PART NUMBERS (Including, but not inclusive)

TB25
TB25-RVCKIT

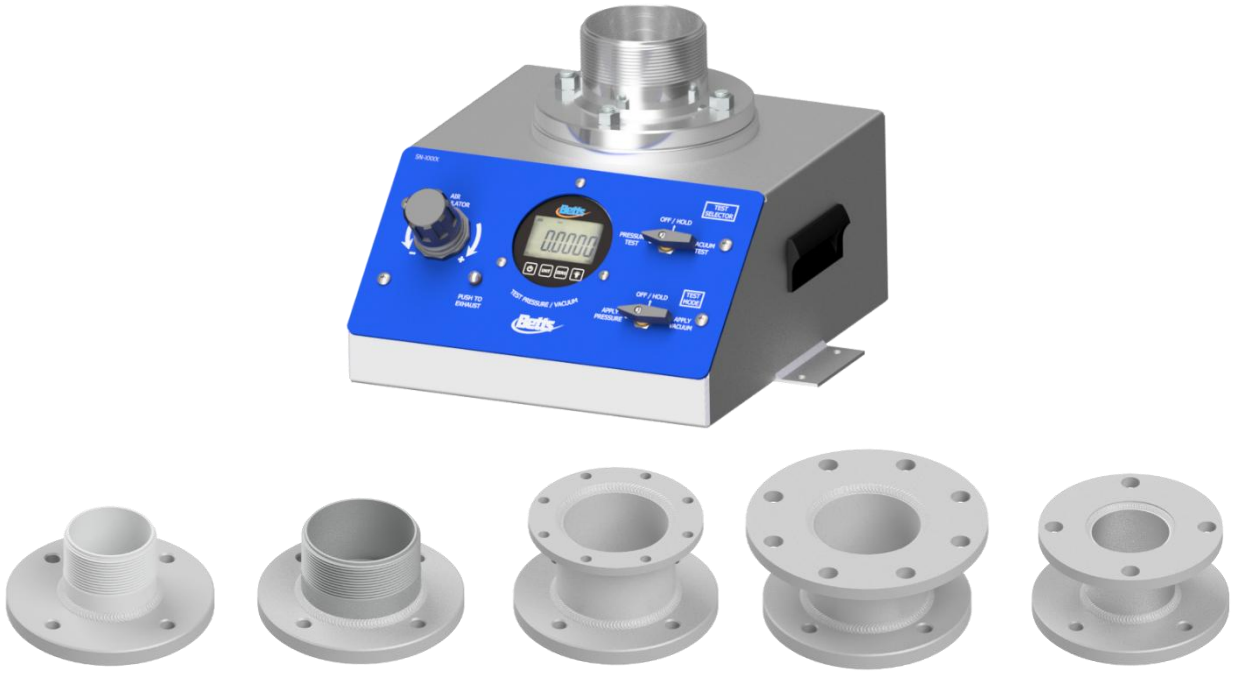


Table of Contents:

1.0 General
2.0 Parts List
3.0 Air Line Diagram
4.0 Description and Intended Use
5.0 Test Box Calibration/Leakage Test
6.0 Operation Guide
7.0 Repair Instructions
8.0 Trouble Shooting Guide

1.0 General Maintenance Manual Guidelines

1.1 It is strongly recommended that this entire manual be read prior to any operation, disassembly, or assembly of this equipment.

1.2 Betts Industries, Inc. provides this manual as a guideline for reference only and assumes no responsibility for personal injury or property damage that may occur in conjunction with this manual. Betts Industries, Inc. cannot be held responsible for incorrect installation, operation or maintenance of this equipment. Use only genuine Betts replacement parts. Substitute parts will void all warranties and could impair the proper function making this equipment unsafe.

1.3 Betts Industries, Inc. recommends all equipment be placed on a regular maintenance schedule that includes the routine replacement of seals and gaskets and visual inspection for leaks and corrosion. The end user must make their own determination and set their own schedule based upon use and environment. In some cases, regulations may dictate the minimum testing frequency of items. Make sure operators are aware of all applicable codes.

1.4 Only trained and qualified personnel should perform maintenance on this equipment.

1.5 As with any maintenance work, proper safety gear must be utilized and approved procedures must be followed at all times. Examples of safety gear may include but are not limited to gloves, safety goggles, face shields, protective suits and respirators. It is the responsibility of the person/company working on this equipment to identify the hazardous products that the equipment has been exposed to and designate specific and appropriate protective gear and safety procedures.

1.6 Safety alert symbols are used to alert operator to potential personal injury hazards. These symbols are per ANSI Z535.5 and are listed below. Operator MUST obey all instructions that follow a safety symbol. Alerts will be used to indicate known safety concerns.

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, **will result** in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, **could result** in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, **may result** in minor or moderate injury. It may also be used to alert against unsafe practices.

A list of hazards may include but are not limited to fall hazards, pressure hazards, loaded springs, corrosive material, flammable product, pinch points. Additional concerns are possible and should be identified and avoided by the operator.

