Honeywell

MP909E,H
Pneumatic Damper Actuators

INSTALLATION INSTRUCTIONS

BEFORE INSTALLATION

This installation literature covers MP909E and H Pneumatic Damper Actuators which can be mounted in any position and installed either externally or internally.

The MP909H includes a positive positioner. To install MP909E and H UL Listed Pneumatic Damper Actuators, refer to form 95-6076. Internally mounted, normally open applications for dampers with 12 in. B dimension are not covered in this document. Consult the factory.

Tools Needed

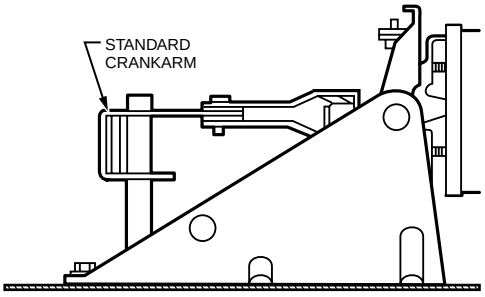
The following tools are required to install MP909E,H Actuators:
— 7/16 in. box end wrench
— 1/8 in. Allen wrench
— Squeeze bulb

NOTE: Use squeeze bulb to stroke (operate) unpiped actuators during adjustment.

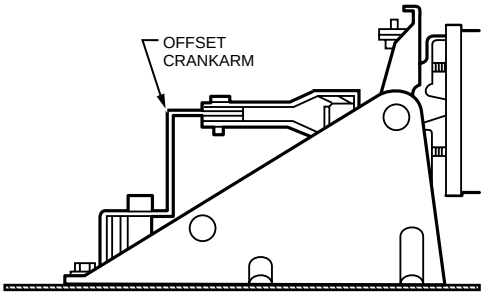
Optional Accessories

Some installation procedures require accessories listed below. These are obtained separately from the actuator or damper. Review these instructions to see that the required accessories are available for the installation.

— 14004106-001 Push Rod Assembly (conversion of internal normally closed to external).
— 14004107-001 Crankarm Assembly (conversion of internal normally closed to external).
— 14004137-001 Conversion Kit to convert MP909E, 5 to 10 psi (35 to 69 kPa) spring range, to MP909H. Contains 3, 5, and 10 psi (21, 35, and 69 kPa) span feedback springs.
— 14004210-001 Positioner Feedback Spring Kit. Contains one 3, 5, and 10 psi (21, 35, and 69 kPa) span spring.
— 14004236-001 Adapter for Internal Side Mount.
— 14004237-001 Mounting Screw Assembly (conversion of internal mounting models to external).
— 14004241-002 Hitch Pin Assembly (contains six clevis pins).
— 14004242-001 Balljoint and Adapter Assembly (for jackshaft installation).
— 14004313-001 Right-Hand Drive Ear Hardware Assembly for internal normally closed mounting (Fig. 2).
— 14004313-002 Right-Hand Drive Ear Hardware Assembly for internal normally open mounting (Fig. 3).
— 14004313-003 External Drive Axle Hardware Assembly.
— 14004324-001 Alternate Top Mount Assembly.
— 14004509-001 Feedback Spring Kit for 3 psi (21 kPa) span, MP909H (10 springs per kit).
— 14004667-001 Offset Crankarm for 1/2 in. damper drive shaft, 1.9 in. offset (Fig. 1).
— 15753692-001 Modular Kit for jackshaft installation.
— 15753693-001 End Kit for jackshaft installation.
— 15753694-001 Operator Kit for jackshaft installation.
— 26025B Crankarm for 3/8 in. diameter drive shaft.
— 27174B Crankarm for 7/16 in. diameter drive shaft.
— 27520 5/16 in. Diameter Pushrod (order to required length).
— 312867C Crankarm for 1/2 in. diameter drive shaft.
— CCT2361 3/8-16 Hex Nuts for shaft extension.
— CCT2718 3/8-16 Threaded Rod for shaft extension.
— CCT2725 3/8-16 Rod Coupling for shaft extension.



A. STANDARD CRANKARM



B. 14004667 OFFSET CRANKARM

C2236

Fig. 1. Offset Crankarm.

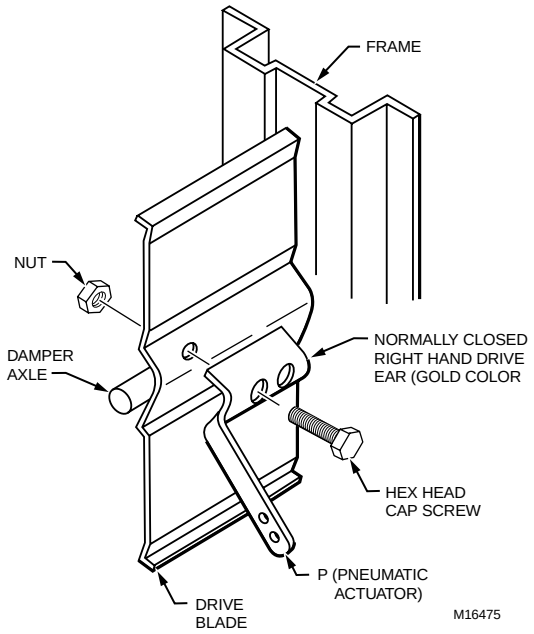


Fig. 2. Normally Closed Drive Ear Mounting.

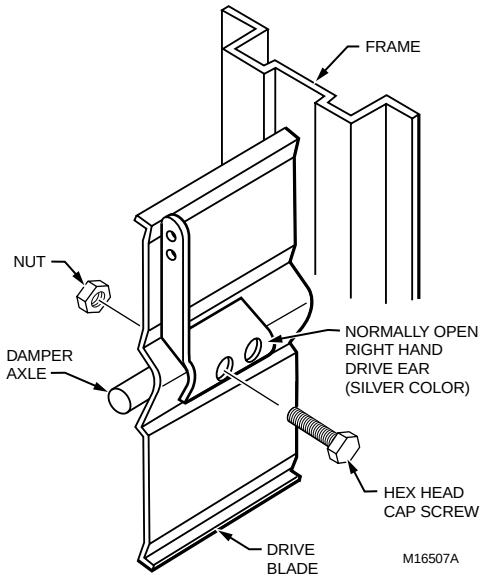


Fig. 3. Normally Open Drive Ear Mounting.

INSTALLATION

General

The MP909 Damper Actuator can be installed externally or internally.There are two mounting approaches: standard and nonstandard. Use nonstandard mounting when standard mounting is not practical (e.g., for extra clearance or non-Honeywell dampers). It can require ordering additional parts.

Standard Mounting

External Mounting

ANGLE BRACKET MOUNTING

NOTE: For dampers with 1/2 in. (13 mm) diameter shaft extension to outside of duct, angle brackets and hardware are furnished with certain MP909E and H models. For shaft extensions other than 1/2 in. (13 mm) diameter, an appropriate crankarm must be ordered (see Table 1).

Table 1. MP909E and H Crankarms.

Part Number	Drive Shaft Diameter in in. (mm)	Maximum Crankarm Radius in in. (mm)
26025B	3/8 (9.5)	4-5/8 (117)
27174B	7/16 (11)	

1. For external mounting dimensions, see Fig. 4.
2. Mark holes using the “B” holes of the bracket template enclosed with the actuator (Fig. 5):
   a. Unfold template and remove paper backing.
   b. Determine damper drive axle direction from normal position.
   c. Install template with appropriate axle hole on template over damper drive axle. Arrow surrounding hole should match rotation determined in step b.
   d. Press template against duct so that it adheres.
   e. Punch mounting holes.
   f. Screw mounting bracket, with actuator, firmly to duct with screws provided.
   g. Secure linkage to actuator and damper drive axle (see Fig. 6).

   NOTE: To provide proper pivot action, align push rod and actuator shaft at start of stroke.

3. Stroke actuator to check damper operation by applying air pressure to actuator. Readjust linkage if necessary.

   NOTES:
   - Two MP909E models (2.5 to 6.5 psi [17 to 45 kPa] and 9 to 13 psi [62 to 90 kPa]) achieve a 3-1/8 in. (80 mm) stroke. This results in 78 degree damper blade rotation.
   - To achieve 90 degree rotation, change the external damper crankarrn from a 2-1/2 in. (63.5 mm) radius to a 2-1/16 in. (52 mm) radius.
   - For modulating control, 78-degree blade rotation provides improved control and usually adequate maximum airflow.

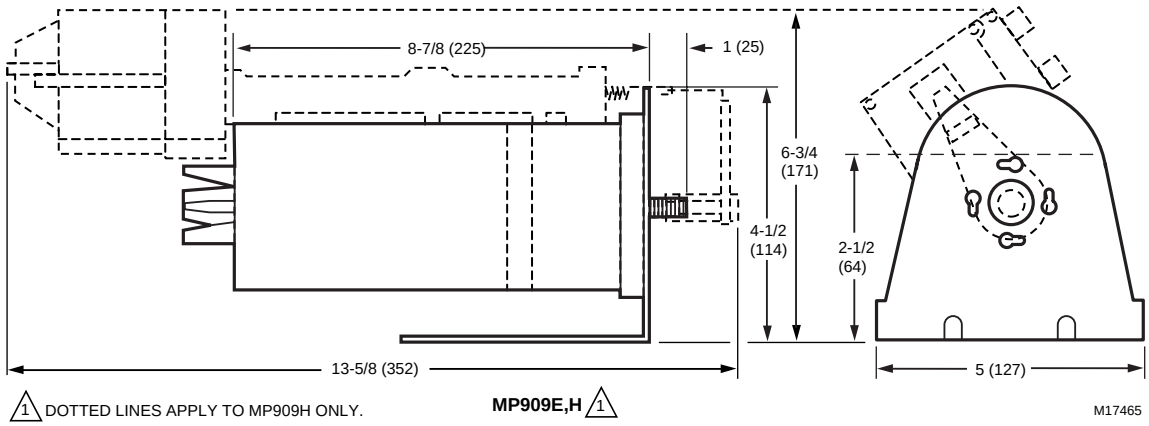


Fig. 4. MP909E and H Dimensions in in. (mm) with Angle Bracket.

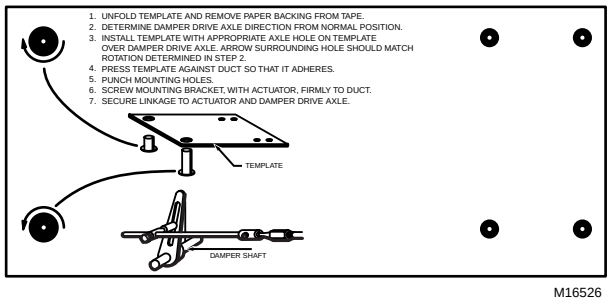


Fig. 5. 14002906-001 Bracket Template (Use “B” Holes).

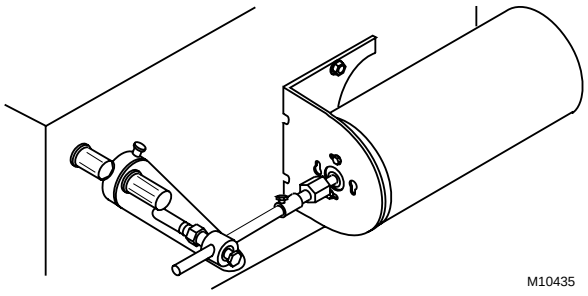


Fig. 6. External Mounting with Angle Bracket.

TRUNNION BRACKET MOUNTING

1. See Fig. 7 for mounting dimensions.
2. Check faceplate position and adjust if necessary (Fig. 8).
3. Determine damper drive axle direction of rotation from the normal position (normally open or normally closed).
4. Rotate damper drive axle to normal position. (Position with 0 psi to actuator).
5. Install actuator with appropriate shaft hole (Fig. 9) on mounting bracket over damper axle. Arrow on bracket surrounding hole should match rotation determined in Step 3.
6. Position bracket.
7. Secure mounting bracket. Use four of the 10 holes available in bracket and drill screws provided.
8. To provide close-off force, use a squeeze bulb and stroke the actuator:
   a. For normally open dampers, fully extend actuator shaft, then retract 1/8 in. (3 mm).
   b. For normally closed dampers, extend actuator shaft 1/8 in. (3 mm).
9. Secure crankarm to damper drive axle.

IMPORTANT

See Fig. 10 for proper crankarm bolt tightening.

10. Go to Piping section.

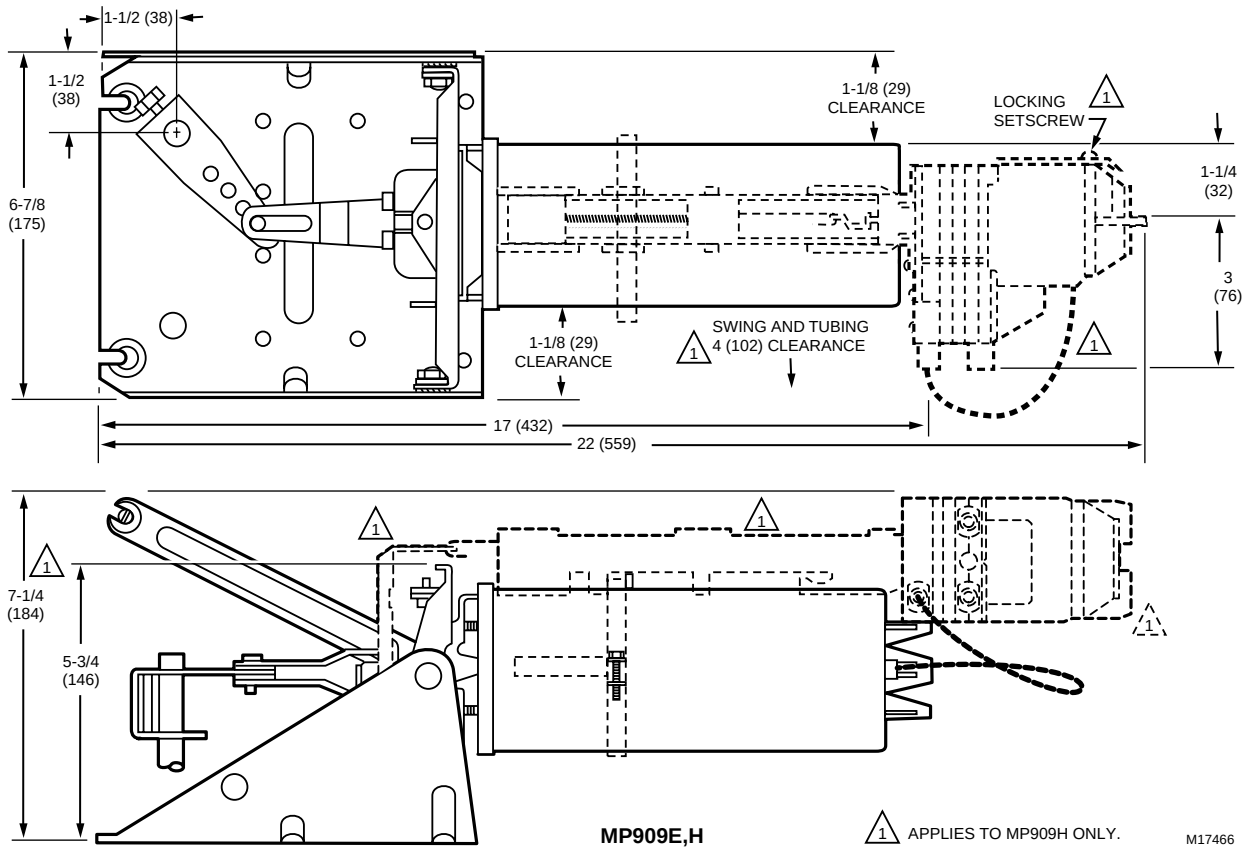


Fig. 7. External Mounting Dimensions in in. (mm) with Trunnion Bracket.

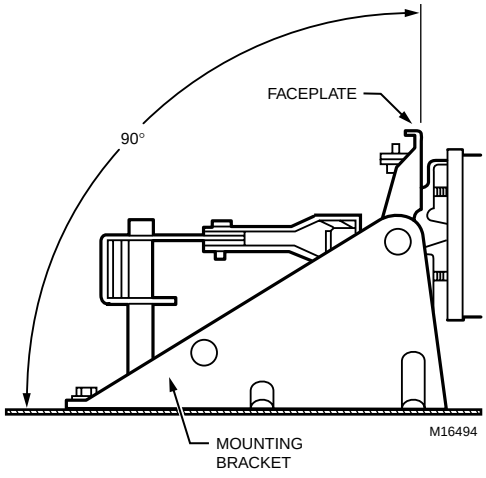


Fig. 8. External Mounting Faceplate Positioning.

