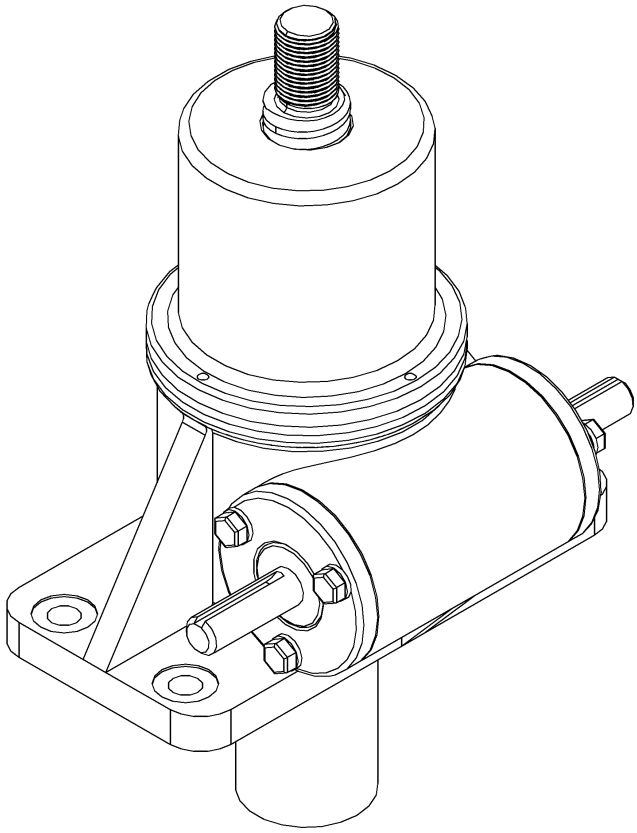
Joyce/Dayton Corp.

Operation and Maintenance Manual for Joyce/Dayton

Ball Screw Jacks



WARNING!

The product described in this catalog is for industrial use only. It may not be used to lift or support people without prior written approval from the Joyce/Dayton Corp. The recommendations in this manual for installation, operation and maintenance must be followed to ensure safe use. All persons responsible for the installation and use of Joyce Jacks must be familiar with the contents of this manual.

Ball screw jacks are not self-locking, and can lower under load. A brake motor or other external locking device must be provided. Customer is responsible for providing travel stops.

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Section I
General Information

1-1 Contacting Joyce Dayton Corp.

Joyce Dayton Corp.
P.O. Box 1630
Dayton, OH 45401
(800) 523-5204 (US and Canada only)
(937) 294-6261 (937) 297-7173 Fax
Email: sales@joycedayton.com
Website: www.joycedayton.com

1-2 Purpose and Scope

This manual provides installation, operation and maintenance instruction for standard Joyce/Dayton ball screw jacks. Although this manual covers the standard jacks and most variations of the Joyce/Dayton ball screw jack, there may be some jacks that vary significantly from this manual. For special jacks not covered, please contact Joyce/Dayton Corp. for assistance.

1-3 Receipt of Product

All equipment should be immediately inspected upon receipt for any damage and to verify correct product and quantities. Any problems should be reported to Joyce/Dayton Corp. and the freight carrier as soon as possible. Products returned without a Return Goods Authorization (RGA) form will not be accepted.

1-4 Warranty

Seller warrants its Products to be free from defects in material and workmanship under normal and proper use in accordance with instruction of Seller for a period of one year from the date of shipment to Buyer. Seller's liability under such warranty or in connection with any other claim relating to the Products shall be limited to the repair, or at Seller's option, the

replacement or refund of the purchase price, of any products or parts or components thereof which are returned to Seller freight prepaid and which are defective in material or workmanship. Products or parts or components thereof which are repaired or replaced by Seller will be returned to Buyer freight collect. This warranty is not intended to cover consumer products, as defined in the Magnuson-Moss Warranty-Federal Trade Commission Improvement Act, 15 U. S. C. Sections 2301-12, which are purchased by Buyer for purposes other than resale. If Buyer is not intending to resell the Products, and if the products are consumer products as defined in the Magnuson-Moss Act, the foregoing warranty, but not the limitation of Seller's liability, shall be null and void. EXCEPT AS EXPRESSLY STATED ABOVE, SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR USE OR OTHERWISE, ON THE PRODUCTS, OR ON ANY PARTS OR LABOR FURNISHED DURING THE SALE, DELIVERY OR SERVICING OF THE PRODUCTS.