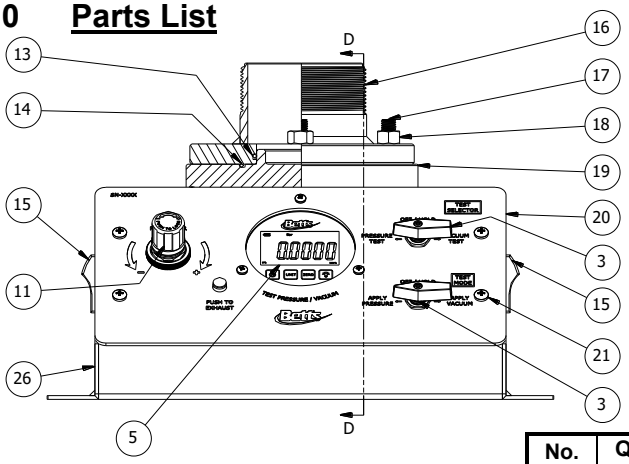
1.7 Product Warranty shall be void if equipment is subject to misapplication, misuse, neglect, alteration, or damage.

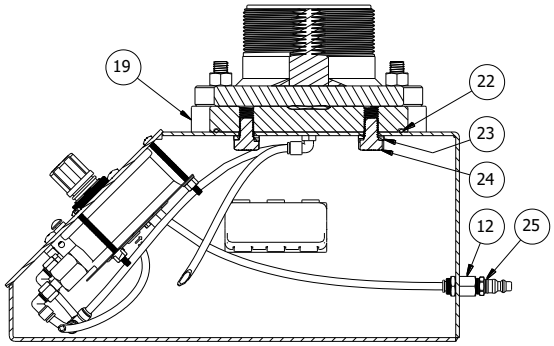
1.8 Specific design details described in this document are for reference only and are subject to change without notice. See Betts Industries, Inc. web page for the most recent revision to this document. www.bettsind.com.

1.9 ⚠ **WARNING:** This product can expose you to chemicals including Chromium (hexavalent compounds), which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov.

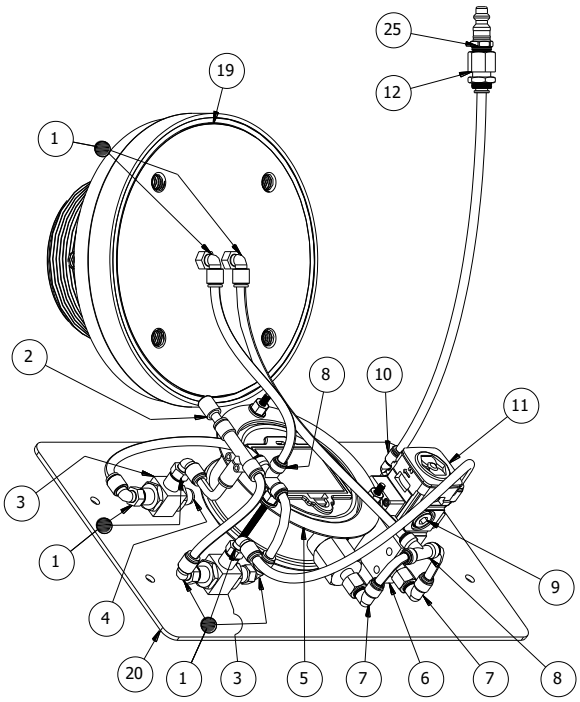
1.10 For additional questions or more detailed technical assistance, contact the Betts Industries, Inc. Customer Service, Sales or Engineering Department at (814) 723-1250.

2.0 Parts List





SECTION D-D



Back of Test Box Panel with shell hidden.

Note: The tubing is ¼" diameter. Specific lengths and locations are shown in MM-TB001.

No.	Qty	Description	Material	Part No.
1	8	Male 1/8 NPT 90°	Brass / Nylon	9Z6201
2	1	Vacuum Ejector	PTFE	9Z4056
3	2	Diverting Valve	PBT	9Z4057
4	1	1/8 NPT Plug	316 Stainless	9V4921
5	1	Digital Gauge	304 Stainless	9Z4053
6	1	Exhaust Air Valve	Brass	9Z6196
7	2	Female 1/8 NPT 90°	Brass / Nylon	9Z4061
8	2	Quick Connect Tee	Nylon	9Z4062
9	1	¼ NPT Plug	Brass	9V4925
10	1	Male ¼ NPT 90° Quick Con.	Brass / Nylon	9Z4054
11	1	Pressure Regulator	Aluminum	9Z4052
12	1	Panel Mount Quick Con.	Brass Ni PL	9Z4055
13	1	Adapter Bore O-Ring	Nitrile	18283BN
14	1	Adapter Crush O-Ring	Nitrile	920146
15	2	Handles	ABS	9Z4051
* 16A	1	4" NPS Adapter	6061-T6511 Al	TB-4N
* 16B	1	4" ANSI Adapter	6061-T6511 Al	TB-4A
* 16C	1	4" TTMA Adapter	6061-T6511 Al	TB-4F
* 16D	1	3" NPS Adapter	6061-T6511 Al	TB-3N
* 16E	1	3" ANSI Adapter	6061-T6511 Al	TB-3A
17	4	½-13 X 2.00" Stud	316 Stainless	17713SS2.00
18	4	½-13 Nut	304 Stainless	9Q5873
19	1	Mounting Plate	6061-T6511 Al	29645AL
20	1	Test Box Panel	Anodized Al	29636AA
21	4	¼-20 X .75 Screw	316 Stainless	9Q6010
22	1	Adapter Plate O-Ring	Nitrile	76350BN
23	4	½" Lock Washer	304 Stainless	9Q5908
24	4	½-13 X .75 HH Bolt	18-8 Stainless	9Q6012
25	1	Air Hose Fitting	Zinc Pl. Steel	9Z4059
26	1	Test Box Frame	Aluminum	47513AL

