STANFORD UNIVERSITY
W.W. HANSEN EXPERIMENTAL PHYSICS LABORATORY
GRAVITY PROBE B, RELATIVITY GYROSCOPE EXPERIMENT
STANFORD, CALIFORNIA 94305-4085

OPEN V5 VALVE TO CHECK THE GREASE LOCKING EFFECT FOR DR#296 INVESTIGATION

GPB ENGINEERING PROCEDURE

P0712

July 11, 2000

PREPARED _____ _____

A. Halevy , GMA Engineer Date

APPROVED _____ _____

C. Warren, Vacuum Engineer Date

APPROVED _____ _____

D. Ross, Quality Assurance Date

APPROVED _____ _____

B. Muhlfelder, Hardware Manager	Date

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1. GENERAL DESCRIPTION

This procedure describes the current measurements that will be taken on the flight vatterfly valves V5 (Howden drawing #3179) in order to find if the Braycote 601 grease has any effect in the DR #296. These measurements will show if the opening current in the first time will vary in relation to the next ones. If the first opening consumes significantly more motor power, than it may lead to the cause DR#296.

2. TEST INFORMATION

- Proper care should be taken in handling components, and their cleanliness must be preserved.
- Temperature: Room temperature
- Humidity: not critical

2.2 Cleanliness

2.2.1 Normal lab environment when components are double bagged.

2.2.2 Class 1000 Clean Room, on laminar flow working table.

2.3 ESD precautions

2.3.1 None required.

ONR representative, and QA to be notified 24 hours prior to beginning this procedure

2.4 Personnel, QA, and Documentation

2.4.1 Personnel Integration and Test Director

The Integration and Test Director (ITD) shall be Aaron Halevy or an alternate that he shall designate. The ITD has overall responsibility for the implementation of this procedure and shall sign off the completed procedure and relevant sections within it. The GMA REE shall also sign off the completed "As-Built" procedure.

Integration Engineers and other personnel. All engineers and technicians participating in this procedure shall work under the direction of the ITD who shall determine personnel that are qualified to participate in this procedure. Participants in this procedure are to be C. Warren and A. Halevy.

The test shall be conducted on a formal basis to approved and released procedures. The QA program office shall be notified of the start of this procedure. A Quality Assurance Representative, designated by D. Ross shall be present during the procedure (if deemed necessary) and shall review any discrepancies noted and approve their disposition. Upon completion of this procedure, the QA Manager, D. Ross or her designate, shall certify their concurrence that the effort was performed and accomplished in accordance with the prescribed instructions by signing and dating in the designated place(s) in this document. Discrepancies will be recorded in a D-log or as a DR per Quality Plan P0108. If a re-test of any or all of the hardware is necessary, the ITD will determine the appropriate changes in the procedure, with the QA Manager's approval.

2.5 Red-line Authority

Authority to red-line (make minor changes during execution) this procedure is given solely to the ITD or his designate, or the GMA Manager, and shall be approved by QA. Additionally, approval by the Hardware Manager shall be required, if in the judgment of the ITD or QA Representative, experiment functionality may be affected.

To conveniently record data directly into the procedure thus generating the "as-built" document, the procedure will be handled, if possible, in a paperless fashion until completed. A Laptop computer containing an electronic version of this procedure will be operated by the ITD or QA Representative and data shall be recorded by typing directly into the electronic file. Alternatively, an "As-Built" may be created after-the-fact from hand written notes in the approved procedure.

Following completion of the procedure and the creation of an edited electronic copy, a hard copy of the "As-Built" procedure shall be printed and ***signed off by all the designated parties.*** It shall then be filed, including an electronic copy into the data base.

The electronic editing of this document shall be as follows:

Data will be inserted into the document using normal font, i.e. non-bold, non-italic

- "Signatures" shall be designated by **BLACK CAPITAL BOLD LETTERS**.
- "Redlines" shall be in ***RED BOLD ITALICS*** to make them distinguishable in computer and on the hard copy printout.
- If available, digital pictures shall be inserted into the document where appropriate.

3. DOCUMENTS AND EQUIPMENT

3.1 Applicable Documents

Howden drawing #3179

3.2 Test Equipment

Equipment	Model and Serial Number	Calibration
Current amplifier	AM 503B-HL02263-2	
Digital oscilloscope		
High gage with dial indicator		
Control box		

4. MEASUREMENT OF CURRENT CONSUMPION: 2.5" VATTERFLY VALVES

Started on: _____

4.1 Setting and equipment test.

4.1.1 Attach the current amplifier to the Digital oscilloscope.

4.1.2 Find the line to be measured (one of the 28V lines) in the control box cable.

4.1.3 Try the setting on V3 valve to see if there is any reading while opening the valve, be sure that the information was recorded in the digital oscilloscope. Video record the opening.

4.1.4 Record opening time appears on the control box (if available).

4.2 Test V5

4.2.1 Arrange the same setting as in 4.1, but with V5.

4.2.2 Measure the sealing plate distance from the flange surface in two points both sides of the bellow. Use the high gage with dial indicator.

Left side	Right side

4.2.3 Be sure that we are measuring the correct electrical line.

4.2.4 Prepare the video camera to record the first time opening

4.2.5 Check the first time opening current while video recording until fully open-**take an extra care with this measurement that cannot be repeated.**

4.2.6 Record opening time appears on the control box (if available).

4.2.7 Repeat the opening and recording operation.

4.2.8 Record cycles of V3 & V5 in table below and in the log book.

Cycles of V3	Cycles of V5

4.2.9 Measure the sealing plate distance from the flange surface in two points both sides of the bellow. Use the high gage with dial indicator.

Left side	Right side

5. RESULTS:

Print out from the Digital oscilloscope.

6. PROCEDURE COMPLETION

The results obtained in the performance of this procedure are acceptable:

7 DATA BASE ENTRY

The following data shall be entered into the GP-B Data base:

- Name, number and revision of this procedure
- Date of successful completion of procedure.
- Part numbers and serial numbers of Vatterfly valve and their components