



**HALL INDUSTRIES, Inc.**

514 MECKLEM LANE., ELLWOOD CITY, PA 16117

PHONE: 724-752-2000 FAX: 724-758-1558

<http://www.hallindustries.com> E mail: service @ hallind.com

## HRJ-145 Tow Bar Equipment Manual

For servicing the EMB 135-145 Aircraft



**Use This Manual for**

- 1. Operating Procedures**
- 2. Maintenance Procedures**
- 3. Tow Bar and Parts Ordering**

### **For ordering new Tow Bars or Renewable Parts**

Please contact: Penny Shirk @ Hall Industries Equipment Division  
One USS Industrial Park  
Ellwood City, PA 16117  
Phone (724) 758-5522  
FAX (724) 758-0753

## **HRJ-145 EQUIPMENT MANUAL**

### **SECTION I Description – Dimensions and Weights**

### **SECTION II Operating Procedures**

### **SECTION III Maintenance Procedures**

### **SECTION IV Renewal Parts**

### **SECTION I DESCRIPTION – DIMENSIONS AND WEIGHTS HRJ-145 TOW BAR ASSEMBLY HRJ-145OPT**

#### **Weight:**

Body	134#
Head with Adapter	30#
Tow Bar, COMPLETE	164#

#### **Length:**

Body with Tow Eye	126"
Head with Adapter	24"
Total Assembly	140"

#### **Width:**

Wheel Carriage	20"
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#### **Height:**

Body	24"
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**SECTION II**  
**OPERATING PROCEDURE**  
**HRJ-145 TOW BAR ASSEMBLY**

**A. ATTACHING TOW BAR TO AIRCRAFT**

The HRJ-145 can be towed forward or pushed aft on hard surfaces using the HRJ-145 Tow Bar. The Tow Bar attaches to the nose landing gear by means of the extension pin on the head. When the tow bar assembly is lined up with the nose gear, not the aircraft, the extension pin will have to be manually locked in position on the nose landing gear by the operator.

**B. ATTACHING TOW BAR TO TOW TRACTOR**

Once the tow bar is securely attached to the nose landing gear, the tow tractor should be placed at the centerline of the Tow Bar. The operator must manually lift the tow bar to engage with the tow tractor and install the locking pin.

**C. PUSHING THE AIRCRAFT**

This must be done in accordance with the instructions in Embraer Air Facility and Equipment Planning Manual.

**CAUTION:** If at any time the jack knife protection torque shear pin yields or breaks, carefully bring the aircraft to a stop. Before pushing or tow can be continued a new jack knife protection torque shear pin must be inserted. Use only a Hall Industries shear pin as follows, Part Number HRJ-145-11-2. Refer to drawing HRJ-145-11, Part #19 is the above shear pin mentioned. The adaptor unit comes with two extra shear pins. These are to be stored in the adaptor, to prevent delays in replacing the shear pin.

**D. DISCONNECTING TOW BAR FROM AIRCRAFT**

Release the extension pin manually to release the head from the nose landing gear on the aircraft. Carefully move the tow bar and tow tractor clear of the aircraft. In the case of the extension pin not releasing, pull the shear pin from the adaptor and head. This will allow free play to the head and the extension pin will now release. The tow bar assembly must be lined up with the nose gear, not the aircraft.

**SECTION III**  
**MAINTENANCE PROCEDURES**  
**HRJ-145 TOW BAR ASSEMBLY**

- A. Check wheels for bent, broken, or worn parts and security. Lubricate pivot points with dry lubricant. Hall Industries, Inc. recommends using MPC SL-10 on the slide bolt assembly of the head. This should be used once a month to ensure proper movement along with correct disengagement. See Renewal Parts for this lubricant. Lubricate wheels with multi-lube grease.
- B. Check head assembly for operation of lock mechanisms, spring wear and free movement of locking pins.
- C. Inspect head assembly for worn or damaged parts and security.
- D. Check tow eye on tow bar for condition and security.
- E. Check tow bar main body tube for bending or cracking.
- F. Check shear pin and bushings for breakage, wear and security.
- G. Clean, repaint or touch-up paint as required.

