

Installation, Operation and Maintenance Manual

These instructions apply to the internal or external field replacement of mounting hardware for direct drive actuators (Belimo [except EFB series] and Honeywell [except MS7505 and MS8105 series]) on Greenheck control dampers when they are duct mounted or sleeved.

Warning

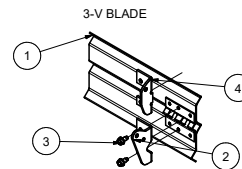
Equipment Damage or Electrical Power Hazard.
 Line voltage can cause death or serious injury and short circuit equipment. Disconnect power supply before installation.

Tools required

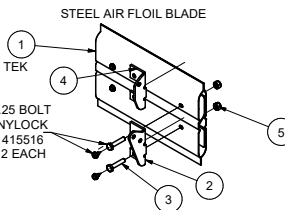
Wrenches: (1) 7/16 in., (1) 3/8 in., (1) 9/16 in.
 (1) Ratchet with 3/8, 7/16, 9/16 in. deepwell socket
 (1) 1/8 in. Allen wrench
 (1) Drill with 3/8 in. and 9/32 in. nut driver
 (1) .203 dia. drill bit

Part No. 872700: Internal Mount - 1/2 in. pin or jackshaft

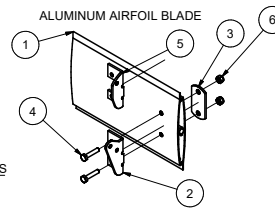
ITEM	QTY	PART NUMBER	DESCRIPTION
5	1	723981	BRKT, INT ACT, 0.5IN JS, GALV, G1L/G2R
3	1	370159	BRG, .5, WEIMER, 8L2-FF, NYLN LNR
16	2	415264	TCS 23 1/4-20X1/2 HWH MZP
1	1	829206	ASM, CRANKARM, 90? LINKAGE, 1/2", GALV
2	1	839475	839475
9	2	451588	E-RING 1/4" ZP
13	1	416179	RTNR, PUSHON, 5, ZP
10	1	593831	JACKSHAFT-INT MT ACTS-6 5"/VCD
14	1	417279	STUD, MNTG, #10-24X1.068, ZP
11	2	415934	NUT, #10-24 HH NYLOC ZP
4	1	360627	BRG, 1/2IN ID, NYLINER 8L1-FF
12	4	415455	NUT, SPNLK 1/4-20ZP
15	4	415609	STUD, PRESS-IN, 1/4-20X1/2, YELLOW ZNC
6	1	723987	BRKT, ANTI-RTN, INT, 0.5JS LRG, GALV, G1L/G2R
8	1	416048	CS, SH, #10-24X.375, GR2, ZP/BAKE
7	1	451786	CLAMP, HOSE, #HC-8 1/2"DIA (WIRE)
25	1	717000	BRKT, BL, EXTD AF, 6/7, GALV, G1L/G2R



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N/A	3V BLADE & AXLE BRKT ASM
2	1	714548	BRKT, BL, 3V, 6/7, GALV, G1L/G2R
3	2	415264	TCS 23 1/4-20X1/2 HWH MZP
4	1	716999	BRKT, BL, EXTD AF, 4/5, GALV, G1L/G2R



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N/A	STEEL AIRFOIL BLADE
2	1	716323	BRKT, BL, AF, 6/7, GALV, G1L/G2R
3	2	415490	CS, 1/4-20X1.25 HH ZP
4	1	716999	BRKT, BL, EXTD AF, 4/5, GALV, G1L/G2R
5	2	415516	NUT, 1/4-20 HEX ZP NYLOCK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N/A	ALUMINUM AIRFOIL BLADE
2	1	717000	BRKT, BL, EXTD AF, 6/7, GALV, G1L/G2R
3	1	507532	REINFORCING STRAP
4	2	415490	CS, 1/4-20X1.25 HH ZP
5	1	716999	BRKT, BL, EXTD AF, 4/5, GALV, G1L/G2R
6	2	415516	NUT, 1/4-20 HEX ZP NYLOCK

