INTRODUCTION

- Hydro Forming
- High Pressure Water As a Punch
- Widely Used In Automobile Industry
HYDRO FORMED COMPONENTS

Fig. Automobile component & Bellows
Fig. Hydro formed handle bar

Fig. Hydro formed T-junction
METHODS OF HYDROFORMING

There are two types

- Tube Hydro Forming
- Sheet Hydro Forming
TUBE HYDRO FORMING

- To Produce Tubular Components

- High Pressure Process

- Plastic Deformation

- Manufacture Components At One Step
Figure 1

Tube Hydroforming

1. Tube blank placed in die
2. Filling of tube with fluid + minimum clamp force
3. Low pressurisation + complete clamp force
4. Full pressurisation (calibration)
5. Hydroformed component
BENEFITS OF TUBE HYDRO FORMING

- Increased Strength to Weight Ratio’s
- Reduction In Weight
- Reduction In Production Cost
- Reduction In Number Of Manufacturing Stages
- Improved Stiffness, Torsion And Bending Rigidity
- Less Floor Area
SHEET HYDRO FORMING

- To Produce Components Made Of Sheet
- High Pressure Process
- Two Stage Process
- Types Of Sheet Hydro Forming
SINGLE SHEET HYDRO FORMING

Diagram showing the process of single sheet hydro forming with labels for BHRF, PF, Blankholder Ram, Punch, Blankholder (Upper Binder), Blank, Draw Ring (Lower Binder), Cavity, and Press Table.
Hydro formed roof rail.

Hydro formed automobile component

Hydro formed chair
DOUBLE SHEET HYDRO FORMING

- Structurally Closed Components Are Formed By This Process
- High Pressure Process
APPLICATION SPECTRUM

- Automotive Components Well Suited To Hydro Forming Of Sheets.
- Outer Skin With Its Extreme Demand Of Surface Quality And Dimensional Accuracy
- Longer Outer Skin Parts For Passenger cars, Utility Vehicles And Truck Such As Goods
APPLICATIONS OF SHEET HYDRO FORMING

- Low capital cost
- Reduction in weight
- High process capability
- Reduction in cost of component
Deformation In A Forged Part Is Analyzed From FLD

If Both Major & Minor Strains Are Positive Deformation Is Known As Stretching
HYDRO FORMING PROCESS CONTROL

- Controller Plays A Virtual Role In Displaying, Monitoring And Controlling
CONCLUSION

- Hydro Forming Is Not Solution For Manufacturing All Automotive Parts.

- This Process Is Economic And Weight of Components Can Be Reduced By Hydro Forming

- Just Like Transistor Revolutionized The Electronic Industry, Hydro Forming Has Taken The Vehicle Manufacturing Industry A Step Up To Evolutionary Ladder.
THANK YOU