

Owner's Manual

EH-HD Model E-Hitch

Installation, Operation and
Maintenance Procedures



Patents (US 8,336,902 B2) (US 8,540,270 B2)
(US D 698,287 S) Other Patents Pending

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Introduction

This manual provides the information necessary for the proper operation and maintenance of the EH-HD E-Hitch.

The EH-HD is designed for aviation ground support equipment and industrial material handling applications. This product is NOT approved by SAF-HOLLAND® for over-the-road use.

SAF-HOLLAND® reserves the right, without giving prior notice, to change specifications and dimensions as designs are altered or improved.

IMPORTANT: Keep this manual in a safe location for future reference.

Read this manual before using or servicing this product and keep it in a safe location for future reference. Updates to this manual, which are published as necessary, are available on the internet at www.safholland.us.

When replacement parts are required, use only SAF-HOLLAND® Original Parts. A list of technical support locations that supply SAF-HOLLAND® Original Parts and the HOLLAND® Coupling Products Catalog are available on the internet at www.safholland.com or contact Customer Service, refer to back cover contact information.

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Notes, Cautions, and Warnings

Before starting any work on the unit, read and understand all the safety procedures presented in this manual. This manual contains the terms "NOTE", "IMPORTANT", "CAUTION", and "WARNING" followed by important product information. These terms are defined as follows:

NOTE: Includes additional information to enable accurate and easy performance of procedures.

IMPORTANT: Includes additional information that if not followed could lead to hindered product performance.

CAUTION Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in property damage.

CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

1. General Safety Instructions

- The E-Hitch is designed for Industrial or Non-road use ONLY and is NOT intended for use on public roads or highways.
- Read and observe ALL Warning and Caution hazard alert messages. The alerts provide information that can help prevent serious personal injury, damage to components, or both.

⚠ WARNING Failure to follow the instructions and safety precautions in this manual could result in improper servicing or operation leading to component failure which, if not avoided, could result in death or serious injury.

- Installation and maintenance MUST be performed by a properly trained technician using proper/special tools, and safe procedures.

NOTE: In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act (OSHA). Equivalent laws could exist in other countries. This manual is written based on the assumption that OSHA or other applicable employee safety regulations are followed by the location where work is performed.

- DO NOT modify or add to these products.
- NEVER exceed the manufacturer's rated capacities of a coupling device, including Maximum Drawbar Pull and Maximum Vertical load.

IMPORTANT: DO NOT weld on these products, except as specified by SAF-HOLLAND® for welded installation.

⚠ WARNING Weld repairs to repair a broken part or to build-up a worn surface are strictly forbidden. Such weld repairs could locally alter the chemistry and heat treatment of the metal, alter the strength of the coupling device, or create a stress concentration that could result in structural failure resulting in death or serious injury.

- Prior to use, ALWAYS inspect a coupling device for excessive wear, cracks, bent or deformed components, secure mounting, and damaged or missing parts. Immediately inspect a coupling device which has been subjected to overload or binding due to jacking or excessive articulation.

⚠ WARNING Failure to inspect a coupling device prior to use could result in vehicle and trailer separation which, if not avoided, could result in death or serious injury.

- NEVER strike any part of a coupling product with a hammer or other tool as parts could break.
- Mounting bolts MUST be long enough to provide a minimum of two (2) full threads beyond the end of the nut. Always use new ASTM Grade 8 bolts with ASTM Grade C lock nuts with hardened steel washers for installation and mounting. Torque to manufacturer's specifications and do not over-torque.

⚠ WARNING Failure to use a long enough bolt or proper fastener type for mounting could result in vehicle and trailer separation which, if not avoided, could result in death or serious injury.

- Verify that the drawbar size is compatible with the coupling device of the tow vehicle. Refer to the Section 4, Design and Performance and Specifications located in this manual.
- Verify that the pin is fully seated in the down position prior to use.

