

DUI Drysuit Repair and Maintenance

Seminar Outline



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This repair manual is an adjunct to the DUI Repair Seminar presented at DEMA. It does not cover all possible repair methods. If you have not attended a DUI Repair Seminar you are encouraged to do so. Authorized DUI dealers are invited to participate in extensive hands-on training at the DUI factory in San Diego. If you have questions regarding procedures in this book or those not mentioned, please contact DUI Repair at 800-325-8439 or Repairs@DUI-Online.com.

Read All Materials Before Beginning

The solvents and glues used in repairing your drysuit should always be used in a well-ventilated area. MSDS (Material Safety Data Sheets) are available from DUI or from the manufacturer of the adhesive or solvent. Always follow manufacturer's directions when using glues or solvents.

DUI Glue - DANGER: contains Toluene and Methyl Ethyl Ketone. Use only in well ventilated areas. Keep away from heat and flame. Avoid prolonged contact with skin. If swallowed, do not induce vomiting. Call physician immediately. KEEP OUT OF REACH OF CHILDREN. WARNING: Using this product will expose you to Toluene, a chemical known to cause birth defects or other reproductive harm.

Cotol-240® - DANGER: CONTAINS TOLUENE. Use only in well-ventilated area. Keep away from heat and flame. Avoid prolonged contact with skin. If swallowed do not induce vomiting call physician immediately. KEEP OUT OF REACH OF CHILDREN. WARNING: Using this product will expose you to Toluene, a chemical known to cause birth defects or other reproductive harm.

Aquaseal® - CAUTION: contains Toluene. use only in well-ventilated area. Keep away from heat and flame. Avoid prolonged contact with skin. KEEP OUT OF REACH OF CHILDREN. Warning: Toluene is known to the State of California, based on laboratory tests, to cause birth defects or other reproductive harm.

Seal Cement (Repair kits) - DANGER: Contains Toluene and Methyl Ethyl Ketone. Use only in well-ventilated areas. Keep away from heat and flame. Avoid prolonged contact with skin. If swallowed, do not induce vomiting. Call physician immediately. KEEP OUT OF REACH OF CHILDREN. WARNING: Using this product will expose you to Toluene, a chemical known to cause birth defects or other reproductive harm.

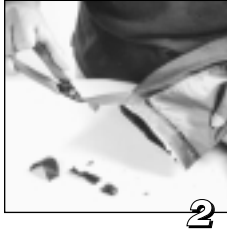
If you have any questions, call DUI at 800-325-8439 or e-mail at Repairs@DUI-Online.com before beginning.

NOTICE: Care must be taken to follow the instructions explicitly. Except for replacement of defective product DUI assumes no liability for damage to suit due to improper installation or other fault.

In cold weather, condensation can build up on the adhesives. Allow approximately 5 extra minutes for curing before bonding items together. Adhesive will be set and ready to bond when dry. To test this, run your finger along the adhesive. When using black glue or neoprene cement it will go from shiny to dull in color when ready to bond.

Solvent - DUI recommends the use of Cotal-240®. Use solvent sparingly. Never saturate material with solvent.

Remove and Replace Latex Wrist Seals



1. Using scissors cut the wrist seal off along the junction where the suit sleeve and seal meet. Do not cut the fabric of the drysuit. (You can use a hair dryer to remove the old wrist seal.)
2. If possible completely remove the old seal. This is the preferred method for installation. However, if time and situation do not permit, you can install the new seal over the existing one. After cutting old seal away from suit, sand the remaining portion. Clean with solvent.
3. Prepare two plugs to be used in sleeve ends for ease of wrist seal installation. You can use cardboard tubes, medium sized cans, small cylinders etc. to make plugs. Make sure the plug has no sharp edges which could damage suit.
4. Insert the sleeve plug down into the sleeve of the suit, letting the plug extend out two inches past the sleeve opening.
5. Using masking tape, tape one inch up from the end of the suit sleeve and tape the sleeve in place onto the plug.
6. Pull the seal into position over the plug until it overlaps the sleeve by one inch. This should be very close to the old seal position.





