CRS Power Flow

GARDNER DENVER

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FLOW DIVIDER VALVE

15,000 PSI and 20,000 PSI

Operation & Maintenance Manual

*Pressure Gauge shown is optional, but recommended, equipment.

GDWJS Part Nos. 800018 (15K) & 800021 (20K)

September 1998

SAFETY is the FIRST DUTY of all concerned with Water Blasting.

Gardner Denver Water Jetting Systems, Inc.
publishes various guides for the safe use of
Water Blasting Equipment and also recommends
that all personnel are made familiar with
"RECOMMENDED PRACTICES FOR THE USE OF MANUALLY OPERATED HIGH PRESSURE WATER JETTING EQUIPMENT"
published by the Water Jet Technology Association
These publications can be obtained
free of charge by contacting
Gardner Denver Water Jetting Systems, Inc.

1-800-231-3628

GARDNER DENVER WATER JETTING SYSTEMS, INC.

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Section 1.0 - SAFETY

These guidelines were prepared to provide the operator of the FDV Flow Divider Valve with the basic information needed to use and service the valve. All operators or service personnel responsible for the care of this equipment should be familiar with the information in this manual.

WARNING: HIGH PRESSURE FLUID SYSTEMS ARE POTENTIALLY DANGEROUS AND ONLY COMPETENT AND TRAINED PERSONS SHOULD BE INVOLVED IN THE MAINTENANCE AND OPERATION OF THIS TOOL.

Any questions about the product should be directed to Gardner Denver Water Jetting Systems, Inc.

Section 2.0 - SAFETY WARNING

Waterjet blasting operations with the CRS FLOW DIVIDER VALVE (FDV) can be potentially dangerous if caution is not exercised prior to and during tool use. Please read and follow all of these instructions.

2.1 Dangerously high pressures can be attained during adjustment of the FDV. This means that a system pressure gauge MUST be observed while any adjustment of the FDV is being carried out.

2.2 DO NOT start the pump unit until the FDV has been FULLY opened. Severe damage to the pumping equipment can be caused by starting against a high head, which can in turn result in severe injury to personnel caused by failing equipment. The FDV will not automatically compensate for any changes in the system.

2.3 RESETTING the FDV is essential every time the system is modified. This is true even if a nozzle is replaced with another of identical size and type.

2.4 Only competent and trained persons should operate this equipment.

NOTE: *It is recommended that all operating personnel be familiar with the "Recommended Practices for the use of Manually Operated High Pressure Water Jetting Equipment," which is published by the Water Jet Technology Association.*

2.5 This equipment should always be used with an operator controlled dump mechanism to release the high pressure water.

2.6 The immediate work area should be marked off to keep out untrained persons.

2.7 All personnel in the area should wear eye protection, and other protective clothing in accordance with specific conditions.

2.8 Inspect the equipment for visible signs of deterioration, damage, or improper assembly. Do not operate until repaired. Make sure all threaded connections are tight and leak free.

2.9 Check to see that all control functions work properly before going to high pressure.

2.10 If it is necessary to have a person work near the cleaning jets, then it is this person who should have control of the pressure dump mechanism.

Section 3.0 - FDV OPERATING INSTRUCTIONS

Connect the FLOW DIVIDER VALVE (FDV) to the pump as shown in Fig. 1 The high pressure supply can be connected to either of the inlet ports, which are on opposite ends of the main block. It is recommended that a pressure gauge be installed on the FDV, using the gauge port provided on the top of the valve. This is especially important if the gauge mounted on the pump cannot be clearly seen by the operator during adjustment of the FDV.

BEFORE STARTING THE PUMP loosen the knurled lock nut on the ADJUSTER HANDLE stem, and unscrew the ADJUSTER HANDLE 4 or 5 turns from the fully closed position (i.e. in the REDUCE PRESSURE direction **as** indicated by the label on the end of the handle). Repeat this for both ADJUSTER HANDLES. The valve is now fully open.

START THE PUMP, and adjust the engine speed to give the desired working pressure while both guns are blasting.