⚠ WARNING Failure to correctly close E-Hitch can result in tow vehicle and trailer separation which, if not avoided, could result in death or serious injury.

- DO NOT over-articulate a coupling connection by jackknifing or binding during vehicle operations.

⚠ WARNING Failure to avoid over-articulation of a coupling connection due to jackknifing or binding could result in failure of the coupling device(s) which, if not avoided, could result in death or serious injury.

- DO NOT apply grease or other lubricants to the exterior surfaces of the pin, coupling device or drawbar eye which could trap abrasive sand and dirt which can accelerate wear in the coupling connection. Additionally, grease or other lubricants can hide cracks or damage present in coupling components.
- Follow inspection and maintenance guidelines listed in the Owner's Manual available from the coupling manufacturer.

2. Standard Decal Requirements

The following three (3) decals **MUST** be properly installed on the E-hitch body prior to putting it in service:

- **Rated Capacity Decals:**
 XL-PH20004DC-en-US (**Figure 1**)
 or XL-PH20003DC-en-US (**Figure 2**)
 (Refer to Section 8 for Rated Capacities).
- **Operation Decal:**
 XL-PH20006ID-en-US (**Figure 3**)
- **Warning Decal:**
 XL-PH10393ID-en-US (**Figure 4**)

It is the responsibility of the end user to periodically inspect all decals and ensure that they are clean and completely legible. If ANY decals are missing, loose, damaged or difficult to read, contact SAF-HOLLAND® Customer Service at 888-396-6501 to order replacements immediately. Refer to (**Figure 5**) for decal locations.

Figure 1



Figure 2



Figure 3

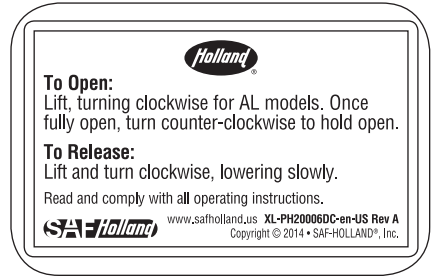


Figure 4



3. Model Identification

EH-HD part numbers will vary depending on the optional feature and mounting specifications. **Table 1** provides an explanation of the part number sequencing.

NOTE: "AL" in part number indicates an installed AutoLock Pin option.

4. Design and Performance Specifications

The EH-HD is available in multiple bolt-on mounting patterns or without holes as a weld-on mounting. Bolt-on patterns will have different ratings of either 30,000 lbs. (13, 608 kg) or 50,000 lbs. (22, 680 kg) depending on the size and placement of the bolts. Weld-on mounting is rated for 50,000 lbs. (22, 680 kg) based on a minimum 5/16" full penetration fillet weld.

Drawbar Eye Compatibility

- Minimum Inside Diameter.....2.25" (57 mm)
- Maximum Inside Diameter.....3" (76 mm)
- Maximum Cross Section Diameter.....1.75" (44 mm)

To determine specific EH-HD rated capacities, reference factory installed decal as illustrated in **(Figure 5)** or match part number with specific bolt pattern code shown in **Table 3**.

Table 1

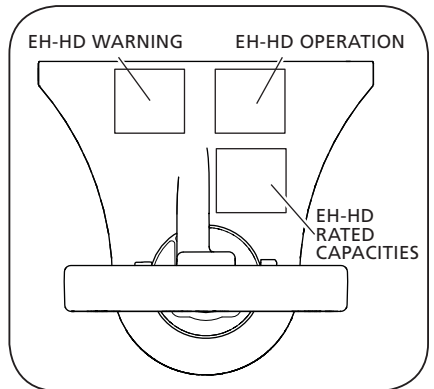
E- HITCH MODEL	PIN	
EH-HD	(Blank)	Non-Lock (Standard)
	AL	Auto-Lock (Optional)



