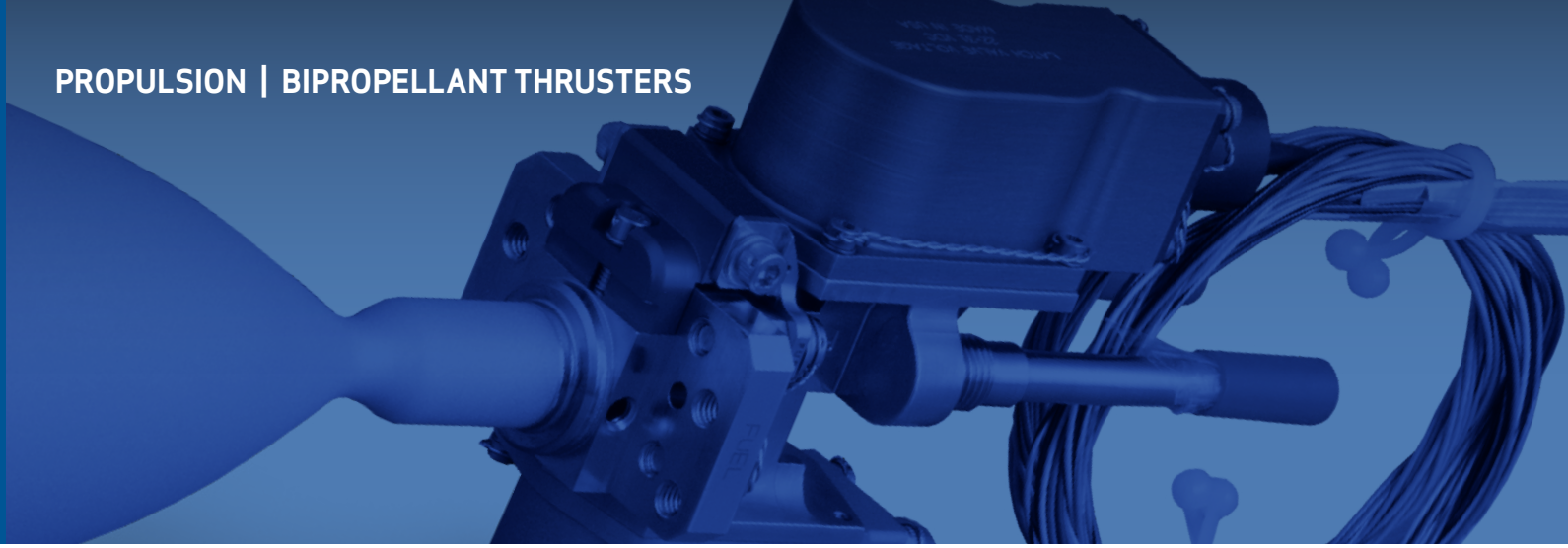
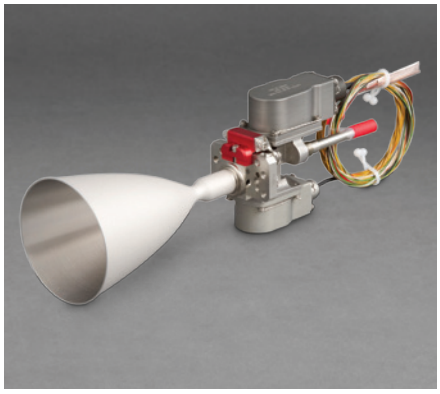
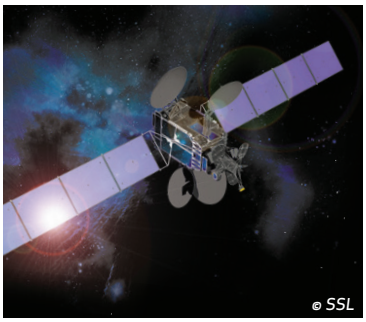
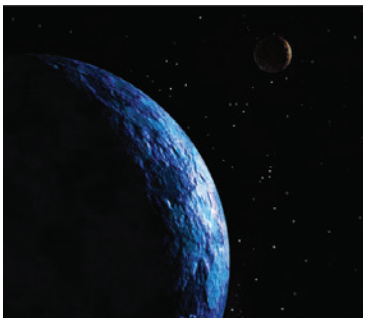


