

# CV

COMMERCIAL VEHICLE

At the heart of the Indian truck & bus industry

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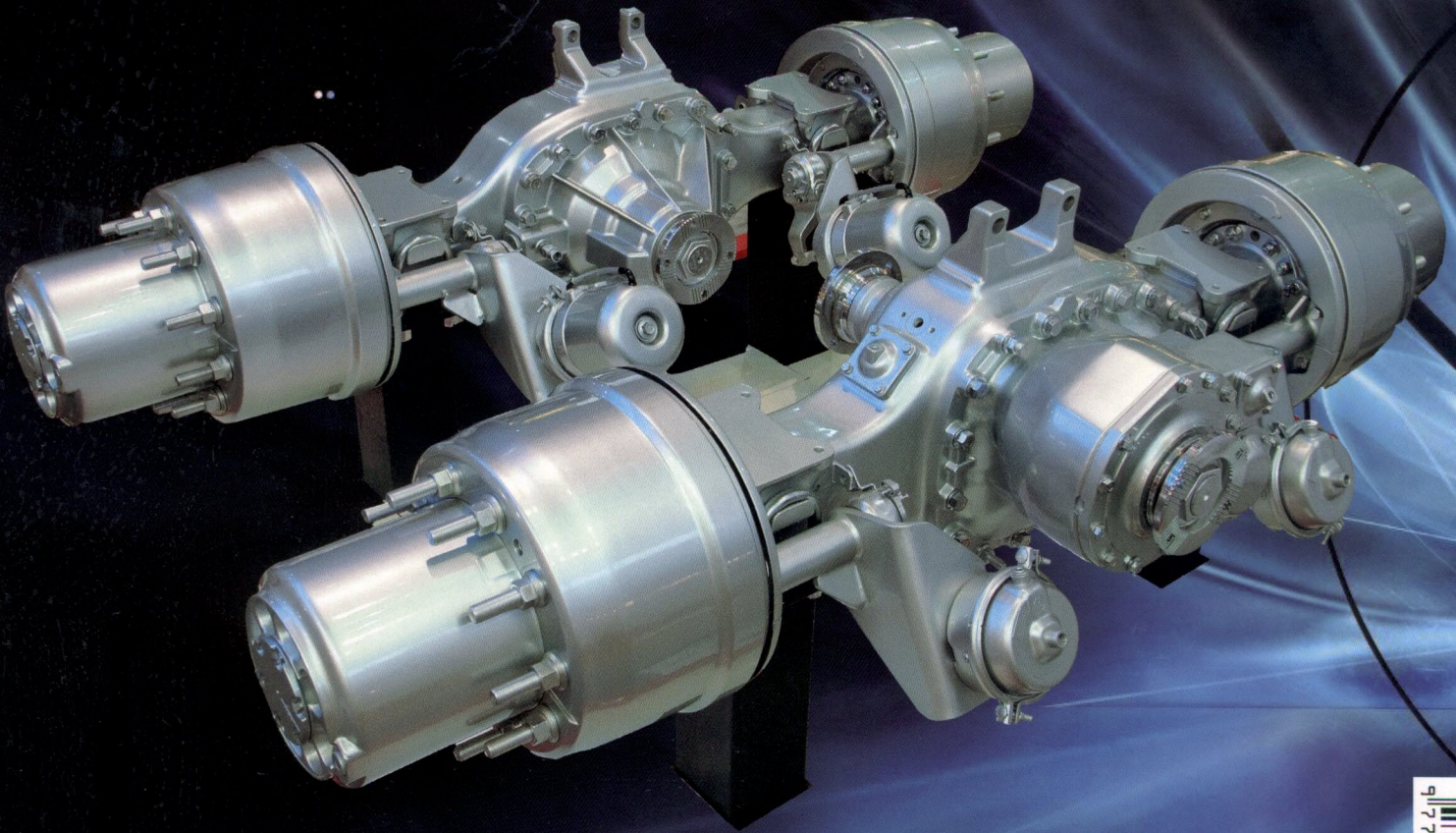
Ural  
*expands portfolio*



