

Installation Manual

John Deere 120R Loader Sub-Frame Mounts

Designed and Fabricated in the USA by L&M Concepts, LLC

NOTE: There is a Rev B Install Manual Supplement available. Please Check the product page under the “Additional Information” tab or click link below.

Link to Rev B Installation Manual Supplement

Applicable Models: John Deere 2013+ X700 “Signature Series” Garden Tractor. *All Wheel Steering (AWS) and 2 Wheel Steering models (2WS).*



Figure 1: 2023 X739 with the 120R AWS Sub-Frame Mounts and John Deere 120R Loader

“Enjoy Your New Capabilities”

2013+ X700 120R Loader Sub-Frame Mount Installation Instructions

AWS Kit includes:

- 1 – Left Side AWS X700 sub-frame Mount
- 1 – Right Side Standard X700 sub-frame Mount
- Common parts listed below

2WS Kit includes:

- 1 – Left Side Standard X700 sub-frame Mount
- 1 – Right Side Standard X700 sub-frame Mount
- Common parts listed below

Common parts between both AWS/2WS kits:

Qty	Description	Notes	Bag ID
1	Replacement forward pedal arm	To address clearance issue with right side primary tube	
13	M12-1.75 x 40mm Flange Bolts	Primary mount hardware	120R Bag-A
13	M12-1.75 Flange Locknuts	Primary mount hardware	120R Bag-A
1	M12-1.75 x 30mm Flange Bolt	Primary mount hardware (Right Red-J Hole)	120R Bag-A
1	M12-1.75 Locknut	Primary mount hardware (Right Red-J Hole)	120R Bag-A
1	M12 Washer	Primary mount hardware (Right Red-J Hole)	120R Bag-A
4	Zip Ties (Red, Blue, Yellow, Black)	Used to re-mark tractor side hydraulic ports to match 120R loader colors	120R Bag-B
4	ORFS-6 O-Rings	Only used if needed - to replace damaged o-rings on hydraulic fittings	120R Bag-B
1	M8 x 60mm Bolt	Longer SCV bolt - upper location	120R Bag-B
1	M8 Nyloc Nut	Locknut for upper SCV bolt	120R Bag-B
1	M8 flat washer	Washer for upper SVC bolt	120R Bag-B
1	M8 x 35mm Bolt	Longer SCV bolt - lower location	120R Bag-B
1	M8 split washer	Lock washer for lower SCV bolt	120R Bag-B
2	M5 washers	Washer/bushing for between upper SCV linkage and hitch pin clips to prevent wear when flipped over	120R Bag-B
2	3" strip - fender protector	To protect fender and mount from vibration and wear	120R Bag-B
3	FS2406-06-06 Hydraulic Fitting	Used to extend hydraulic lines	120R Bag-C

Qty	Description	Notes	Bag ID
1	6410-08-08 Hydraulic Fitting	Used to extend hydraulic line	120R Bag-C

Tools needed

- 24mm wrench (for vertical mast hardware)
- 24mm socket (for vertical mast hardware)
- 18mm wrench
- 16mm wrench
- 15mm wrench (for forward pedal arm fasteners)
- 13mm wrench (SCV nuts/bolts)
- 18mm socket
- 16mm socket
- 13mm socket
- Socket extensions
- Torque wrench (can be borrowed from many auto parts stores)
- Ratchet (Flex head a plus). Long handle and short handle.
- Short/small adjustable wrench (to remove hydraulic lines from SCV)
- C-clamp or locking vice grip c-clamp to act as “third hand” to hold up front of mount while installing fasteners in rear.
- Center/Transfer Punch to mark new holes.
- Electric/cordless drill and 1/4" and 15/32" drill bits. To drill new holes and enlarge existing holes
- Flexible pickup tool. To aid in installing two blind M12 bolts inside primary support tubes.
- Shop towels
- Drain pan (to catch hydraulic fluid)
- Nitrile Gloves
- Jack and jack stands - you need to remove front wheels to drill holes in front of mount)
- Black automotive touchup paint and artist brush (to paint any exposed metal from the drilling process)

Optional Tools to simplify installation

- Automatic center punch / transfer punch (To find center of holes for drilling)
- 1/2" air/cordless impact wrench

- Air/cordless ratchet
- 13/16 flare nut wrench – may help to remove hydraulic lines from SCV
- Swivel impact sockets
- For drilling right side RED-J hole from inside of frame
 - Right Angle Drill or right angle drill adapter (and stubby 15/32" drill bit)
 - Right Angle die-grinder (and ~1/4" carbide burr)
- Ratcheting combination wrenches (13mm, 16mm, 18mm)

Preparation

- It is recommended that you wash your tractor and frame to remove any dirt/dust/grass where the sub-frame mounts will be located.
- Remove mower deck.
- Cycle both hydraulic control levers to release pressure in the system.
- Raise the front of the tractor and place on Jack Stands. Remove both front wheels.
- Review the John Deere 120R Loader [Users Manual](#) (see link) for setup, installation, removal, operation and maintenance of your loader.
- Read full Installation Instructions thoroughly.
- Take a picture of your VIN tag. It will be covered by the right side sub-frame mount.
 - There is a small tag on the frame above the left tire, but it doesn't contain all the same information.
- Take pictures before you disassemble anything to aid in reassembly.
- If you have any questions, please email us at: sales@landmconcepts.com

Identify your Kit

There are two Different Versions of the 120R Sub-Frame Kits. AWS and 2WS show below.



Figure 2 - AWS Mounts



Figure 3 - 2WS Mounts

Note: Your mounts may look different than in the pictures within this manual, but the installation is the same.

1 Right Side Sub-Frame Mount Installation

1.1 Disassembly (2WS and AWS)

The SCV (Selective Control Valve) needs to be removed prior to installation of the right-side sub-frame mount.

On right side of the tractor below the foot pedals you will see a valve body with 4 hydraulic ports. This is the SCV.

Make sure that you've released system pressure by cycling both hydraulic control levers on the dash.



Figure 4 - SCV Bolt locations

There is a nut on the back side of the bolt circled as a GREEN-F.

There is a bolt on the back side of the area circled with a dashed line identified as a GREEN-E. The bolt is "blind" and needs to be removed from the inside of the frame.

1. Remove These two linkages circled in Blue. Make sure you don't lose the 4 hitch pin spring clips..



Figure 5 - SCV Linkages

2. Position a drain pan under the tractor to catch hydraulic fluid.
3. Position yourself under the tractor so you have visual of the 4 SCV hydraulic connections.
4. The lines can only really be installed in one location, so you shouldn't have a concern about crossing lines when you reinstall, but if you have a concern, take pictures or mark the lines with tape or similar method.
5. ***Final Reminder to release hydraulic pressure by actuating hydraulic levers on dash.***
6. It may help you access the upper SCV hydraulic lines if you remove the lockout valve first. If you do this, you will want to screw the lockout valve in all the way. You can then unthread the lockout valve from the SCV body after removing the hydraulic line. This should give you better access to the upper hydraulic lines.



Figure 6: SCV Hydraulic line fittings

7. With nitrile gloves on and using a short adjustable wrench remove the 4 hydraulic fitting “nuts”. Be sure to catch the fluid as it leaks out.
8. Locate the “blind” bolt at the bottom of the inside of the frame and using a ratcheting wrench, remove the bolt.
9. Locate the nut on the backside of the bolt circled in red in picture above. While holding the bolt head, use a ratcheting wrench and remove the nut.
 - **NOTE: Be Careful that the SCV doesn't fall when you remove the bolts**

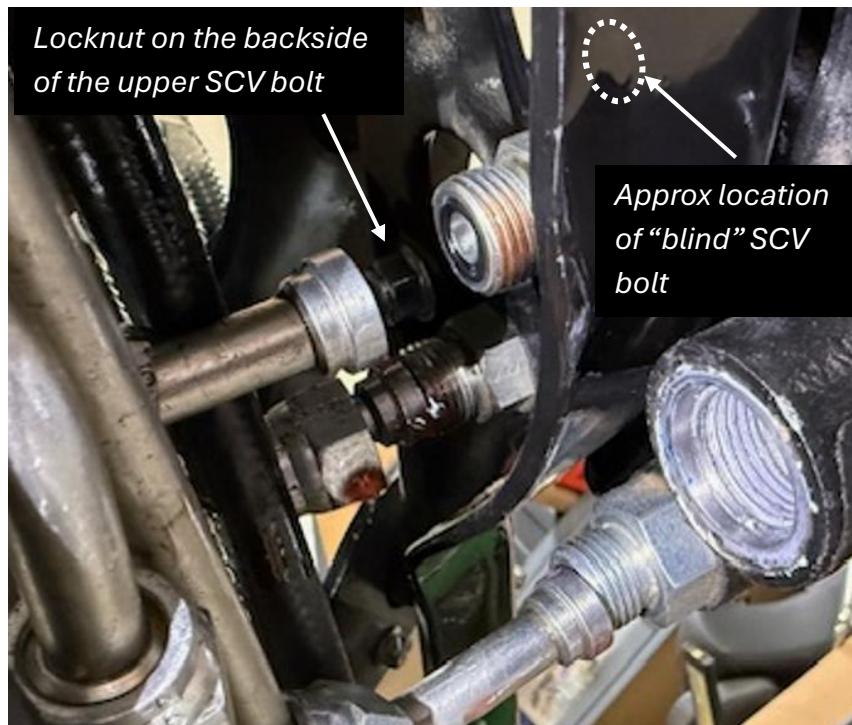


Figure 7: SCV fasteners

10. Remove SCV and place in drain pan to drain hydraulic fluid.

- **Note: Be careful to not damage the fitting o-rings. Keep everything clean.**



Figure 8 - SCV



Figure 9 - SCV Removed

11. Install 3 smaller hydraulic fitting extensions in the two upper locations and front bottom location of the SCV (circled in white). Install larger hydraulic fitting extension at bottom rear (circled in yellow)



Figure 10 - Hydraulic line extensions

1.2 Right Side Installation (AWS and 2WS)

The sub-frame mount is heavy (about 30lbs). Having a helper or some other method of supporting the mount is desirable (floor jack, jack stands, stack of lumber).

