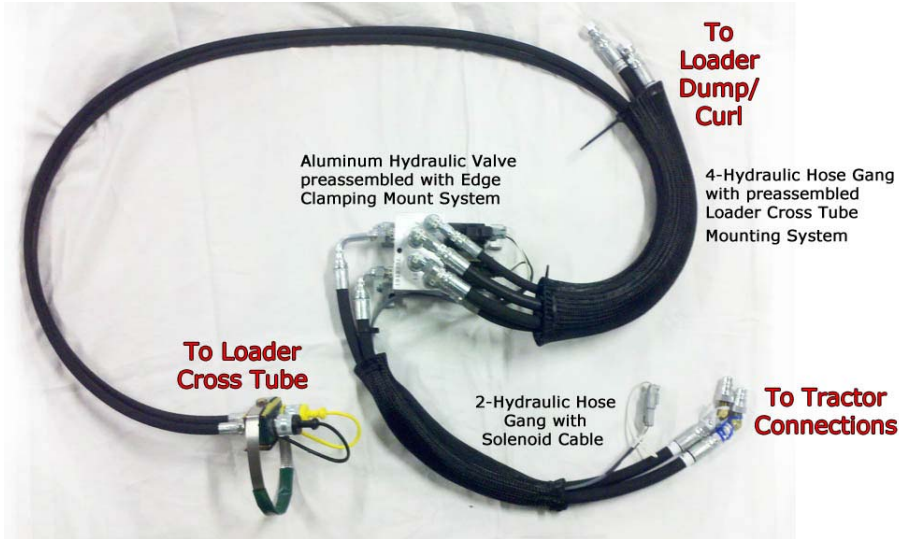




**HYDRAULIC DIVERTER KIT**  
**P/N: HDK-200/H120/H130/120R –PTL**  
 (note: works with 120R MSL loader)  
 (note: fits with John Deere 120R Single Point Hydraulic Connector,  
 but must also purchase kit P/N: HDK-120R-SPHA)




An electrically operated hydraulic valve system to divert hydraulic fluid from the loader dump/curl circuit to a forward auxiliary connection for loader attachments, requiring momentary hydraulic power, such as the Artillian Grapple, Hydraulic Plow, etc.

Approximate Installation Time
Experienced Dealer Technician – 2 Hours
Average Dealer Technician – 4 Hours
Do-It-Yourself – 6 Hours


Approximate Product Specifications
Weight: 12.0 lbs.
Max. Pressure: 3,000 PSI

Register your new product quickly online at [Artillian.com/product-registration/](http://Artillian.com/product-registration/)



