

PROJECT FOR FITMENT OF A T-90 ENGINE IN A TANK T-72

INTRODUCTION

This is the story of a 'Project For Fitment Of a Battle Tank T-72 With T-90 Engine' - a Project that was attempted by BUMAR based in Golconda, Heavy Vehicle Factory Avadi and 505 Army Base Workshop Delhi during the period 2006-2007.

Indian Mechanized Forces have operated Battle Tanks T-55, T-72 and T-90 of Russian origin - the Battle Tanks have 1955, 1972 and 1990 as years of introduction into Russian Mechanized Forces respectively. T-55 tank is a 500 Horsepower, 35 Tonne and around 14.25 Power to Weight Ratio equipment whilst T-72 is a 745 Horsepower, 44 Tonne around 17 Power to Weight Ratio piece and T-90 is a 1000 Horsepower, 46 Tonne and 21.73 Power to Weight Ratio Battle Tank.

GENESIS OF THE PROBLEM

A decision was taken at the highest levels for fitment of Explosive Reactive Armour (ERA) Panels on Tanks T-72 which moved in for Overhaul with Army Base Workshop because the ERA Panels afforded the Battle Tank better protection from Armour Piercing Projectiles (APP). These panels were to be placed on the Front Glacis, Turret and Side Skirts of the T-72 Battle Tank - the drawings, specifications of materials for making the ERA Panels were shared with the Agencies tasked for fitment of ERA Panels on the T-72 Battle Tank viz Heavy Vehicle Factory Avadi and 505 Army Base Workshop Delhi. Further, these T-72s with ERA Panels were rechristened as Combat Improved Ajeya (CIA).

The T-72s were upgraded with fitment of the ERA Panels, but in turn the weight of the Battle Tank became 46 Tonnes from the existing 44 Tonnes thereby affecting its Power to Weight Ratio which fell to 16 thereby affecting the maneuverability of the Battle Tank for operations.

PROJECT FOR FITMENT OF T-90 ENGINE IN T-72 BATTLE TANKS

The Russian origin T-55, T-72 and T-90 Battle Tanks follow the concept of interchangeability ie the Engines of T-55, T-72 and T-90 are same, but are developing different values of Horsepower because a T-72 has a Supercharger whilst the T-90 has a Turbocharger, and the Transmission Systems have been re-engineered so as to gel with the Power-pack.

The three Agencies ie Bumar Golconda, Heavy Vehicle Factory Avadi and 505 Army Base Workshop Delhi were tasked with the project for fitment of a T-90 Engine in a T-72 ie a Turbocharged variant of T-55 Engine in lieu of a Supercharged T-55 Engine variant. A Study Team was nominated for studying feasibility of the same because, if successful - any of the Prototypes aka ex Bumar Golconda, Heavy Vehicle Factory Avadi or 505 Army Base Workshop, then the same was to be frozen for modification to be progressed on the entire population of approximately 2000 tank T-72s in service with Indian Army. A study was carried out and a Project Report prepared giving the Modifications to be carried out in Engine Compartment of a Battle Tank T-72 for the Cooling and Air Filtration Systems, Bill of Materials for progressing the modification to include requirement of expendables and Assemblies / Sub Assemblies, Test Results in an Engine Test House, Financial Implications viz the cost of T-90 Engine, Cooling System, Modification Costs in terms of Bill Of Materials and Manhours employed, and post Acceptance Report, the modification was progressed in 505 Army Base Workshop Delhi.

FIELD TRIALS

The three modified T-72s were moved by respective Agency from modification location to Trial Location by Tank Carriers for Field Trials before acceptance and freezing of Modification, Bill of Materials and subsequent bulk modifications for Indian Army by the Agency whose Prototype was successful during Field Trials.

The three tanks underwent rigorous trials in peak summer of Rajasthan with temperatures at 50 degrees Celsius, but after an exploitation of 50 kilometers the three tanks were found to be having an overheated Engine and an excessive Engine Oil consumption - nearly a barrel aka 200 liters. The Field Trials were called off lest three T-90 Engines be damaged beyond repairs due to further exploitation, but it was a learning for all three Agencies as not to attempt modifications without a complete Transfer of Technology - the Engines and Transmission came as a part of Knocked Down Kit which was merely being assembled at Heavy Vehicle Factory Avadi.

DECISION

Post the Field Trials the Modified T-72s were returned to Modifying Agencies, the modifications undone, and the T-72s are operational with the ERA Panels but with a reduced Power to Weight Ratio.