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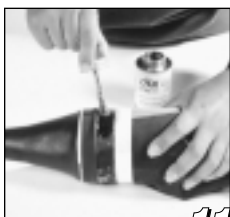


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7. Using masking tape, tape the seal into place one inch below the sleeve end of the suit.
8. Fold the seal back over itself one inch. This will now expose the surface gluing area.
9. Sand the exposed area of the seal which is approximately one inch. This is critical for good adhesion.
10. Clean the sanded area with solvent.
11. Apply three even coats of DUI glue to the sanded area of the seal and the exposed area of the sleeve. Allow a ten-minute curing time between the first and second coat and five minutes between the third coat.



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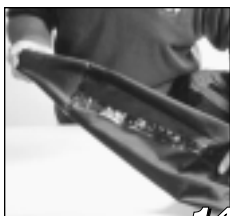


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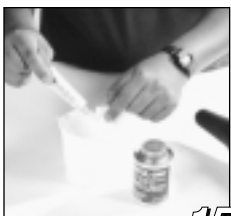


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12. Fold the seal back over the sleeve, joining the two areas where the adhesive has been applied.
13. Use a seam roller to apply an even pressure to the joined area.
14. Turn the sleeve inside out exposing the junction of the seal for sealing.
15. Seal by mixing one ounce of Aquaseal® and one ounce of Cotal-240® and apply two coats of the mixture around the INSIDE junction of the seal and suit. The coats should be 1/2" wide, 1/4" on the seal and 1/4" on the sleeve. Allow to dry for approximately 20 to 30 minutes.
16. Dust with unscented talcum powder.

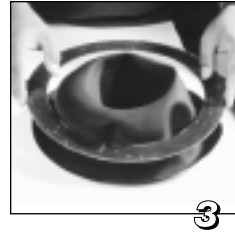


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Remove and Replace Latex Neck Seal



1. Turn the suit inside out. Using scissors cut the neck seal out of the suit along the junction of the seal and the suit. Do not cut the fabric of the drysuit. (You can also use a hair dryer to remove the seal.)
2. If possible completely remove the old seal. This is the preferred method for installation. However, if time and situation do not permit, you can install the new seal over the existing one. After cutting old seal away from suit, sand the remaining portion. Clean with solvent.
3. Turn the seal right side out (Note: the outside of the seal has raised ridges/trim lines) hold the seal by the neck opening and lay on a flat surface. Press the installation ring into place.



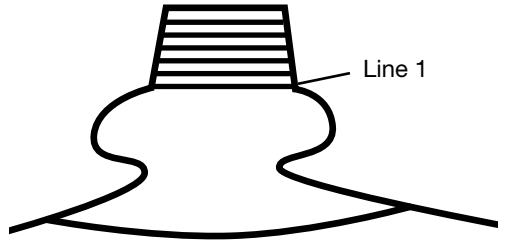
4. Turn the seal and installation ring over to expose the bottom of the seal. Sand around the base of the seal width of the ring which is approximately one inch. This is critical for good adhesion. Clean the sanded area with solvent.
5. Apply three even coats of DUI glue to the sanded area of the seal and the exposes area of the neck opening. Allow a ten-minute curing time between the first and second coats and five minutes between the third coat.



6. Starting on one side press the seal in place and slowly work your way around.
7. Use a seam roller to apply an even pressure to the joined area.
8. Peel up the installation ring and roll again.
9. Seal by mixing one ounce of Aquaseal® and one ounce of Cotol-240® and apply two coats of the mixture around the junction of the seal and suit on the INSIDE. The coats should be 1/2" wide, 1/4" on the seal and 1/4" on the sleeve. Allow to dry for approximately 20 to 30 minutes.
10. Dust with unscented talcum powder.

