

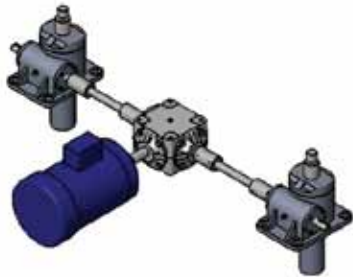
SCREW JACK POWER TRANSMISSION COMPONENTS TYPICAL SYSTEM ARRANGEMENTS

Duff-Norton offers all of the components necessary to complete your power transmission system, whether it consists of a single actuator or a multiple actuator arrangement. We offer a complete line of accessories to interconnect two or more actuators and provide permanent synchronization. Duff-Norton's Application Engineers can specify shafts, couplings, pillow blocks, and right-angle miter gearboxes to accommodate any layout. Bellows boots to protect actuator screws from dirt and other contaminants are available for all actuators, to increase life and reduce maintenance requirements.

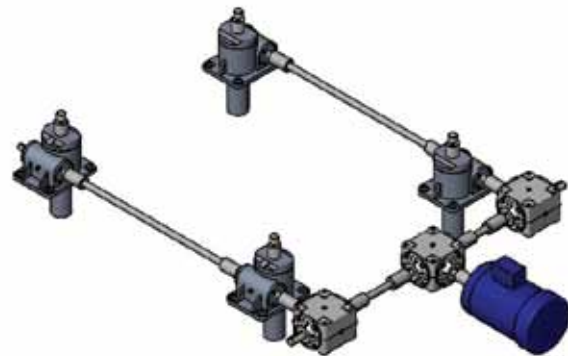
The following pages outline the basic selection of power transmission components that can be utilized to assemble a system. The tables match the parts to their respective actuator sizes to assist selection.

By letting Duff-Norton be your sole source for actuator system components, you can consolidate your needs on one purchase order, reducing time spent sourcing, pricing, and receiving parts. Should you have questions, contact our customer service representatives. Duff-Norton's extensive experience in actuator systems can provide you with suggestions for the most economical and reliable method to complete your lifting system.

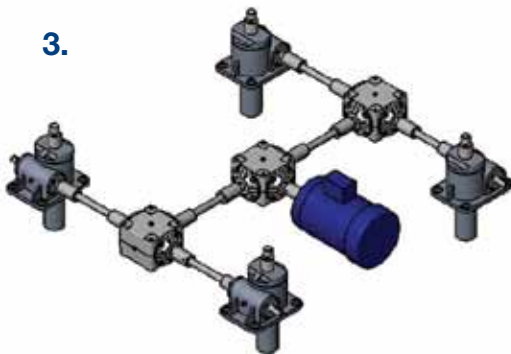
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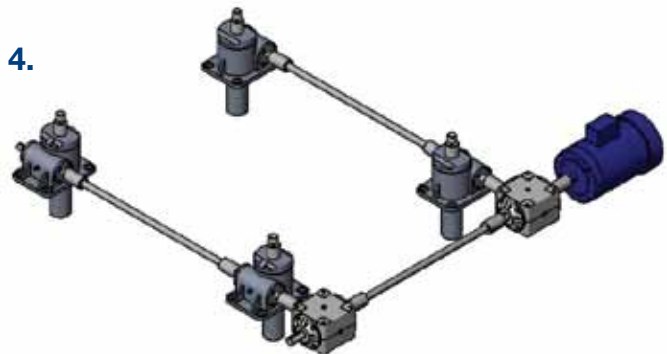
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SCREW JACK POWER TRANSMISSION COMPONENTS

Machine Screw Power Transmission Components								
Actuator Model	Coupling Part Number	Bore Size and Description	Connecting Shaft Part Number	Pillow Block Part Number	Mitre Box Part Number	Mitre Box Description	Mitre Box Part Number	Mitre Box Description
MS 1/4 Ton	SK2555-29	3/8" Bore - Jaw	SH50	PB50	MB-4	3 way		
MS 1/2 Ton	SK2555-29	3/8" Bore - Jaw	SH63	PB63	MB-4	3 way		
MS 1 Ton	SK2402J	1/2" Bore - Jaw	SH75	PB75	MB-7	3 way		
MS 2 Ton	SK2402J	1/2" Bore - Jaw	SH100	PB100	MB-16	3 way		
MS 3 Ton	CP03-500500	1/2" Bore - Chain	SH100	PB100	MB-16	3 way		
MS 5 Ton	CP05-750750	3/4" Bore - Chain	SH150	PB150	MB-19	3 way	MB-19G	4 way
MS 10 Ton	CP20-10001000	1" Bore - Chain	SH163	PB168	MB-19	3 way	MB-19G	4 way
MS 15 Ton	CP20-10001000	1" Bore - Chain	SH200	PB200	MB-20	3 way	MB-20G	4 way
MS 20 Ton	CP20-10001000	1" Bore - Chain	SH200	PB200	MB-20	3 way	MB-20G	4 way
MS 25 Ton	CP35-13751375	1-3/8" Bore - Chain	SH225	PB225	MB-20	3 way	MB-20G	4 way
MS 30 Ton	CP35-13751375	1-3/8" Bore - Chain	SH225	PB225	MB-20	3 way	MB-20G	4 way
MS 35 Ton	CP35-13751375	1-3/8" Bore - Chain	SH250		MB-22	3 way	MB-22G	4 way
MS 50 Ton	CP50-15001500	1-1/2" Bore - Chain	• Please contact our customer service team •					

Anti-Backlash Power Transmission Components								
Actuator Model	Coupling Part Number	Bore Size and Description	Connecting Shaft Part Number	Pillow Block Part Number	Mitre Box Part Number	Mitre Box Description	Mitre Box Part Number	Mitre Box Description
AB 1/4 Ton	SK2555-29	3/8" Bore - Jaw	SH50	PB50	MB-4	3 way		
AB 1/2 Ton	SK2555-29	3/8" Bore - Jaw	SH63	PB63	MB-4	3 way		
AB 1 Ton	SK2402J	1/2" Bore - Jaw	SH100	PB75	MB-7	3 way		
AB 2 Ton	SK2402J	1/2" Bore - Jaw	SH100	PB100	MB-16	3 way		
AB 3 Ton	CP03-500500	1/2" Bore - Chain	SH100	PB100	MB-16	3 way		
AB 5 Ton	CP05-750750	3/4" Bore - Chain	SH150	PB150	MB-19	3 way	MB-19G	4 way
AB 10 Ton	CP20-10001000	1" Bore - Chain	SH163	PB168	MB-19	3 way	MB-19G	4 way
AB 15 Ton	CP20-10001000	1" Bore - Chain	SH200	PB200	MB-20	3 way	MB-20G	4 way
AB 20 Ton	CP20-10001000	1" Bore - Chain	SH225	PB200	MB-20	3 way	MB-20G	4 way
AB 25 Ton	CP35-13751375	1-3/8" Bore - Chain	SH225	PB225	MB-20	3 way	MB-20G	4 way
AB 30 Ton	CP35-13751375	1-3/8" Bore - Chain	SH225	PB225	MB-20	3 way	MB-20G	4 way
AB 35 Ton	CP35-13751375	1-3/8" Bore - Chain	SH250		MB-22	3 way	MB-22G	4 way
AB 50 Ton	CP50-15001500	1-1/2" Bore - Chain	• Please contact our customer service team •					

Ball Screw Power Transmission Components								
Actuator Model	Coupling Part Number	Bore Size and Description	Connecting Shaft Part Number	Pillow Block Part Number	Mitre Box Part Number	Mitre Box Description	Mitre Box Part Number	Mitre Box Description
BS 1/2 Ton	SK2555-29	3/8" Bore - Jaw	SH50	PB50	MB-4	3 way		
BS 1 Ton	SK2402J	1/2" Bore - Jaw	SH63	PB63	MB-4	3 way		
BS 2 Ton	SK2402J	1/2" Bore - Jaw	SH100	PB100	MB-16	3 way		
BS 2 Ton*	SK2402J	1/2" Bore - Jaw	SH100	PB100	MB-16	3 way		
BS 3 Ton	CP03-500500	1/2" Bore - Chain	SH100	PB100	MB-16	3 way		
BS 5 Ton	CP05-750750	3/4" Bore - Chain	SH125	PB125	MB-19	3 way	MB-19G	4 way
BS 5 Ton*	CP05-750750	3/4" Bore - Chain	SH150	PB150	MB-19	3 way	MB-19G	4 way
BS 10 Ton	CP20-10001000	1" Bore - Chain	SH125	PB125	MB-19	3 way	MB-19G	4 way
BS 10 Ton*	CP20-10001000	1" Bore - Chain	SH163	PB168	MB-19	3 way	MB-19G	4 way
BS 20 Ton	CP20-10001000	1" Bore - Chain	SH163	PB168	MB-20	3 way	MB-20G	4 way
BS 20 Ton*	CP20-10001000	1" Bore - Chain	SH200	PB200	MB-20	3 way	MB-20G	4 way
BS 25 Ton	CP35-13751375	1-3/8" Bore - Chain	SH163	PB168	MB-22	3 way	MB-22G	4 way
BS 50 Ton	CP50-15001500	1-1/2" Bore - Chain	• Please contact our customer service team •					

*High Lead Option

NOTE

All selections are based on the actuator's worm input torque at full load. As the application and load changes, the power transmission components best suited for the application may change as well. In particular, connecting shaft sizes could change depending on the shaft length required, which may also result in changes to the pillow blocks and couplings.

