HARKEN®
CARBO RACING FOIL
Unit 0, 1, 2, 3

Installation Manual – Intended for specialized personnel or expert users

4364 v1 07/23

WARNING!: Strictly follow all instructions to avoid an accident, damage to your vessel, personal injury or death. See www.harken.com for additional safety information.

Please read these instructions carefully before installing, servicing, or operating the equipment. This manual may be modified without notice. See: www.harken.com/manuals for updated versions.

PLEASE SAVE THESE INSTRUCTIONS

Pre-Assembly

Size Check

Max	Unit 0	Unit 1	Unit 2	Unit 3
Wire	¼" (6 mm)	5/16" (8 mm)	3/8" (10 mm)	7/16" (11 mm)
Rod	-10 (6.35 mm)	-17 (8.38 mm)	-25 (10.31 mm)	-30 (11.1 mm)

Unit 0	Foil Length*	Max. Headstay
7000.9 m	29'6" (9 m)	32' 9" (10 m)
7000.12 m	39' 4" (12 m)	42' 8" (13 m)
7000.15 m	49' 2" (15 m)	52' 6"(16 m)
Unit 1	**Foil Length***	**Max. Headstay**
7001.12 m	39'4" (12 m)	42' 8" (13 m)
7001.16 m	52' 6" (16 m)	55' 9" (17 m)
7001.20 m	65' 7" (20 m)	68' 11"(21 m)
Unit 2	**Foil Length***	**Max. Headstay**
7002.16 m	52'6" (16 m)	56'6" (17.2 m)
7002.20 m	65'7" (20 m)	69'7" (21.1 m)
7002.24 m	78'9" (24 m)	82'9" (25.2 m)
Unit 3	**Foil Length***	**Max. Headstay**
7003.24 m	78' 8-½" (24 m)	82' 8" (25.2 m)
7003.28 m	91' 10" (28 m)	95' 9" (29.2 m)

*Length may vary; do not use for cutting foil. Measure foil

Parts

Description		Unit 0	Unit 1	Unit 2	Unit 3
Extrusion		H-37931B	H-36315B	H-37820B	H-41360
Trim cap		H-37932B	H-34427B	H-37833B	H-41337
Feeder		H-37934C	H-34394C	H-37838C	H-41315
Spacer tube	Upper	H-37935A	H-34433A	H-37879A	H-41339
	Lower	H-37936A	H-34432A	H-37880A	H-41338
Prefeeder		7006	7006	7006	7006
PVC tape		HCP1748	HCP1748	HCP1748	HCP1748
Chafe guard		7000.30	7001.30	7002.30	—

Fasteners		
Unit 0	HFS1048	6-32x.375 Truss-head screw
	HFS1049	6-32x.375 Barrel nuts
	HFS699	6-32x.625 Flat-head screw
Unit 1	HFS1048	6-32x.375 Truss-head screw
	HFS1049	6-32x.375 Barrel nuts
	HFS1047	6-32x.75 Flat-head screw
Unit 2	HFS1094	6-32x.5 Truss-head screw
	HFS1049	6-32x.375 Barrel nuts
	HFS1093	6-32x.875 Flat-head screw
Unit 3	HFS347	8-32x.5 Truss-head screw
	HFS1139	8-32x.5 Barrel nuts
	HFS1138	8x32x1 Flat-head screw

Tools

Required

Phillips head screwdriver
Flat-bladed screwdriver
Hacksaw
Pliers
Tape measure
Drill with 5 mm (3/16") bit
or 6 mm (¼") Unit 3 only.

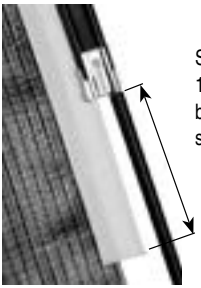
Recommended

Heat gun for cool weather.

Sail Specifications

Luff **rope** dimensions listed. Actual luff **tape** dimensions are larger.

Unit	Luff Size
#0	#5– 4 mm (5/32")
#1	#6– 5 mm (3/16")
#2	#6– 5 mm (3/16")
#3	#6– 5 mm (3/16")
	#7– 6 mm (7/32")



Sail luff tape must be 15-25 cm (6-10") below feeder when sail is raised.

15-25 cm (6-10")

Recommended height above deck:
Feeder: 110 cm (42")
Prefeeder: 76 cm (30")

Pre-Assembly

1. Lay Out Foil

Unroll foil and let it relax for a day or so before installing.

2. Feeder Height

Measure 110 cm (42") from deck and mark stay.

3. Foil Length

Attach tape measure to halyard.

