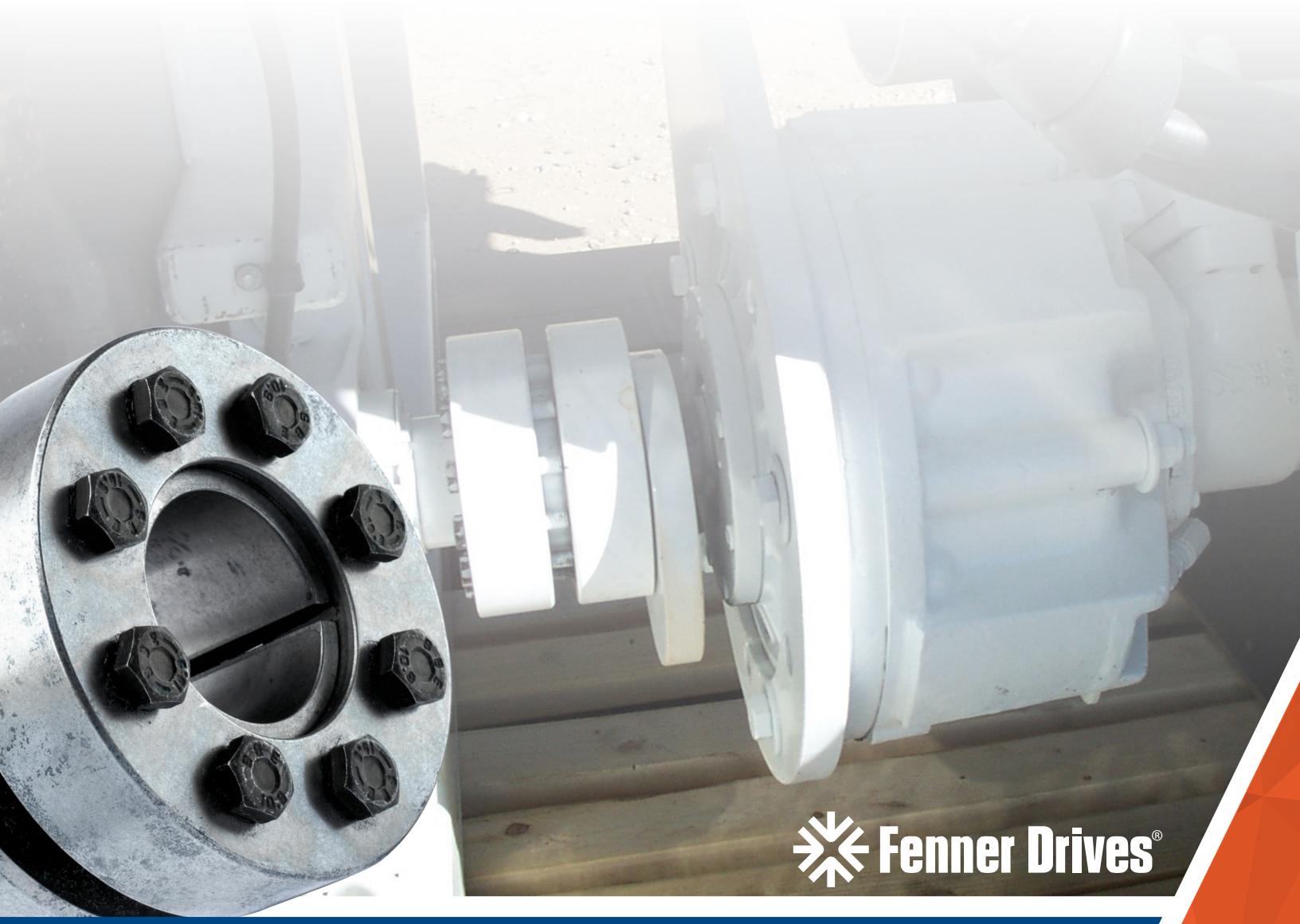
B-LOC® WK Series



The High Performance Keyless Rigid Coupling for Shaft Mounted Drives

Mounting motors and drives with an elegant, maintenance friendly, cost effective solution can be a challenging task. Flexible couplings, a common product used in these applications, require structural support for the drive increasing the overall design cost and complexity. High maintenance costs for flexible couplings are typical because of having to repair keyways that have fretted and corroded. There is also the constant replacement cost of coupling elements. Reduce your costs, simplify your design and make maintenance easier by using a B-LOC WK Rigid Coupling by Fenner Drives.

