

## ENGINE DIVISION

### **INTRODUCTION:**

Engine Division is engaged in assembly and testing of 16 Cylinder HHP Diesel Engines (EMD Design) and 12 & 16 Cylinder ALCO Design Diesel Engines. Many of the vital components of Electric loco (Pivot Ring, Housing Ring, Spacer, Axle Holder, Flange and Bolt) and HHP engine like Turbo supercharger, Power Assembly, Water-Pump, Cam Shaft, Gears, Valve Bridge Assembly etc. are manufactured in house at various sophisticated work-stations & CNC machines installed in different shops of this division.

### **Engine Erection Shop:**

Assembly of Engine is carried out on four stations in this shop. Pre-inspected component like Crank Shaft, Cam Shaft, OST Shaft, Oil pan, Power Assembly, Turbo Super Charger, Exhaust Manifold etc. are mounted on crankcase and oil pan. All Bolts and Nuts are tightened at predefined torque value. During assembly, all the important parameters i.e. various clearances, gear backlashes, Exhaust Valve setting, Injector Timing & injector rack setting etc are being maintained as per design specification.



Generator End



Accessory Drive End

### **Engine Test Shop**

After ensuring no leakage in water, fuel & oil circuit on Pre Test Stand, engine is tested on Engine Test Bed for testing of all the functional parameters of Engine. Alternator is attached separately to the Engine for testing purpose by placing it on a trolley.



Pre Testing Of Engine



Engine Testing

Process of Engine Testing goes through monitoring and recording of various performance parameters by running the engine at eight different notches for a pre-defined period. After completion of testing, the Engine is painted before dispatching it to loco assembly shop.

### **HHP Turbo Assembly Shop**

It is one of its kind, state of art turbo supercharger assembly shop in the entire Indian Railways capable of manufacturing new and repairing/re-conditioning of old turbo Superchargers. Very high level of cleanliness is being maintained in clean assembly room to achieve the specified accuracy level during assembly. Complete requirement of HHP turbo superchargers for BLW as well as Zonal Railways is being fulfilled by this shop.



HHP Turbo Supercharger

### **CNC Shop**

In-house manufacturing of small Engine components is carried out in this shop. High precision components like, Pin cam follower, Seat valve spring, Screw adjusting, valve bridge etc. are manufactured on a variety of state of art CNC machines.



Seat Spring



Screw Adjusting

### **Light Machine Shop**

Several Engine components are being manufactured in Light Machine Shop which are being used for engine assembly. Many of these components like Camshaft, Gear Crank Shaft, Gear Cam Shaft, Valve Bridge Assembly, Axle Holder etc. are high precision jobs requiring highly technical hands and state of the art CNC Machines.



Cam Shaft Gear



Gear Upper Idler

CNC turning centres, CNC machining centres, CNC gear hobbing, CNC gear grinders, Centre-less grinding machine, broaching machines etc. are installed in LMS. Recently, in-house manufacturing of 07 numbers of Electric Loco Components such as Pivot Ring, Housing Ring, Spacers, Axle Holder, Flange and Bolt has been started successfully.



Axle Holder (Electric Loco)



Gear Teeth Grinding Machine

### **Heat Treatment Shop**

Heat Treatment Shop plays a vital role in production of several Engine components in BLW. The process which are carried out here, are Induction Hardening, Case Carburizing (Pack & Gas Carburizing), Hardening, Tempering, Stress relieving, Annealing and Luberiting. The Heat Treated Electric engine components are Electric spacer, Electric loco bogie , Axle Holder and Diesel Engine components are HHP Cam shaft, Alco Cam Shaft, Stiffer Unit Cam Shaft, Spacer bearing, Turbo Drive Gear , Turbo Idler Gear, Main piston pin , Crank case, Block, Stub Shaft Governor Drive Assembly, Stub Shaft Cam Shaft etc.



Carburising & Hardening Furnace