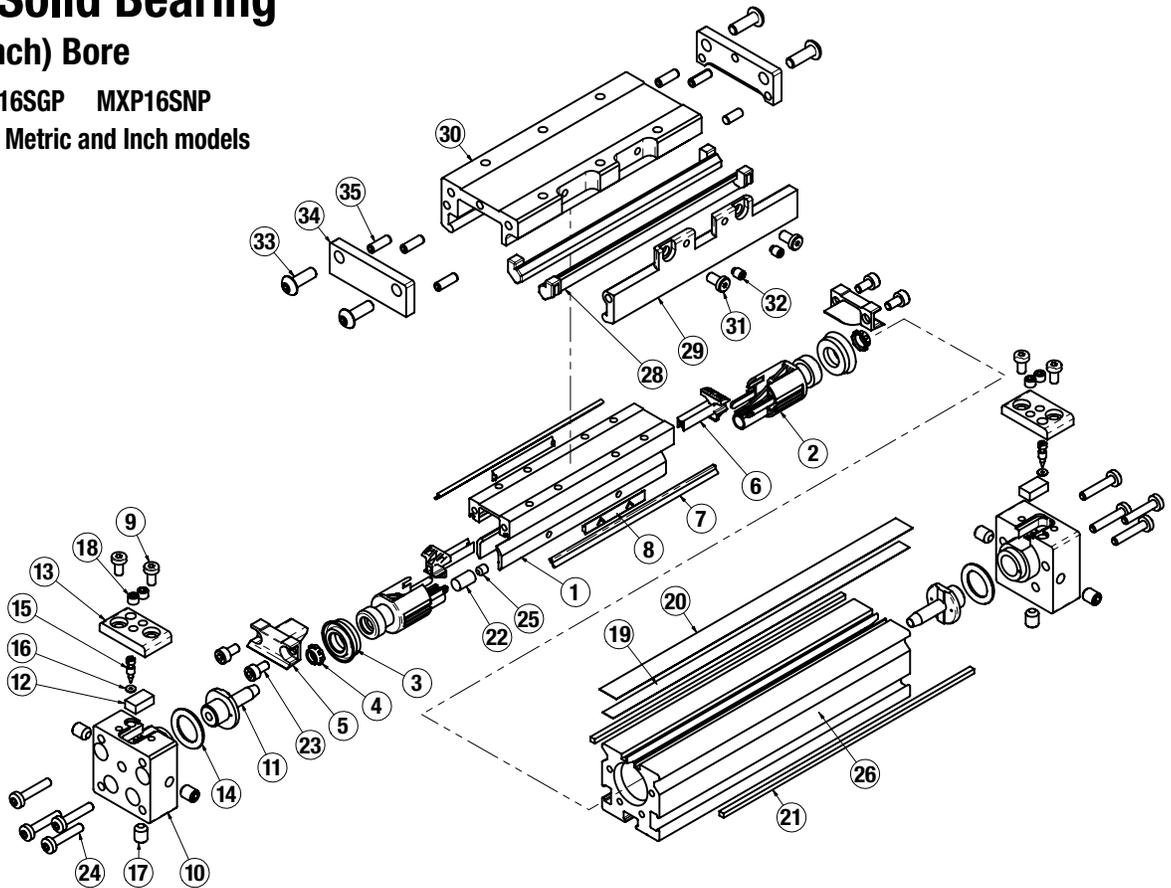


### MXP16S Solid Bearing

16mm (5/8 inch) Bore

Models: MXP16SGP MXP16SNP  
Both Metric and Inch models



ITEM	PART NO. or CONFIG. CODE	DESCRIPTION	QTY.
1	8116-1512	Piston Bracket (Inch)	1
	8116-1012	Piston Bracket (Metric)	1
2	8116-1005	Piston	2
3 <sup>1</sup>	6906-1024	U-Cup	2
4 <sup>1</sup>	6906-1022	Cushion Seal	2
5 <sup>1</sup>	8116-1006	End Cap	2
6 <sup>1</sup>	8116-1007	Band Ramp	2
7 <sup>1</sup>	8116-1059	Wiper	2
8	8116-1028	Bearing, Plastic	2
9 <sup>2</sup>	8125-1022	Low Head Cap Screw	4

ITEM	PART NO. or CONFIG. CODE	DESCRIPTION	QTY.
10 <sup>2</sup>	8116-9001	Head Assy, Metric Mount, Inch Port	2
	8116-9501	Head Assy, Inch Mount, Inch Port	2
	8116-9007	Head Assy, Metric Mnt, Metric Port	2
	8116-9507	Head Assy, Inch Mount, Metric Port	2
11 <sup>2</sup>	6906-1023	Cushion Spear	2
12 <sup>2</sup>	8116-1039	Clamp, Seal Band	2
13 <sup>2</sup>	8116-1032	Clamp, Dust Band	2
14 <sup>1,2</sup>	6906-1065	O-Ring	2
15 <sup>2</sup>	6906-1026	Needle Cushion Screw	2
16 <sup>2</sup>	0912-1101	O-Ring	2

<sup>1</sup> Parts included in Repair Kits RKMXP16SSK (inch) & RKMXP16SSM (metric).

**Ordering method:**

<sup>3</sup> Replacement Seal Band  Seal Band  
 NSB MXP16 S  SK or  SM or  DW   
**EXAMPLE:** NSB MXP16 S SK21-25 DW7

<sup>4</sup> Replacement Dust Band  Dust Band  
 NDB MXP16 S  SK or  SM or  DW   
**EXAMPLE:** NDB MXP16 S SK21-25 DW7  
 Dust Band      Model & Size      Bearing      Stroke Length Aux. Carrier

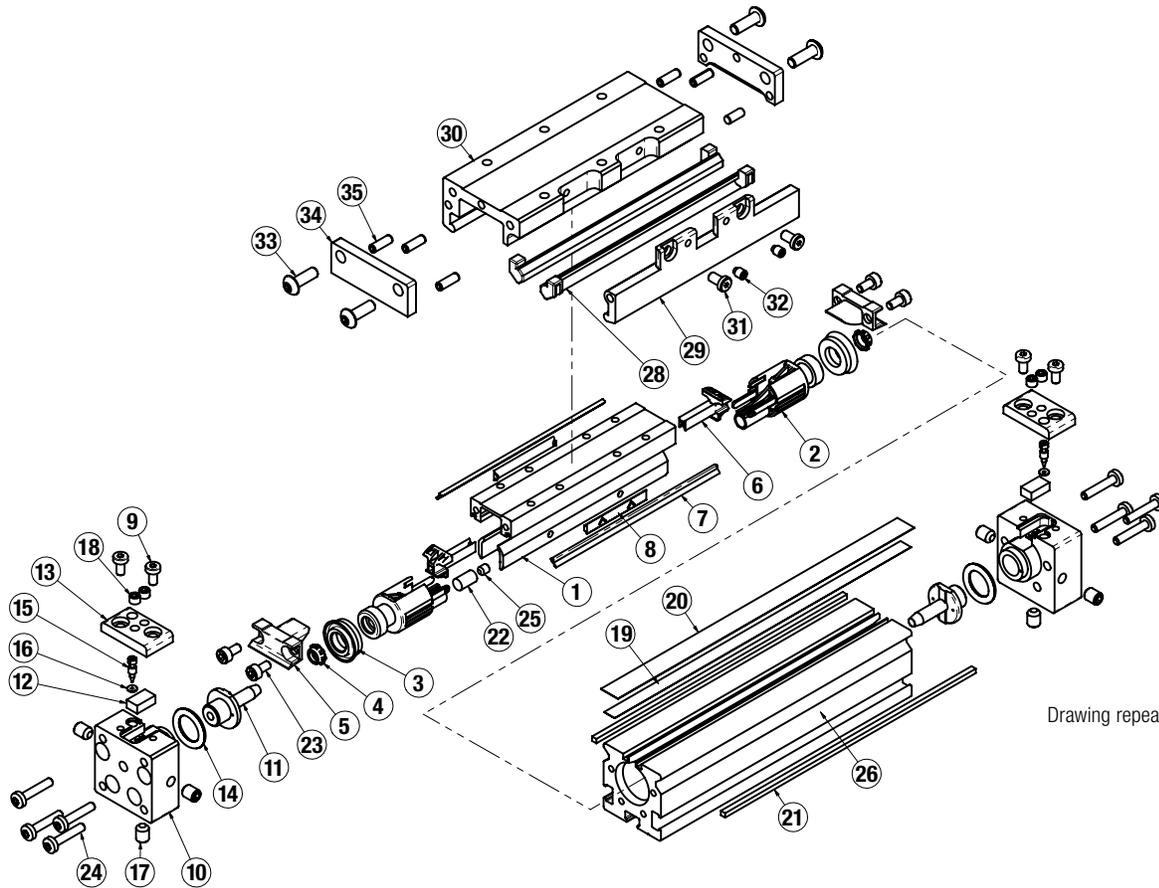
<sup>2</sup> Parts included in Head Assemblies (10).

**Ordering method:**

<sup>5</sup> Replacement Magnet Band  Magnet Band  
 For long stroke lengths the magnet band is shipped in multiple pieces  
 NMB MXP16 S  SK or  SM or  DW   
**EXAMPLE:** NMB MXP16 S SK21-25 DW7

<sup>6</sup> Replacement Tube  Tube  
 RTB MXP16 S  SK or  SM or  DW   
**EXAMPLE:** RTB MXP16 S SK21-25 DW7  
 Tube      Model & Size      Bearing      Stroke Length Aux. Carrier

**Auxiliary Carrier Option Note:** If replacing a Seal Band (19.), Dust Band (20.), Magnet Band (21.), or Tube (26.) on an actuator that has an Auxiliary Carrier, be sure to add "DW \_\_\_" to the end of the configuration string when ordering. "DW" indicates the need for additional length and "\_\_\_" indicates the measurement of space between carriers (in inches [SK] or millimeters [SM] as indicated earlier in the configuration string).



Drawing repeated for reference

ITEM	PART NO. or CONFIG. CODE	DESCRIPTION	QTY.
17 <sup>2</sup>	5910-1008	Set Screw (Inch)	6
	7906-1029	Set Screw (Metric)	6
18 <sup>2</sup>	8116-1071	Set Screw	4
19 <sup>1,3</sup>	NSBMXP16S	Replacement Seal Band (8116-1017) Specify Stroke	A/R
20 <sup>1,4</sup>	NDBMXP16S	Replacement Dust Band (8116-1018) Specify Stroke	A/R
21 <sup>5</sup>	NMBMXP16S	Replacement Magnet Band (8116-1019) Specify Stroke	2A/R
22	8116-1008	Magnet, Disc	1
23	0601-1038	Socket Head Cap Screw	4
24 <sup>2</sup>	8316-1022	Head Screw	8
25	7906-1029	Set Screw	1
26 <sup>6</sup>	RTBMXP16S	Replacement Tube (8116-1010) Specify Stroke	A/R

