

How To Install A Rudder

Installing a Rudder on a Sit-inside Kayak and Using a Gudgeon



This article is meant as an over-view and not intended to be a step-by-step instructions. Rudder Kits come with instructions. Some rudder parts come with instructions.

By reading this you will gain an understanding of what a rudder installation will entail, as well as what tools and skills may be needed.

Much of this information can be applicable to rudder system repair of both sit-in and sit-on kayaks. You will find a wealth of information in our [Kayak Artiles Index](#).

Some kayaks are designed with a rudder in mind. Other kayaks are not. A rudder is often an option - much like power steering on a car was an option many years ago.

There are quite a few recreational kayakers, and some touring kayakers, that were never designed to accept a rudder. Part of what is covered here will address a custom install of a generic rudder gudgeon (aka rudder bracket) on such a kayak.



Most rudder kits are made with a sit-inside kayak in mind. The basic design of sit-in kayaks is more or less the same for the vast majority of models. This makes it fairly easy to apply the components of a rudder kit of one brand sit-in to a variety of other sit-in kayak brands.

Rudder kits are not absolutely universal however. There can be considerable variation. When ever possible select the rudder kit made specifically for your make and model of kayak. (Quite a few kits fit a whole range of models within a single brand or brand family.)

Rudder Bracket

See a variety of rudder gudgeons & brackets [here in the TopKayaker Shop](#)

The primary difference between one brand of rudder bracket, and model to model, is often the shape of the stern. The rudder assembly needs to hang from a rudder bracket, commonly referred to as a **gudgeon**.

One can use the word bracket or gudgeon interchangeably. This bracket must fit the shape of the stern. Most sterns are pointed. Many are flattened. A small number are rounded. There are of course odd shape kayaks as well as slope end sterns.

Some of these kayaks will have nuts molded in the stern to be used to mount the gudgeon with screws. The screw holes on the bracket and nuts in the hull must line up.

Other kayaks may require drilling screw holes, and in some cases may need inside access for a wrench.

Some kayaks have a rudder bracket pre-molded on the stern.

(See link to ["How to install a rudder on a Sit-on-top"](#) for info about sterns pre-molded as a rudder gudgeon, no bracket needed.)

Select a rudder kit that is made specifically for your make and model of kayak. It will contain a gudgeon appropriate for the kayak in question. Kayaks with a stern pre-molded to accept the rudder pin will not have a bracket.

Many kayaks, both new and old, were never planned to have a rudder. It is possible for these kayaks to accept a rudder with some creative planning and careful workmanship. The first step is to identify a rudder bracket that will fit the stern of your kayak. There is a good chance that a ready-made "off the shelf" gudgeon will match up to your boat. If not, you have to custom fabricate one.

Rudder Assembly

Assuming your kayak was not planned to accommodate a rudder, it is best to have the rudder bracket (or a selection of brackets) and the rudder assembly in hand while you are in the planning stages of a custom install.

Hold up the gudgeon and rudder to the stern and simulate the mounting, the full motion of the rudder, side to side and up and down, as well as the parked position on deck.

The rudder blade needs only to move slightly from side to side. 45% off the centerline should be enough. The rudder should hang plumb, or nearly so, with the rudder blade straight down, maximum surface area in the water. Being perfectly plumb is the ideal, but is not a deal breaker.

Once you are satisfied with the placement of the rudder assembly and the gudgeon you can mark the screw hole locations on the stern.

We will be showing a rudder gudgeon for pointed stern on this web page. It fits the most common stern shape, such as this Old Town Loon.

A rudder gudgeon for such a kayak will need to be screwed or riveted to the hull. In most cases with plastic kayaks, a coarse thread stainless steel pointed end screw will be best.

Be sure to pilot the screw holes, leaving the hole tight, so that the screw cuts threads into a plastic hull. For fiberglass it is best to drill holes more loosely for a screw and nut (reach inside), or rivet (no inside access needed).

Once the rudder assembly is hung on the gudgeon at the stern of the kayak, fasten the split ring to secure it. (Some rudders have a nut.) Then you can install the rudder cable tubes and lay out the lift line.

Cable Tubes

The rudder blade is controlled by means of cables that lead to the foot controls. These cables pass through tubes that guide the cables through the hull. Holes must be drilled for the cables to exit out the stern deck.

