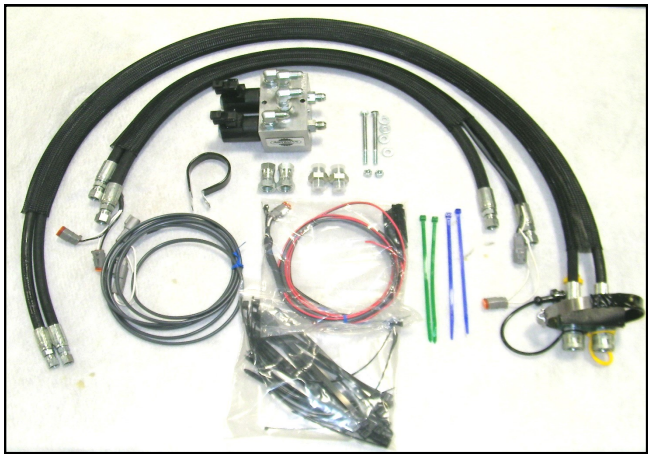
INSTALLATION & OWNER'S MANUAL

HYDRAULIC DIVERTER KIT

P/N: HDK-FL1805–PTL

(fits Massey Ferguson FL 1805)



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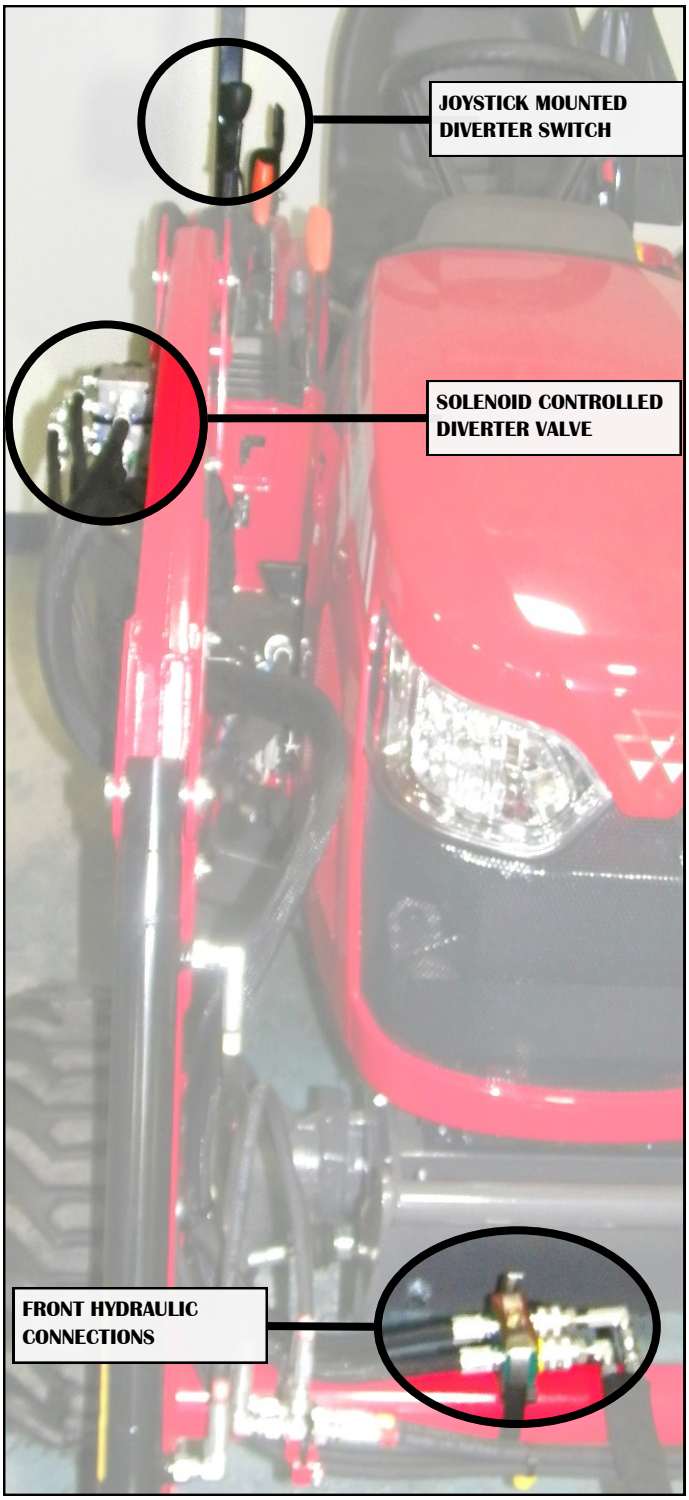
Artillian encourages all customers to register their Artillian products. However, failure to do so will not diminish right to warranty. Curtis Industries does not sell or share your information with anyone else.

Download a digital copy of your installation instructions online at **Artillian.com/literature/**

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

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

Tools Required

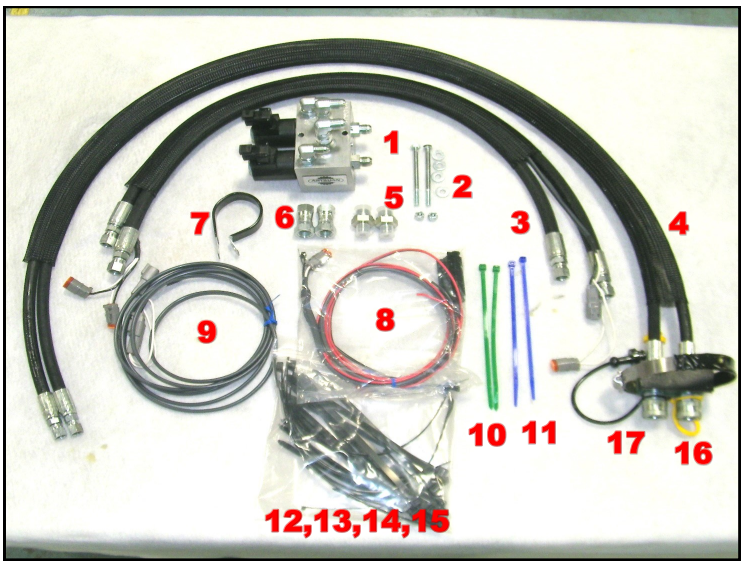
- Open-end wrench assortment, 7/16” thru 15/16”
- Metric open-end wrenches (13mm)
- Metric Allen Wrenches (6mm)
- Adjustable wrenches (optional)
- SAE socket set (Optional)
- Flat screwdriver
- Pliers
- Cut off pliers
- Absorbent rags and/or drain pan
- Electrical wiring tools (for pigtail kits)
- Electrical Tape
- Drill and 5/16” drill bit

