Installation Engineering Handbook 18
Western Electric Company, Incorporated
Kearny Works

Section 17D
5-28-71
Replaces Section
17D dated 2-15-68

INSTALLING STORAGE BATTERIES

FLOOR MOUNTED

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2. GENERAL

2.1 Scope

2.11 This section covers the requirements and methods to be followed when unpacking and placing KS-5562 and KS-20048 floor mounted enclosed type storage cells. The information in this section is to be used with the other sections in the 17 series.

2.2 Description

2.21 These floor mounted cells formerly were identified as "Rubber Tank Type" Cells. The containing vessel is a hard rubber jar with a 1/2-inch soft rubber pad attached to the outside bottom. See Figure 1. KS-20048 consists of the same elements as KS-5562 except that it is enclosed in a ribbed fiber glass container, Figure 2.

2.22 In Tables "A" & "B", width and depth dimensions apply to the cell positioning as normally used. Depth is measured along a lifting ledge. Width is measured from ledge to ledge.

2.23 Cells are received in paperboard cartons and on individual skids as shown in Figure 2. Occasionally cells may be received in wooden crates but this arrangement is usually reserved for individual replacements and for export shipments.

3. INSTALLING EQUIPMENT

3.1 The required tools and supplies are shown in Section 17A.

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TABLE A

KS-5562 MAXIMUM CELL DIMENSIONS AND APPROXIMATE WEIGHTS (PAR. 2.22, FIG. 1)

LIST NO.	AMPERE HOURS	HEIGHT	WIDTH	DEPTH	WEIGHT		
					C&D	EXIDE	GOULD
04	4,000	56 5/8"	18 3/16"	15 7/16"	1,030	1,054	1,075
05	5,000				1,185	1,165	1,255
06	6,000			18	1,325	1,350	1,485
07	7,000			20 9/16	1,660	1,325	1,350

TABLE B

KS-20048 MAXIMUM CELL DIMENSIONS AND APPROXIMATE WEIGHT (PAR. 2.22, FIG. 2)

LIST NO.	AMPERE HOURS	HEIGHT	WIDTH	DEPTH	WEIGHT
1	6,000	57 7/8"	23 3/4"	22 3/4"	1,750

4. MARKING THE FLOOR

4.1 Locate and assemble the battery in accordance with the job information.

4.2 Floor plans for floor mounted cells will have rectangles corresponding to the maximum dimensions permitted for the battery. When installed, the cells which may be considerably smaller, shall be located symmetrically on the longitudinal center line of the rectangle. Unless otherwise specified in the job information, the cell at one end (either end) of the rectangle shall be located with its transverse center line 9-1/16 inches from the end of the rectangle. Standard spacing, as dictated by the intercell connector, will locate the other cells.

4.3 Starting with the first cell mark the floor to indicate the location of the battery and the battery polarity positions. The positive and negative posts of each cell are stamped "POS" or "NEG". The floor should also be marked to indicate the location of additional strings.

5. ASSEMBLY OF LIFT (R-2694)

5.1 Three lengths of outboard tracks are furnished with R-2694 one ton battery lift shown in Figure 4. These lengths can be easily attached or removed to meet cell size and location conditions. The outboard support with casters can be assembled between rows of cells, if required.

5.2 Adjust the outboard caster columns to assure a six point support when each cell is lifted. Examine the lift to determine that there are no damaged or unduly worn parts which could cause a failure.

5.3 It is necessary to carefully tighten all outboard assembly holding bolts, etc., to assure the load distribution intended. Use box wrenches.

5.4 If there is any doubt as to the capabilities of the lift it can be tested by a load not to exceed 2500 pounds secured to the detail 21 bolt. The lift should satisfactorily raise and lower this weight.

5.5 When placing the lifting detail 8 (Figure 5) on detail 21 (Figure 4) be sure that the detail 21 bolt is the 3/4" bolt furnished. The nut should be tightened until the clevis sides are snug against the sides of the lifting member. Examine the lifting detail to determine that all assemblies are properly tightened and in good repair particularly the chains and sprockets. Check to determine that the guard over the sprockets which carry the full weight of the cell is so positioned that the double sprocket chain can not get out of mesh with the sprocket teeth. Clean the sprocket chains with petroleum spirits. Oil with light oil and add a small amount of R-3120 dry lubricant. The gear case should be oiled with any good automobile transmission or differential oil.

5.6 Detailed maintenance information is in Handbook 28. Make immediate corrections if any unsatisfactory conditions are found and do not use the lift until the correction or a replacement has been made.

5.7 Prepare the lifting detail for the particular list number of cell by placing the two Detail 25's, for L04, L05, L06 or two Detail 26's (modified) for L07 in the lifting position as illustrated in Figure 5. The markings are on the fully exposed side of the lifting bar when it is in the lifting position. Remove the other four bars and the long shipping screws from their shipping positions that are not required.

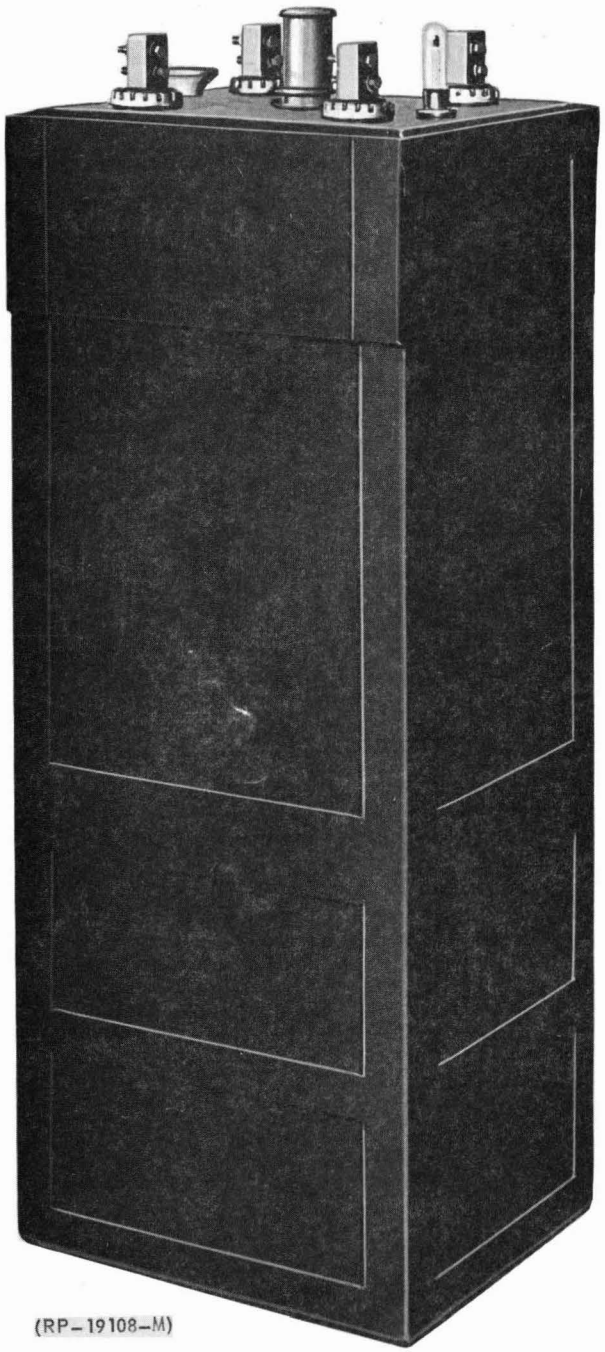


FIG. 1 TYPICAL KS-5562 UNCRATED (PAR. 2.21)

5.71 There are two "T" Bar assemblies furnished, Det.45 and Det.46. See Figure 5. Make sure that the proper detail is used, to fit the cell in question.

5.8 Make certain that each of the ten shorter holding screws and associated threads are in good repair, that all are tight and that each lifting or clamping bar is not held out of position by any dirt, etc., which may not have been removed when securing the lifting bar to its side member. It should also be observed that each lifting bar is resting against the top of the wing bar (Det.43) located just below it.

