

# **HARKEN®**

## **LOCKING CAR AND TRACK SYSTEM**

### **Switch Battcar 32 mm**

Installation and Use Guidelines – Intended for specialized personnel or expert users

5271 03-19



Locking car  
C13807 shown

Headboard plate - C9250 Shown  
**IMPORTANT!** Use only Harken  
approved headboard plate.

Lock track C14526 shown

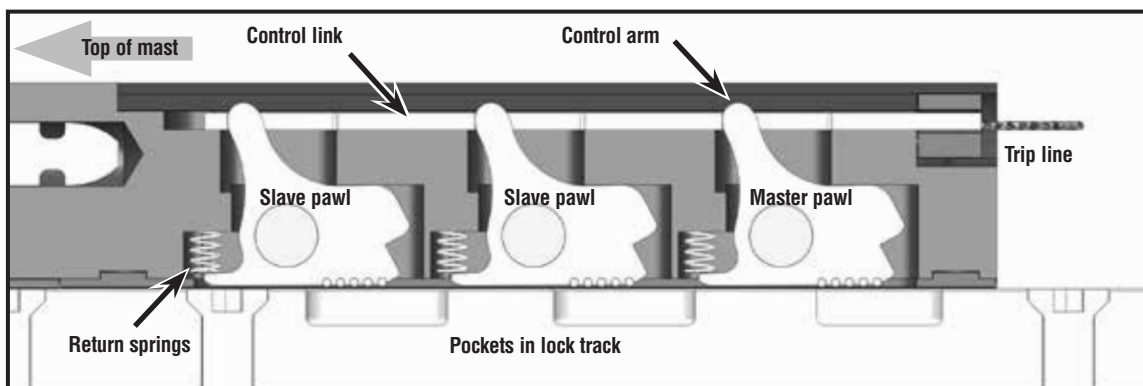


**WARNING!** Strictly follow all instructions to avoid potential hazards that may kill or hurt you and others. See [www.harken.com/manuals](http://www.harken.com/manuals) for general warnings and instructions.

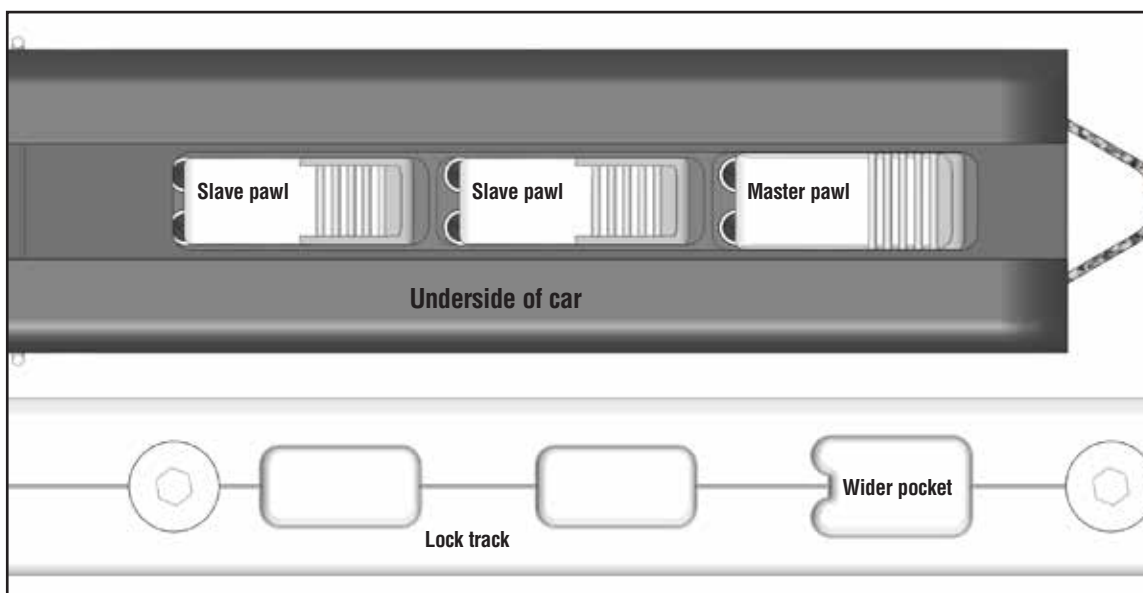
Please read these instructions carefully before installing, servicing, or operating the equipment.  
This manual may be modified without notice. See: [www.harken.com/manuals](http://www.harken.com/manuals) for updated versions.