Trinetra Wireless' telematics solutions • Zanvar Group marches o

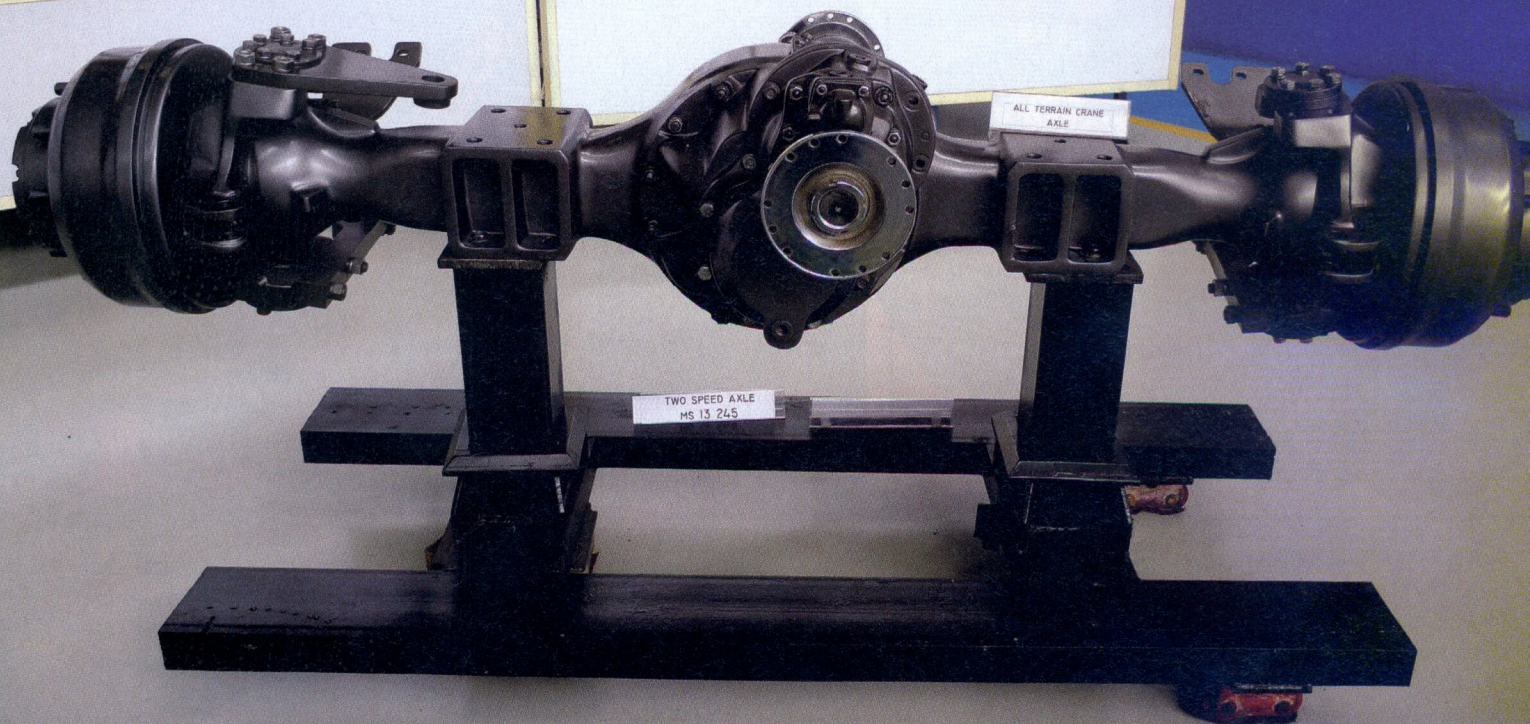
# Meritor

## goes the *next gen* way



NEXT  
GEN  
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# Meritor displays real ambition

The axles and brakes major is about to put out an array of next generation products. In sync with the fresh arrivals, the company is bolstering its core strength in R&D and manufacturing.

