AC POWER FAILURE
OPERATION INSTRUCTIONS
GUIDELINES FOR INDIVIDUAL OFFICE PROCEDURE

CONTENTS PAGE

1. GENERAL

1.01 This section provides guidelines for establishing a procedure to be followed in the case of a failure of commercial power service. Because of the great differences in plants and in conditions, this section may be used most advantageously as an outline or guide when preparing information for the individual office.

1.02 Whenever this section is reissued, the reason(s) for reissue will be given in this paragraph.

2. OPERATION INSTRUCTIONS

A. General

2.01 Each office equipped with essential telephone switching, transmission apparatus, or data processing systems is required to post operation instructions to be used when there is a loss of commercial power service. The operation instruction details must be defined locally and updated as necessary by the operations personnel responsible for the telephone power plant maintenance. Where essential data processing systems are located, particular attention to computer support is required. All employees in each location who might be called upon to assist in performing the operation instructions should be familiar with their content.

2.02 Sketches, photographs, and labels may be helpful in relating written instructions to hardware components and should be used when possible. Labels can be attached to individual equipment components outlining the operation procedures, practice numbers, and drawing numbers. This is particularly recommended on such items as manual operation of the emergency cell switch.

2.03 Operation procedures should be periodically reviewed, particularly after power plant additions or changes.

B. Format

2.04 The operation instructions should include a method of procedure and reference material designed to assist in timely restoration of ac power. The instructions should be preceded by a general description of the plant involved and an outline or table

of contents of any reference material included. An example is shown in Fig. 1.

(a) ***Method of Procedure (MOP):*** The MOP should contain a simple, yet concise, procedure to provide emergency standby ac power. This section should be prepared in a logical sequence as if all steps will successfully be performed. It is helpful to coordinate the MOP steps with numbers displayed on the labels on equipment components. An example of a MOP is shown in Fig. 2.

Note: Since ac Power Failure Operations Instructions may vary greatly, simple examples only are provided to display acceptable instruction detail. The few reference parts included should not be duplicated since they will not exactly apply to any individual office.

(b) ***Reference:*** Reference material should contain more detailed information which may be used if required during the performance of the MOP. Examples of reference material are shown in Fig. 3, 4, and 5.

C. Method of Procedure

2.05 When preparing a MOP for an office, the following operations should be addressed where appropriate.

(a) Operation of emergency lighting

(b) Retiring alarms

(c) Status of telephone power plant

(1) Transfer of ringing supply

Note 1: In non-Electronic Switching System (ESS) offices, the ringing plant will automatically transfer the load from the normal to the spare unit if there is an input failure, interrupter failure, low ringing voltage, or high ringing voltage. If an automatic transfer does not take place, the load on most plants may be transferred manually. The manual procedures should be posted on the plant. Refer to the Bell System Practices (BSPs) on the particular ringing plant for additional information.

Note 2: In ESS offices, the ringing plant contains automatic transfer equipment that is under system control. Any transfer or work operation requires prior consultation with personnel of the ESS. Refer to the BSPs on the particular ringing plant for additional information.

(2) End cell switch

Note: The end cell switch can be operated manually by placing the plant in manual operation and pushing the raise button to raise the voltage or the lower button to lower the voltage. If the switch still does not operate, it may be moved by a handle or hand crank. The appropriate BSP and/or circuit description on the plant will give the operating instructions such as: removing fuses, disconnecting motor, if necessary, cranking, positioning switch, etc.

(3) Countercell

(4) Estimated ampere-hour battery reserve (see Section 790-100-655)

(5) Inverter operation

(6) Plant voltage requirements.

Note: If it is confirmed that the central office equipment is inoperative due to the low battery voltage, a ***supervisor*** should direct the removal of the discharge fuses. The removal of the office load generally allows the battery to recover enough to provide power plant control voltage.

(d) Manual start and transfer of stationary standby ac plant

(1) Air intake and exhaust louvers

(2) Fuel valves and fuel supplies

(3) Lube oil level

(4) Cooling water level

(5) Exhaust moisture drains

(6) Voltage adjustment

(7) Transfer switchgear operation including load sequencing

(8) Engine-alternator logging and monitoring requirements during operation.

Note: See Section 155-185-302 and engine-alternator section for detailed starting instructions.

