Havarikommissionen
Accident Investigation Board Denmark

Safety Alert

During the safety investigation of the train accident on the Great Belt Bridge at 02-jan-2019, safety deficiencies in the railcar trailer hitch model FW6170 mounted on the pocket wagon litra sdggmrs have been discovered.

The hitch locking mechanism used to lock the trailer king pin onto the pocket wagon, was tested and on several occasions found to be unlocked, when following the procedures from the manufacturer of the railcar trailer hitch.

The railcar trailer hitch model FW6170 owners manual (see additional pages) describes on page 2 section B, that the trailer is locked to the hitch, when the retaining notch is no longer visible.

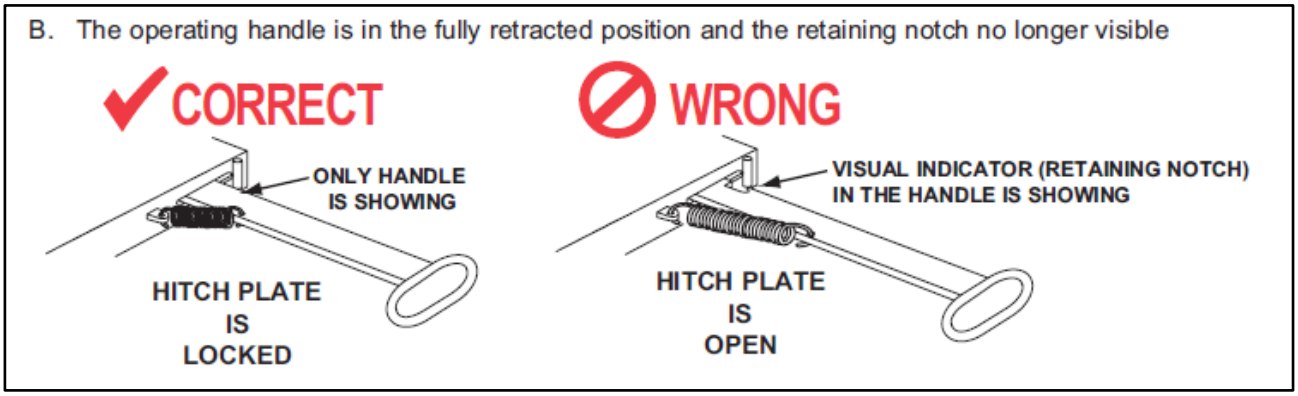

Figure 1. Extract from FW6170 owners manual page 2.

Testing of the hitch involved in the accident, showed that the king pin could be pulled out of the hitch lock with a small amount of force, when a gap of 8,66 mm existed between the hitch plate and the operating handle recess. However, in this position, the retaining notch was not visible, and the hitch therefore appeared to be locked.

No damages existed neither to the locking mechanism of the hitch nor to the king pin.

Figure 2. Operating handle position after king pin has been lowered into the hitch. Gap is 8,66 mm.

On above photo the retaining notch is not visible, even though the hitch is not securely locked. The retaining notch is normally not visible even with the operating handle recess pulled more than 20 mm away from the hitch plate.

The Danish AIB considers the described procedure in the FW6170 owners manual to be inadequate to ensure secure locking of the king pin to the hitch. This potentially affects any operator using the FW6170 railcar trailer hitch and the procedure described in the FW6170 owners manual for railway transportation of trailers.

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FW6170

MAINTENANCE AND OPERATING INSTRUCTIONS

eurohitch

FW6170 Railcar Trailer Hitch

Vertical Load: 15 tonnes
Coupling Height (adjustable):
880, 980 and 1130 mm
Weight: 353 kg
Suitable for trailers with 2" Kingpin

WARNING

Failure to read, understand and follow the important information contained herein may result in a hazardous condition, or cause a hazardous condition to develop.