Story Sridhar Chari

**M**eritor HVS (India) Limited's axles have been bearing a huge chunk of the Indian CV industry's weight for close to three decades now. Now, after having put more than 1 million axles on the road, India's largest independent supplier of axles is bidding to introduce two

cutting edge products in the Indian market. Coming soon are hub reduction and two-speed axles.

Imported pieces of the MS 13 245 two speed hypoid drive axle have either already been supplied or are in the process of being supplied to OEMs like Tata Motors, Ashok Leyland, VECV and Ma-

hindra Navistar. This is in order for the CV majors to complete their internal testing while Meritor conducted testing and validation using localised parts at its Mysore facility. 'The 100 percent localised product is on offer now. Only limited parts such as bearings and seals will be imported,' states S. Raghunathan, VP and

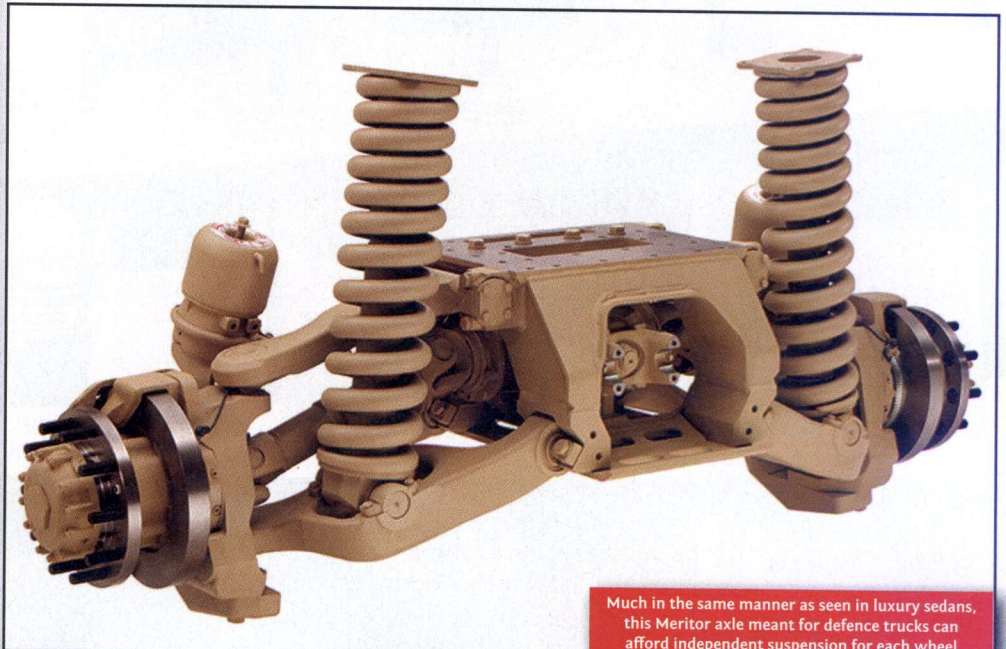


Siva Kumar (L) and S. Raghunathan are confident that superior road infrastructure and the consequent emergence of more powerful trucks would boost demand for hub reduction axles.

