



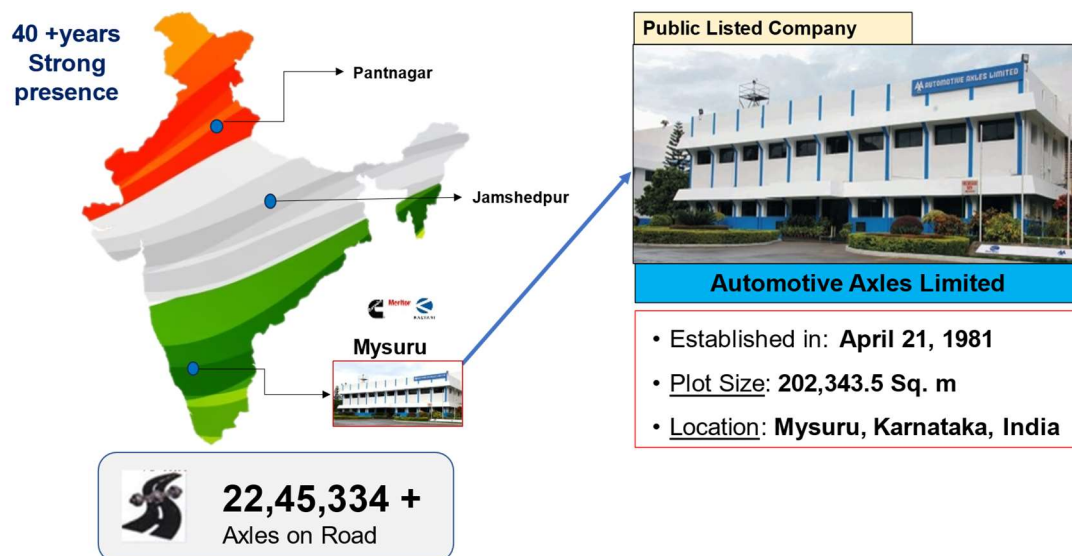
Automotive Axles Limited

Joint Venture between Kalyani & Cummins Meritor Group
Hootagalli Industrial Area, Off Hunsur Road,
Mysuru-570 018 Karnataka State,
India.

1- A. Organization Profile

Established in 1981, Automotive Axles Limited (AAL) is a joint venture of Kalyani Group and Cummins Meritor. With manufacturing facilities located at Mysore (Karnataka), Pantnagar (Uttarakhand) and Jamshedpur (Jharkhand), the company manufactures drive axles, non-drive axles, front steer axles, specialty & defense axles, and drum brakes. It provides these products to the major domestic and global manufacturers of trucks & buses pertaining to segments such as light, medium & heavy commercial vehicles, military & off-highway vehicles, aftermarket, and exports. As a continuous process, the company believes in introducing new products regularly to meet the emerging needs of the commercial vehicle market.

AAL has developed an impressive domestic OEM clientele that includes Ashok Leyland, Tata Motors, Daimler India, Volvo India, BEML, Mahindra Trucks & Buses, Caterpillar, Escorts. AAL also exports axle parts to UD Trucks & Cummins Meritor entity 19 Countries. Our Products range covers all commercial vehicles starting from 7T to 55T (GVW- Gross vehicle weight).



Products



Axles



Brakes


1- B. Accreditations

As a part of our Vision going towards World Class manufacturer, for a consistent Quality, Safety & 5S we are certified with various certifications by prestigious certifying bodies.

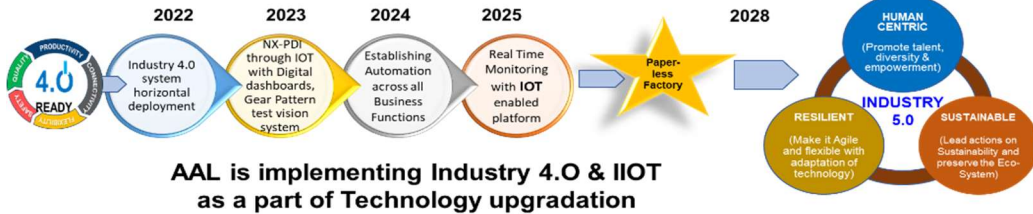
1. IATF 16949:2016 for Quality Management System by DQS India
2. ISO 14001:2015 for Environmental management System by DQS India
3. ISO 45001:2018 for Occupational Health & Safety Management System by DQS India
4. 5S by QCFI & JUSE Japan.