(e) Automatic start and transfer of stationary standby ac plant

(1) Engine-alternator operation including engine breakers, synchronization, meter readings, and voltage adjustment

(2) Position of transfer switchgear

(3) Air intake and exhaust louvers

(4) Fuel valves and fuel supplies

(5) Engine-alternator logging and monitoring requirements during operation.

Note: See Section 155-185-302 and engine-alternator section for detailed starting instructions.

(f) Manual hook-up and start of portable standby ac plant

(1) Engine-alternator availability (phase and voltage compatible)

(2) Towing arrangements and parking location

(3) Electrical hook-up

(4) Fuel valves and fuel supplies

(5) Lube oil level

(6) Cooling water level

(7) Exhaust moisture-drains

(8) Engine-alternator operation including meter readings and voltage adjustment

(9) Transfer switchgear operation.

Note: See Section 155-185-302 and engine-alternator section for detailed starting instructions.

(g) Operation of building items such as air conditioning, sump pumps, lighting, dehydrators, and elevators (see essential service list)

(h) Operation of protected and essential data processing systems

(i) Cause of failure

(1) Status of ac switchgear and breakers

(2) Contact with commercial power company.

(j) Reporting condition of service

(k) Restoral to normal operation

(1) Load transfer

(2) Engine-alternator shutdown

(3) Building systems

(4) DC power plant

(5) Boost charging, including emergency cells

(6) Restoral reports.

D. Reference

2.06 This material will contain more detailed instructions to assist as necessary to perform the MOP. The parts of this material should be referenced in the steps contained in the MOP. The following items should be included in the reference material when appropriate.

(a) Spare parts and components locations.

(b) Manual operation of automatic air louvers.

(c) Manual operation of automatic transfer switchgear and contingency plan for stuck "off normal" transfer switchgear.

(d) ***Caution: When using automotive batteries, care should be taken to ensure compatibility with any charging device. Charging at a current value that is higher than that which can be absorbed by the cell can result in overheating or harmful gassing.*** Engine-alternator start battery charging or replacement.

(e) Service condition reporting requirements.

(f) Boost charging main battery strings.

(g) Deep discharge recovery.

(1) Cell reversals

(2) Starting rectifiers.

(h) Contingency plan for failure of standby ac plant (including single engine in multiple operation).

(1) ***Load Shedding:*** When applying loads to the standby ac plant, it is desirable to connect all required items in the sequence of the largest to the smallest. This procedure allows the largest starting inrush currents to occur at a time when the standby ac plant is not loaded sufficiently for the starting load to exceed the rating of the plant. Generally, ***load shedding*** will follow an opposite sequence from loading.

Note 1: It is sometimes possible for the load to exceed the capacity of the standby ac plant. In such cases, the energizing of equipment should be manually controlled and limiting the amount of load may be necessary; ie, reduce lighting, stop some charging units, etc.

Note 2: With ***multiple engine*** operation, the loss of one unit will probably cause the remaining set(s) to become overloaded unless they are operating on separate busses. Therefore, some must be removed ***immediately*** from the system.

- ***Deload*** the plant by shutting off the lights and other nonessential equipment. Additional load may be removed by stopping some charge units in the dc power plants.
- ***Picking up load*** with separate bus operation requires the closing of an interconnection between the two busses. This procedure must be listed in detail and posted at the house service board. The steps usually include opening the circuits associated with the "down" unit, closing the tie breaker between busses and applying load by closing selective breakers.

(2) Backup engine-alternator.

(i) Estimated fuel consumption rate and tank filling procedures.

(j) Contact telephone numbers (both in and out of normal business hours).

(1) Office supervisors

(2) Control centers

(3) Contractors

(4) Fire, police, and ambulance

(5) Power company

(6) Telephone company staff support.

(k) House service board failures.

Note: Most failures in a house service board require the services of an electrical contractor whose name, address, and phone number(s) should be posted on the house service board as well as in these instructions.

(l) Ground fault detection

Note 1: Ground fault detection is provided in many house service boards to disconnect the ac supply if it should become grounded within the building. Excessive current flowing in the ground system will activate the ground fault detection circuit which should open the main circuit breaker(s) or switch, prevent the emergency engine(s) from running and provide alarm indications. An external fault might cause a false operation of the ground fault circuit.

Note 2: Procedures to be performed following activation of ground fault detection should have been posted at the house service board by the contractor when the circuit was installed. It basically consists of opening all distribution circuits, closing the main breaker(s), or switch selectively closing the distribution circuits to determine which one is in trouble.

