SENTINEL

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15 August 1996

Ms. Michele Burgess
Sealed Source Safety Section
Source Containment and Devices Branch
Division of Industrial of Medical Nuclear Safety, NMSS
U. S. Nuclear Regulatory Commission
Washington, DC 20555

RE: NR-629-D-118-S

Amersham
QSA

Dear Ms. Burgess:

Enclosed please find the information you requested concerning the model 865 device listed in your letter dated 17 July 96. I have responded to the questions in the same order as your letter.

1) Figure 1 shows the keyhole slot.

2) Figure 2 shows the four hex head bolts holding the actuator assembly to the device and the method of securing the source holddown cap to the device.

3) Figure 3 shows the holddown cap in position during performance of maintenance, as can be seen the only possible movement of the source rod is approximately 1/16 inch. This allows the source to remain locked during the performance of the maintenance and when the source holddown cap is removed the source stays in the locked position.

4) The piston limiter tool is shown in use in Figure 4 and is designed to keep the actuator assembly together during the removal of the actuator from the body of the device. It does not lock the source in the stored position, the source locking rod in Figure 3 does this. The statement in the letter dated 24 May 1996 was inaccurate in the description of the tool's function, due to a misunderstanding of the engineering description.

5) A complete copy of Section VII is enclosed.

Should you have any questions regarding this information, please contact me at (617) 272-2000, extension *210.

Sincerely,

Cathleen Roughan

Cathleen Roughan
Regulatory Affairs Manager

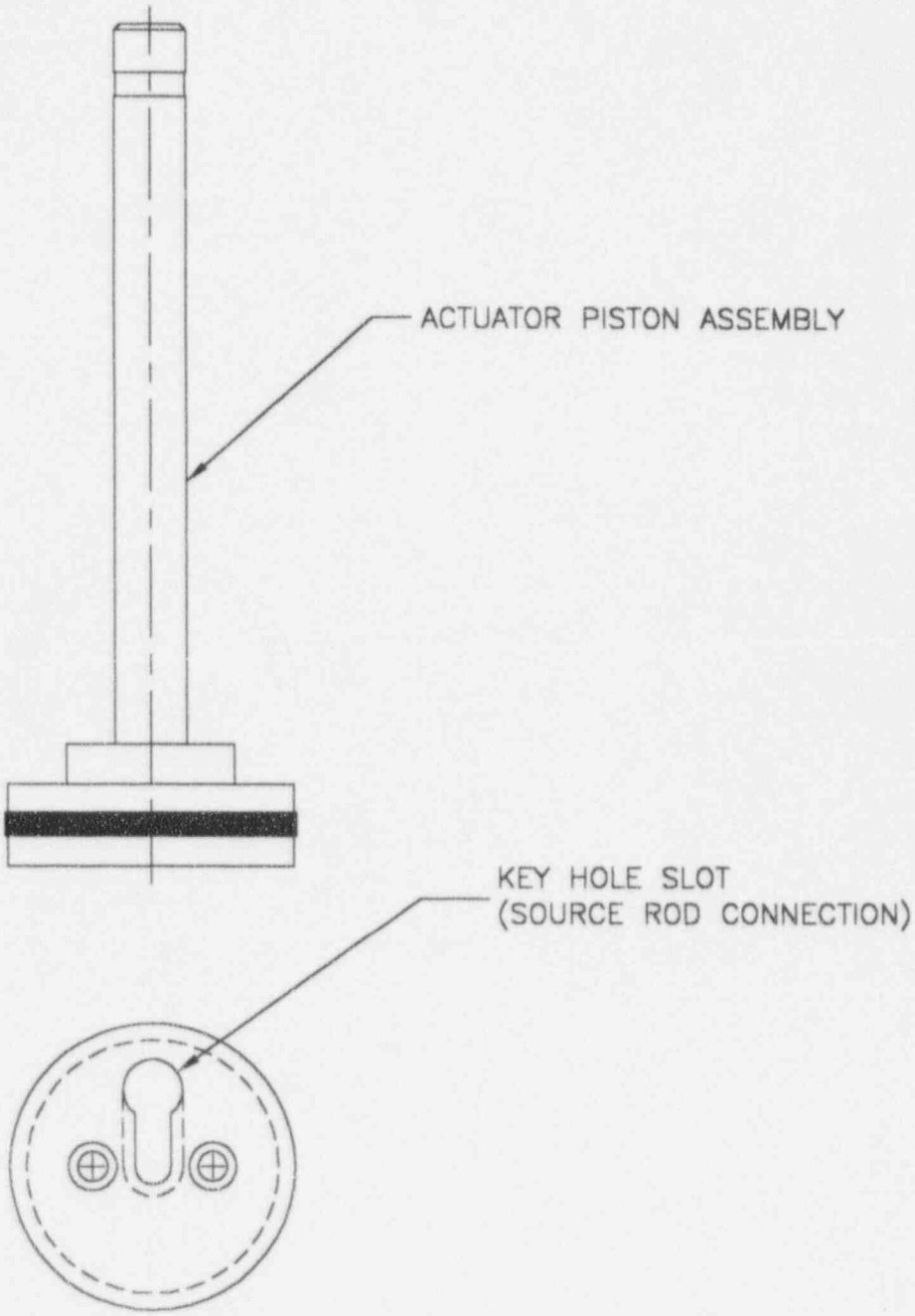
ACTUATOR PISTON ASSEMBLY
KEY HOLE SLOT
(SOURCE ROD CONNECTION)