1-C. Major Manufacturing Capabilities

Our key manufacturing capabilities include state of the art Housing Manufacturing including robotic welding, Gear manufacturing & Axle assembly Line. We have adapted a mix of Single piece flow, Cellular manufacturing & Continuous manufacturing concepts in our plant to optimize productivity.

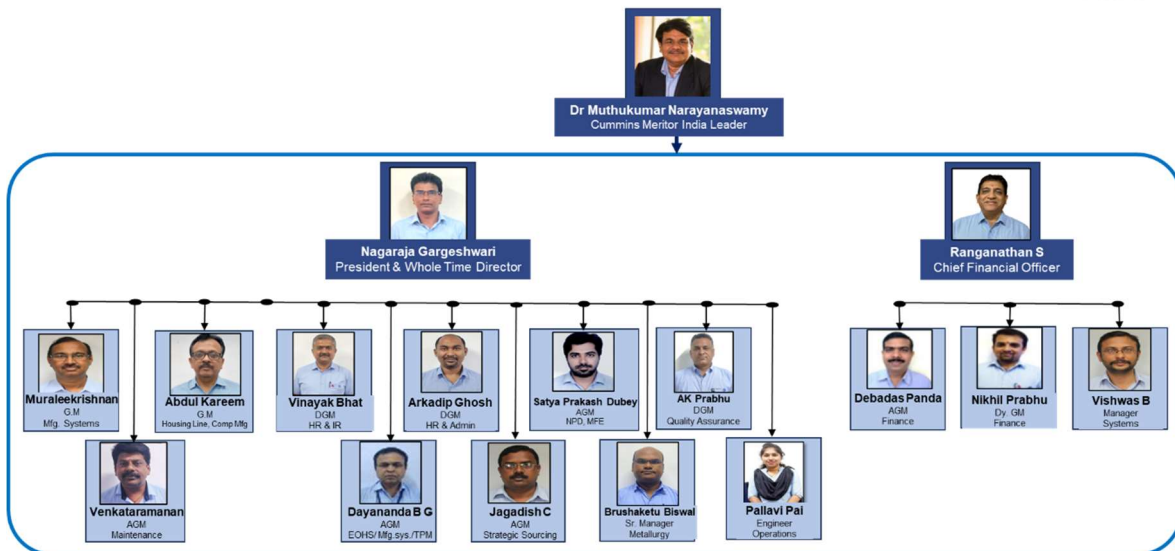
<p>Housing Manufacturing</p>  <ul style="list-style-type: none">• Flexible Housing line with Robotic Cells• Friction welding for spindle• Flexible welding lines• Welding is our key technology process (52%) & critical to product quality <p>Single Piece Flow</p> 	<p>Gear Manufacturing</p>  <ul style="list-style-type: none">• Capability to make Spiral Bevel, Straight Bevel and Hypoid type gears.• Close Loop Manufacturing• Turbo tester with SFT measurement capability. <p>Cellular Manufacturing</p> 
<p>Heat Treatment Facilities</p>  <ul style="list-style-type: none">• 3 Continuous carburizing furnace for heat treatment with Robo quenching.• Induction hardening machines for spindle & drive shafts. <p>Continuous Manufacturing</p> 	<p>Axle Assembly</p>  <ul style="list-style-type: none">• Continuous flow assembly lines for Axle assembly & Drive Head Assembly.• Test rigs for NVH, contact pattern & other parameters.• Industry 4.0 Enabled Line <p>Single Piece Flow</p> 