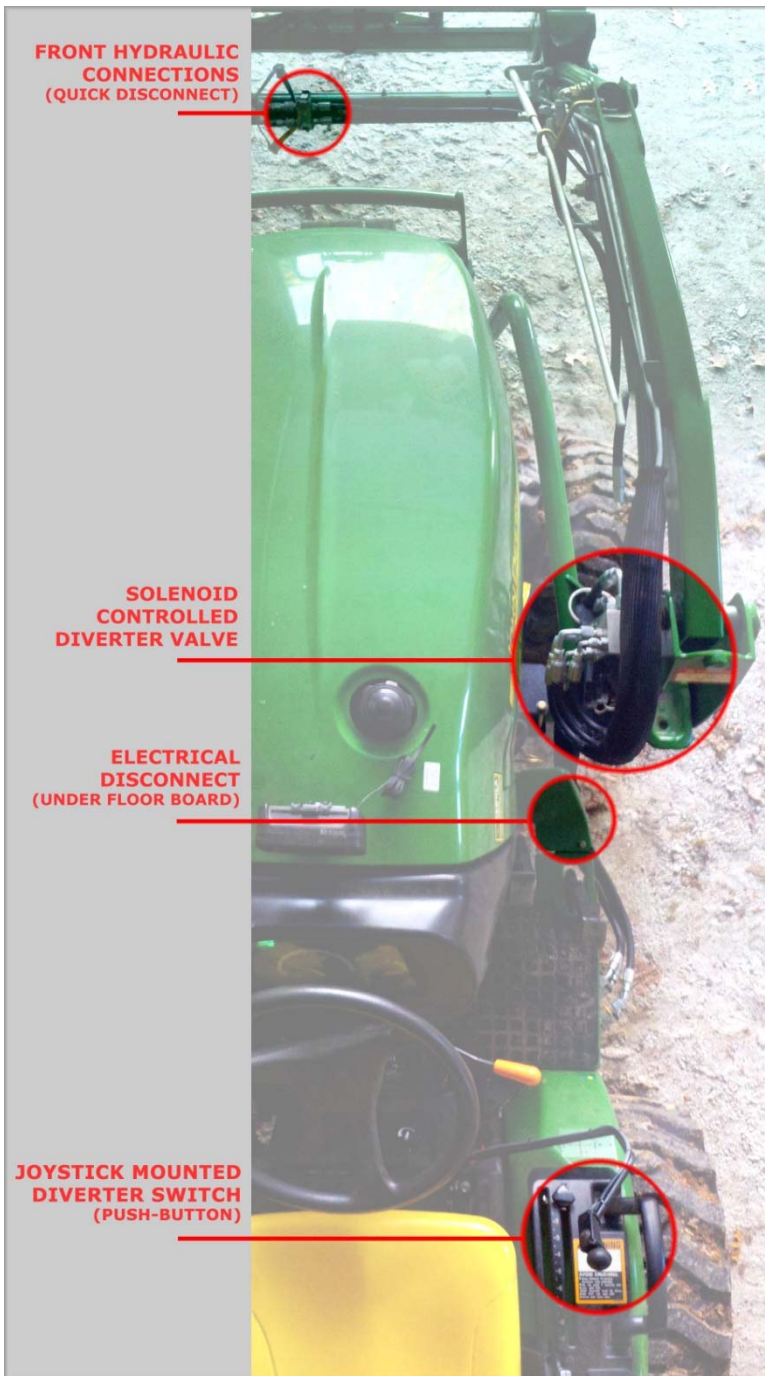
Artillian encourages all customers to register their Artillian products. However, failure to do so will not diminish right to warranty. Curtis Industries does not sell or share your information with anyone else.

Download a digital copy of your installation instructions online at [Artillian.com/literature/](http://Artillian.com/literature/)



Artillian strives to continuously improve our products, technical documentation, etc. Therefore, the installation manual for this product may have been updated after your product was packaged. The latest revision of the installation manual can always be found at the website above.

The contents of this envelope are the property of the owner. Leave with the owner when installation is complete.



## Installation Overview

- Remove factory dump/curl hoses from loader
- Install the diverter valve on the loader
- Install new hydraulic hoses on loader
- Install the joystick switch & wiring harnesses
- Connect to a 12V power source

## Tools Required

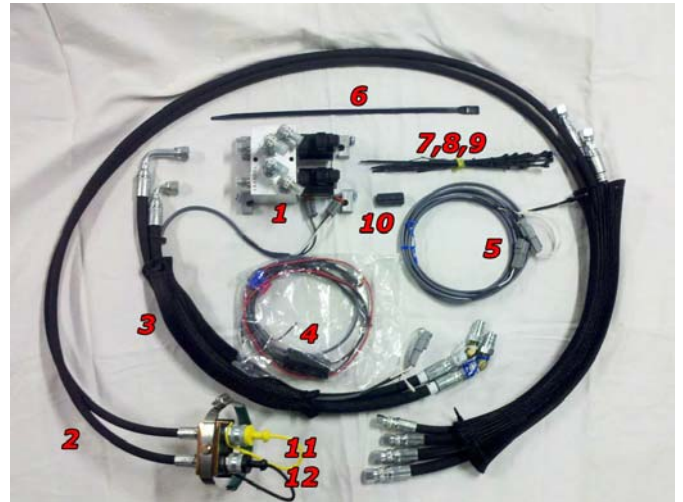
Open end wrench assortment, 7/16" thru 7/8"  
Adjustable wrenches (optional)  
SAE socket set (optional)  
Flat screwdriver  
Pliers  
Cut off pliers  
Absorbent rags and/or drain pan  
Electrical wiring tools (for pigtail kits)  
Electrical Tape

## Valve Specifications

Maximum Valve Flow: 10 GPM  
Maximum Pressure: 3000 PSI  
Solenoid Voltage: 12 VDC  
System Current Draw: 4 Amps Max

