

Solenoid Valve Service Guide

Introduction

This Document is provided to aid in the replacement and service of the HydrX Fuel Conditioner Inlet and Outlet Solenoid Valves.

The HydrX Fuel Conditioning System utilizes Inlet and Outlet solenoid valves to control flow. Each valve is shown in Figure 1.

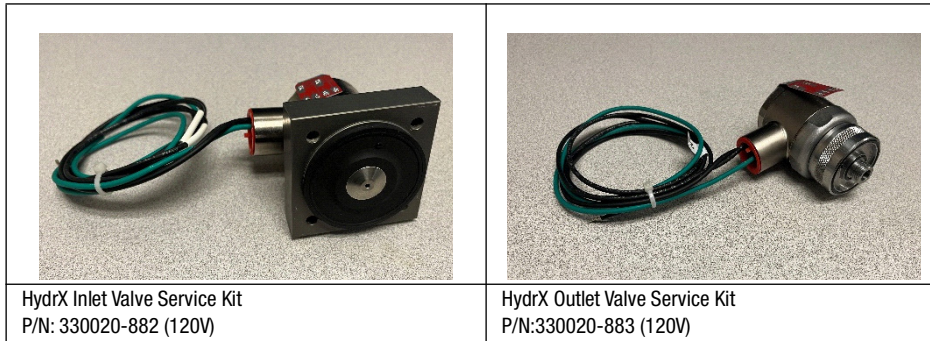


Figure 1. HydrX Inlet/Outlet Valve Solenoids

Both Valves are located on the HydrX Fuel Conditioner Manifold shown in Figure 2.

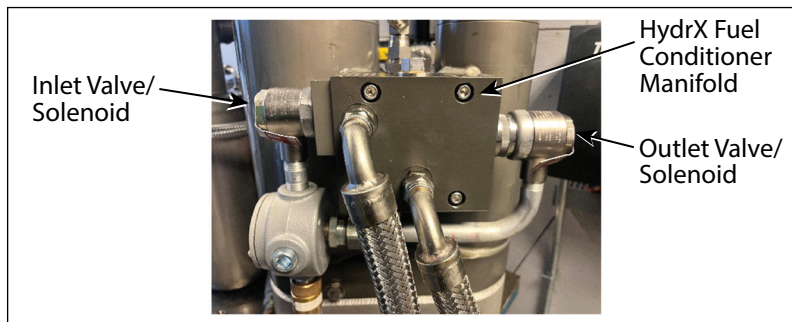


Figure 2. HydrX Fuel Conditioner Manifold

The Inlet Valve is mounted to the left side of the HydrX manifold using four hex socket screws and can be identified by its square body.

The Outlet Valve connects directly to the right side of the HydrX Manifold. It can be identified by its round, knurled body.

Be sure to order the proper valve service kit, with coils matched to the voltage available in your region. (see cross-reference table at the end of this document).

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and program the equipment discussed in this manual:

Service Technician Certification (Previously known as Level 2/3): Contractors holding valid Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. This certification includes TLS-3xx and TLS-4xx certification training.

All service personal on site must comply with all recommended safety practices identified by OSHA and your employer.

Review and comply with all the safety warnings in the manuals listed in this document above and any other Federal, State or Local requirements.

Warranty Registrations may only be submitted by selected Distributors.

Safety Warnings and Precautions

FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD RESULT IN SERIOUS INJURY OR DEATH, AND/OR CAUSE DAMAGE TO PROPERTY, AND THE ENVIRONMENT.

THIS SYSTEM OPERATES NEAR HIGHLY COMBUSTIBLE FUEL STORAGE TANKS.

EXPLOSIVE: Fuels and their vapors are extremely explosive if ignited.

FLAMMABLE: Fuels and their vapors are extremely flammable.

READ ALL RELATED MANUALS: Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.

USE SAFETY BARRICADES: Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape, and your vehicle to block the work area.

APPROVED CONTAINER: Use a non-breakable, clearly marked container, suitable for collecting and transporting hazardous fuels during service.

NOTICE: NOTICE is used to address practices not related to physical injury.

General Precautions

To ensure proper installation, operation, and continued safe use of this product:

1. Read and follow all instructions in this manual, including all safety procedures, local and federal guidelines.
2. Have equipment installed by a contractor trained in its proper installation and in compliance with all applicable codes including: National Electrical Codes 70 and 30A; federal, state, and local codes; and other applicable safety codes.
3. Substitution of components may impair intrinsic safety.
4. Do not modify or use service parts other than those provided by Veeder-Root.

Reference Documents: Manual 577014-466, 577014-492

Suggested Equipment: Valve Service Kit (part numbers listed at the end of this document), approved 5-gallon container to receive diesel fuel; siphon pump; petroleum jelly; adjustable slip-joint pliers, adjustable wrench capable of opening to 2.275" to remove valves.

Procedure to Prepare for Service

WARNING



Tag, lockout power to the HydrX switched neutral.

1. Close the STP Adapter ball valve to isolate the Fuel Conditioner unit from the pump. If coils are to be replaced, disconnect field wiring from coil leads and tag for re-connection. (see Figure 3).

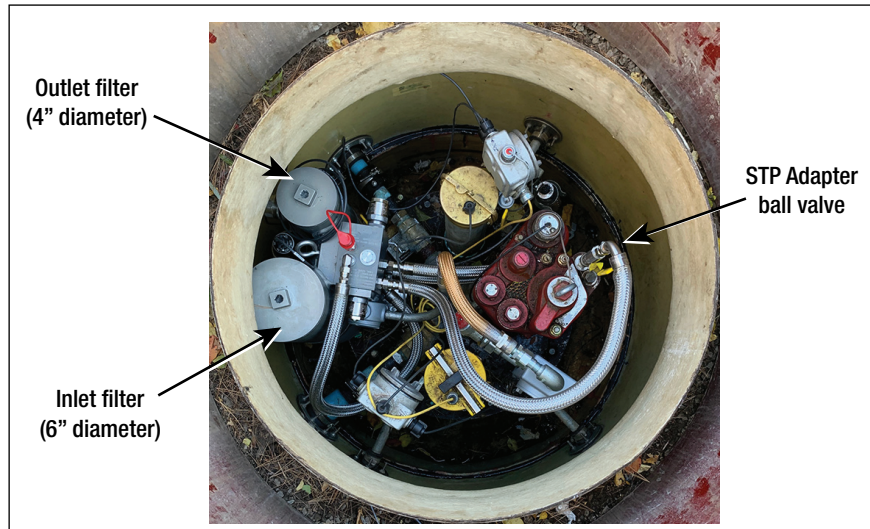


Figure 3. HydrX Sump

2. Using a 1/2" drive ratchet and extension, remove either of the two filter caps.
3. Remove the filter and set it aside. Using a handheld pump or siphon, remove fluid from the HydrX filter housing until the fuel level is at or below the bottom of the filter housing. Re-install the filter and housing cap before proceeding.
4. Remove the lock nuts from both solenoid valves, the lock nuts can be identified by their red metal tags (see Figure 4).

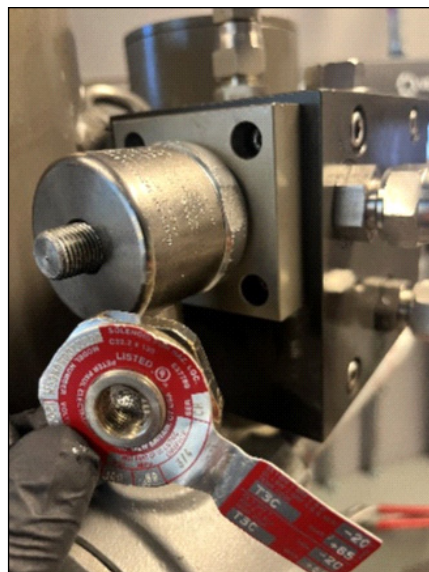


Figure 4. Remove Solenoid Lock Nut

- Remove the conduit body and electrical coils from both solenoid valve stems and set them aside (see Figure 5).