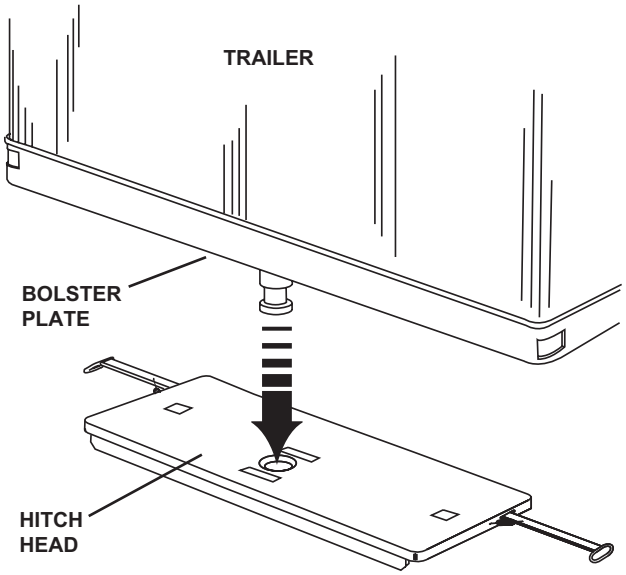
Relative to piggyback operations, there are other checks, inspections and procedures not listed here which are necessary, prudent and /or required by law. The following is in addition to these and pertain to the hitch only.

Perform these procedures with the area clear of obstacles and other personnel.

This product ist designed and intended for use only with a "reach stacker" or crane type trailer loading and unloading.

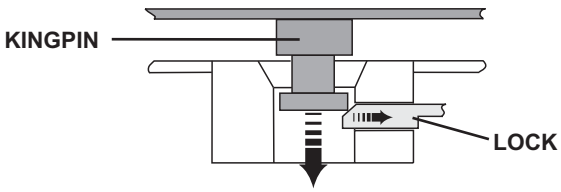
OPERATING INSTRUCTIONS:

COUPLING PROCEDURES (Loading):

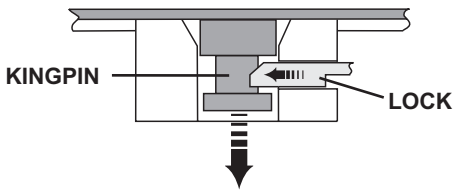


1. **Check out the hitch plate before coupling.**
   - A. Inspect the hitch plate for visible damage prior to each loading operation.
   - B. The hitch plate must be properly lubricated.
   - C. Check that the correct hitch plate height has been selected.
   - D. The hitch plate is locked prior to loading and must not be opened.
2. **Coupling operation.**
   - A. The trailer must be positioned over the hitch plate, so that the kingpin is directly above the guide ring.
   - B. The trailer should be lowered until the rubbing plate is in contact with the hitch plate surface and the kingpin is correctly located in the guide ring.

NOTE: The locking mechanism automatically opens when the kingpin is entered into the guide ring and subsequently locks automatically.



Kingpin automatically retracts lock upon entering "lock opening"

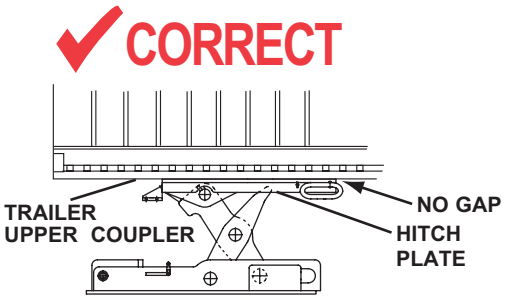


Lock automatically engages as kingpin is lowered into "lock opening"

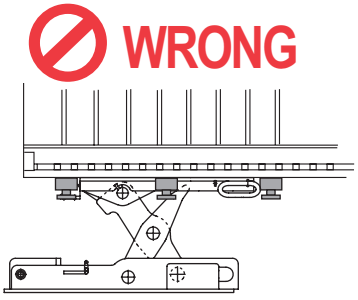
COUPLING PROCEDURE (continued):

3. Inspection of the hitch plate after loading.

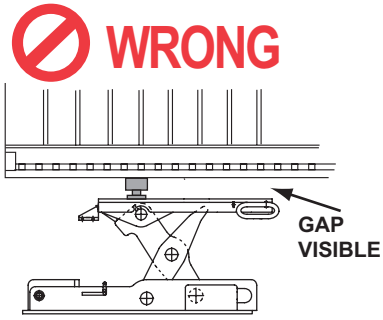
A. The kingpin must be fully inserted into the guide ring and there must be no gaps between the rubbing plate of the trailer and the surface of the hitch plate.



