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LILCO, October 29, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
LONG ISLAND LIGHTING COMPANY)	Docket No. 50-322(OL)
)	
(Shoreham Nuclear Power Station,)	
Unit 1))	

SUPPLEMENTAL TESTIMONY OF ROGER L. MCCARTHY,
CHARLES A. RAU, CLIFFORD H. WELLS,
HARRY F. WACHOB, DUANE P. JOHNSON,
CRAIG K. SEAMAN, EDWARD J. YOUNGLING
AND MILFORD H. SCHUSTER ON BEHALF OF
LONG ISLAND LIGHTING COMPANY ON SUFFOLK
COUNTY CONTENTION REGARDING CYLINDER BLOCKS

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PDR ADOCK 05000322
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1. What is the purpose of this Supplemental Testimony?

A. (McCarthy, Rau, Wells, Wachob, Johnson, Youngling, Seaman, Schuster). It provides new information from the current test run of the EDG 103 that is applicable to the cam gallery area of EDG 101, 102 and 103. Strain gage measurements taken during the test run demonstrate that the vertical stresses in the cam gallery saddle areas are compressive, thus preventing any crack propagation. In addition, measurements of indications detected in the cam gallery of the replacement EDG 103 block by a crack depth gage demonstrate that the indications are very shallow. These indications will not extend during engine operation, and they will not impair the ability of the EDG 103 to perform its intended function.

2. Please describe the cam gallery locations inspected on the replacement EDG 103 block.

A. (Rau, Wachob, Johnson, Youngling, Schuster). A visual inspection of cam gallery location nos. 2 and 8 in the replacement EDG 103 did not reveal any indications. An examination with a material comparator established that there were no repair welds.

Magnetic particle and liquid penetrant examinations, which were not required by the acceptance criteria for the block, were performed on cam saddle location nos. 2 and 8 in preparation for the placement of strain gages in these locations. These inspections revealed discontinuous and fine linear indications. These areas were examined on October 18, 1984 with the same crack depth gage used to inspect EDG 101 and the original 103 block cam saddle regions. The deepest indication in the replacement EDG 103 block was .014 inch.

3. Please describe the recent strain gage measurements in the cam gallery region.

A. (Rau, Wells, Wachob, Youngling, Schuster). Strain gage rosettes were placed on and to the left and right of cam gallery saddles nos. 2 and 8 of EDG 103 as part of the testing program requested by the NRC Staff. The location of these gages is shown on Exhibit B-59. The vertical stress results from the strain gage test, which became available on October 27, are completely consistent with preliminary cam gallery strain gage data provided to the County and NRC counsel at the

depositions of Drs. Rau and Wachob on October 11, 1984, and they demonstrate that the vertical stresses in the cam gallery area remain compressive under operating conditions. The vertical stresses obtained from each of the six strain gage locations are summarized in Exhibit B-59.

4. Are the results of the strain gage test relevant to EDG 101 and 102, since they have repair welds?

A. (Rau, Wells, Youngling) Yes. The large compressive stress induced by bolt torque is sufficient to maintain the cam gallery saddle regions of the EDG 101, 102 and 103 blocks in compressive stress. The repair welds present in the cam gallery of the EDG 101, 102 and the original 103 block introduce additional compressive residual stresses in the cast iron beneath the weld. Therefore, even if the original shrinkage cracks were deeper than the weld repairs in EDG 101 and 102, the strain gage tests confirm that compressive stresses will be present to prevent any extension.

