

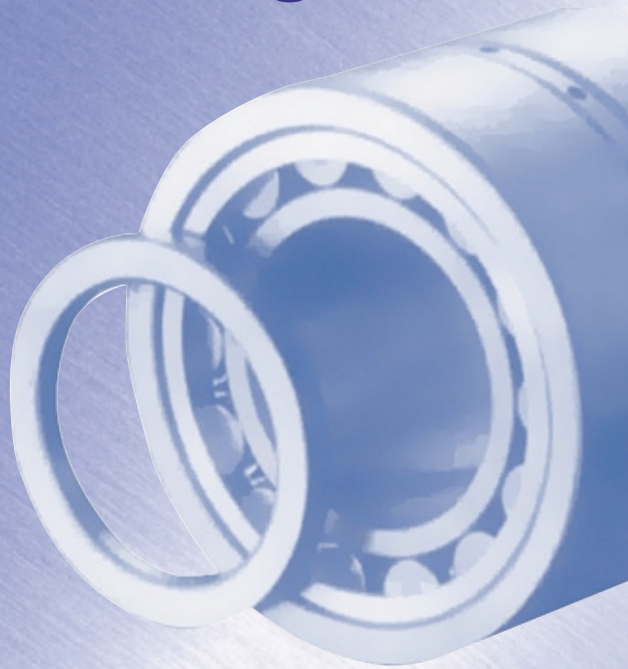
# Axle Bearings for Railway Rolling Stock

## Cylindrical Roller Bearings

The main advantages of cylindrical roller bearings are their high-speed capability, easy maintenance, and ability to either allow or restrict axial movement.



# Cylindrical Roller Bearings



## 1. Characteristics of Cylindrical Roller Bearings

Compared with tapered or spherical roller bearings, cylindrical roller bearings have several strong advantages as journal bearings. These are;

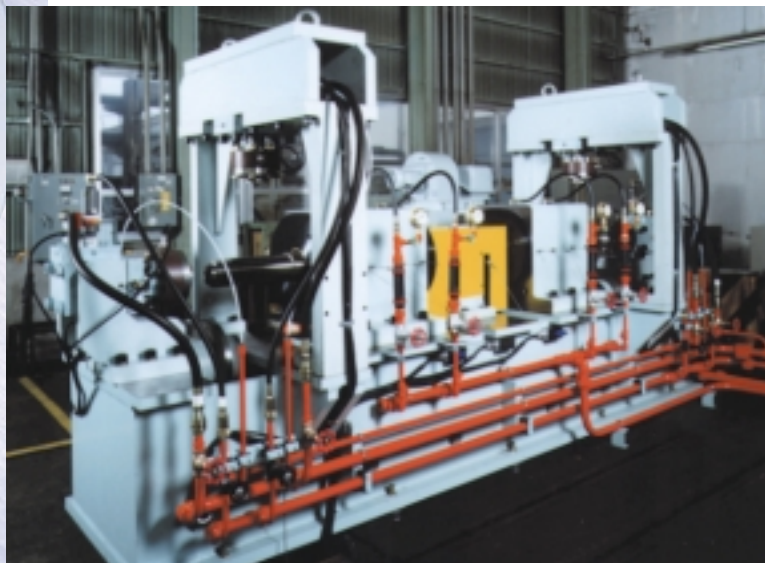
- 1) The outer diameter is smaller and the weight is lower for the same load capacity.
- 2) Assembly and disassembly are easier facilitating maintenance and inspection.
- 3) The speed capability is higher because of the lower friction coefficient.
- 4) They allow the free setup of their axial clearance.

## 2. Cylindrical Roller Bearings combined with Ball Bearings

Usually, the axial loads are borne by a single-row ball bearing such as a deep groove ball bearing or an angular contact ball bearing installed between the bearing box front cover and the axle end. This type has an advantage of although has a disadvantage of increasing the number of parts.

