

# AM-676, AM-686...689, AM-690-R, AM-692, AM-693-R, AM-762, and AM-763

## General Instructions for SmartX Actuator Accessories

### Applications

The AM-676 universal shaft extension extends the length of the damper shaft in applications where the damper shaft is too short to reach the damper actuator.

The AM-686 damper position indicator mounts the actuator to indicate actuator position when the V-bolt indicator is not visible.

The AM-687 universal clamp assembly is used to replace the standard universal clamp assembly when mounting to damper shafts up to 1.05" diameter or up to 5/8" square.

The AM-688 replacement universal clamp is used to clamp the actuator to damper shafts up to 3/4" diameter or up to 1/2" square. Available to replace lost standard clamps shipped with actuator.

The AM-689 rotation limiter is used to limit the angle of rotation of a direct-coupled damper actuator in applications where the damper does not have a proper end-stop.

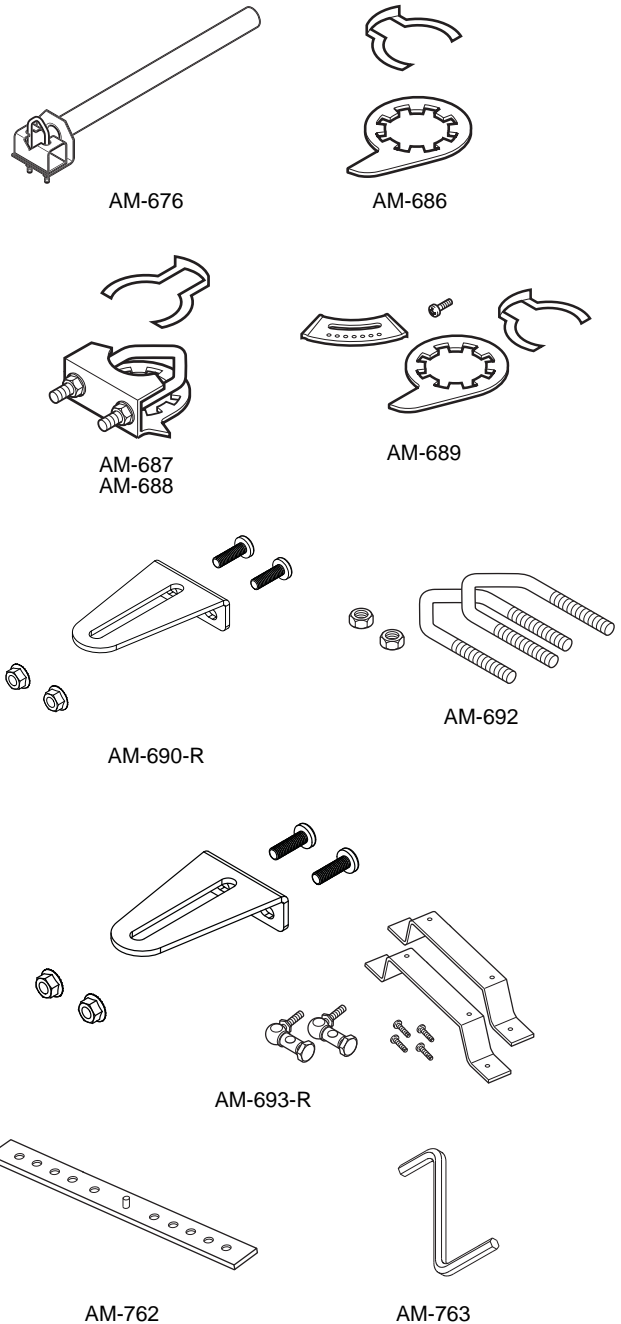
The AM-690-R crankarm kit is used in conjunction with the AM-687 or AM-688 universal clamps to obtain crankarm functionality for non-direct mounting applications.

The AM-692 V-bolt kit is used with the AM-690 and AM-691 crankarm. The V-bolts in the kit are used for standard and larger diameter damper shafts when crankarm assembly is necessary.

The AM-693-R damper linkage kit is used in conjunction with the AM-687 or AM-688 universal clamps to provide a mechanical linkage between the damper actuator and the damper shaft when a direct coupling is not possible.

The AM-762 replacement anti-rotation bracket is used to secure the actuator and prevent it from rotating around the shaft. Available to replace lost anti-rotation brackets shipped with the actuator.

The AM-763 replacement 1/8" hex manual override crank is used with Mx41-707x, 715x, units to rotate the manual override mechanism. Available to replace manual override crank shipped with the actuator.



