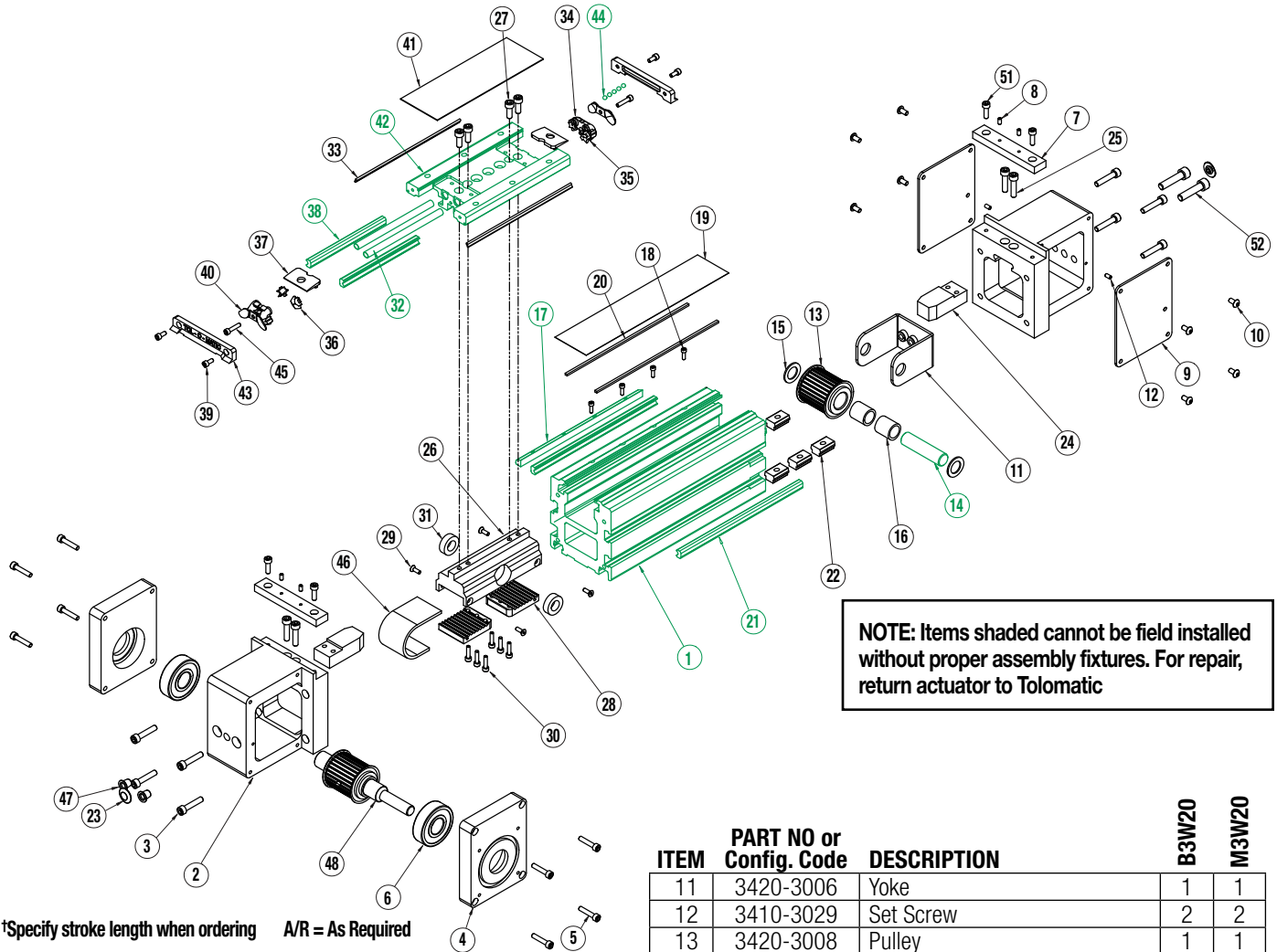


Belt-Drive Actuator, Wedge-Style

B3W20/M3W20 2"/50mm Bore

3600-4154_09

Replaced 3600-4131



*Specify stroke length when ordering A/R = As Required

List of Parts

ITEM	PART NO or Config. Code	DESCRIPTION	B3W20	M3W20
1	3420-3000	Tube	1	1
2	3420-3001	Head	2	2
3	4515-1019	Socket Head Cap Screw	8	8
4	3420-3002	Bearing Plate	2	
	4420-3002	Bearing Plate (metric)		2
5	4415-1022	Socket Head Cap Screw	8	8
6	3420-1417	Bearing	2	2
7	3420-3003	Band Clamp	2	2
8	3410-3029	Set Screw	4	4
9	3420-3004	Cover Plate	2	2
10	4912-1005	Button Head Cap Screw	8	8

