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PAYLOAD ACCOMMODATION SCHEMES IN PSLV

Abstract

The Polar Satellite Launch Vehicle (PSLV) is a four stage Indian Satellite Launch Vehicle with alternate solid and liquid propulsion stages capable of carrying payload mass of 1700kg to 600km Sun Synchronous Polar Orbits (SSPO). There are three vehicle variants namely PSLV Generic (with S9 strapons), PSLV Core-alone (without strapons) and PSLV-XL (with S12 strapons). Though PSLV was developed primarily for launching remote sensing satellites into SSPO, the versatility of the vehicle has been proved in launching of Satellites in Geosynchronous / Sub-Geosynchronous Transfer Orbits (GTO/Sub-GTO) and planar orbits having different inclinations as well. PSLV is meeting the national requirements and also launch requirements for the International customers by successfully launching 290 Satellites in total (53 Indian, 237 Customer satellites) till February 2018. PSLV has carved a niche for itself and is seen as a reliable and affordable low cost launch vehicle in the global market. The long string of consecutive successes, proven multiple-satellite launch capability, putting satellites into multiple orbits and in different inclinations, makes PSLV one of the sought after launch vehicle among international customers. The fact that PSLV was used to place Chandrayaan-1 -India's first Lunar mission, Mangalyaan-India's first Mars Orbiter Mission, Astrosat-India's first Space Observatory and the recent world record of launching 104 satellites in a single mission is testimony to its reliability and versatility. Payloads or Satellites are classified into four types Main, Mini, Micro and Nano satellites. For single Main Satellite assembly, Payload Adaptor (PLA) is used. Dual Launch Adaptor (DLA) in combination with PLA is used when two main Satellites are to be assembled. One Satellite will be assembled on top of DLA and the other Satellite on top of PLA which is housed inside the DLA. Mini and micro satellites are mounted on the Passenger Payload (PPL) decks of Equipment Bay or Multi Satellite Adaptor (MSA) decks using special inclined adaptors. Nano-Satellites are mounted directly on MSA/PPL decks. Two-tier honeycomb deck adaptors are also used on MSA or PPL decks to accommodate more Nano-Satellites. Special brackets and interface plates assembled on the CFRP panel of PLA/DLA is also used for Nano-Satellites assembly. This abstract details the various Payload Accommodation schemes in PSLV.