Valve Specifications

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

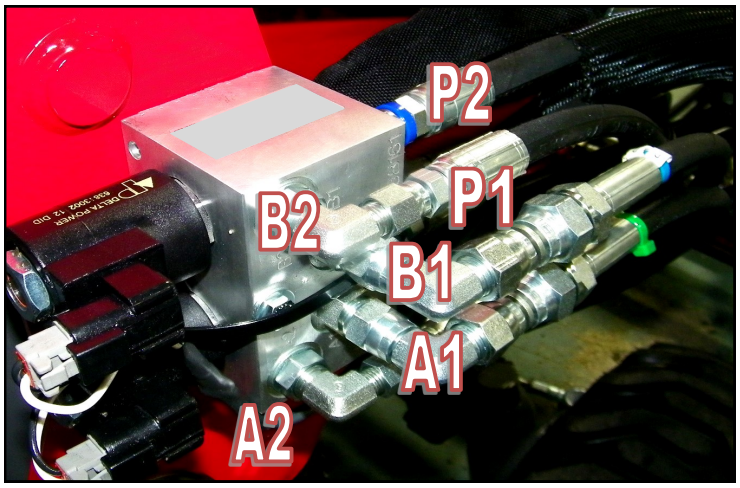
Contents

1 - Hydraulic Diverter Valve
2 - Mounting Kit
3 - Gang of 2 Hoses with Solenoid Wire Harness
4 - Gang of 2 Hoses with Front Manifold
5 - Adapter Fitting—male JIC to male BSPP
6 - Adapter Fitting—female JIC to female BSPP
7 - 2” P-Clamp
8 - Actuator Switch Harness & Power Cable
9 - Intermediate Wire Harness
10 - 8” cable ties, green, 2
11 - 8” cable ties, blue, 2
12 - 4” cable ties, 11
13 - 8” cable ties, 18
14 - 11” cable ties, 11
15 - 16” cable tie, 1
16 - QD dust plug, yellow
17 - QD dust plug, black

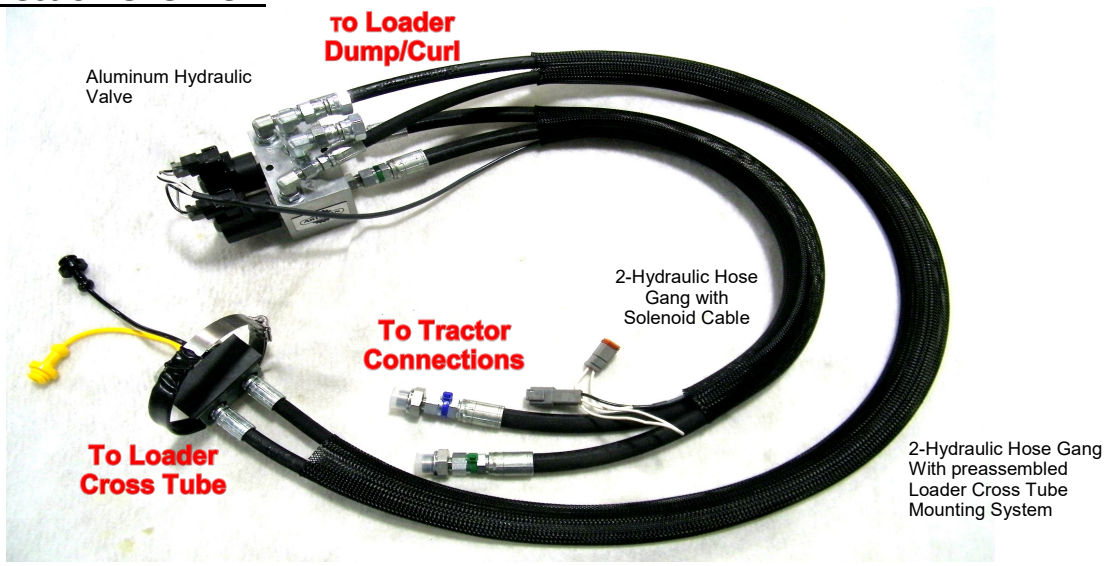


Hydraulic Connections

Valve Port P1—Tractor QD (Green)
Valve Port P2—Tractor QD (Blue)
Valve Port A1—Loader Green “Curl” hose
Valve Port B1—Loader Blue “Dump” hose
Valve Port A2—Loader front QD manifold (Black Plug)
Valve Port B2—Loader front QD manifold (Yellow Plug)



Hydraulic Connection Overview



1. Install the Hydraulic Diverter Valve onto Loader Mast

1.1 Place the Diverter Valve as shown on the outside of the loader mast, on the side of the loader where the hydraulic hoses are routed. Place the block approximately 1” below the loader mounting rod on the loader mast, with the top front edge of the block flush to the front edge of the loader mast. Mark the location of the holes through the valve block OR use the paper template included on Page 10 to mark the holes.

IMPORTANT: When installing this diverter kit along with a cab, rotate the electrical plugs on the Solenoids towards the inside of the tractor until they touch the loader mast.

