Fenner Drives®

T-Max™

BELT & CHAIN TENSIONERS

T-Max™
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Why Should I Use a T-Max™ Tensioner?

To achieve optimum drive performance, correct drive belt or chain tension must be maintained. A self-adjusting T-Max tensioner from Fenner Drives is the solution. Available in both rotary and linear designs, T-Max automatic tensioners eliminate the need for regular manual retensioning of drives. The risk of inadvertently over-tensioning drive components is avoided and overall drive operating efficiency is enhanced.

All frictional V- and flat belt and roller chain drives elongate over time through use and wear. A properly designed and installed V-belt drive typically will offer an efficiency rating of 96%. Left unattended, the V-belt will elongate, allowing slippage to occur. This generates heat which adversely affects belt life, accelerates pulley groove wear and can reduce drive efficiency by as much as 10%. In addition to energy waste, incorrect belt tension leads to increased drive downtime and higher operating costs, as well as inflated replacement costs due to premature belt failure.

Most of the above information also applies to roller chain drives, except that due to the more positive drive characteristics of chain, efficiency losses are approximately 3%.

Combined with an idler pulley or chain sprocket from Fenner Drives, an automatic T-Max tensioner can be used to:

- Maintain correct belt and chain drive tension
- Extend the life of critical drive components
- Reduce system downtime
- Increase drive efficiency
- Reduce belt and chain whip on long center drives
- Ensure drive components do not snag obstructions
- Reduce resonant frequency of chain drives

How to Select a T-Max™ Tensioner

Selecting a tensioner can be difficult because there is no cut-and-dried method for determining the amount of force a tensioner should develop. The size and type of tensioner (belt or chain) are determined based on knowing the drive parameters and power requirements, speed, torque, cycles, etc. These guidelines are suggestions to assist the designer. If there is any doubt, spring force determination should be made in consultation with the belt or chain manufacturer.

V-belt Drives — Light Duty

The RT0500, RT1000, RT1600-L and RT1600 series are best suited for single groove V-belt drives using 3L, 4L or 5L belts or the industrial A cross section belt. They also can be used with the J and K section Micro-V belts.

V-belt Drives — Medium Duty

The RT3000 series is best suited for A and B section classical and 3V and 5V narrow wedge belts. It can also be used with the J, K and M section Micro-V belts.

V-belt Drives — Heavy Duty

RT4000 series tensioners are designed for use on drives with two to four B/5V belts, one to two C cross section belts or multiple groove K and M Micro-V belts.

Chain Drives

Refer to the selection chart on page 19.

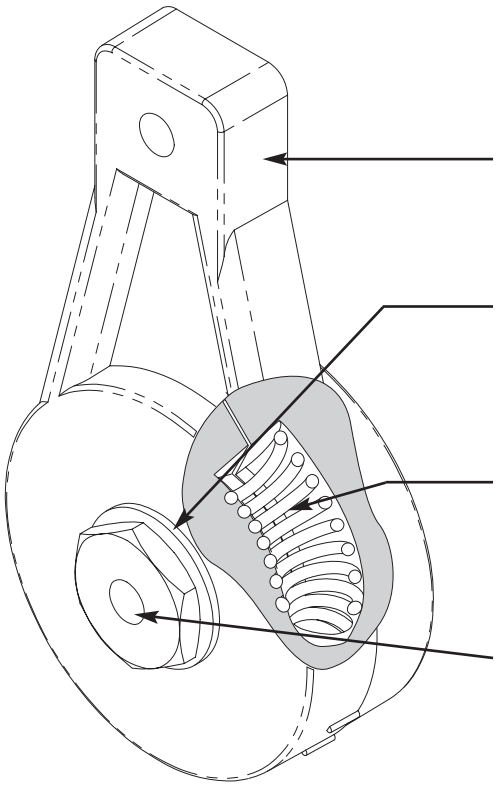
Synchronous Belt Drives

Automatic tensioners are not usually used on power transmitting synchronous belt drives, but are acceptable for use on drives strictly for motion transfer. If an automatic tensioner is desired for a power transmitting drive, consult the belt manufacturer for recommendations.

Idler Guidelines

- Always mount idler on the slack side of the drive, with preferred mounting on the inside of the slack side.
- Follow the belt manufacturer's recommended minimum idler diameter.
- Optimum location for the tensioner is where the idler provides nearly equal arcs of contact on both the driveR and driveN sheaves or sprockets.
- Keep overhung load to a minimum.
- For assistance, contact Fenner Drives' applications engineering group.

T-MAX BELT & CHAIN TENSIONERS Light-Duty Rotary Tensioners



BODY
Rugged, die-cast aluminum or high-strength, lightweight glass-reinforced nylon.

BEARINGS
Oil-impregnated, sintered bronze bearings are used to provide smooth, reliable movement at all wear points. Bearings are positioned by a press-fit and never need lubrication.

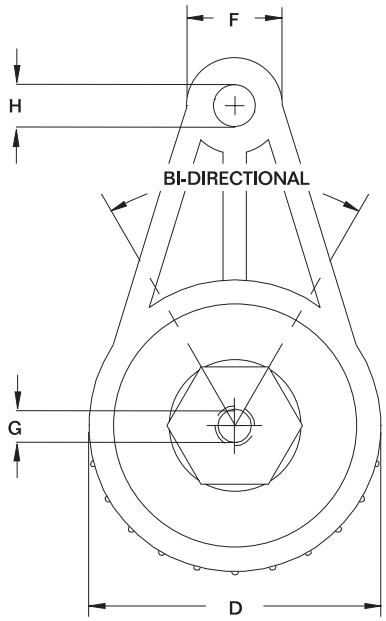
SPRINGS
Alloy steel, accurately wound compression springs are used to provide consistent tensioning force. Grease-lubricated to ensure not only quiet operation, but also long life.

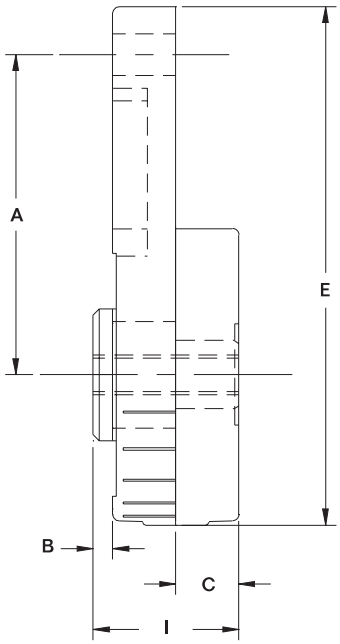
MOUNTING HOLE
Single bolt design for both mounting and tension adjustment.

- Rugged, heavy-duty construction
- Easy installation and adjustment with single bolt feature
- Wide variety of sizes and mounting styles
- Improved performance and extended life for most fixed-center drives
- Built-in spring mechanism absorbs momentary overloads and reduces vibration
- Constructed from high-quality materials for proven durability
- Graduated scale tension adjustment
- Not to be used on reciprocating drives
- For harsh environments, contact Applications Engineering
- Ideal for use with PowerMax™ Idler Pulleys and Sprockets

RT0500

- Molded of premium quality, high-strength glass-reinforced nylon
- Composite material means lighter weight
- Spring forces up to 25 lbs.
- Ideally suited for light-duty 3L, 4L, 5L and single A V-belt drives
- Maximum constant operating temperature is 125°F
- Do not use on reciprocating applications such as IC engines and piston devices



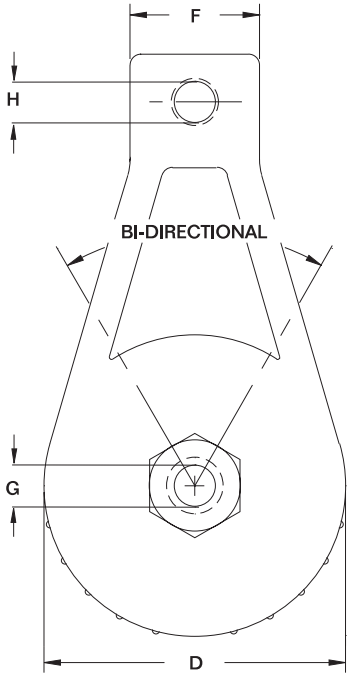


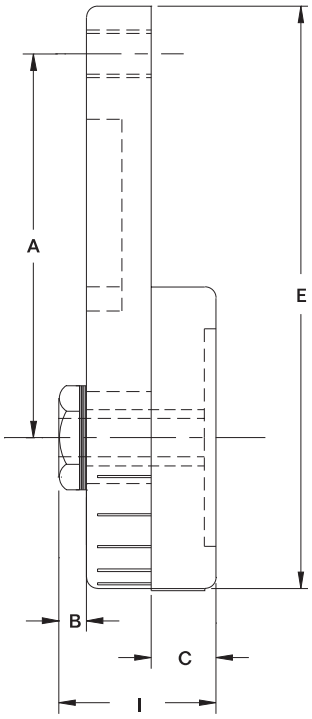
Part No.	A	B	C	D	E	F	G	H	I	Rotation (degrees)	Force[2] (lbs.)
RT0500	3.00	0.19	0.57	2.75	4.86	0.90	3/8-16	0.40	1.36	15 30 45 60	10 15 20 25
RT0501	3.00	0.19	0.57	2.75	4.86	0.90	0.40	0.40	1.36	15 30 45 60	10 15 20 25

Notes 1) All dimensions are in inches.
2) All forces (lbs.) are nominal.
3) Maximum load no more than 1" distance from front face of tensioner to centerline of idler — see page 21.