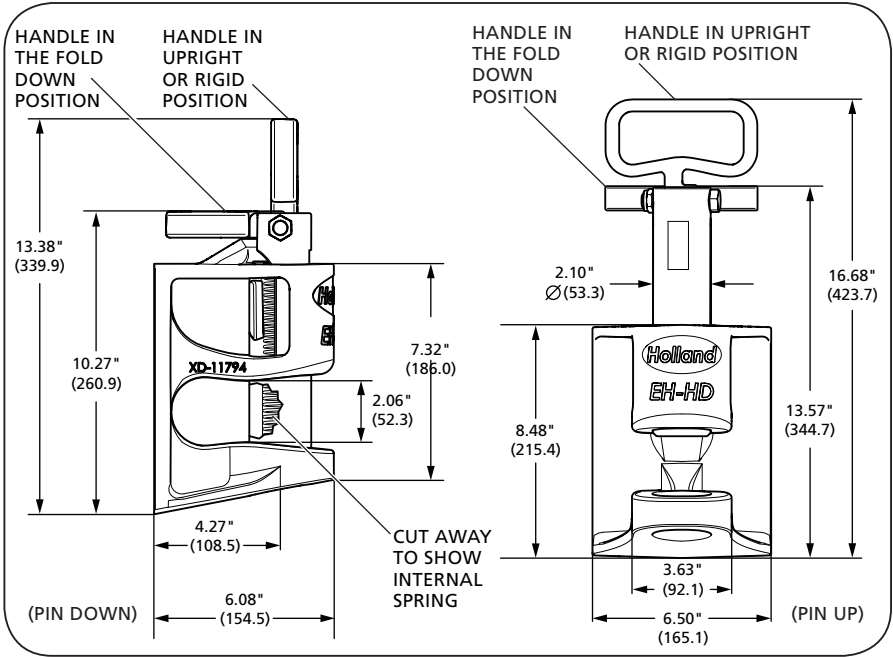
MOUNTING PATTERNS		FRAME COLOR	
00	Weld -On	13	Safety Yellow (Standard)
For Bolt-On Patterns and corresponding rated capacities, see Table 3 .		14	White (Standard)
		17	Red (Optional)

Examples:
 EH-HD-0014 includes standard non-lock pin, weld-on flange and standard white color.
 EH-HDAL-0113 includes optional auto-lock pin, '01' mounting bolt pattern and standard safety yellow color.

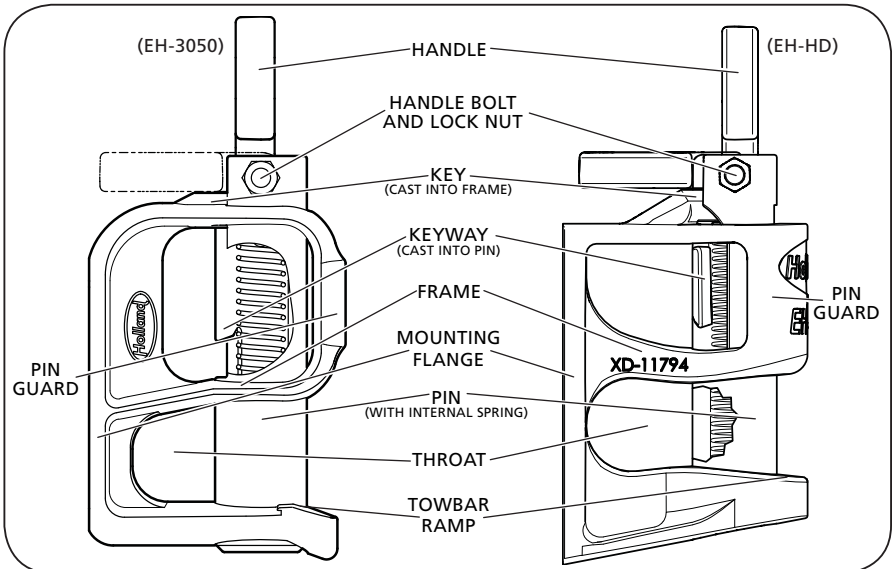
Figure 5



5. Dimensional Layout



6. Parts Identification/E-Hitch Terminology



7. Welding Standards

7.1 Welding Standards

This specification applies to all components supplied by SAF-HOLLAND®, and its products. The customer assumes full responsibility for weld integrity if weld material and procedures differ from those listed below.

