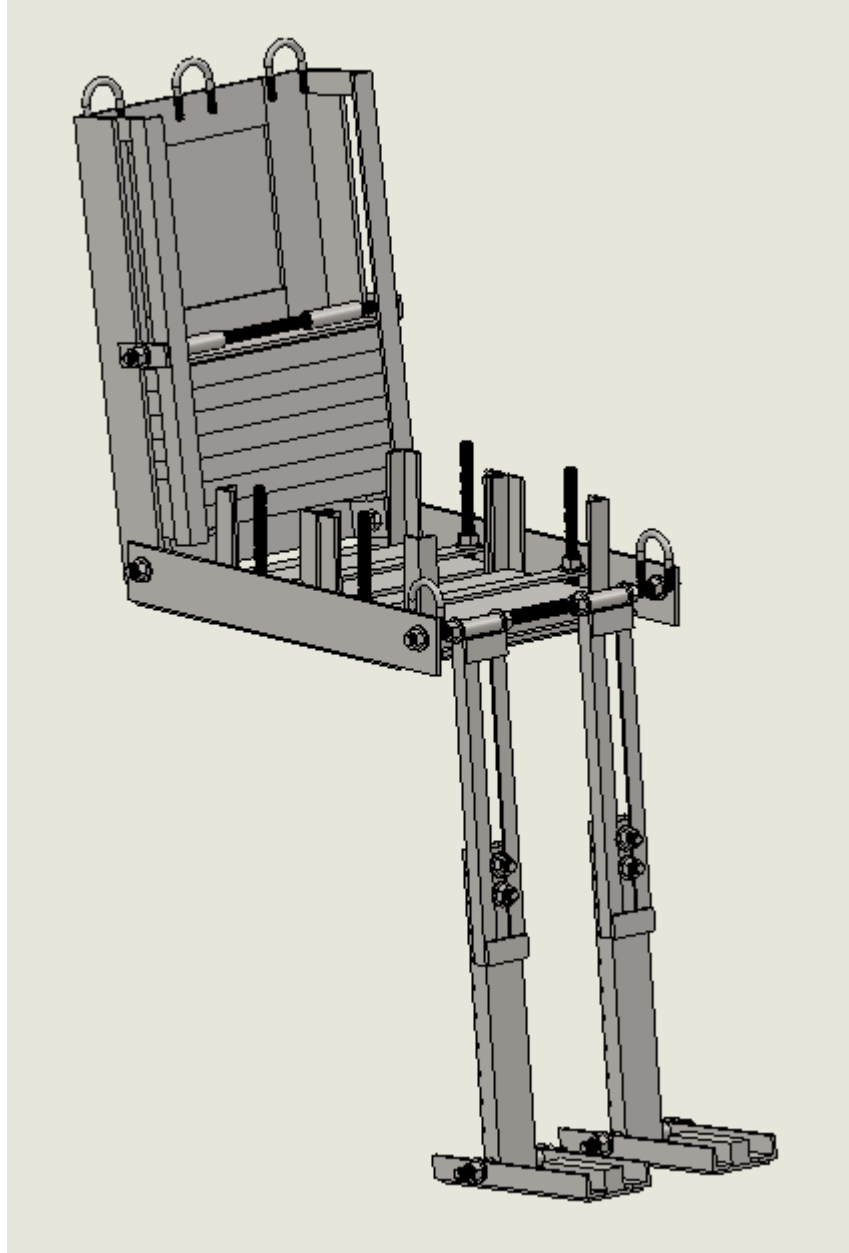


## ISWP Standards Testing – Testing Dummy



100kg testing dummy in compliance with ISO 7176 / RESNA WC-1 standards



## **Please read the following document in its entirety before purchasing materials and assembling.**

### **Design of an ISWP Standards Testing Dummy**

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University of Pittsburgh scientists are working with the U.S. Agency for International Development (USAID) under a multi-year sub-award to develop the International Society of Wheelchair Professionals, a global network to ensure a level of standardization, certification and oversight, to teach and professionalize wheelchair services, and to build affiliations to put better equipment in the right hands. Since 2002, USAID has granted more than \$45 million to improve wheelchairs and wheelchair services worldwide. This sub-award – Agreement No. APC-GM-0068 – was presented by Advancing Partners & Communities, a cooperative agreement funded through USAID under Agreement No. AIDOAA-A-12-00047, beginning Oct. 1, 2012.

For further information on use of the ISWP Standards Testing – Testing Dummy manual or materials, contact the University of Pittsburgh’s Innovation Institute at 412-383-7670 or the International Society of Wheelchair Professionals at [intlsocietywheelchairprof@gmail.com](mailto:intlsocietywheelchairprof@gmail.com).



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## Assembly Instructions

### Notes:

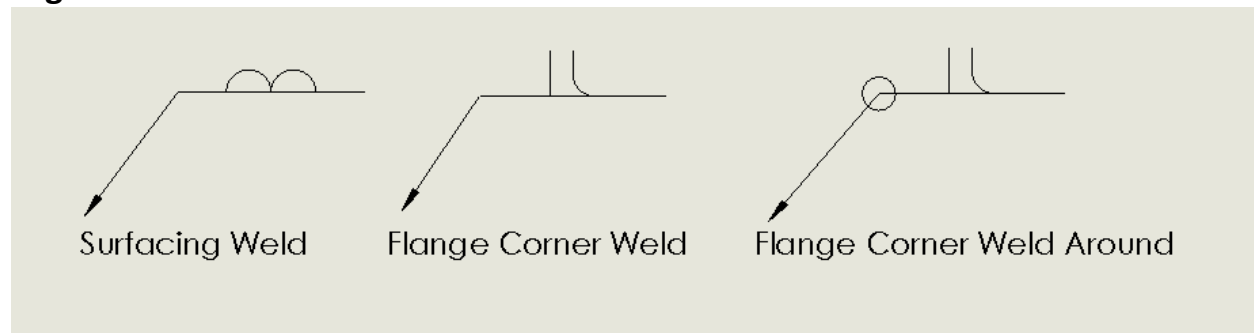
The assembly instructions may only show or dictate about one item, but welding and placement directions apply to all parts of the same name unless specifically stated otherwise.

½-13 hardware is used for the assembly, however, M12-1.75 is an acceptable alternative.

These instructions are to be paired with the dimensioned and assembly drawings for part names and details about each part or assembly.

Feedback provided on these instructions suggests placing fillets on sharp edges. Please note these fillets are not specified in this packet.

### Legend



## 1. Tools Required

- Angle Grinder
- Box or open end wrench set / socket set / adjustable wrenches (2)
- Welder (ARC or MIG)
- Drill and drill bits
- Tape measure
- Hacksaw

### Additional tools that would be helpful:

- Chop Saw
- Drill Press or 3-axis Mill

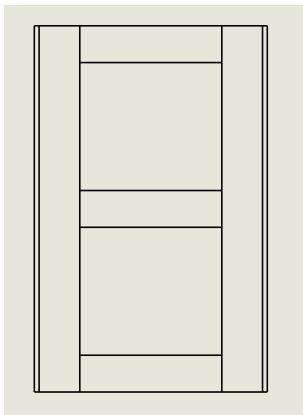
## 2. Building the Seat Back Assembly

### Cutting notes:

All parts should be cut before assembly is started. Some parts may be able to be longer or shorter depending on the function. Please follow the tolerances listed on the dimensioned drawings. Furthermore, all holes should be drilled before assembly begins to ensure they are placed correctly.

### Assembly Start

Starting with the seat back sides (left and right, use one of each) and the seat back top supports, the general shape of the seat back can be laid out. See Figure 1 below.

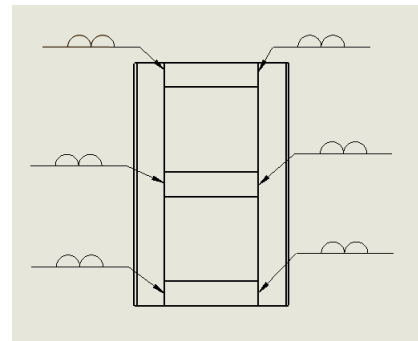


**Figure 1**

When assembling, ensure that the hole of the seat back sides is both at the bottom of the layout but on the side of the angle that is not touching the table. The bottoms of the seat back side need to be flush with each other. The overall width should be 12 ¾ inches (323.85 mm).

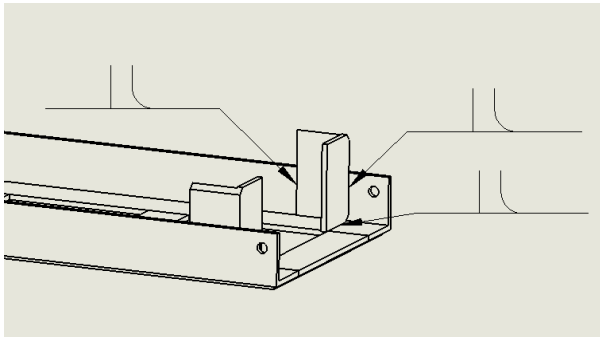
**Figure 2**

One seat back top support is flush with each end and one is centered. Once it is laid out and meets the required width, the seat back top supports can be surface welded to the seat back sides on the face that is pointing up and as annotated in Figure 2. These weld needs to be minimal because weight blocks will sit on this area and it needs to be flat.



Next, the seat back base can be welded on the back side of this assembly. It should be spaced about a ¼ inch (6.35 mm) from all sides. A stitch weld around the outside and on the inside around the seat back top supports and seat back sides will secure the seat back base.

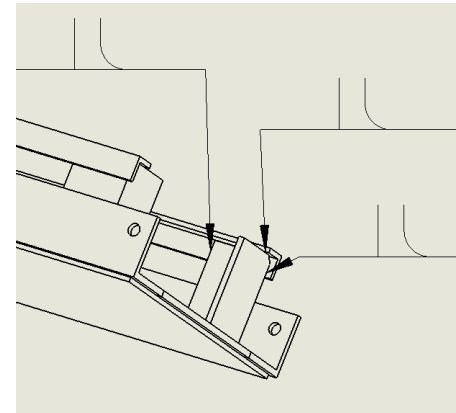
The next piece to add is the seat back weight holder bottoms. The chamfer needs to be cut before they are installed. The chamfer rest in the corner of the seat back sides. The bottom of the seat back weight holder is placed 2 inches (50.8 mm) from the bottom end of the seat back sides. See Figure 3 for more details.



**Figure 3**

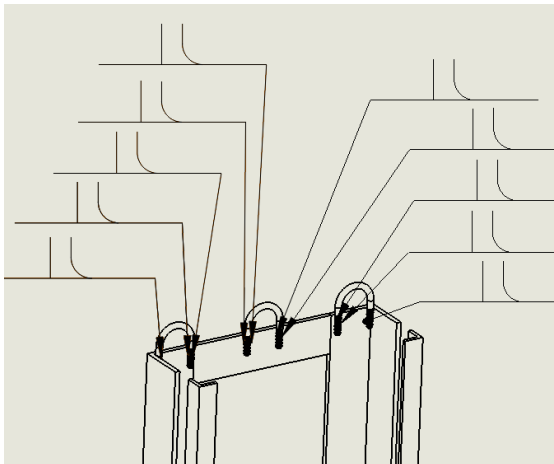
A corner weld will secure the seat back weight holders in three places. This also shows the manner in which the seat back weight holder attaches to the assembly.

The seat back weight holder sides can now be added. The top end of the seat back weight holder side is flush with the top end of the seat back sides and hangs ¼ inch (6.35 mm) over the seat back weight holders.



**Figure 4**

They should be parallel to the seat back sides and be welded in the same way respectively as the seat back weight holder were welded to the assembly.



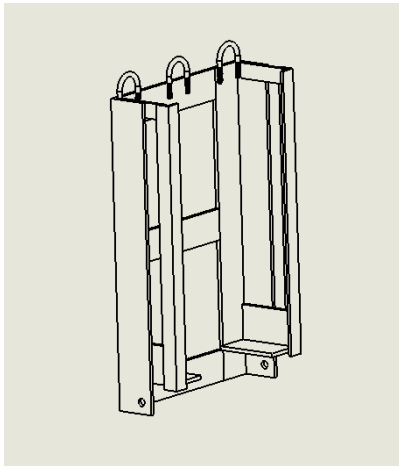
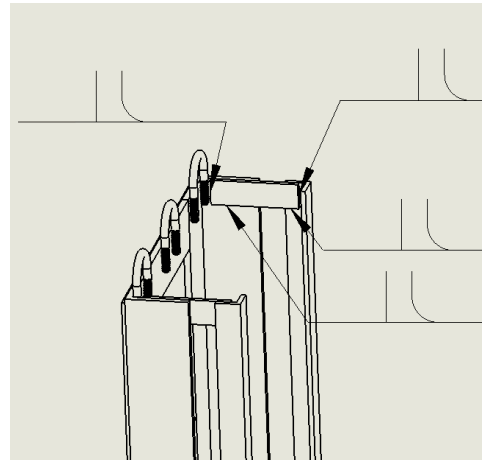
**Figure 5**

Now the 1.5 inch (38.1 mm) ID U-bolts are welded on next. One sits in each corner and the other is centered, but the threaded ends of all 3 are 1 inch (25.4 mm) from the top of the seat back sides. The location of the welds is indicated in Figure 5. It is both sides of the threads on the U-bolt unless it is in the corner, then only the side of the thread that touches the corner is not welded

The seat back weight holder side supports can be added next. They are spaced evenly between the 1.5 inch (38.1 mm) ID U-bolt and the inside of the seat back side support. Figure 6 shows the weld locations.

**Figure 6**

Welds are on 3 out of 4 sides of the seat back weight holder side support.



**Figure 7**

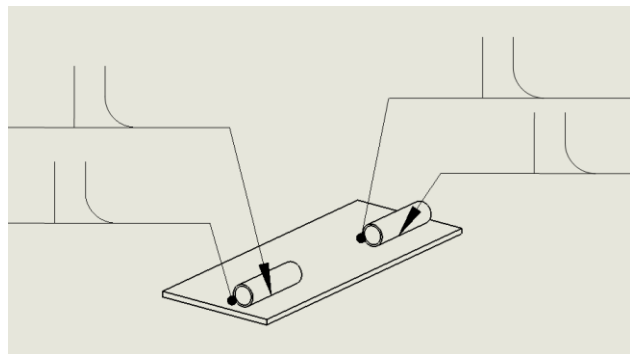
This completes the assembly of the seat back. It should resemble Figure 7. The weight clamp for the seat back is the next piece to assemble.

### Seat Back Weight Clamp Assembly

To build the weight clamp assembly for the seat back, the seat back weight clamp tops are welded onto the seat back weight bottom. The end of the tubes for the seat back weight clamp tops are  $\frac{1}{2}$  inch (12.7 mm) from the edge of the seat back weight clamp bottom. The center of the tubes for the seat back weight clamp tops are  $1\frac{1}{4}$  inches (31.75 mm) from the edge of the seat back weight clamp bottom.

**Figure 8**

The welds are along both long sides of the seat back weight clamp tops.



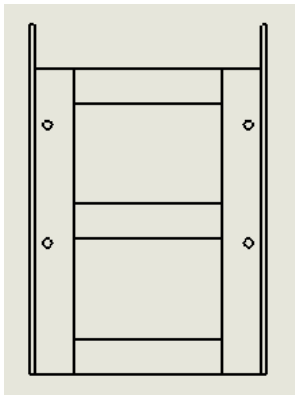
### 3. Building the Seat Pan Assembly

#### Cutting notes:

All parts should be cut before assembly is started. Some parts may be able to be longer or shorter depending on the function. Please follow the tolerances listed on the dimensioned drawings. Furthermore, all holes should be drilled before assembly begins to ensure they are placed correctly.

#### Assembly Start

Starting with the seat pan sides (left and right, use one of each) and the seat back top supports, the general shape of the seat back can be laid out. See Figure 9 below.

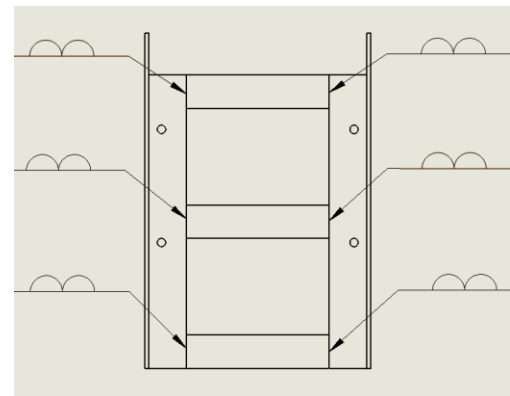


**Figure 9**

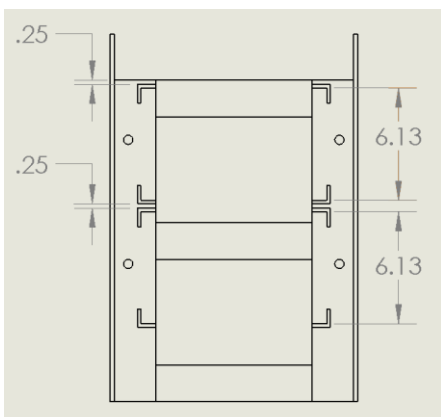
When assembling, ensure that the notched ends of the seat pan sides are both at the top of the layout. The side of the seat pan side with the notch removed should be touching the table. The overall width should be 13 ½ inches (342.9 mm).

**Figure 10**

One seat pan support is flush with each end (where the cutout begins for the notched end) and one is centered. Once it is laid out and meets the required width, the seat back top supports can be surface welded to the seat back sides on the face that is pointing up and as annotated in Figure 10. These welds need to be minimal because weight blocks will sit on this area and it needs to be flat.



Next, the seat pan base can be welded on the back side of this assembly. It should be spaced about a ¼ inch (6.35 mm) from all sides. A stitch weld around the outside and on the inside around the seat pan supports and seat pan sides will secure these part to the seat pan base. It does not go over the notched area.



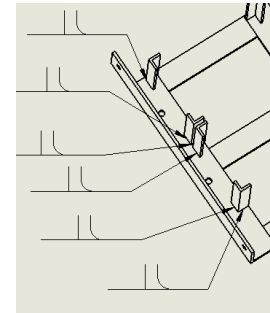
The next piece to add is the seat pan weight holders. The inside edge of the seat pan weight holders are to be placed flush with the inside of the seat pan sides.

**Figure 11**

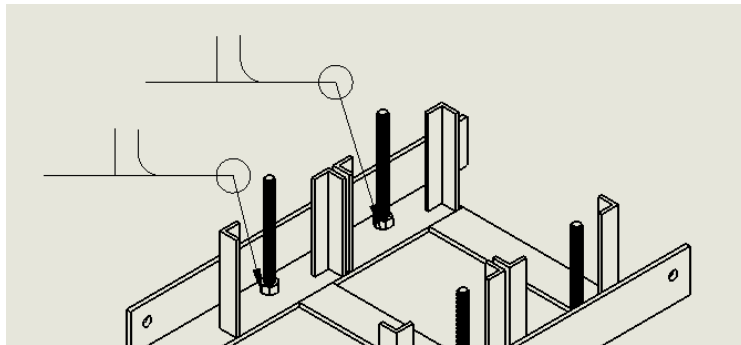


The top set of seat pan weight holders are ¼ inch (6.35 mm) from the edge of the cutout. The next two are 6 1/8 inches (155.575 mm) apart when measured inside to inside. There is ¼ inch (6.35 mm) space in between the second and third sets followed by 6 1/8 inches (155.575 mm) inside to inside for the third and fourth sets. See Figure 11 for more details. The seat pan weight holders should be welded on the outside edges so the weights can remain flat when placed as seen in Figure 12.

