



GE Medical Systems

Technical Publications

Direction 2164322-100

Revision 2

Volume of Oil for Maxiray 150 HV Receptacles Service Manual

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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 TENHA TENTADO 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) 827-3468 /

8*285-3468 **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
0	Sept. 10, 1996	Initial release.
1	July 6, 1998	Add Univolt N61 oil. Add water spray and fog to extinguishing media.
2	May 21, 2001	Add new sub-section 1-1 in Chapter 2 (Emergency Contact Info) New phone number in para "Damage in Transportation"

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CHAPTER 1 – GENERAL

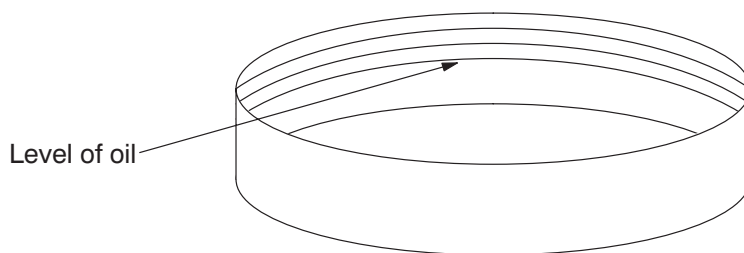
SECTION 1

SPECIFICATION OF THE VOLUME OF OIL THAT HAS TO BE USED TO FILL THE MAXIRAY 150 HV RECEPTACLES

Theoretical calculations and experimental measurements are in good agreement.

The volume of oil that has to be used to fill the HV receptacles of the Maxiray 150 is: **10 cm³**.

To give an order of magnitude, FE can use the red plastic cap that is used to seal the HV receptacles of the X-Ray tube assembly during the shipment. This cap has 3 ridges in its inside. The volume required corresponds to a level of oil up to **the first ridge** from the bottom of the cap.



Cap sketch

1-1 Identification of the substance/preparation

PRODUCT: UNIVOLT 54 or UNIVOLT N61

1-2 Composition/information on ingredients

Ingredients present at or above 0.1 wt% (classified as toxic or very toxic) or 1 wt% (classified as harmful, irritant or corrosive).

Hazardous ingredient: None.

Approximate concentration: None.

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CHAPTER 2 – SAFETY DATA

SECTION 1

1-1 Emergency Contact Info

In case of chemical emergency, call 713-656-3404.

1-2 Hazard identification

This product contains a highly refined base oil.

It is of low oral and dermal toxicity and under normal conditions of use should present no significant health hazards. However, in common with most mineral oils, prolonged and repeated skin contact may cause dermatitis.

Handling precautions should be strictly observed.

1-3 First aid

1-3-1 Inhalation

At ambient/normal handling temperatures, inhalation of vapors is normally not a problem. If overexposed to oil mist, remove from further exposure. Administer artificial respiration if breathing is irregular or has stopped. Get prompt medical attention.

1-3-2 Skin contact

No adverse effects due to skin contact are expected.

1-3-3 Eye contact

Rinse immediately with plenty of water until irritation subsides. If irritation persists, obtain medical advice.

1-3-4 Ingestion

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

1-4 Fire-fighting measures

1-4-1 Extinguishing media

Foam, dry chemical powder, carbon dioxide, water spray, or fog.

1-4-2 Fire and explosion hazards

Combustible material, low hazard. The product can form flammable mixtures or can burn only on heating above the flash point. However, minor contamination by hydrocarbons of higher volatility may increase the hazard.

1-4-3 Special fire-fighting procedures

Water fog or spray, to cool fire-exposed surfaces (e.g. containers) and to protect personnel, should only be used by personnel trained in fire fighting.

Cut off “fuel”; depending on circumstances, either allow the fire to burn out under controlled conditions or use foam or dry chemical powder to extinguish the fire.

Respiratory and eye protection required for fire fighting personnel exposed to fumes or smoke.

1-4-4 Hazardous combustion products

Smoke, and carbon monoxide may be formed in the event of incomplete combustion.

1-5 Accidental release measures**1-5-1 Personal precautions (see Chapter 3, para 1-2)****Land spill**

Shut off source taking normal safety precautions. Prevent liquid from entering sewers, water courses or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation. Take measures to minimise the effects on ground water.

Recover by skimming or pumping using explosion-proof equipment, or contain spilled liquid with booms, sand, or other suitable absorbent and remove mechanically into containers.

If necessary, dispose of adsorbed residues as directed in para 1-8.

