

KAYAK MAINTENANCE and REPAIR

Southern Nevada Paddling Club

I. INTERIOR SECTION MAINTENANCE & REPAIRS – Fiberglass and Kevlar

A. Bulkhead Caulking

1. Remove all old caulking (clean and repair one side at a time). Clean surface with scraper, sand paper, and alcohol.
2. Recommend using 3M Marine Adhesive Sealant 5200 (10 fl oz) to seal bulkhead. Use a caulking gun and apply in sections of approximately four (4) to six (6) inches. Adhesive cold flows, rotate hull to control direction of flow. When first section is stable complete caulking of the next section. This material takes approximately 48 hrs to completely cure.
3. When the first side has cured then repair the opposite side of the Bulkhead.

B. Rudder Cables

1. Apply a light coating of Tri-Flow dry lubricant to areas of the cable that makes contact with metal parts or cable channels (do not use a silicone base lubricant).

C. Foot Pedals and Rails

1. Use masking tape and tape a double thick layer of paper towel on the hull under each end of the Foot Pedal/Slide Bar and Track. This will catch dirt and oil drops that may run off metal parts.
2. Remove Foot Pedal/Slide Bar from Track – clean both with steel brush or stiff brush. Wipe Track and slide bar with paper towel or cloth. **Caution:** metal parts may have sharp edges.
3. Use emery paper or small mill file to remove sharp edges and burrs from Foot Pedal/Slide Bar and Track.
4. Clean the Track groves with a dry Q-tip.
5. Spray a Q-Tip with a small amount of Tri-Flow. Then wipe each grove in the Track. This will remove additional dirt from the Track. Do not spray Tri-Flow directly into the Track
6. Spray the foot pedal/slide - back, front and edges with a thin film of Tri-Flow dry lubricant. Spread lubricant over metal surfaces with a piece of paper towel.
7. Insert Foot Pedal/Slide Bar into the Track. Move Foot Pedal/Slide Bar back-and-forth in theTrack to spread lubricant.

D. Hanging Seat

1. Remove seat and inspect screw holes. If holes are elliptical there are two methods for repair.
 - a) First method – Clean and fill hole with an epoxy patch, and then redrill the hole.
 - b) Second method - Drill a new mounting hole in a different place. This may move the center of gravity a small amount

II. EXTERIOR MAINTENANCE & REPAIRS – Fiberglass and Kevlar

A. Rudder Assembly

1. Use a wrench and screwdriver to remove rudder from mount.
2. Clean assembly parts. Use emery paper or small mill file to remove sharp edges and burrs from Rudder parts.
3. Apply Tri-Flow dry lubricant to metal parts that make metal-to-metal contact.
4. Replace all worn parts and screws with manufactures approved parts.
5. Then reassemble.

E. Hatch Covers

1. Cleaning - Use a mild soap and water to clean hatch cover/gasket and around lip of hatch (coaming).
2. Spray “303 Protectant” on all rubber or neoprene hatch covers.
3. If you are replacing rubber gaskets – contact manufacture for materials and guidance.

II. REQUIRED REPAIR TOOLS AND MATERIALS

1. 3M 2090 Masking tape, ¾ inch wide – none drying tape, blue color. (Source: Home Depot).
2. Emery Paper
3. Mill File (fine tooth file)
4. Q-Tips
5. Screw Drivers, as required

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6. Wrenches, as required
7. Tri-Flow lubricant. Sources: Hardware and Auto Parts stores.
8. 3M Marine Adhesive Sealant 5200, 10 fl oz tube. (Source: Home Depot).
9. Caulking Gun
10. 303 Protectant (303 Protectant Inc. Paleo Cedro, CA). Source: Great Basin Outdoors & REI.
11. Rubber Gloves.

III. **EXTERIOR HULL REPAIRS - Fiberglass and Kevlar**

This section is limited to Gelcoat repairs (surface and cosmetic) and will not cover extensive repair of hull penetration or fracture of Fiberglass or Kevlar materials. Contact kayak manufacture for guidance on all major repairs.

A. **Kayak Hull Repair – Fiberglass and Kevlar**

Gelcoat repair can be accomplished with a minimum of materials and tools. It does however require that specific procedures be followed. The following material can be used in surface repair of Gelcoat.

