

Application

The AM-731, AM-732, AM-733 and AM-734 linkage kits are designed to provide mounting of Schneider Electric DuraDrive™ linear actuators directly to two-way and three-way valves. This combination will provide linear travel to valves from 1-1/4" to 2" VB-7XXX and 2-1/2" to 4" VB-9XXX.

Features

- Direct mounting of linear actuators to valves

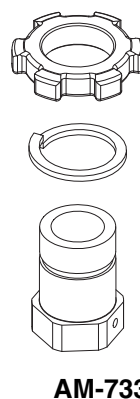
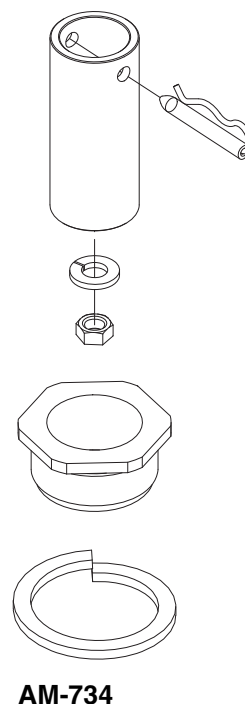
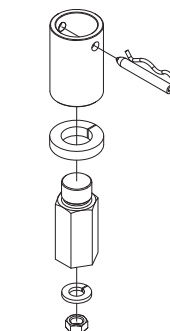
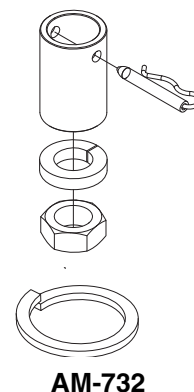
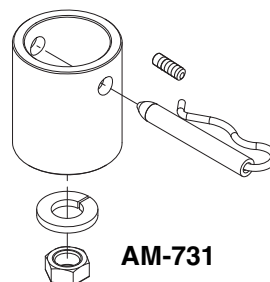


Table-1 Specifications.

Part Number	Used With Actuator	Used With Valves	Included With Actuator
AM-731	MX51-720x	Current 1-1/4" to 2" VB-7XXX	Yes
AM-732	MX61-720x	Current 2-1/4" to 4" VB-9XXX	Yes
AM-733	MX61-720x	Obsolete 1-1/2" and 2" VB-9XXX after date code 9404	No
AM-734	MX61-720x	Obsolete 1-1/2" and 2" VB-9XXX before date code 9404	No

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

- Pliers for removing and inserting connecting pin
- Installer must be a qualified, experienced technician
- TOOL-37, 1-1/2" - 3" adjustable spanner wrench for valve mounting nut
- 5/16" and 3/4" open-end wrench for stem jam nuts
- 1/8" Allen wrench
- Size 10 IP Torx Plus bit
- 5/8", 1-1/2", and 1-3/8" open end wrenches

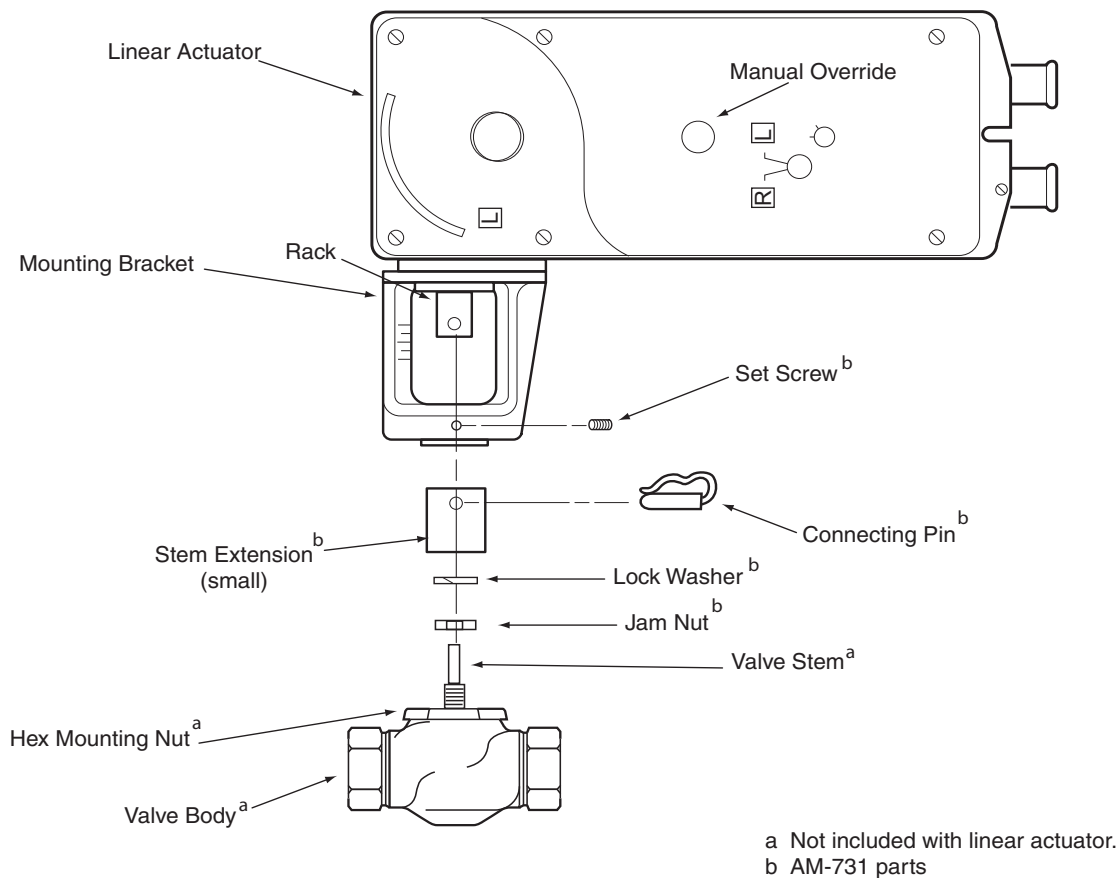


Figure-1 AM-731 Kit with MX51-720X Actuator, Exploded View.

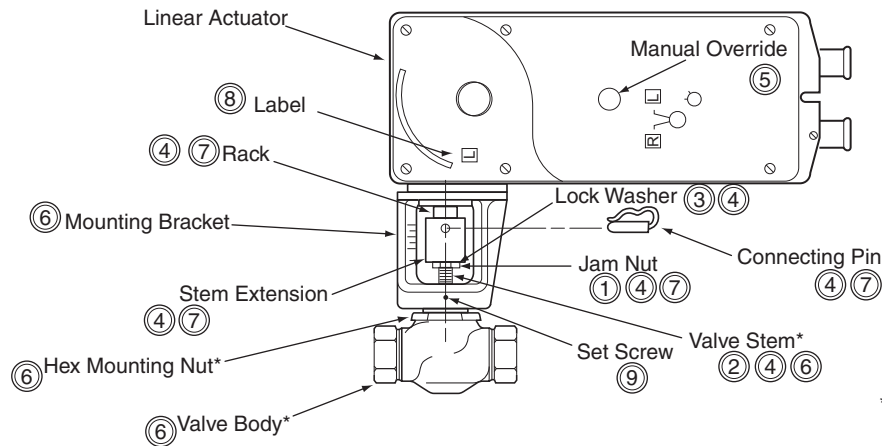


Figure-2 Typical Assembly and Installation of AM-731 Linkage Kit with MX51 Series Actuator to 1-1/4" to 2" VB-7XXX Series Valve Bodies, Stem-Up Closed or Open, 2-Way and 3-Way Valves.

