# TEST LOADS FOR POWER EQUIPMENT

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## 1. GENERAL

### 1.1 Scope

1.11 This section describes the various standard load sets for testing power plants and various power sources.

1.12 The information herein is only general descriptive and operating information. For detailed information it will be necessary to refer to the TMO on the unit. The TMO in most cases will accompany the unit; in many cases a copy of the TMO will be in Handbook 100.

1.13 Maintenance and repair information for ITE-4782 and ITE-4785 will be found in the associated TMO.

## 2. PRECAUTIONS

2.1 Live loads must be clearly labeled with ID-1270 Warning Tags. "DANGER-KEEP AWAY" signs must also be posted around large loads to warn personnel.

2.2 If it is necessary to work on a live load, stand on dry insulating material. Use insulated tools and take extreme care not to touch two parts that may be at different potentials at the same time.

2.3 Remove potential from a water rheostat when not in use. The greatest damage to plates and other parts in the rheostats occur when the rheostat is allowed to "sit" on a dc power source.

2.4 Where possible install a water rheostat outdoors. However, in this case it will be necessary to drain the electrolyte out of the unit in freezing weather. If the rheostat is installed indoors, place the rheostat where equipment, floors, etc. will not be damaged by steaming or overflowing of the solution.

2.5 If a water rheostat is connected across the battery a fuse with a rating equal to about 125% of the desired load current must be used in the battery lead to the rheostat. A 60 ampere fuse, for example, is adequate when the R-2759 is connected across a battery.

## 3. ELECTRICAL CONNECTIONS

3.1 For the large load sets, ITE-4782 and ITE-4785, test leads are not furnished and must be ordered separately. R-3413 leads can always be used, within their rating, for connecting these loads. However, each R-3413 lead is only 50 feet long with a rated capacity of 900 amperes and an insulation rating of 125 volts.

3.2 If power wire is to be ordered for connecting the loads refer to Tables A, B or C for selecting wire sizes. Run a case ground on these loads, according to the tables.

TABLE A: LEADS FOR 208-250 VOLTS 3-PHASE AC

<table>
<tr><th rowspan="2">KW</th><th rowspan="2">LINE AMPS AT 208V</th><th colspan="2">MINIMUM LEAD SIZE</th></tr>
<tr><th>LINES</th><th>CASE GROUND</th></tr>
<tr><td>5</td><td>14</td><td rowspan="5">#8</td><td rowspan="6">#8</td></tr>
<tr><td>10</td><td>28</td></tr>
<tr><td>20</td><td>56</td></tr>
<tr><td>30</td><td>83</td><td rowspan="2">#4</td></tr>
<tr><td>40</td><td>110</td></tr>
<tr><td>45</td><td>124</td><td>#2</td></tr>
<tr><td>60</td><td>167</td><td>#0</td><td>#6</td></tr>
<tr><td>100</td><td>276</td><td rowspan="2">4/0 or 2- #2</td><td rowspan="3">#2</td></tr>
<tr><td>115</td><td>319</td></tr>
<tr><td>150</td><td>416</td><td>350 MCM or 2- 2/0</td></tr>
<tr><td>200</td><td>555</td><td>500 MCM or 2- 3/0</td><td>1/0</td></tr>
<tr><td>225</td><td>625</td><td rowspan="2">750 MCM or 2- 4/0</td><td rowspan="2">2/0</td></tr>
<tr><td>250</td><td>695</td></tr>
</table>

TABLE B: LEADS FOR 416-500 VOLTS 3-PHASE AC

| KW | LINE AMPS AT 480V | MINIMUM LEAD SIZE | |
|---|---|---|---|
| | | LINES | CASE GROUND |
| 100 | 120 | #2 | #8 |
| 115 | 138 | | |
| 150 | 180 | 1/0 or 2- #4 | #4 |
| 200 | 240 | 2/0 or 2- #2 | |
| 225 | 270 | 4/0 or 2- #2 | |
| 250 | 300 | 4/0 or 2- #2 | #2 |

TABLE C: LEADS FOR 12-24-48 VOLTS DC

| LOAD AMPERES | MINIMUM LEAD SIZE (NOTE 1) | CASE GROUND |
|---|---|---|
| 50 | #8 | Connect CASE GROUND stud to plant ground lead with minimum #6 jumper |
| 100 | #4 | |
| 200 | 1/0 or 2- #4 | |
| 300 | 4/0 or 2- 1/0 | |
| 400 | 300 MCM or 2- 2/0 | |
| 800 | 2- 350 MCM or 1- R-3413 | |
| 1600 | 3- 500 MCM or 2- R-3413 | |

## 4. R-2759 WATER RHEOSTAT

### 4.1 Description

4.11 Figure 1 illustrates the R-2759 assembled for shipment. This rheostat is a two-terminal device which may be used as a dc load or as a single-phase ac load. Three of the units may be connected in Y or Delta as a three-phase ac load.

4.12 The R-2759 has the following loading capacities:

24, 48 and 130 volts dc: 50 amperes
230-240 volt 1-Phase ac: 6 KW

CAUTION: To prevent overheating of the solution do not exceed 50 amperes load current on dc. It may be necessary to dilute the solution to keep below 50 amperes.

### 4.2 Operation

4.21 Assemble the unit as follows:

4.211 Remove the cover after taking out the six bolts that hold the cover.

4.212 Remove the separator and the wooden spring pins from inside the tank.

4.213 Remove the bolts that hold the terminal bars in the shipping position. Remove terminal bars, clean contact areas of bars and plates and reassemble the bars so that they project outside the tank and bolt in this position.

4.214 Scrape out any sediment in the bottom of the tank. Clean the interior of the tank by flushing with water from a hose.

4.215 Fasten the load leads to the terminals of the rheostat with bolts and washers.

4.216 Replace the separator in the slot, place the wooden pins on the sides of the separator at the top and lower the separator until the pins rest on the cover.

4.217 Fill the tank to about two inches below the terminals with tap water. (About 18 gallons will be required) The time to obtain load current on dc will be shortened considerably if warm water is used in the tank.

4.218 Dissolve about three (3) tablespoons (1/4 cup) of sodium carbonate crystals in a pint of warm water for each rheostat and pour the pint of solution into the tank.

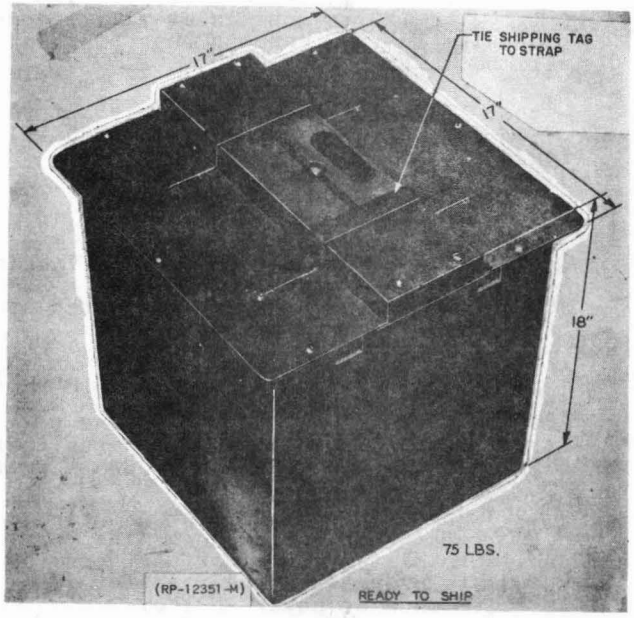



FIG. 1 R-2759 6 KW WATER RHEOSTAT ASSEMBLED FOR SHIPPING

4.22 Raise the separator to increase load current or KW. Hold the separator at the desired load point by placing the wooden pins on the sides of the separator.

4.23 If sufficient load current or KW is not produced with the separator all the way up make another pint of the sodium carbonate solution, lower the separator and slowly add the pint of solution to the rheostat.

4.24 If load current or KW is too high with the separator all the way down it will be necessary to dilute the solution. Disconnect the load, tip the tank far enough to spill out several gallons of solution and then add tap water to bring the level of electrolyte in the tank to about one inch below the terminals.

4.25 At the end of the test pour the solution out of the tank. Flush out the tank with a hose. Scrape or clean out any sediment in the tank.

4.26 Prepare for shipping as follows. Loosen the bolts holding the terminal bars, turn the bars inside the tank and tighten the bolts. Lower the separator through the slot in the cover, place the wooden pins inside the tank and replace the cover. Replace the six bolts that hold the cover in place. Tie a shipping tag to the strap on the cover.

