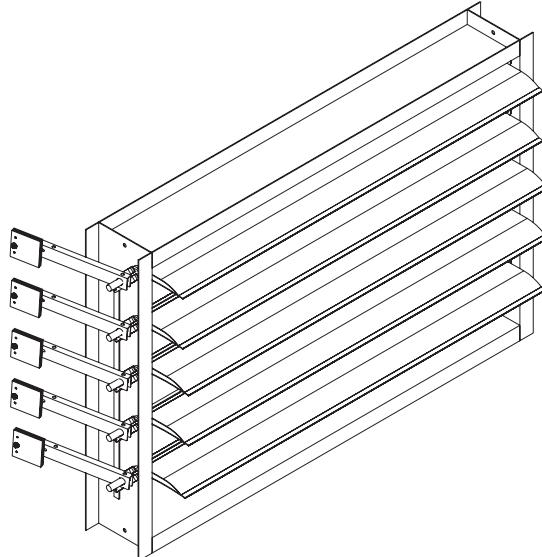
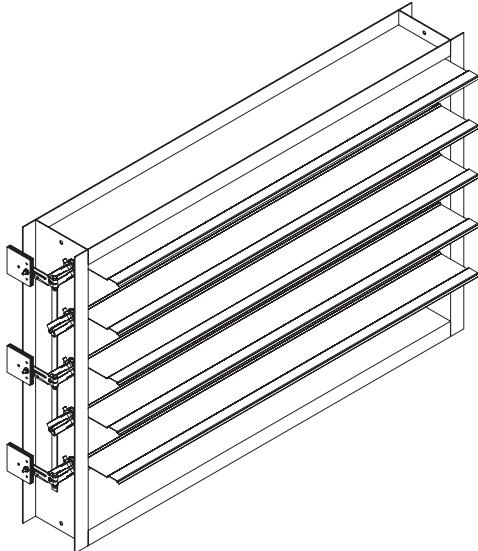


Installation, Operation, and Maintenance Instructions

This manual is the property of the owner, and is required for future maintenance. Please leave it with the owner when the job is complete.



RECEIVING AND HANDLING

Upon receiving dampers, check for both obvious and hidden damage. If damage is found, record all necessary information on the bill of lading and file a claim with the final carrier. Check to be sure that all parts of the shipment, including accessories, are accounted for.

Dampers must be kept dry and clean. Indoor storage and protection from dirt, dust and the weather is highly recommended. Do not store at temperatures in excess of 100°F(37°C).

SAFETY WARNING:

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating, and maintenance instructions thoroughly before installing or servicing this equipment.

Due to continuing research, Greenheck reserves the right to change specifications without notice.

Instructions

The following instructions should be followed when trying to adjust counterbalance weights on HB series dampers. This is not intended to be used to modification for use as pressure relief damper.

Heavy Duty/Industrial backdraft damper are adjusted for the specified flow direction at the factory. The external counterbalance is adjusted for "easy operation". These instructions address adjustment of the blade counterbalance for the following:

- Damper mounting orientation and/or flow direction has changed in the field
- Damper requires excessive start-open pressure or does not close
- Blade seal has been removed in the field
- Counterbalance settings have been erroneously "adjusted" in the field

Single section wide dampers will have external blade counterbalance on one (linkage) side of damper. Dampers with two sections will have linkage on both sides of damper assembly. Arms are usually mounted on every other axle, starting at the bottom, until the magnitude of the counterbalance requires arms on every axle. The steel airfoil models HB-230 and HB-330 will require more counterbalance weights than model HB-120 with single thickness blade or models HB-110 and HB-240 with aluminum blades. The longer arms are angled so they will nest when installed on every axle. Greenheck policy is to distribute counterbalance evenly among blades to minimize linkage loading and to improve blade closure.

Damper Maintenance

Greenheck's dampers are designed to be trouble free and hassle free under normal operation. Dampers are to be installed square and straight so as to prevent binding during operation. The following annual damper maintenance suggestions will help to insure proper damper operation and increase the life expectancy of the damper.

Foreign Matter

Over the course of time, dirt and grime may collect on damper surfaces. The damper surfaces should be cleaned to prevent hindrance to airflow.

Moving Parts

Make sure that parts such as linkage, bearings, blades, etc. that are intended to move freely, can do so.

Bearings. Plastic and pressfit ball bearings (without grease fittings) do not require lubrication. Ball bearings with grease fittings should be lubricated as follows:

Maximum Duct Temperature			
°F	°C	Lubricant	Minimum Frequency
250	121	NLGI Grade 2 lithium 12-hydrostearate grease	twice a year

Closure

Remove foreign materials that may be interfering with blade closure or effective sealing of the blades with each other or with the frame. Inspect blade seals yearly and replace as necessary.

Operation

While operating the damper through its full cycle, check to see that the blades open and close properly. If there is a problem, check for loose linkage.