## Specifications

Table-1 Model Chart for Accessories

Part Number	Compatible Actuators	Description		Tools Required
AM-676	Mx40-704x Mx4x-707x Mx4x-715x Mx40-717x Mx41-6153 Mx41-634x	Universal Shaft Extension	Length: Approximately 9-1/2" (13 mm) Damper Shaft Sizes: 3/8"...11/16" (10...18 mm) round shafts 3/8"...9/16" (10...14 mm) square shafts Customer Supplied Parts: (2) #8 sheet metal screws	No. 24 drill bit for #8 sheet metal screws See Table-2
AM-686	Mx4x-707x Mx4x-715x	Damper Position Indicator	Parts Included: Retaining Clip Position Indicator	
AM-687		Universal Clamp Assemblies	Maximum Damper Shaft Size: 1.05" (27 mm) diameter, 5/8" (15 mm) square Parts Included in AM-687 Kit: Universal Clamp Retaining Clip	10 mm socket wrench
AM-688		Replacement Universal Clamp	Maximum Damper Shaft Size: 3/4" (19 mm) diameter, 1/2" (13 mm) square Parts Included in AM-688 Kit: Universal Clamp Retaining Clip	10 mm socket wrench
AM-689		Rotation Limiter	Maximum Angle Allowed: 95° Setting Increments: 5° (Approximate) for AM-689. Parts Included in AM-689 kit: Retaining Clip Position Indicator Bolt stop	Phillips Head Screwdriver
AM-690-R		Crankarm Kit	Parts Included: Crankarm Bracket (2) Screws (2) Nuts	10 mm socket wrench Phillips Head Screwdriver
AM-692		V-bolt Kit for AM-690-R and AM-693-R Crankarm Kits	Parts Included in Kit: (2) nuts (2) v-bolts	10 mm socket wrench
AM-693-R		Damper Linkage Kit with Crankarm Bracket	Parts Included in Kits: (1) Crankarm bracket with (2) nuts and (2) screws (2) "C" Mounting Brackets (2) Ball Joints (4) #10 self-tapping screws Customer Supplied Parts: (4) #8 sheet metal screws	10 mm socket wrench 13 mm socket wrench No. 24 drill bit for # 8 sheet metal screws Screwdriver with torx head for #10 self tapping screws Screwdriver with flat head for #8 sheet metal screws Phillips Head Screwdriver
AM-762		Replacement Anti-Rotation Bracket	Parts Included in Kits: (1) Anti-rotation bracket	
AM-763	Replacement Manual Override Crank	(1) 1/8" hex manual override crank		

## Applicable Literature

- SmartX MA40-704x, MA4x-707x and MA4x-715x Series Spring Return Two Position Actuators, General Instructions, F-26642.
- SmartX MF40-7043, MF4x-7073 and MF4x-7153 Series Spring Return Floating Actuators, General Instructions, F-26644.
- SmartX MS40-7043, MS4x-7073 and MS4x-7153 Series Spring Return Proportional Actuators, General Instructions, F-26645.
- SmartX Series Selection Guide, F-26646.
- SmartX MA40-717x Series Spring Return Two Position Actuators, General Instructions, F-26742.
- SmartX MF40-6343 Series Non-Spring Return Floating Actuators, General Instructions, F-26744.
- SmartX MS40-634x Non-Spring Return Proportional Actuators, General Instructions, F-26745.
- SmartX MS40-717x Series Spring Return Two Position Actuators, General Instructions, F-26748.
- SmartX MF40-7173 Spring Return Floating Actuators, General

Instructions, F-26749.

- Electric/Electronic Products Catalog, F-27382.

## Installation

### Inspection

Inspect the package for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

### Requirements

Tools (not provided):

— See Table-1

— Torque wrench with appropriate sockets

Training: Installer must be a qualified, experienced technician.

## Mounting

### AM-676 Universal Shaft Extension

**Note:** For additional information on the spring return and non-spring return actuators, refer to the General Instructions listed in the Applicable Literature section. The AM-676 can be used with several types of actuators. Depending on which actuator is installed, a Universal Clamp kit must be used (See Table-2).

Table-2 Tightening Torque.