1-5 Precautions of Use and Installation

1. **Side loading of the lifting screw is not permitted in the dynamic operation of the jack. A limited side load is allowable in the static condition. Contact Joyce/Dayton for the allowable side load for a specific application.**
2. **Mechanical stops are not provided on the lifting screw unless requested. It is the customer's responsibility to provide travel limit devices on all jacks. A mechanical stop, if provided is only an auxiliary device to limit the travel of the lifting screw. Engaging a mechanical stop during jack operation can cause damage to the internal jack mechanism.**
3. **In most applications, factory or manufacturer-assisted installation is not required. However, it is necessary that appropriate, qualified personnel perform the installation of Joyce/Dayton products.**
4. **Joyce/Dayton jacks are not rated for shock-loading, extreme vibration or critical speed conditions (high speed or long-length screw.) It is the responsibility of the user to ensure these conditions are not imposed on a jack or the power transmission equipment.**
5. **In the event that service or maintenance is required, the load must be secured or removed before any work can begin. A brake motor does not qualify as securing the load. A failure in other parts (e.g., a shaft or coupling) will allow the load to lower even though the brake is engaged.**
6. **The ball screw jacks can be mounted and operated in any orientation. When used in a horizontal position, the worm should be below the gear to ensure proper lubrication.**
7. **Never allow the jack to retract beyond the minimum closed position, as damage to the ball-nut can occur.**
8. **Boots or protective bellows covers should be used to protect and keep the lifting screw clean in dusty or abrasive environments.**
9. **Although ball screws are more efficient than machine screw jacks, wormgear jacks are not considered continuous duty actuators. For continuous or high-duty cycles inquire with your local sales representative or consult Joyce/Dayton Corp. regarding Bevel Ball actuators.**

1-6 General Installation instructions

1. **Ensure that all personnel who will service or operate equipment are familiar with its use and limitations.**
2. **Secure or remove the load before any installation procedures begin.**
3. **Be certain the rating of the jack meets or exceeds the load.**
4. **The jacks must be mounted on a structure sufficient to support the maximum possible load. The structure must be rigid. An under-designed structure could lead to bending of the lifting screw causing premature wear or failure.**
5. **Drive shaft alignment is critical. Mis-alignment will cause reversing stresses in rotating members and will lead to fatigue failure.**
6. **In a system with shafts, miter boxes, etc., confirm that the shafts and jacks operate without binding or excessive force before powered drive devices are engaged.**
7. **When fastening the load to a jack, make sure the jack is in the retracted position. This positions the load accurately with respect to the jack screw centerline. Never pull the screw**

to one side to make connection with your structure. Fully extend the jack to make sure the load is aligned with the lifting screw.

8. All jacks are designed to be mounted with S.A.E. Grade 8 bolts or equivalent.
9. Torque all mounting bolts in a symmetric pattern to avoid damage to the sleeve.
10. Shaft and coupling guards are the responsibility of the user.
11. Optional limit switches furnished with the jacks are NOT preset and require field adjustment before use.

Section II
Maintenance

2-1 Lubrication

1. Jacks are lubricated before leaving the factory.
2. For normal operation, jacks should be greased at least once per month. Under extended use, grease twice monthly or as conditions dictate. Grease thru the fitting on the jack with hand or power operated equipment. Usually one-quarter ounce, (about 8 pumps of a hand grease gun) is sufficient. Grease with No. 1 Consistency EP Grease. Do not allow jacks to operate un-lubricated. It is the responsibility of the user to maintain sufficient lubrication of the jack.
3. The products listed below are recommended by the lubricant manufacturers to meet the requirements for normal operation. The listing of brand names is solely for the convenience of users of Joyce equipment and their lubricant suppliers; it does not constitute any endorsement. Joyce/Dayton assumes no responsibilities for the quality, performance or availability of any listed products

COMPANY	BRAND NAME
Mobilgrease	XHP 461
Mobilgrease	XHP 221
Mobilith	SHC 221
Mobilith	SHC 460

4. For operation above 250°F or extreme loading, c onsult the Engineering Department of Joyce/Dayton Corp.
5. Ball screw and ball nut (KFTN models only) should be lubricated with a spindle or 10-weight oil applied to the ball screw.
6. Do not operate jack or ball screw without lubrication.
7. Total grease capacity of gear box by jack type:

Jack Capacity	Shots	Weight	Jack Capacity	Shots	Weight
1 ton	5	1.8 oz.	20 ton	95	33 oz.
2 ton	13	4.5 oz	30 ton	135	47 oz.
5 ton	26	9 oz	50 ton	230	81 oz.
10 ton	50	17 oz			

2-2 Repair Parts

Repair parts may be obtained by calling Joyce/Dayton Customer Service at (800) 523-5204, (937) 294-6261, (937) 297-7173 (facsimile), or your local sales representative. When ordering repair parts, please supply the serial number (located on the jack nameplate).

