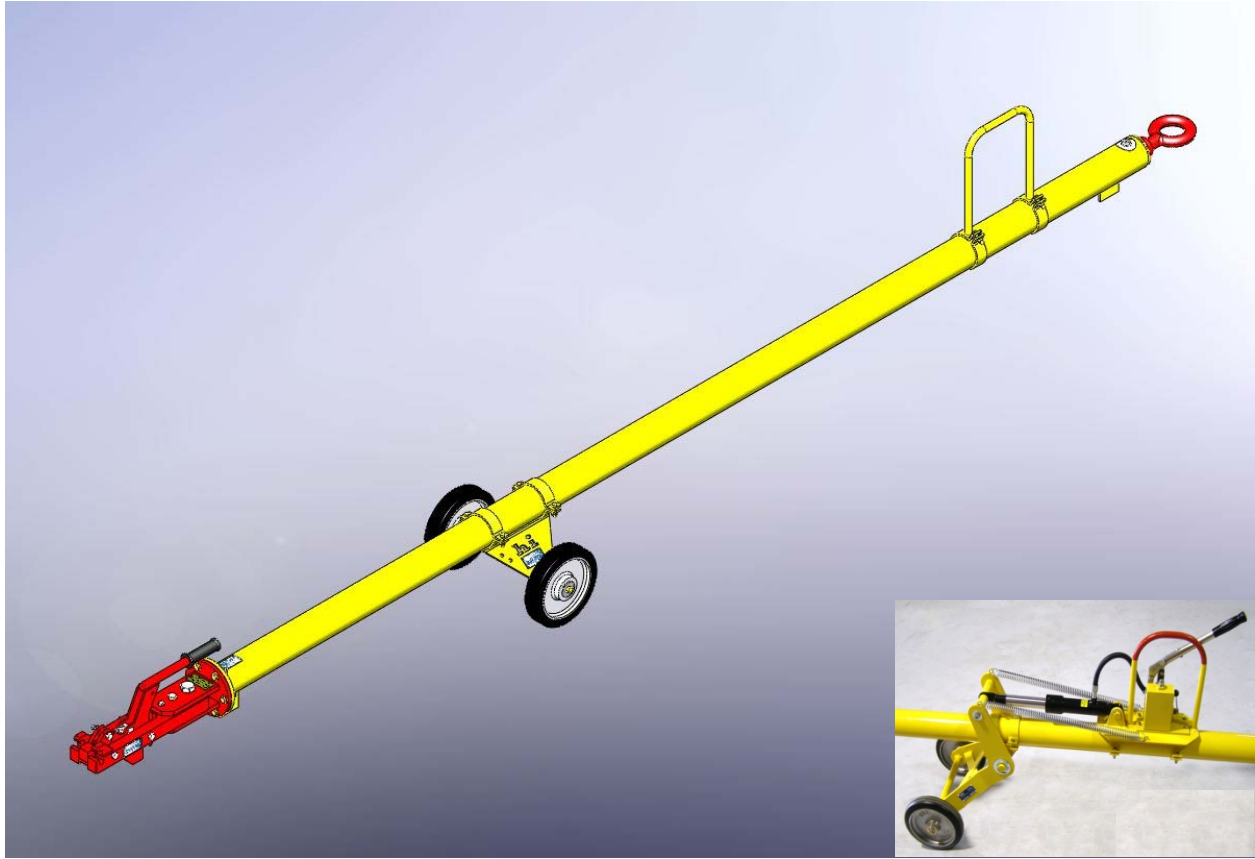




*HALL Technical Services, LLC*

# **TB-9267 TOWBAR MANUAL**



#

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

July 25, 2015  
Revision 06

Rev. 4 - Added Soft Start Option

Rev. 5 - General Revisions; Shear pin & pivot/capture bolt inspection procedure; additional drawings; ordering guide. 05-25-2015

Rev. 6 - General Revisions; weldment rename 07-25-2016





## 2. Operating Procedures

**ALWAYS FOLLOW AIRCRAFT MANUFACTURERS PROCEDURES  
FOR PUSHBACK AND TOWING OPERATIONS**

### 2.1. Responsibility

- Operator of the tractor must understand that it is his/her responsibility to move the aircraft safely in accordance with the aircraft manufacturers operational procedures.
- Employer of tractor operator is responsible for providing sufficient operator training to ensure safe operation of towbar for pushback and towing operations

*The following are recommendations.*

### 2.2. Inspect the Towbar prior to each use:

- 2.2.1. Visually inspect shear pin for correct installation, damage, and that it is the correct shear pin marked 737/ABN (see image below). Shear pin may be gold or silver colored.



- 2.2.2. Visually inspect that Pivot and Capture bolt nuts are present on underside of adapter.
- 2.2.3. Visually inspect towbar tube for cracks at welded joints.
- 2.2.4. Visually inspect tow eye assembly for damage and loose or missing hardware.
- 2.2.5. Visually inspect wheel carriage for damage and loose or missing components.
- 2.2.6. Visually inspect adapter to tube flange bolts.
- 2.2.7. Check head latch mechanism for proper travel and locking action in both forward and back positions. Inspect for damage and loose or missing components.

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



### 2.3. Use the correct size Aircraft Tow Tractor:

An important consideration for safe movement of an aircraft is using the correct category of tractor for pushback and towing operations. Incidents are more likely to occur when using a tractor that is either too large or too small for a particular aircraft. Consult the Aircraft Manufacturers Ground Towing Requirements chart to obtain tractor draw bar pull and total wheel traction requirements based on aircraft and environmental conditions. Category 2 is recommended.

Category	Aircraft Maximum Takeoff Weight	Tractor Draw Bar Pull
1	Up to 50,000 kg (110,000 lbs.)	14,000 kg (8,800 lbs.)
<b>2</b>	<b>Up to 150,000 kg (330,690 lbs.)</b>	<b>212,000 kg (26,455 lbs.)</b>
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"

### 2.4. Attach towbar to aircraft first, then to tractor.

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

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

### 2.7. Always start a pushback with the tractor in-line with the towbar.

### 2.8. Attach the Towbar to the Aircraft

- 2.8.1. First check that the towbar head latch is in the open position.
- 2.8.2. Line up towbar to nose pin of aircraft and slide head under the nose pin.
- 2.8.3. Lower the handle and lock the jaw to the nose pin. Due to the over-center arrangement of the clamping mechanism, the jaws remain closed until the handle is released by the operator. The head can only be disengaged by operation of the handle. If equipped make sure that the handle latch (P/N TB-8312-LHA or P/N TB-8312-LHA-A) locking pin is inserted and is keeping the handle in the down position. Or if equipped make sure the automatic handle latch (TS-737-ASL) is functional.

### 2.9. Attach the Towbar to the Tow Tractor

- 2.9.1. Lift to the level of the tractor hitch.
- 2.9.2. Position the tractor and install the hitch pin.
- 2.9.3. Tow or push the aircraft only if the towbar's tires are not touching the ground.



## **2.10. 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.***

- 2.10.1. Prior to moving, make sure that full swivel release pins are released (if applicable).
- 2.10.2. Double check that all the tie downs and chocks are removed.
- 2.10.3. Double check that aircraft brakes are released.
- 2.10.4. Tow Slow: max speed is a brisk walk (Approximately 5 MPH). This will help to minimize the chance of a jack-knife event.
- 2.10.5. 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.
- 2.10.6. 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.
- 2.10.7. Ensure the operator has 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.

## **2.11. Disconnect the Towbar from the Tractor**

## **2.12. Disconnect the Towbar from the Aircraft**

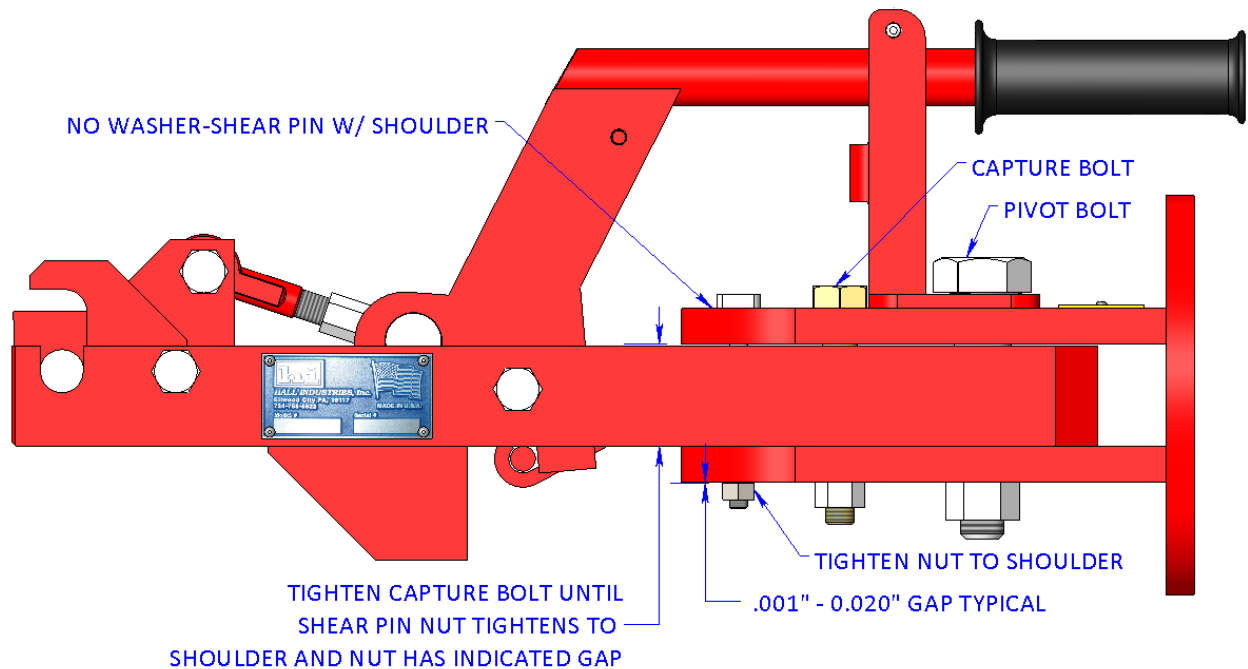
- 2.12.1. If equipped pull the locking pin or ASL and move the handle into the open position.
- 2.12.2. Carefully lower the towbar to the ground (use hydraulic lift if installed).
- 2.12.3. Move pushback tractor and towbar clear of the aircraft.



## 3. Preventive Maintenance

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

- 3.1.** Replace Shear Pin. Shear pin should have a slight vertical play, spin freely and the nut should not be tight to the head. A very small gap (0.001"-0.020" feeler gage) between the nut and the head is required. See *Figure 1* below.



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

- 3.2.** 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. Tighten Capture bolt to shoulder. If head cannot be moved by hand back off until head can be moved. Insert shear pin and inspect per item 3.1 above. Tighten Pivot bolt to contact or shoulder and verify that head can still be moved by hand. If desired a dry lube can be applied to the sliding surfaces between the head and adapter.
- 3.3.** 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.**

- 3.4.** Check adapter/tube flange bolts (TB-8898-12) for tightness. Torque to 50 ft-lbs.



