

MP-Series Electric Cylinders Replacement Parts (Series B and C)

Catalog Numbers MPAR-NA3210C, MPAR-NA323C, MPAR-NA4012C, MPAR-NA405C, MPAR-NA6310C, MPAR-NA6320C

MPAR-NP3210B, MPAR-NP323B, MPAR-NP4012B, MPAR-NP405B, MPAR-NP6310B, MPAR-NP6320B

MPL-x1520F-V-X20x, MPL-x1530F-V-X20x, MPL-x220F-V-X2xx, MPL-x330F-M-X21x, MPL-x420F-M-X21x

MPAR-X1xxxB, MPAR-X1xxxE, MPAR-X2xxxC, MPAR-X2xxxF, MPAR-X3xxxE, MPAR-X3xxxH

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Summary of Changes

This manual contains new and updated information.

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Updated installation instruction for series B and C.	Throughout
MPAR-Series (Series A and B) and TL-Series electric cylinders replacement parts information has been relocated to MP-Series (Series A and B) and TL-Series Electric Cylinders Replacement Parts, publication MPAR-IN004-EN-P	Throughout

About This Publication

An electric-cylinder actuator and accessory supplier change affected the MP-Series™ electric cylinders. MPAR-A1/2xxx and MPAR-B1/2xxx (series C) electric cylinders and MPAR-A/B3xxx (series B) electric cylinders reflect the change.

See MP-Series (series A and B) and TL-Series Electric Cylinders Replacement Parts, publication [MPAR-IN004-EN-P](#), for information regarding MPAR-A1/2xxx and MPAR-B1/2xxx (series A) and MPAR-A/B3xxx (series B) electric cylinders.

About the MP-Series Electric Cylinder Replacement Parts

Electric cylinders have three replaceable parts; the motor, actuator cylinder, and the transmission component. For inline-mount electric cylinders, the transmission component is the coupler and for parallel-mount electric cylinder, it is a belt. Instructions in this manual cover the replacement of these components.

Catalog Number Explanation

Replacement Couplings

Replacement Coupling Cat. No.	Electric Cylinder with Inline Motor Attributes		Use with Electric Cylinder Cat. No.
	Frame Size	Ball Screw Pitch mm/rev (in./rev)	
MPAR-NA3210C	32	10.0 (0.394)	MPAR-x1xxxE-xxA
MPAR-NA323C		3.0 (0.118)	MPAR-x1xxxB-xxA
MPAR-NA4012C	40	12.7 (0.500)	MPAR-x2xxxF-xxA
MPAR-NA405C		5.0 (0.197)	MPAR-x2xxxC-xxA
MPAR-NA6310C	63	10.0 (0.394)	MPAR-x3xxxE-xxA
MPAR-NA6320C		20.0 (0.787)	MPAR-x3xxxH-xxA

Replacement Belts

Replacement Belt Cat. No.	Electric Cylinder with Motor Mounted in Parallel Attributes		Use with Electric Cylinder Cat. No.
	Frame Size	Ball Screw Pitch mm/rev (in./rev)	
MPAR-NP622580	32	10.0 (0.394)	MPAR-x1xxxE-xxB/D/E
MPAR-NP622581		3.0 (0.118)	MPAR-x1xxxB-xxB/D/E
MPAR-NP622582	40	12.7 (0.500)	MPAR-x2xxxF-xxB/D/E
MPAR-NP622583		5.0 (0.197)	MPAR-x2xxxC-xxB/D/E
MPAR-NP622584	63	10.0 (0.394)	MPAR-x3xxxE-xxB/D/E
MPAR-NP622585		20.0 (0.787)	MPAR-x3xxxH-xxB/D/E

