TILTING SHOE THRUST BEARINGS

Kingsbury, Inc.

THE TRADEMARK OF BEARING QUALITY SINCE 1912

Catalog NE

Introduction

To better serve the needs of our overseas customers, Kingsbury is introducing style "NE" bearings, designed to conform with European fluid-film thrust bearing standards. These bearings are designed to the close tolerances necessary for bearings not incorporating a self-aligning device. The bearings feature interchangeable parts: one shoe size can be used with several different base ring diameters. Parts will be carried in stock outside the North American continent to facilitate delivery.

Style "NE" thrust bearings are manufactured to the same exacting quality standards for which Kingsbury has gained worldwide recognition. Our Engineering staff will assist in the application of these bearings and, on request, will provide friction power loss and lubricating oil-flow data. Consultation with regard to housing design and lubrication systems is also available.

General Description

A typical style "NE" bearing is shown on the front cover; note the shoe retention washers and shoe (pad) contours.

The bearing parts are assembled on a base ring, available as a one-piece ring or split in halves. The base ring can be slotted to accommodate the lubricating oil-flow paths required for your application (see Figure 1). Antirotation pins are installed in either a radial or axial orientation depending on your requirements.

The centrally pivoted shoes are evenly spaced and loosely retained in the base ring by shoulder washers. The washers engage slots in the sides of the shoes providing positive shoe positioning during operation and retention during assembly. Fasteners are threaded to ISO metric standards.

The steel shoe bodies have a contoured profile and are lined with babbitt (white metal) which conforms with standards ASTM B23GR2, DIN1703 L.g. SN89 and BS3332/2. The shoes are manufactured to meet Kingsbury's ultrasonic and edge-bond standards. Filler plates and shims are available for setting bearing clearance (end float).

Bearing Selection

Preliminary bearing selection is made using the maximum load ratings given in the dimension tables. Thrust load and shaft size are the parameters used for making a bearing selection. The load capacities shown are maximum values. Specific load capacity will vary depending on shaft speed, oil viscosity and the nature of the thrust load. Condition of the machine with regard to alignment, vibration, lubrication contamination and ambient temperature can also affect bearing thrust capacity.

The maximum recommended shaft size provides space for oil flow into the thrust face and clearance for the fillet/undercut between the integral thrust collar and the shaft. If a separate collar is used, a larger shaft size can be used.

Preliminary thrust bearing selection can be confirmed by contacting our Engineering Department.

Reference Number

Examples of the reference number system:

The reference number system in this catalog will assist you in identifying the bearing size you have selected along with the base ring modifications and accessories desired.

The reference number consists of two parts separated by a diagonal line. Numbers to the left of the diagonal identify bearing style and size; the numbers to right of the diagonal indicate configuration and accessories.

The three numbers immediately to the left of the diagonal line identify the shoe size and are approximately the shoe's radial width in hundredths of an inch. The fourth and fifth numbers left of the diagonal line indicate the number of shoes in a single bearing ring. The letters "NE" are the style designation.

The numbers and letters to the right of the diagonal line identify the type of base ring and the combination of filler plate and shims required (see Figure 1).

If a base ring with less than a full complement of shoes is desired, use a bracketed fraction with the number of shoes in a full complement in the denominator (see Example 3).

Loaded and slack side bearings of equal size are designated by using the appropriate reference number for the loaded side bearing followed by a dash. The numbers and letters to the left of the diagonal describe the slack side bearing (see Example 4).

For unequal size loaded and slack side bearings, use the appropriate reference number for each separated by a dash (see Example 5).

Examples of the reference number system:

1. NE6103/2 — Style NE, 6 thrust shoes, size 103; outer diameter 92 mm, inner diameter 38 mm; two piece base ring with radial and axial slots.

2. NE8159/OK — Style NE, 8 thrust shoes; size 159; outer diameter 176 mm, inner diameter 93.5 mm; one piece base ring with radial slots.

3. NE8159/OK (4/8) — Same as Example 2 except 4 thrust shoes are fitted.

4. NE14225/2P-2P — Style NE, 14 thrust shoes; size 225, outer diameter 394 mm, inner diameter 279 mm; two piece base ring, filler plate with allowance left on thickness for finishing, identical slack side bearing.

