International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 07
March 2018

Emission Controlled By Egr Technique in Ic Engines

Melvin Francis, Niranjan S Raj, Muhammed Sinan KT, Manojmanickam

[a,b,c,d] UG Scholar, Department of Mechanical Engineering, Gnanamani College of Technology, TamilNadu, India
M.Prabhu, Assistant Professor, Department of Mechanical Engineering, Gnanamani College of Technology, Namakkal, Tamilnadu, India

niranjansreeragam412@gmail

Abstract *- In diesel and petrol engines, it is highly desirable to reduce the amount of Nox in the exhaust gas. One efficient way for ensuring this is by exhaust gas recirculation(EGR).EGR is designed widely used system to reduce the exhaust emissions, particularly Nox. The EGR system re circulates fraction of exhaust gases in to the intake manifold where it mixes with the fresh incoming charge. In this papers an experimental study was conducted to observe the effect of different quantities of EGR on emission.*

Key words **–** EGR technique, Emission controlling.

I. INTRODUCTION

The EGR technique is used to recirculates the fraction of exhaust gases in to the intake manifold where it mixes with the fresh incoming charge. NOx emissions can be easily reduced by keeping the combustion chamber temperature down. This reduces the thermal efficiency.

The simplest practical method of reducing maximum flame temperature is to dilute the air-fuel mixture with a non-reacting parasite gas. This gas absorbs energy during combustion without contributing any energy input.

In order to reduce NOx emissions in the exhaust, it is necessary to keep the peak combustion temperatures under control. In short route EGR systems some modifications, such as use of nozzle or venturi mixer, have been investigated. Using EGR helps in reducing NOx, but particulate emissions are observed to increase, hence there is a trade-off between NOx and smoke emissions.

The main reason behind the air pollution is automobile releasing the gases like carbon dioxide and un-burnt hydrocarbon. Carbon emission is the release of carbon in to the atmosphere. The carbon emissions are directly referred to the green house gas emissions.Currently, overall exhaust emissions, crankcase blow by and evaporative losses are the main constituents contributing towards exhaust emissions.

II. LITERATURE SURVEY

EXHAUST EMISSIONS AND IT'S CONTROL TECHNOLOGY FOR AN IC ENGINE

S.Quenon Gamo

He developed a physical model to estimate the pollutants from a diesel engine speed, fuel flow and air flow. They find that the pollution effects become more significant when the speed changes are abrupt and an abrupt change in fuel flow is also induces pollution. He suggested that, for minimizing pollution effects the fuel flow must be progressive with gradual changes in engine speed.

Y.Nakanishi

He used a new method, chemical gas phase process, to reduce the emissions of NOx from diesel engines. For this purpose methylamine is added to the exhaust quantities, which reduced the NOx emissions from the engine.

Yo Shiyuki Kidiguchi

He employed the concept of two stage combustion in a diesel engine in order to reduce the NOx and pin emissions. In the first stage of combustion, a fuel-rich combustion, the NOx emissions are reduced and then

pm emissions are reduced by providing high turbulence in the combustion chamber

E,Arvind

He studied the effect of various oxygenated blend ratios on the combustion , performance and emission characteristics of diesel engines. Experiments are conducted on a four –stroke, single- cylinder, air – cooled diesel engine of 4.4 KW power at an engine speed of 1500 rpm. With an increase in the blend ratio , it was found that there is an improvement in the engine performance.

III. DISCRIPTION OF EQUIPMENTS

Carbon Filter

The entire setup is connected to the silencer or the engine exhaust valve and then the exhaust gas is passed through the filters.In between each filters we used the heat absorbing tubes.It contains dust absorbingfilters

Gas Sensors

Gas sensors are used to detect and analyse gases. They are usually chemical sensors that convert information from the surrounding environment in to the signals. A gas sensor measures the concentration of a gas in the air and forwards the sensor signals to a transmitter.

The entire sensor is connected to the silencer or the engine exhaust valve, when the exhaust gas is passed the light will emits and it alarmed.

