NEW! DESIGNS

UNI-LIFT®

LINEAR ACTUATORS

POW-R-JAC™ ENGINEERED SOLUTIONS

UC-107A

(800) 323-9114
www.tkunilift.com

UNI-LIFT®

www.tkunilift.com

CONFIGURATOR

Need A Quick & Easy Way To Solve Your Jack Problems? Let The Uni-Lift Configurator Do The Work For You!

A VIRTUAL ONLINE ENGINEER

The **Uni-Lift Configurator** walks you through a step by step process to properly select the type, ratio, and size of the machine or ball screw jack for your application. The **Uni-Lift Configurator** calculates the torque and horsepower requirements for all your system needs.

The Uni-Lift Configurator will:

- Quickly optimize your jack and system requirements with easy to answer questions.
- Save hours of time performing manual calculations.
- Immediately print a top level drawing and configuration report to present to your customer.
- Allow you to download scaled 2D and 3D drawings from the Configurator.
- Email drawings and technical specifications to your customer eliminating any confusion with the jack design.
- Support imperial and metric units for global application use.
- Allow you to submit your design to Uni-Lift via the web for quotation.

www.tkunilift.com

★ ★ ★ ★ ★ ★ ★

UNI-LIFT® CONFIGURATOR

www.tkunilift.com

TO ACCESS THE CONFIGURATOR FROM THE UNI-LIFT WEBISTE

1. FROM THE UNI-LIFT HOME PAGE CLICK ON THE CONFIGURATOR LINK.
2. FIRST TIME USERS MUST REGISTER WITH USER NAME AND PASSWORD.
3. AN EMAIL CONFIRMING YOUR VALID REGISTRATION WILL BE SENT WITH A LINK TO THE CONFIGURATOR FOR NEWLY REGISTERED USERS.
4. YOU CAN ACCESS A CONFIGURATOR TUTORIAL FROM THE UNI-LIFT HOME PAGE AT www.tkunilift.com.

LINK TO CONFIGURATOR

Click the Configurator link from the home page to access the log-in screen.

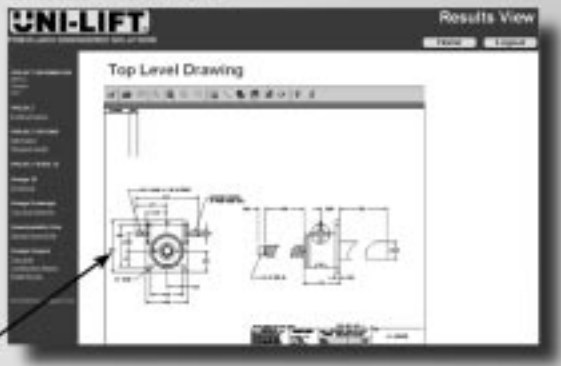
EASY TO USE GRAPHIC INTERFACE

The easy to answer questions and graphical interface replaces the solving of complicated formulas to configure your jacking system.

GLOSSARY OF TERMS

Simply click any underlined word for a detailed explanation of the topic. A complete glossary of terms is available throughout the configuration process.

DOWNLOADABLE DRAWINGS



Email or download scaled 2D (DXF) and 3D (STEP) CAD files for insertion into your customer's drawings.

UNI-LIFT®
2525 Gardner Road
Broadview, IL 60155
TEL: (800) 323-9114 (USA only)
(708) 865-1500 (Outside USA)
FAX: (708) 865-0894

www.tkunilift.com

TABLE OF CONTENTS

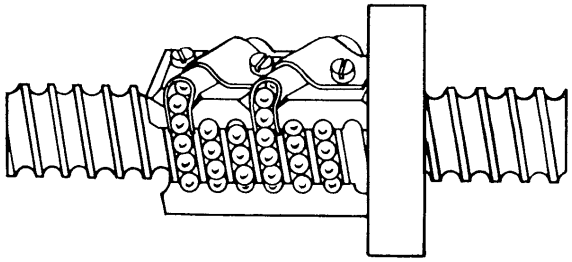
All Uni-Lift Product dimensions and specifications are subject to change without notice. All product drawings are not to scale. Please consult your Uni-Lift Representative for verification of critical dimensions & specifications, or call 1-(800) 323-9114.

UNI-LIFT "LIFETIME" WARRANTY

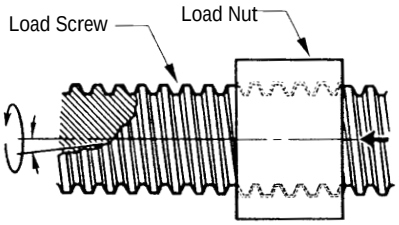
All Uni-Lift Products are under warranty against defects in material and workmanship. Any Uni-Lift Product proven defective will be repaired or replaced at no charge. Contact your authorized Uni-Lift Service Center or call 1-(800)-323-9114.

DESIGN CONFIGURATIONS

BALL SCREW



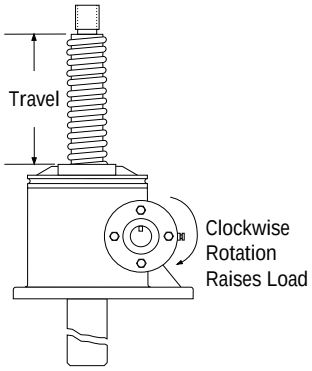
MACHINE SCREW



CONFIGURATIONS

Standard Design (Translating Screw)

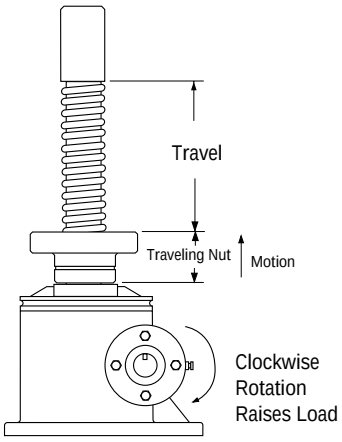
For standard design units, the load screw translates through the unit to push or pull when the screw is fixed to the load and is externally restricted to prevent rotation. To determine motor sizes, input torques and column strength, see the system design calculations in the System Design section.



Rotating Design (Traveling Nut)

The load screw of a rotating design unit is fixed to the worm gear, causing the screw to rotate. A flanged nut travels along the load screw to push or pull the load. The load must be fixed to the traveling nut and restricted from rotation in order to produce linear motion.

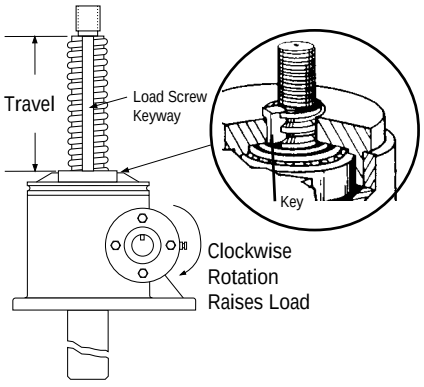
The plain end and traveling nut are pre-assembled on these units. The plain end is designed to fit a standard pillow block bearing to provide support and alignment for the rotating load screw.



Keyed Design

In applications where rotation cannot be prevented externally, the keyed design jack should be used. These Uni-Lifts are keyed internally to prevent rotation of the screw to produce linear motion.

NOTE: For keyed applications where operating loads are expected to exceed 25% of rated capacity, contact factory for technical assistance. Contact the factory for recommendations where long travels or high screw velocities are required.



Frequently Asked Questions (FAQ's) about Uni-Lift Actuators:

1. What is the difference between a Machine Screw Actuator and a Ball Screw Actuator?

The machine screw actuator uses an acme threaded screw that is typically self-locking, meaning it will hold its position without a brake. Ball screw actuators use ball screws to convert rotary motion to linear movement, and require 1/3 the horsepower compared to a machine screw actuator. Due to the efficiency of the ball screw, brakes must be used to stop and hold the load screw in position. Brakes are also recommended for use on any actuator if vibration is present.

2. Why use a machine screw vs. a ball screw actuator?

One type of actuator is usually better suited to the operating conditions. Typically, fast operating speeds and frequent cycle times may be more suited to a ball screw actuator, particularly as the load approaches the rated capacity of the actuator. High load at slower speeds, less frequent cycles and the ability to hold the load in position when the system is at rest may be better suited for a machine screw actuator.

3. What is the input torque requirement for a given output load?

The input torque for a specific load and actuator model is calculated using the technical specifications and formulas in the catalog. The input torque (inch pounds) is listed for each actuator model in the Technical Specifications Section titled "Torque Required to Lift One Pound".

4. How do I operate the actuator?

Most actuators are operated by electric motor, but air motors and hydraulic motors can also be used. Handwheels can be used for manual operation.

5. How do I size motors and calculate required horsepower?

The horsepower requirement for Uni-Lift is calculated using the actuator input torque to move the load times the input RPM to the actuator divided by the constant of 63025.

6. Can I use a larger motor than required?

Yes, but it is not recommended. The actuator or system components could be damaged if an oversize motor is used. Electronic position switches or travel limit controls must be used for each end of travel to stop the motor. If using solid mechanical stops, actuator components can be subject to shock load conditions and oversize motors can cause catastrophic failure of stops and other components.

7. What is TPI?

TPI stands for turns per inch and is listed in the Technical Specifications for each actuator model. The value associated with TPI is the number of revolutions required to the input shaft to move the load one inch. This is calculated by dividing the actuator ratio by the lead of the load screw.

8. How do I stop the actuator at the travel limits?

Limit switches or other controls must be used to shut off the motor when the actuator has reached its full extended or retracted position. Solid stops are not recommended. Their continued use can cause severe damage to the actuator. Uni-Lift offers, as an option, a standard rotary limit switch for this purpose. Other electronic devices include Encoders and Linear Position Transducers and can also be provided by Uni-Lift.

9. Can multiple actuators be used in a system?

Yes, but do not exceed 300% of the rated input torque for a given actuator. Use the standard catalog formulas to determine input torque and motor size.

10. Can different size actuators be used in the same system?

Yes, as long as the input turns for 1 inch of travel are equal. This is sometimes done to accommodate varying load conditions.

FREQUENTLY ASKED QUESTIONS

11. What is the system efficiency?

2 actuator system: 95% 3 actuator system: 90%
4-actuator system: 86% 6 actuator system: 82%
Right angle gearbox efficiency is 95%
Helical Gear Reducers: Single reduction 98.5%
Double reduction 97%
Worm Gear Reducers = $\frac{\text{Horsepower out x 100}}{\text{Horsepower in}}$

12. What is the maximum input speed?

Most Uni-Lift units can be run at 1800 RPM (some run up to 2587 RPM). The catalog sizing procedure correlates the Load vs. Input RPM and Duty Limits and Cycle Times. A gear motor, Helical Gear Reducer, or a Worm Gear Reducer is used to reduce the input RPM to the actuator to provide the required travel speed of the load screw (load screw velocity). Many Uni-Lifts can be driven directly by 1800, 1150 and 900 RPM motors. Motors and reducers are available mounted directly to many Uni-Lift models.

13. Can standard Uni-Lift actuators be used for continuous duty?

Yes. The standard catalog sizing procedure includes the formula for determining the duty limits for each actuator model. This unique feature allows you to calculate the duty cycle limits of each Uni-Lift model for your application.

14. What is the duty cycle?

Duty cycle is the time it takes the actuator to heat up under a given set of operating conditions, limited to a maximum temperature of 180° F.

15. What causes heat build up in the actuator?

The actuator is a mechanical gearbox assembly. The friction of the gears, load screw, bearings and seals generate heat while the actuator is operating. The combination of travel, loading, and input speeds all affect the temperature rise of the actuator. Uni-Lift sizing calculations take these variables into account to insure that you select the right actuator model for your application.

16. What is the load screw capacity and travel?

This is based on the relationship of the screw diameter and the length. Screws in tension are rated for the full capacity of the actuator, regardless of length, providing they do not rotate faster than the critical speed. For screws in compression, capacity is limited by the load screw's column strength. The column strength of a screw is reduced as the screw gets longer. Use the maximum extended screw length (ESL) when using the Column Buckle Charts to determine load screw capacity.

17. How do I determine the full-extended screw length?

The Extended Screw Length (ESL) is normally equal to the travel. Allowances must be added for the closed height of a boot and the addition of stop nuts or special closed heights. These allowances increase the length of the screw. For inverted actuators, the thickness of the mounting structure must also be included. This total length (ESL) should be used when determining the column load capacity of the actuator.

18. Should the load being positioned be guided?

It is highly recommended that the load be guided; however, it is not necessary. A guided system will provide more column stability and allow longer load screw travel. Column length is greatly reduced on unguided systems. External load forces common with unguided systems are detrimental to the life and operation of the Uni-Lift.

19. Can the actuator withstand side loading or a bending moment?

Yes, but this is not recommended. Consult Uni-Lift if this condition will be present! These types of loads apply greater forces on the load screw and housing assembly causing premature wear. Guides are highly recommended and should be used to eliminate side and bending loads.

20. Is there backlash between the load screw and gear nut?

Yes. This is necessary to allow for sliding or rolling action of the screw through the nut. Anti-Backlash actuators are available when the backlash needs to be minimized. See the catalog section for these models and features. Input torque requirements are greater for anti-backlash design actuators.

21. Can the actuator withstand shock loading?

This is not recommended. Oversized actuators are required to handle shock loads. Solid thrust bearings are also available in many actuator models when constant vibration and shock are present in an application.

22. What mounting position can the actuator be mounted?

Uni-Lifts can be mounted in any position, vertical, horizontal or in-between. A position other than vertical should be noted on inquires and purchase orders since special accommodations may be required.

23. How is the load screw protected?

Standard translating screw actuators are fitted with a screw protection tube that stores the screw when the actuator is in the closed position. Boots are available and recommended to protect the screw in the extended position. Two (2) boots may be required for rotating actuators with traveling nuts.

24. How do I attach the load to be positioned to the load screw?

For translating actuators, the load screw has a standard threaded end that can be used to attach the load. Top Plates or Clevis Ends are also available. For traveling nut designs, the traveling nut has a flange with mounting holes. The actuator housing has a mounting base and is also available with a clevis mount for double clevis requirements.

25. Will the load screw rotate?

Yes. You need to prevent the load screw from rotating to produce linear motion. The load screw will not rotate in a multi-unit system with all the load screws attached to the same structure. If rotation of the screw cannot be prevented in the application design, a keyed configuration is available for either the Machine or Ball Screw Uni-Lift. Input torque will increase for keyed actuators and the capacity may be reduced to 25% of rating. Contact factory for keyed applications.

26. What is the maximum temperature rating?

400°F. Standard Uni-Lifts are designed to operate at 80°F ambient temperature with a 100°F temperature rise. For higher temperatures, special grease and seals are used to reach temperature ranges up to 400°F. Advise Uni-Lift of these requirements.

27. What is the low range operating temperature?

Minus 100°F with special grease. Advise Uni-Lift of these requirements.

28. Can actuators be used in food industry applications (USDA)?

Uni-Lift uses USDA approved lubrication for these applications. Advise Uni-Lift of these requirements.

29. How do I lubricate a screw actuator?

Use the proper grease. Fill the gearbox by pumping grease into the grease fittings supplied in the actuator housing. The screws should have grease applied directly to them with a rag or paintbrush. This must be done as part of a regularly scheduled maintenance program.

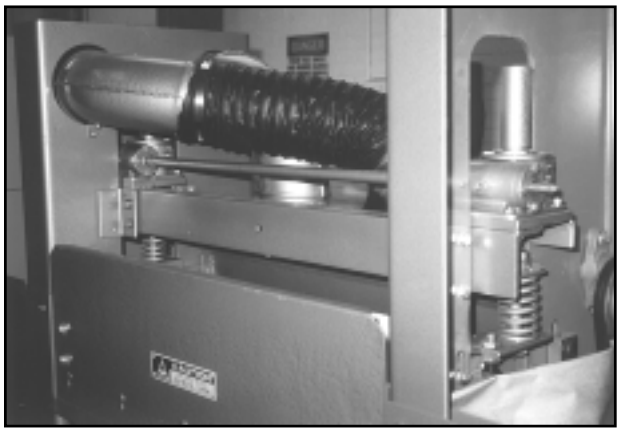
30. How do I select the right actuator?

Determine the direction of the load (compression/tension) and the screw-mounting configuration. Determine the dynamic and static load on each actuator. From the catalog, identify the configuration, Upright, Inverted, Translating, Rotating and required attachments (top plate, clevis, boots, etc). Determine the travel time in minutes (inches per min.). Follow the simple sizing calculations included in the catalog.

31. Who do I call for help?

Uni-Lift, 800-323-9114, Templeton, Kenly, & Co., Inc., Broadview, IL.

PRODUCTS IN ACTION



IN PRODUCTION

Uni-Lifts accurately position and hold laminating rollers for OEM machinery manufacturer.

IN POSITIONING

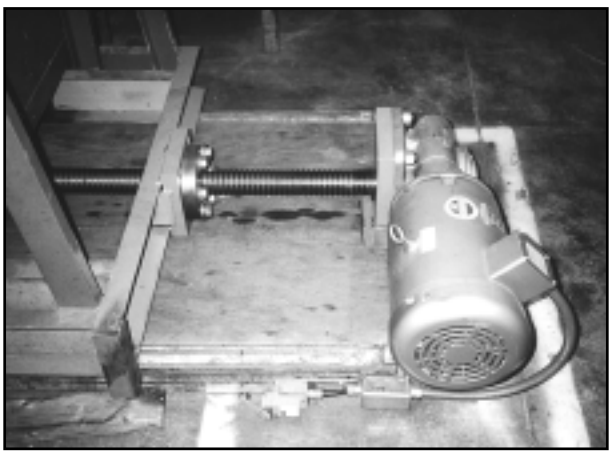
A manufacturer of glass charging equipment uses Uni-Lifts to control a batch charger.

IN MATERIAL TESTING

Structure and actuators are tested with an induced side load on top of the primary load. Each hand cranked Uni-Lift supports and positions a corner of the assembly cart.

IN MATERIAL HANDLING

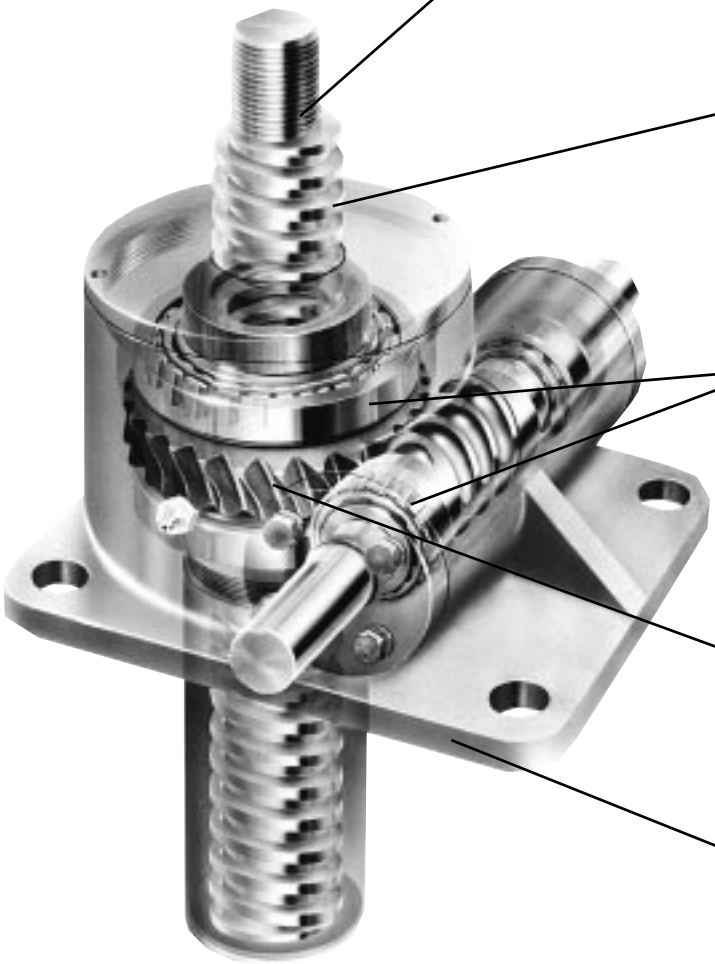
Motorized Uni-Lift pushes and pulls 10,000 lbs. of material in and out of a heat treatment oven. High worm ratio eliminates the need for external gear reducer.



M-SERIES MACHINE SCREW ACTUATOR

FEATURES & BENEFITS

Interchangeability. M-Series machine screw actuators available in 1 ton through 250 ton capacities, and interchange with competitive units.



"V" Threaded Screw End

- Easy mounting of optional screw end accessories or customer connection, insures better alignment.

Clevis

Top Plate

- Bearing journal on end of load screw for rotating jacks provides for better column stability.

High Strength Rolled Formed Thread Load Screws

- Provide minimum friction for smooth operation and longer life from a work hardened surface.
- Self-locking, minimal lead error design to provide positive positioning.
- Minimal axial backlash.

Tapered Roller Bearings

- Preloaded for reduced assembly spring rate and high thrust loads.
- Provide excellent support for side loading and horizontal applications.
- Maintains exact gear alignment under separating and thrust forces from gearing.
- Bearings sized for tough loading conditions.

High Strength Gearing

- Precision hobbed gears and worms manufactured to American Gear Standards with close tolerances and minimal backlash.
- Gear centers are designed for long life.

Rugged Housings

- Well proportioned aluminum, iron, or steel construction.

Superior Performance

- Uni-Lift M-Series actuators provide design integrity and reliability required to stand up where rugged duty and precision is important. (For higher cycle or greater column capacity requirements, see our J-Series Machine Screw Jacks.)

Synchronized Travel

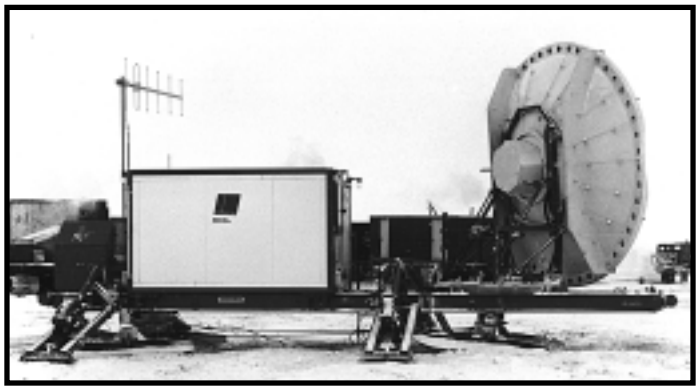
- Uni-Lift actuators can be arranged in systems to provide synchronized travel when driven from a common source.

PRODUCTS IN ACTION

M-SERIES MACHINE SCREW ACTUATOR

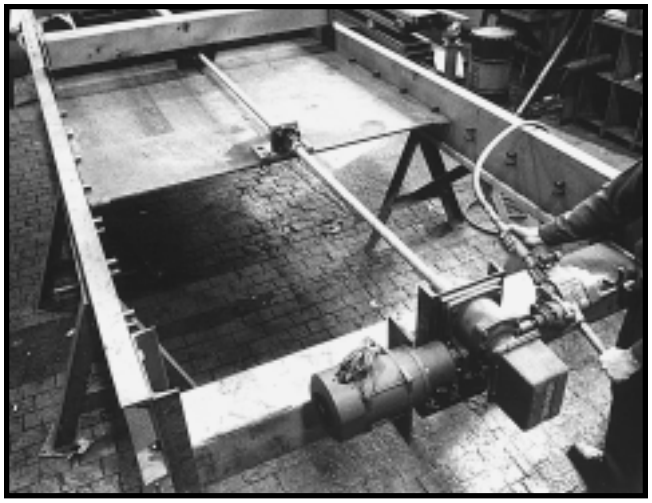
IN HYDROELECTRIC POWER

Uni-Lifts control the flow of water by positioning gates in a hydroelectric dam. Each gate utilizes two 20 ton machine screw actuators with motor and limit controls for easy and reliable operation.



IN EXPLORATION

Geological exploration utilizes Uni-Lift motorized actuators to extend trailer stabilizers, and position a satellite dish used to transmit data in some of the harshest environments on earth.

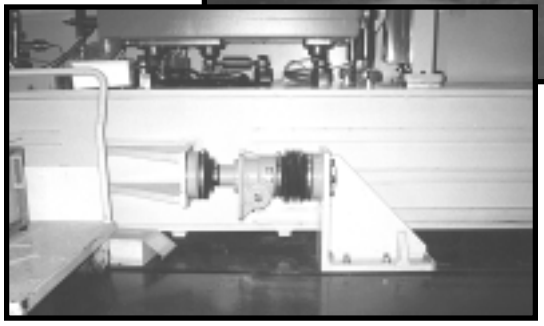


IN MANUFACTURING

Uni-Lift motorized actuators are used in slide gates for large pollution control systems.

IN SCIENTIFIC RESEARCH

Uni-Lift actuators provide exact positioning of magnets used in a particle ring accelerator.



M-SERIES TECHNICAL SPECIFICATIONS (Table 1)

MODEL TYPE AND SIZE		M1	M2.5	M5	M10	M15	M20	M30	M50	M75	M100
CAPACITY IN POUNDS (P)		2,000	5,000	10,000	20,000	30,000	40,000	60,000	100,000	150,000	200,000
DIA. OF LOAD SCREW		0.75	1.00	1.50	2.00	2.25	2.50	3.38	4.50	5.00	6.00
LEAD OF SCREW		0.20	0.25	0.38	0.50	0.50	0.50	0.67	0.67	0.67	0.75
GEAR CENTERS		1.250	1.750	2.188	2.598	2.598	2.875	3.750	5.313	6.000	7.500
GEAR RATIO	LOW	5:1	6:1	6:1	8:1	8:1	8:1	10 2/3:1	10 2/3:1	10 2/3:1	12:1
	HIGH	20:1	24:1	24:1	24:1	24:1	24:1	32:1	32:1	32:1	36:1
(TPI) TURNS OF INPUT SHAFT FOR 1" OF RISE	LOW	25	24	16	16	16	16	16	16	16	16
	HIGH	100	96	48	48	48	48	48	48	48	48
TORQUE REQUIRED TO LIFT ONE POUND (lb-in) (Tp)	LOW	0.024	0.026	0.038	0.041	0.045	0.048	0.051	0.065	0.068	0.078
	HIGH	0.011	0.011	0.015	0.022	0.024	0.025	0.028	0.037	0.035	0.045
NO LOAD TORQUE (lb-in) (To)		4	5	12	18	18	36	48	96	156	204
MAXIMUM INPUT RPM		1800	1800	1800	1800	1800	1800	1200	1200	900	900
APPROXIMATE WEIGHT IN POUNDS	0" TRAVEL	5	17	30	45	55	80	145	280	495	845
	PER INCH	0.5	0.6	0.7	1.1	1.2	1.7	2.9	5	6.3	7.4
RADIUS OF GYRATION (r)		0.154	0.218	0.316	0.423	0.486	0.566	0.743	1.074	1.149	1.387

1. Complete the Uni-Lift Selection Guide located in the inside front cover.

2. Determine the maximum load on one actuator: P_1

$$P_1 = \frac{P_2}{N}$$

P_2 = Total system load (lbs.)
N = Number of actuators in the system
On multi-unit systems where load is not equally distributed, change P_1 to the greatest load supported by one unit.

3. Check Load Screw Column Capacity:
- If the load screw is in tension, select a Uni-Lift with a rated capacity equal to or greater than the maximum load (P_1) on one actuator. Go to step 4.
- If the load screw is in compression, use the calculation steps on page 15 to determine the maximum permissible Extended Screw Length, (ESL). Select a Uni-Lift that has a load screw column length capacity equal to or greater than the length required for the load.

4. Determine the desired load screw velocity (in./min.): (V_d)

$$V_d = \frac{\text{Rise}}{t_2}$$

Rise = One way travel under load (in.)
t_2 = Required one way travel time (min.)

5. Determine Desired Input Speed: (RPM_d)

$$RPM_d = TPI \times V_d$$

TPI = Turns of the input shaft for 1 inch of rise. (See technical specification table 1.)

6. Determine Load Screw Velocity: (V)
From the catalog data, select the drive equipment with an output speed close to the desired input speed (RPM_d). Use the output speed to recalculate the actual load screw velocity (V).

$$V = \frac{RPM}{TPI}$$

7. Check the Duty Limit of the actuator:

$$D_1 = \frac{(2 \times \text{Rise} \times C_h)}{V}$$

D_1= Duty time per hour
C_h = Cycles per hour
Determine if D_1 is equal to or greater than D_2. If D_2 is less than D_1 reduce the input speed to the actuator, or reduce the load per actuator by adding more actuators to the system.
D_2 = Duty Limit (see page 14 for calculations)

Motor Sizing:

The following is a QUICK ESTIMATE FOR MOTOR SIZING FOR A ONE ACTUATOR SYSTEM. For detailed motor sizing and torque requirements on single or multi-unit systems, skip steps 8 and 9, and go to step 10.

8. Estimate the Input Torque T_e (lbs/in):

$$T_e = T_p \times P_3$$

T_p = Torque required to lift one pound (see table 4 for T_p values.)
P_3 = Maximum system running load.

9. Estimate Uni-Lift Horsepower: HP_e

$$HP_e = \frac{(T_e \times RPM)}{63025}$$

M-SERIES MOTOR SIZING AND TORQUE CALCULATIONS (Table 2)

MODEL & SIZE	GEAR RATIO	Turns per inch TPI	Rated cap (lbs) P	STATIC TORQUE Ts	UNIT INPUT TORQUE AT RATED CAPACITY T = RUNNING TORQUE (lb-in) at VARIOUS RPM (Theoretical)								NO LOAD TORQUE To
					50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	
M 1	5:1	25	2,000	48	35	33	32	29	27	26	25	24	4
	20:1	100		22	14	13	13	12	11	10	9	9	
M 2.5	6:1	24	5,000	130	94	87	83	76	71	68	65	62	5
	24:1	96		57	36	34	32	29	26	25	23	21	
M 5	6:1	16	10,000	377	269	248	236	216	202	192	185	174	12
	24:1	64		151	98	91	87	78	71	65	62	58	
M 10	8:1	16	20,000	827	567	519	491	446	414	392	377	353	18
	24:1	48		441	273	249	234	208	184	172	164	152	
M 15	8:1	16	30,000	1350	909	826	771	707	652	615	588	549	18
	24:1	48		719	441	399	376	331	293	273	259	239	
M 20	8:1	16	40,000	1912	1272	1147	1073	979	900	847	808	751	36
	24:1	48		999	609	551	518	453	402	375	355	327	
M 30	10 2/3:1	16	60,000	3056	1976	1770	1652	1499	1372	1287	1226		48
	32:1	48		1688	985	881	822	712	626	580	548		
M 50	10 2/3:1	16	100,000	6465	3880	3356	3166	2821	2544	2362	2235		96
	32:1	48		3705	1988	1730	1591	1329	1177	1082	1017		
M 75	10 2/3:1	16	150,000	10141	6082	5268	4965	4412	3965	3671	3464		156
	32:1	48		5231	2914	2555	2357	1995	1778	1640	1545		
M 100	12:1	16	200,000	15596	8750	7486	7006	6154	5487	5059	4761		204
	36:1	48		9027	4536	3868	3515	2913	2557	2340	2195		

For RPM's not shown use the next slowest RPM. For speeds less than 50 RPM contact factory.

10. Determine Uni-Lift Running Load Proportion Factor: (f)

$$f = \frac{P_3}{(P \times N)}$$

P = Rated Capacity of Uni-lift
P_3 = Max. system running load N= Number of Uni-lifts

11. Determine Unit Running Torque: (T_1) (lb-in)

$$T_1 = (T \times f) + T_o$$

T_0 = No load torque from chart
T = Running torque from chart

12. Find the System Running Torque: (T_2) (lb-in)

$$T_2 = \frac{(T_1 \times N)}{e_1}$$

e_1 = System Arrangement Efficiency, see page 77

13. Find System Power:

$$\text{System HP} = \frac{(T_2 \times RPM)}{(63025 \times e_2)}$$

e_2 = Reducer Efficiency, see page 77
RPM = Uni-Lift input shaft speed

14. Determine System Starting Torque: (T_{s2})

$$T_{s2} = \frac{((T_s \times f) + T_o) \times N}{e_2}$$

T_s = Static torque from chart

15. Determine Motor Starting Torque: (T_{sm}) (lb in)

$$T_{sm} = \frac{T_{s2}}{(R \times e_2)}$$

R = Gear Reducer Ratio

16. Determine Motor Running Torque: (T_{rm})

$$T_{rm} = \frac{T_2}{(R \times e_1)}$$

- Select a motor with a power rating greater than HP requirement in step 13, a starting torque greater than T_{sm} requirement in step 15, and a motor running torque greater than T_{rm} in step 16. See motor chart page 64 for horsepower and torque ratings.
- Select system torque transmission equipment (reducer, mitre gear boxes, couplings, etc.) with ratings greater than the torque to be transmitted, see step 12 and system arrangements, page 77.
- Size shafting for system starting torque to be transmitted, see step 16, and Table B page 76.

M SERIES DUTY CYCLE (Table 3)

Uni-Lift Duty Limit at Full Rated Capacity and 80° F Ambient Temperature

MODEL and SIZE	RATIO	TPI	L2 - DUTY LIMIT SERVICE FACTOR @ VARIOUS RPM INPUT SPEEDS								
			50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	2587 RPM
M-1	5:1	25	356	230	120	70	44	33	27	20	15
	20:1	100	639	412	211	118	75	57	47	35	25
M-2.5	6:1	24	164	106	56	32	20	15	12	8	7
	24:1	96	450	290	149	83	53	40	34	24	18
M-5	6:1	16	107	70	38	22	14	10	8	6	
	24:1	64	294	190	98	55	36	28	22	16	
M-10	8:1	16	66	43	23	13	8	6	5	4	
	24:1	48	137	89	47	27	18	13	11	8	
M-15	8:1	16	43	29	16	9	5	4	3	2	
	24:1	48	91	59	31	18	12	9	7	5	
M-20	8:1	16	43	28	15	9	5	4	3	2	
	24:1	48	85	55	29	17	11	8	7	5	
M-30	10 2/3:1	16	39	26	14	8	6	4	3		
	32:1	48	81	53	28	16	11	8	7		
M-50	10 2/3:1	16	25	17	9	5	4	3	2		
	32:1	48	52	34	19	11	7	5	4		
M-75	10 2/3:1	16	24	16	8	4	3	2	1		
	32:1	48	51	33	18	11	7	5	4		
M-100	12:1	16	26	17	9	5	4	3	2		
	36:1	48	53	35	20	12	8	6	5		

- Duty Limit Service factor (L_2) = Operating time allowed per hour. The numbers greater than 60 are theoretical values and exceed 100% duty, solely to provide base data for adjusting L_2.
- The L_2 values are based on Uni-Lifts loaded at rated capacity, operating in an ambient temperature of 80° F., with a maximum allowable temperature rise of 100° F.
- For ambient temperatures above 180° F or below -20° F, consult factory.
- For speeds not shown, use the next fastest RPM value.

1. Determine Adjusted Duty Limit : D_2

When the unit load is at rated capacity, and the ambient temperature is at 80° F, the L_2 value from the table equals D_2. If not, proceed to step 1A.

1A) For different temperature service, or a unit load less than rated capacity, use the following equation to determine the Adjusted Duty Limit Service Factor (D_2).

$$D_2 = \frac{(180 - T_A) \times P \times L_2}{100 \times P_4}$$

L_2 = Duty Limit Service Factor (see Table 3)
T_A = Ambient temperature (F°) P=Rated capacity (lbs.)
P_4 = Maximum running load per actuator (lbs.)
P = Rated capacity of the Uni-Lift

2. Determine if Duty Cycle is acceptable:
If **D_2> = 60** minutes, the application is rated for continuous duty.
If **D_2> = D_1** then the application is acceptable.
If **D_2<D_1** then the duty cycle limit has been exceeded for this application. You must do one of the following: select larger size Uni-Lift, reduce load by adding additional Uni-Lifts, or reduce speed. If you reduce speed, you must recalculate V_1 and D_1 from the Technical Specifications page 12 steps 6 and 7.

EXAMPLE

A. Consider for an M-10 low ratio 8:1 operating in 100°F ambient temperature, 15,000 lbs. load, and 600 RPM, with a rise of 30 inches and 5 cycles per hour:

$$D_1 = \frac{(2 \times \text{Rise} \times C_h)}{V_1}$$

$$D_1 = \frac{(2 \times 30 \times 5)}{37.5}$$

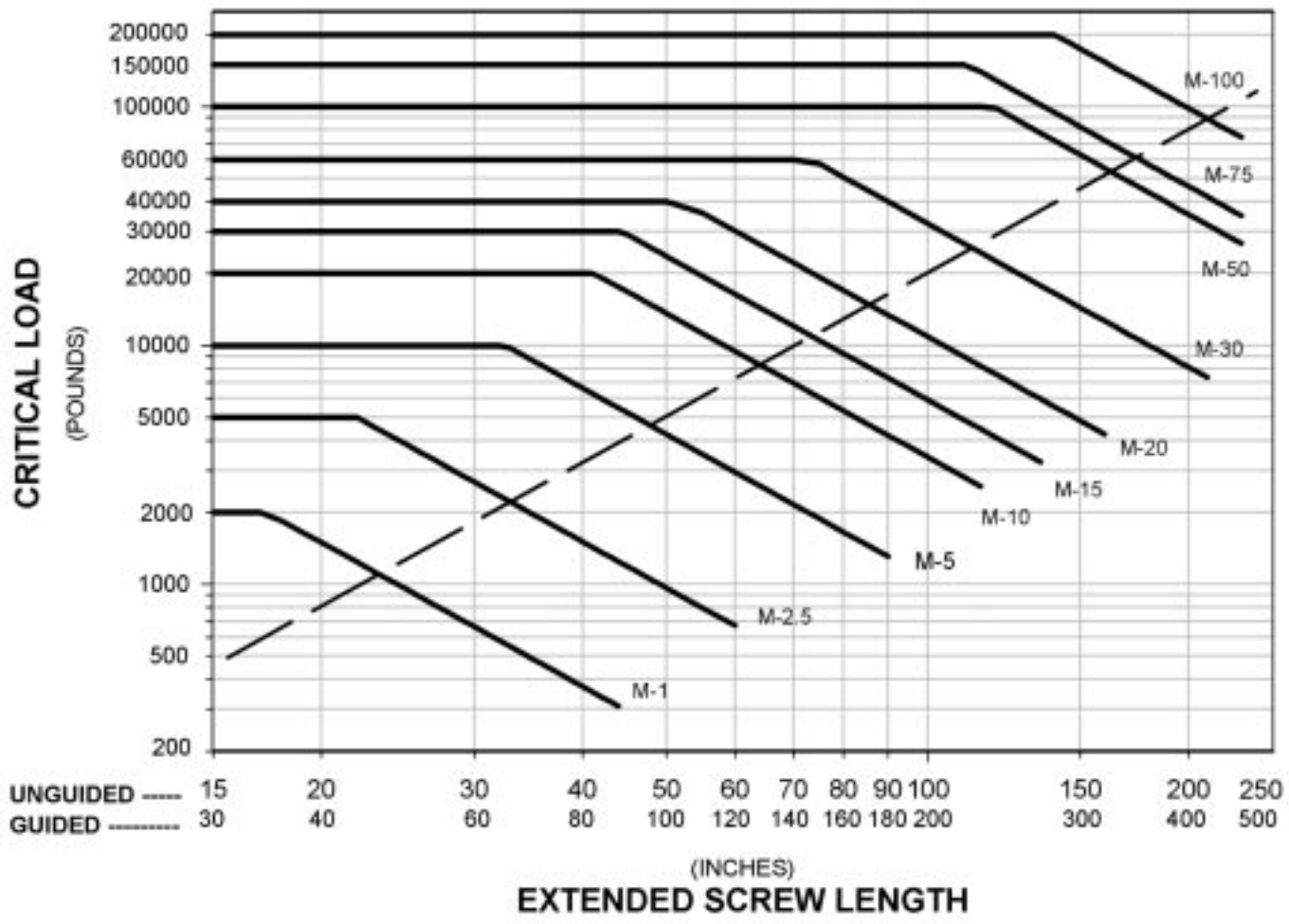
Duty time per hour = 8.0 minutes per hour

$$D_2 = \frac{(180 - 100) \times 20{,}000 \times 8}{100 \times 15{,}000}$$

Duty cycle limit = 8.53 minutes per hour

Since D_2 is greater than D_1 the application is OK for the duty cycle limit.

M-SERIES MACHINE SCREW COLUMN BUCKLE CHART



(For guided and unguided loads)

The maximum ESL values in the chart above are based on a **2:1 factor of safety against column buckle,** and on a standard design with a top plate, or a rotating design travel nut. Increased load screw lengths are not shown where the slenderness ratio exceeds 400.

1. Determine extended screw length: (ESL)
The ESL is the distance in inches the load screw can extend from the housing. See layout page for the model selected to determine ESL.

2. Determine the adjusted screw length: (ASL)
The chart above is for a standard design top plate or the rotating design travel nut. For other design configurations you must adjust the ESL value using the F factor multiplier to determine the adjusted screw length.

ASL=ESL x F

3. Select correct size Uni-lift: On the chart above, draw a horizontal line to represent the maximum load (P_1). Using the set of ESL values that apply to your design (guided or un-guided), draw a vertical line to represent the ESL or ASL. All of the Uni-Lift's above the point of intersection will be acceptable.

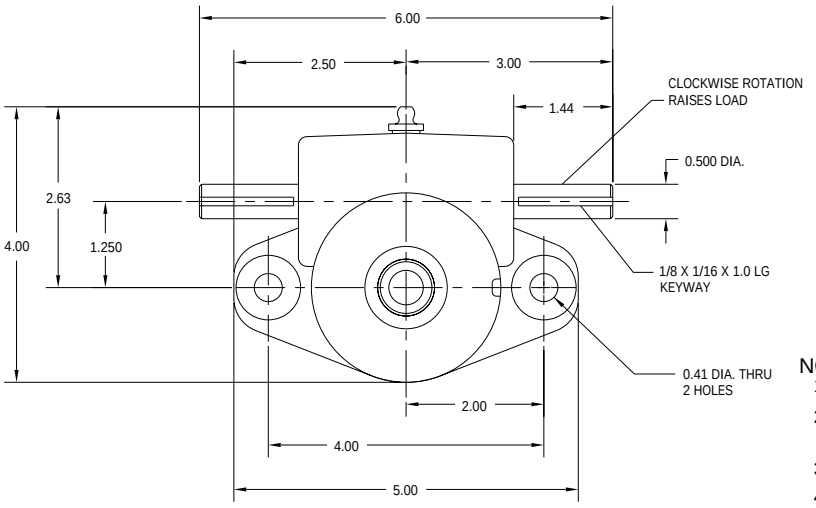
Screw lengths above the dotted line comply with AISC maximum slenderness ratio KL/r=200 specified for design and fabrication of structural steel buildings. This data is for reference only and is not a limiting factor, except as required.

F = Column Factor Multiplier

DESIGN CONFIGURATION	F factor	Guided K factor	Unguided K factor
Standard Design Top Plate	1	0.65	1.3
Rotating Design Traveling Nut	1	0.65	1.3
Standard Design Clevis End	1.25	0.8	1.6
Keyed Design Top Plate	1.25	0.65	1.3
Keyed Design Clevis End	2	0.65	1.6

K=Column Factor
L=Extended Screw Length (ESL)
r =Radius of Gyration
See Technical Specifications (Table 1) for r values

M1 - 1 TON



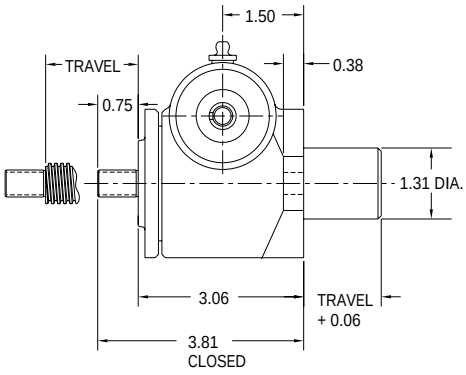
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5:1	25	0.024
H	20:1	100	0.011
RATED CAPACITY			2,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			230 in.
Load Screw			.75 in. dia. x .200 in. lead
Stop Nut Allowance			.75 in.