(m) Associated drawing numbers, BSPs, and operating manual references.

GENERAL DESCRIPTION

This No. 1 ESS office is equipped with a -48V and a +24V 111A power plant, a 660B converter, a 504B inverter, and a standby ac plant with a manual start 225 KW, KS-15929 emergency engine-alternator with manual transfer switchgear. The office is also equipped with an 812A ringing and tone plant mounted in the ESS switchroom.

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The Emergency Operation Instructions are provided to assist personnel in the case of a failure of commercial power service. Procedures included in these instructions should be performed as described.

Method of Procedure
Reference Part A — Transfer Switchgear
Reference Part B — Start Batteries
Reference Part C — Service Condition Reporting
Reference Part D — Boost Charging Main Batteries
Reference Part E — Deep Discharge Recovery
Reference Part F — Contingency Plan for Failure of Standby AC Plant
Reference Part G — Fuel Consumption and Tank Filling Procedures
Reference Part H — Contact Telephone Numbers
Reference Part I — Emergency Parts and Components Locations
Reference Part J — Main String Battery Replacement
Reference Part K — House Service Board Failures
Reference Part L — Ground Fault Detection
Reference Part M — Associated Drawing Numbers and Bell System Practices

Fig. 1—Typical General Description Table of Contents

METHOD OF PROCEDURE

The steps outlined in this procedure may require operating personnel to work in close proximity of moving machinery and high electrical potentials. The personnel involved should proceed with caution and clearly understand these instructions before performing each step.

Each step described will be assigned a numerical designation that will correspond to an identical reflective tag on the appropriate machinery or control equipment (unless otherwise specified "not tagged"). The attending personnel will require a battery lantern or flashlight to permit easy identification of equipment (flashlight mounted on wall adjacent to the power room door). Ear and eye protection are required (mounted on wall adjacent to the power room door). All BSPs and drawings are found in the bookshelf and file next to the power room door.

Note: This plant is equipped for 5 hours of battery reserve at the busy hour current drain of 350 amps on the -48V bus and 700 amps on the +24V bus.

STEP	PROCEDURE
1	Emergency lights over the engine-alternator control panel should be working. If not, check to make sure the emergency light switch located adjacent to the power room door is in the on position.
2	(Not Tagged) Power room alarms may be silenced. A note should be made as to which alarms are operated for later investigation.
3	The 504B inverter should be checked for proper operation. If the inverter has failed, check for fuse problems, otherwise proceed to Step 4 and investigate the inverter failure later.
4	Check plant voltages for status condition. Note the time and voltage reading as they may be needed for later reference. With alternating current off, normal voltages are +22.5 to +24 volts and -45 to -48 volts. ***Note:*** If the battery plant is discharged below +21 or -42 volts, go to referenced Part E after completion of Step 24.
5	Check the fuel supply. Observe the indication on the fuel gauge to the right of the engine control panel. Do not permit the tank to drop below two-thirds full before ordering a fuel delivery. For fuel delivery, see Reference Part G.
6	Manually crank open intake air louvers (rotate handle clockwise).
7	Manually open exhaust air louvers (release chain clasp at top of engine radiator housing, pull down, and attach to the ring at the bottom of radiator housing).
8	Open fuel valve (turn the red handle fully counterclockwise).
9	Close drain valve in the exhaust line (turn green handle fully clockwise).

Fig. 2—Typical Method of Procedure (Sheet 1 of 7)

STEP	PROCEDURE
10	Check that the reset lever of the air damper at the blower inlet housing is in the running or horizontal position. To set this damper, the remote EMERGENCY ONLY-PULL TO STOP knob (located in front of air filter) must be pushed all the way in. Then push down on the small lever at the shaft until it locks. Before the switch can be reset, the air damper must be reset. This is done by moving the arm on the switch controlling the solenoid to the left (towards the governor). The switch linkage (EMERG SWITCH) is now in the run position. The air damper is operated normally by the solenoid when either the engine overspeeds, the water temperature becomes excessively high, or the lubricating oil pressure fails during operation. Operation of the reverse power relay will also operate the solenoid.
11	Check that the circuit breaker located back of the control panel is in the OFF position. If not in that position, drop the control panel to reach the handle for manually operating the circuit breaker. Operate the breaker to the OFF position using the handle and then close the panel. The CIRCUIT BREAKER OPEN lamp will light when the ENGINE RUN switch is closed.
12	Make certain that Air-Box drain tanks (one on each side) are empty.
13	Check that the fuel cup and all fuel oil filters are filled.
14	Check the oil level in the crankcase with the dipstick located on the right side of the engine. If the oil level is below the L mark on the dipstick with the engine stopped, add sufficient oil to bring the level to the H mark.
15	***Caution: The engine should never be operated with the tank oil level in the crankcase below the L mark on the dipstick.*** ***Note:*** Lubricants and engine spare parts are located in the cabinet to the immediate left of the engine.
16	At the engine-alternator control panel, the following controls or indicators should be in the positions listed below. Lamps other than those listed should be extinguished. If other lamps are lighted, depress the TROUBLE RESET pushbutton which will restore all circuits to normal. If any lamp fails to extinguish, check for circuit or equipment faults and correct as necessary. See Section 155-185-301 for detailed instructions.