5. NE8320/20KSF—NE14190/20KSF — Style NE, 8 thrust shoes, size 320; outer diameter 354 mm, inner diameter 191 mm; two piece base ring, shims and filler plate finished to thickness. Slack side, style NE, 14 thrust shoes; size 190; outer diameter 332 mm, inner diameter 235 mm; two piece base ring, shims and filler plate finished to thickness.

Filler Plates and Shim Packs

Filler plates and shim packs are normally used with fluid-film thrust bearings to provide the desired clearance or end float. Standard filler plate thickness is 4.8 mm. The standard shim pack thickness is 2.3 mm. Filler plates are attached to the back of the base ring with screws. The desired end float is obtained by peeling off shims. Alternately, a filler plate with extra stock (2.5 mm depending on bearing size) can be ground to the thickness determined by comparing the bearing stacked height plus clearance to the bearing housing axial length.

BASIC CODE	ONE-PIECE RING 0	RING IN HALVES (2 halves) 2	HALF RING 1
PLAIN RING	0	2	1
PLAIN RING WITHOUT SLOTS Add N	ON	2N	1N
PLAIN RING RADIAL SLOTS ONLY Add K	OK	2K	1K
WITH FILLER PLATE Allowance left for finishing to thickness Add P	OKP	2KP	1KP
Supplied finished to thickness Add PF	OKPF	2KPF	1KPF
WITH FILLER PLATE & SHIMS Allowance left for finishing to thickness Add S	OKS	2KS	1KS
Supplied finished to thickness Add SF	OKSF	2KSF	1KSF

Fig. 1

Lubrication

Kingsbury recommends separate orificed oil inlets to both the loaded and the slack side thrust bearings and a tangential oil outlet sized to maintain a partially flooded housing (see Figure 2). This oil flow arrangement has been used in thousands of thrust bearing applications with excellent reliability. Friction power loss in a partially flooded housing is much less than the loss which would occur in a comparable flooded housing. A flooded oil arrangement with an open oil inlet and orificed oil outlet is recommended only for slower speed applications because of the high friction power loss (see Figure 3). Radial orientation of the oil discharge outlet is recommended only for lower speed applications because the radial outlet has a higher power loss than the tangential oil outlet.