NOTES:

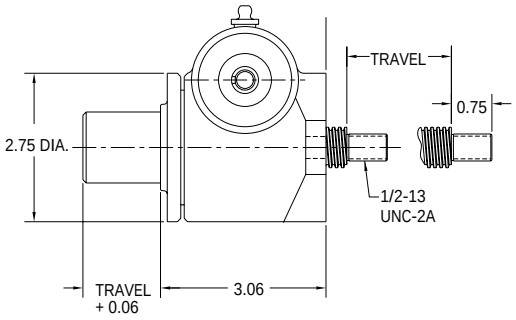
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 0 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

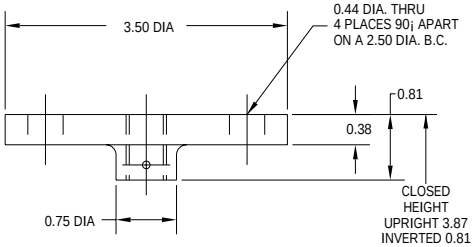
UPRIGHT M-1-U-T

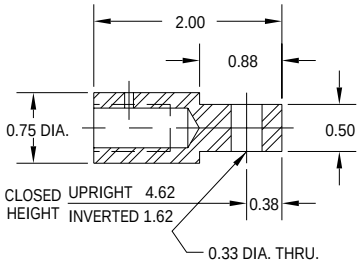


INVERTED M-1-I-T



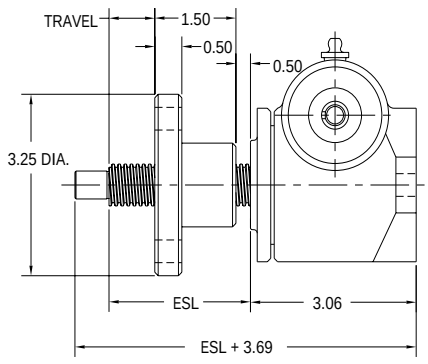
TOP PLATE AND CLEVIS END OPTIONS





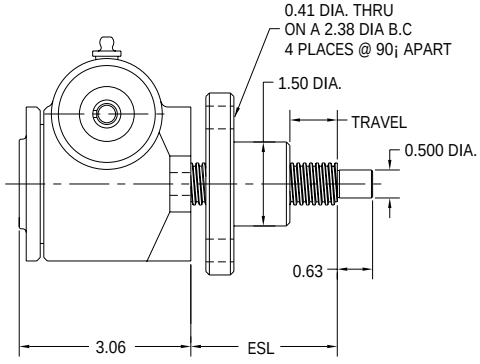
ROTATING WITH TRAVELING NUT

UPRIGHT M-1-U-R



TRAVEL NUT POSITION "B"

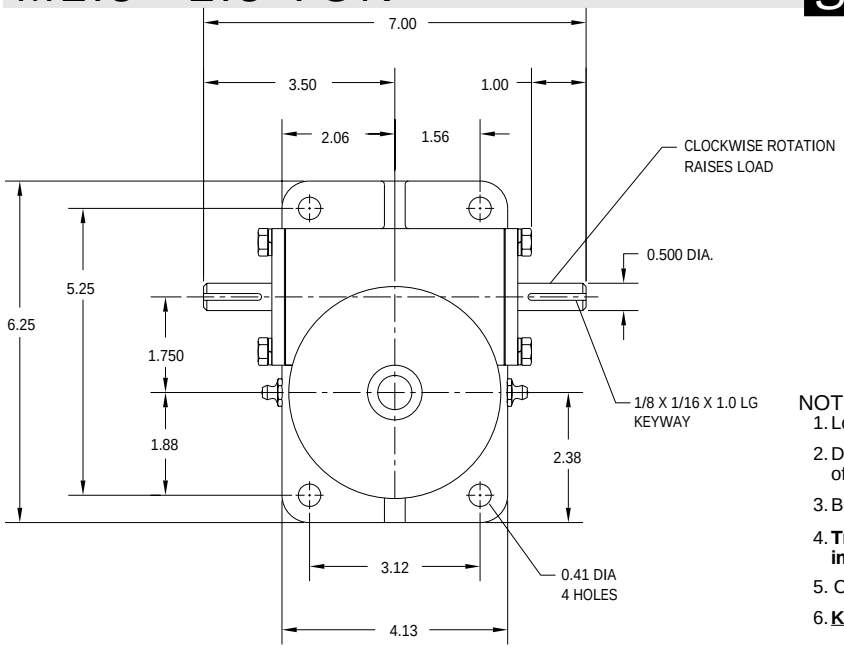
INVERTED M-1-I-R



TRAVEL NUT POSITION "A"

M-SERIES MACHINE SCREW ACTUATOR

M2.5 - 2.5 TON



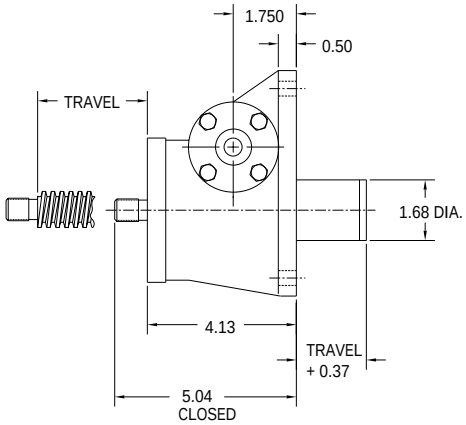
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	6:1	24	0.026
H	24:1	96	0.011
RATED CAPACITY			5,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			232 in.
Load Screw			1 in. dia. x .250 in. lead
Stop Nut Allowance			.75 in.

NOTES:

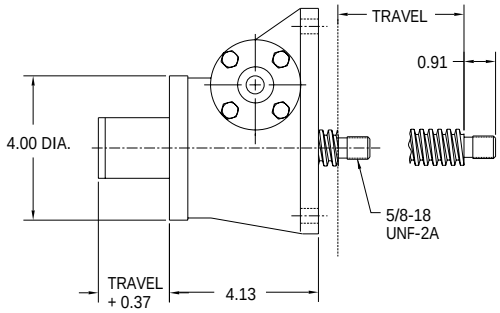
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD .5 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

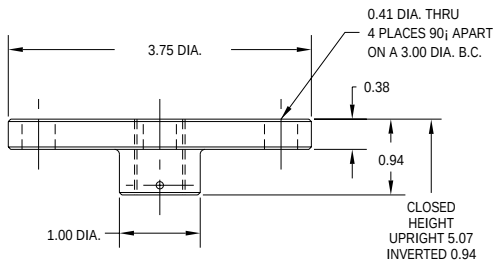
UPRIGHT M-2.5-U-T

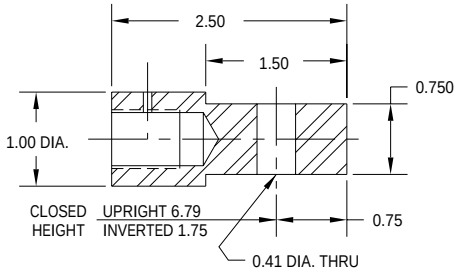


INVERTED M-2.5-I-T



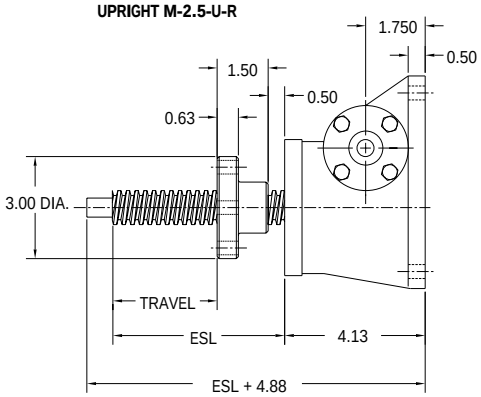
TOP PLATE AND CLEVIS END OPTIONS





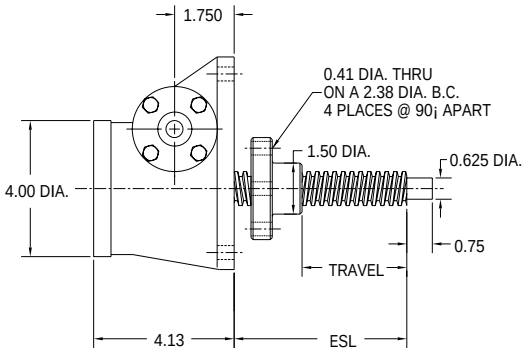
ROTATING WITH TRAVELING NUT

UPRIGHT M-2.5-U-R



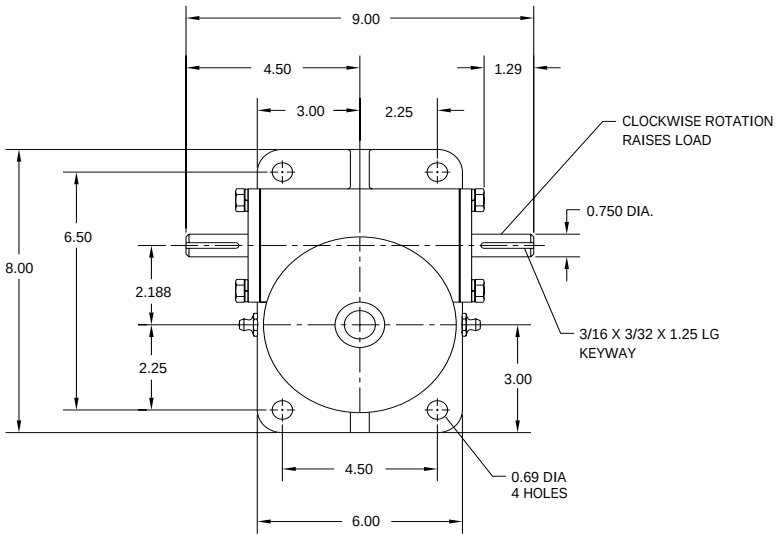
TRAVEL NUT POSITION B

INVERTED M-2.5-I-R



TRAVEL NUT POSITION A

M5 - 5 TON



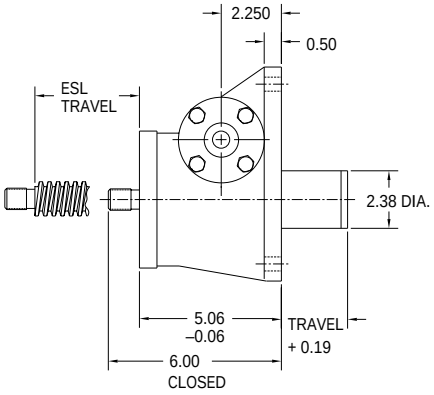
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	6:1	16	0.038
H	24:1	64	0.015
RATED CAPACITY			10,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			230 in.
Load Screw			1 1/2 in. dia. x .375 in. lead
Stop Nut Allowance			1.13 in.

NOTES:

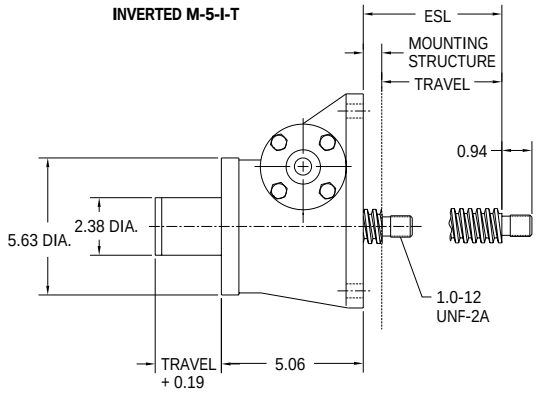
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD .75 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

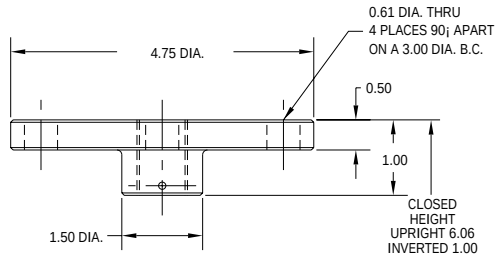
UPRIGHT M-5-U-T



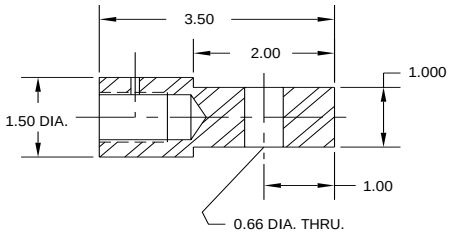
INVERTED M-5-I-T



TOP PLATE AND CLEVIS END OPTIONS

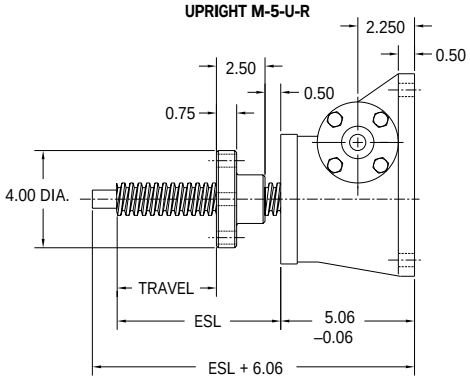


M5 CLEVIS



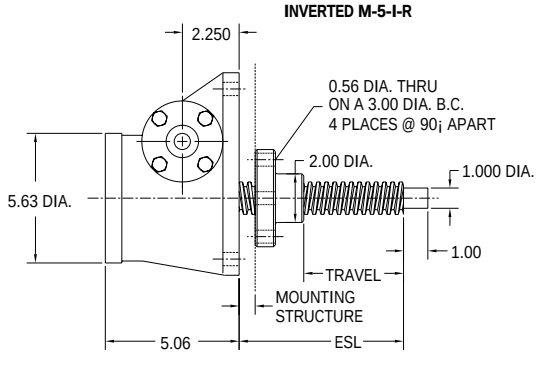
ROTATING WITH TRAVELING NUT

UPRIGHT M-5-U-R



TRAVEL NUT POSITION B

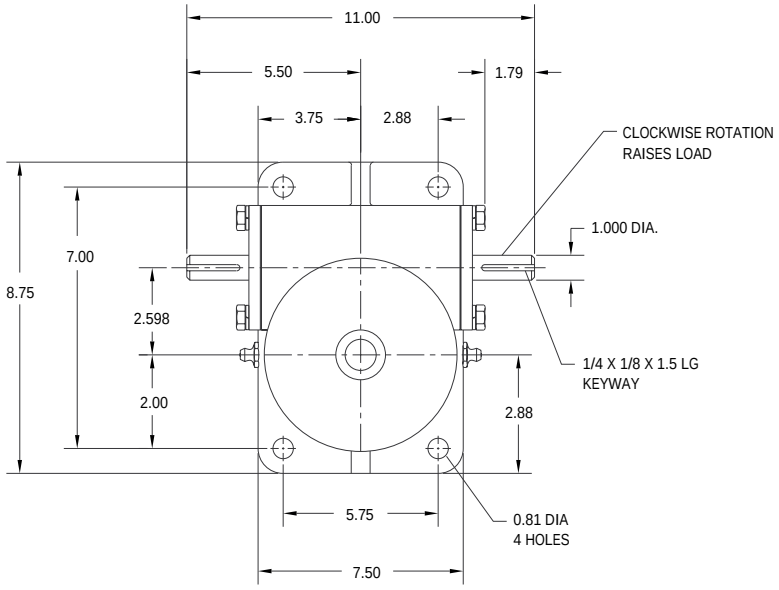
INVERTED M-5-I-R



TRAVEL NUT POSITION A

M-SERIES MACHINE SCREW ACTUATOR

M10 - 10 TON



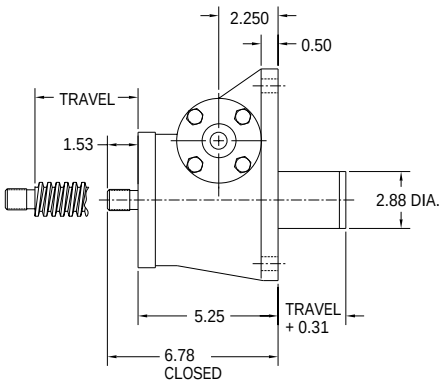
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	8:1	16	0.041
H	24:1	48	0.022
RATED CAPACITY			20,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			228 in.
Load Screw			2 in. dia. x .500 in. lead
Stop Nut Allowance			1.5 in.

NOTES:

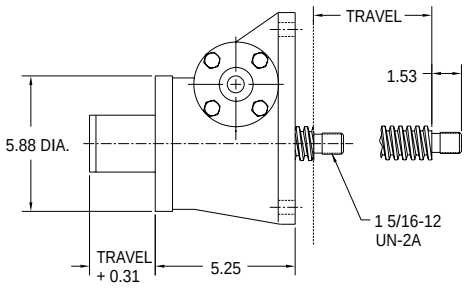
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD .81 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

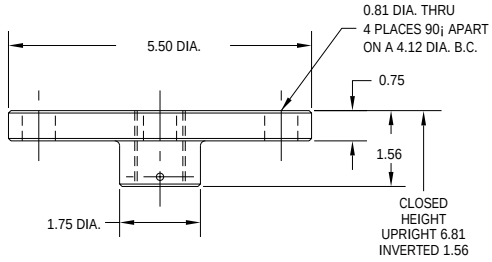
UPRIGHT M-10-U-T

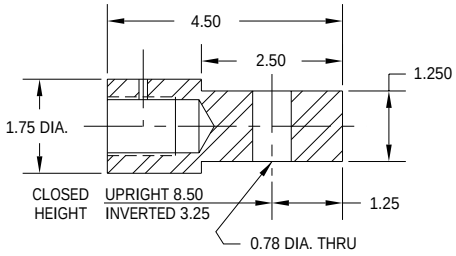


INVERTED M-10-I-T

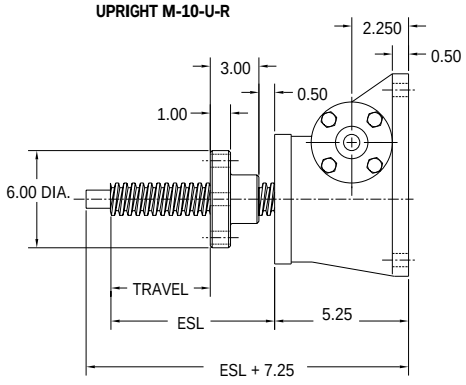


TOP PLATE AND CLEVIS END OPTIONS





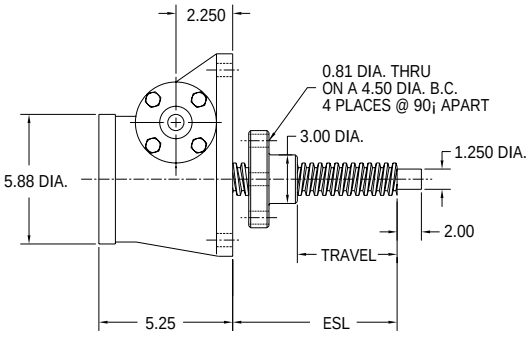
UPRIGHT M-10-U-R



TRAVEL NUT POSITION B

ROTATING WITH TRAVELING NUT

INVERTED M-10-I-R



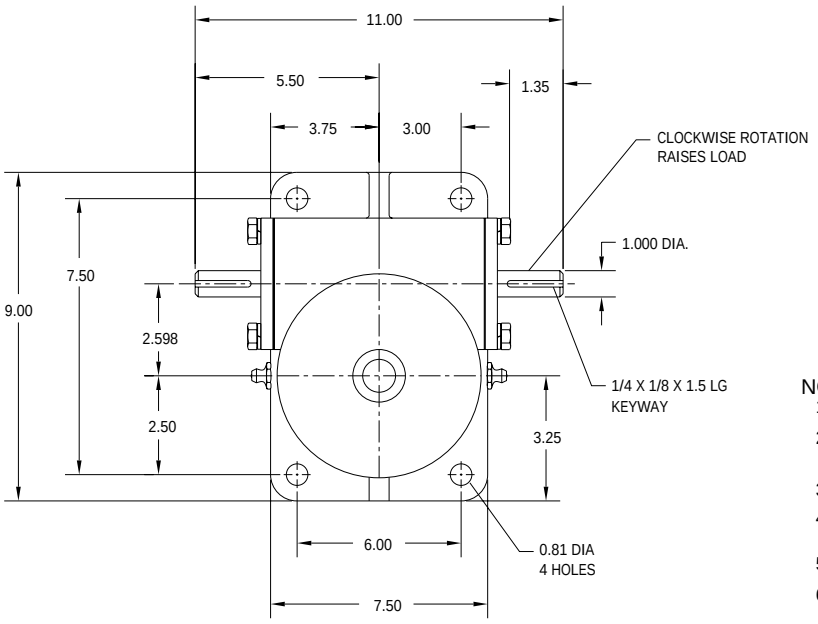
TRAVEL NUT POSITION A

M-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

M15 - 15 TON



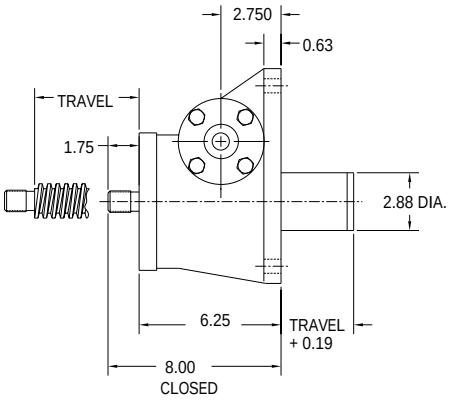
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	8:1	16	0.045
H	24:1	48	0.024
RATED CAPACITY			30,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			224 in.
Load Screw			2 1/4 in. dia. x .500 in. lead
Stop Nut Allowance			1.75 in.

NOTES:

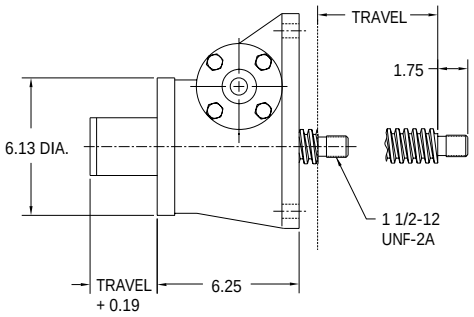
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 1.06 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

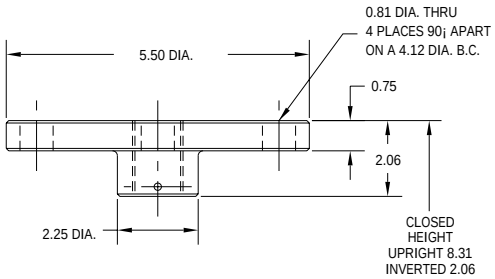
UPRIGHT M-15-U-T

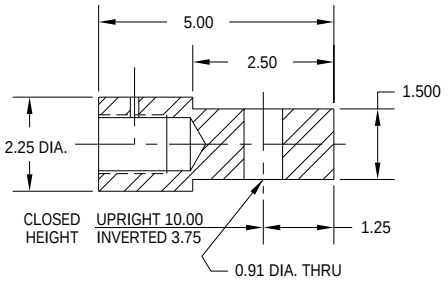


INVERTED M-15-I-T

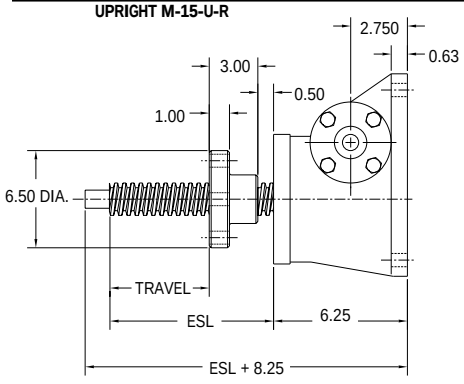


TOP PLATE AND CLEVIS END OPTIONS





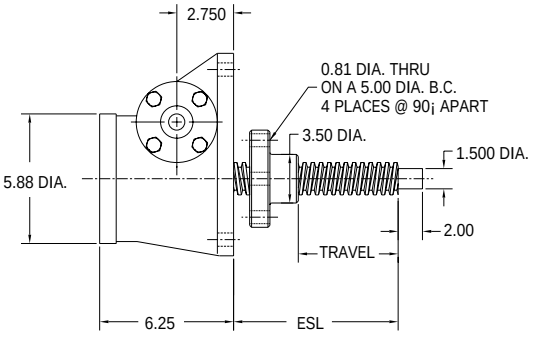
UPRIGHT M-15-U-R



TRAVEL NUT POSITION B

ROTATING WITH TRAVELING NUT

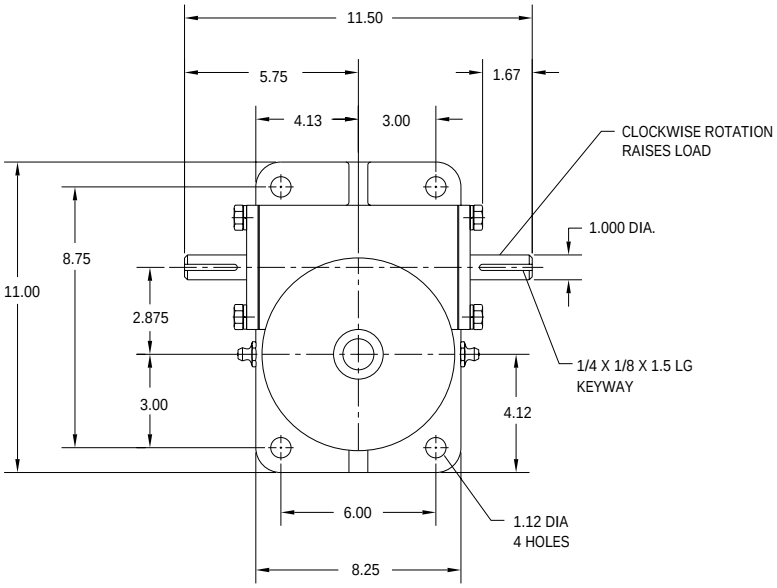
INVERTED M-15-I-R



TRAVEL NUT POSITION A

M20 - 20 TON

M-SERIES MACHINE SCREW ACTUATOR



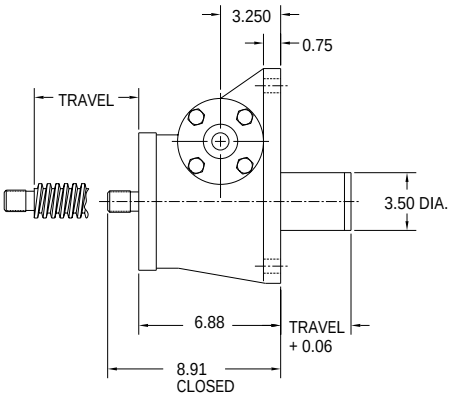
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	8:1	16	0.048
H	24:1	48	0.025
RATED CAPACITY			40,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			224 in.
Load Screw			2 1/2 in. dia. x .500 in. lead
Stop Nut Allowance			1.75 in.

NOTES:

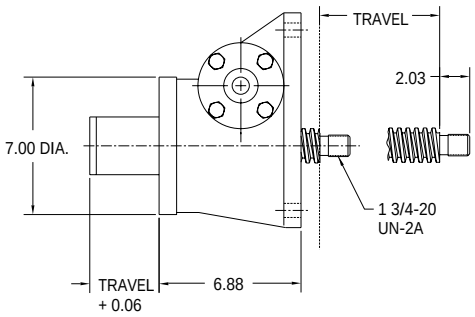
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 1.2 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

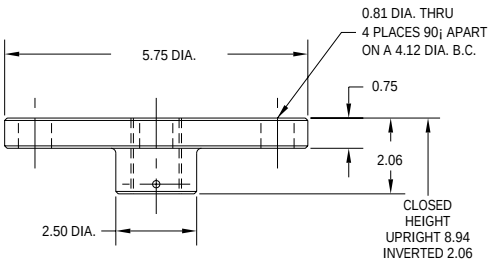
UPRIGHT M-20-U-T

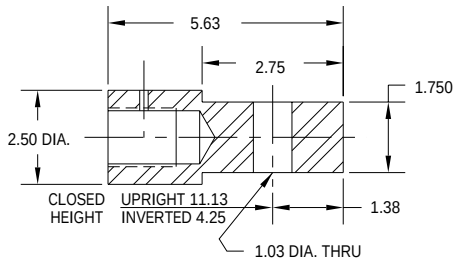


INVERTED M-20-I-T



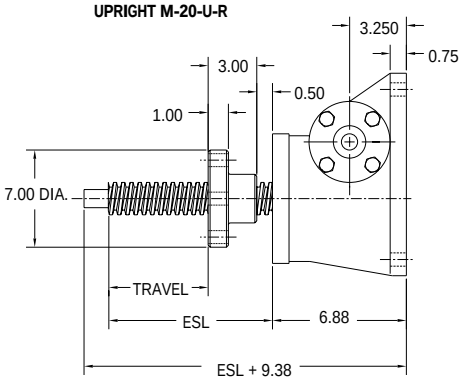
TOP PLATE AND CLEVIS END OPTIONS





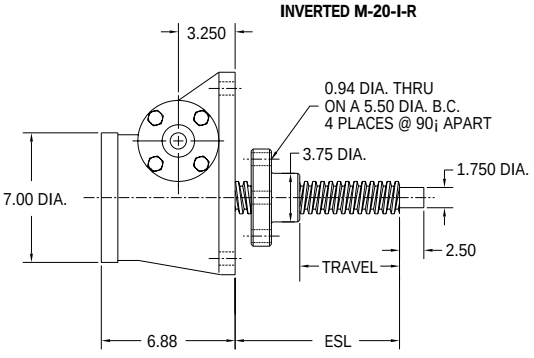
ROTATING WITH TRAVELING NUT

UPRIGHT M-20-U-R



TRAVEL NUT POSITION B

INVERTED M-20-I-R



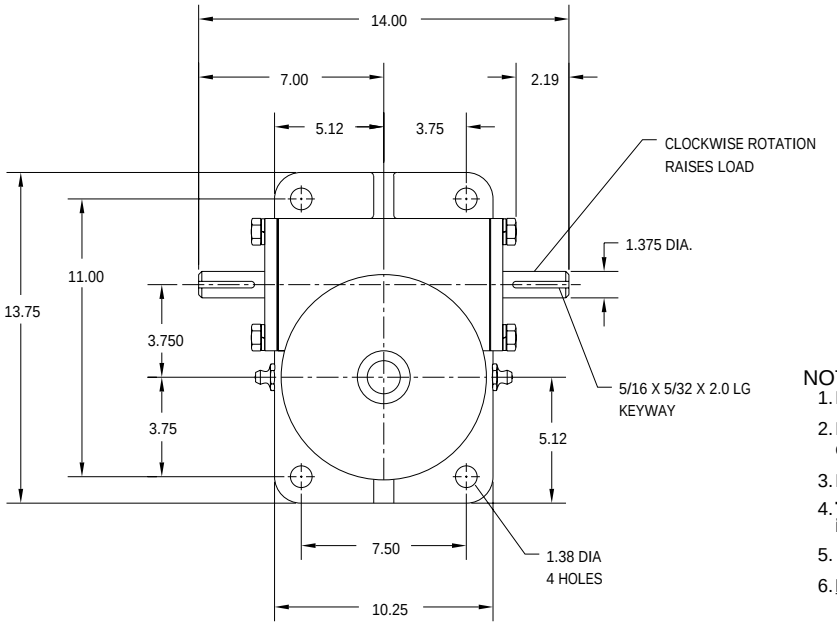
TRAVEL NUT POSITION A

M-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

M30 - 30 TON



REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	$10^{2}/_{3}$:1	16	0.051
H	32:1	48	0.028
RATED CAPACITY			60,000 lbs.
Max Input Speed			1200 rpm
Max Screw Stock			228 in.
Load Screw			3 3/8 in. dia. x .666 in. lead
Stop Nut Allowance			2 in.

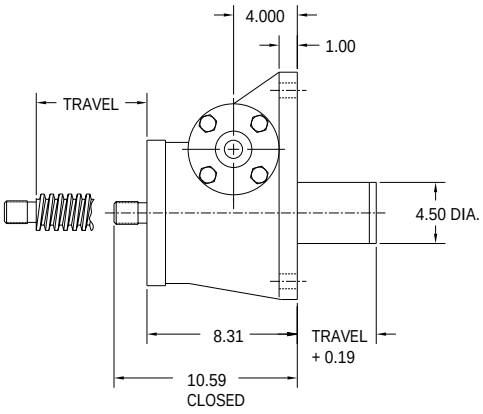
NOTES:

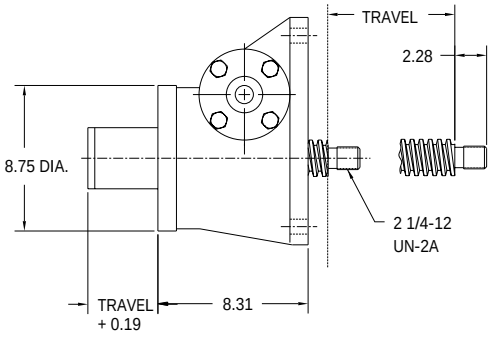
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 1.38 INCHES TO JACK HOUSING.**

UPRIGHT M-30-U-T

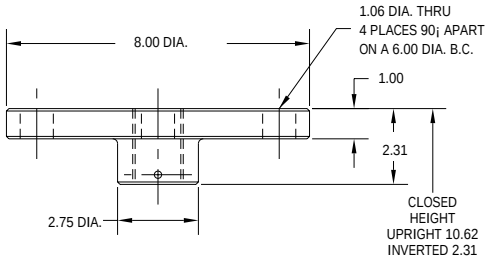
TRANSLATING & KEYED

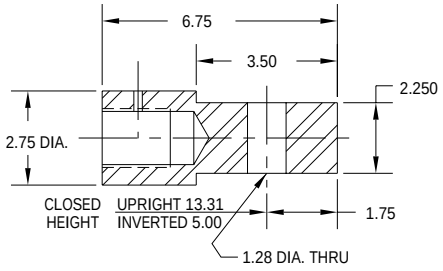
INVERTED M-30-I-T





TOP PLATE AND CLEVIS END OPTIONS

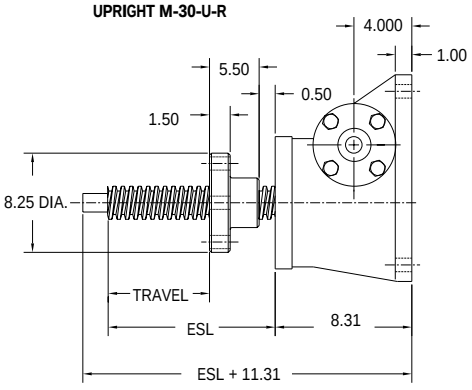




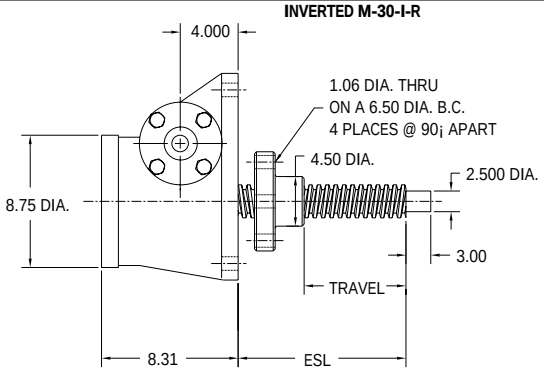
UPRIGHT M-30-U-R

ROTATING WITH TRAVELING NUT

INVERTED M-30-I-R



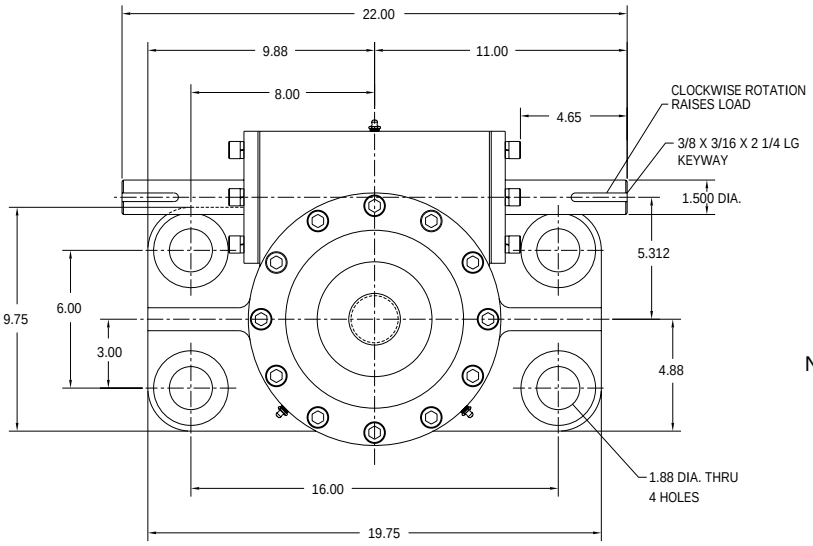
TRAVEL NUT POSITION B



TRAVEL NUT POSITION A

M50 - 50 TON

M-SERIES MACHINE SCREW ACTUATOR



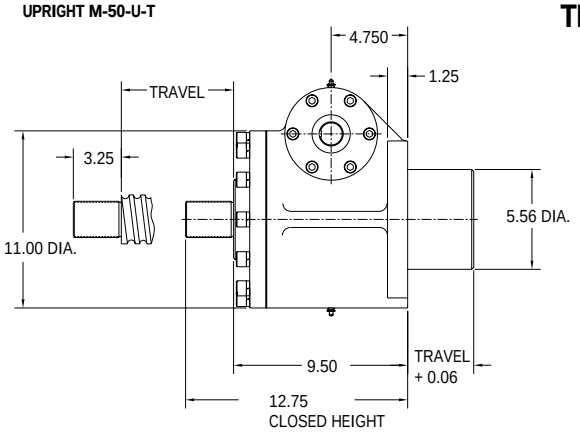
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	10 2/3:1	16	0.065
H	32:1	48	0.037
RATED CAPACITY			100,000 lbs.
Max Input Speed			1200 rpm
Max Screw Stock			222 in.
Load Screw			4 1/4 in. dia. x .667 in. lead
Stop Nut Allowance			2.25 in.

NOTES:

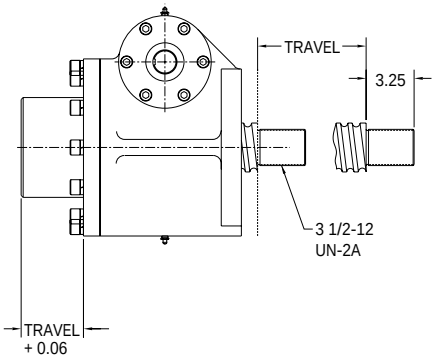
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: CONSULT FACTORY.**

TRANSLATING & KEYED

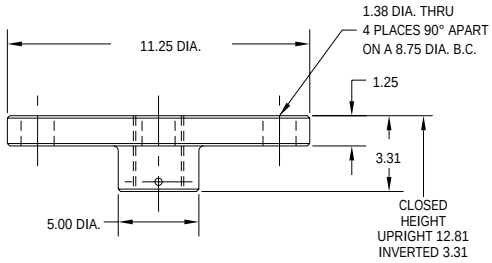
UPRIGHT M-50-U-T

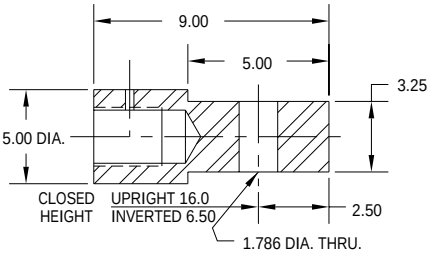


INVERTED M-50-I-T



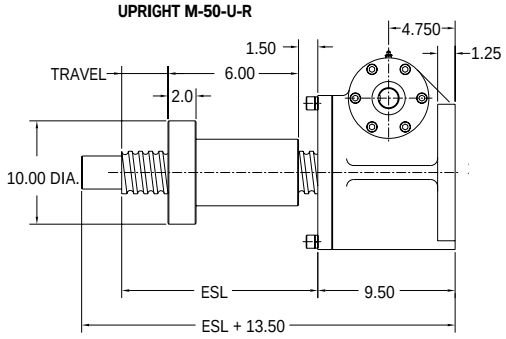
TOP PLATE AND CLEVIS END OPTIONS





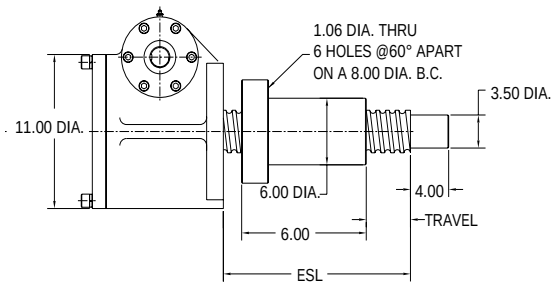
ROTATING WITH TRAVELING NUT

UPRIGHT M-50-U-R



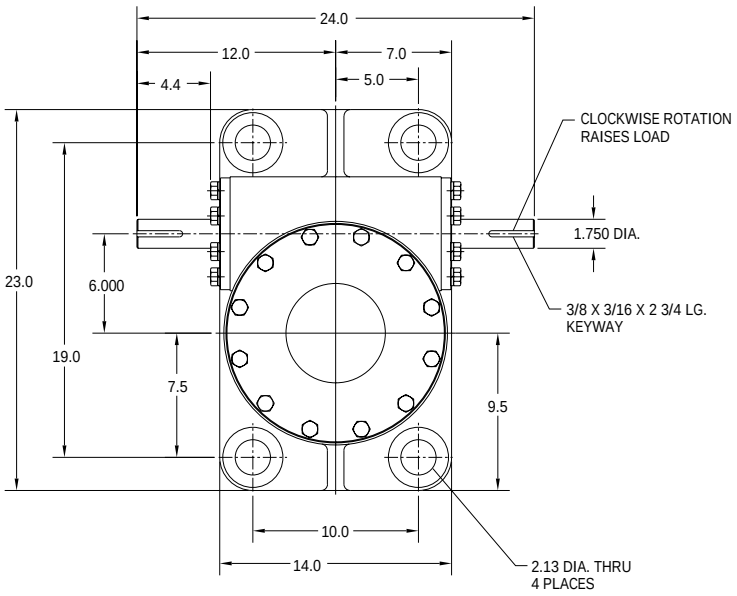
TRAVEL NUT POSITION "B"

INVERTED M-50-I-R



TRAVEL NUT POSITION "A"

M75 - 75 TON



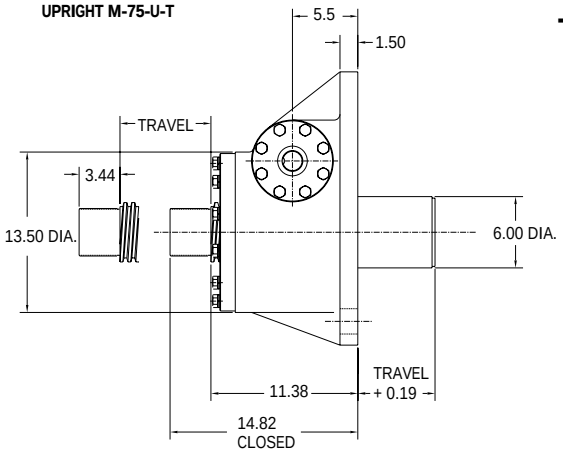
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	10 2/3:1	16	0.068
H	32:1	48	0.035
RATED CAPACITY			150,000 lbs.
Max Input Speed			900 rpm
Max Screw Stock			127 in.
Load Screw			5 in. dia. x .666 in. lead
Stop Nut Allowance			2.375 in.