Digital Manufacturing – IOT - Update

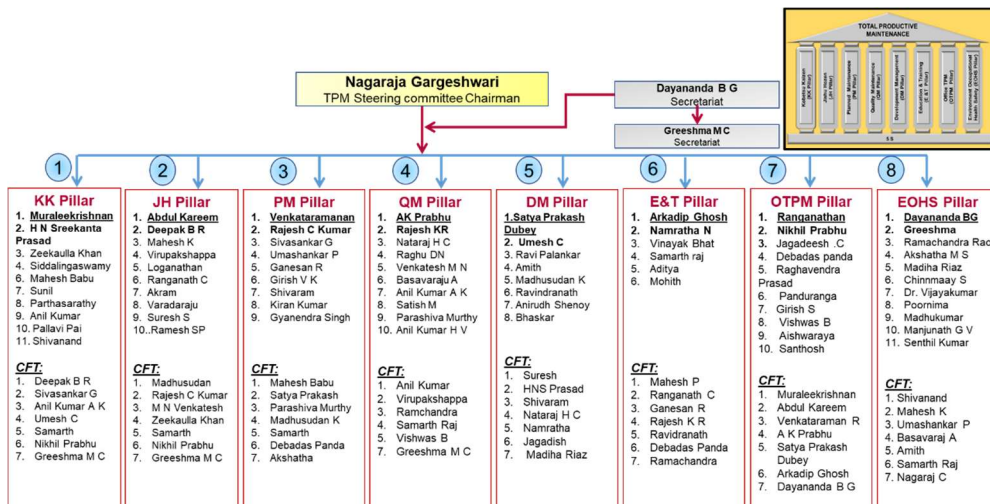


1-D Organization Structure

ORGANIZATION STRUCTURE



1-E TPM Steering Committee



2. Milestone on the Journey to Manufacturing Excellence

In today's competitive scenario, to achieve business excellence in all spheres, TPM is one of the best Manufacturing Practice. 5S Implementation was started across the plant to form a strong base for TPM journey. Automotive Axles was 5S certified by QCFI & JUSE, Japan in the year 2017, & consequently recertified in the year 2020 & 2023.

TPM Journey in AAL started in the year 2018-19 with selection of 3 Manager Model Machines, demonstrated by team of competent and committed Managers to the workers. Automotive Axles launched TPM activities on 4th Nov'2020 with formal kick off in the presence of key customers, supply partners, in collaboration with JIPM under the guidance of CII India. In the initial stage of TPM Implementation to progress and achieve TPM Excellence the year-wise Key Activities were mapped, TPM policy and TPM objectives were formally announced to all employees by the Top management with an oath towards total commitment.

TPM tools & Technique is the solution we adopted for effective management of continual change in Business Scenario. TPM Journey drives Automotive Axles towards a continuous increase in productivity by eliminating all losses & waste.

NEED FOR TPM, SUSTENANCE & CONTINUED TPM JOURNEY

Scenario during Benchmark FY 18-19	Current Scenario FY 22-23	Future Scenario FY 25-26
<p><u>Changing Customer Needs</u></p> <ul style="list-style-type: none"> Emission norm changed from BS4 to BS6. Product Quality & Reliability – Warranty terms increased from 1 year to 3 years (100,000 KM to 300,000 KM) Product traceability. <p><u>Need for Process Improvements</u></p> <ul style="list-style-type: none"> 40+ years old Machines <ul style="list-style-type: none"> (Improve uptime, Reduce losses) Low-Capacity utilization <ul style="list-style-type: none"> Improve Productivity & efficiency Need for upgradation of equipment's to enable Industry 4.0 <p><u>People culture</u></p> <ul style="list-style-type: none"> Acceptance towards New Technology Behaviour change – "I Operate U Maintain" Mindset Managerial Challenge for collective problem solving. Enhance Employee capability 	<p><u>Changing Customer Needs</u></p> <ul style="list-style-type: none"> Product Quality & Reliability – Warranty terms increased from 1-year to 5 years (100,000 KM to 600,000 KM) Component traceability from product to part <p><u>Need for Process Improvements</u></p> <ul style="list-style-type: none"> Sustain Zero Breakdown in A class Machine (Improve uptime, Reduce losses) Achieved Zero Accidents Automation – Enhance Quality & Efficiency All Circles certified for BIQ – Minimize Rework/ Inhouse PPM . <p><u>People culture</u></p> <ul style="list-style-type: none"> Customer centric Overall Organizational Behavioural change . Change in perception to "I Operate I Maintain" TPM Methodology, tools techniques effective utilization for problem-solving. 	<p><u>Changing Customer Needs</u></p> <ul style="list-style-type: none"> Customized products calls for proliferation New product Technologies– NVH ,High Efficiency Axles, E-axle, Disc Brakes. Just In Time Supply & Delivery Challenging Competition to Business Sustenance <p><u>Need for Process Improvements</u></p> <ul style="list-style-type: none"> Fully Automated Lines with built in diagnostics. Sustaining Zero Accidents Gender neutral workspace Organization- WSO Sustain Zero Breakdown in A, B, C class machines. (Adhering - PM ,CBM ,TBM) <p><u>People culture</u></p> <ul style="list-style-type: none"> Diversified & Multi skilled Human Capital Orienting towards Lean Manufacturing "I Operate I Maintain my Process" Mindset All the levels of Employees participation involvement & engagement in continual improvement.