7.2 Workmanship

All welding on SAF-HOLLAND® products MUST be performed by a welder qualified according to the appropriate AWS standard for the weld being made or an equivalent standard. It is the responsibility of the customer to provide good workmanship when welding on SAF-HOLLAND® products.

7.3 Material

Items to be welded that are made from low carbon or high-strength alloy steel are to be welded with AWS filler metal specification AWS A5.18, filler metal classification ER-70S-3, ER-70S-6 or equivalent unless specified on the installation drawing.

NOTE: Any substitution for filler material from the above standard MUST comply, as a minimum, with the following mechanical properties:

Tensile Strength - 72k psi (496 MPa)
 Yield Strength - 60k psi (414 MPa)
 Charpy V Notch - 20ft.-lbs.
 (27 N•m) at 0° F (-17.7° C)%
 Elongation - 22%

The recommended welding gas for gas metal arc welding (GMAW) is 90% Argon / 10% CO₂. If a different gas is used, welds MUST comply with penetration requirements shown (**Figure 6**). Where the installation drawing specifies different than above, the drawing shall prevail.

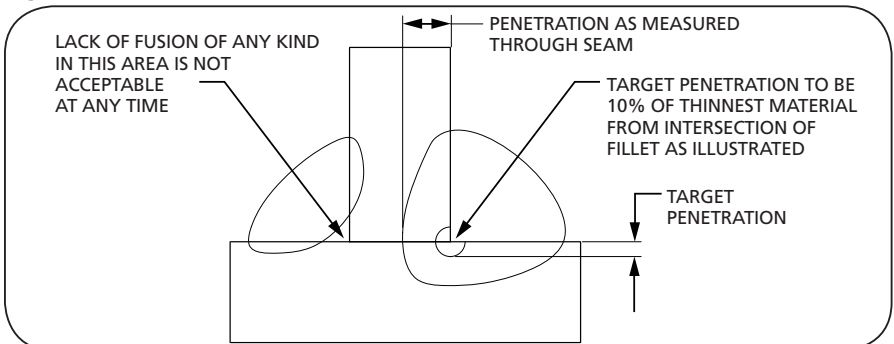
7.4 Procedures

Tack welds used for positioning components are to be located in the center of the final weld, where practical. Tack weld should be completely fused to the finish weld. DO NOT break arc at the end of the weld. Back up all finish welds at least 1/2" (12.7 mm) or a sufficient amount to prevent craters at the end of the weld. Where weld is shown to go around corners, it is assumed the corner represents a stress concentration area. DO NOT start or stop weld within 1" (25.4 mm) of the corner. Particular care should be taken to prevent undercutting in this area.

7.5 Weld Size

If weld size is not specified, the effective throat of the weld MUST be no smaller than the thinnest material being welded (**Figure 6**).

Figure 6



8. Installation Instructions

8.1 Bolt-On Installation

⚠ WARNING Failure to use new properly sized fasteners with the specified torque or an unapproved SAF-HOLLAND® mounting pattern could result in unexpected EH-HD malfunction, which if not avoided, could result in death or serious injury.

Bolt-On Models

Table 3 and Figure 7 provide dimensional mounting patterns and bolt sizes. All bolts and nuts for mounting MUST be Grade 8 for US standards or Grade 10.9 for the European standards. Refer to **Table 2** for the minimum torque specifications. DO NOT torque the bolts past 75% of the manufacturer's stated proof strength. All fasteners are assumed clean and dry.

NOTE: Mount the hitch to a secure structure with sufficient strength to support the load rating.

