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# Airblast AB22AR Owner's Manual



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## Safety Precautions

#### Warning

Explosive Fuel can cause fires and severe burns. If a gaseous odor is detected, ventilate area and contact an authorized service technician.

#### Warning

LPG and Natural Gas are extremely flammable and are heavier than air and tends to settle in low areas where a spark or flame could ignite gas. Do not start or operate this fan in a poorly ventilated area where leaking gas could accumulate and endanger safety of persons in area. To ensure personal safety, installation and repair of LPG/NG fuel supply systems must be performed only by qualified LPG/NG system technicians. Improperly installed and maintained LPG/NG equipment could cause fuel supply system or other components to malfunction, causing gas leaks.

Observe federal, provincial and local laws governing LPG/NG fuel, storage, and systems.

#### Warning

Carbon Monoxide can cause severe nausea, fainting or death.

Avoid inhaling exhaust fumes. Never run fan indoors or in enclosed spaces.

Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, and can cause death if inhaled.

#### Warning

Hot Parts can cause severe burns. Do not touch engine while operating or just after stopping.

Never operate fan with guards removed.

#### Warning

Accidental Starts can cause severe injury or death.

Disconnect and ground spark plug lead(s) before servicing.

Before working on fan, disable engine as follows: 1) Disconnect spark plug leads. 2) Disconnect negative (–) battery cable from battery.

Before disconnecting negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at ground cable terminal which could cause an explosion if LPG or NG fuel vapors are present.

#### Warning

Rotating Parts can cause severe injury. Stay away while fan is in operation. Keep hands, feet, hair, and clothing away from all moving parts to prevent injury. Never operate fan with covers, shrouds, or guards removed.

Allow the fan to come to a complete stop before removing guards or servicing the fan.

#### Warning

This is a high speed fan that generates suction capable of pulling objects or people towards the inlet. Only operate the fan with proper safety shields in place.

## Introduction

Thank you for purchasing a Wavcor Airblast fan. Follow this manual to properly install and setup the fan for safe and efficient operation. All gas connections must be completed by a certified gas fitter and must follow local laws and regulations. Check with your local authorities prior to installation of this fan.

This manual covers all AB22-AR fan options including the manual and controller based fans.

## Intended Use

The Airblast fan is designed solely for use as a fan for providing natural air drying and aeration of grain inside a grain bin. Airblast fans are intended for outdoor use only. Use in any other way is considered as contrary to the intended use and is not covered by the warranty.

Any modifications made to the Airblast fan may relieve the manufacturer of liability for any resulting damage or injury.

## **Operation Safety**

It is the owner, operator and maintenance personnel's responsibility to read and understand all safety instructions, safety decals and manuals and follow them when operating or maintaining the equipment.

- 1. Always keep the inlet screen in place and clean. Remove any debris trapped on the screen prior to fan operation.
- 2. Keep the breather screens on all pressure regulators clean and free of obstructions.
- 3. Do not operate the fan if there is excessive vibration.
- 4. Only use outdoors.
- 5. Propane and Natural Gas are flammable. It is recommended that a fire extinguisher be stored onsite in a highly visible and easily accessible location.

## **Equipment Check**

Check all components as soon as possible after receiving the fan to check for damaged or missing parts. If any parts are damaged or missing, contact Wavcor as quickly as possible to resolve the problem.

## Moving the Fan

The fan is equipped with a lifting eye. If the fan is not mounted to a pallet or other support then it should be lifted with the lifting eye. If lifting the fan with a loader, be sure that the fan is properly secured to the loader and can not fall off. Prior to lifting the fan with the lifting eye, make sure the lifting bolt is tight. Never work under the fan while it is suspended by the lifting bolt. Only use a chain with the lifting bolt that is capable of lifting a minimum of 1500 lbs (680 kg). Prior to moving the fan make sure that it is disconnected from the gas source and the controller power switch is in the OFF position.



## Positioning the Fan

The fan must be position in a near horizontal position. Operating the fan at an angle in excess of 25° may cause engine damage due to insufficient lubrication.

If possible, position the fan inside the hopper legs to reduce the chances of the fan getting damaged by other machinery or vehicles.

It is recommended that the fan be positioned on the ground. If the fan must be mounted in an elevated position, the stand or trailer that the fan is mounted to must be capable of supporting a minimum of 1500 lbs (680 kg).

The fan must be fastened in place to prevent it from moving during operation. Bolt holes are included on the fan to use as fastening points.

## Connect the fan to the Grain Bin

An assortment of adapters and ducts are available for mounting to a variety of grain bins. Contact Wavcor to determine the best mounting option available for your situation.

