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# HOT CELL SERVICES

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a Sovis company

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## FAX COVER SHEET

<b>SEND TO / POUR</b> Company name / Societe <b>TRIUMF</b>	<b>HCS 14066MM</b> From / De <b>Mike Meader</b>
Attention / A L'attention de <b>Ron Kuramoto</b>	Date / date <b>May 5, 2000</b>
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Total Pages, including cover sheet:  
 Nombre de pages, pages de garde incluse 8

### COMMENTS/COMMENTAIRES:

Attached find the procedure for Cold Side Gasket Replacement. This contains the steps to torque the trim frames. The Hot side is the same.

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

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HCSC SAFETY REVIEW  
BOARD APPROVAL

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BY *Donald H Campbell*

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DATE 2-16-95

REVISION STATUS

SHEET	1	2	3	4	5	SKETCH 1	SKETCH 2												
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SHEET																			
REV																			

PREPARED <i>PC</i>	DATE <i>2/16/95</i>	HCS CORPORATION			
CHECKED <i>SS</i>	DATE <i>2/16/95</i>	TITLE  COLD SIDE GASKET REPLACEMENT PROCEDURE			
ENGINEER <i>PC</i>	DATE <i>2/16/95</i>				
QUALITY <i>BS</i>	DATE <i>2/16/95</i>				
APPROVED <i>[Signature]</i>	DATE <i>2/16/95</i>	CONTRACT NO.	DOCUMENT NO. HC-MF-107	REV 0	SHEET 1

## **1.0 Scope**

### **1.1 Purpose**

The purpose of this procedure is to define a safe method of replacing gaskets on Cold Side trim frame assemblies on an existing, installed Radiation Shielding Window. This procedure, in conjunction with the referenced, standard HOT CELL SERVICES Procedures is intended to address the individual tasks required to change the sealing and compression gaskets which may be leaking or may leak in the near future.

## **2.0 References**

- 2.1 The Scope of Work for the specific job (Optional)
- 2.2 The Radiation Shielding Window Fabrication Drawings (if obtainable)
- 2.3 HOT CELL SERVICES Work Order
- 2.4 Related Procedures:

Grounding Procedure, HC-MF-002

Oil Change Procedure, HC-MF-028

Leak Test Procedure, HC-MF-103

## **3.0 Requirements**

- 3.1 Calibrated Torque Wrenches, 0-50 ft-lbs and 0-120 in-lbs
- 3.2 Grounding Equipment per HCS Procedure HC-MF-002
- 3.3 Work Table for cleaning the cover glass
- 3.4 Guide Pins
- 3.5 Socket Wrench and sockets
- 3.6 Gasket material and vulcanizing equipment
- 3.7 Gasket Adhesive (3M - 847)
- 3.8 Hi-Sheen glass cleaner and towels

3.9 Vacuum Cups (2 Pair)

3.10 Stainless Steel Wire Saw

#### 4.0 Detailed Procedure

4.1 Preparation for gasket replacement.

4.1.1 Remove any obstructions near the window which may interfere with the gasket replacement efforts.

4.1.2 Ground the window per HC-MF-002.

4.2 Gasket Replacement

4.2.1 Drain the existing mineral oil from the radiation shielding window per HC-MF-028.

4.2.2 Loosen the trim frame bolts in the 'Loosen Sequence' as shown on Sketch 1. Prior to removing two (2) of the bolts on the bottom of the trim frame, replace with two (2) guide pins to avoid the glass from falling (and breaking).

4.2.3 Remove the cold side trim frame bolts. Remove the grounding connection (temporarily, if necessary) to remove all trim frame bolts **(do not remove guide pins until the cover glass has been removed)**.

4.2.4 Using the vacuum cups, remove (slide) the trim frame and cover glass as a complete unit over the guide pins, away from the window housing.

If the cover glass sticks to the housing, it may be necessary to remove the trim frame separately. If this method is required, one window technician shall remove the trim frame while another technician is supporting the cover glass with the use of the vacuum cups. Once the trim frame is removed, the glass can be freed using a putty knife or stainless steel wire saw.

