

Brakes for Light Duty Casters



Cam Brake

Available on 01 Series.
Step down to engage
and release.
Specify **NB01**.



Face Contact Brake

Available on 02 & 04
Series. Step down to
engage and release.
Specify **F**.



Face Contact Brake

Available on DC & P2
Series. Step down to
engage and release.
Specify **F**.



P2 Total Lock Brake

Available on P2 Series.
Locks wheel and
swivel with simple
press of toe lever.
Specify **T**.



Total Lock Brake

Available on 02 Series.
Locks wheel and swivel
with simple press of toe
lever. Specify **T**.



Grip Lock Brake

Available on 02 Series.
Corrosion resistant brake
features rugged thermoplastic
construction. Specify **GL**.



PC Total Lock

Available on PC Prestige™.
Locks wheel and swivel
with simple press of toe
lever. Specify **T**.

Brakes for Medium and Heavy Duty Casters



Cam Brake

Available on 05, 12, 16, 18, 61, 62, 72, 100, 110 Series. Stainless steel on 05 series. Designed for use with Roller, 52 Delrin and Oilix bearing wheel casters. Specify **CB**. Note: 05 model shown in photo – may appear different on other series.



Single Side Brake

Available on 05, 12, 16, 18, 61, 62, 63, 72, 78, 81, 84, 90, 92, 93, 94, 100, 110, 120, 300, 310, 400, 410, 600, 610 Series. Right hand installation standard, left hand option available. Specify **SSB**.



Double Side Brake

Available on 05, 12, 16, 18, 61, 62, 63, 72, 78, 81, 84, 90, 92, 93, 94, 100, 110, 120, 300, 310, 400, 410, 600, 610 Series. Pedal on both sides for easy access. Specify **DSB**.



Total Lock Brake

Available on 12 & 16 Series. Corrosion resistant brake features rugged thermoplastic construction. Locks both wheel and swivel. Specify **T**. (Order HS60 option for 6" caster.)



Grip Lock Brake

Available on 12 & 16 Series. Corrosion resistant brake features rugged thermoplastic construction. Specify **GL**. (Does not work with swivel lock.)



Face Brake

Available on 12 & 16 Series. Step down to engage and release. Will not work with swivel locks. Specify **FBA**.



Face Brake

Available on 12, 16, 18, 61, 62, 63, 71, 72, 81, 84, 90, 100, 110, 300, 310, 400, 410 Series. Step down to engage and press up to release. Specify **FBB**.



Face Brake

Available on 18, 100, 110 Series. Step down to engage and release. Specify **FBC**.



Face Brake

Available on 05 Series. Step down to engage and release. Stainless steel. Will not work with swivel locks. Specify **FBD**.



Poly Cam Brake

Available on 12, 16, 18, 61, 62, 63, 72, 78, 81, 84, 90, 92, 93, 94, 95, 100, 110, 300, 310, 400, 410, 600, 610, 700, 850 Series. Positive locking action wheel tread. Specify **P**.



Wrap Around Brake

Available on 12, 16, 18, 61, 62, 63, 72, 78, 81, 84, 90, 92, 93, 94, 95, 100, 110, 300, 310, 400, 410, 600, 610, 700, 850 Series. Foot operated on both sides. Use with straight roller bearing. Overall height must be greater than 5-1/4". Specify **WB**.



Face Contact Brake

Available on 81, 84, 90, 92, 93, 94, 95, 300, 400, 410, 600, 610, 700, 298, 850 Series. Turn lever to apply shoe against wheel tread for positive locking action. Specify **F**. (Recommended for Pneumatic casters.)

Albion FBB Face Brake

Easy to Install • Easy to Use

- Easy to install in the field or the factory
- Easy to engage, easy to disengage
- Virtually maintenance free
- Available on all popular heavy duty Albion caster models
- Easy access brake pedal
- Excellent braking action on a variety of wheel tread surfaces
- Rubber brake pad is durable and long-lasting
- Brake pad is easily adjustable to increase brake force or to maintain brake efficiency as wheel wears



A new "Engaging" Brake from Albion.