IV. WORKING PRINCIPLE

- The engine exhaust gas enters into the project setup the entry sensor sense the gas entry.
- The gas passes through the heat absorbing tube to absorbs the heat from the exhaust gas
- Then the gas enters into the Co2 absorbing filter ,It absorbs the Co contained in the gas
- Then it passes through the tube and enters in to the Nox absorbing filter the gas is circulate into the filter and during the circulation the filter absorbs the Nox present in it
- The gas is further circulate into the So2 absorbing filter to eliminate the So2 content present in it
- After that the gas will enters into the dust absorbing filter to eliminate the dust particles or any other solid particles present in the exhaust gas
- Further the end sensor sense any Co,So2 and No particles present in the gas.
- If any pollutants present in the gas it will be blinked to give the signal.

International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 07
March 2018

The present invention relates to a system and method for determining exhaust gas recirculation (EGR) flow for a multi-cylinder internal combustion engine.

2. Background Art

To improve performance,many internal combustion engines, particularly engines, include a turbocharger to increase the oxygen density of the cylinder charge. Exhaust gas recirculation (EGR) has known advantages with respect to reducing emissions of nitrogen oxides (NOx) by reducing peak combustion temperatures within the engine cylinders during transient and steady-state operating conditions. A typical EGR system may include an EGR valve which diverts engine exhaust gases from the engine exhaust manifold to the engine intake manifold. The EGR valve may be an on/off type or modulating type to regulate EGR flow and may be mounted at various places in the EGR circuit.EGR valve is to provide appropriate transient and steady state control to deliver expected performance and reduced emissions.

Optimization of engine emissions, performance and fuel economy depends on the accuracy, response and durability of the EGR components. One method for EGR measurement provides a known restriction in the EGR circuit and measures the temperature and pressure drops across the restriction to determine EGR rate. As the restriction increases, the accuracy of the rate calculation increases.

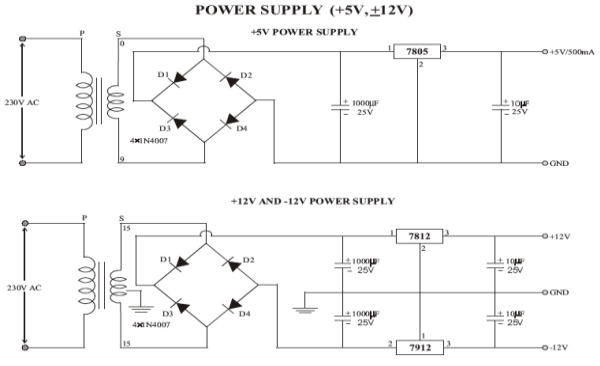

Fig:circuit Diagrams for power supply

V. FACTORS DETERMINING EGR TECHNOLOGY

1. A method of determining EGR flow in a multi cylinder internal combustion engine having a sensor for providing a signal indicative of flow of exhaust gas through an EGR circuit.

2. Determining specific heat of the exhaust gas based on current engine operating conditions, wherein determining specific heat of the exhaust gas comprises. ,tracking amount of plurality of species formed during combustion based on current engine operating conditions.

3. Determining EGR flow rate based on the determined specific heat and the signal provided by the sensor.

4. A method for determining EGR flow in a multi cylinder internal combustion engine having a sensor for providing a signal indicative of flow of exhaust gas through an EGR circuit.

5. Adjusting the base EGR flow using a difference between the determined specific heat of the exhaust gas and reference value associated with the sensor.

6. Controlling at least one of an EGR valve and turbocharger to reduce the EGR flow error.

VI. BACKGROUND OF THE INVENTION

1. Field of Invention

VII. ACKNOWLEDGMENT

We would like to express our deep sense of heartiest thanks to our institution to giving this opportunity to done this project. we are very much grateful to Dr. M. ASHOK RAJKUMAR Dean of Mechanical Engineering Gnanamani College of Technology,Namakkal. And our sincere thanks to Mr.M.PRABHU, Assistant Professor, Department of Mechanical Engineering, Gnanamani College of Technology, Namakkal for the guidance and cooperations.

VIII. REFERENCE

[1] N. Harun, P.L.Douglas, L.Ricardez Sandoval and E.Coroiset,dynamic simulation of MEA Absorption process for co2 capture from fossil fuel power plant.1478-1485.

[2] A.Lawal, M.Wang, P.Stephens and O.Obi, Demonstrating full-scale post-combustion co2 capture for coal-fired power plant through dynamic model and simulation,fuel.101(2012)115-128.

[3] L.S.Tan, K.K.Lau, M.A.Bustam and AM Shariff, Removal of high concentration co2 from natural gas at elevated pressure via absorption process in packed column, journal of natural gas chemistry.21(2012)7-10.