Identify the bolt holes you will be using in the frame. Some are used as is, some are enlarged and some are new. The holes have been identified with colors and letters. The holes with the same letter are the SAME hole but depicted in a different picture. The colors are defined below.

- **Blue** holes are existing holes for M12 sub-frame bolts
- **Orange** holes are new holes for M12 sub-frame bolts. Drill with 15/32" drill bit
- **Green** holes are SCV mounting holes for M8 bolts
- **Red** holes are existing and need to be enlarged.

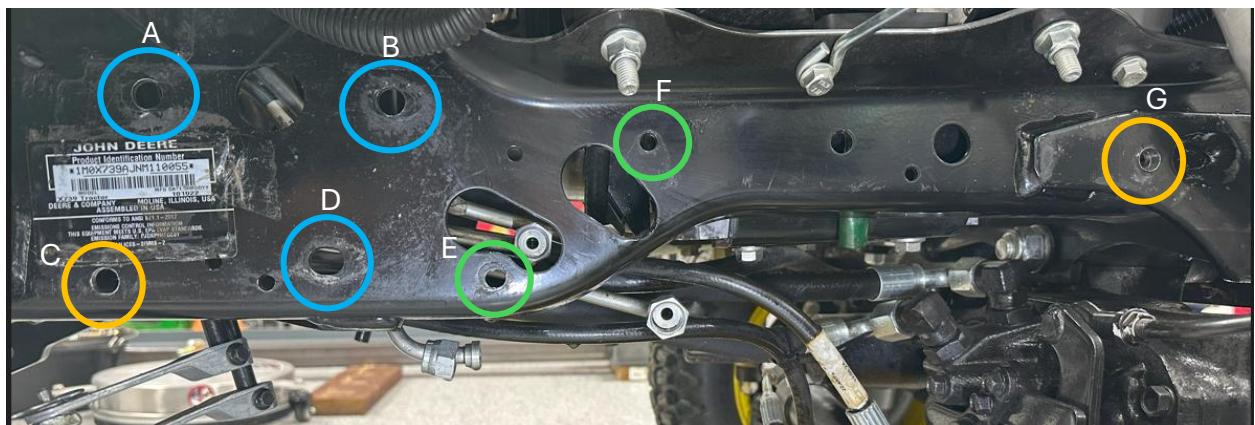


Figure 11 – Right Side Hole Identification



Figure 12: Bolt hole locations

The RED-J hole is a slotted hole behind the muffler exhaust pipe. I did not use this throughout my testing. I do have a bolt in the hole now. I consider it optional, but is best to install the bolt.

To use this hole with M12 hardware, it will have to be enlarged which requires removal of the muffler or drilling it out from the inside of the frame. The diesel muffler is easier to remove than the gas muffler. I don't recommend removing the gas engine muffler. If your diesel engine muffler is rust free, it may be worth trying.

I chose to not remove the muffler and drill instead. I used a stubby 15/32" drill bit with a right-angle drill adapter and a carbide burr on a right-angle die-grinder. I believe the die grinder worked better than the drill bit because the drill bit wanted to jump around in the slot. It took a few minutes, and I was successful with grinding the hole to allow for the short M12 bolt included in the kit to be installed.



Figure 13: Tools that could be used to enlarge right side RED_J hole.

Make sure that you use the shorter 30mm M12 bolt, washer and locknut (without a flange) included in the kit. This will ensure you have clearance between the exhaust pipe and the bolt/nut as shown in the following picture.



Figure 14: RED-J hole enlarged and bolt installed

The corresponding holes in the sub-frame mount are as follows. The BLUE-B hole marked with the dashed circle is inside the primary support tube.

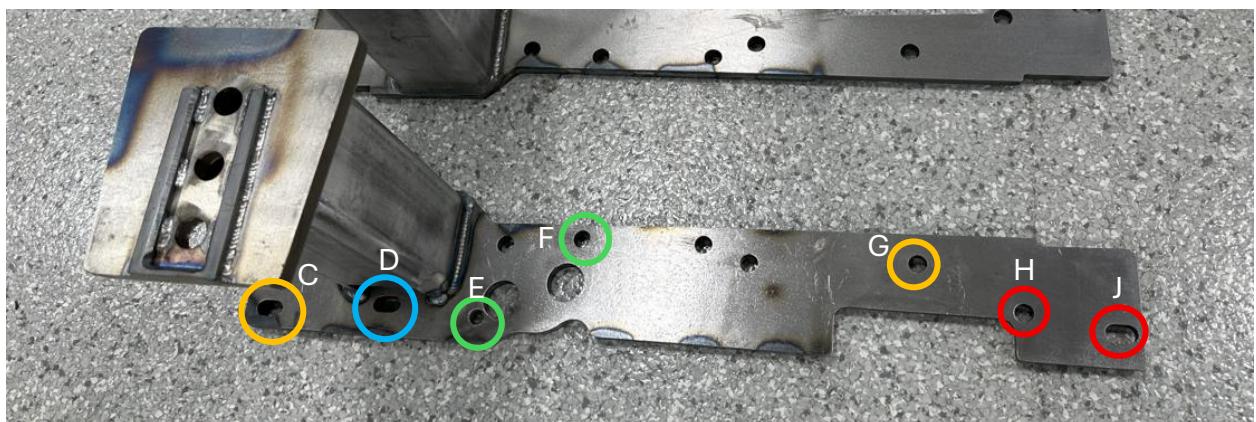


Figure 15: Bolt hole locations



Figure 16: Bolt hole locations

1. Open hood and place a rag over the front tie-rod and axle under the muffler exhaust pipe to protect it from scratches.
2. It is necessary to enlarge the hole identified as "RED-H" in the frame before the initial fitting of the sub-frame mount.
 - ***Important – When drilling, make ABSOLUTELY sure that there is nothing on the back side of the frame that can be damaged by the drill bit coming through the frame. It is a good idea to keep the drill bit from going any further than it needs to by using a depth stop.***

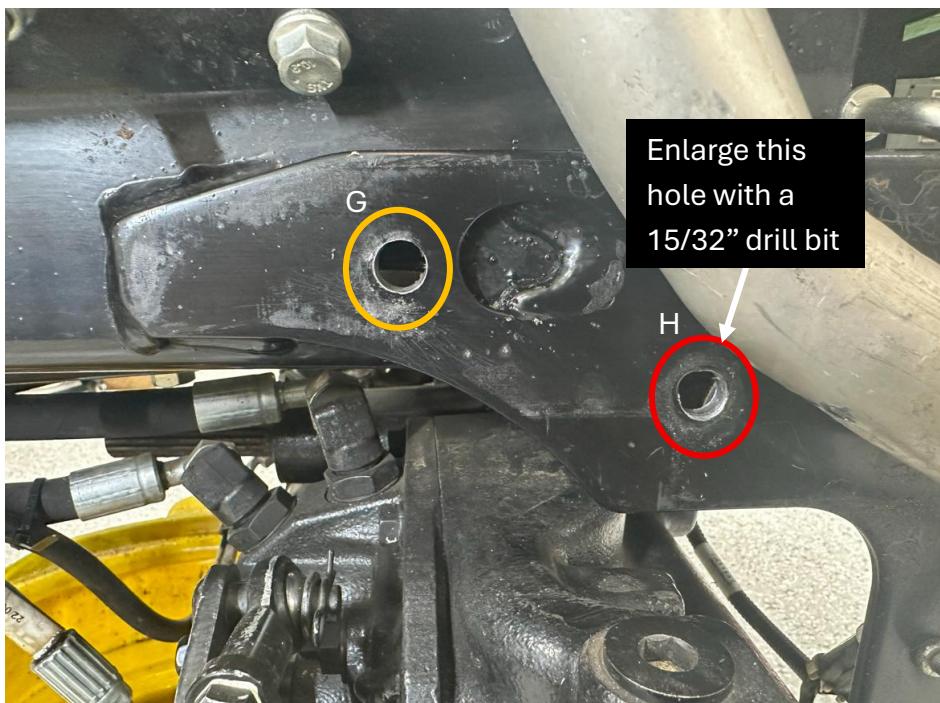


Figure 17: New and enlarged holes

3. Replace the forward pedal arm to ensure you have clearance between the pedal arm and the primary support tube.

- Remove rubber pad from stock forward pedal arm. It should pull off with some resistance. It is just a friction fit.
- From under the tractor, remove the two bolts fastening the pedal arm
- Install the rubber pad on the new pedal arm. It should feel like it is firmly held in place like it was on the OEM arm.
- Install the new arm and tighten the bolts with the pivot arm positioned straight like the stock pedal.