**PLEASE SAVE THESE INSTRUCTIONS**

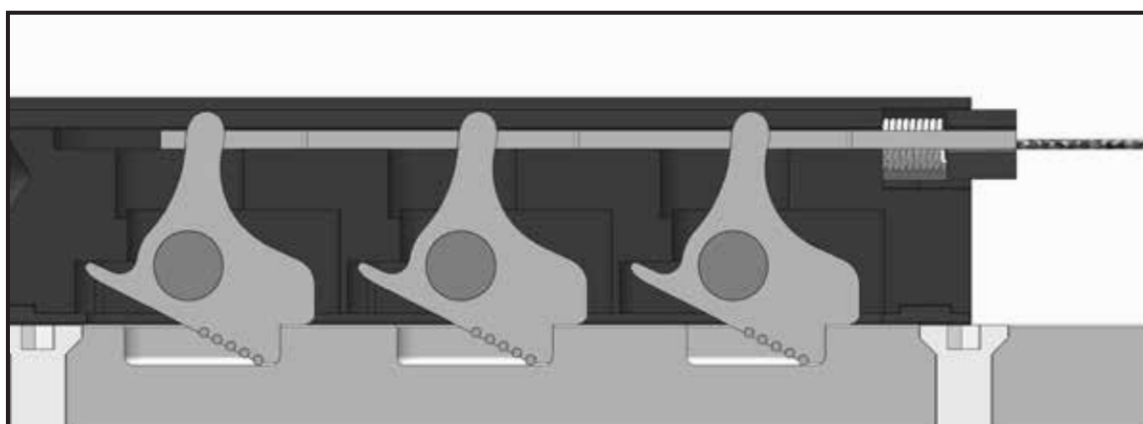
**General description - Locking mechanism** - Locking headboard system consists of locking car, lock track and headboard plate. The car has multiple pawls that lock into pockets in the lock track. Return springs keep the pawls retracted into the car for hoisting and lowering. Once the sail is hoisted to the correct height, pulling the trip line moves the control link, leveraging the pawls' control arms simultaneously engaging the pawls into the lock track pockets. Easing the halyard seats the pawls and the halyard and trip line can completely ease. Halyard should be eased when car is locked.



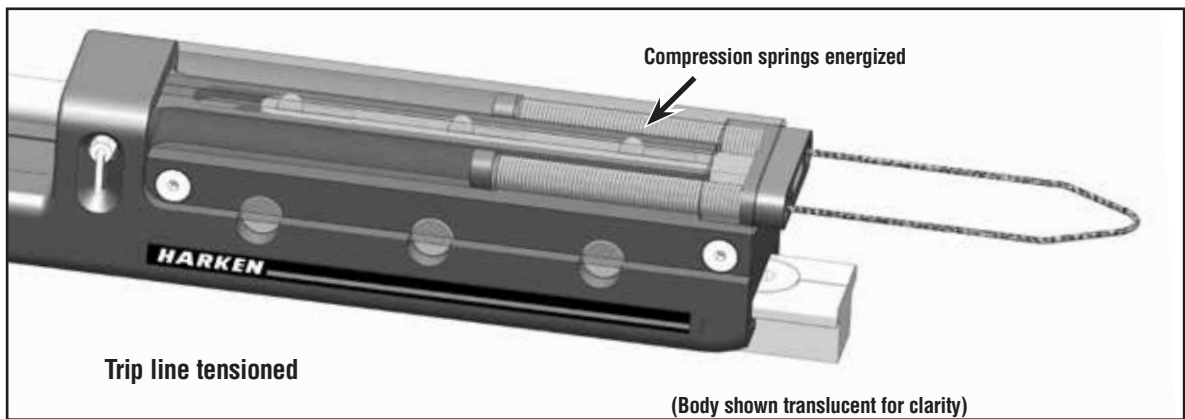
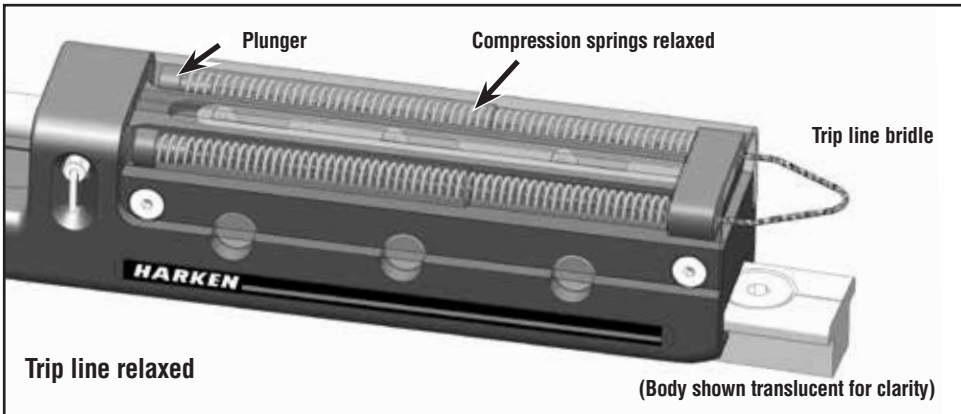
The master pawl and corresponding pocket are wider than the slave pawls. Because all pawls are connected by the control link they cannot engage into the sockets until the master pawl engages in the wider pocket.



The weight of the sail keeps the pawls engaged, so trip line and halyard can ease. When the halyard is tensioned the return springs push on the pawl triggers to retract the pawl into the car.



**General description - Locking mechanism continued** - The trip line connects to plungers that compress springs when the trip line is pulled. The energized springs operate the control link. Once the sail is hoisted so the pawls are just above the pockets, the locking procedure starts. When pulling the trip line and lowering the sail, the energized control link levers the pawls to find the pockets. Continuing to lower the car engages the pockets.

