

Range Spring, Bias Spring, and Spring Retainer/Spacer Selection for Fisher™ 3570 Pneumatic Valve Positioners

Normally, no adjustments to the 3570 positioner are necessary upon initial installation. The positioner is set at the factory for the travel, input signal range, and action specified in the order. Adjustment is necessary when operating conditions are changed, when the unit has been dismantled and reassembled, or when the control valve travel does not correspond to the desired input signal range. If the operating conditions have changed a new range spring, bias spring, and spring retainer/spacer may be required.

Refer to the signal range code descriptions below and table 1, 2, 3, and 4. Once the appropriate range spring, bias spring, and spring retainer/spacer are obtained refer to the Maintenance and Adjustment procedures found in the 3570 instruction manual ([D200137X012](#)) available from your [Emerson sales office](#) or at Fisher.com.

Refer to the instruction manual for all other information regarding 3570 positioners.

Signal Range Codes

The range spring and the bias spring are matched to a specific input signal range and length of travel. Also, the spring retainer length is matched to the application on the 3570, 3570C, 3572, and 3573 positioners. Refer to figure 1 for location of parts.

The signal range codes in table 1 are based on the following applications:

- **Codes for valve travels up to and including 50 mm (2 inches)** are used for actuators that have a 50 mm (2 inch) maximum travel. If the actuator maximum travel is greater than 50 mm (2 inches), an additional retainer spacer (key 235, see figure 1) is required. Refer to the parts list for the additional spring retainer spacer (key 235) part number.
- **Codes for valve travels greater than 50 mm (2 inches), up to and including 105 mm (4-1/8 inches)**, are used for actuators that have a 105 mm (4-1/8 inch) maximum travel, except the 480-12 or 480-15 Size 20 actuators which have a 54 mm (2-1/8 inch) maximum travel. If the actuator maximum travel is greater than 105 mm (4-1/8 inches), an additional retainer spacer are required. Refer to the parts list for the additional spring retainer spacer (key 235) part numbers.
- **Codes for valve travels greater than 105 mm (4-1/8 inches), up to and including 206 mm (8-1/8 inches)**, are for actuators that have a 206 mm (8-1/8 inch) maximum travel. If the valve travel is 105 mm (4-1/8 inches) or less, two additional spring retainer spacers are required. Refer to the parts list for the additional spring retainer spacer (key 235) part numbers.

If the input signal range and travel do not match any of the selections in table 1, consult your Emerson sales office for information. To change the springs, refer to the range and bias spring procedures in the Maintenance section of the 3570 instruction manual ([D200137X012](#)).

From table 1, select the signal range that matches your application. Find the travel length for the application under the signal range selected, then use the code (from the direct or reverse column) that matches the direct or reverse operation of the positioner.

The first number in the code is used to identify the range spring, the letter in the code is used to identify the bias spring, and the second number (after the letter) is used to identify the spring retainer. For example, from table 1, for a signal range of 0 to 1.0 bar (0 to 15 psig), an actuator travel of 14.3 mm (9/16-inch), and direct action, the signal range code from table 1 is 6G3. The “6” indicates the range spring. The “G” indicates the bias spring. The “3” indicates the spring retainer.

Note

It is necessary to add the bias spring seat (key 8) to a unit when changing from an extension type spring (key 9) to a compression type spring (key 48).

When planning to change the bias spring in an existing unit, inspect the unit first to determine if the current bias spring is an extension type spring (key 9) or a compression type spring (key 48). To change from an extension type spring to a compression type spring, it is necessary to add the bias spring seat (key 8). Refer to the appropriate procedures in the Maintenance section found in the 3570 instruction manual ([D200137X012](#)).

In some cases, it is necessary to add an additional spring retainer spacer or change from the standard bellows to the optional high pressure bellows. Table 1 footnotes indicate the use of an additional spring retainer spacer or high pressure bellows.

Use the code from table 1 while referring to tables 2, 3, and 4 to determine the part numbers for the range spring, bias spring, and spring retainer. Unless otherwise specified, use the standard bellows. Also, no spring retainer spacer is required unless the spacer is specified in the footnotes of table 1.