## 3. Cylindrical Roller Bearings with Ribs

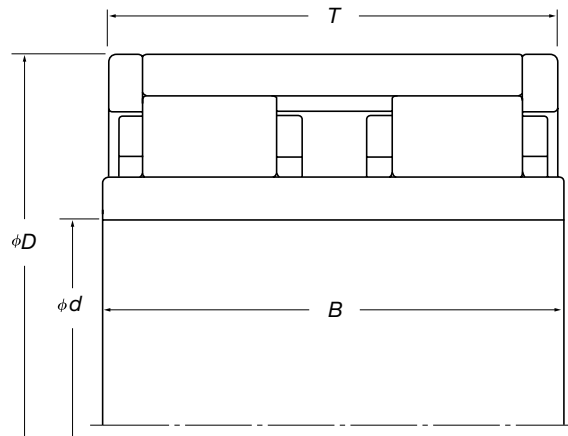
With this type of bearings which is referred as the UIC type and has been standardized in Europe, axial loads are borne by ribs of the outer and inner rings and by the end of rollers. Compared with cylindrical roller bearings combined with ball bearings, this type offers more simpler and compact housing construction owing to the absence of the ball bearing.



**UIC-compliant rotation test equipment for railway axle box bearings based on UIC515-50 standard**

## Cylindrical Roller Bearing Table

### Type A

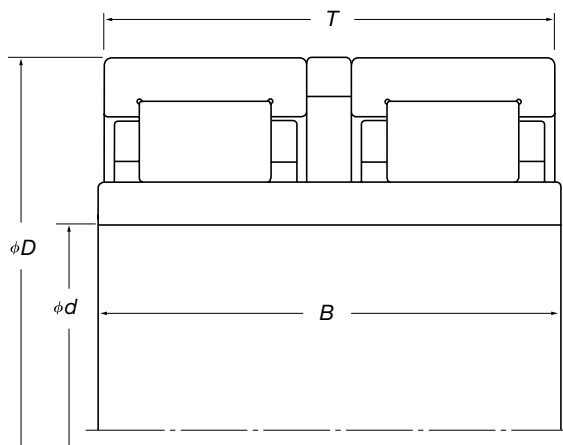


Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
2U85-1	85	155	105	125	400 000	605 000	9.6
2U95-1C	95	170	105	125	440 000	690 000	11.3
2U100-1	100	180	120	130	500 000	795 000	13.7
2U100-2A	100	190	130	140	690 000	1 100 000	17.2
JC1A	110	225	140	150	835 000	1 230 000	28.2
JC3	110	200	160	180	720 000	1 190 000	23.1
JC10	110	225	140	180	935 000	1 430 000	28.4
JC11	120	240	160	180	1 020 000	1 580 000	35.5
2U110-2	110	230	150	160	935 000	1 430 000	32.6
2U110-3	110	220	160	180	945 000	1 510 000	30.5
2U110-7A	110	225	140	150	935 000	1 430 000	28.5
2U120-4	120	250	140	140	1 070 000	1 610 000	34.6
2U120-6A	120	240	160	180	1 020 000	1 580 000	35.6
2U120-7	120	220	160	180	850 000	1 430 000	28.2
JC5A	130	260	160	180	1 080 000	1 710 000	43.4
JC18	130	260	160	205	1 080 000	1 710 000	44.8
2U130-2A	130	260	160	180	1 080 000	1 710 000	43.4
2U130-5	130	220	160	180	790 000	1 390 000	25.3
2U130-6	130	240	160	180	990 000	1 650 000	34.5
2U140-2	140	280	185	205	1 440 000	2 260 000	56.7
160JRX01	160	280	160	180	1 060 000	1 730 000	43.1