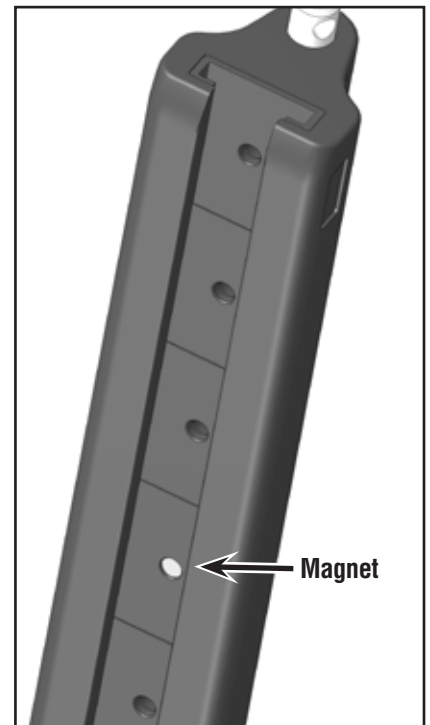
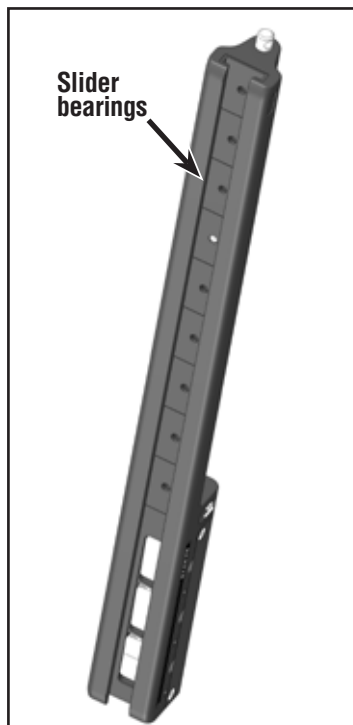


**Installation - Track mounting guidelines.**

Mount lock tracks at locking car locations at full hoist and at each reef. Use all fastener holes.

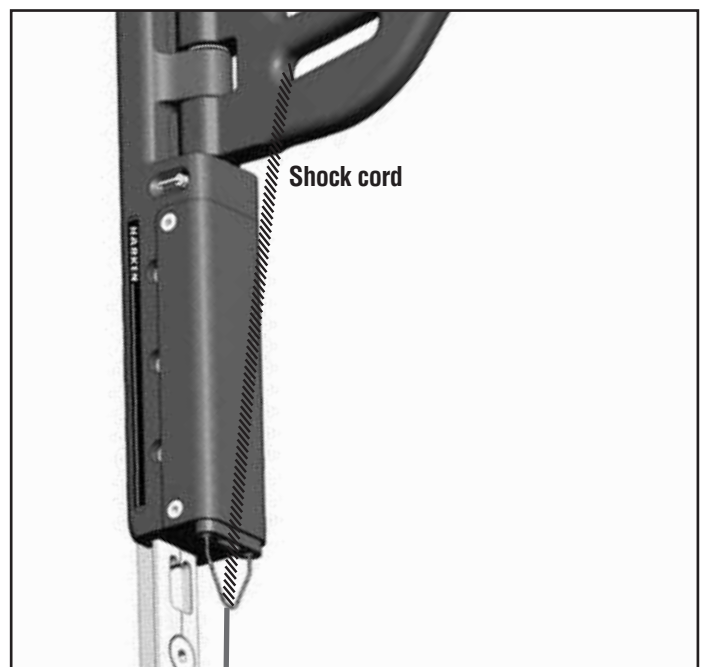
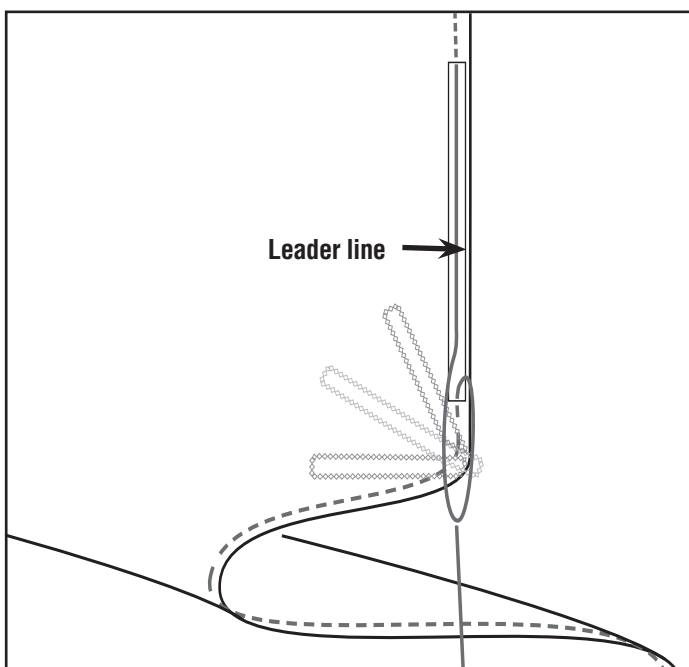
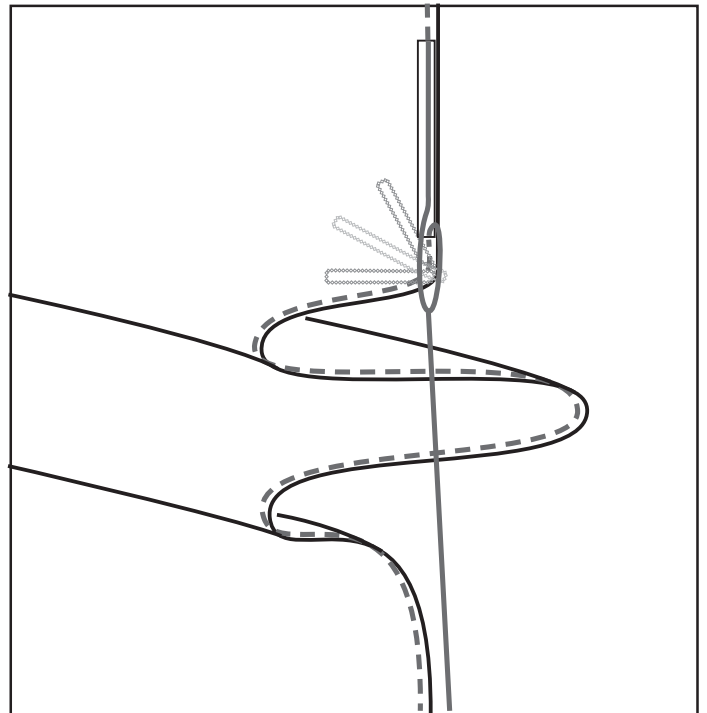
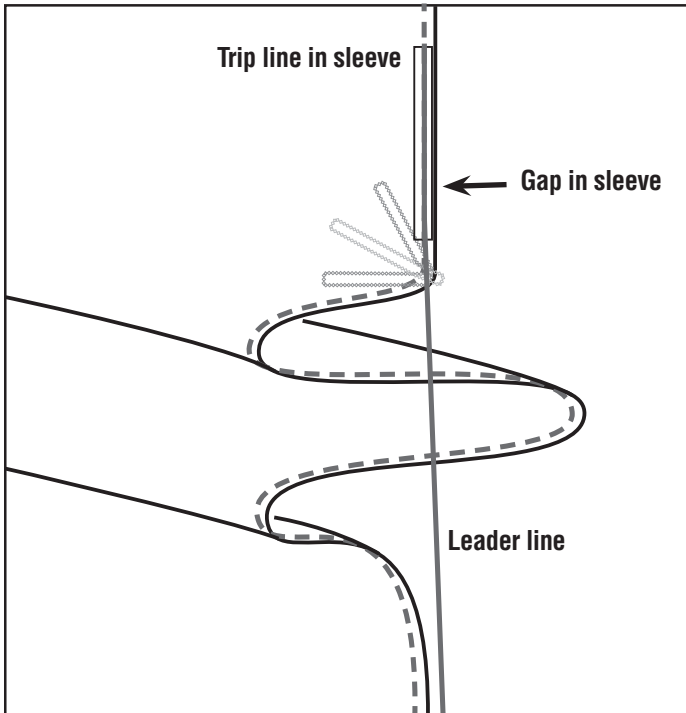
**Installation, Proximity sensor** The locking car has provisions in the slider bearings for a magnet so that proximity sensors can be used at full hoist and at the locking car reef locations. Any of the slider bearings can house the magnet allowing for flexibility of the sensor mount location. A light press-fit holds the magnet in place. Use a block of wood and mallet to tap the magnet in place. In use, a light indicates that the sail height is in the correct position with locking car pawls raised higher than the lock track pockets. Pulling the trip line while the car is lowered energizes the pawls to engage into the locked position. Alternatively use marks on the halyard.