Measure exposed portion of stay from underside of terminal aloft to mark made in Step 2. Deduct 127 mm (5") for upper spacer tube.

4. Cutting Foil

Mark foil using measurement from Step 3.

IMPORTANT! BEFORE CUTTING!

CUT TOP END ONLY. Don't cut bottom of foil with Harken labels and feeder hole.

MEASURE FOIL FROM BOTTOM. Don't measure a calculated deduction from top of a foil assuming the length is as specified in the catalog or the specifications in this manual. Measure full foil.

4. Cutting Foil (continued)

Cut upper end of foil with hacksaw.

5. Trim Cap Hole

Place foil so side grooves face up. Slip cap on foil so split end is over groove and large hole faces up.

Tip: Trim cap holes are different diameters. Make sure 5 mm (3/16") drill bit fits through hole and foil side grooves face up.

Squeeze cap with pliers. Keep drill straight and drill a 5 mm (3/16") hole part way through foil. Remove cap and finish drilling. Check fit of trim cap, screw, and barrel nut. Adjust hole as needed.

Make sure headstay is taut on boat or stretched taut on ground before installation.

Installation

1. Upper Spacer Tube

Splay 5" (127 mm) upper spacer tube with flat bladed screwdriver, slip onto stay and tape.

Important: Tape full length of spacer tube.

2. Foil Start

Identify top of foil. Side groove will be on starboard.

Tip: In cool weather, use a heat gun to warm foil.

Splay foil with screwdriver and pull onto stay. Once foil is started, stop to install trim cap.

Tip: Foil installs easier if excess is held out to starboard side of boat.

3. Trim Cap

Place trim cap on foil so slot is aft, with large hole on starboard. Squeeze together with pliers. Put blue Loctite® in barrel nut. Install two-piece screw and barrel nut with Phillips screwdriver.

4. Foil

Snap foil into place by pulling aft with one hand, while sliding foil up with the other. Use heat gun.

Tip: Use liquid soap to lubricate headstay and foil.

IMPORTANT! Do not use McLube to lubricate headstay and foil. See maintenance on Page 8 for details.

Loctite is a trademark of Henkel AG & Company KGaA.

Installation

5. Feeder

Slip feeder into place and firmly push upwards.

Cut, splay, and snap tube into place.

Coat screw with blue Loctite® and tighten. If screw does not thread, check alignment.

Tape full length of lower spacer tube.

6. Bottom Tube

Push foil up as far as it will go.

Measure length from feeder to bottom of exposed stay for lower spacer tube length.

7. Prefeeder

Measure 12" (300 mm) below feeder and lash prefeeder to tube.

Tape prefeeder in place.

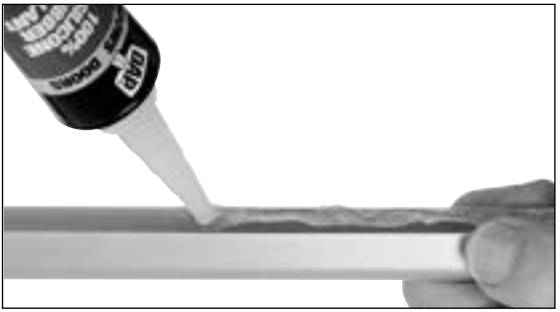
Installation

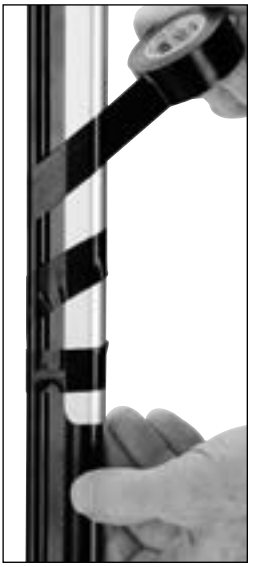
Halyard Lead

Halyard must be parallel to stay. If halyard pulls at an aft angle, it will pull out luff tape and damage foil grooves.

Chafe Guard

Before installing, sail with spinnaker a few times to produce wear marks. Choose location to cover marks. Squeeze bead of silicone sealant up length of each inside edge of guard. Press in place. Use supplied PVC tape to hold guard securely for 24 hours before using.





Using Carbo Racing Foil

Raising Sail

Use prefeeder when raising sail. Raise sail completely and tension halyard before sheeting. Sheeting sail too soon can damage luff tape and foil.

Quieting Bare Foil in Strong Wind

While motoring or moored in high wind the bare foil will oscillate, creating an annoying noise. To prevent this, wrap jib halyard around foil four to six times, secure to deck fitting (foreguy bail), and hand tension at winch.

