RAIL GRINDING MACHINE

General view of Rail Grinding Machine (RGM):

RGM is an important machine for the maintenance of Indian Railway Track in respect of damage to the rail, wheel and other track components, thereby increasing their life. Presently in India there is two Rail Grinding Machine i.e. one is in North Central Railway and other is in South Central Railway and the commissioning month of both the machines are Feb-2011 and July-2011 respectively. The making company of rail grinding machine is M/s Loram Maintenance of Way, USA. In starting both the machine worked on contract basis. The contract includes operation and maintenance of the machine for two years after the supply and commissioning and the technical support was provided by the Nation Research Council (NRC) Canada. The cost of the RGM is approximately 55 croresand and the cost of operation for two year is near about 20 crores. Machine in South Central Railway is working in the entire southern part of the network and machine in North Central Railway is working in the entire northern part of the rail network. The route for RGM is planned in such a way that the machine should come back for next cycle for grinding as per the pre decided grinding interval.

Working of Rail Grinding Machine (RGM):

- RGM is high productivity grinding machine consisting of 72 grinding stones, i.e. 36 stones grind the left side rail and 36 stones for right side rail.
- Each grinding stone is rotated by an independent electric motor of 30 HP at 3600 RPM. Each electric motor can be tilted at a desired angle in isolation from +70° (towards gauge face side) to -30° (toward field side).
- The machine can grind the rail up to the 10° curve and up to 3 gradients but while grinding the rail in curve the check rail should be removed.
- The machine can grind plain as well as curved track (without check rails) in tunnel, bridge (guard rail on bridges are not an obstruction), glued joints, fish plate joints. However level crossing, points & crossings, SEJs and axel counters create obstruction in grinding and are to be skipped by the raising the grinding stones while grinding. It has been alse seen that joggle fish plate provided on high rail of sharp curve also creates an obstruction and should be removed before grinding.
- RGM can grind the rail in both the direction i.e. forward as well as in reverse direction without reversing the direction of machine.
- The speed of machine during grinding ranges from 2.4 kmph to 24 kmph but in Indian Railway track grinding the speed is kept in between 10 kmph to 20 kmph during the grinding of track. The light run speed of machine is 80 kmph by design but RDSO has issued provisional speed certificate for this machine at 50 kmph.
- The machine can remove 0.2 mm of metal on an average while grinding at 12 kmph.
- The specifications of grinding stone are having 250 mm outer diameter and 150 mm inner diameter with 75 mm thickness. There is fiberglass wrapping around the stone so as to contain the debris within the wrapping area in case of breakage of stone. The grinding stone consist of Abrasive Grain Particles for grinding rail and bonding material for abrasive particle. In normal condition life of stone is 08-10 hours of grinding but this may vary depending upon the condition of track.

- As per the obeservation, it is found that the average consumption of diesel during the grinding is 90 litres per km and the average consumption of water is 1100 litres per km.
- In India ‘Preventive Gradual Grinding’ has been adopted wherein we will move to the ‘Preventive’ grinding regime gradually. In Corrective grinding we remove defect in one go, by giving more number of passes at slow speed while the matal removal in preventive grinding is very less but more frequently. The metal removal in preventive gradual strategy will be more as compared to preventive grinding but less as compared to corrective grinding. Wlile grinding the track it must be ensured that deformation does not take place and the temp of rail should not exeed beyong 350 ℃ to avoid the matellurgical changes in the rail.
- During grinding the rail water is required to sprinkle on to the sleepers and on cess with the with help tie sprays and ditch sprays respectively to make the area wet to avoid cases of fire due to sparks generated while grinding.


DANGER