



CE Compliant Low Speed Centrifugal Fan Installation and Operation

Owner's Manual - Original Instructions

PNEG-1900CE

Version: 3.0

Date: 11-15-19



PNEG-1900CE



**CE Declaration of Incorporation
EC MACHINERY DIRECTIVE
2006/42/EC**

1004 East Illinois Street, Assumption, IL, 62510, USA

+1 217 226 4429

The GSI Group declares that

GSI Low Speed (1450 RPM) Centrifugal Fans

Part #	Description
CF-5-6G	Fan: 1450 RPM 5 HP 3 Phase 380V
CF-5-7G	Fan: 1450 RPM 5 HP 3 Phase 415V
CF27-7-6G	Fan: 1450 RPM 7.5 HP 3 Phase 380V
CF27-7-7G	Fan: 1450 RPM 5 HP 3 Phase 415V
CF30-10-6G	Fan: 1450 RPM 10 HP 3 Phase 380V
CF30-10-7G	Fan: 1450 RPM 10 HP 3 Phase 415V
CF30-15-6G	Fan: 1450 RPM 15 HP 3 Phase 380V
CF30-15-7G	Fan: 1450 RPM 15 HP 3 Phase 415V
CF33-20-6G	Fan: 1450 RPM 20 HP 3 Phase 380V
CF33-20-7G	Fan: 1450 RPM 20 HP 3 Phase 415V
CF33-25-6G	Fan: 1450 RPM 25 HP 3 Phase 380V
CF33-25-7G	Fan: 1450 RPM 25 HP 3 Phase 415V
CF36-30-6G	Fan: 1450 RPM 30 HP 3 Phase 380V
CF36-30-7G	Fan: 1450 RPM 30 HP 3 Phase 415V
CF36-40-6G	Fan: 1450 RPM 40 HP 3 Phase 380V
CF36-40-7G	Fan: 1450 RPM 40 HP 3 Phase 415V

Meet the following clauses of the Essential Requirements of the Machinery Directive 2006/42/EC

- 1.1.2 and sub-clauses principles of safety integration
- 1.3.2 Risk of break-up during operation
- 1.3.7 Risk related to moving parts
- 1.3.8 Choice of protection against risks arising from moving parts
 - 1.3.8.1 Moving transmission parts
 - 1.3.8.2 Moving parts involved in the process (*Installer has responsibility to ensure complete compliance with this clause, as per manual.*)
- 1.3.9. Risks of uncontrolled movements
- 1.4. Required characteristics of guards and protective devices
 - 1.4.1. General requirements
 - 1.4.2. Special requirements for guards
 - 1.4.2.1 Fixed guards



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- 1.5.4 Errors of fitting
- 1.5.5 Extreme temperatures
- 1.5.6 Fire
- 1.5.7 Explosion
- 1.5.8 Noise
- 1.5.9 Vibrations
- 1.5.13 Emissions of hazardous materials and substances
- 1.6 Maintenance
 - 1.6.1 Machinery maintenance
 - 1.6.4 Operator intervention
- 1.7 Information
 - 1.7.1 Information and warnings on the machinery
 - 1.7.1.1 Information and information devices
 - 1.7.2 Warning of residual risks
 - 1.7.4. Instructions
 - 1.7.4.1 General principles for the drafting of instructions
 - 1.7.4.2 Contents of the instructions but not inclusive of sub-clause (u)
 - 1.7.4.3 Sales literature

This declaration applies only to the mechanical elements of the above machines and does not imply conformity by any other items of equipment fitted to or connected with the above machines.

The equipment above must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of all relevant Directives, nor until these components have been assembled in the manner recommended in the manufacturers instructions.

Signed :

Name:

Date:

NOTES

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1. Introduction

READ THIS MANUAL carefully to learn how to properly use and install equipment. Failure to do so could result in personal injury or equipment damage.

INSPECT the shipment immediately upon arrival. The customer is responsible for ensuring that all quantities are correct. The customer should report and note any damage or shortage on the bill of lading to justify their claim to the transport company.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your equipment and should be easily accessible when needed.

This warranty provides you the assurance that the company will back its products when defects appear within the warranty period. In some circumstances, the company also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the factory specifications, the warranty will become void and field improvements may be denied.

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Read and save these instructions.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in **SERIOUS INJURY** or **DEATH**.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-4

Cautionary Symbols Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.



This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**



This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**



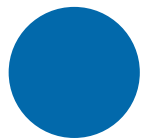
This symbol is used to address practices not related to personal injury.



This symbol indicates a general hazard.



This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection



Respiratory Protection



Foot Protection



Hearing Protection



Head Protection



Fall Protection



Hand Protection



- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.



ST-0002-1

2. Safety

Maintain Equipment and Work Area

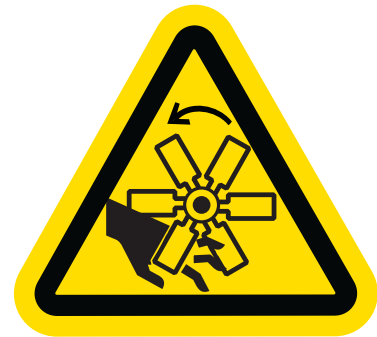
- Understand service procedures before doing work. Keep area clean and dry.
- Never service equipment while it is operating. Keep hands, feet, and clothing away from moving parts.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.



ST-0003-1

Keep Hands Away from Moving Parts

- Do not operate the fan with electrical or mechanical guards removed. Serious injury or death can result.
- Do not put hand or arm in fan. Rotating parts can crush and dismember.
- Do not put any kind of tool inside the fan to clear debris while the fan is operating. Damage to the equipment will result.
- Lock-out power source before making adjustments, cleaning or maintaining equipment.



ST-0020-2

Lifting Hazard

- Single person lift can cause injury.
- Use a mechanical lifting device to lift or move the equipment during installation.



ST-0021-2

Install and Operate Electrical Equipment Properly

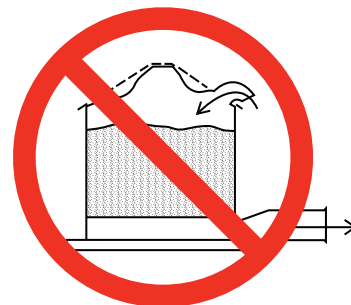
- Electrical controls must be installed by a qualified electrician and must meet the standards set by applicable local codes (National Electrical Code for the US, Canadian Electric Code, or EN60204 along with applicable European Directives for Europe).
- Lock-out power source before making adjustments, cleaning, or maintaining equipment.
- Make sure all equipment and bins are properly grounded.



ST-0075-1

Prevent Roof Damage Due to Vacuum Pressure

- Roof damage can result from excessive vacuum or internal pressure from fans or other air moving systems. The manufacturer does not warrant this type of roof damage.
- Adequate ventilation or “makeup air” devices should be provided for all powered air handling systems.
- The manufacturer does not recommend the use of downward flow systems (suction).
- Severe roof damage can result from any blockage of air passages.
- Operating fans during high humidity or cold weather conditions can cause air exhaust or intake ports to freeze.



ST-0028-2

Sharp Edge Hazard

- This product has sharp edges, which can cause serious injury.
- To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment.



ST-0036-2

2. Safety

Handle and Use Equipment Properly

- Equipment is intended for the use of grain drying only. Any other use is a misuse of this equipment.
- The operating instructions in this manual pertain to the common cereal grains as indicated. When drying any other grain, contact GSI for additional recommendations.
- On LP fired units, set pressure regulator to avoid excessive gas pressure applied to the burner during ignition and operation. Do not exceed maximum recommended drying temperatures.
- Equipment has sharp edges that may cause serious injury. To avoid injury, handle sharp edges with caution and use proper protective clothing and equipment at all times.
- All guards must be in place before and during operation. Images of guards removed in this manual are for illustration purposes only.
- Use caution when working around high-speed fans, gas burners, augers and auxiliary conveyors which can start automatically.
- Keep hands, feet and clothing away from moving parts.
- Do not bypass any safety device or interlock.
- Do not enter the dryer or bin while it is operating.
- Do not operate in an area where combustible material will be drawn into the dryer.



ST-0029-2

Minimum Safety Requirements



Incorrect use of fans can be extremely dangerous. Rotating impellers and shafts can cause serious injury and kill.

Correct Use

1. The fan is for ventilating whole agricultural seeds and grains inside a grain bin or other grain store. Any other use is prohibited and may result in injury or equipment damage.
2. These fans are to be permanently installed and are not designed to be portable.
3. The outlet of the fan is supplied unguarded, being designed to be directly coupled to a transition duct, eliminating scope for personnel access. Never operate the fan with the outlet exposed.
4. If the fan is fitted to a duct into which personnel have access, the user has responsibility to supply and fit a suitable outlet guard. Such a guard should generally be in accordance with EN13857:2008.
5. The installer and operator have responsibility to ensure the final installation is in accordance with all the safety requirements outlined in this manual and fulfils the Essential Requirements of the Machinery Directive 2006/42/EC.
6. Never use the fan with any guards removed.
7. Never enter the grain bin or store unless the power supply to the fan and all other equipment is OFF, TAGGED and LOCKED. (See Figure 2A.)



Figure 2A

8. Never allow an untrained person less or one less than 18 years old to operate the fan.
9. Never allow someone under the influence of alcohol or drugs to operate the equipment.
10. Never modify the fan from it's original specification.
11. The inlet to the fan generates suction. Never work around the inlet to the fan when it is running. Keep loose hair tied back and avoid loose clothing.