ITEM	PART NO or Config. Code	DESCRIPTION	B3W20	M3W20
11	3420-3006	Yoke	1	1
12	3410-3029	Set Screw	2	2
13	3420-3008	Pulley	1	1
14	3420-3009	Idle Shaft	1	1
15	3415-3027	Thrust Washer	2	2
16	3420-3012	Needle Bearing	2	2
17	3420-3020	Wedge	A/R	A/R
18	0605-1045	Socket Head Cap Screw	A/R	A/R
*19	NDBB3W20	New Dust Band (3420-3021)	1	1
*20	NMMB3W20	New Magnet Band, 2 included (3420-3022)	2	2
21	3420-3023	Rail Way	2	2
22	3420-1013	T-Nut	8	
	4420-1013	T-Nut (metric)		8
23	3420-3027	Plug	2	2
24	4420-9219	Bumper	2	2
25	2164-1020	Socket Head Cap Screw	4	4
26	3420-3005	Belt Bracket	1	1

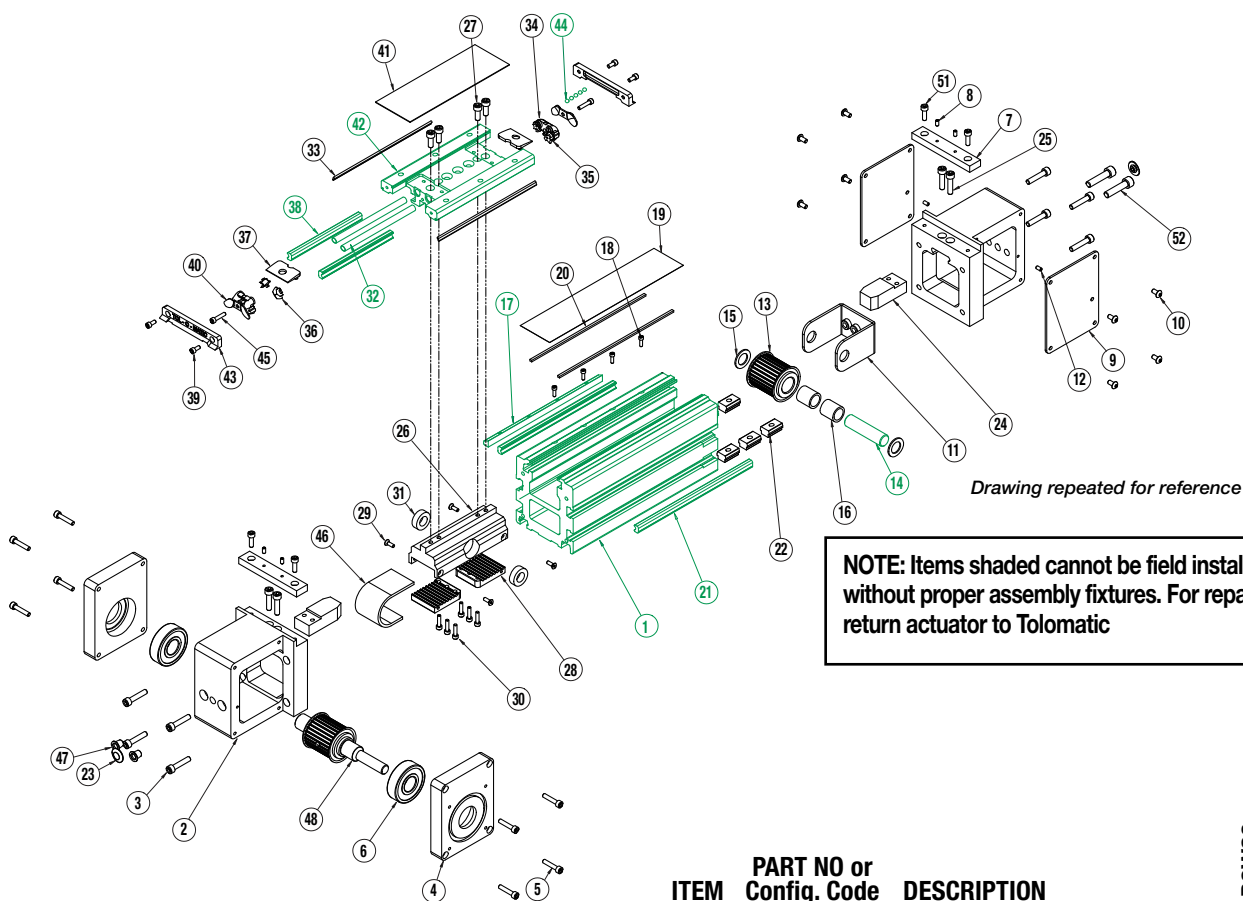
*COMMON REPLACEMENT PARTS:

Ordering replacement belt: To order replacement belt use the following configuration code: **RBB3W20BWS40SK__** (note: the letters SK indicate stroke, follow these letters with the stroke length in decimal inches.) If the actuator has the dual carrier option add the code **DC__** (note: follow the letters DC with the distance between the carriers in decimal inches.)

A **recommended** option to include with the replacement of the belt is the **belt**

tensioning kit. (Kit #3420-9410) To order use the configuration code: **BK** at the end of the configuration string.

