"LAZEEZ"
Cold Flow 1

Cold Flow Test Operations Procedures

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Cold Flow Test Operations Procedures

Contents

This document contains the following procedures:

- The *Pressurant Regulation Test* procedure comprises steps for determining the proper setting of the flow control valves.
- The *Fuel Flow Test* procedure comprises steps for conducting a flow test of the fuel components of the liquid engine.
- The *Oxidizer Flow Test* procedure comprises steps for conducting a flow test of the oxidizer components of the liquid engine.
- The *Cold Flow Test* procedure comprises steps for conducting a cold flow test of the liquid engine, code name LAZEEZ, using manual actuation of valves.

Personnel Required

The test operations team consists of nine personnel:

1 ☐ The **Operations Director [OPS]** directs operations procedures and communicates with the other test personnel.

2 ☐ The **Primary Fill Operator [PRIMARY]** is the main system operator. **PRIMARY** operates all manual valves.

3 ☐ The **Secondary Fill Operator [SECONDARY]** is the backup for **PRIMARY**, and communicates with OPS. If **PRIMARY** becomes incapacitated, **SECONDARY** is responsible for removing them from danger.

4 ☐ The **DAQ Technician [DAQ]** monitors and operates the test data acquisition system.

5 ☐ The **Control System Operator [CONTROL]** operates the test control system, including actuation of the injector valve.

6 ☐ **Perimeter Guard 1 [P1]**, **Perimeter Guard 2 [P2]**, and **Perimeter Guard 3 [P3]** ensure that no unauthorized personnel enter the testing area during test operations.

Background Information

All personnel should familiarize themselves with the following information prior to test start:

- All valves have two names: an alphanumeric code used in the plumbing master system, and a descriptive name used in control system code and documentation. For this test, the correspondence is as follows:
  - **BA-1** is the **Supply Valve**
  - **BA-2** is the **Supply Vent Valve**
  - **BA-3** is the **Fuel Pressurant Valve**
  - **BA-4** is the **Pressurant Vent Valve**
  - **BA-5** is the **Oxidizer Pressurant Valve**
  - **BA-6** is the **Oxidizer Vent Valve**
  - **IJ-1** is the **Injector Valve**
  - **SC** denotes a supply cylinder
  - **R** denotes a flow control valve

Sign-Off

To be completed by all test personnel after reading and familiarization with procedures

1	☐ **Operations Director [OPS]**	_____	_____
2	☐ **Primary Fill Operator [PRIMARY]**	_____	_____
3	☐ **Secondary Fill Operator [SECONDARY]**	_____	_____
4	☐ **DAQ Technician [DAQ]**	_____	_____
5	☐ **Perimeter Guard 1 [P1]**	_____	_____
6	☐ **Perimeter Guard 2 [P2]**	_____	_____
7	☐ **Perimeter Guard 3 [P3]**	_____	_____
8	☐ **Control System Operator [CONTROL]**	_____	_____

Prior to Start

- ☐ Ensure that the following procedures are complete:
  - ☐ Oxidizer Tank Assembly procedure
  - ☐ Plumbing Setup procedure
  - ☐ Oxidizer Tank Stand Setup procedure
  - ☐ Test Stand Setup procedure
  - ☐ Data Acquisition Setup procedure
  - ☐ RLCS Setup Procedure
- ☐ Ensure that all technicians as defined above are available and have completed the sign-off.
- ☐ Ensure that all spectators and test personnel are wearing safety glasses.
- ☐ Ensure that **PRIMARY** and **SECONDARY** are wearing face shields and have no exposed skin.
- ☐ Ensure that **PRIMARY** is wearing thermal gloves.
- ☐ Ensure that the fuel tank **TK-2** has been filled with water.