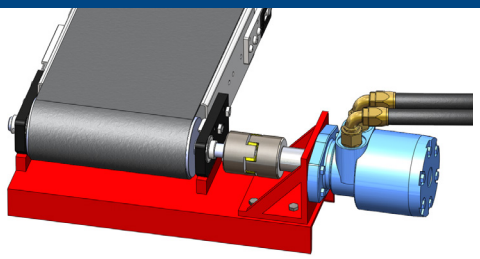
WK Rigid Couplings are external keyless locking devices that simultaneously transmit high torques and bending moments that allow your drive to be overhung shaft mounted. By using a B-LOC WK Rigid Coupling and a simple torque arm (to prevent the mounted drive from rotating), you completely eliminate the need for structural foundations since the drive hangs off the end of the shaft. As a result of this ingenious system, shaft alignment issues are gone and consumable flexible coupling elements a thing of the past.

Like all B-LOC products, the mechanical shrink fit will never wear out, disassembles easily for service and is truly a zero backlash connection.

B-LOC® WK Series

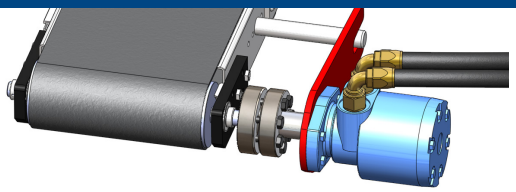
- Keyless, rigid, zero backlash coupling
- Transmits high torque and bending moments
- Eliminates the need for costly mounting brackets and structural support
- Compact, double taper design with self-releasing tapers for easy removal
- Exceptional concentricity
- Installs right over existing keyways and splines
- Not affected by shock or reversing loads
- Easily accommodates shaft sizes, both inch and metric, up to 4-15/16 (125mm).
- Allows coupling of different shaft sizes
- Custom shaft combinations available with quick turn around!

Support Mounted



- Requires bulky frame work and supports
- Shaft misalignment issues necessitate the use of flexible couplings
- Fretted and corroded flexible couplings complicate disassembly
- Higher total cost

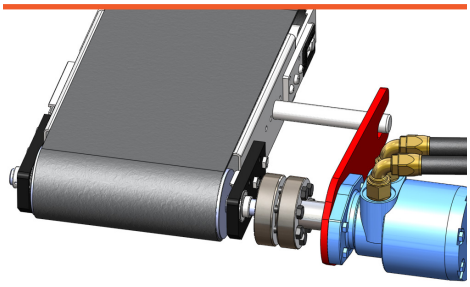
Shaft Mounted



- Shaft mount completely eliminates shaft misalignment and frame work
- Simple torque arm prevents motor rotation
- Keyless mechanical shrink fit never corrodes to the shaft and disassembles easily
- Compact design allows for smaller drive footprint
- Lower overall cost

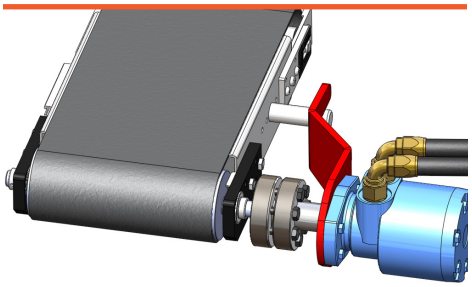
Torque Arm Configurations

Straight Torque Arm



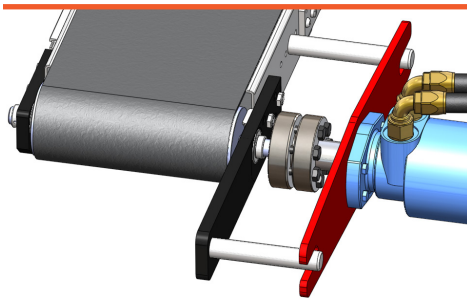
- Simplest, most basic design
- Torque reaction forces create an additional bending moment about the coupling
- Coupling, as well as other drive components, must be designed to handle this additional load
- Depending on torque arm radial positioning, torque reaction force may be used to counter the bending moment created by the weight of the drive (please contact a Fenner Drives Technical Services for more information)

Bent Torque Arm



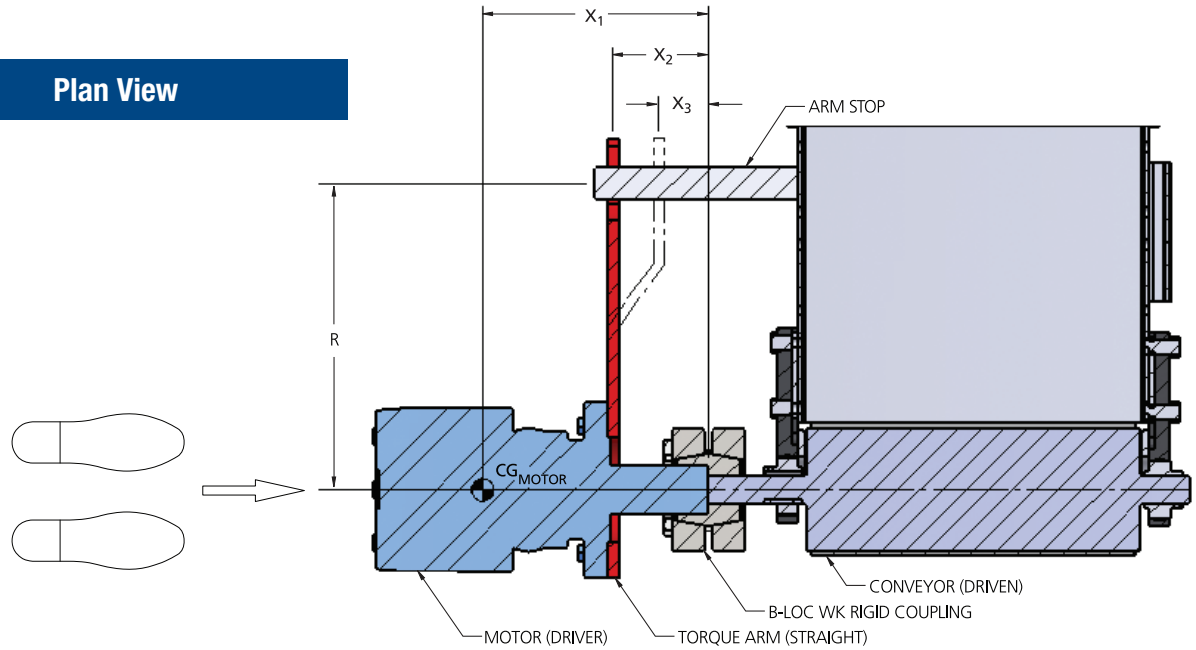
- Advanced design for controlling forces
- A bent torque arm will relocate the torque reaction bending moment
- Depending on the bent arm design, the torque reaction bending moment may be reduced or eliminated at the coupling, allowing for the use of a smaller WK Rigid Coupling
- Other drive components must be designed to handle the additional/ repositioned load

Double Torque Arm



- Ideal design for reducing forces
- Double torque arm with two opposing arms separated by 180° will completely eliminate the torque reaction bending moment in the system
- Coupling and other drive components need only be designed to handle the bending moment created by the weight of the drive

Plan View



Calculations

Once you have selected your WK Rigid Coupling, apply the following calculations to verify that it is suitable for your application. Please reference Plan View above.

1. M_t = published max rated torque capacity of B-LOC WK Rigid Coupling = _____ ft-lb

2. M_{DMAX} = maximum drive torque (stall torque where applicable) = _____ ft-lb

3. W = weight of the overhung shaft mounted drive = _____ lb

4. R = length of the torque arm = _____ ft

5. F_{TA} = torque arm reaction force = $M_{DMAX} \div R$ = _____ lb

6. M_B = bending moment at the coupling
   NOTE: M_B must be $<0.25 \times M_t$

   TORQUE ARM OPTIONS

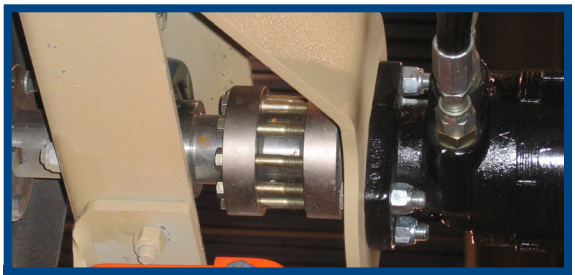
   Straight Torque Arm
   $M_B = (W \times X_1) + (F_{TA} \times X_2)$ = _____ ft-lb

   Bent Torque Arm
   $M_B = (W \times X_1) + (F_{TA} \times X_3)$ = _____ ft-lb

   Double Torque Arm
   $M_B = (W \times X_1)$ = _____ ft-lb

7. M_{tB} = resultant (torque & bending) = $(M_{DMAX})^2 + (2 \times M_B)^2$ = _____ ft-lb
   NOTE: M_{tB} must be $<M_t$

8. If the NOTES in steps 6 and 7 are <u>both</u> satisfied, the B-LOC WK Rigid Coupling is recommended for your application.



Design Tips

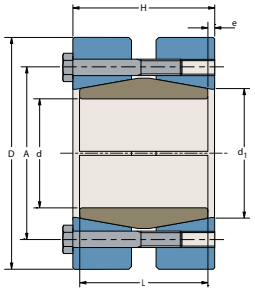
- For any WK Coupling design or engineering questions, contact a Fenner Drives Technical Services by phone at (800) 243-3374 or e-mail at ae@fennerdrives.com.
- Shaft mounting creates bending moments in the system; coupling, shafts, bearings etc., must be designed to handle these bending moments.
- Torque arm design and placement can be used to control or minimize bending moments in the system.
- Torque arm and arm stop(s) must be adequately designed to handle the forces generated by the motor.
- To achieve up to a 20% increase in coupling load capacity, using a non-petroleum based solvent, clean the shafts and coupling bore to produce a completely lubricant free interface.
- WK Couplings can typically join shafts of different sizes up to a ratio of 2:1. For shaft ratios greater than this, please contact a Fenner Drives Technical Services.

