This is under active work right now, and it appears there are a couple of solutions. Our problem is to pick the one which we are content to live with.

With respect to the descent engine (fig. 28) the principal effort has involved obtaining consistent and acceptable performance and acceptable throat erosion. Again I have to give credit to TRW for developing a configuration which takes into account the complexities of the throttling requirement, for acceptable operation over a wide range of operating conditions. This has finally been done, and we seem to be, at this point, through the worst.

Another area which I would like to comment on, which is partly engineering and includes management and manufacturing, has to do with the ground support equipment. Here I want to point out that just about a year ago, we were in rather difficult straits. Today we are on schedule with a supporting program, and it is difficult to imagine today what a struggle it was to get that way. But fundamentally, we have come a long way in this area, and we don't have too much further to go.

This a list of the end items which have been made (fig. 29). This is just the top of the iceberg really. Underneath all this lies the fact that we have to install this equipment usually at a field site, although we have still this activity at Bethpage, and then we have to check it out and make sure it works before we can use it to support the vehicle. So really, you have to look at GSE as being first a problem of finding out what the vehicle really needs to support it, which is difficult to do until the vehicle is pretty well designed, and then quickly you have to produce it so that it is ready when the vehicle is ready; but then before you use it, you have to get it installed and checked out to make sure that it doesn't cause more trouble than the vehicle does.

Fortunately, this is largely behind us.

DESCENT ENGINE

- SATISFACTORY PERFORMANCE AVAILABLE FOR EARLY MISSIONS - PHASE A QUAL
- PROBLEM OF REPEATABILITY (RE: PERFORMANCE) & EROSION HAS BEEN DIAGNOSED. TEST RESULTS INDICATE ADEQUATE CORRECTION IN CRITICAL MISSION SEGMENTS OF DUTY CYCLE
- PHASE B QUAL WILL CONFIRM THIS IN A SERIES OF FORMAL TESTS
- DESCENT ENGINES DELIVERED FOR LTA-5, LTA-8, LM-1, & LM-2

FIGURE 28