pressure Gage	Duragage	NA	109-1004	0-to 500-psig ±0.1% FS accuracy Cal. date 10-13-66
9	Relief Valve	Anderson-Greenwood	81-B-66-0	NA	310-psig
10	LN_2 Tank	Convair-Astronautics	27-29501-803	104898	
11	Pressure Gage	Marsh Instruments	NA	95-1145	0-to 500-psig ±1.0% FS accuracy Cal. date 10-23-66

Table 4-1. Functional Test Equipment List (Continued)

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
12	Hand Valve	Hydromatics	NA	NA	1-inch 400-psi, water or gas
13	Pressure Gage	Marsh Instruments	NA	95-1149B	0-to 500-psig ±0.1% FS accuracy Cal. date 10-14-66
14	Thermometer	Honeywell	NA	640710 99	-300 to +400°F ±1°F accuracy
15	Hand Valve	Hydromatics	NA	NA	1-inch 400-psi, water or gas
16	Hand Valve	Flowmatics	MBL-715-19	NA	1-inch
17	Flowmeter	Fisher-Porter	NA	200595-E	0-to 100-sccm ±5% accuracy
18	Hand Valve	Flowmatics	MBL-715-19	NA	1-inch

Table 4-2. Functional Test Data

Test Media	LN_2
Pressure	300 psig
Leakage:	
Internal	9.84 sccm
Packing Gland	None



Note: All lines 3/4 inch.
Refer to table 4-1 for item identification.

