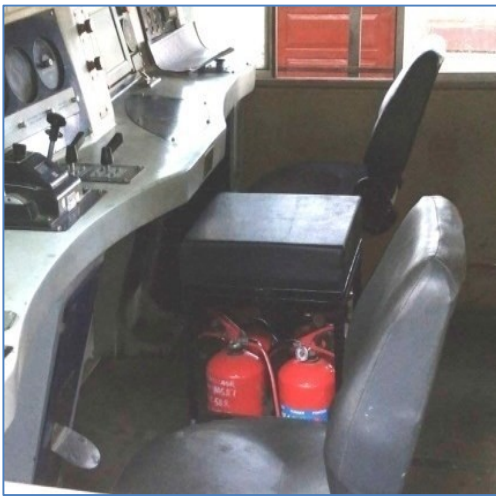


INNOVATIONS DONE BY ABR SHED

Name of Innovation	Arrangement for REPLACEMENT OF GEAR CASE OIL & Fuel Tank Cleaning
Summary	Fuel Tank Cleaning
Detailed Description	Earlier, no machine was available for replacement of gear case oil & cleaning of Fuel Tank. A extended fixture is attached in vacuum cleaner for replacement of gear case oil & cleaning of fuel tank. With the use of this fixture, work of cleaning has been become more easy and also it will save time and manpower. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier the work done with manually and required 24 manpower and 02 days per loco. It has Saved time and manpower and now 04 manpower and 01 shift is required thus saving Rs. 2 lakh per loco.
Impact/benefit accrued to customer or employee due to this innovation	It has Saved time and manpower and now 04 manpower and 01 shift is required thus saving Rs. 2 lakh per loco.

Name of Innovation	Platform for Radiator blow out for HHP Loco
Summary	Platform for Radiator blow out for HHP loco
Detailed Description	A metallic platform has been made and fixed along line no. 5. It will be useful for radiator blowout during schedule. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	In HHP locos, radiators are mounted on top so the staff had to climbed on the railings to do blowout. It will enhance safety of staff as he has no more climbed on rail in grand better cleaning of radiator & reliability of Loco. Saved revenue for railways approx. of Rs. 1.50 Lacs.
Impact/benefit accrued to customer or employee due to this innovation	It will enhance safety of staff as he has no more climbed on rail in grand better cleaning of radiator & reliability of Loco. Saved revenue for railways approx. of Rs. 1.50 Lacs.

Name of Innovation	Seat for Foot plate official with enclosure for Fire Extinguisher
Summary	Seat for Footplate Official with enclosure for fire extinguisher.
Detailed Description	Earlier fire extinguisher were found in sometime in horizontal position and inspecting official used to stand thereby limiting the capacity to footplate for larger duration. In this regard enclosure has been made which houses fire extinguisher in fixed vertical position and good foamed seat for inspecting officer thereby eliminating above motioned problems. Fire extinguisher can be taken out by lifting the seat. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	ALP can concentrate better & probability of damage to Fire Extinguisher is minimized, therefore enhance Loco safety.
Impact/benefit accrued to customer or employee due to this innovation	ALP can concentrate better & probability of damage to Fire Extinguisher is minimized, therefore enhance Loco safety.

Name of Innovation	Mechanical Unit Injector
Summary	Mechanical Unit Injector
Detailed Description	Shed staff developed Mechanical Unit Injector (MUI) calibration test bench for HHP locomotive. Earlier, no machine was available in Diesel Shed Abu Road for testing of delivery of HHP loco Injectors. MUI calibration test bench was made by shed staff with available materials by modifying ALCO test bench. The cost of New Machine as per market price is about Rs. 30 Lacs. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier, no machine was available in Diesel Shed Abu Road for testing of HHP loco Injectors. The cost of New Machine as per market price is about Rs.30 Lacs. Approx 30 Lacs revenue saved.
Impact/benefit accrued to customer or employee due to this innovation	The cost of New Machine as per market price is about Rs.30 Lacs. Approx 30 Lacs revenue saved.

Name of Innovation	Pre Lube Motor for Filtered Oil
Summary	Pre Lube Motor for Filtered Oil
Detailed Description	Pre-lubrication motor has been refitted with turbo filter for lube oil priming so that oil is filtered to the precision level of turbo requirement for full lube oil system of loco. It was kept in mind that flow rate not to be reduced after providing filter. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier the new oil was circulated without filtering. Due to this, wear & tear of lubricated spare parts of locomotive would be minimized and life of spares parts enhanced and reliability of Loco has increased.
Impact/benefit accrued to customer or employee due to this innovation	Due to this, wear & tear of lubricated spare parts of locomotive would be minimized and life of spares parts enhanced and reliability of Loco has increased.