RT1000

- Die-cast aluminum construction
- Spring forces up to 30 lbs.
- Do not use on reciprocating applications such as IC engines and piston devices



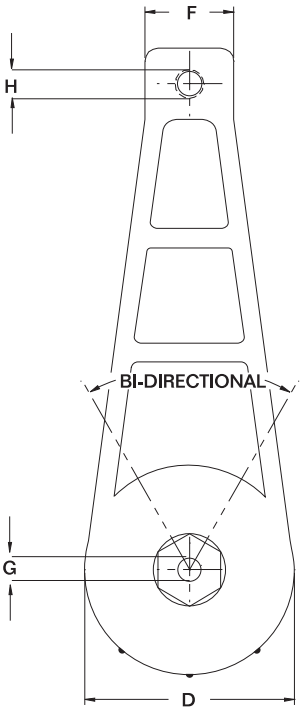


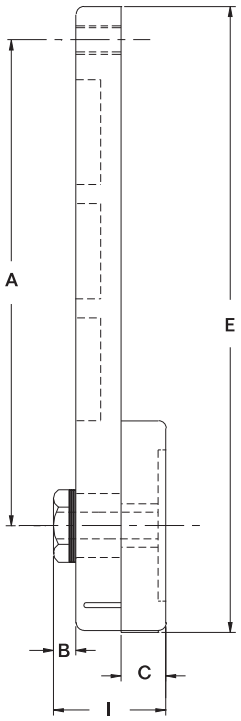
Part No.	A	B	C	D	E	F	G	H	I	Rotation (degrees)	Force[2] (lbs.)
RT1001	3.50	0.25	0.59	2.75	5.31	1.15	3/8-16	3/8-16	1.42	15 30 45	16 23 30
RT1003	3.50	0.25	0.59	2.75	5.31	1.15	0.40	3/8-16	1.42	15 30 45	16 23 30

Notes 1) All dimensions are in inches.
2) All forces (lbs.) are nominal.
3) Maximum load no more than 1" distance from front face of tensioner to centerline of idler — see page 21.

RT1600

- Die-cast aluminum construction
- Extended arm length
- Spring forces up to 26 lbs.
- Do not use on reciprocating applications such as IC engines and piston devices

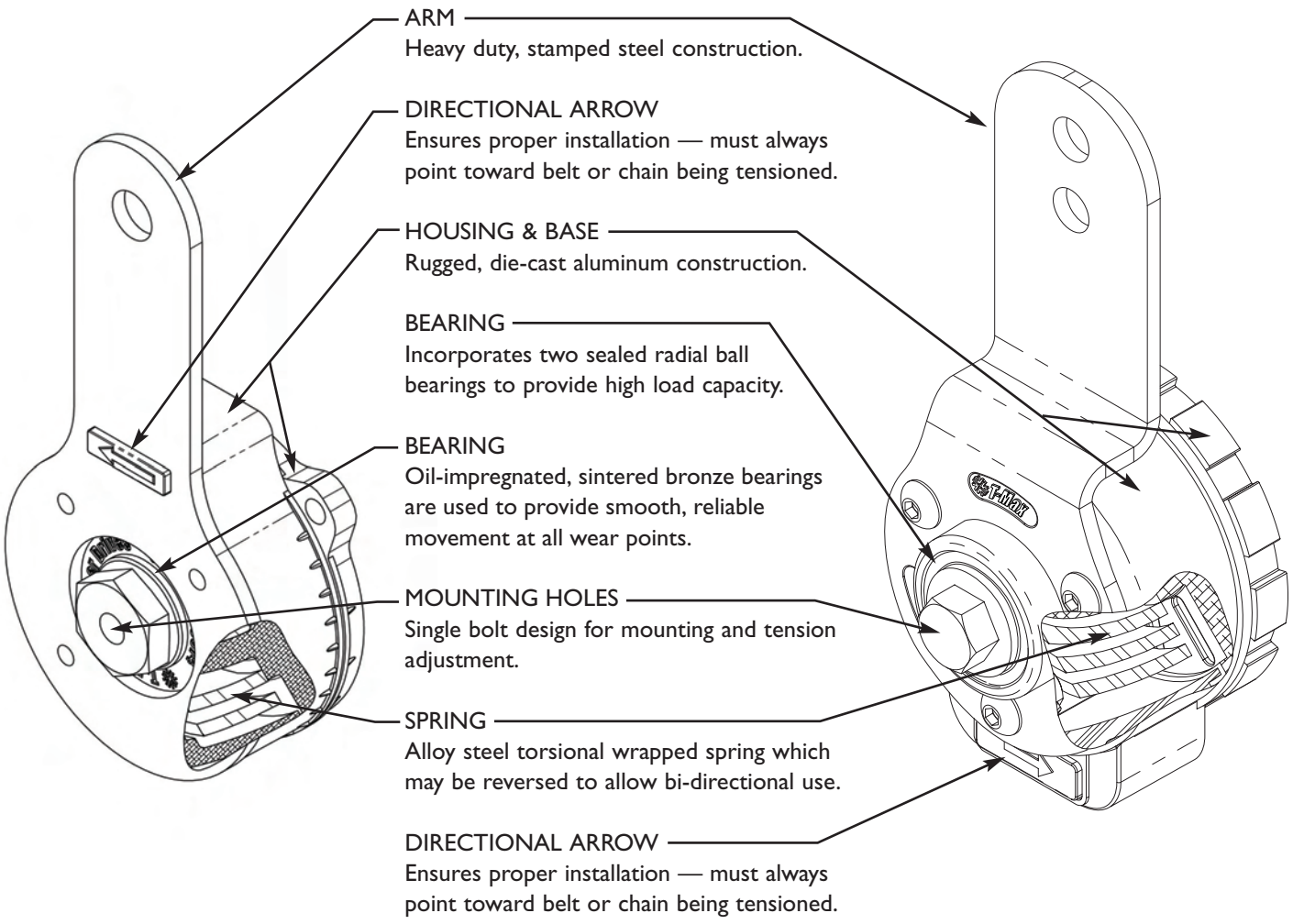




Part No.	A	B	C	D	E	F	G	H	I	Rotation (degrees)	Force[2] (lbs.)
RT1601-L	6.37	0.25	0.59	2.75	8.24	1.12	3/8-16	3/8-16	1.42	15 30 45	10 13 16
RT1603-L	6.37	0.25	0.59	2.75	8.24	1.12	0.40	3/8-16	1.42	15 30 45	10 13 16
RT1601	6.37	0.25	0.59	2.75	8.24	1.12	3/8-16	3/8-16	1.42	15 25 35	20 23 26
RT1603	6.37	0.25	0.59	2.75	8.24	1.12	0.40	3/8-16	1.42	15 25 35	20 23 26

Notes
1) All dimensions are in inches.
2) All forces (lbs.) are nominal.
3) Maximum load no more than 1" distance from front face of tensioner to centerline of idler — see page 21.

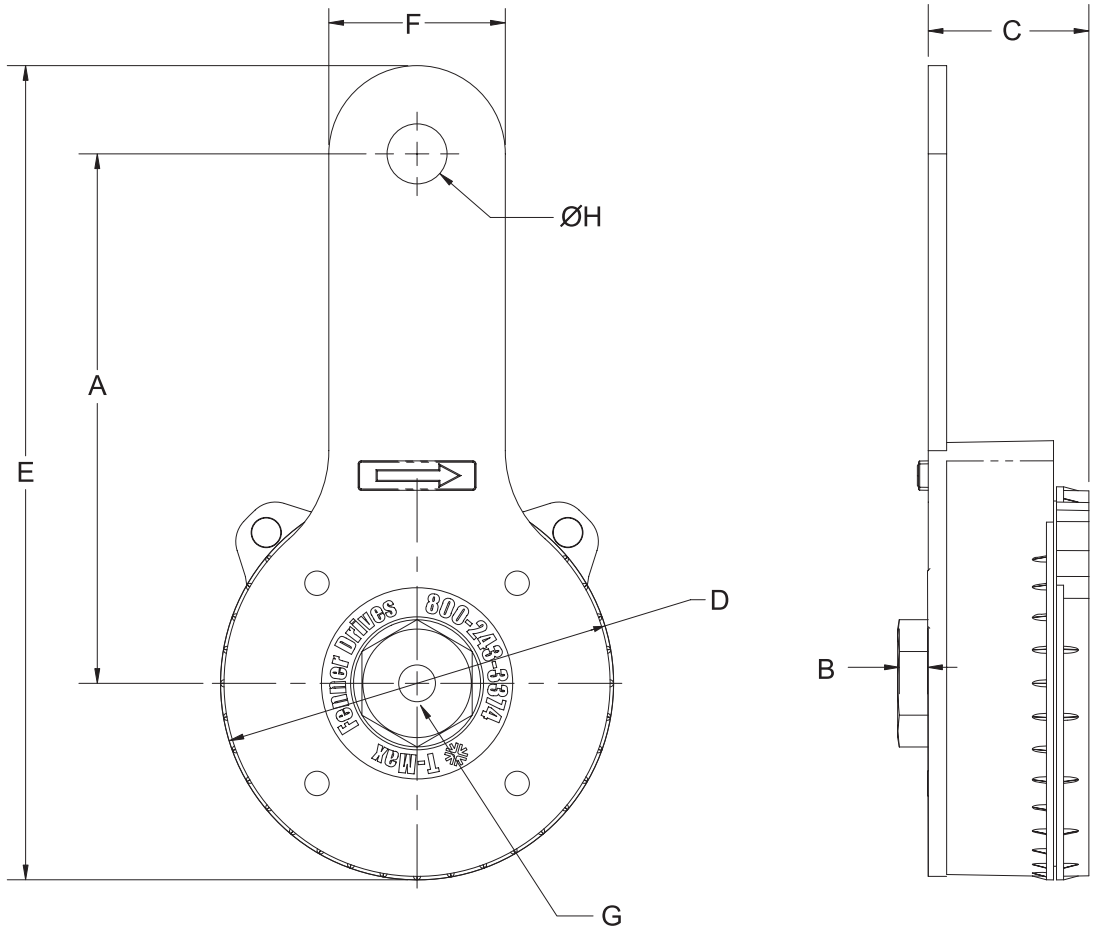
T-MAX™ BELT & CHAIN TENSIONERS Medium- and Heavy-Duty Rotary Tensioners