NOTES:

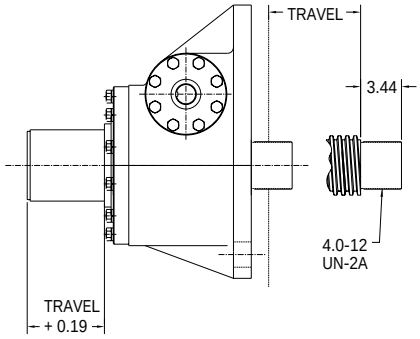
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: CONSULT FACTORY.**

TRANSLATING & KEYED

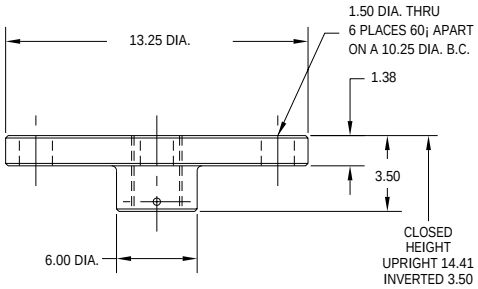
UPRIGHT M-75-U-T

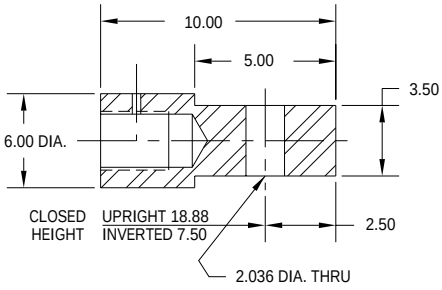


INVERTED M-75-I-T



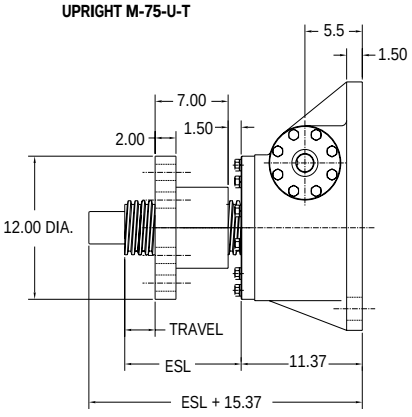
TOP PLATE AND CLEVIS END OPTIONS





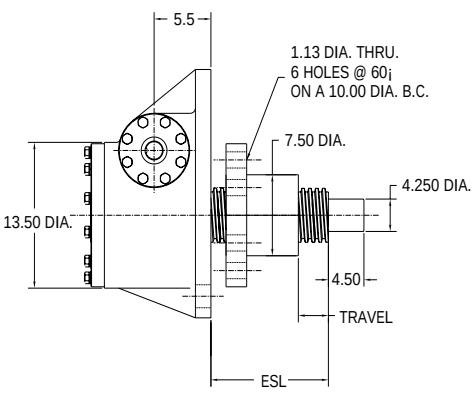
ROTATING WITH TRAVELING NUT

UPRIGHT M-75-U-T



TRAVEL NUT POSITION A

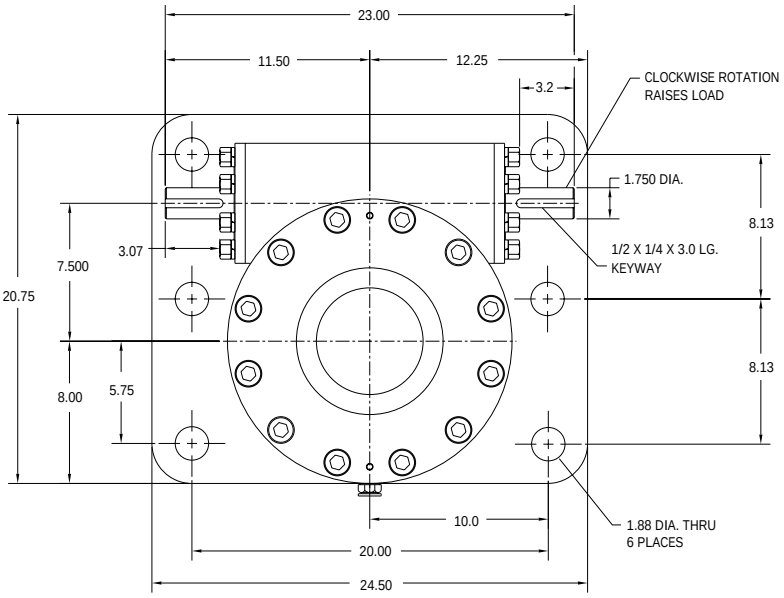
INVERTED M-75-I-T



TRAVEL NUT POSITION B

M100 - 100 TON

M-SERIES MACHINE SCREW ACTUATOR



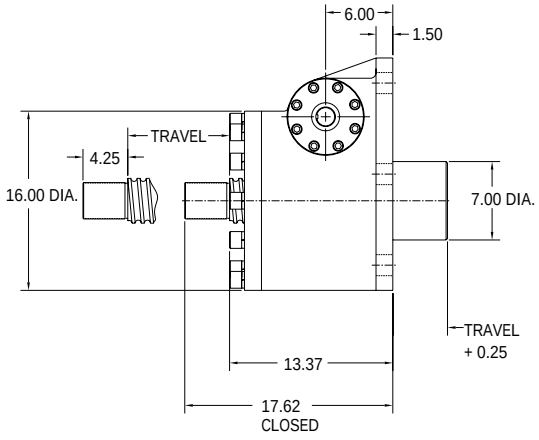
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	12:1	16	0.078
H	36:1	48	0.045
RATED CAPACITY			200,000 lbs.
Max Input Speed			900 rpm
Max Screw Stock			125 in.
Load Screw			6 in. dia. x .750 in. lead
Stop Nut Allowance			4 in.

NOTES:

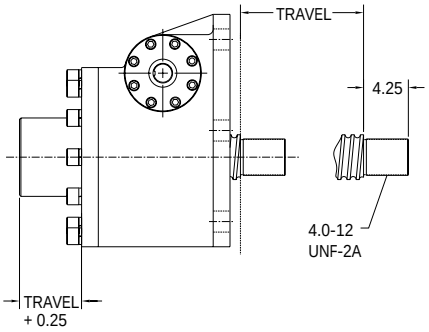
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: CONSULT FACTORY.**

TRANSLATING & KEYED

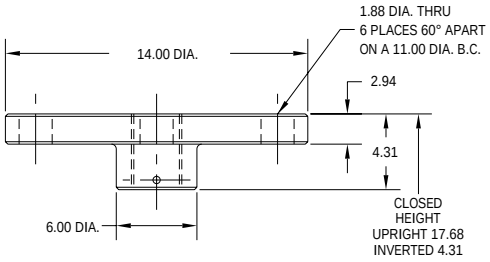
UPRIGHT M-100-U-T

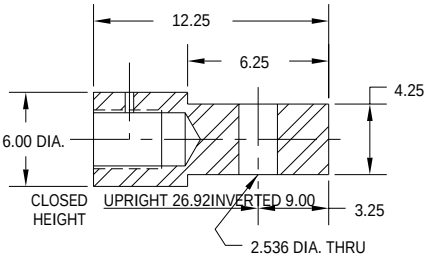


INVERTED M-100-I-T



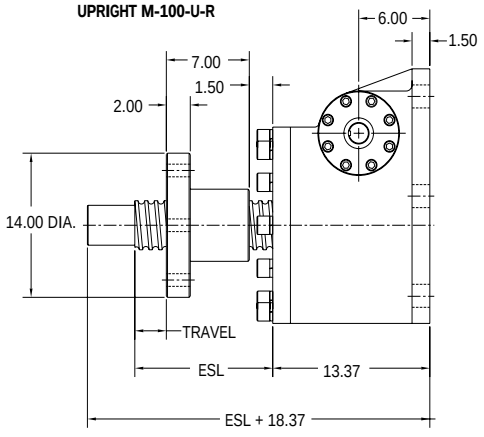
TOP PLATE AND CLEVIS END OPTIONS





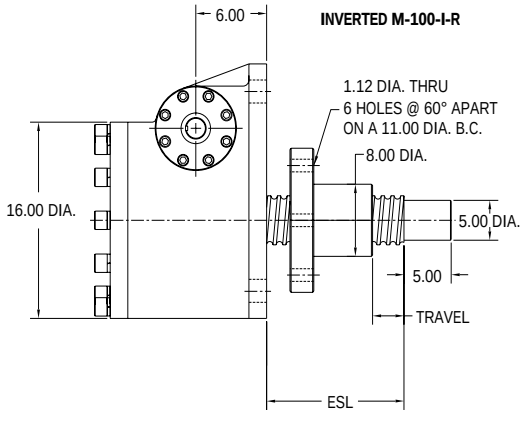
ROTATING WITH TRAVELING NUT

UPRIGHT M-100-U-R



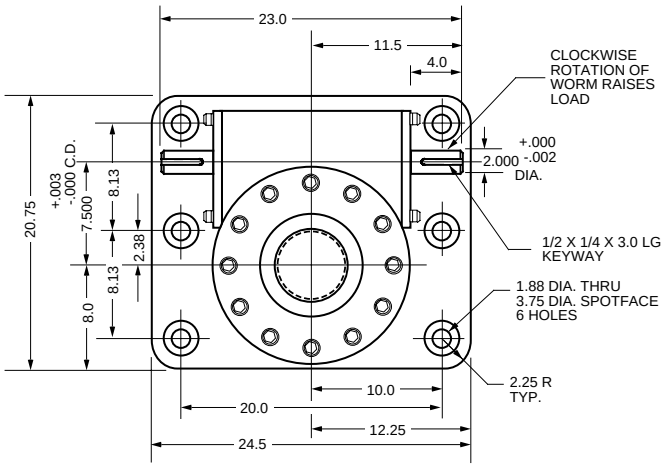
TRAVEL NUT POSITION "B"

INVERTED M-100-I-R



TRAVEL NUT POSITION "A"

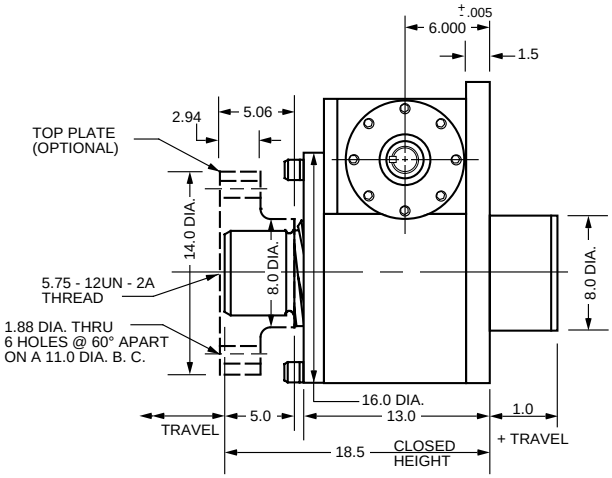
M150 - 150 TON

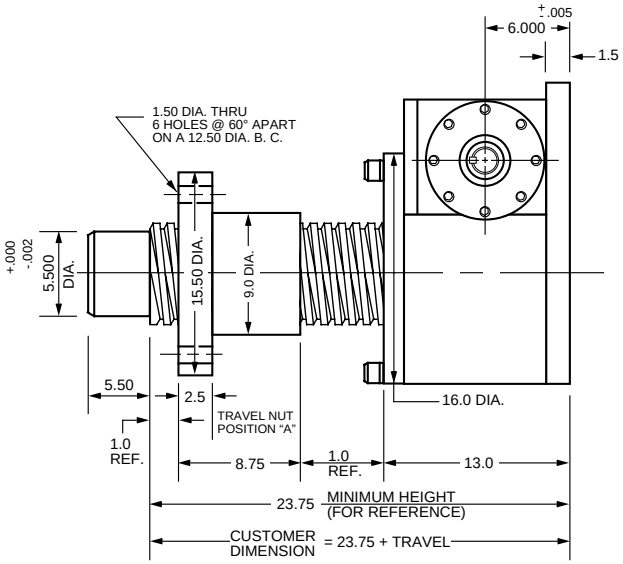


REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	12:1	12	Contact Factory
H	36:1	36	Contact Factory
RATED CAPACITY			300,000 lbs.
Max Input Speed			600 rpm
Max Screw Stock			125 in.
Load Screw			7 in. dia. x 1 in. lead
Stop Nut Allowance			5 in.

NOTES:

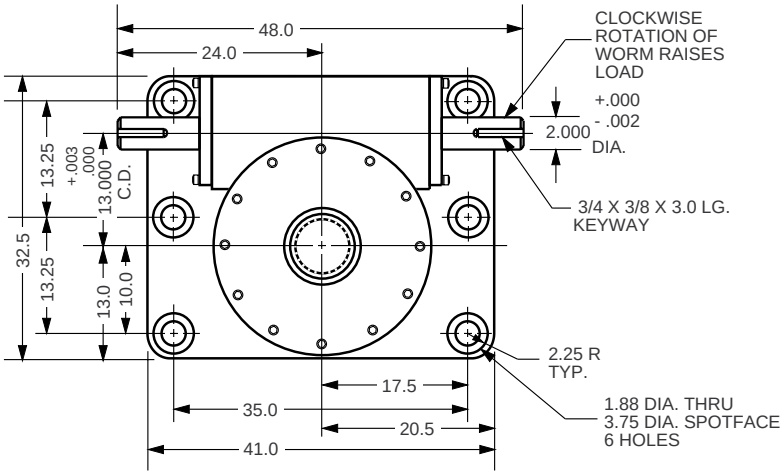
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: CONSULT FACTORY.**





M250 - 250 TON

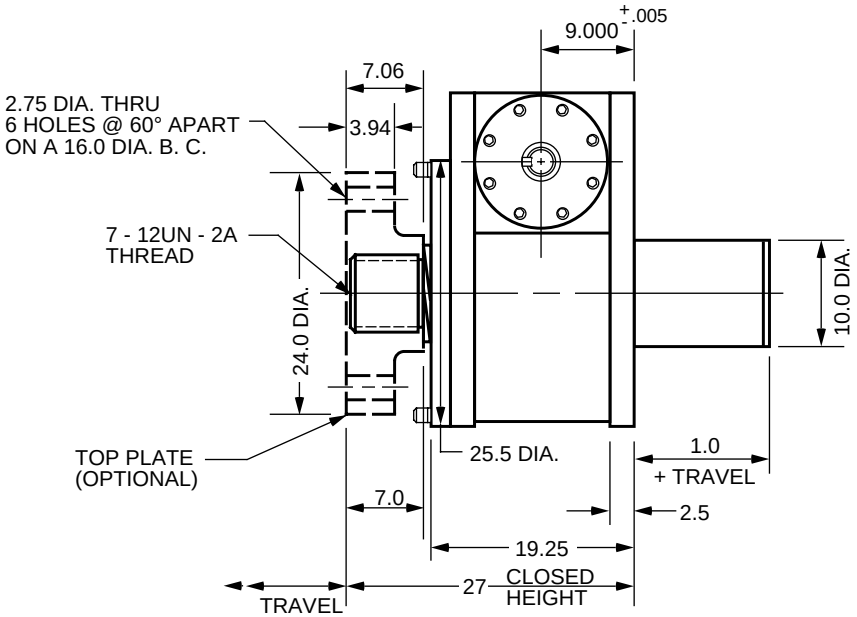
M-SERIES MACHINE SCREW ACTUATOR



REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
H	50:1	50	Contact Factory
RATED CAPACITY			500,000 lbs.
Max Input Speed			600 rpm
Max Screw Stock			117 in.
Load Screw			9 in. dia. x 1 in. lead
Stop Nut Allowance			6 in.

NOTES:

1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: CONSULT FACTORY.**

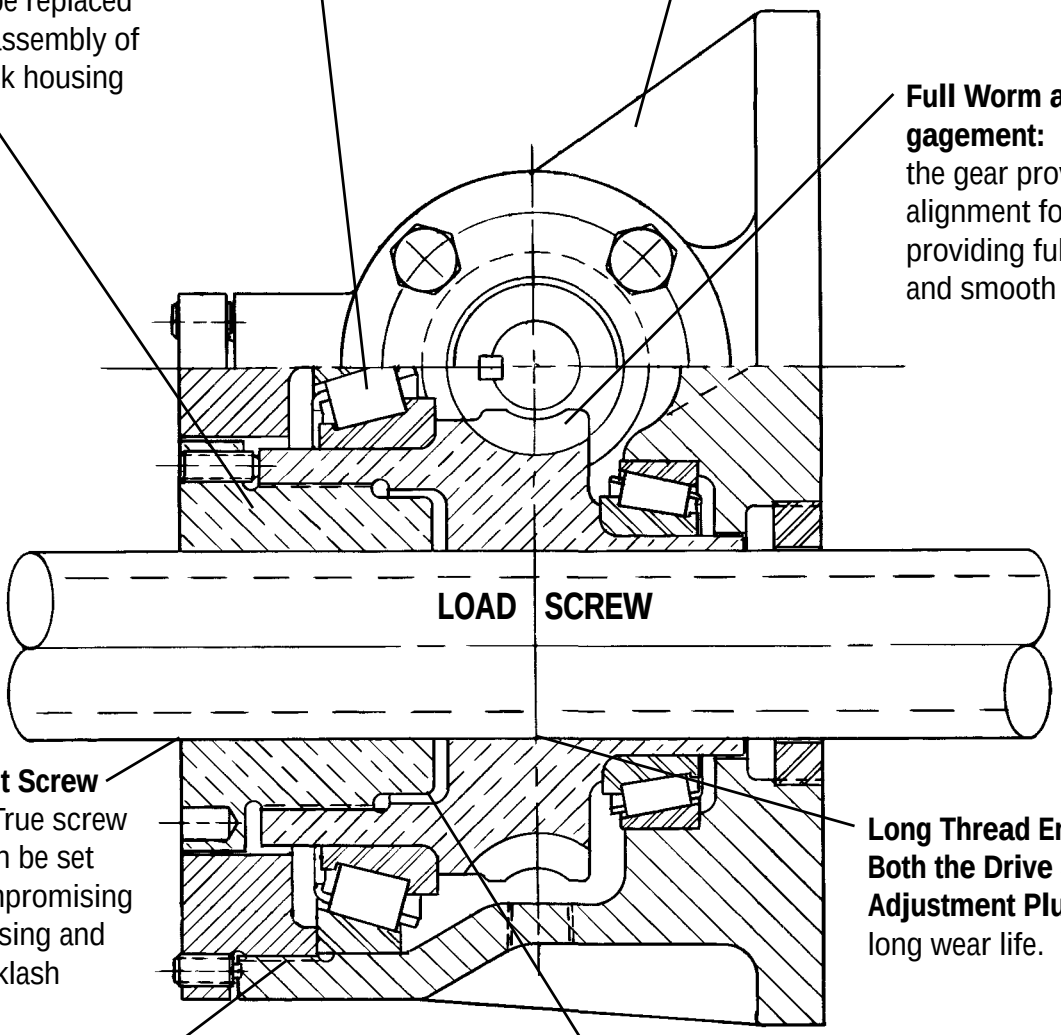


Full Bearing Guided Drive Sleeve and Correct Gear Alignment: Provides longer gear life.

Maintains Standard Product Dimensions: Anti-backlash jack components fit in the same jack housing with the same mounting footprint as our standard jacks. Standard units can be field converted.

Replaceable Anti-Backlash Adjustment Plug: Can be replaced without disassembly of the main jack housing assembly.

Full Worm and Worm Engagement: Rigid support of the gear provides proper alignment for the gear mesh providing full tooth contact and smooth torque transfer.



Independent Screw Backlash: True screw backlash can be set without compromising internal housing and bearing backlash tolerances.

Long Thread Engagement for Both the Drive Sleeve and Adjustment Plug: Provides long wear life.

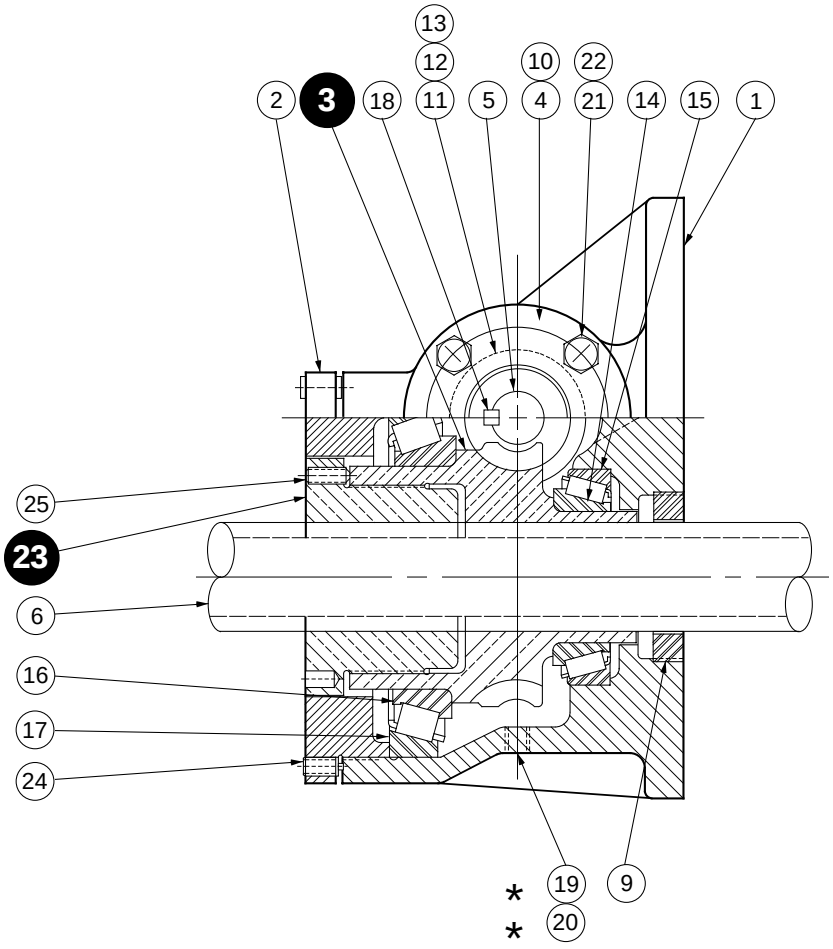
Independent Thrust Bearing Adjustment: This allows the thrust bearings to be independently preloaded, not free to float or allow backlash in the gear nut.

Reduce Unit Spring Rate by Design of Independent Backlash Adjustment: By reducing the expansion and contraction fluctuations of the internal jack components during reversing load conditions.

FULLY ADJUSTABLE BACKLASH

ANTI–BACKLASH FEATURES

The Pow-R-Jac Anti-Backlash design allows the backlash in the lifting screw to be minimized to meet the application requirements by simply adjusting the adjustment plug (23). Features include: One-piece gear nut (3), independent adjustment of the thrust bearing preload (to bearing manufacturers recommendations), extra long screw thread engagement, reduced unit spring rate, and full gear tooth contact. This design insures proper bearing alignment and worm gear tooth contact for maximum unit efficiency. The anti-backlash Pow-R-Jac is a quality product you can depend on to provide a long operating life.



THE ADJUSTMENT PLUG (23) ROTATES TO ELIMINATE AXIAL BACKLASH. THE TWO-PIECE NUT CONSISTS OF THE ADJUSTMENT PLUG (23) AND THE DRIVE SLEEVE AND GEAR (3). FACTORY BACKLASH ADJUSTMENT IS 0.004 INCHES AND IS OBTAINED BY ROTATING THE ADJUSTMENT PLUG IN THE COUNTERCLOCKWISE DIRECTION. SOCKET SET SCREWS (25) MUST BE TIGHTENED AFTER ADJUSTMENT!

BILL OF MATERIAL		
ITEM	QTY	DESCRIPTION
1	1	HOUSING
2	1	HOUSING COVER
3	1	DRIVE SLEEVE & GEAR
4	1	END CAP
5	1	WORM SHAFT
6	1	LIFT SCREW
7	1	SCREW COVER (NOT SHOWN)
8	1	SCREW COVER PLT (NOT SHOWN)
9	1	HOUSING BUSHING
10	2	SHIM
11	2	BEARING CONE (WORM)
12	2	BEARING CUP (WORM)
13	2	SEAL (WORM)
14	1	BEARING CONE (LOWER)
15	1	BEARING CUP (LOWER)
16	1	BEARING CONE (UPPER)
17	1	BEARING CUP (UPPER)
18	2	KEY (WORM)
19	1	GREASE FITTING
20	1	PIPE PLUG
21	8	HEX HEAD CAP SCREW
22	8	LOCK WASHER
23	1	ADJUSTMENT PLUG
24	2	SOCKET SET SCREW (1/2 DOG PT.)
25	2	SOCKET SET SCREW (CONE PT.)

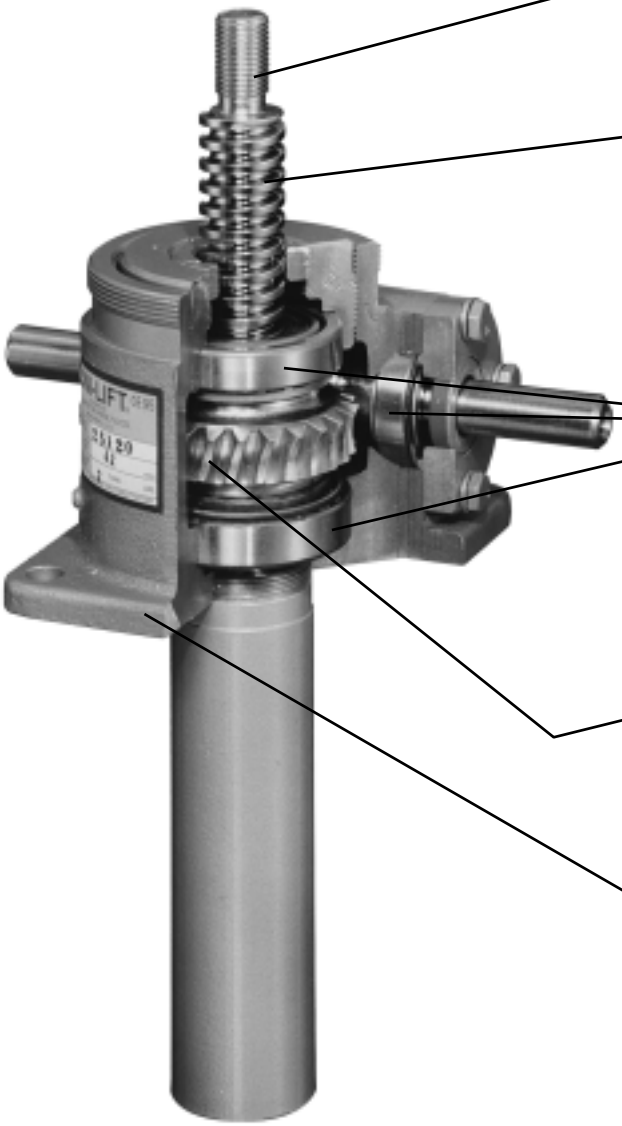
* SHOWN ROTATED 90° FROM ACTUAL LOCATION

JACK SIZE	MAX. ADJUST. PLUG ROTATION BEFORE REPLACEMENT	ALLOWABLE NUT THREAD WEAR BEFORE REPLACEMENT	APPROX. ADJUST. PLUG ROTATION FOR 0.004" AXIAL ADJUSTMENT
2½	115°	1/16	45° (1/8)
5	105°	3/32	45° (1/8)
10	100°	1/8	34° (3/32)
15	110°	1/8	45° (1/8)
20	110°	1/8	45° (1/8)
30	105°	1/8	45° (1/8)

J-SERIES MACHINE SCREW ACTUATOR

FEATURES & BENEFITS

J-Series machine screw actuators are available in 1/4 ton through 40 ton capacities.



"V" Threaded Screw End

- Easy mounting of optional screw end accessories, insures better alignment.

Clevis

Top Plate

High Strength Rolled Formed Thread Load Screws

- Provides minimum friction for smooth operation and longer life from a work hardened surface.
- Self locking design provides positive positioning, and no back driving.
- Minimal axial backlash with Class 3 fit.

Tapered Roller Bearings

- Preloaded for high thrust loads and side loading in horizontal applications.
- Maintains gear alignment under separating and thrust forces from gearing.
- Bearings sized for tough loading conditions.

High Efficiency Gearing

- Precision formed gears manufactured to close tolerance with minimum backlash, usually less than 1°.
- Large gear centers for longer life and higher efficiencies. (Approaching 50%.)
- Higher allowable input speeds for faster cycles.

Rugged Housings

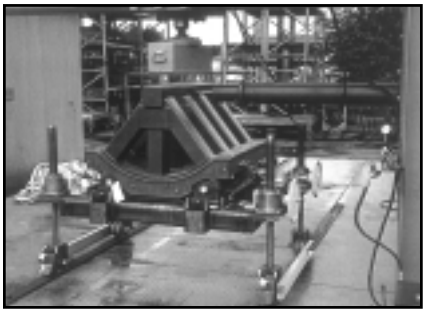
- Ductile iron on the larger J1 to J100 models.
- Smaller J3/4 housings are made of a lightweight, high strength aluminum alloy.
- Lower closed heights save space and weight.

Superior Performance

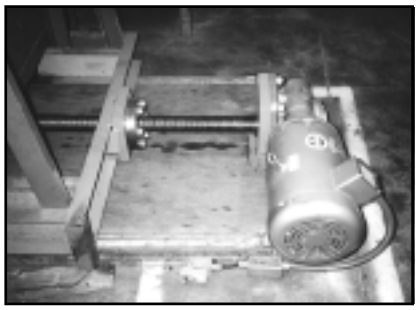
- Uni-Lift actuators provide design integrity and reliability for heavy duty jobs where precision is important. For lighter loads, Uni-Lifts often satisfy the requirements of higher velocity applications that would otherwise require more expensive ball screw actuators.

Synchronized Travel

- Uni-Lift actuators can be arranged in systems to provide synchronized travel when driven from a common source.



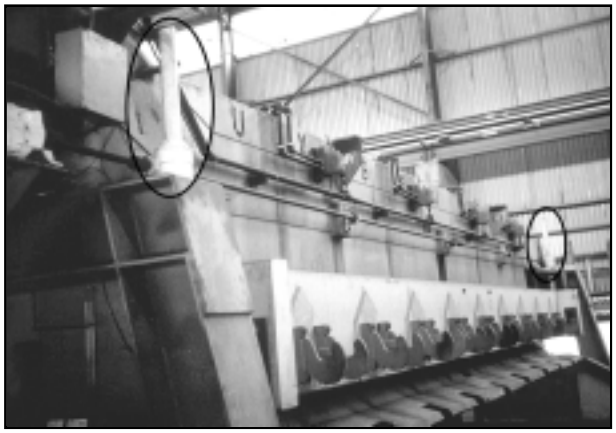
Structure and actuators are tested with an induced side load on top of the primary load. Each hand cranked Uni-Lift controls a corner of the assembly cart.



Motorized Uni-Lift pushes and pulls 10,000 lbs. of material in and out of a heat treatment oven. High worm ratio eliminates the need for external gear reducer.

PRODUCTS IN ACTION

J-SERIES MACHINE SCREW ACTUATOR

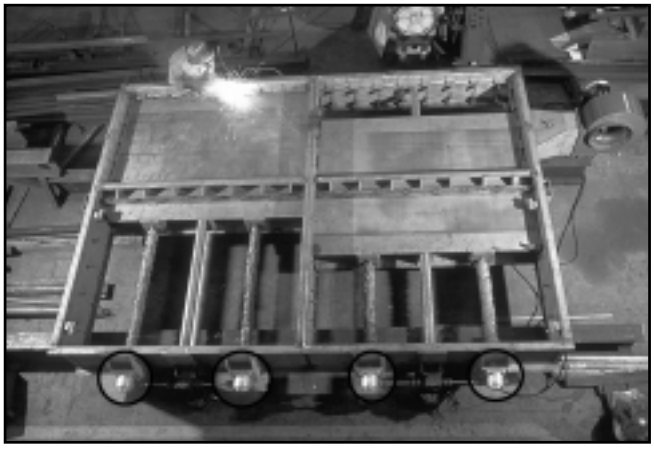


IN PRODUCTION

Uni-Lifts at an aluminum reduction mill control annode position. The larger gear center design stands out when annodes are pulled from frozen crust without damage to the gear set.

IN MANUFACTURING

Positioning of large guillotine damper in process plant is easy and reliable when Uni-Lifts are used. The higher efficiencies allow smaller motors to save cost.

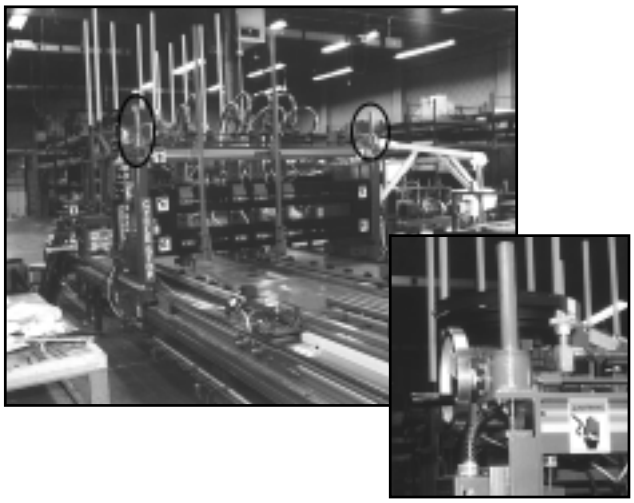


IN BROADCASTING

Satellite antennas not only require accurate, repeatable positioning, but also the integrity to withstand the elements.

IN ASSEMBLY

OEM equipment manufacturers choose Uni-Lift to position the pallets in a nailing operation. Rolled thread load screws, tapered roller bearings and larger gear centers provide long life actuation without interruption.



H & J SERIES TECHNICAL SPECIFICATIONS (Table 4)

Model Type and Size		H1/4	H1/2	J3/4 -20	J3/4-40	J1	J2	J5	J10	J20	J25	J40
CAPACITY IN POUNDS (P)		500	1,000	1,500	1,500	2,000	4,000	10,000	20,000	40,000	50,000	80,000
DIAMETER OF LOAD SCREW		0.500	0.625	0.625	0.625	0.750	1.000	1.500	1.750	2.500	2.750	4.250
LEAD OF SCREW		0.250	0.250	0.250	0.125	0.250	0.250	0.333	0.333	0.500	0.500	0.667
GEAR CENTERS		0.946	0.946	0.941	0.941	1.504	1.835	2.260	3.014	3.675	4.009	5.164
GEAR RATIO	LOW	5:1	5:1	5:1	5:1	5:1	6:1	5 1/3:1	6:1	8:1	9:1	9:1
	MEDIUM						8:1	12:1				
	HIGH	10:1	10:1			10:1	12:1	24:1	12:1	16:1	18:1	
(TPI) TURNS OF INPUT SHAFT FOR 1" OF RISE	LOW	20	20	20	40	20	24	16	18	16	18	18
	MEDIUM						32	32				
	HIGH	40	40			40	48	72	36	32	36	
(Tp) TORQUE REQUIRED TO LIFT ONE POUND (lb-in)	LOW	0.024	0.026	0.026	0.021	0.028	0.028	0.042	0.046	0.050	0.039	0.032
	MEDIUM						0.024	0.027				
	HIGH	0.013	0.015			0.017	0.018	0.019	0.029	0.032	0.024	
NO LOAD TORQUE (lb-in) (To)		1.5	2.0	1.0	2.0	3.0	4.0	5.0	7.0	9.0	10.0	12.0
MAXIMUM INPUT RPM		1725	1725	2587	2587	2587	2587	1725	1725	1725	1450	1450
APPROXIMATE WEIGHT IN POUNDS	0" TRAVEL	2.3	2.3	2	2	9	13	23	47	90	103	103
	PER INCH	0.1	0.1	0.1	0.1	0.2	0.4	0.7	0.9	1.8	2.1	2.1
RADIUS OF GYRATION (r)		0.094	0.125	0.125	0.125	0.156	0.218	0.334	0.396	0.566	0.628	0.985

1. Complete the Uni-Lift Selection Guide located in the inside front cover.

2. Determine the maximum load on one actuator: P_1

$$P_1 = \frac{P_2}{N}$$

P_2 = Total system load (lbs.)
N = Number of actuators in the system
On multi-unit systems where load is not equally distributed, change P_1 to the greatest load supported by one unit.

3. Check Load Screw Column Capacity:
- If the load screw is in tension, select a Uni-Lift with a rated capacity equal to or greater than the maximum load (P_1) on one actuator. Go to step 4.
- If the load screw is in compression, use the calculation steps on page 35 to determine the maximum permissible Extended Screw Length, (ESL). Select a Uni-Lift that has a load screw column length capacity equal to or greater than the length required for the load.

4. Determine the desired load screw velocity (in./min.): (V_d)

$$V_d = \frac{\text{Rise}}{t_2}$$

Rise = One way travel under load (in.)
t_2 = Required one way travel time (min.)

5. Determine Desired Input Speed: (RPM_d)

$$RPM_d = TPI \times V_d$$

TPI = Turns of the input shaft for 1 inch of rise. (See technical specification table 4.)

6. Determine Load Screw Velocity: (V)
From the catalog data, select the drive equipment with an output speed close to the desired input speed (RPM_d). Use the output speed to recalculate the actual load screw velocity (V).

$$V = \frac{RPM}{TPI}$$

7. Check the Duty Limit of the actuator:

$$D_1 = \frac{(2 \times \text{Rise} \times C_h)}{V}$$

D_1= Duty time per hour
C_h = Cycles per hour
Determine if D_1 is equal to or greater than D_2. If D_2 is less than D_1 reduce the input speed to the actuator, or reduce the load per actuator by adding more actuators to the system.
D_2 = Duty Limit (see page 34 for calculations)

Motor Sizing:

The following is a QUICK ESTIMATE FOR MOTOR SIZING FOR A ONE ACTUATOR SYSTEM. For detailed motor sizing and torque requirements on single or multi-unit systems, skip steps 8 and 9, and go to step 10.

8. Estimate the Input Torque T_e (lbs/in):

$$T_e = T_p \times P_3$$

T_p = Torque required to lift one pound (see table 4 for T_p values.)
P_3 = Maximum system running load.

9. Estimate Uni-Lift Horsepower: HP_e

$$HP_e = \frac{(T_e \times RPM)}{63025}$$

H & J SERIES MOTOR SIZING AND TORQUE CALCULATIONS (Table 5)

MODEL & SIZE	GEAR RATIO	Turns per inch TPI	Rated cap (lbs) P	STATIC TORQUE Ts	UNIT INPUT TORQUE AT RATED CAPACITY T = RUNNING TORQUE (lb-in) at VARIOUS RPM (Theoretical)								NO LOAD TORQUE To
					50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	
H 1/4	5:1	20	500	10.7	6.0	5.6	5.4	5.0	4.6	4.4	4.2	4.0	1.5
	10:1	40		6.7	3.6	3.3	3.2	3.0	2.7	2.5	2.5	2.3	
H 1/2	5:1	20	1,000	24.1	13.7	12.7	12.2	10.9	10.2	9.7	9.4	8.8	2
	10:1	40		15.4	8.2	7.6	7.3	6.7	6.1	5.7	5.5	5.1	
J 3/4	5:1	20	1,500	38	30.0	28.0	27.0	24.7	23.3	22.3	21.6	20.5	1
	5:1	40		28.7	22.0	20.3	19.4	17.3	16.2	15.3	14.7	13.7	2
J1	5:1	20	2,000	53.1	39.2	36.8	35.4	32.3	30.5	29.2	28.3	26.8	3
	10:1	40		33.1	23.2	21.7	20.9	19.2	17.5	16.7	16.1	15.2	
J 2	6:1	24	4,000	113	79.0	73.0	70.0	63.0	58.0	56.0	53.0	50.0	4
	8:1	32		93	64.0	59.0	56.0	50.0	47.0	44.0	42.0	40.0	
	12:1	48		73	49.0	45.0	43.0	39.0	35.0	33.0	31.0	29.0	
J 5	5.33:1	16	10,000	424	294	267	251	231	214	203	194	181	5
	12:1	36		261	168	153	144	126	116	109	104	97	
	24:1	72		191	114	103	96	85	75	68	64	59	
J 10	6:1	18	20,000	906	596	535	498	453	416	390	372	436	7
	12:1	36		584	365	329	308	268	245	229	218	202	
J 20	8:1	16	40,000	1973	1287	1154	1079	982	901	847	809	751	9
	16:1	32		1271	789	710	667	582	530	497	472	438	
J 25	9:1	18	50,000	1938	1526	1364	1273	1155	1057	991	945		10
	18:1	36		1215	935	841	787	685	624	583	554		
J 40	20:1	30	80,000	2557	1917	1698	1573	1377	1243	1156	1094		12

For RPM's not shown use the next slowest RPM. For speeds less than 50 RPM contact factory.

10. Determine Uni-Lift Running Load Proportion Factor: (f)

$$f = \frac{P_3}{(P \times N)}$$

P = Rated Capacity of Uni-lift
P_3 = Max. system running load N= Number of Uni-lifts

11. Determine Unit Running Torque: (T_1) (lb-in)

$$T_1 = (T \times f) + T_o$$

T_0 = No load torque from chart
T = Running torque from chart

12. Find the System Running Torque: (T_2) (lb-in)

$$T_2 = \frac{(T_1 \times N)}{e_1}$$

e_1 = System Arrangement Efficiency, see page 77

13. Find System Power:

$$\text{System HP} = \frac{(T_2 \times RPM)}{(63025 \times e_2)}$$

e_2 = Reducer Efficiency, see page 77
RPM = Uni-Lift input shaft speed

14. Determine System Starting Torque: (T_{s2})

$$T_{s2} = \frac{((T_s \times f) + T_o) \times N}{e_2}$$

T_s = Static torque from chart

15. Determine Motor Starting Torque: (T_{sm}) (lb in)

$$T_{sm} = \frac{T_{s2}}{(R \times e_2)}$$

R = Gear Reducer Ratio

16. Determine Motor Running Torque: (T_{rm})

$$T_{rm} = \frac{T_2}{(R \times e_1)}$$

- Select a motor with a power rating greater than HP requirement in step 13, a starting torque greater than T_{sm} requirement in step 15, and a motor running torque greater than T_{rm} in step 16. See motor chart page 64 for horsepower and torque ratings.
- Select system torque transmission equipment (reducer, mitre gear boxes, couplings, etc.) with ratings greater than the torque to be transmitted, see step 12 and system arrangements, page 77.
- Size shafting for system starting torque to be transmitted, see step 16, and Table B page 76.