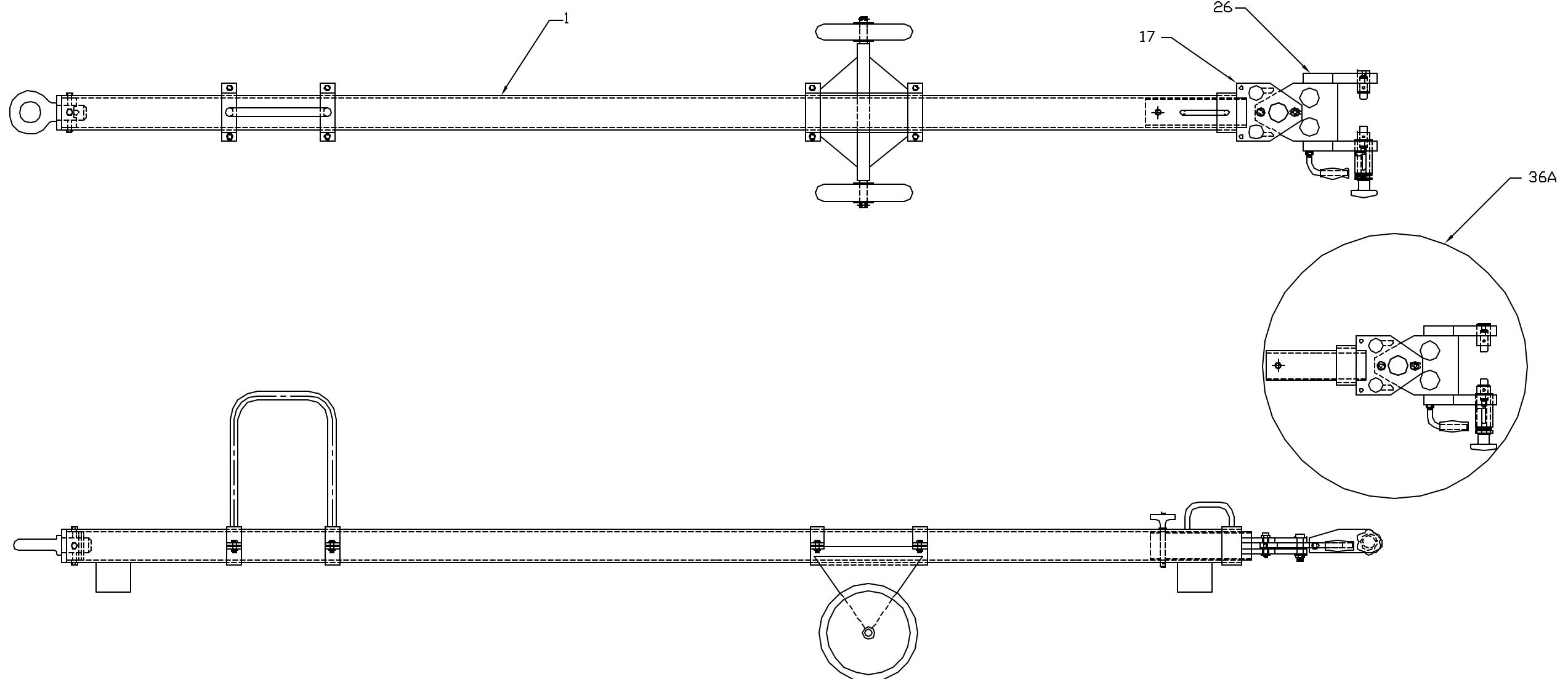
**SECTION IV**  
**RENEWAL PARTS**  
**HRJ-145 TOW BAR ASSEMBLY**

