Constant velocity joint for automobiles and its assembly

Constant velocity joints are mainly used for wheel driven devices on sedan, and transferring the output torque of the engine to the wheels; driving the automobile by transferring force between the two shafts whose relative positions are changing constantly; and ensuring the wheels and output shaft rotate at equal speed. Because of complete constant velocity, it can realize axial sliding, also take impact load, and it is compact in structure, lubricated excellently, convenient for assembling, with high transmission efficiency and large deflection operating angle.

1. Categories

1. Constant velocity joints: widely used for driving shafts on sedan, the output shaft and input shaft rotating with the instant angular velocity ratio equal to 1.

A. Constant velocity joints can fall into movable type and fixed type depending on whether there is movement during operating.

B. Constant velocity joints fall into end-capped type, shaft sleeve type, flanged type and wheel disk type according to their installation mode and shapes in automobiles.

2. Constant velocity joint assembly: mechanical components transferring motion and torque, consisting of two sets or one set of constant velocity joint, intermediate shaft and other parts, mounted between the differential gear or terminal reduction gear and the wheel. They fall into front wheel constant velocity joint assembly and rear wheel constant velocity joint assembly according to the driving forms.

2. Structure type

1. Center fixed type constant velocity joint (constant velocity joint which can only operating angle could be changed)

A. BJ type joints: Center fixed type constant velocity joints, raceway of which is oval in the radial section, steel balls and the raceway are four-point contact type.

B. RF type joints: Center fixed type constant velocity joints, raceway of which is round in the radial section, steel balls and the raceway are two-point contact type

C. GE type joint: Center fixed type constant velocity joints, whose three-pin racks are fixed in the housing, ball ring equipped on the three-pin rack and the fork shaft form an operating angle.

2. Plunging constant velocity joint (constant velocity joints which can change operating angles and make plunging movement)

A. DOJ type constant velocity joint: plunging constant velocity joint

B. TJ type joint: tripod universal joint

C. VL type joints: plunging constant velocity joint whose steel balls are held by the outer spherical cage at the cross of the straight raceways of the inner and outer housings, and the straight raceways of the inner and outer rings tilt reversely with an equal angle in the axial direction.

D. GI type joints: tripod universal joint, with housing of tripod opened and compressed spring inside.

3. Type and shape of mounting part

A. End-capped type joint: Constant velocity joints whose mounting part is solid shaft b. Shaft sleeve joints: Constant velocity joint whose mounting part is hollow shaft.

C. Flange type joints: Constant velocity joints whose mounting part is flange with bolt holes.

D. Wheel disk type joints: Constant velocity joints whose mounting part is wheel disk with bolt holes.

4. Structure of constant velocity joint assembly

1) Front-wheel drive constant velocity joint assembly

A. BJ + DOJ or RF + DOJ structure
B. BJ + VL or RF + VL structure
C. BJ + TJ or RF + TJ structure
D. BJ or RF structure

2) Rear wheel drive constant velocity joint assembly

A. BJ + DOJ or RF + DOJ structure
B. BJ + TJ or RF + TJ structure
C. VL + VL structure
D. TJ + TJ structure

3. Coding method

1. Constant velocity joint code

Constant velocity joint code consists of structural shape code, dimension code and suffix code orderly.

A. Structure shape code
Structure shape codes use 2 ~ 3 letters to represent the structure shapes of the constant velocity joints. Refer to Table 1.

B. Dimension code
Dimension codes use 2 ~ 3 numbers to represent the values of the 100 times of intermediate shaft diameter in inch. For nonstandard dimensions, the letter Y shall be added after the number.

