

KIRBY MORGAN®

455 Balanced Regulator Installation Guide

KMDSI Part #100-204

Patented, patents pending, foreign patents apply



TM

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▲ WARNING

Diving with compressed breathing gas is a hazardous activity. Even if you do everything right there is always the danger that you may be killed or injured. No piece of diving equipment can prevent the possibility that you may be killed or injured any time you enter the water.

The 455 balanced regulator meets or exceeds all performance and testing requirements of all government and non-government testing agencies throughout the world. Only Kirby Morgan masks and helmets have achieved the Dive Lab®, CR (Commercial Rated) mark.

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NOTICE

Every effort is made to ensure that the 455 balanced regulator, and other KMDSI regulators, are interchangeable among the wide variety of helmets and masks we produce. Please be aware that the final alignment of the regulator may vary from unit to unit, and this in no way will affect the function or performance of the finished assembly.

In the midst of today’s fast, mass production by others, Kirby Morgan continues using many “made by hand” processes at our factory. For example, every bent tube is hand bent, every fiberglass shell is handmade/ hand-drilled. The products are crafted by skillfully hand-working the components together. Forty plus years of producing a wide assortment of helmets and regulators will naturally result in variations.

The evolution of helmet design and fabrication continues, with every consideration given high priority when blending the earlier, original processes, with the distinct advantages that come with the new. Slight variations from unit to unit is nothing new. We will continue to improve every aspect of all our products, and we appreciate our customers’ support and loyalty. Thank you.

The original language of the Kirby Morgan Manuals is English. Translation into other languages will be provided upon request. KMDSI may charge a fee for these services.

NOTE: The tools required to remove the SuperFlow® 350 regulator and install the 455 Balanced regulator into the helmet shell are the same and will only be listed once at the beginning of this installation guide.

The following instruction is valid for the following products:

SL 17C	KMB 18**
SL 27*	KMB 28**
KM 37	KM 37SS
KM 57	KM 77

*Mounting to the SL 27® requires installation by a dealer certified in fiberglass repair (for SL 27® helmets built before October 2015).

**Pre ‘99 KMB 18s and pre 2004 KMB 28s will not accept the 455 balanced regulator.

1.1 CE Certification

The helmet has been tested and conforms to the performance requirements as set forth in Annex II of Directive 89/686/EEC and, as far as applicable, the EN15333-1 (class B) for helmets and EN15333-1 (class C) for BandMasks®. It is fully CE marked with demand regulator SuperFlow®

350 or demand valve REX® and oral nasals P/N 510-690 and P/N 510-747.

NOTE: the sticker (CE mark) inside the helmet or BandMask® regards only the helmet/BandMask® without the regulator.


Category of PPE: III

⚠ WARNING



The helmet has been tested with air and CE certificated for use with air up to 50 meters. Compressed air must be compliant with the EN 12021. All the tables reporting the technical data and the pressure of use are relative to compressed air.

1.1.1 CE Marking

On the inside of the helmet shell or BandMask® frame the CE mark is affixed.


EN15333-1 CLASS B		KIRBY MORGAN DIVE SYSTEMS. INC. 1430 Jason Way, Santa Maria, CA 93455
HELMET MODEL: _____		CE 0477
YEAR OF PRODUCTION: _____		

CE Mark on Helmets

EN15333-1 CLASS C		KIRBY MORGAN DIVE SYSTEMS, INC. 1430 Jason Way, Santa Maria, CA 93455
BANDMASK MODEL: _____		 0477
YEAR OF PRODUCTION: _____		

CE Mark on BandMasks®

In the mark the data reported are the following:

1. The name and the address of the manufacturer;
2. Harmonized reference standard:
EN 15333-1;
3. PPE model;
4. The year of production;
5. CE marking: ;
6. Number of notified body.

CAUTION

The user cannot:

- remove the mark from the shell of the helmet;
- modify or counterfeit the data reported on the mark.

CAUTION

The mark must be visible and legible throughout the life of the PPE. If the mark deteriorates or is not legible the user should contact the manufacturer.

1.1.2 Notified Body

The Notified Body is:

Eurofins Product Testing Italy Srl

Address: Via Courgné
21-10156 Torino,
ITALY

Identification number: 0477.

Installing the 455 Balanced Regulator onto a KM 37SS

Parts Included in the 525-765 Kit:

Part #	Description	Qty
100-100	Warranty Card	1
100-204	Installation Guide, 455 Regulator Kit	1
505-455	455 Balanced Regulator	1
520-042	Tie Wrap	2

1.1 Removal of the SuperFlow® 350 Regulator

Tools Required:

- 1 3/8" socket or Regulator Mount Socket Wrench P/N 525-625 (found in 525-620 tool kit).
- 3/8" Drive Extension with driver, minimum 3" in length
- 1/4" flat blade screwdriver
- 7/16", 11/16" and two 7/8" Open end wrenches
- Slip Joint Pliers and a cloth

1.1.1 Removal of the Bent Tube

1) Always start removal at the side block end. Loosen the tube with the 11/16 inch wrench. The free swiveling mount nut on this end of the bent tube can be un-threaded completely and can slide down the tube.

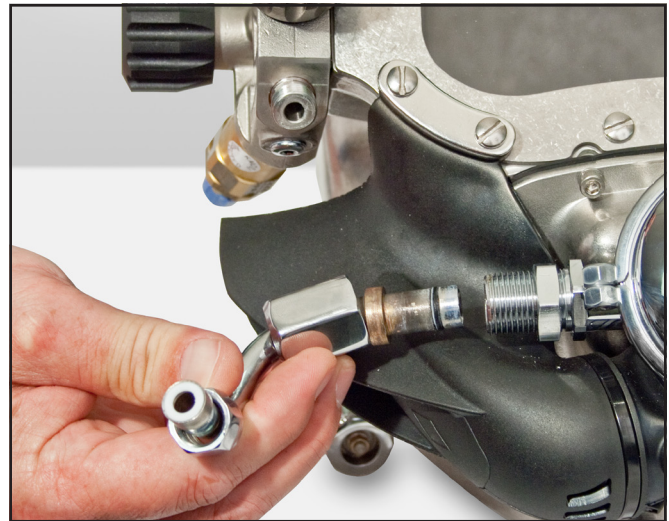


Always start removal at the side block end.