Installation: AM-731 linkage kit with MX51-720X Series Actuator to 1-1/4" to 2" VB-7XXX Series Valve Bodies, Stem-Up Closed or Open, 2-Way and 3-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-2.
 1. Locate the jam nut that came packaged with the kit.
 2. Screw the jam nut onto the valve stem all the way as far as it will go. You may need to use a 5/16" (TOOL-20-1) open-end wrench. At least 1/2" of the valve stem should extend above the nut.
 3. Place lock washer over valve stem.
 4. Thread the stem extension onto the valve stem, making contact with the lock washer and jam nut.
 5. Ensure 15° or 1-1/2 turns of manual override for actuator preload (Figure-12).
 6. Orient the actuator mounting bracket on the valve and tighten the hex mounting nut securely against the bracket using TOOL-37. Raise the valve stem to the full up position.
 7. Rotate stem extension until the through hole lines up with the through hole of actuator rack. Insert connecting pin to secure stem extension and tighten jam nut against stem extension using 5/16" (TOOL-20-1) open end wrench.
 8. Affix open/closed label to the indicator in the appropriate position.
 9. Insert set screw packaged with actuator into the most accessible side. Tighten with a size 10 IP Torx Plus bit to 20-25 lb-in (2.3-2.8 N-m).
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.

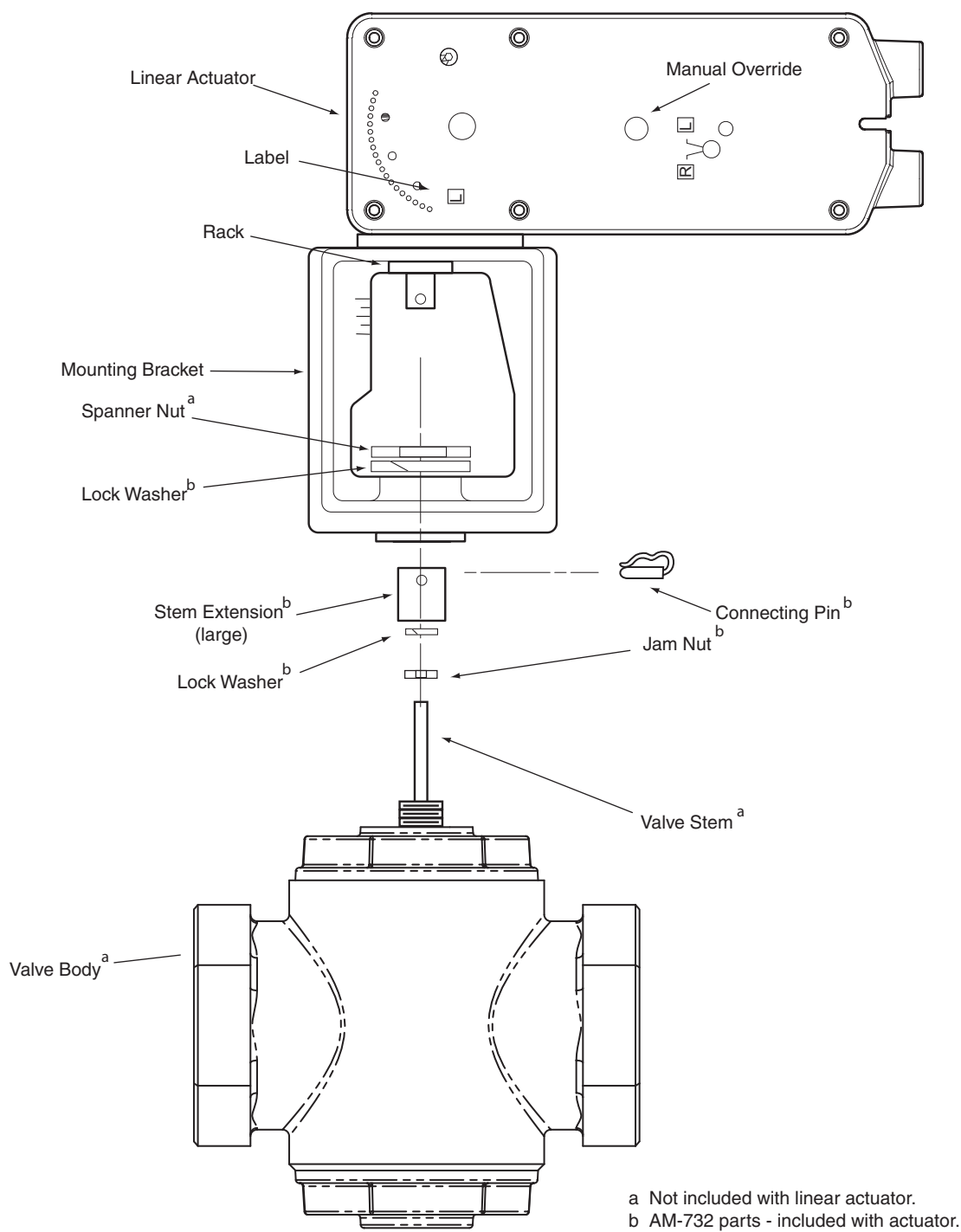


Figure-3 AM-732 with MX61-720X Actuator, Exploded View.

