



HYDRAULIC DIVERTER KIT

P/N: HDK-23L-PTL & APP

(fits Mahindra 23L)



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

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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.



Installation Overview

- Remove factory dump/curl hoses from loader
- Install the Diverter Valve on the loader
- Install new hydraulic hoses on loader
- Connect to a 12V power source

Tools Required

- Open-end wrench assortment
- 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: 12VDC
- System Current Draw: 4 Amps Max

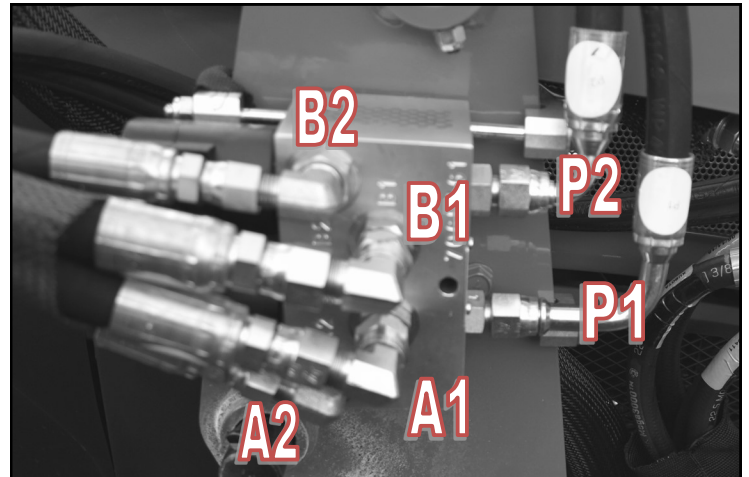
Contents

- 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" cable tie, 1
- 7 - 11" cable ties, 11
- 8 - 8" cable ties, 18
- 9 - 4" cable ties, 11
- 10 - Electrical Tape (not included)
- 11 - QD dust plug, yellow
- 12 - QD dust plug, black
- 13 - QD dust plug, green (not shown)
- 14 - QD dust plug, red (not shown)



Hydraulic Connections

- Valve Port P1—Tractor QD (Green dust cap)
- Valve Port P2—Tractor QD (Red dust cap)
- Valve Port A1—Loader Green “Curl” hard line
- Valve Port B1—Loader Red “Dump” hard line
- Valve Port A2—Loader front QD manifold (Black Plug)
- Valve Port B2—Loader front QD manifold (Yellow Plug)



Hydraulic Connection Overview



1. Remove the factory dump/curl hoses (the existing loader hoses with yellow and black dust caps)

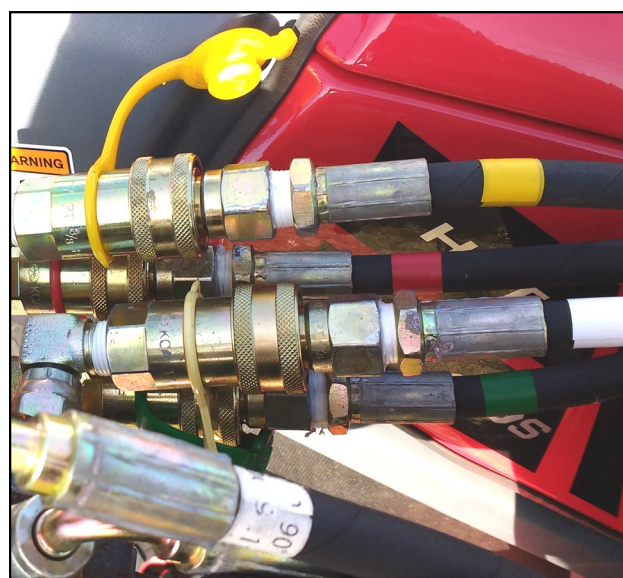
- 1.1 Turn off tractor. Settle loader to the ground. Actuate all hydraulic controls to relieve hydraulic pressure throughout the system.
- 1.2 Locate the Dump and Curl hoses on cross tube near end of loader arm, these can be determined by locating the end fittings with green and red paint marks.
- 1.3 Remove covers protecting soft lines on the right side of the loader. Use 13mm wrench to remove center bolt on cover. Be sure to keep hardware.

