

Remote Hydraulic Modification for the Ford Golden Jubilee (NAA) Tractor

By Paul Schultz

The Ford NAA tractor (1953-54) comes with an adapter plate that enables use of the internal hydraulics for operating various implements. Unfortunately, the OEM adapter plate is basically a cover and does not provide for proper routing of the internal hydraulics for remote operations. Back in the day there was an optional adapter plate called a 'Selec-trol' valve. This allowed the use of the internal hydraulics. Under this set-up control of the hydraulic implement was achieved using the tractors position control lever. The Selec-trol Valve is now very difficult to obtain used.

All hope is not lost! Thanks to some very knowledgeable and resourceful individuals a simple modification was developed that allows use of the tractors hydraulic system. More importantly, this method does not require "chaining down the lift arms" AND you still can operate your 3 point lift arms with this modification in place!

I searched the web thoroughly in an attempt to find details of this modification. I did find some old forum postings describing the details (<http://www.ytmag.com>, search for 'hydraulic diversion' and look for a 2001 posting by John from Colorado). I performed this modification and used my digital camera to document the process so others could benefit as well!

Below is what I started with. My goal was to install the front-end loader (FEL) back to my 1953 Ford Golden Jubilee. I had purchased the tractor a couple months earlier (April, 2005). It came with a Freeman FEL with a trip bucket. The frame was still installed on the tractor but the loader arms and bucket were not. It did not come with any hydraulic equipment with the exception of two short hydraulic hoses.



The Adapter Plate and Test Port

Here is a picture of my original adapter plate. Please note that there is a quick connector attached to (what I would learn is) a return port for the hydraulics. I believe the original owner ran his hydraulic pressure line from the 'test port' (more about this port below) to a control valve and returned the hydraulic fluid through this quick connector. If my assumption were correct then the previous owner would have had to chain down the 3-point lift arms to allow the hydraulics to operate the FEL.... I wanted to avoid having to chain down the lift arms. Take a look at the adapter plate. Notice the two raised linear segments (bosses)? One of these carries the pressure side of the hydraulics and will be modified so we can more elegantly tap into the system.



In this next picture you can see the adapter plate immediately below the seat. Down the right side of the transmission casing you can just see the 'test port' (It has an elbow adapter on my tractor with a yellow plug installed). This test port allows access to the hydraulic pressure side of the internal hydraulics. This will be our access point to tap into the system. Since my tractor came with an elbow and plug installed, I felt this was further evidence that this port was used by the previous owner to run the FEL.



The Modification – A Prelude...

Why should you do some 'fancy' modification? There have been several methods that developed that allow you to tap into the existing hydraulics to operate implements (like my FEL!). But, most are a variation on the same theme. The pressure side of the internal system is used. But, under these methods two common things could happen:

First, under a system where you run a pressure side line to your implement and a return line back to the hydraulic reservoir the following would likely happen. An attempt to operate your hydraulic implement (i.e., try to increase pressure to make it move) results in the hydraulic fluid taking the path of least resistance (apparently a fundamental rule of hydraulics!). In my situation, instead of extending my FEL hydraulic cylinders this pressure ends up travelling to the internal hydraulic system. More specifically, the unloading valve will activate and 'dump' the pressure that you are trying to build up to move your remote hydraulic implement back to the hydraulic reservoir. The result is your implement won't move.

Second, some folks will run a pressure line from the test port to the remote hydraulic cylinder with no return line. In this case, the lift arms must be chained down. The pressure builds and since chaining the lift arms blocks the 3-point lift cylinder the pressure takes the path of least resistance and would now result in extending the FEL cylinders. In this set-up, the existing position control lever is used to operate the FEL. Hydraulic fluid returns via the same pressure line when the lever is pushed to the 'down' position. It is pushed back to the reservoir by the gravitational weight of the FEL. Many people run their Ford 9N, 2N, 8N FEL in this way. There supposedly was an OEM optional 'lift arm locking mechanism' you could have installed for this purpose.

Obviously, it would be nice to have use of your 3-point lift and remote hydraulics without having to go through a 'chain-and-unchain' ritual. Fortunately, unlike the earlier N-series tractors, the NAA hydraulics were designed with this option in mind. But as already stated, the 'Selec-trol' valve is very hard to come by.

The Modification – Adapter Plate Changes

The key to the modification is to change the existing adapter plate. This is necessary due to the rarity of the Selec-trol valve. Even if you were to locate this valve the price is usually very high. Below are images of the adapter plate (again, mine has the quick connector attached). On the left is an overhead view of the adapter plate. On the right is the matching area on the hydraulic top cover.