Name of Innovation	Web Camera
Summary	Web Camera to inspect Power Assembly
Detailed Description	Shed staff modified Web Camera purchased to inspect power assembly and modified its connection so as the camera may be connected to laptop or mobile phone for easy and convenient diagnosis of defective power assembly piston/valve/ liner seizure cases. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier visual checking. Reduction in online failure cases of HHP locos pertaining to engine block. Approx benefit of 1,90,000Rs, if new system was purchased through firm.
Impact/benefit accrued to customer or employee due to this innovation	Reduction in online failure cases of HHP locos pertaining to engine block. Approx benefit of 1,90,000Rs, if new system was purchased through firm.

Name of Innovation	Bogie Trial Run
Summary	Trial Run of Newly Fitted Traction Motor with Gear Case.
Detailed Description	After fitment of Gear case on Traction Motors the wheels are rotated electrically to a predetermined RPM to check any obstruction in movement (TM bearing, Axle box bearing) by rotating the traction motors in both direction by reversing the current and thus any defect can be noticed in shed and corrective action will be taken. With this arrangement gear case misalignment with traction motor is also verified for correction. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	On line case of Smoke from Gear Case or Motor are drastically reduced. Loss of Punctuality also reduced in Passenger Loco. Direct saving of Rs. 2.5 lakh if purchase from Market.
Impact/benefit accrued to customer or employee due to this innovation	On line case of Smoke from Gear Case or Motor are drastically reduced. Loss of Punctuality also reduced in Passenger Loco. Direct saving of Rs. 2.5 lakh if purchase from Market.

Name of Innovation	Gear Case Fitment Fixture
Summary	Gear case fitment
Detailed Description	Gear case fitment fixture was prepared by shed staff in-house with available materials, which will help in easy fitment of gear case on Traction Motors. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier, in many cases gear case had to be removed after fitment resulting in unnecessary man power wastage. It has saved unnecessary man power wastage and approximately 08 manpower has been saved per month and saving of Rs. 1.44 lakh per annum.
Impact/benefit accrued to customer or employee due to this innovation	It has saved unnecessary man power wastage and approximately 08 manpower has been saved per month and saving of Rs. 1.44 lakh per annum.

Name of Innovation	Plant Pot with use of scrap materials
Summary	Plant Pot with use of scrap materials
Detailed Description	Plant Pot has been made by Shed staff with use of unused and scrap materials like, Liners, Connecting Rod, Cam Shaft distance piece etc of locomotive. These plant pots increased magnificence of greenery in sections. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Used of scrap materials and increased greenery & environment in sections.
Impact/benefit accrued to customer or employee due to this innovation	Used of scrap materials and increased greenery & environment in sections.

Name of Innovation	WHEEL LIFTING ARRANGEMENT
Summary	Wheel Lifting Arrangement for HHP loco's wheel
Detailed Description	Wheel lifting arrangement is prepared by shed staff for lifting of HHP loco's wheel. It is used for lifting of loco wheel whenever there are events of axle lock or indications of axle lock. It is a light weight arrangement. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier the work was done with the help of ART equipment & crane and shed staff inciter and involves movement of a large number of staff. Direct saving of Rs. 2.0 lakh if purchased from Market.
Impact/benefit accrued to customer or employee due to this innovation	Saved manpower and time. Direct saving of Rs. 2.0 lakh if purchased from Market.

Name of Innovation	Radiator Fan removal fixture
Summary	Radiator Fan removal fixture
Detailed Description	Radiator fan removal fixture was prepared by shed staff in-house with available materials, which will help in easy removal and fitment of radiator fan in HHP locos. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier no machine was available in shed, and it brought from BGKT Shed through Road Transport. Help in easy removal and fitment of radiator fan in HHP locos and saved manpower and time. Expenses during road transport saved.
Impact/benefit accrued to Customer or employee due to this innovation	Help in easy removal and fitment of radiator fan in HHP locos and saved manpower and time. Expenses during road transport saved.