Gun A (see Fig.1) can then be allowed to “dump” water, while gun B is maintained in a blasting condition although with very low pressure. The ADJUSTER HANDLE for Gun A should now be turned in a clockwise direction (i.e. in the INCREASE PRESSURE direction) until the pressure in the system rises to that previously set with both guns blasting. **BE VERY CAREFUL NOT TO ALLOW THE PRESSURE TO EXCEED THAT PREVIOUSLY SET. DANGEROUS PRESSURES CAN BE REACHED IF THIS STEP IS NOT CARRIED OUT CAREFULLY.**

The knurled LOCK NUT on the side which has been set can now be tightened down against the ADJUSTER CAP NUT.
The above procedure is then repeated for Gun B. The gun which was previously set, i.e. Gun A, should

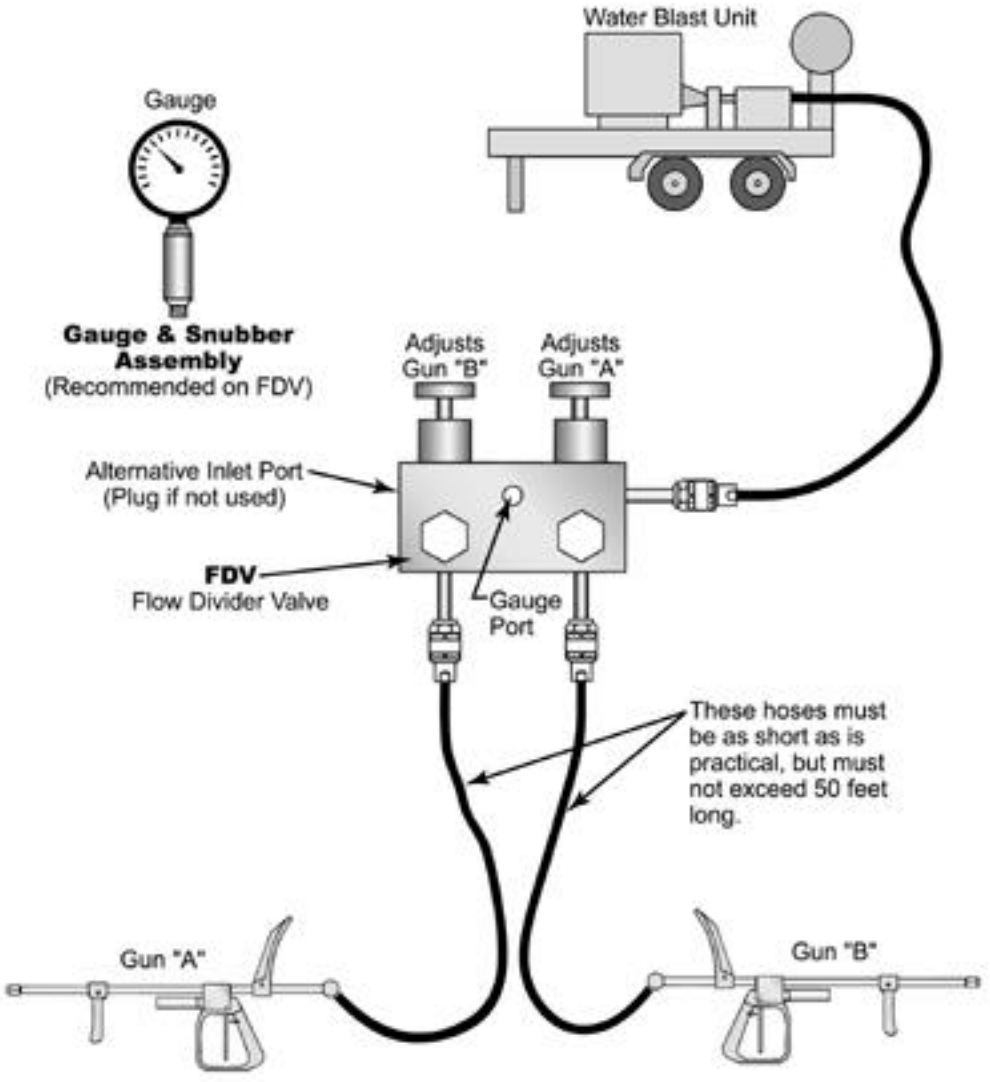


Figure 1

now be set to blast, while the gun which is to be set, Gun B, must be allowed to “dump.” Once again the ADJUSTER HANDLE connected to the gun which is dumping (i.e. Gun B.) is screwed in until the system pressure is again equal to that originally set. Tighten the LOCKNUT and the FDV is now ready to operate.

Check that the FDV is working satisfactorily by alternately dumping pressure from each gun, and also by allowing both guns to dump at the same time. If there are any significant pressure variations, repeat the setting procedure again.

Section 4.0 - FIELD OVERHAUL

If after prolonged use it becomes impossible to set the desired pressure for each gun using the ADJUSTER HANDLE it is probable that the THROTTLING VALVE and SEAT have become worn and must be replaced.