Figure 7

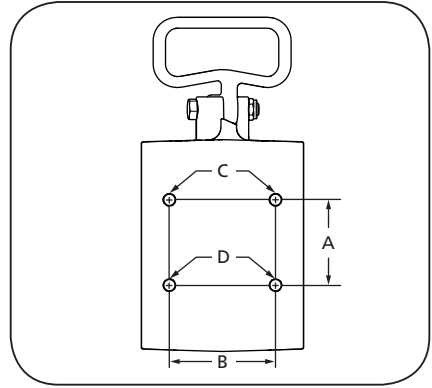


TABLE 2

BOLT THREAD SIZE	TORQUE	TORQUE
1/2"	100 ft.-lbs.	135 N•m
5/8"	180 ft.-lbs.	245 N•m
3/4"	300 ft.-lbs.	407 N•m
12 mm	96 ft.-lbs.	130 N•m
16 mm	180 ft.-lbs.	245 N•m

TABLE 3

BOLT PATTERN CODE	DIM "A"	DIM "B"	"C" BOLT SIZE	"D" BOLT SIZE	MAX. DRAWBAR PULL	MAX. VERTICAL LOAD
-01XX	1.75" (44.5 mm)	3.38" (85.7 mm)	.50" (12.7 mm)	.50" (12.7 mm)	30,000 lb. (13,610 kg)	1,000 lb. (454 kg)
-02XX	3.50" (88.9 mm)	3.50" (88.9 mm)	.50" (12.7 mm)	.50" (12.7 mm)	30,000 lb. (13,610 kg)	1,000 lb. (454 kg)
-03XX	3.50" (88.9 mm)	3.50" (88.9 mm)	.50" (12.7 mm)	.63" (15.9 mm)	50,000 lb. (22,680 kg)	1,000 lb. (454 kg)
-04XX	4.50" (114.3 mm)	4.50" (114.3 mm)	.75" (19.0 mm)	.75" (19.0 mm)	50,000 lb. (22,680 kg)	1,000 lb. (454 kg)
-05XX	4.75" (120.7 mm)	4.75" (120.7 mm)	.63" (15.9 mm)	.63" (15.9 mm)	50,000 lb. (22,680 kg)	1,000 lb. (454 kg)

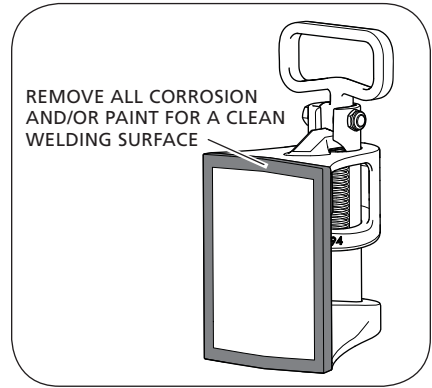
Additional 'pre-engineered' bolt patterns may be available since last revision of Table 3 above. Other metric and SAE bolt patterns can be provided based on customer requirements (minimum order quantities apply). Contact SAF-Holland for more information.

8.2 Weld-On Installation

Weld on Model (EH-HD-00XX or EH-HDAL-00XX)

For weld-on mounting, remove a minimum of 1/2" of paint from the sides, top, bottom, and back of the E-hitch mounting flange where the weld will penetrate (**Figure 8**). Use a minimum 70,000 ksi wire with a low hydrogen process to produce a minimum 5/16" full penetration fillet weld. For proper mounting, the weld **MUST** run the full perimeter (all four (4) sides) of the EH-HD mounting flange (28 linear inches). A properly welded EH-HD will have a rating of 50,000 lbs. (22 680 kg).

Figure 8



9. Operating Instructions

9.1 Opening and closing ED-HD pin with auto-lock feature

- **TO OPEN:** Grasp the handle and lift while turning clockwise. As the handle rises, it will turn about 45° allowing the pin to open. To engage hold-open position. Rotate the pin counter clockwise until the cutout in the keyway rests on top of the key (**Figure 9**).
- **TO CLOSE:** Grasp the handle and lift slightly while turning counter clockwise to disengage hold-open. As the handle lowers it will turn 45° allowing the pin to close. Lower pin through the towbar eye. Verify that the pin is fully seated (**Figure 10**).