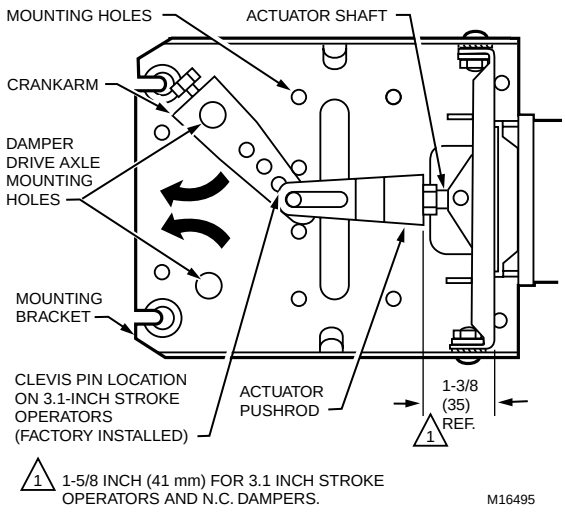


Fig. 9. External Mounting with Trunnion Bracket.

Internal Mounting

NORMALLY CLOSED MOUNTING

1. See Fig. 11 for internal mounting normally closed dimensions.
2. Check faceplate position and adjust if necessary (Fig. 12). The faceplate must be parallel to the back of the mounting bracket.
3. Use 1/5 in. Allen wrench to loosen mounting setscrews on damper mounting clamp one turn (Fig. 12).
4. Remove and discard shipping stop.
5. Loosen faceplate nut between mounting bracket and truss link. Remove clevis pin from actuator pushrod.
6. Find factory-installed drive ear on damper blade (mounted per Damper Ordering Instructions).

   NOTE: Mount actuator in this position *only*.

7. Set actuator in place by hooking damper mounting clamp over bottom edge of damper.
8. Set damper to its normal (closed) position.
9. Reinsert clevis pin through drive ear and actuator pushrod.
10. Connect truss link to damper with mounting screw and tighten faceplate nuts.
11. Tighten damper mounting clamp.
12. Go to Piping section.

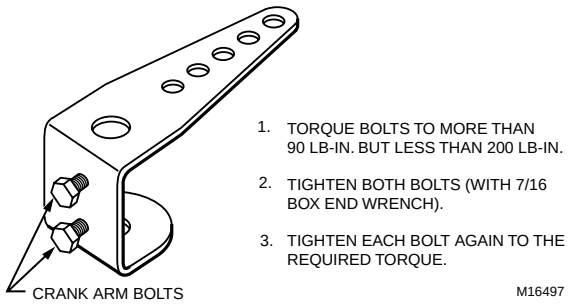


Fig. 10. Crankarm Bolt Tightening.

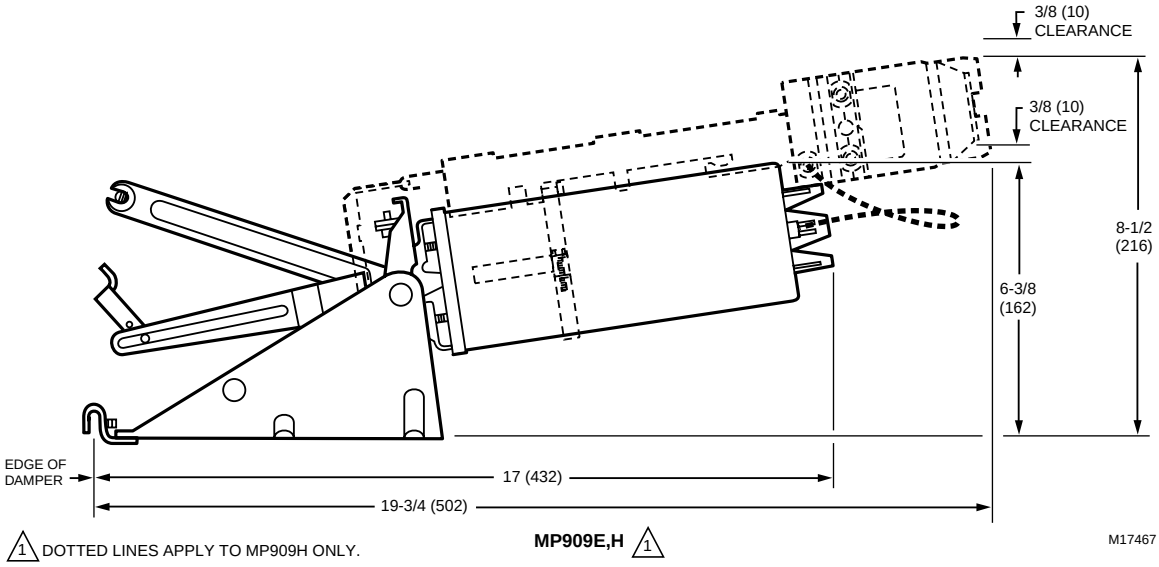


Fig. 11. Internal Mounting Normally Closed Dimensions in in. (mm).

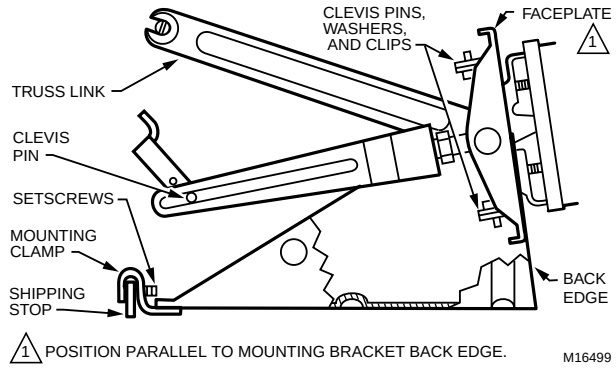


Fig. 12. Internal Mounting Normally Open Faceplate.

NORMALLY OPEN MOUNTING

1. See Fig. 13 for internal mounting normally open dimensions.
2. Ensure faceplate position matches Fig. 14.

   NOTE: The faceplate must be parallel to the back of the mounting bracket.

3. Use 1/8 in. Allen wrench to loosen mounting setscrews on damper mounting clamp one turn (Fig. 14).
4. Remove and discard shipping stop.
5. Determine height of damper drive blade. Dampers with 10 (254), 12 (309), 18 (457), 26 (660), 34 (864), and 48 in. (1219 mm) height have 8 in. (203 mm) drive blades. All others have 6 in. (152 mm) drive blades.

   NOTE: For installation with 6 in. (152 mm) drive blades skip to Step 7.

6. For 8 in. (203 mm) drive blades, remove clevis pin A from damper pushrod clevis pin hole marked 6 and reinstall in clevis pin hole marked 8 (Fig. 14). (Mate with crankarm hole marked 90.)
7. Loosen faceplate nut between mounting bracket and truss link (Fig. 14). Remove clevis pin C from pushrod.
8. Find factory-installed drive ear on damper blade (mounted per Damper Ordering Instructions).

   NOTE: Mount actuator only in this position.

9. Set actuator in place by hooking damper mounting clamp over bottom edge of damper.
10. Set damper to its normal (open) position.
11. Connect damper pushrod to damper drive ear with clevis pin C.
12. Connect truss link to damper with mounting screw and tighten faceplate nuts.
13. Tighten setscrews on damper mounting clamp.
14. Go to Piping section.

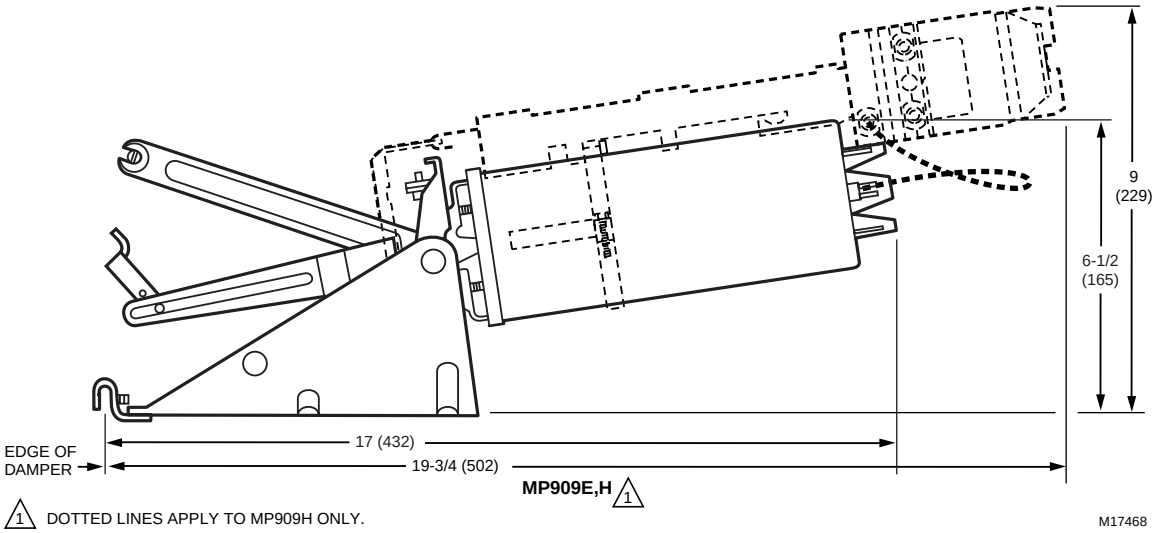


Fig. 13. Internal Mounting Normally Open Dimensions in in. (mm).