H & J SERIES DUTY CYCLE (Table 6)

Uni-Lift Duty Limit at Full Rated Capacity and 80° F Ambient Temperature

MODEL and SIZE	RATIO	TPI	L2 - DUTY LIMIT SERVICE FACTOR @ VARIOUS RPM INPUT SPEEDS								
			50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	2587 RPM
H 1/4	5:1	20	870	412	291	164	107	79	64	46	34
	10:1	40	1380	678	475	263	169	130	105	76	55
H 1/2	5:1	20	429	205	145	85	54	40	32	24	18
	10:1	40	705	336	236	132	85	65	52	38	28
J 3/4	5:1	40	220	105	73	46	27	21	17	13	9
	5:1	20	201	97	67	44	25	19	15	11	7
J 1	5:1	20	330	161	115	66	41	30	24	18	12
	10:1	40	508	243	172	94	61	46	39	28	17
	6:1	24	211	102	74	48	30	22	18	13	9
J 2	8:1	32	261	126	88	54	34	26	21	16	12
	12:1	48	340	164	117	67	45	34	27	20	15
	5.33:1	16	102	51	36	24	15	11	9	6	
J 5	12:1	36	172	85	60	36	24	17	15	11	
	24:1	72	201	98	75	45	31	24	19	15	
J 10	6:1	18	87	48	36	24	20	12	9	6	
	12:1	36	130	63	46	28	18	13	12	8	
J 20	8:1	16	72	36	26	17	11	8	6	4	
	16:1	32	117	57	41	27	16	12	10	7	
J 25	9:1	18	64	32	23	17	10	7	5		
	18:1	36	106	46	38	22	14	11	9		
J 40	20:1	30	81	39	29	17	12	9	8		

- Duty Limit Service factor (L_2) = Operating time allowed per hour. The numbers greater than 60 are theoretical values and exceed 100% duty, solely to provide base data for adjusting L_2.
- The L_2 values are based on Uni-Lifts loaded at rated capacity, operating in an ambient temperature of 80° F., with a maximum allowable temperature rise of 100° F.
- For ambient temperatures above 180° F or below -20° F, consult factory.
- For speeds not shown, use the next fastest RPM value.

1. Determine Adjusted Duty Limit : D_2

When the unit load is at rated capacity, and the ambient temperature is at 80° F, the L_2 value from the table equals D_2. If not, proceed to step 1A.

1A) For different temperature service, or a unit load less than rated capacity, use the following equation to determine the Adjusted Duty Limit Service Factor (D_2).

$$D_2 = \frac{(180 - T_A) \times P \times L_2}{100 \times P_4}$$

L_2 = Duty Limit Service Factor (see Table 6)
T_A = Ambient temperature (F°) P=Rated capacity (lbs.)
P_4 = Maximum running load per actuator (lbs.)
P = Rated capacity of the Uni-Lift

2. Determine if Duty Cycle is acceptable:
If **D_2> = 60** minutes, the application is rated for continuous duty.
If **D_2> = D_1** then the application is acceptable.
If **D_2<D_1** then the duty cycle limit has been exceeded for this application. You must do one of the following: select larger size Uni-Lift, reduce load by adding additional Uni-Lifts, or reduce speed. If you reduce speed, you must recalculate V_1 and D_1 from the Technical Specifications page 32 steps 6 and 7.

EXAMPLE

A. Consider for an J-5 low ratio 5:33:1 operating in 120°F ambient temperature, 5,000 lbs. load, and 600 RPM, with a rise of 20 inches and 5 cycles per hour:

$$D_1 = \frac{(2 \times \text{Rise} \times C_h)}{V_1}$$

$$D_1 = \frac{(2 \times 20 \times 5)}{37.5}$$

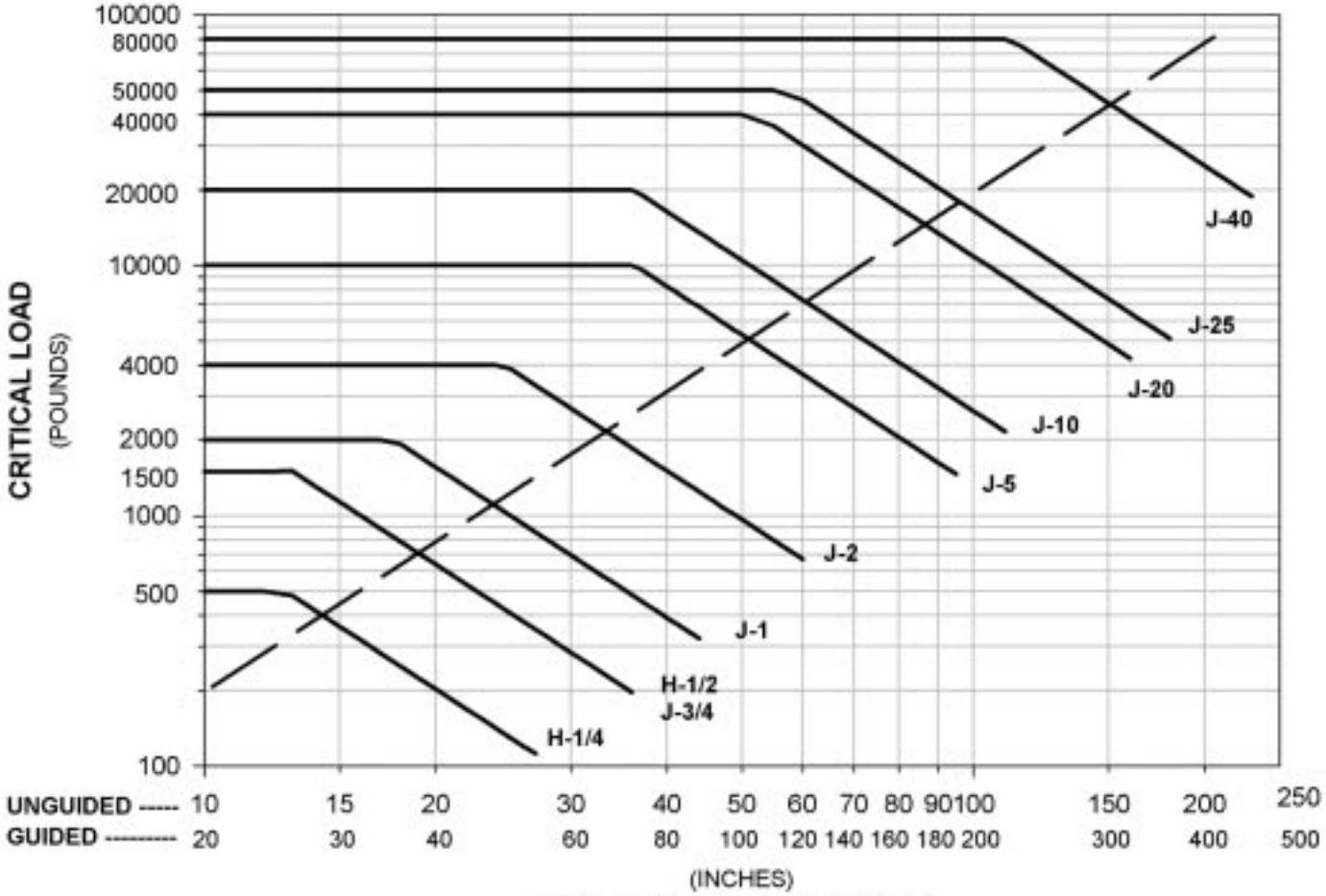
Duty time per hour = 5.33 minutes per hour

$$D_2 = \frac{(180 - 100) \times 10{,}000 \times 15}{100 \times 5{,}000}$$

Duty cycle limit = 18 minutes per hour

Since D_2 is greater than D_1 the application is OK for the duty cycle limit.

H & J SERIES MACHINE SCREW COLUMN BUCKLE CHART



(For guided and unguided loads)

The maximum ESL values in the chart above are based on a **2:1 factor of safety against column buckle,** and on a standard design with a top plate, or a rotating design travel nut. Increased load screw lengths are not shown where the slenderness ratio exceeds 400.

1. Determine extended screw length: (ESL)
The ESL is the distance in inches the load screw can extend from the housing. See layout page for the model selected to determine ESL.

2. Determine the adjusted screw length: (ASL)
The chart above is for a standard design top plate or the rotating design travel nut. For other design configurations you must adjust the ESL value using the F factor multiplier to determine the adjusted screw length.

ASL=ESL x F

3. **Select correct size Uni-lift:** On the chart above, draw a horizontal line to represent the maximum load (P_1). Using the set of ESL values that apply to your design (guided or un-guided), draw a vertical line to represent the ESL or ASL. All of the Uni-Lift's above the point of intersection will be acceptable.

Screw lengths above the dotted line comply with AISC maximum slenderness ratio KL/r=200 specified for design and fabrication of structural steel buildings. This data is for reference only and is not a limiting factor, except as required.

DESIGN CONFIGURATION	F factor	Guided K factor	Unguided K factor
Standard Design Top Plate	1	0.65	1.3
Rotating Design Traveling Nut	1	0.65	1.3
Standard Design Clevis End	1.25	0.8	1.6
Keyed Design Top Plate	1.25	0.65	1.3
Keyed Design Clevis End	2	0.65	1.6

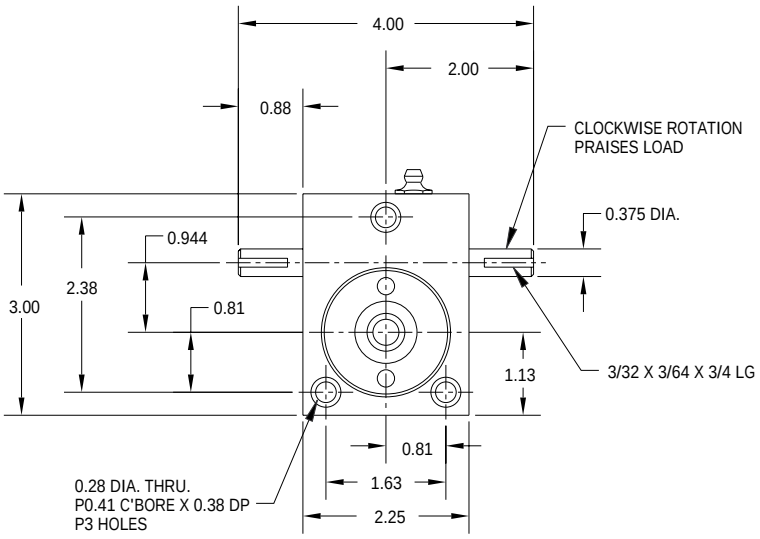
K=Column Factor
L=Extended Screw Length (ESL)
r =Radius of Gyration
See Technical Specifications (Table 4) for r values

H-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

H1/4 - 1/4 TON



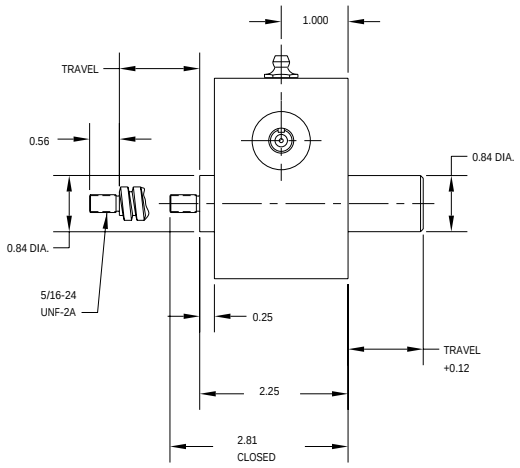
H-1/4-U-T

REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5:1	20	0.024
H	10:1	40	0.013
RATED CAPACITY			500 lbs.
Max Input Speed			1725 rpm
Max Screw Stock			136 in.
Load Screw			1/2 in. dia. x .250 in. lead
Stop Nut Allowance			N/A

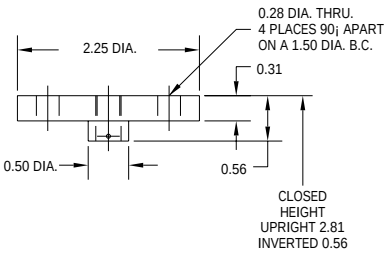
NOTES:

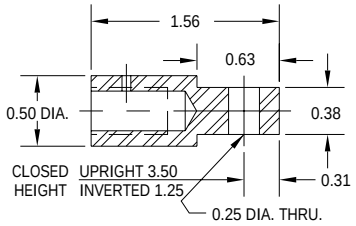
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: NOT AVAILABLE**

TRANSLATING

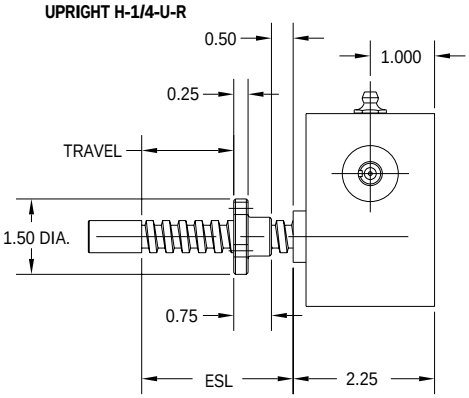


TOP PLATE AND CLEVIS END OPTIONS





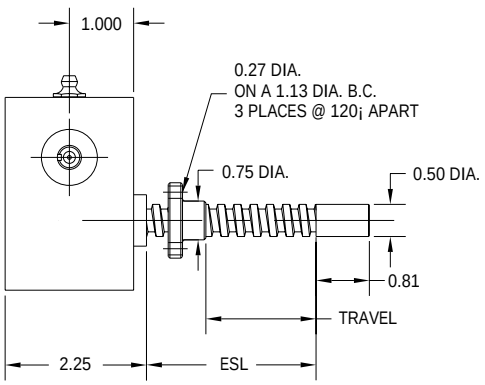
UPRIGHT H-1/4-U-R



TRAVEL NUT POSITION "B"

ROTATING WITH TRAVELING NUT

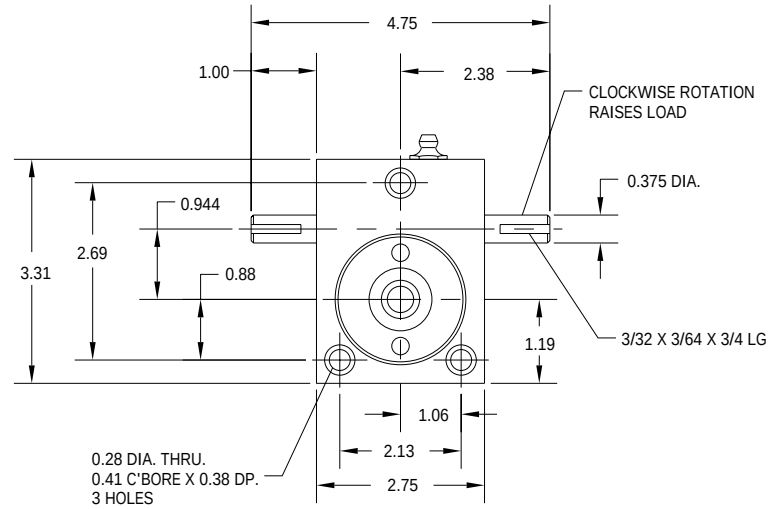
INVERTED H-1/4-I-R



TRAVEL NUT POSITION "A"

H1/2 - 1/2 TON

H-SERIES MACHINE SCREW ACTUATOR



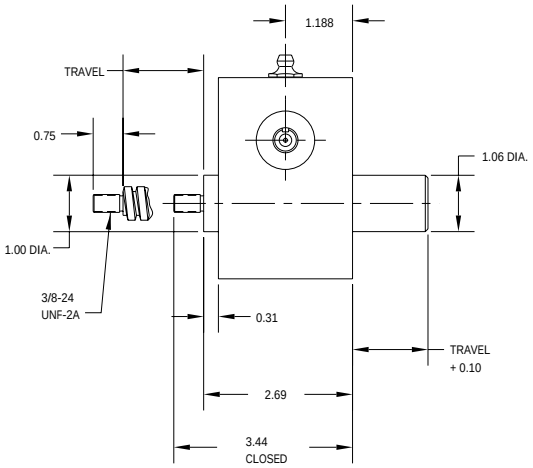
H-1/2-U-T

REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5:1	20	0.026
H	10:1	40	0.015
RATED CAPACITY			1,000 lbs.
Max Input Speed			1725 rpm
Max Screw Stock			136 in.
Load Screw			5/8 in. dia. x .250 in. lead
Stop Nut Allowance			N/A

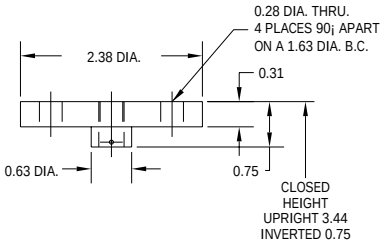
NOTES:

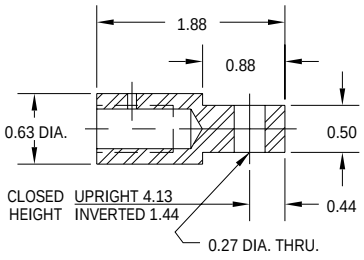
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: NOT AVAILABLE**

TRANSLATING

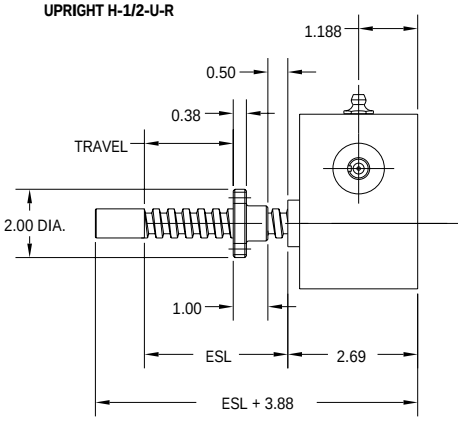


TOP PLATE AND CLEVIS END OPTIONS





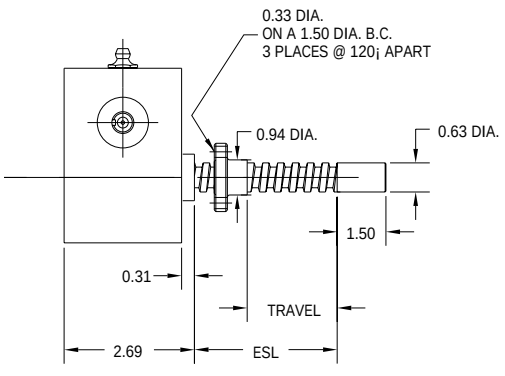
UPRIGHT H-1/2-U-R



TRAVEL NUT POSITION "B"

ROTATING WITH TRAVELING NUT

INVERTED H-1/2-I-R



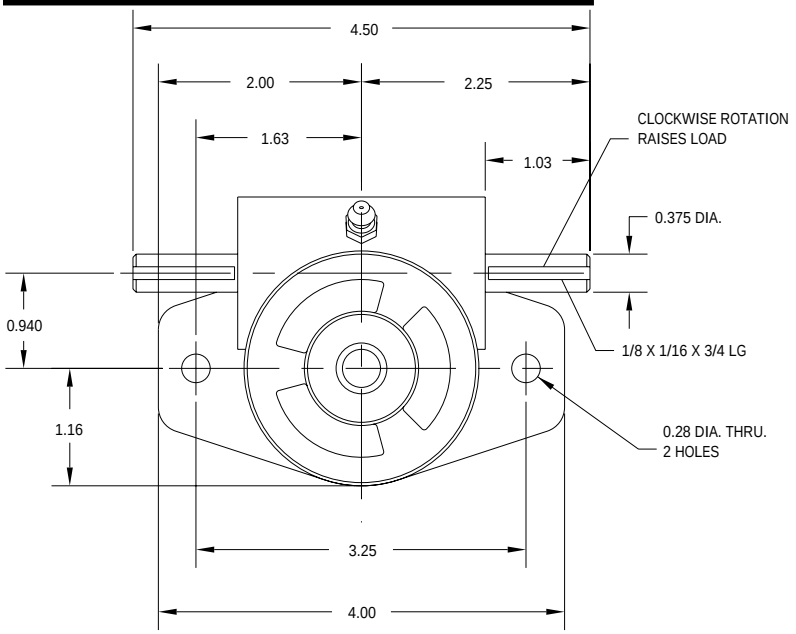
TRAVEL NUT POSITION "A"

J-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

J3/4 - 3/4 TON



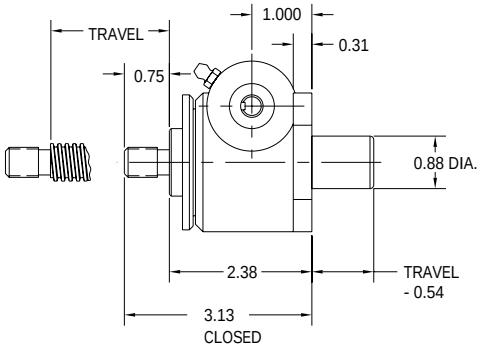
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5:1	20	0.026
H	5:1	40	0.021
RATED CAPACITY			1,500 lbs.
Max Input Speed			2587 rpm
Max Screw Stock			136 in.
Load Screw			5/8 in. dia. x .125 in. lead (40)
Load Screw			5/8 in. dia. x .250 in. lead (20)
Stop Nut Allowance			N/A

NOTES:

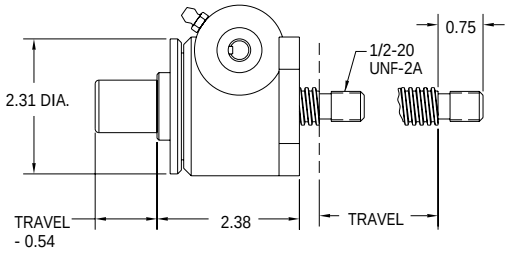
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.

TRANSLATING & KEYED

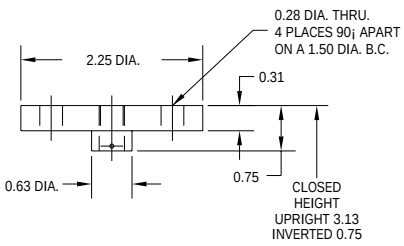
UPRIGHT J-3/4-U-T

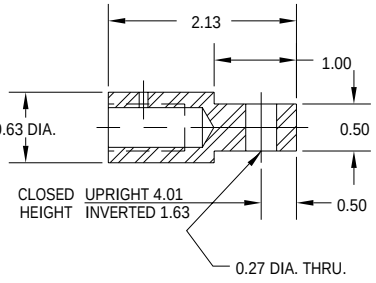


INVERTED J-3/4-I-T

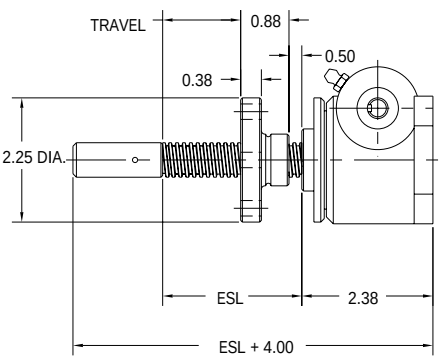


TOP PLATE AND CLEVIS END OPTIONS





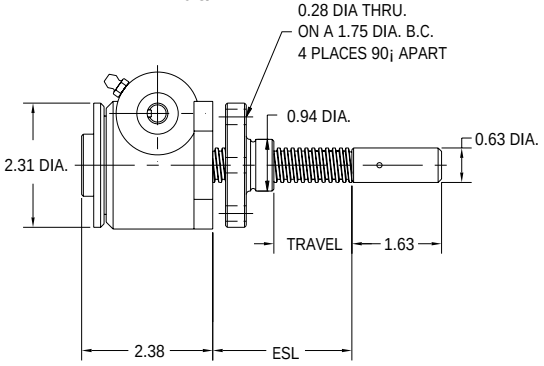
UPRIGHT J-3/4-U-R



TRAVEL NUT POSITION "B"

ROTATING WITH TRAVELING NUT

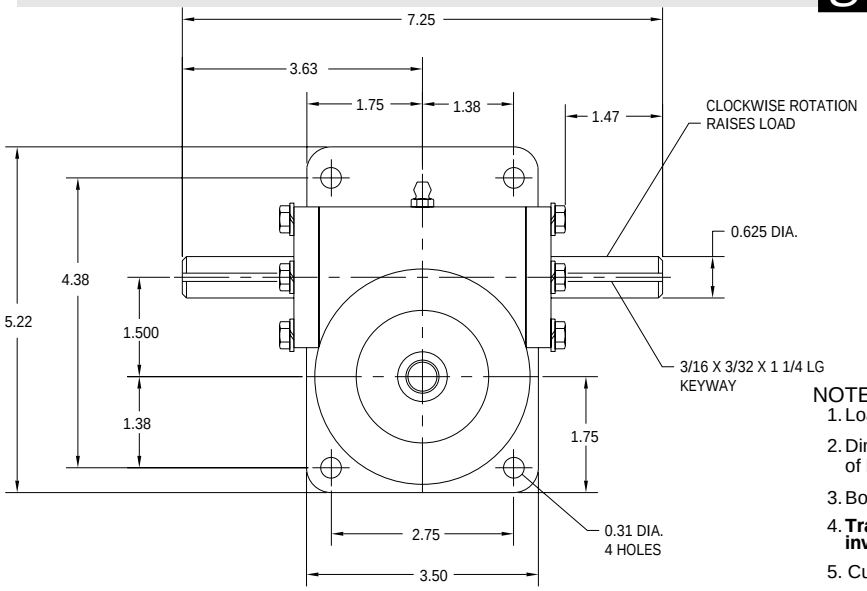
INVERTED J-3/4-I-R



TRAVEL NUT POSITION "A"

J-SERIES MACHINE SCREW ACTUATOR

J1 - 1 TON

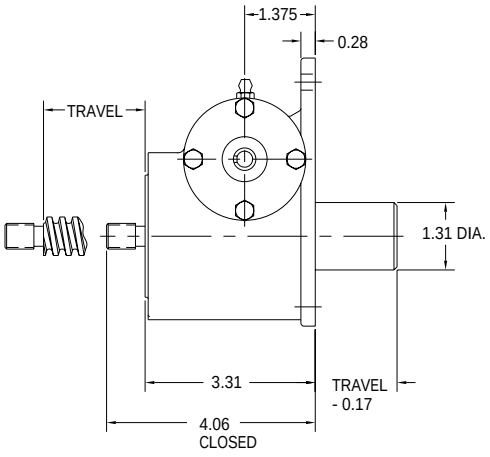


REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5:1	20	0.028
H	10:1	40	0.017
RATED CAPACITY			2,000 lbs.
Max Input Speed			2587 rpm
Max Screw Stock			230 in.
Load Screw			3/4 in. dia. x .250 in. lead
Stop Nut Allowance			5/8 in.

NOTES:

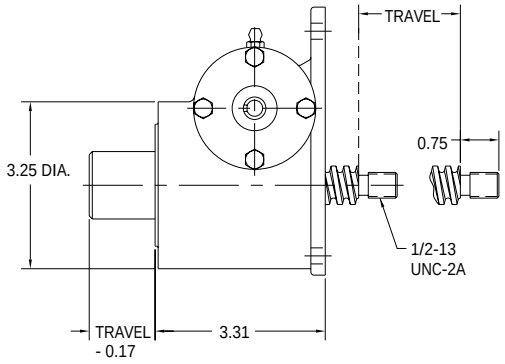
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 5/32 INCHES TO JACK HOUSING.**

UPRIGHT J-1-U-T

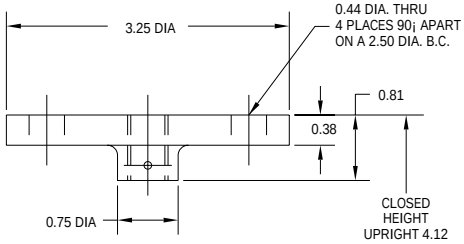


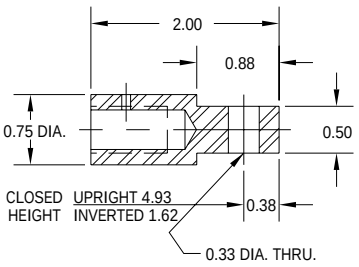
TRANSLATING & KEYED

INVERTED J-1-I-T

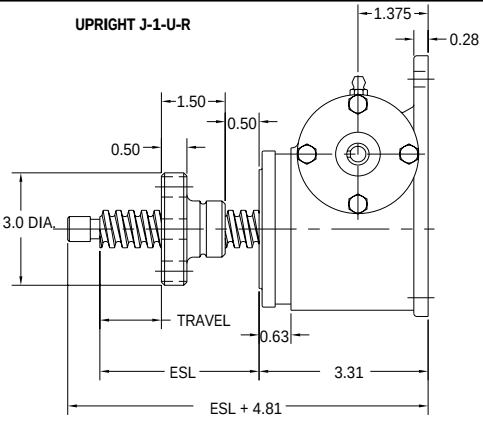


TOP PLATE AND CLEVIS END OPTIONS





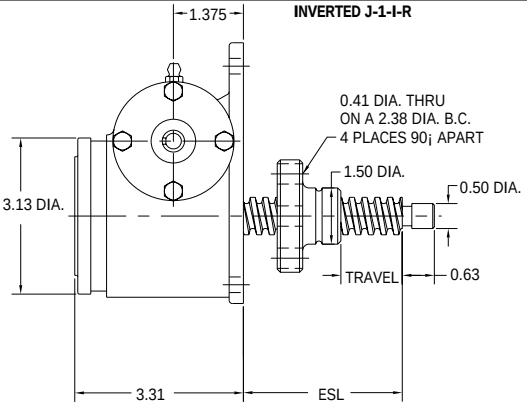
UPRIGHT J-1-U-R



TRAVEL NUT POSITION B

ROTATING WITH TRAVELING NUT

INVERTED J-1-I-R



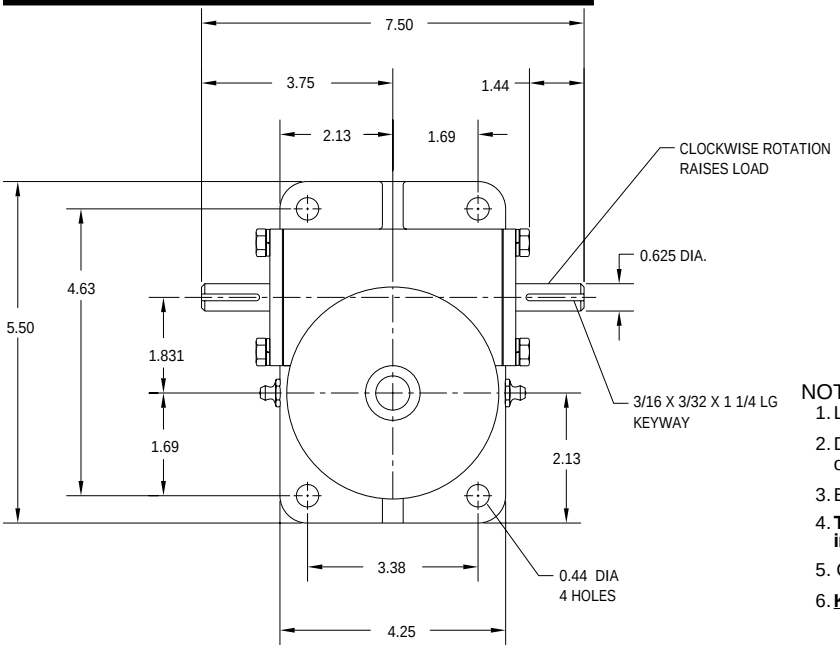
TRAVEL NUT POSITION A

J-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

J2 - 2TON



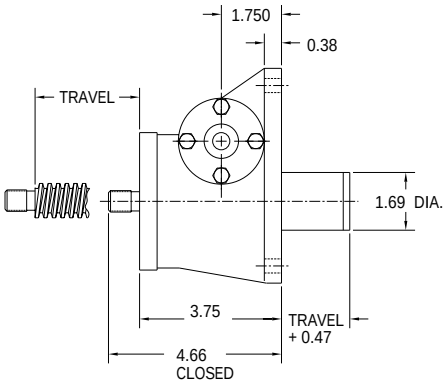
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	6:1	24	0.042
M	8:1	32	0.027
H	12:1	48	0.019
RATED CAPACITY			4,000 lbs.
Max Input Speed			2587 rpm
Max Screw Stock			229 in.
Load Screw			1 in. dia. x .250 in. lead
Stop Nut Allowance			3/4 in.

NOTES:

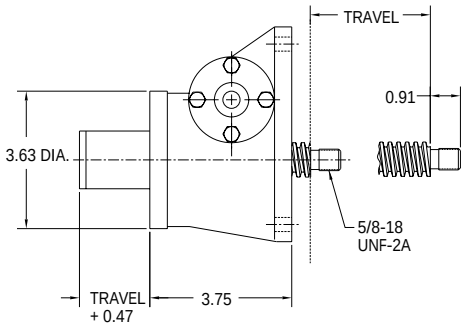
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 5/16 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

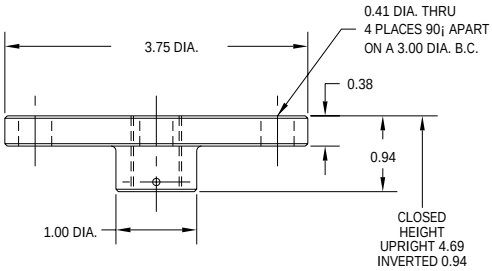
UPRIGHT J-2-U-T

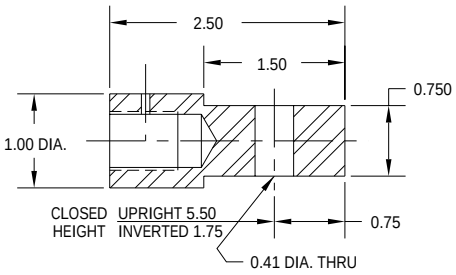


INVERTED J-2-I-T

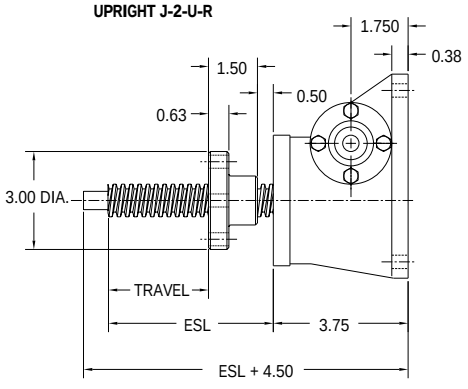


TOP PLATE AND CLEVIS END OPTIONS





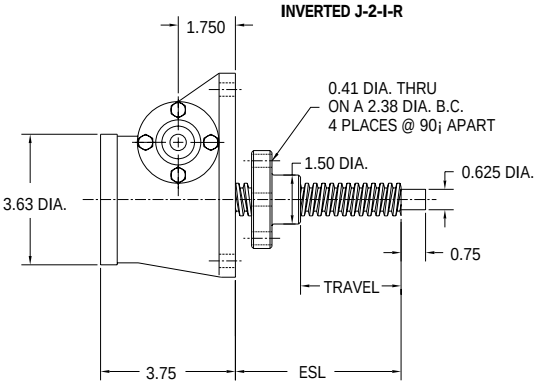
UPRIGHT J-2-U-R



TRAVEL NUT POSITION B

ROTATING WITH TRAVELING NUT

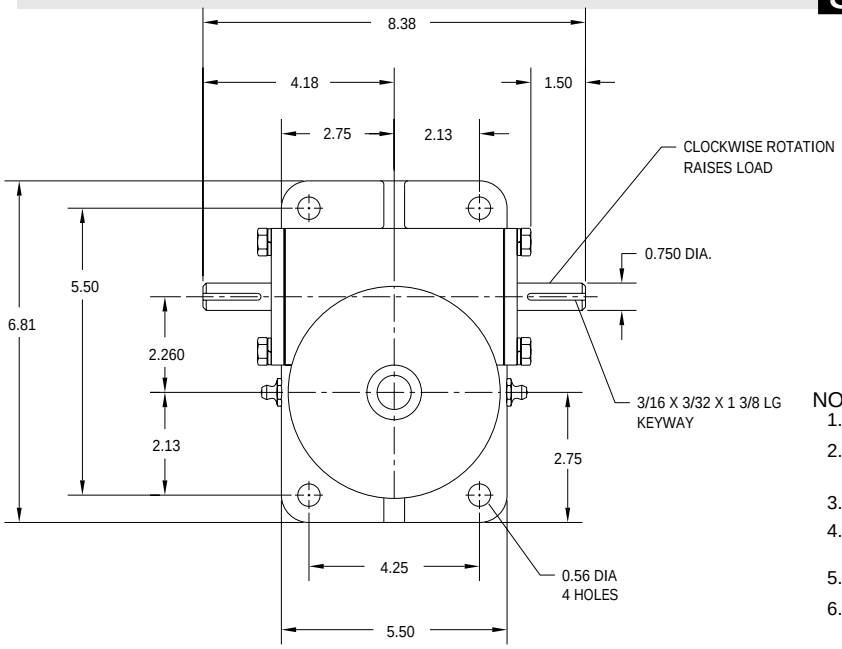
INVERTED J-2-I-R



TRAVEL NUT POSITION A

J-SERIES MACHINE SCREW ACTUATOR

J5 - 5 TON



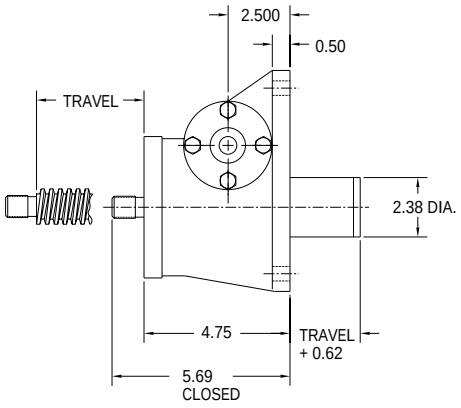
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5 1/3:1	16	0.042
M	12:1	36	0.027
H	24:1	72	0.019
RATED CAPACITY			10,000 lbs.
Max Input Speed			1725 rpm
Max Screw Stock			228 in.
Load Screw			1 1/2 in. dia. x .333 in. lead
Stop Nut Allowance			1 in.

NOTES:

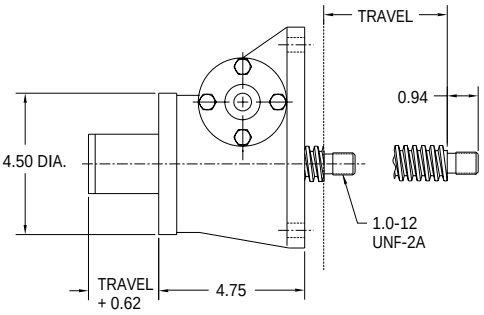
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 9/16 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

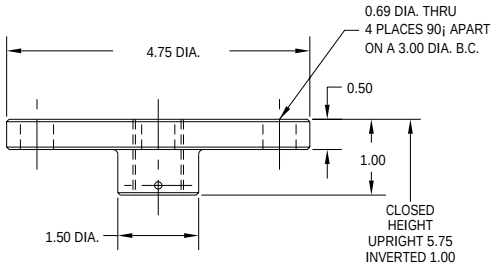
UPRIGHT J-5-U-T

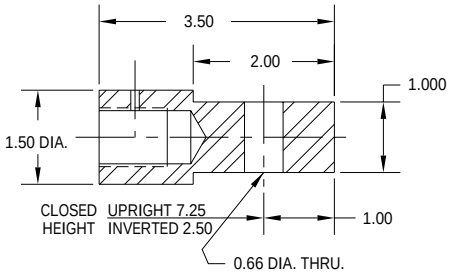


INVERTED J-5-I-T



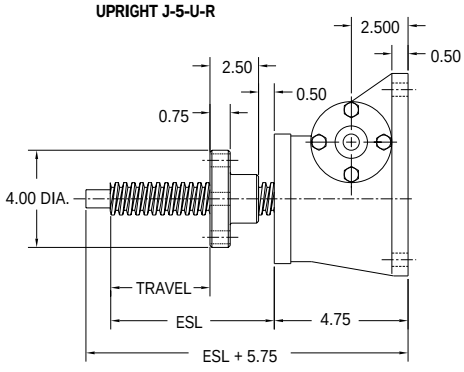
TOP PLATE AND CLEVIS END OPTIONS





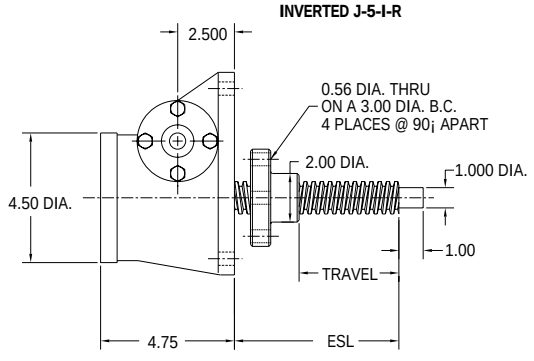
ROTATING WITH TRAVELING NUT

UPRIGHT J-5-U-R



TRAVEL NUT POSITION A

INVERTED J-5-I-R

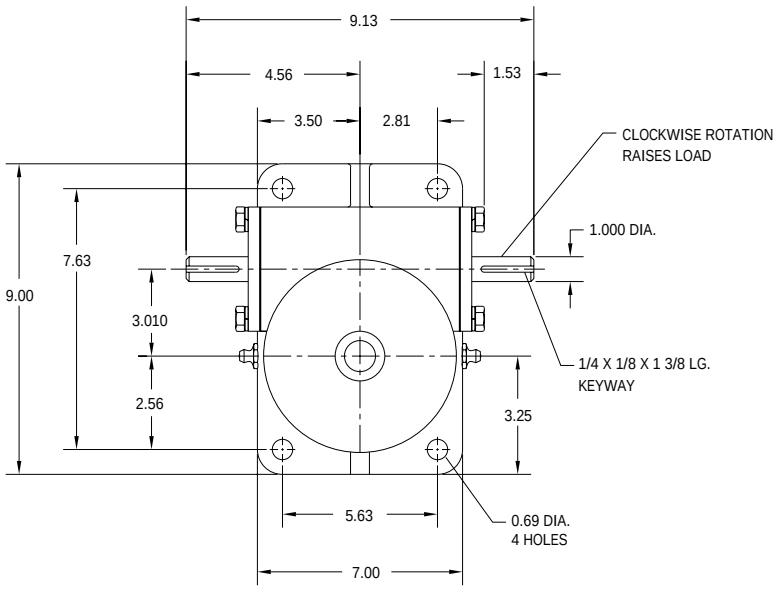


TRAVEL NUT POSITION B

J-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

J10 - 10 TON



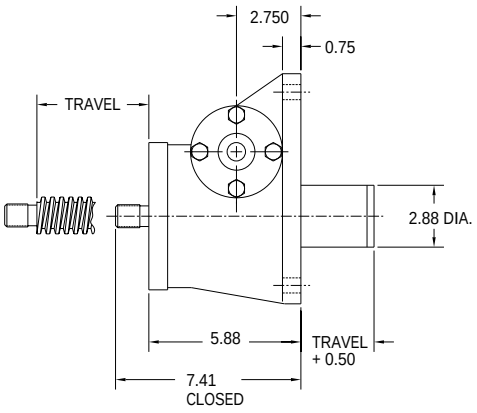
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	6:1	18	0.046
H	12:1	36	0.029
RATED CAPACITY			20,000 lbs.
Max Input Speed			1725 rpm
Max Screw Stock			226 in.
Load Screw			1 3/4 in. dia. x .333 in. lead
Stop Nut Allowance			1 1/4 in.

