



ARTILLIAN 120R SINGLE POINT HYDRAULIC CONNECTOR ADAPTER KIT P/N: HDK-120R-SPHA



This kit accommodates the installation of an Artillian **HDK-120R-PTL Hydraulic Diverter Kit** onto a John Deere 120R Loader with the **John Deere Single Point Hydraulic Connector** installed.

Just two additional fittings are required to adapt the kit, but valve fitting orientation and hose routing is significantly different from the “non-single point hydraulic connector” install.

When installing this kit on a 120R, please refer to this manual for valve installation and hose routing. Please refer to the HDK-120R-PTL manual for wiring and additional information.

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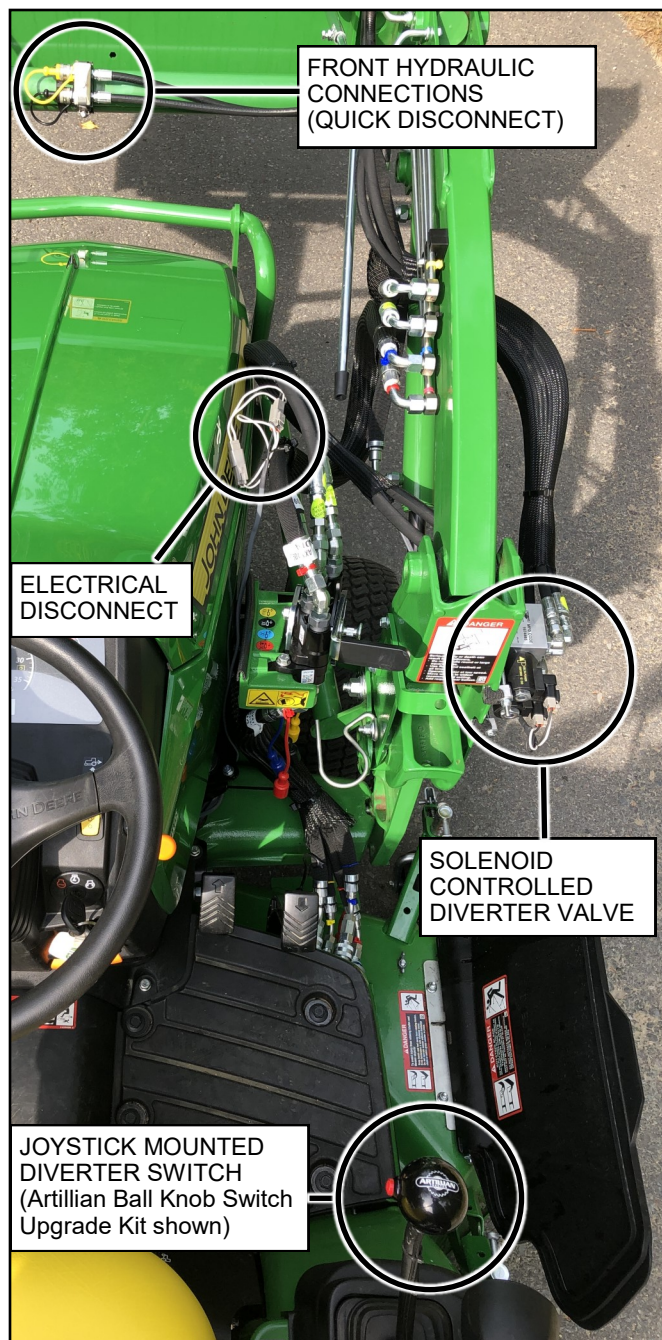
Artillian strives to continuously improve our products, technical documentation, etc. Therefore, the installation manual for this product may have been updated after your product was packaged. The latest revision of the installation manual can always be found at the website above.

