



Spherical roller thrust bearings can accommodate heavy axial loads; they are suitable for relatively high speeds. The raceways which are inclined towards the bearing axis allow the bearings to accommodate radial loads as well. The radial load must be less than 55 % of the axial load.

FAG spherical roller thrust bearings have asymmetrical barrel rollers and compensate for misalignment. As a rule, spherical roller thrust bearings have to be lubricated with oil.

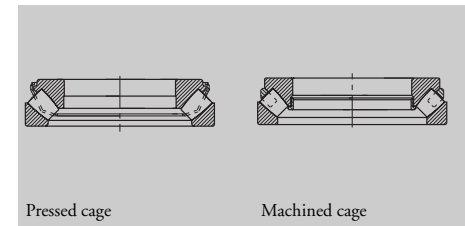
Standards

Spherical roller thrust bearings ISO 104 and DIN 728

Basic design

FAG supply basic spherical roller thrust bearings of reinforced design (suffix E). The bearings of series 292E, 293E, and 294E are designed for maximum load carrying capacity.

The bearings have pressed steel cages (no cage suffix) or machined brass cages (suffix MB).



Tolerances

Spherical roller thrust bearings are made with normal tolerances.

Tolerances: Thrust bearings, page 70.

Alignment

The spherical housing washer raceway makes spherical roller thrust bearings self-aligning and thus allows them to compensate for misalignments and shaft deflections.

If P or $P_0 \leq 0.05 \cdot C_0$ [kN], the misalignment values indicated in the table are admissible provided the shaft washer rotates and the misalignment is constant (static misalignment).

| ▼ Angular misalignment in degrees | |
|-----------------------------------|----------------------|
| Bearing series | Angular misalignment |
| 292E | 1...1.5 |
| 293E | 1.5...2.5 |
| 294E | 2...3 |

The lower values apply to large bearings. For details on the aligning capability at rotating housing washer or wobbling shaft motion (dynamic misalignment), please consult our Technical Service.

Cages

Bearings with a machined brass cage are suffixed MB. All other bearings have pressed steel cages (no cage suffix). The cages hold together the roller set and the shaft washer.

| ▼ Standard cages of spherical roller thrust bearings | | |
|--|------------------------|---------------------------|
| Bearing series | Pressed steel cage (-) | Machined brass cage (MB) |
| Bore reference number | | |
| 292E | up to 64 | all from 68 on from 72 on |
| 293E | | |
| 294E | | |

FAG Spherical Roller Thrust Bearings

Minimum axial load · Speed suitability · Equivalent loads · Suffixes · Design of mating components

Minimum axial load

At high speeds bearing kinematics is impaired by the inertia forces of the rollers if the axial load does not reach a certain minimum. This minimum axial load F_{amin} is calculated by means of the following formula:

$$F_{amin} = \frac{C_0}{1400} + A \cdot \left(\frac{D_g \cdot H \cdot n}{10^6} \right)^2 \quad [\text{kN}]$$

where

C_0 static load rating [kN], see bearing tables

A series-depending factor

A = 0.0027 for series 292E

A = 0.0031 for series 293E

A = 0.0021 for series 294E

D_g outside diameter of housing washer [mm]

H overall height [mm]

n maximum operating speed [min^{-1}]

If the external load and the weight of the supported machine elements are lower than the minimum load, the bearings have to be preloaded, e.g. by means of springs.

If a radial load has to be accommodated in addition to the axial load, the requirement

$F_r \leq 0.55 \cdot F_a$ must be fulfilled.

Speed suitability

General data on the suitability for high speeds are shown on page 87 et seq.

Under appropriate operating conditions, the reference speed may be exceeded up to the value for the limiting speed. Special operating conditions are taken into consideration by determining the thermally permissible operating speed.

If the reference speed in the tables exceeds the limiting speed, the higher value must not be used.