- The industry's first medium- and heavy-duty tensioners for multiple belts
- Rugged, heavy-duty construction for heavy load applications
- Designed for use with single or multiple belts or strands of chain
- Arms available in custom lengths for optimum idler positioning
- No elastomeric tension members to cold-flow, fatigue or take a compression set
- Torsion spring absorbs momentary overloads and reduces vibration
- Ideal for use with single or multiple groove V- and flat belt idler pulleys, available from Fenner Drives
- For harsh environments, contact Applications Engineering

RT3000

- Heavy duty stamped steel arm
- Die-cast aluminum construction
- Spring forces up to 42 lbs.
- Suitable for use on reciprocating applications such as IC engines and piston devices

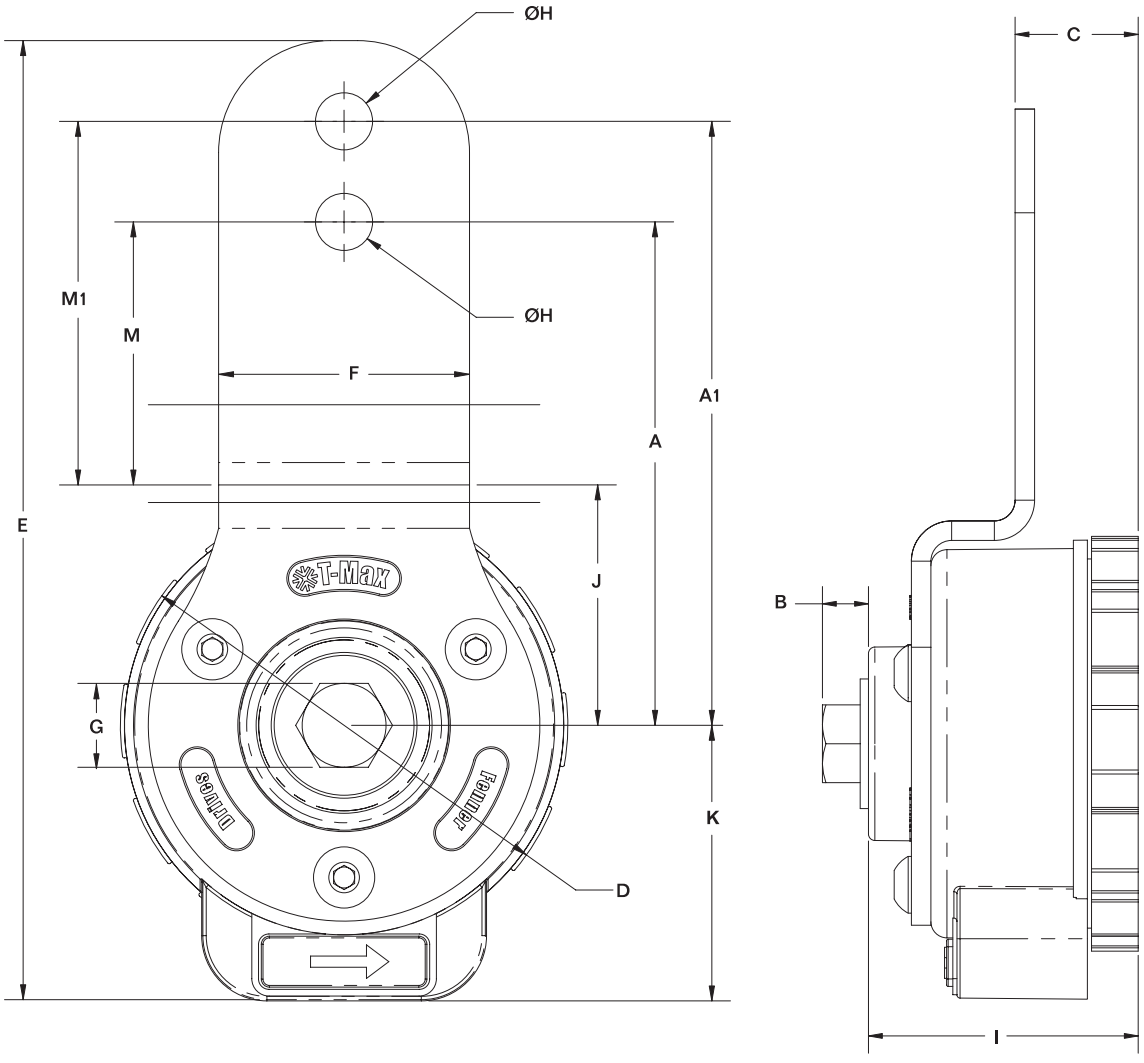


Part No.	A	B	C	D	E	F	G	H	Rotation[3] (degrees)	Force[3] (lbs.)
RT3000	4.50	0.26	1.37	3.34	6.92	1.50	3/8 - 16	0.51	0 - 70	0 - 42
RT3001	4.50	0.26	1.37	3.34	6.92	1.50	0.40	0.51	0 - 70	0 - 42

Notes
1) All dimensions are in inches.
2) Maximum load no more than 1½" distance from front face of tensioner arm to centerline of idler — see page 21.
3) Dimension A: 1° rotation = .6 lb. force. All forces (lbs.) are nominal.

RT4000

- Heavy duty stamped steel arm
- Die-cast aluminum construction
- Spring forces up to 85 lbs.
- Suitable for use on reciprocating applications such as IC engines and piston devices



Part No.	A	A1	B	C	D	E	F	G	H	I	J	K	M	M1	Rotation[3] (degrees)	Force[3] (lbs.)
RT4000	4.50	5.40	0.49	1.19	4.00	8.58	2.24	1/2 - 13	0.51	2.60	2.15	2.46	2.35	3.25	0 - 85	0 - 85
RT4001	4.50	5.40	na	1.19	4.00	8.58	2.24	0.51	0.51	2.60	2.15	2.46	2.35	3.25	0 - 85	0 - 85

Notes
1) All dimensions are in inches.
2) Maximum load no more than 1½" distance from front face of tensioner arm to centerline of idler — see page 21.
3) Dimension A: 1° rotation = 1 lb. force. Dimension A1: 1° rotation = .83 lb. force. All forces (lbs.) are nominal.
4) Requires a fixed head, hook style spanner wrench for tensioning (supplied with unit).

Rotary Tensioner Installation Instructions

RT0500, RT1000, RT1600

V-belt, V-ribbed, Synchronous Belt and Roller Chain Drives

Mounting Requirements
Before beginning the installation, review the following:

- Mounting bracket and supporting framework must be sturdy to prevent twisting under load.
- Mounting bracket and rotary tensioner must be located to allow for correct alignment of the idler with the driveR and driveN pulleys or sprockets.
- Rotary tensioner should always be mounted on the slack side of the belt or chain drive. See Fig. 1.
- The preferred location of a rotary tensioner/idler is on the inside of the belt drive. Optimum location would be where the idler provides nearly equal arcs of contact on both the driveR and driveN pulleys.
- As a rule of thumb, the inside idler pulley should be the same diameter as the driveR pulley.
- An outside spring-loaded rotary tensioner may be used, but it imposes a back bend on the belt. Follow the belt manufacturer's recommendations for diameter and location. Typically, this diameter should be 1/3 larger than the driveR pulley.
- Rotary tensioner and idler sprocket should always be positioned on the outside of the chain.
  Note: At least three idler sprocket teeth must engage the chain.
- If possible, position the rotary tensioner with idler approximately 1/2, but no less than 1/3, of the center distance from the driveR sprocket.
- **Never use a spring-loaded rotary tensioner/idler on a reversing drive.**

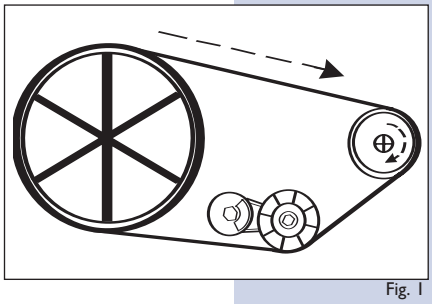


Fig. 1

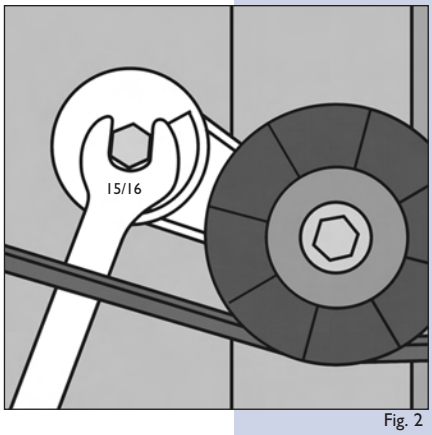


Fig. 2

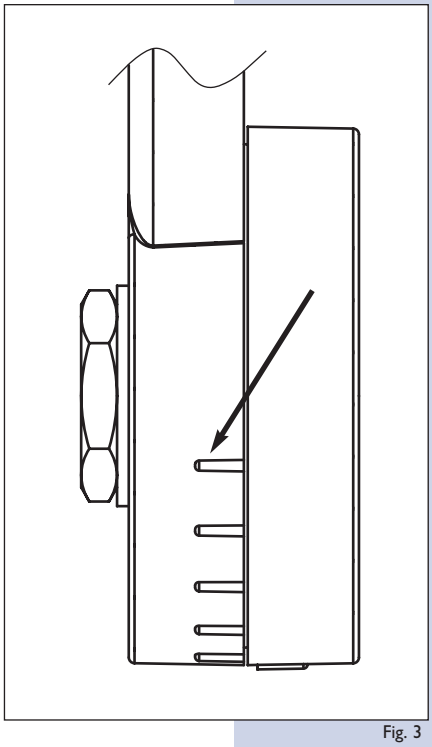


Fig. 3

Assembly Instructions

1. Mount idler pulley/sprocket to rotary tensioner arm.
2. Drill a hole in the mounting bracket, positioned to meet the above Mounting Requirements, corresponding to the mounting bolt size outlined in Table 1.
3. Insert mounting bolt in rotary tensioner body and into the mounting hole. Hand tighten only! Check the alignment with the driveR and driveN pulleys/sprockets. **Any misalignment must be corrected!**
4. Place belt/chain over all the pulleys/sprockets.
5. Place a 15/16" wrench on the hex nut in the tensioner body and a wrench on the mounting fastener. See Fig. 2.
6. Using the wrench on the tensioner body, apply pressure in the appropriate direction until the belt/chain is properly tensioned.
   Note: The tensioner body has marks on it, Fig.3, representing the force and degrees per Table 1.
7. With the tensioner securely held in position, tighten the mounting fastener.
8. Before starting the drive, recheck drive alignment and check all mounting fasteners for tightness.