Kit comes with all necessary hardware (including axle) for easy installation.

Caster Series	Wheel Diameter	Tread Width	Axle Size	Part Number
12, 16, 18, 61, 62, 71, 72, 100, 110	4"	2"	1/2"	WK040202A
	5"	2"	1/2"	WK050202A
	6"	2"	1/2"	WK060202A
12, 16, 18, 61, 62, 71, 100, 110	8"	2"	1/2"	WK080202
	63	5"	2-1/2"	3/4"
63	6"	2-1/2"	3/4"	WK062503A
	8"	2-1/2"	3/4"	WK082503
	10"	2-1/2"	3/4"	WK102503
	12"	2-1/2"	3/4"	WK122503
	81	5"	2-1/2"	3/4"
81, 84	6"	2-1/2"	3/4"	WK062535
300, 310	6"	2-1/2"	3/4"	WK062535A
81, 84, 300, 310	8"	2-1/2"	3/4"	WK082535
	10"	2-1/2"	3/4"	WK102535
81, 300, 310	12"	2-1/2"	3/4"	WK122535
	90, 400, 410	6"	3"	3/4"
8"		3"	3/4"	WK080335
10"		3"	3/4"	WK100335
12"		3"	3/4"	WK120335

Caster Brakes

Brakes Kits for Light Duty Casters to Medium Heavy Duty Casters

Brake Kits

Kit Number	Series	For Wheel Size	Brake Type	Exceptions
FBDC0300 FBDC0350 FBDC0400 FBDC0500	DC, P2	3" 3.5" 4" 5"	Face contact, pedal on side	
FB020300 FB020350 FB020400 FB020500	02	3" 3.5" 4" 5"	Face contact, pedal on side	
GLO20300 GLO20350 GLO20400 GLO20500	02	3" 3.5" 4" 5"	Face contact, pedal trailing	
FB040300 FB040350 FB040400 FB040500	04	3" 3.5" 4" 5"	Face contact, pedal on side	
WK405101 WK405104	12,14,16,61,62. 71,72,100,110	6", 8" 4", 5"	Cam action brake, side pedal	Not for precision or delrin bearings
WK405200 WK405201	05	4", 5" 6", 8"	Cam action brake, side pedal	Not for precision or delrin bearings
FB140400 FB140500 FB140600 FB140800	12,14, 16	4" 5" 6" 8"	Face contact, pedal on side	
FB180400 FB180500 FB180600 FB180800	18, 110	4" 5" 6" 8"	Face contact, pedal on side	
GL160400 GL160500 GL160600 GL160800	12,16	4" 5" 6" 8"	Face contact, pedal trailing	
ZL04208 ZL05208 ZL06208 ZL08208	12,14,16,18,61, 62,71,72,78, 100,110	4" 5" 6" 8"	Face contact, pedal trailing	For use on wheels with 2.438" hub length only.
ZL05408 ZL06408 ZL08408	61,62 63,72,78	5" 6" 8"	Face contact, pedal trailing	For use on wheels with 2.75" hub length only.

Swivel Locks



Welded Hand Operated



Field Installable
Hand Operated



Field Installable
Foot Operated

Hand activated or foot activated plunger can be disengaged for continuous swiveling or engaged for straight line traveling. Requires notched yoke base. To order standard swivel lock installed specify "L" at end of caster number. For field installation options see chart:

Series	Factory Install Code	Hand Operated Field Installable Part Numbers	Foot Operated Field Installable Part Numbers
5	L	SL1200000	N/A
12	L	SL1200000	N/A
16	L	SL1600000	SL1600002
18*	L	SL1600000	SL1000005
40	L	SL1600000	N/A
42	L	SL8100000	N/A
44	L	SL90000002	N/A
61	L	SL6100000	N/A
62	L	SL6200000	N/A
63	L	SL6200000	N/A
71*	L	SL1600000~	SL1600002~
72	L	SL7200000	N/A
78	L	SL7200000	N/A
81*	L	SL8100000~	N/A
84	L	SL8100000	N/A
90	L	SL90000002	N/A

Series	Factory Install Code	Hand Operated Field Installable Part Numbers	Foot Operated Field Installable Part Numbers
92	L	SL9200000	N/A
94	L	SL9400000	N/A
95	L	SL9546000	N/A
100*	L	SL1600000	SL1600002
110*^	L	SL1600000	SL1600002
120*	L	SL1200000	N/A
130*	L	SL1200000	N/A
300*	L	SL3000000	N/A
310*	L	SL3000000	N/A
330*	L	SL3000000	N/A
400*	L	SL4000000	N/A
410*	L	SL4000000	N/A
600*	L	SL6000000~	N/A
610*	L	SL6000000~	N/A
700*	L	SL7000000~	N/A
850*	L	SL8500000~	N/A

* Swivel lock is not attached to caster.
~ Requires notched yoke.

^ SL1600006 if you specify K plate.

Quick-Release Caster Pads



Albion quick-release caster pads make changing casters fast and easy.

- Simplifies caster replacement
- Install or replace casters with just one nut & bolt
- Unplated for easy welding to carts

Description	Series	Caster Pad Number
Fits 2-1/2" x 3-5/8" Top Plate	02, P2, DC, PC	PC020000
Fits 4" x 4-1/2" Top Plate	14, 15, 16	PC160000
Fits 4" x 4-1/2" Top Plate	18, 110	PC110000
Fits 4-1/2" x 6-1/4" Top Plate	62, 63, 72, 16 Pattern K, 310	PC620000

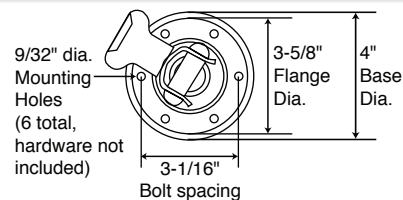


Leveling Jacks



An economical and practical method for leveling and stabilizing portable equipment such as work platforms. They are used to hold equipment in place and elevate it to a required height. These screw jacks can be used in areas where position locks cannot be applied. The hand crank has a radius of 7-1/4". All metal parts are zinc plated for rust prevention.

Overall Height (Inches)	Minimum Height Below Frame of Equipment (Inches)	Maximum Extended Height Below Frame of Equipment (Inches)	Length of Screw Travel (Inches)	Approx. Weight (Lbs)	Jack Number
18	4-1/2	13-1/2	9	10-1/2	LJ625000
26	4-1/2	21-1/2	17	12-1/2	LJ622000
30	4-1/2	25-1/2	21	14	LJ627000

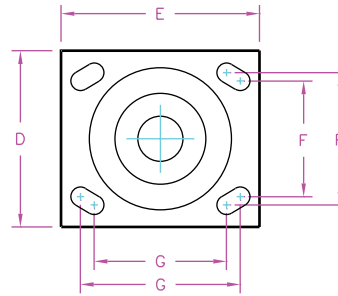


Optional Features

We carry top plates with optional dimensions and bolt hole patterns. As shown in the chart, these will interchange with standard top plates. For an optional top plate not listed please consult factory. To order, begin with ST (swivel) or RT (Rigid) followed by the caster series number (i.e. 16) then end with the alpha designation (i.e. J).