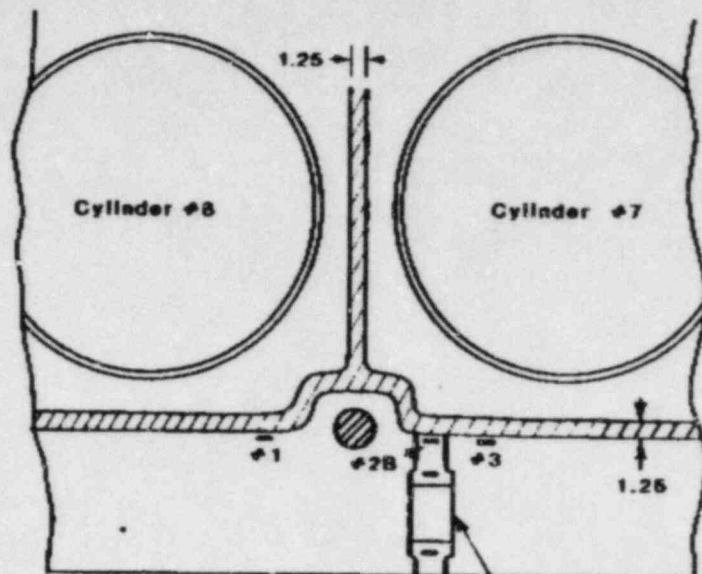
5. Do you have an opinion, based on a reasonable degree of engineering certainty, whether the replacement EDG 103 block, with the indications noted in the cam gallery area, will perform its intended function?

A. (McCarthy, Rau, Wells, Youngling). In our opinion, the indications in the replacement EDG 103 block will not impair the ability of the EDG to perform its intended function. These indications will not extend and will have no effect whatsoever on engine operation or engine reliability.

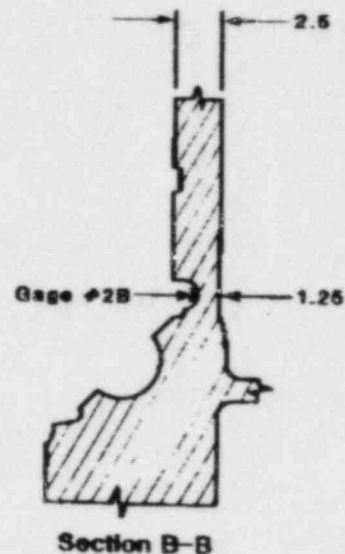
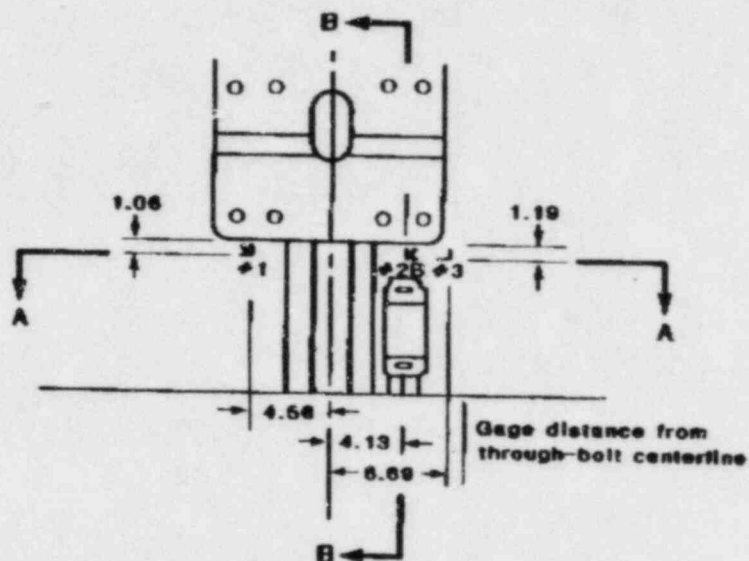
Furthermore, the strain gage results confirm, as the analysis had previously shown, that the vertical stresses in the cam gallery area remain compressive under operating conditions, thereby confirming our conclusion that none of the cam gallery indications in EDG 101, 102 or 103 will extend. This conclusion is also consistent with the destructive examinations of the cam gallery saddles of the original EDG 103 block, which showed no growth. Clearly, therefore, cam gallery cracks, if present, have not propagated and will not propagate, and they will not impair EDG operation.

