

Powered Anode Installation

Thank you for your purchase! It is our goal to offer maximum value and utility to our customers! We hope you will be satisfied and will continue to purchase STOLTCO products!

Warning & Useful Information

Removal and/or installation of water heater components has risk of severe burns, damage to skin or eyes, and possible trauma to body due to use of power tools. Always use safety precautions. Water heater manufacturer instructions and tool manufacturer instructions always take precedence over these installation instructions. Water heaters contain **hot water under pressure**, and can be hazardous if not operated on correctly.

These are universal instructions for anode replacement in a residential hot water heater. It is highly recommended that you visit www.youtube.com and search for and view user-uploaded videos of “changing water heater anodes” (although this is not an endorsement of any particular video) to increase your understanding of the process and issues that may be encountered. Some people like to “flush” the old water (and mineral build-up) from their water heaters during or prior to installing a new anode. Also during or prior to anode installation, many individuals who have had issues with odorous or “stinky egg” water perform [a small amount of] bleach or hydrogen peroxide flush of their hot water heater to kill odor-producing bacteria in the tank. STOLTCO does not endorse or instruct on these mineral or bacteria flushes, but the reader is hereby informed of them and their utility of extending water heater life and/or increasing the quality of water. More information on these flushes can easily be found via internet or youtube.com video searches.

How the Powered Anode Works

To understand how the powered anode works, we must understand how the *galvanic sacrificial anodes* and *galvanic corrosion* works. Sacrificial anodes work because they are made of a metal (typically Aluminum, Zinc, or Magnesium) that has a more negative reduction potential than the tank to which it is electrically coupled. In other words: it is made of a metal that more easily loses its electrons (breaks down) than that of the water heater tank: therefore the metal atoms of the weaker metal “anode” sacrifice themselves before the tank material is sacrificed/corroded.

The powered anode, or “impressed current anode” works because it is made of a relatively non-reactive conductive material from which an electrical current (electrons) are discharged into the water which then conducts [these electrons] onto the sides of the tank which thereby prevent the tank walls from reaching a negative potential which in turn prevents the tank from breaking down or corroding. In optimal practice in the use of a powered anode, only the anode material breaks down (due to discharging electrons), and if it is made of a material that does not easily lose its electrons, such as Titanium/Mixed Metal Oxides, and if it has a large surface area from which it discharges the electrons, then it breaks down very slowly, over decades, rather than years.

The powered anode is superior to the sacrificial/galvanic anode in terms of ability to protect and longevity of protection, and for this reason it is used to protect from corrosion ship hulls, buried or submerged metal piping and structures, commercial/high-value reinforced concrete construction, as well as tanks (such as hot water heaters) that are in contact with a medium which allows for galvanic corrosion, such as water.

Aside from corrosion protection, the powered anode can (but does not in all cases, due to differences in water quality) eliminate “rotten egg smell” produced in the hot water heater. It eliminates the smell by *replacing the magnesium or aluminum anode* that is causing the reaction that results in the production of odorous hydrogen sulfide gas. Therefore with a powered anode corrosion protection is achieved without the gas-producing reaction. It should be noted that in some cases the bacteria causing this reaction may still “feed” on elements in the water or water heater tank, and so they must be eliminated from the tank and/or water supply in order to eliminate the odor.

Components

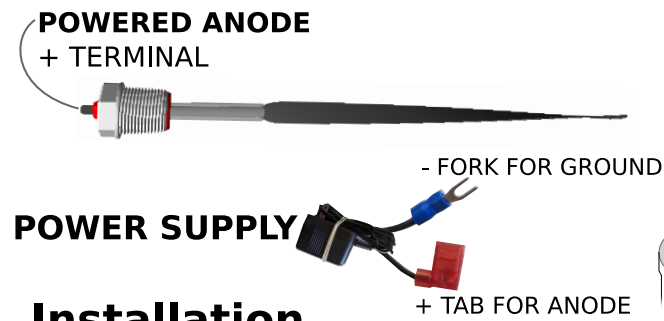
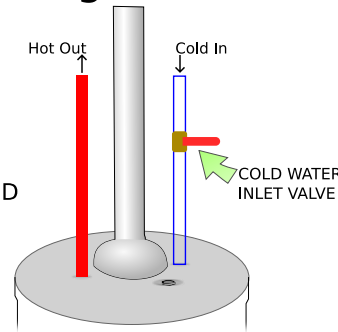


Fig. 4.1



Installation

Tools Required

- 1+1/16” (or 27mm) socket (included in some STOLTCO kits)
- Method to drive the socket (often a ratchet, breaker bar, or impact wrench)
- Large flathead screwdriver
- One or two cloths for absorbing any spills, and for cleaning water heater of dust
- Bucket or hose (for step 5)
- Flashlight may be useful if your water heater is in a dark location

1. Read your water heater manual regarding the procedure for anode replacement. The manufacturer of your water heater may have instructions specific to your model of water heater; their instructions will always take precedence over other instructions, including these.