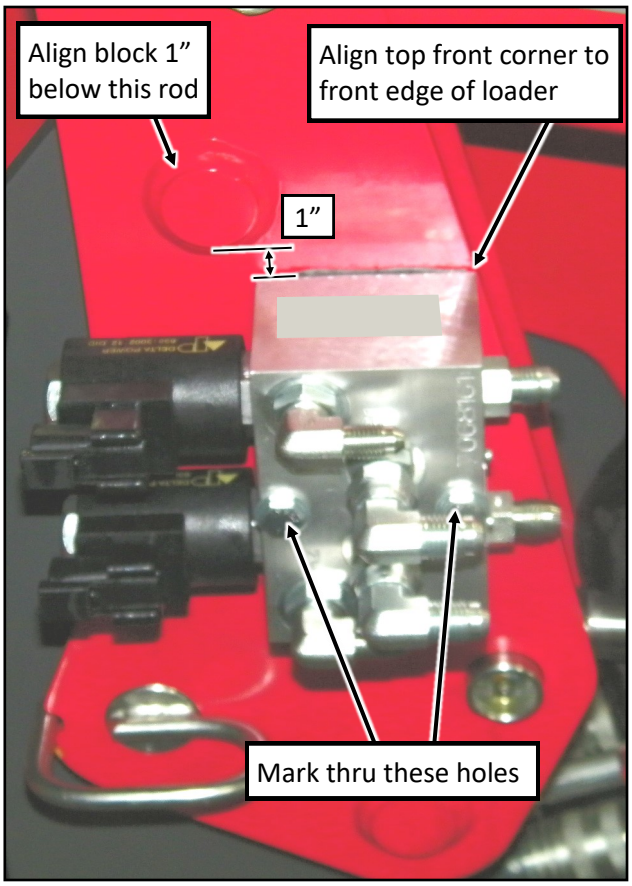
1.2 Drill two 5/16” holes through the loader mast where marked in step 1.1.

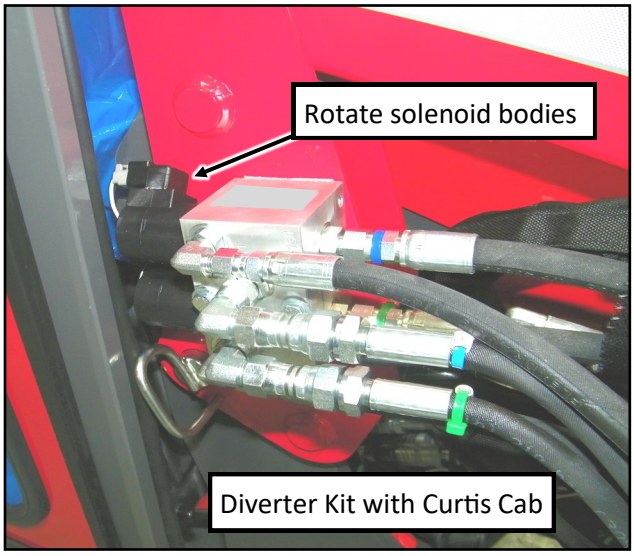
1.3 Touch up the holes with paint to protect the resulting bare metal.

1.4 Attach the Diverter Valve to the loader mast using (2) 1/4-20 x 3.25” long bolts with washers through the two holes in the valve and the two holes in the loader mast then add the washers and self-locking nuts on the inside of the loader mast. Tighten using wrenches until the valve is held securely to the loader mast. The valve fittings should be facing the **FRONT** of the loader. The two black solenoids should face the **REAR** of the loader.

CAUTION: Tighten hardware only until it holds the diverter valve firmly in place.

WARNING: The Diverter Valve is held in place with bolts and nuts that protrude to the inside of the Loader Mast. Use caution when attaching the Loader onto the tractor’s loader mounting frame, to avoid damage to these bolts, to the tractor or to the loader.





2. Attach the factory dump/curl hoses to the Diverter Valve

2.1 Turn off tractor. Settle loader to the ground. Actuate all hydraulic controls to relieve hydraulic pressure throughout the system.

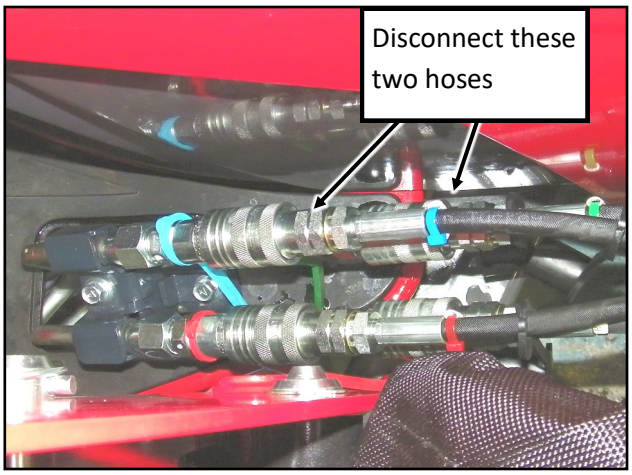
2.2 Place an absorbent rag and/or basin beneath the hose connections to catch hydraulic fluid that will leak from lines.

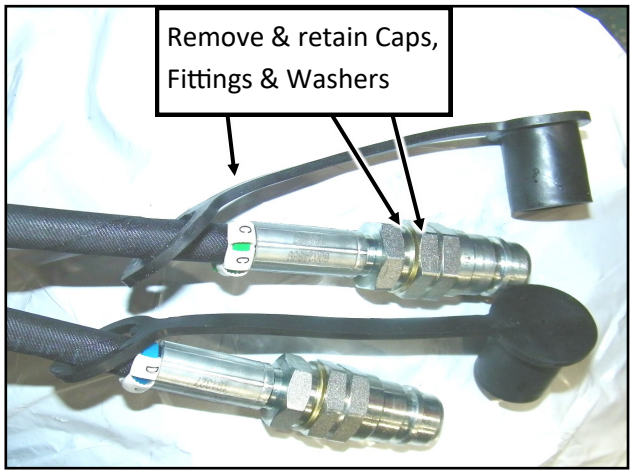
2.3 Disconnect quick disconnects marked with Green (D) and Blue (C) bands from the tractor.

2.4 Using 15/16" and 7/8" wrenches, remove the Quick-Disconnect fittings and sealing washers from the green and blue hoses. Retain for re-use.

2.5 Carefully remove the factory dust plugs from factory hoses, these will be re-used on Artillian hoses.

2.6 Using two 7/8" wrenches, attach a swivel adapter fitting (3/8 BSPP to #6 JIC) onto the end of the Blue and Green hoses. Tighten firmly.

