

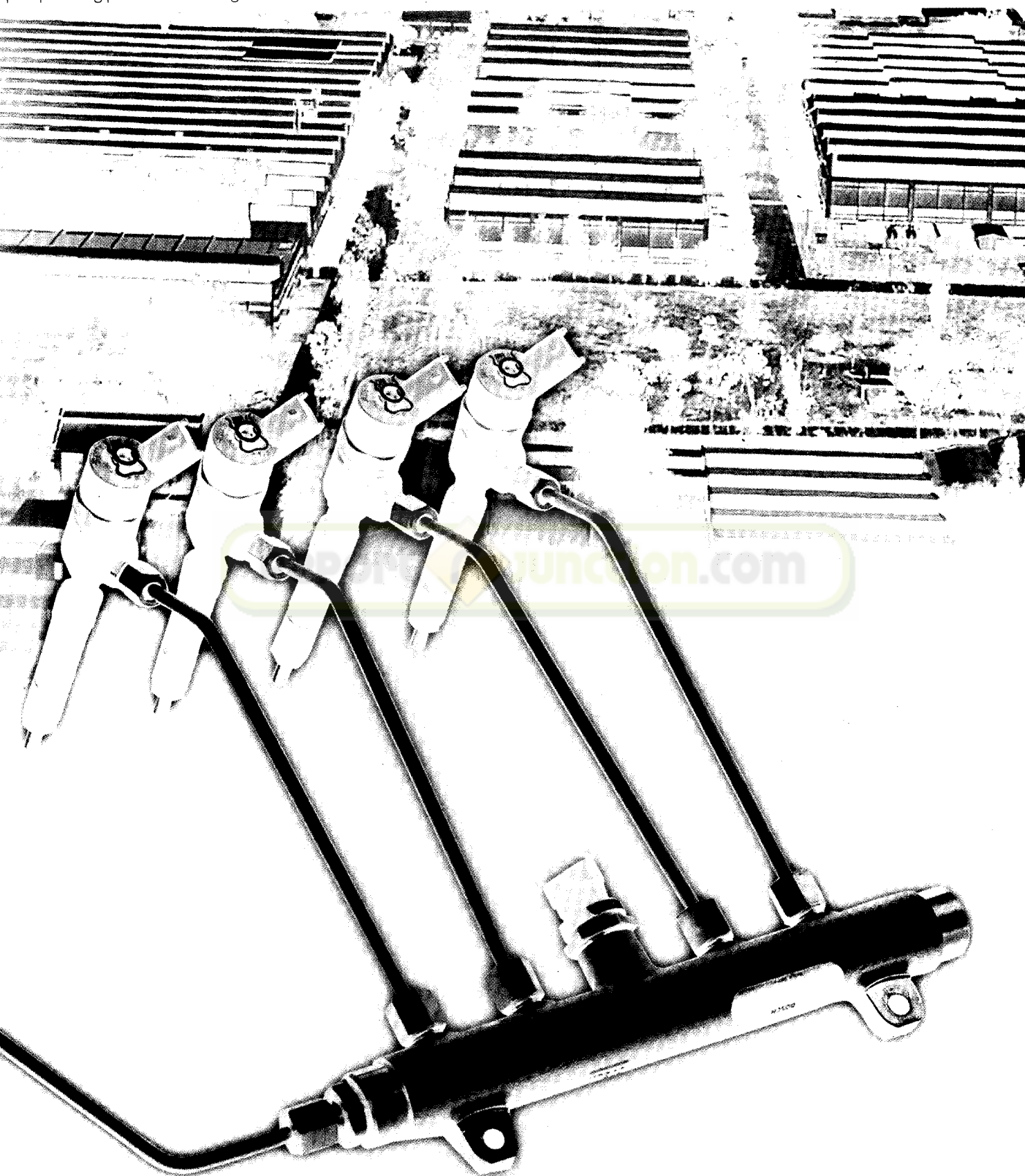
# Motor Industries Co. Ltd. **Annual Report 2004**

**MICO**

The power of We

**BOSCH**

With Rs. 550 Crores earmarked for the introduction of the Common Rail System in India, MICO will start the production of its various components in 2006. The Nashik plant shall manufacture injectors for the Common Rail System in India, with the high pressure pumps being produced at Bangalore.