Pressurant Regulation Test Procedure

- ☐ **OPS**: Wrote down starting pressure: _____
- ☐ **PRIMARY**: Confirm that the following valves are initially closed:
  - ☐ BA-1
  - ☐ BA-2
  - ☐ BA-6
  - ☐ BA-5
  - ☐ BA-3
  - ☐ BA-4
  - ☐ IJ-1
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **DAQ**: Confirm that all load cells are reading the determined zero point.
- ☐ **PAUSE POINT**
- ☐ **P1**, **P2**, and **P3**: Close the perimeter and do not allow any further personnel to enter the testing area.
- ☐ **SECONDARY**: Confirm that no personnel are present in the testing area other than **PRIMARY** and **SECONDARY**.
- ☐ **PRIMARY**: Connect SC-2 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-3 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-4 using the quick connect fitting.
- ☐ **PRIMARY**: Slowly open SC-2 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Slowly open SC-3 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-3.
  - ☐ **PRIMARY**: Close SC-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Slowly open SC-4 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-4.
  - ☐ **PRIMARY**: Close SC-3.
  - ☐ **PRIMARY**: Close SC-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

- ☐ **PRIMARY**: Communicate the pressure reading of PI-2.
- ☐ **DAQ**: Communicate the pressure reading of PT-4.
- ☐ **OPS**: Confirm that the pressure readings agree.
- ☐ If the readings do not agree:
    - ☐ **PRIMARY**: Close Sc-2.
    - ☐ **PRIMARY**: Close SC-3.
    - ☐ **PRIMARY**: Close SC-4.
    - ☐ **PRIMARY**: Slowly open BA-4.
    - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Ensure that R-1 is at the minimum pressure by rotating the valve in the counter-clockwise direction.
- ☐ **PRIMARY**: Open BA-5.
- ☐ **DAQ**: Continuously communicate pressure readings from PT-3.
- ☐ **PRIMARY**: Slowly turn R-1 clockwise to increase the pressure. Stop when PI-2 reads _____ psi.
- ☐ **PRIMARY**: Mark the location of the knob relative to the body and communicate the number of full rotations.
- ☐ **OPS**: Record the number of full rotations:_____
- ☐ **PRIMARY**: Close Sc-2.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-4.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **PRIMARY**: Disconnect SC-2 using the quick connect fitting.
- ☐ **PRIMARY**: Disconnect SC-3 using the quick connect fitting.
- ☐ **PRIMARY**: Disconnect SC-4 using the quick connect fitting.
- ☐ **P1**, **P2**, and **P3**: Open the perimeter.
- ☐ **OPS**: Proceed with tear-down and disassembly.

Fuel Flow Test Procedure

- ☐ **PRIMARY**: Confirm that the following valves are initially closed:
  - ☐ BA-1
  - ☐ BA-2
  - ☐ BA-6
  - ☐ BA-5
  - ☐ BA-3
  - ☐ BA-4
  - ☐ IJ-1
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **DAQ**: Confirm that all load cells are reading the determined zero point.
- ☐ **PAUSE POINT**
- ☐ **P1**, **P2**, and **P3**: Close the perimeter and do not allow any further personnel to enter the testing area.
- ☐ **SECONDARY**: Confirm that no personnel are present in the testing area other than **PRIMARY** and **SECONDARY**.
- ☐ **PRIMARY**: Connect SC-2 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-3 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-4 using the quick connect fitting.
- ☐ **PRIMARY**: Slowly open SC-2 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Slowly open SC-3 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-3.
  - ☐ **PRIMARY**: Close SC-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Slowly open SC-4 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-4.
  - ☐ **PRIMARY**: Close SC-3.
  - ☐ **PRIMARY**: Close SC-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Communicate the pressure reading of PI-2.