2. Make sure the anode you purchased can replace your existing anode. Check the visible portion of the anode that protrudes from the water heater, and ensure you are indeed looking at the anode, and that it has a hex head and is not a “nipple style” anode.

3. Turn off (or turn to low or to pilot light) your hot water heater. Your water heater’s manual will indicate where this is and how to do it. If your water heater is electric, there is typically a single breaker that allows only the water heater to be turned off. If your water heater is gas, then there is typically a rotary knob near the base of the water heater that controls the temperature and which can be set to “pilot light only”. (This step reduces risk of damage to your water heater if you were to accidentally drain all the water from it. It also reduces the risk of pressure building up in the water heater during this process.)

4. Turn off the water supply to your water heater. (See Figure 4.1.) Locate the cold water supply line that enters your water heater. Typically, this line will have a shut-off valve that is close to the water heater. Find this valve and turn it off. If you cannot find this valve, you will need to shut off the water main line that enters your house. **This step is required, because if you do not shut off the water entering the water heater, then there is extreme risk of scalding and flooding if you were to remove the anode while the water heater is under pressure.** The next step will verify that you have properly closed off the supply of water to the hot water heater.

5. Relieve the pressure in the hot water line and water heater tank, and drain approximately 4 gallons from the hot water heater tank. Keep a hot-water faucet on (open) to prevent pressure build-up. Locate a faucet that is connected to the hot water heater, and turn on the hot water only. For the first few seconds the water should come out under a pressure that is typical for your system, and then it should quickly subside or even stop. If your faucet is located above the top of your water heater tank the water will stop after 5-20 seconds. If the faucet is located below the bottom of your water heater tank, then leave the faucet on for 30 seconds after you visually observed a lessening of pressure, but do not leave it on for more than 60 seconds total unless you wish to drain the entire tank.

IF DURING THIS PROCESS YOU DID NOT NOTICE A CHANGE IN WATER PRESSURE WHILE RUNNING HOT WATER FROM A FAUCET THEN THAT MEANS THERE IS STILL PRESSURE IN YOUR HOT WATER HEATER. DO NOT PROCEED UNTIL YOU ARE ABLE TO VERIFY THAT YOU HAVE RELIEVED PRESSURE FROM YOUR HOT WATER TANK AND SYSTEM.

After you have verified that the pressure in your hot water tank and lines has been relieved, as evidenced by a complete lack of flow from hot water faucets, or a substantial decrease in rate of flow, and if your faucet is above the height of your water heater, then: **leave a hot-water faucet open to prevent further pressure build-up**, and then proceed to the next step. (It is only necessary to leave one faucet open/on, as that allows any pressure in the entire system to escape.) If all of your faucets are below the midpoint of your hot water heater it is then recommended to turn your water heater completely off to avoid pressure build-up and/or complete draining of the tank.

Using your water heater’s manufacturer manual, locate the drain valve on the hot water heater tank. An example drain valve is shown below (Figure 5.1). Using caution and protective measures, connect a hose or use a bucket to drain four (4) gallons of hot water from the tank from the drain by operating the valve with a flathead screwdriver. Do not unscrew the valve from the tank. Draining some of the water from the tank aids in removing water from hot water lines above the top of the water heater, and this is important because if you remove the anode while water is still in the plumbing above the anode port, then that water will drain out of the anode port during anode removal.

Fig. 5.1

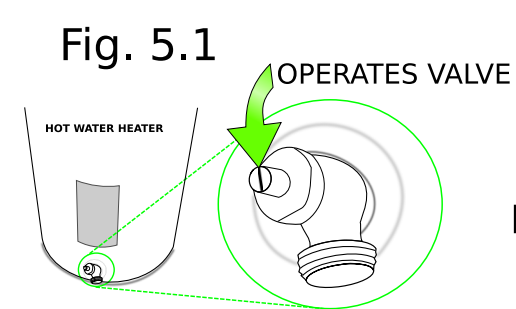


Fig. 6.2

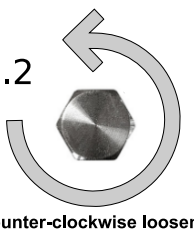
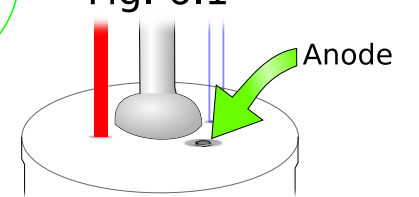


Fig. 6.1



6. Remove the old anode (Figure 6.1). If space is tight, bend or cut the old anode as you retract it. Locate the existing anode by reading the manufacturer’s manual for your water heater. The anode is typically mounted in the top of the tank in a recess in the sheet metal shroud of the water heater, and is typically a 1-1/16” hex head fitting. Sometimes the anode is covered with a small lid that mates to the metal water heater shroud which must be removed to gain access to the anode.

