Versatile Freeze Plug Extractor

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This project comes from the development of an innovative tool for the branch of automotive maintenance. It was found that both manufacturers worldwide, and specialized automotive maintenance workshops have problems with the extraction operation of the engine freeze plug, due to a number of factors; including the lack of proper tools to realize the extraction, the limited access at the operation area and the risk of damage to the engine block. The combination of these factors led to the development of this tool, able to remove freeze plugs with diameters between 30 and 40 mm. For that, it was necessary to investigate the removal methods currently used and analyze the plug format to determine the effort required to extract and then scale, calculate, design and machining a prototype. The tool must be made of AISI 5160, AISI 4340 or AISI 1045 steel, due to the characteristics of each tool component, and then heat treated to achieve adequate hardness. After assembling the prototype, it was tested on engine blocks which presented easy and difficult extraction, showing excellent results. It was necessary to analyze the weaknesses of the prototype for the construction of the final tool. After adjustments and improvements, the tool was tested in several different models of cars and engines as well as in different states of preservation, with excellent results, removing the plug of several cylinder blocks of different car models, without necessity to withdraw the car's engine and without damaging the plugs housing.

Awards Won: