

# HARKEN®

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## INSTRUCTIONS

### Big Boat Windward Sheeting Cars

3176, 3177, 3178, 3179 cars

3180 adapter kit - fits 3163, 3164, 3165, 3166 Big Boat CB cars. Not designed for T32 cars.



**WARNING!** Strictly follow all instructions to avoid an accident, damage to your vessel, personal injury, or death. See [www.harken.com/manuals](http://www.harken.com/manuals) for additional safety information.

**IMPORTANT!** See inspection and maintenance at end of manual.

### Terms

**Windward sheeting** – Mainsheet force on slider assembly opens leeward cleat for one (1) step trimming car to windward.

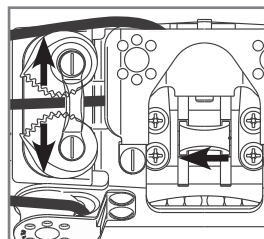
**CB** – Captive bearings. Wire retaining clips hold bearings captive for easy loading onto track and for maintenance.

**CB+ cars** – CB cars that can convert to old-style, non-CB track.

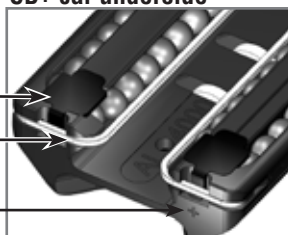
**Corner keepers** – Used on CB+ cars to help retain balls when cars are off track. Introduced beginning of 2015.

**Retaining clips** – Formed wires for holding bearings.

**CB-style track** – Track designed with deeper grooves to accept CB car retaining clips.



**CB+ car underside**



Corner keeper

Retaining clip

+ stamp at one end

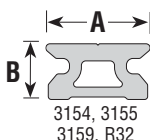
### Specifications

Car	Description	Car width		Car length		Maximum working load		Breaking load	
		in	mm	in	mm	lb	kg	lb	kg
3176	Big Boat CB	3 5/8	136	5 3/8	136	3000	1361	7000	3175
3177	Big Boat CB/stand-up	3 5/8	136	5 3/8	136	3000	1361	7000	3175
3178	Big Boat CB/high-load	3 5/8	136	7 7/16	188	4500	2041	9000	4081
3179	Big Boat CB/high-load	3 5/8	136	7 7/16	188	4500	2041	9000	4081

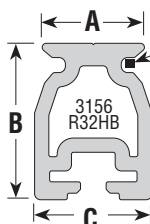
### Track Compatibility

#### CB track

Part No.	A		B		C	
	in	mm	in	mm	in	mm
3154, 3155, 3159, R32	1 1/4	32	3/4	19	1 5/8	42
3156, R32HB	1 1/4	32	2 1/4	57	1 7/16	30



3154, 3155  
3159, R32



Groove for retaining clips

3156  
R32HB

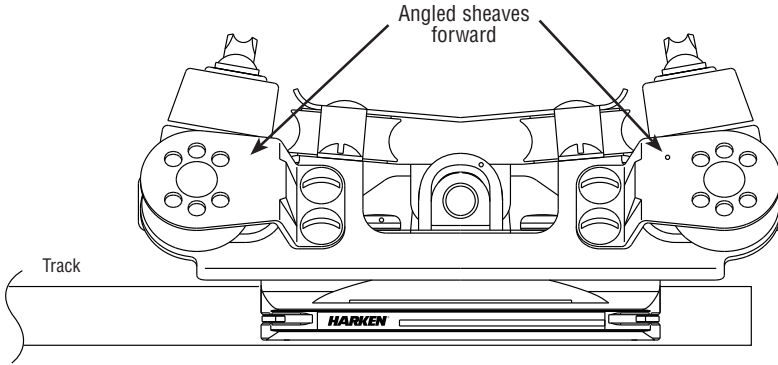
CB cars are shipped for use on CB track with grooves at waist to accept retaining clips first supplied by Harken in 2004. See end of manual if you have older track.

## Installing Windward Car Assembly on Track

1. Position car assembly at end of track so angled sheaves face forward.
2. Gently roll car on track. Car should roll on easily. If not, check to make sure you are using CB track. *Do not remove ball retaining wires. Cars will not roll unless they have retaining clips.*

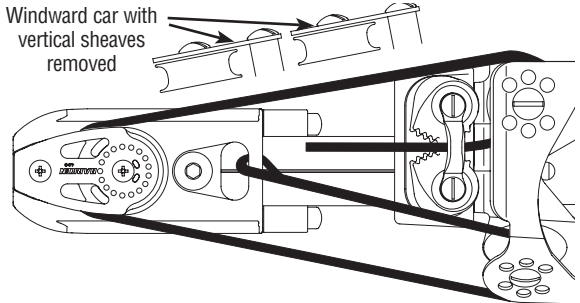
**Exception: CB+ cars can convert to non-CB cars. See Converting Cars to Run on Non-CB Track.**

**Important: Do not install a stand-up spring between mainsheet block and windward car assembly. Use 1896 stand-up toggle if required.**



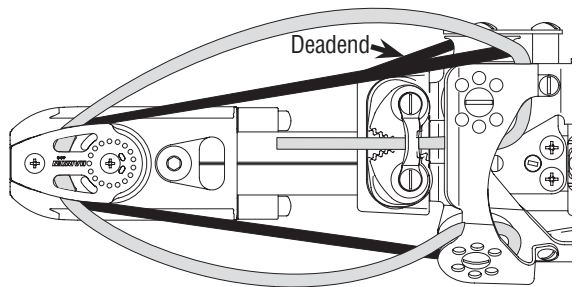
## 4:1 Control Lines - Use 3168 Big Boat End Controls

1. Attach eye splice or tie a bowline knot to inside bar of 3168 end control.
2. Remove vertical sheave and becket.
3. Reeve line downward through angled sheave, around end control sheave around top sheave on windward mechanism, and out through cleat.
4. Tie stop knot in line end to prevent damage to car in an uncontrolled jibe.



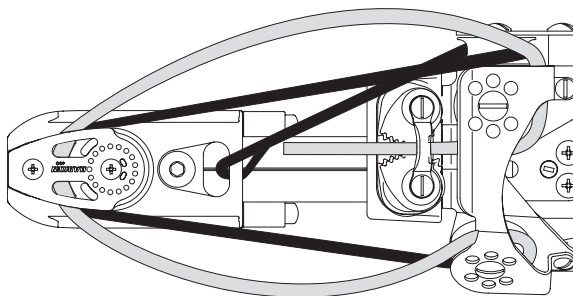
## 5:1 Control Lines - Use 3169 Big Boat End Controls

1. Deadend line to vertical sheave by splicing, tying a bowline or overhand knot as a stop under sheave.
2. Reeve other end of line through lower end-control sheave, around angled car sheave in an upward direction, around the upper end control sheave, around the upper car sheave, and out through the cam cleat.
3. Tie a stop knot in end of control line, placed to prevent damage to car in an uncontrolled jibe.

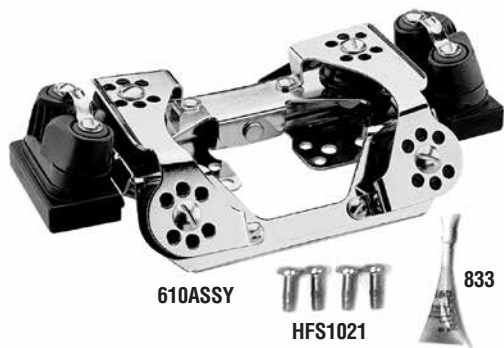


## 6:1 Control Lines - Use 3169 Big Boat End Controls

1. Deadend one end of line to inside bar on 3169 end control.
2. Pass other end of line to car, upward between vertical sheave and post.
3. Continue reeving line through lower sheave at end control, around angled car sheave, upward around upper sheave on end control, around upper car sheave, and out through cam cleat.
4. Tie a stop knot in end of control line, placed to prevent damage to car in an uncontrolled jibe.



