KM Diamond Final Test

⚠ WARNING

This module is our effort to explain the maintenance and testing of the KM Diamond sub-assemblies and the helmet as a complete unit. WE DO NOT HEREIN MAKE ANY EFFORT TO TEACH or REPLACE the recommended KMDSI/ Dive Lab, Inc. Technician training for the KM Diamond Deep Sea Diving Helmet. It is our assumption the reader has experience and is familiar with the operation, inspection and repair process of Kirby Morgan Diving Systems. We highly recommend that all divers should receive proper training, under controlled conditions, in the use of any model of commercial diving helmet that they have not previously used or trained in, prior to use on the job.

Contents

1.1 KM Diamond Leak Check

To be performed as part of the PRE-Dive.

1) Insert a Blanking Plate into helmet.

2) Connect regulated supply pressure of 135–150 PSIG, typically by using EGS.

3) Rotate the Over Pressure Relief valve to the closed position.

4) Ensure Surface Bypass Valve is in the vertical position.

5) Flow gas into helmet until exhaust valves open, but keep gas connected and pressurized.

Check for leaks by submerging helmet while pressurized or spraying with soapy water and observe for bubbles.

1.2 Checking Valve lift Off

NOTE

18 mbar–21 mbar will be the accepted range for test.

Tools Required

To perform the following tests on the KM Diamond a Diamond Set Up & Test Kit P/N DL-D00 is REQUIRED. Contact Dive Lab, Inc. for specifications divelab@divelab.com (850)235-2715 Panama City Beach, Florida USA.

1) Fill manometer with colored water until level reaches zero.

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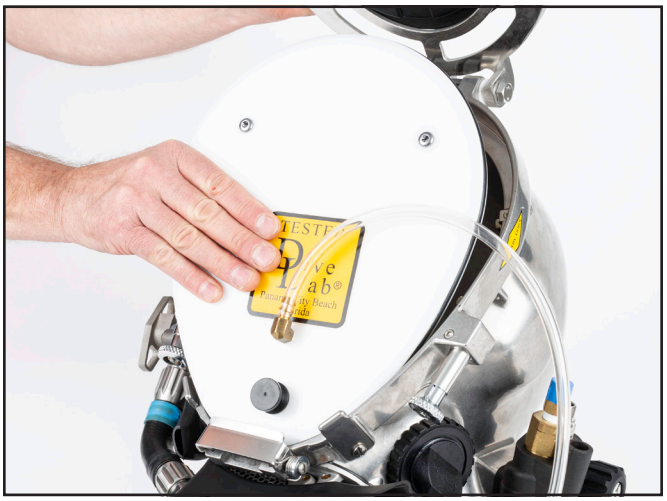
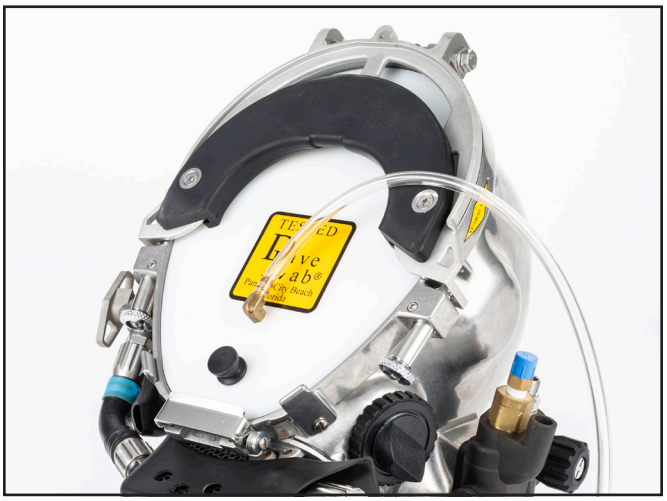
2) Ensure no bubbles are visible. This may require burping off the system by blowing into the tube connected to the manometer.

3) Remove tubing from manometer once the gauge is zeroed out with no bubbles in the system.

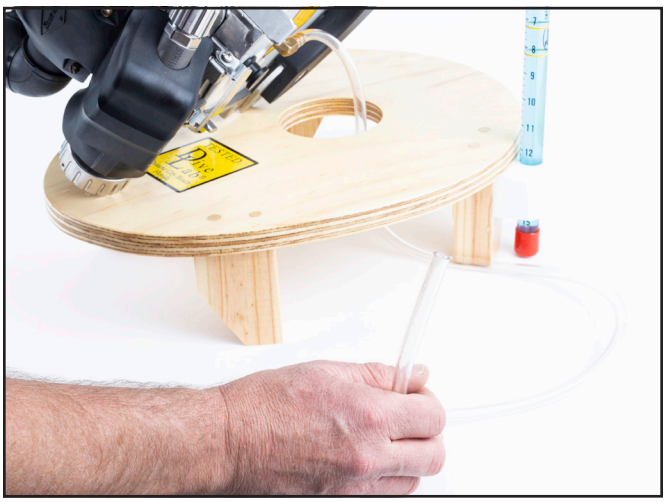
4) Connect tubing to fitting found on bottom of blanking plate.