It is also recommended to **replace these parts when replacing belt:**
 (#19) **NDBB3W20SK__** Dust Band (3420-3021, indicate stroke length)
 (#39) **0605-1046** Socket Head Cap Screws, quantity 4
 (#44) **3420-2024** End Cap, quantity 2



ITEM	PART NO or Config. Code	DESCRIPTION	B3W20	M3W20
27	4415-1000	Socket Head Cap Screw	4	4
28	3420-3010	Belt Clamp	2	2
29	4410-1713	Flat Head Cap Screw	4	4
30	3212-1025	Socket Head Cap Screw	6	6
31	2410-1008	Magnet Ring	2	2
32	3420-1019	Ball Return Tube	2	2
33	3420-1025	Wiper	2	2
34	3420-1014	Ball Return	2	2
35	3420-1015	Ball Race, Right	2	2
36	3420-1032	Ball Race, Left	2	2
37	3415-1047	Upper Band Ramp	2	2

ITEM	PART NO or Config. Code	DESCRIPTION	B3W20	M3W20
38	3420-1024	Carrier Way	2	2
*39	0605-1046	Socket Head Cap Screw (US std)	4	–
	4415-1001	Socket Head Cap Screw (metric)	–	4
40	3420-1069	PLT, Ball Return	2	2
41	3420-2022	Carrier Cover	1	1
42	3420-2021	Carrier	1	1
	4420-1235	Carrier (metric)	1	1
*43	3420-2024	End Cap	2	2
44	3420-1009	Ball	1	1
45	1085-1075	Socket Head Cap Screw	2	2
*46	RBB3W20	Replacement Belt (3420-3016)	1	1
47	3005-1018	Plug	2	2
48	3420-9401	Driveshaft/Bearing Assembly	1	1
	3420-9402	Driveshaft/Bearing Assy, Dual	1	1
51	4415-1016	Socket Head Cap Screw	4	4
52	4925-1033	Socket Head Cap Screw	2	2

***COMMON REPLACEMENT PARTS:**

Ordering replacement belt: To order replacement belt use the following configuration code: **RBB3W20BWS40SK__** (note: the letters SK indicate stroke, follow these letters with the stroke length in decimal inches.) If the actuator has the dual carrier option add the code **DC__** (note: follow the letters DC with the distance between the carriers in decimal inches.)

A **recommended** option to include with the replacement of the belt is the **belt tensioning kit**. (Kit #3420-9410) To order use the configuration code: **BK** at the end of the configuration string.

It is also recommended to **replace these parts when replacing belt:** (#19) **NDBB3W20SK__** Dust Band (**3420-3021**, indicate stroke length) (#39) **0605-1046** Socket Head Cap Screws (US standard), quantity 4 or **4415-1001** Socket Head Cap Screws (metric), quantity 4 (#44) **3420-2024** End Cap, quantity 2

GENERAL DISASSEMBLY INSTRUCTIONS:

- Remove the Band Clamps (7) to free the ends of the Dust Band (19). If desired the Dust Band (19) can be completely removed by removing both End Caps (43) from the Carrier (42).
- Remove idle head Cover Plates (9). Remove Set Screws (12), then both belt Tension Screws (52).
- Remove any motor mounting hardware to expose the Driveshaft (48). Remove Fasteners (5) holding the drive Bearing Plates (4) on the Head (2).
- Pull one drive Bearing Plate (4) off of the head. It may be necessary to press on one end of the Driveshaft Assembly (48) to push the

Driveshaft Assembly (48) out of the plate. The Bearing Plates (4) are held to the drive Bearings (6) with Loctite 641 retaining compound. Note that the Bearing (6) may come off the Driveshaft (48), in which case the Bearing (6) can then be pressed out of the Bearing Plate (4) from the opposite side.

5. Remove the other Bearing Plate (4) and/or Driveshaft Assembly (48). The Driveshaft Assembly (48) can then be pressed out of the Bearing Plate (4).
6. At the idle end, the Pulley (13), Bearings (16), and Spacers (15) can now be removed by sliding the Idle Shaft (14) out of the Yoke (11).
7. Remove the head Fasteners (3) and the drive end Head (2). Remove the Fasteners (27) to free the Belt Bracket (26) from the Carrier (42). Position the Belt Bracket (26) all the way to the end of Tube (1) where the Head (2) has been removed, to expose all fasteners. Remove the belt clamp Fasteners (29,30), from one end of the Belt (46). The Belt Bracket (26) and the Belt (46) can now be removed from the assembly.
8. Remove the other belt clamp Fasteners (29,30) and remove all hardware from the Belt (46).

