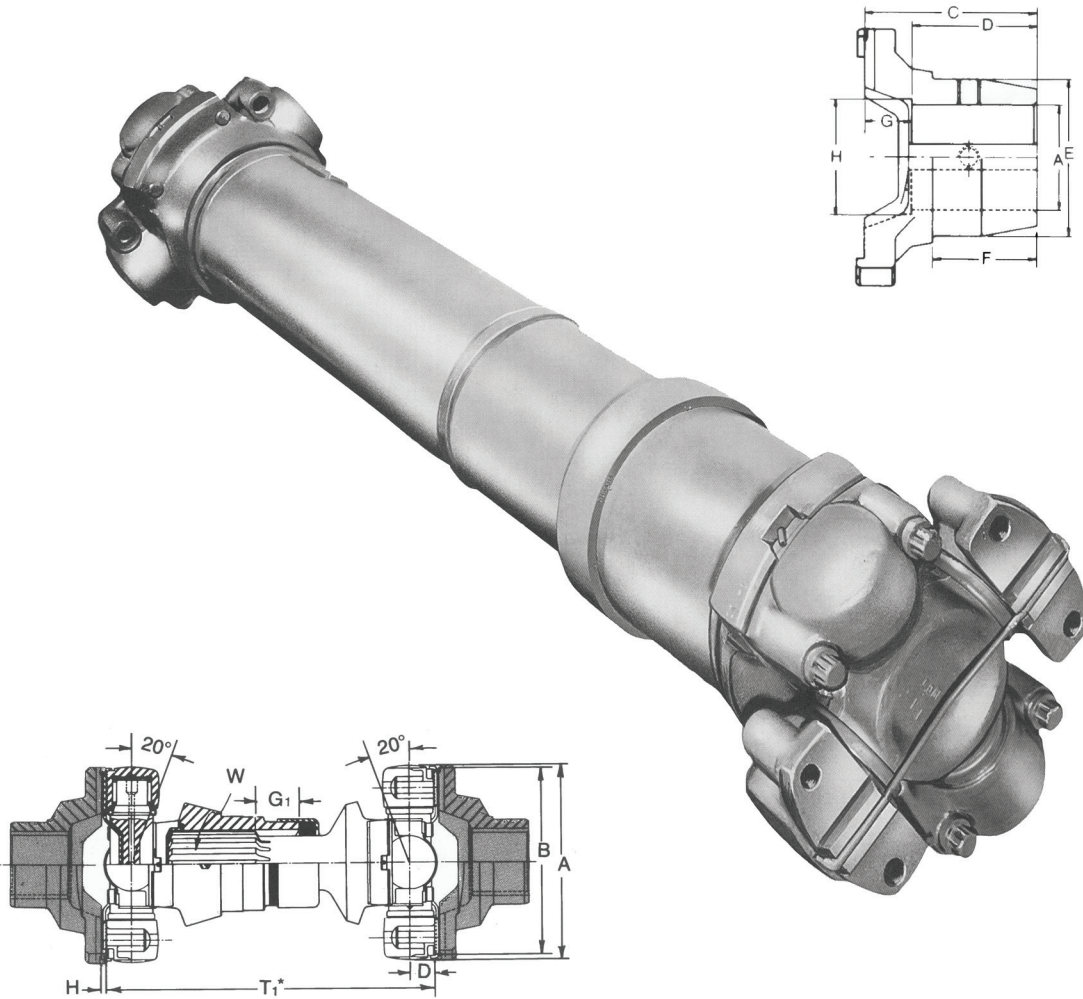


Universal Joints

Winged Style



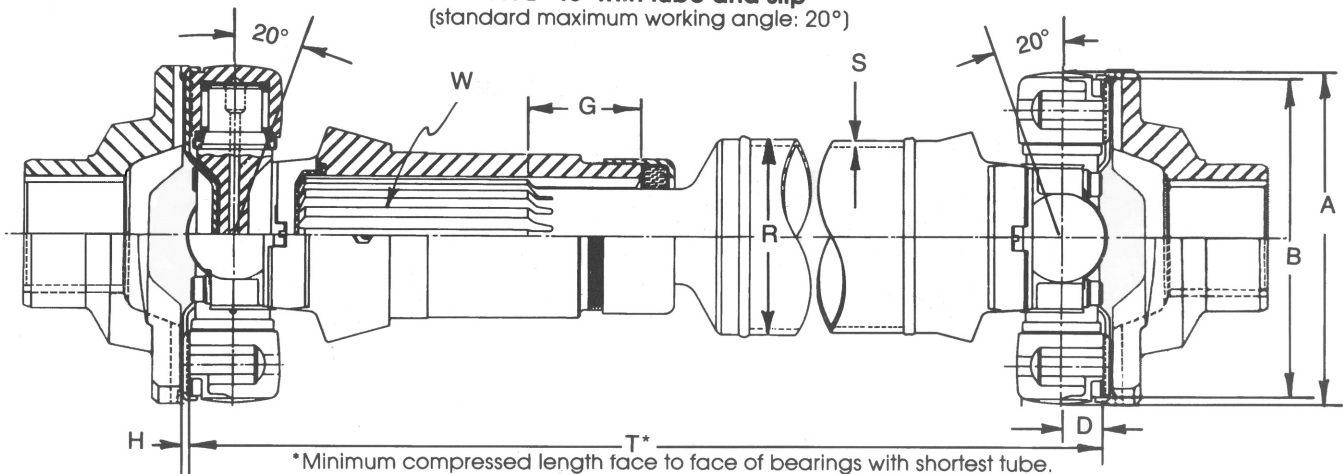
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Wing-Bearing Type Double

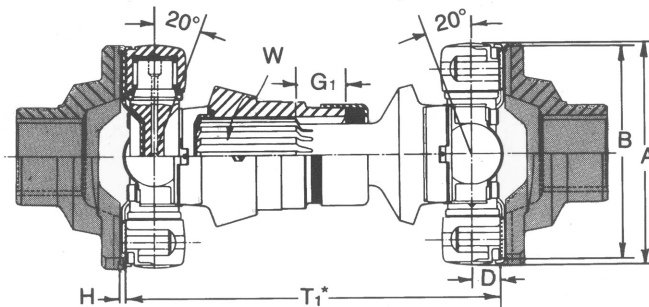
J-170-TS through J-310-TS

TYPE "TS" with tube and slip
(standard maximum working angle: 20°)



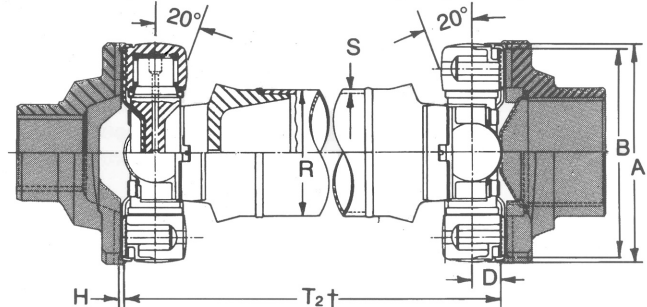
Type "TS" consists of two U-joints coupled by a tube and integral spline connection. With the slip provided in the Type "TS" joint, mating yokes at the ends on the assembly can be axially fixed to the respective machinery components. Primarily designed for vehicles, Type "TS" assemblies are applicable to industrial machinery installations where length is not a limiting factor, such as connecting remotely mounted components. For extremely long drives with critical speed limitations, the Type "TS" can be used with a single U-joints with a tube and center bearing. All slip spline members incorporate a blind tooth to prevent incorrect assembly.

TYPE "CS" with slip and without tube—close-coupled
(standard maximum working angle: 20°)



*Compressed length face to face of bearings of typical assembly.

TYPE "T" with tube and without slip
(standard maximum working angle: 20°)



†Fixed length face to face of bearings.
Minimum fixed length face to face of bearings with shortest tube.

Type "CS" consists of two U-joints connected by a slip spline. Slip is provided in the joint assembly so that fitting yokes at the ends of the assembly can be axially fixed to the respective components. One application for the Type "CS" is in the center of all-wheel-drive vehicles with articulated steering. Other applications include industrial machinery where the components ahead of and behind the U-joint assembly are close together.