FIG. 1

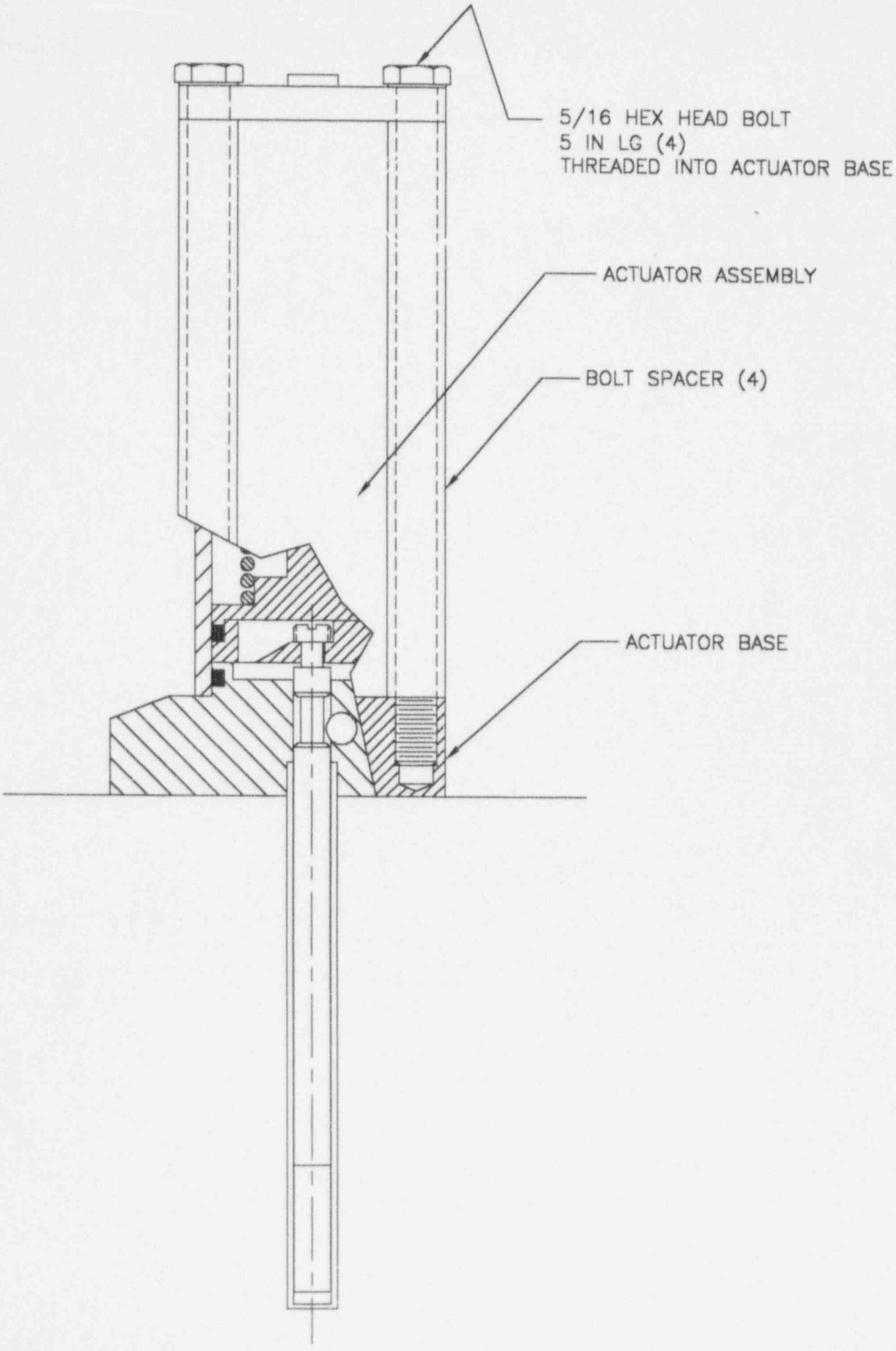
5/16 HEX HEAD BOLT
5 IN LG (4)
THREADED INTO ACTUATOR BASE
ACTUATOR ASSEMBLY
BOLT SPACER (4)
ACTUATOR BASE

