



GE Medical Systems

Technical Publications

Direction 2217718-100

Revision 0

MX150 Tube Replacement Hoist Procedure

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Operating Documentation

WARNING

- THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.
- IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.
- DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.
- FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.

AVERTISSEMENT

- CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.
- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.

WARNUNG

- DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.
- FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.
- VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.
- WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.

AVISO

- ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.
- SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.
- NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
- LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.

ATENÇÃO

- ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.
- SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.
- NÃO TENDE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.
- O NÃO CUMPRIMENTO DESTA AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A' CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.

AVVERTENZA

- IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.
- SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.
- SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.
- NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL'ADDETTO ALLA MANUTENZIONE, ALL'UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.

警告

- ・このサービスマニュアルには英語版しかありません。
- ・GEMS以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
- ・このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。
- ・この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

注意:

- 本维修手册仅存有英文本。
- 非 GEMS 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。
- 未详细阅读和完全了解本手册之前，不得进行维修。
- 忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

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IMPORTANT! . . . X-RAY PROTECTION



X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. The General Electric Company, Medical Systems Group, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide

complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that everyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission

on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that the General Electric Company, Medical Systems Group, its agents, and representatives have no responsibility for injury or damage which may result from improper use of the equipment.

Various protective material and devices are available. It is urged that such materials or devices be used.

CAUTION: United States Federal law restricts this device to use by or on the order of a physician.

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If you have any comments, suggestions or corrections to the information in this document, please write them down, include the document title and document number, and send them to:

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CERTIFIED ELECTRICAL CONTRACTOR STATEMENT



All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing

shall be performed by qualified GE Medical personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the

requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent, have notation "**damage in shipment**" written on **all** copies of the freight or express bill **before** delivery is accepted or "signed for" by a General Electric representative or a hospital receiving agent. Whether noted or concealed, damage **MUST** be reported to the carrier **immediately**

upon discovery, or in any event, within **14** days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this **14** day period.

Call Traffic and Transportation, Milwaukee, WI (414) 827-3449 /

8*285-3449 **immediately** after damage is found. At this time be ready to supply name of carrier, delivery date, consignee name, freight or express bill number, item damaged and extent of damage.

Complete instructions regarding claim procedure are found in Section "S" of the Policy & Procedure Bulletins.

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REVISION HISTORY

REV	DATE	REASON FOR CHANGE
A	May 29, 1998	Preliminary release.
0	July 13, 1998	Initial release.

LIST OF EFFECTIVE PAGES

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**SECTION 1
GENERAL**

A tube lifting crane is provided inside the MX150 X-ray tube crate. The procedures described here enable the tube to be mechanically lifted into place on the TC/TCV systems (Section 2), and on the LCA/LCV +/LC+ systems (Section 3). One person can perform these procedures in most instances.

SECTION 2
PROCEDURE FOR TC/TCV SYSTEMS

1. Remove the outer package and the top of the wooden crate.
2. Take out the 4 blocks: block A, block B, and the two blocks D. (See Illustration 1.)
3. Place the blocks D on the floor, positioned such that when the side door of the crate is lowered, it rests on the blocks. (See Illustration 1.)
4. Put the block B (the smaller of the two remaining blocks) in a convenient spot on the floor, near to the gantry but away from the working area and without blocking any access routes.
5. Position the cart and lift the new tube from the crate and place it on the block B. (See Illustrations 2 and 3.)
6. Remove the TC table top using either a safe lifting method or the procedure in the Quick Reference Guide.
7. Position the C arm at 0 degrees, SID to maximum, and the C arm long movement to about the center of travel.
8. Switch off the system, and perform Lock out/Tag out.
9. Disconnect the tube and make it ready to be removed, as explained in the appropriate positioner manual.
10. Remove the collimator and the collimator plate, remove the mini-tank, and the anode HT cable, disconnect the 2 stator cables, the 2 water pipes and remove the 2 fixing bolts from the tube mount and the strengthening plate that prevents the tube being lifted. The collimator can normally be rested on the C arm without having to disconnect it. (See Illustration 6.)
11. Install the lifting handle on the defective tube. (The system was originally supplied with a handle that should be available for this purpose.)
12. Position the crane (See Illustration 6) and lift the tube as high as possible. Withdraw the tube, you may have to tilt the tube in order for the HT cable port to clear the gantry. Tilt safely, at the end of the open part of the crane's hook. Take care that there is no risk of pushing the tube out of the hook.
13. Take the defective tube and place it in the tube crate; the oil pump end should be towards the bottom of the crate.
14. Use the crane to lift the replacement tube off block B and install it in the TC gantry. You may have to tilt the tube in order for the HT cable port to clear the gantry. Tilt safely, at the end of the open part of the crane's hook. Take care that there is no risk of pushing the tube out of the hook.
15. Reconnect the replacement tube and continue with the calibration process. A Quick Reference Guide and a more detailed procedure for the calibration process is available.
16. Repack the defective tube, the crane and the 4 blocks in the crate for return. A packing guide is contained in the tube documentation. Illustration 7 shows the positions of the securing straps.