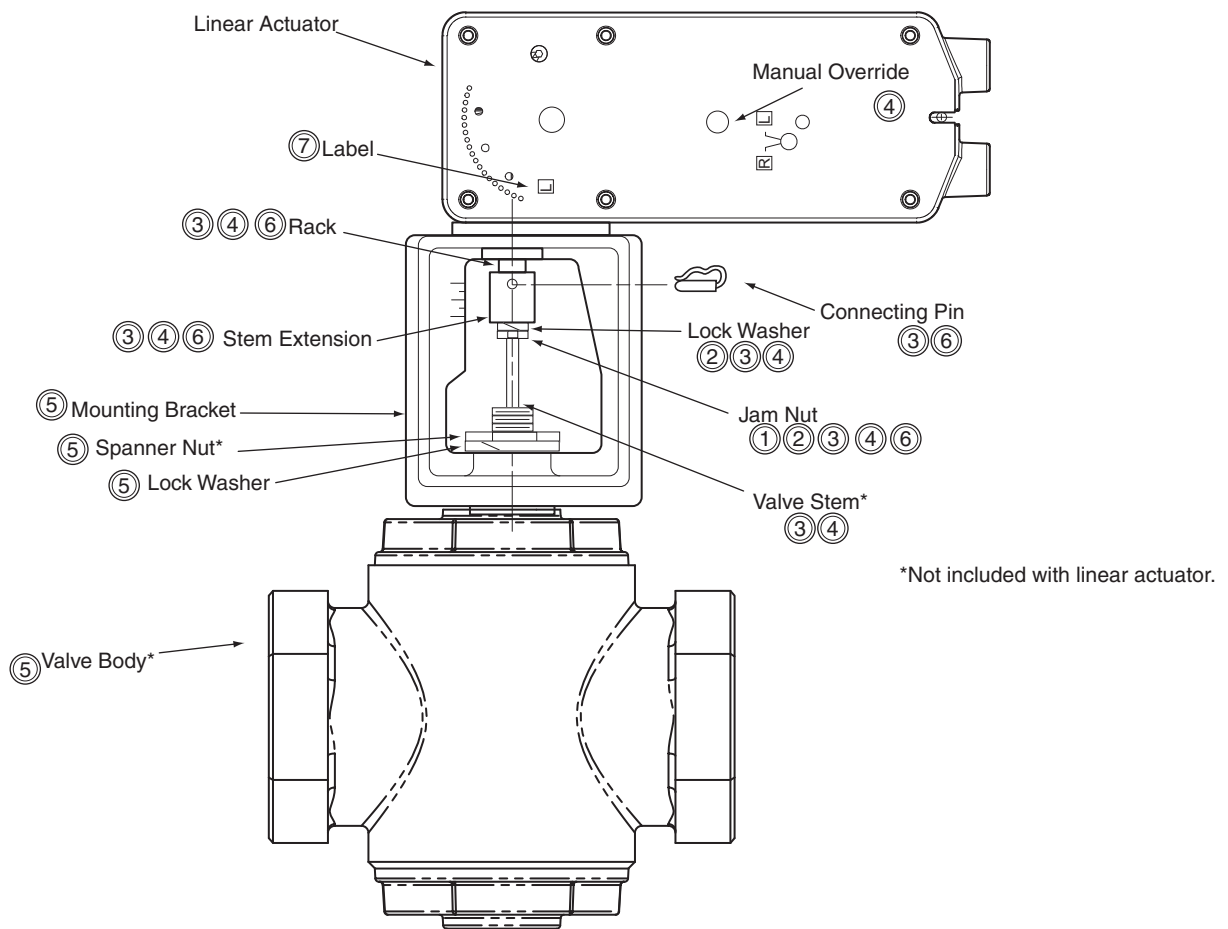


Figure-4 Typical Assembly and Installation of AM-732 Linkage Kit with MX61 Series Actuator to 2-1/2" to 4" VB-9XXX Series Valve Bodies, Stem-Up Closed, 2-Way and 3-Way.

Installation: AM-732 linkage kit to MX61-720X Series Actuator to 2-1/2" to 4" VB-9XXX Series Valve Bodies, Stem-Up Closed, 2-Way and 3-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-4.
 1. Locate the jam nut that came packaged with the kit.
 2. Screw the jam nut onto the valve stem all the way as far as it will go (you may need to use a 3/4" open-end wrench). At least 1/2" of the valve stem should extend above the nut. Place the lock washer over the valve stem.
 3. Thread the stem extension onto the valve stem, making contact with the lock washer and jam nut.
 4. Ensure 15° or 1-1/2 turns of manual override for actuator preload (Figure-12).
 5. Orient the actuator mounting bracket on the valve, place lock washer over valve stem and tighten the mounting nut securely against the bracket using 1-1/2" - 3" adjustable spanner wrench. Raise the valve stem to the full up position.
 6. Rotate stem extension until the through hole lines up with the through hole of actuator rack. Insert connecting pin to secure stem extension and tighten jam nut against stem extension using 3/4" open end wrench.
 7. Affix open/close label to the indicator in the appropriate position.
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.

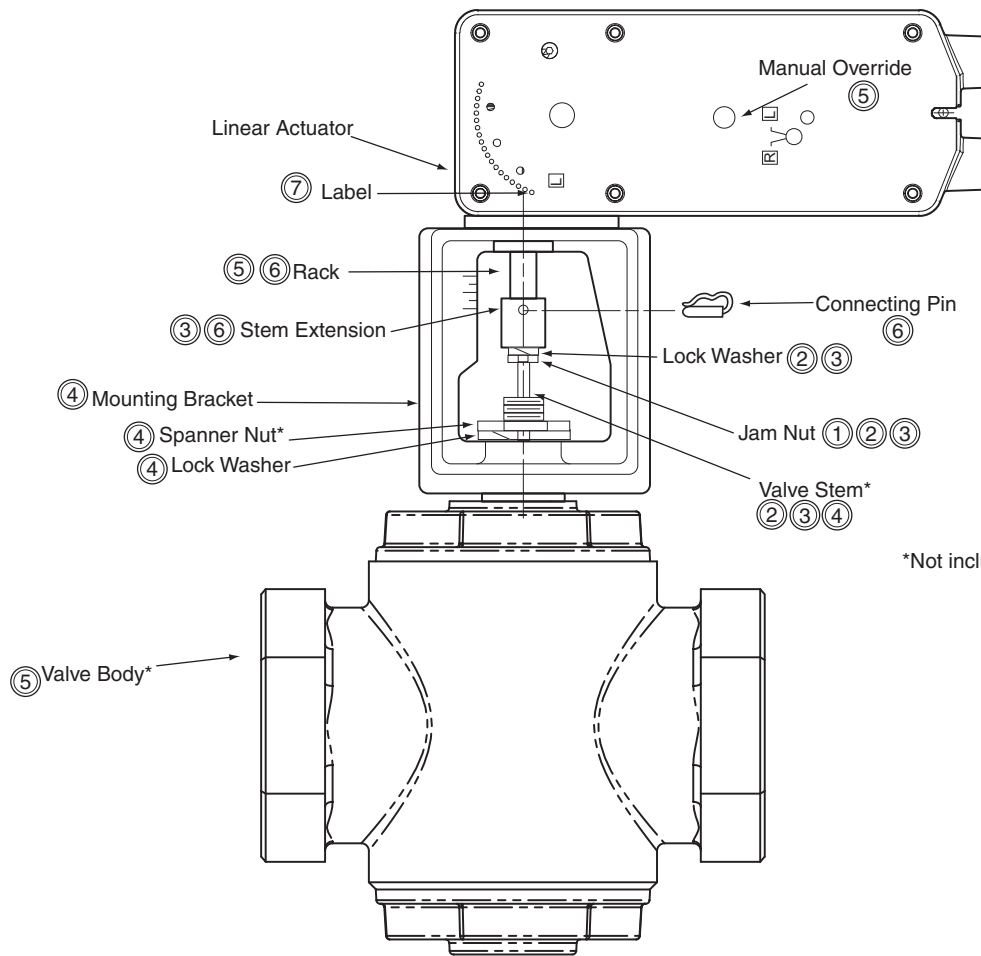


Figure-5 Typical Assembly and Installation of AM-732 Linkage Kit with MX61 Series Actuator to 2-1/2" to 4" VB-9XXX Series Valve Bodies, Stem-Up Open, 2-Way.

