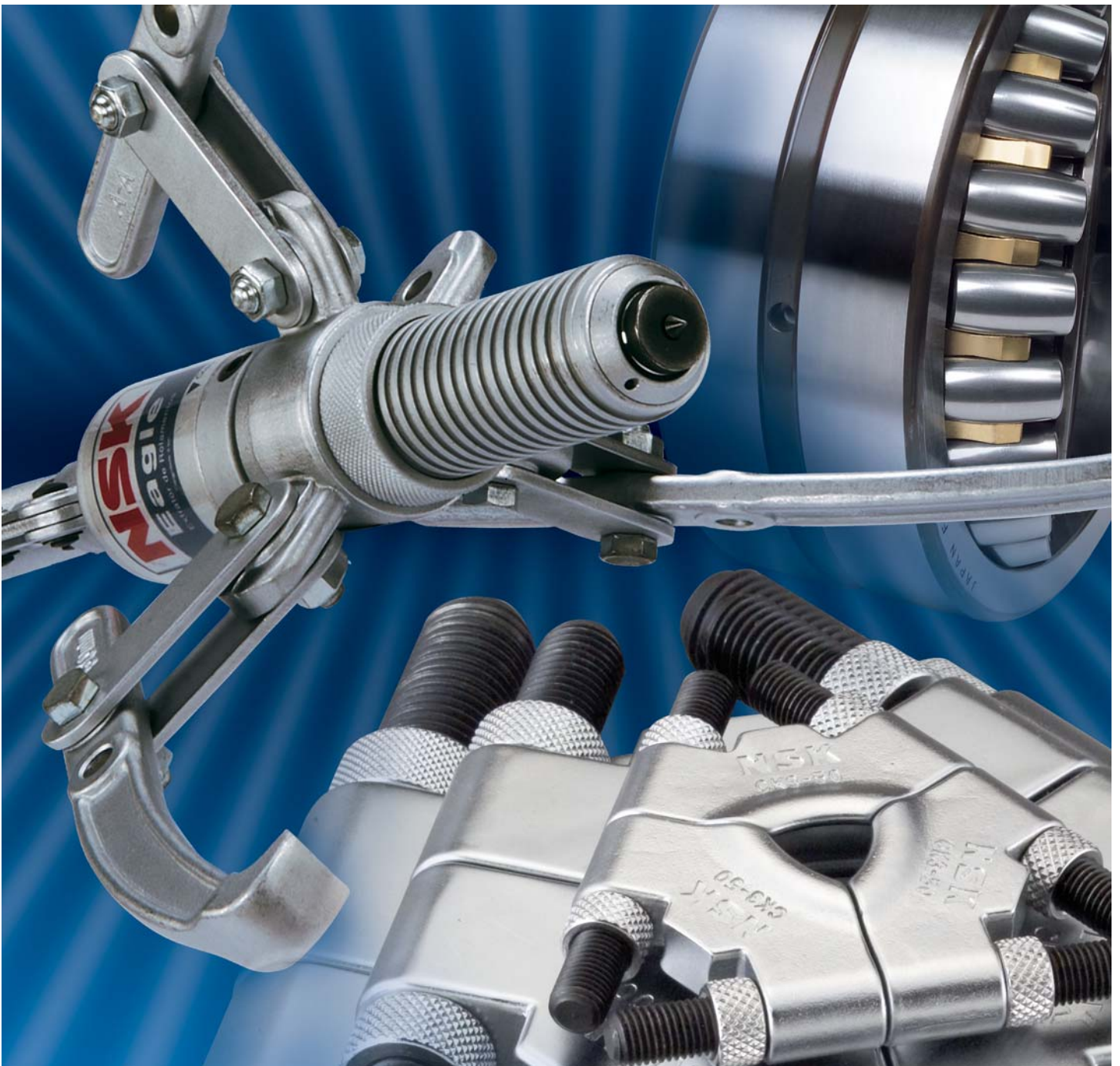


Bearing Maintenance Tools

For the installation and removal of bearings to ensure long, reliable machine life, ease of tear down and quick turnaround time



NSK Bearing Maintenance Tools

NSK is a global leader in bearing manufacturing and related technologies. Our offering of maintenance tools is an extension of our position as an authority in maintenance reliability. Using the proper maintenance tools for bearing installation and removal ensures long reliable machine life, ease of tear down and quick turnaround time.

NSK's family of maintenance tools consists of:

- Sine Bar Gages
- Pullers
- Straighteners
- Pumps
- Jack-Up Nuts
- Bearing Heaters
- Pushers
- Hydraulic Nuts
- Wrenches
- Roll Neck Lifting Tools
- Taper Gages (Shaft Taper)
- Ring Gages (Housing Bore)
- GN Gages (Radial Clearance)

Our extensive offering of tools are backed by the NSK name and come in full size ranges and convenient and high quality carrying cases. Purchase of any of NSK's maintenance tools can be made through an authorized NSK distributor.

NSK is dedicated to being your partner and supplier of choice for your motion and control needs. If you have questions relating to NSK maintenance tools or require assistance, please speak with your local authorized distributor, your local NSK representative or contact us on the web at www.am.nsk.com.



NSK Sine Bar Gages

Page 3-4

Certified NSK sine bar gages are designed to provide an accurate and easy method to check a journal seat's taper, size, out-of-roundness and contact area.



NSK Bearing Heaters

Page 5-6

NSK versatile bearing induction heaters are used to quickly and easily install straight bore bearings onto shafts.



Pullers, Pushers, Straighteners & Tri-Section Press Plates

Page 7-10

Pullers, pushers, straighteners and tri-section press plates are used to easily and quickly install and remove bearings, rings, pulleys and gears from shafts while minimizing damage of the bearing shaft and bodily harm that may occur during the removal process.



NSK Hydraulic Nuts

Page 11-16

A hydraulic nut utilizes fluid power to mount and dismount tapered bore bearings. NSK's hydraulic nuts were manufactured with a patented axial displacement measuring system making them easier and quicker to use compared to conventional nuts.



Hydraulic Pump

Page 17

NSK hydraulic pumps are used in conjunction with hydraulic nuts and pullers to mount and dismount tapered bore bearings. They can also be used by themselves for oil-assisted bearing removal.

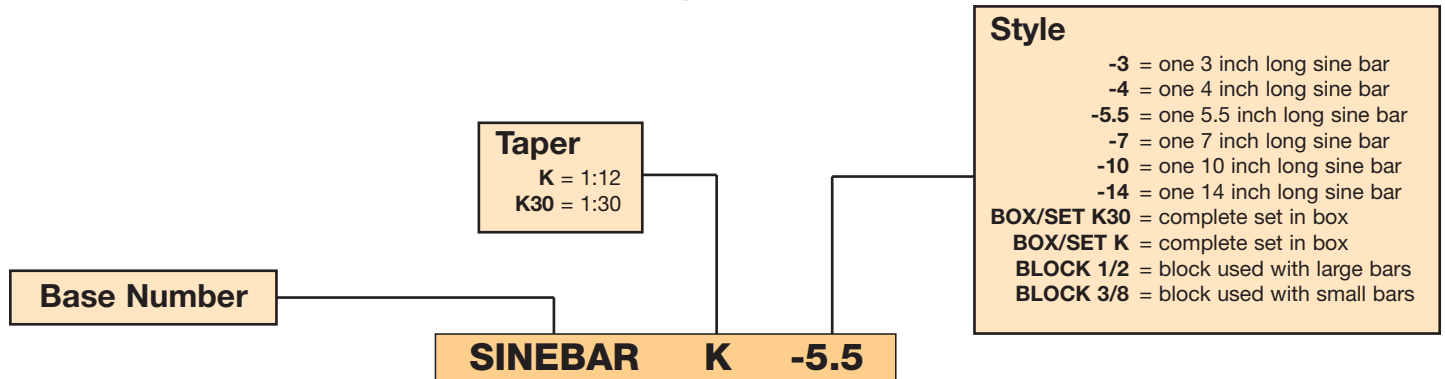


Spanner Wrench

Page 18

Spanner wrenches are used in the hand mounting and removal of tapered bore bearings.

NSK Sine Bar Gages



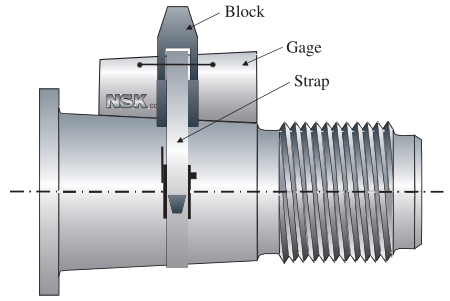
Accurate fit between a tapered bore bearing and its journal is critical if a bearing is to reach maximum life. Certified NSK Sine Bar Gages are designed to provide an accurate and easy method to measure a journal's taper, size, contact area and out of roundness.

A complete sine bar gage set for measurement of either 1:12 or 1:30 shaft tapered journals consists of:

- 3,4,5.5,7,10 and 14 inch long sine bar gages
- 2 sine bar blocks
- a strap
- calibration reports
- wooden box for transportation
- 2 clamps
- journal details charts
- instructions for use

NSK sine bars are coated with a special anti-rusting treatment, come with easy to read laminated instructions and are available individually, in combination or as complete sets. They are lightweight, easy to handle and a cost effective way to ensure maximum bearing life.



