



USE OF GEARBOX VIAR ON FISHING SHIPS

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ABSTRACT: Natural potency, especially fish is one of life source of fisherman community in Kenagarian Siliki Nyalo Subdistrict Koto XI Tarusan. This is included in the area of Mandeh, which is the topography of the bay and headland. Potential untapped optimum, not yet using technology as a boat driving motor. The development goal of producing fishing boats that can move forward and backward. The method applied is the research and development of ship engines and ship propellers, a combination of automotive engineering work, production, and fabrication. Machines used powered 5.5 HP brand Tesla and Viar gearbox. The specialty of this development lies in the integration of Small Engine use with Viar motorcycle gearbox on fishing boats. Test data obtained that comparison ratio of reverse gearbox at 1: 0.75. The development results can be said, each round 1000 rpm on the reverse gearbox input, will produce 750 rpm rotation, a decrease in rotation. The implication is that for the fishing boats in the Nyalo River, the use of these machines and gearboxes is appropriate according to topography, fishermen do not need high speed, the ship can move forward and backward in a narrow area without using a rower.

Keywords: Small engine, gearbox, ship, movement forward and backward.

1. INTRODUCTION

Fishery Potential is one of life source of fisherman community in Kenagarian Siliki Nyalo Subdistrict Koto XI Tarusan. These potentials have not been utilized optimally to meet the daily needs of life. Especially on the fisherman around Kenagarian Siliki Nyalo Subdistrict Koto XI Tarusan not use motor fuel as a motor of the boat, for technical and economic reasons. The need for energy to be able to sail along the beach along Kenagarian Siliki Nyalo Subdistrict Koto XI Tarusan require great power, it can be fulfilled by using motor fuel as a driving force.

In Kenagarian Siliki Nyalo Subdistrict Koto XI Tarusan many river estuaries found that have great fish potential, and is one of the nagari in subdistrict Koto XI Tarusan from 20 Nagari. With an area of Koto XI Tarusan district 425.63 km², and the population of 50.115 people. One of the nags that has beaches, swamps, river estuaries and geographical kenagarian is a bay that has a promontory. Topographical conditions such that make the sea waves are not too large.

The population of Kenagarian Siliki Nyalo is largely dependent on the fishing sector. The location of a fishing village with other fishing villages far enough, and where the fishermen caught quite far away. To go using the boat manually (traditional) requires power and a long time, so the mobility of fishermen is not fast.

Now the use of outboard engines as a prime mover, has been known by the community of nyalo river fishermen. But still rarely fishermen use motor burner stationer as prime mover. Almost all fleets of fishing vessels and existing tourist boats are boats using outboard engines. Whereas by using a

stationary motor fuel that is given propeller (propeller) ships much cheaper price.

A ship engine ideally requires maintenance by using appropriate technology to keep the ship's engine and automotive working optimally. Limitations of the capability of fishermen in the repair and maintenance of machinery and automotive ship itself through appropriate technology must be addressed and improved. Information obtained from fishermen, obtained when the team conducted a survey said that, there is a limitation of the ability of fishermen in developing the ship by using appropriate technology.

The first problem, the expensive modern ship; outboard engine vessels have a very expensive price that is not affordable by fishermen Nyalo Pesisir Selatan River. To that end, fishermen use traditional ships that are manually driven (paddle). As an alternative to troubleshooting, the use of stationary engines given propellers, the price is cheaper than the outboard engine ship. Purpose, to create and develop the usefulness of the use of ship engines (small engine) and propeller (propeller) ship, so that fishermen can reach the price.

2. METHOD

The achievement of the planned results has been accomplished in accordance with the initial expectation of providing a ship engine for fishermen which can work the same as the engine ship's output, but at a much cheaper price. The concept of technology development used is industrial engineering, which is a combination of technology products on the market. Then designed, calculated and assembled to produce a new product.