4.2.5 Remove any gasket remains from the window. The aged gaskets have been known to stick. Some prying and scraping may be required to free it from the window housing surface.

HC-MF-107

REV 0

SHEET 3

- 4.2.6 Re-attach the grounding cable if it was removed in Operational Step 4.2.3.
- 4.2.7 Using the Hi-Sheen cleaner, clean the cover glass (both surfaces). Clean the cold side surface of the first piece of shielding glass.
- 4.2.8 Take measurements of the window sealing surface and trim frame to fabricate new compression and seal gaskets.

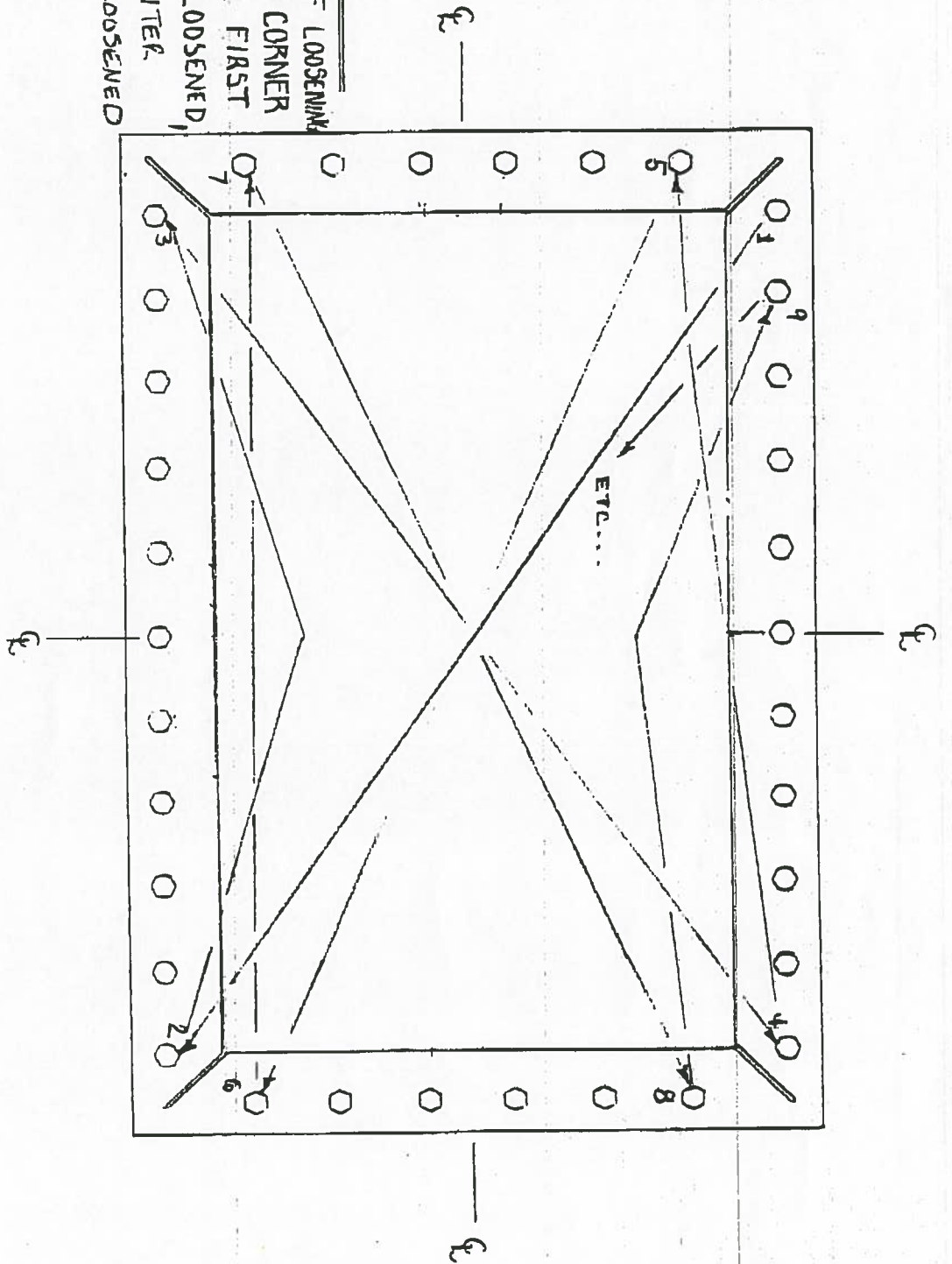
**NOTE:** To determine gasket thickness, measure the cover glass thickness and the internal trim frame height. Normally, the gasket thickness (seal and compression - combined) is 1/16" to 1/8" larger than the difference between the glass thickness and the trim frame height.

If a gasket groove exists, its depth shall be added to the trim frame height when determining the gasket thicknesses.

- 4.2.9 Fabricate the new compression gaskets using the dimensions from the previous Operational Step. The seal gasket shall have continuous (vulcanized) corners. The compression gasket shall be comprised of individual strips which are butted together at the corners. The compression gasket shall be of higher durometer and wider (if possible) to assure that proper sealing of the trim frame assembly is achieved.
- 4.2.10 Remove the old seal gasket remains from the sealing surface of the housing and the compression gasket from the trim frame. Discard these remains. Prepare these surfaces for adhesion of the newly fabricated gaskets.
- 4.2.11 Adhere the seal gasket by applying a liberal amount of gasket adhesive (3M-847) to the housing and placing the gasket onto the glue. Press evenly around the perimeter to assure the entire gasket is in contact with the window housing.
- 4.2.12 Adhere the compression gasket pieces by applying a liberal amount of gasket adhesive (3M-847) to the trim frame and placing the gasket pieces onto the glue. Press evenly along the gaskets pieces to assure the entire gasket is in contact with the trim frame.

- 4.2.13 Re-clean the cover glass, as necessary. Place the cover glass inside the trim frame and prepare for re-assembly. With the guide pins installed, position the trim frame assembly onto the shielding window (by sliding the trim frame over the guide pins and against the sealing surface). Secure to the housing by hand tightening the trim frame bolts.
- 4.2.14 Tighten the bolts in a star pattern (as shown on Sketch 2) to 10 ft-lbs, in 2 ft-lb increments. The 10 ft-lb torque should be repeated two or three times. Compressing the gasket relieves the gasket pressure on adjacent bolts, thus reducing their torque. Therefore, it is necessary to repeat the torquing sequence to assure an even gasketing force is applied.
- 4.3 The next step is normally to leak test the Radiation Shielding Window per HC-MF-103. Some windows may require an oil flush prior to refilling with mineral oil. See HOT CELL SERVICES Work Order (Reference 2.3) for exact window maintenance instructions.

NOTE:  
 THIS TYPE OF LOOSENING  
 PREVENTS THE CORNER  
 BOLTS FROM BEING THE FIRST  
 TO BE LOOSENED,  
 AND THE CENTER  
 BOLTS ARE LOOSENED  
 LAST.