**Note:** The sensor magnet is supplied by Harken. The proximity sensor is not supplied.



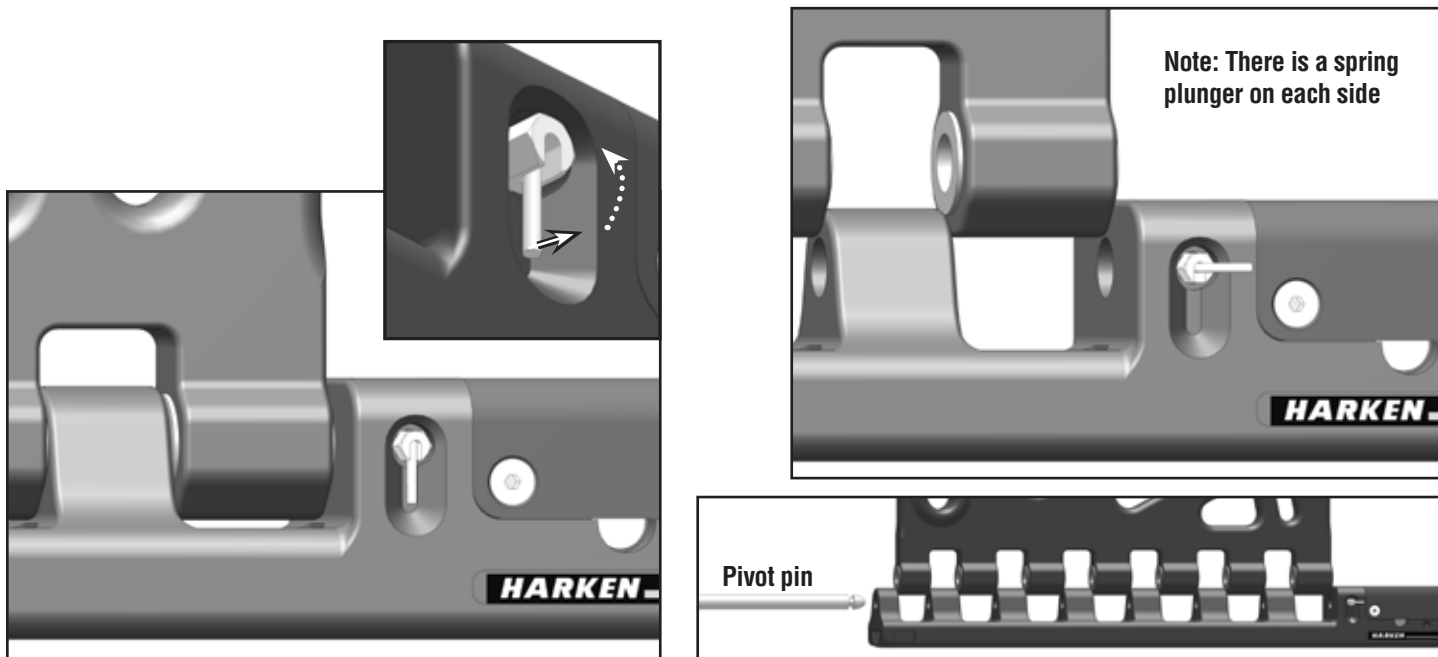
## Installation - Trip line

1. Trip line runs in sleeve in the sail luff. Choose Dyneema® uncovered 12 strand core for the trip line so that it slides easily in the sleeve.
2. In the lower portion, just above the reef tack fittings, provide 1 to 1 1/2 m (3' to 5') gaps in the sleeve for access to the trip line. A leader line can splice to the trip line and exit out the sleeve gaps just above each reef tack location. This allows the tensioning above the reefed sail folds.
3. Secure the top end to the headboard car trip line bridle. Use a shock cord between the spectra line and the headboard plate to reduce unintended tensioning of the trip line. Test to make sure the trip line can overcome the shock cord to engage the pawls.



## Using the system

**Headboard plate pivot pin lock** - The pivot pin locks to the car using two retractable spring plungers. Use a small strap, zip tie or line to get under and lift the arm. Rotate the arm to lock it out. The pivot pin can then be removed.



**Locking car at lock tracks** - Position sail at correct position so the pawls in the locking car are raised higher than the pockets in the lock track. The proximity sensor and/or the mark on the halyard should be set to indicate the proper correct position.

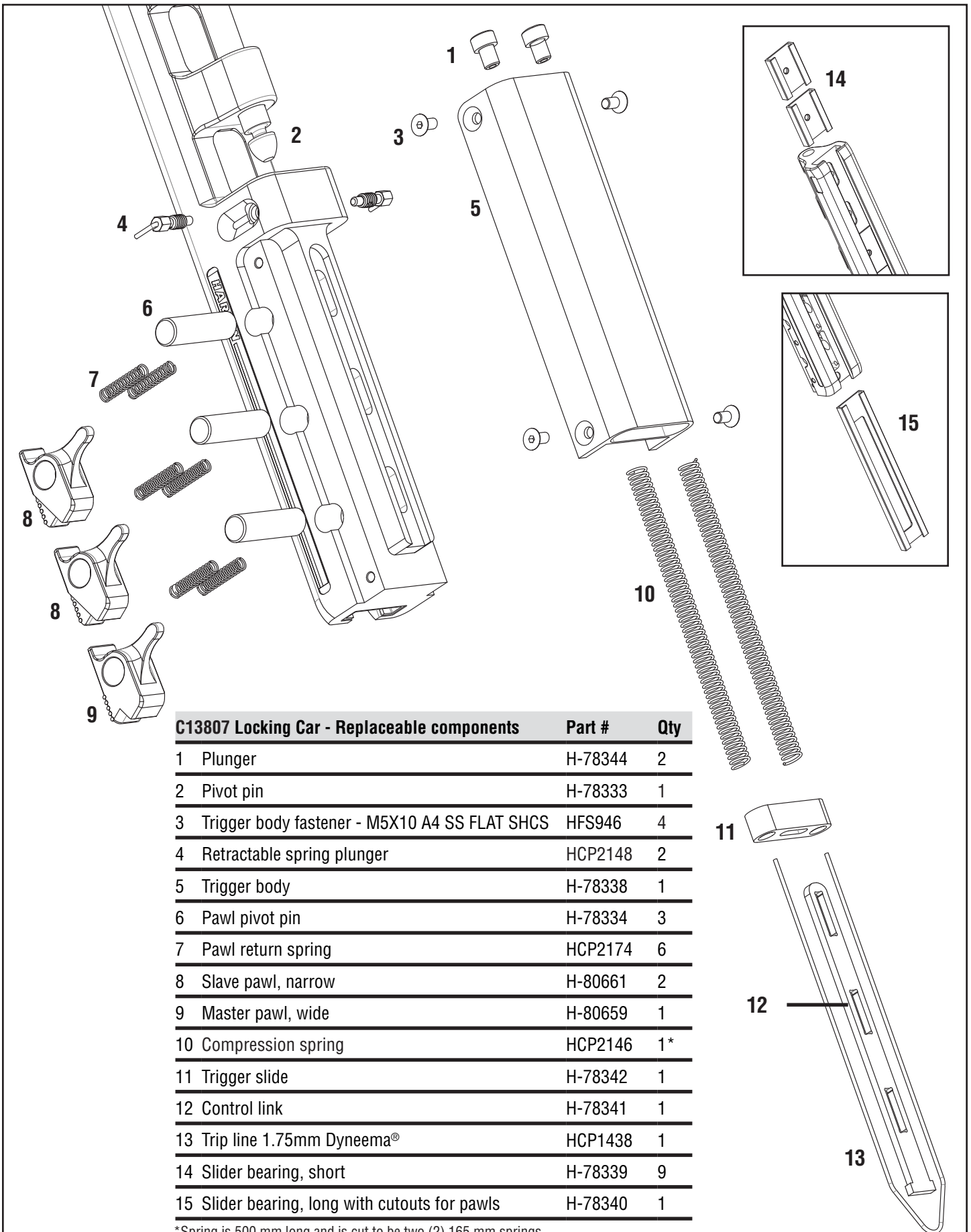
Pull trip line and ease halyard a small amount so the master pawl engages in the master pocket. Maximum load on the trip line should be no more than 10 kg. **IMPORTANT! - Verify that pawls are engaged!**

