International Journal of Engineering Research and General Science Volume 3, Issue 4, July-August, 2015
ISSN 2091-2730

Fuel Injector Testing Machine

Praveen S.Desai, Heramb R Pawaskar, Prof. N N .Manchekar

Asst. Professor Rajendra Mane College of Engg. & Technology, nirman29@gmail.com

Abstract— the injector tester consists of a small tank, pump, pressure gauge and handle. There is a separate bowl for receiving the fuel sprayed from the nozzle. The injector to be tested is fitted in the injection testing equipment.

Keywords— Fuel, Injector, Nozzle, Fuel Injector, Fuel pump

INTRODUCTION

During the compression stroke in a four-stroke diesel engine, air is compressed in the engine cylinder. The pressure of the air is increased and its temperature is also increased. The diesel fuel is injected at the end of the compression stroke and the fuel is ignited. The fuel feed system ensures that the diesel oil is injected into the cylinders at the correct time. It consists of a diesel tank, a feed pump, a filter, an injection pump, an injector and connecting lines. Regular testing of the fuel injection system ensures that the diesel pump works effectively.

To run an engine, the fuel from the tank must each by some means to the engine cylinder. In diesel engine, the fuel is injected into the engine cylinder by an injector. The fuel burns in the cylinder and during the exhaust stroke, the burned gases leave the cylinder passing through the exhaust pipe and silencer.The injector tester consists of a small tank, pump, pressure gauge and handle. There is a separate bowl for receiving the fuel sprayed from the nozzle. The injector to be tested is fitted in the injection testing equipment. A valve which is used to control the fuel is first opened, and then the handle is pressed downward.

The downward movement of the handle causes the fuel to be sprayed through the injector. The reading in the pressure gauge shows the atmospheric pressure. If this pressure is equal to the pressure specified by the manufacturer, then the injector is a good one. If the pressure is either more or less, the spring in the injector should be accordingly adjusted.

METHOD OF OPERATION

The valve will open when from the fuel pump acting on the shoulder of needle valve overcomes the spring compression. As the needle valve lifts, oil flows through the lowerchamber of the atomizer. The extra area of the needle mitre is now subjected to pressure causing the needle to lift allowing the fuel to pass through high pressure through atomizer holes into the combustion chamber. When the fuel pump cut off pressure, the valve will close under spring compression.

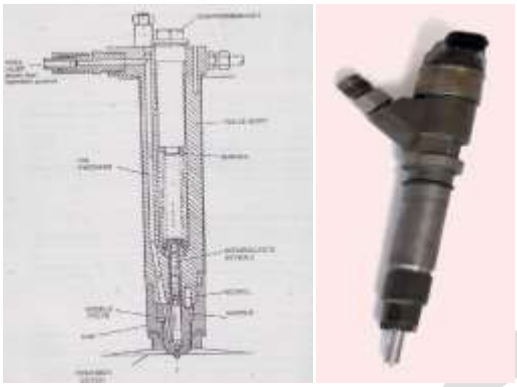

Fig. Fuel injector

Since the needle is now exposed to pressure closing of valve will now occur at pressure lower than at which it is opened. The action of the needle valve must be rapid and positive without leakage. Injector spring compression is adjusted under test and a compression ring is fitted. It is set to allow the needle valve to open at pre-determined fuel pressure.

TESTING OF INJECTOR NOZZLE

Fig. Injector tester

The injector tester consists of a small tank, pump, pressure gauge and handle. There is a separate covered cabin for receiving the sprayed fuel from the nozzle. The injector to be tested is fitted to the injector testing equipment. The valve which is used to control the fuel is opened and then the handle is pressed downwards. The downward movement of the handle causes the fuel to be sprayed through the injector. The reading in the pressure gauge shows atmospheric pressure and if the pressure is equal to the pressure specified by the manufacturer, then the injector is good one and is accepted. If the pressure is more or less then the specified then the spring is adjusted according to the size of shim in the injector.

SELECTED MATERIALS FOR INJECTOR SYSTEM

SR.NO.	PARTS	QUANTITY	MATERIAL	SPECIFICATION
1.	Frame stand	1	Mild Steel	32’ x 12’ x 11’
2.	Fuel Injector	1	Aluminum	12Volt Multi-point injector
3.	Electronic control unit	1	Electronics	555 timer 12volt o/p
4.	Tank	1	M.S	30 Liter capacity (Lorry Air Tank)
5.	Pressure gauge	2	-	(0-10) Bar
6.	Gate Valve	2	M.S	1/2” Gate Valve
7.	Connecting wire	1 meter	Copper	-
8.	Bolt and Nut	-	M.S	-
9.	Hose Collar and connector	1	-	10 mm Hose Collar and 10 x 8 mm Hoses

CONCLUSION

The fuel injection equipment is the essential component for the proper working of the diesel engine. The function of the fuel injector is to disperse the fuel through compressed charge of air in the engine cylinder. Proper functioning of injector should be ensured for proper functioning of engine as fuel injector has to spray fuel uniformly. By this project we could learn the construction, design, working operation and calibration of fuel injection instrument fuel injectors, nozzle, testing of nozzles and timing of injection.

REFERENCES:

[1] V. Ganesan ‘A text book of Internal Combustion Engine’, Tata McGraw Hill Education Private Ltd. New Delhi, 241-245, p272-273, p281-284.

[2] R.K.Rajput, ‘A text book of Thermal Engineering’, Lakshmi Publication, New Delhi.

[3] Litchy, L.C: Combustion Engine Processes, Mc Graw Hill.

[4] Taylor, C.F. and Taylor E.S.: The Internal Combustion Engine in Theory and practice, M.I.T.Press.