## *HALL Technical Services, LLC*

- 3.5. Check wheels and wheel carriage for bent, broken, or worn parts and security. Lubricate pivot points using Hall dry lubricant (P/N TB-LUBE).
- 3.6. Check head assembly for operation of lock mechanism; look for bending, security, etc. Lubricate pivot points using Hall dry lubricant (P/N TB-LUBE).
- 3.7. Inspect jaw assembly for worn or damaged parts and security.
- 3.8. Check latch mechanism to ensure proper travel back and forth. Lubricate pivot points.
- 3.9. Check latch mechanism locking force. The release force on the handle is set at the factory to a minimum of 20 pounds when clamped to an aircraft replacement Nose Pin. When performing PM you can lock it on to a Test Pin (Part number SS-8312) supplied by Hall Industries (do not use a regular hot rolled bolt as a test pin). To adjust the pressure, remove TB-8312-J4, turn the Swing Bolt TB-8312-J2 half of a revolution (clockwise to decrease pressure, counter-clockwise to increase pressure), and replace and retighten TB-8312-J4. Check the release force and repeat if necessary. With daily use some wear / increased clearances will be noticed. The components of this adjustment are available as a kit (see kit section).

**NOTE: When closing/ locking of the handle force is too light, the attachment to the aircraft nose pin will be sloppy and excessive play will result. This can result in the handle opening during a push and loss of aircraft control.**
- 3.10. Check tow eye and hardware (Tractor attachment) for condition and security.
- 3.11. Check main body tube for bending or cracking.
- 3.12. If the drag plate is worn and towbar head or eye is dragging use replacement drag plate kit (Part number AV1009-0001).
- 3.13. Clean, repaint or touch-up paint as required.
- 3.14. Inspect tags and labels. If damaged or missing replace (see the drawings in the attachment section for labels and placements).
- 3.15. If the towbar is equipped with a hydraulic lift, check the fluid reservoir (in the down / collapsed position). Add fluid (Automatic Transmission Fluid) if necessary.



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## 4. Replacement Parts - Kits & Test Pins

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*\*See Section 5 Towbar Ordering Guide and drawings for replacement parts and assemblies*

<b>Part Number</b>	<b>QTY in Kit</b>	<b>Description</b>
TB-9267-WL-BSH-KIT		Bushing & Shear Pin Kit
TB-8312-B3	2	Shear Pin Bushing Adapter
TB-8312-MB6	1	Shear Pin Bushing Head
TB-8312-B6	2	Shear Pins w/ Nuts
TB-8312-J2-J3-KIT		Swing Bolt / Toggle Hinge Kit (For Lock Mechanism)
TB-8312-J2	1	Swing Bolt
TB-8312-J3	1	Toggle Hinge
TB-8312-J2-N	1	Coupling Nut
SS-8312	1	Pin for Checking Clamp Force (3/4" dia.)
SS-8220	1	Pin for Checking Clamp Force (1.5" dia. Airbus)





## 5. Towbar Ordering Guide

The TB-9267 towbar is available in a variety of configurations, as shown in the tables below.

### Complete Towbar - 3/4" Dia. Standard NLG Hookup

Part Number	Tow eye	Wheel Carriage	Handle Latch
TB-9267	Standard Swivel	Standard Fixed	None
TB-9267-WL	Standard Swivel	Standard Fixed	Pin Latch
TB-9267-ASL	Standard Swivel	Standard Fixed	Automatic Latch
TB-9267-HL	Standard Swivel	Hydraulic Lift	None
TB-9267-WL-HL	Standard Swivel	Hydraulic Lift	Pin Latch
TB-9267-ASL-HL	Standard Swivel	Hydraulic Lift	Automatic Latch
TB-9267-SS	Soft Start	Standard Fixed	None
TB-9267-WL-SS	Soft Start	Standard Fixed	Pin Latch
TB-9267-ASL-SS	Soft Start	Standard Fixed	Automatic Latch
TB-9267-HL-SS	Soft Start	Hydraulic Lift	None
TB-9267-WL-HL-SS	Soft Start	Hydraulic Lift	Pin Latch
TB-9267-ASL-HL-SS	Soft Start	Hydraulic Lift	Automatic Latch

### Complete Towbar - 1.5" Dia. Airbus NLG Hookup

Part Number	Tow eye	Wheel Carriage	Handle Latch
TB-9267-ABWL-INTL	Standard Swivel	Standard Fixed	Pin Latch
TB-9267-ABASL-INT	Standard Swivel	Standard Fixed	Automatic Latch
TB-9267-ABWL-ISS	Soft Start	Standard Fixed	Pin Latch

### Towbar Head Options

Part Number	Handle Latch	NLG Hookup Dia.
TB-8312	none	3/4"
TB-8312-WL	Pin Latch	3/4"
TB-8312-WL-A	Pin Latch, larger pin	3/4"
TB-8312-ASL	Automatic	3/4"
TB-8312-AB-INT'L	Pin Latch	1.5"
TB-8312-ABASL-INT	Automatic	1.5"

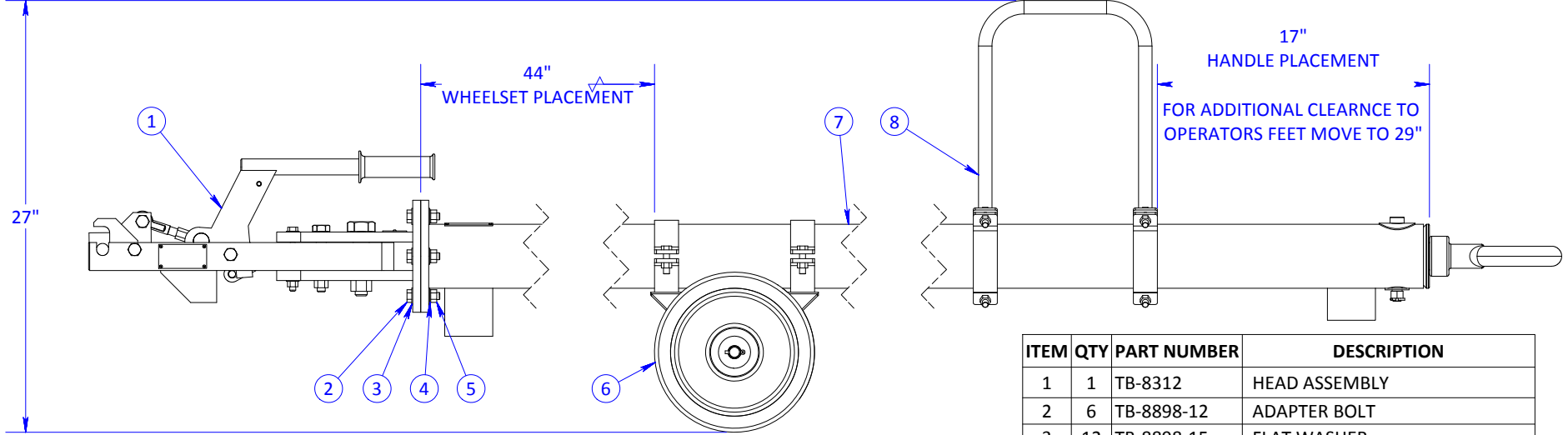
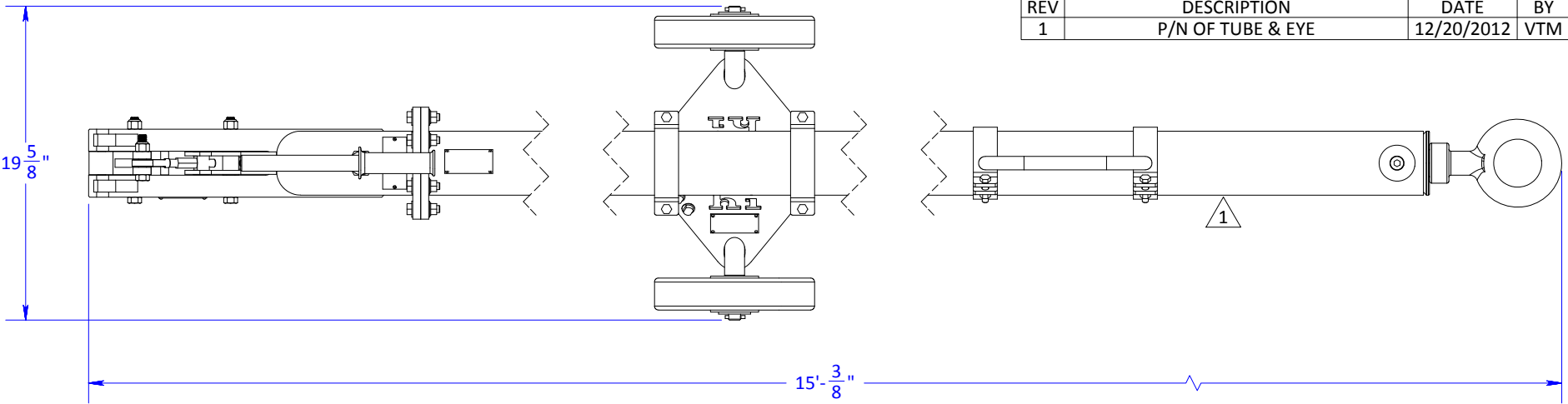


## 6. Attachment List

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6.1.	TB-9267	Full Assembly with Subcomponent Callouts
6.2.	TB-8312	Head Assembly
6.3.	TB-8312-WL	Head Assembly with Pin Handle Latch
6.4.	TB-8312-ASL	Head Assembly with Automatic Handle Latch
6.5.	TB-8898-TE	Tube & Eye with Hardware (Fixed Tow eye)
6.6.	TB-8898-TE-SS	Tube & Eye with Hardware (Soft Start Tow eye)
6.7.	TB-SS4-8898	Soft Start Assembly
6.8.	TB-8898-2	Fixed Wheel Carriage
6.9.	4"OD-LIFT	4" O.D. Towbar Lift
6.10.	TB-8898-10	Handle Assembly
6.11.	TS-737-ASL	Handle Latch (Automatic Version)
6.12.	TB-8312-LHA	Handle Latch (1/4" Dia. Pinned Version)
6.13.	TB-8312-LHA-A	Handle Latch (3/8" Dia. Pinned Version)
6.14.	AV1009-0001	Drag Plate 4" Bolted
6.15.	TB-8898-12-9	Toweye Assembly (4 bolt)

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	P/N OF TUBE & EYE	12/20/2012	VTM	BJE



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8312	HEAD ASSEMBLY
2	6	TB-8898-12	ADAPTER BOLT
3	12	TB-8898-15	FLAT WASHER
4	6	TB-8898-14	WASHER LOCK
5	6	TB-8898-13	ADAPTER NUT
6	1	TB-8898-2	FIXED WHEEL CARRIAGE
7	1	TB-8898-TE	4" TUBE & EYE W/HD
8	1	TB-8898-10	HANDLE ASSEMBLY