ITEM	PART NO. or CONFIG. CODE	DESCRIPTION	QTY.
28	8116-1030	Plain Bearing	2
29	8116-1514	Carrier, Lower (Inch)	1
	8116-1014	Carrier, Lower (Metric)	1
30	8116-1513	Carrier, Upper (Inch)	1
	8116-1013	Carrier, Upper (Metric)	1
31	8116-1515	Lock Screw (Inch)	2
	8125-1022	Lock Screw (Metric)	2
32	8116-1575	Tension (Set) Screw (Inch)	2
	8116-1075	Tension (Set) Screw (Metric)	2
33	8140-1075	Button Head Cap Screw	4
34	8116-1015	End Cap	2
35	3417-1451	Dowel Pin	6

<sup>1</sup> Parts included in Repair Kits RKMXP16SSK (inch) & RKMXP16SSM (metric).

<sup>2</sup> Parts included in Head Assemblies (10).

**Ordering method:**

<sup>3</sup> Replacement Seal Band **NSB MXP16 S** **SK** or **SM** or **DW**  
**EXAMPLE: NSB MXP16 S SK21-25 DW7**

<sup>4</sup> Replacement Dust Band **NDB MXP16 S** **SK** or **SM** or **DW**  
**EXAMPLE: NDB MXP16 S SK21-25 DW7**  
 Dust Band      Model & Size      Bearing      Stroke Length      Aux. Carrier

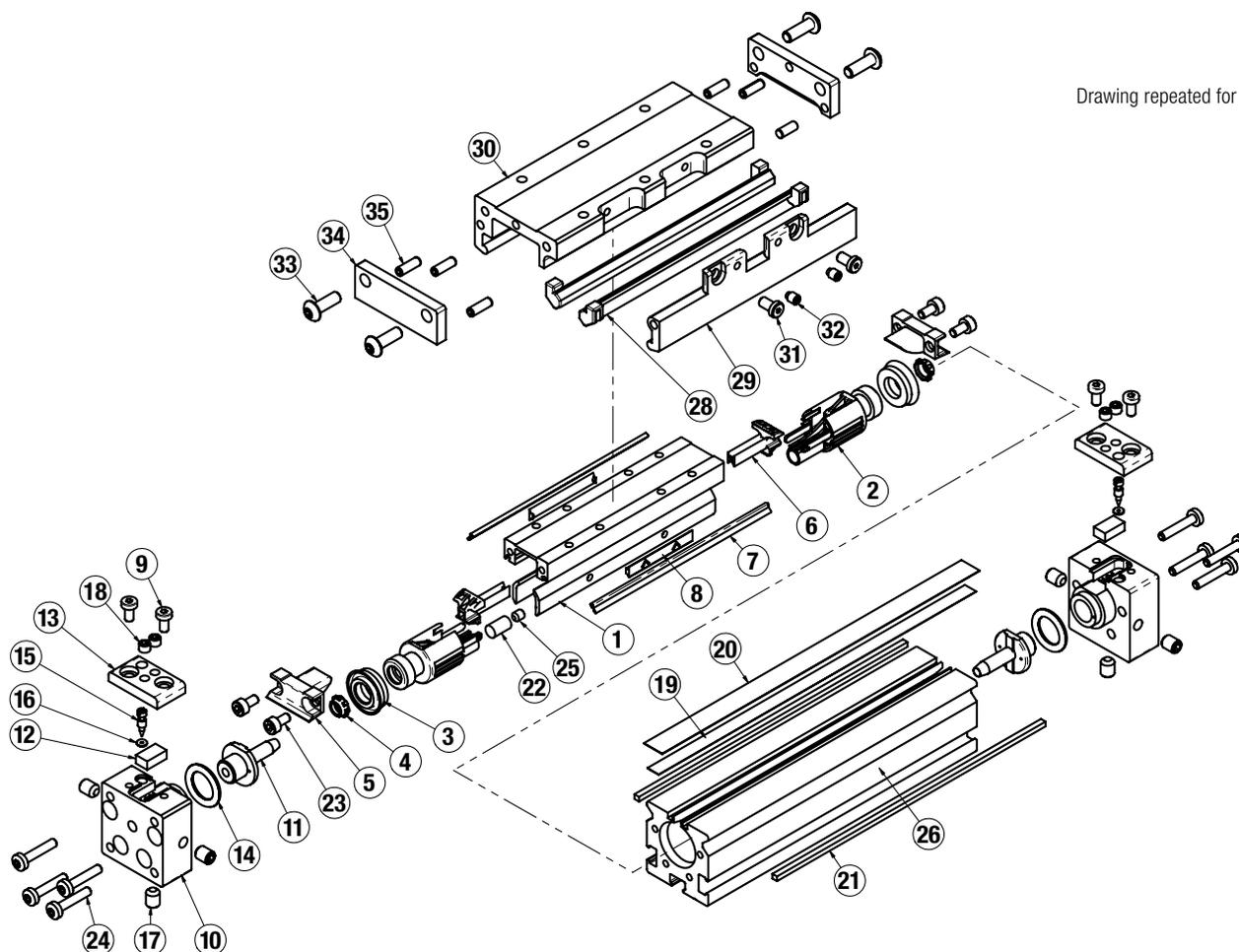
**Ordering method:**

<sup>5</sup> Replacement Magnet Band **NMB MXP16 S** **SK** or **SM** or **DW**  
 For long stroke lengths the magnet band is shipped in multiple pieces **EXAMPLE: NMB MXP16 S SK21-25 DW7**

<sup>6</sup> Replacement Tube **RTB MXP16 S** **SK** or **SM** or **DW**  
**EXAMPLE: RTB MXP16 S SK21-25 DW7**  
 Tube      Model & Size      Bearing      Stroke Length      Aux. Carrier

**Auxiliary Carrier Option Note:** If replacing a Seal Band (19.), Dust Band (20.), Magnet Band (21.), or Tube (26.) on an actuator that has an Auxiliary Carrier, be sure to add "DW \_\_\_" to the end of the configuration string when ordering. "DW" indicates the need for additional length and "\_\_\_" indicates the measurement of space between carriers (in inches [SK] or millimeters [SM] as indicated earlier in the configuration string).

