The Study of Fuel Saving of a 25 cc Single-Cylinder Engine with Electronic Gasoline Injection System

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ABSTRACT

ABSTRACT In this study, we used a HONDA GX-25 traditional carburetor engine, and replaced the engine ’ s original carburetor system with an improved fuel injection system. The ECU (Electric Control Unit) used consists of a Philips-P89C51RD2 microprocessor and sensors used to sense the rotational speed , fuel temperature, bent axle position, throttle angle, and controls the engine. The ECU provides an optimal injection duration of fuel at different throttle angles and rotational speeds as based on the A/F ratio, in order to save fuel. This engine is the smallest four-stoke engine in the market, and has an extensive range of uses. Because of the fast development of the semiconductor industry in recent years, the stability of such microprocessors have increased while costs have decreased. In comparison to carburetor engines, electric fuel injection engines have numerous advantages and are becoming the mainstream in engine development.

Keywords : engine, electronic fuel injection, microcontroller, ECU, injection duration

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REFERENCES

參考文獻 [1] 趙志勇, 楊成宗等人, “ 汽油噴射系統理論與實務, ” 全華科技圖書有限公司, 1995.

[2] 李添財, “ 電子控制式汽車引擎, ” 全華科技圖書股份有限公司, 1996.

[3] Bowler, L.L., “ Throttle Body Fuel Injection (TBI) An Integrated Engine Control System, ” SAE Trans., vol. 800164, 1980.

[4] Gorille, I., Rittmannsberger, N., and Werner, P., “ Bosch Electronic Fuel Injection with Closed Loop Control. ” SAE Trans., vol. 750368, 1975.

[5] Camp, J. and Rachel, T., “ Closed-Loop Electronic Fuel and Air Control of Internal Combustion Engines, ” SAE Trans., vol. 750368, 1975.

[6] Seiter, R. E. and Clark, R. J., “ Ford Three-Way Catalyst and Feedback Fuel Control System, ”, SAE Trans., vol. 750369, 1978.

[7] Glockler, O., Knapp, H., and Manger, H., “ Present Status and Future Development of Gasoline Fuel Injection Systems for Passenger Cars, ” SAE Trans., vol. 800467, 1980.

[8] Shimotani, K., Oikawa, K., Horada, and O., Kagawa, Y., “ Characteristics of gasoline in-cylinder direction injection engine, ” JSAE Trans., vol. 9631632, 1996.

[9] Kamura, H. and Takada, K., “ Development of gasoline direction engine, ” JSAE Trans., vol. 9830280, 1997.

[10] 陳聖中, “ 單缸引擎電子燃油噴射系統對性能之研究, ” 大葉大學碩士論文, 2003.

[11] 李冠宗, 呂有豐等人, “ 內燃機, ” 高立圖書有限公司, 1999.

[12] 黃靖雄, “ 汽車原理, ” 全華科技圖書股份有限公司, 1990.

[13] 李茂力, “ 汽車電腦噴射引擎原理與檢修, ” 財團法人徐氏基會, 1997.
[14] 尤新來, 顏昭文, “ 汽車學-汽油引擎篇, ” 全華科技圖書股份有限公司, 2001.
[15] 黃靖雄, “ 現代汽車引擎, ” 全華科技圖書股份有限公司, 1996.
[16] 王長安, “ 汽車電腦噴射引擎原理及檢修, ” 1988.
[17] 吳金華, “ 汽車噴射引擎原理, ” 1992.
[18] 馬忠梅, 籍順心, 張凱, 馬岩, “ 8051單晶片C語言程式設計-使用Keil Cx51, ” 全華科技圖書股份有限公司, 2005.
[19] 賴麒文, “ C與8051單晶片韌體設計-使用Keil C, ” 文魁資訊股份有限公司, 2003.
[20] 陽明豐, “ 8051單晶片C語言設計實務, ” 碁峰資訊股份有限公司, 2004.