Example: 16TM0620IS
 ST16J
 Swivel top(ST), 16 series (16), bolt hole center (J)

Example: 272PD0620IR
 RT272D
 Rigid top (RT), dual wheel (2), 72 series (72), bolt hole center (D)



Top Plate and Bolt Hole Center Chart

F & G Bolt Hole Centers (Inches)	D & E Top Plate Size (Inches)	Attaching Bolt (Inches)	Series 12, 16	Series 71	Series 72	Series 81	Series 94	Series 95	Series 18, 100, 110	Series 310, 410	Series 400
Slotted for 3 x 4 to 2-5/8 x 3-5/8	4 x 5	3/8	J	J							
Slotted for 3-3/8 x 5-1/4 to 2-7/16 x 4-15/16	4-1/2 x 6-1/4	1/2	K						K		
2-1/8 x 4	4 x 5	3/8		G							
3 x 3	4 x 4	3/8		H							
3-1/4 x 6	4-1/2 x 7-1/4	1/2			W	W					
4-1/8 x 4-1/2	5 x 5-1/2	3/8	D		D	D			D (110 only)		
4-7/8 x 6-3/4	Swivel 6-1/2 x 8 Rigid 6 x 8	5/8					C				
7 x 9-3/4	8-1/2 x 11	5/8						T			
Slotted for 4-5/8 x 5-1/2 to 4-3/8 x 5-5/8	6 x 7	1/2								S	N

Optional Overall Heights

Series	Wheel Diameter (Inches)	Optional Height (Inches)	Swivel Lead (Inches)	Swivel Option Number	Rigid Option Number
12, 16, 33	3-1/4	5-1/4	1-11/16	HS42	HR42
12, 16, 33	4	5-1/4	1-11/16	HS86	HR86
12, 16, 33	5	6-1/8	1-11/16	HS-50	HR50
12, 16, 33	5	6-3/4	1-3/4	HS54	HR54
12, 16, 33	6	6-7/8	2-1/2	HS56	HR56
12	6	7-1/4	1-3/4	HS82	HR82
16	6	7-3/8	1-3/4	HS59	HR59
16	6	7-1/2	1-7/8	HS60	HR60
62	6	7-3/4	1-3/4	HS85	HR85
12, 16	8	10	1-3/4	HS81	HR81
34, 62	8	9-1/2	2-1/4	HS76	HR76
34, 62	8	9-3/4	1-3/4	HS83	HR83
63	8	9-1/2	2-1/4	HS84	HR84
100	8	9-1/2	2-1/2	HS89	HR89

Replacement Parts

Axle and Bearing Components for Standard Models (Consult factory for parts not in this chart)

Caster Series	Wheel Hub Length (Inches)	Axle Hollow	Axle Solid	NUT	Spanner Bushing	Lock Washer	Roller Bearing	Plain Retaining Washer	Sealed Retaining Washer	Nylon sealed combo-washer	Metal combo-washer	Thrust Washer
DC, PC, P2, 02 Series	1.25"	ZJ063502, ZJ063504		NL061600	ZF060824, ZF060826		ZB081718	WA081703				WA082400, WA082406
04 Series	1.25"	ZJ063510		NJ061600	ZF06082401							
05 Series	2.188"	ZJ085600	ZJ085603	NJ081311	ZF081240	WA081401	ZB12193001	WA121904	WA121990	WA121905		WA122603
12,16,18,40, 61,62,71,72, 110,100	2.188"	ZJ085400	ZJ085403	NL082000	ZF081239		ZB121930	WA121900	WA121990	WA121905	WA121999	WA122600
42,61,62,72, 78 Series	2.75"	ZJ086400	ZJ086403	NL082000	ZF081248		ZB121940	WA121900	WA121990	WA121905	WA121999	WA122600
63 Series	2.75"	ZJ126800		NL121001	ZF121648		ZB163140	WA163103	WA163190		WA163199	WA163900
44,81,84,90, 92, 300,310, 400, 410	3.25"	ZJ127600		NL121001	ZF121657, ZF12162057		ZB163148, ZB203948	WA163103, WA203103	WA163190, WA203190		WA163199,	WA163900, WA204800
330 Series	3.25"	ZJ12760009	ZJ128010	NJ121000	ZF12165703	WA122006	ZB16314803	WA16310304	WA16319001		WA163199	WA16390001
600 Series	3.25"		ZJ161496	NL161403	ZF162057		ZB203148, ZB203948	WA203103, WA203903	WA203190, WA203950		WA163199,	WA163900, WA204800
90,92, 600 Series	4.25"	ZJ169601	ZJ161496	NL161403	ZF162073		ZB203964	WA203903	WA203990			WA204800