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

Rev. D, 05/03/2021

P/N: IM-HDK-120R-SPH

Installation Overview



Summary

- Reorient the HDK-120R-PTL valve fittings
 - Replace the P1 & P2 Hose QD Fittings
 - Remove single point 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
- *See HDK-120R-PTL installation manual for wiring*

Tools Required

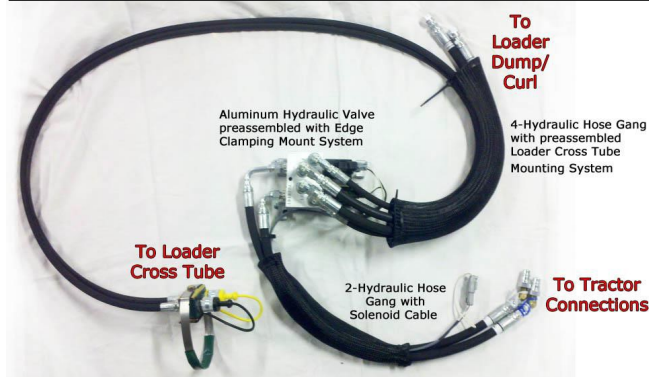
Open-end wrench assortment, 7/16" thru 7/8"
 Adjustable wrenches (optional)
 SAE socket set (optional)
 Flat screwdriver
 Pliers
 Cut-off pliers
 Absorbent rags and/or drain pan
 *Electrical wiring tools (for pigtail kits)
 *Electrical Tape
**See HDK-120R-PTL installation manual for wiring*

Valve Specifications

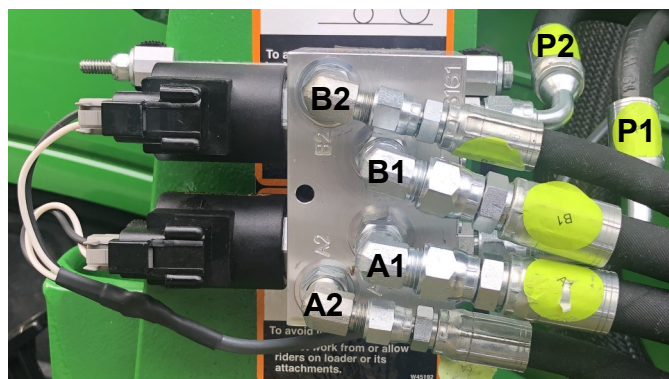
Maximum Valve Flow: 10 GPM
 Maximum Pressure: 3000 PSI
 Solenoid Voltage: 12 VDC
 System Current Draw: 4 Amps Max

Hydraulic Connections

Valve Port P1- Single Point Black Cap
 Valve Port P2- Single Point Yellow Cap
 Valve Port A1- Loader "curl" hard line
 Valve Port B1- Loader "dump" hard line
 Valve Port A2- Loader front QD manifold (Black Plug)
 Valve Port B2- Loader front QD manifold (Yellow plug)



Note: Fittings will be reoriented differently for this installation



KIT PREPARATION

Valve Fitting Reorientation

The four 90° elbow fittings on the HDK-120R-PTL valve assembly must be rotated approximately 180° from their original positions. Follow the steps below and refer to figures 1 and 2. In order to reposition the fittings, hold the body of the fitting with a 9/16" wrench and rotate the jam nut with an 11/16" wrench.

Tools Required:

9/16" Wrench
11/16" Wrench
Adjustable Wrench (Optional)

1. Remove the two middle 90° elbow fittings (A1 & B1) from the valve assembly.
2. Rotate the outer 90° elbow fittings (A2 & B2) approximately 180°. In order to do so, loosen the jam nuts and rotate the fittings counter clockwise until they are approximately 180° from their original position. Tighten the jam nuts.
3. Reinstall the two middle 90° elbow fittings oriented approximately 180° from their original position. Tighten the jam nuts.

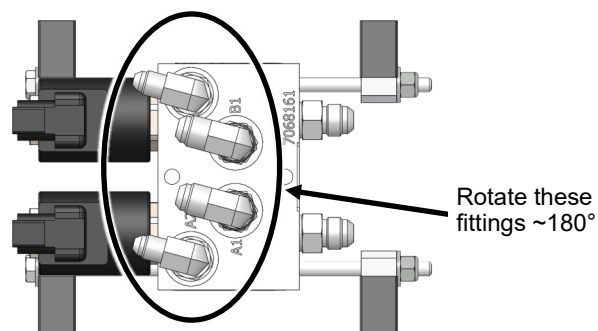


Fig. 1 (Valve Assembly - Original Configuration)

