

HOT AIR STERILISER MACHINE INNOVATION WITH CAR EXHAUST MANIFOLD HEAT SOURCE

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ABSTRACT

Ambulance is one of the components of EMS (Emergency Medical Services) that is available 24 hours a day in most hospitals, health facilities and even in the community. Ambulance is one of the frontline facilities in the fight against emergencies, especially in handling outbreaks. The pick-up of exposed or suspected exposed people, infected patients and even the bodies of patients are transported using specialised vehicles, and most of them are ambulances. Based on many news released by the media, many ambulance drivers actually feel very anxious about being infected, because ambulances are very potentially exposed from what is transported. The standard operating procedure for transporting/transferring positive patients is to isolate them, but this cannot be fully implemented in Indonesia due to various limitations. The design of the ambulance is also not hermetically separated between the driver's cabin and the patient's cabin, which certainly increases the risk of exposure. The creation of a steriliser or machine for environmentally friendly air cleaning is necessary to reduce the risk of disease transmission. For this reason, the innovation of a hot air steriliser machine with a car exhaust manifold heat source is needed. Specifically, this research activity aims to: (1) to identify the characteristics of heat in vehicles, especially in suitable types as used for EMS, (2) to produce a design and modelling of a hot air sterilizer engine, (3) to test the performance of the hot air sterilizer engine. The research was conducted at Jurdiknik Otomotif FT UNY with Daihatsu Grndmax as the subject. An experimental research approach was used to research this hot air steriliser machine innovation. The research stages include: (1) preparation, namely identifying by taking careful data on the characteristics of heat in vehicles, (2) designing a hot air sterilizer machine by designing the shape and specifications, (3) making a hot air sterilizer machine (4) conducting empirical tests on the hot air sterilizer machine.

The results showed the heat on the exhaust wall during stationary rotation after working for 15 minutes, the temperature reached 210oC. The highest heat is on the exhaust wall with the closest distance from the engine, with a temperature of 210oC, and the further it decreases and the temperature on the rear muffler wall is 183oC. The heat of the exhaust wall when the engine speed is increased is also higher. The hot air steriliser engine was created to capture the heat of the exhaust wall to heat the air from the cabin when it is discharged. Based on hot air measurements in the hot air steriliser engine at 2500rpm engine speed after 15 minutes is 175.75 oC. When air flowed with a discharge of 7.5 ltr/min, the air temperature was observed to be 174.25 oC. The temperature was good enough to be used to sterilise the air, as seen from the low bacterial population in the air after passing through the engine. Based on these conditions, it appears that the potential of vehicle heat in vehicle exhaust can be utilised to sterilise the air

Kata Kunci: *Hot air sterilizer, exhaust manifold, Emergency Medical Services*