

## 1.0 COMPANY PROFILE

### 1.1.1 HISTORY OF COMPANY

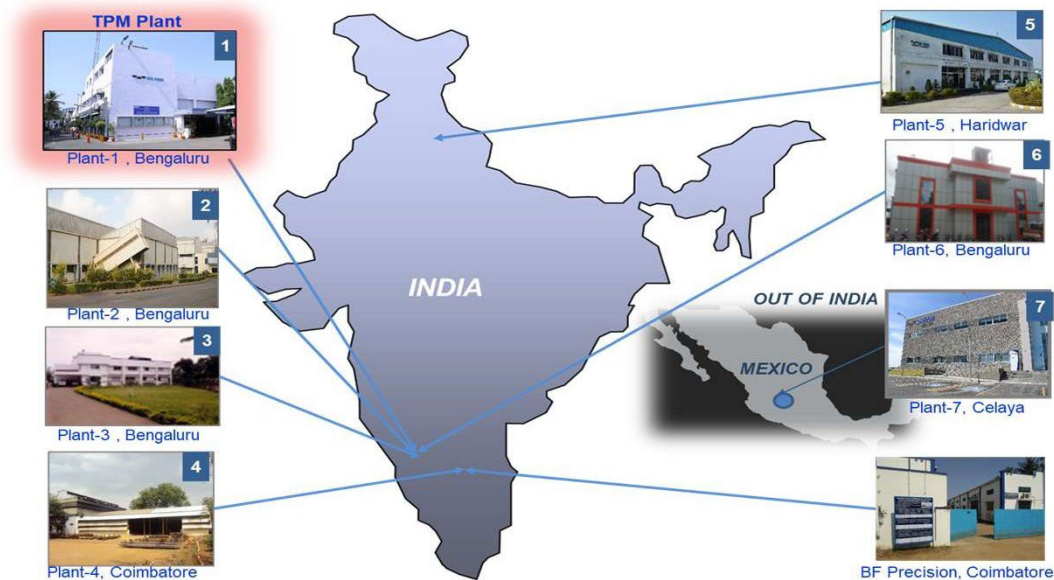
CIE Automotive India Limited (Bill Forge Division) Formerly known as Bill Forge Private Limited started by Mr. Anil Haridas was an unlisted private company incorporated on 23 December 1985 to supply automobile manufacturers

Bill Forge Private Limited was acquired by Mahindra CIE Automotive Limited in 2016, and now it is part Mahindra CIE Automotive Limited

Mahindra CIE Automotive is a Joint venture of Mahindra & Mahindra Indian Based Company and CIE Automotive a Spain Based Company, Our Parent company is CIE Automotive Spain.

### 1.1.2 COMPANY PRESENCE

Bill Forge Division Plant-1 is mother plant of Bill Forge Group located in Bommasandra Industrial Area, of Indian Karnataka State, Facilities include Cold Forging Presses, CNC machines, Centerless grinding Machine, Heat Treatment Furnaces, 90% Business is from 2-wheeler automotive OEMs, Plant-1 Started TPM Journey in 2018 and is ready to apply for the prestigious JIPM TPM excellence Category-A Award