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## About MICO

Motor Industries Company Ltd. (MICO) is a subsidiary of Robert Bosch GmbH, Germany. Founded in 1951, MICO has been a pioneer and a leader in the Indian automotive segment for the last 54 years, and is the largest manufacturer of diesel fuel injection equipment in the country and among the world's largest. It is the largest Indo-German company and a household name in India today. MICO has recently been awarded the "Auto Component Manufacturer of the Year 2005" by leading industry bodies and auto publications in the country.

With access to the international technology of Bosch, conscious commitment to quality, and over 10,000 employees, MICO currently has 4 plants in the country, including two in Bangalore and one each in Jaipur and Nashik. All four plants are TS 16949 and ISO 14001 certified.

MICO businesses include industrial equipment, auto-electrical equipment, gear pumps for tractor applications, electric power tools, packaging machines, security technology products and Blaupunkt car multimedia systems. MICO has developed excellent R&D and manufacturing capabilities, a strong customer base and its market leadership is testimony to the high quality of its technology and products.

MICO also has a strong presence in the Indian automotive service sector. The service network of MICO spans 1,000 towns and cities with over 4,000 authorised representatives who ensure widespread availability of both, products and after-sales services.

## About Bosch

Robert Bosch GmbH is closely associated with the automotive industry across the world. The name Bosch is not just famous for automotive technology products like gasoline, diesel and chassis systems and car electronics alone; it also supplies products relating to automation technology, metals technology, packaging technology as well as power tools, heating technology, household appliances and security systems. In the year 2004 alone, Bosch has filed 2800 patent applications. This makes Bosch the second largest patent applicant in Germany, and the third largest at the European Patent Office.

Founded in 1886 in Germany, as "Workshop for precision mechanics and electrical engineering" by Robert Bosch, Bosch today is the largest automotive technology supplier in the world with a global group turnover of Euro 40 billion.

Bosch is active in every continent with 260 subsidiaries and associated companies in more than 50 countries. Bosch operates 249 manufacturing locations worldwide, of which 185 are located outside Germany in Europe, North and South America, Africa, Asia and Australia. It currently employs 242,400 people worldwide.

## Board of Directors, Committees, etc.

### Directors

H. Zimmerer, *Chairman*  
 Dr. J.J. Irani  
 Dr. G. Krueger (*up to 26.02.05*)  
 Dr. B. Bohr  
 D.S. Parekh  
 Dr. A. Hieronimus, *Managing Director*  
 M. Lakshminarayan, *Joint Managing Director*  
 V.K. Viswanathan, *Joint Managing Director*

### Company Secretary

B.S. Iyer

### Auditors

Price Waterhouse & Co.

### Bankers

State Bank of India  
 Canara Bank  
 Citibank, N.A.  
 Deutsche Bank AG

### Registered Office

Hosur Road  
 Adugodi  
 Bangalore-560030

### Stock Exchanges

(where the shares of the Company are listed)

The Stock Exchange, Mumbai  
 Phiroze Jeejeebhoy Towers  
 Dalal Street  
 Mumbai-400001

National Stock Exchange of India Limited  
 Exchange Plaza  
 Bandra-Kurla Complex  
 Bandra (E)  
 Mumbai-400051

### Audit Committee

D.S. Parekh, *Chairman*  
 H. Zimmerer  
 Dr. G. Krueger (*up to 26.02.05*)  
 Dr. J.J. Irani

### Shareholders'/Investors' Grievance Committee

H. Zimmerer, *Chairman*  
 D.S. Parekh  
 Dr. A. Hieronimus  
 V.K. Viswanathan

### Remuneration Committee

H. Zimmerer  
 Dr. J.J. Irani  
 Dr. G. Krueger (*up to 26.02.05*)

### Investment Committee

D.S. Parekh  
 Dr. J.J. Irani  
 Dr. A. Hieronimus  
 V.K. Viswanathan

### Property Committee

H. Zimmerer  
 D.S. Parekh  
 M. Lakshminarayan  
 V.K. Viswanathan

### Share Transfer Committee

Dr. J.J. Irani  
 Dr. G. Krueger (*up to 26.02.05*)  
 Dr. A. Hieronimus  
 V.K. Viswanathan

### Registrar & Transfer Agent

Alpha Systems Private Limited  
 No. 30, Ramana Residency  
 4th Cross, Sampige Road  
 Malleswaram  
 Bangalore-560003



## The Future of Diesel

### Common Rail Systems

- In August 2004, Bosch announced plans to make significant investments in India directed towards the introduction of the Common Rail Diesel Injection Systems (CRS) including application, testing and manufacturing.
- In 2004, over 46% of newly registered cars in Western Europe were fitted with diesel engines.