Table 1. Fisher 3570 Signal Range Codes⁽¹⁾

SIGNAL RANGE 0 to 1.0 bar (0 to 15 psig)				SIGNAL RANGE 0.2 to 0.6 bar (3 to 9 psig)				SIGNAL RANGE 0.2 to 1.0 bar (3 to 15 psig)				SIGNAL RANGE 0.2 to 1.0 bar (3 to 15 psig)															
Travel		Code		Travel		Code		Travel		Code		Travel		Code													
mm	Inches	Direct	Reverse	mm	Inches	Direct	Reverse	mm	Inches	Direct	Reverse	mm	Inches	Direct	Reverse												
14.3	9/16	6G3	6D3	66.7	2-5/8	15G13	15A13	54	2-1/8	4G1	4B1	190.5	7-1/2	19G5	19C5												
17.5	11/16	2G4	2G4	76.2	3	14G8	14A8	54	2-1/8 ⁽⁸⁾	4G8	4B8					193	7.6	19G8	19C8								
19	3/4	7A1	7C3	79.4	3-1/8	14G8	14A8	55.6	2-3/16	9G3	9B3					196.6	7-3/4	19G3	19B3								
20.6	13/16	7G1	7B1	82.6	3-1/4	14G8	14A8									198.9	7-13/16	19G8	19B8								
26.2	1-1/32	5A12	5D12	85.7	3-3/8	14G8	14A8									203.2	8	19G8	19B8								
																206.4	8-1/8	19G12	19B3								
28.6	1-1/8	5C8	5C8	88.9	3-1/2	14G8	14A8	63.5	2-1/2	9G3	9B3	SIGNAL RANGE 0.2 to 1.8 bar (3 to 27 psig)															
30.2	1-3/16	12A13	12C13	96.8	3-13/16	14G8	14A8					9.5	3/8	10A2	10D2												
38.1	1-1/2	8G5	8B5	101.6	4	14G8	14A8									11.1	7/16	10A2	10D2								
39.7	1-9/16	8G12	8B12	104.8	4-1/8	14G8	14A8									15.9	5/8	3A2	3D2								
44.5	1-3/4	8G5	8A5	117.5	4-5/8 ⁽²⁾	13G3	13A3									19	3/4	11A4	11D4								
																22.2	7/8	11A5	11D5								
50.8	2	8G5	8A5	127	5 ⁽³⁾	13G4	13A4	74.6	2-15/16	9G5	9B5	25.4	1	2C5	2C5												
79.4	3-1/8	9A3	9B3	152.4	6	13G3	13A3									28.6	1-1/8	2A5	2D5								
101.6	4	9A12	9B12	165.1	6-1/2	13G3	13A3									31.8	1-1/4	5G4	5D4								
104.8	4-1/8	9G1	9B1	177.8	7	13G8	13A8									33.3	1-5/16	2A12	2D12								
127	5	21B8	21D8	203.2	8	18G8	18A8									38.1	1-1/2	2C10	2C10								
				206.4	8-1/8	18G8	18A8																				
SIGNAL RANGE 0 to 2.0 bar (0 to 30 psig)				SIGNAL RANGE 0.2 to 1.0 bar (3 to 15 psig)				84.9	3-11/32	9G8	9B8	43.9	1.73	2G12	2D12												
15.9	5/8	10D2	10D2	3.2	1/8	17H4	17H4									85.7	3-3/8	9G13	9B13	47.6	1-7/8	2G10	2C10				
19	3/4	10D3	10D3	3.2	1/8 ⁽⁶⁾	10D3	10D3									86.5	3-13/32	9G10	9B10	50.8	2	5G10	5D10				
25.4	1	11A4	11D4	4	5/32	10D2	10H2									88.9	3-1/2	9G13	9B13	54	2-1/8	12A3	12D3				
28.6	1-1/8	11A5	11D5	6.4	1/4	10B4	10H4									92	3-5/8	9G13	9B13	54	2-1/8 ⁽⁸⁾	12G13	12D13				
33.3	1-5/16	11A12	11D12	8.7	11/32	6A3	6C3									92.9	3-21/32	9G8	9B8	63.5	2-1/2	1A3	1D3				