Release the trip line and carefully ease the halyard making sure the system is correctly locked.

Reduce the load on the halyard and put in about 300 mm (12") of slack in the halyard. **IMPORTANT! - Providing slack to the halyard is important so the trip line is not accidentally tensioned. Damage to the system can result, making it difficult to lower the sail.**

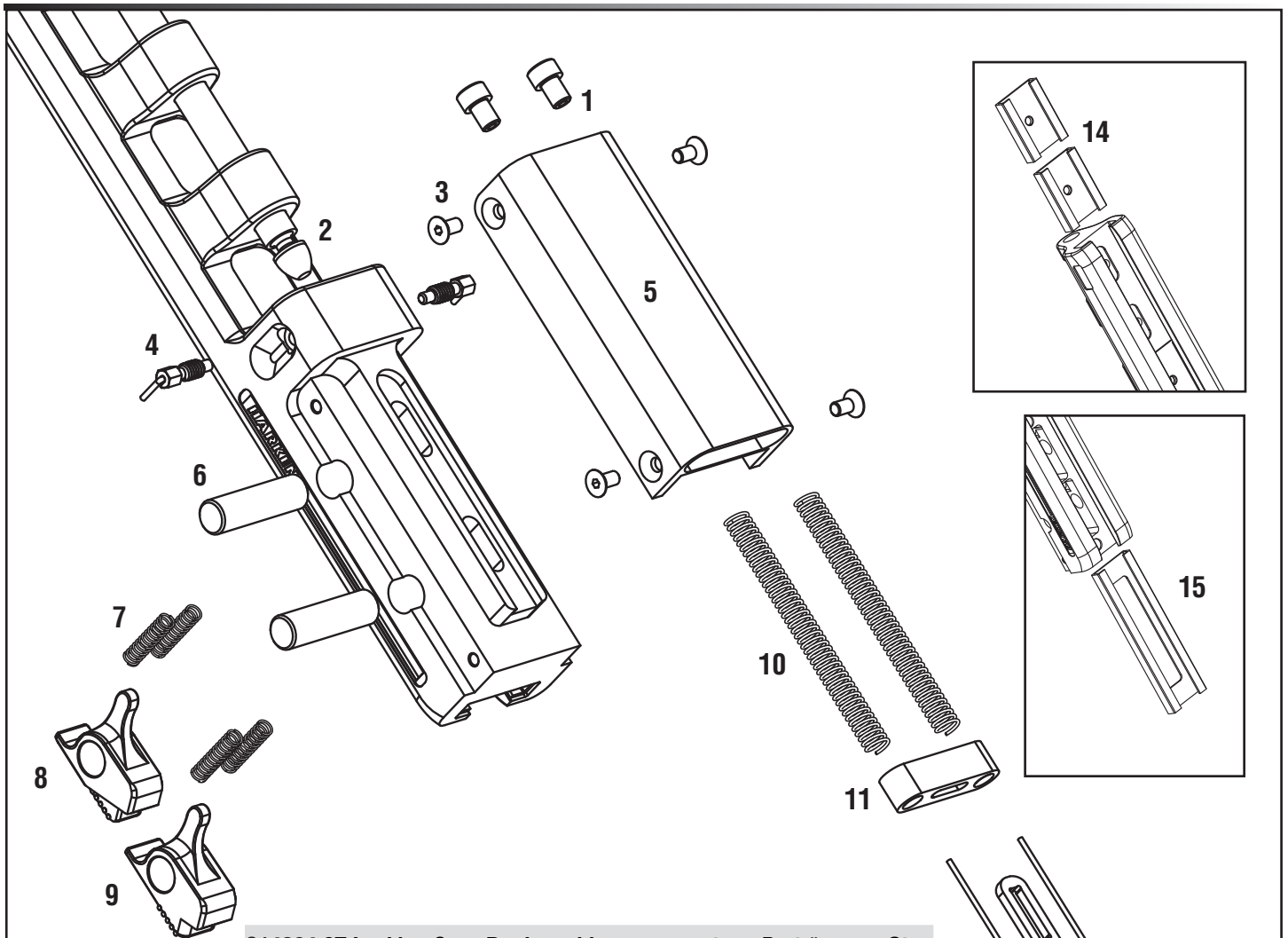
The purpose of the slack is to compensate for tension on the halyard caused when the mast straightens when sailing downwind especially on masts with a lot of prebend. This can raise the car a small amount and partially disengage the pawls. Going through waves can further tension the halyard as the mast swings around a bit. If the halyard tensions, the control link and pawl arms can deform causing the pawl to stick out a bit making it difficult to release and lower the sail.

