

Multi-Wing Z Series Fans Blade Pitch Angle Setting Instructions

Before You Begin:

To maintain balance of fan:

- Mark the hub castings across a joint, so the fan hub can be reassembled in the same orientation.
- Mark the location of any balancing weight. Balancing weight will be on the outer bolt circle, in the form of washers, and/or longer bolts, or an additional balancing nut.
- Number the blades and blade sockets, so that they are replaced into their original position.

If possible, note the location of the pitch setting pin in the blade socket when disassembling the fan, and whether pin is located in the Hub or Retainer half of the fan (see step 7 for detailed definition).

Step 1 – Determine Blade Type: “1Z”, “2Z”, “4Z”, “5Z”, or “6Z”

If the blade has a sickle shape, then look for 1Z or 2Z molded on the blade.

If the blade is wider at the tip than at the base near the hub, then you have a 6Z.

Otherwise, look for 4Z or 5Z markings on blade which are in one of two places:

Look on cone section at base of blade (visible when fan is assembled), or

Look inside the bottom of the socket (blade must be removed from hub).

Alternatively, measure the width of the blade at the widest portion at base of blade:

4Z blade is approximately 4-1/2 inches, 5Z blade is approximately 5-1/4 inches.

Step 2 – Determine Rotation Code: “L” or “R”

R rotation rotates clockwise facing air discharge, L rotation is counterclockwise facing air discharge.

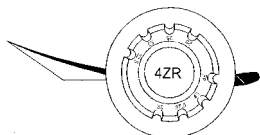
The 1Z and 2Z blade profiles have an arrow showing rotation molded into the blade on inlet side.

The 6Z is universal and can be used as an R or L rotation, depending on how pitch angle is set.

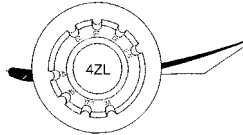
For 4Z and 5Z blades, the rotation code is molded into the blade, either on the cone section at base of blade, or inside bottom of the socket.

Examples of rotation for 4Z blades as viewed from end of socket are below, and 5Z is similar.

R, or clockwise



L, or counterclockwise





Step 3 – Determine Boss location code: “A” or “B”

The boss is the center section of the hub through which the fan is mounted to the shaft, and typically contains either setscrews or a center-tapered hole where the bushing inserts.

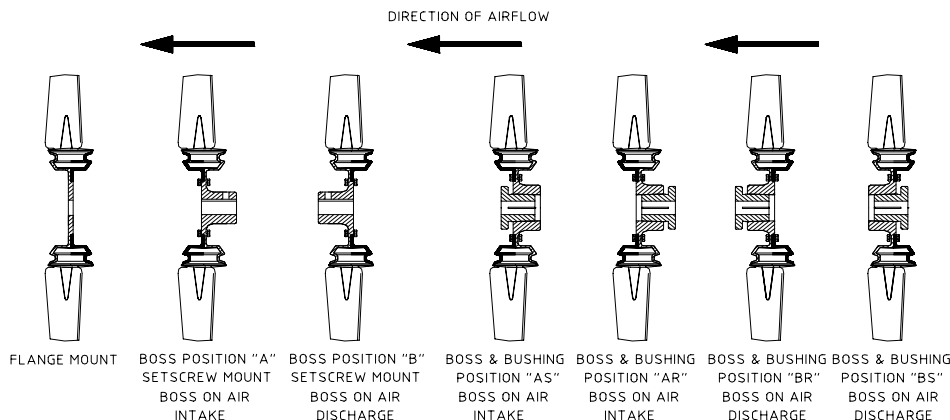
Select boss location A or B:

A is the boss on air inlet, including A, AR, and AS configurations.

B is the boss on air discharge, including B, BR, and BS.

See examples in drawing below.

For flange mounted (engine) fans, use boss location A for blower fans, and boss location B for suction fans.



Step 4 – Find Blade Pitch Angle: 20, 25, 27.5, 30, 32.5, 35, 37.5, 40, 45, or 50

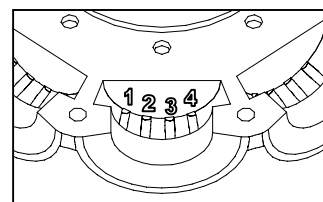
The blade pitch angle can be found several ways:

First, by knowledge of the Multi-Wing fan part number.

