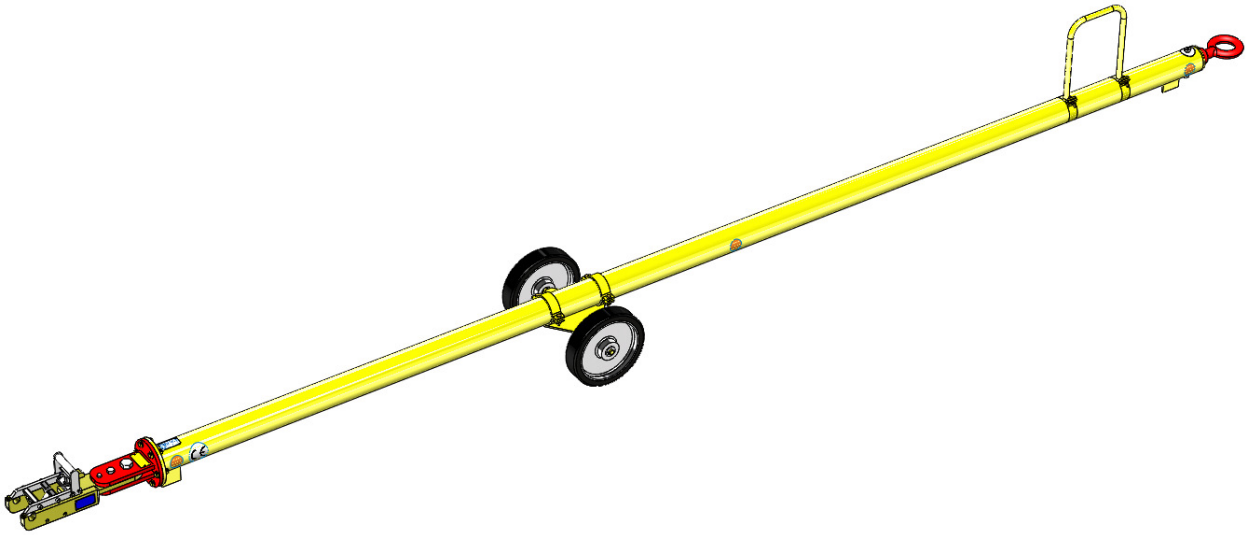
HALL Technical Services, LLC

EMB 170/175/190/195 TOWBAR MANUAL

Towbar Specifications, Usage, Preventive Maintenance, and Parts



Phone 724-752-2000
Fax 724-758-1558
Email service@hallindustries.com

HALL Technical Services, LLC
514 Mecklem Lane
Ellwood City, PA 16117

CE

June 27, 2018
Revision 0

0. Index

1. Specifications

1.1. For use with Embraer 170 / 175 / 190 / 195 aircraft

1.1.1. Listed in Embraer 170/175 AMM only (September 2018)

1.1.2. Top Level Part Numbers in *italics* in list below will not be listed in Embraer 170/175 AMM.

1.2. Physical Specifications

Part Number	Description	Weight	Length
TB-EMB17X	Towbar (19" x 20.5")	226 lb	17'-8 7/8"
TB-EMB17X-SS	Towbar w/ soft start (19" x 20.5")	241 lb	17'-10 7/8"
TB-EMB17X-HL	*Towbar w/ hydraulic lift kit (27"x 20.5")*	*290 lb*	*17'-8 7/8"*
TB-EMB17X-HL-SS	*Towbar w/ lift kit & soft start (27"x20.5")*	*305 lb*	*17'-10 7/8"*
TB-EMB17X-200	Pushbar complete	136 lb	15'-11 5/8"
TB-EMB17X-20S	Pushbar w/ soft start complete	151 lb	15'-11 5/8"
TB-EMB17X-100	Towbar Head with Adapter	50 lb	21 3/16"

1.3. Shear Pin

Shear Pin TB-EMB17X-SP Shear Value: 14,050 lbs

NOTE: Shear pins are produced in controlled batches; only use Hall Industries shear pins. Shear pin testing and manufacturing records are permanently stored for reference.

1.4. Warranty:

All parts are guaranteed against defects for one year. If at any time this manual is not followed it will void the warranty (preventive maintenance logs are required for all warranty replacement parts). All replacement parts must be genuine Hall Industries parts.

2. Safety

To ensure safe operation, please read the following statements and understand their meaning. This manual contains safety precautions which are explained below.

WARNING!
Warning is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage if the Warning Notice is ignored.

CAUTION!
Caution is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage if the Caution Notice is ignored.

WARNING!
A damaged or bent towbar should not be used. Towbar should be repaired or replaced.
BENT TOWBARS CAN NOT BE REPAIRED AND MUST BE REPLACED.

WARNING!
Do not drop towbar toweye onto foot. Be careful when removing toweye from tug hitch to not let the towbar drop. Slowly lower towbar onto ground.

3. Operating Procedures

ALWAYS FOLLOW AIRCRAFT MANUFACTURERS PROCEDURES FOR PUSHBACK AND TOWING OPERATIONS

3.1. Responsibility & Training

3.1.1. Operator of the tug must understand that it is his/her responsibility to move the aircraft safely in accordance with the aircraft manufacturers operational procedures.

3.1.2. Employer of tug operator is responsible for providing sufficient operator training to ensure safe operation of towbar for pushback and towing operations. This training program should cover safety procedures concerning the use of towbars in and around all aircraft types to be serviced at a particular location.

The following are recommendations.

3.2. Inspect the Towbar prior to each use:

3.2.1. Visually inspect towbar tube for cracks at welded joints.

3.2.2. Visually inspect lunette eye assembly for damage and loose or missing hardware.
3.2.3. Visually inspect wheel carriage for damage and loose or missing components.
3.2.4. Visually inspect adapter to tube flange bolts.
3.2.5. Check head latch mechanism for proper travel and locking action in both forward and back positions. Inspect for damage and loose or missing components.
3.2.6. Visually inspect shear pin for damage and that it is the correct shear pin.
3.2.7. Visually inspect that Pivot and Capture bolt nuts are present on underside of adapter.

WARNING: DO NOT attempt to tow an aircraft with a damaged towbar.

3.3. Use the correct size Aircraft Tow Tractor:

An important consideration for safe movement of an aircraft is using the correct category of tug for pushback and towing operations. Incidents are more likely to occur when using a tug that is either too large or too small for a particular aircraft. Consult the Aircraft Manufacturers Ground Towing Requirements chart to obtain tug draw bar pull and total wheel traction requirements based on aircraft and environmental conditions.

Category	Aircraft Maximum Takeoff Weight	Tug Draw Bar Pull
1	Up to 50,000 kg (110,000 lbs.)	14,000 kg (8,800 lbs.)
2	Up to 150,000 kg (330,690 lbs.)	212,000 kg (26,455 lbs.)
3	Up to 260,000 kg (573,196 lbs.)	318,000 kg (39,683 lbs.)
4	More than 260,000 kg (573,196 lbs.)	440,000 kg (88,184 lbs.)
Source: IATA "Airport Handling Ground Support Equipment" Specification AHM 955: "Functional Specification for an Aircraft Tractor"		

3.4. Attach towbar to aircraft first, then to tug.

3.5. Towbar should be horizontal to ground or up to 2" (5cm) higher at the aircraft end.

3.6. Do not exceed a 90 degree angle between towbar and pushback tractor. Damage to towbar or aircraft can occur.

3.7. Always start a pushback with the tug in-line with the towbar.

3.8. Attach the Towbar to the Aircraft

3.8.1. Pull back latch and lock in open position.
3.8.2. Line up towbar to nose pin of aircraft and slide head over the aircraft nose pin.
3.8.3. Release the lock pin then push latch forward and over the top of the nose pin until the lock pin locks into the closed position. Make sure that the lock pin is engaged (handle down) and is keeping the latch in the forward position.

3.9. Attach the Towbar to the Tow Tractor

3.9.1. Lift to the level of the push backs hitch.

3.9.2. Position the push back tractor and install the hitch pin.

3.9.3. Tow or push the aircraft only if the tow bars tires are not touching the ground.

3.10. Push the Aircraft

ALWAYS FOLLOW AIRCRAFT MANUFACTURERS PROCEDURES FOR PUSHBACK AND TOWING OPERATIONS

NOTE: If at any time the shear pin yields or breaks, carefully bring the aircraft to a stop. Follow aircraft manufacturers and/or airline nose landing gear inspection procedures prior to installing a new shear pin to continue the operation.

The following information is provided as general guidance only.

3.10.1. Prior to moving, make sure that full swivel release pins are released (if applicable).

3.10.2. Double check that all the tie downs and chocks are removed.

3.10.3. Double check that aircraft brakes are released.

3.10.4. Tow Slow, max speed is a brisk walk (Approximately 5 MPH). This will help to minimize the chance of a jack-knife.

3.10.5. Do not exceed Aircraft nose wheel angle of towing limits. If not marked or not known, do not exceed 30° from center. Be extra cautious on snow and ice.

3.10.6. If you are driving make sure that you have plenty of help; “wing walkers” are helpful and may be required per airline or aircraft manufacturer procedures.

3.10.7. Make sure the operator / driver has direct contact with the pilot at all times while moving the aircraft.

NOTE: Thousand of dollars in damage can occur in a few seconds while towing. Most incidents are due to operator negligence / error. Accidents can be fatal.

