

How-To

Installation of THRV and Freewheel Lever

Created by L&M Concepts, LLC

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

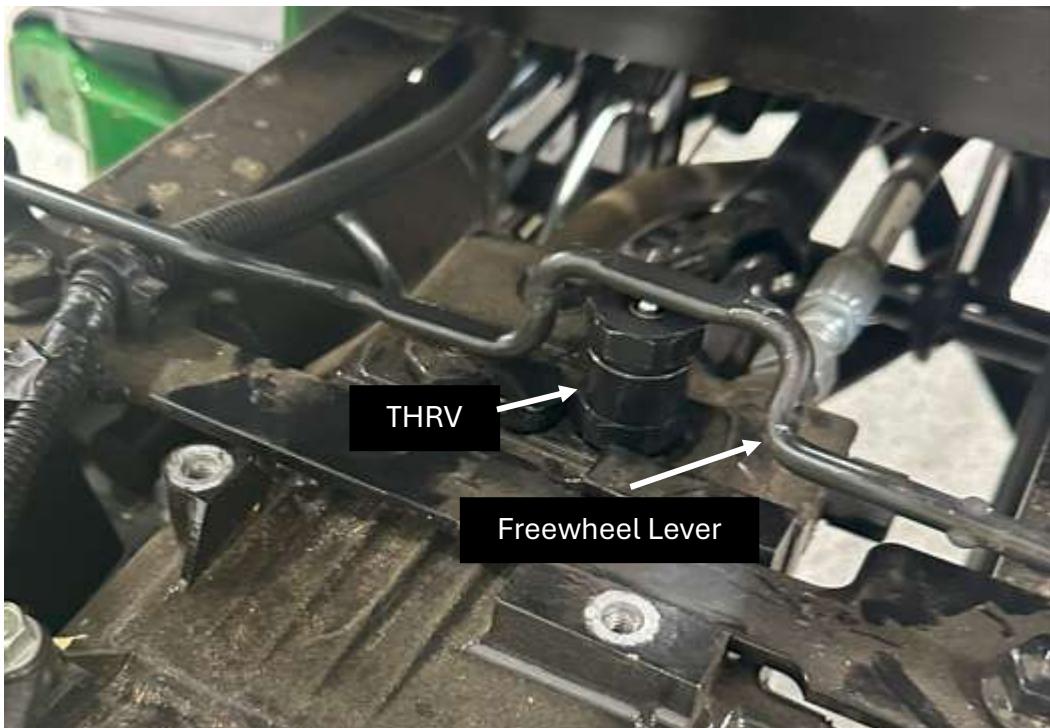


Figure 1: BW15044 John Deere THRV and Freewheel (Neutral) Lever

“Enjoy Your New Capabilities”

1 THRV and Freewheel Lever Installation Instructions

1.1 Introduction

When installing a front end loader (FEL) on your X700, it is highly recommended that you install a Transaxle Hydrostatic Release Valve (THRV). This is especially important on all wheel drive tractors. When using a fully loaded loader, you have sufficient weight that ensures you have full traction. Under full traction conditions while using the tractor, if you were to come to a stop while pushing, it is possible that the transaxle could be damaged. The THRV releases transmission pressure under these conditions. Or 2WD tractors, it is still highly recommended to install, but the 2WD tractor will likely lose traction. This reduces the likelihood of transaxle damage.

1.2 Applicability

This How-To is applicable to 2013+ 2 Wheel Steering and All Wheel Steering tractors.

1.3 Parts Needed

BW15044 – John Deere THRV (AWD)

BW15043 – John Deere THRV (2WD)

M146148 – John Deere Free Wheel Lever (FWL)

1.4 Tools Needed

- Nitrile Gloves
- 3/8" ratchet
- 13mm Socket (shallow and deep well)
- Various Socket extensions
- 13mm wrench
- 19mm combination wrench
- 27mm wrench or adjustable wrench
- Hex wrench set
- Drill
- Drill bit set
- Zip Ties

1.5 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.
- Read full Installation Instructions thoroughly.
- Take pictures before you disassemble anything to aid in reassembly.
- If you have any questions, please email us at: sales@landmconcepts.com

