CAT® SEALS

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INTRODUCTION

Metal Face Seals

For more than 60 years industrial original equipment manufacturers and equipment users have turned to Cat® Seals to protect their components from extreme, abrasive, and corrosive environments. Caterpillar is the leading manufacturer of metal face seals providing the best solutions for tough applications. Cat Seals innovative designs and engineering protect a broad range of equipment and machinery working in adverse conditions such as mud, rock, sand, chemicals, water, heat and cold.

Cat Seals are proven to provide long service life with low maintenance resulting in increased equipment up time, productivity and customer satisfaction.

Caterpillar offers Cat Duo-Cone and Heavy Duty Dual Face seals. Both designs use various elastomeric load rings and various seal ring material. Cat Duo-Cone seals require less space radially and Heavy Duty Dual Face seals require less space axially in a housing. Cat Duo-Cone seals incorporate a round toric while Cat Heavy Duty Dual Face seals have a trapezoidal Belleville Washer.

Protecting Products

Cat Seals provide protection for internal working components like bearings and gears in abrasive applications and permit the use of oil as a lubricant instead of grease resulting in less friction and longer life. In most applications, the lubricant installed at the factory is permanent with no periodic lubrication or adjustment required.

Unscheduled equipment down time is very costly. Cat Seals provide superior performance in extreme applications where lubricant retention and protection from damaging surroundings is essential. Years of proven field experience has shown Cat Seals provide long life in many applications. Manufacturers in a variety of industries have utilized Cat Seals in their equipment for decades.

Design

The design of a Cat seal compensates for many manufacturing and operating variables. Two metal sealing rings float in position; two elastomeric torics or Belleville washers exert uniform pressure to accurately position the metal rings and serve as the static seal between the housing and the seal ring. The load rings also transmits the turning torque from the drive housing to the seal ring.

Cat Seals Features

- Corrosion-resistant seal rings
- Precision machined, self-renewing sealing surfaces
- Minimum face load variations
- Special seal and load ring materials to match application requirements

Rotating speed, lubrication, temperature, and differential pressure are factors to consider when determining seal face loads. Cat Seals provide good performance across a wide range of face loads, therefore, compensating for considerable assembly tolerance buildup, misalignment, and wear.

Long Life

Extensive laboratory and field testing has confirmed Cat Seals last much longer than other radial lip seals. Used for decades by manufacturers of heavy construction equipment, Cat Seals have reached over 30,000 hours of operation without maintenance, in some applications. As wear occurs, machined metal seal faces are automatically and continually renewed.

Problem Solver

The high cost of equipment downtime requires the best quality seal available. The Cat seal provides superior performance in extreme applications where lubricant retention and the ability to keep out damaging and/or abrasive materials are essential. Construction, mining, industrial, forestry, petrochemical, paper, agriculture, sewage treatment, landfill, and many more applications are all examples where Cat Seals have improved bearing protection and overall performance.

Application Engineering

Caterpillar Engineers are available to understand and analyze your sealing requirements, work with your engineering department, and recommend the Cat seal that will best meet your needs. You need only complete an application data sheet (found at www.cat.com/cat-seals) and provide drawings of the area containing the seal.

Seal Ring Materials

Caterpillar offers the widest choice of seal ring and elastomeric material options in the industry. The materials have been engineered to excel in the many different applications in which Cat Seals are integrated.

For further information on any seal ring material please consult Caterpillar at catseals@cat.com

Shown below is a general comparison between seal ring materials available.

	C6	Stellite	NiHard	Formed	Forged
Material	Nickel-Alloy	Iron-Alloy	Iron-Alloy	SAE 1074	SAE 52100
Process	Cast	Cast	Cast	Stamped	Forged
Wear Life	High	High	Low/Medium	Low	Low
Corrosion Resistance	High	Medium/High	Low/Medium	Medium	Low
Scoring Resistance	High	Low	Medium/High	Low	Low

C6

C6 was developed for applications that require high speed and superior corrosion resistance. This alloy offers greater speed capabilities over Stellite with higher resistance to scoring, wear, and corrosion. The C6 alloy is available only from Caterpillar. It is the material of choice around the world in large diameter wheel applications.

Stellite

Stellite has been designed for the harshest operating environments where abrasive and corrosive elements are present. Stellite's formulation is iron based with a high alloy content designed to provide better corrosion resistance. Stellite cast seals are typically found in applications frequently exposed to abrasive and corrosive conditions with moderate rotational speeds. Typical applications include crawler tractor final drives and various undercarriage applications.

NiHard

NiHard is another iron based casting alloy offered by Caterpillar. Pressure velocity characteristics are slightly greater than Stellite, but wear life and corrosion resistance have shown to be less, in tests conducted by Caterpillar. Typical applications would include undercarriage and final drive applications where corrosion resistance is not essential, but seal surface speeds prohibit the use of Stellite.

Formed (Cat Duo-Cone only)

Formed seals were developed for applications that do not require the high levels of corrosion and abrasion resistance, but the versatility of a face seal is desired. Formed seals are used extensively in axle, winch, and final drive applications. Formed seals are interchangeable with cast seal retainers, provide similar load and speed capability as the Stellite seals, at a significantly lower cost.

Forged

Forged seals are available on a limited basis from Caterpillar. These seals have been used successfully on undercarriage applications where minor wear is present and seal cost is critical.

PRODUCT DESIGN REVIEW

Load Ring Materials

Several load ring materials are available to meet a variety of application requirements. The most common materials are Nitrile and silicone, while fluoroelastomer (FKM) and Hydrogenated Nitrile (HNBR) are available for more specialized applications. The table below provides a brief comparison between Cat Seals load ring options.

	Nitrile	LT-NBR	Silicone	HNBR	FKM
Min Temp. (°C/°F)	-17/1	-35/-31	-55/-67	-40/-40	-7/20
Max Temp. (°C/°F)	100/212	100/212	150/302	135/275	160/320
Tear Resistance	Medium	Medium	Low	High	Medium
Abrasion Resistance	Medium	Medium	Low	High	Medium
Oil Resistance	Medium	Medium	Low	High	Superior
Water Resistance	Superior	Superior	Superior	Superior	Medium

Nitrile (NBR)

Nitrile is compatible with most mineral-based lubricant oils. Nitrile load rings offer the maximum resistance to abrasion. It is the most common load ring material choice and is used in most standard axle, final drive, and undercarriage applications.

Low-Temperature Nitrile (LT-NBR)

Low-temperature Nitrile was specifically developed for highly abrasive, low-temperature applications. Typical applications include undercarriage idlers, rollers and final drives.

Silicone

Silicone uses are extreme high (wet disc brake systems) or extreme low (arctic environment) temperature applications.

Hydrogenated Nitrile (HNBR)

Hydrogenated Nitrile is a Nitrile-based material and has very similar abrasion resistance characteristics to standard Nitrile, but Hydrogenated Nitrile has better temperature resistance to permanent deformation.

Fluoroelastomer (FKM)

FKM is a fluoroelastomer and is typically used where extremely high temperatures are a concern and low temperatures are never a problem.

Consult Caterpillar when researching your seal load ring options at catseals@cat.com

Seal Group Size (Class) Options

Seals are available in various radial cross sections with toric sections from 4.30 to 16.00 mm (0.170" to 0.630"). Always specify the largest toric/seal group section that can be accommodated in the housing design envelope. Larger section torics will accommodate greater deflection and are less sensitive to tolerances and environmental effects. The table shown below gives a brief summary of available design options.

Class	Toric Size (mm)	Seal Ramp Angle (°)	Housing Ramp Angle (°)	Common Application
A	4.30	20	15	Specialized
B	6.22	15	10	Small Axles and Wheels
C	9.47	8/15/20	10	Undercarriage
D	12.70	8/15/20	10	Large Axles, Wheels, Final Drives
E				Specialized
K	BW	Load Ring	Square Bore	Square Bore All Applications
L	16.00	15	10	Large Wheels

Class A - 4.30mm (0.17")

Cat Duo-Cone seals utilizing the 4.30 mm cross-section toric ring have very limited applications. They are used in small diameter applications with extreme axial and radial spacial and tolerance constraints (e.g. cartridge pins). Seals of this type have very little end play capability.

Class B - 6.22mm (0.24")

Cat Duo-Cone seals with 6.22 mm cross section toric rings are typically used in small axle or rock bit applications. They are used where sealing is needed in extreme environments, but where there is insufficient space to put a larger (and more typical) cross section Cat Duo-Cone seal. While these seals do have some end play capability, they have less than seals utilizing larger cross section load rings.

Class C - 9.47mm (0.37")

9.47 mm cross-section Cat Duo-Cone seals are typically used in moving undercarriages for crawler tractor and excavator applications. These seals have good end play capability. Seals are available with 8°, 15°, and 20° seal ramps to serve different operating environments.

Class D - 12.70mm (0.50")

This style Cat Duo-Cone seal is very common in axle, wheel, and final drive applications in construction and earth moving equipment. These seals have very good end play capability. Seals are available with both 8°, 15°, and 20° seal ramps for optimized performance in your application.

Class L - 16.00mm (0.63")

Currently, the largest cross section toric ring offered by Caterpillar, the 16.0 mm cross section diameter Cat Duo-Cone seal is for the largest of sealing applications.

Class E - Inverted Cat Duo-Cone Seals

Inverted Cat Duo-Cone Seals specialized design for spacial restraints, used for large shaft clearance.

Class K - Cat Heavy Duty Dual Faced Seals

The Cat Heavy Duty Dual Faced Seal uses a square bore housing design and a Belleville Washer load ring to provide loads to the metal seal faces. This seal is designed for demanding environments and is available in many sizes. Because of the design, there is no rolling of the loading member. This seal type is used in a wide variety of products, including undercarriage, axles, final drives, gear boxes, wheels, etc.

Contact Caterpillar with your seal class questions at catseals@cat.com

PRODUCT DESIGN REVIEW

Cat Duo-Cone Seal Ramp Angles

A unique feature of Cat Duo-Cone seals is the changing of sealing ramp angles to tailor the seal to various operating environments. Below is a brief summary of the purpose of various ramp angles.

8° Seal Ramp

Cat Duo-Cone seals with 8° seal ramps were originally developed for applications that are exposed to high-pressure differentials. This design offers increased toric retention and a more linear face load profile over its range of operation. The 8° Cat Duo-Cone seal is available in both cast alloy and formed steel designs. Formed Cat Duo-Cone seals are interchangeable with cast Cat Duo-Cone seal retainers.

15° Seal Ramp

The 15° Cat Duo-Cone seal is the most common design offered by Caterpillar. This sealing design offers resistance to internal operating pressure and is most commonly used in final drive, axle, and wheel applications.

20° Seal Ramp

Similar to the 15° seal design in that it resists internal pressures. The 20° design produces less compression on the toric and because of its bore requirements being shallow, requiring less room axially in its application, the 20° seal ramp is commonly found in undercarriage applications.

Load Deflection

The combination of the seal ring flange thickness and gage diameter or Heavy Duty Dual Faced Seals inner diameter and elastomeric materials dictate the allowable operating conditions the seal can be used in. The sealing system, the nominal Duo-Cone gap between housings or HDDF operating range and axial tolerance stack will ensure the seal will perform. The Cat seal options are based on those operating conditions. *Caterpillar Engineering should be consulted at catseals@cat.com for proper seal selection and design.*

Speed Capability

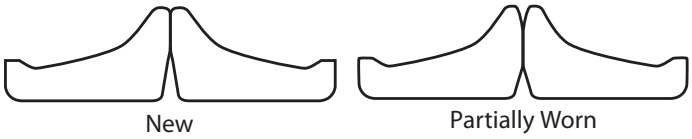
The face load required to keep the metal seal rings in contact is related to the targeted speed of the application. Many factors influence this relationship, including seal ring material, seal ring diameter, operating temperature, lubricant viscosity, differential pressure across the load rings and action of centrifugal force on the load ring.

In low speed applications or with light lubricants, face pressures are generally increased to ensure seal ability. The same is true when seals are exposed to high differential pressures and/or large end play or deflections. Lower face loads are specified for applications producing high rotational speeds or high ambient outside temperatures.

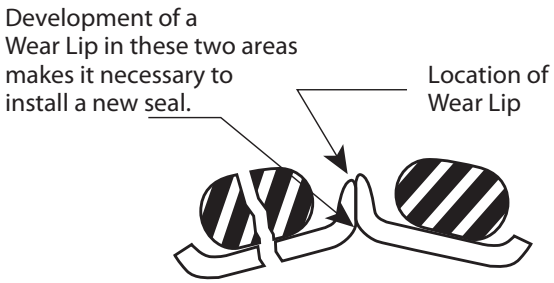
High speeds produce high temperatures which deteriorates lubricant and changes the properties of the elastomer load rings. Depending on the cavity design, high speeds can centrifuge lubricant away from the seal face. All conditions can contribute to adverse sealing effects. *Consult Caterpillar at catseals@cat.com when selecting face load to ensure appropriate design target for your desired speed.*

Seal Wear Measurement

Cast Cat Seals automatically compensate for wear. The mating faces form a contact band approximately 0.5 (0.02“) to 1.0 mm (0.04”) wide that retains the oil lubricant and seals out all foreign material. As wear occurs, the contact band will widen slightly and migrate inward until the inside diameter is reached. As depicted in the figure below, the cast seals wear down the tapered surface.



Formed seals are more flexible than cast seals and as a result will produce a different wear pattern than cast rings. Typically, formed seals wear in an axial rather than radial direction, as depicted below, due to their increased flexibility.



Lubricant Requirements

Cat Seals are a mechanical face sealing technology that require lubrication. Oil lubricant should be used with all Cat Seals. Mineral base oils ranging from 10WT to 90WT are commonly used, depending on temperature requirements. Extreme pressure gear lubricants should be used with caution, as some additive packages are not compatible with polymers.

In some slow rotating or oscillating applications, certain types of grease may be used, but mineral base oils are always preferred.