Figure 4-1. FUNCTIONAL TEST SCHEMATIC

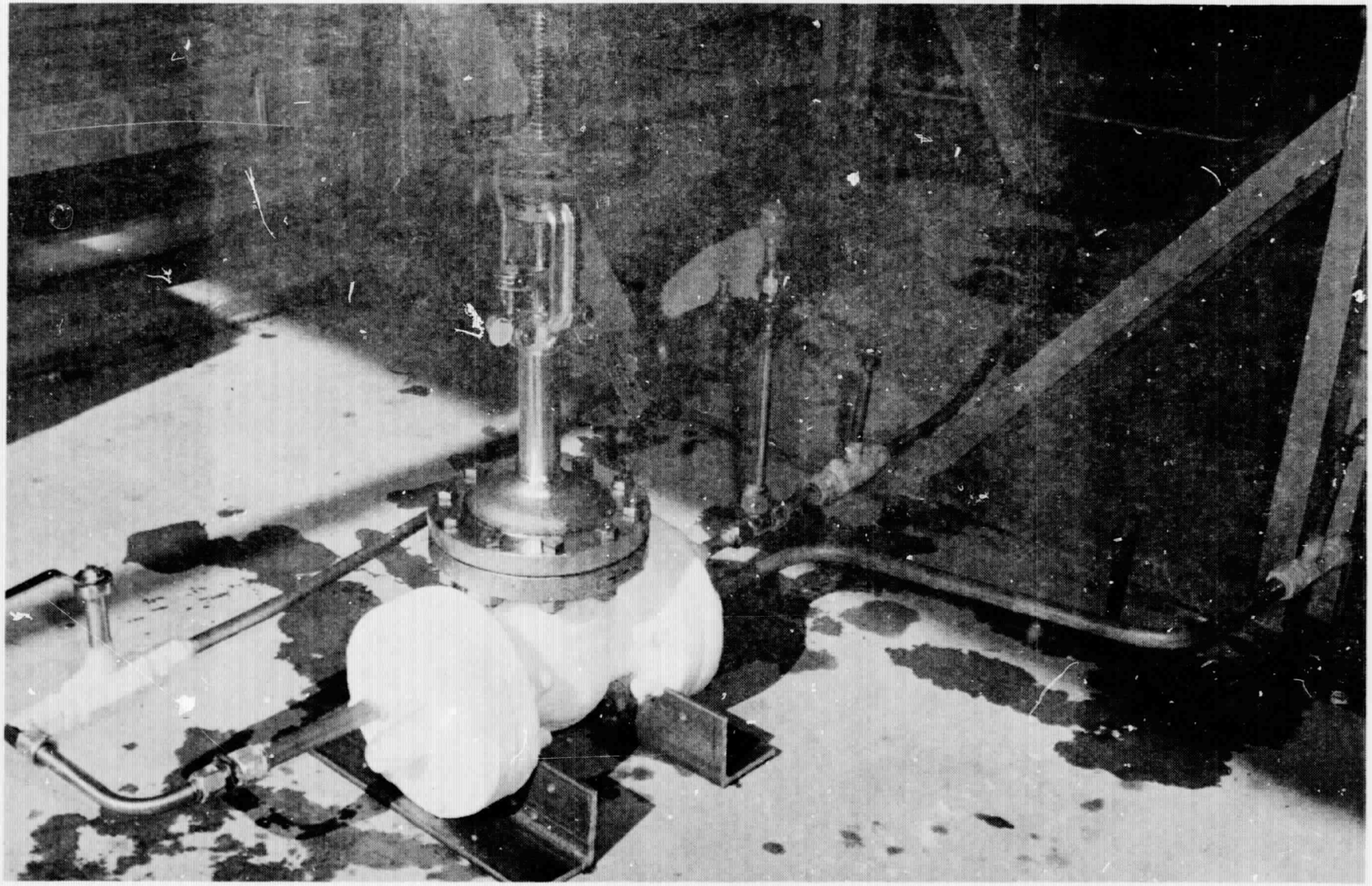


Figure 4-2. FUNCTIONAL TEST SETUP

SECTION V

HIGH TEMPERATURE TEST

5.1 TEST REQUIREMENTS

5.1.1 A high temperature test shall be performed on the test specimen to determine whether the environment causes degradation or deformation.

5.1.2 The rated high temperature is 125 (+4, -0)°F.

5.1.3 A functional test shall be performed during this test, using LN_2 as the test medium.

5.2 TEST PROCEDURE

5.2.1 The test specimen was placed in a high temperature chamber and installed as shown in figure 4-1 (view A) using the equipment shown in tables 4-1 and 5-1.

5.2.2 The chamber was controlled to the specified test conditions (125 (+4, -0)°F), maintaining a relative humidity of 20 (±5) percent.

5.2.3 This temperature was maintained for a period of 72 (+2, -0) hours.

5.2.4 A functional test was conducted while the chamber temperature was maintained.

5.2.5 The chamber temperature was returned to ambient conditions upon completion of the functional test.

5.2.6 The test specimen was visually inspected and functionally tested within 1 hour following the establishment of ambient conditions.

5.2.7 The test data were recorded.

5.3 TEST RESULTS

The test specimen successfully met the requirements of the high temperature test. No leakage was noted.

5.4 TEST DATA

The data presented in tables 5-1, 5-2, and 5-3 were recorded during the high temperature test.

Table 5-1. High Temperature Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Temperature Power Supply	Thermotron Corp.	NA	200507	-100 to +400°F Cal. date 9/6/66
2	Temperature Recorder	Honeywell	NA	64071099	-300 to +400°F Cal. date 10/31/66

Table 5-2. Functional Test Data Obtained During High Temperature Test

Temperature	+125°F
Test Media	LN_2
Pressure	300 psig
Leakage:	
Internal	None
Packing Gland	None

Table 5-3. Functional Test Data Obtained After High Temperature Test

Temperature	Ambient
Test Media	LN_2
Pressure	300 psig
Leakage:	
Internal	None
Packing Gland	None

SECTION VI

SURGE TEST

6.1 TEST REQUIREMENTS

6.1.1 While the test specimen is in the closed position, the inlet pressure shall be increased from 50 to 300 psig in 100 milliseconds. This shall constitute one cycle. A total of 20 cycles shall be performed.

6.1.2 The test medium shall be LN_2.

6.2 TEST PROCEDURE

6.2.1 The test setup shown in figures 6-1 and 6-2 was assembled using the equipment listed in table 6-1.

6.2.2 All hand valves, regulators, and the test specimen were closed.

6.2.3 Hand valves 5 and 15 were opened and the 3000-psig GN_2 supply pressure was monitored on pressure gages 6 and 16.

6.2.4 Solenoid valves 12 and 14 and regulator 7 were opened and the test specimen inlet was filled with LN_2 by pressurizing LN_2 tank 9. The test specimen pressure was maintained at 50 psig by adjusting regulator 7. The test specimen pressure was monitored using pressure transducer 13 and oscillograph 19.

