**2016 Tri State Post No. 6**

**240 R Bio Pak 240 R Bench Contest**



**Table Layout for Bio-Pak 240-R Contest**

|  |  |  |  |  |  |  |  |  |
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| --- | --- | --- | --- | --- | --- | --- |
| **Test Apparatus****With Upper Housing****And Hose Connector Installed** |  | **Test Apparatus Mask** |  | **Upper Housing With Parts** |  | **Visual Apparatus** |
| **Test Kit** |

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**2016 Contest Year**

**Bio Pak 240 R**

**Post # 6 Bench Contest**

|  |
| --- |
| **VISUAL** |
| **Missing Large O-Ring** |
| **Missing Mask Adapter O-Ring** |
| **Missing Screw Harness Shoulder** |
| **Missing Washer Harness Shoulder** |
| **Loose Screw Waist Belt Bottom Left** |
| **Missing Washer Waist Belt Top Right** |
| **TESTER** |
| **Missing Flow Restrictor Audible** |
| **Missing Oxygen Cylinder Seal Audible** |
| **Missing Large O-Ring** |

**BioPak 240 R BENCH CONTESTANT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_WORKING TIME\_\_\_\_\_MIN.\_\_\_\_\_SEC.**

|  |  |
| --- | --- |
| **VISUAL APPARATUS CHECKS**  | **TEST APPARATUS**  |
|  | *Check if ok*  |  | CONNECTIONS  |
|  | UPPER HOUSING  |  |  Vent Valve Assembly - Hand Tight  |
|  | LOWER HOUSING  |  |  Diaphragm Worm Gear - Wrench Tight  |
|  |  Harness Assembly  |  |  Flow Restrictor - Wrench Tight  |
|  |  External Gage  |  |  Breathing Hose Worm Gear - Wrench Tight  |
|  |  O2 Regulator / Seal  |  |  Add / Constant Fittings - Hand Tight  |
|  |  RMS  |  |  Center Section Lid - Hand Tight  |
|  | CENTER SECTION ASSEMBLY  |  |  Center Section Push Pins - Hand Tight  |
|  |  Diaphragm  |  |  Cylinder Connection - Hand Tight  |
|  | **Check O-Ring for damages/lubrication** |  |  Adapter to Facepiece - Hand Tight  |
|  | **Sealing Edges** |  |  Test Fixture Connections - Hand Tight  |
|  |  Demand Valve Assembly  |  | *Check if ok* |
|  |  Moisture Pads  |  | **Zero Adjust the Mag. Gauge** |
|  |  PCM  |  | CONSTANT FLOW TEST  |
|  | CARBON DIOXIDE SCRUBBER  |  |  Flow Between 1.6 and 2.4 Lpm - State Reading  |
|  |  Defects / Damage  |  | DEMAND VALVE TEST  |
|  |  Gasket  |  | EMERGENCY BYPASS TEST  |
|  |  Expiration Date  |  | VENT VALVE TEST  |
|  | CENTER SECTION LID ASSEMBLY  |  |  At or below 2 inches wg - State Reading  |
|  |  Examine for defects / damage  |  | LOW PRESSURE LEAK TEST  |
|  | **Sealing Edges** |  | RMS GAUGE AND TRIM TEST  |
|  |  Ice Canisters  |  |  Observe lights/gauges +/- 10% - State Reading  |
|  |  Coolant Lids  |  | HIGH PRESSURE LEAK TEST  |
|  | CYLINDER TEST  |  | LOW PRESSURE ALARM TEST  |
|  |  Hydrostatic Test Date  |  |  Alarm 650-1000 psig - State Reading  |
|  |  Cylinder Pressure on Gauge  |  |  Power down below 25 psig  |
|  |  Pressure Rating on Cylinder  | **VI**  | **C**  | **VISUAL** |
|  | HOSES  |  |  | **Missing Large O-Ring** |
|  |  Sealing Edges  |  |  | **Missing Mask Adapter O-Ring** |
|  |  Stretching of Hoses for Pliability  |  |  | **Missing Screw Harness Shoulder** |
|  |  Adapter Assy **O-ring damage & lubrication**  |  |  | **Missing Washer Harness Shoulder** |
|  | FACE PIECE TEST  |  |  | **Loose Screw Waist Belt Bottom Left** |
|  |  Head Strap Assembly  |  |  | **Missing Washer Waist Belt Top Right** |
|  |  Mask Body / Nose Cup  | **VI**  | **C** | **TESTER** |
|  |  Sealing Edges  |  |  | **Missing Flow Restrictor Audible** |
|  |  Speech Diaphragms  |  |  | **Missing Oxygen Cylinder Seal Audible** |
|  |  Lens / Anti-Fog Insert  |  |  | **Missing Large O-Ring** |
|  |  **Magnetic Wiper** |  |  |  |

**BioPak 240 R BENCH CONTESTANT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_WORKING TIME\_\_\_\_\_MIN.\_\_\_\_\_SEC.**

|  |  |
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| **VISUAL APPARATUS CHECKS**  | **TEST APPARATUS**  |
|  | *Check if ok*  |  | CONNECTIONS  |
|  | UPPER HOUSING  |  |  Vent Valve Assembly - Hand Tight  |
|  | LOWER HOUSING  |  |  Diaphragm Worm Gear - Wrench Tight  |
|  |  Harness Assembly  |  |  Flow Restrictor - Wrench Tight  |
|  |  External Gage  |  |  Breathing Hose Worm Gear - Wrench Tight  |
|  |  O2 Regulator / Seal  |  |  Add / Constant Fittings - Hand Tight  |
|  |  RMS  |  |  Center Section Lid - Hand Tight  |
|  | CENTER SECTION ASSEMBLY  |  |  Center Section Push Pins - Hand Tight  |
|  |  Diaphragm  |  |  Cylinder Connection - Hand Tight  |
|  | **Check O-Ring for damages/lubrication** |  |  Adapter to Facepiece - Hand Tight  |
|  | **Sealing Edges** |  |  Test Fixture Connections - Hand Tight  |
|  |  Demand Valve Assembly  |  | *Check if ok* |
|  |  Moisture Pads  |  | **Zero Adjust the Mag. Gauge** |
|  |  PCM  |  | CONSTANT FLOW TEST  |
|  | CARBON DIOXIDE SCRUBBER  |  |  Flow Between 1.6 and 2.4 Lpm - State Reading  |
|  |  Defects / Damage  |  | DEMAND VALVE TEST  |
|  |  Gasket  |  | EMERGENCY BYPASS TEST  |
|  |  Expiration Date  |  | VENT VALVE TEST  |
|  | CENTER SECTION LID ASSEMBLY  |  |  At or below 2 inches wg - State Reading  |
|  |  Examine for defects / damage  |  | LOW PRESSURE LEAK TEST  |
|  | **Sealing Edges** |  | RMS GAUGE AND TRIM TEST  |
|  |  Ice Canisters  |  |  Observe lights/gauges +/- 10% - State Reading  |
|  |  Coolant Lids  |  | HIGH PRESSURE LEAK TEST  |
|  | CYLINDER TEST  |  | LOW PRESSURE ALARM TEST  |
|  |  Hydrostatic Test Date  |  |  Alarm 650-1000 psig - State Reading  |
|  |  Cylinder Pressure on Gauge  |  |  Power down below 25 psig  |
|  |  Pressure Rating on Cylinder  | **VI**  | **C**  | **VISUAL** |
|  | HOSES  |  |  | **Missing Large O-Ring** |
|  |  Sealing Edges  |  |  | **Missing Mask Adapter O-Ring** |
|  |  Stretching of Hoses for Pliability  |  |  | **Missing Screw Harness Shoulder** |
|  |  Adapter Assy **O-ring damage & lubrication**  |  |  | **Missing Washer Harness Shoulder** |
|  | FACE PIECE TEST  |  |  | **Loose Screw Waist Belt Bottom Left** |
|  |  Head Strap Assembly  |  |  | **Missing Washer Waist Belt Top Right** |
|  |  Mask Body / Nose Cup  | **VI**  | **C** | **TESTER** |
|  |  Sealing Edges  |  |  | **Missing Flow Restrictor Audible** |
|  |  Speech Diaphragms  |  |  | **Missing Oxygen Cylinder Seal Audible** |
|  |  Lens / Anti-Fog Insert  |  |  | **Missing Large O-Ring** |
|  |  **Magnetic Wiper** |  |  |  |

**BioPak 240 R BENCH CONTESTANT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_WORKING TIME\_\_\_\_\_MIN.\_\_\_\_\_SEC.**

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| **VISUAL APPARATUS CHECKS**  | **TEST APPARATUS**  |
|  | *Check if ok*  |  | CONNECTIONS  |
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|  | LOWER HOUSING  |  |  Diaphragm Worm Gear - Wrench Tight  |
|  |  Harness Assembly  |  |  Flow Restrictor - Wrench Tight  |
|  |  External Gage  |  |  Breathing Hose Worm Gear - Wrench Tight  |
|  |  O2 Regulator / Seal  |  |  Add / Constant Fittings - Hand Tight  |
|  |  RMS  |  |  Center Section Lid - Hand Tight  |
|  | CENTER SECTION ASSEMBLY  |  |  Center Section Push Pins - Hand Tight  |
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|  | **Check O-Ring for damages/lubrication** |  |  Adapter to Facepiece - Hand Tight  |
|  | **Sealing Edges** |  |  Test Fixture Connections - Hand Tight  |
|  |  Demand Valve Assembly  |  | *Check if ok* |
|  |  Moisture Pads  |  | **Zero Adjust the Mag. Gauge** |
|  |  PCM  |  | CONSTANT FLOW TEST  |
|  | CARBON DIOXIDE SCRUBBER  |  |  Flow Between 1.6 and 2.4 Lpm - State Reading  |
|  |  Defects / Damage  |  | DEMAND VALVE TEST  |
|  |  Gasket  |  | EMERGENCY BYPASS TEST  |
|  |  Expiration Date  |  | VENT VALVE TEST  |
|  | CENTER SECTION LID ASSEMBLY  |  |  At or below 2 inches wg - State Reading  |
|  |  Examine for defects / damage  |  | LOW PRESSURE LEAK TEST  |
|  | **Sealing Edges** |  | RMS GAUGE AND TRIM TEST  |
|  |  Ice Canisters  |  |  Observe lights/gauges +/- 10% - State Reading  |
|  |  Coolant Lids  |  | HIGH PRESSURE LEAK TEST  |
|  | CYLINDER TEST  |  | LOW PRESSURE ALARM TEST  |
|  |  Hydrostatic Test Date  |  |  Alarm 650-1000 psig - State Reading  |
|  |  Cylinder Pressure on Gauge  |  |  Power down below 25 psig  |
|  |  Pressure Rating on Cylinder  | **VI**  | **C**  | **VISUAL** |
|  | HOSES  |  |  | **Missing Large O-Ring** |
|  |  Sealing Edges  |  |  | **Missing Mask Adapter O-Ring** |
|  |  Stretching of Hoses for Pliability  |  |  | **Missing Screw Harness Shoulder** |
|  |  Adapter Assy **O-ring damage & lubrication**  |  |  | **Missing Washer Harness Shoulder** |
|  | FACE PIECE TEST  |  |  | **Loose Screw Waist Belt Bottom Left** |
|  |  Head Strap Assembly  |  |  | **Missing Washer Waist Belt Top Right** |
|  |  Mask Body / Nose Cup  | **VI**  | **C** | **TESTER** |
|  |  Sealing Edges  |  |  | **Missing Flow Restrictor Audible** |
|  |  Speech Diaphragms  |  |  | **Missing Oxygen Cylinder Seal Audible** |
|  |  Lens / Anti-Fog Insert  |  |  | **Missing Large O-Ring** |
|  |  **Magnetic Wiper** |  |  |  |

#  BIO-PAK 240-R

**VISUAL APPARATUS (BREAK DOWN)**

**Upper Housing Assembly-Removed**

**Hoses-Removed**

**Coolant Lids and Ice Canisters - Removed**

**Center Section Lid Assembly - Removed**

**Moisture Pads - Removed**

**Carbon Dioxide Scrubbers and Gasket - Removed**

**PCM Canister - Removed**

**Loosen (But do not remove) Flow Restrictor**

**Center Section – Removed**

**Diaphragm and worm gear-Removed**

**Vent Valve Assembly - Removed as a unit**

**Oxygen Cylinder-Removed**

## BIO-PAK 240-R TOOL KIT

**Leak Check Adapter Fitting**

**Flow Test Fixture**

**Test Key**

**Vent Valve Hand Wrench**

**Center Section Pneumatic Plug**

**Regulator Wash Cover**

**Combination Pick Tool**

**#00 Phillips Head Screwdriver**

**#1 Phillips Head Screwdriver**

**#2 Phillips Head Screwdriver**

**1/4” Hex Driver**

**3/16” Nut Driver**

**5/16” Nut Driver**

**9/32” Nut Driver**

**3/8” x 5/16” Open End Wrench**

**7/16” Combination Wrench**

**½” Combination Wrench**

**5/8” x 9/16” Open End Wrench**

**Stop Watch**

**Bypass Valve Tool**

### STATEMENT TO BENCH CONTESTANT

The bench participant will be provided with two Bio-Pak 240- R apparatus (one disassembled, one assembled), a stopwatch, leak detector fluid, test kit, and tool kit. Only the tools and fluid provided will be used for testing and assembly of the apparatus. The work at the bench will consist of:

1. A visual examination of a disassembled Bio-Pak 240-R and the proper assembly and preparation for use in rescue work. This will include correcting any predetermined problem(s) so that the apparatus is in proper working order. Simulating defogging of the facepiece lens will be done as a part of the visual examination. This visual examination, correcting predetermined problem(s), and proper assembly can be done at any time allowed for the working of the problem.
2. Test the assembled Bio-Pak 240-R apparatus with a tester, and correct the predetermined problem(s) so that the apparatus is in proper working condition. Except for removing the facepiece storage plug from the breathing hoses, the assembled Bio-Pak 240-R apparatus cannot be disassembled to look for problems, until the apparatus fails a test. When testing is completed on the assembled Bio-Pak 240-R apparatus, the hoses shall be removed from the tester, connected to the facepiece, and the upper housing installed. This shall be done before the clock is stopped.

When an unplanned deficiency is encountered in the apparatus, the participant will be notified by the judge(s) that the deficiency is not part of the problem. The judge will stop the clock and any time used to correct the deficiency will not be charged to the working time.

A maximum of 30 minutes will be allowed to complete the problem. The judge will tell you when 25 minutes has passed. At the completion of the problem, the judge(s) and the participant will note the working time of the problem with the official timekeeper. Work done after the clock is stopped will not be recognized.