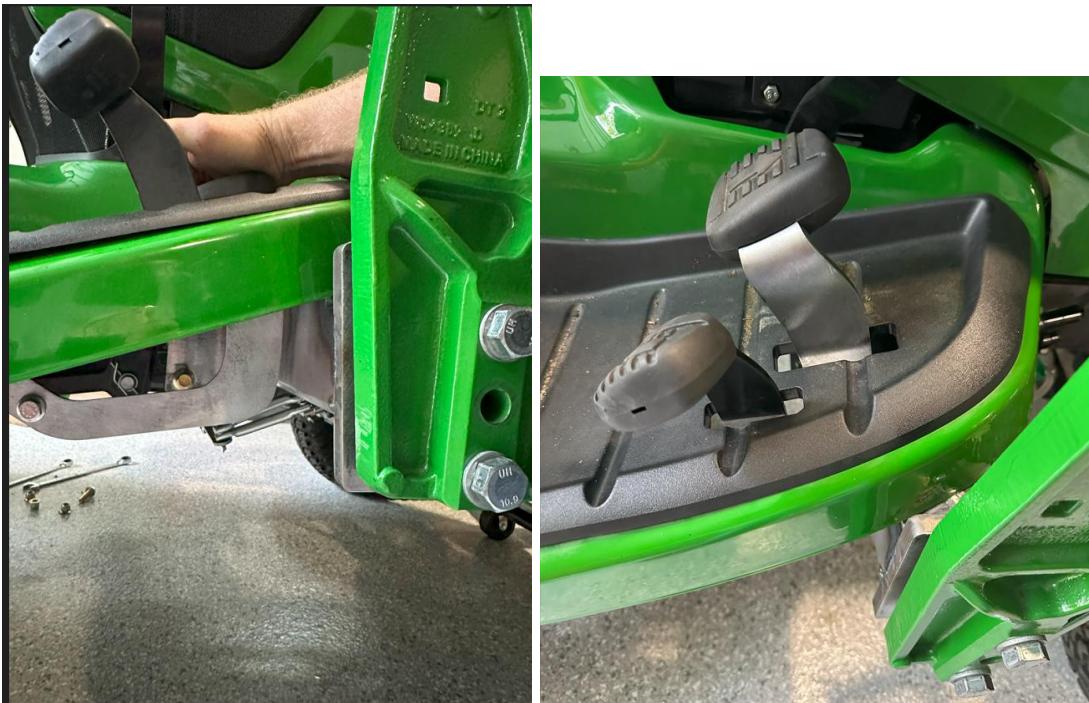


Figure 18: Forward pedal replacement and installation

4. Prior to lifting the sub-frame mount into place, make sure there is nothing keeping the mount from lying flat against the tractor frame. Some tractors may have plastic retention zip ties pushed through the frame. These may have to be removed if there is not a clearance hole in the mount plate. Use a standard zip tie to restrain any line/wire that you removed a zip tie from.
5. Lift primary sub-frame mount into place by first placing the front of the mount over the front axle and behind the muffler exhaust pipe and support with floor jack or jackstands to position mount in the approximate final location.



Figure 19: Protect painted areas

6. Pivot the front of the sub-frame mount up to align the RED-H hole drilled earlier. It may help to Clamp the mount against the frame to align hole with mount. Install a M12 bolt and nut at this location. Hand tighten and then tighten just to the point that it makes contact with frame/mount.



Figure 20: Location of front locating bolt.

7. Install M12 bolt in BLUE-A. Hand tighten the nut enough to keep mount from falling. I usually do this by laying under the tractor and reaching both sides of the frame. I then

tighten to the point that the nut/bolt just contacts the frame/mount and still allows the mount to move forward/aft. **DO NOT** mark the hole location at this time.

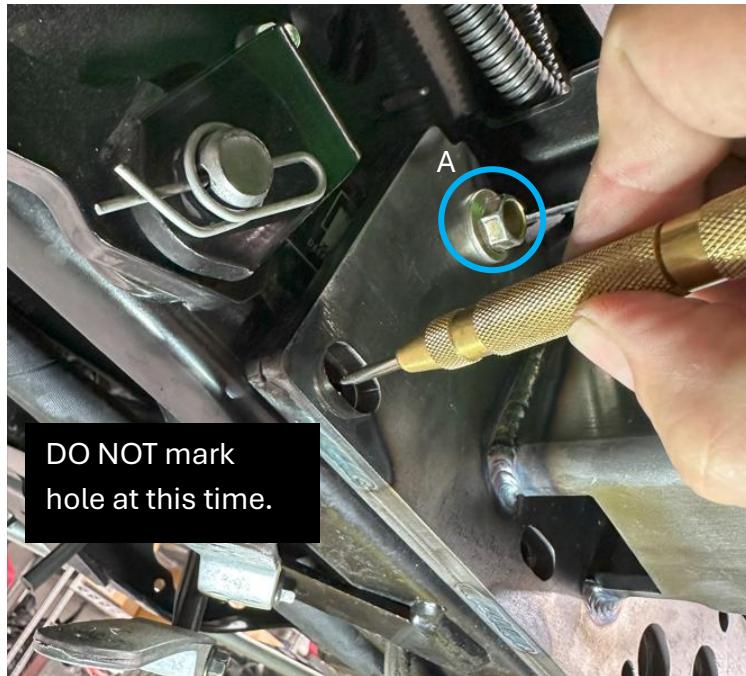


Figure 21: Rear locating bolts

8. Install additional hardware in the existing holes BLUE-B followed by BLUE-D in the sub-frame mount
9. BLUE-B is a blind hole. Using a “finger grabber” (or similar), feed the bolt up through the hole in the primary support tool and push it through the frame plate and install nut. Tighten similar to the other bolts – just to the point where the nut/bolt is hitting frame/mount surfaces.

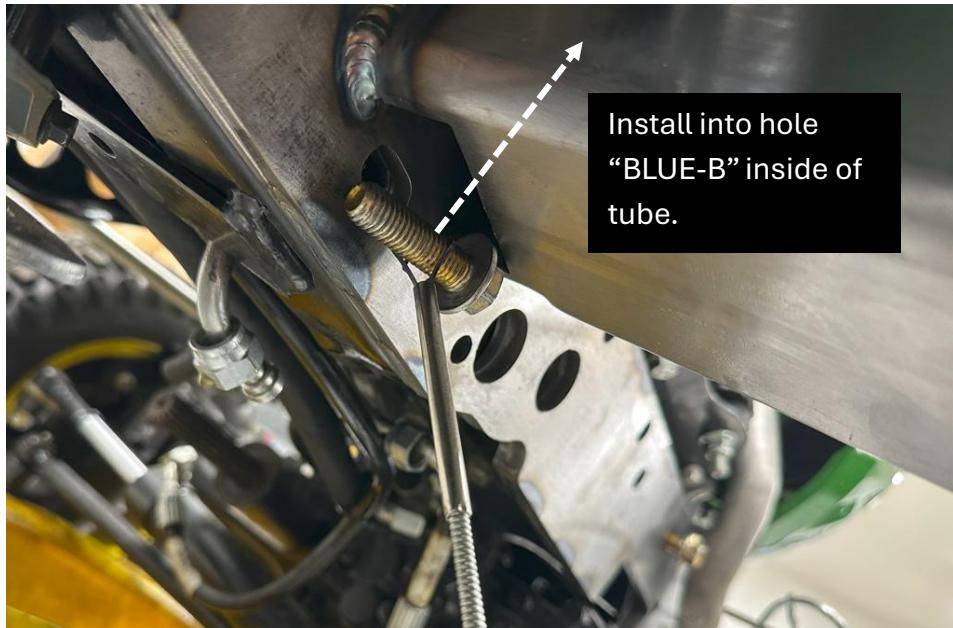


Figure 22: Installation of blind bolt



Figure 23: Blind bolt location

10. Install bolt in BLUE-D hole with nut and tighten like the other fasteners. Just tighten to touch surface of frame and mount.

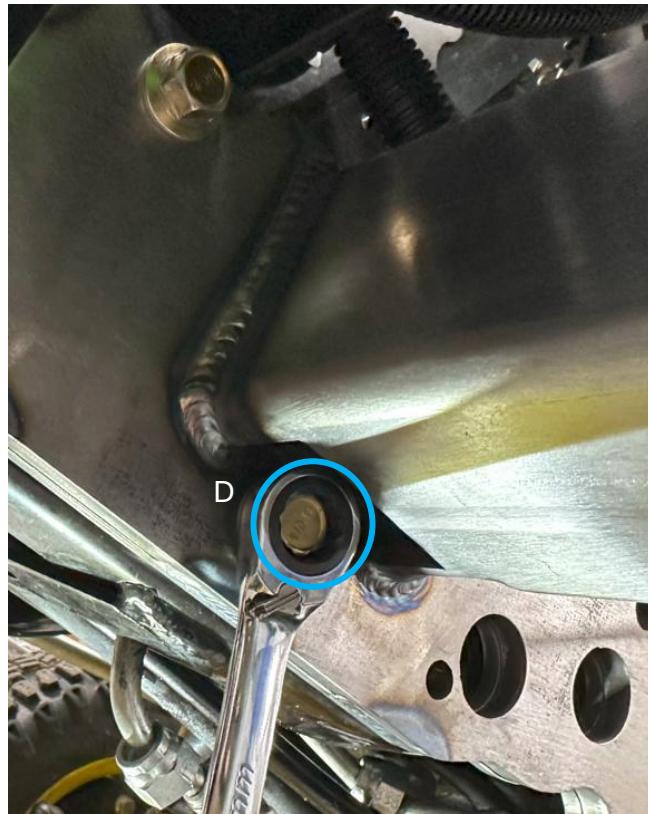


Figure 24: Initial tightening of bolts

11. Now we are starting to align the mount (forward and aft) before tightening and drilling remaining holes. Adjust the alignment of the subframe so that it is touching (or almost touching) the hood hinge plate. There will not be a lot of movement, but make sure the mount is not overlapping the hinge plate. It should almost be butted up to it.