## 5. ITE-4478 "L" CARRIER LOAD SET

5.1 The ITE-4478 Load Set consists of 20 porcelain lamp sockets wired in series. Figure 2 illustrates this load set ready for use.

5.2 The required load current from this load will be either 1.4 or 1.5 amperes, depending on the Power Section. In some cases 20 bulbs will be used on approximately 4400 volts; in other cases 10 bulbs will be used on approximately 2700 volts. Plant test sections describe the number and size of bulbs used.

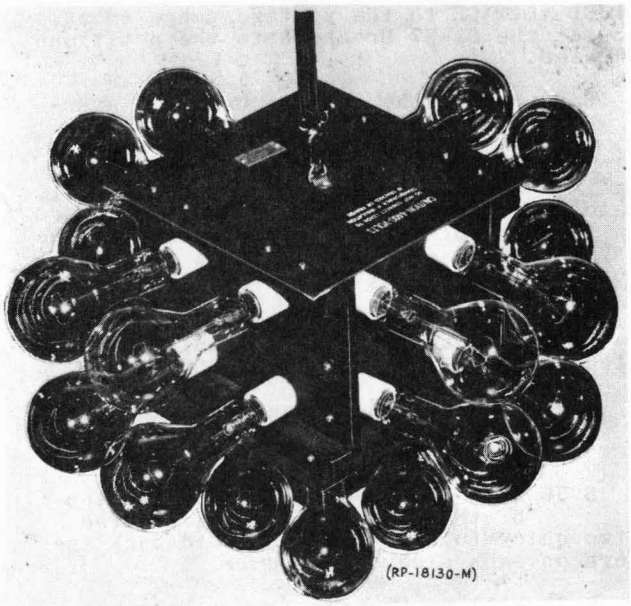
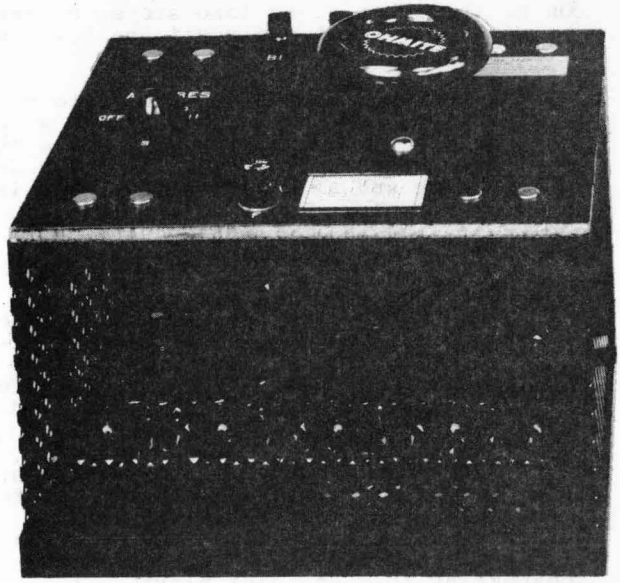



FIG. 2 ITE-4478 "L" CARRIER LOAD SET

## 6. ITE-4626 8-12 AMP LOAD SET

6.1 Figure 3 illustrates the ITE-4626 Load Set. The 8-12 ampere rating is at 48 volts.

6.2 This load is used to test small 24 and 48 volt rectifiers such as in a PBX.




(RP-11465M)

FIG. 3 ITE-4626 8-12 AMP LOAD SET

## 7. ITE-4686 CHANDELIER LOAD SET

7.1 This set is a cube (similar to the ITE-4478) with a total of 32 lamp sockets mounted on the six sides. Thirty-two ITE-4696 Resistors (3 ohm, 60 watt) are shipped with the set. Two connecting leads, ITE-9452 and ITE-9453 are also shipped with the set.

7.2 Six switches and four binding posts are provided on the set to provide flexibility in the series-parallel arrangements of the lamp sockets. Resistors are sometimes used or for some applications light bulbs are used. With light bulbs only 24 sockets can be used out of the 32. Test sections for the various plants will give the recommended connection and set-up information.