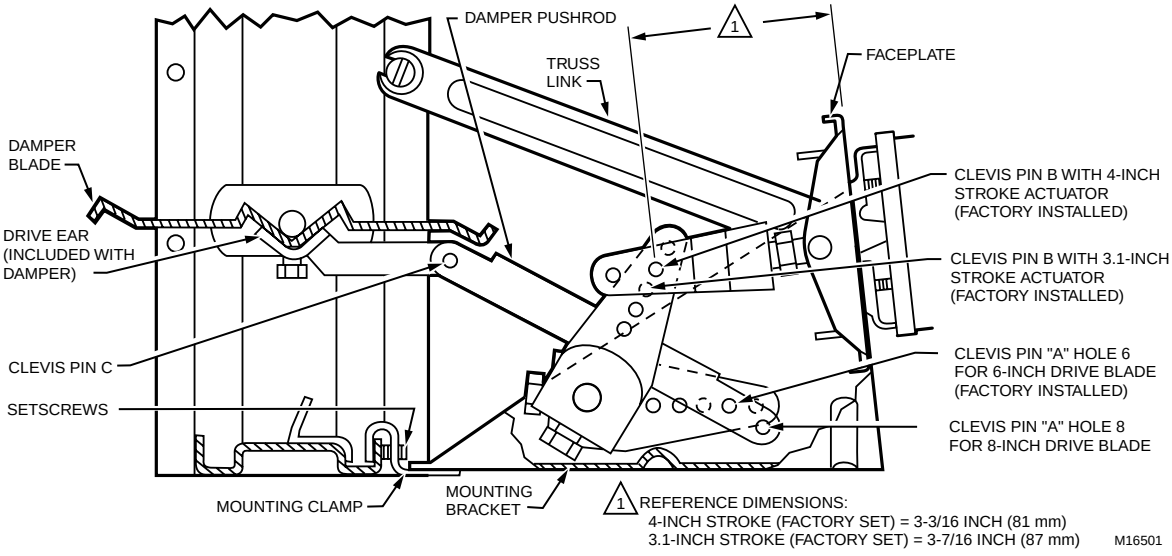


Fig. 14. Internal Mounting Normally Open Installation

Nonstandard Mounting

General

This section describes nonstandard installations. It includes:

— A procedure to use an offset crankarm that allows installation to short drive axles without using couplings and extensions. A 1-7/8 in. (48 mm) offset is provided.

— A procedure to add an actuator shaft extension when the actuator cannot be mounted in damper shaft proximity.

— Two methods for mounting the damper actuator on top of the duct to drive damper crankarm. (The first method, Top Mounting, uses an actuator shaft extension.)

NOTE: Extra installation time may be needed. Additional necessary parts are listed.

External Mounting

OFFSET CRANKARM MOUNTING

1. Obtain one 14004667-001 Offset Crankarm (Fig. 1).
2. Remove standard crankarm (Fig. 1A) from actuator and install offset crankarm (Fig. 1B).
3. Mount actuator and secure offset crankarm to drive axle as covered in External Mounting Section.

ACTUATOR SHAFT EXTENSION MOUNTING

1. Obtain the following additional parts for shaft extension:
   - One CCT2718 3/8-16 Threaded Rod.
   - One CCT2725 3/8-16 Rod Coupling.
   - Two CCT2361 3/8-16 Hex Nuts.
2. Remove clevis pin, washer, and clip (Fig. 9).
3. Disconnect actuator pushrod from crankarm, and unscrew actuator pushrod from actuator shaft.
4. Remove two clevis pins, washers, and clips.
5. Disconnect actuator from faceplate (Fig. 12).

   NOTE: For MP909H, unhook feedback spring.

6. Install mounting bracket using four mounting screws provided (Fig. 15).

   NOTES:
   - Location should allow use of straight shaft extension.
   - Maximum recommended distance between damper axle and mounting bracket faceplate is 41 in. (1041 mm).
   - Use minimum distance practical for the installation.

7. Install actuator to faceplate using the two clevis pins, washers, and clips from Step 4. See Fig. 16.

   NOTE: For MP909H, rehook feedback spring.

8. For offset shaft installation, bend CCT2718 Threaded Rod as required. Use 45-degree bends with a maximum of 3 in. (76.2 mm) offset.
9. Cut threaded rod 5 in. (127 mm) shorter than faceplate to damper axle distance as determined in Step 6.
10. Assemble threaded rod, pushrod, coupling, and nuts to form actuator shaft extension (Fig. 17).
11. Adjust threaded rod length for a 1/8 in. (3.2 mm) clinch at damper closure:
    a. Rotate damper axle to closed damper position.
    b. If linkage is normally open, pressurize actuator to fully extended position.
    c. Adjust actuator pushrod to obtain 1/8 in. (3.2 mm) misalignment in pushrod to crankarm clevis pin hole (Fig. 18).
    d. If linkage is normally open, remove pressure to actuator. If linkage is normally closed, pressurize to stroke actuator at least 1/8 in. (3.2 mm).
    e. Align pushrod and crankarm clevis pin holes and insert clevis pin.
    f. Fasten clevis pin using washer and clip from Step 2.
    g. Tighten hex nuts on actuator shaft and threaded rod (Fig. 17) to lock rod in place.
12. Go to Piping section.

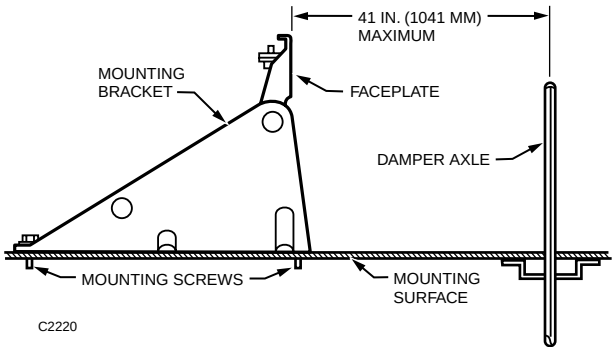


Fig. 15. Mounting Bracket Installation.

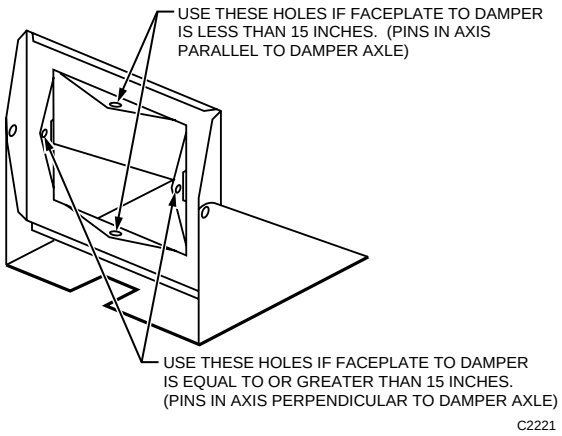


Fig. 16. Faceplate Installation.

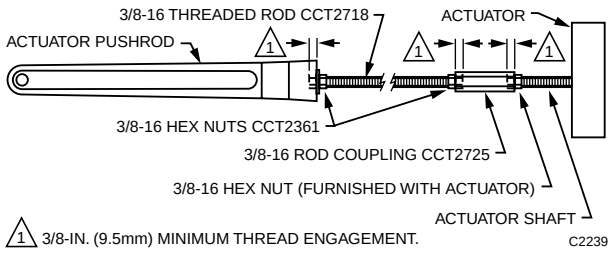


Fig. 17. Assembling Actuator Shaft Extension.

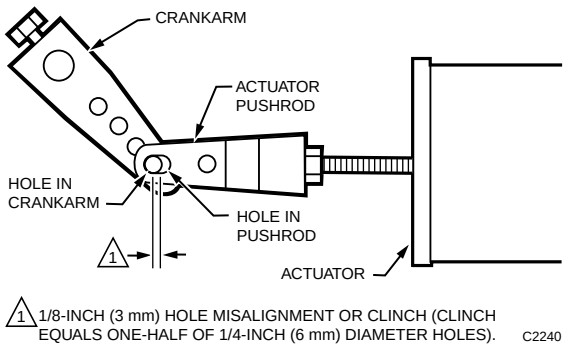


Fig. 18. Threaded Rod Installation.