6.2.5 The inlet of solenoid valve 18 was pressurized to 300 psig by adjusting regulator 17. This pressure was monitored on pressure gage 20.

6.2.6 Hand valve 21 was opened and solenoid valves 12 and 14 were closed simultaneously. Solenoid valve 18 was opened and the pressure rise rate was monitored using transducer 13 and oscillograph 19. Solenoid valve 18 was closed and solenoid valves 12 and 14 were opened simultaneously.

6.2.7 The procedure described in 6.2.6 was repeated and hand valve 21 was adjusted so that the pressure rose from 50 to 300 psig in 100 milliseconds.

6.2.8 Each pressurization to 300 psig in 100 milliseconds constituted one cycle. The test specimen was subjected to 20 cycles.

6.3 TEST RESULTS

The specimen successfully completed the surge test requirements.

6.4 TEST DATA

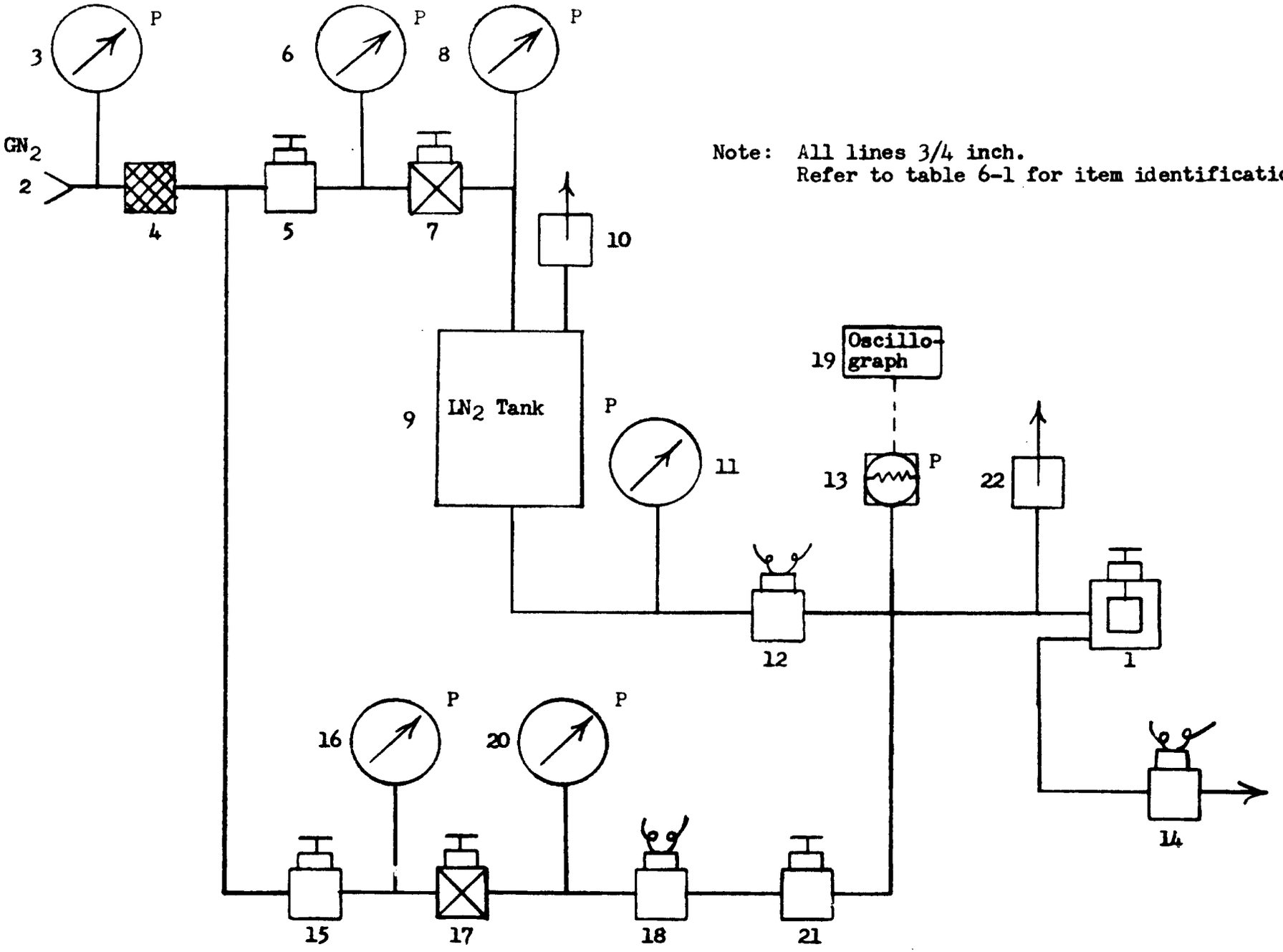
A typical surge waveform is presented in figure 6-3.