Using a 1-1/16” (or 27mm) socket and a tool to drive the socket, begin to unscrew (Figure 6.2) the existing anode assembly SLOWLY, and observe for water leaking out around the threads prior to full removal of anode+fitting. If water is leaking, this means the water level in your water heater is reaching the threaded junction, and more water must be drained before continuing. If water and/or air leaks under pressure from the junction (as evidenced visually, or through sound) work must be stopped, and the steps above of relieving pressure and draining the system must be repeated until nothing escapes under pressure from the anode-to-water heater junction.

Often, the steel hex at the top of the anode has corroded and has fused to some degree to the tank, and can be extremely difficult to remove. The following methods have been observed to aid in removal:

- Use of ratcheting straps wrapped around the water tank, such that the metal mechanism is positioned in an area where it can be used to brace a piece of timber against it and to a wall to keep the water heater from rotating.
- Use of a 3/4” or 1” powered impact driver than can deliver over 1000 foot-lbs of force.

7. At this step (after removal of the old anode) the user may wish to perform any tank flushes or draining of mineral buildup.

8. Install the new anode with teflon (PTFE) tape.

Make sure the hole and threads around the anode port on the water heater are clean and free of old teflon tape and debris. If you purchased a STOLTCO anode with pre-applied thread sealant, then do not apply teflon tape. If you purchased a STOLTCO anode that did not come with pre-applied thread sealant: wrap 3-5 turns of teflon tape around the threads of the anode such that the ending trailing edge of the tape will be "dragged" as the anode is tightened into the port. (With the interior side of the anode facing you, you will wrap the tape in a clockwise direction.)

Insert the anode into the anode port of the equipment (tank) you are installing it in. Gently seat the threads of the anode fitting and tighten by hand prior to using a tool to tighten the anode. Use a hand-tool (NOT an impact driver) to tighten the anode to approximately 35-ft-lbs of torque. (If you must remove the anode, any teflon tape must be removed and reapplied. Pre-applied thread sealant will re-seal up to 8 cycles of removal+reinstallation.)

You will connect power to the anode in later steps.

9. Check and ensure that the drain valve on the water heater is in the closed position (close it if it was open).

10. Open (turn on) the cold water supply to the hot water heater.

The filling of the hot water heater will force air in your system to slowly escape from any open hot water faucets. (Turning the water on all the way, or keeping your faucets closed can result in explosive bursts of air and water to vigorously splash from your faucet.) To release air in each branch in the system, one by one, turn on all hot water fixtures that are connected to the hot water heater and allow to run until a steady stream of water is evident. Using heavy-duty rubber gloves (to prevent scalding!) to hold a loosely-bunched up cloth over the faucet can help suppress explosive bursts of water mixed with air. After all air has been expelled from the lines, close all faucets.

11. CHECK THE ANODE PORT AND DRAIN VALVE FOR LEAKS.

If there is a leak at the anode port the user must repeat the steps of these instructions, and ensure anode has not been cross-threaded into the water heater. If the drain valve leaks, it is likely that it is not completely closed, and could possibly be in a state of being held open by mineral build-up that had flowed or become partially stuck in the valve. It may be possible to "back flush" the valve with a hose and clean water to remove any debris within the valve.

12. Turn water heater back on, or back to the temperature setting it was at prior anode replacement.

13. Connect power to your Powered Anode.

Locate a small metal screw at the top of the hot water heater that holds the shroud to the tank, and unscrew it by 1.5-to-3 turns. If provided, apply a small amount of CONDUCTIVE GREASE under the head of the screw. Install the (-) blue forked connector of the POWER SUPPLY under the head of the screw (around the screw) and then re-tighten screw (figure 13.1). Plug the red female connector of the POWER SUPPLY into the male connector on the top of the newly-installed anode (figure 13.2).



Plug the POWER SUPPLY into an outlet, and check the POWER SUPPLY for green or blue LED light indicating proper operation (figure 13.3).

You did it!

You can expect many years of reliable operation from the anode and power supply! The POWERED ANODE will typically outlive the POWER SUPPLY, and so failure mode of the entire system is typically an exhaustion of electrical components within the power supply, which STOLTCO will happily replace under warranty conditions with an equivalent power supply.

