



FIGURE 13

plete the F-1 engine qualification test and the J-2 engine, 205,000-pound thrust qualification.

Mr. WAGGONNER. Hasn't the J-2 been uprated?

Dr. MUELLER. Up about 5,000 pounds. It has developed a higher specific impulse so instead of being at the lower end of its specification, it is near the upper end which results in higher performance.

Mr. WAGGONNER. Is this higher performance essential?

Dr. MUELLER. Yes, as the spacecraft design has been completed, we found that there have been increases in the weight and we have been able, by virtue of the fact that the performance of the launch vehicle was improved to accommodate those increases in weight.

Mr. WAGGONNER. Was this 5,000-pound increase in the J-2 engine, was this a fractional increase that was necessary for the mission performance?

Dr. MUELLER. No, actually it is part of our normal experience in these engines as they mature, it is relatively easy to raise their performance as a normal course of evolution.

Mr. FULTON. There was an article appearing in the Sunday Washington Post to the effect that there were 20,000 mistakes in the Apollo program already. I would like to have in the record your comments in answer to some of those statements. I think it shouldn't go unanswered.

Mr. WAGGONNER. I think you will find that in yesterday's record. (The information requested follows:)