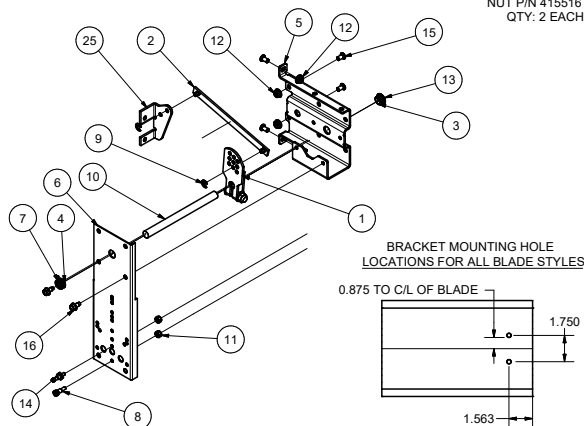


Figure 1

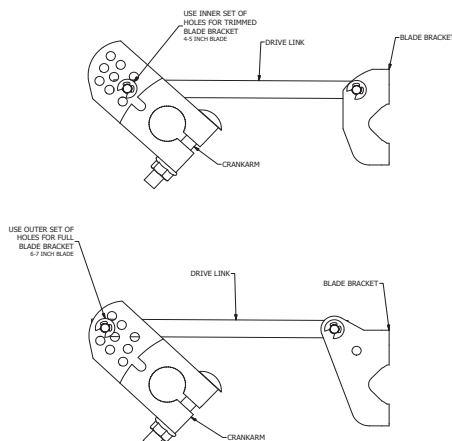


Figure 2: Drive Link Placement on Crankarm

Instructions

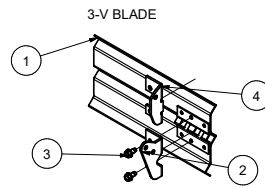
1. Have damper in its closed position.
2. Drill (2) 0.203 inch holes in the first blade (when one or two blade damper) or third blade (more than a two blade damper) at a location as shown above for the blade type you have (see **Figure 1**).
3. Attach blade drive lever (item #13) using two fasteners (see list above based on blade type).
4. Snap the bearing (item # 12) into the actuator bracket (item # 1). Install (2) 1/4 -20 x 1/2 studs (item #15) and nuts (item #14) through holes in damper frame and attach the

Part no. 872700 instructions cont...

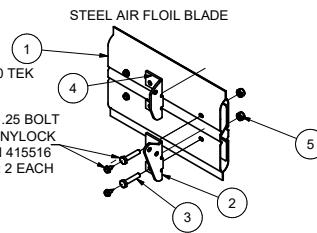
- actuator bracket (item #1). Fasten actuator bracket to the left jamb of damper frame using (1) thread cutting screw in top tab of bracket (0.203 in. hole is required). Note bottom tab does not get a fastener.
- Secure the drive link (item #2) to the blade drive lever (item #13) using the e-clip (item #6) to lock it in place. Slide ½ in. diameter shaft (item #4) through the crankarm (item #3) with the bolt facing outward from the damper. Slide the shaft through the bearing on the actuator bracket (item #1). Install the drive link (item #2) to the crankarm (item #3) using an e-clip. See **Figure 2** to determine the hole to attach the drive link.
 - Make sure the drive link is vertical and tighten the crankarm to the shaft. Snap the bearing (item #17) into the anti-rotation bracket (item #5) and slide onto the shaft. Tighten the anti-rotation bracket (item #5) to the actuator bracket (item #1) using thread cutting screws.
 - Slide the actuator onto the shaft and install the shoulder bolt (item #8 or 10) to the anti-rotation bracket (item #5) using nut (item #9 or 11). Bolt location will vary depending on the actuator model. Tighten the actuator onto the shaft (item #4).
 - Connect all electrical leads to the actuator. Apply power to the actuator. The damper blades should rotate to the power position and return to the fail position when power is disconnected.

