



**RAILWAY
SECTOR**

SOLUTION BY INNOVATION

Four M Technologies Pvt. Limited, India

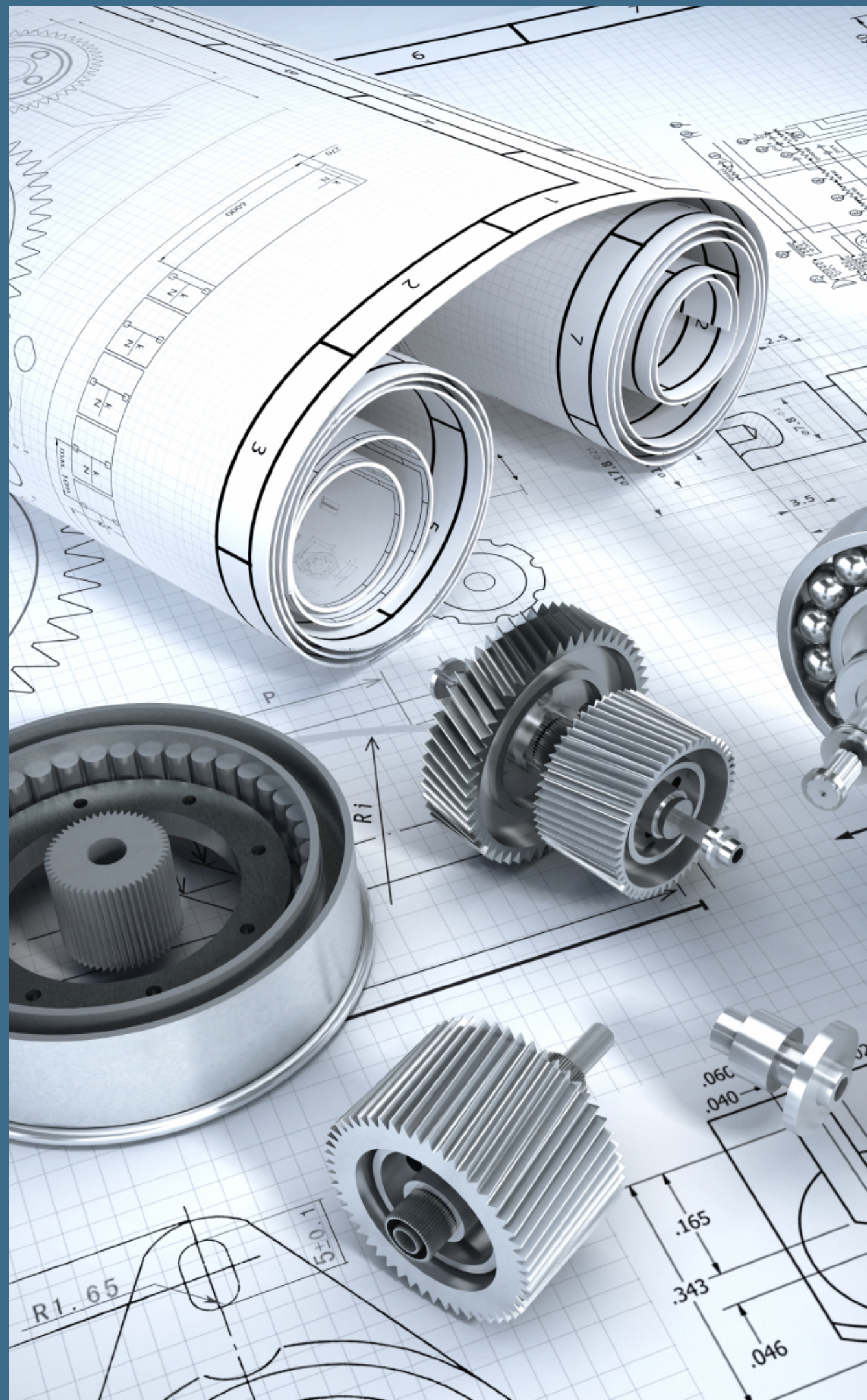
Our Mission

EXPANDING OPPORTUNITIES WHEREVER YOU ARE

Providing Solutions by Innovation for Process Improvement
for Better Safety, Productivity and Quality.