Table 1. Mounting Bolt Selection

Model Series	Mounting Hole (thru)	Mounting Hole (tapped)	Arm Rotation Degrees	Force(1) (lbs.)
RT0500	0.40	3/8 - 16	15 30 45 60	10 15 20 25
RT1000	0.40	3/8 - 16	15 30 45	16 23 30
RT1600-L	0.40	3/8 - 16	15 30 45	10 13 16
RT1600	0.40	3/8 - 16	15 25 35	20 23 26

Notes 1) All forces (lbs.) are nominal.

Rotary Tensioner Installation Instructions

RT3000, RT3001

V-belt, V-ribbed, Synchronous Belt and Roller Chain Drives

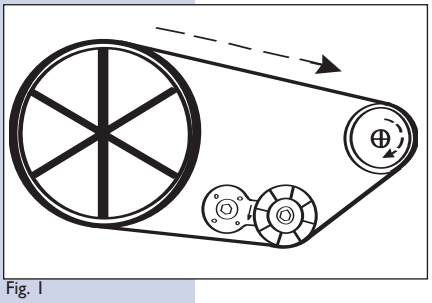


Fig. 1

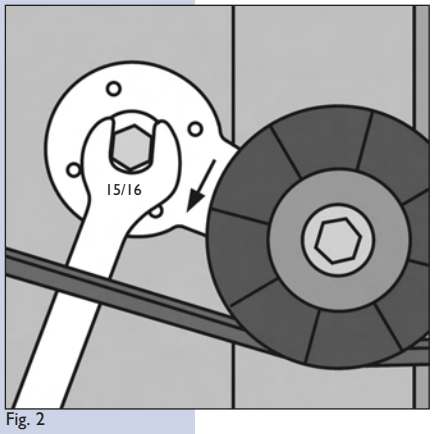


Fig. 2

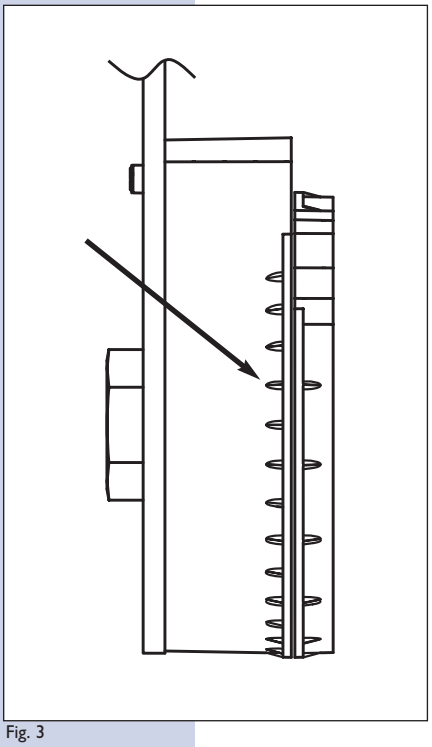


Fig. 3

Mounting Requirements
Before beginning the installation, review the following:

- Mounting bracket and supporting framework must be sturdy to prevent twisting under load.
- Mounting bracket and rotary tensioner must be located to allow for correct alignment of the idler with the driveR and driveN pulleys or sprockets.
- Rotary tensioner should always be mounted on the slack side of the belt or chain drive. See Fig. 1.
- The preferred location of a rotary tensioner/idler is on the inside of the belt drive. Optimum location would be where the idler provides nearly equal arcs of contact on both the driveR and driveN pulleys.
- As a rule of thumb, the inside idler pulley should be the same diameter as the driveR pulley.
- An outside spring-loaded rotary tensioner may be used, but it imposes a back bend on the belt. Follow the belt manufacturer's recommendations for diameter and location. Typically, this diameter should be 1/3 larger than the driveR pulley.
- Rotary tensioner and idler sprocket should always be positioned on the outside of the chain. **Note: At least three idler sprocket teeth must engage the chain.**
- If possible, position the rotary tensioner with idler approximately 1/2, but no less than 1/3, of the center distance from the driveR sprocket.
- **Never use a spring-loaded rotary tensioner/idler on a reversing drive.**

Assembly Instructions

1. Establish the location of the tensioner and check the directional arrow on the top of the arm. This arrow must point in the direction of the belt(s) with which the idler will be in contact. See Fig. 2. If not, it is necessary to disassemble the tensioner and reverse the spring. See step 2. Otherwise, proceed to step 3.
2. When handling, be certain to securely hold both the housing/arm and base to prevent the unit from coming apart. Remove the wire tie from the tensioner. Lift off the aluminum housing/arm assembly, exposing the spring. Remove the spring, flip it over, and replace it on the tensioner base. The spring's center "tail" must engage the slot in the center shaft. On the arm, remove the directional arrow piece. Reverse it so the arrow points the opposite way and push it back into place. **Note: If arrow is not pointing in the correct direction, the tensioner cannot be reassembled.** Replace the housing/arm assembly onto the tensioner base.
3. Drill a hole in the mounting bracket positioned to meet the above Mounting Requirements, corresponding to mounting bolt sizes 3/8"-16 for RT3000 and .410" for RT3001.
4. Mount the idler to the tensioner arm. The hole in the arm is designed to accept a 1/2" diameter bolt.
5. Bolt the tensioner/idler assembly onto the mounting bracket. **Note: When installing the RT3001 use a 3/8"-16 flat socket head capscrew.** Only snug the capscrew at this time — do not fully tighten! Check the alignment of the idler with the driveR and driveN pulleys. **Any misalignment must be corrected.**
6. Place belt(s) over all pulleys.
7. The tensioner spring is not yet under tension. Put the idler in light contact with the belt(s). Place a 15/16" open end wrench on the hex nut on the tensioner body and rotate it clockwise if the arrow points towards the "phone number" or counter-clockwise if the arrow points to "Fenner Drives" (when viewed from the front) until you feel light spring pressure. This will be the starting point for establishing tensioner force and degrees of rotation. See Fig. 2.
8. From the starting point, continue rotating the wrench to the desired degrees of rotation and resulting tensioner force. **Note: The tensioner is rated at .6 lbs. force per degree and has equally spaced graduation marks every 10° on the housing (20° on base) that can be used to establish rotational degrees.** See Fig. 3.
9. Securely holding the 15/16" wrench at the desired tensioner setting tighten the 3/8" mounting bolt holding the tensioner to the bracket. Remove the 15/16" wrench.
10. Before starting the drive, recheck drive alignment and check all mounting fasteners for tightness.

Rotary Tensioner Installation Instructions

RT4000, RT4001

V-belt, V-ribbed, Synchronous Belt and Roller Chain Drives

Mounting Requirements
Before beginning the installation, review the following:

- Mounting bracket and supporting framework must be sturdy to prevent twisting under load.
- Mounting bracket and rotary tensioner must be located to allow for correct alignment of the idler with the driveR and driveN pulleys.
- Rotary tensioner should always be mounted on the slack side of the belt drive. See Fig. 1.
- The preferred location of a rotary tensioner/idler is on the inside of the drive. Optimum location would be where the idler provides nearly equal arcs of contact on both the driveR and driveN pulleys.
- As a rule of thumb, the inside idler pulley should be the same diameter as the driveR pulley.
- An outside spring-loaded rotary tensioner may be used, but it imposes a back bend on the belt. Follow the belt manufacturer's recommendations for diameter and location. Typically, this diameter should be 1/3 larger than the driveR pulley.
- **Never use a spring-loaded rotary tensioner/idler on a reversing drive.**