The pitch angle precedes the blade material code in the part number. For example, the pitch angle is 30 degrees in this part number: 36/9-9/30/PPG/5ZR/ SH 1-3/8 /AS

Second, by careful disassembly with this method:

- Disassemble fan on flat surface, and note in which groove the pin is located. See number code in picture to the right.
- Using pictures in step 7 on next page, determine if the pin was in the hub (HUB) or retainer side (RET) of fan.
- Using table in step 6 below, find the possible blade pitch.
- Using table in step 5 below, select your blade angle based on whether your pin was in the HUB or RET.



Third, by calling a sales engineer at Multi-Wing America for assistance in selecting a blade pitch angle for your application.



Step 5 – Determine Hub/Retainer Code: “HUB” or “RET”

Find “HUB” or “RET” in chart below:

Type	Rotation	Boss Pos.	Blade Pitch Angle									
			20°	25°	27.5°	30°	32.5°	35°	37.5°	40°	45°	50°
1Z,2Z,4Z	R or L	A	RET	RET	-	RET	RET	HUB	HUB	HUB	HUB	-
1Z,2Z,4Z	R or L	B	HUB	HUB	-	HUB	HUB	RET	RET	RET	RET	-
5Z	R or L	A	-	RET	-	RET	RET	RET	HUB	HUB	HUB	HUB
5Z	R or L	B	-	HUB	-	HUB	HUB	HUB	RET	RET	RET	RET
6Z	R	A	RET	RET	HUB	RET	HUB	RET	-	-	-	-
6Z	R	B	HUB	HUB	RET	HUB	RET	HUB	-	-	-	-
6Z	L	A	HUB	HUB	RET	HUB	RET	HUB	-	-	-	-
6Z	L	B	RET	RET	HUB	RET	HUB	RET	-	-	-	-

Step 6 – Determine Groove Number: 1 or 2 or 3 or 4

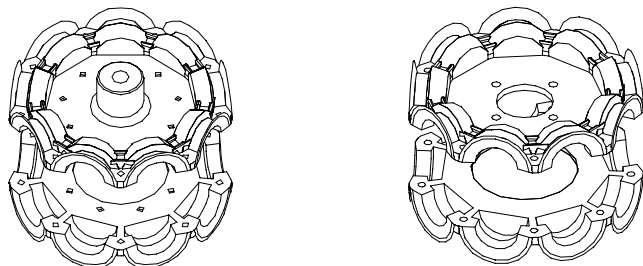
Find the groove number in chart below:

Type	Rotation	Blade Pitch Angle									
		20°	25°	27.5°	30°	32.5°	35°	37.5°	40°	45°	50°
1Z,2Z,4Z	R	4	3	-	2	1	4	3	2	1	-
1Z,2Z,4Z	L	1	2	-	3	4	1	2	3	4	-
5Z	R	-	4	-	3	2	1	4	3	2	1
5Z	L	-	1	-	2	3	4	1	2	3	4
6Z	R	1	2	1	3	2	4	-	-	-	-
6Z	L	1	2	4	3	3	4	-	-	-	-

Step 7 – Final Assembly

Definition of HUB and RET for purposes of these instructions:

For 2-piece hubset like below:

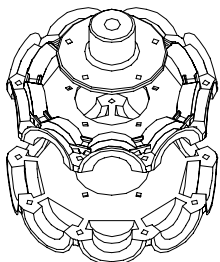


Top half is the HUB, and bottom half is the RET or retainer ring.



Step 7 – Final Assembly continued

For 3-piece hubset as below:



Top two pieces together are considered the HUB, and bottom piece is considered the RET or retainer ring.

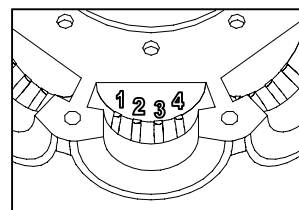
Using the HUB or RET code found in Step 5:

If code is HUB, place the hub down on work surface first (one or two pieces, depending on above).
If code is RET, place one retainer ring only down on the work surface first.

A weighted coffee can could be used to elevate the fan from the work surface.

Using the Groove Number found in Step 6:

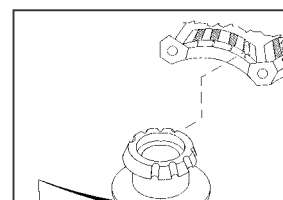
Using picture to right, place the locking pin in the groove number that you found in Step 6 above.