FIG. 2

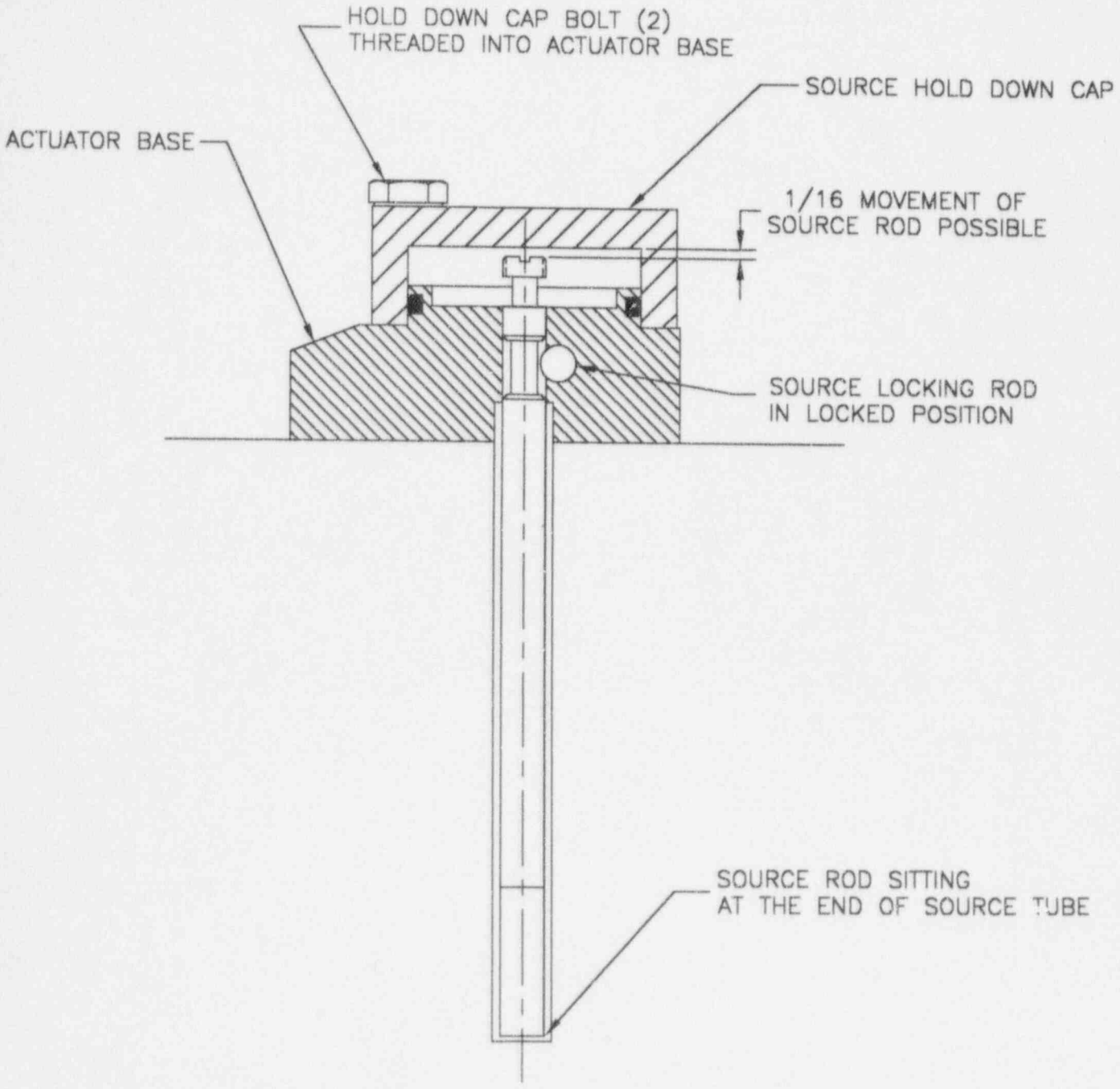
HOLD DOWN CAP BOLT (2)
THREADED INTO ACTUATOR BASE
SOURCE HOLD DOWN CAP
ACTUATOR BASE
1/16 MOVEMENT OF
SOURCE ROD POSSIBLE
SOURCE LOCKING ROD
IN LOCKED POSITION
SOURCE ROD SITTING
AT THE END OF SOURCE TUBE