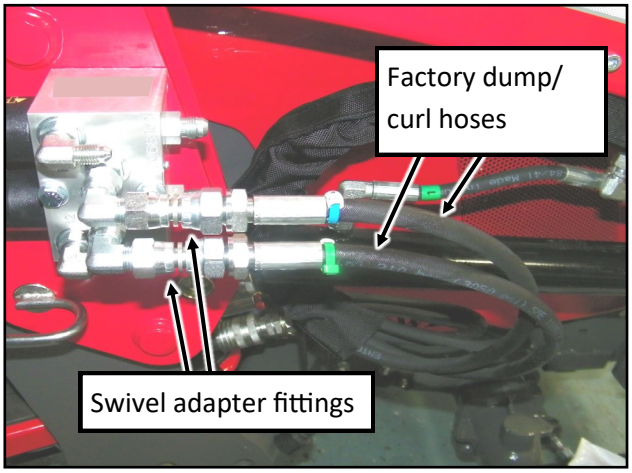




CAUTION: DO NOT use the sealing washers with the female swivel adapter fittings. These fittings need to seal internally to prevent fluid leakage through the swivel housing. The seal washers will be re-used with the male adapter fittings for the quick disconnects.

2.7 Route the hoses to the outside of the loader arm, under the hydraulic cylinder.

2.8 Using a 3/4" wrench, attach the Green (D) hose to A1 on the Diverter Valve. Attach the Blue (C) hose to B1 on the Diverter Valve. Tighten firmly



3. Install the Gang of 2 Hoses with Solenoid Wire Harness

3.1 Locate the gang of 2 hoses that includes the Solenoid wire harness. Identify the shorter of the two hoses in the gang of 2, and mark each end with a Green cable tie (provided).

3.2 Mark the longer hose at each end with a Blue cable tie (provided).

3.3 At the end of the hoses with a single plug on the wire harness, attach the dust caps removed in step 2.5 onto each of the hoses.

3.4 On the same end of the hoses, install a male adapter fitting (#6 JIC to 3/8 BSPP) onto each hose. Tighten with 11/16" and 15/16" wrenches.

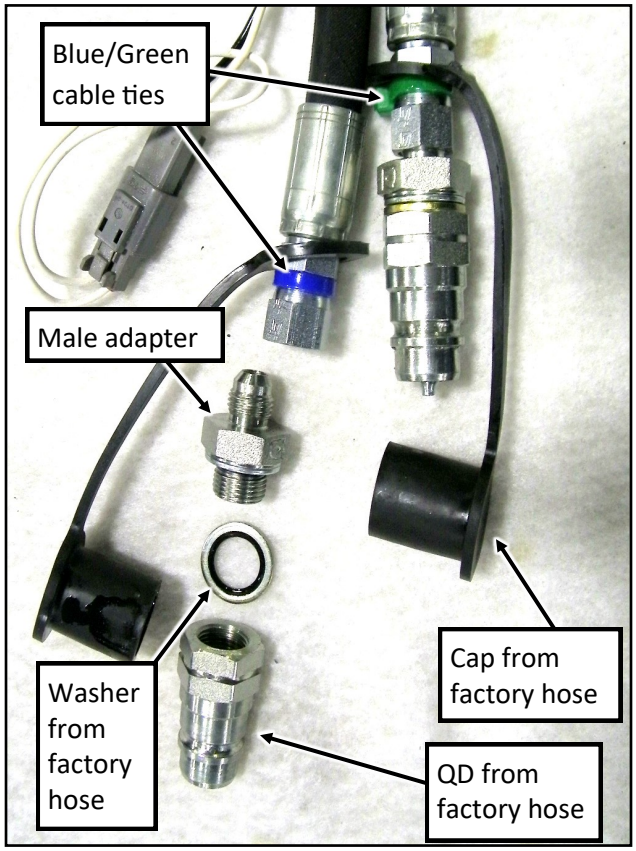
3.5 Place a sealing washer (from step 2.4) and attach the quick-disconnect fitting onto the adapter. Tighten using two 15/16" wrenches.

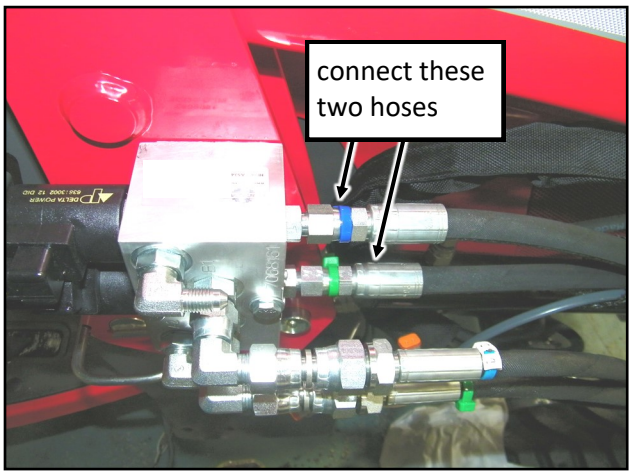
3.6 Attach the Green hose to P1 on the Diverter Valve. Attach the Blue hose to P2. Tighten firmly with an 11/16" wrench.

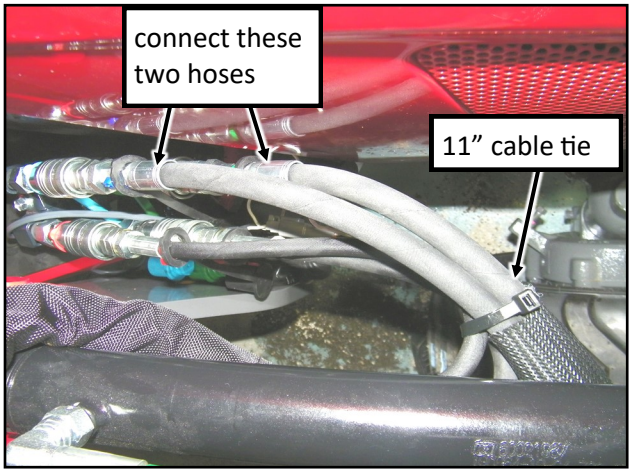
3.7 Connect the Green and Blue quick-disconnects to the corresponding fittings on the tractor.