# Cylindrical Roller Bearings

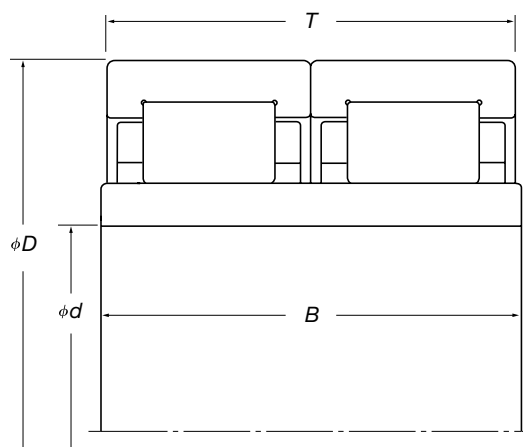
## Cylindrical Roller Bearing Tables

### Type B



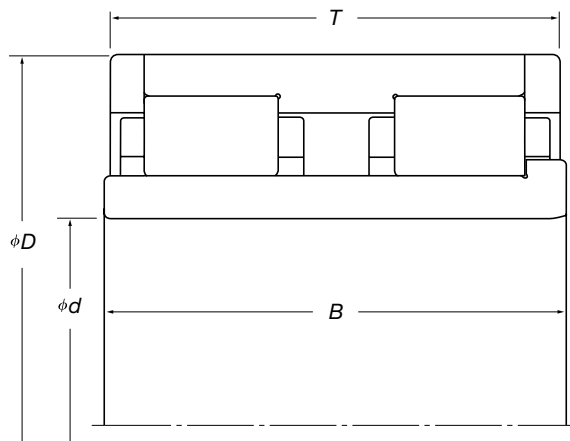
Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
2P85-1	85	150	120	130	365 000	585 000	8.8
90JRU01	90	160	120	130	355 000	530 000	8.6
2P110-4MA	110	225	140	150	935 000	1 430 000	27.4
2P120-6MA	120	240	160	180	935 000	1 450 000	35.0
JC9	130	280	210	215	1 440 000	2 250 000	61.5
JC29	130	270	210	215	1 280 000	2 000 000	56.0
JC9-2	133	280	210	215	1 440 000	2 250 000	60.4
160JRU01	160	260	140	140	820 000	1 460 000	29.0
170JRU01	170	340	230	230	1 660 000	2 760 000	97.9

### Type C



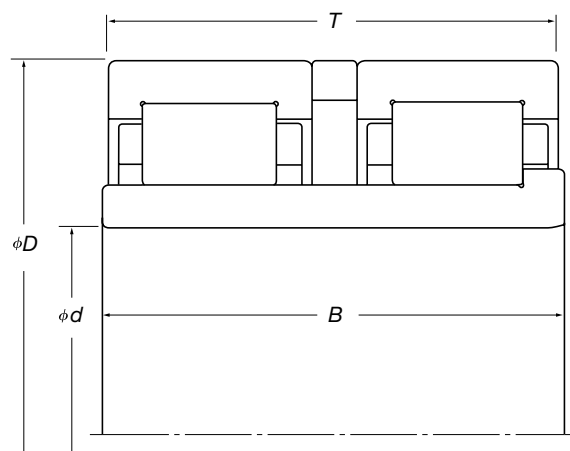
Bearing Number	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
JC2A	110	235	160	180	935 000	1 430 000	35.4

## Type D



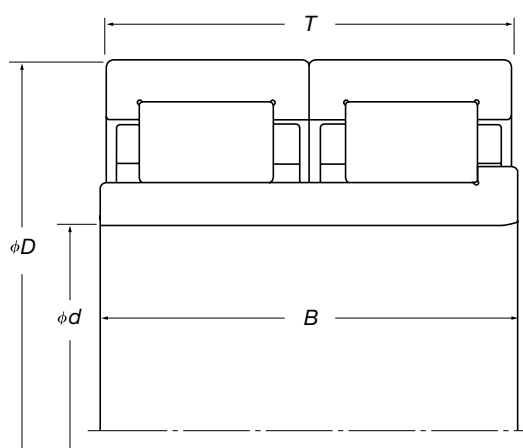
Bearing Number	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
2J100-1	100	180	130	143	560 000	915 000	15.2

