

General Motor Knowledge
Part 17

Which Way Does The Air Move?

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Can you look at the shape of a fan blade and determine how it should be mounted? Which way will the air move? A "Pusher" type fan blade draws air across the motor and pushes it away from the motor. A "Suction" type fan blade sucks the air from one side and blows it across the motor. These terms, by themselves, are not of much help unless you know which way the rotor spins. The fan blade is the part that moves the air. Does the shape of the fan blade indicate which way it was designed to move the air?

A fan blade is a rotary device that moves or accelerates air. The air moves at right angles to the direction the fan blade rotates. The leading edge of the fan blade, like the cutting edge of a knife, must slice into the air with the least amount of resistance. But, once the fan starts rotating, and the air starts moving, this process becomes more complicated. It is similar to paddling a canoe quietly and without loss of effort in splashing or stirring up the water. The paddle must be inserted into the moving water at precisely the same speed that the water is moving. Then force is applied uniformly to the whole face of the paddle to drive the canoe forward during the entire paddle stroke. Next the pressure is relaxed and the blade is removed from the water without splashing.

A fan blade, designed to quietly cut into a moving air stream then accelerate the air along its way, will have a more complex shape than a canoe paddle. Without going into many details, this complicated shape will look like a cup. The air moves out of and away from the cupped side of the fan blade. When you throw a ball, it moves away from the cupped shape of your hand. The leading edge of the fan blade cuts into the moving air stream and the curved shape of the blade turns the air and throws it in the intended direction.

So, the answer is yes! You can look at the shape of a fan blade and determine which way it moves air best. You can picture how the blade must be rotated in order to move the air in this "best" direction. The rotor of a motor turns either clockwise or counter-clock wise. You folks with digital watches might need help with this. This rotation is marked on the back cap. Mount the fan blade so that the motor turns it such that the air is moved in the best direction. Is this the direction that the customer ordered?