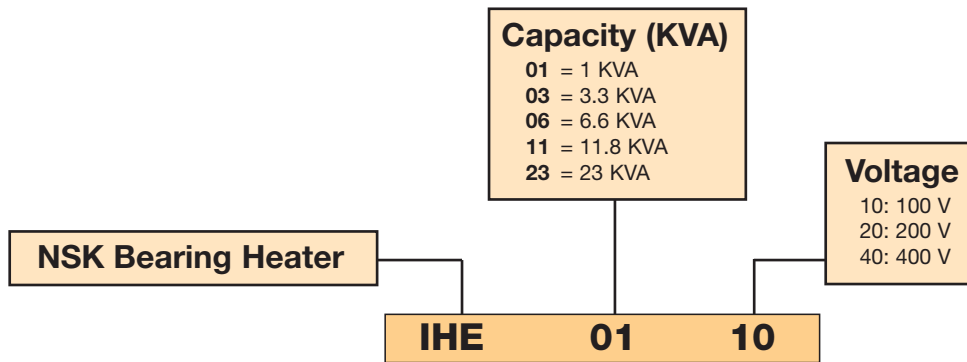


BEARING			1:12 Tapered Journal														1:30 Tapered Journal			
BORE SIZE			222 SERIES		223 SERIES		230 SERIES		231 SERIES		232 SERIES		238 SERIES		239 SERIES		240 SERIES		241 SERIES	
Bore Symbol	Bore - Millimeters	Bore - Inches	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.	Gage No.	Block No.
20	100	3.9370			3	3/8			3	3/8	3	3/8								
22	110	4.3307			3	3/8			3	3/8	3	3/8							3	3/8
24	120	4.7244	3	3/8	3	3/8			3	3/8	3	3/8							3	3/8
26	130	5.1181	3	3/8	3	3/8			3	3/8	3	3/8					3	3/8	3	3/8
28	140	5.5118	3	3/8	4	3/8			3	3/8	3	3/8					3	3/8	3	3/8
30	150	5.9055	3	3/8	4	3/8			3	3/8	3	3/8					3	3/8	4	3/8
32	160	6.2992	3	3/8	4	3/8			3	3/8	4	3/8					3	3/8	4	3/8
34	170	6.6929	3	3/8	4	3/8	3	3/8	3	3/8	4	3/8					3	3/8	4	3/8
36	180	7.0866	3	3/8	4	3/8	3	3/8	3	3/8	4	3/8					4	3/8	4	3/8
38	190	7.4803	3	3/8	4	3/8	3	3/8	4	3/8	4	3/8					4	3/8	4	3/8
40	200	7.8740	3	3/8	5.5	3/8	3	3/8	4	3/8	4	3/8			3	3/8	4	3/8	5.5	3/8
44	220	8.6614	4	3/8	5.5	3/8	3	3/8	4	3/8	5.5	3/8			3	3/8	4	3/8	5.5	3/8
48	240	9.4488	4	3/8	5.5	3/8	3	3/8	4	3/8	5.5	3/8			3	3/8	4	3/8	5.5	3/8
52	260	10.2362	4	3/8	5.5	3/8	4	3/8	5.5	3/8	5.5	3/8			3	3/8	5.5	3/8	7	1/2
56	280	11.0236	4	3/8	5.5	3/8	4	3/8	5.5	3/8	5.5	3/8	3	3/8	3	3/8	5.5	3/8	7	1/2
60	300	11.8110	5.5	3/8			4	3/8	5.5	3/8	7	1/2	3	3/8	3	3/8	5.5	3/8	7	1/2
64	320	12.5984	5.5	3/8			4	3/8	5.5	3/8	7	1/2	3	3/8	3	3/8	5.5	3/8	7	1/2
68	340	13.3858					4	3/8	7	1/2	7	1/2	3	3/8	3	3/8	7	1/2	7	1/2
72	360	14.1732					4	3/8	7	1/2	7	1/2	3	3/8	3	3/8	7	1/2	7	1/2
76	380	14.9606					4	3/8	7	1/2	7	1/2	3	3/8	4	3/8	7	1/2	7	1/2
80	400	15.7480					5.5	3/8	7	1/2	10	1/2	3	3/8	4	3/8	7	1/2	10	1/2
84	420	16.5354					5.5	3/8	7	1/2	10	1/2	3	3/8	4	3/8	7	1/2	10	1/2
88	440	17.3228					5.5	3/8	7	1/2	10	1/2	3	3/8	4	3/8	7	1/2	10	1/2
92	460	18.1102					5.5	3/8	7	1/2	10	1/2	3	3/8	4	3/8	7	1/2	10	1/2
96	480	18.8976					5.5	3/8	7	1/2	10	1/2	3	3/8	4	3/8	7	1/2	10	1/2
/500	500	19.6850					5.5	3/8	10	1/2	10	1/2	3	3/8	4	3/8	7	1/2	10	1/2
/530	530	20.8661					7	1/2	10	1/2	10	1/2	3	3/8	5.5	3/8	10	1/2	10	1/2
/560	560	22.0472					7	1/2	10	1/2	14	1/2	3	3/8	5.5	3/8	10	1/2	14	1/2
/600	600	23.6220					7	1/2	10	1/2	14	1/2	3	3/8	5.5	3/8	10	1/2	14	1/2
/630	630	24.8031					7	1/2	10	1/2	14	1/2	4	3/8	5.5	3/8	10	1/2	14	1/2
/670	670	26.3780					7	1/2	10	1/2	14	1/2	4	3/8	5.5	3/8	10	1/2	14	1/2
/710	710	27.9528					7	1/2	10	1/2	14	1/2	4	3/8	7	1/2	10	1/2	14	1/2
/750	750	29.5276					7	1/2	14	1/2	14	1/2	4	3/8	7	1/2	10	1/2	14	1/2
/800	800	31.4961					10	1/2	14	1/2	14	1/2	5.5	3/8	7	1/2	10	1/2	14	1/2
/850	850	33.4646					10	1/2	14	1/2	14	1/2	5.5	3/8	7	1/2	14	1/2	14	1/2
/900	900	35.4331					10	1/2	14	1/2	14	1/2	5.5	3/8	7	1/2	14	1/2	14	1/2
/950	950	37.4016					10	1/2	14	1/2	14	1/2	5.5	3/8	7	1/2	14	1/2	14	1/2
/1000	1000	39.3701					10	1/2	14	1/2	14	1/2	5.5	3/8	10	1/2	14	1/2	14	1/2

NOTE: Empty spaces in the above chart indicate that a bearing is not an ISO standard size.

BORE SIZE			I SERIES	
Bearing Number	Bore - Millimeters	Bore - Inches	Gage No.	Block No.
I-112618	250	9.8425	4	3/8
I-112630	350	13.7795	7	1/2

NSK Bearing Heaters



Induction heaters are a preferred and much safer method of heating a bearing than using a flame or oil bath. Bearing heaters produce strong alternating magnetic fields that induce eddy currents in the metals. The currents cause rapid and efficient heating of the component and the low voltage output eliminates any hazards due to shocks or sparks.

Bearing heaters from NSK are a fast, safe and efficient way to mount straight bore bearings onto shafts. They provide uniform inner ring heating that helps to reduce bearing mounting, time and cost. With automatic temperature and demagnetizing control features, a light and compact design, and the versatility to heat many different bearing sizes and types of components, NSK bearing heaters are a must have for maintenance professionals.