3.8 Route the solenoid wire harness under the diverter block, connect the plugs from the harness into both of the solenoids and pull any slack toward the quick-disconnect end of the harness.

3.9 Make sure the protective sheath on the hoses is placed as shown and secure the new QD hoses to the other set of factory hoses with an 11" cable tie.





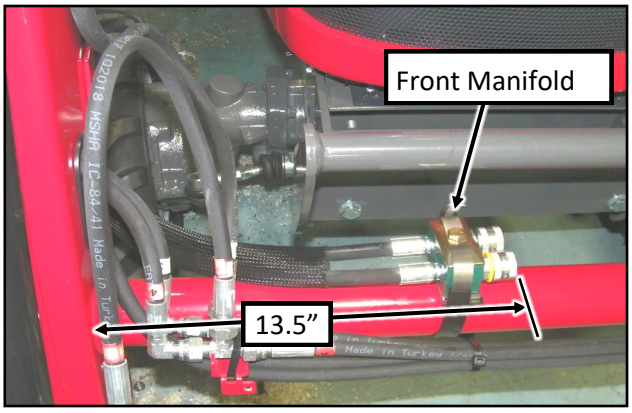


4. Install the Gang of 2 Hoses with Front Manifold

4.1 Remove the cover from the front hoses from the front of the loader cross tube.

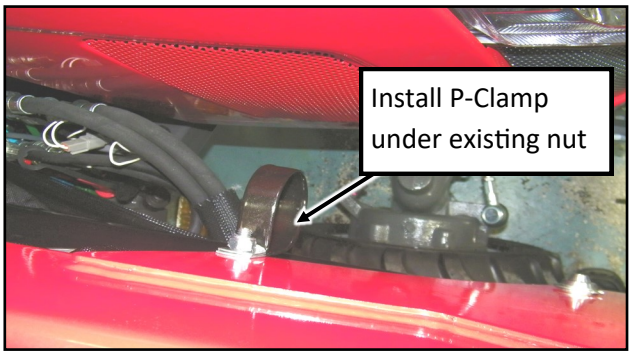
NOTE: The cover can not be reused as-is with the front manifold around the front cross tube. The cover would need to be notched for the front manifold mounting clamp, after the hydraulics are fully installed.

4.2 Locate the gang of 2 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 loader cross tube as shown. Place the manifold with the tip of the hoses about 13.5" from the inside of the loader arm to ensure the hoses have enough slack for lifting the loader.



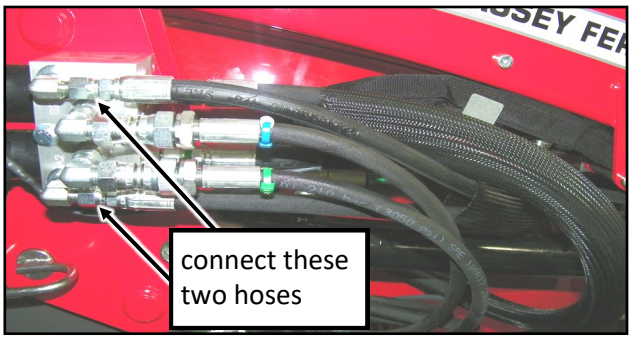
4.3 Insert the tail of the mounting clamp into the screw housing. Take up excess length, leave very loose.

4.4 Using a 13mm wrench and 6mm hex key, remove the nut from the inside of the loader arm and install a 2" P-Clamp under the nut as shown. Tighten the nut firmly.



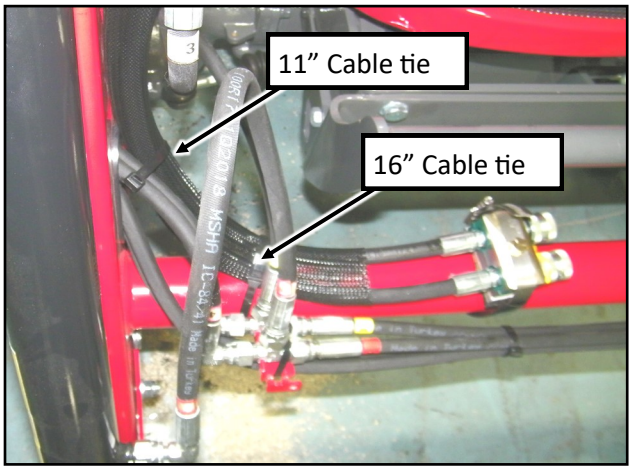
4.5 Route the hoses up the loader arm, through the P-Clamp and through the gap between the loader arm and hydraulic cylinder. Be sure to avoid any pinch points during routing.

4.6 Attach the hoses to the diverter valve, matching to A2 and B2. Tighten the fittings securely with an 11/16" wrench.



4.7 Install the 16" cable tie on the loader cross tube as shown to secure the hoses to the cross tube.

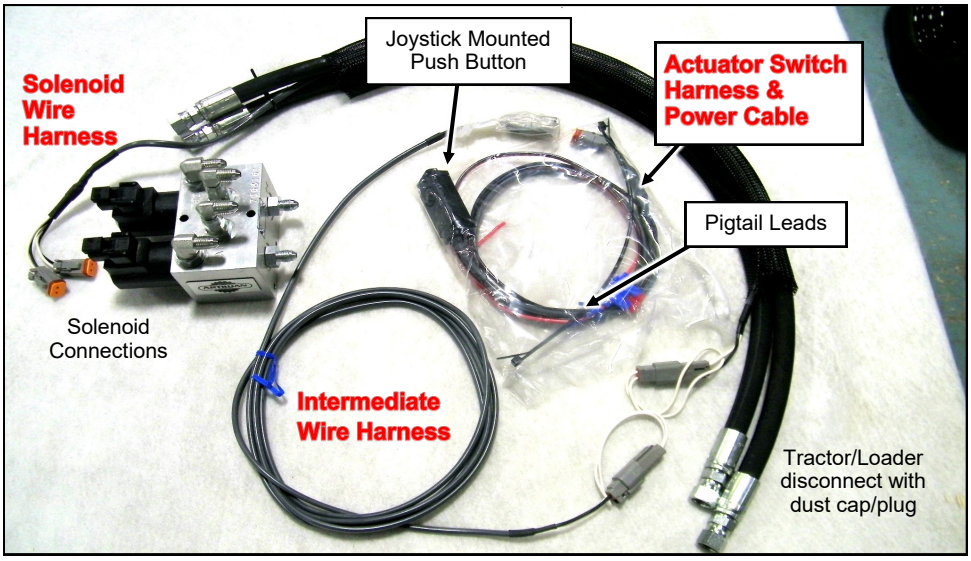
4.8 Secure the hoses from the front manifold to the factory hoses with an 11" cable tie as shown, where the factory hoses emerge from the hole in the loader arm.



