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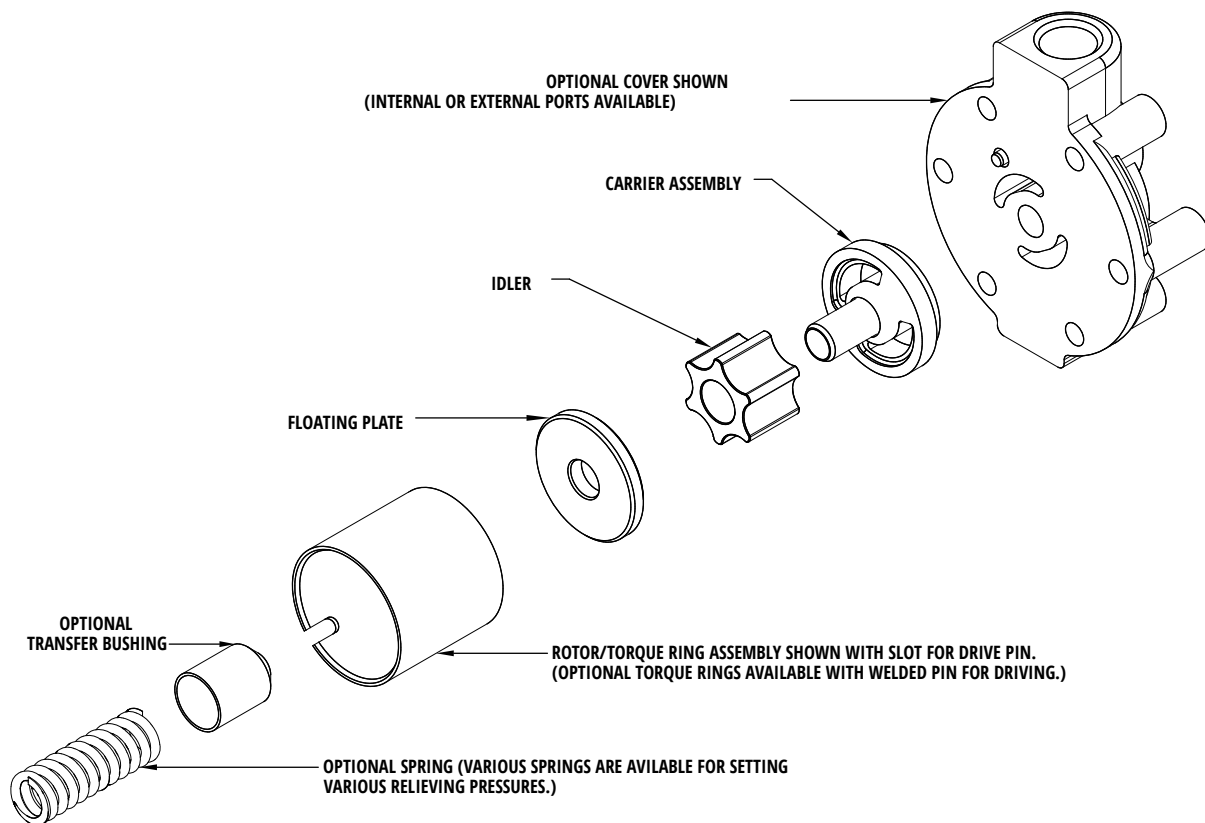
Product Overview

- Pressure to 200 PSI
- Automatic Reversing
- Positive Displacement
- Automatic Pressure Relief
- Designed for OEM built in Applications
- Four Series, Multiple Sizes - 0.13 to 135 GPM
- Configuration 1: Tab/Pin in Torque Ring Mates with Slot in Machinery Drive Shaft
- Configuration 2: Slot in Torque Ring Mates with Tab/Pin in Machinery Drive Shaft
- Pump Consists of Rotor/Torque Rings, Assembly, Idler, Carrier Assembly, and Floating Plate

Options

- Cover - See Pages ()
- Springs and Transfer Bushings - See Pages ()

TR Series Typical Layout

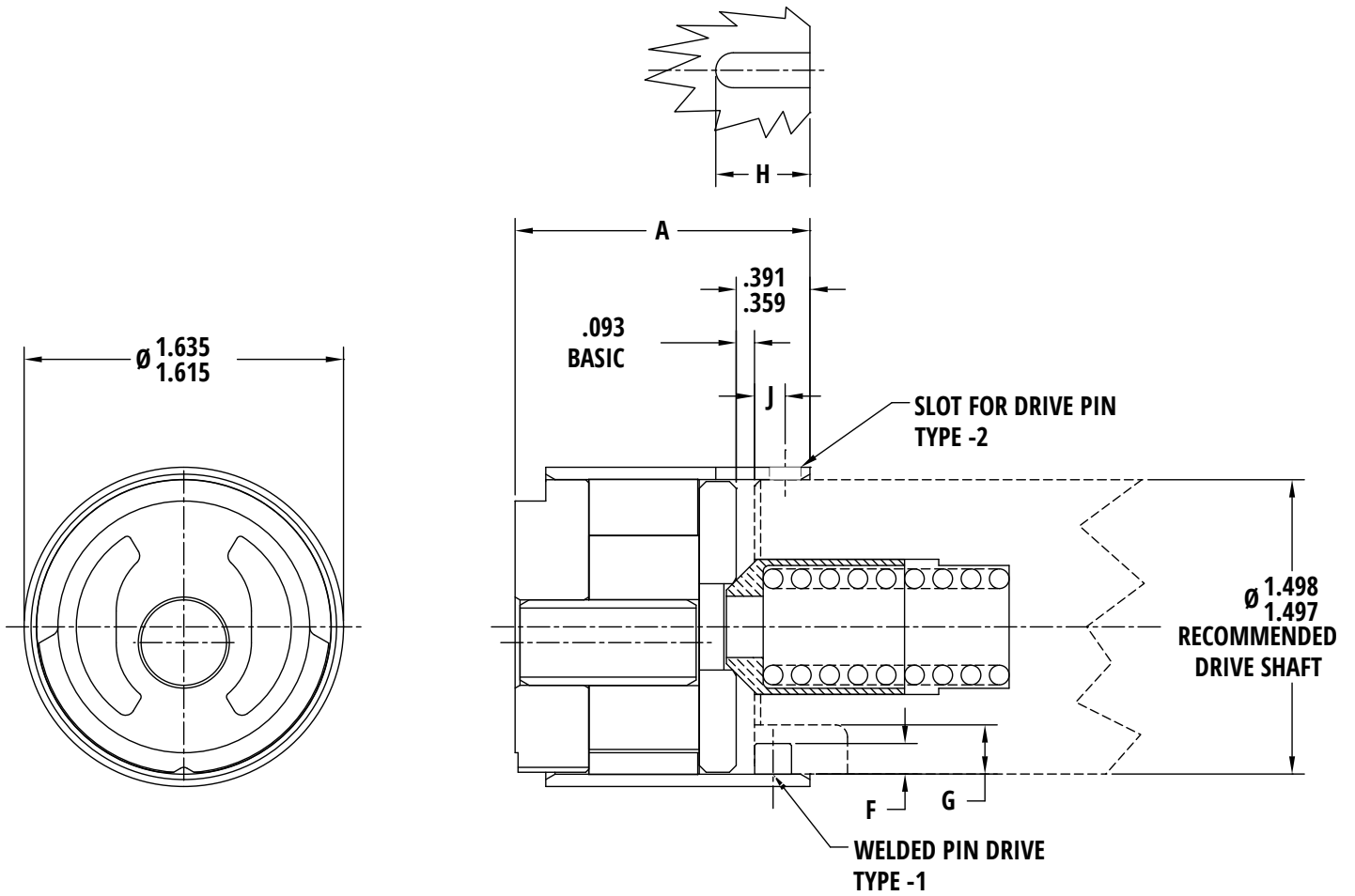


General Pump Operation

In operation all parts of the pump assembly rotate with the drive shaft except the idler gear, idler carrier, and cover. Driven by the rotor assembly, the idler gear turns on the idler pin, and because it has one less tooth than the rotor gear with which it meshes, pumping action is created. The idler carrier is positioned against the cover. When the drive shaft changes rotation, the idler carrier rotates 180° degrees, maintaining the same direction of flow.

The relief valve spring (or pre-compressed spring assembly) keeps all parts of the pumping unit together at less than relief valve settings. When relief pressure is reached the spring compresses and pump clearances increase, allowing oil to bypass between the idler carrier and the gear set, and this oil is relieved externally of the pump.

