

## FAG Heating Rings

Uncomplicated devices for extracting cylindrical roller bearing inner rings



## Application

FAG heating rings are suitable for dismantling the lipless inner rings of cylindrical roller bearings and needle roller bearings and for inner rings with a fixed lip. The heating rings are ideal for the occasional extraction of small and medium-size bearing rings (bore diameters ranging from 50 to 200 mm). Depending on the ring size, the heating process takes 5 to 30 seconds.

## Description

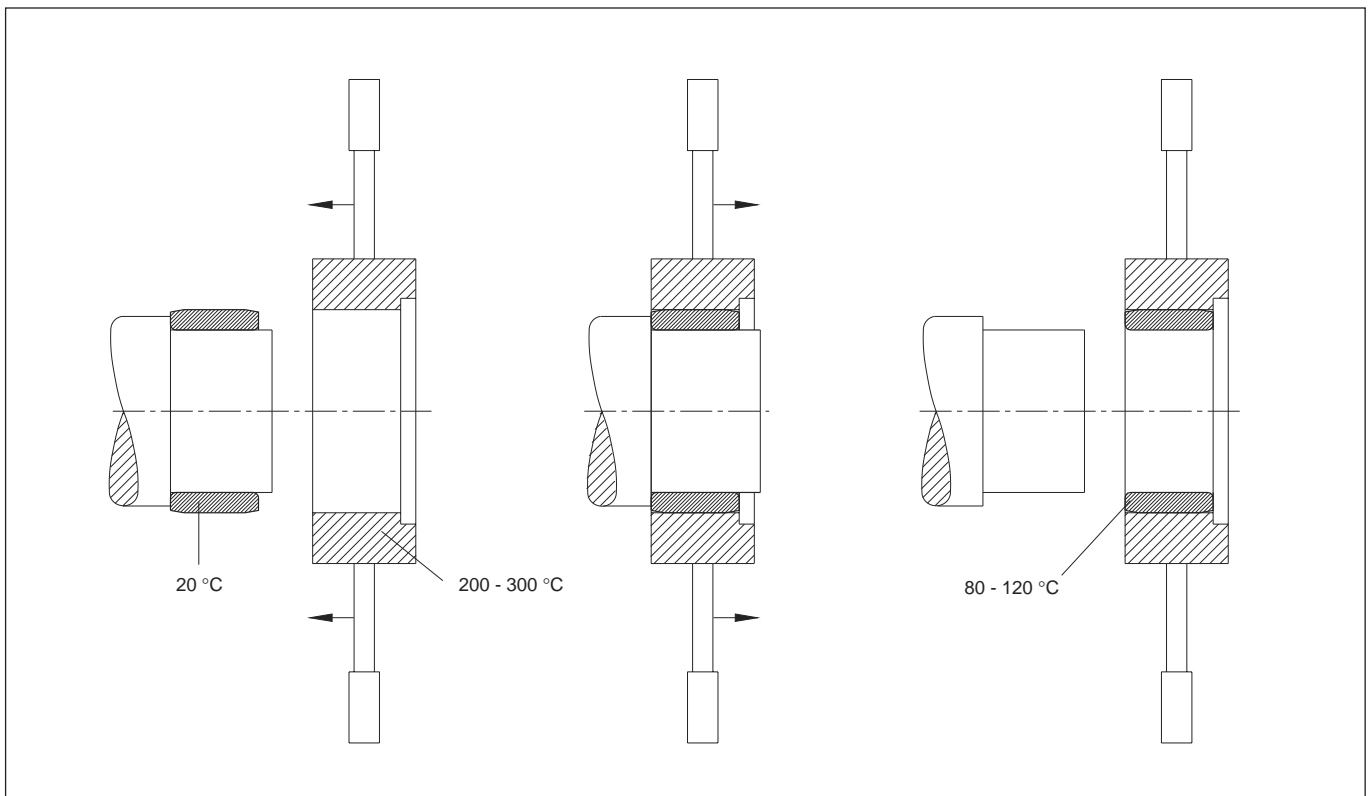
FAG heating rings are slotted rings that are made of a light metal alloy. Their bore diameters and widths are designed in such a way that the inner rings of several cylindrical roller bearing designs of the same size can be extracted with the same heating ring, see page 3.

