E-ISSN: 2986-0326, P-ISSN: 2986-089X
DOI: https://doi.org/10.38035/gijes.v1i3
Received: 30 July 2023, Revised: 29 August 2023, Publish: 14 September 2023

Damage Analysis of Accommodation Space Refrigerator in Mv. Energy Pan

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Abstract: Ships play an important role in the distribution of goods and passengers. Inside the ship there is a refrigeration machine that is used for food or other accommodation. This research examines the causes of damage to the thermal expansion valve, the emergence of frost on the evaporator pipe and reduced lubricating oil in the compressor cooling machine accommodation space. The research objective of this research is to determine the cause of damage to the thermal expansion valve, the emergence of frost on the evaporator pipe and reduced lubricating oil in the compressor. This type of research is qualitative. From the results of the study it was concluded that the cause of damage to the thermal expansion valve was the blockage of the orifice by dirt and the spring not working on the thermal expansion valve.

Keyword: Accommodation Cooling Machine, Thermal Expansion Valve, Evaporator Pipe, Reduced Lubricating Oil, Increased Accommodation Room Temperature

INTRODUCTION

The success of a voyage in reaching its destination if all the supporting components are in good condition. These supporting components can be in the form of infrastructure directly related to navigation tools, machinery, loading and unloading operations and can also be in the form of supporting the health of the crew. One very important factor related to welfare and health is temperature quality, temperature quantity, and air circulation in the ship's accommodation space. If the need for temperature and air temperature are as desired, even though the ship sails for a long time, then the crew does not need to worry about the comfortable temperature of the accommodation on board. If the air temperature is comfortable and cool, the crew will feel comfortable and prosperous so that their ability to work can be carried out more optimally. Based on the author's experience during the practice of approximately one year on board the MV. PAN ENERGEN, the author experiences 4 (four) seasons namely winter, spring, autumn and summer. When entering summer, the room temperature in the accommodation is

very hot, making the crew feel uncomfortable. According to the instruction manual book, the room temperature should be 22.8°C to 25.5°c. In this case, there are various factors, disturbances and problems that cause the work of the air conditioner to be less than optimal so that the temperature in the accommodation room is not normal. refrigerant line system and electrical control system. These tools must be maintained consistently according to the refrigeration manual. Or by paying attention to every watch, if there is an abnormality, immediate action is taken to prevent fatal damage. Because if there is fatal damage it will be very detrimental to the crew and also the company. With fatal damage it will result in extra working hours for the crew and incur high production costs for ship operations and maintenance. Because if there is fatal damage it will be very detrimental to the crew and also the company. With fatal damage it will result in extra working hours for the crew and incur high production costs for ship operations and maintenance. Because if there is fatal damage it will be very detrimental to the crew and also the company. With fatal damage it will result in extra working hours for the crew and incur high production costs for ship operations and maintenance.

In addition to the problems above which are very general and complex in nature, there is one very basic problem that often occurs on ships. These problems are directly related to the optimization and work efficiency of the cooler. Where the circulation of the refrigerant or refrigerant is disrupted which results in the frequent occurrence of a lot of frost along the pipeline, both high pressure pipes and low pressure pipes. The worst happened where the evaporator pipes were completely covered with frost which resulted in the temperature of the ship's accommodation room getting hot. Disruption of refrigerant gas circulation is caused by a refrigerant leak from the system.

By looking at the problems above, I as a researcher and writer are very interested in submitting a title: Damage Analysis of Accommodation Room Cooling Machines at MV PAN Energen.

METHOD

In research writing research conducted by the author on problems in the accommodation space cooling machine, the author uses a qualitative approach method.

Data collection and sources of information are very important things for conducting research, the data collected is complete, objective and can be accounted for so that the data collected will be used to be processed and researched in order to get a correct and clear picture, namely regarding the problems in the accommodation space cooler.

The analysis technique used in order to compile this research, namely using a qualitative descriptive method. The descriptive method is to contain an explanation or description of an object problem that arises at a certain time. This method is used to describe in detail the data obtained with the aim of providing information regarding the handling of problems that arise related to the discussion in this study.

RESULTS AND DISCUSSION

Damage to the Thermal Expansion Valve

If this happens, the flow of refrigerant will be disrupted and cannot be controlled, such as the needs needed in the accommodation space of a ship that can change the temperature of the accommodation space. This can be handled by repairing the thermal expansion valve and replacing damaged component parts with available spare parts or by using reconditioned spare parts. if this has been done, the problems that occur will be resolved and the refrigerant flow will be in accordance with the desired order and will make the accommodation room temperature comfortable and good.

The Formation Of Ice Flowers On The Evaporator Pipe

The cause of the emergence of frost on the evaporator pipe is that the evaporator pipe catches water in the air and often the door to the accommodation cooling machine is open for a long time, in circumstances where the appearance of interest on the evaporator pipe will hinder the performance of the evaporator in absorbing heat which can cause changes in the temperature of the accommodation space. This problem can be handled by defrosting (melting ice) on the evaporator pipe which is covered in ice and installing a door closer to the door of the accommodation cooling machine room. If this is done, the problem of frost formation can be overcome and the temperature of the accommodation space is not disturbed and remains cold.

Reduced Lubricating Oil In Compressors

Reduced lubricating oil in the compressor is caused by too wide a piston ring gab compressor and the oil does not work. The wide piston ring gap in the compressor will cause the escape of lubricating oil during the refrigerant compression process in the compressor and will cause the lubricating oil to be mixed with the refrigerant in the system and will cause the lubricating oil to decrease. And the failure of the oil separator which functions to separate the refrigerant from the lubricating oil also causes a decrease in lubricating oil in the compressor and will cause a trip or failure of the compressor in the accommodation cooling system which can cause temperature changes in the accommodation. This can be overcome by repairing the oil separator and replacing the piston rings in the compressor.

CONCLUSION

Based on the discussion above relating to damage to the accommodation space cooler. Therefore it can be concluded as follows:

a. The occurrence of damage to the thermal expansion valve caused by the blockage of the oriface by dirt and the failure of the spring thermal expansion valve which disrupts the regulation of refrigerant flow which can cause changes in temperature in the accommodation space
b. The occurrence of frost on the evaporator pipe is caused by the evaporator pipe capturing water in the air and opening the door of the refrigeration room for a long time will prevent heat exchange from occurring in the evaporator which can lead to not optimal work of the evaporator which causes changes in temperature in the accommodation space.
c. Reduced lubricating oil in the compressor caused by the compressor ring piston gap being too wide and the oil separator not working will make the lubricating oil level below a safe level and will cause a trip on the compressor and if the compressor is in a trip state the cooling system cycle will be disrupted and will cause a change in temperature in the accommodation space.

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