1. The following parts are recommended for repair or rebuild. Exploded View Section 3-1, 3-2.
   A. (2) Worm shaft bearing and race – Item 3
   B. (1) Shim kit – Assortment of items 4, 5, 6
   C. (2) Worm shaft seal – Item 9 (2-ton and above)

D. (1) Worm – item 10
E. (1) Thrust bearing lower– Item 11
F. (1) Thrust bearing upper – Item 12
G. (1) Wormgear – Item 13
H. (1) Ball nut (return tubes and balls only for rebuild)– Item 16
I. (1) Ball screw – item 17
J. (1) Ball screw shaft seal, KFTN only – item 25 (inverted), item 20 (upright)
K. (1) Boot and clamps for translating jack–Item 22, 23, 24
L. (1) Boot (lower) and clamps for KFTN– Item 27, 28, 29
M. (1) Boot (upper) and clamps for KFTN – Item 30, 31, 32

2-3 Disassembly of Ball Screw Jacks

Use the appropriate disassembly procedure. If the ball nut (with the re-circulating ball bearings) is on the screw outside the sleeve, the jack is a Keyed for Traveling Nut (KFTN). This is also called a "rotating screw" jack. If the ball nut is inside the jack sleeve, the jack is a translating model. Handle machined parts with care, and maintain an "order of disassembly" to aid in re-assembly. Remove all couplings, screw support bearings, etc. before beginning disassembly.

Disassembly Procedure for KFTN (rotating screw) Models: Sections 3-1 & 3-2

1. Tape or otherwise secure the ball nut (item 16) to the ball screw (item 17). Removal of the ball nut from the screw would allow all of the ball bearings to be released. Remove the boot clamps (item 27,29,30,32) and collapse boots (item 28, 31) if the jack is equipped with boots.
2. On upright jacks loosen the (4) set screws (item 19) in the sleeve cap assembly, which includes the sleeve cap (item 14), bushing (item 15) and seal (item 20) and loosen the sleeve cap assembly by rotating counter-clockwise (CCW.)
3. On inverted KFTN models remove the sleeve cap (item 14) by loosening the (4) set screws (item 19) and rotating CCW. The inverted model has a solid sleeve cap without a bushing or seal.
4. On upright KFTN models, the ball screw assembly (with the sleeve cap assembly) can now be removed from the jack sleeve. The ball screw assembly consists of the ball screw (item 17), the ball nut (item 16), the thrust bearings (item 11,12), the thrust sleeve (item 33), the retaining nut (item 22), the key (item 21) and the wormgear (item 13). The retaining nut (item 22) can be removed from the ball screw assembly by loosening the setscrew (item 23) and unthreading the retaining nut. The wormgear will then slide off the end of screw and the upper thrust bearing, the sleeve cap assembly can be removed from the ball screw. Note: The thrust sleeve is secured to the ball screw with a thread adhesive. Removal of the thrust sleeve may be necessary for the sleeve cap removal. The thrust sleeve and retaining nut must be heated to 500°Fahrenheit to be removed.
5. On inverted KFTN models, the ball screw assembly is removed from the bottom of the sleeve. First, remove the upper thrust bearing (item 12) and then remove the set screw (item 23) from the retaining nut. The retaining nut (item 22) can now be un-screwed from the wormgear. Remove the inverted bushing (item 26) or the key will damage the seal (item 25). Push the ball screw (item 17) and the key (item 21), out the bottom of the sleeve only when the retaining nut and bushing have been removed. Remove the wormgear (item 13) and the lower thrust bearing (item 11) from the sleeve. Note: The thrust sleeve is secured to the ball screw with a thread adhesive. It is not necessary to remove this adhesive when removing the sleeve cap. If removal becomes necessary, heat the thrust sleeve and retaining nut to 500°Fahrenheit.
6. It is not recommended to remove the ball nut (item # 16) from the ball screw (item 17) unless it is being replaced. For instructions on removing the ball nut, see Section 2- 6, Ball nut disassembly and rebuild.
7. Remove (6) screws, 3 per side (item 8) from the bearing cap (item 7). Remove the bearing caps and seals (item 9) carefully to avoid damaging seals. Make sure worm shaft keys have been removed first. Note: the one-ton jack has retaining clips.

8. **Carefully remove the shims (item 4,5,6) from the jack sleeve or bearing cap. NOTE: there will not necessarily be an equal quantity of shims per side. Keep track of the number of shims on each side of the jack. Note: the one-ton jack does not have shims.**
9. **Remove the worm bearings (item 3). The cup may be press-fit. Use a dead-blow, plastic or other non-marring mallet to remove the worm (item 10).**

Disassembly Procedure for Translating Models: Section 3-3 & 3-4

1. **Remove the boot clamps (item 22, 24) and remove the boot (item 23) if equipped. On both upright and inverted translating models, loosen the (4) set screws (item 19) and loosen the sleeve cap (item 14) by rotating CCW. T2 (loadpad) and T4 (male clevis) end conditions require the ball nut to be removed from the ball screw as the sleeve cap will be captured between the end condition and the ball nut. If this must be done, see Section 2.6 – Ball nut disassembly and rebuild. The inverted model has the protection tube (item 21a) attached to the sleeve cap. The protection tube may be un-threaded from the sleeve cap if necessary. NOTE: a strap wrench or similar tool may be used on the sleeve cap to aid in removal.**
2. **On upright translating models, the ball screw assembly is removed through the top of the sleeve. The assembly consists of the ball nut (item 16), the thrust bearings (item 11,12) and the wormgear (item 13). The wormgear may be un-screwed from the ball nut (removal will require heating the thread adhesive to 500°Fa hrenheit) after the set screw (item 20) has been loosened, but it is not recommended that the ball nut (item 16) be removed from the ball screw unless it is being replaced. For ball nut removal, see Section 2.6 – Ball nut disassembly and rebuild. NOTE: the bearing races may remain pressed into the sleeve cap (upper bearing race) and the sleeve (lower bearing race). These should not be removed unless they are being replaced. Always replace bearings in sets.**
3. **On inverted translating jacks, the ball screw assembly is removed through the top of the jack for a T1 (plain) or T3 (threaded) end condition. The ball screw assembly consists of the ball screw (item 17), ball nut (item 16), wormgear (item 13) and thrust bearings (item 11,12). The wormgear is attached to the ball nut with set screws and a thread-adhesive. Removal will require heating the thread adhesive to 500°Fahrenheit.**
4. **On inverted translating jacks, the ball screw is removed through the bottom of the jack for a T2 (loadpad) or T4 (male-clevis) end condition. The ball screw retainer screw (item 26) and ball screw retainer (item 25) must be removed from the ball screw (item 17). Loosen the set screw (item 20) in the ball nut (item 16) and unscrew the ball nut from the wormgear (item 13.) Removal will require heating the thread adhesive to 500°Fahrenheit, then remove the ball nut (item 16) from the ball screw; see Section 2.6 – Ball nut disassembly and rebuild. Remove the ball screw from the bottom of the sleeve and the thrust bearings (item 11,12) and wormgear (item 13) from the sleeve.**
5. **Translating jacks have either a protection tube (item 21 – upright) or a bushing (item 15 – inverted) in the bottom of the jack sleeve. These are threaded into the sleeve and may be removed if required.**
6. **Remove (6) screws, 3 per side (item 8) from the bearing caps (item 7). Remove the shaft, bearing caps and seals (item 9) carefully to avoid damaging seals. Make sure keys have been removed first. Note: the one-ton jack has retaining clips.**
7. **Carefully remove the shims (item 4,5,6) from the jack sleeve or bearing cap. NOTE: there will not necessarily be an equal quantity of shims per side. Keep track of the number and order of shims on each side of the jack. The one-ton jack does not have shims**
8. **Remove the worm shaft bearings (item 3). The cup may be press-fit and require the use of a dead-blow, plastic or other non-marring mallet to remove the worm (item 10).**

2-4 Inspection of Components

1. **Before any inspection, it will be necessary to clean all parts of the jack thoroughly. Use caution with any machined or fragile part.**

2. **Inspect the cleaned sleeve (item 1) and sleeve cap (item 14) for any signs of stress or facture, especially around the mounting bolt locations.**
3. **Inspect the worm (item 10) and thrust bearings (item 11,12) for any signs of Brinelling, abrasive wear or spalling. Test for smooth, quiet operation of bearings.**
4. **Inspect bearing caps (item 7) for any signs of stress.**
5. **Inspect the keyway on the worm (item 10) and roll worm on a flat surface to look for wobble in the shaft. Threads on worm should not show a heavy buildup of bronze gear material.**
6. **Replace all seals when a complete disassembly is done.**
7. **Inspect Aluminum-Bronze wormgear (item 13) for signs of excessive wear.**
8. **Check boots for wear or cracks**
9. **Check ball screw (item 17) for straightness or excess wear in ball threads.**

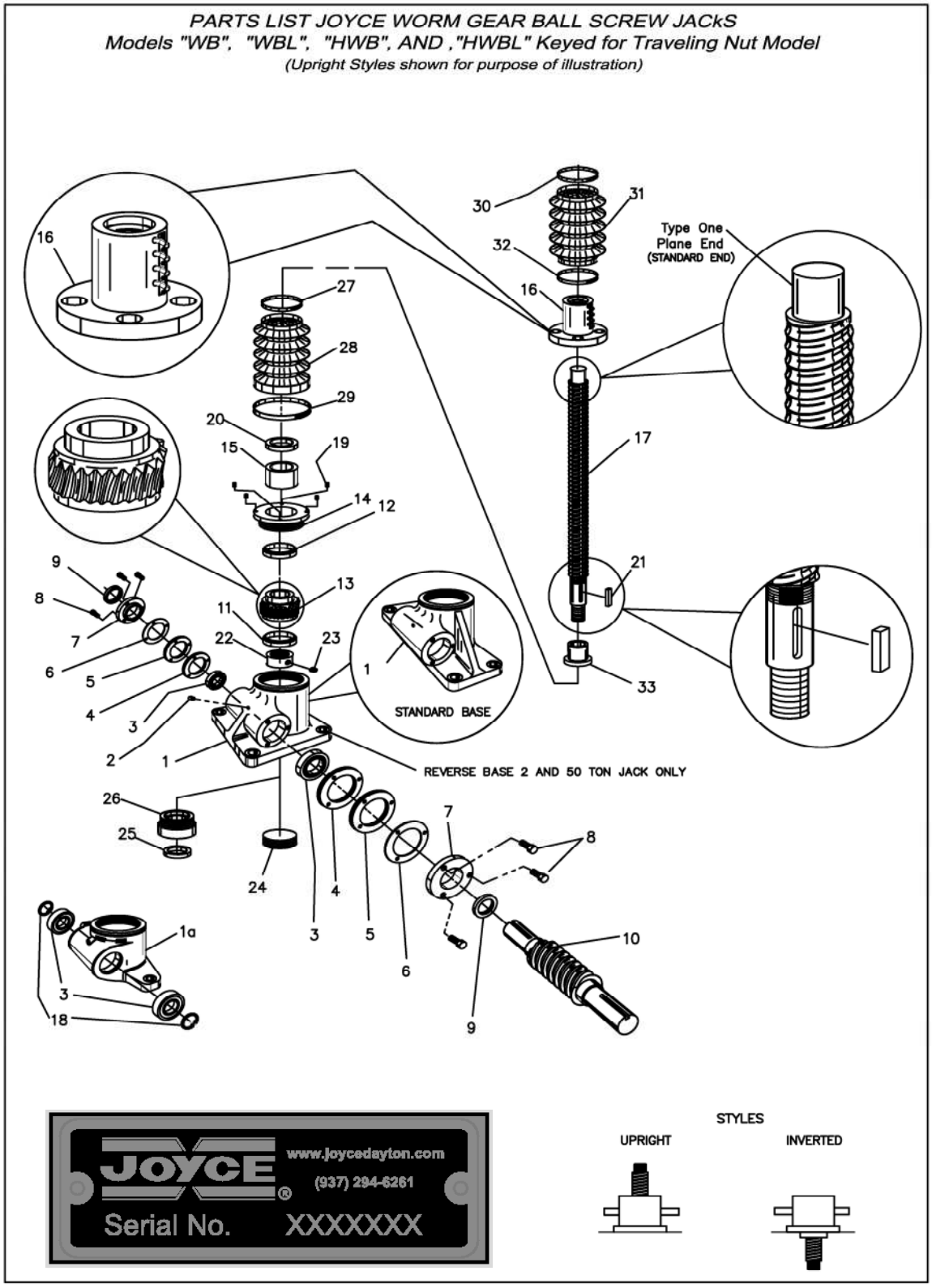
2-5 Assembly of Ball Screw jacks

1. **Assure that all bearings are packed with grease. Coat seals with light oil and put masking tape on keyway and other sharp surfaces to avoid seal damage.**
2. **Assembly of jack is reverse of the disassembly procedure. Make sure all bearings and seals seat properly. The bearing cap screws and sleeve cap should only be hand tightened initially. Some jacks may require the wormgear and thrust bearing be installed first, as they will not pass the worm, if already installed.**
3. **Tighten bearing cap bolts. Check the input shaft for excessive axial or lateral movement. If the input shaft feels loose remove shims, if it feels tight, add shims. Give the input shaft a solid blow on each end (in axial direction) with a soft mallet and re-check the feel. If it feels OK, continue to next step, otherwise continue adding (if tight) or removing (if loose) shims. This is a trial and error operation. The correct set-up has a solid feel without play (axial or lateral) and the input shaft rotates with an even, smooth but snug feel.**
4. **When jack is re-assembled, the thrust bearing pre-load needs to be set. Check by rotating the input shaft, while tightening the sleeve cap. Continue to check the rotation of the input shaft as sleeve cap is tightened. Use a dead-blow hammer on top of sleeve cap to help it seat. Tighten sleeve cap until it will not tighten further by hand.**