## Type E



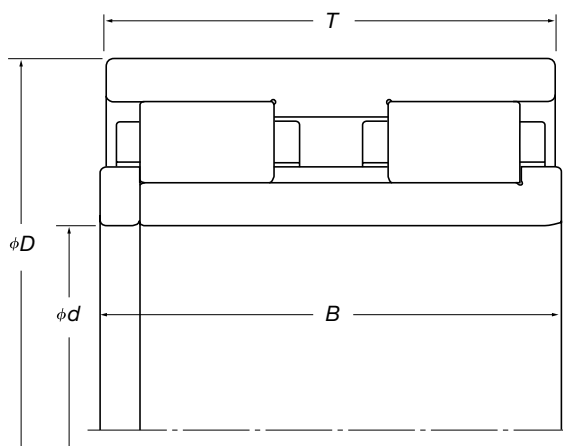
Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
85JRJ02	85	150	120	125	365 000	585 000	8.7
90JRJ01	90	160	118.5	130	355 000	530 000	9.3
110JRJ01	110	200	150	160	625 000	995 000	19.9
2J110-2	110	220	180 (80 × 2)	190	875 000	1 370 000	31.6
120JRJ01	120	220	180	183	850 000	1 430 000	29.5
2J120-1	120	240	180 (80 × 2)	190	935 000	1 450 000	38.1
2J120-3M	120	240	180 (80 × 2)	180	935 000	1 450 000	37.2

## Type F



Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	<i>d</i>	<i>D</i>	<i>T</i>	<i>B</i>			
2J110-1	110	225	70 × 2	150	935 000	1 430 000	28.4
120JRJ02A	120	240	160	180	935 000	1 450 000	36.0

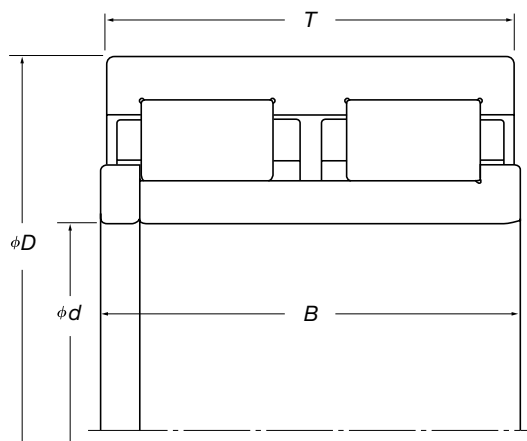
## Type G



Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	<i>d</i>	<i>D</i>	<i>T</i>	<i>B</i>			
2M110-3A	110	220	160	154	875 000	1 370 000	28.9
2M120-9	120	240	180	185	935 000	1 450 000	38.7
120JRF02	120	220	160	165	850 000	1 430 000	28.0
2M130-1	130	270	153	135	820 000	1 140 000	39.2
2M150-3	150	270	153	135	790 000	1 220 000	35.3

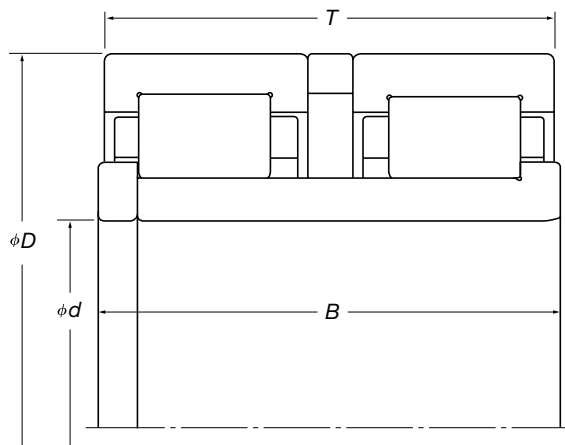


## Type H



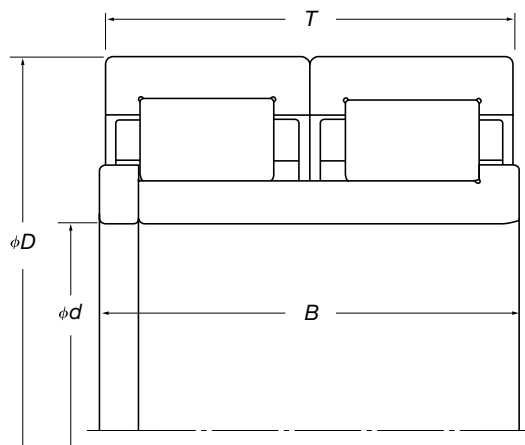
Bearing Number	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
JC14	130	260	160	160	1 140 000	1 840 000	46.6