- ☐ **DAQ**: Communicate the pressure reading of PT-4.
- ☐ **OPS**: Confirm that the pressure readings agree.
- ☐ If the readings do not agree:
    - ☐ **PRIMARY**: Close Sc-2.
    - ☐ **PRIMARY**: Close SC-3.
    - ☐ **PRIMARY**: Close SC-4.
    - ☐ **PRIMARY**: Slowly open BA-4.
    - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Open BA-3.
- ☐ **DAQ**: Confirm that PT-3 is reading _____ psi.
- ☐ **PRIMARY** and **SECONDARY**: Retreat to mission control.
- ☐ **CONTROL**: Conduct the fuel flow test by opening the injector valve.
- ☐ **OPS**: Proceed when the graph steadies.
- ☐ **CONTROL**: Close the injector valve.
- ☐ **OPS**: Confirm mass of tank. If less than half of full value:
    - ☐ **PRIMARY**: Close SC-4.
    - ☐ **PRIMARY**: Close SC-3.
    - ☐ **PRIMARY**: Close SC-2.
    - ☐ **PRIMARY**: Slowly open BA-4.
    - ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
    - ☐ **OPS**: Restart the procedure.
- ☐ If over half:
    - ☐ **PRIMARY** and **SECONDARY**: Approach the plumbing.
    - ☐ **PRIMARY**: Slowly turn R-1 clockwise to increase the pressure. Stop when PI-2 reads _____ psi higher.
    - ☐ **DAQ**: Communicate the pressure reading of PT-3.
    - ☐ **OPS**: Confirm the pressure readings are in agreement.
    - ☐ **OPS**: Return to line 46.
- ☐ **PRIMARY**: Close SC-4.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-2.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **PRIMARY**: Disconnect SC-4.
- ☐ **PRIMARY**: Disconnect SC-3.
- ☐ **PRIMARY**: Disconnect SC-2.
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **P1**, **P2**, and **P3**: Open the perimeter.
- ☐ **OPS**: Proceed to the oxidizer flow test.

Oxidizer Flow Test Procedure

- ☐ **PRIMARY**: Confirm that the following valves are initially closed:
  - ☐ BA-1
  - ☐ BA-2
  - ☐ BA-6
  - ☐ BA-5
  - ☐ BA-3
  - ☐ BA-4
  - ☐ IJ-1
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **DAQ**: Confirm that all load cells are reading the determined zero point.
- ☐ **PAUSE POINT**
- ☐ **P1**, **P2**, and **P3**: Close the perimeter and do not allow any further personnel to enter the testing area.
- ☐ **SECONDARY**: Confirm that no personnel are present in the testing area other than **PRIMARY** and **SECONDARY**.
- ☐ **PRIMARY**: Connect SC-1 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-2 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-3 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-4 using the quick connect fitting.
- ☐ **PRIMARY**: Slowly open SC-1 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close SC-1.
  - ☐ **PRIMARY**: Open BA-2.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Communicate the pressure reading of PI-1.
- ☐ **DAQ**: Communicate the pressure reading of PT-1.
- ☐ **OPS**: Confirm that the pressure readings agree.
- ☐ If the readings do not agree:
  - ☐ **PRIMARY**: Close SC-1.
  - ☐ **PRIMARY**: Open BA-2.
  - ☐ **OPS**: Abort test procedures and revisit the test setup.
- ☐ **PRIMARY**: Slowly open SC-2 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **PRIMARY**: Close SC-1.

- ☐ **PRIMARY**: Open BA-2.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Slowly open SC-3 through $\frac{3}{4}$ of a turn.

☐ If leaks are observed:

- ☐ **PRIMARY**: Close Sc-3.
- ☐ **PRIMARY**: Close SC-2.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Slowly open SC-4 through $\frac{3}{4}$ of a turn.

☐ If leaks are observed:

- ☐ **PRIMARY**: Close Sc-4.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-2.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Communicate the pressure reading of PI-2.

☐ **DAQ**: Communicate the pressure reading of PT-4.

☐ **OPS**: Confirm that the pressure readings agree.

☐ If the readings do not agree:

- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **PRIMARY**: Close Sc-2.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-4.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Open BA-6.

☐ **DAQ**: Communicate the tank mass.

☐ **OPS**: Record the tank mass + 10 kg: _____

☐ **PRIMARY**: Open BA-1 by 10 degrees.

☐ **DAQ**: Communicate when the desired mass is reached.

☐ **PRIMARY**: Close BA-1.