SCREW JACK POWER TRANSMISSION COMPONENTS

Stainless Steel Machine Screw Power Transmission Components								
Actuator Model	Coupling Part Number	Bore Size and Description	Connecting Shaft Part Number	Pillow Block Part Number	Mitre Box Part Number	Mitre Box Description	Mitre Box Part Number	Mitre Box Description
SMS 2 Ton	SK2402J	1/2" Bore - Jaw	SH100	PB100	MB-7	3 way		
SMS 3 Ton	CP03-500500	1/2" Bore - Chain	SH100	PB100	MB-16	3 way		
SMS 5 Ton	CP05-750750	3/4" Bore - Chain	SH150	PB150	MB-16	3 way		
SMS 10 Ton	CP20-10001000	1" Bore - Chain	SH150	PB150	MB-19	3 way	MB-19G	4 way
SMS 15 Ton	CP20-10001000	1" Bore - Chain	SH175	PB175	MB-20	3 way	MB-20G	4 way
SMS 20 Ton	CP20-10001000	1" Bore - Chain	SH175	PB175	MB-20	3 way	MB-20G	4 way
SMS 25 Ton	CP35-13751375	1-3/8" Bore - Chain	SH225	PB225	MB-19	3 way	MB-19G	4 way
SMS 30 Ton	CP35-13751375	1-3/8" Bore - Chain	SH225	PB225	MB-19	3 way	MB-19G	4 way
SMS 35 Ton	CP35-13751375	1-3/8" Bore - Chain	SH2250	PB225	MB-22	3 way	MB-22G	4 way
SMS 50 Ton	CP50-15001500	1-3/8" Bore - Chain	• Please contact our customer service team •					

Continuous Duty Power Transmission Components								
Actuator Model	Coupling Part Number	Bore Size and Description	Connecting Shaft Part No.	Pillow Block Part Number	Mitre Box Part Number	Mitre Box Description	Mitre Box Part Number	Mitre Box Description
CD 7511	SK2402J	1/2" Bore - Jaw	SH100	PB100	MB-7	3 way		
CD 7515	CP20-10001000	1" Bore - Chain	SH100	PB100	MB-16	3 way		
CD 75151*	CP20-10001000	1" Bore - Chain	SH100	PB100	MB-16	3 way		
CD 7522	CP20-10001000	1" Bore - Chain	SH125	PB125	MB-19	3 way	MB-19G	4 way
CD 75221*	CP20-10001000	1" Bore - Chain	SH150	PB150	MB-19	3 way	MB-19G	4 way

* High Lead Option*

NOTE

All selections are based on the actuator's worm input torque at full load. As the application and load changes, the power transmission components best suited for the application may change as well. In particular, connecting shaft sizes could change depending on the shaft length required, which may also result in changes to the pillow blocks and couplings.



SCREW JACK

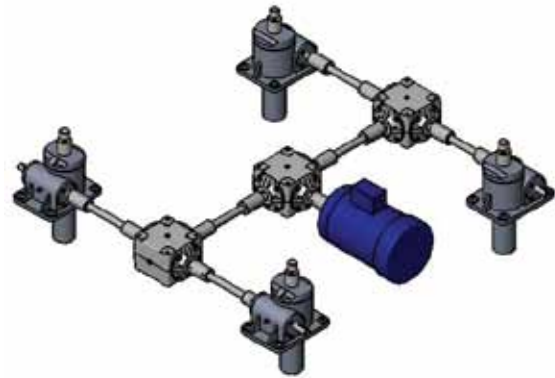
POWER TRANSMISSION COMPONENTS

MITRE BOXES

Power transmission systems frequently use multiple actuator arrangements. Such systems commonly use mitre boxes to effectively position and equally distribute loads. As the mitre boxes are supplied with 1:1 gear ratios as standard, all motion is synchronous upon system actuation through the main drive shaft.

FEATURES

- 98% average efficiency ratings.
- Carburized and case hardened bevel gears.
- Alloy steel input/output shafts for greater strength.
- Anti-friction bearings on all shafts.
- MB-4 and MB-8 models come with lifetime lubrication, stainless steel shafts and aluminum housings.



Mitre Box Performance Specifications			
Part Number	Type	Capacity (in/lbs)	Shaft Diameter
MB-4	3-Way	23	.375"
MB-8	3-Way	97	.75"
MB-16	3-Way	344	.625"
MB-19	3-Way	1400	1.0"
MB-19G	4-Way	1400	1.0"
MB-20	3-Way	3000	1.25"
MB-20G	4-Way	3000	1.25"
MB-22	3-Way	5000	1.375"
MB-22G	4-Way	5000	1.375"

Our mitre boxes feature a compact design, which eliminates the need for an extended hub. With this design feature the bevel gear is supported by tapered roller bearings on both sides. The result is a higher horsepower rating, increased service-life, improved lubrication, and more flexible mounting compared to other brands.

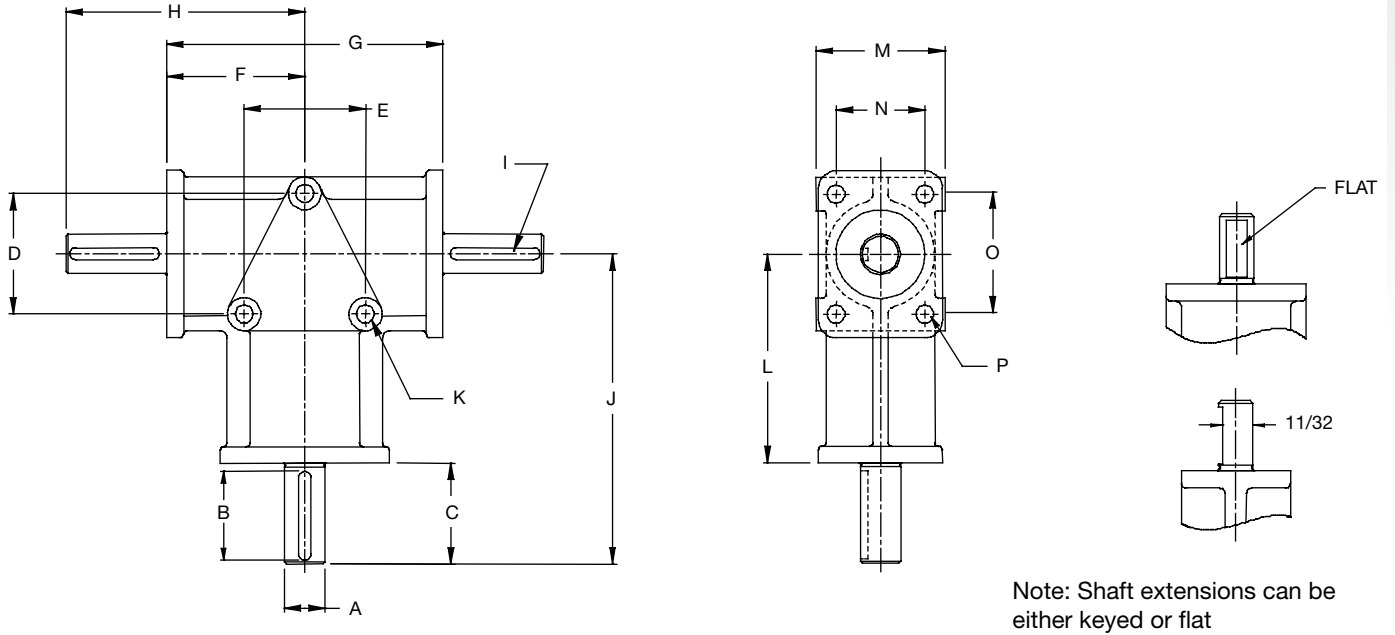


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POWER TRANSMISSION COMPONENTS