5) Lubricate blanking plate O-ring and install plate in helmet with locking collar engaged.





6) Place helmet on base with tubing running through hole.



7) Connect tubing to manometer.

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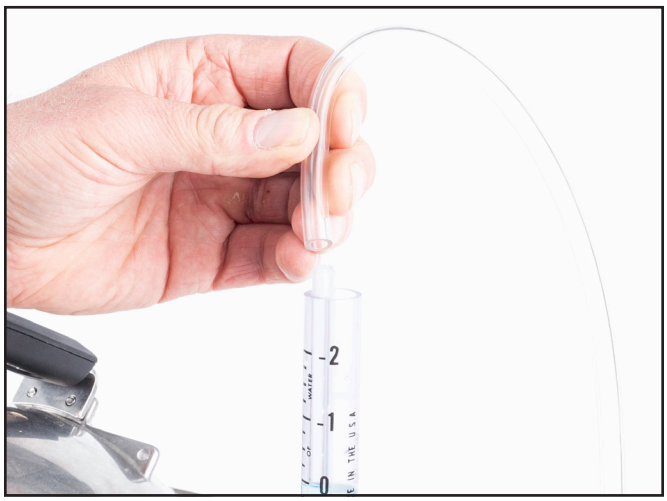
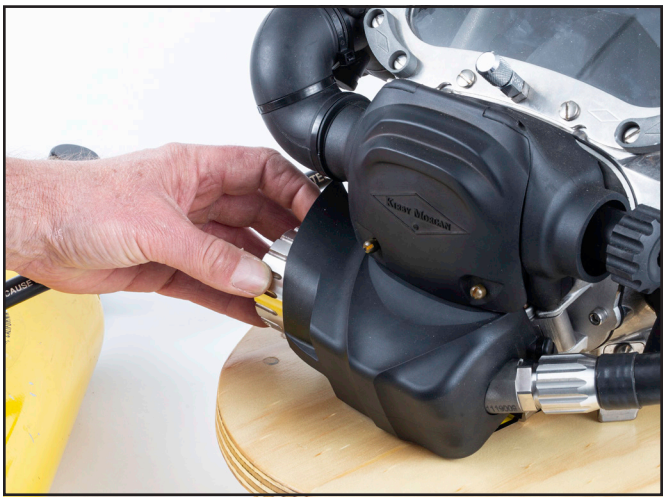


8) Cap Exhaust Hose Adapter fitting.

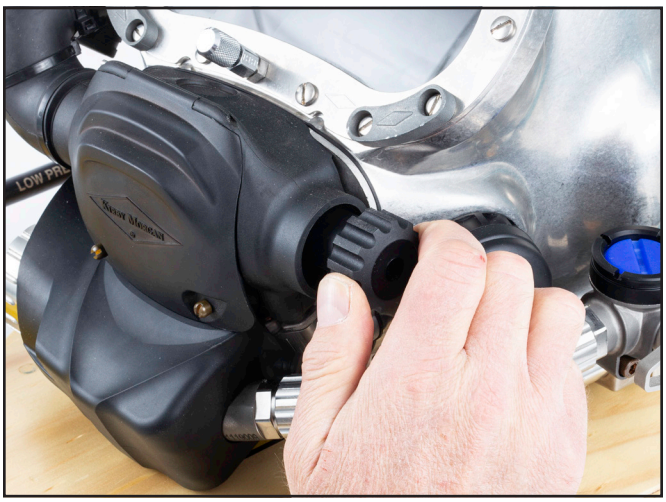
9) Ensure SBV is in open position (parallel).

10) Connect air source to helmet (EGS suggested).

11) Rotate OPRV counterclockwise to open all the way.



12) Turn Demand regulator adjustment knob in (clockwise) until it clicks.