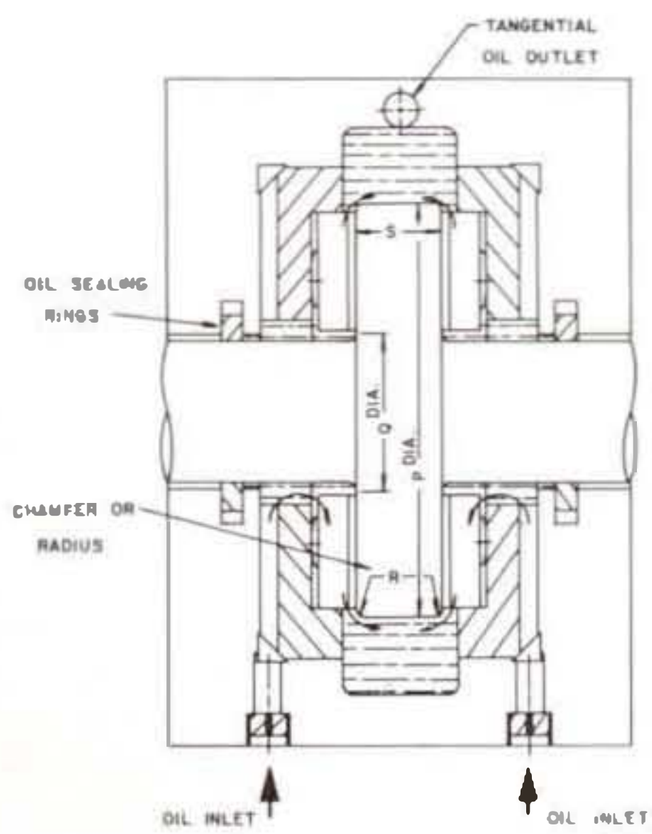

Fig. 2

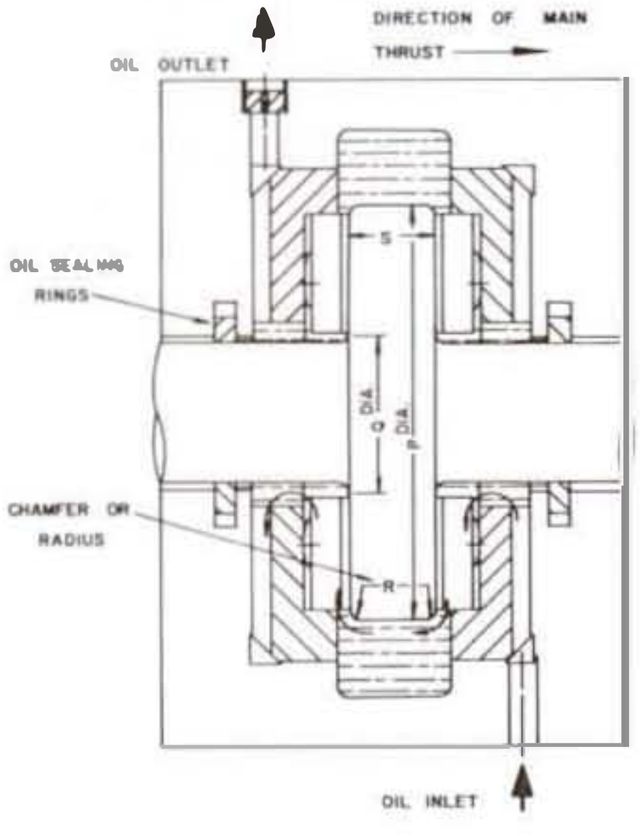

Fig. 3

STYLE "NE" DIMENSION TABLE

SIZE	THRUST SHOE OUTER DIA. A	THRUST SHOE INNER DIA. B	BASE RING THICK-NESS C	BASE RING OUTER DIA. D	E	F	ANTI ROTATION PINS G	H	I	J	K	SHIM PLATE L	M	N	COLLAR SIZE P	Q	R	S	THRUST SURFACE MM²	MEAN DIA. d	MAX. LOAD NEWTON	TOTAL AXIAL CLEAR.	MAX. SHAFT DIA.
NE6103	92	38	20.64	107.95	15	6	4.8	5.8	5	11	33.3	83	51	4.8	95	36	0.4	17	4210	65.8	13.530	0.30	31
NE6123	110	44.5	23.81	127.00	17	6	5.6	6.5	6	12	39.7	98	60	4.8	113	43	0.8	21	6011	78.2	20,010	0.30	36
NE6134	119	49	25.40	139.70	19	6	6.4	7.5	7	13	42.9	105	67	4.8	122	46	0.8	22	7219	85.1	24.150	0.35	40
NE6159	143	58.5	28.58	165.10	21	7	7.9	9	8	14	50.8	124	79	4.8	146	56	0.8	27	9950	102	35.280	0.35	48
NE6190	168	70	34.93	193.68	25	8	9.5	10.5	8	16	60.3	146	95	6.4	171	67	0.8	32	14023	120.4	51.430	0.40	57
NE6225	200	82.5	41.28	228.60	30	10	11.1	12.5	8	19	71.4	175	111	6.4	203	79	0.8	38	20585	143	73.875	0.50	67
NE6246	219	91	44.45	247.65	32	11	12.7	14	10	22	79.4	194	124	6.4	224	87	0.8	43	24539	157	89.300	0.50	74
NE6320	286	117	57.15	317.50	40	13	15.9	17.5	5.6	26	103.2	251	162	6.4	289	116	0.8	56	40897	205	152.845	0.60	96