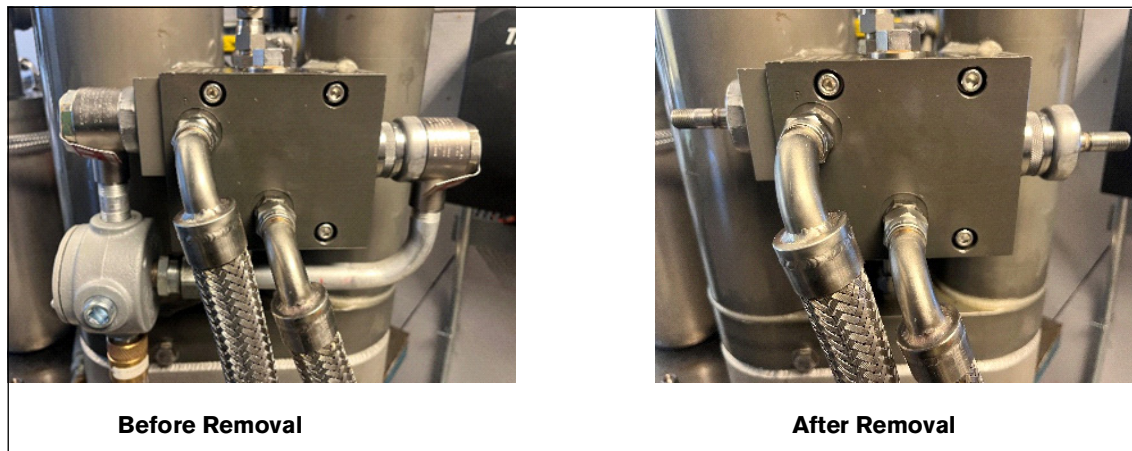


Figure 5. Solenoid Valves/Conduit Removed

INLET SOLENOID VALVE REMOVAL PROCEDURE

- Locate the four hex socket mounting screws on the square body of the Inlet Valve. Using a 5/32" Allen key, remove the four screws and lock washers and set them aside (see Figure 6).

⚠ WARNING

Do not attempt to unthread the inlet valve stem from the manifold, The four mounting screws must be removed for service.

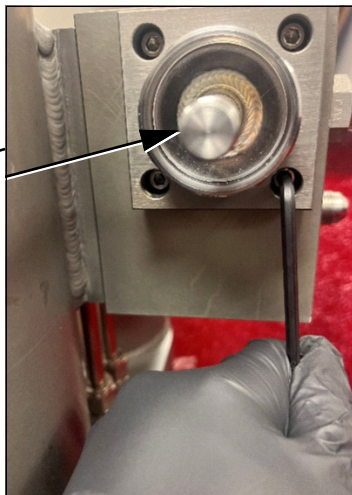


Figure 6. Removing Inlet Valve

- Inspect the Inlet Valve cavity on the HydrX Manifold for debris. Any debris should be removed from the cavity at this time (see Figure 7).

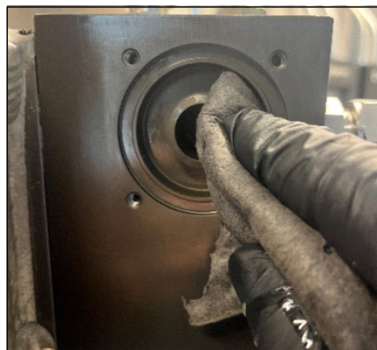


Figure 7. Clean Inlet Valve Cavity

- Clean and inspect all valve components (see Figure 8). If all parts are in good condition the Inlet Valve may be re-assembled for replacement. In the event the valve is damaged, or components have been lost, the valve assembly must be replaced.