## Type I



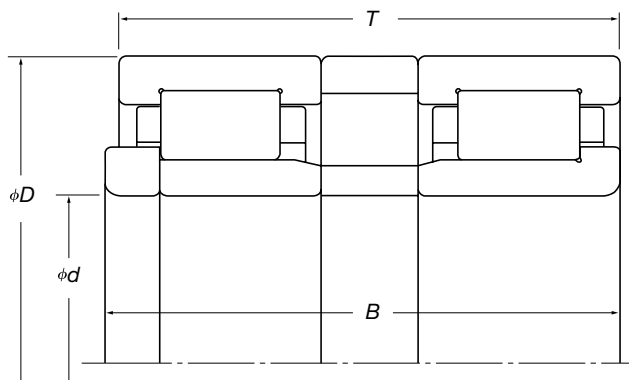
Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
95JRT01	95	190	125	130	800 000	1 340 000	15.7
95JRT02	95	170	115	125	440 000	685 000	11.4
2O100-1	100	200	170	170	650 000	1 030 000	24.8
JC6K	110	220	172	180	790 000	1 190 000	30.5
2O110-1	110	220	180	185	875 000	1 370 000	31.8
JC12	120	240	176	180	1 020 000	1 580 000	38.1
JC34	120	230	165	170	945 000	1 460 000	31.0
JC35	120	225	165	170	875 000	1 380 000	30.0
120JRT01	120	240	180	185	935 000	1 450 000	37.8
120JRT04	120	220	160	165	810 000	1 340 000	28.3
2O120-4	120	240	180	185	935 000	1 450 000	38.1
2O120-11	120	220	180	183	850 000	1 430 000	29.8
2O120-12	120	220	180	185	850 000	1 430 000	29.9
JC38	125	235	165	170	945 000	1 470 000	32.1
JC21	130	260	180	205.5	1 030 000	1 610 000	46.0
JC37	130	265	166	166	1 140 000	1 700 000	43.4
130JRT01	130	260	180	185	1 030 000	1 610 000	45.6
130JRT08	130	235	165	170	895 000	1 520 000	32.1
2O130-6	130	260	180	185	1 030 000	1 610 000	45.7
2O130-7	130	240	180	185	915 000	1 490 000	35.3
2O140-1	140	250	155	160	865 000	1 480 000	33.5
170JRT01	170	340	230	230	1 660 000	2 760 000	99.4

## Type J



Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
JC27X	120	230	150	177	935 000	1 440 000	30.3
JC400K	120	230	150	177	885 000	1 340 000	30.6

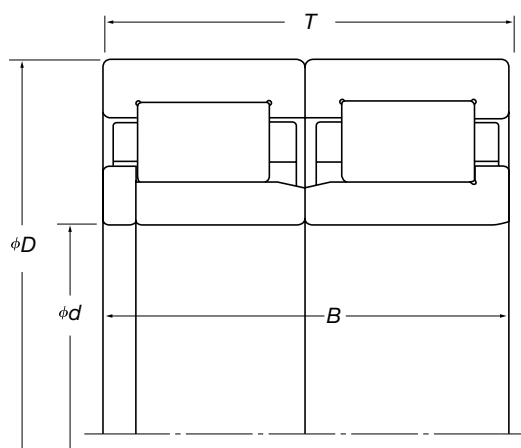
## Type K



Bearing Number	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
J130-5/U130-5DB+KL38	130	240	198 (80 × 2)	204	880 000	1 450 000	38.3