SECTION 3
PROCEDURE FOR LCA/LCV+/LC+ SYSTEMS

1. Remove the outer package and the top of the wooden crate.
2. Take out the 4 blocks: block A, block B, and the two blocks D. (See Illustration 1.)
3. Place the blocks D on the floor, positioned such that when the side door of the crate is lowered, it rests on the blocks. (See Illustration 1.)
4. Put the block B (the smaller of the two remaining blocks) in a convenient spot on the floor, near to the gantry but away from the working area and without blocking any access routes.
5. Position the cart and lift the new tube from the crate and place it on the block B. (See Illustrations 2 and 3.)
6. Position the L and C to zero degrees. Move the Pivot to between 43 and 45 degrees, until the block A (the remaining block with the wooden base) fits just underneath the tube and almost touching it. (See Illustration 4.)
7. Switch off the system, and perform Lock out/Tag out.
8. Disconnect the tube and make it ready to be removed, as explained in the appropriate positioner manual.
9. Remove the collimator and the collimator plate, remove the mini-tank, and the anode HT cable, disconnect the 2 stator cables, the 2 water pipes and remove the 2 fixing bolts from the tube mount. The collimator can normally be rested on the L arm base without having to disconnect it.
10. Install the lifting handle on the defective tube. (The system was originally supplied with a handle that should be available for this purpose.)
11. Using a safe lifting position, unhook the defective tube from the positioner and lower it such that it rests on block A. (See Illustration 5.)
12. Use the crane to lift the defective tube off block A and place it in the tube crate; the oil pump end should be towards the bottom of the crate.
13. Use the crane to lift the replacement tube from block B and place it on block A. Use the handle and a safe lifting position to hook the replacement tube onto the gantry.
14. Reconnect the replacement tube and continue with the calibration process. A Quick Reference Guide and a more detailed procedure for the calibration process is available.
15. Repack the defective tube, the crane and the 4 blocks in the crate for return. A packing guide is contained in the tube documentation. Illustration 7 shows the positions of the securing straps.