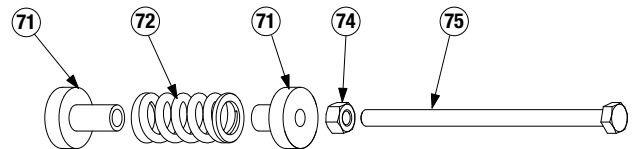
GENERAL ASSEMBLY INSTRUCTIONS:

*Apply Loctite #242 to all fasteners upon installation

1. Slide the Belt (46) through the bottom section of the Tube (1) TEETH FACING UP.
2. Attach both ends of the Belt (46) to the Bracket (26) using the 2 Belt Clamps (28) and the Socket Head Cap Screws (30) through the Belt Clamp (28), and the Flat Head Screws (29) into the sides of the Belt Clamp (28).
3. The teeth of the Belt (46) should mate with the teeth of the Belt Clamp (28), and be inserted into the Belt Clamp (28) as far as possible to maximize engagement of the teeth.
4. *Orientation of Heads (2) on the Tube (1), when viewed from motor end of actuator with primary Carrier (42) up, the wedge side will be to the left.
5. Position the idle Pulley (13) inside the Belt (46) at the end of the Tube (1). Position the Yoke (11) over the Pulley (13), and slide the Idle Shaft (14) through the Yoke (11) such that a Spacer (15) is on either side of the Pulley (13) yet inside the Yoke (11).
6. Position the Head (2) over the Pulley (13)/Yoke (11) and install Head (2) onto Tube (1) with 4 Fasteners (5). Align the Head (2) to the Tube (1) using a flat plate, to ensure that the top of the Head (2) is aligned flush with the top of magnet band surface of the Tube Assembly (1).
7. Start the 2 Tension Screws (52) into the Yoke (11) through the Head (2).
8. Mount the drive Head (2) to the Tube (1) with Fasteners (3).
9. Apply a coating of loctite 641 and primer N to the OD of the Bearing (6) that's located against the shoulder of the Driveshaft (48). Apply a coating of loctite 641 to the ID bore of one of the drive Bearing Plates (4). Install the Bearing (6) into the bore of the Bearing Plate (4) making sure it is completely bottomed out. Wipe away any excess loctite.

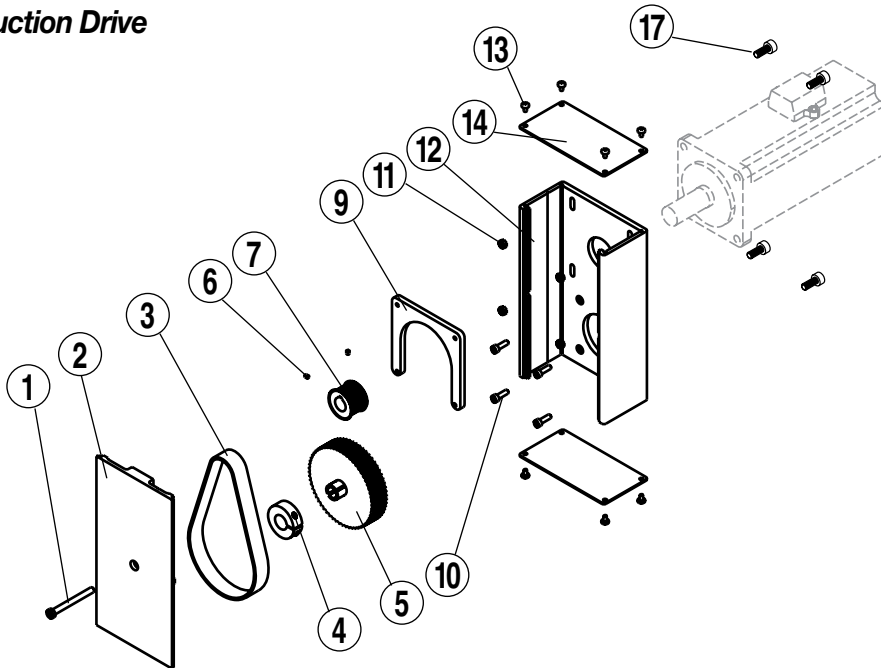
10. Install the Bearing Plate (4)/Driveshaft Assembly (48) onto the drive Head (2) with 4 Fasteners (5), positioning the pulley through the Belt (46). *Note that the center line of the Driveshaft (48) is not symmetrical within top and bottom of the Bearing Plate (4). Install with the Driveshaft (48) nearest the bottom of the Head (2). *The side at which the Driveshaft Assembly (48) is attached to the Head (2) determines left/right drive shaft orientation. Install in the desired orientation.
11. Apply a coating of loctite 641 and primer N to the OD of the exposed Bearing (6). Apply a coating of loctite 641 to the ID of the Bearing Plate (4) bore, and install the non-drive side Bearing Plate (4) onto the Head (2) with 4 Fasteners (5).
12. Insert plastic Plugs (47) into the holes in the end of the drive Head (2).
13. Secure Carrier Assembly (42) to the Belt Bracket Assembly (26). If unit has an auxiliary carrier attach Belt Bracket (26) to the Carrier (42) nearest the motor end.