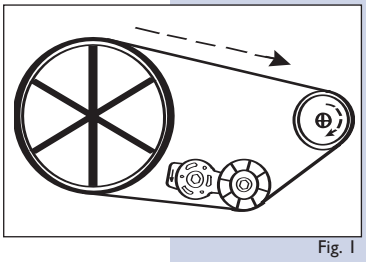


Fig. 1

Fig. 2

Assembly Instructions

1. Establish the location of the tensioner and check the directional arrow at the bottom of the housing. **This arrow must point in the direction of the belt(s) with which the idler will be in contact.** See Fig. 2. If not, it is necessary to disassemble the tensioner and reverse the spring. See steps 2 and 3 for instruction. Otherwise, proceed to step 4.
2. Determine whether the tensioner model is RT4000 or RT4001. RT4000 has a bolt/washer while RT4001 is a thru-hole design (for customer-supplied ½" bolt) and has a cable tie through the body to keep the assembly together.
   RT4000 — Remove the ½" bolt and washer from the body of the tensioner.
   RT4001 — Remove the wire tie from the tensioner. This model does not have a bolt to hold the assembly together; when handling, be certain to securely hold both the housing/arm and base to prevent the unit from coming apart.
3. Lift off the aluminum housing/arm assembly, exposing the spring. Remove the spring, flip it over, and replace it on the tensioner base. The spring's center "tail" must engage the slot in the center shaft. On the aluminum housing/arm assembly, push out the directional arrow piece (you may need to squeeze it to disengage the catch). Reverse it so the arrow points the opposite way and snap it back into place. **Note: If arrow is not pointing in the correct direction, the tensioner cannot be reassembled.** Replace the housing/arm assembly onto the tensioner base.
   RT4000 — Reinsert ½" bolt with washer and tighten.
   RT4001 — Hold tensioner together securely.
4. Drill a hole in the mounting bracket positioned to meet the above Mounting Requirements, corresponding to mounting bolt sizes ½"-13 for RT4000 and .510" for RT4001.
5. Mount the idler to the tensioner arm. The holes in the arm are designed to accept a ½" diameter bolt. The hole closest to the tensioner body yields the highest force but accommodates a smaller idler diameter. The hole farthest from the tensioner body has a lesser force but will accommodate a larger idler. See Table 2.
6. (If installing the RT4001, be certain to remove the wire tie before this step.) Bolt the tensioner/idler assembly onto the mounting bracket. Hand tighten only! Check the alignment of the idler with the driveR and driveN pulleys. **Any misalignment must be corrected.**
7. Place belt(s) over all pulleys.
8. The tensioner spring is not yet under tension. Put the idler in light contact with the belt(s) and rotate the tensioner base clockwise if the arrow points to "CW" or counterclockwise if the arrow points to "CCW" until you feel light spring pressure. Use a marking pencil to mark a line on both the housing and base of the tensioner. This will be the starting point for establishing tensioner force and degrees of rotation. See Fig. 2.
9. The housing of the tensioner has equally spaced graduation marks (every 10°) that can be used to establish rotational degrees and resulting tensioner force. See Fig. 3. For reference, you may want to place a mark on or near the desired graduation mark.
10. Using a $3^{15}/_{16}$" fixed head hook-style spanner wrench on the outside of the tensioner base, rotate the wrench (use the same direction as step 8) until the 0° marks are aligned. From the 0° mark, continue to rotate the base to the desired degrees of rotation (graduation mark). Holding the spanner wrench securely at the desired degree of rotation, tighten the ½" mounting bolt holding the tensioner to the bracket. Remove the spanner wrench.
11. Before starting drive, recheck drive alignment and check all mounting fasteners for tightness.

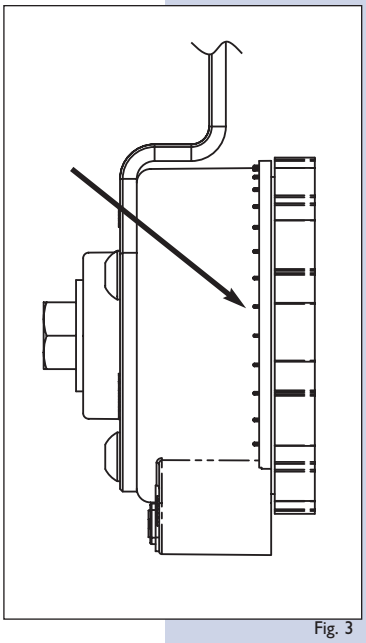


Fig. 3

Table 2

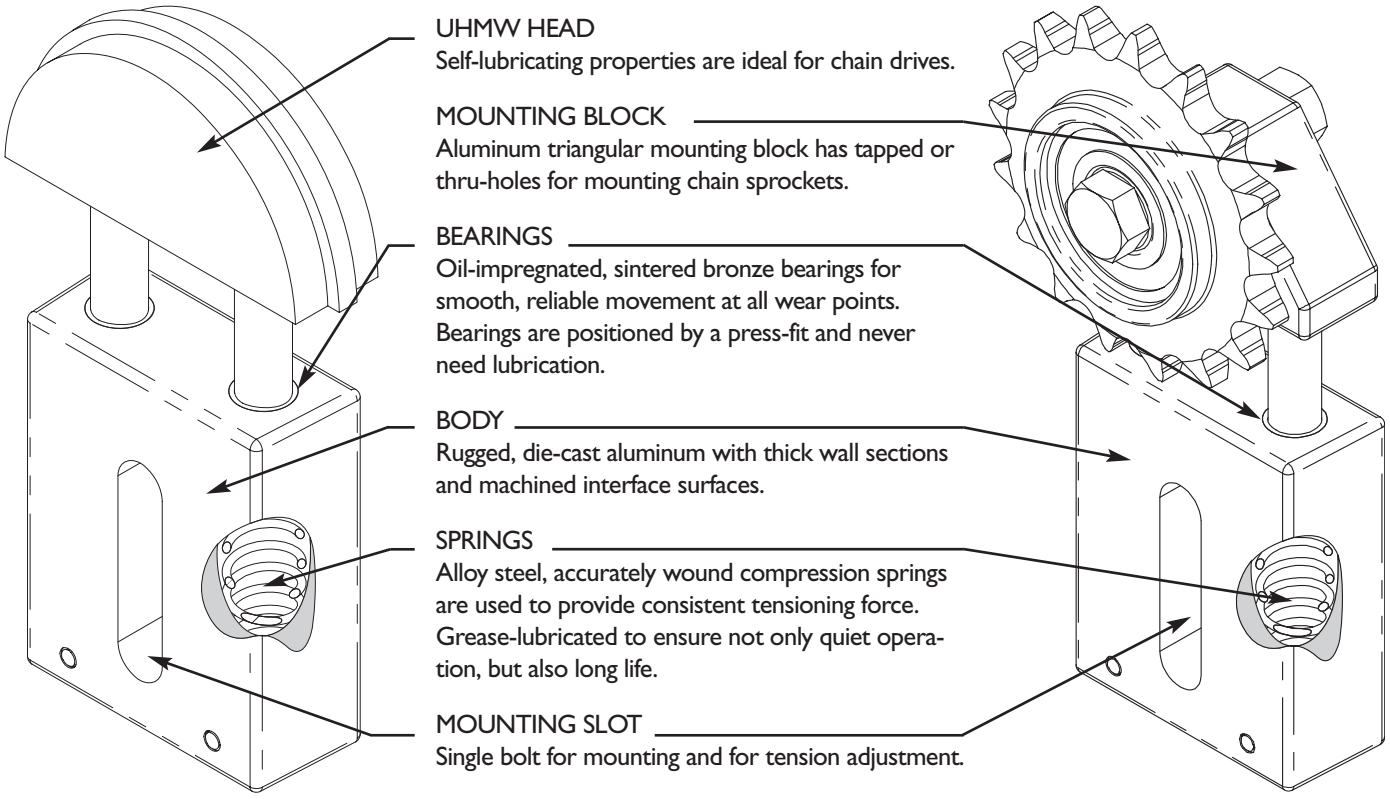
Tensioner Model	Maximum Idler Diameter		Maximum Rotation & Force(2)	
	Closest Hole	Farthest Hole	Closest Hole	Farthest Hole
RT4000, RT4001	4.50"	6.25"	85° @ 85 lbs	85° @ 70 lbs

Notes 1) At closest hole, 1 rotation = 1 lb. force. At farthest hole, 1 rotation = .83 lb. force.
2) All forces (lbs.) are nominal.

Once installed, the tensioner has considerable force. A spanner wrench must be used to hold the tensioner base when loosening the mounting bolt.

Tensioner comes with a limited-use spanner wrench. To assemble, align arrows and push together.

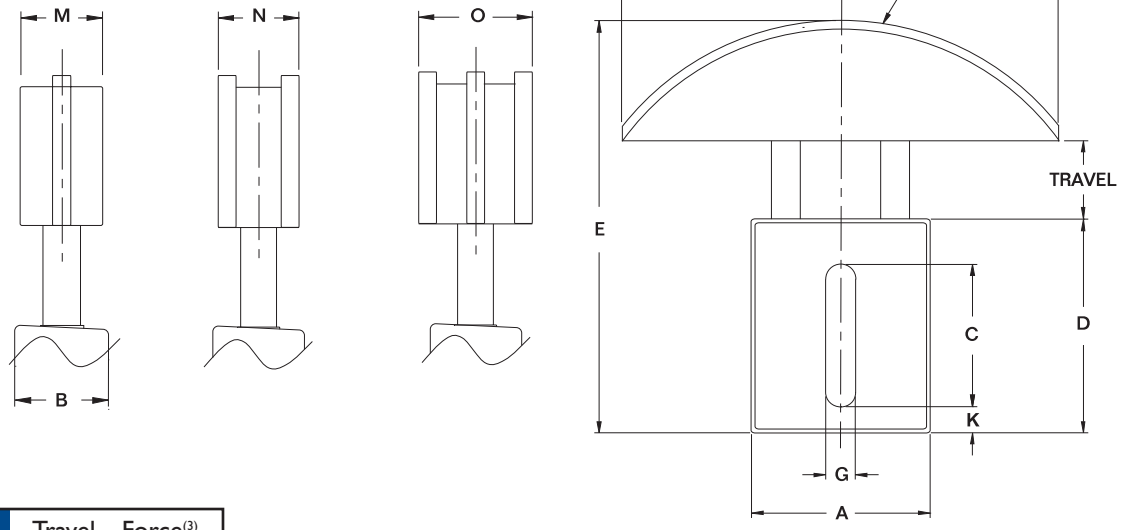
Linear Tensioners



- Die-cast aluminum construction
- Easy installation and adjustment with single bolt feature
- Wide variety of sizes and mounting styles
- Improved performance and extended life for most fixed-center drives
- Built-in spring mechanism absorbs momentary overloads and reduces vibration
- Constructed from high-quality materials for proven durability
- Can be used in a host of industrial applications
- Fully automatic straight-line take up
- For harsh environments, contact Applications Engineering
- LT Series is ideal for use with PowerMax™ Idler Sprockets

CT1100, CT2100 and CT3100

- Large arc-shaped head guides the roller chain
- Head made from UHMW — its self-lubricating properties are ideal for chain drives
- Spring forces up to 200 lbs.