3.11. Disconnect the Towbar from the Tug

3.12. Disconnect the Towbar from the Aircraft

3.12.1. Pull the locking pin upwards and pull back on the towbar latch handle to move the latch into the open position. Carefully lower the tow bar to the ground (use hydraulic lift if installed), and then move push back tractor and towbar clear of the aircraft.

4. Maintenance

Maintenance, service and support should be performed by qualified mechanics only. The towbar cannot be modified in any way without the written approval of Hall Technical Services. Any modifications done without written approval voids all warranties and releases Hall Technical Services, its suppliers, distributers, employees, or financial institutions from any liability from consequences that may occur.

Any questions about operation, maintenance, application and/or functionality of the towbar not answered by this manual should be directed to HALL Technical Services.

NOTE: Hall Industries recommends using this maintenance procedure monthly (or as required by airlines maintenance procedures). Replace worn or damaged parts as needed.

4.1. Replace Shear Pin

4.1.1. Shear pin should spin freely by hand and the nut should not be tight to the head. A very small gap (0.005"-0.010" feeler gage) between the nut and the head is desirable. See *Figure 1* below.

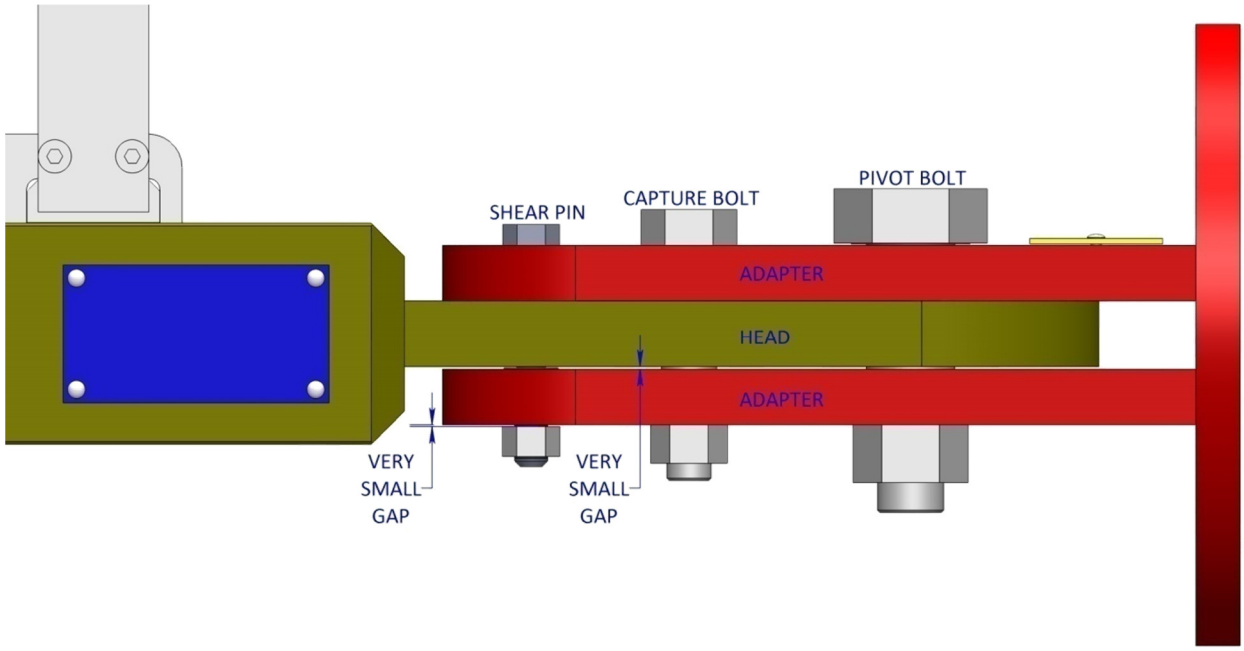


Figure 1. Inspection of shear pin and head/adapter clearance.

4.2. Check Shear Pin Bushings. They should not be worn, cracked, or otherwise damaged.

NOTE: Always replace bushings as a set. Never replace only one bushing.

4.3. Check clearance between head and adapter. With the shear pin removed, the head must be able to slide and pivot within the adapter plates by hand, but sometimes with some difficulty. A very small gap should exist between the head and the adapter (see Figure 1 above). Both the Capture and Pivot bolts are shoulder bolts and the nuts should be able to be tightened up to the shoulder. However, if the adapter is excessively clamping the head slightly loosen Capture and Pivot bolt nuts by 1/8 of a turn to free up the head.

4.4. Check adapter/tube flange bolts (TB-8898-12) for tightness. Torque to 92 in-lbs.

4.5. Check wheels and wheel carriage for bent, broken, or worn parts and security. Lubricate pivot points using Hall dry lubricant (Part number TB-LUBE).

4.6. Check head assembly for operation of lock mechanism; look for bending, security, etc. Lubricate pivot points and sliding contact areas using Hall dry lubricant (Part number TB-LUBE).

4.7. Inspect jaw assembly for looseness and worn or damaged parts.

4.8. Check latch mechanism to ensure proper travel back and forth, and that the locking pin locks in both the open and closed positions. Lubricate pivot points.

4.9. Check tow eye and hardware (tug attachment) for condition and security.

4.10. Check main body tube for bending or cracking.

4.11. Clean, repaint or touch-up paint as required.

4.12. Inspect tags and labels. If damaged or missing replace (see the drawings in the attachment section for labels and placements).

4.13. If the towbar is equipped with optional hydraulic lift, check the fluid reservoir (in the down / collapsed position). Add hydraulic oil (MIL-PRF-5606H) if necessary.

5. Replacement Parts - Kits & Assemblies

Part Number	QTY in Kit	Description
TB-EMB170-BSH-KIT		Bushing Kit
TB-8312-B3	2	Shear Pin Bushing
TB-EMB170-101	1	Shear Pin Bushing
TB-EMB170-150		Latch Mechanism Assembly
TB-EMB170-151	2	Latch Arm
TB-EMB170-152	1	Latch Arm Cross Piece
TB-EMB170-153	1	Handle
TB-EMB170-154	1	T-Handle Pull Pin
TB-EMB170-153-A	2	Latch Arm SHC Screw
TB-EMB170-153-B	4	Handle SHC Screw
TB-EMB170-153-C	4	Handle Nut
TB-8898-EYE-KIT		4" Tube-Toweye kit
WH0110000SS0000	1	Flat Washer
TB-8898-20	1	Curved Washer
TB-8898-21	1	Shoulder Bolt
CN08C0000SS0000	1	Castle Nut
CP4280048SS0000	1	Cotter Pin
HRJ-145-12-7	1	Eye Bolt
TB-8898-12-19		Eye Bolt Assembly (Legacy 4 bolt style)
HRJ-145-12-7	1	Eye Bolt
HRJ-145-12-8	1	Tug Eye Retainer Bar
TB-8898-12-9	1	Tug Eye Collar
TB-8898-17-LW	4	Nordlock Washer
TB-8898-17	4	Drilled Head Bolt

6. End of Life Statement

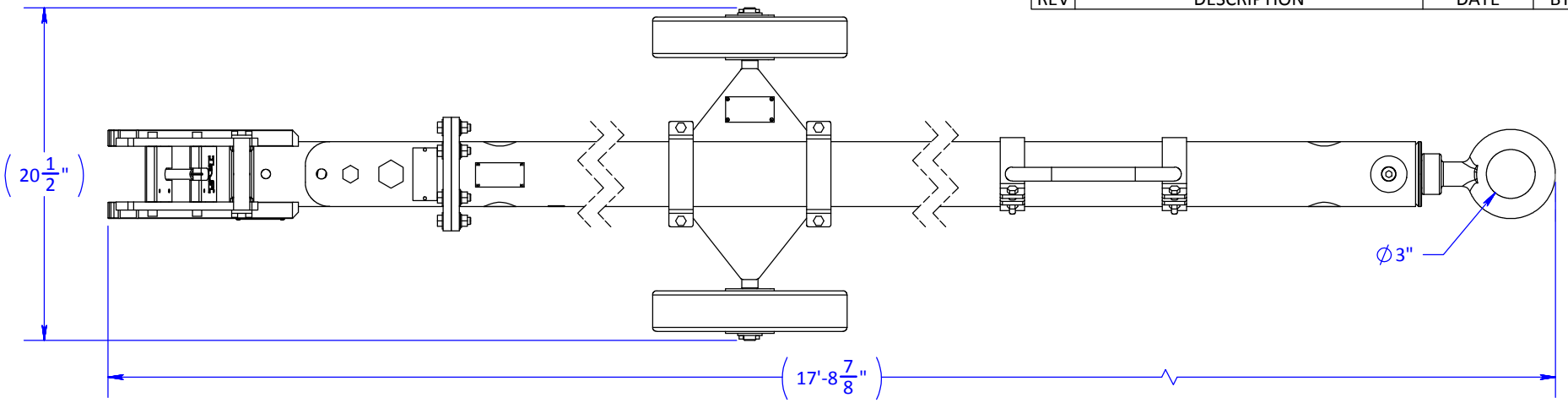
This towbar is designed to provide years of reliable service, but at some point in time it may be necessary to retire the unit from service. To protect our environment specific guidelines and requirements should be followed.