Several slots in the circumference of the heating ring reduce its rigidity and thus enable a close fit on the bearing ring. Heat-insulated handles make handling of the rings easier.

Due to the good heat-conducting properties of the heating ring the bearing ring quickly takes on the temperature required for extraction (80 to 120 °C). The specific heat of the light metal alloy is twice the specific heat of steel, entailing – due to the good thermal conductivity of the alloy – only a minor temperature loss with major heat emission. Since the alloy's coefficient of thermal expansion is twice as high as that of steel, the contact between inner ring and heating ring is improved, and the transmission of heat is intensified when the heating ring cools down and the inner ring is heated.

## Handling

The heating ring is heated to 200 to 300 °C by means of an electric heating plate. The temperature at the bore must be checked constantly. The bore diameter design ensures that the heating ring sits on the bearing ring with a slight interference fit at 200 to 300 °C. The heating ring must be pushed onto the bearing ring (wearing heat-insulated gloves) and clamped by means of the handles. To improve the exchange of heat, the inner ring raceway may be coated with silicone-free heat transfer paste before pushing on the heating ring.



The clamped heating ring has to be rotated to check if the interference fit of the bearing ring has been eliminated; then the heating ring can be withdrawn from the shaft together with the bearing ring. The extracted inner ring must be removed from the heating ring immediately to prevent it from being excessively heated.

Problems may arise with fretting corrosion or cold weldings in the inner ring seat. In such cases the temperature difference between bearing ring and shaft generated by the heating ring may not suffice to extract the bearing ring, and the inner ring must be heated by means of an annular burner (see FAG Publ. No. WL 80 100 „Mounting and Dismounting of Rolling Bearings“).

Frequent use of the heating ring may affect its roundness so that the exchange of heat is reduced to such an extent that the inner ring cannot be extracted. Two or more bearing rings shrunk onto the shaft side by side cannot be dismantled simultaneously with one heating ring. The bearing rings must be heated one by one and extracted separately.

## Comparison with Other Extraction Tools

We recommend to use the heating rings for cases where a small number of cylindrical roller bearing inner rings with bore diameters of up to ca. 200 mm have to be dismantled infrequently. For this particular application, the low purchase price of the heating rings yields real savings.

For large numbers of bearing rings with bore diameters of 100 mm and larger we recommend induction heating, cp. FAG Publ. No. WL 80 107.

Small bearing rings with bore diameters of up to about 100 mm are usually dismantled by means of mechanical extraction tools (see also TI No. WL 80-48).

## Programme, Information for an Offer

The dimensional tables in this TI list FAG heating rings for the commonly used cylindrical roller bearing inner rings with bore diameters ranging from 50 to 200 mm. On request we also supply heating rings in other dimensions.

To prepare an offer we need the following information:

- Bearing code or dimensions of the inner rings
- Shaft fits
- Drawing of the mounting location
- Approximate number of parts to be extracted per day

## Manufacture

In some cases, customers want to manufacture the heating rings themselves.

We recommend to make the heating rings of a heat-resistant aluminium alloy, e. g. AlCuMgPbF38 (material no. WST 3.1645).

The dimensions of the heating rings for commonly used cylindrical roller bearing inner rings are indicated in this TI. The bore of the heating ring is machined to a Z10 fit corresponding to the inner ring raceway diameter. The handles should be made of round bar steel, with a diameter of 8 to 16 mm and a length of 150 to 200 mm, depending on the ring size. The handles must be heat-insulated. The number of slots in the circumference is determined by the outside diameter of the heating ring. We recommend:

up to 300 mm    6 slots  
over 300 mm    10 slots

The depth of the slots should be at least 2/3 of the ring cross section.

## Recommended FAG Accessories

- Electric heating plates  
Order designation:  
172017 (for heating rings with an outside diameter of up to 220 mm) and  
172018 (for heating rings with an outside diameter of up to 300 mm)
- Temperature measuring instrument  
Order designation:  
TEMP.MG
- Gloves  
Order designation:  
HANDSCHUH2
- Heat transfer paste  
Order designation:  
HEATING.RING.PASTE

## Examples of How to Order FAG Heating Rings

### HEATING.RING312E

(for cylindrical roller bearing inner rings of size 312E, suitable bearing designs are shown on page 3)

The heating rings for special bearings are suffixed with the codes of these bearings, i.e. a number beginning with 5 or 8.

### HEATING.RING801634

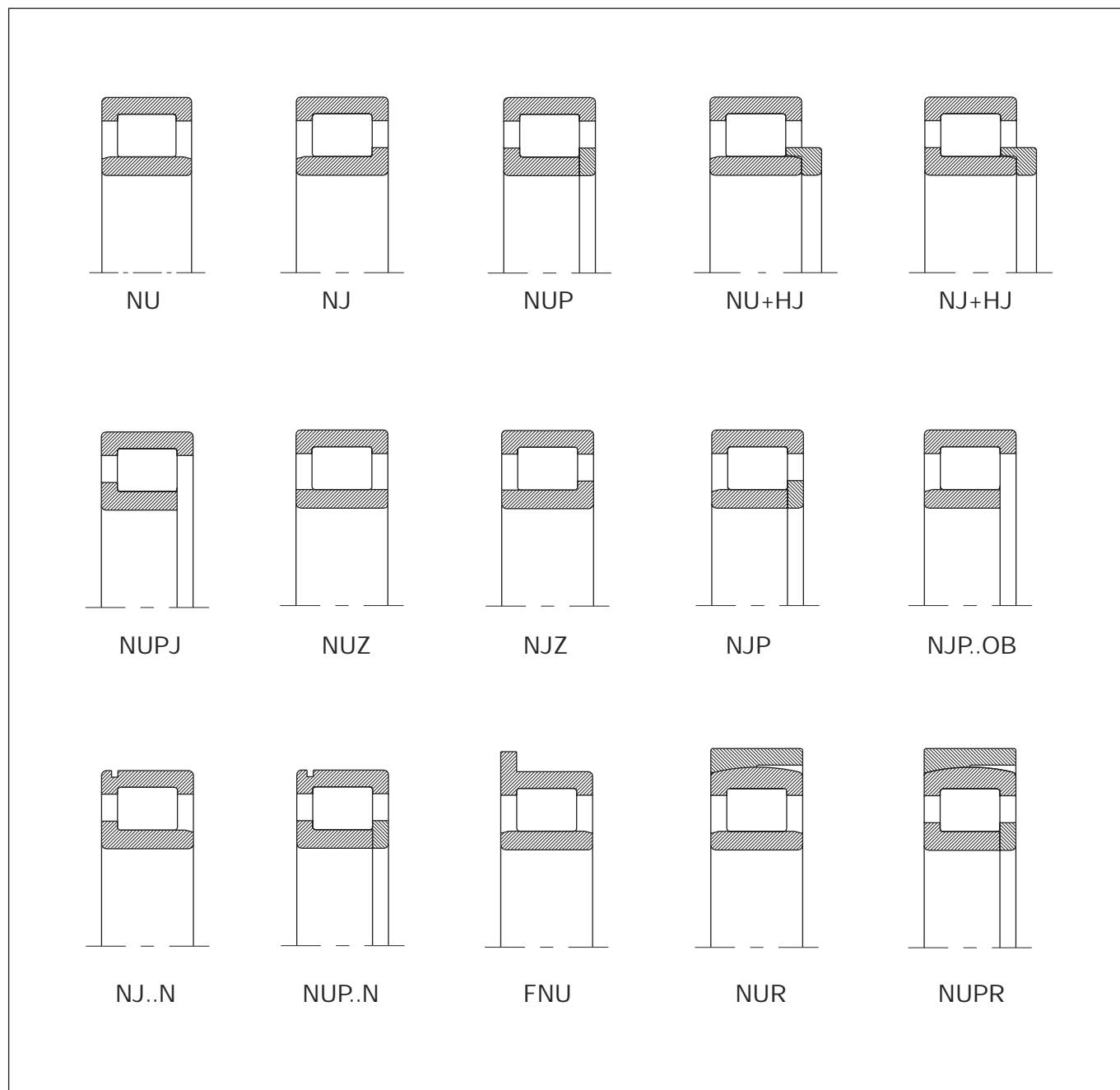
(for the inner rings of FAG cylindrical roller bearings 801634)

# Cylindrical Roller Bearing Inner Rings that Can be Extracted with the Heating Rings

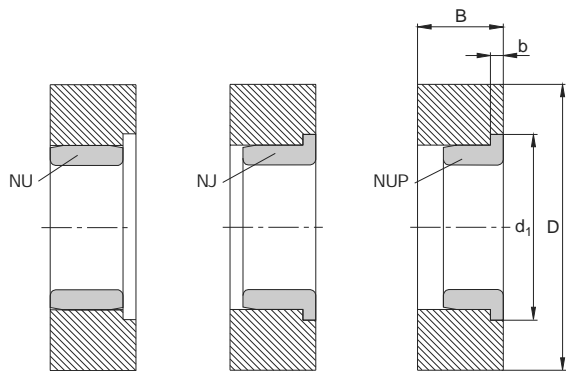
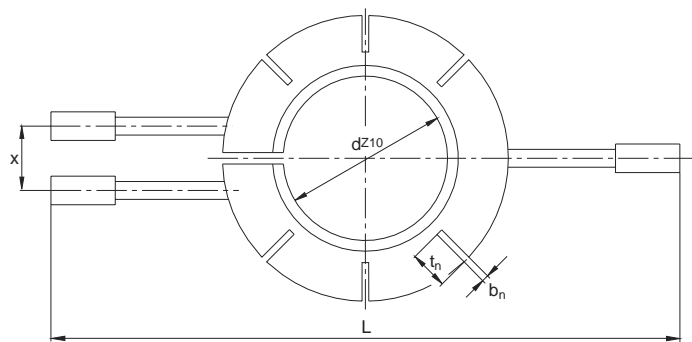
## Cylindrical Roller Bearing Inner Rings that Can be Extracted with the Heating Rings

The dimensions of the heating rings are designed in such a way that they can be used to extract the inner rings of the

commonly used cylindrical roller bearing designs NU, NJ and NUP as well as the inner rings of other designs of the same bearing size. All the suitable cylindrical roller bearing designs are shown below.



# FAG Heating Rings



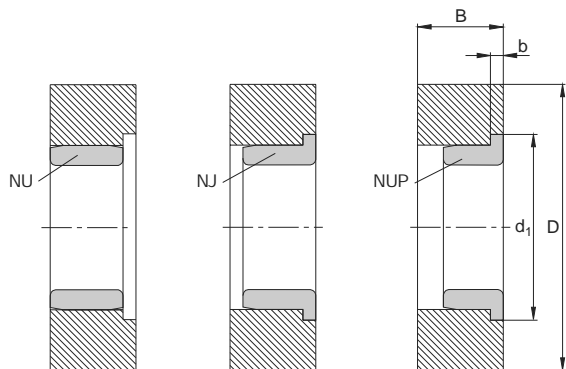
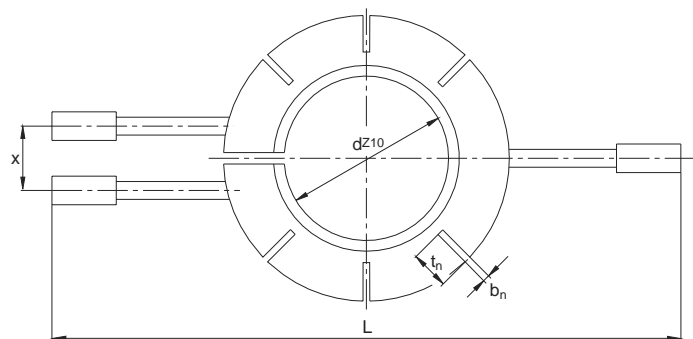
for inner rings of cylindrical roller bearings, e.g. NU, NJ and NUP  
(more designs on page 3)

