

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Smart Materials and Adaptive Structures (5)

Author: Mr. bernard lallemant
SME Pyro Alliance (Groupe SNPE), France

SEPARATION ACTUATOR FOR SATELLITE APPLICATION

Abstract

PyroAlliance has undertaken the production delivery of Separation Actuator for satellite application, soon 1990. The selected technology has several attractive features: • No breaking part, during functioning, inducing an attenuated shock level. • Ability to the individual functioning control by cold gas actuation, increasing the reliability of one decade, with regard to the other pyrodevices of the market. • Low level of functioning pressure, providing limited strains inside the actuator and ensuring a high level of tightness. • Quick functioning time (some milliseconds) allowing the simultaneous triggering of several separation actuators for achieving a satellite mission.

The size range of the offered separation nut technology is between M6 and M20, corresponding to the bolt size.

The generic supply of separation actuator is extended from the simple separation nut, mechanical subassembly, to the structural separation actuator assembly: separation nut, pyro equipped + preloaded bolt at the right accurate tension + bolt catcher, able to withstand to specified shear effort and bending moment and ready to be installed on satellite.

The preferred satellite missions of the separation actuator are under listed: • Antenna reflector, momentum booms, solar arrays in-orbit deployment. • Satellite release directly from dispenser. • Opening of the satellite clamp band to the launcher payload adaptor.

In the frame of the 2000 ESA/TRP programme, PyroAlliance has improved the separation actuator technology by the featuring of a patented low shock device, alleviating the end-of-stroke impact between parts inside the actuator mechanism.

Highlights of the PyroAlliance Separation Actuator technology • “Perfect release” of all the 24 + 8 Globalstar satellites, launched by Soyuz, in 1998/1999 then in 2007, by means of 4 each PyroAlliance P/N ME0032 then ME0039, M10 structural separation actuator assembly, simultaneously triggered. • Successful prequalification at the harsh space environment of the M10 Low Induced Shock Actuator (LISA), PyroAlliance P/N ME0044, in 2007. • “Perfect release” of all the satellites, launched by Ariane 5, by means of the PAS 1194 C clamp band, open by 2 each PyroAlliance P/N ME0026, M10 separation actuator, since the maiden flight 179 on 14 November 2007.

The related demonstrated reliability at 90