Bucket Clamp-on Forks and Receiver Hitch for Compact Utility Tractors

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Introduction

This document contains the construction plans for building a clamp-on bucket receiver hitch and a clamp-on set of bucket forks. The receiver hitch is designed to move light weight empty trailers short distances. The bucket forks are designed to carry loads not exceeding 1000 lbs. The design of the forks will allow weights to be lifted that may exceed the lifting capacity of your front end loader (FEL). It is your responsibility to insure that you do not overload your FEL, which may cause serious and expensive damage to the FEL bucket and frame.

Your success in building these projects is totally dependent on the care you take during construction. If you build them well, they will perform well. Before starting you should read thru all the instructions, drawings and pictures to get an idea of what is involved with this project. Take your time and determine if you want to change any dimensions then double check that the overall dimensions will work for your particular tractor. These designs will fit most compact and sub-compact tractor buckets, with or without a toothbar. A little planning goes a long way. Remember, measure twice and cut and weld only once.

Beginner welding skills are all that's required, however you should be past the beginner skill level to obtain optimal results.

Construction Hints and Tips

Make all metal cuts as you proceed with the assembly instructions. Dimensions shown are approximate and may vary depending on your unique layout.

It is advisable that you tack weld all sub-assemblies together then check for correct fitting and squareness. Once you are sure everything is ok, continue on to weld all joints paying close attention to proper weld penetration. These attachments were constructed using a 240 volt Millermatic 175 Mig welder using C25 shielding gas and .030 solid core wire. Some welds were ground relatively smooth and any spatter was removed.

Basic tools that are needed are a bandsaw or chopsaw to cut metal; a welder; a ½" drill press or a ½" hand drill; ¾" Silver & Deming drill bit with ½" shank; assorted smaller drill bits for drilling pilot holes; and assorted shop tools including a 4" hand grinder.

I have found that Rust-Oleum protective enamel paint gives the best finish. First spray on a good primer then brush on at least 2-3 coats of the paint. This will leave a strong durable finish.

Materials List to make 1 set of forks and 1 receiver hitch

13 ft	3” x 4.10 bar channel (3” x 1.5”)
7 ft	3” x 3/8” flat bar
1 ft	2.5” x ¼” square tubing
2 ft	¾” -10 threaded rod with 6 nuts
2 ft	½” round bar
1	2” receiver tube 8” long
1 ft	1” schedule 40 pipe or equivalent

Itemized Parts and Cut List – Receiver Hitch

Item	Qty	Description	Used for	Source
1	1	2” receiver tube, cut 8” long	part #28473	Agri-Supply
2	1	3” x 4.10 bar channel, 18” long	base	local
3	1	3” x 3/8” flat bar, 11” long	top plate	local
4	1	3” x 3/8” flat bar, 2.5” long	riser	local
5	1	3” x 3/8” flat bar, 7” long	bottom pad	local
6	1	¾” -10 threaded rod, 7” long	clamp rod	local
7	2	¾” -10 nuts	clamp rod nuts	local
8	1	½” round bar, 7” long	clamp handle	local
9	1	1” schedule 40 pipe or equivalent, 3” long	edge clamp	local

Itemized Parts and Cut List – Bucket Forks

Item	Qty	Description	Used for	Source
1	2	3” x 4.10 bar channel, 51” long	fork	local
2	2	3” x 3/8” flat bar, 13” long	top plate	local
3	4	3” x 3/8” flat bar, 2.5” long	riser	local
4	2	3” x 3/8” flat bar, 7” long	bottom pad	local
5	2	2.5” x ¼” square tubing, 2” long	riser block	local
6	2	¾” -10 threaded rod, 7” long	clamp rod	local
7	4	¾” -10 nuts	clamp rod nuts	local
8	2	½” round bar, 7” long	clamp handle	local
9	2	1” schedule 40 pipe or equivalent, 3” long	edge clamp	local
10	2	3” x 4.10 bar channel, 6” to 18” long	optional roll stop	local

Building the Receiver Hitch

1. The receiver hitch (Item 1) comes from the supplier with a length of 12". Cut the receiver to 8" and tack weld it to the base (Item 2).
2. Tack weld the riser (Item 4) to both the receiver and base.
3. The bottom pad (Item 5) should be sized so that it's final length extends from the back of the base to about ½" from the rear of the cutting edge on the bucket bottom. Tack weld the bottom pad to the end of the base.