Exhibit B-59

B-59-1



Section A-A Cam saddle



Gages

- #1, 2B Rosettes (vertical, 45°, horizontal)
- #3 Biaxial (vertical, horizontal)

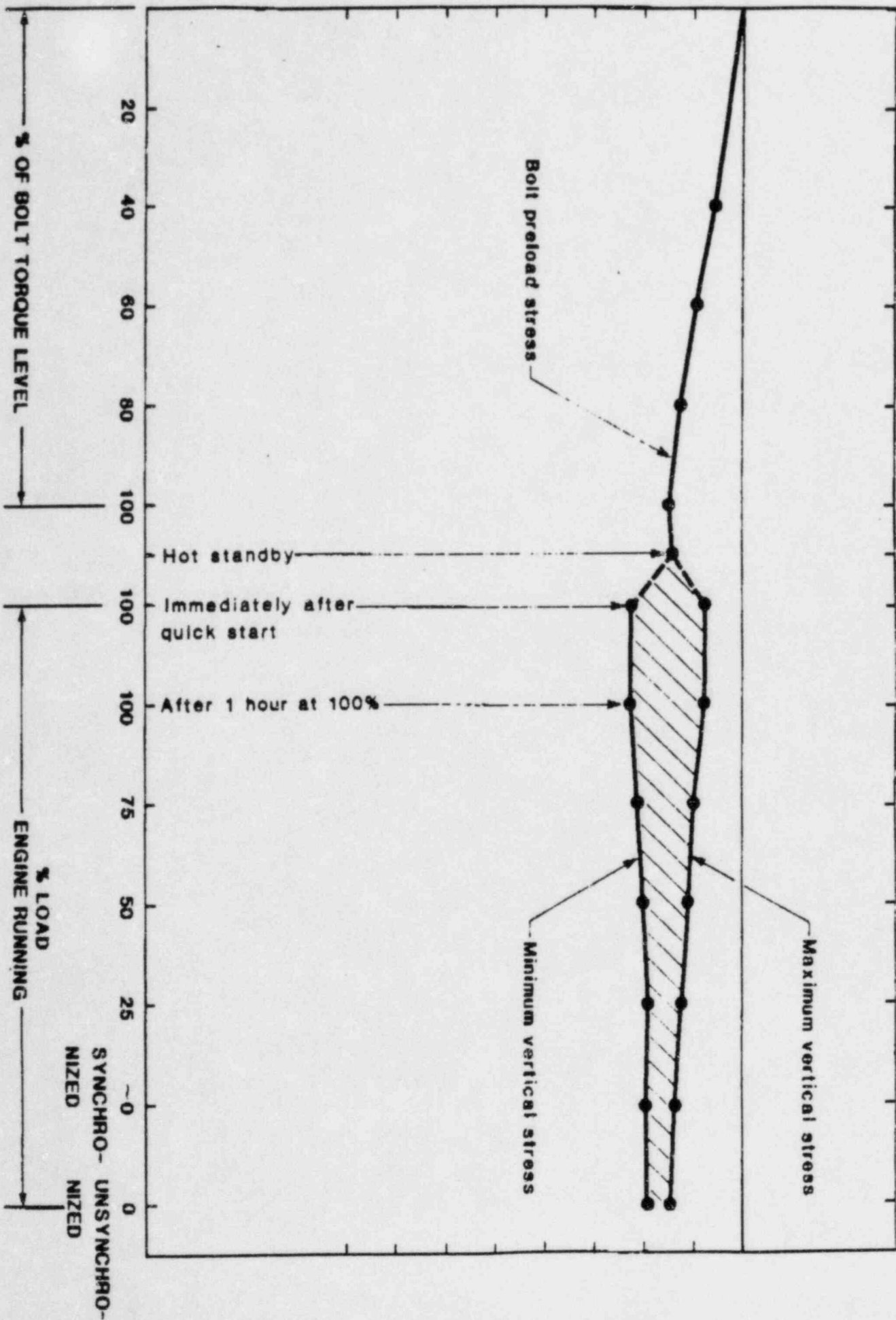
All dimensions in inches

SCHEMATIC OF SHOREHAM EDG-103