Contact Caterpillar for additional information at catseals@cat.com

Oil not only provides lubrication to the sealing faces, but also serves to cool the seal rings. Lubricants are recommended to cover a minimum of one third of the sealing surface, depending on the diameter of the seal, to properly lubricate and cool the rings. Cat Seals work best in clean, closed systems. To allow adequate volume for thermal expansion, non-vented cavities should not be filled more than 90% full. Maximum care should be taken to ensure lube cavities are clean at assembly – free from dirt, scale and other foreign materials.

DESIGN INFORMATION

Lubricant Viscosities for Ambient (Outside) Temperature Ranges

Oil Viscosity	°C min	°C max	°F min	°F max
10W	-30	0	-22	+32
30W	-20	+25	-4	+77
40W*	-10	+40	+14	+104
50W	0	+50	+32	+122
80W90**	-20	+40	-4	+104
85W140**	-10	+50	+14	+122

* Commercially available CD/TD-2 oils that meets requirements
** EP gear lubricants should not be used with seals having silicone torics. Consult with Caterpillar before specifying an API GL-5 or MIL-L-2105C type lubricant.

NOTE: Arctic Lubricants – For operation with ambient temperatures below –20°C (-4°F), use oils with base stocks that have low temperature flow capabilities. Use oils with a CD/TO-2 rating. If the application requires API GL-5 gear oil, use the EP synthetic gear lubricants that are available. Low temperature lubricants are not recommended for temperatures above 0°C (+32°F). When operating temperatures reach 0°C, the oil should be changed to one of the lubricants indicated above.

Specialty Seals

Caterpillar not only offers “off-the-shelf” designs – our team is also available to work with your engineers to design customized or application specific Cat Seals. Whether developing a new seal size or type to fit your application, or integrating a new metal seal or load ring material, Caterpillar Engineers have the experience necessary to design, procure and test these concepts then produce them.

Product Comparison

In most applications, either Cat Duo-Cone or Heavy Duty Dual Face seals can be utilized. However, there are specific advantages to both designs. These should be considered when designing a Cat seal into your application:

Cat Duo-Cone Seal

- Requires less room radially in application
- Very stable in housing prior to final assembly
- Very good end play capability

Cat Heavy Duty Dual Face Seal

- Requires less room axially in application
- Square bore housing cavity design
- No assembly tool or lubricant required

Supplying Quality

We know quality is important to you and we take pride in supplying our customers highly reliable and durable products. The manufacturing quality of Cat Seals is ensured by our ISO 9001: 2008 accreditation.

Testing

Caterpillar laboratories are equipped with the latest technologies and testing procedures for development and validation of new seal designs. *Contact Caterpillar for testing options at catseals@cat.com*

Reliability Testing

Reliability testing is used for evaluating the operating conditions of the specific seal application including the following: seal face loads, internal operating temperatures, internal operating pressures, rotational speeds, etc. and evaluate the performance of the seal to determine a metal seal ring material’s resistance to failure. This test method also determines the maximum speed at which the seal group can perform.

Load Testing

Load tests evaluate the loading characteristics of the elastomeric ring for a given size. This information is used to determine the load ring compression required to obtain optimal loading on the metal seal faces.

Accelerated Wear Tests

Accelerated wear testing employs equipment to evaluate a seal ring material’s resistance to abrasive wear. Seals are assembled and submerged in a unique slurry to accelerate the wear process. Wear is quantified by the amount of movement of the sealing band during the test.

Oil Compatibility Testing

Oil compatibility testing evaluates the effects from exposure with the intended system lubricant and compression level of the system design. This procedure will indicate the rate at which the elastomer will relax during operation and cause a change in load at the seal group interface. The test guides Caterpillar Engineers to identifying the correct load to design for maximum seal life.

Contact Caterpillar Engineering to identify correct oil compatibility at catseals@cat.com

A properly installed Cat seal creates a robust system performing without premature failure. The following considerations should be addressed when designing your system.

Uneven or Excessive Face Load

The seal ring is tilted in the retainer or the toric is twisted result in improper seal installation and can cause uneven loads at the seal interface. This uneven loading can result in premature failure.

Mishandling of Seals

Mishandling of seals can lead to an immediate leak or premature failure. Failure can occur due to cutting or tearing of the elastomeric load ring, breakage of the sealing ring, contamination of the seal face with dirt or lint, etc. When assembling Cat Seals, please carefully observe assembly instructions provided by Caterpillar.

Internal Pressure Spikes

Cat Seals can withstand a varying amount of system pressure, depending on the design. If your application requirements include pressure capability, *consult Caterpillar Engineering at catseals@cat.com*

Improper Housing Design

It is critical that the application seal housing conform to the design information provided by Caterpillar. The relationship between the seal assembly and its mating component is essential to the performance of the sealing system.

The Proper Selection of Oil

Improper selection of oil can have an adverse effect on both the load ring and metal sealing ring. Some oils are incompatible with elastomers and cause long-term degradation with exposure, especially when combined with heat. Improper oil selection can cause metal seal failure due to galling from inadequate lubrication flow.

Mud Packing

Mud packing is a common issue in environments where the Cat Seals are continually exposed to dirt and mud. Debris can pack the cavity between the seal housing, seal ring and load ring. Over time, this can cause the load ring to be pushed out of position.

Seal guarding and labyrinths can prolong seal life if applied correctly. Poor labyrinth application can trap debris against the seal and lead to wearing away of the seal housings.

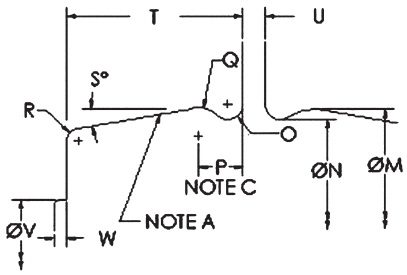
If your application requirements include resistance to excessive debris, contact Caterpillar at catseals@cat.com

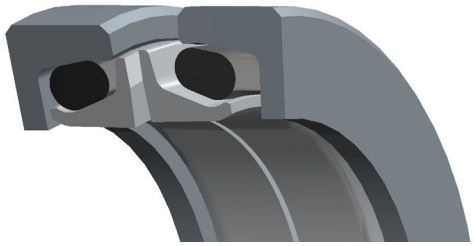
Load Ring Abrasion

Abrasion of the load ring can occur in applications where it is exposed to abrasive conditions like corrosive, dusty, dirty, sandy, and rocky. Abrasion of the load ring causes deterioration and tearing of the elastomer, leading to failure. This can be minimized through proper load ring material selection.

Consult Caterpillar to discuss your seal load ring options at catseals@cat.com

CAT DUO-CONE SEALS





Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
386-0992	J	51	37.5	Stellite	LT-NBR	20	35	37.5
108-6997	B	51	38	Forged	Nitrile	20	52.16	52.98
386-0993	J	58	43	Stellite	LT-NBR	20	40	43
386-0994	J	58	43.8	Stellite	LT-NBR	19	42	43.8
386-0996	J	62	47.5	Stellite	LT-NBR	20	45	47.5
JS0510S	J	65	50.3	Stellite	LT-NBR	20	48	50.3
8E-5612	B	65	51	Stellite	Nitrile	15	66.8	67.62
8E-5610	B	65.67	51	Stellite	Nitrile	15	66.8	67.62
8E-5611	B	65.67	51	Forged	Nitrile	15	66.8	67.62
386-1000	J	70	54.8	Stellite	LT-NBR	20	52.5	54.8
386-1001	J	70	55.3	Stellite	LT-NBR	20	53	55.3
386-1006	J	73	60.3	Stellite	LT-NBR	20	58	60.3
386-1003	J	74	57.3	Stellite	LT-NBR	20	55	57.3
386-1005	J	74	59.3	Stellite	LT-NBR	20	57	59.3
108-6996	B	74	60	Forged	Nitrile	20	75.43	76.25
136-0296	B	74	60	Forged	Nitrile	20	74.96	75.78
JS0580SM	J	75	57.3	Stellite	LT-NBR	20	55	57.3
JS0640SD	J	76	63.3	Stellite	LT-NBR	20	61	63.3
473-1457	C	77.5	58.02	Stellite	LT-NBR	8	80.78	82.02
386-1011	J	78	63.3	Ni-Hard	LT-NBR	17.5	61	63.3
386-1010	J	82.5	62.8	Stellite	LT-NBR	20	60.5	62.8
386-1007	J	82.55	62.1	Stellite	LT-NBR	20	58.7	62.1
171-5883	C	82.55	63.1	Stellite	LT-NBR	20	84.48	85.72
179-1292	C	82.55	63.1	Forged	Nitrile	20	84.48	85.72
212-0440	C	82.55	63.1	Stellite	FKM	20	84.48	85.72
2M-2858	C	82.55	63.1	Stellite	Nitrile	20	84.48	85.72
318-1785	C	82.55	63.1	Stellite	LT-NBR	20	84.48	85.72
356-5452	C	82.55	63.1	Stellite	Nitrile	20	84.48	85.72
5K-6191	C	82.55	63.1	Stellite	Silicone	20	84.48	85.72
8E-1869	C	82.55	63.1	Forged	Nitrile	20	84.48	85.72
8E-1868	C	82.55	63.5	Stellite	Rubber	20	14.68	15.92
386-1014	J	84	68.1	Stellite	LT-NBR	18	66	68.1
386-1013	J	85	65.1	Stellite	LT-NBR	20	63	65.1
386-1024	J	86.6	73.1	Stellite	LT-NBR	20	71	73.1
1Z-9354	A	87.6	77.5	Stellite	Silicone	20	89.5	90.18
251-3272	J	87.6	77.5	Stellite	LT Nitrile	20	75.9	76.5
251-3272	A	87.6	77.5	Stellite	LT-NBR	20	89.5	90.18
7G-0519	A	87.6	77.5	Stellite	Nitrile	20	89.5	90.18
386-1017	J	89	71.1	Stellite	LT-NBR	20	69	71.1
386-1015	J	90	70.1	Stellite	LT-NBR	20	68	70.1

Contact Caterpillar to determine housing dimensions and custom options at catseals@cat.com

CAT DUO-CONE SEALS

Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
386-1028	J	90	77.2	Stellite	LT-NBR	20	75	77.2
386-1020	J	92	72.2	Ni-Hard	LT-NBR	20	70	72.2
386-1022	J	92	72.2	Ni-Hard	LT-NBR	18	70	72.2
107-4889	C	92	72.52	Stellite	Silicone	8	95.28	96.52
162-7862	C	92	72.52	Stellite	LT-NBR	8	95.28	96.52
320-8917	C	92	75.52	Stellite	LT-NBR	8	95.28	96.52
446-6653	C	92.05	72.6	Ni-Hard	LT-NBR	20	94.01	95.25
386-1018	J	92.08	71.6	Stellite	LT-NBR	20	68.3	71.6
171-5882	C	92.08	72.6	Stellite	LT-NBR	20	94.01	95.25
175-7513	C	92.08	72.6	C6	Nitrile	20	94.01	95.25
1M-8747	C	92.08	72.6	Stellite	Nitrile	20	94.01	95.25
318-1783	C	92.08	72.6	Stellite	LT-NBR	20	94.01	95.25
359-4800	C	92.08	72.6	C6	LT-NBR	20	94.01	95.25
422-1454	C	92.08	72.6	C6	LT-NBR	20	94.01	95.25
4S-8984	C	92.08	72.6	Stellite	Silicone	20	94.01	95.25
6V-1915	C	92.08	72.6	Stellite	Nitrile	20	94.01	95.25
6y-0925	C	92.08	72.6	Forged	Nitrile	20	94.01	95.25
8E-4535	C	92.08	72.6	Stellite	Nitrile	20	94.01	95.25
9S-3522	C	92.08	72.6	Stellite	Nitrile	20	94.01	95.25
9W-1059	C	92.08	72.6	Stellite	Silicone	20	94.01	95.25
9W-1060	C	92.08	72.6	Stellite	Nitrile	20	94.01	95.25
320-8915	C	92.08	76.2	Stellite	LT-NBR	20	94.01	95.25
386-1026	J	94	75.1	Stellite	LT-NBR	20	73	75.1
340-8206	C	94.48	75	Forged	LT-NBR	20	96.41	97.65
386-1032	J	98	80.1	Stellite	LT-NBR	20	78	80.1
386-1034	J	98	81.1	Stellite	LT-NBR	20	79	81.1
386-1029	J	99.5	79.6	Ni-Hard	LT-NBR	20	77	79.6
9S-3523	C	100.55	90.1	Stellite	Nitrile	20	111.46	112.7
162-7863	C	102	82.52	Stellite	LT-NBR	8	105.28	106.52
386-1033	C	102	82.52	Stellite	LT-NBR	8	105.28	106.52
9W-8878	C	102	82.52	Stellite	Silicone	8	105.28	106.52
386-1036	J	103	85.1	Stellite	LT-NBR	20	83	85.1
386-1035	J	104.5	84.1	Stellite	LT-NBR	20	82	84.1
216-2957	B	104.67	90	Stellite	LT-NBR	15	105.8	106.62
5P-0373	B	104.67	90	Stellite	Silicone	15	105.8	106.62
6S-3285	B	104.67	90	Stellite	Nitrile	15	105.8	106.62
337-3548	B	104.82	89	Stellite	LT-NBR	15	105.67	106.49
386-1047	J	106.5	93.1	Stellite	LT-NBR	20	91	93.1
251-3279	J	106.6	96.5	Stellite	LT Nitrile	20	94.9	95.5
251-3279	A	106.6	96.5	Jinsung	LT-NBR	20	108.5	109.18
252-7909	A	106.6	96.5	Jinsung	HNBR	20	108.5	109.18
9P-9663	A	106.6	96.5	Jinsung	Nitrile	20	108.5	109.18
386-1037	J	108	87.1	Stellite	LT-NBR	20	85	87.1
386-1038	J	109	89.7	Stellite	LT-NBR	17.5	87	89.7
386-1043	J	109	89.7	Ni-Hard	LT-NBR	17.5	87	89.7
386-1046	J	109	91.1	Stellite	LT-NBR	20	89	91.1
386-1041	J	109.5	89.6	Stellite	LT-NBR	20	87.5	89.6
386-1039	J	109.53	89.1	Stellite	LT-NBR	20	87.5	89.1
204-6277	C	109.53	90.1	Forged	Nitrile	20	111.46	112.7

