



PCA TUBE SYSTEM

Assembly, Usage, and Parts

MANUAL



For ordering New Systems or Replacement Parts Please Contact:

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

Hall Industries, Inc.
514 Mecklem Lane
Ellwood City, PA 16117
724-752-2000

October 28, 2013
Revision 01



REV00 May 28, 2012

0. Index

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1. Specifications

1.1. Physical Specifications

Part Number	Description	Apx. Weight	Ship Length
HT-100PCA-2	PCA 2 Tube Hose System	900	18'
HT-100PCA-3	PCA 3 Tube Hose System	1250	18'
HT-100PCA-4	PCA 4 Tube Hose System	1600	18'

1.2. Shipping Info

Contact Hall Industries Inc. to estimate shipping requirements.

1.3. 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. Operating Procedures

NOTE: This must be done in accordance with the corresponding aircraft & bridge manual.

2.1. Inspect the PCA System (visually inspect):

2.1.1. Check for a bent or damaged frame and for worn or missing parts.

2.1.2. Check tires for damage.

2.1.3. Check that hose clamps are tight.

2.1.4. Check that the air inlet adapter is not damaged.

NOTE: DO NOT attempt to service any aircraft with a damaged air inlet adapter.

2.2. Responsibility

2.2.1. Operator of the system must understand that it is his/her responsibility to move the system safely around the aircraft the entire time it is in use.

2.3. Hooking Up to the Plane ~ Checks:

2.3.1. Is the aircraft high enough to clear the system.

2.4. Attach the System to the Aircraft

2.4.1. Release the clip on the retention chain.

2.4.2. Grab handrail on the last tube and deploy.

2.4.3. Grab the air inlet adapter and pull the layflat hose out to the connection point on the aircraft.

2.4.4. Connect using the Hall Industries Inc. air inlet adapter.

NOTE: This must be done in accordance with the corresponding aircraft & bridge manual.

2.5. Disconnect the System from the Aircraft

2.5.1. Disconnect the air inlet adapter.

2.5.2. Lay the “lay-flat” hose on top of the last hose tube section.

2.5.3. Collapse the tube system.

2.5.4. Reattach the chain and retention clip.





3. Preventive Maintenance

NOTE: Hall Industries recommends using this maintenance procedure bi-annually (or as required in your airlines maintenance procedure if sooner). Replace worn or damaged parts as needed.

- 3.1. Check wheels and frame for bent, broken, or worn parts and security.
- 3.2. Grease the wheels and the hitch connection ball.
- 3.3. Check wear pads (located under the hose elbows).
- 3.4. Check all hardware that nothing has loosened.
- 3.5. Inspect air inlet adapter for worn or damaged parts.
- 3.6. Clean, repaint or touch-up paint as required.
- 3.7. Make sure Hall Industries Inc. tag is intact.

4. Replacement Part / Kits / Assembly Info

- 4.1. See Attachments Section for detailed Assembly Drawings
- 4.2. IVF/FFPCAH1430B LAYFLAT DUCT Required
- 4.3. IVF/PCARED14X08 LAYFLAT REDUCER Required
- 4.4. IVF/FLEXLINK14V FLEX LINK Optional
- 4.5. AV0812-1-0001 PCA HOSE SWIVEL Optional
- 4.6. HT-100PCA-3HS HEAT SHIELD Optional
- 4.7. Custom Frames are available if required.

5. Ordering Info

5.1. Accepted Payments Include (but not limited to):

5.1.1. Visa



- 5.1.2. MasterCard
- 5.1.3. American Express
- 5.1.4. Company Check Wire Transfer
- 5.2. Standard terms ~ NET 30 with approved credit
- 5.3. Minimum Orders ~ \$50
- 5.4. The Order Form is listed in the attachments of this document.

6. Attachment List

- 6.1. HT-100PCA-3 PCA 3 HOSE TUBE ASSEMBLY
- 6.2. HT-100PCA-0001-3 PCA 3 TUBE FRAME ASSEMBLY
- 6.3. HT-100PCA-2 PCA 2 HOSE TUBE ASSEMBLY
- 6.4. HT-100PCA-0001-2 PCA 2 TUBE FRAME ASSEMBLY
- 6.5. HT-100PCA-0002 FIRST TUBE
- 6.6. HT-100PCA-0003 MIDDLE TUBE (2 tube system will not have, 4 tube system will have 2)
- 6.7. HT-100PCA-0004 LAST TUBE
- 6.8. HT-100PCA-3-500 BUMPER ASSEMBLY
- 6.9. HT-100PCA-WP-KIT PCA ELBOW WEAR PAD KIT
- 6.10. HT-100PCA-0005 HARDWARE STACK
- 6.11. HT-100PCA-0001 BRAKE KIT (OPTIONAL)
- 6.12. HT-100PCA-0002 HANDLE KIT (OPTIONAL)
- 6.13. IA-8980 AIR INLET ADAPTER ~ ALUMINUM
- 6.14. IA-8980-N AIR INLET ADAPTER ~ NYLON
- 6.15. Order Form
- 6.16. Other Products and Custom Design Services



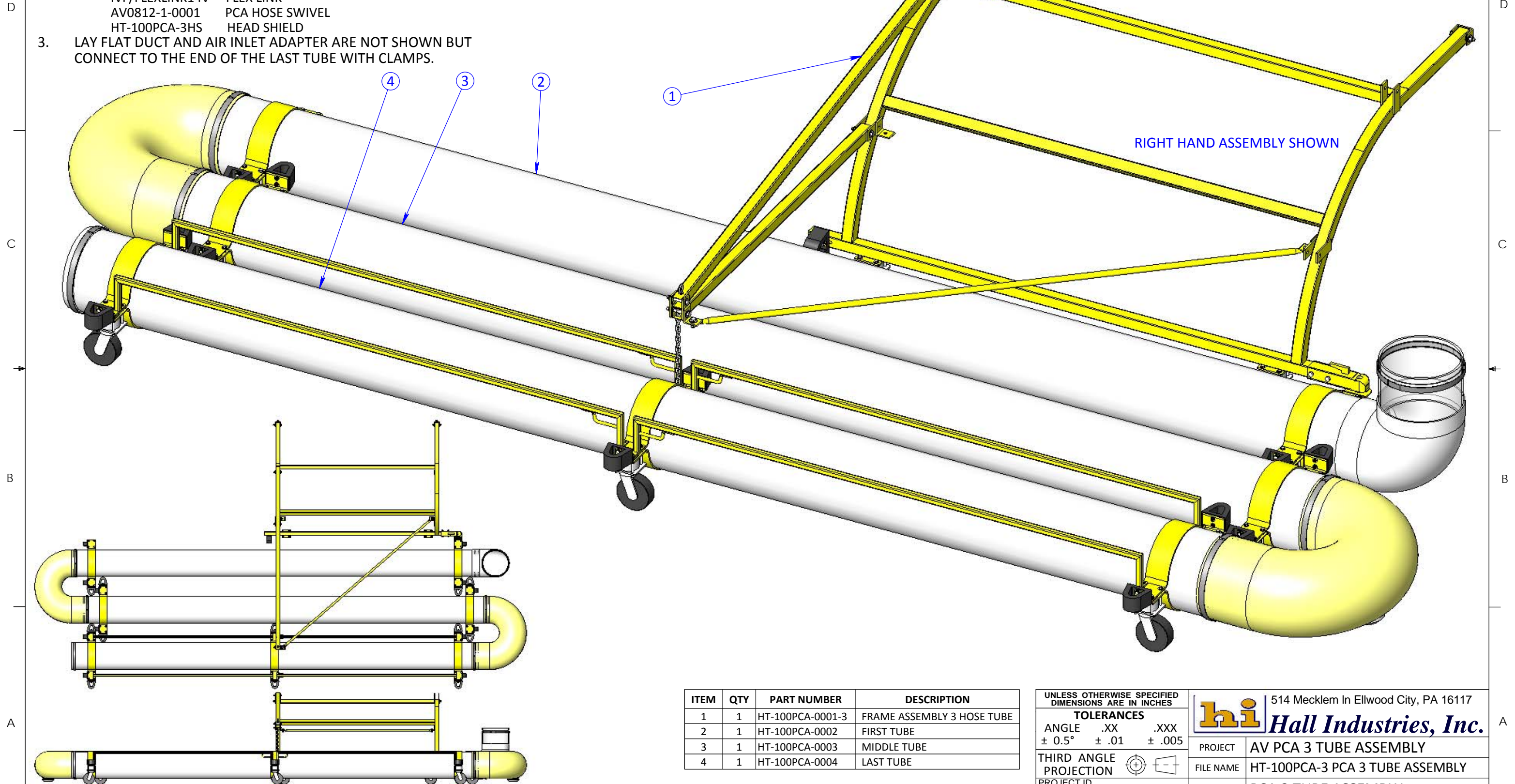
THREE TUBE SYSTEM

THREE TUBE SYSTEM

NOTES:

- SEE SUBASSEMBLY DRAWINGS FOR MORE DETAIL.
- NOT SHOWN:
 IVF/FFPCAH1430B LAYFLAT DUCT
 IVF/PCARED14X08 LAYFLAT REDUCER
 IVF/FLEXLINK14V FLEX LINK
 AV0812-1-0001 PCA HOSE SWIVEL
 HT-100PCA-3HS HEAD SHIELD
- LAY FLAT DUCT AND AIR INLET ADAPTER ARE NOT SHOWN BUT CONNECT TO THE END OF THE LAST TUBE WITH CLAMPS.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	UPDATE DESIGN AND ADD NOTES	10/28/2013	BJE	SAK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HT-100PCA-0001-3	FRAME ASSEMBLY 3 HOSE TUBE
2	1	HT-100PCA-0002	FIRST TUBE
3	1	HT-100PCA-0003	MIDDLE TUBE
4	1	HT-100PCA-0004	LAST TUBE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE	.XX	.XXX
	± 0.5°	± .01 ± .005

THIRD ANGLE PROJECTION

PROJECT ID AV0811

CHECK DC	DATE 5/8/2012
DRAWN BJE	DATE 5/8/2012

hi Hall Industries, Inc.		514 Mecklem In Ellwood City, PA 16117	
PROJECT	AV PCA 3 TUBE ASSEMBLY		
FILE NAME	HT-100PCA-3 PCA 3 TUBE ASSEMBLY		
DESCRIPTION	PCA 3 TUBE ASSEMBLY		
SIZE	DWG/PART NO.	REV	
B	HT-100PCA-3	1	
SCALE 1:15	WEIGHT: 1307.59 LBS	SHEET 1 OF 1	

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NOTES:

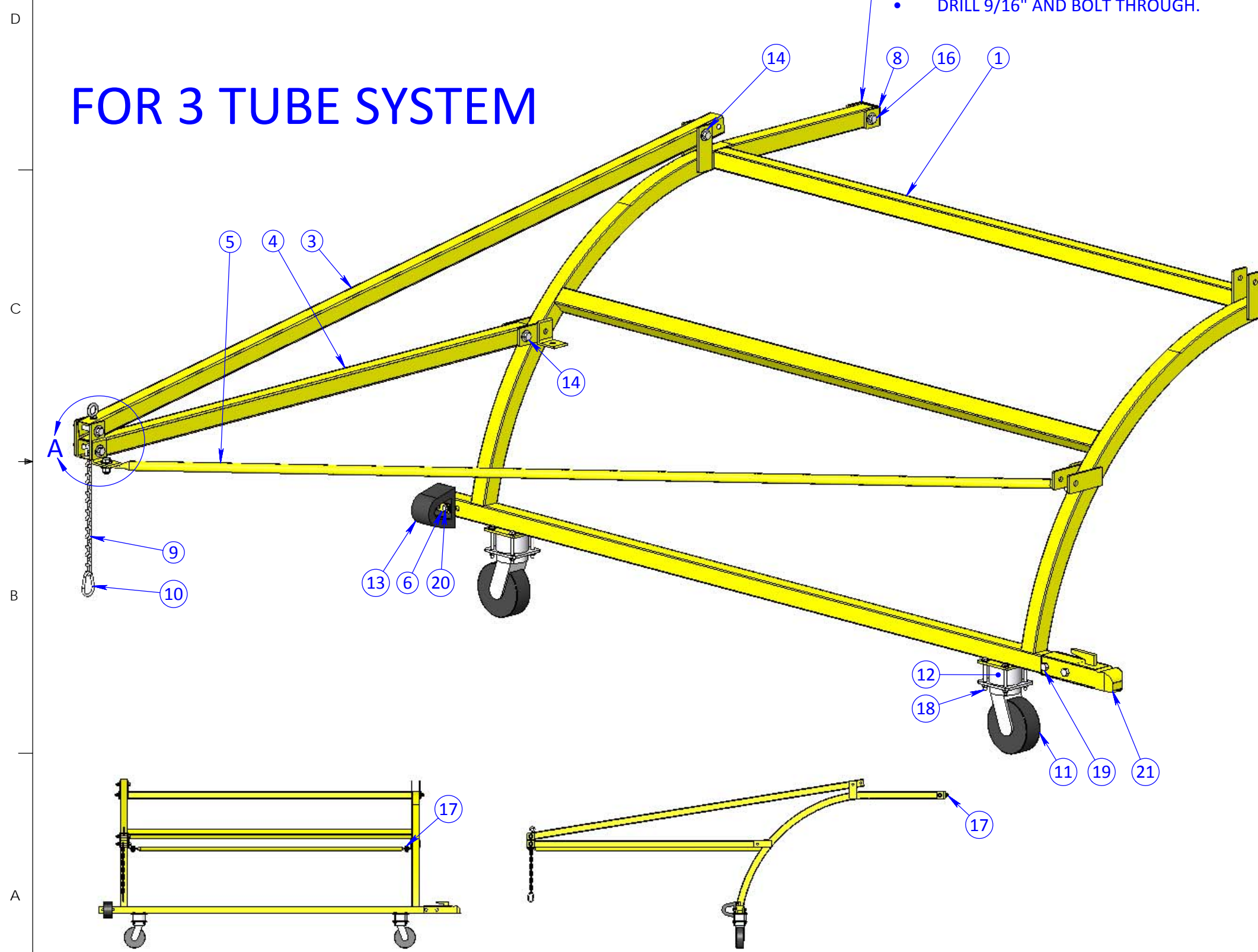
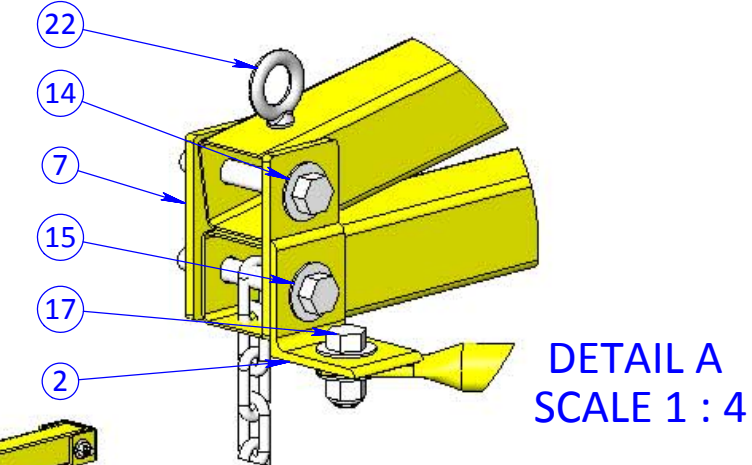
1. THE UPPER ARM OF THIS ASSEMBLY CAN BE REVERSED IF NEEDED.
2. WELD OR BOLT BRACKETS TO BRIDGE.
3. ASSEMBLE THE HARDWARE USING ANTISEIZE.

- ATTACHEMENT OPTIONS:**
- WELD BRACKETS ON.
 - DRILL AND TAP BRIDGE 1/2"-13 (TAP DRILL 27/64").
 - DRILL 9/16" AND BOLT THROUGH.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	ADD NOTES, BUMPER, AND CHAIN HOOK	10/28/2013	BJE	SAK

FOR 3 TUBE SYSTEM

FOR 3 TUBE SYSTEM



ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	1	HT-100PCA-3-100	HOSE TUBE FRAME	N/A
2	1	HT-100PCA-3-100-E	ANGLE BRACKET	STEEL A36
3	1	HT-100PCA-3-200	UPPER CONTAIN TUBE	TUBING ASTM 513 STEEL
4	1	HT-100PCA-3-300	LOWER CONTAIN TUBE	TUBING ASTM 513 STEEL
5	1	HT-100PCA-3-400	BRACE CONTAIN TUBE	PIPE SCH 40 STEEL
6	1	HT-100PCA-3-501	BUMPER PLATE	STEEL A36
7	2	HT-100PCA-3-600	CONTAIN TUBE BRACKET	STEEL A36
8	2	HT-100PCA-3-901	MAIN MOUNT BRACKET	STEEL A36
9	1	HT-100PCA-3-902	CHAIN	HARDWARE
10	1	HT-100PCA-3-902-14	SPRING CLIP	HARDWARE
11	2	HT-100PCA-200	SWIVEL CASTER	HARDWARE
12	2	HT-100PCA-200-SP	SPACER FOR CASTER	ALUMINUM 6061-T6
13	1	HT-100PCA-300	HOLLOW-BULB BUMPER	RUBBER
14	3	HW	HARDWARE STACK 1	N/A
15	1	HW	HARDWARE STACK 2	N/A
16	2	HW	HARDWARE STACK 3	N/A
17	4	HW	HARDWARE STACK 4	N/A
18	8	HW	HARDWARE STACK 5	N/A
19	2	HW	HARDWARE STACK 7	N/A
20	2	HW	HARDWARE STACK 8	N/A
21	1	2743T6	HITCH	HARDWARE
22	1	3014T252	HANGER ZP	HARDWARE
23	1	NY 05C 0000 ZP 0000	NUT NYLOC 5/16"-18 ZP	HARDWARE
24	1	WH 440 0000 ZP 00DG	FLAT WASHER 5/16" USS ZP	HARDWARE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID AV0811

CHECK DC DATE 5/2/2012

DRAWN BJE DATE 5/2/2012

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

PROJECT AV~ PCA 3 HOSE TUBE

FILE NAME HT-100PCA-0001-3 FRAME ASSEMBLY 3 HOSE TUBE

DESCRIPTION FRAME ASSEMBLY 3 HOSE TUBE

SIZE DWG/PART NO. B HT-100PCA-0001-3

SCALE 1:12 WEIGHT: 137.16 LBS SHEET 1 OF 1

REV 1

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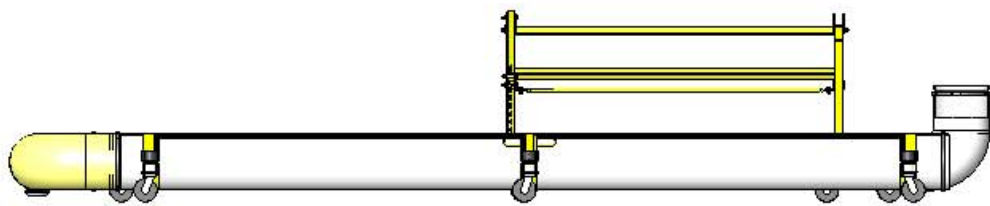
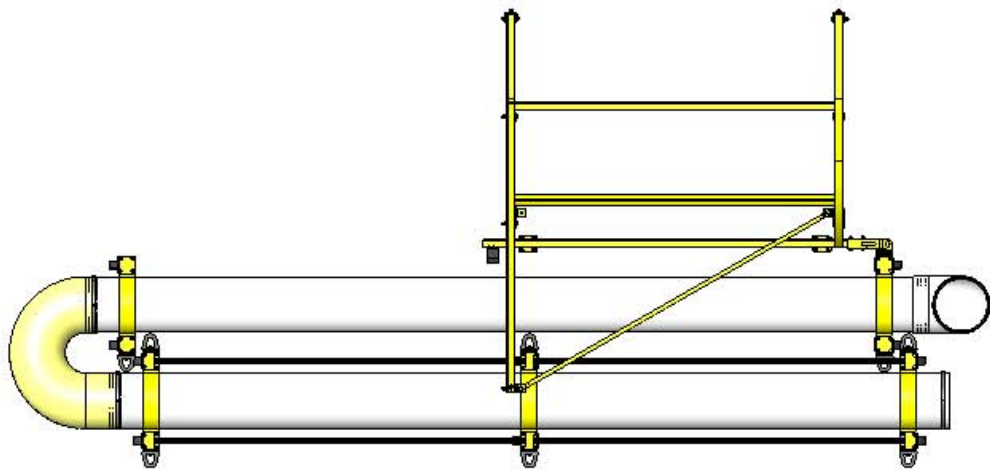
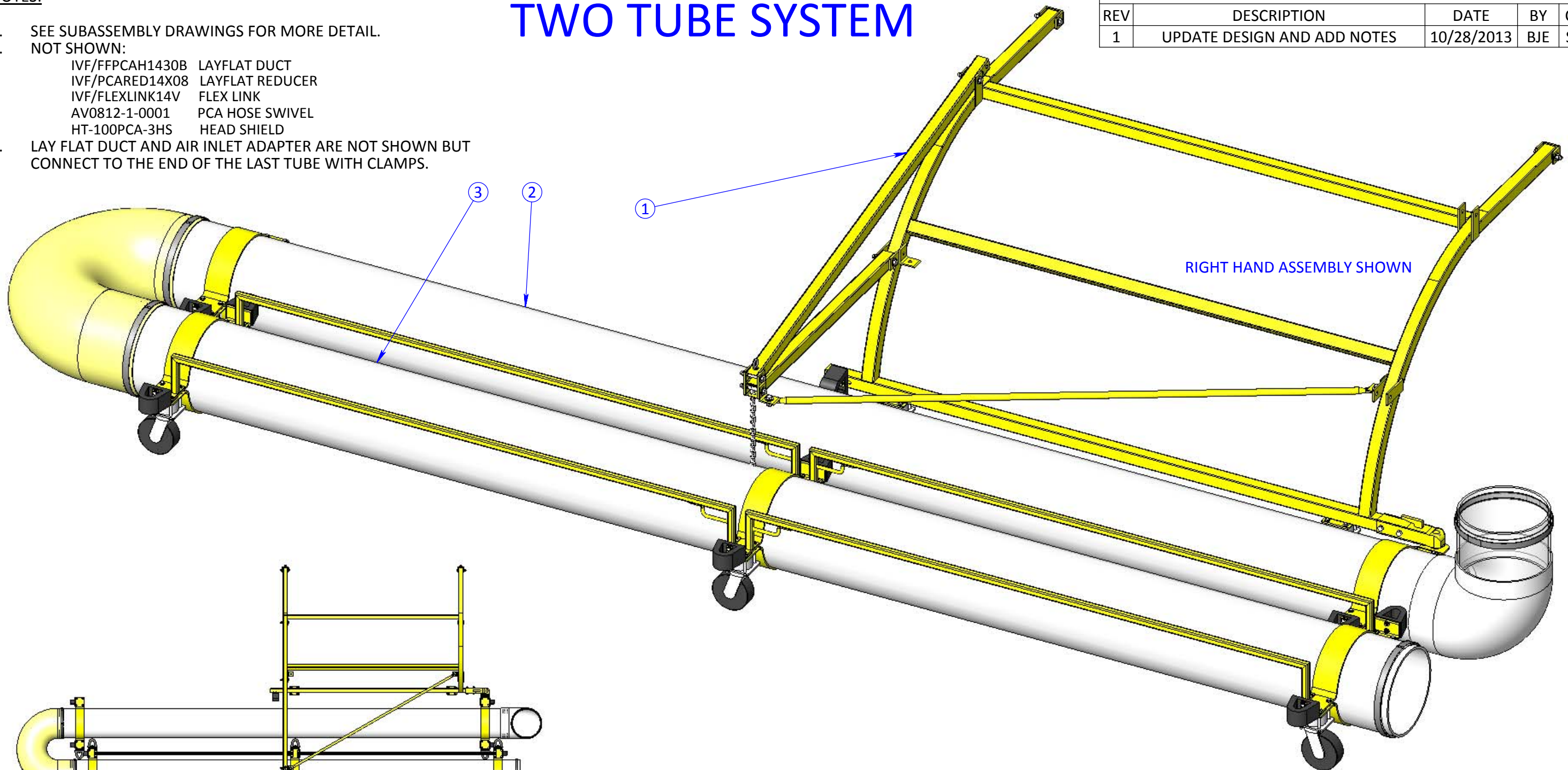
TWO TUBE SYSTEM