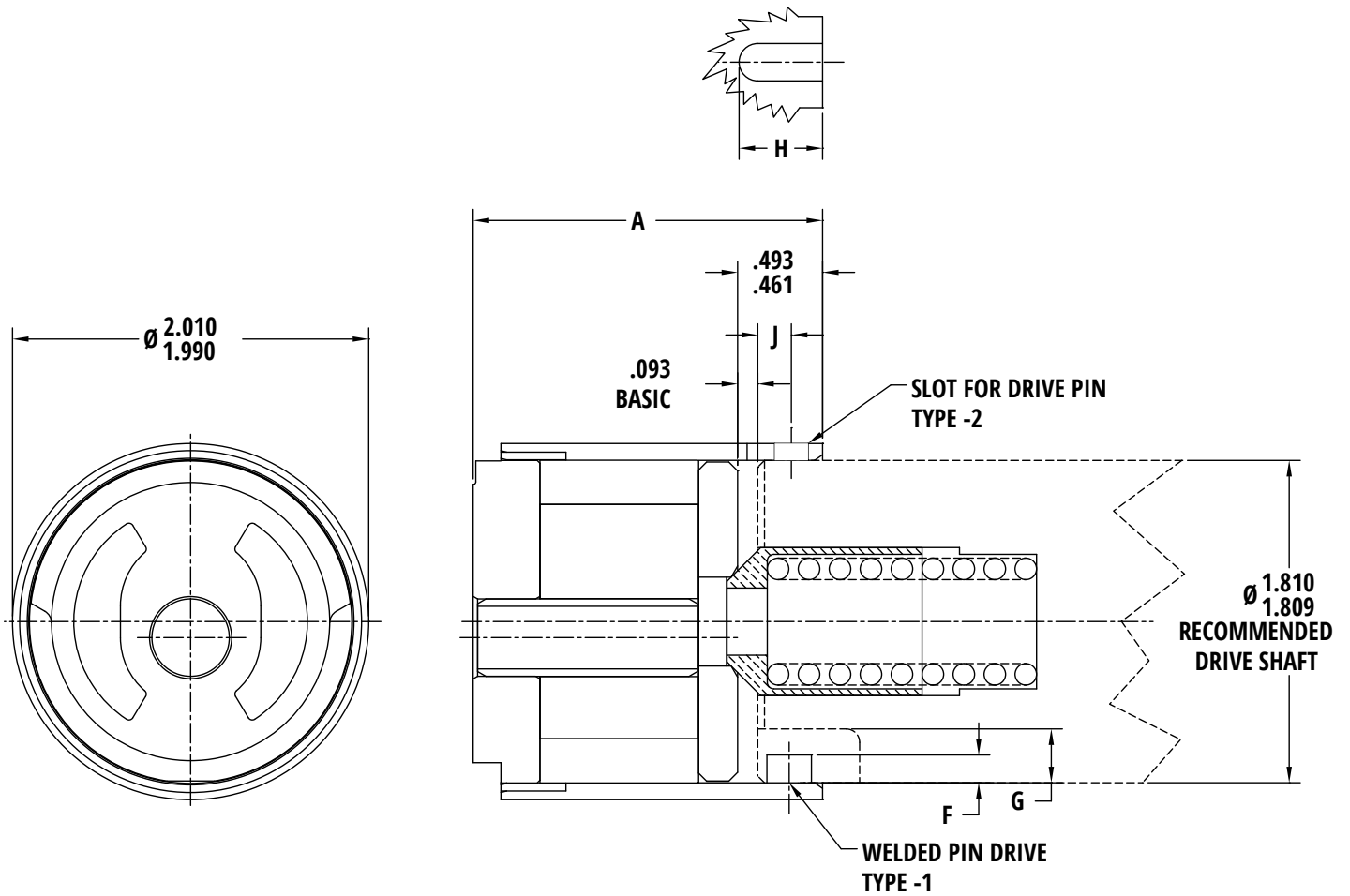
Pump Mounting Dimensions for TRC Model Pumps



MODEL	SIZE	CUBIC IN/REV.	GPM AT 0 PSI			A ± .015	TYPE -1 DRIVE		TYPE -2 DRIVE	
			1200 RPM	1800 RPM	3600 RPM		F	G	H	J
TRC	19	.097	.500	.750	1.500	1.129	.156 X .188 WIDE	.25 X .25 WIDE	.390 X .187 WIDE	.156 - 5/32 PIN
	37	.192	1.000	1.500	3.000	1.313				
	56	.288	1.500	2.250	4.500	1.501				
	75	.384	2.000	3.000		1.688				

Note: Pumps can be used at lower speeds. Capacity in GPM = cu. In/REV. x RPM ÷ 231

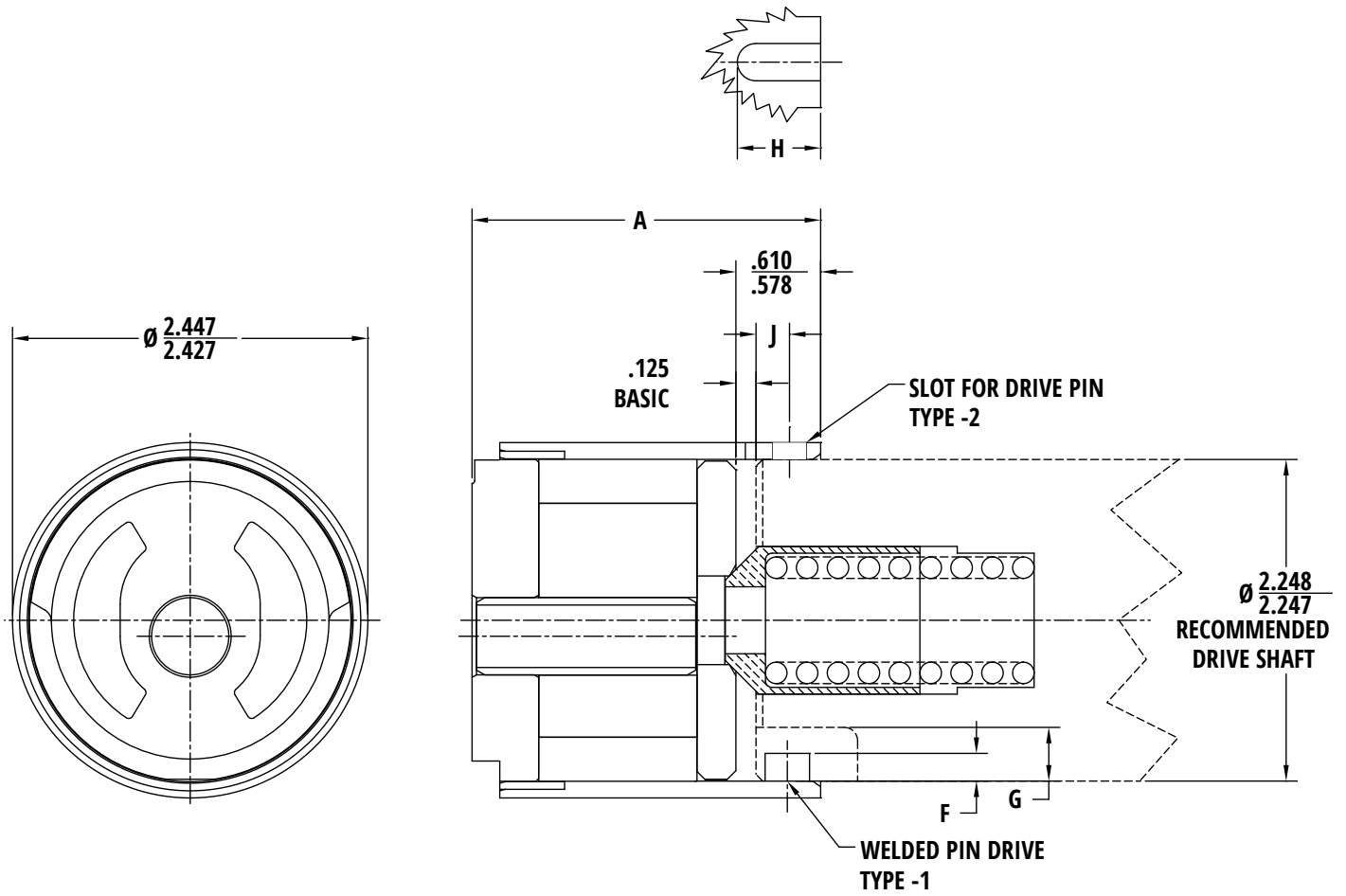
Pump Mounting Dimensions for TRL Model Pumps