2-6 Ball Nut Disassembly and Rebuild

1. **This requires the use of an arbor. An arbor can be acquired from Joyce/Dayton, or manufactured. The arbor is usually a tube or bar that can be made out of plastic, stiff cardboard or steel and should be at least 4 inches longer than the ball nut. The outer diameter is approximately equal to the minor diameter of the ball screw thread. Its purpose is to prevent the ball bearings from falling out of the ball nut. Place the arbor at the end of the screw and carefully un-thread the ball nut onto the arbor. After the ball nut is transferred to the arbor, secure it in place with tape or a clamp.**
2. **Remove the return tubes, one at a time and empty ball bearings from return tube and internal ball nut path in ball nut into a container.**
3. **Continue to remove ball return tubes and empty all ball bearings. There could be up to three return tubes and ball bearing paths.**
4. **Discard the return tubes and used ball bearings (if ball nut is being rebuilt.)**
5. **Flush all components with a clean degreasing solvent.**
6. **Check ball nut threads for damage and replace if necessary.**
7. **Check retaining wire location. Some are free to rotate to other part of nut when the return tubes are removed.**
8. **Lightly oil (Spindle or 10 weight) all components to aid in re-assembly.**
9. **Thread ball nut onto ball screw or arbor.**
10. **Begin re-filling ball bearing paths and return tubes. After the return tube is filled, a small dab of grease will hold the balls in the tube during assembly. Remove one or two balls (for clearance) and assemble return tube and ball nut.**

