

# Initial Assembly and Zeroing for the Fisher™ 8590 and 1061 Tandem Linkage Construction

## Overview

This document is a supplement to the 8590 Rotary Valve Instruction Manual ([D104016X012](#)) and 1061 Pneumatic Piston Rotary Actuator with Style F & G Mounting Adaptations Instruction Manual ([D100324X012](#)). Consult these instruction manuals for additional information. Observe all warnings, cautions, and notes provided in these manuals. Contact your [Emerson sales office](#) for more information.

## Scope

A Tandem Linkage assembly consists of two valves with one actuator. The valves, actuator, and tandem linkage parts will arrive separate from the customer supplied pipe tee. The power valve should arrive with the actuator already mounted, and with the closed position of the power valve zeroed correctly. This can be confirmed prior to assembly into the pipeline. Some of the steps below are true for any tandem linkage construction, but other pieces of information are specific to this exact construction (serial cards F003212935 and F003212936).

## Initial Assembly and Zeroing

The slave valve is shipped from the factory without any zeroing. The most common way to build full tandem linkage constructions is to build on the pipe tee, outside of the pipeline, so you can zero both assemblies with the disks visible. Install line bolting and tighten to hold the valves in the correct position and to compress the gaskets. Confirm that it is working correctly and document the orientation and locations of the linkage parts. The bracket on the slave valve also has a zero-adjustment bracket to document the closed position of the slave valve if desired.

Install the tandem linkage construction when the pipe tee is welded into the pipeline, however the zeroing procedure is more complicated. The power valve should be zeroed with the actuator when it arrives, but zero the slave valve prior to installing it into the pipeline. It is not possible to confirm the position of the disk at travel extremes when adjusting the linkages, so additional steps are required to accurately relate the closed position of the disk to the rotation of the shaft outside of the body when adjusting the linkages. The valve and linkage orientations discussed below are true regardless of the installation method used.

**⚠ WARNING**

To avoid personal injury from sudden release of process pressure, use bypass valves or completely shut off the process to isolate the valves and pipe tee from process pressure. Relieve process pressure from both sides of both valves and pipe tee and drain the process media from the pipe tee prior to installation

**NOTICE**

8590 disk rotation is counterclockwise to open (when viewed from the actuator side of the valve body) through 90 degrees of disk rotation. Improper tandem linkage adjustments that rotate the disk past either the open or closed position could damage the seal and disk sealing surfaces and could cause the disk to jam in the seal retainer.