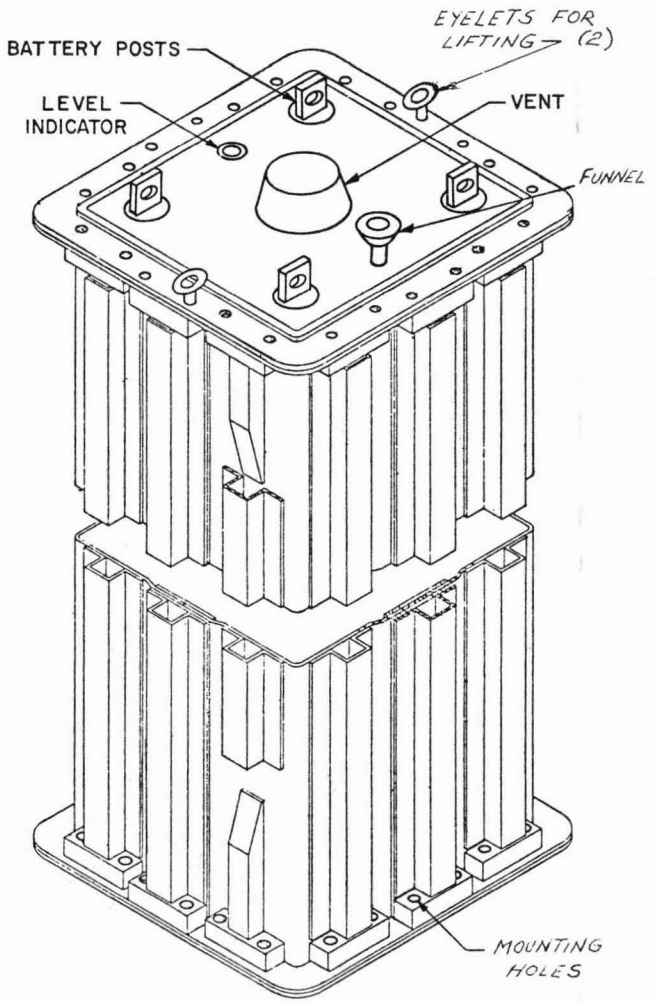


FIG. 2 TYPICAL KS-20048 CELL (PAR. 2.21)

NOTE: KS-20048 Cells can not be handled with the R-2694 Hoist. For these cells use R-3939 and R-4058 Fig. 7 or R-4101 and R-4220, Fig. 8. These may also be used for lifting KS-5562 cells.

6. HAND LIFT TRUCK (R-2695)

6.1 The truck (Figure 6) has a lifting capacity of 2500 pounds. Check the operating features with any weight in excess of 100 pounds prior to attempting to lift any cell. The truck platform should raise and lower this weight smoothly. Operate the handle to raise and press the release lever with the foot to lower. Observe that there is a small horizontal movement when the platform is lowering.

6.2 A too rapid lowering movement indicates lack of oil in the check cylinder. Add No. 10 automobile type of crank case oil. This operation should be done with the elevating platform in the lower position.

6.3 The hand lift trunk will enter the open end of the skids of the crated or boxed cell shown in Figure 3 when in the lowered position. The truck can be used to lift the crated cell and move it to nearby locations. The wheels are hard rubber covered and will not damage a floor. Moving the cell in this manner requires assistance to prevent tipping. When a cell on the truck is lowered, anticipate the small horizontal movement when placing a cell into a close location. Lower by foot control.

6.4 To minimize trucking and hoisting delay, use the truck to move the crated cells away from the door or window through which they are delivered to keep the receiving area clear. Place the cells near the final location but not in an area which may interfere with uncrating operations.

7. DELIVERY OF CELLS

7.1 Cells may be tipped momentarily a maximum of 30° in order to enter doorways, windows, etc.

7.2 Do not permit cells to be bumped or jarred. Because of their weight, containers and contents may be easily damaged unless they are handled carefully.

7.3 A record of the electrolyte level in each cell should be made promptly after the cells are received on the job. This too is covered in Section 17A along with the originating of ID-1285 Storage Battery Report.