DWG HRJ-145

<b>MK#</b>	<b>QTY/UNIT</b>	<b>DESCRIPTION</b>	<b>PART NUMBER</b>
-	1	HRJ-145 TOWBAR COMPLETE WITH 3" ID EYE	HRJ-145OPT
1	1	MAIN PUSHBAR BODY COMPLETE	HRJ-145-12
2	1	MAIN PUSHBAR BODY	HRJ-145-12-1
3	1	TOWBAR HANDLE	HRJ-145-12-2
4	4	HANDLE/WHEEL ASSEMBLY CLAMP	HRJ-145-12-3
4A	1	WHEEL CARRIAGE ASSEMBLY	HRJ-145-12-10
5	1	WHEEL CARRIAGE WELDMENT	HRJ-145-12-4
6	1	ADAPTOR QUICK RELEASE PIN	HRJ-145-12-5
7	1	EYEBOLT WITH 3" ID	HRJ-145-12-7
7A	1	3" ID SWIVEL EYE KIT	HRJ-145-12-11
8	1	TUG EYE RETAINER BAR	HRJ-145-12-8
9	1	TUG EYE COLLAR	HRJ-145-12-9
10	4	LOCK WASHER	TB-8649-4
11	4	HEX HEAD CAP SCREW	37C100HC5Z
12	8	CLAMP BOLT	TB-8898-5
13	8	CLAMP NUT	TB-8898-6
14	2	WHEEL	TB-8898-7
15	4	WASHER	TB-8898-8
16	2	COTTER PIN AXLE	TB-8898-9
17	1	ADAPTOR UNIT COMPLETE	HRJ-145-11
18	1	ADAPTOR WELDMENT	HRJ-145-11-1
19	3	SHEAR PIN	HRJ-145-11-2
20	2	ADAPTOR BUSHING FOR SHEAR PIN	HRJ-145-11-3
21	1	SHOULDER BOLT	HRJ-145-11-4
22	1	FLAT WASHER	HRJ-145-11-5
23	1	NYLOCK NUT	HRJ-145-11-6
24	1	SHEAR PIN LOCK NUT	HRJ-145-11-2A
26	1	HEAD COMPLETE	HRJ-145-7
27	1	HEAD WELDMENT	HRJ-145-7-1
28	1	HEAD BUSHING FOR SHEAR PIN	HRJ-145-7-1-E
29	4	ROLL PIN	HRJ-145-7-2
30	2	NOSE PIN	HRJ-145-7-3
31	1	SLIDE BOLT WELDMENT	HRJ-145-7-4
32	1	RETAINER SCREW (SLIDE BOLT)	HRJ-145-7-5
33	1	SPRING	HRJ-145-7-6
34	1	HANDLE KNOB	HRJ-145-7-8
35	1	HANDLE/SLIDE BOLT PIN	HRJ-145-7-9
36A	1	HEAD AND ADAPTOR COMPLETE	HRJ-145-5
37	1	SLIDE BOLT LUBRICANT	TB-LUBE
38	1	HELPER HANDLE GRIP	HRJ-145-7-7
39	1	HELPER HANDLE	HRJ-145-7-10
40	1	HELPER HANDLE JAM NUT	HRJ-145-7-11