It is recommended that the length of ducts and transitions be kept as short as possible to limit heat loss on cool days.

It is recommended that an air sock be used as part of the connection to allow the fan to easily be moved from bin to bin and to prevent vibrations from the fan from being transferred into the hopper.

## Gas Connection

All gas installations must be installed by a properly certified gas technician and follow local regulations.

- Each Wavcor fan is supplied with a rating plate located on the side of the motor housing. Refer to this rating plate for proper connection requirements. All gas installations must be completed by a certified gas fitter and must follow local laws and regulations. For Canadian installations the equipment must be installed in accordance with the Natural Gas and Propane Installation Code, CSA B149.1 and the Propane Storage and Handling Code, CSA B149.2, or applicable provincial regulations.
- For best operation of propane fans, it is recommended that the fan be operated with a horizontal, stationary tank with a volume of 500 gallons (2300 liters). Smaller tanks may start to freeze in cooler weather while the fan is operating.
- Fans that are used in Manitoba or Alberta must be CSA approved prior to connection to a gas source. CSA approved fans are available from Wavcor. CSA approved fans have a yellow CSA approval sticker on the outside of the motor housing.
- Fans operating in Saskatchewan have received approval from the Technical Safety Authority of Saskatchewan (TSASK). If required, contact Wavcor for a letter of approval from the Technical Safety Authority of Saskatchewan.
- Airblast fans operate on vaporized propane. When connecting the gas supply line to a stationary tank, connect it to the top outlet of the tank.
- 1. Refer to the rating plate on the side of the fan housing to determine the proper supply pressure. Ensure that the gas pressure at the inlet of the fan is within the specified range.
- 2. Connect the gas hose to the 3/8" SAE flare fitting on the bottom side of the manual shutoff valve that is located on the side of the fan. Do not connect the hose to any other port on the fan.
- 3. Perform a leak test on all gas fittings by opening the gas supply and applying a mild soap and water solution to the connections. Turn off the gas supply after testing.

## Converting Between Natural Gas and Liquid Propane

The Kohler engines can be operated on either liquid propane or natural gas. To convert from propane to natural gas an orifice must be removed from the 90° fitting installed in the top of the engine regulator. In most cases the fuel connections can remain as is with the supply line connecting to the second stage regulator installed on the outside of the motor housing. In some cases it may be necessary to install the supply line directly to the input of the fuel solenoid valve. In both situations a manual fuel shutoff valve that is accessible from outside the motor housing must be used.

To convert from natural gas to propane the orifice must be installed in the 90° fitting on top of the engine regulator. There must also be a secondary pressure regulator installed on the fuel inlet so that the inlet pressure to the fuel solenoid valve is at 11 inches of water. A manual shutoff valve that is accessible from outside the motor housing must also be installed.



## Start-Up

**NOTE:** The fan must be connected to a grain bin prior to starting it. Operating the fan disconnected from the fan could cause items to be blown out of the fan and cause damage to property or injuries to people.

- 1. Prior to operation ensure that the fan screen is clear of any debris and the inlet is free of obstructions.
- 2. Make sure there are no obstructions blocking the fan air flow.
- 3. Open all bin roof vents and ensure they are unobstructed.
- 4. Always check oil prior to operating. The engine is equipped with an oil pressure sensor that will prevent the engine from starting if it is low on oil. This sensor may not shut the engine down if the engine runs low on oil during operation.
- 5. Open the gas supply valve at the source.
- 6. For the initial startup it is recommended to position the throttle at approximately half position and manually crank the fan using the key switch. This will purge the fuel supply line and after this is performed the controller can be used to start and stop the fan. Do not crank the fan for more than 20 seconds continuously. If the fan does not start after 20 seconds, wait 30 seconds before attempting again.
- 7. Once the fan starts, use the throttle control to reduce the fan speed to an idle. Let the fan idle for a minimum of one minute. While the fan is idling check for vibration and loose parts.
- 8. After the fan has idled for one minute, speed the fan up to full throttle. With the fan at full throttle, check for excessive vibration. Let the fan run at full throttle for a full minute.

## Shut Down

- 1. Allow the fan to idle for a minimum of 30 seconds and then it can be shut down.
- 2. Turn the gas valve off.

## Storage Instructions

When the fan will not be operated for long periods of time, follow these steps to ensure it is ready for the next use.

- 1. Close the propane valve at the tank.
- 2. Close the shutoff valve on the side of the Airblast fan motor housing.
- 3. Change the oil and oil filter as well as the air filter.

If storing the fan indoors or away from the bin:

- 4. Disconnect the supply hose.
- 5. Disconnect the fan from the bin.
- 6. Move the fan to the storage location.

- 7. It is recommended that the battery be removed from the fan or have a battery maintainer connected to it to maintain the charge.
- 8. If storing outdoors it is good to cover the fan with a tarp or cover.

## Maintenance

- For engine maintenance procedures, refer to the engine specific manual supplied with each fan.
- A list of all engine service intervals is written under the engine air filter cover.
- Ensure that the fan inlet remains free of obstructions. Clean any debris such as leaves and grass off the fan inlet and the heat exchanger.
- Regularly inspect and clean the breather vents on all pressure regulators.
- Make sure any fuel hoses are in an area will they can not be damaged or driven over.

## Operation

**NOTE:** It is recommended that the fan runs at an idle for at least one minute to allow it to warm up prior to speeding the engine up. It is also recommended that the fan idles for one minute prior to turning it off to allow the engine to cool down.

## Operation Without a Controller

For fans that do not have a controller the fan is started and stopped using the key switch on the side of the fan and the throttle switch mounted next to the key switch.

For the throttle switch to function, a 23 pin jumper connector must be installed in the 23 pin round connector on the end of the wire harness. This is located on the outside of the engine housing, near the rating plate.

## Aerating (Cooling) Mode

To run the fan in Aerating mode, run the fan at an idle. Running the fan at lower speeds reduces the airflow, but it also reduces the amount of heat being generated. Aerating mode will also consume less fuel.

To further reduce the amount of heat being generated remove the top lid from the fan.

#### Drying Mode

To operate the fan in drying mode make sure the top lid of the fan is installed and run the fan at full throttle.

This will generate the most airflow and heat, which improves drying.

## Operation With a Controller

**NOTE**: Not all Airblast fans are equipped with a fan controller. If your fan does not have a fan controller then it must be operated manually using the key switch and throttle. **NOTE**: When operating the fan with the controller the engine key must be in the OFF position.

When the fan is not operating for a period of time the controller should be turned off to prevent the engine battery from being depleted. If the controller must be left on for extended periods of time for monitoring the bin without the engine running it is recommended that a battery maintainer or solar panel be connected to the engine battery to extend the battery life.

A 150 Watt solar panel is recommended for maintaining the battery. Ensure that the solar panel includes a solar charge controller to prevent damage to the battery.

## App Download

The Airblast app is available in both the Apple iOS Store and the Google Play Store. Search Wavcor to find the app or scan the appropriate QR code below.



For Android Devices



For Apple Devices

## Controller Startup

When the controller is first turned on, the indicator light will go white and then red. During this time the controller is starting. Once the controller indicator light goes green it is powered on and ready for operation. The time that the controller takes to power on can vary depending on how long it takes to receive a cellular signal. Typically the first time the controller turns on will take the longest.

## Controlling the Fan with the App

Combining the Airblast App with an Airblast Fan provides the most flexibility for controlling the fan and allows for remote monitoring of the fan operation.

The app may be obtained from the Google Play or Apple App Store by searching for "Airblast".

When the Airblast app is first started there are no fans added to the app and the screen is blank.

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Airblast			\$
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#### Adding Fans

To add a fan, click on the '+' button in the bottom right corner of the screen. Enter the fan controller serial number into the popup box that is displayed and then click Ok.

**NOTE:** When near the fan the app may also be used in Bluetooth mode. To do this a scan must be initiated by tapping the Bluetooth button at the bottom of the screen, next to the + button. The scan may take up to 30 seconds to connect to the fan. Once the app connects to the fan, all operation is the same as described. The app will lose connection when the phone moves outside of range.



- 1 Fan Name: This is the name of the fan and it can be renamed on the Setup screen.
- 2 Fan Connection State: This indicates if the fan is connected or not. In this image the fan is not connected.
- 3 Grain Type: This is the type of grain inside the bin. This is set when a new batch is started.
- 4 Fan State: This indicates if the fan is operating or not. This will change whenever the fan switches operating modes.
- 5 Fan Controller Serial Number

Once a fan has been added, clicking anywhere on the fan box will take you to the fan control page.

If the fans are displaying that they are not connected, swiping from the top of the screen towards the bottom will make the app refresh, which will restart the connection. If swiping the screen down does not restart the connection it may be necessary to close the app and then restart it.

#### Removing a Fan

To remove a fan from the app, click and hold the fan on the home screen until a removal popup appears. Click Ok and the fan will be removed from the list of fans.



