#### **BG-4 BENCH STATEMENTS OF FACT**

- 1. A positive pressure leak could be caused by a leakage in or at device components.
- 2. The battery in the Sentinel should be replaced every 6 months.
- 3. Dow Corning 111 is to be used to lubricate O-rings.
- 4. The pressure relief valve is designed to open when the pressure within the breathing circuit is between +20 and +50 millimeters (+2 mbar and +5 mbar) of pressure measured on the water gage.
- 5. To prepare for testing adjust zero point of the RZ-25 tester.
- 6. Test adapter is used to connect the BG-4 apparatus to the RZ-25 tester.
- 7. A leaky exhalation or inhalation valve could be caused by a defective valve seat or valve disc.
- 8. During the exhalation valve test, if valve is operating properly, -10 mbar is indicated on the pressure gauge.
- 9. The EPDM breathing hoses use Bayonet Rings.
- 10. During testing of the inhalation valve, if valve is operating properly, +10 mbar is indicated on the pressure gauge.
- 11. During the positive pressure leak test, the pressure change within 1 minute must be lower than 1 mbar.
- 12. Only DRAGERSORB 400 is to be used to fill the refillable cartridge.
- 13. The factory packed cartridge is good for 4 years from the manufacture date.
- 14. A positive pressure in the breathing circuit prevents ambient air from entering the system.
- 15. The BG-4 is approved with a factory/refillable cartridge.
- 16. The Sentinel monitoring system comprises a sensor unit, switchbox, and Sentinel.
- 17. A steel cylinder is full at 3135 psi when a + is stamped at hydro test.
- 18. The BG-4 constant dosage must be 1.5 to 1.9 L/min.
- 19. The drain valve should not open at less than 10 mbar.
- 20. A fully filled steel oxygen cylinder holds 440 liters of medical oxygen.
- 21. The accuracy of the Sentinel pressure measurement is +or- 2% of the final value.

- 22. Never replace the battery in potentially explosive areas.
- 23. The weight of a fully charged BG-4 apparatus is 15kg (33 lbs.).
- 24. Check the supply of oxygen gas on the Sentinel at intervals of approximately 15 minutes.
- 25. During the constant dosage test, the breathing bag is inflated, the RZ-25 tester is set to red dosage, and the pressure relief valve is capped.
- 26. During the constant dosage test, the needle of the RZ-25 tester should automatically settle between 1.5 and 1.9 LPM.
- 27. The minimum valve provides greater than 80 L/min flow.
- 28. The breathing bag has a 5.5 liter volume.
- 29. Insert speech diaphragm, install retainer ring and tighten with spanner.
- 30. The belt and harness must be dried prior to storage, to prevent growth of mold and fungus.
- 31. The pressure reducer must be replaced every 6 years.
- 32. Symbol X with error code indicates a failed self-check.
- 33. The Sentinel converts pressure into digital signal.
- 34. The cylinder connector and cylinder valve must not be contaminated with oil or grease.
- 35. Three hexagon socket head screws are used in the battery cover of the Sentinel.
- 36. Rubber parts must be particularly protected from direct exposure to radiation.
- 37. Do not use any solvents, such as acetone, alcohol, benzene, white spirit, trichloroethylene, etc. for cleaning rubber and silicone parts.
- 38. The first low pressure warning occurs when the pressure drops to approximately 700 psi.
- 39. At the first low pressure warning approximately 75% of the oxygen has been used up.
- 40. The last low pressure warning occurs when the pressure drops to approximately 145 psi.
- 41. During the low pressure warning test, the alarm should activate at approximately 700 psi for a 4 hour apparatus.

- 42. At the last low pressure warning approximately 95% of the oxygen has been used up.
- 43. To start the main alarm, press the Yellow panic button in center of the Sentinel.
- 44. When the first low pressure warning occurs, the alarm sounds intermittently for approximately 30 seconds and the red LED flashes constantly.
- 45. When the last low pressure warning occurs, the alarm sounds intermittently without stopping and the red LED flashes constantly.
- 46. Medium pressure in the BG-4 is between 58 psi and 64 psi.
- 47. Medium pressure is delivered to the minimum valve.
- 48. The drain valve opens at more than 10 mbar.
- 49. The BG-4 breathing circuit is designed with an air cooler that can be filled with ice to reduce the temperature of the inhaled breath.
- 50. Remove the Tally Key to activate the motion sensor.
- 51. All parts which come in contact with the exhaled air must be thoroughly cleaned and disinfected after use.
- 52. Disinfect parts by immersing them in a disinfectant bath using an approved disinfectant.
- 53. Before washing the minimum valve, it is necessary to isolate the minimum valve with plug.
- 54. Attach minimum valve to breathing bag so that the pin of the minimum valve and the mark on the breathing bag line up.
- 55. All parts which have been disinfected should be rinsed thoroughly under running water.
- 56. CO<sub>2</sub> absorber is not approved for use after indicated expiration date.
- 57. The maximum temperature of the air used to dry parts should not go above 60 degree C (140 degree F).
- 58. Replace the high pressure O-ring located on the pressure reducer yearly for units which are in constant use.
- 59. U.S. Department of Transportation requires hydro tests on composite cylinders every 5 years.
- 60. Replace the O-ring at the plug-in coupling at least once every year for units which are in constant use.