TOP MOUNTING

1. Obtain the following additional parts for shaft extension:
   - One CCT2718 3/8-16 Threaded Rod.
   - One CCT2725 3/8-16 Rod Coupling.
   - Two CCT2361 3/8-16 Hex Nuts.
2. Move damper to normal position with 0 psi applied to actuator.
3. Loosen locknut and remove factory-installed pushrod from actuator shaft (Fig. 19).
4. Loosen faceplate nuts, rotate faceplate parallel to bottom of mounting bracket, and retighten faceplate nuts.
5. Screw 3/8-16 rod coupling onto actuator shaft.
6. Tighten locknut on actuator shaft against coupling.
7. Attach pushrod to crankarm.
8. Secure crankarm to damper drive axle.

IMPORTANT

See Fig. 10 for proper crankarm bolt tightening.

9. Use mounting bracket as a template and mark four mounting screw locations.
10. Secure mounting bracket with four 14 x 1 in. slotted hexhead sheet metal screws (provided).
11. Cut threaded rod to length.
12. Screw locknuts on either end of threaded rod.
13. Install one end of threaded rod on actuator shaft rod coupling and the other end on pushrod connected to damper crankarm.
14. If preload is desired, use a squeeze bulb and stroke actuator approximately 1/8 in. (3 mm).
15. Tighten locknuts on threaded rod.
16. Go to Piping section.

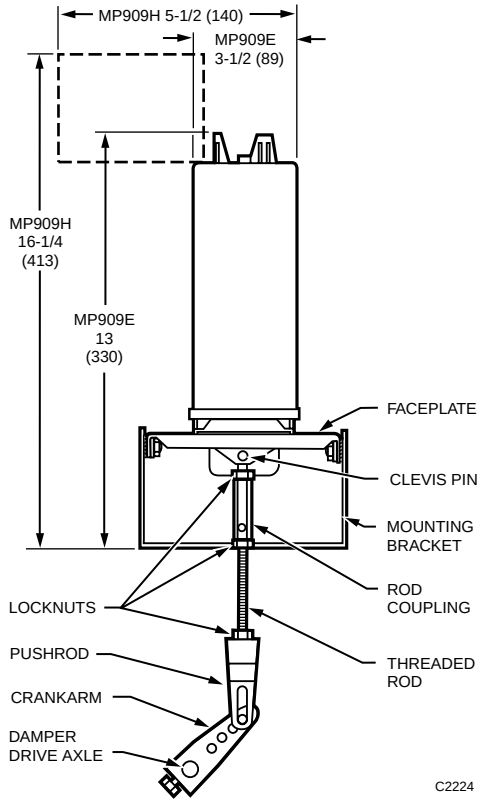


Fig. 19. Nonstandard Top-Mount Installation. Dimensions in in. (mm).

ALTERNATE TOP MOUNTING

1. Obtain the following additional parts:
   - 14004324-001 Alternate Top Mount Assembly. Consists of:
     — One 313661 Crankarm Shaft.
     — Two 1400028-001 Bearings.
     — Two 14004107-001 Crankarm Assemblies.
     — Two 315321 Balljoints.
   - 5/16 in. Diameter Pushrod: 27520 (order to required length)
2. Move damper to normal position with 0 psi applied to actuator.
3. Remove two clevis pins and separate actuator from mounting bracket.
4. Rotate actuator 90 degrees counterclockwise and reinstall clevis pins.
5. Loosen faceplate nuts and align faceplate perpendicular to the bracket base (see Fig. 20).
6. Tighten faceplate nuts.
7. Loosen locknut and screw or unscrew actuator pushrod to dimension shown in Fig. 21.
8. Tighten locknut.
9. Fit white plastic bearings into place (Fig. 21) with flange on outside of mounting bracket.
10. Slide crankarm shaft through crankarm connected to actuator pushrod (Fig. 21).

    NOTE: Crankarm shaft can be extended to either side (Fig. 21).

IMPORTANT

See Fig. 10 for proper crankarm bolt tightening.

11. Tighten bolts on crankarm connected to actuator pushrod (Fig. 21).
12. Use mounting bracket as a template and mark four mounting screw locations.
13. Secure mounting bracket with four 14 x 1 in. slotted hexhead sheet metal screws (provided).
14. Install balljoints on crankarms.

IMPORTANT

See Fig. 10 for proper crankarm bolt tightening.

15. Connect one crankarm from bag assembly to crankarm shaft extended end (Fig. 21).
16. Connect remaining crankarm to damper drive axle (Fig. 21).
17. Cut 5/16 in. pushrod to length.
18. Slide pushrod onto balljoints.
19. If preload is desired, use a squeeze bulb and stroke actuator approximately 1/4 in. (6 mm).
20. Tighten balljoint setscrews.
21. Go to Piping section.

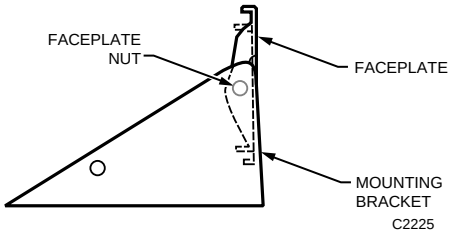


Fig. 20. Alternate Top Mount Faceplate Positioning.

INTERNAL MOUNTING

In non-Honeywell damper installations use 14004242-001 Balljoint and Adapter Assembly and 27520 5/16 in. Diameter Pushrod (order to length) to adapt to damper.

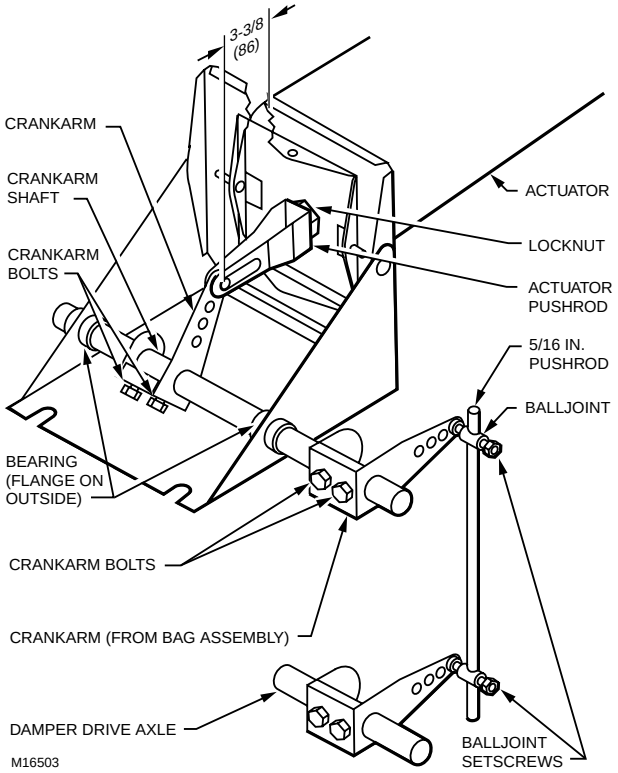


Fig. 21. Alternate Top-Mount Crankarm Installation.

JACKSHAFT INSTALLATION

Installation procedures follow for mounting the jackshaft and kits. Three ways of mounting an actuator using the jackshaft kits are also included: Internal Damper Frame Mounting, Internal Duct Floor Mounting, and External Mounting.

Damper jackshaft installation uses combinations of three separate kits for different installations (illustrated in Fig. 22 and 23). Fig. 24 and 25 illustrate typical installations for normally closed or normally open dampers. Review these figures carefully before installing.

The jackshaft itself must be provided locally and meet the following specifications:

— Must be 3/4 in. (nominal) galvanized steel pipe, schedule 40 (standard) thickness.
— Can be of one continuous length, or made up of shorter lengths joined by threaded pipe ends using standard threaded couplings.
— Couplings and pipe ends must be drilled through and locked together with bolts.

1. Obtain the following parts:
- 15753693-001 End Kit (Fig. 22 and Table 2), one for each installation.
- 15753692-001 Modular Kit (Fig. 23 and Table 2), one for each adjacent, vertical damper bank.
- 15753694-001 Operator Kit (Table 3), one for each actuator.

2. Attach support brackets from end kit and modular kit(s) to sides of damper frame.

NOTE: Mounting holes in brackets will match holes in the frame at only one location. (See Fig. 24 and 25.)

3. Insert snap bearings from kits into brackets.
4. Cut jackshaft to length. Smooth off rough edges.
5. Install jackshaft and crankarrns.

NOTE: Be sure to install crankarms from operator kits.