Some kayaks have bumps, or dips, molded on the deck, often called "frog eyes". Other kayaks do not have this feature. When drilling the holes on a smooth flat



deck surface, be sure to angle your drill through the deck. You do not want the tube, and cable inside, to take a dog-leg turn through the deck surface.

Cables should travel in as nearly a straight line as they can. It is often best to pilot this sharp angled hole with a much smaller drill bit first. Be sure that you drill a tightly fitting hole so there will be no leaking around the tube.

Personally I do not care for the use of rubber grommets or flaring the tube end with fire. I like to finish my tube exit with Rudder Tube Clamps. Be sure to match tube clamp diameter to tube diameter.

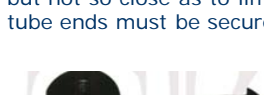
[Link right: Rudder Tube Clamps in the TopKayaker Shop](#)

The rudder cable tube will pass through the inside of the kayak and possibly through a bulkhead.

Rec kayaks typically do not have bulkheads, touring kayaks do. A bulkhead divides the cockpit from the cargo area. While this keeps cargo dry it is for safety. The air chamber creates buoyancy.

You will have to drill or punch holes through a foam, fiberglass or plastic bulkhead dividing wall, close to the rear cargo hatch will greatly help you. Make sure to secure the tube with Rudder Tube Clamps on the inside to hold the tubes against the side of the cargo area, out of the way.

The tubes will end in the cockpit forward of the seat, and aft of the foot braces. The tubes should be fairly close to the foot brace, but not so close as to limit the movement of the foot controls (more on that below). About 12 inches or so should be adequate. The tube ends must be secured with tube clamps in the cockpit. Trim excess with a sharp utility knife.



Lift Line

The rudder blade is lowered into the water from the cockpit using a lift line. The rudder blade is also raised out of the water with the same line. The next step is to lay out the lift line from the rudder assembly to the right hand side of the cockpit. (I suppose that left handed people might want it on the left side.)

The lifting line appears to be a double cord that ends in a loop at the cockpit, within easy reach of the paddler.

[Link left: Round Pad Eye Line Guide, 5 pack in The TopKayaker Shop](#)

While you could tie a rudder knot to finish the lift line I suggest using Rudder Bungee Turtles. Test the lift function before and after you lay-out the lift lines, do this seated when you have the line part way up the back deck. Avoid sharp turns in the path to the cockpit.

See details in the video link in resources below. [Link left: Rudder Bungee Turtles in The TopKayaker Shop](#)

Rudder Rest

The rudder blade must park properly when not in use. Usually this is on the deck, in a V-block, or slot molded into the deck surface. Carry handles and other deck features may inhibit this and might need to be repositioned.

Some rudder blades, such as those by Smart Track, park straight up, like an airplane tail fin. A bungee, and or hook, will secure the blade for transport and storage. The Smart Track and Sea-Lect rudder blades do not need a rudder rest or hook.

Foot Controls

Next step is the foot controls.

Inside the kayak's cockpit you will see the foot braces. The foot pegs are adjustable to fit leg length, usually using a trigger, on the back of the peg, or an adjustment wand.

There are typically 3 components to common rudder foot controls: foot peg, rail and track. For the purpose of this article track will be the U-channel mounted inside the kayak, rail will be "stick" that slides in the track and has multiple foot peg locations. The foot peg, or pedal, fastens to the rail and is adjustable upon it.

There are quite a number of variations out there, but this is the most common system. Smart Track and Necky (also Johnson, modern Ocean Kayak and Old Town) will not be addressed.

The original foot braces must be removed. This is a simple matter of a couple of screws on each side.

Mount the new foot control system following the instructions that come with the kit. In brief, mount the tracks using the original foot brace screw holes in the hull with the proper mounting hardware. Slide the rails onto the tracks; the rails will have the foot pegs on them.

The foot brace screw holes in the hull are standardized for the vast majority of kayak brands, all within a tiny fraction of an inch: 14 1/2 to 14 5/8 inches.

You might expect some minor variation; simply make all the holes slightly oval to accommodate tiny differences and seal with foot brace rubber washers and/or silicone as needed. Greater variations will require filling in of at least one hole per side (patching not covered here) with one new hole drilled per side.

Control Cables

Now that the rudder is in place, the foot controls, the tubes and lift lines installed you can connect the foot controls to the rudder with cables.

While using cordage is sometimes used steel cables are most common. Please note that stainless steel cables are required for kayaks.

