Efforts to Optimize MDO Purifier Maintenance to Support The Smooth Operations of The Main Engine at MV. Tanto Manis

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Abstract. The MDO Purifier aircraft is a very important auxiliary aircraft on board ships. This aircraft uses the basic principle of differences in the specific gravity of a substance so that these substances can be separated perfectly or in another way using the centrifugal principle. This part of the chapter explains the working principle of the MDO Purifier, the function of the components related to fuel and explains the working principle of different specific gravity of a substance so that the substances can be separated perfectly and how to operate and maintain the MDO Purifier. exactly according to the instruction manual book. aboard the MV.TANTO MANIS where the researcher carried out sea practices, several problems occurred during the operation of the MDO Purifier, so that it interferes with the performance of the MDO Purifier when it is not perfect when purifying the fuel. Therefore, maximum handling and maintenance is required to facilitate the performance of the MDO Purifier so that the fuel on board the ship is always clean. In the sense that this research focuses on existing phenomena that can then be understood in depth. This research was carried out by examining parts of the ship's engine components, namely the MDO Purifier components, by directly observing the causes of damage to the MDO Purifier components, less than optimal maintenance on the MDO Purifier, as well as the quality of the fuel on the ship and then finding the cause. The results of this research, if the MDO Purifier is rarely maintained and is not done correctly during the part installation process, the performance of the MDO Purifier can be disrupted because it can cause overflow, the MDO Purifier rotation cannot reach the specified limit, so fuel will be wasted which can be detrimental to the Company.

Keywords: Maintenance, Fuel, Ship, Purifier.

1 Introduction

Based on the Daihatsu Anking manual book, the Purifier is an auxiliary machine that separates water, oil and dirt using centrifugal force above a pressure of 1 atm. On ships that are driven by diesel motors, we really pay attention to the use of fuel and keep it

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clean because fuel containing water will affect the combustion process. The effect that may occur due to the use of dirty fuel in diesel motors is the blockage of the injector holes in the motor. By blocking the fog holes, the combustion that occurs in the diesel motor is also imperfect so that the operation of the ship experiences problems, for example: the number of revolutions or motor power becomes low.

We can actually avoid things like this by using a tool called a Purifier. The purifier functions as a separator of oil from water and dirt based on its specific gravity. In its work, the purifier provides fuel which experiences various kinds of obstacles, including due to the purification that occurs in the purifier being less than perfect or the purifier not working properly. Improper operation of the purifier can also result in the fuel produced still containing water. So as a machinist, you are expected to be able to operate a purifier and are also required to know the process and maintenance properly and correctly. However, in work practices, disturbances still occur which affect the smooth operation of the ship.

2 Research Methodology

The type of research carried out is qualitative research with data presented descriptively. According to Sugiyono (2019), qualitative research methods are research methods used to research the conditions of natural objects, where the researcher is the key instrument, data collection techniques are carried out in a triangulated (combined) manner, data analysis is inductive, and qualitative research results place more emphasis on meaning.

Data collection methods can use surveys, observations, or interviews. Where in this research the author carried out an analysis of distance data between vehicles and analysis of vehicle binding. After the required data is obtained, the data will be presented in a descriptive analysis to describe the objects studied and symptoms that occur related to vehicle transportation based on Minister of Transportation Regulation Number 115 of 2016, Minister of Transportation Regulation Number 30 of 2016, and Minister of Transportation Regulation Number 103 2017.

3 Result and Discussion

The presence of water content in the fuel after the purification process. Mixing fuel with water can have effects on the operation of the main and auxiliary engines. Likewise, a very important condition for the successful operation of the main engine is the intake of truly clean fuel regardless of the dirt that is carried into the system, especially the water content. Things that can cause water content to remain in the fuel are:

a. Inappropriate gravity disc selection.
b. The incoming fuel setting is incorrect.
c. Bowl/vessel rotation is abnormal.
d. Nocorresponds to the average speed.
e. Separatorsproblems at work

f. Debit/the amount of water entering is too much.
g. The condition of the bowl is dirty and there is a blockage.
h. Installation of the shaft must be flashlight.
i. Incorrect installation of drive gear.