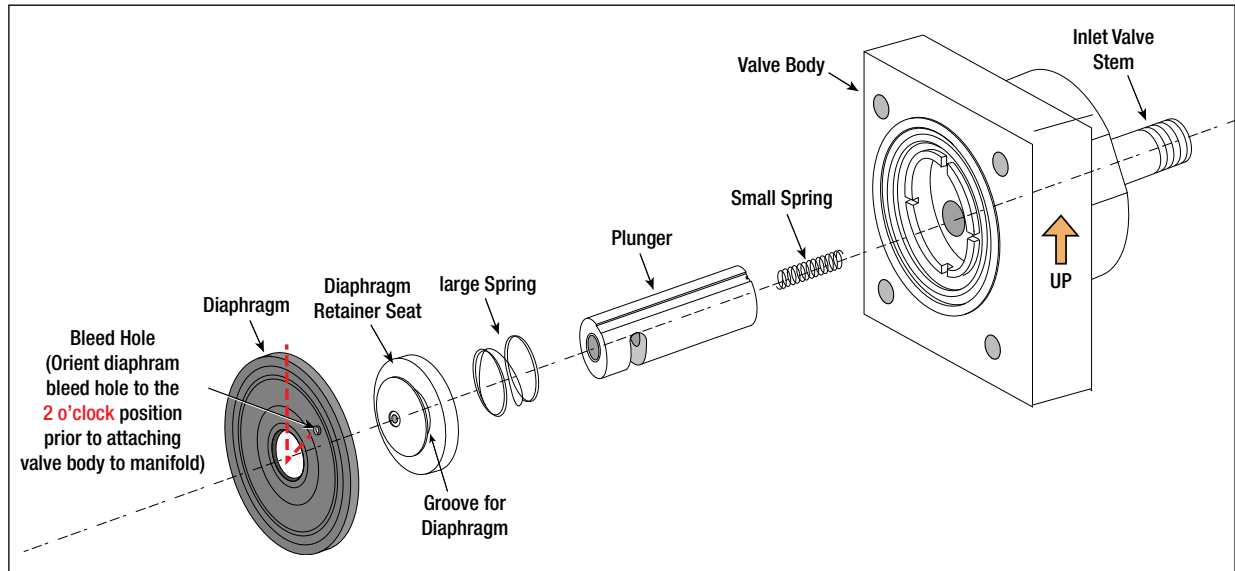


Figure 8. Inlet Valve Components

INLET VALVE INSTALLATION PROCEDURE

- Ensure the Inlet Valve manifold cavity is clean and free of debris.
- Verify all valve components are clean and assembled correctly, referencing Figure 8 above.
- Apply a small amount of petroleum grease to the outer edge of the Inlet Valve diaphragm (the diaphragm also functions as the gasket for this valve). Apply a small amount of petroleum grease to the threads of the four hex socket mounting screws. Ensure the lock washers provided are installed on each screw (see Figure 9).

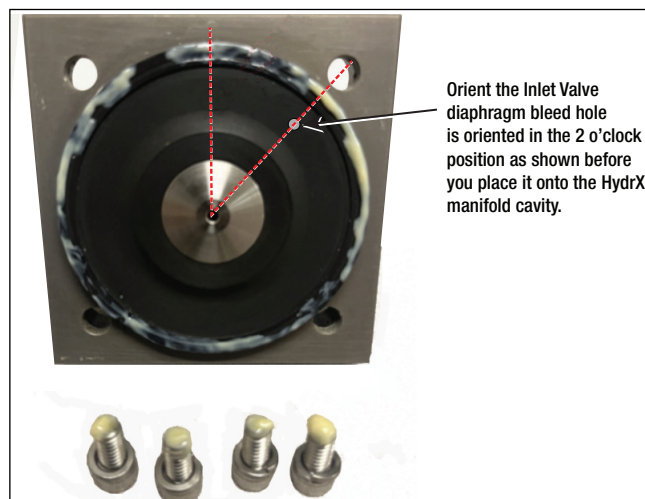


Figure 9. Inlet Valve Assembly/Mounting Screws Greased for Installation.

- Orient the Inlet Valve assembly so the diaphragm bleed hole is oriented in the 2 o'clock position as you place it into the HydrX Manifold cavity. Loose fit all four hex socket mounting screws and ensure the valve is sitting evenly against the

manifold before tightening the screws in a crossing pattern (1 to 2 and 3 to 4 - see Figure 10). Torque the four screws to 18 - 24 lb-in.

Orient the Inlet Valve assembly so the diaphragm bleed hole is oriented in the 12 o'clock position as you place it onto the HydrX Manifold cavity.

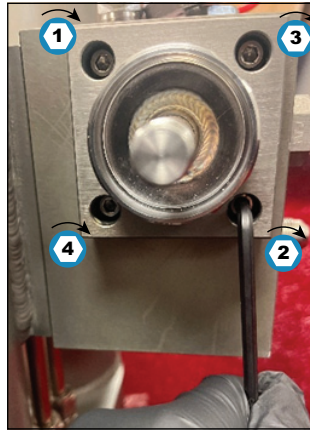


Figure 10. Inlet Valve Assembly Installation.

5. To complete the service, see "Enabling the HydrX System" on page 8.

OUTLET VALVE REMOVAL PROCEDURE

1. Grasp the knurled body of the Outlet Valve with a pair of slip-joint pliers or a small pipe wrench. Rotate the valve counterclockwise to remove it from the HydrX Manifold (see Figure 11).