☐ If the desired tank mass is surpassed:

72 ☐ **DAQ**: Continuously communicate tank mass readings.
73 ☐ **OPS**: Continue when the desired tank mass is reached.
74 ☐ **PRIMARY**: Close BA-6. If leaks are observed:
75 ☐ **PRIMARY**: Close SC-1.
76 ☐ **PRIMARY**: Open BA-2.
77 ☐ **PRIMARY**: Close Sc-2.
78 ☐ **PRIMARY**: Close SC-3.
79 ☐ **PRIMARY**: Close SC-4.
80 ☐ **PRIMARY**: Slowly open BA-4.
81 ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
82 ☐ **PRIMARY**: Open BA-5.
83 ☐ **DAQ**: Confirm that PT-2 is reading _____ psi.
84 ☐ **PRIMARY** and **SECONDARY**: Retreat to mission control.
85 ☐ **CONTROL**: Conduct the cold flow test by opening the injector valve.
86 ☐ **OPS**: Confirm mass of tank. If less than half of full value:
87 ☐ **PRIMARY**: Close SC-4.
88 ☐ **PRIMARY**: Close SC-3.
89 ☐ **PRIMARY**: Close SC-2.
90 ☐ **PRIMARY**: Slowly open BA-6.
91 ☐ **PRIMARY**: Slowly open BA-1 by 10 degrees.
92 ☐ **DAQ**: Communicate when the desired mass is reached.
93 ☐ **PRIMARY**: Close BA-1.
94 ☐ **PRIMARY**: Close BA-6.
95 ☐ **PRIMARY**: Open BA-5.
96 ☐ **PRIMARY**: Slowly turn R-1 clockwise to increase the pressure. Stop when PI-2 reads _____ psi higher.
97 ☐ **DAQ**: Communicate the pressure reading of PT-3.
98 ☐ **OPS**: Confirm the pressure readings are in agreement.
99 ☐ **OPS**: Return to line 46.
100 ☐ If over half:
101 ☐ **PRIMARY** and **SECONDARY**: Approach the plumbing.
102 ☐ **PRIMARY**: Open BA-5.
103 ☐ **PRIMARY**: Slowly turn R-1 clockwise to increase the pressure. Stop when PI-2 reads _____ psi higher.
104 ☐ **DAQ**: Communicate the pressure reading of PT-3.
105 ☐ **OPS**: Confirm the pressure readings are in agreement.
106 ☐ **OPS**: Return to line 46.
107 ☐ **PRIMARY**: Close SC-4.
108 ☐ **PRIMARY**: Close SC-3.

- ☐ **PRIMARY**: Close SC-2.
- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **PRIMARY**: Open BA-1.
- ☐ **PRIMARY**: Open BA-6.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **PRIMARY**: Disconnect SC-4.
- ☐ **PRIMARY**: Disconnect SC-3.
- ☐ **PRIMARY**: Disconnect SC-2.
- ☐ **PRIMARY**: Disconnect SC-1.
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **P1**, **P2**, and **P3**: Open the perimeter.
- ☐ **OPS**: Proceed with tear-down and disassembly.