Kingpin is properly engaged.

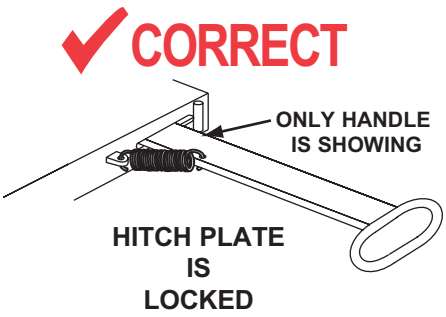


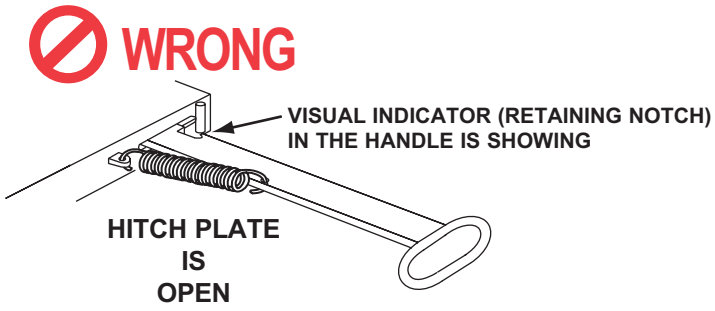
Kingpin is in front of, behind, or to the side



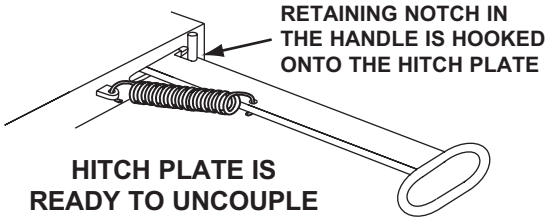
Kingpin is on the top.

B. The operating handle is in the fully retracted position and the retaining notch no longer visible





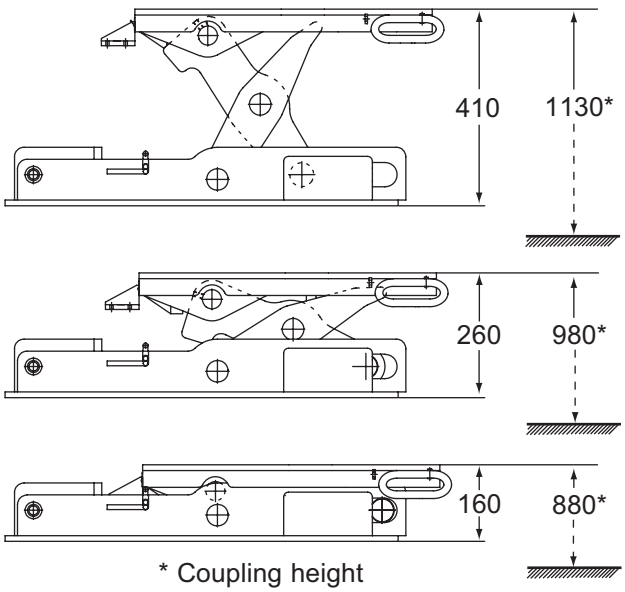
UNCOUPLING PROCEDURE (Unloading):



A. Pull the operating handle fully outwards and hook it on to the retaining notch - The hitch plate is now open and the trailer can be lifted away

NOTE: Once the trailer has been lifted approx. 50mm the locking mechanism of the hitch plate automatically springs back into the locked position

SETTING OF THE HITCH PLATE HEIGHT:



* Coupling height

A. Pull the operating handle outwards and hook in position by moving upwards.

B. Locate the crank handle on the drive shaft and turn clockwise or anti-clockwise respectively to raise or lower the hitch plate.