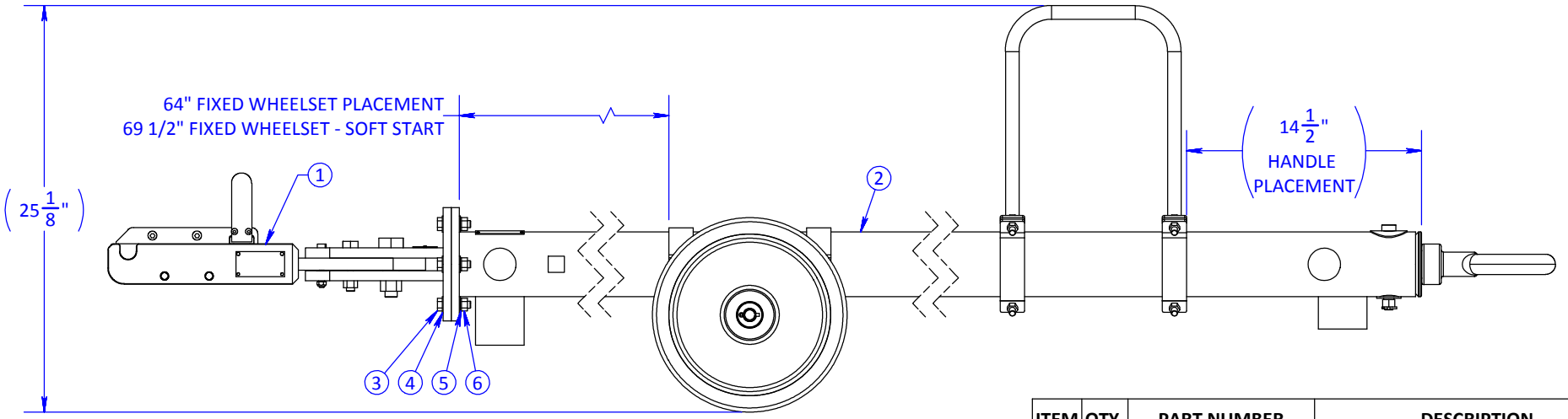
The towbar is primarily constructed of plated or painted carbon steel with a few minor components made of aluminum alloy 6061 and contains no hazardous materials. Please follow country, regional or local requirements for materials recycling.

7. Attachment List

7.1.	TB-EMB17X	Towbar Complete Assembly
7.2.	TB-EMB17X-SS	Towbar with Soft Start Complete Assembly
7.3.	TB-EMB17X-200	Pushbar Complete
7.4.	TB-EMB17X-20S	Pushbar Complete, Soft Start
7.5.	TB-SS4-EMB	Soft Start Toweye Assembly
7.6.	TB-EMB17X-100	Head Assembly
7.7.	TB-EMB170-210	Fixed Wheel Carriage
7.8.	4"OD-LIFT	4” O.D. Towbar Hydraulic Lift *(optional, is not part of listed towbar)*
7.9.	TB-8898-10	Handle Assembly
7.10.	AV1009-0001	4" Bolt On Drag Plate
7.11.	CE Marking	Declaration of conformity

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK





TOWBAR CONFIGURATIONS		
PART NUMBER	**WHEELSET**	**TOWEYE**
TB-EMB17X	FIXED	STANDARD
TB-EMB17X-SS	FIXED	SOFT START
TB-EMB17X-HL	HYDRAULIC	STANDARD
TB-EMB17X-HL-SS	HYDRAULIC	SOFT START

NOTES:

1. FOR MORE INFORMATION SEE SUB-ASSEMBLY DRAWINGS.
2. TAGS MUST BE INSTALLED.

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	TB-EMB17X-100	EMB170 HEAD ASSEMBLY
2	1	TB-EMB17X-200	TUBE ASSEMBLY FIXED WHEELS
3	6	TB-8898-12	ADAPTER BOLT
4	18	TB-8898-15	FLAT WASHER
5	6	TB-8898-14	WASHER LOCK
6	6	TB-8898-13	ADAPTER NUT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE ± 0.5° | .XX ± .01 | .XXX ± .005

X<12"=± 1/32" X>12"=±1/16"

THIRD ANGLE PROJECTION

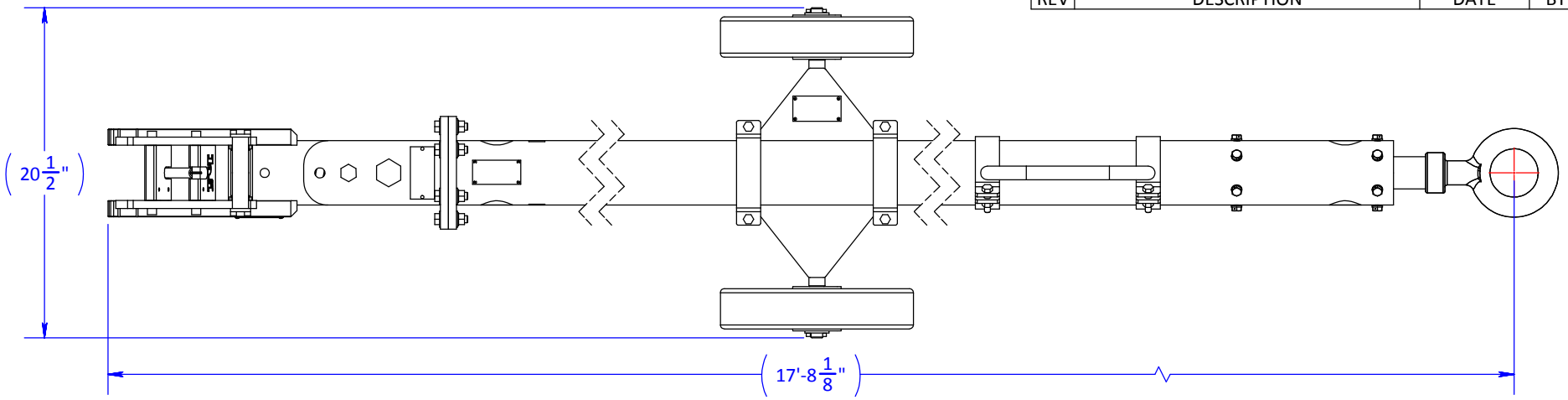
514 Mecklem ln Ellwood City, PA 16117

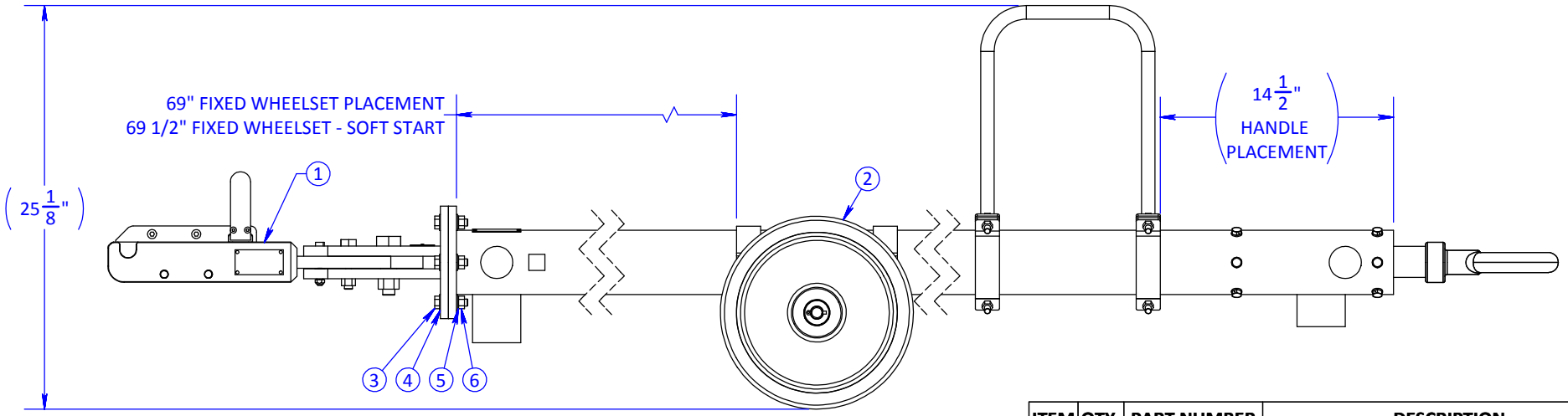
Hall Industries, Inc.