Cold Flow Test Procedure

- ☐ **PRIMARY**: Confirm that the following valves are initially closed:
  - ☐ BA-1
  - ☐ BA-2
  - ☐ BA-6
  - ☐ BA-5
  - ☐ BA-3
  - ☐ BA-4
  - ☐ IJ-1
- ☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.
- ☐ **DAQ**: Confirm that all load cells are reading the determined zero point.
- ☐ **PAUSE POINT**
- ☐ **P1**, **P2**, and **P3**: Close the perimeter and do not allow any further personnel to enter the testing area.
- ☐ **SECONDARY**: Confirm that no personnel are present in the testing area other than **PRIMARY** and **SECONDARY**.
- ☐ **PRIMARY**: Connect SC-1 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-2 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-3 using the quick connect fitting.
- ☐ **PRIMARY**: Connect SC-4 using the quick connect fitting.
- ☐ **PRIMARY**: Slowly open SC-1 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close SC-1.
  - ☐ **PRIMARY**: Open BA-2.
  - ☐ **OPS**: Abort test procedures and revisit the plumbing setup.
- ☐ **PRIMARY**: Communicate the pressure reading of PI-1.
- ☐ **DAQ**: Communicate the pressure reading of PT-1.
- ☐ **OPS**: Confirm that the pressure readings agree.
- ☐ If the readings do not agree:
  - ☐ **PRIMARY**: Close SC-1.
  - ☐ **PRIMARY**: Open BA-2.
  - ☐ **OPS**: Abort test procedures and revisit the test setup.
- ☐ **PRIMARY**: Slowly open SC-2 through $\frac{3}{4}$ of a turn.
- ☐ If leaks are observed:
  - ☐ **PRIMARY**: Close Sc-2.
  - ☐ **PRIMARY**: Slowly open BA-4.
  - ☐ **PRIMARY**: Close SC-1.

- ☐ **PRIMARY**: Open BA-2.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Slowly open SC-3 through $\frac{3}{4}$ of a turn.

☐ If leaks are observed:

- ☐ **PRIMARY**: Close Sc-3.
- ☐ **PRIMARY**: Close SC-2.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Slowly open SC-4 through $\frac{3}{4}$ of a turn.

☐ If leaks are observed:

- ☐ **PRIMARY**: Close Sc-4.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-2.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Communicate the pressure reading of PI-2.

☐ **DAQ**: Communicate the pressure reading of PT-4.

☐ **OPS**: Confirm that the pressure readings agree.

☐ If the readings do not agree:

- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **PRIMARY**: Close Sc-2.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-4.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Open BA-6.

☐ **DAQ**: Communicate the tank mass.

☐ **OPS**: Record the tank mass + 10 kg:_____

☐ **PRIMARY**: Open BA-1 by 10 degrees.

☐ **DAQ**: Communicate when the desired mass is reached.

☐ **PRIMARY**: Close BA-1.

☐ If the desired tank mass is surpassed:

- ☐ **DAQ**: Continuously communicate tank mass readings.
- ☐ **OPS**: Continue when the desired tank mass is reached.

☐ **PRIMARY**: Close BA-6. If leaks are observed:

- ☐ **PRIMARY**: Close SC-1.
- ☐ **PRIMARY**: Open BA-2.
- ☐ **PRIMARY**: Close Sc-2.
- ☐ **PRIMARY**: Close SC-3.
- ☐ **PRIMARY**: Close SC-4.
- ☐ **PRIMARY**: Slowly open BA-4.
- ☐ **OPS**: Abort test procedures and revisit the plumbing setup.

☐ **PRIMARY**: Open BA-5.

☐ **PRIMARY**: Open BA-3.

☐ **DAQ**: Confirm that PT-2 is reading _____ psi.

☐ **DAQ**: Confirm that PT-3 is reading _____ psi.

☐ **PRIMARY** and **SECONDARY**: Retreat to mission control.

☐ **CONTROL**: Conduct the cold flow test by opening the injector valve.

☐ All observe the plume.

☐ **PRIMARY**: Close SC-4.

☐ **PRIMARY**: Close SC-3.

☐ **PRIMARY**: Close SC-2.

☐ **PRIMARY**: Close SC-1.

☐ **PRIMARY**: Open BA-2.

☐ **PRIMARY**: Open BA-1.

☐ **PRIMARY**: Open BA-6.

☐ **PRIMARY**: Slowly open BA-4.

☐ **PRIMARY**: Disconnect SC-4.

☐ **PRIMARY**: Disconnect SC-3.

☐ **PRIMARY**: Disconnect SC-2.

☐ **PRIMARY**: Disconnect SC-1.

☐ **DAQ**: Confirm that all pressure transducers are reading atmospheric pressure.

☐ **P1**, **P2**, and **P3**: Open the perimeter.

☐ **OPS**: Proceed with tear-down and disassembly.