Therefore, correct maintenance and operating methods on aircraft purifiers play a very important role in obtaining good fuel quality and meeting the requirements for use in ship machinery. The process of separating fuel completely from impurities and water content in the fuel must meet the requirements listed below, namely:

a. Centrifugal acceleration should be as large as possible.
   To be able to provide centrifugal acceleration, you can enlarge the center line of the bowl and also increase the angular speed from the number of rotations, but all of this has its limits, because of the fuel pressure that arises in the walls of the centrifuge which rotates at a high circumferential speed. to keep unwanted things at bay. With this, special bowl materials are made from centrifuges that have been tested at speeds much higher than their working speed.
b. The fuel fluid must stay longer in the centrifuge.
   We try to ensure that the fuel liquid entering the separator does not exceed too heavy a load, so that the liquid separation process will run more perfectly.
c. The fuel and dirt and water flows must be separated.
   To fulfill the third requirement, the liquid is divided using cone-shaped plates. These tools are large in number and arranged, each plate has a thin and even clearance, so that dirt will stick to the plates.
d. The fuel fluid that can be cleaned should be kept as liquid as possible.
   In this fourth condition, we implement it by controlling the fuel in a heating system using a thermal heater or steam boiler.
e. Separators should spin smoothly.
   The separator rotates smoothly and sounds very smooth and will be felt in the bearing or spiral gear. This also has an effect if it is connected to a gear drive motor, this can also cause fuel leaks if the bearing moves off center or shows damage, it will look funny when shaken with your hand, the vibrations will appear large. Apart from the loud and rough sound, this vibration can also cause damage to other components, this can be seen in the ammeter which appears to move abnormally due to the load being too heavy.
f. Bowls should spin normally.
   Sometimes the bowl doesn't spin normally and the sound sounds very rough or not smooth. This can be caused by the coupling or brake entering so that the bowl cannot move. If it is discovered that the bowl cannot move, the starter switch will fall by itself (auto stop). For this reason, care is required when carrying out an overhaul so that the bowl is not locked.
g. Bowls must be cleaned frequently.
   The fuel that flows on the disc-shaped plate due to the heat from heating at high rotation will cause dirt to stick to it, as well as graffiti discs or bowls filled with dirt, which will have an effect on blowing.
h. Installation of the shaft must be flashlight.

With high rotation and working continuously and withstanding heavy loads, if this continues continuously it will result in the shaft experiencing changes. If this continues continuously without maintenance it will cause the shaft to wear out and the shaft rotation will not be smooth. This affects the electric motor which will burn out the stator and will also affect the operation of the purifier. The tapered tip will cause the surface to become uneven due to erosion and wear due to friction.

i. Proper installation of Drive gear.
This drive gear is attached to the motor shaft. When moved or rotated you can see the rotation. If the rotation looks uneven then the result will be as if the power is intermittent. This is the result of incorrect installation, causing the gear to change.

4 Conclusion

From all the discussion above, the author can only make suggestions for carrying out maintenance on aircraft purifiers to support the smooth working of diesel engines on ships as follows:

1. When carrying out the purification process, we must ensure that the purifier is truly ready and able to carry out fuel cleaning. For this reason, the things that need to be considered when maintaining a purifier are:
   a. So that adjust the gravity disc to the specific gravity of the fuel will be cleaned by looking at the instruction book.
   b. Material The incoming fuel must be in accordance with the capacity and viscosity, before the purification process.
   c. Observe the purifier during the purification process so you can find out how the purifier works.
2. To achieve maximum work of the purifier, its maintenance and operation must be in accordance with the instruction manual book issued by the manufacturer. Apart from the above, we have to record all the activities we do on the purifier, so that we can find out which equipment/components of the purifier are often damaged and how to solve them so that the purifier can work optimally. It is hoped that carrying out proper maintenance and repairs according to procedures can improve the work of the purifier and maintain the purifier working on time and with maximum results.

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