13) Ensure the EGS and Steady Flow valves are

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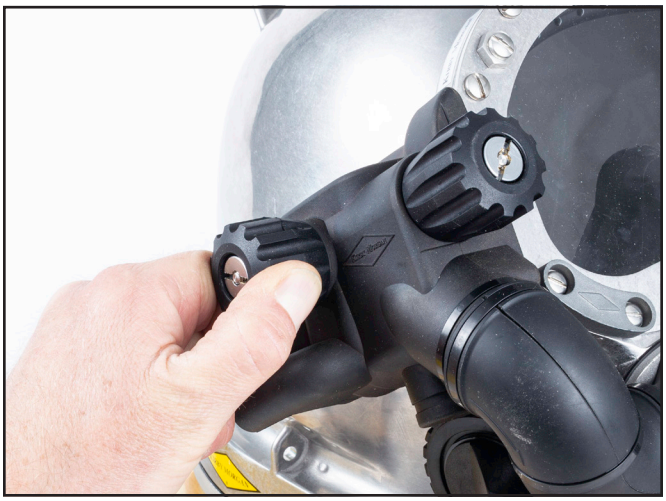
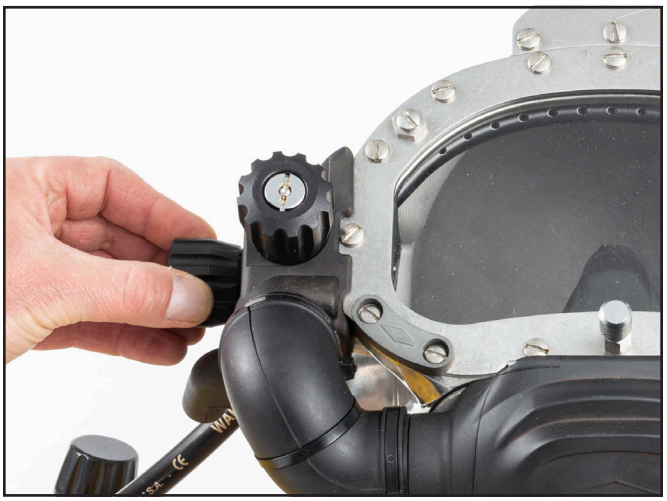
closed BEFORE the EGS supply tank is turned on.

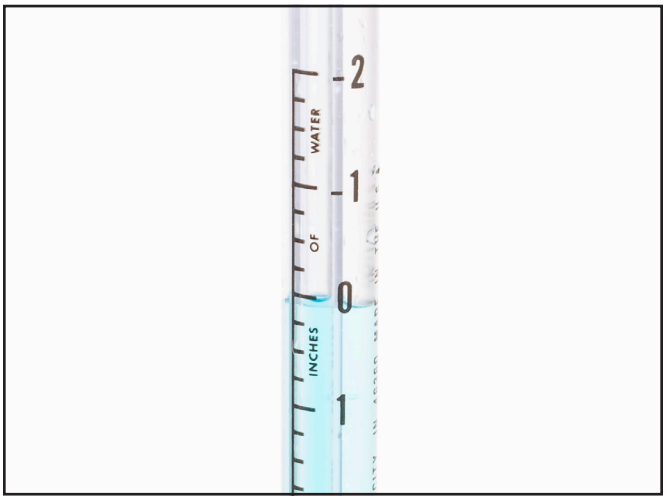


14) Slowly open valve on EGS supply cylinder.

15) Slowly open EGS Valve on side block.



16) Slowly open the steady flow valve until the indicator bubble on the manometer scale is below zero and no greater than below the one mark. A slight hiss should be heard.



17) Rotate OPRV clockwise SLOWLY to the closed position while observing the manometer.

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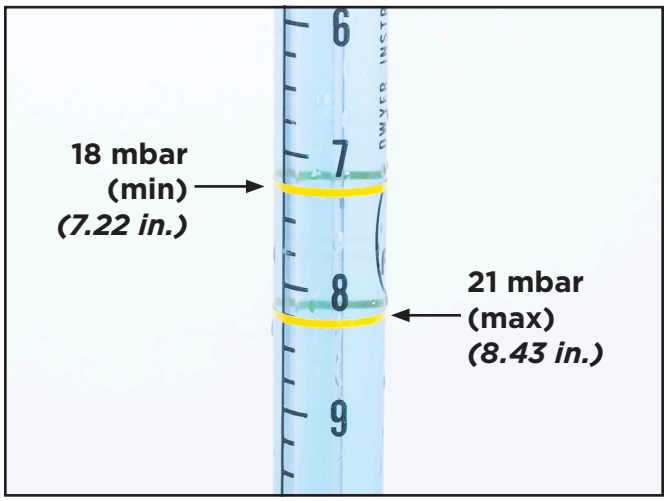
NOTE

Fluid level in smaller tube inside manometer should start to fall. Fluid should stabilize in between the marks on the manometer. If the level settles in this zone, this indicates at least one of the two valves is releasing gas properly; now, each valve must be checked independently.