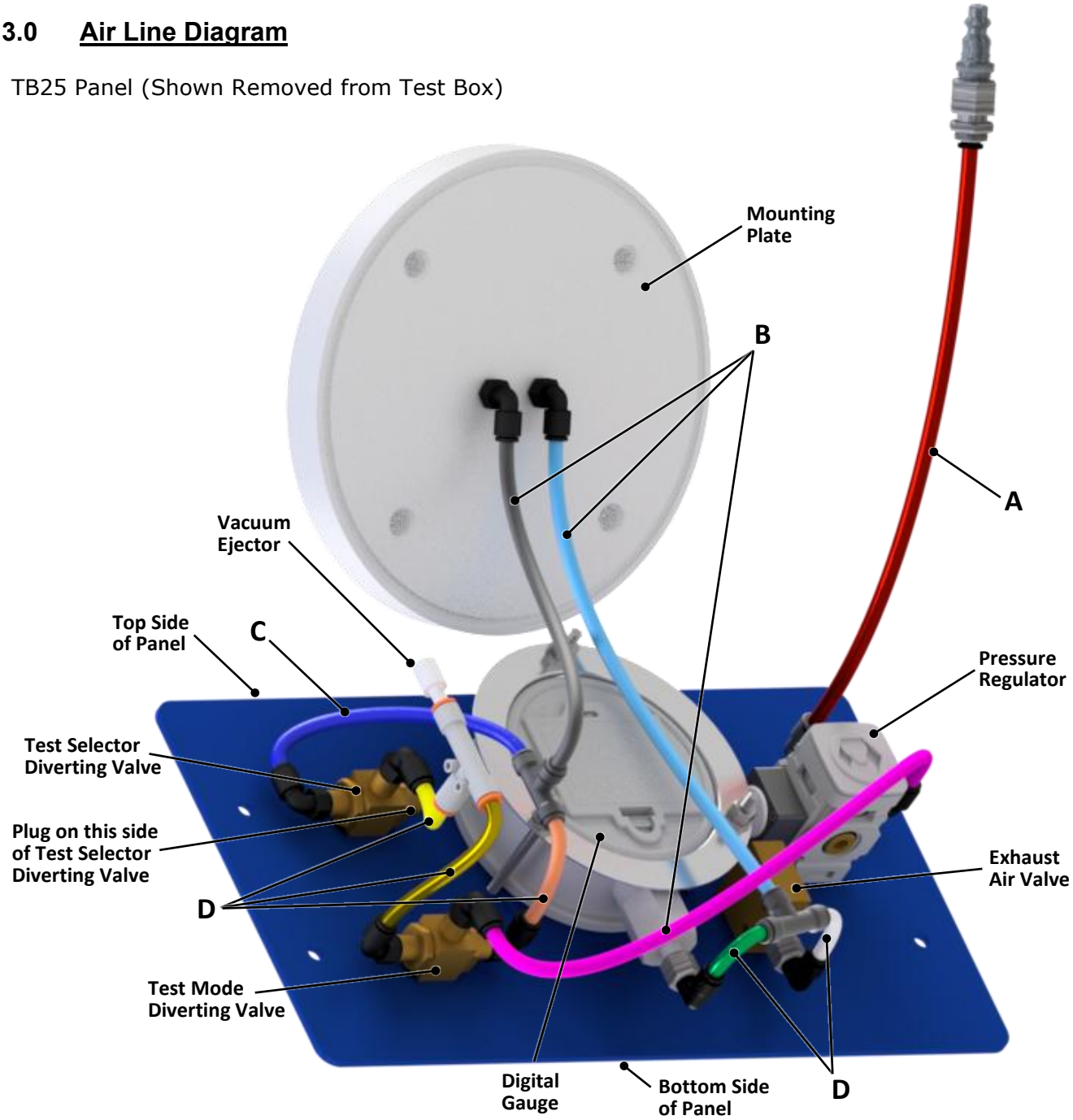
* Provided with "KIT" assembly only.

MAINTENANCE: Test Box assemblies should be calibrated with sufficient frequency to ensure accuracy. See MM-TB001 for detailed instructions, MM-TB002 for operational instructions and MV-TB002 for operational video.

WARNING: Use only genuine Betts replacement parts. Use of substitute parts can impair the proper function & safety of this product and void all warranties.

3.0 Air Line Diagram

TB25 Panel (Shown Removed from Test Box)



Tubing Identifier	Tubing Length	Tubing Diameter
A (1 place)	22″	¼″
B (3 places)	12″	¼″
C (1 places)	6″	¼″
D (5 place)	3.5″	¼″

4.0 Description and Intended Use

4.1 The Betts Test Box is a compact, bench-mounted unit designed for compliance testing of Vacuum Breakers and Pressure Relief Valves. The corrosion-resistant, anodized aluminum front panel features a removable, backlit digital pressure/vacuum gauge for easy readability and versatile controls for functionality. A quick-exhaust button is provided on the front panel to safely release test pressure as needed and the unique control sequence facilitates testing of valves with similar MAWP without the need to adjust the pressure regulator between tests. These features save time and improve testing accuracy. The aluminum body features integrated handles and comes standard with mounting brackets for secure installation on any flat surface.

The Test Box adapters are designed for quick changeovers to reduce the hassle of testing multiple pressure relief valves with various mounting configurations.