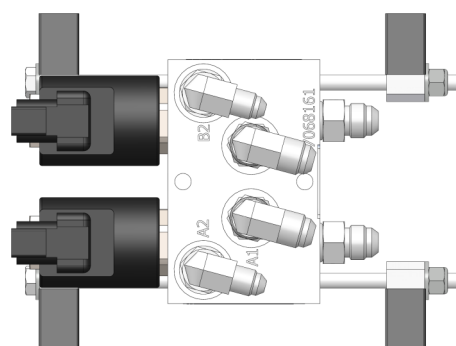


Fig. 2 (Valve Assembly - Fittings Reoriented)

Hose Fitting Replacement

The two 45° male quick disconnect fittings found on the "Gang of 2" (P1 & P2) hoses must be replaced with the 3/8 JIC Male to 3/8 ORFS Female fittings included in this kit. See Fig. 4 and Fig 5.

Tools Required:

9/16" Wrench
11/16" Wrench
3/4" Wrench
Adjustable Wrench (Optional)

4. Locate the 45° fittings at the end of the P1 & P2 hoses. Holding the body of a 45° fitting with a 9/16" wrench, rotate the swivel fitting on the hose with an 11/16" wrench. Remove both the 45° fittings and the male quick disconnect fittings from the hoses. These fittings will not be reused.
5. Install the adapter fittings supplied in this kit to the #6 JIC female swivel fittings retained on the end of the hoses.

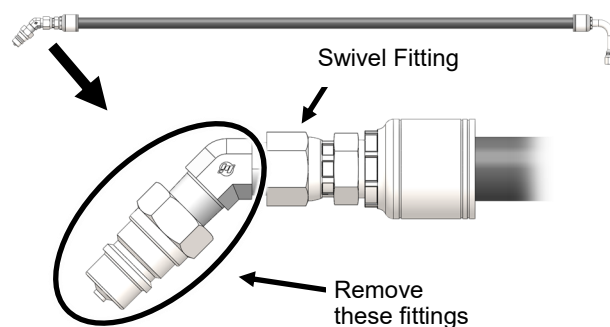


Fig. 4 (P1 & P2 Hose - Original QD Fittings)

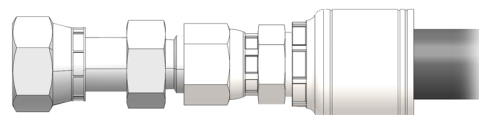


Fig. 5 (P1 & P2 Hose - Fittings Replaced)

Remove Single Point Dump/Curl Hoses

Tools Required:

11/16" Wrench
13/16" Wrench
7/8" Wrenches
Adjustable Wrench (Optional)

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. Locate the two curl cylinder hose connections from the loader **hard lines**. These should be the connections marked with black and yellow zip ties. See Fig. 3
4. Place an absorbent rag and/or basin beneath the hose connections to catch hydraulic fluid. Some will escape!
5. Using a 7/8" wrench on both the hard line hex and the swivel fitting hex, carefully and slowly separate these connections. **DO NOT BEND, TWIST, OR OTHERWISE DEFORM THE ALUMINUM HARD LINES.** Once separated, you may want to bag the ends to contain leaking fluid.
6. Disconnect the opposite ends of these hoses at the single point hydraulic connector on the tractor. These should be the hoses with the yellow and black dust caps. Hold the 45° fitting body with an 11/16" wrench and loosen the swivel fitting on the hose with a 13/16" wrench. See Fig. 6
7. Slide the two hoses out of the protective hose webbing. These hoses will not be reused. They can be stored away for possible future use.
8. 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.

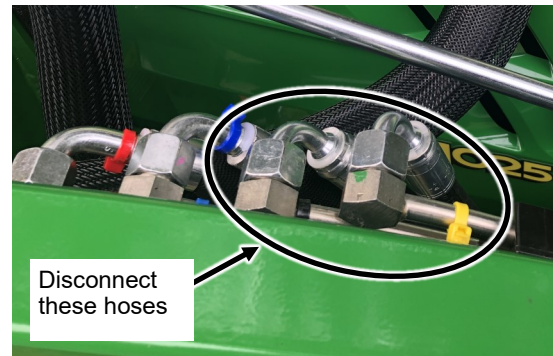


Fig. 3 (Remove Dump/Curl Hoses from Hardlines)