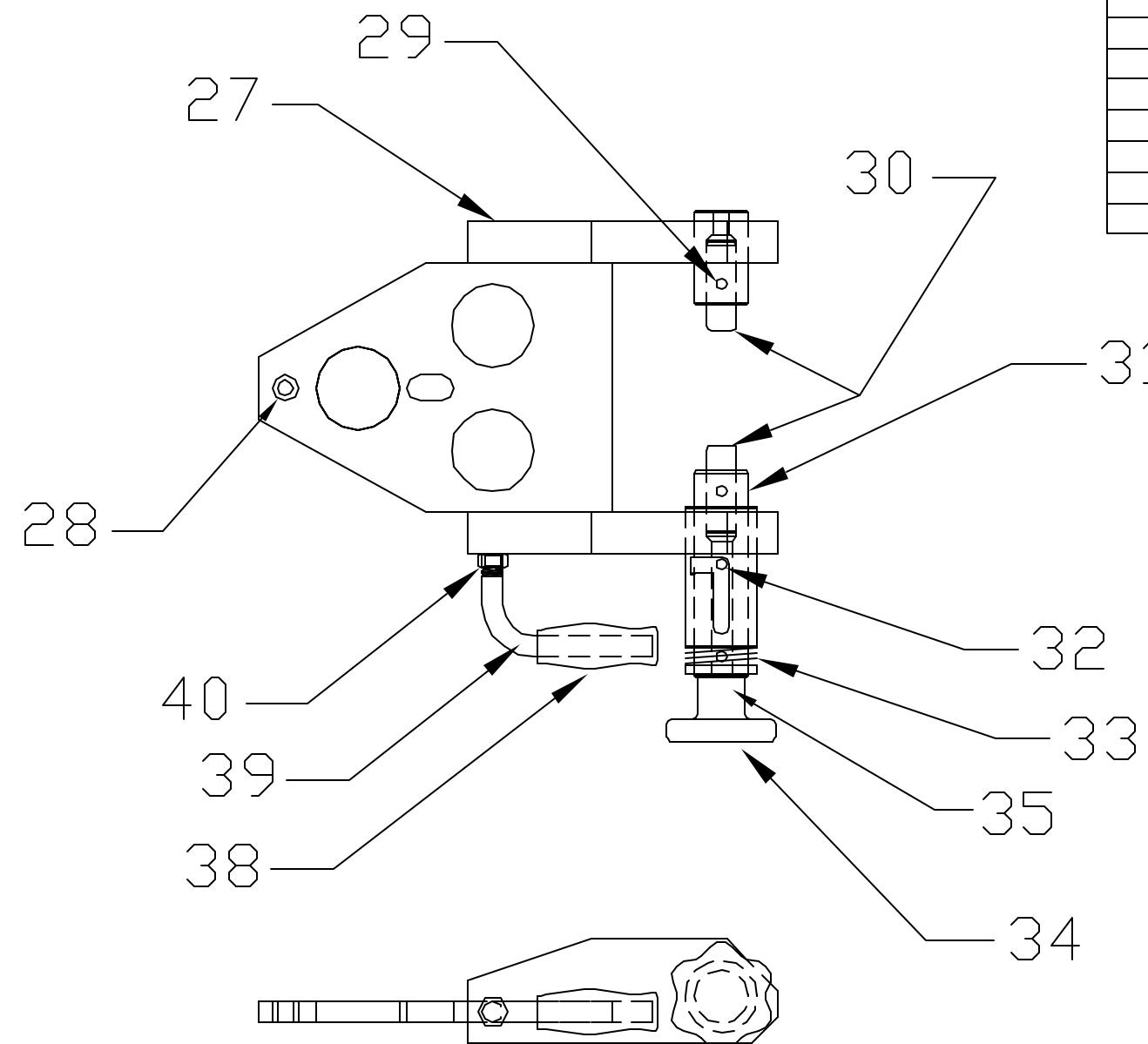
## BILL OF MATERIALS

MARK NO.	QTY	DESCRIPTION	PART NO.
1	1	MAIN PUSHBAR BODY COMPLETE	HRJ-145-12
17	1	ADAPTOR UNIT COMPLETE	HRJ-145-11
26	1	HEAD COMPLETE	HRJ-145-7
36A	1	HEAD AND ADAPTOR COMPLETE	HRJ-145-5



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PROJECT/CUSTOMER				DRAWN DEM SCALE 1"=1"
HALL INDUSTRIES EQUIPMENT				SUBJECT
HRJ-1450PT TOWBAR GENERAL ARRANGEMENT				REV
REV	DATE	REVISIONS DESCRIPTION	BY	OK
DATE	04-21-99	CHECK	HRJ-145	



