

SATURN S-IVB/IB & V MANUFACTURING PERFORMANCE

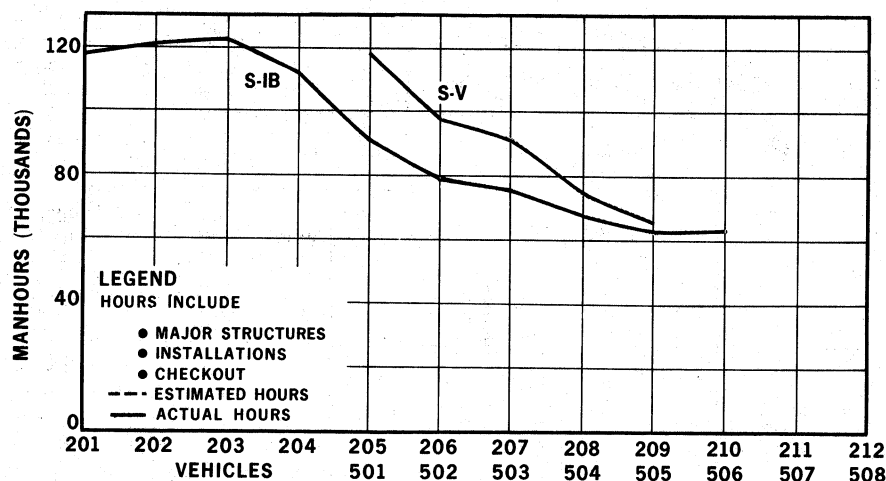


FIGURE 13

this program is an excellent one. These are all actual points, particularly on Saturn V. We started out using about 120,000 man hours per stage. We have expressed a good learning curve; we are down here now, at about 60,000. Saturn V has come closer to the IB than we thought possible; all in all I think it represents an excellent performance.

Now, the ground test program (fig. 14). We have spent an awful lot of money on ground tests and I think it's well justified. I think it's responsible for the wonderful record that the Saturn/Apollo program has had to date in flight. Our program—our component test program—has a total of about 1,132 tests. Each one of these tests could be composed of anywhere between 10 to 30 separate tests of a given component: shock, vibration, cold, heat, vacuum, salt spray, and other things, and combinations of these things. We are roughly at the 92 or 93 percent level. Tests on all of the vehicle-associated things are either finished or very shortly will be. If you will remember, last year we showed you how, before the 201 launch about 60 percent of the program was required to be complete. We have proceeded on these flight associated tests (fig. 15) to be complete by the 501 launch: all the things that were required for the 204 are done; as were all the things that were required for the 503 static fire. We have about three open items before we qualify 501 for launch. The remaining 10 percent of the test program is associated with miscellaneous GSE tests and the reliability-quality maintenance program that was just initiated, which will continually test various components in the program. These programs stretch out now. But the testing effort is largely behind us.

As you know, we have flown three of the uprated Saturn I's (fig. 16). About all you can say is that all three flights were superb.