2) Loosen the lower bent tube nut by using the two 7/8 inch wrenches. Place one wrench on the bent tube mount nut and the second on the regulator inlet jam nut. **Turn only the outer nut on the bent tube to loosen the bent tube.**

The bent tube mount nut can then be rotated until free of the bent tube adapter threads.

3) With the two mount nuts free; the bent tube assembly can be pulled straight out and away from the regulator. The bent tube assembly can be rotated back and forth to aid removal, if necessary.



Removing the bent tube.

1.1.2 Nose Block Device Removal

⚠ CAUTION

The nose block device **MUST** be removed and reinstalled when installing a new oral nasal mask. Simply stretching the oral nasal mask over the nose block device can cause the oral nasal mask to tear. A torn oral nasal mask may lead to an increase in CO₂, causing headaches, difficulty and possibly an accident.

- 1) Hold the nose block knob with a pair of pliers padded by a cloth, while unscrewing the nose block device with your hand from inside the helmet.
- 2) After the knob is removed, loosen and remove the packing nut.
- 3) Slip the two O-rings off the end of the shaft of the nose block device and slide the nose block device out through the oral nasal mask.

1.1.3 Oral Nasal Mask and Microphone Removal

- 1) Verify that the nose block device is removed from the helmet.
- 2) Push the microphone out of the oral nasal mask.
- 3) Pull the oral nasal mask off the regulator mount nut. It is held on by a snap fit.

1.1.4 SuperFlow® 350 Removal from Helmet/Mask

- 1) Verify that the bent tube has been removed from the helmet.
- 2) Remove the screws that secure the whiskers to the port. Take care not to lose the zinc anodes, if so equipped, screws, whisker spacers or kidney plates if present.



Take care not to lose the whisker spacers.

- 3) Remove regulator mounting nut and sealing O-ring from inside the helmet.



Removal of the regulator mount nut.

- 4) Cut the tie wrap sealing the whisker main body to the water dump/exhaust outlet on the pod/water dump adapter cover.
- 5) Pull the regulator body with exhaust whiskers away from the helmet.

If using this exhaust system for the 455 regulator installation, cut the tie wrap that secures the whiskers assembly to the regulator body and re-

move. Inspect this assembly and replace parts as needed.

1.2 Installation of the 455 Balanced Regulator

Tools Required

- Socket Wrench, Regulator Mount Nut, P/N 525-625 (in Tool Kit Included with Helmet) or a 1 3/8" Socket
- 3/8" Drive Extension - Minimum 3" in Length
- Torque Wrench
- 1/4" flat blade Torque Screwdriver
- 7/8" Open End Wrench
- 7/8" and 1 1/16" Open End Attachments
- 3/8" Nut Driver or 3/8" Open End Wrench
- 5/32" Hex Key (Ball End is Helpful)
- #1 Phillips Head Screwdriver
- Christo-Lube® or equivalent
- Loctite® 248 or equivalent medium strength thread locker

NOTE: Every effort is made to ensure that this, and any of Kirby Morgan's regulators, are interchangeable between the wide variety of helmets and masks that Kirby Morgan produces. The 40 plus years of producing such a variety is not without variations. Please be aware that the final alignment of the regulator may have variation from unit to unit, and this in no way will affect the function and/or performance of the finished assembly.

EXHAUST SYSTEM NOTE: Each Quad & Tri-Valve exhaust assembly can be removed and replaced onto the exhaust flange of the regulator as a complete unit. If assembled using the individual components special attention is required to ensure the exhaust valves correct orientation and seating inside the exhaust whiskers. If replacing valves or rebuilding the exhaust valve assembly by individual components see Quad Valve & Tri-Valve section in our modular manual

Before beginning step 1 ensure the exhaust main body with attached whiskers is secured to the exhaust flange of the regulator body with the correct tie wrap.

1) Insert the opening on the exhaust main body onto the exhaust outlet of the water dump valve, while at the same time aligning and inserting the threaded mounting tube on the regulator, into the mounting hole on the pod.



2) Install the tie wrap around the quad main exhaust body and tighten. Cut and remove excess tie wrap.



3) Install the sealing O-ring and regulator mount nut. **DO NOT FULLY TIGHTEN THE NUT AT THIS TIME.**

1.2.1 Re-installation of the Bent Tube Assembly and Regulator

Normal minimum replacement parts during overhaul: O-ring 510-012 & Teflon® O-ring 520-033

1) Lightly lubricate the bent tube O-ring and install into the O-ring groove at the regulator end of the bent tube, then install Teflon® O-ring at the side block end.

2) Push the O-ring end of the bent tube assembly into the bent tube adapter on the regulator. Slide it in until the side block end is aligned with the threads for the mount nut.

3) Be sure the new Teflon® O-ring is in place on the side block end of the bent tube, then engage the threads to the side block and hand tighten.

4) Start the “regulator to bent tube” mount nut onto the bent tube adapter and run it up by hand as far as it will go.

NOTE: Run the mount nut up on the adapter **HAND TIGHT ONLY**.

5) Using a torque wrench, tighten the bent tube assembly nut onto the side block to 100 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.



Tighten the bent tube to the proper torque value.

6) Make certain the regulator end of the bent tube is threaded onto the regulator, by lightly

applying torque. When a small amount of resistance is felt, lock it into place with the jam nut.

7) Hold the hex on the bent tube with a wrench and tighten the jam nut against it with a torque wrench to 40 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.

8) Use a torque wrench inside the helmet with a 1 3/8" socket (regulator mount tool P/N 525-625 found in the KMDSI tool kit P/N 525-363) and extension to tighten the regulator mount nut to 100 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.



9) Attach the whisker to each side of the face port retainer using the screws, zinc anodes or kidney plates with spacers. Using a torque wrench with a flat blade screwdriver adapter, carefully torque these screws to 12 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.

