

Critical Item: Solenoid valve

Find Number: A78152

Criticality Category: 1S

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA
Part No: 79K80225-1

PMN/ S72-0694-1/
Name: ET Intertank Purge Panel

Mfg/ Marotta
Part No: 8037147-0003

Drawing/ 79K06063/79K40023
Sheet No: 3

Function: This solenoid valve controls the operation of pneumatically operated valve A78147.

Critical Failure Mode: Fail open. FM. No. 09PP03-001.007

Failure Effect: Causes valve A78147 to close, shutting off the flow of GN2 to the ET for purge of the ET intertank area. This would result in a hazardous condition for personnel and/or the vehicle if associated with a LH2 or LOX tank leak. Failure is detectable by pressure transducers A78160 and A78161 and the position indicator switch on valve A78147. Hazardous gas concentration is also detectable in the intertank area by the Hazardous Gas Detection System. Possible loss of life and/or vehicle.

Acceptance Rationale

Design:

- o This solenoid valve is operated within all design specifications.
- o Component specifications:

	<u>Rated</u>	<u>Actual</u>
Pressure (psig)	6000	750
Flow (scfm)	108	N/A
Temperature (°F)	0° to 160°	Ambient on the pad

- o The burst pressure is 4 times rated pressure (24,000 psig).

Solenoid valve, A78152 (Continued)

- o The solenoid valve body and poppet are constructed of 300 series SST, the O-rings are made of Buna-N, the backup rings are Teflon, and seats are nylon.

Test/Inspection:

- o File VI verifies the following:
 - Functional operation of the primary and redundant purges prior to each launch and at component replacement. The purges must satisfy the purge pressure specification.
- o The manufacturer's certification test included the following tests:
 - Proof
 - Leak
 - Functional
 - Continuity
 - Insulation resistance
 - Voltage drop

- o Drawing 79K12402 Requirements:

The valve will be functionally tested by LPS with each use.

This drawing requires a test annually and at component replacement. Tests consist of a valve position test, pull-in/drop-out voltage tests and an internal leakage test.

Failure History:

- o PRACA - There were 23 Problem Reports for this type component found in the PRACA Data Base.

No failures in the critical failure mode.
- o GIDEP - The GIDEP Failure Data Interchange System has been researched, and no data on this component was found.