BELT TENSIONING (Kit #3420-9410):



1. On the belt tension tool ensure that the Nut (74) is positioned on the Tension Screw (75) such that it is making contact with the head of the Tension Screw (75). Thread it into this position as needed.
2. Thread the belt tension tool assembly into the Yoke (11) at the idle end until the face of the Spring Standoff (71) makes contact with the actuator Head (2).
3. While holding the Tension Screw (75) from turning, thread the Nut (74) down the Tension Screw (75) until the Spring Standoff (71) makes contact with the opposing Spring Standoff (71). *Caution: Do not tighten past the point of contact being made. This will result in over tension.
4. Adjust the 2 Tension Screws (52) that hold the Yoke (11) in place. View the Yoke (11) through the side of the Head (2) and snug each fastener such that the Yoke (11) is visually parallel to the bottom surface of the Head (2).
5. Install and tighten down the 2 Set Screws (12) to hold the Tension Screws (52) in place.
6. Remove pressure from the tensioning tool and unscrew its shaft out of the Yoke (11).
7. Install plastic Plug (24) button into hole in end of the idler Head (2).
8. Attach the Bumpers (24) to drive and idler Heads (2) as needed. Note: If there is a machined recess in the bumper assembly it is to be assembled against the surface of the head. *Verify there is no contact between the bumper and belt material when assembled.
9. Replace the ends of the Dust Band (19) to their location and install the Band Clamps (7).