				9.5	3/8	6A3	6C3	95.3	3-3/4	9G8	9B8	76.2	3	1B12	1D12												
38.1	1-1/2	11D12	11D12	11.1	7/16	6A4	6D4	96.8	3-13/16	9G8	9C8					79.4	3-1/8	1A12	1D12								
50.8	2	2G5	2D5					11.9	0.469	6A4	6D4					100	3-15/16	21G8	21B8	82.6	3-1/4	4G1	4C1				
54	2-1/8 ⁽²⁾	12G7	12D7					12.7	1/2	7G1	7C1					101.6	4	21G8	21A8	88.9	3-1/2	4G4	4D4				
54	2-1/8 ⁽⁸⁾	12G10	12D10					14.8	0.582	5G4	5C4					101.6	4 ⁽⁶⁾	14G1	14A1	101.6	4	4G1	4B1				
76.2	3	12C3	12C3					15.9	5/8	7G3	7B3									104.8	4-1/8	16G8	16B8				
79.4	3-1/8 ⁽³⁾	12G8	12D8					17.5	11/16	7G4	7B4	108	4-1/4 ⁽⁴⁾	16G13	16D13					104.8	4-1/8	4G5	4D5				
SIGNAL RANGE 0.2 to 0.6 bar (3 to 9 psig)				19	3/4	7G4	7C4					111.1	4-3/8 ⁽²⁾	16G1	16C1					114.3	4-1/2 ⁽⁷⁾	21A13	21D13				
11.1	7/16	5G5	5A5	20.6	13/16	7A5	7B5					114.3	4-1/2 ⁽⁶⁾	20A8	20C8					127	5 ⁽⁶⁾	21A4	21D4				
12.7	1/2	8G5	8A5	22.2	7/8	5G5	5C5					116.8	4.6 ⁽⁴⁾	16G4	16C4					133.4	5-1/4 ⁽⁶⁾	21A3	21D3				
15.9	5/8	8G10	8A10	23.8	15/16	8G5	8B5									117.5	4-5/8 ⁽²⁾	16G3	16B3	152.4	6 ⁽⁵⁾	16G3	16C3				
19	3/4	8G13	8A13	25.4	1	8G5	8B5									120.7	4-3/4 ⁽²⁾	16G3	16B3	190.5	7-1/2 ⁽²⁾	21G1	21D1				
22.2	7/8	8G8	8B8					27	1-1/16	8G12	8B12					127	5 ⁽⁵⁾	14G1	14C1	203.2	8 ⁽⁴⁾	21G10	21D10				
25.4	1	4G8	4B8					31.8	1-1/4	8G12	8B12					133.4	5-1/4 ⁽⁵⁾	19G10	19C10	SIGNAL RANGE 0.4 to 1.2 bar (6 to 18 psig)							
								27	1-1/16	4G8	4B8					139.7	5-1/2 ⁽⁵⁾	14G1	14B1	19	3/4	5G5	5C5				
								28.6	1-1/8	9G8	9A8	152.4	6 ⁽⁵⁾	13G3	13A3									28.6	1-1/8	8G12	8B12
								35	1-3/8	9G8	9A8	155.6	6-1/8 ⁽⁵⁾	13G3	13A3									38.1	1-1/2	8G8	8B8
				38.1	1-1/2	9G8	9A8	165.1	6-1/2 ⁽⁵⁾	13G3	13A3	50.8	2	4G8	4B8												
								169.9	6-11/16	20G3	20B3	54	2-1/8	9G3	9C3												
								54	2-1/8 ⁽⁸⁾	9G12	9B12																
41.3	1-5/8	9G8	9A8	35	1-3/8	8G10	8B10	171.5	6-3/4 ⁽⁵⁾	13G5	13A5	76.2	3	9G5	9C5												
50.8	2	15G8	15A8	36.5	1-7/16	8G13	8B13									173	6-13/16	20G3	20B3	101.6	4	21G8	21B8				
54	2-1/8	15A1	15A1	38.1	1-1/2	8G13	8B13									177.8	7	20G5	20C5	104.8	4-1/8	16G8	16B8				
54	2-1/8 ⁽⁸⁾	15G5	15A5	39.7	1-9/16	8G8	8C8									181.8	7-5/32 ^(2,6)	13G1	13A1	152.4	6 ⁽⁴⁾	13G1	13B1				
58.7	2-5/16	15G1	15A1	41.3	1-5/8	8G8	8B8									188.1	7-13/32	20G3	20B3								
63.5	2-1/2	15G3	15A3	44.5	1-3/4	8G8	8B8																				
				46	1-13/16	4G8	4C8																				
				47.6	1-7/8	4G7	4B7																				
				50.8	2	4G8	4B8																				

-Continued-

Table 1. Fisher 3570 Signal Range Codes⁽¹⁾ (Continued)

SIGNAL RANGE 0.4 to 1.2 bar (6 to 18 psig)				SIGNAL RANGE 0.4 to 2.0 bar (6 to 30 psig)				SIGNAL RANGE 0.6 to 1.0 bar (9 to 15 psig)				SIGNAL RANGE 0.6 to 1.0 bar (9 to 15 psig)			
Travel		Code		Travel		Code		Travel		Code		Travel		Code	
mm	Inches	Direct	Reverse	mm	Inches	Direct	Reverse	mm	Inches	Direct	Reverse	mm	Inches	Direct	Reverse
165.1	6-1/2 ⁽⁵⁾	13G3	13A3	57.1	2-1/4	12G1	12D1	8.7 11.1 12.7 15.9 17.5	11/32 7/16 1/2 5/8 11/16	5A13 5G5 12G13 8G8 8C8	5D13 5B5 12B13 8B8 8C8	104.8	4-1/8	14G8	14B8
206.4	8-1/8	19G5	19C5	58.4	2.3	12G3	12C3					117.5	4-5/8 ⁽⁵⁾	13G3	13B3
SIGNAL RANGE 0.4 to 2.0 bar (6 to 30 psig)				60.3	2-3/8	12A10	12D10					127	5 ⁽³⁾	13G12	13B12
				63.5	2-1/2	1G3	1H3					152.4	6	13G3	13B3
				66.7	2-5/8	1G3	1D3					155.6	6-1/8	13G4	13B4
6.4	1/4	17H4	17H4	69.9	2-3/4	1G4	1D4	165.1	6-1/2	13G12	13B12				
9.5	3/8 ⁽⁶⁾	10A4	10H4	76.2	3	1G1	1D1	177.8	7	13G3	13B3				
11.1	7/16	10A2	10H2	79.4	3-1/8	4G1	4C1	19	3/4	8G10	8B10	203.2	8	18G8	18B8
12.7	1/2	10A2	10D2	82.6	3-1/4	4G1	4C1	25.4	1	4F8	4B8				
15.9	5/8	3G2	3H2	84.1	3-5/16	4G3	4D3	28.6	1-1/8	9G8	9B8	206.4	8-1/8	18G8	18B8
19	3/4	11G4	11H4	85.7	3-3/8	4G1	4H1	38.1	1-1/2	9F8	9B8	SIGNAL RANGE 1.2 to 2.0 bar (18 to 30 psig)			
22.2	7/8	11A5	11H5	88.9	3-1/2	1G12	1D12	41.3	1-5/8	9F8	9B8				
25.4	1	2G4	2D4	90.5	3-9/16	4G1	4D1	50.8	2	15G8	15B8	19	3/4	5G10	5D10
26.2	1-1/32	2G4	2H4	92.9	3-21/32	4G1	4D1	54	2-1/8	15G1	15B1	28.6	1-1/8	5G8	5D8
28.6	1-1/8	2G5	2D5	95.3	3-3/4	4G1	4D1	54	2-1/8 ⁽⁸⁾	15F5	15B5	38.1	1-1/2	8F5	8C5
31.8	1-1/4	2G5	2D5	101.6	4	4G4	4D4	58.7	2-5/16	15G1	15C1	50.8	2	4F8	4D8
35	1-3/8	2G12	2D12	104.8	4-1/8	4G12	4D12	63.5	2-1/2	15F1	15A1	76.2	3	9G8	9H8
38.1	1-1/2	5G5	5D5	127	5 ⁽⁶⁾	21A5	21H5	73	2-7/8	14G8	14B8	79.4	3-1/8	9F8	9C8
39.7	1-9/16	5G5	5D5	133.4	5-1/4 ⁽⁶⁾	21A13	21D13	76.2	3	14G8	14B8	82.6	3-1/4	9F8	9C8
41.3	1-5/8	5G5	5D5	142.9	5-5/8 ⁽⁶⁾	16G1	16D1	79.4	3-1/8	14G8	14B8	82.6	4 ⁽⁶⁾	14E1	14D1
46	1-13/16	5G5	5D5	152.4	6 ⁽⁵⁾	16G3	16C3	82.6	3-1/4	14G8	14B8	101.6	4-1/8	16F8	16D8
48.3	1.9	12G13	12H13	165.1	6-1/2 ⁽⁶⁾	16G1	16C1	87.3	3-7/16	14G8	14B8	104.8	4-1/8	16F8	16D8
50.8	2	12C8	12C8	177.8	7 ⁽⁴⁾	21G12	21D12	88.9	3-1/2	14G8	14B8	127	5 ⁽⁵⁾	14F1	14D1
54	2-1/8 ⁽³⁾	12G7	12D7	203.2	8 ⁽⁴⁾	21E12	21D12	90.5	3-9/16	20F8	20A8	133.4	5-1/4 ⁽³⁾	19F3	19D3
54	2-1/8 ⁽⁸⁾	12G13	12D13					96.8	3-13/16	14G8	14B8	165	6-1/2 ⁽⁵⁾	13F3	13B3
								101.6	4	14G8	14A8	206.4	8-1/8 ⁽⁵⁾	18F1	18D1