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

**TOLERANCES**

ANGLE	.XX	.XXX
± 0.5°	± .01	± .005

THIRD ANGLE PROJECTION

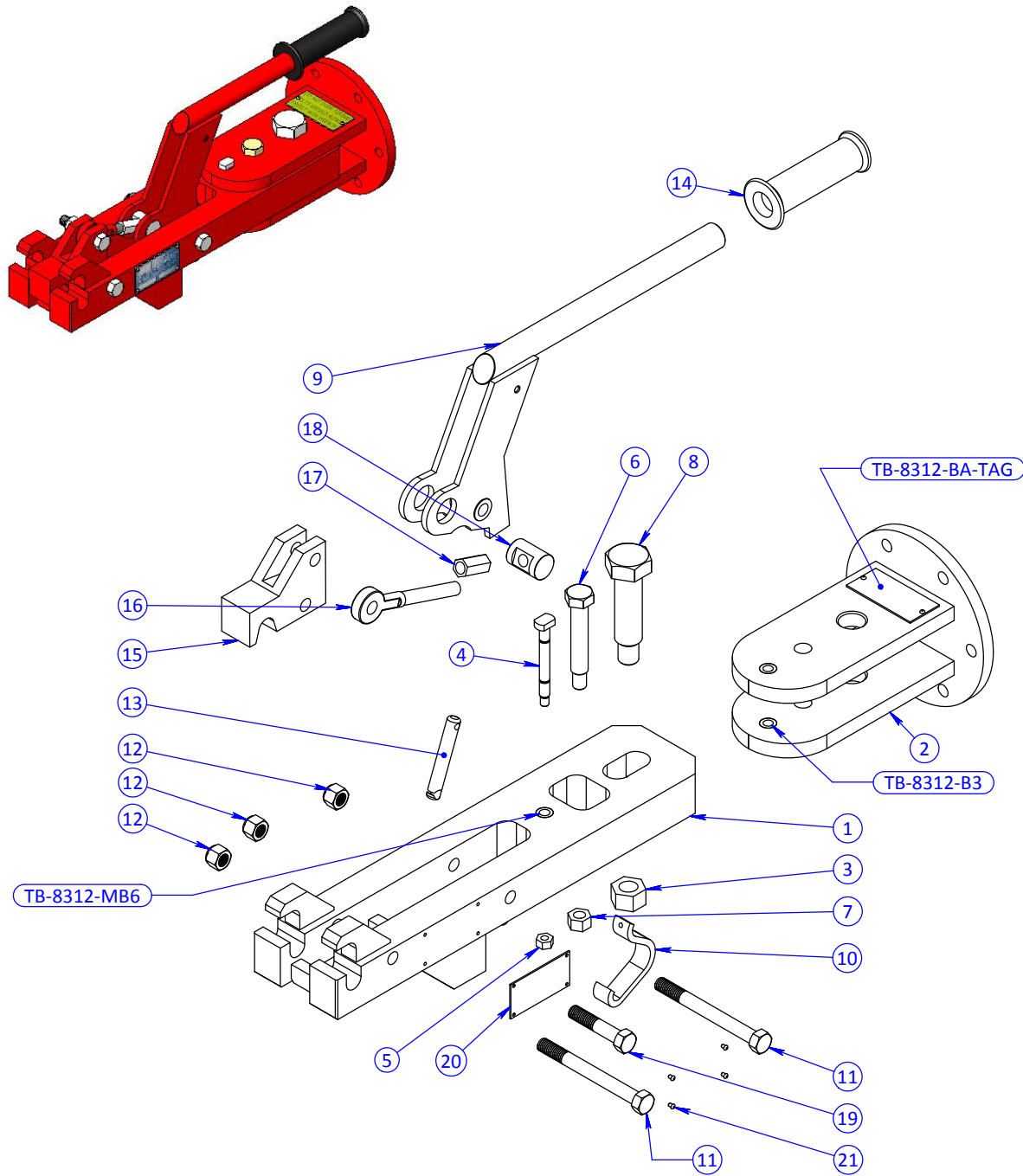
PROJECT ID AV1003

CHECK DC	DATE 5/30/2012
DRAWN BJE	DATE 5/30/2012

**hi** 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**

PROJECT	B737/A320 TOWBAR
FILE NAME	TB-9267 TOWBAR ASSEMBLY COMPLETE
DESCRIPTION	TOWBAR ASSEMBLY
SIZE	DWG/PART NO.
A	TB-9267
SCALE 1:10	WEIGHT: 208.55 LBS
SHEET 1 OF 1	

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REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	ADD AIRBUS 1.5" PIN INFO	3/21/2013	BJE	SAK
2	ADD TAG & BUSHING INFO	7/9/2013	BJE	DC, RH
3	REVISED SHEAR PIN; NO WAVE WASHERS	8/7/2014	VTM	BJE

NOTES:

1. USE ANTI-SEIZE ON ALL NUTS.
2. A DRY LUBRICANT MAY BE USED BETWEEN SLIDING SURFACES.

TB-8312-AB TOWBAR HEAD FOR USE WITH AIRBUS A31x/A32x AIRCRAFT WITH Ø1.5" HOOKUP PIN - SUBSTITUTE ITEMS BELOW.

1. MAIN BODY (ITEM ①) TB-8312-MB1-AB
2. MAIN JAW (ITEM ⑮) TB-8312-J1-AB

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8312-MB1-WB	MAIN BODY
2	1	TB-8312-BA	ADAPTER COMPLETE
3	1	TB-8312-B5	LOCKNUT 3/4"-10 STOVER
4	1	TB-8312-B6	SHEAR PIN
5	1	TB-8312-B6-N	SHEAR PIN NUT
6	1	TB-8312-B7	CUSTOM BOLT (CAPTURE)
7	1	TB-8312-B8	LOCKNUT 1/2"-13 STOVER
8	1	TB-8312-B12	CUSTOM BOLT (PIVOT)
9	1	TB-8312-HA	HANDLE WELDMENT
10	1	TB-8312-H5	SPRING HOOK
11	2	TB-8312-H6	HH BOLT 1/2"-13 x 5" LG
12	3	TB-8312-H7	NYLOC NUT 1/2"-13
13	1	TB-8312-H8	SPRING
14	1	TB-8312-HA-GRP	GRIP, BLACK
15	1	TB-8312-J1	MAIN JAW
16	1	TB-8312-J2	SWING BOLT
17	1	TB-8312-J2-N	COUPLING NUT
18	1	TB-8312-J3	TOGGLE HINGE
19	1	TB-8312-J4	HH BOLT 1/2"-13 x 2.5" LG
20	1	TB-TAG-METAL	HALL INDUSTRIES TAG
21	4	TB-8849-14	DRIVE RIVET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID AV1003

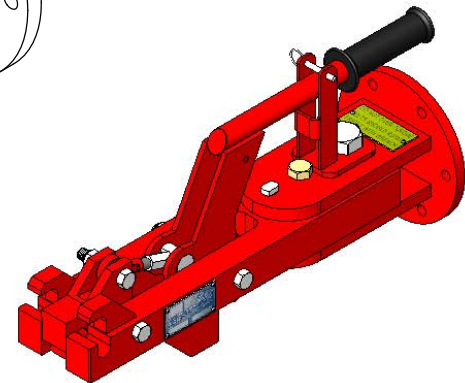
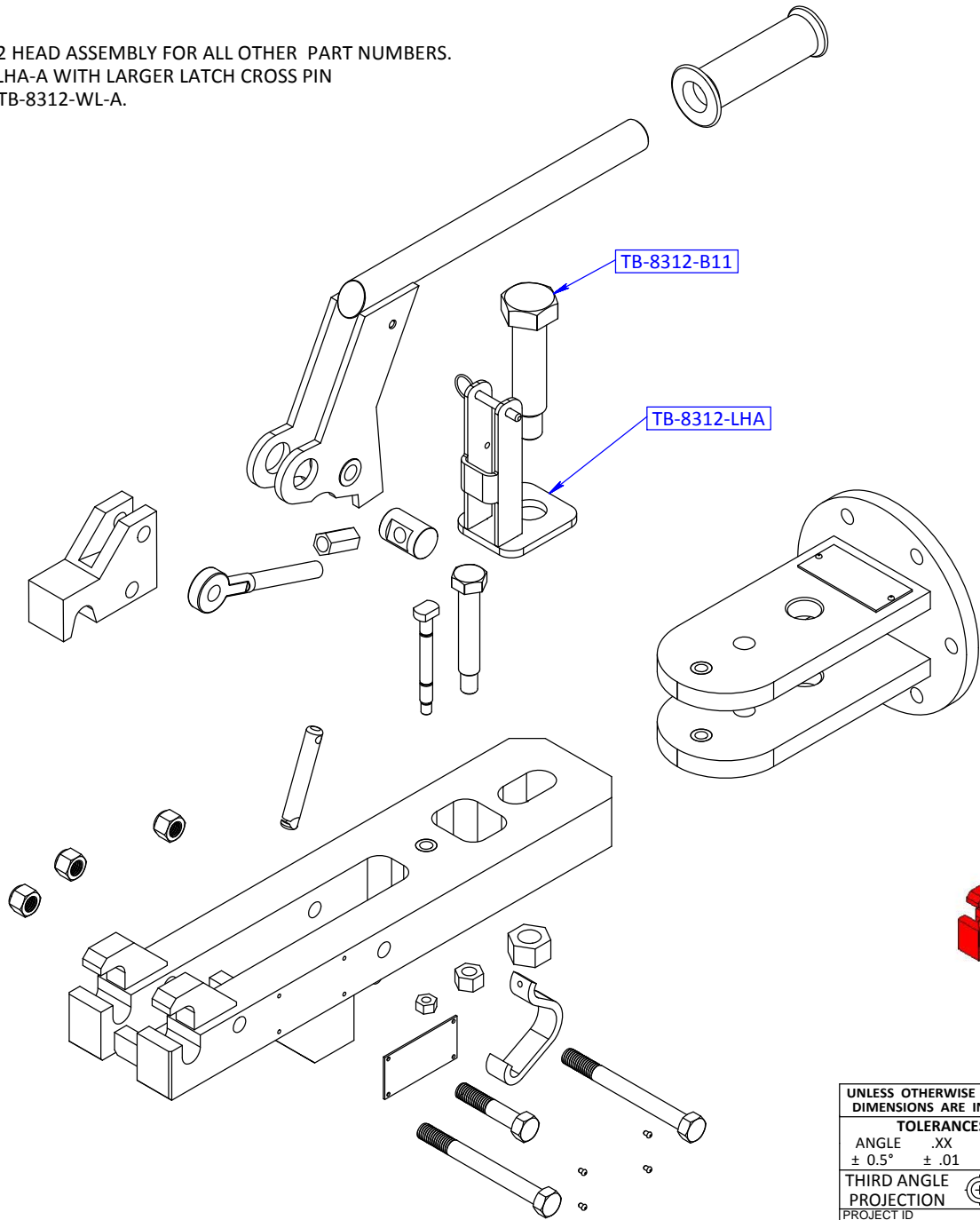
CHECK DC	DATE 6/4/2012
DRAWN BJE	DATE 6/4/2012

514 Mecklem In Ellwood City, PA 16117  
**hi Hall Industries, Inc.**

PROJECT	B737 / A31X / A32X TOWBAR
FILE NAME	TB-8312 HEAD ASSEMBLY
DESCRIPTION	HEAD ASSEMBLY
SIZE DWG/PART NO.	A TB-8312
SCALE 1:6	WEIGHT: 59.38 LBS
SHEET 1 OF 1	REV 3+

**NOTES:**

1. SEE DRAWING TB-8312 HEAD ASSEMBLY FOR ALL OTHER PART NUMBERS.
2. SUBSTITUTE TB-8312-LHA-A WITH LARGER LATCH CROSS PIN FOR HEAD ASSEMBLY TB-8312-WL-A.