MODEL	SIZE	CUBIC IN/REV.	GPM AT 0 PSI			A ± .015	TYPE -1 DRIVE		TYPE -2 DRIVE	
			1200 RPM	1800 RPM	3600 RPM		F	G	H	J
TRL	18	.128	.666	1.000	2.000	1.249	.172 X .234 WIDE	.281 X .312 WIDE	.468 X .210 WIDE	.188 -3/16 PIN
	31	.224	1.166	1.750	3.500	1.382				
	54	.385	2.000	3.000	6.000	1.606				
	89	.642	3.333	5.000		1.962				

Note: Pumps can be used at lower speeds. Capacity in GPM = cu. In/REV. x RPM ÷ 231

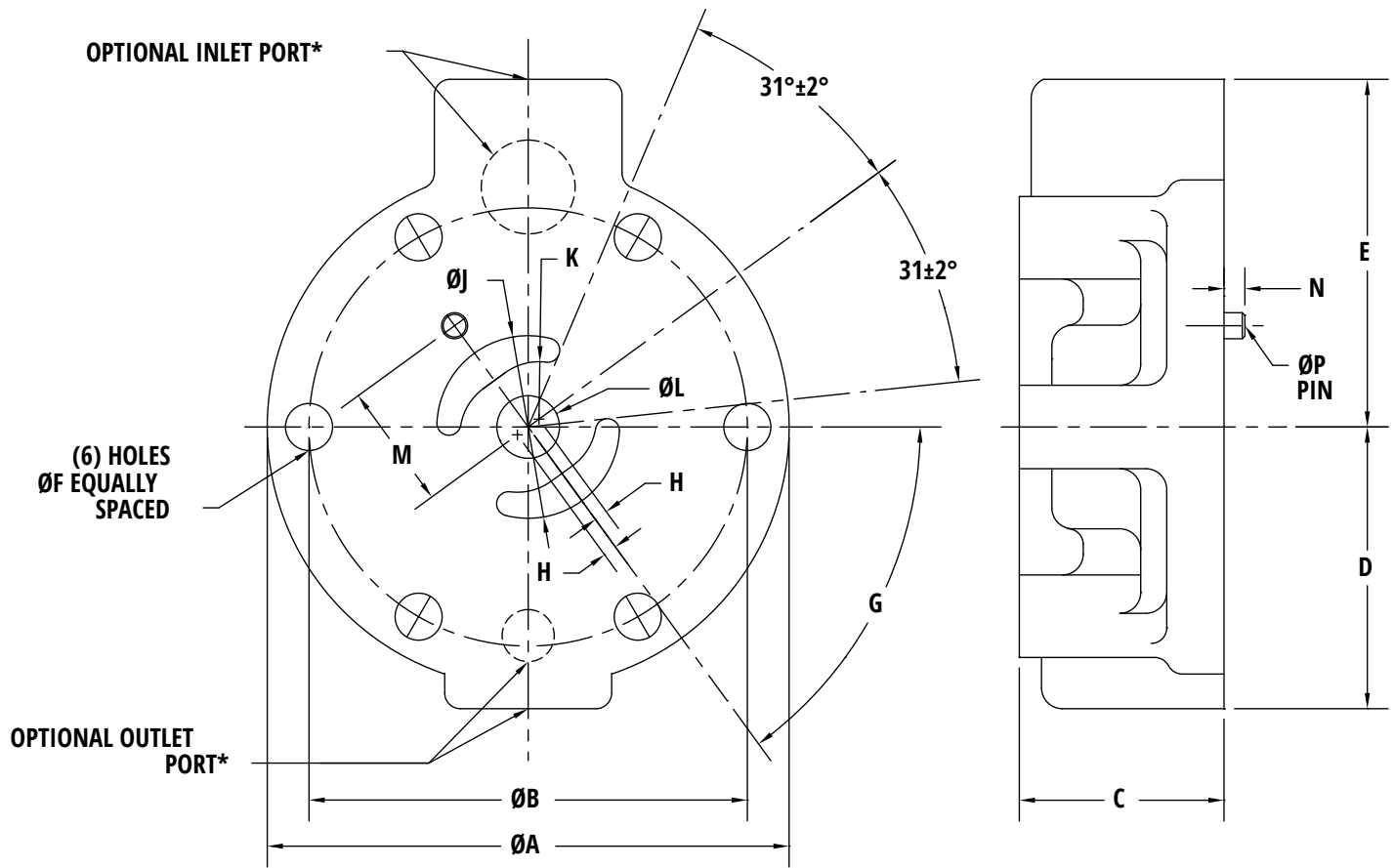
Pump Mounting Dimensions for TRS Model Pumps



MODEL	SIZE	CUBIC IN/REV.	GPM AT 0 PSI			A $\pm .015$	TYPE -1 DRIVE		TYPE -2 DRIVE	
			1200 RPM	1800 RPM	3600 RPM		F	G	H	J
TRS	50	.58	3.00	4.500	9.000	1.844	.220 X .297 WIDE	.312 X .375 WIDE	.625 X .272 WIDE	.250 -1/4 PIN
	75	.87	4.50	6.750	13.500	2.094				
	90	1.16	6.00	9.000		2.344				
	92	1.45	7.50	11.250		2.594				

Note: Pumps can be used at lower speeds. Capacity in GPM = cu. In/REV. x RPM \div 231

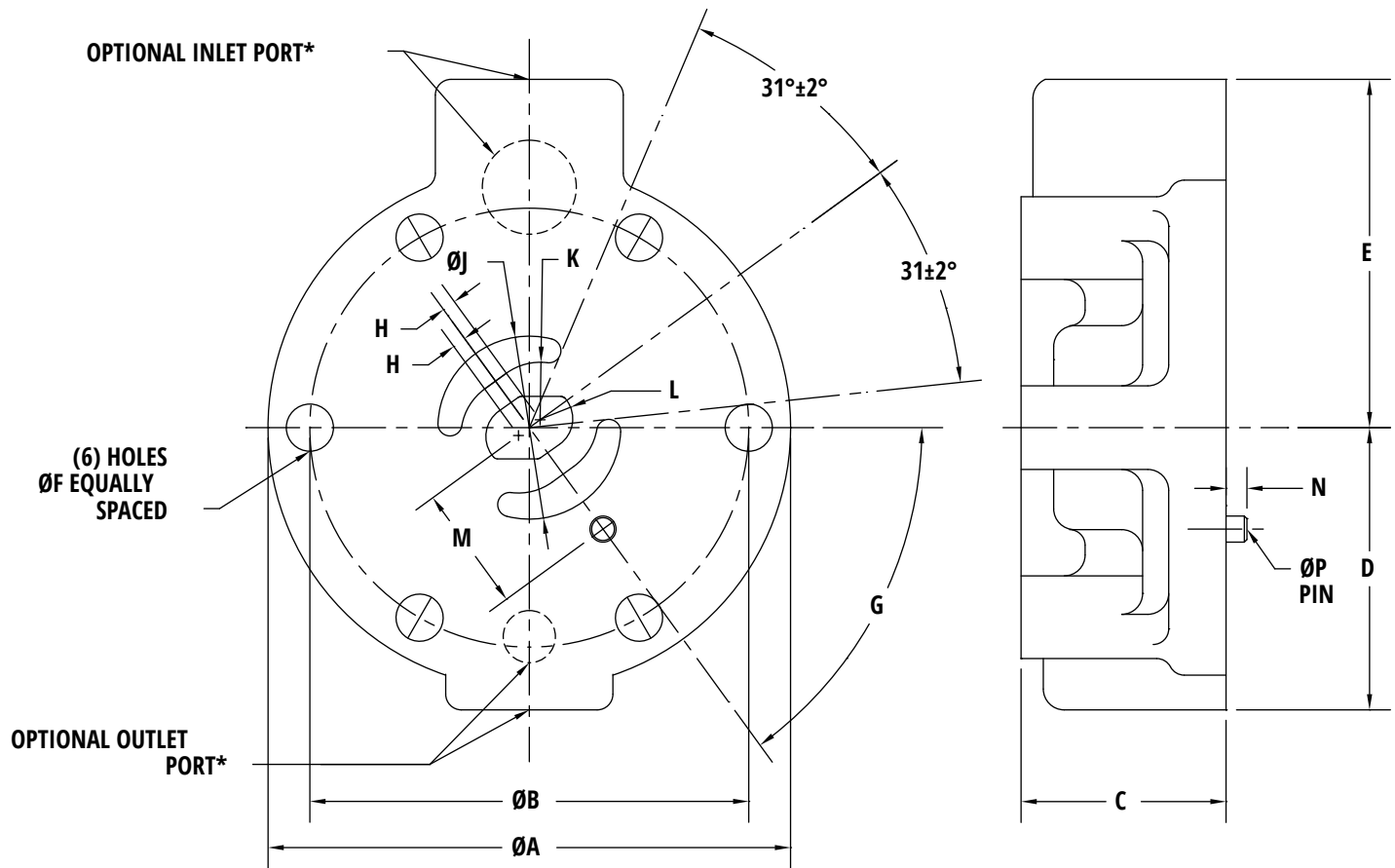
Cover Mounting Dimensions for (TRC & TRS) Models



Model	A ± .030	B ± .005	C ± .015	D ± .030	E ± .030	F BASIC	G BASIC	H ± .010	J BA- SIC	K BASIC	L BASIC	M ± .005	N + .010	P BASIC
TRC	3.125	2.625	1.125	1.688	2.094	.272	54°	.080	1.094	.344	.375	.750	.125	5/32
TRS	4.375	3.625	1.625	2.469	2.969	.397	60°	.120	1.625	.515	.562	1.125	.170	1/4

Note: Combinations of drilled holes to communicate with the cored openings for internal or external ports are available. Covers with cored inlet port also available – please contact factory.