The 4M logo, consisting of the letters '4M' in white on a red square background, is positioned in the top right corner of the image. The background of the entire slide features a high-speed train in motion, blurred to convey speed, with a grid pattern overlaying the left and bottom portions.

Our Advantage



4M

VALUE AND QUALITY AT THE RIGHT PRICE

4M's Vast Experienced Team, Innovative approach, Constant Customer feedback, and an eye for practicality gives its products the best Value and Quality at the Right Price.



ROBUST
STRUCTURES

What
Clients Can
Anticipate

PRODUCTIVITY
INCREASE

INNOVATIVE
PRODUCTS

ERGONOMICAL
DESIGN



PROBLEM ANALYSIS

- ☒ The drive gear box assembly is the heart of the Metro Rail Drive Car. This has to be overhauled by trained professionals with utmost precision and care for the safety of the rail passengers.
- ☒ The wheel axel and gearbox assembly without the wheels weighs approximately 1.5 tons.
- ☒ The overhaul of the drive gear box requires handling of the assembly in both horizontal and vertical directions.
- ☒ The general problems are of operator safety while working with the crane and tilting the long axle.
- ☒ The axle for working is placed on floor which is not ergonomically suitable for long working hours.



PROBLEM ANALYSIS

- ☒ The overhead crane being used for tilting and supporting the axle is blocked and cannot be used for any other purpose on the shop floor during the time of overhaul.
- ☒ The practices followed are likely to result in high Operator Fatigue.
- ☒ Operator fatigue results in low productivity,
- ☒ Operator fatigue results in low workmanship during overhaul.
- ☒ The low workmanship may result to lower safety standards.

