



**INSTALLATION ASSEMBLY
INSTRUCTIONS**

for

**FAN BLADE with BUSHING
(B-LOC™ or TRAN-TORQUE)**
Vane Axial & Turbo Fans

423-324-001A Fan Blade & Bushing Kit

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SAFETY

The operator of this machinery must assume the responsibility for his own safety, and that of those who are working with him. He must also make sure that the equipment was installed properly. Factors that contribute to the overall safety of operation are: proper use, maintenance, and frequent inspection of the equipment. All of these are the operator's responsibility.

If any items covered in this manual are not completely understood, or there is a concern with the safety of the product, contact Shivers Incorporated at the address shown on the front page.

Shivers is genuinely interested in providing the safest practical equipment to our customers. If you have a suggestion which you believe will enhance the safety of this product, please write us and let us know.



**TAKE NOTE ANYTIME THIS SYMBOL APPEARS.
YOUR SAFETY, AND THAT OF PERSONS AROUND
YOU IS AT STAKE.**

Anytime you are working with your drying unit, be sure to observe these common sense rules:

1. All units must be equipped with a main disconnect switch in close proximity to the grain bin's entry door. It must have the capability of being locked into the OFF position. Disconnect and LOCK OFF all electrical power before conducting any inspection, maintenance, repair, adjustment, or cleaning of the drying and transferring system. When you must have the electrical power on to troubleshoot equipment, do it from a safe distance, and always outside the bin.
2. Keep the bin entrances locked at all times. If entering the bin take the lock off the bin entrance and place it on the main disconnect before opening the bin entrance. **Never enter the drying bin unless all power is disconnected and locked off.**
3. Always keep all shields and guards in place. If shields or guards must be removed for inspection or maintenance, make sure power is disconnected and locked off. Replace all shields and guards before turning the power back on.
4. Do not turn the power on without being sure everyone is clear of all the drying and transferring equipment.

5. Make sure that all decals are in place and are easily readable. Do not operate the equipment with missing or illegible decals. If replacements are needed, contact Shivvers Incorporated or your dealer.
6. Prior to use, inspect all equipment to insure that it is in good operating condition. Do not operate with missing, damaged, or worn parts.
7. Metal edges can be sharp. Wear protective clothing and handle equipment and parts with care.
8. Keep all children and bystanders away at all times.
9. If ascending the bin ladder and/or performing maintenance on the top of the bin, take precautions to prevent accidental falls. It is suggested that when on top of the bin a safety harness or other safety device be used.
10. Periodically review all operating and safety manuals with any personnel working with this equipment. Always train new employees before they operate the drying equipment. Insist that they read and understand the operating and safety manuals.

DON'T TAKE CHANCES!

SLOW DOWN AND DO IT RIGHT!

AUTOMATIC CONTROLS CAN START EQUIPMENT AT ANY TIME!

ACCIDENTS ARE FOREVER!

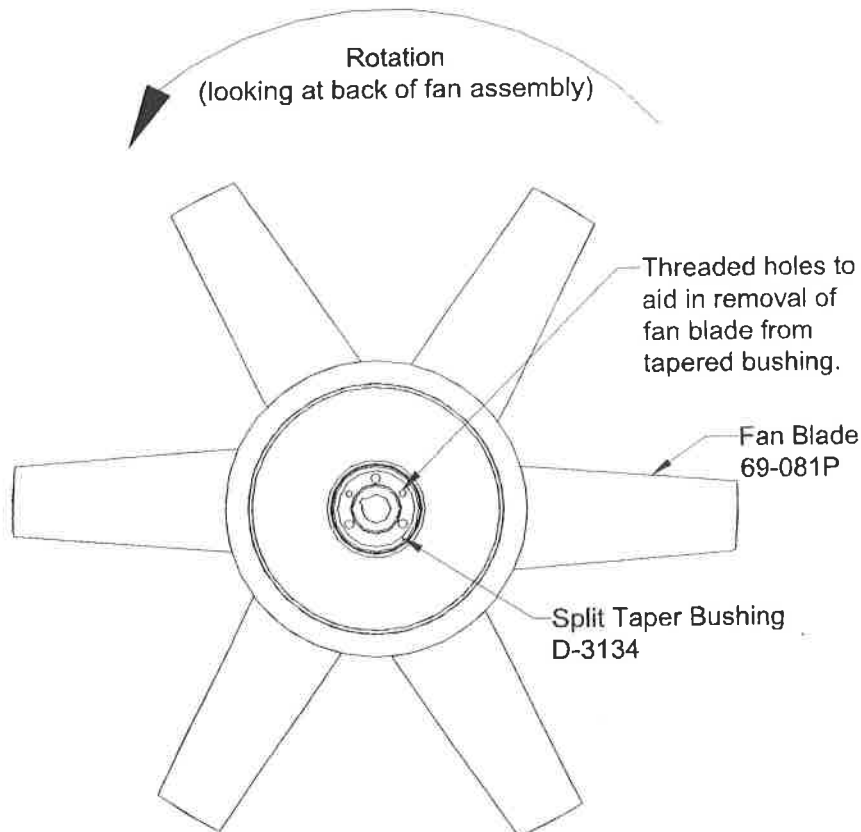
INSTALLING THE FAN BLADE



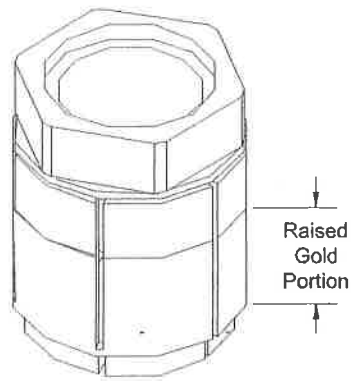
DANGER

MAKE SURE ALL POWER TO DRYING SYSTEM IS DISCONNECTED AND LOCKED OUT.

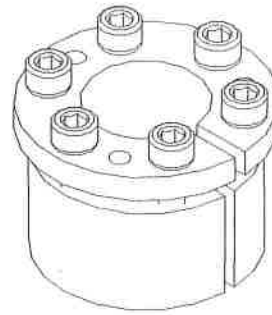
1. Before removing the fan blade guard (Inlet Venturi Assembly; 69-463A, Screen only; H-1433), shut off all power to the unit and lock the power off. Once the Inlet Venturi Assembly has been removed, the old fan blade can be taken off. If a tapered bushing is used, loosen the three bolts on the existing tapered bushing. If the fan blade does not readily come off, remove the bolts entirely from the tapered bushing and thread two into the available adjacent threaded holes. Tighten the bolts against the fan blade until the blade slides off the tapered bushing.



2. Once the old fan blade has been removed, make sure that the key is removed from the key-way, clean the motor shaft so that it is free of rust, grease, and oil, use solvent if necessary.
3. Locate the new Fan Blade (69-475A) and the Tran-torque or B-LOC™ Bushing (D-3619). Do not use a Tran-Torque or B-LOC™ Bushing in a fan blade machined for a Split Taper Bushing.



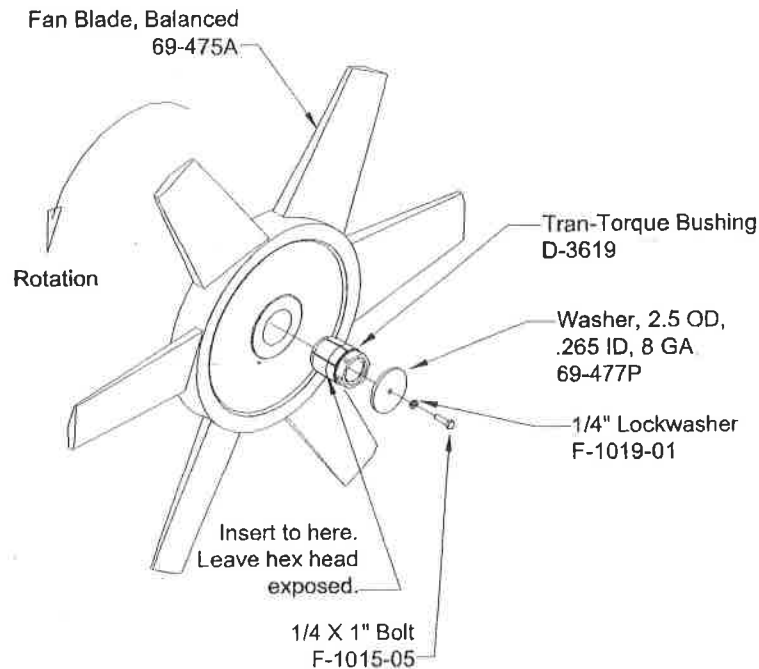
TRAN-TORQUE BUSHING



B-LOC™ BUSHING

If a Tran-torque bushing is used proceed with the following steps. If a B-LOC™ bushing is used skip to Page 7.

- 4A. Loosen the Bushing so that the assembly slides over the motor shaft. Position the Bushing so that the raised gold portion is completely within the Fan Blade casting, position so that the nut flats protrude so as to fully accept the wrench.
- 5A. Once in desired location, hand tighten the Bushing until snug. The fan blade should be even with the edge of inside housing and the tips of the fan blade should be at a uniform distance from around the housing, approx. 1/8" to 1/16". Make sure the fan blade does not hit the housing at any location.
- 6A. Fully tighten the Bushing using 1-3/4" socket and torque wrench. Block the Fan Blade so that it will not turn - using care so as not to damage or crack the fan blade or the housing. Apply 83 ft-lbs. (1000 in-lbs). **DO NOT USE PIPE WRENCH OR PLIERS.** Check to make sure fan blade is still positioned correctly.



- 7A. Locate Washer (69-477P), 1/4"x 1" Bolt (F-1015-05), and 1/4" Lock-washer (F-1019-01) from the parts box. Place the Washer, lock-washer, and the 1/4" bolt in the end of the motor shaft. Apply anti-seize compound to the threads of the bolt and tighten.
- 8A. Replace the Venturi-Assembly and secure in place. Make sure that no one is in the drying bin or near any augers. Make sure that bystanders are clear of the fan and turn the power back on to the fan.



STAND AWAY FROM THE BLADE WHEN STARTING AND WHEN OPERATING, IN CASE OF MALFUNCTION!

Briefly turn the fan on. If no interference is heard then turn the fan on for at least 30 seconds. If at any time the fan blade sounds like it is hitting the housing, immediately shut off the power. If more adjustments need to be made, make sure that the power is locked off before proceeding!



WARNING



When installing or removing B-LOC™ products, always adhere to the following safety standards:

1. Be sure that all power switches are locked out before installing or removing B-LOC™ products.
2. Eye protection is required when installing or removing B-LOC™ products. Please wear safety glasses and protective clothing.

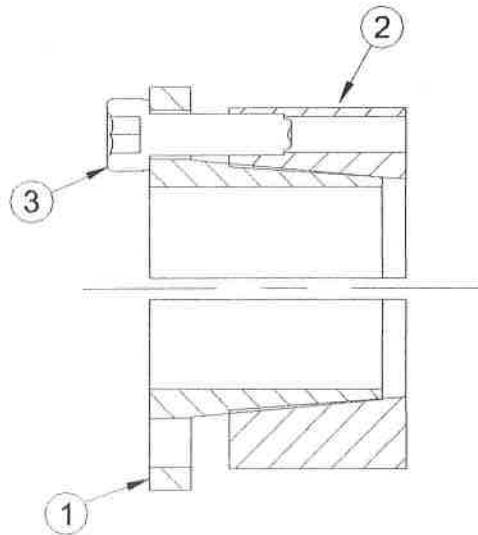


FIGURE 1

Installation of B-LOC™ Locking Assembly Series B-106 (Refer to Figure 1)

It is important **not** to use Molybdenum Disulfide (e.g., Molykote, Never-Seeze or similar lubricants) in any Locking Assembly installation.

- 1B. Make sure that locking screw, taper, shaft and bore contact areas are clean and lightly oiled and that all collar slits are aligned.
- 2B. Loosen all locking screws (Item 3) by a minimum of four (4) turns and transfer at least three (3) screws into push-off threads in order to keep Items 1 and 2 separated during assembly (See Figure 2).

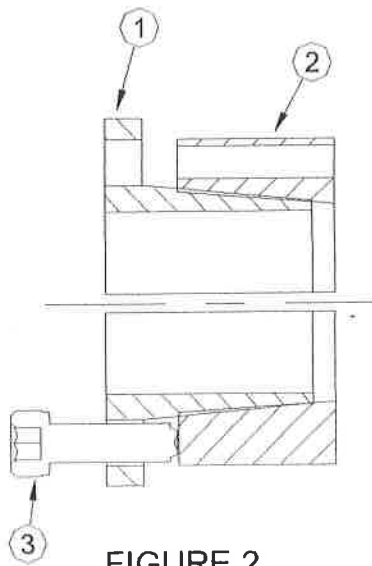


FIGURE 2

- 3B. After inserting Locking Assembly into hub bore, relocate locking screws used for separating Items 1 and 2.

The Locking Assembly should be positioned so that slits in Locking Assembly collars that contact the shaft are located approximately opposite the keyway. In addition, a locking screw should be centered directly over the keyway (See Figure 3).

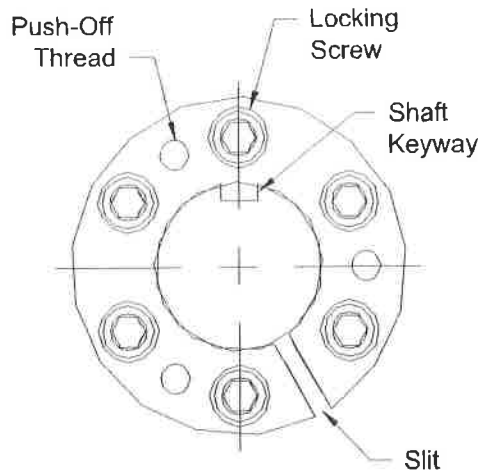
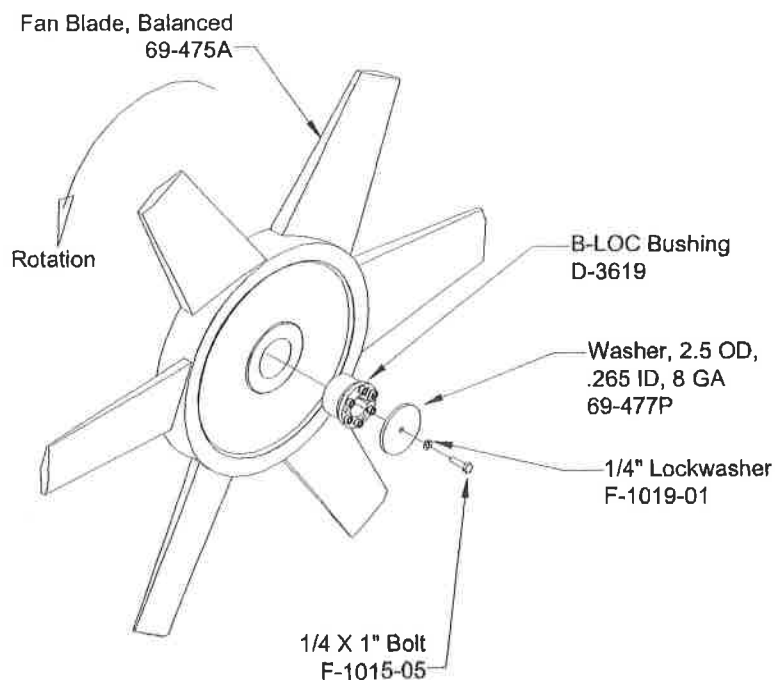


