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INJECTOR CLAMP AND INDEX DEVICE

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ABSTRACT OF THE DISCLOSURE

This disclosure pertains to an internal combustion engine fuel injector having nozzle spray orifices specifically oriented with respect to a mounting clamp so that the orifices are precisely positioned when the clamp is secured to the engine. The mounting bracket includes a sleeve containing an adapter which removably supports the nozzle assembly. During assembly of the adapter within the sleeve an indexing surface provided on the nozzle has to be aligned with a mating indexing surface provided on the sleeve. These indexing surfaces constitute a projection on one member and a mating recess on the other member so that assembly must result in the orientation of the spray orifices.

This invention relates to fuel nozzles of the injector type and is more specifically concerned with means for indexing the spray orifices of the nozzle with respect to its mounting bracket.

Hitherto it has been common in this art to either manually orient injector nozzles with respect to the particular associated engine cylinder or to utilize positioning dowels to precisely locate the fuel injector orifices in relation to an engine mounting bracket. In the latter type devices the nozzle body receives one or more dowels that are positioned within a nozzle adapter making it necessary to use a threaded member or nut to secure the nozzle body and spray tip to the adapter member. The purpose of this invention is to avoid unnecessary components and provide a positive indexing arrangement that is specifically related to the position of a mounting clamp utilized to affix the fuel injector to an engine cylinder head.

Accordingly, among the objects of this invention is the provision of an indexing means that precisely positions fuel injector spray orifices when the injector unit is secured to an engine.

Another object of this invention is to provide an indexing means that requires a minimum of manufacturing expense while assuring that the spray tip is definitely located with respect to a mounting clamp.

A further object of this invention is to correlate the position of the fuel injector mounting clamp with respect to the spray orifices through the utilization of an indexing means between the nozzle spray tip and its adapter receiving sleeve.

A still further object of this invention is to provide indexing surfaces on a sleeve connected to a mounting clamp and on a nozzle body member wherein a minimum of machining is required to produce mating surfaces that provide this feature.

Another object of this invention is the provision of removable fastening means to allow withdrawal of the nozzle body member and adapter from the mounting clamp while it is secured to the engine.

The above and other objects and advantages will be apparent from the following detailed disclosure of an embodiment of the invention as shown by the accompanying drawings in which:

FIGURE 1 is a sectional view of the apparatus in assembled relationship.

FIGURE 2 is a cross sectional view taken on lines 2—2 of FIGURE 1.

Refferring now to the drawings and in particular to FIGURE 1, a mounting clamp or bracket 2 comprising mounting bolt holes 4 is either integral with or otherwise connected to a sleeve member 6. A nozzle adapter 8 is positioned within sleeve 6 and engages a nozzle body member 10 to be securely fastened thereto by threaded connection 12. The nozzle body 10 contains a first valve 14 that is engaged by one end of a spring 16 while the other end of the spring engages a secondary needle valve 18 also disposed within nozzle body 10. The needle valve 18 comprises a shank 20 that is slidably received within sleeve 22 of valve 14 and has an integrally extending needle portion 24 that is disposed within spray tip 26.

The spring tip 26 contains one or more fuel spray orifices 28. A gasket 30 is disposed about spray tip 26 and engages flange portion 32 of nozzle body 10 to sealingly engage a mounting surface of an engine cylinder head.

Adapted member 8 comprises a threaded end section 34 that is secured to fuel supply lines and is retained in the mounting clamp 2 by means of a snap ring 36 fitting within annular groove 37. Snap ring 36 engages a back-up washer 38 to compress a seal washer 40 against the clamp 2.

The terminal end of sleeve 6 comprises an arcuate extension 42 that is received within a like shaped recess 44 in nozzle body 10 for a purpose to be later described.

During assembly of the subject injector nozzle arrangement, the nozzle body 10 is threaded upon an enlarged portion 46 of adapter 8 and when assembled within the mounting clamp 2 and sleeve 6 the projection 42 is received by recess 44 to specifically locate orifice 28 with respect to the mounting clamp 2. Therefore, when the mounting clamp 2 is positioned upon the engine with respect to a particular cylinder, the location of the orifice 28 is definitely located in a predetermined position. Removal of snap ring 36 from groove 37 allows the nozzle body member 10 and adapter 8 to be withdrawn from the mounting clamp 2 and sleeve 6 while they remain secured to the engine. Reassembly of the nozzle body 10 and adapter 8 within sleeve 6 requires extension 42 to align and be received within recess 44 before the snap ring 36 can be placed in groove 37.

From the above description it is obvious that this invention provides a positive positioning of fuel orifices in the nozzle spray tip with respect to a mounting bracket in a simple and economical manner in that several parts have been eliminated and the intricacies of machining have been reduced. While only a preferred embodiment of the subject invention has been described in the foregoing specification, it is to be pointed out that this embodiment is used for purposes of illustration only and the invention is intended to be limited only as defined by the appended claims.

What is claimed is:

1. A diesel engine fuel nozzle assembly comprising a mounting clamp, a sleeve connected to said clamp, an adapter positioned in said sleeve, a nozzle body member having a spray tip thereon, said spray tip having an orifice thereon, spring biased valving with said nozzle body member to regulate fuel flow through said orifice, said nozzle body member being threadedly secured to said adapter member, an indexing recess in said nozzle body member, and an indexing projection on said sleeve whereby said projection is received by said recess to specifically position said spray orifice with respect to the longitudinal axis of said nozzle, said mounting clamp further orienting the assembly with respect to an engine when said assembly is secured thereto.

2. A diesel injection fuel nozzle as described in claim
1 wherein said projection and said recess are located in the terminal mating ends of said sleeve and said nozzle body member respectively.

3. In a fuel nozzle of the injection type having a mounting clamp, a sleeve connected to said clamp, an adapter positioned within said sleeve, and a nozzle tip assembly including a spray tip connected to said adapter and having a fuel spray orifice therein and further having a spring biased valve arrangement therein to control fuel flow through said orifice, the improvement comprising, indexing means on said nozzle tip assembly, and indexing means on said sleeve, said indexing means on said nozzle tip assembly and said sleeve comprising an arcuate projection on one of said members and an arcuate recess in said other member to snugly receive the projection thereby indexing the fuel spray orifice in said spray tip with relation to the mounting clamp.

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