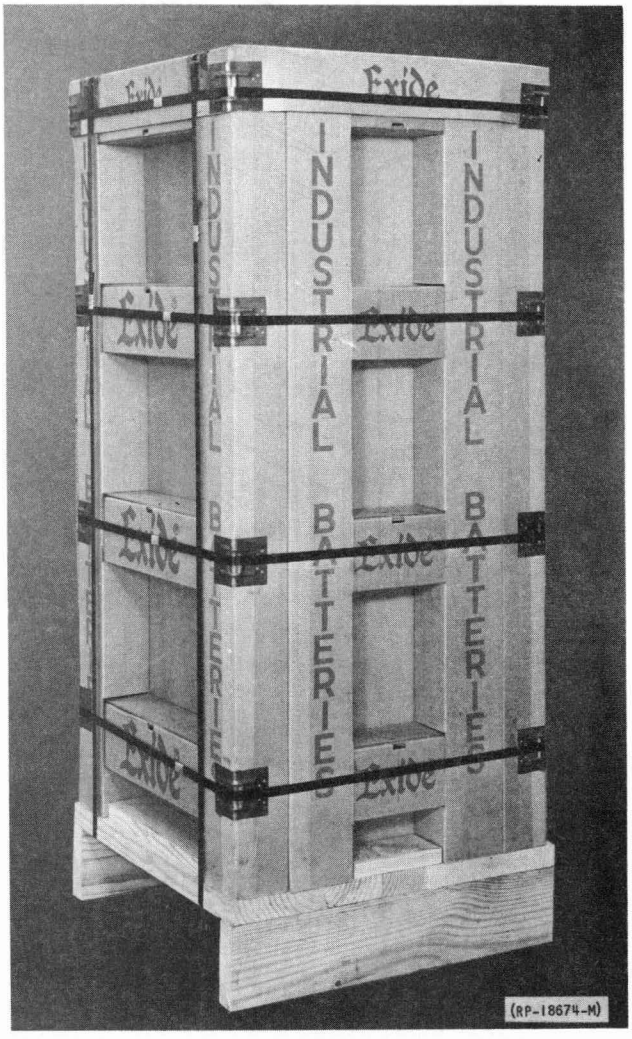


FIG. 3 SINGLE CELL AS RECEIVED SHOWING SHIPPING CARTON AND STEEL BANDS (PARS. 2.33, 6.3,8.1)