- 5S Standardization across the Plant including Office areas
- Active participation of TPM Circles
- Zero BAD & COC Adherence
- Customer centric Organizational Behaviour
- Focus on 100% completion of JH Step 4 Activity

- Adopting, Implementing & Sustaining TPM -JIPM 12 Step methodology to ensure cost effective operation.

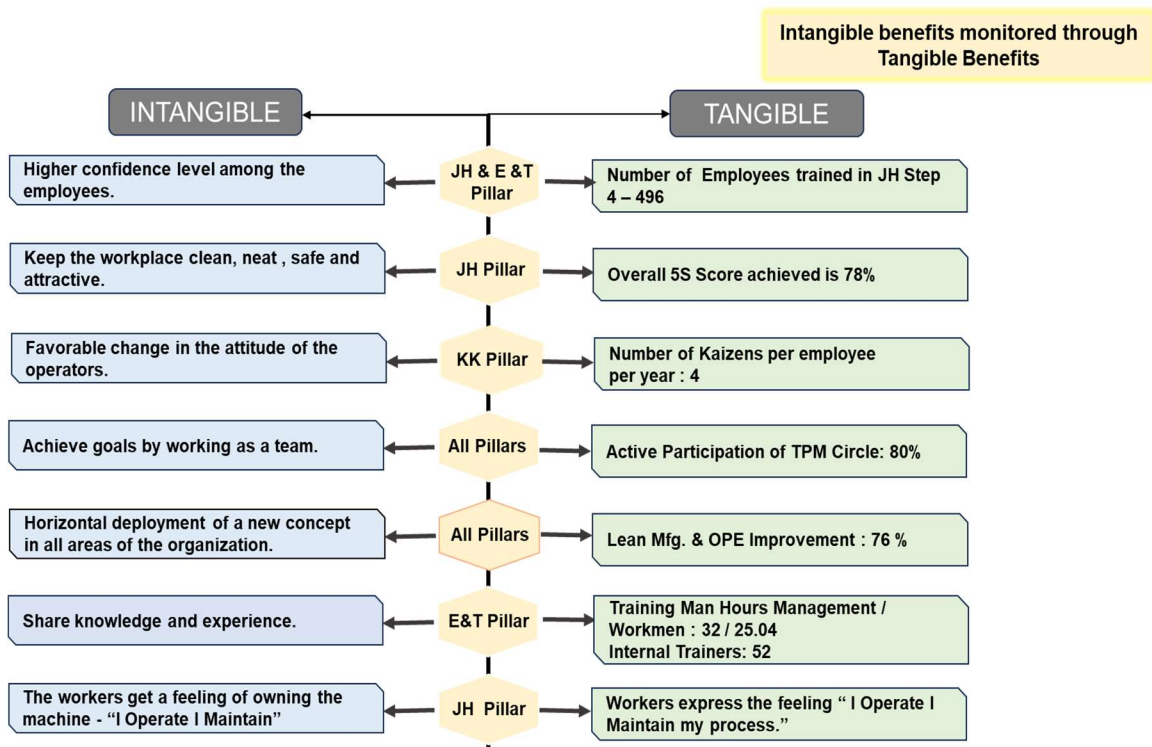
External & Internal Rewards & Recognition

 <p>" SILVER Award "for National Award for Manufacturing Competitiveness 2022-23</p> <p>International Research for Manufacturing Competitiveness conducted an assessment on Manufacturing Competitiveness .</p> <p>FY 22-23</p>	 <p>Gold Award Mysore, India Adjusting Locking Bolt Not Assembled Gold Award Mysore, India Torque Data Traceability Bronze Award Mysore, India Wrong Flange Half Assembly</p> <p>FY 22-23</p>	 <p>Quality Quad Award by DICV</p> <p>successfully achieved defect free component supply consistently .</p> <p>FY 22-23</p>	 <p>Exporter Award by Karnataka Govt.</p> <p>This is a recognition of Meritor's Commendable performance in Exports</p> <p>FY 22-23</p>	 <p>Gold Award Best Performance in ESG</p> <p>. This is a recognition of Meritor's Commendable performance in ESG</p> <p>FY 22-23</p>	 <p>Business Partner of the Year award</p> <p>This is a recognition of Meritor's Commendable overall performance.</p> <p>FY 22-23</p>
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3. Benefits Achieved

TPM implementation at Automotive Axles has not only helped Business results but also brought drastic change in organization culture.