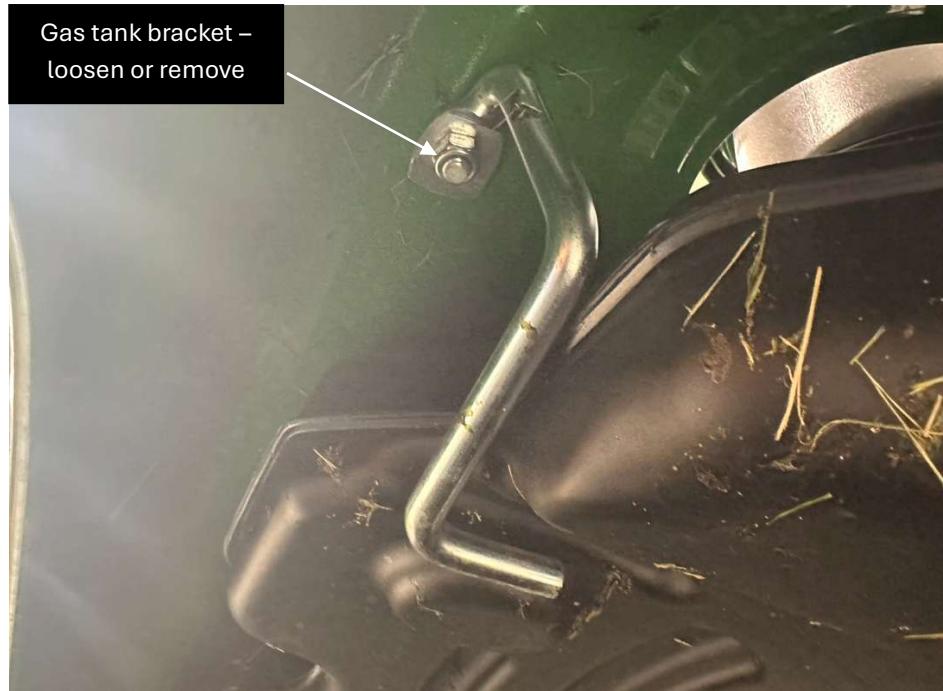
2 Disassembly

First step is to remove the rear seat pan/fender assembly.

- You don't need to remove the seat. Move the seat all the way forward exposes two cap screws. Remove the two screws.
- Disconnect the seat safety switch. Cut the zip tie.
- Remove 2 bolts (4 total) from where the seat pan meets the "running boards". There are two on each side.
- Loosen or remove the gas tank retention bracket (under left fender near fuel cap). You can leave in place and swing out of the way or just remove. Your choice.
- Remove fuel cap. The gassers have a tether (reach down and bend retention feature to get it out of the tank), I don't think the diesels have a tether.
- Remove two bulbs from each side of fender (protect them so they don't get damaged). Remove 12v plug from adapter socket on right side, under fender.
- Tip rear of seat pan up, so you can feed the seat safety switch through the seat pan.
- You should now be able to lift rear of seat pan by grabbing the "Oh \$hit" handles (from the back of tractor) and lifting up so you can tilt up and away from running boards and then just walk it out...seat and all. It is kind of heavy with the seat, but it is nice to not have to remove it.
- Set assembly on floor



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- Remove fuel tank bracket (two bolts) and set aside.
- Get a ratchet strap, rope, etc and tilt/tie up rear of tank to the steering wheel. You have now exposed the Freewheel Lever and relief valves.
- Reinstall the fuel cap to keep fumes down.
- Remove hitch pin from FWL. Remove plastic cap off FWL and manipulate the FWL out of tractor (it can only go one way out because of flatten spots on FWL)

