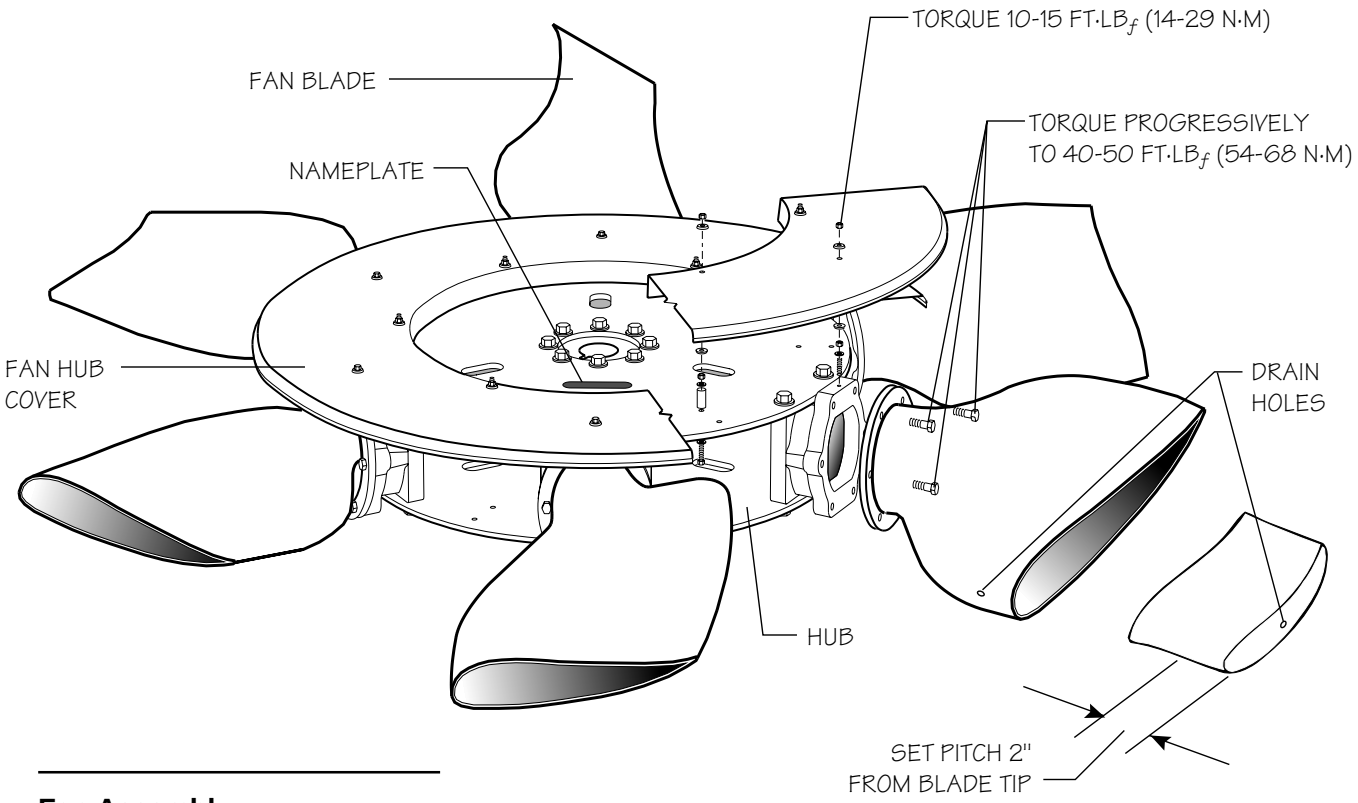
HP7i Fan

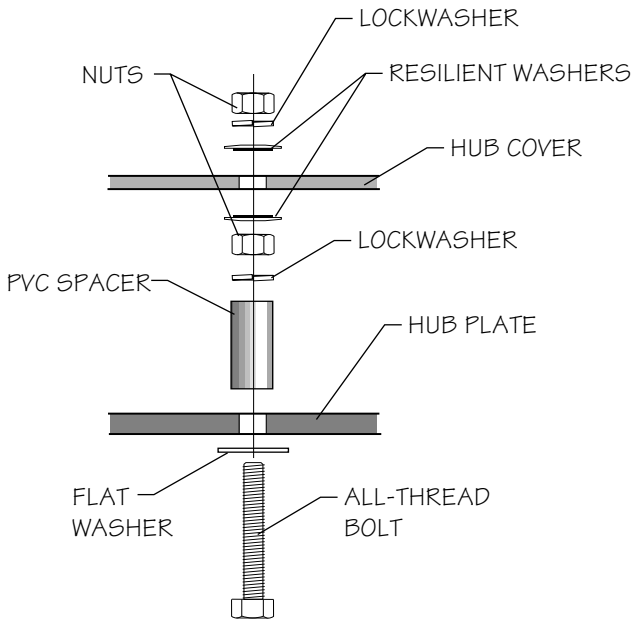
Service Manual

216" through 240" Diameter
Plate Hub Design

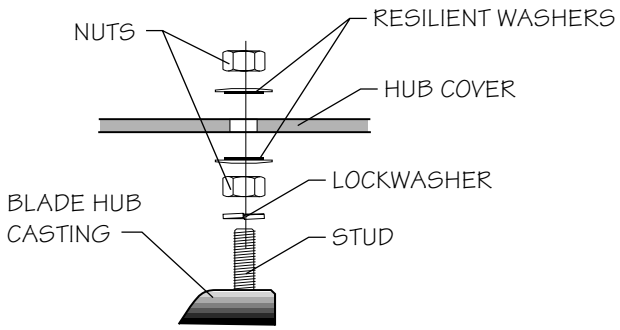
Manual 93-1267A



Fan Assembly



Cover at Hub



Cover at Blade

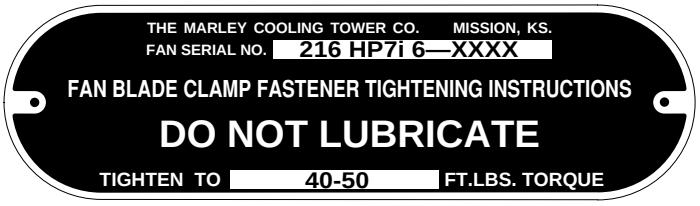
Marley Order No. _____

Trial Pitch Angle _____

Final Pitch Angle _____

Speed-rpm _____

Contract hp _____

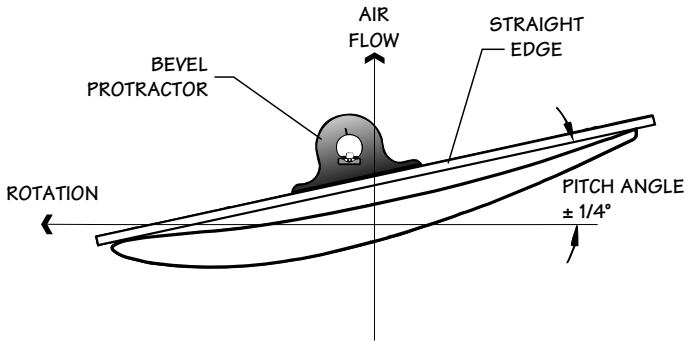


Fan Nameplate

Fan Assembly

1. Visually inspect all tapped blade mounting holes for any debris which could cause problems when tightening cap screws.
2. Install blades with the rotation arrow on the top side and pointing in a clockwise direction.
3. Hold each blade level and tighten the six cap screws sufficiently to hold each blade level.
4. Do not torque cap screws. Blades must be free to turn in their retaining rings in order to adjust pitch.
5. Select a position on the fan circumference and rotate each blade to this location when setting or checking blade pitch. The blade pitch is set within 2" (51 mm) of the blade tip. Place a bevel protractor on top of a parallel sided straight edge that extends the full width of the blade to measure the fan blade pitch.

Blade Pitching Illustration



6. Set the bevel protractor at the specified trial pitch angle supplied by Marley for your fan (see page 2). The trial blade pitch angle is the calculated setting for rated design conditions. Water rate, heat load and/or air density other than the rated design conditions can vary the brake horsepower of the fan.
7. Support the blade at the tip to maintain a proper plane of rotation while holding the pitch angle. Progressively tighten the cap screws between 40 and 50 ft·lb$_f$ torque (54-68 N·m). A crowfoot wrench may be necessary to torque the cap screws that cannot be reached with a socket. Recheck the pitch angle. Blades should be within ±1/4° of the desired pitch.
8. Check the tip track variation. The vertical tip track variation from a reference plane of rotation is ± 3/4" (19 mm). If the tip track variation is off, support the blade tip higher when tightening cap screws.
9. Repeat steps 6 and 7 until all six blades are installed.

Hub Cover Installation

1. Install fan hub cover as shown on page 2.
2. Tighten nuts between 10 and 15 ft·lb$_f$ (14-20 N·m) torque.

Fan Operation

1. Bump the fan motor and check for correct rotation. Rotation should be clockwise when viewed from the air discharge side. Start and operate the fan until the motor and Geareducer® have reached operating temperature (approximately 30 min).