Figure 11. Outlet Valve Assembly Removal

2. Inspect the Outlet Valve cavity on the HydrX Manifold for debris (see Figure 12). Any debris should be removed from the manifold at this time.

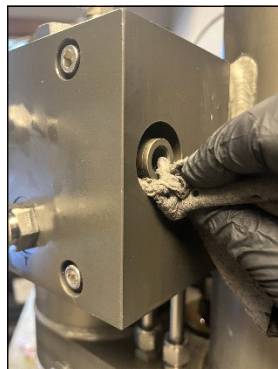


Figure 12. Clean Outlet Valve Cavity

- Grasp the knurled section of the valve body using slip-joint pliers or a small pipe wrench and using a large adjustable wrench on the non-knurled part of the valve body, rotate counterclockwise to separate the two for access to the Outlet Valve plunger, spring, and seat. (see Figure 13).

NOTICE

Steps 3-7 outline the service procedure for the outlet valve, if replacing the valve proceed to page 8.



Figure 13. Separating the Outlet Valve Body from the Valve Seat

- Separate the assembly components, remove any debris and wipe the parts clean (see Figure 14).

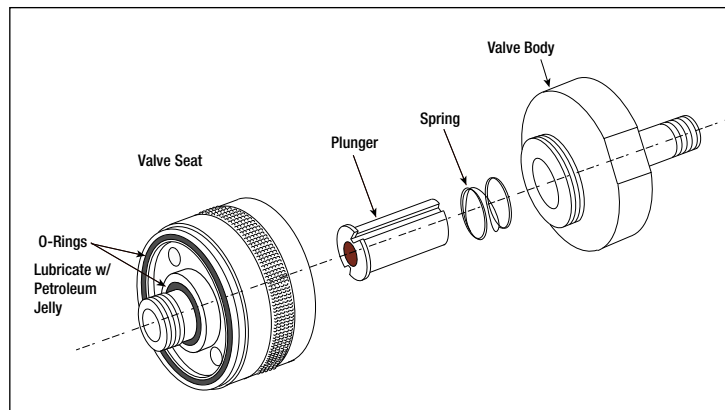


Figure 14. Outlet Valve Assembly Components

- Check that the o-ring inside the valve seat and the two o-rings on the HydrX Manifold side of the valve are not cut or nicked (see Figure 15). In the event the valve is damaged, or components have been damaged or lost, the valve must be replaced.

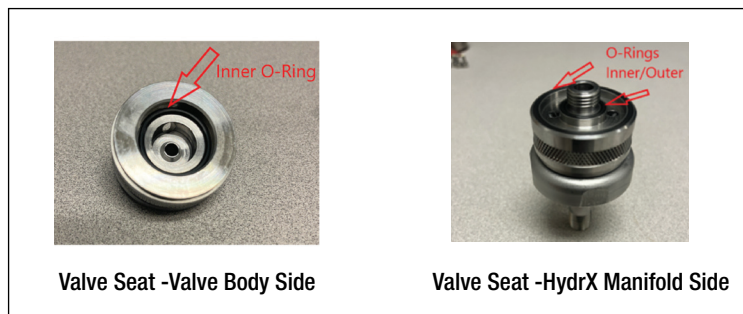


Figure 15. Outlet Valve O-Rings

- Ensure the Outlet Valve manifold cavity is clean and free of debris.
- Verify all valve components are clean and assembled correctly. Grasp the knurled section of the valve seat using slip-joint pliers or a small pipe wrench and using a large adjustable wrench on the valve body, rotate clockwise until the two parts are snug tight.

OUTLET VALVE INSTALLATION PROCESS

1. Apply a small amount of petroleum grease to both o-rings located in the exterior of the valve. Thread the Outlet Valve into the HydrX Manifold until hand tight (see Figure 16).



Figure 16. Outlet Valve Component Assembly

2. Using slip-joint pliers, grasp the knurled body of the outlet valve and tighten to the HydrX manifold (see Figure 17).

NOTICE Do not over tighten the Outlet Valve, as the thread boss is aluminum.



Figure 17. Tightening Outlet Valve to HydrX Manifold

Enabling the HydrX System

1. Fit the solenoid bodies over the stems of both valves and re-install the solenoid valve lock nuts on both valves (see Figure 18). Tighten lock nuts until coils are fully engaged with the valve body.