CAM GALLERY
CAM SADDLE #8 STRAIN GAGE LOCATIONS

Left of Saddle #8
Gage #1

SHOREHAM DG-103 REPLACEMENT BLOCK
CAM GALLERY STRAIN GAGE TEST

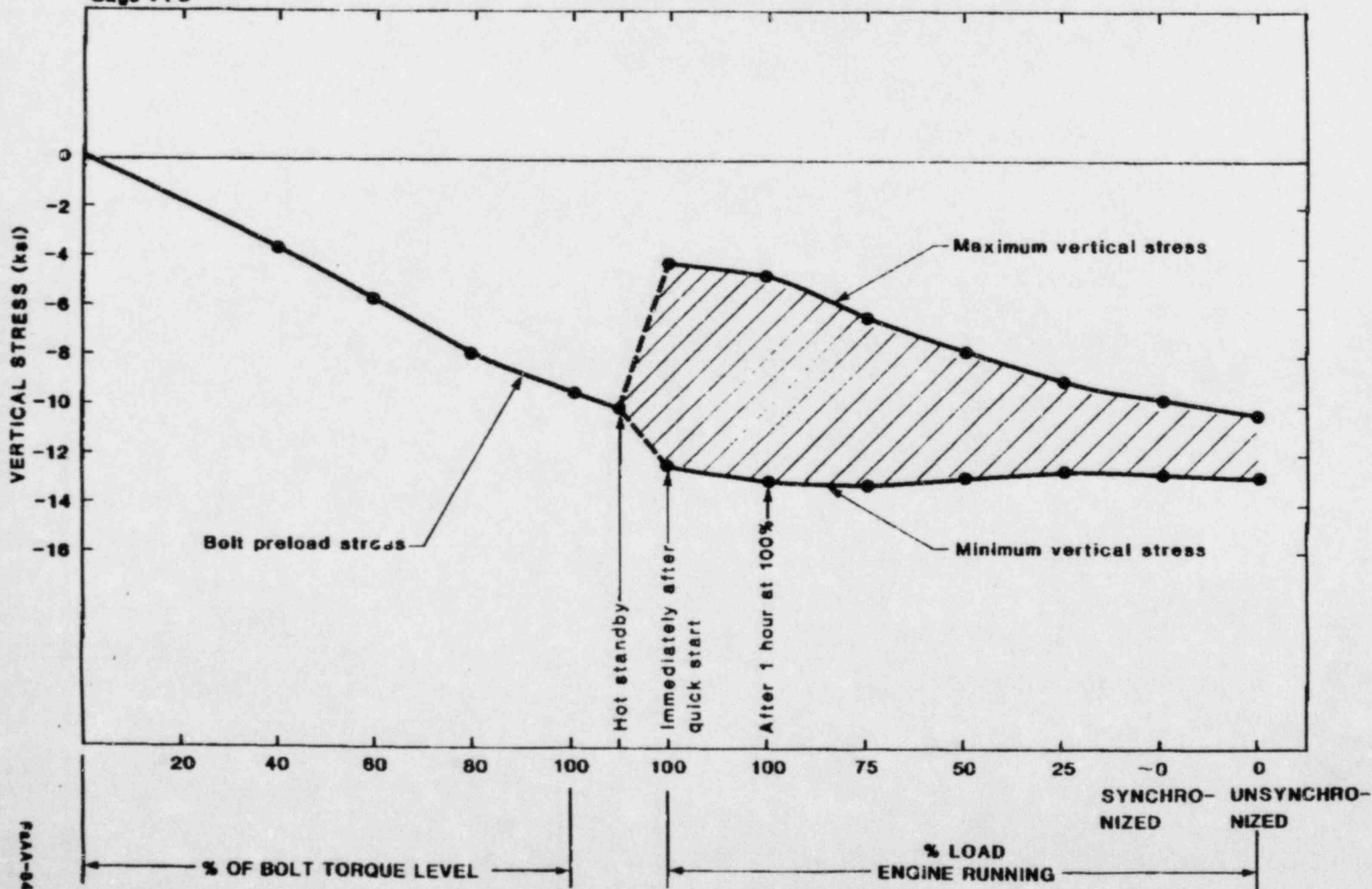
B-59-2



On Saddle #8
Gage #2B