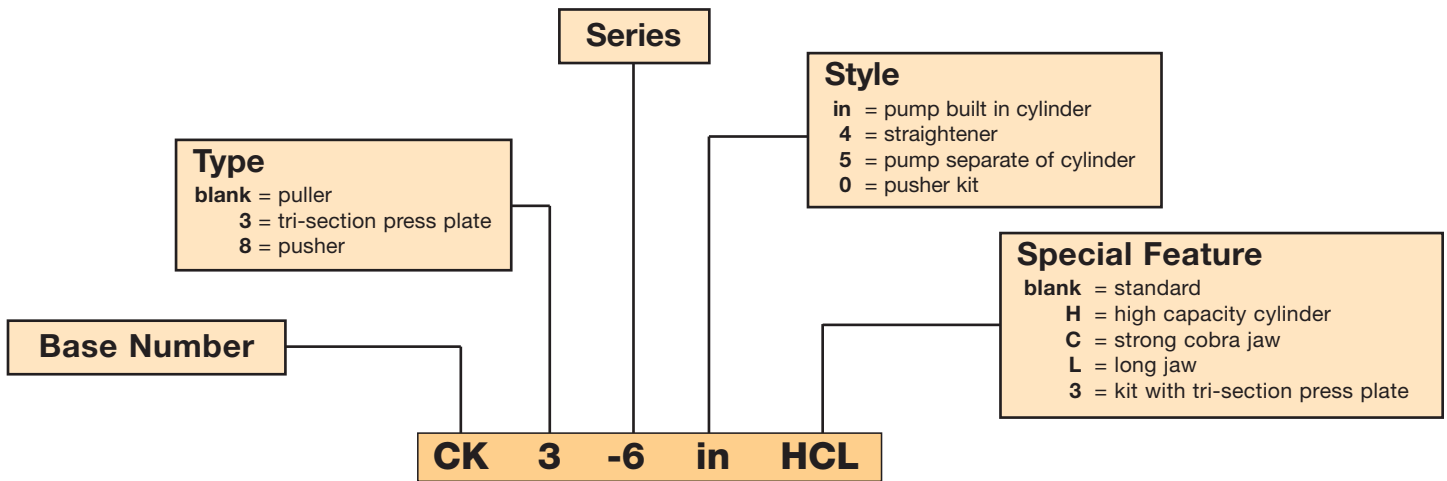
Bearing Heater Standard Specifications

Part Number		IHE0110	IHE0120	IHE0320	IHE0340	IHE0620	IHE0640	IHE1120	IHE1140	IHE2320	IHE2340
Heating Capacity		1kVA		3.3kVA		6.6kVA		11.8kVA		23kVA	
Applicable Bearing Size	Minimal Bore Diameter (mm ϕ)	20		35		35		50		50	
	Maximum Outside Diameter (mm ϕ)	200		300		350		600		800	
	Thickness (mm)	70		110		200		300		400	
	Weight (kg)	12		40		80		300		600	
Heated Bearing Type	Can Heat Pre-greased Bearing	Yes									
	Can Heat Sealed Bearing	Yes									
Power Supply Characteristics	Phase	Single		Three		Three		Three		Three	
	Voltage (V)	100-120V 200-240V		200-240V 380-480V		200-240V 380-480V		200-240V 380-480V		200-240V 380-480V	
	Frequency	50/60Hz		50/60Hz		50/60Hz		50/60Hz		50/60Hz	
	Input Current (A)	7.2A	4.0A	5.3A	2.7A	8.1A	4.0A	13.2A	6.6A	27.0A	13.5A
Dimensions of Body	H (mm)	347		510		660		1230		1435	
	W (mm)	175		305		385		700		850	
	L (mm)	470		755		975		1250		1600	
	Main Body Weight (kg)	13.6	13.2	43		81		241		335	
	Accessories Weight (kg)	2.4		6.6		12.5		33.7		64.2	
Control Specifications	Temperature Control Mode	Range	36 – 250°C								
		Temp. Sensor Type	K – type								
		Accuracy	1°C								
	Time Control Mode	Range	0 – 100 min								
		Accuracy	1s								
	Power Reduction	By 10%	50 – 100%								
Demagnetization		300 μ T(3G)									
Heating Core Spec.	Maximum Flux (T)	1.5T									
Operation Spec.	Operation	Operator with LEDs									
	Sequence Operation	Yes									
Temp. Display	Celsius/Fahrenheit Changeover	Yes									

Slide Type Bearing Installation Table							
I-Type Core	N-CI-1815	(bore diameter 20~35)	•				
	N-CI-1825	(bore diameter 35~50)	•				
	N-CI-1835	(bore diameter 50mm above)	•				
	N-CI-2525	(bore diameter 35~50)		•			
	N-CI-2535	(bore diameter 50~70)		•			
	N-CI-2545	(bore diameter 70mm above)		•			
	N-CI-3725	(bore diameter 35~50)			•		
	N-CI-3735	(bore diameter 50~80)			•		
	N-CI-3755	(bore diameter 80mm above)			•		
	N-CI-5235	(bore diameter 50~80)				•	
	N-CI-5255	(bore diameter 80~100)				•	
	N-CI-5270	(bore diameter 100mm above)				•	
	N-CI-6735	(bore diameter 50~80)					•
	N-CI-6755	(bore diameter 80~130)					•
	N-CI-6785	(bore diameter 130mm above)					•
I-Type Core Lift-up Tool	N-CL-578					•	•
Temperature Sensor	N-CTC-300	lead length 300 mm	•				
	N-CTC-500	lead length 500 mm		•	•		
	N-CTC-1000	lead length 1000 mm				•	•

Remarks 1. Bearings should not be heated higher than 120°C. (248°F) 2. Handle the heated product with care. 3. L': Bearing rest extended. 4. Not available from stock. Contact NSK for details.

NSK Pullers, Pushers, Straighteners & Tri-Section Press Plates



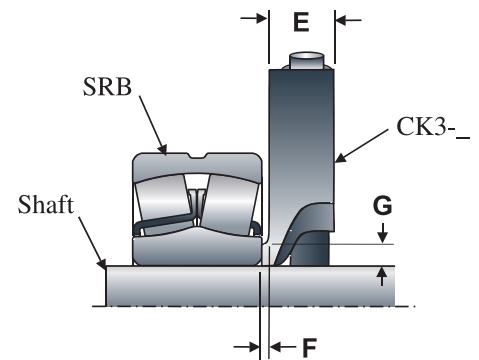
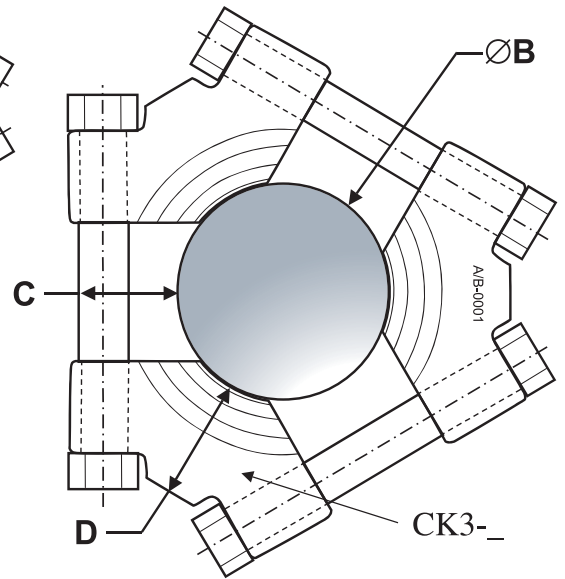
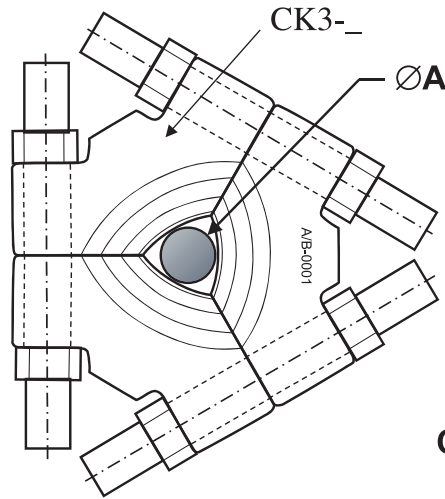
Pullers, pushers, straighteners and tri-section press plates are useful in the quick, easy and safe installation and removal of bearings, rings, pulleys and gears. The use of these tools is helpful in protecting the shaft, bearings and surrounding equipment from damage. They also help reduce the potential for bodily harm to the operator.



NSK's family of pullers, pushers, straighteners and tri-section press plates come in a full range of sizes and come individually or in kits specifically matched to customer needs.



NSK offers a hydraulic pusher, puller and tri-section press plate in a single heavy duty case making transportation and storage more convenient as well as reducing the possibility of lost parts. Pullers are available in non-interchangeable standard and high capacity designs. The high capacity design includes a high pressure cylinder and cobra jaw. Hydraulic pullers and pushers from NSK incorporate coarse threads which make it easier and quicker to assemble than competitive bearing removal products.





Tri-Section Press Plates



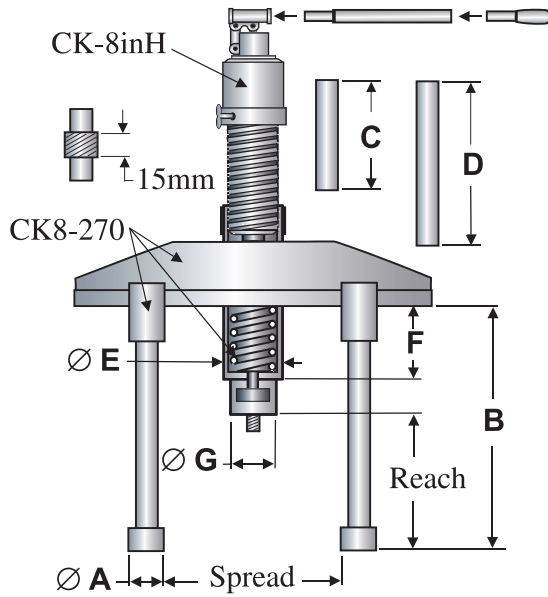
		
CK3-50	21304	22310
CK3-100	22205	22320
CK3-160	22211	23232
CK3-260	23120	23252
CK3-380	23032	24176

		
CK3-50	61801	6410
CK3-100	61805	6320
CK3-160	61811	6232
CK3-260	61820	6252
CK3-380	61832	6076

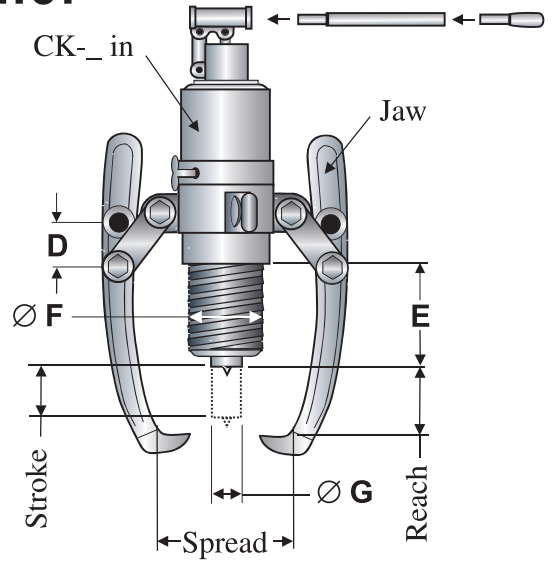
		
CK3-50		
CK3-100	NN4920	NN4120
CK3-160	NN4920	NNU4132
CK3-260	NN3020	NNU4152
CK3-380	NNU49323	NNU4176

Part Number	Capacity		Dimensions							WT
	kN	ton (imp)	A	B	C	D	E	F	G	
			mm							kg
CK3-50	80	8	12	50	20	26	15	2	4	0.5
CK3-100	200	20	26	100	36	45	25	3	6	2.8
CK3-160	300	30	50	160	45	60	33	4	8	6.5
CK3-260	450	45	90	260	70	88	47	6	11	19.5
CK3-380	600	60	140	380	81	112	63	8	14	48.4

