

Bettis CBB/CBA300-Series Pneumatic Valve Actuator

Component Material List

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Section 1: Major Component Material List

1.1 Typical CBB-Series Major Component Material List

Figure 1 CBB-Series Major Components

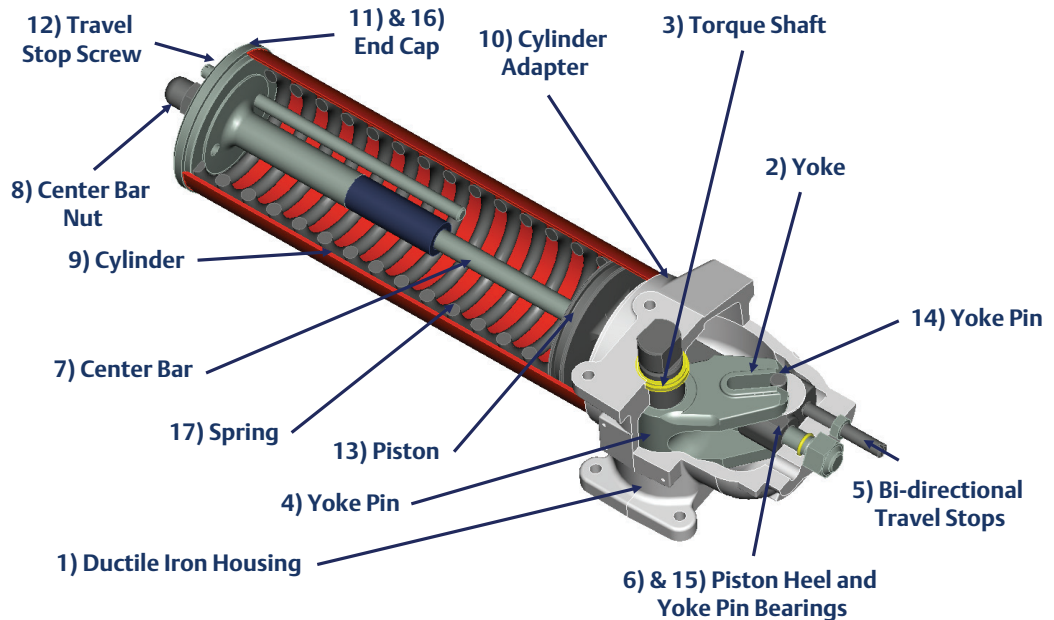


Table 1. Material List

Item	Description	Material	
Housing			
1	Housing	Cast Ductile Iron	ASTM A395
2	Yoke, CBBx15 & CBBx20	Cast steel	ASTM A732
	Yoke, CBBx25	Cast Ductile Iron	ASTM A536
3	Torque shaft	Alloy steel	ASTM A311
4	Yoke key	Steel	ASTM A108
5	Travel stop screw	Alloy steel, Zinc plated	ASTM A193
	Travel stop screw nut	Alloy steel, Zinc plated	ASTM A194
6	Yoke/Yoke pin bearing	UHMWPE plastic	
7	Centerbar	Alloy steel, Nitrided	ASTM A193
8	Centerbar nut	Alloy steel, Zinc plated	ASTM A194

Pneumatic Power Cylinder			
9	Cylinder	Steel, TFE lined	ASTM A513
10	Cylinder adapter	Cast Ductile Iron	ASTM A395
11	Outer endcap, DA	Steel	ASTM A516
12	Travel stop screw	Alloy steel, Zinc plated	ASTM A193
	Travel stop screw nut	Alloy steel, Zinc plated	ASTM A194
13	Piston, standard	Cast Ductile Iron	ASTM A536
14	Yoke pin	Steel, TFE coated	ASTM A108
15	Piston heel bearing	Steel/Bronze/TFE	Garlock DU Style
Spring Cartridge			
16	Outer endcap, SR	Cast Ductile Iron	ASTM A536
17	Spring	Alloy steel	ASTM A229