Type "T" consists of two U-joint assemblies connected by a tubular shaft identical to the Type "TS" except that no slip is provided. Compensating slip must be taken up in one of the yokes at the ends on the assembly.

Joint Size	Assembly Drawing Number					Swing Dia. A	Pilot Dia. B ±.001	Bear-Ing Height D	H
	Type TS	Type CS	Type T	Type CP	Type CP7				
J-170	X-209220	--	X-209221	--	X-209307	6.75	6.375	.92	.20
J-230	X-209055	X-209114	X-209064	X-209147-A	X-209154	6.88	6.500	1.11	.20
J-310	X-218422	X-208998-B	X-218444	X-209005-A	X-209015	8.62	8.250	1.11	.20
J-490	X-229182	X-229606	X-209214	--	X-209483	9.25	8.750	1.34	.34
J-600	X-237365	X-237368	X-229827	--	--	9.25	8.750	1.58	.34
J-800	X-237357	X-237366-A	X-228489	--	X-228717	10.75	10.236	1.50	.44
J-1200	X-237314	X-237317	X-219429	--	--	12.18	11.500	1.78	.44

A	Swing Diameter	M	Bolt Hole Spread
B	Pilot Diameter of Mating Part	N	Bolt Hole Location from Center Line
D	Bearing Height	P	Bolt Hole Diameter
G	Slip	Q	Bolt Size
H	Height of Key	R	Outside Tube Diameter
J	Bolt Hole Spread Across Bearing Wings	S	Tube Wall Thickness
K	Bolt Hole Location from Center Line	T	Compressed or Fixed Length Face to Face of Bearings
L	Key Width of Mating Part		

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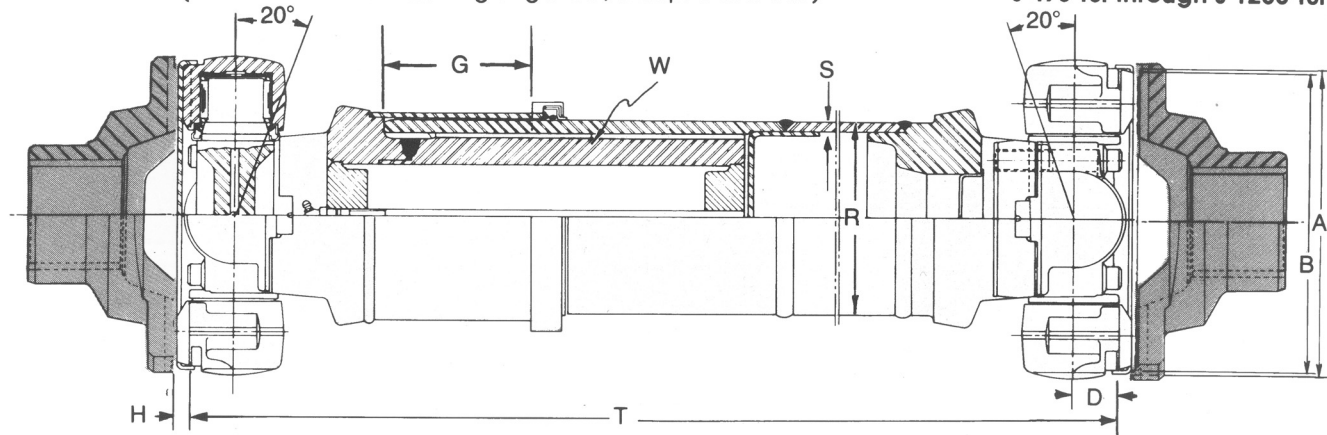
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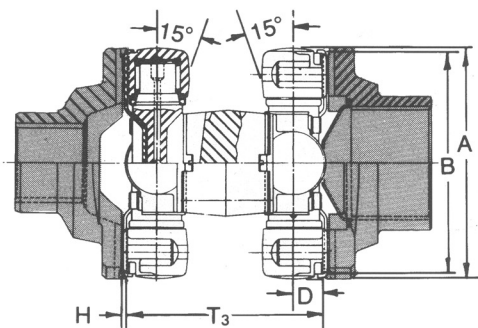
Universal Joint Assemblies

