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NASA TECH BRIEF

NASA Pasadena Office

Injector Has No Backsplash

The problem:

A typical liquid rocket-propellant injection element consists of two streams of liquid angled toward each other (see Figure 1) and impinging a short distance downstream from the face of the injector. In this configuration, a small portion of the liquid has a velocity component directed backward toward the injector face. This backsplash often accumulates on the injector face to form large droplets, which may cause combustion instability, an unnecessary waste of fuel, and the formation of solid deposits on the injector face.

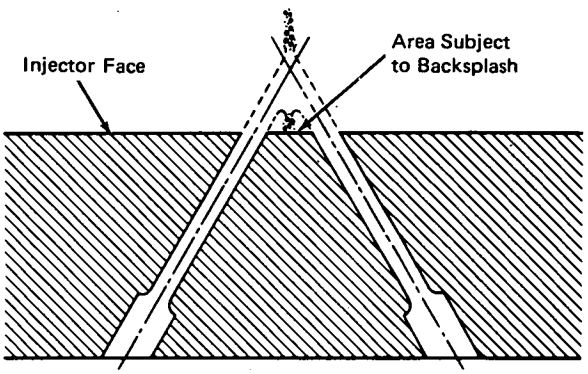

Figure 1. Previous Injector Design

The solution:

The passages of an injector have been modified to eliminate backsplashing.

How it's done:

Figure 2 illustrates the new design; the significant feature is that there is no area subject to backsplash.

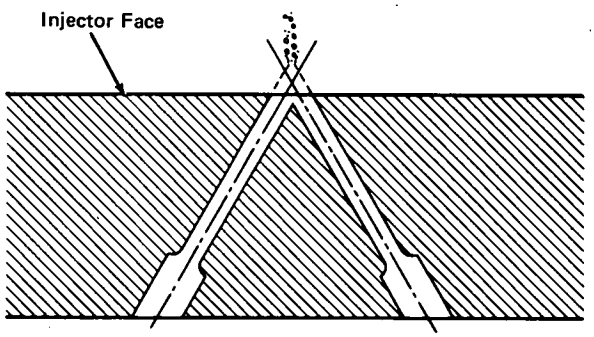

Figure 2. New Injector Design

All of the fluid is expelled in the downstream spray fan. The result is that the face of the injector is completely free of the liquid obstructions.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
NASA Pasadena Office
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Reference: TSP73-10461

Patent status:

NASA has decided not to apply for a patent.

Source: Walter B. Powell of
Caltech/JPL
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Category 07