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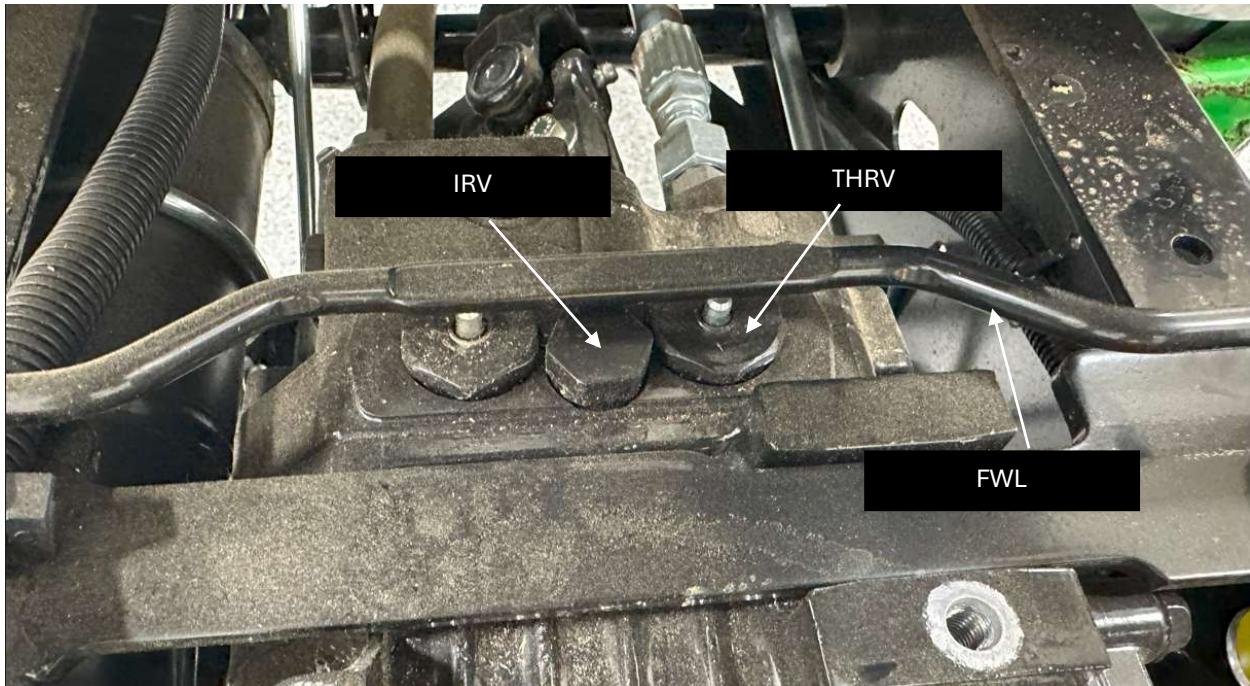
- Clean this area well (air, brush, etc). You don't want debris getting into the transaxle in the next step.



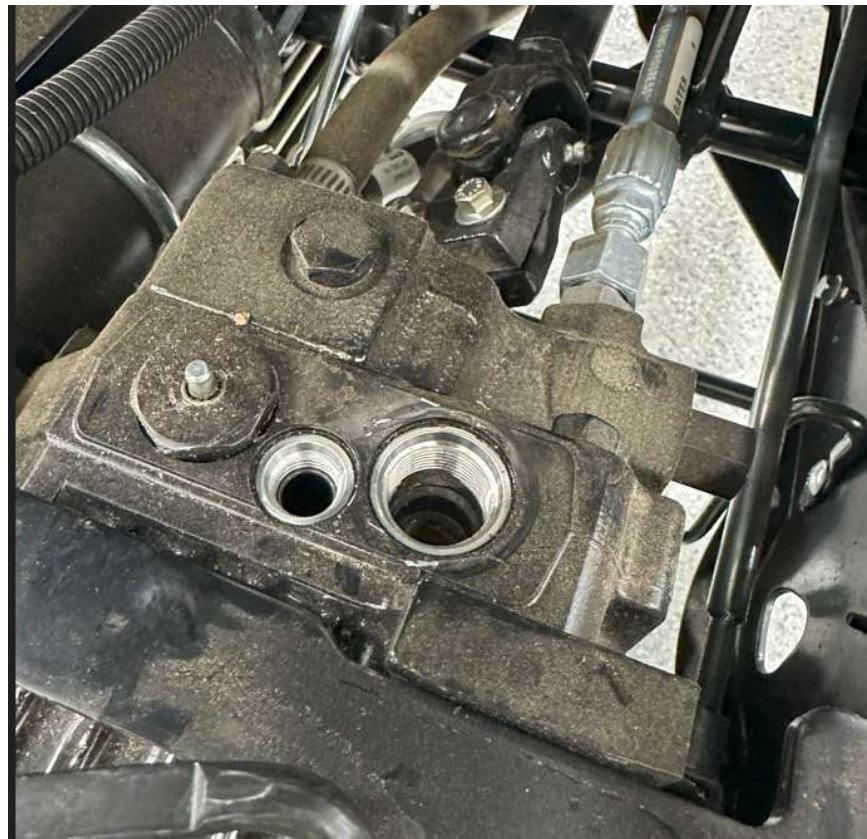
- Remove Freewheel Lever by removing "hitch pin" clip and feeding lever through brackets. You don't need to remove brackets, just work the lever rod out.
- Remove the center valve (Implement Relief Valve (IRV)) with a 19MM socket. Remove this first because it makes the next step easier.
- Remove the right valve with a 27MM wrench (adjustable is fine)

