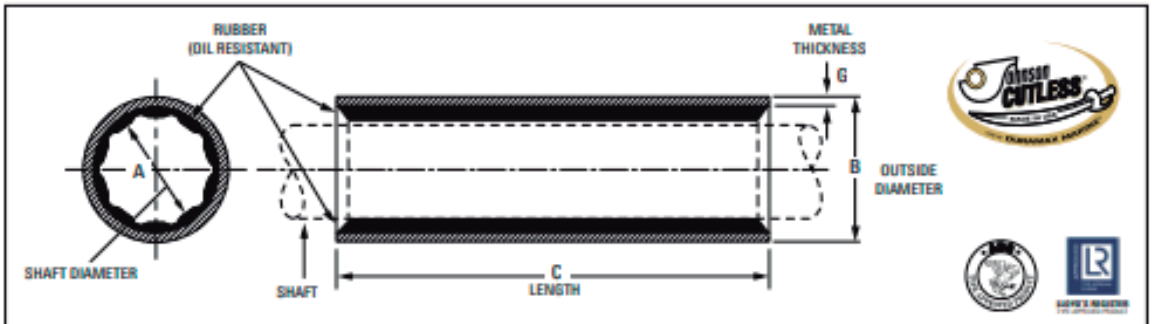
Naval Brass Sleeve Bearings

INCH SIZE SERIES

Johnson Cutless® Naval Brass Sleeve Bearings adapt equally well to strut and stern tube mounts, and are often used effectively as rudder-stock and pintle bushings. Bearing diameters are precision fitted to the designated shaft size with the correct clearance for efficient water lubrication. External brass shells are machined and polished to provide easy fitting. Specially formulated oil and chemical resistant nitrile rubber is securely bonded to the shell. Units with thin shells are available for the struts of small craft. Sleeve bearings are usually installed by light press-fitting and locked in place with cone-pointed set screws.

PRECAUTION:
When shrink fitting of the bearing is required, chilling must be achieved by gradual cooling to not more than minus 20°F(-28°C) using freezer or regular ice **(DO NOT DRY ICE)**. NOTE: Pounding or shocking the bearing while in the chilled state could cause the rubber to separate from the shell.

Approved Bearings: Johnson Cutless® Naval Brass Sleeve Bearings meet military specification MIL-DTL-17901C (SH) Class II Full-Molded type and have full type approval from The American Bureau of Shipping.



Part Number	Code	A Shaft Diameter inches	A Shaft Diameter mm	B Outside Diameter inches	B Outside Diameter mm	C Length inches	C Length mm	G Metal Thickness inches	G Metal Thickness mm	Gross Wt. lb.	Gross Wt. kg.
870152100	ABLE	3/4	19.05	1 1/4	31.75	3	76.20	1/8	3.18	0.5	0.2
870222100	* ACID	7/8	22.23	1 1/4	31.75	3 1/2	88.90	1/16	1.59	0.4	0.2
870222101	APEX	7/8	22.23	1 3/8	34.93	3 1/2	88.90	1/8	3.18	0.7	0.3
870222102	ATOM	7/8	22.23	1 1/2	38.10	3 1/2	88.90	1/8	3.18	0.8	0.4
870252100	* BACK	1	25.40	1 1/4	31.75	4	101.60	1/16	1.59	0.4	0.2
870252144	* BADE	1	25.40	1 1/4	31.75	6	152.40	1/16	1.59	0.6	0.3
870252101	BAIT	1	25.40	1 3/8	34.93	4	101.60	1/16	1.59	0.5	0.2
870252102	BALE	1	25.40	1 1/2	38.10	4	101.60	1/8	3.18	0.7	0.3
870252103	BAND	1	25.40	1 5/8	41.28	4	101.60	1/8	3.18	0.9	0.4
870252104	BASE	1	25.40	2	50.80	4	101.60	1/8	3.18	1.3	0.6
870292100	* BEAM	1 1/8	28.58	1 1/2	38.10	4 1/2	114.30	1/16	1.59	0.6	0.3
870292101	BELT	1 1/8	28.58	1 5/8	41.28	4 1/2	114.30	1/8	3.18	1.0	0.5
870292102	BEND	1 1/8	28.58	1 3/4	44.45	4 1/2	114.30	1/8	3.18	1.1	0.5
870292103	BILL	1 1/8	28.58	2	50.80	4 1/2	114.30	1/8	3.18	1.4	0.6
870322100	* BIND	1 1/4	31.75	1 1/2	38.10	5	127.00	1/16	1.59	0.6	0.3
870322101	BIRD	1 1/4	31.75	1 3/4	44.45	5	127.00	1/8	3.18	1.2	0.5
870322102	BITE	1 1/4	31.75	2	50.80	5	127.00	1/8	3.18	1.5	0.7
870322103	BLOW	1 1/4	31.75	2 1/8	53.98	5	127.00	1/8	3.18	1.7	0.8
870352100	BOAT	1 3/8	34.93	1 7/8	47.63	5 1/2	139.70	1/8	3.18	1.4	0.6
870352101	BOLD	1 3/8	34.93	2	50.80	5 1/2	139.70	1/8	3.18	1.5	0.7
870352102	BOND	1 3/8	34.93	2 1/8	53.98	5 1/2	139.70	1/8	3.18	1.8	0.8
870352103	BOOT	1 3/8	34.93	2 3/8	60.33	5 1/2	139.70	1/8	3.18	1.8	0.8
870382100	BOSS	1 1/2	38.10	2	50.80	6	152.40	1/8	3.18	1.6	0.7
870382101	BRAD	1 1/2	38.10	2 3/8	60.33	6	152.40	1/8	3.18	2.2	1.0
870412100	BREW	1 5/8	41.28	2 1/8	53.98	6 1/2	165.10	1/8	3.18	2.0	1.9
870412101	BRIM	1 5/8	41.28	2 5/8	66.68	6 1/2	165.10	1/8	3.18	2.6	1.2
870452100	BROW	1 3/4	44.45	2 3/8	60.33	7	177.80	1/8	3.18	2.3	1.0

All Bearings Shown Are Carried in Stock *Slimline Bearing

Part Number	Code	A Shaft Diameter		B Outside Diameter		C Length		G Metal Thickness		Gross Wt.	
		inches	mm	inches	mm	inches	mm	inches	mm	lb.	kg.
870452102	BRUT	1 3/4	44.45	2 1/2	63.50	7	177.80	3/32	2.38	2.5	1.1
870452101	BUCK	1 3/4	44.45	2 5/8	66.68	7	177.80	1/8	3.18	2.8	1.3
870482100	BULB	1 7/8	47.63	2 5/8	66.68	7 1/2	190.50	1/8	3.18	2.8	1.3
870482101	BULL	1 7/8	47.63	2 15/16	74.61	7 1/2	190.50	3/32	2.38	3.1	1.4
870512100	CALL	2	50.80	2 5/8	66.68	8	203.20	1/8	3.18	2.8	1.3
870512143	CAMP	2	50.80	2 3/4	69.85	8	203.20	1/8	3.18	3.3	1.5
870512101	CALM	2	50.80	3	76.20	8	203.20	1/8	3.18	3.8	1.7
870542100	CAME	2 1/8	53.98	2 15/16	74.61	8 1/2	215.90	1/8	3.18	3.1	1.4
870542101	CAPE	2 1/8	53.98	3 1/8	79.38	8 1/2	215.90	1/8	3.18	4.1	1.9
870572100	CARE	2 1/4	57.15	2 15/16	74.61	9	228.60	3/32	2.38	3.1	1.4
870572133	CARD	2 1/4	57.15	3	76.20	9	228.60	1/8	3.18	3.9	1.8
870572101	CART	2 1/4	57.15	3 1/8	79.38	9	228.60	1/8	3.18	4.3	2.0
870572102	CASE	2 1/4	57.15	3 3/8	85.73	9	228.60	1/8	3.18	5.1	2.3
870602100	COOK	2 3/8	60.33	3 3/8	85.73	9 1/2	241.30	1/8	3.18	4.8	2.2
870642100	CORD	2 1/2	63.50	3 1/8	79.38	10	254.00	1/8	3.18	4.5	2.0
870642174	CORK	2 1/2	63.50	3 1/4	82.55	10	254.00	1/16	1.59	3.1	1.4
870642101	CORN	2 1/2	63.50	3 3/8	85.73	10	254.00	1/8	3.18	5.1	2.3
870642134	COVE	2 1/2	63.50	3 1/2	88.90	10	254.00	5/32	3.97	6.6	3.0
870672100	CRAB	2 5/8	66.68	3 3/8	85.73	10 1/2	266.70	1/8	3.18	5.2	2.4
870702100	CROW	2 3/4	69.85	3 3/8	85.73	11	279.40	1/8	3.18	4.8	2.2
870702139	CUBE	2 3/4	69.85	3 1/2	88.90	11	279.40	5/32	3.97	6.6	3.0
870702101	CURD	2 3/4	69.85	3 3/4	95.25	11	279.40	1/8	3.18	6.6	3.0
870732100	CURE	2 7/8	73.03	3 3/4	95.25	11 1/2	292.10	1/8	3.18	6.5	2.9
870762100	DANE	3	76.20	3 3/4	95.25	12	304.80	1/8	3.18	6.8	3.1
870762101	DARE	3	76.20	4	101.60	12	304.80	1/8	3.18	7.7	3.5
870802100	DARK	3 1/8	79.38	4 1/4	107.95	12 1/2	317.50	1/8	3.18	8.6	3.9
870832100	DARN	3 1/4	82.55	4	101.60	13	330.20	1/8	3.18	7.8	3.5
870832101	DELL	3 1/4	82.55	4 1/4	107.95	13	330.20	1/8	3.18	8.7	3.9
870862100	DIKE	3 3/8	85.73	4 1/2	114.30	13 1/2	342.90	1/8	3.18	10.2	4.6
870892100	DINE	3 1/2	88.90	4 1/4	107.95	14	355.60	1/8	3.18	8.9	4.0
870892101	DOCK	3 1/2	88.90	4 1/2	114.30	14	355.60	1/8	3.18	10.3	4.7
870922100	DOLE	3 5/8	92.08	4 1/2	114.30	14 1/2	368.30	1/8	3.18	10.0	4.5
870952100	DONE	3 3/4	95.25	4 1/2	114.30	15	381.00	1/8	3.18	9.6	4.4
870952101	DOVE	3 3/4	95.25	5	127.00	15	381.00	3/16	4.76	16.5	7.5
870952102	DRAW	3 3/4	95.25	5 1/4	133.35	15	381.00	3/16	4.76	18.2	8.3
870992100	DULL	3 7/8	98.43	5 1/4	133.35	15 1/2	393.70	3/16	4.76	18.7	8.5
871022100	EARN	4	101.60	5	127.00	16	406.40	3/16	4.76	16.9	7.7
871022101	EASE	4	101.60	5 1/4	133.35	16	406.40	3/16	4.76	18.7	8.5
871052100	ECHO	4 1/8	104.78	5 1/4	133.35	16 1/2	419.10	3/16	4.76	19.0	8.6
871082100	EDIT	4 1/4	107.95	5 1/2	139.70	17	431.80	3/16	4.76	22.0	10.0
871112100	ELSE	4 3/8	111.13	5 3/4	146.05	17 1/2	444.50	3/16	4.76	23.7	10.8
871152100	EPIC	4 1/2	114.30	5 1/2	139.70	18	457.20	3/16	4.76	21.3	9.7
871152101	EDGE	4 1/2	114.30	5 3/4	146.05	18	457.20	3/16	4.76	23.7	10.8
871182100	EVEN	4 5/8	117.48	6 1/8	155.58	18 1/2	469.90	1/4	6.35	42.0	19.1
871212100	EVER	4 3/4	120.65	6 1/8	155.58	19	482.60	1/4	6.35	41.0	18.6
871242100	EVIL	4 7/8	123.83	6 1/8	155.58	19 1/2	495.30	1/4	6.35	41.7	18.9
871272100	FACE	5	127.00	6 1/8	155.58	20	508.00	1/4	6.35	42.3	19.2
871272101	FACT	5	127.00	6 1/2	165.10	20	508.00	1/4	6.35	48.7	22.1
871342100	FADE	5 1/4	133.35	6 3/4	171.45	21	533.40	1/4	6.35	50.3	22.8
871342101	FARE	5 1/4	133.35	7	177.80	21	533.40	1/4	6.35	55.0	24.9
871372100	FEAR	5 3/8	136.53	6 3/4	171.45	21 1/2	546.10	1/4	6.35	51.3	23.3
871372101	FELT	5 3/8	136.53	7	177.80	21 1/2	546.10	1/4	6.35	56.0	25.4
871402100	FIND	5 1/2	139.70	7	177.80	22	558.80	1/4	6.35	56.0	25.4
871402181	FLAG	5 1/2	139.70	7 1/4	184.15	22	558.80	3/8	9.53	58.2	26.4
871432100	FLAT	5 5/8	142.88	7	177.80	22 1/2	571.50	1/4	6.35	55.5	25.2
871462100	FORK	5 3/4	146.05	7	177.80	23	584.20	1/4	6.35	56.5	25.6
871502100	FUEL	5 7/8	149.23	7 1/2	190.50	24	609.60	1/4	6.35	65.8	29.8
871532100	GALE	6	152.40	7 1/2	190.50	24	609.60	1/4	6.35	66.0	29.9
871662100	GOLD	6 1/2	165.10	8 3/8	212.73	30	762.00	7/16	11.11	150.0	68.0

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METRIC SIZE SERIES

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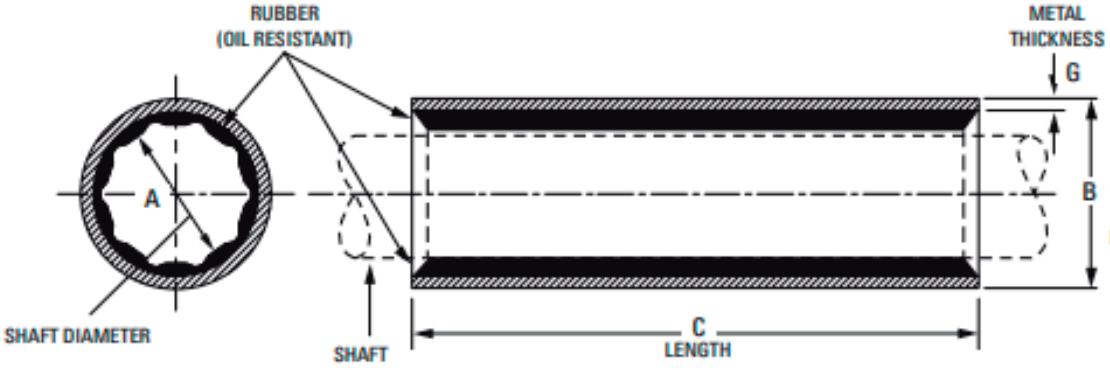

Part Number	A Shaft Diameter mm	B Outside Diameter mm	C Length mm	G Metal Thickness mm	Gross Wt. lb.	Gross Wt. kg.
870254100	25	40	100	2.54	0.8	0.4
870284100	28	42	112	2.35	0.7	0.3
870304100	30	45	120	3.07	1.2	0.5
870324100	32	45	128	3.07	1.3	0.6
870354100	35	50	140	3.07	1.5	0.7
870384100	38	55	152	3.07	1.7	0.8
870404100	40	55	160	3.07	1.8	0.8
870454100	45	65	180	3.30	2.8	1.3
870504100	50	70	200	3.26	3.1	1.4
870554100	55	75	220	2.58	3.8	1.7
870604100	60	80	240	3.26	4.5	2.0
870654100	65	85	260	2.82	4.8	2.2
870704100	70	90	280	4.76	5.8	2.6
870754100	75	95	300	3.05	6.7	3.0
870804100	80	100	320	3.17	7.7	3.5
870854100	85	105	340	3.19	8.7	3.9
870904100	90	110	360	4.78	12.5	5.7
870954100	95	115	380	4.51	13.3	6.0
871004100	100	125	400	3.77	14.3	6.5
871054100	105	130	420	4.52	17.6	8.0
871104100	110	135	440	4.51	19.0	8.6
871154100	115	145	460	4.25	25.3	11.0
871204100	120	155	480	6.06	31.6	14.0
871304100	130	170	520	5.63	49.0	22.0
871404100	140	180	560	7.45	56.0	25.0

Non-Metallic Sleeve Bearings

METRIC SIZE SERIES

Johnson Cutless® Non-Metallic Sleeve Bearings feature a dense structure of engineered reinforced thermoset plastic. The specially compounded Nitrile Rubber is securely bonded to the shell with all tolerances maintained for proper lubrication. Being non-corrosive and inherently resistant to all known chemicals, oil and grease, as well as being anti-electrolytic, the Johnson Cutless® Non-Metallic Sleeve Bearings are ideally suited for installations wherever corrosion or electrolysis is a problem.

PRECAUTION:

When shrink fitting of the bearing is required, chilling must be achieved by gradual cooling to not more than minus 20°F(-28°C) using freezer or regular ice **(DO NOT DRY ICE)**. NOTE: Pounding or shocking the bearing while in the chilled state could cause the rubber to separate from the shell.