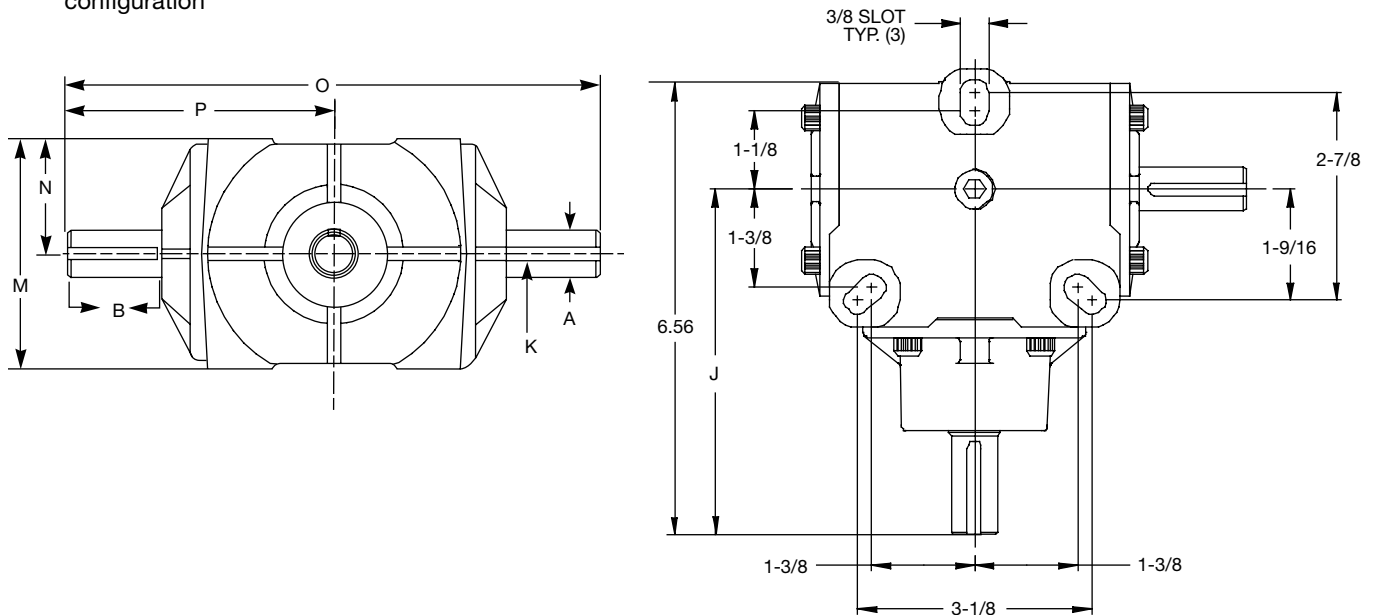
MITRE BOX DIMENSIONAL SPECIFICATIONS

Model	Torque	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MB-4	23	0.375	0.625	0.781	1.313	1.313	1.375	2.750	2.156	FLAT	2.938	0.219	2.156	1.250	0.875	1.188	0.188
MB-8	97	0.750	1.375	1.563	3.000	3.000	3.000	6.000	4.563	3/16"	6.563	0.375	5.000	3.000	2.250	3.000	0.375



Model	Torque	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MB-16	344	0.625	1.219	—	—	—	—	—	—	1.688	4.875	0.187	—	3.188	1.594	7.250	3.625

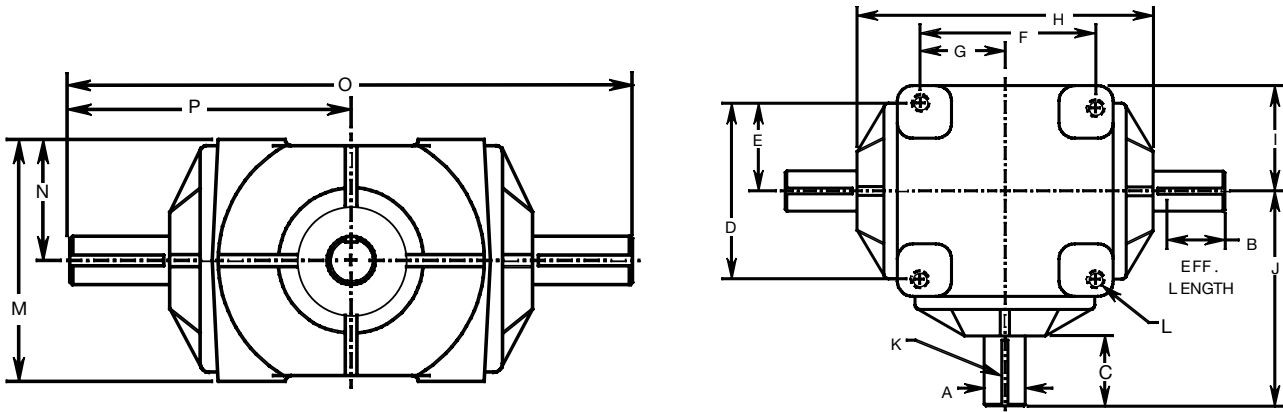
Note: Standard model is a 3-way configuration



SCREW JACK

POWER TRANSMISSION COMPONENTS

MITRE BOX DIMENSIONAL SPECIFICATIONS

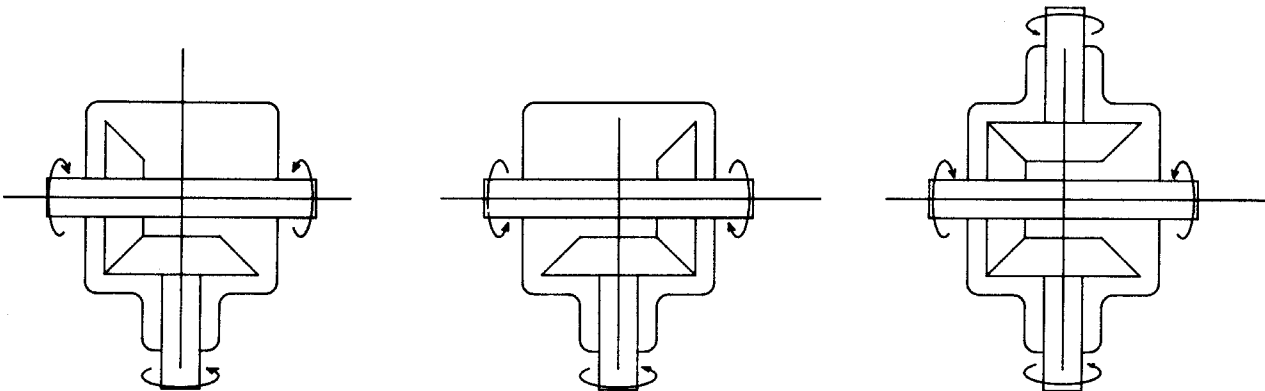


Model	Torque	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MB-19 (G)	1400	1.000	1.396	2.000	4.250	2.125	4.250	2.125	7.000	2.750	5.500	1/4"	3/8"-16	4.125	2.062	11.000	5.500
MB-20 (G)	3000	1.250	1.840	2.500	4.500	2.250	4.500	2.250	8.000	2.875	6.500	1/4"	1/2"-13	5.625	2.813	13.000	6.500
MB-22 (G)	5000	1.375	2.170	2.938	6.000	3.000	6.000	3.000	10.625	4.125	8.250	5/16"	1/2"-13	7.500	3.750	16.500	8.250

Mitre Box Shaft Rotation

Three and four way Duff-Norton MB series mitre boxes are made for reversible mounting. The relationship between input and output shaft rotation can be reversed by mounting the gearbox upside down.

Two way boxes should be specified as "CW in/CW out" or "CW in/CCW out".