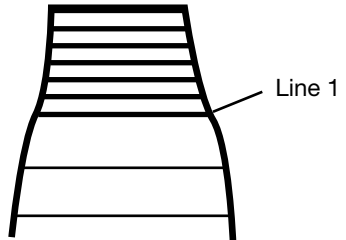
Seal Trim Suggestions

Trim Line	Neck (in)	Neck (mm)
Trim Line 11	11 1/8	283
Trim Line 10	11 3/4	298
Trim Line 9	12 3/8	314
Trim Line 8	13	330
Trim Line 7	13 7/8	352
Trim Line 6	14 1/2	368
Trim Line 5	15	381
Trim Line 4	15 5/8	397
Trim Line 3	16 1/8	410
Trim Line 2	17	432
Trim Line 1	18	457



Note: If your latex seals are not new with 11 trimlines on the neck and 10 trimlines on the wrist contact customer service at DUI for assistance.

Trim Line	Wrist (in)	Wrist (mm)
Trim Line 10	4 1/2	114
Trim Line 9	5	127
Trim Line 8	5 3/8	137
Trim Line 7	5 7/8	149
Trim Line 6	6 3/8	162
Trim Line 5	6 7/8	175
Trim Line 4	7 3/8	187
Trim Line 3	7 7/8	200
Trim Line 2	8 5/8	219
Trim Line 1	8 7/8	225



Latex neck and wrist seals are trimmed to fit to provide a comfortable water-tight seal. Latex seals are tapered and have a series of trim lines (small raised lines running around the outside surface of the seal.) The trim lines start at the seal opening and each line gets progressively bigger. These lines can be used as a guide when trimming the seals to keep the line even. A

good pair of scissors is needed to make smooth cuts. Use the Seal Sizing Table to determine the best starting point for you.

Start by measuring the circumference of your neck and wrists and compare these measurements to the Seal Sizing Table. This will establish a starting point. If your wrists are different sizes you can trim each seal to match each wrist.

Try on the seal (it isn't necessary to put the entire drysuit on to try the neck seal.) For the neck seal, position the seal as low on your neck as possible. It should be snug, but not tight. If you are new to drysuit diving, a snug neck seal may feel a bit uncomfortable out of the water. Once in the water, a properly trimmed neck seal is comfortable.

Wrist seals should be worn just above the wrist bone. They should be snug but not tight and should not restrict blood flow to the hands. If you experience tingling hands trim seals further.

If this is the first time you have trimmed seals and you are concerned about over trimming the seals, start by moving down one size than shown on the Seal Sizing Table. If the table recommends trimming at line 5, start by trimming at line 6 and check the fit. If the seal is overly snug you may want make an additional trim between lines 5 and 6. Trim in small steps and it is difficult to over-trim.

Testing Procedures

TO TEST DRYsuit RIGHT SIDE OUT

1. Stop off the wrist seals with either soup cans or something tapered approximately the diameter of a soup can. Tie cans off with soft strips of material. An old T-shirt cut into strips works well. ***Using anything like cord or nylon straps will cut the latex seal.*** In some cases one can also use masking tape or plastic electrician's tape wrapped around several times very tightly.
2. Close the waterproof zipper.
3. Close the exhaust valve all the way.
4. Again using something that is tapered, put a small bucket or one-gallon juice can in the neck seal. Tie off with soft strips of material. Again an old T-shirt cut into strips works well. In some cases one can also use masking tape or plastic electrician's tape wrapped around several times very tightly.
5. Attach the suit inflation hose to the inflator valve.
6. When pressurizing the suit one must be careful and watch that the cans and seals don't come out. (Tapered pails like those used by children in a sandbox works very well when put in upside down.)

7. Pressurize the suit until the exhaust valve begins to leak. Then spray the suit down with a mixture of soapy water. We use dishwashing detergent diluted roughly 1-10. Locate the leaks and mark with chalk or a piece of bar soap—something that can be cleaned off afterwards.
8. The patches or application of Aquaseal® should be placed on the inside of the suit, not the outside. This way the patches are hidden and are not subject to outside abrasion.

TO TEST DRY SUIT INSIDE OUT

This method is the best at finding leaks in the seams of any TLS or fabric style drysuit. Also if the drysuit still has a leak and it was not located testing right side out, this should find it.