Axle and Bearing Components for Standard Models (Consult factory for parts not in this chart) (Continued)

Caster Series	Wheel Hub Length (Inches)	Precision Ball Bearing	Delrin Bearing (2 pieces)	Delrin Bearing (1 piece)	Bronze Bearing	Oilex Bearing	Drawn Cup Roller Bearing	Top Hat Spacer
DC, PC, P2, 02 Series	1.25"							
04 Series	1.25"							
05 Series	2.188"		TF121912	TF121934	0I121908	Z0121935		
12,16,18,40, 61,62,71,72, 78,110,100	2.188"	ZA081903, ZA081904,	TF121912	TF121934	0I121908	Z0121935	ZX121930	ZY0812001
42,61,62,72, 78 Series	2.75"		TF121912		0I121908			



Roller Bearing
ZB121930
Shown



Spanner Bushing
ZF081239
Shown



Metal Step Retaining Thrust Washer



Nylon Sealed Retaining Thrust Washer
WA121905
Shown



Sealed Retaining Thrust Washer



Solid Axle & Nut
ZJ085409
Shown



Hollow Axle & Nut
ZJ085408
Shown

Replacement Parts



Tapered Roller Bearing

Tapered Roller Bearings and Spacers

Kit Number	Cup Only Part Number*	Cone Only Part Number*	Bearing ID (Inches)	Bearing OD (Inches)	Notes	Spacer Number	Spacer ID (Inches)	Spacer OD (Inches)	Spacer Length (Inches)
ZT082200	ZT082201	ZT082202	0.500	1.375		ZM082800	0.500	1.750	0.000
ZT122800	ZT122801	ZT122802	0.750	1.780		ZY121600	0.750	1.000	0.231
ZT123100	ZT123101	ZT123102	0.750	1.938		ZY121600	0.750	1.000	0.231
ZT163200	ZT163202	ZT163101	1.000	1.979		ZY162004	1.000	1.250	0.281
ZT163900	ZT163901	ZT163902	1.000	2.438		ZY162005	1.000	1.250	0.313
ZT203900	ZT163901	ZT203911	1.250	2.438	Wider	ZY202406	1.250	1.500	0.348
ZT203920	ZT203901	ZT203902	1.250	2.438	Narrower	ZY202404	1.250	1.500	0.281
ZT203940	ZT203901	ZT203802	1.250	2.438	Sealed	SD203013	1.250	1.875	0.000
ZT205000	ZT205001	ZT205002	1.250	3.125		ZY202606	1.250	1.625	0.375
ZT244100	ZT244102	ZT244101	1.500	2.563		ZY242806	1.500	1.750	0.375
ZT245000	ZT205001	ZT245001	1.500	3.125		ZY242806	1.500	1.750	0.375

* Purchased as kit only.