Equivalent dynamic load

$P = F_a + 1.2 \cdot F_r$ [kN] for $F_r \leq 0.55 F_a$

Equivalent static load

$P_0 = F_a + 2.7 \cdot F_r$ [kN] for $F_r \leq 0.55 F_a$

The index of static stressing f_s for spherical roller thrust bearings should be as follows:

$f_s \geq 8$ with axial support by the abutment shoulders given in the bearing tables (D_1 and D_2),

$f_s \geq 6$ with full axial support of the housing washer and shaft washer by the entire mating surface (D_w and d_g),

$f_s \geq 4$ with full axial support (D_w and d_g) and at the same time adequate radial support of the housing washer (housing tolerance K7).

If even higher loads are involved, please consult our Technical Service.

Suffixes

E maximum capacity design

MB machined brass cage, shaft washer guided

Design of mating components

General data on the design of thrust bearing washer seats are given on page 102.

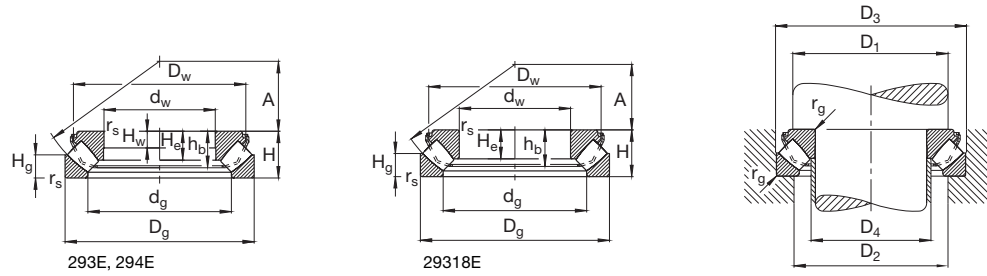
Tolerances of shaft and housing for mounting spherical roller thrust bearings are indicated on pages 105 and 114.

The maximum radius r_s and the diameters of the abutment shoulders can be found in the bearing tables.

The housing bore above the housing washer should be relief-turned to diameter D_{3min} to prevent the rollers from fouling the housing in the case of shaft misalignment.

FAG Spherical Roller Thrust Bearings

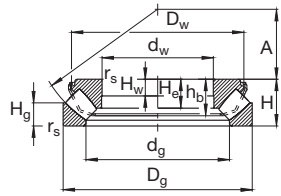
Rolling bearings can be fail-safe if $C_0/P_0 \geq 8$, see page 41.



