DRAFT

TITLE: 737 Rudder PCU Cold Soak Night Time Temperature Test.

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Receive Date 11/7/96

| Initial | Rev | Date |
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PURPOSE: To provide rudder PCU and hydraulic fluid temperatures to the NTSB.

REFERENCE:

GENERAL DESCRIPTION The NTSB will be testing a 737 rudder PCU 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 night time cruise cold soak condition. A 737 will be instrumented for a B1 flight and the temperature profiles will be supplied to the NTSB.

## 1.0 Test Objective.

To determine the hydrauic temperatures of the rudder PCU and the ambient temperatures near the rudder PCU during a night flight 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 during night.
3. Perform cruise during night at an ambient outside air temperature of -65° F for a period of no less than 120 minutes.
4. Descend until the outside air temperature of -65° F for a period of no less than 60 minutes.
5. Perform a normal landing profile similar to USAir 427.

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6. Return the airplane to normal.

## 3.0 Test Article

Any 737-300/400/500 series airplane.

## 4.0 Special Test Support Hardware

None.

See Figures I, II, and III 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, Hydraulic (A Rudder Inlet Port) | -65-300°F | 5 | 1 |
| 2. | Temperature, Hydraulic (B Rudder Inlet Port) | -65-300°F | 5 | 1 |
| 3. | Temperature, Hydraulic (A Rudder Outlet Port) | -65-300°F | 5 | 1 |
| 4. | Temperature, Hydraulic (A Rudder Outlet Port) | -65-300°F | 5 | 1 |
| 5. | Temperature, PCU | -65-300°F | 5 | 1 |
| 6. | Temperature, PCU | -65-300°F | 5 | 1 |
| 7. | Temperature, Ambient (Three Locations) | -65-300°F | 5 | 1 |
| 8. | Temperature, PCU Servo | -65-300°F | 5 | 1 |
| 9. | Temperature, Hydraulic (A EDP Supply) | -65-300°F | 5 | 1 |
| 10. | Temperature, Hydraulic (B EDP Supply) | -65-300°F | 5 | 1 |
| 11. | Temperature, Hydraulic (A EDP Pressure) | -65-300°F | 5 | 1 |
| 12. | Temperature, Hydraulic (B EDP Pressure) | -65-300°F | 5 | 1 |
| 13. | Temperature, Hydraulic (A EDP Case Drain) | -65-300°F | 5 | 1 |
| 14. | Temperature, Hydraulic (B EDP Case Drain) | -65-300°F | 5 | 1 |
| 15. | Temperature, Hydraulic (A ACMP Supply) | -65-300°F | 5 | 1 |
| 16. | Temperature, Hydraulic (B ACMP Supply) | -65-300°F | 5 | 1 |
| 17. | Temperature, Hydraulic (A ACMP Pressure) | -65-300°F | 5 | 1 |
| 18. | Temperature, Hydraulic (B ACMP Pressure) | -65-300°F | 5 | 1 |
| 19. | Temperature, Hydraulic (A ACMP Case Drain) | -65-300°F | 5 | 1 |
| 20. | Temperature, Hydraulic (B ACMP Case Drain) | -65-300°F | 5 | 1 |

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|---|---|---|---|---|
| 21. | Temperature, Hydraulic (A Pressure, Aft of Bulkhead) | -65-300°F | 5 | 1 |
| 22. | Temperature, Hydraulic (B Pressure, Aft of Bulkhead) | -65-300°F | 5 | 1 |
| 23. | Temperature, Hydraulic (A Return, Aft of Bulkhead) | -65-300°F | 5 | 1 |
| 24. | Temperature, Hydraulic (B Return, Aft of Bulkhead) | -65-300°F | 5 | 1 |
| 25. | Temperature, Outside Ambient | -65-300°F | 5 | 1 |
| 26. | Altitude | | | |
| 27. | Airspeed | | | |