SIZE	THRUST SHOE OUTER DIA. A	THRUST SHOE INNER DIA. B	BASE RING THICK-NESS C	BASE RING OUTER DIA. D	E	F	ANTI ROTATION PINS G	H	I	J	K	SHIM PLATE L	M	N	COLLAR SIZE P	Q	R	S	THRUST SURFACE MM²	MEAN DIA. d	MAX. LOAD NEWTON	TOTAL AXIAL CLEAR.	MAX. SHAFT DIA.
NE8103	114	62	20.64	130.18	16	6	6.4	7.5	7	10	44.5	105	73	4.8	117	59	0.8	17	5614	89.2	18,150	0.30	54
NE8123	137	73	23.81	152.40	17	6	6.4	7.5	7	11	53.2	125	87	4.8	140	70	0.8	21	8015	106	26.737	0.30	64
NE8134	149	79.5	25.40	168.28	19	6	7.9	9	8	13	57.9	135	97	4.8	152	76	0.8	22	9625	116	32.375	0.35	70
NE8159	176	93.5	28.58	196.85	21	6	7.9	9	8	13	69.9	162	117	4.8	179	92	0.8	27	13266	137	47.160	0.35	83
NE8190	210	113	34.92	234.95	25	8	9.5	10.5	8	17	82.6	191	140	6.4	213	110	0.8	32	18698	163	68,820	0.40	99
NE8225	251	135	41.28	279.40	30	10	12.7	14	10	19	98.4	229	165	6.4	254	132	0.8	38	27446	196	98,625	0.50	119
NE8246	273	146	44.45	301.63	32	11	12.7	14	5.6	21	106.4	244	181	6.4	276	141	0.8	43	32718	213	118,940	0.50	129
NE8320	354	191	57.15	384.18	40	13	15.9	17.5	5.6	26	138.1	321	232	9.5	357	187	0.8	56	54530	276	203,665	0.60	167

SIZE	THRUST SHOE OUTER DIA. A	THRUST SHOE INNER DIA. B	BASE RING THICK-NESS C	BASE RING OUTER DIA. D	E	F	ANTI ROTATION PINS G	H	I	J	K	SHIM PLATE L	M	N	COLLAR SIZE P	Q	R	S	THRUST SURFACE MM²	MEAN DIA. d	MAX. LOAD NEWTON	TOTAL AXIAL CLEAR.	MAX. SHAFT DIA.
NE11103	148	95.5	2223	168.28	17	6	6.4	7.5	7	11	81	138	106	4.8	151	92	0.8	17	7719	123	24.915	0.30	87
NE11123	175	113	25.40	196.85	19	6	7.9	9	8	13	72	164	125	4.8	178	110	0.8	21	11021	145	36.040	0.30	103
NE11134	191	122	2699	212.73	21	7	7.9	9	8	13	79	178	140	4.8	194	119	0.8	22	13235	158	44.450	0.35	112
NE11159	229	148	30.16	254.00	22	7	9.5	10.5	8	14	95	216	165	6.4	232	144	0.8	27	18241	191	64.440	0.35	136
NE11190	271	175	34.93	301.63	25	8	11.1	12.5	8	17	113	254	197	6.4	275	171	0.8	32	25709	226	94.350	0.40	161
NE11225	324	210	41.28	355.60	29	10	15.9	17.5	5.6	18	135	308	232	9.5	327	206	0.8	38	37739	270	135,375	0.50	193
NE11246	352	227	4445	384.18	32	10	15.9	17.5	5.6	20	146	330	254	9.5	356	224	0.8	43	44988	292	163.400	0.50	209
NE11320	457	295	57.15	495.30	40	13	19.1	21	6.4	26	191	425	337	9.5	464	289	1.5	56	74978	381	280.665	0.60	270