Installation: AM-732 linkage kit to MX61-720X Series Actuator to 2-1/2" to 4" VB-9XXX Series Valve Bodies, Stem-Up Open 2-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-5.
 1. Locate the jam nut that came packaged with the kit.
 2. Screw the jam nut onto the valve stem all the way as far as it will go (you may need to use a 3/4" open-end wrench). At least 1/2" of the valve stem should extend above the nut. Place the lock washer over the valve stem.
 3. Thread the stem extension onto the valve stem, making contact with the lock washer and jam nut.
 4. Orient the actuator mounting bracket on the valve, place lock washer over valve stem and tighten the mounting nut securely against the bracket using 1-1/2" - 3" adjustable spanner wrench.
 5. Insert the hex wrench into manual override and crank to extend the actuator rack to its fully extended position, back off 1-1/2 turn, and lock (Figure-12). Remove hex wrench to prevent accidental spring return of the actuator. Ensure valve stem is completely pushed down.
 6. Rotate stem extension until the through hole lines up with the through hole of actuator rack. Insert connecting pin to secure the assembly. Tighten jam nut against stem extension using 3/4" open end wrench.
 7. Affix open/closed label to the indicator in the appropriate position.
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.

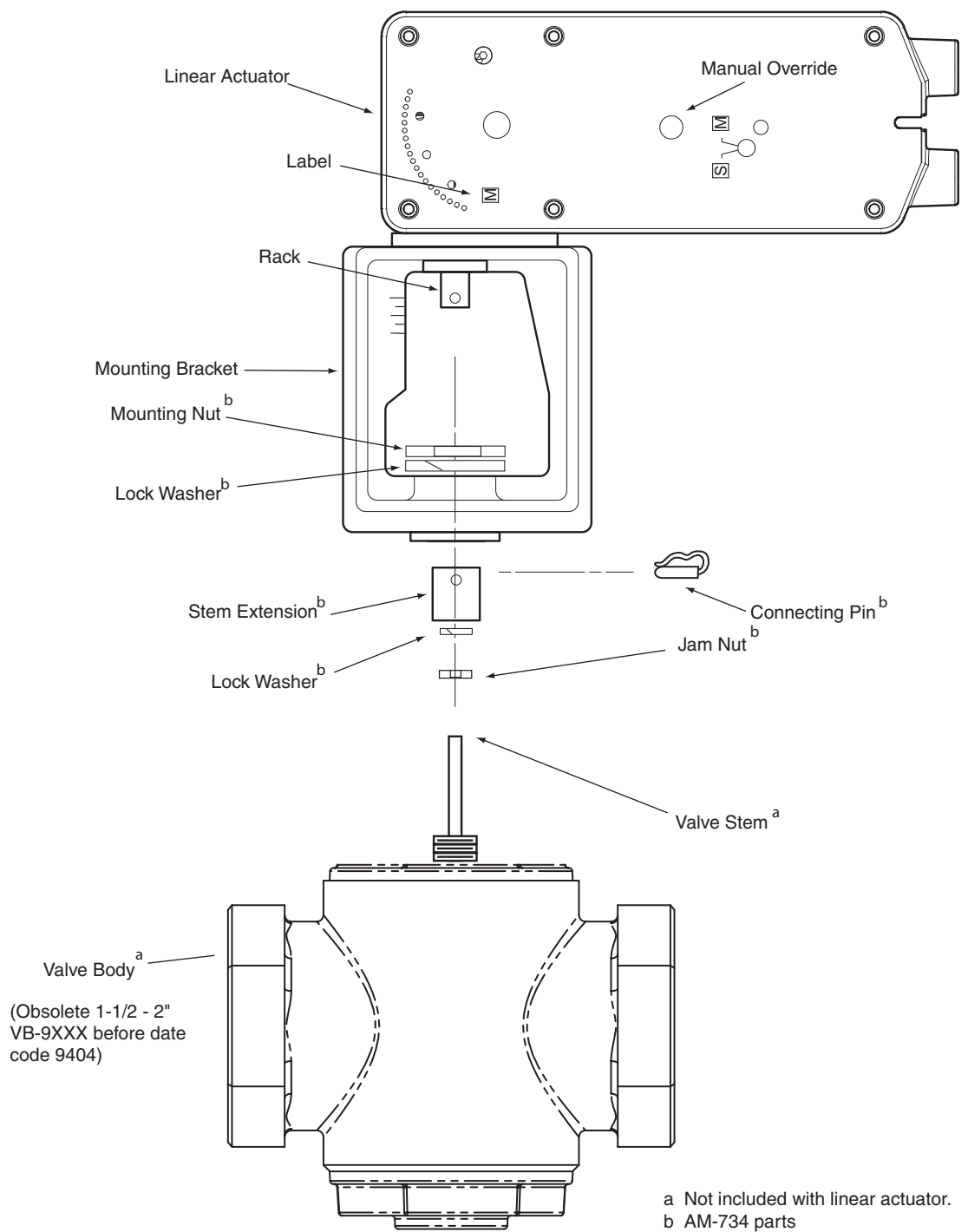


Figure-6 AM-734 Kit with MX61-720X Actuator, Exploded View.