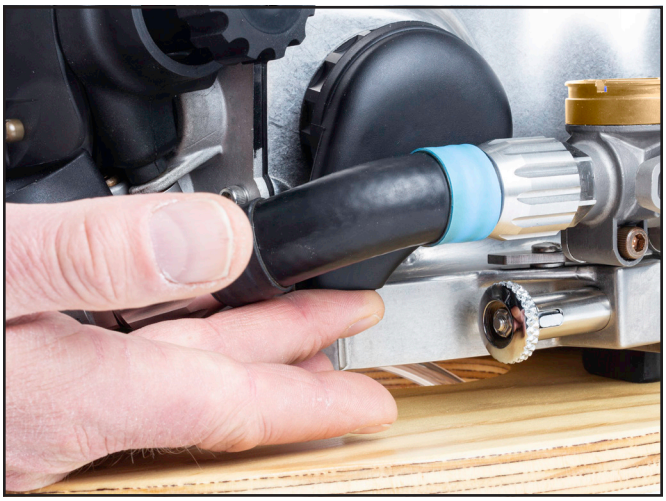


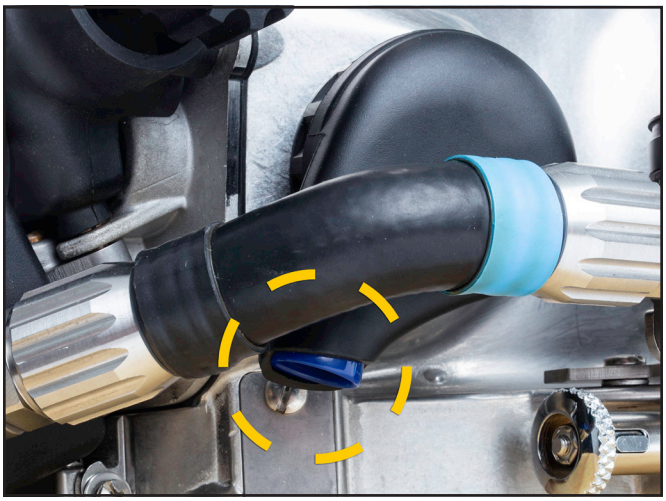
18) Spray OPRV with a leak check solution.

Bubbles should form at the OPRV, indicating the valve is exhausting while gas is simultaneously venting out of the Water Purge Assembly.

1.3 Isolating the OPRV

1) To isolate and ONLY TEST the OPRV plug the Water Dump Assembly exit port using a plug, or finger, while maintaining a steady flow of gas through helmet. Observe manometer, ensure reading is within specified limits. If it is in spec, follow "1.4 Isolating the Water Purge Assembly for Lift Off Parameters" on page KMFNL-6. If the OPRV is out of spec, follow the next steps to properly adjust it.





1.3.1 Adjusting Over Pressure Relief Valve (OPRV)

Tools Required

- ⅜" Deep Welled Socket

NOTE

18 mbar–21 mbar (7.22–8.43 inches) will be the accepted range for test.

1) Use a ⅜" socket on the spring adjuster hex to adjust the spring tension of the OPRV.

Increased back-pressure

Decrease back-pressure

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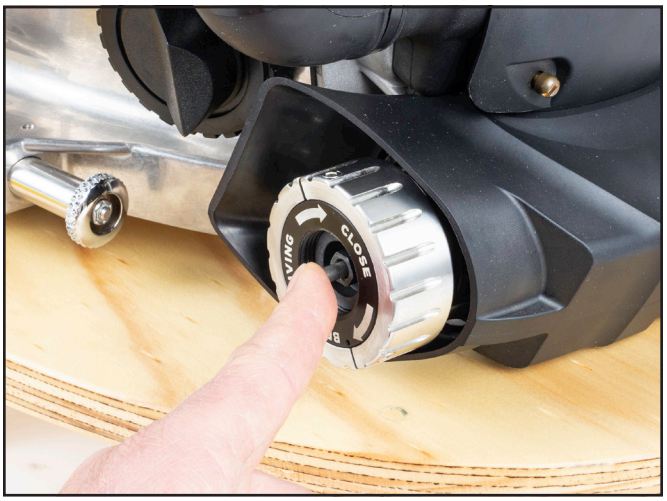
1.4 Isolating the Water Purge Assembly for Lift Off Parameters

The Water Purge Assembly must be installed into the helmet with pick up tubes attached.

1) To isolate the Water Purge Assembly, the OPRV must be rotated closed (clockwise) with a finger lightly pressed in on the center pin found on the control knob.

2) First, if you had installed a plug into the pick-up tube of the water purge assembly, it should be removed. Place the Water Purge Assembly exit port in a small cup of water.

3) While maintaining a steady flow of gas through the helmet, press and hold the stem on the exhaust assembly; this will allow gas to flow only through the water purge assembly.



When bubbles appear that is the indication the water dump valve is opening.

Observe manometer, ensure reading is within specified limits.

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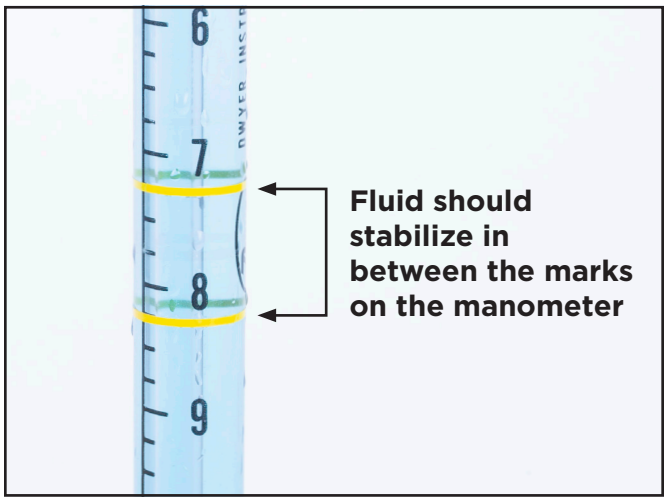


1.5 Spring Adjustment Water Purge Valve

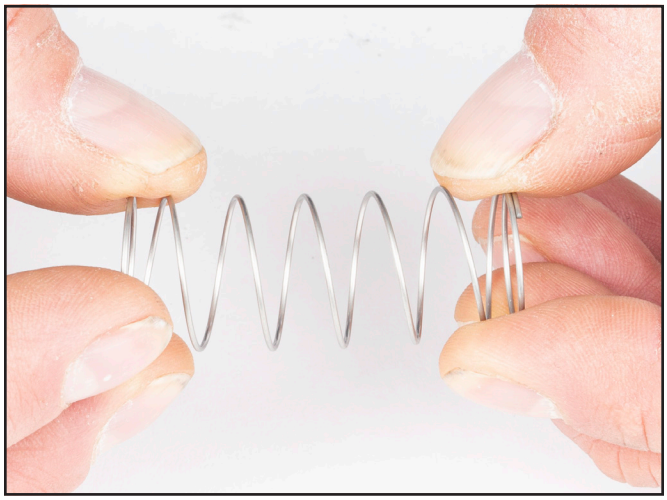
Adjustments are needed if the air bubble level in the manometer is outside specified limits during test.

NOTE

KM Diamond helmets manufactured before April 2022 do not have the main body's spring adjuster insert or recessed O-ring groove found on the main body. These new adjustable components are recommended.

The spring must be removed from the water purge assembly and either stretched or compressed in order to make adjustment.

1) Stretch spring to increase back-pressure. **DO NOT** stretch beyond one inch of spring's free length.



2) Compress spring to decrease back-pressure

1.5.1 Helmets Equipped with Spring Adjuster Insert

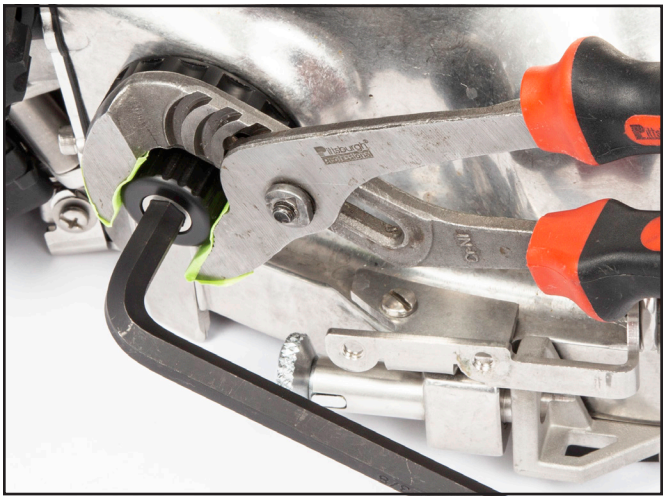
Tools Required

- ⅜" Hex Wrench

NOTE

To increase back pressure turn insert clockwise. To decrease back pressure turn insert counter clockwise.

1) To increase the back pressure (move the bubble down the manometer) turn insert in one full turn and retest.



2) Continue to make adjustments until the correct back pressure is achieved.

NOTE

Full range is about six full turns.

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