Other Bearing Types

Bearing Part Number	Description of Bearing	Bearing ID (Inches)	Bearing OD (Inches)	Bearing Length (Inches)	Notes/Suggestions	Requires Part Number
ZA081900	Industrial Ball	0.500	1.188	1.875		
ZA081902	Industrial Ball	0.500	1.188	2.438	Butt Bearing	
ZA081903	Pedestal Precision Ball	0.500	1.188	2.438	Pedestal Bearing	
ZA081904	Precision Ball	0.500	1.188	2.438	Pedestal Bearing	
ZA122500	Precision Ball	20mm	40mm	Any	6203-2RS	ZY0812001
TF121912	Delrin	0.750	1.188	Any	Not with Cam Brake	
TF121934	Delrin	0.750	1.188	2.438		WA122600 or WA122603
OH121912	Bronze	0.750	1.188	Any		
ZO081722	Oil impregnated iron	0.500	1.063	1.250		
ZO081926	Oil impregnated iron	0.500	1.188	1.875		
ZO081935	Oil impregnated iron	0.500	1.188	2.438		
ZO101926	Oil impregnated iron	0.625	1.188	1.875		
ZO101935	Oil impregnated iron	0.625	1.188	2.438		
ZO121926	Oil impregnated iron	0.750	1.188	1.875		
ZO121935	Oil impregnated iron	0.750	1.188	2.438		



Oilex Bearing
(Oil impregnated iron)

Replacement Parts

Straight Roller Bearing and Retaining Washers



Roller Bearing

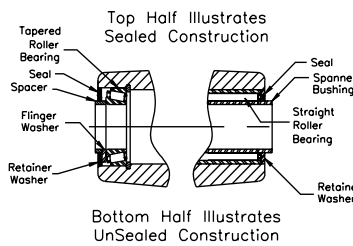


Nylon Sealed Retaining Thrust Washer



Powdered Iron Step Retaining Thrust Washer

Line drawing (below) section view shows typical wheel hub construction with sealed straight and tapered roller bearings. Note spacer tubes are used with tapered roller bearings which increases hub length 1/4" and facilitates proper loading of cup to cone. For non-sealed construction, seal is replaced with retainer and flinger washers.



Part Number	Roller Bearing ID (Inches)	Roller Bearing OD (Inches)	Roller Bearing Length (Inches)	Plain Retaining Washer Number	Rubber Sealed Retaining Washer	Nylon Combo Washer Number	Sintered Iron Combo Washer Number	Washer ID (inches)	Washer OD (inches)
ZB081718	0.500	1.063	1.125	WA081703	WA081790			0.500	1.063
ZB081922	0.500	1.188	1.375	WA121900				0.500	1.188
ZB081930	0.500	1.188	1.875	WA121900				0.500	1.188
ZB081932	0.500	1.188	2.000	WA121900				0.500	1.188
ZB101922	0.625	1.188	1.375	WA121900	WA101990			0.625	1.188
ZB101930	0.625	1.188	1.875	WA121900	WA101990			0.625	1.188
ZB101932	0.625	1.188	2.000	WA121900	WA101990			0.625	1.188
ZB101940	0.625	1.188	2.500	WA121900	WA101990			0.625	1.188
ZB121920	0.750	1.188	1.250	WA121900	WA121990	WA121905	WA121999	0.750	1.188
ZB121930	0.750	1.188	1.875	WA121900	WA121990	WA121905	WA121999	0.750	1.188
ZB12193001*	0.750	1.188	1.875	WA121904		WA121905		0.750	1.188
ZX121930	0.750	1.188	1.875	WA121900	WA121990	WA121905	WA121999	0.750	1.188
ZB121940	0.750	1.188	2.438	WA121900	WA121990	WA121905	WA121999	0.750	1.188
ZB142332	0.875	1.438	2.000	WA162303	WA142390			0.875	1.438
ZB162328	1.000	1.438	1.750	WA162303	WA162390			1.000	1.438
ZB162332	1.000	1.438	2.000	WA162303	WA162390			1.000	1.438
ZB163136	1.000	1.938	2.250	WA163103	WA163190		WA163199	1.000	1.938
ZB163140	1.000	1.938	2.500	WA163103	WA163190		WA163199	1.000	1.938
ZB163148	1.000	1.938	3.000	WA163103	WA163190		WA163199	1.000	1.938
ZB163164	1.000	1.938	4.000	WA163103	WA163190		WA163199	1.000	1.938
ZB183148	1.125	1.938	3.000	WA203103			WA203199	1.250	1.938
ZB203140	1.250	1.938	2.500	WA203103	WA203190		WA203199	1.250	1.938
ZB203148	1.250	1.938	3.000	WA203103	WA203190		WA203199	1.250	1.938
ZB203164	1.250	1.938	4.000	WA203103	WA203190		WA203199	1.250	1.938
ZB203948	1.250	2.438	3.000	WA203903	WA203990			1.250	2.438
ZB203964	1.250	2.438	4.000	WA203903	WA203990			1.250	2.438
ZB203980	1.250	2.438	5.000	WA203903	WA203990			1.250	2.438
ZB243948	1.500	2.438	3.000	WA243903	WA243990			1.500	2.438
ZB243964	1.500	2.438	4.000	WA243903	WA243990			1.500	2.438
ZB243980	1.500	2.438	5.000	WA243903	WA243990			1.500	2.438
ZB284964	1.625	3.063	4.000	WA284903				1.750	3.063
ZB284980	1.625	3.063	5.000	WA284903				1.750	3.063
ZB325264	2.000	3.250	4.000	WA325203				2.000	3.250
ZB325280	2.000	3.250	5.000	WA325203				2.000	3.250

