NOTE: Read this for a full understanding of the Smart Track rudder sytems. See also: "When To Get A Rudder And How To Use It." We stock rudder kits for a variety of kayaks, including the SmartTrack System . Take a look at our full selection of kits and replacement rudder parts at The TopKayaker Shop - Rudders. Note: Click here for: Update to Cool Rudder Wedgies

REVIEW:

The SealLine SmartTrack Rudder System -

Fixed foot braces with rudder control by Tim Walsh of Paddler Supply - photos by or authorized by Tim Walsh

The nay sayers of rudders in the kayaking world have long argued rudder systems that require sliding foot braces to control the rudder sacrifice much needed energy and overall kayak control for the sake of a poorly executed turn. They have also lamented that rudders, due in part to their primitive design, create excess drag making for a wearier paddler at the days end.

The SealLine SmartTrack Control System, a system with solid foot braces and toe operated rudder control, claims to have remedied those ailments and created a rudder system that has many advantages over existing systems. The design, created by Manatee Design, has even won the 2001 Industrial Design Excellence Award which is sponsored by the Industrial Designers Society of America, and Business Week magazine.

While fixed foot peg rudders systems have long been the norm in flat water racing kayaks and some sea kayaks manufactured overseas, this is the first system, from North America, designed to be retro-fitted to existing kayaks or as the equipment on new kayaks. When I caught wind of the opportunity to do a trial installation and operational test, I jumped at the chance to try something this innovative.

Upon picking up the demo kayak, a Northwest Kayaks Synergy and the SmartTrack Control System I headed home to tackle the project. As I opened the box and started pulling out parts and pieces, nightmare visions of the "assemble it yourself" barbecue grill I tackled last summer started streaming through my mind.

My fears were quickly extinguished when I discovered all packages were clearly marked and the accompanying packing list provided me a quick check list of the ½ dozen or so components and parts bags.

I was immediately impressed by the fact that each component of the system had its own set of clear, concise instructions including clear graphics and a contact phone number for further information.

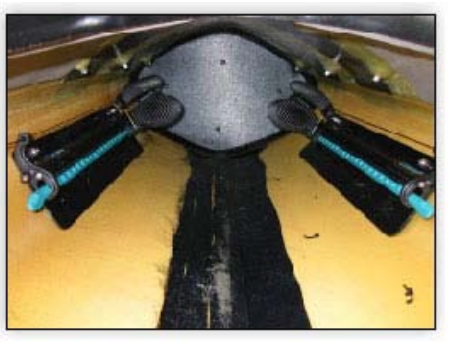
Though I was provided with a 12 page "Instruction Notebook" intended for use by Certified Installation Centers, I chose not to use this source of information as I wanted to see if the installation could be performed by the "average backyard mechanic".

The system is comprised of three major components: the Vertical Adjustment Plate used to adjust the height of the foot pedal from the bottom of the kayak and is also a slick way to allow the use of existing foot brace holes for retro-fit installations; the Toe Pilot Foot Control which includes the foot brace, associated toe pedal and side rails; the Blade Housing which includes the rudder and associated hardware. All parts and pieces appeared to be of stainless steel, plastic or some other material resistant to the corrosive ocean.

At first I wasn't sure with which end of the kayak to start, but after spending 15 minutes or so studying the instructions and another 15 minutes disassembling the existing rudder system I began with the Vertical Adjustment Plate. The instructions state most people will prefer to have the foot peg portion of the system 3-4 inches lower than the existing foot bracesto allow comfortable operation of the Toe Pilot Foot Control. For my size 11 feet, I found about 1 inch lower to be adequate. Using the pre-drilled holes in the Vertical Adjustment Plate, I simply attached a Pilot Foot Control and its associated Side Rail to each of the two Vertical Adjustment Plates, using the supplied hardware, at a height I felt would allow me to operate the Toe Pilot while resting my feet on the pegs.

I then attached the combined Vertical Adjustment Plate and Toe Pilot Foot Control assemblies to the kayak, aligning the pre-drilled holes in the Vertical Adjustment Plate with the existing holes, from the former foot peg assembly, in the kayak hull. I was fortunate enough to be using a kayak where the existing holes in the kayak matched those in the Vertical Adjustment Plate. One beauty of the SmartTrack Control System is that existing holes can be used and if they do not match with the Vertical Adjustment Plate, the needed hole(s) can be drilled in the Vertical Adjustment plate itself thereby alleviating any stress the "do it your selfer" may feel about drilling holes in their kayak.