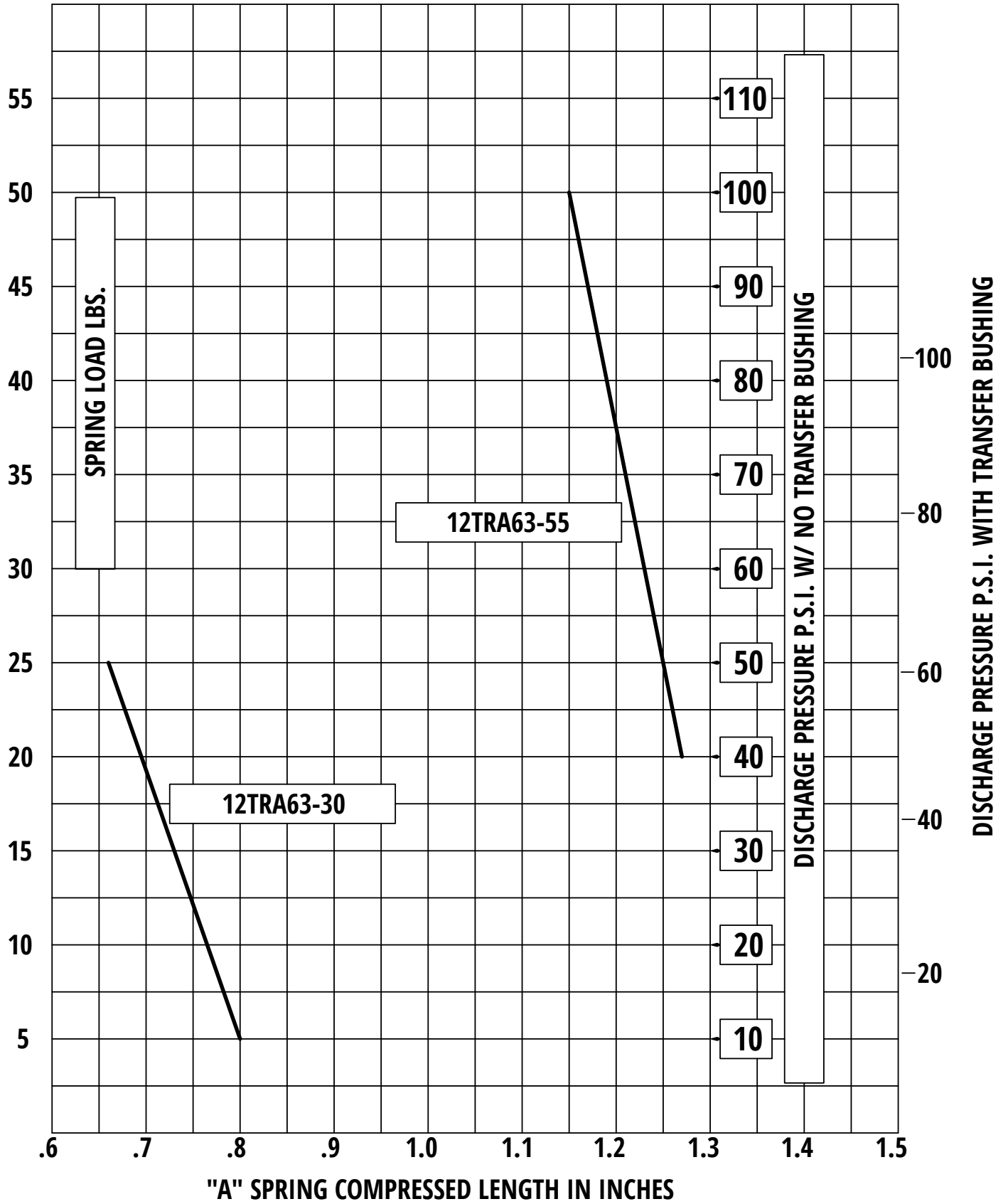
Cover Mounting Dimensions for TRL Models



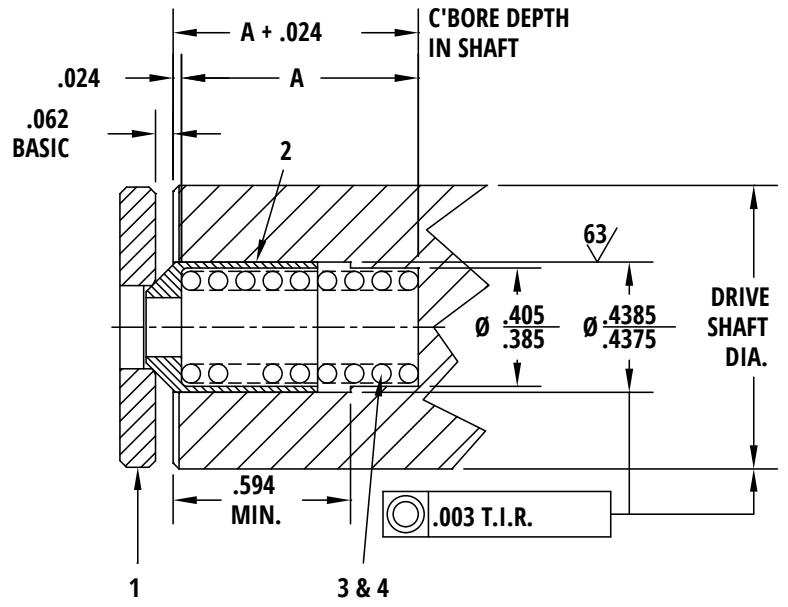
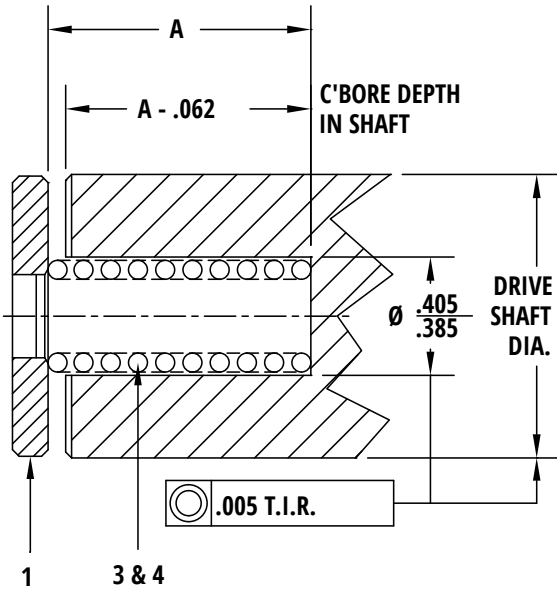
Model	A ± .030	B ± .005	C ± .015	D ± .030	E ± .030	F BASIC	G BASIC	H ± .010	J BA- SIC	K BASIC	L BASIC	M ± .005	N + .010	P BASIC
TRL	3.625	3.000	1.281	2.000	2.250	.332	54°	.090	1.312	.394	.187	.906	.125	3/16

Note: Combinations of drilled holes to communicate with the cored openings for internal or external ports are available. Covers with cored inlet port also available – please contact factory.