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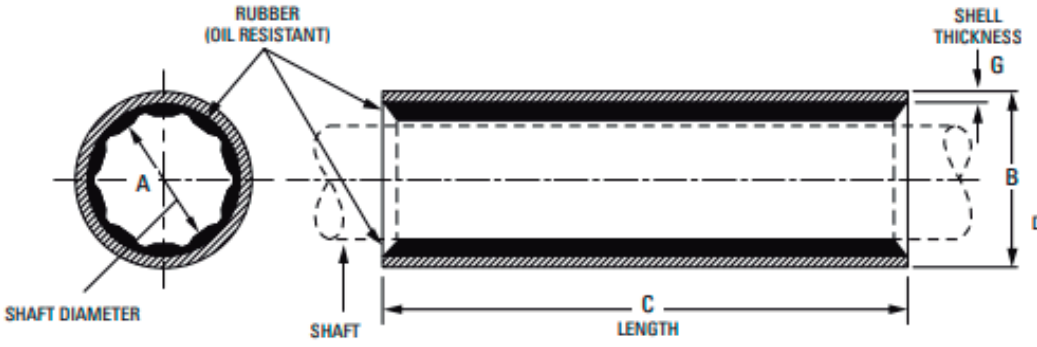

Part Number	A Shaft Diameter mm	B Outside Diameter mm	C Length mm	G Shell Thickness mm	Gross Wt. lb.	Gross Wt. kg.
870255700	25	40	100	2.54	0.3	0.1
870285700	28	42	112	2.35	0.4	0.2
870305700	30	45	120	3.07	0.4	0.2
870325700	32	45	128	3.07	0.5	0.2
870355700	35	50	140	3.07	0.5	0.2
870385700	38	55	152	3.07	0.6	0.3
870405700	40	55	160	3.07	0.6	0.3
870455700	45	65	180	3.30	0.9	0.4
870505700	50	70	200	3.25	1.1	0.5
870555700	55	75	220	2.58	1.3	0.6
870605700	60	80	240	3.25	1.6	0.7
870655700	65	85	260	2.81	1.8	0.8
870705700	70	90	280	4.75	2.0	0.9
870755700	75	95	300	3.05	2.5	1.1
870805700	80	100	320	3.16	2.6	1.2
870855700	85	105	340	3.17	3.0	1.4
870905700	90	110	360	4.76	3.4	1.5
870955700	95	115	380	4.50	4.0	1.8
871005700	100	125	400	3.76	4.6	2.1
871055700	105	130	420	4.51	5.2	2.4
871105700	110	135	440	4.51	6.0	2.7
871155700	115	145	460	4.24	7.6	3.4
871205700	120	155	480	6.06	8.6	3.9
871305700	130	170	520	5.63	13.0	5.9

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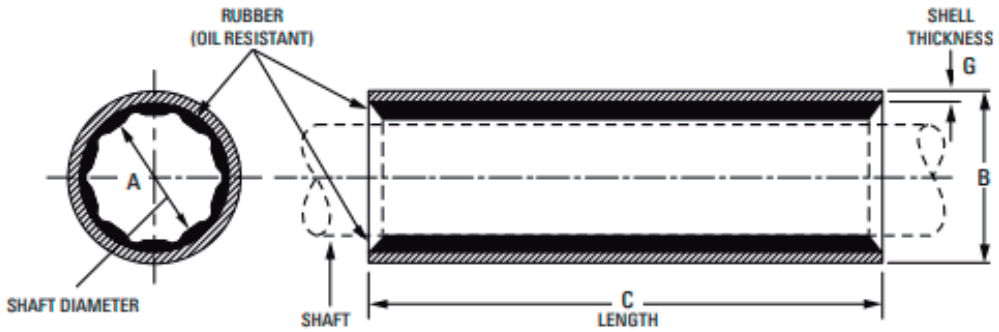

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870193700	ALDA	3/4	19.05	1 1/4	31.75	3	76.20	1/8	3.18	0.2	0.1
870223700	ALICE	7/8	22.23	1 1/4	31.75	3 1/2	88.90	3/64	1.19	0.2	0.1
870223701	ANNE	7/8	22.23	1 3/8	34.93	3 1/2	88.90	1/8	3.18	0.2	0.1
870223702	ARDELE	7/8	22.23	1 1/2	38.10	3 1/2	88.90	1/8	3.18	0.3	0.1
870253700	BABE	1	25.40	1 1/4	31.75	4	101.60	1/16	1.59	0.2	0.1
870253701	BECKY	1	25.40	1 3/8	34.93	4	101.60	3/64	1.19	0.2	0.1
870253702	BETTY	1	25.40	1 1/2	38.10	4	101.60	1/8	3.18	0.3	0.1
870253703	CANDY	1	25.40	1 5/8	41.28	4	101.60	1/8	3.18	0.3	0.1
870253704	CARLA	1	25.40	2	50.80	4	101.60	1/8	3.18	0.5	0.2
870293700	CEIL	1 1/8	28.58	1 1/2	38.10	4 1/2	114.30	3/64	1.19	0.3	0.1
870293701	CINDY	1 1/8	28.58	1 5/8	41.28	4 1/2	114.30	1/8	3.18	0.3	0.1
870293702	CONNIE	1 1/8	28.58	1 3/4	44.45	4 1/2	114.30	1/8	3.18	0.4	0.2
870293703	CORA	1 1/8	28.58	2	50.80	4 1/2	114.30	1/8	3.18	0.5	0.2
870323700	DEENA	1 1/4	31.75	1 1/2	38.10	5	127.00	3/64	1.19	0.2	0.1
870323701	DELLA	1 1/4	31.75	1 3/4	44.45	5	127.00	1/8	3.18	0.4	0.2
870323702	DORIS	1 1/4	31.75	2	50.80	5	127.00	1/8	3.18	0.6	0.3
870323703	DOTTY	1 1/4	31.75	2 1/8	53.98	5	127.00	1/8	3.18	0.6	0.3
870353700	EDNA	1 3/8	34.93	1 7/8	47.63	5 1/2	139.70	1/8	3.18	0.4	0.2
870353701	ELLEN	1 3/8	34.93	2	50.80	5 1/2	139.70	1/8	3.18	0.5	0.2
870353702	ELSA	1 3/8	34.93	2 1/8	53.98	5 1/2	139.70	1/8	3.18	0.6	0.3
870353703	ERMA	1 3/8	34.93	2 3/8	60.33	5 1/2	139.70	1/8	3.18	0.9	0.4
870383700	EVA	1 1/2	38.10	2	50.80	6	152.40	1/8	3.18	0.5	0.2
870383701	FANNY	1 1/2	38.10	2 3/8	60.33	6	152.40	1/8	3.18	0.9	0.4
870413700	FLO	1 5/8	41.28	2 1/8	53.98	6 1/2	165.10	1/8	3.18	0.6	0.3
870413701	FRAN	1 5/8	41.28	2 5/8	66.68	6 1/2	165.10	1/8	3.18	1.1	0.5

All Bearings Shown Are Carried in Stock

Part Number	Code	A Shaft Diameter		B Outside Diameter		C Length		G Shell Thickness		Gross Wt.	
		inches	mm	inches	mm	inches	mm	inches	mm	lb.	kg.
870453700	GLENDA	1 3/4	44.45	2 3/8	60.33	7	177.80	1/8	3.18	0.7	0.3
870453702	GLENNIS	1 3/4	44.45	2 1/2	63.50	7	177.80	3/32	2.38	0.8	0.4
870453701	GLORIA	1 3/4	44.45	2 5/8	66.68	7	177.80	1/8	3.18	0.9	0.4
870483700	GWEN	1 7/8	47.63	2 5/8	66.68	7 1/2	190.50	1/8	3.18	0.8	0.4
870483701	HANNA	1 7/8	47.63	2 15/16	74.61	7 1/2	190.50	1/8	3.18	1.5	0.7
870513700	HAZEL	2	50.80	2 5/8	66.68	8	203.20	1/8	3.18	0.8	0.4
870513701	HELEN	2	50.80	3	76.20	8	203.20	1/8	3.18	1.5	0.7
870543700	HILDA	2 1/8	53.98	2 15/16	74.61	8 1/2	215.90	1/8	3.18	1.3	0.6
870543701	ILA	2 1/8	53.98	3 1/8	79.38	8 1/2	215.90	1/8	3.18	1.6	0.7
870573700	INEZ	2 1/4	57.15	2 15/16	74.61	9	228.60	1/8	3.18	1.2	0.5
870573701	INGRID	2 1/4	57.15	3 1/8	79.38	9	228.60	1/8	3.18	1.4	0.6
870573702	IRENE	2 1/4	57.15	3 3/8	85.73	9	228.60	1/8	3.18	1.6	0.7
870573735	IRIS	2 1/4	57.15	3	76.20	9	228.60	1/8	3.18	3.9	1.8
870603700	JENNY	2 3/8	60.33	3 3/8	85.73	9 1/2	241.30	1/8	3.18	1.7	0.8
870643700	JOAN	2 1/2	63.50	3 1/8	79.38	10	254.00	1/8	3.18	1.4	0.6
870643701	JOSIE	2 1/2	63.50	3 3/8	85.73	10	254.00	1/8	3.18	2.0	0.9
870673700	JOYCE	2 5/8	66.68	3 3/8	85.73	10 1/2	266.70	1/8	3.18	1.8	0.8
870703700	JUNE	2 3/4	69.85	3 3/8	85.73	11	279.40	1/8	3.18	1.6	0.7
870703701	KATHY	2 3/4	69.85	3 3/4	95.25	11	279.40	1/8	3.18	2.6	1.2
870733700	KELLY	2 7/8	73.03	3 3/4	95.25	11 1/2	292.10	1/8	3.18	2.5	1.1
870763700	KIM	3	76.20	3 3/4	95.25	12	304.80	1/8	3.18	2.4	1.1
870763701	LAURA	3	76.20	4	101.60	12	304.80	1/8	3.18	3.1	1.4
870803700	LENA	3 1/8	79.38	4 1/4	107.95	12 1/2	317.50	1/8	3.18	3.8	1.7
870833700	LINDA	3 1/4	82.55	4	101.60	13	330.20	1/8	3.18	2.7	1.2
870833701	LISA	3 1/4	82.55	4 1/4	107.95	13	330.20	1/8	3.18	3.5	1.6
870863700	LOIS	3 3/8	85.73	4 1/2	114.30	13 1/2	342.90	1/8	3.18	4.3	2.0
870893700	MANDY	3 1/2	88.90	4 1/4	107.95	14	355.60	1/8	3.18	3.1	1.4
870893701	MARIE	3 1/2	88.90	4 1/2	114.30	14	355.60	1/8	3.18	4.1	1.9
870923700	MARTHA	3 5/8	92.08	4 1/2	114.30	14 1/2	368.30	1/8	3.18	3.7	1.7
870953700	MARY	3 3/4	95.25	4 1/2	114.30	15	381.00	1/8	3.18	3.5	1.6
870953701	NANCY	3 3/4	95.25	5	127.00	15	381.00	3/16	4.76	5.9	2.7
870953702	NEVA	3 3/4	95.25	5 1/4	133.35	15	381.00	3/16	4.76	7.4	3.4
870993700	NORA	3 7/8	98.43	5 1/4	133.35	15 1/2	393.70	3/16	4.76	6.4	2.9
871023700	OLGA	4	101.60	5	127.00	16	406.40	3/16	4.76	5.3	2.4
871023701	OLIVE	4	101.60	5 1/4	133.35	16	406.40	3/16	4.76	6.4	2.9
871053700	OPAL	4 1/8	104.78	5 1/4	133.35	16 1/2	419.10	3/16	4.76	6.3	2.9
871083700	PAM	4 1/4	107.95	5 1/2	139.70	17	431.80	3/16	4.76	8.3	3.8
871113700	PANSY	4 3/8	111.13	5 3/4	146.05	17 1/2	444.50	3/16	4.76	8.8	4.0
871153700	PAULA	4 1/2	114.30	5 1/2	139.70	18	457.20	3/16	4.76	7.3	3.3
871153701	PENNY	4 1/2	114.30	5 3/4	146.05	18	457.20	3/16	4.76	8.8	4.0
871183700	RHODA	4 5/8	117.48	6 1/8	155.58	18 1/2	469.90	1/4	6.35	11.3	5.1
871213700	RINA	4 3/4	120.65	6 1/8	155.58	19	482.60	1/4	6.35	11.0	5.0
871243700	ROSE	4 7/8	123.83	6 1/8	155.58	19 1/2	495.30	1/4	6.35	10.3	4.7
871273700	RUTH	5	127.00	6 1/8	155.58	20	508.00	1/4	6.35	9.5	4.3
871273701	SALLY	5	127.00	6 1/2	165.10	20	508.00	1/4	6.35	13.0	5.9
871343700	SANDRA	5 1/4	133.35	6 3/4	171.45	21	533.40	1/4	6.35	14.0	6.4
871343701	SARAN	5 1/4	133.35	7	177.80	21	533.40	1/4	6.35	16.0	7.3
871373700	SUSAN	5 3/8	136.53	6 3/4	171.45	21 1/2	546.10	1/4	6.35	12.8	5.8
871373701	TONI	5 3/8	136.53	7	177.80	21 1/2	546.10	1/4	6.35	15.8	7.2
871403700	TRICIA	5 1/2	139.70	7	177.80	22	558.80	1/4	6.35	14.8	6.7
871433700	VERA	5 5/8	142.88	7	177.80	22 1/2	571.50	1/4	6.35	14.0	6.4
871463700	WANDA	5 3/4	146.05	7	177.80	23	584.20	1/4	6.35	14.8	6.7
871503700	WINNIE	5 7/8	149.23	7 1/2	190.50	24	609.60	1/4	6.35	18.0	8.2
871533700	ZELDA	6	152.40	7 1/2	190.50	24	609.60	1/4	6.35	18.8	8.5

All Bearings Shown Are Carried in Stock

Solid Naval Brass Flanged Bearings

STRUT OR AFT STERN TUBE

FLANGE DRILLING DIAGRAM ON PAGE 18

Johnson Cutless® Flanged Bearings are centrifugally cast naval brass with an integral flange for bolting to stern tube or strut housing to retain bearing and prevent rotation in housing. Specially formulated oil and chemical resistant nitrile rubber is securely bonded to the shell. Shells are heavy walled providing structural strength and can be step turned if desired. Flanges are furnished UN-DRILLED unless specified. See page 18 for Drilling Diagrams. For Split and Stepped Styles see pages 14-17.

PRECAUTION:

When shrink fitting of the bearing is required, chilling must be achieved by gradual cooling to not more than minus 20°F(-28°C) using freezer or regular ice (DO NOT DRY ICE). NOTE: Pounding or shocking the bearing while in the chilled state could cause the rubber to separate from the shell.

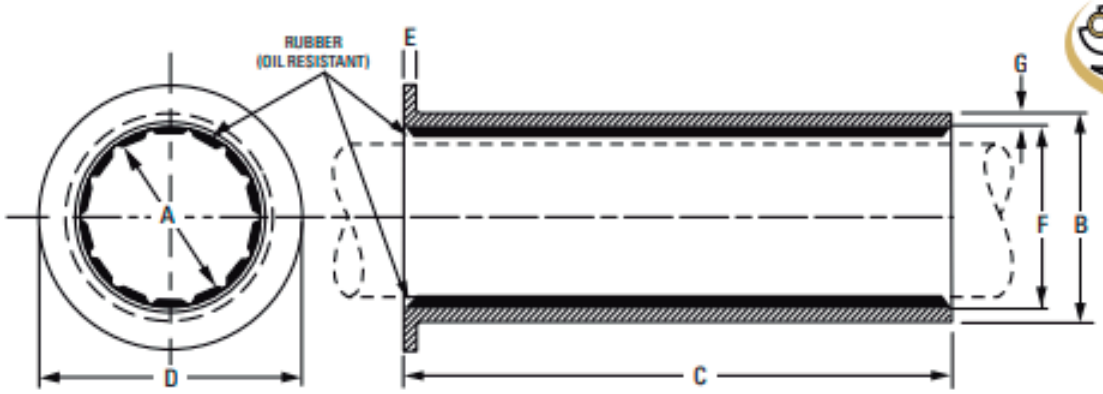
Approved Bearings: Johnson Cutless® Naval Brass Flanged Bearings meet military specification MIL-DTL-17901C (SH) Class II Full-Molded type and have full type approval from The American Bureau of Shipping.

Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness		Gross Wt.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs.	kg.
860512102	BRACE	2	50.80	3	76.20	8	203.20	5	127.00	3/8	9.53	2 5/8	66.68	3/16	4.76	7	3.2
860642100	BROAD	2 1/2	63.50	3 3/8	85.73	10	254.00	5 1/2	139.70	3/8	9.53	3 1/8	79.38	1/8	3.18	9	4.1
860762100	CATCH	3	76.20	4 1/4	107.95	12	304.80	6 3/4	171.45	1/2	12.70	3 3/4	95.25	1/4	6.35	20	9.1
860832100	CLAMP	3 1/4	82.55	4 1/2	114.30	13	330.20	7	177.80	1/2	12.70	4	101.60	1/4	6.35	22	10.0
860892100	CRANK	3 1/2	88.90	4 3/4	120.65	12 1/2	317.50	6 3/4	171.45	1/2	12.70	4 1/4	107.95	1/4	6.35	21	9.5
860892101	CLEAR	3 1/2	88.90	4 7/8	123.83	14	355.60	7 3/8	187.33	1/2	12.70	4 1/4	107.95	5/16	7.94	29	13.2
860952100	CIVIL	3 3/4	95.25	5 1/4	133.35	15	381.00	7 3/4	196.85	1/2	12.70	4 5/8	117.48	5/16	7.94	32	14.5
861022100	DRAFT	4	101.60	5 1/2	139.70	16	406.40	8	203.20	1/2	12.70	4 7/8	123.83	5/16	7.94	36	16.3
861082100	DREAD	4 1/4	107.95	5 3/4	146.05	17	431.80	8 1/4	209.55	1/2	12.70	5 1/8	130.18	5/16	7.94	48	21.8
861112100	DANCE	4 3/8	111.13	6	152.40	22	558.80	8 7/8	225.43	1/2	12.70	5 3/8	136.53	5/16	7.94	64	29.0
861152100	DRINK	4 1/2	114.30	6	152.40	18	457.20	8 7/8	225.43	1/2	12.70	5 3/8	136.53	5/16	7.94	56	25.4
861212100	DROVE	4 3/4	120.65	6 1/4	158.75	19	482.60	9 1/8	231.78	1/2	12.70	5 5/8	142.88	5/16	7.94	62	28.1
861272100	EARTH	5	127.00	6 3/4	171.45	20	508.00	9 5/8	244.48	9/16	14.29	6	152.40	3/8	9.53	76	34.5
861342100	EASEL	5 1/4	133.35	6 7/8	174.63	21	533.40	9 7/8	250.83	9/16	14.29	6 1/8	155.58	3/8	9.53	81	36.7
861402100	ERASE	5 1/2	139.70	7 1/4	184.15	22	558.80	10 1/4	260.35	9/16	14.29	6 1/2	165.10	3/8	9.53	86	39.0
861462100	EVENT	5 3/4	146.05	7 1/4	184.15	23	584.20	10 1/4	260.35	9/16	14.29	6 1/2	165.10	3/8	9.53	88	39.9
861532100	FABLE	6	152.40	7 3/4	196.85	15	381.00	12 1/4	311.15	9/16	14.29	6 1/2	165.10	3/8	9.53	75	34.0
861532101	FAULT	6	152.40	7 3/4	196.85	24	609.60	11	279.40	9/16	14.29	7	177.80	3/8	9.53	101	45.8
———	———	6 1/8	155.58	7 7/8	200.03	22	558.80	10 1/2	266.70	9/16	14.29	7	177.80	3/8	9.53	———	———
861592100	FENCE	6 1/4	158.75	8	203.20	22 1/2	571.50	10 5/8	269.88	9/16	14.29	7 1/8	180.98	3/8	9.53	97	44.0
———	———	6 3/8	161.93	8 1/8	206.38	23	584.20	10 3/4	273.05	9/16	14.29	7 1/4	184.15	3/8	9.53	———	———
861662100	FLARE	6 1/2	165.10	8 3/8	212.73	23 1/2	596.90	11	279.40	9/16	14.29	7 3/8	187.33	7/16	11.11	113	51.3
861662101	FLEET	6 1/2	165.10	8 3/8	212.73	30	762.00	11	279.40	5/8	15.88	7 1/2	190.50	7/16	11.11	141	64.0
861692100	FLUTE	6 5/8	168.28	8 1/2	215.90	15	381.00	13 1/2	342.90	5/8	15.88	7 1/2	190.50	7/16	11.11	100	45.4
861692101	FLOOR	6 5/8	168.28	8 1/2	215.90	24	609.60	11 1/4	285.75	9/16	14.29	7 5/8	193.68	7/16	11.11	133	60.3
861692103	FRANK	6 5/8	168.28	8 5/8	219.08	24	609.60	11 1/4	285.75	9/16	14.29	7 5/8	193.68	3/8	9.53	130	59.0
861722100	FROZE	6 3/4	171.45	8 3/4	222.25	24	609.60	11 1/4	285.75	5/8	15.88	7 7/8	200.03	7/16	11.11	127	57.6
861722101	FANCY	6 3/4	171.45	8 3/4	222.25	24 1/2	622.30	11 3/8	288.93	9/16	14.29	7 7/8	200.03	7/16	11.11	135	61.2
861752100	FOUND	6 7/8	174.63	8 7/8	225.43	24 1/2	622.30	11 3/8	288.93	9/16	14.29	7 7/8	200.03	1/2	12.70	134	60.8
861752101	———	6 7/8	174.63	8 7/8	225.43	25	635.00	11 1/2	292.10	9/16	14.29	8	203.20	3/16	4.76	———	———
861782100	GAVEL	7	177.80	9	228.60	25 1/2	647.70	11 5/8	295.28	9/16	14.29	8 1/8	206.38	7/16	11.11	140	63.5
861782101	GLAND	7	177.80	9 1/8	231.78	25 1/2	647.70	11 5/8	295.28	9/16	14.29	8 1/8	206.38	1/2	12.70	154	69.9
———	———	7 1/8	180.98	9 1/8	231.78	25 1/2	647.70	11 3/4	298.45	9/16	14.29	8 1/4	209.55	7/16	11.11	———	———
861852100	GLASS	7 1/4	184.15	9 1/4	234.95	26 1/2	673.10	11 7/8	301.63	9/16	14.29	8 3/8	212.73	7/16	11.11	150	68.0
———	———	7 3/8	187.33	9 1/2	241.30	27	685.80	12 1/8	307.98	9/16	14.29	8 5/8	219.08	7/16	11.11	———	———
861912100	GLORY	7 1/2	190.50	9 5/8	244.48	17 1/2	444.50	14 1/2	368.30	1	25.40	8 3/4	222.25	7/16	11.11	129	58.5
861912101	GLOBE	7 1/2	190.50	9 5/8	244.48	27 1/2	698.50	12 3/4	323.85	9/16	14.29	8 3/4	222.25	7/16	11.11	160	72.6
———	———	7 5/8	193.68	9 3/4	247.65	28	711.20	12 3/8	314.33	9/16	14.29	8 3/4	222.25	1/2	12.70	———	———
861972100	GIPSY	7 3/4	196.85	9 7/8	250.83	28 1/2	723.90	12 1/2	317.50	9/16	14.29	8 7/8	225.43	1/2	12.70	180	81.6
———	———	7 7/8	200.03	10	254.00	29 1/2	749.30	12 5/8	320.68	9/16	14.29	9 1/8	231.78	7/16	11.11	———	———
862042101	HEART	8	203.20	10 1/4	260.35	29 1/2	749.30	13 1/4	336.55	5/8	15.88	9 1/2	241.30	3/8	9.53	166	75.3
862042102	HEDGE	8	203.20	10 1/2	266.70	29 1/2	749.30	13 1/4	336.55	5/8	15.88	9 1/2	241.30	1/2	12.70	210	95.3
———	———	8 1/8	206.38	10 3/8	263.53	30	762.00	13 3/8	339.73	5/8	15.88	9 3/8	238.13	1/2	12.70	———	———
862102100	HITCH	8 1/4	209.55	10 1/2	266.70	30 1/2	774.70	13 1/2	342.90	5/8	15.88	9 1/2	241.30	1/2	12.70	208	94.3
———	———	8 3/8	212.73	10 5/8	269.88	31	787.40	13 5/8	346.08	5/8	15.88	9 5/8	244.48	1/2	12.70	———	———
862172100	HOIST	8 1/2	215.90	10 3/4	273.05	31 1/2	800.10	13 3/4	349.25	5/8	15.88	9 3/4	247.65	1/2	12.70	215	97.5
———	———	8 5/8	219.08	10 7/8	276.23	32	812.80	13 7/8	352.43	5/8	15.88	9 7/8	250.83	1	25.40	———	———
862232100	HOVER	8 3/4	222.25	11	279.40	32 1/2	825.50	14	355.60	5/8	15.88	10	254.00	1/2	12.70	233	105.7
———	———	8 7/8	225.43	11 1/8	282.58	33	838.20	14 1/8	358.78	3/4	19.05	10 1/8	257.18	1/2	12.70	———	———
862292100	INFRA	9	228.60	11 1/4	285.75	33 1/2	850.90	14 1/4	361.95	3/4	19.05	10 1/4	260.35	1/2	12.70	254	115.2
862292101	IDEAL	9	228.60	11 1/2	292.10	33 3/8	847.73	15	381.00	3/4	19.05	10 1/4	260.35	5/8	15.88	301	136.5

NOTE: *Dimensions for each size bearing continue across both pages.*

MEREX

A = SHAFT DIAMETER
B = OUTSIDE DIAMETER
C = LENGTH
D = FLANGE DIAMETER
E = FLANGE THICKNESS
F = METAL I.D.
G = METAL THICKNESS



Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness		Gross Wt.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs.	kg.
862332101	———	9 1/8	231.78	11 3/8	288.93	34	863.60	14 1/2	368.30	3/4	19.05	10 3/8	263.53	1/2	12.70	———	———
862332100	INNER	9 1/8	231.78	11 1/2	292.10	34 1/2	876.30	16 3/8	415.93	5/8	15.88	10 3/8	263.53	9/16	14.29	284	128.8
862362100	IRISH	9 1/4	234.95	11 1/2	292.10	34 1/2	876.30	14 5/8	371.48	11/16	17.46	10 1/2	266.70	1/2	12.70	260	117.9
862392100	———	9 3/8	238.13	11 5/8	295.28	35	889.00	14 3/4	374.65	3/4	19.05	10 5/8	269.88	1/2	12.70	———	———
862422100	INSET	9 1/2	241.30	11 3/4	298.45	35 1/2	901.70	14 7/8	377.83	3/4	19.05	10 3/4	273.05	1/2	12.70	274	124.3
862452100	———	9 5/8	244.48	11 7/8	301.63	36	914.40	15	381.00	3/4	19.05	10 7/8	276.23	1/2	12.70	———	———
862482100	IVORY	9 3/4	247.65	12 1/8	307.98	36 1/2	927.10	15 1/4	387.35	3/4	19.05	11	279.40	9/16	14.29	307	139.3
———	———	9 7/8	250.83	12 1/4	311.15	37	939.80	15 3/8	390.53	3/4	19.05	11 1/8	282.58	9/16	14.29	———	———
862552100	JEWEL	10	254.00	12 3/8	314.33	37 1/2	952.50	15 1/2	393.70	3/4	19.05	11 1/4	285.75	9/16	14.29	333	151.1
862582100	———	10 1/8	257.18	12 1/2	317.50	38	965.20	15 5/8	396.88	3/4	19.05	11 1/4	285.75	5/8	15.88	———	———
862612100	JETTY	10 1/4	260.35	12 5/8	320.68	38 1/2	977.90	15 7/8	403.23	3/4	19.05	11 1/2	292.10	9/16	14.29	352	159.7
———	———	10 3/8	263.53	12 3/4	323.85	39	990.60	16	406.40	3/4	19.05	11 5/8	295.28	9/16	14.29	———	———
862682100	JUMBO	10 1/2	266.70	12 7/8	327.03	39 1/2	1003.30	16 1/8	409.58	3/4	19.05	11 3/4	298.45	9/16	14.29	350	158.8
———	———	10 5/8	269.88	13	330.20	40	1016.00	16 1/4	412.75	3/4	19.05	11 7/8	301.63	9/16	14.29	———	———
862742100	JUDGE	10 3/4	273.05	13 1/8	333.38	40 1/2	1028.70	16 3/8	415.93	3/4	19.05	12	304.80	9/16	14.29	368	166.9
———	———	10 7/8	276.23	13 1/4	336.55	41	1041.40	17	431.80	3/4	19.05	12 1/8	307.98	9/16	14.29	———	———
862802100	KNOCK	11	279.40	13 1/2	342.90	41 1/2	1054.10	17 1/4	438.15	3/4	19.05	12 3/8	314.33	9/16	14.29	420	190.5
———	———	11 1/8	282.58	13 5/8	346.08	42	1066.80	17 3/8	441.33	3/4	19.05	12 1/2	317.50	9/16	14.29	———	———
862872100	KRAFT	11 1/4	285.75	13 3/4	349.25	42 1/2	1079.50	17 1/2	444.50	3/4	19.05	12 5/8	320.68	9/16	14.29	432	196.0
———	———	11 3/8	288.93	14	355.60	43	1092.20	17 3/4	450.85	3/4	19.05	12 3/4	323.85	5/8	15.88	———	———
862932101	KNEEL	11 1/2	292.10	14 1/8	358.78	43 1/2	1104.90	17 7/8	454.03	3/4	19.05	12 7/8	327.03	5/8	15.88	482	218.6
862932100	KNIFE	11 1/2	292.10	14 7/8	377.83	50 3/4	1289.05	20 1/4	514.35	1 1/4	31.75	12 7/8	327.03	1	25.40	860	390.1
862962100	———	11 5/8	295.28	14 1/4	361.95	44	1117.60	18	457.20	3/4	19.05	13	330.20	5/8	15.88	———	———
862992100	KNOTS	11 3/4	298.45	14 3/8	365.13	44 1/2	1130.30	18 1/8	460.38	3/4	19.05	13 1/8	333.38	5/8	15.88	502	227.7
———	———	11 7/8	301.63	14 1/2	368.30	45	1143.00	18 1/4	463.55	3/4	19.05	13 1/4	336.55	5/8	15.88	———	———
863062100	LABOR	12	304.80	14 3/4	374.65	45 1/2	1155.70	18 1/2	469.90	3/4	19.05	13 1/2	342.90	5/8	15.88	516	234.1
863092100	LOGAN	12 1/8	307.98	14 7/8	377.83	46	1168.40	18 5/8	473.08	3/4	19.05	13 5/8	346.08	5/8	15.88	———	———
863122100	LANCE	12 1/4	311.15	15	381.00	46 1/2	1181.10	18 3/4	476.25	3/4	19.05	13 3/4	349.25	5/8	15.88	539	244.5
———	LEASE	12 3/8	314.33	15 1/8	384.18	47	1193.80	18 7/8	479.43	3/4	19.05	13 7/8	352.43	5/8	15.88	———	———
863182100	LAYER	12 1/2	317.50	15 1/4	387.35	47 1/2	1206.50	19	482.60	3/4	19.05	14	355.60	5/8	15.88	554	251.3
863222100	LOGIC	12 5/8	320.68	15 3/8	390.53	48	1219.20	19 1/8	485.78	3/4	19.05	14 1/8	358.78	5/8	15.88	582	264.0
863252100	MILKY	12 3/4	323.85	15 1/2	393.70	48 1/2	1231.90	19 1/4	488.95	3/4	19.05	14 1/4	361.95	5/8	15.88	———	———
863282100	MUSIC	12 7/8	327.03	15 5/8	396.88	49	1244.60	19 3/8	492.13	3/4	19.05	14 3/8	365.13	5/8	15.88	———	———
863312100	MINCE	13	330.20	15 7/8	403.23	50	1270.00	19 5/8	498.48	7/8	22.23	14 1/2	368.30	11/16	17.46	674	305.7
863342100	MITTY	13 1/8	333.38	16	406.40	50 1/2	1282.70	19 3/4	501.65	7/8	22.23	14 1/2	368.30	3/4	19.05	710	322.1
863372100	MISTY	13 1/4	336.55	16 1/8	409.58	51	1295.40	19 7/8	504.83	7/8	22.23	14 1/2	368.30	13/16	20.64	———	———
863412100	NIFTY	13 3/8	339.73	16 1/4	412.75	51 1/2	1308.10	19 7/8	504.83	7/8	22.23	14 1/2	368.30	7/8	22.23	696	315.7
863442100	NIECE	13 1/2	342.90	16 3/8	415.93	52	1320.80	20 1/8	511.18	7/8	22.23	15	381.00	11/16	17.46	697	316.2
863472100	NOVEL	13 5/8	346.08	161/2	419.10	52 1/2	1333.50	20 1/4	514.35	7/8	22.23	15 1/8	384.18	11/16	17.46	———	———
863502100	ORTHA	13 3/4	349.25	16 5/8	422.28	53	1346.20	20 3/8	517.53	7/8	22.23	15 1/4	387.35	11/16	17.46	———	———
———	OGGLE	13 7/8	352.43	16 3/4	425.45	53 1/2	1358.90	20 1/2	520.70	7/8	22.23	15 3/8	390.53	11/16	17.46	———	———
863572100	OPERA	14	355.60	16 7/8	428.63	54	1371.60	20 5/8	523.88	7/8	22.23	15 1/2	393.70	11/16	17.46	735	333.4
———	PURSE	14 1/8	358.78	17	431.80	54 1/2	1384.30	20 3/4	527.05	7/8	22.23	15 5/8	396.88	11/16	17.46	———	———
863632100	POLAR	14 1/4	361.95	17 1/8	434.98	55	1397.00	20 7/8	530.23	7/8	22.23	15 3/4	400.05	11/16	17.46	———	———
863662100	POINT	14 3/8	365.13	17 1/4	438.15	55 1/2	1409.70	21	533.40	7/8	22.23	15 7/8	403.23	11/16	17.46	842	381.9
863692100	PRUNE	14 1/2	368.30	17 1/2	444.50	56	1422.40	21 1/4	539.75	7/8	22.23	16	406.40	3/4	19.05	852	386.5
———	PRICE	14 5/8	371.48	17 5/8	447.68	56 1/2	1435.10	21 3/8	542.93	7/8	22.23	16 1/8	409.58	3/4	19.05	———	———
———	PUNCH	14 3/4	374.65	17 3/4	450.85	57	1447.80	21 1/2	546.10	7/8	22.23	16 1/4	412.75	3/4	19.05	———	———
———	QUAKE	14 7/8	377.83	17 7/8	454.03	57 1/2	1460.50	21 5/8	549.28	7/8	22.23	16 3/8	415.93	3/4	19.05	———	———
863822100	QUIET	15	381.00	18	457.20	58	1473.20	21 3/4	552.45	7/8	22.23	16 1/2	419.10	3/4	19.05	905	410.5

NOTE: *Dimensions for each size bearing continue across both pages.*

Split Naval Brass Flanged Bearings

SPLIT STRUT OR AFT STERN TUBE

FLANGE DRILLING DIAGRAM ON PAGE 18

Johnson Cutless® Flanged Bearings are centrifugally cast naval brass with an integral flange for bolting to stern tube or strut housing to retain bearing and prevent rotation in housing. Specially formulated oil and chemical resistant nitrile rubber is securely bonded to the shell.

Split styles offer ease of installation and change. Shells are heavy walled providing structural strength and can be step turned if desired. Flanges are furnished UN-DRILLED unless specified. See page 18 for Drilling Diagrams.

PRECAUTION:
When shrink fitting of the bearing is required, chilling must be achieved by gradual cooling to not more than minus 20°F(-28°C) using freezer or regular ice **(DO NOT DRY ICE)**. NOTE: Pounding or shocking the bearing while in the chilled state could cause the rubber to separate from the shell.

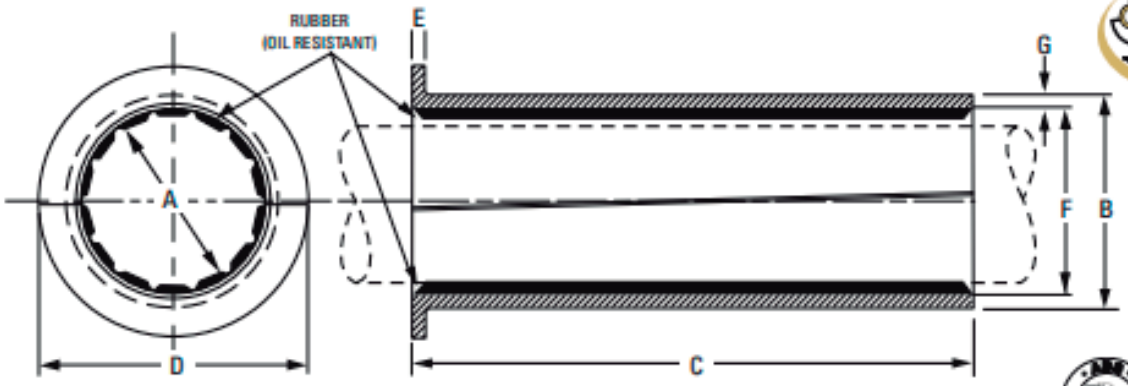
Approved Bearings: Johnson Cutless® Naval Brass Flanged Bearings meet military specification MIL-DTL-17901C (SH) Class II Full-Molded type and have full type approval from The American Bureau of Shipping.

Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
861532120	FAITH	6	152.40	8 1/2	215.90	20	508.00	11 5/8	295.28	5/8	15.88	7	177.80	3/4	19.05
861532121	FARCE	6	152.40	8 1/2	215.90	24	609.60	11 5/8	295.28	5/8	15.88	7	177.80	3/4	19.05
861532123	FERRY	6	152.40	8 3/4	222.25	24	609.60	11 5/8	295.28	5/8	15.88	7	177.80	7/8	22.23
—	—	6	152.40	7 7/8	200.03	21 1/2	546.10	10 3/8	263.53	9/16	14.29	7	177.80	7/16	11.11
—	—	6 1/8	155.58	8	203.20	22	558.80	10 1/2	266.70	9/16	14.29	7 1/8	180.98	7/16	11.11
—	—	6 1/4	158.75	8 1/8	206.38	22 1/2	571.50	10 5/8	269.88	9/16	14.29	7 1/4	184.15	7/16	11.11
861622120	—	6 3/8	161.93	8 1/4	209.55	23	584.20	10 3/4	273.05	9/16	14.29	7 3/8	187.33	7/16	11.11
—	—	6 1/2	165.10	8 3/8	212.73	23 1/2	596.90	11	279.40	9/16	14.29	7 1/2	190.50	7/16	11.11
—	—	6 5/8	168.28	8 5/8	219.08	24	609.60	11 1/4	285.75	9/16	14.29	7 5/8	193.68	1/2	12.70
861722120	FORCE	6 3/4	171.45	8 3/4	222.25	24	609.60	11 1/4	285.75	9/16	14.29	7 7/8	200.03	7/16	11.11
861722122	FLASH	6 3/4	171.45	8 7/8	225.43	24 1/2	622.30	11 3/8	288.93	9/16	14.29	7 7/8	200.03	1/2	12.70
—	—	7	177.80	9 1/8	231.78	25 1/2	647.70	11 5/8	295.28	9/16	14.29	8 1/8	206.38	1/2	12.70
—	—	7 1/8	180.98	9 1/4	234.95	25 1/2	647.70	11 3/4	298.45	9/16	14.29	8 1/4	209.55	1/2	12.70
—	—	7 1/4	184.15	9 3/8	238.13	26 1/2	673.10	11 7/8	301.63	9/16	14.29	8 3/8	212.73	1/2	12.70
—	—	7 3/8	187.33	9 5/8	244.48	27	685.80	12 1/8	307.98	9/16	14.29	8 5/8	219.08	1/2	12.70
861912120	GRADE	7 1/2	190.50	9 7/8	250.83	27 1/2	698.50	10 1/4	260.35	9/16	14.29	8 3/4	222.25	9/16	14.29
861912121	GRAIN	7 1/2	190.50	9 7/8	250.83	27 1/2	698.50	12 3/8	314.33	9/16	14.29	8 3/4	222.25	9/16	14.29
861912122	—	7 1/2	190.50	9 3/4	247.65	27 1/2	698.50	12 1/4	311.15	9/16	14.29	8 3/4	222.25	1/2	12.70
—	—	7 5/8	193.68	9 7/8	250.83	28	711.20	12 3/8	314.33	9/16	14.29	8 3/4	222.25	9/16	14.29
—	—	7 3/4	196.85	10	254.00	28 1/2	723.90	12 1/2	317.50	9/16	14.29	8 7/8	225.43	9/16	14.29
—	—	7 7/8	200.03	10 1/8	257.18	29	736.60	12 5/8	320.68	9/16	14.29	9 1/8	231.78	1/2	12.70
862042120	—	8	203.20	10 3/8	263.53	29 1/2	749.30	13 1/4	336.55	5/8	15.88	9 1/4	234.95	9/16	14.29
—	—	8 1/8	206.38	10 1/2	266.70	30	762.00	13 3/8	339.73	5/8	15.88	9 3/8	238.13	9/16	14.29
—	—	8 1/4	209.55	10 5/8	269.88	30 1/2	774.70	13 1/2	342.90	5/8	15.88	9 1/2	241.30	9/16	14.29
—	—	8 3/8	212.73	10 3/4	273.05	31	787.40	13 5/8	346.08	5/8	15.88	9 5/8	244.48	9/16	14.29
—	—	8 1/2	215.90	10 7/8	276.23	31 1/2	800.10	13 3/4	349.25	5/8	15.88	9 3/4	247.65	9/16	14.29
—	—	8 5/8	219.08	11	279.40	32	812.80	13 7/8	352.43	5/8	15.88	9 7/8	250.83	9/16	14.29
—	—	8 3/4	222.25	11 1/8	282.58	32 1/2	825.50	14	355.60	5/8	15.88	10	254.00	9/16	14.29
—	—	8 7/8	225.43	11 1/4	285.75	33	838.20	14 1/8	358.78	3/4	19.05	10 1/8	257.18	9/16	14.29
862292120	—	9	228.60	11 3/8	288.93	33 1/2	850.90	14 1/4	361.95	3/4	19.05	10 1/4	260.35	9/16	14.29
862332120	—	9 1/8	231.78	11 1/2	292.10	34	863.60	14 1/2	368.30	3/4	19.05	10 3/8	263.53	9/16	14.29
—	—	9 1/4	234.95	11 5/8	295.28	34 1/2	876.30	14 5/8	371.48	3/4	19.05	10 1/2	266.70	9/16	14.29
—	—	9 3/8	238.13	11 3/4	298.45	35	889.00	14 3/4	374.65	3/4	19.05	10 5/8	269.88	9/16	14.29
862422120	INSUL	9 1/2	241.30	11 7/8	301.63	20 3/4	527.05	14 3/4	374.65	1	25.40	10 3/4	273.05	9/16	14.29
862422121	—	9 1/2	241.30	11 7/8	301.63	35 1/2	901.70	14 7/8	377.83	3/4	19.05	10 3/4	273.05	9/16	14.29
—	—	9 5/8	244.48	12	304.80	36	914.40	15	381.00	3/4	19.05	10 7/8	276.23	9/16	14.29
—	—	9 3/4	247.65	12 1/4	311.15	36 1/2	927.10	15 1/4	387.35	3/4	19.05	11	279.40	5/8	15.88
—	—	9 7/8	250.83	12 3/8	314.33	37	939.80	15 3/8	390.53	3/4	19.05	11 1/8	282.58	5/8	15.88
—	—	10	254.00	12 1/2	317.50	37 1/2	952.50	15 1/2	393.70	3/4	19.05	11 1/4	285.75	11/16	17.46

NOTE: *Dimensions for each size bearing continue across both pages.*

MEREX

A = SHAFT DIAMETER
B = OUTSIDE DIAMETER
C = LENGTH
D = FLANGE DIAMETER
E = FLANGE THICKNESS
F = METAL I.D.
G = METAL THICKNESS

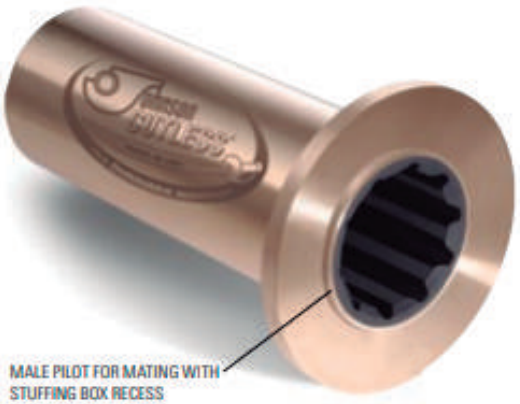


To Facilitate Assembly and Removal of Bearing — Split on Taper as Follows:
Split Above or Below Ctr. Line, At End: Bearing Length 1/16 ..... Up to and including 36" long

Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
862582120	—	10 1/8	257.18	12 5/8	320.68	38	965.20	15 5/8	396.88	3/4	19.05	11 1/4	285.75	5/8	15.88
864612120	—	10 1/4	260.35	12 3/4	323.85	38 1/2	977.90	15 7/8	403.23	3/4	19.05	11 1/2	292.10	5/8	15.88
—	—	10 3/8	263.53	12 7/8	327.03	39	990.60	16	406.40	3/4	19.05	11 5/8	295.28	5/8	15.88
—	—	10 1/2	266.70	13	330.20	39 1/2	1,003.30	16 1/8	409.58	3/4	19.05	11 3/4	298.45	5/8	15.88
—	—	10 5/8	269.88	13 1/8	333.38	40	1,016.00	16 1/4	412.75	3/4	19.05	11 7/8	301.63	5/8	15.88
—	—	10 3/4	273.05	13 1/4	336.55	40 1/2	1,028.70	16 3/8	415.93	3/4	19.05	12	304.80	5/8	15.88
—	—	10 7/8	276.23	13 3/8	339.73	41	1,041.40	17	431.80	3/4	19.05	12 1/8	307.98	5/8	15.88
—	—	11	279.40	13 5/8	346.08	41 1/2	1,054.10	17 1/4	438.15	3/4	19.05	12 3/8	314.33	5/8	15.88
—	—	11 1/8	282.58	13 3/4	349.25	42	1,066.80	17 3/8	441.33	3/4	19.05	12 1/2	317.50	5/8	15.88
—	—	11 1/4	285.75	13 7/8	352.43	42 1/2	1,079.50	17 1/2	444.50	3/4	19.05	12 5/8	320.68	5/8	15.88
—	—	11 3/8	288.93	14 1/8	358.78	43	1,092.20	17 3/4	450.85	3/4	19.05	12 3/4	323.85	11/16	17.46
—	—	11 1/2	292.10	14 1/4	361.95	43 1/2	1,104.90	17 7/8	454.03	3/4	19.05	12 7/8	327.03	11/16	17.46
—	—	11 5/8	295.28	14 3/8	365.13	44	1,117.60	18	457.20	3/4	19.05	13	330.20	11/16	17.46
—	—	11 3/4	298.45	14 1/2	368.30	44 1/2	1,130.30	18 1/8	460.38	3/4	19.05	13 1/8	333.38	11/16	17.46
—	—	11 7/8	301.63	14 5/8	371.48	45	1,143.00	18 1/4	463.55	3/4	19.05	13 1/4	336.55	11/16	17.46
—	—	12	304.80	14 7/8	377.83	45 1/2	1,155.70	18 1/2	469.90	3/4	19.05	13 1/2	342.90	11/16	17.46
—	—	12 1/8	307.98	15	381.00	46	1,168.40	18 5/8	473.08	3/4	19.05	13 5/8	346.08	11/16	17.46
—	—	12 1/4	311.15	15 1/8	384.18	46 1/2	1,181.10	18 3/4	476.25	3/4	19.05	13 3/4	349.25	11/16	17.46
—	—	12 3/8	314.33	15 1/4	387.35	47	1,193.80	18 7/8	479.43	3/4	19.05	13 7/8	352.43	11/16	17.46
863182120	—	12 1/2	317.50	15 3/8	390.53	47 1/2	1,206.50	19	482.60	3/4	19.05	14	355.60	11/16	17.46
—	—	12 5/8	320.68	15 1/2	393.70	48	1,219.20	19 1/8	485.78	3/4	19.05	14 1/8	358.78	11/16	17.46
—	—	12 3/4	323.85	15 5/8	396.88	48 1/2	1,231.90	19 1/4	488.95	3/4	19.05	14 1/4	361.95	11/16	17.46
—	—	12 7/8	327.03	15 3/4	400.05	49	1,244.60	19 3/8	492.13	3/4	19.05	14 3/8	365.13	11/16	17.46
832212120	—	13	330.20	16	406.40	50	1,270.00	19 5/8	498.48	7/8	22.23	14 1/2	368.30	3/4	19.05
—	—	13 1/8	333.38	16 1/8	409.58	50 1/8	1,273.18	19 3/4	501.65	7/8	22.23	14 5/8	371.48	3/4	19.05
—	—	13 1/4	336.55	16 1/4	412.75	51	1,295.40	19 7/8	504.83	7/8	22.23	14 3/4	374.65	3/4	19.05
—	—	13 3/8	339.73	16 3/8	415.93	51 1/2	1,308.10	20	508.00	7/8	22.23	14 7/8	377.83	3/4	19.05
—	—	13 1/2	342.90	16 1/2	419.10	52	1,320.80	20 1/8	511.18	7/8	22.23	15	381.00	3/4	19.05
—	—	13 5/8	346.08	16 5/8	422.28	52 1/2	1,333.50	20 1/4	514.35	7/8	22.23	15 1/8	384.18	3/4	19.05
—	—	13 3/4	349.25	16 3/4	425.45	53	1,346.20	20 3/8	517.53	7/8	22.23	15 1/4	387.35	3/4	19.05
—	—	13 7/8	352.43	16 7/8	428.63	53 1/2	1,358.90	20 1/2	520.70	7/8	22.23	15 3/8	390.53	3/4	19.05
—	—	14	355.60	17	431.80	54	1,371.60	20 5/8	523.88	7/8	22.23	15 1/2	393.70	3/4	19.05
—	—	14 1/8	358.78	17 1/8	434.98	54 1/2	1,384.30	20 3/4	527.05	7/8	22.23	15 5/8	396.88	3/4	19.05
—	—	14 1/4	361.95	17 1/4	438.15	55	1,397.00	20 7/8	530.23	7/8	22.23	15 3/4	400.05	3/4	19.05
—	—	14 3/8	365.13	17 3/8	441.33	55 1/2	1,409.70	21	533.40	7/8	22.23	15 7/8	403.23	3/4	19.05
—	—	14 1/2	368.30	17 5/8	447.68	56	1,422.40	21 1/4	539.75	7/8	22.23	16	406.40	13/16	20.64
—	—	14 5/8	371.48	17 3/4	450.85	56 1/2	1,435.10	21 3/8	542.93	7/8	22.23	16 1/8	409.58	13/16	20.64
—	—	14 3/4	374.65	17 7/8	454.03	57	1,447.80	21 1/2	546.10	7/8	22.23	16 1/4	412.75	13/16	20.64
—	—	14 7/8	377.83	18	457.20	57 1/2	1,460.50	21 5/8	549.28	7/8	22.23	16 3/8	415.93	13/16	20.64
—	—	15	381.00	18 1/8	460.38	58	1,473.20	21 3/4	552.45	7/8	22.23	16 1/2	419.10	13/16	20.64

Solid Naval Brass Flanged Bearings

FORWARD STERN TUBE



Johnson Cutless Forward Stern Tube Flanged Bearings are made of centrifugally cast naval brass and feature a heavy metal wall and integral flange. The specially formulated nitrile rubber compound is securely bonded to metal shell and is chemical and oil resistant. The integral flange permits solid bolting of the bearing to stern tube stuffing box. The machined male pilot on the integral flange mates with the female recess of the stuffing box. Flanges are furnished UN-DRILLED unless specified. See page 18 for "Drilling Diagrams". For Split or Stepped styles see pages 14-17.

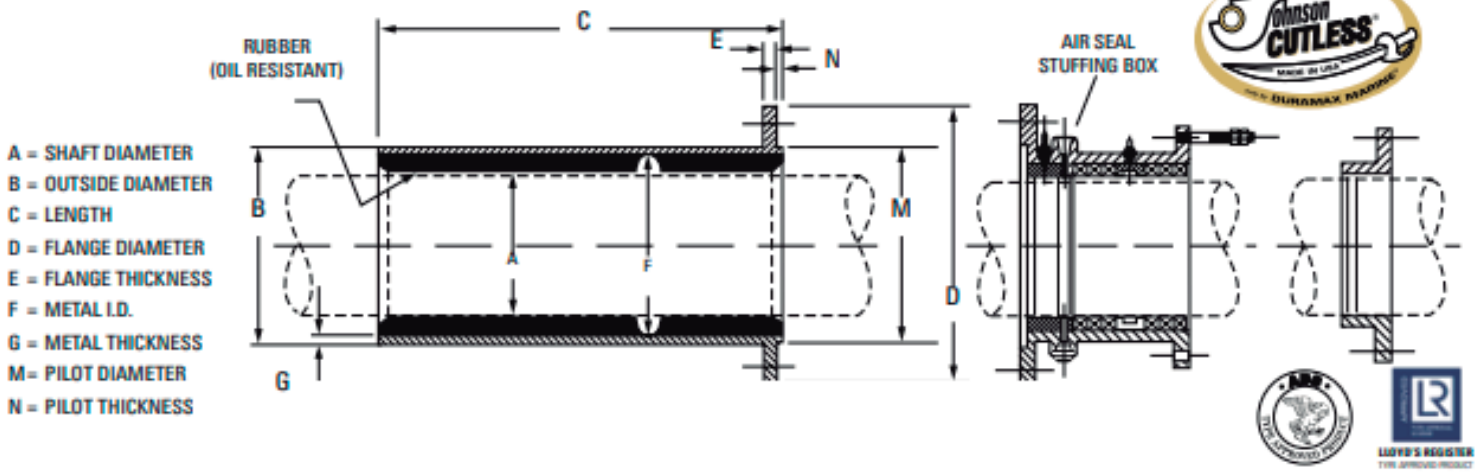
PRECAUTION:
When shrink fitting of the bearing is required, chilling must be achieved by gradual cooling to not more than minus 20°F(-28°C) using freezer or regular ice **(DO NOT DRY ICE)**. NOTE: Pounding or shocking the bearing while in the chilled state could cause the rubber to separate from the shell.

Approved Bearings: Johnson Cutless® Naval Brass Flanged Bearings meet military specification MIL-DTL-17901C (SH) Class II Full-Molded type and have full type approval from The American Bureau of Shipping.

Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness		M Pilot Diameter		N Pilot Thickness		Gross Wt.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs.	kg.
860642180	212	2 1/2	63.50	3 3/8	85.73	10	254.00	6 1/4	158.75	3/8	9.53	3 1/8	79.38	1/8	3.18	4	101.60	3/16	4.76	12	5.4
860762180	300	3	76.20	4 1/4	107.95	12	304.80	7 1/2	190.50	1/2	12.70	3 3/4	95.25	1/4	6.35	4 3/4	120.65	3/16	4.76	21	9.5
860832180	314	3 1/4	82.55	4 1/2	114.30	13	330.20	7 1/2	190.50	1/2	12.70	4	101.60	1/4	6.35	4 3/4	120.65	3/16	4.76	24	10.9
860892180	312	3 1/2	88.90	4 7/8	123.83	14	355.60	8 1/8	206.38	1/2	12.70	4 1/4	107.95	5/16	7.94	5 1/4	133.35	3/16	4.76	38	17.2
860952180	334	3 3/4	95.25	5 1/4	133.35	15	381.00	8 1/8	206.38	1/2	12.70	4 5/8	117.48	5/16	7.94	5 1/4	133.35	3/16	4.76	43	19.5
861022180	400	4	101.60	5 1/2	139.70	16	406.40	8 5/8	219.08	1/2	12.70	4 7/8	123.83	5/16	7.94	5 3/4	146.05	3/16	4.76	48	21.8
861082180	414	4 1/4	107.95	5 3/4	146.05	17	431.80	8 5/8	219.08	1/2	12.70	5 1/8	130.18	5/16	7.94	5 3/4	146.05	3/16	4.76	52	23.6
861152180	412	4 1/2	114.30	6	152.40	18	457.20	9 3/8	238.13	1/2	12.70	5 3/8	136.53	5/16	7.94	6 1/2	165.10	3/16	4.76	58	26.3
861212180	434	4 3/4	120.65	6 1/4	158.75	19	482.60	9 3/8	238.13	1/2	12.70	5 5/8	142.88	5/16	7.94	6 1/2	165.10	3/16	4.76	61	27.7
861272180	500	5	127.00	6 3/4	171.45	20	508.00	10 1/8	257.18	9/16	14.29	6	152.40	3/8	9.53	7 1/4	184.15	3/16	4.76	75	34.0
861342181	514	5 1/4	133.35	6 7/8	174.63	21	533.40	10 1/8	257.18	9/16	14.29	6 1/8	155.58	3/8	9.53	7 1/4	184.15	3/16	4.76	79	35.8
861402180	512	5 1/2	139.70	7 1/4	184.15	22	558.80	10 5/8	269.88	9/16	14.29	6 1/2	165.10	3/8	9.53	7 3/4	196.85	3/16	4.76	90	40.8
861462180	534	5 3/4	146.05	7 1/4	184.15	23	584.20	10 5/8	269.88	9/16	14.29	6 1/2	165.10	3/8	9.53	7 3/4	196.85	3/16	4.76	92	41.7
861532180	600	6	152.40	7 3/4	196.85	15	381.00	11 3/8	288.93	9/16	14.29	7	177.80	3/8	9.53	8	203.20	3/8	9.53	75	34.0
——	618	6 1/8	155.58	7 7/8	200.03	15	381.00	12 1/4	311.15	9/16	14.29	7 1/8	180.98	3/8	9.53	8	203.20	3/8	9.53	-	-
861592180	614	6 1/4	158.75	7 7/8	200.03	15	381.00	11 3/8	288.93	9/16	14.29	7 1/8	180.98	3/8	9.53	8	203.20	3/8	9.53	77	34.9
——	638	6 3/8	161.93	8 1/8	206.38	15	381.00	12 5/8	320.68	9/16	14.29	7 3/8	187.33	3/8	9.53	8 3/8	212.73	3/8	9.53	-	-
861662180	612	6 1/2	165.10	8 3/8	212.73	15	381.00	13 1/2	342.90	5/8	15.88	7 1/2	190.50	7/16	11.11	8 5/8	219.08	3/8	9.53	91	41.3
861692180	FETCH	6 5/8	168.28	8 5/8	219.08	15	381.00	13 1/2	342.90	5/8	15.88	7 5/8	193.68	1/2	12.70	8 5/8	219.08	3/8	9.53	104	47.2
——	658	6 5/8	168.28	8 1/2	215.90	15	381.00	13 1/2	342.90	5/8	15.88	7 5/8	193.68	7/16	11.11	8 5/8	219.08	3/8	9.53	-	-
861722180	634	6 3/4	171.45	8 3/4	222.25	15	381.00	13 3/4	349.25	5/8	15.88	7 7/8	200.03	7/16	11.11	9	228.60	3/8	9.53	99	44.9
——	678	6 7/8	174.63	8 7/8	225.43	15	381.00	13 3/4	349.25	5/8	15.88	8	203.20	7/16	11.11	9	228.60	3/8	9.53	-	-
861782180	700	7	177.80	9	228.60	17 1/2	444.50	13 3/4	349.25	5/8	15.88	8 1/8	206.38	7/16	11.11	9	228.60	3/8	9.53	116	52.6
——	718	7 1/8	180.98	9 1/8	231.78	17 1/2	444.50	14 1/8	358.78	5/8	15.88	8 1/4	209.55	7/16	11.11	9 5/8	244.48	3/8	9.53	-	-
861852180	714	7 1/4	184.15	9 1/4	234.95	17 1/2	444.50	14 1/8	358.78	5/8	15.88	8 3/8	212.73	7/16	11.11	9 5/8	244.48	3/8	9.53	122	55.3
——	738	7 3/8	187.33	9 1/2	241.30	17 1/2	444.50	14 1/8	358.78	5/8	15.88	8 5/8	219.08	7/16	11.11	9 5/8	244.48	3/8	9.53	-	-
861912180	712	7 1/2	190.50	9 5/8	244.48	17 1/2	444.50	14 1/2	368.30	5/8	15.88	8 3/4	222.25	7/16	11.11	10	254.00	3/8	9.53	123	55.8
——	758	7 5/8	193.68	9 3/4	247.65	17 1/2	444.50	14 1/2	368.30	5/8	15.88	8 7/8	225.43	7/16	11.11	10	254.00	3/8	9.53	-	-
861972180	734	7 3/4	196.85	9 7/8	250.83	17 1/2	444.50	14 1/2	368.30	5/8	15.88	8 7/8	225.43	1/2	12.70	10	254.00	3/8	9.53	126	57.2
——	778	7 7/8	200.03	10	254.00	17 1/2	444.50	14 7/8	377.76	5/8	15.88	9 1/8	231.78	7/16	11.11	10 3/8	263.53	3/8	9.53	-	-
862042180	HARDY	8	203.20	10 1/4	260.35	20	508.00	14 7/8	377.76	5/8	15.88	9 1/4	234.95	1/2	12.70	10 3/8	263.53	3/8	9.53	145	65.8
——	818	8 1/8	206.38	10 3/8	263.53	20	508.00	14 7/8	377.76	5/8	15.88	9 3/8	238.13	1/2	12.70	10 3/8	263.53	3/8	9.53	-	-
862102180	814	8 1/4	209.55	10 1/2	266.70	20	508.00	15 1/4	387.35	5/8	15.88	9 1/2	241.30	1/2	12.70	10 3/4	273.05	3/8	9.53	157	71.2
——	838	8 3/8	212.73	10 5/8	269.88	20	508.00	15 1/4	387.35	5/8	15.88	9 5/8	244.48	1/2	12.70	10 3/4	273.05	3/8	9.53	162	73.5
862172180	812	8 1/2	215.90	10 3/4	273.05	20	508.00	15 1/4	387.35	5/8	15.88	9 3/4	247.65	1/2	12.70	10 3/4	273.05	3/8	9.53	162	73.5
——	858	8 5/8	219.08	10 7/8	276.23	20	508.00	15 5/8	396.88	3/4	19.05	9 7/8	250.83	1/2	12.70	11 1/8	282.58	3/8	9.53	-	-
862232180	834	8 3/4	222.25	11	279.40	20	508.00	15 5/8	396.88	3/4	19.05	10	254.00	1/2	12.70	11 1/8	282.58	3/8	9.53	170	77.1
——	878	8 7/8	225.43	11 1/8	282.58	20	508.00	15 5/8	396.88	3/4	19.05	10 1/8	257.18	1/2	12.70	11 1/8	282.58	3/8	9.53	-	-
862292180	900	9	228.60	11 1/4	285.75	22 1/2	571.50	16	406.40	3/4	19.05	10 1/4	260.35	1/2	12.70	11 1/2	292.10	3/8	9.53	193	87.5
——	918	9 1/8	231.78	11 3/8	288.93	22 1/2	571.50	16	406.40	3/4	19.05	10 3/8	263.53	1/2	12.70	11 1/2	292.10	3/8	9.53	-	-
862362180	INLET	9 1/4	234.95	11 1/2	292.10	22 1/2	571.50	16	406.40	3/4	19.05	10 1/2	266.70	1/2	12.70	11 1/2	292.10	3/8	9.53	200	90.7
——	938	9 3/8	238.13	11 5/8	295.28	22 1/2	571.50	16 3/8	415.93	3/4	19.05	10 5/8	269.88	1/2	12.70	11 7/8	301.63	3/8	9.53	-	-
862422180	912	9 1/2	241.30	11 3/4	298.45	22 1/2	571.50	16 3/8	415.93	3/4	19.05	10 3/4	273.05	1/2	12.70	11 7/8	301.63	3/8	9.53	205	93.0

NOTE: *Dimensions for each size bearing continue across both pages.*

MEREX

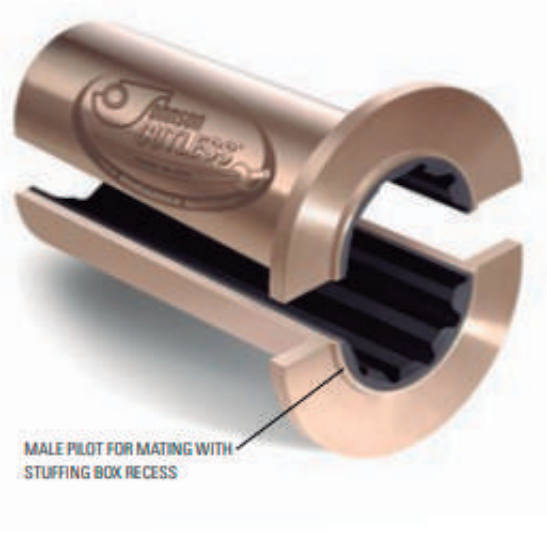


Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness		M Pilot Diameter		N Pilot Thickness		Gross Wt.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs.	kg.
862452182	958	9 5/8	244.48	11 7/8	301.63	22 1/2	571.50	16 3/8	415.93	3/4	19.05	10 7/8	276.23	1/2	12.70	11 7/8	301.63	3/8	9.53	-	-
862482180	934	9 3/4	247.65	12 1/8	307.98	22 1/2	571.50	16 7/8	428.56	3/4	19.05	11	279.40	9/16	14.29	12 3/8	314.33	3/8	9.53	217	98.4
862522180	978	9 7/8	250.83	12 1/4	311.15	22 1/2	571.50	16 7/8	428.56	3/4	19.05	11 1/8	282.58	9/16	14.29	12 3/8	314.33	3/8	9.53	-	-
862552180	1000	10	254.00	12 3/8	314.33	25	635.00	16 7/8	428.56	3/4	19.05	11 1/4	285.75	9/16	14.29	12 3/8	314.33	3/8	9.53	240	108.9
———	1018	10 1/8	257.18	12 1/2	317.50	25	635.00	17 7/8	453.96	3/4	19.05	11 3/8	288.93	9/16	14.29	12 3/4	323.85	3/8	9.53	-	-
862612180	1014	10 1/4	260.35	12 5/8	320.68	25	635.00	17 7/8	453.96	3/4	19.05	11 1/2	292.10	9/16	14.29	12 3/4	323.85	3/8	9.53	244	110.7
———	1038	10 3/8	263.53	12 3/4	323.85	25	635.00	17 7/8	453.96	3/4	19.05	11 5/8	295.28	9/16	14.29	12 3/4	323.85	3/8	9.53	-	-
862682180	1012	10 1/2	266.70	12 7/8	327.03	25	635.00	18 1/4	463.55	3/4	19.05	11 3/4	298.45	9/16	14.29	13 1/8	333.38	3/8	9.53	247	112.0
———	1058	10 5/8	269.88	13	330.20	25	635.00	18 1/4	463.55	3/4	19.05	11 7/8	301.63	9/16	14.29	13 1/8	333.38	3/8	9.53	-	-
862742180	JOLLY	10 3/4	273.05	13 1/8	333.38	25	635.00	18 1/4	463.55	3/4	19.05	12	304.80	9/16	14.29	13 1/8	333.38	3/8	9.53	250	113.4
———	1078	10 7/8	276.23	13 1/4	336.55	25	635.00	18 5/8	473.08	3/4	19.05	12 1/8	307.98	9/16	14.29	13 1/2	342.90	3/8	9.53	-	-
862802180	KETCH	11	279.40	13 1/2	342.90	27 1/2	698.50	18 5/8	473.08	3/4	19.05	12 3/8	314.33	9/16	14.29	13 1/2	342.90	3/8	9.53	300	136.1
———	1118	11 1/8	282.58	13 5/8	346.08	27 1/2	698.50	18 5/8	473.08	3/4	19.05	12 1/2	317.50	9/16	14.29	13 1/2	342.90	3/8	9.53	-	-
862872180	1114	11 1/4	285.75	13 3/4	349.25	27 1/2	698.50	19	482.60	3/4	19.05	12 5/8	320.68	9/16	14.29	13 7/8	352.43	3/8	9.53	312	141.5
———	1138	11 3/8	288.93	14	355.60	27 1/2	698.50	19	482.60	3/4	19.05	12 3/4	323.85	5/8	15.88	13 7/8	352.43	3/8	9.53	-	-
862932180	1112	11 1/2	292.10	14 1/8	358.78	27 1/2	698.50	19	482.60	3/4	19.05	12 7/8	327.03	5/8	15.88	13 7/8	352.43	3/8	9.53	326	147.9
———	1158	11 5/8	295.28	14 1/4	361.95	27 1/2	698.50	19 3/8	492.13	3/4	19.05	13	330.20	5/8	15.88	14 1/8	358.78	3/8	9.53	-	-
862992180	1134	11 3/4	298.45	14 3/8	365.13	27 1/2	698.50	19 3/8	492.13	3/4	19.05	13 1/8	333.38	5/8	15.88	14 1/8	358.78	3/8	9.53	335	152.0
———	1178	11 7/8	301.63	14 1/2	368.30	27 1/2	698.50	19 3/8	492.13	3/4	19.05	13 1/4	336.55	5/8	15.88	14 1/8	358.78	3/8	9.53	-	-
863062180	1200	12	304.80	14 3/4	374.65	30	762.00	19 3/4	501.65	3/4	19.05	13 1/2	342.90	5/8	15.88	14 1/2	368.30	3/8	9.53	360	163.3
863092180	1218	12 1/8	307.98	14 7/8	377.83	30	762.00	19 3/4	501.65	3/4	19.05	13 5/8	346.08	5/8	15.88	14 1/2	368.30	3/8	9.53	-	-
863122180	1214	12 1/4	311.15	15	381.00	30	762.00	19 3/4	501.65	3/4	19.05	13 3/4	349.25	5/8	15.88	14 1/2	368.30	3/8	9.53	373	169.2
863152180	1238	12 3/8	314.33	15 1/8	384.18	30	762.00	20 1/8	511.18	7/8	22.23	13 7/8	352.43	5/8	15.88	15 1/8	384.18	3/8	9.53	-	-
863182180	1212	12 1/2	317.50	15 1/4	387.35	30	762.00	20 1/8	511.18	7/8	22.23	14	355.60	5/8	15.88	15 1/8	384.18	3/8	9.53	394	178.7
863222180	1258	12 5/8	320.68	15 3/8	390.53	30	762.00	20 1/8	511.18	7/8	22.23	14 1/8	358.78	5/8	15.88	15 1/8	384.18	3/8	9.53	-	-
———	1234	12 3/4	323.85	15 1/2	393.70	30	762.00	20 1/2	520.70	7/8	22.23	14 1/4	361.95	5/8	15.88	15 1/2	393.70	3/8	9.53	-	-
———	1278	12 7/8	327.03	15 5/8	396.88	30	762.00	20 1/2	520.70	7/8	22.23	14 3/8	365.13	5/8	15.88	15 1/2	393.70	3/8	9.53	-	-
———	1300	13	330.20	15 7/8	403.23	32 1/2	825.50	20 1/2	520.70	7/8	22.23	14 1/2	368.30	11/16	17.46	15 1/2	393.70	3/8	9.53	-	-
———	1318	13 1/8	333.38	16	406.40	32 1/2	825.50	21	533.40	7/8	22.23	14 5/8	371.48	11/16	17.46	15 3/4	400.05	3/8	9.53	-	-
———	1314	13 1/4	336.55	16 1/8	409.58	32 1/2	825.50	21	533.40	7/8	22.23	14 3/4	374.65	11/16	17.46	15 3/4	400.05	3/8	9.53	-	-
———	1338	13 3/8	339.73	16 1/4	412.75	32 1/2	825.50	21	533.40	7/8	22.23	14 7/8	377.83	11/16	17.46	15 3/4	400.05	3/8	9.53	-	-
863442181	1312	13 1/2	342.90	16 3/8	415.93	32 1/2	825.50	21 3/8	542.93	7/8	22.23	15	381.00	11/16	17.46	16 1/4	412.75	3/8	9.53	-	-
863472180	1358	13 5/8	346.08	16 1/2	419.10	32 1/2	825.50	21 3/8	542.93	7/8	22.23	15 1/8	384.18	11/16	17.46	16 1/4	412.75	3/8	9.53	-	-
———	1334	13 3/4	349.25	16 5/8	422.28	32 1/2	825.50	21 3/8	542.93	7/8	22.23	15 1/4	387.35	11/16	17.46	16 1/4	412.75	3/8	9.53	-	-
———	1378	13 7/8	352.43	16 3/4	425.45	32 1/2	825.50	21 3/4	552.45	7/8	22.23	15 3/8	390.53	11/16	17.46	16 5/8	422.28	3/8	9.53	-	-
———	1400	14	355.60	16 7/8	428.63	35	889.00	21 3/4	552.45	7/8	22.23	15 1/2	393.70	11/16	17.46	16 5/8	422.28	3/8	9.53	-	-
———	1418	14 1/8	358.78	17	431.80	35	889.00	21 3/4	552.45	7/8	22.23	15 5/8	396.88	11/16	17.46	16 5/8	422.28	3/8	9.53	-	-
———	1414	14 1/4	361.95	17 1/8	434.98	35	889.00	22 1/8	561.98	7/8	22.23	15 3/4	400.05	11/16	17.46	17 1/4	438.15	3/8	9.53	-	-
———	1438	14 3/8	365.13	17 1/4	438.15	35	889.00	22 1/8	561.98	7/8	22.23	15 7/8	403.23	11/16	17.46	17 1/4	438.15	3/8	9.53	-	-
———	1412	14 1/2	368.30	17 1/2	444.50	35	889.00	22 1/8	561.98	7/8	22.23	16	406.40	3/4	19.05	17 1/4	438.15	3/8	9.53	-	-
———	1458	14 5/8	371.48	17 5/8	447.68	35	889.00	22 1/2	571.50	7/8	22.23	16 1/8	409.58	3/4	19.05	17 1/2	444.50	3/8	9.53	-	-
———	1434	14 3/4	374.65	17 3/4	450.85	35	889.00	22 1/2	571.50	7/8	22.23	16 1/4	412.75	3/4	19.05	17 1/2	444.50	3/8	9.53	-	-
———	1478	14 7/8	377.83	17 7/8	454.03	35	889.00	22 3/4	577.85	7/8	22.23	16 3/8	415.93	3/4	19.05	17 3/4	450.85	3/8	9.53	-	-
———	1500	15	381.00	18	457.20	35	889.00	22 3/4	577.85	7/8	22.23	16 1/2	419.10	3/4	19.05	17 3/4	450.85	3/8	9.53	-	-

NOTE: *Dimensions for each size bearing continue across both pages.*

Split Naval Brass Flanged Bearings

SPLIT FORWARD STERN TUBE



Made of the same engineered quality as other Johnson Cutless® Naval Brass Bearings, these Flanged Bearings for Forward Stern Tube installation have a male pilot designed to mate with the female recess in the Stuffing Box flange. Stuffing Box has an inlet for piping water to lubricate bearings.