Drawing repeated for reference



### CYLINDER DISASSEMBLY INSTRUCTIONS

Begin with a clean work area. Make sure all replacement parts are available and have no visual damage or defects. The following tools and materials are recommended for proper disassembly and assembly. (Exact wrench sizes will vary depending on cylinder size.)

- Allen wrench set (English and Metric)
- Torx wrench set
- Small straight edge screwdriver
- Socket wrench & socket set
- Needle nose pliers
- Tin snips
- Razor Blade
- RheoGel TEK664 grease

For best actuator performance it is recommended that the following instructions be read and followed carefully.

#### 1. REMOVE BAND CYLINDER FROM MACHINERY

Remove all mounting hardware and air connections, if present, from the Cylinder Heads (10) and/or Carrier (30).

#### 2. REMOVE CARRIER FROM CYLINDER

Remove Low Head Cap Screws (31), Set Screws (32) and Button Head Screws (33). Pull End Caps (34) from Upper (30) and Lower (29) Carrier. Pins (35) are loose fit and can be removed. **DO NOT LOSE PINS!** Remove Upper and Lower Carriers from cylinder.

#### 3. REMOVE BAND CLAMPS

Loosen Set Screws (18) on Dust Band Clamp (13). Remove Screws (9) from Cylinder Heads (10). Remove Seal Band Clamp (12) from

between Dust Band (20) and Seal Band (19). Repeat for other Cylinder Head.

#### 4. REMOVE DUST BAND

Remove End Caps (5) from both ends of the Piston Bracket (1) by removing Screws (23). To remove Dust Band (20), lift one end and pull the Band through the Piston Bracket. The Band is magnetically retained so some resistance will be present when removing.

#### 5. REMOVE HEADS

Remove the four Head Screws (24) to free each Cylinder Head (10). Remove each Head by rocking it up and down until the Head is free from the Cylinder Tube (26). **DO NOT TWIST!** Remove the O-ring (14) from both Heads with a small straight edge screwdriver.

#### 6. REMOVE SEAL BAND

**⚠ CAUTION:** Sealing Band edges are sharp. Grasp the top and bottom of the Band when removing, not the edges.

Slide Piston Bracket (1) out of the Cylinder Tube (26). Remove the Sealing Band (19) through the slot in the Tube.

#### 7. DISASSEMBLE PISTON BRACKET

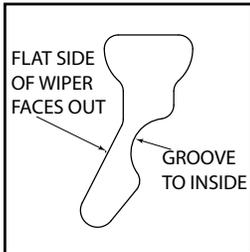
Remove Wipers (7) from the Piston Bracket (1). With a small straight edge screwdriver, remove the U-Cups (3) from both Pistons (2). Remove the Cushion Seal (4) from each Piston. Remove the Pistons (2) by inserting a small allen wrench into the holes on each side of Piston Bracket (1) to disengage the Pistons. With a small screwdriver, remove the Band Ramps (6) and the Plastic Bearings (8) by disengaging the side retaining tabs for each. Keep the Piston Bracket (1) and the two Pistons (2) for reassembly.

**CYLINDER ASSEMBLY INSTRUCTIONS****1. CLEAN AND LUBRICATE**

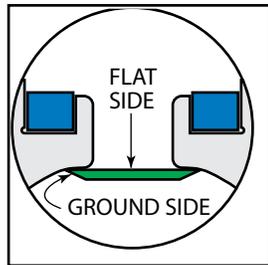
Thoroughly clean all components, particularly the Tube Bore, Tube Slot, Sealing Band and Dust Band. Thoroughly lubricate the Tube Bore with a thin, uniform layer of RheoGel TEK664 grease.

**2. PISTON BRACKET ASSEMBLY**

With the Piston Bracket (1) in hand, install the Band Ramps (6), with small end down, so the ends on each side snap into the hole of the Piston Bracket. Install one Plastic Bearing (8) on each side of Piston Bracket and between the Band Ramps by snapping ends into holes. Note, install Plastic Bearings with arrows pointing up. Install the Pistons (2) into the Piston Bracket (1), with Band Ramp up, until Piston snaps into hole in Piston Bracket. Install new lubricated U-Cups (3) (seal lips facing out), and Cushion Seals (4) (small end facing out). Slide new Wipers (7) into the groove on the Piston Bracket (1) until flush with end. Trim off excess flush to other end of Piston Bracket. Wipers need to be installed with the flare edges facing outward.

**3. INSTALL INNER SEAL BAND**

**CAUTION:** Metal edges of Sealing Band are sharp. Exercise caution to avoid injury to yourself while installing. Handle Sealing Band with care. Do not damage edges while handling.



