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DESIGN AND MANUFACTURING STATUS OF ADVANCED STRUCTURES FOR REUSABLE LAUNCH SYSTEMS DEMONSTRATORS WITH RETRO PROPULSION ASSISTED LANDING TECHNOLOGIES (RETALT)

Abstract

To foster the competitiveness of the European industry on the global launcher market there is not only an urgent need of building up the necessary know-how on state-of-the-art Vertical Take-Off Vertical Landing (VTVL) Two Stage To Orbit (TSTO) concepts, but also to go beyond this approach. Historically, many concepts of Reusable Launch Vehicle (RLV) are based on Single Stage To Orbit (SSTO) designs, e.g. the VentureStar, the DC-X and the Russian CORONA. In the EU Horizon 2020 project RETALT (RETro propulsion Assisted Landing Technologies) the VTVL approach is also investigated for SSTO RLV. In this way, the concept of vertical landing with retro propulsion is investigated in a more general way and has the potential to be applied to more concepts of future RLV. The vertical landing of an RLV applying retro propulsion is a complex multidisciplinary task. The investigation for both reference configurations will be performed in the areas of aerodynamics, aerothermodynamics and flight dynamics and GNC as well as advanced structural parts and materials, health monitoring systems and advanced propulsion assisted landing systems. The focus of the contribution of MT Aerospace lies on design and manufacturing of hardware for aerodynamic and aerothermal experiments as well as demonstrators of structures and mechanisms of aerodynamic control surfaces and landing structures. Therefore, TRL 5 will be reached at the end of the project. This paper presents the status and the main results of the project and an outlook will be given on the future activities.

Reference: A. Gülhan, A. Marwege, J. Klevanski, J. Riehmer, D. Kirchheck; "Retro Propulsion Assisted Landing Technologies (RETALT): Current Status and Outlook of the EU Funded Project on Reusable Launch Vehicles" (Abstract for D2.4 Session)