Part no. 872701: Internal Mount for 1 in. jackshaft

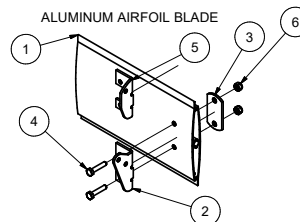
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	728330	BRKT, INT ACT, 1.0IN JS, GALV, G1L/G2R
2	1	839475	839475
3	1	829205	ASM, CRANKARM, 90° LINKAGE, 1", GALV
4	1	REF	1" JACKSHAFT
5	1	846484	ASM, INT, ANTI-RTN BRKT, LRG, 1" JSHFT
6	2	451588	E-RING 1/4" ZP
7	4	415264	TCS 23 1/4-20X1/2 HWH MZP
8	1	416048	CS, SHD. SOC., #10-24x.375, ZPBAKE
9	2	415934	NUT, #10-24 HH NYLOC ZP
10	1	417279	STUD, MNTG, #10-24X1.068, ZP
11	1	714548	BRKT, BL, 3V, 6/7, GALV, G1L/G2R
12	2	415455	NUT, SPNLK 1/4-20ZP
13	2	415609	STUD, PRESS-IN, 1/4-20X1/2, YELLOW ZNC
14	1	446025	CARTON, FOL, 11.50 X 6.00 X 9.00, ECT32C



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N/A	3V BLADE & AXLE BRKT ASM
2	1	714548	BRKT, BL, 3V, 6/7, GALV, G1L/G2R
3	2	415264	TCS 23 1/4-20X1/2 HWH MZP
4	1	716999	BRKT, BL, EXT D AF, 4/5, GALV, G1L/G2R



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N/A	STEEL AIRFOIL BLADE
2	1	716323	BRKT, BL, AF, 6/7, GALV, G1L/G2R
3	2	415490	CS, 1/4-20x1.25 HH, ZP
4	1	716999	BRKT, BL, EXT D AF, 4/5, GALV, G1L/G2R
5	2	415516	NUT, 1/4-20 HEX ZP NYLOCK



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	N/A	ALUMINUM AIRFOIL BLADE
2	1	717000	BRKT, BL, EXT D AF, 6/7, GALV, G1L/G2R
3	1	507532	REINFORCING STRAP
4	2	415490	CS, 1/4-20x1.25 HH, ZP
5	1	716999	BRKT, BL, EXT D AF, 4/5, GALV, G1L/G2R
6	2	415516	NUT, 1/4-20 HEX ZP NYLOCK

