

Comparison of original 1926 Goddard Rocket with 2003 Replicas

Part (Drawing number) reference	Original (reference)	Static replica	Flight replica
Feedline check valves at injector (80M45489 F/N 12, 16)	Goddard106.jpg	Assumed brass, are incomplete W/O springs, disks & retainer assembly	TBD
Feedline Needle valves (80M45489 F/N 13, 18)	Goddard106.jpg	do not have needle and seat installed (existing are press fit and should be welded)	TBD
Feedlines at Needle valves	Feedlines were threaded with threads sealed and not glued in place Goddard106.jpg	valves need to be reworked with proper thread profile	TBD
Drip Rod control (80M45491 F/N 11 through 30)	Goddard109.jpg through Goddard113.jpg Per Goddard's notes, two tension springs were used, however F/N 27 must be a compression spring to work and best available pictures clearly show one tension spring. Comment: Goddard's paper was written perhaps 10 years after actual work was performed.	Materials: brass versus aluminum? Drip Rod Dimensions on 80M45491 are different than Arloe Mayne's dimensions and were estimated from best available pictures.	Second tension spring needs to be added. Calculations based on best available pictures show ~ 20 lb spring force would be needed at 100 psi for drip rod to work. Our opinion is that some sort of flexible seal had to be used in the pressure piston F/N 11 & 12 and 1/8" drip rod housing F/N 23 & 26 to keep GOX from leaking & causing a fire, per Arloe Mayne a few thousands gap between moving parts. 80M45491 F/N 5,6, 26 must be rotated slightly to avoid hanging up on Lox outlet cork float shut off plate F/N10.
All thread profiles		threaded per photographs	All thread profiles need to be reviewed as pressure test failed 60 TPI, (power screw threads may have been used that would not cut so deep into base material & given more strength to the threaded

			connection.
125 psi Relief valve 80M445490, sheet 3 F/N 16, 18		Orifice plug (needs F/N) are not installed.	TBD
Washer at Nozzle exit (80M45489 F/N 23).	welded	super glued	welded
Injector and nozzle liners	Alundum liners	none	Alumina coating for injector; Alumina liner for nozzle
Combustion Chamber liner	Alundum	fiberglass and Alundum liner	Paper phenolic liner
LOX fill tube vented cap (80M45491 F/N 33)	Goddard106.jpg marked "35".	Not per print & does not exactly match best available picture	TBD
LOX pick up tube (80M45491 F/N 40)	Goddard113.jpg material undetermined	Stainless steel. Not per print. The short radius bend at the LOX inlet could be made by welding short degree bends together or from a forged aluminum- cooling coil.	TBD
Launch frame (80M45493)		Assumed square base of 66 inches may be too large.	TBD
(80M45493 F/N 7)		Inadvertently cut off center and could be re worked.	TBD
Guide bars (80M45493 F/N 9)	Goddard126.jpg "Galvanized" guide per Goddard's notes	Guide bars are not "day of flight" configuration This picture does not show enough detail to easily build guide assembly. It looks like U-Bolt pivot points, wood "L" shape bracket	TBD