NOTES:

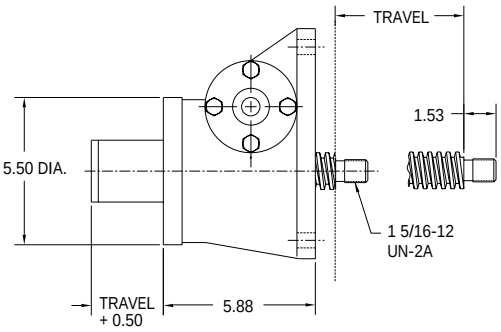
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 3/8 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

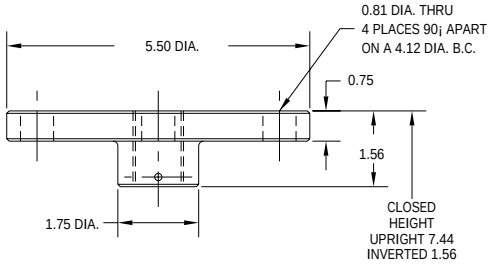
UPRIGHT J-10-U-T

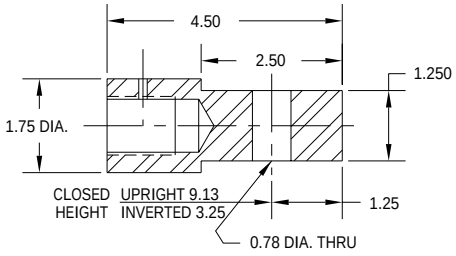


INVERTED J-10-I-T

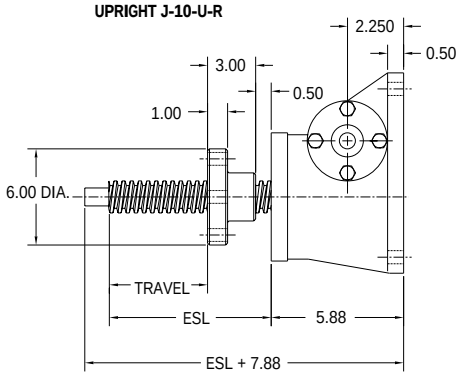


TOP PLATE AND CLEVIS END OPTIONS



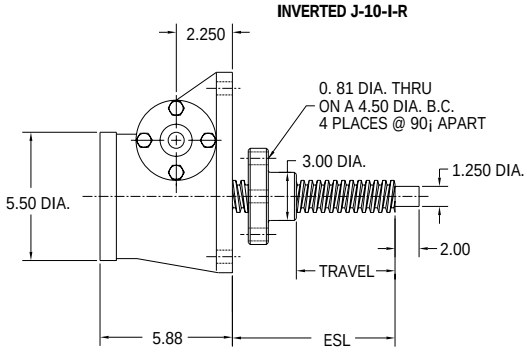


UPRIGHT J-10-U-R



ROTATING WITH TRAVELING NUT

INVERTED J-10-I-R

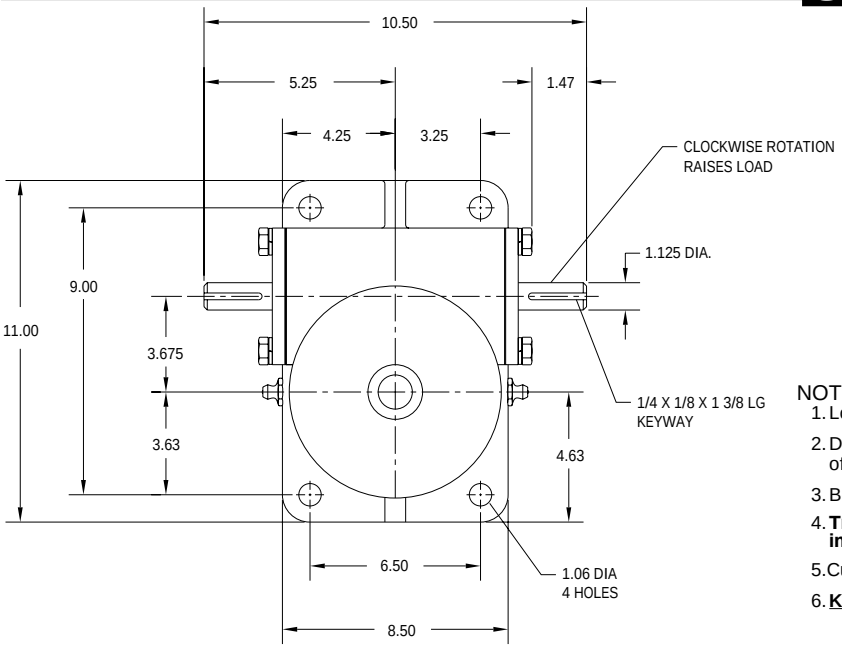


TRAVEL NUT POSITION B

TRAVEL NUT POSITION A

J-SERIES MACHINE SCREW ACTUATOR

J20 - 20 TON



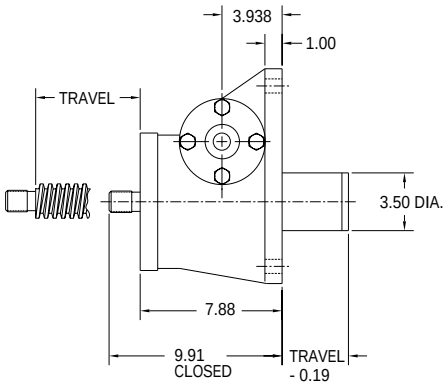
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	8:1	16	0.050
H	16:1	32	0.032
RATED CAPACITY			40,000 lbs.
Max Input Speed			1725 rpm
Max Screw Stock			224 in.
Load Screw			2 1/2 in. dia. x .500 in. lead
Stop Nut Allowance			1 1/2 in.

NOTES:

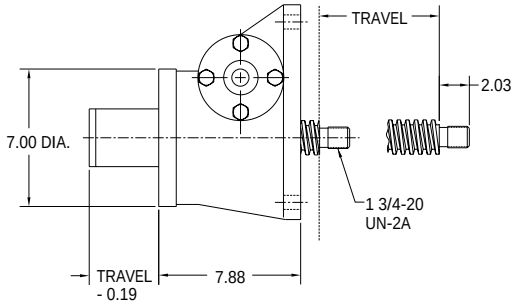
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 0 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

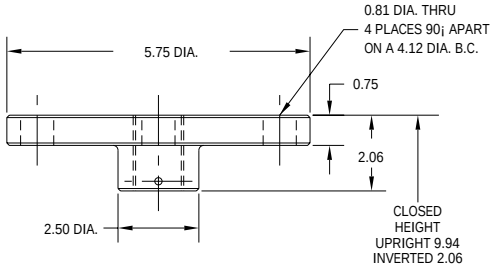
UPRIGHT J-20-U-T

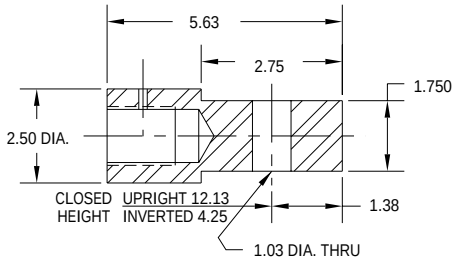


INVERTED J-20-I-T



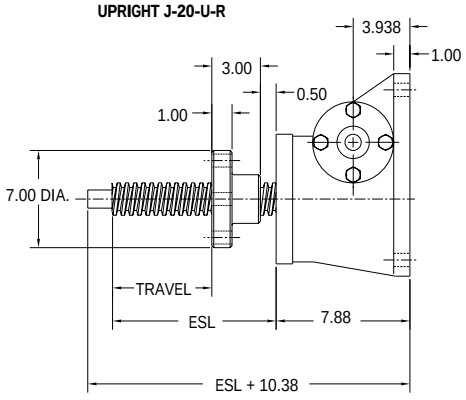
TOP PLATE AND CLEVIS END OPTIONS





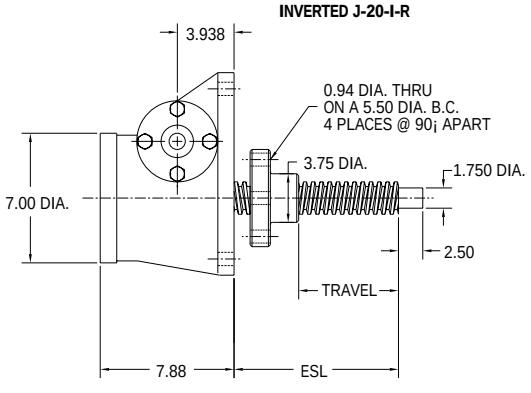
ROTATING WITH TRAVELING NUT

UPRIGHT J-20-U-R



TRAVEL NUT POSITION B

INVERTED J-20-I-R



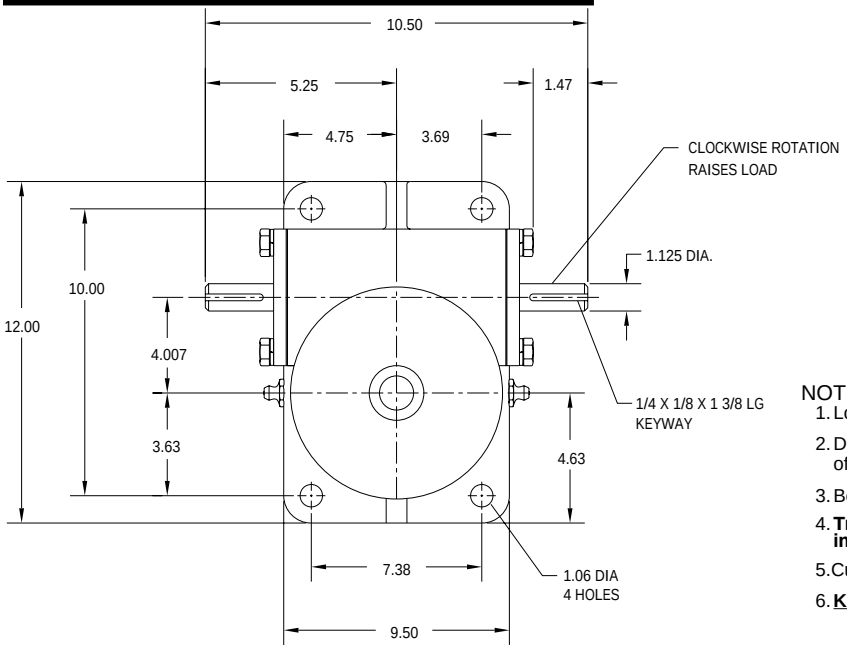
TRAVEL NUT POSITION A

J-SERIES MACHINE SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

J25 - 25 TON



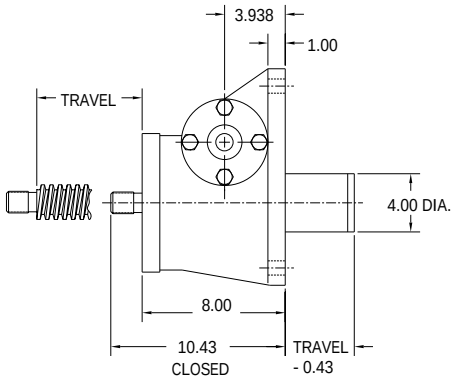
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	9:1	18	0.039
H	18:1	36	0.024
RATED CAPACITY			50,000 lbs.
Max Input Speed			1450 rpm
Max Screw Stock			223 in.
Load Screw			2 3/4 in. dia. x .500 in. lead
Stop Nut Allowance			1 3/4 in.

NOTES:

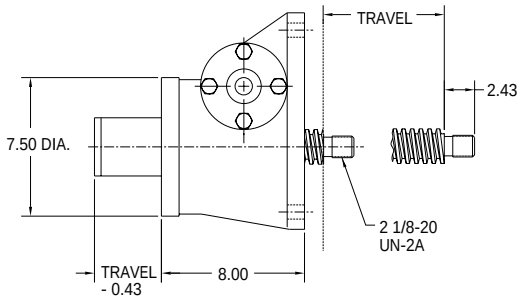
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 0 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

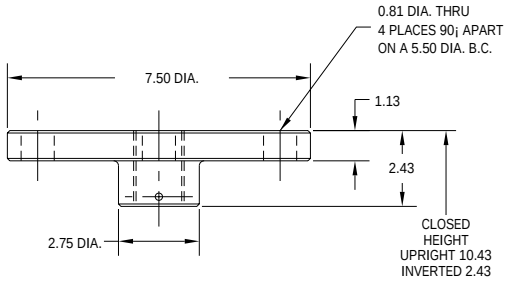
UPRIGHT J-25-U-T

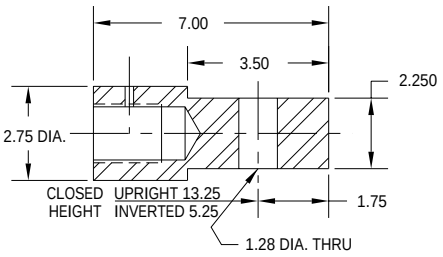


INVERTED J-25-I-T

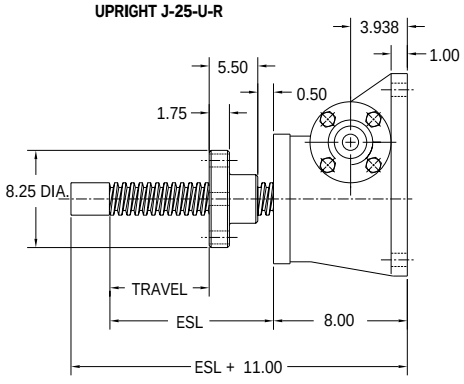


TOP PLATE AND CLEVIS END OPTIONS





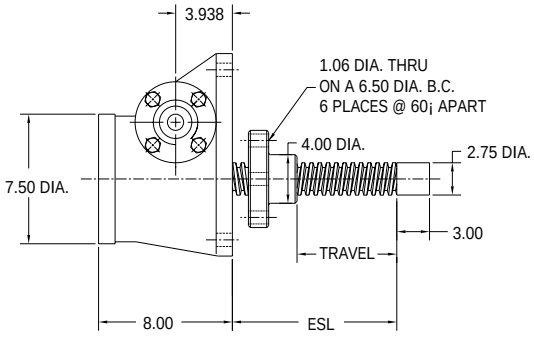
UPRIGHT J-25-U-R



TRAVEL NUT POSITION B

ROTATING WITH TRAVELING NUT

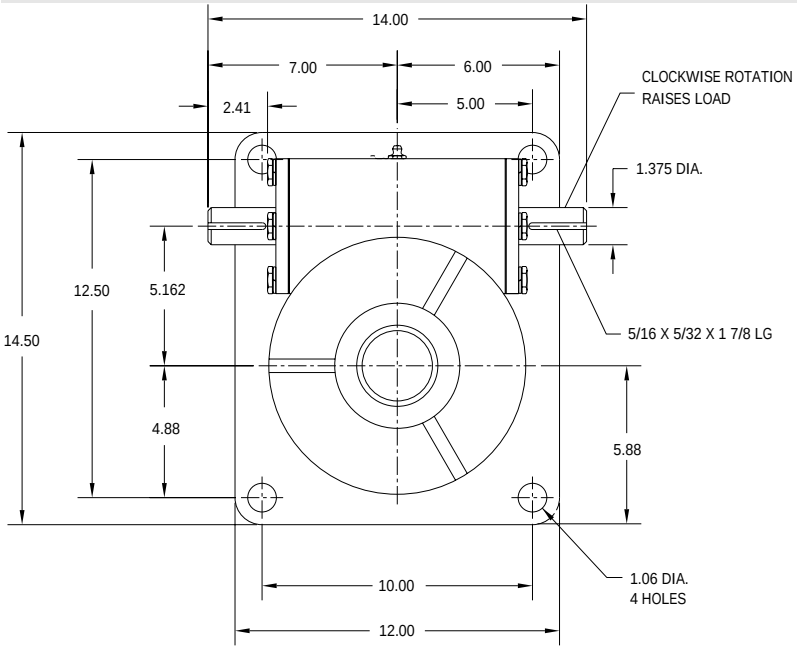
INVERTED J-25-I-R



TRAVEL NUT POSITION A

J-SERIES MACHINE SCREW ACTUATOR

J40 - 40 TON



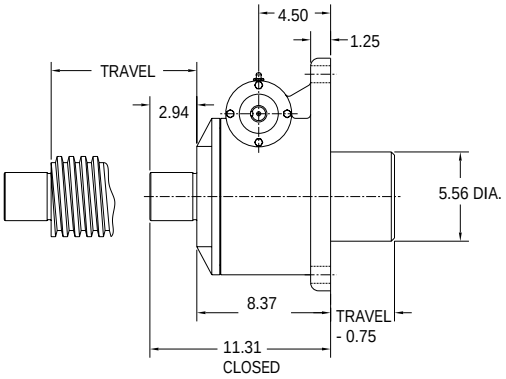
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	20:1	30	0.032
RATED CAPACITY			80,000 lbs.
Max Input Speed			1450 rpm
Max Screw Stock			222 in.
Load Screw			4 1/4 in. dia. x .667 in. lead
Stop Nut Allowance			2 1/2 in.

NOTES:

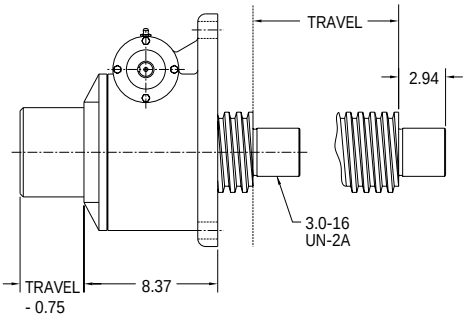
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **KEYED JACKS: ADD 0 INCHES TO JACK HOUSING.**

TRANSLATING & KEYED

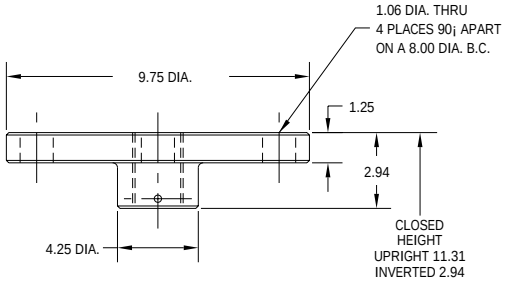
UPRIGHT J-40-U-T

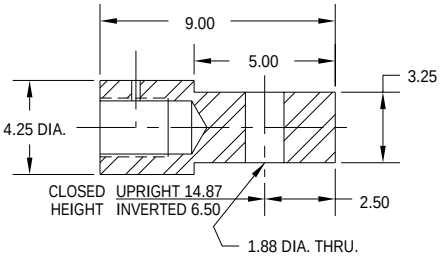


INVERTED J-40-I-T

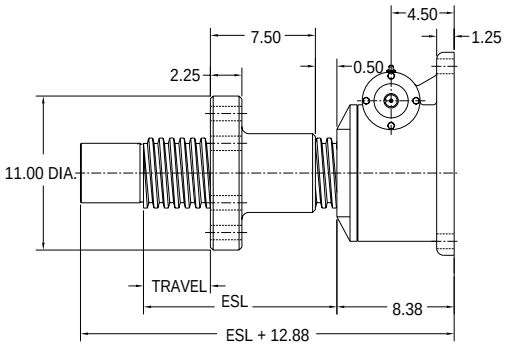


TOP PLATE AND CLEVIS END OPTIONS





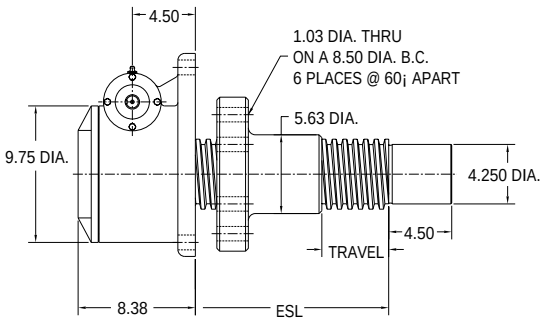
UPRIGHT J-40-U-R



TRAVEL NUT POSITION "B"

ROTATING WITH TRAVELING NUT

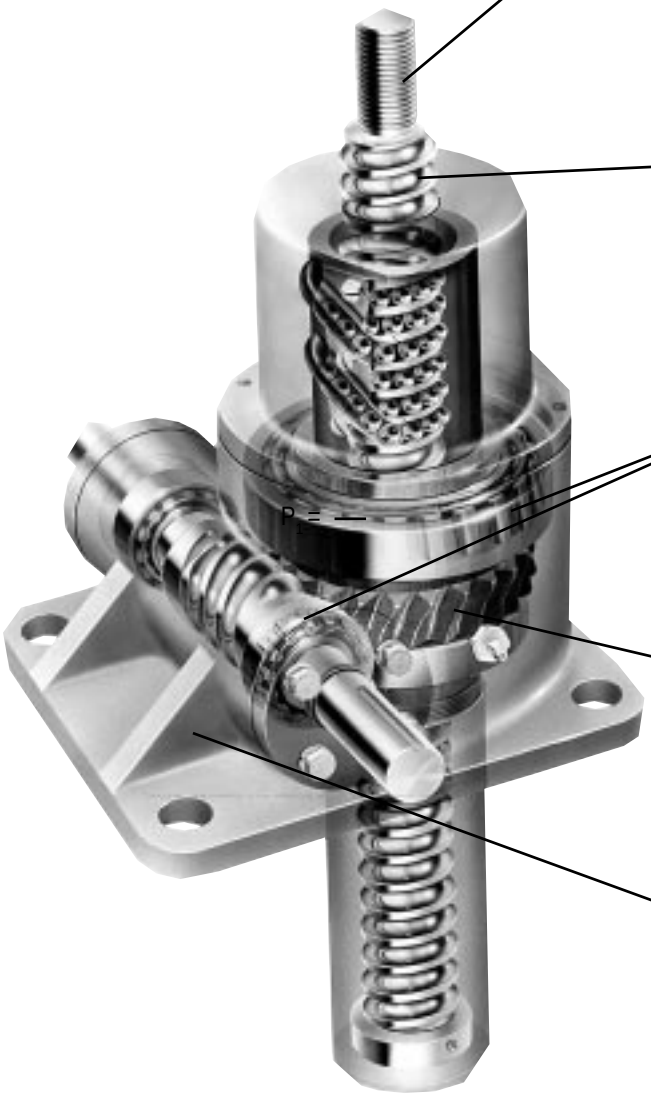
INVERTED J-40-I-R



TRAVEL NUT POSITION "A"

FEATURES & BENEFITS

Interchangeability. B-Series ball screw actuators are available in 1 ton through 100 ton capacities, and are directly interchangeable with competitive units.



"V" Threaded Screw End

- Easy mounting of optional screw end accessories or customer connection, insures better alignment.

Clevis

Top Plate

- Bearing journal on end of load screw for rotating jacks provides better column stability.

High Strength Rolled Formed Ball Thread Load Screws

- Provides 95% efficiency for minimum input force to position loads.
- Ball Screw is rolled and hardened for strength and wear resistance.

Tapered Roller Bearings

- Provides total support of the gear nut and worm shaft for thrust and radial forces.
- Better design bearing arrangement with upper and lower thrust bearings located in the main housing and mounted directly on the gear nut for full support under any loading conditions (vertical or horizontal).

High Strength Gearing

- Precision formed and finished worm gear sets.
- All gearing is designed in accordance with established American Gear Manufacturing Standards.
- Precision gearing provides greater efficiency and allows higher input speeds.

Rugged Housings

- Manufactured from high grade iron and steel alloys designed to withstand the most severe applications.
- Low closed height design saves space, reduces weight, and allows these ball screw actuators to fit into tight areas.

Superior Performance

- Uni-Lift Ball Screw Actuators and systems provide smooth, fast operation, high cycle reliability, and rugged construction to provide an affordable choice for a wide variety of applications.

Synchronized Travel

- Uni-Lift Ball Screw Actuators require less input horsepower. These actuators are well suited for multi-unit synchronized systems.

B-SERIES TECHNICAL SPECIFICATIONS (Table 7)

MODEL TYPE AND SIZE		B1	B2.5	B5	B10	B20	B30	B50	B75	B100
CAPACITY IN POUNDS (P)		2,000	5,000	10,000	20,000	40,000	60,000	100,000	150,000	200,000
DIA. OF LOAD SCREW		0.75	1.0	1.5	1.5	2.25	3.0	4.0	4.0	4.0
LEAD OF SCREW		0.500	0.250	0.474	0.474	0.500	0.666	1.0	1.0	1.0
GEAR CENTERS		1.504	1.750	2.188	2.598	2.875	3.750	5.313	6.000	7.500
GEAR RATIO	LOW	5:1	6:1	6:1	8:1	8:1	102/3:1	102/3:1	102/3:1	12:1
	HIGH	10:1	24:1	24:1	24:1	24:1	32:1	32:1	32:1	36:1
(TPI) TURNS OF INPUT SHAFT FOR 1" OF RISE	LOW	10	24	12.66	16.88	16	16	10.66	10.66	12
	HIGH	20	96	50.66	50.66	48	48	32	32	36
TORQUE REQUIRED TO LIFT ONE POUND (lb-in) (Tp)	LOW	0.024	0.008	0.019	0.015	0.016	0.017	0.025	0.024	0.023
	HIGH	0.014	0.003	0.007	0.008	0.008	0.009	0.014	0.012	0.013
HOLDING TORQUE (lb-ft) (Thb)	LOW	1.4	4	14	13	27	21	40	107	128
	HIGH	2	1.5	5	4	7	5	10	24	50
NO LOAD TORQUE (lb-in) (To)		4	5	12	18	36	48	96	156	204
MAXIMUM INPUT RPM		1800	1800	1800	1800	1800	1200	1200	1200	1200
APPROXIMATE WEIGHT IN POUNDS	0" TRAVEL	2.3	17	35	50	85	220	340	590	960
	PER INCH	0.07	0.6	0.6	0.8	1.5	2.4	2.8	4.6	4.6
RADIUS OF GYRATION (r)		0.154	0.205	0.285	0.285	0.463	0.620	0.835	0.835	0.835

1. Complete the Uni-Lift Selection Guide located in the inside front cover.

2. Determine the maximum load on one actuator: P_1

$$P_1 = \frac{P_2}{N}$$

P_2 = Total system load (lbs.)
N = Number of actuators in the system
On multi-unit systems where load is not equally distributed, change P_1 to the greatest load supported by one unit.

3. Check Load Screw Column Capacity:
- If the load screw is in tension, select a Uni-Lift with a rated capacity equal to or greater than the maximum load (P_1) on one actuator. Go to step 4.
- If the load screw is in compression, use the calculation steps on page 50 to determine the maximum permissible Extended Screw Length, (ESL). Select a Uni-Lift that has a load screw column length capacity equal to or greater than the length required for the load.

4. Determine the desired load screw velocity (in./min.): (V_d)

$$V_d = \frac{\text{Rise}}{t_2}$$

Rise = One way travel under load (in.)
t_2 = Required one way travel time (min.)

5. Determine Desired Input Speed: (RPM_d)

$$RPM_d = TPI \times V_d$$

TPI = Turns of the input shaft for 1 inch of rise. (See technical specification table 7.)

6. Determine Load Screw Velocity: (V)
From the catalog data, select the drive equipment with an output speed close to the desired input speed (RPM_d). Use the output speed to recalculate the actual load screw velocity (V).

$$V = \frac{RPM}{TPI}$$

7. Check the Duty Limit of the actuator:

$$D_1 = \frac{(2 \times \text{Rise} \times C_h)}{V}$$

D_1 = Duty time per hour
C_h = Cycles per hour
Determine if D_1 is equal to or greater than D_2. If D_2 is less than D_1 reduce the input speed to the actuator, or reduce the load per actuator by adding more actuators to the system.
D_2 = Duty Limit (see page 49 for calculations)

Motor Sizing:

Once you have determined the motor horsepower, you need to calculate the Motor Brake Torque. All ball screw jacks and systems must be supplied with a brake. This is necessary to stop the jack and also to hold the position. Stop Nuts are to be used only for emergencies. They are available as an option.

The following is a QUICK ESTIMATE FOR MOTOR SIZING FOR A ONE ACTUATOR SYSTEM. For detailed motor sizing and torque requirements on single or multi-unit systems, skip steps 8 and 9, and go to step 10.

8. Estimate the Input Torque T_e (lbs/in):

$$T_e = T_p \times P_3$$

T_p = Torque required to lift one pound (see table 4 for T_p values.)
P_3 = Maximum system running load.

9. Estimate Uni-Lift Horsepower: HP_e

$$HP_e = \frac{(T_e \times RPM)}{63025}$$

B-SERIES MOTOR SIZING AND TORQUE CALCULATIONS (Table 8)

MODEL No.	GEAR RATIO	Turns per inch TPI	Rated cap (lbs) P	STATIC TORQUE Ts	UNIT INPUT TORQUE AT RATED CAPACITY T = RUNNING TORQUE (lb-in) at VARIOUS RPM (Theoretical)								NO LOAD TORQUE To
					50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	
B-1	5:1	10	2,000	49	44	43	42	41	40	40	39	38	3
	10:1	20		29	26	25	24	23	22	22	21	21	
B 2.5	6:1	24	5,000	41	37	36	35	34	33	33	32	32	5
	24:1	96		17	14	13	13	12	11	11	10	10	
B 5	6:1	12.66	10,000	186	170	167	164	160	156	154	152	150	12
	24:1	50.66		71	59	57	54	51	48	47	45	43	
B 10	8:1	16.88	20,000	302	269	262	256	247	240	236	233	229	18
	24:1	50.66		154	125	118	112	105	98	94	91	87	
B 20	8:1	16	40,000	628	561	546	533	516	502	493	487	479	36
	24:1	48		313	254	242	230	215	202	194	189	181	
B 30	10 2/3:1	16	60,000	987	864	838	815	784	761	746	736		48
	32:1	48		520	408	384	363	335	312	298	289		
B 50	10 2/3:1	16	100,000	2519	2149	2105	2010	1929	1870	1835	1814		96
	32:1	48		1361	1017	948	887	811	755	722	631		
B 75	10 2/3:1	10.66	150,000	3604	3132	3036	2952	2846	2769	2723	2335		156
	32:1	32		1781	1384	1303	1232	1141	1074	1035	1010		
B 100	12:1	12	200,000	4622	3844	3696	3567	3413	3307	3248	3212		204
	36:1	48		2568	1837	1697	1575	1429	1327	1271	1236		

For RPM's not shown use the next slowest RPM. For speeds less than 50 RPM contact factory.

10. Determine Uni-Lift Running Load Proportion Factor: (f)

$$f = \frac{P_3}{(P \times N)}$$

P = Rated Capacity of Uni-lift
P_3 = Max. system running load N= Number of Uni-lifts

11. Determine Unit Running Torque: (T_1) (lb-in)

$$T_1 = (T \times f) + T_o$$

T_0 = No load torque from chart
T = Running torque from chart

12. Find the System Running Torque: (T_2) (lb-in)

$$T_2 = \frac{(T_1 \times N)}{e_1}$$

e_1 = System Arrangement Efficiency, see page 77

13. Find System Power:

$$\text{System HP} = \frac{(T_2 \times \text{RPM})}{(63025 \times e_2)}$$

e_2 = Reducer Efficiency, see page 77
RPM = Uni-Lift input shaft speed

14. Determine System Starting Torque: (T_{s2})

$$T_{s2} = \frac{((T_s \times f) + T_o) \times N}{e_2}$$

T_s = Static torque from chart

15. Determine Motor Starting Torque: (T_{sm}) (lb in)

$$T_{sm} = \frac{T_{s2}}{(R \times e_2)}$$

R = Gear Reducer Ratio

16. Determine Motor Running Torque: (T_{rm})

$$T_{rm} = \frac{T_2}{(R \times e_1)}$$

- Select a motor with a power rating greater than HP requirement in step 13, a starting torque greater than T_{sm} requirement in step 15, and a motor running torque greater than T_{rm} in step 16.
- Select system torque transmission equipment (reducer, mitre gear boxes, couplings, etc.) with ratings greater than the torque to be transmitted, see step 12 and system arrangements, page 77.
- Size shafting for system starting torque to be transmitted, see step 16, and Table B page 76.

17. Select a Brake Size (required for all ball screw jack applications):

$$T_b = \frac{C}{TPI \times d \times R} \times \frac{(f \times T_{hb} \times N)}{R}$$

C = Motor brake factor R_1 = Reducer ratio
T_b = Motor brake torque T_{hb} = Hold torque (see technical data)
d = Stopping distance N = Number of Uni-Lifts in the system

C Factor For Motor Brake (ft.-lbs.)

Motor	1140	1725	Motor	1140	1725
1/4	3.2	4.1	3	38	66.5
1/3	4	4.9	5	48.3	87.4
1/2	5.1	6.1	7 1/2	69.4	112
3/4	7.89	9.2	10	126	146
1	9.18	17.8	15	268	273
1 1/2	11.3	21.6	20	306	315
2	29.5	25.6	25	548	596

B SERIES DUTY CYCLE (Table 9)

Uni-Lift Duty Limit at Full Rated Capacity and 80° F Ambient Temperature

MODEL and SIZE	RATIO	TPI	L2 - DUTY LIMIT SERVICE FACTOR @ VARIOUS RPM INPUT SPEEDS								
			50 RPM	115 RPM	172 RPM	345 RPM	600 RPM	870 RPM	1140 RPM	1725 RPM	2587 RPM
B-1	5:1	10	553	268	191	108	69	52	42	30	22
	10:1	20	584	303	223	134	90	70	58	43	32
B-2.5	6:1	24	575	293	188	103	63	46	37	26	18
	24:1	96	1022	520	353	203	132	101	83	61	46
B-5	6:1	12.66	351	220	115	62	38	28	22	15	
	24:1	50.66	658	417	227	129	84	63	52	38	
B-10	8:1	16.88	252	158	84	46	29	21	17	12	
	24:1	50.66	373	239	132	76	50	38	31	23	
B-20	8:1	16	190	120	63	35	22	16	12	9	
	24:1	48	284	181	100	58	38	29	24	17	
B-30	10 2/3:1	16	185	117	63	35	22	16	12		
	32:1	48	261	172	96	56	38	29	24		
B-50	10 2/3:1	10.66	105	66	36	20	13	9	7		
	32:1	32	143	96	54	32	22	17	14		
B-75	10 2/3:1	10.66	110	71	36	21	13	9	8		
	32:1	32	177	116	65	38	25	19	16		
B-100	12:1	12	130	82	46	26	17	12	10		
	36:1	36	185	124	71	43	29	23	18		

- Duty Limit Service factor (L_2) = Operating time allowed per hour. The numbers greater than 60 are theoretical values and exceed 100% duty, solely to provide base data for adjusting L_2.
- The L_2 values are based on Uni-Lifts loaded at rated capacity, operating in an ambient temperature of 80° F., with a maximum allowable temperature rise of 100° F.
- For ambient temperatures above 180° F or below -20° F, consult factory.
- For speeds not shown, use the next fastest RPM value.

1. Determine Adjusted Duty Limit : D_2

When the unit load is at rated capacity, and the ambient temperature is at 80° F, the L_2 value from the table equals D_2. If not, proceed to step 1A.

1A) For different temperature service, or a unit load less than rated capacity, use the following equation to determine the Adjusted Duty Limit Service Factor (D_2).

$$D_2 = \frac{(180 - T_A) \times P \times L_2}{100 \times P_4}$$

L_2 = Duty Limit Service Factor (see Table 9)
T_A = Ambient temperature (F°) P=Rated capacity (lbs.)
P_4 = Maximum running load per actuator (lbs.)
P = Rated capacity of the Uni-Lift

2. Determine if Duty Cycle is acceptable:
If **$D_2 > = 60$** minutes, the application is rated for continuous duty.
If **$D_2 > = D_1$** then the application is acceptable.
If **$D_2 < D_1$** then the duty cycle limit has been exceeded for this application. You must do one of the following: select larger size Uni-Lift, reduce load by adding additional Uni-Lifts, or reduce speed. If you reduce speed, you must recalculate V_1 and D_1 from the Technical Specifications page 47 steps 6 and 7.

EXAMPLE

A. Consider for an B-10 low ratio 8:1 operating in 100°F ambient temperature, 10,000 lbs. load, and 1725 RPM, with a rise of 30 inches and 25 cycles per hour:

$$D_1 = \frac{(2 \times \text{Rise} \times C_h)}{V_1}$$

$$D_1 = \frac{(2 \times 30 \times 25)}{102.2}$$

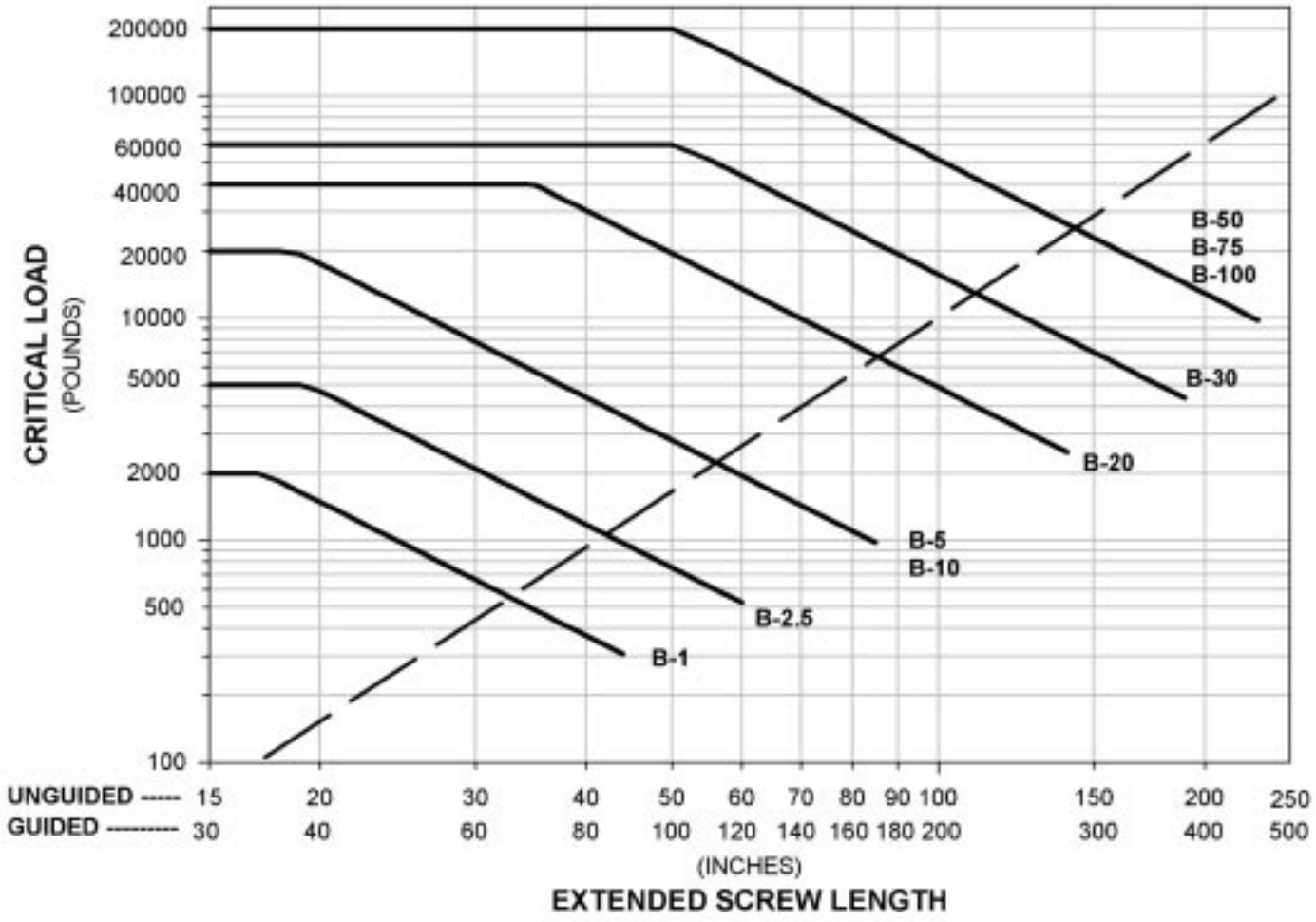
Duty time per hour = 14.76 minutes per hour

$$D_2 = \frac{(180 - 60) \times 20{,}000 \times 23}{100 \times 10{,}000}$$

Duty cycle limit = 55.2 minutes per hour

Since D_2 is greater than D_1 the application is OK for the duty cycle limit.

B-SERIES BALL SCREW COLUMN BUCKLE CHART



(For guided and unguided loads)

The maximum ESL values in the chart above are based on a **2:1 factor of safety against column buckle,** and on a standard design with a top plate, or a rotating design travel nut. Increased load screw lengths are not shown where the slenderness ratio exceeds 400.

1. Determine extended screw length: (ESL)
The ESL is the distance in inches the load screw can extend from the housing. See layout page for the model selected to determine ESL.

2. Determine the adjusted screw length: (ASL)
The chart above is for a standard design top plate or the rotating design travel nut. For other design configurations you must adjust the ESL value using the F factor multiplier to determine the adjusted screw length.

ASL=ESL x F

3. Select correct size Uni-lift: On the chart above, draw a horizontal line to represent the maximum load (P_1). Using the set of ESL values that apply to your design (guided or un-guided), draw a vertical line to represent the ESL or ASL. All of the Uni-Lift's above the point of intersection will be acceptable.

Screw lengths above the dotted line comply with AISC maximum slenderness ratio KL/r=200 specified for design and fabrication of structural steel buildings. This data is for reference only and is not a limiting factor, except as required.

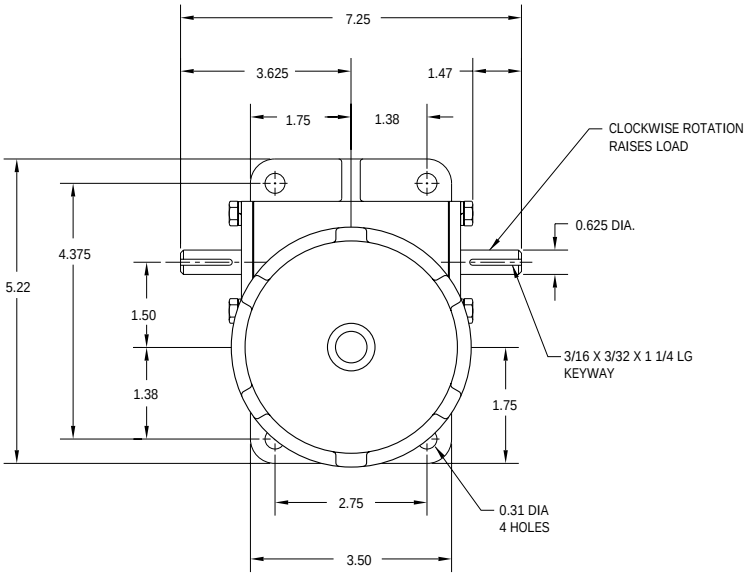
F = Column Factor Multiplier

DESIGN CONFIGURATION	F factor	Guided K factor	Unguided K factor
Standard Design Top Plate	1	0.65	1.3
Rotating Design Traveling Nut	1	0.65	1.3
Standard Design Clevis End	1.25	0.8	1.6
Keyed Design Top Plate	1.25	0.65	1.3
Keyed Design Clevis End	2	0.65	1.6

K=Column Factor
L=Extended Screw Length (ESL)
r =Radius of Gyration
See Technical Specifications (Table 7) for r values

B1 - 1 TON

B-SERIES BALL SCREW ACTUATOR



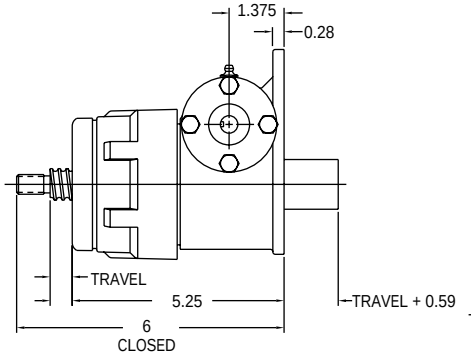
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	5:1	10	0.024
H	10:1	20	0.014
RATED CAPACITY			2,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			233 in.
Load Screw			.75 in. dia. x .500 in. lead
Stop Nut Allowance			.75 in.