4.2 Mounting the Test Box to a workbench.

4.2.1 The Test Box has mounting brackets on each side for mounting to a workbench.

4.2.2 Drill bench as needed and secure with four screws or bolts.

4.2.3 A ¼“quick connect air fitting is supplied. Apply thread sealant to the threads and install into the port in the back of the box.

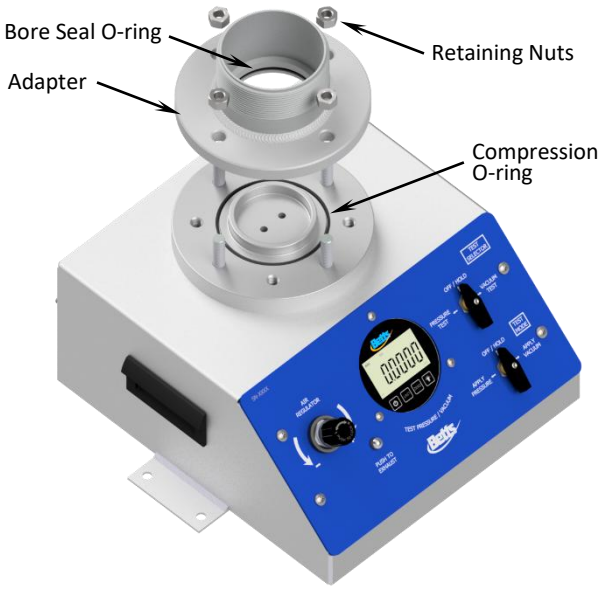
5.0 Test Box Calibration / Test

WARNING		**Pressure Hazard** – Test Fixture or airlines may contain residual pressure and failure to safely relieve could result in sudden loss of pressure causing death or serious injury.

5.1 Test Box Airline Inlet and Diverter Valve Test:

5.1.1 Install Adapter on Test Box:

- Select appropriate adapter for the pressure relief valve being tested.
- Verify the Bore Seal O-ring is in place, in good condition and lubricated. This O-ring is the primary seal for the adapter. **O-ring and bore must be lubricated to facilitate ease of adapter removal.**
- Install the Adapter on the studs and push down until it seats on the Compression O-ring.
- Install the Retaining Nuts snug with wrench to hold the adapter in place. There is no need to excessively tighten these nuts.



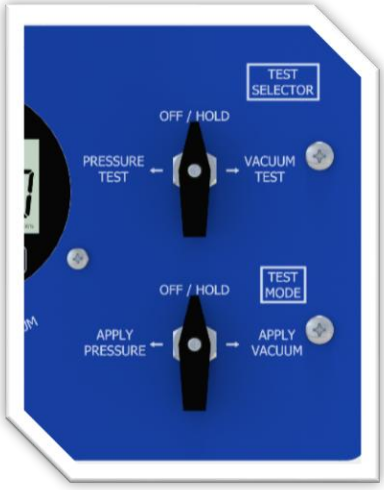
5.1.2 Install a standard TTMA / ANSI blind flange or NPT cap with appropriate gaskets on the top of the Adapter to seal off the system. Never position body or extremities directly over cap.

5.1.3 Ensure both the Test Selector and Test Mode diverting valves are in the “Off/Hold” position, and the gauge is powered on.

5.1.4 Connect an air supply line to the fitting on the back of the test box. 125 psi max. pressure.

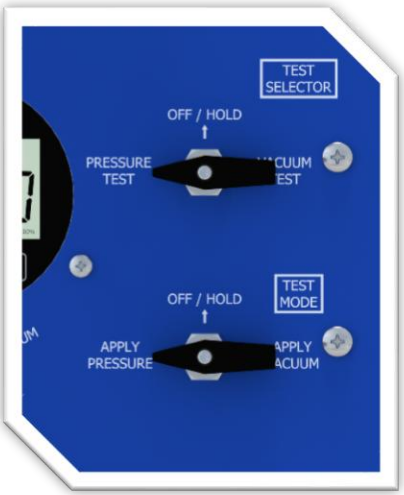
5.1.5 Turn the regulator clockwise until the regulator stops turning.

5.1.6 Push and release the “Push to Exhaust” button. Inspect the Test Box for 15 seconds.



- If the pressure gauge reads any pressure - this is a failure. Refer to the trouble shooting guide “Calibration 1” to resolve the issue.
- If there is an air leak - this is a failure. First check to see if the leak is coming from the cap or blind flange. If so, correct the issue and retest. If the leak is coming from someplace else, refer to the trouble shooting guide “Calibration 2” to resolve the issue.
- If no leaks are observed and the pressure gauge reads zero pressure - this portion of the calibration test is successful. Move to the next step.

5.2 Test Box Pressure Calibration:



5.2.1 Turn the Test Selector to “Pressure Test” and Test Mode diverting valve to “Apply Pressure”.

5.2.2 Adjust the Air Regulator so the digital gauge reads 30 to 50 psi.

5.2.3 If the Test Box will not build pressure - this is a failure. Refer to trouble shooting guide “Calibration 3” to correct issue.