Water spill

Confine the spill immediately with booms. Warn other shipping. Notify port and other relevant authorities.

Remove from the surface by skimming or with suitable absorbents. Disperse the residue in unconfined waters, if permitted by local authorities and environmental agencies.

1-6 Toxicological information**1-6-1 Effects of over exposure****Inhalation**

Negligible hazard at ambient/normal handling temperatures.

Elevated temperatures or mechanical action may form vapours, mists, or fumes which may be irritating to the eyes, nose, throat, and lungs.

Avoid breathing vapours, mists, or fumes.

Skin contact

Low order of acute toxicity.

Prolonged or repeated contact may lead to mild skin irritation.

Eye contact

Slightly irritating, but does not injure eye tissue.

Ingestion

Minute amounts aspirated into the lungs during ingestion or vomiting may cause severe pulmonary injury and death.

Chronic

This product has shown no carcinogenic activity in laboratory animals (long-term repeated skin painting tests).

1-6-2 Toxicity data**Acute**

Test data available for this and other similar products indicate that there is a low order of toxicity and irritation hazard. The general effects of mineral oils of this type are well known and are described in numerous publications including CONCAWE Report 5/87 "Health Aspects of Lubricants".

Chronic

This product has been subjected to a skin-painting bioassay using a standard Exxon test protocol. This product exhibited no evidence of carcinogenicity.

1-7 Ecological information

In the absence of specific environmental data for this product, this assessment is based on information for general hydrocarbon components found in lubricant mineral oils. Lubricant mineral oils, immediately following a release into the environment, will remain largely on the soil surface, and in water, will remain largely on the water surface.

Based on chemical/physical information from the literature for this product category, no harmful effects to terrestrial or aquatic habitats would be expected. This product is expected to be resistant to biodegradation and to persist in the environment.

1-8 Disposal considerations

Collect and dispose of waste product at an authorised disposal facility, in conformance with national and local regulations, and in accordance with EEC Directives on the disposal of waste oil.

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CHAPTER 3 – CHARACTERISTICS

SECTION 1

1-1 Handling and storage

Store the product in cool, well ventilated surroundings, well away from sources of ignition. Provide suitable mechanical equipment for the safe handling of drums and heavy packages.

Electrical equipment and fittings must comply with local regulations regarding fire prevention with this class of product.

LOAD/UNLOAD TEMPERATURE deg. C: Ambient to 40

STORAGE TEMPERATURE deg. C: Ambient to 40

1-1-1 Special precautions

Keep containers closed when not in use.

Prevent small spills and leakages to avoid slip hazard.

1-2 Exposure controls and personal protection

1-2-1 Occupational exposure limit

5 mg/m³ for oil mists (TWA, 8 h - workday) recommended based upon the ACGIH TLV (Analysis according to US NIOSH Method 5026, NIOSH Manual of Analytical Methods, 3rd Ed.).

1-2-2 Personal protection

In open systems where contact is likely, wear safety goggles, chemical resistant overalls, and chemically impervious gloves.

Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.

When concentrations in air may exceed the occupational exposure limit, and where engineering, work practices, or other means of exposure reduction are not adequate, approved respirators may be required.

1-3 Physical and chemical properties

APPEARANCE/ODOUR:

Clear straw-coloured liquid, mild petroleum odour.

DENSITY, kg/m³: < 870 at 15 deg. C

BOILING RANGE: Data not available.

VISCOSITY, mm²/S: 7.7 at 40 deg. C

VAPOUR PRESSURE, kPa: at 20 deg. C Very low

VAPOUR DENSITY AT 1 BAR (AIR=1): Heavier than air
EVAPORATION RATE (n-butyl acetate=1): Very low
SOLUBILITY IN WATER: 20 deg. C Negligible
pH: Not applicable
FLASH POINT: >140 deg. C
METHOD: PMCC (ASTM D93)
AUTOIGNITION TEMPERATURE: Data not available.
PARTITION COEFFICIENT n-octanol/water: Data not available.

1-4 Stability and reactivity

STABILITY (THERMAL, LIGHT, ETC): Stable

1-4-1 Conditions to avoid

Keep away from heat sources, open flames and other sources of ignition.

1-4-2 Incompatible materials

Avoid contact with strong oxidants such as liquid chlorine and concentrated oxygen.

1-4-3 Hazardous decomposition products

Product does not decompose at ambient temperature.

1-5 Transport information**1-5-1 Usual shipping containers**

Rail cars, tank trucks, drums.

TRANSPORT TEMPERATURE deg. C: Ambient to 40.



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