Section III
Views & Parts List
3-1 Exploded View - Keyed For Travel Nut KFTN



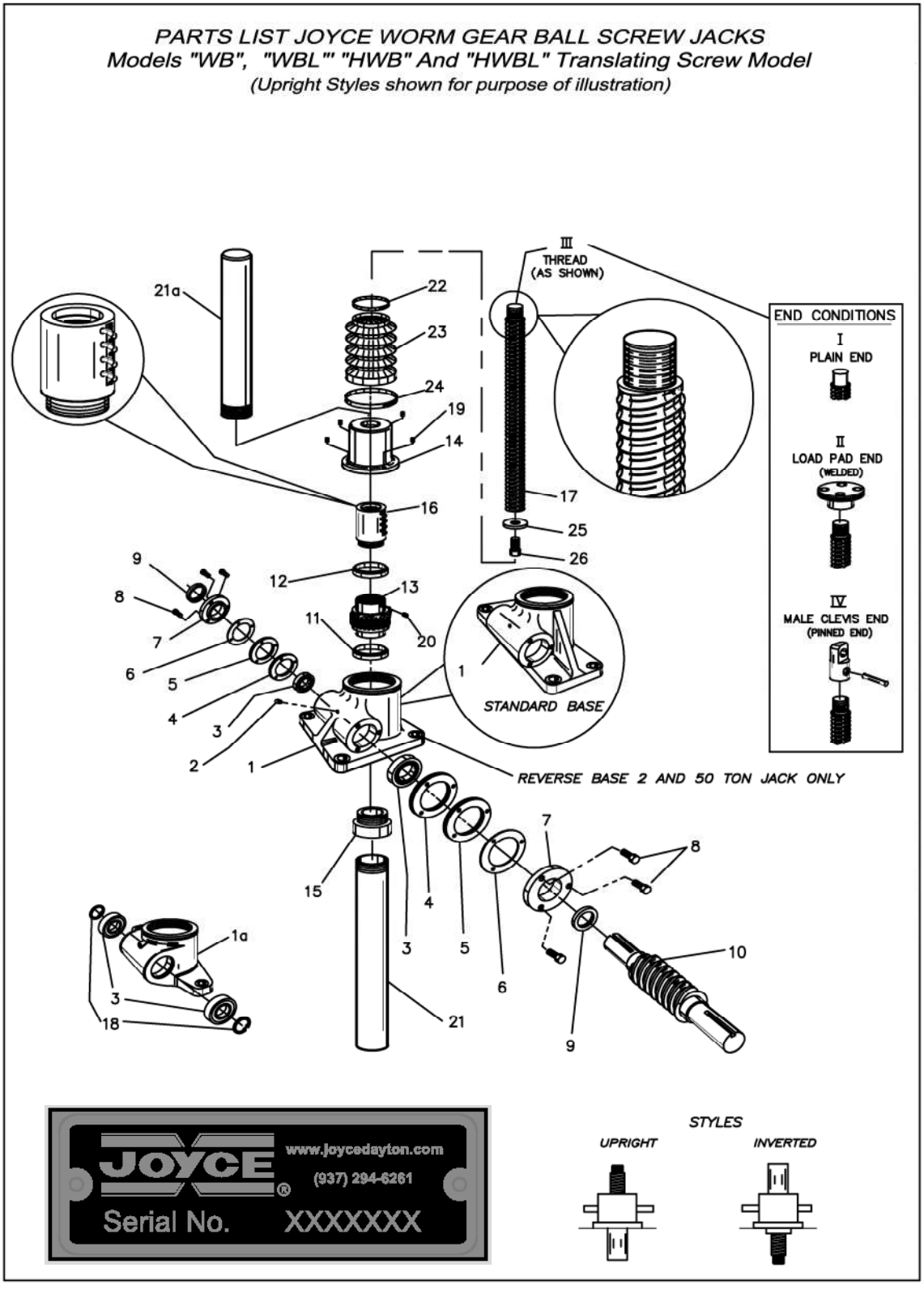
3-2 Parts List for KFTN Jack

Parts list KFTN Jack

Item	KFTN- Keyed For Traveling Nut
1	Sleeve (1)
1a	Sleeve (miniature jack) (1)
2	Grease Fitting (2)
3	Worm Shaft Bearing (2)
4	Shim (2)
5	Shim (2)
6	Shim (2)
7	Bearing Cap (2)
8	Bearing Cap Screw (6)
9	Worm Shaft Seal (2)
10	Worm (Input Shaft) (1)
11	Lower Thrust Bearing (1)
12	Upper Thrust Bearing (1)
13	Wormgear (1)
14	Sleeve Cap (1)
15	Bushing (upright only) (1)
16	Ball nut (traveling nut) (1)
17	Ball Screw (1)
18	Retaining Ring (miniature jacks only) (2)
19	Set Screw - Sleeve Cap (4)
20	Upper Seal (upright only) (1)
21	Key(1)
22	Retaining Nut (1)
23	Set Screw - retaining nut (1)
24	Plug (upright only) (1)
25	Lower Seal (inverted only) (1)
26	Bushing (Inverted only) (1)
27	Top Clamp Lower Boot - if equipped
28	Lower Boot - if equipped
29	Bottom Clamp Lower Boot - if equipped
30	Top Clamp Upper Boot - if equipped
31	Upper Boot - if equipped
32	Lower Clamp Upper Boot - if equipped
33	Thrust Sleeve (1)
34*	Ball Nut Rebuild Kit (return tubes and balls)

*** Not shown on exploded view.**

3-3 Exploded View – Translating Jack



3-4 Parts List for Translating Jack

Parts list for Translating Jack

Item	Translating
1	Sleeve
1a	Sleeve (miniature jack)
2	Grease Fitting
3	Worm Shaft Bearing (2)
4	Shim (2)
5	Shim (2)
6	Shim (2)
7	Bearing Cap (2)
8	Bearing Cap Screw (6)
9	Worm Shaft Seal (2)
10	Worm (Input Shaft)
11	Lower Thrust Bearing
12	Upper Thrust Bearing
13	Wormgear
14	Sleeve Cap
15	Bushing (inverted only)
16	Ball Nut
17	Ball Screw
18	Retaining Ring (miniature jacks only) (2)
19	Set Screw - Sleeve Cap (4)
20	Set Screw - Wormgear (3)
21	Protection Tube - upright
21a	Protection Tube - inverted
22	Top Boot Clamp - if equipped
23	Boot - if equipped
24	Bottom Boot Clamp - if equipped
25	Ball Screw Retainer
26	Ball Screw Retainer Screw

3-5 Specifications

Model Number	WBL51 WBL201	WB51 WB201	(R)WB62 (R)WB122 (R)WB242	(R)HWB62 (R)HWB122 (R)HWB242	WB65 WB125 WB245	HWB65 HWB125 HWB245	WBL810 WBL2410	HWBL810 HWBL2410
Capacity	1 TON	1 TON	2 TON	2 TON	5 TON	5 TON	10 TON	10 TON
Lifting Screw Diameter (inches)	3/4	3/4	1	1	1-1/2	1-1/2	1-1/2	1-1/2
Thread Pitch/ Lead (inches)	.2	.2	.25	1.00	.474	1.00	.474	1.00
Worm Gear Ratio	5:1 20:1	5:1 20:1	6:1 12:1 24:1	6:1 12:1 24:1	6:1 12:1 24:1	6:1 12:1 24:2	8:1 24:1	8:1 24:1
Worm Shaft Turns for 1" Travel	25 100	25 100	24 48 96	6 12 24	12.66 25.33 50.66	6 12 24	16.88 50.66	8 24
Tare Torque (inch/Lbs.)	3	3	4	4	10	10	20	20
Starting Torque (inch/Lbs.)	. 014W* .005W*	.014W* .005W*	.015W* .009W* .006W*	.064W* .039W* .028W*	.030W* .019W* .013W*	.065W* .041W* .029W*	.022W* .010W*	.047W* .024W*
Operating Torque † (inch lbs.) @ Worm RPM	.012W* .004W* @ 500 RPM	.012W* .004W* @ 500 RPM	.013W* .007W* .004W* @ 500 RPM	.051W* .028W* .017W* @ 500 RPM	.025W* .014W* .008W* @ 300 RPM	.052W* .029W* .018W* @ 300 RPM	.019W* .008W* @ 200 RPM	.039W* .016W* @ 200 RPM
Screw Torque ** (inch lbs.)	.035 W*	.035 W*	.044W	.177 W*	.084 W*	.177W	.084 W*	.177 W*
Efficiency Rating % approx.	51.7 38.5	51.7 38.5	52.1 47.2 39.3	52.1 47.2 39.3	51.1 45.7 37.2	51.1 45.7 37.2	50.7 40.3	50.7 40.3
Ball Screw Life at Rated Load (Inches travel X 1000)	108	858	642	190	1,015	512	127	64
Worm Holding Torque ††	.006W* .002W*	.006W* .002W*	.007W* .004W* .002W*	.033W* .020W* .014W*	.013W* .007W* .004W*	.033W* .020W* .014W*	.010W* .004W*	.024W* .012W*
Basic Jack Weight (lbs.)	8	8	18	18	42	42	58	58
Add to Basic Jack Weight (lbs.) for each Additional 1" of Travel	.25	.25	.4	.4	.7	.7	.9	.9

****Screw torque is the required torque to keep the screw from rotating**

† Operating torque is the torque required for a given load (increases as speed decreases)

†† Torque required to prevent worm (input shaft) from backdriving.

3-5 Specifications

Model Number	WB810 WB2410	HWB810 HWB2410	WB820 WB2420	WB1130 WB3230	WB1150 WB3250
Capacity	10 TON	10 TON	20 TON	30 TON	50 TON
Lifting Screw Diameter (inches)	2	2	2 1/4	3	4
Thread Pitch/ Lead (inches)	.5	1	.5	.66	1.00
Worm Gear Ratio	8:1 24:1	8:1 24:1	8:1 24:1	11:1 32:1	11:1 32:1
Worm Shaft Turns for 1" Travel	16 48	8 24	16 48	16.67 48.48	11 32
Tare Torque (inch/Lbs.)	20	20	40	60	100
Starting Torque (inch/Lbs.)	.023W* .011W*	.047W* .023W*	.024W* .012W*	.027W* .016W*	.038W* .020W*
Operating Torque † (inch lbs.) @ Worm RPM	.019W* .008W* @200 RPM	.039W* .016W* @ 200 RPM	.020W* .009W* @ 200 RPM	.020W* .009W* @ 200 RPM	.029W* .012W* @ 200 RPM
Screw Torque ** (inch lbs.)	.088W*	.177 W*	.088 W*	.117 W*	.177 W*
Efficiency Rating % approx.	50.7 40.3	50.7 40.3	47.4 35	48 35	49.3 37.5
Ball Screw Life at Rated Load (Inches travel X 1000)	729	1423	121	343	614
Worm Holding Torque ††	.009W* .003W*	.018W* .006W*	.009W* .003W*	.009W* .003W*	.013W* .005W*
Basic Jack Weight (lbs.)	62	62	105	220	460
Add to Basic Jack Weight (lbs.) for each Additional 1" of Travel	1.4	1.4	2.6	3.2	4.8

****Screw torque is the required torque to keep the screw from rotating**
† Operating torque is the torque required for a given load (increases as speed decreases)
†† Torque required to prevent worm (input shaft) from backdriving.

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3-6 Maintenance

Date	Maintenance Performed	Initials

Joyce Dayton Serial Number Tag

Contact Joyce Dayton Corporation and provide the serial number to obtain the product information needed for maintenance, repair and reorder.

Joyce Dayton Corp
P.O. Box 1630
Dayton, Ohio 45401
Phone (800) 523-5204 (U.S. & Canada); (937) 294-6261 Fax (937) 297-7173
www.joycedayton.com E-mail: sales@joycedayton.com

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