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- If you are going to shim, now is the time. You can see the one washer/shim in the pictures. This is stock (approx.. 1000psi). I added 0.7mm to get to 1225 psi. You will want to measure as you are making changes. Don't blindly use my numbers.
- Remove stock THRV (I don't know what the stock one is called) and replace with the new one (BW15044 - there is a different part number for the 2WS tractors).
- Torque both IRV and THRV to "good-n-tight"...or find the spec yourself)



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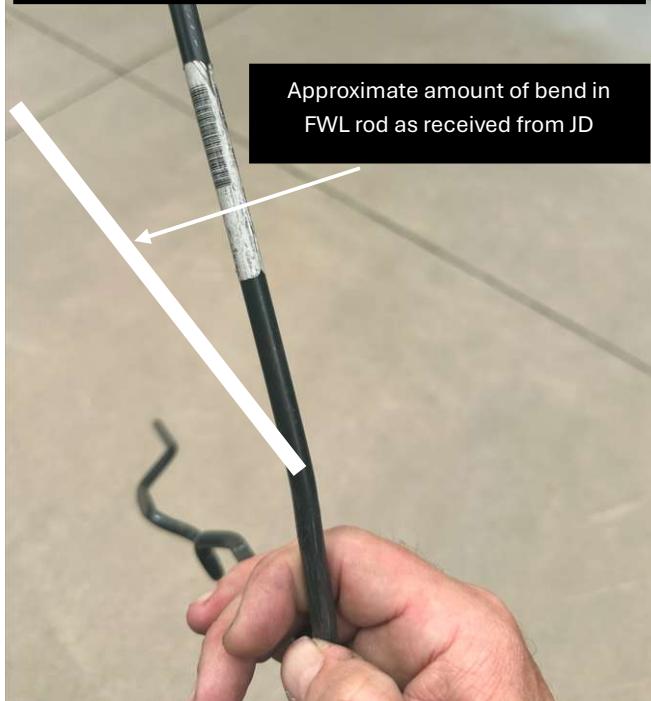
3 Reassembly

- Check pressure at SCV with hydraulic pressure gauge and re-shim until you get your target pressure.
- Drill a hole in FWL the same size and in same location as the stock lever (not sure why the replacement doesn't have the hitch pin clip hole).
- You will need to modify the bend on the FWL or it will hit the gas tank before releasing the wheels (via release on THRV and other valve). I put the lever in a vice and made it almost straight (maybe a little bend remained)
- Install FWL and install hitch pin. Snake it into position. Install the plastic cap removed from the stock FWL.