1. **Kits and Repair Materials**

Epoxy Patch Kit (select one type)

- a) Evercoat® Marine “Match and Patch”, Gelcoat Repair Kit, No. 668. Source: West Marine. Includes 6 color pigments.
- b) Sea Fit, Gelcoat Repair Kit, SEAFI No. 105192 (model # 140251). Source: West Marine. Includes 6 color pigments.
- c) Marine-Tex, Mfg: Travaco. Trvco # 133884 (model # 140251). Source: West Marine plus Marine and Auto Parts stores.

Most repair kits come with instructions for mixing the epoxy resin and hardener (catalyst) – use rubber gloves when handling materials. **Follow the health warnings; these materials can cause skin and eye irritation plus respiratory irritation.**

2. **Repair Materials**

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| <ol style="list-style-type: none">a) Squeegeeb) Sandpaper, 320, 380, 400, 600-grit.c) Backing pad for sandpaperd) Rubbing compounde) Clear plastic sheetf) Masking tape, ¾ or 1 inch wide. | <ol style="list-style-type: none">g) Spatula (Ice cream stick), for mixing and applying material.h) Alcohol, Denaturedi) Plastic coffee can lid or similar material.j) Rubber Gloves.k) Dust mask, good quality |
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4. **Gelcoat Repair**

A. **Surface Preparation**

1. Remove any cracked or flaking gel material.
2. Lightly sand repair area to remove fading and oxidized materials. Use a good quality dust mask during all sanding projects.
3. Bevel edge of scratch or gouge to improve adhesion of repair epoxy patch.
4. Clean the patch area with Denatured Alcohol. Be careful not to touch work area with bare hands.

B. **Epoxy Blend and Color Test**

1. Use a plastic coffee can lid or similar plastic piece to mix epoxy material on.
2. Place a suitable amount of epoxy and hardener on plastic surface and mix. Be sure to completely mix all materials.
3. Separate the mixed epoxy material into three equal parts. You must do the following steps rapidly.
 - a) Apply the colored pigment onto one sample section. Add **pigment** until color match appears to be correct. Mix completely. Spread out one edge of the sample until it is thin. Clean spatula.
 - b) On the second test sample section apply **20 percent** more **pigment** than the first test sample. Mix completely. Spread out one edge of the sample until it is thin. Clean spatula
 - c) Leave the third sample section without any pigment.
4. Allow all test samples to cure. Every few minutes test all epoxy samples for the following:
 - a) The usable work time.
 - b) The cure time.

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5. After the samples have completely cured.
 - a) Check the unpigmented sample for hardness and flexibility. It should be hard and brittle.
 - b) The first pigmented test sample should also be hard and brittle. You may find that the color sample may have very little color in the thin section of the sample.
 - c) The second pigmented test sample should also be hard and brittle. You will find that the color sample will have improved color density in the thin section of the sample. If the sample is soft and flexible then there is too much pigment or not enough hardener in the epoxy.

Note:

1. The above test requires constant attention until you can determine usable work times and material mix ratios.
2. Ambient temperature, humidity, and amount of material in each batch will affect the cure times of the epoxy.
3. Follow all the manufactures safety and health procedures during the above tests and repair procedures.

C. Epoxy Hull Repair

After you have identified the epoxy mix and color ratio; mix a suitable amount of material to perform the hull repair. You will have approximately 5 to 10 minutes to complete all work before the epoxy starts to setup.

- Apply a thin layer of epoxy into the damaged area that is to be repaired.
- Place a clear thin plastic sheet over the epoxy patch material.
- Spread the epoxy material that is under the plastic sheet with a squeegee. Run the squeegee along the line of the scratch or at a 45-degree angle, not across the scratch.
- Use masking tape to hold down the plastic sheet until epoxy has cured.

D. Patch Finish

Caution: avoid breathing the sanding dust. Use a Mask. Peel off the plastic sheet.

- If required sand patch area using 320 to 380-grit paper with a backing pad.
- Next sand with 400-grit paper and backing pad to remove scratches.
- Finally sand with 600-grit paper with backing pad.
- Use rubbing compound to finish surface.
- Use a good quality marine Wax/Polish. Polish as needed.