7.3 The set is designed to be hung from superstructure by an ITE-4451 Strap (also furnished with the set). If all six sides of the set are equipped with resistors or lamps, the set must be hung up. If the lamp sockets on the bottom are not equipped the set may be placed on a stool. In this case precautions must be taken to avoid heat damage to surrounding equipment and to prevent persons from being burned by coming into contact with resistors or lamp bulbs.

## 8. ITE-4782 150 KW AC/DC LOAD

### 8.1 Description

8.11 This unit uses coil-spring resistors cooled by a fan. Air is drawn in the bottom of the unit, pushed

through the coils and exhausted out the top. Resistors are grouped for various load combinations with bus bar links in the CONNECTION BOX at the rear of the unit.

8.12 There are 17 load steps. On ac only 10 steps are used and these are controlled by contactors operated from a remote control unit over a 40 foot cable. On dc the other seven load steps, controlled by manually-operated circuit breakers, may also be used.

8.13 Fan and contactors operate from 110 volts single-phase ac which connects to the control box through a three-wire power cord. Total current drawn with fan running and all contactors closed is about 7 amperes. The fan is a 1/2 hp motor which has a surge current of about 10 amperes at starting.

8.14 The load is semi-portable and mounted on four six-inch diameter rubber-tired wheels. Weight is approximately 540 pounds. It is approximately 52" high, 39" deep and 31" wide. Handles are furnished suitable for handling and hoisting the unit.

8.15 A case ground stud is furnished. However, resistors are isolated from the case. Line fuses and circuit breakers are contained in the load, making it unnecessary to use an external fuse when connecting to a dc power plant.

8.16 Hot air is exhausted directly out the top of the unit. The top cover is a two-piece fold-away type cover that remains attached to the unit. A storage box in the front holds the remote control unit, bar links and other hardware.

8.17 The unit has a canvas cover. This cover protects the unit during shipment and is suitable for outdoor storage.

8.18 The unit has the following capacities:

12 volts dc: 460 amperes
24 volts dc: 925 amperes
48 volts dc: 1850 amperes
130 volts dc: 1100 amperes
208 volts, 3-phase ac: 150 KW
480 volts, 3-phase ac: 200 KW
230-240 volts, 1-phase ac: 1.3-210 amperes
230-240 volts, 1-phase ac: 0.3-67 KW

8.19 Load leads are not furnished with the unit. R-3413 Wire & Lug Assemblies may be ordered or power wire may be ordered. If power wire is used it will be necessary to furnish solderless-type lugs for connecting. (See Paragraph 3)

8.2 Precautions

8.21 The load requires an adequate amount of cooling air. There should be a clear space of at least 3 feet on the three intake (grilled) sides of the unit.

8.22 The unit must be placed in an outside doorway or completely outside for engine-alternator tests which normally last three hours.

8.23 The unit may be used indoors for tests about 20 minutes in length, which covers most rectifier and dc plant tests. Be sure to place the unit some distance from batteries as there may be some sparks generated when contactors are operated or released. The 50 foot R-3413 leads and the 40 foot remote control cable will allow the unit to be placed at a safe distance.

8.24 DO NOT USE A FORK LIFT TRUCK TO HANDLE THE UNIT after the original shipping skid has been removed.

8.3 Set-Up Operations

NOTE: Refer to connection tables D through H.

8.31 Remove the canvas cover, fold it flat and store it away.

8.32 Remove the CONNECTION BOX cover (rear of unit).

8.33 Remove the storage box (front of unit) which contains the control unit, connection links and other hardware.

8.34 Remove the canvas bag from the storage compartment that contains the bar links and hardware. Mount the required bar links. Leave unused links and hardware in the canvas bag. Refer to appropriate tables D through H.

NOTE: When mounting the large bus link for the dc operation, tighten the 28 nuts on the small studs at least twice. Tighten once around with the Spin-Tite wrench and then make a second complete round.

8.35 Refer to the appropriate tables. Set the switch marked SET TO MATCH APPLIED VOLTAGE to the voltage range shown. Also set the S1-S7 Breakers to the positions indicated.

8.36 Remove the control unit and associated cables from the storage box. Remove the canvas cover from the control unit and hang the control unit by the hook in a convenient location. Operate all toggle switches on the control unit to OFF. Plug the control cord into the socket in the CONNECTION BOX. Plug the control cord into a convenient 115 volt socket.

8.37 After line connections have been made and the control unit connected, replace the CONNECTION BOX cover.

NOTE: There is a cover interlock that must be closed before the fan will operate.

8.38 Open the cover plates on the top of the unit. These are secured by two quick-turn fasteners. Fold back the covers on each side of the unit.

8.39 Roll up the two canvas bags and put them back in the storage box. Mount the storage box on the front of the unit.

8.4 Loading AC Power Sources

8.41 Be sure connection links are correctly placed, INPUT VOLTAGE SWITCH is set to match the source voltage

TABLE D

200-250 VOLTS 3-PHASE AC

VOLTAGE SWITCH AT "208-250 V AC"

CLOSE BREAKERS S1-S7

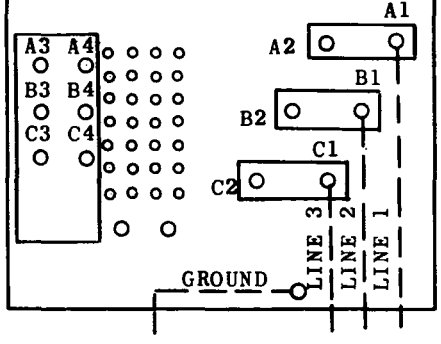



TABLE E

416-500 VOLTS 3-PHASE AC

VOLTAGE SWITCH AT "416-500 V AC"

OPEN BREAKERS S1-S7

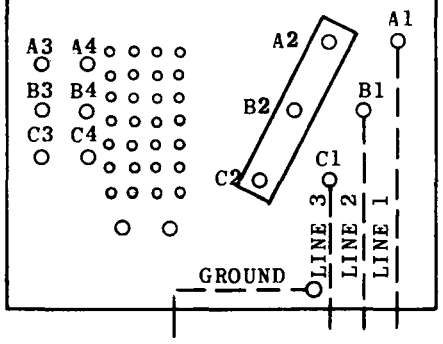



TABLE F

230 VOLTS 1-PHASE AC

VOLTAGE SWITCH AT "416-500 V AC"

OPEN BREAKERS S1-S7

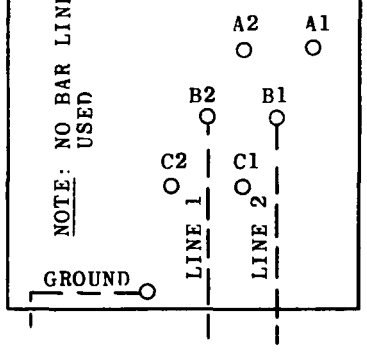



TABLE G

12-24-48 VOLTS DC

VOLTAGE SWITCH AT "12-24-48 V DC"

OPEN BREAKERS S1-S7

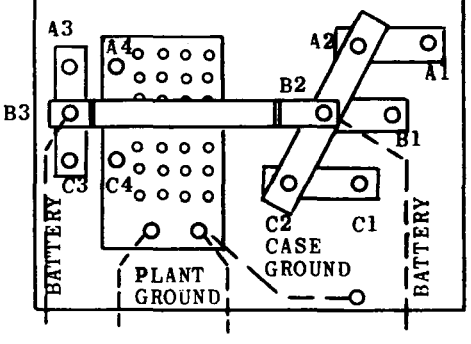
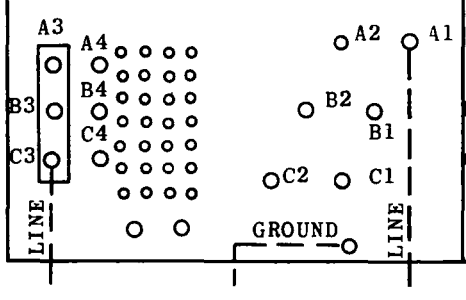
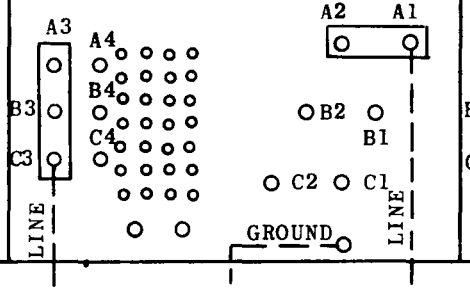
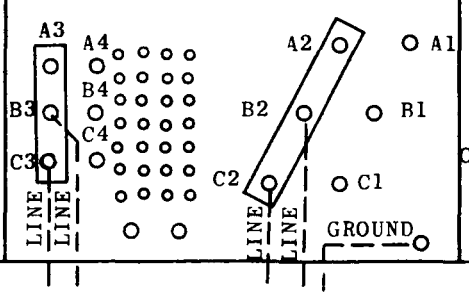
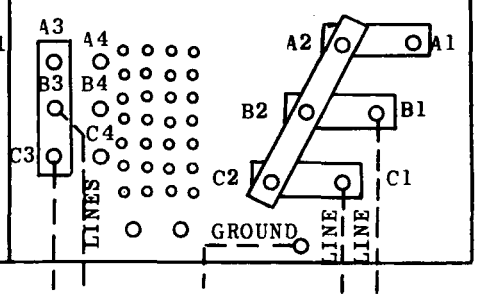



