

Installation and Operation Manual

Industrial Fans

Models BC/BAF (All Sizes), RBO/RBA (All Sizes), and
JRW (All Sizes)



Throughout this manual statements indicating precautions necessary to avoid equipment failure are referenced in a **Note**. Statements indicating potential hazards that could result in *personal injury* or *property damage* are referenced in a **CAUTION!** box.

Illustrations are for reference only, as actual product may vary.

This manual is property of the owner. Leave with the unit when set-up and start-up are complete. Donaldson Company reserves the right to change design and specifications without prior notice.



CAUTION!

Application of Dust Control Equipment

- Combustible materials such as buffing lint, paper, wood, aluminum or steel dust, weld fume, or flammable solvents represent fire or explosion hazards. Use special care when selecting and operating all dust or fume collection equipment when combustible materials are present to protect workers and property from damage due to fire and/or explosion. Consult and comply with National and Local Codes relating to fire or explosion and all other appropriate codes when determining the location and operation of dust or fume collection equipment.
- When combustible materials are present, consult with an installer of fire extinguishing systems familiar with these types of fire hazards and local fire codes for recommendations and installation of fire extinguishing and explosion protection systems. Donaldson Torit dust collection equipment is not equipped with fire extinguishing or explosion protection systems.
- DO NOT allow sparks, cigarettes or other burning objects to enter the hood or duct of any dust or fume control equipment as these may initiate a fire or explosion.
- For optimum collector performance, use only Donaldson Torit replacement parts.

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This manual contains specific precautionary statements relative to worker safety. Read thoroughly and comply as directed. Discuss the use and application of this equipment with a Donaldson Torit representative. Instruct all personnel on safe use and maintenance procedures.

Data Sheet

Model Number _____	Serial Number _____
Ship Date _____	Installation Date _____
Customer Name _____	
Address _____	

Filter Type _____	
Accessories _____	
Other _____	

INTRODUCTION

Thank you for purchasing a Donaldson Torit industrial fan. Your new Donaldson Torit fan is built to the highest industry standards. Great care has been taken to design and manufacture a high quality, low maintenance product that is economical to use and maintain.

This manual is intended to assist in the installation, operation and maintenance of your fan. The instructions in this manual are general in nature and apply to a variety of models. Each situation dictates the need for any special precautions and it is the user's responsibility to ensure that adequate safety measures are employed in installation, operation and maintenance. As always, follow good safety practices around all equipment.

SHIPPING AND RECEIVING

Donaldson Torit fans are shipped completely assembled and ready for immediate installation. Upon arrival inspect all components for damage that may have occurred during shipping. Check the bill of lading or packing list to verify the proper equipment and quantities. Should any discrepancies arise contact the carrier immediately.

All fans should be lifted by the base or the lifting angle on the fan housing (see Fan Assembly) using appropriately rated lifting equipment (i.e. crane , forklift) using nylon slings or spreader bars to prevent damage to the fan. Never lift fan by shaft, drives, motor, wheel or inlet and outlet flanges



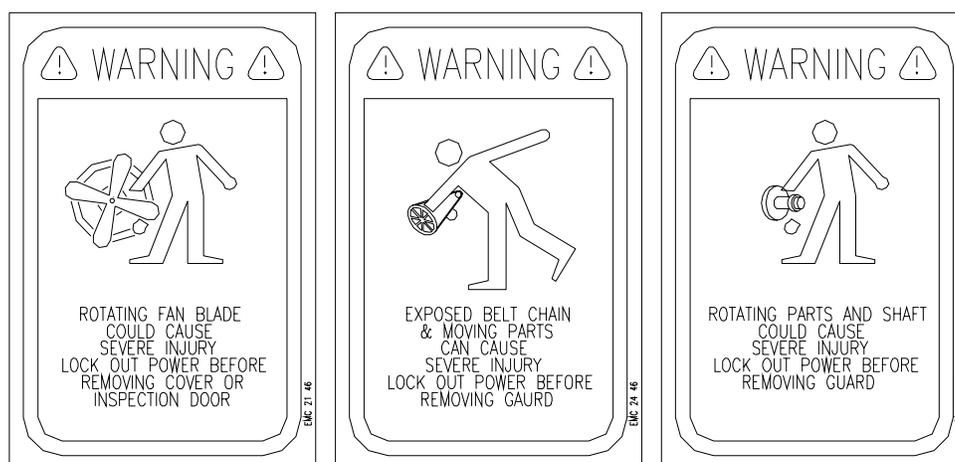
CAUTION!

- Misuse or modification of this equipment may result in personal injury.
- Do not misuse or modify.

Safety First!

Read this before installing fan.

Donaldson Torit fans like all commercial equipment must be used correctly and with common sense. All installations must include guards, duct or other devices on both the inlet and discharge sides of the fan that will prevent anyone from reaching into or being exposed to the rotor. Failure to provide these devices will endanger personnel. Before servicing or inspecting turn off **and** lock out power to the fan. Refer to your facilities's "LOCK OUT - TAG OUT" procedure. Many systems employ sequencing that may allow a fan to start without warning. It is imperative that all service and inspection be performed with the power turned off **and** locked out. Failure to do so may cause serious injury or death.



INSTALLATION

Donaldson Torit fans arrive fully assembled and can be installed immediately. Foundations or structural supports must be designed to withstand both static and dynamic loads induced by the fan. Consult local codes for any other foundation or structural requirements. All base mounting holes must be used to ensure proper structural stability. If mounting pad is uneven shim the fan to level and then grout the entire frame to provide support. See figure 1.

Ducting should be attached to the fan with flex connections and must be independently supported. Connecting ducting directly to the fan can damage the fan housing and/or may cause vibration. Inlet vibration dampers are available from Donaldson Torit.

Fan inlets and discharges that are not attached to ducting must have a guard in place. Optional inlet guards and fan evases are available from Donaldson Torit.

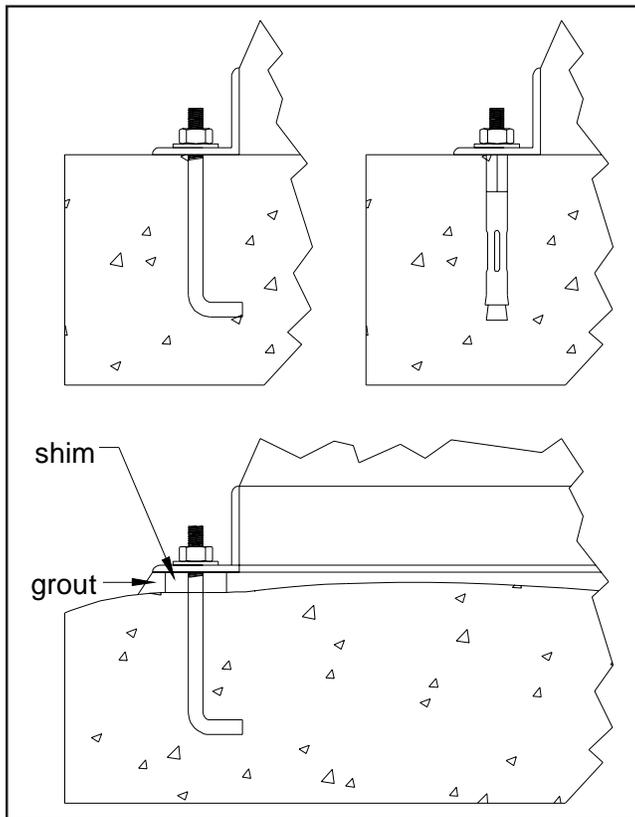


FIGURE 1 Typical anchor detail

Make electrical connections as required by local codes and the system into which the fan is installed. All electrical work should be performed by **qualified** electricians. Refer to motor label for wiring diagram.

Prior to shipping, all Donaldson Torit fan bearings are lubricated with the proper amount of grease. If the fan is stored for an extended period of time prior to installation bearings should be inspected for lubrication.

OPERATION

Pre-start-up Checklist

- All safety precautions have been followed.
- All electrical connections made and locked off.
- All bolt connections are tight. All Set screws are tight.
- All guards in place. All ducting is connected.
- All obstructions in fan housing and drive are removed (i.e. tools, lifting straps, etc.).
- Manually rotate fan wheel to check for any obstructions, or rubbing.
- Check fan rotation by “bump” starting. Rotation is marked on wheel or can be determined using figure B.
- Check drive alignment and tension.
- Correct any problems found. Follow all safety rules and procedures.
- Start fan and bring to full speed. Observe operation for abnormal noise or vibration.
- After several minutes, one hour and one week of operation check all bolt connections, anchors, setscrews and drive components and re-tighten if necessary.

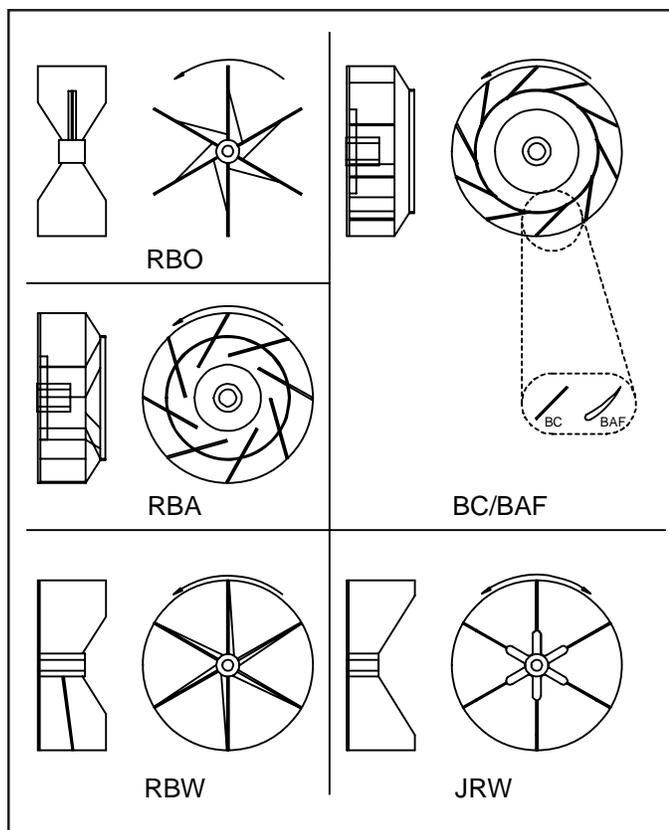


FIGURE 2 Fan wheel types

MAINTENANCE

The following instructions and guidelines are general in nature and should be adjusted to the particular application. Whenever a problem arises in any equipment, corrective measures must be taken to ensure continued safe and reliable performance.

1) Motor

The motor should be kept dry, clean and properly lubricated to ensure optimal performance and longevity. Dust can cause motors to overheat that can lead to failure. As conditions dictate clean the motor periodically, following all safety procedures. Motors also need to be lubricated. Follow motor manufactures recommended lubrication schedule. A typical lubrication schedule is shown in figure 4.

DO NOT OVER LUBRICATE.

Motor H.P.	normal	dusty	extreme
<10	5 years	2 1/2 years.	15 mo.
15 to 40	3 years	1 1/2 years	9 mo.
50 to 150	yearly	6 mo.	3 mo.

FIGURE 4 Motor lubrication schedule

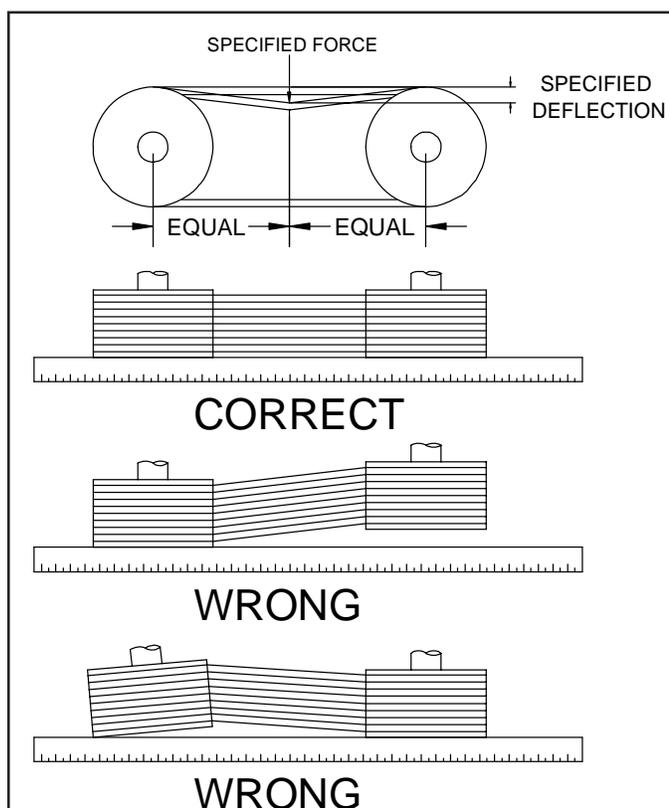


FIGURE 3 Belt installation

2) Bearings

Instructions covered in this section are general and are intended to serve as a guide for normal bearing maintenance. The bearing manufacturer's lubrication recommendation and schedule should be followed. These are available at www.lmcwest.com or the bearing manufacturer's website. Excessive lubricant will cause bearings to overheat.

Bearings should be kept clean and well lubricated. Frequency of lubrication will be determined by the severity of environmental conditions and applied loads. Figure 5 is a typical lubrication schedule for bearings operating under normal conditions.

LUBRICATION SCHEDULE (MONTHS)

SPEED (RPM) SHAFT DIA.	500	1000	1500	2000	2500	3000	3500	4000	4500
1/2"-1 11/16"	6	6	5	3	3	2	2	1	1
1-15/16"-2 7/16"	6	5	4	2	2	1	1	1	1
2 1/2"-3 7/16"	5	4	3	2	1	1	1		
3 1/2"-3 15/16"	4	3	2	1	1	1			

FIGURE 5 Typical bearing lubrication schedule

3) Sheaves & Belts

Fans with v-belt drives need periodic belt maintenance. Belts should be inspected for wear, frayed edges and proper tension. Sheaves must be inspected for wear, alignment and other mechanical damage. Sheaves that are worn need to be replaced.

Whenever replacing belts and/or sheaves always use new parts. Use new set screws, bushings etc. On multiple belt applications always replace the entire set of belts with a matched set.

To replace belts the following procedure should be followed. First lock out and tag fan motor to prevent accidental start. Remove belt guard by loosening the six retaining bolts. Loosen but do not remove motor mount bolts. Adjust motor to loosen belts using motor base adjustment bolt. On large motors a properly blocked bottle jack can assist in moving the motor as the adjustment bolt is turned. Care should be taken to prevent damage to the motor and/or injury. Belts should be loosened so that they can be taken off by sliding over the sheave rather than shifting the belts from groove to groove.

If sheaves are to be removed loosen the setscrew in bushing. Loosen and remove the three bushing retaining bolts. Use all three retaining bolts to extract the bushing by screwing them into the threaded holes on the bushing. The bolts should be tightened evenly to prevent damage to sheave, shaft or bushing.

Clean and inspect all parts for wear and/or damage. When installing sheave and bushing make sure all mating surfaces including threads are clean, dry and oil free. Place the motor sheave as far onto the shaft as clearance allows. This will minimize the overhung load on the shaft and increase bearing life. Locate the driven sheave using a straight edge as shown in Figure 3.

Incrementally tighten the three bushing bolts taking care not to warp the sheave. On large diameter sheaves it is highly recommended that a dial indicator be used to prevent excessive runout

due to a misaligned bushing. Belt and bearing life will be shortened if sheaves are not properly aligned.

Torque all setscrews and bolts to manufacturer's specified values. If torque specifications are not available from component manufacture consult Figure 6.

Place all belts onto sheaves and tighten making sure that sheaves remain in the same plane. Rotate sheaves manually to help seat the belts while tightening. Check belt tension by using a tension tester or "fish" scale. Press on center of each belt and check deflection for the specified force. See fig. 3. For correct deflection contact the drive provider if not Donaldson Torit.

After belts are properly installed replace guard and tighten bolts. New belts will require retightening after about 1 week of operation. Check all bolt and set screws at the same time.

4) Wheel and Shaft

Inspect fan wheel for wear and build up of dirt or debris. Build up on fan wheels will cause an imbalance that can lead to catastrophic failure. Check set screws and retighten if necessary. Check for signs of fatigue and/or corrosion. Special skills and equipment are required to balance fan wheels therefore this procedure should be left to a skilled professional.

Inspect fan shaft for trueness and signs of fatigue.

If the shaft is suspect it should be replaced with a new Donaldson Torit approved shaft.

5) Fan Housing & Base

The safety, reliability and performance of the fan relies on the structural integrity of the fan housing and base. Periodically inspect welds, bolt connections and anchors for fatigue and/or corrosion.