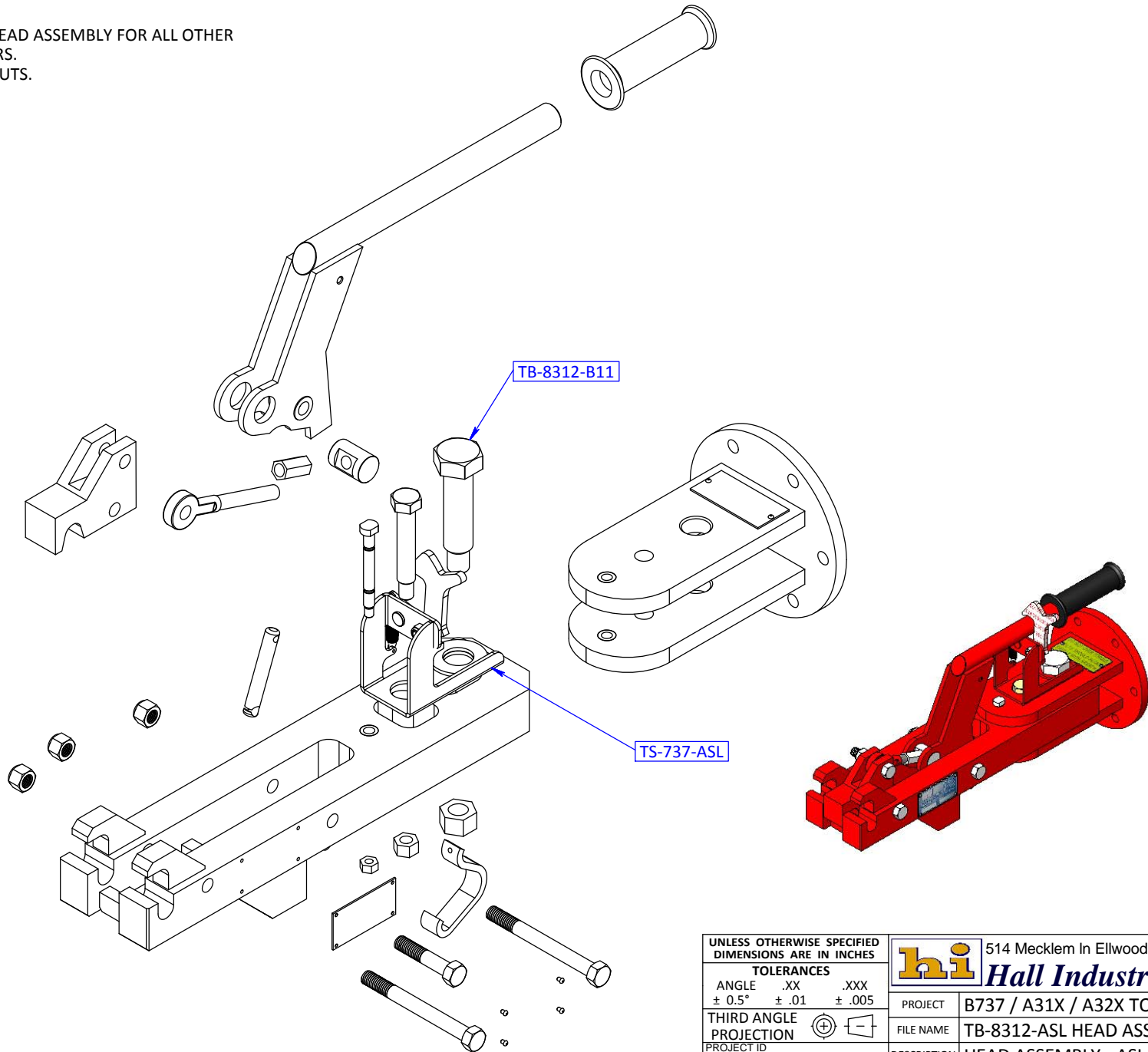
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TOLERANCES		<b>Hall Industries, Inc.</b>	
ANGLE	.XX .XXX	PROJECT	B737 / A31X / A32X TOWBAR
± 0.5°	± .01 ± .005	FILE NAME	TB-8312-WL HEAD ASSEMBLY
THIRD ANGLE PROJECTION		DESCRIPTION	HEAD ASSEMBLY
PROJECT ID AV1003		SIZE DWG/PART NO.	A TB-8312-WL
CHECK DC	DATE 6/4/2012	REVISION	0
DRAWN VTM	DATE 6/4/2012	SCALE 1:5	WEIGHT: 60.35 LBS
			SHEET 1 OF 1

**NOTES:**

1. SEE DRAWING TB-8312 HEAD ASSEMBLY FOR ALL OTHER ASSEMBLY PART NUMBERS.
2. USE ANTI-SEIZE ON ALL NUTS.



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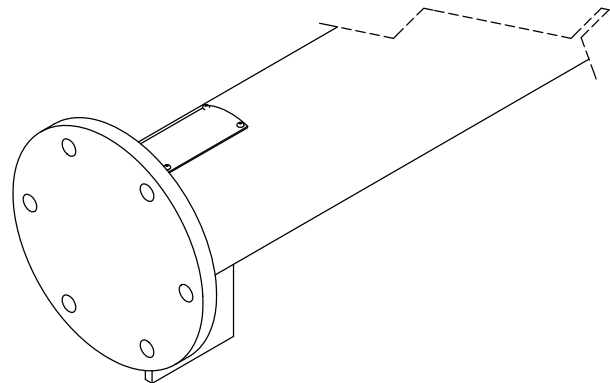
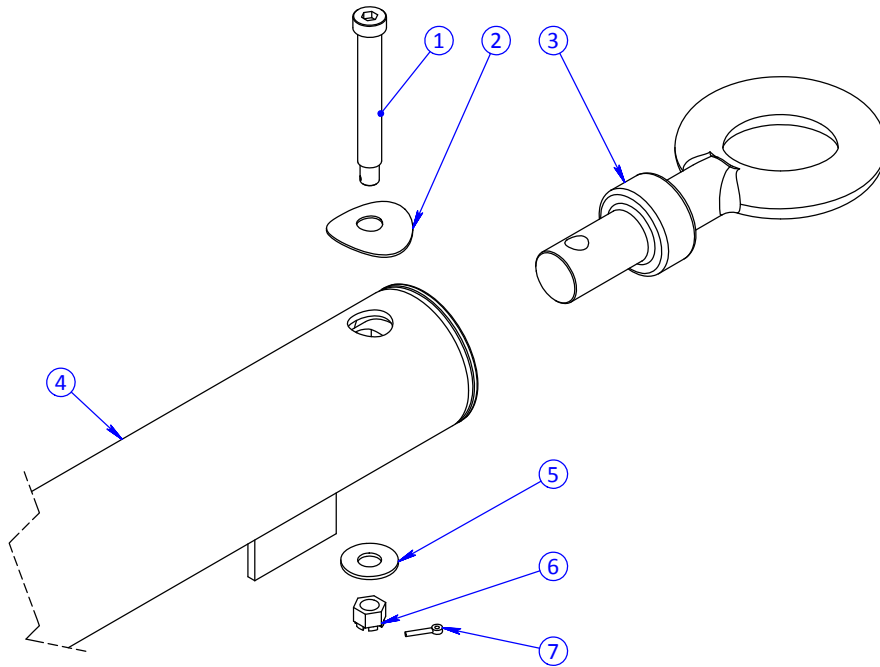
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TOLERANCES		<b>Hall Industries, Inc.</b>	
ANGLE	.XX .XXX	PROJECT	B737 / A31X / A32X TOWBAR
± 0.5°	± .01 ± .005	FILE NAME	TB-8312-ASL HEAD ASSEMBLY
THIRD ANGLE PROJECTION		DESCRIPTION	HEAD ASSEMBLY - ASL
PROJECT ID AV1003		SIZE	DWG/PART NO.
CHECK DC	DATE 6/4/2012	A	TB-8312-ASL
DRAWN BJE	DATE 6/4/2012	SCALE 1:5	WEIGHT: 60.64 LBS
			SHEET 1 OF 1

**NOTES:**

1. TAGS MUST BE INSTALLED.
2. EYEBOLT & NECESSARY HARDWARE IS SOLD AS A KIT:  
TB-8898-EYE-KIT 4" TUBE-TOWEYE KIT W/HRDWR

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	UPDATE / CHANGE PART NUMBERS	6/24/2013	BJE	VTM



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8898-21	SHOULDER BOLT
2	1	TB-8898-20	CURVED WASHER
3	1	HRJ-145-12-7	EYEBOLT
4	1	TB-8898-1	4" TUBE W/TAG&DECAL B737/A320
5	1	WH0110000SS0000	WASHER SS
6	1	CN08C0000SS0000	CASTLE NUT SS
7	1	CP4280048SS0000	PIN COTTER

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

**TOLERANCES**

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

**hi** 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**

THIRD ANGLE PROJECTION	PROJECT	4" TOWBAR
	FILE NAME	TB-8898-TE 4 INCH TUBE & EYE W HD
	DESCRIPTION	4" TUBE & EYE W/HD
CHECK DC	DATE	11/18/2010
DRAWN BJE	DATE	11/17/2010
SIZE	DWG/PART NO.	A TB-8898-TE
SCALE 1:5	WEIGHT: 115.66 LBS	SHEET 1 OF 1