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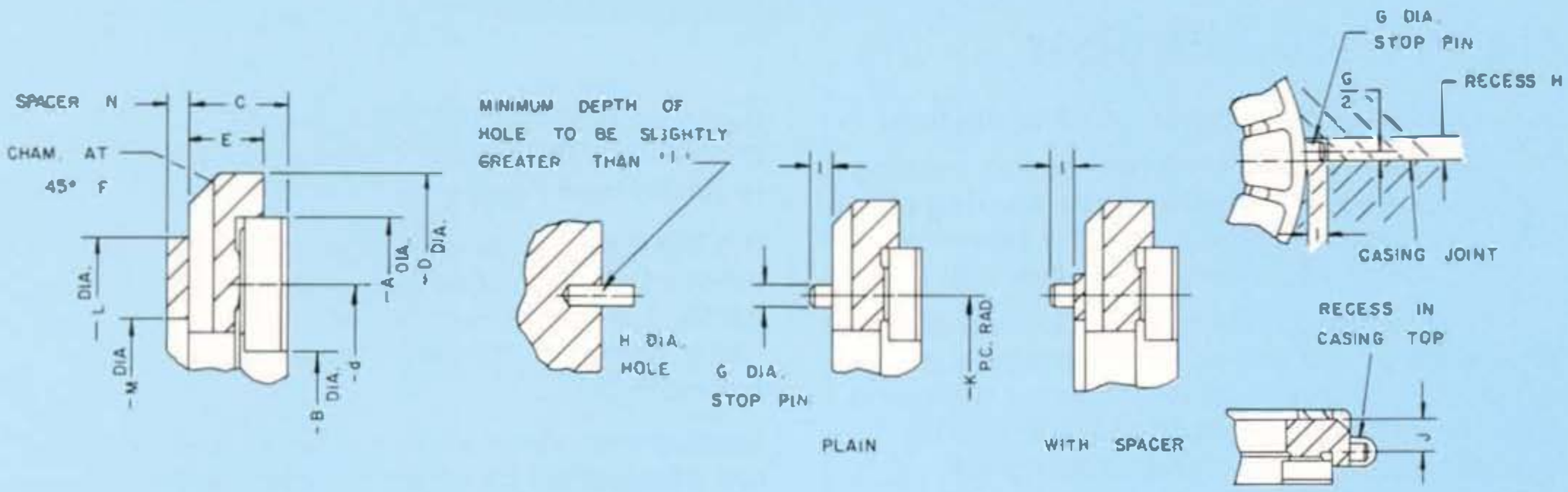
NE14103	181	129	22.23	200.03	17	5	7.9	9	8	10	77.8	175	137	4.8	184	125	0.8	17	9824	156	31.515	0.30	119
NE14123	214	152	25.40	238.13	19	6	9.5	10.5	8	13	93.7	210	165	4.8	217	149	0.8	21	14027	185	46,575	0.30	141
NE14134	235	165	26.99	26035	21	6	9.5	10.5	8	13	101.6	225	181	6.4	238	164	0.8	22	16844	203	56.350	0.35	154
NE14159	279	197	31.75	30798	24	6	11.1	12.5	6	15	120.7	267	216	6.4	283	195	0.8	27	23216	241	82.440	0.35	185
NE14190	332	235	38.10	361.95	29	10	12.7	14	5.6	19	142.9	318	254	6.4	335	232	0.8	32	32721	286	120.250	0.40	220
NE14225	394	279	4445	42545	33	11	15.9	17.5	6.4	21	169.9	378	302	9.5	400	273	1.5	38	48031	340	172.550	0.50	260
NE14246	432	305	47.63	463.55	35	13	19.1	21	6.4	22	185.7	416	327	9.5	438	302	1.5	43	57257	373	208.240	0.50	285
NE14320	558	396	60.33	596.90	43	14	22.2	24	8.0	28	241.3	533	432	9.5	565	391	1.5	54	95427	483	355.355	0.60	370

SIZE	THRUST SHOE OUTER DIA. A	THRUST SHOE INNER DIA. B	BASE RING THICK-NESS C	BASE RING OUTER DIA. D	E	F	ANTI ROTATION PINS G	H	I	J	K	SHIM PLATE L	M	N	COLLAR SIZE P	Q	R	S	THRUST SURFACE MM²	MEAN DIA. d	MAX. LOAD NEWTON	TOTAL AXIAL CLEAR.	MAX. SHAFT DIA.
NE18103	224	171	23.81	24448	19	6	7.9	9	8	13	100.1	219	181	4.8	227	168	0.8	17	12631	200	40,590	0.30	158
NE18123	267	205	28.58	288.93	22	7	9.5	10.5	8	15	119.1	260	216	6.4	270	202	0.8	21	18034	237	60,030	0.30	191
NE18134	292	224	3016	317.50	24	7	11.1	12.5	8	15	130.2	286	235	6.4	295	221	0.8	22	21657	260	72.800	0.35	209
NE18159	346	265	34.93	374.65	27	10	12.7	14	5.6	17	154.0	337	279	6.4	349	262	0.8	27	29849	307	105.840	0.35	248
NE18190	413	316	41.28	444.50	32	11	15.9	17.5	5.6	21	184.2	406	330	9.5	419	311	0.8	32	42069	367	154,290	0.40	297
NE18225	492	378	47.63	527.05	35	13	19.1	21	6.4	22	219.1	483	394	9.5	498	371	0.8	38	61755	438	221.250	0.50	355
NE18246	536	413	50.80	571.50	38	13	19.1	21	8.0	25	238.1	521	432	9.5	543	406	1.5	43	73617	478	267,140	0.50	388