Pusher



Puller



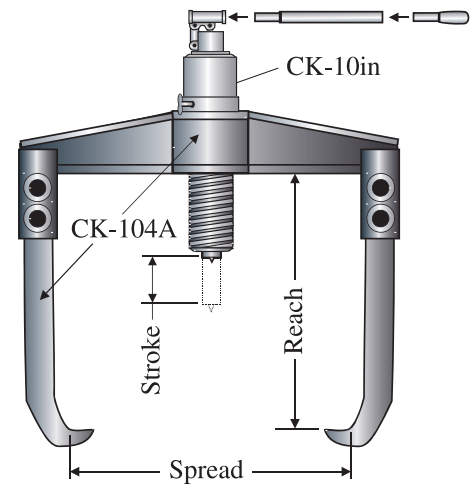
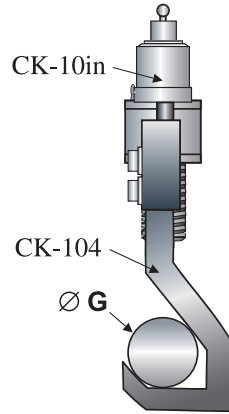
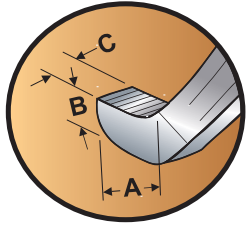
Part Number	Capacity		Jaw**				Cylinder		Case*				Safety Bag†		Pusher	Puller	Tri-Section Press Plate
	kN	ton (imp)	Std.		Cobra		(kpsi)		CB	M	PE	W	B	M			
			S	L	S	L	10	12									
CK-6sd	60~65	6~6.5	•				•						•	•			
CK-6in	60~65	6~6.5	•				•						•	•			
CK-6inL	60~65	6~6.5		•			•						•	•			
CK-6inHC	100~105	10~10.5			•			•		•			•	•			
CK-6inHCL	100~105	10~10.5				•		•		•			•	•			
CK-6in3	60~65	6~6.5	•				•						•	•		• (CK3-100)	
CK-6in3H	100~105	10~10.5			•			•		•			•	•		• (CK3-100)	
CK-8in	80~85	8~8.5	•				•						•	•			
CK-8inL	80~85	8~8.5		•			•						•	•			
CK-8inHC	120~125	12~12.5			•			•		•			•	•			
CK-8inHCL	120~125	12~12.5				•		•		•			•	•			
CK-8in3	80~85	8~8.5	•				•						•	•		• (CK3-160)	
CK-8in3H	120~125	12~12.5			•			•		•			•	•		• (CK3-160)	
CK-10in	150~155	15~15.5	•				•						•	•			
CK-10inL	150~155	15~15.5		•			•			•			•	•			
CK-10in3	150~155	15~15.5	•				•						•	•		• (CK3-160)	
CK-11inHC	200~205	20~20.5			•			•				•	•	•			
CK-11inHCL	200~205	20~20.5				•		•		•			•	•			
CK-11in3H	200~205	20~20.5			•			•		•			•	•		• (CK3-160)	
CK-12inHC	250~255	25~25.5			•			•				•	•	•			
CK-12inHCL	250~255	25~25.5				•		•		•			•	•			
CK-15inHC	300~305	30~30.5			•			•				•	•	•			
CK-25	400~405	40~40.5			•	•		•		•			•	•			
CK-25C	400~405	40~40.5			•			•		•			•	•			
CK-25CL	400~405	40~40.5			•	•		•		•			•	•			
CK-105	150~155	15~15.5	•				•			•			•	•			
CK-105L	150~155	15~15.5		•			•			•			•	•			
CK-105HC	175~180	17.5~18			•			•		•			•	•			
CK-105HCL	175~180	17.5~18				•		•		•			•	•			
CK-135HC	225~230	22.5~23			•			•		•			•	•			
CK-135HCL	225~230	22.5~23				•		•		•			•	•			
CK-155HC	250~255	25~25.5			•			•		•			•	•			
CK-104	150~155	15~15.5							•								
CK-104A	150~155	15~15.5							•								
CK-104B	150~155	15~15.5							•								
CK-130										•							
CK8-270	80	8								•							
CK8-270A	120	12								•							
CK8-270C	80	8								•							
CK8-270G	120	12			•					•						• (CK3-160)	
CK8-INP										•							

* CB = cardboard, M = metal, PE = plastic enclosure, W = wood box

** S = short, L = long

† B = PVC bag, M = PVC mesh

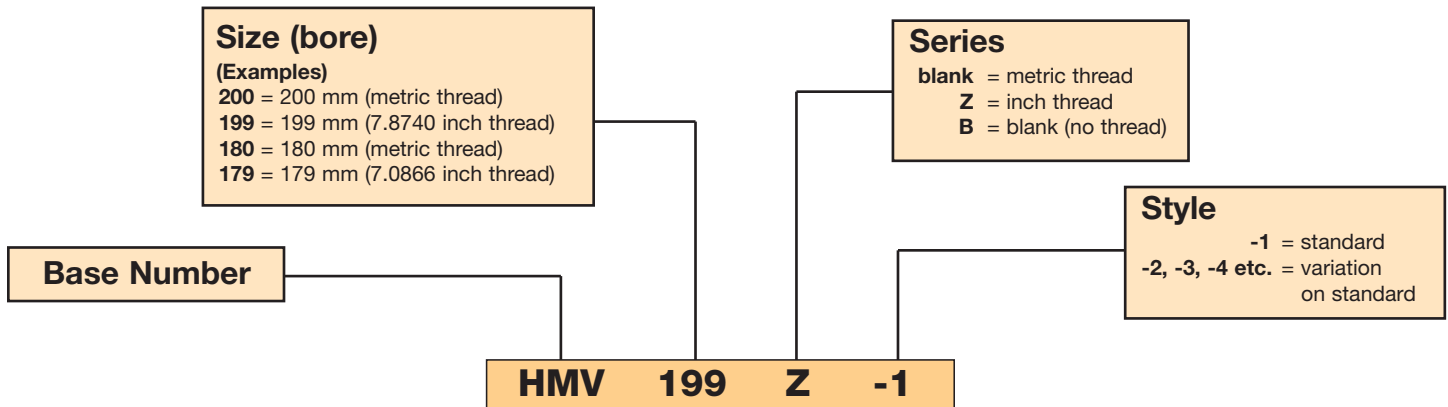
Puller/Straightener



CK-10in is sold separately from CK-104A

Reach	Spread	Stroke	Dimensions							WT	Part Number
			A	B	C	D	E	F	G		
mm			mm							kg	
152	30/150	55	11	6	22	32	53	42	25	5.0	CK-6sd
152	30/200	82	11	6	22	32	83	42	25	5.5	CK-6in
190	30/200	82	11	10	25	51	83	42	25	6.3	CK-6inL
182	280	82	11	6	22	32	113	42	25	6.7	CK-6inHC
220	280	82	11	10	25	51	113	42	25	7.6	CK-6inHCL
152	30/200	82	11	6	22	32	83	42	25	9.1	CK-6in3
182	280	82	11	6	22	32	113	42	25	9.5	CK-6in3H
190	30/250	82	11	10	25	51	83	50	28	7.3	CK-8in
229	30/250	82	14	10	29	51	83	50	28	8.1	CK-8inL
220	305	82	11	10	25	51	113	50	25	9.2	CK-8inHC
259	305	82	14	10	29	51	113	50	25	10.7	CK-8inHCL
190	30/250	82	11	10	25	51	83	50	28	13.8	CK-8in3
220	305	82	11	10	25	51	113	50	25	15.7	CK-8in3H
229	280	82	14	10	29	51	83	60	35	9.3	CK-10in
300	280	82	30	28	33	75	83	60	35	12.9	CK-10inL
229	280	82	14	10	29	51	83	60	35	15.8	CK-10in3
259	356	82	14	10	29	51	113	60	35	12.0	CK-11inHC
300	356	82	30	28	33	75	113	60	35	14.2	CK-11inHCL
259	356	82	14	10	29	51	113	60	35	18.6	CK-11in3H
300	406	110	30	28	33	75	140	70	45	19.3	CK-12inHC
375	406	110	27	36	38	78	140	70	45	24.3	CK-12inHCL
375	50/540	110	27	36	38	78	170	74	55	32.4	CK-15inHC
		250					165	110	71	88.7	CK-25
405	800	250	30	38	28	76				57.2	CK-25C
635	1200	250	30	38	28	76				72.2	CK-25CL
229	280	82	14	10	29	51	83	60	35	13.8	CK-105
300	280	82	30	28	33	75	83	60	35	17.3	CK-105L
259	356	82	14	10	29	51	113	60	35	16.4	CK-105HC
300	356	82	30	28	33	75	113	60	35	18.6	CK-105HCL
300	406	110	30	28	33	75	140	70	45	23.8	CK-135HC
375	406	110	27	36	38	78	140	70	45	28.7	CK-135HCL
375	540	110	27	36	38	78	170	74	55	31.6	CK-155HC
150	100/410	82							60	10.4	CK-104
205	100/410	82	32	17	35					9.1	CK-104A
150/205	100/410	82	32/60	17	35				60	14.6	CK-104B
-55-395	36-130		30	188	90	230	30	160	35	7.5	CK-130
-55-385	58-270	82	35	193	90	230	58	130	35	12.3	CK8-270
-55-385	58-270	82								15.4	CK8-270A
-55-385	58-270	82								14.4	CK8-270C
-55-385	58-270	82								30.9	CK8-270G
											CK8-INP