6. Secure drive ears to damper blades.
7. Attach balljoint assembly to crankarms.
8. Assemble push rod and clevis. Tighten nut against clevis.
9. Insert pushrod into balljoint assembly,
10. Secure clevis to drive ear using shoulder screw and nut.
11. Align and tighten crankarms using Allen wrench.
12. Tighten balljoint setscrews to hold push rod.

NOTE: If there is insufficient clearance to insert shaft through bearings after brackets are mounted, the order of Steps 2 through 5 can be altered.

13. Go to one of the following actuator mounting sections
- Internal Damper Frame Mount
- Internal Duct Floor Mounting
- External Mounting.

Table 2. End and Modular Kit Parts.

Quantity.	Part No.	Description
2	6220	Lockwasher 1/4 in.
2	7289-21	Nut 1/4-20 hex head
2	80895AB	Screw 1/4-20 x 3/4
1	[a]	Drive ear[a]
1	14000672-001	Shoulder screw
1	14000767-001	Nut 10-24 hex head
1	315439	Clevis
1	3048 14-767	Nut 3/8-16 hex head
1	14000645-004	6 in. push rod
1	315321	Balljoint assembly
2	14000168-366	Set screw 1/4-20
1	15753688-001	Crankarm
1	15753675-001	Snap bearing
1	15753674-001	Support bracket

[a] For End Kit: 14000644-002 Right-side drive ear.
For Modular Kit: 14000644-004 Left-side drive ear.

Table 3. Operator Kit Parts.

Quantity	Part Number	Description
1	315321	Balljoint assembly
2	14000168-366	Set screw 1/4-20
1	15753688-001	Crankarm

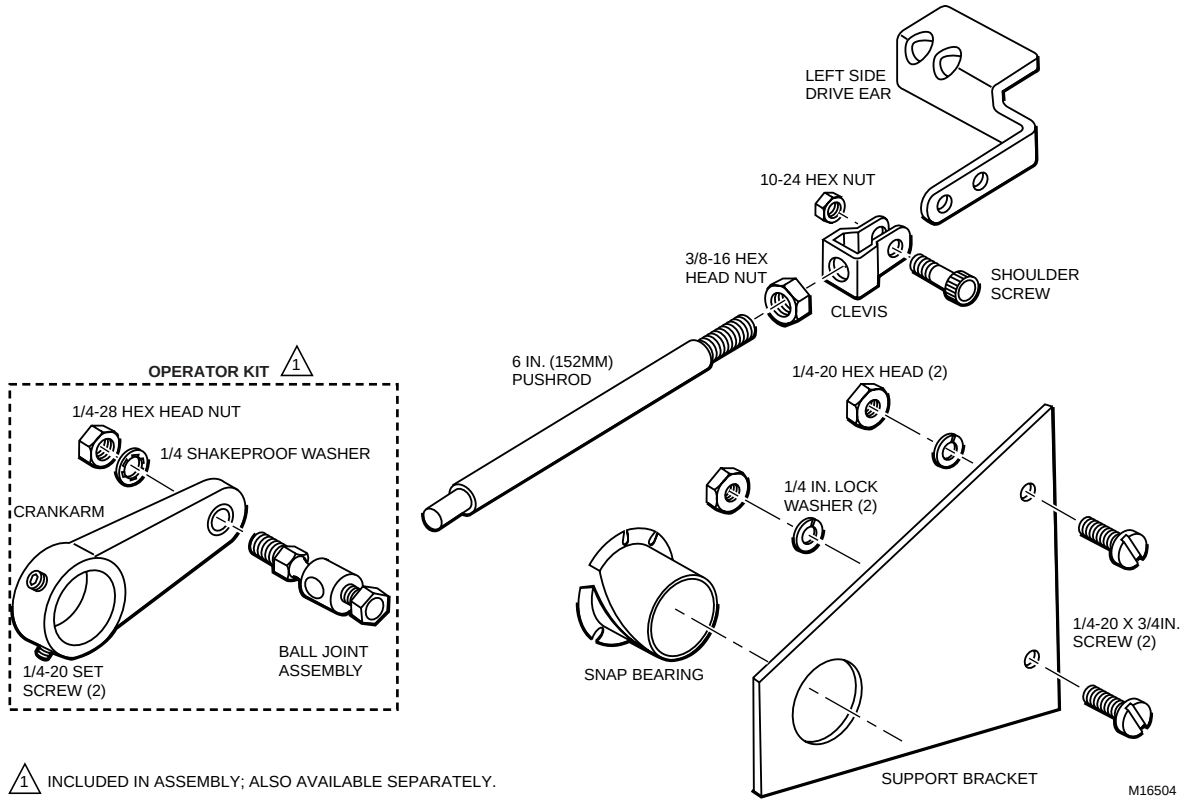


Fig. 22. End Kit Assembly.

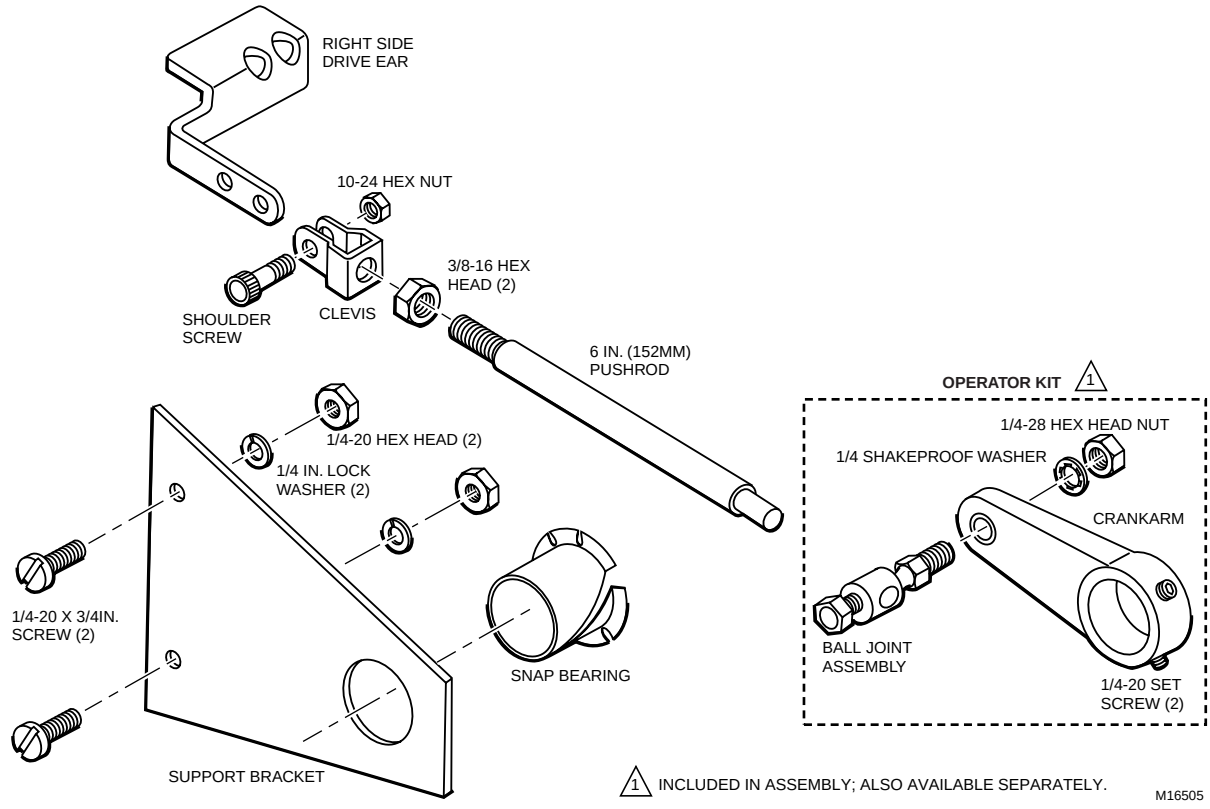


Fig. 23. Modular Kit Assembly.

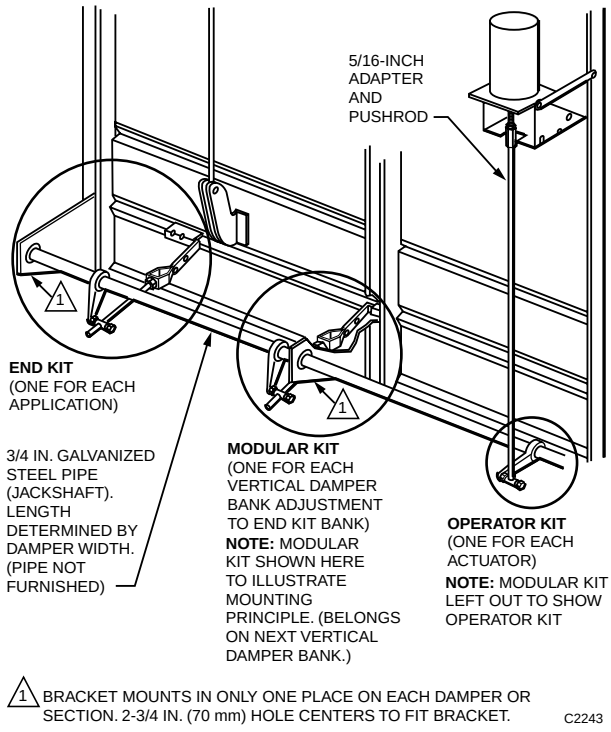


Fig. 24. Normally closed damper jackshaft installation.