Bearing bore mm	Heating ring Order designation FAG	Dimensions		B	d <sub>1</sub>	b	b <sub>n</sub>	t <sub>n</sub>	L	x
		d mm	D							
50	HEATING.RING210E	59.5	90	24	64.5	4	2	10	390	35
	HEATING.RING2210E	59.5	90	27	64.5	4	2	10	390	35
	HEATING.RING310E	65	110	32	72	5	2	15	410	35
	HEATING.RING2310E	65	110	46.5	72	6.5	2	15	410	35
	HEATING.RING410E	70.8	125	36.5	79.5	5.5	2	18	425	40
55	HEATING.RING211E	66	100	24.5	71.5	3.5	2	11	400	35
	HEATING.RING2211E	66	100	29	71.5	4	2	11	400	35
	HEATING.RING311E	70.5	115	34	78.2	5	2	15	415	35
	HEATING.RING2311E	70.5	115	49.5	78.2	6.5	2	15	415	35
	HEATING.RING411E	77.2	135	39.5	86	6.5	2	19	435	40
60	HEATING.RING212E	72	110	26	78.5	4	2	12	410	35
	HEATING.RING2212E	72	110	32	78.5	4	2	12	410	35
	HEATING.RING312E	77	130	36.5	85	5.5	2	18	430	40
	HEATING.RING2312E	77	130	53	85	7	2	18	430	40
	HEATING.RING412E	83	145	41.5	92.5	6.5	2	20	445	40
65	HEATING.RING213E	78.5	120	27	85.5	4	2	14	420	35
	HEATING.RING2213E	78.5	120	35.5	85.5	4.5	2	14	420	35
	HEATING.RING313E	82.5	135	38.5	91.5	5.5	2	17.5	435	40
	HEATING.RING2313E	82.5	135	56	91.5	8	2	17.5	435	40
	HEATING.RING413E	89.3	155	44	99.5	7	3	22	455	40
70	HEATING.RING214E	83.5	130	28	90.5	4	2	15.5	430	40
	HEATING.RING2214E	83.5	130	35.5	90.5	4.5	2	15.5	430	40
	HEATING.RING314E	89	145	40.5	98.5	5.5	2	18.5	445	40
	HEATING.RING2314E	89	145	59.5	98.5	8.5	2	18.5	445	40
	HEATING.RING414E	100	180	50	111.5	8	3	26	480	45
75	HEATING.RING215E	88.5	135	29	95.5	4	2	15.5	435	40
	HEATING.RING2215E	88.5	135	35.5	95.5	4.5	2	15.5	435	40
	HEATING.RING315E	95	155	42.5	105.5	5.5	3	20	455	40
	HEATING.RING2315E	95	155	63.5	105.5	8.5	3	20	455	40
	HEATING.RING415E	104.5	185	53.5	117	8.5	3	27	485	45
80	HEATING.RING216E	95.3	145	30.5	103	4.5	2	16.5	445	40
	HEATING.RING2216E	95.3	145	37.5	103	4.5	2	16.5	445	40
	HEATING.RING316E	101	165	45	111.5	6	3	21.5	465	45
	HEATING.RING2316E	101	165	67	111.5	9	3	21.5	465	45
	HEATING.RING416E	110	190	57	123	9	3	26.5	490	45