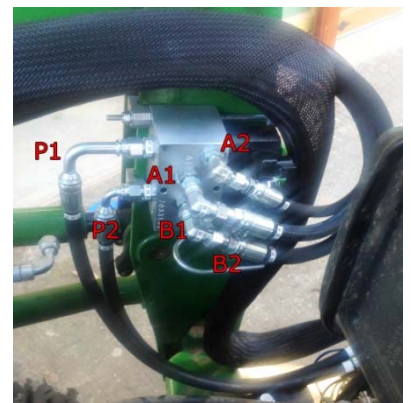
## Contents

- 1- Hydraulic Diverter Valve with Edge Clamp Mounting System
- 2- Gang of 4 Hoses with Front Manifold
- 3- Gang of 2 Hoses with Solenoid Wire Harness
- 4- Actuator Switch Harness & Power Cable, with pigtail leads or aux power plug (depending on kit)
- 5- Intermediate Wire Harness
- 6- 16" (or longer) cable tie, 1
- 7- 11" cable ties, 11
- 8- 8" cable ties, 18
- 9- 4" cable ties, 11
- 10- Electrical Tape (not included)
- 11- John Deere QD dust plug, yellow
- 12- John Deere QD dust plug, silver or black

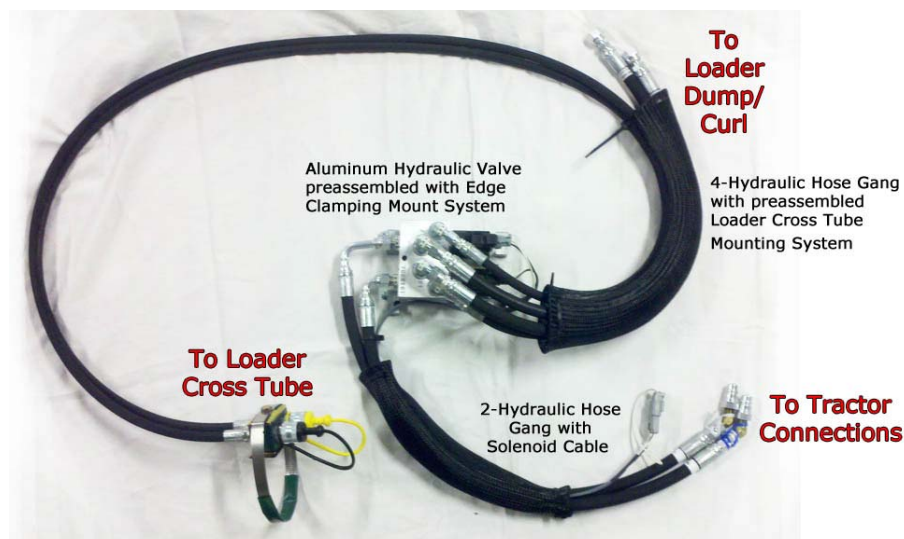


## Hydraulic Connections

- Valve Port P1- Tractor QD (Silver or Black dust cap)
- Valve Port P2- Tractor QD (Yellow dust cap)
- Valve Port A1- Loader "curl" hard line
- Valve Port B1- Loader "dump" hard line
- Valve Port A2- Loader front QD manifold (Silver or Black plug)
- Valve Port B2- Loader front QD manifold (Yellow plug)



## Hydraulic Connection Overview



## Installation

**Note:** If installing on a 120R loader with Single Point Hydraulic Connector, use instructions provided with HDK-120R-SPHA for installation.

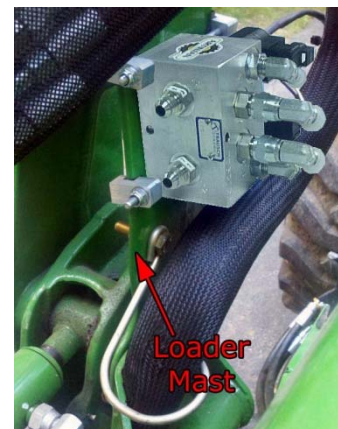
- **Remove the factory dump/curl hoses (the existing loader hoses with yellow and silver (or black) dust caps)**