ED, Meritor HVS (India) Ltd. Primarily intended for 6x2 and 8x2 rigids as also 4x2 tractors, the 13 tonne GAWR axle allows the driver to change rear axle ratios on the fly depending upon application and terrain. 'While a fully loaded truck would need ratios of between 5-6:1, on the practically empty return trip, it can do very well with a ratio of 4-5:1. Two speed axles offer this flexibility, resulting in superior speeds and better fuel-efficiency. Needless to say, the ratios may be modified to achieve the same benefits, depending upon the gradient being navigated too,' avers Siva Kumar – Director, India Product Program, Meritor Heavy Vehicle Systems LLC, USA. Thanks to the coupling of planetary gears with the main gear, twin-speed axles can virtually double the available gearbox's speeds. The broad pitch that Meritor is making in offering two-speed axles is that, when they are coupled with six speed transmissions, the combination is more cost-effective than a standalone 9-speed transmission. 'An Indian fleet operator, has been running three trucks fitted with our twin-speed axles for 3,00,000 kms over the course of a year. The firm confirms that use of the twin-speed axle has reduced turnaround time by 20 percent, while boosting fuel-economy by 5-10 percent. This means that breakeven

on the product can be achieved within a year,' claims Raghunathan. That is not all there is to twin-speed axles. 'Based upon Meritor's successful experience in a market like Brazil, we can even bring to the table, electronic controls that would prevent drivers from making ill-advised changes to gear ratios,' reveals Indranil Dasgupta, Chief-Product Engg. & R&D, Meritor HVS (India) Limited.

Meanwhile, the hub reduction axles are coming along well too. Meritor HVS (India) has made available close to 20 hub reduction axles to Ashok Leyland for testing. By August, Mahindra Navistar shall also be part of the sampling exercise. In the background, prototypes of hub reduction axles localised in Mysore are being tested at Meritor's European facilities. If all goes well, these axles will be localised by



Much in the same manner as seen in luxury sedans, this Meritor axle meant for defence trucks can afford independent suspension for each wheel.

January 2012. Fundamentally, hub reduction axles are deployed in order to improve ground clearance for off-road (usually 6x4 and 8x4 rigids) and high powered trucks. While off-road trucks require superior ground clearance on account of the terrain in which they operate, high powered trucks need more efficient reduction. 'It is not feasible to have reduction occurring at just a single hub for high powered trucks. There is a limit to how large the gears can be. It is for the same reason that such trucks need a retarder to assist with the braking function. That way, the brake at the wheel, need not be unduly large,' reckons Dasgupta. Meritor HVS India will offer two such tandem axles in India – the MT 32 610 and 616. While, the first one is a fabricated axle with a rating of 16 tonnes, the latter is a cast product with a rating of 18 tonnes. These axles feature four planet hub reduction. The Driver Controlled Differential Locks (DCDL) available on both axles, provides the vehicle with traction on demand. Needle bearings in the interaxle differential provide spin-out protection,



Indranil Dasgupta avers that the use of better quality of steel, coupled with heat treatment enables Meritor to put out stronger and more durable axles in the market

eliminating the need for a lube-pump. Further, the optimised driveline angle reduces drivetrain NVH, thereby increasing the life of the axles. 'Fleet operators using trucks made by an OEM, which adopted our (imported) hub reduction axles early, state

that, at times, the axles have outlived the rest of the vehicle,' claims Raghunathan.

#### INNOVATION KEY

Much of the longevity of the axles also stems from a purposeful manufacturing process. For instance, the crown wheel pinions are made from SAE 8822 grade steel. This alloy has high resistance to shocks stemming from overloads. Adding further value is Meritor's closely guarded, proprietary heat treatment facility. Dasgupta asserts that taken together, these two aspects improve the life of gears by as much as 30 percent relative to competition. Similarly, Meritor's housings also stand out. 'Our housings, made of Tuten 55 grade of hot rolled steel have enhanced life, despite been 1mm thinner vis-a-vis competition. The clincher is the heat treatment and the superior geometry. Using a stronger press, we are able to put out housings with a smaller radius, thereby further boosting strength,' asserts Dasgupta. The long life results in reduction in maintenance costs too. 'We have been able to push forward

Automotive Axles' Mysore plant is the manufacturing hub for Meritor in India

**AA** AUTOMOTIVE AXLES LIMITED

FIRE BRIGADE  
PATH



The company's Pant Nagar plant is likely to see investments towards improving local content of the drum brakes.

greasing intervals from 16,000 kms to 72,000 kms. Correspondingly, the use of recommended additives now means that oil changes need only take place after 1,20,000 kms as opposed to 40,000 kms earlier,' claims Dasgupta.