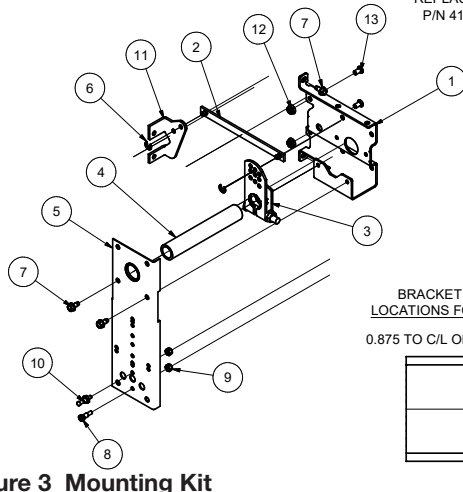


Figure 3 Mounting Kit

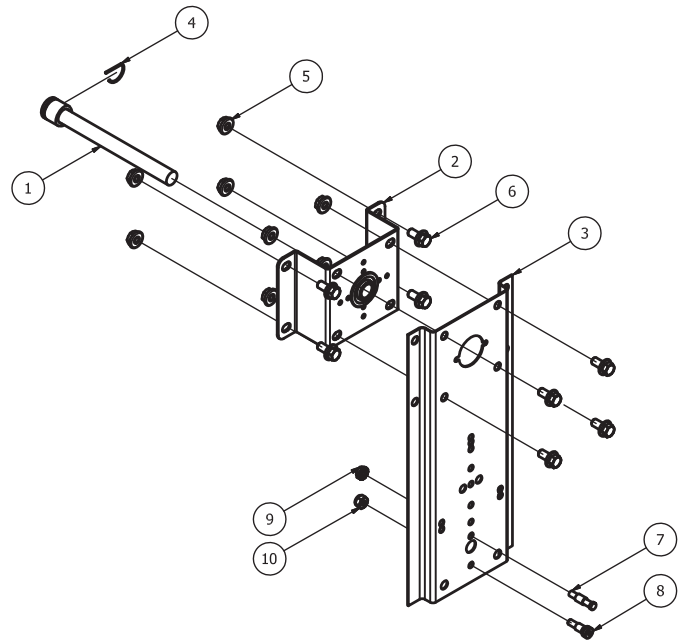
Instructions

- Have damper in its closed position.
- Drill (2) 0.203 inch holes in the first blade (when one or two blade damper) or third blade (more than a two blade damper) at a location as shown above for the blade type you have (see **Figure 3**).
- Attach blade drive lever (item #12) using two fasteners (see list above based on blade type).
- Install (2) ¼ -20 x ½ studs (item #14) and nuts (item #13) through holes in damper frame and attach the actuator bracket (item #1). Fasten actuator bracket to the left jamb of damper frame using (1) thread cutting screw in top tab of bracket (0.203 in. hole is required). Note bottom tab does not get a fastener.
- Secure the drive link (item #2) to the blade drive lever (item #12) using the e-clip (item #6) to lock it in place. Slide 1 in. diameter shaft (item #4) through the crankarm (item #5) with the bolt facing outward from the damper. Slide the shaft through the actuator bracket (item #1). Install the drive link (item #2) to the crankarm (item #3) using an e-clip. See **Figure 2** to determine the hole to attach the drive link.

Part no. 872701: Internal Mount for 1 in. jackshaft cont...

6. Make sure the drive link is vertical and tighten the crankarm to the shaft. Snap the bearing (item #16) into the anti-rotation bracket (item #5) and slide onto the shaft. Tighten the anti-rotation bracket (item #5) to the actuator bracket (item #1) using thread cutting screws.
7. Slide the actuator onto the shaft and install the shoulder bolt (item #8 or 10) to the anti-rotation bracket (item #5) using nut (item #9 or 11). Bolt location will vary depending on the actuator model. Tighten the actuator onto the shaft (item#4).
8. Connect all electrical leads to the actuator. Apply power to the actuator. The damper blades should rotate to the power position and return to the fail position when power is disconnected.

Part no. 872907: External mount direct drive



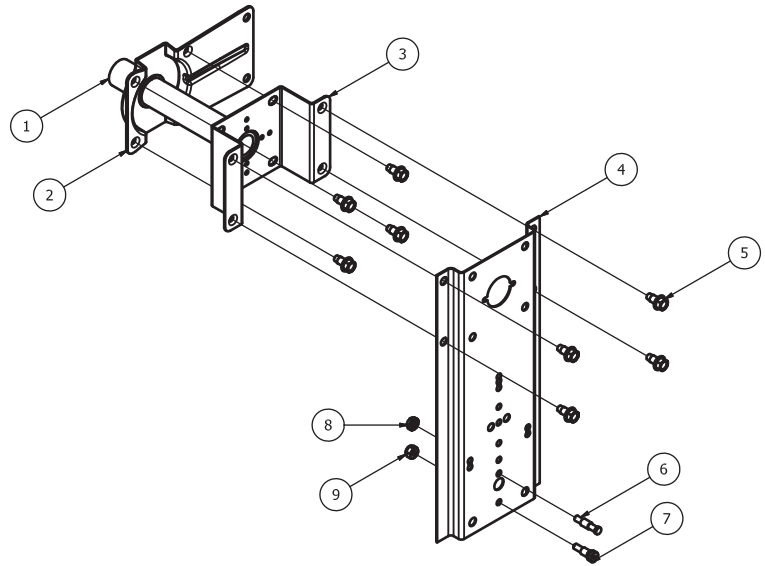
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	452509	PIN,EXT 3/8SQ TO 1/2DIA,5.75"LONG
2	1	815027	EXT PIN SUPP BRKT ASM/G/VCD
3	1	723089	BRKT,EXT MNT,ANTI-RTN,LRG,GALV
4	1	451738	CLIP,RET .050 DIA
5	8	415455	NUT,SPNLK 1/4-20ZP
6	8	415475	BOLT,SPNLK1/4-20X1/2ZP
7	1	416122	THREADED MTG STUD-BELIMO ACT
8	1	416048	CS,SHD. SOC.,#10-24x.375,ZPBAKE
9	1	415385	NUT,#10-32 HX KEPS ZP
10	1	415934	NUT,#10-24 HH NYLOC ZP