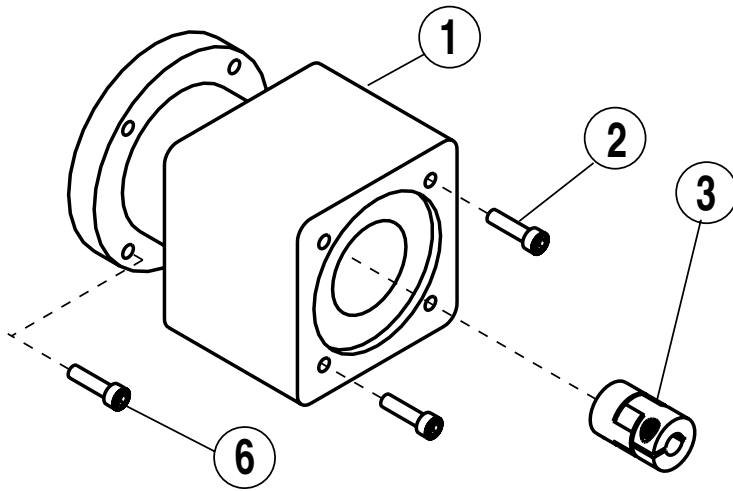
3:1 Reduction Drive



3:1 Reduction Drive Parts Listing

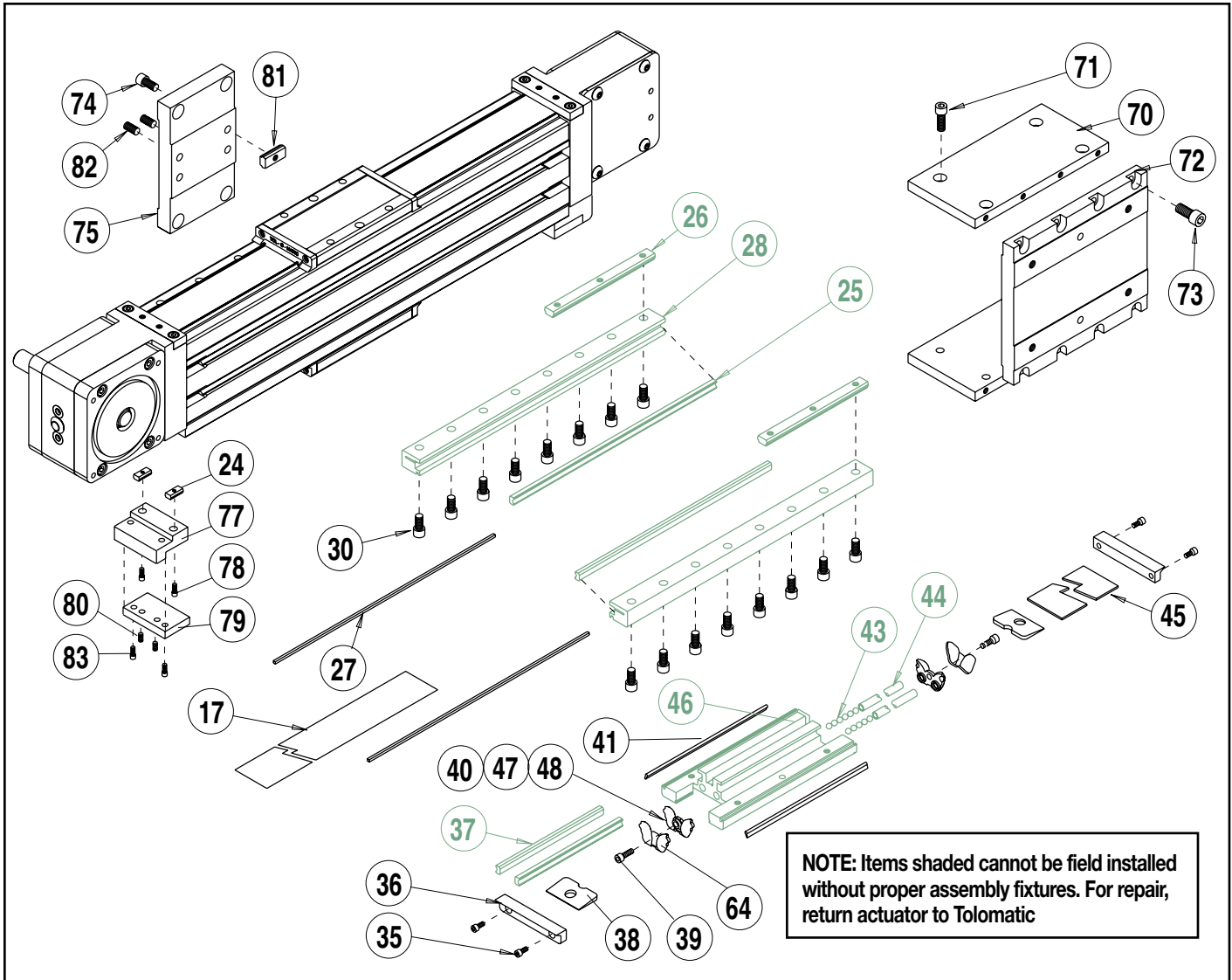
Item	Part No.	Description	B3W20			M3W20		
			MRV21,22,23,24	MRV31,32,33	MRV51	MRV21,22,23,24	MRV31,32,33	MRV51
1.	3420-1641	LHCS, M6 X 1.0, 60 MM LONG	1	1	1	1	1	1
2.	3420-1613	COVER, B3W-23 FRAME	1			1		
	3420-1614	COVER, B3W-34 FRAME		1			1	
	3420-1616	COVER, B3W-51 FRAME			1			1
3.	3415-1441	TIMING BELT, 425-5M-19	1	1		1	1	
	3415-1453	TIMING BELT, 535-5M-19			1			1
4.	0520-1067	CLAMP COLLAR, Ø.688	1	1	1	1	1	1
5.	3415-1439	PULLEY, 60 TEETH, 19MM WIDTH	1	1	1	1	1	1
7.	3415-1438	PULLEY, 20 TEETH, 19 MM WIDTH	1	1		1	1	
	3420-1438	PULLEY, 20 TEETH, 19 MM WIDTH			1			1
9.	0602-1057	PLATE, MOTOR, 34 FRAME		1			1	
	3420-1625	PLATE, MOTOR, 51 FRAME			1			1
10.	3420-1229	BHCS, TORX #10-24 x .50	4	4	4			
	3420-1645	LHCS, M5 X 0.8, 16 MM LONG				4	4	4
11.	0603-2089	NUT, HEX, M5 X 0.8	4			4		
12.	3420-1603	HOUSING, B3W-23 FRAME	1			1		
	3420-1604	HOUSING, B3W-34 FRAME		1			1	
	3420-1606	HOUSING, B3W-51 FRAME			1			1
13.	0601-1625	SCREW, #6 X .25, SELF-TAPPING	8	8	8	8	8	8
14.	3420-1602	END CAP	2	2	2	2	2	2
17.	2212-1098	SHCS, M5 X 0.8, 20 MM LONG	4			4		
	2212-1099	SHCS, M5 X 0.8, 25 MM LONG		4			4	
	3420-1638	SHCS, M8 X 1.25, 35 MM LONG			4			4

Direct Drive



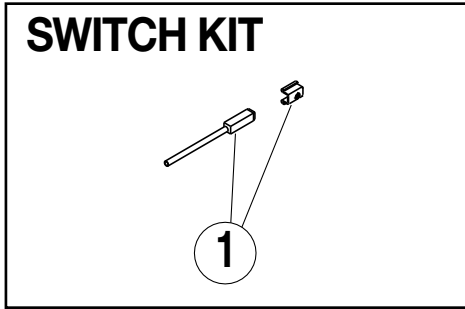
Direct Drive Parts Listing

Item	Part No.	Description	Gearhead				
			MRV34X	MRV23, W/GHJ20, GHJ21, GHK20	MRV 34_, W/GHJ30	MRV34, W/GHJ30, GHJ31, GHK30	MRV34, W/GHJ31
1.	3410-1453	Motor Adapter, Mach, B3W			1	1	1
	3410-1455	Motor Adapter, Mach, B3W		1			
	3410-1456	Motor Adapter, Mach, B3W		1			
2.	0910-1314	SHCS, #10-24 x 0.75, BLK	4	4	4	4	4
3.	3420-9041	Coupler	1	1	1	1	1
6.	4415-1020	SHCS, M5 x .8 x 20, BLK	4	4	4	4	4
	1024-7711	SHCS, #10-24 x .88, BLK	4	4	4	4	4