1. Turn off tractor. Settle loader to the ground. Actuate all hydraulic controls to relieve hydraulic pressure throughout the system.
2. Cut and remove the cable ties at both ends of the protective webbing on the loader hoses. Before cutting, note the position of the ends of the protector.
3. Slide the upper end of the hose protector back enough to achieve access to the two curl cylinder hose connections to the loader hard lines. These *should* be the two upper connections of the stack.
4. Separate the hard lines from their restraints on the loader arm just enough for wrench access. **BE CAREFUL NOT TO BEND, TWIST, OR OTHERWISE DEFORM THE ALUMINUM HARD LINES. (On newer loader models hardline fittings are elbows, 120R kit fittings are elbows to match.)**
5. Place an absorbent rag and/or basin beneath the hose connections to catch hydraulic fluid. Some will escape!
6. Using wrenches, carefully and slowly separate these connections. **DO NOT TO BEND, TWIST, OR OTHERWISE DEFORM THE ALUMINUM HARD LINES.** Once separated, you may want to bag the ends to contain leaking fluid.
7. Disconnect the opposite ends of the hoses from the tractor. These should be the two hoses with the yellow and silver/black dust caps.
8. Carefully remove the factory dust caps from the hose ends to be re-used on the new hoses.
9. Slide the two hoses out of the protective hose webbing. The cleanest method is to pull them up and out. These hoses will not be reused. They can be stored away for possible future use.
10. Install new 8" cable ties at each end of the hose protector around the two remaining hoses. Be sure the hose protector is back in its original location. DO NOT include the two open hard line ends that feed the dump/curl cylinders.



- **Install the “Hydraulic Valve with preassembled Edge Clamp Mounting System” and the “Gang of 2 Hoses with Solenoid Wire Harness”**

1. Loosely install the Diverter Valve on the loader mast using the Edge Clamp Mounting System. Note: Longer valve mounting screws have been provided to accommodate MSL (Mechanical Self-Leveling) loaders. It is up to the discretion of the installer to replace the valve mounting screws, as required. The valve should be mounted on the **INSIDE** of the loader mast, nested within the loop of the hoses. The two black solenoids should face the **REAR** of the tractor. Slide the valve body toward the **FRONT** of the



tractor on the shafts. You only need to get the valve to hold onto the loader mast arbitrarily for now, it will likely have to move up or down during installation.

2. Insert the "Gang of 2 Hoses with Solenoid Wire Harness" through the loader hose guide(s) and run the gang alongside the existing loader hoses down to the tractor quick disconnect manifold.
3. Attach the 2 hoses to the diverter valve, matching the numbered tags. Tighten the connections. **DO NOT OVERTIGHTEN.**
4. Route the Solenoid Wire Harness plugs beneath the valve and insert the two electrical connectors into the two solenoids on the diverter valve until the locking tabs engage.
5. Install your colored dust caps from the original hydraulic hoses over the quick disconnect fittings of the new hoses according to the labels on the new hoses.
6. Connect the hoses to the tractor and situate the hoses so they flow smoothly alongside the existing hoses.
7. The electrical connector should be positioned for convenient access. This is the system disconnect when detaching the loader. Adjust position as needed.
8. Slide the diverter valve up or down on the loader mast until the hoses are positioned naturally alongside the existing loader hoses, or lie in their least stressed position. **SLIDE THE VALVE BODY TO THE FRONT OF THE TRACTOR ALONG THE MOUNTING SHAFTS.**
9. Tighten the valve body Edge Clamp Mounting System. **TIGHTEN ONLY UNTIL IT HOLDS THE VALVE BODY FIRMLY IN PLACE. OVERTIGHTENING WILL CAUSE BENDING AND MAY DAMAGE THE SOLENOIDS.**
10. Back at the tractor hose connections, check orientation and tighten the 45 degree elbow fittings using open end wrenches. **DO NOT OVERTIGHTEN.**
11. Once satisfied with overall fit, fasten the new hose gang to the existing hose gang using cable ties.