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Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
8E-5029	C	109.53	90.1	Forged	Nitrile	20	111.46	112.7
1M-8746	C	109.55	90.1	Stellite	Nitrile	20	111.46	112.7
206-9211	C	109.55	90.1	Stellite	LT-NBR	20	111.46	112.7
434-1920	C	109.55	90.1	C6	LT-NBR	20	111.46	112.7
8S-5656	C	109.55	90.1	Stellite	Silicone	20	111.46	112.7
107-9621	C	110	90.04	Stellite	Silicone	8	112.8	114.04
162-7864	C	110	90.04	Stellite	LT-NBR	8	112.8	114.04
JS0950ST	J	111	94.1	Stellite	LT-NBR	20	92	94.1
386-1048	J	114	94.1	Ni-Hard	LT-NBR	18	92	94.1
337-3551	B	115.82	100	Stellite	LT-NBR	15	116.67	117.49
386-1054	J	119	99.1	Stellite	LT-NBR	20	97	99.1
386-1054	J	119	100	Stellite	LT Nitrile	20	97	99.1
386-1051	J	119.08	98.6	Stellite	LT-NBR	20	121.01	122.25
171-5811	C	119.08	99.6	Stellite	LT-NBR	20	121.01	122.25
175-8593	C	119.08	99.6	Forged	LT-NBR	20	121.01	122.25
1M-8748	C	119.08	99.6	Stellite	Nitrile	20	121.01	122.25
206-9212	C	119.08	99.6	Stellite	LT-NBR	20	121.01	122.25
273-9595	C	119.08	99.6	Stellite	Silicone	20	121.01	122.25
325-3297	C	119.08	99.6	Stellite	LT-NBR	20	121.01	122.25
386-1051	J	119.08	99.6	Stellite	LT Nitrile	20	96	98.6
3P-1848	C	119.08	99.6	Stellite	Silicone	20	121.01	122.25
5P-7143	C	119.08	99.6	Stellite	FKM	8	121.01	122.25
8E-1881	C	119.08	99.6	Stellite	Nitrile	20	121.01	122.25
9S-3524	C	119.08	99.6	Stellite	Nitrile	20	121.01	122.25
386-1053	J	120	99.1	Stellite	LT-NBR	20	97	99.1
386-1059	J	121	103.1	Stellite	LT-NBR	20	101	103.1
386-1055	J	122	101.1	Ni-Hard	LT-NBR	18	99	101.1
386-1061	J	127	108	Ni-Hard	LT-NBR	18	106	108
386-1063	J	131.5	111.05	Stellite	LT-NBR	20	110	111.05
109-0885	C	131.5	112.05	Stellite	Nitrile	20	133.43	134.67
133-0513	C	131.5	112.05	Stellite	Silicone	20	133.43	134.67
148-3533	C	131.5	112.05	Stellite	LT-NBR	20	133.43	134.67
434-1922	C	131.5	112.05	C6	LT-NBR	20	133.43	134.67
475-8458	C	131.5	112.05	Stellite	LT-NBR	20	133.43	134.67
175-8631	C	131.5	112.1	Forged	Nitrile	20	133.43	134.67
386-1060	J	132	108.1	Stellite	LT-NBR	20	106	108.1
155-9879	C	133	114.02	Stellite	LT-NBR	8	14.68	15.92
161-7525	C	133	114.02	Stellite	Silicone	8	14.68	15.92
386-1066	J	137	114	Ni-Hard	LT-NBR	20	112	114
386-1068	J	138.5	119.2	Stellite	LT-NBR	20	117	119.2
272-1012	B	139.82	124	Stellite	LT-NBR	15	140.67	141.49
386-1070	J	141	123	Ni-Hard	LT-NBR	20	121	123
JS1270SK	J	141	126	Stellite	LT-NBR	16	124	126
252-7907	B	141.25	126.5	Stellite	HNBR	15	142.38	143.2
315-1147	B	141.25	126.5	Stellite	HNBR	15	142.38	143.2
3S-0303	B	141.25	126.5	Stellite	Nitrile	15	142.38	143.2
8I-5519	B	141.25	126.5	Stellite	Silicone	15	142.38	143.2
386-1074	J	146	126	Ni-Hard	LT-NBR	15	123	126
6y-5218	C	146	127.07	Formed	Silicone	15	147.9	149.14

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Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
6y-5219	C	146	127.07	Formed	Nitrile	15	147.9	149.14
386-1072	J	146.05	125.6	Stellite	LT-NBR	20	124.9	125.6
109-0881	C	146.05	126.6	Stellite	Nitrile	20	147.98	149.22
142-1579	C	146.05	126.6	Stellite	Silicone	8	147.98	149.22
176-5331	C	146.05	126.6	Stellite	LT-NBR	20	147.98	149.22
273-9594	C	146.05	126.6	Stellite	Silicone	20	147.98	149.22
379-8802	C	146.05	126.6	C6	LT-NBR	15	147.98	149.22
5P-7146	C	146.05	126.6	Stellite	Nitrile	8	147.98	149.22
5P-9121	C	146.05	126.6	Stellite	Nitrile	15	147.98	149.22
9S-4294	C	146.05	128.6	Stellite	Nitrile	15	147.98	149.22
285-9346	B	148.82	133	Stellite	LT-NBR	15	149.67	150.49
386-1077	J	152	129	Ni-Hard	LT-NBR	20	127	129
JS1430s	J	157	142	Stellite	LT-NBR	15	140	142
252-7912	B	157	142.3	Stellite	HNBR	15	158.13	158.95
315-1149	B	157	142.3	Jinsung	HNBR	15	158.13	158.95
359-4802	B	157	142.3	Stellite	LT-NBR	15	158.13	158.95
5K-5288	B	157	142.3	Stellite	Nitrile	15	158.13	158.95
5P-0375	B	157	142.3	Stellite	Silicone	15	158.13	158.95
9S-4295	B	157	142.3	Stellite	Nitrile	15	158.13	158.95
337-3554	B	159.82	144	Stellite	LT-NBR	15	160.67	161.49
386-1079	J	168	145	Stellite	LT-NBR	15	143	145
386-1087	J	168	152.8	Stellite	LT-NBR	15	151	152.8
186-6531	B	168.3	153.6	Stellite	Nitrile	15	169.43	170.25
351-9947	B	168.3	153.6	Stellite	Silicone	15	169.43	170.25
359-4804	B	168.3	153.6	Stellite	LT-NBR	15	169.43	170.25
424-0676	B	168.3	153.6	C6	LT-NBR	15	169.43	170.25
4C-2002	B	168.3	153.6	Stellite	Silicone	15	169.43	170.25
5K-1078	B	168.3	153.6	Stellite	Nitrile	15	169.43	170.25
8I-5516	B	168.3	153.6	Stellite	Silicone	15	169.43	170.25
9S-4296	B	168.3	153.6	Stellite	Nitrile	15	169.43	170.25
386-1082	J	170	147	Stellite	LT-NBR	15	145	147
386-1081	J	170	147.5	Ni-Hard	LT-NBR	17.5	145	147.5
386-1084	J	170	149	Ni-Hard	LT-NBR	17.5	147	149
109-0868	C	171.5	152.05	Stellite	Nitrile	20	173.43	174.67
133-0512	C	171.5	152.05	Stellite	Silicone	20	173.43	174.67
176-5332	C	171.5	152.05	Stellite	LT-NBR	20	173.43	174.67
372-2638	C	171.5	152.05	Stellite	LT-NBR	20	173.43	174.67
6T-8440	D	171.7	143.76	Stellite	Nitrile	15	174.54	175.92
6T-9984	D	171.7	143.76	Stellite	Silicone	15	174.54	175.92
9S-4297	D	171.7	143.76	Stellite	Nitrile	15	174.54	175.92
9W-6717	D	171.7	143.76	Forged	Nitrile	15	174.54	175.92
6T-2981	D	171.7	147.39	Formed	Silicone	15	174.49	175.87
9G-5311	D	171.7	147.39	Formed	Nitrile	15	174.49	175.87
386-1085	J	172	149	Stellite	LT-NBR	17	147	149
386-1088	J	173.5	152.8	Stellite	LT-NBR	20	151	152.8
272-6133	B	173.82	158	Stellite	LT-NBR	15	174.67	175.49
386-1089	J	180	159.5	Ni-Hard	LT-NBR	17.5	157	159.5
386-1090	J	183.5	163.8	Ni-Hard	LT-NBR	20	163.8	183.5
109-0861	C	188.5	169.05	Stellite	Nitrile	20	190.43	191.67

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Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
133-0511	C	188.5	169.05	Stellite	Silicone	20	190.43	191.67
171-5825	C	188.5	169.05	Stellite	LT-NBR	20	190.43	191.67
JS1630S	J	191	162	Stellite	LT-NBR	15	160	162
191-6664	D	191.26	163.32	C6	Nitrile	15	194.12	195.5
210-5536	D	191.26	163.32	C6	HNBR	15	194.12	195.5
4C-1494	D	191.26	163.32	C6	Silicone	15	194.12	195.5
6T-8436	D	191.26	163.32	Stellite	Nitrile	15	194.1	195.48
6T-9985	D	191.26	163.32	Stellite	Silicone	15	194.1	195.48
9S-4298	D	191.26	163.32	Stellite	Nitrile	15	194.1	195.48
9W-7331	D	191.26	163.32	Stellite	Nitrile	8	194.1	195.48
6T-3377	D	191.26	166.95	Formed	Silicone	15	194.06	195.44
9G-5313	D	191.26	166.95	Formed	Nitrile	15	194.06	195.44
272-6134	B	193.82	178	Stellite	LT-NBR	15	194.67	195.49
8E-5322	C	199	179.55	Stellite	Silicone	15	200.93	202.17
386-1093	J	210	180.8	Stellite	LT-NBR	15	180.8	210
386-1094	J	210	189.8	Stellite	LT-NBR	20	189.8	210
460-5369	D	210.31	182.37	Ni-Hard	Silicone	15	213.15	214.53
6T-8438	D	210.31	182.37	Stellite	Nitrile	15	213.15	214.53
6T-8439	D	210.31	182.37	Stellite	Nitrile	8	213.15	214.53
6T-9986	D	210.31	182.37	Stellite	Silicone	15	213.15	214.53
9S-4299	D	210.31	182.37	Stellite	Nitrile	15	213.15	214.53
331-7073	D	210.31	186	Formed	LT-NBR	15	213.12	214.5
3T-6541	D	210.31	186	Formed	Silicone	15	213.12	214.5
9G-5315	D	210.31	186	Formed	Nitrile	15	213.12	214.5
386-1095	J	215	190.8	Ni-Hard	LT-NBR	20	190.8	215
272-1014	B	215.82	200	Stellite	LT-NBR	15	216.67	217.49
380-4914	B	215.82	200	Stellite	LT-NBR	15	216.67	217.49
177-6717	B	222.5	203.18	C6	Nitrile	15	8.3	9.12
357-7361	B	222.5	208.68	Stellite	FKM	15	8.3	9.12
5N-7639	B	222.5	208.68	Stellite	Nitrile	15	8.3	9.12
JS2050S	J	227	204.5	Stellite	LT-NBR	15	202	204.5
JS2070R	J	227.5	205.8	Ni-Hard	LT-NBR	20	204	205.8
JS2070S	J	227.5	205.8	Stellite	LT-NBR	20	204	205.8
JS2070SF2	J	227.5	205.8	Stellite	HNBR	20	204	205.8
386-1097	J	228.5	198.8	Stellite	LT-NBR	15	198.8	228.5
386-1099	J	234	207.8	Stellite	LT-NBR	14	207.8	234
JS2090R	J	234	207.8	Ni-Hard	LT-NBR	14	206	207.8
JS2200R	J	239.5	218.8	Ni-Hard	LT-NBR	20	217	218.8
386-1101	J	241.4	218.8	Stellite	LT-NBR	15	218.8	241.4
171-5897	D	251.46	223.52	Stellite	LT-NBR	15	254.3	255.68
195-3070	D	251.46	223.52	C6	Nitrile	8	254.3	255.68
210-5535	D	251.46	223.52	C6	HNBR	8	254.3	255.68
213-7509	D	251.46	223.52	Ni-Hard	Nitrile	15	254.3	255.68
440-4292	D	251.46	223.52	Stellite	Nitrile	8	254.3	255.68
445-0455	D	251.46	223.52	C6	Silicone	8	254.3	255.68
466-7328	D	251.46	223.52	Ni-Hard	Silicone	8	254.3	255.68
469-9174	D	251.46	223.52	Ni-Hard	Silicone	8	254.3	255.68
6T-8435	D	251.46	223.52	Stellite	Nitrile	15	254.3	255.68
6y-0859	D	251.46	223.52	Stellite	Nitrile	8	254.3	255.68