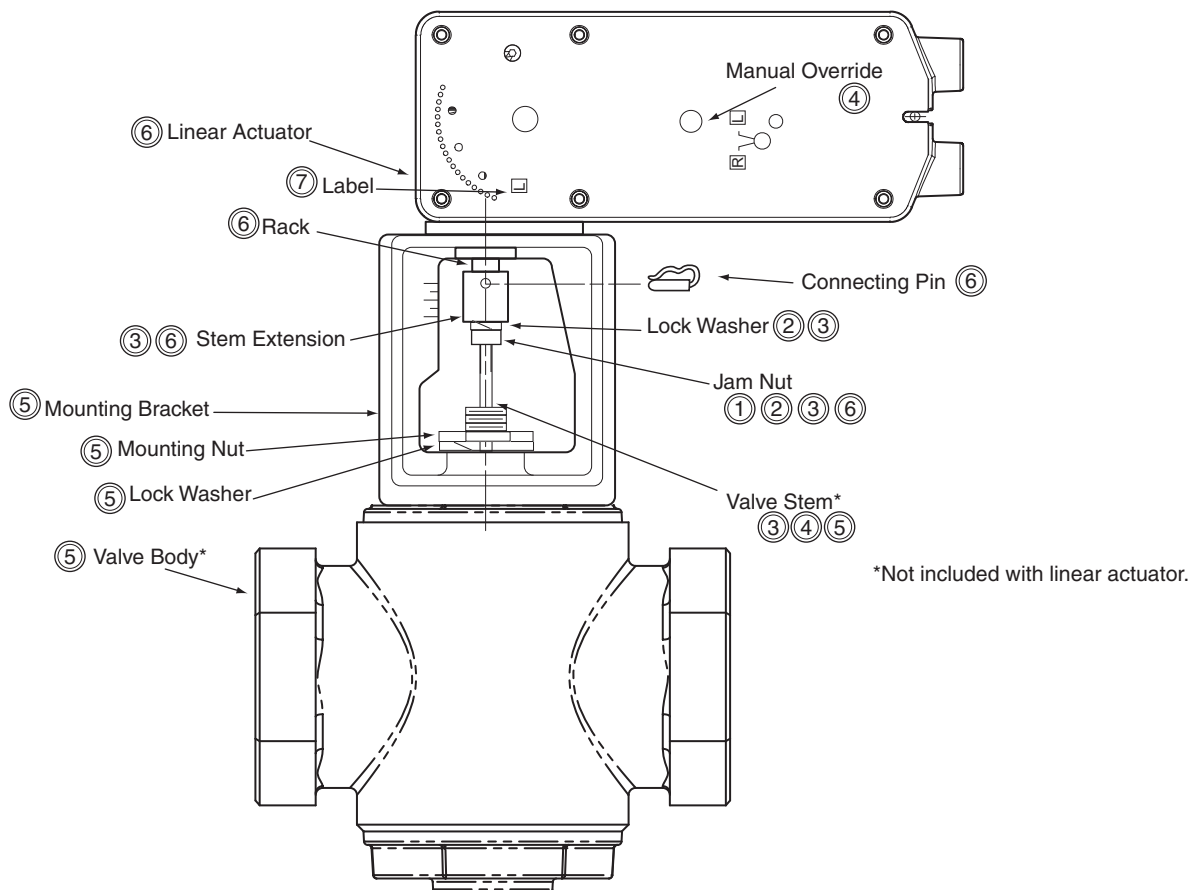


Figure-7 Typical Assembly and Installation of AM-734 Linkage Kit with MX61 Series Actuator of Obsolete 1-1/2" to 2" VB-9XXX Series Valve Bodies, before date code 9404, Stem-Up Closed, 2-Way and 3-Way.

Installation: AM-734 linkage kit to MX61-720X Series Actuator to Obsolete 1-1/2" to 2" VB-9XXX Series Valve Bodies, before date code 9404, Stem-Up Closed, 2-Way and 3-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-7.
 1. Locate the jam nut that came packaged with the kit. Do not re-use the brass jam nut from an existing valve.
 2. Screw the jam nut onto the valve all the way as far as it will go (you may need to use a 5/16" open-end wrench). Place lock washer over valve stem.
 3. Thread the stem extension onto the valve stem, making contact with the lock washer and jam nut.
 4. Ensure 15° or 1-1/2 turns of manual override for actuator preload (Figure-12).
 5. Orient the actuator mounting bracket on the valve placing the lock washer over the valve stem. Tighten the mounting nut securely against the bracket using 1-3/8" open end wrench. Raise the valve stem to the full up position.
 6. Rotate the stem extension until the through hole lines up with the through hole of actuator rack. Insert connecting pin to secure stem extension and tighten jam nut against stem extension using 5/16" open end wrench.
 7. Affix open/closed label to the indicator in the appropriate position.
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.

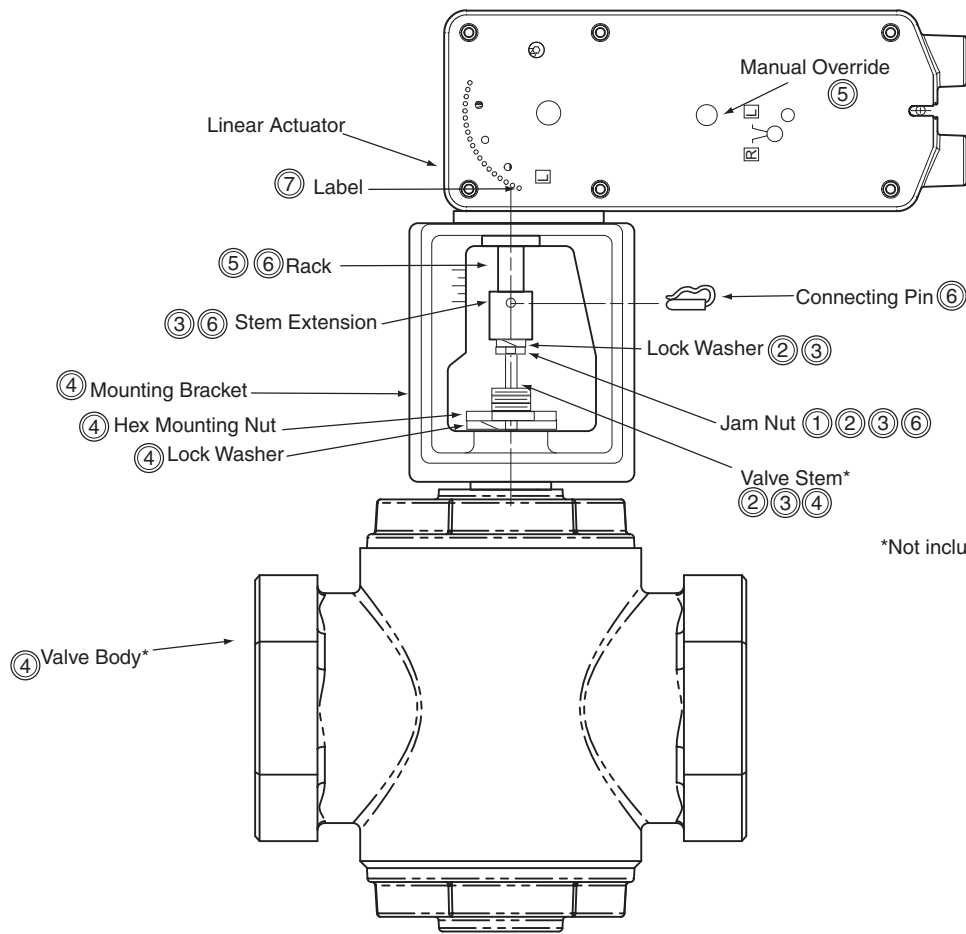


Figure-8 Typical Assembly and Installation of AM-734 Linkage Kit with MX61 Series Actuator to Obsolete 1-1/2" to 2" VB-9XXX before date code 9404 Series Valve Bodies, Stem-Up Open, 2-Way.

Installation: AM-734 linkage kit to MX61-720X Series Actuator to Obsolete 1-1/2" to 2" VB-9XXX before date code 9404 Series Valve Bodies, Stem-Up Open, 2-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-8.
 1. Locate the jam nut that came packaged with the kit. Do not re-use the jam nut from an existing valve.
 2. Screw the jam nut onto the valve stem all the way as far as it will go (you may need to use a 5/16" open-end wrench). Place the lock washer over the valve stem.
 3. Thread the stem extension onto the valve stem, making contact with the lock washer and jam nut.
 4. Orient the actuator mounting bracket on the valve, place lock washer over valve stem and tighten the mounting nut securely against the bracket using 1-3/8" open end wrench.
 5. Insert the hex wrench into manual override and crank to extend the actuator rack to its fully extended position, back off 1-1/2 turn, and lock (Figure-12). Remove hex wrench to prevent accidental spring return of the actuator. Ensure valve stem is completely pushed down.
 6. Rotate stem extension until the through hole lines up with the through hole of actuator rack. Insert connecting pin to secure the assembly. Tighten jam nut against stem extension using 5/16" open end wrench.
 7. Affix open/closed label to the indicator in the appropriate position.
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.