1.2.2 Oral Nasal Mask and Microphone Installation

1) Snap the oral nasal mask over the regulator mount nut. Take extra care to make sure the mask has snapped into position all the way around the mount nut.

2) Reinstall the microphone.

1.2.3 Nose Block Device Installation

- 1) Prior to reassembly, lubricate the two o-rings.
- 2) Slide the shaft through the oral nasal mask in the helmet or mask shell.



Install the nose block device through the interior of the oral nasal mask.

- 3) Place both o-rings on the shaft, followed by the packing nut and the knob.
- 4) Tighten the packing nut until snug. Do not over tighten, as this will make it difficult to slide the nose block device in and out.
- 5) Tighten the knob with the pliers, padded by a cloth, while holding the padded end inside the helmet with your hand.



Properly installed nose block device.

1.3 Test the regulator for proper function

NOTE: When checking the regulator by depressing the purge button, the regulator may free flow without back pressure inside the oral nasal mask. This is completely normal. Placing a finger or hand over the outlet tube of the regulator will prevent free flow. See "1.1.4 Adjusting the 455 Balanced Regulator" on page 455BAL-2 in module 455 Balanced Regulator for proper adjustment.

NOTE: For all maintenance and adjustment procedures, refer to the 455 Balanced Regulator module found in the "Manuals and Exploded Views" link under the "Support" link at www.kirbymorgan.com.

Installing the 455 Balanced Regulator onto a SL 17C, SL 27®, KM 37 or KM 57 Helmet

Parts Included in the 525-765 Kit:

Part #	Description	Qty
100-100	Warranty Card	1
100-204	Installation Guide, 455 Regulator Kit	1
505-455	455 Balanced Regulator	1
520-042	Tie Wrap	2

1.1 Removal of the SuperFlow® 350 Regulator

Tools Required:

- Torque wrench and 1 $\frac{3}{8}$ inch socket and/or P/N 525-625 regulator mount socket wrench (found in 525-620 tool kit).
- $\frac{3}{8}$ " Drive Extension Bar
- $\frac{1}{4}$ inch flat blade screwdriver
- Open-end attachments $\frac{7}{8}$ and $1\frac{1}{16}$ inch
- Open-end wrench $\frac{7}{16}$ and $\frac{7}{8}$ inch
- Slip Joint Pliers and a cloth

1.1.1 Removal of the Bent Tube

1) Always start removal at the side block end. Loosen the tube with the $1\frac{1}{16}$ inch wrench. The free swiveling mount nut on this end of the bent tube can be un-threaded completely and can slide down the tube.



Always start removal at the side block end.

2) Loosen the lower bent tube nut by using the two $\frac{7}{8}$ inch wrenches. Place one wrench on the bent tube mount nut and the second on the regulator inlet jam nut. **Turn only the outer nut on the bent tube to loosen the bent tube.**

The bent tube mount nut can then be rotated until free of the bent tube adapter threads.

3) With the two mount nuts free; the bent tube assembly can be pulled straight out and away from the regulator. The bent tube assembly can be rotated back and forth to aid removal, if necessary.



Removing the bent tube.

1.1.2 Nose Block Device Removal

⚠ CAUTION

The nose block device **MUST** be removed and reinstalled when installing a new oral nasal mask. Simply stretching the oral nasal mask over the nose block device can cause the oral nasal mask to tear. A torn oral nasal mask may lead to an increase in CO₂, causing headaches, difficulty and possibly an accident.

1) Hold the nose block knob with a pair of pliers padded by a cloth, while unscrewing the nose block device with your hand from inside the helmet.

2) After the knob is removed, loosen and remove the packing nut.

3) Slip the two O-rings off the end of the shaft of the nose block device and slide the nose block device out through the oral nasal mask.

1.1.3 Oral Nasal Mask and Microphone Removal

1) Verify that the nose block device is removed from the helmet.

2) Push the microphone out of the oral nasal mask.

3) Pull the oral nasal mask off the regulator mount nut. It is held on by a snap fit.

1.1.4 SuperFlow® 350 Removal from Helmet/Mask

1) Verify that the bent tube has been removed from the helmet.

2) Remove the screws that secure the whiskers to the port. Take care not to lose the zinc anodes, if so equipped, screws, whisker spacers or kidney plates if present.



Take care not to lose the whisker spacers.

3) Remove regulator mounting nut and sealing O-ring from inside the helmet.



Removal of the regulator mount nut.

NOTE: If you are installing the 455 balanced regulator on an SL 27® skip to step 5).

4) Cut the tie wrap sealing the whisker main body to the water dump/exhaust outlet on the pod/water dump adapter cover.

5) Pull the regulator body with exhaust whiskers away from the helmet.

If using this exhaust system for the 455 regulator installation, cut the tie wrap that secures the whiskers assembly to the regulator body and remove. Inspect this assembly and replace parts as needed.

1.2 Installation of the 455 Balanced Regulator

Tools Required

- Socket Wrench, Regulator Mount Nut, P/N 525-625 (in Tool Kit Included with Helmet) or a 1 3/8" Socket
- 3/8" Drive Extension - Minimum 3" in Length
- Torque Wrench
- 1/4" flat blade Torque Screwdriver
- 7/8" Open End Wrench
- 7/8" and 1 1/16" Open End Attachments
- 3/8" Nut Driver or 3/8" Open End Wrench
- 5/32" Hex Key (Ball End is Helpful)
- #1 Phillips Head Screwdriver
- Christo-Lube® or equivalent
- Loctite® 248 or equivalent medium strength thread locker

NOTE: Every effort is made to ensure that this, and any of Kirby Morgan's regulators, are interchangeable between the wide variety of helmets and masks that Kirby Morgan produces. The 40 plus years of producing such a variety is not without variations. Please be aware that the final alignment of the regulator may have variation from unit to unit, and this in no way will affect the function and/or performance of the finished assembly.