Replacement Motor for MPAR-Series Electric Cylinders

Replacement Motor Cat. No.	Electric Cylinder Attributes				Use with Electric Cylinder Cat. No.		
	Voltage Class	Frame Size	Pitch mm/rev (in./rev)	Brake			
MPL-A1520F-V-X203	200	32	3.0 (0.118)	None	MPAR-A1xxxB-x2x		
MPL-A1520F-V-X204				24V Brake	MPAR-A1xxxB-x4x		
MPL-A1530F-V-X205			10.0 (0.394)	None	MPAR-A1xxxE-x2x		
MPL-A1530F-V-X206				24V Brake	MPAR-A1xxxE-x4x		
MPL-A1530F-V-X207		40	5.0 (0.197)	None	MPAR-A2xxxC-x2x		
MPL-A1530F-V-X208				24V Brake	MPAR-A2xxxC-x4x		
MPL-A220F-V-X209			12.7 (0.50)	None	MPAR-A2xxxF-x2x		
MPL-A220F-V-X210				24V Brake	MPAR-A2xxxF-x4x		
MPL-A330F-M-X211		63	10.0 (0.394)	None	MPAR-A3xxxE-x2x		
MPL-A330F-M-X212				24V Brake	MPAR-A3xxxE-x4x		
MPL-A420F-M-X213			20 (0.787)	None	MPAR-A3xxxH-x2x		
MPL-A420F-M-X214				24V Brake	MPAR-A3xxxH-x4x		
MPL-B1520F-V-X215			400	32	3.0 (0.118)	None	MPAR-B1xxxB-x2x
MPL-B1520F-V-X216						24V Brake	MPAR-B1xxxB-x4x
MPL-B1530F-V-X217	10.0 (0.394)	None			MPARBA1xxxE-x2x		
MPL-B1530F-V-X218		24V Brake			MPAR-B1xxxE-x4x		
MPL-B1530F-V-X219	40	5.0 (0.197)		None	MPAR-B2xxxC-x2x		
MPL-B1530F-V-X220				24V Brake	MPAR-B2xxxC-x4x		
MPL-B220F-V-X221		12.7 (0.50)		None	MPAR-B2xxxF-x2x		
MPL-B220F-V-X222				24V Brake	MPAR-B2xxxF-x4x		
MPL-B330F-M-X223	63	10.0 (0.394)		None	MPAR-B3xxxE-x2x		
MPL-B330F-M-X224				24V Brake	MPAR-B3xxxE-x4x		
MPL-B420F-M-X225		20.0 (0.787)		None	MPAR-B3xxxH-x2x		
MPL-B420F-M-X226				24V Brake	MPAR-B3xxxH-x4x		

Replacement Actuator

Replacement Actuator Cat. No.	Electric Cylinder Attributes			
	Frame Size	Pitch mm/rev (in./rev)	Stroke Length mm (in.)	Use with Electric Cylinder Cat. No.
MPAR-X1100B	32	3.0 (0.118)	100	MPAR-x1xxxB-xxx
MPAR-X1200B			200	MPAR-x1xxxB-xxx
MPAR-X1300B			300	MPAR-x1xxxB-xxx
MPAR-X1400B			400	MPAR-x1xxxB-xxx
MPAR-X1100E		10.0 (0.394)	100	MPAR-x1xxxE-xxx
MPAR-X1200E			200	MPAR-x1xxxE-xxx
MPAR-X1300E			300	MPAR-x1xxxE-xxx
MPAR-X1400E			400	MPAR-x1xxxE-xxx
MPAR-X2100C	40	5.0 (0.197)	100	MPAR-x2xxxC-xxx
MPAR-X2200C			200	MPAR-x2xxxC-xxx
MPAR-X2300C			300	MPAR-x2xxxC-xxx
MPAR-X2400C			400	MPAR-x2xxxC-xxx
MPAR-X2600C			600	MPAR-x2xxxC-xxx
MPAR-X2100F		12.7 (0.50)	100	MPAR-x2xxxF-xxx
MPAR-X2200F			200	MPAR-x2xxxF-xxx
MPAR-X2300F			300	MPAR-x2xxxF-xxx
MPAR-X2400F			400	MPAR-x2xxxF-xxx
MPAR-X2600F			600	MPAR-x2xxxF-xxx
MPAR-X3100E	63	10.0 (0.344)	100	MPAR-x3xxxE-xxx
MPAR-X3200E			200	MPAR-x3xxxE-xxx
MPAR-X3300E			300	MPAR-x3xxxE-xxx
MPAR-X3400E			400	MPAR-x3xxxE-xxx
MPAR-X3600E			600	MPAR-x3xxxE-xxx
MPAR-X3800E			800	MPAR-x3xxxE-xxx
MPAR-X3100H		20.0 (0.787)	100	MPAR-x3xxxH-xxx
MPAR-X3200H			200	MPAR-x3xxxH-xxx
MPAR-X3300H			300	MPAR-x3xxxH-xxx
MPAR-X3400H			400	MPAR-x3xxxH-xxx
MPAR-X3600H			600	MPAR-x3xxxH-xxx
MPAR-X3800H			800	MPAR-x3xxxH-xxx