The next step in the process was to install the Blade Housing. At first the four pages of instructions look a bit intimidating until you realize that they are written to include the three, most common, existing rudder installation methods and so only a portion are appropriate for a given retro-fit. The Synergy had a Rear Mount system with a bracket that is bolted to the flat stern of the kayak. Removing the existing bracket and installing the provided SmartTrack bracket was a snap using the existing holes in the stern of the kayak.



Once the bracket was mounted, I routed the control cables, which arrive attached to the Toe Pilot Foot Control, back through the existing cable housing to the tiller plate on the Blade Housing. To attach the cables to the tiller bracket I used a nifty device SealLine calls a Cool Rudder Wedge (CRW) that made the process quite painless compared to other methods I have seen employed.

In fact the CRW is itself, a revolution installation of rudders. The trick to installing the cables was to have someone else sit in the kayak and operate the Toe Pilot Pedal while I kept the Rudder Housing straight and they provided feedback as to proper tension. The instructions provided great insight into the best position (angle) of the Toe Pilot Pedals depending upon the foot ware the paddler may use. Fine adjustments can be made at the slide rail on the cockpit end of the system.

The final steps required installation of the rudder into the Blade Housing and attaching and routing the rudder cord. Installing the rudder is a bit tricky, but again the clear instructions made the process go smoothly. Unlike other rudder systems which require the paddler to give a mighty heave on one of two cords to deploy the rudder, the SmartTrack uses a coiled spring, which is imbedded into the rudder, to facilitate deployment of the rudder. When installing the rudder, a Tension Control Knob is used to set the correct tension on the spring. The single rudder control line is connected to the rudder using one overhand knot wedged into a slot in the rudder. It is then routed through a couple of eyelets on the rear deck and to a cinch cleat beside the cockpit at a convenient position for the paddler. The instructions warn that the knot must be flush or it will interfere with rudder operations. I did find getting the knot into the slot to be a bit of a hassle even after following the suggestions provided.

As I stepped back to view the completed installation, I was amazed how, unlike the barbecue project, there were no extra pieces on the ground, no multiple trips to the hardware store and during the whole installation process, only PG language was used. Overall the installation went quite smoothly and is definitely a project that can be accomplished by the endeavoring paddler with basic hand tools.

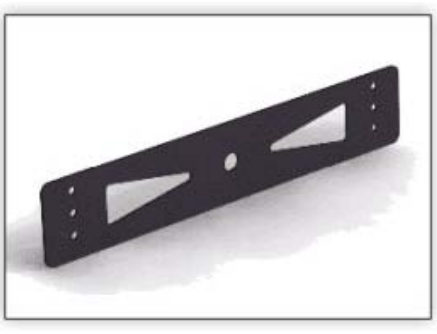
Now that I had the SmartTrack System installed, it was time to take the kayak out on the water and see how well it performed. After all, the proof is in the paddling. Before heading out on the water I considered the different aspects of a rudder system that would be important to the user, contrasted them with the claims of the manufacturer and with the known functionality of rudder systems that have been in existence for some time. I decided to pay particular attention to: ease of operation and control, functionality and performance, and overall durability and reliability.

SmartTrack Video Link:

SmartTrack Kayak Rudder Housings

This system uses one rudder control line and a spring coiled inside the rudder to deploy the rudder. The same line is used to retract the rudder. As I paddled away from shore I reached down to pull the control cord from the cinch cleat to deploy the rudder. There was a satisfying "thunk" as the coiled spring sliced the rudder down into the water telling me, without a doubt, that the rudder was down. Cruising forward I spotted length of kelp. Paddling over it, the rudder slipped up, then back down with a softer, yet just as reassuring, "thunk". Paddling over other obstacles, even unseen rocks slightly below the surface, provided the same positive results. Reaching to the control line to retract the rudder back to its stowed position, I gave a light pull and with little resistance the rudder slipped up and stowed in its vertical position. While a major portion of the rudder is surrounded by the Rudder Housing, the rudder does stow in a vertical position. The vertical position looks a bit peculiar, though of more significant concern may be of what will happened when a kayak is rolled over in a rough shore break or even surf. The vertical positioned rudder may be either broken off or the housing may be damaged to a degree that the system is inoperable. At a minimum, it will be a shin biter on the beach.