1.2 Typical CBA300-Series Major Component Material List

Figure 2 CBA300-Series Major Components

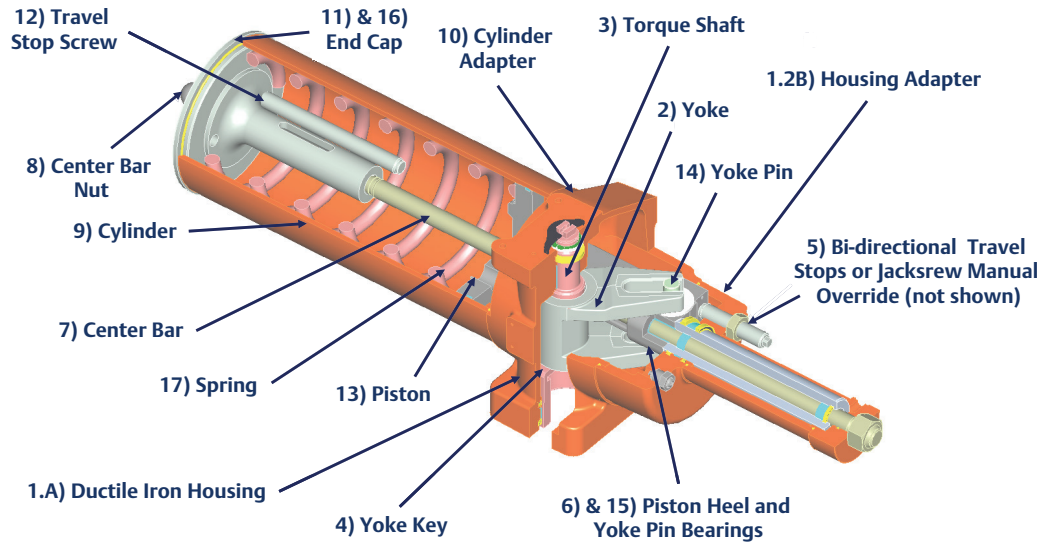


Table 2. Material List

Item	Description	Material	
Housing			
1.A	Housing	Cast Ductile Iron	ASTM A395
1.B	Housing adapter	Cast Ductile Iron	ASTM A395
2	Yoke,	Cast Ductile Iron	ASTM A536
3	Torque shaft	Alloy steel, Nitrided	AISI 4140 HT
4	Yoke key	Steel	ASTM A108
5	Travel stop screw	Alloy steel, Zinc plated	ASTM A193
	Travel stop screw nut	Alloy steel, Zinc plated	ASTM A563
6	Yoke/Yoke pin bearing	UHMWPE plastic	
7	Centerbar	Alloy steel, Nitrided	ASTM A193
8	Centerbar nut	Alloy steel, Zinc plated	ASTM A194

Pneumatic Power Cylinder			
9	Cylinder	Steel, TFE lined	ASTM A513
10	Cylinder adapter	Steel	ASTM A516
11	Outer endcap, DA	Steel	ASTM A516
12	Travel stop screw	Alloy steel, Zinc plated	ASTM A193
12	Travel stop screw nut	Alloy steel, Zinc plated	ASTM A563
13	Piston	Cast Ductile Iron	ASTM A536
14	Yoke pin	Alloy steel	AISI 4140 HT
15	Piston heel bearing	Steel/Bronze/TFE	Garlock DU Style
	Yoke pin bearing	Steel/Bronze/TFE	Garlock DU Style
	Rod bushing	Acetal plastic	
	Piston bearing	TFE	
Spring Cartridge			
16	Outer endcap, SR	Cast Ductile Iron	ASTM A536
17	Spring	Alloy steel	ASTM A689

Section 2: Seal Material List

2.1 Typical CBB/CBA300-Series Seal Material List

Description	Type	Application
Piston OD / Cylinder ID	O-ring / D-ring	Dynamic
Piston / Centerbar	O-ring / T-seal	Dynamic
Torque shaft	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 pitted, 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, CBB 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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