

# Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES  
 NORMALLY OPEN OPERATION — SOFT CLOSING  
 1", 1 1/4", 1 1/2", 2", OR 2 1/2" NPT

SERIES

8221

Form No.V6493R3

**NOTICE:** See separate solenoid installation and maintenance instructions for information on: Wiring, Solenoid Temperature, Causes of Improper Operation, Coil or Solenoid Replacement.

## DESCRIPTION

Series 8221 valves are 2-way normally open, internal pilot-operated solenoid valves designed for soft closing. Valves are made of forged brass with internal parts of brass or stainless steel and elastomers of Buna N, or ethylene propylene, depending upon service requirements. Valves may be provided with a general purpose or explosionproof/watertight solenoid enclosure.

## OPERATION

**Normally Open:** Valve is open when solenoid is de-energized; closed when energized.

**IMPORTANT:** Minimum operating pressure differential required is 5 psi. Valve will remain open down to 3 psi differential once opened at 5 psi or higher.

## INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

## Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

## Temperature Limitations

For maximum valve ambient and fluid temperatures, refer to chart. Check catalog number prefix and suffix on nameplate to determine the maximum temperatures. See example following chart.

Construction AC or DC	Catalog Number Prefix	Catalog- Number Suffix	Maximum Temperature	
			Ambient	Fluid
AC	None, DF KF, SF or SC	None	125° F (51.7° C)	180° F (82° C)
	HT,KH, ST or SU	None	140° F (60° C)	
	None, DF KF, SF or SC	HW	125° F (51.7° C)	210° F (99° C)
	HT,KH, ST or SU	HW	140° F (60° C)	
DC	None, or HT	None	77° F (25° C)	150° F (66° C)

**EXAMPLES:** For Catalog No. HT822127, AC construction the maximum ambient temperature is 140° F with a maximum fluid temperature of 180° F. For Catalog No. 822129HW, AC construction the maximum ambient temperature is 125° F with a maximum fluid temperature of 210° F.

## Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub-assembly area.

## Piping

Connect piping or tubing to valve according to markings on valve body.

**▲ CAUTION:** Valves with suffix "HW" in the catalog number are equipped with ethylene propylene elastomers which can be attacked by oils and greases. Use on oil-free systems only. Wipe the threads clean of cutting oils.

Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

**▲ CAUTION:** To protect the solenoid valve, install a strainer or filter suitable for the service involved, in the inlet side as close to the valve as possible. Clean periodically depending on service conditions. See ASCO Series 8600, 8601 and 8602 for strainers.

## MAINTENANCE

**▲ WARNING:** To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.

**NOTE:** It is not necessary to remove the valve from the pipeline for repairs.

## Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close. Clean strainer or filter when cleaning the valve.

## Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to insure proper opening and closing.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

## Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

## Valve Disassembly

Note: Refer to Figure 1 for 1", 1 1/4" or 1 1/2" NPT valve constructions. Refer to Figure 2 for 2" or 2 1/2" NPT, Suffix HW valve constructions.

1. Disassemble valve in an orderly fashion using exploded views for identification of parts.
2. Remove solenoid, see separate instructions.

**▲ CAUTION: Do not remove body plug on 2" or 2 1/2" NPT valves. The body plug has been sealed in place at the factory. Removal is not necessary for cleaning or rebuilding.**

3. Unscrew solenoid base sub-assembly with special wrench adapter supplied in ASCO Rebuild Kit. For wrench only, order ASCO Wrench Kit No. K218950.
4. Remove solenoid base sub-assembly, core, plugnut assembly, and solenoid base gasket. On suffix "HW" valve constructions, remove stem.
5. Unscrew adapter and remove disc holder assembly, disc holder spring, and adapter gasket.
6. For normal maintenance (cleaning), it is not necessary to remove the valve seat. However, for valve seat removal use a 7/16" thin wall socket wrench.
7. Remove bonnet screws and valve bonnet from valve body. Then remove the following parts:

- |                 |                    |                        |
|-----------------|--------------------|------------------------|
| • Piston Spring | • Disc             | • Bleed gasket         |
| • Lip Seal      | • Aspirator tube † | • Bleed washer         |
| • Support       | • Snubber          | • Flow control         |
| • Piston        | • Body gasket      | • Lower bleed washer † |

† Present on 2" & 2 1/2" NPT valve constructions only.