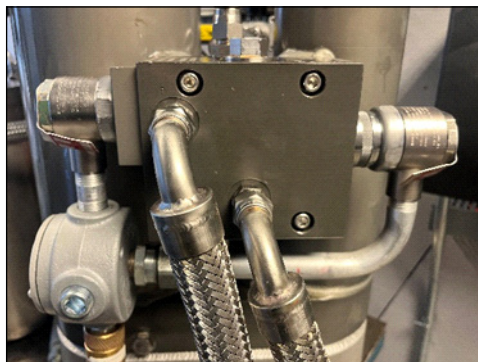


Figure 18. Reattach Solenoid/Conduit to Inlet/Outlet Valves

2. Open the STP Adapter ball valve (see Figure 19). Turn power back On.

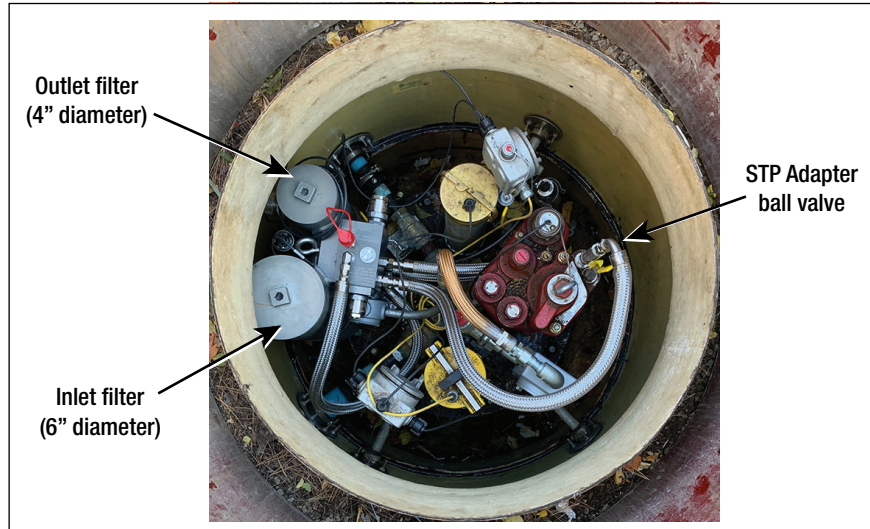


Figure 19. HydrX Sump

3. Touch **Menu>Diagnostics>HydrX>Overview** (Item 1, Figure 20) to open the HydrX Diagnostic Overview screen (see Figure 21).

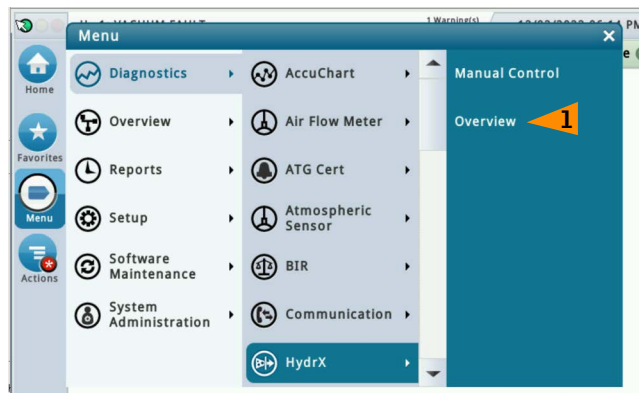


Figure 20. Accessing HydrX Diagnostic Overview Screen

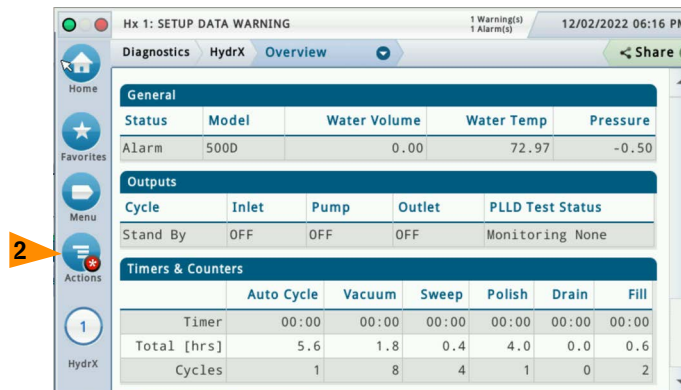


Figure 21. HydrX Diagnostic Overview Screen

4. Touch the **Actions** button (Item 2, Figure 21) to open the HydrX diagnostic service buttons menu. Note: Gray Action buttons are disabled.