PROJECT	EMBRAER 170/175/190/195
FILE NAME	TB-EMB17X TOWBAR COMPLETE
DESCRIPTION	TOWBAR COMPLETE FOR EMBRAER 170/190

CHECK	DATE	SIZE	DWG/PART NO.	REV
DC	11/17/2010	A	TB-EMB17X	0
DRAWN	DATE	SCALE 1:10	WEIGHT: 234.75 LBS	SHEET 1 OF 1
BJE	11/17/2010			

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK





TOWBAR CONFIGURATIONS		
PART NUMBER	WHEELSET	TOWEYE
TB-EMB17X	FIXED	STANDARD
TB-EMB17X-SS	FIXED	SOFT START
TB-EMB17X-HL	HYDRAULIC	STANDARD
TB-EMB17X-HL-SS	HYDRAULIC	SOFT START

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	TB-EMB17X-100	EMB170 HEAD ASSEMBLY
2	1	TB-EMB17X-20S	EMB170 PUSHBAR COMPLETE, SOFT START
3	6	TB-8898-12	ADAPTER BOLT
4	18	TB-8898-15	FLAT WASHER
5	6	TB-8898-14	WASHER LOCK
6	6	TB-8898-13	ADAPTER NUT

NOTES:

1. FOR MORE INFORMATION SEE SUB-ASSEMBLY DRAWINGS.
2. TAGS MUST BE INSTALLED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES
ANGLE ± 0.5° .XX ± .01 .XXX ± .005
X<12"=± 1/32" X>12"=±1/16"

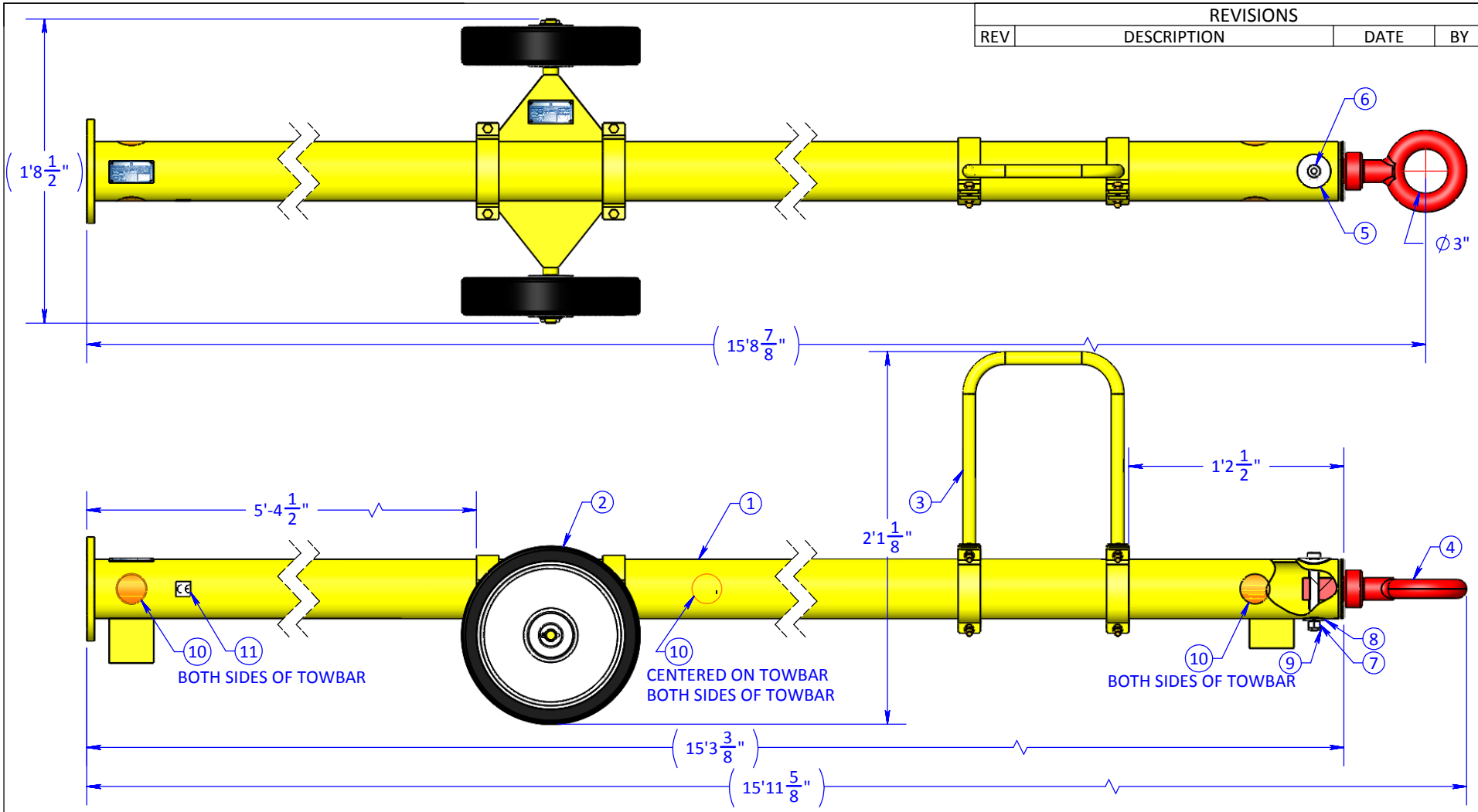
THIRD ANGLE PROJECTION

514 Mecklem ln Ellwood City, PA 16117
Hall Industries, Inc.

PROJECT	EMBRAER 170/175/190/195 TOWBAR
FILE NAME	TB-EMB17X-SS TOWBAR W SOFT START COMPLETE
DESCRIPTION	EMB170/190 TOWBAR SOFT START COMPLETE

CHECK	DATE	SIZE	DWG/PART NO.	REV
DC	11/17/2010	A	TB-EMB17X-SS	0
DRAWN	DATE	SCALE 1:10	WEIGHT: 258.22 LBS	SHEET 1 OF 1
BJE	11/17/2010			

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-EMB170-220	TOWBAR TUBE W/ TAG & DECAL
2	1	TB-EMB170-210	FIXED WHEEL CARRIAGE
3	1	HRJ-145-12-2ASY	HANDLE ASSEMBLY
4	1	HRJ-145-12-7	EYEBOLT
5	1	TB-8898-20	CURVED WASHER
6	1	TB-8898-21	SHOULDER BOLT
7	1	CN08C0000SS0000	CASTLE NUT SS
8	1	WH0110000SS0000	WASHER SS
9	1	CP4280048SS0000	PIN COTTER
10	6	STK-AM-R	ROUND AMBER REFLECTIVE STICKER
11	2	TB-STK-CE	CE STICKER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE ± 0.5° .XX ± .01 .XXX ± .005

THIRD ANGLE PROJECTION

PROJECT ID: EMBRAER 170 TOWBAR

CHECK: MCKENNA — DATE: 11/27/2012

DRAWN: BJE — DATE: 11/27/2012

514 Mecklem ln Ellwood City, PA 16117

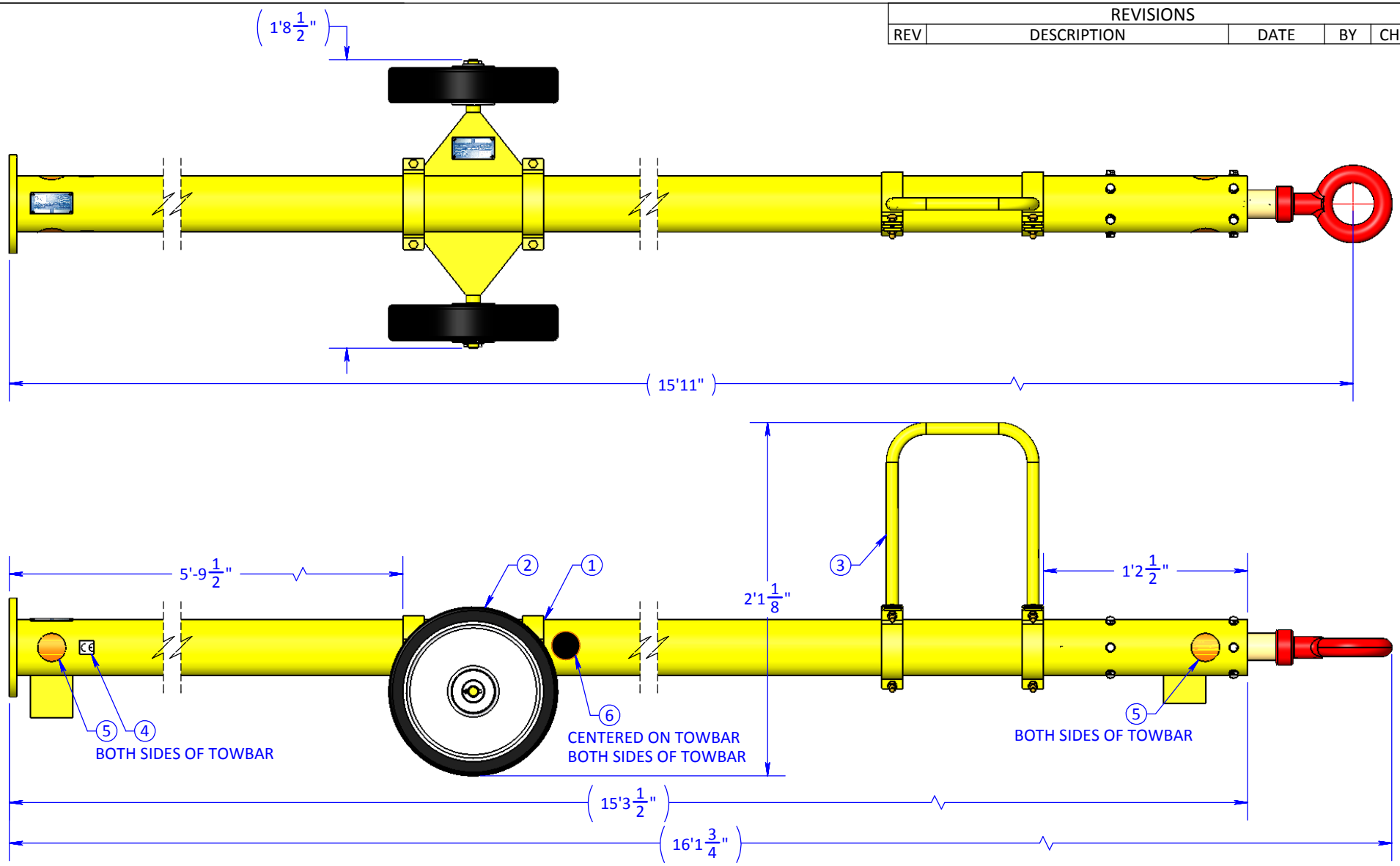
Hall Industries, Inc.