Fig. 2—Typical Method of Procedure (Sheet 2 of 7)

STEP	PROCEDURE	
	CONTROL OR INDICATOR AT CABINET	POSITION
	ENGINE RUN	ON
	SWITCH OFF NORMAL (lamp)	Not lit
	ENGINE SPEED CONTROL	Approximately vertical (off position)
	ALTERNATOR VOLTAGE	Full counterclockwise
	CIRCUIT BREAKER OPEN (lamp)	Lighted (green)
	EMERGENCY ONLY — PULL TO STOP switch (front air filters)	All the way in
	GOVERNOR (single operation)	To left (isochronous)
17	Depress the ENGINE START pushbutton on the control panel. This should start the cranking cycle and if, after 10 to 20 seconds the engine fails to start, release the ENGINE START pushbutton and check for failure to start. Allow 2 minutes between each attempt to start engine to permit starter to cool.	
18	***Caution: If the engine fails to start, do not depress the pushbutton until the cranking motor stops rotating. Serious damage to the cranking motor may result if the above is not followed. If the engine does not start after three or four attempts at starting, refer to TROUBLES at the end of Section 155-185-301.***	
19	(Not Tagged) Check engine for proper operation. (a) After the engine starts, release the ENGINE START pushbutton. Observe that the ENGINE OIL PRESSURE gauge on the control panel indicates a pressure and that it gradually increases to a minimum of 30 pounds. If after 10 or 15 seconds no pressure or low oil pressure is indicated, stop the engine immediately by operating the ENGINE RUN switch to OFF position. Determine the cause of the trouble and correct before the engine is started again. If oil pressure is indicated, engine may be permitted to run and engine oil pressure should gradually increase to approximately 50 pounds. ***Note 1:*** Depressing the EMERGENCY STOP pushbutton on the panel or at a remote location (if provided) will also stop the engine. However, this should not be used except in emergencies as the air shutdown latch and the EMERG SWITCH will be operated and will have to be reset manually as covered in Section 155-185-301.	

Fig. 2—Typical Method of Procedure (Sheet 3 of 7)

STEP	PROCEDURE
	Note 2: When the engine is cold, it will be noted that the oil pressure indicated on the gauge may rise above normal but as the engine warms up it will drop to normal pressure. (b) Allow engine to run for a few minutes to warm up. Check for any water, fuel, or oil leaks. Tighten any connections necessary. (c) After initial warmup, the ENGINE WATER TEMPERATURE gauge should indicate from 160° to 185°F and with the ENGINE OIL TEMPERATURE gauge indicating from 190° to 225°F. (d) Once the engine has started and stabilized, check the ac voltage of each phase using the VOLTMETER and VOLTMETER SELECTOR switch located on the control panel and adjust the voltage to the arrow on the gauge by operating the ALTERNATOR VOLTAGE knob on the panel. (e) Record engine run data on the displayed E5697 (Section 155-002-010).
20	Emergency Stopping of Set: (a) ***At the Engine:*** Pull the EMERGENCY ONLY-PULL TO STOP knob located in front of the air filter on the left side of the engine; this will also stop the engine. (b) When the set is shut down, the CIRCUIT BREAKER OFF lamp (green) will light, the red lamp will extinguish and the horn mounted inside the main control cabinet will sound, the circuit breaker will open, and the set will stop. The SWITCH OFF NORMAL lamp (red) will also light. Oil to the governor will also be dumped by the operation of the TSCV valve, thus causing the fuel rack to assume no fuel position. The lamps will remain lighted and the horn will continue to sound until the circuit has been restored to normal. Depressing the HORN DISCONNECT pushbutton will silence the horn while the trouble is corrected. To restore the circuit to normal, depress TROUBLE LAMP RESET pushbutton located on the front of the control cabinet. (c) The engine cannot be started again until the air damper and EMERG SWITCH are reset by hand as covered in Section 155-185-301, or in Step 10 of these instructions.
21	Follow the yellow tape on the floor to the ac transfer switchgear. Please note the switches marked A (Telephone Essential) and B (Building Essential). The up position is for commercial alternating current, the middle position is for off, and the down position is for standby alternating current.