Before You Begin

Before you begin, use the [Catalog Number Explanation](#) to verify that the replacement parts match the electric cylinder that you are attempting to repair. Read through the procedure before you begin a repair or replacement.

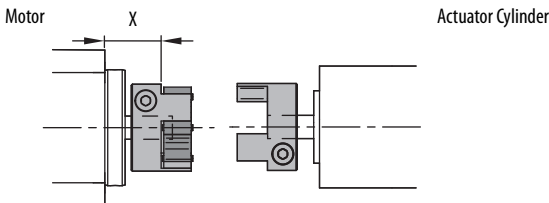
Replace Inline-mount Electric Cylinder Motor

This procedure applies to Bulletin MPAR-xxxxxx-xxA electric cylinders.

IMPORTANT Apply Loctite 222 to screws \leq M4 and Loctite 242 for screws \geq M5 during assembly steps.

Follow these steps to replace the motor.

1. Disconnect motor and feedback cables.
2. Remove the four screws that secure the motor to the motor flange.
3. Remove the screw from the coupling hub on the motor shaft.
4. Remove the coupling hub from the motor shaft.
5. Clean the replacement motor shaft with a soft cloth and isopropyl alcohol.
6. Position the coupling hub on the shaft of the replacement motor.
Use the dimension from the table on shown in table.
7. Torque the coupling screw to the value on shown in table.



Cat. No.	X mm (in.)	Torque N·m (lb·in)
MPAR-x1xxxB-xxA	18.0 (0.71) ⁽¹⁾	4.0 (35.4)
MPAR-x1xxxE-xxA		
MPAR-x2xxxC-xxA	19.1 (0.75) ⁽¹⁾	
MPAR-x2xxxF-xxA	20.7 (0.81) ⁽¹⁾	8.0 (70.8)
MPAR-x3xxxE-xxA	31.1 (1.22) ⁽²⁾	
MPAR-x3xxxH-xxA	38.5 (1.52) ⁽²⁾	

(1) Tolerance is \pm 0.3 mm (0.01 in.).

(2) Tolerance is \pm 0.7 mm (0.03 in.).

8. Align the coupling, the motor, and the actuator cylinder, then push them together.
9. Attach the motor to the motor mount flange by using all four screws.
10. Torque the screws as follows.

Cat. No.	Screw Size	Torque N·m (lb·in)
MPAR-x1xxx-xxA	M5 X 16	5.9 (52.2)
MPAR-x2xxxC-xxA		
MPAR-x2xxxF-xxA		
MPAR-x3xxxE-xxA	M6 x 25	5.9 (52.22)
MPAR-x3xxxH-xxA	M8 x 25	10.1 (89.39)

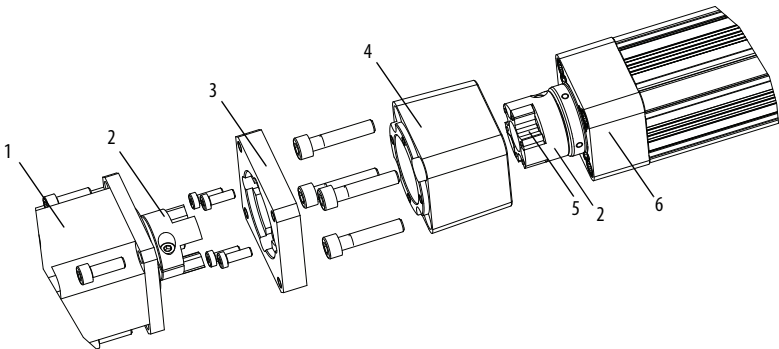
Replace Inline-mount Electric Cylinder Coupling or Actuator Cylinder

This procedure applies to Bulletin MPAR-xxxxxx-xxA electric cylinders.