CAUTION: BE CAREFUL NOT TO BEND, TWIST, PUNCTURE OR OTHERWISE DAMAGE HYDRAULIC LINES. THIS WILL DAMAGE LOADER FUNCTION.

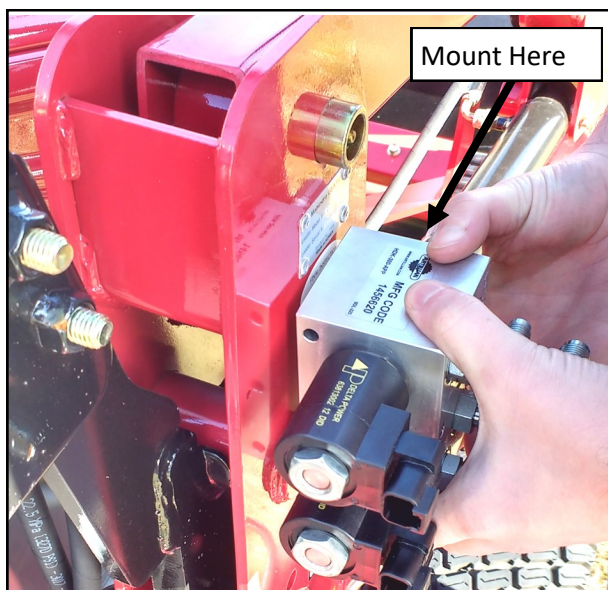
- 1.4 Place an absorbent rag and/or basin beneath the hose connections to catch hydraulic fluid that will leak from lines.
- 1.5 Using 11/16" wrenches, carefully and slowly separate these connections. Once separated, bagging the ends of these lines is recommended to catch any excess fluid.



- 1.6 Disconnect quick disconnects marked with Red and Green dust plugs from the tractor.
- 1.7 Remove factory hoses, these hoses will not be re-used, but you may wish to store them for possible future use.
- 1.8 Do not reinstall covers at this time.



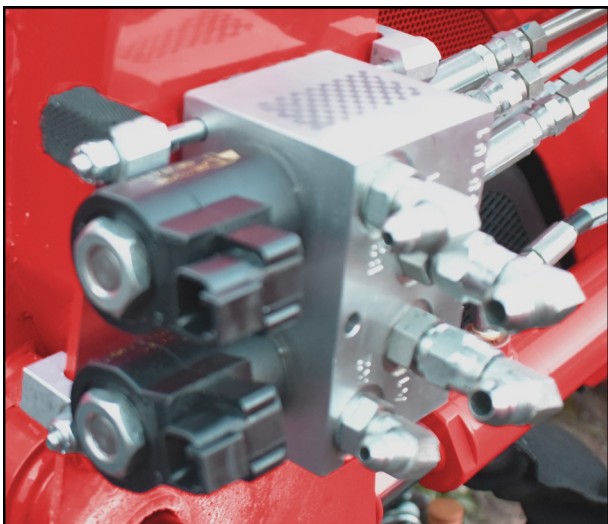
Installation



2. Install the Hydraulic Valve with preassembled edge Clamp Mounting System.

- 2.1 Orient hydraulic diverter valve as shown.
- 2.2 Place diverter valve on outside of loader. Be sure that it is oriented so the solenoids are towards the rear of the tractor & the longer fastener is located on the bottom of the diverter valve.
- 2.3 Slide diverter valve up and down loader mast until it is roughly where shown.
- 2.4 Slide diverter valve forward on 1/4-20 bolts towards the front of the tractor and tighten hardware to secure edge clamps around loader mast.