NOTES:

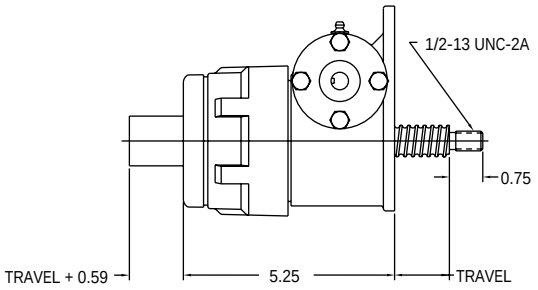
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

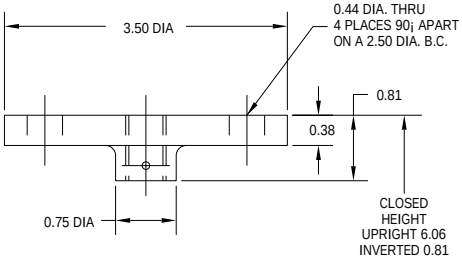
UPRIGHT B-1-U-T

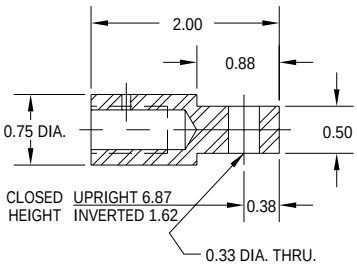


INVERTED B-1-I-T



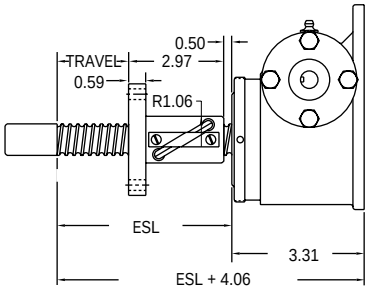
TOP PLATE AND CLEVIS END OPTIONS





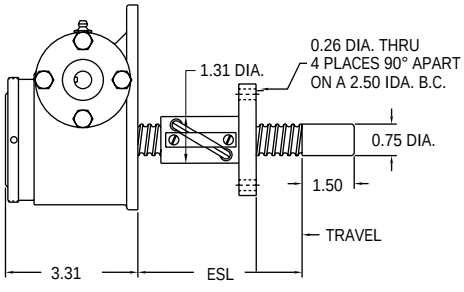
ROTATING WITH TRAVELING NUT

UPRIGHT B-1-U-R



TRAVEL NUT POSITION B

INVERTED B-1-I-R



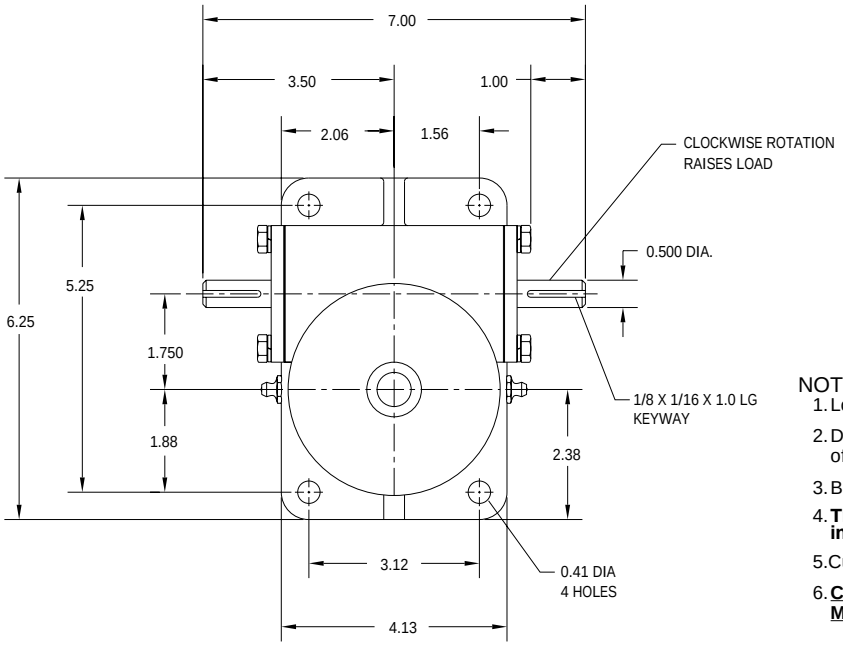
TRAVEL NUT POSITION A

B-SERIES BALL SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

B2.5 - 2.5 TON



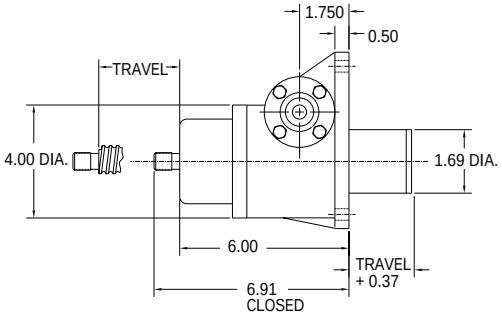
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	6:1	24	0.008
H	24:1	96	0.003
RATED CAPACITY			5,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			230 in.
Load Screw			1 in. dia. x .250 in. lead
Stop Nut Allowance			.75 in.

NOTES:

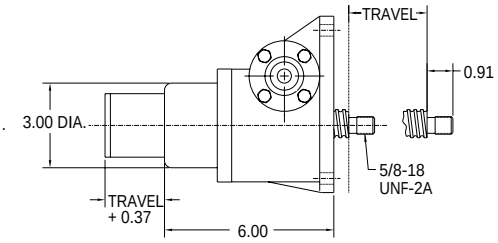
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

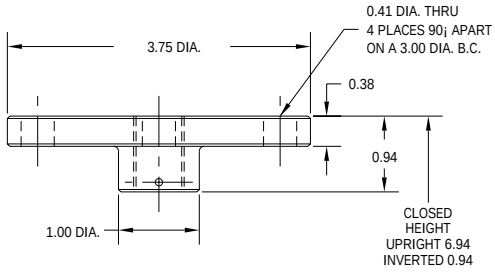
UPRIGHT B-2-U-T

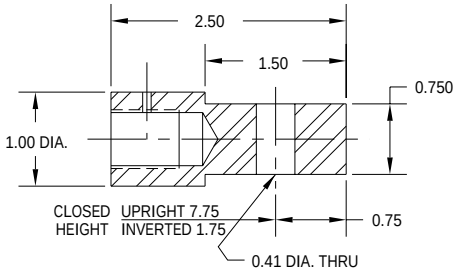


INVERTED B-2-I-T



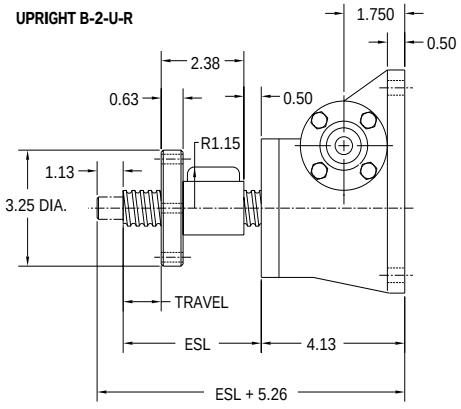
TOP PLATE AND CLEVIS END OPTIONS





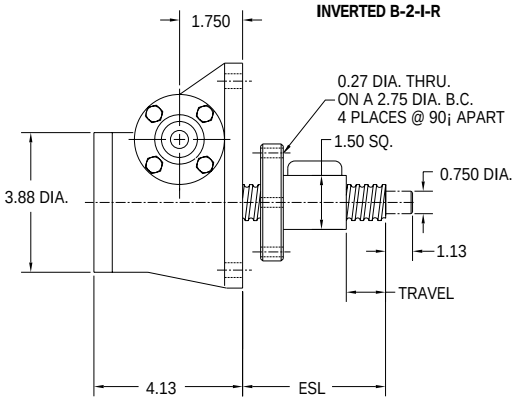
ROTATING WITH TRAVELING NUT

UPRIGHT B-2-U-R



TRAVEL NUT POSITION "B"

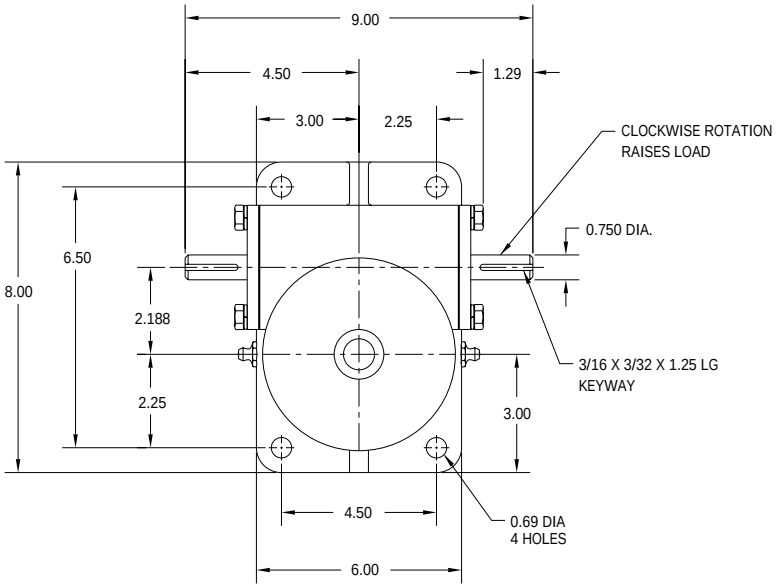
INVERTED B-2-I-R



TRAVEL NUT POSITION "A"

B5 - 5 TON

B-SERIES BALL SCREW ACTUATOR



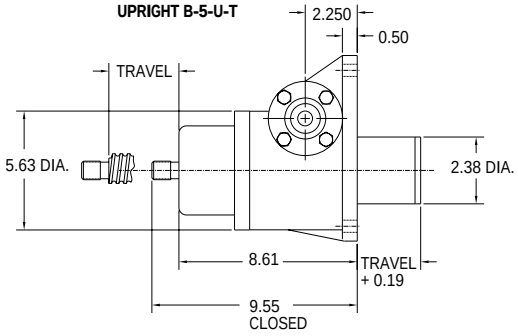
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	6:1	12.66	0.008
H	24:1	50.66	0.003
RATED CAPACITY			10,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			227 in.
Load Screw			1 1/2 in. dia. x .474 in. lead
Stop Nut Allowance			1.75 in.

NOTES:

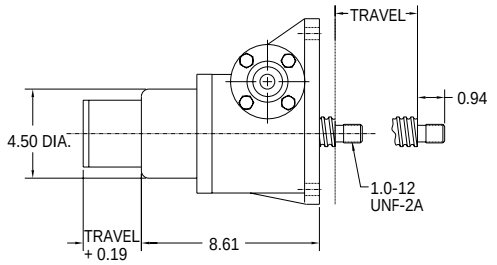
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

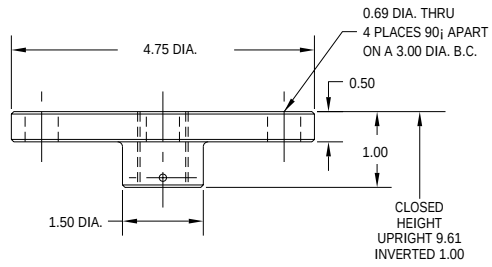
UPRIGHT B-5-U-T

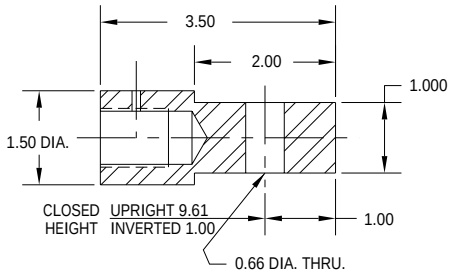


INVERTED B-5-I-T



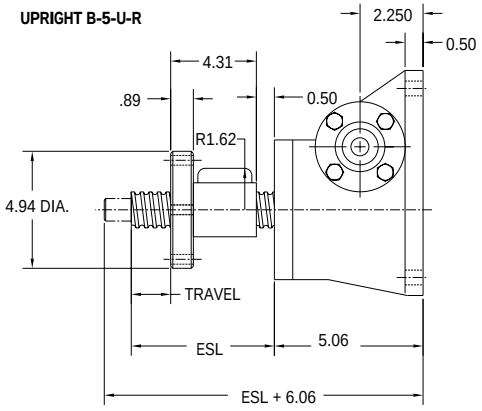
TOP PLATE AND CLEVIS END OPTIONS





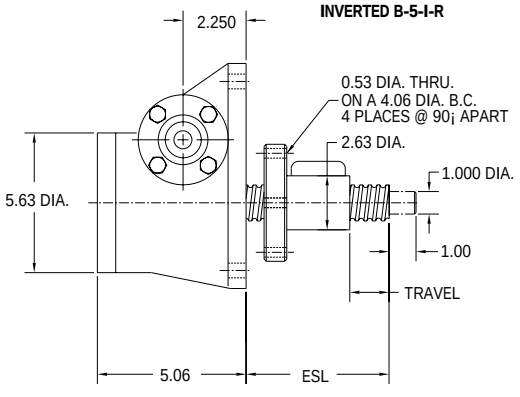
ROTATING WITH TRAVELING NUT

UPRIGHT B-5-U-R



TRAVEL NUT POSITION "B"

INVERTED B-5-I-R



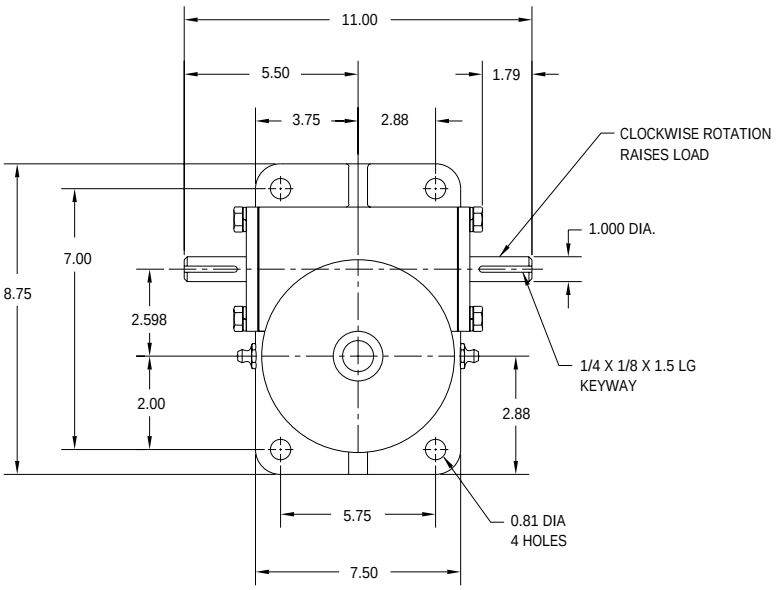
TRAVEL NUT POSITION "A"

B-SERIES BALL SCREW ACTUATOR

UNI-LIFT®

LINEAR MOTION
800-323-9114

B10 - 10 TON



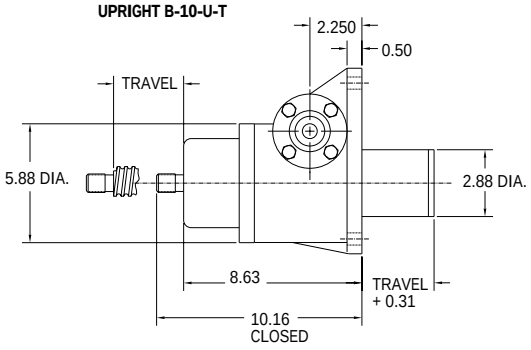
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	8:1	16.88	0.015
H	24:1	50.66	0.008
RATED CAPACITY			20,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			227 in.
Load Screw			1 1/2 in. dia. x .474 in. lead
Stop Nut Allowance			1.75 in.

NOTES:

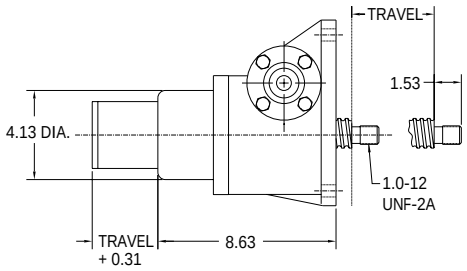
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

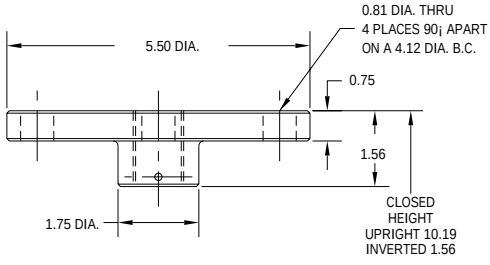
UPRIGHT B-10-U-T

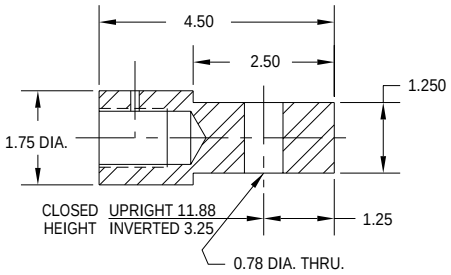


INVERTED B-10-I-T



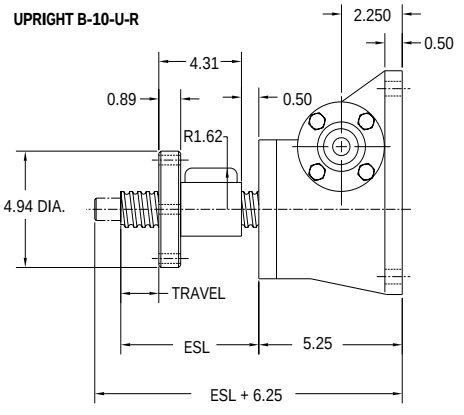
TOP PLATE AND CLEVIS END OPTIONS





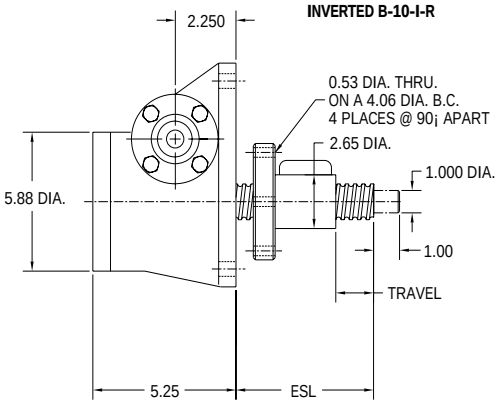
ROTATING WITH TRAVELING NUT

UPRIGHT B-10-U-R



TRAVEL NUT POSITION "B"

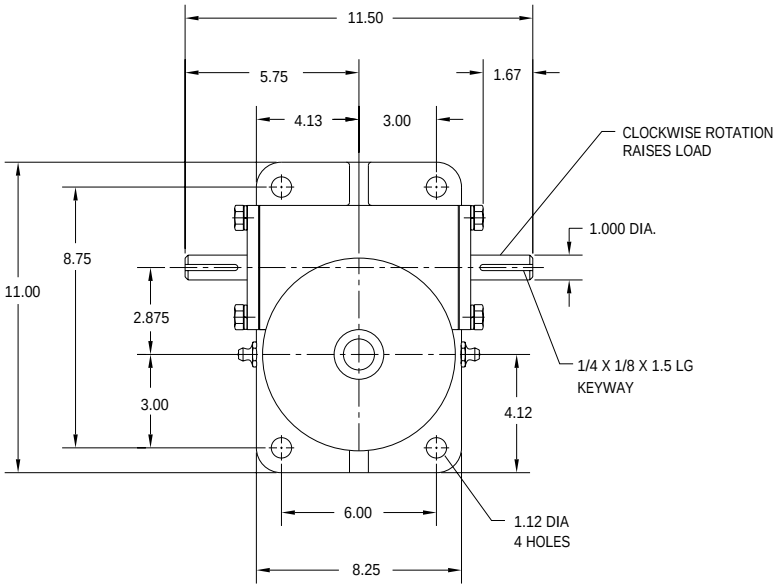
INVERTED B-10-I-R



TRAVEL NUT POSITION "A"

B20 - 20 TON

B-SERIES BALL SCREW ACTUATOR



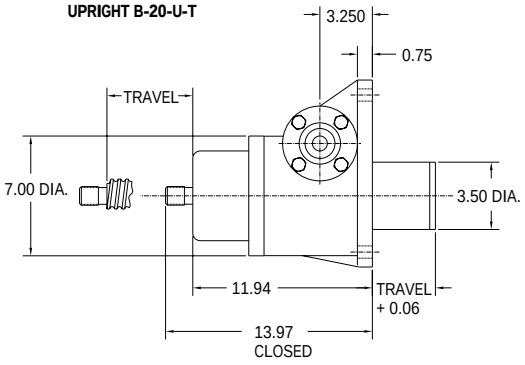
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	8:1	16	0.016
H	24:1	48	0.008
RATED CAPACITY			40,000 lbs.
Max Input Speed			1800 rpm
Max Screw Stock			223 in.
Load Screw			2 1/4 in. dia. x .500 in. lead
Stop Nut Allowance			2 in.

NOTES:

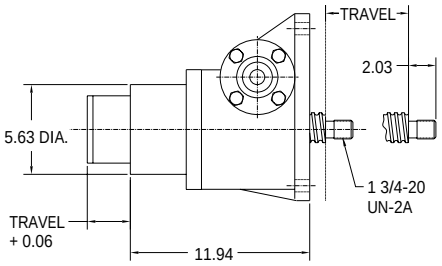
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

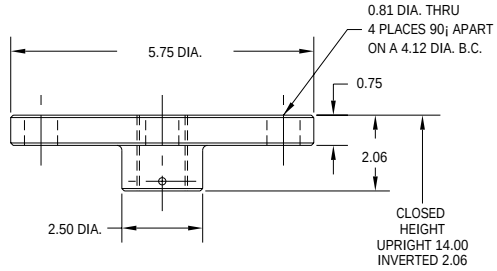
UPRIGHT B-20-U-T

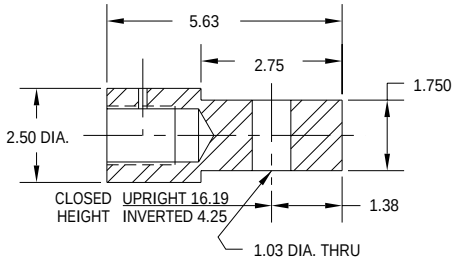


INVERTED B-20-I-T

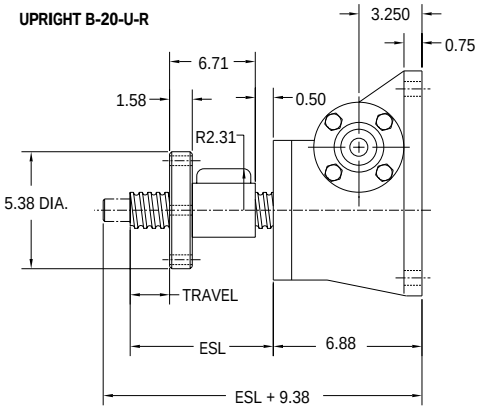


TOP PLATE AND CLEVIS END OPTIONS





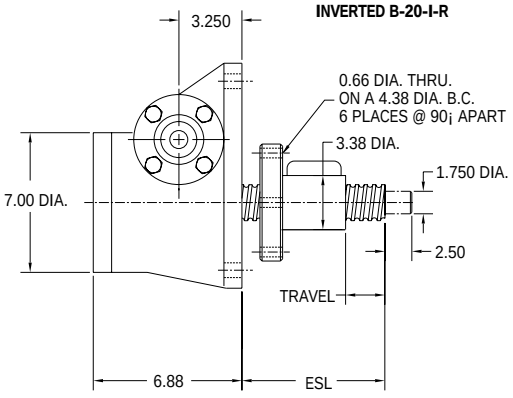
UPRIGHT B-20-U-R



TRAVEL NUT POSITION "B"

ROTATING WITH TRAVELING NUT

INVERTED B-20-I-R

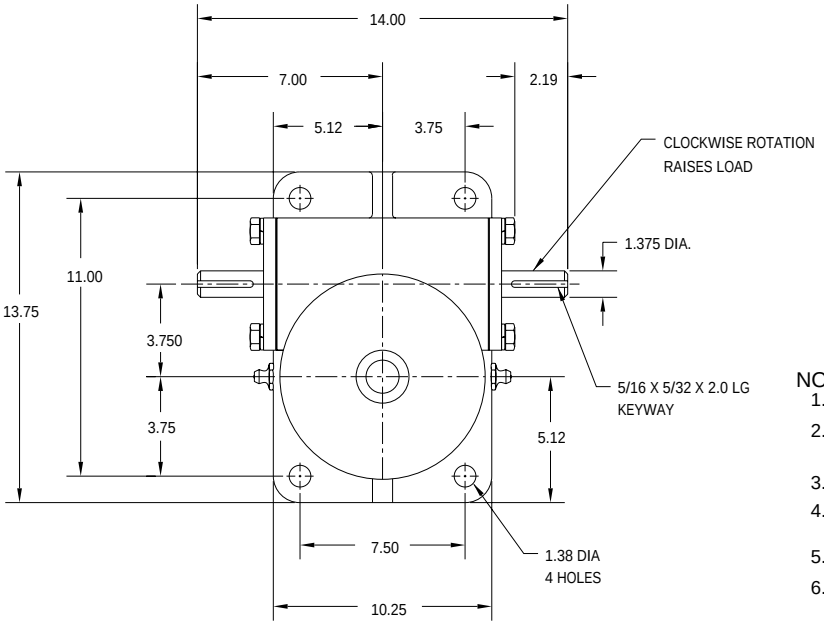


TRAVEL NUT POSITION "A"

B-SERIES BALL SCREW ACTUATOR

UNI-LIFT®

B30 - 30 TON



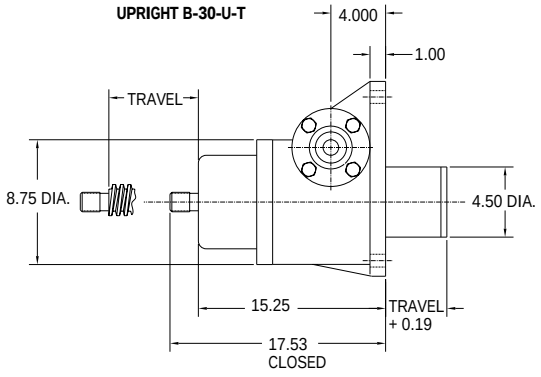
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	$10^2/_{3}$:1	16	0.017
H	32:1	48	0.009
RATED CAPACITY			60,000 lbs.
Max Input Speed			1200 rpm
Max Screw Stock			219 in.
Load Screw			3 in. dia. x .667 in. lead
Stop Nut Allowance			3 in.

NOTES:

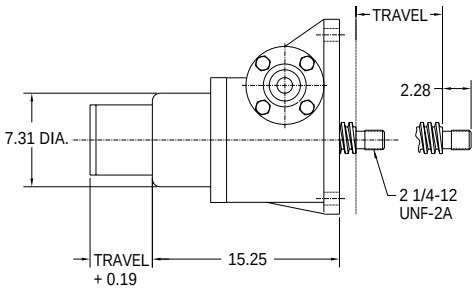
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

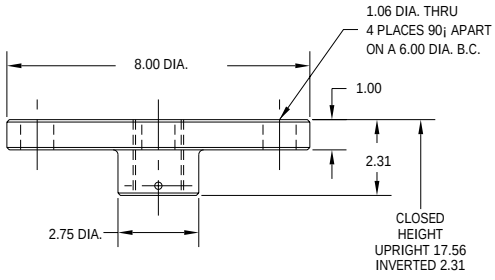
UPRIGHT B-30-U-T

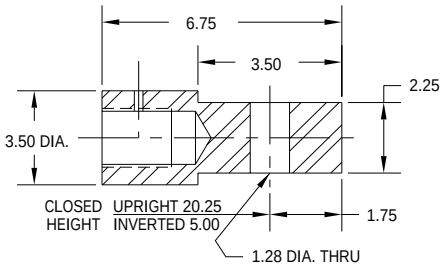


INVERTED B-30-I-T



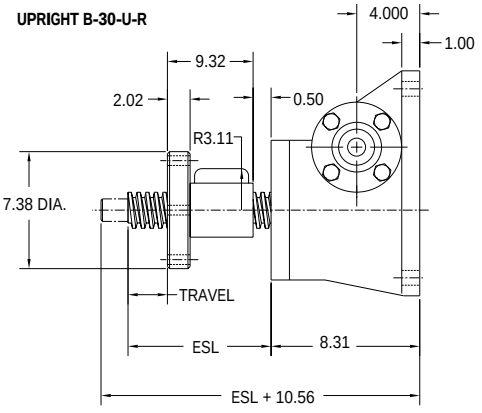
TOP PLATE AND CLEVIS END OPTIONS





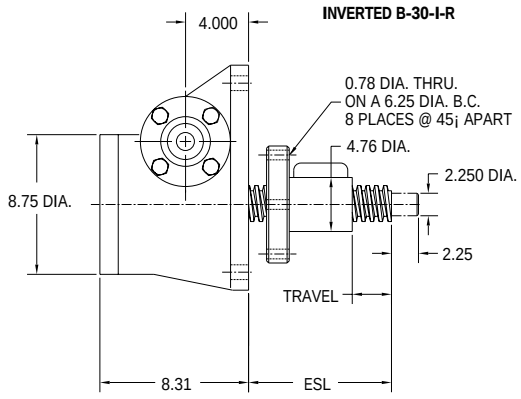
ROTATING WITH TRAVELING NUT

UPRIGHT B-30-U-R



TRAVEL NUT POSITION "B"

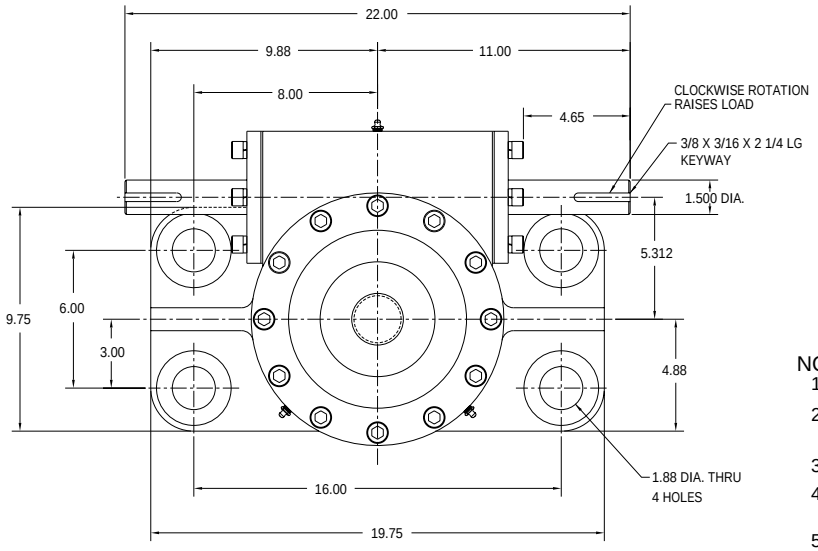
INVERTED B-30-I-R



TRAVEL NUT POSITION "A"

B50 - 50 TON

B-SERIES BALL SCREW ACTUATOR



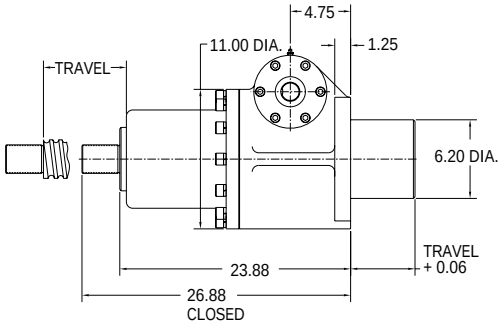
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	10.66:1	10 2/3	0.025
H	32:1	32	0.014
RATED CAPACITY			100,000 lbs.
Max Input Speed			1200 rpm
Max Screw Stock			215 in.
Load Screw			4 in. dia. x 1 in. lead
Stop Nut Allowance			3 in.

NOTES:

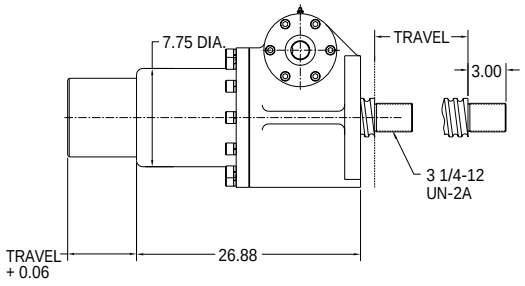
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

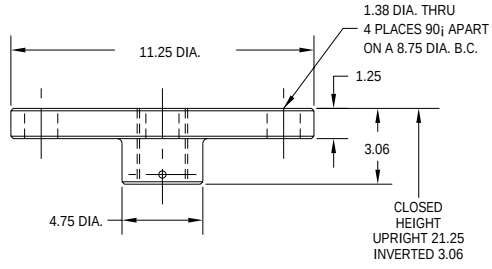
UPRIGHT B-50-U-T

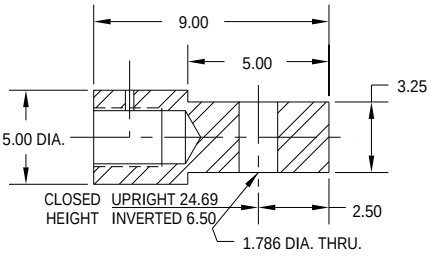


INVERTED B-50-I-T



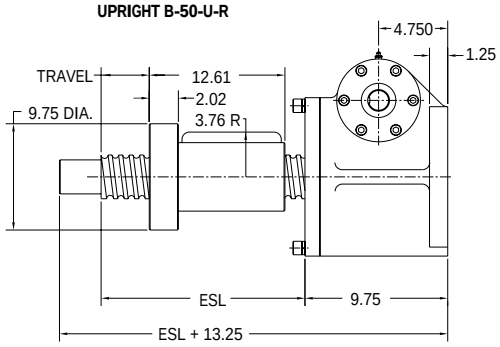
TOP PLATE AND CLEVIS END OPTIONS





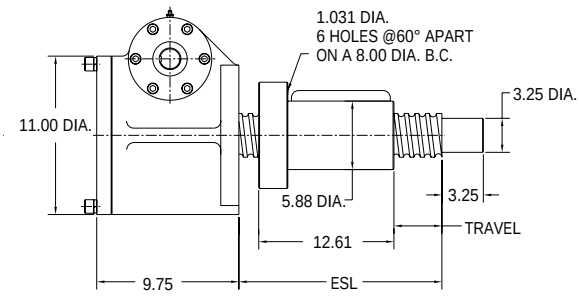
ROTATING WITH TRAVELING NUT

UPRIGHT B-50-U-R



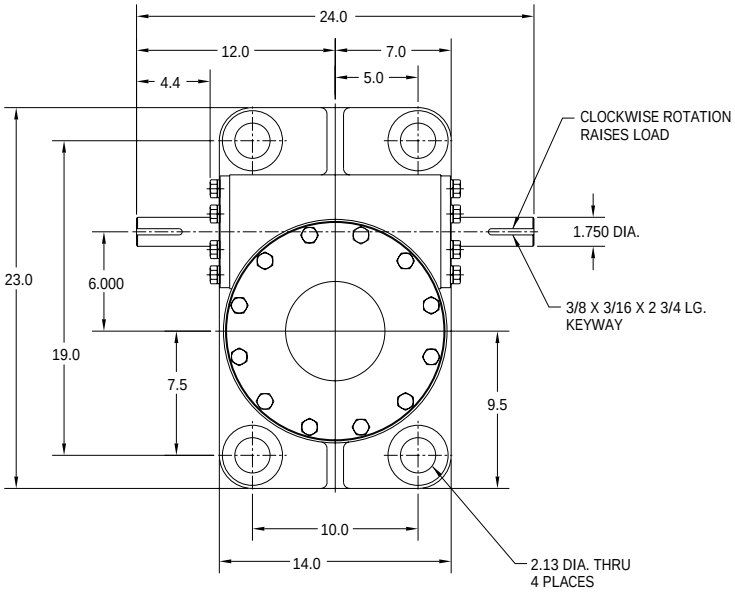
TRAVEL NUT POSITION "B"

INVERTED B-50-I-R



TRAVEL NUT POSITION "A"

B75 - 75 TON



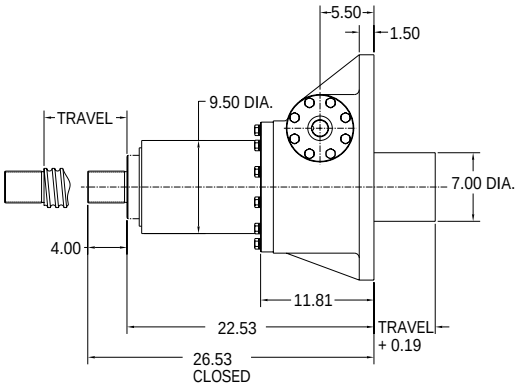
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	$10^{2}/_{3}$:1	10.66	0.024
H	32:1	32	0.012
RATED CAPACITY			150,000 lbs.
Max Input Speed			1200 rpm
Max Screw Stock			206 in.
Load Screw			4 in. dia. x 1 in. lead
Stop Nut Allowance			4 in.

NOTES:

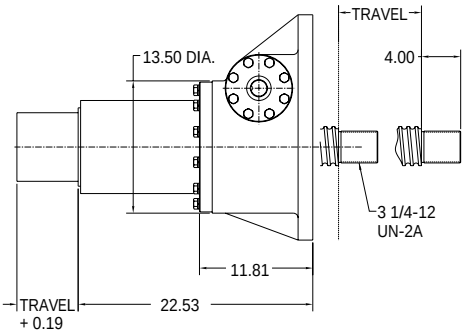
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

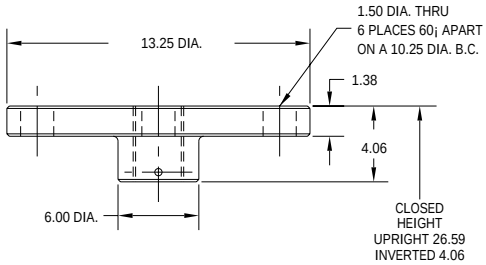
UPRIGHT B-75-U-T

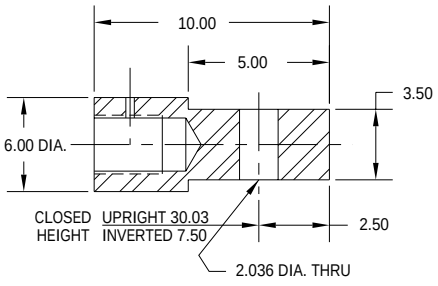


INVERTED B-75-I-T



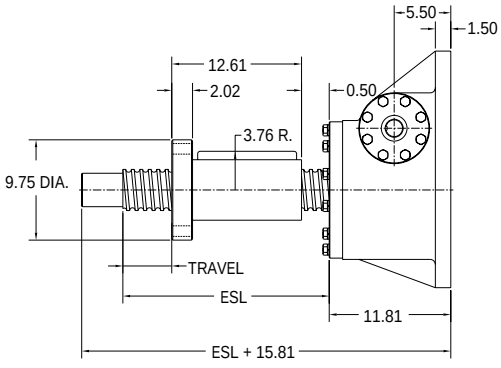
TOP PLATE AND CLEVIS END OPTIONS





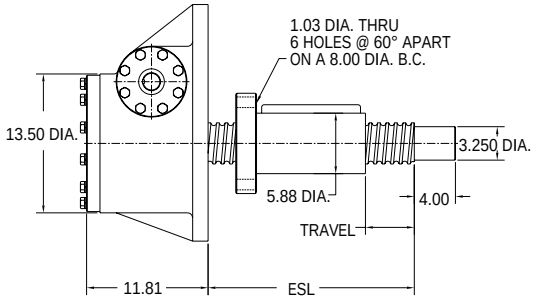
ROTATING WITH TRAVELING NUT

UPRIGHT B-75-U-R



TRAVEL NUT POSITION "B"

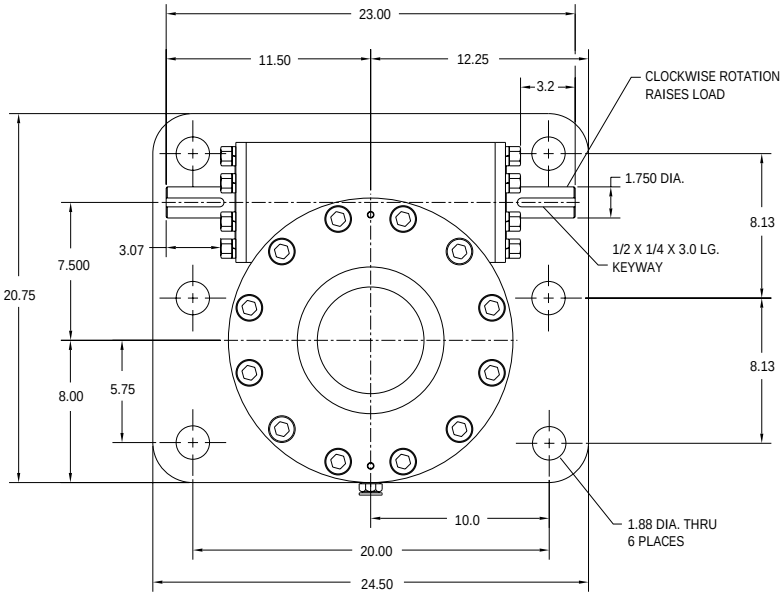
INVERTED B-75-I-R



TRAVEL NUT POSITION "A"

B100 - 100 TON

B-SERIES BALL SCREW ACTUATOR



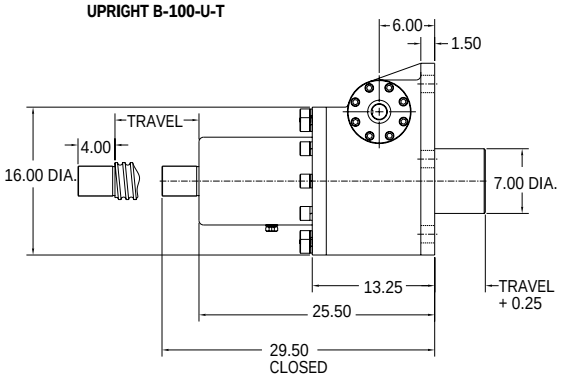
REF.	GEAR RATIO	TURNS /INCH	TORQUE REQUIRED TO LIFT 1 LB (lb-in)
L	12:1	12	0.023
H	36:1	36	0.013
RATED CAPACITY			200,000 lbs.
Max Input Speed			1200 rpm
Max Screw Stock			206 in.
Load Screw			4 in. dia. x 1 in. lead
Stop Nut Allowance			4 in.