Actuator	Kit	Tightening Torque	V-Clamp Socket Wrench Size
Mx4x-707x Mx4x-715x	AM-687, AM-688 (or original clamp supplied with actuator)	6...8 ft-lb (8...11 N-m)	10 mm and 7/16"
Mx40-704x	AM-710	4...6 ft-lb (5...8 N-m)	10 mm
Mx40-717x Mx41-634x	AM-753 Use both Universal Clamps	4...6 ft-lb (5...8 N-m)	1/2"
Mx41-615x	None	6...8 ft-lb (8...11 N-m)	18 mm
Mx4x-707x Mx4x-715x	AM-690-R, AM-693-R	6...8 ft-lb (8...11 N-m)	10 mm

- Loosen the universal clamp nuts on the universal shaft extension and the damper actuator.
- Fit the universal shaft extension fully onto the damper shaft. Finger-tighten the extension's universal clamp nuts.
- Assemble the damper actuator onto the universal shaft extension, allowing the extension to slide through the actuator's universal clamp assembly. Fit the actuator mounting bracket onto the actuator and position the actuator and bracket on the mounting surface. See Figure-1.
- Adjust the position of the damper actuator on its mounting surface, as necessary, so that the actuator's universal clamp assembly and the universal shaft extension are in alignment with the damper shaft. Mark the position of the actuator's mounting bracket on the mounting surface.
- If the universal shaft extension protrudes excessively above the damper actuator's universal clamp assembly complete the following:
  - Mark the point at which the extension must be cut.
  - Remove the damper actuator from the universal shaft extension, and remove the extension from the damper shaft.
  - Shorten the universal shaft extension by cutting it at the mark.
  - Re-assemble actuator and shaft extension.
- Drill holes in the mounting surface for the actuator's mounting bracket. Install the bracket onto the mounting surface using the sheet metal screws.
- Slide the universal shaft extension approximately halfway into the damper actuator's universal clamp assembly. Finger tighten the actuator's universal clamp nuts.
- Install the damper actuator onto its mounting bracket. Loosen the actuator's universal clamp nuts, and extend the universal shaft extension until it is fitted fully onto the damper shaft.

- Make sure the actuator's universal clamp assembly and the universal shaft extension are in alignment with the damper shaft. The slits in the universal shaft extension's end should be pulled together tight by the V-bolt. Then tighten the universal clamp nuts on both the shaft extension and the actuator.

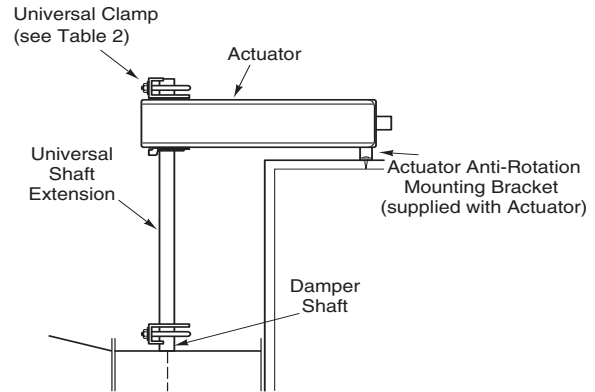


Figure-1 Installation of AM-676 Universal Shaft Extension.

### AM-686 Damper Position Indicator

**Note:** For additional information on the Mx4x-707x and Mx4x-715x Series actuators, refer to the General Instructions listed in the Applicable Literature section.

The AM-686 is used in short shaft (3/4" ... 3 1/2") applications. For clockwise spring return, install the position indicator on the "R" side of the actuator and on the "L" side for counterclockwise spring return.

- Place the position indicator on the actuator as shown in Figure 2 and secure in place, using the retaining clip provided.

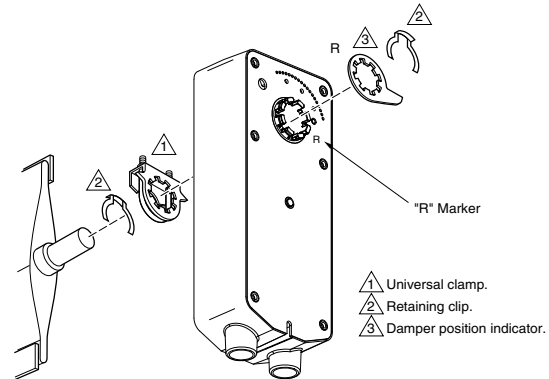


Figure-2 Installation of AM-686 Damper Position Indicator.

### AM-687 Universal Clamp for Jackshafts up to 1.05" (26.7 mm) in Diameter and 5/8" Square

**Note:** For additional information on the Mx4x-707x and Mx4x-715x Series actuators, refer to the General Instructions listed in the Applicable Literature section.