Here is the adapter plate flipped over so you can view the bottom. The holes with the rubber O-rings are hydraulic passages that travel through the raised linear bosses shown in the above image. The remaining holes are for the bolts. The port/passage shown in this image that is at the left edge is the one that will be modified. This is the port that lines up with the pressure passage. When the adapter is on the tractor this port is basically in a vertical line directly above the test port area (the one on my tractor with the elbow and yellow plug).

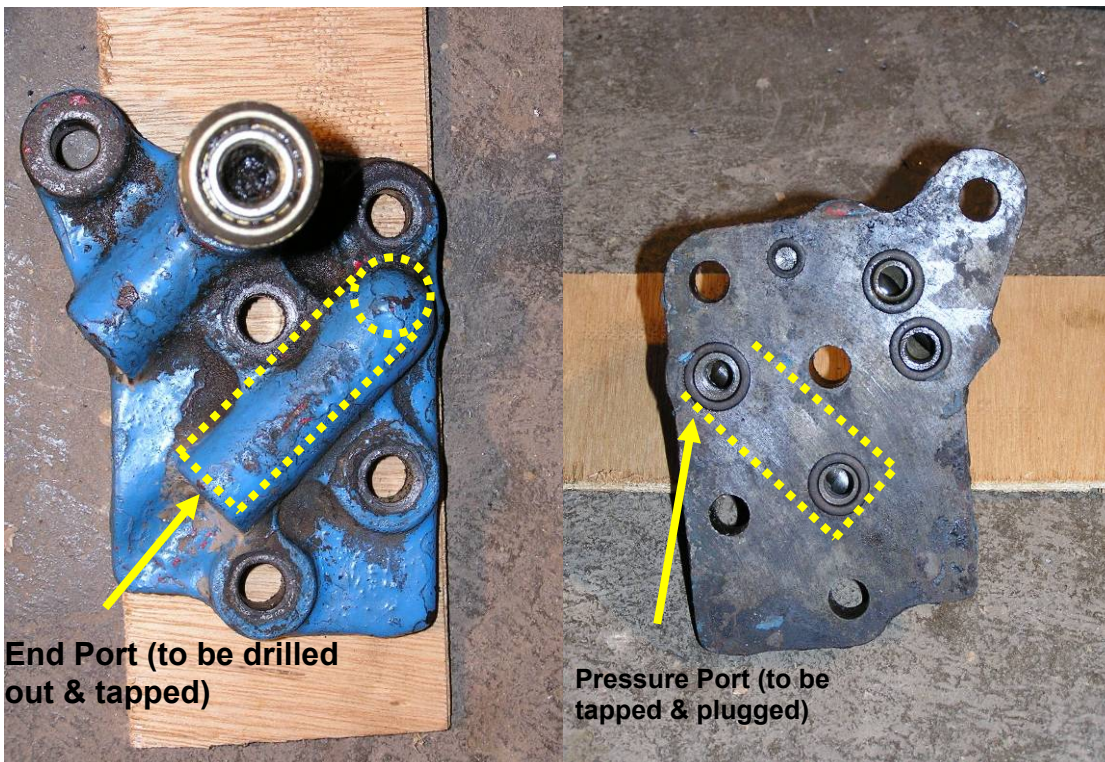


The modification explained:

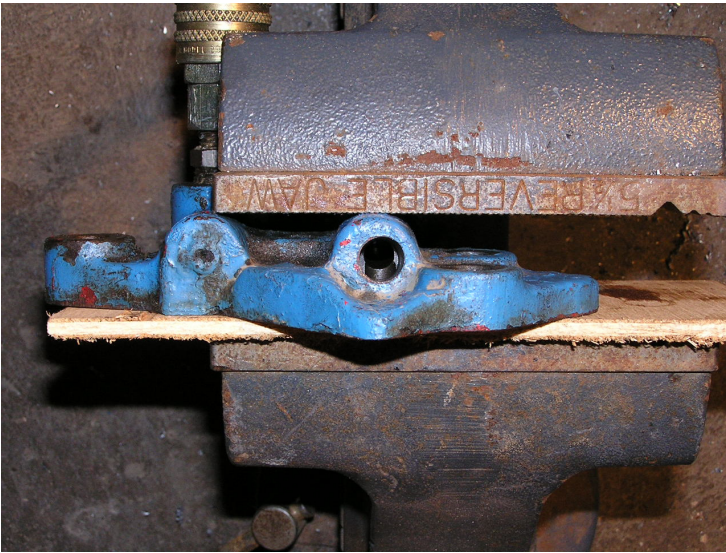
I hinted at the problem with using the internal hydraulic system to run a remote system. If there is more than one path for the hydraulic fluid to take, it will take the path with less resistance. One method as already noted was to chain the lift arms down so that this path would have infinitely GREATER resistance. In this method, the path of least resistance would then be the remote cylinder. This works but requires the user to always stop and chain things down.... something I was trying to avoid.