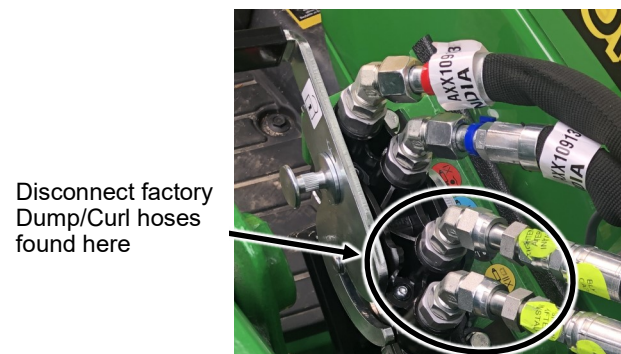


Fig. 6 (Disconnect Dump/Curl Hoses from Single Point Hydraulic Connector)

Install Hydraulic Diverter Valve

Tools Required:

7/16" Wrenches

1. Install the Diverter Valve on the loader mast using the *Edge Clamp Mounting System*. The valve should be mounted on the **OUTSIDE** of the loader mast, with the top edge clamps at the top of the opening inside the loader mast. See Fig. 1

*Note: The two black solenoids should face the **REAR** of the tractor. Slide the valve body toward the **FRONT** of the tractor on the screws and tighten until snug.*



Fig. 1 (Diverter Valve Location)

Install Gang of 2 Hoses

Tools Required:

11/16" Wrench

2. Pass the "**Gang of 2 Hoses with Solenoid Wire Harness**" between the loader arm and the lift cylinder and connect to the P1 and P2 ports on the diverter valve. See Fig. 2. Tighten the connections. **DO NOT OVERTIGHTEN.**

Connect the small 90° elbow fitting to the P2 port and the larger 90° fitting to the P1 port. Orient the fittings upwards toward the hood of the tractor, as they will need to clear the loader lift cylinder when it is raised.

3. Route the hoses towards the front of the tractor and then loop them back towards the single point hydraulic connector. See Fig. 3

You may need to twist the individual hoses inside the protective webbing in order to get the proper curvature. Sliding the webbing to the valve end or removing it temporarily may aid in achieving the right curve.

4. Connect the hose labeled "**BLK CAP**" to the 3rd port on the single point hydraulic connector. Connect the hose labeled "**YLW CAP**" to the 4th port on the single point hydraulic connector.
5. 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. The opposite end of the harness should be resting near the single point connector at this time.



Fig. 2 (Attach Gang of 2 Hoses to Valve)



Fig. 3 (Loop Gang of 2 Hoses toward Single Point)



Fig. 5 (Attach Wire Harness Plugs to Solenoids)

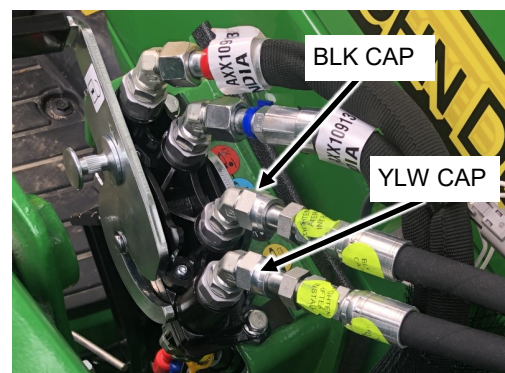


Fig. 4 (Attach Gang of 2 Hoses to Single Point)

Install Gang of 4 Hoses

Tools Required:

Flat Head Screwdriver or 5/16" Socket
9/16" Wrench, 11/16" Wrench, 7/8" Wrenches

Locate the "Gang of 4 Hoses with Front Manifold".
To ease installation, remove the two 1/4" hoses from the gang, run them up the loader, and then reinsert them into the protective hose webbing after connecting the shorter 3/8" hoses to the tractor hard lines.

1. 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. See Fig. 1
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.
4. Using a few 8" cable ties, secure the two 1/4" hydraulic hoses to one or more of the hydraulic hard lines to keep the hoses in the desired path.