TOLERANCE (T_L)

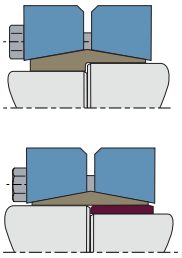
T_L = .003" for shafts up to 1"
.006" for shafts over 1"

d = Shaft diameter machined to d+0/-T_L

Metric hex head locking screws grade 10.9.
(See M_a for install torque.)



Note: Shaft engagement equal for both ends with gap not exceeding 5% of shaft diameter.



WK Couplings can be manufactured to accommodate different shaft diameters; this can also be accomplished using an adaptor sleeve.

WK Series

Part Number	Type	d (in)	D (in)	H (in)	L (in)	e (in)	d_1 (in)	A (in)	Locking Screws Qty	Locking Screws Size	M_a Install Torque (ft lb)	M_t Maximum Transmissible Torque (ft lb)	Ship wt (lb)
HWK0152010	WK 15	5/8	2.047	1.339	1.181	0.079	0.827	1.378	3	M6 x 30	8.7	132	0.9
HWK0152011		11/16										145	0.9
HWK0152012		3/4										158	0.9
HWK0202013	WK 20	13/16	2.362	1.575	1.339	0.118	1.024	1.614	5	M6 x 35	8.7	286	1.4
HWK0202014		7/8										308	1.3
HWK0202015		15/16										330	1.3
HWK0252100	WK 25	1	2.598	1.732	1.496	0.118	1.260	1.890	7	M6 x 35	8.7	492	1.8
HWK0252101		1 1/16										523	1.8
HWK0252102		1 1/8										554	1.7
HWK0302103	WK 30	1 3/16	2.992	1.890	1.654	0.118	1.496	2.126	8	M6 x 40	8.7	668	2.7
HWK0302104		1 1/4										703	2.7
HWK0302106		1 3/8										774	2.6
HWK0402107	WK 40	1 7/16	3.780	2.205	1.969	0.118	1.850	2.638	7	M8 x 45	22	1371	5
HWK0402108		1 1/2										1430	5
HWK0402110		1 5/8										1550	5
HWK0402111		1 11/16										1609	5
HWK0402112		1 3/4										1669	5
HWK0502114	WK 50	1 7/8	4.409	2.676	2.362	0.157	2.283	3.150	10	M8 x 50	22	2554	8
HWK0502115		1 15/16										2639	8
HWK0502200		2										2724	8
HWK0502202		2 1/8										2895	8
HWK0602203	WK 60	2 3/16	4.724	3.071	2.756	0.157	2.598	3.504	12	M8 x 55	22	3576	10
HWK0602204		2 1/4										3678	10
HWK0602206		2 3/8										3882	10
HWK0602207		2 7/16										3984	10
HWK0602208		2 1/2										4087	9
HWK0702209	WK 70	2 9/16	5.826	3.464	3.150	0.157	3.110	4.173	12	M10 x 65	44	6642	19
HWK0702210		2 5/8										6804	19
HWK0702211		2 11/16										6966	18
HWK0702212		2 3/4										7128	18
HWK0702214		2 7/8										7452	17
HWK0802215	WK 80	2 15/16	6.693	4.095	3.701	0.197	3.701	4.961	10	M12 x 80	74	9128	28
HWK0802300		3										9323	28
HWK0802302		3 1/8										9711	27
HWK0802304		3 1/4										10099	26
HWK0802306		3 3/8										10488	26
HWK0902307	WK 90	3 7/16	7.283	4.567	4.173	0.197	4.094	5.433	12	M12 x 80	74	12819	36
HWK0902308		3 1/2										13052	36
HWK0902310		3 5/8										13518	35
HWK0902312		3 3/4										13984	34
HWK0902314		3 7/8										14450	34
HWK1002315	WK 100	3 15/16	7.756	4.960	4.488	0.236	4.488	5.866	15	M12 x 90	74	18354	43
HWK1002400		4										18645	43
HWK1002404		4 1/4										19810	42
HWK1202407	WK 120	4 7/16	9.055	5.984	5.433	0.276	5.276	7.087	12	M16x 110	185	31802	65
HWK1202412		4 3/4										34041	65
HWK1202415		4 15/16										35385	64

NOTE: If your application requires increased torque transmission and/or thrust, use a non-petroleum based solvent to clean both the shafts and the bore of the WK Rigid Coupling to produce an oil free connection. This in turn will result in up to a 20% increase in M_t and Th performance values. Contact Fenner Drives Technical Services for additional details.

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