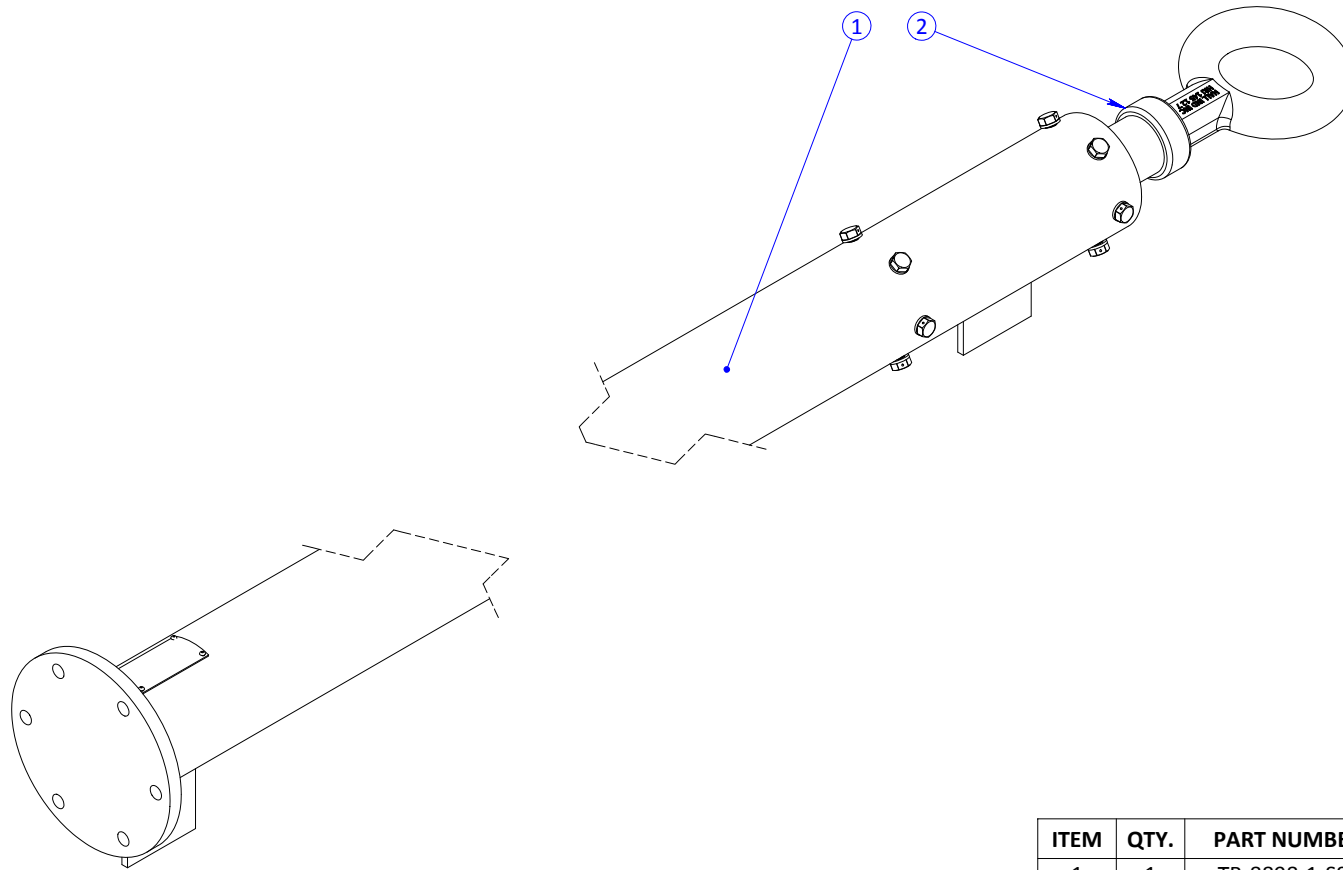
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**NOTES:**

1. ANTI-SIEZE ALL THREADS & WIRE TIE BOLTS.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	TB-8898-1-SS	4" TUBE W/TAG,DECAL,SS
2	1	TB-SS4-8898	SOFT START

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		<b>hi</b> 514 Mecklem In Ellwood City, PA 16117	
TOLERANCES		<b>Hall Industries, Inc.</b>	
ANGLE	.XX .XXX	PROJECT	AV
± 0.5°	± .01 ± .005	FILE NAME	TB-8898-TE-SS 4 INCH TUBE & SS EYE W HD TB-9267
X<12"=± 1/32" X>12"=±1/16"		DESCRIPTION	4" TUBE & SS EYE W/HD TB-9267
THIRD ANGLE PROJECTION		SIZE	DWG/PART NO.
CHECK	DATE	A	TB-8898-TE-SS
VTM	6/24/2013	SCALE 1:6	WEIGHT: 130.95 LBS
DRAWN	DATE	SHEET 1 OF 1	
BJE	6/24/2013	REV 0	

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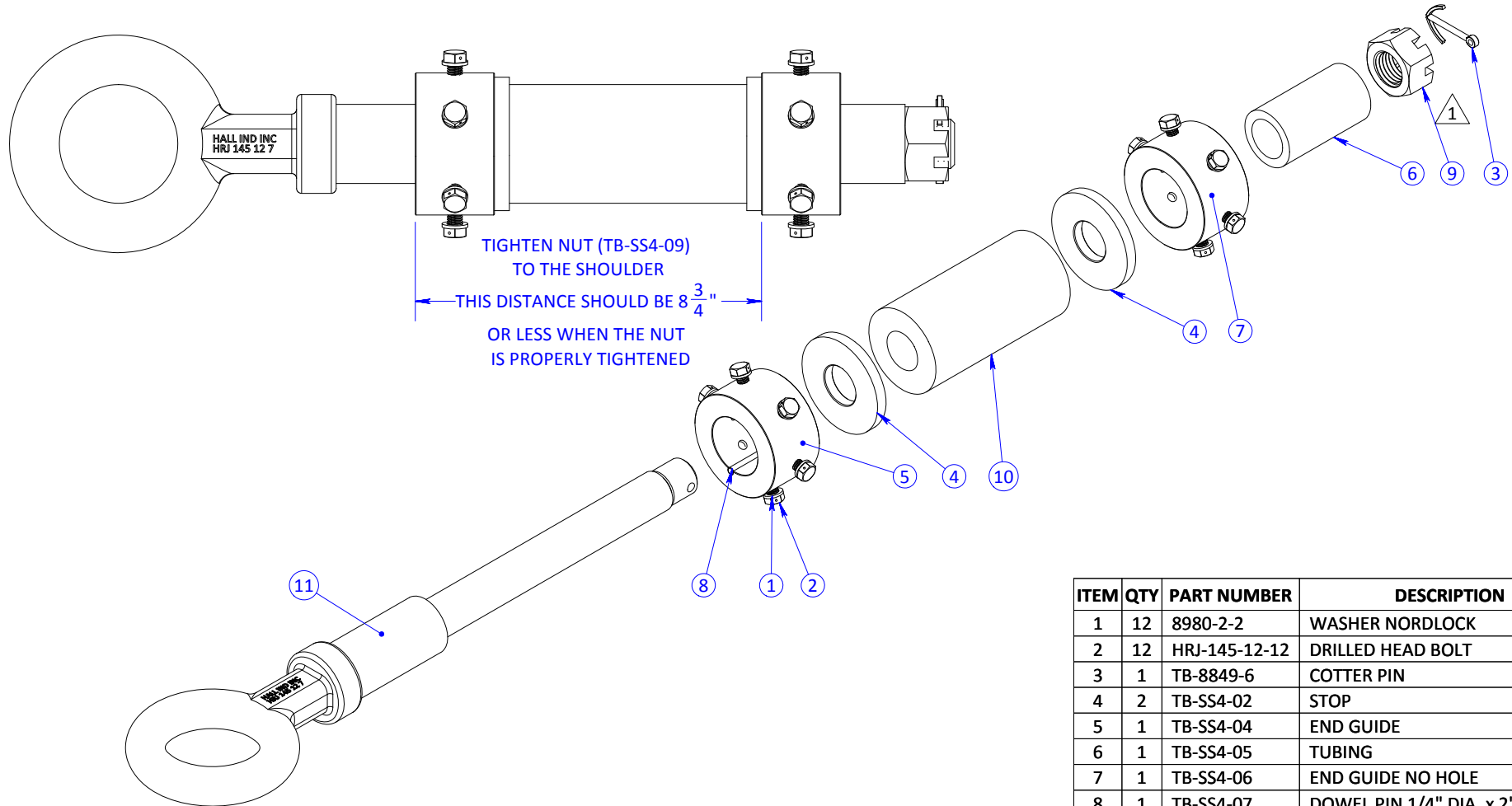
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**NOTES:**

1. USE ANTI-SEIZE ON ALL THREADED HARDWARE.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	CHANGE PART NUMBER	3/25/2013	VTM	SAK
2	ADD CASTLE NUT AND COTTER PIN	9/4/2013	BJE	SAK



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-SS4-10	CUSHION
11	1	TB-SS4-11	EYE & SHAFT

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

**TOLERANCES**

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

THIRD ANGLE  
PROJECTION

CHECK  
SAK & VTM  
DRAWN  
BJE

DATE  
4/25/2013  
DATE  
4/25/2013

**hi** 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**

PROJECT AV ~ SS EYE

FOLDER / FILE NAME AV0801/ TB-SS4-8898 SOFT START ~ FOR MANUAL

DESCRIPTION SOFT START 4 INCH

SIZE DWG/PART NO.  
A TB-SS4-8898

SCALE 1:5 WEIGHT: 27.70 LBS SHEET 1 OF 1

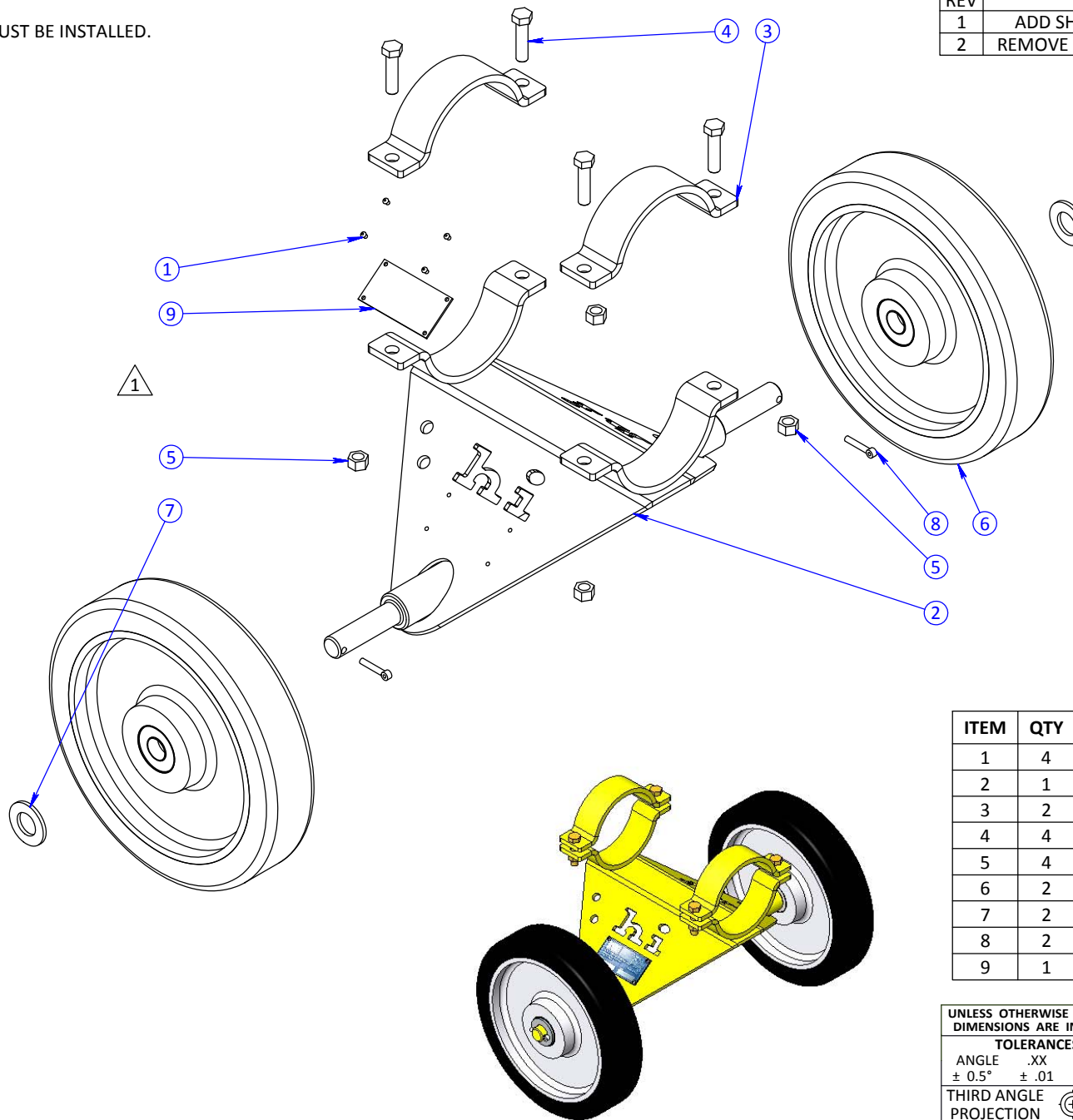
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**NOTES:**