EXHAUST SYSTEM NOTE: Each Quad & Tri-Valve exhaust assembly can be removed and replaced onto the exhaust flange of the regulator as a complete unit. If assembled using the individual components special attention is required to ensure the exhaust valves correct orientation and seating inside the exhaust whiskers. If replacing valves or rebuilding the exhaust valve assembly by individual components see Quad Valve & Tri-Valve section in our modular manual

NOTE: (This does NOT apply to the SL 27®). Before beginning step 1 ensure the exhaust main body with attached whiskers is secured to the exhaust flange of the regulator body with the correct tie wrap.

1) Insert the opening on the exhaust main body onto the exhaust outlet of the water dump valve, while at the same time aligning and inserting the threaded mounting tube on the regulator, into the mounting hole on the pod. If this is being installed on an SL 27 then align and insert the threaded mounting tube on the regulator, into the mounting hole on the pod.



NOTE: If you are installing the 455 balanced regulator on an SL 27® skip to step 3).

2) Install the tie wrap around the quad main exhaust body and tighten. Cut and remove excess tie wrap.



3) Install the sealing O-ring and regulator mount nut. **DO NOT FULLY TIGHTEN THE NUT AT THIS TIME.**

1.2.1 Re-installation of the Bent Tube Assembly and Regulator

Normal minimum replacement parts during overhaul: O-ring 510-012 & Teflon® O-ring 520-033

1) Lightly lubricate the bent tube O-ring and install into the O-ring groove at the regulator end of the bent tube, then install Teflon® O-ring at the side block end.

2) Push the O-ring end of the bent tube assembly into the bent tube adapter on the regulator. Slide it in until the side block end is aligned with the threads for the mount nut.

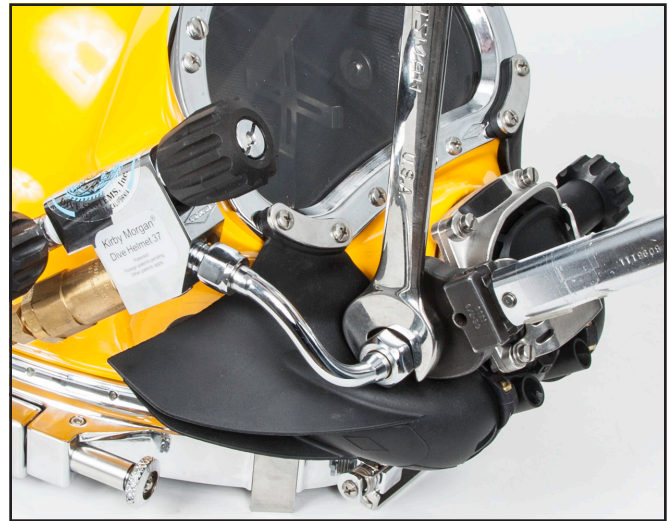
3) Be sure the new Teflon® O-ring is in place on the side block end of the bent tube, then engage the threads to the side block and hand tighten.

4) Start the “regulator to bent tube” mount nut onto the bent tube adapter and run it up by hand as far as it will go.

NOTE: Run the mount nut up on the adapter **HAND TIGHT ONLY.**

5) Using a torque wrench, tighten the bent tube assembly nut onto the side block to 100 inch lbs./11.3 Newton Meters Always reference "Torque Specs" starting on

page APNDX-19 in our modular manual to confirm current correct torque.



Tighten the bent tube to the proper torque value.

6) Make certain the regulator end of the bent tube is threaded onto the regulator, by lightly applying torque. When a small amount of resistance is felt, lock it into place with the jam nut.

7) Hold the hex on the bent tube with a wrench and tighten the jam nut against it with a torque wrench to 40 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.

8) Use a torque wrench inside the helmet with a 1 3/8" socket (regulator mount tool P/N 525-625 found in the KMDSI tool kit P/N 525-363) and extension to tighten the regulator mount nut to 100 inch lbs./11.3 Newton Meters. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.

1.2.2 Oral Nasal Mask and Microphone Installation

1) Snap the oral nasal over the regulator mount nut. Take extra care to make sure the mask has snapped into position all the way around the mount nut.

2) Reinstall the microphone.

1.2.3 Nose Block Device Installation

- 1) Prior to reassembly, lubricate the two o-rings.
- 2) Slide the shaft through the oral nasal mask in the helmet shell.



Install the nose block device through the interior of the oral nasal mask.

- 3) Place both o-rings on the shaft, followed by the packing nut and the knob.
- 4) Tighten the packing nut until snug. Do not over tighten, as this will make it difficult to slide the nose block device in and out.
- 5) Tighten the knob with the pliers, padded by a cloth, while holding the padded end inside the helmet with your hand.



Properly installed nose block device.

1.3 Test the regulator for proper function

NOTE: When checking the regulator by depressing the purge button, the regulator may free flow without back pressure inside the oral nasal mask. This is completely normal. Placing a finger or hand over the outlet tube of the regulator will prevent free flow. See "1.1.4 Adjusting the 455 Balanced Regulator" on page 455BAL-2 in module 455 Balanced Regulator for proper adjustment.

NOTE: For all maintenance and adjustment procedures, refer to the 455 Balanced Regulator module found in the "Manuals and Exploded Views" link under the "Support" link at www.kirbymorgan.com.

Installing the 455 Balanced Regulator onto a KMB 18/28 Band Mask®

Parts Included in the 525-765 Kit:

Part #	Description	Qty
100-100	Warranty Card	1
100-204	Installation Guide, 455 Regulator Kit	1
505-455	455 Balanced Regulator	1
520-042	Tie Wrap	2

1.1 Removal of the SuperFlow® 350 Regulator

Tools Required:

- Torque wrench and 1 $\frac{3}{8}$ inch socket and/or P/N 525-625 regulator mount socket wrench (found in 525-620 tool kit).
- $\frac{3}{8}$ " Drive Extension Bar
- $\frac{1}{4}$ inch flat blade screwdriver
- Open-end attachments $\frac{7}{8}$ and $1\frac{1}{16}$ inch
- Open-end wrench $\frac{7}{16}$ and $\frac{7}{8}$ inch
- Slip Joint Pliers and a cloth

1.1.1 Removal of the Bent Tube

1) Always start removal at the side block end. Loosen the tube with the $1\frac{1}{16}$ inch wrench. The free swiveling mount nut on this end of the bent tube can be un-threaded completely and can slide down the tube.