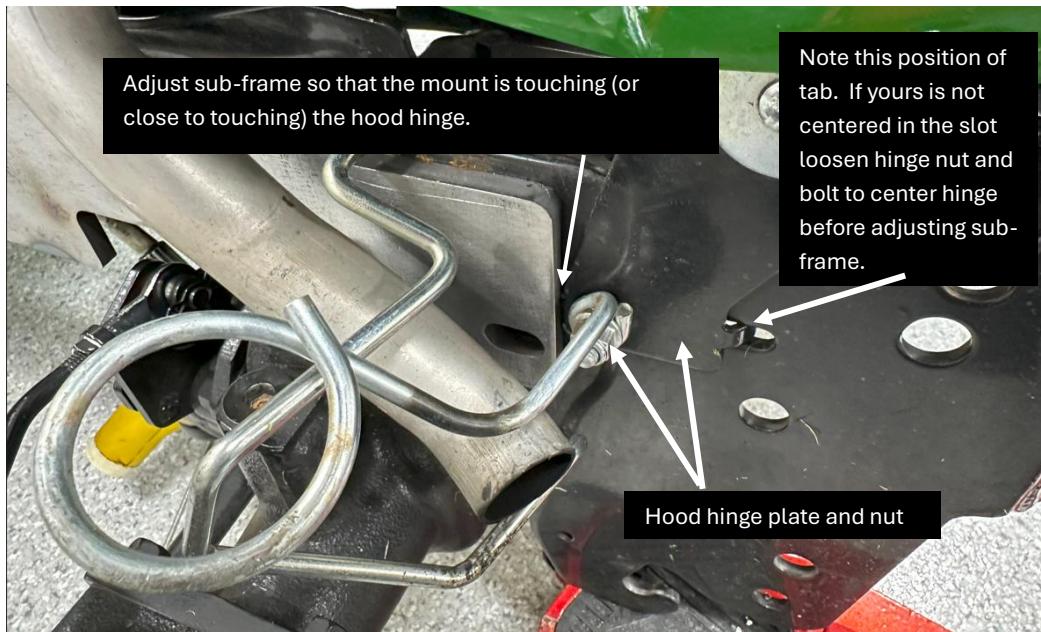


Figure 25: Locating of mount

12. Tighten all M12 hardware that has been installed. This doesn't have to be final torque, but tighten sufficiently (approx. 60 lb-ft) so that the sub-frame mount cannot move.
13. Center punch, pilot drill (3/16") and final drill (15/32") new holes identified as ORANGE-G and ORANGE-C.
 - ***NOTE: I recommend final drilling with sub-frame mount in place to use holes in the mount as a guide. Be as centered as possible to minimize damage to powder coat.***

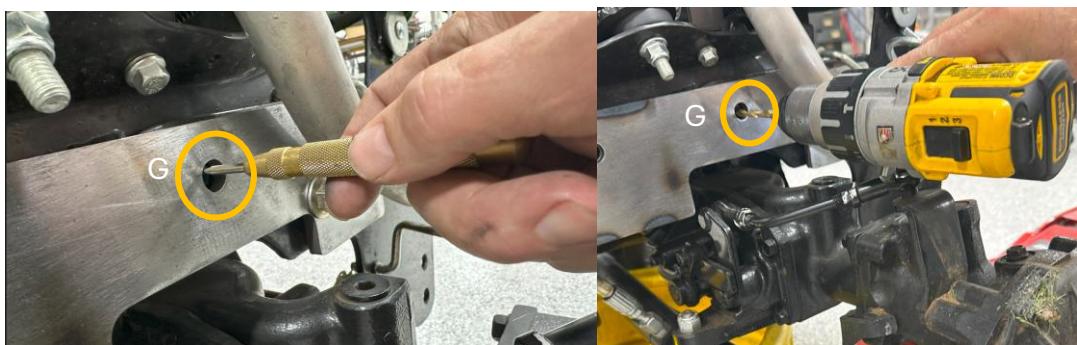


Figure 26: Drilling of new hole in front of mount



Figure 27: Drilling front hole to final size

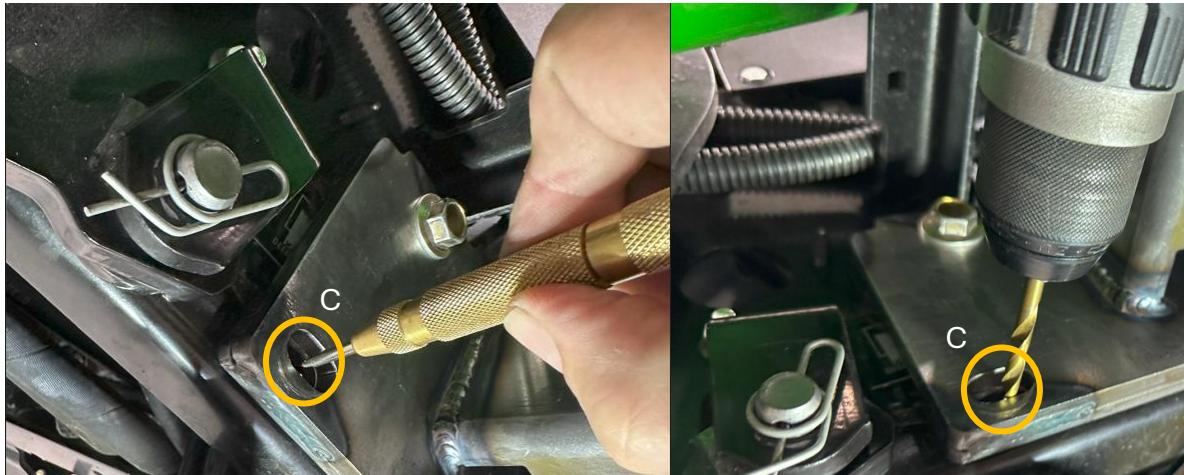


Figure 28: Marking and drilling rear hole

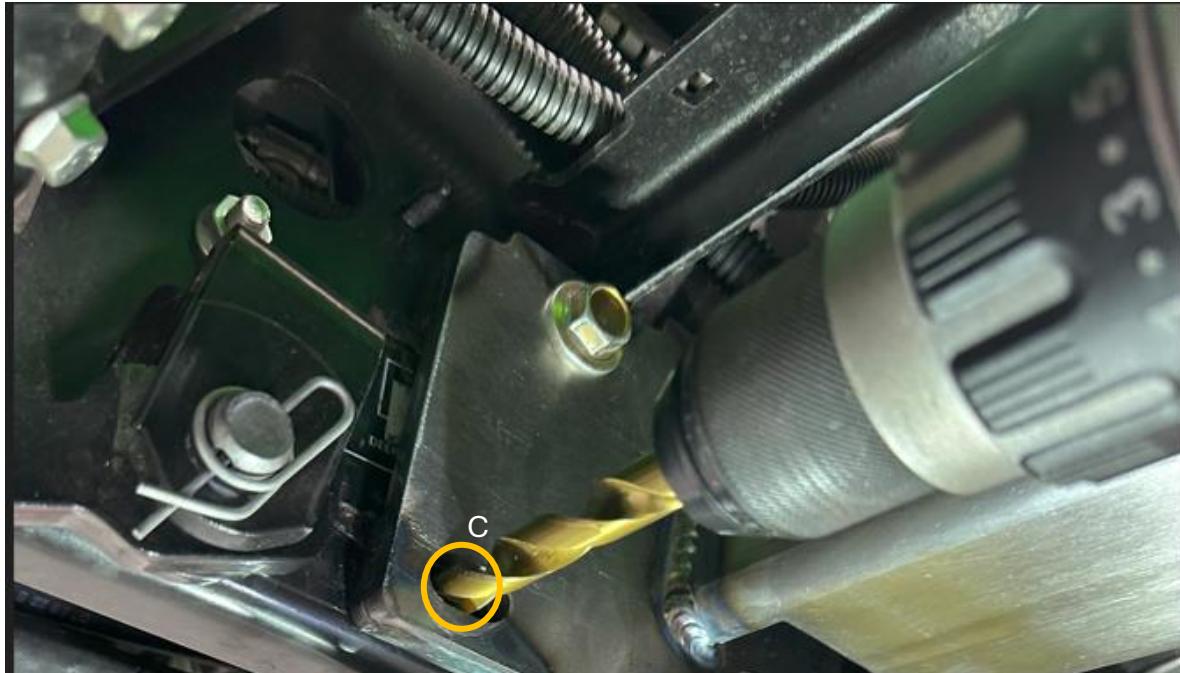


Figure 29: Drilling of rear hole to size

14. Install M12 bolts and nuts into new holes and tighten to approx. 60 lb-ft.



Figure 30: Initial tightening of bolts

15. Perform a final check of alignment and torque all M12 hardware to 100 -110 lb-ft. The bolts are all grade 10.9 and it would be very difficult to over torque with small tools. If you don't have a torque wrench, use a 1/2" ratchet get as tight as you can. For reference, lug nuts on a car are usually 90-100 lb-ft.