Figure 9

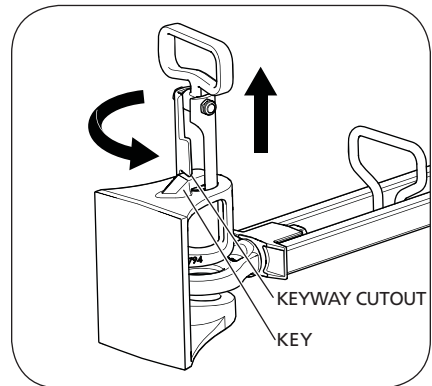
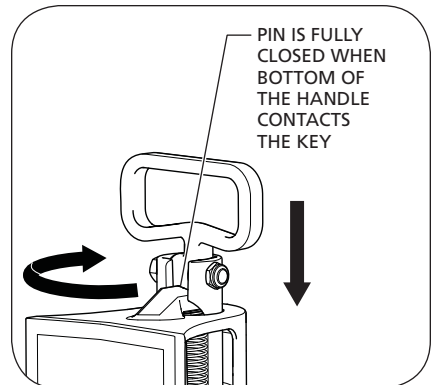


Figure 10



9.2 Opening and closing ED-HD pin without auto-lock feature.

- **TO OPEN:** Grasp the handle and lift pin to full open position. (Maximum upward travel). To engage hold-open position, rotate the pin counter clockwise until the cutout in the keyway rests on top of the key (**Figure 11**).
- **TO CLOSE:** Grasp the handle and lift slightly while turning counter clockwise to disengage hold-open. Lower pin through the towbar eye. Verify that the pin is fully seated (**Figure 12**).

NOTE: Be sure the towbar eye is compatible with the coupling device on the tow vehicle. Refer to Section 4.

NOTE: Pinch points exist where the pin slides through the EH-HD frame and where the handle attaches to the pin.

CAUTION Failure to keep hands and feet away from the pin and frame while operating could result in pinched body parts which, if not avoided, could result in minor or moderate injury.

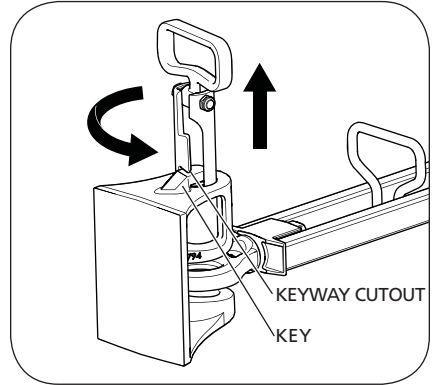
10. Handle Conversion

The EH-HD is packaged with the handle in the fold down position. The following instructions are for converting the handle from a fold down to a rigid setting or vice-versa.

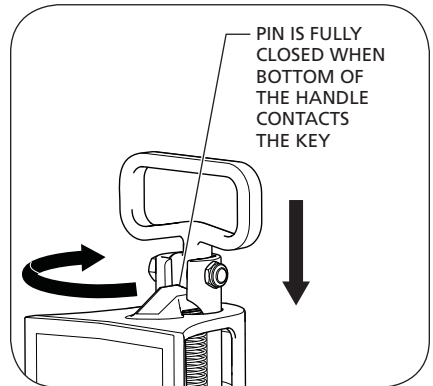
1. If the EH-HD is not mounted securely to a vehicle, the frame should be gripped in a vise of adequate size to hold securely while converting.

CAUTION Failure to support the pin while changing the handle could result in ejection of the spring loaded pin which, if not avoided, could result in minor or moderate injury.