## 3180 Windward Sheeting Adapter Kit for 3161, 3163, 3164, 3165, Big Boat CB (Captive Ball) Cars

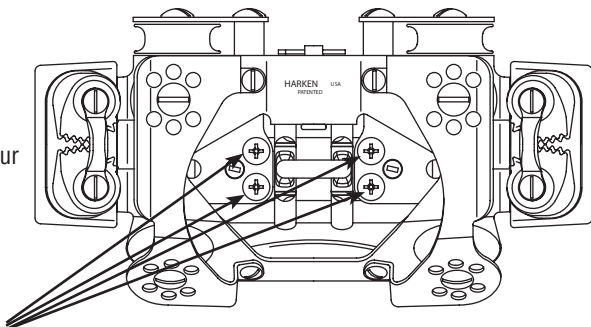


### Kit parts

Part No.	Quantity	Description
610ASSY	1	Windward sheeting assembly
HFS1021	4	M6 X 1 X 12 screw
833	1	Blue Loctite® adhesive

## Mounting 3180 Big Boat Adapter Kit

1. Remove screws holding swivel ears or control blocks on top of car. Save screws.
2. Place adapter kit on car so angled sheaves face forward.
3. Put a few drops of blue Loctite on four (4) screws and install in corresponding holes in adapter kit. Tighten screws firmly.
4. Reeve line as instructed.

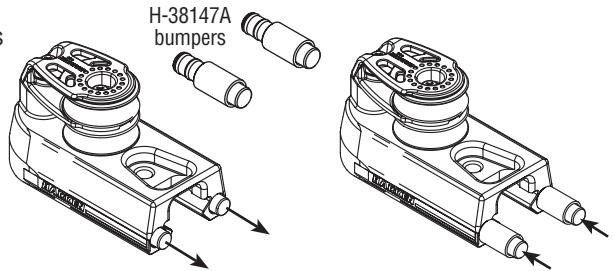


Install four (4) HFS1021 screws and tighten firmly

## Installing Bumper Extensions on 3169 End Controls

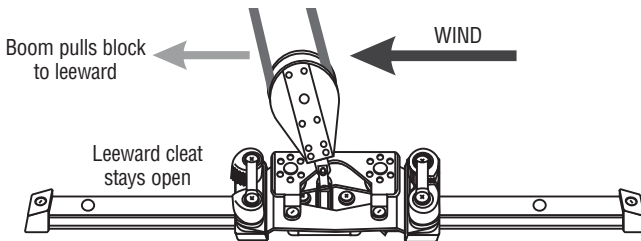
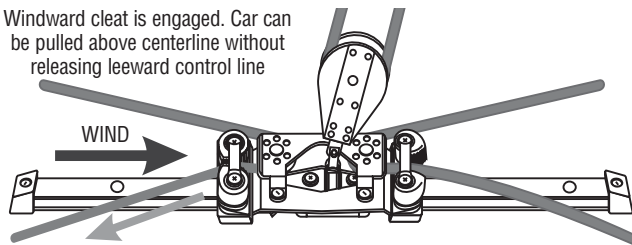
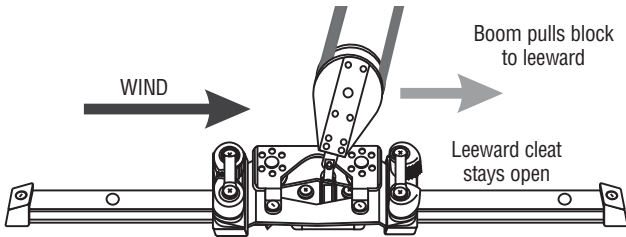
Use bumper extensions included with controls on 3176 and 3177 car bodies to keep windward assembly from hitting end control blocks. Longer  $7\frac{7}{16}$ " cars (188 mm) do not need them.

1. Use pliers to remove old bumpers from 3169 end controls.
2. Push in new bumper extensions.



## How to Use Your Harken Windward Sheeting Car

The windward sheeting traveler car is much easier to use than to describe.



