## Fuel Injection Nozzles

Fuel injection plays an important role in both the performance and the consumption of an engine.

Manufacturing of injection nozzles requires the forming of small holes in the head of the nozzle to provide a calibrated fuel flow into the combustion chamber.

LMJ used for:
- Drilling of injection holes

## Perfect Holes, Better than EDM

Fuel injection nozzles are made of steel.

Main processing criteria:
- No HAZ
- High precision
- No burrs
- High tolerances
- Sharp edges

Machining technologies able to reach these criteria:
- EDM
- Ultra-short pulse laser
- Laser MicroJet (LMJ) - water jet guided laser technology

## No HAZ, Production-Proven, Better ROI

LMJ advantages versus EDM:
- 5x faster
- Production-proven, automation
- Low consumables
- High stability

Installed machine type:
- 3x LCS 300
- 60 W IR laser

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Sources: Magneti Marelli website, Synova