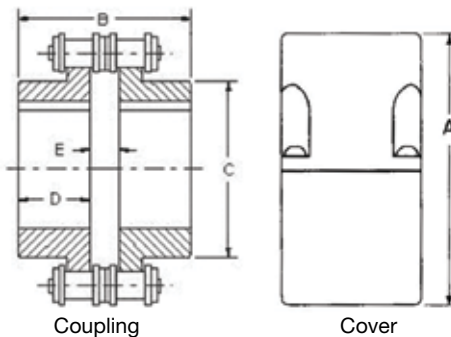
SCREW JACK POWER TRANSMISSION COMPONENTS ACTUATOR - CHAIN COUPLINGS

Duff-Norton provides three coupling types which have been tailored to specific actuator requirements:

FEATURES

Chain Couplings:

- Integrates well with Duff-Norton mid and larger capacity actuators.
- High torque capacities.
- Standard ANSI dimensions, straight bore diameters.
- Common bore diameters may be custom ordered.
- Special bore diameters may be custom ordered.
- Long service lives.
- Easy fit onto the actuator's worm shaft.
- Allows for incremental system adjustments.



Coupling with cover

Chain Coupling Specifications

Capacity	Part Number	Measurements in inches								Actual Torque at Load **	Coupling Torque	Misalignment (Max.)	
		Standard Bore***	Maximum Bore	Key Broach Dimensions	A*	B	C	D	E			Parallel	Angular
2 Ton	CP03-500500	.500	.875	.125 x .63	4.00	2.53	1.41	1.13	.28	132	1354	.015	1/2 Deg.
3 Ton	CP03-625625	.625	.875	.125 x .63	4.00	2.53	1.41	1.13	.28	181	1354	.015	1/2 Deg.
5 Ton	CP05-750750	.750	1.25	.1875 x .093	4.00	2.53	1.41	1.13	.28	4.95	1354	.015	1/2 Deg.
10-20 Ton	CP20-10001000	1.000	1.687	.25 x .125	5.13	3.25	2.50	1.44	.38	2255	4614	.015	1/2 Deg.
25-30 Ton	CP35-13751375	1.375	2.000	.313 x .156	5.13	3.75	2.97	1.69	.38	4400	5969	.015	1/2 Deg.
50 Ton	CP50-15001500	1.500	2.437	.375 x .1875	6.38	4.23	3.50	1.88	.47	8250	10899	.015	1/2 Deg.

*Includes two hubs, four rubber gaskets, chain, and cover
 ***Tolerance for all bores is +.001/- .000

**Based on Anti-backlash actuator torque ratings

NOTE: Duff-Norton recommends using the cover assembly with the chain coupling

Coupling Selection Guide

1. Flexible couplings are made up of components. Two hubs each with a bore and keyway to match the shafts being coupled and a chain cover (for chain couplings) or a sleeve kit (for gear-type couplings) or a spider (for jaw-type couplings). The bores in the coupling hubs are sized to give an easy fit on actuator worm shafts.
2. Determine required coupling torque with this formula: Torque Requirement per Actuator X Number of Actuators to Be Driven by the Coupling.
3. Verify the required coupling torque. Make sure it's not greater than the maximum rating in the accompanying coupling tables.
4. Chain or full-flex gear couplings are recommended for close coupled arrangements.
5. Chain or flex-rigid gear couplings are recommended for floating shaft arrangements with the rigid hub (if selected) mounted to the floating shaft.
6. For maximum performance, the actuators, shafts, gear boxes and motor should be carefully aligned.

SCREW JACK

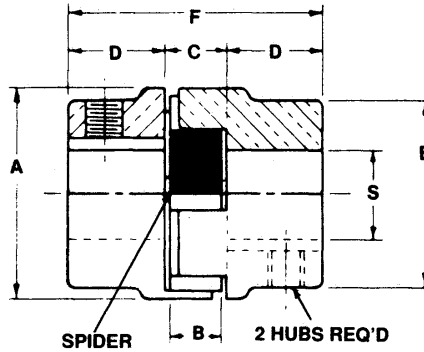
POWER TRANSMISSION COMPONENTS

ACTUATOR - JAW, FULL-FLEX, & FLEX-RIGID GEAR COUPLINGS

FEATURES

Jaw Couplings:

- Integrates well with Duff-Norton smaller capacity actuators.
- Does not require lubrication.
- Our Hytrel® spiders provide 2 times the torque capability vs. a standard urethane or BUNA® spider.
- Easy fit onto the actuators worm shaft.



Jaw Type Coupling Specifications

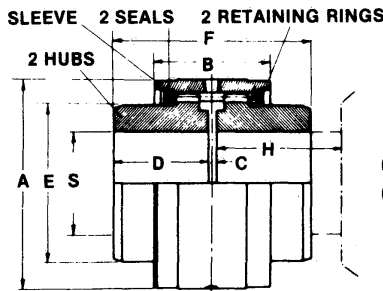
Part Number		Standard Bore***	Maximum Bore	Key Broach Dimensions	A*	B	C	D	E	F	Coupling Torque	Misalignment (Max)	
Hub #	Spider #											Parallel	Angular
SK2555H2	SK2555-29S	.375"	.875"	None	1-5/64	7/16	15/32	5/8	1-5/64	1-23/32	50	.015	1/2 Deg.
SK2402J-H1	SK2402-JS	.375"	.875"	.125" x .63"	1-3/4	15/32	1/2	13/16	1-3/4	2-1/8	250	.015	1/2 Deg.
SK2402J-H2	SK2402-JS	.626"	.875"	.1875" x .0938"	1-3/4	15/32	1/2	13/16	1-3/4	2-1/8	250	.015	1/2 Deg.

*Includes two hubs, and Hytrel spider **Based on Anti-backlash actuator torque ratings ***Tolerance for all bores is +.001/-.000

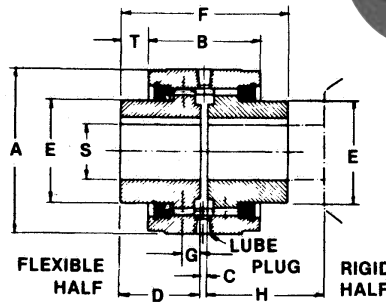
FEATURES

Full-Flex and Flex-Rigid Gear Couplings:

- Gives great strength under load due to compact design and construction.
- Allows for incremental system adjustment.



Gear Coupling



Flex—Rigid Coupling



Gear Coupling Performance Specifications

Capacity	Part Number			Std. Bore***	Max. Bore***	Key Broach Dimensions	A*	B	C	D	E	F	H	Actual Torque at Load**	Coupling Torque	Misalignment (Max)	
	Sleeve Kit	Flex Hub	Rigid Hub													Parallel	Angular
5 Ton	SK2405S	SK2405H	SK2404H	.0751	1.25	.1875" x .0938"	3-5/16	2	1/8	1-1/2	2	3-1/8	2-1/8	495	6300	+	1/2 Deg.
10-20 Ton	SK2410S	SK2410H	SK2409H	1.001	1.25	.25" x .125"	3-5/16	2	1/8	1-1/2	2	3-1/8	2-1/8	2255	6300	+	1/2 Deg.
25-35 Ton	SK2425S	SK2425H	SK2424H	1.376	1.625	.313" x .156"	3-3/4	2-17/32	1/8	1-13/16	2-3/8	3-3/4	2-21/32	4400	18900	+	1/2 Deg.
50 Ton	SK2450S	SK2450H	SK2449H	1.501	1.625	.375" x .1875"	3-3/4	2-17/32	1/8	1-13/16	2-3/8	3-3/4	2-21/32	8250	18900	+	1/2 Deg.
100 Ton	SK2499S	SK2499H	SK2498H	1.751	2.125	.50" x .25"	4-3/4	2-9/16	1/8	2-1/16	3-1/4	4-1/4	2-11/16	17600	50000	+	1/2 Deg.