**Figure 12**



These are the weld locations for the seat pan weight holders. It is both outside edges on all eight holders.



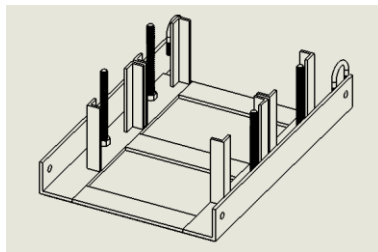
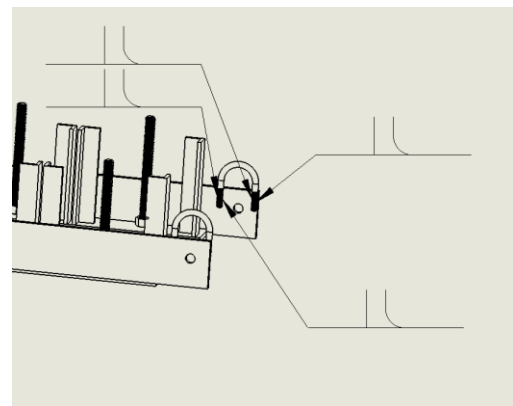
**Figure 13**

The ½ -13 by 6-inch (152.4 mm) studs are placed in the holes on the seat pan sides. A nut is placed ¼ inch (6.35 mm) from the edge to be used as a stop. Once the stud is placed vertically, the nut is welded onto the seat pan sides. Before welding, make sure the seat pan weight block

strap fits onto the studs easily.

**Figure 14**

The last item to be welded on the seat pan assembly is the 1.5inch (38.1 mm) ID U-bolt. They are mounted flush with the end of the seat pan side and the end of the threads is set 1 inch (25.4 mm) from the top of the seat pan side. Welds are to be placed on both side of the threads where it contacts the seat pan side.



**Figure 15**

This completes the assembly of the seat pan. It should resemble Figure 15.

## 4. Building the Legs

### Cutting notes:

All parts should be cut before assembly is started. Some parts may be able to be longer or shorter depending on the function. Please follow the tolerances listed on the dimensioned drawings. Furthermore, all holes should be drilled before assembly begins to ensure they are placed correctly.

### Feedback:

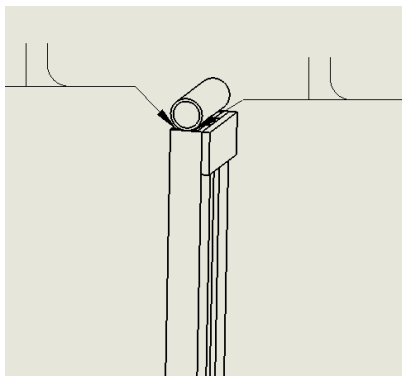
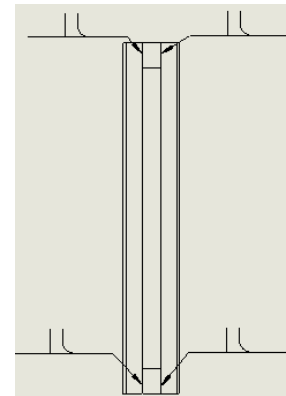
Product feedback suggests utilizing solid rods and bushings in place of threaded rods at the knee joint (figure 21). Please note that this recommendation is not reflected in this packet.

### Assembly Start

The leg assemblies are very simple to construct. Remember, two of them have to be made for one complete dummy.

Start with the leg supports lying on the table and place the leg tops on top of the leg supports. One side of the angle should be on the outside edge of the leg supports facing up. Once the leg tops are flush in all corners with the leg supports, welds can be placed inside the leg tops to secure the leg supports as seen in Figure 16. Next, the assembly can be flipped over and reinforcing welds can be added to the back side. Figure 17 shows an additional angle (disregard the leg top slider).

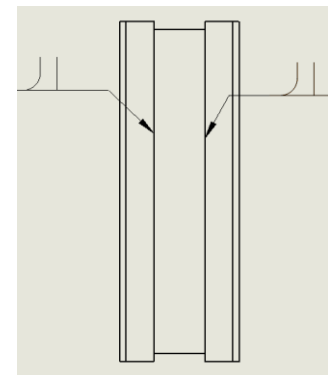
**Figure 16**



**Figure 17**

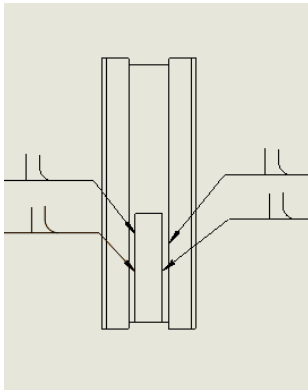
The leg top slider is added next. It is centered on the end of the leg tops and welded on both sides and underneath if possible.

**Figure 18**



### Foot Assembly

The foot sides (left and right, use one of each) are set  $\frac{1}{4}$  inch (6.35 mm) over foot plate. Ensure the holes are on the vertical side and aligned. Then stitch weld down the center of the foot sides from the hole to the closer end of the foot side. After that, the assembly can be flipped over and the foot plate can be stitch welded around its perimeter to the foot sides. Figure 18 shows the placement of the foot side on the foot plate.



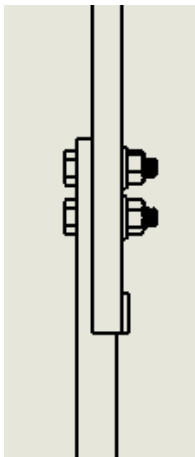
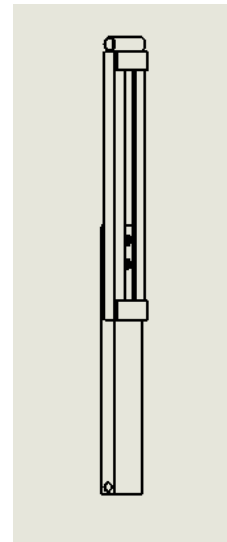
**Figure 19**

The foot weight can be added. The end of it sits flush with the end of the foot plate on the side farthest away from the hole. Weld should be placed on all sides of the foot weight and the stitch weld on the foot side can be continued to this side of the holes.

### Assembling the Legs

Starting with the leg bottom, it can be slid into the leg top assembly. The end of the leg bottom with two centered holes goes into the back side of the leg top assembly. Figure 20 shows this more clearly.

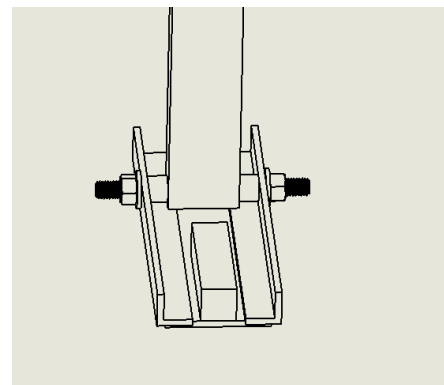
**Figure 20**



**Figure 21**

To secure the leg bottom to the leg top, two (2) ½-13 by 2 inch (50.8 mm) bolts are placed from the back of the leg bottom through the leg tops and then a washer and nut are placed on it. If it becomes difficult to access the bolt while setting up the dummy, the head can be welded to the leg bottom.

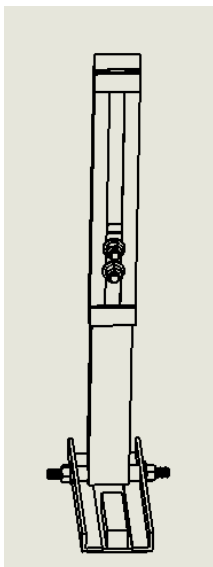
**Figure 22**



The last part to add is the foot assembly. One (1) ½-13 by a 6-inch (152.4 mm) stud is placed through the foot side, leg foot spacer, leg bottom, the second leg foot spacer, and the other foot side. A washer and nut are placed on the outside each foot side to secure it. Extra stud length can be cut off if it becomes an issue during use of the dummy.

**Figure 23**

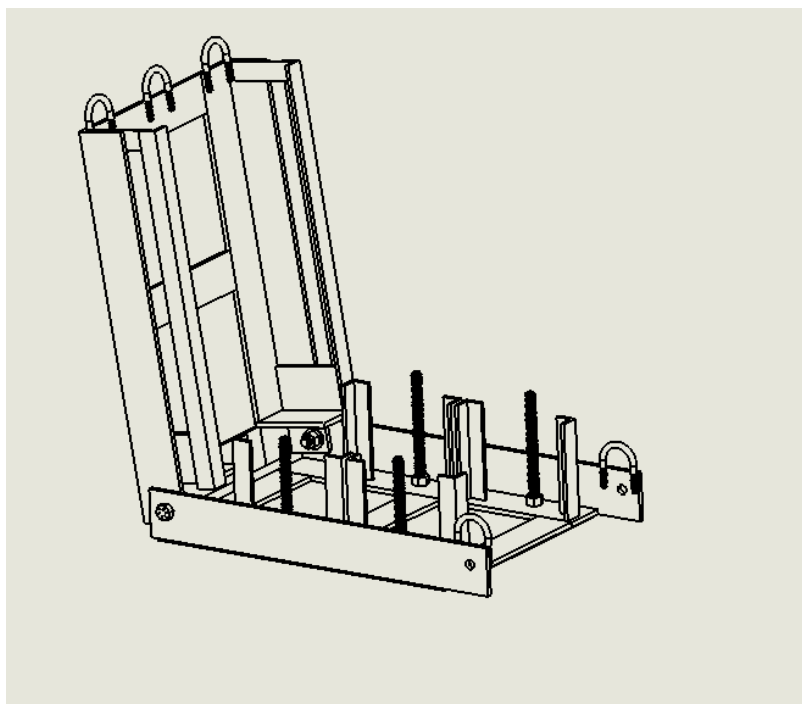
The leg should resemble this Figure 23 when complete.



## 5. Complete Assembly

### Combining the Seat Back Assembly to the Seat Pan Assembly

After all major components have been made, the dummy sections can be assembled. The seat back assembly is bolted to the seat pan assembly using (2) ½-13 x 1½ inch (38.1 mm) hex cap screws, (4) ½ inch (12.7 mm) washers, and (2) ½-13 nuts. The end of the seat back assembly with the two holes is mated to the end of the seat pan assembly without the notched end. The seat back assembly must be positioned between 90° and 110° relative to the base of the seat pan to be joined. The bolt should be placed through the seat pan side, through a washer, through the seat back side, and completed with another washer and nut. The washer in between the seat pan side and seat back side can be eliminated if there is not enough space.



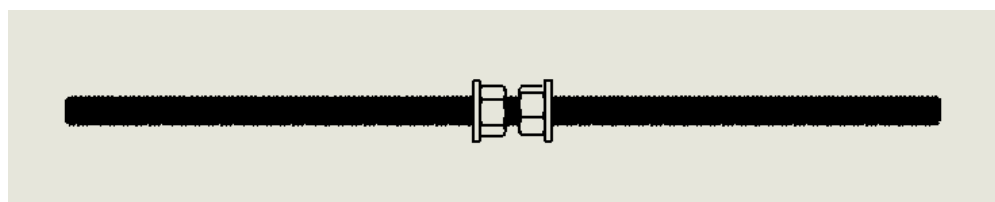
**Figure 24**

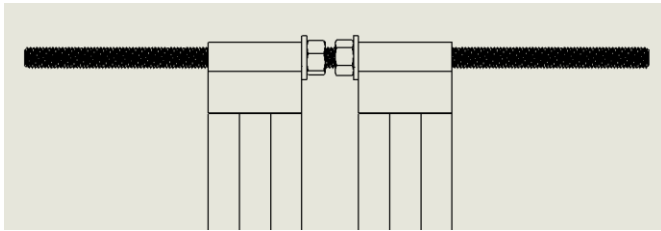
The assembly of the seat back and seat pan should resemble this figure when complete.

### Adding the Legs

The next step is adding the legs. This is done using a (1) ½-13 x 15-inch (381 mm) stud, (8) ½ inch (12.7 mm) washers, and (8) ½-13 inch nuts. This section is slightly difficult to assembly. A washer and nut are placed on each side of the leg top sliders and each side of the seat pan sides. The stud threads the whole way across the dummy. To start, have two nuts close together in the center of the stud and a washer on the outside of each nut as seen in Figure 25.

**Figure 25**



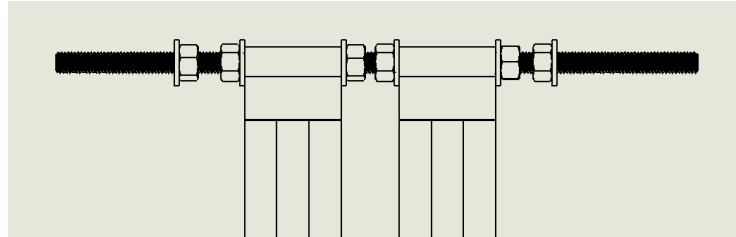


**Figure 26**

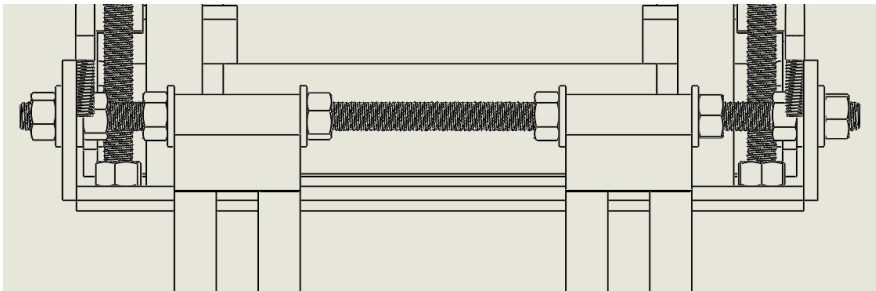
Next, add slide the leg assembly on by feeding the stud through the leg top sliders till they touch the washers.

**Figure 27**

Then, a washer and nut can be added to the outside of the leg top sliders. Following this, an additional nut and washer should be added.



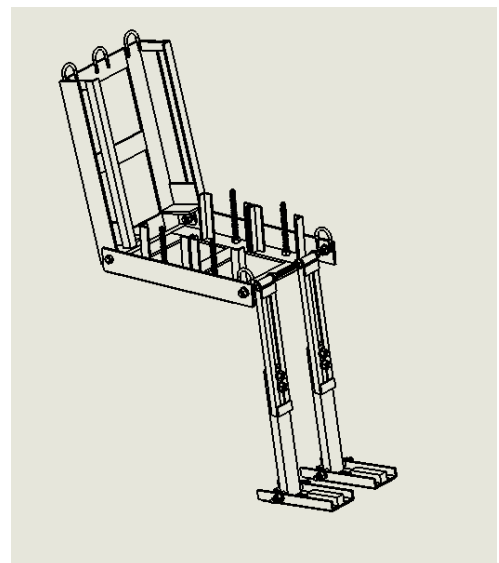
While ensuring that the legs face forward, this assembly can now be added to the seat pan assembly. The stud has to be placed through the holes at a slight angle and then shifted backward to go through the hole on the other side of the seat pan. After that, a washer and nut can be placed on the outside of each seat pan side as seen in Figure 28



**Figure 28**

**Figure 29**

The assembly should resemble this figure when it is complete.



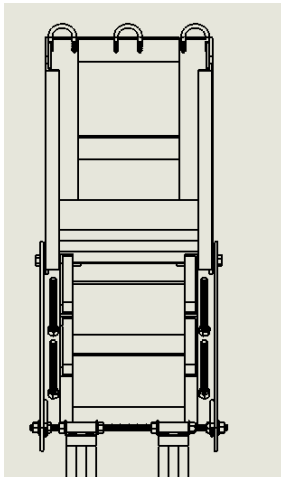
## 6. Weighting the dummy

Note:

This instructional is only to provide you on how to load and secure the weights. ISO 7176 / RESNA WC-1 Volume, 1 Section 11 explains the necessary weight distribution. Adding the weights as described below, makes the dummy weight approximately 100 kg (220 lbs). The weight of each section follows the guidelines in aforementioned standards. However, the exact placement of the weights needs to be tested using blank to determine a proper center of gravity. A wood block may be needed to change the placement of the weight blocks to have the correct center of gravity. Also, rubber or foam dampening material may be needed to reduce the movement of the weight blocks.

### Weighting the Seat Back Assembly

There are two types of weight block for the seat back. The seat back weight block upper is longer than the seat back weight block lower. The seat back weight block lowers (3) are loaded in first. To load them, they must be tilted at a 45° across the opening, slid in, straightened out and then lowered.



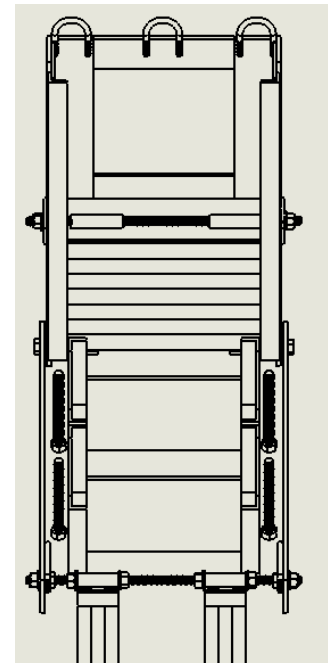
**Figure 30**

This figure shows what the dummy should resemble after all three seat back weight block lowers are installed.

Once all three lowers are in place, (4) seat back weight block uppers are loaded in the same manner.

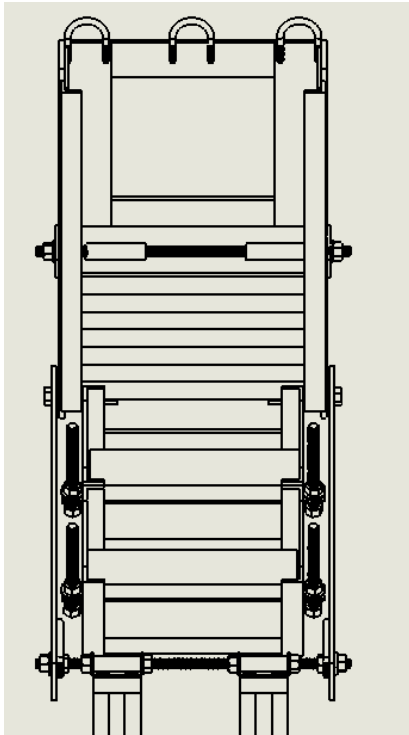
The weights are held in place by the seat back weight clamp assembly that was previously built. It is loaded in the same manner as the weight blocks. The seat back weight clamp tops should be facing up and align with the slot channel in the side of the seat back. It is secured using (1) ½ inch by 15-inch (381 mm) stud. The stud is put through each of the pieces in the following order: the seat back weight clamp, the slot on the side of the seat back assembly, the seat back weight clamp tops, the slot in the other side of the seat back assembly, and the second seat back weight clamp. The seat back weight clamps are followed by one ½ inch (12.7 mm) washer and one ½ -13 nut on each side. When complete, it should resemble Figure 31.