1. TAGS MUST BE INSTALLED.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	ADD SHEAR PINS AND HARDWARE	7/9/2013	BJE	DC
2	REMOVE SHEAR PINS AND HARDWARE	3/17/2015	BJE	DC



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

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UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

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

THIRD ANGLE  
PROJECTION

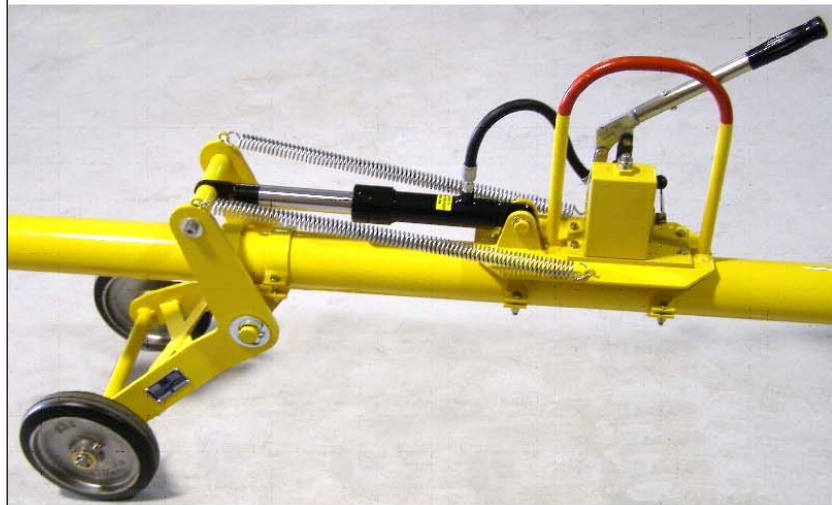
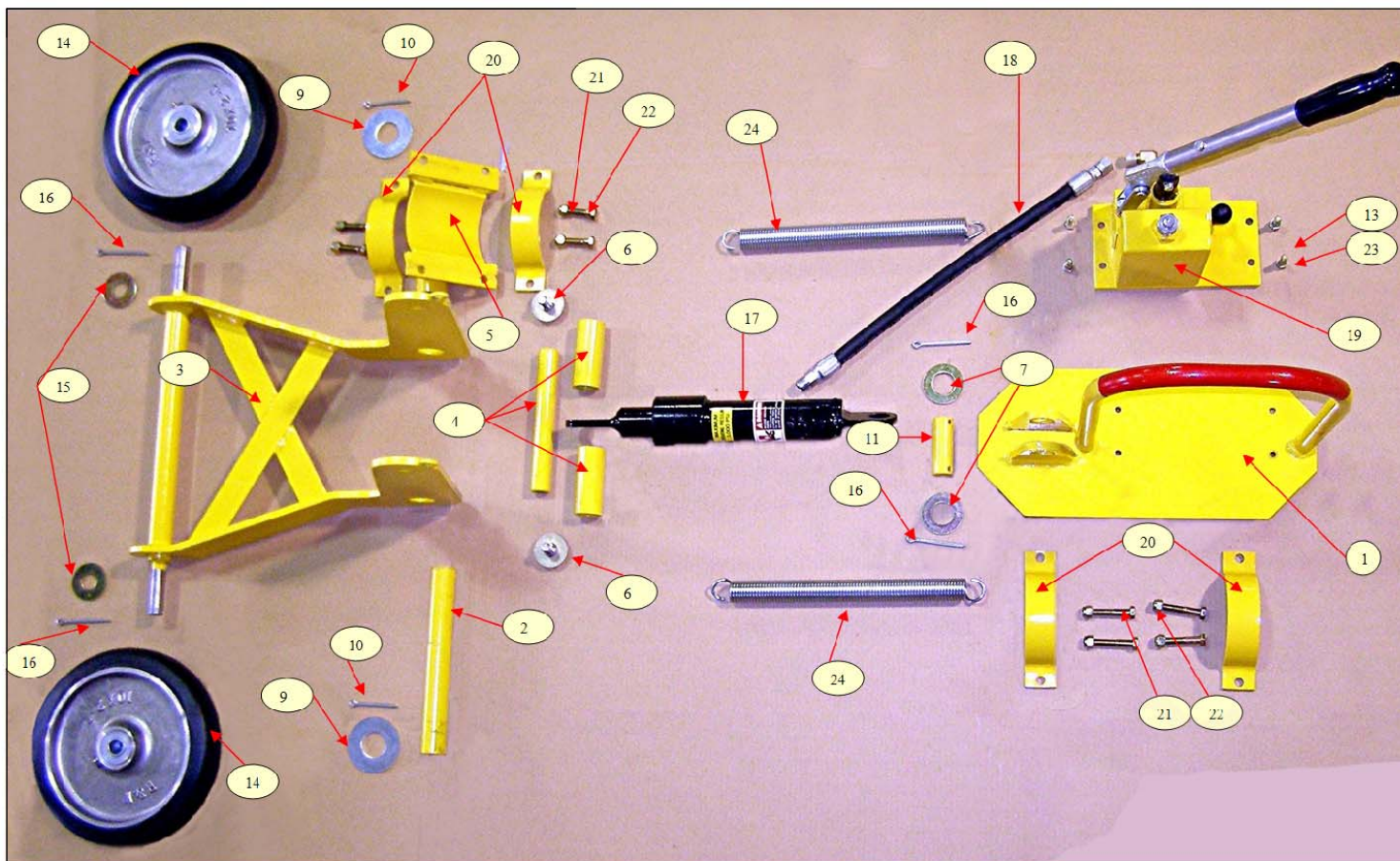
PROJECT ID  
AV1003

CHECK	DATE
DC	11/18/2010
DRAWN	DATE
BJE	11/18/2010

**hi** 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**

PROJECT	AV
FILE NAME	TB-8898-2 FIXED WHEEL CARRIAGE
DESCRIPTION	FIXED WHEEL CARRIAGE
SIZE	DWG/PART NO.
A	TB-8898-2
SCALE 1:5	WEIGHT: 27.75 LBS
SHEET 1 OF 1	

REV  
2



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	1	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)

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID AV1000

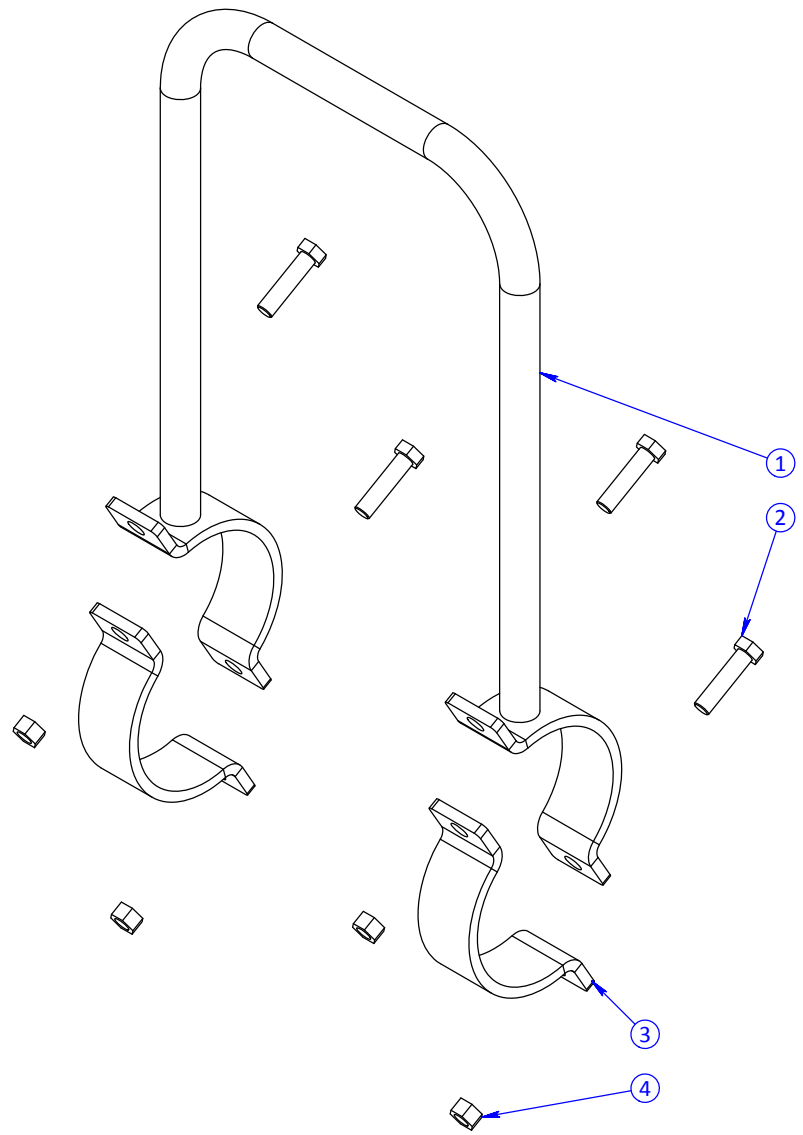
CHECK DC	DATE 11/20/2010
DRAWN BJE	DATE 11/20/2010

**hi** 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**



PROJECT	
FILE NAME	4in OD-LIFT 4in OD TOWBAR LIFT
DESCRIPTION	4" OD TOWBAR LIFT
SIZE DWG/PART NO.	A 4" OD-LIFT
SCALE 1:1	WEIGHT: 50 LBS
	SHEET 1 OF 1

REV 0+

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	ROTATE CLAMPS TO AVOID LEGS	5/24/2012	BJE	CS



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

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		 514 Mecklem In Ellwood City, PA 16117 <b>Hall Industries, Inc.</b>	
TOLERANCES		PROJECT	AV
ANGLE	.XX .XXX	FILE NAME	TB-8898-10 HANDLE ASSEMBLY
± 0.5°	± .01 ± .005	DESCRIPTION	HANDLE ASSEMBLY
THIRD ANGLE PROJECTION		PROJECT ID	AV1006
CHECK	DATE	SIZE	DWG/PART NO.
DC	11/20/2010	A	TB-8898-10
DRAWN	DATE	SCALE 1:4	WEIGHT: 4.05 LBS
BJE	11/20/2010	SHEET 1 OF 1	