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Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
9S-4300	D	251.46	223.52	Stellite	Nitrile	15	254.3	255.68
9W-4650	D	251.46	223.52	Stellite	Silicone	15	254.3	255.68
383-4232	D	251.46	227.15	Formed	Silicone	8	254.3	255.68
6T-2815	D	251.46	227.15	Formed	Silicone	15	254.3	255.68
9G-5317	D	251.46	227.15	Formed	Nitrile	15	254.3	255.68
9G-5343	D	251.46	227.15	Formed	Nitrile	8	254.3	255.68
9W-5977	D	251.46	227.15	Formed	Silicone	8	254.3	255.68
386-1103	J	252	222.3	Stellite	LT-NBR	15	222.3	252
386-1105	J	252	224.2	Stellite	LT-NBR	21	224.2	252
202-3206	D	258.58	236.5	Formed	Nitrile	15	262.44	263.82
195-4446	D	259.59	231.65	Cast Steel	Nitrile	15	262.43	263.81
9W-4098	D	259.59	231.65	Stellite	Nitrile	15	262.43	263.81
9W-6617	D	259.59	231.65	Stellite	Silicone	15	262.43	263.81
200-4059	D	259.59	235.28	Formed	Nitrile	15	262.44	263.82
314-4124	D	259.59	235.28	Formed	Silicone	15	262.44	263.82
6y-0520	D	259.59	235.28	Formed	Silicone	15	262.44	263.82
JS2400R	J	262.8	238.8	Ni-Hard	LT-NBR	15	237	238.8
309-7664	D	264.71	236.77	C6	Silicone	15	271.93	273.31
386-1109	J	276	248.8	Ni-Hard	LT-NBR	15	248.8	276
137-2429	D	292.86	264.82	Ni-Hard	Nitrile	15	295.6	296.98
145-8032	D	292.86	264.82	Ni-Hard	Silicone	15	295.6	296.98
171-5898	D	292.86	264.82	Stellite	LT-NBR	15	295.6	296.98
190-0270	D	292.86	264.82	Stellite	FKM	8	295.6	296.98
204-6452	D	292.86	264.82	Ni-Hard	FKM	15	295.6	296.98
381-0705	D	292.86	264.82	Stellite	Silicone	8	295.6	296.98
6T-8437	D	292.86	264.82	Stellite	Nitrile	15	295.6	296.98
9S-4301	D	292.86	264.82	Stellite	Nitrile	15	295.6	296.98
9W-3732	D	292.86	264.82	Stellite	Nitrile	8	295.6	296.98
9W-4651	D	292.86	264.82	Stellite	Silicone	15	295.6	296.98
174-4873	D	292.86	268.45	Formed	LT-NBR	15	295.6	296.98
3T-9117	D	292.86	268.45	Formed	Silicone	15	295.6	296.98
9G-5319	D	292.86	268.45	Formed	Nitrile	15	295.6	296.98
386-1110	J	293	263.8	Ni-Hard	LT-NBR	15	263.8	293
386-1113	J	303	273.8	Stellite	LT-NBR	15	273.8	303
7T-2459	D	310.88	282.92	Stellite	Nitrile	15	313.69	315.07
386-1114	J	314	280.8	Stellite	LT-NBR	15	280.8	314
386-1116	J	325	298.5	Stellite	LT-NBR	15	298.5	325
386-1115	J	328	298.5	Stellite	LT-NBR	20	298.5	328
446-1424	D	328	302	Ni-Hard	LT-NBR	15	330.72	332.1
454-7635	D	328	302	Ni-Hard	LT-NBR	15	330.72	332.1
125-5538	D	328	303.57	Formed	Silicone	15	330.72	332.1
174-4874	D	328	303.57	Formed	LT-NBR	15	330.72	332.1
336-7869	D	328	303.57	Formed	LT-NBR	15	330.72	332.1
386-1118	J	341	317.2	Stellite	LT-NBR	15	317.2	341
386-1117	J	345	317.5	Stellite	LT-NBR	15	317.5	345
118-2900	D	346.46	318.52	C6	Silicone	8	349.3	350.68
175-6294	D	346.46	318.52	Stellite	FKM	15	349.3	350.68
186-3277	D	346.46	318.52	Ni-Hard	Silicone	8	349.3	350.68
190-0271	D	346.46	318.52	Stellite	FKM	8	349.3	350.68

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Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
191-6128	D	346.46	318.52	Jinsung	Nitrile	15	349.3	350.68
373-1647	D	346.46	318.52	C6	Silicone	8	349.3	350.68
383-1597	D	346.46	318.52	Stellite	LT-NBR	8	349.3	350.68
417-7857	D	346.46	318.52	C6	Nitrile	8	349.3	350.68
6T-8434	D	346.46	318.52	Stellite	Nitrile	15	349.3	350.68
6y-0857	D	346.46	318.52	Stellite	Nitrile	8	349.3	350.68
6y-6275	D	346.46	318.52	Stellite	Silicone	8	349.3	350.68
9S-4302	D	346.46	318.52	Stellite	Nitrile	15	349.3	350.68
9W-4652	D	346.46	318.52	Stellite	Silicone	15	349.3	350.68
163-7368	D	346.46	322.14	Formed	LT-NBR	8	349.3	350.68
207-1571	D	346.46	322.14	Formed	LT-NBR	15	349.3	350.68
314-4122	D	346.46	322.14	Formed	Silicone	8	349.3	350.68
3T-8500	D	346.46	322.14	Formed	Silicone	15	349.3	350.68
9G-5321	D	346.46	322.14	Formed	Nitrile	15	349.3	350.68
9G-5347	D	346.46	322.14	Formed	Nitrile	8	349.3	350.68
9W-5978	D	346.46	322.14	Formed	Silicone	8	349.3	350.68
166-8815	D	347.5	318.52	Ni-Hard	Nitrile	15	349.3	350.68
462-6304	D	347.5	318.52	Ni-Hard	Silicone	15	349.3	350.68
386-1119	J	368	336.8	Stellite	LT-NBR	15	336.8	368
386-1120	J	368	338.5	Stellite	LT-NBR	15	338.5	368
305-7976	D	368.75	341.75	C6	Nitrile	20	374.76	376.14
386-1123	J	375	349	Stellite	LT-NBR	15	349	375
386-1124	J	381	354.5	Stellite	LT-NBR	15	354.5	381
386-1126	J	391	366.5	Stellite	LT-NBR	15	366.5	391
255-2272	D	394.1	369.77	Formed	LT-NBR	15	397.3	398.68
314-4120	D	394.1	369.77	Formed	Silicone	15	397.3	398.68
9G-5323	D	394.1	369.77	Formed	Nitrile	15	397.3	398.68
133-0441	D	394.46	366.52	C6	HNBR	15	397.3	398.68
137-2428	D	394.46	366.52	Ni-Hard	Nitrile	15	397.3	398.68
149-8434	D	394.46	366.52	C6	Silicone	15	397.3	398.68
155-1388	D	394.46	366.52	Ni-Hard	Silicone	15	397.3	398.68
205-9115	D	394.46	366.52	Stellite	LT-NBR	15	397.3	398.68
213-4737	D	394.46	366.52	Stellite	Rubber	15	397.3	398.68
314-4119	D	394.46	366.52	Ni-Hard	Silicone	15	397.3	398.68
341-8543	D	394.46	366.52	C6	Silicone	15	397.3	398.68
6T-4316	D	394.46	366.52	C6	Nitrile	15	397.3	398.68
6T-8433	D	394.46	366.52	Stellite	Nitrile	15	397.3	398.68
6y-0855	D	394.46	366.52	Stellite	Nitrile	8	397.3	398.68
6y-6273	D	394.46	366.52	Stellite	Silicone	8	397.3	398.68
9G-5349	D	394.46	370.05	Formed	Nitrile	8	397.3	398.68
9W-5979	D	394.46	370.05	Formed	Silicone	8	397.3	398.68
386-1125	J	394.5	365	Stellite	LT-NBR	15	365	394.5
386-1127	J	413.5	382.5	Stellite	LT-NBR	15	382.5	413.5
386-1128	J	415	385.5	Stellite	LT-NBR	15	385.5	415
314-4128	D	427.2	400.2	C6	Silicone	15	430.04	431.42
386-1130	J	454	428	Stellite	LT-NBR	15	428	454
386-1131	J	454	428	Stellite	Viton	15	428	454
386-1129	J	457	427.5	Stellite	LT-NBR	15	426	427.5
386-1129	J	457	429	Stellite	LT Nitrile	15	427.5	457

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CAT DUO-CONE SEALS

Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
175-6297	D	457.2	429.26	Stellite	FKM	15	460.04	461.42
186-6493	D	457.2	429.26	Cast Steel	Nitrile	15	460.04	461.42
205-9025	D	457.2	429.26	Stellite	LT-NBR	15	460.04	461.42
4d-8960	D	457.2	429.26	Stellite	Nitrile	15	460.04	461.42
201-5468	D	457.2	430.35	C6	FKM	8	460.04	461.42
212-2784	D	457.2	430.35	C6	Nitrile	8	460.04	461.42
137-4343	D	458.36	429.26	C6	HNBR	15	460.04	461.42
175-6299	D	458.36	429.26	C6	FKM	15	460.04	461.42
195-3495	D	458.36	429.26	C6	Nitrile	15	460.04	461.42
195-9706	D	458.36	429.26	C6	Silicone	15	460.04	461.42
314-4126	D	458.36	429.26	C6	Silicone	15	460.04	461.42
JS4500SB	J	480	448.5	Stellite	LT-NBR	13	447	448.5
365-4924	D	482.6	454.66	C6	Silicone	15	485.44	486.82
319-3887	D	482.8	454.66	C6	Silicone	15	485.44	486.82
386-1132	J	533.4	503.5	Stellite	LT-NBR	15	503.5	533.4
214-7880	D	533.4	505.46	C6	LT-NBR	15	536.24	537.62
365-4922	D	533.4	505.46	C6	Silicone	15	536.24	537.62
147-5509	D	534	505.8	C6	Silicone	15	536.24	537.62
175-6298	D	534	505.8	C6	FKM	15	536.24	537.62
190-4136	D	534	505.8	C6	Silicone	15	536.24	537.62
297-9546	D	534	505.8	C6	Silicone	15	536.24	537.62
6T-6802	D	534	505.8	C6	Nitrile	15	536.24	537.62
JS5300SB	J	560	528.5	Stellite	LT-NBR	13	527	528.5
172-5284	D	567.94	540	C6	Nitrile	15	570.78	572.16
317-6441	D	567.94	540	C6	Silicone	15	570.78	572.16
365-4920	D	567.94	540	C6	Silicone	15	570.78	572.16
8E-6327	D	567.94	540	C6	Silicone	15	570.78	572.16
459-9259	D	623.14	595.2	C6	HNBR	15	625.98	627.36
147-5510	D	700	667.58	C6	Silicone	15	703.28	704.66
149-7581	D	700	667.58	C6	HNBR	15	703.84	705.22
314-4130	D	700	667.58	C6	Silicone	15	703.28	704.66
433-1348	D	700	667.58	C6	Nitrile	15	703.28	704.66
378-0592	D	806.72	773.72	C6	Silicone	15	810	811.38
110-9718	D	865	832	C6	Nitrile	16	868.28	869.66
147-5511	D	865	832	C6	Silicone	16	868.28	869.66
152-9157	D	865	832	C6	HNBR	16	868.28	869.66
314-4132	D	865	832	C6	Silicone	16	868.28	869.66
453-5929	D	865.44	832	C6	Silicone	16	869.37	870.75
422-9076	L	939.8	898	C6	Silicone	8	942.37	944.11
148-6633	L	939.8	898.22	C6	HNBR	16	943.44	945.18
314-4134	L	939.8	898.22	C6	Silicone	16	943.44	945.18

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INVERTED CAT DUO-CONE SEALS

Item	Class	OD (mm)	ID (mm)	Ring	Toric	Ramp Angle	Housing Dia.	Lip Dia.
7T-4080	E	71.4	54.5	Stellite	Nitrile	0	5.5	6.18
7T-4086	E	71.4	54.5	Stellite	Nitrile	0	5.5	6.18
108-2382	E	83.4	66.5	Stellite	Nitrile	0	14.68	15.92
7T-0158	E	83.4	66.5	Stellite	Nitrile	0	5.5	6.18
7T-4722	E	83.4	66.5	Stellite	Silicone	0	5.5	6.18
7T-5133	E	83.4	66.5	Stellite	Nitrile	0	5.5	6.18
108-2381	E	93.4	76.5	Stellite	Nitrile	0	5.5	6.18
7T-0159	E	93.4	76.5	Stellite	Nitrile	0	5.5	6.18
7T-5125	E	93.4	76.5	Stellite	Nitrile	0	5.5	6.18
6V-1800	E	99.4	82.5	Stellite	Nitrile	0	5.5	6.18
6V-2614	E	99.4	82.5	Stellite	Nitrile	0	5.5	6.18
7T-0157	E	99.4	82.5	Stellite	Nitrile	0	5.5	6.18
6V-2615	E	125.4	108.5	Stellite	Nitrile	0	5.5	6.18
7T-0160	E	125.4	108.5	Stellite	Nitrile	0	5.5	6.18