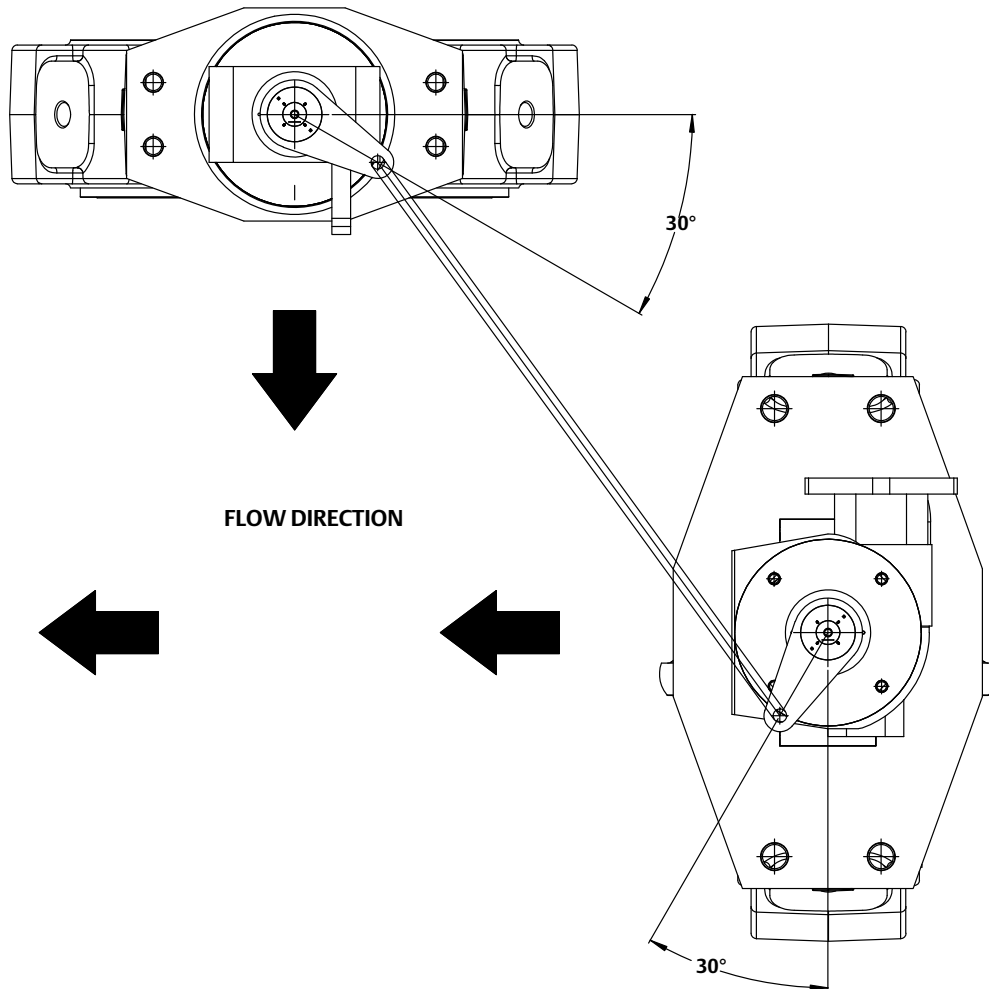
See the 8590 Rotary Valve Instruction Manual ([D104016X012](#)) to determine the proper closed position. There are index marks on the end of the shaft to show the relative disk position when the valve is installed in the pipeline, but these are not accurate enough for zeroing the valve. The slave valve should be zeroed prior to being installed in the pipeline, and some kind of marks or reference will need to be added to the shaft or linkage arms on the slave valve. This mark will need to be compared against another mark or reference on the valve body or mounting brackets that acts as a fixed reference. This is the only way to confirm the slave valve is zeroed correctly at the end of the linkage adjustment procedure discussed below. Do not put the slave valve into the pipeline until these references have been accurately established. Incorrectly zeroing the valve can result in trim damage or leakage.

The valve orientation to the pipeline is very important. Butterfly valve seals are often unidirectional, and will only provide the correct shutoff in one direction. The 8590 valves on serial cards F003212935 and F003212936 need to be installed in reverse flow. This application is for converging service, so the flow should go in both valves and out through the blank end of the pipe tee. As both valves need to be in reverse flow, the retainer side of the valve should be facing the pipe tee, with the shaft side of the disk upstream.

The 1061 actuator was ordered as push-down-to-close, so the power valve should be in the fully open position when the actuator is at the top of stroke. The disk of the slave valve should be in the fully closed position when the actuator is at the top of stroke. Both butterfly valves are clockwise-to-close, so it is important that the linkages are setup so that a counter-clockwise rotation of the valve shaft opens the valve, and clockwise rotations close the valve. A clockwise rotation of the power valve shaft should create a counter-clockwise rotation of the slave valve shaft.

The angle of each linkage lever is critical for proper function. The lever arms should be at 30 degree angles as seen in the below figure 1. The linkage length will need to be adjusted so that each valve, when closed is at its proper closed position. See the 8590 Rotary Valve Instruction Manual ([D104016X012](#)) to determine the proper closed position. Use the included spacers between the rod end bearing and levers arms to allow full freedom of movement. Both rod end bearing in the linkage are right-hand threaded; it is not a turnbuckle that has one right-hand and one-left handed rod end bearing. After adjusting the linkage length, tighten the rod end bearing jam nuts.

Figure 1. Linkage Orientations



## Installation into the Pipeline

If the assembly is calibrated outside the of the pipeline:

Once a linkage assembly works correctly on the tee outside of the pipeline, it can be reassembled into the pipeline. Paint marks and zero adjustment bracket can be used to make sure the linkage parts are reassembled with the correct orientation when it is rebuilt in the pipeline.

If the pipe tee cannot be removed from the pipeline, zeroing the closed position of both valves will need to be completed prior to installing the valves into the pipeline. Once installed, assembling and calibrating the linkage components can be done.

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