FIG. 3

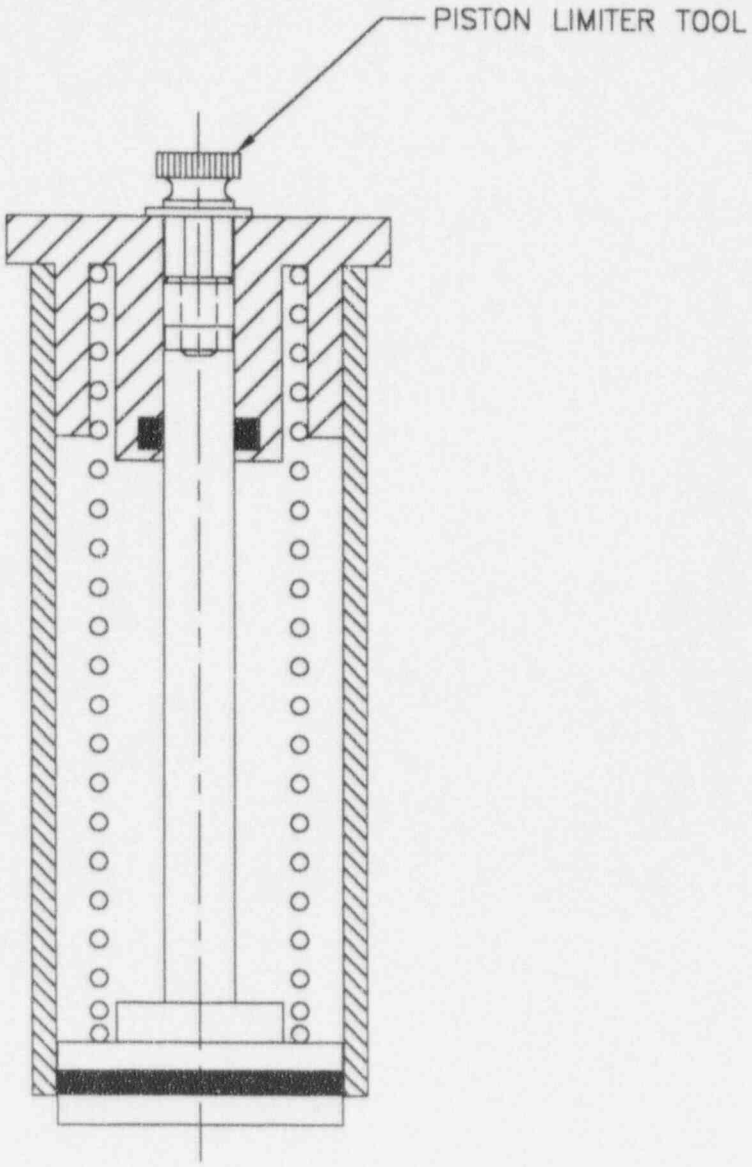

FIG. 4

If the vehicle is transporting a package bearing a "Radioactive Yellow III" label, 49 CFR Part 172.504 requires that the vehicle be posted on all four sides with a "Radioactive" placard. It should be noted that operation of a vehicle which is required to be placarded requires compliance with the Federal Motor Carrier Safety Regulations, 49 CFR Parts 390 to 397.

5. Hand Carrying

In order to minimize radiation exposure, it is recommended that care be taken when hand carrying the unit. A direct reading pocket dosimeter and film badge or TLD should be worn on the side of the body closest to the exposure device. If more than one person is present, it is good practice to alternate the hand carrying between them to minimize radiation doses to any one individual. Likewise, no person should be permitted to sit on or lounge against the exposure device.

6. Storage

When storing the system, the exposure device must be kept physically secure to prevent tampering or removal by unauthorized personnel. The storage area must be secured such that no unauthorized personnel are allowed entrance where radiation exposure levels exceed 2 millirem in any one hour. 10 CFR Part 34.22 and 34.23 require that the exposure device be kept locked and secured during storage.