**Figure 31**



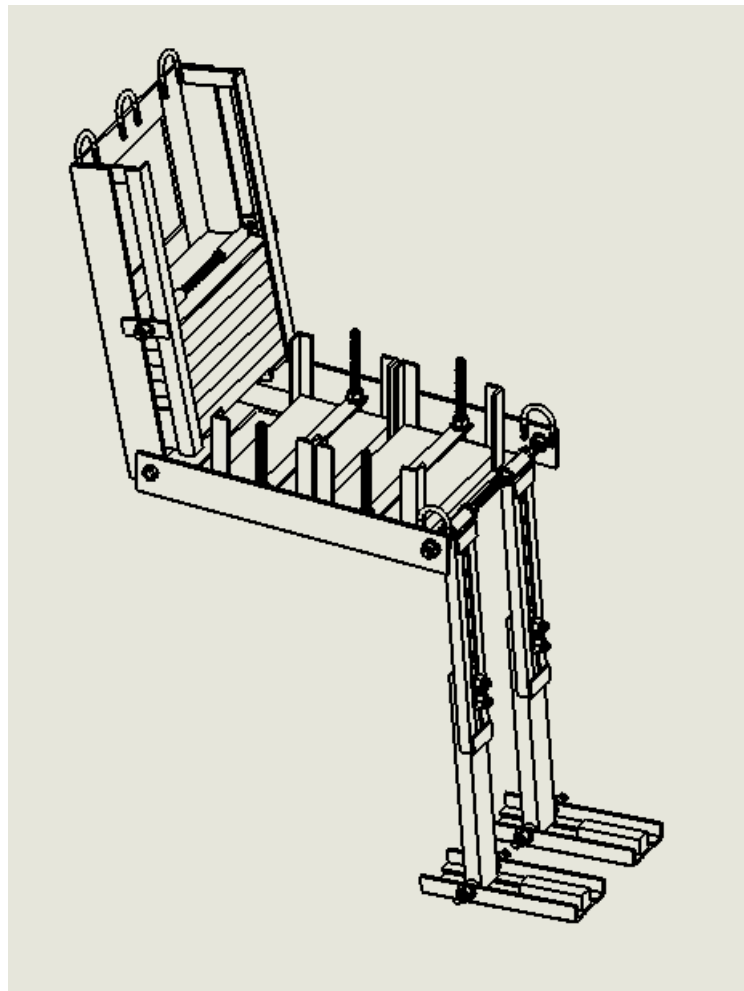
## Weighting the Seat Pan Assembly

The seat pan assembly is fairly simple to weight. The seat pan weight blocks sit in the corrals built with the eight seat pan weight holders. One Seat pan weight block is lowered into each corral, (2) in total, and the seat pan weight block strap is used to secure each weight block. The strap is followed by ½ inch (12.7 mm) washer and ½-13 nut on each stud. Figure 32 shows the completed assembly.



**Figure 32**

This figure shows what the dummy should resemble when the seat pan weight blocks have been added.



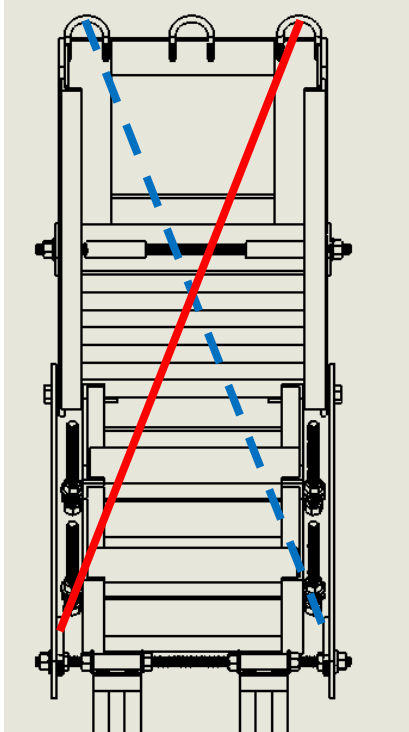
**Figure 33**

This figure shows what the dummy should resemble when all weight blocks have been added.

Note: Both assemblies provide space for additional weight blocks for testing over 100 kg (220 lbs).

## 7. Lifting and moving the dummy

Once the dummy is assembled and properly weighted, it has to be moved. To do this, two straps are placed in an X pattern from the seat back U-bolts to the seat pan U-bolts. The two outside U-bolts on the seat back will be used for this.



**Figure 34**

This figure shows the placement of securement straps to secure the seat back from moving when being lifted.

The dummy can be lifted from the center U-bolt on top of the seat back but not by the straps.





## Bill of Materials

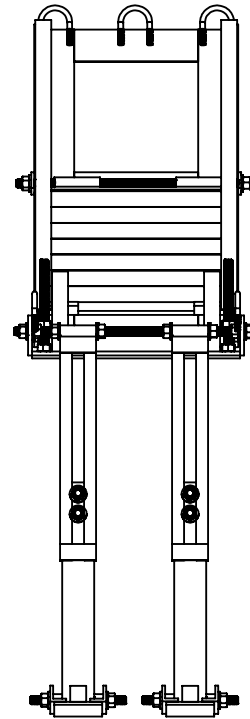
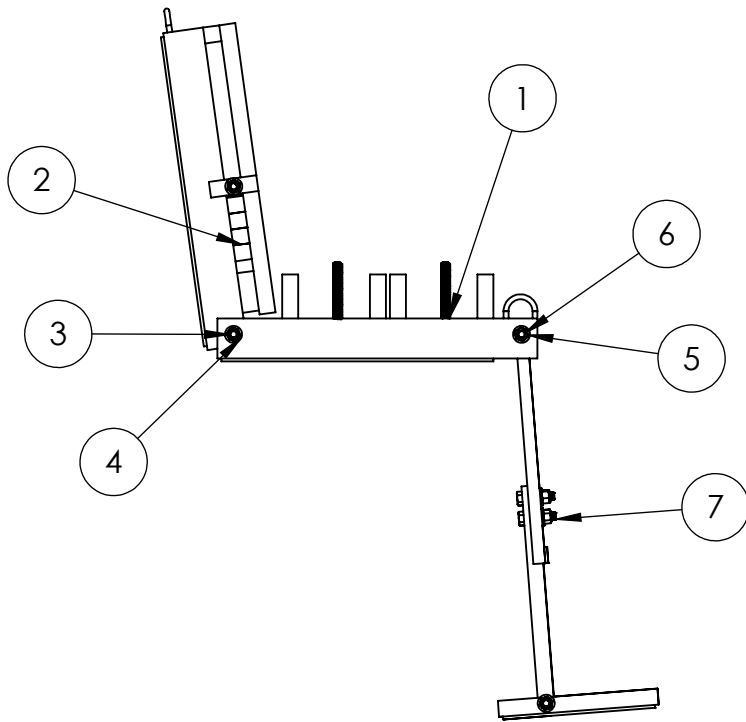
Material	Amount Needed	Units	Source	Part Number	Size to Order	Qty to Order	Cost	Total Cost	Parts for which Material is used	Notes
3/16" A36 Steel Plate	610.375	in <sup>2</sup>	Metals Depot	<a href="#">P1316</a>	2 ft x 4ft	1	\$ 88.24	\$ 88.24	Seat Back Base, Seat Back Weight Holder Side Support, Seat Back Weight Clamp Bottom, Seat Back Weight Clamp, Seat Pan Base, Seat Pan Weight Block Strap, Leg Support, Foot Plate	2- 2 ft x 2 ft sheets would also work
3/4 x 3/4 x 1/8 A36 Steel	56	in	Metals Depot	<a href="#">A1343418</a>	6 ft	1	\$ 9.28	\$ 9.28	Leg Top	
1 x 1 x3/16" A36 Steel Angle	116.5	in	Metals Depot	<a href="#">A111316</a>	6 ft	2	\$ 12.46	\$ 24.92	Seat Back Weight Holder Side, Seat Pan Weight Holder, Foot Side Left, Foot Side Right	
2-1/2 x 2-1/2 x 1/4 A36 Steel Angle	88.2	in	Metals Depot	<a href="#">A121214</a>	8 ft	1	\$ 49.20	\$ 49.20	Seat Back Left Side, Seat Back Right Side, Seat Back Weight Holder Bottom, Seat Pan Left Side, Seat Pan Right Side	
2 x 1/4 A36 Steel Flat Bar	48.75	in	Metals Depot	<a href="#">F2142</a>	6 ft	1	\$ 15.64	\$ 15.64	Seat Back Top Support, Seat Pan Support	
4 x 1 A36 Steel Flat Bar	84.5	in	Metals Depot	<a href="#">F214</a>	8 ft	1	\$ 151.88	\$ 151.88	Seat Back Weight Block Upper, Seat Back Weight Block Lower, Foot Weight	
6 x 1 A36 Steel Flat Bar	20	in	Metals Depot	<a href="#">F216</a>	2 ft	1	\$ 65.08	\$ 65.08	Seat Pan Weight Block	
2 x 1 0.083 Wall A513	28	in	Metals Depot	<a href="#">T12114</a>	4 ft	1	\$ 16.12	\$ 16.12	Leg Bottom	
3/4" x 0.065 Wall A513 Round Steel Tube	12.5	in	Metals Depot	<a href="#">T2W34065</a>	4 ft	1	\$ 7.24	\$ 7.24	Seat Back Weight Clamp Top, Leg Top Slider, Leg Foot Spacer	
							Shipping \$ 129.44			May change due to location
							Metals Depot Total \$ 557.04			
<b>Hardware</b>	<b>Qty Needed</b>		<b>Source</b>		<b>Package Size</b>	<b>Orders to Order</b>	<b>Cost</b>	<b>Total Cost</b>	<b>Parts for which Hardware is used</b>	<b>Notes</b>
1/2-13 x 15" Stud	2		McMaster Carr	<a href="#">98790A063</a>	1	2	\$ 1.97	\$ 3.94	Seat Back Clamp, Leg Pivot	Plain Finish, 18" long that can be cut down
1/2-13 x 6" Stud	6		McMaster Carr	<a href="#">91565A736</a>	5	2	\$ 8.50	\$ 17.00	Seat Pan Weight Holder, Foot	Plain Finish
1/2-13 x 1.5" Bolt	2		McMaster Carr	<a href="#">92965A716</a>	10	1	\$ 8.40	\$ 8.40	Seat Back to Seat Pan	Plain Finish
1/2-13 x 2" Bolt	4		McMaster Carr	<a href="#">92965A720</a>	10	1	\$ 9.78	\$ 9.78	Legs	Plain Finish
5/16/18 x 1-1/2" U-bolt	5		McMaster Carr	<a href="#">3201T33</a>	1	5	\$ 1.04	\$ 5.20	Seat Back, Seat Pan	Plain Finish
1/2 Flat Washer	26		McMaster Carr	<a href="#">98023A033</a>	25	2	\$ 6.00	\$ 12.00	Seat Back, Seat Pan, Legs	Plain Finish, could not find on McMaster
1/2-13 Nut	28		McMaster Carr	<a href="#">95479A121</a>	25	2	\$ 10.73	\$ 21.46	Seat Back, Seat Pan, Legs	Plain Finish
							Shipping			
					McMaster Carr Total			\$ 77.78		
					Final Total			\$ 634.82		

2

1

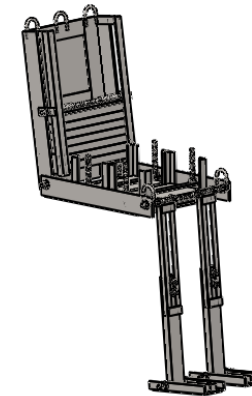
B

B



ITEM NO.	PART NUMBER	Default/ QTY.
1	Seat pan assembly V2	1
2	Seat back assembly V2	1
3	0.5" x 1.5" Bolt	2
4	0.5" Flat Washer	12
5	0.5" Nut	10
6	0.5" x 15" Stud	1
7	Leg V2.1	2

Quantity 1



A

A



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TITLE:			
<b>Complete Assembly V2.1</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Material <not specified>		Plain	
TOLERANCES:			
SCALE:	SIZE:	DATE:	REV:
1:24	A	12/8/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 220.62	SHEET 1 OF 1

2

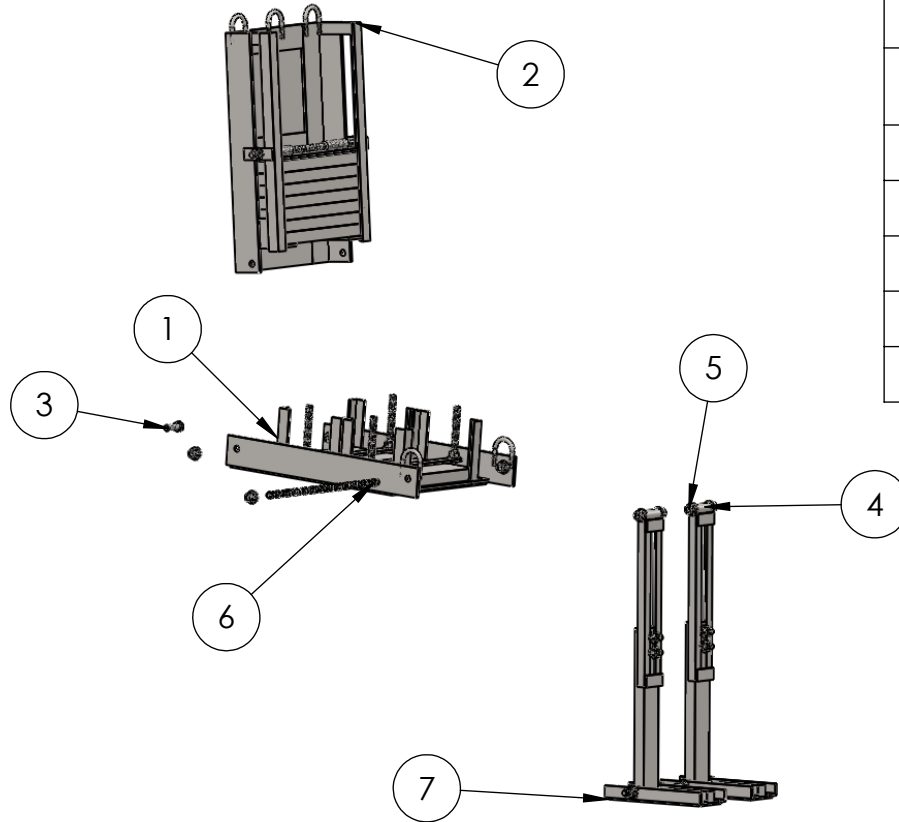
1

2

1

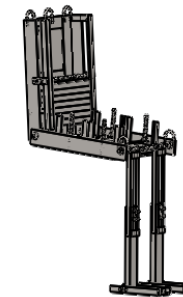
B

B



ITEM NO.	PART NUMBER	Exploded/QTY.
1	Seat pan assembly V2	1
2	Seat back assembly V2	1
3	0.5" x 1.5" Bolt	2
4	0.5" Flat Washer	12
5	0.5" Nut	10
6	0.5" x 15" Stud	1
7	Leg V2.1	2

Quantity 1



A

A



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TITLE: <b>Complete Assembly Exploded V2.1</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL: Material <not specified>		FINISH: Plain	
TOLERANCES:			
SCALE: 1:32	SIZE: A	DATE: 12/11/2017	REV: 3
DO NOT SCALE DRAWING		WEIGHT (LBS): 220.62	SHEET 1 OF 1

2

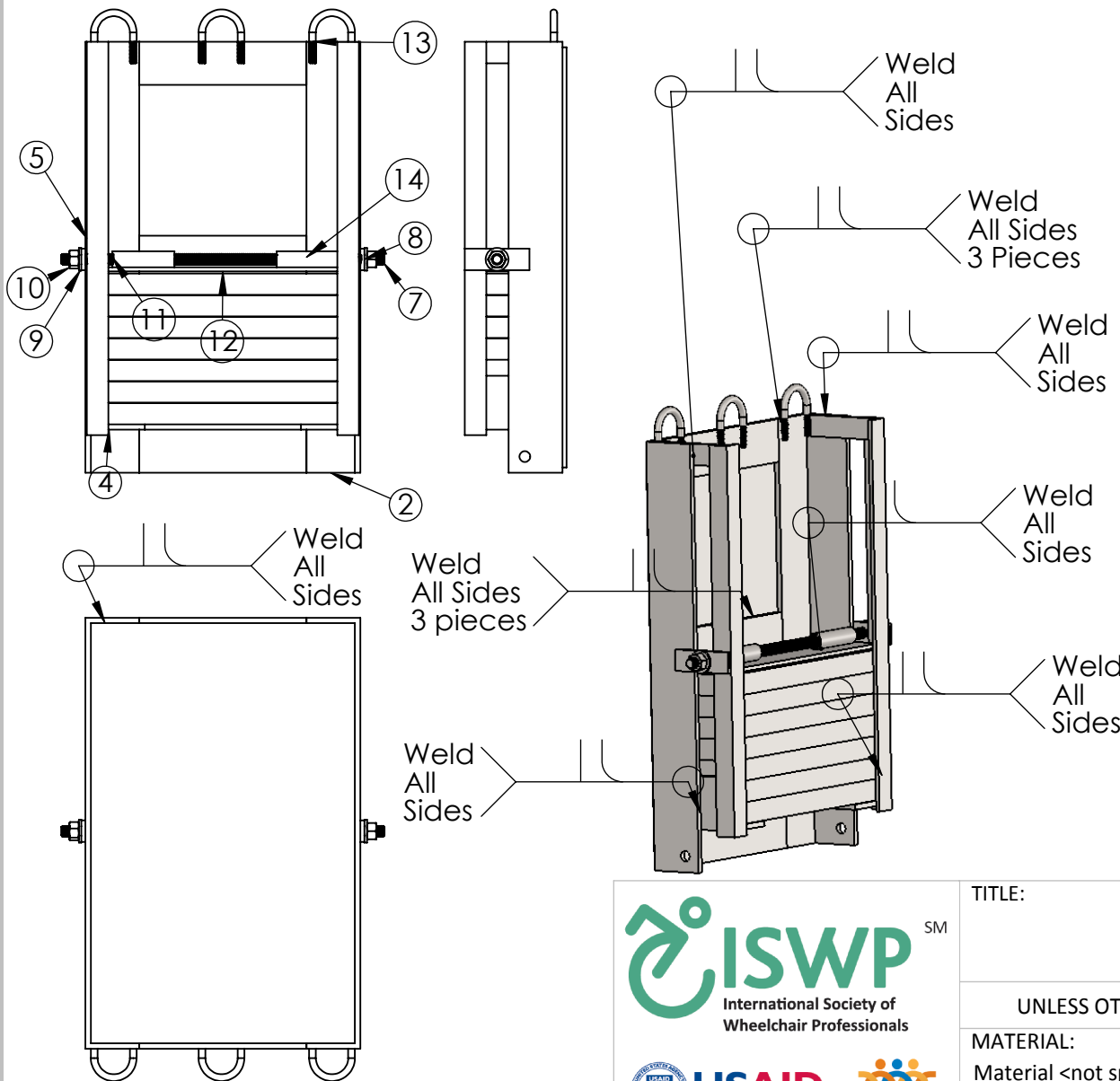
1

2

1

B

B



ITEM NO.	PART NUMBER	Default/ QTY.
1	Seat back base V2	1
2	Seat back side V2	1
3	Seat back side V2	1
4	Seat back weight holder bottom V2	2
5	Seat back weight holder side V2	2
6	Seat back weight holder side support V2	2
7	0.5" x 15" Stud	1
8	Seat back weight clamp V2	2
9	0.5" Flat Washer	2
10	0.5" Nut	2
11	Seat back weight clamp top V2	2
12	Seat back weight clamp bottom V2	1
13	1.5" U-bolt	3
14	Seat back top support V2	3
15	Seat back weight block lower V2	3
16	Seat back weight block upper V2	4

