



harmony[®]
INSTRUCTIONS

**WILDERNESS SYSTEMS
RUDDER READY KIT**

INTRODUCTION TO WILDERNESS SYSTEMS RUDDER READY KIT INSTALLATION INSTRUCTIONS

The addition of a rudder to a kayak results in additional control and efficiency, especially in certain sea and wind conditions or for specific uses such as drift fishing. The presence of a rudder is by no means essential, nor does it mean it must be deployed at all times. A rudder is not a substitute or replacement for paddling experience and ability.

During the 2009 model year Wilderness Systems began making the Tsunami, Tarpon, Ride, and Pamlico Tandem models "rudder-ready". Rudder-ready models have factory installed tubing that guides the rudder cables forward from the rudder to the cockpit.

CAUTION:

Considerable effort has been given to these instructions to provide for a successful installation of your new rudder but the process does require permanent alteration of your kayak. Please read all instructions prior to beginning the process. Be safe, measure twice before proceeding with any step requiring drilling or cutting of your hull. Use caution when tightening screws in inserts molded in hull as they cannot be replaced. If you are uncomfortable with any part of this process, we suggest you contact your local dealer for support and advice. It is possible they will undertake this installation for you at a moderate cost.

All directions included in these instructions reference starboard (right), port (left), forward, aft, behind, etc., are given as if you are standing behind your kayak looking forward.

Call our Customer Service line: 800.445.3763 (and follow prompts for consumer assistance) should additional assistance be required.

IDENTIFY YOUR KAYAK:

This kit contains parts and instructions that enable rudder installation on a number of different Wilderness Systems kayaks. As such, it is likely that you will have parts left over that do not apply to the specific model kayak you are working with. Depending on phase of installation, there are portions that are common to all or most models and parts that are specific to different models. Instructions have been provided to cover the following models:

WILDERNESS SYSTEMS:

2009 Tarpon 120, 120 Ultralite, 140, 160

Tsunami 135, 140, 145, 160, 165, 175

Ride 135

Pamlico 135T, 145T, 160T

Commander 120

It is critical that you confirm that the section of instructions you are following is applicable to your kayak as you work your way through the procedure. Please pay particular attention if you are working on a Tarpon 120 or a Tarpon 120 Ultralite.

CONTENTS OF KIT

PART NUMBER	DESCRIPTION	QTY
17060016	BTS Rudder Assembly w/ lift line and split ring	1
14820023	Rudder Bracket, Molded, Black	1
17010021	Footbrace Extrusion, Aluminum, Black	2
17010025	Footbrace, Keepers Assembly, Black, 08	2
17060011	Cable, Rudder, 131"	2
3250-0100	Copper Ferrule	4
5715-3200	Shrink Tube, ¼" x 4"	1
2CHINDECL	Deck Loop, Nylon, black	1
3455-0099	Round Pad Eye	4
3290-0120	Carry Handle with Bungee	1
7110-0100	Turtle Lift line adjuster assembly (attached to lift line)	1
7075-0102	V-Block Rudder Rest	1
2FAS041	J-hook Deck Fitting	1
14810028	Tarpon Deck Fitting	1
2RUD01	Rudder Split Ring, 5/8"	3
30700041	Clevis Pin, 3/16 x 5/8, stainless	2
2CORD3/16	Bungee Cord, 3/16" x 1' Black	1
3545-0303	Rivet, Countersink, Star, w/Seal	2
1FAS0045	Screw, 10-32 x 1", Phillips flat head	3
3585-3205	Screw, 10-32 x 7/8" Phillips Flat Head	6
1FAS001	Screw, 10-32 x 1" Phillips Truss Head	2
1FAS004	Screw, 10-32 x 1", Phillips Truss head	4
3585-0112	Screw, 8-32 x 5/8", Phillips flat head	2
585-0223	Screw, 8-32 x 3/4" Phillips flat head	1
30000015	Screw, ¼-20 x 5/8", Socket head	2
2FAS010	Screw, ¼-20 x 3/8" Phillips truss head	2
2FAS011	Screw, ¼-20 x ½ Phillips Truss Head	2
2FAS013	Screw, ¼-20 x ¾ Phillips Truss Head	2
1FAS090	Washer, #10 x 5/8", Neoprene/Stainless	8
3730-0103	Washer, ¼" Lock, Stainless	4
1FAS043	Washer Neoprene ¼ x ½	4
30400008	Washer, Lock, Toothed	2
2RUD004	Cap Nut, 10-32, Nickel/Brass	4
3430-0102	Locknut, 8-32 Nylon/Stainless	2
1FAS015	Locknut, 10-32 Nylon/Stainless	4
17070009	Equal Arm 3/16" Allen Wrench	1

ADDITIONAL TOOLS & MATERIALS REQUIRED:

Depending on the model of kayak being worked on, not all tools below may be required. You can determine specific tools necessary by reviewing the instructions for your particular model kayak.