5.2.4 Move the Test Selector to “Off/Hold”.

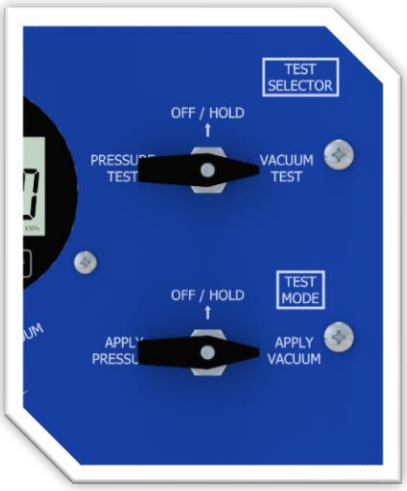
5.2.5 Move the Test Mode to “Off/Hold”

5.2.6 Inspect the Test Box for 15 seconds.

- If the gauge pressure drops - this is a failure. Refer to trouble shooting guide “Calibration 4” to correct issue.
- If the pressure gauge remains stable and the Test Box holds the pressure, this portion of the calibration test is successful. Move to the next step.

5.2.7 Push and hold the “Push to Exhaust” button to relieve all pressure.

5.3 Test Box Vacuum Calibration:



5.3.1 Turn the Test Selector to “Vacuum Test” and Test Mode diverting valve to “Apply Vacuum”.

5.3.2 Adjust the Air Regulator so the digital gauge reads -5 to -7 psi. **Note that there will be an audible air leakage sound in the box during this test due to the vacuum ejector.**

5.3.3 If the Test Box will not build vacuum - this is a failure. Refer to trouble shooting guide “Calibration 5” to correct issue.

5.3.4 Move the Test Selector to “Off/Hold”. This must be done first.

5.3.5 Move the Test Mode to “Off/Hold”. This must be done second.

5.3.6 Inspect the Test Box for 15 seconds.

- If the gauge vacuum drops - this is a failure. Refer to trouble shooting guide “Calibration 6” to correct issue.
- If the vacuum gauge remains stable and the Test Box holds the vacuum, this portion of the calibration test is successful. Move to the next step.

5.3.7 Push and hold the “Push to Exhaust” button to relieve all pressure.

5.4 Gauge Calibration:

5.4.1 The pressure gauge is certified from the factory.

5.4.2 The gauge should be calibrated and recertified at a minimum every year.

6.0 Operation Guide

6.1 The following steps outline the procedure for conducting a pressure test or vacuum test on a pressure relief valve. This is the same procedure as provided in Operational Procedure MM-TB002.

①

⚠ WARNING

Pressure Hazard – Test fixture or airlines may contain residual pressure and failure to safely relieve could result in sudden loss of pressure causing serious injury.

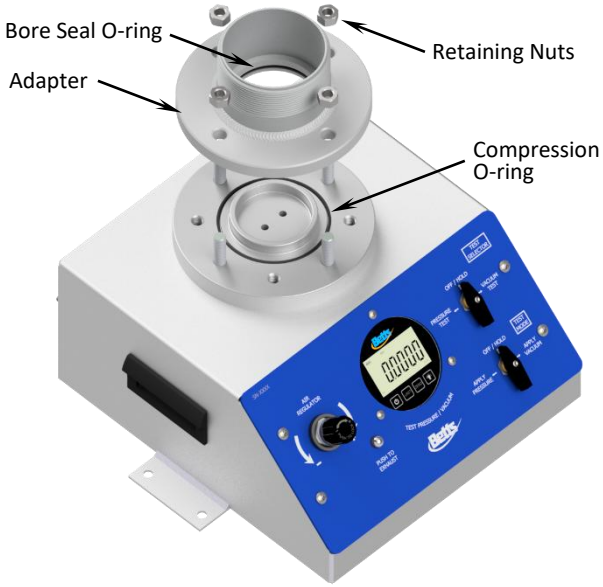
Hazardous Material – Relief Valves may contain residual hazardous material from cargo tank. Safely clean relief valves prior to handling.

---

② **Install Adapter on Test Box:**

1. Select appropriate adapter for the pressure relief valve being tested.
2. Verify the Bore Seal O-ring is in place, in good condition and lubricated. This O-ring is the primary seal for the adapter. **O-ring and bore must be lubricated to facilitate ease of adapter removal.**
3. Install the Adapter on the studs and push down until it seats on the Compression O-ring.
4. Install the Retaining Nuts snug with wrench to hold the adapter in place. There is no need to excessively tighten these nuts.

Note: To remove the Adapter, unscrew the four Retaining Nuts and pull up evenly on the Adapter. If needed, two screwdrivers can be used simultaneously to gently pry up on opposite sides of the Adapter to remove.



---

③ **Install Relief Valve to Test Box:**

1. Verify the pressure relief valve has a mounting seal/gasket installed and in good condition. Note: It is permissible to use an alternate elastomer mounting gasket for testing purpose if desired.
2. Install pressure relief valve on adapter and tighten to ensure a leak tight seal.

Notes:

- Test procedure for Pressure Relief Valve or Pres/Vac Combo Relief Valve starts at step #4 *"Set Pressure Test".*
- Test procedure for Vacuum Valve starts at step #8 *"Vacuum Set Test".*

Pressure Test

4 **Set Pressure Test**:

1. Rotate the Test Selector to “Pressure Test”.
2. Rotate the Test Mode to “Apply Pressure”.
3. Slowly turn the Air Regulator clockwise to increase pressure in test box.
4. Monitor the Pressure Gauge for the Set Pressure reading.
5. See Maintenance Manual MM-RV002 for pass /fail criteria dependent on PRV being tested.