A

A

Quantity 1  
Weight Blocks  
Not shown



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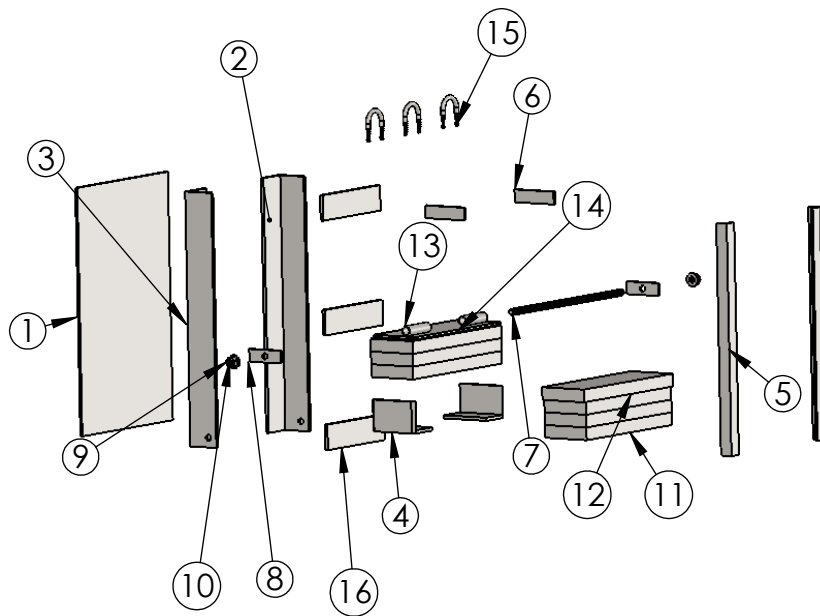
TITLE: <b>Seat back assembly V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL: Material <not specified>		FINISH: Plain	
TOLERANCES:			
SCALE: 1:8	SIZE: A	DATE: 12/11/2017	REV: 3
DO NOT SCALE DRAWING		WEIGHT (LBS): 132.88	SHEET 1 OF 1

2

1

2

1



ITEM NO.	PART NUMBER	Exploded/QTY.
1	Seat back base V2	1
2	Seat back side V2 R	1
3	Seat back side V2 L	1
4	Seat back weight holder bottom V2	2
5	Seat back weight holder side V2	2
6	Seat back weight holder side support V2	2
7	0.5" x 15" Stud	1
8	Seat back weight clamp V2	2
9	0.5" Flat Washer	2
10	0.5" Nut	2
11	Seat back weight block lower V2	3
12	Seat back weight block upper V2	4+
13	Seat back weight clamp top V2	2
14	Seat back weight clamp bottom V2	1
15	1.5" U-bolt	3
16	Seat back top support V2	3



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TITLE:

## Seat back assembly Exploded V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Material &lt;not specified&gt;

FINISH:

Plain

TOLERANCES:

SCALE:

1:24

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 132.88

SHEET 1 OF 1

Quantity 1

2

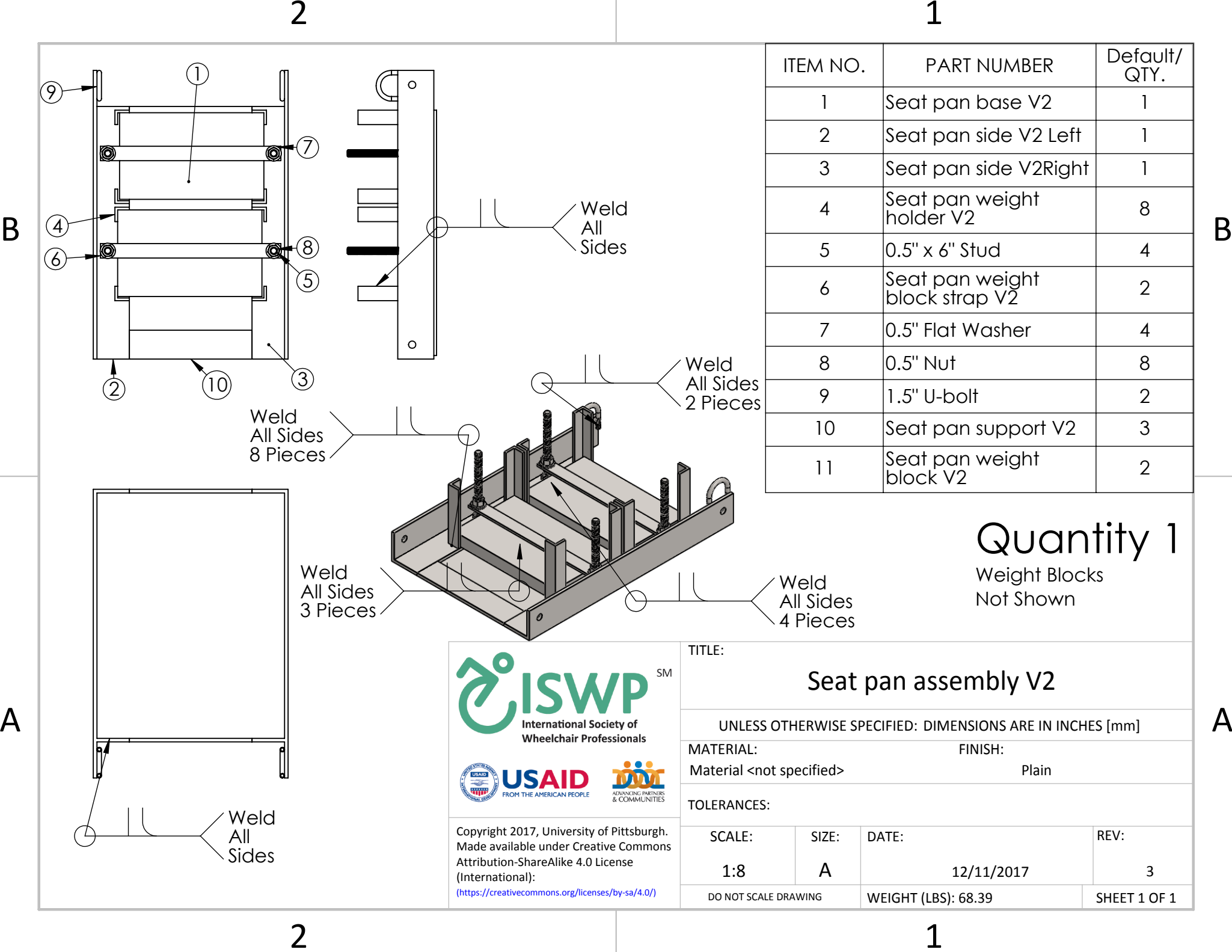
1

B

B

A

A



ITEM NO.	PART NUMBER	Default/QTY.
1	Seat pan base V2	1
2	Seat pan side V2 Left	1
3	Seat pan side V2Right	1
4	Seat pan weight holder V2	8
5	0.5" x 6" Stud	4
6	Seat pan weight block strap V2	2
7	0.5" Flat Washer	4
8	0.5" Nut	8
9	1.5" U-bolt	2
10	Seat pan support V2	3
11	Seat pan weight block V2	2

**Quantity 1**  
 Weight Blocks  
 Not Shown



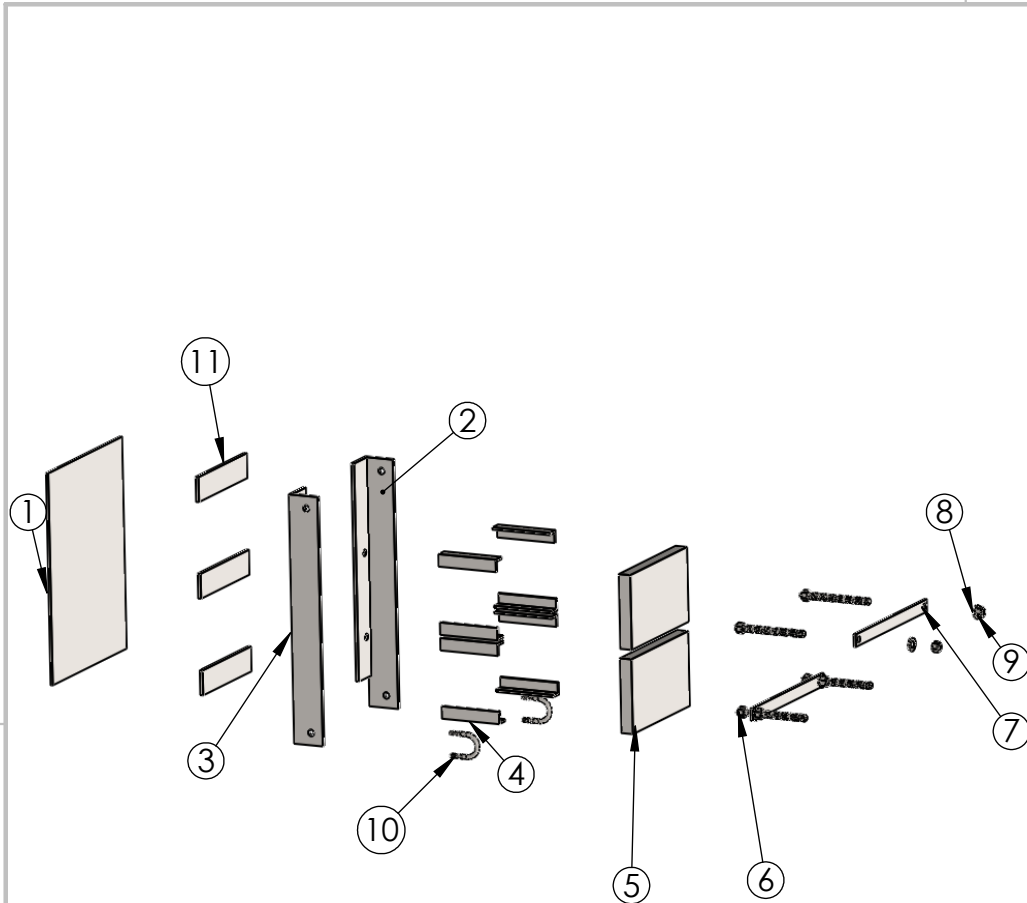
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TITLE: <b>Seat pan assembly V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL: Material <not specified>		FINISH: Plain	
TOLERANCES:			
SCALE: 1:8	SIZE: A	DATE: 12/11/2017	REV: 3
DO NOT SCALE DRAWING		WEIGHT (LBS): 68.39	SHEET 1 OF 1

2

1

B



ITEM NO.	PART NUMBER	Exploded/QTY.
1	Seat pan base V2	1
2	Seat pan side V2 L	1
3	Seat pan side V2 R	1
4	Seat pan weight holder V2	8
5	Seat pan weight block V2	2+
6	0.5" x 6 Stud	4
7	Seat pan weight block strap V2	2
8	0.5" Flat Washer	4
9	0.5" Nut	8
10	1.5" U-bolt	2
11	Seat pan support V2	3

B

Quantity 1

A



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TITLE:

Seat pan assembly Exploded V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Material &lt;not specified&gt;

FINISH:

Plain

TOLERANCES:

SCALE:

1:24

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 68.39

SHEET 1 OF 1

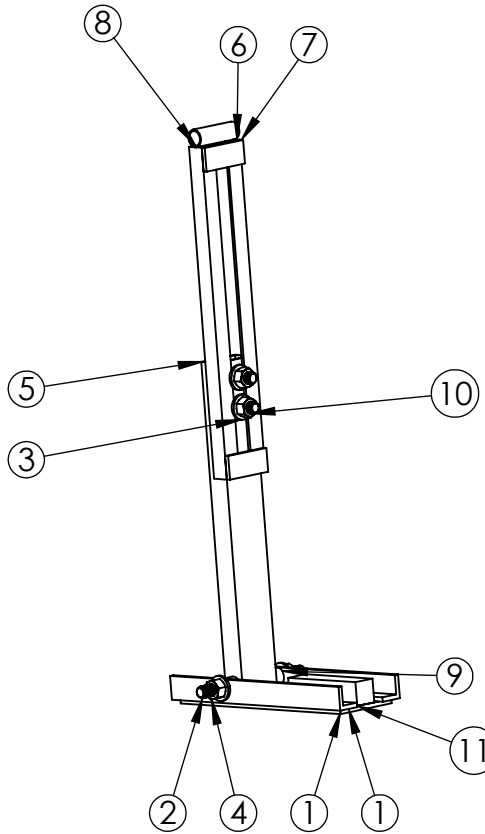
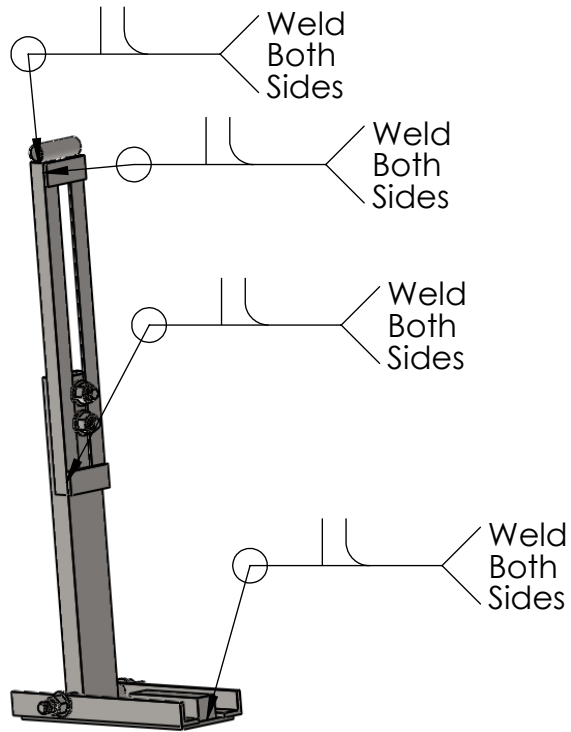
2

1

A

2

1



ITEM NO.	PART NUMBER	QTY.
1	Foot Assembly V2	1
2	0.5" x 6" Stud	1
3	0.5" Flat Washer	4
4	0.5" Nut	4
5	Leg bottom V2.1	1
6	Leg top V2.1	2
7	Leg support V2.1	2
8	Leg top slider V2.1	1
9	Leg Foot spacer V2.1	2
10	0.5" x 2" Bolt	2
11	Foot Weight	1

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# Quantity 2

See Foot Assembly for separate weld instructions



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FROM THE AMERICAN PEOPLE



ADVANCING PARTNERS  
& COMMUNITIES

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TITLE:

## Leg V2.1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Material <not specified>

FINISH:

Plain

TOLERANCES:

SCALE:

1:8

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 8.88

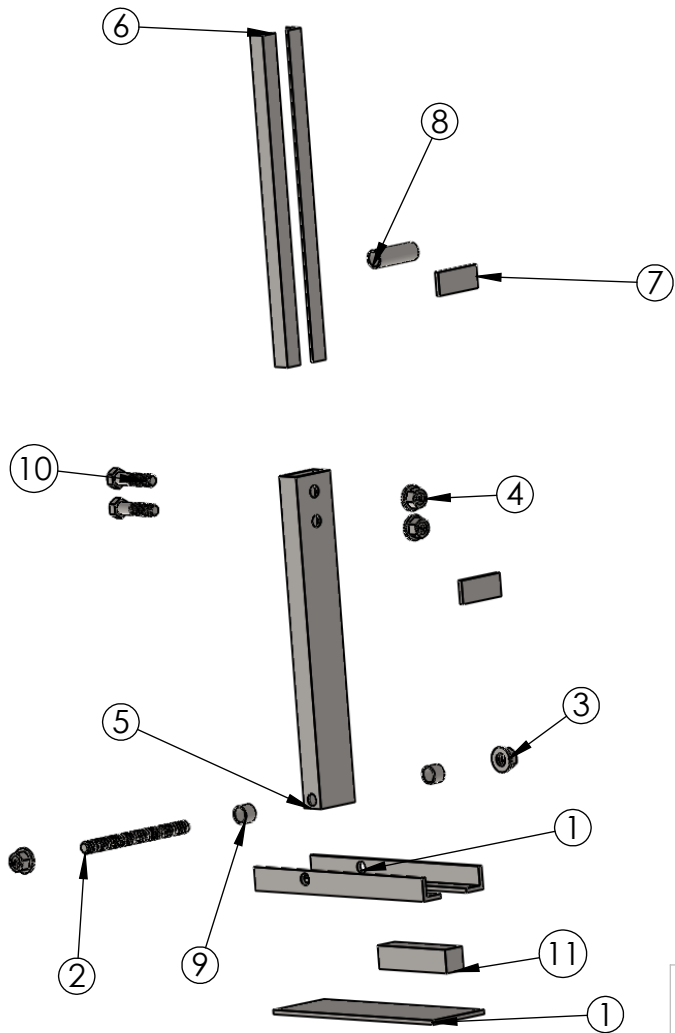
SHEET 1 OF 1

2

1



B



A

2

1

ITEM NO.	PART NUMBER	QTY.
1	Foot Assembly V2	1
2	0.5" x 6" Stud	1
3	0.5" Flat Washer	4
4	0.5" Nut	4
5	Leg bottom V2.1	1
6	Leg top V2.1	2
7	Leg support V2.1	2
8	Leg top slider V2.1	1
9	Leg Foot spacer V2.1	2
10	0.5" x 2" Bolt	2
11	Foot Weight	1

B

Quantity 2

A



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TITLE:

Leg Exploded V2.1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Material &lt;not specified&gt;

FINISH:

Plain

TOLERANCES:

SCALE:

1:16

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

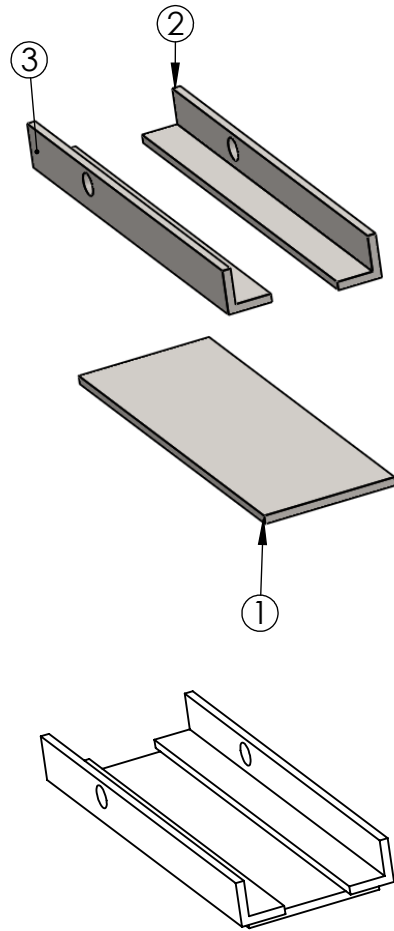
WEIGHT (LBS): 8.88

SHEET 1 OF 1

1

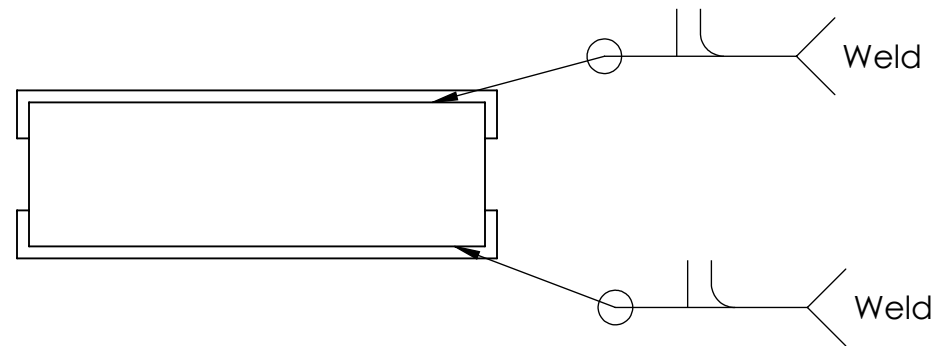
2

1



ITEM NO.	PART NUMBER	Exploded/QTY.
1	Foot plate V2	1
2	Foot side V2 Left	1
3	Foot side V2 Right	1