*Includes two hubs, and Hytrel spider **Based on Anti-backlash actuator torque ratings ***Tolerance for all bores is +.001/-.000

SCREW JACK

POWER TRANSMISSION COMPONENTS

CONNECTING SHAFTS

Problem Scenario

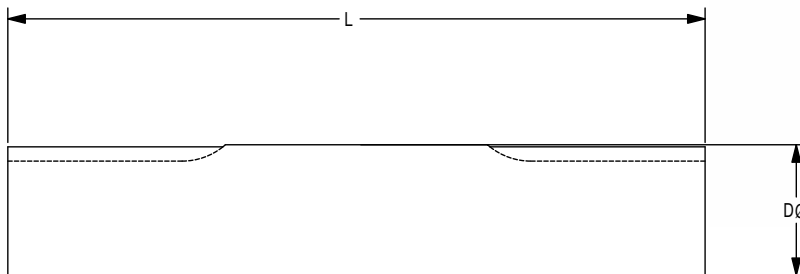
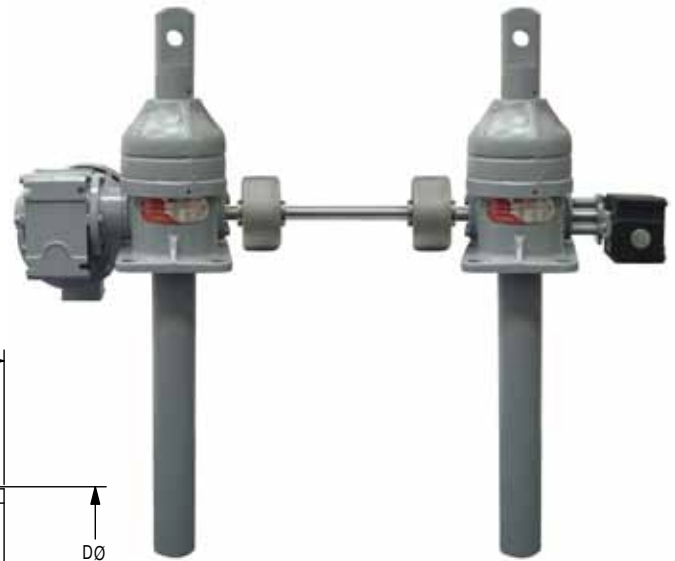
A common system operating problem stems from connecting shafts made from standard steel, which are often bowed or out-of-round. This results in a whipping effect while the system is being run with the connecting shaft working its way loose from the system at high speeds and doing a great deal of damage to the system's equipment.

Solution

Duff-Norton connecting shafts, which are furnished with close tolerance Turned, Ground, and Polished steel for smooth rotation.

FEATURES

- Turned, Ground, and Polished steel
- Shaft material is machined from cold-drawn bar.
- Furnished with ANSI-standard in-line keyways.
- Coordinates well with Duff-Norton Couplings (pages 142-143) and Block Supports (pages 146-147).



Dimensions and Minimum Size												
Model	SH50	SH63	SH75	SH100	SH125	SH150	SH163	SH175	SH200	SH225	SH250	
Minimum Shaft Length* "L" (in)	5	5	5	5	6	7	7	7	8	10	10	
Shaft Diameter "D" (in)	Nominal	1/2	5/8	3/4	1	1-1/4	1-1/2	1-5/8	1-3/4	2	2-1/4	2-1/2
	Actual	0.500	0.625	0.750	1.000	1.250	1.500	1.625	1.750	2.000	2.250	2.500
Keyway Width (in)	1/8	3/16	3/16	1/4	1/4	3/8	3/8	3/8	1/2	1/2	5/8	
Keyway Flat (in)	1.25	1.25	1.25	1.25	1.5	1.75	1.75	2	2	2.5	2.5	

Note: Minimum shaft length may vary depending on the specified coupling.

SCREW JACK

POWER TRANSMISSION COMPONENTS

SHAFT SELECTION CRITERIA

Instructions:

1. Find a torque value that is greater than or equal to your calculated torque requirements.
2. Use the second column to find the required shaft diameter (rounding up is recommended.)
3. Check the third column for the maximum allowable shaft span before supports are required.
4. Match your selected shaft's maximum allowable speed (rpm) to actual shaft speed (rpm). Increasing your selected shaft size is recommended until it falls into the allowable range.



Shaft Diameter (Inches)	Maximum Torque (in/lbs)	Maximum** Distance Between Supports (inches)	For Shaft Lengths below, Maximum Allowable RPMs***									
			36	48	60	72	84	96	108	120	132	144
0.500	9	68	1469	826	529	367	270	207	163	132	109	92
0.625	22	79	1836	1033	661	459	337	258	204	165	137	115
0.750	45	89	2204	1240	793	551	405	310	245	198	164	138
1.000	141	107	2938	1653	1058	735	540	413	326	264	219	184
1.250	345	125	3673	2066	1322	918	675	516	408	331	273	230
1.500	716	141	4407	2479	1587	1102	810	620	490	397	328	275
1.625	986	148	4775	2686	1719	1194	877	671	531	430	355	298
1.750	1326	156	5142	2892	1851	1285	944	723	571	463	382	321
2.000	2262	170	5877	3306	2116	1469	1079	826	653	529	437	367
2.250	3624	184	6611	3719	2380	1653	1214	930	735	595	492	413
2.500	5523	198	7346	4132	2644	1836	1349	1033	816	661	546	459

* Based on .08 degrees per foot torsional deflection.

** Based on .010 in/ft maximum sag between bearings. Shaded area exceeds sag recommendation.

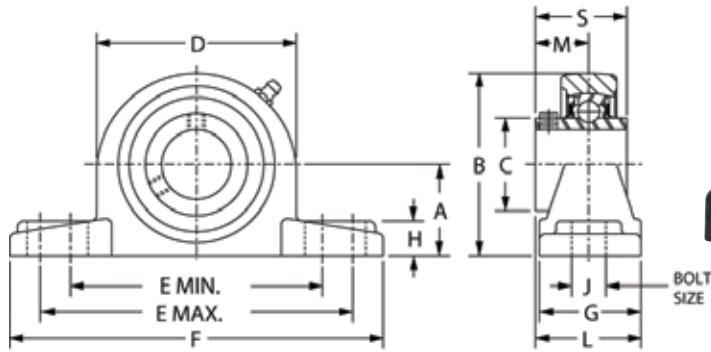
*** Based on 80% critical speed, simple supports

Reference: Machinery's Handbook, 23rd edition.

Maximum Torque:	$D = .29(T)^{1/4}$	$T = (D/.29)^4$
Bearing Distance:	$L(\text{ft.}) = 8.95(D^2)^{1/3}$	$L(\text{in.}) = 107.4(D^2)^{1/3}$
Critical Speed, Shaft Only, Simple Supports:	$N = 1.0 \times 4.76 \times 10^6 \times D/L^2$	

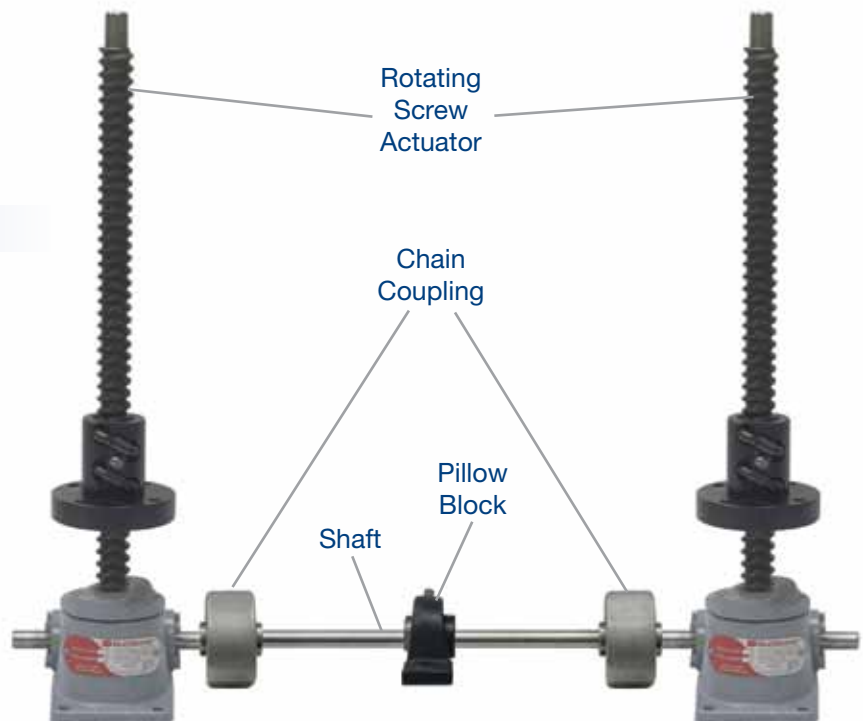
SCREW JACK POWER TRANSMISSION COMPONENTS ACTUATOR PILLOW BLOCKS

Duff-Norton provides a wide assortment of Pillow Blocks designed to operate with our actuators, shafts, and couplings meeting a wide range of system requirements. Pillow Blocks may be used in any shafting configuration for additional shaft support, but are specifically required when the shaft length exceeds the dimensions listed in our shaft selection tables.



FEATURES

- Ductile iron housing - for extra strength vs. the standard gray iron.
- Setscrew locks - to properly secure the connecting shaft regardless of direction.
- Anti-Rotation Pins - to help prevent random bearing movement.
- For more Pillow Block information please see the table below



Part Number	Diameter	A	B	C	D	E Min.	E Max.	F	G	H	J	L	M	S	Weight (lbs)
PB50C	1/2	1-1/16	2-1/8	.969	2-1/4	3-3/8	3-5/8	4-3/4	1-3/8	33/64	3/8	1-5/16	.626	1.079	1.2
PB63C	5/8	1-1/16	2-1/8	.969	2-1/4	3-3/8	3-5/8	4-3/4	1-3/8	33/64	3/8	1-5/16	.626	1.079	1.2
PB75C	3/4	1-1/4	2-1/2	1.142	2-5/8	3-3/4	3-31/32	5-1/32	1-1/2	35/64	3/8	1-15/32	.720	1.220	1.9
PB100C	1	1-5/16	2-5/8	1.339	2-23/32	4	4-1/4	5-1/2	1-9/16	19/32	3/8	1-9/16	.776	1.339	2.4
PB125C	1-1/4	1-13/16	3-19/32	1.843	3-27/32	4-13/16	5-3/16	6-9/16	1-7/8	45/64	1/2	1-15/16	1.00	1.689	3.8
PB150C	1-1/2	1-15/16	3-27/32	2.063	4-3/16	5-5/16	5-11/16	7-1/8	2-1/16	3/4	1/2	2-7/32	1.189	1.937	4.8
PB168C	1-11/16	2-1/16	4-1/8	2.260	4-17/32	5-9/16	5-15/16	7-7/16	2-1/8	23/32	1/2	2-1/4	1.189	1.937	5.4
PB175C	1-3/4	2-1/16	4-1/8	2.260	4-17/32	5-9/16	5-15/16	7-7/16	2-1/8	25/32	1/2	2-1/4	1.189	1.937	5.4
PB200C	2	2-7/16	4-27/32	2.705	5-5/16	6-7/8	7-3/8	9-1/8	2-3/8	29/32	5/8	2-1/2	1.315	2.189	8.7
PB225C*	2-1/4	2-11/16	5-11/32	2.949	5-13/16	7-9/32	7-15/16	9-1/2	2-17/32	63/64	5/8	2-25/32	1.528	2.114	10.9

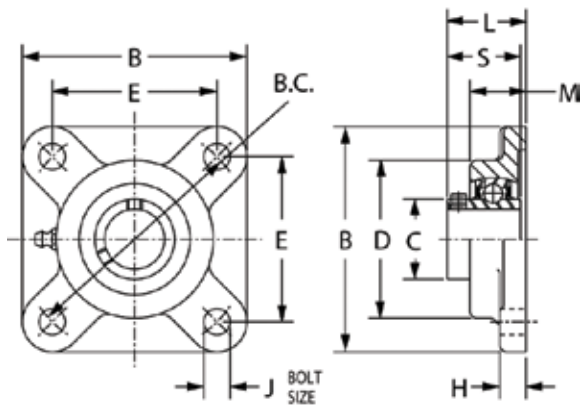
*Cast iron housing

SCREW JACK

POWER TRANSMISSION COMPONENTS

ACTUATOR FLANGE BLOCKS

Duff-Norton provides a wide assortment of Flange Blocks designed to operate with our rotating type Machine Screw, Ball Screw, and Continuous Duty actuators. Flange Blocks lock on to the end of the rotating screw, and can then be bolted on to the machine or fixture. This ensures that the load being carried by the actuator's lifting nut is properly guided.



Flange Block

Rotating Screw Actuator



FEATURES

- Ductile iron housing - for extra strength vs. the standard gray iron.
- Setscrew locks - to properly secure the connecting shaft regardless of direction.
- Anti-rotation Pins - to help prevent random bearing movement.

For more Pillow Block information please see the table below

Part Number	Rotating Actuator	Shaft Size	B	B.C.	C	D	E	H	J	L	M	S	Weight (lbs)
FB50C	MS and BS up to 1 Ton	1/2	3	3	.969	2-3/32	2-1/8	7/16	3/8	1-7/32	31/32	1.079	1.0
FB63C	2 Ton MS	5/8	3	3	.969	2-3/32	2-1/8	7/16	3/8	1-7/32	31/32	1.079	1.0
FB75C	2 and 3 Ton BS	3/4	3-3/8	3-5/8	1.142	2-3/8	2-1/2	19/32	3/8	1-15/32	1-5/32	1.220	1.5
FB87C	3 Ton MS	7/8	3-21/32	3-57/64	1.339	2-3/4	2-3/4	19/32	7/16	1-17/32	1-3/16	1.399	1.9
FB100C	5 Ton MS, 5-10 Ton BS	1	3-21/32	3-57/64	1.339	2-3/4	2-3/4	19/32	7/16	1-17/32	1-3/16	1.399	1.9
FB125C	10 Ton MS	1-1/4	4-9/16	5-1/8	1.843	3-9/16	3-5/8	11/16	1/2	1-27/32	1-3/8	1.689	4.4
FB150C	15 Ton MS	1-1/2	5-3/32	5-43/64	2.063	4-1/32	4	11/16	1/2	2-1/8	1-17/32	1.937	5.6
FB175C	20 Ton MS and BS	1-3/4	5-5/16	5-27/32	2.260	4-1/4	4-1/8	23/32	1/2	2-1/8	1-9/16	1.937	6.0
FB225C*	25 Ton BS	2-1/4	6-29/32	7-31/32	2.949	5-5/16	5-5/8	23/32	5/8	2-43/64	1-57/64	2.114	11.9

*Cast iron housing

SCREW JACK POWER TRANSMISSION COMPONENTS BELLOWS BOOTS

Duff-Norton highly recommends the use of a bellows boot for most actuator applications. Duff-Norton can provide bellows boots for the most stringent application requirement.



FEATURES

- Protects the lifting screw from: dust, dirt, moisture, and corrosive contaminants.
- Helps maintain the proper lubrication.
- Can be provided for all actuator screw end types and configurations.
- Standard bellows boots are made of neoprene coated nylon with sewn construction.
- Special bellows boots can be provided with a variety of materials for applications involving high temperatures, highly corrosive atmospheres, and other special conditions.
- Bellows boots can also be provided from molded materials, with internal or external guides to prevent sagging, and with zippers for easy installation or removal.

