

## Receiver Hitch and Pin

### Description:

The hitch is used with a standard 2" receiver hitch commonly found on trucks and SUVs. It can be fitted with any size ball. It may be mounted up or down depending on the desired height.

### Skills Required:

Cold metal, hot bending, arc welding, and layout skills are used to construct this project.

### Materials:

- 2 x 2 x .188" Steel Tubing
- ¾ x 2 HR Flat Steel
- 5/8 CR Round Stock

### Tools Required:

- Chop saw or horizontal band saw
- Bench grinder or angle grinder
- Arc Welder
- Blacksmith or engineer's hammer
- Oxy-Acetylene Cutting Torch with rosebud tip.
- Drill Press
- 5/32" drill bit
- 1" drill bit
- 5/8" drill bit
- Protractor
- Steel Tape

### Bill of Materials:

Complete the bill of materials below for this project. Use the completed bill of materials for your record book budget by entering the name of the project and the total amount as an expense.

Size	Description	Units	Qty/Project	Cost/Unit	Order	Amount
2"x2" x .188"	Square Tubing	Lbs	3.5	\$1.20		\$4.20
2 1/2" x 3/4"	Flat H.R.	Lbs	4	\$0.90		\$3.60
5/8"	Round C.R.	Lbs	.5	\$0.90		\$0.45
	Shop Fee (if any)					\$1.00
					TOTAL	\$9.25

### Project Price:

Enter the expected price you will receive for the project in your record book budget (income).

**Estimated Construction Time:**

4 hours.

**Directions:**

1. Set the chop saw to 65° and cut the 2" square tube to length.
2. Cut the flat and round stock to length.
3. Layout the 1" hole in the flat stock and drill a pilot hole using the 5/32 drill. Complete the hole with the 1" drill.
4. Layout and drill the 5/32" hole in round stock.
5. Layout and drill the 5/8" hole in the square tubing. This is a critical dimension as the hole must match the receiver hitch. You may wish to drill a pilot hole first to insure proper placement.
6. Using a course bench grinder round the edges of the pin and flat stock.
7. Place the welded hitch in a vise and heat the flat stock at the bend until it is red hot. Using a large adjustable wrench or a hammer bend the flat stock as shown in the plan. Be careful not to heat the vise.
8. Place the round stock in a vise and heat the bend. Bend as shown in the plan.
9. Clean up any sharp edges on the project. Test the fit in a hitch and make any needed adjustments.
10. Paint as desired.

**Photo/Drawing:**





**Actual Price Received:**

Enter the actual price you received for the project in your record book journal as income.

**Project Portfolio:**

Complete a portfolio for the project that includes:

- A description of the project and the skills you learned building the project. Include the hours spent on the project and the income (if sold). Use the construction log to complete this narrative. Write in complete sentences.
- The Bill of Materials
- The project plan
- 2-8 photos documenting the project at various stages of construction.

**Sample Record Book Entries:****Budget:**

Tran ID	Date	Description	No units	Price/Unit	Unit	Expense	Income	Net
7881	5/1/2013	Receiver Hitch Materials				\$10.00		
7882	5/1/2013	Receiver Hitch Sale					\$20.00	
Shop Projects TOTAL						\$10.00	\$20.00	\$10.00
TOTAL						\$10.00	\$20.00	

Net Income: \$10.00

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**Journal:**

Tran ID	Date	Description	Enterprise	No units	Price/Unit	Unit	Expense	Income	Cash	Hours	Net
7889	6/8/2013	Check from auction	Shop Projects					\$22.00			\$22.00
7888	6/2/2013	Pay shop for supplies	Shop Projects				\$9.25				\$12.75
7887	5/15/2013	Hitch grinding and painting	Shop Projects				\$0.00			1	\$12.75
7886	5/9/2013	Hitch Welding and Bending	Shop Projects				\$0.00			1	\$12.75
7885	5/8/2013	Hitch layout and drilling	Shop Projects				\$0.00			1	\$12.75
7883	5/2/2013	Hitch Cutout	Shop Projects				\$0.00			1	\$12.75
7884	5/1/2013	Hitch Planning	Shop Projects				\$0.00			0.5	\$12.75
TOTAL							\$9.25	\$22.00	\$0.00	4.5	