NSK Hydraulic Nuts

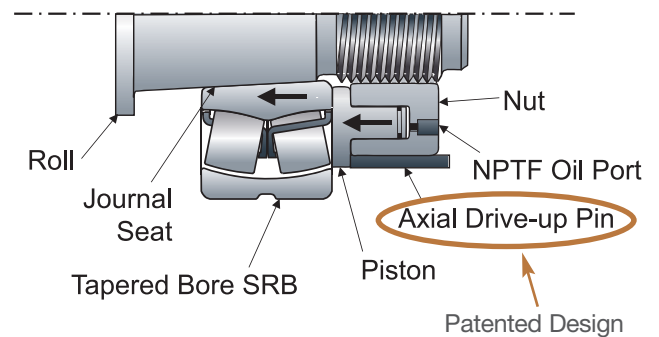


Hydraulic nuts from NSK utilize an axial drive-up method to ensure the accurate and quick installation of tapered bore bearings. The axial drive-up method ensures that the internal clearance and interference fits are correct by monitoring the movement of the piston, and thus the bearing's inner ring, in relation to the hydraulic nut. This method minimizes the need to continually check the clearance reduction with feeler gages.

The benefit of NSK's patented axial drive-up method is that it does not require the use of a dial indicator or charts. Competitive axial drive-up systems require a special dial indicator and the use of printed charts, which not only add to the cost but can also be difficult to read.

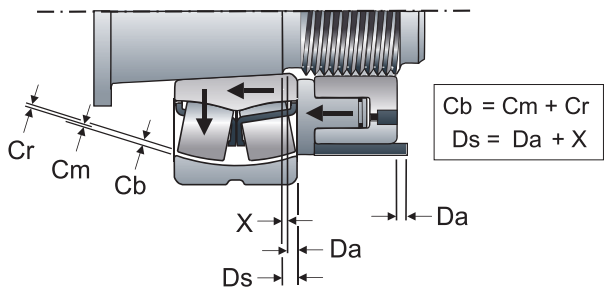
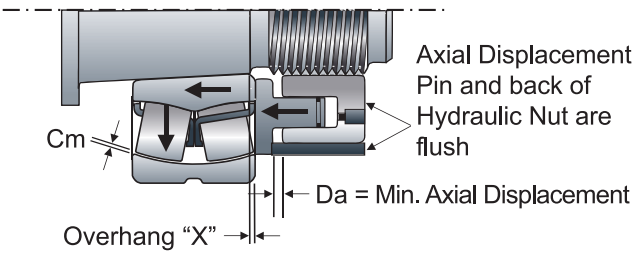
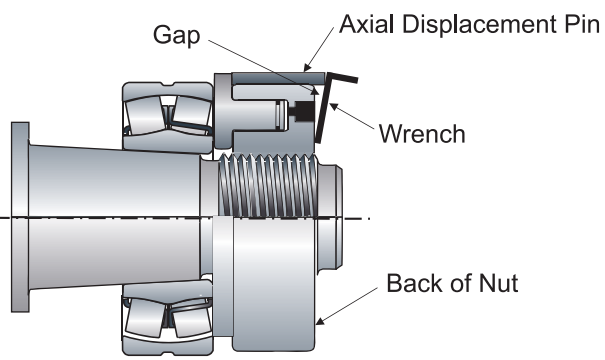
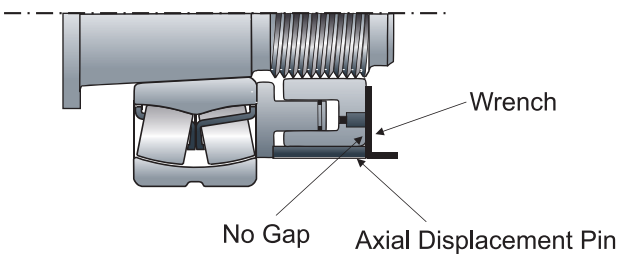
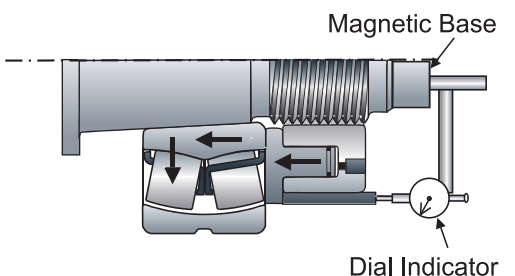
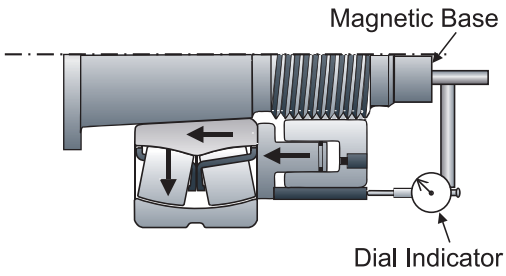
NSK hydraulic nuts are coated with Armoloy, a special permanent anti-rusting layer, making them much more durable than other offerings. They also use NPT ports so replacement fittings are inexpensive and easy to obtain. Cranking handles come in standard diameter rod sizes so replacements can be made from standard stock instead of having to buy specialized sizes as is common with competitive offerings. Larger sizes are made with tapped holes for eye bolts for easy lifting.

Hydraulic nuts come complete with jack out bolts that are very useful in making the replacement of seals quick and easy. A full size range is available and all hydraulic nut kits come in a secure carrying case.

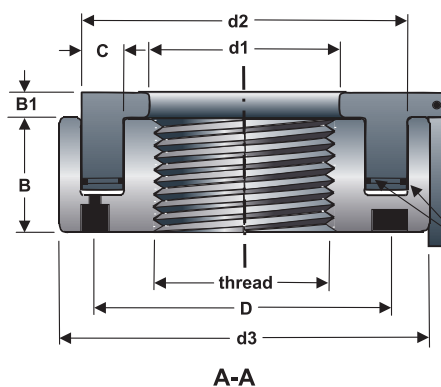


NSK Hydraulic Nuts

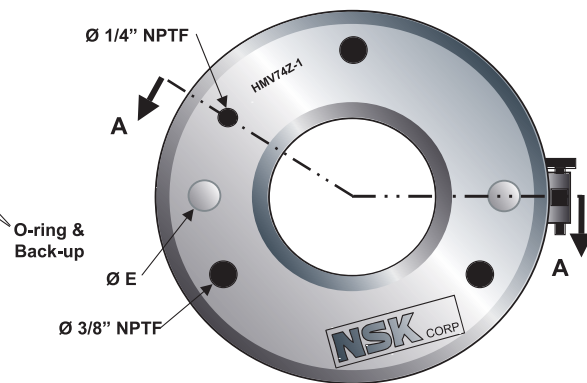
There are three different ways to use Hydraulic Nuts. Below are the three methods. Contact NSK if you have any questions.

Before Mounting		After Mounting	
1	Axial displacement method	1	Axial displacement method
 <p> $C_b = C_m + C_r$ $D_s = D_a + X$ </p> <p> C_b = Bench Clearance D_s = Starting Distance C_m = Mounted Clearance D_a = Min. Axial Displacement C_r = Clearance Reduction X = Overhang after Installed </p> <p>Using Axial Displacement Pin: Piston is ready to move the bearing by pushing against the inner ring.</p>		 <p> Axial Displacement Pin and back of Hydraulic Nut are flush D_a = Min. Axial Displacement Overhang "X" </p> <p>Using Axial Displacement Pin: Piston has moved the bearing the minimum axial displacement. The Axial Displacement pin is flush with the back of the nut.</p>	
2	Straight edge method	2	Straight edge method
 <p> Gap Axial Displacement Pin Wrench Back of Nut </p> <p>Using Straight Edge: Placing a straight edge such as a wrench will show a gap.</p>		 <p> No Gap Axial Displacement Pin Wrench </p> <p>Using Straight Edge: The gap has disappeared indicating the bearing has moved the minimal axial displacement.</p>	
3	Dial indicator method	3	Dial indicator method
 <p> Magnetic Base Dial Indicator </p> <p>Using Dial Indicator: Place a dial indicator on the back of the axial displacement pin.</p>		 <p> Magnetic Base Dial Indicator </p> <p>Using Dial Indicator: Watch the gauge to determine the axial displacement of the bearing.</p>	