1. Position car by pulling the windward traveler control line.
2. Don't release line from leeward cleat to pull car to windward.
3. Tack and car will stay. Now pull car to windward on new tack without releasing leeward control line.
4. If car is pulled to windward and then dropped to centerline before a tack, there will be slack in leeward control line. The car will drop below centerline on new tack.

## Don't Let the Windward Sheeting Car Slat in Light Air/Large Waves

For conditions where there is little wind and large waves, you can install override cleats on deck at outboard ends of track to stabilize car. Use Harken Cam-Matic® cam cleats.

## Mooring/Motoring

Tie windward sheeting car to one side while motoring or when moored. Otherwise car can work loose and become damaged when it hits track ends.

## Installing Traveler Car on Track

Position car at end of track and gently roll on. Car should roll on easily. If not, check to make sure you are using CB track. **Do not remove ball retaining clips.** *Cars will not roll unless they have retaining clips.* **Exception: CB+ cars can convert to non-CB cars. See reverse side.**

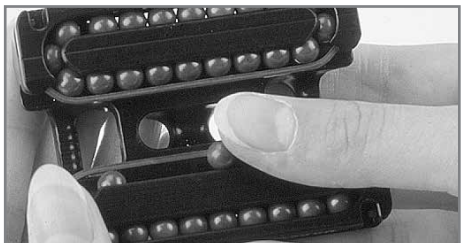
## Removing Ball Bearings from CB Cars



Position car on edge and gently push one (1) ball at a time from center of retaining clip.

**Do not remove retaining clip from car!**

## Loading Ball Bearings into CB Cars



Position car on edge with retaining clip in place. Gently push one (1) ball at a time into car from center of clip. Allow balls to roll into return race and insert remaining balls.

**Do not overfill car!**

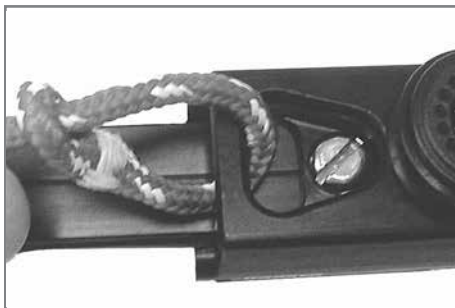
## Ball replacement chart

CB car	Description	Car length	Balls/car	Balls	Order	Balls/set	Ball Ø
3176/3177	Big Boat	5 $\frac{3}{8}$ " (136 mm)	50	Torlon®	547	25	$\frac{3}{8}$ "
3178/3179	Big Boat/high-load	7 $\frac{1}{16}$ " (188 mm)	72	Torlon	547	25	$\frac{3}{8}$ "

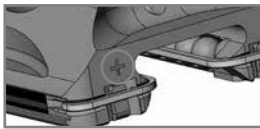
## Attaching Splice

Pass eye through bail and run tail through to make a cow hitch.

**Note: Insert eye down from above.**



## CB + Cars can Convert to Fit Old-Style, Non-CB Track



CB+ cars designed for CB track.

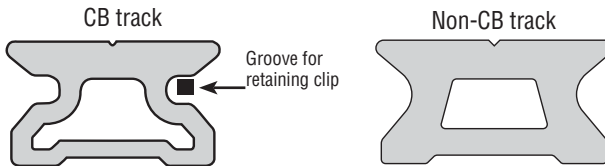


CB+ cars can convert to run on old-style, non-CB track.



Order car loader.

Car length	Loader
5 3/8" 136 mm	HBB1
7 7/16" 188 mm	HBB28



Track built after 2003. No need to convert car.

Track built through 2003.

## Converting CB + Cars to Run on Non-CB Track

**Important! Requires CB+ cars. See complete instructions at [www.harken.com/manuals](http://www.harken.com/manuals).**



1. Use flat-bladed screwdriver to push retaining clip toward end.



2. Pry retaining clip off and dump balls in box.



3. Remove retaining clips and corner keepers over box to catch balls.



4. Hold car on edge and load lower side with correct number of balls. **Do not overload.** Consult chart to confirm quantity.