FIGURE 3

When tightening locking screws, it is important to follow the installation procedure, which specifies equal 1/4 turns of each locking screw. Failure to follow these instructions could result in excessive tightening of the screw over the keyway, possibly causing permanent deformation of the Locking Assembly collars.

- 4B. Hand tighten locking screws and confirm that collar (Item 1, see Figure 1) is parallel and in full contact with face of part to be attached to shaft.

- 5B. Position fan blade even with edge of inside housing and tips of the fan blade should be at a uniform distance around the housing, approx. 1/8" to 1/16". Make sure the fan blade does not hit the housing at any location. Use torque wrench and set it approximately 5% higher (set to 13 ft-lb or 156 in-lb) than specified tightening torque (12 ft-lb or 144 in-lb). Tighten locking screws in either a clockwise or counterclockwise sequence (it is not necessary to tighten in a diametrically opposite pattern), using only 1/4 (i.e., 90 deg.) turns for several passes until 1/4 turns can no longer be achieved. Even after 1/4 turns can no longer be achieved, it is important to continue to use equal turning angles for every screw until the specified tightening torque is reached.
- 6B. Continue to apply overtorque for 1 to 2 more passes. This is required to compensate for a system-related relaxation of locking screws since tightening of a given screw will always relax adjacent screws. Without overtorquing, an infinite number of passes would be needed to reach specified tightening torque.
- 7B. Reset torque wrench to specified torque (12 ft-lb or 144 in-lb) and check all locking screws. No screw should turn at this point, otherwise repeat Step 6B for 1 or 2 more passes. It is not necessary to re-check tightening torque after equipment has been in operation.
- 8B. Check to make sure the fan blade is still positioned correctly. The fan blade should be even with the edge of inside housing and the tips of the fan blade should be at a uniform distance from around the housing, approx. 1/8" to 1/16". Make sure the fan blade does not hit the housing at any location.
- 9B. Locate Washer (69-477P), 1/4"x 1" Bolt (F-1015-05), and 1/4" Lockwasher (F-1019-01) from the parts box. Place the Washer, lock-washer, and the 1/4" bolt in the end of the motor shaft. Apply anti-seize compound to the threads of the bolt and tighten.



- 10B. Replace the Venturi-Assembly and secure in place. Make sure that no one is in the drying bin or near any augers. Make sure that bystanders are clear of the fan and turn the power back on to the fan.



STAND AWAY FROM THE BLADE WHEN STARTING AND WHEN OPERATING, IN CASE OF MALFUNCTION!

Briefly turn the fan on. If no interference is heard then turn the fan on for at least 30 seconds. If at any time the fan blade sounds like it is hitting the housing, immediately shut off the power. If more adjustments need to be made, make sure that the power is locked off before proceeding!

Removal of B-LOC™ Locking Assembly (Refer to Figure 2)

Prior to initiating the following removal procedure, check to ensure that no torque or thrust loads are acting on the Locking Assembly, shaft or any mounted components.

IMPORTANT! Make sure ends of locking screws used for removal are ground flat and are slightly chamfered to prevent damage to screw and collar threads during push-off.

1. Check to ensure that axial movement of collars – necessary for release of connection – is not restricted. Likewise, ensure that push-off threads are in good condition.
2. Relax all locking screws by approx. four (4) complete turns and transfer screws to three push-off threads located in flange of collar (Item 1).
3. Release connection by evenly tightening all push-off screws (not exceeding ¼ turns) in a diametrically opposite sequence.