16. Reinstall the SCV using the included longer M8 bolts

- ***Note – Be careful to not damage o-rings on hydraulic fittings. Extras have been included if needed.***
- Place SCV in original location and install the bolt identified as GREEN-F first. While lying under tractor install washer and nut and hand tighten.

- Next install the blind bolt and lock-washer identified as GREEN-E. This can be difficult to install because it is low on the frame and there is not much room for your hand. I use good lighting to identify the hole from under/inside the frame and insert the bolt in the hole and try to line it up while looking between the subframe and SCV from under the tractor.
- Using a 13mm ratcheting wrench tighten both bolts (you will need to hold the head of the GREEN-F bolt). Approx 15 lb-ft. **Do not overtighten. You could break a bolt or damage the SCV.**
- Using Colored Zip Ties, re-identify hydraulic ports to match the 120R loader hydraulic connections. I recommend keeping the factory colors as well for your snow blower, front quick hitch, etc.

(X700 -> 120R)

- Yellow -> Yellow
- Green -> Blue
- Gray -> Black
- Black -> Red



Figure 31 - SCV Installation

17. From under the tractor, clean both mating surfaces of each hydraulic line and apply a little hydraulic fluid (from catch pan) to the o-ring (being careful not to dislodge the o-ring).
18. Align and hand tighten the hydraulic fittings. Because the SCV has been repositioned, it may require some manipulation/bending of the lines to get them to align properly. It shouldn't take much adjustment.

19. Once all fittings are hand tight, tighten fully. This is an o-ring seal. The fittings should be snug, but not over-tightened. Use good judgement and just get them tight enough to seal. I'd estimate 20 lb-ft.
20. Reinstall linkages in the orientation and in holes shown below. If the top linkage is flipped (like stock), it could interfere with the primary support tube. Use two included small M5 washers where indicated to prevent wear of hitch pin. Tip: Rotate the SCV piston to install top linkage pin, then rotate to position shown and install washers and hitchpin clips.



Figure 32 - SCV Linkage Installation

21. Now it is time to install the vertical mast that you received with your loader.
 - Install the top bolt (with washers) first. You will use 2 washers. One on the outside and one on the inside. It helps to place a piece of tape over one side and insert the nut into the wrench to hold it in place and thread the bolt into the nut from the outside.



Figure 33: Mast installation tip

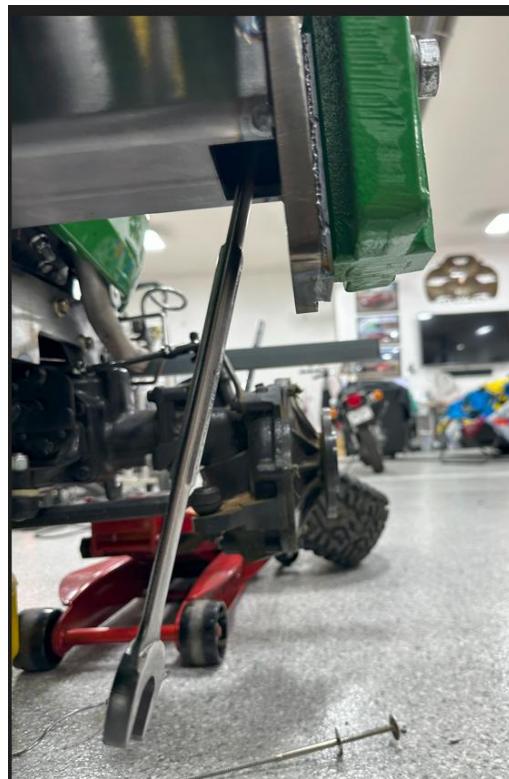


Figure 34: Mast installation

- Before tightening top bolt, insert one of the other two bolts to ensure the mount is aligned.
 - Partially tighten top bolt to ~50 lb-ft
 - Install bottom bolt and tighten to ~50 lb-ft
 - Fully tighten top bolt to ~220 lb-ft
 - Install center bolt and fully tighten to ~220 lb-ft
 - Fully tighten bottom bolt to ~220 lb-ft
 - ***Note: If you don't have a torque wrench, get a long breaker bar and tighten bolts as tight as possible.***

22. Install a piece of plastic edging on the edge of the foot/pedal tray - between the primary support tube and tray (only about 2 inches is needed.) This prevents vibration and also protects the finish on the tray and primary tube.

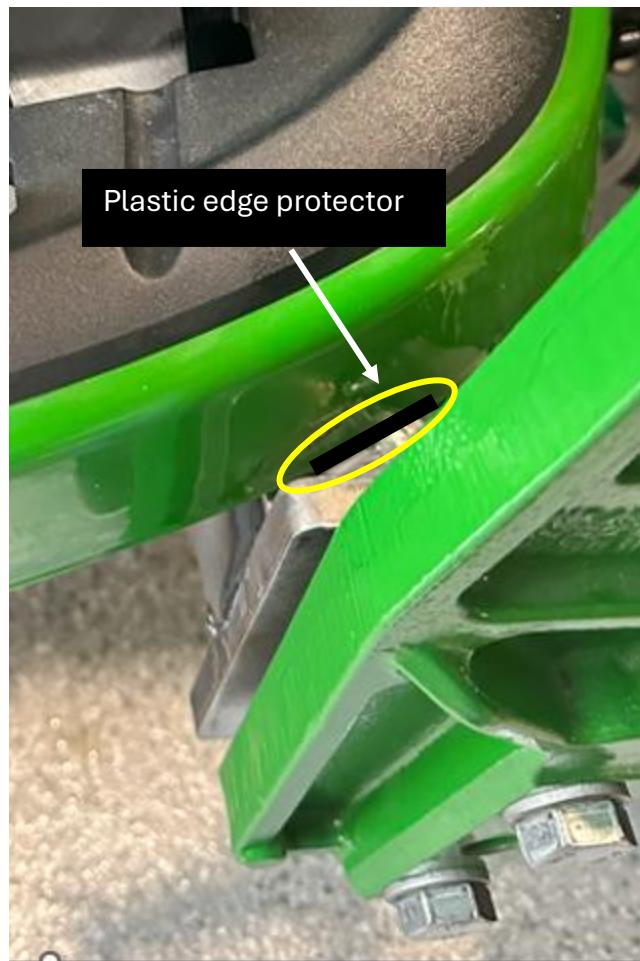


Figure 35: Location of plastic edge protector

23. Congratulations! You've completed the most difficult portion of the installation!

2 Left Side Sub-Frame Mount Installation (2WS)

The left side installation is very similar to the right side without removal of the SCV and hydraulic connections.

2.1 Disassembly

- Other than the front wheels, there is no disassembly on the right side of the tractor.
- Make sure all surfaces on the left frame are clean and free of any dirt/debris so the mount will lay flat against the frame.

2.2 Left Side Installation (2WS)

Note: It is very important to protect the power steering shaft prior to placing the left side mount into position. The power steering shaft can easily be damaged/scratched by the heavy sub-frame mount.

The sub-frame mount is heavy (about 30lbs). Having a helper or some other method of supporting the mount is desirable (floor jack, jack stands, stack of lumber).

Identify the bolt holes you will be using in the frame. Some are used as is, some are enlarged and some are new. The holes have been identified with colors and letters. The holes with the same letter are the SAME hole but depicted in a different picture.

The colors are defined below.

- **Blue** holes are existing holes for M12 sub-frame bolts
- **Orange** holes are new holes for M12 sub-frame bolts. Drill with 15/32" drill bit.
- **Red** holes are existing and need to be enlarged.

Note: The following picture is from an AWS tractor, but the frames are common with the 2WS tractors and the holes are in the same place.



Figure 36 - Left Side Hole Identification

The corresponding holes in the sub-frame mount are as follows. The blue “B” hole marked with the dashed circle is inside the primary support tube.