#### **Bill Forge Plant-1**

Plant Started: 1985

Employees :325

Plot Area: 2 Acers

Operating Shifts: 3 Shifts

**1.1.3 PRODUCT RANGE**



**TRIPOD HOUSING**



**WHEEL HUB FLANGES**



**SPIDER CROSS**



**ARRESTER**



**FEMALE TRIPOD HOUSING**



**SUSPENSION ARM**



**STEERING COLUMN YOKE & TUBE YOKE**



**PINION SHAFT**



**INPUT SHAFT**



**COMMON RAIL**

**COLD FORGED PRODUCTS**



**VALVE SPRING RETAINERS**



**SPARK PLUG HOUSING**



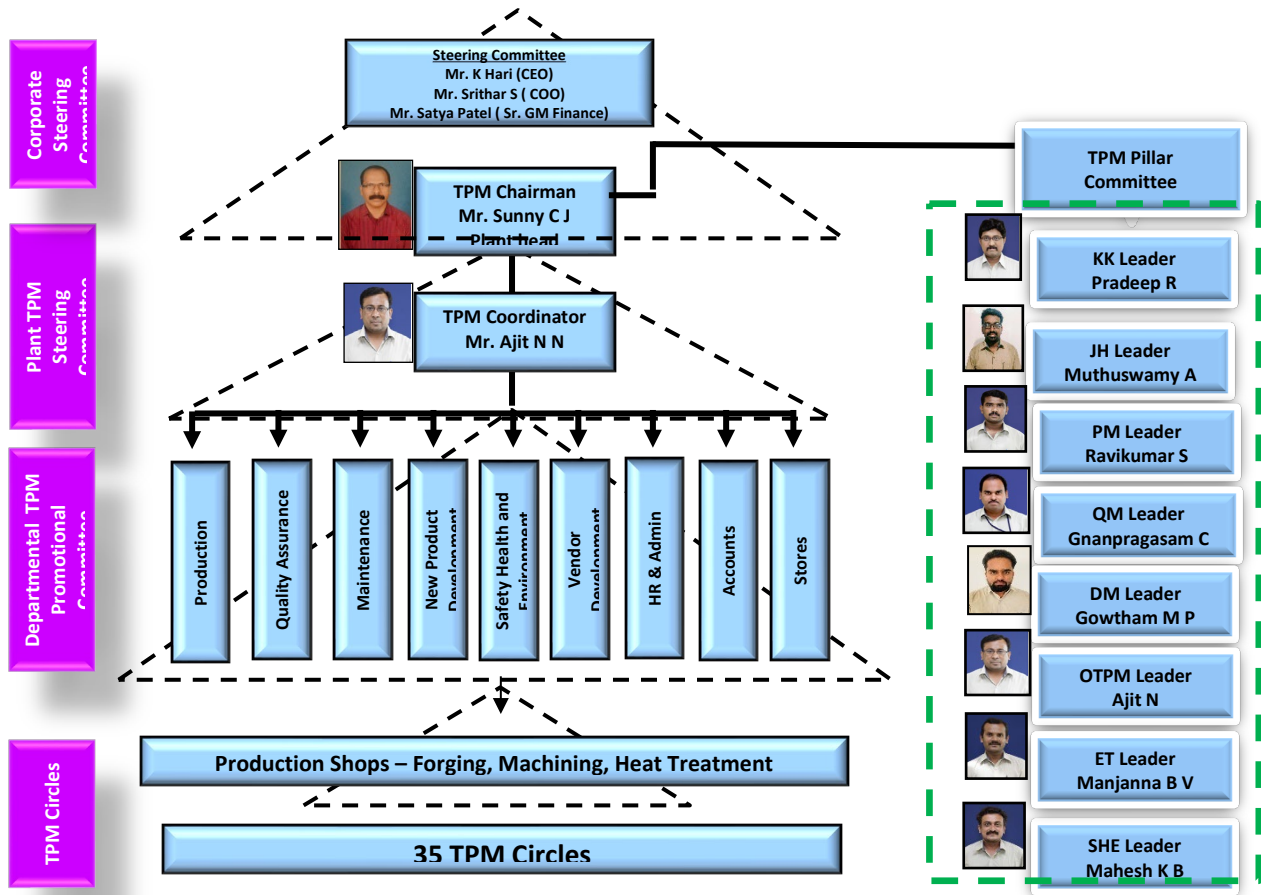
**STEERING RACES**



**AXLE SHAFT**

Above cold forged parts are manufactured in plant-1 where TPM is being practiced

# TPM ORGANIZATION STRUCTURE



Our TPM promotional organization structure/ Covering from top management to TPM circles

### 1.1.4 OUR CUSTOMERS

Bill Forge Division customers include all Major Automobile manufacturers and Tier-1 Companies. We have also started including Electric Vehicles Manufacturers



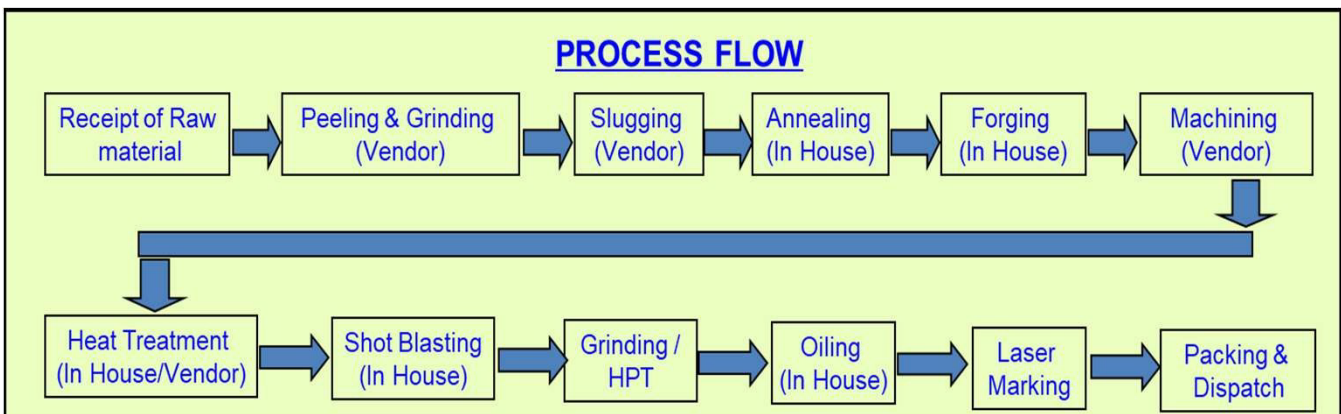
We have good generation of revenue both from 2-wheeler and 4-wheeler market covering all OEMs and Tier-1 Companies

### 1.1.5 PROCESS TECHNOLOGY

Bill Forge Division plant-1 is having Forging, Machining and Heat Treatment facilities

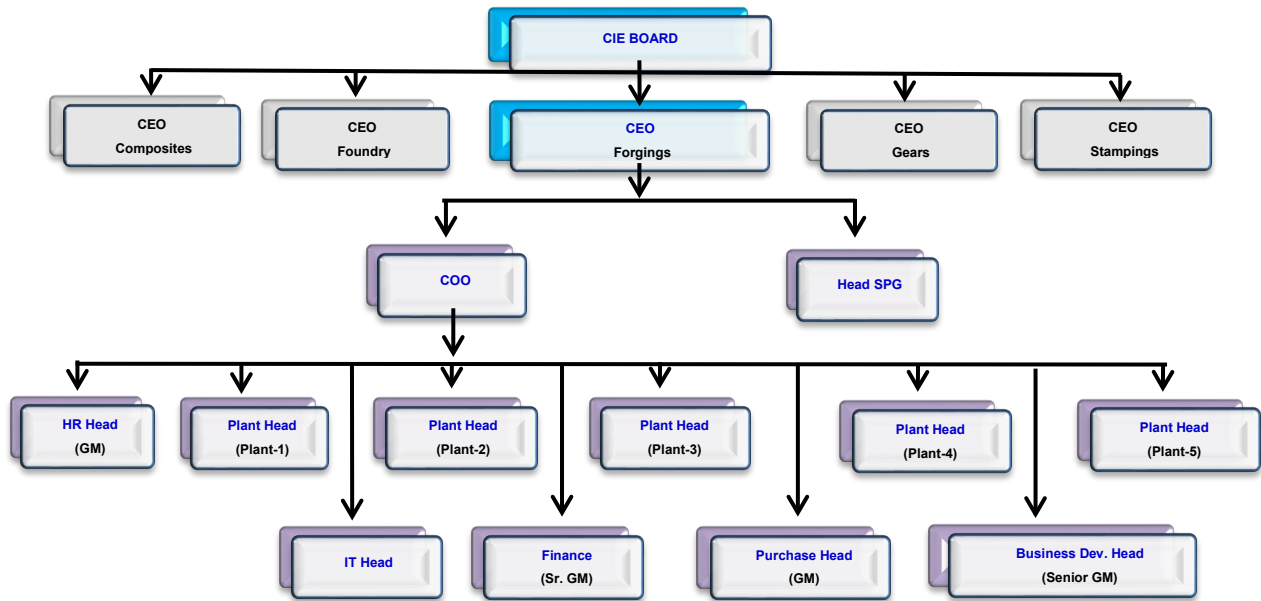


### 1.1.6 PROCESS FLOW



Bill Forge Division plant-1 general process flow covering the outsourced process and inhouse process