Of course, these benefits percolate across the range of products put out by Meritor HVS (India) Ltd. The company offers a range of single and tandem axles. Among single axles the portfolio ranges from the MS06-100 (Gross Axle Weight Rating 4-6 tonnes suitable for a Gross Combination Weight of 12 tonnes) to the MS14-160 (GAWR 11-14 tonnes suitable for a GCW of 44 tonnes). As for tandem axles, the range extends from MT26-109 (GAWR 20-26 tonnes suitable for a GCW of 50 tonnes) to the MT26-160 (GAWR 24-28 tonnes suitable for a GCW of 70 tonnes). Of these products, the C100, MS120 as well as the MS160 & MT 160 axles are scheduled for an upgrade by 2014.

Steered axles include the FG 945 (GAWR 6.6 tonnes) and the FH 946 (GAWR 7.5 tonnes). Notably, after a coupling with the ELSA 225-H air disc brake, the latter have featured in Tata Marcopolo low-floor buses acquired by the DTC. Coming soon are the ELSA 175 and 195

disc brakes that will be directed at the next generation of LMCVs being developed by Indian OEMs. In any case, Meritor offers asbestos-free drum brakes in the 325-410mm bracket. Currently, the company commands roughly a third of the market, with the rest falling in the basket of Brakes India. Like the axles, the brakes portfolio is going to be contemporarised too. While the Next Gen version of the 410mm brake is going to be upgraded by the end of this year, the upgraded 410mm brake will be out in the market by 2012. Further the 360mm drum brake will be launched in 2013.

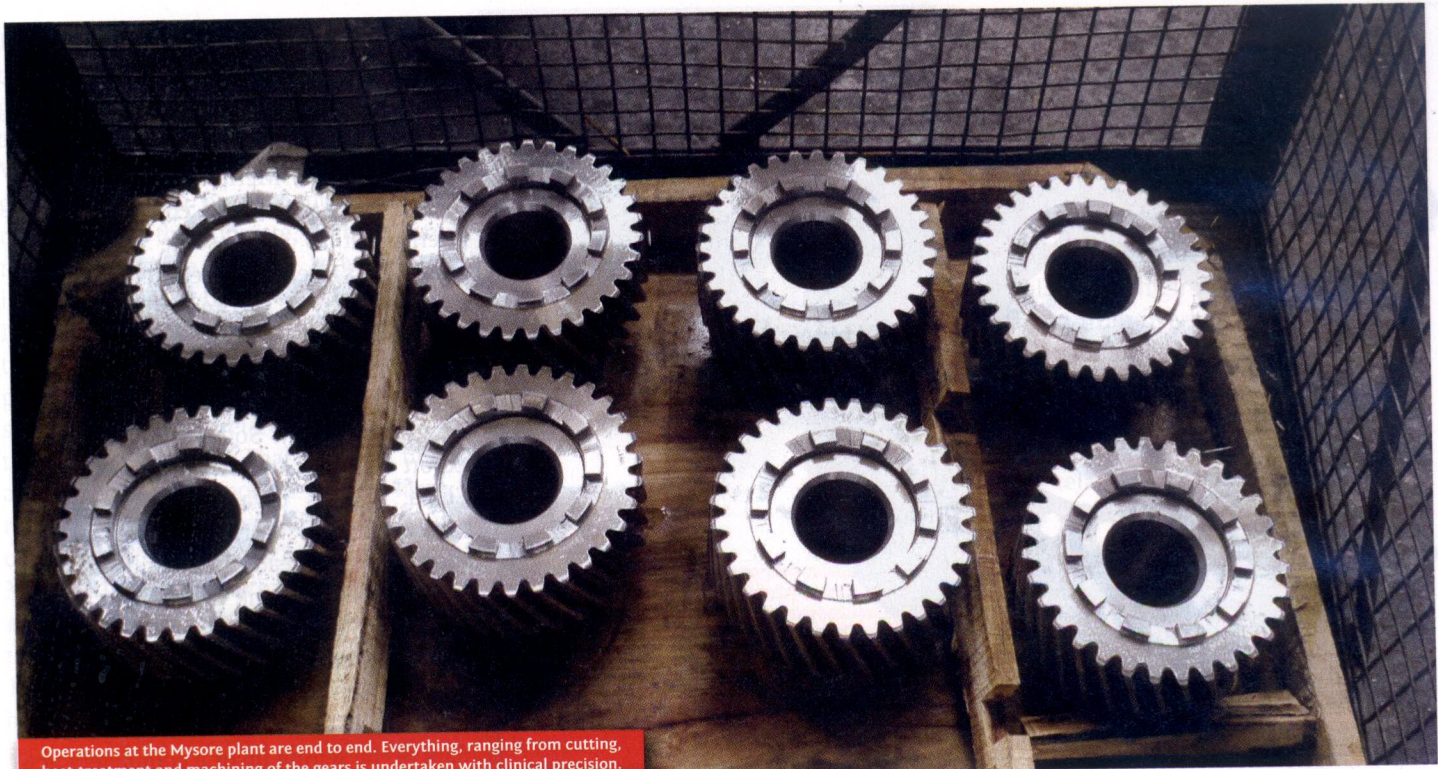
Boasting of such a large product portfolio, it is not surprising that Meritor has fared well in the market. 'At peak levels, we put out 11,500-12,000 axles per month. Last year, revenues from sales of