Figure 37: Hole identification

1. Open hood and protect the power steering rod and axle using padding of some sort (rag, pool noodle, cardboard, etc). ***This is very important because you don't want to ding/scratch the power steering shaft.***

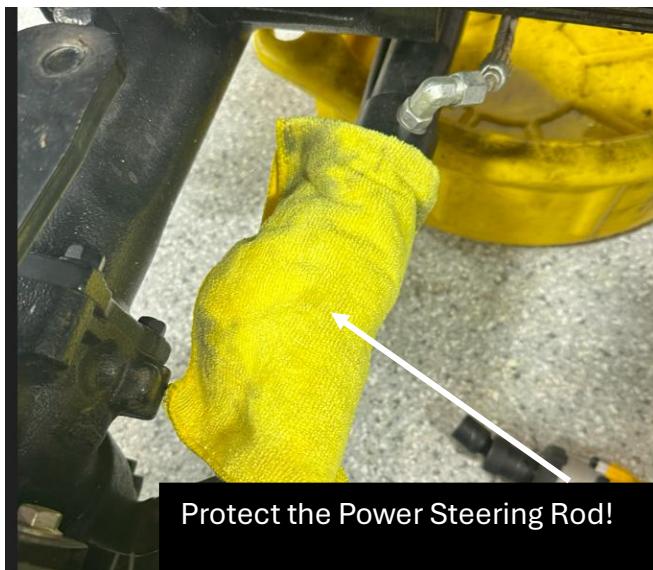


Figure 38: Protect power steering rod from damage

2. It is necessary to enlarge the hole identified as “RED-H” in the frame before the initial fitting of the sub-frame mount. You could also enlarge RED-J at this time, but I found that utilizing the mount as a guide helps keep the drill bit from jumping around.

Important – When drilling, make ABSOLUTELY sure that there is nothing on the back side of the frame that can be damaged by the drill bit coming through the frame. It

is a good idea to keep the drill bit from going any further than it needs to by using a depth stop.

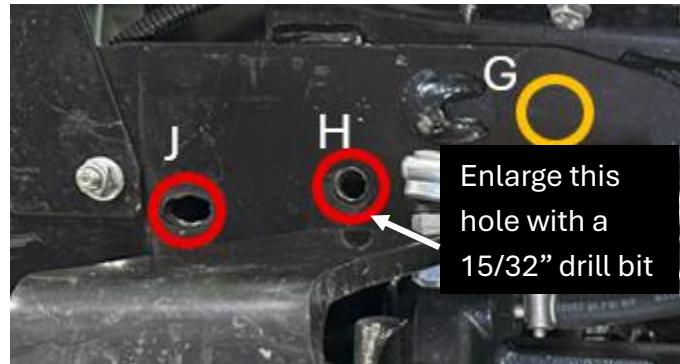


Figure 39: Front hole to be enlarged

3. Prior to lifting the sub-frame mount into place, make sure there is nothing keeping the mount from lying flat against the tractor frame. Some tractors may have plastic retention zip ties pushed through the frame. These may have to be removed if there is not a clearance hole in the mount plate. Use a standard zip tie to restrain any line/wire that you removed a zip tie from.
4. Lift primary sub-frame mount into place by first placing the front of the mount over the front axle and power steering shaft and support with floor jack or jackstands in approximate final location. It may help to clamp mount in place with RED-H in mount with RED-H in frame aligned.

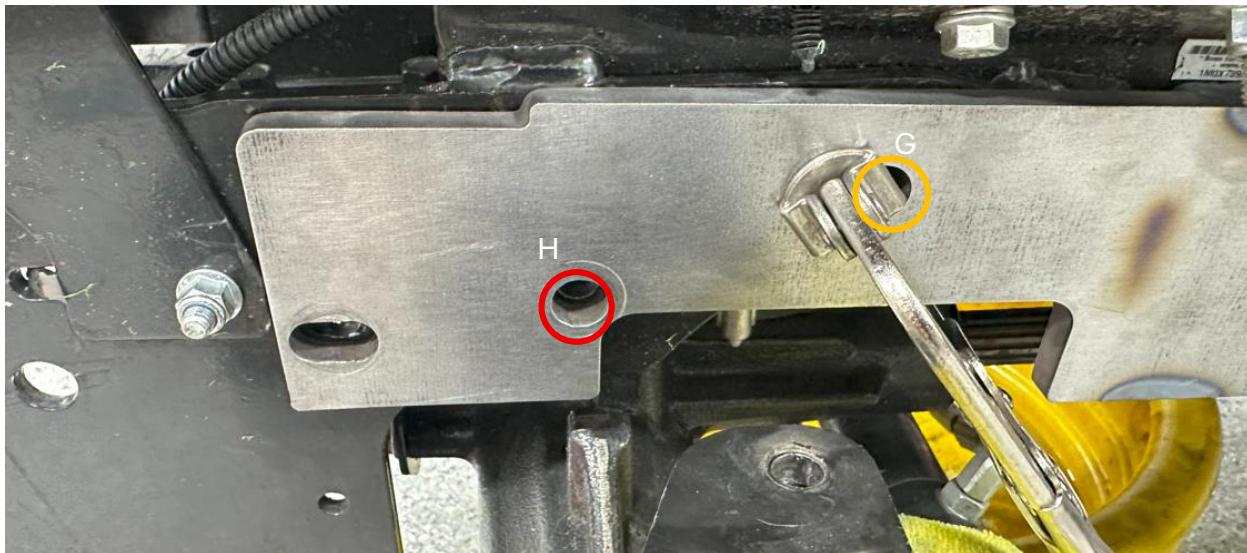


Figure 40: Initial front bolt installation

5. Install M12 bolt in RED-H location and tighten just to the point of bolt/nut flanges touching the frame/mount (you want to be able to move mount some). The installation

of this bolt will provide the vertical alignment of the front mount. There may still be some forward/aft movement.



Figure 41: Supporting the front of the left mount with bolt in RED-H

6. Install Bolt BLUE-A. Tighten the nut enough to keep mount from falling. I usually do this by hand at the start - laying under the tractor and reaching both sides of the frame. I then tighten to the point that the nut/bolt just contacts the frame/mount and still allows the mount to move forward/aft.



Figure 42: Supporting the rear of the mount with bolt in BLUE-A hole

7. Install additional hardware in the “existing” holes BLUE-B followed by BLUE-D in the sub-frame mount

8. BLUE-B is a blind hole. Using a “finger grabber” (or similar), feed the bolt up through the hole in the primary support tool and push it through the mount/frame and install nut. Tighten similar to the other bolts – just to the point where the nut/bolt is hitting frame/mount surfaces.



Figure 43: Tip to install blind bolt

9. Install bolt in BLUE-D hole with nut and tighten similar to other fasteners. Just tighten to touch surface of frame and mount.



Figure 44: Installation of bolt in BLUE-D hole

10. Now we are starting to align the mount (forward and aft) before tightening and drilling remaining holes. Adjust the alignment of the subframe so that it is touching (or almost touching) the hood hinge plate.

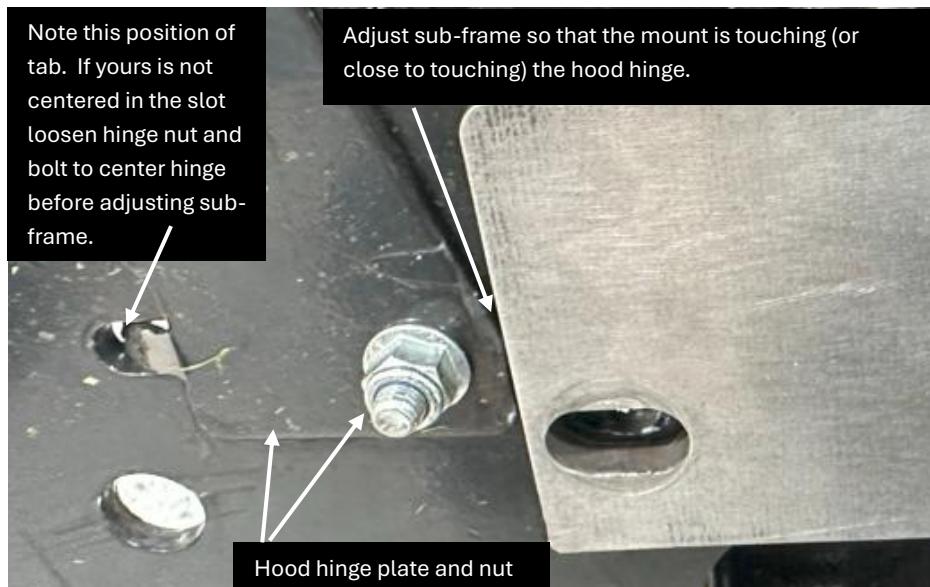


Figure 45:

11. Tighten all M12 hardware that has been installed. This doesn't have to be final torque, but tighten sufficiently (approx. 60 lb-ft) so that the sub-frame mount cannot move.
12. Enlarge RED-J with a 15/32" drill bit. Go slow and hold the drill steady so it doesn't jump in the slotted hole.



Figure 46: Enlarge RED-J hole

13. Center punch, pilot drill (3/16") and final drill (15/32") new holes identified as ORANGE-C and ORANGE-G (not shown below).