Fig. 2—Typical Method of Procedure (Sheet 4 of 7)

STEP	PROCEDURE
22	Depress the lock button at the end of the A lever. While holding the A lever with both hands and the lock button depressed, move the lever in one continuous motion from the up position to the down position. Return to the engine control panel and observe voltage output. Adjust as necessary using the ALTERNATOR VOLTAGE knob on the panel. Allow the engine to stabilize for 5 minutes, then repeat this procedure for transfer switch B. ***Note:*** If the engine is unable to carry the load with both transfer switches in the down position, return transfer switch B to the up position. If either switch sticks in an off-normal position, go to Reference Part A.
23	(Not Tagged) Check status of 111A power plant to ensure rectifiers have restarted and float voltage has been achieved (24V Bus-25.8 to 26.3 volts; 48V Bus-51.5 to 52.6 volts). If RECT FAIL lamp is lit, operate the ON/OFF switch to OFF, then to ON to restart rectifier. If problems are encountered, refer to Section 167-217-102.
24	(Not Tagged) While the engine is running, certain checks are required. (a) Observe the following gauges located on the control panel or engine to see that the pressures or temperatures shown are being maintained at or above the minimums listed but ***do not exceed*** the maximum.

GAUGES	MIN READING	MAX READING
Engine Water Temperature	160°F	200°F
Inlet and Outlet Water Temperature at Engine	160°F inlet	200°F inlet
When Remote Radiator is Used	160°F outlet	200°F outlet
Engine Oil Temperature	190°F	225°F
Engine Oil Pressure	30 psi	55 psi

(b) Check that the lube oil filters are warm by feeling with your hand. If cold, it indicates that the filter or oil cooler is clogged. Correct as necessary.

(c) Keep engine clean and lubricated.

(d) If for any reason, the engine should shut down due to overspeed or reverse power, causing the overspeed trip or reverse power relays to operate, or high water temperature, or low lube oil pressure, any one of which will cause the air damper to close and stop the engine, allow the engine to come to a complete stop. After determining and clearing the cause of the shutdown, reset the air damper and EMERG SWITCH and repeat the starting operation.

Fig. 2—Typical Method of Procedure (Sheet 5 of 7)

STEP	PROCEDURE
	(e) ***Caution: Do not stop the engine by manually closing the air damper. This is an emergency shutoff only and is not intended to be used as a regular means of stopping the engine.***
	(f) Every 8 hours of continuous engine operation; check the oil level in the crankcase, while the engine is running, with the dipstick located just back of the oil cooler. If the oil level is at or has fallen below the L mark, lube oil should be added to bring the level up to the H mark. The engine must be stopped before adding oil.
	(g) ***Caution: The engine should never be operated with the oil level in the crankcase below the L mark.***
	Note: Additional information may be obtained in Section 155-185-301.
25	Check for proper operation of air conditioning unit. The green operate light should be on. If not, reset by operating the marked breaker to the right of the operate light.
26	Check for proper operation of dehydrator. The red operate light should be on. If not, reset by operating the marked breaker.
27	(Not Tagged) Based on alarm conditions, status of the ac switchgear, and information obtained from the commerical power company (see Reference Part H for telephone numbers), determine the likely cause of the failure and when commercial power will be restored.
28	(Not Tagged) Using the procedure outline in Reference Part C, report the condition of service as a result of the loss of commercial power.
29	(Not Tagged) After commercial power is restored for at least 15 minutes, return the power plant to normal operation.
	(a) Operate transfer switch lever B to the up position. Then operate transfer switch lever A to the up position. If either switch sticks in an off-normal position, go to Reference Part A.
	(b) Shut down procedure.
	(1) ***Caution: Never stop the engine by shutting off the fuel supply valve.***
	(2) Allow engine to run 3 to 5 minutes after deloading.