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

4.10 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.

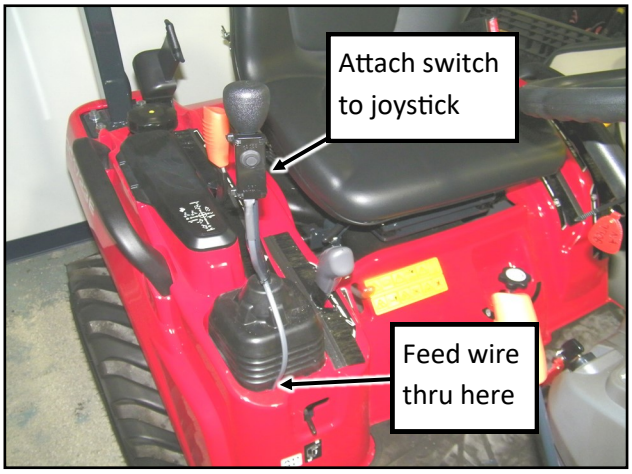
NOTE: See instructions on the next page for how to attach the switch to the tractor joystick.

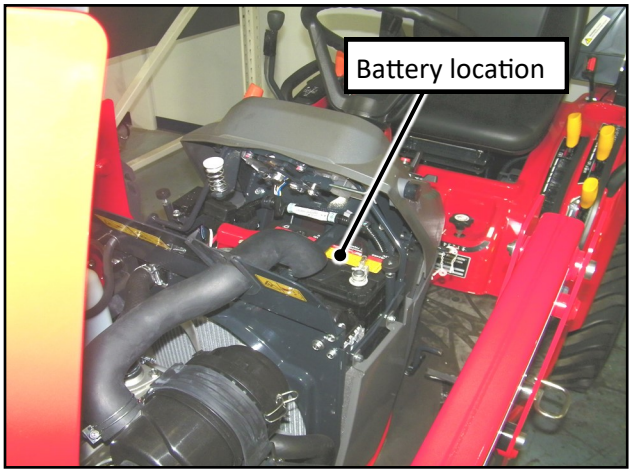
5.2 Note where build-up might be needed to support the switch housing. Using electrical tape; cut strips to length and roll it around the joystick base.

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.

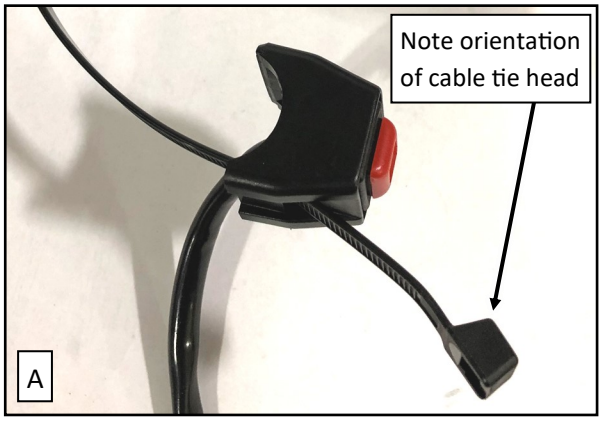
5.5 Using the 4" cable ties provided, secure the Switch Cable to the joystick shaft all the way to the bottom of the joystick shaft. Tighten and trim the cable ties once satisfied with fit.

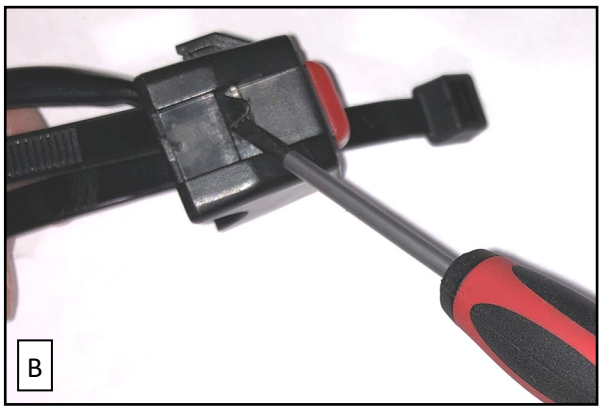


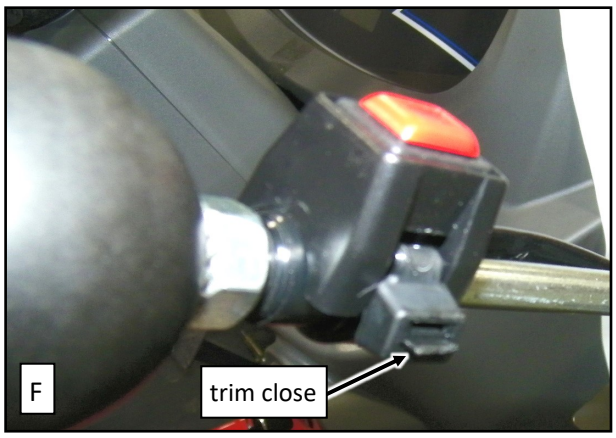


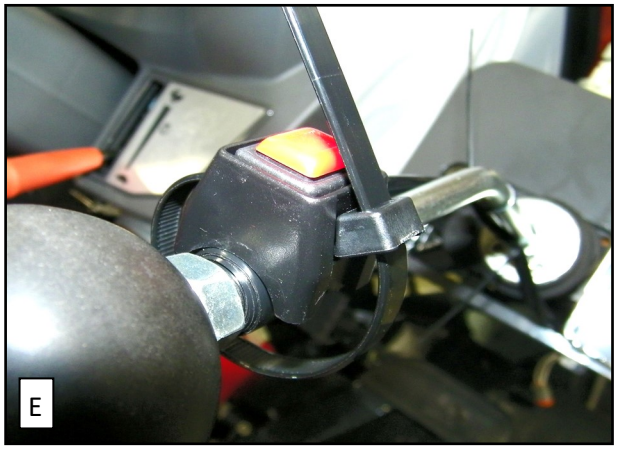
5a. Attach the Switch to the Tractor Joystick

- 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.
- 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.









6. Install the Intermediate Cable and Connect to a 12V Power Source.

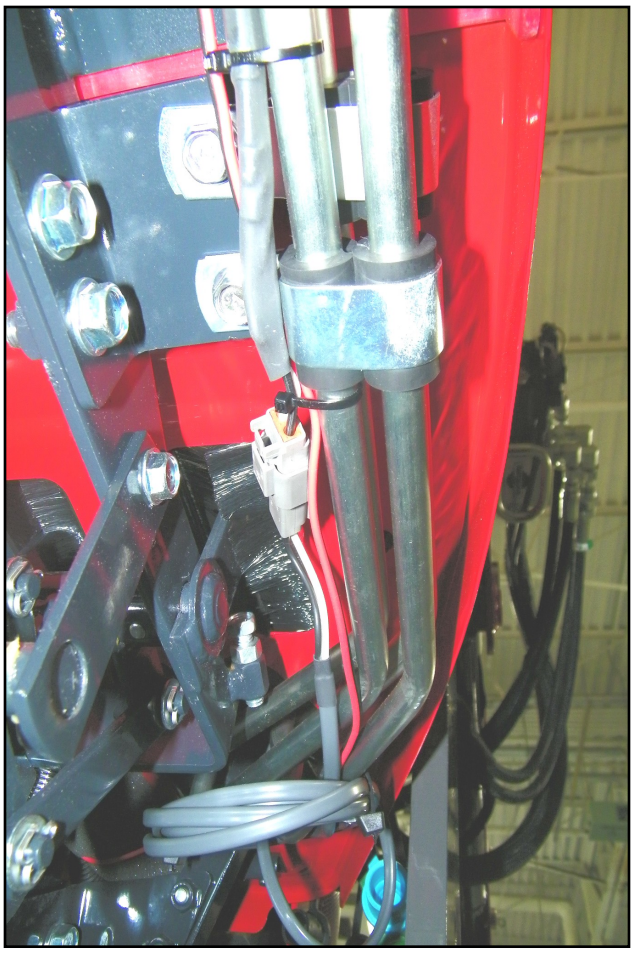
Remaining electrical routings are up to your discretion. Here are a Few points to mention:

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 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.



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

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.

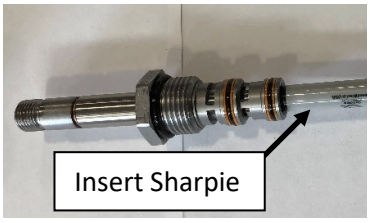
If this functionality is observed, the user should take note of how far they are able to move the joystick to the right before the Grapple jaws change from opening to closing, and then limit their joystick input when opening the Grapple. An alternative solution is to switch the Grapple hoses at the quick 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.

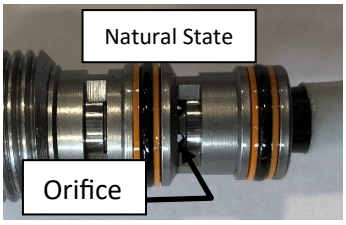
Congratulations and Thank you for choosing Artillian!

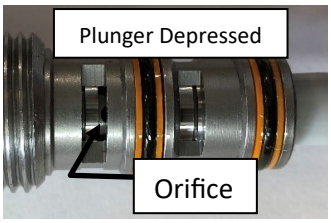
Troubleshooting

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.







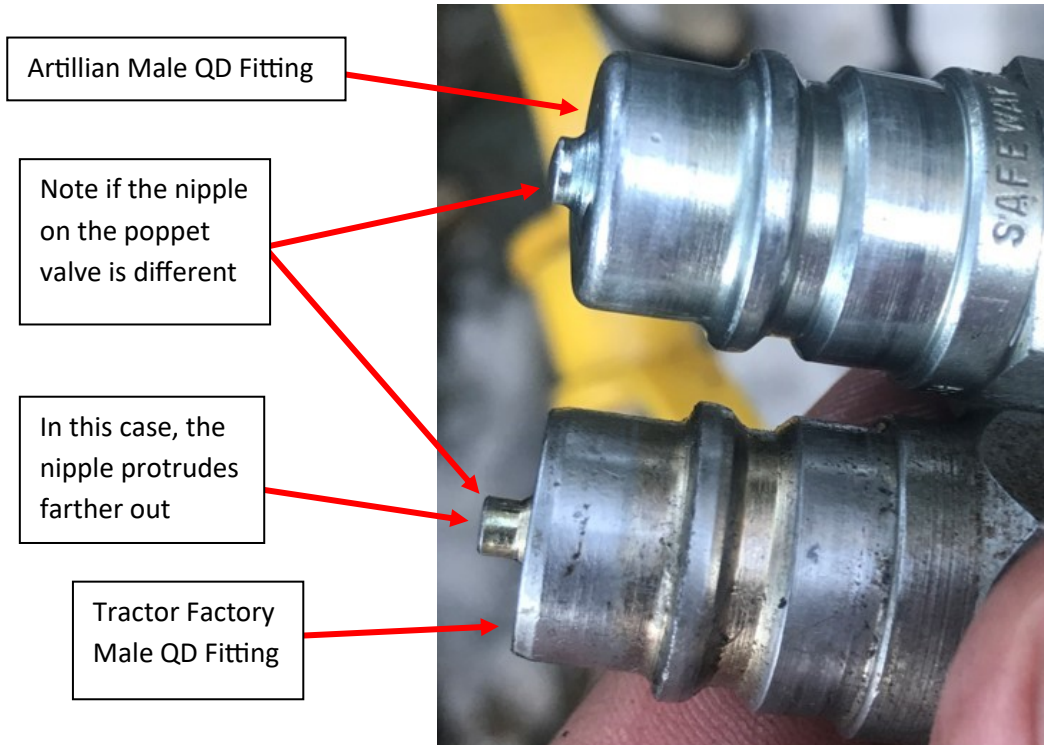
5. Depress the plunger several times. If it is sticking, gritty, or stuck, spray the internal components of the valve with WD40 and/or compressed air to dislodge the debris.
6. Clean the valve, then lubricate with fresh hydraulic oil.
7. Reinstall the solenoid onto the valve and energize to confirm functionality.
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:

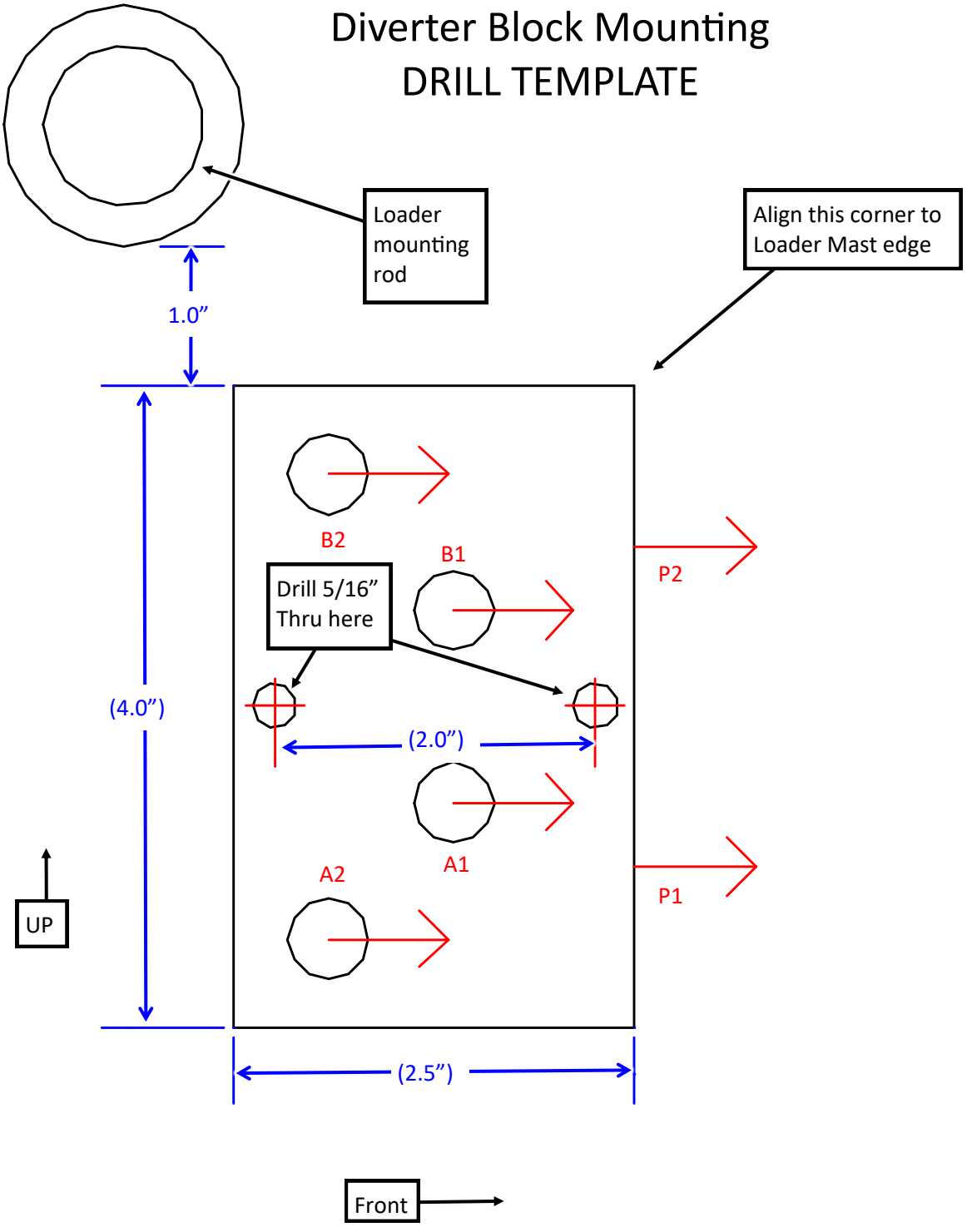
- Grapple (or other attachment) opening / closing for a short period of time and then "locking up"
- Grapple not functioning at all
- Tractor dump / curl operation working for a short period of time and then "locking up"
- Tractor dump / curl operation not functioning at all

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.

Diverter Block Mounting
DRILL TEMPLATE



PRINT OR COPY AT 100% SCALE (FULL, 1:1, Actual Size) ONLY

Service Parts

PART NUMBER	DESCRIPTION
8SV-DVRK-FL1805	DIVERTER VALVE REBUILD KIT
9SV-HYD-00031	HYDRAULIC DIVERTER VALVE ASSEMBLY, W/ ACTUATOR
9SV-HYD-00061	HYDRAULIC SOLENOID VALVE ACTUATOR ASSEMBLY
8SV-HYA-00031	2 HOSE ASSEMBLY W/ SOLENOID WIRE HARNESS
8SV-HYA-00029	3/8" HOSE ASSEMBLY, 38" LONG
8SV-HYA-00030	3/8" HOSE ASSEMBLY, 34" LONG
8SV-WH-00059	WIRE HARNESS, HYDRAULIC DVTR, W/ 2 CONN END
8SV-HYA-00042	2 HOSE ASSEMBLY W/ FRONT MANIFOLD
8SV-HYA-00035	1/4" HOSE ASSEMBLY, 57" LONG
8SV-HYA-00036	1/4" HOSE ASSEMBLY, 59" 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.