   This length is important. The pad should almost butt against the bucket cutting edge. This will keep the receiver hitch from slipping forward when in use.
4. Clamp the top plate (Item 3) to the receiver. Fit the receiver to your tractor's bucket. Place the edge clamp pipe (Item 9) so that it sits on the beveled cutting edge on the top of the bucket. Weld the edge clamp to the riser. Do NOT weld the top plate (Item 3) at this time.
5. Check receiver fit and alignment again. If everything is ok then fully weld the base assembly parts (steps 1,2,3). Do NOT weld the top plate (Item 3) at this time.
6. Drill a ¾" hole in the top plate (Item 3) 1.5" from one end and centered.
7. Place the threaded clamp rod (Item 6) into the hole in the top plate and place a clamp rod nut (Item 7) on each side of the top plate. Weld ONE of the nuts in place to the top plate. Remove the clamp rod and remaining clamp rod nut and allow to cool.
8. Notch the top of the clamp rod and weld the clamp handle (Item 8) to the clamp rod.
9. Weld the top plate (Item 3) to the receiver assembly.

Building the Bucket Forks

1. Cut one end of each fork (Item 1) at an angle (about 45 deg.) leaving the thickness of the fork metal as the blunt point.
2. Weld a riser (Item 3) to each open side of the riser block (Item 5). Do this for both riser blocks.
3. Measure 36” from the cut end of the fork. Tack weld a riser block assembly to this point of the fork. The riser block assembly should extend to the rear (non cut end) of the fork. Do this for both forks.
4. The bottom pad (Item 4) should be sized so that it’s final length extends from the back of the fork to about ½” from the rear of the cutting edge on the bucket bottom. Tack weld the bottom pad to the end of each fork.
5. Clamp the top plate (Item 2) to the riser assembly. Fit the fork to your tractor’s bucket. Place the edge clamp pipe (Item 9) so that it sits on the beveled cutting edge on the top of the bucket. Weld the edge clamp to the riser of each fork. Do NOT weld the top plate (Item 2) at this time.
6. Check fork fit and alignment again. If everything is ok then fully weld the fork assembly parts (steps 2,3,4,5). Do NOT weld the top plate (Item 2) at this time.
7. Drill a ¾” hole in the top plate (Item 2) 1.5” from one end and centered. DO this for both top plates.
8. Place the threaded clamp rod (Item 6) into the hole in the top plate and place a clamp rod nut (Item 7) on each side of the top plate. Weld ONE of the nuts in place to the top plate. Remove the clamp rod and remaining clamp rod nut and allow to cool.
9. Notch the top of the clamp rod and weld the clamp handle (Item 8) to the clamp rod.
10. Weld the top plate to the fork assembly. Do this for both forks.

This next step is optional but recommended.

11. Stand the roll stop (Item 10) on end and weld it to the front of the riser assembly. The length of the roll stop should be anywhere from 6” to 18” depending on your application. This roll stop will prevent large objects from rolling back into or off of the bucket and causing damage.

Miscellaneous

1. Grind all welds smooth and grind way any weld spatter.
2. Prime then paint with 2-3 coats of brushed on Rust-Oleum protective enamel in the color of your choice.