Insert Sealing Band (19) into Cylinder Tube (26) by laying the Band out along the length of the actuator and passing it sideways through the slot in Tube. With flat side facing up (ground side facing down), position the Band so the length of band sticking out the end of the Tube is as long as Piston Assembly. (5 - 10 inches or 12 - 25 cm)

**4. INSTALL PISTON ASSEMBLY**

Place generous amounts of grease around bore of Tube (26) and on exterior surfaces of both Pistons (2), U-Cups (3), Band Ramps (6) and Plastic Bearings (8). Use the 6-inch length of Seal Band included with repair kit, or a short length of the old Seal Band, slightly kink the Band upwards, one inch (25mm) from the end. Insert into slot between the Band Ramp (6) and Piston (2) on the Piston Bracket (1), and stop against opposite end of the Piston Bracket and up the short length of inserted Band. Once the Seal Band is through the Piston Bracket, remove the short length of band material and discard.

Grasp the Piston Bracket while holding the Wipers in place with your fingers. Flare the Wiper edges out, while inserting the Piston Bracket partway into the Tube. Do not force the Piston Bracket. Place a finger over the opposite end of the Piston Bracket to keep the Wipers in place, while pushing the remainder of the Piston Bracket into the Tube (26). With the Piston Assembly experiences resistance, use a small screwdriver to press in the ends of the Band Ramps (6) and the Plastic Bearings (8) where it enters the Tube. With the Piston Assembly in place, slide the length of the Tube until the end of the Piston just extends out of the Tube. Wipe off any excess grease from the end of the Piston and Tube. Position Piston Assembly so it is fully engaged in the Tube.

**Note:** If Tube and Piston Assembly were greased properly, excess grease should be present as the Piston exits the end of the Tube. If there is no excess grease present, remove the Piston Assembly and re-grease the Tube, then re-install the Piston Assembly.

**5. INSTALL HEADS**

**CAUTION:** Twisting the Head (10) during installation may cut the O-ring (14) resulting in excessive leakage during operation.

Install new lubricated O-Ring (14) onto each Head (10). Position Piston Assembly near the end of the Tube in which the Head is being installed. Position the Seal Band (19) so .394" (10mm) is protruding from the end of the Tube (26) and centered with the slot in the Tube. With black marker, make vertical line where the Seal Band intersects with the Tube and a horizontal line at the center of the Seal Band and slot. Install Head into Tube using a slight up and down rocking motion (not side-to-side or twisting) until the Head is flush with the end of the Tube. Secure Head to Tube by installing Head Screws (24) applying a torque of 10 in-lbs (1.13 N-m). Verify horizontal mark on Seal Band is still centered to the Tube slot. If not, remove Head and try again until centered. Verify vertical mark on Seal Band is still aligned with end of Tube. If not, use needle nose pliers to pull on Seal Band until properly located.

Move Piston Assembly to other end of the Tube and repeat the steps above to install the other Head. Trim Seal Band with tin snips if needed to achieve .394" (10mm) from end of Tube.

Once 2nd Head is properly installed, verify the horizontal and vertical marks on Seal Band on 1st Head did not move. If moved, use needle nose pliers to properly locate Seal Band for both Heads.

**6. INSTALL DUST BAND**

Position the Piston Assembly at mid-stroke of cylinder. Slide Dust Band (20) through the upper slot of Piston Bracket (1) and lay on top of the Cylinder Tube slot. Position the Dust Band .394" (10mm) from each end of Tube. Install End Caps (5) using Screws (23) into ends of Piston Bracket (1).

**7. SECURE SEAL AND DUST BANDS**

In the Head (10) slot, place Seal Band Clamp (12) between Seal Band (19) and Dust Band (20) positioning end of Seal Band Clamp against end of Tube (26). Place Dust Band Clamp (13) onto Head (10) so there is access to the Cushion Needle (15) then secure using Screws (9). Tighten both Set Screws (18) to secure Dust Band. Repeat to secure other end.

**8. CHECK ASSEMBLY**

Manually push the Piston Assembly back and forth along the entire length of stroke to make certain that the cylinder is properly assembled before reconnecting to the pneumatic supply. The Piston Assembly should move consistently with minimal friction along the stroke. The Dust Band should not kink at end of stroke. If it does, loosen Set Screws (18) until kinking is eliminated and retighten.

**9. INSTALL THE CARRIER**

Verify existing or new Bearings (28) are properly snapped onto the Upper Carrier (30) and Lower Carrier (29). Place Upper Carrier on the Piston Bracket (1) with Bearing (28) aligned with groove on Tube. Insert two Pins (35) into each side of Upper Carrier. Place one Pin (35) into each end of the Lower Carrier. Align Lower Carrier with Upper Carrier and hold together by hand while installing End Caps (34). Pins align with End Caps. Secure End Caps with Button Head Screws (33). The Piston Assembly should be captured by the Carrier. Start threads for Low Head Screws (31) and Set Screws (32), do not tighten.

*(continues)*

**10. TENSION THE CARRIER**

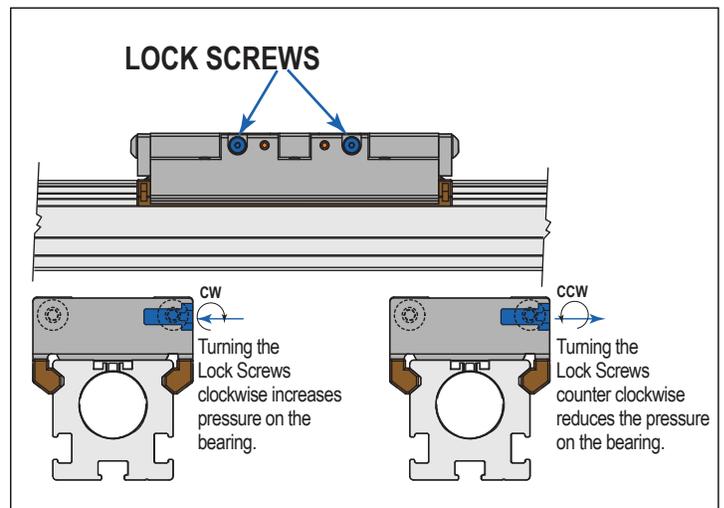
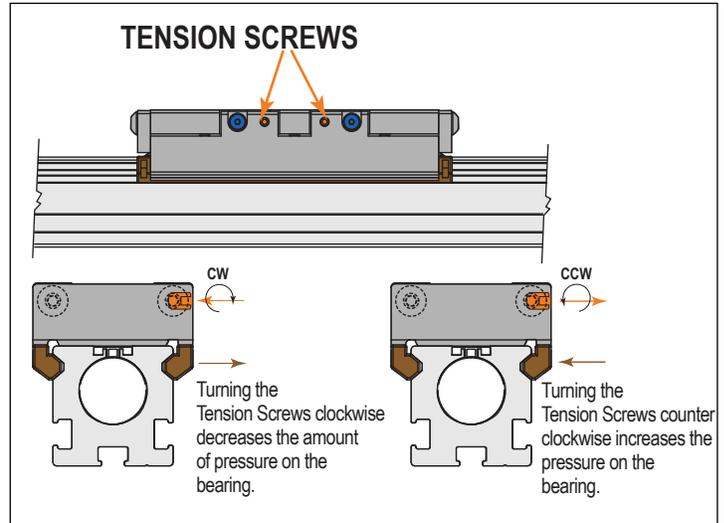
The MX Solid Bearing Carrier will provide best performance when properly adjusted. The Carrier design contains both Tension and Lock Screws. The Tension Screws control the amount of pressure placed on the Carrier Bearing. The Lock Screws lock the Tension Screws in place and provide fine adjustment of the Carrier Bearing.

- Fully loosen all Tension (32) and Lock Screws (31) so they are not engaged with the Bearing.
- Tighten Tension Screws (32) into Carrier roughly 1/8 turn clockwise past where the Set Screw starts to feel snug. The Carrier should be difficult or impossible to move by hand. If not, turn each set screw another 1/8 of a turn clockwise until Carrier is difficult to move.
- Adjust the Lock Screws (31) on Carrier roughly 1/8 turn clockwise past where the Screw starts to engage. The Carrier will feel loose but should not rock side-to-side. To correct this, loosen Lock Screws (31) about 1/16 of a turn. If the Carrier becomes too snug, tighten the Lock Screws (31) another 1/8 of a turn.
- Ideal Carrier tension is achieved when the Carrier feels snug in relation to the Tube, yet can be moved by hand. No rocking motion should be present. The Carrier should also be loose enough to be moved by hand over the entire length of the actuator. If after this process the Carrier has become too loose, equally adjust all of the Lock Screws (31) with a slight 1/32 turn counter-clockwise. A Carrier that is adjusted too tight will increase the breakaway pressure required for motion and in extreme cases no motion will occur when air is applied.

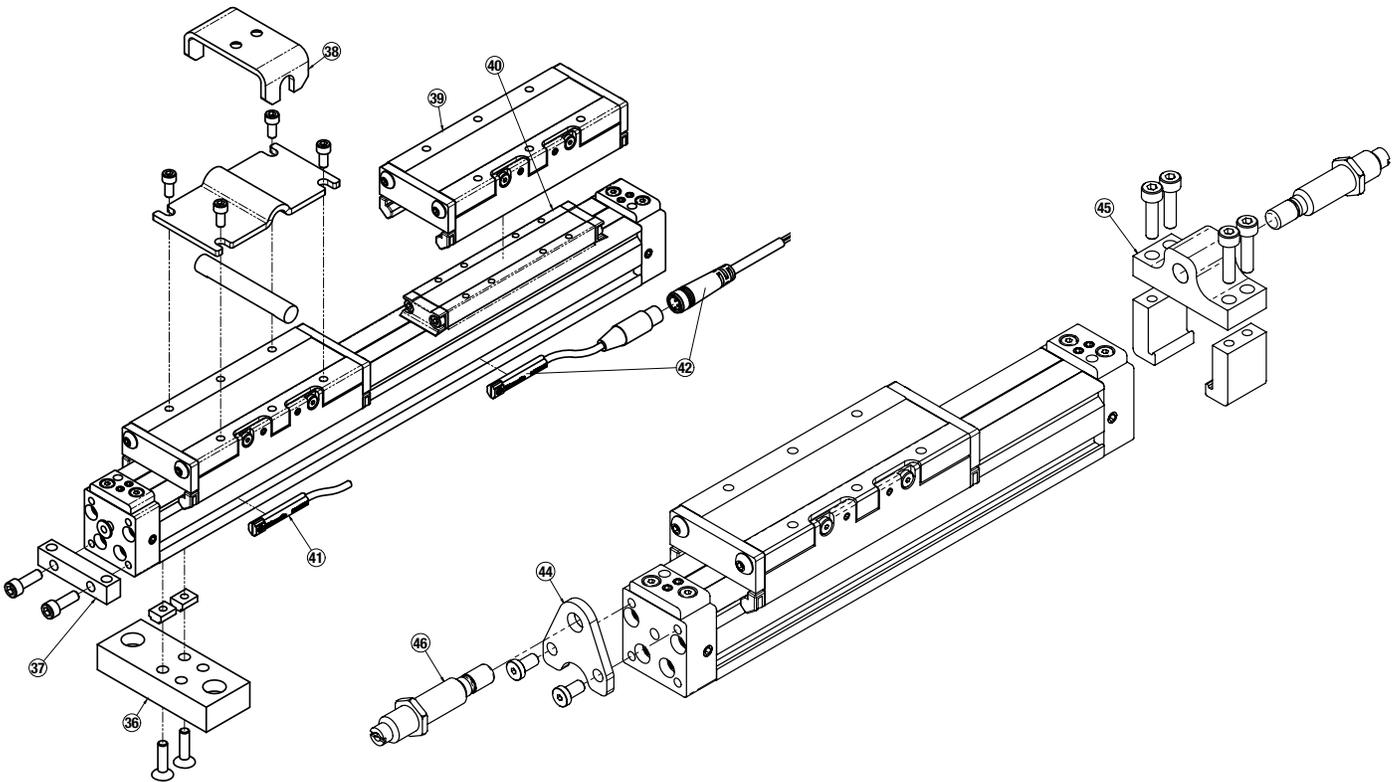
***Depending on the duty cycle of the application, over time, this process may need to be repeated. Keeping the Carrier in a properly adjusted tension will prolong the life of the MX Bearing System and the actuator itself.***

**11. REMOUNT THE CYLINDER ONTO THE MACHINE**

- ⚠** Be certain any flow controls are in place and adjusted prior to applying compressed air to the cylinder.



Check out our MX--S carrier adjustment video on the web  
<https://youtu.be/LVWPg2gfy0A>



**Options - List of Parts**

ITEM	PART NO. or CONFIG. CODE	DESCRIPTION	QTY. IN KITS
<b>MOUNTING KITS</b>			
<b>36</b>	<b>8316-9016</b>	<b>Mounting Plate Kit</b>	
	8316-1030	Mounting Plate	1
	8316-1050	T-Nut	2
	4410-1018	Flat Head Cap Screw	2
<b>37</b>	<b>8116-9519</b>	<b>Foot Mount Kit (inch)</b>	
<b>37</b>	<b>8116-9019</b>	<b>Foot Mount Kit (metric)</b>	
	8116-1055	Foot Mount	1
	0910-1166	Screw (inch)	2
	0604-1028	Screw (metric)	2
<b>38</b>	<b>8116-9536</b>	<b>Floating Mount Kit (inch)</b>	
<b>38</b>	<b>8116-9036</b>	<b>Floating Mount Kit (metric)</b>	
	8116-1066	Floating Mount Bracket	1
	8116-1067	Floating Mount Lower Bracket Strap	1
	8116-1065	Floating Mount Pin	1
	0905-1135	Screw (inch)	4
	8325-1027	Screw (metric)	4
<b>DUAL CARRIER</b>			
<b>39</b>	<b>8116-9505</b>	<b>Auxiliary Carrier Assembly (inch)</b>	
	8116-9005	Auxiliary Carrier Assembly (metric)	
<b>40</b>	<b>8116-9528</b>	<b>Dual Carrier Piston Bracket Assembly (inch)</b>	
	8116-9028	Dual Carrier Piston Bracket Assembly (metric)	
<b>SWITCHES</b>			
<b>41</b>	<b>Switches without Quick-Disconnect Couplers</b>		
	SWMXP16SRY	Reed Switch, SPST Normally Open	
	SWMXP16SNY	Reed Switch, SPST Normally Closed	
	SWMXP16STY	Solid State Switch, PNP (sourcing) Normally Open	
	SWMXP16SKY	Solid State Switch, NPN (sinking) Normally Open	
	SWMXP16SPY	Solid State Switch, PNP (sourcing) Normally Closed	
	SWMXP16SHY	Solid State Switch, NPN (sinking) Normally Closed	

ITEM	PART NO. or CONFIG. CODE	DESCRIPTION	QTY. IN KITS
<b>42</b>	<b>Switches with Quick-Disconnect Couplers</b>		
	SWMXP16SRK	Reed Switch, SPST Normally Open	
	SWMXP16SNK	Reed Switch, SPST Normally Closed	
	SWMXP16STK	Solid State Switch, PNP (sourcing) Normally Open	
	SWMXP16SKK	Solid State Switch, NPN (sinking) Normally Open	
	SWMXP16SPK	Solid State Switch, PNP (sourcing) Normally Closed	
	SWMXP16SHK	Solid State Switch, NPN (sinking) Normally Closed	
<b>SHOCK ABSORBERS</b>			
<b>44</b>	<b>8116-9520</b>	<b>Fixed Shock Mounting Kit (inch)</b>	
<b>44</b>	<b>8116-9020</b>	<b>Fixed Shock Mounting Kit (metric)</b>	
	8116-1060	Fixed Shock Bracket	1
	8125-1574	Screw (inch)	2
	8325-1027	Screw (metric)	2
<b>45</b>	<b>8116-9023</b>	<b>Adjustable Shock Mounting Kit</b>	
	8116-1080	Upper Shock Bracket	1
	8116-1082	Lower Shock Bracket Clamp	2
	0602-1027	Screw	4
<b>46</b>	<b>7906-1065</b>	<b>Lite Duty Shock Absorber</b>	
	7906-1066	Heavy Duty Shock Absorber	

**LUBRICATION AND MAINTENANCE**

All Tolomatic MX Band Cylinders are prelubricated at the factory. To ensure maximum cylinder life, the following guidelines should be followed.