Quantity 2



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TITLE:

Foot Assembly V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Material &lt;not specified&gt;

FINISH:

Plain

TOLERANCES:

SCALE:

1:4

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 3.40

SHEET 1 OF 1

2

1

B

B

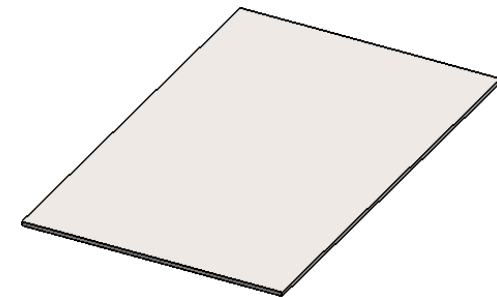
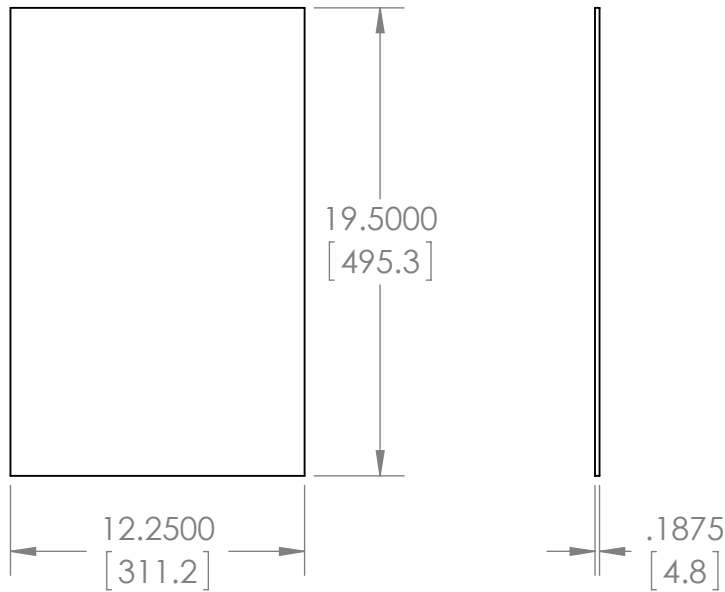
A

A

2

1

Quantity 1  
3/16" Steel Plate



B

B

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A



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TITLE:				Seat back base V2	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]					
MATERIAL:			FINISH:		
Plain Carbon Steel			Plain		
TOLERANCES:		+ 0.1000		- 0.1000	
SCALE:	SIZE:	DATE:	REV:		
1:8	A	12/11/2017	3		
DO NOT SCALE DRAWING		WEIGHT (LBS): 12.62		SHEET 1 OF 1	

2

1

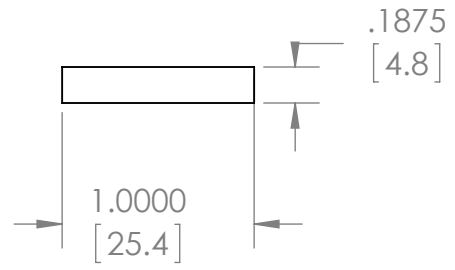
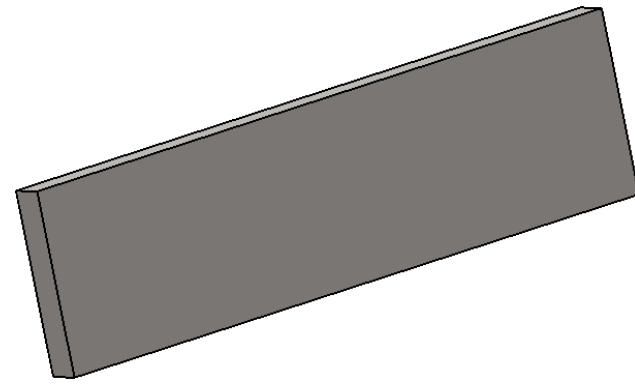
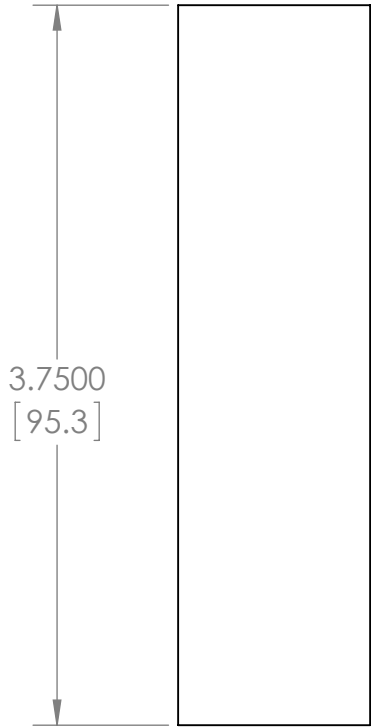
2

1

B

B

Quantity 2  
3/16" Steel Plate



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TITLE:			
Seat back weight holder side support V2			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000 - 0.1000	
SCALE:	SIZE:	DATE:	REV:
1:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.20	SHEET 1 OF 1

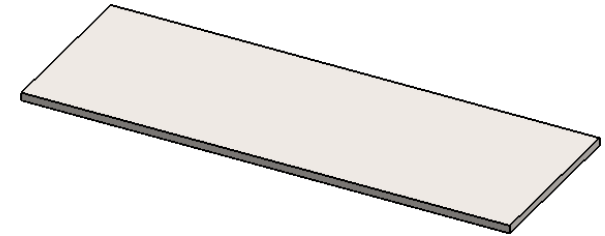
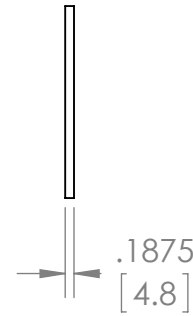
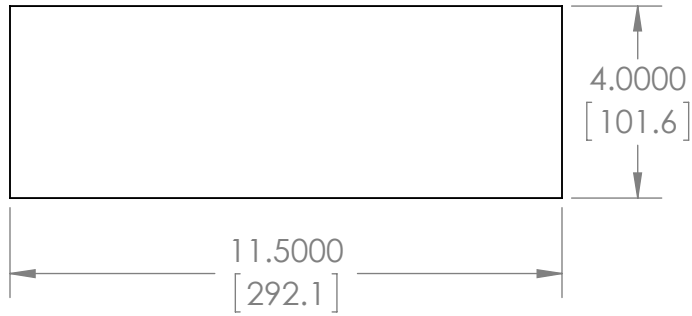
2

1

2

1

Quantity 1  
3/16" Steel Plate



B

B

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A



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TITLE:

Seat back weight clamp bottom V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:4

SIZE:

A

DATE:

12/11/2017

REV:

3

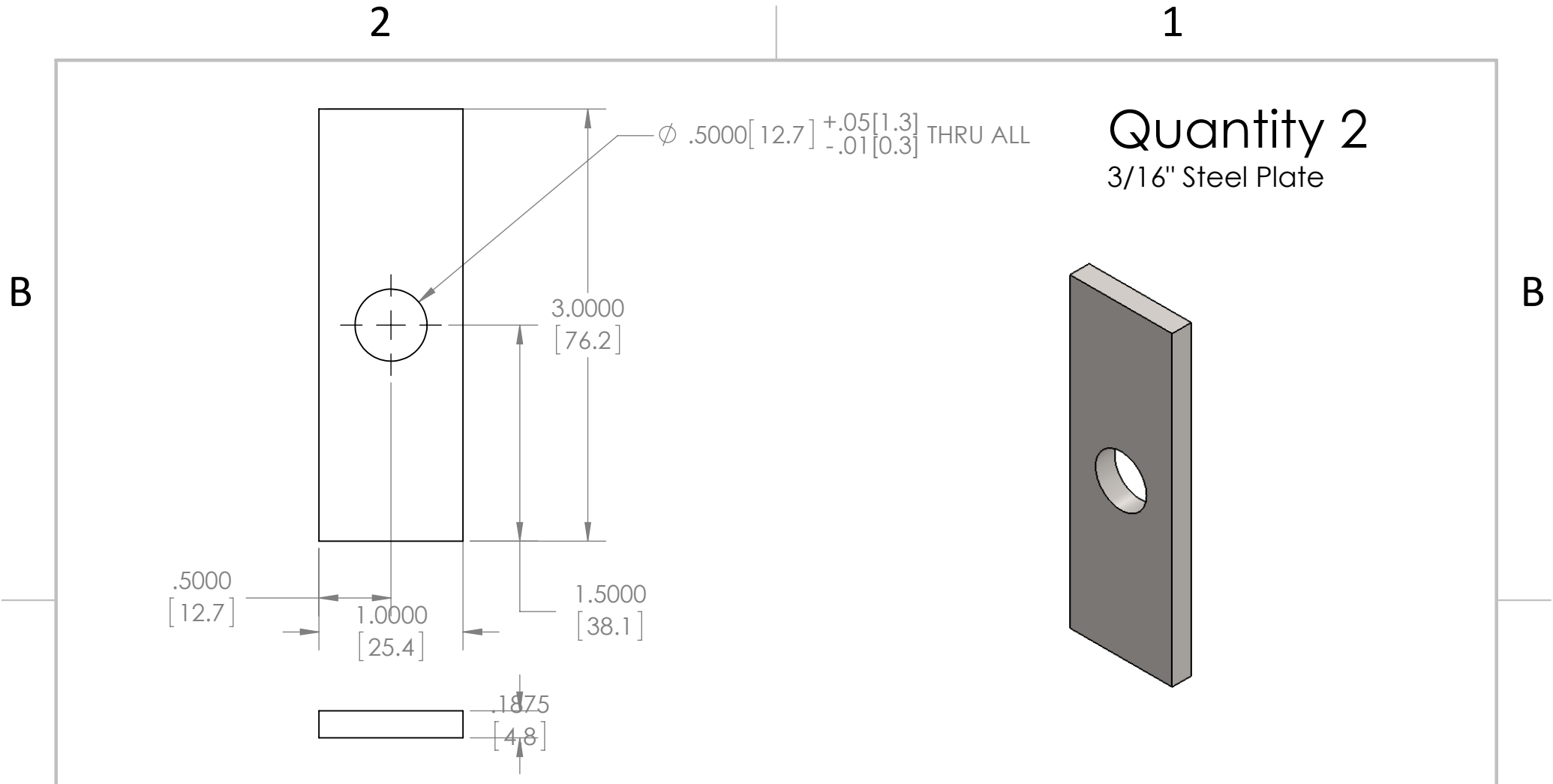
DO NOT SCALE DRAWING

WEIGHT (LBS): 2.43

SHEET 1 OF 1

2

1



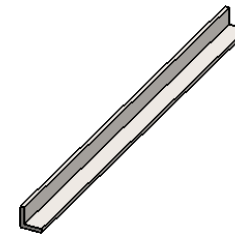
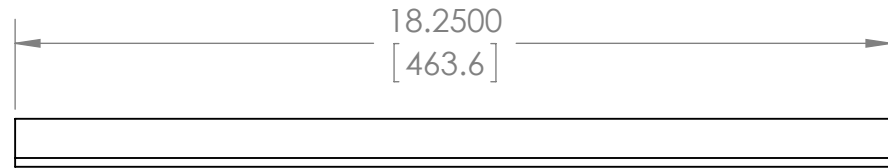
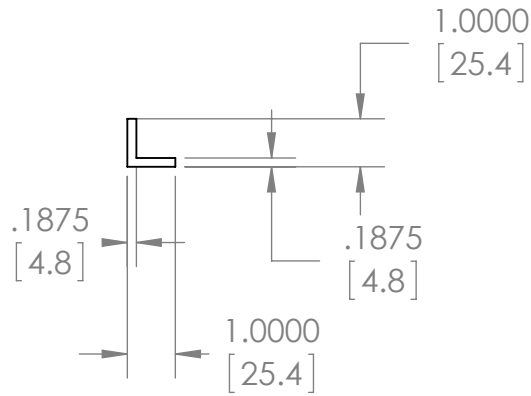
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TITLE:			
<b>Seat back weight clamp V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.15	SHEET 1 OF 1

2

1

Quantity 2  
1" x 1" x 3/16" Steel  
Angle Iron



B

B

A

A



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TITLE:

Seat back weight holder side V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:8

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 1.75

SHEET 1 OF 1

2

1

2

1

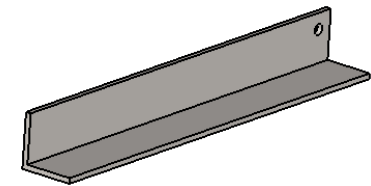
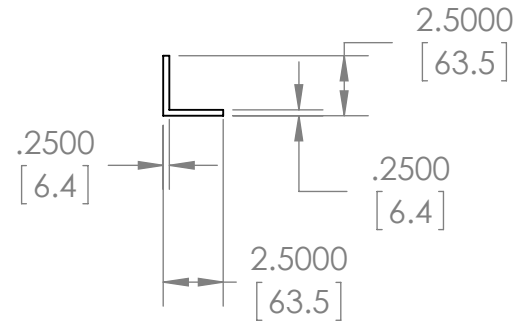
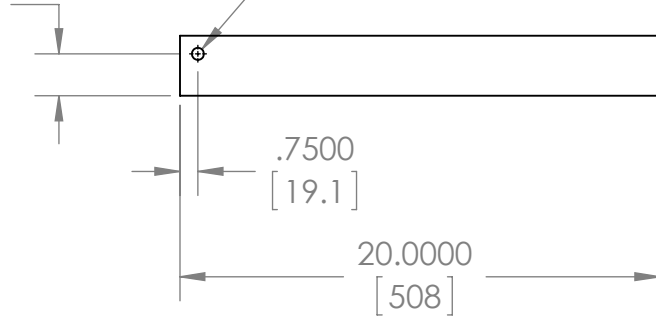
# Quantity 1

2-1/2" x 2-1/2" x 1/4" Steel  
Angle Iron

**Left Side**

$\phi .50000 [12.7] \begin{matrix} +.05 [1.3] \\ -.01 [0.3] \end{matrix}$  THRU ALL

1.7500  
[44.5]



B

B

A

A



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TITLE:

### Seat back Left side V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:8

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS):

SHEET 1 OF 1

2

1



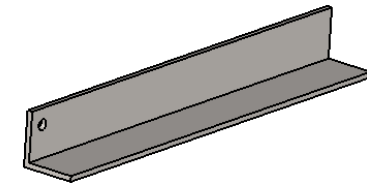
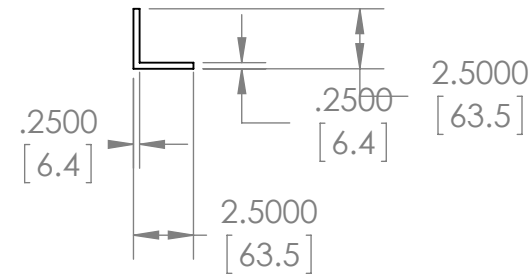
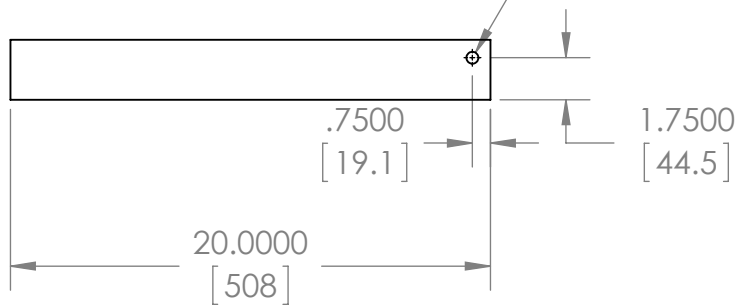
2

1

# Quantity 1

2-1/2" x 2-1/2" x 1/4" Steel  
Angle Iron  
**Right Side**

$\phi .50000 [12.7]^{+.05 [1.3]}_{-.01 [0.3]}$  THRU ALL



B

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TITLE:

## Seat back Right side V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:8

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS):

SHEET 1 OF 1

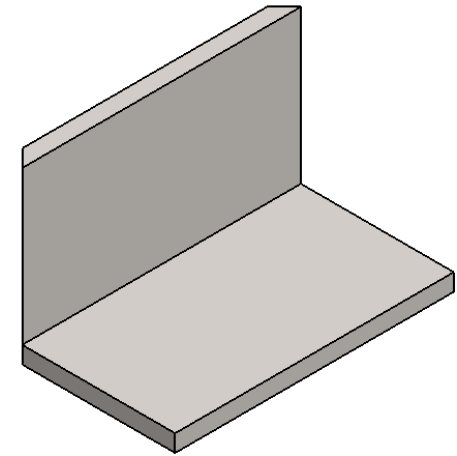
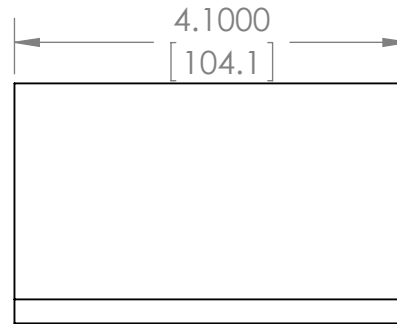
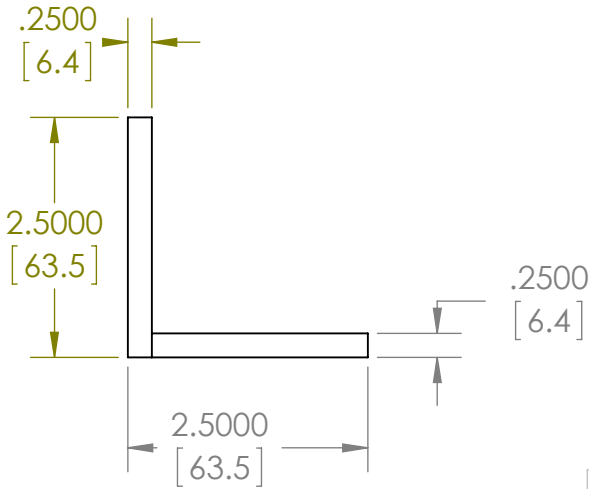
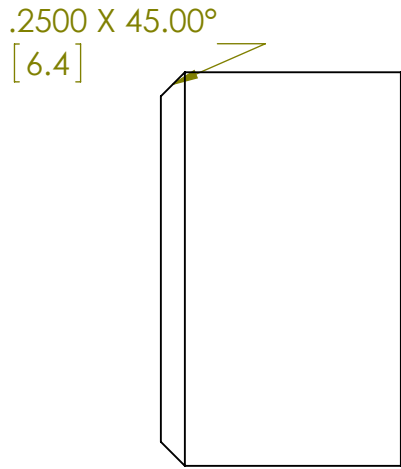
2

1

2

1

Quantity 2  
 2-1/2" x 2-1/2" x 1/4"  
 Steel Angle Iron



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TITLE:			
Seat back weight holder bottom V2			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+0.1000	-0.0000
SCALE:	SIZE:	DATE:	REV:
1:2	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 1.33	SHEET 1 OF 1