8. All parts are now accessible to clean or replace. Replace worn or damaged parts with a complete ASCO Rebuild kit.

## Valve Reassembly

1. Reassemble using exploded views for identification and placement of parts.
2. Lubricate the disc and all gaskets with DOW CORNING® 111 Compound lubricant or an equivalent high-grade silicone grease.
3. On 2" or 2 1/2" NPT valve constructions, install lower bleed washer (small diameter) into valve body. Then position the flow control into valve body with concave end outward; facing the valve bonnet. Position bleed washer and gasket over the flow control.
4. Preassemble aspirator tube (2" or 2 1/2" NPT construction only), snubber, disc, and piston.
5. Position lip seal, flanged end up, onto piston. Position body gasket and support in valve body cavity. Install piston with snubber, disc, and lip seal into support in valve body cavity.
6. Replace piston spring, valve bonnet and bonnet screws. Torque bonnet screws in a crisscross manner to  $144 \pm 15$  in-lbs [ $16,3 \pm 1,7$  Nm].
7. If removed, replace seat with a small amount of thread compound on male threads to avoid possible leakage. Torque valve seat to  $65 \pm 15$  in-lbs [ $7,3 \pm 1,7$  Nm].
8. Replace disc holder spring, disc holder assembly, stem (suffix "HW" valves only), adapter gasket, and adapter. Torque adapter to  $175 \pm 25$  in-lbs [ $19,8 \pm 2,8$  Nm].
9. Replace solenoid base gasket, plugnut assembly, core with small end up and solenoid base sub-assembly. Torque solenoid base sub-assembly to  $175 \pm 25$  in-lbs [ $19,8 \pm 2,8$  Nm].
10. Install solenoid, see separate instructions. Then make electrical hookup to solenoid.

**▲ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a nonhazardous, noncombustible fluid.**

11. Restore line pressure and electrical power supply to valve.
12. After maintenance is completed, operator the valve a few times to be sure of proper operation. A metallic *click* signifies the solenoid is operating.

## ORDERING INFORMATION FOR ASCO REBUILD KITS

Parts marked with an asterisk (\*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

