



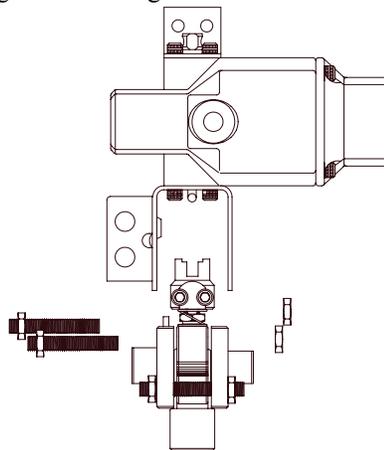
Maintenance Instructions for Pneumatically Operated Ball Valve Welker, Part No. VL439[][][]

Before beginning maintenance, stop the operation of the ball valve by blocking the supply pressure to the actuator and process pressure to and from the valve body. Pay close detail to the current orientation of the ball valve before removing from service. This will be very important when reassembling the actuator and ball valve back together. Once all valves have been blocked, bleed all trapped pressure from the ball valve. Remove the actuator and valve body in one piece from within the system. Before disassembling the ball valve, move it to an area that will accommodate a clean work area, as there are several parts that may be lost.

NOTE Pay close detail to the current orientation of the ball valve. This will include the ball to the actuator coupling to the actuator itself. If the configuration is different when reassembly, the valve will not function correctly.

NOTE When sealing fittings with PTFE tape, refer to the proper sealing instructions for the tape used.

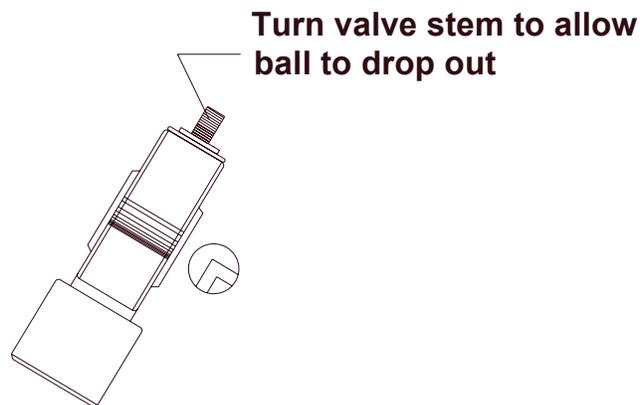
To remove the actuator from the valve body, loosen the body stud nuts on the two stud bolts closest to the actuator. Once loose, remove nuts from bolts and remove the studs from the valve body. Gently guide the actuator away from the valve body. Once done, the bottom stud bolts and nuts may be removed. When removing the bottom two bolts, be careful as this will allow the valve body to separate into three parts, (2) flanges and (1) center body. This will expose the seat assembly, O-rings and ball. Remove the seats and O-rings to prevent them from being lost or damaged.



Loosen the two socket cap screws that hold the actuator coupling to the valve stem and remove the coupling. When removing the coupling, do so slowly as to not lose the grounding spring. Remove the grounding spring. If equipped with a packing nut retainer, gently bend the tabs away from the stem nut and unscrew the nut from the stem. If the ears break off the retainer as they are bent down, this piece must be replaced. The retainer keeps the nut in position to keep proper tension on the valve stem packing. If the

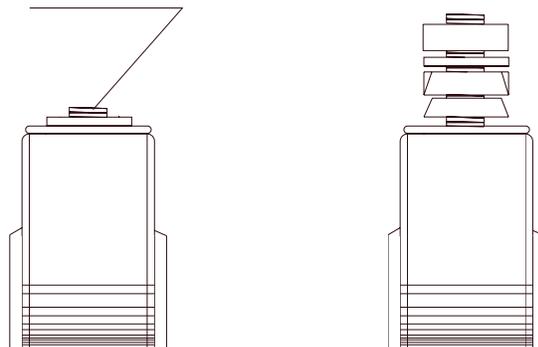
retainer is not replaced, the nut may slowly unscrew and release tension on the packing and possibly cause leakage to the atmosphere. If the nut will not loosen, do not place anything within the opening of the ball as a brace, as this will damage the ball and possibly cause seat failure. There should be enough of the valve stem to place a small wrench as support as the nut is loosened and removed from the valve stem. Once the nut has been removed, the packing components may be removed. First, remove the stem springs. The stem springs are used for compensating temperature and pressure changes by maintaining tension against the packing assembly when the stem nut has been torqued down. The stem springs do this by placing them with the concaved area facing away from each other. This allows for a gap between the two pieces, around the outside edges of the springs, which allows for expansion or retraction due to changes in the conditions. Only the centers of the springs maintain contact with each other.

Hold the center body at a slight angle and turn the valve stem until the ball drops out of the body.



Now push the valve stem down into the center body. Do not remove the stem from the body when pushing downward. At an angle, push the stem back upward. This will allow the threads of the stem to push the packing assembly out of the I.D. bore of the center body. Some ball valves may have included the O-ring from the factory. If equipped, remove it with the packing assembly and replace it.