CT Series	Travel (inches)	Force[3] (lbs.)
1100-L	1.10	5 - 30
1100	0.85	15 - 40
2100	1.25	20 - 60
3100	1.65	45 - 100
3100-H	1.00	30 - 200
3196	1.00	45 - 100

Common Dimensions

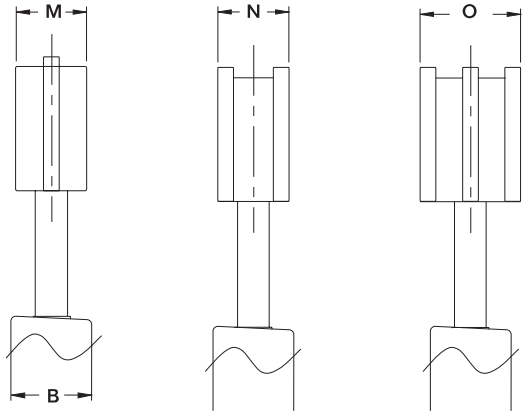
Series	A	C	D	E	G	H	K
CT1100	2.31	1.80	2.91	5.52	0.42	5.50	.42
CT2100	2.95	2.36	3.52	6.51	0.49	5.50	.43
CT3100	3.54	2.95	4.25	7.60	0.57	5.50	.43

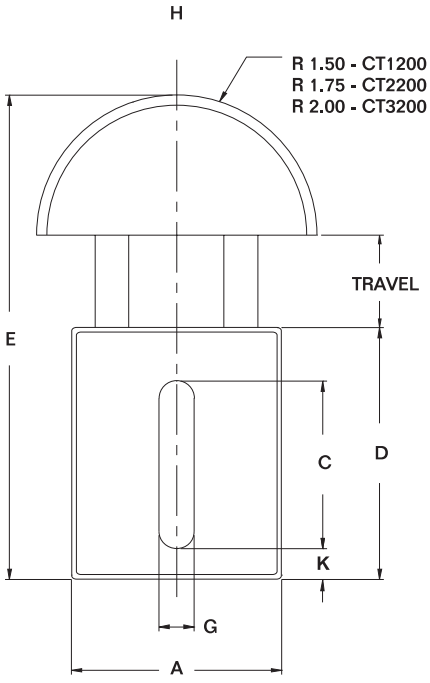
Single Chain				Double Chain				Triple Chain			
Part No.	Chain	B	M	Part No.	Chain	B	N	Part No.	Chain	B	O
CT1101-L	#35	0.98	0.79	CT1103-L	#35	0.98	0.63	CT1105-L	#35	0.98	1.02
CT1101	#35	0.98	0.79	CT1103	#35	0.98	0.63	CT1105	#35	0.98	1.02
CT1102	#40	0.98	0.79	CT1104	#40	0.98	0.81	CT1106	#40	0.98	1.36
CT2101	#50	1.18	0.87	CT2103	#50	1.18	0.98	CT2105	#50	1.18	1.63
CT2102	#60	1.18	0.87	CT2104	#60	1.18	1.37				
CT3101	#80	1.38	0.98	CT3103	#80	1.38	1.81				
CT3102	#100	1.38	0.98								
CT3102-H	#100	1.38	0.98								
CT3196	#81X	1.38	1.75								

Notes
1) All dimensions are in inches.
2) These tensioners can be used on chain sizes up to #160 (see tensioner selection chart on page 19). Contact Fenner Drives applications engineering group for head dimensions.
3) All forces (lbs.) are nominal.

CT1200, CT2200 and CT3200

- Small arc-shaped head for use when space is limited
- Head made from UHMW — its self-lubricating properties are ideal for chain drives
- Spring forces up to 200 lbs.





CT Series	Travel (inches)	Force[3] (lbs.)
1200-L	1.10	5 - 30
1200	0.85	15 - 40
2200	1.25	20 - 60
3200	1.65	45 - 100
3200-H	0.90	30 - 200

Common Dimensions

Series	A	C	D	E	G	H	K
CT1200	2.31	1.80	2.91	5.52	0.42	3.00	.42
CT2200	2.95	2.36	3.54	6.51	0.49	3.50	.43
CT3200	3.54	2.95	4.25	7.60	0.57	4.00	.43

Single Chain

Part No.	Chain	B	M
CT1201-L	#35	0.98	0.79
CT1201	#35	0.98	0.79
CT1202	#40	0.98	0.79
CT2201	#50	1.18	0.86
CT2202	#60	1.18	0.86
CT3201	#80	1.38	0.98
CT3202	#100	1.38	0.98
CT3202-H	#100	1.38	0.98

Double Chain

Part No.	Chain	B	N
CT1203-L	#35	0.98	0.63
CT1203	#35	0.98	0.63
CT1204	#40	0.98	0.81
CT2203	#50	1.18	0.98
CT2204	#60	1.18	1.37
CT3203	#80	1.38	1.81

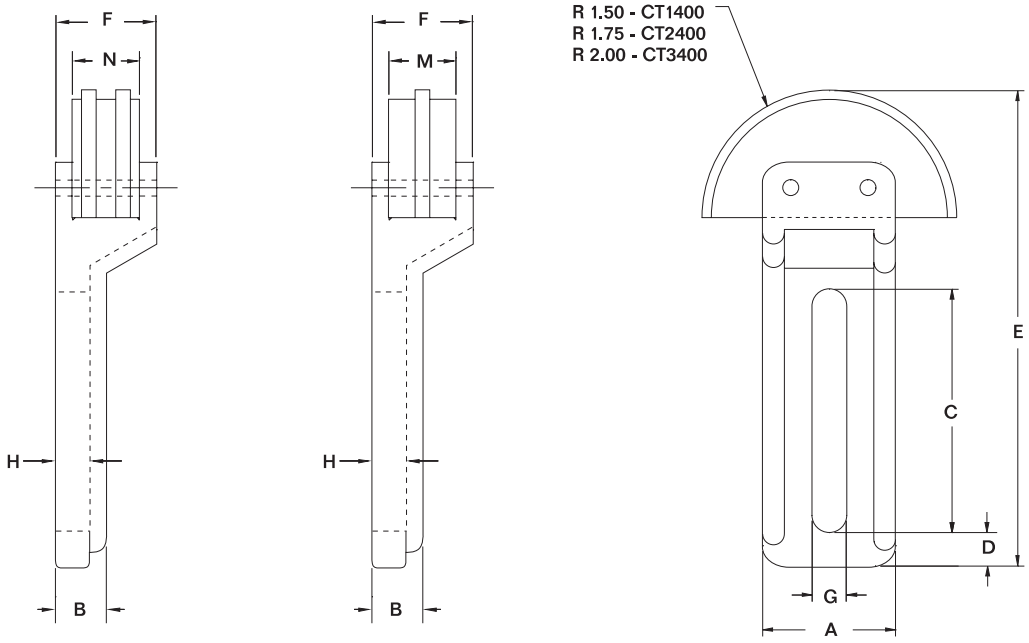
Triple Chain

Part No.	Chain	B	O
CT1205-L	#35	0.98	1.02
CT1205	#35	0.98	1.02
CT1206	#40	0.98	1.36
CT2205	#50	1.18	1.75

Notes
1) All dimensions are in inches.
2) These tensioners can be used on chain sizes up to #160 (see tensioner selection chart on page 19). Contact Fenner Drives applications engineering group for head dimensions.
3) All forces (lbs.) are nominal.

CT1400, CT2400, and CT3400 Fixed

- An economical tensioner for use when automatic tensioning is not required
- Slotted frame for quick and precise adjustment in any direction
- Head made from UHMW — its self-lubricating properties are ideal for chain drives
- For single and double chain applications

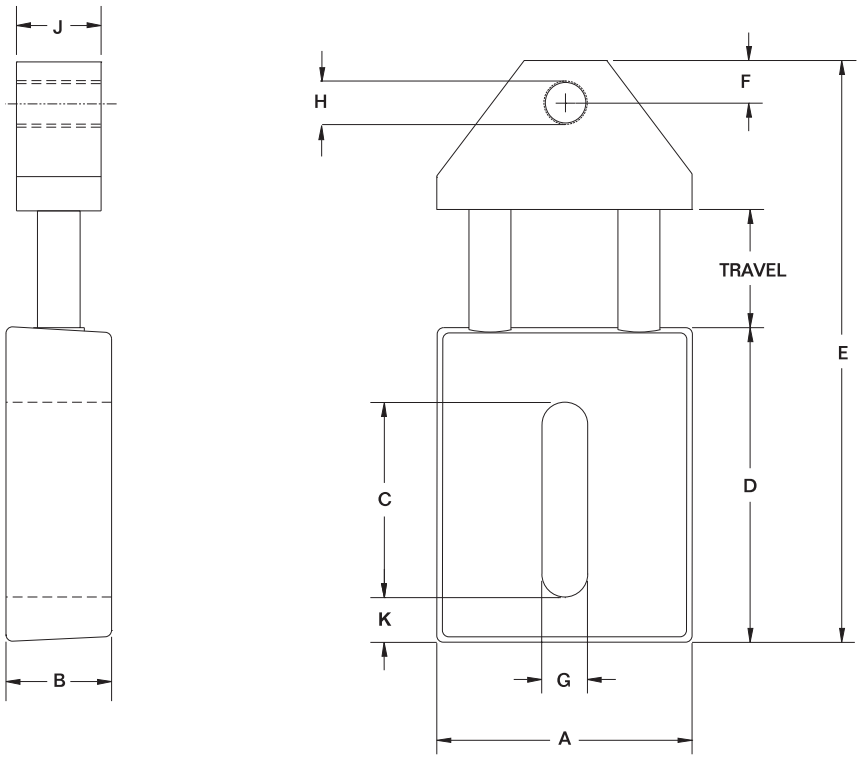


Part No.	A	B	C	D	E	F	G	H	M	N	Chain
CT1401	1.56	0.59	2.87	0.39	5.60	1.18	0.41	0.39	0.79	—	#35
CT1402	1.56	0.59	2.87	0.39	5.60	1.18	0.41	0.39	—	0.79	#35
CT1403	1.56	0.59	2.87	0.39	5.60	1.18	0.41	0.39	0.79	—	#40
CT1404	1.56	0.59	2.87	0.39	5.60	1.18	0.41	0.39	—	0.95	#40
CT2401	1.97	0.71	3.35	0.47	6.50	1.42	0.51	0.47	0.86	—	#50
CT2402	1.97	0.71	3.35	0.47	6.50	1.42	0.51	0.47	—	1.11	#50
CT2403	1.97	0.71	3.35	0.47	6.50	1.42	0.51	0.47	0.86	—	#60
CT2404	1.97	0.71	3.35	0.47	6.50	1.42	0.51	0.47	—	1.53	#60
CT3401	2.36	0.77	3.23	0.51	6.68	1.57	0.51	0.55	0.98	—	#80
CT3402	2.36	0.77	3.23	0.51	6.68	1.57	0.51	0.55	—	1.98	#80

Note All dimensions are in inches.