* Stainless Steel

Note: Straight roller bearings include roller assembly with split outer race but does not include the retaining washers. Retaining washers are ordered separately in quantities of 2 per wheel.

Axles and Nuts



Solid Axle & Nut
ZJ085409
Shown



Hollow Axle & Nut
ZJ085408
Shown

Axle Part Number	Type	Matching Nut	Matching Lock Washer	Diameter (Inches)	Length (Inches)	Threads (Per Inch)	Notes
ZJ063502	Hollow	NL061600		0.375	2.188	16	No Grease Zerk
ZJ063504	Hollow	NL061600		0.375	2.188	16	
ZJ083510	Solid	NJ061600		0.375	2.188	16	Stainless Steel
ZJ084500	Hollow	NL082000		0.500	2.813	20	
ZJ085400	Hollow	NL082000		0.500	3.375	20	
ZJ085403	Solid	NL082000		0.500	3.375	20	
ZJ085600	Hollow	NJ081311	WA081401	0.500	3.500	13	Stainless Steel
ZJ085603	Solid	NJ081311	WA081401	0.500	3.500	13	Stainless Steel
ZJ086400	Hollow	NL082000		0.500	4.000	20	
ZJ086403	Solid	NL082000		0.500	4.000	20	
ZJ087200	Solid	NL082000		0.500	4.500	20	
ZJ105610	Hollow	NL101800		0.625	3.500	18	
ZJ126802	Hollow	NL121001		0.750	4.250	12	
ZJ127600	Hollow	NL121001		0.750	4.750	12	
ZJ127603	Solid	NL121001		0.750	4.750	12	
ZJ168000	Solid	NL161403		1.000	5.000	14	
ZJ169601	Hollow	NL161403		1.000	6.000	14	
ZJ169602	Solid	NL161403		1.000	6.000	14	

Hollow axles have zerk fitting for lubrication and solid axles are without lubrication fitting. All axles come complete with lock nut. Consult factory for optional slotted nuts and lock pins.