One claim of the manufacturer is that the foot braces can be adjusted while seated in the kayak. Though most kayakers who use the same kayak on a regular basis usually set the foot braces to a comfortable position and never move them, the easy adjustment will be beneficial to persons who get into an unfamiliar kayak and don't get the adjustment quite right the first time. It will also benefit kayak rental organizations where there is frequent adjustment of foot braces as clients come and go. To prove the ease of adjustment, I reached down beside each leg, grasped the adjustment bar and pulled the each Toe Pilot Control back one notch. Each assembly slipped back and locked into the next notch with ease, however the springs that are supposed to hold the Toe Pilots in their forward position did not seem to do the job and the Toe Pilots tipped aft. This was easy enough to overcome by pushing the Toe Pilots back forward, to their appropriate position, with my toes.



When foot braces were adjusted to a comfortable position, I started to focus on the systems primary functions, tracking control and turning. Most existing North American rudder systems require the paddler to push on a foot peg which is attached via cable to the rudder. The foot peg slides in a track, pulls the cable, and turns the rudder. The SmartTrack System uses fixed foot braces on which the paddler can brace his or her feet and small toe pedals, attached by cables to the rudder, to turn the rudder. SealLine refers to the toe pedal as Toe Pilots. As I paddled, I started making turns by pressing the Toe Pilots forward, on the left or right, to turn the kayak. I was surprised by how little deflection was required to turn the kayak. Kayakers who are familiar with other rudder systems may feel the need to "kick" the rudder hard one direction or the other to attain full deflection; however I did not find this necessary. To perform extremely sharp turns, I found, as with all other rudder systems, it more effective to edge the kayak and use a sweep stroke... with the SmartTrack System the fixed foot braces provided the solid control necessary to execute this type of turn. Another significant advantage of the fixed foot braces employed by the SmartTrack System is transfer of energy. When paddling, much of the energy put forth by the paddle stroke is transferred into moving the kayak forward via the foot pedals. If the foot pedals slide, as in most other rudder systems, there is a significant loss of efficiency. With the SmartTrack System I quickly noticed the power I gained with the stationary foot braces.

Drag has long been a nemesis of rudders and as long as something is trailing in the water, there will be drag. However, the hydrodynamics of the SmartTrack rudder were tested at the University of Washington and SealLine claims their rudder is 25% more efficient than the standard aluminum rudder available on the market. I was provided with two of SealLines' rudders, one high performance rudder made of composite materials and one standard rudder made of a high density plastic. I installed the high performance for most of the testing and only switched to the standard to determine any difference between the two. With the kayak empty and the rudder trimmed to neutral, both rudders were very quiet and drag was unperceivable with either rudder. Once I began to execute turns, I could definitely feel the drag and hear the rudder in the water, however I was not able to sense whether it was less than any other rudder nor was I able to perceive any difference in performance between the standard and the high performance rudders.

As most sea kayaks are intended for some level of touring duty, I put 50 pounds of weight in the stern of the kayak to simulate a fully loaded kayak. The turning performance of the system was predictably degraded though the kayak was still maneuverable and I could easily track in a slight cross wind. One side effect of the additional weight, on this kayak, was that the Rudder Housing drags in the water, making a gurgling noise and increasing overall drag.

Equipment malfunction or failure can plague any sporting activity and kayaking is no exception. Fortunately, kayaks do not have any moving parts other than a rudder or skeg, if so equipped. The primary challenges of a reliable rudder system are its resistance to jamming from sand or gravel and how easily field repairs can be made in the event of failure.

I tested the SmartTracks resistance to sand in gravel in two areas, one was the Rudder Housing and rudder itself and the other was the Toe Pilot Control and associated side rails.

When touring in kayaks, the kayaks are often turned over on the beach in the evenings to keep out moisture and various critters. When the kayaks are turned, the rudders are often driven into the beach gravel, especially if turned solo from the bow. Another way sand or gravel can become lodged in the rudder assembly is during landing in rougher conditions where the waves or surf are churning up the sea bottom. To test these scenarios I scooped up a couple of handfuls of sand and gravel and poured them over the Rudder Housing. I then lightly rinsed the material off and paddled out letting the waves do the rest of the cleaning. When I released the rudder it fully deployed, this time with a grinding noise and without the resounding "thunk". I retracted the rudder and attempted to deploy it again. It stuck a bit, but did drop into position after working the control line a bit. On the final attempt to retract the rudder it would not retract. I paddled to the beach to investigate and found a few lentil sized pieces of gravel were lodged between the rudder and the housing. I quickly dislodged the gravel and the system was again in operation.