This is a simple operation requiring the removal of the ADJUSTER HANDLE and ADJUSTER BODY from the FDV block (see Fig. 2 and Fig. 4). The THROTTLING VALVE SEAT (Item 10 in Fig.2 and Fig. 3) can be removed by screwing the ADJUSTER HANDLE in a clockwise direction which will push it out of its housing. A new seat, which is supplied in a kit, can then be easily snapped into place. The ADJUSTER CAP NUT is then removed from the ADJUSTER BODY allowing the THROTTLING VALVE (Item 2 in Fig.2) and SPRING (Item 3 in Fig.2) which is

Figure 2

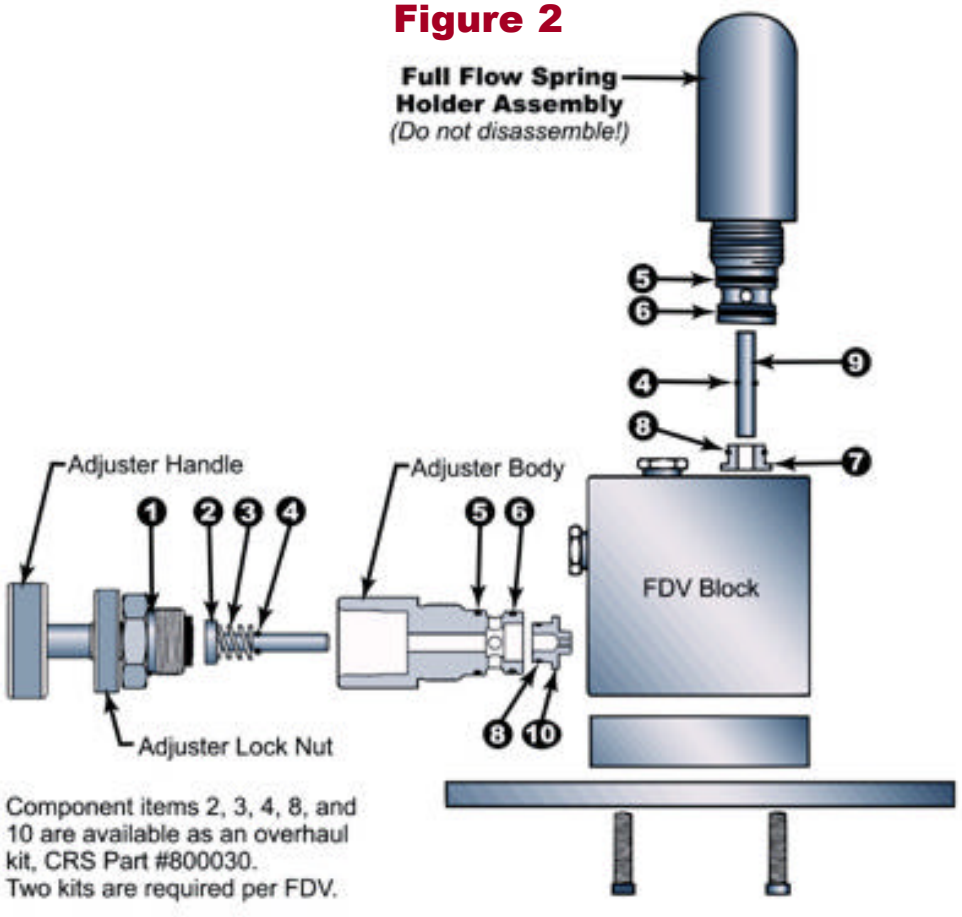


Figure 4

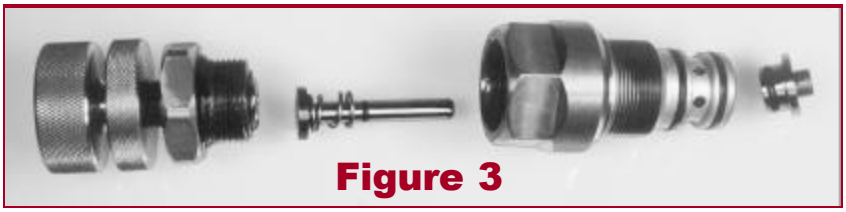


Figure 3

included in the kit with seat, to be withdrawn. A new valve and spring can then be pushed into place, and the adjuster assembly can be reinstalled on the FDV block.