TWO TUBE SYSTEM

NOTES:

- SEE SUBASSEMBLY DRAWINGS FOR MORE DETAIL.
- NOT SHOWN:
 IVF/FFPCAH1430B LAYFLAT DUCT
 IVF/PCARED14X08 LAYFLAT REDUCER
 IVF/FLEXLINK14V FLEX LINK
 AV0812-1-0001 PCA HOSE SWIVEL
 HT-100PCA-3HS HEAD SHIELD
- LAY FLAT DUCT AND AIR INLET ADAPTER ARE NOT SHOWN BUT CONNECT TO THE END OF THE LAST TUBE WITH CLAMPS.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	UPDATE DESIGN AND ADD NOTES	10/28/2013	BJE	SAK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HT-100PCA-0001-2	FRAME ASSEMBLY 2 HOSE TUBE
2	1	HT-100PCA-0002	FIRST TUBE
3	1	HT-100PCA-0004	LAST TUBE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

ANGLE	.XX	.XXX
	± 0.5°	± .01 ± .005

THIRD ANGLE PROJECTION

PROJECT ID AV0811

CHECK	DATE
DC	5/8/2012
DRAWN	DATE
BJE	5/8/2012

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

PROJECT	AV PCA 2 TUBE ASSEMBLY
FILE NAME	HT-100PCA-2 PCA 2 TUBE ASSEMBLY
DESCRIPTION	PCA 2 TUBE ASSEMBLY
SIZE	DWG/PART NO.
B	HT-100PCA-2
SCALE 1:15	WEIGHT: 975.91 LBS
SHEET 1 OF 1	

REV 1

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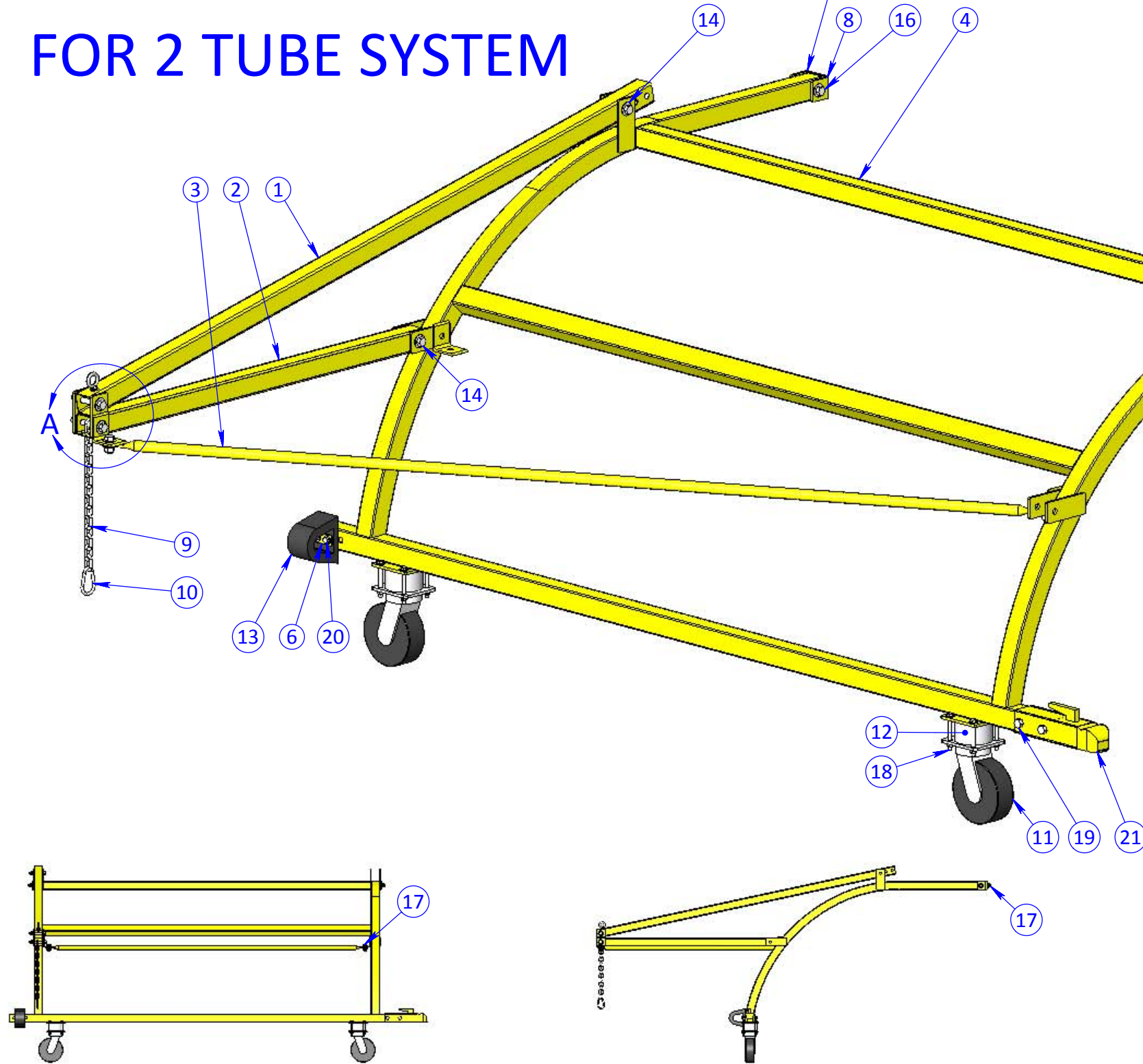
NOTES:

1. THE UPPER ARM OF THIS ASSEMBLY CAN BE REVERSED IF NEEDED.
2. WELD OR BOLT BRACKETS TO BRIDGE.
3. ASSEMBLE THE HARDWARE USING ANTISEIZE.

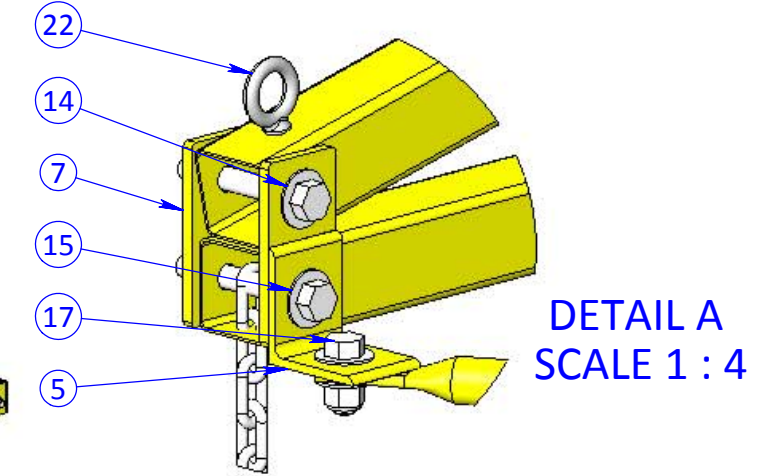
ATTACHEMENT OPTIONS:

- WELD BRACKETS ON.
- DRILL AND TAP BRIDGE 1/2"-13 (TAP DRILL 27/64").
- DRILL 9/16" AND BOLT THROUGH.

FOR 2 TUBE SYSTEM



FOR 2 TUBE SYSTEM



ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	1	HT-100PCA-2-200	UPPER CONTAIN TUBE	TUBING ASTM 513 STEEL
2	1	HT-100PCA-2-300	LOWER CONTAIN TUBE	TUBING ASTM 513 STEEL
3	1	HT-100PCA-2-400	BRACE CONTAIN TUBE	PIPE SCH 40 STEEL
4	1	HT-100PCA-3-100	HOSE TUBE FRAME	N/A
5	1	HT-100PCA-3-100-E	ANGLE BRACKET	STEEL A36
6	1	HT-100PCA-3-501	BUMPER PLATE	STEEL A36
7	2	HT-100PCA-3-600	CONTAIN TUBE BRACKET	STEEL A36
8	2	HT-100PCA-3-901	MAIN MOUNT BRACKET	STEEL A36
9	1	HT-100PCA-3-902	CHAIN	HARDWARE
10	1	HT-100PCA-3-902-14	SPRING CLIP	HARDWARE
11	2	HT-100PCA-200	SWIVEL CASTER	HARDWARE
12	2	HT-100PCA-200-SP	SPACER FOR CASTER	ALUMINUM 6061-T6
13	1	HT-100PCA-300	HOLLOW-BULB BUMPER	RUBBER
14	3	HW	HARDWARE STACK 1	N/A
15	1	HW	HARDWARE STACK 2	N/A
16	2	HW	HARDWARE STACK 3	N/A
17	4	HW	HARDWARE STACK 4	N/A
18	8	HW	HARDWARE STACK 5	N/A
19	2	HW	HARDWARE STACK 7	N/A
20	2	HW	HARDWARE STACK 8	N/A
21	1	2743T6	HITCH	HARDWARE
22	1	3014T252	HANGER ZP	HARDWARE
23	1	NY 05C 0000 ZP 0000	NUT NYLOC 5/16"-18 ZP	HARDWARE
24	1	WH 440 0000 ZP 00DG	FLAT WASHER 5/16" USS ZP	HARDWARE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID AV0811

CHECK DC DATE 5/2/2012

DRAWN BJE DATE 5/2/2012

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

PROJECT AV~ PCA 3 HOSE TUBE

FILE NAME HT-100PCA-0001-2 FRAME ASSEMBLY 2 HOSE TUBE

DESCRIPTION FRAME ASSEMBLY 2 HOSE TUBE

SIZE DWG/PART NO. B HT-100PCA-0001-2

SCALE 1:12 WEIGHT: 131.42 LBS SHEET 1 OF 1

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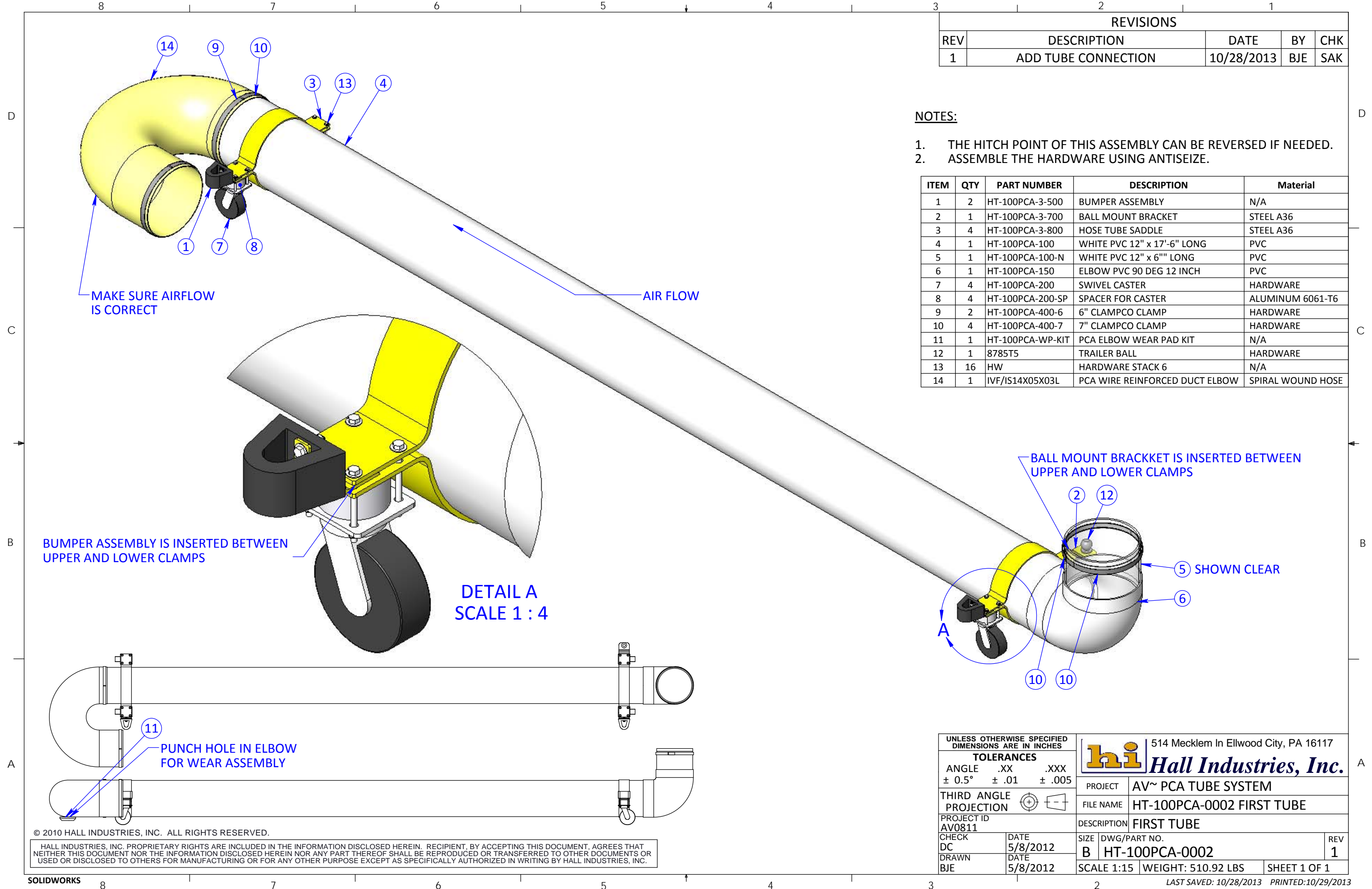
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REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	ADD TUBE CONNECTION	10/28/2013	BJE	SAK