- ***NOTE: I recommend final drilling with sub-frame mount in place to use holes as a guide. Be as centered as possible to minimize damage to powder coat. Using a Transfer punch will help ensure you are centered.***



Figure 47: Marking and drilling of rear hole

14. Install all M12 bolts and nuts into new and enlarged holes and tighten to approx. 60 lb-ft.

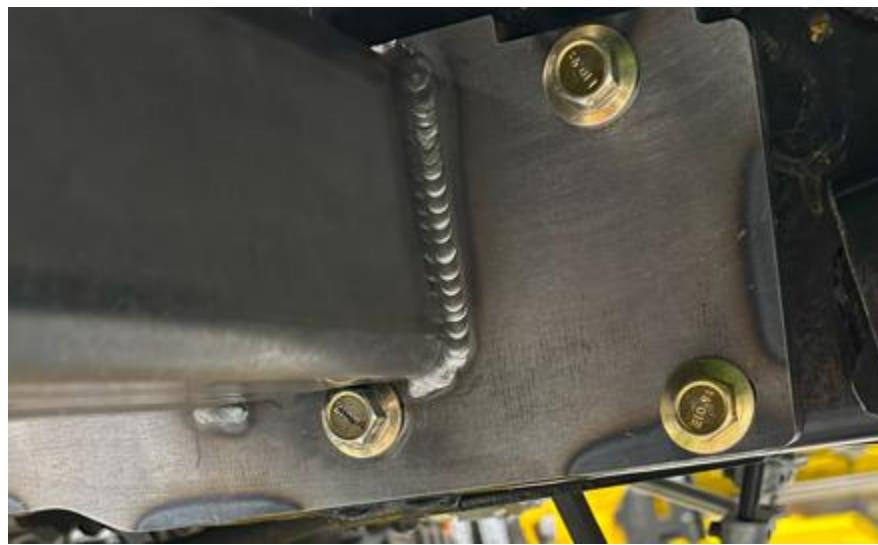


Figure 48:

15. Perform a final check of alignment and torque all M12 hardware to 100 -110 lb-ft. The bolts are all grade 10.9 and it would be very difficult to over torque with small tools. If

you don't have a torque wrench, use a 1/2" ratchet get as tight as you can. For reference, lug nuts on a car are usually 90-100 lb-ft.

16. Now it is time to install the vertical mast that you received with your loader.

1. Install the top bolt (with washers) first. You will use 2 washers. One on the outside and one on the inside. Getting the nut on can be difficult. It helps to place a piece of tape over one side and insert the nut into the wrench to hold it in place and thread the bolt into the nut from the outside.



Figure 49: TIP – Hole mast nut



Figure 50: Mast Installation

2. Before tightening top bolt, insert one of the other two bolts to ensure the mount is aligned.
 - Partially tighten top bolt to ~50 lb-ft
 - Install bottom bolt and tighten to ~50 lb-ft
 - Fully tighten top bolt to ~220 lb-ft
 - Install center bolt and fully tighten to ~220 lb-ft
 - Fully tighten bottom bolt to ~220 lb-ft

- **Note: If you don't have a torque wrench, get a long breaker bar and tighten bolts as tight as possible.**

17. Like you did on the right side, install the plastic edge protector on the foot/pedal tray edge between the tray and the primary tube to address the potential of vibration and damage to paint finishes.
18. Check the hydraulic fluid level following the process defined in the owners manual.
19. Re-install both front wheels and torque lug bolts (in a crisscross pattern) to 65 lb-ft for steel and aluminum wheels.
20. Congratulations! You've completed the installation of the L&M Concepts X700 120R loader sub-frame mounts!! Time to celebrate and "Enjoy Your New Capabilities!"

2.3 Left Side Sub-Frame Mount Installation (AWS)

The AWS linkage mechanism needs to be removed prior to the installation of the left side sub-frame mount.

The hole numbers are colors are the same as the 2WS mount installation.



Figure 51: AWS left side hole locations

Many of the steps are common to the 2WS left side sub-frame installation. Please read the 2WS Left Side installation section above. I will highlight the important steps as well as any differences in the following section.

NOTE: As with the 2WS instructions, it is very important to protect the power steering rod. Use a bunch of rags, cardboard, pool noodle, whatever you have. You do not want to drop the heavy mount on the rod.

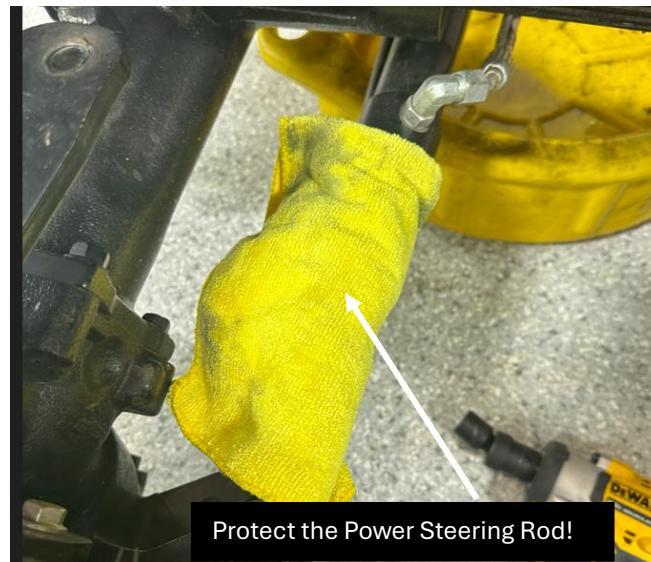


Figure 52: Protect power steering rod

1. The AWS “tie-rod” needs to be disconnected from the AWS pivot and the two bolts holding the AWS pivot to the frame need to be removed. This is done by using a 16mm wrench to hold the ball joint and a 18mm wrench to remove the nut (circled in green). Then remove the two bolts/nuts (BLUE-B and BLUE-A) from holding the pivot to the frame. There are locknuts inside the frame that need to be removed.

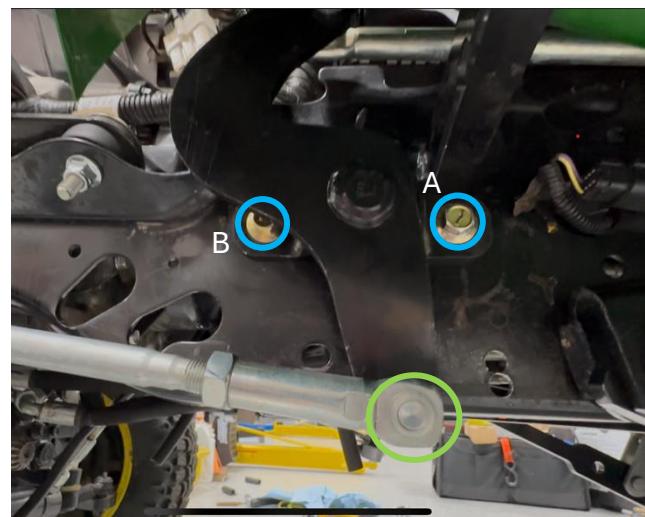


Figure 53: AWS tie-rod and pivot bolts

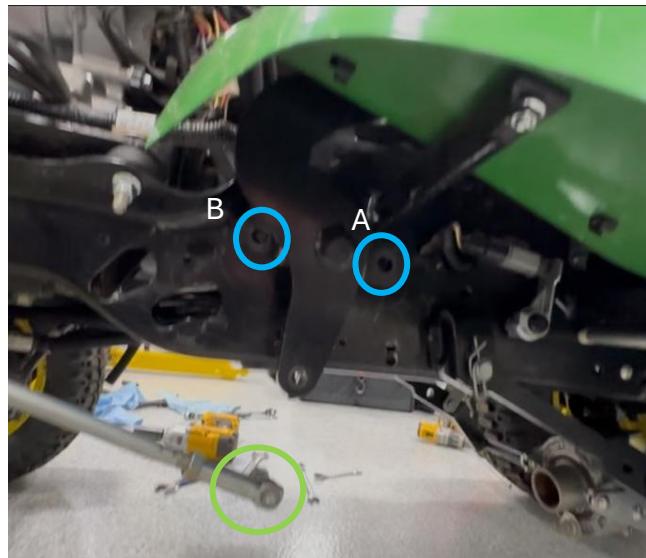


Figure 54: AWS tie-rod and pivot bolts removed

2. Enlarge hole RED-H hole before installing mount. This will allow you to install a bolt to hold the front of the mount in place while working on the back of the mount. You could also enlarge RED-J at this time, but I found that utilizing the mount as a guide helps keep the drill bit from jumping around.
3. To prepare for marking ORANGE-C hole location, it would be a good idea to place some blue painters tape at the location where ORANGE-C will be drilled on the frame. This way, when the mount is put in place and you trace the hole (in a future step), you will easily see the marks. Otherwise, it will be difficult to see on the black frame.

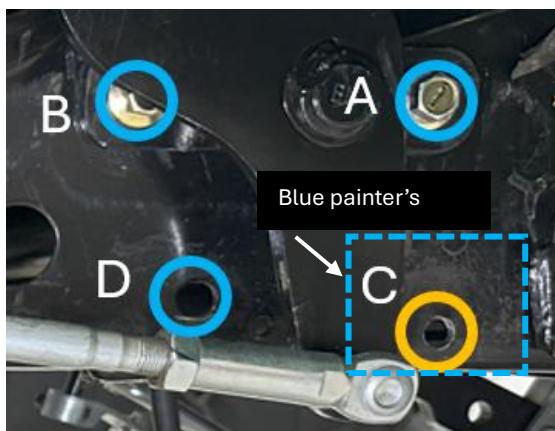


Figure 55: Blue painter's tape to help highlight traced ORANGE-C hole location

Important – When drilling, make ABSOLUTELY sure that there is nothing on the back side of the frame that can be damaged by the drill bit coming through the frame. It is a good idea to keep the drill bit from going any further than it needs to by using a depth stop.