Figure 11



12



2. Pull up on the handle to retract the pin.
3. Place a block of wood between the bottom of the pin and the towbar ramp section of the frame, then lower the pin onto the wood block.
4. Remove the lock nut and bolt. Lift the handle out of the pin and rotate the handle 180°. Lower the handle back into the pin and replace the bolt and lock nut. Tighten the nut contact plus 1/2 turn (**Figure 13**).
5. Using new fasteners, replace the lock nut and bolt. Tighten the lock nut until it contacts the pin and tighten an additional 1/2 turn.
6. Pull up on the handle and remove the block of wood placed in Step 3.
7. Check for proper operation before continued use of EH-HD

11. Maintenance Procedures

Perform the following every three (3) months for proper performance:

- Clean and check for proper operation.
- Inspect for worn, damaged, or missing parts.
- Inspect mounting and verify it is secure.
- Correct and replace parts as required using only genuine SAF-HOLLAND® original parts (Refer to Section 12 for repair kits).
- Using a light oil, lubricate the handle pivot and internal spring (**Figure 14**).
- Using a (caliper or micrometer) inspect the towbar eye contact area of the pin for wear and damage. If wear exceeds 0.13" (3 mm) from the original surface profile replace the pin (**Figure 15**).

Figure 13

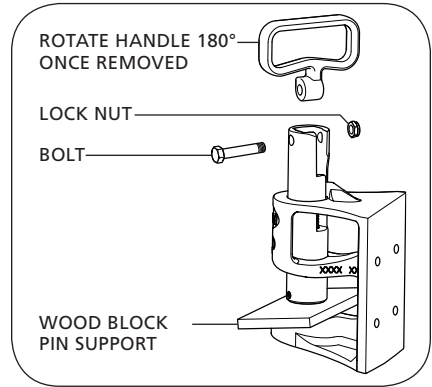


Figure 14

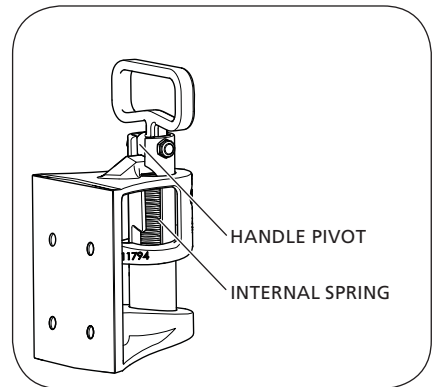
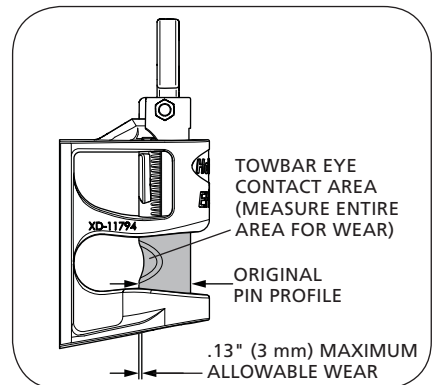


Figure 15



- Inspect the pull force of the pin for proper spring tension. This can be done by using a hand held force gage. Attach the gage to the handle and pull the pin up until it is approximately 1" (25 mm) above the top of the towbar ramp. **(Figure 16).**
- Lower the pin until the bottom of the pin is even with the top of the towbar ramp **(Figure 17)**. This is done to ensure there is nothing snagging on the pin to give a false reading. When the pin bottom is level with the top of the towbar ramp, the force gage should read according to **Table 4**.