axles were USD 260-270 million. About USD 10 million accrued from the aftermarket,' states Siva Kumar.

Aside from manufacturing and selling complete axles, Meritor is also involved in marketing gears and couplings to the aftermarket as well as the large export market. As mentioned earlier, couplings are a speciality at Meritor. 'Since we have time-tested manufacturing and testing infrastructure at Mysore, the plant boasts of twice the range on half the volumes made at our US facility. Some of our important export markets are the US, Europe and China,' claims Siva Kumar. Therefore, hardly without surprise, the capacity for housings has already been utilised to the tune of 80-85 percent. Discussions are underway to expand capacity. 'Depending upon a decision by our Board of Directors, the expansion could either be in the form of enhanced automation at our Mysore plant or the setting up of a completely new plant,' says Raghunathan. There is hardly any shortage of funds for such an expansion. The Asia Pacific region, where it has 8 manufacturing locations in 5 countries, and a total employee strength of 2,600, already accounts for 15 percent of Meritor's revenues. And, the



Meritor is optimistic that disc brakes will be demanded by Indian OEMs developing a new generation of LMCVs



Operations at the Mysore plant are end to end. Everything, ranging from cutting, heat-treatment and machining of the gears is undertaken with clinical precision.

company has set aside USD 60 million towards investment over the next 2-3 years in the region.

Within the next 2-3 months, a small part of this kitty could also go towards the acquisition of a trailer axle manufacturer located on the outskirts of Delhi. The logic of this acquisition is this: Mechanical trailer axles are not high value products – certainly not high enough to push the already tight capacity at the Mysore plant. But, fleet operators and OEMs

alike want a ‘complete’ offering from their vendor for axles.

