

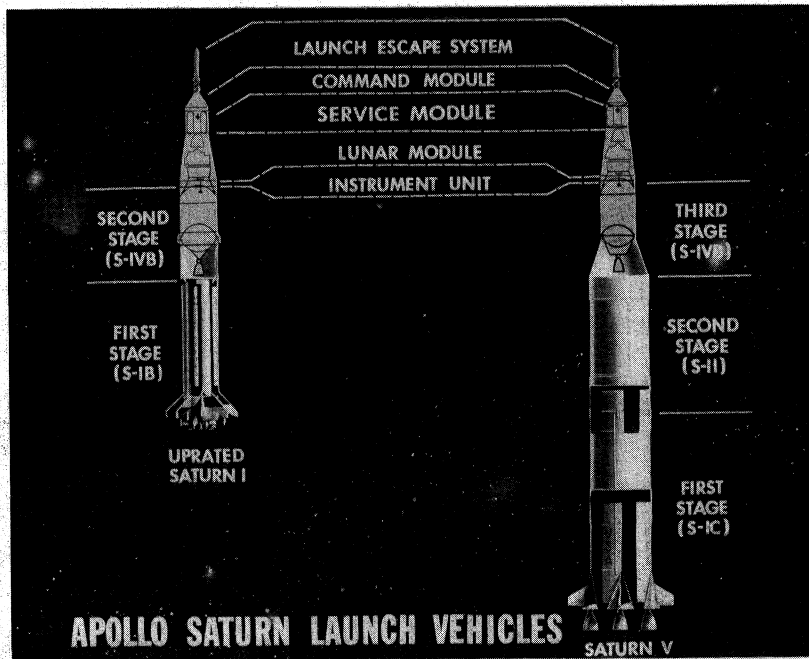


FIGURE 7

The first stage of the Uprated Saturn I is a clustering of nine tanks and eight engines; kerosene and liquid oxygen are used as propellants. The second stage (S-IVB) is the improved second stage which I mentioned we flew on the Saturn I vehicle. This stage is serving a dual role—second stage for the Uprated Saturn I and the third stage of the Saturn V vehicles. So one might say that from the Saturn V second stage down we developed two new propulsive stages to meet our lunar objectives. We acquired the knowledge and experience and technology with the Saturn I, then we went to a larger diameter (33-foot) stage with Saturn V. You saw the second first-stage flight article in the quality laboratory this morning. The basic differences, other than size, are the use of an integral tank rather than a clustering of tanks, and use of an F-1 engine rather than the much smaller H-1. However, the same kerosene and liquid oxygen propellant is employed and one can say this is within the state of the art.

The second stage is manufactured by the space and information division of North American Aviation and is probably the largest liquid hydrogen-liquid oxygen stage in existence. It is a new stage. However, we did apply the Saturn I second-stage liquid hydrogen-liquid oxygen technology to this stage and, to the best of our ability, transferred that knowledge and experience to the prime contractor, North American.

UPRATED SATURN I PROGRAM

In the Uprated Saturn I program (figs. 8 and 9), three successful Apollo missions, designated AS-201, 202, 203, have been completed. These served to prove the design of the Uprated Saturn I vehicle and