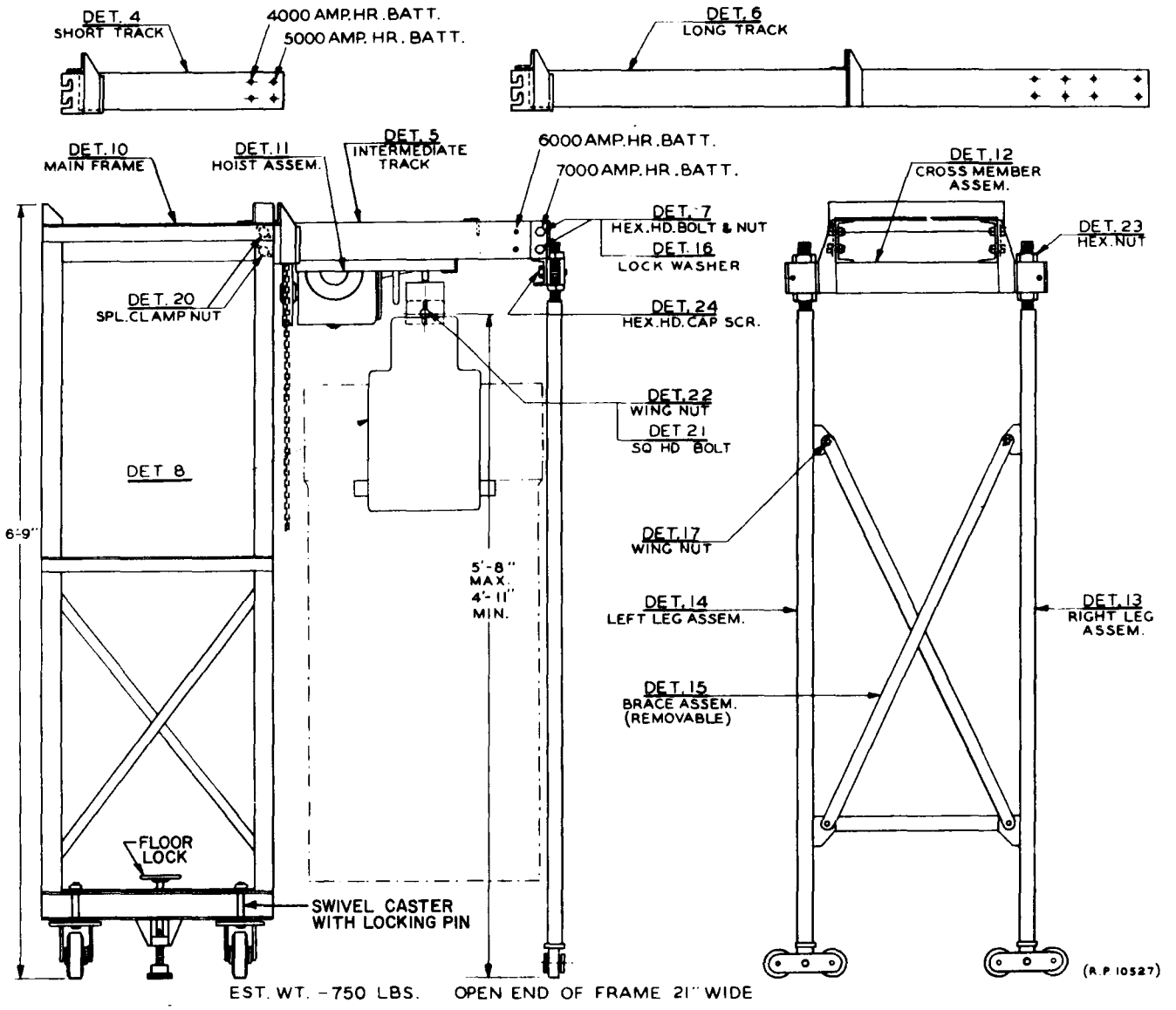


FIG. 4 R-2694 ONE TON BATTERY LIFT
(PARS. 5.1, 5.5, 9.07, 9.09)

8. UNCRATING CELLS

8.1 Remove steel bands carefully as the sudden release of tension must be avoided to prevent personnel and equipment damage. See Figure 3.

8.2 Use the R-3662 Safety Steel Strap Cutter to remove steel bands. As an alternate, grasp a midportion of the band with two pair of long nose pliers (adjacent plier jaws touching) and by separating the pliers with a shearing action the band will be torn. Retain hold on the pliers until the ends of the band can be contained.

8.3 Lift off the top. The four sides will fall away leaving the cell resting on the skid. Discard the packing material.

8.4 It is necessary to clean and neutralize the outside of the cells to remove any electrolyte spilled during the shipping and handling interval. Inspect, clean and neutralize each cell as covered in detail in Section 17A.

8.5 A change in the container design for Gould cells results in more evident mold marks. These should not be mistaken for cracks.

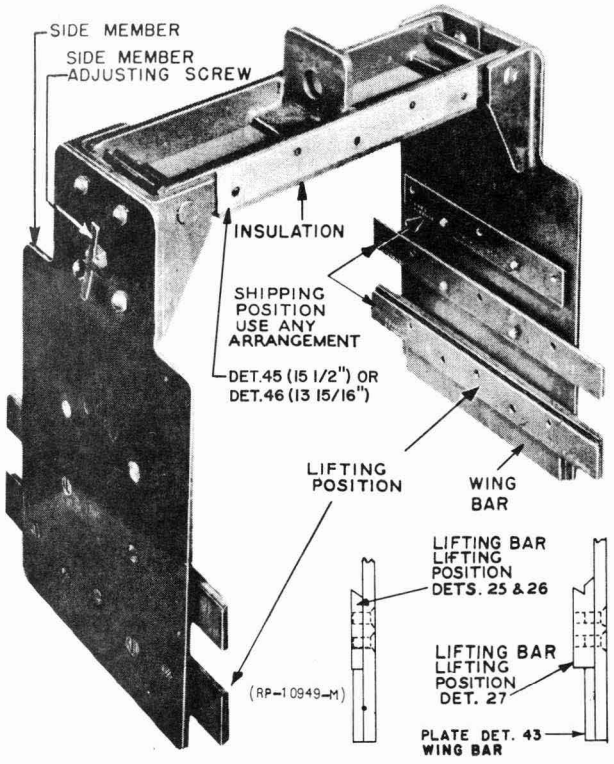


FIG. 5 R-2694 LIFTING DETAIL 8 (PARS. 5.5, 5.7, 5.71 NOTE, 9.11)

