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Gasoline engines with direct fuel injection (GDI engines) — Installation of the high pressure fuel pump to the engine

Moteur à essence à injection directe (moteurs GDI) — Installation de la pompe d'injection de carburant à haute pression sur le moteur

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Foreword

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Introduction

The motor vehicle industry is increasingly being pressured by the world's regulators to improve fuel consumption whilst reducing exhaust emissions (particularly CO_2 emissions). The challenge for automotive engineers is to balance the trade-offs between the technology to improve fuel consumption and that to reduce regulated emissions.

The most promising new engine technology of late is the direct injection spark ignition engine [also known as the gasoline direct injection (GDI) engine]. Listed amongst the advantages of GDI are a significantly improved fuel economy and corresponding lower CO_2 emissions than on comparable gasoline engines.

With this technology comes new fuel system components and new interfaces with the engine. One component of the GDI fuel system is the high pressure fuel pump that supplies fuel to the common rail. This high pressure fuel pump is usually driven by a separate cam lobe on the engine camshaft and thus has to be integrated into the engine housing.

This document provides design engineers with best practices (dimensional requirements) for the assembly of the GDI fuel pump into the engine.

GDI fuel systems typically operate in a pressure range of around 35 MPa and are labelled “high pressure”. In the context of all injections systems, including diesel, this same pressure range is considered as medium pressure, as diesel injection operates at much higher pressures. Thus, the term “high pressure” in this document, and “medium pressure” in the ISO 18418 series, refer to the same pressure range for the same purpose.