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CAT DUO-CONE SEALS TOOLS

Seal Groups	Seal Ring Class	Seal Ring OD (mm)	Seal Ring Angle (mm)	Toric Cross-Section (mm)	Installation Tool	Assembled Height Nominal	Assembled Height +/-Variation
8E-5608	B	65.67	15	6.22	9U-5985	7.6	1.5
136-0296	B	74	20	6.22	123-3800	6.1	1.5
161-7247	C	77.5	8	9.47	179-7208	10.6	1.5
171-5883	C	82.55	20	9.47	224-9466	9.3	1.5
179-1292	C	82.55	20	9.47	224-9466	8.87	1.5
212-0440	C	82.55	20	9.47	224-9466	9.3	1.5
2M-2858	C	82.55	20	9.47	224-9466	9.3	1.5
356-5452	C	82.55	20	9.47	224-9466	9.38	1.5
5K-6191	C	82.55	20	9.47	224-9466	9.3	1.5
9W-5224	C	82.55	20	9.47	224-9466	8.84	1.5
093-1414	B	84	20	6.22	123-3801	8.01	1.5
1Z-9354	A	87.6	20	4.3	TBD	3.5	1
251-3272	A	87.6	20	4.3	TBD	3.5	1
7G-0519	A	87.6	20	4.3	TBD	3.5	1
107-4889	C	92	8	9.47	224-9467	10.6	1.5
162-7862	C	92	8	9.47	224-9467	10.6	1.5
20-8917	C	92	8	9.47	224-9467	10.6	1.5
446-6653	C	92.05	20	9.47	1U-8840	8.88	1.5
171-5882	C	92.08	20	9.47	1U-8840	8.88	1.5
175-7513	C	92.08	20	9.47	1U-8840	8.88	1.5
1M-8747	C	92.08	20	9.47	1U-8840	8.88	1.5
320-8915	C	92.08	20	9.47	1U-8840	8.88	1.5
359-4800	C	92.08	20	9.47	1U-8840	8.88	1.5
422-1454	C	92.08	20	9.47	1U-8840	8.88	1.5
4S-8984	C	92.08	20	9.47	1U-8840	8.88	1.5
6Y-0925	C	92.08	20	9.47	1U-8840	8.9	1.5
8E-4535	C	92.08	20	9.47	1U-8840	8.9	1.5
340-8207	C	94.5	20	9.47	1U-6145	8.8	1.5
125-3267	C	102	8	9.47	227-4755	10.6	1.5
162-7863	C	102	8	9.47	227-4755	10.6	1.5
9W-8878	C	102	8	9.47	227-4755	10.6	1.5
099-0159	C	104.4	20	9.47	1U-8850	9.1	1.5
216-2957	B	104.67	15	6.22	1U-8850	7.6	1.5
5P-0373	B	104.67	15	6.22	1U-8850	7.6	1.5
6S-3285	B	104.67	15	6.22	1U-8850	7.6	1.5
251-3279	A	106.6	20	4.3	306-5147	3.5	1
252-7909	A	106.6	20	4.3	306-5147	3.5	1
9P-9663	A	106.6	20	4.3	306-5147	3.5	1
204-6277	C	109.53	20	9.47	1U-8841	8.9	1.5
9W-2142	C	109.53	20	9.47	1U-8841	8.88	1.5
1M-8746	C	109.55	20	9.47	1U-8841	8.68	1.5
206-9211	C	109.55	20	9.47	1U-8841	8.68	1.5
434-1920	C	109.55	20	9.47	1U-8841	8.68	1.5
8S-5656	C	109.55	20	9.47	1U-8841	8.68	1.5
107-9621	C	110	8	9.47	129-1340	10.6	1.5
162-7864	C	110	8	9.47	129-1340	10.6	1.5
5P-7143	C	119.08	8	9.47	1U-8842	8.8	1.5

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CAT DUO-CONE SEALS TOOLS

Seal Groups	Seal Ring Class	Seal Ring OD (mm)	Seal Ring Angle (mm)	Toric Cross-Section (mm)	Installation Tool	Assembled Height Nominal	Assembled Height +/-Variation
096-4254	C	119.08	20	9.47	1U-8842	8.8	1.5
171-5811	C	119.08	20	9.47	1U-8842	8.9	1.5
175-8593	C	119.08	20	9.47	1U-8842	8.88	1.5
1M-8748	C	119.08	20	9.47	1U-8842	8.7	1.5
206-9212	C	119.08	20	9.47	1U-8842	8.7	1.5
273-9595	C	119.08	20	9.47	1U-8842	8.9	1.5
325-3297	C	119.08	20	9.47	1U-8842	8.7	1.5
3P-1848	C	119.08	20	9.47	1U-8842	8.7	1.5
9W-2201	C	119.08	20	9.47	1U-8842	8.9	1
109-0885	C	131.5	20	9.47	9U-7537	8.9	1.5
133-0513	C	131.5	20	9.47	9U-7537	8.88	1.5
148-3533	C	131.5	20	9.47	9U-7537	8.88	1.5
175-8631	C	131.5	20	9.47	9U-7537	8.88	1.5
434-1922	C	131.5	20	9.47	9U-7537	8.88	1.5
436-1439	C	131.5	20	9.47	9U-7537	8.88	1.5
155-9879	C	133	8	9.47	159-9843	10.6	1.5
161-7525	C	133	8	9.47	159-9843	10.6	1.5
252-7907	B	141.25	15	6.22	1U-8699	7.5	1.5
315-1147	B	141.25	15	6.22	1U-8699	6.9	1.5
3S-0303	B	141.25	15	6.22	1U-8699	6.5	1.5
8L-5519	B	141.25	15	6.22	1U-8699	6.9	1.5
6Y-5218	C	146	15	9.47	1U-8849	8.9	1.5
6Y-5219	C	146	15	9.47	1U-8849	8.9	1.5
142-1579	C	146.05	8	9.47	1U-8849	8.8	1.5
5P-7146	C	146.05	8	9.47	1U-8849	8.8	1.5
379-8802	C	146.05	15	9.47	1U-8849	8.85	1.5
5P-9121	C	146.05	15	9.47	1U-8849	8.8	1.5
109-0881	C	146.05	20	9.47	1U-8849	8.9	1.5
135-9104	C	146.05	20	9.47	1U-8849	8.9	1.5
151-9446	C	146.05	20	9.47	1U-8849	8.9	1.5
156-0620	C	146.05	20	9.47	1U-8849	8.88	1.5
176-5331	C	146.05	20	9.47	1U-8849	8.88	1.5
211-2211	C	146.05	20	9.47	1U-8849	8.9	1.5
273-9594	C	146.05	20	9.47	1U-8849	8.88	1.5
252-7912	B	157	15	6.22	1U-8698	7.2	1.5
315-1149	B	157	15	6.22	1U-8698	7.55	1.5
359-4802	B	157	15	6.22	1U-8698	7.55	1.5
5K-5288	B	157	15	6.22	1U-8698	7.55	1.5
5P-0375	B	157	15	6.22	1U-8698	7.55	1.5
337-3554	B	159.82	15	6.22	1U-8698	6.5	1.5
186-6531	B	168.3	15	6.22	1U-8697	7.6	1.5
351-9947	B	168.3	15	6.22	1U-8697	7.55	1.5
359-4804	B	168.3	15	6.22	1U-8697	7.6	1.5
424-0676	B	168.3	15	6.22	1U-8697	7.55	1.5
4C-2002	B	168.3	15	6.22	1U-8697	7.4	1.5
5K-1078	B	168.3	15	6.22	1U-8697	7.55	1.5
8L-5516	B	168.3	15	6.22	1U-8697	7.55	1.5

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CAT DUO-CONE SEALS TOOLS

Seal Groups	Seal Ring Class	Seal Ring OD (mm)	Seal Ring Angle (mm)	Toric Cross-Section (mm)	Installation Tool	Assembled Height Nominal	Assembled Height +/-Variation
109-0868	C	171.5	20	9.47	4C-6206	8.9	1.5
133-0512	C	171.5	20	9.47	4C-6206	8.9	1.5
139-6611	C	171.5	20	9.47	4C-6206	8.9	1.5
151-9447	C	171.5	20	9.47	4C-6206	8.9	1.5
156-0621	C	171.5	20	9.47	4C-6206	8.88	1.5
176-5332	C	171.5	20	9.47	4C-6206	8.88	1.5
372-2638	C	171.5	20	9.47	4C-6206	8.9	1.5
6T-2981	D	171.7	15	12.7	1U-6443	11.62	1.5
6T-8440	D	171.7	15	12.7	1U-6443	11.55	1.5
9G-5311	D	171.7	15	12.7	1U-6443	11.62	1.5
9W-6717	D	171.7	15	12.7	1U-6443	11.55	1.5
109-0861	C	188.5	20	9.47	9U-7538	8.9	1.5
171-5825	C	188.5	20	9.47	9U-7538	8.88	1.5
9W-7331	D	191.26	8	12.7	1U-6442	15	1.5
4C-1494	D	191.26	15	12.7	1U-6441	11.55	1.5
6T-3377	D	191.26	15	12.7	1U-6441	11.64	1.5
6T-8436	D	191.26	15	12.7	1U-6441	11.55	1.5
9G-5313	D	191.26	15	12.7	1U-6441	11.64	1.5
6T-8439	D	210.31	8	12.7	1U-6440	15	1
331-7073	D	210.31	15	12.7	1U-6439	11.66	1.5
3T-6541	D	210.31	15	12.7	1U-6439	11.66	1.5
6T-8438	D	210.31	15	12.7	1U-6439	11.55	1.5
6T-9986	D	210.31	15	12.7	1U-6439	11.55	1.5
9G-5315	D	210.31	15	12.7	1U-6439	11.66	1.5
177-6717	B	222.5	15	6.22	4C-9527	6.5	1.5
357-7361	B	222.5	15	6.22	4C-9527	6.5	1.5
5N-7639	B	222.5	15	6.22	4C-9527	6.5	1.5
195-3070	D	251.46	8	12.7	1U-6437	15	1.5
326-9200	D	251.46	8	12.7	1U-6437	15	1.5
383-4232	D	251.46	8	12.7	1U-6437	15.17	1.5
445-0455	D	251.46	8	12.7	1U-6437	15	1.5
6Y-0859	D	251.46	8	12.7	1U-6437	15	1.5
6Y-6277	D	251.46	8	12.7	1U-6437	15	1.5
9G-5343	D	251.46	8	12.7	1U-6437	15.17	1.5
9W-5977	D	251.46	8	12.7	1U-6437	15.17	1.5
171-5897	D	251.46	15	12.7	1U-6436	11.55	1.5
213-7509	D	251.46	15	12.7	1U-6436	11.55	1.5
6T-2815	D	251.46	15	12.7	1U-6436	11.73	1.5
6T-8435	D	251.46	15	12.7	1U-6436	11.55	1.5
9G-5317	D	251.46	15	12.7	1U-6436	11.73	1
9W-4650	D	251.46	15	12.7	1U-6436	11.55	1.5
200-4059	D	259.59	15	12.7	1U-6438	11.73	1.5
202-3206	D	259.59	15	12.7	1U-6438	11.73	1.5
314-4124	D	259.59	15	12.7	1U-6438	11.73	1.5
6Y-0520	D	259.59	15	12.7	1U-6438	11.73	1.5
9W-4098	D	259.59	15	12.7	1U-6438	11.55	1.5
381-0705	D	292.86	8	12.7	1U-6435	15	1.5

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CAT DUO-CONE SEALS TOOLS

Seal Groups	Seal Ring Class	Seal Ring OD (mm)	Seal Ring Angle (mm)	Toric Cross-Section (mm)	Installation Tool	Assembled Height Nominal	Assembled Height +/-Variation
9W-3732	D	292.86	8	12.7	1U-6435	15	1.5
137-2429	D	292.86	15	12.7	1U-6434	11.55	1.5
145-8032	D	292.86	15	12.7	1U-6434	11.55	1.5
171-5898	D	292.86	15	12.7	1U-6434	11.55	1.5
1C-9747	D	292.86	15	12.7	1U-6434	11.77	1.5
3T-9117	D	292.86	15	12.7	1U-6434	11.77	1.5
6T-8437	D	292.86	15	12.7	1U-6434	11.55	1.5
9G-5319	D	292.86	15	12.7	1U-6434	11.77	1.5
9G-5349	D	292.86	15	12.7	1U-6434	11.77	1.5
9W-4651	D	292.86	15	12.7	1U-6434	11.55	1.5
9W-5979	D	292.86	15	12.7	1U-6434	11.77	1.5
7T-2459	D	310.86	15	12.7	220-5726	11.55	1.5
125-5538	D	328	15	12.7	173-6703	11.83	1.5
174-4874	D	328	15	12.7	173-6703	11.83	1.5
336-7869	D	328	15	12.7	173-6703	11.83	1.5
446-1424	D	328	15	12.7	173-6703	11.45	1.5
118-2900	D	346.46	8	12.7	1U-5934	15	1.5
130-6889	D	346.46	8	12.7	1U-5934	15	1.5
163-7368	D	346.46	8	12.7	1U-5934	15.17	1.5
186-3277	D	346.46	8	12.7	1U-5934	15	1.5
314-4122	D	346.46	8	12.7	1U-5934	15.17	1.5
373-1647	D	346.46	8	12.7	1U-5934	15	1.5
383-1597	D	346.46	8	12.7	1U-5934	15	1.5
417-7857	D	346.46	8	12.7	1U-5934	15	1.5
6Y-0857	D	346.46	8	12.7	1U-5934	15	1.5
6Y-6275	D	346.46	8	12.7	1U-5934	15	1.5
9G-5347	D	346.46	8	12.7	1U-5934	15.17	1.5
9W-5978	D	346.46	8	12.7	1U-5934	15.17	1.5
207-1571	D	346.46	15	12.7	1U-5933	11.88	1.5
3T-8500	D	346.46	15	12.7	1U-5933	11.88	1.5
6T-8434	D	346.46	15	12.7	1U-5933	11.55	1.5
9G-5321	D	346.46	15	12.7	1U-5933	11.88	1.5
9W-4652	D	346.46	15	12.7	1U-5933	11.55	1
166-8815	D	347.5	15	12.7	1U-5933	11.55	1.5
305-7976	D	368.75	20	12.7	317-3806	11.4	1.5
255-2272	D	394.1	15.3	12.7	8T-9206	12.1	1.5
314-4120	D	394.1	15.3	12.7	8T-9206	12.1	1.5
9G-5323	D	394.1	15.3	12.7	8T-9206	12.1	1.5
6Y-0855	D	394.46	8	12.7	8T-7789	15	1.5
6Y-6273	D	394.46	8	12.7	8T-7789	15	1.5
133-0441	D	394.46	15	12.7	8T-9206	11.55	1.5
137-2428	D	394.46	15	12.7	8T-9206	11.55	1.5
149-8434	D	394.46	15	12.7	8T-9206	11.55	1.5
213-4737	D	394.46	15	12.7	8T-9206	11.55	1.5
314-4119	D	394.46	15	12.7	8T-9206	11.55	1.5
341-8543	D	394.46	15	12.7	8T-9206	11.55	1.5
6T-4316	D	394.46	15	12.7	8T-9206	11.55	1.5