- **Install the "Gang of 4 Hoses with Front Manifold"**

1. Locate the "Gang of 4 Hoses with Front Manifold". Open the band clamp of the front manifold enough to pass it around the loader front cross tube with the two hoses directed toward the side of the loader with the diverter valve. Set the manifold on top of the protective cover of the loader cross tube similar to how it is shown in the photo. **Note: A larger band clamp has been provided in the kit for adapting to larger loader front cross tubes. Replace the standard band clamp with the larger one, if necessary.**
2. Insert the tail of the mounting clamp into the screw housing. Take up excess length, but leave it very loose.
3. Route the hoses up the loader arm, avoiding any pinch points. You may prefer to remove the two ¼" hoses from the gang, run them up the loader, and then reinsert them into the protective hose webbing.
4. Using a few 8" cable ties, secure the two ¼" hydraulic hoses to one or more of the hydraulic hard lines to keep the hoses in the desired path. **LEAVE THEM LOOSE SO THE HOSES ARE FREE TO SLIDE UP OR DOWN. ROUTE THE HOSES SO THAT THEY WILL NOT GET BOUND OR PINCHED BY ANY OF THE MOVING PARTS ON THE LOADER ARM.**



5. Continue laying the hose gang along the path of the existing hoses and connect the 4 hose fittings to the diverter valve fittings by matching the labels in order A2, B2, A1, and B1. Tighten each fitting fully as you go.



**DO NOT OVERTIGHTEN.**

6. Connect the new dump/curl hoses from ports A1 & B1 to the loader hard lines.

Observe which hard line

serves the **CURL** end of the cylinders (the **LOWER** port on the cylinder) and the **DUMP** end of the cylinder (the **UPPER** port on the cylinder). Starting with the **LOWER** of the two *hard lines in the stack*, match the labels on the hoses to the appropriate hard line. Be sure to tighten these fittings securely.

**DO NOT TWIST OR BEND THE LOADER HARD LINES.**

7. Return the hard lines back into their restraints on the loader arm.
8. Cover the hose connections with the new hose protector and cable tie in place. Trim excess cable tie.
9. Making your way back down the loader arm, straighten and align the two hoses leading to the front, tightening the cable ties and clipping off the excess as you go. Perform this all the way down to the Front QD Manifold.
10. Install the 16" cable tie on the loader cross tube as needed to secure the hoses to the cross tube.
11. Back up near the diverter valve, use cable ties to pair the new hose gang to the existing hose gang. When finished, all hard line connections should be covered by webbing.
12. Tighten the Front QD Manifold clamp until the Manifold is firmly secured on the loader cross tube. **DO NOT OVERTIGHTEN.**



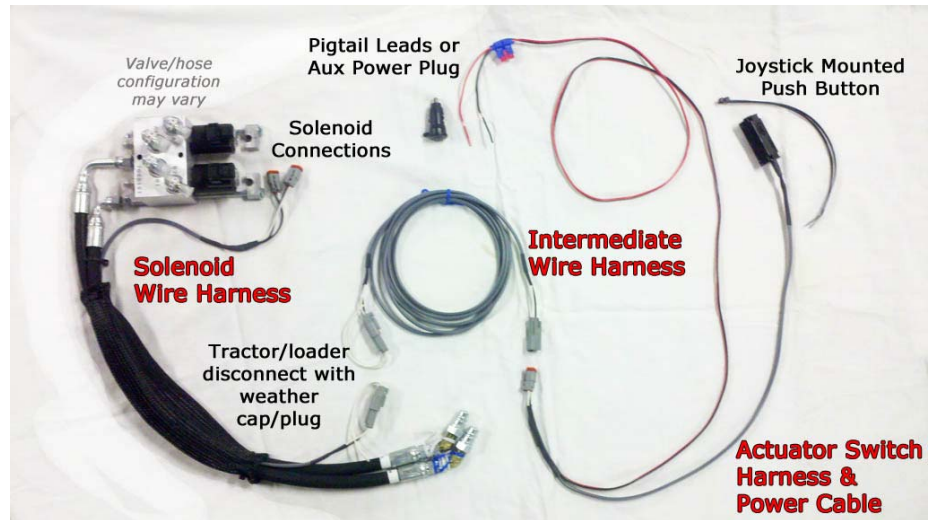
**THE HYDRAULICS ARE NOW INSTALLED. YOUR INSTALLATION SHOULD LOOK SIMILAR TO BELOW**

Now is a good time to clean everything, start the engine, and check your connections. Run the loader through all of its functions, raise and lower, curl and dump. Lift your loader all the way up and observe the new hoses to make sure nothing is being stretched or kinked. When dumping and curling the loader, observe the moving parts attached to the loader arms. Be sure nothing is pinching the new hoses going to the Front QD Manifold. Check your hydraulic fluid and replace as necessary.