- Replace the factory installed universal clamp with the AM-687 universal clamp for jackshafts. Remove the retaining clip and universal clamp from the actuator.
- Place the AM-687 universal clamp in the same orientation as the universal clamp previously installed on the actuator. Secure it in place using the retaining clip. See Figure 3.
- Tighten V-bolt nuts between 6...8 lb-ft (8...11 N-m) of torque.

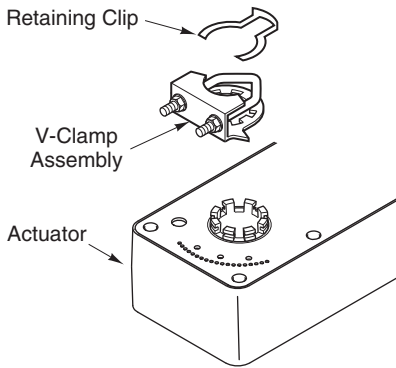


Figure-3 Installation of Clamp for Jackshafts.

### AM-688 Replacement Universal Clamp

The AM-688 is used to clamp the actuator up to 3/4" diameter round shaft or up to 1/2" square shaft. This clamp is available to replace lost standard clamps shipped with the actuator.

**Note:** Refer to General Instructions listed in the Applicable Literature section for universal clamp and Mx4x-707x/Mx4x-715x installation instructions.

### AM-689 Rotation Limiter for Mx4x-707x and Mx4x-715x Actuators

**Note:** For additional information on the Mx4x-707x and Mx4x-715x Series Actuators, refer to the General Instructions listed in the Applicable Literature section.

- For clockwise spring return, install the rotation limiter on the "R" side of the actuator and on the "L" side for counterclockwise spring return.
- The V-clamp and the rotation limiter must be on opposite sides of the actuator.

1. Place the position indicator on the actuator as shown in Figure-4.
2. Determine the limit of rotation necessary for the application and align the recesses on the actuator with the studs on the rotation limiter.
3. Within the selected rotation range, a "+" marks the location of a hole under the actuator label.
4. Insert the screw provided and tighten using a Phillips head screwdriver.
5. Secure it in place using the retaining clip provided.

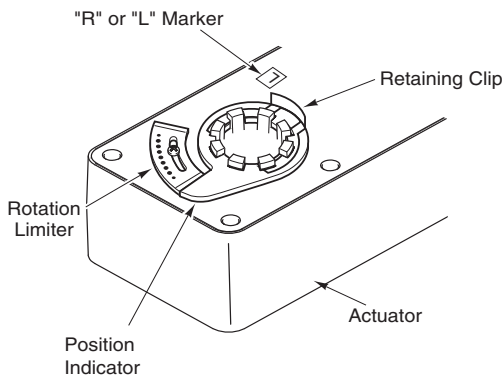


Figure-4 Installation of AM-689 Rotation Limiter.

### AM-690-R Crankarm Kit (used in conjunction with the AM-687 or AM-688 universal clamp)

**Note:** For additional information on the Mx4x-707x and Mx4x-715x Series actuators, refer to the General Instructions listed in the Applicable Literature section.

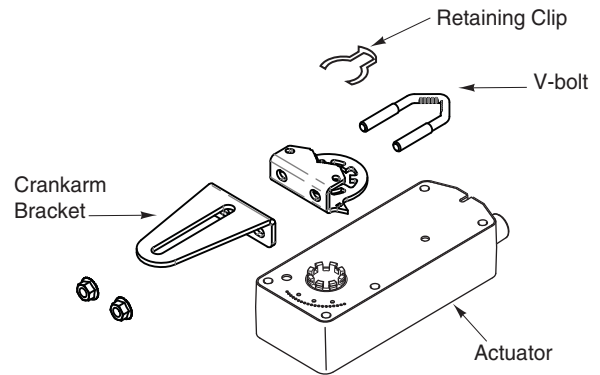


Figure-5 Installation of AM-690-R Crankarm Kit

1. Remove V-bolt from universal clamp.
2. Place actuator over damper shaft with universal clamp still installed and held in place by the retaining clip. See Figure 5.
3. Place the crank arm bracket against the universal clamp. The crankarm bracket should be oriented with its long slotted side raised above the universal clamp keyed mechanism (above the actuator). Slide the V-bolt over the damper shaft and through the holes/slots in both the universal clamp and the crankarm bracket.
4. Tighten nuts onto V-bolt to 6...8 ft-lb (8...11 N-m) of torque.

### AM-693-R Damper Linkage Kit with Crankarm Bracket (used in conjunction with the AM-687 or AM-688 universal clamp)

**Note:** For additional information on the Mx4x-707x, and Mx4x-715x Series actuators, refer to the General Instructions listed in the Applicable Literature section. The AM-693-R is used only with the Mx4x-707x and Mx4x-715x actuators.

1. Remove the universal clamp from the damper actuator.
2. If not placing actuator onto damper shaft (strictly non direct mount application), assemble crankarm bracket onto universal clamp with the two screws and locking nuts. The crankarm bracket should be oriented with its long slotted side raised above the universal clamp keyed mechanism (above the actuator). Nuts should be tightened to 6...8 ft-lb (8...11 N-m). If the actuator will be used on an damper shaft with the crankarm bracket, use the universal clamp V-bolt (instead of the two screws) with the two nuts provided to secure the crankarm bracket onto universal clamp as shown in the Detail inset of Figure 6, and refer to steps 2 through 4 of the AM-690-R instructions on the previous page.
3. Attach clamp assembly with the crankarm to the actuator oriented as shown using the retaining clip.
4. Secure the crankarm bracket/universal clamp assembly with Retaining Clip.
5. Locate the pre-drilled mounting holes on the actuator label that are covered by a white "+" sign. See Figure-6.

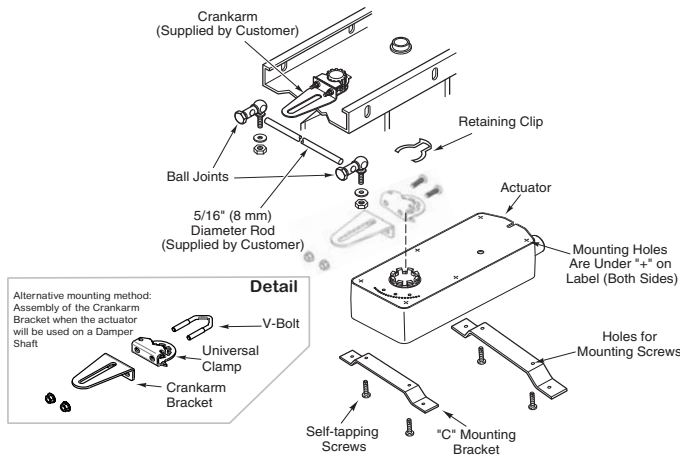


Figure-6 Installation of AM-693-R Damper Linkage Kit with Crankarm (used in conjunction with the AM-687 or AM-688 universal clamp).

## Maintenance

AM-600 and AM-700 Series accessories require no maintenance. Regular maintenance of the total system is recommended to assure sustained, optimum performance.

## Field Repair

None. Replace any damaged or failed parts with functional replacements.

6. Puncture the four locations that will be used for the "C" mounting brackets.

**Note:** Do not drill holes in the actuator body. Use #10 self-tapping screws provided with accessory kit to screw into actuator body.

7. Use the #10 self-tapping screws to secure the two "C" brackets to the actuator. See Figure-6.
8. On a suitably rigid mounting surface, position the damper actuator in alignment with the damper shaft. If the mounting surface is uneven, make sure that there is a minimum clearance of 3/8" (10 mm) between the actuator and the mounting surface. Drill four holes in the mounting surface using the "C" mounting brackets as templates.
9. Secure the actuator to the mounting surface using four sheet metal screws (not provided).
10. Install a suitable crankarm, supplied by the customer, onto the damper shaft.
11. Install the two ball joints onto the crankarms on the damper actuator and the damper shaft.
12. Install the customer-supplied 5/16" (8 mm) rod between the two crankarms.
13. Adjust the positions of the ball joints on the crankarms, and the position of the 5/16" (8 mm) rod in the ball joints, as necessary. Tighten all fasteners.

### AM-762 Anti-Rotation Bracket

The AM-762 replacement anti-rotation bracket is used to secure the actuator and prevent it rotating around the shaft. Available to replace lost anti-rotation brackets shipped with the actuator.

**Note:** Refer to General Instructions listed in the Applicable Literature section for installation instructions.

### AM-763 Replacement Manual Override Crank

The AM-763 replacement 1/8" hex manual override crank is used to replace lost override crank shipped with Mx41-707x and Mx41-715x actuators. The override crank is used to rotate the manual override mechanism.

