

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

LEWIS RESEARCH CENTER

21000 BROOKPARK ROAD

CLEVELAND, OHIO 44135

SPECIFICATIONS

FOR

DESIGN AND FABRICATION

OF A

THRUST STAND

SPECIFICATION NO. 3-536330  
(3 pages)

DATED: February 10, 1984

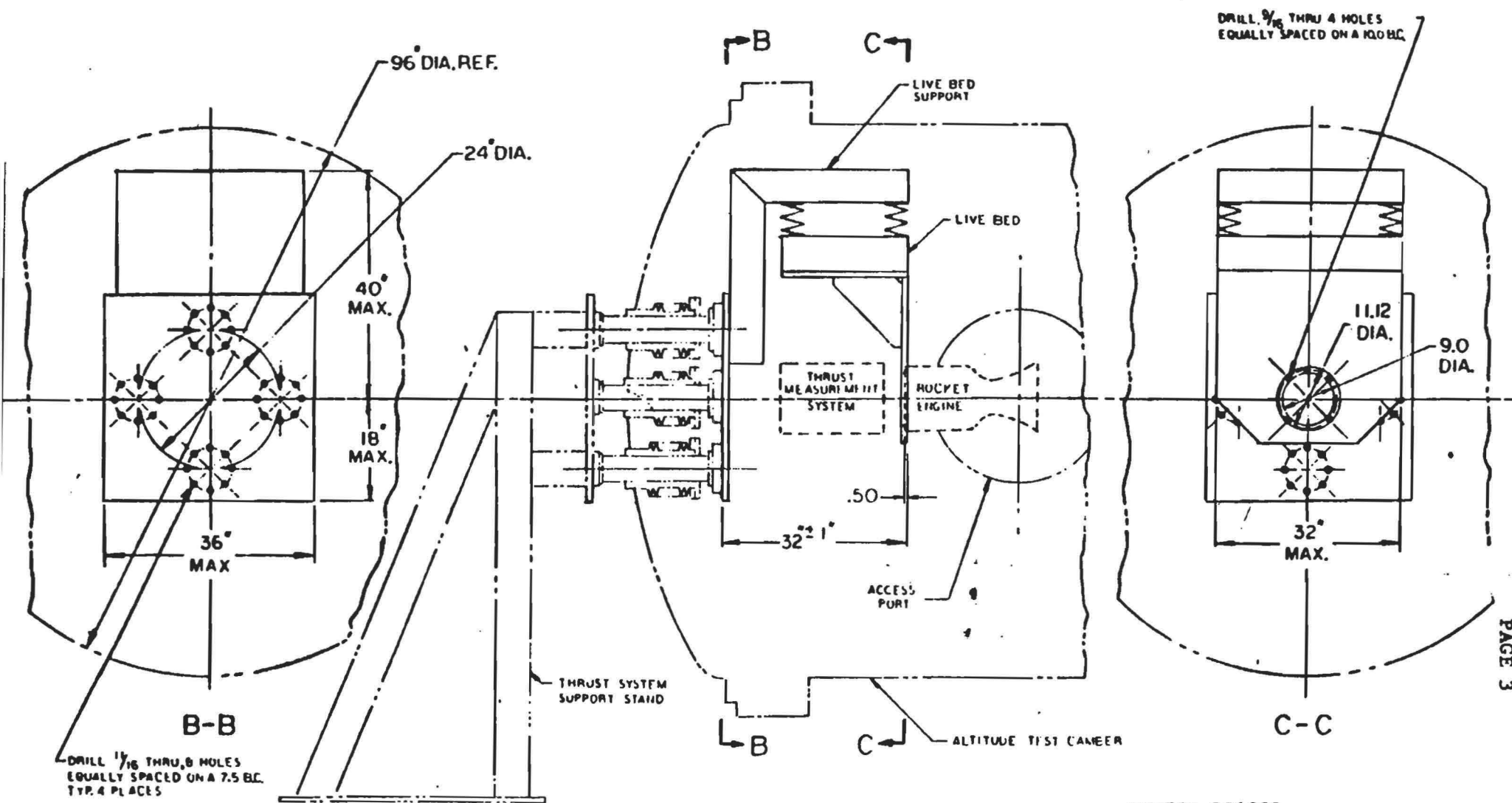
SPECIFICATIONS 536330

I. The Thrust Stand shall be designed and fabricated and:

- A. Shall be of modular construction, each component shall be manufactured, calibrated and shipped as modules. Installation shall not require more than two shifts of work by two experienced aerospace mechanics (32 man hours) and after installation, the thrust stand shall be capable of removal or reinstallation without effecting the thrust system characteristics or alignment and shall not require more than one shift of work by two experienced Aerospace mechanics (16 man hours).
- B. Shall operate over two thrust ranges with an accuracy equal to or better than .15% of full thrust.
  - a. The Contractor shall provide calibration and run load cells for operation in the 200 lb. to 1000 lb. thrust range.
  - b. The Contractor shall provide calibration and run load cells for operation in the 40 lb. to 200 lb. thrust range.
- C. Shall conform to the Design Envelop shown in attached Sketch 536330 , page 3 attached.
  - a. The Thrust Stand shall be configured to bolt directly to the four hard point penetrations in the Altitude Test Chamber.
  - b. The outside dimensions shall not exceed the dimensions shown but can be smaller.
- D. Shall have provisions for attaching to an overhead crane for removal and installation by the Government.
- E. Shall use universal flexures at flex points. The use of ball and socket joints if prohibited.
- F. Shall have a calibration system that can be remotely operated outside the Altitude Test Chamber and is a self-contained, integral part of the basic thrust stand. The only penetrations needed to operate the calibration system shall be hydraulic lines and electrical lines. Calibration system shall have provisions to prevent overloading the run load cell.
- G. Shall have provisions for mechanically or optically aligning the rocket engine to within .03 degrees of the longitudinal axis of the Altitude Test Chamber; Contractor shall provide any special tooling for accomplishing this.
- H. Shall use run and calibration load cells with dual strain gage bridges. Load cells to be calibrated and certified by a reliable agency which can accomplish 0.05% full scale certification that is traceable to the National Bureau of Standards, U.S.A.

SPECIFICATIONS 536330 (Cont'd.)

- I. Shall have provisions for piping oxidant and fuel propellants as well as purge gases to the rocket engine.
  - a. For operation in the 200 lb. to 1000 lb. thrust range, the oxidant and fuel propellant lines coming to the thrust stand will be two 1" x .065 wall 304 stainless steel tubes.
  - b. For the operation in the 40 lb. to 200 lb. thrust range, the oxidant and fuel propellant lines coming to the thrust stand will be two 1/2" x .035 wall 304 stainless steel tubes.
  - c. For operation at either thrust range, provisions shall be made for eight purge gas lines; these shall be 1/4" O.D. x .035 wall 304 stainless steel tubes.
- II. The Contractor shall provide a complete operation and installation manual in triplicate.



SKETCH 536330  
THRUST STAND DESIGN ENVELOP