## Electrical Overview



**NOTE: Your kit has one of the following 3 switch configurations. Mount your switch to your loader joystick per your discretion. Suggested guidelines are provided below.**

The 3 configurations shown below from left to right are:

- 1) Rectangular plastic housing/switch assembly with black button.
- 2) Rubber switch without a plastic housing.
- 3) Square plastic housing with red button.



1

2

3

Attach configuration 1 to the joystick using two cable ties thru the provided openings near the ends of the plastic housing (see below left). If your joystick has a bend close to the knob, such that the plastic switch housing will not fit, depress the 4 tabs on the plastic housing to open it, exposing the rubber switch inside. Discard the plastic housing and mount the rubber switch (configuration 2) with two cable ties located close together as shown below and to the right.



Plastic housing/switch assembly



Rubber switch w/o a plastic housing

For suggestions on mounting configuration 3 (the square plastic housing with red button), see the next page.

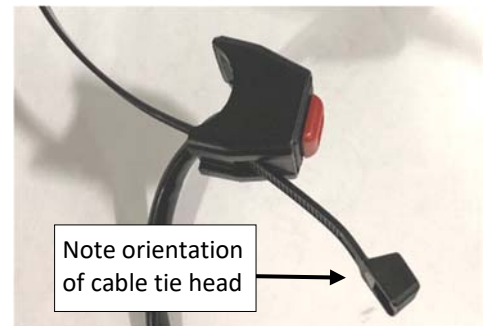
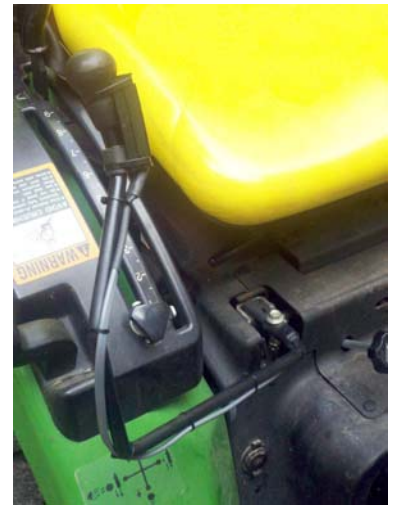


- **Install the Joystick Switch and Switch Cable**

1. Note where build-up might be needed to support the switch housing. Using electrical tape, cut strips to length and roll it around the joystick base.
2. Insert a large cable tie through the slot on the side of the switch, from the switch side with the head facing the switch. Feed the cable tie through the slot on the other side of the switch to form a loop in the cable tie.

**NOTE: A small screwdriver may be needed to start the tip of the cable tie through the slot.**

3. Place the switch over the tractor joystick, orient as desired then pull the cable tie loop tight until the switch won't fall but may still be rotated. Do not trim ties!
4. Feed wire harness through opening at the base of the joystick.
5. Sit on the tractor seat and orient the switch to the desired position for your comfort. Loop the free end of the cable tie back around the joystick shaft, opposite the switch. Feed the end through the cable tie head and pull tight. Trim the excess from the cable tie.
6. Using the 4" cable ties provided, secure the Switch Cable to the joystick shaft all the way to the bottom of the joystick shaft. Tighten and trim the cable ties once satisfied with fit.



## ●Install the Intermediate Cable and Connect to a 12V Power Source

Remaining electrical routings are up to your discretion. Here are a few points to mention:

1. The Intermediate Cable is used to connect the Switch Cable to the Solenoid Cable. It should be routed under the tractor operator station. Once the connection is made, any excess cable can be bundled up and fastened in a safe place under the floorboard using cable ties.
2. You may need to remove some of the covers from the operator station to determine the best path for the wiring.
3. It is critical to remember that wires must not encounter moving parts. While performing the installation, it may be helpful to have someone actuate pedals and levers to observe what interferences may exist.
4. Use cable ties to help keep wires away from any moving parts, such as the SCV linkage, as shown below.
5. The diverter valve solenoids require 4 amps of electrical current at 12VDC. The power wire is protected by a 10 amp fuse. If your kit has an aux power plug, an 8 amp barrel fuse is in the plug.
6. If your diverter kit has the optional auxilliary power plug, wherever the Switch Cable passes through the tractor body, the power wire should branch off and be routed externally to the auxilliary power port on your tractor.