Figure 16

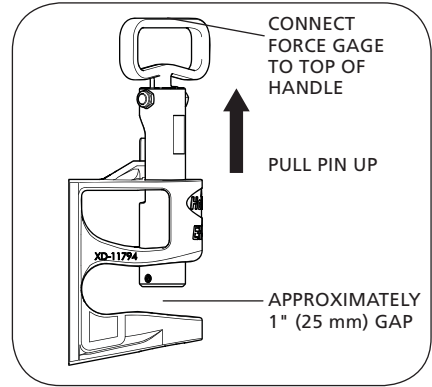


Figure 17

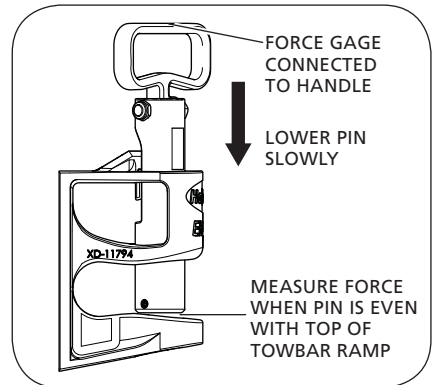


TABLE 4		
E-HITCH™ PIN TYPE	NO LESS THAN	NO LESS THAN
Non-lock Pin	20 ft.-lbs.	89 N•m
Auto-lock Pin	10 ft.-lbs.	44 N•m

Regardless of the reading on the force gage, if the spring is broken it **MUST** be replaced. The replacement spring for the non-lock pin is part number XA-11423-G. The replacement kit for the auto-lock pin is part number RK-11789. Refer to section 12 for ordering information.

⚠WARNING Failure to follow the above maintenance instructions could result in unintentional uncoupling during operation which, if not avoided, could result in death or serious injury.

12. Repair Kits and Ordering Information

Listed below are the repair kits offered for the EH-HD (**Figure 18**).

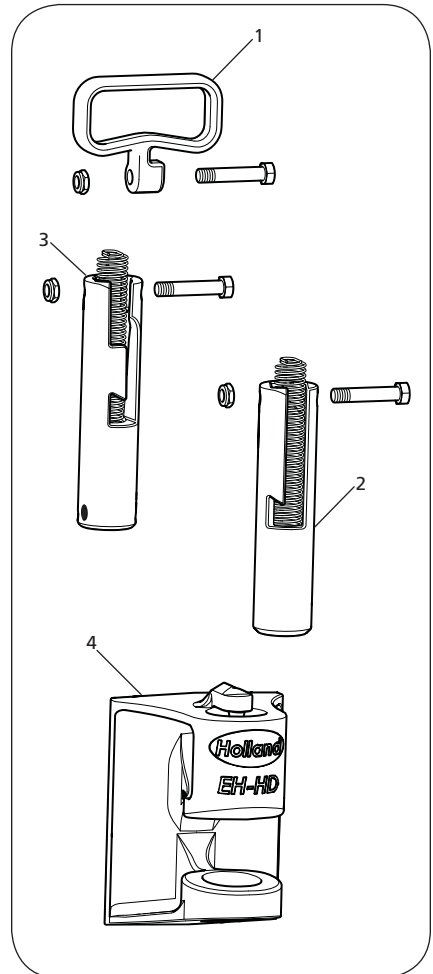
To order repair kits, contact SAF-HOLLAND® Customer Service at 888-396-6501.

Specify the kit number along with the quantity needed.

NOTE: The EH-HD frame is NOT a saleable item. To order a frame, a complete assembly MUST be specified.

ITEM	REBUILD AND REPLACEMENT KITS	PART NUMBER
1	Handle, Bolt, Lock Nut	RK-11440
2	Non-Lock Pin, Non-Lock Spring, Bolt, Lock Nut	RK-11439
3	Auto-Lock Pin Assembly (Pin, Spring, Coil Pin), Bolt, Lock Nut	RK-11789
4	Frame	Not sold separately

Figure 18





From fifth wheel rebuild kits to suspension bushing repair kits, SAF-HOLLAND Original Parts are the same quality components used in the original component assembly.

SAF-HOLLAND Original Parts are tested and designed to provide maximum performance and durability. Non SAF-HOLLAND parts will only limit the performance potential and could possibly void SAF-HOLLAND's warranty. Always be sure to specify SAF-HOLLAND Original Parts when servicing SAF-HOLLAND products.

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