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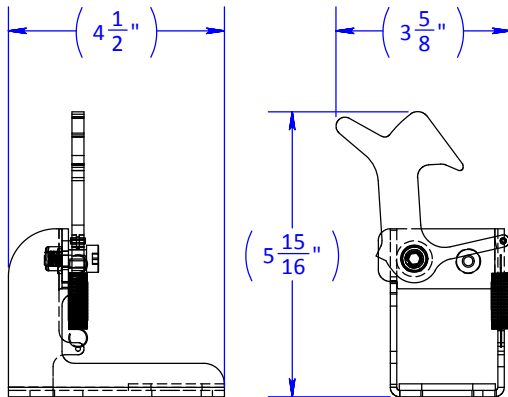
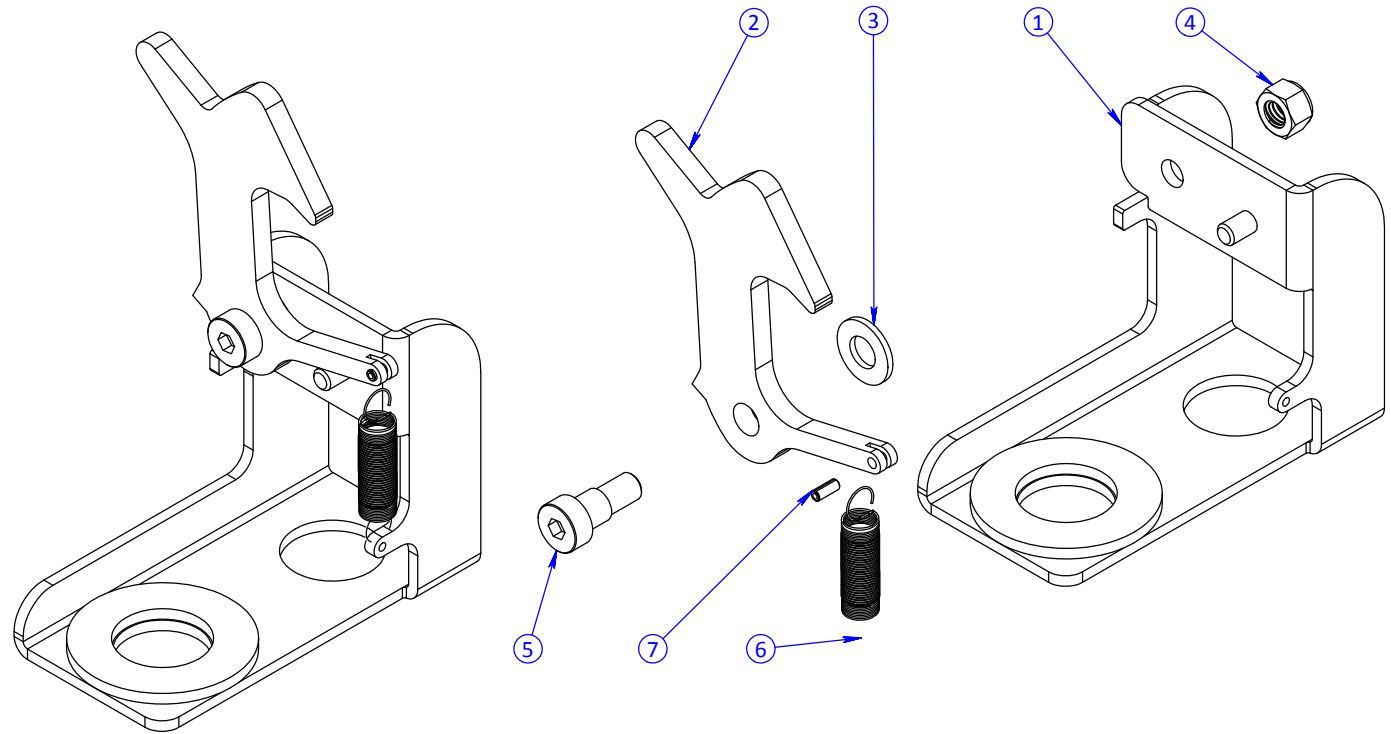
**NOTES:**

1. USE ANTI-SIEZE WHEN INSTALLING NUT.

TO ADD TO AN EXISTING BAR WITHOUT LATCH  
ORDER KIT PART NUMBER TS-737-ASL-HW

- AUTOMATIC LATCH TS-737-ASL
- BOLT TB-8312-B11
- NUT TB-8312-B5
- WASHER TB-8312-B13

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	UPDATE LATCH HOOK AND WASHER COUNT	9/28/2011	BJE	DC
2	UPDATE NOTES TO INCLUDE CUSTOM BOLT	6/5/2012	BJE	DC
3	INCLUDE KIT NUMBER	3/5/2013	BJE	VTM



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TS-737-ASL-BW	BASE WELDMENT
2	1	PSE-ASL-LH	SAFETY LATCH HOOK
3	1	TB-8312-B10	FLAT WASHER
4	1	TB-737-ASL-6	NUT NYLOC JAM
5	1	TS-737-ASL-1	SHOULDER BOLT
6	1	TS-737-ASL-3	EXTENSION SPRING
7	1	TS-737-ASL-5	SPRING PIN

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID AV1003

CHECK DC	DATE 9/28/2011
DRAWN BJE	DATE 9/28/2011

514 Mecklem In Ellwood City, PA 16117 <b>Hall Industries, Inc.</b>	
PROJECT	AV
FILE NAME	TS-737-ASL AUTOMATIC LATCH
DESCRIPTION	AUTOMATIC LATCH
SIZE	DWG/PART NO.
A	TS-737-ASL
SCALE 1:4	WEIGHT: 1.21 LBS
SHEET 1 OF 1	REV 3+

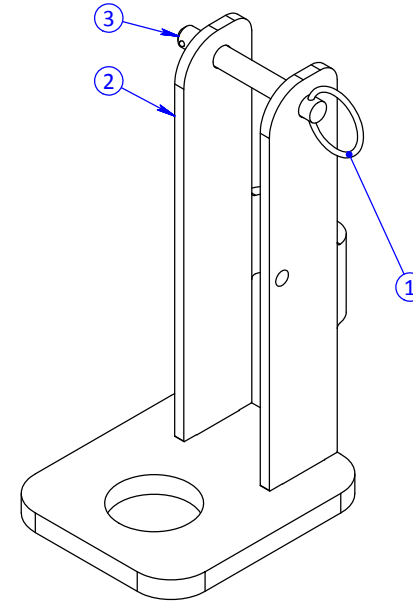
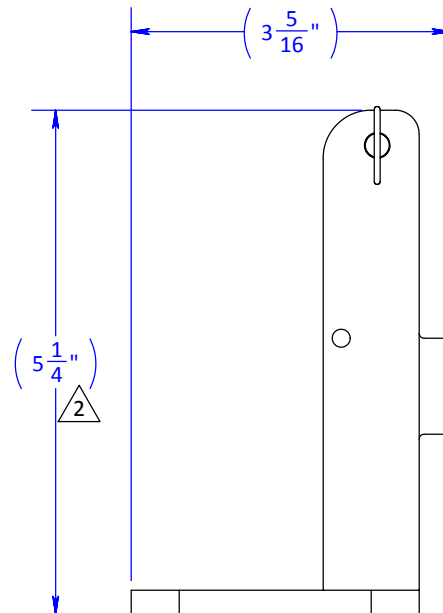
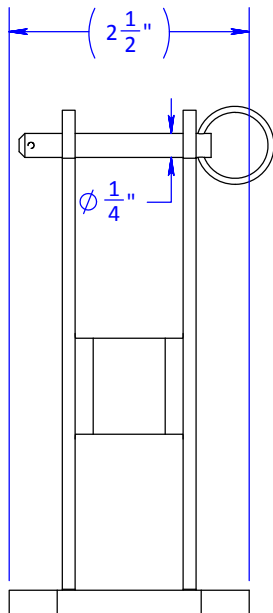
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4

## ORDERING INFO:

1. TO ADD TO EXISTING BAR WITHOUT LATCH ORDER KIT  
PART NUMBER TB-8312-LHA-HW
  - LATCH TB-8312-LHA
  - BOLT TB-8312-B11
  - NUT TB-8312-B5
  - WASHER TB-8312-B13
2. LANYARD KIT - PART NUMBER TB-8312-LHA-LK
  - LANYARD
  - KEY RING (QTY 2)
3. LANYARD ONLY - PART NUMBER TB-8312-LHA-L
4. RING ONLY - PART NUMBER TB-9205-AT-1003



REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	INCLUDE KIT PART NUMBER	3/5/2013	BJE	VTM
2	1/8" HEIGHT INCREASE	4/3/2013	BJE	VTM
3	ADD NOTES	6/24/2013	BJE	VTM
4	REVISED NOTES	5/29/2015	VTM	DC

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8312-LHA-LK	LANYARD KIT (NOT SHOWN)
2	1	TB-8312-LHA-RM	LATCH HOLDER WELDMENT
3	1	TB-8312-LHA-S4	QUICK RELEASE PIN

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID  
AV1003

CHECK DC	DATE 6/27/2012
DRAWN BJE	DATE 9/28/2011


 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**

PROJECT	AV
FILE NAME	TB-8312-LHA LATCH HANDLE ASSEMBLY
DESCRIPTION	LATCH HANDLE ASSEMBLY
SIZE	DWG/PART NO.
A	TB-8312-LHA
SCALE 1:2	WEIGHT: 0.91 LBS
	SHEET 1 OF 1

REV  
4

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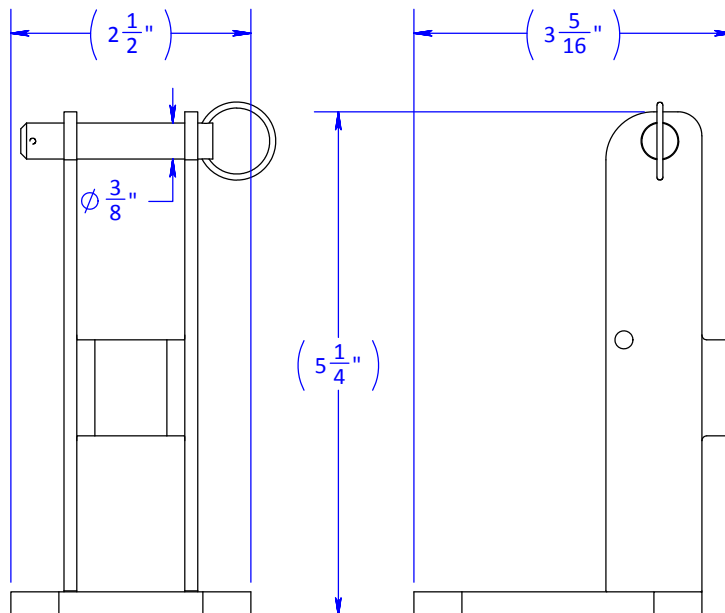
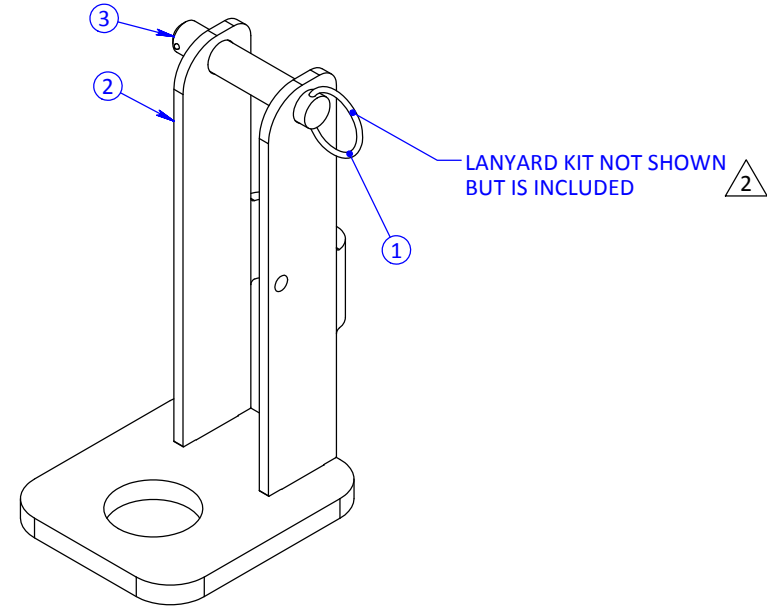
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**ORDERING INFO:**