Phillips Head Screwdriver	Rivet Gun
Drill with 5/32 (5 mm) bit	Scissors
Measuring Tape or Ruler	Non-permanent Marker
Cable Crimpers	Electrical Tape
Cable Cutters	¼" Drill Bit (for Ride 135 installation)
3/8" Box Wrench, (may require offset or socket wrench, depending on boat)	3/8" Drill Bit, (for Tarpon 120 Ultralite installation)
Adjustable Wrench	

INSTALLING THE RUDDER BRACKET

WILDERNESS SYSTEMS TARPONS, RIDES, PAMLICOS AND TSUNAMIS:

1. Remove the two filler screws and set aside.
2. With the raised "stop" pin facing up, align the bracket with the mounting holes in hull. Place #3730-0103 ¼" lock washers (2 on each screw) over #30000015 ¼-20 x 5/8" socket head screws and thread screws into mounting holes using the #17070009 3/16" Allen or hex head wrench provided with kit.
3. Start both screws before tightening either one completely. Tighten each screw fully.

INSTALLING THE RUDDER REST

The rudder rest cradles the rudder blade on the deck of the kayak when it is not deployed. It includes a tie down mechanism to secure the blade in this position when not in use.

NOTE: Rudder blades should always be in stowed position and secured when carrying or transporting your kayak. When launching, do not forget to release your rudder blade before entering your kayak.

TARPON 120, 140:

1. Back out screws holding existing carry handle at stern of kayak.
2. Replace with #3290-0120 Carry Handle with Bungee Cord provided with this kit. Use 2 #2FAS013 ¼-20 x ¾" Phillips Truss Head Screws install replacement carry handle, making sure the bungee cord loop faces towards stern.
3. Use bungee cord loop to secure blade in stowed position.

TARPON 160:

1. Locate groove in center of deck extending from stern. Locate indent on one side of groove with insert. Remove filler screw from insert.
2. Cut a 5" length of #2CORD3/16 bungee and tie a stopper knot on one end of bungee and slide a #2FAS041 J Hook onto other end of bungee.
3. Slide other end of bungee through hole in tab on #14810028 Deck Fitting and tie stopper knot.
4. Using a #2585-3205 10-32 x 7/8" Phillips flat head screw secure deck fitting to insert in indent.
5. To secure rudder when stowed, hook the J hook over top of rudder blade. It may be necessary to adjust position of knots to provide adequate tension.

TARPON 120 ULTRALITE, RIDE 135:

1. Use the sternmost run of bungee running across hull perpendicular to keel line to secure rudder. Position rudder in stowed position. Lift bungee forward and then over top of rudder blade to secure.

TSUNAMI 135, 140, 145, 160, 165, 175:

1. Identify sternmost "star" deck fitting centered on deck and routing existing deck rigging through one hole.
2. Thread 12" length of #2CORD3/16" bungee cord through unused hole in deck fitting.
3. Insert rudder post in stern bracket and rest rudder blade on deck.
4. Tie bungee cord in a loop tight enough to hold the rudder blade down against the deck. Depending on size of hole in deck fitting it may be possible to thread bungee through from each end and tie a stopper knot on each end to create a loop.

PAMLICO 135T:

1. The Pamlico 135T comes with factory installed tie down. Tie down consists of a length of bungee cord incorporated in the stern carry handle. Release the bungee from the tie down and loop over rudder blade when stowed and re-secure under hook.

PAMLICO 145T, 160T:

1. Identify the #7075-0102 V-block rudder rest.
2. Place the V-block rudder rest on the raised flat mounting surface located 11" +/- (measurement will vary slightly by model) forward of stern of boat. Center the V-block on the mounting panel so that the center notch is aligned with the seam bisecting the kayak deck.
3. Using the holes on the sides of the block as guides, mark drill holes in hull using the 5/32" drill bit.
4. Push 2 #3545-0303 rivets through the holes on the block and then through drilled holes in deck and secure with rivet gun. If the rivet does not snap off on first trigger pull, release trigger and push head of rivet gun flush against the rivet flange and pull again.
5. To secure rudder blade when stowed, lift the attached bungee cord on the V-block up and over end of rudder blade.

INSTALLING THE RUDDER LIFT LINE SYSTEM

The lift line assembly allows you to deploy or stow your rudder while underway. It consists of a long cord loop deployed on the deck of your kayak along the right side, running from the head of the rudder to a position next to the cockpit. As with the rudder rest installation, recommended installation will vary by model. Please identify your model kayak from the procedures below and proceed as instructed.

The precise location of the forward terminus of the lift line will vary on different models and is also subject to personal preference. As you will use the lift line by grasping at the forward end, you should consider modifying location to provide easy and convenient access to the line from your preferred paddling position. Some paddlers feel more comfortable if lift line is visible from paddling position, others are fine operating by feel alone. Ideally, the lift line should run "flat" or horizontal from closest pad eye towards stern to the cockpit. Location need not be determined by having to remove all slack from the line. The tension in the line is adjustable and process will be described in course of these instructions.

ALL MODELS:

1. Unclip the split ring on base of rudder post and insert post into rudder bracket on stern of kayak.
2. Unroll the cord attached to the rudder assembly and lay out along the right side of your kayak from rudder forward to cockpit or seating position. Lay out cord so that it creates a smooth loop without tangles.

A. INSTALLING THE LIFT LINE DECK FITTINGS

Specific locations for lift line deck fittings are provided below per model. Hardware used to install lift line system will also vary by model.

2009 TARPONS:

Depending on model length and time of manufacture, some Tarpons have molded-in threaded inserts at pad eye locations between the stern of kayak and cockpit terminus of lift line.

If your boat has inserts:

1. Remove the filler screws and position a #3455-0090 round pad-eye over the insert. Thread the lift line through the slots in base of pad-eye and orient pad-eye so slots are parallel to keel line. Make sure lifeline runs in a true loop for its entire length.
2. Insert #3585-3205 10-32 x 7/8" Phillips flat head screw through pad-eye and into insert. Tighten securely.

If your Tarpon does not have inserts at designated locations, install #3455-0099 round pad-eyes as follows:

1. Locate center point of recess. Drill a 5/32" hole through hull at this point.
2. Align round pad-eye over lift line and insert #3585-6203 8-32 x 3/4" Phillips pan head screw through pad-eye and hole drilled in recess.
3. Accessing underside of hull via the stern hatch, secure screw with #1FAS090 neoprene/stainless washer and #3430-0102 lock nut. Position washer so that neoprene side is against hull interior.

TARPON 120, TARPON 140, TARPON 160:

1. Locate 4 circular recesses along right side of deck with inserts. Remove filler screw and discard. Install #3455-0090 round pad eye at each location with #3585-3205 10-32 x 7/8" Phillips flat head screws. Do not tighten down fully.
2. Unroll lift line cord from rudder assembly and lay-out along side of hull so that it runs over the top of the round pad eyes. Tape end next to the forward most round pad eye. Make sure cord makes a smooth loop without crossing or tangles and that one turtle at end of loop is above the forward most deck loop and one below.
3. Slide the line under the edges of the round pad eyes so that line fits into notches milled in base of pad eye and forms a smooth loop.
4. At forward most pad eye make sure that one of the turtle line adjusters is positioned above and one below the pad eye.
5. Tighten all pad eyes fully.

TARPON 120 ULTRALITE:

1. Locate the 4 round pad eyes installed on right side of deck running from rudder forward to just behind seat.
2. Unroll lift line cord from rudder assembly and lay-out along side of hull so that it runs over the top of the round pad eyes. Tape end next to the #2CHINDECL deck loop located just in front of side carry handle on right side. Make sure cord makes a smooth loop without crossing or tangles and that one turtle at end of loop is above the deck loop and one below.

3. Loosen screws securing round pad eyes enough to slide the lift line under bottom edge. Align cord under notches milled in base of pad eye and retighten screws.
4. At foremost location, loosen screw securing stern end of deck loop and place cord under center of deck loop. Re-secure deck loop by tightening screw. Make sure one turtle line adjuster is above and one below the deck loop.

TSUNAMI'S:

For locations with preinstalled round pad-eyes:

1. Loosen screw securing pad-eye sufficiently to slide lift lines under edge of pad-eye. Route lift line so that it fits under slots in base of pad-eye and forms a true loop.
2. Secure pad-eye by tightening center screw.