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CAT DUO-CONE SEALS TOOLS

Seal Groups	Seal Ring Class	Seal Ring OD (mm)	Seal Ring Angle (mm)	Toric Cross-Section (mm)	Installation Tool	Assembled Height Nominal	Assembled Height +/-Variation
6T-8433	D	394.46	15	12.7	8T-9206	11.55	1.5
314-4128	D	427.2	15	12.7	285-8787	11.5	1.5
212-2784	D	457.2	8	12.7	176-1724	15	1.5
205-9025	D	457.2	15	12.7	8T-0531	11.55	1.5
4D-8960	D	457.2	15	12.7	8T-0531	11.55	1.5
137-4343	D	458.36	15	12.7	8T-0531	11.54	1.5
195-3495	D	458.36	15	12.7	8T-0531	11.54	1.5
195-9706	D	458.36	15	12.7	8T-0531	11.54	1.5
314-4126	D	458.36	15	12.7	8T-0531	11.54	1.5
319-3887	D	482.6	15	12.7	340-0988	11.55	1.5
365-4924	D	482.6	15	12.7	340-0988	11.55	1.5
214-7880	D	533.4	15	12.7	140-7642	11.55	1.5
365-4922	D	533.4	15	12.7	140-7642	14.55	1.5
147-5509	D	534	15	12.7	140-7642	14.55	1.5
297-9546	D	534	15	12.7	140-7642	14.55	1.5
6T-6802	D	534	15	12.7	140-7642	14.55	1.5
172-5284	D	567.94	15	12.7	9U-5691	11.55	1.5
365-4920	D	567.94	15	12.7	9U-5691	11.55	1.5
8E-6327	D	567.94	15	12.7	9U-5691	11.55	1.5
147-5510	D	700	15	12.7	4C-6582	13.65	1.5
314-4130	D	700	15	12.7	4C-6582	13.65	1.5
433-1348	D	700	15	12.7	4C-6582	13.65	1.5
449-7480	D	700	15	12.7	4C-6582	13.78	1.5
378-0592	D	806.72	15	12.7	264-5067	13.78	1.5
314-4132	D	865	16	12.7	4C-4907	13.89	1.5
314-4134	L	939.8	16	16	149-0974	17.74	2
449-7481	L	939.8	16	16	149-0974	17.74	2

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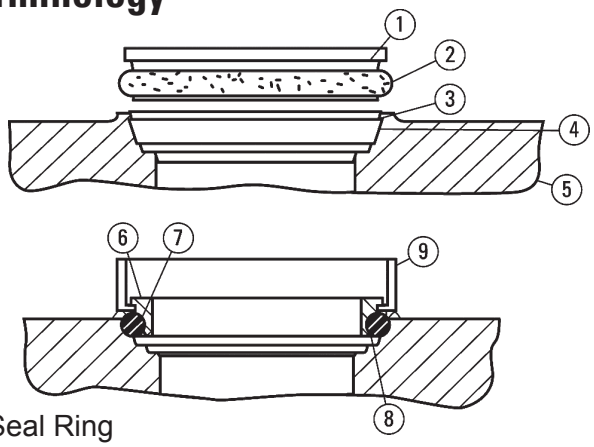
CAT DUO-CONE SEALS INSTALLATION

Cat Duo-Cone Seal Assembly Contents:

- (2) Metal Seal Rings
- (2) Elastomeric Toric Rings

Terminology



1. Seal Ring
2. Rubber Toric
3. Housing Retainer Lip
4. Housing Ramp
5. Seal Ring Housing
6. Seal Ring Face
7. Seal Ring Ramp
8. Seal Ring Retaining Lip
9. Installation Tool

Handling the Seals

The idea is to protect the seal face. The more precausions taken, the more likely the seals will last in the field.

Staging

When staging, have the seal package on the top shelf of the kit cart or on a flatbed kit cart. (Reasoning: the seals need to be removed from the packaging from the center flaps)

Stacking

Make sure seal packages are not stacked more than 5 high to reduce the risk of tipping during transit. (No banding or wracked straps should be used)

Package Removal

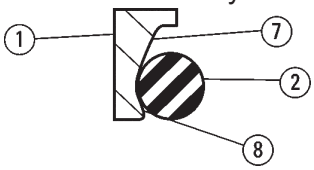
Do not remove the seal from the secondary packaging when transporting the seal. This will help ensure the seal does not get damaged and protects it from contamination.

Remove seal from the center flaps of the packaging, allowing more access to the seal and reduce the risk of the seals sliding against each other or another surface causing damage to the seal. Cut the center tape, making sure the knife point is not going to cut the toric or seal. (Use of a safety knife is the best tool for this procedure)

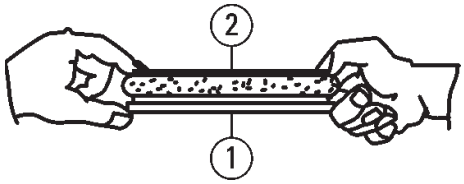
Housing Preparation

The housing components that contact the rubber toric rings (3 and 4) must be free from foreign material (oil, grease, dirt, metal chips, dust or lint particles, etc.) before installing the seal. This should be done using a lint-free wipe and a non-petroleum based solvent. Dry with a clean wipe.

Remove any foreign material from the rubber torics (2), the ramps (7) and the lips (8) of both seal rings. This should also be done with a lint-free wipe and a non-petroleum based solvent. Dry with a clean wipe.



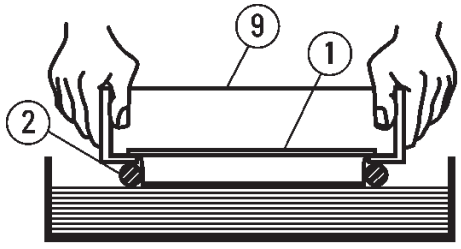
Place the rubber torics on the metal seal ring at the bottom of the seal ring ramp and against the retaining lip.



Make sure the rubber toric is straight on the seal ring and not twisted. Be careful not to nick or cut the torics during the assembly, as this can cause leaks.

Put the installation tool onto the metal seal ring and rubber toric. Lightly dampen the lower half of the rubber toric with the appropriate assembly lubricant.

Techniques to dampen the toric include wiping with a lint-free towel, lubricating using a clean foam brush, or dipping in a container lined with towels saturated in the assembly lubricant (as shown).



Seal groups with silicone torics can be assembled using a freezer to slightly contract the toric rings. Seal groups should be placed in a freezer for 5 minutes at -40°C to -18°C prior to installation. Contraction will be sufficient to allow installation. Groups should warm to room temperature prior to further assembly.

Approved Assembly Lubricants

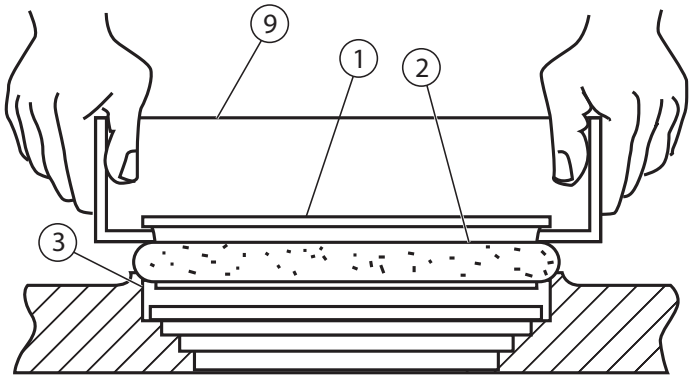
- Isopropyl Alcohol*
- Houghto-Grind 60 CT
- Quaker® Solvo Clean 68-RAH

(*) All applicable safety and disposal guidelines for flammable liquids must be followed.

Note: Do not use Stanosol or any other liquid that leaves an oil film and/or does not evaporate quickly.

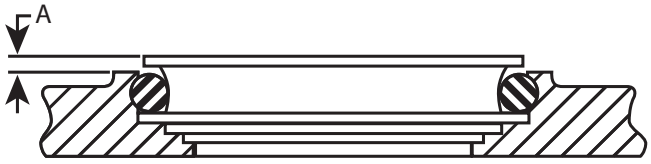
Installation Process

With the lower half of the rubber toric still wet, use the installation tool to position the seal ring and the rubber toric squarely against the application housing (as shown).



For smaller diameter seals, use sudden and even pressure to push the rubber toric under the retaining lip of the housing. For larger diameter seals, which will not press in with sudden and even pressure, it is acceptable to work the toric past the retaining lip by starting one side and tapping the opposite side of the installation tool with a rubber mallet until it is engaged past the retaining lip of the housing.

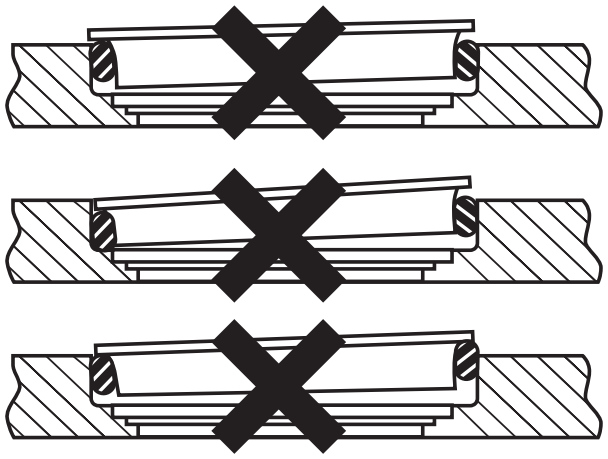
Check the assembled height variation (A) in a least four places, 90° apart, use a caliper, toolmakers' ruler or any other calibrated measuring device.



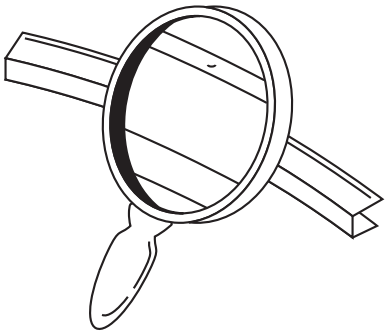
The difference in height around the ring must not be more than 1.0 mm. If small adjustments are necessary, do not push or pull directly on the seal ring. Use the installation tool to push down and your fingers to pull up uniformly on the rubber toric and seal ring.

The rubber toric can twist if it is not wet all around during installation or if there are burrs or fins on the retaining lip of the housing. Twists, misalignment, and bulges of the toric (as shown) will result in seal failure. If correct installation is not obvious, remove the seal from the housing and repeat process.

The rubber torics must never slip on the ramps of either the seal ring or the housing. To prevent slippage, allow adequate evaporation time for the lubricant before proceeding with further assembly. Once correctly in place, the rubber toric must roll on the ramp only. The following shows incorrect installations resulting in cocked seals.



Wipe the face of each seal ring using a lint-free wipe. No particles of any kind are permissible on the sealing surfaces. (Even a hair can hold the seal faces apart and cause a leak)

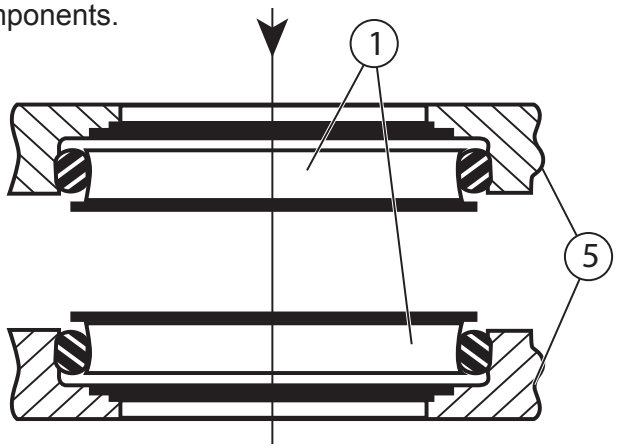


Apply a thin film of oil on the entire seal face of one or both seals using a lint-free applicator. Oil must not contact surfaces other than the sealing face.

CAT DUO-CONE SEALS INSTALLATION

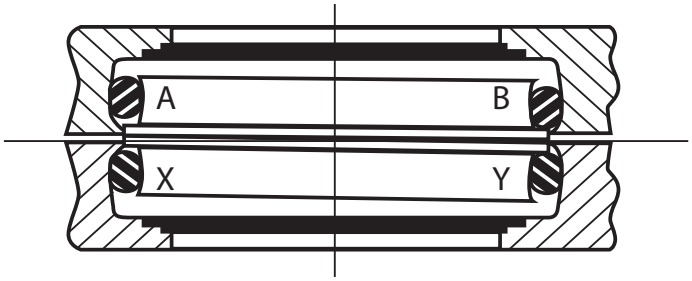
Final Assembly

While completing the final assembly of the unit, make sure that both housings are in correct alignment and are concentric. Slowly bring the two housings together. High impact can scratch or break the seal components.

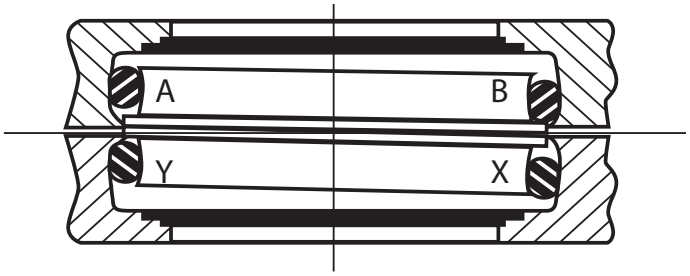


If the rubber toric slips at any location, it will twist, causing the seal rings to cock. Any wobbling motion of the seal is an indication of cocked seals and can cause dirt to enter by pumping mud past the torics.

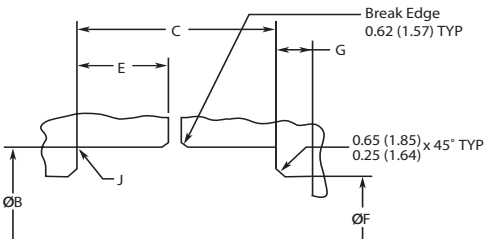
The following examples show the effects of a cocked seal group.