Table 6-1. Surge Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Test Specimen	Pacific Valve Co.	S8530F (8)-12T-ASA	15319	Gate valve, 4-inch, 300-pound
2	GN_2 Source	CCSD	NA	NA	3000-psig
3	Pressure Gage	Ashcroft	1057	NA	0-to 5000-psig ±1.0% FS accuracy
4	Filter	Bendix	5-S-13460-16-B-0	NA	10-micron
5	Hand Valve	Robbins Aviation, Inc.	SSNA 3758-8T	NA	1/2-inch
6	Pressure Gage	Duragage	NA	109-1001	0-to 5000-psig ±1.0% FS accuracy Cal. date 10-13-66
7	Pressure Regulator	Tescom	26-1101-162	NA	0-to 5000-psig inlet 0-to 500-psig outlet
8	Pressure Gage	Duragauge	NA	109-1004	0-to 500-psig 1.0% FS accuracy Cal. date 10-13-66
9	LN_2 Tank	Convair-Astronautics	27-29501-803	104898	300-psig
10	Relief Valve	Anderson-Greenwood	81B-66-0	NA	320-psig
11	Pressure Gage	Marsh Instruments	NA	95-1145	0-to 500-psig ±0.1% FS accuracy Cal. date 10-23-66

Table 6-1. Surge Test Equipment List (Continued)

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
12	Solenoid Valve	Ansco	WP-826 812 LT	86376N	1-inch
13	Pressure Transducer	CEC	4-350-0001	95-1341B	0-to 500-psig ±0.1% FS accuracy Cal. date 11-7-66
14	Solenoid Valve	Marotta	204274-1	NA	1-inch
15	Hand Valve	Hydromatics	NA	NA	1-inch 400-psi, water or gas
16	Pressure Gage	Ashcroft	Dura-gauge	95-1210B	0-to 5000-psig 1.0% FS accuracy Cal. date 11-8-66
17	Pressure Regulator	Tescom	26-1101-162	NA	0-to 5000-psig inlet 0-to 500-psig outlet
18	Solenoid Valve	Ansco	WP-826 812LT	70335N	1-inch
19	Oscillograph	CEC	T5-124	5224	
20	Pressure Gage	Marsh Instruments	NA	95-1149B	0-to 500-psig 0.1% FS accuracy Cal. date 10-24-66
21	Hand Valve	Hydromatics	NA	NA	1-inch 400-psi, water or gas
22	Relief Valve	Anderson-Greenwood	81B-66-0	NA	320-psig



Note: All lines 3/4 inch.
Refer to table 6-1 for item identification.

Figure 6-1. SURGE TEST SCHEMATIC

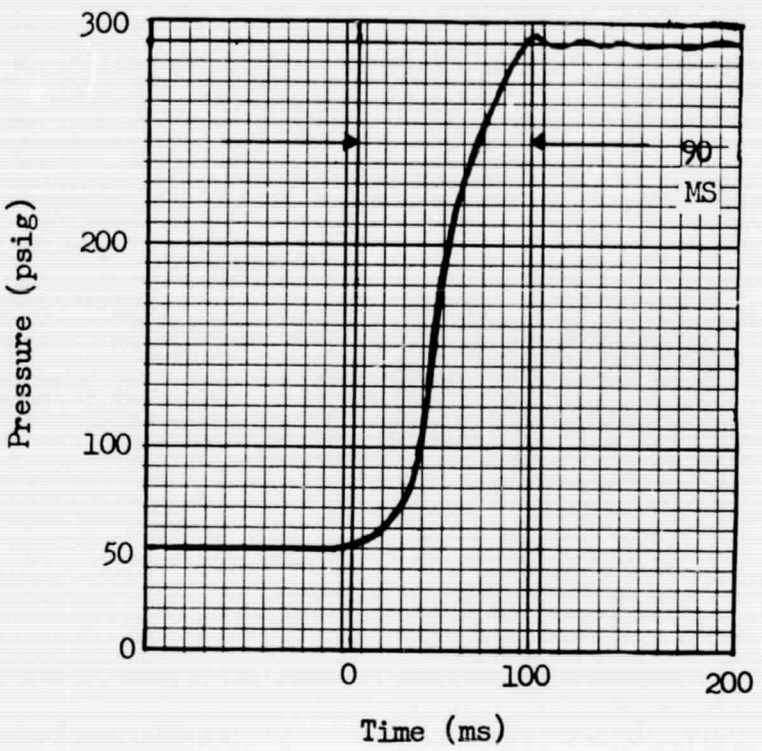


Figure 6-3. TYPICAL SURGE WAVEFORM

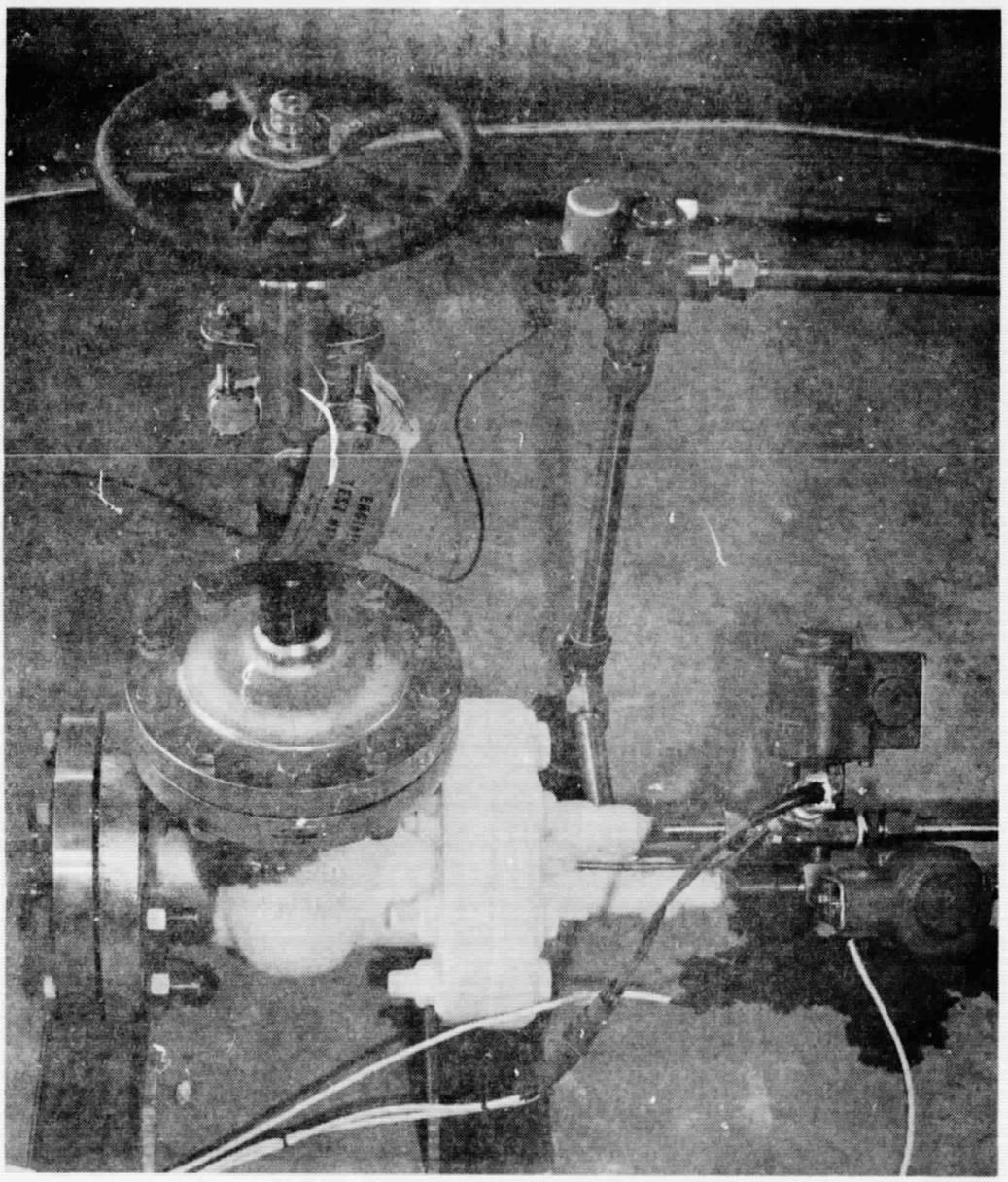


Figure 6-2. SURGE TEST SETUP

SECTION VII

CYCLE TEST

7.1 TEST REQUIREMENTS

7.1.1 The test specimen shall be subjected to 500 cycles of the cycle test.

7.1.2 Each cycle shall consist of opening and then closing the specimen while the specimen is pressurized to 300 psig with LN_2.

7.1.3 The test specimen shall be subjected to a functional test following each 100 cycles of the cycle test.

7.2 TEST PROCEDURE

7.2.1 The test setup was assembled as shown in figures 4-1 and 7-1 using the equipment listed in table 4-1.

7.2.2 A functional test as described in 4.2.2 through 4.2.6 was performed.

7.2.3 Opening and then closing the specimen constituted one cycle. Five hundred cycles were performed.

7.2.4 Following each 100 cycles, the specimen was subjected to a functional test as specified in section IV.

7.3 TEST RESULTS

The functional tests were completed satisfactorily. No leakage or distortion was noted.

7.4 TEST DATA

Data recorded during the cycle test are presented in table 7-1.

Table 7-1. Functional Data Obtained After 100, 200, 300, 400, and 500 cycles.

Cycles	Test Media	Pressure (psig)	Leakage (sccm)	
			Internal	Packing Gland
100	LN_2	300	None	None
200	LN_2	300	None	None
300	LN_2	300	None	None
400	LN_2	300	None	None
500	LN_2	300	None	None

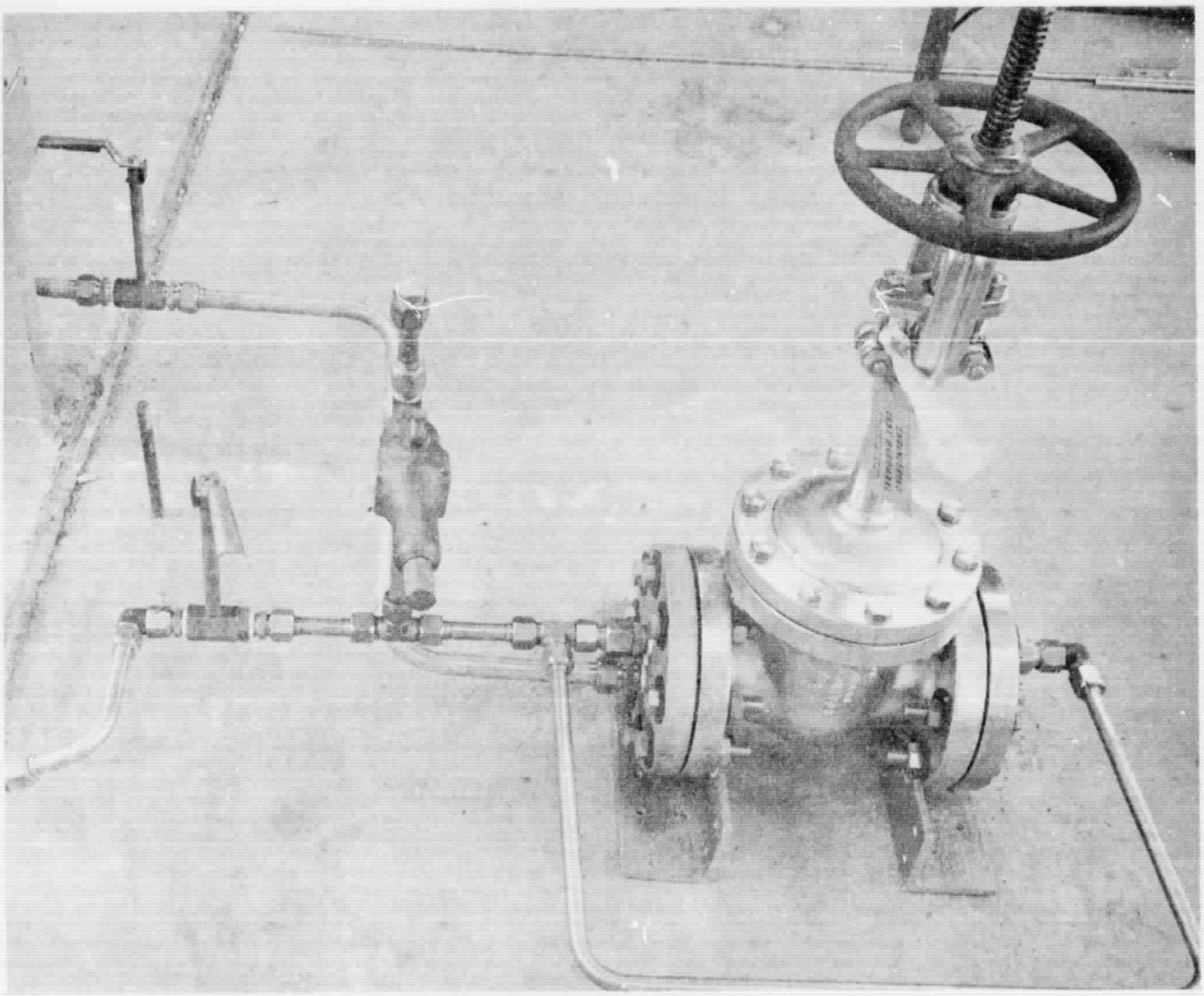


Figure 7-1. CYCLE TEST SETUP

SECTION VIII

BURST TEST

8.1 TEST REQUIREMENTS

8.1.1 With the test specimen in the open position, the inlet and outlet ports shall be simultaneously pressurized to 1200 psig. This pressure shall be maintained for 5 minutes.

8.1.2 The test specimen shall be checked for leakage and distortion.

8.1.3 The test medium shall be H_2O.

8.2 TEST PROCEDURE

8.2.1 The test setup was assembled as shown in figures 3-1 and 8-1 using the equipment listed in table 3-1.

8.2.2 The test described in 3.2.2 through 3.2.8 was performed, except the specimen was pressurized to 1200 psig for 5 minutes.

8.3 TEST RESULTS

No leakage or distortion of the specimen was detected during the 5-minute pressurization.

8.4 TEST DATA

Data recorded during the burst test are presented in table 8-1.

