

2 NEEDLE VALVE GAUGE TEST PROCEDURES

RP (RELIEF VALVE TEST) (Notify Identify Inspect Observe)

1. In this order 4, 3, 2, 1 **open** TC's to **flush** and **leave open**, Then **close** TC's in this order 1, 2, 3, 4.
2. (If needed) Install appropriate fittings on TC's.
3. **Attach** low side hose to TC 3, **attach** high side hose to TC 2, and **attach** bypass hose to the low side bleed valve on gauge.
4. **Open** TC 3, then **open** low side bleed valve and **leave open**.
5. **Open** TC 2, then slowly **open** high side bleed valve and **leave open**.
6. **Close** in this order: SOV 2, high side bleed valve, and then low side bleed valve. (Observe and **record** the apparent reading, must be 5 psi or more to continue)
7. **Connect** the open end of the bypass hose to the high side bleed valve; **low and high side bleed valves are now connected together using the bypass hose**.
8. **Open** the high side bleed valve 1 turn. then **open** the low side bleed valve no more than ¼ turn, when gage reading starts to drop **observe** the relief valve for discharge. When relief valve starts to drip **record this reading** as the relief valve opening point. (Relief must open at 2 psi or more to pass)
9. **Close** low and high bleed valves.

(#2 CHECK VALVE TEST)

10. **Remove** bypass hose from low side bleed valve and **connect** to TC 4; **open** TC 4
11. **Open** low side bleed valve to reestablish the zone, then **close** low side bleed valve.
12. **Open** high side bleed valve one turn, if gage reading does not drop to the relief valve opening point **record** that the second check is closed tight.

(#1 CHECK VALVE TEST)

13. **Open** low side bleed valve to reestablish the zone, then **close** low side bleed valve. When gage settles **record this reading** as the differential pressure across check valve #1. (Reading must be 5 psi or more, and above the relief opening point to pass)
14. **Close** TC's, **remove** equipment and fittings. Slowly **open** SOV 2.

DC (#1 CHECK VALVE TEST) (Notify Identify Inspect Observe)

1. To flush **open** and **close** all 4 TC's. (any order)
2. (If needed) Install appropriate fittings on TC's.
3. **Attach** sight tube to TC 3.
4. **Install** bleed valve tool and high side hose to TC 2.
5. **Open** TC 2, then **open** the high side bleed valve to remove air from gage and hose, then **close** high side bleed valve.
6. **Open** TC 3 to fill the sight tube, and then **close** TC 3.
7. **Close** SOV 2, **lift** the gage to proper elevation, and then **close** SOV 1.
8. Slowly **open** TC 3, when water stops running from the sight tube **record this reading** as the #1 check valve value. (Must be 1psi or more to pass)
9. **Close** TC's 2 and 3 and then **open** SOV 1 to re-pressurize the assembly.

(#2 CHECK VALVE TEST)

10. **Move** sight tube from TC 3 to TC 4.
11. **Move** bleed valve tool and high side hose from TC 2 to TC 3.
12. **Open** TC 3, then **open** the high side bleed valve to remove air from gage and hose, then **close** high side bleed valve.
13. **Open** TC 4 to fill sight tube, and then **close** TC 4.
14. **Lift** gage up to proper elevation, then **close** SOV 1.
15. Slowly **open** TC 4, when water stops running from the sight tube **record this reading** as the #2 check valve value. (Must be 1psi or more to pass)
16. **Close** all TC's **remove** equipment and fittings.
17. **Open** SOV 1, and then slowly **open** SOV 2.

SVB (CHECK VALVE TEST) (Notify Identify Inspect Observe)

1. **Remove** the air inlet canopy then **flush** TC and vent valve. (any order)
2. (If needed) Install appropriate fitting on TC.
3. **Attach** bleed valve tool and high side hose to TC 1, then **open** TC 1.
4. **Open** high side bleed valve to remove the air from hose and gauge, then **close** high side bleed valve.
5. **Close** SOV 2, **lift** gage to proper elevation and **maintain** gage at this level for the remainder of the test, **close** SOV 1.
6. Slowly **open** and **remove** the vent valve screw. When gage reading settles **record this reading** as the check valve holding point. (Watch the air inlet to see if it opens before the check valve holding point, if the air inlet opens first then also record air inlet opening point). (Must be 1psi or more to pass)

(AIR INLET TEST)

7. **Maintain** gage at proper elevation.
8. Slowly **open** high side bleed valve and **watch** both the needle on gage and the air inlet. When air inlet opens **record this reading** as the air inlet value. (Must be 1psi or more to pass)
9. **Remove** the high side hose and bleed tool from TC1 to **drain** all the water from the body of the assembly. (Observe and **record** that the air inlet opened all the way)
10. **Close** TC, **install** and **close** vent valve screw, **remove** equipment and fitting.
11. **Open** SOV 1, and then slowly **open** SOV 2.
12. **Replace** canopy.

PVB (AIR INLET TEST) (Notify Identify Inspect Observe)

1. **Remove** the air inlet canopy and **flush** TC's 1 and 2, (any order)
2. (If needed) Install appropriate fittings on TC's.
3. **Attach** bleed valve tool and high side hose to TC 2, then **open** TC 2.
4. **Open** high side bleed valve to remove the air from hose and gauge, then **close** high side bleed valve.
5. **Close** SOV 2; **lift** gage to proper elevation, then **close** SOV 1.
6. Slowly **open** high side bleed valve and **watch** both the needle on gage and the air inlet. When air inlet opens **record this reading** as the air inlet value. (Must be 1psi or more to pass)
- 7 **Remove** the high side hose and bleed tool from TC2 to **drain** all the water from the body of assembly. (Observe and **record** that the air inlet opened all the way)
8. **Close** the high side bleed valve then **close** TC 2.
9. **Open** SOV 1 to re-pressurize the assembly.