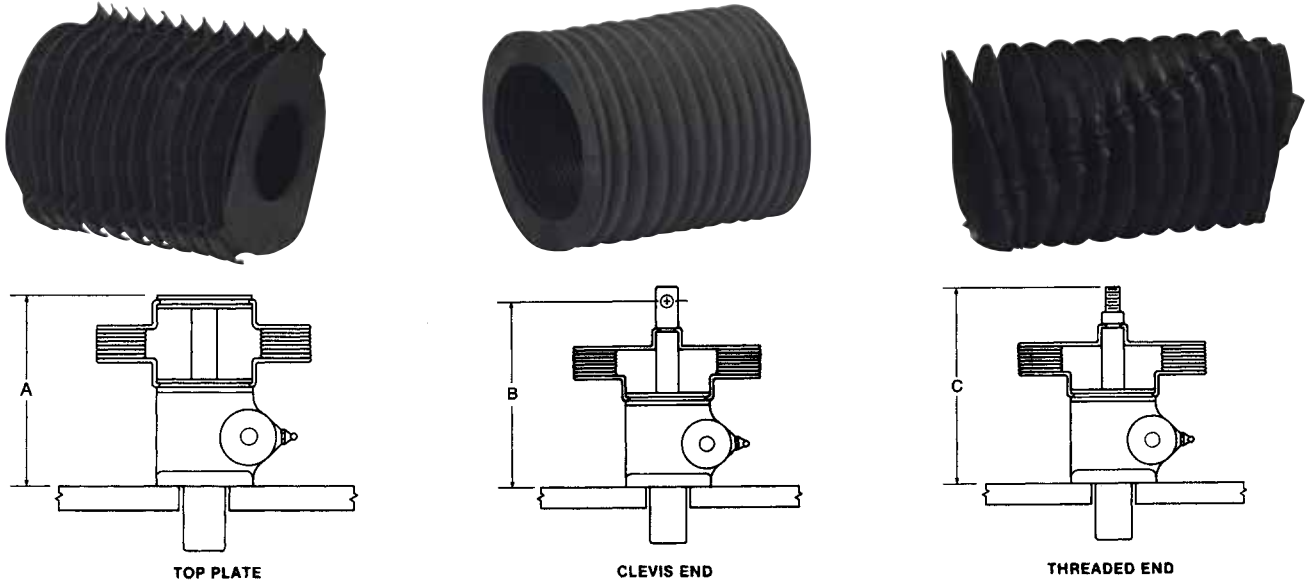
Shell Cap Dimensions			
Actuator Capacity	Shell Cap Diameter "A"	Actuator Capacity	Shell Cap Diameter "A"
1/4 Ton MS	2-1/4		
1/2 Ton MS	2-1/4	1/2 Ton BS	2-1/4
1 Ton MS	2-3/4	1 Ton BS	2-3/4
2 Ton MS	3-1/2	2 Ton BS	3-1/2
3 Ton MS	3-6/16	3 Ton BS	3-1/2
5 Ton MS	4-1/2	5 Ton BS	5-3/8
10 Ton MS	5-1/4	10 Ton BS	4-1/2
15 Ton MS	5-5/8	15 Ton BS	5-5/8
20 Ton MS	6	20 Ton BS	7
25 Ton MS	7-1/2	25 Ton BS	8-7/8
30 Ton MS	7-1/2	50 Ton BS	9-1/2
35 Ton MS	7-7/8		
50 Ton MS	11-1/4		
75 Ton MS	13-1/4		
100 Ton MS	10		
150 Ton MS	10		
250 Ton MS	16		

SCREW JACK

POWER TRANSMISSION COMPONENTS

BELLOWS BOOTS

Closed Height When Optional Bellows Boots are Required on Standard Upright Actuators



Machine Screw Closed Heights - Upright																									
Actuator Capacity	Boot O.D.	Raise up to 12"			Raise 12" to 18"			Raise 18" to 24"			Raise 24" to 30"			Raise 30" to 36"			Raise 36" to 48"			Raise 48" to 60"			Raise 60" to 72"		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
¼ Ton MS	4-1/4	4	4	4-1/4	4-3/4	4-5/8	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
½ Ton MS	4-1/4	4	4	4-1/2	4-1/4	4-5/8	4-1/2	4-1/4	4-5/8	4-1/2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1 Ton MS	6	4-1/2	5	5-3/8	5-1/8	5-5/8	6	5-1/2	5-3/4	6-1/4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2 Ton MS	7-3/4	5-1/4	6-1/2	7-1/4	5-1/4	7-1/2	8-1/4	5-3/4	7-1/2	8-1/4	5-3/4	7-1/2	8-1/4	6-1/4	8-1/2	9-1/4	—	—	—	—	—	—	—	—	—
3 Ton MS	7-3/4	5-3/4	6-1/2	6-1/2	6-1/8	7	7	6-5/8	7	7	6-5/8	7-7/8	8	7-7/8	7-7/8	8	—	—	—	—	—	—	—	—	—
5 Ton MS	7-3/4	7	7	8	7	8-1/2	9-1/2	7	8-1/2	9-1/2	8	8-1/2	9-1/2	8	10	11	9	10	11	—	—	—	—	—	—
10 Ton MS	9	7-1/4	8-1/2	9-3/4	7-1/4	8-1/2	9-1/2	7-1/4	9-1/2	10-3/4	8-1/2	9-1/2	10-3/4	8-1/2	9-1/2	10-3/4	9-1/2	10-1/2	11-3/4	10-1/2	11-1/2	12-3/4	11-1/2	12-1/2	13-3/4
15 Ton MS	9	8	8-1/2	9-3/4	8	10	11-1/4	8	10	11-1/4	9	10	11-1/4	9	10	11-1/4	11	12	12-1/4	11	12	13-1/4	12	13	14-1/4
20 Ton MS	9	9-1/4	10	11-1/2	9-1/4	11	12-1/2	9-1/4	11	12-1/2	10-1/2	12	13-1/2	10-1/2	12	13-1/2	11-1/2	13	14-1/2	12-1/2	14	15-1/2	13-1/2	15	16-1/2
25 Ton MS	10-3/4	11	12	13-3/4	11	12	13-3/4	11	13-1/4	15	12	13-1/4	15	12	14-1/2	16-1/4	13	15-3/4	17-1/2	14	15-3/4	17-1/2	15	16-3/4	18-1/2
30 Ton MS	10-3/4	11	12	13-3/4	11	12	13-3/4	11	13-1/4	15	12	13-1/4	15	12	14-1/2	16-1/4	13	15-3/4	17-1/2	14	15-3/4	17-1/2	15	16-3/4	18-1/2
35 Ton MS	11	12	13	15	12	13	—	12	13	15	12	13-3/4	15-3/4	12	13-3/4	15-3/4	12-7/8	14-3/4	13-3/4	15-1/2	17-1/2	14-3/4	16-1/2	18-1/2	
50 Ton MS	14-1/2	13	15	17-1/2	13	16	18-1/2	13	16	18-1/2	14	16	18-1/2	14	17	19-1/2	15	18	20-1/2	16	18	20-1/2	17	19	21-1/2
75 Ton MS	16-1/2	17-1/2	19	21-1/2	17-1/2	19	21-1/2	17-1/2	19	21-1/2	17-1/2	19	21-1/2	17-1/2	19	21-1/2	18-1/2	20	20-1/2	19-1/2	21	23-1/2	20-1/2	22	24-1/2
100 Ton MS	11-1/4	24	24	25	24	24	25	24	24	25	24	24	25	24-1/2	24-1/2	25-1/2	25	25-1/2	26-1/2	26	26-1/2	27-1/2	27	27-1/2	28-1/2
150 Ton MS	12-1/4	24	24	25	24	24	25	24	24	25	24	24	25	24-1/2	24-3/8	25-3/8	25	25-1/8	26-1/8	26	26-7/8	26-7/8	27	26-5/8	27-5/8
250 Ton MS	16	30	—	—	30	—	—	30	—	—	30-1/2	—	—	30-1/2	—	—	30-1/2	—	—	30-1/2	—	—	32	—	—

Ball Screw Closed Heights - Upright																									
Actuator Capacity	Boot O.D.	Raise up to 12"			Raise 12" to 18"			Raise 18" to 24"			Raise 24" to 30"			Raise 30" to 36"			Raise 36" to 48"			Raise 48" to 60"			Raise 60" to 72"		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1/2 Ton BS	4-1/2	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1 Ton BS	4-1/4	—	—	6-1/4	—	—	6-7/8	—	—	7-1/2	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—
2 Ton BS	6-5/8	—	—	7-1/2	—	—	7-1/2	—	—	7-1/2	—	—	8-1/2	—	—	—	—	—	—	—	—	—	—	—	—
3 Ton BS	6-5/8	—	—	9-1/4	—	—	9-1/4	—	—	9-1/4	—	—	10-1/4	—	—	10-1/4	—	—	11-1/4	—	—	—	—	—	—
5 Ton BS	7-1/2	—	—	10-3/4	—	—	10-3/4	—	—	10-3/4	—	—	12-1/2	—	—	12-1/2	—	—	13-3/4	—	—	—	—	—	—
10 Ton BS	7	—	—	10-3/8	—	—	10-3/8	—	—	10-3/8	—	—	11-5/8	—	—	11-5/8	—	—	12-7/8	—	—	—	—	—	—
20 Ton BS	9	—	—	16-1/2	—	—	16-1/2	—	—	16-1/2	—	—	16-1/2	—	—	16-1/2	—	—	18-1/2	—	—	20-1/2	—	—	21-1/2
25 Ton BS	11	—	—	19-3/4	—	—	19-3/4	—	—	19-3/4	—	—	19-3/4	—	—	21-1/4	—	—	21-1/4	—	—	22-3/4	—	—	24-1/4
50 Ton BS	12	—	—	25-3/8	—	—	25-3/8	—	—	25-3/8	—	—	25-3/8	—	—	26-3/8	—	—	26-3/8	—	—	27-3/8	—	—	28-3/8

