

“Study of Upper Case and Lower-Case Assembly in Rotary Compressor Manufacturing”

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Abstract

study of the upper case and lower case assembly processes used in compressor manufacturing at GMCC India Pvt. Ltd., Supa. The study focuses on understanding the assembly sequence, major components, fitting methods, inspection requirements, and quality-control practices involved in compressor production. During industrial training, practical observations were made on the main assembly line, particularly during upper case and lower case installation. The study helps to understand how proper component alignment, fastening, sealing, and inspection contribute to compressor performance, reliability, and production efficiency.

1.Introduction

A compressor is an important component used in refrigeration and air-conditioning systems. In rotary compressor manufacturing, several components are assembled accurately to obtain reliable and efficient operation.

The upper case and lower case form an important part of the compressor housing. Their correct assembly is necessary to maintain proper sealing, dimensional accuracy, structural strength, and protection of internal components.

During industrial training at GMCC India Pvt. Ltd., Supa, the upper case and lower case installation process was studied on the main assembly line. The training provided practical knowledge about assembly procedures, tools, inspection methods, safety practices, and quality requirements.

2. Company Profile

GMCC India Pvt. Ltd., Supa is a compressor manufacturing company under Midea Industrial Technology. GMCC was established in 1995 and manufactures rotary, reciprocating and scroll compressors. Its compressors are used in air conditioners, refrigerators, heat pumps and other refrigeration systems.

3. Objectives of the Study

1. To study the upper case and lower case assembly process of a rotary compressor.
2. To understand the sequence of component fitting and alignment.
3. To study fastening, sealing, and inspection methods.
4. To identify common assembly defects and their causes.

5. To understand the importance of assembly in compressor quality and reliability.

6. To gain practical knowledge of industrial compressor manufacturing processes.

4. Literature Review

Previous studies on rotary compressors show that proper clearance, alignment, and assembly accuracy are important for reducing internal leakage and improving compressor efficiency. Yanagisawa and Shimizu found that correct eccentricity and clearance help reduce leakage losses.

Recent studies also show that clearance, sealing, and installation accuracy affect compressor performance and volumetric efficiency.

Therefore, proper Upper Case and Lower Case assembly is important for compressor quality, reliability, and efficient operation

5 Research Methodology

Industrial Observation: The main assembly line and compressor manufacturing activities were observed during training.

Component Study: The major components of the rotary compressor, especially the upper case and lower case, were studied.

Assembly Process Study: The procedures for upper case and lower case installation were observed and understood.

Inspection Study: Dimensional, visual, alignment, leakage, and other quality inspection activities were studied.

Defect Observation: Common assembly defects and their possible causes were observed during the manufacturing process.

Data Collection: Relevant information was collected through practical observation, discussions with supervisors, and training records.

Analysis: The collected information was analyzed to understand the importance of proper case assembly in compressor manufacturing.

Table 1

Observability Experiences at	Self Development	Selected 2021 Completion Rate / Status	Application
Upper Case Installation	Assembly & process understanding	Manufacturing / Engineering Practice	Correct fitting and positioning
Lower Case Installation	Component handling	Engineering Practice / Technical	Proper component assembly
Compressor Unit Identification	Technical knowledge	Work Processes & Engineering Fundamentals	Understanding various components
Compressor Testing	Testing & Measurement	Equipment Assessment & Interpretation	Checking operating parameters
Assembly Observation	Measurement skill	Measurement & Interpretation	Checking component dimensions
Size of Assembly Unit	Unit handling	Engineering Practice	Adhering to safety procedures
Quality Inspection	Quality control skill	Industrial Management / Quality control	Identifying quality defects
Observation of Production Line	Industrial process knowledge	Industrial Safety / Engineering Practice	Understanding production workflow
Safety Identification	Problem solving	Problem Solving & Engineering Practice	Identifying safety-related issues
Component Failure	Component fitting	Engineering Design / Problem Solving	Relating failure with manufacturing
Following SOPs	Adhering to process guidelines	Professional Practice	Following standard procedures
Workplace Safety	Safety awareness	Industrial Safety	Safety-related practices
Workshop with Students	Communication & teamwork	Professional Ethics	Working effectively in a team
Task Planning/Implementation	Communication skill	Communication Skills	Reporting work and observations

Fig -1: Figure

5. Industrial Training Activities

Worked on the Main Assembly Line.
Observed and performed Upper Case Installation.
Observed and performed Lower Case Installation.
Learned about different compressor components.
Performed compressor testing under supervision.
Learned to check and measure compressor dimensions.
Observed assembly quality and inspection procedures.
Followed safety rules and standard operating procedures.

6 . Results and Discussion

The study of upper case and lower case assembly provided practical knowledge of rotary compressor manufacturing. During industrial training, the main assembly process, upper case installation, lower case installation, component inspection, dimensional checking, and compressor testing were studied.

The observations showed that proper alignment and accurate fitting of the upper and lower cases are important for maintaining assembly quality. Clean components and correct positioning help to reduce assembly defects and leakage. Dimensional and visual inspections help to identify variations at an early stage. Compressor testing further confirms the quality and operating condition of the assembled unit.

The practical training also improved knowledge of compressor components, assembly procedures, inspection methods, safety practices, and quality control. Overall, proper assembly and inspection procedures contribute to better reliability and consistent quality of rotary compressors.

7 . CONCLUSIONS:

The study concludes that proper Upper Case and Lower Case assembly is essential for compressor quality and reliable operation. Correct alignment, fastening, sealing, and inspection help reduce leakage, defects, and vibration. Industrial Training Activities

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Performed compressor testing under supervision.
Learned to check and measure compressor dimensions.

Observed assembly quality and inspection procedures.
Followed safety rules and standard operating procedures.
Industrial training provided practical knowledge of compressor assembly, testing, quality control, and safety practices.

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