## System Operation

The loader dump/curl circuit functions normally when the joystick push button is not depressed. Dumping and curling your loader should behave exactly the same as before the diverter system was installed.

When the joystick push button is depressed, instead of fluid traveling to the loader dump/curl cylinders, the electric solenoids will redirect the fluid to the Front QD Manifold. Something needs to be attached to the Front QD Manifold for the diverter system to demonstrate functionality. Otherwise, the tractor hydraulics will simply “dead head” and open the tractor’s internal pressure relief valve.

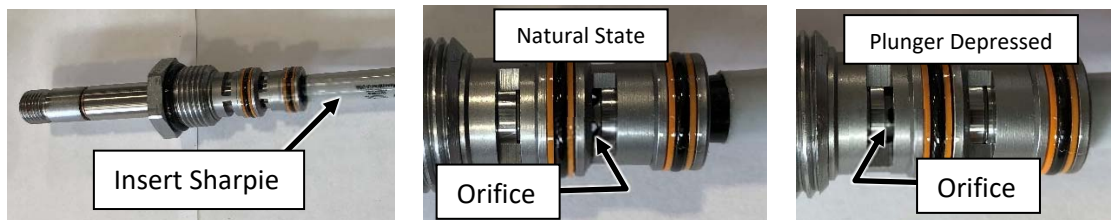
When an attachment is connected to the Front QD Manifold, whenever you **BOTH**, A) Press the joystick push button, **AND**, B) move the joystick to the left or right, fluid will be diverted to the Front QD Manifold and to your attachment **WHILE** you continue to press the button. If you release the joystick push button at any time, fluid flow will return to the normal dump/curl functionality.

When using your tractor with the diverter valve, it is best to **NOT** engage the joystick push button **WHILE** fluid is moving through the valve. It is best to either curl/dump your loader **OR** divert to the Front QD Manifold.

## Troubleshooting

**Small dirt particles and debris can cause the hydraulic valves to stick and not function properly. Below are the steps to troubleshoot this problem. The whole process should take around 10 minutes or less.**

1. Disconnect the power connector from one of the valves and press the joystick button (with tractor key in “ON” position if wired to OEM fuse block). You should hear an audible click.
2. Repeat for the opposite valve. No sound could mean the valve is stuck.
3. Once the malfunctioning valve is identified, remove the valve from the valve block. 7/8” and 1” wrenches required. You may want to reinstall the solenoid onto the valve and energize while it is out of the valve block to confirm malfunction.
4. Manually depress the plunger by inserting a fine point sharpie marker (or equivalent) into the end of the valve. Observe the orifice moving from the far groove to the near groove.