SHOREHAM DG-103 REPLACEMENT BLOCK CAM GALLERY STRAIN GAGE TEST

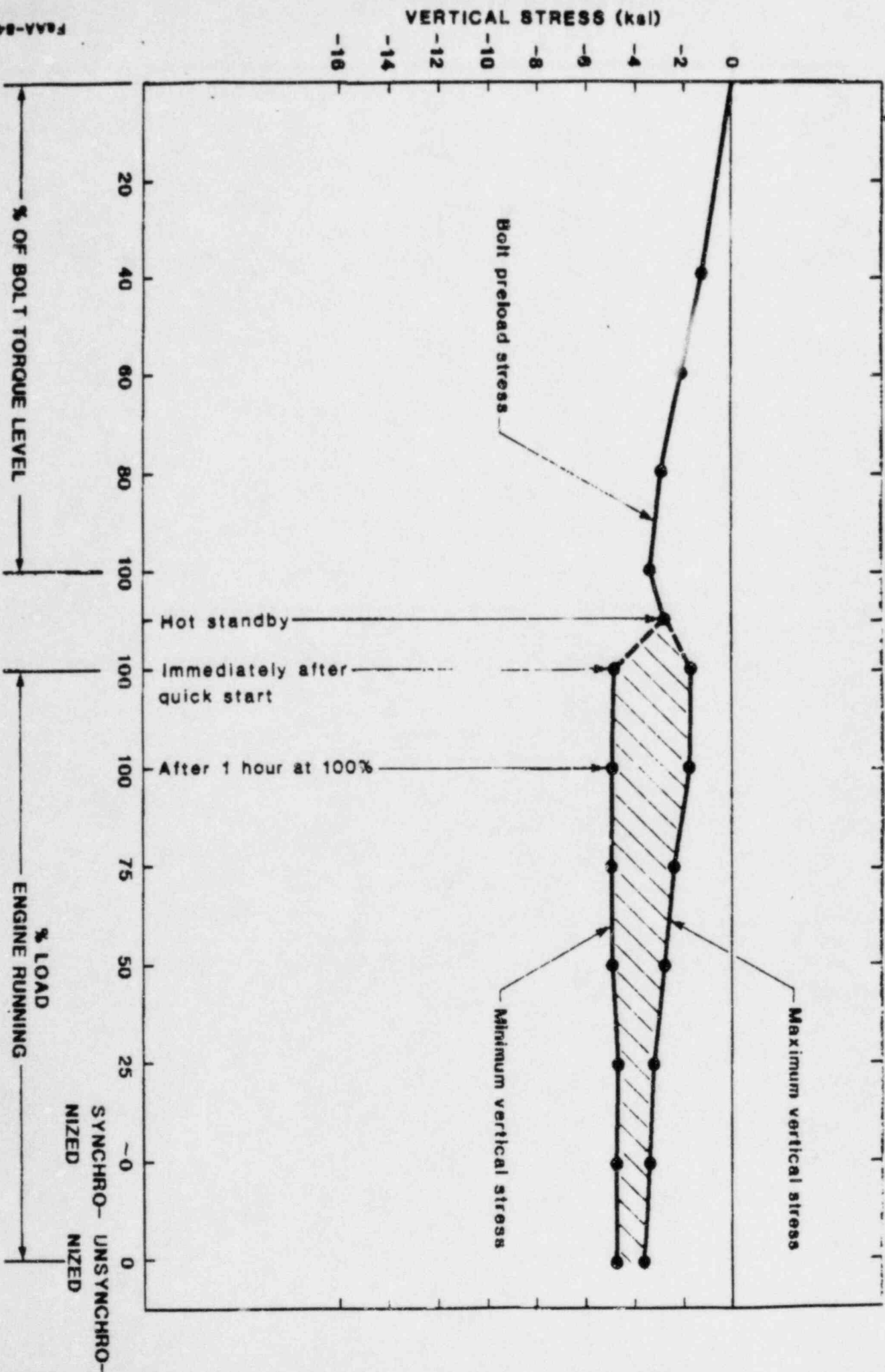
B-59-3



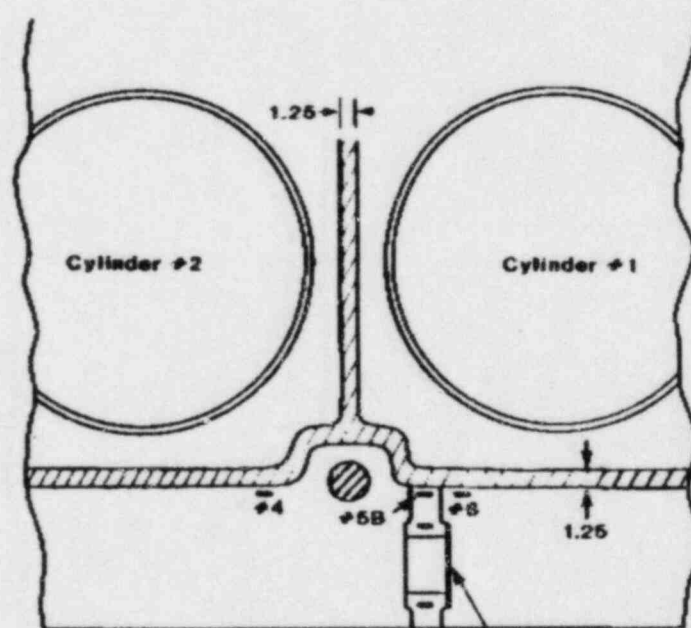
Right of Saddle #8
Gage #3

SHOREHAM DG-103 REPLACEMENT BLOCK
CAM GALLERY STRAIN GAGE TEST

