

FAX COVER PAGE

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REFER TO:	LIGO-T960098-00-B, LIGO E960089-00-B
SUBJECT:	Baffle weld procedure, memo
NUMBER OF PAGES FAXED INCLUDING THIS COVER SHEET: 3	

NOTE: additional copies, per your request

LIGO-7960098-00-B

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM
3570-063-96 PM/ki

April 30, 1996

TO: Allen Sibley

FROM: Paul McGrath *PM*

SUBJECT: Feasibility Study, to Resistance Weld LIGO Baffles

At the request of the LIGO project, the Jet Propulsion Laboratory, Fabrication Section, conducted a limited feasibility study, using resistance welding (RW) to secure Beam Tube Baffles within the beam tube.

Resistance welding was pursued to eliminate the need to have both a fitter and welder, and to minimize the operator/welder's effect on the quality outcome of the welds. The baffles are 304SS material that has been oxidized at 755 deg. F. Weld shear strength and consistency were the criteria for evaluation of the equipment and set up.

The Miller MSW-41T was tested at Miller, and the unit provided welds that appeared adequate. Some expulsion was evident, but this was acceptable to the LIGO project. One of the Miller RW's was taken on loan to run additional tests. Shear tests were conducted using the standard 6 inch tongs, standard (#040 211) tips and the flat (#040 212) tips. In addition a separate set of 6 inch tongs were fabricated with additional offset to allow access in to the baffle. Timing was varied between 2 tenths of a second and 2 seconds, and the camlock (that provides pressure to the tips) was adjusted to provide significant deflection to the tongs. There is no current adjustment on this unit so timing, Tip configuration, and to some extent pressure are the only parameters available.

The results of 30 shear tests indicated welds with 350 to 750 lb. shear strength can be reliably produced with this unit. Optimized settings produced 20 shear test welds in the 550 to 750 lb. range, with some expulsion on every weld. For optimized weld settings see recommended weld procedure.

The Miller unit was found to be reliable, simple to use, and light enough to be handled easily within a confined space. The Power requirement is standard 110 voltage 60 cycle current, so the power cord is easily moved through the tube and can be extended to any reasonable length.

The drawback to the Miller unit is the inability to fine tune the welds to eliminate the expulsion. To do this would require weld current control and a pneumatic or hydraulic actuated tip pressure. While this type of RW is available, they are much heavier and cumbersome to use.

PM:ki

cc: D. Denne