TYPE "TSI" with tube and inverted, large diameter slip spline
(standard maximum working angle: 20°, except J-600: 17.5°)



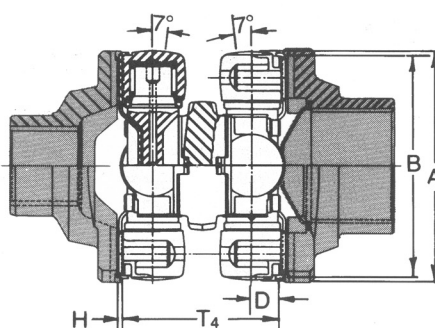
Type "TSI" consists of two cross and bearing assemblies connected by a tube and large diameter spline. The large diameter spline provides less slip resistance under load and a smoother operating shaft at high speeds. Slip members have a blind tooth to prevent incorrect assembly.

TYPE "CP" with coupling plate and without slip—close-coupled (standard maximum working angle: 15°)

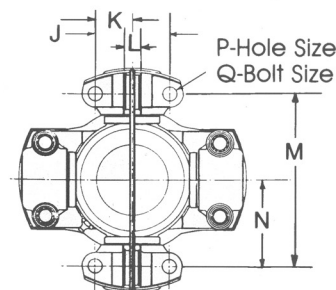


Shortest length face to face of bearings for 15° angle

TYPE "CP7" with coupling plate and without slip—extra-close-coupled (standard maximum working angle: 7°)



Shortest length face to face of bearings for 7° angle



End View for All Types

Type "CP" consists of two cross and bearing assemblies connected by a coupling plate. Compensating slip must be taken up in one of the yokes at the ends of the assembly. Type "CP" is primarily designed for front-wheel-drive installations. If properly applied, this joint will give performance similar to constant velocity joints at substantial cost savings. Type "CP" operates in the open, and requires no grease-tight enclosure. Cross and bearings can be replaced without complete disassembly of the axle. This assembly is also recommended for industrial machinery where space is at a premium.

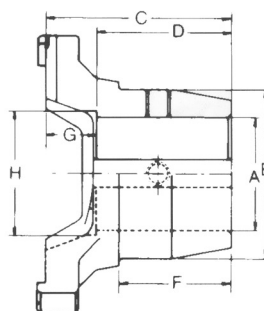
Type "CP7" is similar in construction to type "CP" but designed to fit in an even shorter space. One application is in vehicle installations for the drive between a torque converter and a midship mounted transmission.

Minimum Compressed or Fixed Length					Slip		Size Slip Spline W	Tube							Bolt Hole P	Bolt Size Q
(TS) T	(CS) T ₁	(T) T ₂	(CP) T ₃	(CP7) T ₄	(TS) G	(CS) G ₁		O.D. R	Wall Thickness S	J ±.010	K ±.005	L ±.0005	M ±.010	N ±.005		
18.06	--	9.80	--	5.52	3.00	--	2 3/8-16	4.00	.120	2.440	1.220	.6235	4.930	2.465	15/32	7/16-20
21.75	14.44	13.12	6.50	6.00	3.00	2.00	2 5/8-16	4.50	.188	2.812	1.406	.6235	4.874	2.437	17/32	1/2-20
24.50	12.00	13.12	7.00	6.00	5.00	1.25	3-16	5.00	.250	2.812	1.406	.6235	6.624	3.312	17/32	1/2-20
25.66	18.62	13.98	--	7.68	5.00	2.75	5-29	5.62	.313	3.500	1.750	.9985	6.800	3.400	21/32	5/8-18
26.04	21.00	12.94	--	--	4.00	2.50	5-29	6.50	.250	3.500	1.750	.9985	6.800	3.400	25/32	3/4-16
30.25	23.56	17.31	--	9.67	5.00	4.00	5 43/64-33	6.50	.375	3.936	1.968	1.2485	7.872	3.936	25/32	3/4-16
32.37	21.62	20.00	--	--	5.00	1.00	5 43/64-33	6.50	.375	4.640	2.320	1.2485	8.880	4.440	29/32	7/8-14