These facts emphasise not just the importance of Common Rail Systems in Bosch's global plans, but more importantly the increasingly significant role this technology is playing worldwide. It also highlights the importance of CRS in India, especially with the implementation of the stringent Bharat Stage emission norms. It is the Common Rail System technology that is powering the resurgence of diesel engines in today's world and Bosch has played a major role as a pioneer of this technology.

Since introducing the first Diesel Injection System in 1927, Bosch has been leading the way in the development of diesel systems and components. The modern high-pressure injection systems have transformed the ponderous, smoke-belching slowcoaches of yesterday into the sporty, fuel-efficient and clean automobiles of today.

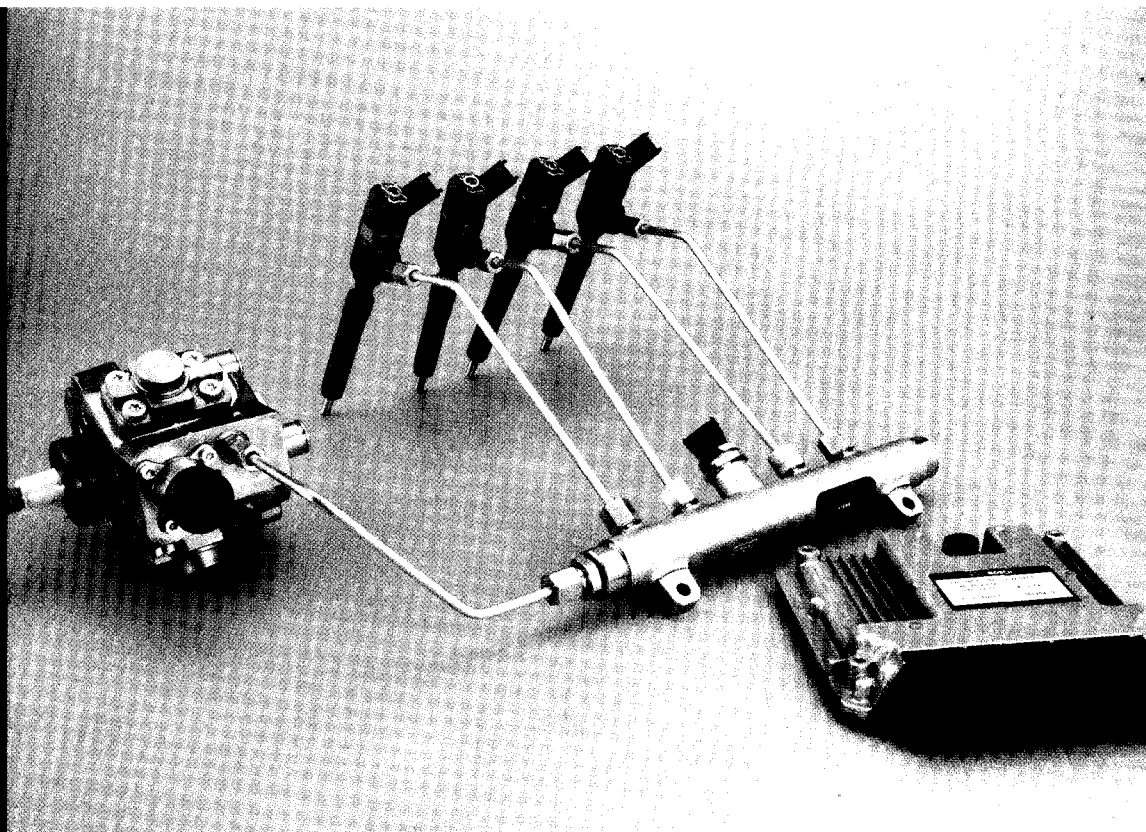
With the increase in global demand and emergence of diesel as a fuel of choice for countries like India, Bosch will continue to introduce several technological enhancements of the diesel fuel injection systems which represent a tremendous opportunity for Bosch worldwide, and MICO in India.