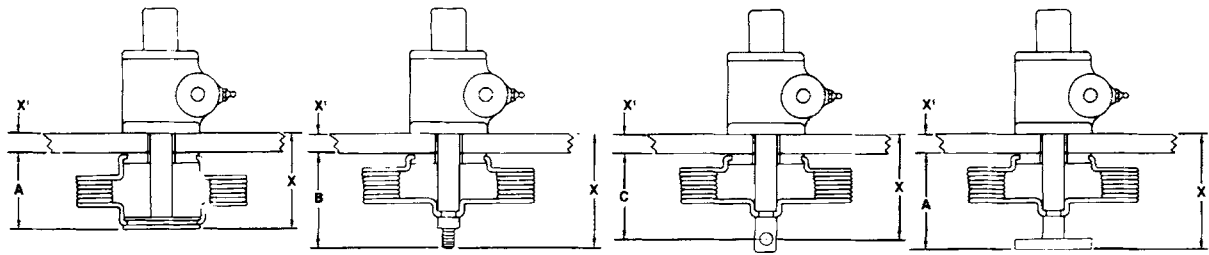
Note:(—) indicates "Not Applicable"

SCREW JACK

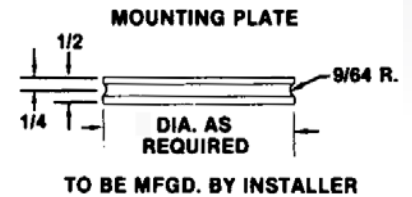
POWER TRANSMISSION COMPONENTS

INVERTED MACHINE SCREW & BALL SCREW ACTUATORS

Machine Screw Actuators - Inverted



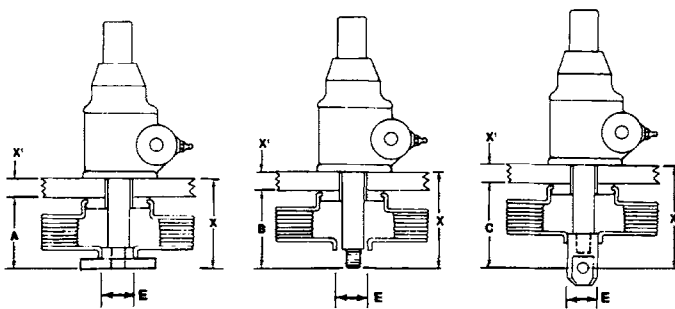
Machine Screw Closed Heights - Inverted												
Actuator Capacity	Raise up to 6"			Raise 7" to 12"			Raise 13" to 18"			Raise 19" to 24"		
	A	B	C	A	B	C	A	B	C	A	B	C
1/4 Ton BS	2	2-3/8	2	2	2-3/8	2	2-1/8	—	—	—	—	—
1/2 Ton BS	2	2-5/8	2-1/8	2	2-5/8	2-1/8	2-1/8	3-1/4	2-3/4	—	—	—
1 Ton BS	2-1/6	3	2-5/8	2-1/6	3	2-5/8	2-11/16	3-5/8	3-1/4	3-1/16	4	3
2 Ton BS	2-3/8	4-3/8	3-5/8	2-3/8	4-3/8	3-5/8	2-7/8	3-3/8	4-5/8	3	5-3/8	4-5/8
3 Ton BS	2-3/8	3	2-3/4	2-3/8	3-1/2	3-1/4	2-7/8	4	3-3/4	3	4	3-3/4
5 Ton BS	3-3/16	4-3/16	3-3/16	3-3/16	4-3/16	3-3/16	3-3/16	5-11/16	4-11/16	3-1/2	5-11/16	4-11/16
10 Ton BS	3-1/4	5-3/4	4-1/2	3-1/4	5-3/4	4-1/2	3-1/4	5-3/4	4-1/2	3-9/16	7	5-3/4
15 Ton BS	3-1/4	5-1/4	4	3-1/4	5-1/4	4	3-1/4	6-3/4	5-1/2	3-9/16	6-3/4	5-1/2
20 Ton BS	3-1/4	5-9/16	4-1/16	3-1/4	5-9/16	4-1/16	3-1/4	6-9/16	5-1/16	3-1/4	6-9/16	5-1/16
25 Ton BS	3-3/8	6-3/4	5	3-3/8	6-3/4	5	3-3/8	6-3/4	5	3-3/8	7-3/4	6
30 Ton BS	3-3/8	6-3/4	5	3-3/8	6-3/4	5	3-3/8	6-3/4	5	3-3/8	7-3/4	6
35 Ton BS	4-1/2	7-1/2	5-1/2	4-1/2	7-1/2	5-1/2	4-1/2	7-1/2	5-1/2	4-1/2	7-1/2	5-1/2
50 Ton BS	4-7/8	9-5/16	6-13/16	4-7/8	9-5/16	6-13/16	4-7/8	10-5/16	7-13/16	4-7/8	10-5/16	7-13/16
75 Ton BS	2-3/8	6-7/8	4-7/8	3-3/4	6-7/8	4-7/8	2-3/4	7-1/2	5-1/2	3-3/8	7-7/8	5-7/8
100 Ton BS	7-11/16	8-11/16	7-11/16	7-11/16	8-11/16	7-11/16	7-11/16	8-11/16	7-11/16	7-11/16	8-11/16	7-11/16
150 Ton BS	7-11/16	8-11/16	7-11/16	7-11/16	8-11/16	7-11/16	7-11/16	8-11/16	7-11/16	7-11/16	8-11/16	7-11/16



Note:

- a. If $A = X_1$ is less than 5 1/2", $X = 5$ 1/2"
 - b. If $B = X_1$ is less than 9 1/2", $X = 9$ 1/2"
 - c. If $C = X_1$ is less than 7", $X = 7$ "
- * If $A + X_1$ and $B + X_1$ are less than 12", $X = 12$ ". If greater than 12", use the dimensions shown.
- ** If $C + X_1$ is less than 9", $X = 9$ ". If greater than 9", use dimensions shown.

Ball Screw Actuators - Inverted



Finding minimum closed dimensions: Add your structure thickness X_1 to A, B or C from appropriate chart to find minimum closed dimension. Other styles and sizes of boots can be supplied. In order to use a standard boot, make the mounting plate diameter of the appropriate machine screw or ball screw actuator.

When boots are required for rotating screw jacks, consult Duff-Norton Customer Service.

Ball Screw Closed Heights - Inverted														
Actuator Capacity	Raise up to 6"			Raise 7" to 12"			Raise 13" to 18"			Raise 19" to 24"			Standard Boot Collar Dia. E	
	A	B	C	A	B	C	A	B	C	A	B	C		
1/2 Ton BS	2	2	2-3/4	2-3/8	2-3/8	3-1/4	2-3/4	2-3/4	3-3/4	3-1/4	3-1/4	4-1/4	0.75	
1 Ton BS	2	2	2-7/8	3	2-7/8	3-5/8	3-3/4	3-5/8	4-3/8	4-3/8	4-1/4	5	1.25	
2 Ton BS	4-3/16	4-5/8	5-1/4	4-3/16	4-5/8	5-1/4	4-3/16	4-5/8	5-1/4	4-3/16	4-5/8	5-1/4	1.50	
3 Ton BS	4-3/16	4-5/8	5-1/4	4-3/16	4-5/8	5-1/4	4-3/16	4-5/8	5-1/4	4-3/16	4-5/8	5-1/4	1.50	
5 Ton BS	4-3/16	5-1/8	6-1/8	4-5/8	5-1/8	6-1/8	4-5/8	5-1/8	6-1/8	4-5/8	5-1/8	6-1/8	1.75	
10 Ton BS	4-3/4	5-1/8	6-1/8	4-3/4	5-1/8	6-1/8	4-3/4	5-1/8	6-1/8	4-3/4	5-1/8	6-1/8	1.50	
20 Ton BS	6-3/4	8	9-3/4	6-3/4	8	9-3/4	6-3/4	8	9-3/4	6-3/4	8	9-3/4	2.615	
25 Ton BS	5-1/2	6-3/4	9-1/2	5-1/2	6-3/4	9-1/2	5-1/2	6-3/4	9-1/2	5-1/2	6-3/4	9-1/2	3.50	
50 Ton BS	7-1/4	7-1/4	10-7/8	7-1/4	7-1/4	10-7/8	7-1/4	7-1/4	10-7/8	7-1/4	7-1/4	10-7/8	4.50	

Note: Dimensions subject to change without notice.