



**UNITED
TECHNOLOGIES
CARRIER**

Commercial Division
Carrier Corporation

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DATE: 4/23/76
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SERVICE BULLETIN

SUBJECT:

MOTOR REPLACEMENT GUIDELINES

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Installation, repair and service and equipment referenced in this Service Bulletin should be undertaken only by qualified persons. Carrier Corporation (1) makes no representations or warranties, expressed or implied, concerning the accuracy, completeness or right to use the information contained herein, and (2) disclaims all liability for injuries, damages, infringements and other losses which may arise on account of, or which may result from, the use or application of any information, method or apparatus disclosed herein.

PURPOSE:

To outline the procedure for repairing a hermetic centrifugal after a motor failure.

**MACHINES
AFFECTED:**

All hermetic centrifugals.

PROCEDURE:

Phase I- Initial Inspection

1. Upon arrival at the jobsite, obtain information from the operator outlining the sequence of events leading up to the suspected failure. Obtain answers to at least the following questions:
 - a. Why is failure suspected?
 - b. What tripped the machine off the line?
 - c. Were restarts attempted? (Note: Do not attempt a restart yourself!)
 - d. Was any other equipment affected?
 - e. Were there any other electrical problems such as power outage, lightning, etc. experienced at or about the time of failure?

2. Visually inspect the machine for at least the following:
 - a. ~~Light/program timer sequence condition. (where are controls in start-run-shutdown sequence?)~~
 - b. Tripped safeties.
 - c. Condition of oil in oil sight glass.
 - d. Condition of refrigerant in refrigerant sight glass.
 - e. Check motor sight glass for appearance of soot.



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3. Visually inspect starter for signs of arcing, burning, welding contacts, tripped overloads, hung linkages, or other abnormal conditions.
4. With power disconnected from starter (and contacts clear) confirm failure with Ohmmeter (not Megger) on load side of starter. Check for shorts phase-to-ground and phase-to-phase. Disconnect leads from motor terminals and repeat Ohmmeter checks on motor terminals. Record all readings. Use Megger only if above Ohmmeter checks are inconclusive.
5. Inspect and document condition of other equipment on jobsite (other machines, breakers, fuses, capacitors, and other associated electrical equipment) and obtain name-plate data.
6. Secure the machine. Insure that power supply to machine is locked out and tagged. For R113 and R11 machines, remove refrigerant through drier into drums at earliest opportunity. For high pressure machines, (R114, R12, R500, etc.) transfer charge to storage tank at earliest opportunity.
7. Take samples of oil and refrigerant for possible future analysis.

Oil - sample from first oil removed from charging valve.
Refrigerant - sample from last refrigerant transferred.

Phase II- Intermediate Steps

1. Lube Cycle - Remove oil and filters, clean filter housing, clean oil sump if oil is dark, install new oil filters and 5 - 10 gal. oil and circulate for one hour, drain oil, install new filters and add a new oil charge.
2. Refrigerant Drier - Add a temporary or permanent refrigerant drier system as required. Adding extra valves as indicated will permit recharging the machine through this drier. Drier core manufacturers recommend using their standard cores such as KH29E2070. Special "acid" cores are of no extra value in our application.
3. Motor Cooling Filter (19EA, FA) - Replace the refrigerant strainer with a motor cooling filter package.



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4. Starter - Replace any damaged components in the starter. With the motor leads disconnected at the starter, dry run the starter and control panel to insure that they are operating properly and that the safeties will de-energize the starter. Leave motor leads disconnected.
5. Rigging - Use A-Frame and trolley if at all possible to reduce chance of damage while handling motors. The rigging pedestal tool permits positioning the I beam directly over the stator for a smooth, straight pull.

Phase III- Motor Replacement

1. Remove stator (and rotor if required).

192A, FA - Remove rear bearing and seal assembly, remove stator. If rotor must be removed, the suction elbow and compressor cap must be removed.
2. Inspect rotor for severe burns, damage to dams, pitted journals, etc. The results of this inspection will determine whether the transmission and other bearings must be inspected. Clean rotor, shaft, baffles and motor shell (if it is to be reused) with R-11 or other solvent.
3. Inspect replacement stator carefully for nicks, abrasion or bruising. Insure internal terminal connections are tight.
4. Install new stator, taking extreme care not to allow rotor to touch stator windings. This is when the A-Frame and trolley are most important.
5. Perform megger tests to determine insulation integrity and continuity test to verify terminal numbering.
6. Reassemble machine.

Phase IV- Cleanup and Followup

1. Leak test, evacuate and dehydrate.
2. Return refrigerant charge to machine through a filter drier. Change cores every 1,000 lbs. if a 4 core drier is used.
3. Reconnect and confirm wiring from starter to motor. Megger these leads in the starter. DO NOT MEGGER STATOR WITH THE MACHINE UNDER A DEHYDRATION VACUUM.
4. Run machine, trim charge, confirm operation of cleanup system. On machines with an eductor, pull from the higher cooler connection unless heat exchangers were very dirty. In that case, draw from the lower connection.



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5. Insulate and paint motor housing, remove rigging, clean up job.
6. Operate the machine for one week then take oil and refrigerant samples for analysis. Replace oil, oil filters, motor cooling filters (not used on 19C, CB) and the drier cores. If no indication of acid remains, the machine can be considered cleaned up.
7. Advise customer to change drier cores a minimum of every three months if permanently installed. Change cores sooner if dry eyes show wet.