Name of Innovation	Crane/Hoist
Summary	Crane/Hoist
Detailed Description	Shed staff prepared a Crane/Hoist in order to place/move WW governor or other heavy equipments from floor to test bench or vice versa in governor room. This is operated through hand hold iron chain. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	3-4 persons muscle power and it varied as per weight of the equipment. Approx benefit of 100000 Rs, if machine was purchased through trade
Impact/benefit accrued to customer or employee due to this innovation	Removal of unnecessary fatigue and increased accuracy and sophistication in placement. Approx benefit of 100000Rs, if machine was purchased through trade

Name of Innovation	Trolley for bring & carry of WW Governor
Summary	Trolley for bring & carry of WW Governor from section to loco.
Detailed Description	Earlier, a trolley for carry to WW governor from Section to Loco is not available in the Shed. Previously WW governor is bring & carry from section to loco with the use of Lifter. Whenever lifter was not available timely, there was wastage of time and manpower. Trolley is innovated by Shri Jagdish Prasad, Tech-I (Sub assembly) with the use of scrap materials available in shed. Due to this, carry of WW governor from section to loco has become more easy and safe. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier the WW governors carry with the use of Lifter. It has saved Rs. 25000/- if purchased from Market.
Impact/benefit accrued to Customer or employee due to this innovation	Save time and manpower. It has saved Rs.25000/- if purchased from Market.

Name of Innovation	Vertical Pin of Traction Motor Nose Pad	
Summary	Additional Safety features for securing Vertical Pin of Traction Motor Nose Pad	
Detailed Description	Usually TM Nose Pad clamped by vertical pin which is protected by a horizontal pin kept in place by splitpin. In case of breakage of splitpin there is a chance of shifting of horizontal pin which may result in dropping of vertical pin. To avoid the situation small U clamp is being provided on head of horizontal keeper pin. 	
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation		
Impact/benefit accrued to customer or employee due to this innovation	Shed detection of missing vertical pin are reduced improved reliability of loco and out of course thus saved around 04 manpower(Rs. 6000/-) per month approx Rs. 72000/- per annum.	

Name of Innovation	Liner and Sleeve removal fixture
Summary	Liner and Sleeve removal fixture
Detailed Description	Liner and Sleeve removal fixture was prepared by shed staff with available materials in shed. Which will help in easy removal and fitment liner and sleeve in HHP locos. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier no machine available in the shed and it brought from BGKT shed. Help in easy removal and fitment liner and sleeve in HHP locos and saved manpower and time.
Impact/benefit accrued to customer or employee due to this innovation	Help in easy removal and fitment liner and sleeve in HHP locos and saved manpower and time.

Name of Innovation	Axle Box Removal and Pressing Fixture
Summary	Axle Box Removal and Pressing Fixture
Detailed Description	Axle box removal and pressing fixture was prepared by shed staff for ALCO locomotive, which will help in easy removal and pressing of Roller Bearing. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier Roller bearings removed and press with Hammer. Help in easy removal and pressing of Roller Bearing and saved manpower and time.
Impact/benefit accrued to customer or employee due to this innovation	Due to use of this fixture, there is no possibility of damage of bearings.

Name of Innovation	Cranking Bar Fixture
Summary	Cranking Bar
Detailed Description	A cranking bar was prepared by shed staff or rotating of crank shaft of HHP locomotives, which saved time and man power during maintenance 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier no HHP locos homed at ABR Shed.
Impact/benefit accrued to customer or employee due to this innovation	With use of cranking bar man power and time saved during maintenance work.

Name of Innovation	Arrangement for CBC Lock pin
Summary	CBC Lock Pin Modified Arrangement
Detailed Description	In original design, CBC lock pin was locked using Nut Bolt arrangement which at several times were not found on incoming loco due to their breakage on vibration and went missing. To overcome this, Bogie staff “Shri Bharat Kumar, Technician” had made an arrangement “Chain coupled key to lock CBC lock pin” to avert missing cases. This will avert punctuality cases due to missing on nut bolt to lock the CBC lock pin. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier, CBC lock pin was locked by ordinary Nut Bolt.
Impact/benefit accrued to Customer or employee due to this innovation	Improvement in punctuality.

Name of Innovation	COLOUR DUSTBINS WITH use of scrap materials
Summary	COLOUR DUSTBINS WITH use of scrap materials
Detailed Description	Shed staff prepared color coded dustbins using scrap and waste oil drums. With the use of these dustbins, cleanliness of shed will improve. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	It is a initiative under taken under “Swachh Bharat Abhiyan”
Impact/benefit accrued to customer or employee due to this innovation	Improved cleanliness in the shed.