Section VI

1. Leak Testing

The source assembly used in the Model 865 should be leak tested for removable radioactive contamination at intervals not to exceed six months. This can be accomplished using Amersham Model 518 Leak Test Kit.

This test must be performed in a properly secured Restricted Area. The individual performing this test should wear a direct reading pocket dosimeter and either a film badge or thermoluminescent dosimeter (TLD). The individual should also use a properly calibrated and operable radiation survey instrument.

a. Assure that the exposure device is locked. Assure that the source assembly is in the proper shielded storage position by surveying the exposure device at the surface and at one meter (40 inches) from the surface. The radiation levels should not exceed 200 mR/hr at the surface nor 10 mR/hr at one meter (40 inches) from the surface when the device is loaded to its capacity.

b. Moisten the wipe test swab with EDTA solution. Wipe the point on the device where the source position indicator emerges. Wipe the air inlets on the actuator assembly. Wipe the areas near each end of the locking rod. Wipe the end fittings of the control hoses.

c. Place the wipe test swab in the plastic envelope.

d. Set the survey meter on its most sensitive range and place the meter in a low background area. Move the wipe test swab towards the meter and observe the radiation level indication.

e. If there was no indicated increase in the background radiation level, place the plastic envelope in the mailing box and send to Amersham. Be sure to complete and return the identification sheet.

f. If the meter indicates an increase in the background radiation level, **DO NOT MAIL THE WIPE TEST PATCH**. Contact Amersham for further instructions.

Section VII

1. Maintenance

It is recommended that inspection and maintenance of the Model 865 exposure device and Model 86550 control unit be performed at intervals not to exceed three months.

To properly service the Model 865 exposure device and control unit, the following tools and equipment are required:

Master Key (A66001-811)
Cleaning Solvent
Vibratite
Piston Limit Tool (AT865-7)
Socket Wrench Set with Sockets: 1/2 inch, 10 mm
Source Holddown Cap (AT865-8)
Replacement O-Rings and Seals
Lock Seal Removal Tool (AT865-9)
1/32 dia. stainless steel safety wire
Molykote III Compound

a. Control Unit

1. Inspect the entire length of each control hose to assure that each section is free from cuts and damage.

2. Inspect the end fittings to assure that they are tightly connected. Check the threads on the fittings for damage.

3. With the control switch in the OFF position, close off the expose hose. Pressurize the control to approximately 30 psig. Observe that the pressure gauge functions properly. Turn the control switch to the EXPOSE position. Observe that the indicated pressure reduces by approximately 4psi. Open the expose hose. Assure that air flows through the exposing hose and the pressure returns to atmospheric.

4. With the control switch in the OFF position, close off the retract hose. Pressurize the control to approximately 30 psig. Turn the control switch to the RETRACT Position. Observe that the indicated pressure reduces by approximately 4 psi. Open the retract hose. Assure that air flows through the retracting hose and the pressure returns to atmospheric.

b. Exposure Device

1. Check the operation of the survey meter and check to assure that the source is properly stored by measuring the radiation intensity at the surface of the exposure device and at one meter from the surface. The radiation level should not exceed 200 mR/hr at the surface nor 10 mR/hr at one meter from the surface.

2. Inspect the exposure device for any signs of damage or excessive wear. Check to assure that there are no loose fasteners or broken safety wire. Assure that the exposure device is properly labeled.

   NOTE: The manufacturer recommends that maintenance of the actuator assembly not be performed at quarterly intervals but performed during normal source replacement intervals at the manufacturers facility. In cases where the user must perform maintenance of the actuator assembly, the procedure of steps 3 through 29 should be followed. Individuals performing this operation should wear a direct reading pocket dosimeter and either a film badge or a thermoluminescent dosimeter (TLD). All operations should be monitored with a properly calibrated and operable radiation survey instrument.

3. Assure that the key operated lock is engaged and the key is removed.

4. Remove the actuator cover by removing the four attachment screws.

5. Install the piston limit tool by threading it into the source position indicator rod.

6. Cut and remove the safety wire from the four actuator tie bolts. Remove the actuator tie bolts.

7. Carefully monitor this operation with a survey meter. Remove the actuator assembly by lifting the assembly and moving it in a circular motion until it disengages from the source assembly.

8. Install the source holddown cap to the exposure device using the four bolts.

9. Disassemble the actuator assembly by carefully removing the piston limit tool. The piston is under spring force. Take care while removing the piston limit tool to assure that no damage or injury can occur.