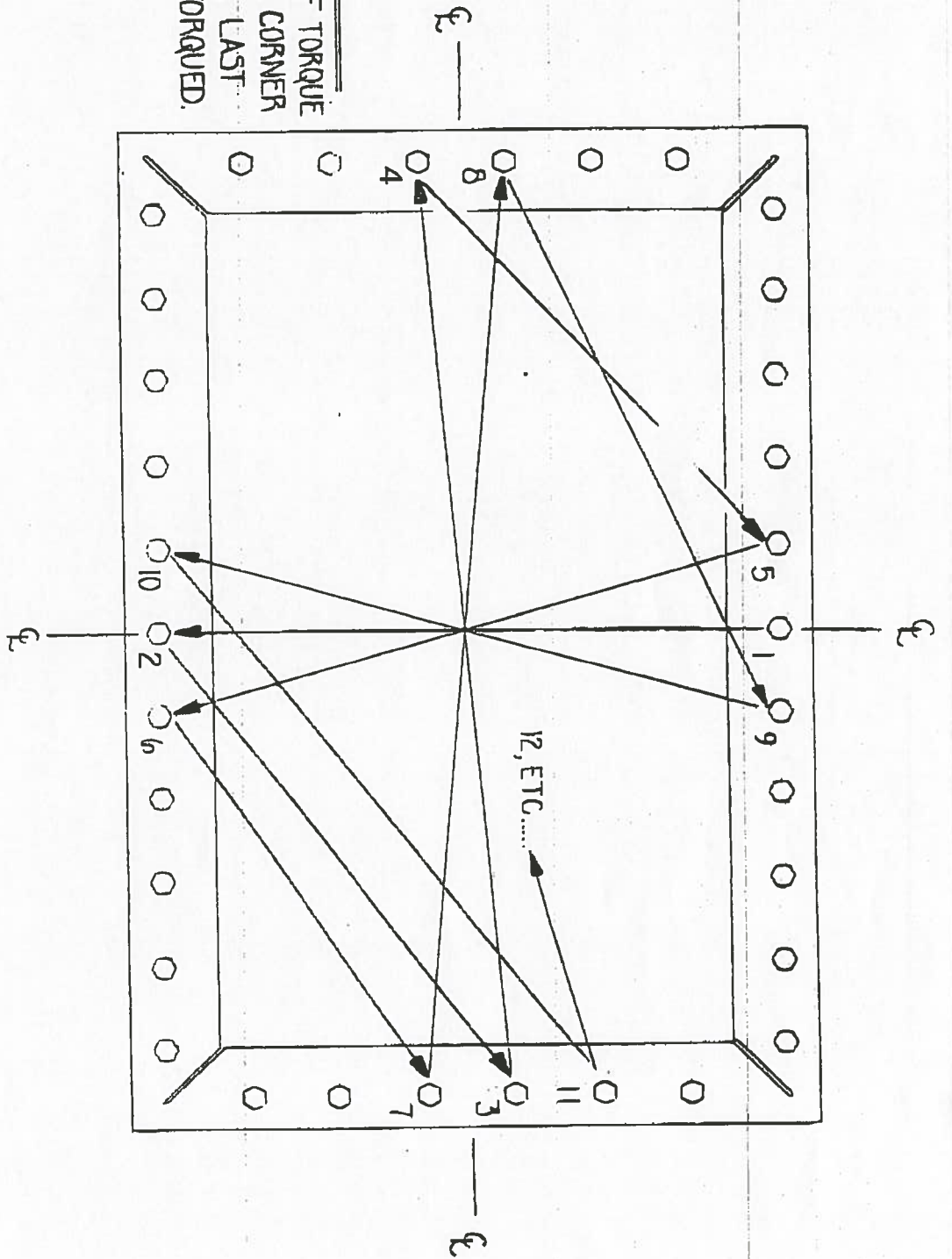


GENERAL BOLT LOOSENING:

THE BOLTS SHOULD BE LOOSENED INCREMENTALLY  
 (1/4-TURN, 1/2-TURN, 3/4-TURN, ETC...) IN THE  
 STAR PATTERN SHOWN ABOVE. ALL BOLTS SHOULD  
 BE LOOSENED THE SAME ROTATION BEFORE REPEATING  
 THE SEQUENCE.

SKETCH 1

TE:  
THIS TYPE OF TORQUE  
SEQUENCE THE CORNER  
BOLTS ARE THE LAST  
TO BE TORQUED.



GENERAL BOLT TORQUE PATTERN

THE GENERAL "STAR" PATTERN ALLOWS THE CENTER BOLTS TO BE TORQUED FIRST, PROGRESSING OUTWARD TOWARD THE CORNERS. TO LOOSEN THE BOLTS REVERSE THE PROCEDURE OUTLINED ABOVE.

SKETCH 2  
TOTAL P.08