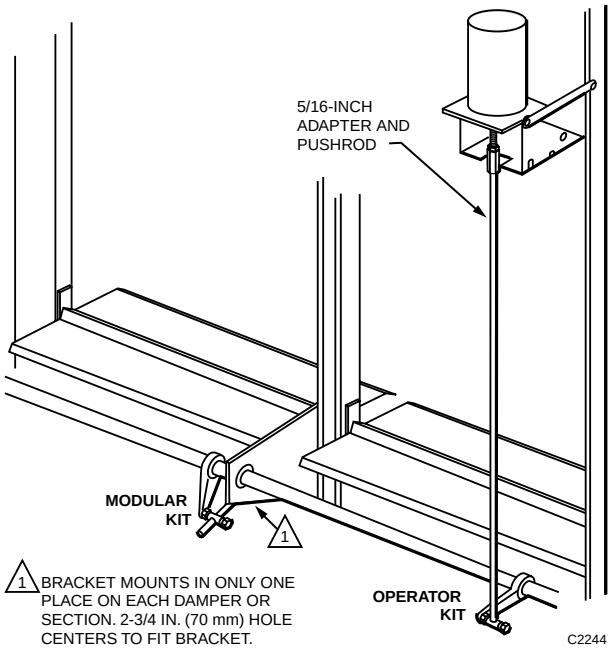


Fig. 25. Normally open damper jackshaft installation.

INTERNAL DAMPER FRAME MOUNTING

Use internal-mount, normally closed damper actuator (Fig. 26):

1. Obtain the following additional parts:
   - 14004242-001 Balljoint and Adapter Assembly.
   - 27520 5/16 in. Diameter Pushrod (order to required length).
2. Loosen locknut and remove factory-installed pushrod.
3. Use 1/8 in. Allen wrench to loosen mounting setscrews on damper mounting clamp one turn.
4. Remove and discard shipping stop.
5. Remove mounting screw from damper end of truss link.
6. Loosen faceplate nuts between mounting bracket and truss link.
7. Set actuator in place by hooking actuator mounting clamp over bottom edge of an upper damper frame.
8. Connect truss link to damper frame.
9. Tighten mounting setscrews.
10. Move damper to normal position with 0 psi applied to actuator.
11. Rotate actuator to vertical position and retighten faceplate nuts.
12. Screw adapter onto the actuator shaft and tighten locknut against adapter.
13. Cut 5/16 in. pushrod to length.
14. Slide pushrod into balljoint and slip into adapter.
15. Tighten adapter setscrew.
16. If preload is desired, use a squeeze bulb and stroke actuator approximately 1/4 in. (6 mm).
17. Tighten balljoint setscrew.
18. Go to Piping section.

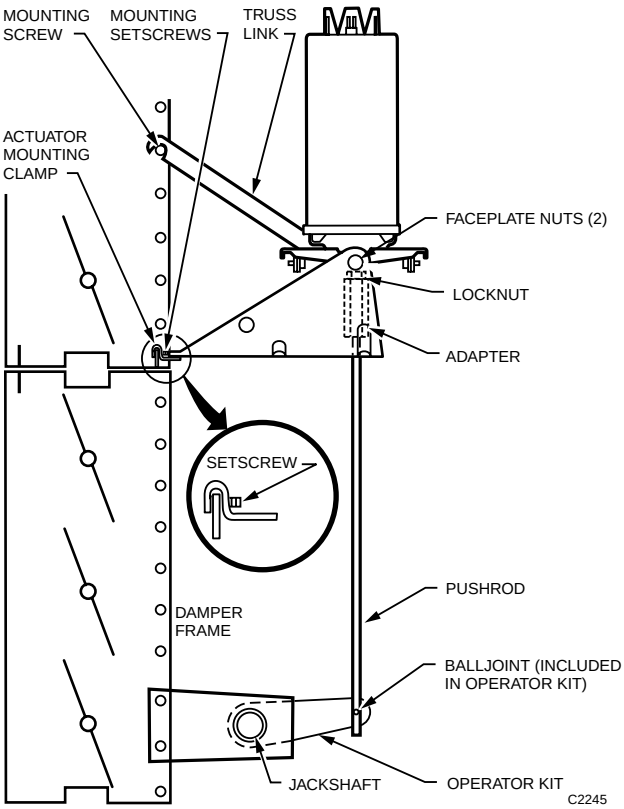


Fig. 26. Internal Mounting on Damper Frame.

INTERNAL DUCT FLOOR MOUNTING

1. Obtain the following additional parts:
   - 14004242-001 Balljoint and Adapter Assembly.
   - 27520 5/16 in. Diameter Pushrod (order to required length).
2. Mount actuator inside duct (Fig. 27). Use balljoint included in operator kit.

EXTERNAL MOUNTING

1. Obtain the following additional parts:
   - 14004242-001 Balljoint and Adapter Assembly.
   - 27520 5/16 in. Diameter Pushrod (order to required length).
2. Extend jackshaft to the outside of the duct and mount actuator externally (Fig. 28) Use balljoint included in operator kit.

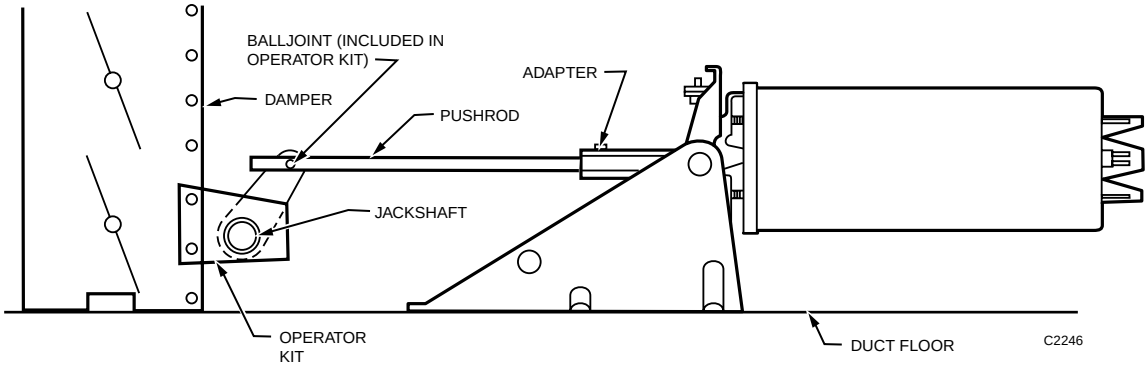


Fig. 27. Internal Mounting on Duct Floor.

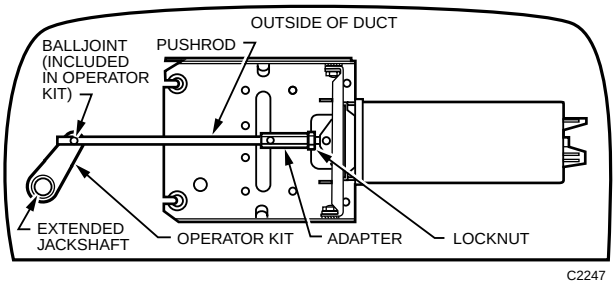


Fig. 28. External Mounting.

Actuator Converting

If damper actuator is ordered for internal mounting but internal mounting is impractical, obtain the proper actuator or convert using the following procedures:

CONVERTING INTERNALLY MOUNTED NORMALLY OPEN ACTUATOR TO EXTERNAL MOUNTING

1. Obtain the following additional parts:
   - 14004237-001 Mounting Screw Assembly.
   - 14004313-003 External Drive Axle Hardware Assembly.
2. Remove all four clevis pins (Fig. 29).
3. Loosen all four crankarm bolts.
4. Slide out crankarm shaft and discard shaft, one crankarm, and damper pushrod.
5. Loosen two damper mounting clamp screws and remove clamp if necessary.
6. Loosen faceplate nut, remove truss link, and retighten nut.
7. Loosen locknut and adjust pushrod to dimensions shown in Fig. 30.
8. Tighten locknut.
9. Reinstall actuator noting change in clevis pin location (Fig. 30).
10. Install one crankarm on pushrod with a clevis pin (Fig. 30).
11. Install actuator using standard external mounting instructions.