Spring Data Chart - TRA Models

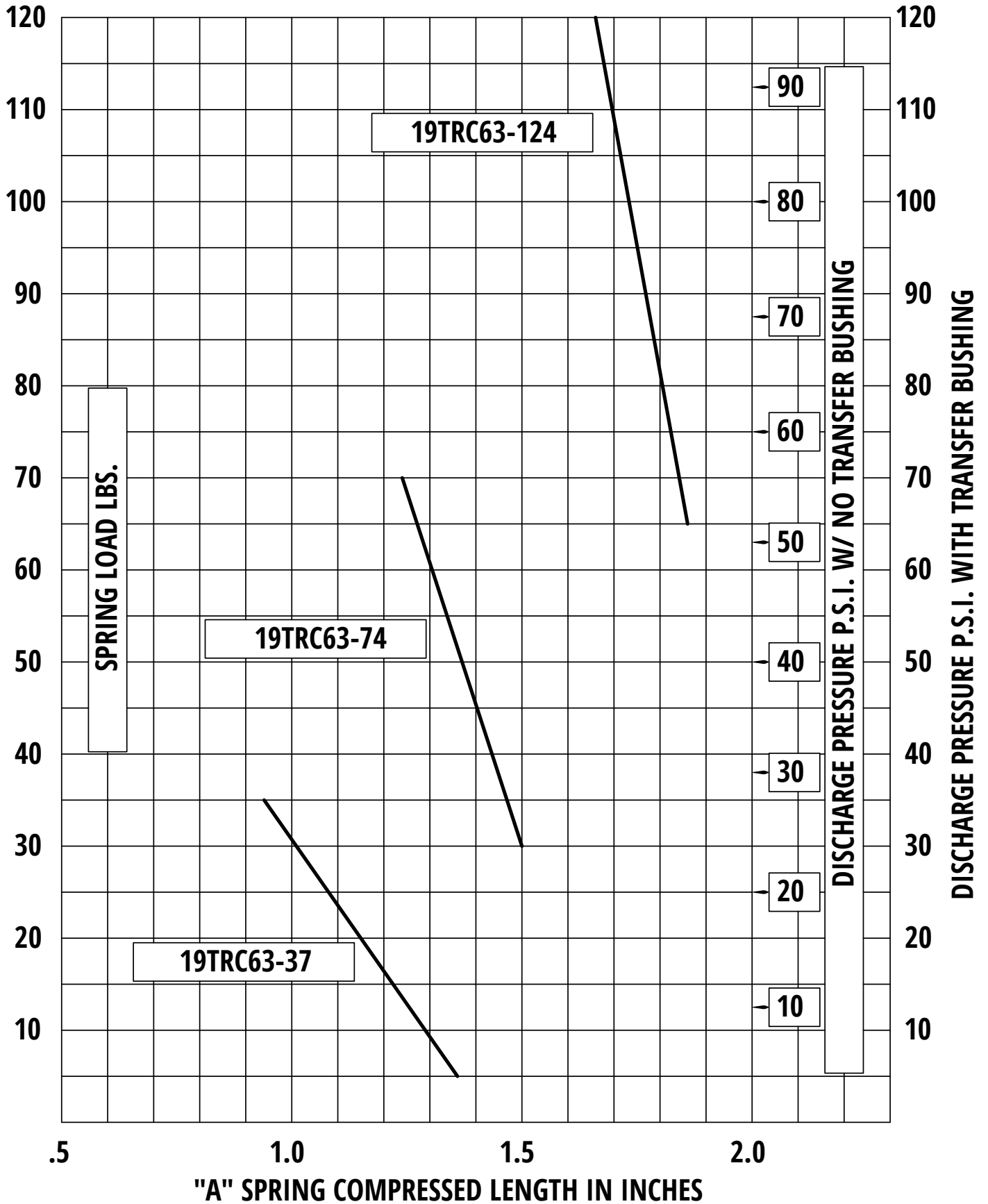


TRA Pump Dimensions

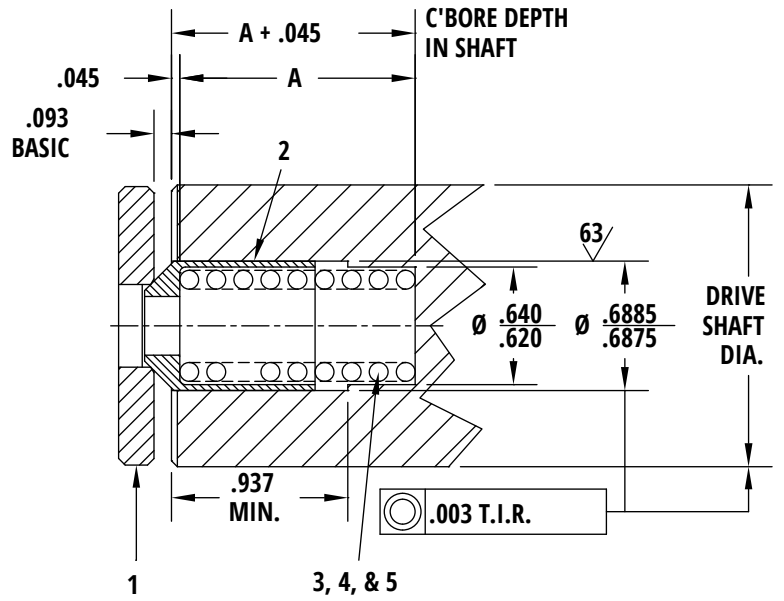
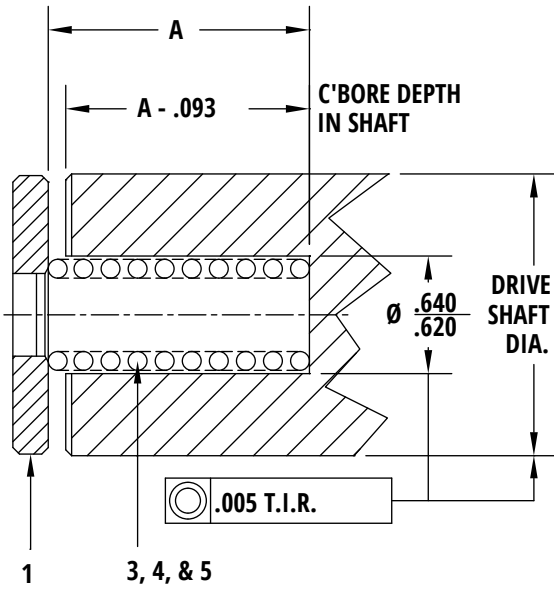


Ref No.	Part Name	Part No.
1	Floating Plate	12TRA25
2	Transfer Bushing	12TRA58
3	Spring #55	12TRA63-55
4	Spring #30	12TRA63-30