- 61. The inhalation/exhalation valve should be replaced every 3 years for units which are in constant use.
- 62. The O-ring under the speech diaphragm should be lubricated with Dow Corning 111.
- 63. The pressure reducer should be replaced after at least 6 years usage.
- 64. A steel oxygen cylinder must be retested by a certified testing facility every 5 years.
- 65. The BG-4 is approved for use at temperatures above -5 degree C (23 degree F)
- 66. A defective pressure reducer should be replaced as needed.
- 67. Only oxygen (medical grade or better) with > 99.5% purity is to be used to fill the BG-4 oxygen cylinders.
- 68. The use of ice in the cooling system is only required at ambient temperature above 0 degree C (32 degree F).
- 69. Pressurized oxygen in contact with oil, grease, or other contamination can result in fire or explosion.
- 70. It is safe to use the BG 4 for up to 4 hours with a battery warning 1 Icon.
- 71. The battery must be replaced if battery warning 2 Icon is indicated.
- 72. A defective pressure reducer is the probable cause if the manual by-pass valve does not blow-off.
- 73. The green LED flashes to indicate that the Sentinel is operating normally.
- 74. Bypass output is > 50 L/min.
- 75. Relief valve activation is 6 bar or (87 psi).
- 76. The oxygen cylinder burst disc ruptures at 4,450 psi (307 bar).
- 77. Refillable cartridge concerns are over packing and under packing.
- 78. The FPS 7000 masks allow 90% peripheral vision.
- 79. Polycarbonate or Plexiglas lenses can be used in the mask.
- 80. A minimum of 2600 psi is needed for a Sentinel to perform a proper high pressure leak test.
- 81. The drain valve opens at approximately 15 mbar and is therefore out of the RZ reading range.

82. To prepare the ice pack:

Fill the ice receptacle with water up to 2 inches from rim Freeze at least 16 hours @ -15 degree C (5 degree F) Fill to rim with water Freeze again for another 8 hours

- 83. If the speech diaphragm is deformed or shows signs of damage, it must be replaced.
- 84. The BG-4 Sentinel lights up when the button is briefly pressed.
- 85. Press then release the right hand button to display temperature.
- 86. Do not re-use Factory cartridges.
- 87. The breathing hoses are equipped with anti-crush rings.
- 88. When conducting component checks use a test pressure between +7 mbar and +10 mbar with a max pressure loss of 1 mbar/min.
- 89. Only the following batteries are approved for use in the Sentinel:
  - Rayovac Eveready Panasonic Ultra-life Lithium





1Carrying Housing12Breathing Bag2Cover Shell, complete15Lever, Complete3Shoulder Pad Assembly16Factory/refillable cartridge5Cooler17Pressure Boducer BC4	1 2 Cons. No. Designation	1 2 Cons. No. Designation
5Cooler17Pressure Reducer bG46Relief valve, Complete19Oxygen Cylinder7Minimum Valve21Distribution Hose8Drain Valve22FPS 7000 Mask9Sentinel10Switch Box_11Pressure Sensor_	<ol> <li>Carrying Housing</li> <li>Cover Shell, complete</li> <li>Shoulder Pad Assembly</li> <li>Cooler</li> <li>Relief valve, Complete</li> <li>Minimum Valve</li> <li>Drain Valve</li> <li>Drain Valve</li> <li>Sentinel</li> <li>Switch Box</li> <li>Pressure Sensor</li> </ol>	<ul> <li>Breathing Bag</li> <li>Lever, Complete</li> <li>Factory/refillable cartridge</li> <li>Pressure Reducer BG4</li> <li>Oxygen Cylinder</li> <li>Distribution Hose</li> <li>FPS 7000 Mask</li> </ul>