C. As soon as the operating handle springs inwards, the next available height has been correctly reached and it is no longer possible to turn the crank handle (attached to the railcar in the vicinity of the hirch plate).

NOTE: The locking mechanism closes automatically when the next available height is reached. This procedure must be repeated should a further increase or decrease in height be necessary.

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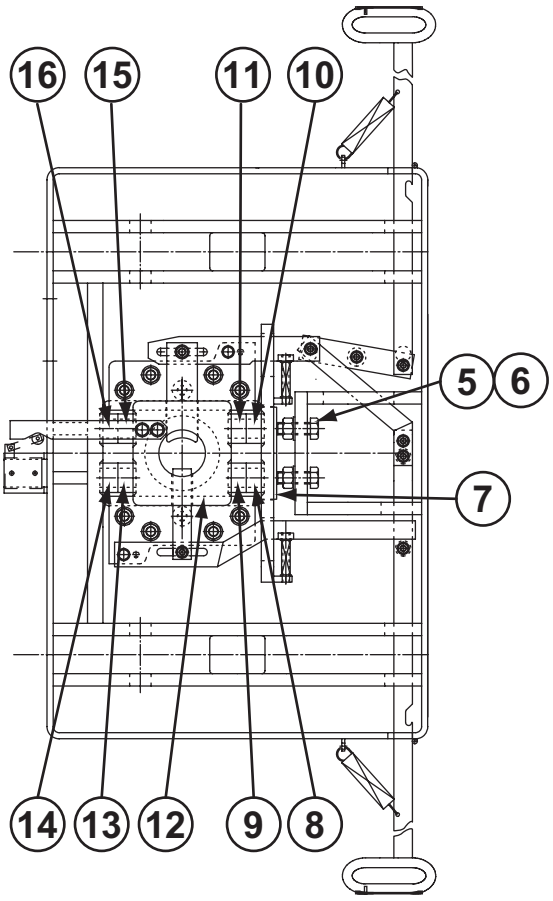
REPLACEMENT OF THE SHOCK ABSORBER ELEMENTS:



A. Loosen the bolt (Item 5) and the lock nut (6)
B. Remove pressure plate (7)
C. Remove shock absorber elements (8-11)
D. Slide guide ring (12) to one side
E. Remove shock absorber elements (13-16)
F. Insert new shock absorber elements (13-16)
G. Push guide ring (12) against shock absorber elements
H. Insert new shock absorber elements (8-11)
I. Replace the pressure plate (7)
J. Tighten the bolt (5) and secure the lock nut (6)

MAINTENANCE PROCEDURE:

The following is a description of the required lubrication and periodic inspection procedures for the railcar trailer hitch FW6170. These procedures are normally completed every four months, but this frequency may need to be adjusted depending upon its usage. Rebuilding should be considered after approximately 10.000 couplings and uncouplings. Individual components are referred to by item number and are illustrated in the exploded view drawing found on page 6 - 9.

LUBRICATION

1. **Be sure to thoroughly lubricate all moving parts (e.g. lock, etc.) with a water-resistant, lithium-based grease.**
2. **Clean the shaft guide before each lubrication.**
3. **Keep a water-resistant, lithium-based grease applied to all moving parts as well as the trailer contact surface of the hitch plate.**

INSPECTION

1. **Closely inspect the hitch plate and vertical adjusting mounting base. Replace any missing or damaged bolts and nuts.**
2. **Visually inspect the hitch plate lock for damage or excessive corrosion. Replace if necessary.**
3. **Inspect the release handles for damage. Make sure handles are not bent and that the handles function.**
4. **Check the release handle springs. Missing or damage springs must be replaced.**