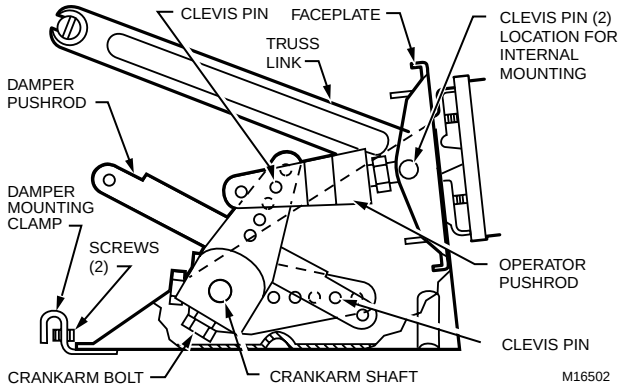


Fig. 29. Converting an Internally Mounted Normally Open Actuator to Externally Mounted.

CONVERTING INTERNALLY MOUNTED NORMALLY CLOSED ACTUATOR TO EXTERNAL MOUNTING

1. Obtain the following additional parts:
   - 14004106-001 Push Rod Assembly.
   - 14004107-001 Crankarm Assembly.
   - 14004237-001 Mounting Screw Assembly.
2. Loosen two damper mounting clamp screws and remove clamp if necessary (Fig. 29).
3. Loosen faceplate nut, remove truss link, and retighten nut.
4. Remove clevis pins and actuator (Fig. 30).
5. Remove factory-installed pushrod.
6. Loosen locknut and adjust pushrod to dimensions shown in Fig. 30.
7. Tighten locknut.
8. Install crankarm on pushrod with a clevis pin.
9. Install actuator with standard external mounting instructions.

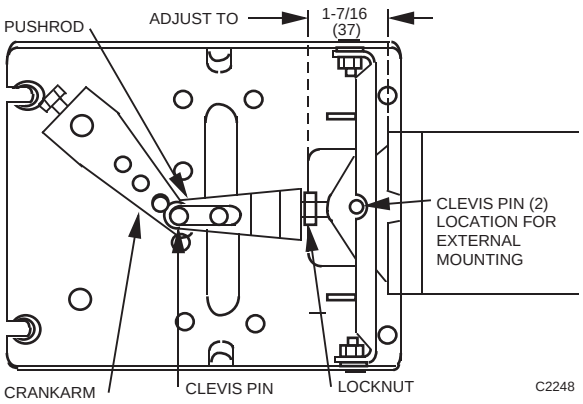


Fig. 30. Clevis Pin Locations.

PIPING

MP909E Actuator Piping

1. Connect 1/4 in. (6 mm) O.D. plastic tubing per job drawings to actuator inlet port.
2. MP909E installation is complete.

MP909H Actuator Piping

1. Connect 5/32 in. (4 mm) 0.D. plastic tubing per job drawings to pilot port (P) of positive positioner.
2. Connect 1/4 in. (6 mm) O.D. plastic tubing from main line to main port (M).
3. See Slave Actuator Piping Section if slaving is desired.
4. Go to Positioner Adjustment section.

Slave Actuator Piping

Slaving damper actuators (Fig. 31) together provides increased capacity to operate large damper installations. Any actuators used in slave operation with an MP909H Actuator must have 5 to 10 psi (35 to 70 kPa) spring range. The MP909H branch line from positive positioner to actuator must be cut, a 1/4 in. (6 mm) tee inserted, and a line run to slave actuators.

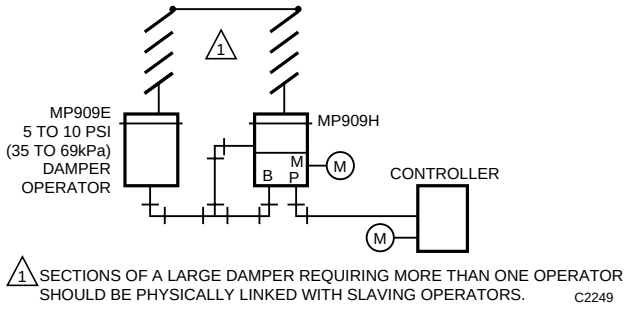


Fig. 31. Slaving an MP909E to an MP909H for large damper installations.

POSITIONER ADJUSTMENT (MP909H ONLY)

The MP909H is shipped with one of the following feedback springs:
— 14004012-001, 3 psi (21 kPa).
— 14004013-001, 5 psi (35 kPa).
— 14004014-001, 10 psi (70 kPa).
The original feedback spring range is marked on the side of the positive positioner (Fig. 32).

NOTE: Ensure that the positioner feedback spring is not binding on the positioner support.

1. If the original feedback spring is satisfactory, set the start point adjustment only.
2. If the feedback spring is changed:
   a. Calibrate the positioner.
   b. Set the start point adjustment.
   c. Adjustment of the MP909H is then complete.

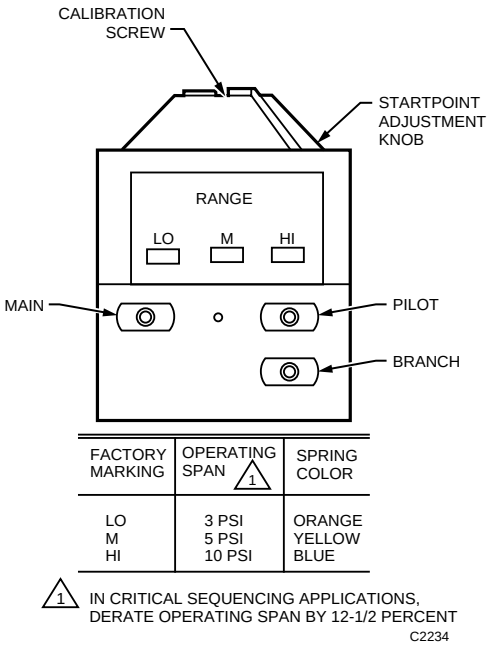


Fig. 32. Original Feedback Spring Marking.

Fig. 33 shows proper feedback spring hook location related to three available spans of 3, 5, and 10 psi (21, 35, and 70 kPa). Use of the 3 psi (21 kPa) spring in the hole location shown causes start point calibration to shift approximately 1/2 psi (3.4 kPa). If this is unacceptable, recalibrate the unit.

Start Point Adjustment

1. Set the start point on positioner to the value specified in job drawings.
2. Each click of the start point knob adjusts the start point 1/4 psi (1.7 kPa).
3. To lock start point, tighten locking setscrew (Fig. 7) with a 5/16 in. Allen wrench.

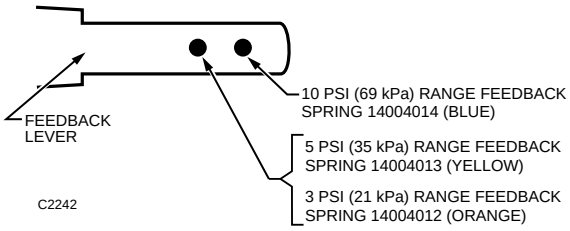


Fig. 33. Feedback Spring Hook Location.

Calibration Adjustment

1. Check that the branch line of the positioner is piped to the actuator inlet port.
2. Supply main air to the positioner.
3. Connect positioner pilot port to a variable air source such as a squeeze bulb or PRV and pressure gage.
4. Set start point knob to indicate a 3 psi (21 kPa) start point.
5. Slowly raise pilot port pressure to 3 psi (21 kPa). The shaft should not move.
6. If the shaft moves, turn the calibration screw (located in the middle of the start point knob) clockwise until the shaft is retracted.
7. Turn the calibration screw counterclockwise until the shaft begins to move.

APPENDIX

Basic Replacement Operator

The MP909E1026 serves as a basic replacement operator for the following:

— MP909B 1007, 1106, 1650, 1684, 1742.
— MP903B 1003, 1011, 1029, 1037, 1078, 1086.
— MP909E 1000, 1018.
— MO903B 1, 2, 3, 4, 5.

NOTE: For the MP903 and MO903, a 315781-605 Ball Joint is also required.

Instructions

1. Disconnect the operator air supply.
2. Remove the linkage connecting to the shaft.
3. Remove the operator from the bracket.
4. If the old operator is piped in copper, use 1578 Adapter for connection to the barb fitting.
5. Reassemble.

NOTE: If replacing an MP903 or MO903, use a 315781 Ball Joint on the operator shaft.

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