B-59-4



B-59-5



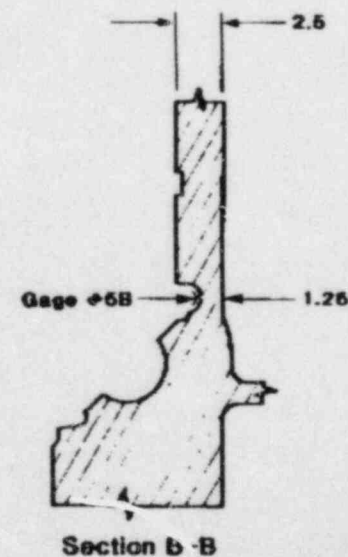
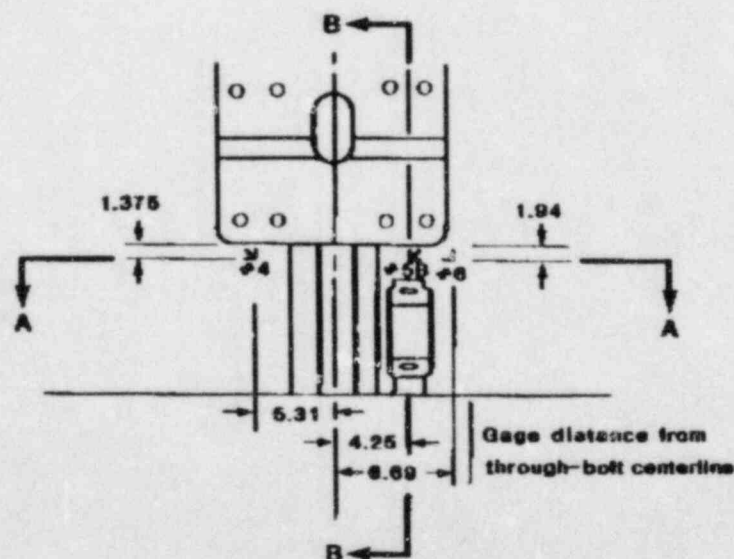
Section A-A

Cam saddle

Gages

#4, 5B Rosettes (vertical, 45°, horizontal)

#6 Biaxial (vertical, horizontal)