Sail Misfeed

To prepare for the rare occasion when a sail misfeeds, some Grand Prix sailors drill a small exit port (shown at right). If sail jams on hoist, lower until misfeed runs down into gap, then rehoist.

Troubleshooting

Installation		
Problem	**Probable Cause**	**Solution**
Foil is difficult to start onto stay.	Foil is stiff from cold.	Heat foil to improve flexibility.
	Too much friction from stay.	Check diameter of stay. See specifications on page 2.
Foil is curved when unrolled.	Foil has taken set.	Unroll foil and let it relax in warm conditions.
Trim cap does not fit.	Trim cap is incorrectly aligned.	Place cap on foil with split side on groove side and large hole on starboard.
	Hole is drilled incorrectly.	Examine hole and ream out so it fits.
Difficult to snap foil on stay.	Stay is too loose.	Tension stay. If on ground stretch taut between two solid attachments.
	Needs more upward movement.	Pull foil in and up. Push down on foil if installing on land.
Feeder does not fit.	Feeder is on upside down.	Remove feeder and install so side groove is on starboard.

Use		
Problem	**Probable Cause**	**Solution**
Bare foil is noisy in wind.	Needs to be stabilized.	Wrap jib halyard around foil 4-6 times, secure to deck, and hand tension at winch.
Sail luff tape comes out of groove.	Luff tape too small.	Check to see if luff tape is #6, 5 mm (3/16") in diameter.
Top of luff tape does not feed into feeder or catches.	Luff tape is frayed.	Trim loose material with hot knife. Smooth with sandpaper.
Bottom of luff tape pulls out of plastic foil.	Luff tape is cut too short.	Install longer luff tape so it protrudes 15 cm (6") below feeder.
Top of luff tape pulls out of plastic foil.	Halyard angles too far aft.	Change location of halyard sheave so halyard is parallel to stay.
Top of sail has pulled out of foil above feeder.	Halyard has yanked luff tape out of foil.	Remove feeder to refeed. Drill hole in foil just above feeder to refeed future pull-outs.
Sail will not raise or lower easily, too much friction.	Halyard sheave is jammed.	Check sheave bearings and sideload bearings.
	Dirt or other material in foil grooves.	Make a cleaner out of piece of luff tape and grommets.
	Luff tape is too large.	Install correct luff tape. System 7000 uses #5, 4 mm (5/32"); System 7001, 7002 uses #6, 5 mm (3/16").
	Luff tape is damaged or dirty.	Clean sail luff tapes and lubricate with thin film of McLube® Sailkote™. Spray on shore, away from Carbo Racing Foil and boat. Replace or repair as necessary.
	Luff tape needs lubrication.	Clean sail luff tapes and lubricate with thin film of McLube Sailkote. Spray on shore, away from Carbo Racing Foil and boat. Let McLube Sailkote dry completely before feeding sail into foil. McLube or other toluene- or acetone-based lubricants must not be sprayed near foil. Use McLube on sails but not on Carbo Foil.
Luff tape damaged after raising sail.	Load put on sail before it is raised.	Raise sail and tension halyard before sheeting.

HARKEN®

Maintenance

Harken equipment requires minimal maintenance, but some is required to give the best service and to comply with Harken's limited warranty.

It is important to keep equipment clean by frequently flushing with fresh water. In corrosive atmospheres, stainless parts may show discoloration around holes, rivets, and screws. This is not serious and may be removed with a fine abrasive.

Sails—Keep sail luff clean and inspect for signs of damage and fraying.
Repair if necessary.

The Carbo foil material is slippery. If more lubrication is required, spray a thin coat of McLube® Sailkote™ **on sail luff tapes away from Carbo Racing Foil and boat deck**. **Be sure to let sail dry before feeding sail into foil.**

WARNING! Do not spray sail while it is on boat. McLube Sailkote overspray will cause slippery decks which may result in loss of footing, falling overboard, and personal injury or death.

CAUTION! Read instructions on McLube can before using. Spray McLube Sailkote on sails in a well-ventilated area.

IMPORTANT! Spray sail away from the Carbo Racing Foil. Let McLube Sailkote dry completely before feeding sail into foil. McLube Sailkote or other toluene- or acetone-based lubricants must not be sprayed on or near foil. Spraying McLube Sailkote directly on Carbo Racing Foil may damage it.

Storing

If storing mast down, foil should be reasonably straight with foil groove down to avoid water and ice buildup.

Before stepping mast, use soap and water to clean Carbo Racing Foil grooves.

Warranty

For additional safety, maintenance, and warranty information: www.harken.com/manuals or the Harken catalog.

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Printed in USA 4364 v1 07/23