ILLUSTRATION 1
MX 150 X-RAY TUBE CRATE

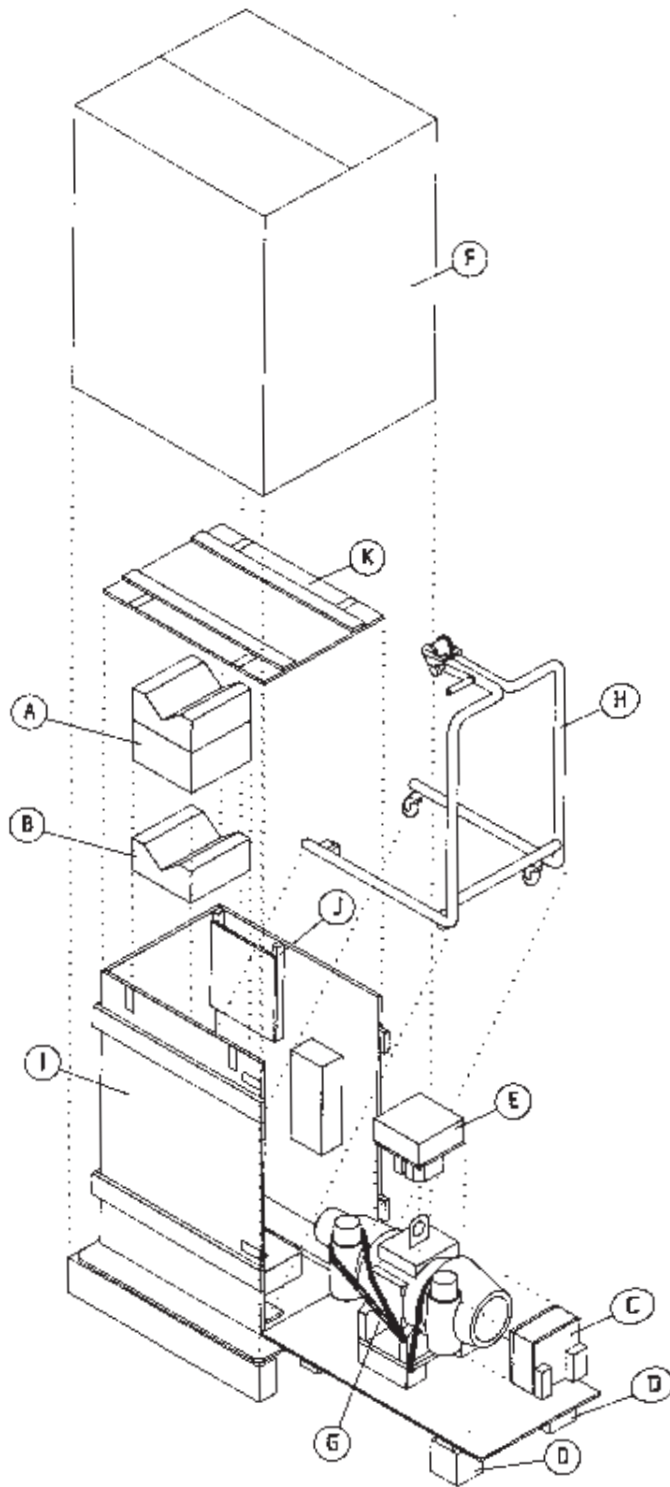


ILLUSTRATION 2
LIFTING NEW TUBE FROM CRATE

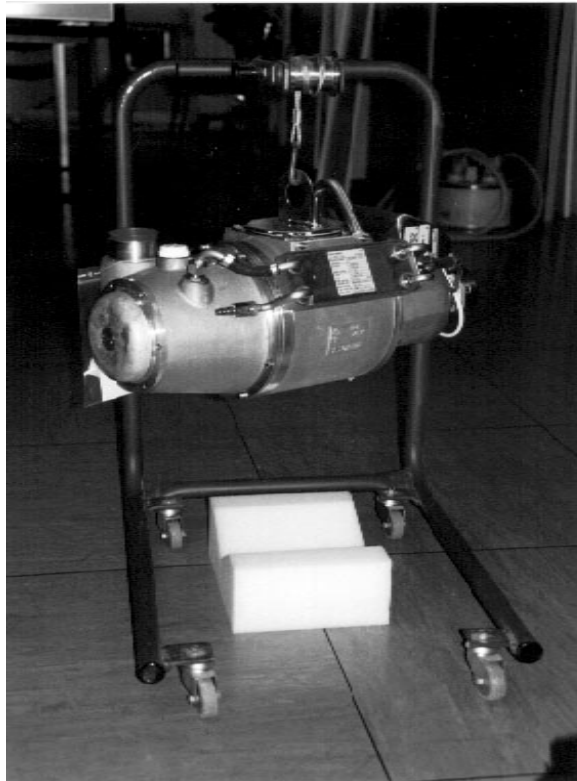


ILLUSTRATION 3