10. Remove the piston, spring and top flange from the actuator assembly.

    NOTE: If removal of the lock assembly is necessary, the procedure of steps 11 through 19 should be followed. Otherwise proceed to step 20. Assure that the source holddown cap is properly installed.

11. Remove the end cap of the locking rod and the cap screw which holds the lock body in the lock housing.

12. Insert the key into the lock. Rotate the key 90° and pull the lock and locking rod assembly from the lock housing. The locking rod has two seals. One seal should remain with the locking rod and one seal should remain in the lock housing. This seal can be removed using the lock seal removal tool.

13. Inspect the lock and locking rod. Replace shaft seal.

    NOTE: To replace shaft seal located near the lock body, it is necessary to remove the pin nearest the seal. When reassembling the lock and locking end assembly, the end cap and its associated shaft seal must be assembled last.

14. Lightly grease the shaft seal, insert the return springs and spring guide pins into the lock body.

15. Depress the plunger on the side of the lock body so it clears the hole in the lock housing and insert the locking assembly into the housing.

16. Align the screw hole in the lock body with the slot in the housing and secure the lock with its cap screw.

17. Lightly grease the second shaft seal and place it on the locking rod.

18. Attach end cap to locking rod so that the cap is flush with the end of the rod.

19. Insert key in lock and check that lock works freely.

20. Replace shaft seal and "O" ring on the rear flange, lightly grease the seal and "O" ring and insert the flange into the actuator housing.

21. Replace and lightly grease the piston seal and install the piston and return spring in the actuator housing.

22. Thread piston limit tool into end of source position indicator shaft.

23. Assure that the key operated lock is engaged and the key is removed. Remove the source holddown cap.

24. Replace and lightly grease the base "O" ring seal.

25. Connect the source rod to the keyhole slot in the actuator piston. Assemble the actuator to the base being sure to align the air line connectors.

26. Fasten actuator assembly to base with the four tie rod bolts.

27. Safety wire the tie rod bolts.

28. Remove the piston limit screw.

29. Attach the actuator guard.

30. Assure that the exposure device operates properly by performing the operation in Section IV.

Figure 1

UNIFORM STRAIGHT BILL OF LADING

UNIFORM STRAIGHT BILL OF LADING
ORIGINAL NOT NEGOTIABLE

CARRIER

ABC TRUCKING

SHIPPER ORDER NO.
ORD

SHIP DATE 01/25/96

SHIPPER
Amersham Corporation
40 North Avenue
Burlington, Massachusetts 01803

CONSIGNEE
SENTINEL
AMERSHAM CORPORATION
40 NORTH AVENUE
BURLINGTON, MA 01803

TELEPHONE: 617-272-2000

SHIPPER'S SIGNATURE	DECLARED VALUE
NO. OF CARTONS	WEIGHT

It is mutually agreed that the goods herein described are accepted in apparent good order (except as noted) for transportation, as specified herein, subject to rules, classifications and tariffs, in effect as of the date hereof, which are listed in accordance with law. Said rules, classifications and tariffs, copies of which are available for inspection, are hereby incorporated into and made part of this contract. Unless a greater value is declared hereon, the shipper agrees and declares that the value of the property described herein is released to a value not exceeding $50.00 per shipment.

SHIPPERS CERTIFICATION ATTACHED FOR THE FOLLOWING PACKING LIST(S):

☐ COLLECT
☒ PREPAID

Route

Car Initials and Number

No. Packages	Kind of Package, Description of Articles, Special Marks and Exceptions	*Weight (Sub. to Cor.)	Or Rate Class	Ck. Col.	WEIGHT-RATE CHARGE
01	MODEL 865 GRP CONTAINING:	85 LBS			PICK-UP CHARGE
	RQ, RADIOACTIVE MATERIAL,				DELIVERY CHARGE
	SPECIAL FORM, N.O.S., CLASS 7, UN2974				ADVANCE C.O.D. CHARGE
	74.0 CURIES IRIDIUM-192				ADVANCE TRANS. CHARGE
	TRANSPORT INDEX: 0.6				EXCESS CHARGE
	USA/9187/B(U) TYPE B				SUB TOTAL
	YELLOW II LABELS ATTACHED				CONSIGNOR'S C.O.D.
	EMERGENCY TELEPHONE #				C.O.D. FEE
	CHEMTREK 1-800-424-9300				
					TOTAL
					COMMENTS: