

**Kirby Morgan®**  
Deep Sea Diving Helmets  
KM Diamond

## **A2.1**

### Annual Inspection/Overhaul/Maintenance Checklist

THIS INSPECTION AND MAINTENANCE SHOULD BE PERFORMED **AT LEAST ANNUALLY** AND AS DICTATED BY CONDITION REVEALED DURING DAILY/MONTHLY INSPECTION. MONTHLY INSPECTIONS DETERMINE NECESSITY FOR OVERHAUL WITH MORE ACCURACY THAN SIMPLY PLACING A NUMBER OF HOURS OF USE.

This checklist is intended to aid persons performing routine overhauls of the KM Diamond helmet. The checklist should be used in conjunction with the latest version of the applicable KMDSI Modular Operations and Maintenance Manual for the model helmet being serviced. This checklist is primarily intended to guide and document the maintenance as it is completed and to help guide the technician during overhauls. Specific detailed procedures for each section of this checklist can be found in the latest KMDSI Modular Operations and Maintenance Manuals and when completed should be retained in the equipment maintenance files.

#### **⚠ WARNING**

**These are recommended minimum checks when using Kirby Morgan Helmets or Masks. Additional checks may be required as dictated by the conditions and tasks being performed. Failure to perform in-water checks may result in serious injury or death.**



**NOTE**

To complete an A2.1 Annual Inspection and overhaul maintenance checklist a Dive Lab, Inc DL-D-00 Diamond set up and test kit or equivalent **IS REQUIRED**.



**NOTE**

When performing the A2.1, as a schedule overhaul, all O-rings must be replaced. When using the A2.1 as an “inspection” only, in-between annual overhauls, O-rings may be reused if inspection reveals the O-rings are serviceable.



**NOTE**

This checklist may not match all the KMDSI Modular Helmet Operations and Maintenance Manuals, chapter, page, and paragraph.



**NOTE**

Helmets being used in extreme environments will require more frequent inspection.



**NOTE**

This checklist should be used in conjunction with the most current KMDSI Modular Operations and Maintenance Manual. Please check the KMDSI web page at [www.kirbymorgan.com](http://www.kirbymorgan.com).

Date: \_\_\_\_\_

Helmet Serial Number \_\_\_\_\_

Diamond Pod Serial # \_\_\_\_\_ Diamond Exhaust Serial # \_\_\_\_\_

Associated Equipment Serial #(s): \_\_\_\_\_

Technician (*print name*): \_\_\_\_\_

## Preparation

Remove any and all NON KMDSI factory stickers from helmet shell and wash exterior surfaces with a solution of mild detergent and fresh water, then rinse and towel dry.

### 1. Neck Ring Assembly and Helmet Attachment Components

#### CHECK THE FOLLOWING:

Procedures	Initials
1) Remove the Diamond Exhaust Assembly. Disassemble, Clean and inspect all components. Replace all soft goods, reassemble and test. <b>GUIDANCE:</b> KM Diamond Exhaust Regulator Maintenance and Testing (KMDEX) module.	
2) Remove the Surface Bypass Valve hose. Clean and inspect the fittings and hose material. Remove and replace the two sealing O-rings. If the hose fittings are damaged or if the hose is torn or punctured, contact a KMDSI Authorized dealer to inquire about the KM Diamond hose exchange process.	
3) Remove Surface Bypass Valve assembly from Helmet. Disassemble, Clean and inspect all components. Replace all soft goods, reassemble and test. <b>GUIDANCE:</b> KM Diamond Surface Bypass Valve Maintenance and Testing (KMSBV) module.	
4) Remove all Surface Bypass mounting brackets and fasteners from helmet shell. Inspect and clean and reinstall using Loctite® 248 or Medium strength thread locker equivalent. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	

Procedures	Initials
5) Remove Inhale Regulator Shroud Lid with Pin. Remove Hot Water Tube A & B and set aside <i>(if installed)</i> .	
6) Remove the Neck Ring Assembly from the Helmet. Carefully inspect the Neck Dam material for signs of wear, holes, tears, or any damage, replace if any damage is found. For Lock in Dress, ensure neck ring assembly is secured correctly to dry suit material and Dry suit neck seal is in good condition, correct size and without damage. <b>GUIDANCE:</b> Neck Ring Assembly, Locking Collar and Front Stand Offs (NKDM) module.	
7) Ensure all screws on neck ring assembly are torqued to 14 inch lbs (1.6 Newton Meters). <b>GUIDANCE:</b> Neck Ring Assembly, Locking Collar and Front Stand Offs (NKDM)	
8) Remove and discard the O-ring. Clean the O-ring groove and inspect Neck Ring for signs of damage, dents, bent or deformed plates. Check to ensure all Neck Ring screws are present. Lightly lubricate and install new O-ring. <b>GUIDANCE:</b> Neck Ring Assembly, Locking Collar and Front Stand Offs (NKDM) module.	
9) Remove the two Neck Strap Retainer Screws and snap tabs, and then remove the Neck Strap assembly. Inspect the Neck Strap for signs of wear, damage and function. Replace the strap if it is not functioning correctly or any wear/damage is found. <b>GUIDANCE:</b> Snap Tabs, Chin Strap, Swing Catch, Sealed Pull Pins Stainless Steel (SSBTM) module.	
10) Remove the Sealed Pull Pin Assemblies, clean, and inspect the pin recess. Inspect the pins for the presence of silicon oil, which would indicate that the seal is bad. Check for proper function. If the pins do not function smoothly, or if oil is present, the pins require service. Pull Pins should be serviced at a minimum of once every 12 months, refer to helmet maintenance log for previous pull pin service/overhaul. Replace parts and components as necessary; reassemble. <b>GUIDANCE:</b> Snap Tabs, Chin Strap, Swing Catch, Sealed Pull Pins Stainless Steel (SSBTM) module.	
11) Locking Collar: disassemble Locking Collar COMPONENTS . Clean and inspect, replace components as necessary. <b>GUIDANCE:</b> Neck Ring Assembly, Locking Collar and Front Stand Offs (NKDM) module.	

Procedures	Initials
12) Front Stand Offs: Remove, clean & inspect for bends or any obvious damage, re-install. <b>GUIDANCE:</b> Neck Ring Assembly, Locking Collar and Front Stand Offs (NKDM) module.	
13) Disassemble the Swing Tongue Catch Assembly, clean, and inspect all components. Replace components as required/necessary and reassemble. <b>GUIDANCE:</b> Snap Tabs, Chin Strap, Swing Catch, Sealed Pull Pins Stainless Steel (SSBTM) module.	

## 2. Helmet Assembly

### CHECK THE FOLLOWING:


Procedures	Initials
1) Visually inspect Helmet Shell exterior for loose and/or missing fasteners and obvious signs of damage; including cracks, gouges, and/or depressions.	
2) Remove communication module from the helmet. Remove the covers and protectors from the earphones and inspect. Inspect the microphone. Clean, Inspect mount nut & replace O-ring. Perform a communications check. Clean and repair/replace as necessary. <b>GUIDANCE:</b> Communications (COM) module.	
3) Remove and inspect Head Cushion for tears and broken snaps. Remove foam from liner and check the condition of the foam. Lightly lubricate male snaps with Dow Corning Molykote® 111 grease or equivalent. Repair/replace as necessary. <b>GUIDANCE:</b> Head cushion (HDCSH) module.	
4) Remove the Nose Clearing Device. Clean and inspect the Nose Clearing Pad & Shaft. Replace O-rings. <b>GUIDANCE:</b> Face Port, Port Retainer and Nose Block (FCPRT) module.	
5) Remove the Diamond Oral Nasal Mask from the helmet. If installed, remove oral nasal insert, clean and set aside. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	

Procedures	Initials
6) Remove Oral Nasal Valve body as an assembly. Remove valve from valve body. Clean the Oral Nasal Valve Body. Install new valve into valve body. Clean and inspect Diamond Oral Nasal Mask. Replace if necessary. Set aside Diamond Oral Nasal with new valve and Valve body installed.	
7) Remove Oral Nasal Mount (lower) and inspect screws, washers and mount for damage or deterioration & reinstall. Replace if necessary. Reinstall mount followed by Diamond Oral Nasal Mask. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	
8) Remove the Main Tube from the Diamond Pod and set aside. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	
9) Inspect the Inhalation Tube (upper). Ensure the Inhalation Tube is secured into the Diamond Pod and will remain secured with slight pressure (it is normal for the tube to wiggle slightly when secured to the Diamond Pod). Remove and replace, if broken.	


### 3. Diamond Pod

#### CHECK THE FOLLOWING:

Procedures	Initials
1) Remove Bent Tube, adapter sleeves and the Inhale Regulator Shroud ( <i>if installed</i> ).	
2) Remove Hex Nut Insert. Inspect and clean screw threads. Remove O-ring and replace with new lubricated O-ring. Lightly coat the last two threads of the mounting screw with Loctite® 248 or medium strength thread locking compound. Secure hex to Pod with screw.	

Procedures	Initials
 <p>The regulator pod does not need to be physically removed from the Helmet Shell every year providing excessive internal corrosion is not present in the pod. However, the water dump valve must be overhauled and soft goods changed in accordance with the A2.1 Annual Inspection/Overhaul/Maintenance Checklist. KMDSI recommends at least every THREE (3) years the regulator pod be physically removed from the Helmet.</p> <p><b>GUIDANCE:</b> KM Diamond (DIAMD) module.</p> <p>Regulator pod removed? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>3) Clean, inspect pod, replace dewatering valve, per Modular O &amp; M Manual module.</p> <p><b>GUIDANCE:</b> KM Diamond (DIAMD) module.</p>	

#### 4. Side Block

 The Side Block does not need to be physically removed from the Helmet Shell every year in order to overhaul the Steady Flow, Emergency and One Way Valve providing excessive internal corrosion is not present in the side block passages or valve components. However, all valves must be overhauled and soft goods changed in accordance with the Operations and Maintenance manual. **KMDSI recommends at least every THREE (3) years the Side Block Assembly be physically removed from the Helmet, overhauled and reinstalled, per Modular O & M Manual.**

#### CHECK THE FOLLOWING:

Procedures	Initials
Side Block removed? <input type="checkbox"/> Yes <input type="checkbox"/> No	
1) Remove Side Block Shroud. Keep One Way Valve, steady flow & emergency valve control knobs and all their parts down to the seat assembly separate and set aside.	
2) Remove Umbilical Adapter from One Way Valve. <b>GUIDANCE:</b> One Way Valve (OWV) module.	
3) Remove, disassemble, and overhaul the One Way Valve. Install new Umbilical Adapter when rebuild complete. <b>GUIDANCE:</b> Stainless Steel Side Block (SSB) module.	

Procedures	Initials
4) Clean and inspect the Emergency Valve and Steady Flow Valve components, replace all O-rings and reassemble.	


## 5. Demand Regulator



NOTE

KMDSI recommends the soft goods, including diaphragm and exhaust valves on all Demand Regulator models be replaced at least annually and/or as dictated by condition revealed during daily/monthly inspection. Monthly inspections will reveal the need for overhaul with greater accuracy.

### DIVER/TENDER - CHECK THE FOLLOWING:

Procedures	Initials
1) Remove and disassemble the Diamond Main Tube per O&M Manual. Visually inspect the interior of the Regulator Body/Diamond Pod for corrosion and/or contamination. Clean as necessary. <b>GUIDANCE:</b> 455 Regulator (455BAL) module.	
2) After the Diamond Main Tube has been disassembled, clean and inspect all parts per O & M Manual. Replace all O-rings and the inlet valve seat.	
3) Reassemble the Diamond Main Tube. <b>GUIDANCE:</b> 455 Balanced Regulator (455BAL) module.	
4) Ensure Flex Knob rotates smoothly and there is no binding.	
5) Install Diamond main tube in the Diamond Pod. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	
6) Reinstall Diamond Oral Nasal Mask and Nose Block Device. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	
 <p>If the oral nasal insert will be used, (optional), it will need to be installed before the nose block device.</p>	

Procedures	Initials
7) Adjust the Demand Regulator in IAW O& M Manual and fine tune as necessary. <b>GUIDANCE:</b> KM Diamond (DIAMD) module.	

## 6. Emergency Gas Supply (EGS)





NOTE

The Emergency Gas System consists of a good quality First Stage Regulator an Over Pressure Bleed/Relief Valve, and an Emergency Gas Supply Hose that connects to the Emergency Valve on the Helmet Side Block.

### DIVER/TENDER - CHECK THE FOLLOWING:

Procedures	Initials
1) Check the hydrostatic date and last visual inspection record ("VIP") of the Cylinder. Ensure date(s) are within the specified range. The VIP is done at least annually and the hydrostatic test is done at least every five years.	
2) Check the maintenance record of the EGS components to ensure the First Stage Regulator's maintenance has been performed in accordance with the manufacturer's recommendations.	
3) Check all Hoses for signs of blisters, cover slippage, cuts, and/or abrasions. Replace any Hose(s) that show signs of leakage/damage. If a Quick Connect EGS Hose is being used, inspect Quick Connect and fittings for signs of wear/damage service in accordance with the manufactures recommendations.	
4) Submersible Pressure Gauge: Ensure it has been compared to a gauge of known accuracy. Ensure maintenance is performed IAW manufactures recommended procedures.	
5) Overhaul and test the First Stage Bleed/Relief Valve. <b>GUIDANCE:</b> applicable O& M Manual, or KMDSI Bleed/Relief Valve Cleaning, Inspection, and Overhaul Procedure.	
6) Log the lifting pressure _____ psig.	



Procedures	Initials
<div data-bbox="191 289 272 394">  <p><b>NOTE</b></p> </div> <p>An adjustable pressure source that can provide the recommended range of 180 to 200 psi (12.4 to 13.8 bar) is required for adjusting the bleed relief.</p> <div data-bbox="191 422 272 527">  <p><b>NOTE</b></p> </div> <p>The Bleed/Relief Valve should be adjusted to start relief between 180–200 psig (12.4–13.8 bar) when tested.</p>	
<p>7) Check the intermediate pressure setting of the First Stage to ensure it is within the manufacturer's specified pressure range. For KMDSI Helmets and Masks, the minimum I.P. intermediate pressure for the emergency supply is normally between 135 psig to 165 psig (9.3–11.38 bar). Log the intermediate pressure.</p>	
<p>8) Perform a leak check of all EGS components and fittings using soapy water in a pressurized condition. Repair/replace items as necessary.</p>	
<p>9) Inspect the Harness Assembly for signs of wear and/or damage. Repair/replace as necessary.</p>	

Recorded in service records for helmet and EGS System (maintenance log books)? ☐ Yes ☐ No

Recorded service in helmet maintenance log book? ☐ Yes ☐ No



I \_\_\_\_\_ hereby certify that I have performed the work required in the A2.1 and that **I AM** a certified KMDSI / Dive Lab technician.

Print Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

ID #: \_\_\_\_\_ Date of Certification: \_\_\_\_\_



I \_\_\_\_\_ hereby declare that I have performed the work required in the A2.1 and **I AM NOT** a certified KMDSI/Dive Lab technician.

Technician/Owner Print Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Comments: \_\_\_\_\_

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KMDSI strongly recommends that a certified KMDSI Repair Technician make all repairs and that only genuine KMDSI repair and replacement parts be used. Owners of KMDSI products that elect to do their own repairs and inspections should only do so if they possess the knowledge and experience. All inspections, maintenance, and repairs should be completed using the appropriate KMDSI user guide and Operations and Maintenance Manual(s). Persons performing repairs should retain all replacement component receipts for additional proof of maintenance history. Should any questions on procedures, components, or repairs arise, please contact Kirby Morgan Dive Systems, Inc., by telephone at (805) 928-7772 or via e-mail at [kmdsi@kirbymorgan.com](mailto:kmdsi@kirbymorgan.com), or contact Dive Lab, Inc., by telephone at (850) 235-2715 or via e-mail at [divelab@divelab.com](mailto:divelab@divelab.com).

**NOTE**

The Maintenance Log, Appendix 3, found in the Misc. Appendices checklists on the Kirby Morgan website, may be used as a template to create blank pages to record all the maintenance performed.