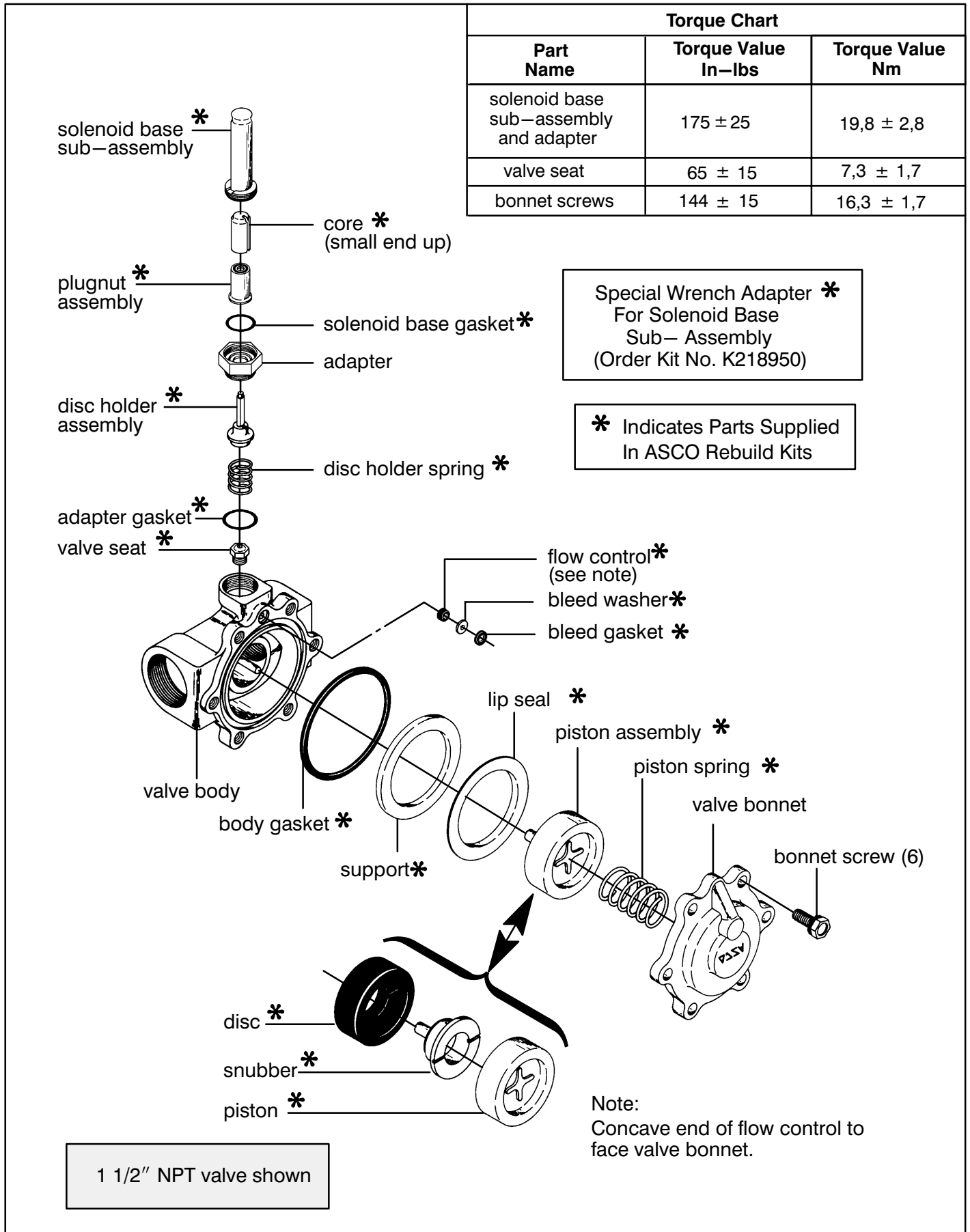


Figure 1. Series 8221 valve without solenoid, 1", 1 1/4" or 1 1/2" NPT, construction shown.

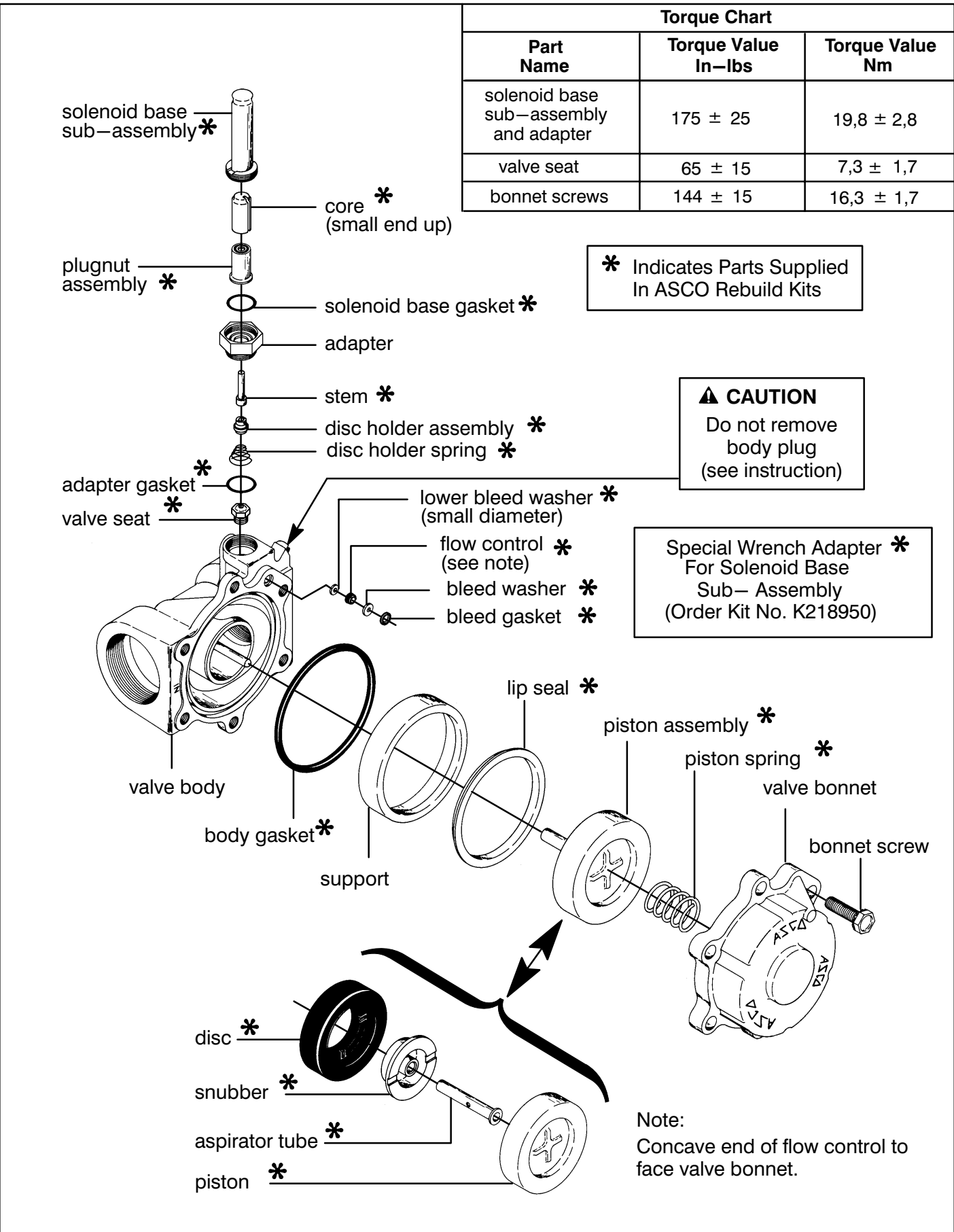


Figure 2. Series 8221 valve without solenoid, 2" or 2 1/2" NPT, suffix "HW" construction shown.