Spring Data Chart - TRC Models

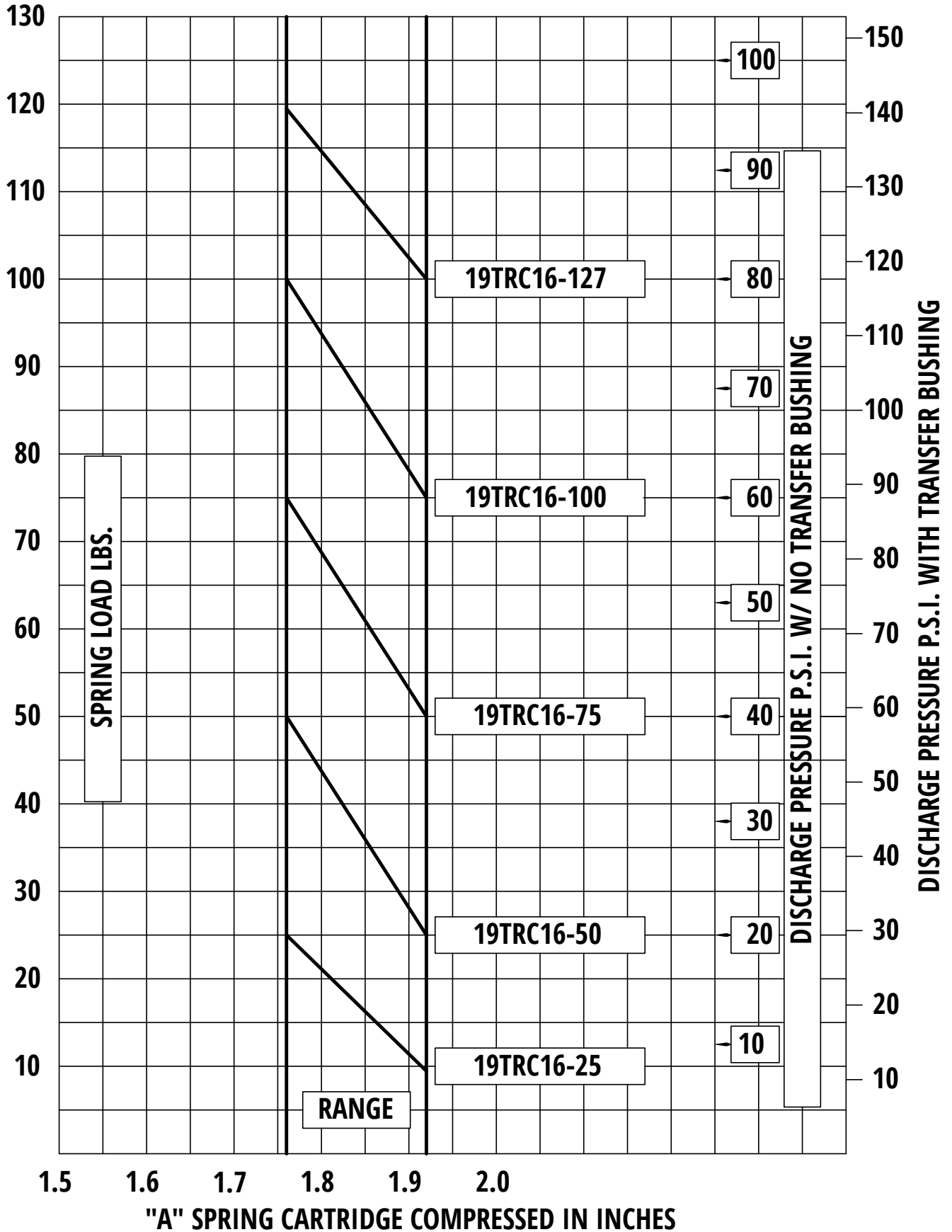


TRC Pump Dimensions

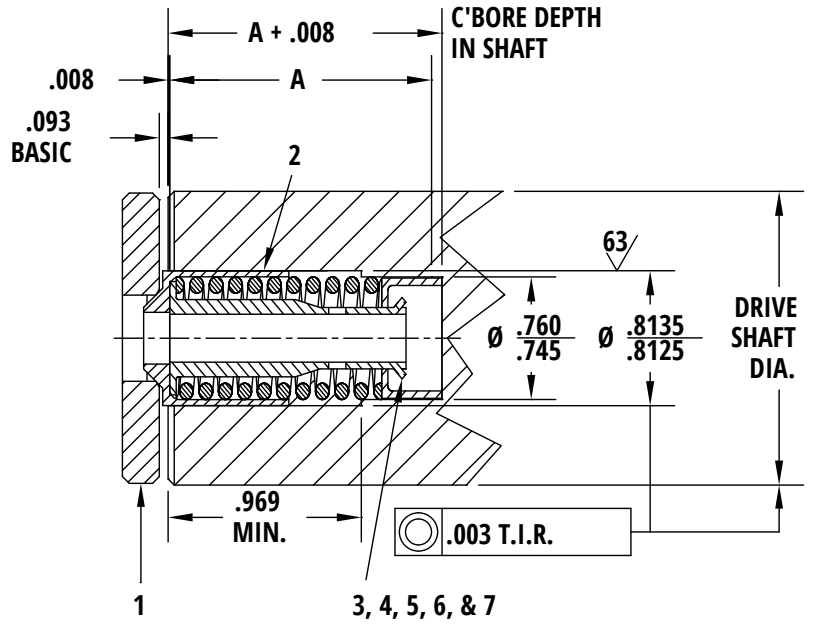
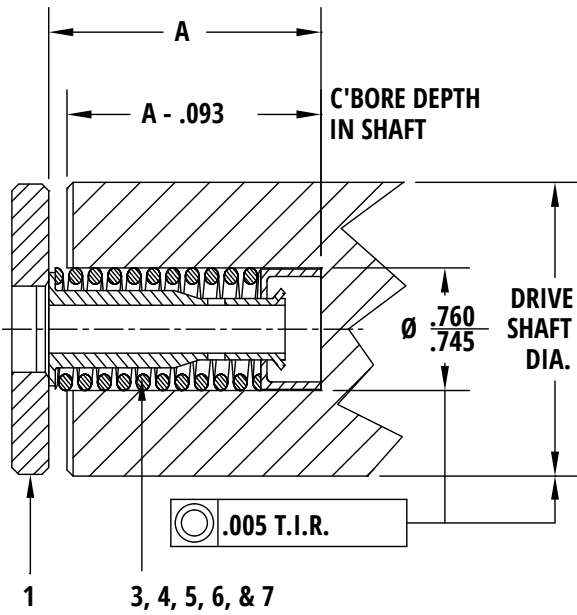


Ref No.	Part Name	Part No.
1	Floating Plate	19TRC25
2	Transfer Bushing	19TRC58
3	Spring #37	19TRC63-37
4	Spring #74	19TRC63-74
5	Spring #124	19TRC63-124

Spring Data Chart - TRC Pumps (Precompressed Spring Assemblies)

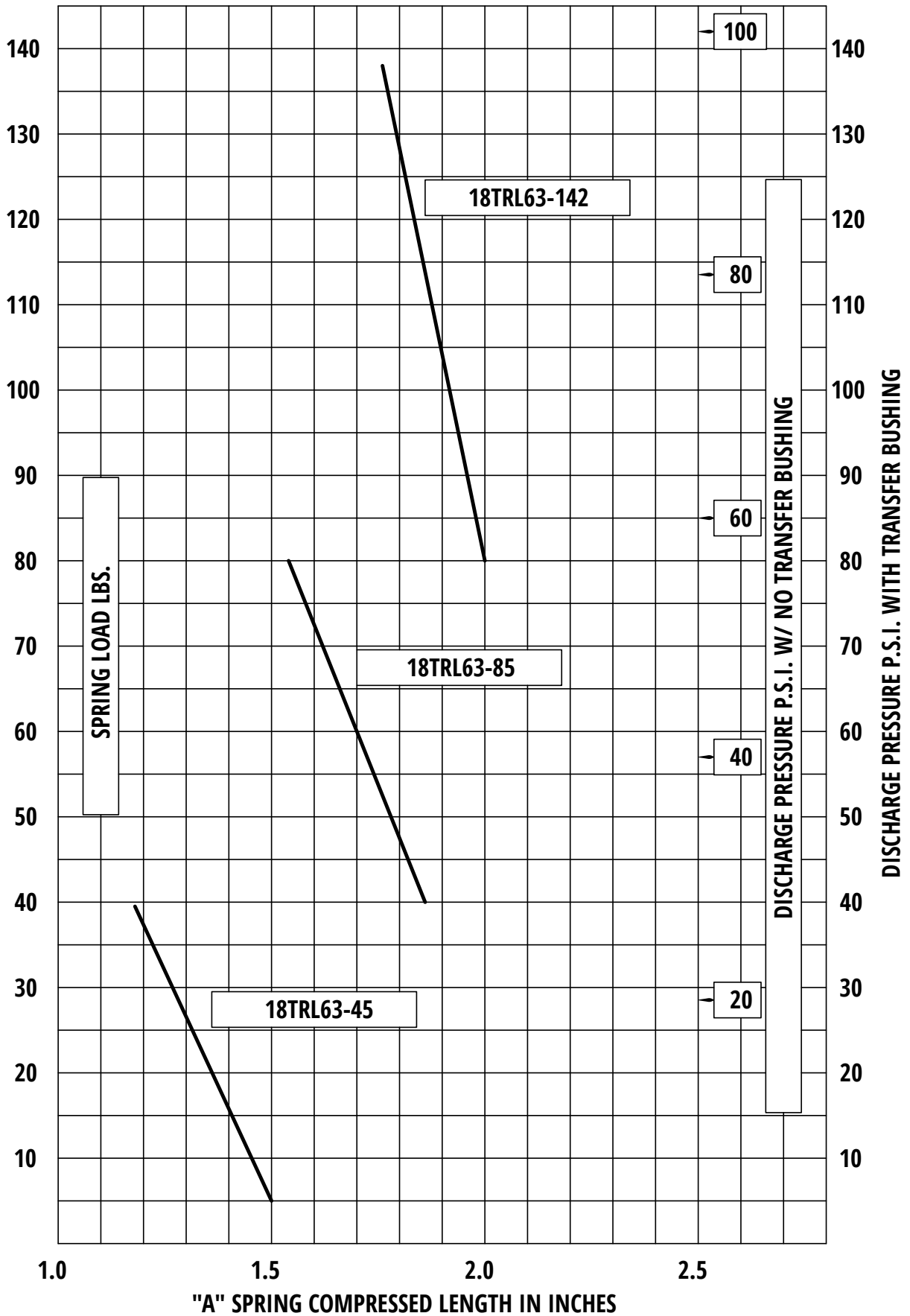


TRC Pump Dimensions (Precompressed Spring Assemblies)