Net Income (income-expenses): \$12.75

Net Cash: \$12.75

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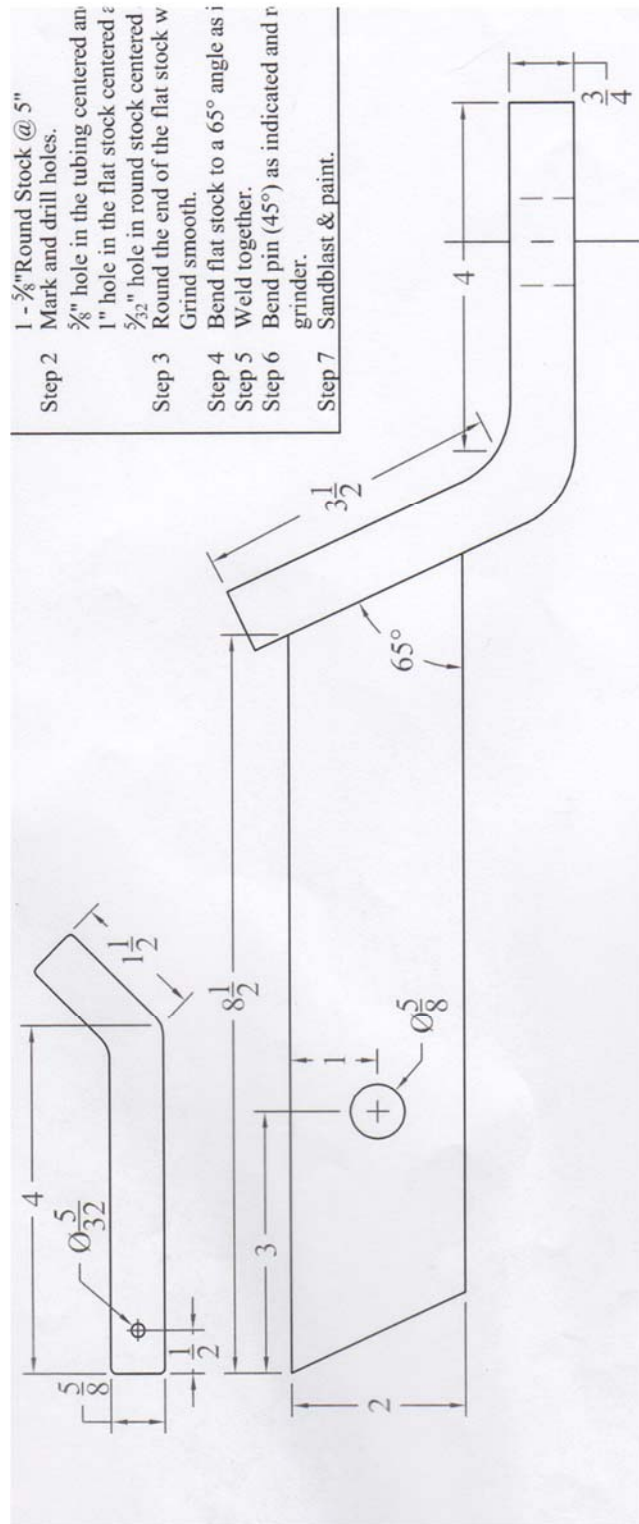
## Sample Receiver Hitch Portfolio

In building this project I developed a budget based on a bill of materials developed from the project plans. I built the project after school using the skills I learned in my Ag Mechanics class. I took 4 days to complete the project. The skills I used were layout of the materials, cutting with a horizontal band saw, precision drilling with the drill press, GMAW welding, and bending steel by heating with an oxy-acetylene torch. I sold the finished project at our agricultural mechanics auction.

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### Plans



## **Photos**

(need some photos here)