Wheel Manufacturing Process:

Wheel Manufacturing facility was set up in RWF with complete technology transfer from M/s. Griffin Wheel Company, which is a subsidiary of Amsted Industries USA. The Parabolic/Deep Dish Design of Wheel developed by M/s Griffin is a low stress Wheel with the advantage of a high strength to weight ratio. M/s Griffin’s patented process of Controlled Pressure Pouring is used for Wheel Casting. The technical support from M/s Griffin continued till 1991. Thereafter, RWF is independently pursuing Manufacture and Technological Improvements, including development of new designs of wheels. RWF is successfully meeting the requirement of Wheels of Wagon Builders and loose Wheels require for ROH/POH of Wagon / Coaches.

A Wheel is Cast in every 2 minutes. Wheel manufacturing is carried out in Wheel Shop - consists of Melt Shop. Moulding Room and Wheel Final Processing Shop (WFPS)
The Plant utilizes Railway scrap as raw material. The scrap is melted in Three Electric Arc furnaces. The chemistry of the molten metal is precision controlled using Computerized Spectrometers. This enables precise control of steel composition during steel making for obtaining optimum metallurgical characteristics needed for tough service and long life.
Moulding Room Process

The Casting is done in Graphite Moulds, which are precision-machined using forming tools. This ensures that all Wheels are Cast to the same dimensions and tolerances.

The Controlled Pressure Pouring Process is employed for casting. The molten metal ladle is placed in a chamber and sealed with an airtight cover. A ceramic pouring tube is attached to the cover. Compressed air, forced into the chamber, pushes the steel up through the pouring tube and into the graphite mould positioned over the tube. The steel fills the mould from bottom to form the Wheel. As the steel is forced into the mould at a controlled rate, wheel is cast to extremely close tolerances.
The wheels as cast are normalized in a huge rotary hearth furnace to improve metallurgical structure and relieve internal stresses. Quenching of rim and tread area is done to increase their hardness.
Wheel Final Processing Shop (WFPS)

The Wheels are shot-peened to induce compressive stresses so that the Cast Wheels do not fail due to crack propagation in service. Each Wheel is subjected to magnetic particle testing for surface flaws and Ultrasonically tested for internal flaws to ensure maximum reliability.

Magnetic Particle Testing
Axle Manufacturing Process

Axle Manufacturing is carried out in Axle Shop - consists of Axle Forging Shop, Axle Machine Shop and Assembly Shop

Axle forge shop

Axles are manufactured from Billets cut from Blooms supplied by reputed indigenous Steel Plants. The Billets are heated in a Rotary Hearth Furnace to forging temperatures. They are then forged on a Special Purpose Long Forging Machine having multiple hammers. The long forging machine was procured from M/s. GFM, Austria. The machine is capable of forging axle to close tolerances in one-heat shaping at 4 minutes. The forged axle is gas cut to required length, number stamped and then heat treated under controlled conditions to ensure axle forgings meeting the desired metallurgical and physical properties.
The forged axles are machined on a battery of conventional machines supplied by M/s. HMT Ltd, India and state of the art CNC machines supplied by Spain. The operations include end machining, rough turning and finish M/s Group Danobat of turning which are carried out on hydraulic copying lathes, multiple operation axle machining centers and grinding/burnishing machines. A concept of integrated engineering has been adopted for handling and transfer of axles from machine to machine, which facilitates the flow of axles.
All axles are subjected to Ultrasonic Testing and magnetic particle testing for ensuring zero defect products of the highest quality.
Wheel Set Assembling Process

The assembly of Wheel Sets is done on a highly automated Wheel Assembly Complex. The Wheel seat size of the Axles is measured on an automated measuring unit and the dimensions are transferred to two wheel borers. Paired wheels are custom bored as per the wheel seat size to get correct interference fit. The wheels are then pressed on the axle in a 300T SMTC Wheel Press.
WHEEL SET

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