NOTES:

1. THE HITCH POINT OF THIS ASSEMBLY CAN BE REVERSED IF NEEDED.
2. ASSEMBLE THE HARDWARE USING ANTISEIZE.

ITEM	QTY	PART NUMBER	DESCRIPTION	Material
1	2	HT-100PCA-3-500	BUMPER ASSEMBLY	N/A
2	1	HT-100PCA-3-700	BALL MOUNT BRACKET	STEEL A36
3	4	HT-100PCA-3-800	HOSE TUBE SADDLE	STEEL A36
4	1	HT-100PCA-100	WHITE PVC 12" x 17'-6" LONG	PVC
5	1	HT-100PCA-100-N	WHITE PVC 12" x 6" LONG	PVC
6	1	HT-100PCA-150	ELBOW PVC 90 DEG 12 INCH	PVC
7	4	HT-100PCA-200	SWIVEL CASTER	HARDWARE
8	4	HT-100PCA-200-SP	SPACER FOR CASTER	ALUMINUM 6061-T6
9	2	HT-100PCA-400-6	6" CLAMP CO CLAMP	HARDWARE
10	4	HT-100PCA-400-7	7" CLAMP CO CLAMP	HARDWARE
11	1	HT-100PCA-WP-KIT	PCA ELBOW WEAR PAD KIT	N/A
12	1	8785T5	TRAILER BALL	HARDWARE
13	16	HW	HARDWARE STACK 6	N/A
14	1	IVF/IS14X05X03L	PCA WIRE REINFORCED DUCT ELBOW	SPIRAL WOUND HOSE



MAKE SURE AIRFLOW IS CORRECT

AIR FLOW

BUMPER ASSEMBLY IS INSERTED BETWEEN UPPER AND LOWER CLAMPS

DETAIL A
SCALE 1 : 4

BALL MOUNT BRACKET IS INSERTED BETWEEN UPPER AND LOWER CLAMPS

5 SHOWN CLEAR

11 PUNCH HOLE IN ELBOW FOR WEAR ASSEMBLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		hi 514 Mecklem In Ellwood City, PA 16117	
TOLERANCES		Hall Industries, Inc.	
ANGLE	.XX .XXX	PROJECT	AV~ PCA TUBE SYSTEM
± 0.5°	± .01 ± .005	FILE NAME	HT-100PCA-0002 FIRST TUBE
THIRD ANGLE PROJECTION		DESCRIPTION	FIRST TUBE
PROJECT ID	AV0811	SIZE	DWG/PART NO.
CHECK	DATE	B	HT-100PCA-0002
DC	5/8/2012	SCALE 1:15	WEIGHT: 510.92 LBS
DRAWN	DATE	SHEET 1 OF 1	
BJE	5/8/2012		

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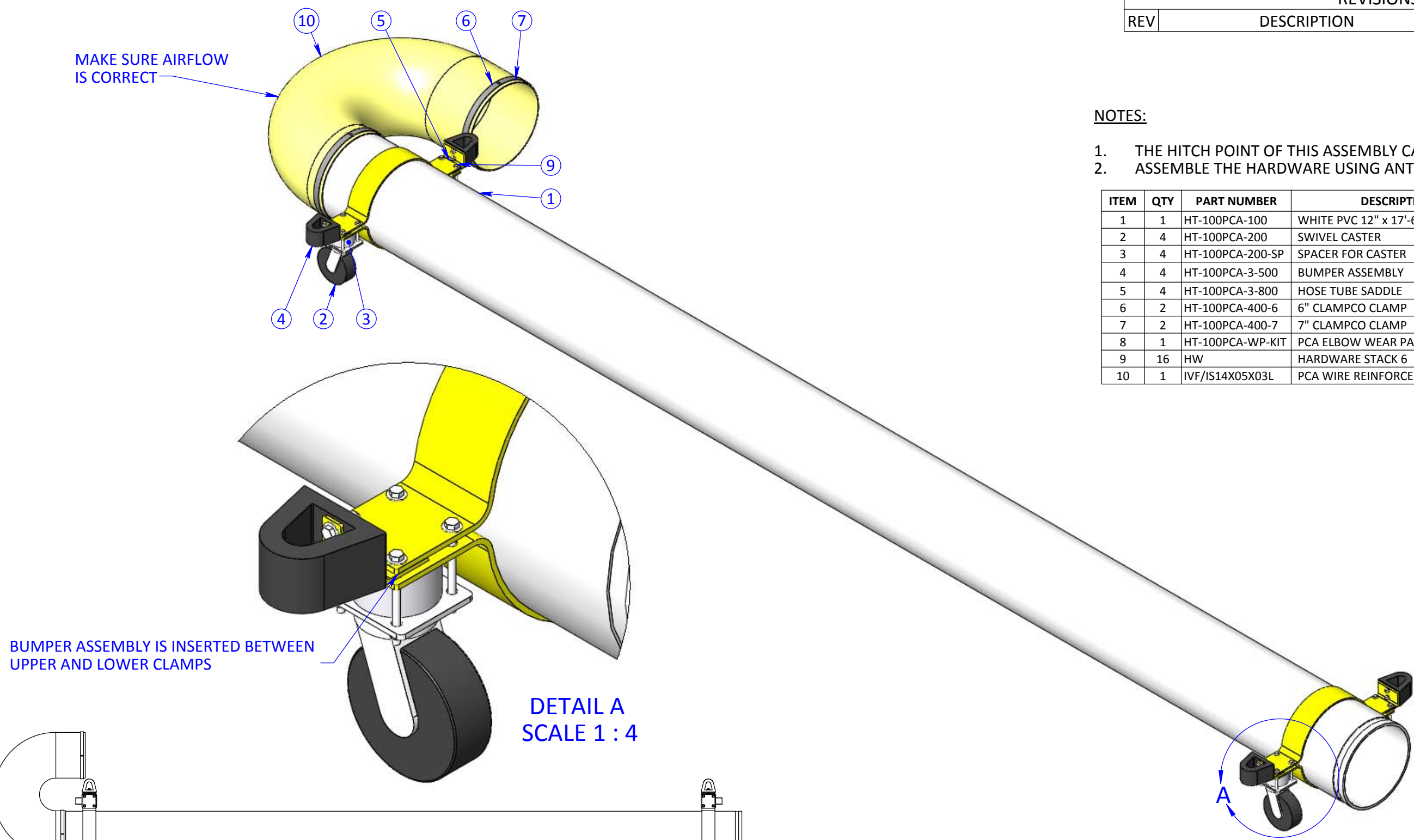
REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK

NOTES:

1. THE HITCH POINT OF THIS ASSEMBLY CAN BE REVERSED IF NEEDED.
2. ASSEMBLE THE HARDWARE USING ANTISEIZE.

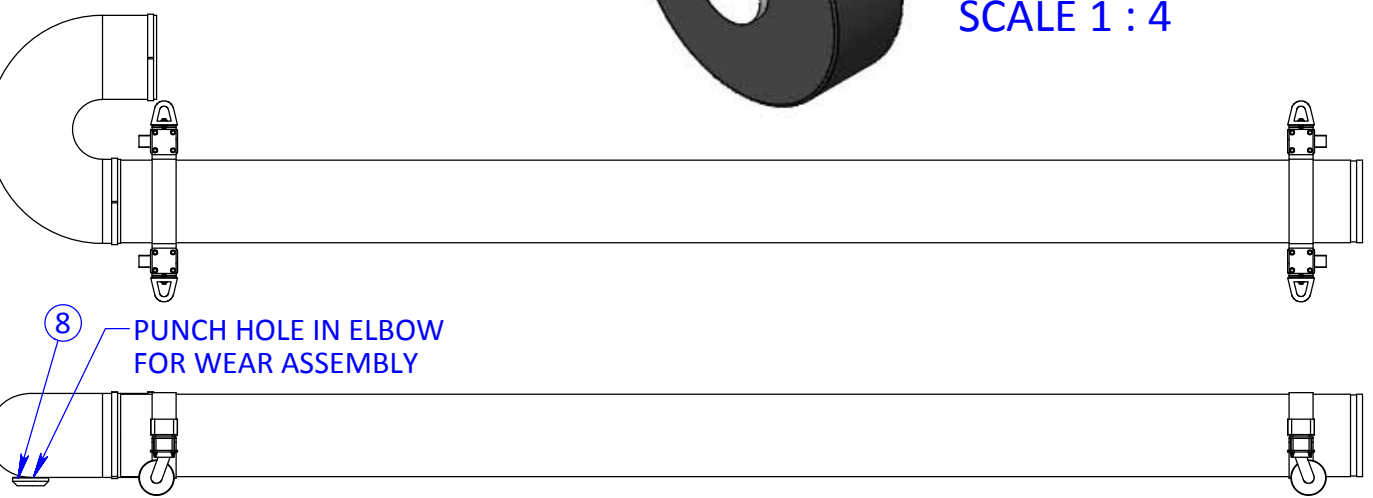
ITEM	QTY	PART NUMBER	DESCRIPTION	Material
1	1	HT-100PCA-100	WHITE PVC 12" x 17'-6" LONG	PVC
2	4	HT-100PCA-200	SWIVEL CASTER	HARDWARE
3	4	HT-100PCA-200-SP	SPACER FOR CASTER	ALUMINUM 6061-T6
4	4	HT-100PCA-3-500	BUMPER ASSEMBLY	N/A
5	4	HT-100PCA-3-800	HOSE TUBE SADDLE	STEEL A36
6	2	HT-100PCA-400-6	6" CLAMP CO CLAMP	HARDWARE
7	2	HT-100PCA-400-7	7" CLAMP CO CLAMP	HARDWARE
8	1	HT-100PCA-WP-KIT	PCA ELBOW WEAR PAD KIT	N/A
9	16	HW	HARDWARE STACK 6	N/A
10	1	IVF/IS14X05X03L	PCA WIRE REINFORCED DUCT ELBOW	SPIRAL WOUND HOSE

MAKE SURE AIRFLOW IS CORRECT



BUMPER ASSEMBLY IS INSERTED BETWEEN UPPER AND LOWER CLAMPS

DETAIL A
SCALE 1 : 4



8 PUNCH HOLE IN ELBOW FOR WEAR ASSEMBLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		514 Mecklem In Ellwood City, PA 16117	
TOLERANCES		hi Hall Industries, Inc.	
ANGLE	.XX .XXX	PROJECT	AV~ PCA TUBE SYSTEM
± 0.5°	± .01 ± .005	FILE NAME	HT-100PCA-0003 MIDDLE TUBE
THIRD ANGLE PROJECTION		DESCRIPTION	MIDDLE TUBE
PROJECT ID	AV0811	SIZE	DWG/PART NO.
CHECK	DATE	B	HT-100PCA-0003
DC	5/8/2012	SCALE 1:15	WEIGHT: 325.94 LBS
DRAWN	DATE	SHEET 1 OF 1	
BJE	5/8/2012	LAST SAVED: 5/29/2012 PRINTED: 5/29/2012	