## 1.2.1 ORGANIZATION STRUCTURE



## 2 .MILESTONE ON THE JOURNEY OF MANUFACTURING EXCELLENCE

### 2.1.1 NEED FOR TPM

#### External Factors

- ❑ **Growing Customer Expectation**
  - ❖ Year on Year Price Reduction
  - ❖ Alternate choices for customers
  - ❖ NPD lead time reduction
- ❑ **Competition**
  - ❖ Domestic
  - ❖ Global
- ❑ **Cost**
  - ❖ Increase in Variable cost
  - ❖ Increase in Manpower cost
- ❑ **Demand**
  - ❖ Fluctuating Market demand
  - ❖ Increased variety of Products
  - ❖ Strict Norms in Environment control
  - ❖ Rapid entry of new products

#### Internal Factors

- ❑ **Machines**
  - ❖ Old & Less Reliable
  - ❖ High Breakdown
  - ❖ High maintenance cost
  - ❖ Manually operated
- ❑ **Operatives**
  - ❖ Low skill level
  - ❖ Lack of Multi skill
  - ❖ Traditional mind set
- ❑ **Quality**
  - ❖ High rejection
  - ❖ High rework
  - ❖ Customer complaints
- ❑ **Manufacturing**
  - ❖ Increase in no. of set ups
  - ❖ Low Operational efficiency
  - ❖ High Losses
- ❑ **Cost**
  - ❖ High Inventory
  - ❖ High Power cos

**Need Systematic Approach**



**BIRTH OF TPM**

We considered the internal and external factors and understood TPM is the best tool to adopt for systematic growth and sustain

## 2.1.2 OTHER CRITICAL FACTORS

### **KK Pillar**

- Low OEE of 62%
- Low Production per man 15800 parts per man
- High conversion cost 22.81 % of sales
- High raw material yield 15.09 % of sales

### **JH Pillar**

- Poor basic condition of machines
- Frequent minor stoppage (1344 occurrences / month)
- Mind-set of operator – I operate You Maintain
- High coolant consumption 800 liters/Month

### **PM Pillar**

- High breakdown occurrence-110 Occurrence/Month
- High MTTR 6.15 Hours/Machine
- High repair and maintenance cost – 12.14 Lakhs/Month

### **QM Pillar**

- High customer complaints 8 Nos / Year
- High In-house rejection of 1.38%
- High supplier Rejections 3.83%
- High Cost of poor quality – 0.97 % of sales

### **DM Pillar**

- High lead time for new product development
- High rejection in new product development

### **E&T Pillar**

- Breakdown due to inadequate skill was high as 40 Nos / Month
- Defects due to inadequate skill was 0.12% Per Month
- Accident due to lack of skill 4 Occurrence/Year

### **OTPM Pillar**

- High management Loss of 1500 Hours /Month
- High WIP inventory of 60 days

### **SHE Pillar**

- Minor accidents – 6 Occurrences/Year
- High hazardous waste generation 3000Kgs/Month
- Poor industrial hygiene
- Unsafe working environment

### 2.1.3 OUR TPM JOURNEY



### 3. BENEFITS ACHIEVED

#### 3.1 TANGIBLE BUSINESS GROWTH

Area	Sl. No.	Parameters	UOM	Better	BM (2018 )	Target	Actual (2023)
<b>BUSINESS</b>	1	Sales	Millions INR /Year	↑	2098	1743	1547
	2	Conversion Cost	% of sale/Month	↓	22.81	20.3	20.29

Sales target is revised considering the customer projection, Conversion cost is reduced by 8%