Finally, Insert Blades:

- Place the blade over the pin in the hub/retainer blade socket, so that the pin also fits into the appropriate pitch angle groove in the blade. See example picture to the right.

For 6Z fans, use the pitch angle groove in the blade marked with your rotation (R or L) and pitch angle. Example: L35 is “L” rotation and 35-degree pitch angle.



- Repeat for all blades.
- Assemble hubset together, aligning the match marks you made.
- Replace any balancing weight to its original position.
- To finish, tighten the bolts in a cross pattern to 5 to 6 foot-pounds of torque.

**INSTRUCTIONS FOR BLADE PITCH ADJUSTMENT
FOR THE LARGE SERIES MULTI-WING W BLADES**

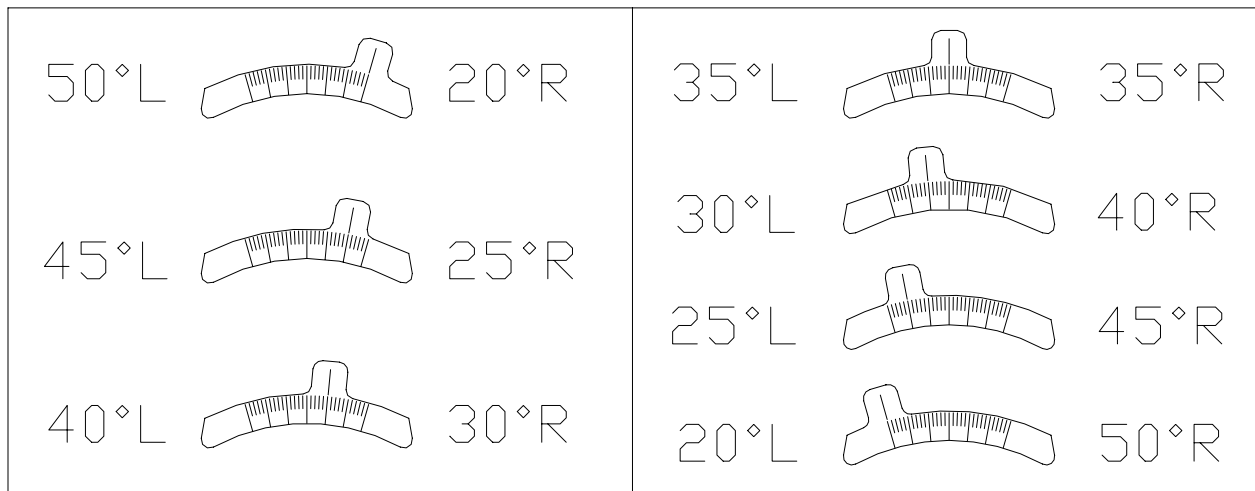
1) NOTE ORIGINAL POSITION OF RETAINING PLATES, CENTER BOSS AND ALL HARDWARE INCLUDING ADDITIONAL HARDWARE USED FOR BALANCING

2) REMOVE **ALL** THE BOLTS AND NUTS.

3) DETERMINE BLADE ROTATION – ON THE CONCAVE SIDE OF THE BLADE IS A BLADE MARKING SHOWING 6WR, 6WL, 7WL, 7WR, OR 9WR. THE “L” AND “R” DENOTE THE ROTATION OF THE BLADE.

4) REPLACE THE PITCH INSERT IN THE BLADE ROOT WITH AN INSERT OF THE DESIRED PITCH.

PITCH IS DETERMINED BY COUNTING DIAL MARKS ON THE INSERT FROM THE SIDE OF APPROPRIATE BLADE ROTATION FOUND IN STEP 3. EACH LARGE MARK REPRESENTS 5 DEGREES. THE ENDS OF THE INSERT ARE 20 AND 50 DEGREES ACCORDINGLY.



5) REPLACE BLADES TO THEIR ORIGINAL LOCATION.

6) REPLACE ALL NUTS, BOLTS, AND WASHERS ON THE FAN HUB.

7) REPLACE RETAINING PLATES AND CENTER BOSS TO ORIGINAL LOCATION.

7) TIGHTEN NUTS AND BOLTS TO:
14 FOOT POUNDS OF TORQUE

(REV. 9/7/05)