IV. KAYAK USEFUL TIPS - Fiberglass and Kevlar

A. Storage Tips

1. Store kayak in garage or under a cover to reduce UV damage to hull and deck rigging.
2. When storing kayak remove or release pressure all hatch covers to allow moisture in compartments to escape.
3. Place kayak on a form fitting hull cradle or suspend on web belts, 2 inches wide. Place cradle or belts at or near Bulkhead area.
4. Storing kayaks on side of hull also works well.

B. Transport Tips

1. Do not tighten holding straps excessively. This can cause Gelcoat cracking and excessive pressure on fiberglass or Kevlar reinforcing materials may cause delamination.
2. Use a bowline tied to car bumper or other car part to reduce bow lifting. On long kayaks also use a stern line to prevent kayak rocking to reduce hull damage.
3. During long trips do not tighten hatch covers firmly, allow internal compartments to breathe and release excess pressure.

V. POLYETHYLENE PLASTIC KAYAK HULL REPAIR

This section is also limited to surface repair and maintenance of plastic hulls. Hull penetration repairs should be performed by the manufacture.

A. Hull Surface Blemishes

Removal of surface blemishes such as plastic hairs and scratch ridges – these can be removed by a safety razor or small wood plane. Lightly sand with 600-grit Sandpaper if needed.

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B. Hull Deformation

1. **Hull Dents** - Remove hull dents by heating area with a heat lamp or hair dryer gun, then press on inside of hull to return hull to original shape. **Caution:** do not over heat hull surface. A small beanbag or sandbag placed on inside of dented area while heating outside of hull also works.
2. **Hogged** – Remove reversed hull curve (Hogged Hull) by hanging kayak by its carrying handles with hull side down. Works best during hot summer days.

VI. KAYAK USEFUL TIPS - Polyethylene Plastic

A. Storage and Tips

1. Store kayak in garage or under a cover to reduce UV damage to hull and deck rigging.
2. When storing kayak remove or release pressure all hatch covers to allow moisture in compartments to escape.
3. Place kayak on a form fitting hull cradle or suspend on web belts, 1 to 2 inches wide. Place cradle or belts at or near Bulkhead area.
4. Storing kayaks on side of hull or on the top deck for plastic boats reduces hogging and denting of hull.
5. Manufacturers often store plastic kayaks by standing them on end.

B. Transport Tips

1. Do not tighten holding straps excessively. Can deform hull and change Tracking, especially in summer.
2. Use a bowline tied to car bumper or other car part to reduce bow lifting. On long kayaks also use a stern line to prevent kayak rocking this can reduce hull damage. Do not pull down excessively on lines, which may cause hogging.

VII. FIELD EMERGENCY REPAIR - Fiberglass, Kevlar and Plastic

1. **Pierced Hull** – Duct Tape or Epoxy putty stick on inside and outside of hull.
2. **Rudder Cable breakage** – Several methods. Splice short section of cable into rudder cable using material from emergency kit.
 - a) Use a short piece of rope to join broke cable.
 - b) Replace the broken cable using material from emergency kit.
3. **Rudder Assembly** – Use Nuts and bolts from emergency kit.

VIII. EMERGENCY REPAIR KIT

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| <ol style="list-style-type: none">1. Duct Tape and Epoxy stick or putty.2. Alcohol swabs - prepackaged3. Spare screws, washer's nuts and bolts.4. Screw drivers – Phillips and common blades.5. Vice-grip pliers and common pliers6. Multitool knife7. Spare rudder cable and swages. | <ol style="list-style-type: none">8. Rudder Cable cutting tool.9. Bungee cord10. Galvanized wire11. Adjustable wrenches or set of open end wrenches12. Rope, ¼ or 3/8 inch, 20 ft long.13. Sand Paper – 320 or 380 grit14. Sharp Knife. |
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IX. EXTERIOR HULL REPAIRS - Wood

Some of the above repair and maintenance procedure may also work for wood hulls. This document has no specific guidance for wood hull repair.

General Notes:

1. Inspection procedures are provided in the Southern Nevada Paddling Club's "KAYAK INSPECTION and MAINTENANCE" Document.
2. Great Book for Repair and Maintenance for most outdoor equipment: The **Essential Outdoor Gear Manual**, Annie Getchell, Ragged Mountain Press.
3. When in doubt about maintenance or repairs procedures contact the manufacture for guidance.