CAUTION: TIGHTEN HARDWARE ONLY UNTIL IT HOLDS THE DIVERTER VALVE FIRMLY IN PLACE.



3. Install the Gang of 2 Hoses

- 3.1 Route Elbow ends of Gang of 2 Hoses over loader mast as shown above Diverter valve and to P1 and P2 connections on diverter valve.
- 3.2 Attach 2 hoses with elbows to diverter valve matching the numbered tags. Tighten these connections.

CAUTION: Do not overtighten fittings, this could lead to damaged fittings and cause leaks or air bubbles.

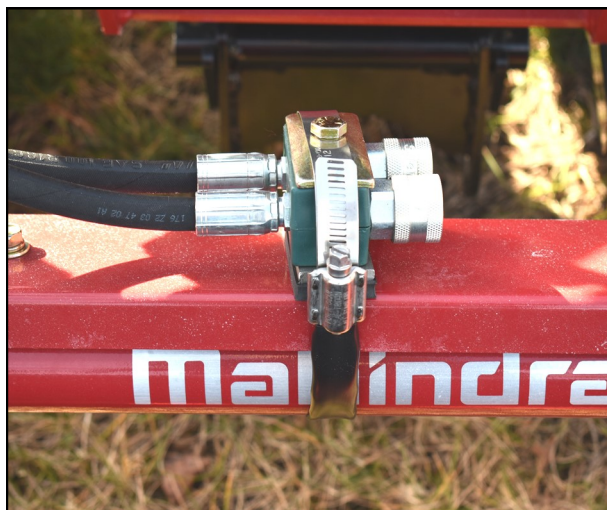
- 3.3 Route solenoid wire harness plugs under diverter valve to solenoids and connect one to each solenoid.

- 3.4 Take supplied Red and Green dust plugs and attach them to Artillian P1 & P2 hoses. Green on the P1 hose and Red on the P2 hose.
- 3.5 Connect hoses to tractor matching colors. Adjust so they flow smoothly alongside the existing hoses and over top of loader arm. Position electrical connector so it can be easily accessed when attaching and detaching loader.
- 3.6 Adjust hoses until satisfied with overall fit , use cable ties to secure to factory hose and away from hot surfaces and moving parts.