TABLE H 130 VOLT DC CONNECTIONS

| VOLTAGE SWITCH AT "208-250 V AC" | OPEN BREAKERS S1 THRU S7 | | |
|---|---|---|---|
| (NO. 1) CAPACITY = 207 AMPS | (NO. 2) CAPACITY = 414 AMPS | (NO. 3) CAPACITY = 552 AMPS | (NO. 4) CAPACITY = 1104 AMPS |
| S1 THRU S4 = 46 AMPS<br>S5 = 23 AMPS | S1 THRU S4 = 92 AMPS<br>S5 = 46 AMPS | S1 THRU S4 = 138 AMPS<br>DO NOT USE S5. S6. S7 | S1 THRU S4 = 276 AMPS<br>DO NOT USE S5. S6. S7 |
|  |  |  |  |



NOTE 1: Tables D through H cover VOLTAGE SWITCH positions, Breaker positions and bar link placement for various voltages.

NOTE 2: IS1 interlock is actuated by large DC bar link. IS2 interlock is actuated by A3-B3-C3 bar. IS3 interlock is actuated by connection box cover.

and S1-S7 breakers are set correctly. All toggle switches on the control unit should be at OFF.

8.42 Start the fan on the load by operating the BLOWER switch to ON. When the fan is up to speed the indicating lamp on the control unit lights. At that time operate the MASTER LOAD switch to ON.

8.43 When ready to load an engine-alternator, close its circuit breaker. Load the engine-alternator by operating Control Box toggle switches to ON.

8.44 The entire load may be dropped and reapplied by operating MASTER LOAD switch to OFF and then back to ON.

8.45 After completing the test run, operate all load switches to OFF. Allow the Blower to run a few minutes to cool the resistors. Then operate BLOWER switch to OFF.

8.5 Loading 12, 24, and 48 Volt dc Plants

8.51 Be sure all connection links are correctly placed, INPUT VOLTAGE SWITCH is set at 12-24-48 VDC, and S1 through S7 breakers are open. All toggle switches on the control unit should be at OFF.

8.52 Start the fan on the load by operating the BLOWER switch to ON. When the fan is up to speed, the indicating lamp on the control unit lights. At that time operate the MASTER LOAD Switch to ON.

8.53 When ready to load the dc source, operate load toggle switches to ON. If more load is desired, the S1 through S7 Breakers on the load, itself, have to be operated manually.

8.54 All the load controlled by the contactors (toggle switches) may be dropped and reapplied by operating the MASTER LOAD Switch to OFF and back to ON.

8.55 After completing the test, operate all load switches to OFF, including the S1 through S7 Breakers. Allow the Blower to run a few minutes to cool the resistors. Then operate BLOWER switch to OFF.

8.6 Loading 130 Volt dc Plants

8.61 The load steps are closed through the S1 through S7 breakers and not by using the contactors. The contactors will not make or break 130 volts dc without excessive arcing and contact damage.

8.62 Be sure all connection links are correctly placed, INPUT VOLTAGE SWITCH is set at 208-250 VAC and S1 through S7 breakers are open. All toggle switches on the control unit should be at OFF.

8.63 Start the fan on the load by operating the BLOWER switch to ON. When the fan is up to speed, the indicating lamp on the control unit lights. At that time operate the MASTER LOAD switch to ON.