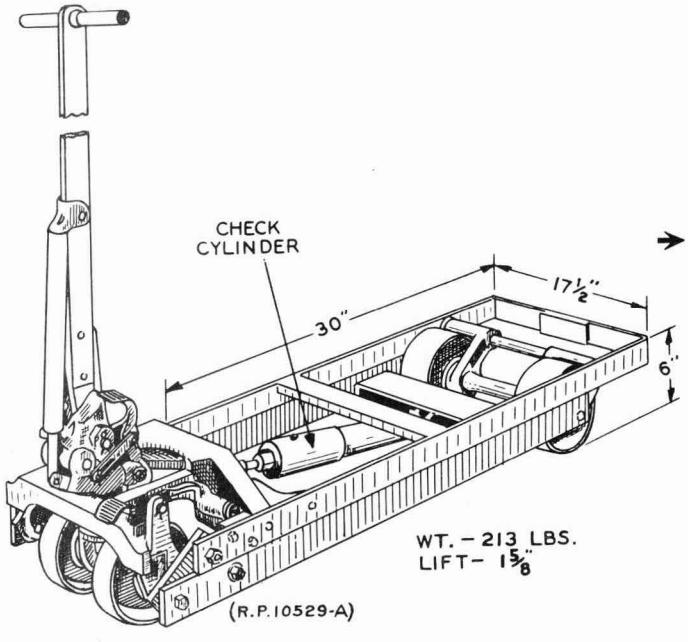


FIG. 6 R-2695 HAND LIFT TRUCK (PAR. 6.1)

9. PLACING KS-5562 CELLS

9.01 The KS-5562 enclosed cells are installed on a floor previously leveled and finished by the operating company. Make sure the floor is clean.

9.02 Terminals shall be in alignment within ±1/16" for each cell and within ±1/4" for the line of cells. Each cell shall be approximately level.

9.03 The cell top, center to center dimension will be approximately 18-7/16" and the post to post dimension will be approximately 7-5/16", however, the length of the connecting strap will determine the final spacing. Cells shall not touch.

9.04 The spacing between rows of cells shall be at least 3-inches.

9.05 There may be several cells which, due to height tolerance, are appreciably lower or higher than the rest. Separate these for use at the end of the line-up where they may be placed adjacent to cells nearest their height or for use as emergency cells. No more than three or four cells should have to be hand picked for this reason.

9.06 DO NOT ROCK, PRY, SKID OR SLIDE THE CELL. USE ONLY THE R-2694 BATTERY LIFT OR THE R-3939 GANTRY AND R-4058 LIFT ASSEMBLY FOR MOVING CELLS ONCE THEY HAVE BEEN REMOVED FROM THE SKID.

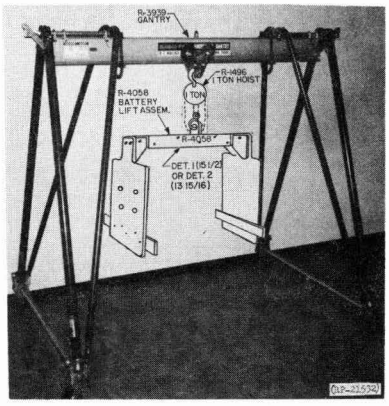


FIG. 7 USE OR R-3939 GANTRY, R-1496 HOIST & R-4058 LIFT. (PAR. 7.3 & 9.08, 9.081)

9.07 The R-2694 Battery Lift shown in Figure 4 should be used only for additions and maintenance in existing offices or offices where space restrictions exist.

9.08 For new installations, where there are no overhead obstructions, such as air conditioning ducts, auxiliary framing, bus bars, etc., the R-3939 Gantry an R-1496 Hoist and the R-4058 Lift assembly should be used. See Figure 7. The lifting and placing operations with this arrangement are essentially the same as described in the following paragraphs for the R-2694 Battery Lift.

9.081 Two "T" Bar assemblies, Details 1 & 2, are furnished with the R-4058 Lift assembly. See Fig. 7. Be sure that the proper detail is used, to fit the cell in question.

9.09 Place the battery lift into position in the space to be occupied by the first cell. Select and assemble in place the outboard lift track for the cell size and location conditions. See Figure 4.

9.10 Select the cell to be placed on the end of the lineup, and with the hand lift truck move the uncrated cell on the skid under the track into the aisle position.