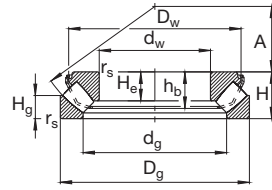
| Shaft | Dimensions | | | | | | | | | | | Mass ≈ kg | Load rating | | Limiting speed min ⁻¹ | Reference speed | Code Bearing FAG | Abutment dimensions | | | | |
|-------|----------------------|----------------|----------------|----------------|-----|----------------|----------------|----------------|-----------------------|----------------|-----|-----------------|-----------------|-------------------------|-------------------------------------|-----------------|------------------------|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | d _w mm | d _g | D _w | D _g | H | H _g | H _w | H _e | r _s min | h _b | A | | dyn. C kN | stat. C ₀ | | | | D ₁ min mm | D ₂ max | D ₃ min | D ₄ max | r _g max |
| 60 | 60 | 88 | 115 | 130 | 42 | 20 | 15 | 27 | 1.5 | 36 | 38 | 2.4 | 335 | 900 | 3600 | 4800 | 29412E | 90 | 107 | 133 | 70 | 1.5 |
| | 65 | 94 | 125 | 140 | 45 | 21 | 16 | 29.5 | 2 | 38 | 42 | 3.03 | 380 | 1020 | 3400 | 4500 | 29413E | 100 | 115 | 143 | 73 | 2 |
| 70 | 70 | 102 | 135 | 150 | 48 | 23 | 17 | 31 | 2 | 40 | 44 | 3.71 | 430 | 1200 | 3000 | 4000 | 29414E | 105 | 124 | 153 | 80 | 2 |
| 75 | 75 | 108 | 140 | 160 | 51 | 24 | 18 | 33.5 | 2 | 43 | 47 | 4.4 | 490 | 1370 | 2800 | 3600 | 29415E | 115 | 132 | 163 | 86 | 2 |
| 80 | 80 | 116 | 150 | 170 | 54 | 26 | 19 | 35 | 2.1 | 45 | 50 | 5.28 | 550 | 1560 | 2800 | 3400 | 29416E | 120 | 141 | 173 | 91 | 2.1 |
| | 85 | 111 | 135 | 150 | 39 | 19 | 14 | 24.5 | 1.5 | 33 | 50 | 2.54 | 345 | 1060 | 3400 | 3800 | 29317E | 115 | 129 | 153 | 93 | 1.5 |
| 85 | 85 | 123 | 160 | 180 | 58 | 28 | 21 | 37 | 2.1 | 48 | 54 | 5.89 | 600 | 1730 | 2600 | 3200 | 29417E | 130 | 150 | 183 | 97 | 2.1 |
| | 90 | 115 | 140 | 155 | 39 | 19 | 14 | 24.5 | 1.5 | 33 | 52 | 2.65 | 355 | 1100 | 3400 | 3600 | 29318E | 118 | 135 | 158 | 99 | 1.5 |
| 90 | 90 | 130 | 170 | 190 | 60 | 29 | 22 | 39 | 2.1 | 50 | 56 | 7.38 | 670 | 1930 | 2400 | 3000 | 29418E | 135 | 158 | 193 | 103 | 2.1 |
| | 100 | 129 | 155 | 170 | 42 | 20.8 | 15 | 26 | 1.5 | 36 | 58 | 3.38 | 415 | 1370 | 3000 | 3200 | 29320E | 132 | 148 | 173 | 109 | 1.5 |