PROJECT	EMBRAER 170/190 TOWBAR
FILE NAME	TB-EMB17X-200 TUBE ASSY
DESCRIPTION	TUBE ASSEMBLY FIXED WHEELS

SIZE	DWG/PART NO.	REV
A	TB-EMB17X-200	0

SCALE 1:10 | WEIGHT: 173.80 LBS | SHEET 1 OF 1

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



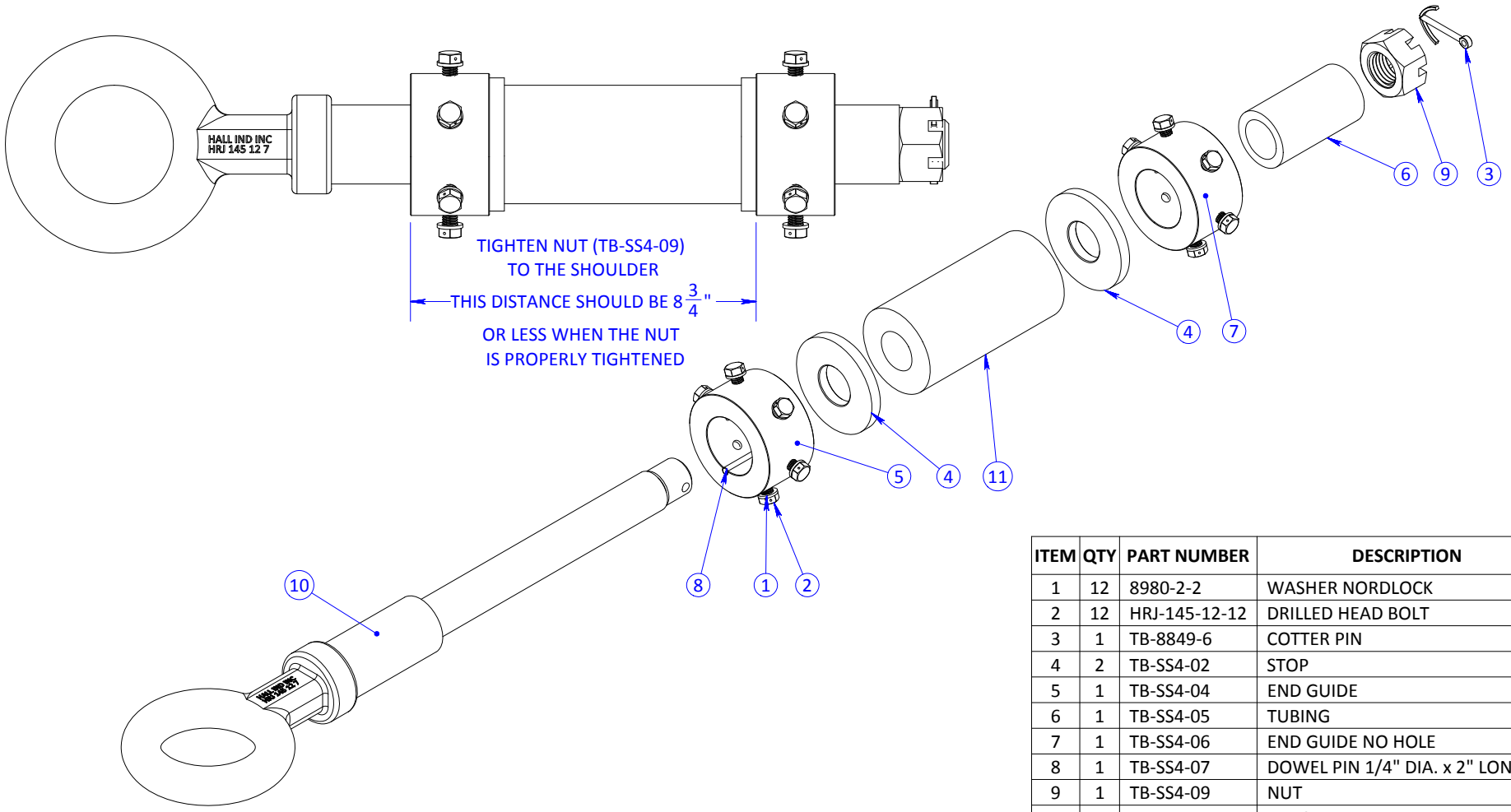
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-EMB170-TE-SS	4" TUBE & SS EYE W/HD
2	1	TB-EMB170-210	FIXED WHEEL CARRIAGE
3	1	HRJ-145-12-2ASY	HANDLE ASSEMBLY
4	2	TB-STK-CE	CE STICKER
5	6	STK-AM-R	REFLECTIVE STICKER

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLE ± 0.5° .XX ± .01 .XXX ± .005 THIRD ANGLE PROJECTION		514 Mecklem ln Ellwood City, PA 16117 Hall Industries, Inc.	
PROJECT ID EMBRAER 170 TOWBAR		PROJECT	EMBRAER 170/190 TOWBAR
		FILE NAME	TB-EMB17X-20S PUSHBAR COMPLETE SOFT START
		DESCRIPTION	EMB170 PUSHBAR COMPLETE, SOFT START
CHECK MCKENNA	DATE 11/27/2012	SIZE A	DWG/PART NO. TB-EMB17X-20S
DRAWN BJE	DATE 11/27/2012	REV 0	
		SCALE 1:10	WEIGHT: 197.27 LBS SHEET 1 OF 1

NOTES:

1. USE ANTI-SEIZE ON ALL THREADED HARDWARE.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	12	8980-2-2	WASHER NORDLOCK
2	12	HRJ-145-12-12	DRILLED HEAD BOLT
3	1	TB-8849-6	COTTER PIN
4	2	TB-SS4-02	STOP
5	1	TB-SS4-04	END GUIDE
6	1	TB-SS4-05	TUBING
7	1	TB-SS4-06	END GUIDE NO HOLE
8	1	TB-SS4-07	DOWEL PIN 1/4" DIA. x 2" LONG SS
9	1	TB-SS4-09	NUT
10	1	TB-SS4-11	EYE & SHAFT
11	1	TB-SS4-12	CUSHION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE ± 0.5° .XX ± .01 .XXX ± .005

X<12"=± 1/32" X>12"=±1/16"