TSUNAMI 135:

1. Locate the two circular recesses along starboard side of deck, one behind and the other in front of stern hatch.
2. Drill at center of each recess with a 5/32" bit. Secure #3455-0099 round pad eye with #1FAS0045 10-32 x 1" Phillips flat head screw, 1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut. Do not tighten fully.
3. Identify the #3455-0099 factory installed round pad eye on right side of seat. Loosen screw holding pad eye so that lift line can be routed under the pad eye.
4. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
5. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

TSUNAMI 140:

1. Locate the two circular recesses along starboard side of deck. Sternmost is 15" forward of stern. Front location is 39" forward of stern.
2. Drill at center of each recess with a 5/32" bit. Secure #3455-0099 round pad eye with #1FAS0045 10-32 x 1" Phillips flat head screw, 1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut at each location. Do not tighten fully.
3. Identify the #3455-0099 factory installed round pad eye on right side of seat. Loosen screw holding pad eye so that lift line can be routed under the pad eye.
4. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
5. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

TSUNAMI 145:

1. Locate the two circular recesses along starboard side of deck. Sternmost is 15" forward of stern. Front location is 45" forward of stern.
2. Drill at center of each recess with a 5/32" bit. Secure #3455-0099 round pad eye with #1FAS0045 10-32 x 1" Phillips flat head screw, #1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut. Do not tighten fully.
3. Identify the #3455-0099 factory installed round pad eye on right side of seat. Loosen screw holding pad eye so that lift line can be routed under the pad eye.
4. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
5. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

TSUNAMI 160:

1. Locate 2 circular recesses along starboard side of deck. Sternmost may have molded-in threaded insert. If so, loosen and discard filler screw. Use #3585-0223 10-32 x 3/4" Phillips flat head screw to secure pad-eye.
2. If no insert, drill at center of recess with a 5/32 bit. Secure with #1FAS0045 10-32 x 1" Phillips flat head screw, 1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut.
3. Forward recess does not have an insert and will require drilling with a 5/32" bit at center. Secure with #1FAS0045 10-32 x 1" Phillips flat head screw, #1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut.

4. Identify the #3455-0099 factory installed round pad eye on right side of seat. Loosen screw holding pad eye so that lift line can be routed under the pad eye.
5. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
6. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

TSUNAMI 165:

1. Locate 3 circular recesses along starboard side of deck. Sternmost recess may have molded-in threaded insert. If so, loosen and discard filler screw. Use #3585-0223 10-32 x 3/4" Phillips flat head screw Phillips pan head screw to secure #3455-0099 round pad-eye.
2. If no insert, drill at center of recess with 5/32" bit and secure a #3455-0099 round pad eye with #1FAS0045 10-32 x 1" Phillips flat head screw, #1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut. Do not tighten fully.
3. Center and forward recesses do not have molded-in inserts and will required drilling with a 5/32" bit.
4. Proceed to install #3455-0099 round pad-eyes using #1FAS0045 10-32 x 1" Phillips flat head screw, #1FAS090 neoprene/stainless washer (neoprene side against underside of deck), and #2RUD004 10-32 Cap nut to secure a #3455-0099 round pad eye at each location. Do not tighten fully.
5. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
6. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

TSUNAMI 175:

1. Locate 3 circular recesses along starboard side of deck. Sternmost recess may have molded-in threaded insert. If so, loosen and discard filler screw. Use #3585-0223 10-32 x 3/4" Phillips flat head screw Phillips pan head screw to secure #3455-0099 round pad-eye.
2. If no insert, drill at center of recess with 5/32" bit and secure a #3455-0099 round pad eye with #1FAS0045 10-32 x 1" Phillips flat head screw, #1FAS090 neoprene/stainless washer, and #2RUD004 Cap nut. Do not tighten fully.
3. Center and forward recesses do not have molded-in inserts and will required drilling with a 5/32" bit.
4. Proceed to install #3455-0099 round pad-eyes using #1FAS0045 10-32 x 1" Phillips flat head screw, 1FAS090 neoprene/stainless washer, and #2RUD004 10-32 Cap nut to secure a #3455-0099 round pad eye at each location. Do not tighten fully.
5. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
6. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

RIDE 135:

1. Locate 4 round deck recesses located on right side of deck spaced between rudder assembly and seat.
2. Drill hole at center of recess with 5/32" bit.
3. Secure a #3455-0099 round pad eye at each location using a #3585-3205 10-32 x 7/8" Phillips flathead screw, and #1FAS090 Stainless/neoprene washer (neoprene against underside of hull), and a #2RUD004 Cap nut. Do not tighten fully.
4. Unroll lift line from rudder assembly and lay out over round pad eyes on right side of hull. Loop end of lift line around foremost pad eye, making sure one turtle line adjuster is above and one below the pad eye. Route line under notches in base of pad eye and confirm that line makes a smooth fair loop. Tighten pad eye fully.
5. Route line through notches in base of other pad eyes, aligning bases so that notches allow smooth loop of line and tighten fully.

PAMLICO 135T:

1. Locate two sets of triangular mold marks on hull on right side forward of stern. A single mark will be positioned between stern hatch and rear end of cockpit rim. A pair of marks will be approximately $\frac{1}{4}$ of the length of the cockpit forward from rear of cockpit.
2. Drill hole at each mark (total of 3) with a $\frac{5}{32}$ " bit.
3. Unroll the lift line from the rudder head and run alongside of the hull so that it lays over the holes drilled in previous step. Tape end of loop of line at foremost end so that it forms a fair loop without twists or tangles.
4. Secure a #3455-0099 Round Pad Eye at sternmost location (between hatch and cockpit rim) with a #1FAS0045 10-32 x 1" Phillips flathead screw with a #1FAS090 #10 x 5/8" neoprene/stainless washer (neoprene against underside of deck) and a #2RUD004 Capnut. Tighten pad eye to deck making sure that the lift line runs through insets in bottom edge of pad eye.
5. At forward location, Insert a #3585-0112 8-32 x 5/8" Phillips flathead screw through sternmost hole in #2CHINDECL deck loop and align with sternmost hole drilled in hull and secure with #1FAS090 neoprene washer (neoprene against underside of hull) and #3430-0102 lock nut.
6. Place the end of the lift line loop through center hoop of deck loop and secure front mounting hole with same hardware. Make sure the lift line forms a smooth loop and one turtle line tensioner is above and one below the pad eye.
7. Place the end of the lift line loop through center hoop of deck loop and secure front mounting hole with same hardware. Make sure the lift line forms a smooth loop and one turtle line tensioner is above and one below the pad eye.

PAMLICO 145T:

1. Locate two molded recesses along right side of deck behind the cockpit.
2. Drill hole at center of each recess with a $\frac{5}{32}$ " bit.
3. Unroll the lift line from the rudder head and run alongside of the hull so that it lays over the holes drilled in previous step. Tape end of loop of line at foremost end so that it forms a fair loop without twists or tangles.
4. Secure a #3455-0099 Round Pad Eye at each location, using a #1FAS0045 10-32 x 1" Phillips flathead screw with a #1FAS090 #10 x 5/8" neoprene/stainless washer (neoprene against underside of deck) and a #2RUD004 Capnut.
5. Locate mold marks approximately $\frac{1}{4}$ of cockpit length forward of rear of cockpit on right side of deck and drill $\frac{5}{32}$ " hole at each mark. Before tightening the pad eye down fully, place the loop of lift line under the insets in base of round pad eye and orient pad eye so that one side of loop runs above and the other below the mounting screw. Tighten completely.
6. Alongside of cockpit on right side, locate the two triangle marks in hull between edge of hull and cockpit approximately 12" forward of the sternmost screw securing the seat rail and 2" up from edge of deck. Drill $\frac{5}{32}$ " at each mark.
7. Insert a #3585-0112 8-32 x 5/8" Phillips flathead screw through sternmost hole in pad-eye and sternmost hole in hull and secure with #1FAS090 neoprene washer (neoprene against underside of hull) and #3430-0102 lock nut.
8. Place the end of the lift line loop through center hoop of deck loop and secure front mounting hole with same hardware. Make sure the lift line forms a smooth loop and one turtle line tensioner is above and one below the pad eye.
9. Place the end of the lift line loop through center hoop of deck loop and secure front mounting hole with same hardware. Make sure the lift line forms a smooth loop and one turtle line tensioner is above and one below the pad eye.

PAMLICO 160T:

1. Locate mark positioned $34\frac{3}{4}$ " from stern along right side of deck. Mark will be $3\frac{1}{2}$ " above edge of hull.
2. Drill $\frac{5}{32}$ " hole at mark.
3. Unroll the lift line from the rudder head and run alongside of the hull so that it lays over the hole drilled in previous step. Tape end of loop of line at foremost end so that it forms a fair loop without twists or tangles.
4. Secure a #3455-0099 Round Pad Eye at drilled hole, using a #1FAS0045 10-32 x 1" Phillips flathead screw with a #1FAS090 #10 x 5/8" neoprene/stainless washer (neoprene against underside of deck) and a #2RUD004 Capnut. Before tightening the pad eye down fully, place the loop of lift line under the insets in base of round pad eye and orient pad eye so that one side of loop runs above and the other below the mounting screw. Tighten completely.
5. Alongside of cockpit on right side, measure 7" forward of the sternmost screw securing the seat rail and 2" up from edge of deck. Mark location.
6. Center a #2CHINDECL over mark, oriented parallel to the keel line and mark the two mounting holes. Drill at each mounting hole mark with $\frac{5}{32}$ " bit.