Follow these steps to replace the coupling or actuator cylinder.

IMPORTANT Apply Loctite 222 to screws \leq M4 and Loctite 242 for screws \geq M5 during assembly steps.

1. Disconnect the motor and feedback cables.
2. Disassemble the motor, motor flange, and coupling housing, using the following diagram.



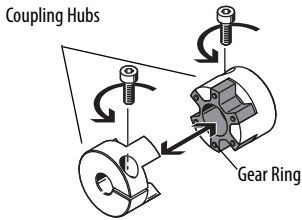
Item	Description
1	Motor
2	Coupling hub
3	Motor flange

Item	Description
4	Coupling housing
5	Gear ring
6	Actuator cylinder

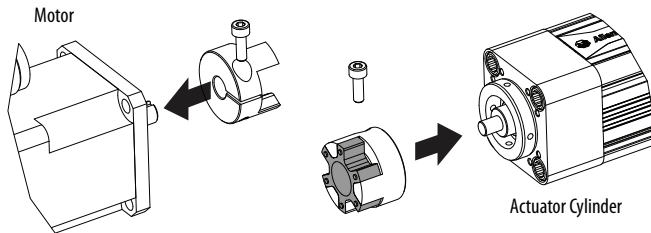
Replace Only the Coupling

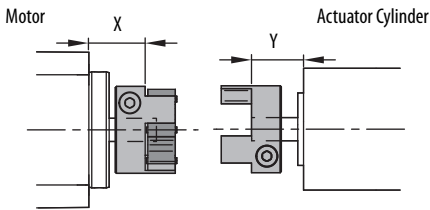
If you are replacing the coupling only, follow these steps. If replacing the actuator cylinder, go to [Replace Only the Actuator Cylinder](#) on [page 10](#).

1. Remove the coupling hubs from the motor and actuator.



2. Pull apart the new coupling.
3. Insert the new gear ring in one of the coupling hubs.
4. Using the table on [page 9](#), position the coupling hub with the diameter that matches the motor shaft on the motor shaft.
5. Using the table [page 9](#), position the coupling hub with the diameter that matches the actuator cylinder shaft on the actuator cylinder shaft.





Cat. No.	X mm (in.)	Y mm (in.)
MPAR-x1xxxB-xxA	18.0 (0.71) ⁽¹⁾	19.7 (0.76) ⁽¹⁾
MPAR-x1xxxE-xxA		
MPAR-x2xxxC-xxA	19.1 (0.75) ⁽¹⁾	18.7 (0.74) ⁽¹⁾
MPAR-x2xxxF-xxA	20.7 (0.81) ⁽¹⁾	17.7 (0.70) ⁽¹⁾
MPAR-x3xxxE-xxA	31.1 (1.22) ⁽²⁾	23.5 (0.93) ⁽²⁾
MPAR-x3xxxH-xxA	38.5 (1.52) ⁽²⁾	24.5 (0.94) ⁽²⁾

(1) Tolerance is ± 0.3 mm (0.01 in.).

(2) Tolerance is ± 0.7 mm (0.03 in.).

6. Tighten the clamping screws on both the coupling hubs to the torque shown.

Cat. No.	Torque N·m (lb·in)
MPAR-x1xxxB-xxA	4.0 (35.4)
MPAR-x1xxxE-xxA	
MPAR-x2xxxC-xxA	
MPAR-x2xxxF-xxA	
MPAR-x3xxxE-xxA	8.0 (70.8)
MPAR-x3xxxH-xxA	

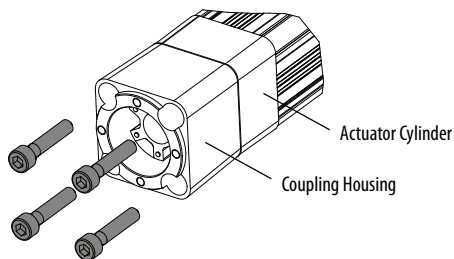
Continue with [Assemble the Electric Cylinder](#) on [page 10](#).