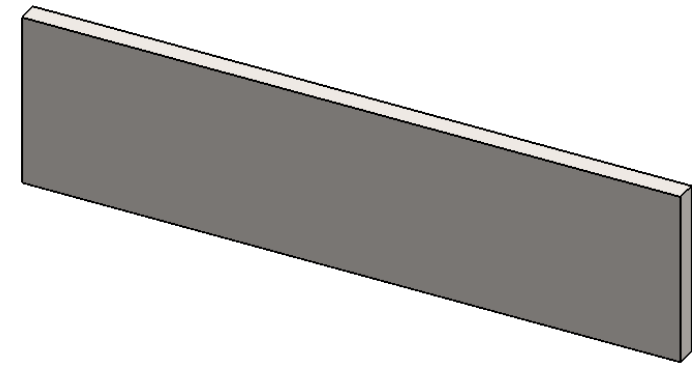
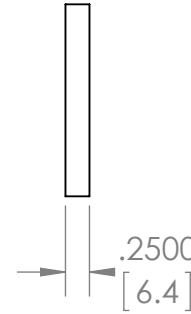
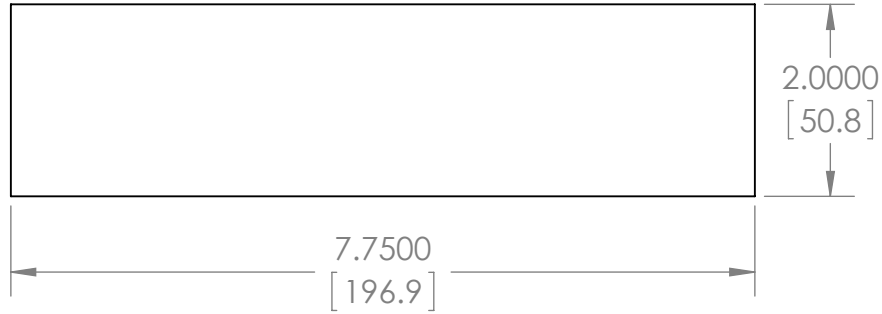
2

1

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1

Quantity 3  
2" x 1/4" Steel Flat Bar



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TITLE:			
Seat back top support V2			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:2	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 1.09	SHEET 1 OF 1

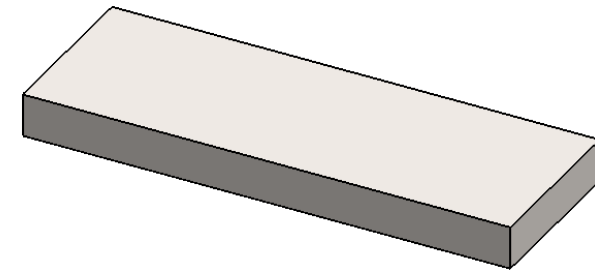
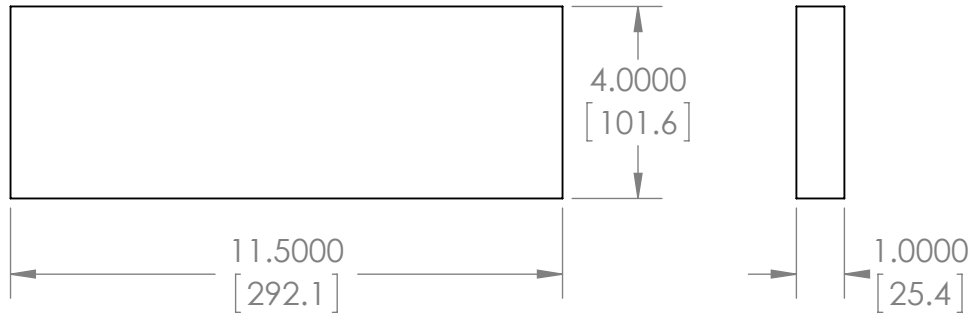
2

1

2

1

Quantity 3  
4" x 1" Steel Flat Bar



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TITLE:			
<b>Seat back weight block lower V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 12.96	SHEET 1 OF 1

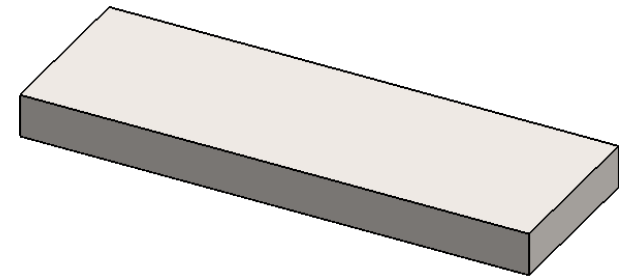
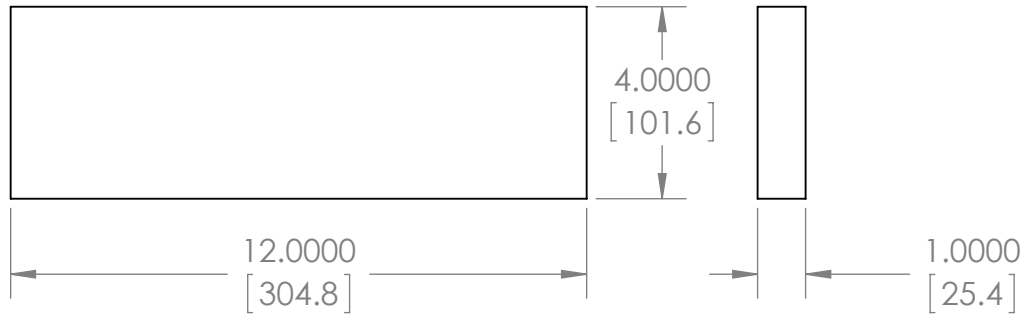
2

1

2

1

Quantity 4+  
4" x 1" Steel Flat Bar



B

B

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TITLE:

Seat back weight block upper V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:4

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 13.53

SHEET 1 OF 1

2

1

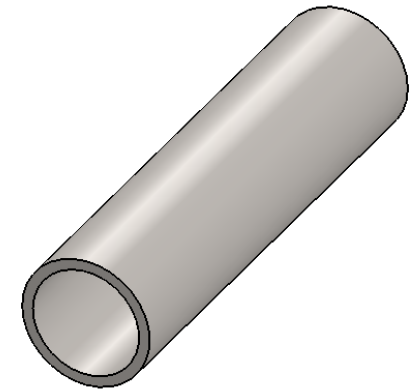
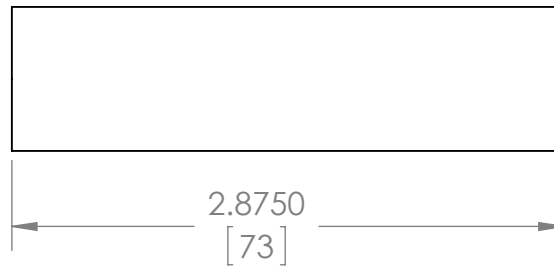
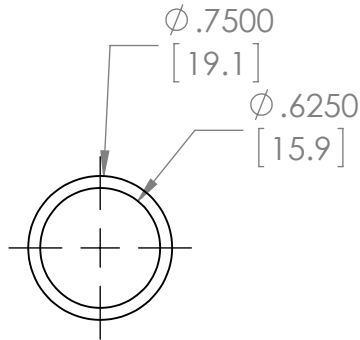
2

1

Quantity 2  
3/4" Steel Tubing

B

B



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TITLE:

Seat back weight clamp top V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:1

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 0.11

SHEET 1 OF 1

2

1

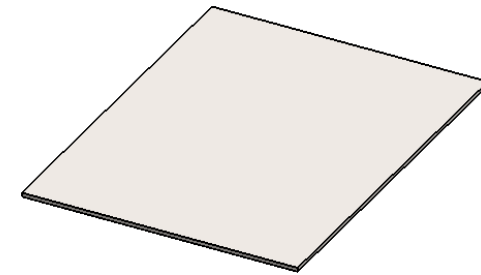
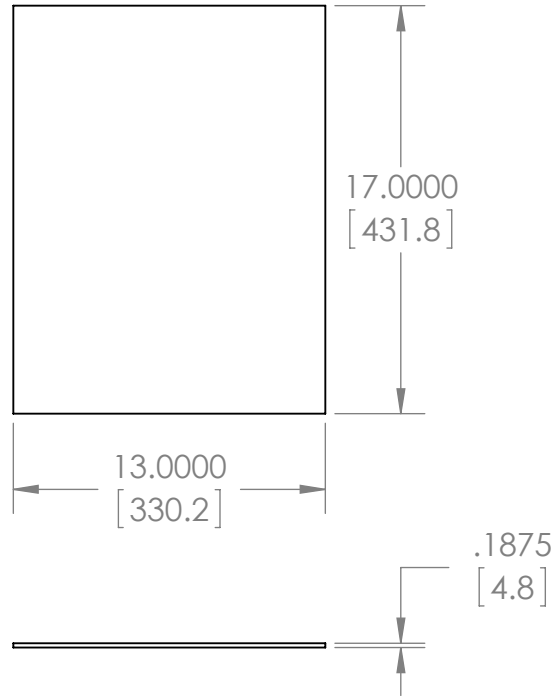
2

1

Quantity 1  
3/16" Plate Steel

B

B



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TITLE:			
Seat pan base V2			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:8	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 11.68	SHEET 1 OF 1

2

1

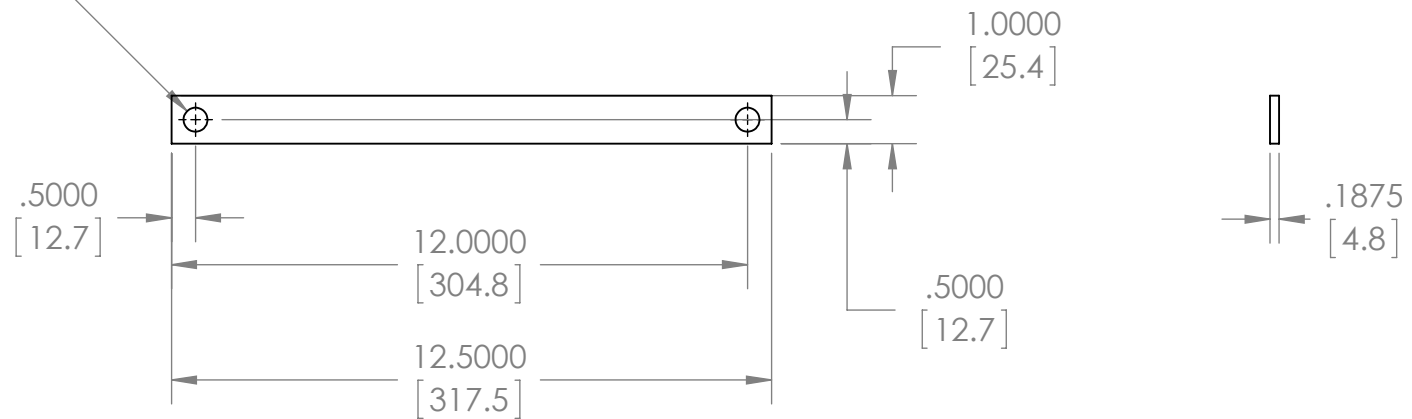
2

1

# Quantity 2

3/16" Plate Steel

2X  $\phi$  .5000 [12.7]  $\begin{matrix} +.05 [1.3] \\ -.05 [1.3] \end{matrix}$  THRU ALL



B

B

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TITLE:			
Seat pan weight block strap V2			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.0500 - 0.0500	
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.64	SHEET 1 OF 1

2

1

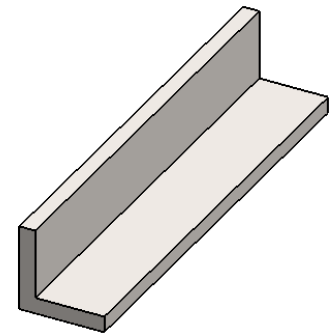
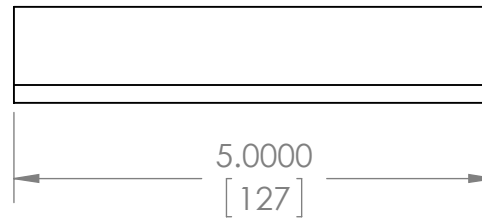
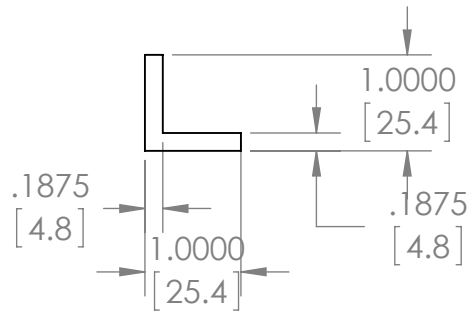


2

1

# Quantity 8

1" x 1" x 3/16" Steel Angle Iron



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TITLE:			
<b>Seat pan weight holder V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:2	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.48	SHEET 1 OF 1

2

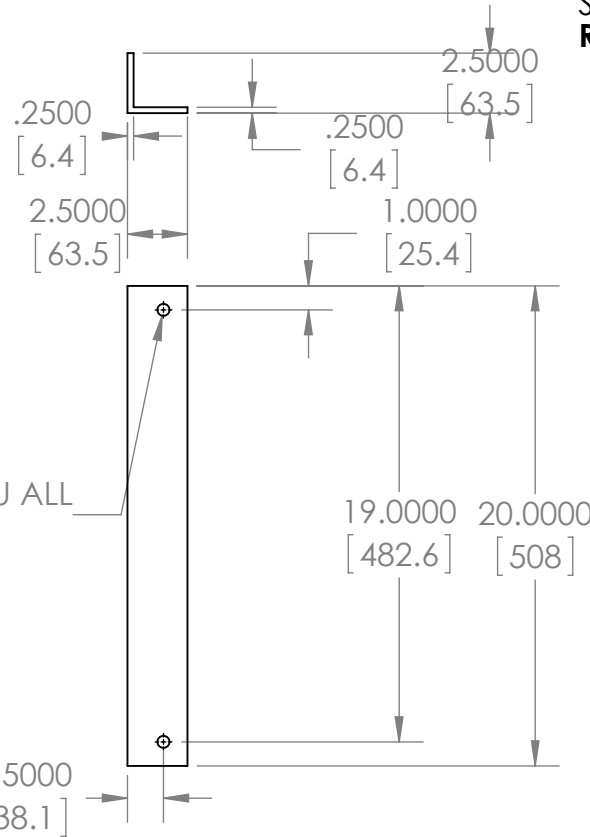
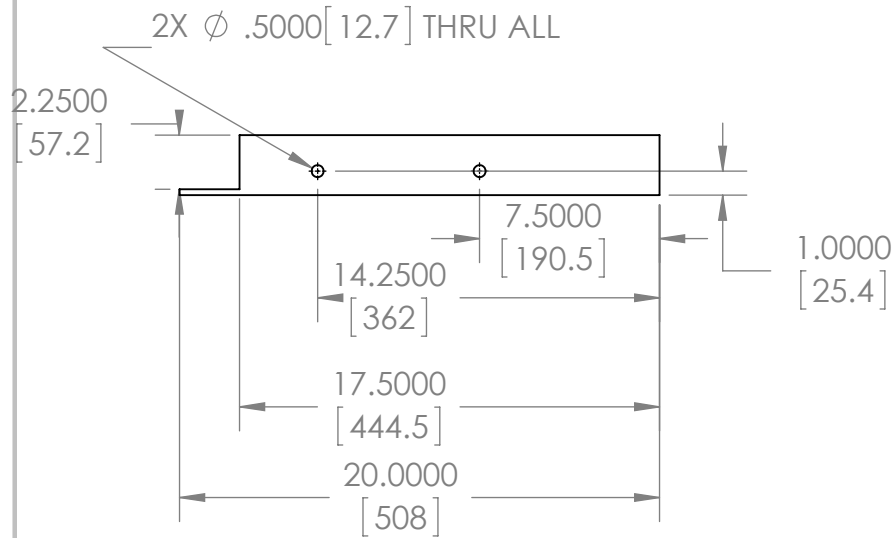
1

2

1

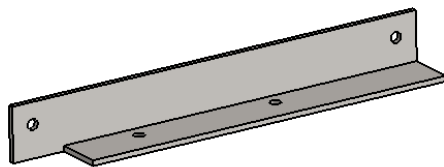
# Quantity 1

2-1/2" x 2-1/2" x 1/4"  
Steel Angle Iron  
Right Side



B

B



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TITLE:

## Seat pan Right side V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.0500

- 0.0500

SCALE:

1:8

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 6.24

SHEET 1 OF 1

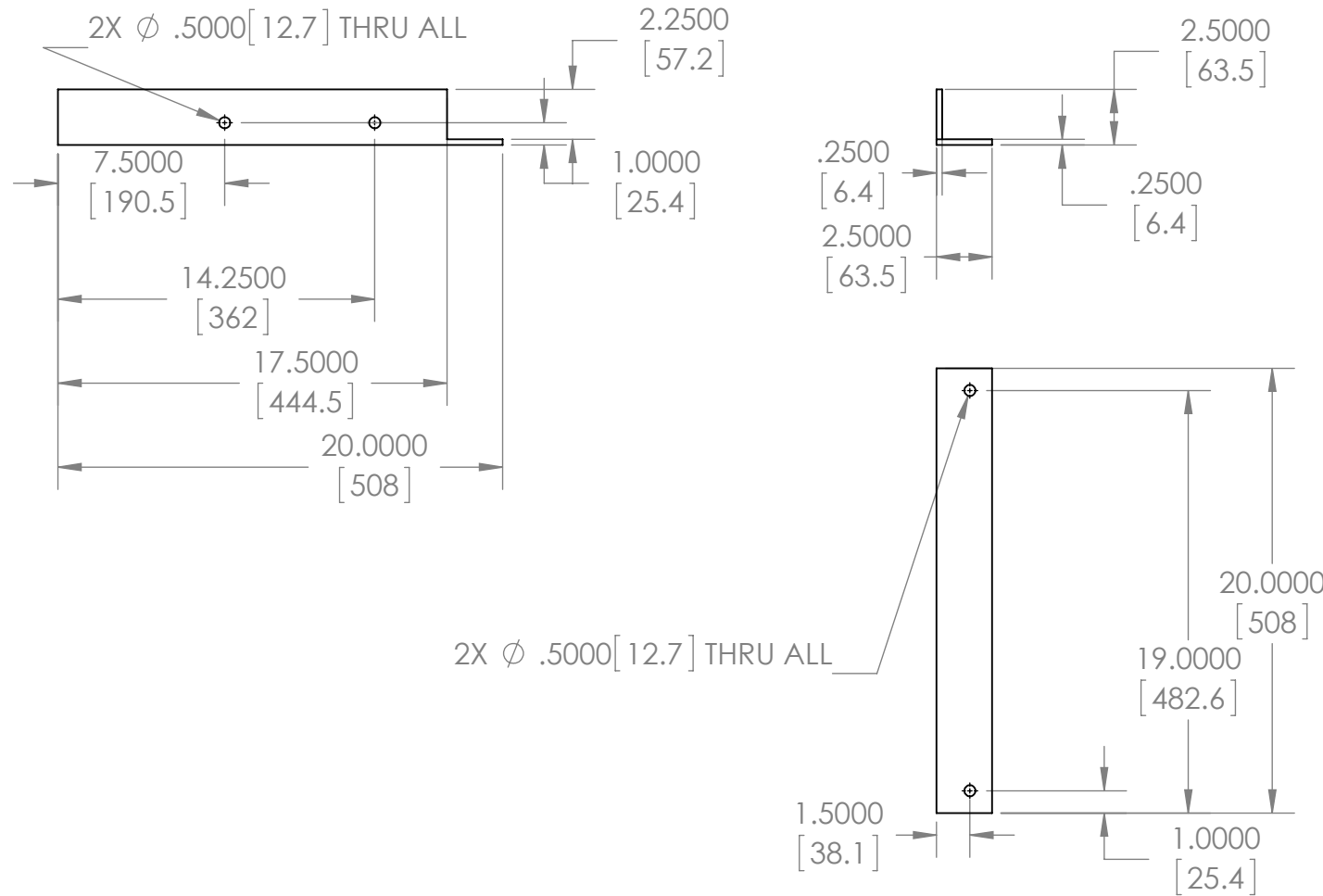
2

1

2

1

**Quantity 1**  
 2-1/2" x 2-1/2" x 1/4"  
 Steel Angle Iron  
**Left Side**

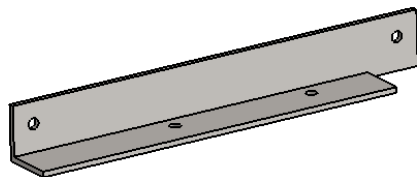


B

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TITLE:			
<b>Seat pan Left side V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.0500	- 0.0500
SCALE:	SIZE:	DATE:	REV:
1:8	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 6.24	SHEET 1 OF 1