#### Origin of Common Rail System

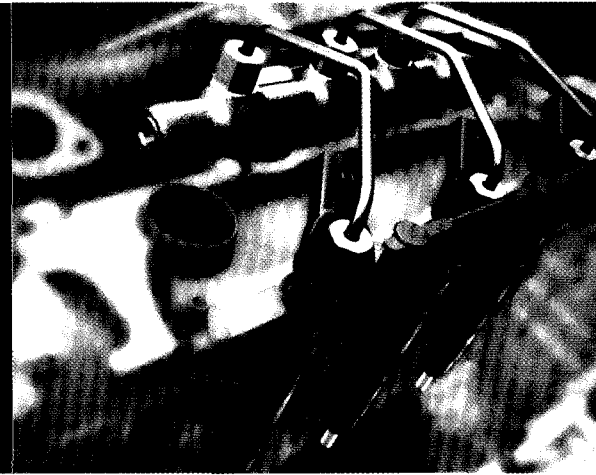
The basic idea of Common Rail System has been around for more than 50 years. Engine development engineers at Bosch applied for the first patent to cover an accumulator-type injection system for diesel engines.

The implementation of this technology was a challenge in itself, and it was Bosch who first introduced the Common Rail System to the passenger car segment. It has sold three times more Common Rail Systems (20 million systems) worldwide than all its competitors put together. With this, it has yet again showcased to the world, its innovative technologies that are making the world cleaner, safer and more economical.

Main components of a Common Rail System: Pump, Rail, Injectors and Electronic Control Unit.



Common Rail System applied to an engine.



### How does the Common Rail System work ?

The manner in which fuel is injected into the cylinder determines the engine's torque, fuel consumption, emission and noise level. The pressure of the fuel as it enters the cylinder, the shape and the number of the injections are critical factors. Essentially a Common Rail System is designed to provide the required fuel pressure consistently to the electronically controlled injectors through a shared fuel reservoir.

At the heart of the Common Rail System, are the following components:

- High Pressure Pump, for generating pressure in the rail.
- Rail, which contains the pressurized reserves of fuel.
- Injectors, which inject the requisite precise quantities of fuel into the combustion chamber.
- Electronic Control Unit (ECU), which acts as the control centre with inputs from a number of sensors.

In the Common Rail System, the two functions of pressure generation and injection are performed separately - by first generating and storing the fuel under high pressure in a central rail, then delivering it to the individual cylinders through the electronically-controlled injectors on demand. A high-pressure pump generates in an accumulator - the rail - a pressure of up to 1,600 bar (determined by the injection pressure setting in the engine control unit), independently of the engine speed and the quantity of fuel injected. The fuel is fed through rigid pipes to the injectors, which inject the correct amount of fuel in a fine spray into the

combustion chambers. The ECU controls all the injection parameters with extreme precision such as the pressure in the rail, the timing and duration of injection, as well as performing other engine functions. This ensures that incredibly high injection pressures are available at all times, even at low engine speeds.

### CRS Means Clean Diesel Technology

Worldwide, the shift from Gasoline towards Diesel has been primarily propelled by the CRS technology. Diesel engines inherently have been incapable of offering higher power that similar sized gasoline engines could muster, though they were always the torqueier of the two. All internal combustion engines need two key ingredients to operate: Air and Fuel. The precise delivery of these two ingredients is what makes clean and powerful combustion possible. Just as turbochargers help deliver copious amounts of air to burn fuel efficiently, the parallel revolution in fuel delivery has ushered in the resurgence of diesel engines worldwide.

Over the last few decades, there has been a lot of effort towards improving the diesel engine technology. The holy grail of Diesel Engine technology - the Common Rail System, has made diesel engines on par with gasoline engines. High fuel injection pressure produces a fine mist of fuel that burns better and cleaner in the combustion chambers. Also for every combustion cycle, Common Rail Systems allow up to five injections per cycle. The driver thus benefits through lower fuel consumption, better engine performance, higher torque and lesser noise.