Split styles offer ease of installation and change. Sufficient space is required to move stuffing box forward to enable withdrawal of Forward Stern Tube Bearing. Space allocated should be equal to the combined length of both the Forward Stern Tube Bearing and Stuffing Box, plus two inches. Consult factory when dimensions are less than dimensions specified.

APPROVED BEARINGS:

Johnson Cutless® Naval Brass Flanged Bearings meet military specification MIL-DTL-17901C (Ships) Class II Full-Molded type. Flanged are furnished NOT DRILLED unless specified. See page 18 for "Drilling Diagrams". NOTE: for Johnson Stuffing Box Dimensional Data, contact Duramax Marine® LLC.

PRECAUTION:

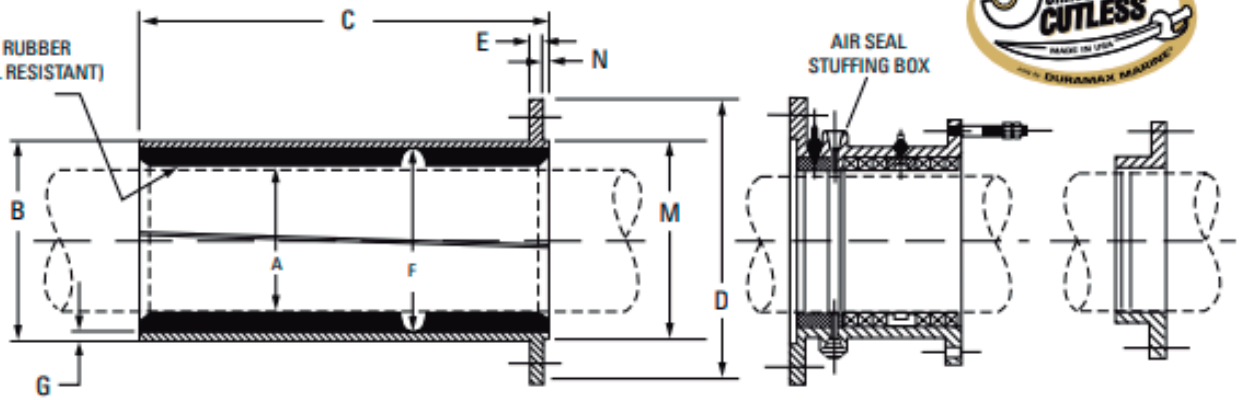
When shrink fitting of the bearing is required, chilling must be achieved by gradual cooling to not more than minus 20°F(-28°C) using freezer or regular ice **(DO NOT DRY ICE)**. NOTE: Pounding or shocking the bearing while in the chilled state could cause the rubber to separate from the shell.

Approved Bearings: Johnson Cutless® Naval Brass Flanged Bearings meet military specification MIL-DTL-17901C (SH) Class II Full-Molded type and have full type approval from The American Bureau of Shipping.

Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness		M Pilot Diameter		N Pilot Thickness		Gross Wt.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs.	kg.
861532190	FLAKE	6	152.40	8 3/4	222.25	20	508.00	11 5/8	295.28	5/8	15.88	7	177.80	7/8	22.23	8	203.20	1/4	6.35	-	-
-	600	6	152.40	7 7/8	200.03	15	381.00	12 1/4	311.15	9/16	14.29	7	177.80	7/16	11.11	8	203.20	3/8	9.53	-	-
-	618	6 1/8	155.58	8	203.20	15	381.00	12 1/4	311.15	9/16	14.29	7 1/8	180.98	7/16	11.11	8	203.20	3/8	9.53	-	-
-	614	6 1/4	158.75	8 1/8	206.38	15	381.00	12 5/8	320.68	9/16	14.29	7 1/4	184.15	7/16	11.11	8 3/8	212.73	3/8	9.53	-	-
861622190	638	6 3/8	161.93	8 1/4	209.55	15	381.00	12 5/8	320.68	9/16	14.29	7 3/8	187.33	7/16	11.11	8 3/8	212.73	3/8	9.53	-	-
861662190	612	6 1/2	165.10	8 3/8	212.73	15	381.00	13 1/2	342.90	5/8	15.88	7 1/2	190.50	7/16	11.11	8 5/8	219.08	3/8	9.53	-	-
-	658	6 5/8	168.28	8 5/8	219.08	15	381.00	13 1/2	342.90	5/8	15.88	7 5/8	193.68	1/2	12.70	8 5/8	219.08	3/8	9.53	-	-
861722190	634	6 3/4	171.45	8 7/8	225.43	15	381.00	13 3/4	349.25	5/8	15.88	7 7/8	200.03	1/2	12.70	9	228.60	3/8	9.53	-	-
-	678	6 7/8	174.63	9	228.60	15	381.00	13 3/4	349.25	5/8	15.88	8	203.20	1/2	12.70	9	228.60	3/8	9.53	-	-
-	700	7	177.80	9 1/8	231.78	17 1/2	444.50	13 3/4	349.25	5/8	15.88	8 1/8	206.38	1/2	12.70	9	228.60	3/8	9.53	-	-
-	718	7 1/8	180.98	9 1/4	234.95	17 1/2	444.50	14 1/8	358.78	5/8	15.88	8 1/4	209.55	1/2	12.70	9 5/8	244.48	3/8	9.53	-	-
-	714	7 1/4	184.15	9 3/8	238.13	17 1/2	444.50	14 1/8	358.78	5/8	15.88	8 3/8	212.73	1/2	12.70	9 5/8	244.48	3/8	9.53	-	-
-	738	7 3/8	187.33	9 5/8	244.48	17 1/2	444.50	14 1/8	358.78	5/8	15.88	8 5/8	219.08	1/2	12.70	9 5/8	244.48	3/8	9.53	-	-
861912190	712	7 1/2	190.50	9 3/4	247.65	17 1/2	444.50	14 1/2	368.30	5/8	15.88	8 3/4	222.25	1/2	12.70	10	254.00	3/8	9.53	-	-
-	758	7 5/8	193.68	9 7/8	250.83	17 1/2	444.50	14 1/2	368.30	5/8	15.88	8 7/8	225.43	1/2	12.70	10	254.00	3/8	9.53	-	-
-	734	7 3/4	196.85	10	254.00	17 1/2	444.50	14 1/2	368.30	5/8	15.88	9	228.60	1/2	12.70	10	254.00	3/8	9.53	-	-
-	778	7 7/8	200.03	10 1/8	257.18	17 1/2	444.50	14 7/8	377.83	5/8	15.88	9 1/8	231.78	1/2	12.70	10 3/8	263.53	3/8	9.53	-	-
-	800	8	203.20	10 3/8	263.53	20	508.00	14 7/8	377.83	5/8	15.88	9 1/4	234.95	9/16	14.29	10 3/8	263.53	3/8	9.53	-	-
-	818	8 1/8	206.38	10 1/2	266.70	20	508.00	14 7/8	377.83	5/8	15.88	9 3/8	238.13	9/16	14.29	10 3/8	263.53	3/8	9.53	-	-
-	814	8 1/4	209.55	10 5/8	269.88	20	508.00	15 1/4	387.35	5/8	15.88	9 1/2	241.30	9/16	14.29	10 3/4	273.05	3/8	9.53	-	-
-	838	8 3/8	212.73	10 3/4	273.05	20	508.00	15 1/4	387.35	5/8	15.88	9 5/8	244.48	9/16	14.29	10 3/4	273.05	3/8	9.53	-	-
-	812	8 1/2	215.90	10 7/8	276.23	20	508.00	15 1/4	387.35	5/8	15.88	9 3/4	247.65	9/16	14.29	10 3/4	273.05	3/8	9.53	-	-
862202190	858	8 5/8	219.08	11	279.40	20	508.00	15 5/8	396.88	3/4	19.05	9 7/8	250.83	9/16	14.29	11 1/8	282.58	3/8	9.53	-	-
-	834	8 3/4	222.25	11 1/8	282.58	20	508.00	15 5/8	396.88	3/4	19.05	10	254.00	9/16	14.29	11 1/8	282.58	3/8	9.53	-	-
862262190	878	8 7/8	225.43	11 1/4	285.75	20	508.00	15 5/8	396.88	3/4	19.05	10 1/8	257.18	9/16	14.29	11 1/8	282.58	3/8	9.53	-	-
-	900	9	228.60	11 3/8	288.93	22 1/2	571.50	16	406.40	3/4	19.05	10 1/4	260.35	9/16	14.29	11 1/2	292.10	3/8	9.53	-	-
-	918	9 1/8	231.78	11 1/2	292.10	22 1/2	571.50	16	406.40	3/4	19.05	10 3/8	263.53	9/16	14.29	11 1/2	292.10	3/8	9.53	-	-
-	914	9 1/4	234.95	11 5/8	295.28	22 1/2	571.50	16	406.40	3/4	19.05	10 1/2	266.70	9/16	14.29	11 1/2	292.10	3/8	9.53	-	-
-	938	9 3/8	238.13	11 3/4	298.45	22 1/2	571.50	16 3/8	415.93	3/4	19.05	10 5/8	369.88	9/16	14.29	11 7/8	301.63	3/8	9.53	-	-
-	912	9 1/2	241.30	11 3/4	298.45	22 1/2	571.50	16 3/8	415.93	3/4	19.05	10 3/4	273.05	9/16	14.29	11 7/8	301.63	3/8	9.53	-	-
-	958	9 5/8	244.48	12	304.80	22 1/2	571.50	16 3/8	415.93	3/4	19.05	10 7/8	276.23	9/16	14.29	11 7/8	301.63	3/8	9.53	-	-
-	934	9 3/4	247.65	12 1/4	311.15	22 1/2	571.50	16 7/8	428.63	3/4	19.05	11	279.40	5/8	15.88	12 3/8	314.33	3/8	9.53	-	-
-	978	9 7/8	250.83	12 3/8	314.33	22 1/2	571.50	16 7/8	428.63	3/4	19.05	11 1/8	282.58	5/8	15.88	12 3/8	314.33	3/8	9.53	-	-
-	1000	10	254.00	12 1/2	317.50	25	635.00	16 7/8	428.63	3/4	19.05	11 1/4	285.75	5/8	15.88	12 3/8	314.33	3/8	9.53	-	-
-	1018	10 1/8	257.18	12 5/8	320.68	25	635.00	17 7/8	454.03	3/4	19.05	11 3/8	288.93	5/8	15.88	12 3/4	323.85	3/8	9.53	-	-
-	1014	10 1/4	260.35	12 3/4	323.85	25	635.00	17 7/8	454.03	3/4	19.05	11 1/2	292.10	5/8	15.88	12 3/4	323.85	3/8	9.53	-	-
-	1038	10 3/8	263.53	12 7/8	327.03	25	635.00	17 7/8	454.03	3/4	19.05	11 5/8	295.28	5/8	15.88	12 3/4	323.85	3/8	9.53	-	-

NOTE: *Dimensions for each size bearing continue across both pages.*

MEREX



A = SHAFT DIAMETER
B = OUTSIDE DIAMETER
C = LENGTH
D = FLANGE DIAMETER
E = FLANGE THICKNESS
F = METAL I.D.
G = METAL THICKNESS
M = PILOT DIAMETER
N = PILOT THICKNESS

To Facilitate Assembly and Removal of Bearing — Split on Taper as Follows:
Split Above or Below Ctr. Line, At End: Bearing Length 1/16 ..... Up to and including 36" long

Part No.	Code	A Shaft Diameter		B Outside Diameter		C Length		D Flange Diameter		E Flange Thickness		F Metal I.D.		G Metal Thickness		M Pilot Diameter		N Pilot Thickness		Gross Wt.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs.	kg.
-	1012	10 1/2	266.70	13	330.20	25	635.00	18 1/4	463.55	3/4	19.05	11 3/4	298.45	5/8	15.88	13 1/8	333.38	3/8	9.53	-	-
-	1058	10 5/8	269.88	13 1/8	333.38	25	635.00	18 1/4	463.55	3/4	19.05	11 7/8	301.63	5/8	15.88	13 1/8	333.38	3/8	9.53	-	-
-	1034	10 3/4	273.05	13 1/4	336.55	25	635.00	18 1/4	463.55	3/4	19.05	12	304.80	5/8	15.88	13 1/8	333.38	3/8	9.53	-	-
-	1078	10 7/8	276.23	13 3/8	339.73	25	635.00	18 5/8	473.08	3/4	19.05	12 1/8	307.98	5/8	15.88	13 1/2	342.90	3/8	9.53	-	-
-	1100	11	279.40	13 5/8	346.08	27 1/2	698.50	18 5/8	473.08	3/4	19.05	12 3/8	314.33	5/8	15.88	13 1/2	342.90	3/8	9.53	-	-
-	1118	11 1/8	282.58	13 3/4	349.25	27 1/2	698.50	18 5/8	473.08	3/4	19.05	12 1/2	317.50	5/8	15.88	13 1/2	342.90	3/8	9.53	-	-
-	1114	11 1/4	285.75	13 7/8	352.43	27 1/2	698.50	19	482.60	3/4	19.05	12 5/8	320.68	5/8	15.88	13 7/8	352.43	3/8	9.53	-	-
-	1138	11 3/8	288.93	14 1/8	358.78	27 1/2	698.50	19	482.60	3/4	19.05	12 3/4	323.85	11/16	17.46	13 7/8	352.43	3/8	9.53	-	-
-	1112	11 1/2	292.10	14 1/4	361.95	27 1/2	698.50	19	482.60	3/4	19.05	12 7/8	327.03	11/16	17.46	13 7/8	352.43	3/8	9.53	-	-
-	1158	11 5/8	295.28	14 3/8	365.13	27 1/2	698.50	19 3/8	492.13	3/4	19.05	13	330.20	11/16	17.46	14 1/8	358.78	3/8	9.53	-	-
-	1134	11 3/4	298.45	14 1/2	368.30	27 1/2	698.50	19 3/8	492.13	3/4	19.05	13 1/8	333.38	11/16	17.46	14 1/8	358.78	3/8	9.53	-	-
-	1178	11 7/8	301.63	14 5/8	371.48	27 1/2	698.50	19 3/8	492.13	3/4	19.05	13 1/4	336.55	11/16	17.46	14 1/8	358.78	3/8	9.53	-	-
-	1200	12	304.80	14 7/8	377.83	30	762.00	19 3/4	501.65	3/4	19.05	13 1/2	342.90	11/16	17.46	14 1/2	368.30	3/8	9.53	-	-
-	1218	12 1/8	307.98	15	381.00	30	762.00	19 3/4	501.65	3/4	19.05	13 5/8	346.08	11/16	17.46	14 1/2	368.30	3/8	9.53	-	-
-	1214	12 1/4	311.15	15 1/8	384.18	30	762.00	19 3/4	501.65	3/4	19.05	13 3/4	349.25	11/16	17.46	14 1/2	368.30	3/8	9.53	-	-
-	1238	12 3/8	314.33	15 1/4	387.35	30	762.00	20 1/8	511.18	7/8	22.23	13 7/8	352.43	11/16	17.46	15 1/8	384.18	3/8	9.53	-	-
863182190	1212	12 1/2	317.50	15 3/8	390.53	30	762.00	20 1/8	511.18	7/8	22.23	14	355.60	11/16	17.46	15 1/8	384.18	3/8	9.53	-	-
-	1258	12 5/8	320.68	15 1/2	393.70	30	762.00	20 1/8	511.18	7/8	22.23	14 1/8	358.78	11/16	17.46	15 1/8	384.18	3/8	9.53	-	-
-	1234	12 3/4	323.85	15 5/8	396.88	30	762.00	20 1/2	520.70	7/8	22.23	14 1/4	361.95	11/16	17.46	15 1/2	393.70	3/8	9.53	-	-
-	1278	12 7/8	327.03	15 3/4	400.05	30	762.00	20 1/2	520.70	7/8	22.23	14 3/8	365.13	11/16	17.46	15 1/2	393.70	3/8	9.53	-	-
-	1300	13	330.20	16	406.40	32 1/2	825.50	20 1/2	520.70	7/8	22.23	14 1/2	368.30	3/4	19.05	15 1/2	393.70	3/8	9.53	-	-
-	1318	13 1/8	333.38	16 1/8	409.58	32 1/2	825.50	21	533.40	7/8	22.23	14 5/8	371.48	3/4	19.05	15 3/4	400.05	3/8	9.53	-	-
-	1314	13 1/4	336.55	16 1/4	412.75	32 1/2	825.50	21	533.40	7/8	22.23	14 3/4	374.65	3/4	19.05	15 3/4	400.05	3/8	9.53	-	-
-	1338	13 3/8	339.73	16 3/8	415.93	32 1/2	825.50	21	533.40	7/8	22.23	14 7/8	377.83	3/4	19.05	15 3/4	400.05	3/8	9.53	-	-
-	1312	13 1/2	342.90	16 1/2	419.10	32 1/2	825.50	21 3/8	542.93	7/8	22.23	15	381.00	3/4	19.05	16 1/4	412.75	3/8	9.53	-	-
-	1358	13 5/8	346.08	16 5/8	422.28	32 1/2	825.50	21 3/8	542.93	7/8	22.23	15 1/8	384.18	3/4	19.05	16 1/4	412.75	3/8	9.53	-	-
-	1334	13 3/4	349.25	16 3/4	425.45	32 1/2	825.50	21 3/8	542.93	7/8	22.23	15 1/4	387.35	3/4	19.05	16 1/4	412.75	3/8	9.53	-	-
-	1378	13 7/8	352.43	16 7/8	428.63	32 1/2	825.50	21 3/4	552.45	7/8	22.23	15 3/8	390.53	3/4	19.05	16 5/8	422.28	3/8	9.53	-	-
-	1400	14	355.60	17	431.80	35	889.00	21 3/4	552.45	7/8	22.23	15 1/2	393.70	3/4	19.05	16 5/8	422.28	3/8	9.53	-	-
-	1418	14 1/8	358.78	17 1/8	434.98	35	889.00	21 3/4	552.45	7/8	22.23	15 5/8	396.88	3/4	19.05	16 5/8	422.28	3/8	9.53	-	-
-	1414	14 1/4	361.95	17 1/4	438.15	35	889.00	22 1/8	561.98	7/8	22.23	15 3/4	400.05	3/4	19.05	17 1/4	438.15	3/8	9.53	-	-
-	1438	14 3/8	365.13	17 3/8	441.33	35	889.00	22 1/8	561.98	7/8	22.23	15 7/8	403.23	3/4	19.05	17 1/4	438.15	3/8	9.53	-	-
-	1412	14 1/2	368.30	17 5/8	447.68	35	889.00	22 1/8	561.98	7/8	22.23	16	406.40	13/16	20.64	17 1/4	438.15	3/8	9.53	-	-
-	1458	14 5/8	371.48	17 3/4	450.85	35	889.00	22 1/2	571.50	7/8	22.23	16 1/8	409.58	13/16	20.64	17 1/2	444.50	3/8	9.53	-	-
-	1434	14 3/4	374.65	17 7/8	454.03	35	889.00	22 1/2	571.50	7/8	22.23	16 1/4	412.75	13/16	20.64	17 1/2	444.50	3/8	9.53	-	-
-	1478	14 7/8	377.83	18	457.20	35	889.00	22 3/4	577.85	7/8	22.23	16 3/8	415.93	13/16	20.64	17 3/4	450.85	3/8	9.53	-	-
-	1500	15	381.00	18 1/8	460.38	35	889.00	22 3/4	577.85	7/8	22.23	16 1/2	419.10	13/16	20.64	17 3/4	450.85	3/8	9.53	-	-

DuraBlue

DuraBlue Stern Tube Bearings

DuraBlue water-lubricated stern tube bearings are manufactured using a unique synthetic reinforced composite that incorporates solid lubricants for superior operation and outstanding wear life in blue water applications. The composite resin matrix was designed to withstand the rigors of seawater operation and frictional heat generated when used in stern tube propulsion systems.

Benefits of DuraBlue stern tube bearing.

- Pollution Free
- Approved for 2:1 L/d operation
- Ultra low friction propulsion bearing - COF 0.001
- High strength-to-weight ratio
- Internal lubricants for superior operation
- Proprietary fiber/resin matrix for extended wear life
- Low coefficient of thermal expansion
- Easy to machine and install

DuraBlue is an engineered composite material with ABS type approval.

The DuraBlue composite matrix was engineered and tested to provide superior performance in blue water stern tube applications. It has received full ABS type approval for use in propulsion bearings with length to diameter ratios L/d as low as 2:1. DuraBlue bearings meet the requirements for operation in propulsion systems by all other class societies.

DuraBlue stands ahead of the competition.
Unlike unstable thermoplastic polyurethane elastomers, DuraBlue has an engineered composite matrix that will not suffer from hysteresis failure or swelling from hydrolysis. DuraBlue has a much lower coefficient of thermal expansion than polyurethane elastomers and will never loosen or become dislodged in the stern tube.

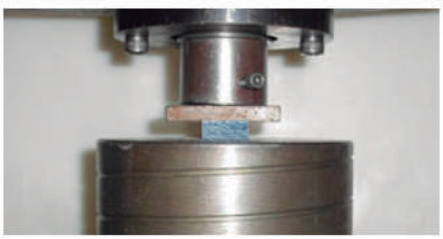
Duramax Marine maintains a commitment to the environment.
Duramax Marine offers the most complete range of seawater-lubricated propulsion system bearings in the industry. Our bearing systems are used on more commercial and navy vessels than any other brand.

DuraBlue is is a cost-effective stern tube bearing solution for blue water use.

DuraBlue Bearing is dimensionally stable and abrasion resistant.
Swelling in sea water is virtually eliminated with our proprietary composite resin matrix. DuraBlue thermoset polymer matrix is reinforced with synthetic fibers, and contain no organic fibers that can swell in sea water. It has an absorption rate ≤0.09%.

DuraBlue meets the Duramax Marine highest level of industry standards.
DuraBlue stern tube bearings have been tested in Duramax in-house lab and meet the highest level of marine industry standards. They are manufactured to meet ISO 9001 standards and are approved for commercial blue water marine use by ABS.

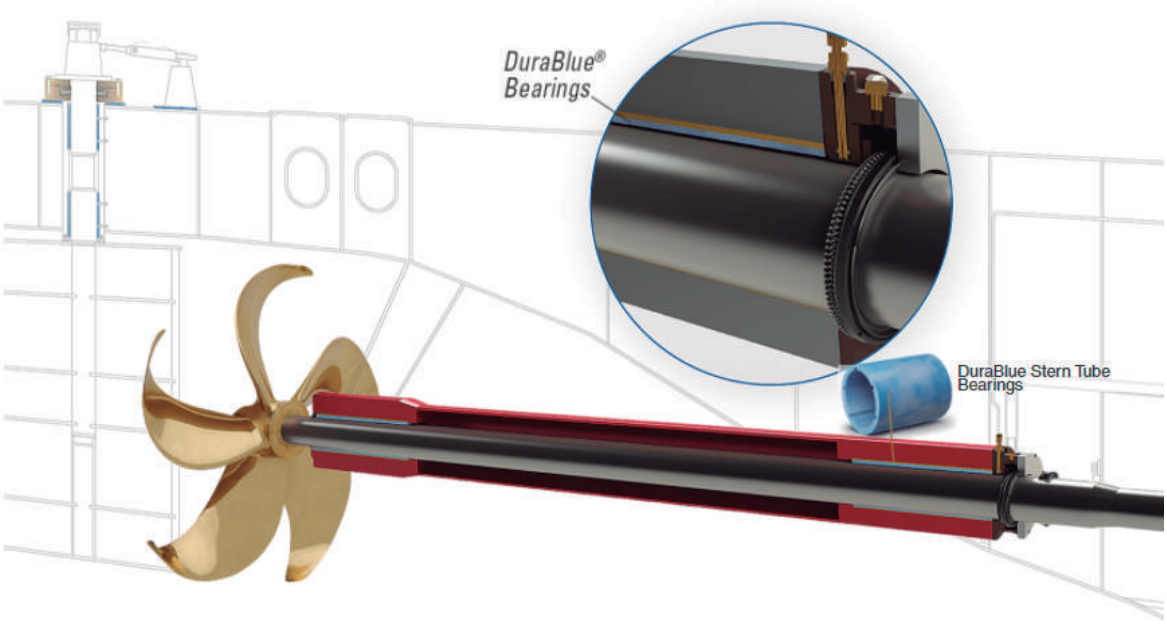
Duramax DuraBlue Compression Test
An independent laboratory static compression test on the DuraBlue composite material showed it exceeded 51,000 PSI.



PROPERTY	UNIT		VALUE	
Compressive Strength (ASTM D695)	MPa	Psi	> 207	> 35,000
Shear Strength (ASTM D2344)	MPa	Psi	> 13.8	> 2,000
Modulus of Elasticity (ASTM D638)	MPa	Psi	> 3,102	> 450,000
Hardness (ASTM D785)	Rockwell "R"		> 110	
Density (ASTM D792)	10^3 kg/m^3	lb/in^3	1.25	0.045
Water Absorption (ASTM D570)	%		< 0.5	
Coefficient of Thermal Expansion (ASTM D696)	10^{-6}/°C	10^{-6}/°F	43	24
Chemical Resistance	NA		Good	
Color	NA		Blue	
Maximum Temperature (ASTM D648)	°C	°F	100	212
Minimum Temperature	°C	°F	< -200	< -328
Advised Maximum Working Temperature	°C	°F	80	176
Coefficient of Friction - Steady State	Tested dry operation at 15N/mm^2		0.1 – 0.2	
	Tested wet at 80 npsi		0.001 – 0.003	
General Wear Resistance	NA		Very Good	
Resistance Against Abrasive Wear	NA		Good	
Deflection*	in		< 0.010	

* after 24 hour at 15 N/mm^2

MEREX



DuraBlue is ideal for conversion of oil to water-lubricated propulsion systems.

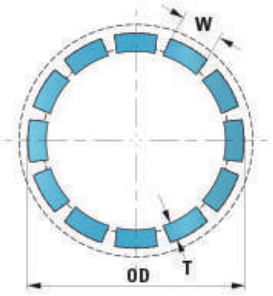
Duramax Marine Engineers can design a complete conversion of your oil lubricated propulsion system to a water-lubricated system.

Seawater lubrication - The ideal lubricant.
Seawater is the ideal lubricant for use in modern propulsion systems. It offers the obvious advantages of being nonpolluting and environmentally friendly. It is plentiful and a cost effective and superior alternative to oil lubricated propulsion systems. Our engineering team can design a water-lubricated propulsion system that eliminates oil pollution and keeps our oceans clean.

Ultra low friction and wear.
Wear and friction are more important considerations with water-lubricated bearings than with oil lubricated bearings. This is because of the very low viscosity of water and the resulting thin film thickness. DuraBlue is designed to operate hydrodynamically and support water film development at very low shaft speeds. The material matrix is also extremely resistant to wear by third body abrasion.

Special designs.
Special bearings for naval application that incorporate partial arc segmental bearings mounted in split bronze housings are also available. All bearings can be manufactured as full or split bearings.

Stave Bearing design.
Staves can be machined using sheet stock and is an easy and more economical solution when removing worn staves and keeper strips for replacing staves in the bronze carrier.



DuraBlue Bearings, custom fit to match your application.

DuraBlue Bearings can be easily machined.
As a general guide DuraBlue Bearing is machinable using standard conventional machine shop techniques. Methods used for brass, aluminum or lignum vitae will apply for DuraBlue. It is preferable to use tungsten carbide turning tools with cutting speeds of 5.5 m/s (19ft/s). Must be machined dry, without use of coolant.

DuraBlue Bearings are available in any size.
DuraBlue Bearings are available for any shaft diameter. The bearings can be supplied from our factory in unfinished tubes or we can supply fully machined ready for service.

Fitting methods for DuraBlue Bearings.
DuraBlue can be easily installed using one of these recommended installation techniques:
Press Fit
Freeze Fit
Liquid Nitrogen (Vapor Method)
Liquid Nitrogen (Immersion Method)
Dry Ice and Alcohol Method

DuraBlue

Duramax DuraBlue Greaseless Rudder Bushing

DuraBlue is a self lubricated composite bushing designed for use in highly loaded oscillatory applications such as found in rudder, pintle and stearing gear assemblies. DuraBlue needs no lubrication and is exceptionally wear resistant with an extremely long wear life. It has a low coefficient of friction value of 0.1 to 0.2, resulting in no stick-slip during operation. DuraBlue experiences virtually no swelling in seawater, and a very low thermal coefficient of expansion. Its proprietary fiber matrix greatly extends wear life and a self-lubricating formulation for dry running.

Benefits of DuraBlue greaseless composite material.

- Virtually no swelling in seawater
- High strength-to-weight ratio
- Self-lubricating formulation for dry running
- Chemical and corrosion resistant
- Proprietary fiber matrix extends wear life
- Very low thermal coefficient of expansion
- Easy to machine
- Easy to install

DuraBlue Is An Engineered Composite Material.

No lubrication is required.
Duramax DuraBlue has a proprietary lubrication formulation integrated evenly in its resin system. Needs no grease or oil, eliminating the risk of costly marine pollution fines. It will operate wet running, or run dry over extended periods of time without lubrication.

DuraBlue is chemical and corrosion resistant.
DuraBlue remains stable in chemical solutions and not affected by many solvents, inorganic solutions, fat and weak acids. It is non-metallic, non conductive and corrosion resistant.

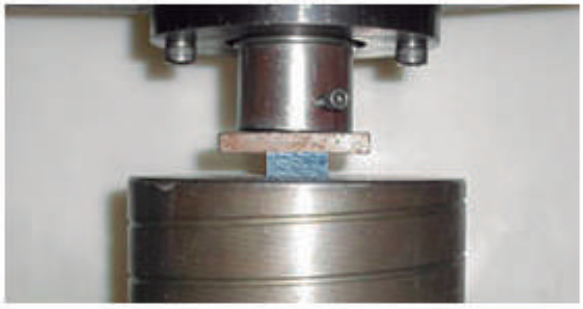
Minimum thermal expansion and contraction.
DuraBlue has a low thermal expansion rate in high and low temperature environments. Unlike polyurethane rudder bushings that have a wide range of thermal expansion and contraction rate that can affect the interference needed to hold the bushing in place.

Experiences no swell and is abrasion resistant.
DuraBlue has virtually no swell when operating in salt or fresh water environments with an absorption rate of < 0.5%. Resists abrasion and wear in the harshest of conditions.

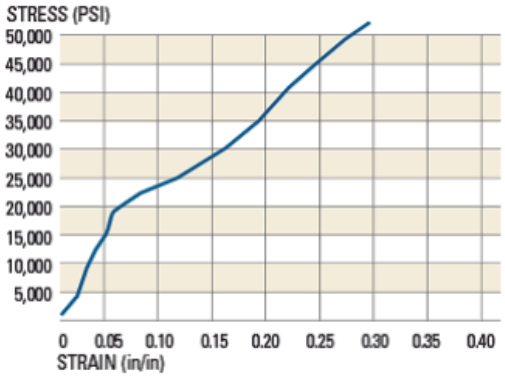
PROPERTY	UNIT		VALUE	
Compressive Strength (ASTM D695)	MPa	Psi	> 207	> 35,000
Shear Strength (ASTM D2344)	MPa	Psi	> 13.8	> 2,000
Modulus of Elasticity (ASTM D638)	MPa	Psi	> 3,102	> 450,000
Hardness (ASTM D785)	Rockwell "R"		> 110	
Density (ASTM D792)	10^3 kg/m^3	lb/in^3	1.25	0.045
Water Absorption (ASTM D570)	%		< 0.5	
Coefficient of Thermal Expansion (ASTM D696)	10^{-6}/°C	10^{-6}/°F	43	24
Chemical Resistance	NA		Good	
Color	NA		Blue	
Maximum Temperature (ASTM D648)	°C	°F	100	212
Minimum Temperature	°C	°F	< -200	< -328
Advised Maximum Working Temperature	°C	°F	80	176
Typical Friction Value	NA		0.1 – 0.2	
General Wear Resistance	NA		Very Good	
Resistance Against Abrasive Wear	NA		Good	
Deflection*	in		< 0.010	

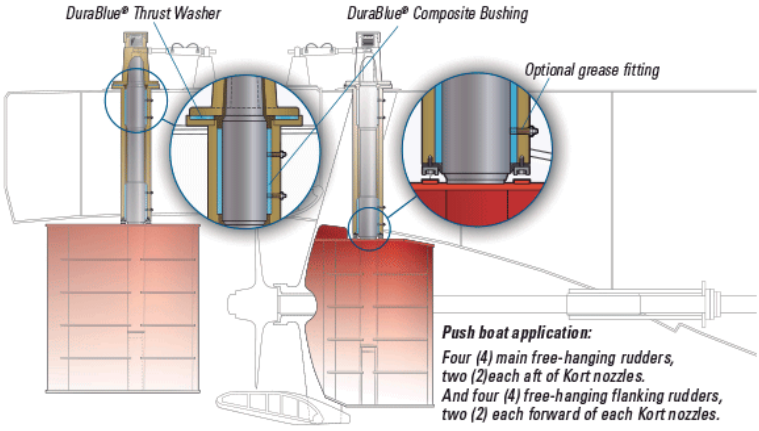
* after 24 hour at 15 N/mm^2

MEREX



Duramax DuraBlue Compression Test
An independent laboratory static compression test
on the DuraBlue composite material showed it exceeded 51,000 PSI.





Absorbs stresses and high impact loads
Duramax DuraBlue rudder bushings are light in weight and engineered to better absorb the stresses and high impact loads associated with rudder applications than metal material alternatives like bronze, brass, nylon and other urethane based products. DuraBlue also works well with all corrosion resistant materials: 316 Stainless Steel, Inconel, Monel, Stellite and Gunmetal.
DuraBlue bushings can better handle the damaging effects of misalignment and offers extremely smooth operation with specific pressure of up to 25N/mm2. A 4 to 32 micro inch surface finish is recommended to extend bushing life.

Tolerant to edge loading
The DuraBlue bushing is stable even with misalignments and tolerates edge loading. It is an engineered fiber composite material that maintains a high compression strength. It is lightweight and resists damage or fracture. With a high strength-to-weight ratio.

Easy installation
Duramax Durablue rudder bushings can be easily machined to exact specifications at the shipyard to fit your application. It is installed with an interference fit. Freezing the bushing in liquid nitrogen or dry ice will allow for easy fitting of bushing into housing. As the bushing returns to normal temperature and increases in size, the proper interference with the housing will be obtained. It can also be installed using a draw bar or press fitted into place.

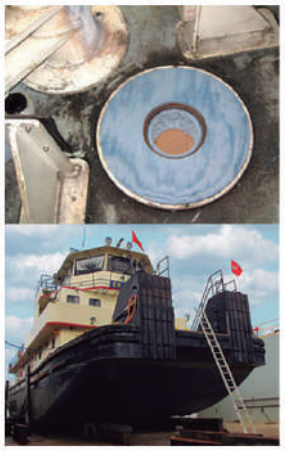
DuraBlue Thrust Washers and Wear Pads.

DuraBlue is an engineered thermoset composite solution that is excellent for thrust washer and wear pad applications. DuraBlue composite thrust washers are an environmentally friendly, cost-effective, grease-free alternative to traditional metallic materials such as brass. They can also be used in place of PTFE, UHMW, Cast Nylon and other Phenolics and composite materials.

Suitable for high load applications
DuraBlue composite engineered fabrics are impregnated with thermosetting resins, with solid lubricants dispersed evenly, along with proprietary additives. It has a low coefficient of friction and high load capacity that's excellent for thrust washers and wear pad applications when operating with intermittent or oscillating movements.

Flexible bonding ability
DuraBlue can be bonded to itself and metals such as bronze, brass, aluminum, and stainless steel using a two-part epoxy resin adhesive. Call your Duramax DuraBlue specialist for detailed instructions.

Custom inserts for easy fastening
DuraBlue composite wear pads can be held in place with countersunk screws and keeper plates. Wear pads can be held in place by metal inserts imbedded into the composite. Flat head screws, helicoils and Keenserts can be used to fasten wear pads in place.



Rudder Bushing

DX490

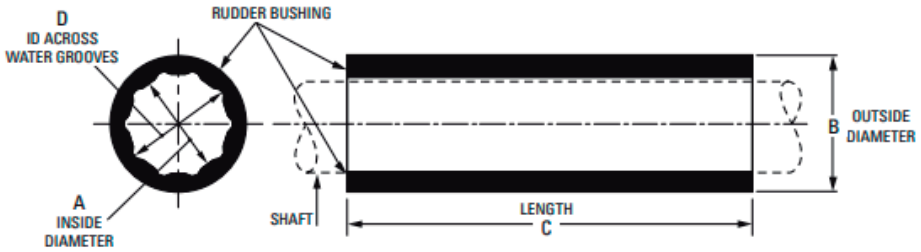
DX490 Rudder Bushings are molded from a 70 Scale D, Durometer, Nitrile Rubber Compound (approximately the same hardness as a bowling ball). They are formulated to withstand the rugged "impact" service encountered in ship's rudder steering systems. DX490 has high rigidity for maximum dimensional stability while still retaining a degree of resiliency required to dampen peak shock loads.

DX490 Rudder Bushings are supplied as unfinished cylinders molded with longitudinal lubrication grooves. The bushings can be easily machined in a local machine shop for proper fit. Grease, oil and water serve equally well as lubricants. The DX490 Rudder Bushing is resistant to deterioration by hydrocarbons, acids, salt water corrosion and electrolysis.

CAUTION:
DX490 Rudder Bushings are supplied as unfinished with molded I.D. and O.D. dimensions which allow ample material for finish machining. However, when finish boring I.D. dimensions do not remove more than 70% of the lubricant groove depth.

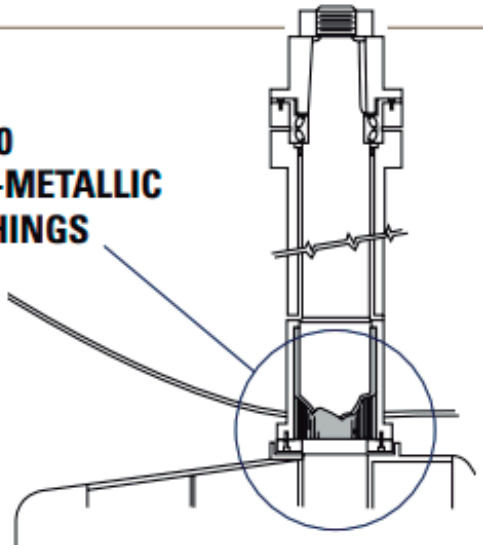
IMPORTANT: In addition to interference press fit, DX490 Rudder Bushings must be mechanically secured with set screws or other locking devices to prevent movement during operation and the expected operating temperature range.

FIGURE 13



Part Number	Code	A Inside Diameter		B Outside Diameter		C Length		D ID Across Water Grooves		Gross Wt.	
		inches	mm	inches	mm	inches	mm	inches	mm	lb.	kg.
812100038	DX150	1.45	36.83	2.35	59.69	11	279.40	1.62	41.15	1.0	0.5
812100044	DX175	1.70	43.18	2.59	65.79	13	330.20	1.97	50.04	1.5	0.7
812100051	DX200	1.95	49.53	3.07	77.98	15	381.00	2.20	55.88	2.5	1.1
812100057	DX225	2.18	55.37	3.32	84.33	7 1/2	190.50	2.57	65.28	2.3	1.0
812100064	DX250	2.44	61.98	3.68	93.47	9	228.60	2.75	69.85	2.7	1.2
812100070	DX275	2.70	68.58	3.92	99.57	10	254.00	2.97	75.44	3.0	1.4
812100076	DX300	2.95	74.93	4.20	106.68	11	279.40	3.39	86.11	4.0	1.8
812100083	DX325	3.19	81.03	4.42	112.27	12	304.80	3.60	91.44	4.0	1.8
812100089	DX350	3.34	84.84	5.19	131.83	13	330.20	3.76	95.50	7.5	3.4
812100095	DX375	3.66	92.96	5.18	131.57	14	355.60	4.05	102.87	6.5	2.9
812100102	DX400	3.93	99.82	5.45	138.43	15	381.00	4.28	108.71	7.5	3.4
812100108	DX425	4.16	105.66	5.68	144.27	16	406.40	4.55	115.57	9.0	4.1
812100114	DX450	4.42	112.27	6.02	152.91	17	431.80	4.68	118.87	11.0	5.0
812100121	DX475	4.65	118.11	6.01	152.65	18	457.20	5.05	128.27	10.0	4.5
812100127	DX500	4.93	125.22	6.68	169.67	19	482.60	5.31	134.87	15.0	6.8
812100135	DX525	5.15	130.81	6.90	175.26	20 1/2	520.70	5.64	143.26	17.0	7.7
812100140	DX550	5.39	136.91	7.61	193.29	21	533.40	5.91	150.11	21.0	9.5
812100146	DX575	5.65	143.51	7.65	194.31	22	558.80	6.00	152.40	22.0	10.0
812100152	DX600	5.87	149.10	8.65	219.71	22	558.80	6.40	162.56	24.0	10.9
812100165	DX650	6.36	161.54	8.67	220.22	22	558.80	6.84	173.74	27.8	12.6
812100171	DX675	6.65	168.91	9.00	228.60	23	584.20	7.16	181.86	31.0	14.1
812100178	DX700	6.88	174.75	9.08	230.63	24 1/2	622.30	7.35	186.69	31.0	14.1
812100184	DX725	7.10	180.34	10.47	265.94	27 1/2	698.50	7.60	193.04	38.0	17.2
812100191	DX750	7.33	186.18	10.47	265.94	27 1/2	698.50	8.07	204.98	35.0	15.9
812100197	DX775	7.70	195.58	10.47	265.94	27 1/2	698.50	8.30	210.82	45.0	20.4
812100203	DX800	7.82	198.63	10.56	268.22	29 1/2	749.30	8.50	215.90	50.0	22.7
812100216	DX850	8.37	212.60	12.20	309.88	35	889.00	9.09	230.89	65.0	29.5
812100222	DX875	8.64	219.46	11.32	287.53	32 1/2	825.50	9.11	231.39	58.0	26.3
812100229	DX900	8.89	225.81	11.32	287.53	32 1/2	825.50	9.49	241.05	73.0	33.1
812100235	DX925	9.11	231.39	12.22	310.39	35	889.00	9.72	246.89	85.0	38.6

DX490 NON-METALLIC BUSHINGS



PHYSICAL PROPERTIES:

Deformation	Load PSI		Deflection	Temperature
	225		.004"	72° F
	300		.0045"	72° F
Compressive Strength	15,000		Elastic Limit	72° F
Tensile	3000 PSI			
Expansion and Contraction	Configuration	Contraction	Temp.	Recovery
	Std. Tubular	.002" -.0025" per inch of OD	—20° F	100%
Absorption	Aging	Liquid	Temp.	Vol. Change %
	70 hrs.	ASTM #3 Oil	212° F	+ 4.9%
	70 hrs.	ASTM #3 Oil	100° F	+ less than 1%
	70 hrs.	ASTM #3 Oil	72° F	Negligible
	70 hrs.	H_2O	212° F	+ 2.6%
	70 hrs.	H_2O	100° F	Negligible
Range of working temperature - - —20° to 180° continuous service.				

CALCULATING THE FINISHED (MACHINED) SIZE OF DX490

Nominal Bushing I.D. and O.D. dimensions must be adjusted to allow for proper shaft to bearing running clearance, thermal expansion and contraction and interference press fit. Before machining, calculate the finished machined bearing I.D. and O.D. dimensions as follows:

EXAMPLE:

Nominal Shaft Diameter:	8 inches
Nominal Bearing Housing Diameter:	12 inches

To determine the finished machined bearing I.D. dimension

refer to the machining tables and add the running clearance (Table X), thermal factor (Table Y) and press fit allowance (Table Z), to the nominal shaft diameter.

Finished Machined Bearing I.D. Dimension equals:

+ Nominal Bearing Shaft Diameter	8.000
+ Running Clearance (Table X)	0.018
+ Thermal Factor (Table Y)	0.016
+ Press Fit Allowance (Table Z)	0.008
	8.042 inches I.D.

To determine the finished machined bearing O.D. dimension

Refer to the machining tables and add the thermal factor (Table Y) and the press fit allowance (Table Z), to the nominal bearing housing diameter.

Finished Machined Bearing O.D. Dimension equals:

+ Nominal Bearing Housing Diameter	12.000
+ Thermal Factor (Table Y)	0.016
+ Press Fit Allowance (Table Z)	0.008
	12.024 inches O.D.

TABLE X — RUNNING CLEARANCE

Nominal ID inches	2	3	4	5	6	7	8	9	10	11	12	13	14
Allowance inches	0.012	0.013	0.014	0.015	0.016	0.017	0.018	0.019	0.020	0.021	0.022	0.023	0.024
Nominal ID mm	50.80	76.20	101.60	127.00	152.40	177.80	203.20	228.60	254.00	279.40	304.80	330.20	355.60
Allowance mm	0.30	0.33	0.36	0.38	0.41	0.43	0.46	0.48	0.51	0.53	0.56	0.58	0.61

TABLE Y — THERMAL FACTOR

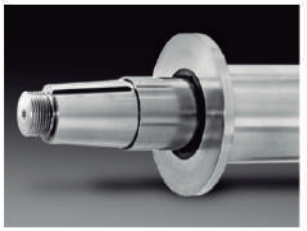
Nominal ID inches	2	3	4	5	6	7	8	9	10	11	12	13	14
Allowance inches	0.004	0.006	0.008	0.010	0.012	0.014	0.016	0.018	0.020	0.022	0.024	0.026	0.028
Nominal ID mm	50.80	76.20	101.60	127.00	152.00	177.80	203.20	228.60	254.00	279.40	304.80	330.20	355.60
Allowance mm	0.10	0.15	0.20	0.25	0.30	0.35	0.41	0.46	0.51	0.56	0.61	0.66	0.71

TABLE Z — PRESS FIT ALLOWANCE

Nominal ID inches	2	3	4	5	6	7	8	9	10	11	12	13	14
Allowance inches	0.005	0.005	0.005	0.005	0.005	0.008	0.008	0.008	0.008	0.010	0.010	0.010	0.010
Nominal ID mm	50.80	76.20	101.60	127.00	152.00	177.80	203.20	228.60	254.000	279.40	304.80	330.20	355.60
Allowance mm	0.13	0.13	0.13	0.13	0.13	0.20	0.20	0.20	0.20	0.25	0.25	0.25	0.25

DURAMAX NCB Shaft Sleeves

Installation Manual



Introduction

DURAMAX® NCB HARDCOATING RESISTS ABRASION AND CORROSION, EXTENDING SHAFT-ASSEMBLY LIFE:

DURAMAX® NCB (Nickel-Chrome-Boron) SHAFT SLEEVES are guaranteed to double the life of conventional materials such as 316 or heat treated 410 stainless and will actually give 4-5 times increased wear life. The 58 to 62 Rockwell "C" hardness rating of the DURAMAX® NCB (Nickel-Chrome-Boron) SHAFT SLEEVE increases service wear life of shafts and shaft sleeves where mechanical abrasion and corrosion take place (example – seal, packing, and bearing areas.)

The fused area of the shaft sleeve is undercut .065 to .070 inches per side. The undercut area is then thermal coated with the Nickel-Chrome-Boron (NCB) powder. Using multiple spraying passes, the sleeve is hard-coated to an oversize dimension. A heat treating process is used to fuse or metallurgically bond the NCB hard coating to the base metal at around 2000°F. After cooling, the shaft sleeve is ground to a 6-8 RMS finish and provides a 58-62 Rockwell "C" hardness.

DURAMAX® SHAFT SLEEVE OPTIONAL BORE DIMENSIONS:

Duramax® NCB Shaft Sleeves are supplied with either "FINISHED BORE" or "ROUGH BORE" inside diameters.

FINISHED BORE:
Duramax® NCB Shaft Sleeves with "FINISHED BORE" dimensions are supplied ready for shrink-fit installation on the shaft and do not require machining of the sleeve bore diameter prior to installation. Duramax® NCB Shaft Sleeves ordered with "FINISHED BORE" dimensions require the customer to provide shaft diameter dimensions so the correct shrink fit and the "finish bore" dimensions can be calculated prior to the manufacture of the shaft sleeve.

ROUGH BORE:
When shaft dimensions are not readily available or the shaft must be modified or repaired at dry-docking, Duramax® NCB Shaft Sleeves with "ROUGH BORE" dimensions are available. The "ROUGH BORE" sleeve is supplied with an undersized bore diameter and requires a finish boring operation prior to installation.

Installation of Duramax® NCB Rudder Stock & Tail Shaft Sleeves

SHRINK-FIT INSTALLATION OF NCB SLEEVES:

Duramax® NCB Shaft Sleeves consist of a NCB (Nickel Chrome Boron) Coating that is fused to a base metal such as Carbon Steel or Stainless Steel. The NCB coating expands and contracts uniformly with the base metal. However, there are certain procedures and precautions that must be taken when preparing the shaft sleeve for installation and during the shrink fitting process.

I. SHAFT PREPARATION

The most important factor is the condition of the shaft onto which the shaft sleeve will be installed.

The shaft should be straight before attempting to install the shaft liner.

The shaft should be clean, concentric and free of excessive dimensional run out and/or tapers in the sleeve mounting area.

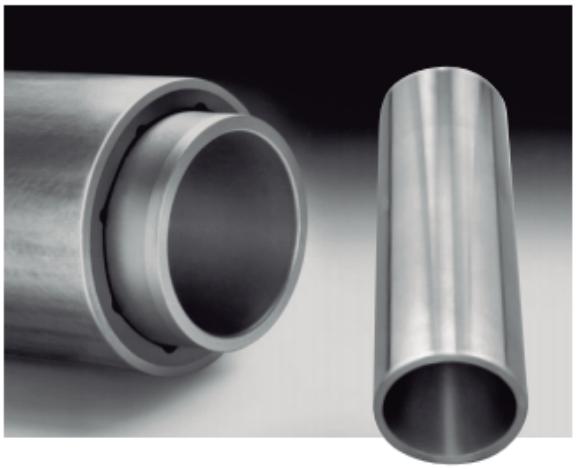
It is essential to remove all high spots or burrs on the shaft. They can cause the shaft sleeve to stick during the installation process and can create stress concentrations during the shrink fitting process that may damage the NCB coating.

II. SHRINK FIT TOLERANCE

For proper shrink fitting of the Duramax® NCB Shaft Sleeve onto a shaft, calculate an interference shrink fit of 0.0005 inches per inch of shaft diameter not to exceed 0.004 inches.

For example, a Duramax® NCB Shaft Sleeve bored to 6.000 inches inside diameter would require a maximum of .003 shrink fit.

WARNING: The Maximum Interference fit should never exceed 0.004 inches. Interference fits in excess of 0.004 inches may result in the fracture or cracking of the NCB Coating.



MEREX

Installation of Duramax® NCB Rudder Stock and Tail Shaft Sleeves (continued)

III. SHAFT SLEEVE BORE MACHINING & TOLERANCES

The ideal machining method to maintain the required bore tolerances is to machine bore the I.D. on a lathe to within 0.002 to 0.003 inches of the required finished bore diameter.

Next, hone the I.D. to final dimension with a maximum surface finish of 63 RMS.

The better the bore finish, the easier the installation and the less probability of "sticking" the sleeve on the shaft before getting to the proper location.

SHAFT DIAMETER	SLEEVE I.D. TOLERANCE	MAXIMUM ID TO OD RUN OUT
up to 6.000 inches	-0.002 to -0.003 inches	0.002 inches
6.000 to 8.000 inches	- 0.003 to -0.0035 inches	0.003 inches
over 8.000 inches	- 0.0035 to -0.004 inches	0.003 in

IV. SHRINK FITTING

CAUTION: The installation and shrink fitting of NCB Shaft Sleeves requires the handling and transporting of hot objects or materials that have been heated to temperatures in excess of 400° F. Improper handling or coming in contact with these heated objects can result in severe burns and injury to unprotected skin and tissues. **USE OF PROPER CLOTHING AND EYE PROTECTION IS REQUIRED.**

Prior to heating and shrink fitting the Duramax® NCB Shaft Sleeve, make sure the shaft is at room temperature and all surfaces are dry and in clean condition. Use an indelible ink to mark the area of the shaft where the NCB Shaft sleeve will be shrink-fitted. In addition to this marking, it is advisable to place a stop-block on the shaft in order to ensure the proper shrink fitting location of the shaft sleeve.

Using inside micrometers, set the micrometers to a heat expanded bore dimension of approximately 0.020 to 0.025 inches larger than the finished bore dimension of the shaft sleeve. The micrometers will be used as a gage to determine when the heated shaft sleeve's bore has expanded to an oversize dimension for installation on the shaft.

Always heat the shaft sleeve slowly and uniformly to avoid rapid and localized thermal expansion. Heating the shaft sleeve for shrink fitting can be done with a convection oven or hot oil bath. These heating methods apply heat to the entire shaft sleeve, heat the shaft sleeve slowly and uniformly, and avoid thermal shocking of the NCB Coating. The best method is to heat the sleeve in a convection oven to a temperature range of 375° to 425° F.

We do not recommend using a torch for heating the shaft sleeve because of the difficulty in controlling the temperature of the shaft sleeve. **CAUTION: Concentrated torch heating of the shaft sleeve for extended periods of time can result in thermal shock damage to the shaft sleeve.**

DO NOT HEAT THE SHAFT SLEEVE TO TEMPERATURES IN EXCESS OF 425° F.

The NCB shaft sleeve is ready for shaft installation when your pre-set micrometers can be dropped into or clear the inside diameter of the heated shaft sleeve.

Next, rapidly slide the heated shaft sleeve to the stop-block or the pre-marked shrink fit location on the shaft. When the NCB shaft sleeve is in the proper location, maintain its position at the stop-block and allow the shaft sleeve to slowly cool down and shrink fit to the shaft.

During the positioning of the heated shaft sleeve, take every precaution to avoid contact of the heated shaft sleeve to colder materials such as the shaft. The colder material will act as a heat sink, rapidly reduce the temperature of the heated shaft sleeve and will accelerate the shrinkage of the sleeve before it is in the proper location on the shaft.

In the event that the heated shaft sleeve should shrink and "stick" out of position, you must wait until both the shaft sleeve and the shaft have completely cooled before attempting to remove the shaft sleeve. DO NOT try to force the shaft sleeve on after it has shrunk to the shaft and is out of position. Galling, etc. will occur and permanent damage to the shaft or sleeve will occur.

After complete cooling of the shaft and shaft sleeve, reheat the sleeve to remove or to complete the installation. During the reheating process, wet cloths should be wrapped around the shaft at the ends of the shaft sleeve to avoid excessive heating of the shaft during this operation.

REMOVAL OF USED SLEEVES:

Used shaft sleeves can be removed using an "air-arc" (argon mix/acetylene), gouging tool or "green grinding wheel" (diamond coated) to cut through the hard coating layer. After the NCB coating is cut, use an oxygen/acetylene torch to cut through the base liner holding it at a tangent to the shaft to avoid damaging the shaft. Any marks on the shaft should be turned off prior to installing replacement liner.