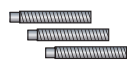
Hydraulic Nuts



A-A



Lifting Bolt
Bore > 260 mm



Jack Out Bolt



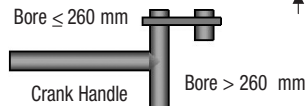
Ø 3/8" NPTF Plug



Wrench



Bore ≤ 260 mm



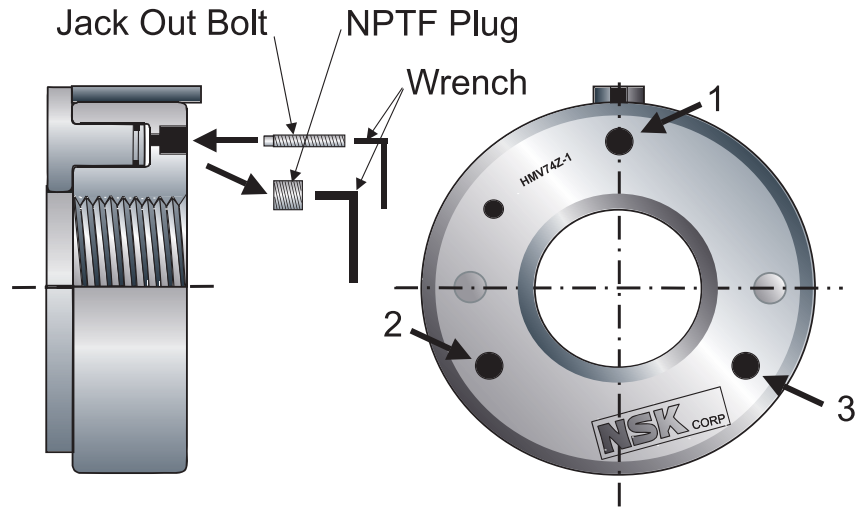
Bore > 260 mm

Bearing Bore Size***			Hydraulic Nut p/n			Dimensions							
Bore Symbol	Bore (mm)	Bore (inch)	Metric HMV(-)-1	Inch HMV(Z)-1	Blank HMV(B)-1	d1 (mm)	d2 (mm)	d3 (mm)	B (mm)	B1 (mm)	D (mm)	E (mm)	C (mm)
10	50	1.9685	50	49	50	50.5	84	114	38	4	72	12.7	13.0
11	55	2.1654	55	54	55	55.5	89	120	38	4	76	12.7	13.0
12	60	2.3622	60	59	60	60.5	95	125	38	5	81	12.7	13.0
13	65	2.5591	65	64	65	65.5	101	130	38	5	88	12.7	13.0
14	70	2.7559	70	69	70	70.5	107	135	38	5	95	12.7	13.0
15	75	2.9528	75	74	75	75.5	112	140	38	5	100	12.7	13.0
16	80	3.1496	80	79	80	80.5	117	146	38	5	106	12.7	13.0
17	85	3.3465	85	84	85	85.5	122	150	38	5	110	12.7	13.0
18	90	3.5433	90	89	90	90.5	127	156	38	5	116	12.7	13.0
19	95	3.7402	95	94	95	95.5	133	162	38	5	122	12.7	13.0
20	100	3.9370	100	99	100	100.5	138	166	38	6	126	12.7	13.0
21	105	4.1339	105	104	105	105.5	143	172	38	6	130	12.7	13.0
22	110	4.3307	110	109	110	110.5	149	178	38	6	136	12.7	13.0
n/a	n/a	n/a	115	n/a	115	115.5	154	182	38	6	141	12.7	13.0
24	120	4.7244	120	119	120	120.5	159	188	38	6	146	12.7	13.0
n/a	n/a	n/a	125	n/a	125	125.5	164	192	38	6	151	12.7	13.0
26	130	5.1181	130	129	130	130.5	170	198	38	6	156	12.7	13.0
n/a	n/a	n/a	135	n/a	135	135.5	175	204	38	6	161	12.7	13.0
28	140	5.5118	140	139	140	140.5	180	208	38	7	166	19	13.0
n/a	n/a	n/a	145	n/a	145	145.5	186	214	39	7	171	19	13.5
30	150	5.9055	150	149	150	150.5	191	220	39	7	176	19	13.5
n/a	n/a	n/a	155	n/a	155	155.5	198	226	39	7	183	19	14.0
32	160	6.2992	160	159	160	160.5	204	232	40	7	190	19	14.5
n/a	n/a	n/a	165	n/a	165	165.5	209	238	40	7	195	19	14.5
34	170	6.6929	170	169	170	170.5	215	244	41	7	200	19	15.0
36	180	7.0866	180	179	180	180.5	227	256	41	7	212	19	15.5
38	190	7.4803	190	189	190	191	239	270	42	8	230	19	16.5
40	200	7.8740	200	199	200	201	251	282	43	8	241	19	17.0
n/a	n/a	n/a	205	n/a	205	207	256	288	43	8	247	19	17.0
n/a	n/a	n/a	210	n/a	210	212	262	294	44	8	252	19	17.5
n/a	n/a	n/a	215	n/a	215	217	267	300	44	8	258	19	17.5
44	220	8.6614	220	219	220	222	273	306	44	8	263	19	18.0
n/a	n/a	n/a	225	n/a	225	227	280	312	45	8	269	19	18.5
n/a	n/a	n/a	230	n/a	230	232	285	318	45	8	274	19	18.5
n/a	n/a	n/a	235	n/a	235	237	291	326	46	8	281	19	19.0
48	240	9.4488	240	239	240	242	296	330	46	9	285	19	19.0
n/a	n/a	n/a	250	n/a	250	252	307	342	46	9	296	19	19.5
52	260	10.2362	260	258	260	262	319	356	47	9	308	19	20.0
n/a	n/a	n/a	270	n/a	270	272	330	368	48	9	319	19	20.5
56	280	11.0236	280	279	280	282	341	380	49	9	330	19	21.0
n/a	n/a	n/a	290	n/a	290	292	353	390	49	9	340	19	21.5
60	300	11.8110	300	299	300	302	364	404	51	10	352	19	22.5
n/a	n/a	n/a	310	n/a	310	312	375	416	52	10	363	19	22.6

* Inch threads for HMV49Z-1 to HMV328Z-1 are American National Form Class 3. Inch threads for HMV338Z-1 to HMV950Z-1 are ACME General Purpose Class 3 G.

** Metric threads for HMV49-1 to HMV200-1 are ISO 965/111-1980 tolerance class 6H. Metric threads for HMV205-1 to HMV1000-1 are ISO 2901-1977 tolerance class 7H.