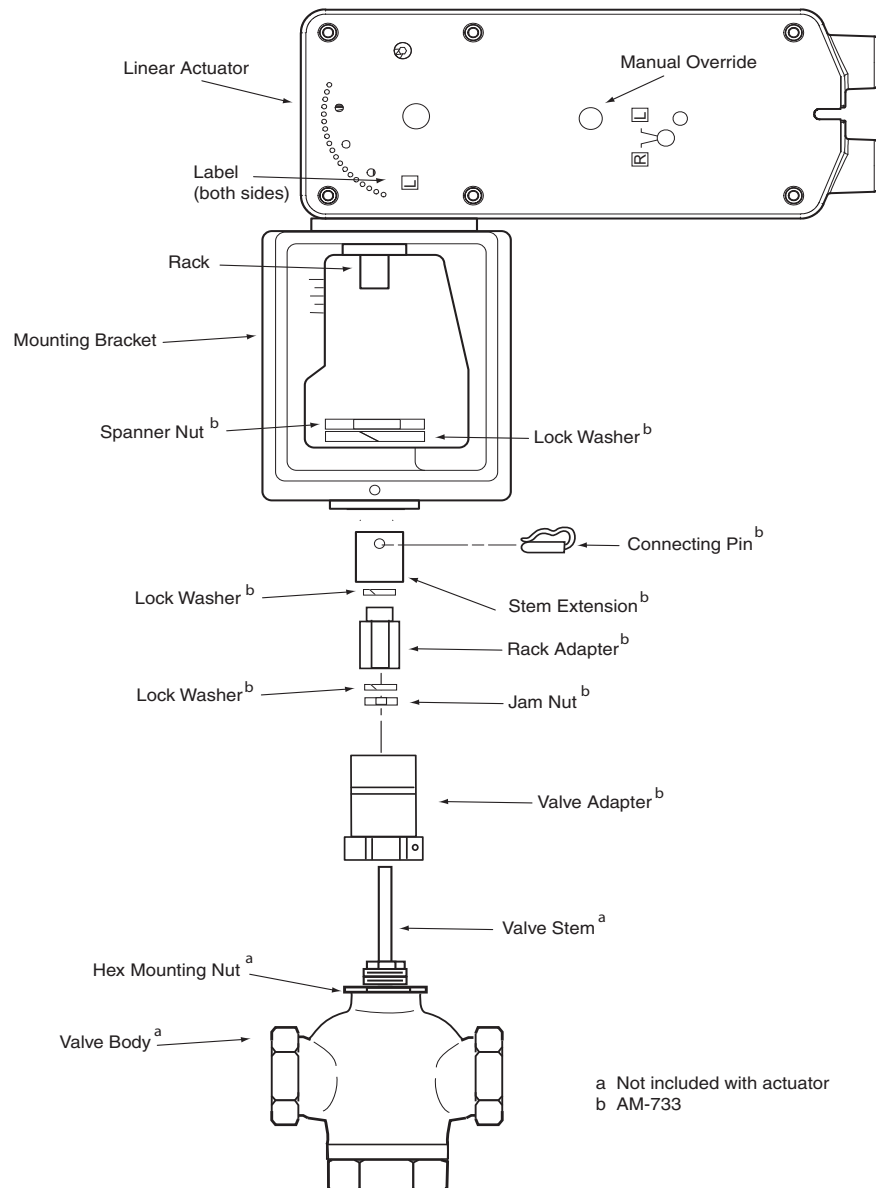


Figure-9 AM-733 Kit with MX61-720X Actuator and Old Style VB-9XXX after Date Code 9404.

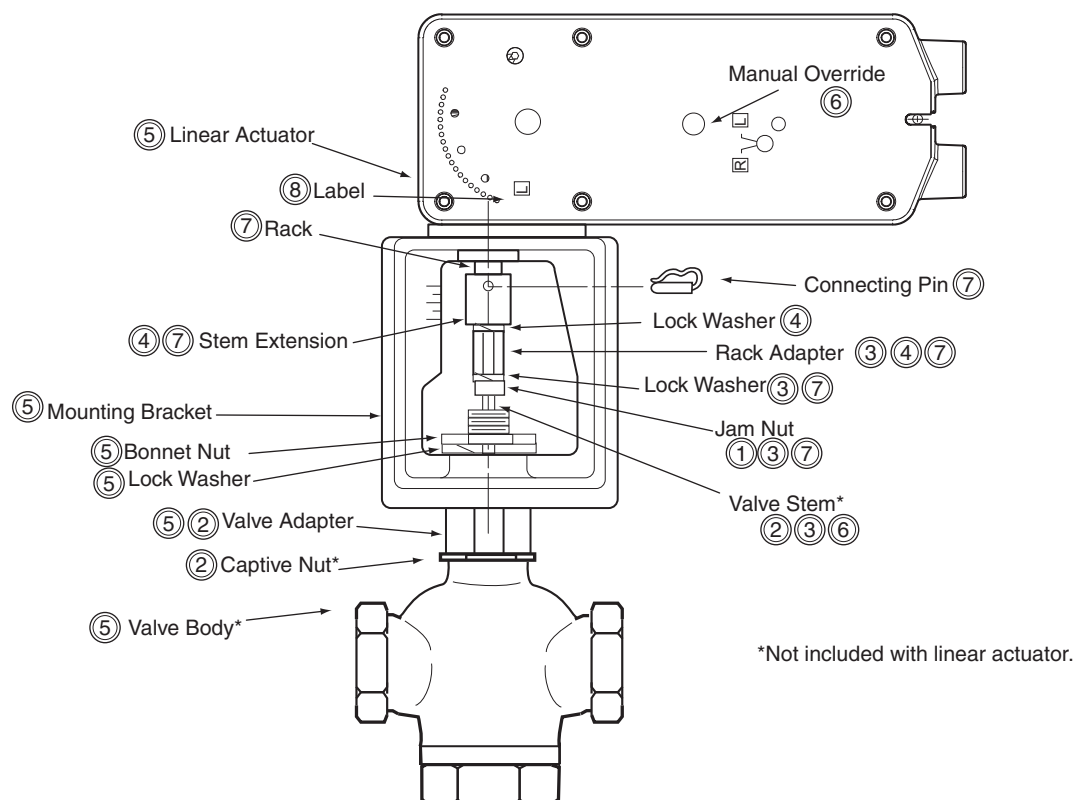


Figure-10 Typical Assembly and Installation of AM-733 Linkage Kit to MX61-720X Series Actuator to Obsolete 1-1/2" to 2" Old Style VB-9XXX After Date Code 9404 Series Valve Bodies, Stem-Up Closed, 2-Way and 3-Way.

Installation: AM-733 linkage kit to MX61-720X Series Actuator to Obsolete 1-1/2" to 2" Old Style VB-9XXX After Date Code 9404 Series Valve Bodies, Stem-Up Closed 2-Way and 3-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-10.
 1. Locate the jam nut that came packaged with the kit. Do not re-use the brass jam nut from an existing valve.
 2. Place valve adapter over valve stem and screw it onto the valves' captive nut, as far as it will go and tighten using 1-1/2" and 1-5/8" open end wrenches.
 3. Thread the rack adapter onto the valve stem, making contact with the lock washer and jam nut using 5/8" and 5/16" open end wrenches.
 4. Use the lock washer and screw the stem extension into the rack adapter and tighten using 5/8" open end wrench.
 5. Orient the actuator and mounting bracket on the valve placing the lock washer and bonnet nut onto the threads of the valve adapter. Tighten the bonnet nut using spanner wrench and 1-1/2" open end wrench.
 6. Ensure 15° or 1-1/2 turns of manual override preload (Figure-12). Raise the valve stem to the full up position.
 7. Rotate the rack until the through hole of the stem extension lines up with the through hole of actuator rack. Insert connecting pin to secure the assembly. Tighten the jam nut against the rack adapter using 5/16" open end wrench.
 8. Affix open/closed label to the indicator in the appropriate position.
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.