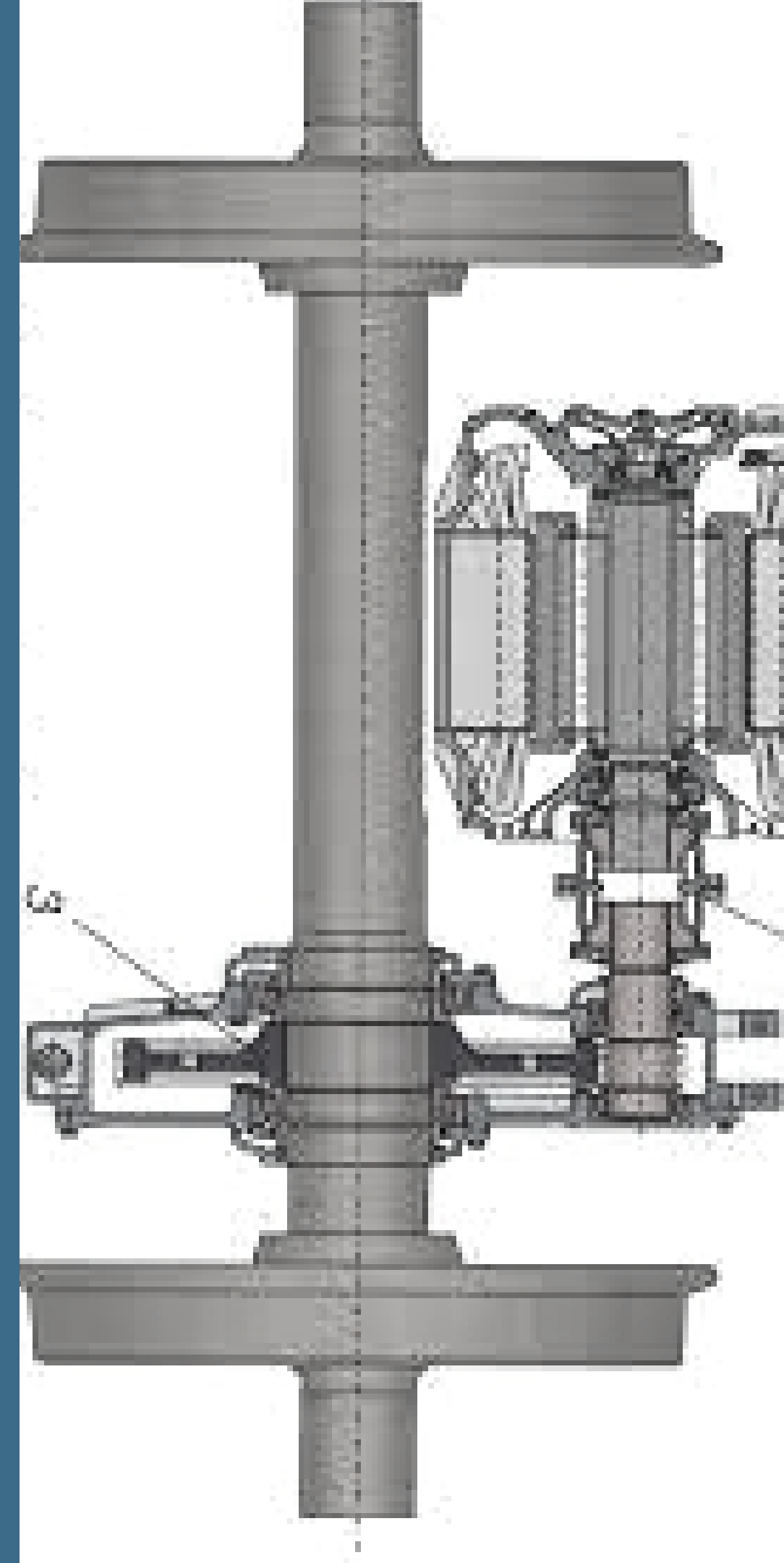
Case Study at DMRC

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OBSERVATIONS

Scope for Improvement

- Dedicated crane for the axle handling.
- Rotating and tilting of the axle not to be done using crane for operator safety.
- The assembly to be fixed firmly for operator safety
- Separate fixtures for holding sub assemblies.
- The working height to be ergonomically designed for low operator fatigue even when the assembly is tilted .
- The fixturing and operation of tilting should be easy and simple for the operator to concentrate on his core job of overhauling the gear box.





DESIGN OBJECTIVES

- To lift the axle & gearbox assembly and place on Work Bench.
- The work bench to be designed ergonomically to suit to operate at standard working heights for operational ease and low operator fatigue.
- The work bench to be very rigid as it should handle the heavy axle assembly
- The work bench should have provision for different mounting facility of the axle assembly for working during different stages of overhaul.
- The working on the work bench should be simple and easy.
- The working on the work bench should be safe.
- The work bench should be compact and space saving.

Case Study at DMRC



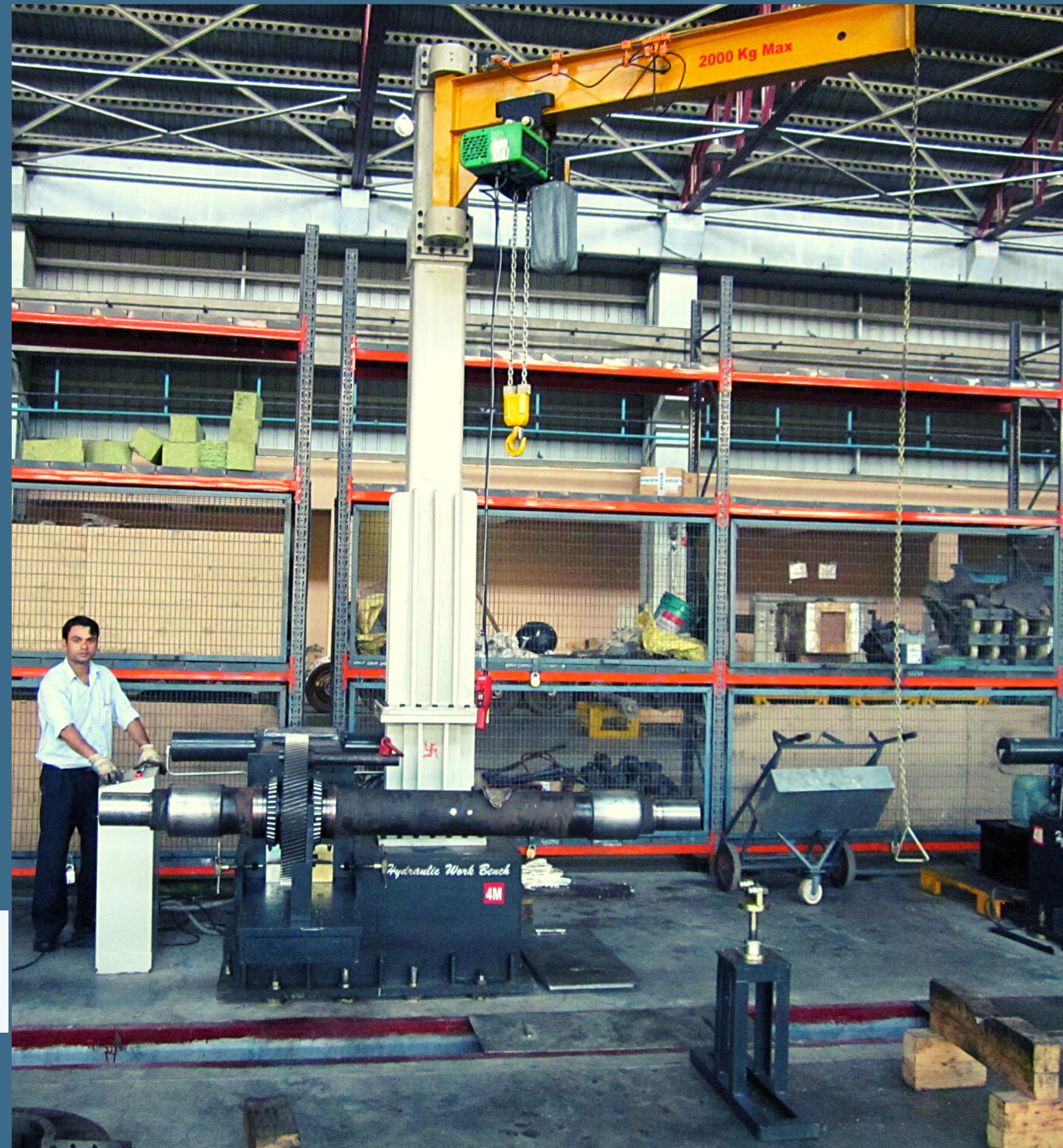
DESIGN CONCEPT

- Hydraulic power to be used for rotating and holding of axle assembly during overhaul.
- Separate 2Ton Jib crane for loading and unloading of axle assemblies.
- Dedicated fixturing provisions for clamping on the work bench.
- Working height ergonomically designed to be around 850 mm.
- Work bench designed for high rigidity and safe working.
- Easy push button controls for rotating and locking in position.
- Safety provision for sudden power failure during working.
- Noise Free operation & Low power consumption.

