

# **Bettis G-Series Spring-Return Pneumatic 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 Pneumatic (also available in double-acting type)

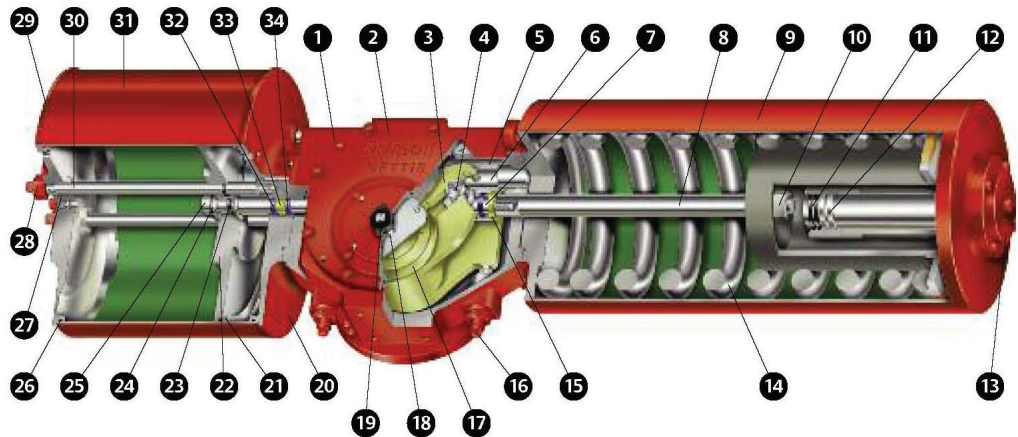


Table 1. Material List

Item	Description	Material	
1	Housing	Cast Ductile Iron	ASTM A536
2	Housing cover	Cast Ductile Iron	ASTM A536
3	Yoke & Yoke Cover	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
	Guide bar bearing	Steel/Bronze/TFE	Garlock DU style
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
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
17	Yoke pin bearing	Steel/Bronze/TFE	Garlock DU style
	Yoke pin thrust bearing	UHMWPE plastic	
	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	Cast Ductile Iron	ASTM A395
21	Piston Seal	Nitrile	
22	Piston	Cast Ductile Iron	ASTM A395
23	O-Ring Seal	Nitrile	
24	Split ring	Alloy steel	AISI 6150 HT
25	Piston rod	Alloy steel, Nitrided	AISI 4140 HT
26	O-Ring Seal	Nitrile	
27	Pipe plug	Steel	ASTM A105
28	Tiebar nut	Alloy steel	ASTM A194 2H
29	Outer endcap	Cast Ductile Iron	ASTM A395
30	Tiebar	Alloy steel, Nitrided	ASTM A193 B7
31	Cylinder	Steel, TFE lined	ASTM A53
32	Polypak Seal	Urethane Impregnated	
33	Rod bushing	Acetal plastic	
	Spring guide	Cast Ductile Iron	ASTM A536
	Tension rod bushing	Acetal plastic	
34	Rod Wiper	Urethane Impregnated	

## 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 pit, 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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