FINITE ELEMENT ANALYSIS OF THE MODIFIED TURRET LIFTING
HOPS OF COMBAT VEHICLE

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ABSTRACT

Finite element model of Weld assembly of the Turret Lifting Hooks of the Combat Vehicle at the modified positions is prepared from the assembly solid model. The solid geometry of the weld assembly has meshed with 10 node C3D10 quadratic tetrahedron elements. Common nodes shared by the Turret Lifting Hooks and the Welds and by the Welds and the Plates are merged, in order to ensure the connectivity of the respective components with the respective welds.

Analysis has been done for two load cases as mentioned below:

Load Case 1: Non-linear Static analysis of the Turret Lifting Hooks welding assembly of Combat Vehicle applied with a vertical hanging load of 215820 N (22 Tons) at the CG of Turret & Weapon System (TWS) in order to simulate gradual lifting of the TWS.

Load Case 2: Non-linear Static analysis of the Turret Lifting Hooks welding assembly of Combat Vehicle applied with a vertical hanging load of 215820 N (22 Tons) at the CG of TWS in order to simulate sudden lifting of the TWS.

From the results of the above said analysis of the weld assembly of Combat Vehicle Turret Lifting Hooks, it has been observed that in the Load case 1, the critical stress value in the Lifting Hooks Front, LH side and RH side are 486 MPa, 433.4 MPa, and 411.4 MPa respectively and peak stress values in the Welds of the Lifting Hook Front, LH and RH are 98.3 MPa, 177.9 MPa and 177.4 MPa respectively. Whereas the yield limit of the Turret Lifting Hooks material (Homogenous weldable steel armor to SPC CDA-99) is 800 MPa. Hence the stress induced is clearly less than the yield value of the material.

KEYWORDS: Turret Lifting Hooks Welding Assembly, Gradual Lifting, Sudden Lifting, Turret & Weapon System (TWS)

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