7. Insert a #3585-0112 8-32 x 5/8" Phillips flathead screw through sternmost hole in pad-eye and sternmost hole in hull and secure with #1FAS090 neoprene washer (neoprene against underside of hull) and #3430-0102 lock nut.
8. Place the end of the lift line loop through center hoop of deck loop and secure front mounting hole with same hardware. Make sure the lift line forms a smooth loop and one turtle line tensioner is above and one below the pad eye.

COMMANDER 120:

1. Identify the 4 molded recesses located along the right side of hull running from stern towards seat.
2. At each location, drill a 5/32" hole at center of recess.
3. Secure a #3455-0099 Round Pad Eye at drilled hole, using a #1FAS0045 10-32 x 1" Phillips flathead screw with a #1FAS090 #10 x 5/8" neoprene/stainless washer (neoprene against underside of deck) and a #2RUD004 Cap nut. Before tightening the pad eye down fully, place the loop of lift line under the insets in base of round pad eye and orient pad eye so that one side of loop runs above and the other below the mounting screw. Tighten completely.

B. ADJUSTING THE TENSION IN THE LIFT LINE

The lift line should be tensioned sufficiently so that it does not droop or sag between fittings. It should also not be drum tight. To adjust to proper tension:

1. Make sure the rudder blade is stowed and centered in the rudder rest.
2. Slide the top turtle line tensioner forward until it contacts the forward-most pad-eye on the lift line. Pull the knot in the lift line out of the turtle, pulling the line taut without moving the turtle. Untie original knot and tie a new knot against the body of the turtle.
3. Repeat process with turtle on lower side of pad-eye.
4. Release the rudder blade from the rudder rest and test the lift line's functionality by pulling the lower turtle forward causing the rudder to deploy and then the top turtle forward, causing the rudder blade to rise to stowed position. Tension should remain consistent during both operations and rudder blade should deploy and stow completely. Adjust tension as necessary by tying new knots at each turtle.
5. Once function of the lift line is as desired, pull the new knots out of the turtles, cut off excess line and melt the knot with a lighter or a match to make it permanent.

INSTALLING STEERING CABLES

The next step in the rudder installation is to route the rudder cables through the factory installed plastic tubing under the stern deck of the kayak forward to the seating area.

ALL MODELS:

1. Remove any caps sealing the ends of the rudder tubes on stern next to rudder or in the cockpit area.
2. Uncoil the rudder cables.
3. Remove split ring and pin from each rudder wing. Place eyelet on end of rudder cable on top side of rudder wing with hole aligned with wing, reinsert original pin and secure with split ring. Repeat with other wing, taking care to make sure you're keeping the cables separate so they can be routed to appropriate side in hull.
4. Feed the opposite end of cable into tube. You may find it helpful to wrap the leading end of cable tightly with a thin wrap of electrical tape to lessen resistance with tubing and to contain any protruding strands of rudder cable. If cable binds or stops feeding into tubing do not continue to push cable forward as this may result in a kinking of cable. Instead, pull cable back towards stern and then push forward vigorously to see if cable will "pop" past bend or obstacle.
5. Continue feeding cable until end of cable protrudes from end of tubing in cockpit. Pull cable forward until it is taut. This will help straighten the tubing as much as possible. If you applied tape to end of cable, remove it at this time.

INSTALLING THE KEEPERS FOOTBRACE STEERING SYSTEM

The rudder is controlled by cables linking the rudder to the footbraces. Push forward on the portside footbrace and the rudder will pivot to port and turning force to port will be exerted on the hull by the angle of the rudder blade.

These instructions apply to all solo model kayaks. Additional components and instructions for footbrace installation in tandem kayaks (Pamlico 135T, 140T, 160T, and 160Excel are included in the BTS Tandem Kayak Module Kit #8025417.)

INSTALLING FOOTBRACE RAIL EXTRUSIONS

TSUNAMI 135, 140, 145, 160, 165, 175; PAMLICO 135T, 145T, 160T; COMMANDER 120:

1. Remove existing footbraces and hardware and discard.
2. Attach the metal footbrace track extrusions to the inside of hull using 2 #2FAS010 ¼-20 x 3/8" Phillips truss head screws positioned in hole at forward end of each extrusion. Insert screws from outside of hull through original holes, aligning holes in extrusion. Tighten enough to engage lock extrusion.
3. At end of extrusion nearest seat, secure extrusion using 2 #FAS011 ¼-20 x ½" Phillips truss head screws. The longer screws will block the footbrace from sliding out of extrusion.
4. Once you have both screws engaged, hold or tape extrusion so that it is oriented parallel front to back and tighten completely.

2009 TARPON 120, 140, 160

Sit-on-Top kayaks can present access issues as interior of hull is "sealed" compared to sit-in kayaks. Access to interior of hull can be achieved through bow or stern hatches or via round hatch in front of seat. Depending on model and length and size of arm, the best tool for accessing interior hardware could be a box wrench, offset box wrench, or socket wrench. With sit-on-top kayaks, hardware is mounted with nut and sealing washer placed in interior of hull and screw positioned from the exposed foot well area into hull interior.

TIP: To keep from losing nuts while accessing interior of hull, put a piece of tape (masking or electric) around back of box wrench head. Stick nut in head and press against the tape. When nut is tightened it will pull out of head of wrench.

1. Remove existing footbraces. Use appropriate 3/8" wrench to access locknuts on interior of hull and Phillips head screwdriver to loosen mounting hardware.
2. The metal footrail extrusion is tapped for ¼-20 screws. The hardware used to install the extrusions is 10-32 and should easily pass through the mounting holes in extrusions.
3. Align holes in extrusions over existing mounting holes. Insert #1FAS004 #10-32 x 1" Phillips Truss head screw into extrusion and into interior of hull.
4. Place a #1FAS090 #10 neoprene/stainless washer over end of screw in interior of hull, neoprene side against side of hull.
5. Secure screw and washer with #1FAS015 #10-32 lock nut, secured to end of box wrench or socket.
6. Make sure extrusion is level and tighten securely.
7. Repeat process on opposite side.

TARPON 120 ULTRALITE

1. Loosen screws securing existing footbraces and remove footbraces. Set screws aside for reuse.
2. Drill mounting holes in each end of extrusion with 3/8" drill bit.
3. Insert footbrace rail with pedal into extrusion.
4. Align mounting holes in extrusion with inserts glued to hull, slide extrusion over exposed shank of insert. You may need to slide the footbrace rail forward or back to gain access to the mounting holes in extrusions.
5. Secure extrusion to hull using original screws.
6. Slide #30400008 toothed lock washer over end of #3585-3205 10-32 x 7/8" Phillips truss head screw, orienting washer so cupped teeth are towards head of screw.
7. Thread screw and washer into recessed hole in middle of footbrace rail. Tighten until snug. The extension of screw behind the footbrace rail acts as a stopper to prevent footbrace from sliding out of stern end of extrusion.
8. Repeat for other extrusion.

Ride 135

The Ride 135 has a molded-in insert at the footbrace mounting screw location closest to the seat due to accessibility issues. Depending on time of manufacture this insert could require a ¼-20 screw or a 10-32 screw. Please follow directions below to determine which insert your boat is equipped with and how that impacts installation.

1. Remove existing footbraces.
2. Use a ¼-20 screw (such as #2FAS010 or #2FAS013 supplied with kit) and a 10-32 screw (such as #1FAS004, also supplied with kit) and test thread into insert. Do not force screw into insert, it should engage and turn smoothly.

IF YOUR BOAT HAS A ¼ - 20 INSERT

1. Use a ¼" bit to drill out corresponding hole in metal footbrace extrusion that matches insert location.
2. Place a #2FAS014 ¼-20 x ¾" Phillips truss head screw through drilled hole in extrusion and place a #1FAS043 neoprene washer over end of screw behind extrusion
3. Align screw with insert and start screw into insert. Do not tighten fully.
4. At opposite end of extrusion, place a #1FAS004 #10-32 x 1" Phillips Truss head screw through hole in extrusion and place a #1FAS043 neoprene washer over end of screw.
5. Insert screw into hole in boat and level footrail extrusion front to back. Tighten screw in insert to hold extrusion in place.
6. Reach inside of hull and place a #1FAS090 neo/stainless washer over end of 10-32 screw with neoprene side against hull. Secure screw with #1FAS015 lock nut and tighten fully.
7. Repeat for opposite side.

IF YOUR BOAT HAS A 10-32 INSERT

1. Remove existing footbraces.
2. Place a #1FAS004 10-32 x 5/8" Phillips truss head screw through hole in extrusion aligned with insert. Place a #1FAS043 neoprene washer over end of screw behind extrusion.
3. Thread screw into insert. Do not tighten fully.
4. At opposite end of extrusion, place a #1FAS004 #10-32 x 1" Phillips Truss head screw through hole in extrusion and place a #1FAS043 neoprene washer over end of screw.
5. Insert screw into hole in boat and level footrail extrusion front to back. Tighten screw in insert to hold extrusion in place.
6. Reach inside of hull and place a #1FAS090 neo/stainless washer over end of 10-32 screw with neoprene side against hull. Secure screw with #1FAS015 lock nut and tighten fully.
7. Repeat for opposite side.

INSTALLING SET SCREW STOPPER (All Ride 135)

1. Slide #30400008 toothed lock washer over end of #3585-3205 10-32 x 7/8" Phillips Truss head screw, orienting washer so cupped teeth are towards head of screw.
2. Thread screw and washer into recessed hole in middle of footbrace rail. Tighten until snug. The extension of screw behind the footbrace rail acts as a stopper to prevent footbrace from sliding out of stern end of extrusion.
3. Repeat for other side.

INSTALLING FOOTBRACES

1. Examine the molded footbrace rails. Position rail so that raised stopper on one end is towards bow of boat and slide rail with footpedals installed into extrusions, feeding first into the end at front of boat. (If you are working on a Tarpon 120 Ultralite, you have already completed this step.)
2. Secure rudder in rudder rest, making sure it is centered.
3. Cut the 4" length of #5715-3200 shrink tubing in half and slide one piece and 2 #3250-0100 copper ferrules over end of each rudder cable and push back several inches on cable.
4. Thread end of cable through hole in end of footbrace rail nearest the seat. Thread cable from the inside of footrail to the outside. Pull cable through footrail until slightly taut.
5. Sit in kayak with footpedals in centered position on rails and judge the fit compared to your leg length. You can adjust foot pedal as needed but make sure foot pedal can be adjusted to fit as long legged or short legged paddlers as you expect to use the boat. Leaving foot pedal in mid-position, mark its' location on the extrusion.
6. Maintaining the foot pedal at its' mark, slide end of cable back through inside of ferrules and push first ferrule up against end of footbrace rail and position second ferrule about ¼" behind the first. Firmly crimp both ferrules several times to secure loop in cable.
7. Repeat for opposite side, striving to keep footbrace in equal and balanced position to the first.
8. Cut off cable extending beyond the rearmost ferrule.
9. Slide shrink tubing over both ferrules and heat with lighter to shrink tightly around both ferrules end of cable.

TESTING THE RUDDER SYSTEM OPERATION

1. Initial testing is best done on dry land. Position the kayak so that it will safely bear your weight and the rudder will not contact the floor or ground when it is deployed. A good way to achieve this is to put boat on a deck or bank with stern extending off end of structure.
2. Release the rudder from the rudder rest.
3. Grasp the lift line at the lower turtle and pull forward. Rudder should deploy from the rest and drop into working position smoothly.
4. Test steering position of rudder by pushing forward on one footbrace and then the other. Rudder should swing back and forth across the stern of the kayak smoothly.
5. Return rudder to a centered position by placing foot pedals in a balanced position. Grab the top turtle on lift line and pull forward. Rudder blade should rise over deck and drop onto rudder rest. Note the degree of adjustment with pedals to make rudder blade drop smoothly into rudder rest.
6. Assume seated position in cockpit and repeat tests. Work on getting a "feel" of the rudder position and position of the turtles when rudder is fully deployed or stowed so you can operate by feeling alone.
7. Repeat testing process in shallow, protected water in calm conditions with help and assistance at hand before venturing into deeper water further from shore.
8. Thoroughly test the rudder's effect on your boat's handling in various conditions and with boat facing into, abeam, and away from wind and waves.

GETTING USED TO YOUR NEW RUDDER SYSTEM

1. Always secure rudder blade in stowed position on rudder rest when carrying or cartopping your kayak.
2. Always remember to release tie down securing rudder blade in rest before launching your kayak. Even though your rudder blade has the capability to "kick up" when contacting an obstruction, it still pays off to be cautious when approaching land or in shallow water and raising the blade before contacting the bottom. It is possible that the blade could be bent or deformed by striking an underwater obstacle.
3. The presence of a rudder on the stern of a kayak means you need to take extra care in handling the kayak. The rudder assembly and rudder blade can be easily bent if banged on the ground. Remember that the addition of the rudder will change the balance point of your kayak. You will need to determine the new balance point to ensure safe handling of your kayak.
4. Care should also be taken when handling the stern of a ruddered kayak as the edges of a rudder are sharp and can cut hands or wrists should boat twist or turn when being loaded or unloaded. If you carry your boat upside down on top of your car, don't assume you still have adequate room to walk under stern of boat. Addition of a rudder "lowers" the height of an upside down kayak by about 6". Be aware as well that the sharp hard edges of a rudder blade will easily scratch or damage your vehicle finish upon impact.