Set pressure defined as point at which continuous flow is seen, felt, or heard around seat area. *(Nomenclature per ASME section XII part TR-110 and TTMA TB-126).*

---

5 **Pressure Re-seal Test**:

1. Rotate the Test Mode to “Off/Hold”.
2. The pressure will bleed down and then stabilize.
3. Monitor the Pressure Gauge for the Re-seal Pressure.
4. See Maintenance Manual MM-RV002 for pass/fail criteria dependent on PRV being tested.

Reseal pressure defined as point at which seat re-seals to a leak tight condition. *(Nomenclature per TTMA TB-126).*

---

6 **Relieve Pressure in Test Box** – Push and hold the “Push to Exhaust” button to relieve pressure in the Test Box.

---

7 **Remove Valve** - If testing just a Pressure Relief Valve, the test is complete. Remove valve from test fixture.

or

Continue with Vacuum Test - If testing a Pressure/Vacuum Combo Valve, proceed to step #8 for Vacuum Set Test.

Alternate Quick Test Procedure for Testing Additional Pressure Relief Valves with Similar Set Pressure:

1. The Air Regulator has already been set from the previous test.
2. Install Relief Valve on Test Box
3. Rotate the Test Selector to “Pressure Test”.
4. Slowly feather the Test Mode in a counterclockwise position to gradually increase the pressure.
5. Monitor the Pressure Gauge for the Set Pressure reading.
6. Once the Set Pressure is identified, rotate the Test Mode back to “Off/Hold”.
7. Monitor the Pressure Gauge for the Re-seal Pressure.

Vacuum Test

8 **Vacuum Set Test**:

1. Rotate the Test Selector to “Vacuum Test”.
2. Rotate the Test Mode to “Apply Vacuum”.
3. Slowly turn the Air Regulator clockwise to increase the vacuum. (Please note: an internal venturi is used to generate the vacuum. Air will be heard exhausting inside the box during the vacuum test.)
4. Monitor the Pressure Gauge for the Vacuum Set reading.
5. See Maintenance Manual MM-RV002 for pass /fail criteria dependent on PRV being tested.

Vacuum set defined as point at which continuous flow is seen, felt, or heard around seat area. *(Nomenclature per ASME section XII part TR-110 and TTMA TB-126).*

---

9 **Vacuum Re-seal Test**:

1. Test selector must be rotated to the “Off/Hold” position first.
2. Next, rotate the Test Mode to “Off/Hold”.
3. The vacuum will bleed down and then stabilize.
4. Monitor the Pressure Gauge for the Re-seal Vacuum.
5. See Maintenance Manual MM-RV002 for pass/fail criteria dependent on PRV being tested.

Reseal vacuum defined as point at which seat re-seals to a leak tight condition. *(Nomenclature per TTMA TB-126).*

---

10 **Relieve Vacuum in Test Box** – Push and hold the “Push to Exhaust” button to relieve vacuum in the Test Box.

---

11 **Remove Valve** - Test is complete. Remove valve from test fixture.

Alternate Quick Test Procedure for Testing Additional Vacuum Relief Valves with Similar Vacuum Set:

1. The Air Regulator has already been set from the previous test.
2. Install Relief Valve on Test Box
3. Rotate the Test Selector to “Vacuum Test”.
4. Slowly feather the Test Mode in a clockwise position toward “Apply Vacuum” to gradually increase the vacuum.
5. Monitor the Pressure Gauge for the Vacuum Set reading.
6. Once the Vacuum Set is identified, the Test Selector must be rotated back to “Off/Hold” position first.
7. Rotate the Test Mode back to “Off/Hold”.
8. Monitor the Pressure Gauge for the Re-seal Vacuum.

7.0 Repair Instructions – Refer to Part List (Section 2) for images and part number references. Air line diagram is found in section 3. Please note: all airline fittings must be leak free. Use of thread tape or thread sealer compound is required.

WARNING		**Pressure Hazard** – Test Fixture or airlines may contain residual pressure and failure to safely relieve could result in sudden loss of pressure causing death or serious injury.

External Repair

7.1 Adapter (16) replacement.

7.1.1 Unscrew the four Retaining Nuts (18) and pull up evenly on the Adapter. If needed, two screwdrivers can be used simultaneously to gently pry up on opposite sides of the Adapter to remove.

7.1.2 Inspect for wear.

7.1.3 Lube O-rings

7.2 Adapter O-rings replacement.

7.2.1 Remove Adapter Bore O-ring (13) and Adapter Crush O-ring (14). Discard the used O-rings.

7.2.2 Clean and inspect grooves for damage. Scratched or damaged sealing surfaces will not properly seal.

7.2.3 Lubricate new O-rings and install in corresponding grooves.

7.3 Adapter Stud (17) replacement.

7.3.1 Double nut the exposed threads of the stud.

7.3.2 Extract by turning counterclockwise. Discard any damaged studs.

7.3.3 Lube the threads of new stud with anti-seize and thread fully into Mounting Plate (19).

7.4 Handle (15) replacement.

7.4.1 The Handles can be removed by pulling upwards on the handle while simultaneously pulling out on the bottom of the handle.

7.4.2 To reinstall, insert the top of the handle first and snap-in the bottom to secure.

Internal Repair

7.5 Front Panel (20) removal.

7.5.1 Ensure no pressure is in the Test Box by disconnecting the air feed from the Air Hose Fitting (25) on the back of the test box and pushing the “Push to Exhaust” button.