Intangible Benefits



4. TPM Award Assessment Achievement Sheet

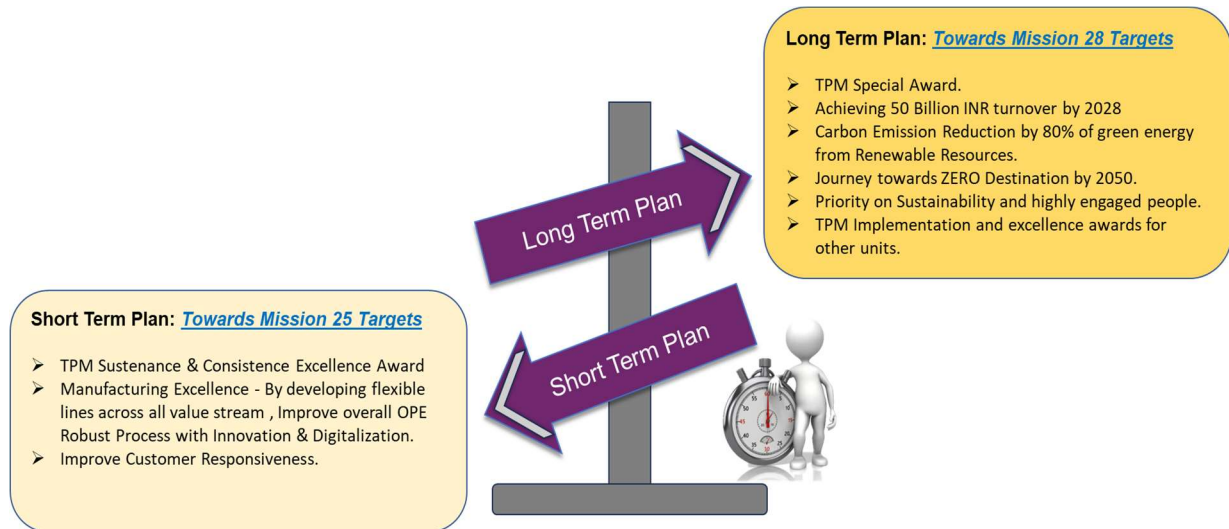
Below are tangible benefits on key business results in terms of PQCDsME.

2023 TPM Award -Achievement Sheet					
Company	Automotive Axles Limited				
Plant name	Automotive Axles Limited, Mysuru				
TPM Slogan/Objectives	<i>“Together Towards World Class Through TPM”</i>				
Year when TPM activity started	2018				
Year of benchmarking	2018- 2019				
Category	Index (Calculation Formula)	Unit	Kick off/TPM Started (FY 2018- 2019)	Actual Status FY 2022- 2023	
S	Number of work-related accidents requiring days off work	Cases/ year	3	1	
S	Number of work-related accidents not requiring days off work	Cases/ year	11	15	
P	Productivity for main products	SDLH/Manday * Standard Direct Labour Hour	4.01	5.2	
P	OEE (Overall Plant Efficiency)	%	60	76	
P	Availability	%	74.9	87	
P	Performance Rate	%	80.9	88	
P	Quality Products Rate	%	99	99	
P	Number of breakdowns	Breakdowns/ Month	367	132	
P	MTBF	Hour	1750	2401	
P	MTTR	Hour	3.7	2.2	
Q	Number of customer complaints	Number/year	70	41	
Q	In-line defect rate, scrap	PPM	2187	2087	
Q	In-line defect rate, rework	PPM	38136	7760	
C	Cost index	Conversion Cost	% to Sales	5.1	3.6
		Material Cost	% to Sales	73.1	75.6
D	Production Lead time	Days	7	6	
D	Delivery performance	%	95	92	
S	Safety index	Accidents per 1,000,000 operator hours	0.5	0.14	
M	Number of Employee Suggestion / Kaizen	Number/year	2100	4500	

5.Key of our Manufacturing Excellence

The Key to our manufacturing excellence lies in continual improvement activities and periodic review of pillar activities and achieving Mission 25 & 28 Targets.

Future Plan



6. Contact

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