PLACING NEW TUBE ON BLOCK B



ILLUSTRATION 4
LCA/LCV+/LC+
POSITIONING L, C, AND PIVOT

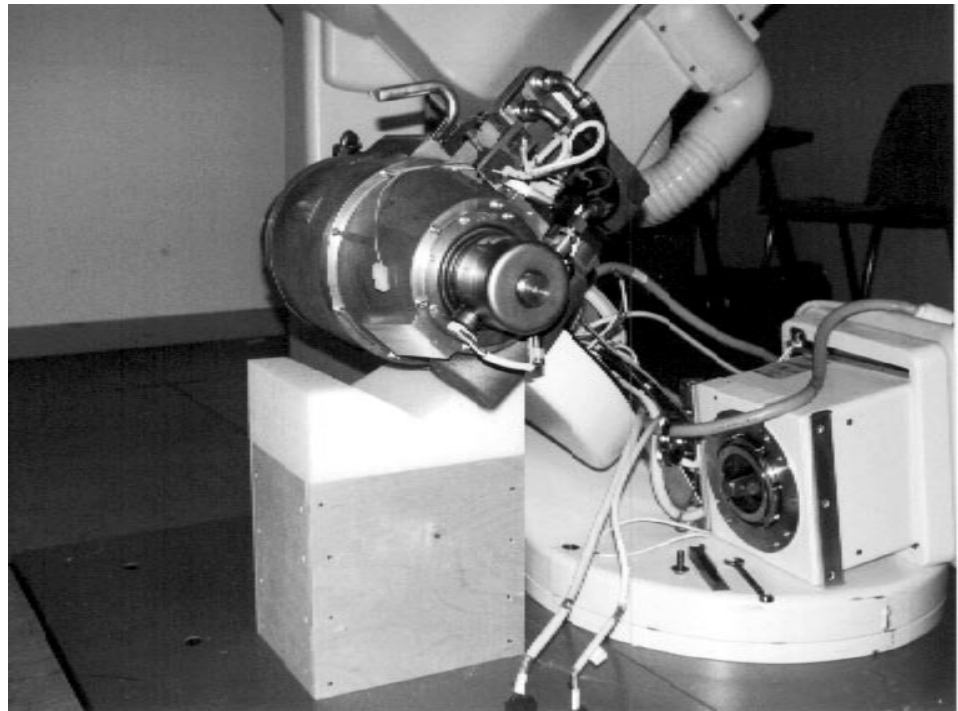
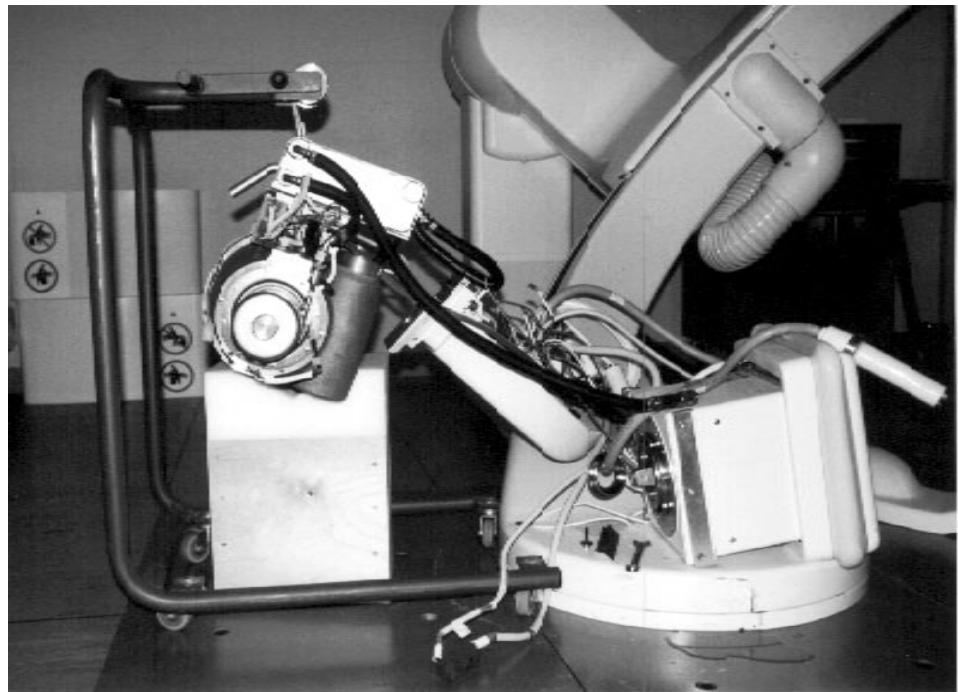
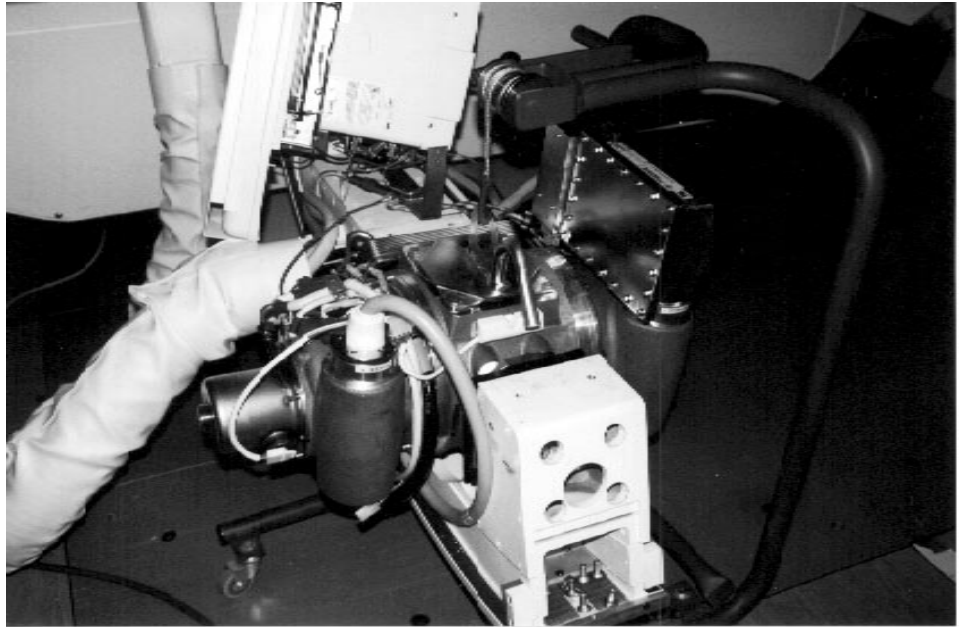