**Locking car out of lock tracks** - Tension the halyard slightly and hoist a small amount. The pawls flip out of the pocket and into the car. Ease the halyard slightly to check.



C13807 Locking Car - Replaceable components		Part #	Qty
1	Plunger	H-78344	2
2	Pivot pin	H-78333	1
3	Trigger body fastener - M5X10 A4 SS FLAT SHCS	HFS946	4
4	Retractable spring plunger	HCP2148	2
5	Trigger body	H-78338	1
6	Pawl pivot pin	H-78334	3
7	Pawl return spring	HCP2174	6
8	Slave pawl, narrow	H-80661	2
9	Master pawl, wide	H-80659	1
10	Compression spring	HCP2146	1*
11	Trigger slide	H-78342	1
12	Control link	H-78341	1
13	Trip line 1.75mm Dyneema®	HCP1438	1
14	Slider bearing, short	H-78339	9
15	Slider bearing, long with cutouts for pawls	H-78340	1

\*Spring is 500 mm long and is cut to be two (2) 165 mm springs.



C14084 8T Locking Car - Replaceable components		Part #	Qty
1	Plunger	H-78344	2
2	Pivot pin	H-78964	1
3	Trigger body fastener - M5X10 A4 SS FLAT SHCS	HFS946	4
4	Retractable spring plunger	HCP2148	2
5	Trigger body	H-78965	1
6	Pawl pivot pin	H-78334	2
7	Pawl return spring	HCP2174	4
8	Slave pawl, narrow	H-80661	1
9	Master pawl, wide	H-80659	1
10	Compression spring	HCP2146	1*
11	Trigger slide	H-78342	1
12	Control link	H-78966	1
13	Trip line 1.75mm Dyneema®	HCP1438	1
14	Slider bearing, short	H-78339	6
15	Slider bearing, long with cutouts for pawls	H-78963	1

\*Spring is 500 mm long and is cut to be two (2) 125 mm springs.

**IMPORTANT! - All parts must be inspected, cleaned and serviced regularly.**

**Servicing locking mechanism**

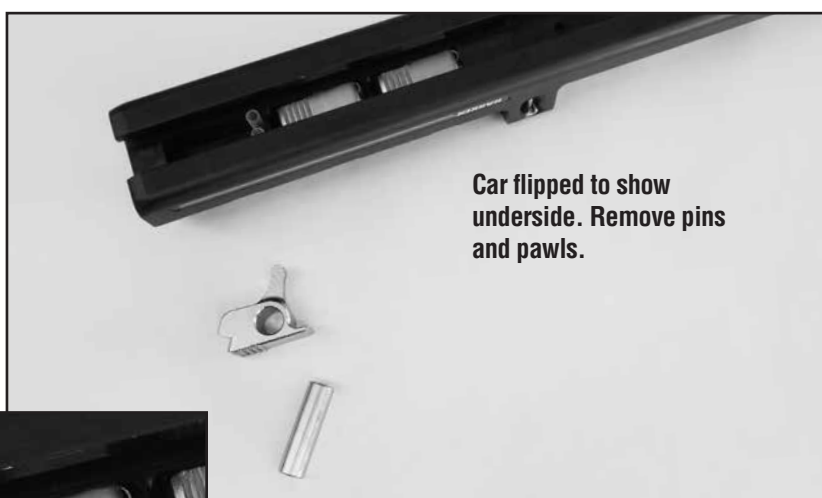
Use 3 mm hex key to remove four screws holding trigger body assembly in place.



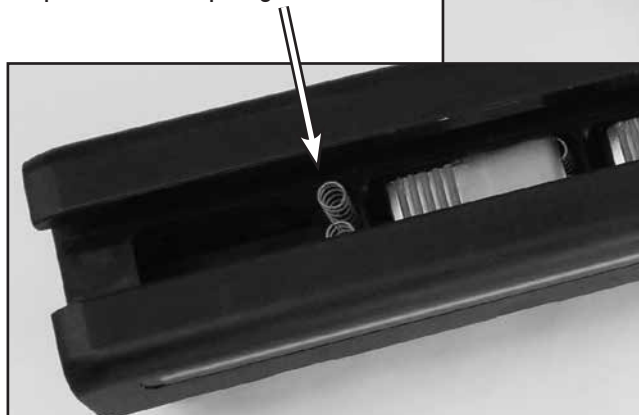
Lift trigger body assembly.



Push pivot pin out of main body and remove pawl from the underside. Remove master and slave pawls.