Replace Only the Actuator Cylinder

1. Remove the coupling hub from the actuator cylinder.
2. Remove the screw from the coupling hub.
3. Position the coupling hub on the shaft of the actuator cylinder.
Use the dimension that is shown on the table in [step 5](#) on page [8](#).
4. Tighten the coupling hub screw to the torque shown on the table in [step](#) on page [9](#).
Continue with [Assemble the Electric Cylinder](#) on [page 10](#).

Assemble the Electric Cylinder

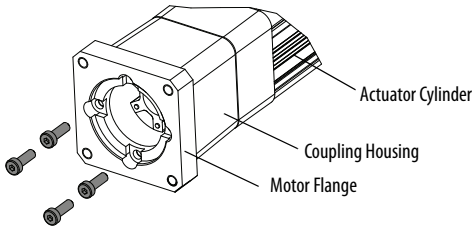
1. Attach the coupling housing by using four screws.



2. Torque the screws as shown in this table.

Cat. No.	Screw Size	Torque N·m (lb·in)
MPAR-x1xxx-xxA	M6 x 30	4.0 (35.40)
MPAR-x2xxxC-xxA		
MPAR-x2xxxF-xxA		
MPAR-x3xxxE-xxA	M8 x 40	10.1 (89.39)
MPAR-x3xxxH-xxA		

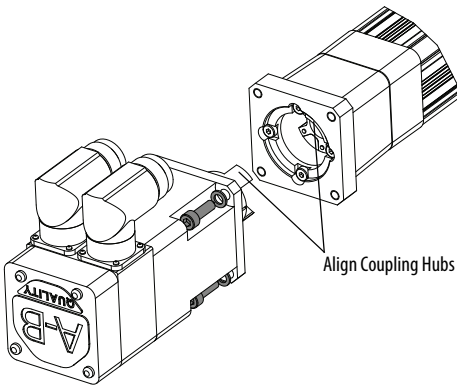
- Attach the motor flange by using the required number of screws.
See table in following step for the screw quantity.



- Torque the screws as shown in this table.

Cat. No.	Screw Quantity	Screw Size	Torque N·m (lb·in)
MPAR-x1xxx-xxA	4	M4 x 12	3.0 (25.6)
MPAR-x2xxxC-xxA			
MPAR-x2xxxF-xxA			
MPAR-x3xxx-xxA		M6 X 16	10.1 (89.39)

- Align the coupling, the motor, and the actuator cylinder and push them together.



- Attach the motor to the motor mount flange by using all four screws.

7. Torque screws as follows.

Cat. No.	Screw Size	Torque N·m (lb·in)
MPAR-x1xxxx-xxA	M5 X 16	5.9 (52.22)
MPAR-x2xxxC-xxA		
MPAR-x2xxxF-xxA		
MPAR-x3xxxE-xxA	M6 x 25	5.9 (52.22)
MPAR-x3xxxH-xxA	M8 x 25	10.1 (89.39)

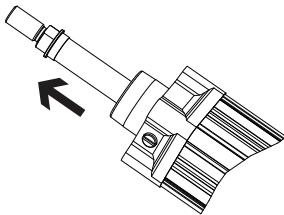
Replace a Parallel-mount Electric Cylinder Motor or Belt

This procedure is for Bulletin MPAR-xxxxxx-xxB/D/E electric cylinders. These steps can be used to change the motor or the actuator cylinder orientation.

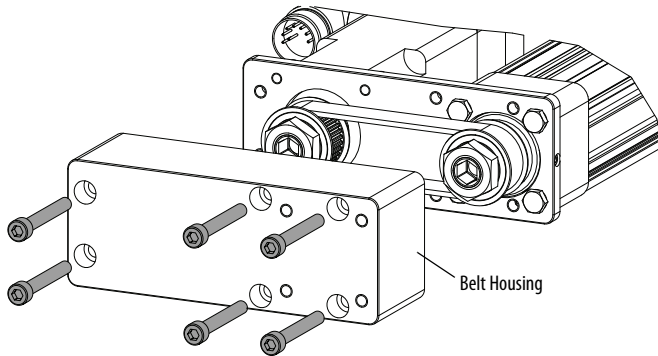
Follow these steps to replace the belt, motor, or actuator cylinder.

IMPORTANT Apply Loctite 222 to screws \leq M4 and Loctite 242 for screws \geq M5 during assembly steps.