### BILL OF MATERIALS

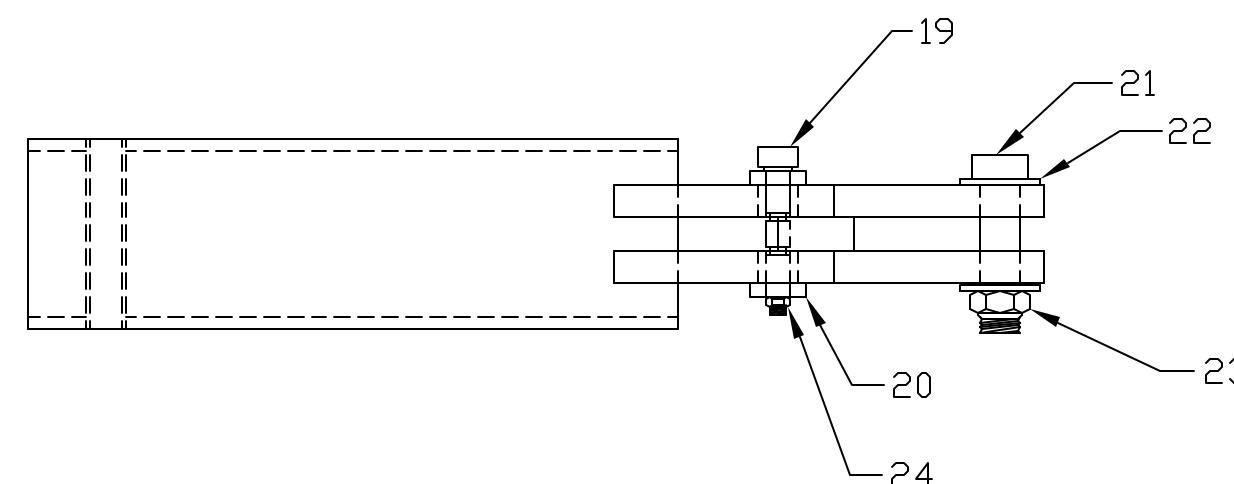
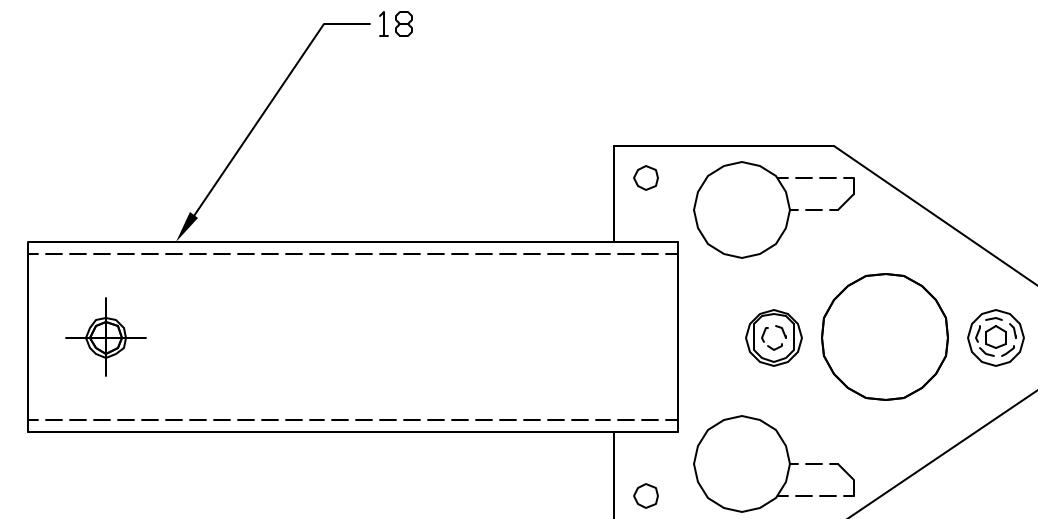
MARK NO.	QTY	DESCRIPTION	PART NO.
27	1	HEAD WELDMENT	HRJ-145-7-1
28	1	HEAD BUSHING FOR SHEAR PIN	HRJ-145-7-1-E
29	4	ROLL PIN	HRJ-145-7-2
30	2	NOSE PIN	HRJ-145-7-3
31	1	SLIDE BOLT WELDMENT	HRJ-145-7-4
32	1	SLIDE BOLT RETAINER SCREW	HRJ-145-7-5
33	1	SPRING	HRJ-145-7-6
34	1	HANDLE KNOB	HRJ-145-7-8
35	1	HANDLE/SLIDE BOLT PIN	HRJ-145-7-9
38	1	HELPER HANDLE GRIP	HRJ-145-7-7
39	1	HELPER HANDLE	HRJ-145-7-10
40	1	HELPER HANDLE JAM NUT	HRJ-145-7-11