Technical Specifications

POWER SUPPLY	Input: 80-130VAC (50W max) Output: See information printed on adapter. (Typically 24VDC @ 20mA, constant current)12' 24AWG cord, red female tab connector for + (positive) anode, blue forked connector for - (negative) cathode. ETL/UL Certified.
POWERED ANODE: FITTING	304 (A2) Stainless Steel, meets/exceeds ASME/ANSI standard B36.10/19
POWERED ANODE: INTERIOR SEAL	Food-grade Silicone Rubber
POWERED ANODE: ELECTRODE ROD	Proprietary mixed metal oxide exterior, thermally fused to titanium substrate.

Troubleshooting

PROBLEM	POTENTIAL SOLUTION
Anode/Fitting leaks around threaded connection to water heater tank	1. Was teflon tape used during installation? Lack of teflon tape can cause leaking. 2. If teflon tape was used, anode may not be sufficiently tightened. Disconnect the cord from the anode, and tighten anode. Anodes with teflon tape can typically be tightened up to 40 foot-lbs of force. Excessive force can fracture the male or female threaded connection, so do not over-tighten!
Power Supply: red light, or no light	1. Check the connection from the power supply to the water heater tank (forked connector), and to the anode (female tab connector) to make sure they are electrically conductive; that connections were made per these instructions, and that no rust, plastic, or other debris are impairing the connection. 2. Check the household AC outlet that 110-120AC voltage is present (recommended to plug in a household device that is known to work, thereby testing the outlet).
Male tab on top of POWERED ANODE is bent	The + (positive) connection on top of the POWERED ANODE can be safely bent to 90-degrees or vertical orientations.
Electrode rod on bottom of POWERED ANODE is bent	The electrode rod may be gently bent by hand into a straightened condition. Repeated bending can damage the MMO coating and thus void the warranty.
+ Positive tab connection on POWER SUPPLY has loose fit to male anode connection	The red connector that connects to the top of the anode must have a relatively tight fit to ensure a good electrical connection. If this connection is so loose that the power supply light is not turning on, then a small flathead screwdriver can be used to pry bend the rounded metal contacts toward the flat metal contact, thereby creating a tighter fitting connector. Do not use conductive grease on this connection because the grease may eventually run and create a short.
Anode is leaking between either the MMO anode and silicone, or between silicone and stainless steel fitting	Replace with new anode: before returning, please kindly be sure that it is an active leak and not extra water dripping from the water heater shroud due to retraction of the old anode or other steps of the installation process. An active leak will only happen while the water tank is under pressure. If an active leak occurs, please let us quickly help by contacting STOLTCO via our website www.stoltco.com or by calling 218-209-2310.

Warranty

1. Summary

1. Replacement of defective anode or power supply with equivalent product within XX years of purchase, non-transferable, registration or original receipt required, time period (xx) as per below.
2. "PA" part number/labeled product: 8 years warranty.
3. "PAK" part number/labeled product: 20 years warranty.

2. Terms of Warranty

1. To redeem warranty: For fastest resolution please first contact STOLTCO through current contact information listed at www.stoltco.com (or by phone: 218-209-2310).
2. All claims are required to be submitted in writing to:
STOLTCO WARRANTY SERVICE
645 RANCHO VISTA RD
VISTA CA 92083

3. Claim in writing shall be made within 14 days of knowledge of defect, and shall include the original or copy of original sales receipt.
4. Length of time of warranty: ("xx" years as per above, per part number/label) from the date of purchase as recorded on sales receipt.
5. Product was installed in accordance with STOLTCO or water-heater-manufacturer instructions.
6. Warranty applies only to STOLTCO powered anode and the power supply, and does not cover any product/kit accessories.
7. Anode/fitting assembly was not exposed to temperatures above 100 degrees Celsius (212 degrees Fahrenheit).
8. Product was kept in "powered on" state with supplied equipment from time of installation.
9. Products were not subjected to abnormal operating environment or conditions: I.e., no exposure to blunt force, ice, snow, rain, fire, gases, or fluids other than normal atmosphere and water.
 1. Power supply shall not have been operating in temperature above 50 degrees Celsius (122 degrees Fahrenheit), nor shall power supply come in contact with any fluids.
10. STOLTCO shall not be responsible for any shipping, equipment, or services outside of the STOLTCO product listed on the receipt.
11. The customer may be required and responsible for the cost of shipping defective product to a STOLTCO address within the continental United States.
12. Warranty shall only apply to STOLTCO product, and does not apply to any other equipment or accessories. Warranty lifetime years apply only to product described in these terms, and only to products manufactured, sold, and purchased with and under these terms.

Thank you for choosing
STOLTCO

We always LOVE to see positive customer stories, reviews, pictures and video posted as feedback....especially if you found a trick that can help others !

If something did not go well, please let us help!

218-209-2310
www.stoltco.com