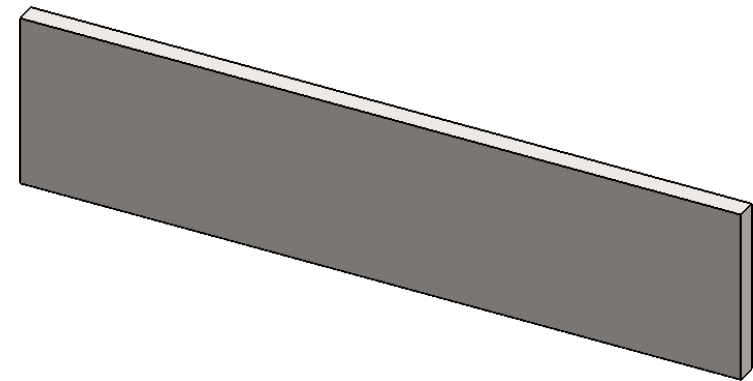
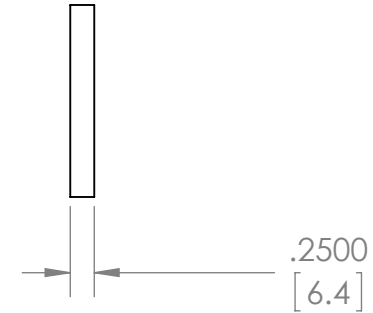
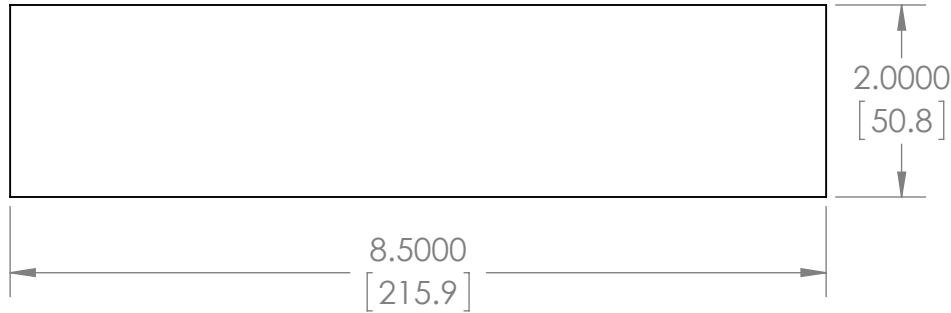
2

1

2

1

Quantity 3  
2" x 1/4" Flat Bar



B

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TITLE:			
<b>Seat pan support V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.0500	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:2	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 1.20	SHEET 1 OF 1

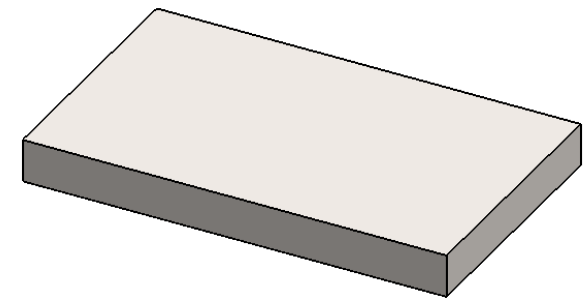
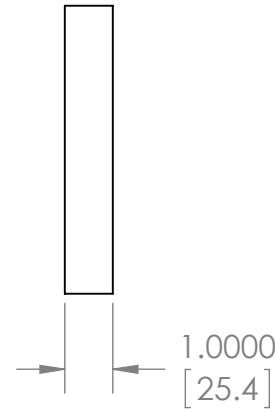
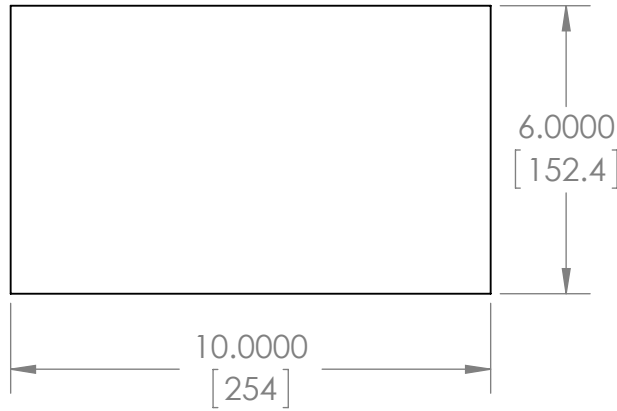
2

1

2

1

Quantity 2+  
6" x 1" Steel Flat Bar



B

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TITLE:			
<b>Seat pan weight block V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 16.91	SHEET 1 OF 1

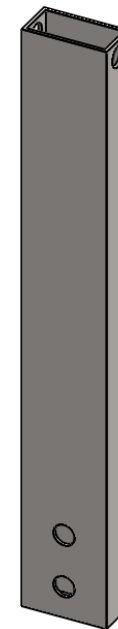
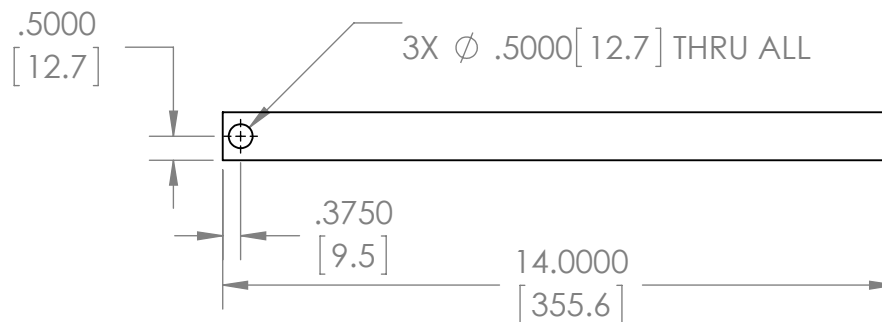
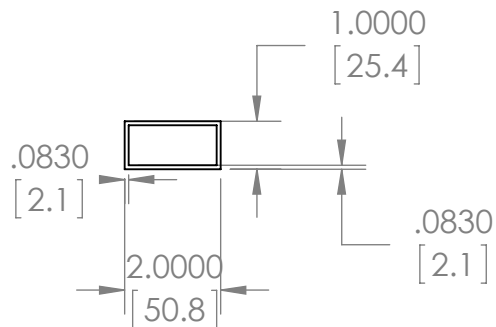
2

1

2

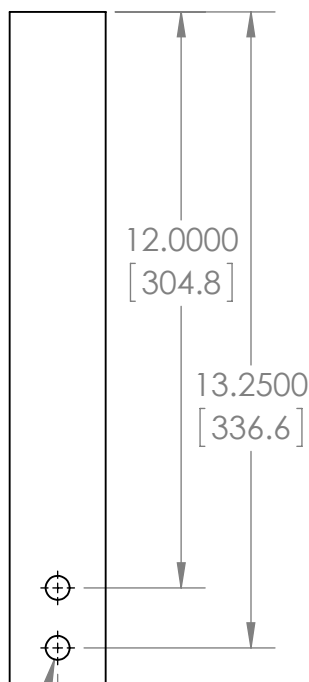
1

**Quantity 2**  
 2" x 1" 0.083 wall Steel  
 Rectangular Tubing



B

B



3X Ø .5000 [12.7] THRU ALL

A

A



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TITLE:			
<b>Leg bottom V2.1</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.0500	- 0.0500
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 1.83	SHEET 1 OF 1

2

1

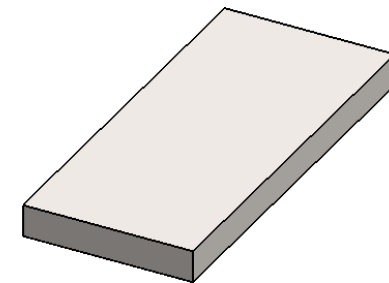
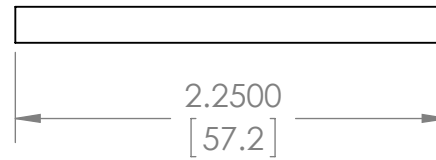
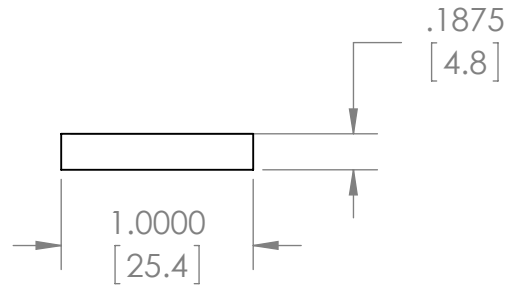
2

1

Quantity 4  
3/16" Steel Plate

B

B



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TITLE:

Leg support V2.1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:1

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 0.12

SHEET 1 OF 1

2

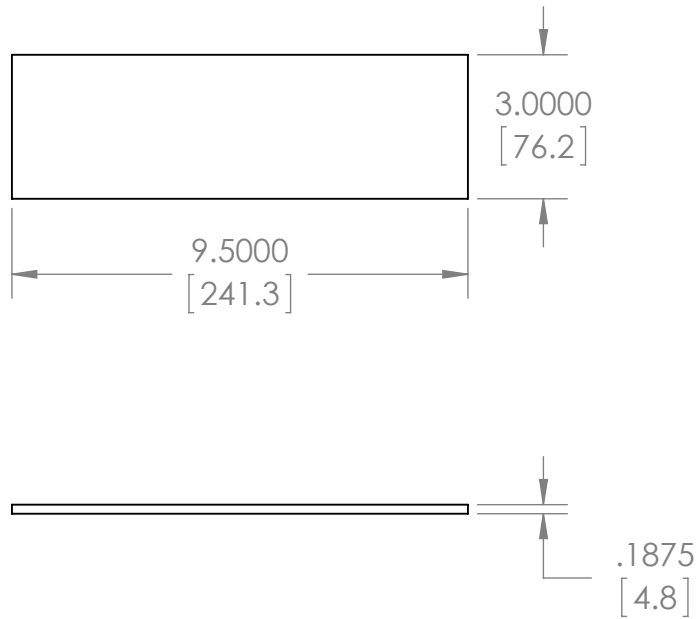
1

2

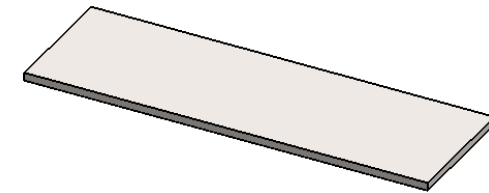
1

B

B



Quantity 2  
3/16" Plate Steel



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TITLE:			
Foot plate V2			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.28	SHEET 1 OF 1

2

1

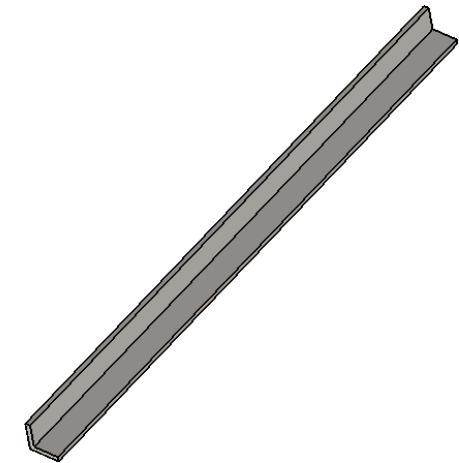
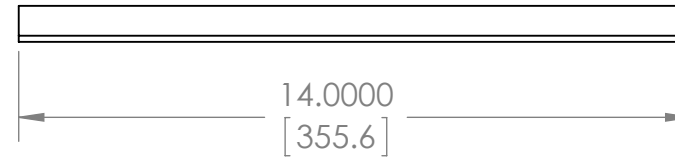
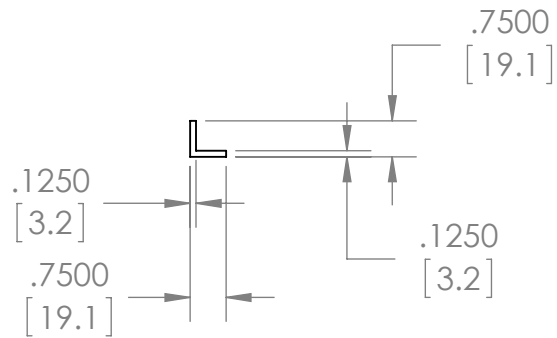


2

1

Quantity 4

3/4" x 3/4" x 1/8" Steel Angle Iron



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TITLE:

Leg top V2.1

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:4

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 0.68

SHEET 1 OF 1

2

1

B

B

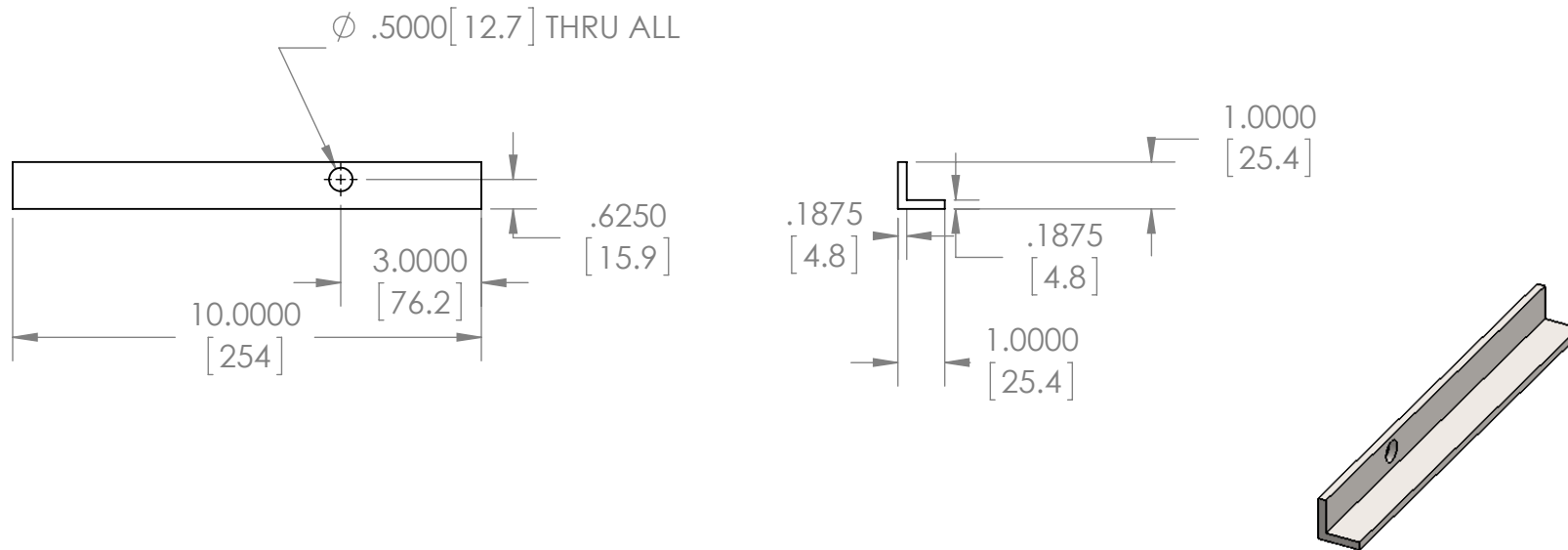
A

A

2

1

**Quantity 2**  
 1" x 1" x 3/16" Steel  
 Angle Iron  
**Left Side**



B

B

A

A



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TITLE:			
<b>Foot side Left V2</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.95	SHEET 1 OF 1

2

1

2

1

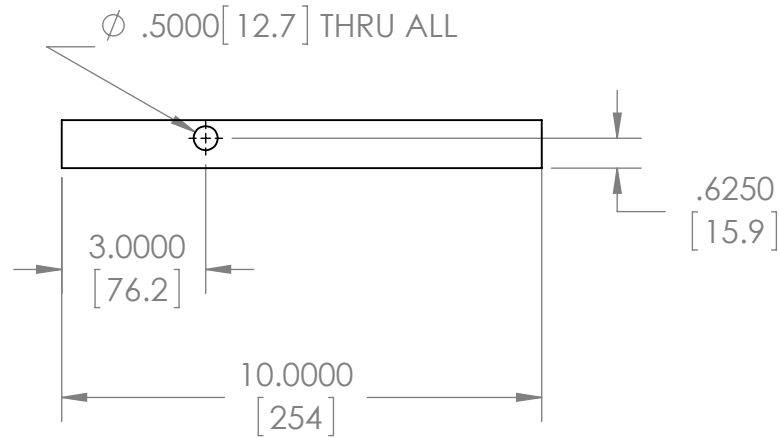
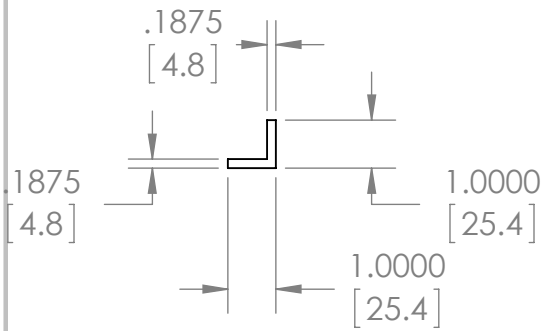
## Quantity 2

1" x 1" x 3/16" Steel

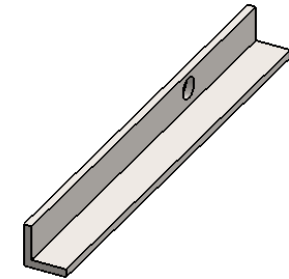
Angle Iron

Right Side

B



B



A



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TITLE:

Foot side Right V2

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

+ 0.1000

- 0.1000

SCALE:

1:4

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 0.95

SHEET 1 OF 1

A

2

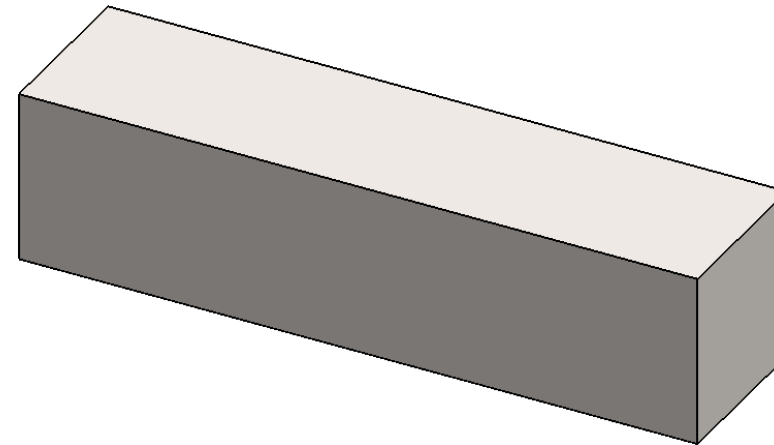
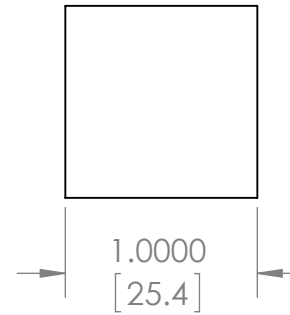
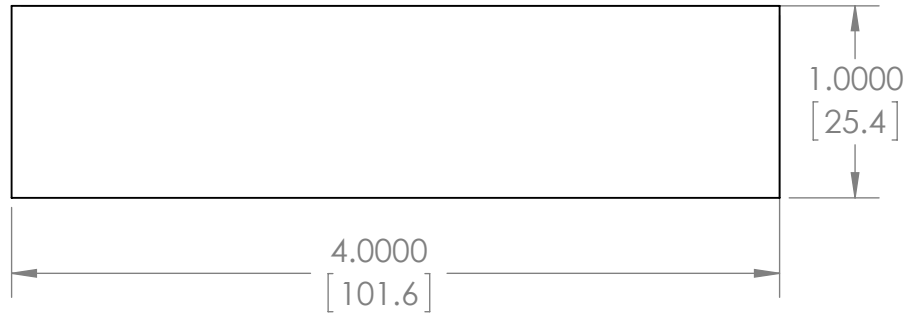
1

2

1

# Quantity 2

4" x 1" Steel Flat Bar



B

B

A

A



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TITLE:			
<b>Foot Weight</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
1:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 1.13	SHEET 1 OF 1

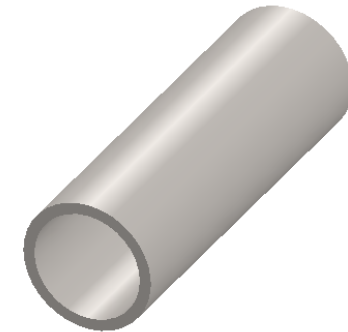
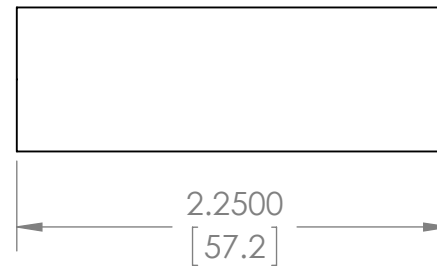
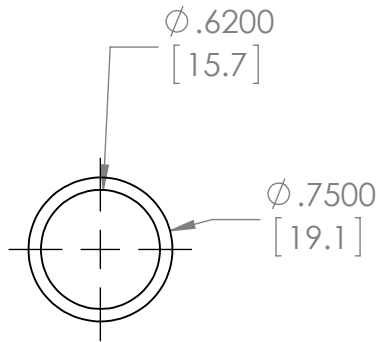
2

1

2

1

**Quantity 2**  
 3/4" 0.065 wall Steel Tubing






B

B

A

A

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	<b>Leg top slider V2.1</b>			
	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
	MATERIAL:		FINISH:	
	Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000	
SCALE:	SIZE:	DATE:	REV:	
1:1	A	12/11/2017	3	
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.09	SHEET 1 OF 1	

2

1

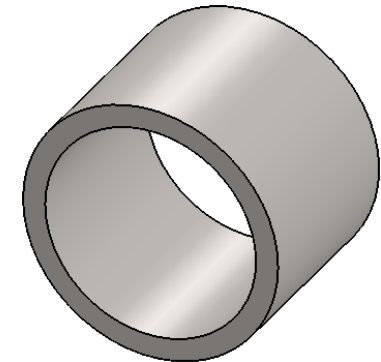
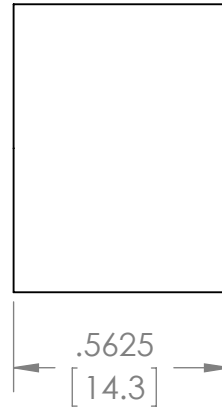
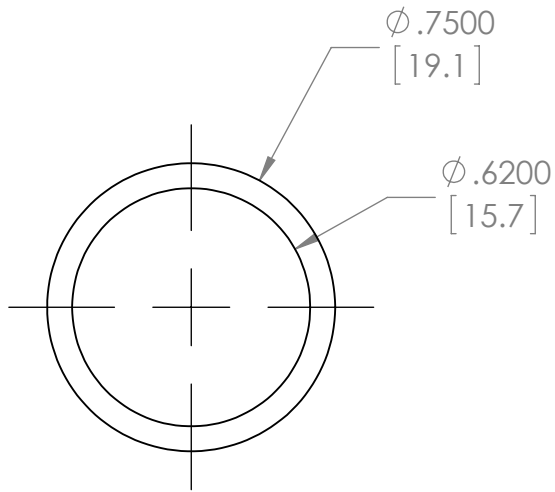
2

1

Quantity 4  
3/4" 0.065 wall Steel Tubing

B

B



A

A



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TITLE:			
<b>Leg Foot spacer V2.1</b>			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		+ 0.1000	- 0.1000
SCALE:	SIZE:	DATE:	REV:
2:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.02	SHEET 1 OF 1

2

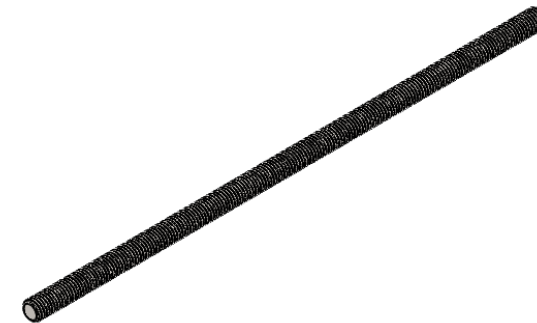
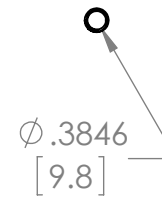
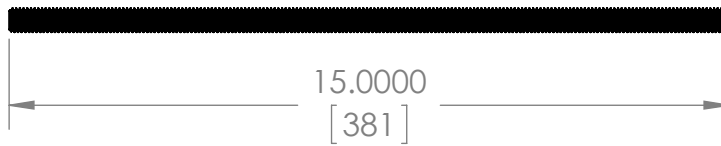
1

2

1

# Quantity 2

1/2-13 x 15" Stud



B

B

A

A



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TITLE:			
0.5 x 15 stud 98790A063			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		See Manufacturer Specifications	
SCALE:	SIZE:	DATE:	REV:
1:4	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.68	SHEET 1 OF 1

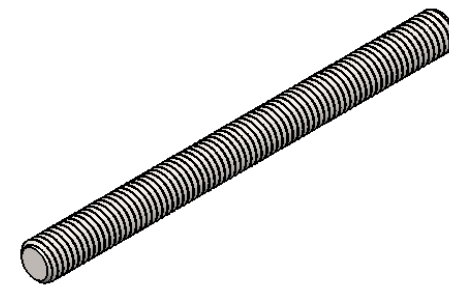
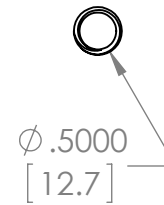
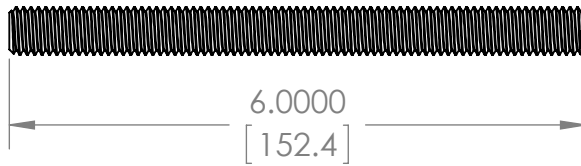
2

1

2

1

Quantity 6  
1/2-13 x 6" Stud



B

B

A

A



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TITLE:			
0.5 x 6 stud 95475A736			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES: See Manufacturer Specifications			
SCALE:	SIZE:	DATE:	REV:
1:2	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.27	SHEET 1 OF 1

2

1



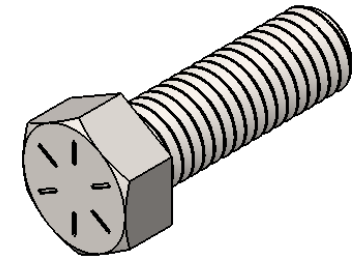
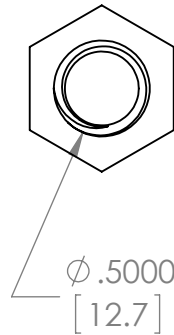
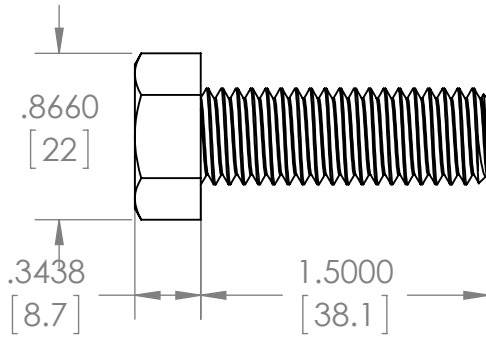
2

1

Quantity 2  
1/2-13 x 1-1/2" Bolt

B

B



A

A



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TITLE:

0.5 x 1.5 HCS 92620A716

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

See Manufacturer Specifications

SCALE:

1:1

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 0.11

SHEET 1 OF 1

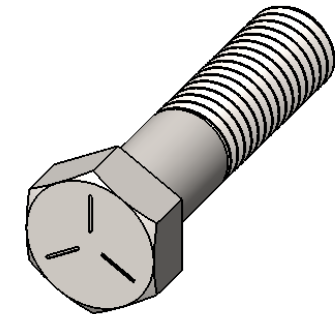
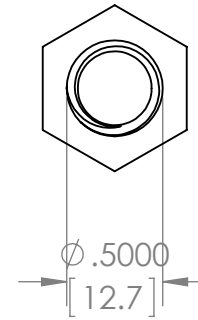
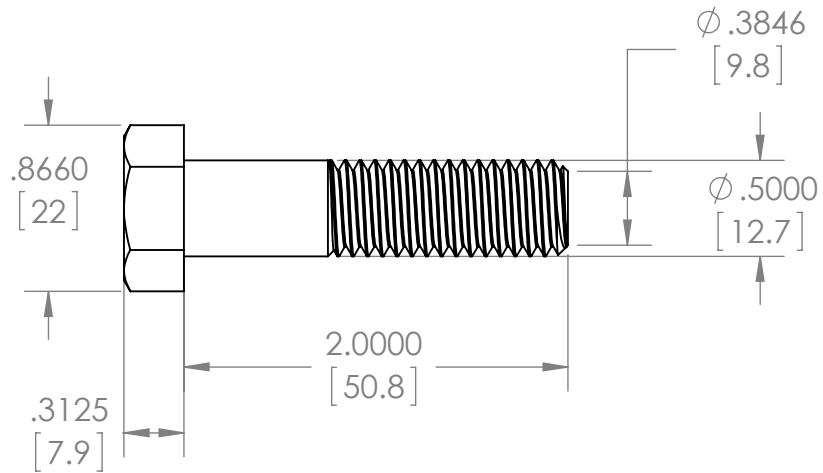
2

1

2

1

Quantity 4  
1/2-13 x 2" Bolt



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TITLE:

0.5 x 2 HCS 92965A720

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]

MATERIAL:

Plain Carbon Steel

FINISH:

Plain

TOLERANCES:

See Manufacturer Specifications

SCALE:

1:1

SIZE:

A

DATE:

12/11/2017

REV:

3

DO NOT SCALE DRAWING

WEIGHT (LBS): 0.14

SHEET 1 OF 1

2

1

B

B

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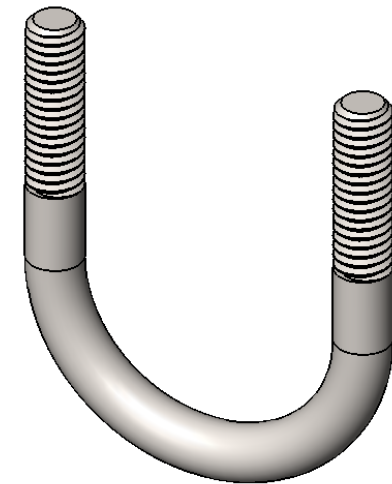
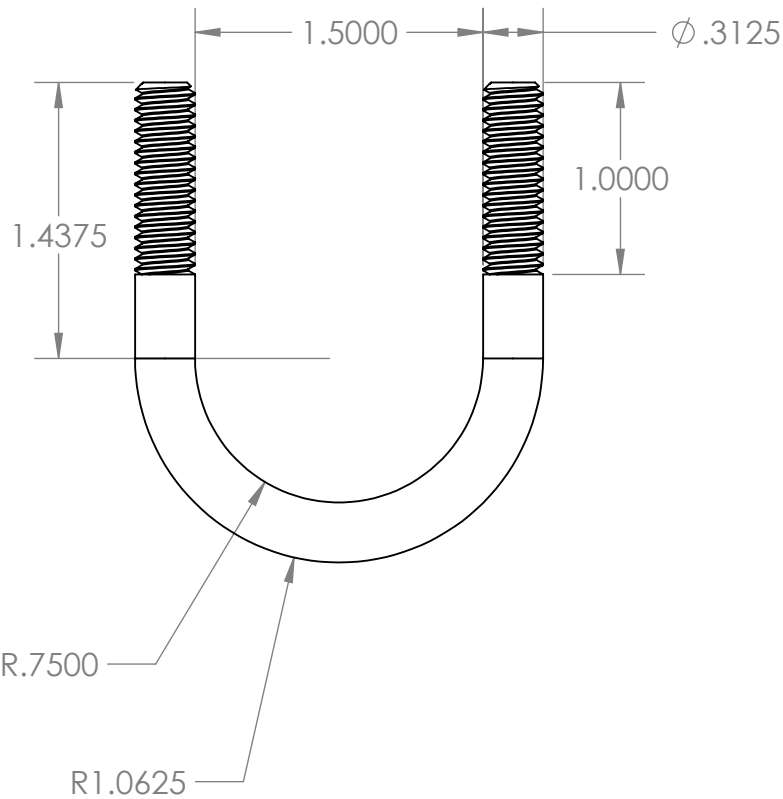
2

1

Quantity 5  
5/16-18 x 1-1/2" U-bolt

B

B



A

A



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TITLE:			
1.5ID Steel U-BOLT 3201T330			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES:		See Manufacturer Specifications	
SCALE:	SIZE:	DATE:	REV:
1:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.114	SHEET 1 OF 1

2

1

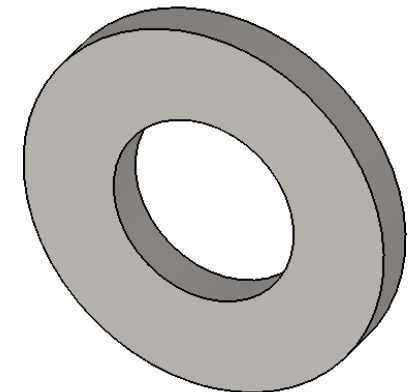
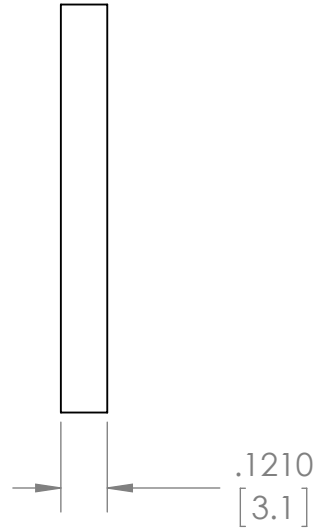
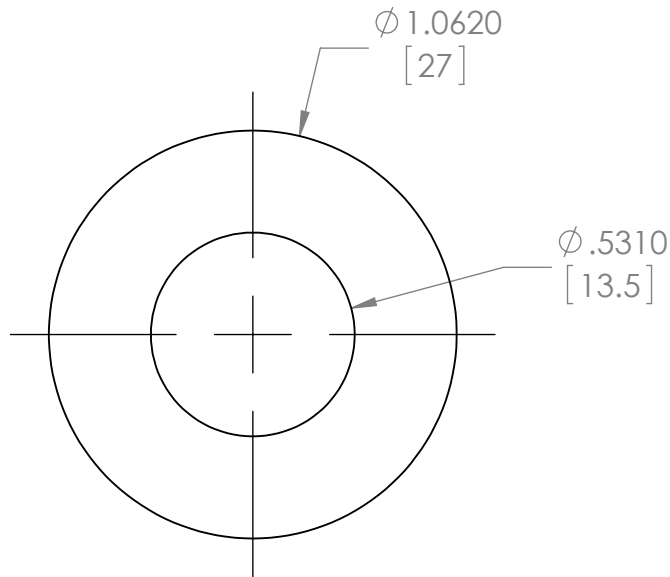
2

1

Quantity 26  
1/2" Flat Washer

B

B



A

A



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TITLE:			
0.5 flat washer 98023A033			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES: See Manufacturer Specifications			
SCALE:	SIZE:	DATE:	REV:
2:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.02	SHEET 1 OF 1

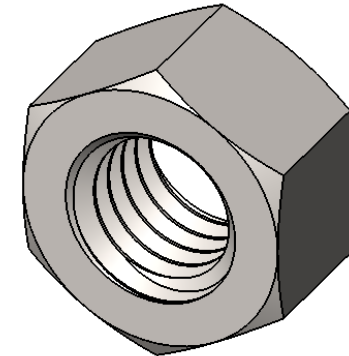
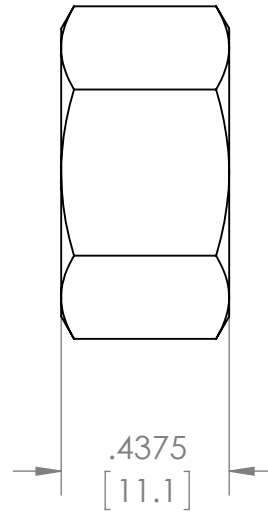
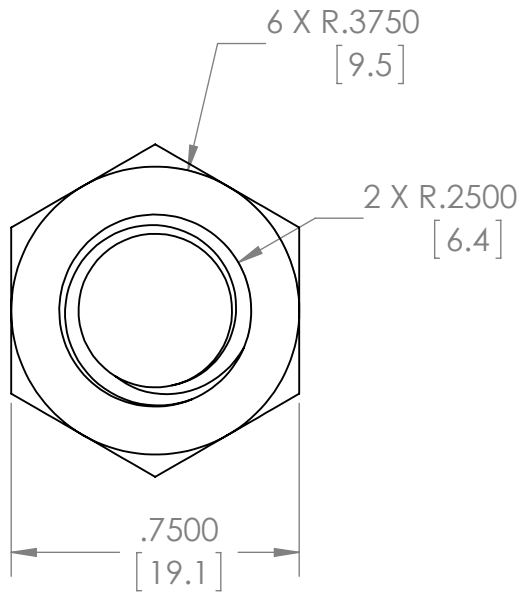
2

1

2

1

Quantity 28  
1/2-13 Nut



B

B

A

A



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TITLE:			
0.5 hex nut 95462A033			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES [mm]			
MATERIAL:		FINISH:	
Plain Carbon Steel		Plain	
TOLERANCES: See Manufacturer Specifications			
SCALE:	SIZE:	DATE:	REV:
2:1	A	12/11/2017	3
DO NOT SCALE DRAWING		WEIGHT (LBS): 0.040	SHEET 1 OF 1

2

1