8.64 When ready to load the dc source, refer to Table H. First operate the contactors, using the toggle switches on the remote control unit, for the load step desired. Then apply load by operating S1 through S7 Breakers. In some cases S6 and S7 do not apply any load.

NOTE: The 3-Pole breaker trip units are rated at 100 amperes, and single-pole breakers at 50 amperes. Table H shows "DO NOT USE" where these ratings are exceeded.

CAUTION: In this application do not use the MASTER LOAD switch to remove the load.

8.65 After completing the test, reduce load to zero by opening breakers S1 through S7. Then operate load toggle switches to OFF on the remote control unit. Operate MASTER LOAD Switch to OFF.

8.66 Allow the Blower to run a few minutes to cool the resistors. Then operate BLOWER Switch to OFF.

8.7 Preparation for Shipment

8.71 Remove the CONNECTION BOX cover and disconnect the line leads. It will not be necessary to remove bar links from the CONNECTION BOX panel. However, be sure all nuts are tight so that they will not come off in transit.

8.72 Disconnect the control unit power cord from the ac receptacle. Disconnect the control cable from the load.

8.73 Remove the storage box from the front of the unit.

8.74 Place a small canvas bag over the control unit. Roll up the two cords attached to the control unit. Open the cover of the storage box and put the control unit and attached cords into the storage box. Close the storage box and replace it on the front of the unit.

8.75 Replace the CONNECTION BOX plate.

8.76 Open the SWITCH PANEL cover. Check the position of Breakers S1-S7. Operate these to OFF position if not already OFF. Close the cover over the breakers.

8.77 Close the top cover of the unit. Put the canvas cover on the unit.

8.78 Place shipping papers in the envelope on the front of the unit.

9. ITE-4785 250KW 3-PHASE AC LOAD

9.1 Description

9.11 This unit uses coil-spring resistors cooled by a fan. Air is drawn in the bottom of the unit, pushed through the coils and exhausted out the top.

9.12 There are six load steps, four 50KW steps and two 25KW steps. The unit operates on 3-phase ac only, in the range 208-240 volts and 440-500 volts. The 1 hp fan is a 3-phase fan, prohibiting the use of the load on anything but 3-phase ac sources.

9.13 The load is semi-portable and mounted on four four-inch diameter rubber-tired wheels. Weight is approximately 490 pounds. It is approximately 52" high, 42" deep and 31" wide. Handles are furnished suitable for handling and hoisting the unit.

9.14 The unit has a canvas cover. This cover protects the unit during shipment and is suitable for outdoor storage.

9.15 Line cables are not furnished. Order either R-3413 Wire & Lug Assemblies or RH-RW power wire. If power wire is ordered it will be necessary to order solderless connector for the load terminals.

9.2 Precautions

9.21 DO NOT USE A FORK LIFT TRUCK TO HANDLE THE UNIT. This may cause damage to the undercarriage.

9.22 DO NOT USE THE LOAD ON DC VOLTAGE SOURCES NOR SINGLE-PHASE AC SOURCES. The three-phase fan motor, operating from source voltage, prevents use of this load on anything but three-phase ac power sources.

9.23 The fan motor requires 1-2-3 phase sequence for correct direction of rotation, and a "PHASE SEQUENCE" switch is provided to change motor connections for correct rotation. DO NOT CHANGE THIS SWITCH FROM ONE POSITION TO ANOTHER (ABC or CBA) WITH POWER APPLIED TO THE MOTOR. The high current drawn by the motor in reversing may cause the switch to explode. It will also be necessary to wait for the motor to stop before applying voltage, if it was necessary to change the switch position, to prevent damage to the switch.

9.3 Set-Up Operations

9.31 Place the unit outdoors, making sure there is at least 18" minimum air space at the sides and front. If two or more units are used, they must be spaced at least 3-feet apart. Remove the canvas cover.

9.32 The skids may be removed from the bottom of the unit and it will then be portable, sitting on four - 4" diameter rubber-tired wheels. Skids are bolted on in four places, two on each skid. Access to the bolts is in the connection compartment in the rear (remove bottom rear plate) and in the front of the air intake area (remove front bottom access screen).

9.33 Remove the rear cover and make the line and case ground connections. R-3413 leads may be used and bolted directly to A, B and C terminals, or, RH-RW power wire may be used for connections after mounting solderless terminal lugs on the terminals.