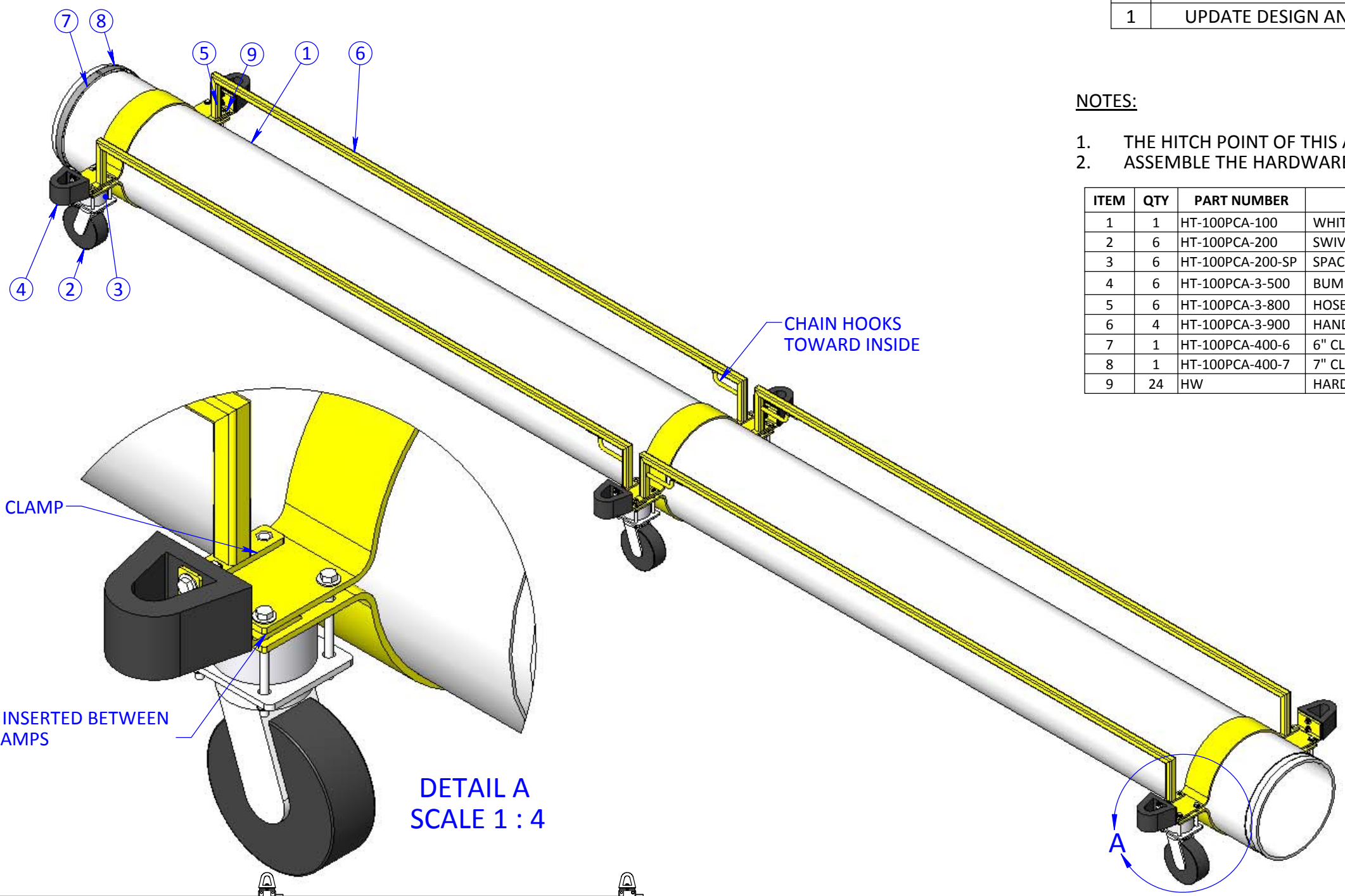
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REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	UPDATE DESIGN AND ADD NOTES	10/28/2013	BJE	SAK

NOTES:

1. THE HITCH POINT OF THIS ASSEMBLY CAN BE REVERSED IF NEEDED.
2. ASSEMBLE THE HARDWARE USING ANTISEIZE.

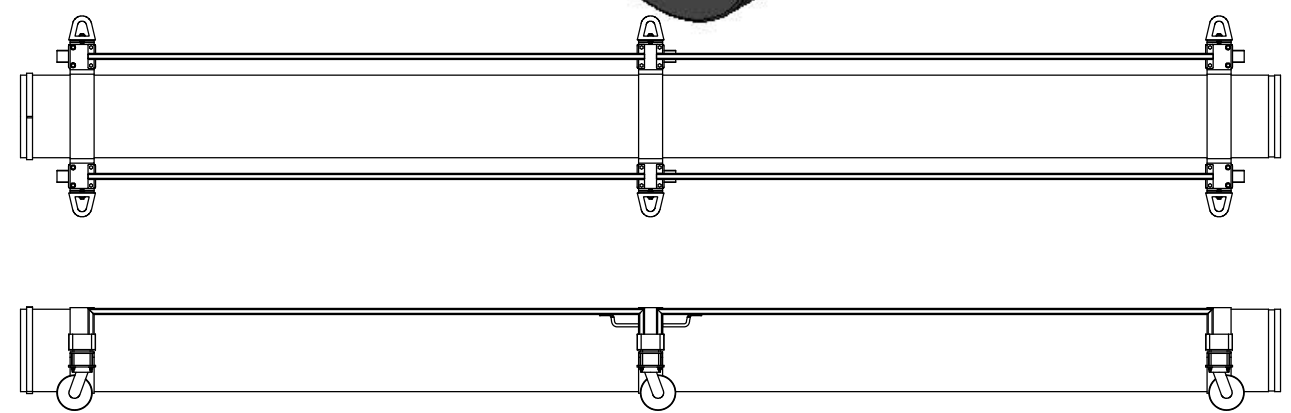
ITEM	QTY	PART NUMBER	DESCRIPTION	Material
1	1	HT-100PCA-100	WHITE PVC 12" x 17'-6" LONG	PVC
2	6	HT-100PCA-200	SWIVEL CASTER	HARDWARE
3	6	HT-100PCA-200-SP	SPACER FOR CASTER	ALUMINUM 6061-T6
4	6	HT-100PCA-3-500	BUMPER ASSEMBLY	N/A
5	6	HT-100PCA-3-800	HOSE TUBE SADDLE	STEEL A36
6	4	HT-100PCA-3-900	HAND RAIL	N/A
7	1	HT-100PCA-400-6	6" CLAMP CO CLAMP	HARDWARE
8	1	HT-100PCA-400-7	7" CLAMP CO CLAMP	HARDWARE
9	24	HW	HARDWARE STACK 6	N/A



HANDRAIL SITS ON TOP OF UPPER CLAMP

BUMPER ASSEMBLY IS INSERTED BETWEEN UPPER AND LOWER CLAMPS

DETAIL A
SCALE 1 : 4



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

CHECK	DATE	SIZE	DWG/PART NO.	REV
DC	5/8/2012	B	HT-100PCA-0004	1
DRAWN	DATE	SCALE 1:15	WEIGHT: 333.57 LBS	SHEET 1 OF 1
BJE	5/8/2012			

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

PROJECT	AV~ PCA TUBE SYSTEM
FILE NAME	HT-100PCA-0004 LAST TUBE
DESCRIPTION	LAST TUBE

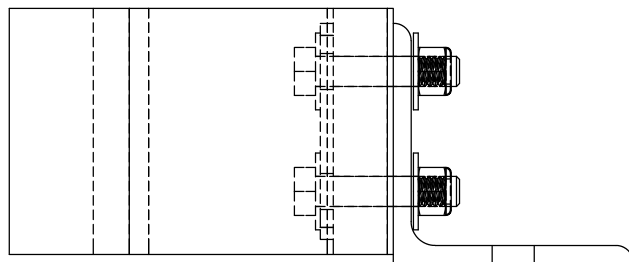
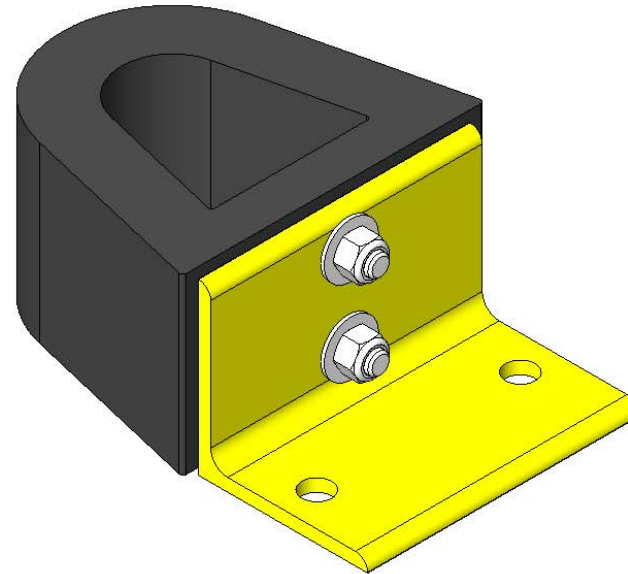
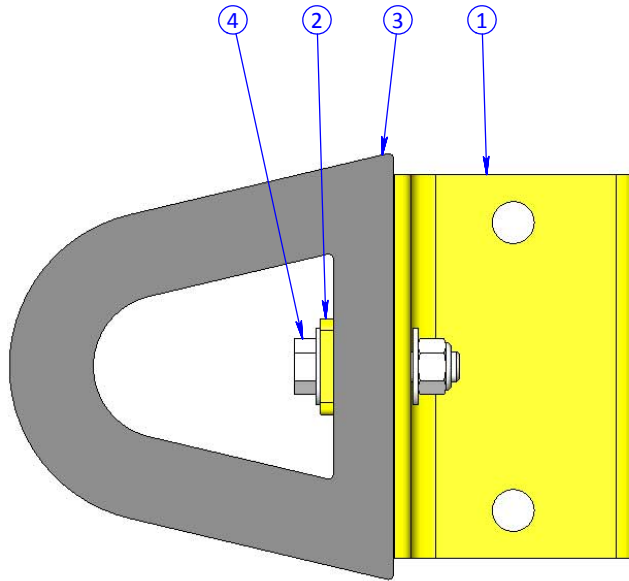
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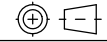
NOTES:

1. ASSEMBLE USING ANTI-SEIZE.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	HT-100PCA-3-500-1	ANGLE BUMPER BRACKET
2	1	HT-100PCA-3-501	BUMPER PLATE
3	1	HT-100PCA-300	HOLLOW-BULB BUMPER
4	2	HW	HARDWARE STACK 8

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		 514 Mecklem In Ellwood City, PA 16117 Hall Industries, Inc.	
TOLERANCES			
ANGLE	.XX .XXX	PROJECT	AV~ PCA TUBE SYSTEM
± 0.5°	± .01 ± .005	FILE NAME	HT-100PCA-3-500 BUMPER ASSEMBLY
THIRD ANGLE PROJECTION		DESCRIPTION	BUMPER ASSEMBLY
PROJECT ID	AV0811	SIZE	DWG/PART NO.
CHECK	DATE	A	HT-100PCA-3-500
DC	5/8/2012	SCALE 1:2	WEIGHT: 2.03 LBS
DRAWN	DATE	SHEET 1 OF 1	
BJE	5/8/2012	REV 0	