Parts Listing

Item	B3W20D Part No.	M3W20D Part No.	Description	QTY.	Item	B3W20D Part No.	M3W20D Part No.	Description	QTY.
17.	3420-1424	3420-1424	Dust Band	1	46.	3420-2021	4420-1235	Machined Carrier	1
24.	3420-1013	4420-1013	Nut, B320 / M320	4	47.	3420-1015	3420-1015	Right Ball Race	2
25.	3420-1426	3420-1426	Rail Way	2	48.	3420-1032	3420-1032	Left Ball Race	2
26.	3420-1428	4420-1428	Rail Nut	AR	64.	3420-1069	3420-1069	PLT Ball Return	2
27.	3420-1425	3420-1425	Band Magnet	2	70.	3420-1049	4420-1049	Plate, Conn., Dual Carrier	2
28.	3420-1427	3420-1427	Machined Rail	2	71.	0920-1093	4415-1019	Socket Head Cap Screw	8
30.	3420-1077	4415-1018	Socket Head Cap Screw	AR	72.	3420-1446	4420-1446	Plate, Dual Carrier	1
35.	0605-1046	4415-1001	Socket Head Cap Screw	4	73.	0920-1093	4415-1019	Socket Head Cap Screw	8
36.	3420-2024	3420-2024	End Cap	2	74.	2317-1015	4920-1025	Socket Head Cap Screw	4
37.	3420-1024	3420-1024	Carrier Way	2	75.	3420-1453	3420-1453	Tube Support	1
38.	3415-1047	3415-1047	Upper Band Ramp	2	77.	3420-1448	4420-1448	PLT, Band, Dual 180° Carrier	2
39.	2307-1021	4418-1018	Socket Head Cap Screw	2	78.	0920-1093	4920-1048	Socket Head Cap Screw	4
40.	3420-1014	3420-1014	Ball Return	2	79.	3420-1404	4420-1404	Clamp, Dust Band	2
41.	3420-1025	3420-1025	Wiper	2	80.	2317-1062	4915-1044	Set Screw	4
43.	3420-1009	3420-1009	Ball	92	81.	3420-1013	4420-1013	Nut	4
44.	3420-1019	3420-1019	Ball Return Tube	2	82.	3415-1219	3415-1219	Set Screw	2
45.	3420-2022	3420-2022	Carrier Cover	1	83.	0707-1010	4415-1016	Socket Head Cap Screw	4



ITEM	B3W15 PART NO.	M3W15 PART NO.	DESCRIPTION	QTY.
1.			SWITCH KIT	
CONFIG. CODE ORDERING				
	CODE	DESCRIPTION		
	BT	Switch Kit, Reed, Form C, 5m		
	BM	Switch Kit Reed, Form C, Quick Disconnect		
	RT	Switch Kit, Reed, Form A, 5m		
	RM	Switch Kit, Reed, Form A, Quick Disconnect		
	CT	Switch Kit, Triac, 5m		
	CM	Switch Kit, Triac, Quick Disconnect		
	KT	Switch Kit, Hall-effect, Sinking, 5m		
	KM	Switch Kit, Hall-effect, Sinking, Quick Disconnect		
	TT	Switch Kit, Hall-effect, Sourcing, 5m		
	TM	Switch Kit, Hall-effect, Sourcing, Quick Disconnect		
NOTE: Switch bracket, set screw, & mating QD cable is included				

2. **Switches.** Secure Switch (1) to magnet side of Tube with Switch Clamp (2) and Set Screw.

3. **SWITCHES REED SWITCHES**

NOTE: Form A Reed Switches should not be used in TTL logic circuits. A voltage drop caused by the L.E.D. indicator will result. For applications where TTL circuits are used, please contact the factory.

WARNING: An ohmmeter is recommended for testing Reed Switches. NEVER use an incandescent light bulb as a high current rush may damage the switch.

TO ORDER RETROFIT KITS:

SW then the model number and base size, and code for type of switch needed:

EXAMPLE: SWB3W20RM

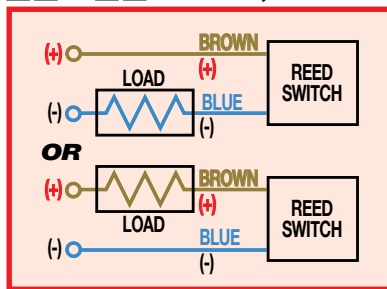
Where SW is the switch, B3W20 is the 2 inch size, and RU is a Form A Reed Switch with quick disconnect and 5 meter lead

All switch kits include 1 switch and mounting hardware

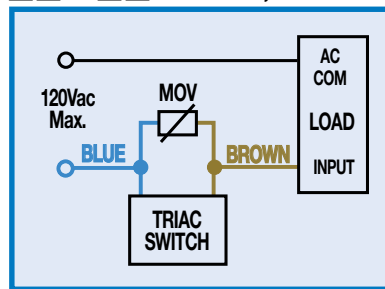
Reed and TRIAC switches are only recommended for signalling position, not directly powering solenoids. For shifting a solenoid, a relay or resistor is recommended between it and the Reed Switch. Switch ratings must not be exceeded at any time.

WIRING DIAGRAMS

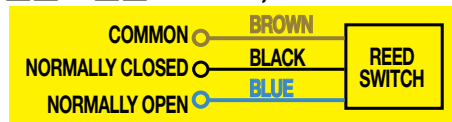
RT & RM DC REED, FORM A



CT & CM AC REED, TRIAC

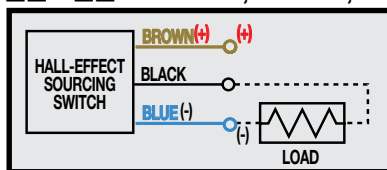


BT & BM DC REED, FORM C

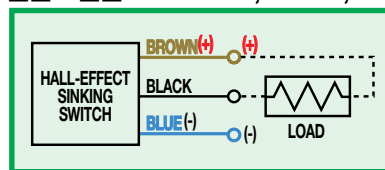


Some actuators may require switch mounting on a specific side of the assembly. Call Tolomatic for details.