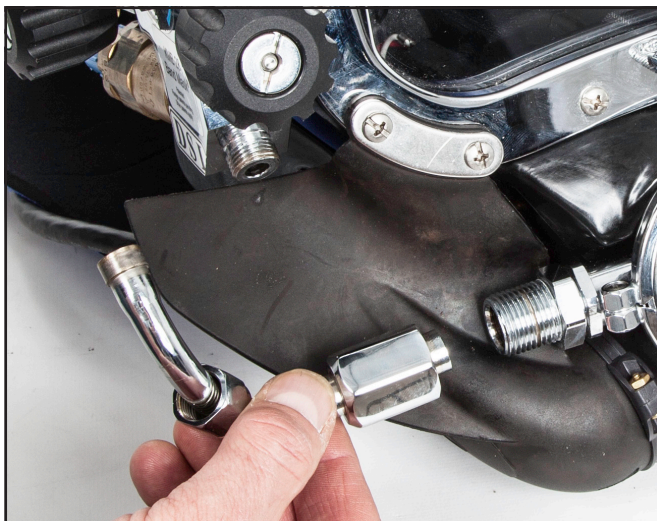


Always start removal at the side block end.

2) Loosen the lower bent tube nut by using the two $\frac{7}{8}$ inch wrenches. Place one wrench on the bent tube mount nut and the second on the regulator inlet jam nut. **Turn only the outer nut on the bent tube to loosen the bent tube.**

The bent tube mount nut can then be rotated until free of the bent tube adapter threads.

3) With the two mount nuts free; the bent tube assembly can be pulled straight out and away from the regulator. The bent tube assembly can be rotated back and forth to aid removal, if necessary.



Removing the bent tube.

1.1.2 Nose Block Device Removal

⚠ CAUTION

The nose block device **MUST** be removed and reinstalled when installing a new oral nasal mask. Simply stretching the oral nasal mask over the nose block device can cause the oral nasal mask to tear. A torn oral nasal mask may lead to an increase in CO₂, causing headaches, difficulty and possibly an accident.

1) Hold the nose block knob with a pair of pliers padded by a cloth, while unscrewing the nose block device with your hand from inside the mask.

2) After the knob is removed, loosen and remove the packing nut.

3) Slip the two O-rings off the end of the shaft of the nose block device and slide the nose block device out through the oral nasal mask.

1.1.3 Oral Nasal Mask and Microphone Removal

1) Verify that the nose block device is removed from the Band Mask.

2) Push the microphone out of the oral nasal mask.

3) Pull the oral nasal mask off the regulator mount nut. It is held on by a snap fit.

1.1.4 SuperFlow® 350 Removal from Helmet/Mask

1) Verify that the bent tube has been removed from the Band Mask.

2) Remove the screws that secure the whiskers to the port. Take care not to lose the zinc anodes, if so equipped, screws, whisker spacers or kidney plates if present.



Take care not to lose the whisker spacers.

3) Remove regulator mounting nut and sealing O-ring from inside the helmet.



Removal of the regulator mount nut.

4) Pull the regulator body with exhaust whiskers away from the Band Mask.

If using this exhaust system for the 455 regulator installation, cut the tie wrap that secures the whiskers assembly to the regulator body and remove. Inspect this assembly and replace parts as needed.

1.2 Installation of the 455 Balanced Regulator

Tools Required

- Socket Wrench, Regulator Mount Nut, P/N 525-625 (in Tool Kit Included with Helmet) or a 1 3/8" Socket
- 3/8" Drive Extension - Minimum 3" in Length
- Torque Wrench
- 1/4" flat blade Torque Screwdriver
- 7/8" Open End Wrench
- 7/8" and 1 1/16" Open End Attachments
- 3/8" Nut Driver or 3/8" Open End Wrench
- 5/32" Hex Key (Ball End is Helpful)
- #1 Phillips Head Screwdriver
- Christo-Lube® or equivalent
- Loctite® 248 or equivalent medium strength thread locker

NOTE: Every effort is made to ensure that this, and any of Kirby Morgan's regulators, are interchangeable between the wide variety of helmets and masks that Kirby Morgan produces. The 40 plus years of producing such a variety is not without variations. Please be aware that the final alignment of the regulator may have variation from unit to unit, and this in no way will affect the function and/or performance of the finished assembly.

EXHAUST SYSTEM NOTE: The Tri-Valve exhaust assemblies can be removed and replaced onto the exhaust flange of the regulator as a complete unit. If assembled using the individual components special attention is required to ensure the exhaust valves correct orientation and

seating inside the exhaust whiskers. If replacing valves or rebuilding the exhaust valve assembly by individual components see Band Mask Tri-Valve Exhaust in our modular manual

1) Align and insert the threaded mounting tube on the regulator, into the mounting hole on the pod.



2) Install the sealing O-ring and regulator mount nut. **DO NOT FULLY TIGHTEN THE NUT AT THIS TIME.**

1.2.1 Re-installation of the Bent Tube Assembly and Regulator

Normal minimum replacement parts during overhaul: O-ring 510-012 & Teflon® O-ring 520-033

1) Lightly lubricate the bent tube O-ring and install into the O-ring groove at the regulator end of the bent tube, then install Teflon® O-ring at the side block end.

2) Push the O-ring end of the bent tube assembly into the bent tube adapter on the regulator. Slide it in until the side block end is aligned with the threads for the mount nut.

3) Be sure the new Teflon® O-ring is in place on the side block end of the bent tube, then engage the threads to the side block and hand tighten.

4) Start the "regulator to bent tube" mount nut onto the bent tube adapter and run it up by hand as far as it will go.

NOTE: Run the mount nut up on the adapter **HAND TIGHT ONLY.**

Using a torque wrench, tighten the bent tube assembly nut onto the side block to 100 inch lbs./11.3 Newton Meters Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.



Tighten the bent tube to the proper torque value.

5) Make certain the regulator end of the bent tube is threaded onto the regulator, by lightly applying torque. When a small amount of resistance is felt, lock it into place with the jam nut.