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PROJECT/CUSTOMER				DRAWN DEM SCALE 3'-1"
HALL INDUSTRIES EQUIPMENT				REV
SUBJECT				HRJ-145OPT TOWBAR HEAD ARRANGEMENT
REV	DATE	REVISIONS DESCRIPTION	BY	01-21-99

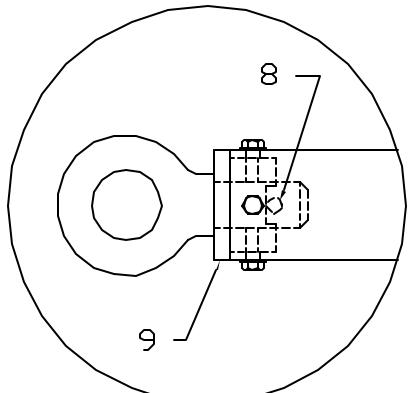
HALL INDUSTRIES EQUIPMENT DIVISION  
1100 INDUSTRIAL PARK, ELLWOOD CITY, PA 16117  
DATE 01-21-99 CHECK HRJ-145-7

BILL OF MATERIALS				
MARK NO.	QTY	DESCRIPTION	PART NO.	
18	1	ADAPTOR WELDMENT	HRJ-145-11-1	-
19	3	SHEAR PIN	HRJ-145-11-2	-
20	2	ADAPTOR BUSHING FOR SHEAR PIN	HRJ-145-11-3	-
21	1	SHOULDER BOLT	HRJ-145-11-4	-
22	1	FLAT WASHER	HRJ-145-11-5	-
23	1	NYLOCK NUT	HRJ-145-11-6	-
24	1	SHEAR PIN LOCK NUT	HRJ-145-11-2A	-