1. Disconnect the motor and feedback cables.
2. If the motor has brake, release the brake on motor so that the rod moves freely.
3. Position the rod to the center of travel.

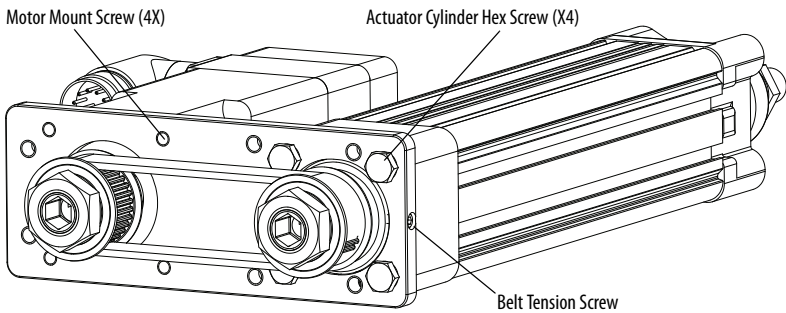


4. Remove the cover from belt housing.

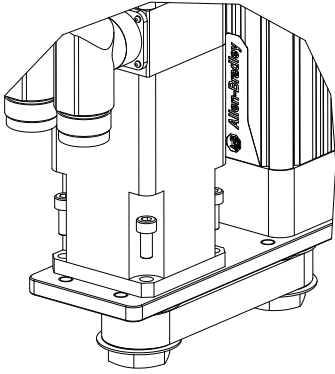


ATTENTION: Exposed parts that move can cause severe injury. Do not operate the electric cylinder without the cover in place. Follow the lock-out procedures before servicing the machine.

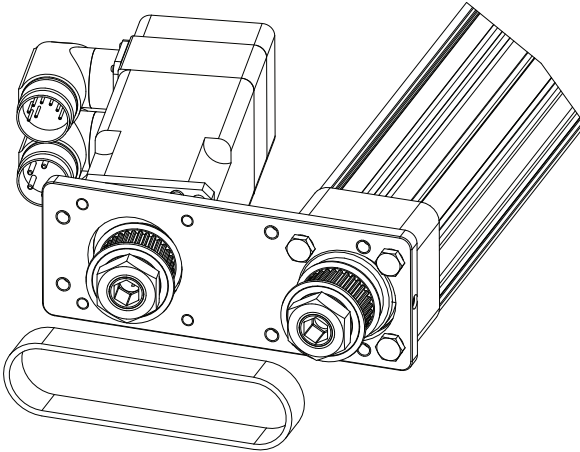
5. Loosen, but do not remove the four hex screws that hold the actuator cylinder to the baseplate.
6. Loosen the belt tension screw.



7. Remove the four socket head cap screws that secure the motor to the baseplate.

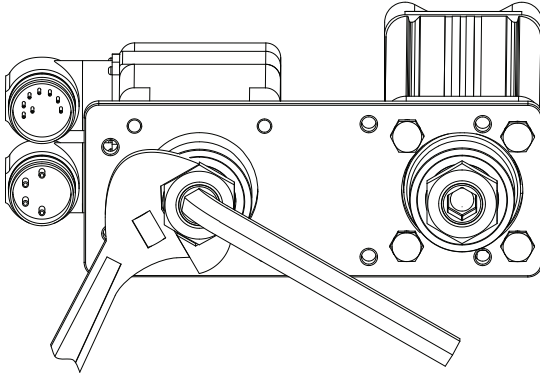


8. Angle the motor away from the actuator cylinder and remove the belt.

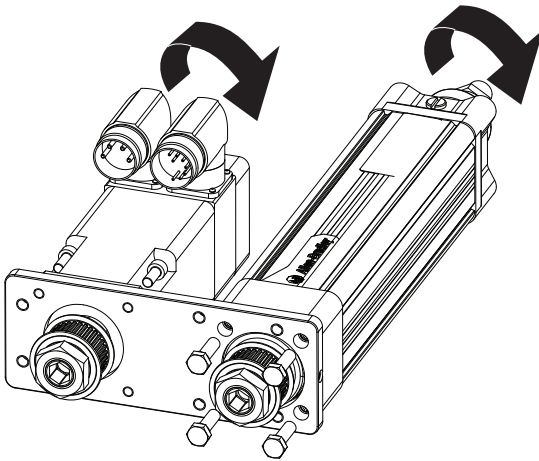


9. If you are replacing a motor or actuator cylinder, remove the pulley from the part being replaced.

Use a hex driver to hold the clamping cone and release the jam nut to release the pulley.



