

Application of Exhaust Gas-Air Brake System in Petrol and Diesel Engine

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Abstract : The possible role of the engine brake is to convert a power-producing engine into a power-absorbing retarding mechanism. In this braking system, exhaust gas (EG) from the internal combustion (IC) engines is used to operate air brake in the automobiles. Airbrake is most used braking system in vehicles. In the proposed model, instead of air brake, EG is used to operate the brake lever and stored in a specially designed tank. This pressure of EG is used to operate the pneumatic cylinder and brake lever. Filters used to remove the impurities from the EG, then it is allowed to store in the tank. Pressure relief valve is used to achieve a specific pressure in the tank and helps to avoid further damage to the tank as well as in an engine. The petrol engine is used in the proposed EG braking system. The petrol engine is chosen initially because it produces less impurity in the exhaust than diesel engines. Moreover, exhaust brake system (EBS) for the Diesel engines is composed of gate valve, pneumatic cylinder and exhaust brake valve with the on-off solenoid. Exhaust brake valve which is core component of EBS should have characteristics such as high reliability and long life. In a diesel engine, there is butterfly valve in exhaust manifold connected with solenoid switch which is used to on and off the butterfly valve. When butterfly valve closed partially, then the pressure starts built up inside the exhaust manifold and cylinder that actually resist the movement of piston leads to crankshaft getting stops resulting stopping of the flywheel. It creates breaking effect in a diesel engine. The exhaust brake is a supplementary breaking system to the service brake. It is noted that exhaust brake increased 2-3 fold the life of service brake may be due to the creation of negative torque which retards the speed of the engine. More study may also be warranted for the best suitable design of exhaust brake in a diesel engine.

Keywords : exhaust gas, automobiles, solenoid, airbrake

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