Build sheets for your particular fan are available by calling the Engineering Dept. at Donaldson Torit at 1-800-562-0072. These sheets will provide the bearing and drive information necessary for servicing your fan. Please have the serial number available when calling.

Bolt Torques (Ft-Lbs)				QD Bushing Torques (in-Lbs)				
Plated and cleaned bolts. Do NOT lubricate.				Cap Screw		Set screw		
BOLT SIZE	GRADE 2	GRADE 5	GRADE 8	TYPE	SIZE	IN-LBS	SIZE	IN-LBS
1/4-20	4	6	9	H	1/4-20	90	NONE	
5/16-18	8	13	19	JA	10-24	60	NONE	
3/8-16	14	23	33	SH	1/4-20	108	1/4-20	87
7/16-14	23	39	56	SDS	1/4-20	108	1/4-20	87
1/2-13	35	58	88	SD	1/4-20	108	1/4-20	87
9/19-12	52	87	128	SK	5/16-18	180	1/4-20	87
5/8-11	75	120	179	SF	3/8-16	360	3/8-16	290
3/4-10	124	206	304	E	1/2-13	720	3/8-16	290
7/8-9	169	313	492	F	9/16-12	900	3/8-16	290
1-8	260	493	706	J	5/8-11	1620	1/2-13	620
Fan Wheel Set Screw Torques				M	3/4-10	2700	1/2-13	620
SIZE	TORQUE	UNITS	N	7/8-9	3600	5/8-11	1325	
1/4	66	in-lbs	P	1-8	5400	5/8-11	1325	
3/8	19	ft-lbs	W	1 1/8-7	7200	3/4-10	2400	
1/2	42	ft-lbs	S	1 1/4-7	9000	1-8	7200	
3/4	150	ft-lbs						

Figure 6 Drive component torque specifications.

TROUBLESHOOTING

Air Flow

- System static pressure not at design level. Fan may over speed drawing more horsepower.
- Fan not operating at design speed
- Wheel rotation reversed.
- Ducting closed or plugged.
- Sheaves misaligned or belts worn
- Anchor bolts loose, bearing bolts loose.

Noise

Vibration

- Wheel misaligned, damaged or loose. Dirt build up present.
- Shaft bent or loose in bearings.
- Bearings worn or failed.
- Worn or loose belts.
- Bearings worn or lack lubrication.
- Fan operating in unstable performance region.

PHOTOCOPY THIS FORM

PARTS ORDER FORM

MAIL TO: Donaldson Torit
 Customer Service
 5300 Claus Road
 Riverbank, CA 95367

OR

FAX TO: (209)-869-0258

CUSTOMER NAME: _____

SHIPPING ADDRESS _____ BILLING ADDRESS: _____

MODEL NO. _____

SERIAL NO. _____

DESCRIPTION	QTY	DESCRIPTION	QTY
<input type="checkbox"/> MOTOR	<input type="checkbox"/>	<input type="checkbox"/> BELTS	<input type="checkbox"/>
<input type="checkbox"/> SHAFT	<input type="checkbox"/>	<input type="checkbox"/> BEARINGS	<input type="checkbox"/>
<input type="checkbox"/> DRIVE SHEAVE	<input type="checkbox"/>	<input type="checkbox"/> FAN WHEEL W/ INLET CONE	<input type="checkbox"/>
<input type="checkbox"/> DRIVEN SHEAVE	<input type="checkbox"/>	<input type="checkbox"/> BELT GUARD	<input type="checkbox"/>