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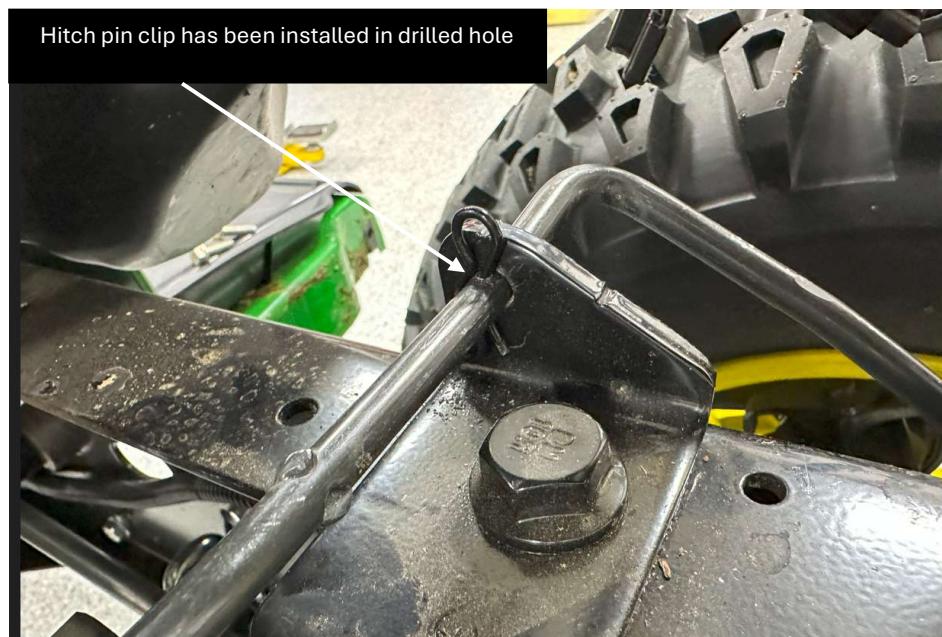
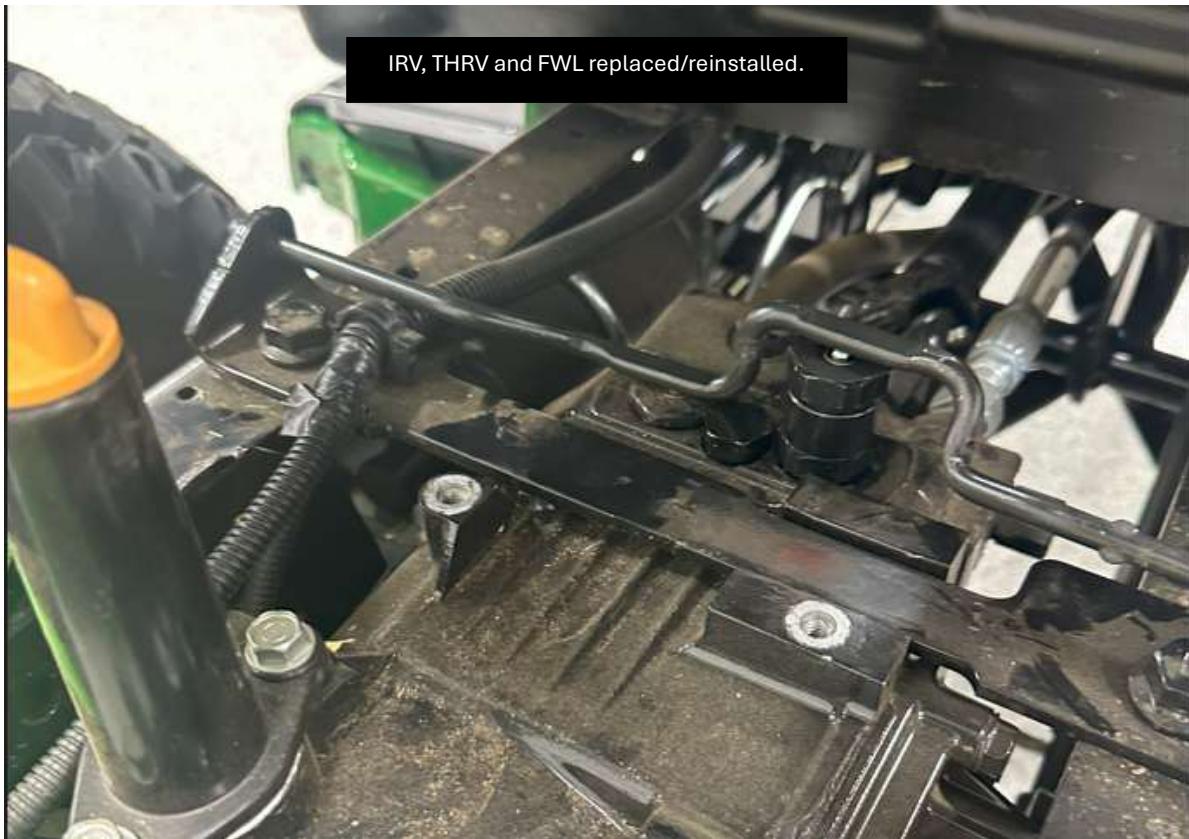


Remove much of the bend in the IRV (the rod was designed for previous tractors). It will otherwise hit the gas tank and will not put transmission into neutral.