1 2	1 2
Cons. No. Designation	Cons. No. Designation
<ol> <li>Cover Shell</li> <li>Hinge</li> </ol>	<ul><li>3 Grip Cap</li><li>4 Button</li></ul>



1 2	1 2
Cons. No. Designation	Cons. No. Designation
<ol> <li>Shoulder Pad Assembly</li> <li>Shoulder Adjusting Strap</li> <li>Hose Clip</li> <li>Hose Strap Harness</li> </ol>	<ul> <li>5 Adjusting Belt Assembly</li> <li>6 Waist belt</li> <li>7 Belt Assembly</li> <li>8 Buckle</li> </ul>

# **Breathing Hose Assembly**



1 2	1 2
Cons. No. Designation	Cons. No. Designation
<ol> <li>Coupling</li> <li>Inhalation Valve Seat</li> <li>Exhalation Valve Seat</li> <li>Valve Disc</li> <li>Corrugated Hose</li> </ol>	<ul><li>6 Bayonet Ring</li><li>7 Anti-Crush rings</li><li>8 Toroidal Sealing Ring</li><li>9 Sealing Cap</li></ul>

### Cooling Canister (Revised Drawing)



1 2	1 2
Cons. No. Designation	Cons. No. Designation
1 Cooler 2 O-Ring, Cooler 3 Cover	<ul><li>4 Angle Connector</li><li>5 Reaction Ring</li></ul>

### Drain/Relief/Minimum Valve Assembly (Revised Drawing)



1	2	1	2
Cons. No	D. Designation	Cons. No.	Designation
1 2 3 4 5 6 11 12 13 14-16, 3-4	Valve Disc Crater Housing Valve Disc Spring O-Ring Cap Compression Ring Coupling O-Ring Drainage Valve	14 15-16 17-24 17 18 19-20 21 24 25	Cap, Drain Valve Drain Valve & Filter Minimum Valve Crater Washer Rocker Arm Spring Angle Connector Holding Clamp

# Sentinel



1 2	1 2
Cons. No. Designation	Cons. No. Designation
<ol> <li>Sentinel</li> <li>Switch Box</li> <li>Angle Connector</li> <li>Pressure Sensor</li> </ol>	<ul><li>8 Copper Ring</li><li>9 9 volt battery</li><li>13 Tally Key</li></ul>

# Refillable Cartridge



1	2	1	2
Cons. 1	No. Designation	Cons. No	o. Designation
1-8 2 3 4	Refillable Cartridge Lid Seal, Refillable Cartridge Strap with Tension Spring Hook	5 6 8	Refillable Scrubber Screen Filter Mats NIOSH Approval Label



1 2	1 2
Cons. No. Designation	Cons. No. Designation
<ol> <li>Mask Body FPS 7000</li> <li>Upper Visor Frame</li> <li>Visor</li> <li>Lower Visor Frame</li> <li>Clamp</li> <li>Connector Piece</li> <li>Cover</li> <li>Turning Knob</li> <li>Disc</li> </ol>	<ul> <li>13 Inner Mask</li> <li>14 Button</li> <li>15A Head Strap</li> <li>15B Hairnet</li> <li>16 Sliding Buckle</li> <li>17 Double Button</li> <li>18 Neck Strap</li> </ul>

### Oxygen Cylinder



1 Como	2 No. Designation	1 Corra N	2 La Designation
Cons.	No. Designation	Cons. P	No. Designation
3	Valve Housing	18	Lock Washer
10	Hand-wheel	19	Lock Nut
13	Safety Ring	20	Bursting Disc
16	Sealing Ring	21	Oxygen Cylinder
17	Manometer	22	Label



1 2	1 2
Cons. No. Designation	Cons. No. Designation
<ol> <li>Plug For Breathing Bag</li> <li>Nozzle For Breathing Bag</li> <li>Sealing Plug (Corrugated Hose)</li> <li>Test Socket for Corrugated Hose</li> <li>Sealing Cap for Corrugated Hose</li> <li>Sealing Cap</li> <li>Testing Plug</li> <li>Test Cap for Corrugated Hose</li> <li>Test Connection for Control Valve</li> </ol>	<ol> <li>Sealing Plug for Mask</li> <li>Test Adaptor</li> <li>Sealing Plug for Plug In Conn.</li> <li>Test Hose/Metering Control</li> <li>Sealing Ring Lifters</li> <li>Spanner</li> </ol>