6) Hold the hex on the bent tube with a wrench and tighten the jam nut against it with a torque wrench to 40 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.

7) Use a torque wrench inside the helmet with a 1 3/8" socket (regulator mount tool P/N 525-625 found in the KMDSI tool kit P/N 525-363) and extension to tighten the regulator mount nut to 100 inch lbs./11.3 Newton Meters. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.



8) Attach the whisker to each side of the face port retainer using the screws, zinc anodes or kidney plates with spacers. Using a torque wrench with a flat blade screwdriver adapter, carefully torque these screws to 12 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.

1.2.2 Oral Nasal Mask and Microphone Installation

1) Snap the oral nasal over the regulator mount nut. Take extra care to make sure the mask has snapped into position all the way around the mount nut.

2) Reinstall the microphone.

1.2.3 Nose Block Device Installation

1) Prior to reassembly, lubricate the two o-rings.

2) Slide the shaft through the oral nasal mask in the mask shell.



Install the nose block device through the interior of the oral nasal mask.

3) Place both o-rings on the shaft, followed by the packing nut and the knob.

4) Tighten the packing nut until snug. Do not over tighten, as this will make it difficult to slide the nose block device in and out.

5) Tighten the knob with the pliers, padded by a cloth, while holding the padded end inside the helmet with your hand.



Properly installed nose block device.

1.3 Test the regulator for proper function

NOTE: When checking the regulator by depressing the purge button, the regulator may free flow without back pressure inside of the oral nasal. This is completely normal. Placing a finger or hand over the outlet tube of the regulator will prevent free flow. See "1.1.4 Adjusting the 455 Balanced Regulator" on page 455BAL-2 in module 455 Balanced Regulator for proper adjustment.

NOTE: For all maintenance and adjustment procedures, refer to the 455 Balanced Regulator module found in the "Manuals and Exploded Views" link under the "Support" link at www.kirbymorgan.com.

Installing the 455 Balanced Regulator onto a KM 77

To remove the REX regulator on the KM 77 and replace it with a 455 Balanced Regulator, the REX Pod must be removed. The regulator and REX pod can be removed as one unit.

Along with the corresponding equipment manuals, a two part video illustrating this process can be viewed at the Kirby Morgan YouTube channel or by locating the 525-769 kit in the Kirby Morgan web-site.

Parts Included in the 525-769 Kit:

Part #	Description	Qty
100-100	Warranty Card	1
100-097	Manual, KMDH 97	1
100-204	Installation Guide, 455 Regulator Kit	1
505-776	455 Regulator Pod Assembly	1
510-403	Pod Gasket	1
510-747	Oral Nasal Mask	1
520-042	Tie Wrap	3
525-630	Tool Kit, 455 Regulator	1
530-145	Lock Nut	8
555-155	Bent Tube w/O-rings	1

1.1 REX® Pod System and Regulator Removal

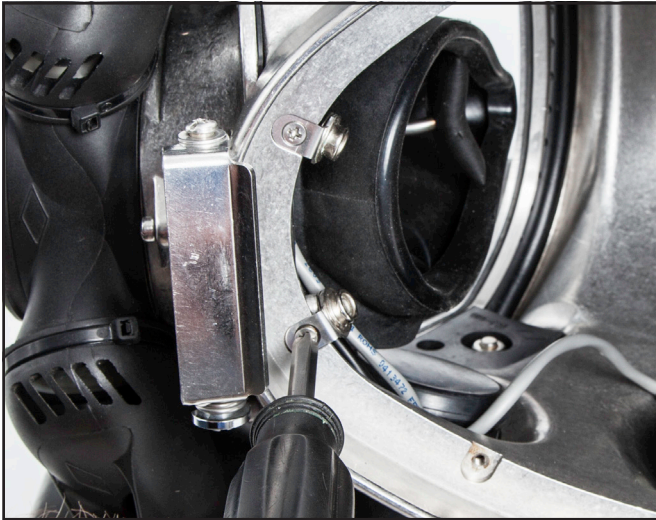
Tools Required:

- Regulator Mount Nut Tool P/N 325-640 (in Tool Kit P/N 525-768 Included with Helmet)
- 3/8" Drive Extension with driver, minimum 3" in length
- 3/8" Nut Driver or 3/8" Open End Wrench
- 5/32" Hex Key (Ball End is Helpful)
- REX® Regulator adjustment tools P/N 540-550 and 540-552 (in Tool Kit P/N 525-768 Included with Helmet) or 2 ea. 13/16" open ended wrenches
- 7/16" and 1 1/16" Open end wrenches
- #1 Phillips Head Screwdriver
- Slip Joint Pliers and a cloth

- 1) Remove the chin strap by removing the screws that secure it.



- 2) Remove the two snap tabs adjacent to the swing catch assembly.



3) Remove the screws that secure the whisker to the port retainer. Take care not to lose the whisker spacers and the zinc anodes. If the helmet has no anodes (standard on stainless steel helmets since late 2012) it will have kidney plates on the whiskers.



NOTE: That the bottom two nuts attach on the exterior of the pod, while the remaining nuts attach on the interior of the pod.

8) Loosen the screws that secure the pod to the helmet shell gradually in a staggered pattern. This is much easier to do if you loosen the regulator mount nut so that the regulator is free to turn and allows access to the mounting screws.



4) Remove the bent tube assembly as per "1.1.2 Removal of the Bent Tube Assembly" on page BNT-1.

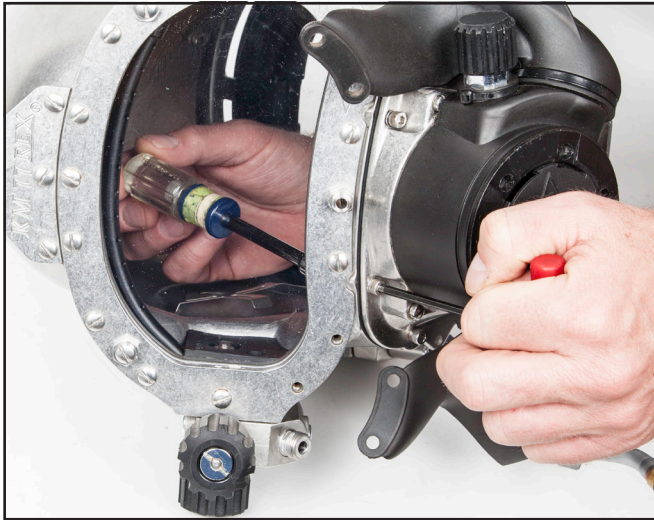
5) Remove the nose block device as per "1.2.1 Nose Block Assembly Removal" on page FCPRT-5.