While it can be the more extreme situation, surf landings or even landings with significant wind waves can result in a cockpit full of water sand and gravel. To test this scenario, I tossed a double handful of sand and gravel into the cockpit, sloshed it around a bit and then rinsed it out by sloshing sea water around then pouring it out by overturning the kayak. I then paddled off shore to see how the Toe Pilots operated after experiencing a bit of grit. Though I could feel the grit in the system and they did not feel as smooth, they did rock forward allowing the rudder to turn with ease. The other moveable portion of the system is that which allows the Toe Pilot Controls to adjust fore and aft for different leg lengths. Reaching into the cockpit and grasping the adjustment bars, I was initially able to slide the Toe Pilot Control assemblies fore and aft a short distance, but not the full range of motion. After sliding the braces forward to the position that fit me, I paddled around a bit and then back to shore and rinsed the kayak out again. While on shore, I attempted to slide the assemblies back and forth and they would not move. After more rinsing with sea water and multiple attempts to dislodge the assemblies, I headed home to investigate the problem. Cleaning the sand and gravel out of the system required full removal of the assemblies from the boat which required one end wrench and a phillips screwdriver. After using a garden hose to clean out the tracks, one assembly still would not operate. Upon further investigation a small piece of grit, which prevented the rudder cable from sliding through the Toe Pilot, was found and removed at which time the assembly operated fine.

A fixed foot brace rudder system, available to the paddling masses, is long over due and the SmartTrack System is a quantum leap in the right direction. The System performed very well in my first two areas of concern, but did not fare as well in the third. It installed easily, was simple operate and adjust while underway. More importantly, it did a fine job of providing tracking control and turning while supplying rock solid foot braces for more secure boat handling. I felt the reliability challenges I met with the SmartTrack System were due in part to its precision engineering. When a couple of pebbles or a speck of grit can bring a well engineered system to a standstill, a more rudimentary solution may be more desirable.

SmartTrack Cool Rudder Wedgie and Control Cable Up-Date

The tiny wedge parts of the Cool Rudder Wedgies (CRW) used with the SmartTrack rudder system have been updated. The SmartTrack control cables have been updated as well.

SmartTrack changed the control cables from a nylon coated stainless steel cable, to uncoated stainless cable. The nylon coating was a problem because the nylon would rot off and gum up the system. The older sand-cast Wedgies work fine on the original Cascade Design's nylon coated cable. The old Wedgie has been a sporadic problem on the new uncoated cables; sometimes they work, sometimes they do not. SmartTrack redesigned the Wedgie to fit the new cables; it is slightly different now and is injection molded stainless steel.

In the image you can easily see the difference between the old (on the right) and the new (on the left) Wedgies. The most easily identifiable difference is the length of the slot down the center, Old: 1/2 in. slot, New: 5/16 in. slot.

The older CRW work well on the original SmartTrack systems by Cascade Designs equipped with nylon coated control cables. The new version CRWs will also work on the older coated control cables. For best results use the new version CRWs with the modern uncoated control cables.

There is a quantity of SmartTrack products that contain the older versions of the SmartTrack parts still on the market. You may find older SmartTrack kits, CRW, Control Cables, Blade Housings and Spare Parts Kits with the original Wedgies, and/or nylon-coated cables.

Smart Track kits with CRWs, sold through **The TopKayaker Shop**, will include extra new version Wedgies, and instructions, in every kit that contains old version Wedgies. This will allow the user to determine witch wedge style will work best for their equipment. At some point the supply of old version Wedgies and nylon-coated cable will run out. Compatibility will no longer be an issue. At that time duplication of CRWs in kits will be unnecessary.

The updated equipment will be the norm, the older version phased out completely.

Related Articles & Links:

*We stock **rudder kits** for a variety of kayaks. Take a look at our full selection of kits and replacement rudder parts at The **Top Kayaker Shop - RUDDERS***

- *Read this before you invest in a rudder: **"When To Get A Rudder And How To Use It"**
- **How To Install A Rudder On A Sit-on-top Kayak** by Tom Holtey This serves as a suppliment to the Yakima/Perception rudder instructions and provides insight into rudder installation for other kayak brands.
- For some additional information on the use of well-nuts please read: **"The Basics of Strap Eyes, Rivets & Well'Nuts"**
- **SmartTrack Kayak Blade Housings** - Manufactuers YouTube video

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