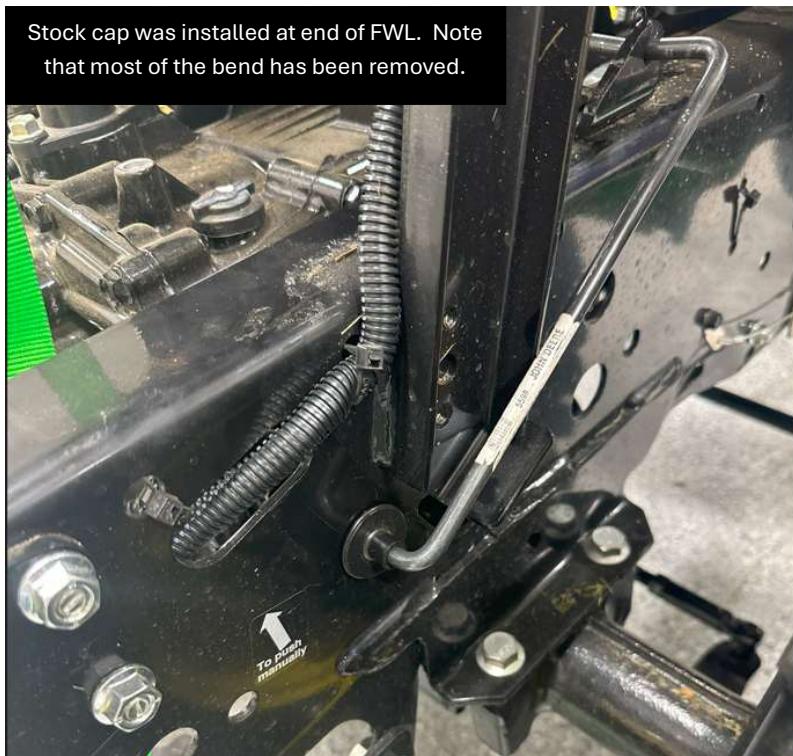


Approximate amount of bend in
FWL rod as received from JD

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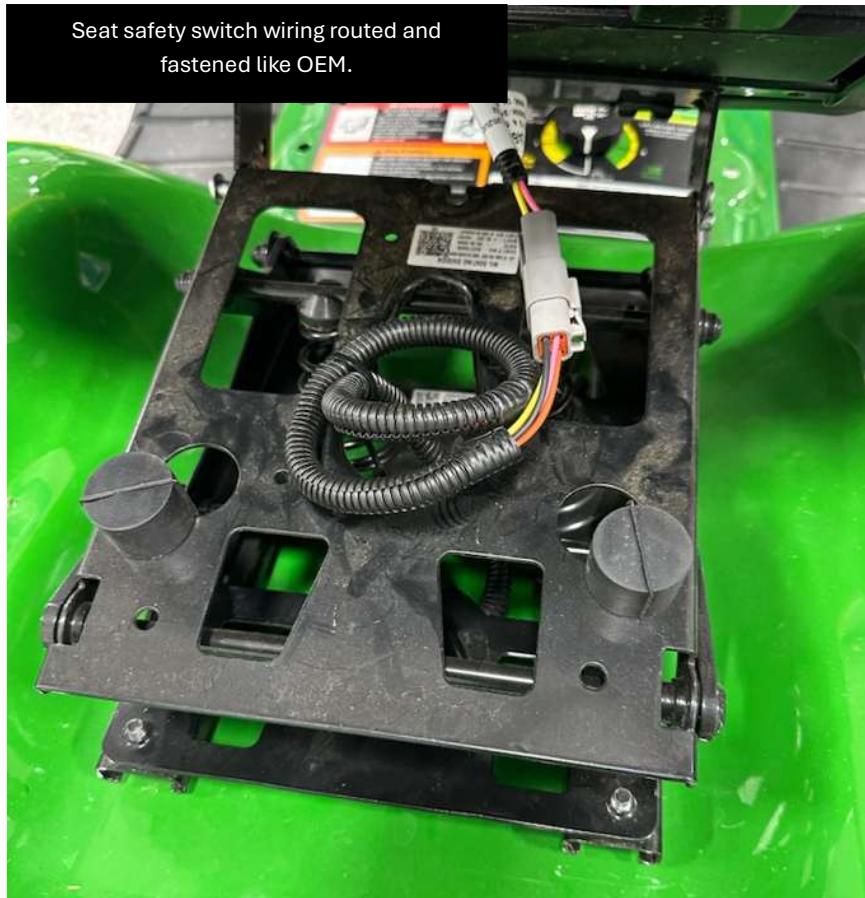


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- Lower the fuel tank and fasten tank retention bracket back into place.
- Remove the fuel cap before reinstalling seat pan. It helps to tip the pan to the running boards and then setting the back of the seat tray down.
- Reverse all remaining steps for reassembly.
 - Make sure you route the seat safety switch like it was (refer to your pictures) as you lower seat pan.
 - Carefully reinstall lights (refer to pictures so you get the correct one in the correct lens)
 - Install 12V adapter plug
 - Install the running boards bolts first...tighten by hand/don't cross thread.
 - Install two cap screws under seat
 - Tighten the running board screws followed by cap screws
 - Reinstall tank retention bracket near fuel cap.

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- Grab a cool drink to celebrate, you are done!