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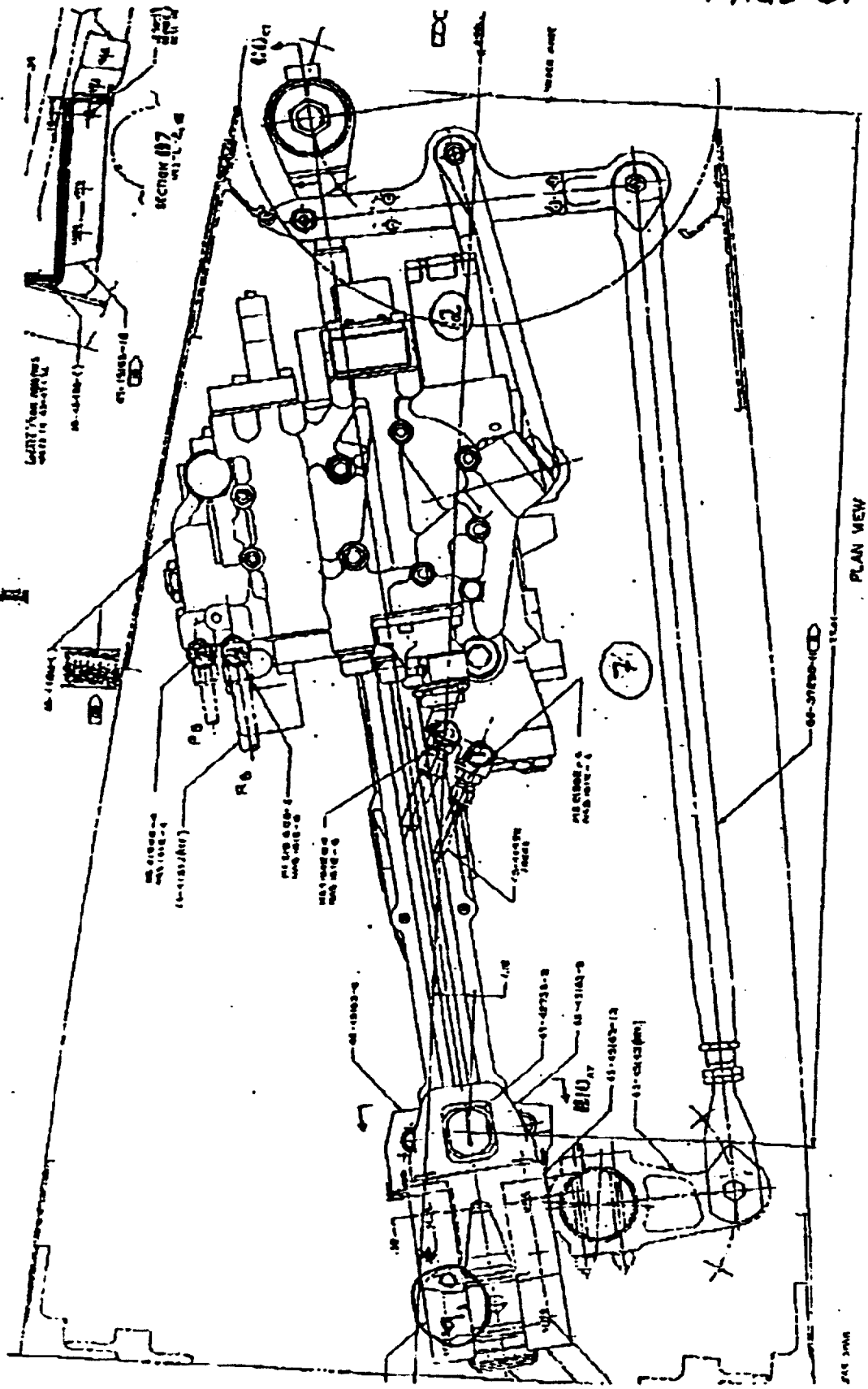