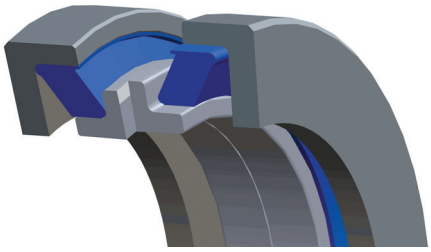


The above depicts how the torics have slipped instead of rolling on the left hand side of the seal. The following shows the same seal after the bottom half is rotated 180°.



CAT HEAVY DUTY DUAL FACED SEALS





Class K Cat Heavy Duty Dual Faced Seals uses a square bore housing design and a Belleville Washer load ring to provide loads to the metal seal faces.

Part No.	OD	Smaller Outer Dia.	Shaft Dia.	Seal Ring	Belleville Washer
132-0358	61.6	46.86	42.88	Stellite	Nitrile
132-0362	61.6	46.86	42.88	Stellite	LT-NBR
132-0363	61.6	46.86	42.88	Stellite	LT-NBR
170-3452	61.6	46.86	42.88	Stellite	LT-NBR
192-0052	65.08	50.86	46.02	C6	Nitrile
132-0365	65.08	50.86	46.02	Stellite	Nitrile
132-0367	65.08	50.86	46.02	Stellite	Nitrile
132-0368	65.08	50.86	46.02	Stellite	Nitrile
132-0369	65.08	50.86	46.02	Stellite	Nitrile
132-0371	65.08	50.86	46.02	Stellite	Nitrile
215-6276	65.08	50.86	46.02	Stellite	LT-NBR
215-6277	65.08	50.86	46.02	Stellite	LT-NBR
215-6278	65.08	50.86	46.02	Stellite	LT-NBR
132-0377	73	58.27	53.98	Stellite	Nitrile
132-0379	73	58.27	53.98	Stellite	Nitrile
132-0380	86.36	67.46	63.5	Stellite	Nitrile
132-0382	86.36	67.46	63.5	Stellite	Nitrile
132-0383	86.36	67.46	63.5	Stellite	Nitrile
132-0385	86.36	67.46	63.5	Stellite	Nitrile
132-0386	86.36	67.46	63.5	Stellite	LT-NBR
132-0388	86.36	67.46	63.5	Stellite	LT-NBR
132-0389	86.36	67.46	63.5	Stellite	LT-NBR
215-6279	86.36	67.46	63.5	Stellite	LT-NBR
215-6280	86.36	67.46	63.5	Stellite	LT-NBR
265-5193	90	76	73.92	Stellite	Nitrile
269-3358	90	76	73.92	C6	FKM
132-0397	92.48	73.81	69.85	Stellite	Nitrile
132-0399	92.48	73.81	69.85	Stellite	Nitrile
132-0400	92.48	73.81	69.85	Stellite	Nitrile
132-0402	92.48	73.81	69.85	Stellite	Nitrile
132-0404	92.48	73.81	69.85	Stellite	LT-NBR
132-0407	92.48	73.81	69.85	Stellite	LT-NBR
132-0415	92.48	73.81	69.85	Stellite	Nitrile
132-0416	92.48	73.81	69.85	Stellite	Nitrile
132-0417	92.48	73.81	69.85	Stellite	Nitrile
132-0418	92.48	73.81	69.85	Stellite	Nitrile
192-0061	92.48	73.81	69.85	C6	Nitrile

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CAT HEAVY DUTY DUAL FACED SEALS

Part No.	OD	Smaller Outer Dia.	Shaft Dia.	Seal Ring	Belleville Washer
215-6281	92.48	73.81	69.85	Stellite	LT-NBR
215-6282	92.48	73.81	69.85	Stellite	LT-NBR
132-0432	96.61	83	78	Stellite	Ring Only
215-6284	98.45	74.22	59.56	Stellite	LT-NBR
215-6285	98.45	74.22	59.56	Stellite	LT-NBR
215-6286	98.45	74.22	59.56	Stellite	LT-NBR
215-6287	98.45	74.22	59.56	Stellite	LT-NBR
132-0410	98.45	74.22	69.85	Stellite	Nitrile
138-4162	98.45	74.22	69.85	Stellite	Nitrile
132-0422	100.33	82.55	77.8	Stellite	Nitrile
132-0424	100.33	82.55	77.8	Stellite	Nitrile
245-4631	100.33	82.55	77.8	C6	FKM
444-1244	100.33	82.55	77.8	C6	LT-NBR
458-6657	100.33	82.55	77.8	Ni-Hard	FKM
253-1727	104	88	83.5	Stellite	FKM
377-2188	104	88	83.5	Stellite	LT-NBR
132-0433	106.55	90.25	86.36	Stellite	Nitrile
132-0435	112.06	94.64	88.9	Stellite	Nitrile
132-0437	112.06	94.64	88.9	Stellite	Nitrile
132-0438	112.06	94.64	88.9	Stellite	Nitrile
132-0440	112.06	94.64	88.9	Stellite	Nitrile
132-0442	112.06	94.64	88.9	Stellite	LT-NBR
215-6283	112.06	94.64	88.9	Stellite	LT-NBR
250-4366	112.06	94.64	88.9	Stellite	FKM
266-3142	112.06	94.64	88.9	Stellite	Nitrile
377-2182	112.06	94.64	88.9	C6	FKM
439-2605	112.06	94.64	88.9	Stellite	FKM
132-0447	119.46	94.06	88.9	Stellite	Nitrile
132-0448	119.46	94.06	88.9	Stellite	Nitrile
140-9881	119.46	94.06	88.9	Stellite	FKM
215-6288	119.46	94.06	88.9	Stellite	LT-NBR
215-6289	119.46	94.06	88.9	Stellite	LT-NBR
215-6290	119.46	94.06	88.9	Stellite	LT-NBR
132-0460	123.83	104.78	98.42	Stellite	Nitrile
132-0462	123.83	104.78	98.42	Stellite	Nitrile
132-0463	123.83	104.78	98.42	Stellite	Nitrile
132-0464	123.83	104.78	98.42	Stellite	Nitrile
132-0466	123.83	104.78	98.42	Stellite	Nitrile
132-0467	123.83	104.78	98.42	Stellite	Nitrile
132-0469	123.83	104.78	98.42	Stellite	Nitrile
185-8643	123.83	104.78	98.42	C6	Nitrile
199-7214	123.83	104.78	98.42	Stellite	LT-NBR
132-0471	132.84	114.3	109.53	Stellite	Nitrile
132-0473	132.84	114.3	109.53	Stellite	Nitrile
132-0475	132.84	114.3	109.53	Stellite	Nitrile
132-0476	132.84	114.3	109.53	Stellite	LT-NBR
132-0479	132.84	114.3	109.53	Stellite	Nitrile
132-0480	132.84	114.3	109.53	Stellite	LT-NBR

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CAT HEAVY DUTY DUAL FACED SEALS

Part No.	OD	Smaller Outer Dia.	Shaft Dia.	Seal Ring	Belleville Washer
132-0481	132.84	114.3	109.53	Stellite	Nitrile
209-4514	132.84	114.3	109.53	C6	Nitrile
132-0484	138.91	117.86	114.3	Stellite	Nitrile
132-0485	138.91	117.86	114.3	Stellite	Nitrile
132-0483	142.24	114.3	109.53	Stellite	Nitrile
133-0445	142.24	114.3	109.53	C6	Nitrile
425-1284	142.24	114.3	109.53	C6	LT-NBR
132-0490	144.15	123.83	117.48	Stellite	Nitrile
132-0492	144.15	123.83	117.48	Stellite	Nitrile
132-0493	144.15	123.83	117.48	Stellite	Nitrile
077-2898	144.15	124.33	117.48	Stellite	Nitrile
132-0488	144.15	124.33	117.48	Stellite	Nitrile
377-2186	144.4	126.37	117.48	C6	FKM
132-0500	155.07	133.35	128.57	Stellite	Nitrile
132-0502	155.07	133.35	128.57	Stellite	Nitrile
132-0503	155.07	133.35	128.57	Stellite	Nitrile
132-0505	155.07	133.35	128.57	Stellite	Nitrile
205-8684	155.07	133.35	128.57	Stellite	LT-NBR
205-9682	155.58	134.37	128.57	C6	FKM
132-0506	155.58	134.37	130.81	Stellite	Nitrile
132-0497	155.98	124.33	117.48	Stellite	Nitrile
132-0513	162.91	144.17	140.2	C6	Nitrile
132-0510	165.1	142.88	137.16	Stellite	Nitrile
132-0512	165.1	142.88	137.16	Stellite	Nitrile
132-0524	167.49	147.32	144.02	Stellite	Nitrile
132-0508	167.64	142.88	139.7	Stellite	Nitrile
132-0509	167.64	142.88	139.7	Stellite	Nitrile
132-0520	167.95	145.54	142.88	C6	Nitrile
132-0515	168.3	149.4	142.88	Stellite	Nitrile
132-0516	168.3	149.4	142.88	Stellite	Nitrile
132-0518	168.3	149.4	142.88	Stellite	Nitrile
132-0519	168.3	149.4	142.88	Stellite	Nitrile
132-0521	168.3	149.4	142.88	Stellite	Nitrile
132-0522	168.3	149.4	142.88	Stellite	Nitrile
133-0449	168.3	149.4	142.88	Stellite	Nitrile
133-0476	168.3	149.4	142.88	Stellite	Nitrile
132-0528	179.86	154.46	149.23	Stellite	Nitrile
132-0529	179.86	154.46	149.23	Stellite	Nitrile
132-0531	179.86	154.46	149.23	Stellite	Nitrile
139-5535	180.34	154.94	157.18	Stellite	Nitrile
139-5542	180.34	154.94	157.18	Stellite	Nitrile
132-0532	184.15	162.86	158.75	Stellite	Nitrile
132-0534	184.15	162.86	158.75	Stellite	Nitrile
132-0535	195.07	168.91	161.93	Stellite	Nitrile
132-0536	195.07	168.91	161.93	Stellite	Nitrile
132-0537	195.07	168.91	161.93	Stellite	FKM
132-0538	195.07	168.91	161.93	Stellite	LT-NBR
132-0542	195.07	168.91	161.93	Stellite	Nitrile

Contact Caterpillar to determine housing dimensions and custom options at catseals@cat.com

CAT HEAVY DUTY DUAL FACED SEALS

Part No.	OD	Smaller Outer Dia.	Shaft Dia.	Seal Ring	Belleville Washer
132-0543	195.07	168.91	161.93	Stellite	Nitrile
132-0544	195.07	168.91	161.93	Stellite	FKM
132-0546	196.85	174.24	169.06	Stellite	Nitrile
132-0550	196.85	174.24	169.06	Stellite	Nitrile
132-0551	207.16	179	171.45	Stellite	Nitrile
132-0552	207.16	179	171.45	Stellite	Nitrile
132-0553	214.55	194.18	188.93	Stellite	Nitrile
132-0554	214.55	194.18	188.93	Stellite	Nitrile
132-0555	214.55	194.18	188.93	Stellite	FKM
132-0558	214.55	194.18	188.93	Stellite	Nitrile
132-0559	214.55	194.18	188.93	Stellite	Nitrile
132-0560	214.55	194.18	188.93	Stellite	FKM
133-0432	214.55	194.18	188.93	Stellite	Nitrile
133-0446	214.55	194.18	188.93	Stellite	Nitrile
133-0469	214.55	194.18	188.93	Stellite	Nitrile
133-0471	214.55	194.18	188.93	Stellite	Nitrile
133-0473	214.55	194.18	188.93	Stellite	Nitrile
174-5432	214.55	194.18	188.93	Ni-Hard	Nitrile
358-0793	214.55	194.18	188.93	C6	Nitrile
132-0580	214.55	195.83	190.58	Stellite	Nitrile
132-0564	220.68	198.12	192.07	Stellite	Nitrile
132-0565	220.68	198.12	192.07	Stellite	Nitrile
132-0568	220.68	198.12	192.07	Stellite	Nitrile
132-0569	220.68	198.12	192.07	Stellite	Nitrile
132-0561	222.25	193.73	188.93	Stellite	Nitrile
132-0563	222.25	193.73	188.93	Stellite	Nitrile
077-4144	229.49	203.84	198.12	Stellite	Nitrile
132-0570	229.49	203.84	198.12	Stellite	FKM
132-0571	229.49	203.84	198.12	Stellite	Nitrile
132-0572	229.49	203.84	198.12	Stellite	Nitrile
132-0577	229.49	203.84	198.12	Stellite	FKM
132-0578	229.49	203.84	198.12	Stellite	Nitrile
161-4343	229.49	203.84	198.12	Stellite	FKM
132-0582	242.09	215	209.55	Stellite	Nitrile
132-0584	242.09	215	209.55	Stellite	Nitrile
132-0587	245.75	225.43	220.68	Stellite	Nitrile
132-0590	245.75	225.43	220.68	Stellite	Nitrile
133-0433	245.75	225.43	220.68	Stellite	Nitrile
423-6536	245.75	225.43	220.68	Stellite	LT-NBR
132-0586	249.23	215.14	209.55	Stellite	Nitrile
132-0591	260.35	227.33	220.68	Stellite	Nitrile
132-0592	260.35	227.33	220.68	Stellite	Nitrile
155-8358	261.93	238.5	236.2	C6	Nitrile
172-1619	261.93	244.55	240.15	Formed	LT-NBR
132-0604	270.51	247.65	242.87	Stellite	Nitrile
132-0607	270.51	247.65	242.87	Stellite	Nitrile
132-0595	273.05	241.3	236.52	Stellite	Nitrile
132-0597	273.05	241.3	236.52	Stellite	Nitrile

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CAT HEAVY DUTY DUAL FACED SEALS