Name of Innovation	Fixture is prepared for disassembling the valve bridge.
Summary	Fixture is prepared for disassembling the valve bridge.
Detailed Description	Earlier, no machine was available for disassembled of Valve Bridge. A fixture is prepared by Shri Jagdish Prasad, Tech-I (Sub Assembly) for disassembling the valve bridge. With the use of this fixture, work of disassembling has become more easy and safe and also it will save time and manpower. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier the work done with manually and it has improved reliability of Loco.
Impact/benefit accrued to Customer or employee due to this innovation	Save time and manpower and it has improved reliability of Loco.

Name of Innovation	Modified Control adjust linkage
Summary	HHP loco has mechanical unit injector (MUI). Work of these injectors is pressurization and atomization of fuel so that combustion may be efficient. In ALCO locos, if any injector (same work done by FIP-fuel injection pump) is seized, then it can be isolated by pulling the rack. But in case of HHP loco, if even a single injector gets jammed it leads to loco failure as there is no isolation mechanism of injector with control linkage.
Detailed Description	Modified Control adjust linkage has been prepared by ABR shed. In this modified linkage, if any injector gets jammed, it will not restrict the movement of rest of working injectors. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	It will prevent online failure of locos.
Impact/benefit accrued to customer or employee due to this innovation	Save time and manpower.

Name of Innovation	Diode Testing Bench
Summary	Diode testing was commenced as per RDSO instructions by doing requisite modifications in the existing 293 card test bench by Relay Room staff resulting in reduction of Rectifier failures
Detailed Description	Diode testing was commenced as per RDSO instructions by doing requisite modifications in the existing 293 card test bench by Relay Room staff resulting in reduction of Rectifier failures. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier diode testing was not done, but increasing diode failures prompted the shed to undertake this innovation. It has increased reliability of loco & directly saved Rs. 2.0 lakh if purchased from market.
Impact/benefit accrued to customer or employee due to this innovation	Rectifier failure son account to diodes reduced drastically. It has increased reliability of loco & directly saved Rs. 2.0 lakh if purchased from market.

Name of Innovation	3Phase AC Motor (2 HP) for filling lube oil in WDG4G loco
Summary	3 Phase AC Motor (2 HP) prepared by shed staff for lube oil filling in WDG4G locomotives of Roza Shed, using which lube oil is being directly filled in WDG4G locos.
Detailed Description	3 Phase AC Motor (2 HP) prepared by shed staff for lube oil filling in WDG4G locomotives of Roza Shed, using which lube oil is being directly filled in WDG4G locos. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Earlier, this work was being done manually and time and manpower to filling the lube oil in locomotives. But with use of this motor, it has saved time and manpower
Impact/benefit accrued to customer or employee due to this innovation	Saved time and manpower.

Name of Innovation	Mud Pump Arrangement
Summary	Mud Pump Arrangement
Detailed Description	In rainy season, Pits of Diesel Shed Abu road was full fill with rainy water. Due to this, maintenance works of under frame and locomotive was affected badly. Shed staff made an arrangement to drain rainy water with help of 5 HP and 10 HP mud pump. Using of these mud pump pitswere clean in short time. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Saving time and manpower to drain rainy water from Pits.
Impact/benefit accrued to customer or employee due to this innovation	Saving time and manpower to drain rainy water from Pits.

Name of Innovation	Cranking Barring inform of Pneumatic type
Summary	Arrangement of cranking barring inform of Pneumatic type
Detailed Description	Earlier there are hand bar pressurein shed for cranking which is feud and cab son, if take time and more man power. Shed staff made Pneumatic one arrangement. 
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Saved time and manpower.
Impact/benefit accrued to customer or employee due to this innovation	Saved time and manpower.

Name of Innovation	Portable Load Box Testing unit
Summary	Portable Load Box Testing unit for testing of LHB Power Car
Detailed Description	Diesel Shed ABR has developed 03 Nos. Portable Load Box Testing unit for testing of LHB Power Car & handed over to Carriage Depot, Madar, Carriage Depot, Jaipur and Coaching depot, Udaipur. The load box tester is portable, it can be placed anywhere near the Power Car and testing can be done easily. The image contains four photographs of the testing unit's components, arranged in a 2x2 grid. The top-left photo shows the 'Knife Sw. & Coupler side view', a metal frame with a red component. The top-right photo shows the 'Rectifier', a large metal cabinet. The bottom-left photo shows the 'Grid Cooling Blower Motor', a large metal cabinet with a fan. The bottom-right photo shows the 'Grids and Insulators', a large metal cabinet with a fan.
Savings in revenue/manpower/material/office work/customer/service realized due to this innovation	Saved time and manpower.
Impact/benefit accrued to customer or employee due to this innovation	Saved time and manpower.