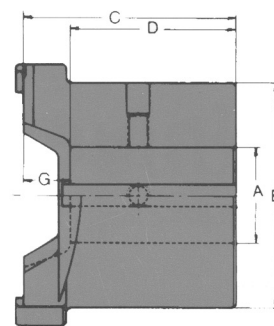
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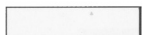
Fitting Yokes



Forged Yoke with Straight Bore and Keyway



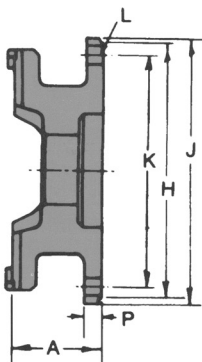
Cast Yoke

 Forged Yoke
 Cast Yoke

Series	Stock-Bore Yoke Number	A		C	D	E	F	G	H
		Bore ± .001							
		Minimum	Maximum						
J-170	218487	1.375		4.68	3.43	4.00	2.00	1.25	3.25
	209589	2.751		5.19	4.00	6.00	--	1.19	--
J-230	218470	1.500		4.75	3.31	4.68	2.50	1.44	3.50
	209194	2.000		5.36	4.00	6.00	--	1.36	--
J-310	227486	1.500		6.56	4.94	5.10	3.50	1.62	4.00
	227790	3.249		6.56	5.00	7.75	--	1.56	--
J-490	218488	2.250		6.16	4.54	6.12	3.25	1.62	4.875
	227882	3.875		6.80	5.00	7.75	--	1.80	--
J-600	229512	2.250		6.16	4.54	6.12	3.25	1.62	4.875
	229513	4.000		6.80	5.00	7.75	--	1.80	--
J-800	228587	2.875		6.62	4.36		3.25	2.26	--
	228511	3.250		9.00	6.85	9.25	--	2.00	5.00
J-1200	219415	2.250		8.25	6.00	7.50	5.00	2.25	--
	227883	4.499		10.00	7.85	10.50	--	2.15	--

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Flanged Yokes



Series	Flange Yoke	A	H	J	K	L		P
		Overall Length	Flange Pilot	Flange O.D.	Bolt Circle	No. of Holes	Hole Diameter	Flange Width
J-170	209560	1.44	$\frac{7.747}{7.749}$	$\frac{7.999}{8.001}$	7.250	8	.378	.38
	X-219130	2.62	$\frac{10.872}{10.874}$	$\frac{10.872}{10.874}$	9.750	10	.643	.62
J-230	209420-A	3.12	$\frac{7.747}{7.749}$	$\frac{7.999}{8.001}$	7.250	12	.440	.44
	X-219028	3.68	$\frac{10.872}{10.874}$	$\frac{10.872}{10.874}$	9.750	10	.643	.62
J-310	209419-B	3.12	$\frac{7.747}{7.749}$	$\frac{7.999}{8.001}$	7.250	12	.440	.44
	X-219027	3.68	$\frac{10.872}{10.874}$	$\frac{10.872}{10.874}$	9.750	10	.643	.62
J-490	X-218625-B	3.68	$\frac{10.872}{10.874}$	$\frac{10.872}{10.874}$	9.750	10	.643	.62
	X-219196	4.25	$\frac{5.5118}{5.5134}$	$\frac{9.831}{9.833}$	8.583	8	.781	.70
	228415	2.25	$\frac{8.747}{8.749}$	$\frac{10.890}{10.870}$	9.750	8	.628	.62
J-600	X-237285	3.38	$\frac{10.999}{11.001}$	$\frac{10.999}{11.001}$	9.750	10	.656	.75
J-800	X-228500	5.15	$\frac{6.8897}{6.8913}$	$\frac{11.230}{11.210}$	9.645	8	.781	.79
J-1200	X-219169	6.00	$\frac{14.995}{14.998}$	$\frac{14.995}{14.998}$	12.500	10	1.018	.87
	X-219169-F	6.29	$\frac{6.8897}{6.8913}$	$\frac{12.420}{12.380}$	11.024	8	.906	1.17

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