**If a seal needs replacing, the use of NSK's jack out bolts make the task quick and easy.

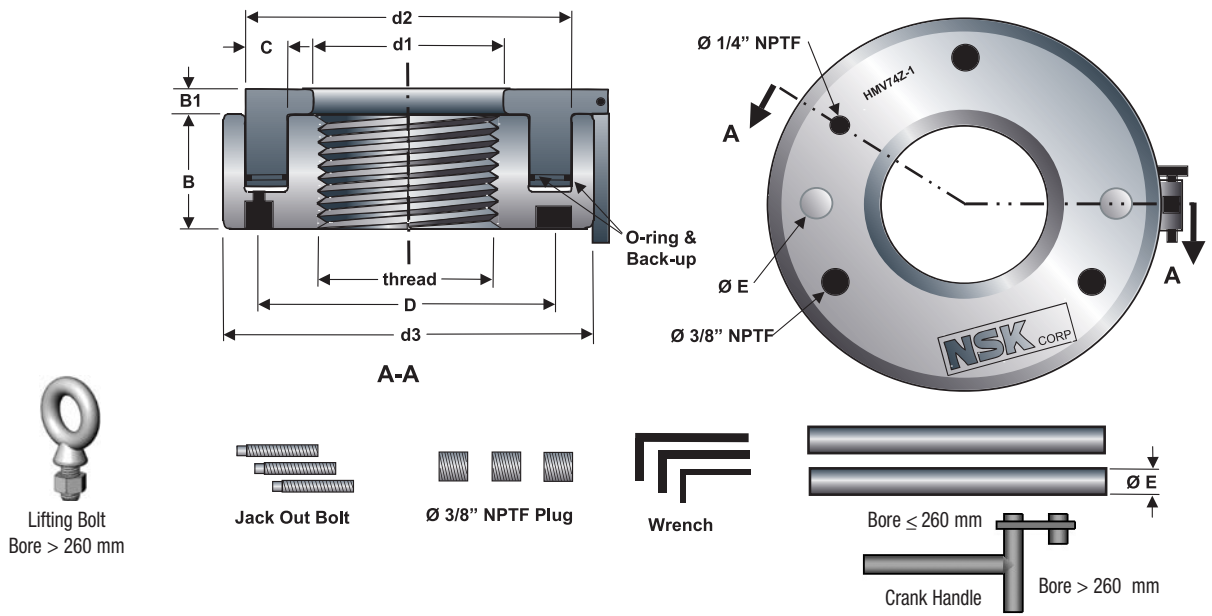


Properties			Metric Thread **	Inch Threads*		1:12 (mm) axial displacement		1:30 (mm) axial displacement	
piston stroke	piston area (cm ²)	mass (kg)		Nominal Diameter	Threads per inch	min.	max.	min.	max.
5	29	2.70	M50x1.5	1.967	18				
5	31	2.75	M55x2	2.157	18				
5	33	2.80	M60x2	2.360	18	0.45	0.55		
5	36	3.00	M65x2	2.548	18				
5	38	3.20	M70x2	2.751	18				
5	40	3.40	M75x2	2.933	12	0.60	0.70		
5	42	3.70	M80x2	3.137	12				
5	45	3.75	M85x2	3.340	12				
5	47	4.00	M90x2	3.527	12				
5	49	4.30	M95x2	3.730	12	0.70	0.85	1.75	2.15
5	51	4.40	M100x2	3.918	12				
5	53	4.65	M105x2	4.122	12				
5	56	4.95	M110x2	4.325	12	0.75	0.90	1.90	2.25
5	58	5.00	M115x2	n/a	n/a				
5	60	5.25	M120x2	4.716	12				
5	62	5.25	M125x2	n/a	n/a				
5	64	5.65	M130x2	5.106	12	0.90	1.10	2.25	2.75
5	66	5.65	M135x2	n/a	n/a				
5	68	6.00	M140x2	5.497	12				
5	73	6.50	M145x2	n/a	n/a				
5	75	6.60	M150x2	5.888	12	1.00	1.30	2.50	3.25
5	81	6.95	M155x3	n/a	n/a				
6	86	7.60	M160x3	6.284	8				
6	89	7.90	M165x3	n/a	n/a				
6	94	8.40	M170x3	6.659	8	1.10	1.40	2.75	3.50
6	103	9.15	M180x3	7.066	8				
7	115	10.5	M190x3	7.472	8	1.30	1.60	3.25	4.00
8	125	11.5	M200x3	7.847	8				
8	128	12.0	Tr205x4	n/a	n/a				
9	134	12.5	Tr210x4	n/a	n/a				
9	137	13.0	Tr215x4	n/a	n/a	1.40	1.70	3.50	4.25
9	144	13.5	Tr220x4	8.628	8				
9	152	14.5	Tr225x4	n/a	n/a				
9	155	15.5	Tr230x4	n/a	n/a				
10	162	16.0	Tr235x4	n/a	n/a	1.60	1.90	4.00	4.75
10	165	16.0	Tr240x4	9.442	6				
10	176	17.5	Tr250x4	n/a	n/a				
11	188	19.0	Tr260x4	10.192	6				
12	199	20.5	Tr270x4	n/a	n/a	1.70	2.20	4.25	5.50
12	211	22.0	Tr280x4	11.004	6				
13	224	22.5	Tr290x4	n/a	n/a				
14	236	25.5	Tr300x4	11.785	6	1.90	2.40	4.75	6.00
14	250	27.0	Tr310x4	n/a	n/a				

*** Mounting directly on a tapered shaft or an adapter sleeve. For inch sizes, if mounting on a removal sleeve, choose next smallest inch size hydraulic nut.

For metric sizes, if mounting on a removal sleeve, choose next smallest metric size.

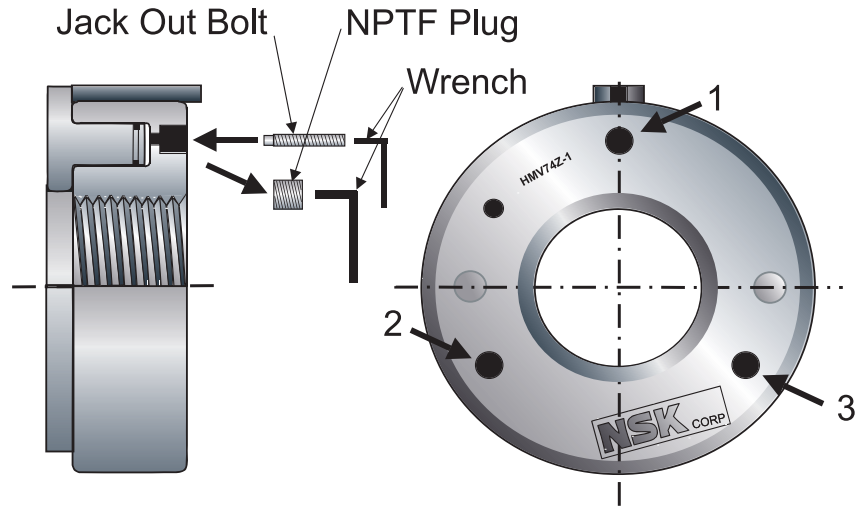
n/a = ISO bearing and standard inch hydraulic nut size does not exist for mounting directly on a shaft or on an adapter sleeve. Consult NSK for non-standard sizes.



Bearing Bore Size***			Hydraulic Nut p/n			Dimensions							
Bore Symbol	Bore (mm)	Bore (inch)	Metric HMV(-)-1	Inch HMV(Z)-1	Blank HMV(B)-1	d1 (mm)	d2 (mm)	d3 (mm)	B (mm)	B1 (mm)	D (mm)	E (mm)	C (mm)
64	320	12.5984	320	319	320	322	387	428	53	10	374	19	23.0
n/a	n/a	n/a	330	n/a	330	332	397	438	53	10	384	19	23.0
68	340	13.3858	340	338	340	342	408	450	54	10	395	19	23.5
n/a	n/a	n/a	345	n/a	345	347	414	456	54	10	401	19	24.0
n/a	n/a	n/a	350	n/a	350	352	420	464	56	10	407	19	24.0
72	360	14.1732	360	359	360	362	431	472	56	10	416	19	24.5
n/a	n/a	n/a	365	n/a	365	367	436	482	57	11	424	19	24.5
n/a	n/a	n/a	370	n/a	370	372	442	486	57	11	428	19	25.0
76	380	14.9606	380	379	380	382	452	498	58	11	439	25.4	25.0
n/a	n/a	n/a	385	n/a	385	387	459	504	58	11	445	25.4	25.5
80	400	15.7480	400	399	400	402	475	522	60	11	461	25.4	26.0
n/a	n/a	n/a	410	n/a	410	412	486	534	61	11	472	25.4	26.5
84	420	16.5354	420	419	420	422	498	546	61	11	483	25.4	27.0
n/a	n/a	n/a	430	n/a	430	432	508	558	62	11	494	25.4	27.0
88	440	17.3228	440	439	440	442	519	566	62	12	503	25.4	27.5
n/a	n/a	n/a	450	n/a	450	452	530	580	64	12	515	25.4	28.0
92	460	18.1102	460	459	460	462	541	590	64	12	525	25.4	28.0
n/a	n/a	n/a	470	n/a	470	472	552	602	65	12	536	25.4	28.5
96	480	18.8976	480	479	480	482	563	612	65	12	546	25.4	29.0
n/a	n/a	n/a	490	n/a	490	492	573	624	66	12	557	25.4	29.0
/500	500	19.6850	500	499	500	502	585	636	67	12	568	25.4	29.5
n/a	n/a	n/a	510	n/a	510	512	596	648	68	12	579	25.4	30.0
n/a	n/a	n/a	520	n/a	520	522	606	658	68	13	589	25.4	30.0
/530	530	20.8661	530	530	530	532	617	670	69	13	600	25.4	30.5
n/a	n/a	n/a	540	n/a	540	542	629	682	69	13	611	25.4	31.0
n/a	n/a	n/a	550	n/a	550	552	639	693	70	13	622	25.4	31.0
/560	560	22.0472	560	560	560	562	650	704	71	13	632	25.4	31.5
n/a	n/a	n/a	570	n/a	570	572	661	716	72	13	643	25.4	32.0
n/a	n/a	n/a	580	n/a	580	582	671	726	72	13	653	25.4	32.0
/600	600	23.6220	600	600	600	602	693	748	73	13	674	25.4	32.5
/630	630	24.8031	630	630	630	632	726	782	74	14	706	25.4	33.5
n/a	n/a	n/a	650	n/a	650	652	747	804	75	14	727	25.4	33.5
/670	670	26.3780	670	670	670	672	768	826	76	14	748	25.4	33.5
n/a	n/a	n/a	690	n/a	690	692	792	848	77	14	769	25.4	34.2
/710	710	27.9528	710	710	710	712	812	870	78	15	790	25.4	34.7
/750	750	29.5276	750	750	750	752	862	912	79	15	831	25.4	35.8
/800	800	31.4961	800	800	800	802	909	965	80	16	883	25.4	36.8
/850	850	33.4646	850	850	850	852	960	1020	83	16	935	25.4	38.3
/900	900	35.4331	900	900	900	902	1012	1075	86	17	988	25.4	39.4
/950	950	37.4016	950	950	950	952	1065	1126	86	17	1038	25.4	40.9
/1000	1000	39.3701	1000	n/a	1000	1002	1123	1180	88	17	1090	25.4	41.9

* Inch threads for HMV49Z-1 to HMV328Z-1 are American National Form Class 3. Inch threads for HMV338Z-1 to HMV950Z-1 are ACME General Purpose Class 3 G.
 ** Metric threads for HMV49-1 to HMV200-1 are ISO 965/111-1980 tolerance class 6H. Metric threads for HMV205-1 to HMV1000-1 are ISO 2901-1977 tolerance class 7H.