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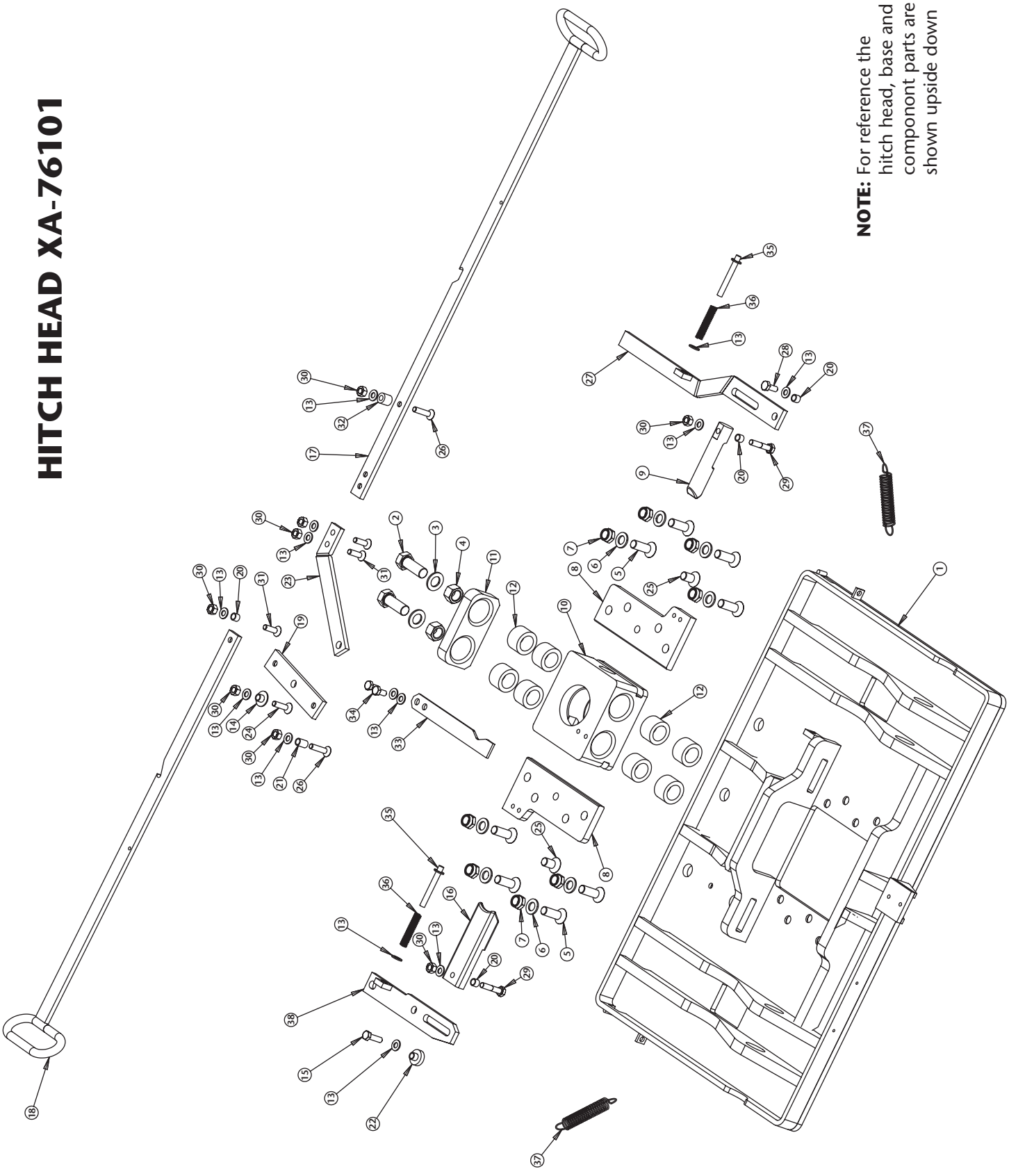
HITCH HEAD XA-76101

NOTE: For reference the hitch head, base and componont parts are shown upside down



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PARTS LIST FOR HITCH HEAD XA-76101