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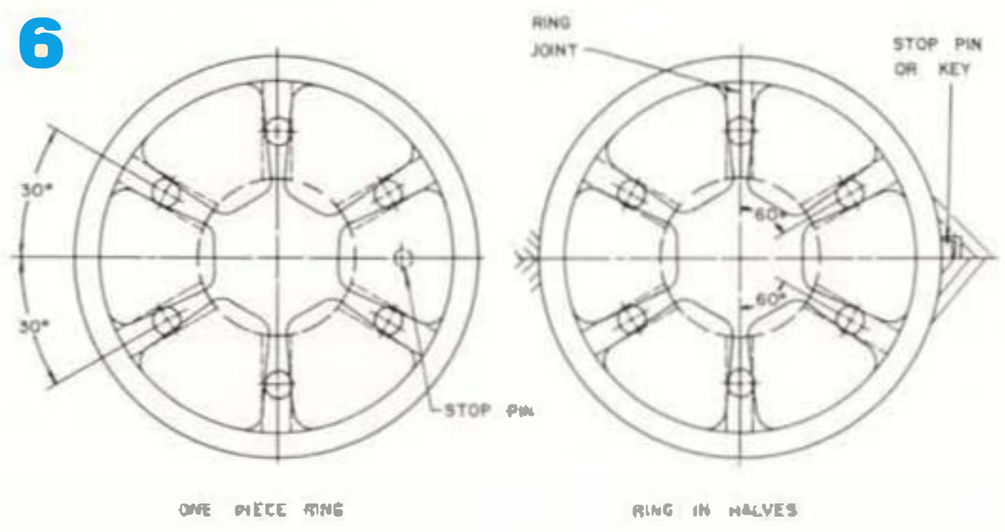

ONE PIECE RING — RING IN HALVES

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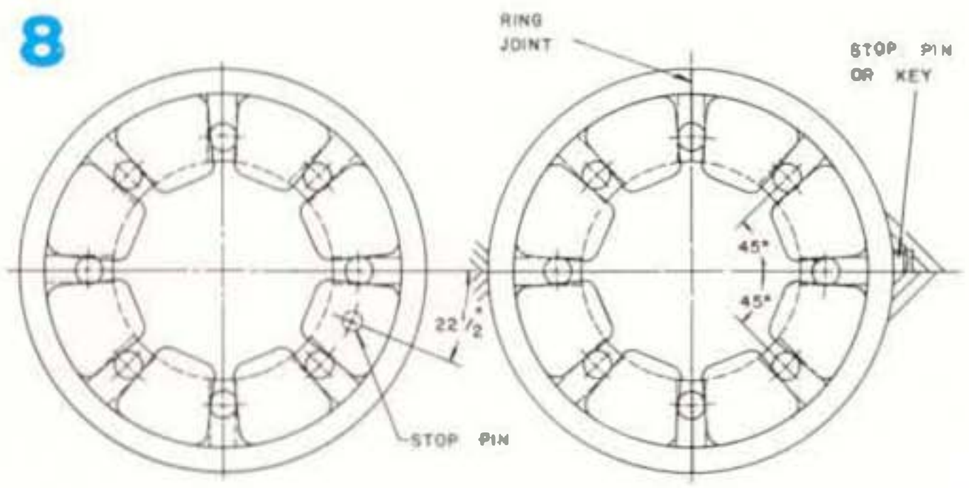

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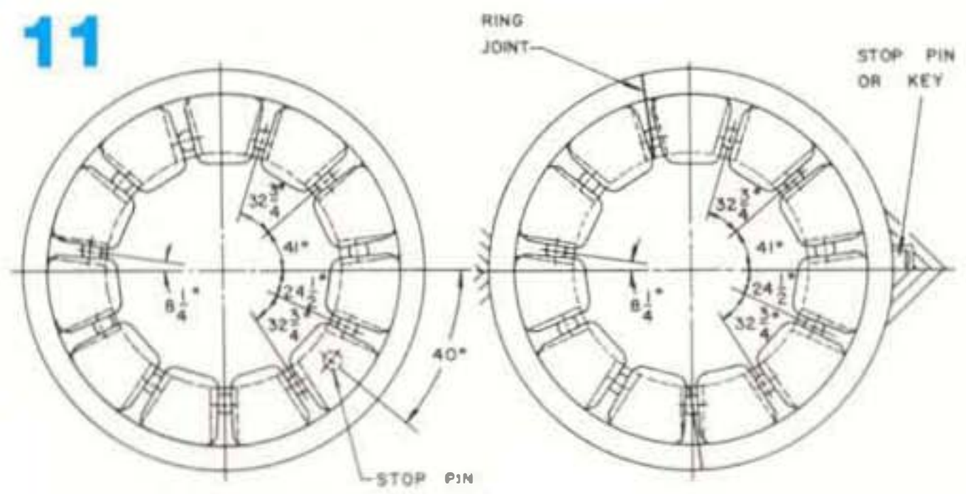