Fortunately, the NAA hydraulics were designed to accommodate a remote hydraulic pathway. Since it is isolated it is the ONLY pathway. So, there is no concern of having a second or alternate path with less resistance that the hydraulic fluid would prefer to push down!

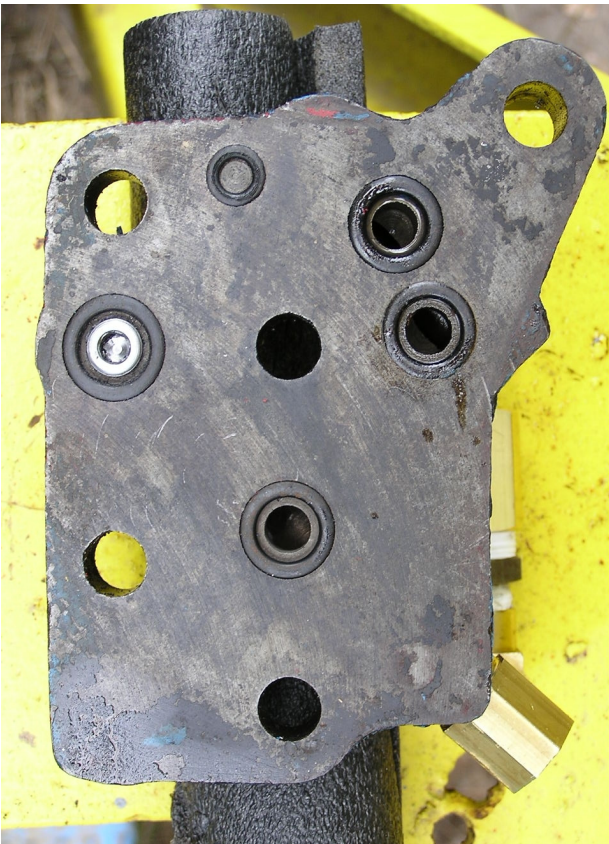
In order to use the existing adapter plate a plugged access on the top side has to be drilled out of the end of one of the raised linear bosses (linear segments) and tapped to receive a fitting. Also, one of the ports on the underside of the adapter plate has to be tapped so that a plug can be screwed into it. Here are the same images as above with the areas identified:



I placed the adapter plate in a vise so I could line it up and use a power drill to carefully drill out the End Port. You have to drill it fairly centered so that you can tap some threads in it to receive some plumbing fittings. Below shows the End Port plug drilled out. Note the other raised boss to the left. It still has its plug in place. Underneath the blue paint I believe these plugs have recessed hex socket holes...drilling it out was easier!



The next image shows the Pressure Port on the underside of the Adapter Plate with the port plugged with a recessed hex plug. The hole was drilled to the proper size and then tapped to receive the plug. I used a matching drill bit and tap. This was purchased at the hardware store as a packaged combination.



Here is the finished Adapter Plate with modifications. I used common brass plumbing fittings bought at the local hardware store. The brass plug is where my original Quick Connector had been.



With this modified Adapter Plate the pressure port on the underside is plugged. So, there is no delivery of hydraulic pressure up to the Adapter Plate. In order to use this set-up for auxiliary hydraulic implements I ran a hydraulic hose from the Test Port on the side of the tractor to a remote hydraulic control valve. The valve was plumbed up appropriately to operate the FEL. The return hydraulic line leaving the control valve attached to the brass fitting added to the End Port (see above).