**If a seal needs replacing, the use of NSK's jack out bolts make the task quick and easy.



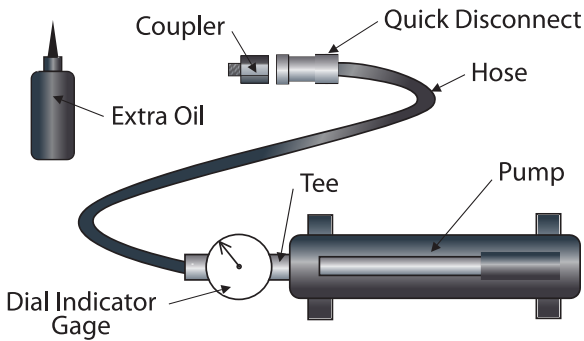
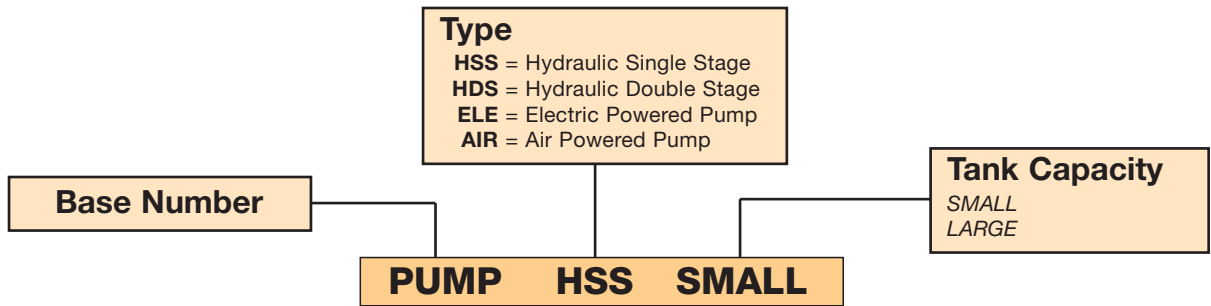
Properties			Metric Thread **	Inch Threads*		1:12 (mm) axial displacement		1:30 (mm) axial displacement	
piston stroke	piston area (cm ²)	mass (kg)		Nominal Diameter	Threads per inch	min.	max.	min.	max.
14	263	29.5	Tr320x5	12.562	6				
14	270	30.0	Tr330x5	n/a	n/a				
14	284	31.5	Tr340x5	13.339	5	2.20	2.70	5.50	6.75
14	294	32.5	Tr345x5	n/a	n/a				
14	299	35.0	Tr350x5	n/a	n/a				
15	313	35.5	Tr360x5	14.170	5				
15	317	38.5	Tr365x5	n/a	n/a				
16	328	39.0	Tr370x5	n/a	n/a	2.40	3.00	6.00	7.50
16	335	40.5	Tr380x5	14.957	5				
16	347	41.0	Tr385x5	n/a	n/a				
17	367	45.5	Tr400x5	15.745	5				
17	383	48.0	Tr410x5	n/a	n/a				
17	400	50.0	Tr420x5	16.532	5				
17	408	52.5	Tr430x5	n/a	n/a	2.70	3.30	6.75	8.25
17	425	54.0	Tr440x5	17.319	5				
17	442	57.5	Tr450x5	n/a	n/a				
17	451	60	Tr460x5	18.107	5				
18	469	62	Tr470x5	n/a	n/a				
19	487	63	Tr480x5	18.894	5	3.00	3.70	7.50	9.25
19	496	66	Tr490x5	n/a	n/a				
19	515	70	Tr500x5	19.682	5				
20	533	74	Tr510x6	n/a	n/a				
20	543	75	Tr520x6	n/a	n/a				
21	562	79	Tr530x6	20.867	4	3.40	4.30	8.50	11.00
21	582	81	Tr540x6	n/a	n/a				
21	592	84	Tr550x6	n/a	n/a				
22	612	88	Tr560x6	22.048	4				
23	632	91	Tr570x6	n/a	n/a				
23	642	94	Tr580x6	n/a	n/a	3.70	4.80	9.25	12.00
23	674	100	Tr600x6	23.623	4				
23	729	110	Tr630x6	24.804	4				
23	761	115	Tr650x6	n/a	n/a				
24	802	120	Tr670x6	26.379	4	4.20	5.30	10.50	13.00
25	842	127	Tr690x6	n/a	n/a				
25	878	135	Tr710x7	27.961	3				
25	953	146	Tr750x7	29.536	3	4.50	5.90	11.50	15.00
25	1040	161	Tr800x7	31.504	3				
26	1145	181	Tr850x7	33.473	3	5.00	6.60	12.50	16.50
30	1242	205	Tr900x7	35.441	3				
30	1357	218	Tr950x8	37.410	3	5.50	7.40	14.00	18.50
34	1459	239	Tr1000x8	n/a	n/a				

*** Mounting directly on a tapered shaft or an adapter sleeve. For inch sizes, if mounting on a removal sleeve, choose next smallest inch size hydraulic nut.

For metric sizes, if mounting on a removal sleeve, choose next smallest metric size.

n/a = ISO bearing and standard inch hydraulic nut size does not exist for mounting directly on a shaft or on an adapter sleeve. Consult NSK for non-standard sizes.

Hydraulic Pump



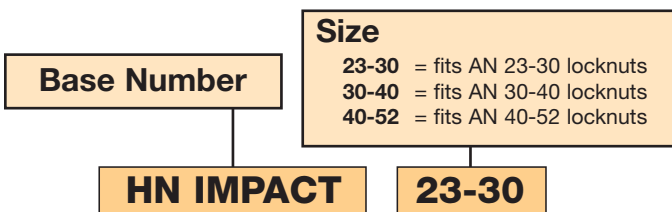
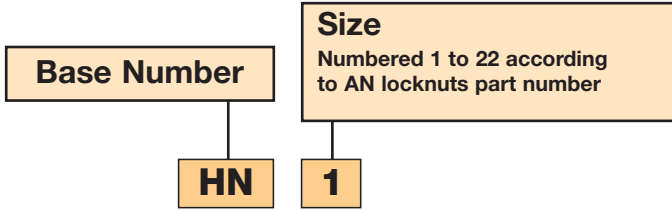
NSK offers hydraulic pumps that inject oil into hydraulic nuts during bearing installation and simplify the bearing removal process by pumping oil between the inner ring and journal. NSK heavy duty pumps are offered in two sizes, are lightweight and come in a specially designed protective carrying case.

NSK P/N**	Pump Description	Max. Working Pressure* psi	Usable Oil Capacity inch ³	Oil Displacement Per Stroke inch ³		Max. Handle Effort lbs	Piston Stroke inch	Oil Outlet Port NPTF	Weight lbs	Pump Dimensions inch (mm)		
				1 st stage	2 nd stage					L	W	H
PUMP HSS LARGE	Hand Pump Single Speed	10,000	48		0.15	24.4	0.98	3/8"-18	16.50	22.05 (560)	5.51 (140)	5.51 (140)
PUMP HSS SMALL	Hand Pump Single Speed	10,000	30.15		0.18	24.4	0.98	3/8"-18	13.44	15.16 (385)	5.51 (140)	5.32 (135)

* All pumps include a relief valve set at 10,000 psi.

** All pumps come in kits which include a pump, hose, quick disconnect, coupler (nipple), gage, tee, extra oil and a metal case.

Spanner Wrench



Spanner wrenches are a simple and inexpensive means of installing small size tapered bore bearings onto shafts and adapter sleeves. Because they clamp onto the slot in a locknut, they do not cause damage to the locknut which frequently occurs when using a hammer and keystock.

NSK standard spanner wrenches are made from 1/4" (7mm) thick plates. The heads of impact spanner wrenches are made of forged steel, which is welded to a strong alloyed steel handle covered by easy grip rubber.

NSK impact-spanner wrenches are heavy duty and can withstand the impact force of a hammer. All wrenches come with a convenient hole for ease of storage or hanging.

LOCKNUT P/N			STANDARD SPANNER WRENCH P/N
INCH	METRIC		
		NSK	SKF
N 01		KM 1	HN 1
N 02	AN 02	KM 2	HN 2
N 03	AN 03	KM 3	HN 3
N 04	AN 04	KM 4	HN 4
N 05	AN 05	KM 5	HN 5
N 06	AN 06	KM 6	HN 6
N 07	AN 07	KM 7	HN 7
N 08	AN 08	KM 8	HN 8
N 09	AN 09	KM 9	HN 9
N 10	AN 10	KM 10	HN 10
N 11	AN 11	KM 11	HN 11
N 12	AN 12	KM 12	HN 12
N 13	AN 13	KM 13	HN 13
N 14	AN 14	KM 14	HN 14
AN 15	AN 15	KM 15	HN 15
AN 16	AN 16	KM 16	HN 16
AN 17	AN 17	KM 17	HN 17
AN 18	AN 18	KM 18	HN 18
AN 19	AN 19	KM 19	HN 19
AN 20	AN 20	KM 20	HN 20
AN 21	AN 21	KM 21	HN 21
AN 22	AN 22	KM 22	HN 22*

* The largest standard spanner wrench is HN 22.

LOCKNUT P/N**								NSK IMPACT SPANNER WRENCH P/N
LOCKNUT SERIES	KM	HM..T	HML..T	HM30	HM31	AN-00	N-000	
LOCKNUT NUMBER	23-30	*	*	*	*	24-30	026-032	HN IMPACT 23-30
	30-40	*	41-42	*	*	30-40	034-040	HN IMPACT 30-40
	40-52	41-50	41-54	44-52	*	40-44	044-052	HN IMPACT 40-52

* Locknut of that size does not exist in this series.

**All Locknut Series have letter and number part numbers (i.e. AN-24).



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