Section b-b

All dimensions in inches

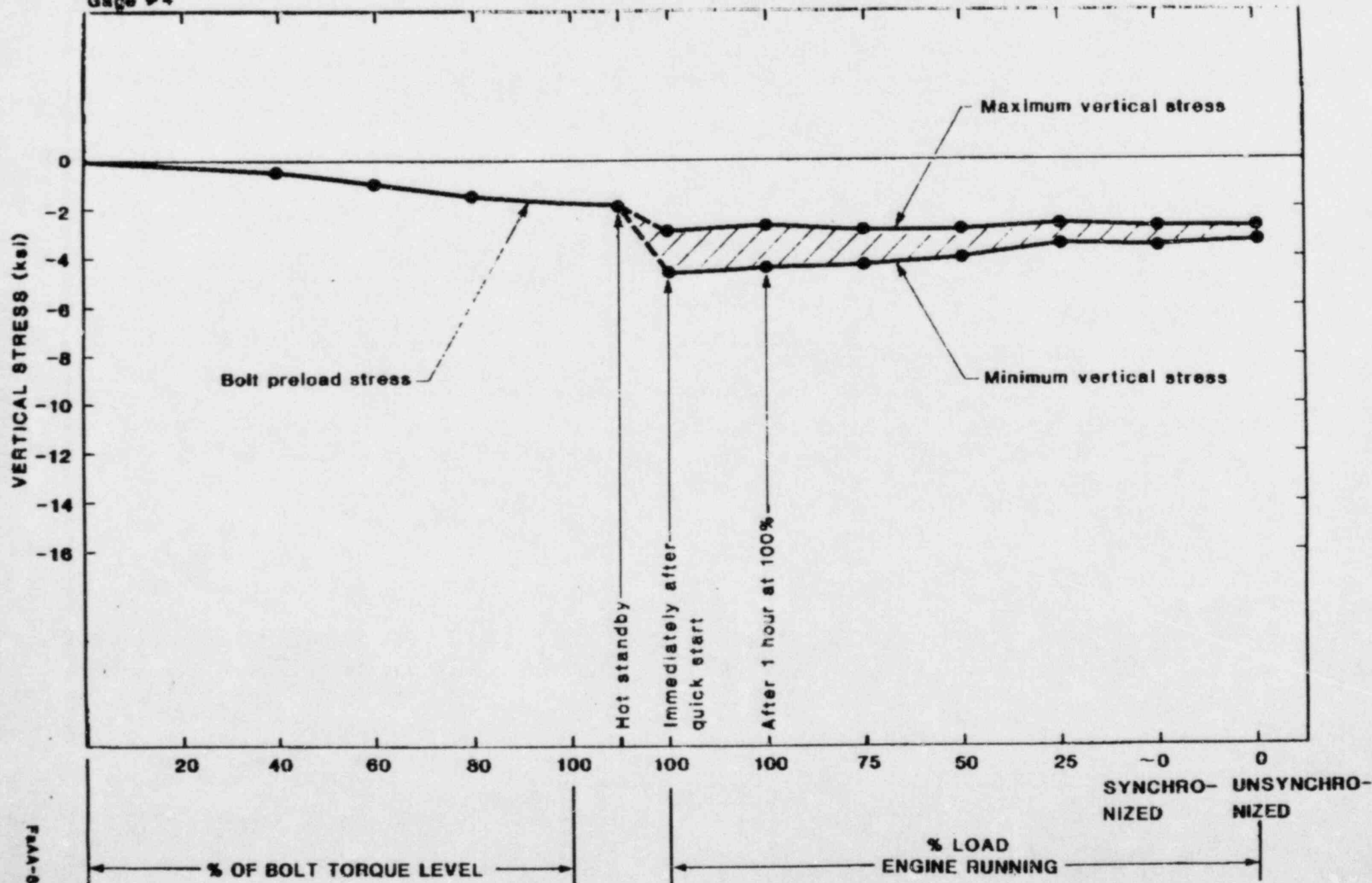
SCHEMATIC OF SHOREHAM EDG-103
CAM GALLERY
CAM SADDLE #2 STRAIN GAGE LOCATIONS

Left of Saddle #2

SHOREHAM DG-103 REPLACEMENT BLOCK CAM GALLERY STRAIN GAGE TEST

B-59-6