**1. Filtration**

We recommend the use of dry, filtered air in our products. "Filtered air" means a level of 10 Micron or less. "Dry" means air should be free of appreciable amounts of moisture. Regular maintenance of installed filters will generally keep excess moisture in check.

**2 External Lubricators (optional)**

The factory prelubrication of Tolomatic Band Cylinders will provide optimal performance without the use of external lubrication. However, external lubricators can further extend service life of pneumatic actuators if the supply is kept constant.

Oil lubricators, (mist or drop) should supply a minimum of 1 drop per 20 standard cubic feet per minute to the cylinder. As a rule of thumb, double that rate if water in the system is suspected. Demanding conditions may require more lubricant.

If lubricators are used, we recommend a non-detergent, 20cP @ 140°F 10-weight lubricant. Optimum conditions for standard cylinder operation is +32° to +150°F (+0° to 65.5°C).

**NOTE:** Use of external lubricators may wash away the factory installed lubrication. External lubricants must be maintained in a constant supply or the results will be a dry actuator prone to premature wear.

**3. Sanitary Environments**

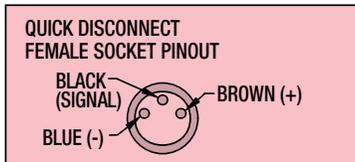
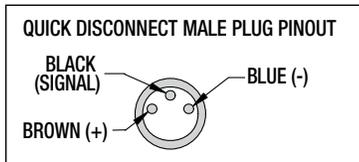
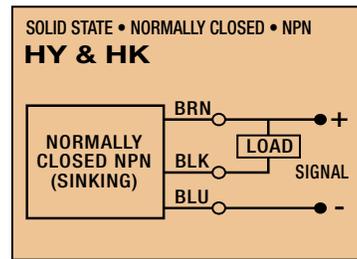
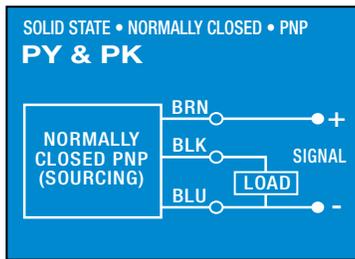
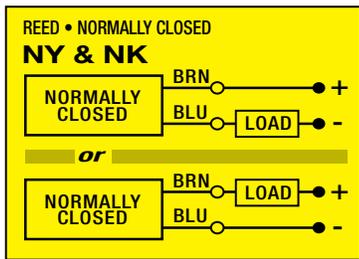
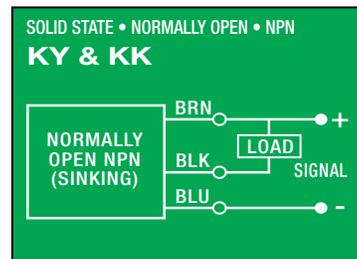
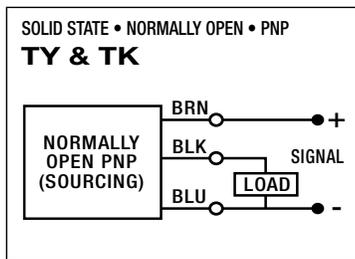
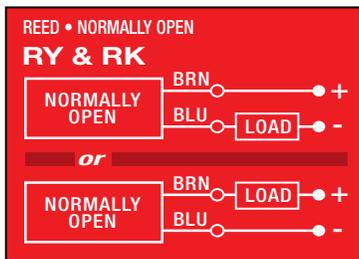
Oil mist lubricators must dispense "Food Grade" lubricants to the air supply. Use fluids with ORAL LD50 toxicity ratings of 35 or higher such as Multitherm® PG-1 or equivalent. Demanding conditions can require a review of the application.

**4. Cushion Adjustment**

Adjust the Cushion Needles in the Cylinder Heads carefully to obtain optimum deceleration for your particular application. If there are questions on proper adjustment, please consult Tolomatic.

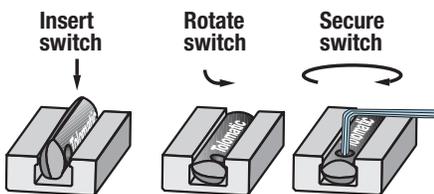
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**SWITCH WIRING DIAGRAMS AND LABEL COLOR CODING (CE and RoHS Compliant)**



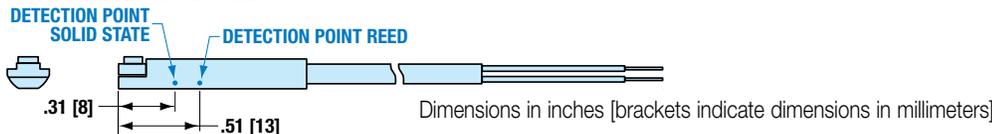
- Switches for MX:
- Include retained mounting hardware
  - In slot, sit below extrusion profile
  - Same for all sizes and bearing styles

**SWITCH INSTALLATION AND REPLACEMENT**



Place switch in side groove on tube at desired location with "Tolomatic" facing outward. While applying light pressure to the switch, rotate it such that the switch is halfway in the groove. Maintaining light pressure, rotate the switch in the opposite direction until the switch is fully inside the groove with "Tolomatic" visible. Re-position the switch to the exact location and lock the switch securely into place by tightening the screw on the switch.

**SWITCH DETECTION POINT**



COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

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