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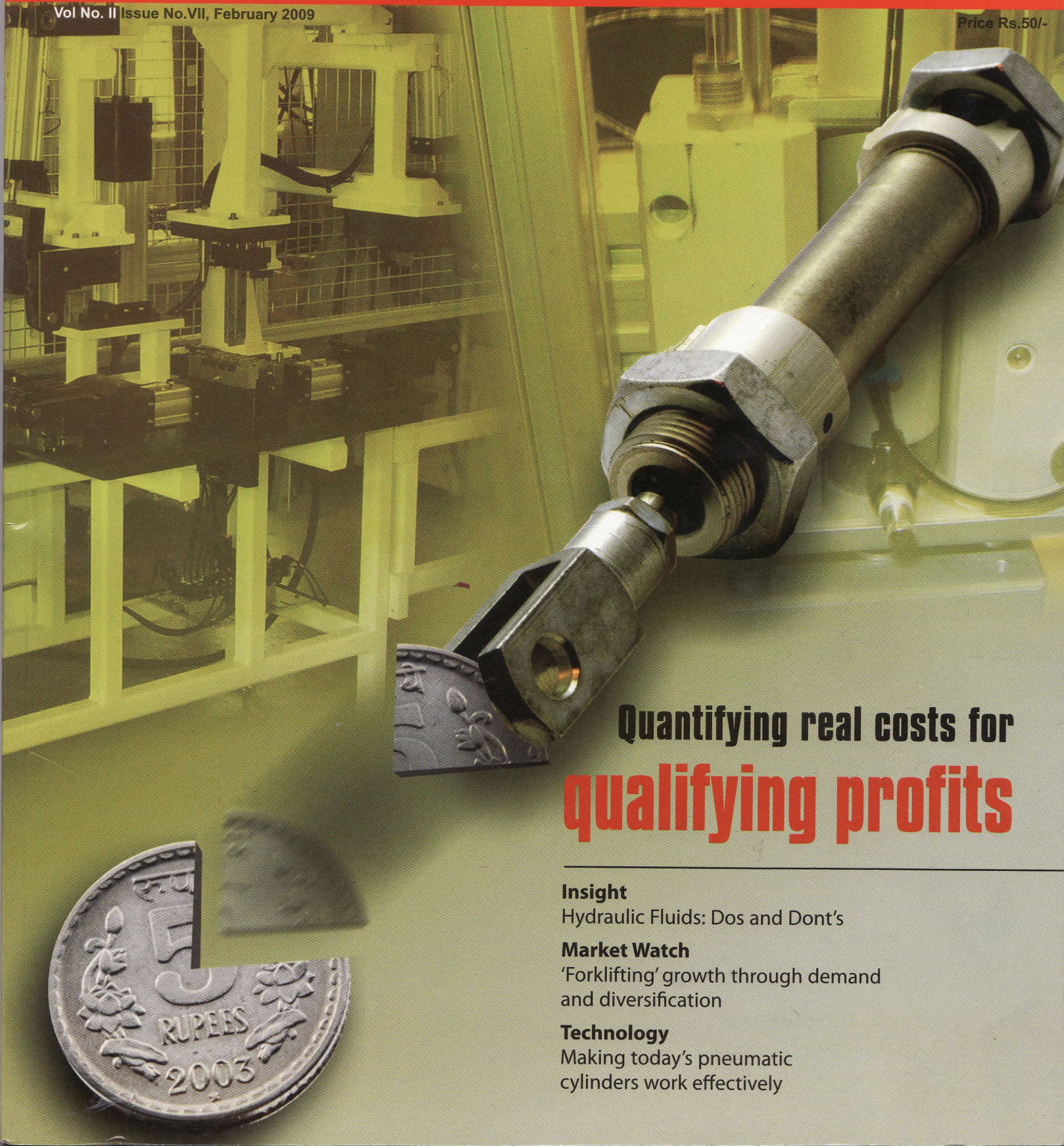


Quantifying real costs for qualifying profits

Insight
Hydraulic Fluids: Dos and Dont's

Market Watch
'Forklifting' growth through demand and diversification

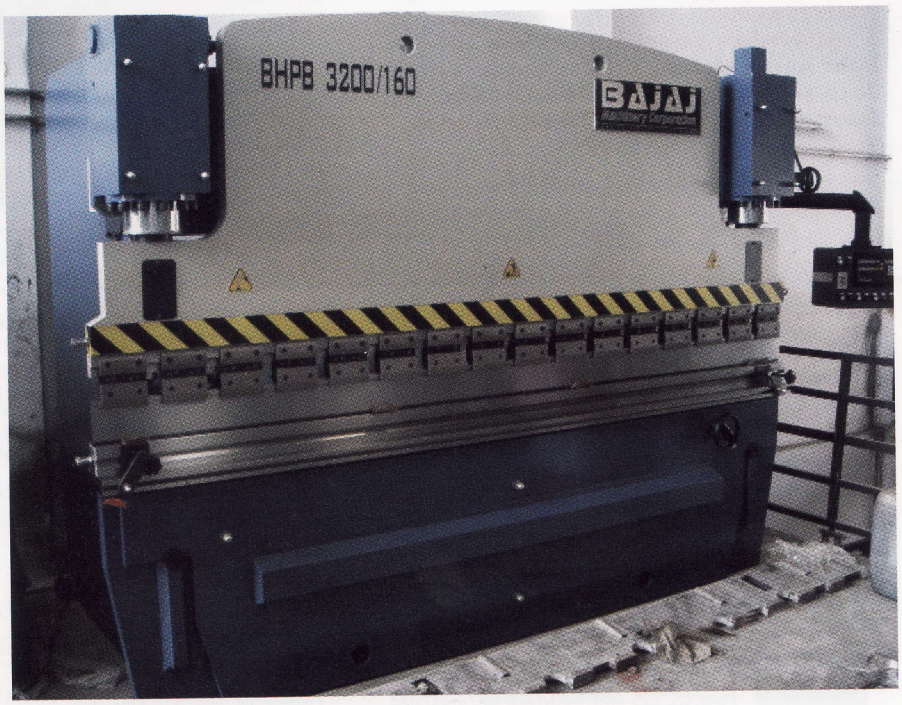
Technology
Making today's pneumatic cylinders work effectively