LT1000, LT2000, and LT3000

- Ideal for use with Fenner Drives Roller Chain Idler Sprockets
- Spring forces up to 200 lbs.



Part No.	A	B	C	D	E	F	G	H	J	K	Travel (inches)	Force[3] (lbs.)
LT1001-L	2.31	0.98	1.80	2.91	5.52	0.39	0.42	3/8 - 16	0.79	0.42	1.10	5 - 30
LT1001	2.31	0.98	1.80	2.91	5.52	0.39	0.42	3/8 - 16	0.79	0.42	0.85	15 - 40
LT1002	2.31	0.98	1.80	2.91	5.52	0.39	0.42	0.40	0.79	0.42	0.85	15 - 40
LT2001	2.95	1.18	2.36	3.54	6.81	0.47	0.49	1/2 - 13	0.98	0.43	1.25	20 - 60
LT2002	2.95	1.18	2.36	3.54	6.81	0.47	0.49	0.51	0.98	0.43	1.25	20 - 60
LT3001	3.54	1.38	2.95	4.25	8.27	0.55	0.57	1/2 - 13	1.18	0.43	1.65	45 - 100
LT3002	3.54	1.38	2.95	4.25	8.27	0.55	0.57	0.51	1.18	0.43	1.65	45 - 100
LT3002-H	3.54	1.38	2.95	4.25	8.27	0.55	0.57	0.51	1.18	0.43	0.90	30 - 200

Notes
1) All dimensions are in inches.
2) Maximum load no more than 1" distance from front face of tensioner to centerline of idler — see page 21.
3) All forces (lbs.) are nominal.

Linear Tensioner Installation Instructions
Roller Chain Drives

Mounting Requirements
Before beginning the installation, review the following:

- Mounting bracket and supporting framework must be sturdy to prevent twisting under load.
- Mounting bracket and linear tensioner must be located to allow for correct alignment with the driveR and driveN sprockets.
- The linear tensioner should always be mounted on the slack side of the drive. See Fig. 1.
- A linear tensioner used on a chain drive should always be positioned on the outside of the chain. See Fig. 2. **Note: If using the LT series and idler sprocket, at least three teeth must engage the chain.**
- If possible, position the linear tensioner approximately 1/2, but no less than 1/3, of the center distance from the driveR sprocket.
- **Never use a spring-loaded linear tensioner on a reversing drive.**

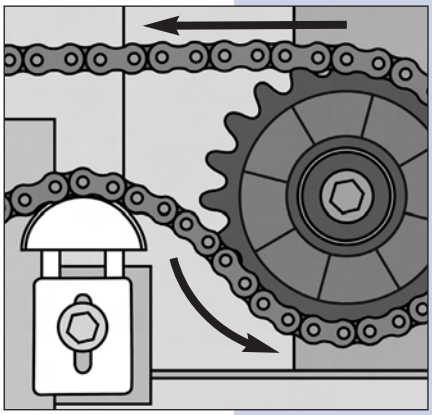


Fig. 1

Assembly Instructions

1. If you are using a CT series tensioner, continue to step 2; otherwise, mount the idler sprocket to the LT linear tensioner head.
2. Drill a hole in the mounting bracket, positioned to meet the above Mounting Requirements, corresponding to mounting bolt size outlined in Table 1.
3. Insert mounting bolt in linear tensioner body and into the mounting hole. See Fig. 1 and Fig. 2. Hand tighten only! Check the alignment with the driveR and driveN sprockets. **Any misalignment must be corrected!**
4. Determine the final mounting location, amount of travel, and necessary tightening force on the chain. See Table 1.
5. With the tensioner securely held into position, tighten the mounting fastener.
6. Compress the tensioner head to the desired amount of travel.
7. Place the chain over all of the sprockets.
8. Slowly release the force of the linear tensioner head until it contacts the chain.
9. Before starting the drive, recheck drive alignment and check all mounting fasteners for tightness.

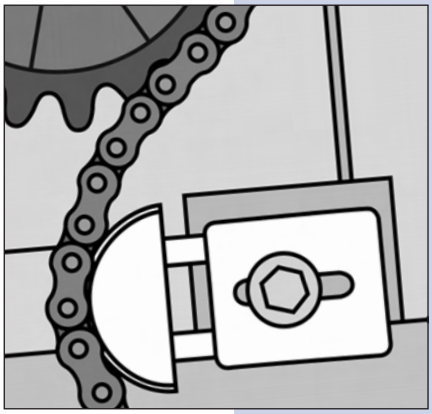


Fig. 2

Table 1. Tensioner Data

Model Series	Force Range (lbs.)	Total Travel (in.)	Appx. Force (lbs.)(1) per 1/8" Travel	Mounting Slot	Mounting Hole (thru)	Mounting Hole (tapped)
CT1000-L	5 - 30	1.10	2.8	0.42	—	—
LT1000-L	5 - 30	1.10	2.8	0.42	0.40	3/8 - 16
CT1000	15 - 40	0.85	3.7	0.42	—	—
LT1000	15 - 40	0.85	3.7	0.42	0.40	3/8 - 16
CT2000	20 - 60	1.25	4.0	0.49	—	—
LT2000	20 - 60	1.25	4.0	0.49	0.51	1/2 - 13
CT3000	45 - 100	1.65	5.3	0.57	—	—
LT3000	45 - 100	1.65	5.3	0.57	0.51	1/2 - 13

Note 1) All forces (lbs.) are nominal.

Tensioner Selection Chart for Roller Chain Drives

Rotary and Linear Tensioners — Single Chain

Model Series	Chain Size #35	#40	#50	#60	#80	#100	#120	#140	#160
RT0500	X	X	X						
RT1600-L	X	X	X						
RT1600	X	X	X	X	X				
RT1000	X	X	X	X	X				
RT3000				X	X	X			
RT4000						X	X	X	
LT/CT1000-L	X	X	X						
LT/CT1000	X	X	X	X	X	X			
LT/CT2000			X	X	X	X			
LT/CT3000					X	X	X	X	
LT/CT3000-H								X	X

Rotary and Linear Tensioners — Double Chain

Model Series	Chain Size #35	#40	#50	#60	#80	#100	#120	#140	#160
RT0500	X	X							
RT1600-L	X	X							
RT1600	X	X	X	X					
RT1000	X	X	X	X					
RT3000				X	X	X			
RT4000					X	X			
LT/CT1000-L	X	X							
LT/CT1000	X	X	X	X	X				
LT/CT2000			X	X	X				
LT/CT3000					X	X			
LT/CT3000-H							X	X	X

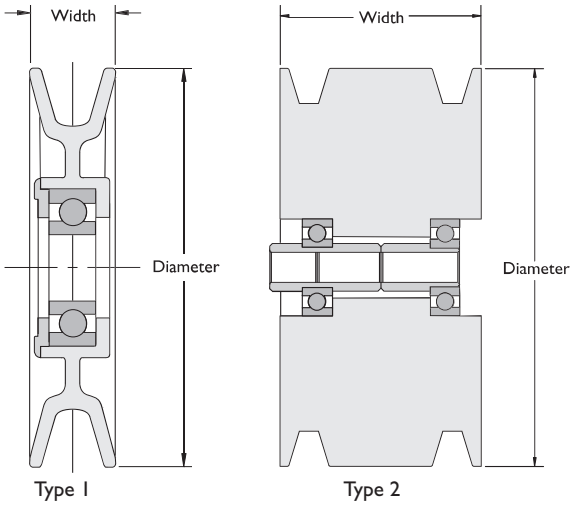
PowerMax SHEAVES & IDLERS Pulleys and Sprockets

Fenner Drives offers a wide range of metallic and non-metallic idlers for use with V-, flat and synchronous belts, and ANSI standard pitch roller chain sprockets. Listed below are some of the more frequently used sizes. For a complete product offering with dimensional data, visit our web site www.fennerdrives.com for more information.

For elevated operating temperatures, contact Applications Engineering.