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Bearing bore mm	Heating ring Order designation FAG	Dimensions								
		d mm	D	B	d <sub>1</sub>	b	b <sub>n</sub>	t <sub>n</sub>	L	x
85	HEATING.RING217E	100.5	155	32.5	109	4.5	3	18	455	40
	HEATING.RING2217E	100.5	155	41	109	5	3	18	455	40
	HEATING.RING317E	108	175	47.5	119	6.5	3	22.5	475	45
	HEATING.RING2317E	108	175	70	119	10	3	22.5	475	45
	HEATING.RING417E	113	195	62	127	10	3	27.5	495	45
90	HEATING.RING218E	107	165	35	115.5	5	3	19.5	465	45
	HEATING.RING2218E	107	165	46	115.5	6	3	19.5	465	45
	HEATING.RING318E	113.5	185	49.5	125	6.5	3	24	485	45
	HEATING.RING2318E	113.5	185	74	125	10	3	24	485	45
	HEATING.RING418E	123.5	215	64	138	10	3	30.5	515	45
95	HEATING.RING219E	112.5	170	37	122	5	3	19.5	470	45
	HEATING.RING2219E	112.5	170	49.5	122	6.5	3	19.5	470	45
	HEATING.RING319E	121.5	200	52.5	133.5	7.5	3	26	500	45
	HEATING.RING2319E	121.5	200	78.5	133.5	11.5	3	26	500	45
100	HEATING.RING220E	119	185	39	129	5	3	22	485	45
	HEATING.RING2220E	119	185	52	129	6	3	22	485	45
	HEATING.RING320E	127.5	210	54.5	141	7.5	3	27.5	510	45
	HEATING.RING2320E	127.5	210	83.5	141	10.5	3	27.5	510	45
105	HEATING.RING221E	125.5	195	42	136	6	3	23	495	45
	HEATING.RING321E	133	225	56.5	148	7.5	3	30	525	45
110	HEATING.RING222E	132.5	205	44	143	6	3	24	505	45
	HEATING.RING2222E	132.5	205	61.5	143	8.5	3	24	505	45
	HEATING.RING322E	143	240	58	157	8	3	32.5	540	45
	HEATING.RING2322E	143	240	92.5	157	12.5	3	32.5	540	45
120	HEATING.RING224E	143.5	220	46	155	6	3	25.5	520	45
	HEATING.RING2224E	143.5	220	67	155	9	3	25.5	520	45
	HEATING.RING324E	154	250	63.5	170	8.5	3	32	550	45
	HEATING.RING2324E	154	250	98	170	12	3	32	550	45
130	HEATING.RING226E	153.5	230	46	166	6	3	25.5	530	45
	HEATING.RING2226E	153.5	230	74	166	10	3	25.5	530	45
	HEATING.RING326E	167	275	67	184	9	3	36	575	45
	HEATING.RING2326E	167	275	107	184	14	3	36	575	45

# FAG Heating Rings



for inner rings of cylindrical roller bearings, e.g. NU, NJ and NUP  
(more designs on page 3)

Bearing bore mm	Heating ring Order designation FAG	Dimensions								
		d mm	D	B	d <sub>1</sub>	b	b <sub>n</sub>	t <sub>n</sub>	L	x
<b>140</b>	HEATING.RING228E	169	260	49	182	7	3	30.5	560	45
	HEATING.RING2228E	169	260	80	182	12	3	30.5	560	45
	HEATING.RING328E	180	295	72	198	10	3	38.5	595	45
	HEATING.RING2328E	180	295	118	198	16	3	38.5	595	45
<b>150</b>	HEATING.RING230E	182	285	52.5	195	7.5	3	34.5	585	45
	HEATING.RING2230E	182	285	85.5	195	12.5	3	34.5	585	45
	HEATING.RING330E	193	315	75	212	10	3	40.5	615	45
	HEATING.RING2330E	193	315	124.5	212	16.5	3	40.5	615	45
<b>160</b>	HEATING.RING232E	195	305	56	209	8	3	37	605	45
	HEATING.RING2232E	193	300	92.5	208	12.5	3	36	600	45
	HEATING.RING332E	204	335	78	224	10	3	44	635	45
	HEATING.RING2332E	204	335	131	224	17	3	44	635	45
<b>170</b>	HEATING.RING234E	207	325	60	222	8	3	40	625	45
	HEATING.RING2234E	205	315	98	221	12.5	3	37	615	45
	HEATING.RING334E	218	365	83	239	11	3	49	665	45
	HEATING.RING2334EX	216	365	137.5	238	17.5	3	49	665	45
<b>180</b>	HEATING.RING236E	217	335	60	232	8	3	40	635	45
	HEATING.RING2236E	215	330	98	231	12	3	39	630	45
	HEATING.RING336E	231	380	86.5	253	11.5	3	50	680	45
	HEATING.RING2336EX	227	380	144	250	18	3	51	685	45
<b>190</b>	HEATING.RING238E	230	355	63.5	246	8.5	3	42	655	45
	HEATING.RING2238E	228	350	105.5	245	13.5	3	41	650	45
	HEATING.RING338E	245	400	90	266	12	3	52	800	45
	HEATING.RING2338EX	240	405	150.5	264	18.5	3	54	805	45
<b>200</b>	HEATING.RING240E	243	380	67	260	9	3	46	680	45
	HEATING.RING2240E	241	370	112	259	14	3	43	670	45
	HEATING.RING340E	258	430	92	281	12	3	57	830	45
	HEATING.RING2340EX	253	430	157	278	19	3	57	830	45

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# Notes

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## FAG Heating Rings

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