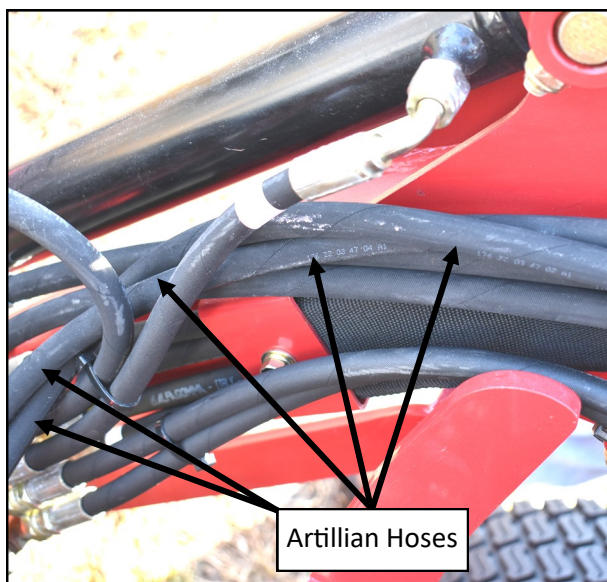


4. Install the Gang of 4 Hoses with Front Manifold

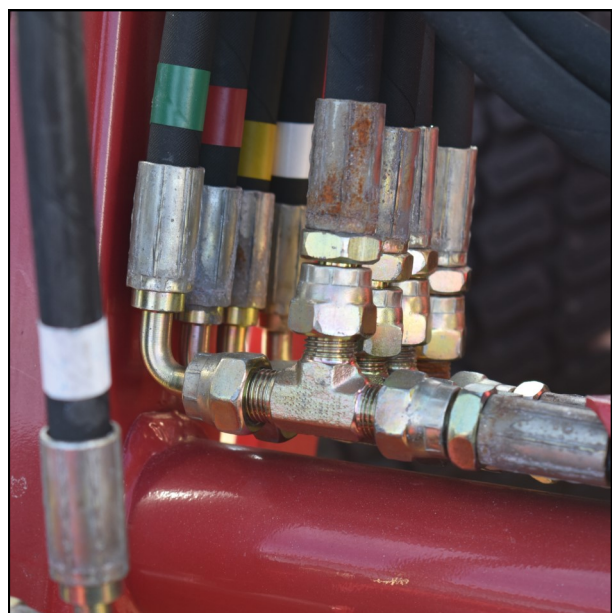
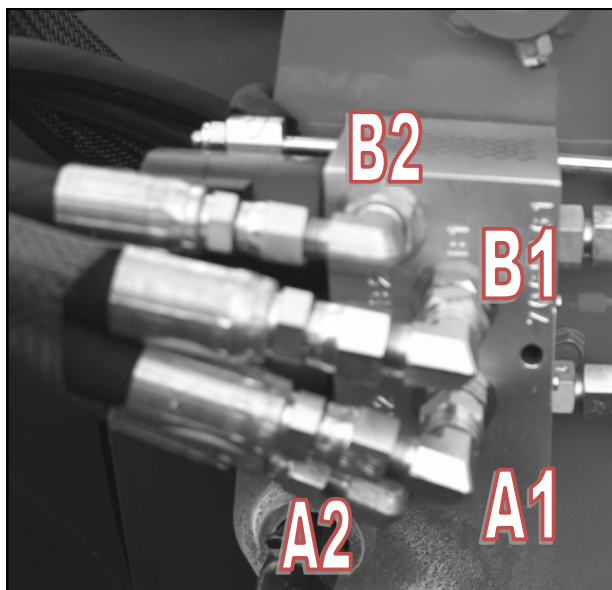
- 4.1 Locate the gang of 4 hoses that contains the front manifold. Unscrew and open up the band and wrap it around the loader front cross tube with the two hoses directed toward the right side of the loader. Set manifold on top of the protective cover of the loader cross tube as shown.
- 4.2 Insert the tail of the mounting clamp into the screw housing. Take up excess length, leave very loose.
- 4.3 Route gang of 4 hoses up the loader arm and to Artillian Diverter Valve. Be sure to avoid any pinch points during routing.
- 4.4 Secure 1/4" hoses loosely to the loader arm or hydraulic hard lines using 8" cable ties to help keep desired path.



NOTE: Leave them loose so lines are free to slide up or down while installing.



Installation



4.5 Connect fittings from gang of 4 hoses to the diverter valve by matching hose labels to labels on valve. Tighten each fitting securely as you go, **DO NOT OVERTIGHTEN.**
NOTE: Fittings should be installed in this order: A2, B2, A1, B1.

4.6 Connect the dump/curl hoses from ports A1 & B1 to the loader hard lines. Observe which hard line serves the CURL end of the cylinder (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.

CAUTION: BE CAREFUL NOT TO BEND, TWIST, OR OTHERWISE DEFORM ALUMINUM HARD LINES. THIS WILL DAMAGE LOADER FUNCTION.

4.7 Making your way down the loader arm, straighten and align the four hoses leading to the front, perform this all the way down to the Front QD Manifold.

4.8 Reinstall hose covers with gang of 4 hoses beneath removed in step 1.3. Secure 1/4" hoses to the loader arm or hydraulic hard lines using 8" cable ties to help keep desired path.