5. Remove two (2) clips from car loader. Slide car loader in so loading port is on the side of car without balls.



6. Put one (1) clip on "open" end of loader. Load rest of balls through ball loading port into empty bearing race. Consult chart to confirm quantity. Line up car loader with track and gently roll car onto track.

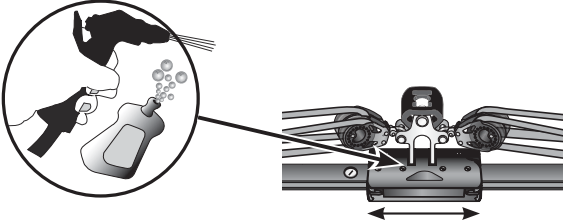
**Do not use corner keepers.**

## Inspect

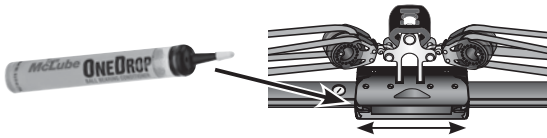
Frequently inspect shackles and control block fittings for signs of fatigue. Replace as necessary. Make sure every installation includes Harken track endstops. Arrange control tackle so cars do not hit endstops under load.

## Maintenance

**Traveler cars:** Clean by frequently flushing with fresh water. Periodically clean car by squirting a detergent/water solution into center openings. Roll car back and forth to distribute evenly. Flush bearings with fresh water.



Do not use spray lubricants because ball bearings can skid, not roll. Once car and track are dry, apply one (1) to two (2) drops of McLube® OneDrop™ ball bearing conditioner to ball contact surfaces of track. Roll car back and forth through OneDrop conditioner several times to distribute onto bearings. Wipe remaining OneDrop off track. OneDrop conditioner is preferred, but you can also use one (1) to two (2) drops of a light machine oil. Too much oil attracts dirt.



**Track:** Clean with detergent and water.

**Important! Exposure to some teak cleaners and other caustic solutions can result in discoloration of part and is not covered under the Harken warranty.**

## Warranty

For additional safety, maintenance, and warranty information see [www.harken.com/manuals](http://www.harken.com/manuals) or the Harken catalog.

McLube is a registered trademark of McGee Industries, Inc.  
OneDrop is a trademark of Mclube, a division of McGee Industries, Inc.

## Replacement Parts

No.	Part No.	Quantity	Description
1	HFS107	4	Trusshead screws 10-32X1.5"
2	201	2	Eyestraps
3	150SP* **	2	Cam cleats (special)
4	HFS181	1	Cotter pin
5	SP-038	1	Clevis pin
6	HCP218	2	Plastic slide set

\*Replacement kit (balls): Part No. 150BALLS;

\*\*Cam rebuild kit (parts/balls): Part No. 150KIT



1



2



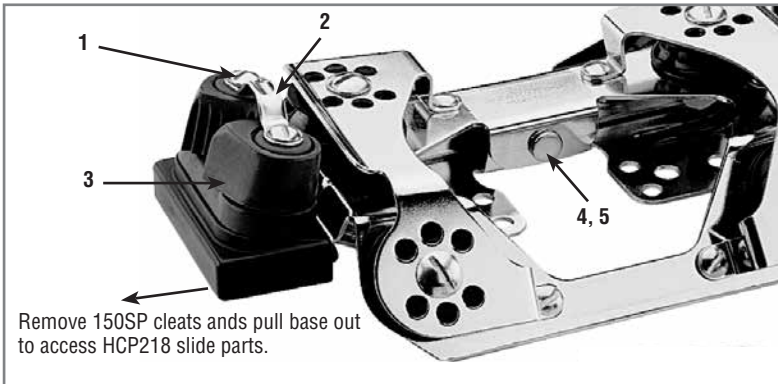
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4, 5



6



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