Part No.	OD	Smaller Outer Dia.	Shaft Dia.	Seal Ring	Belleville Washer
132-0599	273.05	241.3	236.52	Stellite	Nitrile
132-0601	273.05	241.3	236.52	Stellite	Nitrile
197-9203	273.05	241.3	236.52	Stellite	FKM
344-3837	273.05	241.31	73.92	Jinsung	Nitrile
132-0609	285.75	257.18	250.82	Stellite	Nitrile
132-0610	285.75	257.18	250.83	Stellite	Nitrile
132-0611	304.8	283.21	276.23	Stellite	Nitrile
132-0613	304.8	283.21	276.23	Stellite	Nitrile
132-0617	322.58	283.21	276.23	Stellite	Nitrile
133-0447	322.58	283.21	276.23	Stellite	Nitrile
164-0341	322.58	283.21	276.23	Stellite	Nitrile
422-0069	322.58	283.21	276.23	Stellite	LT-NBR
132-0615	329.31	301.63	295.28	Stellite	Nitrile
148-9594	352.43	320.05	314.96	C6	Nitrile
161-4456	352.43	321	314.96	Stellite	Nitrile
132-0625	391.16	355.6	349.25	Stellite	Nitrile
132-0626	391.16	355.6	349.25	Stellite	FKM
132-0627	391.16	355.6	349.25	Stellite	Nitrile
132-0631	391.16	355.6	349.25	Stellite	Nitrile
132-0632	391.16	355.6	349.25	Stellite	Nitrile
132-0633	391.16	355.6	349.25	Stellite	Nitrile
132-0634	391.16	355.6	349.25	Ni-Hard	Nitrile
132-0635	391.16	355.6	349.25	Ni-Hard	Nitrile
203-0340	391.16	355.6	349.25	Stellite	FKM
132-0636	413.46	379.73	374.65	Stellite	Nitrile
132-0637	413.46	379.73	374.65	Stellite	FKM
149-3957	458.22	429.64	426.72	Stellite	Rubber
132-0642	469.9	441.86	434.98	Stellite	Nitrile
132-0643	469.9	441.86	434.98	Stellite	FKM
132-0646	469.9	441.86	434.98	Stellite	FKM
132-0639	481.33	438.15	431.16	Stellite	Nitrile
139-5949	481.33	441.33	434.98	C6	Nitrile
132-0649	529.5	491.8	485.78	Stellite	Nitrile
133-0510	529.5	491.8	485.78	Stellite	LT-NBR
132-0650	531	492.9	485.78	Ni-Hard	Nitrile
205-9683	531	492.9	485.78	Ni-Hard	FKM
176-1164	531	497.9	490.78	Ni-Hard	Nitrile
132-0651	651.24	620	606.43	Stellite	Nitrile
132-0654	651.24	620	606.43	Stellite	FKM
132-0657	651.24	620	606.43	Stellite	Nitrile
132-0652	782.3	749.4	736.6	C6	Nitrile
132-0653	782.3	749.4	736.6	C6	FKM

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CAT HEAVY DUTY DUAL FACED SEALS SERVICE KIT

OD	Field Kit No.	Washer Matl.	Washer 1 No.	Washer 2 No.
61.6	132-0357	Nitrile	132-0860	
61.6	170-0734	LT Nitrile	132-5586	
61.6	174-9900	Viton	132-5593	
65.08	132-0366	Nitrile	132-0824	132-0855
65.08	132-0373	LT Nitrile	132-5595	
65.08	132-0370	Nitrile	132-0855	
73	132-0378	Nitrile	132-0865	
86.36	132-0381	Nitrile	132-0822	132-0853
86.36	132-0384	Nitrile	132-0853	
92.86	132-0398	Nitrile	132-0827	132-0859
92.86	132-0401	Nitrile	132-0859	
98.83	132-0412	LT Nitrile	141-1088	
98.83	132-0414	Viton	132-5596	
100.33	132-0421	Nitrile	132-0832	132-0864
100.33	132-0423	Nitrile	132-0864	
100.33	132-0429	LT Nitrile	132-5589	
112.45	132-0436	Nitrile	132-0829	132-0861
112.45	132-0457	Nitrile	132-0858	
112.45	132-0439	Nitrile	132-0861	
119.46	132-0446	Viton	132-5594	
123.83	132-0461	Nitrile	132-0890	
123.83	132-0465	Nitrile	132-0826	132-0857
123.83	132-0468	Nitrile	132-0857	
132.84	132-0472	Nitrile	132-0891	
132.84	132-0477	Nitrile	132-0866	
132.84	132-0478	LT Nitrile	132-0848	132-5587
132.84	147-2281	Viton	141-4932	
144.15	132-0489	Nitrile	132-0856	
155.58	132-0501	Nitrile	132-0835	132-0867
155.58	132-0504	Nitrile	132-0867	
165.1	132-0511	Nitrile	132-5568	
167.49	132-0526	Silicone	132-5601	
168.28	132-0517	Nitrile	132-0868	
168.28	132-0523	Nitrile	132-0876	
179.86	132-0530	Nitrile	132-0854	
184.15	132-0533	Nitrile	132-0886	
195.07	132-0539	Nitrile	132-0878	
195.07	132-0540	Nitrile	132-0859	132-0878
195.07	132-0541	Viton	132-5563	
196.85	132-0548	Nitrile	132-0887	
207.16	5E-9812	Nitrile	132-0893	
214.55	132-0556	Nitrile	132-0838	132-0872
214.55	133-0460	Viton	132-5597	132-0872
214.55	132-0557	Nitrile	132-0872	

Contact Caterpillar prior to ordering a field service kit at catseals@cat.com

CAT HEAVY DUTY DUAL FACED SEALS SERVICE KIT

OD	Field Kit No.	Washer Matl.	Washer 1 No.	Washer 2 No.
220.68	132-0567	Nitrile	132-0888	
220.68	132-0566	Nitrile	132-0841	132-0888
222.25	132-0562	Nitrile	132-5566	
229.49	132-0574	Viton	132-0830	132-0862
229.49	132-0575	Nitrile	132-0831	132-0863
229.49	132-0576	Nitrile	132-0863	
242.09	132-0583	Nitrile	132-0882	
245.75	132-0589	Nitrile	132-0873	
260.35	132-0593	Nitrile	132-0897	
261.92	171-1188	Nitrile	155-4091	
270.51	132-0606	Nitrile	132-0889	
273.05	132-0598	Nitrile	132-0881	
273.05	132-0602	Nitrile	132-5562	
322.58	133-0465	Nitrile	132-5590	
329.31	132-0618	Nitrile	132-0896	
352.43	132-0619	Nitrile	132-0899	
391.16	132-0628	Nitrile	132-0877	
391.16	132-0629	Viton	132-0900	
413.46	132-0638	Viton	132-5577	
469.9	132-0644	Viton	132-5592	
481.33	132-0640	Nitrile	132-0871	
529.46	133-0461	Nitrile	132-0875	
663.58	132-0655	Nitrile	132-5564	
663.58	132-0656	Viton	132-5581	
780.19	148-3471	Nitrile	132-5567	

Contact Caterpillar prior to ordering a field service kit at catseals@cat.com

CAT HEAVY DUTY DUAL FACED SEALS INSTALLATION

Cat Heavy Duty Dual Face Seal Assembly Contents:

1. (2) Metal Seal Rings
2. (2) Rubber Belleville Washers

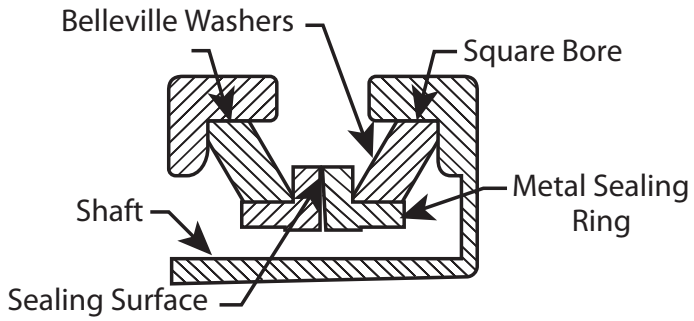
Service Kit Contents:

1. (1) Seal Group
2. Installation Instruction

Field Kit Contents:

1. (2) Rubber Belleville Washers
2. Installation Instructions

Terminology



Handling the Seals

The idea is to protect the seal face. The more precausions taken, the more likely the seals will last in the field.

Staging

When staging, have the seal package on the top shelf of the kit cart or on a flatbed kit cart. (Reasoning: the seals need to be removed from the packaging from the center flaps)

Stacking

Make sure seal packages are not stacked more than 5 high to reduce the risk of tipping during trans-it. (No banding or wracked straps should be used)

Package Removal

Do not remove the seal from the secondary packaging when transporting the seal. This will help ensure the seal does not get damaged and protects it from contamination.

Remove seal from the center flaps of the packaging, allowing more access to the seal and reduce the risk of the seals sliding against each other or another surface causing damage to the seal. Cut the center tape, making sure the knife point is not going to cut the toric or seal. (Use of a safety knife is the best tool for this procedure)

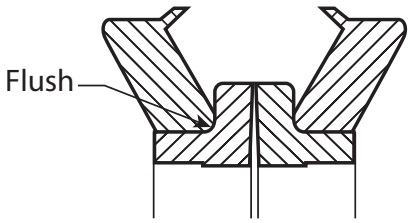
Housing Preparation

The housing components that contact the Belleville Washers must be free from foreign material (oil, grease, dirt, metal chips, dust or lint particles, etc.) before installing the seal. This should be done using a lint-free wipe and a non-petroleum base solvent. Dry with a clean wipe.

Seal rings must be handled with care. Machined seal faces must not be damaged or scratched. All parts are to be free of grease, oil, dirt and scale.

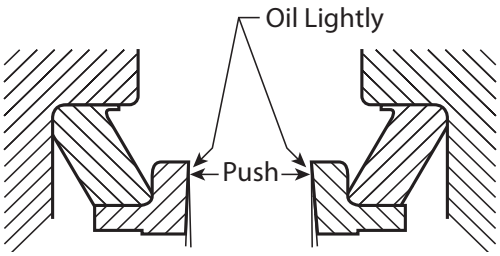
Seal Preparation

Belleville Washers should be installed flush against the inside shoulder of the metal sealing rings.



Installation Process

Install each half seal (Belleville Washer and sealing ring) into the housing by carefully pushing on the seal half until it is fully seated. Check to be sure that the seal is not cocked and that the washer is seated evenly at the bottom of the bore. If the seal is a single barb design, the barbed half goes in the suspended housing to insure no movement of the seal half during the assembly process.



After installing the seal halves into the unit, wipe both metal sealing faces clean with a lint-free wipe. Apply a thin film of oil to the sealing faces with a lint free applicator. Oil must not contact surfaces other than the sealing faces.

Final Assembly

While completing the final assembly of the unit, make sure that both housings are in correct alignment and are concentric. Observe carefully that the rubber rings do not unseat from the bottom of the housing. Slowly bring the two housings together. (High impact can scratch or break the seal components)

To set the seals, hold one-half of the assembly stationary while rotating the other member a minimum of ten complete revolutions. This is very important!

NOTES:

APPLICATION DATA SHEET

Company Name_____

Address _____ City _____

State/Province_____ Zip / Postal Code _____ Country _____

Contact Name _____

Telephone _____ Email _____

Description of proposed seal application _____

_____

Action

Rotating

Normal rotating speed _____ RPM

Maximum rotating speed _____ RPM

Duration of maximum RPM _____ minutes

Time to reach maximum RPM _____ seconds

Oscillating

Angular arc _____ degrees

Frequency _____ cycles / minute

Duration of motion _____ seconds

Sealing System

Shaft size or internal component diameter _____ mm Is seal exposed to the environment? _____

Radial tolerance stack _____ mm Axial tolerance stack _____ mm

Pressure

Is oil compartment vented? _____ If no, what is operating pressure (kPa) _____ Maximum (kPa) _____

If pressurized, where is the pressure (inside / outside / both)? _____

Lubrication

Type of lubricant to be used _____

List other contacting substances to seal (e.g. grease) _____

What is the oil level with relation to the shaft centerline? (mm) _____

Normal operating temperature _____ °C Maximum operating temperature _____ °C

Operating Environment

Prolonged muddy conditions? _____Description _____

Prolonged abrasive conditions (e.g. quarry)? _____ Description _____

Prolonged high temperatures (above 100°C)? _____ Prolonged cold temperatures (below 0°C) _____

Other (e.g. landfill) _____

Assembly Drawing

To determine tolerance stack-up, end play, surface textures, and axial / radial spatial constraint

Gap distance between seals (U-gap) _____

To check design for simplicity, ease of assembly, and exposure to and protection from outside environment

Anticipated Annual Volume

Anticipated Annual Volume:

Year 1:_____, Year 2:_____, Year 3: _____

APPLICATION DATA SHEET

SEAL AREA DATA:

Send data sheet to Caterpillar at catseals@cat.com

APPLICATION DATA SHEET

Company Name_____

Address _____ City _____

State/Province_____ Zip / Postal Code _____ Country _____

Contact Name _____

Telephone _____ Email _____

Description of proposed seal application _____

_____

Action

Rotating

Normal rotating speed _____ RPM

Maximum rotating speed _____ RPM

Duration of maximum RPM _____ minutes

Time to reach maximum RPM _____ seconds

Oscillating

Angular arc _____ degrees

Frequency _____ cycles / minute

Duration of motion _____ seconds

Sealing System

Shaft size or internal component diameter _____ mm Is seal exposed to the environment? _____

Radial tolerance stack _____ mm Axial tolerance stack _____ mm

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What is the oil level with relation to the shaft centerline? (mm) _____

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Prolonged abrasive conditions (e.g. quarry)? _____ Description _____

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Anticipated Annual Volume:

Year 1:_____, Year 2:_____, Year 3: _____

APPLICATION DATA SHEET

SEAL AREA DATA:

For more information on Cat Seals

www.cat.com/cat-seals

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