Once designed and calculated, the engine used a small brand Tesla engine with 5.5 HP power and

power train using Viar gearbox. Technical drawings of 'installed products' can be shown as follows:

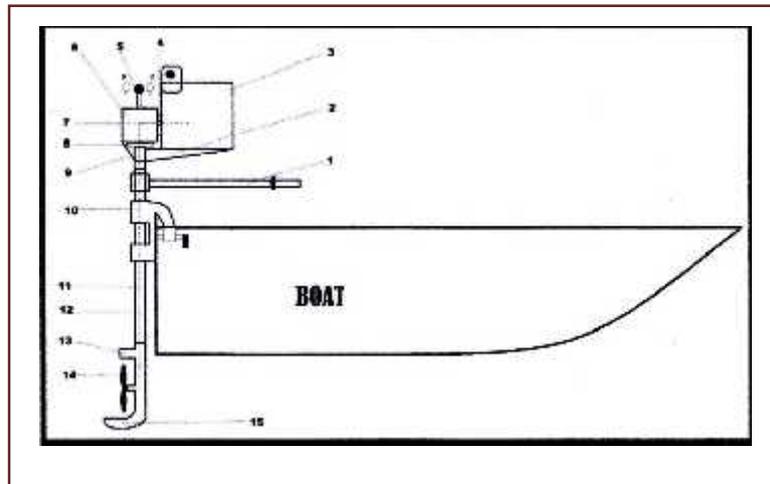


Figure 1: Image of product development techniques

Work undertaken includes calculation of power requirements in accordance with automotive technology. Flange and crank component construction on boat body with fabrication and production technology. This development was carried out in FT UNP's machinery and automotive workshop. Product trials were conducted at Kanagarian Sungai Nyalo, Mandeh area, Tarusan - Pesisir Selatan District.

3. RESULT AND DISCUSSION

Once created and developed, then tested the product, found little problem that the speed of the boat (boat) is slower when compared to the outboard ship engines used by the previous community. The cause of ship speed is not in accordance with the expected due to errors when designing power transfer system. Where the output output after going through the reverse gearbox decreased which causes the propeller spin down so that the boat speed is low. Here are the calculations to solve the problem:

From the test data can be obtained that the ratio of reverse gear ratio on the direct sight is about 1: 0.75, with each description occurs 1 round in the input then the new output occurs 0.75 rounds (not complete one full rotation). In other words, every 1000 rpm rotation on the reverse gearbox input, then the output will produce 750 rpm rotation, in other words a decrease of rotation after going through reverse gearbox.

$$\begin{aligned} 1 & : 0.75 \\ 1 \times 1000 \text{ rpm} & : 0.75 \times 1000 \text{ rpm} \\ 1000 \text{ rpm} & : 750 \text{ rpm} \end{aligned}$$

If the reverse gearbox position is reversed it will get the ratio of input with output of 1: 1.33 with annotation every one rotation at input feed outputnya will happen 1.33 rounds (more than one round).

Ratio in the original position	1 : 0.75
Ratio if reversed	1 : (1/0,75)
	1 : 1.33

From the above data then obtained the result that each round 1000 rpm at the input, then at the output will produce 1330 rpm, in other words the increment of rotation after the reverse gearbox position is reversed

$$\begin{aligned} 1 & : 1.33 \\ 1 \times 1000 \text{ rpm} & : 1.33 \times 1000 \text{ rpm} \\ 1000 \text{ rpm} & : 1330 \text{ rpm} \end{aligned}$$

From the above description based on the problems that occur in power transfer system on the boat modification engine, it can be concluded to solve the problem can be done by reversing the reverse gearbox position.

4. CONCLUSION

After the experiments can be concluded: 1. Design and calculation generate opinion can use machine with power 5,5 HP; 2. Transfer of power to the propeller shaft can use Viar gearbox; 3. Baling boats (boat) at least use the size of five inches; 4. The product may be mounted on the ship's body with slight modification of the holder on the rear of the vessel; 6. The ship can move forward and backward, in accordance with the



natural topography conditions of the River Nyalo,
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