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Work Bench

CONCEPT TO CREATION



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Work Bench

CONCEPT TO CREATION



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Work Bench

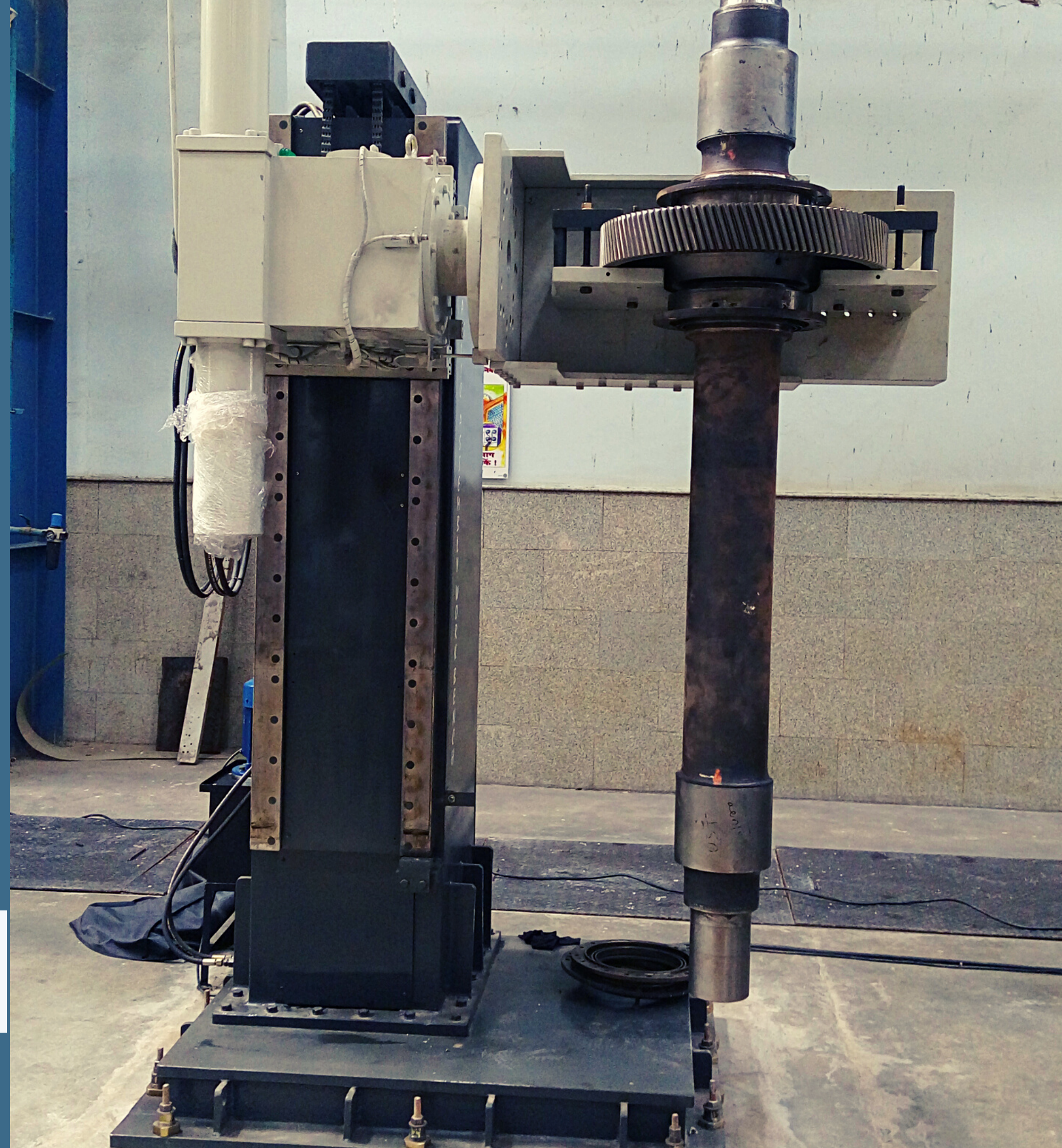
CONCEPT TO CREATION