2. Safety

Electrical Safety Equipment

Please refer to [Chapter 5 on Page 24](#) for electrical control requirements.

1. All electrical installation and design must be carried out by a qualified electrical engineer and in accordance with EU Directives and standards and in accordance with local laws and codes.
2. The electrical supply must include a properly designed protective earth system (PE).
3. The motor must be connected to protective earth at the terminal provided.
4. The control system must include short circuit protection and over current protection.
5. It is recommended to provide earth leakage protection, such as residual current device (RCD) or residual current circuit breaker (RCCB) to provide automatic disconnection from the power in the event of a fault.

Sound

1. Sound levels generated by the fans can be harmful to hearing.
2. Never work around a fan whilst it is running.
3. If you need to be around the fan whilst it is running, wear suitable ear defenders.

Safe Maintenance

1. The fan must always be LOCKED off to prevent inadvertent re-start when undertaking any maintenance.
2. Even when off, the fan wheel can free-wheel under air movement from outside or other fans attached to the same air space. To prevent injury, use a piece of timber to choc the wheel.
3. Remove wheel choc and replace all guards before re-starting.

3. Safety Decals

Below are the safety warning decals that should be fitted to the fan. These warn of residual risks and required safety measures and must remain intact, legible at all times. If any decals have become damaged or unreadable, please contact GSI or your dealer for free replacements.

International Decals

International, translated versions of the decals fitted to the equipment are available as part of the Language Pack that was supplied with the product. If you need further copies or a different language, please contact GSI or you dealer.

The international decals have been designed to be placed directly over the USA standard versions. Normally these will be factory fitted, but if you need to change them, please refer to the decal cross reference sheet, provided with the Language Pack and the decal locations given in the user's manual.

DC-2262

DC-2162

DC-2163

DC-2166

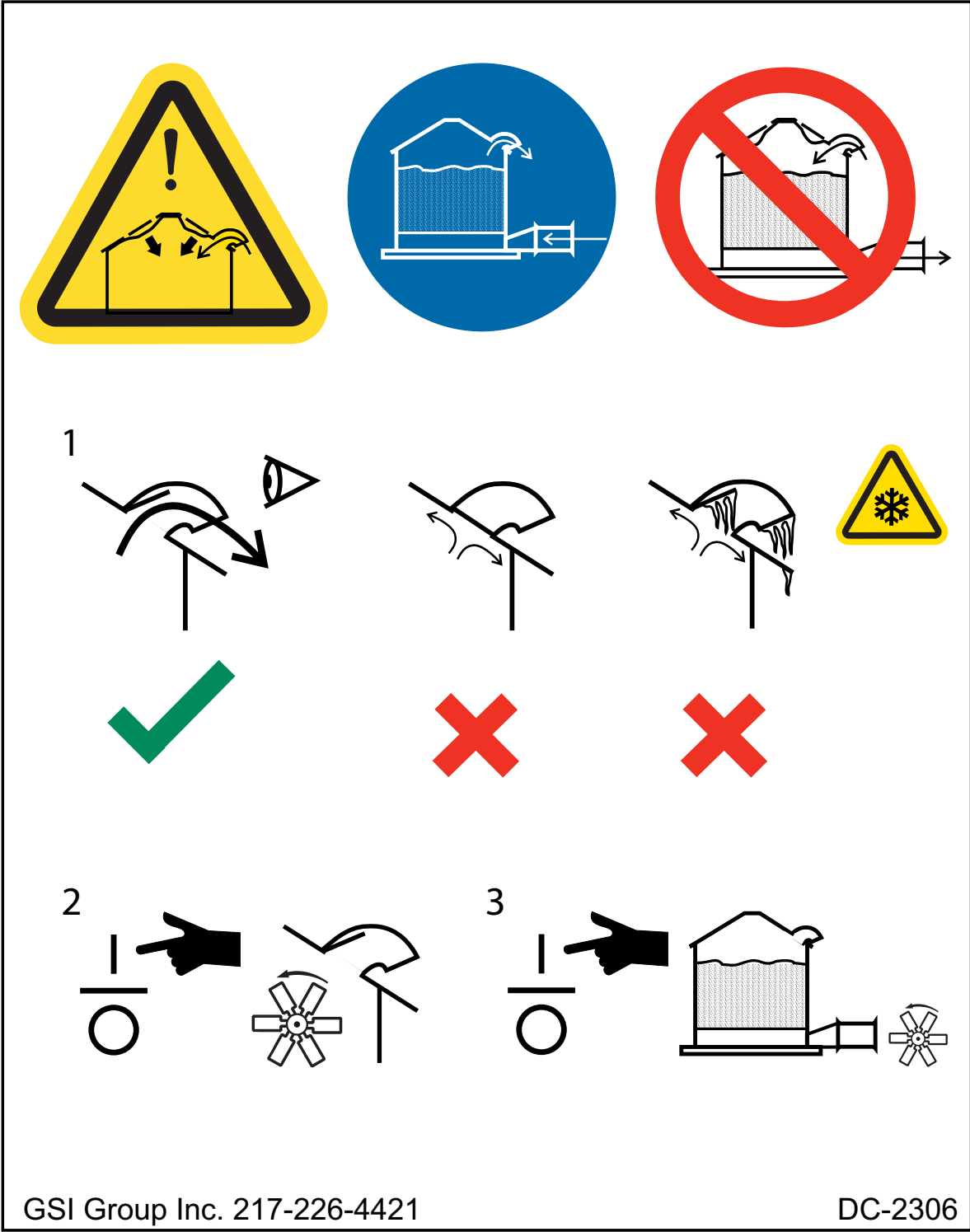
DC-219

DC-1971

DC-2262 and DC- 2163 (Opposite side adjacent to motor.)

Roof Damage Warning and Disclaimer

The manufacturer does not warrant any roof damage caused by excessive vacuum or internal pressure from fans or other air moving systems. Adequate ventilation and/or “makeup air” devices should be provided for all powered air handling systems. The manufacturer does not recommend the use of downward flow systems (suction). Severe roof damage can result from any blockage of air passages. Running fans during high humidity/cold weather conditions can cause air exhaust or intake ports to freeze.



4. Fan Specifications

Airflow

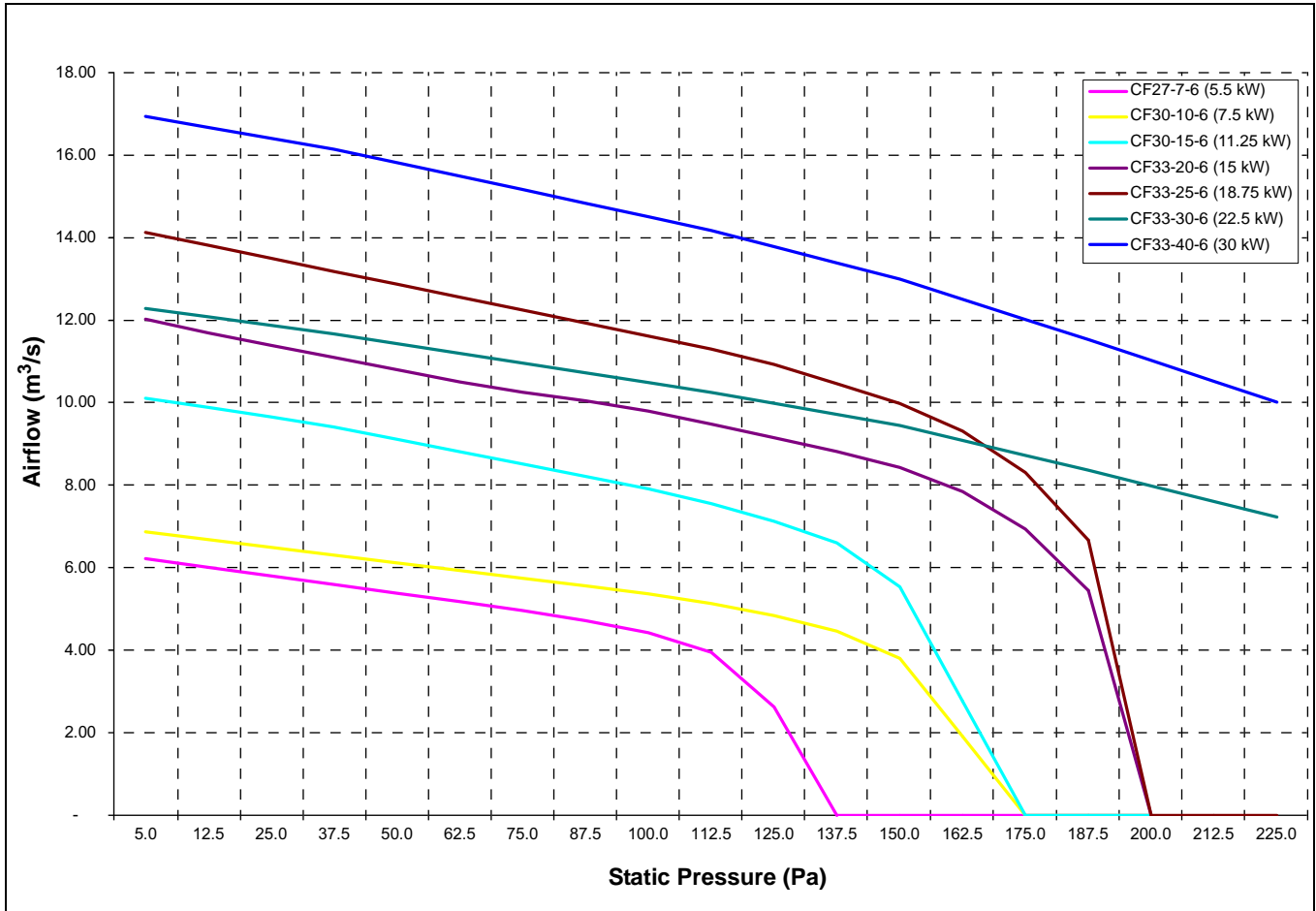


Figure 4A Centrifugal Fan Performance

Sound

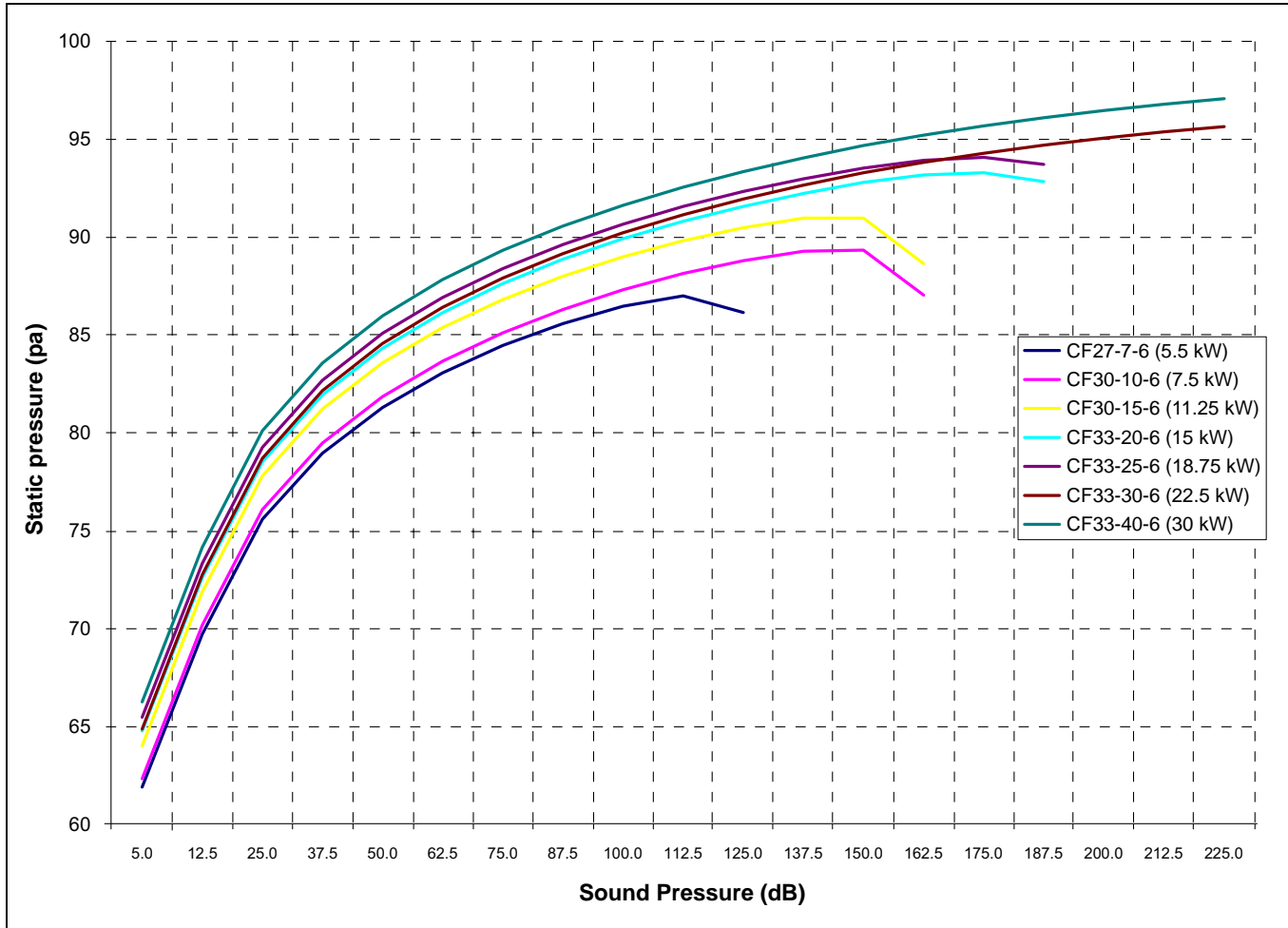


Figure 4B Centrifugal Fan Sound Curves (Calculated with Open Outlet)

Use the table below to determine the number of GSI roof vents (0.16 m² free area). Also minimum inlet area, for fans enclosed in a fan house:

Minimum GSI Roof Vents per Fan

Fan Model	Maximum Airflow (m ³ /s)	Roof Vents	Inlet Area (m ²)
CF27-7-6 (5.5 kW)	6.22	8	0.78
CF30-10-6 (7.5 kW)	6.87	8	0.86
CF30-15-6 (11.25 kW)	10.10	12	1.26
CF33-20-6 (15 kW)	12.02	15	1.50
CF33-25-6 (18.75 kW)	14.12	17	1.77
CF33-30-6 (22.5 kW)	12.28	15	1.54
CF33-40-6 (30 kW)	16.93	21	2.12

4. Fan Specifications

Dimensions

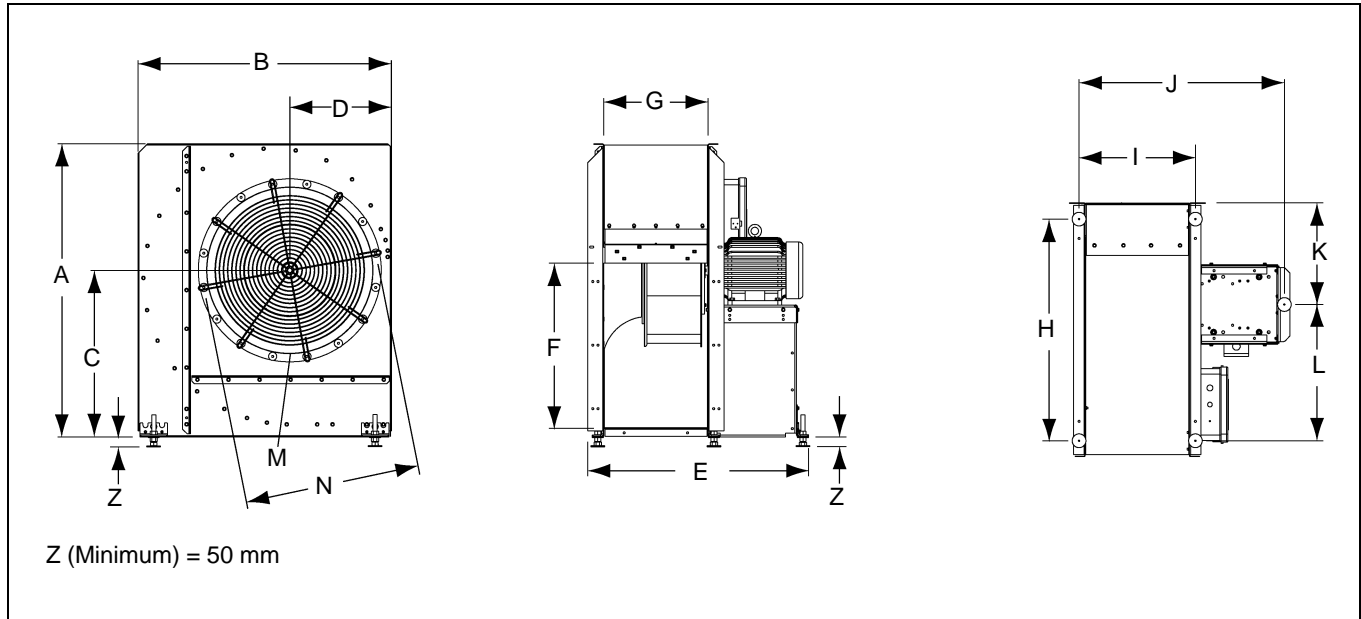


Figure 4C

Fan Dimensions (mm)

Fan	A	B	C	D	E	F	G	H	I	J	K	L	M	N
CF-3	1118	962	637	389	783	599	343	815	398	732	389	499	632	664
CF-5	1234	1067	704	433	881	692	362	918	418	827	433	558	695	740
CF-7.5	1234	1067	704	433	976	692	457	918	513	922	433	558	695	740
CF-10	1346	1167	765	468	981	759	443	1018	502	910	468	626	762	806
CF-15	1346	1167	765	468	1018	759	479	1018	539	947	468	626	762	806
CF-20	1496	1284	847	510	1154	845	497	1129	554	1090	510	693	854	892
CF-25	1496	1284	847	510	1213	845	556	1129	611	1146	510	693	854	892
CF-30	1636	1416	920	565	1211	845	556	1266	613	1149	567	776	927	975
CF-40	1636	1416	920	565	1257	845	602	1266	659	1195	567	776	927	975

Mounting Flange Drillings

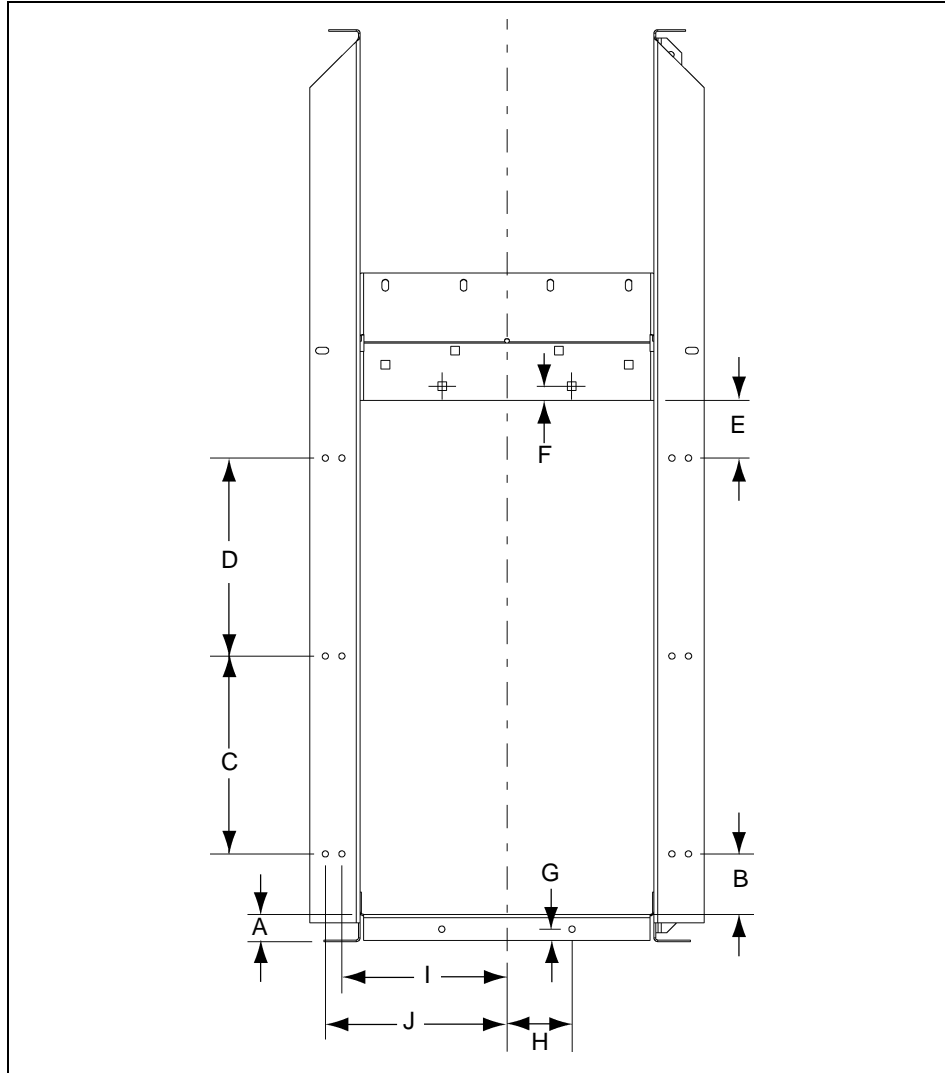


Figure 4D

Mounting Flange Drillings

Fan	A	B	C	D	E	F	G	H	I	J
CF-3	39	119	150	150	180	28	22	61	199	***
CF-5	46	130	214	214	133	22	19	70	204	***
CF-7.5	46	130	214	214	133	22	19	95	252	***
CF-10	40	89	292	292	85	21	17	95	244	268
CF-15	40	89	292	292	85	21	17	146	262	287
CF-20	42	207	215	215	208	19	19	146	267	296
CF-25	42	207	215	215	208	19	19	146	296	325
CF-30	33	208	214	214	207	19	19	146	296	***
CF-40	33	208	214	214	207	19	19	146	319	***

Fan Base Requirements

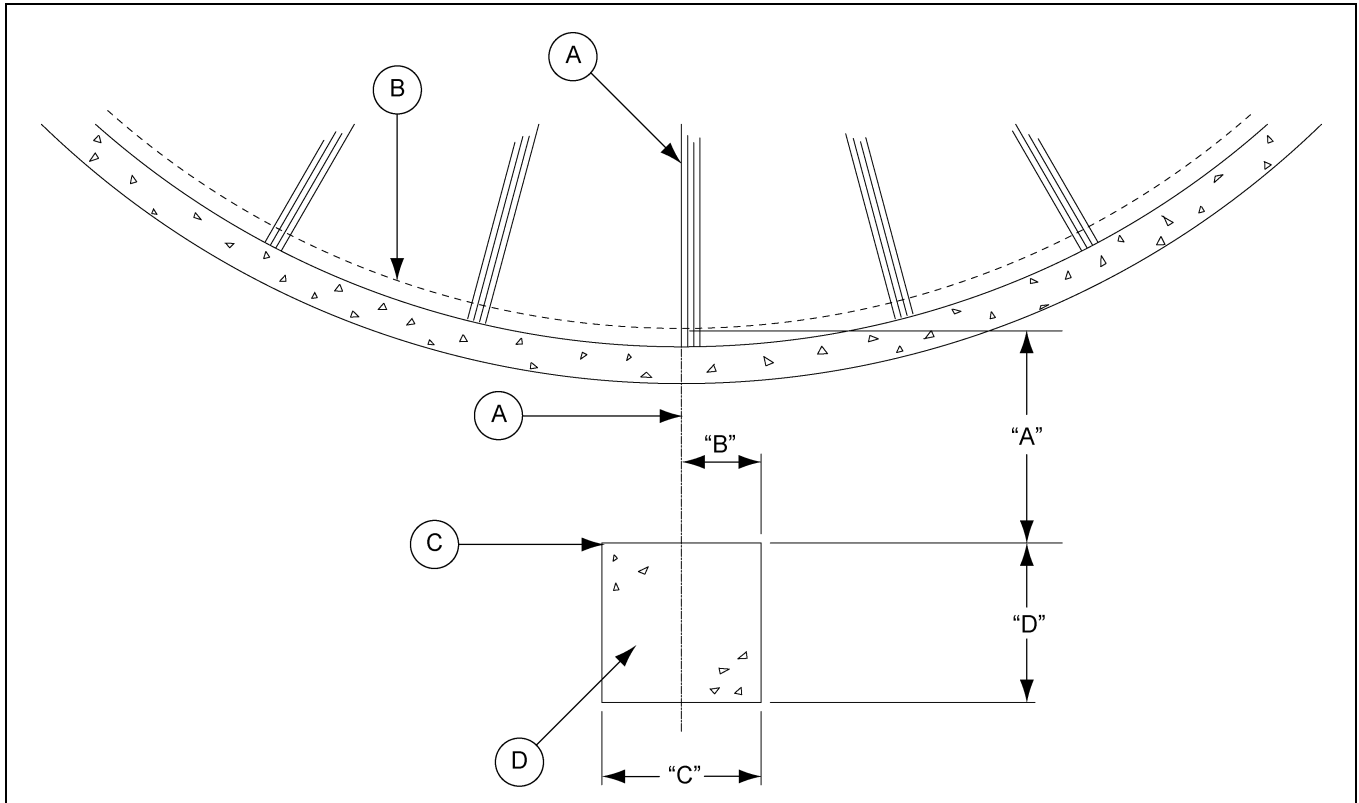


Figure 5A

Ref #	Description
A	Centerline of Bin
B	Bin Wall
C	Dimension from Sidewall
D	Fan Pad

Fan Base Dimensions and Location per GSI Transition Duct (mm)

Transition Duct	"A"	A with Heater	"B"	"C"	"D"
TR-4734	508	1118	254	1016	1016
TR-7048	1143	1753	254	1016	1219
TR-6918/TR-6919	813	1651	330	1219	1321
TR-7049	1143	1981	330	1219	1321
TR-6207	1067	1981	330	1219	1524
TR-6958	1397	2159	330	1219	1524
TR-6853	1372	2235	711	2540	1524
TR-4013	914	-	330	1219	1524
TR-6944	1219	-	330	1219	1524

Fan Placement

1. Fan base must be flat and level to ensure smooth fan operation.
2. To connect the fan to the bin, a steel transition duct is required. Consult GSI or your dealer for the correct duct for the fan and bin.
3. Remove packaging materials and inspect fan for any shipping damages. Report these at once to the shipper.
4. Check all fasteners on the fan to make sure they are tight. (Fasteners may loosen during shipment.)
5. Tighten any loose fasteners, check for proper clearance and re-tighten.
6. Check all electrical connections that may have loosened during shipment.
7. Rotate the fan wheel. Wheel should rotate freely and should not make contact with the housing sides or inlet cone.
8. Place fan in proper location on the fan pad. Attach fan to transition duct and seal connection with caulk.
9. Check all joints and seams around the lower part of the bin. Verify that these are well sealed to prevent air leakage from the bin plenum. Inspect the transition duct as well. Seal any leaks that may be present to prevent air losses that reduce fan efficiency.
10. Level fan front to back and left to right with a spirit level. The legs should be adjusted so that, when level, all five (5) legs touch the pad. Fans not resting on support legs may have excess vibration which can lead to premature wear and tear on fan components.
11. Do not fix the fan to the base. Fix only to the transition duct.

Electrical Installation

3 Phase Power Requirements

Fan Power (kW)	2.3	3.8	5.7	7.5	11.3	15	18.8	22.5	30
Voltage (V)									
380	4.7	7.7	11.6	15.2	22.9	30.4	38.1	45.6	60.8
400	4.5	7.4	11.0	14.5	21.8	28.9	36.2	43.4	57.8
415	4.3	7.1	10.6	14.0	21.0	27.9	34.9	41.8	55.7
440	4.1	6.7	10.0	13.2	19.8	26.3	32.9	39.4	52.5

Motor Current Requirements (A) (Check motor rating plate for precise details.)

NOTE: The *above* table does not allow for motor starting currents.

5. Installation

Electrical Control System

Fans are supplied without any controls. A correctly designed control system is required. In particular:

1. Fan motor starter to minimize starting currents. (Check when ordering fan that the motor supplied is suitable for the chosen method of starting.)
2. For service and maintenance purposes, the equipment can be locked out with no risk if inadvertent re-start.

The following items are the minimum required when making electrical connections to the fan:

1. Main power supply with protective earth, over-current and short circuit protection.

2. Main electrical disconnect.



- a. Wired to disconnect all electrical power to the fan and other associated equipment.
- b. Lockable.

3. Service disconnect.



- a. Wired to break all electrical power to the fan motor.
- b. Lockable.

4. Emergency stop.



- a. Wired to stop the fan motor (and any other associated equipment) immediately when pressed.
- b. Must remain engaged until manually disengaged.

5. Start/Stop controls.



- a. Recessed start push button labelled 1.
- b. Non recessed stop push button labelled 0.
- c. Motor starter, short circuit protection and motor overload.
- d. Control must be designed to default to OFF after a power interruption. (Eg: Self maintained relay.)
- e. The fan **MUST NOT** be able to immediately re-start following re-establishment of power.

NOTE: *Electrical controls located on the side of the bin will be subject to significant water due to run-off from the roof during rain. These controls should be rated for out door use (minimum IP65) and will also benefit from being covered to protect from direct water.*

Wiring Motor

- The motor may be 3, 6, 9 or 12 wire, with wires bundled loose inside the connection box.
NOTE: 3 and 9 wire motors cannot be started 'star-delta'.
- Each wire is individually numbered.
- Refer to wiring schematic in table [below](#) or provided inside the motor terminal box for correct wiring. This will depend on the chosen starting method.
- Note that motors may be multi-voltage. Check motor rating plate for the required voltage.
- Ensure the motor is correctly connected to the protective earth (PE) system with the power supply. The earth terminal is inside the motor connection box.
- Make connections using connectors approved for use in the region, ensuring the connections are correct for the voltage and starting method.
- Check the full load current for the motor at the supply frequency and voltage and set the motor overload relay at or below this value.

Motor Connections

GSI Part #	Baldor Part #	Motor Power	380V 50 Hz "Star" Start Connections	380V 50 Hz "Delta" Run Connections
C-7947	36J719T043H2	5 HP/3.75 kW		
C-7948	37H493Y750H2	7.5 HP/5.6 kW		
C-7949	37H493Y749G1	10 HP/7.5 kW		
C-7950	07J256W746H2	15 HP/11.25 kW		
C-7951	09F388X724H2	20 HP/15 kW		
C-7952	10E978X150H2	25 HP/18.75 kW		
C-7953	10E978X177H2	30 HP/22.5 kW		
C-7954	12T036X152H2	40 HP/30 kW		
Swap any two (2) line connections to reverse motor direction.				

GSI Part #	Baldor Part #	Motor Power	415 V 50 Hz "Star" Start Connections	415 V 50 Hz "Delta" Run Connections
C-8539	10F973W708	30 HP/22.5 kW		
MTR-0138	07M080X657H2	15 HP/11.25 kW		
Swap any two (2) line connections to reverse motor direction.				

5. Installation

Final Check

Ensure the power to the fan is OFF, LOCKED and TAGGED before final checks.



Figure 5B

1. Check the fan wheel can rotate freely and maintains an even gap to the inlet cone.
2. Check to make sure all safety guards are in place and not damaged. Replace damaged parts.
3. Check to make sure all decals are visible and not damaged. Replace damaged decals.
4. Check to make sure all control boxes are closed and no wiring is exposed.
5. With all guards fitted, start the fan to check correct impeller rotation. Check against rotation decal on inlet side of fan. Fan should rotate counterclockwise when viewed through the inlet guard. To reverse rotation, switch any 2 phases.

Start-Up

1. Start the fan and allow it to run, checking for smooth, quiet running.
2. Check each phase with a meter for correct phase voltage and equal phase current.
3. Voltage drop at the motor should be no greater than 5% of nominal voltage.
4. Check the fan legs remain all in contact with the base and the lock nuts are tight.

1. Where the fan is out of use for long periods, GSI recommend running it for 20 minutes per month to help reduce pre-harvest service issues.
2. Do not allow debris to build-up on the impeller. If required, with the power LOCKED OFF remove the inlet guard and cone and clean the impeller.
3. Check the impeller for cracks or damage. A damaged impeller can run out of balance and result in wider damage to the fan, motor and bearings.
4. Check the grille over the cooling fan to the motor to ensure it remains clear.

Lubrication and Bearings

Type of Annual Usage	1450 RPM - NEMA Frame Size			2900 RPM - NEMA Frame Size		
	Up to 280 incl.	Over 280 to 360 incl.	Over 360	Up to 280 incl.	Over 280 to 360 incl.	Over 360
Continuous Normal Duty *	9500 Hrs	7400 Hrs	3500 Hrs	3600 Hrs	2200 Hrs	2200 Hrs
Continuous Severe Duty **	4750 Hrs	3700 Hrs	1750 Hrs	1800 Hrs	1100 Hrs	1100 Hrs
Seasonal Service Motor (Idle 6 Months)	Grease at the Beginning of Season and then Follow the Interval above.					

- Use suitable high temperature roller bearing grease.
- Clean all grease fittings.

Fan Wheel Removal and Installation



Always disconnect and lock out power before working on or around fan.

The fan wheel is secured to the motor shaft by the use of a taper-lock bushing, motor shaft key and cap screws. The size, quantity and torque of cap screws required will depend on the model of the fan.



Although the taper-lock method of retaining the wheel onto the motor shaft is very simple and obvious, it is essential that the following points be read carefully and fully understood, as improper installation can result in serious or fatal injury caused by a loose, fast flying wheel.

THREADED BUSHING HOLES: The threaded holes within the bushing are provided for disassembly purposes only. Do not attempt to use these holes for re-assembly, as they will not allow the parts to become locked onto the shaft, thereby causing an extremely hazardous operating condition.

CLEARANCE HOLES: When re-assembling parts, the cap screws must be installed through the UNTAPPED CLEARANCE HOLES to cause the wheel to be pulled forward onto the tapered bushing, thus locking the parts securely onto the motor shaft. Refer to [Page 30](#) (under installation section) for assembly details.

Removing the Fan Wheel Assembly

1. Lock out and tagout the main power to make sure the dryer cannot be started during servicing.
2. Remove the inlet cone and grill guard.
3. If there is a safety washer present, remove the bolt, lock washer and safety washer.
4. Remove the bolts from the unthreaded holes of the bushing. Do not use these bolts for bushing removal.
5. Using an allen wrench, undo the set screw (if present) and remove the key from the keyway.
6. Install grade 5 or stronger bolts into the threaded holes in the bushing and gradually apply torque to each bolt to loosen the bushing.
7. Remove the bushing and fan wheel assembly.

Installing the Fan Wheel Assembly

1. Clean the motor shaft, key, bushing and the bore of the hub with a non-residual cleaner, such as brake parts cleaner or electric parts cleaner. It is important that these mating surfaces be clean and dry and no grease or oil is present. The parts must be assembled dry for maximum friction.



Do not use any lubricant or thread locking compound during installation. The use of such products will cause improper bolt torque and will crack the fan hub.

2. Insert bolts into bushing holes and ensure the shoulder portion of the bolt is NOT protruding the hole.
3. Install the fan wheel assembly onto the motor shaft.
4. Align the keyway in the bushing with the key and slide the bushing onto the motor shaft.
NOTE: *Do not use excessive force to drive the bushing onto the shaft.*
5. Align bushing and hub keyways with the key. Bushing should be flush with the end of the motor shaft.
6. Loosely install the bolts through the unthreaded holes in the bushing into the threaded holes of the hub.
7. Find the applicable torque for the bushing in the chart [on Page 29](#). The bushing type is etched into the face of the bushing.
8. Torque the bushing gradually to evenly seat it inside the hub and onto the motor shaft. Set the torque wrench to 1/3 of the required torque setting and tighten each bolt in a circular pattern three (3) times. Increase the torque setting on the wrench to 2/3 of the required torque and tighten each bolt in a circular pattern three (3) times. Increase the setting on the torque wrench to the final required torque setting and tighten each bolt in a circular pattern three (3) times.
9. If there is a safety washer present, install the washer, lock washer and bolt.
10. Turn the fan wheel assembly by hand to make sure there is freedom of movement and uniform clearance around the inlet.
11. Install the inlet cone and grill guard.

Installing the Fan Wheel Assembly (Continued)

12. Turn ON the main power source and operate the fan for 30 minutes.
13. Stop the fan and lock out and tagout the main power to make sure the dryer cannot be started during servicing.
14. Remove the grill guard and re-tighten the bolts in a circular pattern one time at the final required torque setting.
15. Install the grill guard and turn ON the main power source.

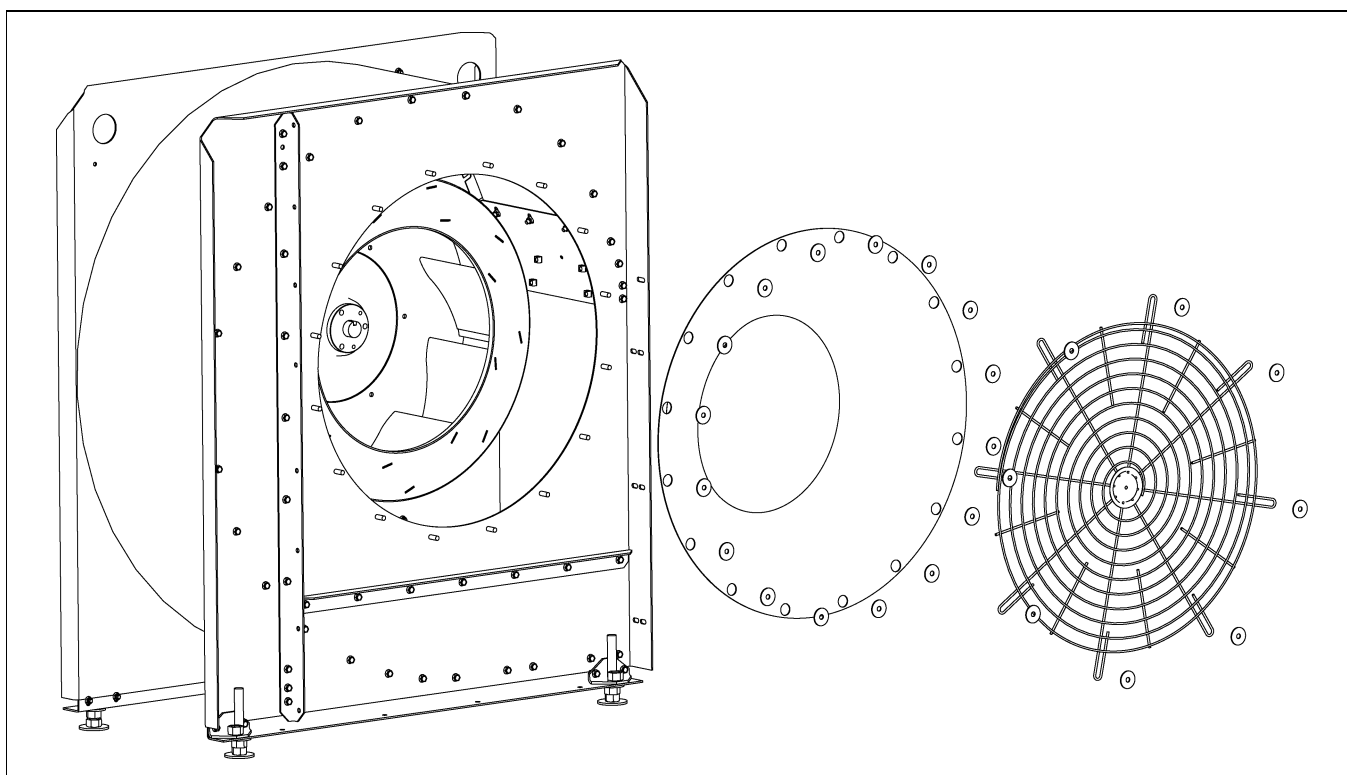


Figure 6A Centrifugal Fan



Do not exceed the torque specifications listed on the bushing bolt torque chart. Exceeding the recommended torque will crack the fan hub.

Bushing	Bolt Thread	Bolt Torque (Nm)
JA	863.60 mm	6.75
G	514.35 mm	8.10
H	514.35 mm	8.10
SH	514.35 mm	10.80
SD	514.35 mm	12.15
SDS	514.35 mm	12.15

Bushing	Bolt Thread	Bolt Torque (Nm)
P-1	465.13 mm	17.55
SK	465.13 mm	20.25
SF	415.92 mm	31.05
Q-1	415.92 mm	39.15
R-1	415.92 mm	39.15

Installing the Fan Wheel Assembly (Continued)

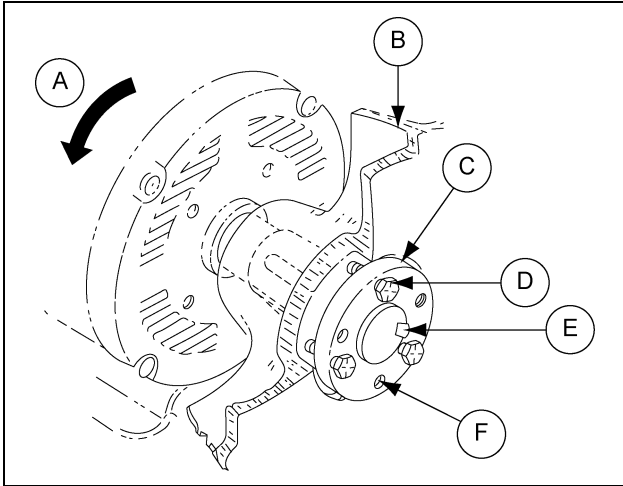


Figure 6B Cutaway Drawing of Typical Propeller Installation

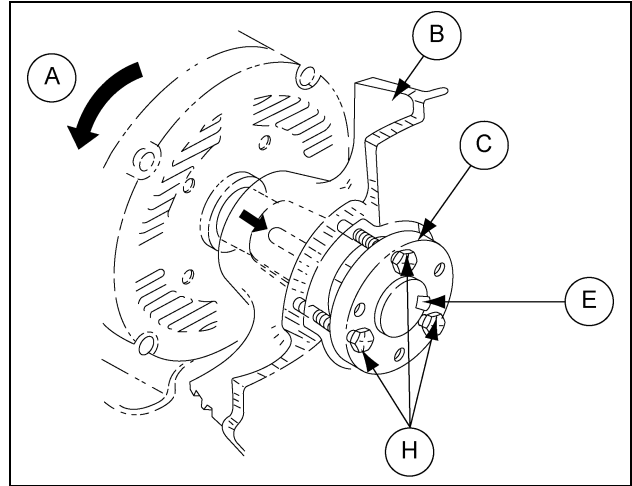


Figure 6D Cap Screw Arrangement for Resassembly

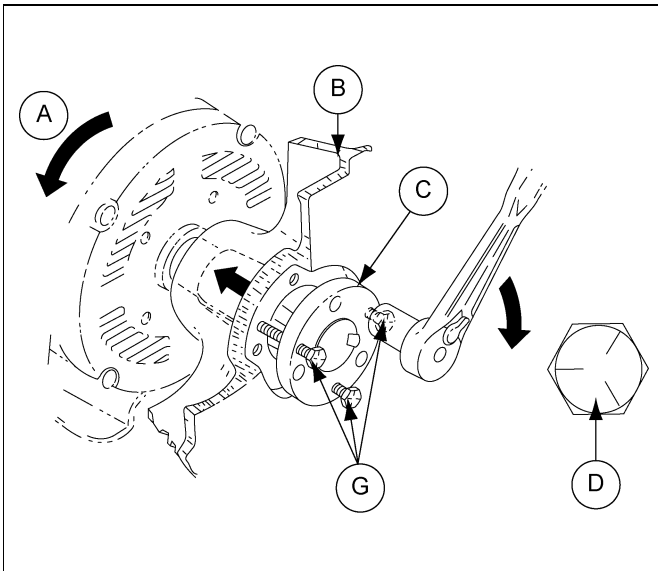


Figure 6C Cap Screw Arrangement for Disassembly

Ref #	Description
A	Rotation
B	Propeller
C	Taper-Lock Bushing
D	Cap Screw (Grade 5)
E	Key
F	Threaded Holes in Bushing
G	Cap screws installed into threaded holes to force propeller off bushing.
H	Cap screws installed through clearance holes of bushing. (See text on Page 29 for proper torque.)

Fan Wheel Inspection and Maintenance

Pre-season inspections should be done on the fan wheel to look for the following.

1. Any debris (stalks, bees wings, mud, insects and insect nests) accumulated on the surfaces of the fan wheel. Remove these items as they will likely disrupt airflow over the fan airfoils and can potentially cause vibration problems.
2. Inspect the fan wheel for any broken, cracked or loose parts. Blade should NOT be operated with broken or loose parts. Contact dealer for determination of the repairs required.



Do not attempt to pull the flange of the bushing flush with the wheel hub. A clearance of 3 mm to 6 mm must be maintained between bushing flange and wheel hub surface. Wheel will loosen and cause damage or injury.

Taper-Lock Bushing Torque Requirements

Browning Taper-Lock Bushing Bolt Tightening Torque

Bushing Size	Hex Bolt Size	Torque (Nm)
P	465.14 mm x 31.75 mm	21.70
Q	415.92 mm x 38.10 mm	39.32

Fan Motor Removal and Installation

In the event of motor failure, remove the motor, as described and take it to the nearest authorized service station. **AUTHORIZED SERVICE STATIONS ARE THE ONLY PLACES THAT CAN PROVIDE MOTOR WARRANTY.** Motor service and repair at other places will be at owner's expense. If service station determines motor failure to be caused by faulty material or workmanship, repair will be under warranty when within the warranty period. Motor failure because of external causes will result in a charge to the owner for repair.

1. LOCK OUT THE MAIN POWER SUPPLY, then remove fan guard, inlet cone and wheel as outlined earlier.
2. Open motor junction box cover and disconnect the motor lead wires from within the box.

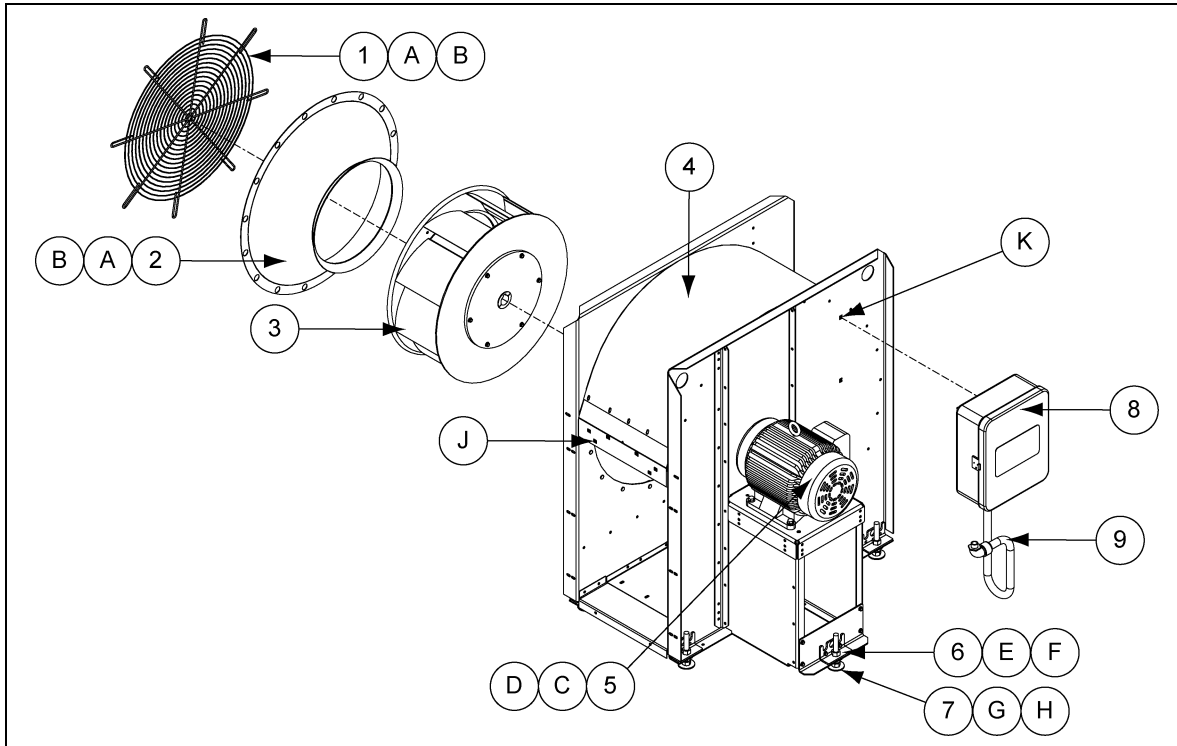
NOTE: Tag, or otherwise identify wires for ease of reassembly.

3. Remove motor mount bolts. If there are any shims between the motor and its base, note their locations so they can be properly installed during re-assembly.
4. Disconnect the motor end of the motor conduit, if required, then carefully pull conduit and wires through hole in the motor junction box. Remove motor. If motor requires service, take it to an authorized service station.
5. To re-install motor, slide onto motor base plate and replace shims (if required) between motor and base plate. Re-install motor mount bolts and washers and fully tighten them at this time. Re-install conduit and wires and carefully remake all electrical wiring connections.

NOTE: Make sure to install and tighten the wheel in accordance with earlier instructions.

7. Parts List

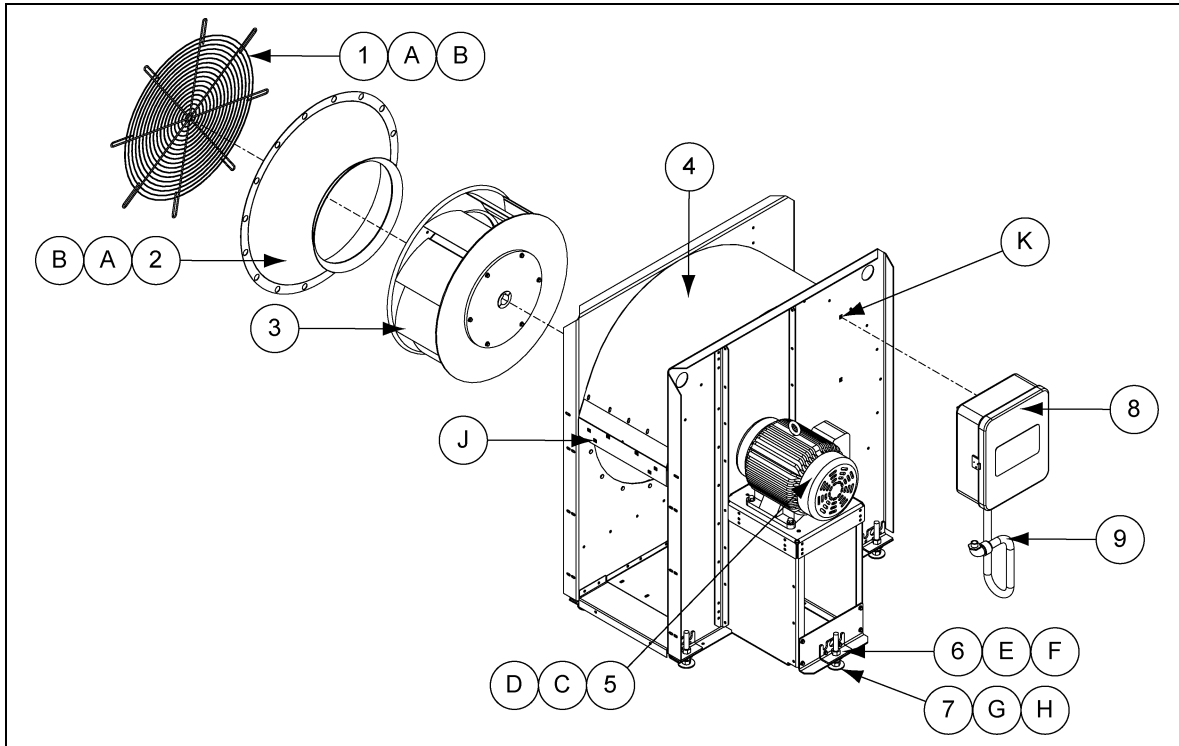
1450 RPM Centrifugal Fan Parts



CF-5-*G			
Ref #	Part #	Description	Qty
1	C-7747	Grill Guard	1
2	C-7749-Y	Inlet Cone - Painted	1
3	C-956	Blade and Hub Assembly	1
4	C-8114	Housing Assembly	1
5	C-7947	Motor - 3 Phase 380 Volt	1
5	NA	Motor - 3 Phase 415 Volt	-
6	C-8322	Leveling Leg Bracket	5
7	C-7519	Leveling Leg	5
8	NA	Control Box Assembly	-
9	NA	Conduit Assembly	-
A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16
B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24
C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4
D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4
E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10
F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10
G	S-866	Flat Washer 3/4" USS ZN Grade 2	5
H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10
J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2
K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2

CF27-7-*G			
Ref #	Part #	Description	Qty
1	C-7750	Grill Guard	1
2	C-7751-Y	Inlet Cone - Painted	1
3	C-8031	Blade and Hub Assembly	1
4	C-8093	Housing Assembly	1
5	C-7948	Motor - 3 Phase 380 Volt	1
5	NA	Motor - 3 Phase 415 Volt	-
6	C-8322	Leveling Leg Bracket	5
7	C-7519	Leveling Leg	5
8	NA	Control Box Assembly	-
9	NA	Conduit Assembly	-
A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16
B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24
C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4
D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4
E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10
F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10
G	S-866	Flat Washer 3/4" USS ZN Grade 2	5
H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10
J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2
K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2

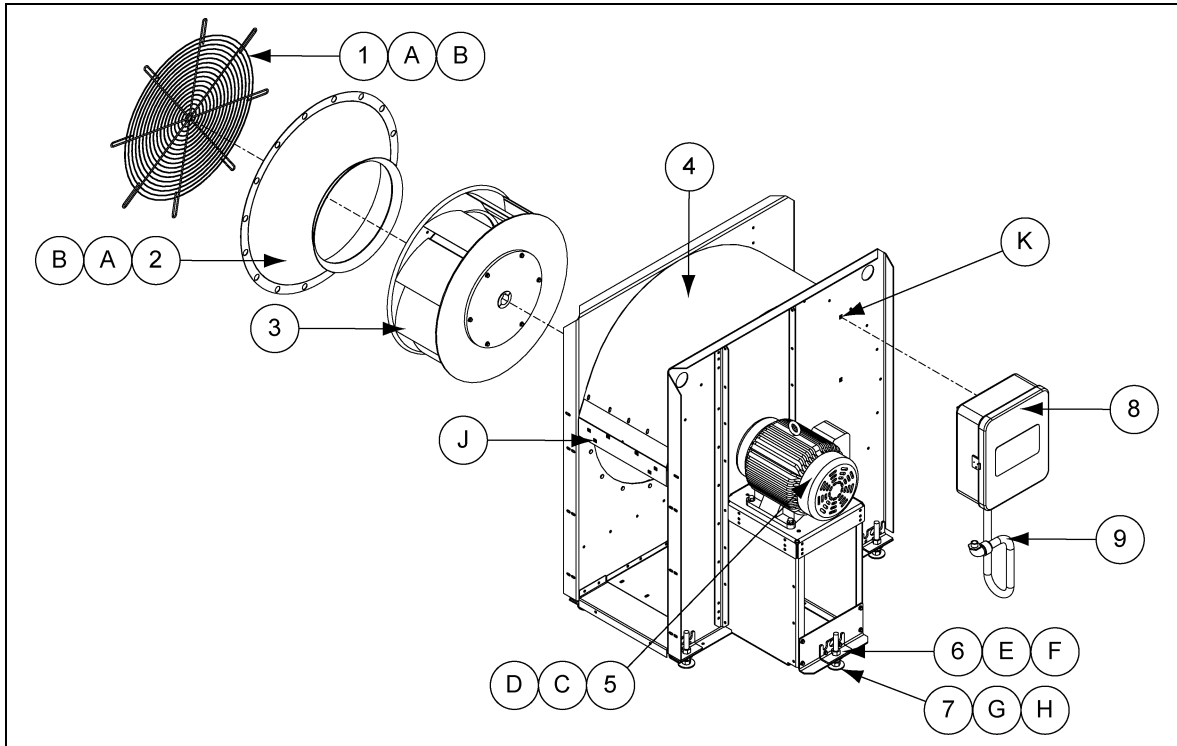
1450 RPM Centrifugal Fan Parts (Continued)



CF30-10-*G				CF30-15-*G			
Ref #	Part #	Description	Qty	Ref #	Part #	Description	Qty
1	C-7752	Grill Guard	1	1	C-7752	Grill Guard	1
2	C-7753-Y	Inlet Cone - Painted	1	2	C-7753-Y	Inlet Cone - Painted	1
3	C-8032	Blade and Hub Assembly	1	3	C-7763	Blade and Hub Assembly	1
4	C-8097	Housing Assembly	1	4	C-8096	Housing Assembly	1
5	C-7949	Motor - 3 Phase 380 Volt	1	5	C-7950	Motor - 3 Phase 380 Volt	1
5	MTR-0137	Motor - 3 Phase 415 Volt	1	5	MTR-0138	Motor - 3 Phase 415 Volt	1
6	C-8322	Leveling Leg Bracket	5	6	C-8322	Leveling Leg Bracket	5
7	C-7519	Leveling Leg	5	7	C-7519	Leveling Leg	5
8	NA	Control Box Assembly	-	8	NA	Control Box Assembly	-
9	NA	Conduit Assembly	-	9	NA	Conduit Assembly	-
A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16	A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16
B	S-3671s	Fender Washer 25/64" x 1-1/2" ZN	24	B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24
C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4	C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4
D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4	D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4
E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10	E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10
F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10	F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10
G	S-866	Flat Washer 3/4" USS ZN Grade 2	5	G	S-866	Flat Washer 3/4" USS ZN Grade 2	5
H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10	H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10
J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2	J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2
K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2	K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2

7. Parts List

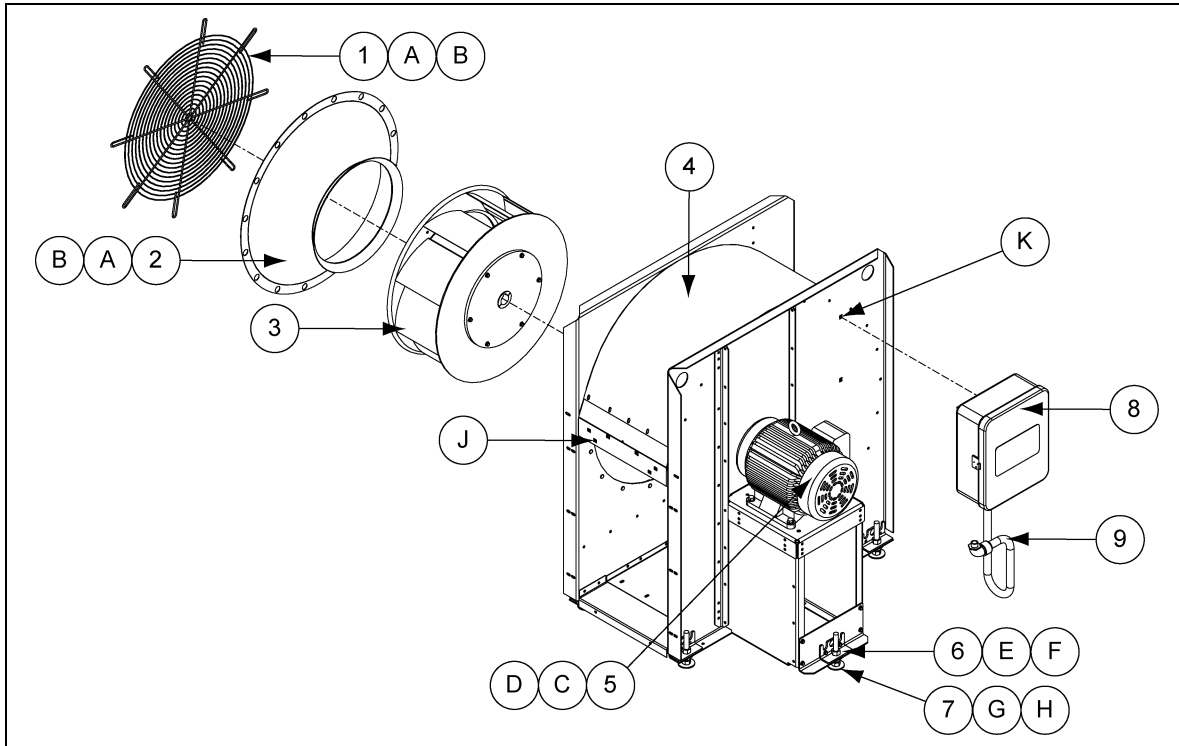
1450 RPM Centrifugal Fan Parts (Continued)



CF33-20-*G			
Ref #	Part #	Description	Qty
1	C-7752	Grill Guard	1
2	C-7754-Y	Inlet Cone - Painted	1
3	C-7818	Blade and Hub Assembly	1
4	C-8463	Housing Assembly	1
5	C-7951	Motor - 3 Phase 380 Volt	1
5	C-8460	Motor - 3 Phase 415 Volt	1
6	C-8322	Leveling Leg Bracket	5
7	C-7519	Leveling Leg	5
8	NA	Control Box Assembly	-
9	NA	Conduit Assembly	-
A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16
B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24
C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4
D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4
E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10
F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10
G	S-866	Flat Washer 3/4" USS ZN Grade 2	5
H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10
J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2
K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2

CF33-25-*G			
Ref #	Part #	Description	Qty
1	C-7752	Grill Guard	1
2	C-7754-Y	Inlet Cone - Painted	1
3	C-7827	Blade and Hub Assembly	1
4	C-8467	Housing Assembly	1
5	C-7952	Motor - 3 Phase 380 Volt	1
5	MTR-0139	Motor - 3 Phase 415 Volt	1
6	C-8322	Leveling Leg Bracket	5
7	C-7519	Leveling Leg	5
8	NA	Control Box Assembly	-
9	NA	Conduit Assembly	-
A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16
B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24
C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4
D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4
E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10
F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10
G	S-866	Flat Washer 3/4" USS ZN Grade 2	5
H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10
J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2
K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2

1450 RPM Centrifugal Fan Parts (Continued)



CF36-30-*G				CF36-40-*G			
Ref #	Part #	Description	Qty	Ref #	Part #	Description	Qty
1	C-8318	Grill Guard	1	1	C-8318	Grill Guard	1
2	C-7927-Y	Inlet Cone - Painted	1	2	C-7927-Y	Inlet Cone - Painted	1
3	C-7928-PB	Blade and Hub Assembly	1	3	C-7929	Blade and Hub Assembly	1
4	C-8337	Housing Assembly	1	4	C-8356	Housing Assembly	1
5	C-7953	Motor - 3 Phase 380 Volt	1	5	C-7954	Motor - 3 Phase 380 Volt	1
5	C-8539	Motor - 3 Phase 415 Volt	1	5	MTR-0140	Motor - 3 Phase 415 Volt	1
6	C-8322	Leveling Leg Bracket	5	6	C-8322	Leveling Leg Bracket	5
7	C-7519	Leveling Leg	5	7	C-7519	Leveling Leg	5
8	NA	Control Box Assembly	-	8	NA	Control Box Assembly	-
9	NA	Conduit Assembly	-	9	NA	Conduit Assembly	-
A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16	A	S-968	Flange Nut 3/8"-16 ZN Grade 5	16
B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24	B	S-3671	Fender Washer 25/64" x 1-1/2" ZN	24
C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4	C	S-9064	Flange Bolt 3/8"-16 x 1-1/2" ZN Grade 5	4
D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4	D	S-968	Flange Nut 3/8"-16 ZN Grade 5	4
E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10	E	S-6606	Flange Bolt 5/16"-18 x 3/4" ZN Grade 5	10
F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10	F	S-3611	Flange Nut 5/16"-18 ZN YDP Grade 2	10
G	S-866	Flat Washer 3/4" USS ZN Grade 2	5	G	S-866	Flat Washer 3/4" USS ZN Grade 2	5
H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10	H	S-234	Hex Nut 3/4"-10 ZN Grade 5	10
J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2	J	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2
K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2	K	090-1709-6	Retainer Nut 5/16"-18 x 0.120" ZN	2

NOTES

Limited Warranty - N.A. Grain Products

The GSI Group, LLC. (“GSI”) warrants products which it manufactures, to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI’s sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

Warranty Enhancements:

The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
Storage	Grain Bin Structural Design <ul style="list-style-type: none"> • Roof, doors, platforms and walk arounds • Flooring (when installed using GSI specified floor support system for that floor) • Hopper tanks 	5 Years
	Dryer Structural Design - (Tower, Portable and TopDry) <ul style="list-style-type: none"> • Includes (frame, portable dryer screens, ladders, access doors and platforms) 	5 Years
	All other Dryer parts including: <ul style="list-style-type: none"> • Electrical (controls, sensors, switches and internal wiring) 	2 Years
	Bullseye Controllers	2 Years
Material Handling	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY PRODUCT MANUFACTURED OR SOLD BY GSI, OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained.

Notice Procedure:

In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

Service Parts:

GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

(Limited Warranty - N.A. Grain Products_ revised 19 October 2018)

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.



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