### • CRS - The Bosch Advantage

The Bosch Common Rail Systems are characterized by injection pressures of up to 1600 bar.

Bosch is constantly innovating to improve the CRS technology. The focus at Bosch is to:

- Reduce emission
- Increase potential engine power
- Lower fuel consumption
- Lower the engine noise

### CRS - The MICO Advantage

Bosch and MICO are well poised to leverage the Indian diesel market with innovative products and technologies that would make mobility cleaner, safer and more economical. The current share of diesel vehicles in India is around 51%. We believe that as this diesel market expands, 60% of the diesel applications available will be Common Rail Systems over the next 8-10 years.

The Common Rail System technology in India has several advantages, at the individual and the industry level. For the individual car owner using CRS means less consumption of diesel and higher torque. For the industry it means saving of valuable foreign exchange and enhancing the export potential.

The CRS technology from Bosch and MICO can meet the Bharat Stage II and III emission norms that are being rolled out across the country this year. This technology is also capable of meeting the Euro IV emission norms to be introduced in the future.

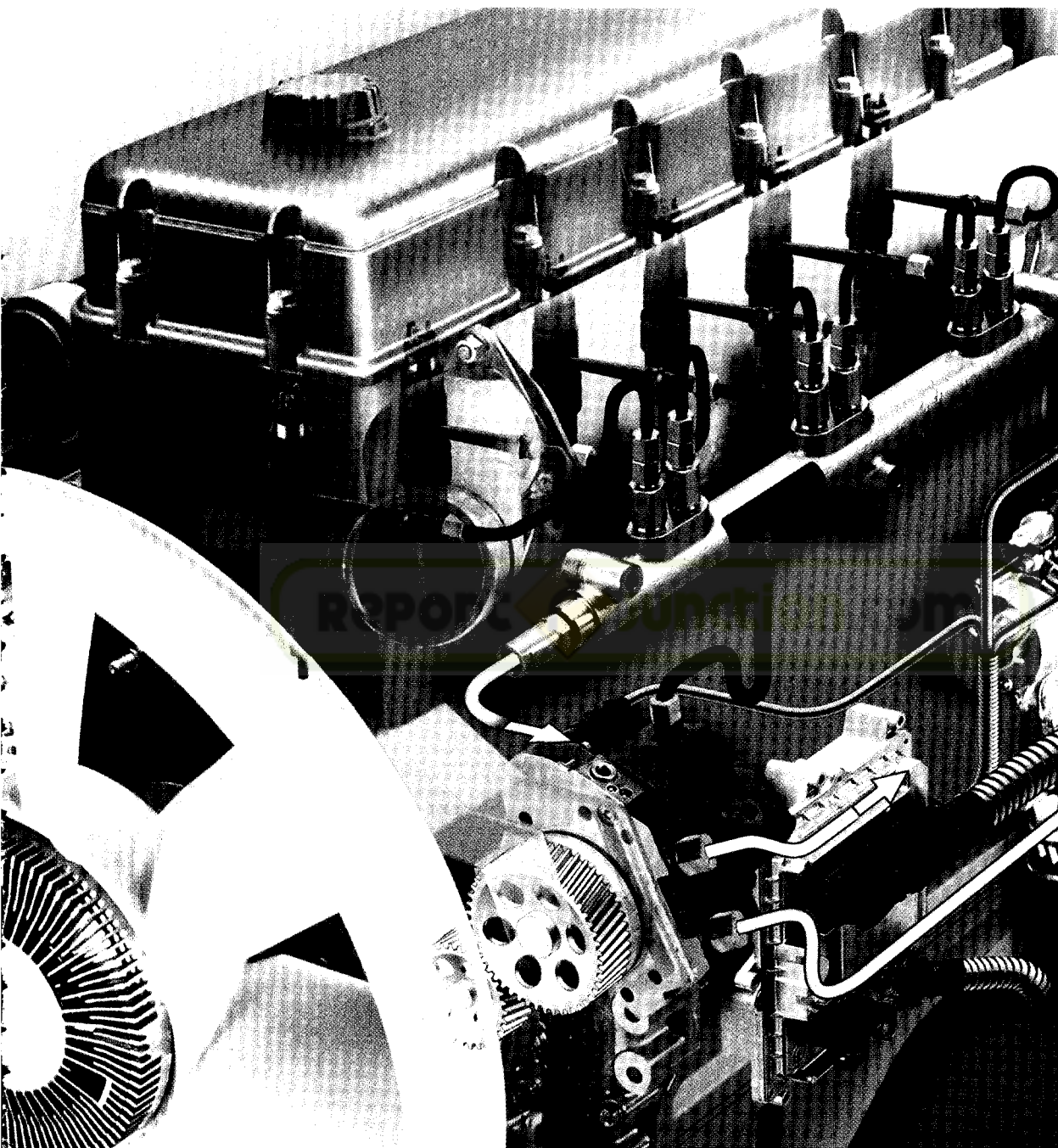
Recently, Bosch announced a Rs. 1,000 Crores investment in India over the next 4 years as part of its strategy to focus on Asia to drive global growth, and support MICO with its innovation, investment and expertise. A significant part of this investment, Rs 550 Crores, will be directed towards the introduction of the Common Rail Diesel Injection Systems in India. MICO will start the production of various components for CRS in 2006. The high pressure pumps for the system will be produced at Bangalore, supported by the production of injectors at Nashik.