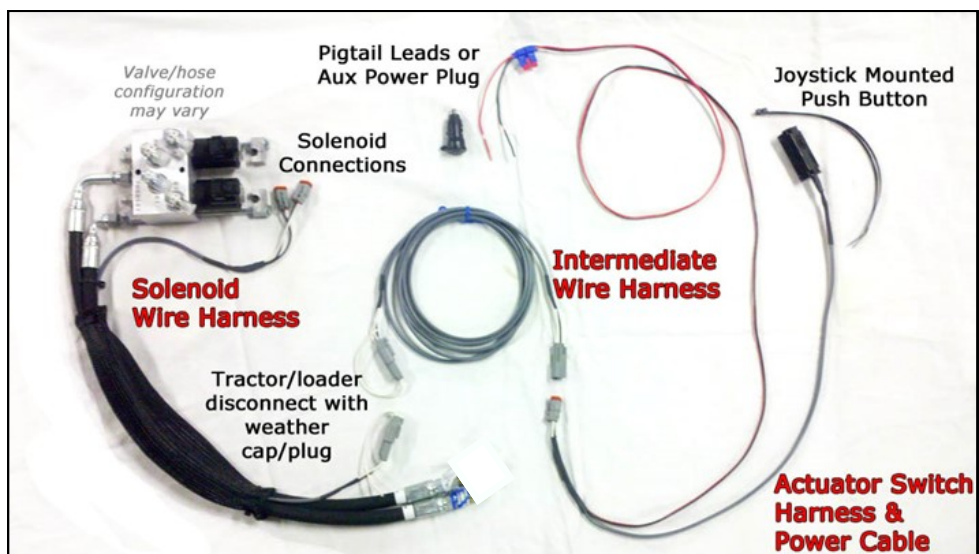
4.9 Install the 16" cable tie on the loader cross tube as needed to secure the hoses to the cross tube.

4.10 Back up near the diverter valve, use cable ties to pair the new hose gang to the existing hose gang.

4.11 Tighten the Front QD Manifold clamp until the manifold is firmly secured on the loader cross tube. **DO NOT OVERTIGHTEN.**

4.13 Hydraulics are now installed. Start the engine, and check your connections. Run the loader through all of its functions. 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.

5. Install the Joystick Switch and Switch Cable

- 5.1 Set switch housing against the tractor joy stick where shown.

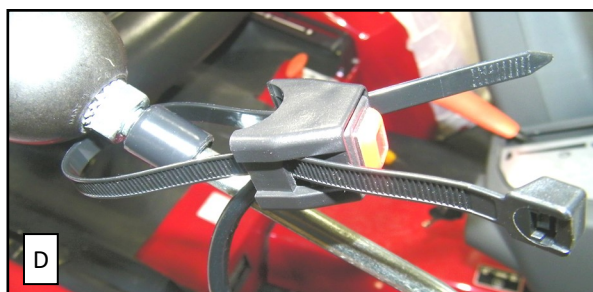
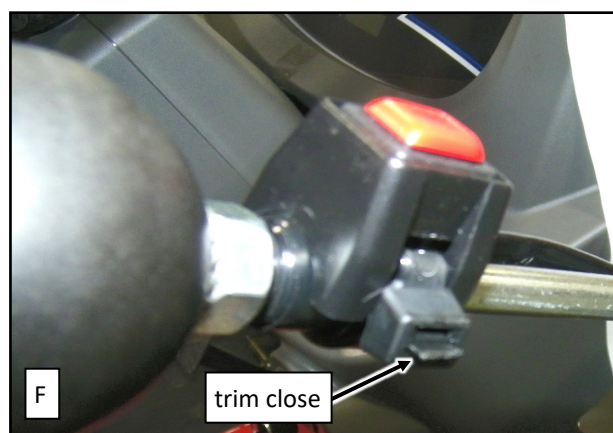
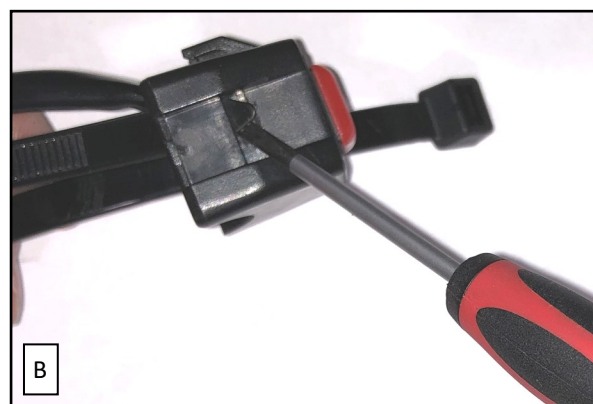
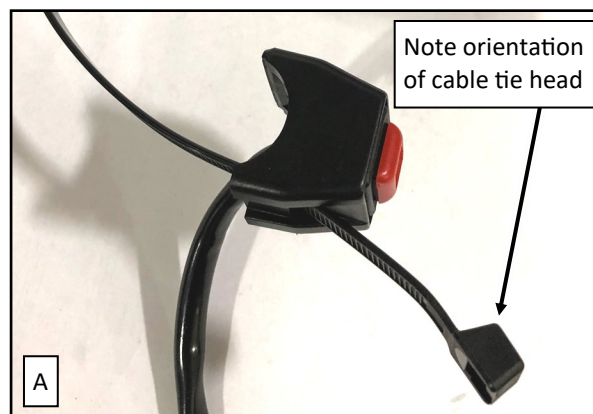
NOTE: See instructions on the next page for how to attach the switch to the tractor joystick.