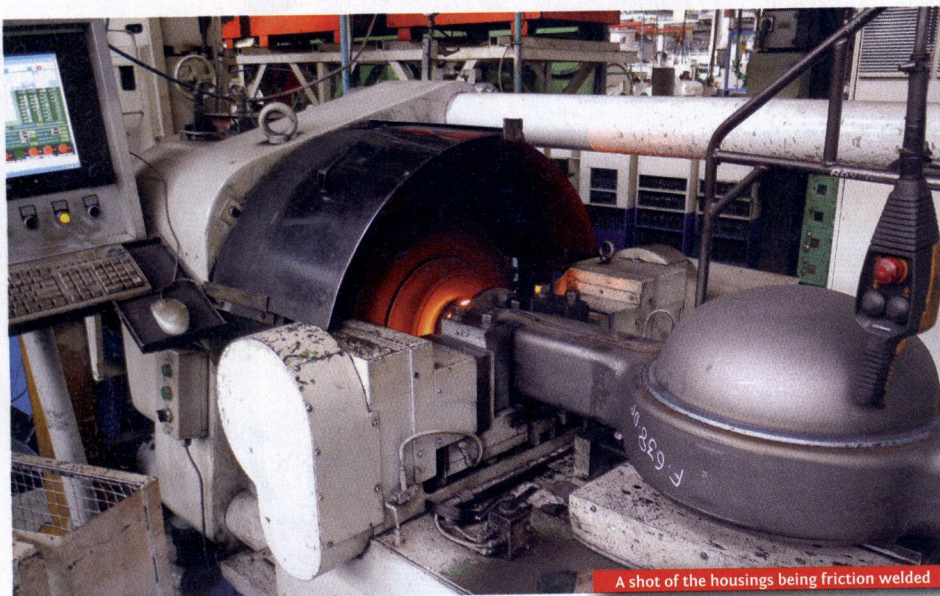
Also part of the drive to optimise capacity and value is an expansion at the company’s Pant Nagar plant, which assembles brakes for Ashok Leyland. ‘We will enhance value addition to the products in order to optimise the cost benefits accruing from doing business at this low-tax location,’ mentions Raghunathan. In recent times, Meritor’s test facilities at Bangalore and Mysore have also seen

investments of USD 6 million.

#### MANUFACTURING AND R&D

In a move designed to separate production processes from the transfer and maintenance of intellectual property, the functions of technology acquisition, product support and testing are vested with Meritor Heavy Vehicles India Limited (MHVIL), which is controlled by Meritor in a 51:49 JV with the Kalyani Group. Manufacturing and sourcing operations are the realm of the publicly listed American Axles Limited (where partners, the Kalyani Group and Meritor have a 35 percent stake each).

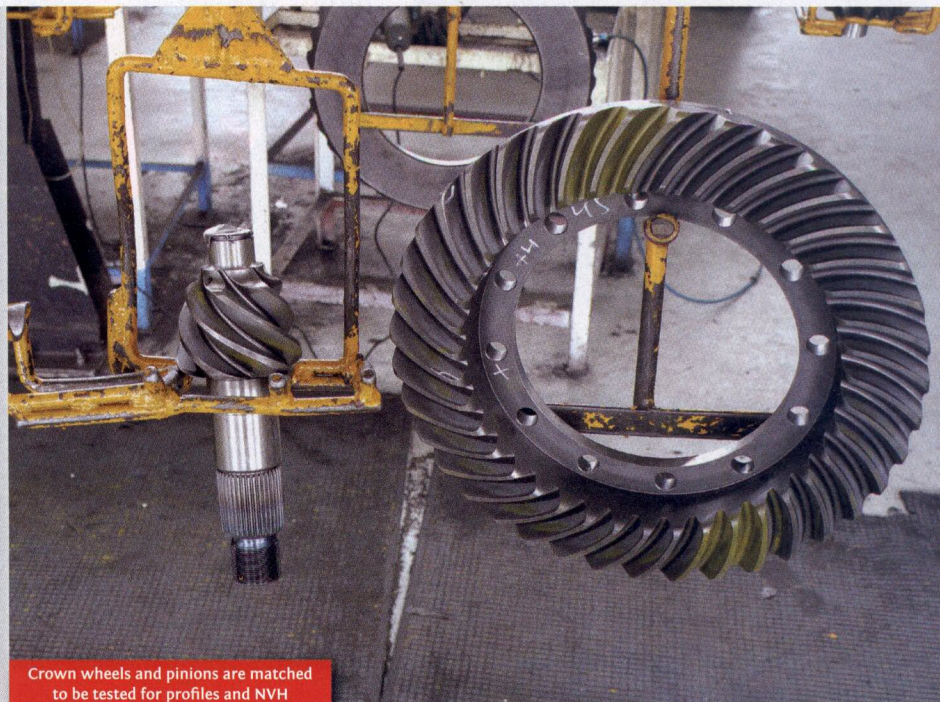
The AAL plant, built on 2,02,345 sq. metre of land employs over 2,000. Manufacturing operations occur in three areas - housings, gears and assemblies. The current housing capacity is 550 units per day, while that for carriers, gear sets and axle assemblies is 500, 900 and 540 units per day. ‘We intend to standardise production of components/aggregates as well as axle assemblies to 600 units per day,’ states Voji Almeda, AGM, Mfg. Engg., AAL. We venture into the housings assembly area first. The two housing halves core are friction welded following which customisation of fitments occurs depending upon customer demand. Following this heat treatment oc-