(CHECK VALVE TEST)

10. **Attach** bleed valve tool and high side hose to TC 1 then **open** TC1.
11. **Open** high side bleed valve to remove the air from hose and gauge, then **close** high side bleed valve.
12. **Lift** gage to proper elevation then **close** SOV 1.
13. Slowly **open** TC 2. When water stops flowing from TC 2, **record this reading** as the check valve value. (Must be 1psi or more to pass)
14. **Close** TC's, **remove** equipment and fittings.
15. **Open** SOV 1, and then slowly **open** SOV 2.
16. **Replace** canopy

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SVB (CHECK VALVE TEST) (Notify Identify Inspect Observe)

1. **Remove** the air inlet canopy then **flush** TC and vent valve. (any order)
2. **(If needed)** Install appropriate fitting on TC.
3. **Attach** bleed valve tool and high side hose to TC 1, then open TC 1.
4. **Open** high side bleed valve to remove the air from hose and gauge, then **close** high side bleed valve.
5. **Close** SOV 2, **lift** gage to proper elevation and **maintain** gage at this level for the remainder of the test, **close** SOV 1.
6. Slowly **open** and **remove** the vent valve screw. When gage reading settles **record this reading** as the check valve holding point. **(Watch** the air inlet to see if it opens before the check valve holding point, if the air inlet opens first then also record air inlet opening point). **(Must be 1psi or more to pass)**

(AIR INLET TEST)

7. **Maintain** gage at proper elevation.
8. Slowly **open** high side bleed valve and **watch** both the needle on gage and the air inlet. When air inlet opens **record this reading** as the air inlet value. **(Must be 1psi or more to pass)**
9. **Remove** the high side hose and bleed tool from TC1 to **drain** all the water from the body of the assembly. **(Observe and record that the air inlet opened all the way)**
10. **Close** TC, **install** and **close** vent valve screw, **remove** equipment and fitting.
11. **Open** SOV 1, and then slowly **open** SOV 2.
12. **Replace** canopy.

PVB (AIR INLET TEST) (Notify Identify Inspect Observe)

1. **Remove** the air inlet canopy and **flush** TC's 1 and 2, (any order)
2. **(If needed)** Install appropriate fittings on TC's.
3. **Attach** bleed valve tool and high side hose to TC 2, then **open** TC 2.
4. **Open** high side bleed valve to remove the air from hose and gauge, then **close** high side bleed valve.
5. **Close** SOV 2; **lift** gage to proper elevation, then **close** SOV 1.
6. Slowly **open** high side bleed valve and **watch** both the needle on gage and the air inlet. When air inlet opens **record this reading** as the air inlet value. **(Must be 1psi or more to pass)**
- 7 **Remove** the high side hose and bleed tool from TC2 to **drain** all the water from the body of assembly. **(Observe and record that the air inlet opened all the way)**
8. **Close** the high side bleed valve then **close** TC 2.
9. **Open** SOV 1 to re-pressurize the assembly.

(CHECK VALVE TEST)

10. **Attach** bleed valve tool and high side hose to TC 1 then **open** TC1.
11. **Open** high side bleed valve to remove the air from hose and gauge, then **close** high side bleed valve.
12. **Lift** gage to proper elevation then **close** SOV 1.
13. Slowly **open** TC 2. When water stops flowing from TC 2, **record this reading** as the check valve value. **(Must be 1psi or more to pass)**
14. **Close** TC's, **remove** equipment and fittings.
15. **Open** SOV 1, and then slowly **open** SOV 2.
16. **Replace** canopy

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4. **Open** TC 3, then **open** low side bleed valve and **leave open**.
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6. **Close** in this order: SOV 2, high side bleed valve, and then low side bleed valve. **(Observe and record the apparent reading, must be 5 psi or more to continue)**
7. **Connect** the open end of the bypass hose to the high side bleed valve; **low and high side bleed valves are now connected together using the bypass hose**.
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14. **Close** TC's, **remove** equipment and fittings. Slowly **open** SOV 2.

DC (#1 CHECK VALVE TEST) (Notify Identify Inspect Observe)

1. To flush **open** and **close** all 4 TC's. (any order)
2. **(If needed)** Install appropriate fittings on TC's.
3. **Attach** sight tube to TC 3.
4. **Install** bleed valve tool and high side hose to TC 2.
5. **Open** TC 2, then **open** the high side bleed valve to remove air from gage and hose, then **close** high side bleed valve.
6. **Open** TC 3 to fill the sight tube, and then **close** TC 3.
7. **Close** SOV 2, **lift** the gage to proper elevation, and then **close** SOV 1.
8. Slowly **open** TC 3, when water stops running from the sight tube **record this reading** as the #1 check valve value. **(Must be 1psi or more to pass)**
9. **Close** TC's 2 and 3 and then **open** SOV 1 to re-pressurize the assembly.

(#2 CHECK VALVE TEST)

10. **Move** sight tube from TC 3 to TC 4.
11. **Move** bleed valve tool and high side hose from TC 2 to TC 3.
12. **Open** TC 3, then **open** the high side bleed valve to remove air from gage and hose, then **close** high side bleed valve.
13. **Open** TC 4 to fill sight tube, and then **close** TC 4.
14. **Lift** gage up to proper elevation, then **close** SOV 1.
15. Slowly **open** TC 4, when water stops running from the sight tube **record this reading** as the #2 check valve value. **(Must be 1psi or more to pass)**
16. **Close** all TC's **remove** equipment and fittings.
17. **Open** SOV 1, and then slowly **open** SOV 2.