7.5.2 Remove four Front Plate Retaining Screws (21).

7.5.3 Carefully pull forward the Test Box Panel (20) exposing the airlines.

7.5.4 Carefully reach into the Test Box and disconnect the two airlines connecting to the bottom of the Mouning Plate (19) and the airline connection to the Panel Mount Quick Connect (12).

7.5.5 The Test Box Panel (20) can now be fully removed.

7.6 Battery replacement Pressure Guage.

7.6.1 With the front panel removed, the battery cover is on the back of the Digital Gauge (5).

7.6.2 Remove the battery cover and replace batteries with 3 new AA batteries.

7.7 Digital Guage (5) replacement.

7.7.1 With the Front Panel (20) removed, disconnect the airline attached to the gauge.

7.7.2 Remove the three Phillips head screws while holding the nut on the backside of the gauge mounting flange.

7.7.3 Remove the old gauge.

7.7.4 Install a new push-in fitting (7) to the new Digital Gauge (5) and carefully orient the gauge in the face of the panel. Hold the gauge in position and install three Phillips head screws while holding the nut on the backside of the gauge mounting flange. Carefully tighten each to ensure equal torque until the gauge is held securely in the face of the panel.

7.7.5 Reference the airline diagram shown in section 3 and install the appropriate airline to the Digital Gauge fitting.

7.8 Mounting Plate (19) replacement.

7.8.1 With the Front Panel (20) and Adapter (16) removed, remove four Bolts (24) and four Lock Washers (23) from interior top of Test Box.

7.8.2 Remove Mounting Plate (19), clean and inspect for damage. Clean and inspect grooves for damage. Scratched or damaged sealing surfaces will not properly seal.

7.8.3 Replace push-in tube fittings (1) as needed.

7.8.4 Replace Mounting Plate O-ring (22) and Adapter Crush O-ring (14).

7.8.5 Reinstall Mounting Plate (19) and four Lock Washers (23) and Bolts (24) to secure.

7.8.6 Reference the airline diagram shown in section 3 and install the two airlines to the bottom of the Mounting Plate. Locations on the Mounting Plate are universal and either line can be installed in either fitting.

7.9 Diverter Valve Switch replacement.

7.9.1 With the Front Panel (20) removed, disconnect the airlines attached to the Diverter Valve (3) in need of replacement.

7.9.2 On the front of the panel, remove the Phillips head screw from the diverting valve knob and pull off the diverting valve knob.

7.9.3 On the front face of the panel, remove the mounting nut for the Diverting Valve and remove the Diverting Valve from the panel.

7.9.4 Replace push in airline fittings (1) as needed.

7.9.5 For the Test Selector Diverter Valve, install 1/8” NPT Plug (4) into Pressure Test outlet port. See image in section 3 for the specific location. The Test Mode Diverter Valve does not require a plug.

7.9.6 Reinstall the Diverter Valve using the mounting nut on the front of the panel.

7.9.7 Reinstall the knob on the front of the Diverting Valve.

7.9.8 Reference the airline diagram shown in section 3 and install the appropriate airlines to the Pressure Regulator.

7.9.9 Please note: After the Test Box is fully assembled, the Diverting Valve must be tested for proper function. The knob may require removal and replacement at 180° to ensure proper function.

7.10 Pressure Regulator (11) replacement.

7.10.1 With the Front Panel (20) removed, disconnect the airlines attached to the Pressure Regulator (11).

7.10.2 On the front face of the panel, remove the mounting nut for the Pressure Regulator.

7.10.3 The Pressure Regulator can now be extracted for replacement.

7.10.4 Relace the air fittings (10) and use mounting nut to secure new Pressure Regulator in the orientation shown in section 3.

7.10.5 Reference the airline diagram shown in section 3 and install the appropriate airlines to the Pressure Regulator.

7.11 Exhaust Air Valve (6) replacement.

7.11.1 With the Front Panel (20) removed, disconnect the airline attached to the Exhaust Air Valve (6).

7.11.2 On the front face of the panel, remove the mounting nut for the Exhaust Air Valve.

7.11.3 The Exhaust Air Valve can now be extracted for replacement.

7.11.4 Relace the air fitting and use mounting nut to secure new Exhaust Air Valve to the panel.

7.11.5 Reference the airline diagram shown in section 3 and install the appropriate airline to the Exhaust Air Valve.

7.12 Vacuum Ejector (2) replacement.

7.12.1 With the Front Panel (20) removed, disconnect the airlines attached to the Vacuum Ejector and discard old ejector.

7.12.2 Reference the airline diagram shown in section 3 and install the appropriate airlines to the Vacuum Ejector as shown.