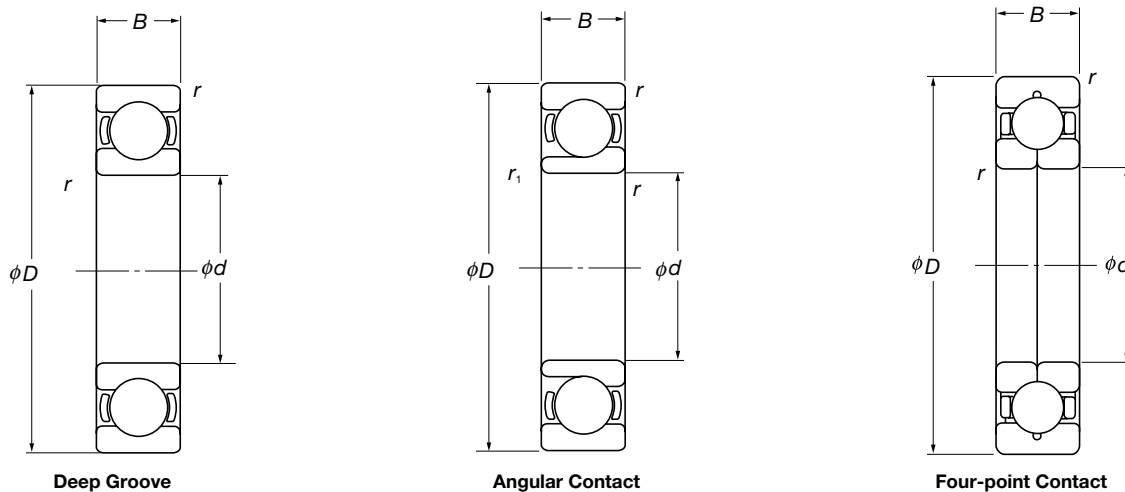
## Type L



Bearing Numbers	Dimensions (mm)				Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.
	$d$	$D$	$T$	$B$			
J110-2/U110-4DB	110	215	73 × 2	73 × 2	800 000	1 240 000	25.4
J120-1C/U120-2C	120	240	80 × 2	80 × 2	960 000	1 500 000	35.1
J120-1D/U120-2D	120	240	80 × 2	80 × 2	960 000	1 500 000	35.4
42724T/152724T	120	240	80 × 2	80 × 2	910 000	1 400 000	35.1
JC130M	130	250	160	160	1 030 000	1 610 000	38.0
42726T/152726T	130	250	80 × 2	80 × 2	1 030 000	1 610 000	36.9
J130-3/U130-4	130	250	80 × 2	80 × 2	1 030 000	1 610 000	37.1
J150-5/U150-2	150	270	160 (80 × 2)	160 (80 × 2)	1 020 000	1 700 000	41.0

# Cylindrical Roller Bearings

## Table of Ball Bearings for Axial Loads



Bearing Numbers		Boundary Dimensions (mm)					Basic Dynamic Load Rating (N)	Basic Static Load Rating (N)	Mass (kg) approx.	Examples of Matching Radial Roller Bearings
Deep Groove	Angular Contact	$d$	$D$	$B$	$r$	$r_1$				
JB8	—	70	150	35	3.5	—	99 500	68 000	2.56	JC2, JC3, JC10
JB8A	—	70	150	35	3.5	—	99 500	68 000	2.56	JC2, 2U95-1
6314	—	70	150	35	3.5	—	104 000	68 000	2.56	JC11
6315	—	75	160	37	3.5	—	113 000	77 000	3.05	2U100, JC1
—	JB1D	85	180	41	4.0	2.0	121 000	93 000	4.30	JC2, JC11
—	JB1E	85	180	41	4.0	2.0	141 000	116 000	4.80	JC2, JC11
6220	—	100	180	34	3.5	—	122 000	93 000	3.15	2U110, 2U130, JC1
—	JB2	100	215	47	4.0	2.0	170 000	138 000	6.60	2U140
6320	—	100	215	47	4.0	—	173 000	141 000	7.00	JC5
—	JB3	110	215	47	4.0	2.0	165 000	142 000	6.40	JC5
—	JB5*	110	215	47	4.0	—	179 000	167 000	6.80	JC5
JB4	—	125	260	55	4.0	—	207 000	185 000	13.0	JC9
JB9	—	125	250	55	4.0	—	186 000	162 000	11.9	JC29

\* Four-point contact ball bearing