The FULL FLOW VALVE will probably not require any servicing, even after prolonged use. If, however, leakage past this valve is suspected, or if general cleaning and maintenance require that this part of the valve is removed from the block, DO NOT ATTEMPT TO REMOVE THE DOMED BONNET FROM THE FULL FLOW VALVE SPRING ASSEMBLY. Simply unscrew the whole assembly from the block (see Fig. 5), and the preload pressure from the spring will push the FULL FLOW VALVE SEAT (item 7 in Fig.2) out of its housing. This will expose the FULL FLOW VALVE (item 9 in Fig.2, and Fig 6), which can either be replaced, or reversed to utilize a new seating surface. Replacement FULL FLOW VALVES & VALVE SEATS are available in a complete kit.

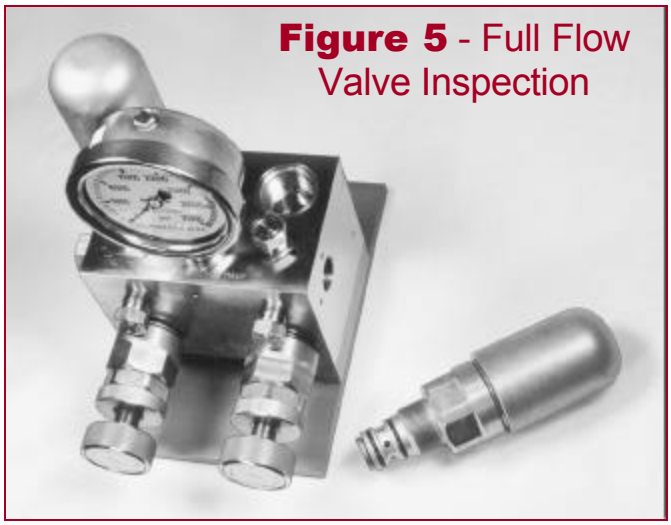
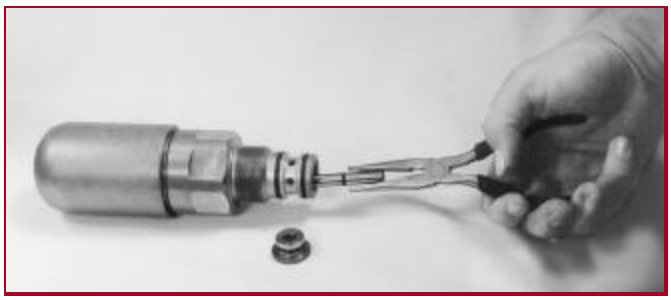


Figure 5 - Full Flow Valve Inspection

As a general rule when servicing these valves, keep all parts as clean as possible, inspect all seals for signs of wear or deterioration, and replace if necessary. Seals should be lightly coated with lithium grease before being reassembled. This will make assembly easier and improve smoothness of operation. All screw threads must be coated with an anti-siege compound to prevent “galling”. CRS Power Flow can provide high-quality anti seize products for use with their products.



Figures 6 & 7 - Remove the valve seat, then use needlenose pliers to carefully remove the valve spring assembly by grasping the full flow (throttling) valve. Inspect all parts for corrosion and wear.

Section 5.0 - PRESSURE GAUGE INSTALLATION

For convenient, safe and accurate adjustment of the FDV, it is strongly recommended that a pressure gauge and snubber is installed on the FDV in the port provided. This will greatly assist the operator when adjusting the valve. If the gauge on the pump cannot be clearly seen by the operator while carrying out the adjusting procedure, a gauge is an essential item to prevent dangerous over-pressures being developed.

Section 6.0 - FDV COMPONENTS

ITEM	DESCRIPTION	QTY.	ITEM ID.
COMPLETE	**FLOW DIVIDER VALVE, 15K**	**1**	**800018**
COMPLETE	**FLOW DIVIDER VALVE, 20K**	**1**	**800021**
COMPLETE	**PRV OVERHAUL KIT***	**1***	**800030**
COMPLETE	**FULL FLOW VALVE OVERHAUL KIT***	**1***	**800034**
NOTE: Two of each overhaul kit are required for overhaul of each FDV.			
OPTIONAL	**PRESSURE GAUGE, 15K**	**1**	**512020**
OPTIONAL	**SNUBBER, 15K**	**1**	**512021**
OPTIONAL	**PRESSURE GAUGE, 20K**	**1**	**512019**
1	O-RING	2	800028
2	THROTTLING VALVE	2	800014
3	SPRING	2	513009
4	O-RING	2	800024
5	O-RING	4	800023
6	O-RING	4	800026
7	FULL FLOW SEAT	2	800005
8	O-RING	4	800025
9	FULL FLOW (THROTTLING) VALVE	2	800009
10	THROTTLING VALVE SEAT	2	800015

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