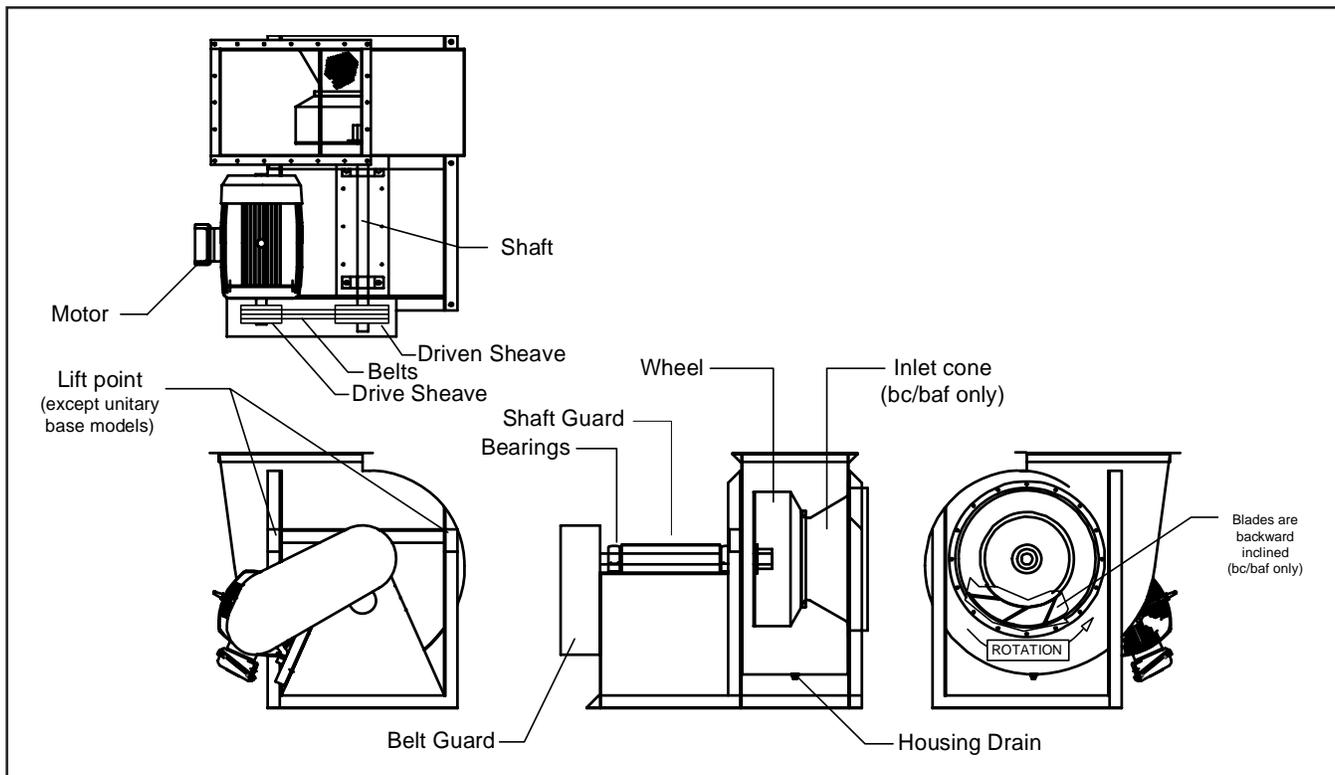


FIGURE 7 Fan assembly

The Donaldson Torit Warranty

Donaldson warrants to the original purchaser that the products will be free from defects in materials and workmanship for one (1) years from the date of shipment, if properly installed, maintained and operated under normal conditions. Donaldson does not warrant against damages due to corrosion, abrasion, normal wear and tear, product modification, or product misapplication. Donaldson also makes no warranty whatsoever as to any goods manufactured or supplied by others including electric motors, fans and control components. After Donaldson has been given adequate opportunity to remedy any defects in material or workmanship, Donaldson retains the sole option to accept return of the goods, with freight paid by the purchaser, and to refund the purchase price for the goods after confirming the goods are returned undamaged and in usable condition. Such a refund will be in the full extent of Donaldson's liability. Donaldson shall not be liable for any other costs, expenses or damages whether direct, indirect, special, incidental, consequential or otherwise. The terms of this warranty may be modified only by a special warranty document signed by a Director, General Manager or Vice President of Donaldson. Failure to use genuine Donaldson replacement parts may void this warranty. **THERE EXIST NO OTHER REPRESENTATIONS, WARRANTIES OR GUARANTEES EXCEPT AS STATED IN THIS PARAGRAPH AND ALL OTHER WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESS OR IMPLIED ARE HEREBY EXPRESSLY EXCLUDED AND DISCLAIMED.**

Parts and Service

For genuine Donaldson Torit replacement filters
and parts, call the Parts Express Line

800-562-0072

www.donaldsonorit.com/lmcwest

For faster service, have unit's model and serial number,
part number, description, and quantity available.



Donaldson
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Donaldson Company, Inc. is the leading designer and manufacturer of dust, mist, and fume collection equipment used to control industrial-air pollutants. Our equipment is designed to help reduce occupational hazards, lengthen machine life, reduce in-plant maintenance requirements, and improve product quality.