2. Measure the operating voltage and amperage for use in calculating motor horsepower by the following equation:

$$HP_A = \frac{VOLTS_A \times AMPS_A}{VOLTS_N \times AMPS_N} \times HP_N$$

HP_A	=	Actual Horsepower	$VOLTS_N$	=	Nameplate Volts
$VOLTS_A$	=	Actual Volts	$AMPS_N$	=	Nameplate Amperage
$AMPS_A$	=	Actual Amperage	HP_N	=	Nameplate Horsepower

3. The calculated horsepower should be close to the contract horsepower specified by Marley (page 2). Measurements used in these calculations must be made with the specified rate of hot water flowing through the tower.

△ **Caution**

Measurements taken on motors operating with Variable Frequency Drive controls may read up to 15% high from errors in measuring the approximated sine wave. Instruments capable of measuring a squared off wave form accurately should be used for measuring power in this situation.

4. Adjust the fan pitch as required to obtain the desired motor load. If blades are repitched cap screws must be retorqued. Record the final pitch angle on page 2.

△ **Caution**

When checking and/or changing blade pitch or cycling fan in normal operation, do not exceed 30 sec/hour total motor starting time as motor may be overheated.

Routine Maintenance

Preventive maintenance will prolong useful life and assure continued trouble-free operation.

1. Retorque blade cap screws after the first week of operation and subsequently at six month intervals.
2. Inspect the fan for damage from airborne debris or corrosive attack at the same time the torque is checked. Remove any accumulation of scale or dirt if there are indications balance is affected.
3. Check to be sure drain holes in the blades are open.

Fan Service

1. When contacting the Marley sales office or representative for repair or replacement parts, please refer to the tower serial number.
2. Replacement blades can be installed without rebalancing. The fan series—HP7i—and diameter are required when ordering replacement parts.
3. If rebalancing is required, trial and error attachment of balance weights to the fan hub may produce a satisfactory dynamic balance. If this is not satisfactory, return the complete fan assembly to The Marley Cooling Tower Company for factory rebalance. Obtain a ***Customer Return Material*** tag from your Marley sales office or the representative in your area.

Marley Cooling Tower
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