ITEM	PART NO.	NO. REQ'D	PART NAME
1	XA-77144	1	Hitch Plate
2	XB-76030	2	HHCS, M20 x 2,5
3	XB-76032	2	Washer, Plain M20
4	XB-76031	2	Nut, Hex M20 x 2,5
5	XB-76023-1	8	HCSCS, M10 x 30
6	XB-76025	8	Washer Plain M16
7	XB-76026-1	8	Nut Lock M16 x 2,0
8	XA-76152	2	Control Plate
9	XA-76163	1	Lock Plunger
10	XA-76168	1	Guide Ring
11	XA-76157	1	Pressure Plate
12	XB-76033	8	Shock Absorber DEFORM plus
13	33023	14	Washer, Plain M10
14	XA-76162	1	Bushing
15	XB-76034	1	HHCS, M10 x 1,5
16	XA-76156	1	Lock
17	XA-76159	1	Release Handle
18	XA-76160	1	Release Handle
19	XA-76155	1	Handle Link
20	XA-76166	4	Bushing
21	XA-76166-1	1	Bushing
22	XA-76167	1	Bushing
23	XA-76158	1	Handle Guide
24	XB-76028	1	FHCS, M10 x 1,5
25	XB-76024-1	2	HCSCS, M16 x 2,0
26	XB-76038	2	FHSCS, M10 x 35
27	XA-76133	1	Release Arm
28	31008	1	Hex Head Screw, DIN 933 M10 x 25 Grade 8,8
29	31032	2	Hex Head Screw, DIN 933 M10 x 50 Grade 8,8
30	32008	8	Nut, Lock, DIN 980 M10
31	31038	3	FHSCS, M10 x 35
32	XA-76169	1	Plunger Bush
33	XA-76176	1	Plunger
34	XB-60137	2	HHCS, M10 x 1,5
35	XA-76134	2	Spring Guide
36	XB-76008	2	Spring, Compression
37	XB-D-05843-1	2	Spring, Extension
38	XA-76153	1	Release Arm

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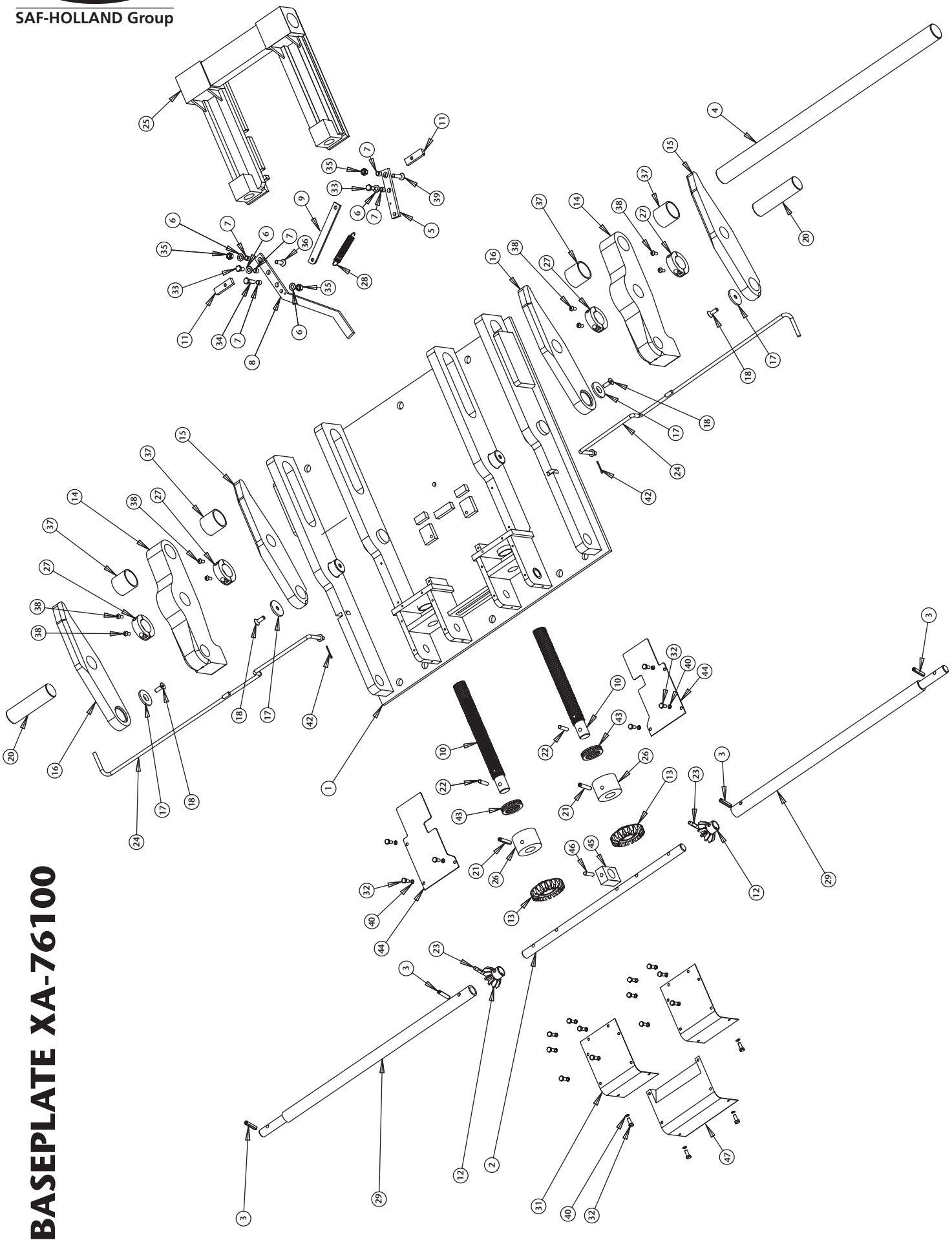
BASEPLATE XA-76100



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PARTS LIST FOR BASE PLATE XA-76100

ITEM	PART NO.	NO. REQ'D.	DESCRIPTION
1	XA-76109-A	1	Mounting Base
2	XA-76123	1	Drive Shaft
3	XB-E-61135	4	Spring Pin, 10 x 45
4	XA-76121	1	Guide Shaft
5	XA-76135	1	Handle Link
6	33023	4	Washer, Plain M10
7	XA-76141	5	Bushing
8	XA-76182	1	Handle Link
9	XA-76140	1	Pull Handle
10	XA-76125	2	Spindle
11	XA-76137-1	2	Lock
12	XA-76134	2	Gear, Bevel Pinion
13	XA-76232	2	Gear, Bevel
14	XA-76103	2	Lifting Arm, Inner
15	XA-76105-R	2	Outer Arm, Right
16	XA-76105-L	2	Outer Arm, Left
17	XA-76119	4	Washer
18	XB-76023	4	HCSCS, M10 x 25
19	XB-60129	4	Ring, Shim (40 x 50 x 0,5)
20	XA-76122	2	Centre Bolt
21	34011	2	Spring Pin, 10 x 70
22	XA-CRP-V-06635	2	Pin, 3/8" x 2"
23	XB-76705	2	Pin, Grooved 10 x 35
24	XA-76131	2	Release Handle
25	XA-76126	1	Sliding Frame
26	XA-76177	2	Spindle Nut
27	XA-76144	4	Clamping Ring
28	XA-76040	1	Spring, Extension
29	XA-76179	2	Extension Shaft
30	XA-76181	2	Bushing
31	XA-76173-A	2	Cover Plate
32	XB-76060	22	HHCS, M6 x 12
33	31008	2	HHCS, M10 x 25
34	XB-60137	1	HHCS, M10 x 30
35	32008	3	Nut, Lock, M10
36	XB-76038	1	FHSCS, M10 x 45
37	XA-76185	4	Spacer Bush
38	XB-76102	8	SBHCS, M8 x 20
39	XB-76038	1	FHSCS, M10 x 45
40	XB-76061	22	Washer
41	XB-76103	2	Ring, Shim (25 x 35 x 0,5)
42	XB-76044-1	2	Pin, Split, 3.2 x 32
43	XB-76041-1	2	Bearing
44	XB-76173-B	2	Cover Plate
45	XA-76139	1	Square Block
46	XB-76118	1	Roll Pin, 10 x 45
47	XA-76173-C	1	Cover Plate

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