Counterbalance Adjustment Instructions

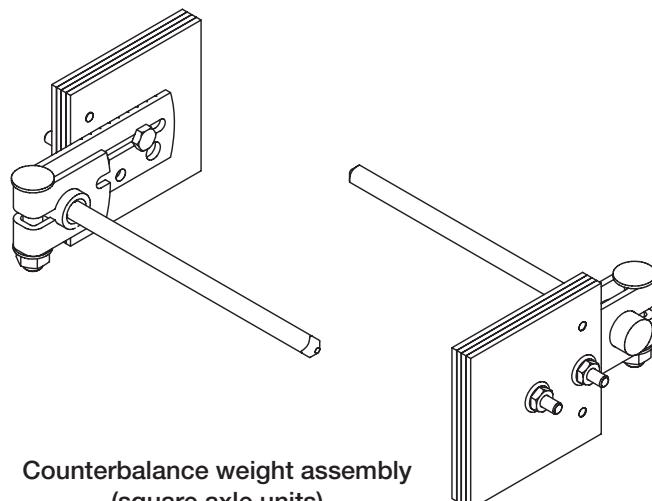
1. Adjust FULL OPEN blade stop first. On most models, a bolt with a spacer is used through the top linkage clevis arm. Open and close damper to verify there is no interference between axles and the nested counterweight arm.

2. Place damper in the installed mounting position and flow direction.

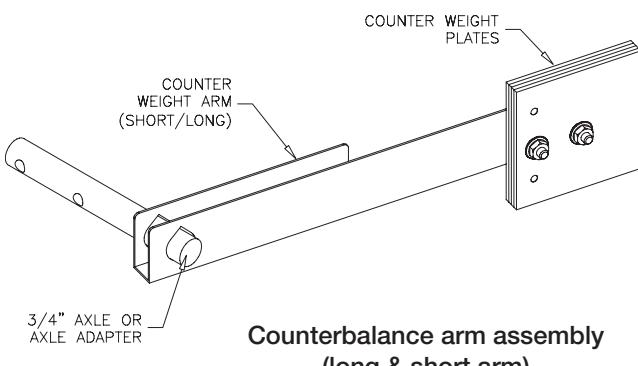
3. Adjust blade counterbalance at full open position first. Fan (flow) must not be operating. Rotate damper blades open. the crankarms or counterweight arms are generally 180° from the damper blade centerline. On very small dampers with aluminum blades, the crankarm may be inclined towards damper outlet, due to the torque of the linkage. Adjust counterweight plate center distance until blades will start to close from full open position. Moving plate(s) out will increase counterbalance. It may be necessary to add or delete a plate. Counterweight plate quantity per arm should not vary by more than one and the distance outward from the axle centerline should not vary more than 1/2 inch among counterweight arms.

4. Close damper. Blades should close completely (you can feel the blade edge seals make contact) without slamming. NOTE: Counterweight arms are welded to the axles as shipped. Arm adjustment will require weld to be removed and to be rewelded after modification.

- If closing too hard, loosen arm fastener to the axle and rotate top of arm towards upstream of air entering side. Retighten fastener.
- If not closing, loosen the arm fastener to the axle and rotate top of arm towards downstream or discharge. Retighten fastener.



Counterbalance weight assembly
(square axle units)



Counterbalance arm assembly
(long & short arm)

Counterbalance Adjustment Instructions cont...

5. Open damper and recheck full open operation. Readjust per step 3 if necessary. Recheck full closed position (step 4) as any modification at one position has a slight impact on the other.
6. Tighten all counterweight and arm fasteners securely.
7. Test damper closure by opening damper blades and releasing from 1/4, 1/2, 3/4 and full open position. Damper should close from all positions without assistance.

Standard Components

Component	Applicable Model	Galvanized Part Number	Stainless Part Number
Axle Adapter, 3/8" to 3/4" square OD	HB-110, HB-120	370120	416343
3/4" Crankarm	All	652982	687738
3/8"-16x2 Crankarm Bolt	All	415882	415924
3/8"-16 Hex Nut for Crankarm	All	415457	415799
Short Counterweight Arm (8½ in.)	All	657344	689404
Long Counterweight Arm (12½ in.)	All	657343	683951
3/8"-16 set screw for short/long arm	All	415050	415763
3/8" -16 Weldnut/Hex nut for short/long arm	All	415127	415799
Counterweight plate, 2½" x 3½"	All	653143	687636
Counterweight plate, 3½" x 3½"	All	653142	687635
¼"-20 Serrated Flange Nut	All	415455	415575
¼"-20 x 3/4" Bolt	All	415490	415573
¼"-20 x 1¼" bolt/ 1½" bolt	All	415973	416103

WARRANTY

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove to be defective during the warranty period will be repaired or replaced at our option. Greenheck shall not be liable for damages resulting from misapplication or misuse of its products. Greenheck will not be responsible for any installation or removal costs. Greenheck will not be responsible for any service work or backcharges without prior written authorization.



P.O. Box 410 • Schofield, WI 54476-0410 • 715.359.6171 • greenheck.com

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