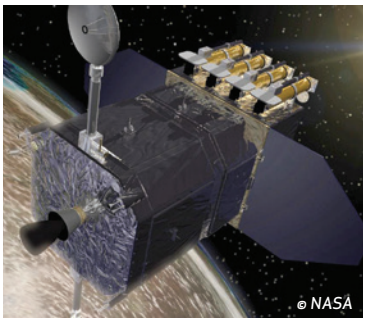
BIPROPELLANT ATTITUDE CONTROL SYSTEM (ACS) THRUSTERS



Moog is a world leader in Bipropellant attitude control propulsion for commercial and defense satellites. Our DST family of 5 lbf thrusters combines a high performance injector design with a high temperature Platinum/Rhodium chamber to provide industry leading performance in both steady state and pulse mode operation. We also supply our heritage 5 lbf and 2 lbf thrusters, which have been providing reliable attitude control for more than twenty years. Moog ACS engines have been the industry standard with more than 2,000 delivered.







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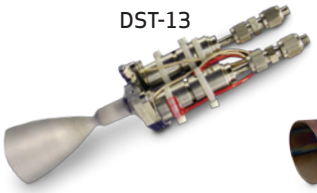
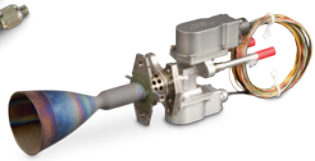
BIPROPELLANT ATTITUDE CONTROL SYSTEM (ACS) THRUSTERS

LINEAR ACTUATORS – PERFORMANCE CHARACTERISTICS

Design	DST-11H	DST-12	DST-13	5 lbf
				
Propellant	Hydrazine/MON	MMH/MON	MMH/MON	MMH/MON
Nominal Steady State Thrust	5 lbf (22N)	5 lbf (22N)	5 lbf (22N)	5 lbf (22N)
Feed Pressure	80 – 400 psia (5.5 – 27.6 bar)	60 – 400 psia (4.1 - 27.6 bar)	80 – 400 psia (5.5 - 27.6 bar)	39 - 320 psia (2.8 - 22.1 bar)
Nozzle Expansion	300:1	300:1	300:1	150:1/300:1
Nominal Mixture Ratio	0.85	1.61	1.65	1.61/1.65
Valve	Solenoid	Latching Torque Motor	Solenoid	Latching Torque Motor or Solenoid
Valve Power	41 watts max (2 coils wired in series)	6 watts max (Latch) 7 watts max (primary) 9 watts max (secondary	41 watts max (2 coils wired in series)	6 watts max (Latch) 7 watts max (primary) 9 watts max (secondary) (Torque Motor) 15.6 watts max (solenoid)
Mass	1.7 lbm (0.77 kg)	1.4 lbm (0.64 kg)	1.5 lbm (0.68 kg)	1.4 – 2.0 lbm (0.64 – 0.91 kg)
Length	10.3 in (262 mm)	9.6 in (244 mm)	10.4 in (264 mm)	9.7-13.5 in (248 - 343 mm)
Chamber Material	Platinum/Rhodium Alloy	Platinum/Rhodium Alloy	Platinum/Rhodium Alloy	C-103

Performance	DST-11H	DST-12	DST-13	5 lbf
Specific Impulse	310 secs	302 secs	298 secs	288 secs/292 secs
Throughput	907 kg (2000 lbm)	1073 kg (2365 lbm)	637 kg (1404 lbm)	484 kg (1068 lbm)
Programs	Intelsat, BepiColombo, Wild Geese, Tenacious, GOES-R	AsiaSat 5, Telstar, Himawari, Turksat	NASA SDO	ETS-8, QZSS, Superbird-7, ST-2, WGS, Intelsat
Highlights	DST-11H provides highest performance available in a hydrazine/ MON ACS Thruster	DST-12/13 Provides highest performance available in MMH/MON ACS Thruster		Engine has been in production for more than 30 years, with > 2000 delivered and flown

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SPACE AND DEFENSE GROUP

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