1. For 3570P signal range codes, contact your [Emerson sales office](#).
2. Use spring retainer spacer 1J803846172; for additional information, see table 4.
3. Use spring retainer spacer 1J223346172; for additional information, see table 4.
4. Use spring retainer spacer 1J803946172; for additional information, see table 4.
5. Use with high pressure bellows and spring retainer spacer 1J803946172; for additional information, see table 4.
6. Use with high pressure bellows.
7. Use with high pressure bellows and spring retainer spacer 1J223346172; for additional information, see table 4.
8. For use with 480-12 or 480-15 size 20 actuators.

Table 2. Range^(1,2)

Code Number	Part Number ⁽³⁾
1	1H8914000A2
2	1H8915000A2
3	1H8916000A2
4	1H8917000A2
5	1H8918000A2
6	1H8919000A2
7	1H8920000A2
8	1H8921000A2
9	1H8922000A2
10	1H8955000A2
11	1H895627012
12	1H8957000A2
13	1J5185000A2
14	1J5715000A2
15	1K5363000A2
16	1K6684000A2
17	1R613527012
18	1R2822000A2
19	1R853527012
20	1R899827012
21	1U582727012
22	17A3811X022

1. The range spring code number is the first number given in each signal range code listed in table 1. For example, for a signal range of 0 to 1.0 bar (0 to 15 psig), an actuator travel of 14.3 mm (9/16-inch), and direct action, the signal range code from table 1 is 6G3. The appropriate range spring is indicated by "6".

2. Range springs do not have a color code. All range springs are silver.

3. The first six numbers of a range spring part number is also the tag number. For example, a range spring with part number 1H8914 000A2 has a tag number of 1H8914. Tags are attached to the parts at the time the parts are manufactured.

Table 3. Bias Spring^(1,2)

Code Letter	Color Code	Part Number
A	Silver	1H861827012 ⁽³⁾
B	Light blue	1H893227012 ⁽³⁾
C	Red	1H893327012 ⁽³⁾
D	Light green	1H896827012 ⁽³⁾
E	Dark green	1J2932X0012 ⁽⁴⁾
F	Pink	1J2933X0012 ⁽⁴⁾
G	Black	1N7177X0012 ⁽⁴⁾
H	Brown	1R613427012 ⁽³⁾

1. The bias spring code letter is the letter given in each signal range code listed in table 1. For example, for a signal range of 0 to 1.0 bar (0 to 15 psig), an actuator travel of 14.3 mm (9/16-inch), and direct action, the signal range code from table 1 is 6G3. The appropriate bias spring is indicated by "C".

2. It is necessary to add the bias spring seat (key 8) to a unit when changing from an extension type spring (key 9) to a compression type spring (key 48).