C. Suffix code
Suffix codes use 1 ~ 2 letters to represent special requirements and mounting types. Refer to Table 2.

D. Example: BJ 75 YTM
BJ: The structure form of the constant velocity universal joint is BJ type
75: The diameter of the intermediate shaft is 19mm, 75 means the value multiplied 100 in inch
Y: Value of the intermediate shaft diameter multiplied 100 in inch is non-standard
T: Special requirement to the grease
M: End-capped type

Table 1

Code	Meaning
BJ	BJ type constant velocity joint
RF	RF constant velocity joint
GE	GE constant velocity joint
DOJ	DOJ constant velocity joint
TJ	TJ constant velocity joint
VL	VL constant velocity joint
GI	GI constant velocity joint

Table 2

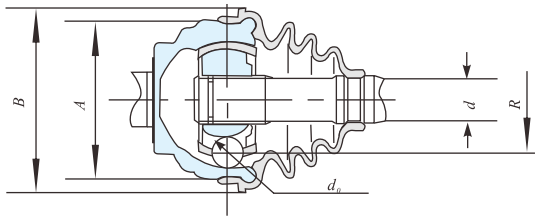
Code	Meaning
T	Special requirement for lubricating grease
M	End-capped type
Z	Shaft sleeve type
F	Flange type
L	Wheel disk type

2. Codes for constant velocity joint assembly

Codes for constant velocity joint assembly consists of basic code and suffix code orderly
A. Basic code
Basic code is made up with the code of the constant velocity joint mounted beside the wheel plus the code of the constant velocity joint mounted on the differential gear or final reduction gear.
B. Suffix code
Suffix codes use 1 letter to represent the structure of the intermediate shaft. Refer to Table 3
C. Example: BJ 75 YTM + TJ 75 YTM/h
/H: Welded intermediate shaft
TJ 75 YTM: Code of flex type constant velocity joint mounted beside the differential gear or final reduction gear
BJ 75 YTM: Code of constant velocity joint mounted beside the wheel

Table 3

Code	Meaning
/H	Welded intermediate shaft
/K	Hollow intermediate shaft
/S	Solid intermediate shaft



Boundary dimensions of BJ type universal joints

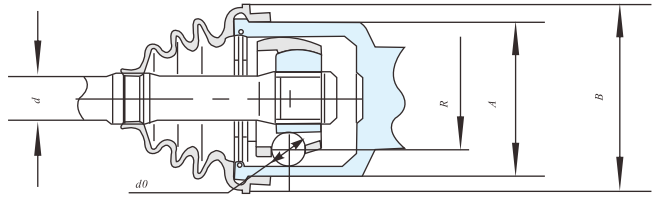
Unit:mm

Basic models	Boundary dimensions				
	A	*B*	*d*	d_0	*R*
BJ 68	61.6	72	17	12.7	20.96
BJ 71	65.3	76	18	12.7	20.96
BJ 75	70	81	19	14.288	23.57
BJ 87	81	100	22.2	16.699	27.5
BJ 95	90	109	23.9	18.000	29.7
BJ 100	92	109	25.4	19.050	31.43
BJ 112	103	120	28.2	21.431	35.36
BJ 125	115	125	31.8	23.812	39.2
BJ 150	137	157	38.1	28.575	47.15
BJ 175	160	180	44.4	33.338	55.00
BJ 200	182	202	50.8	38.100	62.87
BJ 225	204	225	57.2	42.862	70.72
BJ 250	227	249	63.5	47.625	78.58

Boundary dimensions of RF type universal joints (Figure as above)

Unit:mm

Basic models	Boundary dimensions				
	A	*B*	*d*	d_0	*R*
RF 71	62	74	18	12.700	21.43
RF 80	72	84	20.1	14.600	24.00
RF 87	81	94	22.2	15.875	27.50
RF 103	90	103	26.1	17.462	30.25
RF 112	98	114	28.2	19.050	33.00
RF 134	115	145	34	23.812	39.65
RF 165	138	158	42	28.575	47.5
RF 175	155	175	44.4	31.750	54.05
RF 200	186	208	50.8	38.100	64.00

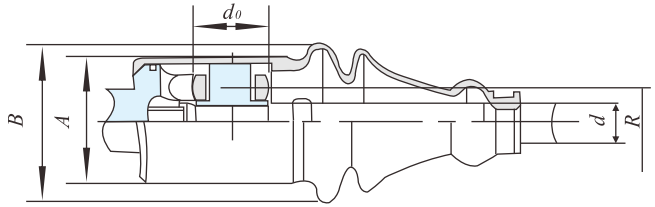


Boundary dimensions of DOJ type universal joints

Unit:mm

Basic models	Boundary dimensions		
	A	*B*	*d*
DOJ 68	61.5	69.5	17
DOJ 71	65.0	74.0	18
DOJ 75	69.0	78.0	19
DOJ 85	72.5	81.3	21.2
DOJ 87	75.7	85.7	22.2
DOJ 92	79.0	89.0	23.3

