

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

METERING VALVE DISASSEMBLY

GP-B SCIENCE MISSION PROCEDURE

04 December, 1998

PREPARED _____
D. Gill, R&D Engineer Date _____

APPROVED _____
C. Warren, Integration Date _____

APPROVED _____
D. Bardas, Integration Manager Date _____

APPROVED _____
B. Taller, Quality Assurance Date _____

APPROVED _____
S. Buchman, Hardware Manager Date _____

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1 SCOPE

This procedure describes the method used for removing the valve stem and orifice assembly from the body in preparation for body modification per drawing 25499 and to properly store internal valve stem and orifice assembly. This procedure covers Porter Instrument Valve Models 4W-CVL-SS-0, 4W-CVL-SS-1 & 4W-CVL-SS-4

1.1 Acronyms

The following acronyms are used in this document

ITD Integration and Test Director

2 REFERENCES

2.1 Plans and Procedures

P0059 GP-B Contamination Control Plan
P0037 Entry/Exit Procedures for GP-B HEPL Clean Room Complex

2.2 Drawings

25107 Metering Valve Assembly
25499 Metering Valve Body

3 GENERAL REQUIREMENTS

3.1 Environmental Requirements

3.1.1 Cleanliness

Disassembly shall be conducted on a clean room flow bench with laminar flow maintained at Class 100 per Federal Standard 209 in the HEPL Class 1000 or Class 10,000 Clean rooms. Minimum protective garments for personnel working in the clean rooms shall be per P0037.

3.1.2 Particulate Contamination

All parts and tools shall be cleaned at least to the cleanliness levels of the rooms where they are used for assembly or testing. In addition, all flight parts shall be maintained at level 100 cleanliness per GP-B Contamination Control Plan (P0059). Take all necessary precautions to keep tools and handling equipment free of particulate contamination.

3.2 Integration and Test Personnel

3.2.1 Integration and Test Director

The Integration and Test Director (ITD) shall be Dr. Doron Bardas 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.

3.2.2 Personnel

All engineers and technicians participating in this procedure shall work under the direction of the ITD who shall determine which personnel are qualified to participate in this procedure. Participants in this procedure are expected to be D. Bardas, C. Warren, J. Vanden Beukel, G. Asher among others.

3.3 Safety

3.3.1 General

The RE (responsible engineer) shall ensure that all personnel are aware of the specific personnel and hardware safety concerns indicated in the safety requirements, cautions and warnings in this procedure.

3.4 Quality Assurance

Disassembly and re-assembly 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 B. Taller shall review any discrepancy noted during this procedure, and approve its disposition. The presently designated QA Representative is A. Nakashima. Upon completion of this procedure, the

QA Program Engineer, B. Taller or P. Unterreiner, will certify his 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.

3.5 Red-line Authority

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

4 REQUIRED EQUIPMENT

4.1 Flight Hardware

- 4.1.1 Valves, 4W-CVL-SS-0 Qty (2)
- 4.1.2 Valves, 4W-CVL-SS-1 Qty (1)
- 4.1.3 Valves, 4W-CVL-SS-4 Qty (3)

4.2 Ground Support Equipment and Miscellaneous Equipment

4.2.1 Materials

50 mL Centrifuge Tube, Corning 25331-50
125 mL Polypropylene Jar and Closure, Nalgene.
MICRO 90 Detergent
Z-foam sheet
Miracle Wipe

4.2.2 Tools and Miscellaneous

Open end wrench, 11/16"
HEPL 132 General Wet Bench
HEPL 132 Rotor Cleaning Wet Bench

5 PREPARATIONS

- Prepare storage containers for stem/orifice assembly and the valve body.
- Clean containers.
- Open all containers to be used.
- Immerse in 1% solution of MICRO 90 Detergent for 10 minutes.
- Scrub each container using Z-foam sheet.
- Rinse each container with DI spray and place in dump rinser.
- Run dump rinser for 4 cycle rinse.
- Remove from dump rinser, blow off majority of water with filtered nitrogen.
- Place on Miracle Wipe in Class 100 or better air flow and allow to air dry.
- Label containers with valve model number, orifice size and Lot Date Code.

6 DISASSEMBLY

- Clamp valve body in vise or smooth jawed wrench.
- Using 11/16" open end wrench, loosen stem/body nut.
- Un-screw stem assembly from body.
- Bag and tag the body.
- Clean room bag and tag the stem assembly.

7 PROCEDURE COMPLETION

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

Integration Engineer _____ Date _____

Discrepancies if any:

ITD _____ Date _____

Test procedure is as represented and the documentation is complete and correct:

QA Representative _____ Date _____

QA Program Engineer _____ Date _____

Copy discrepancies to D-Log and open Discrepancy Reports when required.

Hardware Manager _____ Date _____

8 DATA BASE ENTRY

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

- a) Name, number and revision of this procedure
- b) An electronic copy of this document
- c) A copy of the “as-built” procedure with data and pictures, when completed.