1. Close the exhaust valve and turn the suit inside out.
2. Stop off the wrist seals with either soup cans or something tapered approximately the diameter of a soup can. Tie cans off with soft strips of material. An old T-shirt cut into strips works well. **Using anything like cord or nylon straps will cut the latex seal.** In some cases one can also use masking tape or plastic electrician's tape wrapped around several times very tightly.
3. Close the waterproof zipper by reaching your arm down through the neck seal. Drop the scuba regulator inside the neck seal and tie off the neck seal around the hose using strips taken from an old T-shirt. Wrap several times tightly and then tie in a knot.
4. Pull the regulator up into the neck seal and depress the button on the regulator to inflate the suit. This creates the pressure gradient from the outside of the suit going to the inside of the suit.
5. Then spray the suit down with a mixture of soapy water. We use dishwashing detergent diluted roughly 1-10. Locate the leaks and mark with a white soft-lead pencil or a piece of bar soap—something that can be cleaned off afterwards.
6. Rinse with fresh water to remove soap.

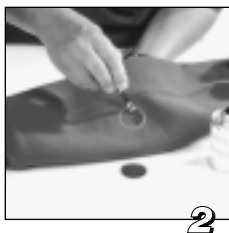
Patching Leaks

Leaks can be patched two ways. The first is with a material overpatch. This method is more time consuming but has a neater appearance when completed. The second method is using a sealant mixture. This method is a little quicker and easier and great for puncture repairs.

MATERIAL PATCH

1. Locate and mark where the leak is. (If on a CF200 suit, glue the tear together before sealing patch.) Lay the suit inside out and on a flat surface. With scissors cut a patch of material $\frac{1}{2}$ " to $\frac{3}{4}$ " larger than the area marked.

2. On a fabric suit apply two coats of DUI glue to the marked area and to the patch. On a neoprene style suit apply three coats of DUI glue or neoprene glue to the marked area and to the patch. In both cases, allow 5 minutes between coats to dry.



3. Apply the patch to the suit, pressing it down as you move across the area insuring that you do not trap air under the patch. Using a seam roller, apply even pressure over the patch.
4. Seal by mixing $\frac{1}{2}$ ounce of Aquaseal® and $\frac{1}{2}$ ounce of Cotel-240® and apply two coats of the mixture to the edges of the patch. Allow to dry for approximately 20 to 30 minutes.



SEALANT PATCH

1. Locate and mark where the leak is. Lay the suit inside out and on a flat surface.
2. Seal by mixing $\frac{1}{2}$ ounce of Aquaseal® and $\frac{1}{2}$ ounce of Cotel-240® and apply two coats of the mixture approximately one inch around the marked area. Allow to dry for approximately 20 to 30 minutes.

Kneepad Mounting Instructions

1. Thoroughly clean the area of your suit with solvent where glue will be applied.
2. Get into your suit.
3. Mark the center of your knee. Place your kneepad where it will cover the largest wear area for you. The kneepad is generally centered on the knee.
4. Draw around your kneepads with chalk.
5. Remove your suit.
6. Lay your suit on a flat surface or table and redraw around the kneepads.
7. Draw another line one inch inside the first line. This should give you a one-inch wide band the shape of the kneepads. Mark the back of the kneepads with a one-inch wide band around the entire edge.

8. Inside the one-inch wide band on the kneepads and on your suit, paint three coats of black glue (neoprene glue), allowing 5 minutes between coats. Be sure the coats are well brushed into the rubber and cover the entire band area. When the last coat is tacky (about 3-4 minutes), press the accessory into place. Press down hard being careful to leave no wrinkles. Use a seam roller to apply even pressure to the joined area.

Accessory Pocket Mounting Instructions

1. Clean the area of your suit thoroughly where glue will be applied with solvent.
2. Get into your suit. If you have a two-piece wetsuit, be sure to don the jacket.
3. Mark the place where the pocket is most comfortable for you to use. The recommended place is on the front or outside thigh area between the knee and hip. If you have a jacket, be sure the jacket does not cover the pocket. The top of the pocket should be approximately at the level of the crotch of the suit.
4. Draw around the pocket with chalk. If necessary, have a friend draw around the pocket while holding it in place.
5. Remove your suit.
6. Lay your suit on a flat surface or table and redraw around the pocket.
7. Draw another line one inch inside the first line. This should give you a one-inch wide band the shape of the pocket. Mark the back of the pocket with a one-inch wide band around the entire edge.
8. Inside the one-inch wide band on the pocket and on your suit, paint three coats of black glue (neoprene glue) allowing 5 minutes between coats. Be sure the coats are well brushed into the rubber and cover the entire band area. When the last coat is tacky (3-4 minutes), press the accessory into place. Press down hard being careful to leave no wrinkles. Use a seam roller to apply an even pressure to the joined area.

