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

GMA VALVE CONTROLLER ACCEPTANCE TEST

GP-B ENGINEERING PROCEDURE
P0612 Rev A

26 February, 2001

PREPARED _____   _____
R. Stephenson, GMA Engineer   Date

APPROVED _____   _____
C. Gray, GMA REE   Date

APPROVED _____   _____
D. Ross, Quality Assurance   Date

APPROVED _____   _____
B. Muhlfelder, Hardware Manager   Date

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1   SCOPE

This procedure is used to test the GMA valve controller. This box allows the manual manipulation of the GMA solenoid valves. It also reads the GMA pressure sensors. Upon the completion of the test, this control box will be qualified to use in the testing of the flight GMA.

1.1   Acronyms

The following acronyms may be used in this document

QA   Quality Assurance

2. REFERENCES

2.1   Plans and Procedures
N/A

2.2   Drawings
Gas Management Assembly 25110 Rev D

2.3   Specifications
N/A

3   GENERAL REQUIREMENTS

3.1   Environmental Requirements

3.1.1   Cleanliness
A normal lab environment is appropriate for this assembly

3.1.2   Magnetic Contamination
N/A

3.1.3   Electrostatic Discharge Control
N/A

3.2   Personnel

3.2.1   Engineer
The Engineer shall be Rick Stephenson or an alternate that he shall designate. The Engineer has overall responsibility for the implementation of this procedure and shall sign off the completed procedure and relevant sections within it.

3.3   Safety

N/A

3.4 Quality Assurance

This assembly will 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 and shall review any discrepancies noted and approve their disposition. Upon completion of this procedure, the QA Program Engineer, D. Ross or her designate, will certify her 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. <u>Discrepancies will be recorded in a D-log or as a DR per Quality Plan P0108</u>.

3.5 Red-line Authority

Authority to red-line (make minor changes during execution) this procedure is given solely to the technician or his designate and shall be approved by the QA Representative.

4 REQUIRED EQUIPMENT

4.1 Tools and Materials

The following tools and Materials will be available:
- GMA Qualification Valve S/N A8
- Non Flight Pressure Sensor ST550-15A
- Non Flight Pressure Sensor ST550-500A
- Non Flight Pressure Sensor ST550-5000A
- GMA Engineering Wiring harness 26202 Rev A S/N 001
- GMA Engineering "Pig tail" connectors
- Potentiometer Assembly

5   TEST OF THE GMA VALVE CONTROLLER

5.1   Solenoid Valve Function

5.1.1   Connect the Solenoid Valve Controller to the GMA Engineering Wiring Harness using the pigtail connectors and potentiometer assembly.

5.1.2   Connect the Qualification Solenoid Valve A8 to the SV1 connection on the wiring harness.

5.1.3   Cycle the valve open and closed using the Valve Controller box.

5.1.4   Verify that LED shows the correct state of the solenoid valve, and that the valve cycles by listening for the click and record this data in Table 1.

5.1.5   Cycle the switches for all other valves to make sure there is no cross talk.

5.1.6   Verify that the Qualification Valve does not open during these cycles.

5.1.7   Disconnect the Qualification Valve from SV1 and connect it to SV2.

5.1.8   Repeat steps 5.1.3 − 5.1.7 for all GMA solenoid valves per Table 1.

5.2   Pressure sensor function

5.2.1   Connect the appropriate non-flight pressure sensor to SP1 according to Table 2.

5.2.2   Verify that the control box reads about 15 psia and record the measurement in Table 2.

5.2.3   Remove the pressure sensor from SP1 and connect the appropriate sensor to SP2.

5.2.4   Repeat steps 5.2.1 − 5.2.3 for all pressure sensors according to Table 2.

6 TABLES

6.1   Table 1

Solenoid	Open	Close	Telemetry Open	Telemetry Close
SV1				
SV2				
SV3				
SV4				
SV5				
SV6				
SV7				
SV8				
SV9				
SV10				
SV11				
SV12				
SV13				
SV14				
SV15				
SV16				
SV17				
SV18				
SV19				
SV20				
SV21				
SV22				
SV23				
SV24				
CV1				
CV1A				
CV2				
CV2A				
CV3				
CV3A				
CV4				
CV5				

6.2   Table 2

Pressure Sensor	Sensor Range	Pressure measured
SP1	5000 psia	
SP2	5000 psia	
SP3A	500 psia	
SP3B	500 psia	
SP4	15 psia	

SP5	15 psia	
SP6	15 psia	
SP7	15 psia	
SP8	15 psia	
SP9	15 psia	
CP1	500 psia	
CP2	500 psia	
CP3	500 psia	
CP4	500 psia	

7   PROCEDURE COMPLETION

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

_____   date: _____
GMA Engineer

Discrepancies if any:

Approved: _____   date: _____
C. Gray, GMA REE

Approved: _____   date: _____
QA Representative

Approved: _____   date: _____
D. Ross, QA

8   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.