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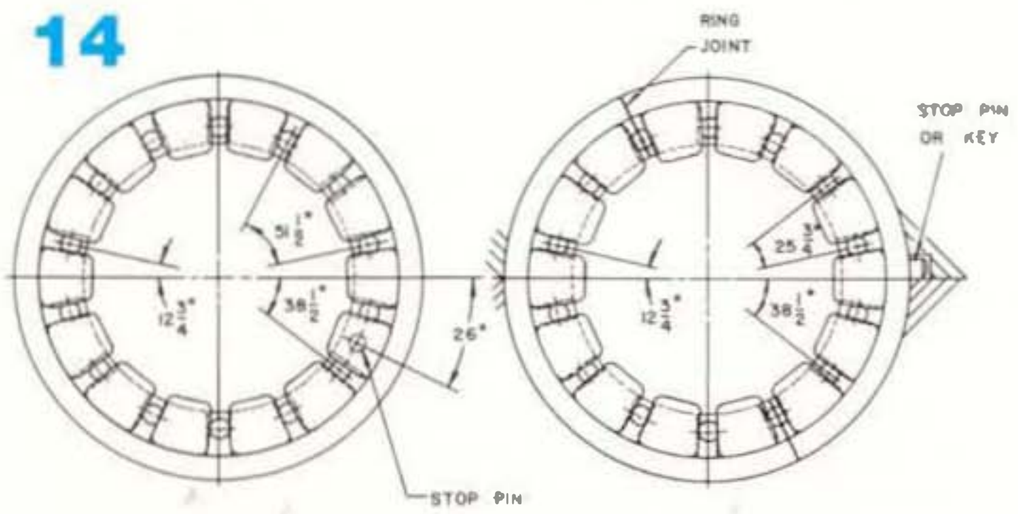

ONE PIECE RING — RING IN HALVES

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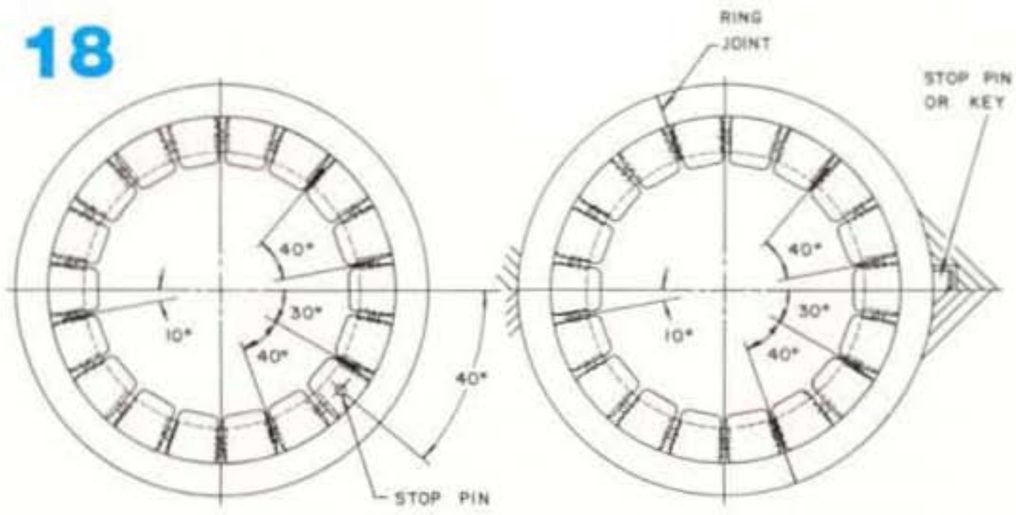

ONE PIECE RING — RING IN HALVES

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