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NASA TECH BRIEF

Run-In With Chemical Additive Protects Gear Surface

The problem:

Scoring of highly loaded gears of the Mk 3 turbopump is a problem which lubricants such as MIL-L-25336, MIL-L-7808, and kerosenes in RP-1 rocket fuel and RJ-1 ramjet fuel have been unable to prevent.

The solution:

Employ a run-in procedure on the turbopump gears prior to their actual use in an engine.

How it's done:

The gear assembly is cleaned, vapor-honed, and subjected to controlled running-in on a back-to-back gear stand. During the run-in, the gears are step-loaded up to a point exceeding full operational loading while being subjected to a highly reactive, extreme pressure additive. The run-in treatment apparently applies a protective coating on the gear surfaces so that they are capable of operation under marginal conditions in mineral oil (including kerosene) and diester lubricants.

Notes:

1. This procedure can be used to protect highly loaded gears during relatively short-term operation.
2. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama, 35812
   Reference: B66-10069

Patent status:

No patent action is contemplated by NASA.

Source: M. A. Hartman
of North American Aviation, Inc.,
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