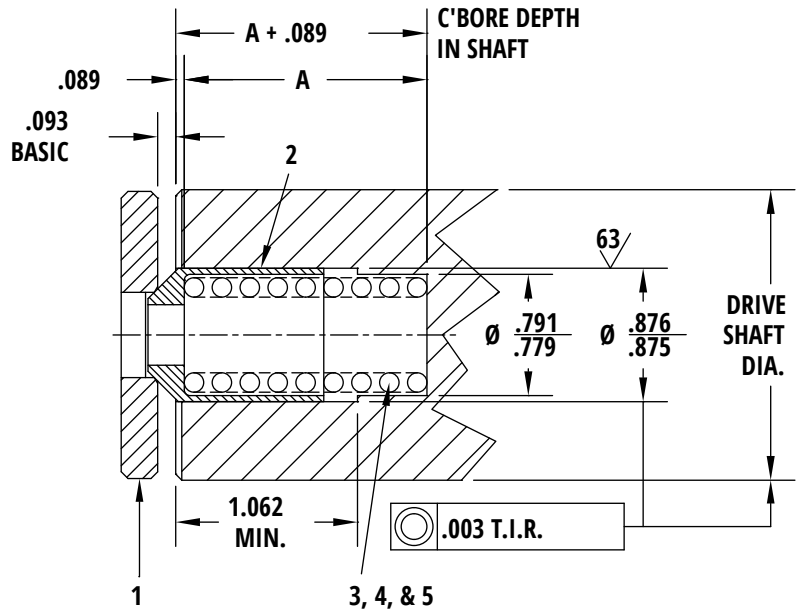
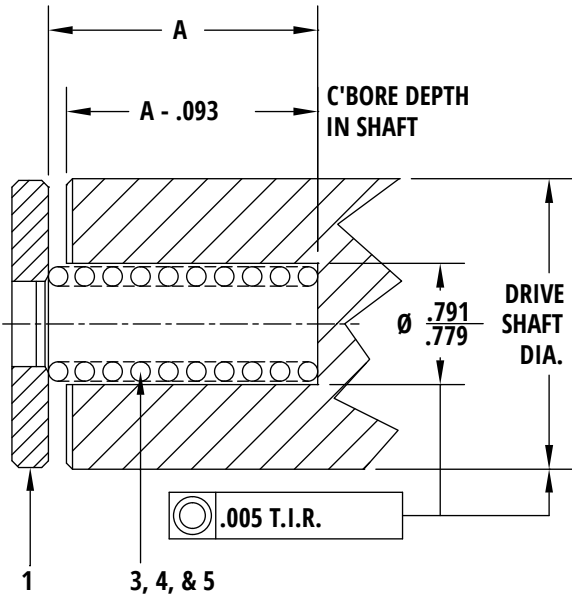


Ref No.	Part Name	Part No.
1	Floating Plate	19TRC25
2	Transfer Bushing	19TRC58-A
3	Spring Assembly #25	19TRC16-25
4	Spring Assembly #50	19TRC16-50
5	Spring Assembly #75	19TRC16-75
6	Spring Assembly #100	19TRC16-100
7	Spring Assembly #127	19TRC16-127

Spring Data Chart - TRL Models

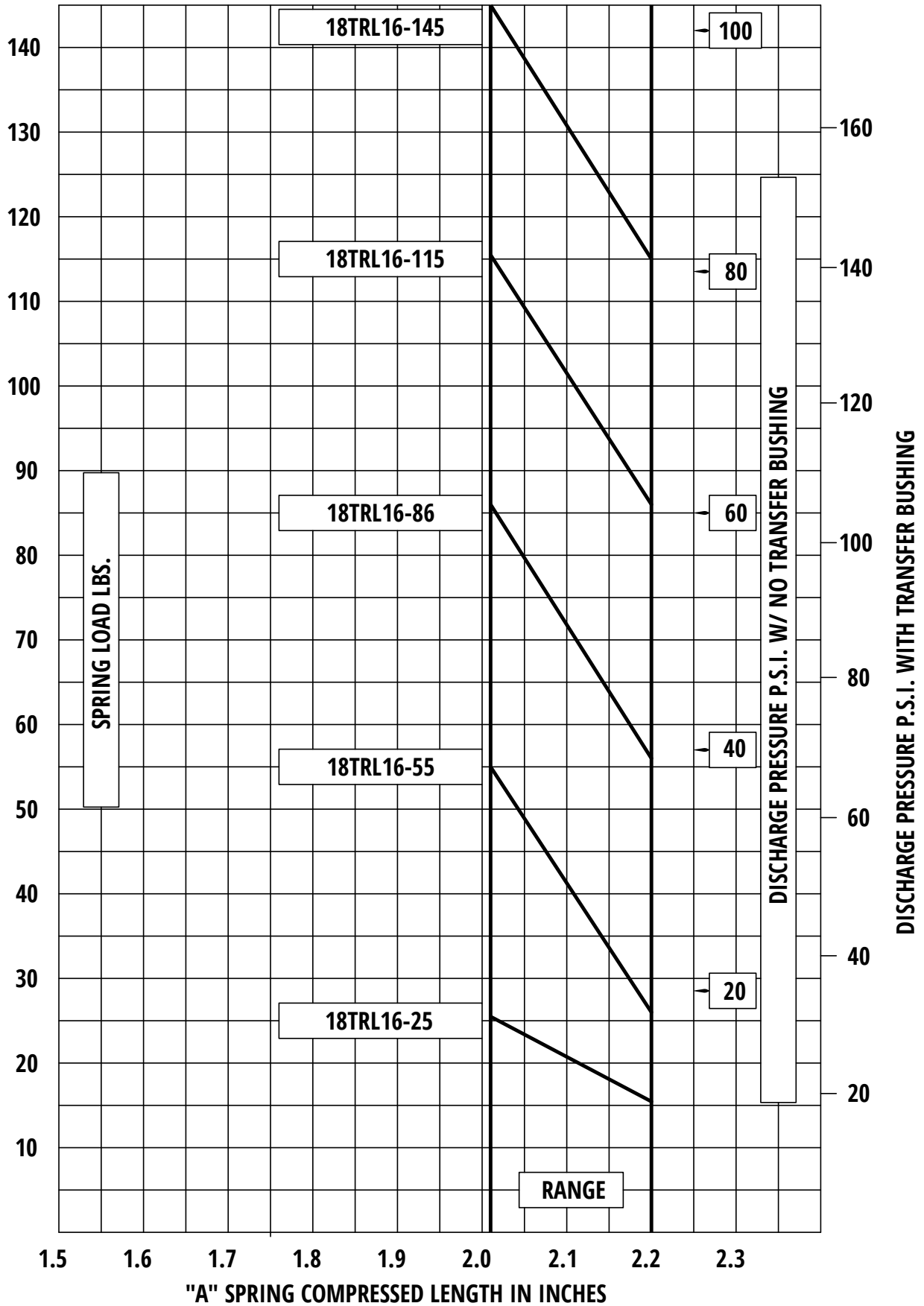


TRL Pump Dimensions

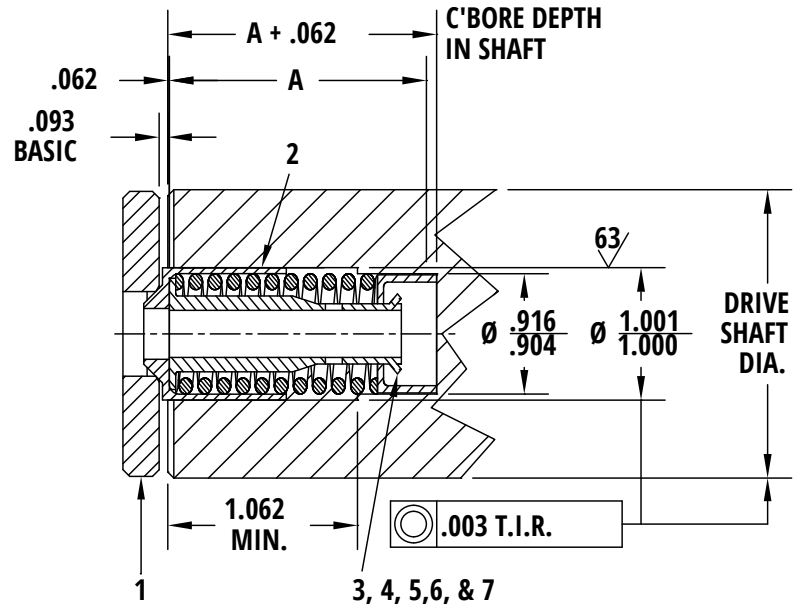
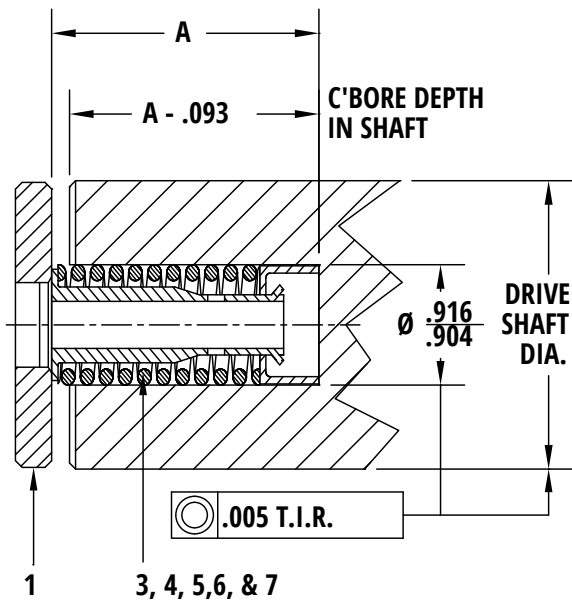