LEAVE THE CABLE TIES 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. Connect the elbow fittings on the 3/8" hoses to the dump/curl hard lines, according to the labels on the hoses. See Fig. 5.
6. Gather the four loose hoses together, pass them between the loader arm and lift cylinder, and then reinstall the protective hose webbing. See Fig. 5.
7. Connect the four hoses to the elbow fittings on the diverter valve, according to labels. **DO NOT OVERTIGHTEN.**



Fig. 1 (Front Manifold Location)



Fig. 3 (Route Gang of 4 Hoses up Loader)



Fig. 7 (Connect Hoses to Diverter Valve)

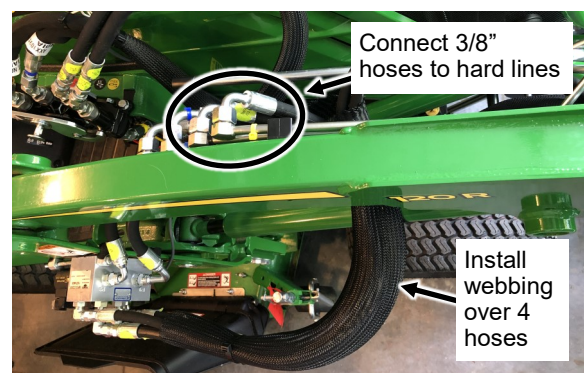


Fig. 5 (Connect Hoses to Dump/Curl Hard Lines)

Leak Check & Adjustment

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.

If any of the hoses are being stretched or kinked, loosen the fittings and reorient until the hoses are no longer being stretched or kinked. It may be necessary to disconnect the fittings from one end or the other and twist the hose so that the natural curve of the hose promotes hose movement without kinking.

Check your hydraulic fluid and replace as necessary. Tighten all cable ties, tighten the QD manifold band clamp, and install additional cable ties, as desired.

Electrical Connection

See the HDK-120R-PTL installation manual for electrical connection. It is recommended that the user purchase an "Add-A-Circuit" fuse tap in order to connect the red power wire directly to the tractor fuse block. The black ground wire should be connected to an appropriate ground screw on the vehicle chassis.

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 and 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

Some tractors have a regenerative flow circuit on the dump function of the loader control valve (sometimes referred to as "fast dump"). This is usually actuated by moving the joystick to the far right position.

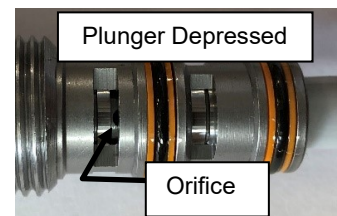
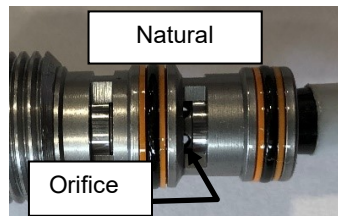
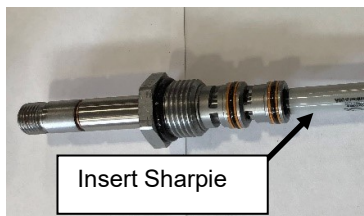
By design, the jaws on the Artillian Grapple are opened by pressing the hydraulic diverter kit button while moving the joystick to the right (corresponding with the dump function of the loader). However, if the joystick is moved to the far right regenerative flow circuit, this will result in the Grapple jaws closing. Some users may not realize that their tractor has a regenerative flow circuit and interpret this behavior as a malfunction of either the Grapple or hydraulic diverter valve. This is not the case. Due to the nature of a regenerative flow circuit, this is expected behavior.

If this functionality is observed, the user should take note of how far they are able to move the joystick to the right before the Grapple jaws change from opening to closing, and then limit their joystick input when opening the Grapple. An alternative solution is to switch the Grapple hoses at the quick disconnect manifold. This, of course, will invert the functionality of the Grapple. Moving the joystick to the left will now cause the Grapple jaws to open, while moving it to the right will cause the jaws to close. This will, however, allow the user to move the joystick to the far right position, without exhibiting the behavior described above.

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.