7.13 Airline replacement.

7.13.1 The airlines must be installed as shown in the airline diagram in section 3.

7.13.2 Review the chart in section 3 to determine the cut length for the section in need of replacement.

7.13.3 Make sure the cut edge is square and do not pinch or crimp the end of the tubing during the cutting process.

7.13.4 Plumb the airlines exactly as shown in section 3.

8.0 Trouble Shooting Guide – Reference Section 7 for detailed repair instructions.

Problem	Potential Cause	Potential Solution
Calibration 1 Failure: Gauge not reading zero when Test Mode diverting valve is in "OFF/HOLD" position and pressure has been released by tapping "Push to Exhaust" button.	Incorrect airline plumbing.	Remove front panel and verify correct plumbing per diagram in section 3.
	Worn or damaged Test Mode diverting valve.	Remove front panel, replace Test Mode diverting valve.
	Damaged Pressure Gauge.	Calibrate gauge and replace if needed.
Calibration 2 Failure: Audible Air Leak when Test Mode diverting valve is in "OFF/HOLD" position.	Incorrect airline plumbing.	Remove front panel and verify correct plumbing per diagram in section 3.
	Faulty air lines or quick connectors leaking.	Remove front panel, inspect for leaks, repair or replace airlines and fittings as needed.
	Worn or damaged Test Mode diverting valve.	Remove front panel, replace Test Mode diverting valve.
	Worn or damaged pressure regulator.	Remove front panel, replaced pressure regulator.
Calibration 3 Failure: Test Box will not build pressure.	Flange/Cap leak	Verify Flange/Cap is tight to the adapter and seal is not damaged. Use elastomer gasket to facilitate seal.
	Worn, damaged or dirty Bore Seal on Adapter.	Inspect and clean bore seal O-ring and all mating surfaces. Replace Bore seal O-ring if needed.
	Incorrect airline plumbing.	Remove front panel and verify correct plumbing per diagram in section 3.
	Faulty air lines or quick connectors leaking.	Remove front panel, inspect for leaks, repair or replace airlines and fittings as needed.
	Worn or damaged Test Mode diverting valve.	Remove front panel, replace Test Mode diverting valve.
	Plug in Test Selector diverting valve missing or leaking.	Remove front panel, remove plug in the side of the Test Selector diverting valve and apply thread seal tape. Reinstall plug.
	Worn or damaged pressure regulator.	Remove front panel, replaced pressure regulator.
	Damaged Pressure Gauge.	Calibrate gauge and replace if needed.

Calibration 4 Failure: Test Box will not hold pressure when both diverting valves are in “OFF/HOLD” position.	Flange/Cap leak	Verify Flange/Cap is tight to the adapter and seal is not damaged. Use elastomer gasket to facilitate seal.
	Worn, damaged or dirty Bore Seal on Adapter.	Inspect and clean bore seal O-ring and all mating surfaces. Replace Bore seal O-ring if needed.
	Faulty air lines or quick connectors leaking.	Remove front panel, inspect for leaks, repair or replace airlines and fittings as needed.
	Worn or damaged diverting valve.	Remove front panel. Check BOTH diverting valves and replace if needed.
	Worn or damaged Exhaust Air Valve	Remove front panel and replace Exhaust Air Valve.
	Damaged Pressure Gauge.	Calibrate gauge and replace if needed.
Calibration 5 Failure: Test Box will not build vacuum.	Flange/Cap leak	Verify Flange/Cap is tight to the adapter and seal is not damaged. Use elastomer gasket to facilitate seal.
	Worn, damaged or dirty Bore Seal on Adapter.	Inspect and clean bore seal O-ring and all mating surfaces. Replace Bore seal O-ring if needed.
	Worn or damaged Vacuum Ejector	Remove front panel and replace Vacuum Ejector.
	Incorrect airline plumbing.	Remove front panel and verify correct plumbing per diagram in section 3.
	Faulty air lines or quick connectors leaking.	Remove front panel, inspect for leaks, repair or replace airlines and fittings as needed.
	Worn or damaged Exhaust Air Valve	Remove front panel and replace Exhaust Air Valve.
	Damaged Pressure Gauge.	Calibrate gauge and replace if needed.
Calibration 6 Failure: Test Box will not hold vacuum when both diverting valves are in “OFF/HOLD” position.	Incorrect sequence of switching diverting valves.	When testing vacuum, the **Test Selector** diverting valve must always be moved to Off/Hold **first** before moving the Test Mode diverting valve to Off/Hold.
	Flange/Cap leak	Verify Flange/Cap is tight to the adapter and seal is not damaged. Use elastomer gasket to facilitate seal.
	Worn, damaged or dirty Bore Seal on Adapter.	Inspect and clean bore seal O-ring and all mating surfaces. Replace Bore seal O-ring if needed.

Continued – Calibration 6 Failure: Test Box will not hold vacuum when both diverting valves are in “OFF/HOLD” position.	Faulty air lines or quick connectors leaking.	Remove front panel, inspect for leaks, repair or replace airlines and fittings as needed.
	Worn or damaged diverting valve.	Remove front panel. Check BOTH diverting valves and replace if needed.
	Worn or damaged Exhaust Air Valve	Remove front panel and replace Exhaust Air Valve.
	Damaged Pressure Gauge.	Calibrate gauge and replace if needed.
Test Box builds vacuum when Pressure Test is selected or Test Box builds pressure when Vacuum Test is selected.	Test Selector diverting valve knob is on backward.	Move Selector Diverting Valve knob to “Pressure Test”. Remove the diverting valve knob and reinstall the knob in the “Vacuum Test” position.
	Test Mode diverting valve knob is on backward.	Move Test Mode Diverting Valve knob to “Apply Pressure”. Remove the diverting valve knob and reinstall the knob in the “Apply Vacuum” position.
	Incorrect airline plumbing.	Remove front panel and verify correct plumbing per diagram in section 3.
Digital Gauge is not turning on or working correctly.	Dead batteries.	Change batteries.
	Damaged Pressure Gauge.	Calibrate gauge and replace if needed.
All other issues	Test Box requires calibration inspection.	See section 5 and follow calibration steps.