#### Fan Control Page

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	< R	8B0B0110			\$
2	Fan State	Stop	ped		1
4	Fan Control	Start	t Fan		
5	Function	Aerate	Dry		
6	Fan Mode	Manual	Auto		
7	Batch I	nformation	(		>
8	Live Inf	ō			>)
	1	1	0	<	

- 1 Settings: Clicking the settings icon will allow different fan parameters to be changed.
- 2 Fan State: This indicates the state of the fan such as if it is running or not.
- 3 Information: When this icon is displayed, clicking on it will provide more information about how and why the fan was started or stopped.
- 4 Fan Control: This button is used to start or stop the fan.
- 5 Function: Use this button to switch between aerating or drying. When aerating, the fan operates at an idle. When drying the fan operates around 3000 RPM.
- 6 Fan Mode: Use this to switch between Auto or Manual mode. When in Auto mode, the fan will start and stop automatically depending on the conditions.
- 7 Batch Information: Clicking this button provides details on the current batch and allows for new batches to be started.
- 8 Live Info: Clicking this button provides live feedback on the fan about various parameters. If bin moisture or temperature cables are connected they can be viewed in this screen.

#### **Bin Settings**



Fan Name:	The name of the fan can be changed to something more recognizable. This makes it easier to distinguish between fans when more than one fan is setup in the app. To change the name, click the box around the fan name.
Fan Model	This is the model name of the fan.
Min	When in Auto and drying, the fan will
Temperature	turn off if the ambient air temperature
to Dry at	drops below this temperature.
Maximum	When in Auto and drying, the fan will
Humidity to	turn off if the ambient humidity goes
Dry at(%)	above this level.
Max	When in Auto and aerating, the fan will
Temperature	turn off if the temperature goes above
to Aerate at	this level.
Minimum	When in Auto and aerating, the fan will
Humidity to	turn off if the humidity goes below this
Aerate at(%)	level.
Aggressiveness	The controller will use the Equilibrium Moisture Content (EMC) to determine when to start or stop the fan. A higher aggressiveness will make the fan operate more often.
Engine Cool	This is time in minutes that the fan will
Down Time	operate before turning off. This is to give
(minutes)	the engine an opportunity to cool down.
Engine Warm Up Time (minutes)	The time in minutes that the fan will operate before going to full throttle. This is to give the engine an opportunity to warm up.

#### **Batch Information**

The batch information screen shows information about the current batch.



- 1 Batch Name: Clicking on the batch name drop down allows you to select different batch so that past batches can be reviewed. When first coming onto this screen, the most recent batch will be shown.
- 2 Clicking the Grain Temperature button will display the temperatures of any bin cables.
- 3 Clicking the Grain Moisture button will display the moistures from any moisture cables.
- 4 Stop Batch: Will end the current batch.
- 5 New Batch: Will start a new batch.

## Further Bin Details

The further bin details page shows live information about the fan. This information is updated approximately every 10 seconds.

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Fan 1 - Details	No.
Bin Account Expires On	
Controller Version	00 31-26
App Version	1 0 3 (6)
Engine Hours	1.7
Engine PDM	1.7
Statia Dragouro	0.2
Static Pressure	0.3
Battery voltage	13.1
Plenum Temperature	
Plenum Humidity	
Ambient Temperature	28.5
Ambient Humidity	37.4
Signal Strength	7
Cables Connected	0
•	

## AB22AR Parts



ltem	Part	
No.	Number	Description
1	10020	Impeller – BCA500
2	10135	Kohler-Vanguard Driveshaft – No Flange
3	10019	Fan Shroud – ICA500
4	10025	Motor Housing Assembly
5	10282	Kohler Exhaust Assembly
6	10204	12V Battery 14-BS
7	10126	Heat Exchanger Assembly
8	10056	Kohler CH740 Engine
9	10343	Kohler Motor Mount Assembly
10	10510	Propane Two Stage Regulator 9-13" wc
11	10511	Regulator – Impco KN for Kohler
12	10623	Gas Shutoff Solenoid Valve – ASCO
13	10738	Fan Controller v2
14	10005	Motor Screen



\* dotted gray lines indicate a white wire.

1	Key Switch	12	Exhaust Sensor*
2	Key Switch Plug	13	Ambient Sensor*
3	Throttle Switch	14	Solenoid Shift Starter Assembly
4	Throttle Actuator	15	Starter Solenoid
5	Gas Solenoid	16	10 Amp Fuse
6	Flywheel Stator Assembly	17	Battery
7	Ignition Module	18	RPM Sensor
8	Spark Plug	19	Static Pressure Sensor
9	Oil Pressure Switch	20	Controller Connector
10	Rectifier Regulator	21	5 Amp Fuse
11	Plenum Sensor*		

\* Not all models have the Plenum and Ambient Sensor connected to the wire harness.