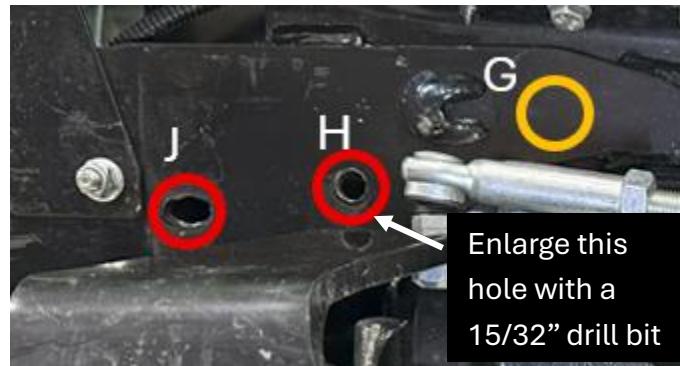


Figure 56: Enlarge RED-H

4. Install AWS mount by lifting into place and inserting the tie-rod into opening at the front of the mount. You don't need to connect tie-rod to the pivot at this time. A helper makes this step easier. You could also utilize a floor jack or a jack stand to position mount while installing RED-H and BLUE-B, BLUE-A and BLUE-D.

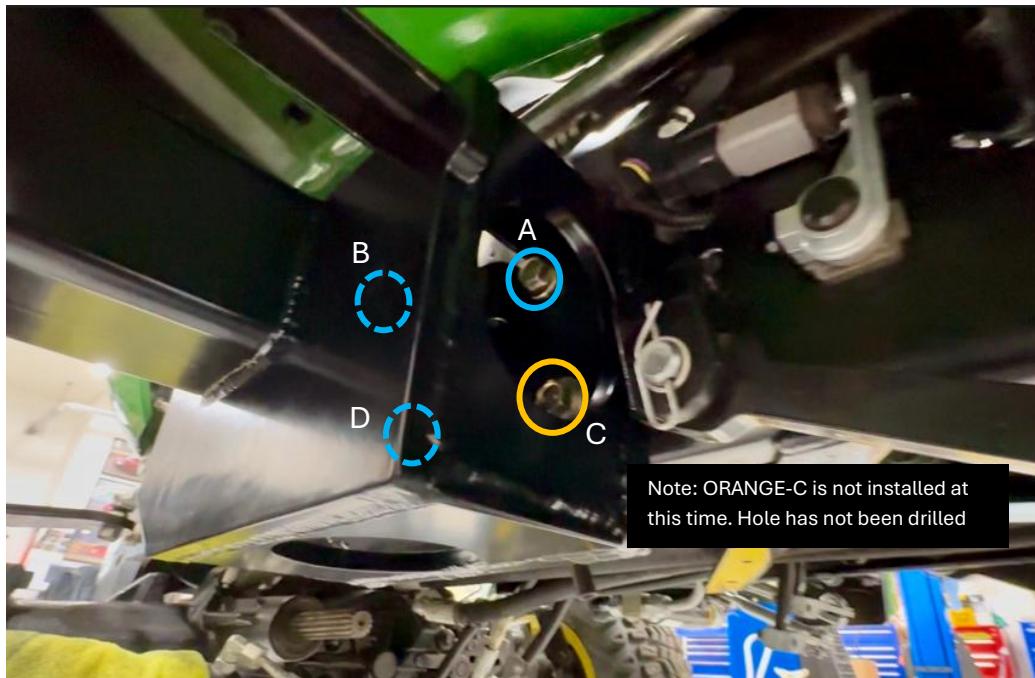


Figure 57: AWS mount initial bolt install

5. Only tighten until bolts until the mount is just touching the frame, but can still move slightly. Make sure that the front of the mount is just touching or almost touching the hood hinge.

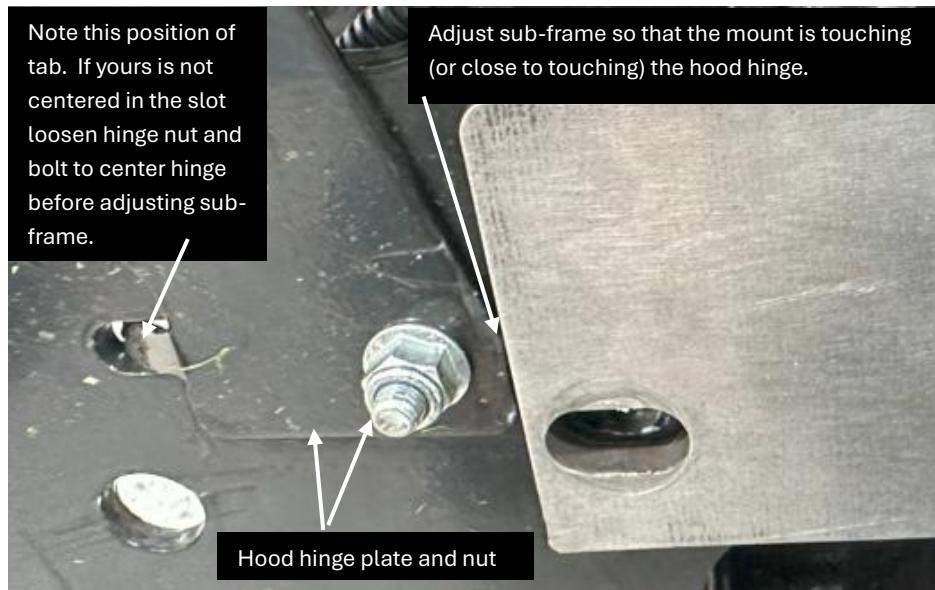


Figure 58: Mount position on frame

6. Tighten fasteners to approximately 60 lb-ft to hold mount in place for enlarging RED-J.

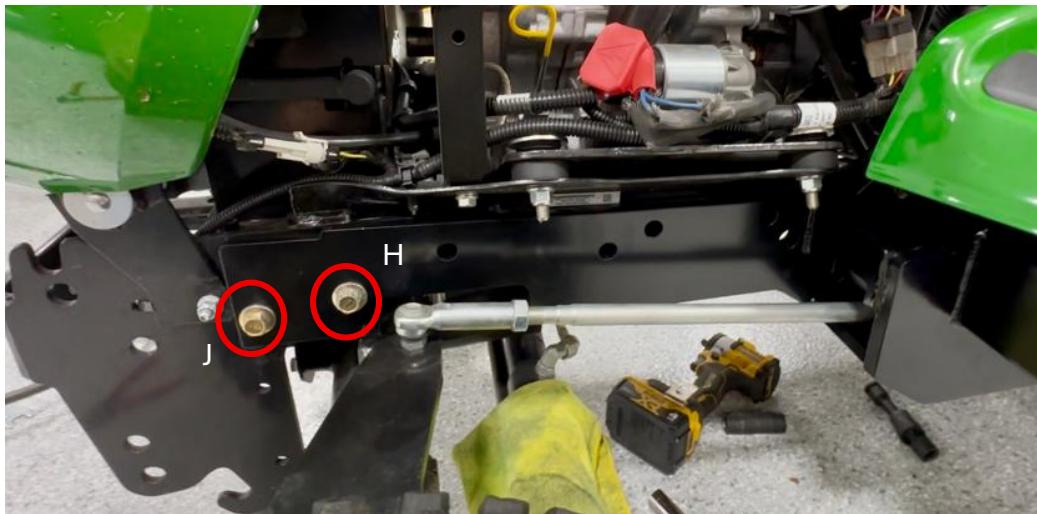


Figure 59: Enlarging RED-J hole

7. If you didn't do it in an earlier step, enlarge RED-J by drilling with 15/32" drill bit. Hold drill steady so it doesn't jump around. Confirm that RED-J bolt can be installed, but don't install.
8. Mark ORANGE-C by reaching inside of mount cavity and trace the inside of the ORANGE-C slotted hole with a small marker, sharpie, pencil. Make sure that the marks are clear. If you used the blue painter's tape in previous step, the mark should be clear.
9. The next step is to drill ORANGE-C. Unfortunately, the mount must be completely removed. Remove mounting bolts and carefully lower the mount to the floor.

10. Locate the hole location you traced with the pencil or sharpie. Center/transfer punch the center of the traced slot (vertically and horizontally) and drill a pilot hole with a 1/4" drill bit. Final drill with a 15/32" drill bit.
11. Remove blue tape and re-install the mount as described in the steps above.
12. Install hardware initially just flush with mount and frame and ensure alignment with hood hinge as described above. When that is confirmed, tighten all fasteners to approximately 60lb-ft.
13. Using ORANGE-G mount hole, mark the ORANGE-G frame hole location with a center or transfer punch. Drill a 1/4" pilot hole and final drill with a 15/32" drill bit.
14. Install bolt into new ORANGE-G hole.
15. Final torque all fasteners to approximately 100lb-ft.
16. Install tie-rod end into AWS pivot. Torque to approximately 35lb-ft
17. Install Vertical mast following the same method described in the 2WS left side mount section above.



Figure 60: Installation of left side vertical mast

18. Reinstall wheels and torque bolts in a criss-cross pattern to 65lb-ft (steel and aluminum wheels)
19. Congratulations! You have completed the installation of the AWS 120R loader mounts!
Enjoy Your New Capabilities!!

Revision History	
Rev A	Initial Release
Rev B	Major update – Corrected typos/grammar, added detail for hardware kit, added more tools, clarified some installation steps, added AWS section