6) Remove the communication module from the helmet per "1.3.3 Removal of Communications Assembly" on page COM-3.

7) Remove the oral nasal mask by pulling it off the regulator mount nut.



Loosen the regulator for easier removal of the pod screw.



9) Separate the pod/regulator assembly from the helmet assembly.



10) Discard gasket and lock nuts and set aside the screws and washers for conversion process.

Converting a KM 77 into a KM 97 requires installing different components not found on the KM 77. These include:

- Regulator Mount Pod, 350
- Bent Tube
- Oral Nasal Mask
- Whisker Wings
- Regulator Mount Nut plus O-ring
- 455 Balanced Regulator

1.2 Installing the 455 Balanced Regulator

1.2.1 Installing Regulator Mount Pod, 350

Tools Required:

- Socket Wrench, Regulator Mount Nut, P/N 525-625 (in Tool Kit Included with Helmet) or a 1 3/8" Socket
- Torque Wrench with 3/8" Drive Extension, Minimum 3" in Length
- Flat Blade Torque Screwdriver
- 7/8" Open End Wrench
- 7/8" and 1 1/16" Open End Attachments
- 3/8" Nut Driver or 3/8" Open End Wrench
- 5/32" Hex Key (Ball End is Helpful)
- #1 Phillips Head Screwdriver
- Christo-Lube® or equivalent
- Loctite® 248 thread locker or equivalent

1) Locate the screws and washers that were used to secure the Rex Pod and set aside along with the lock nuts found in the conversion kit.

2) Use the new gasket from the conversation kit to install onto the Regulator Mount Pod, 350. Make sure that the ridge on the gasket is properly seated in the groove in the pod.



NOTE: Thread all of these screws through the gasket slowly so as not to damage the holes in the gasket with possible sharp edges of the thread. These holes have small sealing rings molded around them to seal the threads to the holes in the metal parts. It is **recommended to thread the screws** through the gasket rather than push it through.

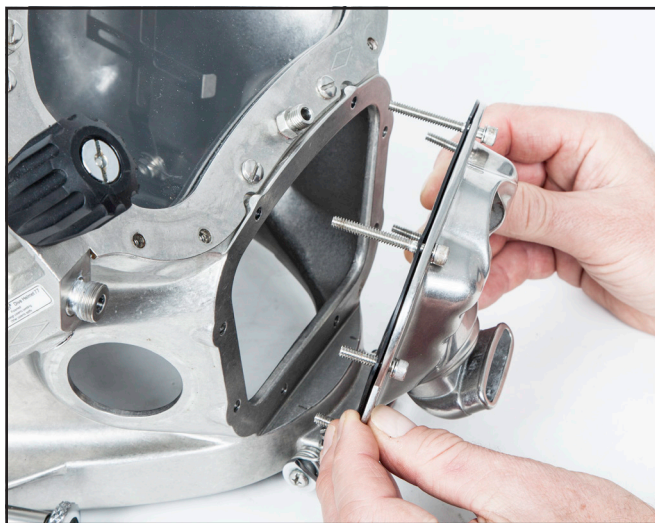
The two **long screws** are installed in the **top two holes** of the pod and the two bottom screws are secured in the **opposite orientation** of the rest of the screws used (lock nuts are on the outside of the pod).

There is a washer on each side of the pod; the thinner washer is used on the outside of the pod and the thicker washer on the inside of the pod.

3) Thread all of the Allen screws and washers through the pod and gasket, **with the exception of the bottom two, do not insert the two bottom screws.** *The screws will help to align the pod and gasket to the helmet.*



4) Mate the pod to the helmet shell.



5) Install the remaining two bottom screws, washers and nuts. Run all the nuts up until they are finger tight. Except the two bottom screws all of the nuts are positioned on the inside of the pod.



6) Using the hex key and/or wrench along with the nut driver, tighten the nuts gradually in a staggered pattern, such as the one shown. The lock nuts should be tightened to the point where the gasket can be seen just barely starting to extrude out from between the pod and shell.

1.2.2 Installation of the 455 Balanced Regulator

Tools Required:

- Torque Wrench
- Socket Wrench, Regulator Mount Nut, P/N

525-625 (in Tool Kit P/N 525-620—Included with Helmet) or 1 3/8" Socket

- 3/8" Drive Extension, Minimum 3" in Length
- 1/4" Flat Blade Torque Screwdriver
- 7/8" Open End Wrench
- 7/8" and 1 1/16" Open End Attachments
- #1 Phillips Head Screwdriver
- Loctite® 248 or equivalent medium strength thread locker
- Christo-Lube® or equivalent

Before beginning step 1 ensure the exhaust main body with attached whiskers is secured to the exhaust flange of the regulator body with the correct tie wrap. Use section "1.1.4 Quad Valve™ and Tri-Valve® Assembly Installation", in module QUAD beginning on page QUAD-7 as a reference guide.

1) Insert the opening on the exhaust main body onto the exhaust outlet of the water dump valve, while at the same time aligning and inserting the threaded mounting tube on the regulator, into the mounting hole on the pod.

2) Install the tie wrap around the quad main exhaust body and tighten. Cut and remove excess tie wrap. *This tie wrap can also be preinstalled prior to step 1.*



3) Install the sealing O-ring and regulator mount

nut. **DO NOT FULLY TIGHTEN THE NUT AT THIS TIME.**



1.2.3 Install Bent Tube Assembly

1) Lightly lubricate the bent tube O-ring at the regulator end of the bent tube, then install Teflon® O-ring at the side block end.



2) Push the O-ring end of the bent tube assembly into the regulator nipple tube. Slide it in until the side block end is aligned with the threads for the mount nut.

3) Be sure the new Teflon® washer is in place on the side block end of the bent tube, then engage the threads to the side block and hand tighten.



4) Start the “regulator to bent tube” mount nut onto the nipple tube of the demand regulator and run it up by hand as far as it will go.

NOTE: Run the mount nut up on the inlet nipple **HAND TIGHT ONLY**.

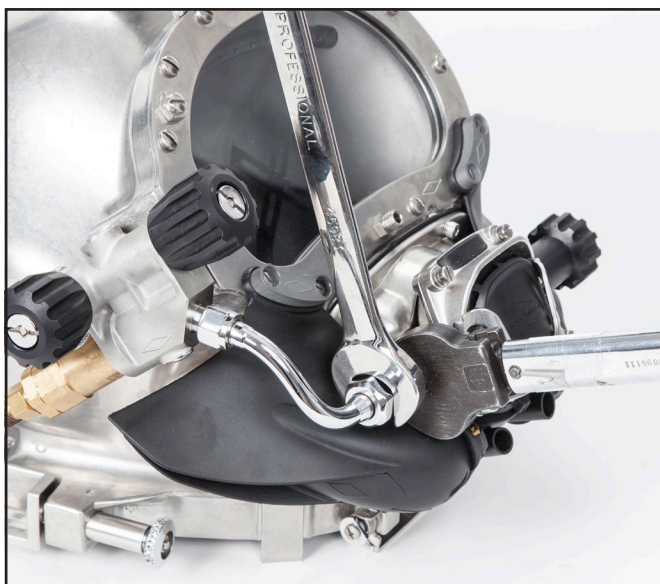
5) Using a torque wrench, tighten the bent tube assembly nut onto the side block to 100 inch lbs. Always reference "Torque Specs" starting on page APNDX-19 in our modular manual to confirm current correct torque.



6) Make certain the regulator end of the bent tube is threaded onto the regulator (nipple tube), by lightly applying torque to the hex nut on that end. When a small amount of resistance is felt, lock it into place with the jam nut.

7) Hold the hex on the bent tube with a wrench and tighten the jam nut against it with a torque

wrench to 40 inch lbs. Always reference “Torque Specs” beginning on page APNDX-19 in our modular manual to confirm current correct torque.

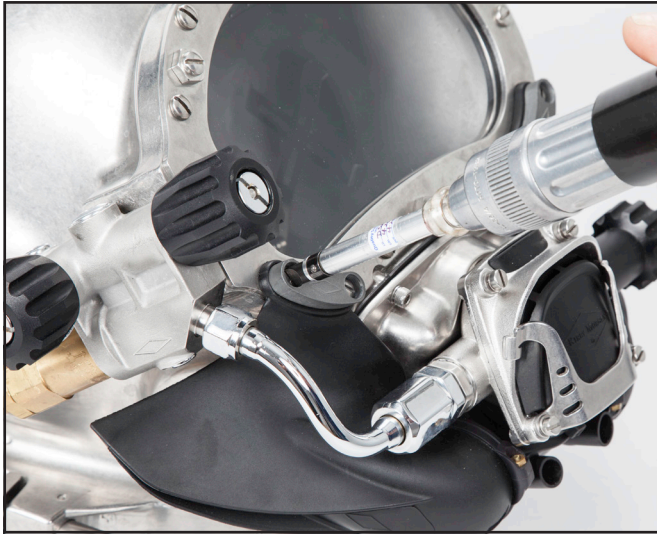


8) Use a torque wrench inside the helmet with a 1 3/8" socket (regulator mount tool P/N 525-625 found in the KMDSI tool kit P/N 525-363) and extension to tighten the regulator mount nut to 100 inch lbs. Always reference “Torque Specs” on page APNDX-19 in our modular manual to confirm current correct torque.



9) Attach the whisker to each side of the face port retainer using the screws, zinc anodes or kidney plates with spacers. Using a torque wrench with a flat blade screwdriver adapter, carefully torque

these screws to 15 inch lbs. Always reference "TorqueSpecs" starting on page APNDX-19 in our modular manual to confirm current correct torque.



1.2.4 Oral Nasal Mask and Microphone Installation

1) Snap the oral nasal over the regulator mount nut. Take extra care to make sure the mask has snapped into position all the way around the mount nut.

2) Reinstall the microphone and communications.



1.2.5 Nose Block Device Installation

1) Prior to reassembly, lubricate the two o-rings.

2) Slide the shaft through oral nasal mask in the helmet or mask shell.

3) Place both O-rings on the shaft, followed by the packing nut and the knob.

4) Tighten the packing nut until snug. Do not over tighten, as this will make it difficult to slide the nose block device in and out.



5) Hold the knob with the pliers, padded by a cloth or plastic cap, while tightening the padded end of the nose block inside the helmet with your hand.



1.2.6 Chin Strap Replacement

NOTE: The adjustment strap should pull toward the right side of the helmet when it is on your head.

- 1) Put Loctite® 248 on the screws that secure the tabs that hold the chin strap.
- 2) Install the two screws that hold the chin strap in position, using the two screws supplied with the chin strap replacement kit.
- 3) Tighten the screws with a torque screwdriver in accordance with the torque specification found in the correct Table (correct model) of the manual Appendix.

1.2.7 Head cushion snaps

- 1) Install the two snap tabs adjacent to the swing catch assembly.

1.3 Test the regulator for proper function

NOTE: When checking the regulator by depressing the purge button, the regulator may free flow without back pressure inside of the oral nasal. This is completely normal. Placing a finger or hand over the outlet tube of the regulator will prevent free flow. See "1.1.4 Adjusting the 455 Balanced Regulator" on page 455BAL-2 in module 455 Balanced Regulator for proper adjustment.

NOTE: For all maintenance and adjustment procedures, refer to the 455 Balanced Regulator module found in the "Manuals and Exploded Views" link under the "Support" link at www.kirbymorgan.com.

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