3. Compression type bias spring (key 48).

4. Extension type bias spring (key 9).

Table 4. Spring Retainer

CODE NUMBER ⁽¹⁾	OVERALL LENGTH ⁽²⁾		EFFECTIVE LENGTH ⁽²⁾		PART NUMBER ⁽³⁾
	mm	Inches	mm	Inches	
1	57	2-15/64	44	1-47/64	1H8907X0012
2	53	2-5/64	40	1-37/64	1H8908X0012
3	50	1-63/64	38	1-31/64	1H8909X0012
4	48	1-7/8	35	1-3/8	1H8911X0012
5	43	1-11/16	30	1-3/16	1H8910X0012
7	25	31/32	12	15/32	1H8912X0012
8	22	7/8	10	3/8	1H8552X0012
10	35	1-3/8	22	55/64	1H8913X0012
12	38	1-1/2	25	1	1J3572X0012
13	29	1-1/8	16	21/32	1J9796X0012

1. Code numbers 6, 9, and 11 are not used.

2. Refer to figure 1.

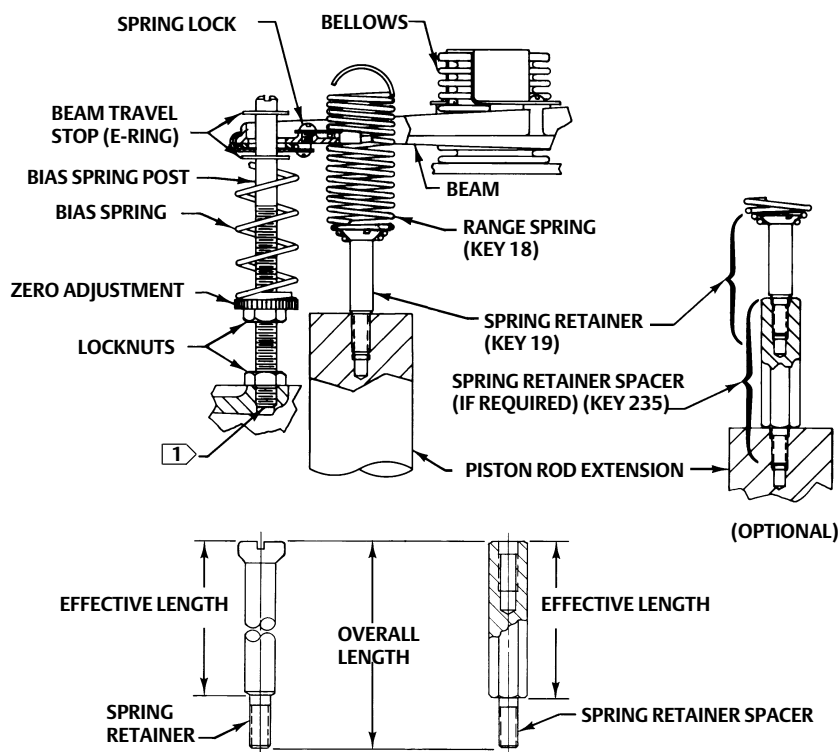
3. The spring retainer code number is the second number given in each signal range code listed in table 1. For example, for a signal range of 0 to 1.0 bar (0 to 15 psig), an actuator travel of 14.3 mm (9/16-inch), and direct action, the signal range code from table 1 is 6G3. The appropriate spring retainer is indicated by "3".

Table 5. Spring Retainer Spacer

OVERALL LENGTH ⁽¹⁾		EFFECTIVE LENGTH ⁽¹⁾		PART NUMBER ⁽²⁾
mm	Inches	mm	Inches	
41	1-5/8	29	1-1/8	1L2069X0012
52	2-1/16	40	1-9/16	1J223346172
57	2-1/4	44	1-3/4	1J803846172
94	3-11/16	81	3-3/16	1P3957X0012
97	3-13/16	84	3-5/16	1J803946172

1. Refer to figure 1.
2. The spacer number is the first 6 characters of the part number and is stamped on the part.

Figure 1. Bias and Range Springs for Zero and Span Adjustments



NOTE:

1 BOTTOM OF BIAS SPRING POST THREAD MUST BE POSITIONED AS SHOWN FOR PROPER POSITION OF E-RING TRAVEL STOPS.

AJ7270-C
1H8907-C
1J2233-C
B2402

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