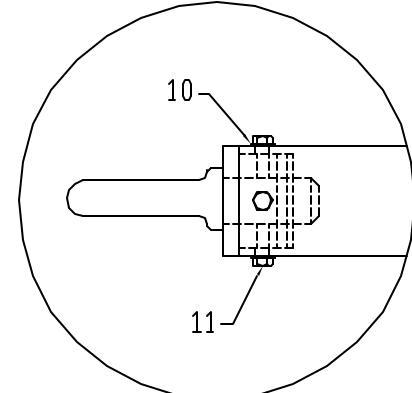


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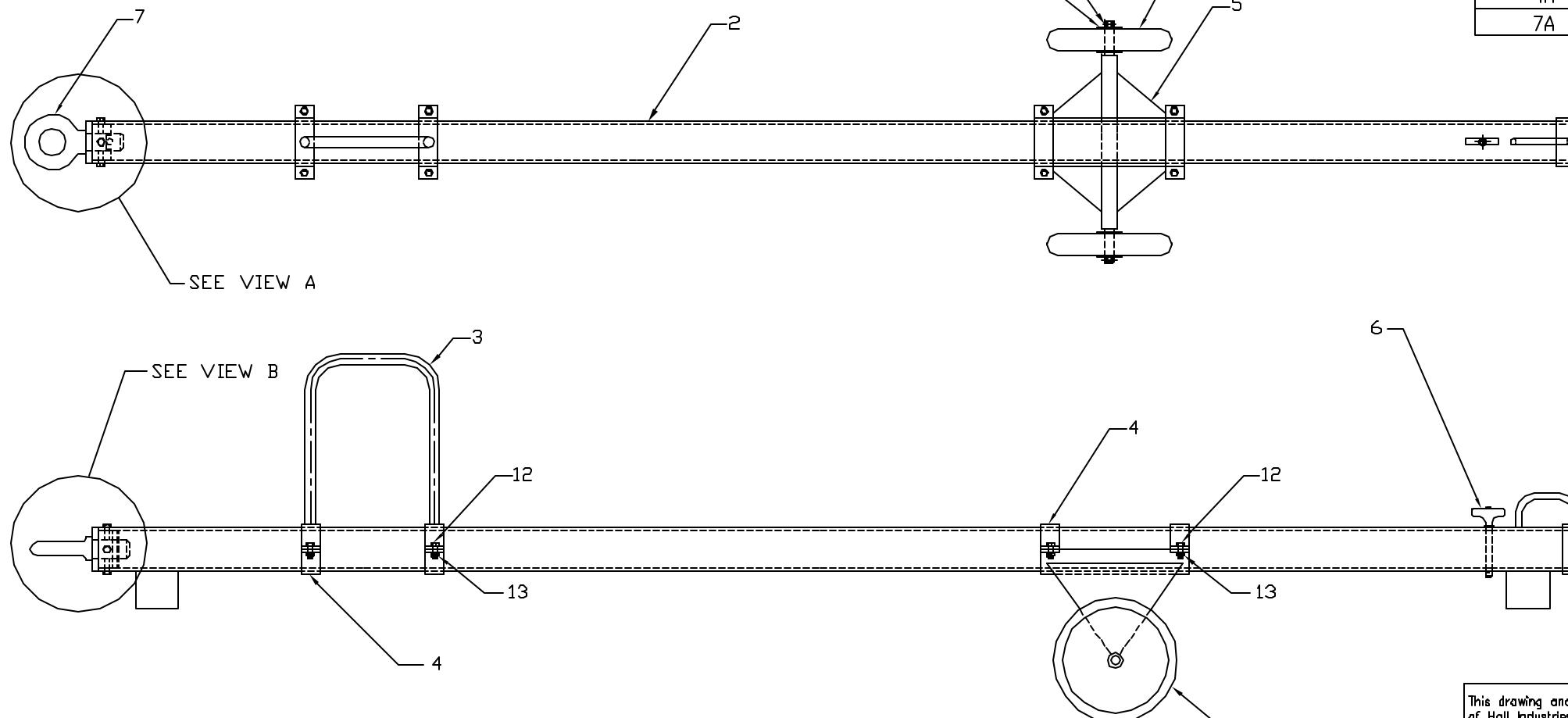
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			SUBJECT <b>HRJ-145OPT TOWBAR ADAPTOR ARRANGEMENT</b>	REV
<b>REVISIONS</b> DESCRIPTION BY CHK			 <b>HALL INDUSTRIES EQUIPMENT DIVISION</b> 1 USG INDUSTRIAL PARK, ELLWOOD CITY, PA 16117	
SW	DATE		DATE 01-14-99	CHECK <b>HRJ-145-11</b>



## VIEW A



### *VIEW B*



# **BILL OF MATERIALS**

MARK NO.	QTY	DESCRIPTION	PART NO.	WEIGHT
2	1	MAIN PUSHBAR BODY	HRJ-145-12-1	-
3	1	TOWBAR HANDLE	HRJ-145-12-2	-
4	4	HANDLE/WHEEL ASSEMBLY CLAMP	HRJ-145-12-3	-
5	1	WHEEL CARRIAGE WELDMENT	HRJ-145-12-4	-
6	1	ADAPTOR QUICK RELEASE PIN	HRJ-145-12-5	-
7	1	EYEBOLT WITH 3" ID	HRJ-145-12-7	-
8	1	TUG EYE RETAINER BAR	HRJ-145-12-8	-
9	1	TUG EYE COLLAR	HRJ-145-12-9	-
10	4	LOCK WASHER	TB-8649-4	-
11	4	HEX HEAD CAP SCREW	37100HC5Z	-
12	8	CLAMP BOLT	TB-8898-5	-
13	8	CLAMP NUT	TB-8898-6	-
14	2	WHEEL	TB-8898-7	-
15	4	WASHER	TB-8898-8	-
16	2	COTTER PIN AXLE	TB-8898-9	-
4A	1	WHEEL CARRIAGE ASSEMBLY	HRJ-145-12-10	-
7A	1	3" ID SWIVEL EYE KIT	HRJ-145-12-11	-

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PROJECT/CUSTOMER  
HALL INDUSTRIES EQUIPMENT  
SUBJECT  
HRJ-1450PT TOWBAR  
PUSHBAR ARRANGEMENT

REVISIONS		BY	DATE	HALL INDUSTRIES EQUIPMENT DIVISION	
SW	DATE	DESCRIPTION	CHK	DATE	CHK#
				04-21-99	HRJ-145-12