NOTES:

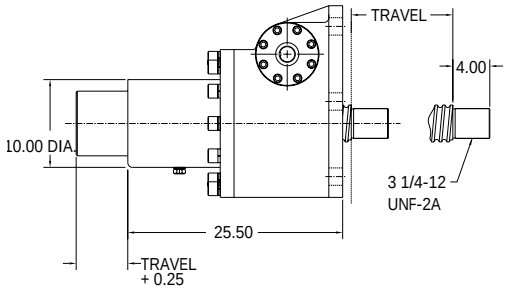
1. Load screw or nut must be secured to produce linear travel.
2. Dimensions are for reference only and will change with the addition of boots, attachments, and accessories.
3. Boots and boot adaptors are available. (Pages 74-75)
4. **Travel must be adjusted to allow for mounting structure on inverted actuators.**
5. Customer is responsible for providing positive stops at ends of travel.
6. **CAUTION: BALL SCREW JACKS ARE NON-LOCKING, BRAKES MUST BE USED TO HOLD SCREW IN POSITION.**

TRANSLATING & KEYED

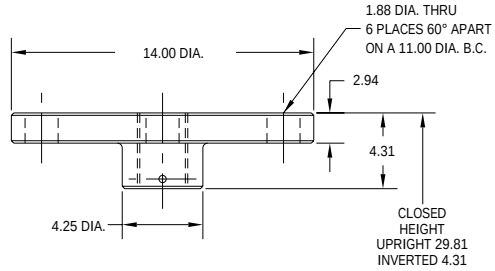
UPRIGHT B-100-U-T

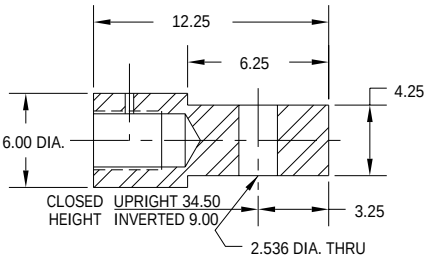


INVERTED B-100-I-T



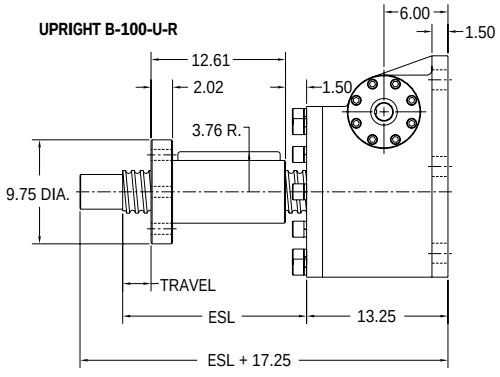
TOP PLATE AND CLEVIS END OPTIONS





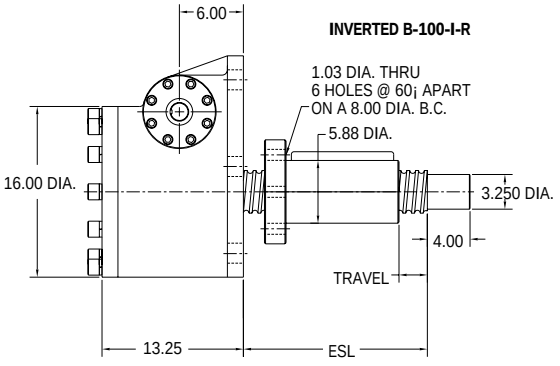
ROTATING WITH TRAVELING NUT

UPRIGHT B-100-U-R

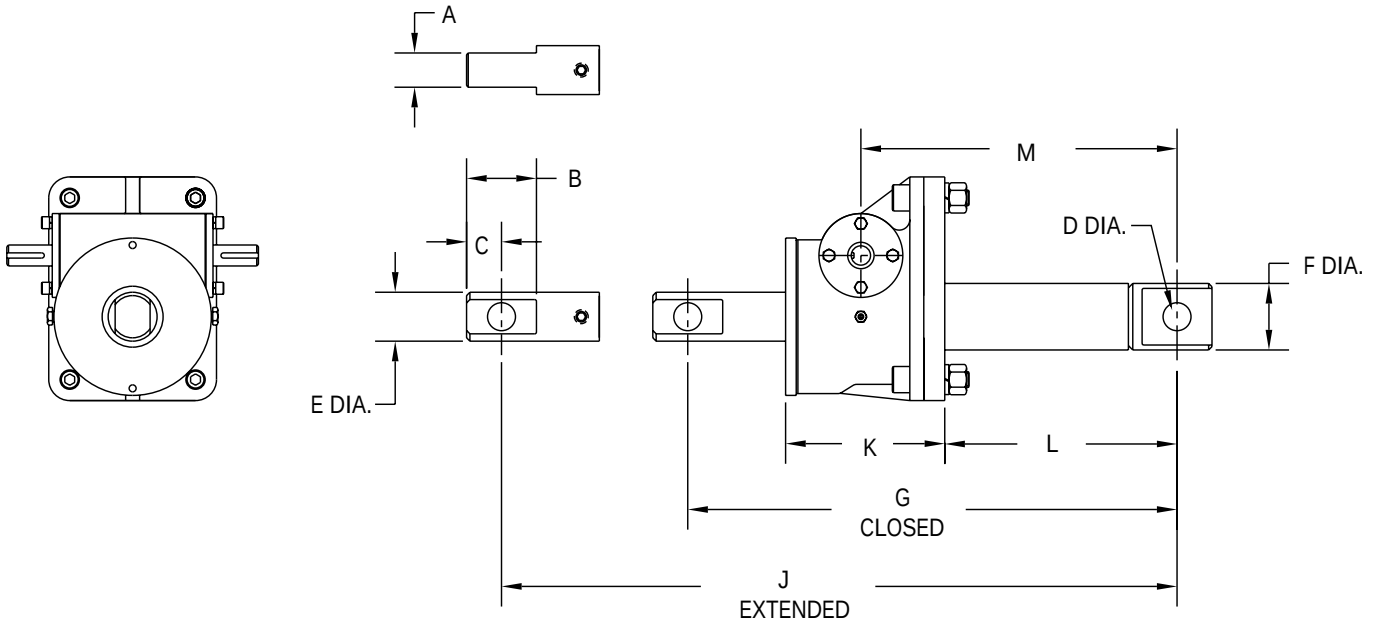


TRAVEL NUT POSITION "B"

INVERTED B-100-I-R



TRAVEL NUT POSITION "A"



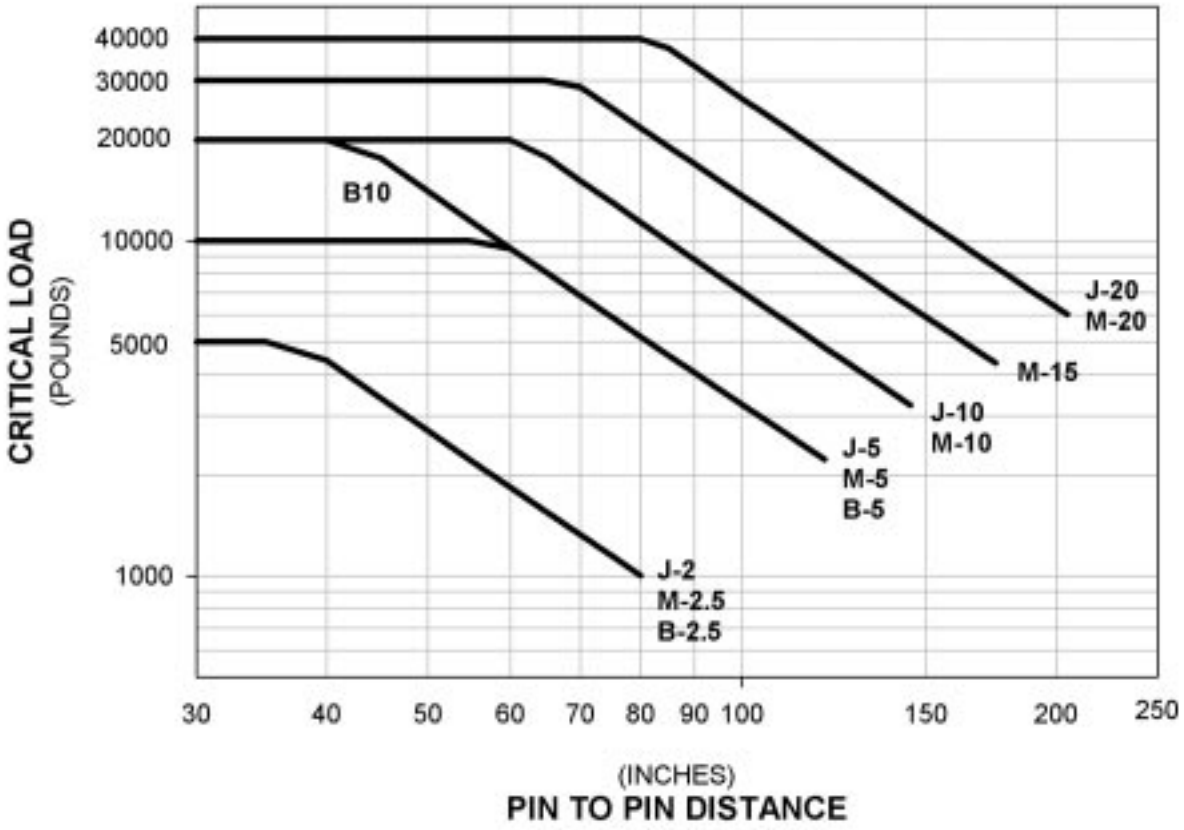
CLEVIS DIMENSIONS

MODEL SIZE	Width of Flat A	Length of Flat B	End of Clevis to Centerline of Pin Hole C	Diameter of Pin Hole D	Diameter of Clevis End E	Diameter of Clevis End (Tube End) F
M-2.5	0.75	1.50	0.75	0.41	1.00	1.38
M-5	1.00	2.00	1.00	0.66	1.50	2.13
M-10	1.25	2.50	1.25	0.78	1.75	2.50
M-15	1.50	2.50	1.25	0.91	2.25	2.50
M-20	1.75	2.75	1.38	1.03	2.50	3.13
J-2	0.75	1.50	0.75	0.41	1.00	1.38
J-5	1.00	2.00	1.00	0.66	1.50	2.13
J-10	1.25	2.50	1.25	0.78	1.75	2.50
J-20	1.75	2.75	1.38	1.03	2.50	3.13
B-2.5	0.75	1.50	0.75	0.41	1.00	1.38
B-5	1.00	2.00	1.00	0.66	1.50	2.13
B-10	1.25	2.50	1.25	0.78	1.75	2.50

JACK DIMENSIONS

MODEL SIZE	Closed Height Pin to Pin G	Extended Height Pin to Pin J	Height of Uni-Lift Housing K	Length from Pin Hole (Tube End) to Housing at 0" Travel L	Length from Pin Hole (Tube End) to Input Shaft at 0" Travel M	Maximum Travel / Extended Height at Rated Capacity
M-2.5	7.38 + Travel	G + Travel	4.44	1.18	3.25	14.8 / 37.0
M-5	10.06 + Travel	G + Travel	5.50	2.06	4.75	23.4 / 57.0
M-10	11.41 + Travel	G + Travel	5.68	2.34	5.16	24.5 / 62.0
M-15	12.91 + Travel	G + Travel	6.81	2.34	5.66	27.0 / 67.0
M-20	17.2 + Travel	G + Travel	7.56	2.69	6.63	32.4 / 82.0
J-2	7.00 + Travel	G + Travel	4.06	1.18	3.25	17.0 / 41.0
J-5	9.75 + Travel	G + Travel	5.18	2.06	5.00	23.6 / 57.0
J-10	12.56 + Travel	G + Travel	6.43	2.34	5.66	24.7 / 62.0
J-20	15.63 + Travel	G + Travel	8.56	2.69	7.32	33.2 / 82.0
B-2.5	9.25 + Travel	G + Travel	6.31	1.18	3.25	13.9 / 37.0
B-5	13.62 + Travel	G + Travel	9.04	2.06	4.75	21.7 / 57.0
B-10	14.79 + Travel	G + Travel	9.19	2.34	5.16	13.6 / 42.0

DOUBLE CLEVIS COLUMN BUCKLE CHART



The Pin-to-Pin values in the chart above are based on a **2:1 factor of safety against column buckle** on a Double Clevis Uni-Lift. Increased load screw lengths are not shown where the slenderness ratio exceeds 400.

1. Determine Maximum Extended Height (J)
The maximum extended height is the distance between the clevis pins, in the fully extended position. See table 10, page 60.

2. Determine the maximum unit load: (lbs.) (P_1)

$$P_1 = \frac{P_2}{N}$$

P_2 = Total system load N = Number of Uni-lifts

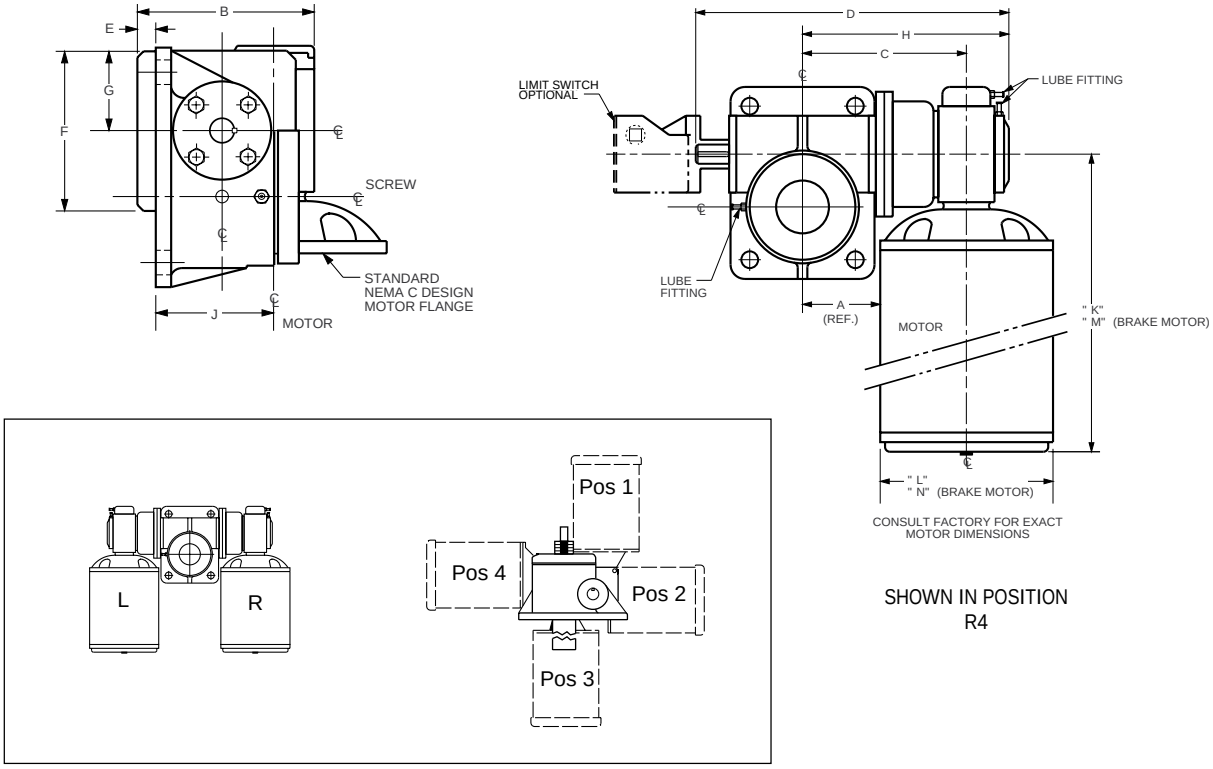
On multi-unit systems where load is not equally distributed, change P_1 to the greatest load supported by one unit.

3. Check Column Buckle Chart:
On the chart above draw a horizontal line to represent the maximum load (P_1). Draw a vertical line to represent the maximum extended height (J). All of the Uni-Lift's above the point of intersection will have acceptable column capacity.

4. Select Correct Size Uni-Lift:
Follow the directions on the pages listed below for proper sizing of the Uni-Lift actuators:

- For M-Series Actuators see pages 12 - 14
- For J-Series Actuators see pages 32 - 34
- For B-Series Actuators see pages 47 - 49

The UNI-PAC electromechanical linear actuator conforms to the same high design principles as the standard “M” and “B” series jacks. The UNI-PAC design is available with load ratings from 2 1/2 tons through 20 tons. These units provide a compact, economical way to operate a single jack or multi-jack system. This design is ideal for double clevis actuators. The addition of our standard limit switch makes these units a complete self-contained actuator.



MOTORIZED ACTUATOR DIMENSIONS (for reducer & adaptor dimensions):

Jack Size M & B Series	A	B	C	D	E	F	G	H	J	K * Max. Length	L * Max. Dia.	M * Max. Length	N * Max. Dia.
2. 5	2.06	4.88	6.19	11.50	1.13	5.38	2.69	8.00	3.50	17	8	18	8
5	3.00	5.38	6.88	13.19	.63	5.38	2.69	8.69	4.00	17	8	18	8
10	3.75	6.62	8.01	16.26	2.00	8.50	4.25	10.76	4.63	18	10	23	10
20	4.13	8.00	8.50	16.82	1.25	8.50	4.50	11.07	5.88	21	10	24	10

* These dimensions account for the largest motors that fit on these actuators. For specific motor sizes, request actual dimensional information from the factory.

See the standard catalog page pertaining to the unit size required for complete jack dimensional information.

The reducer can be mounted on either side of the jack (L or R). The standard position is R4. The reducers can be rotated in 90° increments, i.e., R1, R2, R3, R4. When ordering a UNI-PAC actuator, always state the mounting position and motor requirements, if different than the standard 3/60/230/460 TEFC.

Standard options are available with motorized actuators, including boots, emergency stop nuts, clevis’s, top plates, threaded ends, limit switches or other electronic position indicators.

UNI-PAC "M" SERIES MOTORIZED ACTUATORS

Actuator Size	Actuator Ratio	Motor Size (H.P.)	**Reducer Model Number**	Dynamic Load Capacity (lbs.)	Travel Rate Inches / Minute
M-2.5	6:1 (L)	1/2	**R5**	2,000	15
		3/4	**R5**	3,000	
		1	**R5**	4,000	
		3/4	**R10**	5,000	7 1/4
	24:1 (H)	1/2	**R5**	5,000	3 3/4
		1/2	**R10**	5,000	1 7/8
M-5	6:1 (L)	3/4	**R5**	2,300	22 1/2
		1		3,100	
		1 1/2		4,700	
		3/4	**R10**	4,500	11
		1		6,000	
		1 1/2		9,000	
	24:1 (H)	3/4	**R5**	6,500	5 3/4
		1		9,000	
		1 1/2		10,000	
		1/2	**R10**	7,000	2 3/4
		3/4		10,000	
M-10	8:1 (L)	5	**R5**	15,000	21 3/4
		3	**R10**	17,150	11
	24:1 (H)	3	**R5**	20,000	7 1/4
		2	**R10**	20,000	3 1/2
M-20	8:1 (L)	7 1/2	**R5**	21,300	21 3/4
		5	**R10**	28,000	11
	24:1 (H)	3	**R5**	21,000	7 1/4
		3	**R10**	24,000	3 1/2

UNI-PAC "B" SERIES MOTORIZED ACTUATORS

Actuator Size	Actuator Ratio	Motor Size (H.P.)	Motor Brake Size (lbs. -ft.)	**Reducer Model Number**	Dynamic Load Capacity (lbs.)	Travel Rate Inches / Minute
B-2.5	6:1 (L)	1/3	3	**R5**	2,000	15
		1/2	3		4,500	
		1/2	3	**R10**	5,000	7 1/4
	24:1 (H)	1/2	3	**R5**	5,000	3 3/4
		1/2	3	**R10**	5,000	1 7/8
B-5	6:1 (L)	3/4	6	**R5**	4,000	28
		1	6		5,800	
		1 1/2	10		8,000	
		3/4	6	**R10**	8,000	14 1/4
		1	6		10,000	
	24:1 (H)	1/3	3	**R5**	3,000	7
		1/2	3		6,000	
		3/4	6		10,000	
		1/2	3	**R10**	10,000	3 1/2
B-10	8:1 (L)	3	15	**R5**	20,000	21
		2	10	**R10**		10 1/4
	24:1 (H)	2	10	**R5**		7
		1 1/2	10	**R10**		3 1/2
B-20	8:1 (L)	5	15	**R5**	40,000	21 3/4
		3	15	**R10**		11
	24:1 (H)	3	15	**R5**		7 1/4
		3	15	**R10**		3 1/2

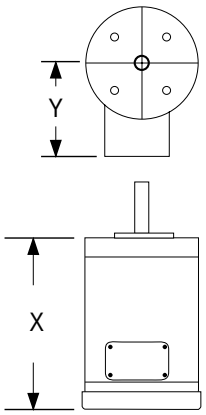
Check column capacity for all applications. Motors are TEFC, 3/60/230/460 Volt. Above selections are for intermittent operation. Running time not to exceed 15 minutes unless duty cycle calculations are checked.
To order, use the standard actuator number matrix and substitute the reducer model number (bold print) for the motor adaptor part number, i.e., R5, R10. Also, add the mounting position, i.e., R4, L3, etc.

MOTORS - NEMA C-FACE

- 230/460 Volts, 3 Phase.
- Totally Enclosed, Fan Cooled.
- Heavy Steel Frame.
- Ball Bearings.
- C-Face Less Base.

MOTOR CHART

Order Number	H.P.	R.P.M.	NEMA Frame	Weight (lbs.)	Starting Torque (in. lbs.)	Running Torque (in. lbs.)	X Dim. (in.)	Y Dim. (in.)
2400231	1/4	1725	56C	18	30	9	9.38	4.50
2400232	1/4	1140	56C	19	36	13	9.38	4.50
2400233	1/3	1725	56C	20	45	12	9.38	4.50
2400234	1/3	1140	56C	21	53	18	9.38	4.50
2400235	1/2	1725	56C	22	63	18	9.38	4.50
2400236	1/2	1140	56C	23	74	27	9.38	4.50
2400237	3/4	1725	56C	25	105	27	9.38	4.50
2400238	3/4	1140	56C	32	116	40	11.30	4.50
2400239	1	1725	143TC	31	85	36	9.94	4.50
2400240	1	1140	145TC	37	122	54	11.25	5.25
2400241	1 1/2	1725	145TC	34	150	54	10.25	5.25
2400242	1 1/2	1140	145TC	40	134	84	11.25	5.25
2400243	2	1725	145TC	41	198	72	11.25	5.25
2400244	2	1140	184TC	65	252	108	13.94	6.00
2400245	3	1725	182TC	61	264	108	12.56	5.88
2400246	3	1140	213TC	105	409	162	15.56	7.44
2400247	5	1725	184TC	75	436	180	13.94	6.00
2400248	5	1160	215TC	133	783	270	16.68	7.44
2400249	7 1/2	1725	213TC	123	488	270	15.56	7.44
2400250	10	1725	215TC	138	732	360	16.58	7.44



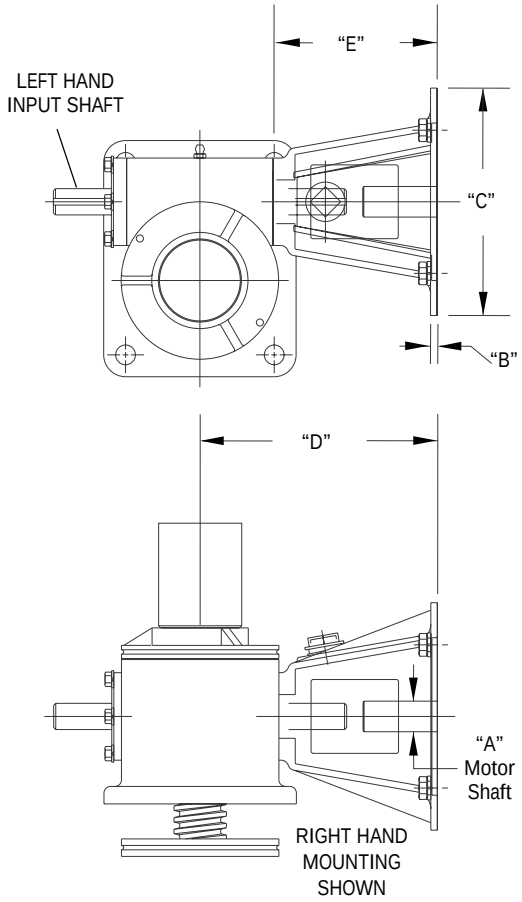
For other configurations contact factory.

NOTE: When sizing motors, Uni-Lift suggests using only 80% or less of running torque.

MOTOR ADAPTORS

- Available for 1 ton through 25 ton Uni-Lifts.
- Designed to NEMA C-Face Standards.
- Direct couple motor to left or right hand actuator input shaft.
- All hardware provided, including coupling.

Actuator	Kit Order Number	Motor Frame	"A"	"B"	"C"	"D"	"E" (Ref.)
J-1 B-1	2400177	56C	5/8	3/16	6 1/2	6 9/32	4 23/32
	2400178	143TC 145TC 182C 184C	7/8				
J-2	2400177	56C	5/8	3/16	6 1/2	6 13/16	4 23/32
	2400178	143TC 145TC 182C 184C	7/8				
J-5	2400179	56C	5/8	3/16	6 1/2	6 25/32	4 11/16
	2400180	143TC 145TC 182C 184C	7/8				
	2400181	182TC 184TC 213C 215C	1 1/8	11/16	9	7 9/32	5 3/16
J-10	2400182	56C	5/8	3/16	6 1/2	7 3/8	4 15/16
	2400183	143TC 145TC 182C 184C	7/8				
	2400184	182TC 184TC 213C 215C	1 1/8	3/4	9	7 15/16	5 1/2
J-20	2400186	56C	5/8	3/16	6 1/2	8 13/16	5 1/4
	2400187	143TC 145TC 182C 184C	7/8				
	2400188	182TC 184TC 213C 215C	1 1/8	3/4	9	8 23/32	5 17/32
	2400189	213TC 215TC	1 3/8				
J-25	2400186	56C	5/8	3/16	6 1/2	8 13/32	5 1/4
	2400187	143TC 145TC 182C 184C	7/8				
	2400188	182TC 184TC 213C 215C	1 1/8	3/4	9	8 23/32	5 17/32
	2400189	213TC 215TC	1 3/8				



M & B SERIES MOTOR ADAPTOR DIMENSIONAL CHART

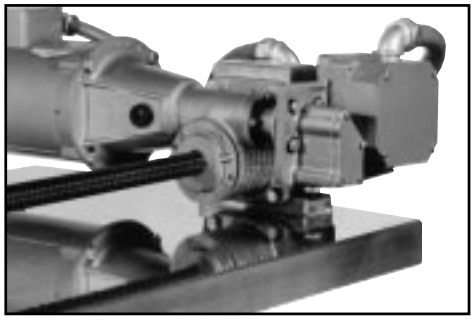
Actuator		Kit Order Number	Motor Frame	A	C	D
M-2.5	B-2.5	Request from Uni-Lift	56C	5/8	6 5/8	6 1/4
M-5	B-5		56C	5/8	6 5/8	7 1/4
M-10	B-10		184C	7/8	6 5/8	8 1/4
M-15			184C	7/8	6 5/8	8 1/4
M-20	B-20		182TC	1 1/4	9 1/4	9

ROTARY LIMIT SWITCHES

Kits Include:

Limit Switches in NEMA 4 Housing
Mounting Adaptor
Mounting Screws
Coupling Pin

Note: Input shaft must be drilled per engineering print 89767.



The limit switch easily mounts onto either input shaft & counts the revolutions to allow accurate positioning.

Specifications

- Limit Switches are available in three series: #360, #1440, and #4320.
- The series numbers relate to the maximum allowable input revolutions for each limit switch.
- You must calculate the input revolutions for your application and choose a limit switch that has the next higher capacity than required.
- Input revolutions to the limit switch equal the input revolutions to the Uni-Lift for the required load screw travel in one direction.

Sizing

To calculate the required number of revolutions, utilize the following formula:

R = TPI x Rise

TPI - Turns of the input shaft for 1 inch of rise.
Rise - one way travel.

Example:
20 ton jack, 8:1 ratio, 72 inches of rise, TPI = 16

16 x 72 = 1152 turns

1152 turns is less than 1440, therefore, select a #1440 series limit switch.

ACTUATOR SIZE (TON)	A (in.)
1*	3.303
2 & 2.5	3.303
5	3.272
10 & 15	3.273
20-25-30	3.368

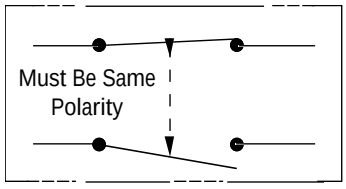
NOTE: Contact factory when using Limit Switches on short travel applicatons, i.e., less than 3 inches.

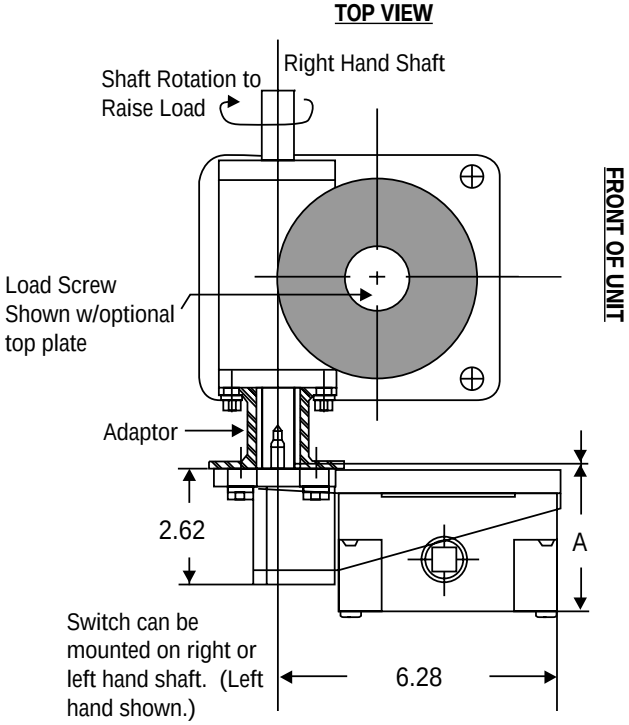
* Only available with the B1 and J1 actuator.

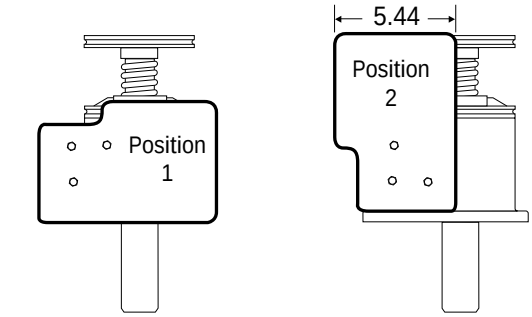
SPDT Switches Rating

115 VAC	15 AMPS
230 VAC	10 AMPS

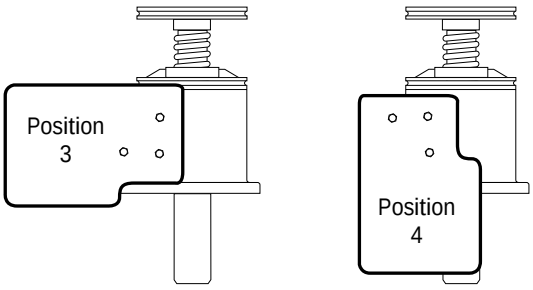
Typical S.P.D.T. Switch Wiring Diagram



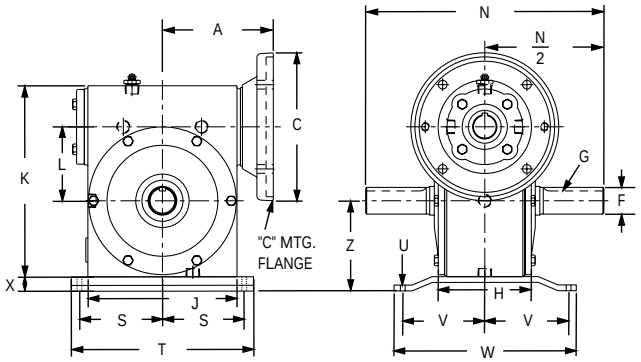




Switch can easily be mounted in any one of these positions.



"C" Flange Units Model 134A Through Model 454A



WORM GEAR REDUCER RATING TABLES

C Flange Models	NEMA Flange	Uni-Lift Number	Ratio	1725 RPM Input			1140 RPM Input			Shipping Weight/ Oil Capacity
				Output		Input HP	Output		Input HP	
				RPM	Torque (lb.-in.)		RPM	Torque (lb.-in.)		
134A	56C	2400931	5:1	345	181	1.10	228	212	0.84	13 lbs. 0.09 Gallons
		2400932	10:1	172	235	0.75	114	261	0.55	
		2400933	15:1	115	251	0.56	76	288	0.43	
184A	56C	2400934	5:1	345	358	2.17	228	436	1.73	16 lbs. 0.11 Gallons
		2400935	10:1	172	415	1.72	114	501	1.36	
		2400936	15:1	115	472	1.51	76	540	1.13	
214A	56C	2400937	5:1	345	492	3.01	228	601	2.40	23 lbs. 0.13 Gallons
	143TC, 145TC	2400941	10:1	172	621	2.01	114	776	1.64	
		2400942	15:1	115	663	1.52	76	826	1.23	
264A	182TC, 184TC	2400949	5:1	345	723	4.47	228	915	3.67	33 lbs. 0.19 Gallons
		2400950	10:1	172	1260	3.91	114	1570	3.18	
		2400951	15:1	115	1110	2.51	76	1410	2.06	
324A	182TC, 184TC	2400958	5:1	345	1820	11.1	228	2270	9.0	64 lbs. 0.33 Gallons
		2400959	10:1	172	2323	7.5	114	2820	5.8	
		2400960	15:1	115	2390	5.4	76	3020	4.4	
384A	182TC, 184TC	2400967	5:1	345	2820	17.2	228	3500	13.8	84 lbs. 0.50 Gallons
		2400968	10:1	172	3510	11.2	114	4410	9.0	
		2400969	15:1	115	3750	8.4	76	4730	6.8	
454A	213TC, 215TC	2400976	10:1	172	5130	16.3	114	6400	13.2	112 lbs. 0.9 Gallons
		2400977	15:1	115	5520	12.4	76	6880	10.1	

The above mechanical ratings are based on 2 hour duty cycles with equal shutdown time. For 30 minute duty, multiply table ratings by 1.5. For continuous duty, consult factory. Reducers are shipped dry. Use ISO grade 460 synthetic gear oil.

OUTER DIMENSIONS FOR SIMPLEX WORM GEAR REDUCERS

Model No.	NEMA Flange	A	C	F Output Shaft	G Keyseat	H	J	K	L	N	S	T	U	V	W	X	Z
134A	56C	3 3/8	6 1/2	.625 / .624	3/16 x 1 1/4 LG	2 15/16	3 1/8	4 3/32	1.333	6 1/2	2.187	5 3/8	11/32	1.656	4 3/16	.687	2.250
184A	56C	3 3/4	6 1/2	.750 / .749	3/16 x 1 5/8 LG	3	3 7/8	5	1.750	7	2.875	6 7/8	13/32	2.250	5 5/8	.875	2.750
214A	56C 143TC, 145TC	4 1/8	6 1/2	.875 / .874	3/16 x 1 31/32 LG	3 3/4	4 7/8	6	2.062	8 1/2	3.187	7 1/2	15/32	2.343	5 13/16	.562	3.000
264A	182TC, 184TC	4 3/4	9	1.250 / 1.249	1/4 x 1 25/32 LG	4 5/8	5 5/8	7 7/16	2.625	9	4.000	9 1/2	17/32	2.625	6 3/4	.750	3.687
324A	182TC, 184TC	6 1/4	9	1.375 / 1.374	5/16 x 2 9/16 LG	4 3/4	7 3/8	8 5/8	3.250	10 7/8	4.750	10 3/4	17/32	3.062	7 3/8	1.125	4.375
384A	182TC, 184TC	6 5/8	9	1.500 / 1.499	3/8 x 3 1/4 LG	5 3/8	8	10 1/16	3.750	13 3/8	5.187	11 5/8	19/32	3.500	8 1/4	.875	4.812
454A	213TC, 215TC	6 3/4	9	1.625 / 1.624	3/8 x 1 7/16 LG	6 1/8	9 1/4	11 5/8	4.500	14 1/2	6.062	13 5/16	21/32	3.812	8 7/8	1.000	5.625

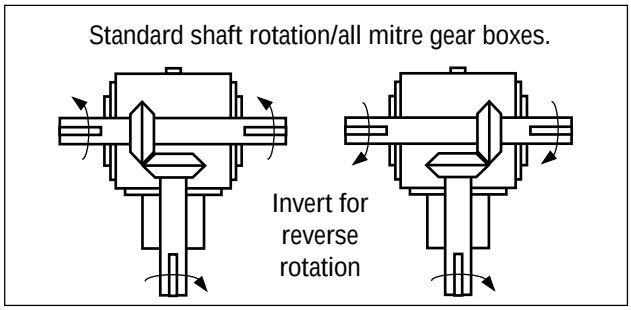
Lightweight Aluminum Models
AD-3, AD-4 & AD-5

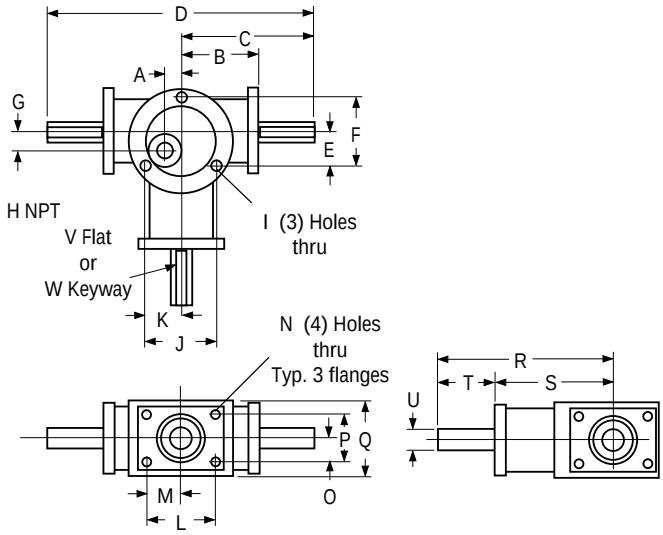
Features:

- **Lightweight aluminum housing** resists corrosion and provides rigid gear and bearing support.
- **Stainless steel shafts** provide resistance to corrosion.
- **Precision ball bearings** accommodate higher operating speeds.
- **Spiral bevel gearing** assures low noise level at higher operating speeds.
- **Factory lubricated for life** to assure trouble free service.
- **Universal mounting** (5 surfaces) for maximum design flexibility.

Standard Units

Standard units may be inverted to reverse rotation. Input shaft can be rotated in either direction. Other styles and ratios are available upon request.





Rating Table - Selected by Torque

Model No.	Order No.	Ratio	Output Torque Rating @ 1140 RPM	Input H.P @ 1140 RPM	Output Torque Rating @ 1725 RPM	Input H.P @ 1725 RPM	Shipping wt. (lbs.)
AD-3	21580	1:1	194	3.5	189	5.2	8.25
AD-4	21574	1:1	33	0.6	32	0.9	.50
AD-5	21575	1:1	80	1.4	78	2.1	2

Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T*	U*	V* Flat	W*
AD-3	0.8	3.00	5.00	10.00	1.50	3.000	.88	1/4	0.320	3.000	1.50	3.000	1.50	0.328	1.125	2.250	3.005 3.000	7.00	5.00	2.00	0.750 0.749	-	3/64 x 3/32
AD-4	0	1.385	1.975	3.947	0.656	1.312	.44	1/8	0.193	1.312	0.656	1.188	0.594	0.171	0.438	0.876	1.255 1.250	2.755	2.165	0.590	0.375 0.374	1/32 deep	-
AD-5	0.5	2.125	3.625	7.250	0.937	1.875	.50	1/8	0.265	1.875	0.937	1.875	0.937	0.265	0.687	1.375	2.005 2.000	4.750	3.250	1.500	0.625 0.624		3/16 x 3/32

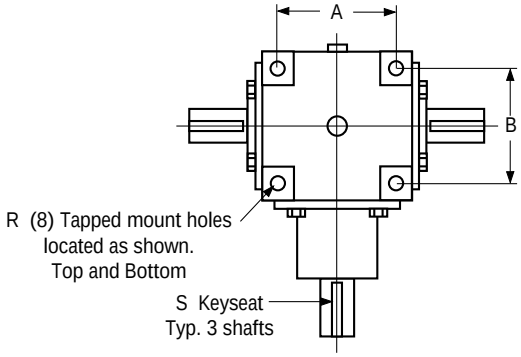
* Identical for all 3 shafts.

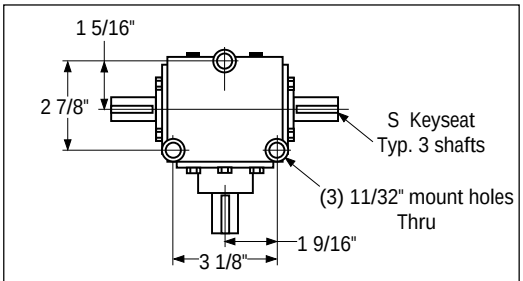
MITRE GEAR BOXES

Heavy Duty Models with Rugged Iron Housings

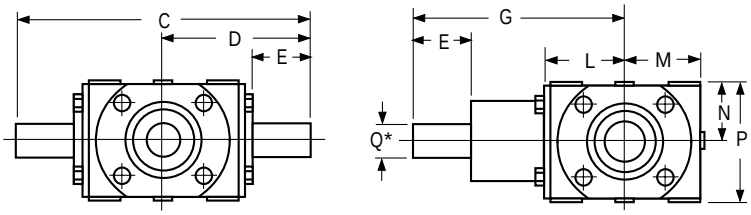
Features:

- **Rugged iron housing** designed for rigid gear and bearing support.
- **Tapered roller bearings** for endurance and strength.
- **Double lip, spring loaded seals** to keep lubricant in, keep dirt out.
- **Universal mounting** assures maximum design flexibility.
- **Spiral bevel gearing** for lower noise level and higher input speeds. (All models except M2)
- Use ISO 220 viscosity lube oil.





Mounting Hole Detail (Model M2 Only)



Model No.	Order No.	Ratio	Output Torque @1140 RPM	Input HP @1140 RPM	Max. Approvd. Input RPM	Output Torq. @1725 RPM	Input HP @1725 RPM	A	B	C	D	E*	G	L	M	N	P	Q*	R	S* Keyseat
M2	21600	1:1	83	1.5	2400	81	2.2	-	-	7 1/2	3 3/4	1 1/2	4 9/16	2 1/4	1 47/64	1 19/32	3 3/16	0.625 0.624	-	3/16 X 3/32 X 1 5/32
150	21701	1:1	600	11	3000	580	16	4 1/4	4 1/4	10 3/16	5 3/32	2	5 23/32	2 27/32	2 9/16	2 1/16	4 1/8	1.000 0.999	3/8 NC	1/4 X 1/8 X 1 17/32
66	21751	1:1	1670	30	2400	1650	46	4 1/2	4 1/2	12 1/4	6 1/8	2 1/2	8 15/32	3 7/16	2 15/16	2 13/16	5 5/8	1.251 1.250	1/2 NC	1/4 X 1/8 X 1 25/32
88	21851	1:1	3450	63	1725	3240	90	6 1/2	6 1/2	15 13/16	7 29/32	3	10 7/8	4 17/32	3 27/32	4 3/32	8 3/16	1.376 1.375	1/2 NC	5/16 X 5/32 X 2 5/16
800	21901	1:1	4930	90	1725	4750	132	6 1/2	6 1/2	16 3/32	8 3/64	3 1/16	11 15/32	4 19/32	3 27/32	4 3/32	8 3/16	1.499	1/2 NC	3/8 X 3/16 X 2 1/4
1010	21955	1:1	9481	170	1725	9039	250	8	8	21 1/2	10 3/4	4	15	5 1/4	4 3/4	4 3/4	9 1/2	2.000 1.998	1/2 NC	1/2 X 1/4 X 3 3/4

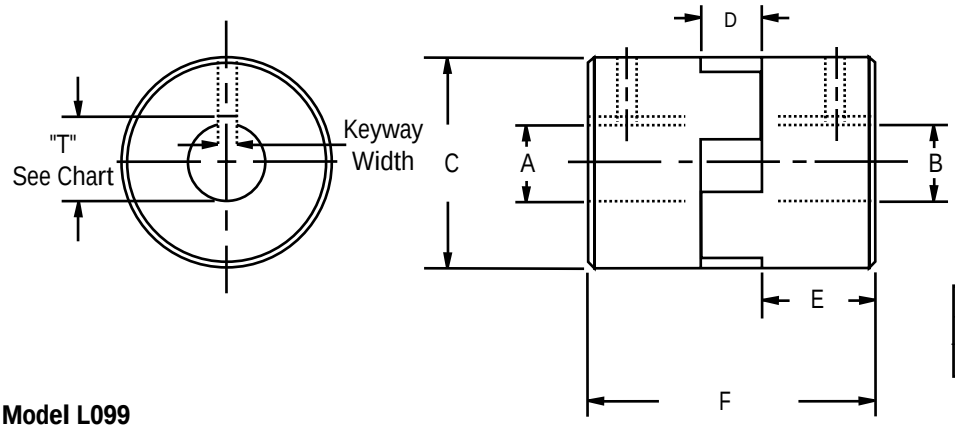
* Identical for all 3 shafts.

Torque ratings are mechanical, based upon continuous duty service. Output capacity is higher for intermittent duty (contact factory).

Units Shipped Dry - Shipping Weights (lbs.): 9, 25, 48, 88, 115 & 175 respectively.

FLEXIBLE JAW COUPLINGS

- Easy to assemble.
- Visual wear inspection.
- Max. angular offset 1°.
- Max. parallel offset 0.015 inches.
- Sintered iron j aws, open center polyurethane spider.
- Temperature range -30° to 160° F.



Model No.	C (in)	D (in)	E (in)	F (in)
LO95	2 7/64	1/2	1	2 1/2
LO99	2 17/32	3/4	1 1/16	2 7/8

Model L099
Rated Torque 477 in-lb
Rated H.P. 13 @ 1725 RPM

Item No.	Hub Finish Bore +.001/-.000			
	A Dia.	Keyway Width x "T"	B Dia.	Keyway Width x "T"
2486171	5/8	3/16 x .709	5/8	3/16 x .709
2486172	5/8	3/16 x .709	3/4	3/16 x .837
2486173	5/8	3/16 x .709	7/8	3/16 x .964
2486174	5/8	3/16 x .709	1	1/4 x 1.114
2486175	5/8	3/16 x .709	1 1/8	1/4 x 1.241
2486176	5/8	3/16 x .709	1 1/4	1/4 x 1.367
2486177	5/8	3/16 x .709	1 3/8	5/16 x 1.518
2486178	3/4	3/16 x .837	3/4	3/16 x .837
2486179	3/4	3/16 x .837	7/8	3/16 x .964
2486180	3/4	3/16 x .837	1	1/4 x 1.114
2486181	3/4	3/16 x .837	1 1/8	1/4 x 1.241
2486182	3/4	3/16 x .837	1 1/4	1/4 x 1.367
2486183	3/4	3/16 x .837	1 3/8	5/16 x 1.518
2486184	7/8	3/16 x .964	7/8	3/16 x .964
2486185	7/8	3/16 x .964	1	1/4 x 1.114
2486186	7/8	3/16 x .964	1 1/8	1/4 x 1.241
2486187	7/8	3/16 x .964	1 1/4	1/4 x 1.367
2486188	7/8	3/16 x .964	1 3/8	5/16 x 1.518
2486189	1	1/4 x 1.114	1	1/4 x 1.114
2486190	1	1/4 x 1.114	1 1/8	1/4 x 1.241
2486191	1	1/4 x 1.114	1 1/4	1/4 x 1.367
2486192	1	1/4 x 1.114	1 3/8	5/16 x 1.518
2486193	1 1/8	1/4 x 1.241	1 1/8	1/4 x 1.241
2486194	1 1/8	1/4 x 1.241	1 1/4	1/4 x 1.367
2486195	1 1/8	1/4 x 1.241	1 3/8	5/15 x 1.518
2486196	1 1/4	1/4 x 1.367	1 1/4	1/4 x 1.367
2486197	1 1/4	1/4 x 1.367	1 3/8	5/16 x 1.518
2486198	1 3/8	5/16 x 1.518	1 3/8	5/16 x 1.518

Model L095
Rated Torque 291 in-lb
Rated H.P. 8 @ 1725 RPM

Item No.	Hub Finish Bore +.001/-.000			
	A Dia.	Keyway Width x "T"	B Dia.	Keyway Width x "T"
2486122	5/8	3/16 x .709	5/8	3/16 x .709
2486123	5/8	3/16 x .709	11/16	3/16 x .773
2486124	5/8	3/16 x .709	3/4	3/16 x .837
2486125	5/8	3/16 x .709	13/16	3/16 x .900
2486126	5/8	3/16 x .709	7/8	3/16 x .964
2486127	5/8	3/16 x .709	15/16	1/4 x 1.051
2486128	5/8	3/16 x .709	1	1/4 x 1.114
2486129	5/8	3/16 x .709	1 1/16	1/4 x 1.178
2486130	5/8	3/16 x .709	1 1/8	1/4 x 1.241
2486139	3/4	3/16 x .837	3/4	3/16 x .837
2486140	3/4	3/16 x .837	13/16	3/16 x .900
2486141	3/4	3/16 x .837	7/8	3/16 x .964
2486142	3/4	3/16 x .837	15/16	1/4 x 1.051
2486143	3/4	3/16 x .837	1	1/4 x 1.114
2486144	3/4	3/16 x .837	1 1/16	1/4 x 1.178
2486145	3/4	3/16 x .837	1 1/8	1/4 x 1.241
2486152	7/8	3/16 x .964	7/8	3/16 x .964
2486153	7/8	3/16 x .964	15/16	1/4 x 1.051
2486154	7/8	3/16 x .964	1	1/4 x 1.114
2486155	7/8	3/16 x .964	1 1/16	1/4 x 1.178
2486156	7/8	3/16 x .964	1 1/8	1/4 x 1.241
2486161	1	1/4 x 1.114	13/16	1/4 x 1.114
2486162	1	1/4 x 1.114	1 1/16	1/4 x 1.178
2486163	1	1/4 x 1.114	1 1/8	1/4 x 1.241
2486166	1 1/8	1/4 x 1.241	1 1/8	1/4 x 1.241

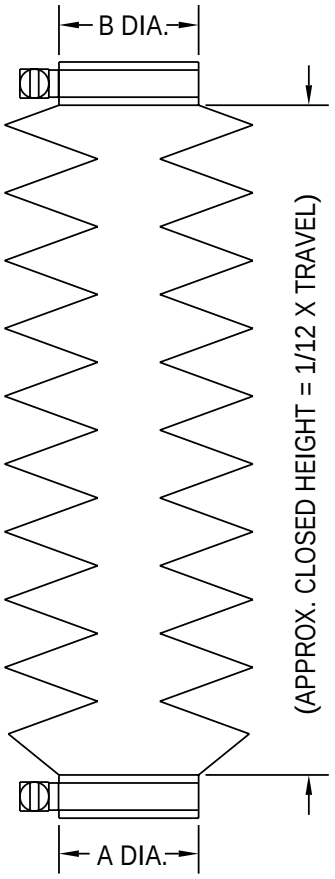
BOOTS

- Uni-Lift boots are constructed of stitched neoprene coated nylon material to provide maximum protection from abrasive material and other hostile environmental conditions. Uni-Lift boots are available for special severe duty applications, such as weld splatter and high temperature.
- All boots having 60" or more of travel are equipped with permanent tie straps to provide equal weight distribution and controlled extension.
- Horizontal or angled applications require guides for travel greater than 24". These guides will keep the boot centered on the load screw to avoid untimely deterioration. One guide is supplied for each 24" of travel. Boot guides do not require additional load screw length.
- To determine **Extended Screw Length (ESL)** add travel, closed boot height, mounting structure (for inverted applications), boot mounting flanges, and any other required clearances.
- For dimensional information regarding boots for Keyed models, contact factory.

Call Factory for Sizing Assistance: (800) 323-9114 or Fax (708) 865-0894.

Material	Temperature Range	Application Comments
Neoprene Coated Nylon	-40° F to 220° F	Good flexibility, resists oils and greases.
Hypalon Coated Polyester	-60° F to 300° F	Good chemical and abrasion resistance.
Silicone Coated Fiberglass	-40° F to 550° F	High temperature.
Aluminized Fiberglass	-40° F to 550° F	High temperature, weld splatter and good abrasion resistance.

MODEL & SIZE	BOOT DIAMETERS		COLLAR DIM.				BOOT CLOSED HEIGHT
	OUTSIDE DIA.	INSIDE DIA.	TRANSLATING		ROTATING		
M-SERIES			A	B	A	B	(APPROXIMATE) CLOSED BOOT HEIGHT = 1/12 x TRAVEL
1	5.00	2.00	2.81	0.81	2.81	3.06	
2.5	5.00	2.00	4.06	1.06	4.06	3.06	
5	5.50	2.50	5.94	1.81	5.69	4.06	
10	6.50	3.50	5.94	1.81	5.94	3.00	
15	7.00	4.00	6.19	2.31	6.19	6.56	
20	7.50	4.50	7.06	2.56	7.06	7.06	
30	8.00	5.00	8.81	3.06	8.81	8.31	
H-SERIES							
1/4	4.00	1.00	0.90	0.56	0.90	1.56	
1/2	4.50	1.50	1.06	0.69	1.06	2.06	
J-SERIES							
3/4	4.50	1.50	1.19	0.69	1.19	2.31	
1	4.50	1.50	3.19	0.81	3.19	1.56	
2	5.00	2.00	3.69	1.06	3.69	3.06	
5	5.50	2.50	4.56	1.56	4.56	4.06	
10	6.50	3.50	5.56	1.81	5.56	5.06	
20	7.50	4.50	7.06	2.56	7.06	7.06	
25	8.00	5.00	7.56	2.81	7.56	8.31	
B-SERIES							
1	4.50	1.50	3.19	0.81	3.31	2.65	
2.5	5.00	2.00	3.06	1.06	4.06	3.34	
5	5.50	2.50	4.56	1.56	5.69	5.00	
10	6.50	3.50	4.25	1.81	5.94	5.00	
20	6.50	3.50	5.69	2.56	7.06	5.47	
30	8.00	5.00	7.37	3.06	8.81	7.47	

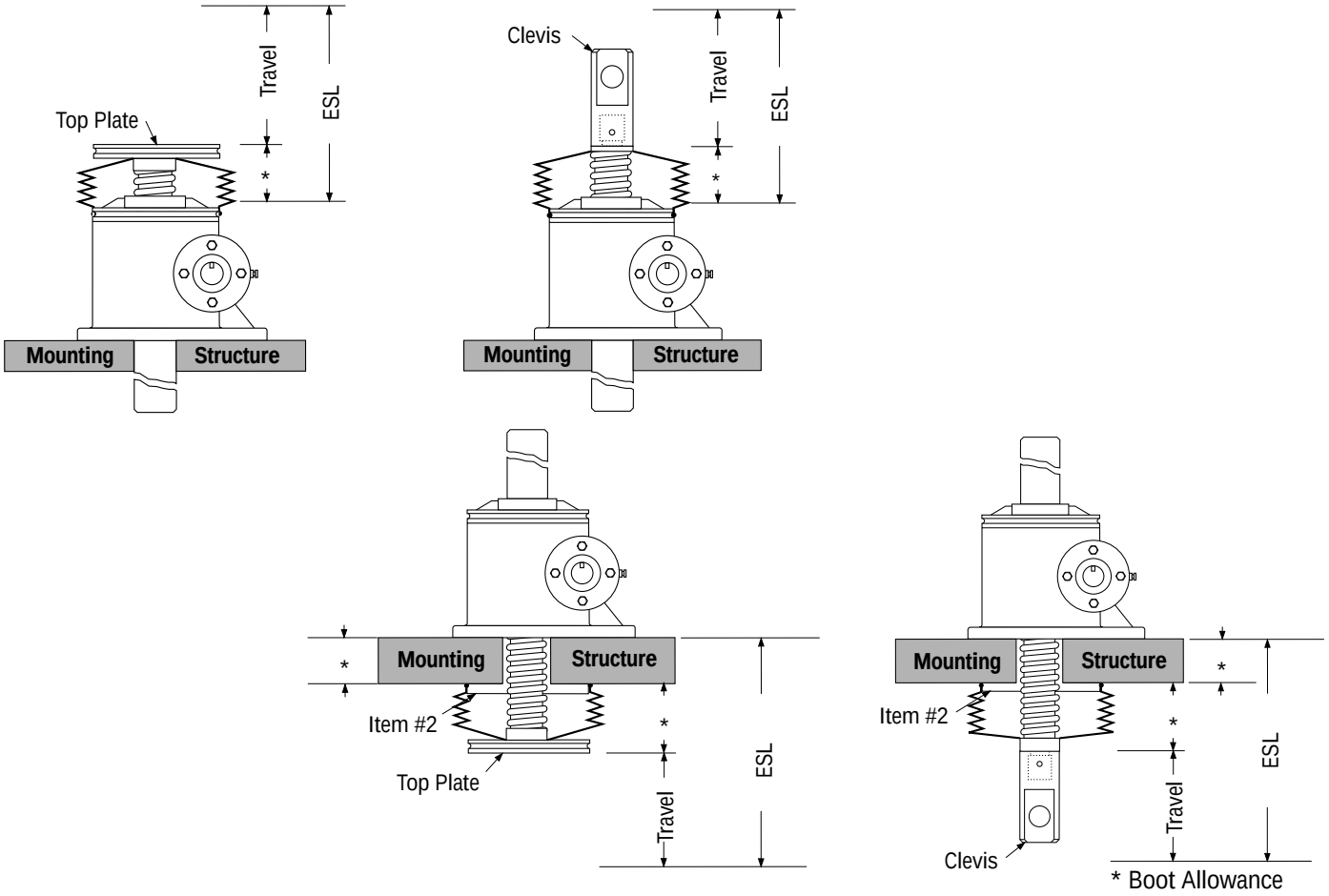


Order The Proper Load Screw Length (ESL)/Boot Application

To determine the load screw length (ESL) required when ordering Uni-Lift actuators, extra screw must be included for: mounting structure, traveling nut, boot closed height, boot accessories, etc. Typical areas where extra screw length must be provided are marked with an asterisk (*).

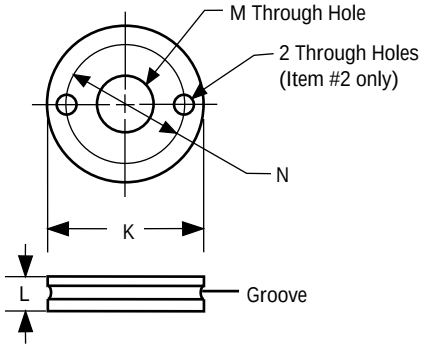
• To calculate closed height of boot, see boot specifications on adjacent page.

Boot Selection for Rotating Design or Double Clevis Applications: Contact Factory.



Boot Accessory Plate/Dimensional Data

Boot Retainer Plate Including Screws (Item #2)						
Uni-Lift Cap. (ton)	**Order Number**	**K**	**L**	**M**	**N**	**Screw Size**
1/4	2480001†	2 1/4	3/16	.875	1 3/16	6 - 32
1/2	2480002†	2 3/8	3/16	1.031	1 7/16	
3/4	2480072	2 1/4	3/16	1.031	1 7/16	
1	2480003	3 1/4	3/8	.812	2 5/16	1/4 - 20
2 & 2.5	2480004	3 5/8	3/8	1.125	2 1/8	
5	2480005	4 1/2	1/2	1.625	3 5/16	
10 & 15	2480006	5 1/2	1/2	2.250	4 1/16	
20	2480007	7	5/8	2.562	5 5/8	
25 & 30	2480008	7 1/2	5/8	2.812	5 3/4	
40 & 50	2480009	9 3/4	1/2	4.320	8	5/16 - 18
75 & 100	2480010	14	3/4	6.020	8 1/2	



† Retainer plate mounts to housing when using top plate.

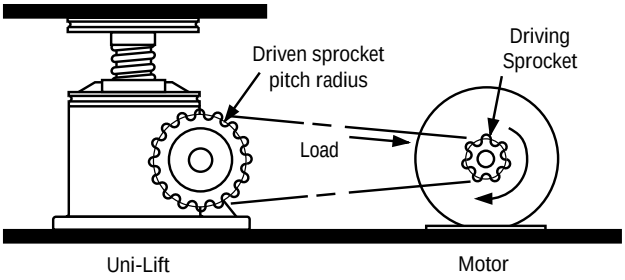
There may be applications where driving direct shaft connection to the motor or reducer is impractical. Examples include:

When the required input speed cannot be obtained using a gear reducer; when the design economy dictates elimination of geared speed reducers; or when the configuration of surrounding structure prohibits use of mitre gear boxes with connecting shafts between units.

In all these cases, a single Uni-Lift or Uni-Lift system may be operated by sprocket and chain drive as shown in the figure below.

There is a limit for overhung shaft loads applied to Uni-Lift input shafts. To find the overhung shaft load applied to the input shaft, divide the required input operating torque by the pitch radius of the driven sprocket. This load should not exceed the rating in Table A.

Typical Sprocket and Chain Drive Application



Notes:

- To reduce the overhung load effect, use a driven sprocket with a larger radius.
- Uni-Lift does not supply overhung drive components.

Table A - Overhung Load Capacity

Capacity Tons	Shaft Dia. (In.)	Shaft RPM						
		0-50	115	345	600	900	1140	1725
		Max. Overhung Shaft Load (Lbs)						
3/4	3/8	30	25	23	20	15	15	10
1	7/16	80	70	65	50	40	35	30
2	5/8	100	95	80	70	55	40	35
5	3/4	105	100	95	85	72	60	50
10	1	240	230	210	172	133	95	65
20	1 1/8	295	275	235	195	155	115	80
30	1 1/8	280	260	245	200	160	120	85
50	1 3/8	465	450	375	325	200	160	
100	1 3/4	670	627	585	500	400		

Overhung load limits shown are based upon load applied at 1/2 the Uni-Lift shaft keyseat.

Specifying Shafting

Selection of the smallest recommended shaft diameter gives the system more shock absorbing capability, which greatly improves the life of geared components.

Shaft torque ratings in Table B are based upon torsional deflection of approximately 0.5 DEG/FT during operation, and provide a shear strength safety factor of over 3:1 based on C.R.S. 1018.
Formula to calculate torsional deflection of shafting per linear foot:

$$a = \frac{.0006(Ts_2)}{D^4}$$

a = Angle of Torsional Deflection (DEG/FT)

Ts_2 = Start Up Torque Transmitted (LB-IN)

D = Shaft Diameter (IN)

NOTE: No more than 0.75 DEG/FT should be allowed using effective starting torque (Static Torque) to be transmitted.

Table B

Shaft Selection

Shaft Dia. (In.)	Shaft Torque Rating (Lb.In.)
3/8	15
7/16	30
1/2	50
5/8	125
3/4	260
7/8	480
1	820
1 1/8	1300
1 1/4	2000
1 3/8	2900
1 1/2	4100
1 5/8	5700
1 3/4	7600
2	13100
2 3/16	19100

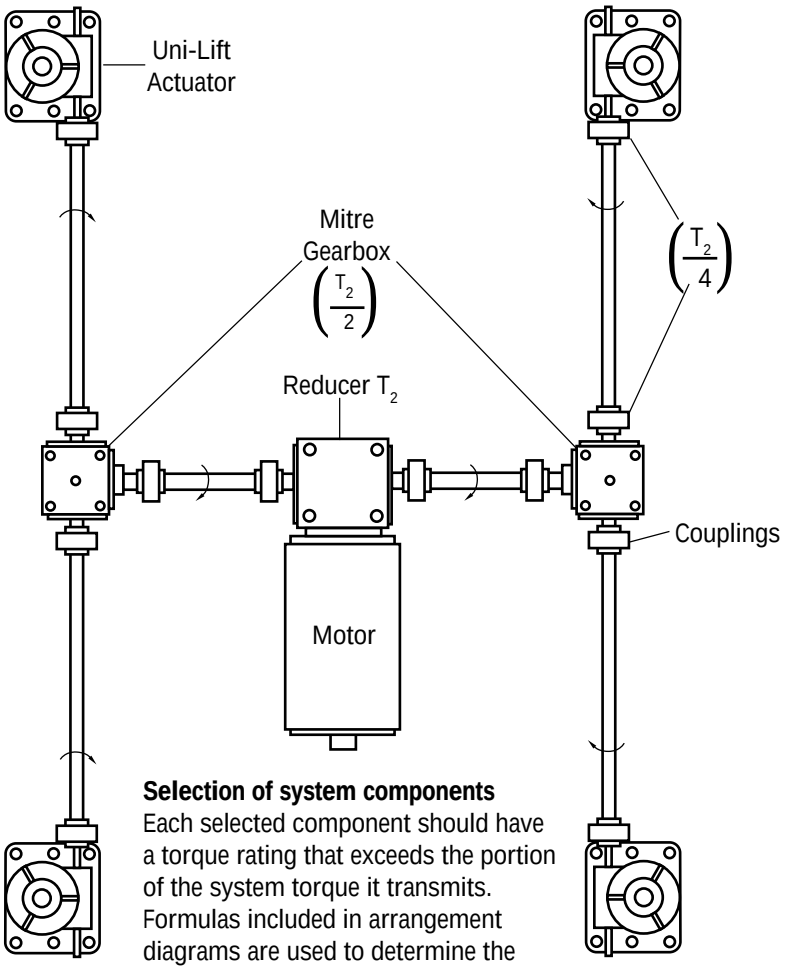
Pillow Block Spacing

Shaft Speed (RPM)				
0-230	345	690	1140	1725
* Max. Pillow Spacing (In.)				
56	56	46	36	29
62	62	50	38	31
68	68	53	41	33
79	79	59	46	37
89	89	64	50	41
98	98	70	54	44
107	105	75	58	47
116	111	79	61	50
125	117	83	65	53
133	123	87	68	55
141	129	91	71	58
148	134	95	74	60
156	139	98	76	62
170	149	105	82	66
181	155	110	86	70

* Distance from end of shaft to nearest pillow block should be approximately 20% of the value shown. A minimum of 2 pillow blocks should be used if shaft's overall length exceeds 60% of the value shown.

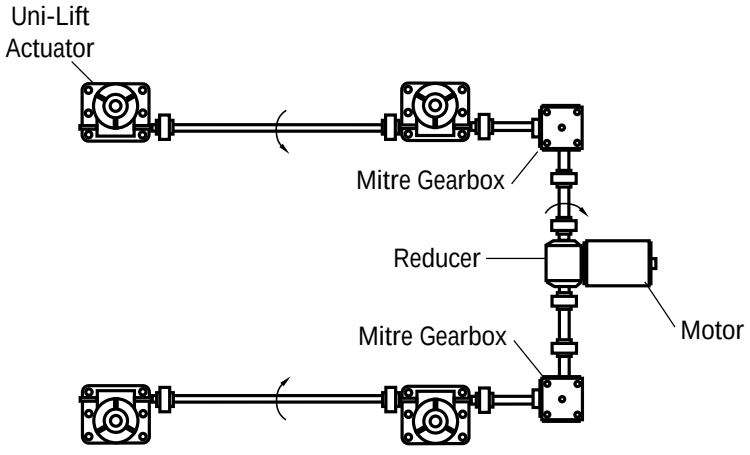
SYSTEM ARRANGEMENT

ARRANGEMENT I
e_1 = 0.83 (INCLUDES MITRE BOX EFF)



Selection of system components
Each selected component should have a torque rating that exceeds the portion of the system torque it transmits. Formulas included in arrangement diagrams are used to determine the torque requirements for power transmission components used in the system, i.e., $T_2 \div 2$ in Arrangement I equals the output torque required at each bevel box.

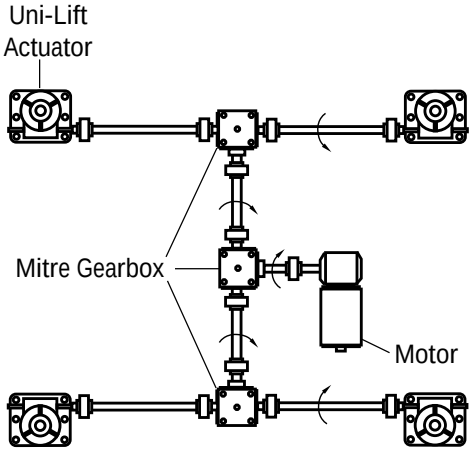
ARRANGEMENT II
e_1 = 0.83



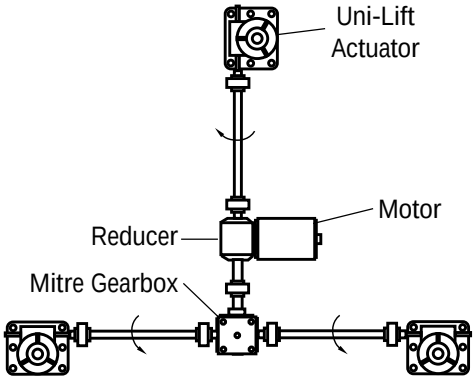
Rotation arrows show direction to extend Upright Units.

One jack system efficiency = 99%

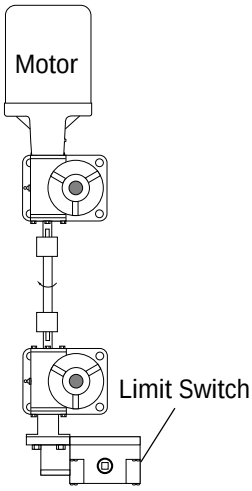
ARRANGEMENT III
e_1 = 0.81



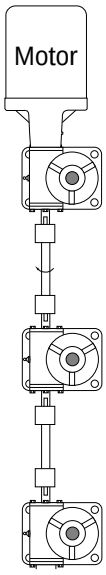
ARRANGEMENT IV
e_1 = 0.89



ARRANGEMENT V
e_1 = 0.95



ARRANGEMENT VI
e_1 = 0.90



(e_2) Reducer & Gear Box Efficiency

Efficiency Factor of Worm Gear Reducers (for sizing motors)			
Ratio	5:1	10:1	15:1
e_2 (Approx.)	0.92	0.87	0.83

Efficiency Factor of Mitre Boxes		
Ratio	1:1	2:1
e_2 (Approx.)	0.99	0.96

e_2 Helical Gear Reducer 97% EFF

LOAD SCREW KEY TORQUE

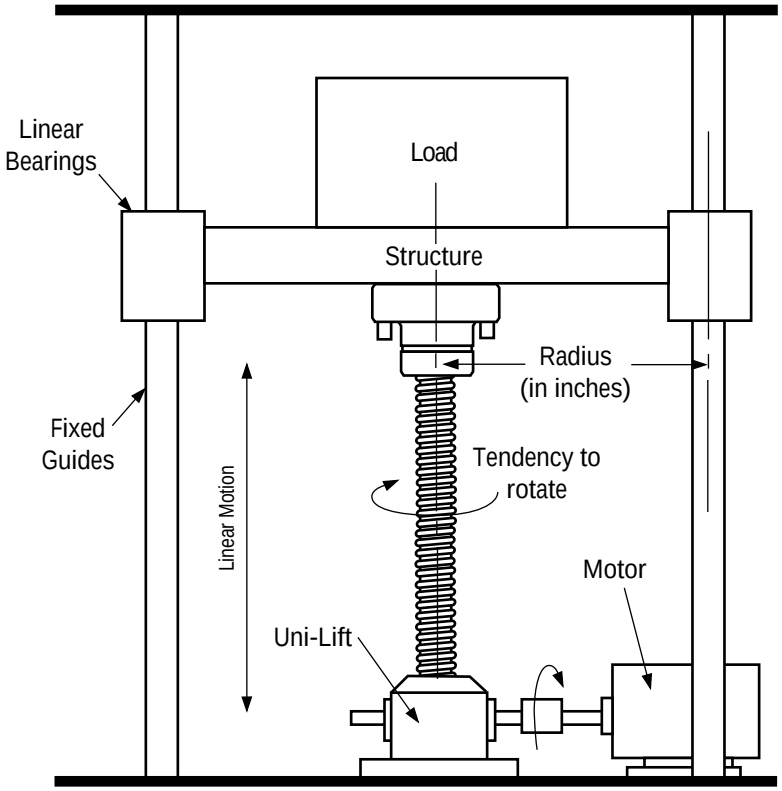
Preventing Load Screw Rotation

Rotation of load screw or traveling nut must be prevented in order to produce travel (linear motion).

Key torque is the amount of torque measured in inch pounds that must be overcome to prevent load screw rotation. There are three general methods used to overcome key torque:

- **Use of external guiding** of the load as shown in the illustration Fig. K. This method is highly recommended for all applications involving side thrust or column buckle and is mandatory for horizontal applications.
- **Configure a system using two or more actuators** attached to the load. (A rigid structure bolted to more than one Uni-Lift will not rotate.)
- **Using a keyed load screw.** (Keyway full length of Acme Screw) This form of internal guiding is the least preferred method of preventing load screw rotation. Should it become necessary to have a keyed load screw, the load should be no more than 25% of rated capacity in order to minimize key friction problems. Contact the factory for assistance in selecting the properly sized keyed Uni-Lift actuator.

Key torque for all Uni-Lift models is given in Table below.



$$\text{Guide Thrust} = \frac{\text{(Unit Key Torque from Table) x F}}{\text{(Radius) x (Number of Guides)}}$$

Fig. K

Load Screw Key Torque (Output Torque at Full Load)

Capacity (Tons)	Unit Key Torque (lb. in.)
1/4	28
1/2	65
3/4-20	97
3/4-40	127
1	184
2/2.5	444
5	1,608
10	3,617
20	10,423
30	16,789
50	41,822
100	112,930

*For reduced loads, key torque is reduced proportionately. Multiply table values by load proportion factor.

$$F = \frac{\text{Actual load (lbs.)}}{\text{Rated capacity (lbs.)}}$$

Important: Guides must be sized to prevent bending or deflection, and aligned in true position with the jack and the load screw.
Note: If more than one unit is attached to a common structure, the tendency to rotate is resisted by reaction in the structure instead of the guides.

Uni-Lift actuators have been designed to provide long life with an adequate safety margin to prevent loss of control of the load being moved or positioned. The following conditions must be met before installation begins:

- **A Uni-Lift has been selected with capacity and rating greater than the load.**
- **A method of preventing screw rotation is used so translation will occur. See "Key Torque" table in catalog for strength requirements.**
- **Mechanical travel stops as part of the structure and travel limit controls are available to prevent ejection of the load screw or retraction into the housing.**
- **A check that the maximum compressive capability hasn't been exceeded. Column buckle calculations available in catalog.**
- **A minimum of Grade 5 bolts have been selected for mounting of the Uni-Lift.**
- **Check that rated input speeds of the Uni-Lift will not be exceeded. Verify in Uni-Lift catalog.**
- **Check that mounting structure has sufficient strength to support the load, and is rigid enough to prevent deflection or distortion of supporting members.**
- **Use brakes when vibration present.**

Check Safety Codes and Specifications
Safety codes are for your protection. Uni-Lift recommends compliance with all safety codes, applicable building codes, elevator codes, AISC Steel Construction specifications, and others. OSHA Title 29, Chapter 1910-219, and ANSI B15.1 Safety Code for Mechanical Power Transmission Apparatus are to be followed.
Use of Uni-Lifts to move human cargo is not recommended, consult the factory.

When in doubt about any of these conditions being met, contact **Templeton, Kenly & Co., Inc.** for recommendations.

The foundations of Uni-Lift mounting are critical to insure alignment. Mount the actuator and check that the axis of the load screw is parallel to the movement of the load and centered with respect to the load. Shim under the mounting base to achieve this if needed. Both eccentric loading and/or side loading will cause premature wear and possible bending and failure of the Uni-Lift. Once the alignment is correct, hand tighten the mounting bolts.

Next align all system power transmission components. Insure drive shafts are aligned with the Uni-Lift input shaft(s). Alignment of all components is critical for proper operation.

As an alignment aid - use of laser transits are recommended.

Verify that the Uni-Lift turns freely by hand, and that all other components are in alignment, then tighten the mounting fasteners and attach the load to the Uni-Lift. Check to insure all equipment is properly lubricated, rotating parts are protected and all personnel are clear of danger.

Finally the load screw should be lubricated with a light film of grease and the Uni-Lift housing checked to be sure that it is properly filled with grease.

MAINTENANCE

1. **External Cleaning:** The Uni-Lift should be wiped down and visually inspected for signs of wear and/or abuse each month. The load screw should be coated with a light film of grease. The housing grease should be topped off using the grease fittings provided. Check the input shaft end plate screws and the housing cap set screws and mounting bolts. Retighten if required.

2. **Periodic Inspection:** Every 6 months a measurement of linear backlash should be made. **WARNING: Backlash in excess of 50% of the acme thread thickness may result in thread shear failure, causing the load to drop suddenly.**

3. **Alignment:** Along with periodic inspection, check the alignment of the Uni-Lift load screw to the load. Misalignment will cause premature wear and possible failure. The load should be centered on the axis of the load screw and motion should be parallel to the axis of the load screw. The power output shafting must be aligned with respect to the jack input shaft. Binding during rotation will cause premature wear. After the Uni-Lifts, shafting, mitre boxes, and gear reducers are coupled together in a system, it should be possible to rotate the shafts to fully extend the unloaded jacks by hand.

LUBRICATION

1. **Up to 180° F Operation:** Uni-Lifts are lubricated by a grease gun through the fitting or fittings outside the side of the worm gear housing. Use Texaco "Multifak EP2" industrial grease. If another brand "EP2" is used, it should have oil viscosity of 840 to 890 SUS at 100° F, and 76 to 84 at 210° F.

2. **Up to 400° F Operation:** Use a "Lubripalte 630-AA" grease for elevated temperatures. Please be aware of reduced seal life at elevated temperatures.

3. **Special Requirements:** USDA approved grease for food industry applications or grease for extremely low temperature (-100° F) applications, and other lubricants are available. Contact Uni-Lift Division of Templeton, Kenly & Co., Inc.

EMERGENCY STOP NUT

Although recommended as a safety precaution, emergency stop nuts are intended for use only as secondary stops in case of overtravel emergencies.

Gear damage may result when used as primary travel limit unless other means of overload protection are incorporated into the system.

It is important that positive stops or emergency stop nuts be positioned so that stop contact for all units will occur simultaneously to equally distribute the system stall load should overtravel occur.

APPLICATION INFORMATION AND ORDER DATA CHECKLIST

Complete the information from below to identify the application data required to perform jack sizing and system configuration.

No. of lifting jacks per system ..... Total system load ..... lbs.
Maximum load per jack ..... lbs. Travel speed desired ..... in/min.
If operating load is less than maximum load, state operating load: ..... lbs.
Travel required ..... inches. Side thrust force on load screw* ..... lbs.

***Applications with side thrust loads may require external guiding of load.**

Load condition: Compression ❑ Tension ❑ Compression & Tension ❑ Guided: Yes ❑ No ❑
Type of Drive: Electric ❑ Air ❑ Hydraulic ❑ Manual ❑
Electrical power available: Voltage ..... Phase ..... Cycle ..... Hz. .....
Operating conditions: Shock or impact loads ❑ Vibration ❑
Ambient Temp. (specify range) ..... °F/C Corrosive Atmosphere ❑ .....
Other unusual conditions (describe) .....
Number of operating cycles: Per hour ..... Per day ..... Per week .....
Braking distance desired for Ball Screw applications: ..... inches.
Life expectancy: ..... years Personnel support: Yes ❑ No ❑

Make a preliminary jack selection based on the application data. Then complete the order information form below. Refer to the actuator part number matrix on fold out of the catalog.

Jack model: ..... Jack size ..... ton, Mounting style: U, I, D, ...
Screw configuration: K, R, T, ..., Gear ratio: L, M, H, ...
End configuration: TE, C, P, TP ....., Number of boots required for rotating jacks ..... .
Mounting position: Vertical ❑ Horizontal ❑ Diagonal ❑ ..... Degrees.
Emergency Stop Nut: Yes ❑ No ❑, Motor adaptor number .....

System Components Required (Refer to System Arrangements on Page 77):

Right angle gear box model number: ..... Qty. required: .....
Optional Pillow Blocks - model number: ..... Qty. required: .....
Flexible jaw coupling model number: ..... Qty. required: .....
Floating shaft coupling (qty. required, size and length): .....
Limit Switches - series number: ..... Position: .....
Motor part number: ..... Position: .....

Include Your System Arrangement Drawing and Describe Your Application.

Name ..... Date .....
Company Name .....
Phone No. ..... Fax No. ..... E-Mail Address .....
Address .....
City ..... State ..... Zip .....

UNI-LIFT®

Division of Templeton, Kenly & Co., Inc.
2525 Gardner Road • Broadview, IL 60155
Telephone: (800) 323-9114 or Fax: (708) 865-0894
or www.tkunilift.com

ACTUATOR PART NUMBER MATRIX

ACTUATOR BUILD CHART

Model Type					Size
			H		*1/4 Ton
			H		*1/2 Ton
		J			3/4 Ton
M	B	J			1 Ton
		J			2 Ton
M	B			A	2.5 Ton
M	B	J		A	5 Ton
M	B	J		A	10 Ton
M	B			A	15 Ton
M	B	J		A	20 Ton
		J			25 Ton
M	B			A	30 Ton
		J			40 Ton
M	B			A	50 Ton
M	B			A	75 Ton
M	B			A	100 Ton

M = Machine Screw
B = Ball Screw
J = High Cycle Machine Screw
H = High Cycle Aluminum Machine Screw
A = Anti-Backlash

Mounting Style
U = Upright
I = Inverted
D = Double Clevis

Screw Configuration
K = Keyed
R = Rotating
T = Translating
KH = Keyed High Lead
RH = Rotating High Lead
TH = Tranlating High Lead

Extended Screw Length (ESL) xxx.x
Input Value

Gear Ratio
L = Low
M = Medium
H = High

End Configuration
TE = Threaded End
C = Clevis End
P = Plain End
TP = Top Plate

CUSTOM ACCESSORIES

Boot
Blank = No Boot
B = Boot
BX = Special Boot Config.

Stop Nut
Blank = No Nut
SN = Stop Nut
SX = Special Configuration

Motor Adaptor
Blank = No Motor Adaptor
L56C
R56C
L182C
R182C
L182TC
R182TC
L184C
R184C
L184TC
R184TC
L213C
R213C
L213TC
R213TC
L215C
R215C
L215TC
R215TC

Motor
Blank = No Motor
M### = Motor
MX = Special

Limit Switch
Blank = No Limit Switch
R140
R240
R340
R440
L140
L240
L340
L440
R120
R220
R320
R420
L120
L220
L320
L420
R110
R210
R310
R410
L110
L210
L310
L410

EXAMPLE: J-2-U-T-012.0-L-TP

DESCRIPTION:
High Cycle - 2 Ton - Upright - Translating - 12” - Low Ratio - Top Plate

KEY: MOTOR
M = Motor
Next three digits - The last three digits of motor part #.

MOTOR ADAPTORS
First Character - L = Left Hand Mount
R = Right Hand Mount
Remaining Characters - Motor Frame Sizes

LIMIT SWITCHES
First Character - L = Left Hand Mount
R = Right Hand Mount
Second Character - Position Indicator (1, 2, 3, 4)
Last Two Characters - Limit Switch Ratio (10, 20 & 40)

SIMPLEX HYDRAULIC & MECHANICAL PRODUCTS

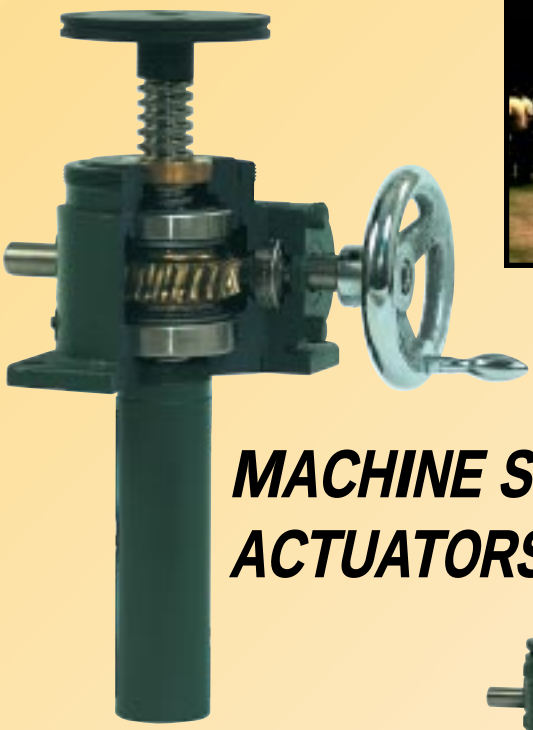
- Rams with capacities from 5 to 1,000 tons.
- Low Profile Cylinders and Flat Jacks with closed heights as little as 1 11/16".
- The world's best Lock Nut Cylinders.
- Hydraulic & Mechanical Spreaders with up to 10 ton capacities.
- For industrial & maintenance applications such as bending, holding, spreading and hundreds more.

- High performance **Suc-O-Matic Pumps** that suck down load return cylinders.
- Permanent Magnet Motor Pumps that run on as little as 60 VAC.
- High tech valving for smooth and safe lifting and lowering.
- High flow Hand Pumps, with low **back saving** handle efforts.

- H-Frame Presses from 10 through 200 tons.
- Double pinned & heavy duty welded construction for operator safety.
- Wide variety of electric, air or manual power sources.

CALL FOR A FREE SIMPLEX GENERAL LINE CATALOG SC103A

(800) 323-9114



MACHINE SCREW ACTUATORS

BALL SCREW ACTUATORS

UNITED STATES HOME OFFICE
2525 Gardner Road
Broadview, IL 60153
Phone: (708) 865-1500
Fax: (708) 865-0894
Toll Free: (800) 323-9114
Email: sales@tksimplex.net
www.tkunilift.com

CANADAIAN WAREHOUSE
637 McCaffrey
St. Laurent, PQ H4T1N3
Phone: (514)731-4893
Fax: (514) 731-7457
Toll Free: (800) 840-1196
Email: info@ips-serv.com

EUROPEAN WAREHOUSE
Economiestraat 39, Unit 8
Hoensbroek 6433 • Netherlands
Phone: +31-45-5234545
Fax: +31-45-5234556
Email: info@tksimplex.nl
www.tksimplex.nl

ASIA & PACIFIC RIM
Phone: +612-9736-1619
Fax: +612-9736-2170
Email: fcimenti@tksimplex.net

MEXICO
Mexico City
Phone: +52-55-2163 0630
Fax: +52-55-2163 0636
Monterey
Phone/Fax: +52-81-8135 8207

MIDDLE EAST
Phone: +32-10-223322
Fax: +32-10-229444
omourrah@tksimplex.net

SOUTH AFRICA
Phone: +27-11-908-1721
Fax: +27-11-908-5806

Distributed By:

SERVING INDUSTRY WITH PRIDE
SIMPLEX
SINCE - 1899
Templeton Kenly & Co., Inc.
QUALITY

Printed in USA

UC205