Figure 1

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

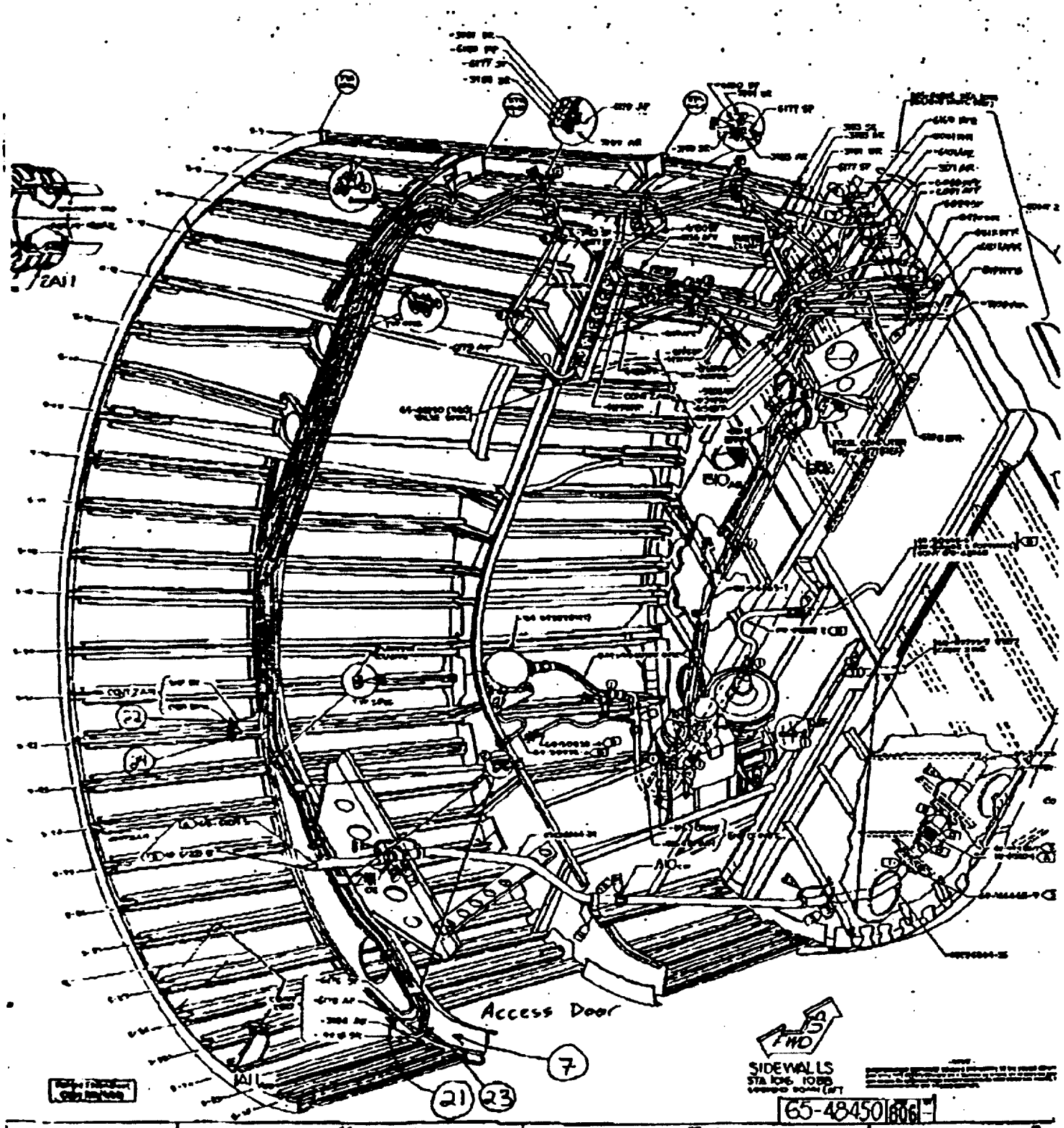


FIGURE 11

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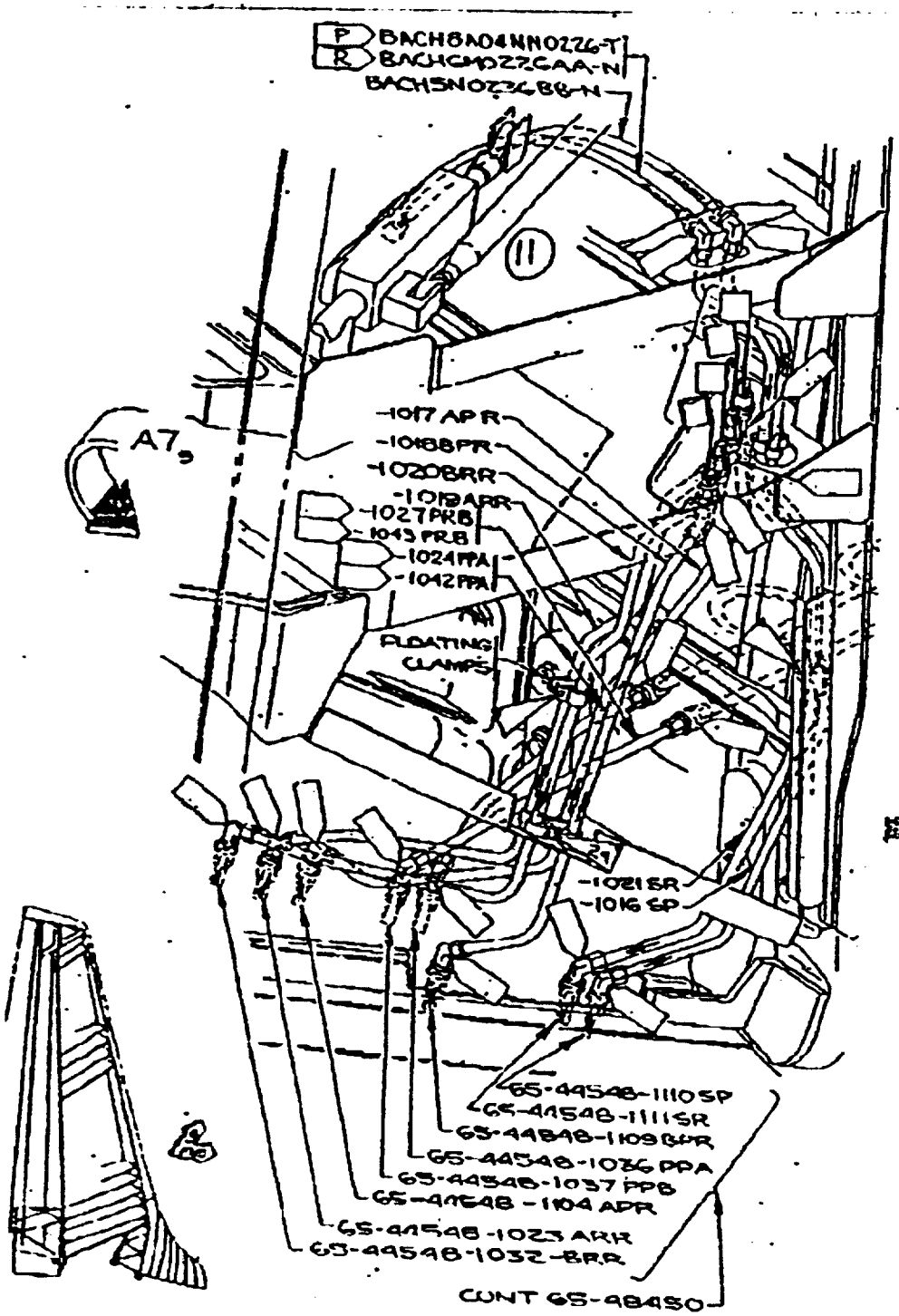


Figure 111

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