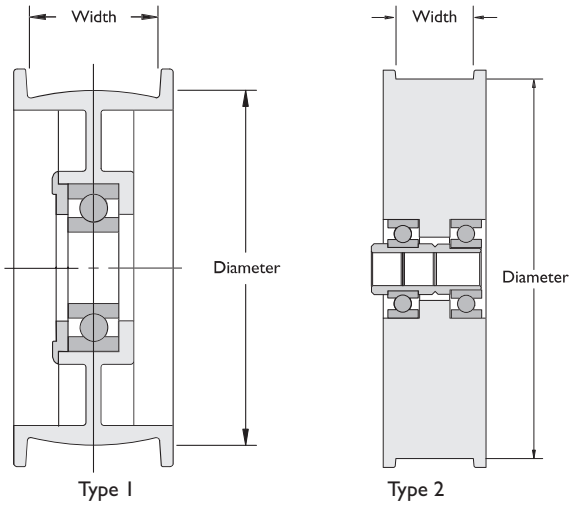
V-belt Idler Pulleys

Part No.	Type	Grooves	Belt Section	Dimensions Dia.	Width
VA3001	1	1	A/4L	3.00	0.70
VA4001	1	1	A/4L	4.00	0.70
VA5001	1	1	B/5L	5.00	0.81
VA6250	1	1	A/B	6.25	0.95
V2B6280	2	2	B/5V	6.28	1.72
V3B6280	2	3	B/5V	6.28	2.44
V4B6280	2	4	B/5V	6.28	3.16



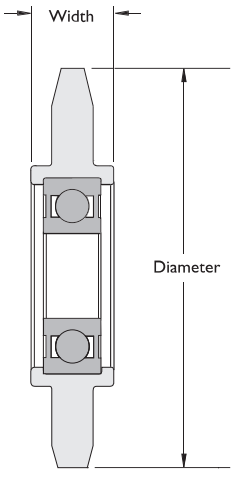
Flat Belt Idler Pulleys

Part No.	Type	Belt Size	Dimensions Dia.	Width
FA2750	1	1.00	2.00	1.09
FA3002	1	1.00	2.50	1.02
FA3502	1	1.00	3.00	1.00
FA4501	1	1.00	4.00	1.09
FA5501	1	1.00	5.00	1.02
F1B6280	2	1.00	6.00	1.23
F2B6280	2	2.00	6.00	2.10
F3B6280	2	2.75	6.00	2.91
F4B6280	2	3.75	6.00	3.85



Chain Idler Sprockets

Part No.	Chain No.	No. Teeth	Dimensions Dia.	Width
CS3502	35	19	2.50	0.67
CS4002	40	17	3.00	0.67
CS5002	50	15	3.25	0.67
CS6002	60	13	3.50	0.67
CS8002	80	12	4.40	0.67



Note All dimensions are in inches.

Overhung Load Information

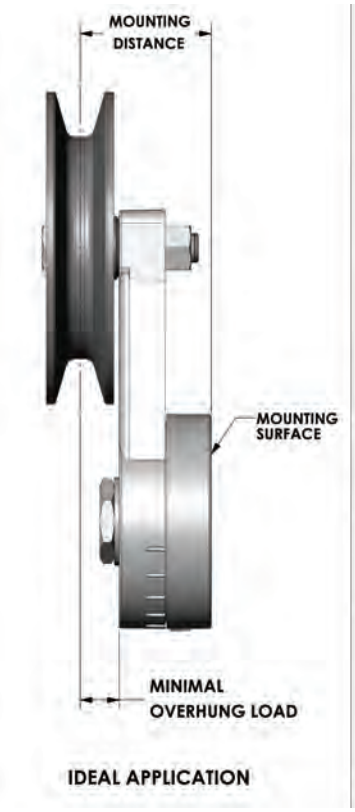


Fig. 1

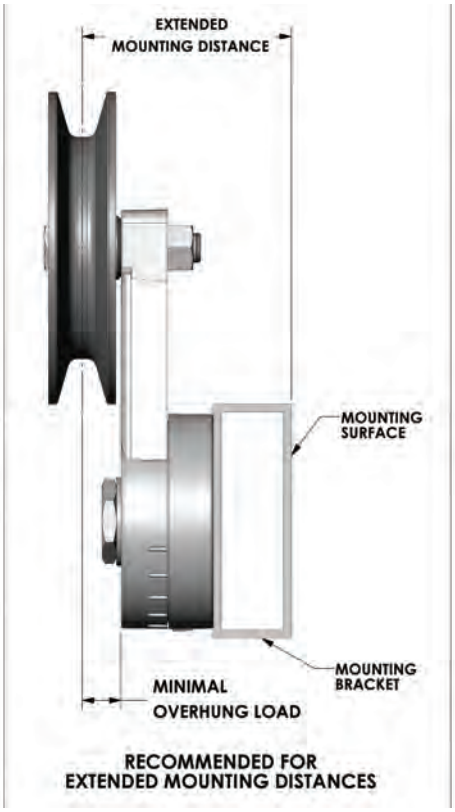


Fig. 2

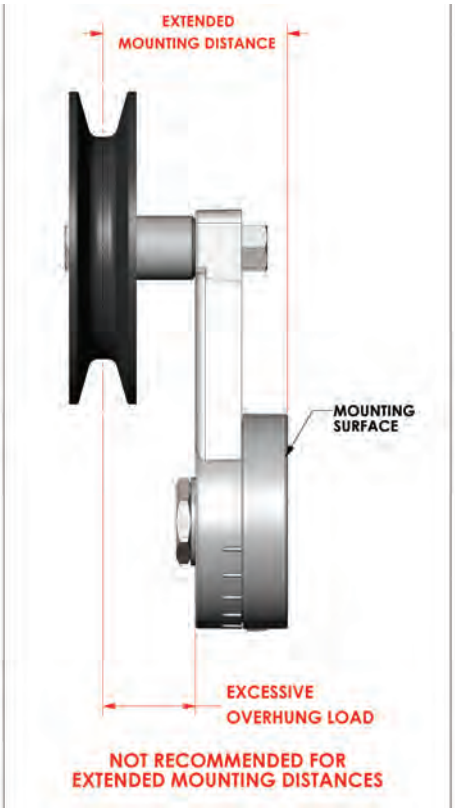


Fig. 3

Correct

To receive a full measure of performance from the tensioner/idler assembly, it is important to keep overhung loads to a minimum. Fig. 1 illustrates a properly designed tensioner/idler assembly where the overhung load is located close to the tensioner arm.

Overhung load is directly related to the tensioner mounting location. When considering a tensioner/idler assembly, the idler should be mounted close to the tensioner arm and then the tensioner/idler assembly positioned on the mounting surface. In some instances it may be necessary to fabricate a new mounting bracket or add plates, spacers, channel, etc. to the existing mounting surface to position the assembly allowing for correct alignment of the idler with the driveR and driveN components as illustrated in Fig. 2.

Incorrect

Although it is easy to move the idler further away from the tensioner arm to achieve correct alignment with the driveR and driveN, this is NOT the correct thing to do. Fig. 3 illustrates a poorly designed tensioner/idler assembly. Note the distance from the idler to the tensioner is excessive. This arrangement will introduce excessive load on the idler mounting bolt, tensioner arm and the tensioner body. The result will be poor performance and premature failure of the tensioner.

If in doubt, contact Fenner Drives' applications engineering group for assistance.

Frequently Asked Questions

Q When should I use a rotary versus linear tensioner?

A A linear moves in a straight line and a rotary swings in an arc. Sometimes mounting location, drive configuration, etc., will not permit the use of one versus the other. The application should be closely reviewed to determine which tensioner is best suited. We can help you determine which is best for your application — just give us a call.

Q Which tensioner is the best one for my application?

A Generally, the rotary style is primarily used on belt drives, although it can also be used with chain drives. The CT linear tensioner with the UHMW head is the most popular on chain drives.

Q Can I use the tensioner/idler on the backside of a belt?

A Yes. Although a backside idler increases wrap angle and power transmission capacity, it does introduce a reverse or back bend in the belt that will shorten belt life. Consult with the belt manufacturer for minimum pulley diameter and location.

Q My drive reverses — where do I locate the tensioner/idler?

A Spring-loaded tensioners should never be used on reversing drives. If they are, when the drive reverses the slack side becomes the tight side and vice versa. A tensioner designed for the slack side would then have inadequate spring force to maintain belt tension.

Q How do I determine what size tensioner/idler I need for my belt drive?

A Selection of the proper size tensioner can be made using the guidelines specified in this catalog. Consult with the belt manufacturer, who can determine the right amount of spring force based on the application and drive parameters.

Q I have some contaminants in my application — will they have any effect on the tensioner?

A Our tensioners are made from glass filled nylon or aluminum. Although many chemicals/oils will not affect them, they are not resistant to all. Contact Fenner Drives' applications engineering group with the contaminants present and we'll make a recommendation.

Q On my belt or chain drive, where should the tensioner/idler be located?

A Always install the tensioner/idler on the slack side of the drive.

Q Where is the best place on my V-belt drive to locate a tensioner/idler?

A Preferably, a tensioner/idler should be located on the inside of the drive. Optimum placement would be where it provides nearly equal arcs of contact on both the driveR and driveN pulleys.

Q Where do I position the tensioner on my chain drive?

A The tensioner should be located on the slack or sag side of the chain and outside the perimeter of the chain strand.

Q I am using chain other than standard ANSI roller chain. Can I get the UHMW head on a CT linear tensioner to match my chain?

A Consult Fenner Drives' applications engineering group. In many instances we have been able to design and furnish a special UHMW head.

Q Do I need to periodically grease the springs?

A In most cases, no. The springs are pre-lubricated at the factory and the unit is assembled. However, on occasion an application may dictate the need for re-lubrication. Contact Fenner Drives' applications engineering group. We may be able to design a tensioner with a fitting that will allow this.

Q Where should I position the tensioner in the chain span?

A Unless a chain guide is being used, the tensioner should be located an equal distance from the driveR and driveN sprockets.

Q My chain drive appears to have excessive slack — will a tensioner help this problem?

A Usually, under normal conditions chain slack should not exceed 4% of the span. For unusual conditions such as heavy loads, frequent starts/stops, etc. it should not exceed 2% of the span. Excessive chain slack usually occurs on drives with long spans. Typically a span greater than 50P (P = chain pitch) will require a tensioner.

Count on Fenner Drives.

We've got the right product for your application.

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