A shot of the housings being friction welded

As mentioned earlier, heat treatment is a strong USP for Meritor. The treatment occurs over 4-5 stages, not just for housings, but also for crown wheel pinions, differential gears and carriers. Moving to the gear manufacturing area, it is apparent that they go through three stages, cutting, heat treatment and machining. Thereafter, the crown wheel is coupled with a matching pinion and tested for NVH in a sound proof chamber. As a next stage, the drive head, carrier gear and differential are assembled. Painting ensues, post leak test and curing. And then, shot penning of gears is undertaken, which serves to reduce residual stress. The only thing that remains is for the gear analyser to check the profiles of the gears.

Irrespective of the extent of customisation across the myriad variety of parts, work proceeds at a smooth pace. The key is systematic planning. 'We undertake sunrise and sunset reviews each day to plan as well as take stock of work for the day. It is according to this plan, that trolleys are kept ready with materials for individual production jobs,' explains Almeda. The fully assembled axles and brakes are tested at Meritor's laboratory. At the lab, the vertical fatigue test measures deflections on the axle along the vertical plane following the cyclical application of 0-2G force. Similarly, the side skid test measures deflections while a vehicle is turning. So far as brakes are concerned, the brake chucker test re-



Crown wheels and pinions are matched to be tested for profiles and NVH

lies on a 630Kw dynamometer to produce force and counterforce that measures braking efficiency as well as torsional stability. While most things seem to be going well on the manufacturing and R&D front, there is still scope for improvement.

'We want to bring up quality to 50 PPM levels, and also improve our delivery schedules to 99 percent,' states Siva Kumar. Given Meritor's track record thus far, the first objective may be easily met. The second one may not be that easy. We operate in a fragmented market. And, in

the absence of a proper demand forecasting mechanism, OEMs can often err in projections for both numbers and nature of axles. As a result, tier 1 suppliers such as Meritor are perpetually on edge. What is worse, in the case of sudden modifications, their own supply chains go for a toss too. 'We have an issue in India because of the unpredictability of demand for axles from OEMs. While, it may not be practical to expect demand schedules to be frozen two months in advance as in the US, there is scope for improvement in the current scenario following consultation with the OEMs,' adds Siva Kumar.

#### CLOSING NOTES

Meritor is eyeing fresh business from Daimler India Commercial Vehicles as well construction equipment majors BEML and Caterpillar. It is interesting to note that the company, which has prematurely exited the construction equipment axles business in 2003, following a sale to Axeltch, re-entered it in 2009. This is not a moment too early, considering the boom in the infrastructure sector. 'We see sizeable growth in the truck and construction equipment market over the next five years. And, Meritor is keenly placed to lead this growth. We are in various stages of implementing 8 major programmes for customers,' concludes Siva. ■



Last year, the aftermarket accounted for 10 percent of Meritor India's revenues.