Flexing and folding with the 'hydraulic' element

Hydraulic press brakes have streamlined and alleviated cutting, forming, bending, and stamping operations in the sheet metal processes. **Karan Bajaj** discusses the application and utility of hydraulic press brakes in the sheet metal working segment, while highlighting the various types of hydraulic press brakes, and CNC hydraulic press brake in particular

Executive summary: The manufacturing sector had been using semi automated processes during sheet metal operations. However, with the evolution of hydraulic press brake, cutting out metal into desired pieces, joining and assembling metal sheets, cold forming, shaping, and clamping the metal sheets have become a lot easier. Based on linear measurement and control systems, these hydraulic press brakes can perform various continuous metal forming processes with efficiency. This article elaborates on the flexibility of hydraulic press brakes, while focusing on its applications in the sheet metal working industry.

Cracking the tough metal with a hydraulic punch



Designed to handle rough industrial production, hydraulic press brakes find utility in continuous production processes and specialised sheet metal work. With flexing and folding capabilities, hydraulic press brake finds major application in sheet metal works. The hydraulic press brake implements the electro hydraulic control in the entire sheet metal process. The hydraulic press not only holds together loose ends of metal panels, but also seals pieces of sheets that would require nailing. The hydraulic involvement in the entire process becomes vital in the cutting, punching, spinning, bending press brake forming, roll forming, rolling and stamping operations.

The hydraulic brakes perform these functions with reliability, speed and accuracy, giving scope to the manufacturer to seamlessly integrate the hydraulic brakes with shears, cutters, punches, presses and bending units. There are different types of press brake machines such as the mechanical

With flexing and folding capabilities, hydraulic press brake finds major application in sheet metal works. The hydraulic press brake implements the electro hydraulic control in the entire sheet metal process. The hydraulic press not only holds together loose ends of metal panels, but also seals pieces of sheets that would require nailing. There are different types of press brake machines such as the mechanical press brake, hydraulic press brake - this comes in some variants like the conventional models fitted with DRO for the reading of X and Y axis), NC press brakes and CNC press brakes.

press brake, hydraulic press brake – this comes in some variants like the conventional models fitted with DRO for the reading of X and Y axis), NC press brakes and CNC press brakes. The hydraulic press brake uses a hydraulic pump and hydraulic cylinders to move the RAM. This design is far more efficient, allowing increased speed and accuracy. While there are different types of hydraulic press brakes, a study of CNC press brake will highlight the fact that hydraulic presses allow wide bending ranges and networking capacities.

CNC press brake

A Computerised Numerically Controlled (CNC) hydraulic press brake includes an actuator and control system, which automatically provides variable pre-programmable ram opening and closing strokes. A microprocessor within the control system responds to stroke parameters entered by the operator, and an encoder-generated signal indicative of ram position to generate a velocity command signal, defining a velocity profile for positioning the ram to the stroke limits. Closed-loop servo systems associated with each ram cylinder respond to the velocity command signal to cause movement of the ram in accordance with the velocity profile. A ram-levelling circuit, responsive to individual position sensors, associated with respective sides of the ram, compensates for ram tilt by simultaneously applying correction signals to the respective servo systems. A second velocity profile may be generated in response to the stored parameters to position a back gauge concurrently with ram movement by means of a second. There are different CNC controllers for the applications. The major controller comes from Delem, Cybelec, Siemens, Fanuc and Mitsubishi. These companies make specific press brake and dedicated controllers, which can give the ease to the operator.

Applications in India

Industries such as automotive and infrastructure have led to the increased use of hydraulic brakes sheet metal work. Indian manufacturers have started buying faster and accurate hydraulic brakes, and have improved in processes to reduce process time. This in turn is increasing the demand for sheet metal working machines such as NC and CNC hydraulic press brakes, augmenting development in the manufacturing sectors. This has encouraged Indian hydraulic manufacturers to roll-out hydraulic clamping, CNC attachments, robot interface, work area illumination, cooler for hydraulics and electrical cabinet over +30 °C, +85 °F.

Apart from the Indian companies, there are a lot of foreign companies who have set up their manufacturing facilities in India. This is because the use of hydraulics has made sheet metal working an automated process in aerospace and automotive sectors. Almost all large machinery houses – plastic processing machines, packaging machines, textile machines, printing machines, chemical plants, distilleries, etc. are building main frames from sheet metal. Therefore, they are investing heavily in CNC hydraulic press brakes. The market size has expanded 10 times in the past 5 years.

Repair and maintenance

The repair and maintenance for all these machines is very important, and it plays a vital role in the long life of these high-end machines. Generally, the manufacturers or suppliers of these machines provide proper training to the customers up to their satisfaction. During the same, the basic and key features are explained, and the procedures of the maintenance of the machines are explained thoroughly to the operators of the end users.

The maintenance activities include unloading of the machine, foundation of the machine, and the weekly / monthly check up of the machine. And, it includes oiling and greasing of the running parts – the operators should make sure is that the machine is operating under normal temperatures, and is protected from dust particles (especially, NC and CNC press brakes).

The author is MD, Bajaj Machine Tools