### 3.2.1 INTANGIBLE BENEFITS

#### ENHANCEMENT SEEN IN :-

- ❖ Employees **morale** due to clean, safe & pleasant work environment
- ❖ **Sense of pride** in employees about the company.
- ❖ Enhanced **operator capability** by grasping Knowledge and Experience through sharing
- ❖ Increased **involvement** and enthusiasm of Workforce

#### INCREASE IN AWARENESS IN :-

- ❖ Better **understanding** of equipment performance
- ❖ Better understanding of **Equipment criticality** to take focused Improvement efforts & achieve benefits
- ❖ Shift in approach towards **Root cause Analysis** to eliminate the Problems.
- ❖ Enhanced **operator capability** by grasping Knowledge and Experience through sharing.

### 3.2.2 EMPLOYEE INVOLVEMENT

Glimpses of TPM promotional activities shown below



Best 5S Zone Competition  
Monthly



Best Kaizen Competition  
Fortnightly



Safety day competitions  
Yearly



Won Second Prize in Kaizen  
Competition by ACMA



Winner in TPM Circle Zonal level  
Competition by CII



Won Second Prize in Kaizen  
Competition by ACMA

## 4.0 KEY OF OUR MANUFACTURING EXCELLENCE

- ❖ Implementing innovative/break through kaizens across workplace to achieve zero losses
- ❖ Up keeping the momentum of all our employees by maintaining the positive work culture
- ❖ Develop subject matter experts from the shop floor for JH and PM topics
- ❖ Increased involvement and enthusiasm of Workforce

## 5. ACHIEVEMENT RECORDS

Area	Sl. No.	Parameters	UOM	BM (2018)	Target					Actual				
					2019	2020	2021	2022	2023	2019	2020	2021	2022	2023
<b>Business</b>	1	Sales	Mio Rs	1626	1500	1600	1500	1600	1743	1637	1231	1545	1543	1547
	2	EBIDTA (%)	% of sale	17	18	20	23	24	25.00	17.14	18.13	24.26	24.71	27.69
<b>Productivity</b>	3	Overall Equipment Efficiency	%	62	69	74	79	85	87	73	76	79	81	85
	4	Production Per Man	No./Hour	15800	17556	18372	19268	20550	20870	16632	17556	18588	19600	19750
	5	Breakdown Hours Total	Hours	717	359	179	89	0	0	226	334	40	3	2.0
	6	Breakdown Occurrences Total	No.	110	74	140	55	8	0	27	55	7	2	2
<b>Quality</b>	7	Customer Complaints	No.	8	4	2	1	0	0	0	2	4	0	0
	8	In house Rejection	%	1.38	1.11	0.84	0.57	0.40	0.1	0.86	0.93	0.46	0.13	0.11
	9	Rework	%	4.61	3.69	2.77	2.25	1.75	0.7	3.51	2.20	2.01	0.87	0.64
	10	Supplier Rejection	%	3.83	3.06	2.30	1.54	0.75	0.4	2.54	1.99	0.94	0.55	0.39
	11	COPQ	% of sale	0.97	0.78	0.59	0.40	0.20	0.1	0.65	0.48	0.24	0.13	0.11
<b>Cost</b>	12	Conversion Cost	% of sale	22.81	22.35	21.89	21.44	20.98	20.3	22.12	21.67	21.21	20.52	20.29
	13	RM Cost		15.09	14.79	14.49	14.19	13.58	13.43	14.94	14.64	14.34	13.88	13.73
<b>Delivery</b>	14	Delivery adherence	%	100%	98	100	100	100	100	100	100	100	100	100
	15	WIP Inventory	Days	60	55	50	45	42	38	55	50	42	42	41
<b>Safety</b>	16	Major Accidents	No.	0	0	0	0	0	0	0	0	0	0	0
	17	Minor Accidents	No.	6	2	2	1	0	0	2	1	0	0	0
<b>Morale</b>	18	No of kaizens/Year	No.	No data	250	600	950	1520	1800	483	674	1145	1303	1867
	19	No. of suggestions/Year	No.	No data	500	900	1550	2280	2500	400	1000	1600	1900	3089