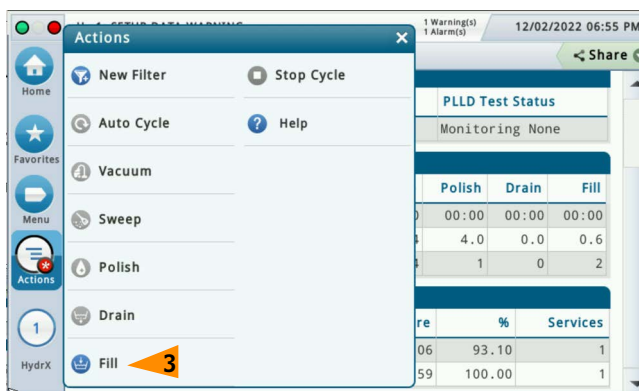


Figure 22. HydrX Diagnostic Service Menu

5. Touch **Fill** (Item 3, Figure 22) to refill the HydrX filter housing with fuel from the tank.

SYSTEM INSPECTION

During the HydrX Fill Cycle, inspect the areas where the valves meet the manifold for signs of leakage. Also inspect any hose connections or other system components disassembled during valve service. When the Fill Cycle is complete, navigate to the HydrX diagnostic overview and ensure the unit is holding stable vacuum when in the Idle state.

NOTICE The default interval for the HydrX fill cycle is 30 minutes, this duration can be shortened by navigating to Menu>Setup>HydrX and entering the value 3 under "fill duration" Ensure the cycle completes and the housing is holding vacuum before completing service.

Valve Troubleshooting

Table 1 can be used to troubleshoot and verify service of HydrX solenoid valves.

NOTICE Under normal conditions, when idle, the HydrX system should hold a vacuum. If the system is unable to hold a vacuum when idle, check for any visible leaks before proceeding with valve troubleshooting.

Following any service, a "Fill Cycle" should be run to completion.

Table 1. Solenoid Valve Troubleshooting

Action	Typical Function	Problem Condition	Issue/Response
Start pump	STP engages	STP does not engage	Confirm Wiring, setup and programming outlined in HydrX Fuel Conditioning System Installation Manual (577014-446)
Start pump	STP engages: No change In HydrX pressure	STP engages: - HydrX housing positive pressure	Inlet Valve not closing fully, service or replace valve.
		STP engages: - HydrX housing negative pressure	Outlet Valve not closing fully, service or replace valve
Start pump, start Inlet Valve	STP engages: Positive pressure builds in HydrX housing (15 to 50 psi)	STP engages: - No pressure change	1. HydrX ball valve is closed, check position before proceeding. 2. Inlet Valve not opening, confirm proper voltage at coils, check coil continuity.
		STP engages: Negative pressure builds in HydrX housing (0 to -13 psi)	Valves control wiring is backwards, swap inlet/outlet power wires and retest.

Table 1. Solenoid Valve Troubleshooting

Action	Typical Function	Problem Condition	Issue/Response
Start pump, Start Outlet Valve	STP engages: Negative Pressure builds in HydrX housing (0 to -13 psi)	STP engages: - No pressure change	1. HydrX ball valve is closed, check position before proceeding. 2. Outlet Valve not opening, confirm proper voltage at coils, check coil continuity.
		STP engages: Positive pressure builds in HydrX housing (15 to 50 psi)	Valves control wiring is backwards, swap inlet/outlet power wires and retest.

Kit Part Numbers

Table 2. HydrX System Inlet/Outlet Valve Kits

Part Number	Description	Category
330020-882	kit- Inlet Valve Service – UL/cUL 120V/60Hz	Replacement
330020-883	kit- Outlet Valve Service – UL/cUL 120V/60Hz	Replacement
330020-916	kit- Inlet Valve Service – UL/cUL 240V/60Hz	Replacement
330020-917	kit- Outlet Valve Service – UL/cUL 240V/60Hz	Replacement
330020-918	kit- Inlet Valve Service – UL/cUL 240V/50Hz	Replacement
330020-919	kit- Outlet Valve Service – UL/cUL 240V/50Hz	Replacement

For additional assistance, please contact Veeder-Root Technical Support by phone at 800-323-1799 or by email to technical-support@veeder.com.