Basic models	Boundary dimensions		
	A	*B*	*d*
DOJ 96	82.0	91.9	24
DOJ 100	85.5	96.0	25.4
DOJ 110	89.0	99.0	27.6
DOJ 112	95.0	106.0	28.2
DOJ 125	98.5	109.5	31.8



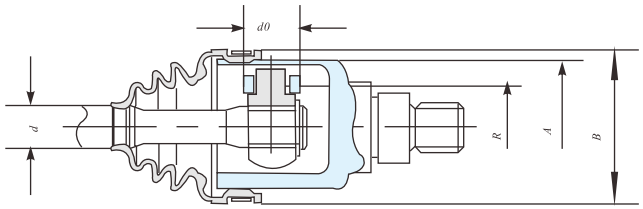
Boundary dimensions of GI type universal joints

Unit:mm

Basic models	Boundary dimensions				
	A	*B*	*d*	d_0	*R*
GI 75	58	60	19	28.4	18.64
GI 81	63	65	20.6	29.95	20.84
GI 87	69	73	22.2	31.95	23.3
GI 100	72	76	25.4	37.1	23.3
GI 110	82	88	27.6	33.95	28.15
GI 125	87	94	31.8	33.95	30.5
GI 140	116~126	134	35.5	*	*

Remarks:

* These dimensions can be determined by the manufacturers according to the auto automobile . In case of any problem, please contact the technical center of C&U Group.

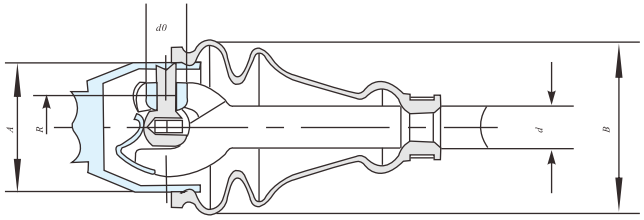


Boundary dimensions of TJ type universal joints

Unit:mm

Basic models	Boundary dimensions		
	A	B	d
TJ 68	61.5	71.0	17
TJ 71	65.0	74.0	18
TJ 75	68.0	78.0	19
TJ 80	71.4	82.0	20.1
TJ 85	74.6	85.8	21.2

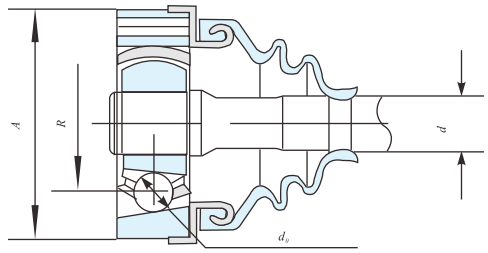
Basic models	Boundary dimensions		
	A	B	d
TJ 87	78.7	90.2	22.2
TJ 92	81.6	93.1	23.3
TJ 100	89.0	100.5	25.4
TJ 105	95.0	106.7	26.5



Boundary dimensions of GE type universal joints

Unit:mm

Basic models	Boundary dimensions				
	A	B	d	d_0	R
GE 71	58	64	18	16.9	14.1
GE 85	67.6	74	21.2	19.7	16.15
GE 86	67.6	74	21.7	21.9	18.3
GE 100	86	92	25.4	23.7	20.2
GE 105	86	95	26.5	24.9	20.85
GE 112	93	103	28.2	25.9	21.6
GE 118	95	105	30	26.8	22.5
GE 125	99	110	31.8	28.4	24.2



Boundary dimensions of VL type universal joints

Unit:mm

Basic models	Boundary dimensions			
	A	d	d_0	R
VL 80	80	20.1	15.875	24.0
VL 103	100	26.1	19.050	30.0
VL 112	108	28.2	22.225	31.95
VL 118	120	30	23.812	35.0
VL 125	128	31.8	25.400	38.5