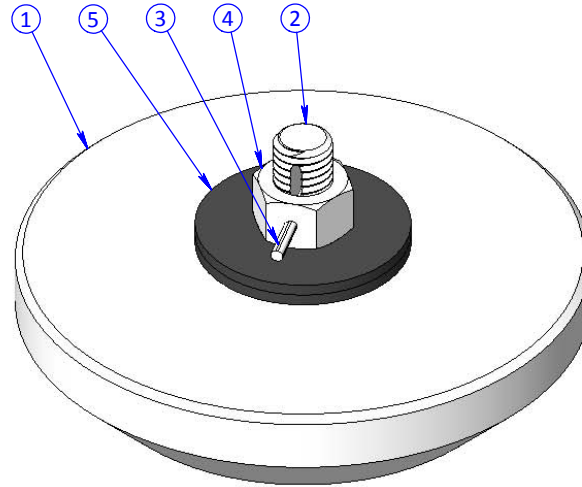
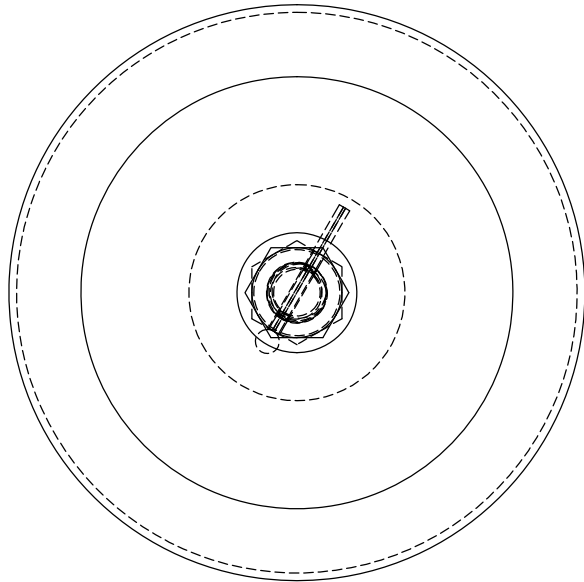
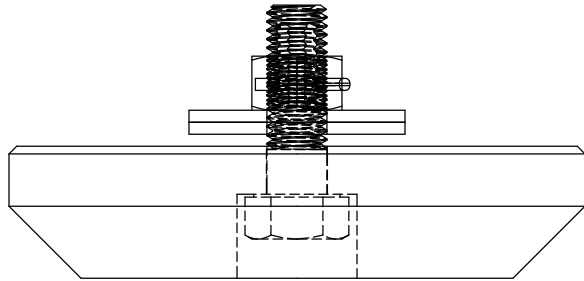
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NOTES:

1. THIS IS TYPICALLY ASSEMBLED WITH THE DUCT PRIOR TO SHIPPING.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HT-100PCA-WPAD	PCA ELBOW WEAR PAD
2	1	HT-100PCA-WPAD-B	PCA ELBOW WEAR PAD NYLON BOLT 91244A755
3	1	HT-100PCA-WPAD-CP	PCA ELBOW WEAR PAD COTTER PIN
4	1	HT-100PCA-WPAD-N	PCA ELBOW WEAR PAD NUT 94812A625
5	2	HT-100PCA-WPAD-W	PCA ELBOW WEAR PAD WASHER

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID
AV0811

CHECK DC	DATE 5/8/2012
DRAWN BJE	DATE 5/8/2012

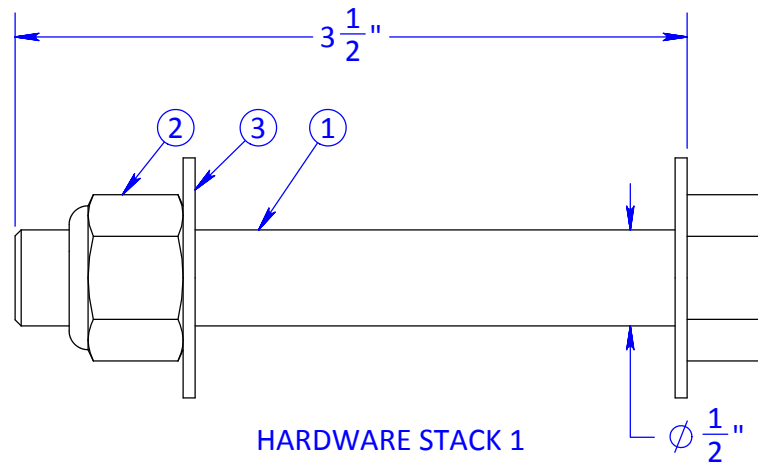
514 Mecklem In Ellwood City, PA 16117
Hall Industries, Inc.

PROJECT	AV~ PCA TUBE SYSTEM		
FILE NAME	HT-100PCA-WP-KIT PCA ELBOW WEAR PAD KIT		
DESCRIPTION	PCA ELBOW WEAR PAD KIT		
SIZE	DWG/PART NO.	REV	
A	HT-100PCA-WP-KIT	0	
SCALE 1:2	WEIGHT: 1.44 LBS	SHEET 1 OF 1	

NOTES:

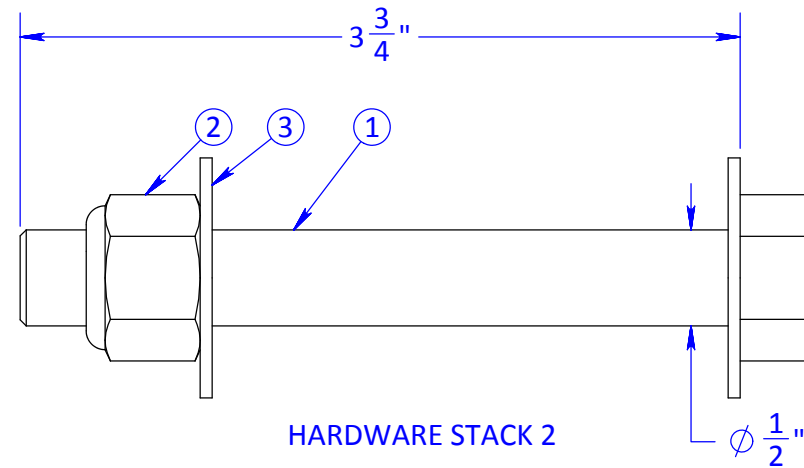
1. USE ANTISEIZE.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK



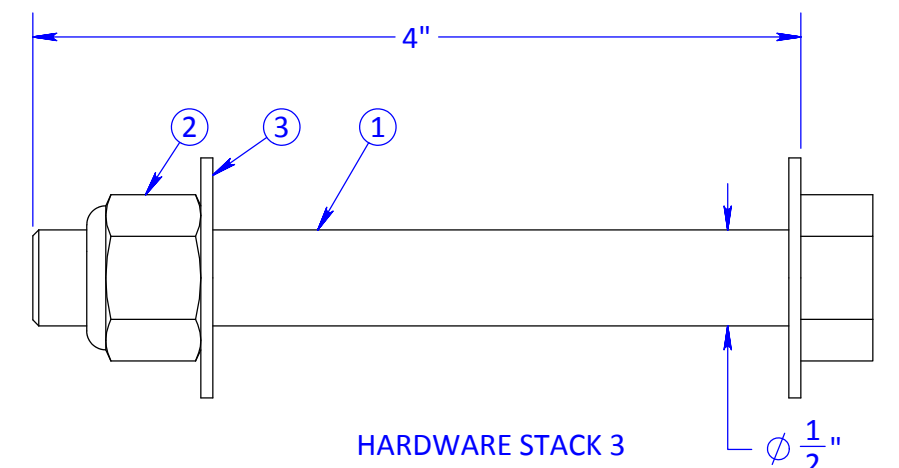
HARDWARE STACK 1

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	H5 08C 0112 ZP 0000	HH BOLT 1/2"-13 x 3.5" LG GR5 ZP
2	1	NY 08C 0000 ZP 0000	NUT NYLOC .5-13 ZP
3	2	UW 452 0000 ZP 0000	FLAT WASHER 1/2" USS ZP



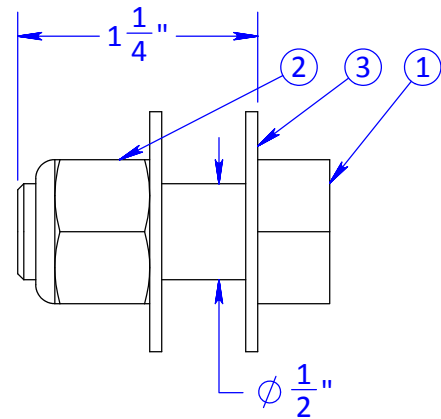
HARDWARE STACK 2

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	H5 08C 0104 ZP 0000	HH BOLT 1/2"-13 x 3.75 LG GR5 ZP
2	1	NY 08C 0000 ZP 0000	NUT NYLOC .5-13 ZP
3	2	UW 452 0000 ZP 0000	FLAT WASHER 1/2" USS ZP



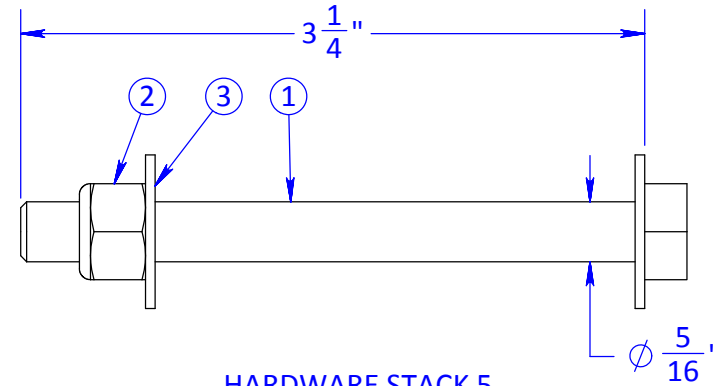
HARDWARE STACK 3

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HX 08C 0128 00 ZPBG	HH BOLT 1/2"-13 x 4" LG GR5 ZP
2	1	NY 08C 0000 ZP 0000	NUT NYLOC .5-13 ZP
3	2	UW 452 0000 ZP 0000	FLAT WASHER 1/2" USS ZP



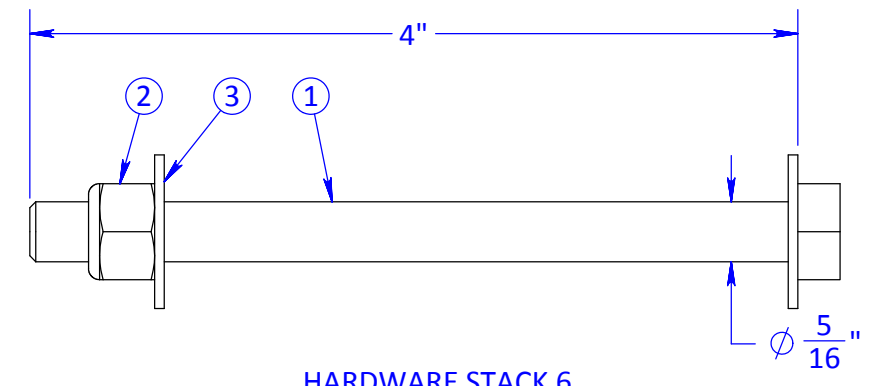
HARDWARE STACK 4

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	H5 08C 0040 ZP 00DG	HH BOLT 1/2"-13 x 1.25" LG GR5 ZP
2	1	NY 08C 0000 ZP 0000	NUT NYLOC .5-13 ZP
3	2	UW 452 0000 ZP 0000	FLAT WASHER 1/2" USS ZP



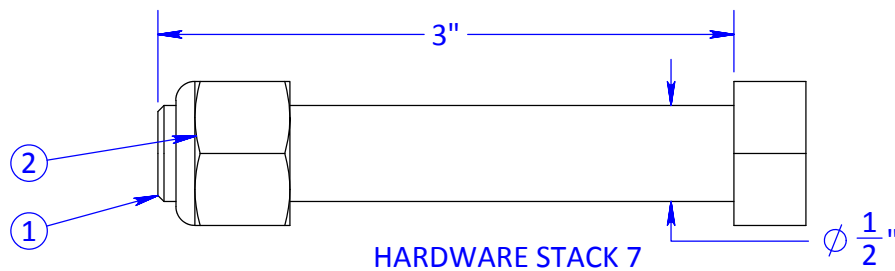
HARDWARE STACK 5

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HX 05C 0104 YZ 0000	HH BOLT 5/16"-18 x 3.25" LG ZP
2	1	NY 05C 0000 ZP 0000	NUT NYLOC 5/16"-18 ZP
3	2	WH 440 0000 ZP 00DG	FLAT WASHER 5/16" USS ZP



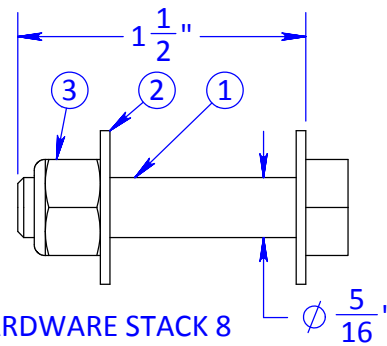
HARDWARE STACK 6

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HX 05C 0128 YZ 0000	HH BOLT 5/16"-18 x 4" LG ZP
2	1	NY 05C 0000 ZP 0000	NUT NYLOC 5/16"-18 ZP
3	2	WH 440 0000 ZP 00DG	FLAT WASHER 5/16" USS ZP