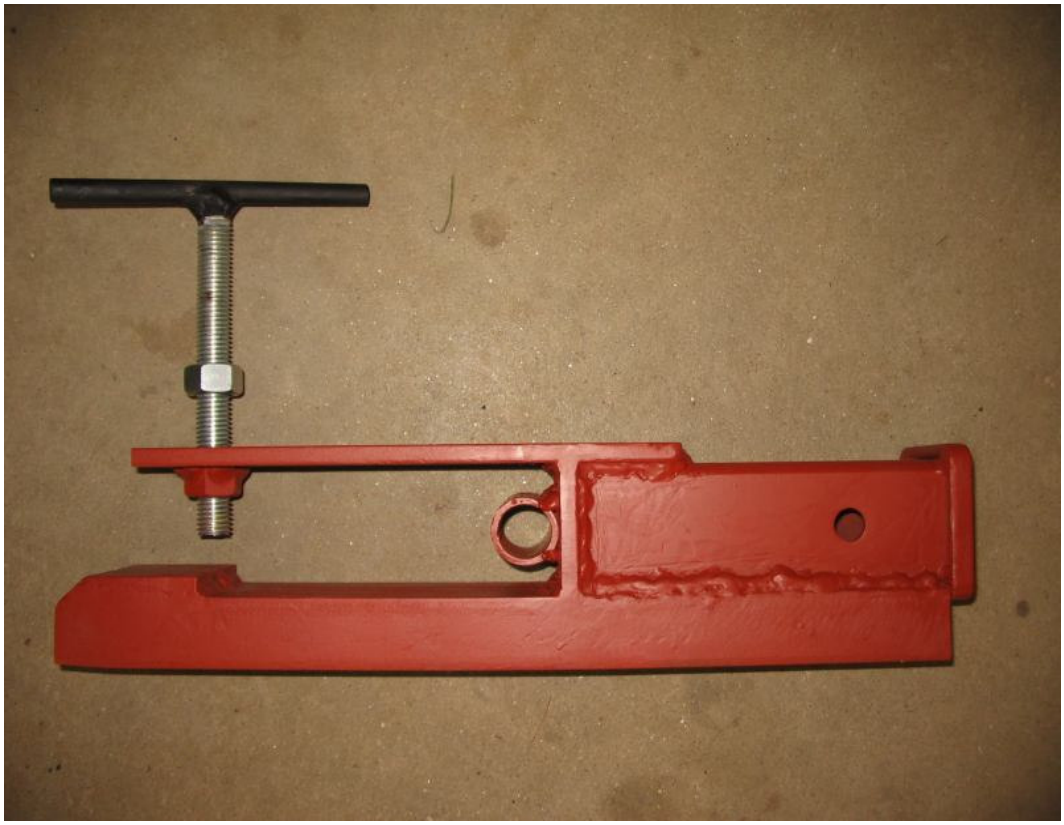
Design Alternatives and Comments

It is highly recommended that you use the roll stops on the bucket forks. This is both a safety issue and damage preventative issue.

The forks and receiver hitch may slip on your bucket. The bottom pad should be sized such that it is almost against the bottom bucket cutting edge. Additionally, a small pad may be welded onto the clamp rods but this has the disadvantage of never being able to remove the clamp rod once the pad is welded on.

Picture Gallery

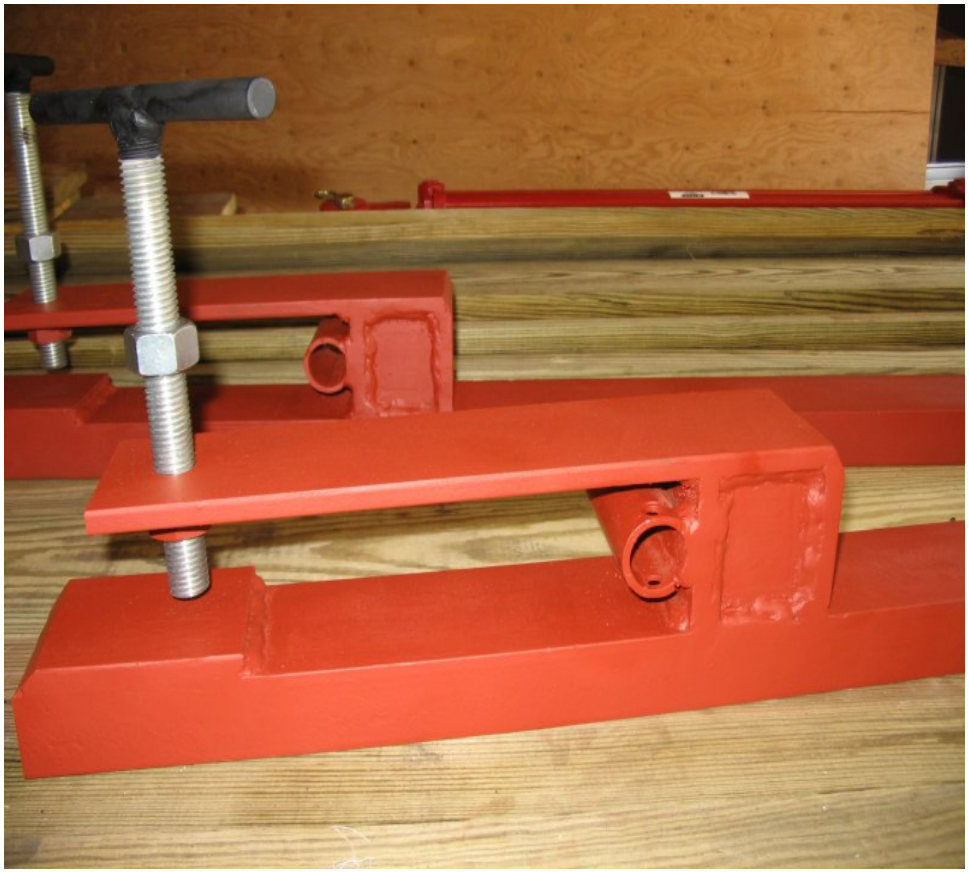
Finished receiver hitch mounted on bucket with toothbar.