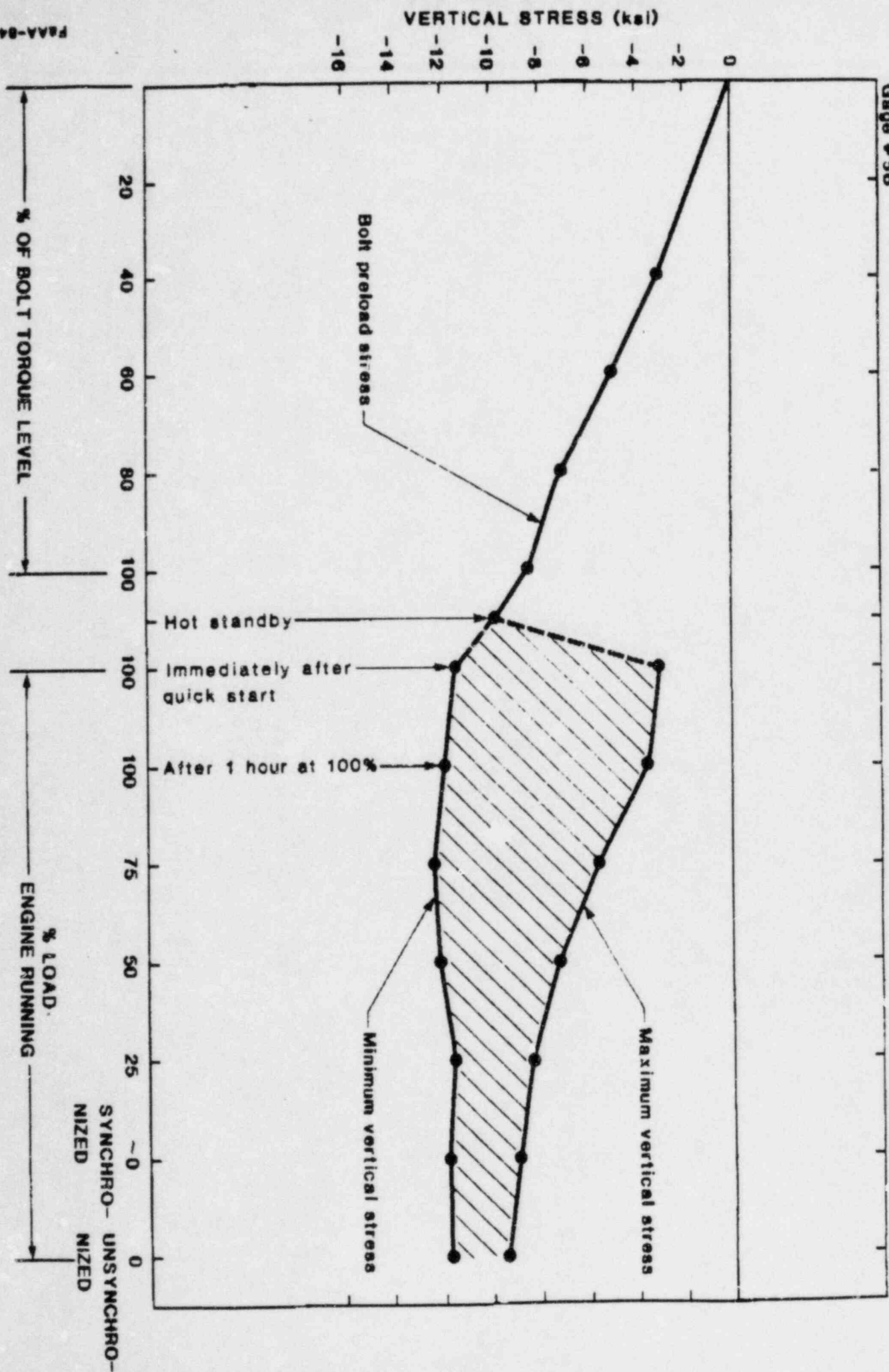
Gage #4



On Saddle #2
Gage #5B

SHOREHAM DG-103 REPLACEMENT BLOCK
CAM GALLERY STRAIN GAGE TEST

B-59-7



Right of Saddle #2
Gage #8

SHOREHAM DG-103 REPLACEMENT BLOCK
CAM GALLERY STRAIN GAGE TEST

B-69-8