Fig. 2—Typical Method of Procedure (Sheet 6 of 7)

STEP	PROCEDURE
	(3) Open the circuit breaker by depressing the CIRCUIT BREAKER OPEN pushbutton on the panel. As soon as the breaker trips, note that the red indicating lamp which has been lighted goes out, and that the green indicating lamp lights, showing that the circuit breaker has opened. This green lamp remains lighted as long as the circuit breaker is in the OPEN position.
	(4) Stop the engine by operating the ENGINE RUN switch to OFF.
	(c) Restore air louvers (Steps 6 and 7), fuel valve (Step 8), and drain valve (Step 9) to original position.
30	***Caution: Do not boost charge batteries without reading Reference Part D.*** (Not Tagged) Check status of 111A power plant to ensure rectifiers are on and float voltage has been achieved. Detailed procedures are listed in Section 167-217-102.
31	(Not Tagged) Check for proper operation of air conditioning unit as in Step 23 of these instructions.
32	(Not Tagged) Check for proper operation of dehydrator as in Step 24 of these instructions.
33	(Not Tagged) Make final service condition report as outlined in Reference Part C.
34	Clean engine thoroughly and be sure it is in proper condition for the next run.
35	Check the amount of fuel in the tank and replenish as required so that there will be an ample supply for the next run.

Fig. 2—Typical Method of Procedure (Sheet 7 of 7)

BOOST CHARGING

1. ***DANGER: Wait 24 hours after boost charging before handling a cell.***

2. When the 111A power plant is used with ESS No. 1, No. 1A, No. 2 Traffic Service Position System (TSPS), Automatic Intercept System (AIS), 4A Electronic Translator System (ETS), etc, a boost charge to 2.20 volts per cell should not be scheduled. The voltage design of the components in the ESS Central Processor (CC, CS, and PS) will not tolerate the boost charge voltage of 2.20 volts per cell. If the battery is used to supply power during a power failure, they will recover full charge by using the normal float voltage of 2.17 volts per cell. See Section 167-217-301 for additional information.

3. If for some reason, an individual cell requires boost charging, instructions may be found in Section 157-601-701, Section 157-629-701, and Section 169-621-301.

4. Safety precautions during and after boost charging should be followed as outlined in Section 157-629-701.

Fig. 3—Typical Reference Part for Boost Charging Main Batteries

DEEP DISCHARGE RECOVERY

A. Rectifier Restart

If the battery voltage has become insufficient for starting the 111A plant after a deep discharge to below emergency volt limits, the procedure outlined in Section 167-217-301 should be used.

Note: If it is confirmed that the central office equipment is inoperative due to the low battery voltage, a ***supervisor*** should direct the removal of the discharge fuses. The removal of the office load generally allows the battery to recover enough to provide power plant control voltage.

B. Cell Reversal

The possibility of reversing a cell(s) should be suspected whenever a battery plant is discharged below 21 or 42 volts. If cell reversal is suspected, refer to Section 157-601-701 or Section 157-629-701 before recharging the cell(s).

Fig. 4—Typical Reference Part for Deep Discharge Discovery

CONTACT NUMBERS

Supervisors			
C.O. Power	John Doe	Ofc., 222-1234	Res., 222-1235
ESS	Joe Smith	Ofc., 222-1236	Res., 222-1237
Building Operations	Sue Jones	Ofc., 222-1238	Res., 222-1239
District Manager	O.C. Gates	Ofc., 222-4321	Res., 222-5321
Control Centers			
Switching Control Center		223-1234	
Building Operations Control Center		223-1235	
Contractors			
Engine Start Batteries — Hobbs Battery Company			Ofc. — 224-1234 Out of Hours — 225-1234
Engine Rental and Repair — Jones Equipment Company			Ofc. — 224-1235 Out of Hours — 225-1235
Building AC Switchgear — Gonzalez Electric			Ofc. — 224-1236 Out of Hours — 225-1236
Diesel Fuel — County Fuel Supply			Ofc. — 224-1237 Out of Hours — 225-1237
Fire Department		226-1111	
Police Department		226-1112	
Ambulance		226-1113	
Power Company	Business Hours Out of Hours	226-1114 226-1115	
Telephone Company Staff			
Power Engineer	Bill White	Ofc. 222-5432 Res. 222-6543	
Division Technical Staff	Ed Smith	Ofc. 222-7654 Res. 222-8765	

Fig. 5—Typical Reference Part for Contact Telephone Number