1. TO ADD TO EXISTING BAR WITHOUT LATCH ORDER KIT  
PART NUMBER TB-8312-LHA-A-HW
  - LATCH TB-8312-LHA-A
  - BOLT TB-8312-B11
  - NUT TB-8312-B5
  - WASHER TB-8312-B13
2. LANYARD KIT - PART NUMBER TB-8312-LHA-LK
  - LANYARD
  - KEY RING (QTY 2)
3. LANYARD ONLY - PART NUMBER TB-8312-LHA-L
4. RING ONLY - PART NUMBER TB-9205-AT-1003

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
0	ORIGINAL	UNK	-	-
1	UPDATE DESIGN	4/1/2013	BJE	DC
2	ADD NOTES	6/4/2013	BJE	SAK
3	REVISED NOTES	5/29/2015	VTM	DC



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8312-LHA-LK	LANYARD KIT (NOT SHOWN)
2	1	TB-8312-LHA-A-RM	LATCH HOLDER WELDMENT
3	1	TB-8312-LHA-S4-A	QUICK RELEASE PIN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		514 Mecklem In Ellwood City, PA 16117 <b>Hall Industries, Inc.</b>	
<b>TOLERANCES</b> ANGLE .XX .XXX $\pm 0.5^\circ$ $\pm .01$ $\pm .005$		PROJECT	AV
THIRD ANGLE PROJECTION		FILE NAME	TB-8312-LHA-A LATCH HANDLE ASSEMBLY
PROJECT ID AV1003		DESCRIPTION	LATCH HANDLE ASSEMBLY
CHECK DC	DATE 4/1/2013	SIZE DWG/PART NO.	REV 3
DRAWN BJE	DATE 4/1/2013	A TB-8312-LHA-A	
		SCALE 1:2	WEIGHT: 0.91 LBS
		SHEET 1 OF 1	

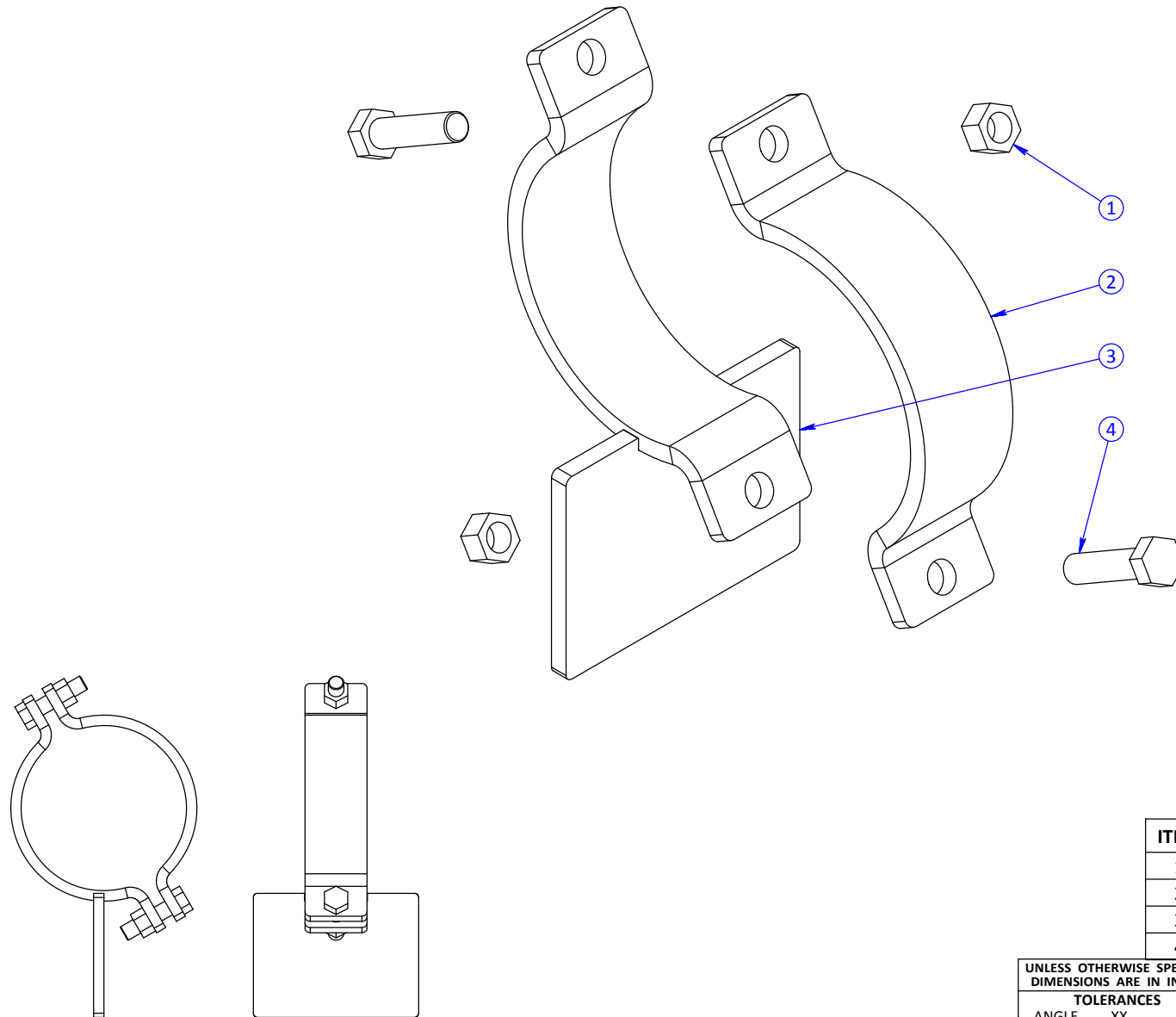
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**NOTES:**

- 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	.XX	.XXX
± 0.5°	± .01	± .005

THIRD ANGLE PROJECTION

PROJECT ID AV1009

**hi** 514 Mecklem In 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

CHECK DATE  
 BJE 6/27/2012  
 DRAWN DATE  
 BJE 6/27/2012

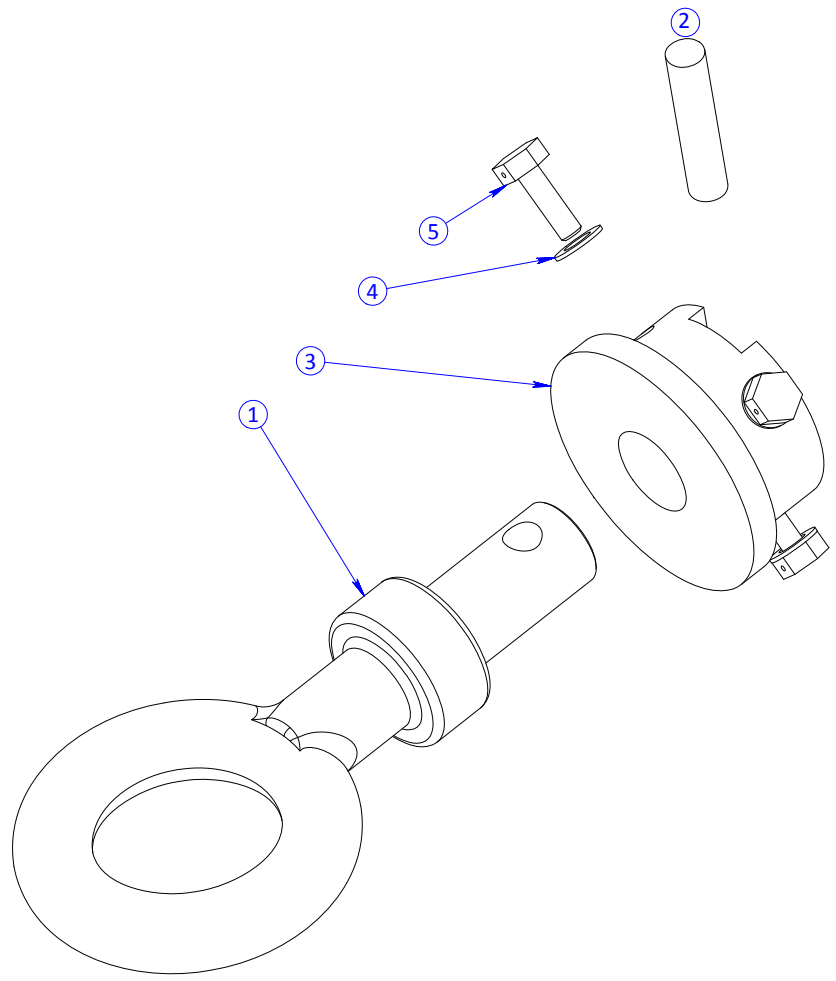
SIZE DWG/PART NO.  
 A AV1009-0001  
 SCALE 1:2 WEIGHT: 2.70 LBS SHEET 1 OF 1

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REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HRJ-145-12-7	EYEBOLT
2	1	HRJ-145-12-8	TUG EYE RETAINER BAR
3	1	TB-8898-12-9	TUG EYE COLLAR
4	4	TB-8898-17-LW	NORDLOCK WASHER
5	4	TB-8898-17	DRILLED HEAD BOLT

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES

**TOLERANCES**

ANGLE .XX .XXX  
± 0.5° ± .01 ± .005

X<12"=± 1/32" X>12"=±1/16"

**hi** 514 Mecklem In Ellwood City, PA 16117  
**Hall Industries, Inc.**

THIRD ANGLE PROJECTION

CHECK DATE  
VTM 5/28/2015

DRAWN DATE  
BJE 5/28/2015

PROJECT AV

FILE NAME TB-8898-12-19 EYE BOLT ASSEMBLY (4 BOLT)

DESCRIPTION EYE BOLT ASSEMBLY (4 BOLT)

SIZE DWG/PART NO. REV  
A TB-8898-12-19 0+

SCALE 1:3 WEIGHT: 14.21 LBS SHEET 1 OF 1

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