

HOT FORGING and AUTOMOTIVE INDUSTRY

Michel Barthole

Olivier Jaillet

PSA Peugeot Citroen, France

This paper deals with the main hot forged parts used within the automotive industry, and places this production in the present industrial context.

A part is **strategic** for an automotive manufacturer when he wants to :

- have and develop a top design level
- produce on an industrial scale.

On the opposite, when a part is **not strategic** for an automotive manufacturer, the supplier, starting from functional specifications, will be asked to design, validate and produce.

Underbody parts

Hubs and subs axles :

- represent 10 kg in a car
- are not strategic parts
- offer high mechanical characteristics and low cost (due to automated horizontal presses)
- have no real product / process competitor
- have a flat trend of production level

Suspension arms :

- represent 10 kg in a car
- are strategic parts
- offer high mechanical characteristics within a low volume
- are rather heavy and expensive
- have product / process competitors like steel sheet or aluminum
- have a decreasing trend of production level

Gear box parts

Gear and transmission shafts :

- represent 10 kg in a car
- are not strategic parts

- offer high mechanical characteristics
- are rather heavy and expensive
- have product / process competitors like cold forged parts or tubes
- have a decreasing trend of production level

Pinions and crown wheels :

- represent 15 kg in a car
- are not strategic parts
- offer high mechanical characteristics and low cost (due to automated horizontal presses)
- could have product / process competitors like powder metallurgy parts
- have a flat trend of production level

Engine parts

Connecting rods :

- represent 5 kg in a car
- are not strategic parts
- offer high mechanical characteristics
- need a heavy machining
- could have product / process competitors like powder metallurgy parts
- have a flat trend of production level

Crank shafts :

- represent 20 kg in a car
- are strategic parts
- offer high mechanical characteristics
- are rather expensive and need a heavy machining
- have product / process competitors like Spheroidal Graphite iron
- have a really increasing trend of production level

Industrial context

The main features of the present automotive industrial context are :

- production increasing, profitability increasing, innovation
- quicker, better and cheaper design
- mass reduction
- machining reduction

More over :

- the purchaser will want to buy a function rather than only a part
- that is to say that, to some extent, the supplier will have to design, to validate and to forge, and in some cases, within a more or less near future, he will perhaps have to machine and assemble

And either the purchaser or the supplier will have to keep in mind that, if they want to sell everywhere in the world, they will have to buy everywhere in the world and think about local production, whatever the industrial solution they choose to do it.