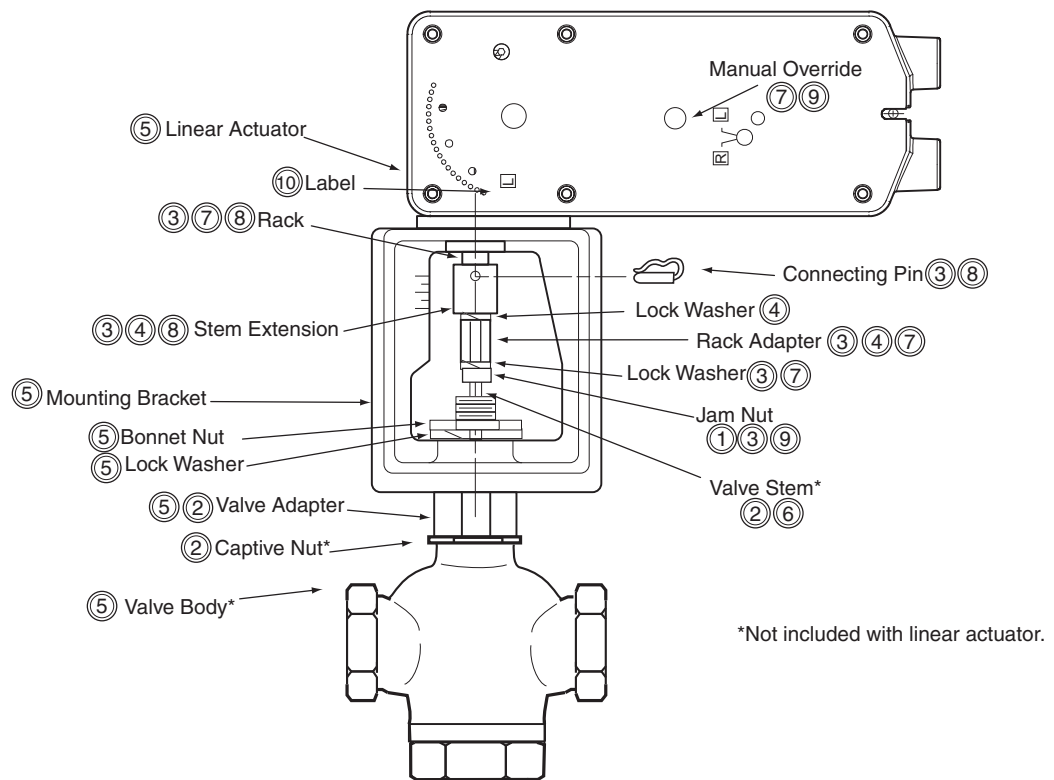
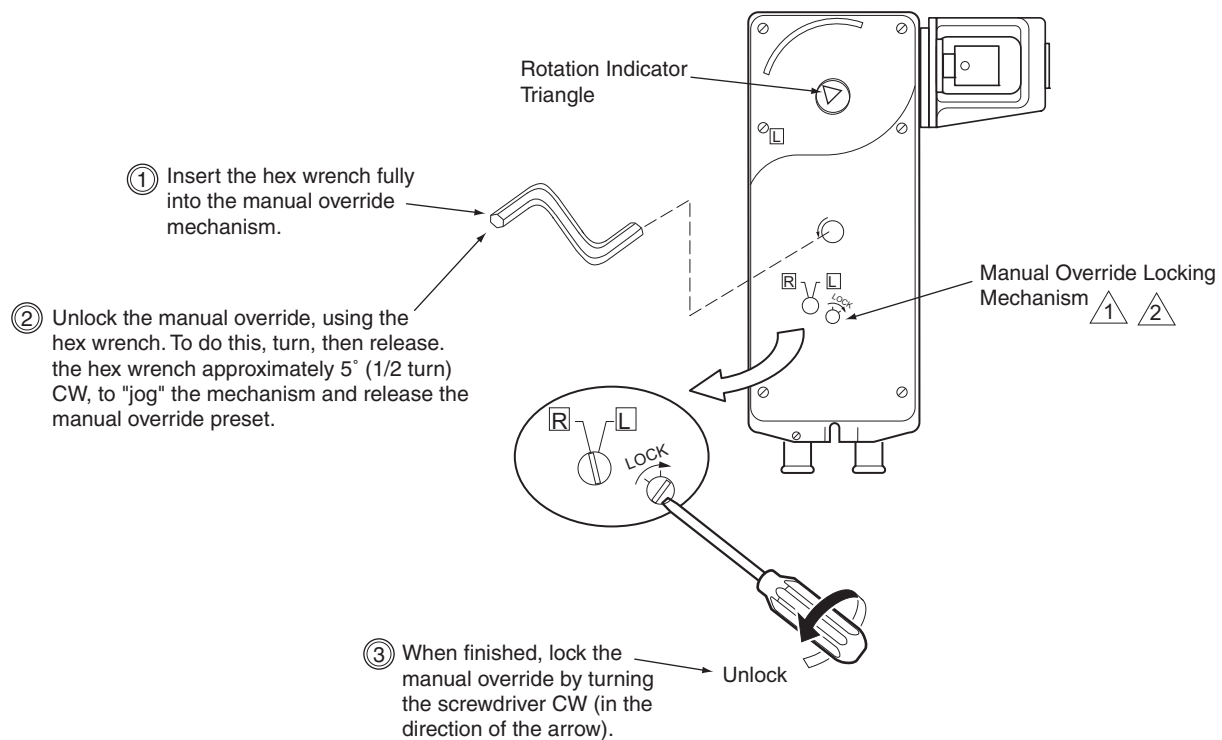


Figure-11 Typical Assembly and Installation of AM-733 Linkage Kit to MX61-720X Series Actuator to Obsolete 1-1/2" to 2" Old Style VB-9XXX After Date Code 9404 Series Valve Bodies, Stem-Up Open, 2-Way.

Installation: AM-733 linkage kit to MX61-720X Series Actuator to Obsolete 1-1/2" to 2" Old Style VB-9XXX After Date Code 9404 Series Valve Bodies, Stem-Up Open, 2-Way

- A. Install the actuator onto the valve. Set up the assembly according to the numbered steps in Figure-11.
 1. Locate the jam nut that came packaged with the kit. Do not re-use the brass jam nut from an existing valve.
 2. Place valve adapter over valve stem and screw it onto the valves' captive nut, as far as it will go and tighten using 1-1/2" and 1-5/8" open end wrenches.
 3. Thread the rack adapter onto the valve stem, making contact with the lock washer and jam nut using 5/8" and 5/16" open end wrenches.
 4. Use the lock washer and screw the stem extension into the rack adapter and tighten using 5/8" open end wrench.
 5. Orient the actuator and mounting bracket on the valve placing the lock washer and bonnet nut onto the threads of the valve adapter. Tighten the bonnet nut using spanner wrench and 1-1/2" open end wrench.
 6. Ensure that the valve stem is completely pushed down.
 7. Insert the hex wrench into manual override and crank to extend the actuator rack to its' fully extended position. Back the crank off 1-1/2 turn and lock (Figure-12). Remove hex wrench to prevent accidental spring return of the actuator.
 8. Rotate the stem extension until the through hole of the stem extension lines up with the through hole of actuator rack. Insert connecting pin to secure the assembly.
 9. Unlock manual override by turning crank 1/2 turn in the direction of the arrow. Allow the actuator to return to full up position. Tighten the jam nut against the rack adapter using 5/16" open end wrench.
 10. Affix open/closed label to the indicator in the appropriate position.
- B. Apply power to the actuator and check the system operation for heating or cooling output in response to the control signal.



1 When necessary, the manual override mechanism may be used to reposition the actuator at any point between -5° and 85°. This mechanism is accessible on both sides of the actuator and can be used to ensure tight close-offs for valves.

When using the manual override mechanism:

- Fully engage the hex wrench in the manual override before cranking.
- When operating the manual override, ensure proper release by backing off 5° from the full extended mechanical stop.

Figure-12 Manual Override.

Caution:

- Only use manual override when the actuator drive motor is not powered.
- Engaging the manual override when the actuator is powered will cause damage to the gears.
- Using power tools to adjust the override will cause damage to the gears.
- Avoid manually repositioning the actuator beyond its adjustable travel limit setting.

CHECKOUT

After the entire system has been installed and the actuator has been powered up, the following check can be made for proper system operation. Check for correct operation of the valve while actuator is being stroked.

1. Apply power to the actuator. Actuator and valve should be driven to their powered position as determined by the control signal.
2. Break power to the actuator. Actuator and valve should return to the spring return position.

THEORY OF OPERATION

The MA, MF and MS series actuators are directly mounted onto the valve without the use of an additional linkage. They are equipped with true mechanical spring return operation for reliable, positive close-off on valves. When power is applied, the actuator moves to its powered position, at the same time tensing the spring return safety mechanism. When the power is removed, the spring returns the actuator to its normal position. The spring return system provides consistent close-off force to the valve.

MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained optimum performance. The Linear series actuators are maintenance free.

FIELD REPAIR

None. For replacement contact your Schneider Electric Representative and specify the desired model number from Table 1.

DIMENSIONAL DATA

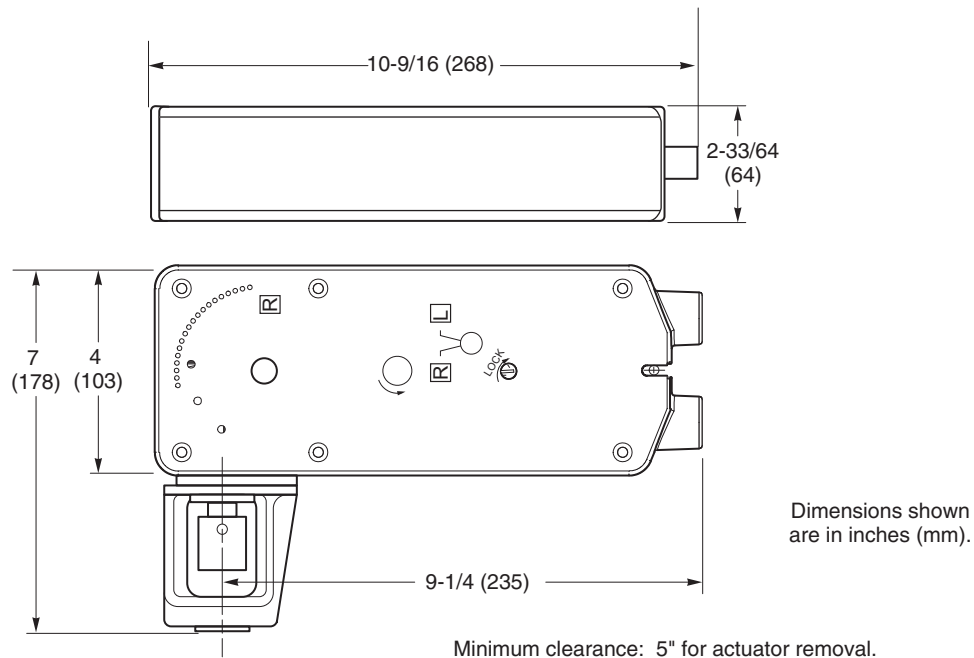


Figure-13 MX51-720X Spring Return Valve Actuator Dimensions.

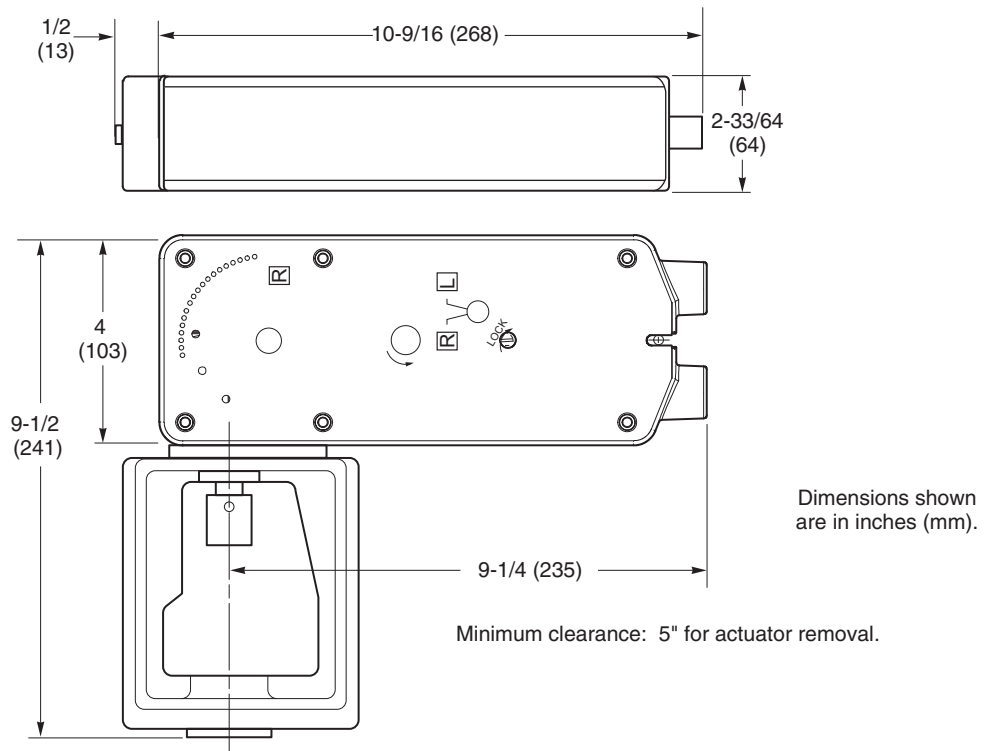


Figure-14 MX61-720X Spring Return Valve Actuator Dimensions.

On October 1st, 2009, TAC became the Buildings business of its parent company Schneider Electric. This document reflects the visual identity of Schneider Electric, however there remains references to TAC as a corporate brand in the body copy. As each document is updated, the body copy will be changed to reflect appropriate corporate brand changes.

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