Figure 4 External Mounting Kit

Instructions

1. Have damper in its closed position.
2. Install clip (item #4) into extension pin (item #1). Push extension pin onto drive blade (bottom blade for dampers with one or two blades) or third blade (when damper has more than two blades).
3. Mount the stand-off bracket (item #2) over the extension pin (item #1) spanning across the damper frame. Fasten to the damper frame with bolts and nuts (items 5 & 6).
4. Fasten the actuator bracket (item #3) to the standoff bracket using bolts and nuts (items #5 & 6).
5. Install shoulder bolt (item #7 or 8) to the anti-rotation bracket (item #3) using nut (item #9 or 10). Bolt location will vary depending on the actuator model.
6. For fail close, position the blades in the closed position and the actuator in its fail position. For fail open, position the blades in the open position and the actuator in its fail position. Tighten the actuator clamp to the damper pin (item #1).
7. Attach actuator to anti-rotation bracket assembly (item #3). Tighten the actuator onto the shaft (item #1).
8. Connect all electrical leads to the actuator. Apply power to the actuator. The damper blades should rotate to the power position and return to the fail position when power is disconnected.

Part no. 872908: External Mount Jackshafted



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	REF	1" JACKSHAFT
2	1	REF	ASM, 1IN JSHFT BRKT W/NYLINER BRG
3	1	702973	BRKT, STANDOFF W/EXTRUDED HOLES
4	1	723089	BRKT, EXT MNT, ANTI-RTN, LRG, GALV
5	8	415264	TCS 23 1/4-20X1/2 HHW MZP
6	1	416122	THREADED MTG STUD-BELIMO ACT
7	1	416048	CS, SHD. SOC., #10-24x.375, ZPBAKE
8	1	415385	NUT, #10-32 HX KEPS ZP
9	1	415934	NUT, #10-24 HH NYLOC ZP

Instructions

1. Have damper in its closed position.
2. Jackshaft supplied is 1 in. (25mm) diameter or ½ in. (13mm) diameter. Mount the stand-off bracket (item #3) with thread cutting screws (item #5). Orient the stand-off bracket (item #3) so the hole is centered on the jackshaft.
3. Fasten the actuator bracket (item #4) to the stand-off bracket using thread cutting screws (item #5). Use outer four holes of the actuator bracket.
5. Install shoulder bolt (item #6 or 7) to the anti-rotation bracket (item #3) using nut (item #8 or 9). Bolt location will vary depending on the actuator model.
4. For fail close, position the blades in the closed position and the actuator in its fail position. For fail open, position the blades in the open position and the actuator in its fail position. Tighten the actuator clamp to the jackshaft (item #1).
5. Attach actuator to anti-rotation bracket assembly (item #4). Tighten the actuator onto the shaft (item #1).
6. Connect all electrical leads to the actuator. Apply power to the actuator. The damper blades should rotate to the power position and return to the fail position when power is disconnected.



Link to video on External to Internal Actuator Conversion

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