- 5.2 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.
- 5.3 Once satisfied with fit, insert the included cable tie through switch and around the joystick. Tighten somewhat, until the switch will not fall but may still be rotated. DO NOT TRIM TIES!
- 5.4 Sit on tractor seat and orient the switch to the desired position for your comfort, then tighten the cable ties and trim away excess.
- 5.5 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. For this step, you may want to remove some of the cover panels from the operator station in the area of the joystick as the wiring going forward will be passing through this area.

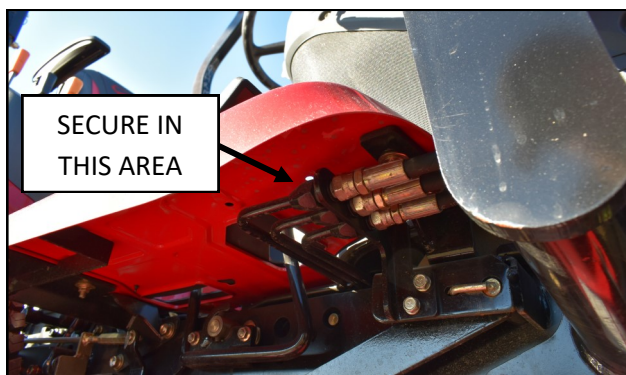


5a. Attach the Switch to the Tractor Joystick

- Wrap electrical tape or friction tape around the tractor joystick just below the knob to build up the diameter closer to the contour of the switch.
- Insert the supplied cable tie through the slot on the side of the switch, from the switch side, with the head facing the switch. See fig. A.
- 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.** See figures B and C.
- Place the switch over the tractor joystick, orient as desired. See fig. D. Pull the pointed end of the cable tie tight until the switch is snug to the joystick. See fig. E. Pull the cable tie tight.
- Loop the pointed end of the cable tie back around the joystick shaft, opposite the switch (overlapping the existing cable tie loop). Feed the pointed end through the cable tie head. See fig. E. Pull the cable tie tight.
- Trim the excess from the tightened cable tie. See fig. F.



Installation



6. 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:

- 6.1 The intermediate 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.
- 6.2 You may need to remove some of the covers from the operator station to determine the best path for wiring.
- 6.3 It is critical to remember that wires must not encounter moving parts. Use cable ties to secure wires. These parts include SCV linkage as shown . While performing the installation, it may be helpful to have someone actuate pedals and levers to observe what interferences may exist.
- 6.4 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.
- 6.5 If your diverter kit has the optional auxiliary power plug, wherever the Switch Cable passes through the tractor body, the power wire should branch off and be routed externally to the auxiliary 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.

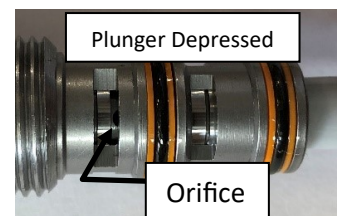
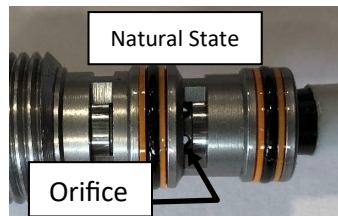
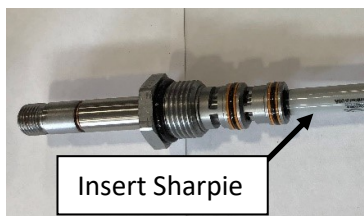
When an attachment is connected to the Front QD Manifold, whenever you **BOTH**, A) Press the joystick push button, **AND, B)** move the joystick to the left or right, fluid will be diverted to the Front QD Manifold and to your attachment **WHILE** you continue to press the button. If you release the 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.



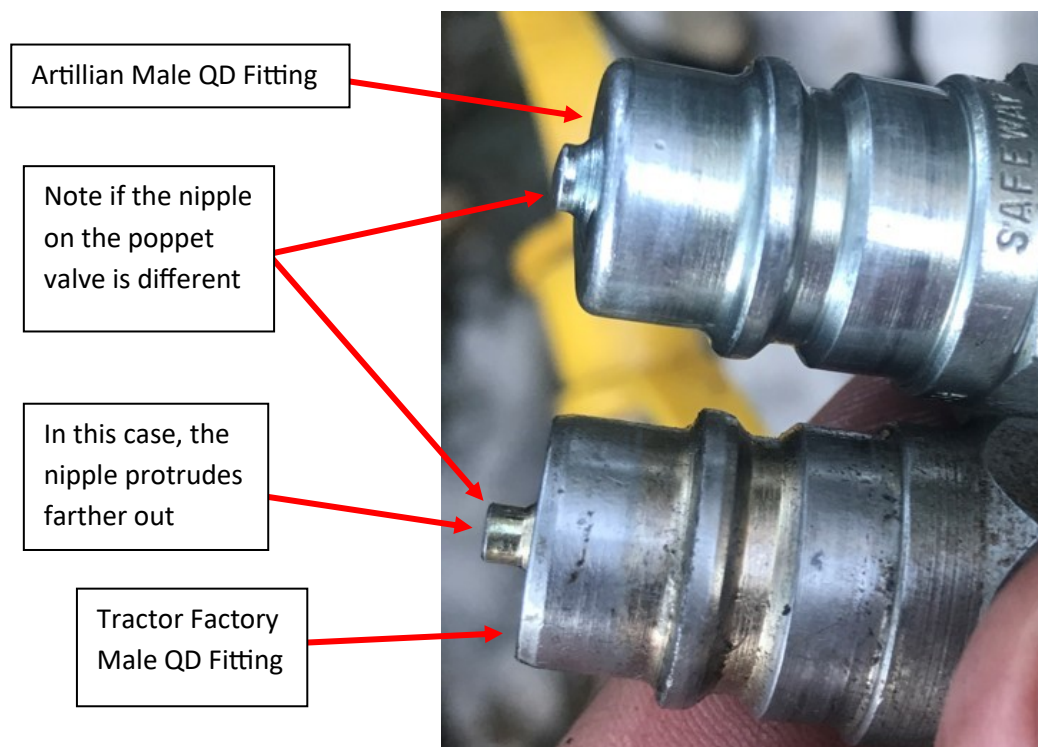
5. Depress the plunger several times. If it is sticking, gritty, or stuck, spray the internal components of the valve with WD40 and/or compressed air to dislodge the debris.
6. Clean the valve, then lubricate with fresh hydraulic oil.
7. Reinstall the solenoid onto the valve and energize to confirm functionality.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

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 then 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.

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.