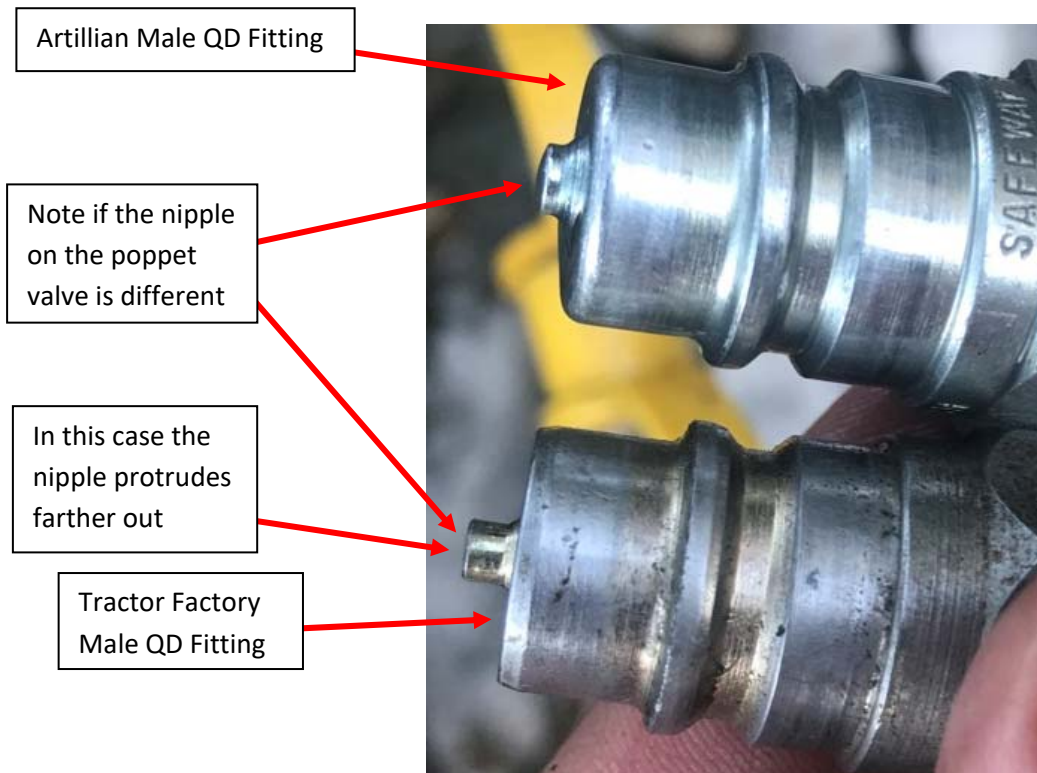


5. Depress the plunger several times. If it is sticking, gritty, or stuck, spray the internal components of the valve with WD40 and/or compressed air to dislodge the debris.
6. Clean the valve, then lubricate with fresh hydraulic oil.
7. Reinstall the solenoid onto the valve and energize to confirm functionality.
8. Reinstall into the valve block and test for functionality. Repeat on the other valve if required.

**The male quick disconnect (QD) fittings on the Artillian Hydraulic Diverter Kit P1 & P2 hoses may not engage properly with some OEM female quick disconnect fittings. This could allow fluid to flow into the hydraulic hoses, but not return to the tank on the tractor. Symptoms may include:**

- Grapple (or other attachment) opening / closing for a short period of time and then “locking up”
- Grapple not functioning at all
- Tractor dump / curl operation working for a short period of time and then “locking up”
- Tractor dump / curl operation not functioning at all

1. Compare the male QD fittings from the Artillian HDK P1 & P2 hoses with the male QD fittings on the original dump / curl hoses removed from the tractor.



2. If the nipple on the tractor factory QD fitting poppet valve protrudes farther out than it does on the Artillian QD fitting, then the Artillian HDK kit may not function properly.
3. Remove the male QD fittings from the Artillian P1 & P2 hoses and from the tractor factory dump / curl hoses.
4. Replace the male QD fittings on the Artillian P1 & P2 hoses with the male QD fittings removed from the tractor factory dump / curl hoses. Reattach the P1 & P2 hoses to the appropriate female QD fittings on the tractor.
5. The grapple (or other attachment) and the tractor dump curl functions should now be working properly.

Congratulations and Thank you for choosing Artillian!

## *Warranty*

**Artillian, LLC** warrants to the original purchaser that this product will be free from defects in material and workmanship for a period of **90 days** from the date possession taken by the original purchaser for use with Artillian hydraulic products and used as intended and under normal service and conditions for personal use. If not purchased for use with Artillian hydraulic products (e.g. Grapple, Plow Adapter, etc.) the warranty period is limited to **30 days**.

Finishes (coatings, labels, & decals) are not inclusive. Artillian, LLC reserves the right to inspect items claimed to be defective in material or workmanship. Artillian LLC's obligation under this warranty is limited to repair or replacement with a nearest similar part.

This Warranty will not apply to any part or product which in Artillian LLC's judgment shall have been misused or damaged by accident, abuse, misapplication, fire, negligence, or lack of normal maintenance or care, or which has been altered or repaired in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed.

Artillian, LLC's obligations under this warranty, to the extent allowed by law, is in lieu of all warranties, implied or expressed, including implied warranties of merchantability and fitness for a particular purpose and any liability for incidental and consequential damages with respect to the sale or use of the product warranted. In any event, liability on behalf of Artillian LLC is limited to the original purchase price.