TT & TM HALL-EFFECT, SOURCING, PNP



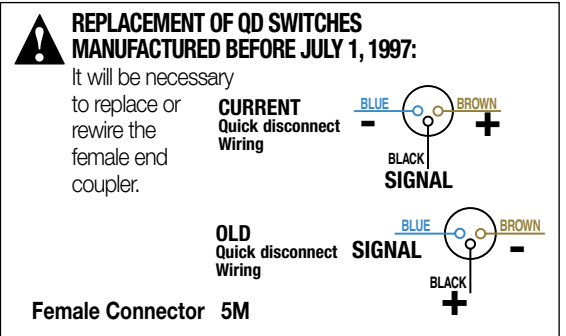
KT & KM HALL-EFFECT, SINKING, NPN

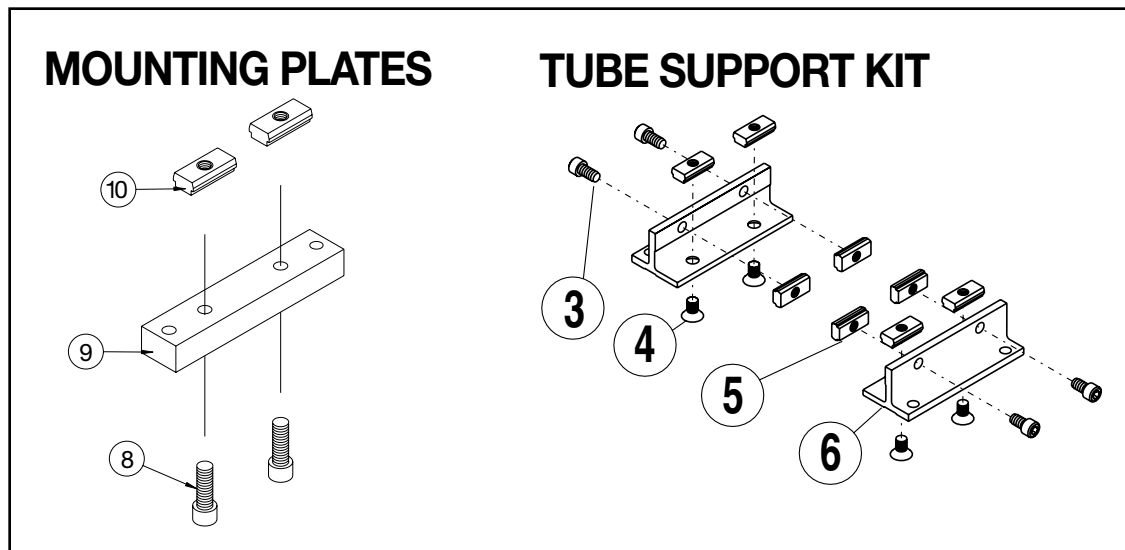


INSTALLATION INFORMATION



THE NOTCHED FACE OF THE SWITCH INDICATES THE SENSING SURFACE AND MUST FACE TOWARD THE MAGNET.





TUBE SUPPORT KIT					
3.	2317-1015	4415-1011	SHCS, 5/16-18 x .63/MB x 1.25 x 12	4	
4.	3415-1046	4415-1014	SFHCS, 1/4-20 x .44/M6 x 1 x 10	4	
5.	3420-1013	4420-1013	B3W20 Nut	4	
6.	3420-1044	3420-1044	Tube Support	2	
MOUNTING PLATES					
8.	2307-1018	2307-1018	SHCS, 5/16-18 x 0.63	4	
		4415-1018	4415-1018	SHCS, M8 x 1.25 x 18	4
9.	3420-1232	3420-1232	Mounting Plate, B3W, 0.50	2	
10.	3420-1013		Nut	4	
		4420-1013	Nut, Metric	4	

OPTIONAL ACCESSORY ASSEMBLY INSTRUCTIONS

1. TUBE SUPPORTS. Four T-Nuts (5) are required on each side of the Tube (30), two T-Nuts on bottom of Tube and two in lower slots on tube sides. Tube Supports should be secured at the required distances determined for the application to prevent Tube deflection. Apply Loctite #242 to Screws (4) and secure Tube Supports (6) to Tube aligning holes in T-Nuts with holes in Tube Supports.

Bearing lubrication

The bearing system is pre-lubricated at the factory with Mobil HP grease. Re-lubrication is recommended every .5-1 million cycles using a lithium-soap base grease for optimal bearing performance. To re-lubricate, remove Set Screws (8) and SHCS (51), Band Clamp (7). Lift back Dust Band (19) and apply grease directly to the stationary ball ways.

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COMPANY WITH
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