THIRD ANGLE PROJECTION

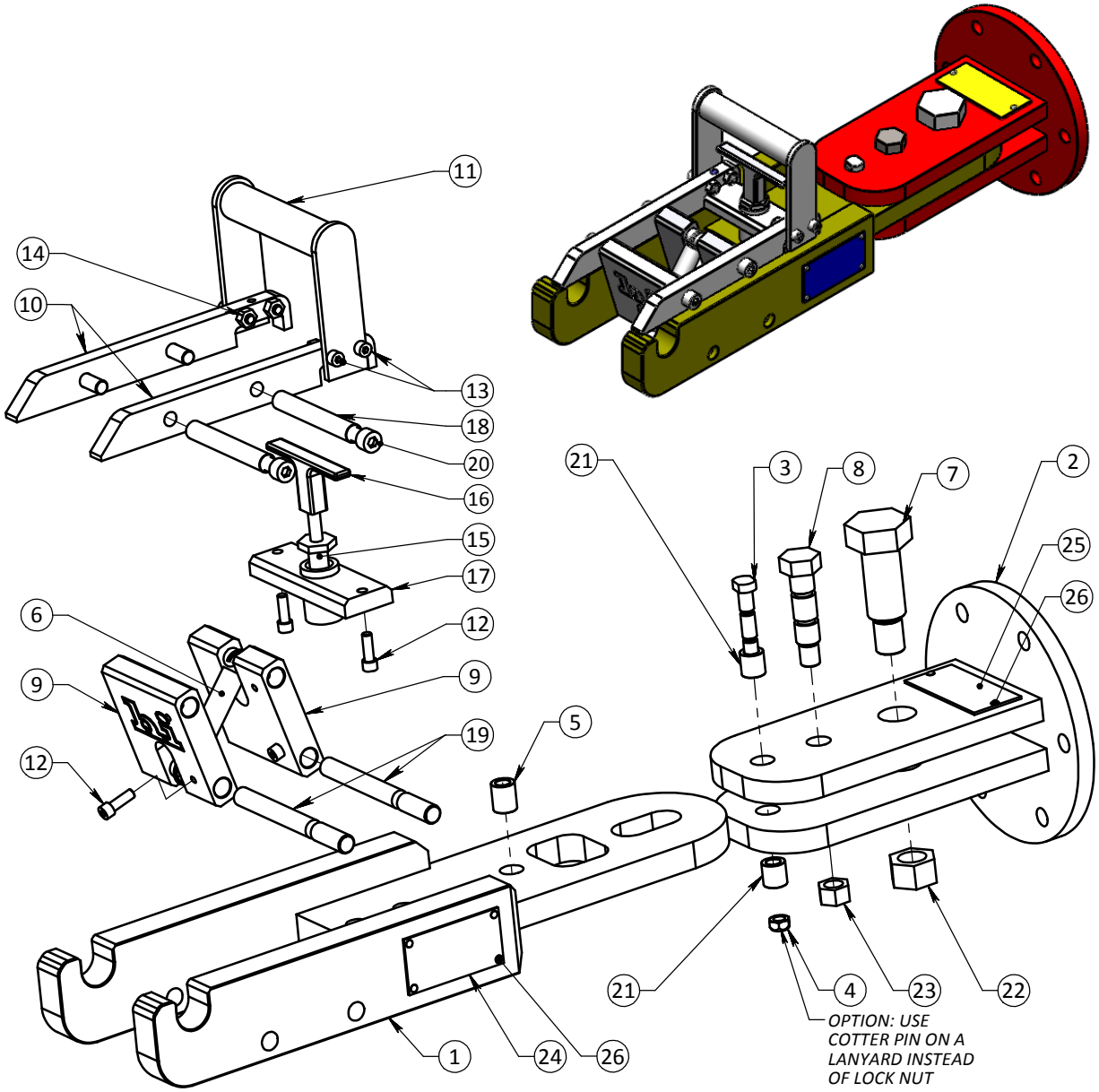
514 Mecklem ln Ellwood City, PA 16117

Hall Industries, Inc.

PROJECT	AV ~ SS EYE
FOLDER / FILE NAME	AV0801/ TB-SS4-EMB SOFT START ~ FOR MANUAL
DESCRIPTION	SOFT START 4 INCH

CHECK	DATE	SIZE	DWG/PART NO.	REV
SAK & VTM	10/15/2013	A	TB-SS4-EMB	0
DRAWN	DATE	SCALE 1:5	WEIGHT: 27.97 LBS	SHEET 1 OF 1
BJE	10/15/2013			

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-EMB170-110W	HEAD WELDMENT
2	1	TB-EMB170-190	ADAPTER WELDMENT
3	1	TB-EMB17X-SP	SHEAR PIN
4	1	HRJ-145-11-2A	STOVER LOCKNUT
5	1	TB-EMB170-101	BUSHING, SHEAR PIN
6	1	TB-EMB170-102	SPRING
7	1	TB-EMB170-103	PIVOT BOLT
8	1	TB-EMB17X-104	CAPTURE BOLT
9	2	TB-EMB170-141	GRAB LINK
10	2	TB-EMB170-151	LATCH ARM
11	1	TB-EMB170-153	HANDLE
12	4	TB-EMB170-153-A	SHCS, 1/4-20 X 3/4", SS
13	4	TB-EMB170-153-B	SHCS 1/4-20 X 1
14	4	TB-EMB170-153-C	NUT, 1/4-20, SS
15	1	TB-EMB170-154	T-HANDLE PIN
16	1	TB-EMB170-156	EMB170 TEE HANDLE, METAL
17	1	TB-EMB170-155	LATCH ARM CROSS PIECE ASSY
18	2	TB-EMB170-170	SPACER
19	2	TB-EMB170-170W	LOWER SPACER
20	4	SH06C0040AY	SHCS, 3/8-16 X 1
21	2	TB-8312-B3	SHEAR PIN BUSHING
22	1	TB-8312-B5	NUT
23	1	TB-8312-B8	NUT
24	1	TB-TAG-METAL	METAL ID TAG
25	1	TB-8312-BA-TAG	TAG YELLOW
26	6	TB-8849-14	DRIVE RIVET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE ± 0.5° .XX ± .01 .XXX ± .005

THIRD ANGLE PROJECTION

PROJECT ID: EMB170

CHECK: SHUMAKER DATE: 3/5/2004

DRAWN: MCKENNA DATE: 3/1/2004

514 Mecklem ln Ellwood City, PA 16117

Hall Industries, Inc.

PROJECT	EMB170/190 TOWBAR
FILE NAME	TB-EMB17X-100 HEAD ASSY EXP
DESCRIPTION	EMB170 HEAD ASSEMBLY

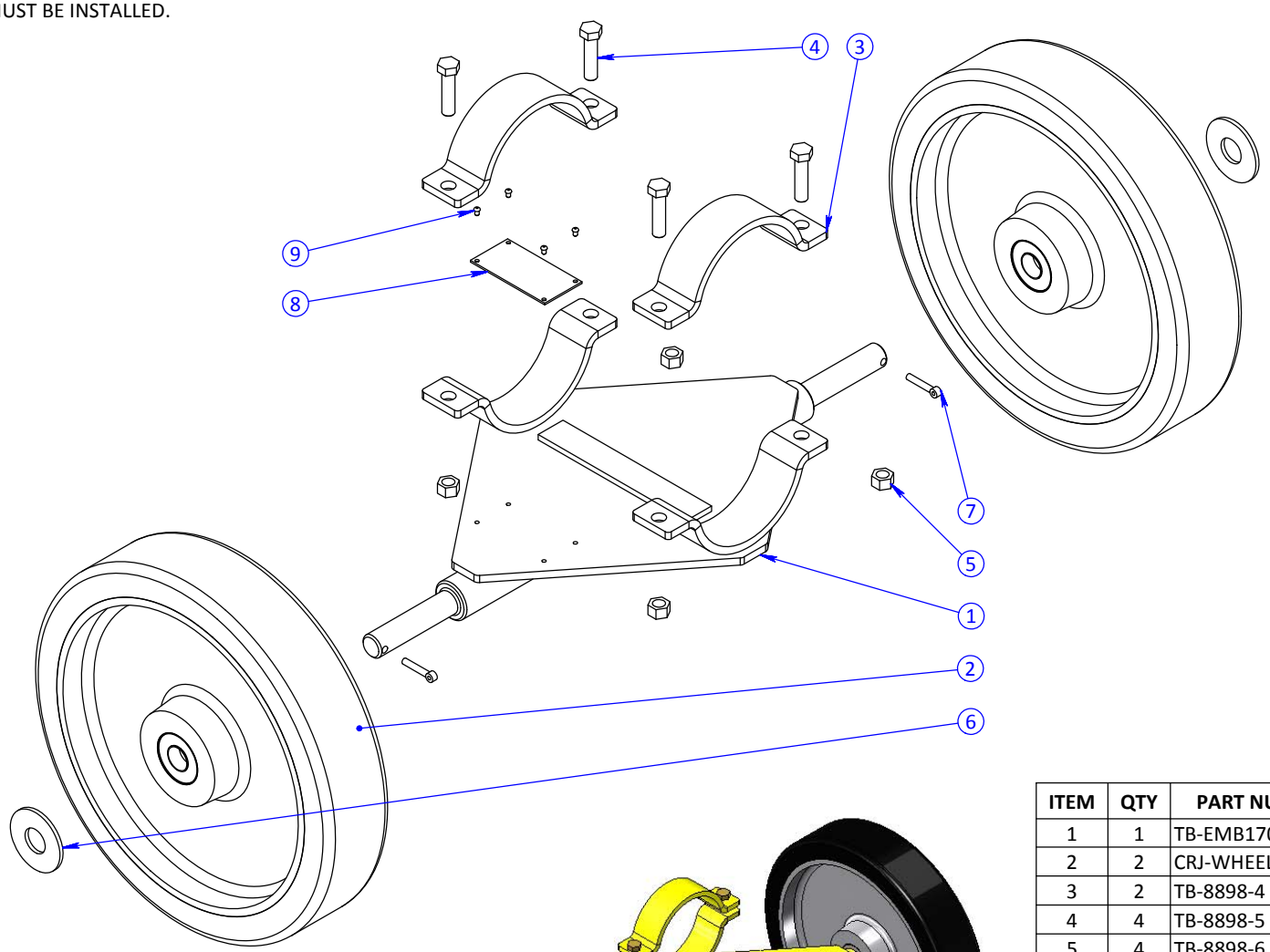
SIZE A | DWG/PART NO. TB-EMB17X-100 | REV 0

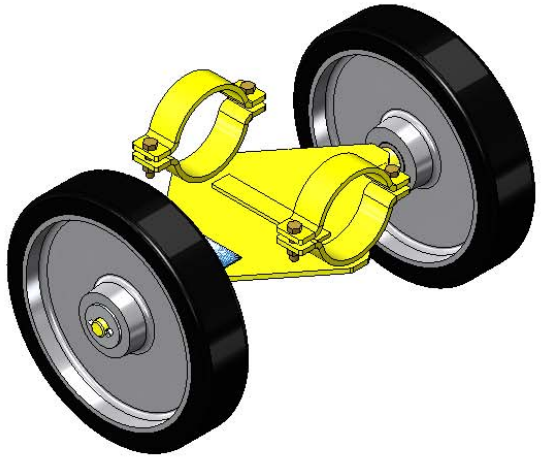
SCALE 1:4.5 | WEIGHT: 59.89 LBS | SHEET 1 OF 1