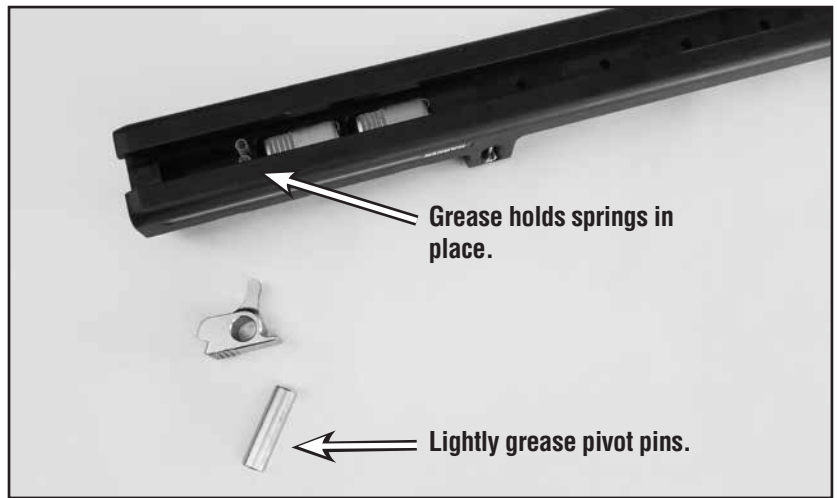


Be sure to retain pawl return springs.





After cleaning parts, put a small amount of grease in the spring sockets. Lightly grease entire pawl pivot pin.



Clean and inspect all trigger body assembly. Be sure to inspect knots on end of trip line. Replace trip line as necessary.

Lightly grease pawl arms.



To assemble trigger body assembly, pull on trip line and place lower end on the car body.

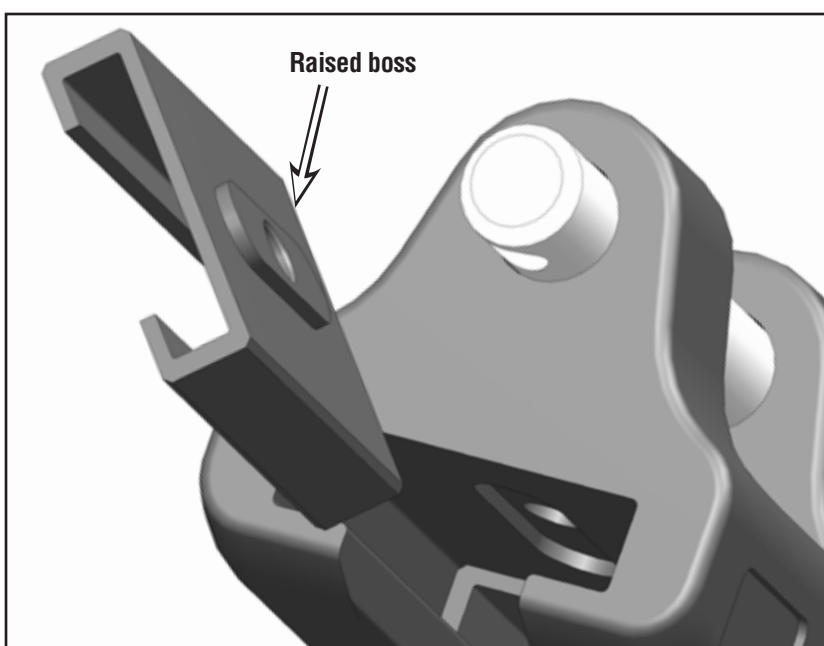


Install four screws using a drop of blue Loctite®.



### Servicing slider mechanism

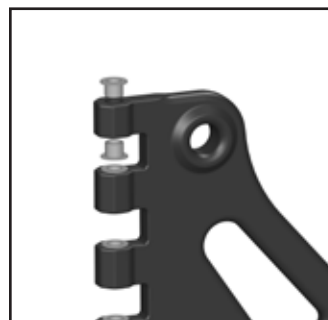
Occasionally the slider bearings on either end of the car may need replacing. To remove a slider, use a large zip tie or similar plastic item to pry the slide away so it can slip off the car end. Slider bearings have a raised boss that mates with the recess in the car. See image below.



### Servicing bushings in headboard plate. **IMPORTANT! Use only Harken approved headboard plate.**

Bushings in headboard plate must be inspected and in good working condition. Replace if there is any visible wear.

Headboard Plate	Used with	Bushing Part #	Qty
C9250	C13807	HCP1804	14
C10622	C14084	HCP1804	12



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## Troubleshooting

Locking car will not release -

Make sure:

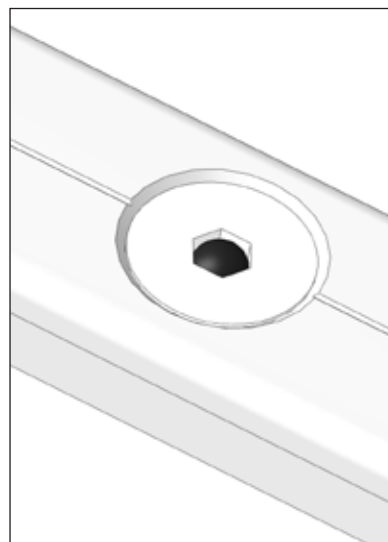
1. Trip line is eased. Make sure it is not caught on anything.
2. Halyard is tensioned to counter the weight of the sail.

If the tip line does not have tension and pawls will not release, remove four screws securing trigger body to the car. Lift the trigger body so the pawls can release.

## Car pawls catching on track mounting holes. Tracks supplied before 2018.

Use a plastic hammer to tap a Delrin® ball bearing in the 10 mm flathead screw socket used for the hex key driver. The ball prevents pawls from accidentally catching in the socket.

32 mm track - 1/4" Delrin ball.



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