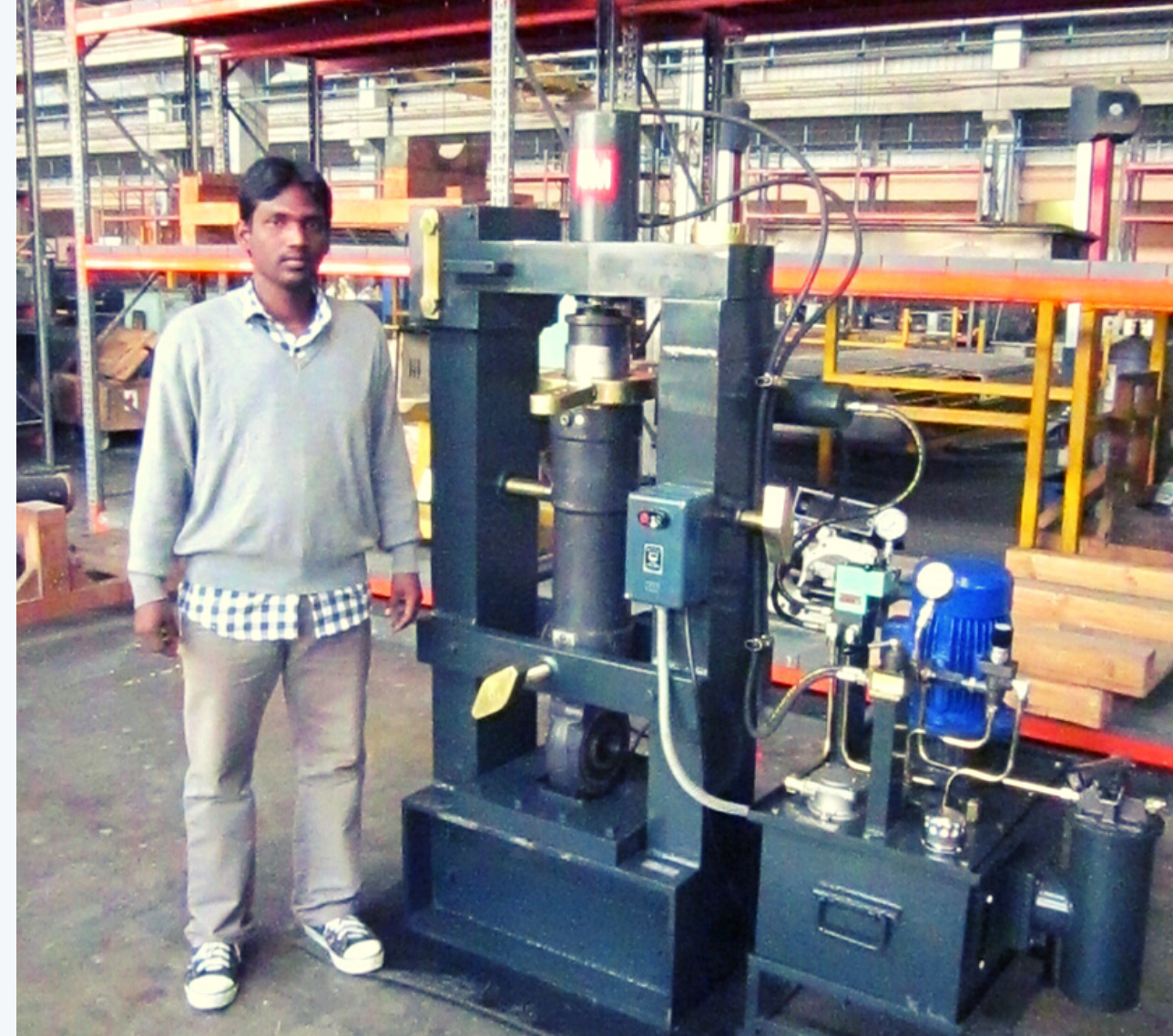


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Work Bench

CONCEPT TO CREATION





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OTHER EQUIPMENT'S DEVELOPED FOR METRO RAIL

Automatic Coupler Assembly Press and Test Bench



CONTACT US

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