NOTES:

1. TAGS MUST BE INSTALLED.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK





ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-EMB170-210-W	WHEEL CARRIAGE WELDMENT
2	2	CRJ-WHEEL	WHEEL
3	2	TB-8898-4	CLAMP
4	4	TB-8898-5	CLAMP BOLT
5	4	TB-8898-6	CLAMP NUT
6	2	TB-8898-8	WASHER
7	2	TB-8898-9	PIN COTTER
8	1	TB-TAG-METAL	HALL INDUSTRIES TAG
9	4	TB-8849-14	DRIVE RIVET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

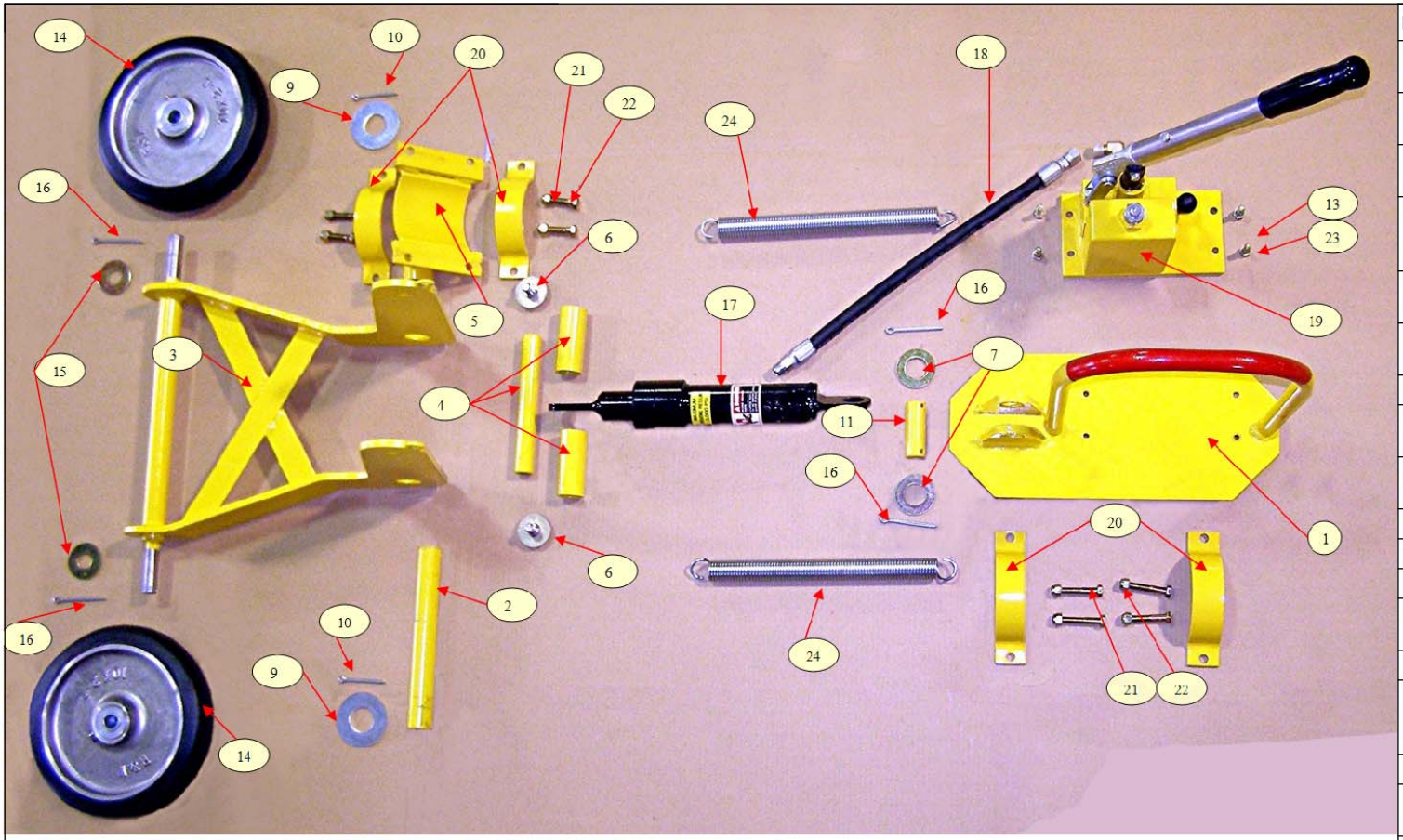
TOLERANCES

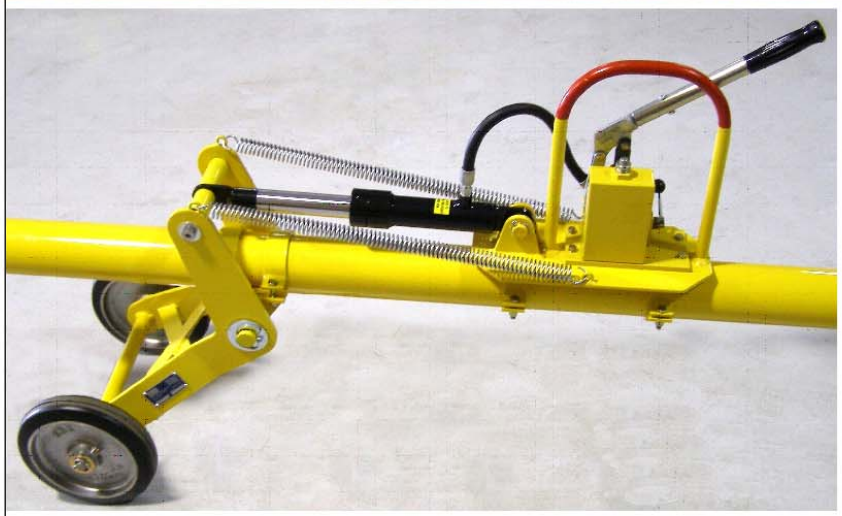
ANGLE	.XX	.XXX
± 0.5°	± .01	± .005

THIRD ANGLE PROJECTION

514 Mecklem ln Ellwood City, PA 16117
Hall Industries, Inc.

PROJECT	AV
FILE NAME	TB-EMB170-210 FIXED WHEEL CARRIAGE
DESCRIPTION	FIXED WHEEL CARRIAGE
PROJECT ID	AV1000
CHECK	DC
DATE	11/18/2010
DRAWN	BJE
DATE	11/18/2010
SIZE	A
DWG/PART NO.	TB-EMB170-210
REV	0
SCALE 1:5	WEIGHT: 35.49 LBS
SHEET 1 OF 1	





ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	LIFT-15	PUMP MOUNTING BRACKET
2	1	LIFT-4	LOWER PIVOT SHAFT
3	1	LIFT-3	WHEEL ARM WELDMENT
4	1	LIFT-2R	WHEEL ARM PIVOT SHAFT/ W 2 COLLARS
5	1	LIFT-5	WHEEL ARM PIVOT WELDMENT
6	2	LIFT-8	HEX SOCKET SHOULDER BOLT
7	2	TB-8986-9	FLAT WASHER ZP
9	4	LIFT-11	FLAT WASHER SAE ZP
10	2	LIFT-12	COTTER PIN, PIVOT SHAFT
11	1	LIFT-14	CLEVIS PIN
13	4	TB-8714-1	HEX BOLT GR5 ZP
14	2	TB-8898-7	WHEEL 10"
15	2	TB-8898-8	FLAT WASHER USS ZP
16	4	TB-8898-9	COTTER PIN, AXLE
17	1	TB-8714-20	HYD CYLINDER W/QUICK DISC, CPLG
18	1	TB-8714-23	HYDRAULIC HOSE
19	1	TB-8714-24	HYDRAULIC PUMP ASSEMBLY
20	4	TB-8898-4	HANDLE/WHEEL ASSY CLAMP
21	8	TB-8898-5	HEX BOLT GR5 ZP
22	8	TB-8898-6	HEX NUT NYLOCK ZP
23	4	TB-8714-2	LOCK WASHER ZP
24	2	TB-8714-10	EXTENSION SPRING
25	1	TB-TAG-METAL	IDENTIFICATION TAG (NOT SHOWN)
26	4	TB-8849-14	DRIVE RIVET FOR TAG (NOT SHOWN)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE ± 0.5° | .XX ± .01 | .XXX ± .005

THIRD ANGLE PROJECTION

PROJECT ID: AV1000

CHECK: DC | DATE: 11/20/2010

DRAWN: BJE | DATE: 11/20/2010

514 Mecklem ln Ellwood City, PA 16117

Hall Industries, Inc.

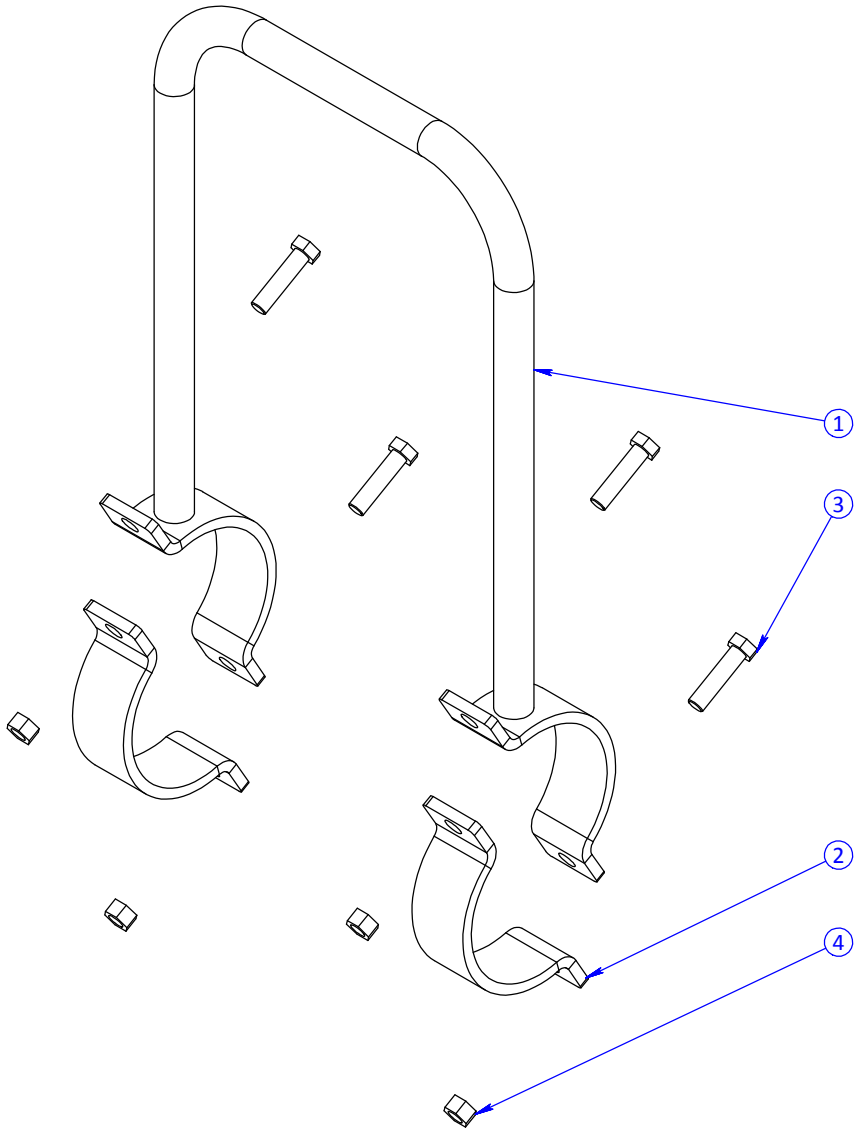
PROJECT:

FILE NAME: 4in OD-LIFT 4in OD TOWBAR LIFT

DESCRIPTION: 4" OD TOWBAR LIFT

SIZE: A | DWG/PART NO.: 4" OD-LIFT | REV: 0

SCALE 1:1 | WEIGHT: 50 LBS | SHEET 1 OF 1



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8898-11	HANDLE
2	2	TB-8898-4	CLAMP
3	4	TB-8898-5	CLAMP BOLT
4	4	TB-8898-6	CLAMP NUT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE	.XX	.XXX
± 0.5°	± .01	± .005

THIRD ANGLE PROJECTION

PROJECT ID: AV1000

CHECK: DC — DATE: 11/20/2010

DRAWN: BJE — DATE: 11/20/2010

514 Mecklem ln Ellwood City, PA 16117
Hall Industries, Inc.

PROJECT	AV
FILE NAME	TB-8898-10 HANDLE ASSEMBLY
DESCRIPTION	HANDLE ASSEMBLY

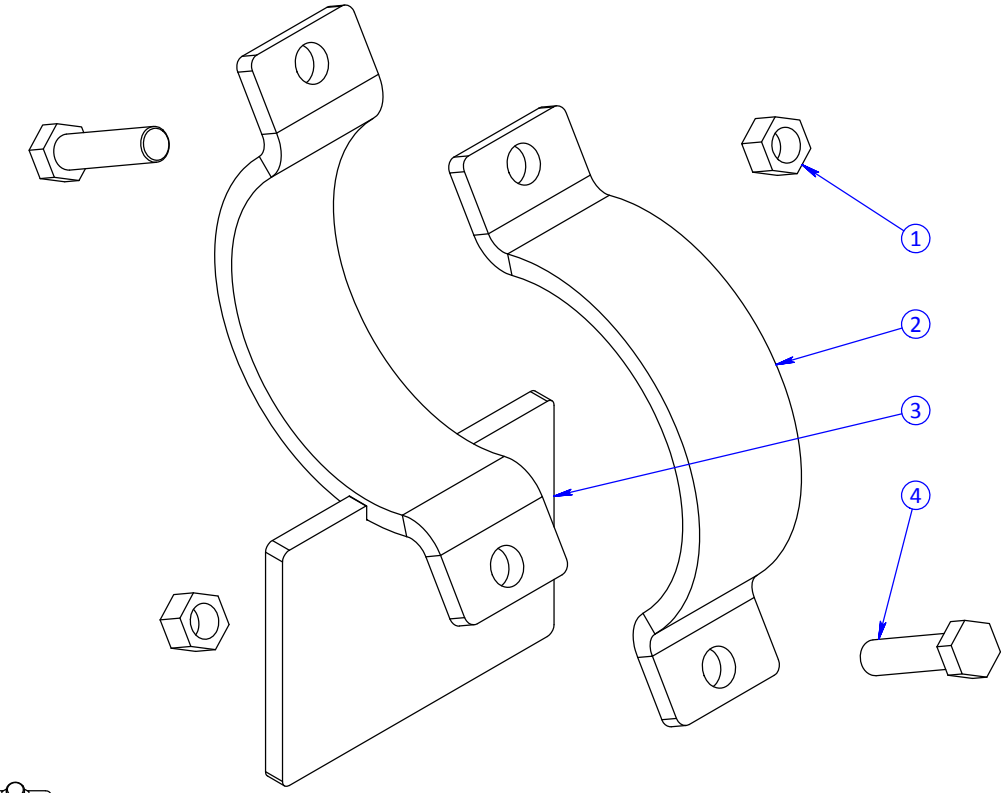
SIZE	DWG/PART NO.	REV
A	TB-8898-10	1

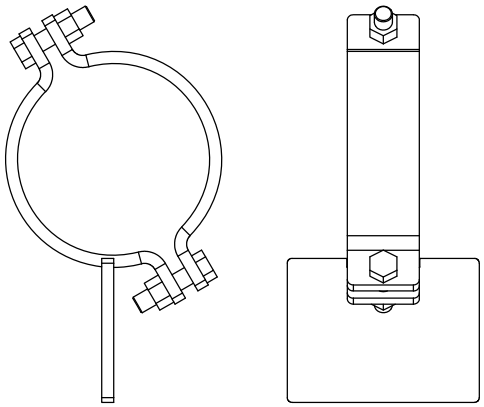
SCALE 1:4 | WEIGHT: 4.05 LBS | SHEET 1 OF 1

NOTES:

1. USE WHEN FACTORY INSTALLED DRAG PLATES HAVE BEEN WORN DOWN.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK





ITEM	QTY.	PART NUMBER	DESCRIPTION
1	2	TB-8898-6	CLAMP NUT
2	1	TB-8898-4	CLAMP
3	1	AV1009-3000	DRAG PLATE WELDMENT
4	2	TB-8898-5	CLAMP BOLT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE ± 0.5° .XX ± .01 .XXX ± .005

THIRD ANGLE PROJECTION

PROJECT ID AV1009

CHECK BJE DATE 6/27/2012

DRAWN BJE DATE 6/27/2012

514 Mecklem ln Ellwood City, PA 16117

Hall Industries, Inc.

PROJECT	AV
FILE NAME	AV1009-0001 TOWBAR DRAG PLATE 4 INCH BOLTED
DESCRIPTION	TOWBAR DRAG PLATE 4 INCH BOLTED

SIZE	DWG/PART NO.	REV
A	AV1009-0001	0

SCALE 1:2 | WEIGHT: 2.70 LBS | SHEET 1 OF 1

HALL Technical Services LLC

Declaration of Conformity CE

Manufacturer:

Hall Technical Services, LLC

514 Mecklem Ln.

Ellwood City, PA USA 16117

724-752-2000

The undersigned hereby declares, on behalf of HALL Technical Services, LLC, that the below referenced products, to which this declaration relates, are in conformity with the provisions of the following European directives pertaining to Ground Service Equipment compliance and Mechanical Safety:

- EN 1915-1:2013
- EN 1915-2:2001+A1:2009
- EN 1915-3:2004+A1:2009
- EN 1915-4:2004+A1:2009
- EN 12312-7:2005+A1:2009
- EN 12100:2010
- Machinery Directive 2006/42/EC

Type of Equipment: Aircraft Ground Service Equipment

Product Description: Tow Bar

Model Numbers:

- TB-EMB17X
- TB-EMB17X-SS

The Technical Report No. AVEMB170-CE Revision 01, dated 2018-06-07, required by this Directive, is maintained at the corporate headquarters of HALL Technical Services, LLC, 514 Mecklem Lane, Ellwood City, PA 16117.

BY: D. Mark Hall

TITLE: Vice President of Engineering & Sales

DATE: JUNE 25, 2018