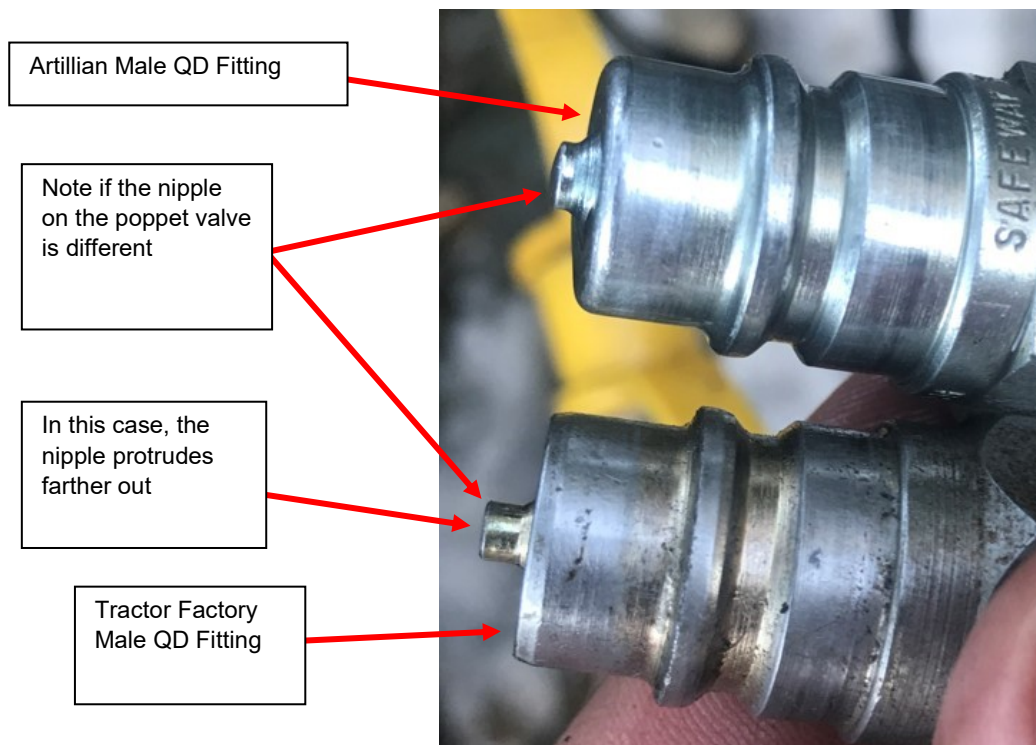


5. Depress the plunger several times. If it is sticking, gritty, or stuck, spray the internal components of the valve with WD40 and/or compressed air to dislodge the debris.
6. Clean the valve, then lubricate with fresh hydraulic oil.
7. Reinstall the solenoid onto the valve and energize to confirm functionality.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

Continued on next page.

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.

HDK-120R-PTL HYDRAULIC DIVERTER KIT SERVICE PARTS

| PART NUMBER | DESCRIPTION |
|---------------|---|
| 8SV-DVRK-H120 | DIVERTER VALVE REBUILD KIT |
| 9SV-HYD-00031 | HYDRAULIC DIVERTER VALVE ASSEMBLY, W/ ACTUATOR |
| 9SV-HYD-00061 | HYDRAULIC SOLENOID VALVE ACTUATOR ASSEMBLY |
| 8SV-HYA-00015 | 2 HOSE ASSEMBLY W/ SOLENOID WIRE HARNESS |
| 8SV-HYA-00011 | 3/8" HOSE ASSEMBLY, 36" LONG |
| 8SV-HYA-00012 | 3/8" HOSE ASSEMBLY, 35" LONG |
| 8SV-WH-00059 | WIRE HARNESS, HYDRAULIC DVTR, W/ 2 CONN END |
| 8SV-HYA-00046 | 2 HOSE ASSEMBLY W/ FRONT MANIFOLD |
| 8SV-HYA-00007 | 1/4" HOSE ASSEMBLY, 78" LONG |
| 8SV-HYA-00008 | 1/4" HOSE ASSEMBLY, 80" LONG |
| 8SV-HYA-00047 | 3/8" HOSE ASSEMBLY, 30.5" LONG |
| 8SV-HYA-00048 | 3/8" HOSE ASSEMBLY, 32.5" LONG |
| 8SV-HYA-00013 | TUBE CLAMP ASSEMBLY |
| 9SV-WH-00061 | WIRE HARNESS, HYD DIVERTER, SWITCH & PTL |
| 9SV-WH-00083 | WIRE HARNESS, HYD DIVERTER, W/ 1 CONNECTOR & DUST CAP |

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.