Important: The cable you can get from your local hardware store is for picture hanging and is not rust proof, it will rot and decay in the tubes. Be sure to use **stainless steel cables** made for kayaks.

While there is variation from kayak brand to brand, as well as installer to installer, typically the process boils down to this:

Pass the cables through the tubes, back to front, leaving the eyelets out at the stern. Fasten the eyelet ends of the cables to the wings of the rudder using screws and nuts, or clevis pins and rings. The free end of the cable will be crimped to the foot controls inside the cockpit.

This can be approached in several ways, but the end result is the same. The two cables must be exactly the same length after crimping to the foot controls, and, the crimps must be squeezed hard enough as to never slip again.

Crimping is easier done outside the kayak, but you must prep inside the cockpit.

Carefully poke the foot brace rails on the track. The rails should be centered in the tracks, not placing out forward or back.

Slide two swages (aka crimps, ferules or swags) onto each cable. Two is better than one.

Slip on some shrink tube if you have it, it is optional.

Slip the cables onto the holes in the rails; you may have to drill this hole yourself. Tighten the loop like a noose.

Secure it with a bit of tape, but make sure the two cables are exactly the same length and that the tape is very secure.

Now you can slip the rail off the track and crimp the swags outside the kayak. It is OK to crimp inside the kayak if it is comfortable to do so. This may be preferable with a large open cockpit kayak.

Crimping is easy. However once you have crimped you cannot undo it, so double check before you squeeze!

You can use strong vice grips as your tool, but a **cable crimping and cutting tool** is best. If you plan to do a couple or few kayaks you should have that tool.

Squeeze really hard! You do not want the swag to ever come loose. Then cut the cable close to the swag with heavy wire cutters.

The 2nd swag can be used to cover the "prickly end" of the cable. When you do it right you do not need shrink tube. Shrink tube is shrunk with the heat from a heat gun, best, or the flame of a lighter... or a hair dryer that might not be quite hot enough, possibly slow.

Test your work

Slip the rails back onto the tracks and you are done.

Test the motion of the foot controls by hand first, while the kayak is elevated, and then on the floor with the rudder only partly down.

The next step is a shakedown cruise out on the water. This should be done in controlled conditions, like a cove, or pond, just in case there is a problem.

Tools Needed

The tools commonly needed are:

- Drill and assorted bits
- Tape measure
- Screw drivers and wrenches
- A rivet tool is needed if you use rivets
- Sharp utility knife to cut tube
- Scissors to cut rope and bungee
- Heavy Duty Vice Grips and Heavy Duty Wire Cutters. Bike cable cutters work very well. A Cable Crimper-Cutter is best for the job.
- Ice Pick or Awl
- Silicone adhesive sealant
- Heat gun, cigarette lighter or hair dryer

[Link to Rudder Cable Crimper-Cutter Tool at The TopKayaker Shop](#)

Extra Information

Some years ago most rudder kits were very model specific. Nowadays kayak companies make rudder kits to be "universal" within a single brand.

With the consolidation of many kayak brands under one roof, there is a standardization of parts and the rudder kits are made to address a wide range of kayaks within a family of several brands.

Rudder parts such as cables, tubes, and foot controls can be considered somewhat generic, and it is possible to take parts made from one brand and apply them to another.

Rudder brackets and rudder assemblies are not as generic, however a rudder assembly with a 3/8" diameter pin is extraordinarily common.

See all your rudder options in the TopKayaker [Rudders + Skegs Dept.](#)

Related Links & Articles:

Some helpful tools for kayak work are the Stanley Surform and a Marson HP-2 Hand Rivet Tool.

- Read this before you invest in a rudder: ["When To Get A Rudder And How To Use It"](#)
- For some additional information on the use of well-nuts please read: ["The Basics of Strap Eyes, Rivets & Well Nuts"](#)
- [How To Install A Rudder On A Sit-on-top Kayak](#)
- [The SealLine Smart Track Rudder System](#)
- [Kayak Rudder Cable Connection Options](#) Several ways to connect control cables to your rudder system.
- [Ocean Kayak Video part 1](#)
- [Ocean Kayak Video part 2](#)
- [Confluence Rudder Install Video part 1](#) (rudder mount, lift line, foot braces & control cables)
- [Confluence Rudder Install Video part 2](#) (rudder tubes)

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