9.11 Raising the lifting detail 8 until the insulated surface on the under side of the cross member clears the terminal posts of the cell, center the lift above the cell. Carefully inspect each cell lifting slot to insure that it is uniform and free of obvious defects. If each one is satisfactory, draw the side members against the cell by operating the side member adjusting screws. (See Figure 5). Insure that each side has been equally tightened by observing that the exposed threaded ends of the side member adjusting screws are of equal length. Raise the lifting detail until the lifting bar edges enter the lifting slots on the side of the cell. The lifting edge on detail 8 should be fully engaged before lifting the cell. However, the lifting slot on some cells may be deeper than the lifting edge on the lifting detail. After lifting, inspect the bottom of each cell for stones or other foreign matter that would damage the cell when lowered onto the floor.

9.12 Rotate the cell as requierd to have the terminal posts in proper position as noted on the floor marking and lower into position.

9.13 The faces of the positive and negative posts can be used to indicate the alignment of a string of cells. A cord drawn tight from the first cell against the faces of the posts on the first cell and anchored at the proper height beyond the location of the last cell to be installed in that row can be advantageously used for aligning purposes even though it must be disturbed each time a cell is initially placed.

9.14 Subsequent cells will be handled in the same manner. The final location of each cell will be facilitated by the use of a wooden template equivalent to the intercell connectors as the proper spacing and alignment of the posts are the imperative features in the aligning and spacing of the cells. Drill the holes accurately in the template and equip with pins very nearly the same size as the holes in the posts. The intercell connectors when correctly placed should not put any mechanical strain on the cell posts and their careful assembly will guard against cumulative dimensional tolerances in either direction. Due to irregularities in the outside cell dimensions they are located by center to center dimensions using the posts as reference points and the spacing is controlled by the solid intercell connectors.

9.15 When space limitations are close for the final location of a cell as on narrow aisles, at the end of a lineup or at some emergency cell layouts, assemble the lift in a convenient location and use the hand lift truck to move the cell under the outboard end of the lift. Move the carrier detail into position over the cell. Tighten the floor locks. Raise the cell off its skid. Rotate the cell as required to have the terminal posts in proper position for the subsequent moves into the cell's final location. By means of the overhead carrier assembly move the cell into the main frame of the battery lift and lower to a light rest on the base of the main member. Remove the skid, hand lift truck and the outboard assembly. Loosen the floor locks and by means of the main frame move the cells into the aisle position adjacent to its final position. Reassemble the appropriate track depending on the situation and place the cell into position. When moving the main frame use the swivel caster locking pins to hold the two front wheels.

9.16 There is a slight settling of the cells due to the rubber pads on the bottoms of the cells gradually conforming to the floor surface. Allow at least an overnight period before checking the alignment. After settling in place, gauge by eye along the top edges of the cells for proper appearance and at the sides which should be approximately vertical and uniformly spaced. Jar sides slightly out of plumb or bulging slightly are considered acceptable.

9.17 Slight irregularities of floor or cell may be compensated for by using under the cells, shims made of thin strips of rubber or plastic preferably of the type used on battery stands.

9.171 A maximum of 1/8" of shimming is permitted to compensate for small vertical misalignments.

9.172 This shimming is not a substitute for correcting abnormal floor conditions. If more than slight shimming is necessary because of floor condition, the floor shall be releveled.

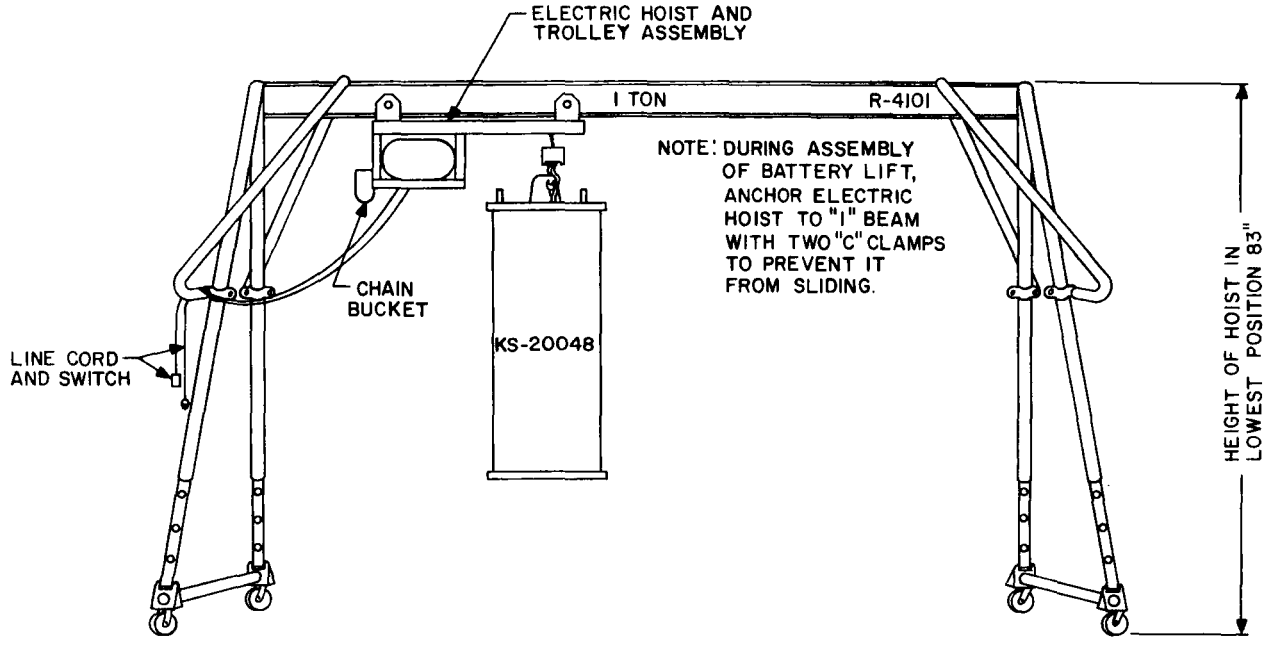
10. PLACING KS-20048 CELLS

10.1 Battery cells per KS-20048, are placed on the platforms per ED-82219-50 by means of the R-3939 Gantry, R-3991 Hoist and R-3896 Battery Lifting Yoke or with the R-4101 Battery Lift and the R-4220 Battery Lift Adapter. See Figure 8. The lifting yoke is equipped with hoisting hooks which engage the eyebolts furnished as part of the battery cell.

NOTE: Assembly instructions for the R-4101 Lift are furnished with each lift. They are similar to instructions for the R-3847 and R-3939 floor supported hoisting centers covered in Handbook 30.

CAUTION: When placing the electric hoist onto the "I" beam during assembly, lock it in position by placing two "C" clamps on the beam. This is done to prevent it from rolling along the beam.

10.2 Since the platforms mounting battery cells have been drilled and tapped by the supplier, it is not anticipated that any difficulty will be encountered in installing them. Each cell is attached to the platform with 24 High Tensile Socket Head steel cap screws.



➔ FIG. 8 R-4101 BATTERY LIFT (PARS. 7.3 NOTE and 10.1)

Because of the close proximity of the cells to each other, and the design of protruding ribs, the bolts must be tightened from the top down, with the R-4015 Magnetic Allen Wrench which has a 60" long handle.

10.21 When using the magnetic wrench for installing the socket head cap screws, place the lock washer and flat washer on the screw and prevent them from sliding off by placing a rubber band on the shank of the cap screw. The shank of the screws, as well as the mounting holes shall be covered with R-3266 NO-OX-ID Compound.

CAUTION: Do not use any electrically driven tools for tightening the battery mounting screws as too much torque applied might crack the base of the battery cell.

10.3 Eight stanchions, 4'-9" high, for the support of bus bar and other battery connections, are attached to the top plate with four battery mounting screws each. Use the R-4015 Wrench for tightening them.

NOTE: When using the R-4015 wrench around live equipment, tape the handle in accordance with information furnished in other sections of this handbook.

→ Arrowed lines indicate new or changed information.

[Vertical line at side of paragraphs indicates requirements.

Manager, Product Engineering

Reason for Reissue:
1. To include information on lifting KS-20048 Batteries. (Pars. 2.1, Table "B", Pars. 10.1 to 10.3 and Fig. 8).
2. To include reference to Dets. 1, 2 45 and 46 "T" bar assemblies. (Pars. 5.71 and Figure 4 and 9.081 and Fig. 7).
3. To add new Figure 8 showing R-4101 Battery Lift.
4. To make minor changes and corrections throughout section.