Replacement Parts

Spanner Bushings & Thrust Washers



Spanner Bushing



Nylon Sealed Retaining Thrust Washer



Powdered Iron Step Retaining Thrust Washer

Part Number	Spanner Bushing ID (Inches)	Spanner Bushing OD (Inches)	Spanner Bushing Length (Inches)	Spanner Material	Lubrication Holes	Matching Thrust Washers	Washer I.D. (Inches)	Washer O.D. (Inches)
ZF060824	0.375	0.500	1.500	Stainless	1	WA082406	0.500	1.500
ZF06082401	0.375	0.500	1.500		1			
ZF060826	0.375	0.500	1.625		1	WA082400	0.500	1.500
ZF081030	0.500	0.625	1.875		2	WA102400	0.625	1.500
ZF081033	0.500	0.625	2.063		2	WA102400	0.625	1.500
ZF081036	0.500	0.625	2.250		2	WA102400	0.625	1.500
ZF081038	0.500	0.625	2.375		2	WA102400	0.625	1.500
ZF081039	0.500	0.625	2.438		2	WA102400	0.625	1.500
ZF081046	0.500	0.625	2.875		2	WA102400	0.625	1.500
ZF081230	0.500	0.750	1.875		2	WA122600	0.750	1.625
ZF081236	0.500	0.750	2.250	2	WA122600	0.750	1.625	
ZF081238	0.500	0.750	2.375	2	WA122600	0.750	1.625	
ZF081239	0.500	0.750	2.438	Stainless	2	WA122600	0.750	1.625
ZF081240	0.500	0.750	2.438		2	WA122603	0.750	1.625
ZF081248	0.500	0.750	3.000		2	WA122600	0.750	1.625
ZF081264	0.500	0.750	4.000		none	WA122600	0.750	1.625
ZF101239	0.625	0.750	2.438		2	WA122600	0.750	1.625
ZF121648	0.750	1.000	3.000		2	WA163900	1.000	2.438
ZF121657	0.750	1.000	3.500		2	WA163900	1.000	2.438
ZF121664	0.750	1.000	4.000		none	WA163900	1.000	2.438
ZF121677	0.750	1.000	4.812		none	WA163900	1.000	2.438
ZF162057	1.000	1.250	3.563		none	WA203903	1.250	2.438
ZF162073	1.000	1.250	4.563	none	WA204800	1.250	3.000	
ZF162089	1.000	1.250	5.563	none	WA204800	1.250	3.000	
ZF202458	1.250	1.500	3.563	none	WA245600	1.500	3.500	
ZF202473	1.250	1.500	4.563	none	WA245600	1.500	3.500	
ZF202489	1.250	1.500	5.563	none	WA245600	1.500	3.500	

All spanner bushings are hardened to form precision inner race for roller bearings. Except as noted by "none", all spanner bushings are cross drilled for lubrication through hollow axle. Thrust washers are hardened. They are not part of the spanner bushing assembly and must be ordered separately. Thrust washers are not required with ball bearings, 2 piece delrin bearings, or with combo washers.

PARTS FOR EMPIRE 15 AND 60 SERIES RIGS

AXLES AND NUTS



Hollow Axle & Nut

Solid Axle & Nut

Axle Number	Type	Matching Nut	Diameter (inches)	Length (inches)	Threads (per inch)
ZJ085400	Hollow	NL082000	0.500	3.375	20
ZJ085403	Solid	NL082000	0.500	3.375	20

SPANNERS AND THRUST WASHERS



Spanner Bushing

Spanner Number	Spanner ID (inches)	Spanner OD (inches)	Spanner Length (inches)	Lubrication Holes	Matching Thrust Washers	Washer ID (inches)	Washer OD (inches)
ZF081239	0.500	0.750	2.438	2	WA122600	0.750	1.625

ROLLER BEARINGS & RETAINER WASHERS



Bearing Number	Bearing ID (inches)	Bearing OD (inches)	Bearing Length (inches)	Plain Retaining Washer	Rubber Sealed Retaining Washer	Nylon Combo Washer	Sintered Iron Combo Washer	Washer ID (inches)	Washer OD (inches)
ZB121930	0.750	1.188	1.875	WA121900	WA121990	WA121905	WA121999	0.750	1.188

DELTRIN BEARINGS (IB POLYPROPYLENE WHEELS ONLY)



Bearing Number	Bearing ID (inches)	Bearing OD (inches)	Bearing Length (inches)	NOTE: Two piece Delrin bearing (spanner not included)
TF121912	0.750	1.188	.75	