10. If necessary, reposition the motor and or actuator cylinder and secure to baseplate.



IMPORTANT If you are mounting the motor with the connectors between the actuator cylinder and the motor, rotate the motor connectors so they exit 180° away from the shaft.

11. Securely attach the motor and electric cylinder, but do not torque at this time.

12. Reinstall the pulley on the new part.

Set height and torque the motor jam nut to values shown in this table.

Cat. No.	Pulley Height mm (in.)	Jam Nut	Torque N·m (lb·in)
MPAR-x1xxxx-xxB/D/E	6.5...7 (0.26...0.28)	M16 x 1.5	12 (106.21)
MPAR-x2xxxC-xxB/D/E			
MPAR-x2xxxF-xxB/D/E	8...8.5 (0.32...0.36)	M22x 1.5	32 (283.25)
MPAR-x3xxxE-xxB/D/E	7.5...8 (0.30...0.32)	M30 x 1.5	70 (619.55)
MPAR-x3xxxH-xxB/D/E			

13. Remove motor socket-head cap screws.
 14. Position motor as shown in [step 8](#) and slip on new belt.
 15. Attach the motor to the baseplate by using four socket head cap screws.

Torque the motor socket-head cap screws. to values shown in this table.

Cat. No.	Screw Size	Torque N·m (lb·in)
MPAR-x1xxxB-xxB/D/E	M5 x 16	5.9 (52.2)
MPAR-x1xxxE-xxB/D/E		
MPAR-x2xxxC-xxB/D/E		
MPAR-x2xxxF-xxB/D/E		
MPAR-x3xxxE-xxB/D/E	M6 x 20	5.9 (52.22)
MPAR-x3xxxH-xxB/D/E	M8 x 20	10.1 (89.39)

16. Secure, but do not tighten the actuator cylinder with four hex screws.
 17. Tighten belt tension screw.

This table shows the recommended frequency values.

Cat. No.	Recommend Belt Tension N (lbf)	Frequency Hz
MPAR-x1xxxx-xxB/D/E	32...35 (7.2...7.9)	242...254
MPAR-x2xxxC-xxB/D/E		242...254
MPAR-x2xxxF-xxB/D/E	57...63 (12.8...14.2)	152...160
MPAR-x3xxxx-xxB/D/E	108...119 (24.3...26.8)	161...168

IMPORTANT A low pretension force is better than a high pretension force.

Excessive pretension on the belt results in:

- impermissible radial loads causing shaft to break
 - increased wear in the axis and motor gears
 - reduction of the service life of the belt
-

18. Torque the actuator cylinder screws to values shown in this table.

Cat. No.	Hex Screw Torque N·m (lb·in)
MPAR-x1xxxx-xxB/D/E	5.9 (52.22)
MPAR-x2xxxC-xxB/D/E	
MPAR-x2xxxF-xxB/D/E	
MPAR-x3xxxx-xxB/D/E	10.1 (89.39)

19. Secure the cover to the belt housing with five socket head cap screws.

Cat. No.	Screw Size	Torque N·m (lb·in)
MPAR-x1xxxx-xxB/D/E	M6x45	5.9 (52.22)
MPAR-x2xxxC-xxB/D/E		
MPAR-x2xxxF-xxB/D/E	M6x60	
MPAR-x3xxxx-xxB/D/E	M8x70	10.1 (89.39)

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
MP-Series Electric Cylinders Installation Instructions, publication MPAR-IN001	Information on how to install MP-Series electric cylinders
MP-Series Brushless Servo Motor Installation Instructions, publication MP-IN001	Information on how to install, medium frame (100...165 mm) MP-Series low-inertia motors
MP-Series Brushless Servo Motor Installation Instructions, publication MP-IN006	Information on how to install small frame (<75 mm) MP-Series low-inertia motors
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Notes:

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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