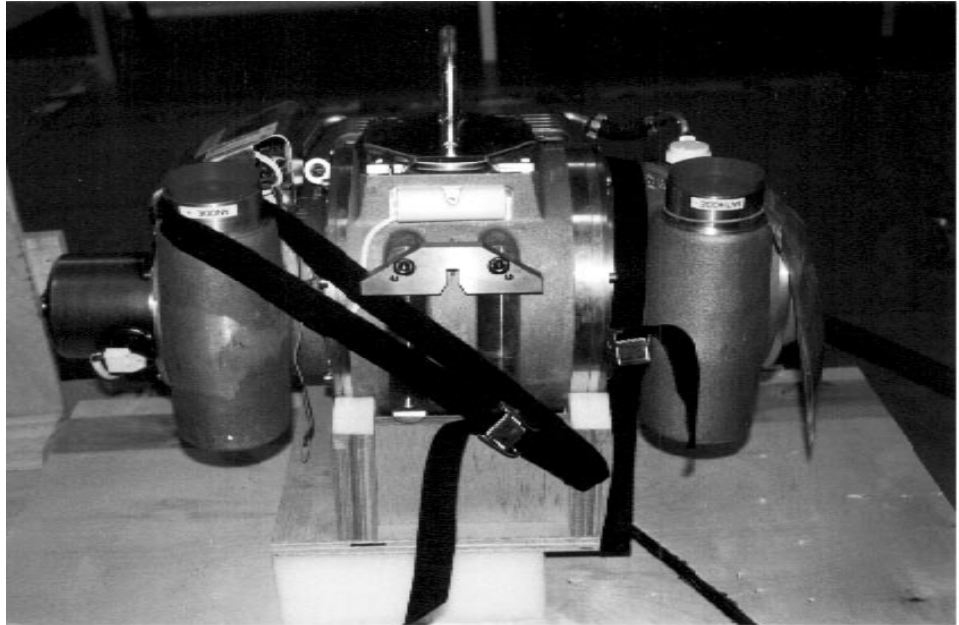
ILLUSTRATION 5
LCA/LCV+/LC+
RESTING DEFECTIVE TUBE ON BLOCK A



**ILLUSTRATION 6
TC/TCV
LIFTING DEFECTIVE TUBE**



**ILLUSTRATION 7
REPACKING DEFECTIVE TUBE**



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