MICO plans to roll out its first completely manufactured, applicated and tested Common Rail System in the year 2007. The first locally applicated Common Rail System was launched with Mahindra Scorpio 2.6 Turbo in February 2005. Mahindra & Mahindra alongwith the MICO and Bosch engineers applicated this technology in a record time of 1 year with a series of rigorous tests conducted at India, Spain, Germany & Switzerland.

Technologies that help make Mobility cleaner, safer and more economical.







Common Rail System  
fitted to a modern  
6 cylinder engine

## Financials at a glance

(Rs. Million)

	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
Sales	23279	18979	15507	14513	14927	13647	11932	12494	10647	8465
Of which export sales	3993	3256	2490	1928	1998	1779	1921	1906	1417	964
Profit before taxation	5635	3836	2005	1290	1434	1698	1158	1405	1242	1158
Less : Provision for tax on income	1887	1486	664	473	622	640	459	602	633	632
Profit after taxation	3748	2350	1341	817	812	1058	699	803	609	526
Add : Other adjustments (Net of tax)	-	-	-	-	309	-	-	-	-	-
Profit before appropriation	3748	2350	1341	817	1121	1058	699	803	609	526
Appropriations :										
Debenture redemption reserve	-	-	-	-	-	-	-	-	-	-
Capital redemption reserve	-	-	20	20	20	-	-	-	-	-
Capital reserve	-	-	-	3	-	5	30	1	5	56
Interim dividend (%)	-	-	10 (3)	-	-	-	-	-	-	-
Dividend (%)	321 (100)	208 (65)	128 (40)	99 (31)	106 (31)	99 (26)	84 (22)	99 (26)	91 (24)	84 (22)
Tax on dividend	42	27	-	10	11	11	8	10	9	-
Tax on dividend written back	-	-	-10	-	-	-	-	-	-	-
Tax on dividend for 2002	-	16	-	-	-	-	-	-	-	-
General reserve	2700	1700	900	685	984	943	577	693	504	386
Balance carried forward	685	399	293	-	-	-	-	-	-	-
Total	3748	2350	1341	817	1121	1058	699	803	609	526
Paid - up Capital	321	321	321	341	361	381	381	381	381	381
Reserves	12218	8833	6734	6001	4863	4673	3725	3119	2425	1916
Net worth	12539	9154	7055	6342	5224	5054	4106	3500	2806	2297
Gross block	14894	14392	14263	13699	13179	12046	10775	9650	7515	6039
Net block	1947	1927	2290	2463	2711	2926	2812	2852	2083	1653
Additions to Gross block	1019	680	940	1133	1327	1538	1373	2199	1542	1227
Earnings per share (EPS) (Rs.)	117	73	42*	24*	30* <sup>@</sup>	28	18	21	16	14

\* Based on weighted average of the number of shares.

<sup>@</sup> Adjusted EPS for change in inventory valuation : Rs. 18.

Previous years figures have been recast/regrouped wherever necessary. EPS for earlier years has been changed to bring the same in line with 2004 @ 10/- per share.