PURPOSE: To provide rudder PCU and hydraulic fluid temperatures to the NTSB to support October 7, 1996 rudder PCU testing.

REFERENCE:

GENERAL DESCRIPTION The NTSB will be testing a 737 rudder PCU during the week of October 7, 1996 as part of their on going investigation of the USAir 427 accident. The NTSB wants to test the rudder PCU at temperatures that are common for a cruise cold soak condition. A 737 will be instrumented for a B1 flight and the temperature profiles will be supplied to the NTSB for use in their October 7, 1996 rudder PCU test.

1.0 Test Objective

To determine the temperatures of the rudder PCU surface and the ambient temperatures near the rudder PCU to support NTSB rudder PCU testing.

2.0 Test Description & Conditions

1. The data requirements per the instrumentation listed in section 5.0 shall be recorded throughout the test.
2. Perform a normal takeoff.
3. Perform cruise at an ambient outside air temperature of -38°C TO -41°C for a period of no less than 70 minutes.
4. After 60 minutes of the 70 minute cruise time stamp the recorded data.
5. Perform a normal landing profile similar to USAir 427.
6. Return the airplane to normal.

3.0 Test Article

Any 737-300/400/500 series airplane.

4.0 Special Test Support Hardware

None.

5.0 Instrumentation Requirements

See Figures I, II, III, and IV for approximate installation locations for items 1 through 8. Locations correspond to the numbers listed below. A total of 27 thermocouples will be used. We will need approximately 30 channels for digital data. Record on a strip chart airspeed, outside ambient temperature, altitude, and any other two temperatures during flight for verification of proper functioning.

	Name	Range	Accuracy(+/-)	Rate/sec
1.	Temperature, Ambient (A Rudder Inlet Port)	-65-100°F	5	1
2.	Temperature, Ambient (B Rudder Inlet Port)	-65-100°F	5	1
3.	Temperature, Ambient (A Rudder Outlet Port)	-65-100°F	5	1
4.	Temperature, Ambient (A Rudder Outlet Port)	-65-100°F	5	1
9.	Temperature, PCU	-65-100°F	5	1
10.	Temperature, PCU	-65-100°F	5	1

(2)

11.	Temperature, Ambient	-65-100°F	5	1
12.	Temperature, PCU Servo	-65-100°F	5	1
13.	Temperature, Hydraulic (A EDP Supply)	-65-100°F	5	1
14.	Temperature, Hydraulic (B EDP Supply)	-65-100°F	5	1
15.	Temperature, Hydraulic (A EDP Pressure)	-65-100°F	5	1
16.	Temperature, Hydraulic (B EDP Pressure)	-65-100°F	5	1
	Temperature, Hydraulic (A EDP Case Drain)	-65-100°F	5	1
18.	Temperature, Hydraulic (B EDP Case Drain)	-65-100°F	5	1
19.	Temperature, Hydraulic (A ACMP Supply)	-65-100°F	5	1
20.	Temperature, Hydraulic (B ACMP Supply)	-65-100°F	5	1
21.	Temperature, Hydraulic (A ACMP Pressure)	-65-100°F	5	1
22.	Temperature, Hydraulic (B ACMP Preesure)	-65-100°F	5	1
23.	Temperature, Hydraulic (A ACMP Case Drain)	-65-100°F	5	1
24.	Temperature, Hydraulic (B ACMP Case Drain)	-65-100°F	5	1
25.	Temperature, Outside Ambient	-65-100°F	5	1
26.	Altitude			
27.	Airspeed			

6.0 Engineering Design Participation in Test Flight

None.

7.0 Test Completion Criteria

Temperature data provided to Chad Leinweber M/S 02-XW and Dick Kullberg M/S 02-KE.

8.0 Test Reports

Flight test will generate a test report.

9.0 Support Organization Responsibility

B-X5?B - Flight Test Instrumentation
Support testing as required

B-X6?B - Flight Test Operations
Support and conduct testing as required

B-X7?B - Flight Test Analysis
Support and conduct testing as required

B - ???? - Supporting Lab
Support and conduct testing as required

10.0 Schedules

Program to be completed by October 7, 1996.

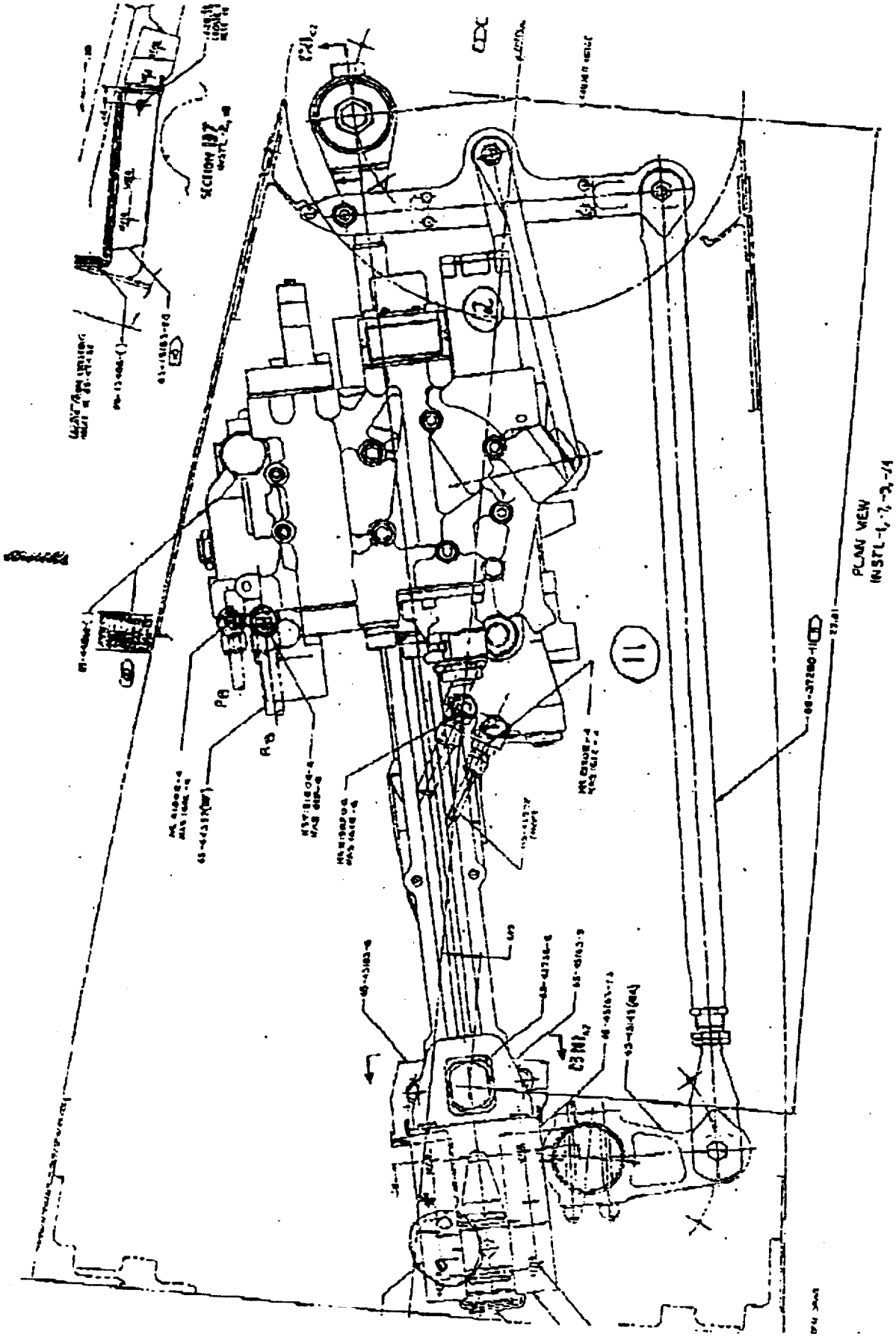
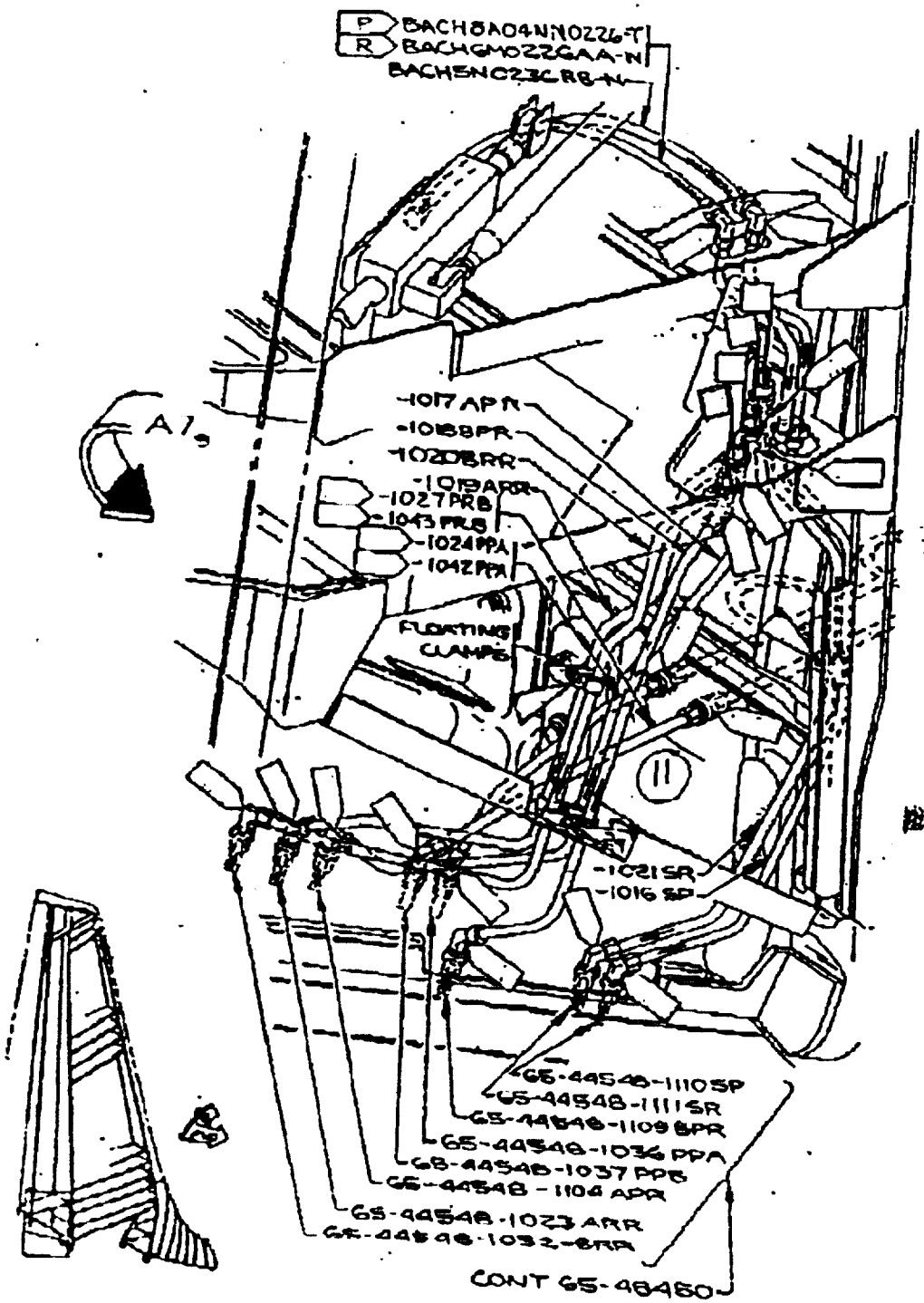


Figure 1

* One thermocouple on the top rabbit ear and one on the bottom rabbit ear.



Note: 5, 6, 7, 8 need to be on the tubes and not on fittings.

5 on -1017 APR

6 on -1018 BPR

7 on -1019 ARR

8 on -1020 BRR

Figure 11

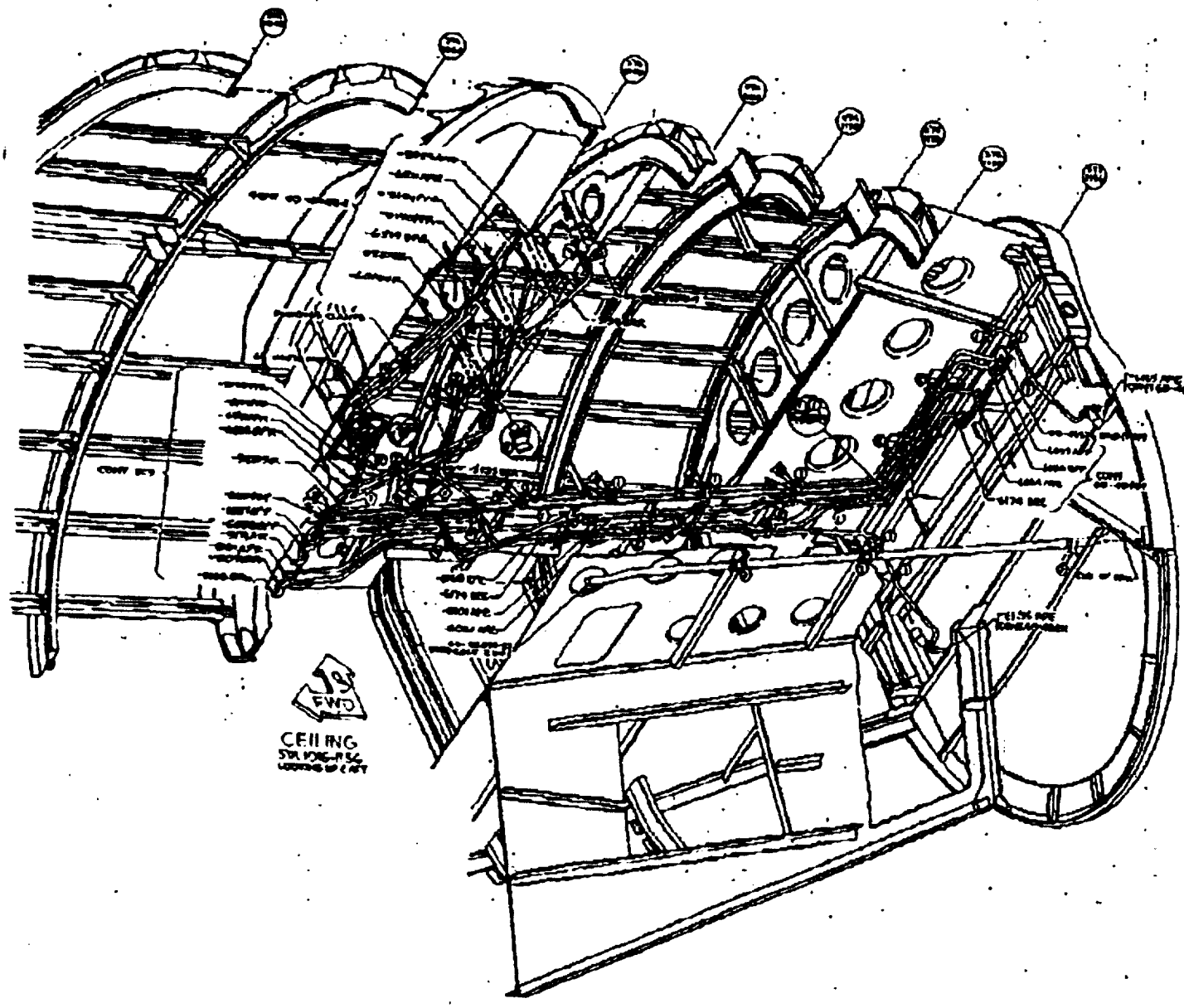


Figure 111

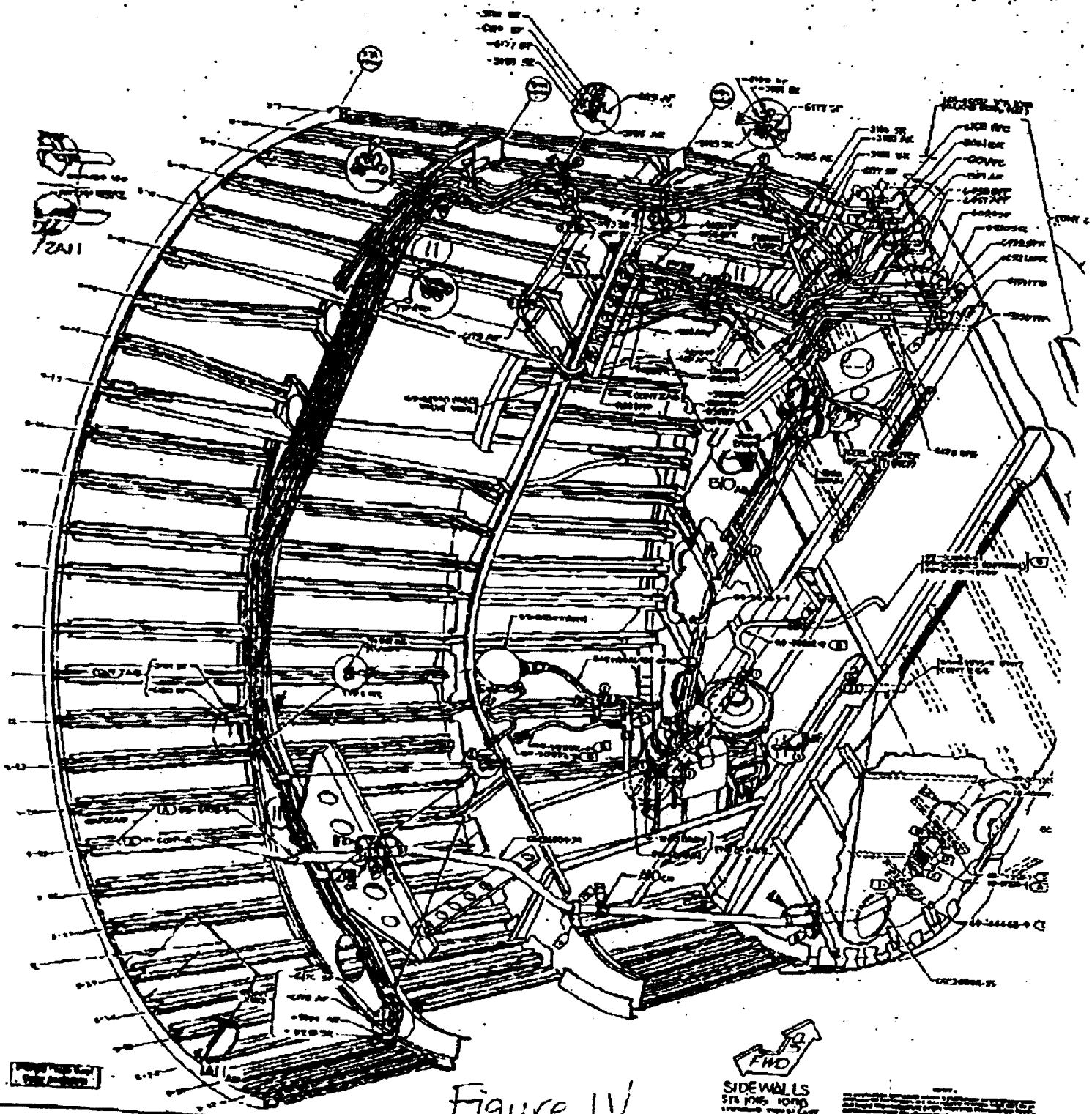


Figure IV

R 3 2 25 94 * On pressure tubing (A & B) (8)