

Bettis G-Series Spring-Return Hydraulic Valve Actuator

Component Material List

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Section 1: Major Component Material List

1.1 Typical G-Series Major Component Material List

Figure 1 G-Series Spring-Return Hydraulic (also available in double-acting type)

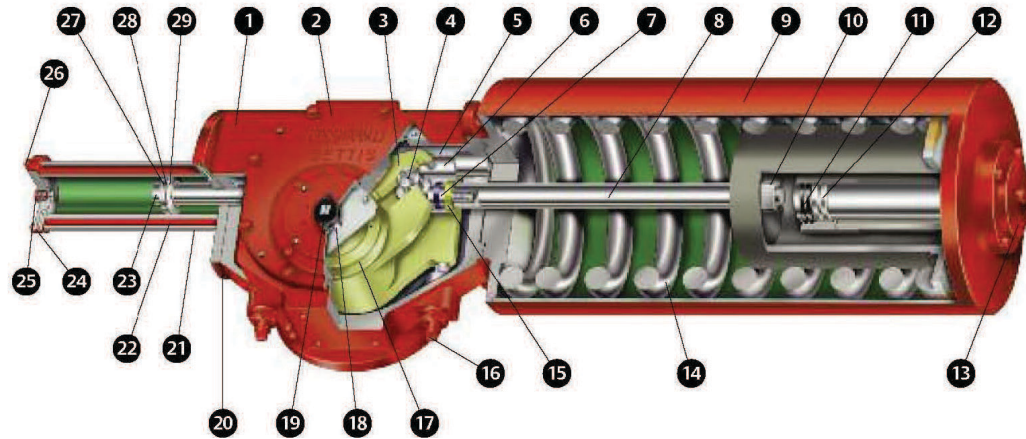


Table 1. Material List

Item	Description	Material	
1	Housing	Cast Ductile Iron	ASTM A536
2	Housing cover	Cast Ductile Iron	ASTM A536
3	Yoke	Cast Ductile Iron	ASTM A536
4	Yoke pin	Alloy steel	AISI 8620 HT
5	Guide block	Cast Ductile Iron	ASTM A536
	Spherical washer	Alloy steel, Nitrided	AISI 4140 HT
6	Guide bar	Alloy steel, Nitrided	AISI 4140 HT
7	Extension rod	Alloy steel	AISI 4340 HT
8	Tension rod	Alloy steel	AISI 4140 HT
9	Spring cartridge weldment	Steel	
10	Tension Lok	Alloy steel	
11	O-Ring Seal	Nitrile	
12	Hydraulic Override Assembly	Carbon steel	
13	Cover Plate for Spring Can	Carbon steel	
14	Spring	Alloy steel	ASTM A304/A401
	Tension rod bushing	Acetal plastic	
15	Extension rod retainer nut	Alloy steel	AISI 4140 HT
16	Travel stop screw	Alloy steel, Zinc plated	ASTM A193
	Travel stop screw nut	Alloy steel, Zinc plated	ASTM A194
	Yoke pin thrust bearing	UHMWPE plastic	
	Guide bar bearing	Steel/Bronze/TFE	Garlock DU style

17	Yoke pin bearing	Steel/Bronze/TFE	Garlock DU style
	Yoke/Guide block bearing	UHMWPE plastic	
	Yoke bearing	Steel/Bronze/TFE	Garlock DU style
18	Position indicator thrust bearing	Acetal plastic	
	Position indicator bearing	Acetal plastic	
19	Position indicator assembly	Stainless steel	AISI 304
20	Inner endcap	Steel	ASTM A516
21	Tiebar	Alloy steel	ASTM A193
22	Cylinder	Steel, Nitrided	ASTM A513
	Outer endcap	Steel	ASTM A516
23	Piston rod	Alloy Steel, Nitrided	AISI 4140
	Split ring	Alloy steel	AISI 6150 HT
24	O-Ring Seal	Nitrile	
25	Pipe plug	Steel	ASTM A105
	Rod bushing	Acetal plastic	
	Spring Cartridge Module		
	Spring guide	Cast Ductile Iron	ASTM A536
26	Tiebar nut	Alloy steel	ASTM A194
27	Polypak Seal	Urethane Impregnated	
28	Piston Bearing	Polyethylene	
29	Piston	Steel, Nitrided	AISI 1215

Section 2: Seal Material List

2.1 Typical G-Series Seal Material List

Table 2.

Description	Type	Application
Piston OD / Cylinder ID	D-ring	Dynamic
Piston / Tiebar	T-seal	Dynamic
Piston rod	Polypak	Dynamic
Yoke	O-ring	Rotary
All remaining seals	O-ring	Static

Section 3: Typical Coatings

3.1 Nitriding

Bettis utilizes a Nitride surface finish on many component parts instead of Chrome or Nickel plating.

The nitrided surface is not a coating, it is an integral part of the component base material. Because of this, it will not pitting, crack, chip or flake off and any possibility of hydrogen embrittlement (a common problem in any plating process) is eliminated.

The Nitride surface layer is extremely hard and displays improved wear resistance when compared with plated coatings. Dent resistance is also improved.

The Nitride surface layer has also been shown to display superior corrosion resistance to plated coatings.

Nitride surface finishing has become very popular in the fluid power industry in the past decade replacing chrome and nickel plating in many applications.

Typical components - piston rods, tiebars, CBA centerbars, cylinder bores, pistons.

Typical process results in a thin surface layer of iron oxide over a second layer of porous Iron Nitride over a third layer of non-porous Iron Nitride all fused on top of the base substrate steel material.

3.2 Teflon lined cylinder bores

The standard coating on all Bettis pneumatic cylinder bores is Xylan, a proprietary Teflon coating.

The use of this Teflon lining results in superior corrosion resistance while improving seal life and overall actuator performance.

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