HARDWARE STACK 7


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	TB-8650-8	HH BOLT 1/2"-13 x 3" LG GR5 ZP
2	1	NY 08C 0000 ZP 0000	NUT NYLOC .5-13 ZP



HARDWARE STACK 8

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	HT-100PCA-2000	HH BOLT 5/16"-18 x 1.5" LG ZP
2	2	WH 440 0000 ZP 00DG	FLAT WASHER 5/16" USS ZP
3	1	NY 05C 0000 ZP 0000	NUT NYLOC 5/16"-18 ZP

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	
TOLERANCES	
ANGLE	.XX .XXX
± 0.5°	± .01 ± .005
THIRD ANGLE PROJECTION	
PROJECT ID AV0811	
CHECK DC	DATE 5/3/2012
DRAWN BJE	DATE 5/2/2012

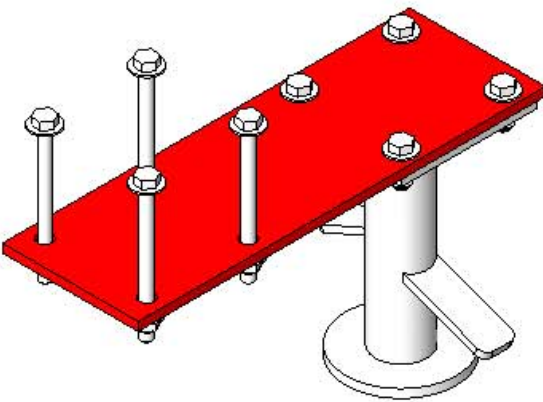
 514 Mecklem In Ellwood City, PA 16117	
Hall Industries, Inc.	
PROJECT	AV ~ PCA TUBE SYSTEM
FILE NAME	HT-100PCA-0005 HARDWARE STACK
DESCRIPTION	HARDWARE STACK
SIZE	DWG/PART NO.
B	HT-100PCA-0005
SCALE 1:1	WEIGHT: 0.33 LBS
SHEET 1 OF 1	
REV	0

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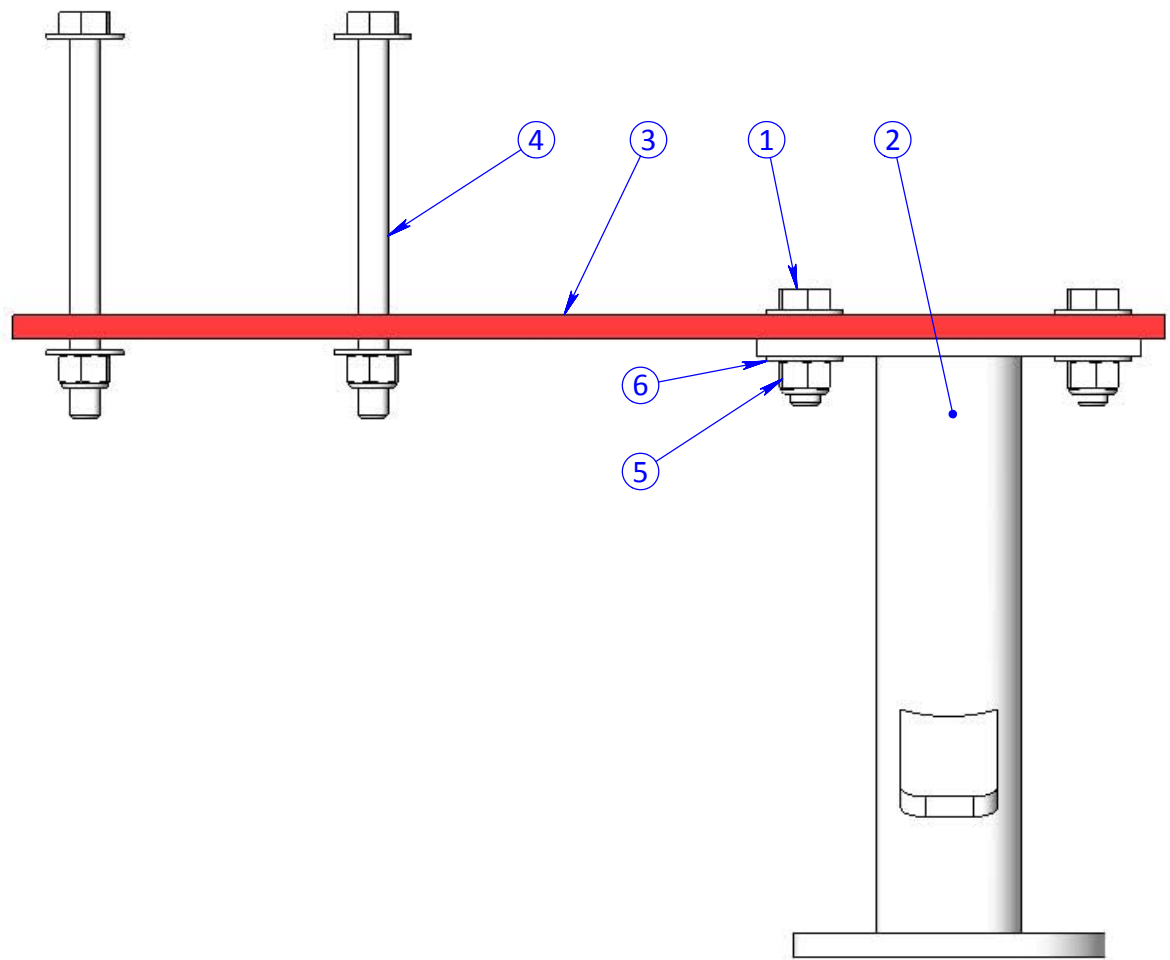
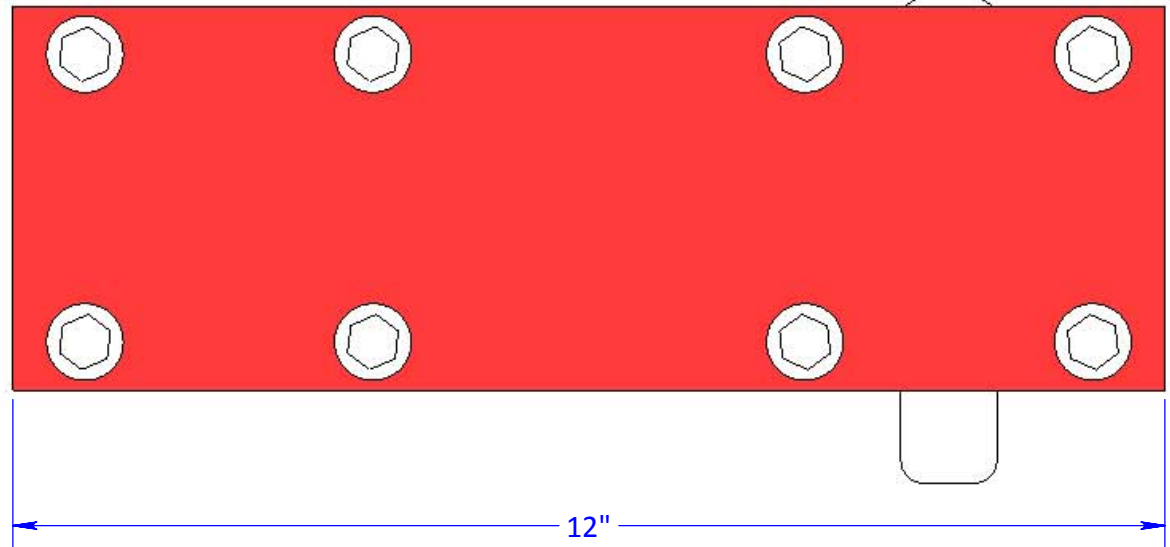
NOTES:

1.



REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	UPDATE HARDWARE	11/29/2012	BJE	DC
2	ADD PART NUMBERS	10/28/2013	BJE	SAK

OPTIONAL BRAKE KIT



ITEM	QTY	PART NUMBER	DESCRIPTION	Material
1	4	92865A583	HH BOLT 5/16"-18 x 1" LG ZP	HARDWARE
2	1	HT-100PCA-201	FLOOR LOCK	HARDWARE
3	1	HT-100PCA-1000	FLOOR LOCK PLATE	STEEL A36
4	4	HW	HARDWARE STACK 6	N/A
5	4	NY 05C 0000 ZP 0000	NUT NYLOC 5/16"-18 ZP	HARDWARE
6	8	WH 440 0000 ZP 00DG	FLAT WASHER 5/16" USS ZP	HARDWARE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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

THIRD ANGLE PROJECTION

PROJECT ID AV0811

CHECK VTM DATE 11/12/2012

DRAWN BJE DATE 11/12/2012

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

PROJECT AV
 FILE NAME HT-100PCA-0001 BRAKE ASSEMBLY
 DESCRIPTION BRAKE ASSEMBLY

SIZE DWG/PART NO. B HT-100PCA-0001
 SCALE 1:2 WEIGHT: 6.48 LBS SHEET 1 OF 1

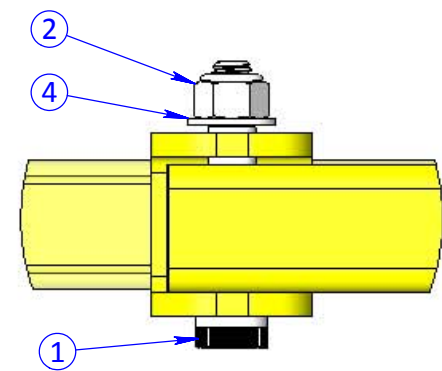
REV 2

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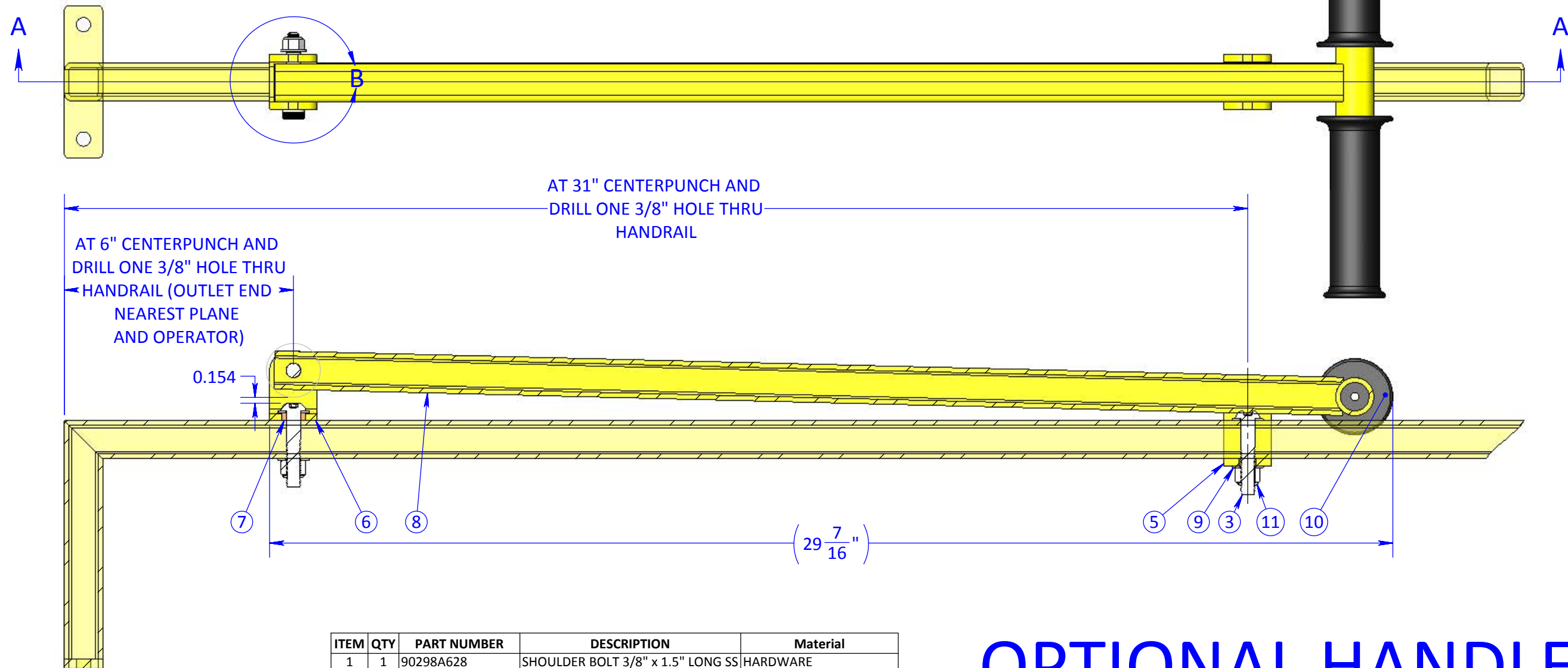
NOTES:

1. ASSEMBLE WITH ANTI-SIEZE.
2. DRILL HOLES AS NOTED.

REVISIONS				
REV	DESCRIPTION	DATE	BY	CHK
1	CHANGED ITEM TO SS	11/29/2012	BJE	DC
2	ADD PART NUMBERS TO MISSING	10/28/2013	BJE	SAK



**DETAIL B
SCALE 2 : 3**



AT 6" CENTERPUNCH AND
DRILL ONE 3/8" HOLE THRU
HANDRAIL (OUTLET END
NEAREST PLANE
AND OPERATOR)

AT 31" CENTERPUNCH AND
DRILL ONE 3/8" HOLE THRU
HANDRAIL

$29 \frac{7}{16}$ "

0.154

HANDRAIL SHOWN BUT
NOT INCLUDED

1

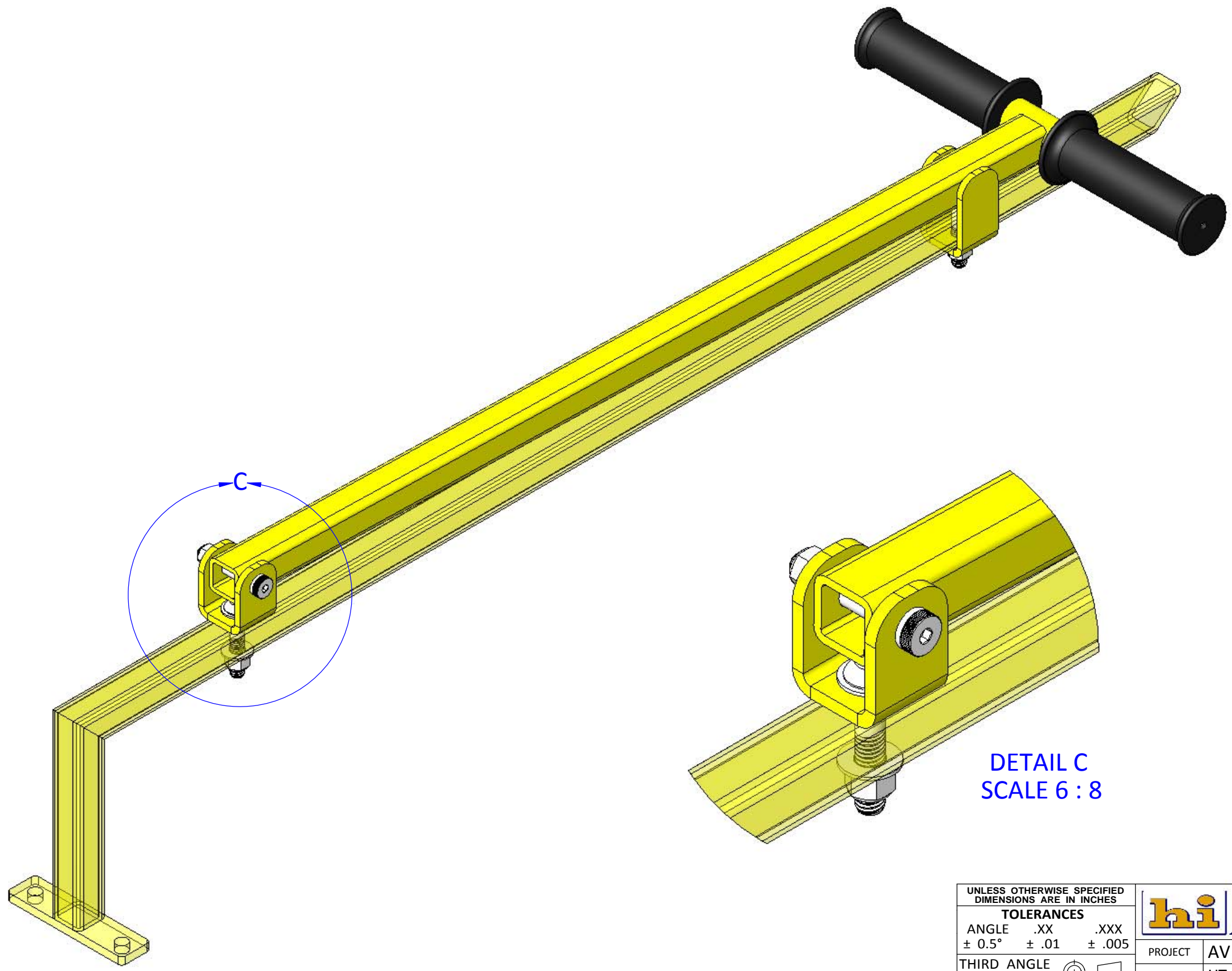
ITEM	QTY	PART NUMBER	DESCRIPTION	Material
1	1	90298A628	SHOULDER BOLT 3/8" x 1.5" LONG SS	HARDWARE
2	1	91831A030	NYLOC NUT 5/16"-18 SS	HARDWARE
3	2	92949A632	BHSCS 3/8" -16 x 2" LG SS	HARDWARE
4	1	96659A107	FLAT WASHER 5/16 SS	HARDWARE
5	1	HT-100PCA-1001	TIE DOWN	STEEL A36
6	1	HT-100PCA-1002	MOUNT FOR HANDLE	STEEL A36
7	1	HT-100PCA-1003	SPACER	BRONZE 932 / 660
8	1	HT-100PCA-3000	HANDLE	N/A
9	4	TB-8312-B10	FLAT WASHER 3/8" ZP	HARDWARE
10	2	TB-8312-HA-GRP	GRIP, BLACK	RUBBER
11	2	TB-8898-6	NYLOC NUT 3/8"-16 ZP	HARDWARE

OPTIONAL HANDLE KIT


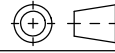
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		hi 514 Mecklem In Ellwood City, PA 16117	
TOLERANCES		Hall Industries, Inc.	
ANGLE	.XX .XXX	PROJECT	AV
$\pm 0.5^\circ$	$\pm .01 \pm .005$	FILE NAME	HT-100PCA-0006 T-HANDLE ASSEMBLY
THIRD ANGLE PROJECTION		DESCRIPTION	T-HANDLE ASSEMBLY
PROJECT ID	AV0811	SIZE	DWG/PART NO.
CHECK	DATE	B	HT-100PCA-0006
VTM	11/9/2012	SCALE 1:3	WEIGHT: 11.17 LBS
DRAWN	DATE	SHEET 1 OF 2	
BJE	11/8/2012		

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DETAIL C
SCALE 6 : 8

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		 514 Mecklem In Ellwood City, PA 16117 Hall Industries, Inc.	
TOLERANCES			
ANGLE	.XX	.XXX	
	± 0.5°	± .01	± .005
THIRD ANGLE PROJECTION			
PROJECT ID AV0811	PROJECT	AV	
CHECK VTM	DATE 11/9/2012	FILE NAME	HT-100PCA-0006 T-HANDLE ASSEMBLY
DRAWN BJE	DATE 11/8/2012	DESCRIPTION	T-HANDLE ASSEMBLY
	SIZE	DWG/PART NO.	REV
	B	HT-100PCA-0006	2
	SCALE 1:3	WEIGHT: 11.17 LBS	SHEET 2 OF 2

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PCA INLET ADAPTER - ALUMINUM

"The GSE Problem Solvers"



Molded EPDM Gasket is service proven to last for years.



Stainless Steel screen insert to keep debris from entering aircraft.

FEATURES

- Complete Assembly Part #IA-8980
- PCA 8" Adapter/ Connector
- Fits ATA Standard Flange
- Fits Standard 8" Hose
- Rotary Cam Action Latch Handles
- No exposed linkages, springs, or bolts
- Eliminates FOD
- Minimizes moving parts
- Molded EPDM Gasket
- Weighs less than 5 pounds
- Protects duct from damage
- 1 year warranty on Latch Handle Casting
- US Patent No. 6289949

COMPONENTS

Hall Part #8980-2-100K

Handle Housing Replacement

Fits right or left side, includes (2) bolts, (2) Nord-Lock washer sets and Rubber Grip Handle

Hall Part #8980-2-200

Base Ring Assembly with Gasket

Includes the gasket attached to the base



The word "LOCK" is cast into the handles. Provides added safety as ramp service staff can check locked position.



Rotary Cam Action Latch Handles with Slot Filling Latch.

For more information please visit us online at www.halltechservices.com, call us at 724.824.7100, or email us at info@halltechservices.com



HALL Technical Services, LLC

PCA INLET ADAPTER - NYLON

"The GSE Problem Solvers"



Molded EPDM Gasket is service proven to last for years.

Stainless Steel screen insert to keep debris from entering aircraft.

FEATURES

- Complete Assembly Part #IA-8980-N
- PCA 8" Adapter/ Connector
- Fits ATA Standard Flange
- Fits Standard 8" Hose
- High impact resistant polymer
- Impact tested for durability
- Rotary Cam Action Latch Handles
- No exposed linkages, springs, or bolts
- Eliminates FOD
- Minimizes moving parts
- Molded EPDM Gasket
- Weighs less than 5 pounds
- Protects duct from damage
- 1-year Warranty on Latch Handle Casting

COMPONENTS

Hall Part #8980-2-100K

Handle Housing Replacement

Fits right or left side, includes (2) bolts, (2) Nord-Lock washer sets and Rubber Grip Handle

Hall Part #8980-2-200P

Base Ring Assembly with Gasket

Includes the gasket attached to the base



The word "LOCK" is cast into the handles. Provides added safety as ramp service staff can check locked position.



Rotary Cam Action Latch Handles with Slot Filling Latch.

For more information please visit us online at www.halltechservices.com, call us at 724.824.7100, or email us at info@halltechservices.com

Hall Industries Equipment Division ~ AIRLINE ORDERS

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

ORDER DATE: _____ TAKEN BY: _____ TIME: _____ AIRLINE CODE: _____
 PERSON CALLING: _____ PHONE#: _____ FAX: _____
 E-MAIL ADDRESS: _____ CUSTOMER P.O.# _____
 MASTER CARD# _____
 EXP. DATE: _____ CVC# _____
 SHIP DATE: _____ HOW TO SHIP: UPS: GRD _____ RED _____ OTHER _____
 FED EX: GRD _____ O/N _____ O/N P1 _____ OTHER _____ Acct. # _____
 TRUCKING COMPANY: _____
 HUB : _____ EMPLOYEE # _____
 BILLING ADDRESS: _____ SHIP TO ADDRESS: _____

PART NUMBER:	DESCRIPTION:	QTY:	PRICE:

NOTES: _____

Other Products and Custom Design Services:

Hall Industries provides a number of additional products beyond our towbar line. Some of the custom projects that we have done are shown below. We have our own engineering staff along with machine, fabrication, and GSE maintenance shops. We can design and build your ideas to increase safety, productivity, and profits.



0017-0001 Custom Towbar (Solve a Problem)

<<This project involved designing and manufacturing a custom towbar to be used in the Nuclear Industry. This towbar shipped complete with custom shear pins calibrated to the application.



IA-8980 Preconditioned Air Inlet (PCA) Adapters

<< Our PCA Inlet Adapters are part of our GSE product line. We inventory all of the parts and can ship usually the same day as ordered.>>



0010-0001 Certified Transmission Lifting Bracket (Meet a Demand)

A customer came to us with a lifting problem. They needed a tested and certified lifting bracket to prevent them from getting cited by OSHA. We designed, tested, and fabricated a solution. >>



<<1000-3002 Adapter 8312 to Tronair 1000-0001 Hydro Adapter Assembly>>

Hall Industries offers adapters for nearly every towbar (even competitors) that allow you to use our towbar tubes / heads with your existing equipment.



Besides the products listed above some of the other things that we sell include PCA ducting, Solid PBB tires, and baggage cart tires.

Feel free to contact us about your GSE problems; after all we are “The Problem Solvers”.