Ref No.	Part Name	Part No.
1	Floating Plate	18TRL25
2	Transfer Bushing	18TRL58
3	Spring #45	18TRL63-45
4	Spring #85	18TRL63-85
5	Spring #142	18TRL63-142

Spring Data Chart - TRL Pumps (Precompressed Spring Assemblies)

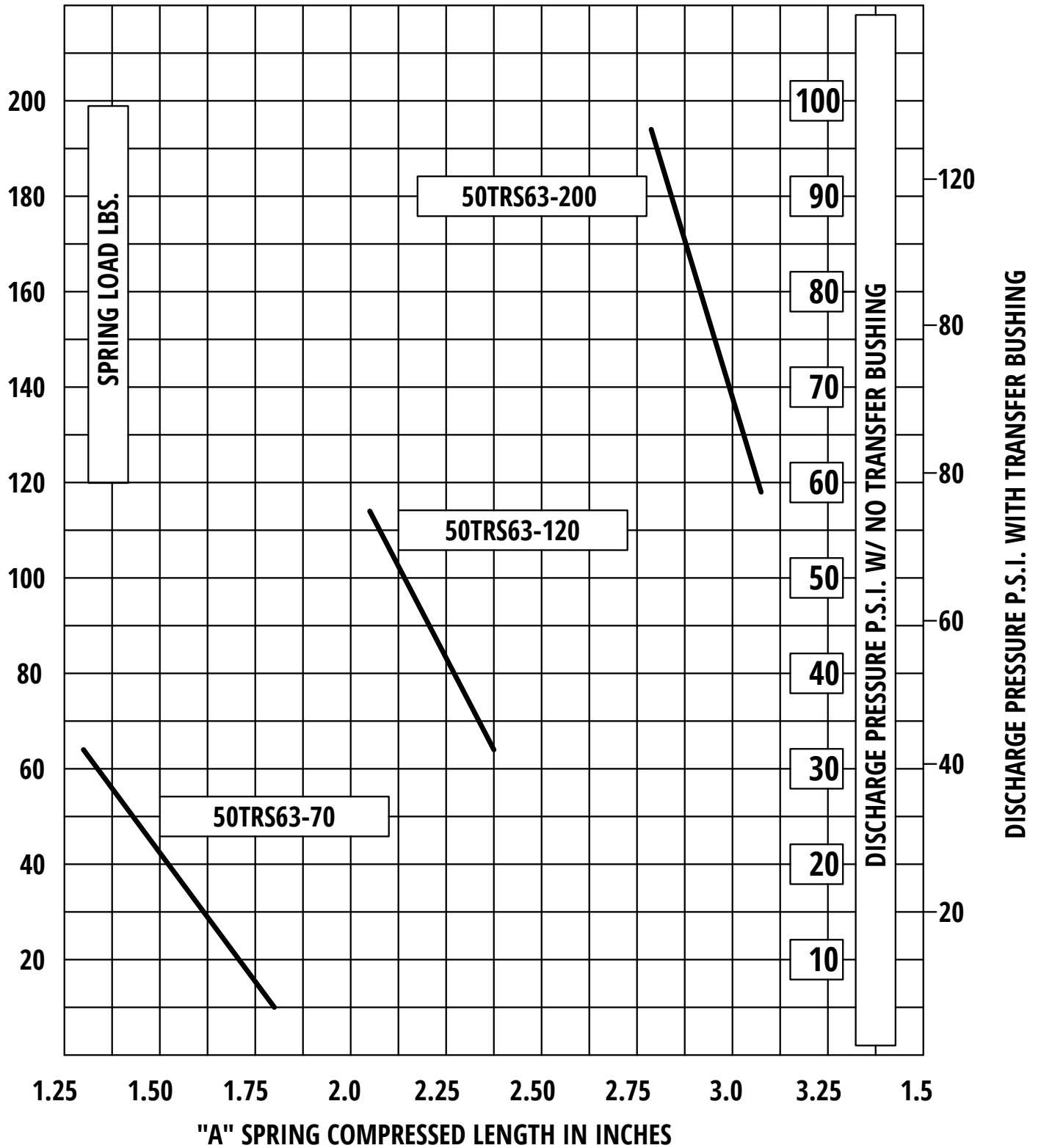


TRL Pump Dimensions (Precompressed Spring Assemblies)

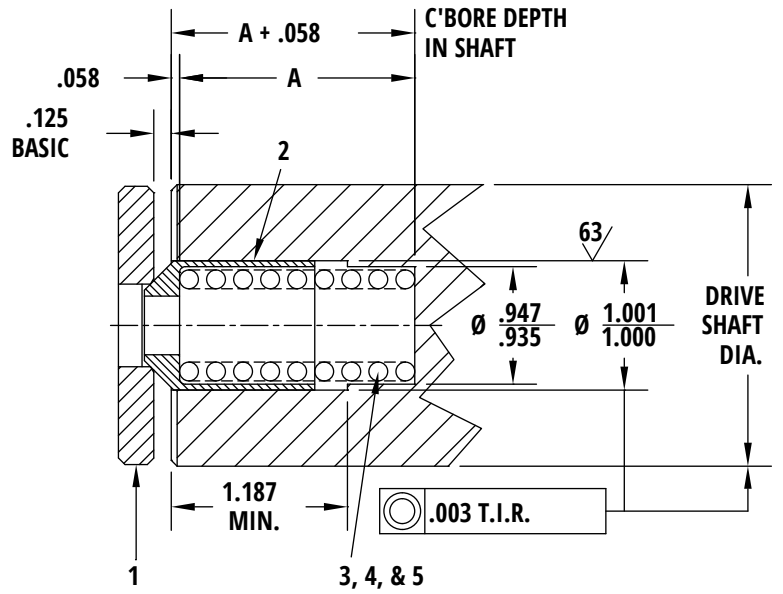
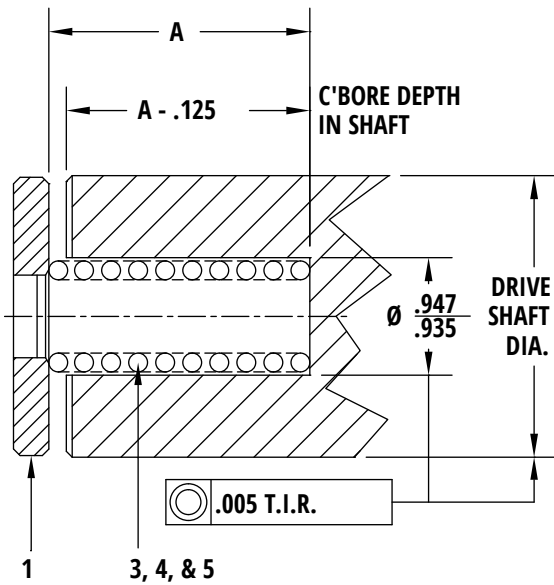


Ref No.	Part Name	Part No.
1	Floating Plate	18TRL25
2	Transfer Bushing	18TRL58-A
3	Spring Assembly #25	18TRL16-25
4	Spring Assembly #55	18TRL16-55
5	Spring Assembly #85	18TRL16-86
6	Spring Assembly #115	18TRL16-115
7	Spring Assembly #145	18TRL16-145

Spring Data Chart for TRS Models



TRS Pump Dimensions



Ref No.	Part Name	Part No.
1	Floating Plate	50TRS25
2	Transfer Bushing	50TRS58
3	Spring #70	50TRS63-70
4	Spring #120	50TRS63-120
5	Spring #200	50TRS63-200