9.34 After line connections are made replace the cover on the connection compartment.

9.35 Open the two small doors on the front of the unit. On the right there are two rotary switches and a bus bar link. Set the switches and link as follows:

9.351 Operate PHASE ROTATION Switch to ABC.

9.352 Operate APPLIED VOLTAGE Switch to 210, 230 or 460, depending on the source voltage.

9.353 If the source voltage is in the range 200-210 volts place the neutral bar link on the 18 studs in the 200/210 position, using the Spin-tite Wrench in the compartment to tighten the nuts. Otherwise, leave the bar in the 230/460 position.

9.36 Remove the cover from the top of the unit. Take care to prevent large amounts of rain or snow from entering the unit. Once the fan is in operation, light rain or snow will be blown away. However, if there is a severe storm, it would be well to erect a shelter of some sort about ten feet above the top of the unit.

9.37 Close the small door on the front of the unit. Observe that all control switches on the left panel are at the OFF position.

9.4 Operation

9.41 As soon as ac power can be connected to the load check fan rotation. Do this as follows:

9.411 Operate BLOWER switch to ON. The fan should start. If the fan rotates in the correct direction, air will be blown out the top of the unit. Also, the green indicating lamp will be lit.

9.412 If fan rotates in the reverse direction, air will be blown out of the bottom of the unit. Also, the red indicating lamp will be lit.

9.413 If fan rotates in the wrong direction, immediately operate BLOWER switch to OFF. Wait several minutes until the fan stops. Then operate PHASE ROTATION switch to CBA position. Again operate BLOWER switch to ON. Fan should now rotate in correct direction and the green indicating lamp should be lit.

9.42 With the fan operating operate MASTER LOAD switch to ON. Load the voltage source as required by operating the various load step switches to ON.

9.43 There are no small steps of load on the unit. If necessary to have an exact KW load, the source voltage should be changed. (The KW load will increase if voltage increases).

9.44 After a load has been set up, the entire load may be thrown off and then on by operating the MASTER LOAD switch to OFF and then back to ON.

9.45 When through using the load, operate the load switches to OFF. Allow the fan to run about two minutes to cool the resistors before turning off the fan. Then operate BLOWER switch to OFF.

9.46 Disconnect the voltage source from the load. If the load will not be used again, remove the line and ground connections.

9.5 Preparation for Shipment

9.51 When through using the load, replace the top cover and secure it in place.

9.52 Disconnect the line and ground connections. Replace the bolts, washers and nuts on the line terminals.

9.53 If the wooden skids were removed, replace these and tighten the nuts on the bolts holding the skids to the bottom of the unit.

9.54 Replace the rear cover over the connection compartment.

9.55 Close the two doors on the front of the unit.

9.56 Place the canvas cover on the unit and close it up with the zippers. This cover is expected to provide adequate protection for outdoor storage.

10. OTHER TYPES OF LOADS

10.1 Sometimes resistances, lamps or heater units are specified for tests. These loads are noninductive.

10.2 Some telephone companies have installed permanent artificial loads for routining engine-alternators. Their capacity will generally be about 30% of the rating of the engine-alternator(s). These may be used as part of the load for both Preliminary and Acceptance Tests with the telephone company's permission.

10.3 New supplementary loads, KS-20023, are being provided for routine testing of engine-alternators. These are in the radiator discharge ducts and may be used as part of the test load on the engine-alternator. These loads are less than 30% of the rating of the associated engine-alternator and are intended to supplement office load for routine runs so that the engine-alternator is loaded at least 30%.

10.4 Office load (telephone equipment) should be used whenever possible to supplement artificial load if inadequate artificial load has been provided. This is useful on engine-alternators because it gives an idea of how the engine-alternator reacts to a load other than unity power factor.

10.5 There have been a large number of rectifier additions to existing power plants. Office load should be used here wherever possible to load the new unit. Many rectifiers are not exactly stable when an artificial load is directly connected to them.

Arrows not shown due to extensive changes.

Manager, Product Engineering

Reasons for Reissue:
(1) To remove information on R-3104 Water Rheostat.
(2) To add information on ITE-4686 and ITE-4782 Test Loads.

Replaces Section 24 dated 12-16-65.