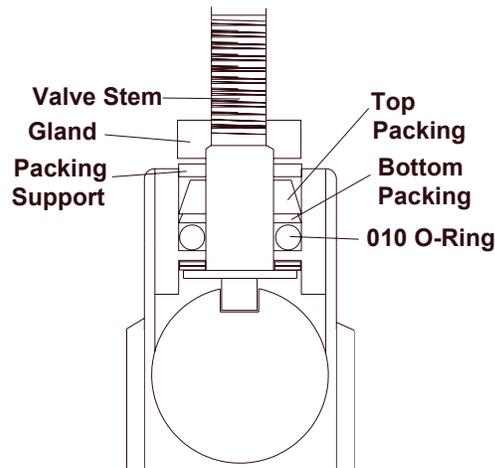
Push valve stem down into body



Remove the packing from the valve stem and discard. Clean the body and valve stem with solvent and dry. Inspect all parts for damage and replace if needed. Once done, the ball valve is ready to be re-assembled.

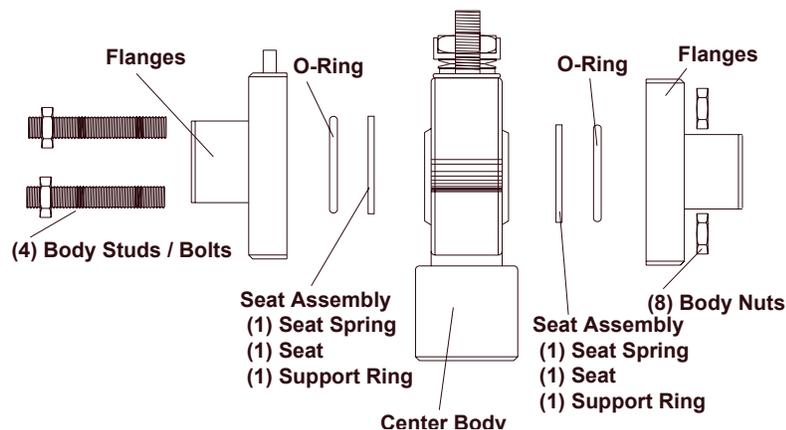
***NOTE* When reassembling ball valve, please reference drawing VL439.**

Replace ball back into the center body and align it to the valve stem and rotate so the ball is held into place. Lightly lubricate the new packing assembly and O-ring with grease. Begin by placing the 010 O-ring with in the packing I.D. detail in the top of the center body. This O-ring will seal around the valve stem and provide a better seal than the packing assembly by itself. The elastomer O-ring will allow for more flexibility with repeated actuation than the Teflon packing alone. After the O-ring is in place, continue to add the other packing components in the order shown below.



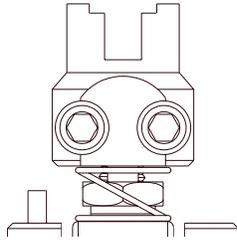
Once the packing assembly is in place, the two stem springs, the packing nut retainer and nut may now be replaced. When replacing the stem springs, place them with the concaved area facing away from each other as mention previously. Once the stem springs are in place, replace the nut retainer and then fasten the nut to the valve stem and **torque down to 25 inch pounds**. Once the nut has been tightened, bend the ears of the retainer in so that it hugs to the nut.

Replace seat assemblies and O-rings back into the center body.

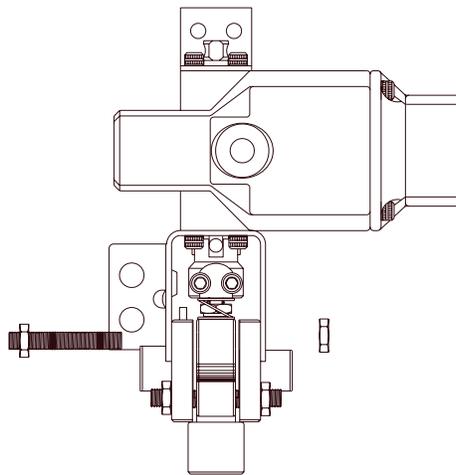


Reposition flanges upon the center body and insert stud bolts through the bottom two holes within the flanges and attach nuts. Do not tighten. Reposition the actuator coupling and grounding spring back onto the valve stem and snug the socket cap crews into the coupling.

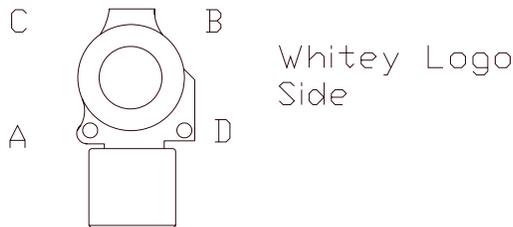
***NOTE* When doing this, pay attention to the orientation of the ball and the coupling.**



Position the actuator over the valve body and line the holes of the bracket to the holes on the top of the valve body and insert the stud bolts and attach nuts and fasten them snugly. When doing this, make sure the coupling is properly positioned to mate with the drive shaft from the actuator.



Torque the studs in alphabetical order in a crisscross sequence shown in the diagram below. Repeat this step 5 times until the studs are torqued to 40 inch pounds.



Body Material	Torque Values (in. lbs)				
	1 st	2 nd	3 rd	4 th	5 th
Stainless Steel	5	10	20	40	40
Carbon Steel	5	10	20	40	40
Brass	5	10	20	30	30

Tighten the socket cap screws into the coupling to fasten it to the valve stem. Ball valve is now ready for service.