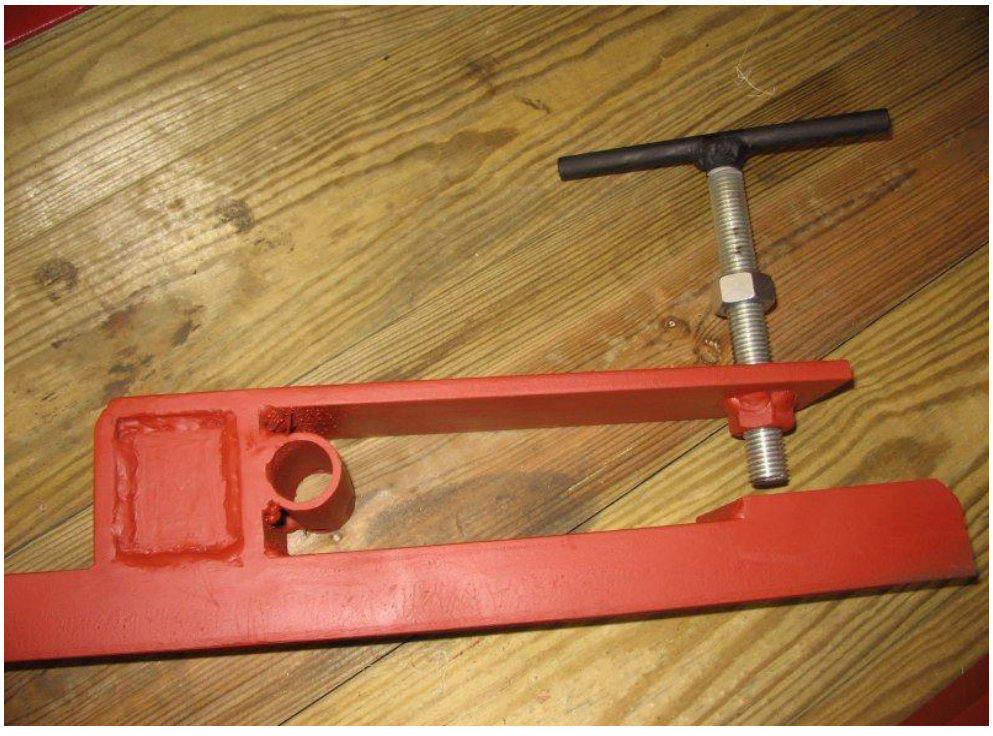
Prior to finish painting. Note that the bottom pad should be sized to fit up against the bucket cutting edge or any other protruding edge on the bottom of the bucket.

Close-up of bucket bottom showing the bottom pad up against the bucket cutting edge.

Finished forks.



Basic construction complete for forks.



Another view.