# Troubleshooting

Engine Does Not Crank	
Low Battery	• If clicking noises are heard when the key is turned on, but the engine does not crank or if no noises are heard, check to make sure the battery voltage is above 12V and all connections are tight.
Burnt out fuse	• A glass fuse (AGC 10 Amp) is located in a yellow fuse holder near the battery.
Damaged starter	• If the starter spins, but does not engage the starter may be damaged.

Engine Cranks but Does Not Start		
Air in Fuel Line	• When first connecting the fan to a fuel source it is sometimes required to crank the engine longer than normal to purge all of the air. If connecting the fan to a long fuel line it may be necessary to manually bleed all the air from the fuel line.	
Insufficient Fuel	<ul> <li>Make sure the fuel valve at the propane tank and the manual shutoff valve on the fan are fully open.</li> <li>Ensure the propane tank is more than 30% full.</li> <li>Make sure the fuel lines are properly sized for the length of hose.</li> <li>Make sure all vents and screens on each regulator are clean and clear of obstructions.</li> </ul>	

Low Battery	<ul> <li>If the battery is low, the engine may crank, but not fast enough to pull in enough fuel to fire.</li> </ul>
Faulty Fuel Solenoid	<ul> <li>Make sure that when the key is turned from off to on and then on to off, the gas solenoid clicks.</li> <li>Disconnect the solenoid connector and measure the voltage on the connector. When the key is in the ON position, there should be 12V present.</li> </ul>
Low Oil	• The ignition coil is grounded through the oil pressure sensor. If the oil level is too low there will not be enough oil to trigger the oil pressure sensor, which prevents the coil from creating a spark.
Faulty Oil Pressure Sensor	<ul> <li>See "Low Oil"</li> <li>Using a spark tester, test for spart at the spark plugs.</li> </ul>

<b>Excessive Fan Vibration</b>	
Change the RPM	• Operating the fan between 2000 RPM and 2700 RPM can cause more vibration on the fan. Try operating the fan at a higher or lower RPM.
Out of Balance Impeller	<ul> <li>Check that the Impeller housing is free of debris.</li> <li>Make sure the fan does not have a build up of material on any part of it.</li> <li>Check the impeller for cracks or damage.</li> </ul>

## Statement of Limited Warranty

Wavcor International Inc., also known as Wavcor, warrants all equipment of its manufacture to be free of defects in material and workmanship for a period of one year. This warranty period is for a period of twelve months from the date the equipment is delivered by Wavcor or its authorized dealer to the purchaser. Items include fans and genuine replacement parts manufactured by Wavcor. Auxiliary components not manufactured by Wavcor or Wavcor rebuilt parts are covered by a 90-day warranty.

Wavcor will repair free of charge items returned within the warranty period to one of Wavcor's authorized service centers. In countries where Wavcor maintains authorized service centers, freight will be paid one way and returned by the same carrier unless instructed differently. The purchaser is responsible that the item is properly packaged for shipment. Shipping damage is not covered under this warranty.

Wavcor or its authorized Service Center will repair or replace, at its option, any defective part or component at no cost to the purchaser during the Warranty period. If service in the field is required Wavcor will authorize on-site repairs at no charge for parts and labor. Travel time, travel costs and per diem expenses to and from the place where repairs are made, will not be covered by this warranty.

For the nearest Service Center visit our website at www.wavcor.ca or call +1 306 660 9282 or email info@wavcor.ca

Any evidence of negligent or abnormal use, alteration of serial numbers, or repairs attempted by other than Wavcor authorized personnel or not using Wavcor certified or recommended parts, automatically voids the warranty. Normal wear is not covered under this warranty.

Wavcor will not warranty any complaints relating to inadequate installation (unless the installation was performed by Wavcor), adjustments or calibration.

The forgoing states the entire liability of Wavcor regarding the purchase and use of its equipment. The purchaser agrees that Wavcor accepts no liability for any consequential loss or damage of any kind. The purchaser further agrees that the warranties contained herein are in lieu of all other warranties, expressed or implied, and, specifically Wavcor disclaims any implied warranty regarding merchantability or fitness for a particular purpose. This paragraph is of no force or effect in those jurisdictions, where the limitations of the type noted herein are prohibited by law.

To ensure warranty coverage the customer must register within 30 days of their purchase online at www.wavcor.ca.