Table 8-1. Burst Test Data

Pressure	1200 psig for 5 minutes
Leakage	None
Distortion	None

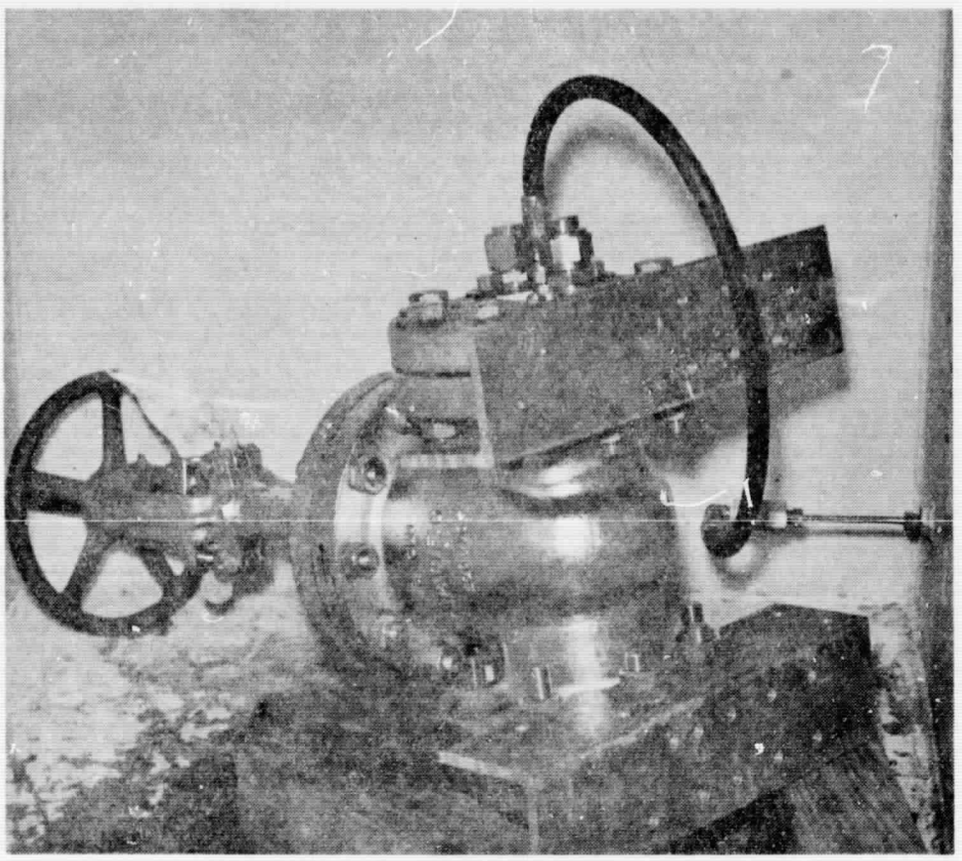


Figure 8-1. BURST TEST SETUP

APPENDIX A

OPENING AND CLOSING TORQUE TEST

APPENDIX A

OPENING AND CLOSING TORQUE TEST

1.1 TEST REQUIREMENTS

1.1.1 The test specimen shall be filled with LN_2 at 300 psig.

1.1.2 The test specimen shall be closed with the greatest manual torque that can be exerted on the handwheel.

1.1.3 The torque required to open the test specimen shall be determined.

1.2 TEST PROCEDURE

1.2.1 The test setup was assembled as shown in figure 4-1 using the equipment listed in tables 4-1 and 1-1.

1.2.2 A functional test as described in 4.2.2 through 4.2.6 was performed.

1.2.3 The specimen was closed by hand using a torque of 90 foot-pounds.

1.2.4 The torque required to open the specimen was measured using torque wrench 1.

1.3 TEST RESULTS

The maximum manual torque exerted through the specimen handwheel to close the valve was 90 foot-pounds.

The torque required to open the valve was 72 foot-pounds.

If torque exceeding 90 foot-pounds was applied to the handwheel of the valve with a lever, the valve could not be opened.

Excess torque will induce binding.

1.4 TEST DATA

The data presented in table 1-2 were recorded during the torque test.

Table 1-1. Opening and Closing Torque Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Torque Wrench	Armstrong Bros. Tool Co.	SR-100	7650374	0-to 100-ft-lb Initial cal. date 8-8-66

Table 1-2. Data Obtained During Opening and Closing Torque Test

Test Specimen Pressure	300 psig
Pressure Medium	LN_2
Closing Torque	90 foot-pounds
Opening Torque	72 foot-pounds
Closing Torque	Above 90 foot-pounds
Opening Torque	Beyond measure (Handwheel had to be bumped to open valve)

APPROVAL

TEST REPORT

GATE VALVE, MANUALLY OPERATED

4-INCH, 300-POUND

Pacific Valve Company Model Number S8530F(8)-12T-ASA

NASA Drawing Number 75M12930 LGV-IC

SUBMITTED BY:

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