NOTICE: Care must be taken to follow the above instructions explicitly. This accessory will be replaced if defective in manufacture, labeling, or packaging. Except for such replacement, DUI assumes no liability for damage to suit due to improper installation or other fault.

Apeks Drysuit Inflation Valves

If valve area is leaking, unscrew the valve and apply a small portion of silicon sealant to the base of the valve and reseal valve.

Apeks valves are virtually maintenance free. The valves should be rinsed in fresh water after use and then the remaining water gently shaken off.

If the valves are not working properly, replace the valves.

Repair Parts

ITEM	SUGGESTED RETAIL
<input type="checkbox"/> Inlet Valve	\$80.00
<input type="checkbox"/> Exhaust Valve	\$72.00
<input type="checkbox"/> Inflator Hose 36"	\$64.00
<input type="checkbox"/> Neck Seal Installation Rings	\$30.00
<input type="checkbox"/> 1 Seam Roller	\$50.00
<input type="checkbox"/> 1 Flush Cutter	\$40.00
<input type="checkbox"/> DUI Glue, 4 oz. can	\$20.00 (Fabric style suits)*
<input type="checkbox"/> Neoprene Glue, 4 oz. can	\$20.00 (CF series suits)*
<input type="checkbox"/> Cotal®, 4 oz. can	\$20.00*
<input type="checkbox"/> Aquaseal®, 1 oz. tube	\$10.00*
<input type="checkbox"/> Zipper Ease	\$5.00
<input type="checkbox"/> Necklace	\$10.00
* Hazardous material fee-shipping.	\$15.00

Uninstalled Drysuit Accessories

ITEM	SUGGESTED RETAIL
<input type="checkbox"/> CF200™ Knee pads (13.5" x 5.5")	\$40.00
<input type="checkbox"/> CF200™ Knee pads, extra long (17.5" x 5.5")	\$50.00
<input type="checkbox"/> CF200™ Elbow Pads (5" x 7")	\$40.00
<input type="checkbox"/> Kevlar® Knee pads (13.5" x 5.5")	\$60.00
<input type="checkbox"/> Kevlar® Knee pads, extra long (17.5" x 5.5")	\$75.00
<input type="checkbox"/> Kevlar® Elbow Pads (5" x 7")	\$40.00
<input type="checkbox"/> Warm Neck Collar	\$40.00
<input type="checkbox"/> Zipper Guard (For old style CF200 drysuits)	\$48.00
<input type="checkbox"/> Cordura® Zipper Pocket with D-ring	\$60.00
<input type="checkbox"/> Small Cordura® Zipper Pocket with D-ring	\$60.00
<input type="checkbox"/> Cordura® Zipper Pocket with Knife Sheath	\$80.00
<input type="checkbox"/> Large Knife Pocket	\$50.00
<input type="checkbox"/> Medium Knife Pocket	\$50.00
<input type="checkbox"/> Small Knife Pocket	\$40.00
<input type="checkbox"/> Folding Knife Pocket	\$36.00
<input type="checkbox"/> Standard Neoprene Utility Pocket	\$52.00
<input type="checkbox"/> Small Utility Pocket	\$52.00
<input type="checkbox"/> Standard Cordura® Bellows Pocket with D-ring	\$50.00
<input type="checkbox"/> Small Cordura® Bellows Pocket with D-ring	\$50.00
<input type="checkbox"/> Reflective Tape, per foot	\$35.00
<input type="checkbox"/> Latex Hood	\$75.00
<input type="checkbox"/> Extreme Exposure Balance P-valve	\$150.00

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