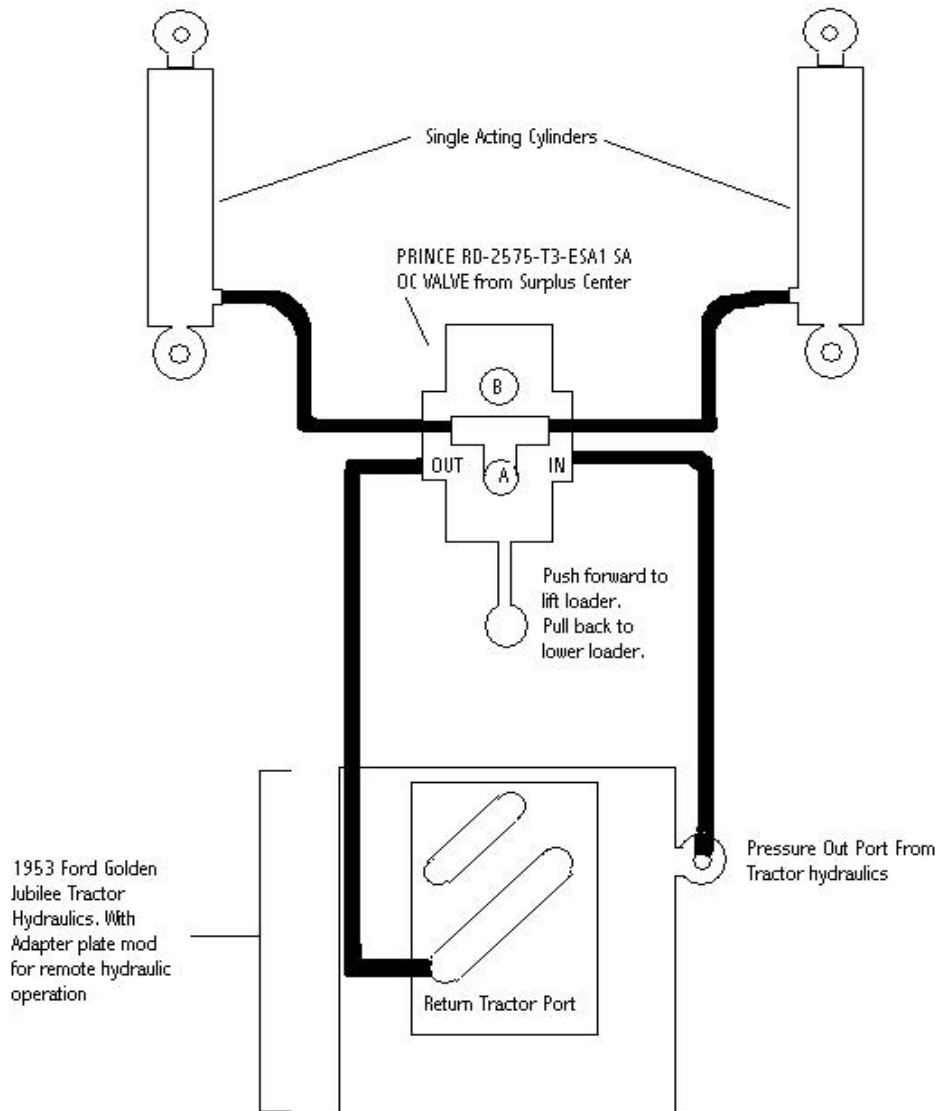
Let's follow the hydraulic pressure!

In the unmodified situation, pressure would run up the passage to the pressure port on the Adapter Plate. The pressure goes up into the Adapter Plate and through the linear boss. The pressure dives down a second port and back into the internal hydraulic pathways within the Top Cover of the NAA tractor.

In the modified situation, the transmission of pressure through the Adapter plate is blocked since the new hex plug blocks the Adapter Plate Pressure Port. But, since the Test Port is still being used, the pressure travels to the remote hydraulic set-up (in my case a control valve and FEL). The return hose (from my FEL control valve) is hooked up to the opposite end of the linear boss. In this way, the returning pressure is re-introduced to the Adapter Plate "downstream" of the plug that was added to the pressure port. The pressure once again enters the internal hydraulic pathways within the Top Cover of the NAA tractor.

In order for this set-up to work the remote hydraulic control valve has to be what is called "open center". This means that while the control valve handle is in its neutral "rest" position hydraulic pressure passes through and back to the Adapter Plate.

Below is a schematic showing my remote hydraulic set-up. It works great. Hopefully, this tutorial will help you use your NAA tractor to its fullest!



Some Final Notes...

If you want to disconnect your remote hydraulics from this system you need to do one of two things.

The first option would be to take the adapter plate off and remove the hex plug from the underside. You also would have to place a plug in the top side 'return port'. The adapter plate could then be reinstated and it would function as it did prior to the modifications.

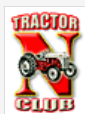
The second option would be to connect a hose directly from the test port to the newly installed 'return port'. Below is a picture of a crudely connected hose to illustrate this method. If you were going to have a hose installed like this you would likely fit it in such a way where it wouldn't interfere with your leg!



The original forum posting regarding this modification does warn against trying to use the remote hydraulic implement (my FEL for instance) and the 3 point lift simultaneously. No internal damage would result but one hydraulic system would not operate and the other might drop. However, I have never had the need to raise my FEL and the 3 point lift at exactly the same time. So, for me this hasn't been an issue at all.

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*Best internet source
of information and help
for old Ford tractors.*

www.ntractorclub.com