POST 5

MINE RESCUE

2026 WVU BENCH BASH

Drager BG4 CONTEST

DAY 1

STATEMENT TO BENCH CONTESTANT

The bench participant will be provided with two BG-4 apparatus (one disassembled, one assembled), an RZ-25, RZ-7000 tester, or Test-It 6100 tester, a stopwatch, defogging solution, 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 at the bench will consist of:

1. A visual examination of a disassembled BG-4 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 BG-4 apparatus with a tester, and correct the predetermined problem(s) so that the apparatus is in proper working condition. Except for removing the sealing cap from the coupling on the breathing hoses, and removing the cover shell, the assembled BG-4 apparatus cannot be disassembled to look for problems, until the hoses are attached to the tester, and the apparatus fails a test. When testing is completed on the assembled BG-4 apparatus, the hoses shall be removed from the tester, connected to the facepiece, and the back cover 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.

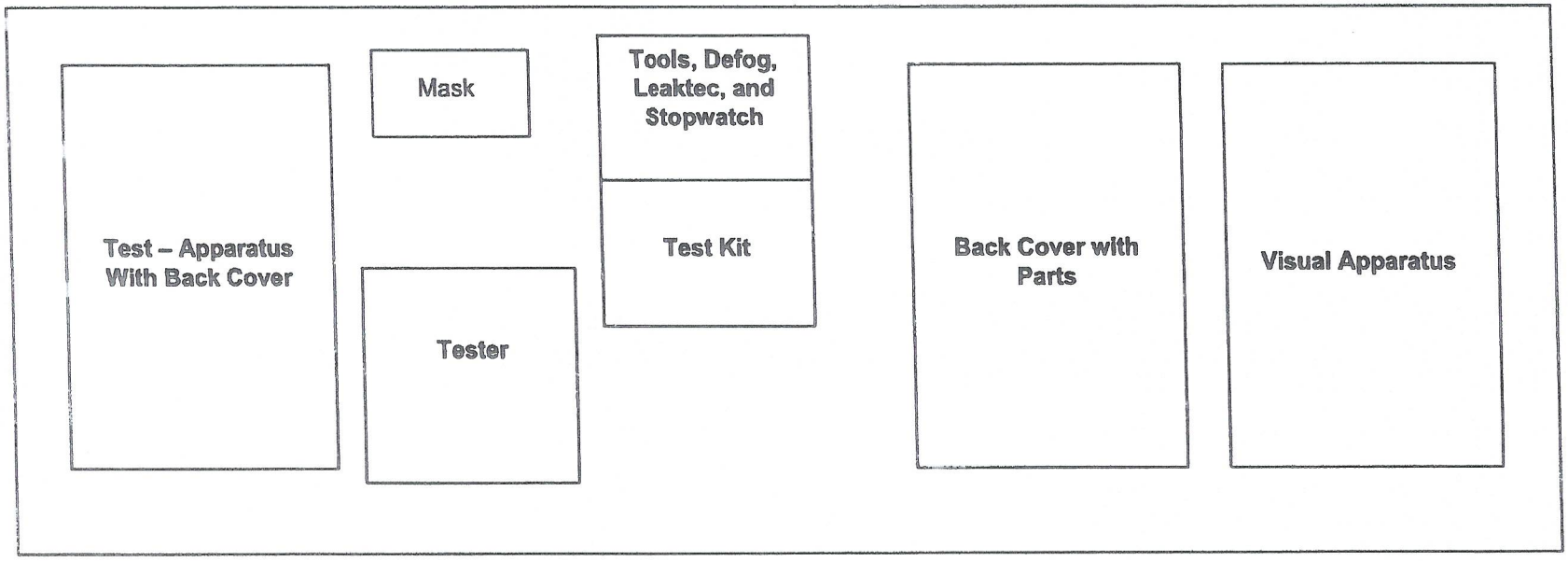
BG-4
VISUAL APPARATUS (BREAKDOWN)

Back Cover Removed
Hoses – Disassembled
Connector Removed
Inhalation – Exhalation Valves Removed Cooler and Cooler Cap Removed
Relief Valve (Intact)
Lever Arm
Canister
Springs
Breathing Bag
O2 Bottle
Retainer Clip for Minimum Valve
Minimum Valve
Drain Valve (Intact)
Switchbox (Unlatched with Crossover line off and still attached to cables)

BG-4 TOOL KIT

7mm – Open End/Box End
8mm – 10mm Combination
10mm – Open End
12mm – 14mm Combination
17mm – 19mm Combination
10mm – 11mm Offset Box
Flat Screwdriver
Phillips Screwdriver
Spanner Wrench
2mm – Allen Wrench
15mm – Open End
Dow-Corning 111
TORX – T-20
Reaction Ring Tool

Table Layout for BG-4 Contest
2020 Contest Year



BENCH DISCOUNTS

Contestant does not call out each test being conducted.

They should be discounted for failure to verbally identifying each test being conducted under A1 (2 point discount for each test)

Contestant does not find a bug on either the Test or Visual unit.

They should be discounted for failing to identify the bug under A2 (5 point discount) for failing to identify and under A3 (5 point discount) for failing to correct the bug. (Total 10 point discount) for every bug that is missed on either unit.

If the problem design only calls for the contestant to identify a bug and not correct it. In that case they should still be discounted under A2 and A3 for failing to identify and correct the bug (10 point discount).

Contestant does not perform any visual exam or test. (This means they did not do the visual exam or test at all).

They should be discounted for not performing a Visual Exam or Test under A5 (5 point discount) for failing to conduct a visual exam or test.

Contestant does not call out one of the connected or good connections required by the rules to be called out. (Any similar terminology should be accepted)

They should be discounted under A6 (1 point discount for each connection) for failure to tighten connections properly during assembly or testing. This discount is used if they did not call out any of the connected or good connections on your judge's checklist.

Contestant blows into a hose or uses body fluid in any way on the units during the problem or the contestant uses a tool or anything else that they brought with them (Multi- Tool, Keys, Pocket knife, etc.).

They should be discounted under A8 (2 point discount each infraction) for rules not covered on the discount sheet. It is covered in the rules that only the tools and fluid provided will be used during the problem.

Contestant fails to call out any of the required items on your judge's checklist when conducting any of the visual exams

They should be discounted under B2 thru B8 (2 point discount for each item not called out)

Contestant fails to zero the tester or mag gauge before testing.

They should be discounted under A7 (10 point discount).

Contestant runs out of time or for any other reason does not have the visual unit assembled properly including having the back cover and face mask installed. This includes leaving something unhooked, partially hooked, or something hanging out the side of the unit. The hoses on the visual unit do not need to be buckled in the straps at the end of the problem.

They should be discounted under B9 (5 point discount) visual apparatus not ready for use. This should only be discounted once no matter how much they left wrong with the visual unit. Do not dock them for this because they missed a bug and didn't correct the bug.

Contestant fails to do a proper test on any of the required tests to be conducted.

They should be discounted under C1 thru C8 (2 point discount each). This discount should only be used for a test not done properly. Example: Pumps the tester too hard and fast to actually see when the low pressure warning activates or doesn't state the opening pressure of the relief valve. Etc. C1 thru C8 should not be used for tests not done due to running out of time. Those tests not done due to running out of time should be docked under A5 as a 5 point dock.

Contestant runs out of time or for any other reason does not have the test unit assembled properly including having the unit disconnected from the tester, and the back cover and face mask installed. This includes leaving something unhooked, partially hooked, or something hanging out the side of the unit. This also includes leaving the test cap inside the unit. The hoses on the test unit do not need to be buckled in the straps at the end of the problem.

They should be discounted under C9 (5 point discount) Test apparatus not ready for use. This should only be discounted once no matter how much they left wrong with the Test unit.

Contestant Cuts and Runs.

They should be discounted under A4 (40 point discount) for failing to correct each problem for cutting and running.

They should be discounted under A2 (5 point discount) for not identifying the bug.

They should be discounted under A3 (5 point discount) for not correcting the bug.

They should be discounted under C1 thru 8 (2 point discount) for whatever test they couldn't pass due to the bug they couldn't find.

They should be discounted under C9 (5 point discount) for failure to have the test unit ready for use.

The initial 40 point discount for cutting and running can only be removed if the contestant returns and finds the bug and corrects the bug and then continues from that point and completes all the remaining tests in sequence from that point to completion.

2026 WVU Bench Bash

Day 1 Bug List

DAY 1 VISUALS

- Hand Wheel Damaged
- Hole in Cannister Lid
- Missing Tally Key
- Breathing Hose Clogged
- Twisted Strap in Hairnet

DAY 1 TEST BUGS

- Plugged Crossover Line
- Battery Installed Backwards
- Bag Off Minimum Valve
- Clogged Minimum Valve

BG-4 BENCH CONTESTANT_____ WORKING TIME_____MIN._____SEC.

VISUAL APPARATUS CHECKS	
✓	*Check if ok*
	FRAME/HARNESS ASSEMBLY
	BREATHING BAG
	CYLINDER TEST
	REGENERATIVE CANISTER
	SIMULATE ADDING DRAGERSORB
	RELIEF VALVE
	COOLER
	SIMULATE ADDING ICE
	HOSES
	COUPLING
	FACE PIECE TEST
	SIMULATE DEFOGGING MASK
	.
	CONNECTIONS CONNECTED OR GOOD
	. Cap on Drain Valve
	. Drain Valve to Breathing Bag
	. Minimum Valve to Breathing Bag
	. Minimum Valve to O2 Supply Line
	. Cylinder Connection
	. Regenerative Canister Connections
	. Relief Valve to Regenerative Canister
	Crossover Hose Switchbox and Relief Valve
	. Cooler to Breathing Bag
	. Distribution Hose
	. Breathing Hoses
	. Hose Adapter on RZ-25 or Test-It 6100
	.
	.
	.
	.
	.
	.

TEST APPARATUS		
✓	*Check if ok*	
	ZERO TESTER PRIOR TO TESTING	
	LOW PRESSURE WARNING TEST	1.4 MBAR MAX.
	INHALATION VALVE TEST	10 MBAR +
	EXHALATION VALVE TEST	10 MBAR -
	DRAIN VALVE TEST	10 MBAR
	LEAK TEST with POSITIVE PRESSURE	1 MBAR IN 60 SEC.
	RELIEF VALVE TEST	
	. State Opening Pressure	2 TO 5 MBAR
	HIGH PRESSURE LEAK TEST	OPEN CYL. ICON
	CONSTANT METERING VALVE TEST	
	. State Final Reading	1.5 TO 1.9 L/MIN
	MINIMUM VALVE TEST	
	. State Opening Pressure	0.1 TO 2.5 MBAR
	BYPASS VALVE TEST	
	ALTERNATE RELIEF VALVE TEST	2 TO 5 MBAR
	LOW PRESSURE WARNING TEST	
	. State Warning Reading	APPROX. 700 PSI
	BATTERY TEST	BATT FULL/ ICON

VI	C	VISUAL APPARATUS
		HAND WHEEL - DAMAGED
		HOLE IN CANNISTER LID
		MISSING TALLY KEY
		BREATHING HOSE CLOGGED
		TWISTED STRAP IN HAIRNET
		TEST APPARATUS
		PLUGGED CROSSOVER LINE
		BATTERY INSTALLED BACKWARDS
		BAG OFF MINIMUM VALVE
		CLOGGED MINIMUM VALVE

2026 WVU Bench Bash
BG4 - Day 1 Written Exam

Name_____ Working Number _____

1. A positive pressure leak could be caused by a _____ in or at device components.
   a. Leak
   b. Leaky
   c. Leakage

2. The battery in the _____ should be replaced every 6 months.
   a. Switchbox
   b. Drager BG4
   c. Sentinel

3. Dow Corning 111 is to be used to lubricate _____.
   a. Parts
   b. Seals
   c. 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 _____ gauge.
   a. Tester
   b. Measurement
   c. Water

5. To prepare for testing _____ zero point of the RZ-25 tester.
   a. Move
   b. Center
   c. Adjust

6. Test _____ is used to connect the BG-4 apparatus to the RZ-25 tester.
   a. Plug
   b. Seal
   c. Adapter

7. A leaky exhalation or inhalation valve could be caused by a _____ valve seat or valve disc.
   a. Leaky
   b. Damaged
   c. Defective

8. During the exhalation valve test, if valve is operating properly, -10 mbar is _____ on the pressure gauge.
   a. Shown
   b. Measured
   c. Indicated

9. The EPDM breathing hoses use _____Rings.
   a. Anti Crush
   b. Hose
   c. Bayonet

10. During testing of the inhalation valve, if valve is _____ properly, +10 mbar is indicated on the pressure gauge
    a. Operating
    b. Opening
    c. Functioning

11. Pg 20: Part number 8
    a. Drainage Valve
    b. Spit Valve
    c. Drain Valve

12. Pg 20: Part number 9
    a. Display
    b. Gauge
    c. Sentinel

13. Pg 20: Part number 10
    a. Pneumatics
    b. Transduce
    c. Switch box

14. Pg 20: Part number 12
    a. Breathing Bag
    b. Plate
    c. Lever, Complete

15. Pg 20: Part number 17
    a. Pressure Reducer
    b. Pressure Sensor
    c. Pressure Reducer BG4

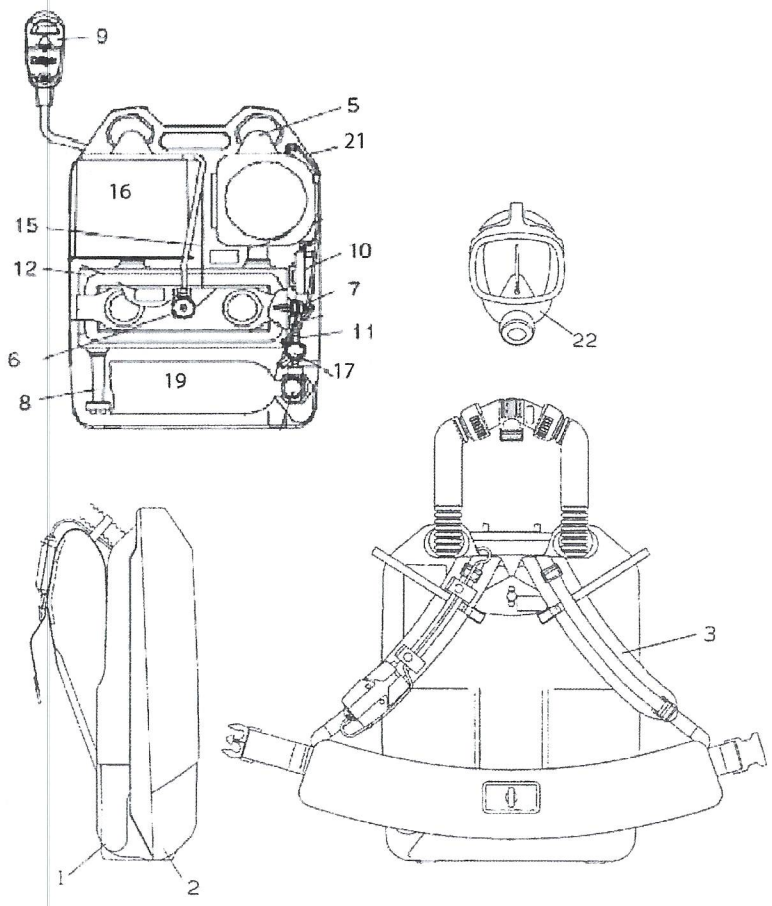
16. Pg 22: Part Number 1
    a. Harness Assembly
    b. Shoulder Adjusting Strap
    c. Shoulder Pad Assembly

17. Pg 22: Part Number 2
    a. Shoulder Pad Assembly
    b. Adjusting Belt Assembly
    c. Shoulder Adjusting Strap

18. Pg 22: Part Number 3
    a. Hose Strap Harness
    b. Hose Strap
    c. Hose Clip

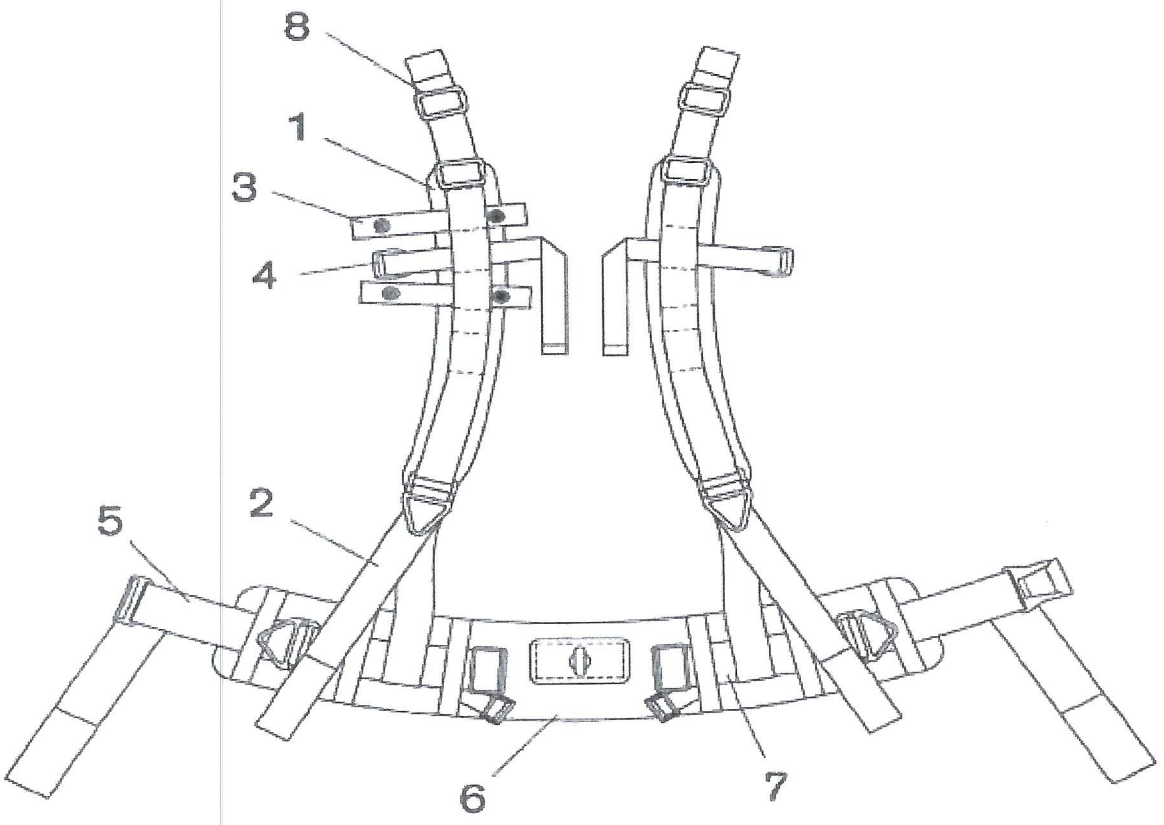
19. Pg 22: Part Number 4
    a. Hose Strap Harness
    b. Hose Strap
    c. Hose Clip
20. Pg 22: Part Number 5
    a. Waist Belt
    b. Belt Assembly
    c. Adjusting Belt Assembly

BG-4



1 Cons. No	2 Designation	1 Cons. No.	2 Designation
1	Carrying Housing	12	
2	Cover Shell, complete	15	Lever, Complete
3	Shoulder Pad Assembly	16	Factory/refillable cartridge
5	Cooler	17	
6	Relief valve, Complete	19	Oxygen Cylinder
7	Minimum Valve	21	Distribution Hose
8		22	FPS 7000 Mask
9			
10			
11	Pressure Sensor		

Harness Assembly



1 2 Cons. No. Designation		1 2 Cons. No. Designation	
1		5	
2		6	Waist belt
3		7	Belt Assembly
4		8	Buckle