| 100 | 100 | 142 | 185 | 210 | 67 | 32 | 24 | 43 | 3 | 55 | 62 | 10 | 830 | 2450 | 2200 | 2600 | 29420E | 150 | 175 | 214 | 112 | 2.5 |
| | 110 | 142 | 175 | 190 | 48 | 23 | 17 | 30.3 | 2 | 41 | 64 | 5.04 | 530 | 1700 | 2600 | 3000 | 29322E | 145 | 165 | 193 | 119 | 2 |
| 110 | 110 | 158 | 205 | 230 | 73 | 35 | 26 | 47 | 3 | 60 | 69 | 13.1 | 950 | 2800 | 2000 | 2400 | 29422E | 165 | 192 | 234 | 125 | 2.5 |
| | 120 | 158 | 190 | 210 | 54 | 26 | 19 | 34 | 2.1 | 46 | 70 | 6.9 | 640 | 2080 | 2400 | 2600 | 29324E | 160 | 182 | 213 | 132 | 2.1 |
| 120 | 120 | 172 | 220 | 250 | 78 | 37 | 28 | 50.5 | 4 | 64 | 74 | 16.3 | 1120 | 3350 | 1800 | 2200 | 29424E | 180 | 210 | 254 | 135 | 3 |
| | 130 | 169 | 205 | 225 | 58 | 28 | 21 | 36.5 | 2.1 | 49 | 76 | 8.49 | 720 | 2360 | 2200 | 2400 | 29326E | 170 | 195 | 228 | 141 | 2.1 |
| 130 | 130 | 187 | 240 | 270 | 85 | 41 | 31 | 54 | 4 | 69 | 81 | 12.9 | 1250 | 3900 | 1700 | 2000 | 29426E | 195 | 227 | 275 | 151 | 3 |
| | 140 | 181 | 220 | 240 | 60 | 29 | 22 | 38.5 | 2.1 | 51 | 82 | 9.87 | 800 | 2700 | 2000 | 2200 | 29328E | 185 | 208 | 244 | 152 | 2.1 |
| 140 | 140 | 194 | 250 | 280 | 85 | 41 | 31 | 54 | 4 | 69 | 86 | 21.9 | 1290 | 4050 | 1700 | 2000 | 29428E | 205 | 237 | 285 | 158 | 3 |
| | 150 | 192 | 230 | 250 | 60 | 29 | 22 | 38 | 2.1 | 51 | 87 | 10.5 | 815 | 2850 | 2000 | 2000 | 29330E | 195 | 220 | 254 | 163 | 2.1 |
| 150 | 150 | 211 | 270 | 300 | 90 | 44 | 32 | 58 | 4 | 74 | 92 | 26.9 | 1460 | 4800 | 1500 | 1800 | 29430E | 220 | 253 | 306 | 171 | 3 |
| | 160 | 206 | 245 | 270 | 67 | 32 | 24 | 42 | 3 | 56 | 92 | 13.6 | 965 | 3350 | 2000 | 1900 | 29332E | 210 | 236 | 274 | 174 | 2.5 |
| 160 | 160 | 224 | 285 | 320 | 95 | 45 | 34 | 60.5 | 5 | 78 | 99 | 31.6 | 1660 | 5300 | 1400 | 1700 | 29432E | 230 | 271 | 326 | 181 | 4 |
| | 170 | 215 | 255 | 280 | 67 | 32 | 24 | 42 | 3 | 57 | 96 | 14.2 | 1000 | 3450 | 1800 | 1900 | 29334E | 220 | 247 | 284 | 184 | 2.5 |
| 170 | 170 | 239 | 305 | 340 | 103 | 50 | 37 | 65.5 | 5 | 84 | 104 | 39.2 | 1860 | 6000 | 1300 | 1600 | 29434E | 245 | 288 | 346 | 191 | 4 |

FAG Spherical Roller Thrust Bearings

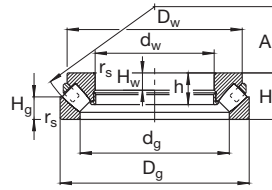
Rolling bearings can be fail-safe if $C_0/P_0 \geq 8$, see page 41.



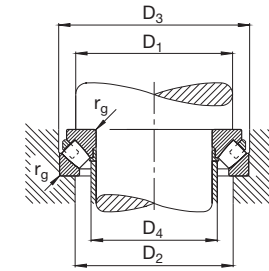
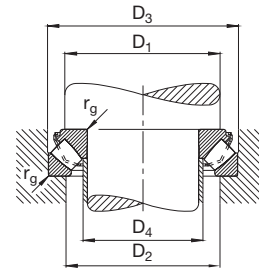
293E, 294E



293E, 294E
 $d_w \geq 220 \text{ mm}$



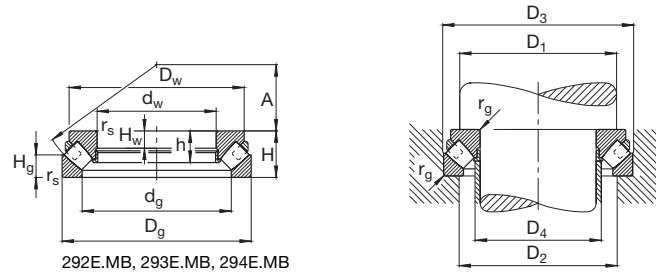
292E.MB, 293E.MB, 294E.MB



| Shaft | Dimensions | | | | | | | | | | | | Mass ≈ kg | Load rating | | Limiting speed min ⁻¹ | Reference speed | Code Bearing FAG | Abutment dimensions | | | | |
|-------|----------------------|----------------|----------------|----------------|-----|----------------|----------------|----------------|-----------------------|-----|----------------|-----|-----------------|-----------------|-------------------------|-------------------------------------|-----------------|------------------------|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | d _w mm | d _g | D _w | D _g | H | H _g | H _w | H _e | r _s min | h | h _b | A | | dyn. C kN | stat. C ₀ | | | | D ₁ min mm | D ₂ max | D ₃ min | D ₄ max | r _g max |
| 180 | 180 | 230 | 275 | 300 | 73 | 35 | 26 | 46 | 3 | | 61 | 103 | 18.1 | 1180 | 4150 | 1700 | 1700 | 29336E | 235 | 263 | 304 | 193 | 2.5 |
| | 180 | 253 | 320 | 360 | 109 | 52 | 39 | 69.5 | 5 | | 89 | 110 | 46.2 | 2080 | 6800 | 1300 | 1400 | 29436E | 260 | 305 | 366 | 202 | 4 |
| 190 | 190 | 243 | 295 | 320 | 78 | 38 | 28 | 49 | 4 | | 66 | 110 | 22.8 | 1320 | 4650 | 1500 | 1600 | 29338E | 250 | 281 | 325 | 206 | 3 |
| | 190 | 268 | 340 | 380 | 115 | 55 | 41 | 73 | 5 | | 94 | 117 | 54.9 | 2320 | 7500 | 1200 | 1400 | 29438E | 275 | 322 | 386 | 214 | 4 |
| 200 | 200 | 236 | 265 | 280 | 48 | 24 | 17 | 29 | 2 | 45 | | 108 | 8.15 | 655 | 2650 | 2000 | 2000 | 29240E.MB | 235 | 258 | 284 | 211 | 2 |
| | 200 | 258 | 310 | 340 | 85 | 41 | 31 | 53.5 | 4 | | 71 | 116 | 28 | 1530 | 5300 | 1400 | 1500 | 29340E | 265 | 298 | 348 | 215 | 3 |
| | 200 | 282 | 360 | 400 | 122 | 59 | 44 | 77 | 5 | | 99 | 122 | 64.7 | 2550 | 8500 | 1100 | 1300 | 29440E | 290 | 338 | 406 | 225 | 4 |
| 220 | 220 | 254 | 285 | 300 | 48 | 24 | 17 | | 2 | 35 | | 117 | 9.18 | 720 | 3150 | 2000 | 1700 | 29244E.MB | 260 | 277 | 304 | 229 | 2 |
| | 220 | 279 | 330 | 360 | 85 | 41 | | 53 | 4 | | 71 | 125 | 29.9 | 1560 | 5600 | 1400 | 1400 | 29344E | 285 | 316 | 368 | 235 | 3 |
| | 220 | 303 | 375 | 420 | 122 | 58 | | 76.5 | 6 | | 99 | 132 | 67.4 | 2600 | 8500 | 1100 | 1200 | 29444E | 310 | 360 | 428 | 243 | 5 |
| 240 | 240 | 282 | 320 | 340 | 60 | 30 | 22 | | 2.1 | 44 | | 130 | 16.1 | 1040 | 4500 | 1700 | 1600 | 29248E.MB | 285 | 311 | 344 | 251 | 2.1 |
| | 240 | 299 | 350 | 380 | 85 | 41 | | 53 | 4 | | 71 | 135 | 32.5 | 1700 | 6400 | 1400 | 1300 | 29348E | 300 | 337 | 390 | 256 | 3 |
| | 240 | 321 | 400 | 440 | 122 | 59 | | 78 | 6 | | 99 | 142 | 73.5 | 2700 | 9500 | 1100 | 1100 | 29448E | 330 | 381 | 448 | 265 | 5 |
| 260 | 260 | 302 | 340 | 360 | 60 | 30 | 22 | | 2.1 | 44 | | 139 | 17.1 | 1060 | 4750 | 1700 | 1500 | 29252E.MB | 305 | 331 | 365 | 272 | 2.1 |
| | 260 | 327 | 385 | 420 | 95 | 45 | | 61 | 5 | | 79 | 148 | 45.2 | 2040 | 7650 | 1200 | 1200 | 29352E | 330 | 372 | 430 | 277 | 4 |
| | 260 | 353 | 435 | 480 | 132 | 64 | | 83 | 6 | | 107 | 154 | 93.6 | 3100 | 11000 | 1000 | 1000 | 29452E | 360 | 419 | 488 | 291 | 5 |
| 280 | 280 | 322 | 360 | 380 | 60 | 30 | 22 | | 2.1 | 44 | | 150 | 18.3 | 1120 | 5100 | 1500 | 1300 | 29256E.MB | 325 | 351 | 385 | 291 | 2.1 |
| | 280 | 346 | 405 | 440 | 95 | 46 | | 61 | 5 | | 79 | 158 | 48.8 | 2120 | 8300 | 1200 | 1100 | 29356E | 350 | 394 | 450 | 298 | 4 |
| | 280 | 380 | 470 | 520 | 145 | 68 | | 92 | 6 | | 118 | 166 | 121 | 3650 | 12900 | 900 | 950 | 29456E | 390 | 446 | 530 | 310 | 5 |
| 300 | 300 | 353 | 395 | 420 | 73 | 38 | 26 | | 3 | 51 | | 162 | 28.6 | 1430 | 6550 | 1400 | 1300 | 29260E.MB | 355 | 386 | 426 | 317 | 2.5 |
| | 300 | 378 | 440 | 480 | 109 | 50 | | 69 | 5 | | 90 | 168 | 66.4 | 2550 | 9650 | 1100 | 1000 | 29360E | 380 | 429 | 490 | 320 | 4 |
| | 300 | 398 | 490 | 540 | 145 | 70 | | 93 | 6 | | 118 | 175 | 129 | 3900 | 14000 | 900 | 900 | 29460E | 410 | 471 | 550 | 326 | 5 |
| 320 | 320 | 372 | 415 | 440 | 73 | 38 | 26 | | 3 | 51 | | 172 | 30.3 | 1500 | 6950 | 1300 | 1200 | 29264E.MB | 375 | 406 | 450 | 336 | 2.5 |
| | 320 | 396 | 465 | 500 | 109 | 53 | | 68 | 5 | | 90 | 180 | 71 | 2650 | 10600 | 1100 | 950 | 29364E | 400 | 449 | 510 | 340 | 4 |
| | 320 | 432 | 525 | 580 | 155 | 75 | | 97 | 7.5 | | 126 | 191 | 158 | 4300 | 15600 | 800 | 850 | 29464E | 435 | 507 | 590 | 354 | 6 |
| 340 | 340 | 391 | 435 | 460 | 73 | 37 | 26 | | 3 | 52 | | 183 | 32 | 1560 | 7350 | 1300 | 1100 | 29268E.MB | 395 | 427 | 470 | 353 | 2.5 |
| | 340 | 426 | 500 | 540 | 122 | 59 | 44 | | 5 | 85 | | 192 | 98.9 | 3250 | 12900 | 950 | 850 | 29368E.MB | 430 | 484 | 550 | 364 | 4 |
| | 340 | 458 | 560 | 620 | 170 | 82 | | 106 | 7.5 | | 138 | 201 | 200 | 5200 | 19000 | 750 | 750 | 29468E | 465 | 541 | 630 | 373 | 6 |
| 360 | 360 | 423 | 475 | 500 | 85 | 44 | 31 | | 4 | 59 | | 194 | 46.1 | 1900 | 8800 | 1200 | 1100 | 29272E.MB | 420 | 461 | 510 | 380 | 3 |
| | 360 | 446 | 520 | 560 | 122 | 59 | 44 | | 5 | 86 | | 202 | 103 | 3350 | 13400 | 900 | 630 | 29372E.MB | 450 | 504 | 572 | 384 | 4 |
| | 360 | 475 | 580 | 640 | 170 | 82 | 61 | | 7.5 | 121 | | 210 | 219 | 5400 | 20400 | 750 | 700 | 29472E.MB | 485 | 560 | 650 | 391 | 6 |

FAG Spherical Roller Thrust Bearings

Rolling bearings can be fail-safe if $C_0/P_0 \geq 8$, see page 41.



292E.MB, 293E.MB, 294E.MB

| Shaft | Dimensions | | | | | | | | | | Mass ≈ kg | Load rating | | Limiting speed min ⁻¹ | Reference speed | Code Bearing FAG | Abutment dimensions | | | | |
|-------|----------------------|----------------|----------------|----------------|-----|----------------|----------------|-----------------------|-----|-----|-----------------|-----------------|-------------------------|-------------------------------------|-----------------|------------------------|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | d _w mm | d _g | D _w | D _g | H | H _g | H _w | r _s min | h | A | | dyn. C kN | stat. C ₀ | | | | D ₁ min mm | D ₂ max | D ₃ min | D ₄ max | r _g max |
| 380 | 380 | 440 | 490 | 520 | 85 | 42 | 31 | 4 | 61 | 202 | 48.8 | 2080 | 9650 | 1100 | 1000 | 29276E.MB | 440 | 480 | 530 | 395 | 3 |
| | 380 | 474 | 555 | 600 | 132 | 63 | 48 | 6 | 94 | 216 | 132 | 3900 | 16000 | 850 | 750 | 29376E.MB | 480 | 538 | 612 | 404 | 5 |
| | 380 | 500 | 610 | 670 | 175 | 85 | 63 | 7.5 | 124 | 230 | 248 | 5850 | 22400 | 700 | 670 | 29476E.MB | 510 | 587 | 682 | 415 | 6 |
| 400 | 400 | 460 | 510 | 540 | 85 | 42 | 31 | 4 | 62 | 212 | 51.2 | 2120 | 10200 | 1100 | 950 | 29280E.MB | 460 | 500 | 550 | 415 | 3 |
| | 400 | 493 | 575 | 620 | 132 | 64 | 48 | 6 | 94 | 225 | 137 | 4000 | 16600 | 850 | 750 | 29380E.MB | 500 | 557 | 634 | 424 | 5 |
| | 400 | 530 | 645 | 710 | 185 | 89 | 67 | 7.5 | 131 | 236 | 294 | 6400 | 25000 | 670 | 630 | 29480E.MB | 540 | 622 | 722 | 441 | 6 |
| 420 | 420 | 489 | 550 | 580 | 95 | 46 | 34 | 5 | 70 | 225 | 70.5 | 2650 | 12500 | 1000 | 850 | 29284E.MB | 490 | 534 | 590 | 437 | 4 |
| | 420 | 520 | 600 | 650 | 140 | 68 | 50 | 6 | 97 | 235 | 157 | 4300 | 18000 | 800 | 700 | 29384E.MB | 525 | 585 | 664 | 447 | 5 |
| | 420 | 550 | 665 | 730 | 185 | 89 | 67 | 7.5 | 132 | 244 | 305 | 6700 | 26000 | 630 | 600 | 29484E.MB | 560 | 643 | 742 | 455 | 6 |
| 440 | 440 | 506 | 570 | 600 | 95 | 49 | 34 | 5 | 70 | 235 | 74 | 2650 | 13400 | 1000 | 850 | 29288E.MB | 510 | 554 | 610 | 458 | 4 |
| | 440 | 548 | 630 | 680 | 145 | 70 | 52 | 6 | 100 | 245 | 176 | 4550 | 19000 | 750 | 670 | 29388E.MB | 548 | 614 | 695 | 470 | 5 |
| | 440 | 585 | 710 | 780 | 206 | 100 | 74 | 9.5 | 144 | 260 | 393 | 7650 | 30000 | 600 | 560 | 29488E.MB | 595 | 684 | 794 | 486 | 8 |
| 460 | 460 | 528 | 590 | 620 | 95 | 46 | 34 | 5 | 70 | 245 | 76.3 | 2700 | 13400 | 950 | 800 | 29292E.MB | 530 | 575 | 632 | 477 | 4 |
| | 460 | 567 | 660 | 710 | 150 | 72 | 54 | 6 | 108 | 257 | 203 | 5000 | 21200 | 700 | 630 | 29392E.MB | 575 | 638 | 726 | 487 | 5 |
| | 460 | 605 | 730 | 800 | 206 | 100 | 74 | 9.5 | 144 | 272 | 407 | 7800 | 31000 | 600 | 560 | 29492E.MB | 615 | 704 | 815 | 502 | 8 |
| 480 | 480 | 556 | 620 | 650 | 103 | 55 | 37 | 5 | 71 | 259 | 90.9 | 2800 | 14600 | 900 | 800 | 29296E.MB | 555 | 603 | 662 | 508 | 4 |
| | 480 | 587 | 675 | 730 | 150 | 72 | 54 | 6 | 107 | 270 | 208 | 5200 | 22400 | 700 | 600 | 29396E.MB | 593 | 660 | 746 | 507 | 5 |
| | 480 | 630 | 770 | 850 | 224 | 108 | 81 | 9.5 | 159 | 280 | 511 | 9300 | 36500 | 530 | 530 | 29496E.MB | 645 | 744 | 865 | 521 | 8 |
| 500 | 500 | 574 | 640 | 670 | 103 | 55 | 37 | 5 | 72 | 268 | 93.5 | 2900 | 15300 | 900 | 750 | 292/500E.MB | 575 | 622 | 682 | 527 | 4 |
| | 500 | 610 | 700 | 750 | 150 | 74 | 54 | 6 | 105 | 280 | 216 | 5100 | 22800 | 700 | 600 | 293/500E.MB | 615 | 683 | 768 | 532 | 5 |
| | 500 | 654 | 790 | 870 | 224 | 107 | 81 | 9.5 | 160 | 290 | 525 | 9300 | 37500 | 530 | 500 | 294/500E.MB | 670 | 765 | 886 | 542 | 8 |
| 530 | 530 | 612 | 675 | 710 | 109 | 57 | 39 | 5 | 74 | 288 | 110 | 3100 | 16300 | 850 | 750 | 292/530E.MB | 611 | 661 | 722 | 560 | 4 |
| | 530 | 646 | 745 | 800 | 160 | 76 | 58 | 7.5 | 116 | 295 | 266 | 6000 | 26500 | 630 | 560 | 293/530E.MB | 650 | 724 | 818 | 561 | 6 |
| | 530 | 690 | 840 | 920 | 236 | 114 | 85 | 9.5 | 169 | 309 | 621 | 10200 | 41500 | 500 | 480 | 294/530E.MB | 700 | 810 | 937 | 573 | 8 |
| 560 | 560 | 642 | 715 | 750 | 115 | 60 | 41 | 5 | 81 | 302 | 131 | 3650 | 19300 | 800 | 670 | 292/560E.MB | 645 | 697 | 762 | 586 | 4 |
| | 560 | 729 | 890 | 980 | 250 | 120 | 90 | 12 | 182 | 328 | 733 | 11800 | 49000 | 480 | 430 | 294/560E.MB | 750 | 860 | 997 | 606 | 10 |
| 600 | 600 | 688 | 760 | 800 | 122 | 65 | 44 | 5 | 82 | 321 | 152 | 3800 | 20400 | 750 | 630 | 292/600E.MB | 690 | 744 | 814 | 633 | 4 |
| | 600 | 782 | 940 | 1030 | 258 | 127 | 93 | 12 | 182 | 347 | 820 | 12200 | 52000 | 450 | 430 | 294/600E.MB | 800 | 900 | 1055 | 653 | 10 |
| 630 | 630 | 724 | 805 | 850 | 132 | 67 | 48 | 6 | 94 | 338 | 195 | 4800 | 25500 | 670 | 560 | 292/630E.MB | 730 | 789 | 864 | 657 | 5 |
| | 630 | 820 | 995 | 1090 | 280 | 136 | 101 | 12 | 198 | 365 | 1030 | 14000 | 58500 | 430 | 400 | 294/630E.MB | 840 | 960 | 1115 | 681 | 10 |
| 670 | 670 | 773 | 855 | 900 | 140 | 74 | 50 | 6 | 93 | 364 | 228 | 4900 | 26000 | 630 | 600 | 292/670E.MB | 775 | 836 | 915 | 710 | 5 |

